

PLANNING BOARD

Tuesday, January 9, 2024 at 4:30 PM
Hybrid Meeting, Room 24 (Basement
Level of City Hall) and Zoom



MEMBERS

Brandon Mazer, Chair
Justin Barker, Vice Chair
Marphleen Chann
Sean Murphy
David Silk
Austin Smith
Maggie Stanley

The Planning Board invites the public to attend the meeting in person or Zoom pursuant to the Remote Meeting Policy adopted by the Planning Board. Prior to the meeting, please check the Agenda Center (<https://portlandme.portal.civicclerk.com>) to view memos and reports which will be posted by the end of the day on the Friday before the Planning Board meeting. To submit written public comment on an agenda item, email planningboard@portlandmaine.gov. Submissions must be received by 12:00 pm the day before the Planning Board meeting to guarantee their inclusion in the agenda packet. All submissions must include the commenter's name and legal address. To help ensure your comment is submitted for the correct item, please include the name of the agenda item (see below).

REMOTE PARTICIPATION

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Webinar ID: 849 2215 6977

International numbers available: <https://portlandmaine-gov.zoom.us/j/84922156977>

AGENDA:

WORKSHOP - 4:30 PM

- i. Major Site Plan and Site Location of Development; 716 Stevens Avenue; University of New England, Applicant. The Planning Board will hold a hybrid workshop to consider a proposal by the University of New England to improve and expand an existing carriage road which connects the University's Portland Campus to its intermodal transportation facility located at 172 Bishop Street. Expansion of the carriage road will permit the Campus Shuttle, as well as students, staff, and faculty to drive, cycle or walk between the University's primary parking facility and campus without using public street facilities, and will reduce university related traffic through Morrill's corner. The subject property totals 28.1 acres, and is located in the R-3 and R-5 Residential Zones. A project and plan summary are available for viewing on the city's CSS Portal (<https://css.portlandmaine.gov/>) by referencing Plan Number PL-002666-2023.

PUBLIC HEARING - 5:30 PM

1. ROLL CALL AND DECLARATION OF QUORUM

2. COMMUNICATION AND REPORTS

3. REPORT OF ATTENDANCE AT THE MEETING HELD ON DECEMBER 12, 2023

Public Hearing

Planning Board Officer Elections: Chann, Mazer, Murphy, Silk, Smith and Stanley present. Barker absent.

477 Congress Street: Chann, Mazer, Murphy, Silk, Smith and Stanley present. Barker absent.

15 Crescent Street: Chann, Mazer, Murphy, Smith and Stanley present. Barker absent, and Silk recused.

66 Eighth Street: Chann, Mazer, Murphy, Smith and Stanley present. Barker and Silk absent.

4. REPORTS OF DECISIONS AT THE MEETING HELD ON DECEMBER 12, 2023

- i. Record of Decision for 19 Willis Street Appeal, Application PL-000807-2019 Mazer motioned, and Stanley seconded a motion to approve the supplemental approval letter as drafted and authorize the Board Chair to sign the letter as drafted. Vote 5-0, Barker absent and Murphy Recused.
- ii. Planning Board Elections Silk motioned, and Murphy seconded a motion to nominate Brandon Mazer as the Planning Board Chair and Justin Barker as the Vice Chair. Vote 6-0, Barker absent.
- iii. Major Site Plan; 477 Congress Street; GreenMars Real Estate Company, Applicant. Stanley motioned, and Murphy seconded a motion to approve the conditional use application for inclusionary zoning. Vote 6-0, Barker absent. Stanley motioned, and Silk seconded a motion to approve the major site plan application. Vote 6-0, Barker absent. Stanley motioned, and Silk seconded a motion to adopt the draft approval letter as drafted as the Planning Board's decision, and authorize the Board Chair to sign the letter as drafted. Vote 6-0, Barker absent.
- iv. Major Site Plan; 15 Crescent Street; Developers Collaborative, Applicant. Stanley motioned, and Murphy seconded a motion to the major site plan application. Vote 5-0, Barker absent, and Silk Recused. Stanley motioned, and Murphy seconded a motion to adopt the draft approval letter as drafted as the Planning Board's decision, and authorize the Board Chair to sign the letter as drafted. Vote 5-0, Barker absent and Silk Recused.
- v. Subdivision; 66 Eighth Street; Laurie Sirois, Applicant. Stanley motioned, and Murphy seconded a motion to waive Ch. 14, Sec. 15.5.4.J, which requires that sidewalk be constructed along all street frontages within a subdivision. Vote 5-0, Barker and Silk absent. Stanley motioned, and Murphy seconded a motion to waive Ch. 14, Sec. 15.5.4.K, which requires that curbing be installed along all street frontages within a subdivision. Vote 5-0, Barker and Silk absent. Stanley motioned, and Murphy seconded a motion to waive Ch. 14, Sec. 15.7.11.H, which requires that overhead utility lines be placed underground within a subdivision. Vote 5-0, Barker and Silk absent. Stanley motioned, and Murphy seconded a motion to approve the subdivision application. Vote 5-0, Barker and Silk absent. Stanley motioned, and Murphy seconded a motion to adopt the draft approval letter as drafted as the Planning Board's decision, and authorize the Board Chair to sign the letter as drafted. Vote 5-0, Barker and Silk absent.

5. NEW BUSINESS

- i. Conditional Use; 1901 Forest Avenue; M and G Auto Repair, Applicant. The Planning Board will hold a hybrid public hearing to consider a conditional use application to operate an

automotive dealership at a 0.75-acre property, located at 1901 Forest Avenue, in the B-2 Community Business zone. The automotive dealership is a conditional use in the B-2 zone, subject to Planning Board review per Ch. 14, Sec. 6.5.6.A. A project and plan summary are available for viewing on the city's CSS Portal (<https://css.portlandmaine.gov/>) by referencing Plan Number CU-002683-2023.

- ii. Major Site Plan and Conditional Use; 19 West Street; Carleton West, LLC, Applicant. The Planning Board will hold a hybrid public hearing to consider a proposal to redevelop an 8,360 square foot medical office building as a five-unit residential building, and construct two separate duplex structures on a 0.86-acre property addressed at 19 West Street, with frontage on Carleton Street. The project also involves the construction of 18 new parking spaces, and would further retain 23 existing parking spaces for use by neighborhood residents. The property is zoned R-6 residential, and is also located within the West End Historic District. A project and plan summary are available for viewing on the city's CSS Portal (<https://css.portlandmaine.gov/>) by referencing Plan Number PL-002614-2023 and CU-002693-2023.

To: Chair Mazer & Members of the Planning Board
From: Maya Balassa
Date: January 5, 2024
Re: UNE Connector Road
Project ID: PL-002666-2023
CBL: 145 B014001
Meeting Date: January 9, 2024

I. INTRODUCTION

The University of New England has submitted a Major Site Plan to facilitate the reconstruction of the Connector Road that runs from Bishop Street to College Street/Stevens Avenue for use by students, faculty staff, and the campus shuttle bus. This application is being referred to the Planning Board for compliance with the City of Portland's Land Use Code Site Plan Standards, Section 14.6.

The Planning and Urban Development Department mailed 107 notices advertising this meeting to property owners within 500 feet of the site. A legal advertisement ran in the December 28 and 29, 2023 editions of the *Portland Press Herald*.

Applicant: Andrew Philippe, University of New England
Applicant Tom Saucier, Site Design Associates
Representatives:

II. REQUIRED REVIEWS

<i>Review</i>	<i>Applicable Standards</i>
Site Plan	Section 14.6
Maine Site Location of Development	Delegated Review

<i>Waiver Requests</i>	<i>Applicable Standards</i>
The applicant is requesting to add lighting with a color temperature of 4000K.	Technical Manual, Section 12.3.5 requires all fixtures shall not exceed 3000K CCT. <i>Staff are supportive of the waiver.</i>

III. PROJECT DATA

Existing Zoning	R-5 Residential, R-3 Residential, IM Moderate Impact Industrial
Property Size	1,224,036 square feet
Existing Use	Roadway
Proposed Use	Roadway

IV. BACKGROUND AND EXISTING CONDITION

The University of New England – Portland Campus is located in Deering Center with its principal frontage along Stevens Avenue, and it occupies approximately 40 acres, extending west from Stevens Avenue towards Evergreen Cemetery, and northwest towards Bishop Street. In order to manage traffic and parking for students, faculty and staff, the University has been operating a shuttle bus between the core campus area and its Intermodal Transportation Facility, located off of Bishop Street. This shuttle operates along an existing Connector Road, measuring approximately 20 feet in width, that connects Bishop Street with College Street through an area of dense vegetation and wetlands.

In 2023, the City approved a major site plan ([PL-002343-2023](#)) to redevelop the Bishop Street Intermodal Transportation Facility, which as approved, involves the removal of approximately 2 acres of existing impervious area, and the regrading and repaving of the site to create a 344-space off-street parking area with sidewalks, plantings, stormwater soil filters and a shelter for the campus shuttle. The project included an access drive that is intended to connect to the Connector Road when it is realigned.

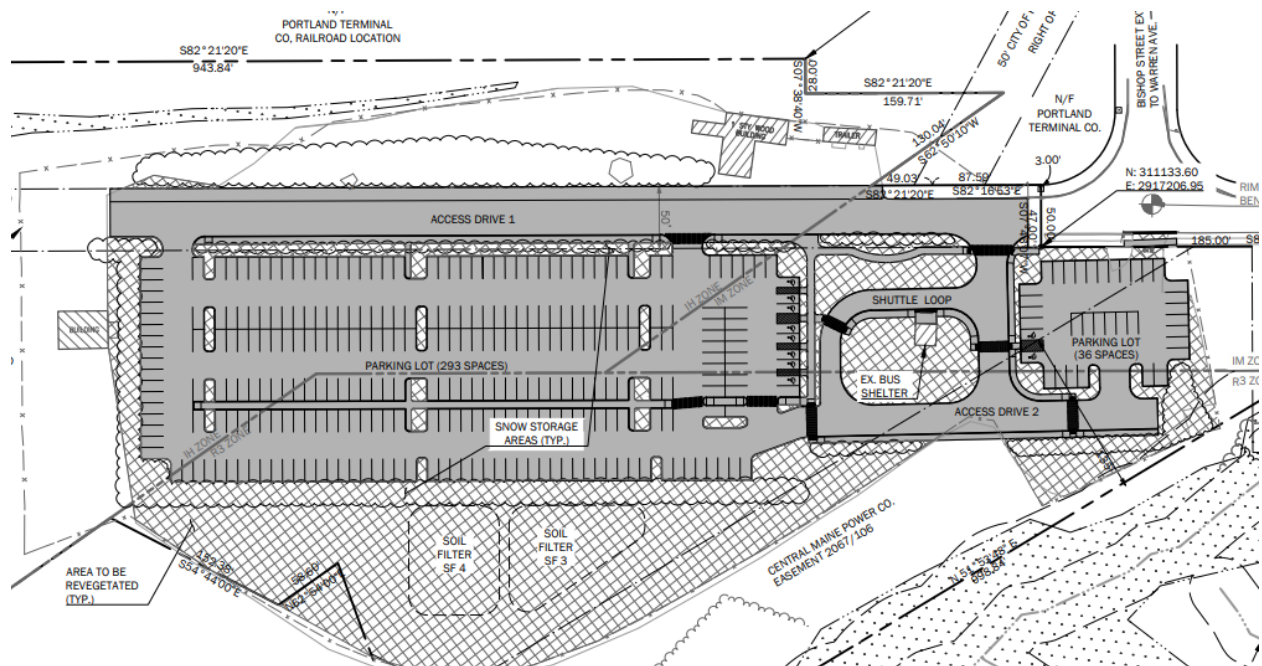


Figure 1 Approved Site Plan for 172 Bishop Street

V. PROPOSED DEVELOPMENT

The proposed Major Site Plan application would facilitate the reconstruction of the Connector Road on the UNE campus. The Connector Road is proposed to be realigned and widened to 31 feet, with a 24-foot street, five-foot sidewalk, and a two-foot gravel shoulder. The road currently connects directly to Bishop Street, however under this proposal, the Connector Road would be realigned to connect into the southeast corner of the Bishop Street Intermodal Transportation Facility. The curb cut along Bishop Street is proposed to be narrowed to prohibit cars, but would still allow for pedestrian and bicycle traffic.

The stormwater treatment for this project is being looked at in conjunction with the Intermodal Transportation Facility in the Site Location of Development Application. The stormwater features for the Intermodal Transportation Facility were oversized in anticipation of the Connector Road being developed with wetland impacts and increased impervious surfaces. Fifty percent of developed area (calculated with

both projects) is being treated with three soil filters. Two soil filters have been approved at the Intermodal Transportation Facility and one is being proposed for this project along the Connector Road.

The site plan shows 45 trees proposed to be removed in and near wetlands for this project. The applicant is proposing to plant 15 trees.

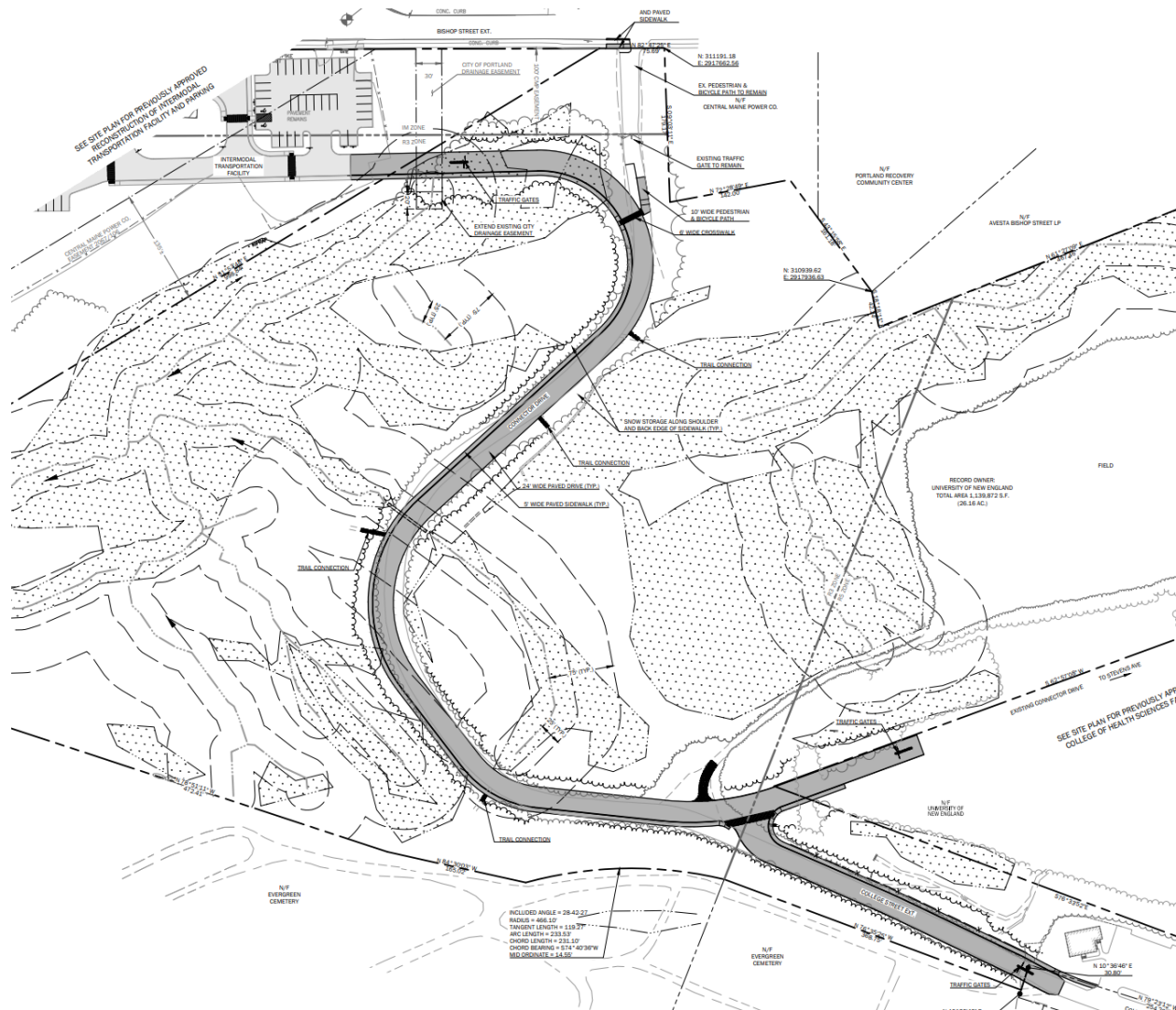


Figure 2 Site Plan

VI. RIGHT, TITLE, & INTEREST

The University of New England has shown right, title, and interest with the submission of the deed (Applicant Submittal D).

VII. FINANCIAL & TECHNICAL CAPACITY

The applicant has shown financial and technical capacity in their application documentation. The applicant, the University of New England, has submitted a letter certifying the institution has secured the required funding (Applicant Submittal F). The application was prepared by Tom Saucier, a licensed professional engineer from Site Design Associates, demonstrating adequate technical capacity (Applicant Submittal L).

VIII. ZONING ANALYSIS

The 28.1-acre site lies in the R-5 Residential, R-3 Residential, and I-M Moderate Impact Industrial zones. The proposed road and sidewalk would cover 4.7% of the lot. The proposed project is found to be meeting zoning requirements.

IX. SITE PLAN REVIEW STANDARDS (Section 14.6)

The proposed development has been reviewed by staff for conformance with the relevant review standards of the City of Portland's Site Plan Ordinance, Section 14.6.

1. Transportation Standards (Section 14.6.1)

A. Impact on surrounding street systems

The Connector Road will be utilized by staff, students, faculty, and a shuttle bus. By allowing access to and from campus through Bishop Street, the University can hopefully remove unnecessary trips through Morrill's corner.

The proposed sidewalk is intended to increase access by the public and add connectivity in the area.

B. Access and circulation

Access is proposed to be restricted at the entrance of the Intermodal Transportation facility and at the end of College Street to the Connector Road. The width of the roadway is proposed to be 24-feet (two 12-foot aisles). Staff have requested that the lanes be decreased to 11 feet, for a total roadway width of 22 feet. The City's third-party traffic engineer has attested that 11-foot-wide lanes will function safely as a shared lane with cyclists, while decreasing impervious surface, decreasing wetland impact, and decreasing the number of trees that need to be removed. There are least five trees approximately two feet from the line of disturbance. Staff is seeking board feedback on the traffic engineers recommendation to reduce lanes to 11-feet.

There are two crosswalks proposed for this project. One crosswalk is proposed for pedestrians and cyclists entering the road from the reduced curb cut along Bishop Street at the northern bend. Staff have concerns around the safety of this crosswalk, given how short sightlines are. Staff request either additional signaling or signage for vehicles to increase safety, or the relocation of the sidewalk. The second crosswalk is proposed at the intersection of the Connector Road and College Street Extension, which the City finds to be acceptable as designed.

C. Public transit access

Not applicable.

D. Parking

There is no parking associated with this project. The Intermodal Transportation Facility was approved for redevelopment in 2023, and will be utilized in conjunction with the Connector Road.

During the site plan review of the Intermodal Transportation Facility, the applicant and staff discussed opportunities for connecting existing nearby bicycle and pedestrian facilities through the project site, and agreed to coordinate further around this when the Connector Road application was submitted. Improvements here would provide new trail connections for the trails in Evergreen Cemetery, and

would fill a portion of an existing gap in the City's Neighborhood Byway network. Trail connections that would serve as neighborhood byway connections from the Connector Road are recommended to be a minimum of 6 feet in width to meet byway standards. City staff are encouraging the applicant to add bicycle parking near the Bishop Street curb cut for public access.

E. Transportation demand management (TDM)

Not applicable. The campus of UNE has a TDM plan, but it is not being impacted by this project.

2. Environmental Quality Standards (Section 14.6.2)

A. Preservation of significant natural features

The project proposes 11,148 square feet of wetland impact. When significant natural features cannot be preserved, the "applicant must demonstrate compliance with applicable state and federal regulations and implement preservation measures to the extent practicable". The applicant has submitted an approved Natural Resource Protection Act permit by the Maine DEP (Applicant Submittal C) to meet the first requirement. The applicant must also demonstrate that they are preserving significant natural features, which includes freshwater wetlands, to the greatest extent practicable. As mentioned above, Staff are recommending that the applicant reduce the width of the proposed roadway to further reduce the amount of wetland impact.

B. Landscape preservation

The applicant is not proposing to preserve any of the trees within the limits of disturbance. Due to the size of the property and the fact that it is almost entirely vegetated, the City did not request that the applicant show all of the trees outside of the limits of disturbance on the site plan.

C. Site landscaping and buffers

The applicant is proposing to plant 15 sugar maple trees.

Staff are requesting the applicant select a different species of tree due to the high percentage of maples currently in the city and their susceptibility to the Asian Long-Horned Beetle.

D. Water quality/storm water management/erosion control

The applicant is proposing a soil filter along the edge of the southern part of the Connector Road. The applicant has submitted stormwater calculations for treatment of both the Connector Road and the Intermodal Transportation Facility (ITF), as much of the stormwater infrastructure intended to treat the Connector Road was included as part of the ITF application. The three soil filters proposed (two at the ITF and one along the Connector Road) will provide treatment for 50% of the redeveloped area. Staff find the proposed treatment to meet Maine DEP requirements.

Since the project will have wetland impacts, a Natural Resource Protection Act permit is required and has been approved by the State of Maine Department of Environmental Protection (Applicant Submittal C).

To meet Chapter 500 erosion and sedimentation control standards, the applicant is proposing a double row of erosion control measures.

3. Public Infrastructure and Community Safety Standards (Section 14.6.3)

A. Consistency with City Master Plans

By adding bicycle and pedestrian connections, the applicant is increasing connectivity. Offering the Connector Road to students, faculty and staff will support diversion of some traffic away from Morrill's Corner. These outcomes are in alignment with Transportation goals on Portland 2030.

B. Public safety and fire prevention

The Connector Road will be access controlled at either side and will be well lit. The Fire Department recently provided comments requiring that roadway gates utilize a Knox Box system. The applicant will need to confirm that they are proposing this system.

C. Availability and capacity of public utilities

The City is still waiting on ability to serve confirmation from CMP for the proposed lighting.

4. **Site Design Standards (Section 14.6.4)**

A. Massing, ventilation, and wind impact

Not applicable. No building is proposed.

B. Shadows

Not applicable. No building is proposed.

C. Snow and ice loading

Snow and ice loading are shown on the site plan along the roadway shoulder. The proposed snow removal plan meets the standard.

D. View corridors

Not applicable. Not located in the Downtown Vision View Corridor Protection Plan. No building is proposed.

E. Historic resources

Not applicable. Not located in a historic district.

F. Exterior lighting

The project is proposing 20 street lights along the Connector Road. The information that is provided on the lighting cut sheet related to the proposed roadway lighting does not align with the information provided on the photometric plan. The cut sheet lighting details show lights with a file name RSX2 LED P6 40K R3 while the photometric site plan proposing lighting with the file name RSX2 LED P1 30K R2. The applicant has been asked to clarify what is being proposed for further review.

The applicant has requested a waiver of the Technical Manual Section 12.3.5 requiring a maximum color temperature of 3000K, to allow for lighting with a higher color temperature of 4000K. If the applicant clarifies that what they are proposing is the lighting that is shown on the cut sheet details, and not the photometric site plan, staff are supportive of the waiver as it was granted on two previous projects for UNE on the basis that it is consistent with their campus wide lighting and public safety scheme.

G. Noise and vibration

Not applicable. No HVAC, AHU, emergency generator or similar equipment is proposed.

H. Signage and wayfinding

The applicant is proposing signage to promote sharing the road with cyclists. Signage is also being discussed for Portland Trail connections. Staff are supportive of the signage being proposed.

I. Zoning-related design standards

Not applicable. There are no zoning related design standards for a roadway in the R-3 Residential, R-5 Residential nor the IM Moderate Impact Industrial zones.

X. SITE LOCATION OF DEVELOPMENT

A site location of development minor amendment application has been submitted for the impact to an urban impaired stream and a freshwater wetland. The original SLOD application was just for the Bishop Street Intermodal Transportation Facility. The amendment expands area to include the Connector Road impact and treatment.

The SLODA review standards are listed below.

1. Financial and technical capacity

Please refer to the site plan review above. The application is meeting this standard.

2. Traffic movement

The application is not anticipated to generate 100 or more passenger car equivalents at peak hour, and therefore, this standard is not applicable.

3. No adverse impacts on the natural environment

The project will impact freshwater wetlands and an urban impaired stream. To account for the proposed impacts, the applicant has received a Natural Resource Protection Act permit. The City is recommending that the roadway width be reduced by two feet, so as to further reduce impacts on the natural environment.

4. Soil types

The predominant soil types in the existing condition are Scantic silt loam, Buxton silt loam, and Lyman-Tunbridge complex, which are suitable for the proposed project. The application is meeting this standard.

5. Infrastructure

The only utility for the Connector Road is power for the overhead lighting, for which staff is seeking confirmation from CMP that they have capacity to serve this improvement. Additionally, the realignment of the Connector Road will reduce traffic through Morrill's Corner, and reduce the number of left-turn movements onto Bishop Street from Stevens Avenue, which will alleviate congestion through this intersection. The application is meeting this standard.

6. Ground water

The project is not proposing any increased direct pollution of groundwater- the proposed infiltration basins work to protect groundwater by allowing for slow infiltration in vegetation that clean stormwater as it infiltrates and feeds groundwater. The application is meeting this standard.

7. Flooding

The project is proposing stormwater infrastructure that result in the infiltration of stormwater of storms from the 2-year, 10-year, and 25-year frequency and reduced flows. The application is meeting this standard.

8. Stormwater management and sediment and erosion control

Please refer to the site plan review above. The application is meeting this standard.

XI. NEIGHBORHOOD MEETING & PUBLIC COMMENT

A neighborhood meeting was held on November 7, 2023. There was one person in attendance. No public comments have been submitted to the city in regards to this project.

XII. NEXT STEPS

The next steps for this application include:

1. Address staff and Planning Board comments. Staff are specifically looking for Board input on the width of the roadway.
2. Prepare final plan submission.
3. Schedule and hold planning board public hearing.

XIII. ATTACHMENTS

APPLICANT SUBMITTAL

- A. Stormwater Report
- B. SLODA Application
- C. Cover Letter and Attachments
- D. Deed
- E. Dewatering Plan
- F. Financial Capacity Letter
- G. Letter of Agent
- H. Light Fixtures and Poles
- I. Lighting Waiver Request
- J. Major Site Plan Checklist
- K. Project Description
- L. Technical Ability
- M. Temp Bus Route
- N. Zoning Analysis Table
- O. Zoning Compliance
- P. Neighborhood Meeting
- Q. Neighborhood Meeting Attendance

PLANS

- P1. Landscape Plan
- P2. Existing Condition and Removals Plan
- P3. Site and Utility Plan
- P4. Connector Road Traffic Gate Plan
- P5. Connector Road Plan and Profile
- P6. Connector Road Plan and Profile

- P7. College Ave Ext Plan and Profile
- P8. Wetland Impact Plan
- P9. Erosion Control Details
- P10. Site Details
- P11. Site Details
- P12. Cover Letter and Attachments
- P13. Photometric Plan
- P14. Site Plan
- P15. Boundary Survey
- P16. Boundary Survey
- P17. Light Fixtures and Poles
- P18. Main Campus Boundary

REPORT ATTACHMENTS

1. City Staff Comments 11.1.23
2. City Staff Comments 1.4.24



Dear Applicant,

We have completed our review of your application (PL-002666-2023) proposing to redevelop the carriage road connecting the Bishop Street Intermodal Transportation Facility with College Street off of Stevens Avenue in the R-5 Residential, R-3 Residential, and IM Moderate Industrial Zones. This development triggers major site plan review, and is subject to the following regulations:

- Site Plan – Article 14.6

An overview of the City's review can be viewed in the attached project review worksheets.

Next Steps

Please review all feedback and reach out to the project review manager if you have any questions or would like to discuss this feedback in more detail. In order to proceed, the applicant shall prepare a written response to all feedback, and shall update plans, documents and other materials as necessary to address the below listed comments. The applicant shall notify the project review manager when a resubmission is uploaded to ProjectDox. Once received, the project review manager will notify the applicant of their scheduled review timeline for this resubmission.

Based upon the City's findings related to your application, the City will advance this application for a workshop with the Planning Board on **Tuesday, 1/9/2023**. Please let me know at your earliest convenience if there are any conflicts with proposed date.

Sincerely,

Maya Balassa
Planner

Attachments

1. Site Plan Worksheet

City Staff and Third-Party Peer Reviewers have completed the latest review of this application based off of the most recent submissions. Comments below have been provided to the Planning & Urban Development Department from the Department of Public Works, Water Resources, Zoning, and Third-Party Consulting Engineers (Stormwater + Traffic).

Please submit a written response to the comments below and upload the response, revised submissions, and new material to Project Dox (make sure all submissions maintain the same file naming format to allow for versioning). Once uploaded, please send an email to mbalassa@portlandmaine.gov notifying the planner of the resubmission.

Be advised that additional comments may be forthcoming and other changes may still be required if the comments are not addressed adequately. If you have any questions, please do not hesitate to ask.

Green signifies the standard is being met; red signifies the there are outstanding comments.

General Review Comments		
Review	Discussion	Status
RTI	<u>Overview:</u> The applicant has shown right, title and interest over the carriage road through the submitted deed.	
Financial & Technical Capacity	<u>Overview:</u> The applicant has demonstrated financial and technical capacity. The applicant has submitted a letter showing financial capacity. The applicant team includes Site Design Associates and Ledgewood.	
Permits / Other Requirements	<u>Overview:</u> A Site Location of Development Permit is needed. An application has been submitted. See below comments.	
Zoning	<u>Overview:</u> <u>Comments:</u>	
<u>Additional Submissions Requested:</u> The address on Energov says 716 Stevens Ave. The documents and site plans utilize 83 College Street. Please alter the application materials to have a single address across.		

14.6.1: Transportation Standards		
Standard	Discussion	Status
Impact on Surrounding Street Systems	<u>Overview:</u> The carriage road will continue to be utilized by the shuttle bus from the Bishop Street Intermodal Transportation Facility to the UNE campus on Stevens Avenue. The public will have access to the pedestrian/bike path. The path is proposed to connect to the trail system in Evergreen Cemetery.	

Access and Circulation	Overview: The road will have gate-controlled access at either side. The shuttle bus from the Bishop Street Parking Lot runs to campus on Stevens Avenue and back on this road. Students, faculty and staff will be some permissions to utilize this road. A five-foot wide path, accessible to the public, will be paved alongside the realigned road for pedestrian and cyclists. The path will connect to some trails in the back of Evergreen Cemetery. The pedestrian and bike lane will support greater bike connectivity throughout the city. Comments: - Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road. - To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet. - Please clarify who specifically will have gate card access. - The Bishop Street driveway is to remain in place and gated. While the city supports a pedestrian/bicycle connection, we would suggest that the curb cut be closed.	
Public Transit Access	Overview: Comments:	
Parking	Overview: The Bishop Street Intermodal Facility was approved by the Planning Board this year. No parking is being proposed as part of this application. Comments: We are in support of adding bike parking on the outside of the Intermodal Transportation Facility to support access to the trail.	
Transportation Demand Management	Overview: The campus has a Transportation Demand Management Plan that will not be impacted by the scope of this project. Comments:	
Additional Submissions Requested:		

14.6.2: Environmental Quality Standards		
Standard	Discussion	Status
Preservation of Significant Natural Features	Overview: Comments:	
Landscape Preservation	Overview: The realignment of the carriage road as proposed will involve removal of vegetation and will have wetland impacts. Comments: Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.	

	- This survey indicates areas with tree canopy cover but not tree locations, size and species information. Per the City's Technical Manual Chapter 4.3.1, the survey should identify location, size and species of all existing trees 10" diameter at breast height (DBH) or greater on the site. Given the predominantly wooded nature of the project site, it is acceptable for the applicant to identify only trees proposed to be removed as part of this project, noting the size (in DBH) and species information for existing trees 10" DBH or greater. - The existing site has some notable patches of Japanese Knotweed. The applicant shall follow the requirements laid out in Technical Manual section 4.7.4 for the containment and removal of invasive plants in the limit of work to prevent them spreading into newly disturbed ground. - For existing trees being preserved that are adjacent to the limit of work, the applicant shall follow tree protection requirements described in Technical Manual chapter 4.3 and tree preservation detail IV-2 - Areas around the carriage road that are being cleared of trees due to grading shall be replanted with native straight species trees and exposed soil shall be covered with undyed wood mulch and/or seeded with native shade-tolerant seed mixes where appropriate.	
Site Landscaping and Buffers	Overview: There are areas of existing gravel that are being removed. Comments: - The area where gravel is being removed is currently proposed to be covered with loam and reseeded with "park mix" grass seed. The area in question is surrounded by woodland and is partly shaded. City staff suggest selecting a seed mix that is composed of native part shade-tolerant forbs that will fit into the woodland setting. The park mix grass seed is more appropriate for maintained lawn areas than forested woodlands. - There are at least three existing footpaths/trails that connect to the carriage road which are not currently represented on the plans. Please locate the existing trails on the site plan and ensure the pathway connections are being maintained or improved as part of the carriage road improvement project. At least one of the trails is heavily used by pedestrians as a connection between Evergreen Cemetery and the UNE campus.	
Water Quality, Stormwater Management and Erosion Control	Overview: The parcel contains a large area of wetlands. The proposed realignment will have wetland impacts and create new impervious area. Comments: The project generally is required to comply with the stormwater regulations as outlined by Maine DEP Chapter 500 and the City of Portland Technical Manual Section 5 requirements. As follow-up to discussions on previous UNE projects, the Applicant has submitted as part of this project a Site Location of Development Application, which is reviewed and approved by the City under their Delegated Review Authority. Overall SLOD – Additional clarity is needed on the area that is intended to be covered by the SLOD Application. As was noted on previous application reviews that highlighted the need for the SLOD permit, looking at the entire site as one is advantageous, allowing for treatment to be accounted for across the site to meet the required standards. The Applicant is proposing to do that here, but additional information is needed. The figures provided show the redevelopment evaluation of the Intermodal Transportation Facility and Connector Drive to determine the amount of treatment that will be required per the MaineDEP standards for redevelopment. The ultimate stormwater management scenario includes systems located within this area, but also	

	a system within the Center for Health Sciences. As I understand the analysis, the Center for Health Services project area is not included as part of the SLOD calculations. - General/Redevelopment Standards - As noted, our understanding of the project intent is that treatment from both the Intermodal Transportation Facility and the Center for Health Sciences is to be counted towards the requirement for the Connector Drive. Detail on the Intermodal Transportation Facility is included, but it is unclear how the Center for Health Sciences site's design fits into the area/treatment calculations. - Basic Standards – Details have been provided for erosion and sedimentation control measures. Erosion control measures are shown on the plan and profile sheets. - Flooding Standards – The entire site has been evaluated for the flooding standard, including both the Intermodal Transportation Facility and the Center for Health Sciences. The site in its entirety will meet the Flooding Standard. The applicant has noted that there will be a Tier 1 NRPA permit for the proposed impacts. This approval should be provided when received from the MaineDEP. - The applicant shall prepare easement documents for the proposed expanded easement associated with the extension of the City's 36" Bishop Street storm-water outfall and provide information/details of how the existing 36" RCP pipe will be extended. - The applicant shall submit DEP permits for the proposed stream crossings and wetland impacts for review as part of this site plan review.	
Transportation Demand Management	<u>Overview:</u> <u>Comments:</u>	
<u>Additional Submissions Requested:</u>		

14.6.3: Public Infrastructure + Community Safety Standards		
Standard	Discussion	Status
Public Safety and Fire Prevention	<u>Overview:</u> There are no public safety concerns at this time. <u>Comments:</u>	
Public Utilities	<u>Overview:</u> Lighting is proposed along the road. <u>Comments:</u>	
<u>Additional Submissions Requested:</u>		

14.6.4: Site Design Standards		
Standard	Discussion	Status

Massing, Ventilation and Wind Impact	Overview: Massing, ventilation and wind impacts not anticipated. Comments:	
Shadow	Overview: Not applicable. Comments:	
Snow and Ice Loading	Overview: Snow storage is identified on the edges of the roadway. Comments:	
View Corridors	Overview: Not applicable. Comments:	
Historic Resources	Overview: Not applicable. Comments:	
Exterior Lighting	Overview: The applicant is proposing lighting along the road that is consistent with the campus wide lighting scheme. The lighting is proposed to meet full cutoff standards and have a color temperature of 4000K. The applicant is requesting a waiver for the color temperature standard. Comments: - The city is in support of the color temperature waiver, as it was approved for previous UNE projects and is in line with the campus wide plan. - The photometric plan shows a maximum foot-candle of 6.3 and an average foot-candle of 2.3 in the stat zone. The maximum foot-candle allowed is 5 for this use, with an average of 1.25. Please adjust the lighting plan to meet this standard. - The	
Noise and Vibration	Overview: Noise and vibration impacts are not anticipated. Comments:	
Signage and Wayfinding	Overview: Comments:	
Design Standards	Overview: Not applicable. Comments:	
Additional Submissions Requested:		

STORMWATER MANAGEMENT REPORT

UNE CONNECTOR DRIVE

83 College Street, Portland, Maine

September 22, 2023

Introduction

Site Design Associates (SDA) was retained to assist the University of New England (UNE) (Applicant) in the design and permitting for the reconstruction of the Connector Drive between the UNE Intermodal Transportation Facility (ITF) (currently under recently approved reconstruction) and the Harold and Bibby Alford Center for Health Sciences facility (CFHS) (currently under previously approved construction) at the UNE campus in Portland, Maine. The spur from the Connector Drive to College Street is also being reconstructed. The widening of the drive itself will result in 25,095 square feet of additional impervious area and a reduction of developed area by 4,707 square feet. However, the proposed project is considered an expansion of the redevelopment of the ITF because the drive is and always has been integral to the operation of the ITF. Together with the previously approved ITF reconstruction and reduction of impervious area, the overall project including the Connector Drive results in 8.9 acres of redeveloped area with a net reduction of 73,150 square feet of impervious area and a net reduction of 48,182 square feet of developed area.

This Stormwater Management Report assesses both pre-development and post-development peak runoff rates and stormwater treatment practices for the redevelopment area in accordance with the City of Portland land use code.

Methodology

The stormwater runoff analysis has been undertaken utilizing the HydroCAD Stormwater Modeling System software (Version 10.0) developed by the Applied Microcomputer Systems of Chocorua, New Hampshire. The program is based upon the TR-20 computer program and the TR-55 tabular method, both of which are based upon techniques developed by the USDA Soil Conservation Service. The analysis was undertaken for the 2, 10, and 25-year frequencies (3.1, 4.6, and 5.8 inches, respectively). Twenty-four hour storms with a Type III distribution were the basis for the analysis.

All storm drainage piping and stormwater treatment BMPs have been sized for the 25-year, 24-hour storm utilizing the HydroCAD program. Copies of the pre and post development HydroCAD output are included in Appendix A and Appendix B of this report, respectively.

Pre-Development Conditions

The existing Connector Drive currently runs between Bishop Street and College Street. The paved drive varies in width, but averages approximately 20 feet wide with varying width grassed shoulders on each side. Minor portions of the redevelopment area (primarily at the new tie-in points at either end) are currently undeveloped and forested. Multiple wetlands are located along

both sides of the existing drive. Once corroded 36-inch CMP stream crossing culvert is located approximately in the middle of the existing connector drive. As taken from the website of the “*Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey*,” the predominant soil types in the redevelopment area are Scantic silt loam (Sn) (HSG D), Buxton silt loam (Bu) (HSG C/D), and Windsor loamy sand (Wm) (HSG A). The USDA soil map is included in Appendix D of this report. The soil boundaries are shown on drawings D1.0 Pre-development Drainage Plan (West), D1.1 Pre-development Drainage Plan (East), D2.0 Post-development Drainage Plan (West) and D2.1 Post-development Drainage Plan (East) in Appendix F of this report.

Properly modeling the stormwater conditions for the Connector Drive reconstruction project require including portions of the previously approved predevelopment stormwater models from the CFHS project (subcatchments 4.1 – 4.4) and the ITF reconstruction project (subcatchments 7.0, 7.1, and 8.0). Generally, stormwater from the west side of the campus flows overland and into the large wetland east of the connector drive and then under the connector drive through the 36-inch CMP culvert, where it then continues to flow to the west through the wetland/stream complex and offsite at analysis point AP8. Stormwater from the west side of the campus flows directly into the wetland/stream complex west of the connector drive and offsite at analysis point AP8.

Stormwater peak runoff flow rates from the site for the 2, 10, and 25-year storm events were analyzed at analysis point AP8 and are summarized in Table 1 in the Stormwater Quantity section of this report. Pre-development HydroCAD calculations are included in Appendix A. Sheet D1.0 – Pre Development Drainage Plan (West) and D1.1 – Pre Development Drainage Plan (East) are included in Appendix F.

Post-Development Conditions

The proposed project includes the reconstruction and widening of the existing connector drive. The reconstructed drive will include a 24-foot wide paved drive with a curb and sidewalk on the west side. The reconstructed drive will generally follow the same path as the existing drive, except at the ends where it will connect directly to the ITF parking lot on the northwesterly end and directly to the CFHS facility on the southeasterly end. The spur that ties into College Street will also be reconstructed with a curb and a sidewalk on the west side.

The reconstruction and widening of the drive itself will result in 25,095 square feet of additional impervious area. However, the proposed project is considered an expansion of the redevelopment of the ITF because the drive is and always has been integral to the operation of the ITF. Together with the previously approved ITF reconstruction and reduction of impervious area, the overall project including the drive results in 8.9 acres of redeveloped area with a net reduction of 73,150 square feet of impervious area.

Stormwater will generally be collected in multiple catch basin and storm drain systems along the westerly curbed side of the drive. Stormwater from the east side will drain into a roadside ditch. Multiple culverts will be installed to allow water to cross under the drive. The existing corroded

36-inch CMP stream crossing culvert will be replaced with a 36-inch HDPE culvert with a buried invert.

Portions of the northwesterly and southeasterly ends of the connector drive will be collected in catch basin systems and directed to soil filters SF1 and SF3, which are currently being constructed as part of the Center of Health Sciences and ITF reconstruction projects, respectively. The soil filters were designed with additional capacity to treat the additional runoff from the reconstructed Connector Drive.

Post-development stormwater peak runoff flow rates for the 2, 10, and 25-year storm events at the analysis point are summarized in Table 1 in the Stormwater Quantity section of this report

Stormwater Quantity

Properly modeling the stormwater conditions for the Connector Drive reconstruction project require including portions of the previously approved post development stormwater models from the CFHS project (series 4 subcatchments) and the ITF reconstruction project (series 8 subcatchments).

The overall stormwater runoff volume from the campus is significantly reduced due to the reduction of 73,150 square feet of impervious area associated with the Connector Drive and ITF reconstruction projects and the additional reduction of 43,107 square feet from the CFHS. The total reduction of impervious area on campus results in 2.67 acres. Additional stormwater detention is provided within the four grassed underdrained soil filters (SF1-SF4) that were approved as part of the ITF reconstruction and CFHS projects.

Stormwater runoff from the ends of the Connector Drive are directed to soil filters SF1 and SF3, which were designed with additional capacity to handle the flow from the contributing areas of the reconstructed connector drive.

Stormwater runoff peak flow rates for the 2, 10, and 25-year storm events were analyzed at the analysis point for both the pre and post development conditions to verify that the peak flow rates are maintained or reduced in the post development condition. Table 1 below summarizes the peak flow rates at the analysis point.

Table 1			
Pre and Post Development Peak Runoff Rates (cfs)			
Storm Frequency	2-Year	10-Year	25-Year
AP8			
Pre-Development	25.5	42.1	56.0
Post-Development	14.4	35.9	51.6

As shown in Table 1, the peak runoff rate at the analysis point under the post-development conditions are less than the peak pre-development runoff rates for the 2, 10, and 25-year storm

events. Based on this analysis, we do not anticipate any adverse impact on downgradient drainage systems due to the proposed development.

Redevelopment and Stormwater Quality

The reconstruction and widening of the drive itself will result in 25,095 square feet of additional impervious area. However, the proposed project is considered an expansion of the redevelopment of the ITF because the drive is and always has been integral to the operation of the ITF. Together with the previously approved ITF reconstruction and reduction of impervious area, the overall project including the drive results in 8.9 acres of redeveloped area. Therefore, the City of Portland Redevelopment Standard is applicable to this project, which required treatment of 50% of the redeveloped impervious area. The Maine DEP SLODA redevelopment standard is also applicable to this project, which requires treatment of 50% of the redeveloped developed area.

The existing impervious area within the redevelopment window is 293,873 square feet. The proposed impervious area within the redevelopment window is 220,723 square feet, which results in a reduction of 73,150 square feet of impervious area in the redeveloped condition. See Sheets I1.0 – Pre Development Impervious Area Plan and I2.0 – Post Development Impervious Area Plan in Appendix F for the redevelopment impervious area calculations.

The existing developed area within the redevelopment window is 342,597 square feet. The proposed developed area within the redevelopment window is 294,415 square feet, which results in a reduction of 48,182 square feet of developed area in the redeveloped condition. Pollutant loading calculations have been performed for the pre and post development conditions within the redevelopment window in accordance with Maine DEP Chapter 500 methodology for redevelopment projects. It is assumed that a 2-foot wide grassed shoulder will be maintained beyond the edge of the drive and sidewalk and the remaining ditches and slopes will be returned to a meadow conditions and mowed not more than twice per year and considered undeveloped per Maine DEP Chapter 500 rules. Therefore, the total redeveloped developed area at the completion of the project will be 6.8± acres. The total impervious area will also be significantly reduced, therefore, the Ranked Impact Change (RIC) from the pre to post development condition is -0.8, which would typically mean that stormwater treatment is not required because the RIC is less than 0.0. However, since more than 5,000 square feet of non-roof impervious area will be reconstructed, the City of Portland requires that stormwater treatment is provided for a minimum of 50% of the total redeveloped impervious area. The Maine DEP also requires treatment of 50% of the overall redeveloped developed area for projects that trigger a SLODA permit. See Sheets R1.0 – Pre Development Pollutant Loading Plan and R2.0 – Post Development Pollutant Loading Plan in Appendix F for the redevelopment pollutant loading calculations.

Two grassed underdrained soil filters (SF3 and SF4) are being constructed to provide stormwater treatment at the site as part of the previously approved ITF project. Runoff from a small portion of the northwesterly end of the Connector Drive will be directed to SF3. Two grassed underdrained soil filters are being constructed as part of the previously approved CFHS project (SF1 and SF2). A portion of the southeasterly end of the Connector Drive will be directed to soil filter SF1. Soil filters SF1 and SF3 were designed with additional capacity to treat the contributing runoff from

the Connector Drive. The contributing areas to the stormwater filters are shown on Sheet D3.0 – Stormwater Treatment Plan in Appendix F.

The proposed stormwater management plan will collect and treat stormwater runoff from 111,315 square feet of impervious area, which results in treatment of 50.4% of the redeveloped impervious area associated with the ITF/Connector Drive project. The proposed stormwater management plan will collect and treat stormwater runoff from 155,184 square feet of developed area, which results in treatment of 52.7% of the redeveloped developed area associated with the ITF/Connector Drive project. Stormwater treatment calculations are summarized below in Table 2.

Table 2 Water Quality Calculations													
	Center for Health Sciences		Intermodal Transportation Facility and Connector Drive										
Subcatchment Area	Impervious Area (SF)	Landscaped Area (SF)	Impervious Area (Intermodal Trans. Facility) (SF)	Impervious Area (Connector Drive) (SF)	Landscaped Area (SF)	Developed Area (SF)	Filter Area Required ¹ (SF)	Filter Area Provided (SF)	Water Quality Volume Required ² (CF)	Water Quality Volume Provided (CF)	Sediment Forebay Volume required ³ (CF)	Sediment Forebay Volume Provided (CF)	BMP
TREATED AREAS													
4.3	37,812	21,557	0	7,405	440	7,845	2,701	3092	4,479	5,951	58	61	Soil Filter (SF1)
8.1			17,932	215	4,661	22,808	3,166	3,177	5,249	5,393	63	81	Soil Filter (SF3)
8.2			15,948	2,061	12,948	30,957							
8.3			15,232		2,355	17,587							
8.4			0		9,852	9,852							
8.5			28,262		3,314	31,576	2,898	3,128	4,809	5,486	67	203	Soil Filter (SF4)
8.6			14,522		735	15,257							
8.7			9,738		0	9,738							
8.8			0		9,564	9,564							
TOTAL TREATED			111,315		43,429	155,184							
TOTAL REDEVELOPED IMPERVIOUS AND DEVELOPED AREA			220,723			294,416							
PERCENT REDEVELOPED IMPERVIOUS & DEVELOPED AREA TREATED			50.4%			52.7%							
Notes: 1. Filter area required is calculated at 5% of contributing impervious area and 2% of contributing landscaped area. 2. Water quality volume required is calculated as 1" over the contributing impervious area plus 0.4" over the contributing landscaped area 3. Sediment Volume Required is calculated as Sanded Area (acres) x 500lbs/acre x 90 lbs/CF x 10 storms/year. 4. See Sheet I2.0 for Total Redeveloped Impervious Area.													

Urban Impaired Stream Standard

The project is located within the Capisic Brook Urban Impaired Stream (UIS) watershed, as identified by the Maine DEP. Previous projects and impervious area reductions on campus resulted in 7.30 banked UIS watershed credits to be applied to future projects (see previously approved ITF stormwater report). Since the Connector Drive project, by itself, results in a net increase of 25,095 square feet of impervious area from the previously approved ITF project, some of the banked UIS credits will be used to offset the development. The total landscaped area resulting from the Connector Drive project will be reduced, so no credit is required for the landscaped area associated with the Connector Drive.

Table 3 below summarizes the UIS mitigation credits used for this project based on the increase in impervious area per Maine DEP Chapter 501 standards.

Table 3 Urban Impaired Stream Compensation Credits Required				
Development Activity	Area (SF)	Area (AC)	Credit Per Acre	Credit Required
Creation of Non-Roof Impervious Area	25,095	0.58	0.5	0.29
Creation of Landscaped Area	0	0.00	0.5	0.00
Total Mitigation Credit Required				0.29
Total Campus UIS Mitigation Credit Achieved and Previously Banked for Future Development				7.30
Total Campus UIS Mitigation Credit Remaining and Banked for Future Development				7.01

As indicated in Table 3 above, the Connector Drive project requires 0.29 UIS mitigation credits. The table also shows the 7.30 previously achieved UIS credits from the recently permitted CFHS and ITF projects. The remaining total campus credit of 7.01 will be banked for potential future development projects onsite.

Erosion Control

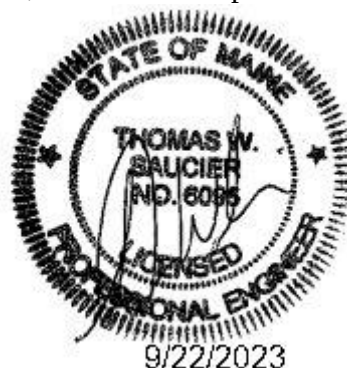
BMPs such as stabilized construction entrances, silt fence and/or filter berms of erosion control mix, riprap pipe inlet and outlet protection, turf reinforcement matting, mulch, and permanent seeding will be used to prevent erosion and downstream migration of sediment during construction. The locations of temporary and permanent erosion control measures and erosion and sedimentation control notes and details are shown on the design drawing set.

Inspection & Maintenance

The University of New England will be responsible for maintaining the stormwater facilities for the project. An Inspection and Maintenance Plan is included as Appendix E. The plan includes a draft of a Stormwater Drainage System Maintenance Agreement, to be finalized and recorded as a condition of approval.

Conclusions

The HydroCAD calculations show that the peak runoff rates at the analysis points under post-development conditions are estimated to be less than the peak pre-development runoff rates for the 2, 10, and 25-year storm events. This meets the stormwater quantity requirements of the City of Portland ordinance. Previously approved stormwater treatment BMPs have been designed to treat stormwater runoff from more than 50% of the redeveloped impervious and more than 50% of the redeveloped developed area in compliance with the City of Portland ordinance and the Maine DEP Chapter 500 standards. Based on the information provided, no adverse impacts to downstream receiving bodies are anticipated.



SUPPORTING DATA AND CALCULATIONS

The following material presents calculations and copies of source material used during the analysis for this study.

Appendix A: Pre-Development HydroCAD Calculations

Appendix B: Post-Development HydroCAD Calculations

Appendix C: Stormwater BMP Spillway & Draindown Calculations

Appendix D: USDA NRCS Soil Map

Appendix E: Inspection & Maintenance Plan & City of Portland Maintenance Agreement

Appendix F: Drainage Plans

I1.0 – Pre Development Impervious Area Plan

I2.0 – Post Development Impervious Area Plan

R1.0 – Pre Development Pollutant Loading Plan

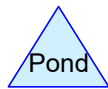
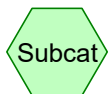
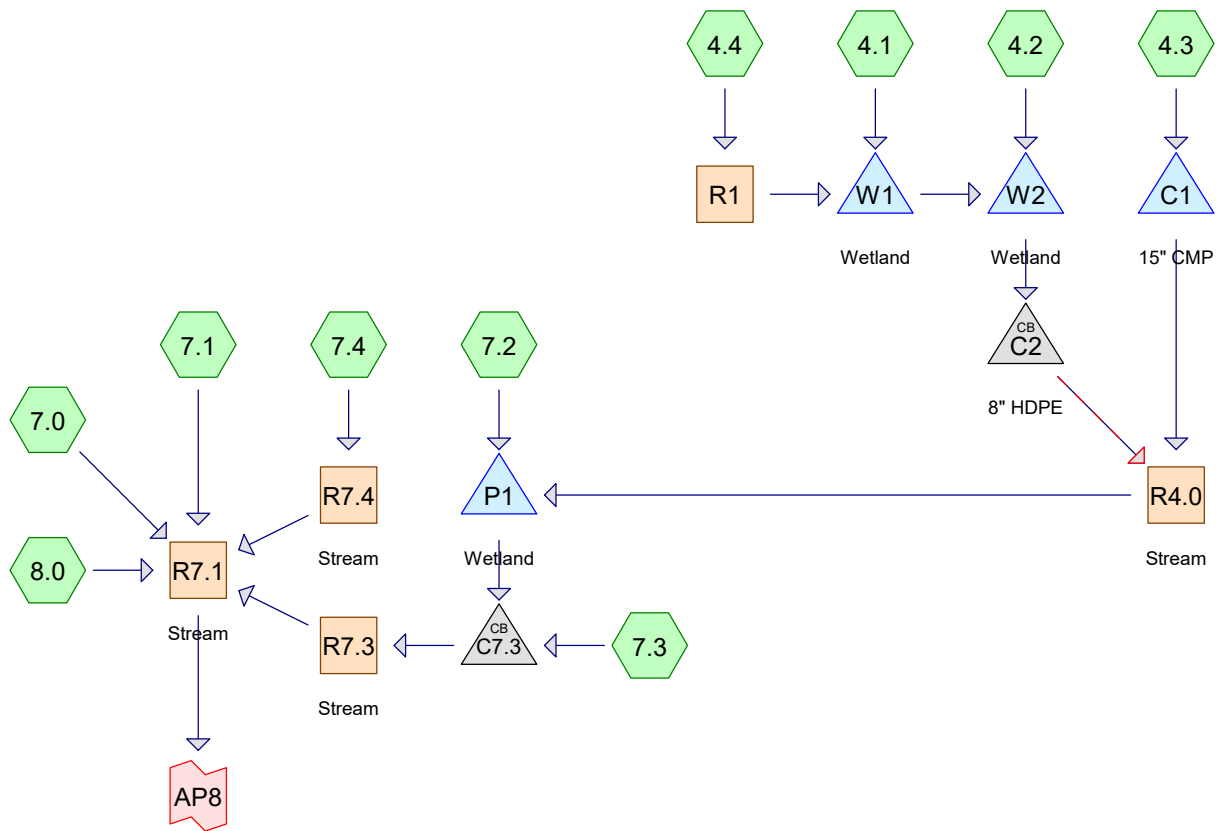
R2.0 – Post Development Pollutant Loading Plan

D1.0 – Pre Development Drainage Plan

D2.0 – Post Development Drainage Plan

D3.0 – Stormwater Treatment Plan

Appendix A:
Pre-Development HydroCAD Calculations



Routing Diagram for Pre-Development_ROAD
 Prepared by Atlantic Resource Consultants, Printed 8/29/2023
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Pre-Development ROAD

Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=155,030 sf 42.26% Impervious Runoff Depth>0.59" Flow Length=520' Tc=13.8 min CN=66 Runoff=1.50 cfs 0.175 af
Subcatchment 4.2:	Runoff Area=154,566 sf 72.80% Impervious Runoff Depth>2.07" Tc=5.0 min CN=90 Runoff=8.84 cfs 0.613 af
Subcatchment 4.3:	Runoff Area=34,895 sf 0.00% Impervious Runoff Depth>1.14" Flow Length=80' Slope=0.0900 ' ' Tc=10.0 min CN=77 Runoff=0.90 cfs 0.076 af
Subcatchment 4.4:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth>2.87" Tc=5.0 min CN=98 Runoff=1.78 cfs 0.137 af
Subcatchment 7.0:	Runoff Area=332,135 sf 2.58% Impervious Runoff Depth>1.07" Flow Length=270' Tc=49.4 min CN=76 Runoff=4.07 cfs 0.679 af
Subcatchment 7.1:	Runoff Area=23,135 sf 59.74% Impervious Runoff Depth>1.99" Tc=5.0 min CN=89 Runoff=1.27 cfs 0.088 af
Subcatchment 7.2:	Runoff Area=468,795 sf 1.99% Impervious Runoff Depth>1.18" Flow Length=330' Tc=50.7 min CN=78 Runoff=6.37 cfs 1.063 af
Subcatchment 7.3:	Runoff Area=79,357 sf 11.20% Impervious Runoff Depth>0.96" Flow Length=275' Tc=39.9 min CN=74 Runoff=0.96 cfs 0.146 af
Subcatchment 7.4:	Runoff Area=123,722 sf 9.46% Impervious Runoff Depth>0.37" Flow Length=235' Tc=29.3 min CN=60 Runoff=0.44 cfs 0.087 af
Subcatchment 8.0:	Runoff Area=336,062 sf 87.02% Impervious Runoff Depth>2.55" Tc=5.0 min CN=95 Runoff=22.54 cfs 1.636 af
Reach R1:	Avg. Flow Depth=0.24' Max Vel=2.90 fps Inflow=1.78 cfs 0.137 af n=0.022 L=300.0' S=0.0167 ' ' Capacity=111.27 cfs Outflow=1.72 cfs 0.137 af
Reach R4.0: Stream	Avg. Flow Depth=0.53' Max Vel=4.64 fps Inflow=16.60 cfs 0.935 af n=0.025 L=280.0' S=0.0196 ' ' Capacity=91.72 cfs Outflow=8.72 cfs 0.933 af
Reach R7.1: Stream	Avg. Flow Depth=1.22' Max Vel=4.93 fps Inflow=27.31 cfs 4.618 af n=0.025 L=860.0' S=0.0093 ' ' Capacity=63.12 cfs Outflow=25.53 cfs 4.607 af
Reach R7.3: Stream	Avg. Flow Depth=0.46' Max Vel=4.62 fps Inflow=7.42 cfs 2.131 af n=0.025 L=355.0' S=0.0225 ' ' Capacity=98.24 cfs Outflow=7.42 cfs 2.128 af
Reach R7.4: Stream	Avg. Flow Depth=0.07' Max Vel=2.05 fps Inflow=0.44 cfs 0.087 af n=0.025 L=140.0' S=0.0429 ' ' Capacity=135.47 cfs Outflow=0.44 cfs 0.086 af
Pond C1: 15" CMP	Peak Elev=95.53' Storage=79 cf Inflow=0.90 cfs 0.076 af 15.0" Round Culvert n=0.025 L=20.0' S=0.0050 ' ' Outflow=0.85 cfs 0.076 af

Pre-Development_ROAD*Type III 24-hr 2-Yr Storm Rainfall=3.10"*

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Pond C2: 8" HDPE

Peak Elev=98.04' Inflow=15.87 cfs 0.859 af
Primary=1.93 cfs 0.616 af Secondary=13.94 cfs 0.243 af Outflow=15.87 cfs 0.859 af

Pond C7.3:

Peak Elev=76.36' Inflow=7.42 cfs 2.131 af
36.0" Round Culvert w/ 6.0" inside fill n=0.025 L=55.0' S=0.0164 '/' Outflow=7.42 cfs 2.131 af

Pond P1: Wetland

Peak Elev=83.61' Storage=12,240 cf Inflow=10.17 cfs 1.996 af
Outflow=6.73 cfs 1.985 af

Pond W1: Wetland

Peak Elev=100.41' Storage=6,526 cf Inflow=2.63 cfs 0.312 af
Outflow=0.31 cfs 0.246 af

Pond W2: Wetland

Peak Elev=98.01' Storage=1,215 cf Inflow=8.96 cfs 0.859 af
Outflow=15.87 cfs 0.859 af

Link AP8:

Inflow=25.53 cfs 4.607 af
Primary=25.53 cfs 4.607 af

Total Runoff Area = 39.776 ac Runoff Volume = 4.700 af Average Runoff Depth = 1.42"
68.39% Pervious = 27.201 ac 31.61% Impervious = 12.575 ac

Pre-Development_ROAD

Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Summary for Subcatchment 4.1:

Runoff = 1.50 cfs @ 12.23 hrs, Volume= 0.175 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	65,523	98	Impervious
	30,118	39	>75% Grass cover, Good, HSG A
	41,927	30	Woods, Good, HSG A
	17,462	77	Woods, Good, HSG D
	155,030	66	Weighted Average
	89,507		57.74% Pervious Area
	65,523		42.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	110	0.0140	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.10"
0.9	110	0.1600	2.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
0.5	300	0.0170	9.36	112.37	Trap/Vee/Rect Channel Flow, CD
					Bot.W=2.00' D=2.00' Z= 2.0 ' / Top.W=10.00'
					n= 0.022 Earth, clean & straight
13.8	520	Total			

Summary for Subcatchment 4.2:

Runoff = 8.84 cfs @ 12.07 hrs, Volume= 0.613 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	112,529	98	Impervious
	3,492	39	>75% Grass cover, Good, HSG A
	3,392	80	>75% Grass cover, Good, HSG D
	3,417	30	Brush, Good, HSG A
	31,736	77	Woods, Good, HSG D
	154,566	90	Weighted Average
	42,037		27.20% Pervious Area
	112,529		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Summary for Subcatchment 4.3:

Runoff = 0.90 cfs @ 12.15 hrs, Volume= 0.076 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
34,895	77	Woods, Good, HSG D
34,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	80	0.0900	0.13		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"

Summary for Subcatchment 4.4:

Runoff = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.0:

Runoff = 4.07 cfs @ 12.72 hrs, Volume= 0.679 af, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 8,574	98	Impervious
1,029	74	>75% Grass cover, Good, HSG C
19,605	65	Brush, Good, HSG C
48,667	73	Brush, Good, HSG D
1,406	70	Woods, Good, HSG C
252,854	77	Woods, Good, HSG D
332,135	76	Weighted Average
323,561		97.42% Pervious Area
8,574		2.58% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 1.27 cfs @ 12.07 hrs, Volume= 0.088 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 13,822	98	Impervious
5,192	74	>75% Grass cover, Good, HSG C
4,121	80	>75% Grass cover, Good, HSG D
23,135	89	Weighted Average
9,313		40.26% Pervious Area
13,822		59.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.2:

Runoff = 6.37 cfs @ 12.73 hrs, Volume= 1.063 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 9,333	98	Impervious
755	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
149,187	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
290,226	77	Woods, Good, HSG D
468,795	78	Weighted Average
459,462		98.01% Pervious Area
9,333		1.99% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 0.96 cfs @ 12.60 hrs, Volume= 0.146 af, Depth> 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 8,886	98	Impervious
1,670	39	>75% Grass cover, Good, HSG A
8,218	30	Woods, Good, HSG A
2,830	77	Woods, Good, HSG D
57,753	77	Woods, Good, HSG D
79,357	74	Weighted Average
70,471		88.80% Pervious Area
8,886		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 ' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 0.44 cfs @ 12.59 hrs, Volume= 0.087 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	11,706	98	Impervious
	5,496	39	>75% Grass cover, Good, HSG A
	2,160	74	>75% Grass cover, Good, HSG C
	45,486	30	Woods, Good, HSG A
	3,125	70	Woods, Good, HSG C
	55,749	77	Woods, Good, HSG D
	123,722	60	Weighted Average
	112,016		90.54% Pervious Area
	11,706		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 'l' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 8.0:

Runoff = 22.54 cfs @ 12.07 hrs, Volume= 1.636 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	292,441	98	Impervious
	8,405	74	>75% Grass cover, Good, HSG C
	8,516	80	>75% Grass cover, Good, HSG D
	26,700	70	Woods, Good, HSG C
	336,062	95	Weighted Average
	43,621		12.98% Pervious Area
	292,441		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R1:

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2-Yr Storm event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af
 Outflow = 1.72 cfs @ 12.09 hrs, Volume= 0.137 af, Atten= 3%, Lag= 1.2 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 2.90 fps, Min. Travel Time= 1.7 min

Avg. Velocity = 0.83 fps, Avg. Travel Time= 6.0 min

Peak Storage= 178 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.24'

Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 111.27 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 '/' Top Width= 10.00'

Length= 300.0' Slope= 0.0167 '/'

Inlet Invert= 108.00', Outlet Invert= 103.00'



Summary for Reach R4.0: Stream

Inflow Area = 8.481 ac, 54.95% Impervious, Inflow Depth > 1.32" for 2-Yr Storm event

Inflow = 16.60 cfs @ 12.12 hrs, Volume= 0.935 af

Outflow = 8.72 cfs @ 12.13 hrs, Volume= 0.933 af, Atten= 47%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.64 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.3 min

Peak Storage= 526 cf @ 12.13 hrs

Average Depth at Peak Storage= 0.53'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Summary for Reach R7.1: Stream

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 1.39" for 2-Yr Storm event
Inflow = 27.31 cfs @ 12.08 hrs, Volume= 4.618 af
Outflow = 25.53 cfs @ 12.11 hrs, Volume= 4.607 af, Atten= 6%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.93 fps, Min. Travel Time= 2.9 min

Avg. Velocity = 1.98 fps, Avg. Travel Time= 7.2 min

Peak Storage= 4,445 cf @ 12.11 hrs

Average Depth at Peak Storage= 1.22'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 1.21" for 2-Yr Storm event
Inflow = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af
Outflow = 7.42 cfs @ 12.88 hrs, Volume= 2.128 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.62 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 1.96 fps, Avg. Travel Time= 3.0 min

Peak Storage= 570 cf @ 12.88 hrs

Average Depth at Peak Storage= 0.46'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



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Summary for Reach R7.4: Stream

Inflow Area = 2.840 ac, 9.46% Impervious, Inflow Depth > 0.37" for 2-Yr Storm event
 Inflow = 0.44 cfs @ 12.59 hrs, Volume= 0.087 af
 Outflow = 0.44 cfs @ 12.60 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 2.05 fps, Min. Travel Time= 1.1 min

Avg. Velocity= 1.08 fps, Avg. Travel Time= 2.2 min

Peak Storage= 30 cf @ 12.60 hrs

Average Depth at Peak Storage= 0.07'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 ' / '

Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: 15" CMP**

Inflow Area = 0.801 ac, 0.00% Impervious, Inflow Depth > 1.14" for 2-Yr Storm event
 Inflow = 0.90 cfs @ 12.15 hrs, Volume= 0.076 af
 Outflow = 0.85 cfs @ 12.19 hrs, Volume= 0.076 af, Atten= 6%, Lag= 2.4 min
 Primary = 0.85 cfs @ 12.19 hrs, Volume= 0.076 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 95.53' @ 12.19 hrs Surf.Area= 446 sf Storage= 79 cf

Plug-Flow detention time= 0.5 min calculated for 0.076 af (100% of inflow)

Center-of-Mass det. time= 0.5 min (857.0 - 856.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	3,164 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916

Device	Routing	Invert	Outlet Devices
#1	Primary	94.90'	15.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900

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Inlet / Outlet Invert= 94.90' / 94.80' S= 0.0050 ' / n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=0.84 cfs @ 12.19 hrs HW=95.53' TW=94.99' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 0.84 cfs @ 2.00 fps)

Summary for Pond C2: 8" HDPE

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 1.34" for 2-Yr Storm event
Inflow = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af
Outflow = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 12.12 hrs, Volume= 0.616 af
Secondary = 13.94 cfs @ 12.12 hrs, Volume= 0.243 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.04' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.60'	8.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.60' / 95.30' S= 0.0150 ' / n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.93 cfs @ 12.12 hrs HW=98.04' TW=95.03' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.93 cfs @ 5.52 fps)

Secondary OutFlow Max=13.94 cfs @ 12.12 hrs HW=98.04' TW=95.03' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 13.94 cfs @ 2.16 fps)

Summary for Pond C7.3:

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 1.21" for 2-Yr Storm event
Inflow = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af
Outflow = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af, Atten= 0%, Lag= 0.0 min
Primary = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.36' @ 12.86 hrs

Flood Elev= 77.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.30'	36.0" Round Culvert w/ 6.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.80' / 73.90' S= 0.0164 ' / n= 0.025 Corrugated metal, Flow Area= 6.29 sf

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Primary OutFlow Max=7.42 cfs @ 12.86 hrs HW=76.36' TW=75.46' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 7.42 cfs @ 2.52 fps)**Summary for Pond P1: Wetland**

Inflow Area = 19.243 ac, 25.33% Impervious, Inflow Depth > 1.24" for 2-Yr Storm event
 Inflow = 10.17 cfs @ 12.14 hrs, Volume= 1.996 af
 Outflow = 6.73 cfs @ 12.96 hrs, Volume= 1.985 af, Atten= 34%, Lag= 49.5 min
 Primary = 6.73 cfs @ 12.96 hrs, Volume= 1.985 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 83.61' @ 12.96 hrs Surf.Area= 19,988 sf Storage= 12,240 cf

Plug-Flow detention time= 23.8 min calculated for 1.985 af (99% of inflow)
 Center-of-Mass det. time= 20.6 min (899.3 - 878.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=6.73 cfs @ 12.96 hrs HW=83.61' TW=76.36' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 6.73 cfs @ 3.08 fps)↑**1=Sharp-Crested Vee/Trap Weir** (Passes 6.73 cfs of 9.21 cfs potential flow)**Summary for Pond W1: Wetland**

Inflow Area = 4.132 ac, 50.27% Impervious, Inflow Depth > 0.91" for 2-Yr Storm event
 Inflow = 2.63 cfs @ 12.13 hrs, Volume= 0.312 af
 Outflow = 0.31 cfs @ 14.19 hrs, Volume= 0.246 af, Atten= 88%, Lag= 123.7 min
 Primary = 0.31 cfs @ 14.19 hrs, Volume= 0.246 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 100.41' @ 14.19 hrs Surf.Area= 8,342 sf Storage= 6,526 cf

Plug-Flow detention time= 279.0 min calculated for 0.245 af (79% of inflow)

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Center-of-Mass det. time= 191.2 min (1,028.8 - 837.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	31,698 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022
102.50	17,962	697.0	7,988	31,698	41,371

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	6.0" Round Culvert L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Device 1	99.40'	18.0" Round Culvert L= 14.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.31 cfs @ 14.19 hrs HW=100.41' TW=97.24' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.31 cfs @ 1.56 fps)

2=Culvert (Passes 0.31 cfs of 2.15 cfs potential flow)

Summary for Pond W2: Wetland

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 1.34" for 2-Yr Storm event
 Inflow = 8.96 cfs @ 12.07 hrs, Volume= 0.859 af
 Outflow = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af, Atten= 0%, Lag= 2.8 min
 Primary = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.01' @ 12.11 hrs Surf.Area= 2,664 sf Storage= 1,215 cf

Plug-Flow detention time= 1.6 min calculated for 0.859 af (100% of inflow)

Center-of-Mass det. time= 1.3 min (871.5 - 870.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=98.01' TW=98.04' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Controls 0.00 cfs)

Summary for Link AP8:

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 1.39" for 2-Yr Storm event
Inflow = 25.53 cfs @ 12.11 hrs, Volume= 4.607 af
Primary = 25.53 cfs @ 12.11 hrs, Volume= 4.607 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=155,030 sf 42.26% Impervious Runoff Depth>1.46" Flow Length=520' Tc=13.8 min CN=66 Runoff=4.45 cfs 0.432 af
Subcatchment 4.2:	Runoff Area=154,566 sf 72.80% Impervious Runoff Depth>3.49" Tc=5.0 min CN=90 Runoff=14.55 cfs 1.032 af
Subcatchment 4.3:	Runoff Area=34,895 sf 0.00% Impervious Runoff Depth>2.29" Flow Length=80' Slope=0.0900 '/' Tc=10.0 min CN=77 Runoff=1.87 cfs 0.153 af
Subcatchment 4.4:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth>4.36" Tc=5.0 min CN=98 Runoff=2.66 cfs 0.208 af
Subcatchment 7.0:	Runoff Area=332,135 sf 2.58% Impervious Runoff Depth>2.18" Flow Length=270' Tc=49.4 min CN=76 Runoff=8.66 cfs 1.388 af
Subcatchment 7.1:	Runoff Area=23,135 sf 59.74% Impervious Runoff Depth>3.39" Tc=5.0 min CN=89 Runoff=2.13 cfs 0.150 af
Subcatchment 7.2:	Runoff Area=468,795 sf 1.99% Impervious Runoff Depth>2.35" Flow Length=330' Tc=50.7 min CN=78 Runoff=12.99 cfs 2.107 af
Subcatchment 7.3:	Runoff Area=79,357 sf 11.20% Impervious Runoff Depth>2.03" Flow Length=275' Tc=39.9 min CN=74 Runoff=2.13 cfs 0.308 af
Subcatchment 7.4:	Runoff Area=123,722 sf 9.46% Impervious Runoff Depth>1.06" Flow Length=235' Tc=29.3 min CN=60 Runoff=1.77 cfs 0.252 af
Subcatchment 8.0:	Runoff Area=336,062 sf 87.02% Impervious Runoff Depth>4.02" Tc=5.0 min CN=95 Runoff=34.69 cfs 2.585 af
Reach R1:	Avg. Flow Depth=0.30' Max Vel=3.31 fps Inflow=2.66 cfs 0.208 af n=0.022 L=300.0' S=0.0167 '/' Capacity=111.27 cfs Outflow=2.59 cfs 0.208 af
Reach R4.0: Stream	Avg. Flow Depth=0.73' Max Vel=5.50 fps Inflow=18.05 cfs 1.646 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=14.98 cfs 1.644 af
Reach R7.1: Stream	Avg. Flow Depth=1.61' Max Vel=5.67 fps Inflow=44.40 cfs 8.407 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=42.13 cfs 8.391 af
Reach R7.3: Stream	Avg. Flow Depth=0.65' Max Vel=5.56 fps Inflow=13.21 cfs 4.036 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=13.21 cfs 4.032 af
Reach R7.4: Stream	Avg. Flow Depth=0.16' Max Vel=3.45 fps Inflow=1.77 cfs 0.252 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=1.77 cfs 0.252 af
Pond C1: 15" CMP	Peak Elev=95.80' Storage=271 cf Inflow=1.87 cfs 0.153 af 15.0" Round Culvert n=0.025 L=20.0' S=0.0050 '/' Outflow=1.64 cfs 0.153 af

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Pond C2: 8" HDPE

Peak Elev=98.08' Inflow=16.90 cfs 1.493 af
Primary=1.94 cfs 0.957 af Secondary=14.95 cfs 0.536 af Outflow=16.90 cfs 1.493 af

Pond C7.3:

Peak Elev=76.84' Inflow=13.21 cfs 4.036 af
36.0" Round Culvert w/ 6.0" inside fill n=0.025 L=55.0' S=0.0164 '/' Outflow=13.21 cfs 4.036 af

Pond P1: Wetland

Peak Elev=84.26' Storage=27,654 cf Inflow=18.32 cfs 3.751 af
Outflow=11.79 cfs 3.727 af

Pond W1: Wetland

Peak Elev=101.30' Storage=14,973 cf Inflow=6.09 cfs 0.640 af
Outflow=0.51 cfs 0.462 af

Pond W2: Wetland

Peak Elev=98.21' Storage=1,832 cf Inflow=14.78 cfs 1.494 af
Outflow=16.90 cfs 1.493 af

Link AP8:

Inflow=42.13 cfs 8.391 af
Primary=42.13 cfs 8.391 af

Total Runoff Area = 39.776 ac Runoff Volume = 8.614 af Average Runoff Depth = 2.60"
68.39% Pervious = 27.201 ac 31.61% Impervious = 12.575 ac

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.1:

Runoff = 4.45 cfs @ 12.20 hrs, Volume= 0.432 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	65,523	98	Impervious
	30,118	39	>75% Grass cover, Good, HSG A
	41,927	30	Woods, Good, HSG A
	17,462	77	Woods, Good, HSG D
	155,030	66	Weighted Average
	89,507		57.74% Pervious Area
	65,523		42.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	110	0.0140	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.10"
0.9	110	0.1600	2.00		Shallow Concentrated Flow, BC Woodland Kv= 5.0 fps
0.5	300	0.0170	9.36	112.37	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 ' / Top.W=10.00' n= 0.022 Earth, clean & straight
13.8	520	Total			

Summary for Subcatchment 4.2:

Runoff = 14.55 cfs @ 12.07 hrs, Volume= 1.032 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	112,529	98	Impervious
	3,492	39	>75% Grass cover, Good, HSG A
	3,392	80	>75% Grass cover, Good, HSG D
	3,417	30	Brush, Good, HSG A
	31,736	77	Woods, Good, HSG D
	154,566	90	Weighted Average
	42,037		27.20% Pervious Area
	112,529		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.3:

Runoff = 1.87 cfs @ 12.14 hrs, Volume= 0.153 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
34,895	77	Woods, Good, HSG D
34,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	80	0.0900	0.13		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"

Summary for Subcatchment 4.4:

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.0:

Runoff = 8.66 cfs @ 12.68 hrs, Volume= 1.388 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 8,574	98	Impervious
1,029	74	>75% Grass cover, Good, HSG C
19,605	65	Brush, Good, HSG C
48,667	73	Brush, Good, HSG D
1,406	70	Woods, Good, HSG C
252,854	77	Woods, Good, HSG D
332,135	76	Weighted Average
323,561		97.42% Pervious Area
8,574		2.58% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 2.13 cfs @ 12.07 hrs, Volume= 0.150 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 13,822	98	Impervious
5,192	74	>75% Grass cover, Good, HSG C
4,121	80	>75% Grass cover, Good, HSG D
23,135	89	Weighted Average
9,313		40.26% Pervious Area
13,822		59.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.2:

Runoff = 12.99 cfs @ 12.69 hrs, Volume= 2.107 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 9,333	98	Impervious
755	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
149,187	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
290,226	77	Woods, Good, HSG D
468,795	78	Weighted Average
459,462		98.01% Pervious Area
9,333		1.99% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 2.13 cfs @ 12.56 hrs, Volume= 0.308 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
8,886	98	Impervious
1,670	39	>75% Grass cover, Good, HSG A
8,218	30	Woods, Good, HSG A
2,830	77	Woods, Good, HSG D
57,753	77	Woods, Good, HSG D
79,357	74	Weighted Average
70,471		88.80% Pervious Area
8,886		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 1.77 cfs @ 12.47 hrs, Volume= 0.252 af, Depth> 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	11,706	98	Impervious
	5,496	39	>75% Grass cover, Good, HSG A
	2,160	74	>75% Grass cover, Good, HSG C
	45,486	30	Woods, Good, HSG A
	3,125	70	Woods, Good, HSG C
	55,749	77	Woods, Good, HSG D
	123,722	60	Weighted Average
	112,016		90.54% Pervious Area
	11,706		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 'l' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 8.0:

Runoff = 34.69 cfs @ 12.07 hrs, Volume= 2.585 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	292,441	98	Impervious
	8,405	74	>75% Grass cover, Good, HSG C
	8,516	80	>75% Grass cover, Good, HSG D
	26,700	70	Woods, Good, HSG C
	336,062	95	Weighted Average
	43,621		12.98% Pervious Area
	292,441		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R1:

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth > 4.36" for 10-Yr Storm event
 Inflow = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af
 Outflow = 2.59 cfs @ 12.09 hrs, Volume= 0.208 af, Atten= 2%, Lag= 1.1 min

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.31 fps, Min. Travel Time= 1.5 min

Avg. Velocity = 0.94 fps, Avg. Travel Time= 5.3 min

Peak Storage= 235 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.30'

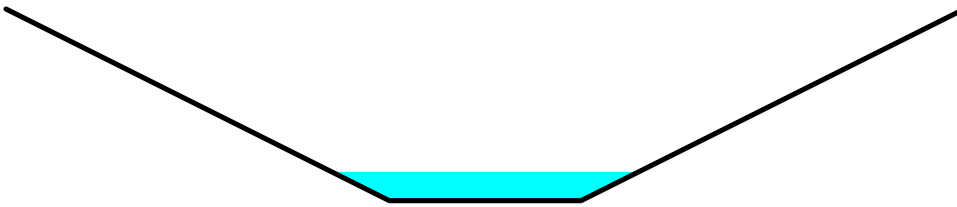
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 111.27 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 '/' Top Width= 10.00'

Length= 300.0' Slope= 0.0167 '/'

Inlet Invert= 108.00', Outlet Invert= 103.00'



Summary for Reach R4.0: Stream

Inflow Area = 8.481 ac, 54.95% Impervious, Inflow Depth > 2.33" for 10-Yr Storm event

Inflow = 18.05 cfs @ 12.08 hrs, Volume= 1.646 af

Outflow = 14.98 cfs @ 12.11 hrs, Volume= 1.644 af, Atten= 17%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.50 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 1.73 fps, Avg. Travel Time= 2.7 min

Peak Storage= 762 cf @ 12.11 hrs

Average Depth at Peak Storage= 0.73'

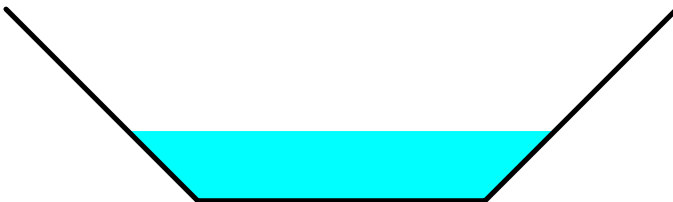
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Reach R7.1: Stream

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 2.54" for 10-Yr Storm event
Inflow = 44.40 cfs @ 12.08 hrs, Volume= 8.407 af
Outflow = 42.13 cfs @ 12.11 hrs, Volume= 8.391 af, Atten= 5%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.67 fps, Min. Travel Time= 2.5 min

Avg. Velocity = 2.36 fps, Avg. Travel Time= 6.1 min

Peak Storage= 6,392 cf @ 12.11 hrs

Average Depth at Peak Storage= 1.61'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 2.30" for 10-Yr Storm event
Inflow = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af
Outflow = 13.21 cfs @ 12.83 hrs, Volume= 4.032 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.56 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 2.41 fps, Avg. Travel Time= 2.5 min

Peak Storage= 844 cf @ 12.83 hrs

Average Depth at Peak Storage= 0.65'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Reach R7.4: Stream

Inflow Area = 2.840 ac, 9.46% Impervious, Inflow Depth > 1.06" for 10-Yr Storm event
Inflow = 1.77 cfs @ 12.47 hrs, Volume= 0.252 af
Outflow = 1.77 cfs @ 12.48 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.45 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 1.47 fps, Avg. Travel Time= 1.6 min

Peak Storage= 72 cf @ 12.48 hrs

Average Depth at Peak Storage= 0.16'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 ' / '

Inlet Invert= 73.00', Outlet Invert= 67.00'



Summary for Pond C1: 15" CMP

Inflow Area = 0.801 ac, 0.00% Impervious, Inflow Depth > 2.29" for 10-Yr Storm event
Inflow = 1.87 cfs @ 12.14 hrs, Volume= 0.153 af
Outflow = 1.64 cfs @ 12.20 hrs, Volume= 0.153 af, Atten= 12%, Lag= 3.6 min
Primary = 1.64 cfs @ 12.20 hrs, Volume= 0.153 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 95.80' @ 12.20 hrs Surf.Area= 1,017 sf Storage= 271 cf

Plug-Flow detention time= 1.0 min calculated for 0.153 af (100% of inflow)

Center-of-Mass det. time= 1.0 min (837.1 - 836.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	3,164 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916

Device	Routing	Invert	Outlet Devices
#1	Primary	94.90'	15.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Inlet / Outlet Invert= 94.90' / 94.80' S= 0.0050 ' / n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=1.64 cfs @ 12.20 hrs HW=95.80' TW=95.12' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 1.64 cfs @ 2.44 fps)

Summary for Pond C2: 8" HDPE

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 2.33" for 10-Yr Storm event
Inflow = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af
Outflow = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.08 hrs, Volume= 0.957 af
Secondary = 14.95 cfs @ 12.08 hrs, Volume= 0.536 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.08' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.60'	8.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.60' / 95.30' S= 0.0150 ' / n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.93 cfs @ 12.08 hrs HW=98.05' TW=95.19' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.93 cfs @ 5.53 fps)

Secondary OutFlow Max=14.29 cfs @ 12.08 hrs HW=98.06' TW=95.18' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 14.29 cfs @ 2.18 fps)

Summary for Pond C7.3:

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 2.30" for 10-Yr Storm event
Inflow = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af
Outflow = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af, Atten= 0%, Lag= 0.0 min
Primary = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.84' @ 12.82 hrs

Flood Elev= 77.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.30'	36.0" Round Culvert w/ 6.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.80' / 73.90' S= 0.0164 ' / n= 0.025 Corrugated metal, Flow Area= 6.29 sf

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Primary OutFlow Max=13.21 cfs @ 12.82 hrs HW=76.84' TW=75.65' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 13.21 cfs @ 3.04 fps)**Summary for Pond P1: Wetland**

Inflow Area = 19.243 ac, 25.33% Impervious, Inflow Depth > 2.34" for 10-Yr Storm event
 Inflow = 18.32 cfs @ 12.14 hrs, Volume= 3.751 af
 Outflow = 11.79 cfs @ 13.03 hrs, Volume= 3.727 af, Atten= 36%, Lag= 53.4 min
 Primary = 11.79 cfs @ 13.03 hrs, Volume= 3.727 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 84.26' @ 13.03 hrs Surf.Area= 26,516 sf Storage= 27,654 cf

Plug-Flow detention time= 28.6 min calculated for 3.724 af (99% of inflow)
 Center-of-Mass det. time= 25.1 min (892.8 - 867.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=11.79 cfs @ 13.03 hrs HW=84.26' TW=76.82' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 11.79 cfs @ 3.77 fps)↑**1=Sharp-Crested Vee/Trap Weir** (Passes 11.79 cfs of 22.04 cfs potential flow)**Summary for Pond W1: Wetland**

Inflow Area = 4.132 ac, 50.27% Impervious, Inflow Depth > 1.86" for 10-Yr Storm event
 Inflow = 6.09 cfs @ 12.16 hrs, Volume= 0.640 af
 Outflow = 0.51 cfs @ 14.88 hrs, Volume= 0.462 af, Atten= 92%, Lag= 163.3 min
 Primary = 0.51 cfs @ 14.88 hrs, Volume= 0.462 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 101.30' @ 14.88 hrs Surf.Area= 10,991 sf Storage= 14,973 cf

Plug-Flow detention time= 316.1 min calculated for 0.462 af (72% of inflow)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Center-of-Mass det. time= 216.5 min (1,046.8 - 830.3)

Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	31,698 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022
102.50	17,962	697.0	7,988	31,698	41,371

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	6.0" Round Culvert L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Device 1	99.40'	18.0" Round Culvert L= 14.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.51 cfs @ 14.88 hrs HW=101.30' TW=97.30' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.51 cfs @ 2.58 fps)

2=Culvert (Passes 0.51 cfs of 5.85 cfs potential flow)

Summary for Pond W2: Wetland

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 2.33" for 10-Yr Storm event
 Inflow = 14.78 cfs @ 12.07 hrs, Volume= 1.494 af
 Outflow = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af, Atten= 0%, Lag= 0.6 min
 Primary = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.21' @ 12.11 hrs Surf.Area= 3,493 sf Storage= 1,832 cf

Plug-Flow detention time= 1.7 min calculated for 1.493 af (100% of inflow)

Center-of-Mass det. time= 1.4 min (872.4 - 871.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=10.66 cfs @ 12.08 hrs HW=98.19' TW=98.06' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Weir Controls 10.66 cfs @ 1.73 fps)

Summary for Link AP8:

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 2.53" for 10-Yr Storm event
Inflow = 42.13 cfs @ 12.11 hrs, Volume= 8.391 af
Primary = 42.13 cfs @ 12.11 hrs, Volume= 8.391 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1: Runoff Area=155,030 sf 42.26% Impervious Runoff Depth>2.29"
 Flow Length=520' Tc=13.8 min CN=66 Runoff=7.27 cfs 0.678 af

Subcatchment 4.2: Runoff Area=154,566 sf 72.80% Impervious Runoff Depth>4.65"
 Tc=5.0 min CN=90 Runoff=19.09 cfs 1.374 af

Subcatchment 4.3: Runoff Area=34,895 sf 0.00% Impervious Runoff Depth>3.30"
 Flow Length=80' Slope=0.0900 '/' Tc=10.0 min CN=77 Runoff=2.71 cfs 0.220 af

Subcatchment 4.4: Runoff Area=24,940 sf 100.00% Impervious Runoff Depth>5.56"
 Tc=5.0 min CN=98 Runoff=3.36 cfs 0.265 af

Subcatchment 7.0: Runoff Area=332,135 sf 2.58% Impervious Runoff Depth>3.17"
 Flow Length=270' Tc=49.4 min CN=76 Runoff=12.65 cfs 2.017 af

Subcatchment 7.1: Runoff Area=23,135 sf 59.74% Impervious Runoff Depth>4.54"
 Tc=5.0 min CN=89 Runoff=2.81 cfs 0.201 af

Subcatchment 7.2: Runoff Area=468,795 sf 1.99% Impervious Runoff Depth>3.37"
 Flow Length=330' Tc=50.7 min CN=78 Runoff=18.67 cfs 3.020 af

Subcatchment 7.3: Runoff Area=79,357 sf 11.20% Impervious Runoff Depth>2.99"
 Flow Length=275' Tc=39.9 min CN=74 Runoff=3.17 cfs 0.454 af

Subcatchment 7.4: Runoff Area=123,722 sf 9.46% Impervious Runoff Depth>1.78"
 Flow Length=235' Tc=29.3 min CN=60 Runoff=3.19 cfs 0.421 af

Subcatchment 8.0: Runoff Area=336,062 sf 87.02% Impervious Runoff Depth>5.21"
 Tc=5.0 min CN=95 Runoff=44.30 cfs 3.349 af

Reach R1: Avg. Flow Depth=0.34' Max Vel=3.56 fps Inflow=3.36 cfs 0.265 af
 n=0.022 L=300.0' S=0.0167 '/' Capacity=111.27 cfs Outflow=3.29 cfs 0.265 af

Reach R4.0: Stream Avg. Flow Depth=0.85' Max Vel=5.95 fps Inflow=21.45 cfs 2.195 af
 n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=19.41 cfs 2.192 af

Reach R7.1: Stream Avg. Flow Depth=1.88' Max Vel=6.11 fps Inflow=58.58 cfs 11.616 af
 n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=55.97 cfs 11.596 af

Reach R7.3: Stream Avg. Flow Depth=0.75' Max Vel=5.98 fps Inflow=16.81 cfs 5.632 af
 n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=16.81 cfs 5.628 af

Reach R7.4: Stream Avg. Flow Depth=0.23' Max Vel=4.27 fps Inflow=3.19 cfs 0.421 af
 n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=3.19 cfs 0.420 af

Pond C1: 15" CMP Peak Elev=95.98' Storage=501 cf Inflow=2.71 cfs 0.220 af
 15.0" Round Culvert n=0.025 L=20.0' S=0.0050 '/' Outflow=2.25 cfs 0.220 af

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Pond C2: 8" HDPE

Peak Elev=98.16' Inflow=19.70 cfs 1.974 af
Primary=1.98 cfs 1.130 af Secondary=17.72 cfs 0.844 af Outflow=19.70 cfs 1.974 af

Pond C7.3:

Peak Elev=77.11' Inflow=16.81 cfs 5.632 af
36.0" Round Culvert w/ 6.0" inside fill n=0.025 L=55.0' S=0.0164 '/' Outflow=16.81 cfs 5.632 af

Pond P1: Wetland

Peak Elev=84.85' Storage=44,412 cf Inflow=24.82 cfs 5.212 af
Outflow=14.87 cfs 5.178 af

Pond W1: Wetland

Peak Elev=102.01' Storage=23,799 cf Inflow=9.33 cfs 0.943 af
Outflow=0.62 cfs 0.601 af

Pond W2: Wetland

Peak Elev=98.37' Storage=2,472 cf Inflow=19.43 cfs 1.975 af
Outflow=19.70 cfs 1.974 af

Link AP8:

Inflow=55.97 cfs 11.596 af
Primary=55.97 cfs 11.596 af

Total Runoff Area = 39.776 ac Runoff Volume = 12.000 af Average Runoff Depth = 3.62"
68.39% Pervious = 27.201 ac 31.61% Impervious = 12.575 ac

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Summary for Subcatchment 4.1:

Runoff = 7.27 cfs @ 12.20 hrs, Volume= 0.678 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	65,523	98	Impervious
	30,118	39	>75% Grass cover, Good, HSG A
	41,927	30	Woods, Good, HSG A
	17,462	77	Woods, Good, HSG D
	155,030	66	Weighted Average
	89,507		57.74% Pervious Area
	65,523		42.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	110	0.0140	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.10"
0.9	110	0.1600	2.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
0.5	300	0.0170	9.36	112.37	Trap/Vee/Rect Channel Flow, CD
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00'
					n= 0.022 Earth, clean & straight
13.8	520	Total			

Summary for Subcatchment 4.2:

Runoff = 19.09 cfs @ 12.07 hrs, Volume= 1.374 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	112,529	98	Impervious
	3,492	39	>75% Grass cover, Good, HSG A
	3,392	80	>75% Grass cover, Good, HSG D
	3,417	30	Brush, Good, HSG A
	31,736	77	Woods, Good, HSG D
	154,566	90	Weighted Average
	42,037		27.20% Pervious Area
	112,529		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.3:

Runoff = 2.71 cfs @ 12.14 hrs, Volume= 0.220 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
34,895	77	Woods, Good, HSG D
34,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	80	0.0900	0.13		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"

Summary for Subcatchment 4.4:

Runoff = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.0:

Runoff = 12.65 cfs @ 12.68 hrs, Volume= 2.017 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 8,574	98	Impervious
1,029	74	>75% Grass cover, Good, HSG C
19,605	65	Brush, Good, HSG C
48,667	73	Brush, Good, HSG D
1,406	70	Woods, Good, HSG C
252,854	77	Woods, Good, HSG D
332,135	76	Weighted Average
323,561		97.42% Pervious Area
8,574		2.58% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.201 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 13,822	98	Impervious
5,192	74	>75% Grass cover, Good, HSG C
4,121	80	>75% Grass cover, Good, HSG D
23,135	89	Weighted Average
9,313		40.26% Pervious Area
13,822		59.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.2:

Runoff = 18.67 cfs @ 12.68 hrs, Volume= 3.020 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 9,333	98	Impervious
755	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
149,187	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
290,226	77	Woods, Good, HSG D
468,795	78	Weighted Average
459,462		98.01% Pervious Area
9,333		1.99% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 3.17 cfs @ 12.55 hrs, Volume= 0.454 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 8,886	98	Impervious
1,670	39	>75% Grass cover, Good, HSG A
8,218	30	Woods, Good, HSG A
2,830	77	Woods, Good, HSG D
57,753	77	Woods, Good, HSG D
79,357	74	Weighted Average
70,471		88.80% Pervious Area
8,886		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 3.19 cfs @ 12.45 hrs, Volume= 0.421 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	11,706	98	Impervious
	5,496	39	>75% Grass cover, Good, HSG A
	2,160	74	>75% Grass cover, Good, HSG C
	45,486	30	Woods, Good, HSG A
	3,125	70	Woods, Good, HSG C
	55,749	77	Woods, Good, HSG D
	123,722	60	Weighted Average
	112,016		90.54% Pervious Area
	11,706		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 'l' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 8.0:

Runoff = 44.30 cfs @ 12.07 hrs, Volume= 3.349 af, Depth> 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	292,441	98	Impervious
	8,405	74	>75% Grass cover, Good, HSG C
	8,516	80	>75% Grass cover, Good, HSG D
	26,700	70	Woods, Good, HSG C
	336,062	95	Weighted Average
	43,621		12.98% Pervious Area
	292,441		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R1:

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth > 5.56" for 25-Yr Storm event
 Inflow = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af
 Outflow = 3.29 cfs @ 12.09 hrs, Volume= 0.265 af, Atten= 2%, Lag= 1.0 min

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.56 fps, Min. Travel Time= 1.4 min

Avg. Velocity = 1.02 fps, Avg. Travel Time= 4.9 min

Peak Storage= 277 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.34'

Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 111.27 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 '/' Top Width= 10.00'

Length= 300.0' Slope= 0.0167 '/'

Inlet Invert= 108.00', Outlet Invert= 103.00'



Summary for Reach R4.0: Stream

Inflow Area = 8.481 ac, 54.95% Impervious, Inflow Depth > 3.11" for 25-Yr Storm event

Inflow = 21.45 cfs @ 12.10 hrs, Volume= 2.195 af

Outflow = 19.41 cfs @ 12.12 hrs, Volume= 2.192 af, Atten= 9%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.95 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 1.91 fps, Avg. Travel Time= 2.4 min

Peak Storage= 913 cf @ 12.12 hrs

Average Depth at Peak Storage= 0.85'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Reach R7.1: Stream

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 3.50" for 25-Yr Storm event
Inflow = 58.58 cfs @ 12.08 hrs, Volume= 11.616 af
Outflow = 55.97 cfs @ 12.10 hrs, Volume= 11.596 af, Atten= 4%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 6.11 fps, Min. Travel Time= 2.3 min

Avg. Velocity = 2.61 fps, Avg. Travel Time= 5.5 min

Peak Storage= 7,871 cf @ 12.10 hrs

Average Depth at Peak Storage= 1.88'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 3.21" for 25-Yr Storm event
Inflow = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af
Outflow = 16.81 cfs @ 12.81 hrs, Volume= 5.628 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.98 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 2.70 fps, Avg. Travel Time= 2.2 min

Peak Storage= 998 cf @ 12.81 hrs

Average Depth at Peak Storage= 0.75'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Reach R7.4: Stream

Inflow Area = 2.840 ac, 9.46% Impervious, Inflow Depth > 1.78" for 25-Yr Storm event
 Inflow = 3.19 cfs @ 12.45 hrs, Volume= 0.421 af
 Outflow = 3.19 cfs @ 12.46 hrs, Volume= 0.420 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.27 fps, Min. Travel Time= 0.5 min

Avg. Velocity= 1.71 fps, Avg. Travel Time= 1.4 min

Peak Storage= 104 cf @ 12.46 hrs

Average Depth at Peak Storage= 0.23'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 ' / '

Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: 15" CMP**

Inflow Area = 0.801 ac, 0.00% Impervious, Inflow Depth > 3.30" for 25-Yr Storm event
 Inflow = 2.71 cfs @ 12.14 hrs, Volume= 0.220 af
 Outflow = 2.25 cfs @ 12.21 hrs, Volume= 0.220 af, Atten= 17%, Lag= 4.4 min
 Primary = 2.25 cfs @ 12.21 hrs, Volume= 0.220 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 95.98' @ 12.21 hrs Surf.Area= 1,533 sf Storage= 501 cf

Plug-Flow detention time= 1.4 min calculated for 0.220 af (100% of inflow)

Center-of-Mass det. time= 1.4 min (827.0 - 825.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	3,164 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916

Device	Routing	Invert	Outlet Devices
#1	Primary	94.90'	15.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900

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Inlet / Outlet Invert= 94.90' / 94.80' S= 0.0050 '/' Cc= 0.900
 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=2.25 cfs @ 12.21 hrs HW=95.98' TW=95.22' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.25 cfs @ 2.67 fps)

Summary for Pond C2: 8" HDPE

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 3.08" for 25-Yr Storm event
 Inflow = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af
 Outflow = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.98 cfs @ 12.10 hrs, Volume= 1.130 af
 Secondary = 17.72 cfs @ 12.10 hrs, Volume= 0.844 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.16' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.60'	8.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.60' / 95.30' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.98 cfs @ 12.10 hrs HW=98.15' TW=95.33' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.98 cfs @ 5.66 fps)

Secondary OutFlow Max=17.45 cfs @ 12.10 hrs HW=98.15' TW=95.33' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 17.45 cfs @ 2.33 fps)

Summary for Pond C7.3:

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 3.21" for 25-Yr Storm event
 Inflow = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af
 Outflow = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af, Atten= 0%, Lag= 0.0 min
 Primary = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.11' @ 12.80 hrs

Flood Elev= 77.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.30'	36.0" Round Culvert w/ 6.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.80' / 73.90' S= 0.0164 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.29 sf

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Primary OutFlow Max=16.81 cfs @ 12.80 hrs HW=77.11' TW=75.75' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 16.81 cfs @ 3.32 fps)**Summary for Pond P1: Wetland**

Inflow Area = 19.243 ac, 25.33% Impervious, Inflow Depth > 3.25" for 25-Yr Storm event
 Inflow = 24.82 cfs @ 12.12 hrs, Volume= 5.212 af
 Outflow = 14.87 cfs @ 13.10 hrs, Volume= 5.178 af, Atten= 40%, Lag= 58.4 min
 Primary = 14.87 cfs @ 13.10 hrs, Volume= 5.178 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 84.85' @ 13.10 hrs Surf.Area= 30,764 sf Storage= 44,412 cf

Plug-Flow detention time= 33.6 min calculated for 5.178 af (99% of inflow)
 Center-of-Mass det. time= 29.9 min (889.2 - 859.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=14.87 cfs @ 13.10 hrs HW=84.85' TW=77.08' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 14.87 cfs @ 4.73 fps)↑**1=Sharp-Crested Vee/Trap Weir** (Passes 14.87 cfs of 37.46 cfs potential flow)**Summary for Pond W1: Wetland**

Inflow Area = 4.132 ac, 50.27% Impervious, Inflow Depth > 2.74" for 25-Yr Storm event
 Inflow = 9.33 cfs @ 12.16 hrs, Volume= 0.943 af
 Outflow = 0.62 cfs @ 15.38 hrs, Volume= 0.601 af, Atten= 93%, Lag= 192.9 min
 Primary = 0.62 cfs @ 15.38 hrs, Volume= 0.601 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 102.01' @ 15.38 hrs Surf.Area= 14,118 sf Storage= 23,799 cf

Plug-Flow detention time= 338.3 min calculated for 0.600 af (64% of inflow)

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Center-of-Mass det. time= 227.5 min (1,052.0 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	31,698 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022
102.50	17,962	697.0	7,988	31,698	41,371

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	6.0" Round Culvert L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Device 1	99.40'	18.0" Round Culvert L= 14.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.62 cfs @ 15.38 hrs HW=102.01' TW=97.33' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.62 cfs @ 3.16 fps)

2=Culvert (Passes 0.62 cfs of 8.84 cfs potential flow)

Summary for Pond W2: Wetland

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 3.09" for 25-Yr Storm event
 Inflow = 19.43 cfs @ 12.07 hrs, Volume= 1.975 af
 Outflow = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af, Atten= 0%, Lag= 1.8 min
 Primary = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.37' @ 12.11 hrs Surf.Area= 4,260 sf Storage= 2,472 cf

Plug-Flow detention time= 1.8 min calculated for 1.973 af (100% of inflow)

Center-of-Mass det. time= 1.6 min (867.4 - 865.8)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=15.86 cfs @ 12.10 hrs HW=98.37' TW=98.15' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Weir Controls 15.86 cfs @ 2.15 fps)

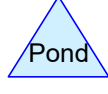
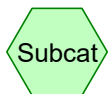
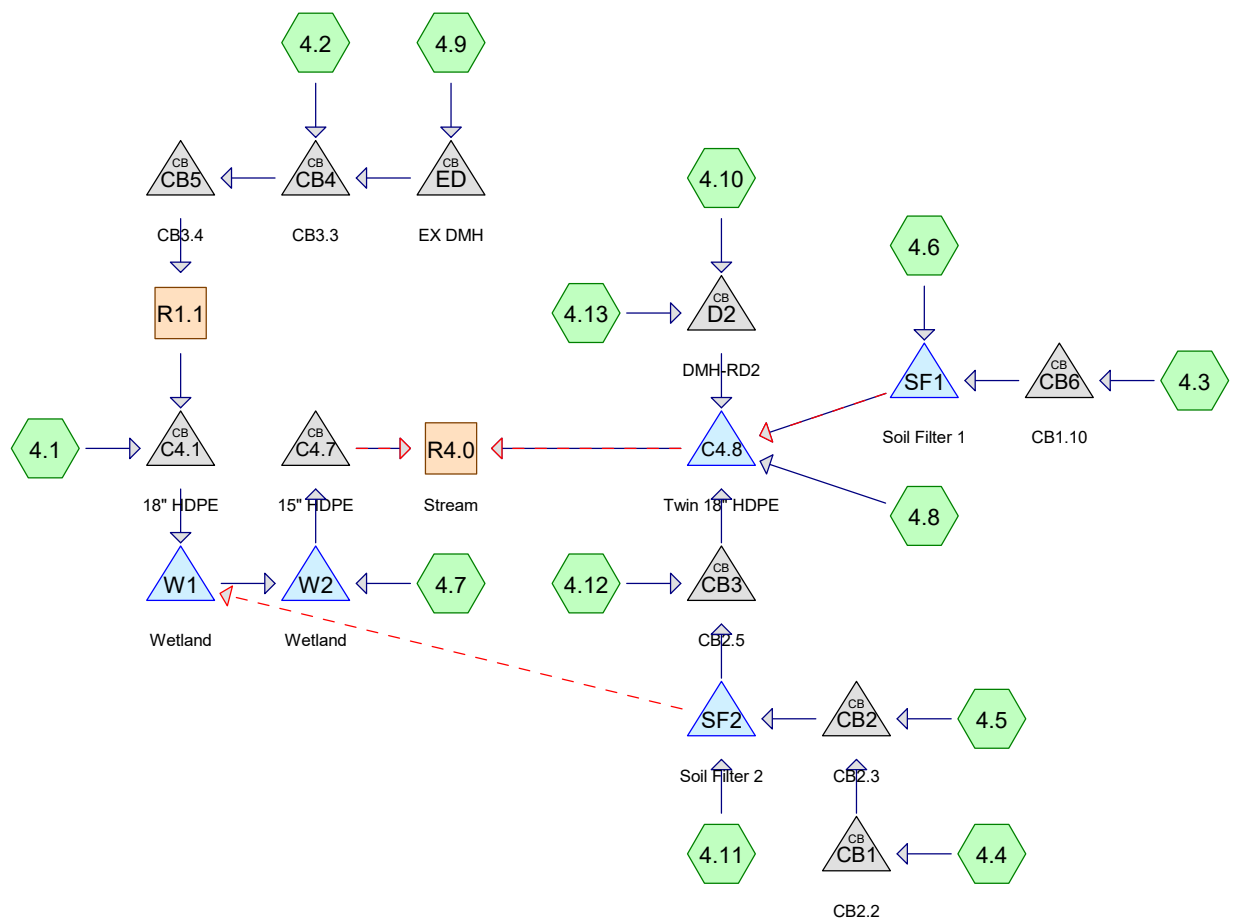
Summary for Link AP8:

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 3.50" for 25-Yr Storm event
Inflow = 55.97 cfs @ 12.10 hrs, Volume= 11.596 af
Primary = 55.97 cfs @ 12.10 hrs, Volume= 11.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Appendix B:

Post-Development HydroCAD Calculations



Routing Diagram for Post-Development EAST
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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Time span=0.00-50.00 hrs, dt=0.02 hrs, 2501 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=101,414 sf 28.81% Impervious Runoff Depth=0.31" Flow Length=338' Tc=8.3 min CN=58 Runoff=0.34 cfs 0.060 af
Subcatchment 4.10:	Runoff Area=38,900 sf 100.00% Impervious Runoff Depth=2.87" Tc=5.0 min CN=98 Runoff=2.77 cfs 0.213 af
Subcatchment 4.11:	Runoff Area=15,561 sf 10.00% Impervious Runoff Depth=1.46" Tc=5.0 min CN=82 Runoff=0.63 cfs 0.043 af
Subcatchment 4.12:	Runoff Area=30,195 sf 94.29% Impervious Runoff Depth=2.76" Tc=5.0 min CN=97 Runoff=2.12 cfs 0.159 af
Subcatchment 4.13:	Runoff Area=7,038 sf 10.83% Impervious Runoff Depth=0.03" Tc=5.0 min CN=45 Runoff=0.00 cfs 0.000 af
Subcatchment 4.2:	Runoff Area=64,010 sf 24.27% Impervious Runoff Depth=0.17" Tc=5.0 min CN=53 Runoff=0.08 cfs 0.021 af
Subcatchment 4.3:	Runoff Area=57,153 sf 79.12% Impervious Runoff Depth=2.08" Tc=5.0 min CN=90 Runoff=3.27 cfs 0.227 af
Subcatchment 4.4:	Runoff Area=26,029 sf 94.93% Impervious Runoff Depth=2.65" Tc=5.0 min CN=96 Runoff=1.79 cfs 0.132 af
Subcatchment 4.5:	Runoff Area=23,192 sf 94.13% Impervious Runoff Depth=2.55" Tc=5.0 min CN=95 Runoff=1.56 cfs 0.113 af
Subcatchment 4.6:	Runoff Area=10,062 sf 0.00% Impervious Runoff Depth=1.20" Tc=5.0 min CN=78 Runoff=0.33 cfs 0.023 af
Subcatchment 4.7:	Runoff Area=45,242 sf 0.00% Impervious Runoff Depth=1.03" Tc=5.0 min CN=75 Runoff=1.23 cfs 0.089 af
Subcatchment 4.8:	Runoff Area=25,845 sf 0.00% Impervious Runoff Depth=1.14" Tc=5.0 min CN=77 Runoff=0.80 cfs 0.056 af
Subcatchment 4.9:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth=2.87" Tc=5.0 min CN=98 Runoff=1.78 cfs 0.137 af
Reach R1.1:	Avg. Flow Depth=0.22' Max Vel=2.93 fps Inflow=1.78 cfs 0.158 af n=0.030 L=300.0' S=0.0367 '/' Capacity=160.95 cfs Outflow=1.72 cfs 0.158 af
Reach R4.0: Stream	Avg. Flow Depth=0.45' Max Vel=4.25 fps Inflow=6.69 cfs 1.274 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=6.65 cfs 1.274 af
Pond C4.1: 18" HDPE	Peak Elev=102.31' Inflow=1.87 cfs 0.217 af 18.0" Round Culvert n=0.013 L=28.0' S=0.0571 '/' Outflow=1.87 cfs 0.217 af

Post-Development_EAST

Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Pond C4.7: 15" HDPE

Peak Elev=95.92' Inflow=1.61 cfs 0.306 af
 Primary=1.61 cfs 0.306 af Secondary=0.00 cfs 0.000 af Outflow=1.61 cfs 0.306 af

Pond C4.8: Twin 18" HDPE

Peak Elev=96.15' Storage=792 cf Inflow=5.81 cfs 0.968 af
 Primary=5.08 cfs 0.968 af Secondary=0.00 cfs 0.000 af Outflow=5.08 cfs 0.968 af

Pond CB1: CB2.2

Peak Elev=102.37' Inflow=1.79 cfs 0.132 af
 15.0" Round Culvert n=0.013 L=110.0' S=0.0050 '/' Outflow=1.79 cfs 0.132 af

Pond CB2: CB2.3

Peak Elev=101.75' Inflow=3.34 cfs 0.245 af
 18.0" Round Culvert n=0.013 L=155.0' S=0.0050 '/' Outflow=3.34 cfs 0.245 af

Pond CB3: CB2.5

Peak Elev=96.93' Inflow=2.18 cfs 0.448 af
 18.0" Round Culvert n=0.013 L=145.0' S=0.0050 '/' Outflow=2.18 cfs 0.448 af

Pond CB4: CB3.3

Peak Elev=122.07' Inflow=1.78 cfs 0.158 af
 15.0" Round Culvert n=0.013 L=102.0' S=0.0200 '/' Outflow=1.78 cfs 0.158 af

Pond CB5: CB3.4

Peak Elev=119.93' Inflow=1.78 cfs 0.158 af
 15.0" Round Culvert n=0.013 L=120.0' S=0.0607 '/' Outflow=1.78 cfs 0.158 af

Pond CB6: CB1.10

Peak Elev=100.25' Inflow=3.27 cfs 0.227 af
 15.0" Round Culvert n=0.013 L=21.0' S=0.0052 '/' Outflow=3.27 cfs 0.227 af

Pond D2: DMH-RD2

Peak Elev=107.85' Inflow=2.77 cfs 0.214 af
 15.0" Round Culvert n=0.013 L=280.0' S=0.0357 '/' Outflow=2.77 cfs 0.214 af

Pond ED: EX DMH

Peak Elev=125.08' Inflow=1.78 cfs 0.137 af
 10.0" Round Culvert n=0.013 L=48.0' S=0.0260 '/' Outflow=1.78 cfs 0.137 af

Pond SF1: Soil Filter 1

Peak Elev=99.54' Storage=6,147 cf Inflow=3.60 cfs 0.250 af
 Primary=0.25 cfs 0.250 af Secondary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.250 af

Pond SF2: Soil Filter 2

Peak Elev=100.64' Storage=5,706 cf Inflow=3.97 cfs 0.288 af
 Primary=1.16 cfs 0.288 af Secondary=0.00 cfs 0.000 af Outflow=1.16 cfs 0.288 af

Pond W1: Wetland

Peak Elev=99.84' Storage=2,144 cf Inflow=1.87 cfs 0.217 af
 18.0" Round Culvert n=0.013 L=80.0' S=0.0113 '/' Outflow=0.76 cfs 0.217 af

Pond W2: Wetland

Peak Elev=97.24' Storage=87 cf Inflow=1.63 cfs 0.306 af
 Outflow=1.61 cfs 0.306 af

Total Runoff Area = 10.780 ac Runoff Volume = 1.274 af Average Runoff Depth = 1.42"
50.78% Pervious = 5.474 ac 49.22% Impervious = 5.306 ac

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Summary for Subcatchment 4.1:

Runoff = 0.34 cfs @ 12.31 hrs, Volume= 0.060 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 29,214	98	Impervious
26,743	39	>75% Grass cover, Good, HSG A
2,976	80	>75% Grass cover, Good, HSG D
10,780	77	Woods, Good, HSG D
31,701	30	Woods, Good, HSG A
101,414	58	Weighted Average
72,200		71.19% Pervious Area
29,214		28.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	40	0.1000	0.12		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"
2.3	30	0.5000	0.22		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	95	0.0260	8.47	135.53	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
0.1	28	0.0180	7.98	14.09	Pipe Channel, DE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.2	145	0.0510	11.86	189.82	Trap/Vee/Rect Channel Flow, EF Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
8.3	338	Total			

Summary for Subcatchment 4.10:

Runoff = 2.77 cfs @ 12.07 hrs, Volume= 0.213 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 38,900	98	Impervious
38,900		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 4.11:

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 0.043 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	1,556	98	Impervious
	14,005	80	>75% Grass cover, Good, HSG D
	15,561	82	Weighted Average
	14,005		90.00% Pervious Area
	1,556		10.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.12:

Runoff = 2.12 cfs @ 12.07 hrs, Volume= 0.159 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	28,472	98	Impervious
	1,723	80	>75% Grass cover, Good, HSG D
	30,195	97	Weighted Average
	1,723		5.71% Pervious Area
	28,472		94.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.13:

Runoff = 0.00 cfs @ 15.60 hrs, Volume= 0.000 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	762	98	Impervious
	6,276	39	>75% Grass cover, Good, HSG A
	7,038	45	Weighted Average
	6,276		89.17% Pervious Area
	762		10.83% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.2:

Runoff = 0.08 cfs @ 12.39 hrs, Volume= 0.021 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 15,536	98	Impervious
48,474	39	>75% Grass cover, Good, HSG A
64,010	53	Weighted Average
48,474		75.73% Pervious Area
15,536		24.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.3:

Runoff = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 45,217	98	Impervious
5,466	39	>75% Grass cover, Good, HSG A
6,470	80	>75% Grass cover, Good, HSG D
57,153	90	Weighted Average
11,936		20.88% Pervious Area
45,217		79.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.4:

Runoff = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	24,710	98	Impervious
	821	39	>75% Grass cover, Good, HSG A
	498	80	>75% Grass cover, Good, HSG D
	26,029	96	Weighted Average
	1,319		5.07% Pervious Area
	24,710		94.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.5:

Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.113 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	21,831	98	Impervious
	1,322	39	>75% Grass cover, Good, HSG A
	39	80	>75% Grass cover, Good, HSG D
	23,192	95	Weighted Average
	1,361		5.87% Pervious Area
	21,831		94.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.6:

Runoff = 0.33 cfs @ 12.08 hrs, Volume= 0.023 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
	10,062	78	Meadow, non-grazed, HSG D
	10,062		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 4.7:

Runoff = 1.23 cfs @ 12.08 hrs, Volume= 0.089 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
25,292	73	Brush, Good, HSG D
19,950	77	Woods, Good, HSG D
45,242	75	Weighted Average
45,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.8:

Runoff = 0.80 cfs @ 12.08 hrs, Volume= 0.056 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
25,845	77	Woods, Good, HSG D
25,845		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.9:

Runoff = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Reach R1.1:

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 0.93" for 2-Yr Storm event
Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af
Outflow = 1.72 cfs @ 12.09 hrs, Volume= 0.158 af, Atten= 3%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 2.93 fps, Min. Travel Time= 1.7 min

Avg. Velocity = 0.92 fps, Avg. Travel Time= 5.4 min

Peak Storage= 176 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.22'

Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 160.95 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 3.0 '/' Top Width= 14.00'

Length= 300.0' Slope= 0.0367 '/'

Inlet Invert= 113.00', Outlet Invert= 102.00'



Summary for Reach R4.0: Stream

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth = 1.42" for 2-Yr Storm event
Inflow = 6.69 cfs @ 12.11 hrs, Volume= 1.274 af
Outflow = 6.65 cfs @ 12.13 hrs, Volume= 1.274 af, Atten= 1%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 4.25 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 1.23 fps, Avg. Travel Time= 3.8 min

Peak Storage= 437 cf @ 12.13 hrs

Average Depth at Peak Storage= 0.45'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Summary for Pond C4.1: 18" HDPE

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
 Inflow = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af
 Outflow = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.31' @ 12.10 hrs

Flood Elev= 104.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.60'	18.0" Round Culvert L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 101.60' / 100.00' S= 0.0571 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.86 cfs @ 12.10 hrs HW=102.31' TW=99.73' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.86 cfs @ 2.26 fps)**Summary for Pond C4.7: 15" HDPE**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 0.68" for 2-Yr Storm event
 Inflow = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af
 Outflow = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 95.92' @ 12.11 hrs

Flood Elev= 97.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.20'	15.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.20' / 95.00' S= 0.0100 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.61 cfs @ 12.11 hrs HW=95.92' TW=94.95' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 1.61 cfs @ 3.17 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=95.20' TW=94.50' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Summary for Pond C4.8: Twin 18" HDPE

Inflow Area = 5.371 ac, 69.00% Impervious, Inflow Depth = 2.16" for 2-Yr Storm event
 Inflow = 5.81 cfs @ 12.07 hrs, Volume= 0.968 af
 Outflow = 5.08 cfs @ 12.12 hrs, Volume= 0.968 af, Atten= 13%, Lag= 2.6 min
 Primary = 5.08 cfs @ 12.12 hrs, Volume= 0.968 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 96.15' @ 12.12 hrs Surf.Area= 1,870 sf Storage= 792 cf

Plug-Flow detention time= 1.6 min calculated for 0.968 af (100% of inflow)
 Center-of-Mass det. time= 1.5 min (1,128.2 - 1,126.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	6,851 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916
97.50	11,617	951.0	3,687	6,851	71,991

Device	Routing	Invert	Outlet Devices
#1	Primary	95.10'	18.0" Round Culvert X 2.00 L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.10' / 95.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	97.40'	400.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.06 cfs @ 12.12 hrs HW=96.15' TW=94.95' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 5.06 cfs @ 2.70 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.00' TW=94.50' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond CB1: CB2.2

Inflow Area = 0.598 ac, 94.93% Impervious, Inflow Depth = 2.65" for 2-Yr Storm event
 Inflow = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af
 Outflow = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 102.37' @ 12.07 hrs
 Flood Elev= 105.30'

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Device	Routing	Invert	Outlet Devices
#1	Primary	101.57'	15.0" Round Culvert L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.57' / 101.02' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.77 cfs @ 12.07 hrs HW=102.36' TW=101.75' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 1.77 cfs @ 3.08 fps)

Summary for Pond CB2: CB2.3

Inflow Area = 1.130 ac, 94.56% Impervious, Inflow Depth = 2.60" for 2-Yr Storm event
Inflow = 3.34 cfs @ 12.07 hrs, Volume= 0.245 af
Outflow = 3.34 cfs @ 12.07 hrs, Volume= 0.245 af, Atten= 0%, Lag= 0.0 min
Primary = 3.34 cfs @ 12.07 hrs, Volume= 0.245 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 101.75' @ 12.07 hrs
Flood Elev= 105.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.77'	18.0" Round Culvert L= 155.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.77' / 100.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.32 cfs @ 12.07 hrs HW=101.75' TW=100.17' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 3.32 cfs @ 3.86 fps)

Summary for Pond CB3: CB2.5

Inflow Area = 2.180 ac, 80.62% Impervious, Inflow Depth = 2.46" for 2-Yr Storm event
Inflow = 2.18 cfs @ 12.07 hrs, Volume= 0.448 af
Outflow = 2.18 cfs @ 12.07 hrs, Volume= 0.448 af, Atten= 0%, Lag= 0.0 min
Primary = 2.18 cfs @ 12.07 hrs, Volume= 0.448 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 96.93' @ 12.08 hrs
Flood Elev= 103.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.13'	18.0" Round Culvert L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.13' / 95.41' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.17 cfs @ 12.07 hrs HW=96.92' TW=96.09' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 2.17 cfs @ 3.33 fps)

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Summary for Pond CB4: CB3.3

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 0.93" for 2-Yr Storm event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af
 Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 122.07' @ 12.07 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	121.42'	15.0" Round Culvert L= 102.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.42' / 119.38' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=122.07' TW=119.93' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.76 cfs @ 2.74 fps)

Summary for Pond CB5: CB3.4

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 0.93" for 2-Yr Storm event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af
 Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 119.93' @ 12.07 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	119.28'	15.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.28' / 112.00' S= 0.0607 ' / S= 0.0607 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=119.93' TW=113.22' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.76 cfs @ 2.74 fps)

Summary for Pond CB6: CB1.10

Inflow Area = 1.312 ac, 79.12% Impervious, Inflow Depth = 2.08" for 2-Yr Storm event
 Inflow = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af
 Outflow = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.25' @ 12.07 hrs

Flood Elev= 103.60'

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Device	Routing	Invert	Outlet Devices
#1	Primary	99.11'	15.0" Round Culvert L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.11' / 99.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.25 cfs @ 12.07 hrs HW=100.24' TW=98.81' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.25 cfs @ 3.65 fps)

Summary for Pond D2: DMH-RD2

Inflow Area = 1.055 ac, 86.34% Impervious, Inflow Depth = 2.43" for 2-Yr Storm event
Inflow = 2.77 cfs @ 12.07 hrs, Volume= 0.214 af
Outflow = 2.77 cfs @ 12.07 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min
Primary = 2.77 cfs @ 12.07 hrs, Volume= 0.214 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 107.85' @ 12.07 hrs
Flood Elev= 113.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	15.0" Round Culvert L= 280.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 97.00' S= 0.0357 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.75 cfs @ 12.07 hrs HW=107.84' TW=96.09' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.75 cfs @ 3.13 fps)

Summary for Pond ED: EX DMH

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2-Yr Storm event
Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af
Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 125.08' @ 12.07 hrs
Flood Elev= 128.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.20'	10.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 124.20' / 122.95' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=125.07' TW=122.07' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.76 cfs @ 3.23 fps)

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Summary for Pond SF1: Soil Filter 1

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 1.95" for 2-Yr Storm event
 Inflow = 3.60 cfs @ 12.07 hrs, Volume= 0.250 af
 Outflow = 0.25 cfs @ 13.57 hrs, Volume= 0.250 af, Atten= 93%, Lag= 89.6 min
 Primary = 0.25 cfs @ 13.57 hrs, Volume= 0.250 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 99.54' @ 13.57 hrs Surf.Area= 4,887 sf Storage= 6,147 cf

Plug-Flow detention time= 681.9 min calculated for 0.250 af (100% of inflow)
 Center-of-Mass det. time= 682.2 min (1,493.3 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.25 cfs @ 13.57 hrs HW=99.54' TW=95.53' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.25 cfs of 6.93 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.08 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 0.17 cfs @ 0.66 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SF2: Soil Filter 2

Inflow Area = 1.487 ac, 74.24% Impervious, Inflow Depth = 2.33" for 2-Yr Storm event
 Inflow = 3.97 cfs @ 12.07 hrs, Volume= 0.288 af
 Outflow = 1.16 cfs @ 12.39 hrs, Volume= 0.288 af, Atten= 71%, Lag= 19.3 min
 Primary = 1.16 cfs @ 12.39 hrs, Volume= 0.288 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.64' @ 12.39 hrs Surf.Area= 4,133 sf Storage= 5,706 cf

Plug-Flow detention time= 549.4 min calculated for 0.288 af (100% of inflow)
 Center-of-Mass det. time= 549.3 min (1,335.6 - 786.2)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	16,412 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,831	0	0
100.50	4,010	5,131	5,131
102.00	5,316	6,995	12,125
102.80	5,402	4,287	16,412

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	15.0" Round Culvert L= 73.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.13' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	99.00'	0.750 in/hr Exfiltration over Horizontal area Phase-In= 0.01'
#3	Device 1	100.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	101.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.16 cfs @ 12.39 hrs HW=100.64' TW=96.81' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.16 cfs of 9.94 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.07 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 1.09 cfs @ 1.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.00' TW=99.40' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W1: Wetland

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
 Inflow = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af
 Outflow = 0.76 cfs @ 12.48 hrs, Volume= 0.217 af, Atten= 59%, Lag= 22.5 min
 Primary = 0.76 cfs @ 12.48 hrs, Volume= 0.217 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 99.84' @ 12.48 hrs Surf.Area= 6,613 sf Storage= 2,144 cf

Plug-Flow detention time= 61.6 min calculated for 0.217 af (100% of inflow)
 Center-of-Mass det. time= 61.7 min (892.9 - 831.3)

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Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	23,709 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	18.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 98.50' S= 0.0113 ' / S= 0.0113 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.76 cfs @ 12.48 hrs HW=99.84' TW=97.19' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 0.76 cfs @ 1.78 fps)

Summary for Pond W2: Wetland

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 0.68" for 2-Yr Storm event
 Inflow = 1.63 cfs @ 12.09 hrs, Volume= 0.306 af
 Outflow = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af, Atten= 1%, Lag= 0.9 min
 Primary = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.24' @ 12.11 hrs Surf.Area= 543 sf Storage= 87 cf

Plug-Flow detention time= 1.2 min calculated for 0.306 af (100% of inflow)

Center-of-Mass det. time= 1.2 min (884.5 - 883.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=1.61 cfs @ 12.11 hrs HW=97.24' TW=95.92' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Weir Controls 1.61 cfs @ 1.58 fps)

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Time span=0.00-50.00 hrs, dt=0.02 hrs, 2501 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=101,414 sf 28.81% Impervious Runoff Depth=0.96" Flow Length=338' Tc=8.3 min CN=58 Runoff=1.96 cfs 0.185 af
Subcatchment 4.10:	Runoff Area=38,900 sf 100.00% Impervious Runoff Depth=4.36" Tc=5.0 min CN=98 Runoff=4.14 cfs 0.325 af
Subcatchment 4.11:	Runoff Area=15,561 sf 10.00% Impervious Runoff Depth=2.72" Tc=5.0 min CN=82 Runoff=1.18 cfs 0.081 af
Subcatchment 4.12:	Runoff Area=30,195 sf 94.29% Impervious Runoff Depth=4.25" Tc=5.0 min CN=97 Runoff=3.19 cfs 0.245 af
Subcatchment 4.13:	Runoff Area=7,038 sf 10.83% Impervious Runoff Depth=0.32" Tc=5.0 min CN=45 Runoff=0.02 cfs 0.004 af
Subcatchment 4.2:	Runoff Area=64,010 sf 24.27% Impervious Runoff Depth=0.68" Tc=5.0 min CN=53 Runoff=0.81 cfs 0.084 af
Subcatchment 4.3:	Runoff Area=57,153 sf 79.12% Impervious Runoff Depth=3.49" Tc=5.0 min CN=90 Runoff=5.38 cfs 0.382 af
Subcatchment 4.4:	Runoff Area=26,029 sf 94.93% Impervious Runoff Depth=4.14" Tc=5.0 min CN=96 Runoff=2.72 cfs 0.206 af
Subcatchment 4.5:	Runoff Area=23,192 sf 94.13% Impervious Runoff Depth=4.02" Tc=5.0 min CN=95 Runoff=2.39 cfs 0.179 af
Subcatchment 4.6:	Runoff Area=10,062 sf 0.00% Impervious Runoff Depth=2.38" Tc=5.0 min CN=78 Runoff=0.66 cfs 0.046 af
Subcatchment 4.7:	Runoff Area=45,242 sf 0.00% Impervious Runoff Depth=2.13" Tc=5.0 min CN=75 Runoff=2.67 cfs 0.184 af
Subcatchment 4.8:	Runoff Area=25,845 sf 0.00% Impervious Runoff Depth=2.29" Tc=5.0 min CN=77 Runoff=1.65 cfs 0.113 af
Subcatchment 4.9:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth=4.36" Tc=5.0 min CN=98 Runoff=2.66 cfs 0.208 af
Reach R1.1:	Avg. Flow Depth=0.32' Max Vel=3.59 fps Inflow=3.41 cfs 0.292 af n=0.030 L=300.0' S=0.0367 '/' Capacity=160.95 cfs Outflow=3.33 cfs 0.292 af
Reach R4.0: Stream	Avg. Flow Depth=0.72' Max Vel=5.47 fps Inflow=14.71 cfs 2.242 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=14.70 cfs 2.242 af
Pond C4.1: 18" HDPE	Peak Elev=102.93' Inflow=5.16 cfs 0.477 af 18.0" Round Culvert n=0.013 L=28.0' S=0.0571 '/' Outflow=5.16 cfs 0.477 af

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Pond C4.7: 15" HDPE

Peak Elev=96.42' Inflow=3.62 cfs 0.662 af
 Primary=3.62 cfs 0.662 af Secondary=0.00 cfs 0.000 af Outflow=3.62 cfs 0.662 af

Pond C4.8: Twin 18" HDPE

Peak Elev=96.88' Storage=2,711 cf Inflow=13.66 cfs 1.581 af
 Primary=11.41 cfs 1.581 af Secondary=0.00 cfs 0.000 af Outflow=11.41 cfs 1.581 af

Pond CB1: CB2.2

Peak Elev=102.65' Inflow=2.72 cfs 0.206 af
 15.0" Round Culvert n=0.013 L=110.0' S=0.0050 '/' Outflow=2.72 cfs 0.206 af

Pond CB2: CB2.3

Peak Elev=102.05' Inflow=5.12 cfs 0.384 af
 18.0" Round Culvert n=0.013 L=155.0' S=0.0050 '/' Outflow=5.12 cfs 0.384 af

Pond CB3: CB2.5

Peak Elev=97.89' Inflow=7.53 cfs 0.711 af
 18.0" Round Culvert n=0.013 L=145.0' S=0.0050 '/' Outflow=7.53 cfs 0.711 af

Pond CB4: CB3.3

Peak Elev=122.39' Inflow=3.41 cfs 0.292 af
 15.0" Round Culvert n=0.013 L=102.0' S=0.0200 '/' Outflow=3.41 cfs 0.292 af

Pond CB5: CB3.4

Peak Elev=120.25' Inflow=3.41 cfs 0.292 af
 15.0" Round Culvert n=0.013 L=120.0' S=0.0607 '/' Outflow=3.41 cfs 0.292 af

Pond CB6: CB1.10

Peak Elev=100.85' Inflow=5.38 cfs 0.382 af
 15.0" Round Culvert n=0.013 L=21.0' S=0.0052 '/' Outflow=5.38 cfs 0.382 af

Pond D2: DMH-RD2

Peak Elev=108.11' Inflow=4.15 cfs 0.329 af
 15.0" Round Culvert n=0.013 L=280.0' S=0.0357 '/' Outflow=4.15 cfs 0.329 af

Pond ED: EX DMH

Peak Elev=125.64' Inflow=2.66 cfs 0.208 af
 10.0" Round Culvert n=0.013 L=48.0' S=0.0260 '/' Outflow=2.66 cfs 0.208 af

Pond SF1: Soil Filter 1

Peak Elev=99.76' Storage=7,223 cf Inflow=6.04 cfs 0.427 af
 Primary=2.74 cfs 0.427 af Secondary=0.00 cfs 0.000 af Outflow=2.74 cfs 0.427 af

Pond SF2: Soil Filter 2

Peak Elev=100.88' Storage=6,709 cf Inflow=6.29 cfs 0.466 af
 Primary=4.85 cfs 0.466 af Secondary=0.00 cfs 0.000 af Outflow=4.85 cfs 0.466 af

Pond W1: Wetland

Peak Elev=100.18' Storage=4,614 cf Inflow=5.16 cfs 0.477 af
 18.0" Round Culvert n=0.013 L=80.0' S=0.0113 '/' Outflow=2.18 cfs 0.477 af

Pond W2: Wetland

Peak Elev=97.40' Storage=200 cf Inflow=3.66 cfs 0.662 af
 Outflow=3.62 cfs 0.662 af

Total Runoff Area = 10.780 ac Runoff Volume = 2.242 af Average Runoff Depth = 2.50"
50.78% Pervious = 5.474 ac 49.22% Impervious = 5.306 ac

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.1:

Runoff = 1.96 cfs @ 12.14 hrs, Volume= 0.185 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	29,214	98	Impervious
	26,743	39	>75% Grass cover, Good, HSG A
	2,976	80	>75% Grass cover, Good, HSG D
	10,780	77	Woods, Good, HSG D
	31,701	30	Woods, Good, HSG A
	101,414	58	Weighted Average
	72,200		71.19% Pervious Area
	29,214		28.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	40	0.1000	0.12		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"
2.3	30	0.5000	0.22		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	95	0.0260	8.47	135.53	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
0.1	28	0.0180	7.98	14.09	Pipe Channel, DE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.2	145	0.0510	11.86	189.82	Trap/Vee/Rect Channel Flow, EF Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
8.3	338	Total			

Summary for Subcatchment 4.10:

Runoff = 4.14 cfs @ 12.07 hrs, Volume= 0.325 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	38,900	98	Impervious
	38,900		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.11:

Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.081 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	1,556	98	Impervious
	14,005	80	>75% Grass cover, Good, HSG D
	15,561	82	Weighted Average
	14,005		90.00% Pervious Area
	1,556		10.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.12:

Runoff = 3.19 cfs @ 12.07 hrs, Volume= 0.245 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	28,472	98	Impervious
	1,723	80	>75% Grass cover, Good, HSG D
	30,195	97	Weighted Average
	1,723		5.71% Pervious Area
	28,472		94.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.13:

Runoff = 0.02 cfs @ 12.34 hrs, Volume= 0.004 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	762	98	Impervious
	6,276	39	>75% Grass cover, Good, HSG A
	7,038	45	Weighted Average
	6,276		89.17% Pervious Area
	762		10.83% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.2:

Runoff = 0.81 cfs @ 12.10 hrs, Volume= 0.084 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 15,536	98	Impervious
48,474	39	>75% Grass cover, Good, HSG A
64,010	53	Weighted Average
48,474		75.73% Pervious Area
15,536		24.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.3:

Runoff = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 45,217	98	Impervious
5,466	39	>75% Grass cover, Good, HSG A
6,470	80	>75% Grass cover, Good, HSG D
57,153	90	Weighted Average
11,936		20.88% Pervious Area
45,217		79.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.4:

Runoff = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	24,710	98	Impervious
	821	39	>75% Grass cover, Good, HSG A
	498	80	>75% Grass cover, Good, HSG D
	26,029	96	Weighted Average
	1,319		5.07% Pervious Area
	24,710		94.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.5:

Runoff = 2.39 cfs @ 12.07 hrs, Volume= 0.179 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	21,831	98	Impervious
	1,322	39	>75% Grass cover, Good, HSG A
	39	80	>75% Grass cover, Good, HSG D
	23,192	95	Weighted Average
	1,361		5.87% Pervious Area
	21,831		94.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.6:

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 0.046 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
	10,062	78	Meadow, non-grazed, HSG D
	10,062		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 4.7:

Runoff = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
25,292	73	Brush, Good, HSG D
19,950	77	Woods, Good, HSG D
45,242	75	Weighted Average
45,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.8:

Runoff = 1.65 cfs @ 12.08 hrs, Volume= 0.113 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
25,845	77	Woods, Good, HSG D
25,845		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.9:

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Reach R1.1:

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 1.72" for 10-Yr Storm event
Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af
Outflow = 3.33 cfs @ 12.10 hrs, Volume= 0.292 af, Atten= 2%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 3.59 fps, Min. Travel Time= 1.4 min

Avg. Velocity = 1.10 fps, Avg. Travel Time= 4.6 min

Peak Storage= 279 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.32'

Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 160.95 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 3.0 '/' Top Width= 14.00'

Length= 300.0' Slope= 0.0367 '/'

Inlet Invert= 113.00', Outlet Invert= 102.00'



Summary for Reach R4.0: Stream

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth = 2.50" for 10-Yr Storm event
Inflow = 14.71 cfs @ 12.18 hrs, Volume= 2.242 af
Outflow = 14.70 cfs @ 12.19 hrs, Volume= 2.242 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 5.47 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 1.38 fps, Avg. Travel Time= 3.4 min

Peak Storage= 752 cf @ 12.19 hrs

Average Depth at Peak Storage= 0.72'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Summary for Pond C4.1: 18" HDPE

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 1.31" for 10-Yr Storm event
 Inflow = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af
 Outflow = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.93' @ 12.11 hrs

Flood Elev= 104.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.60'	18.0" Round Culvert L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 101.60' / 100.00' S= 0.0571 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.12 cfs @ 12.11 hrs HW=102.93' TW=99.95' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 5.12 cfs @ 3.10 fps)

Summary for Pond C4.7: 15" HDPE

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 1.47" for 10-Yr Storm event
 Inflow = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af
 Outflow = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 96.42' @ 12.12 hrs

Flood Elev= 97.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.20'	15.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.20' / 95.00' S= 0.0100 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=3.61 cfs @ 12.12 hrs HW=96.42' TW=95.19' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.61 cfs @ 2.96 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.20' TW=94.50' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Summary for Pond C4.8: Twin 18" HDPE

Inflow Area = 5.371 ac, 69.00% Impervious, Inflow Depth = 3.53" for 10-Yr Storm event
 Inflow = 13.66 cfs @ 12.11 hrs, Volume= 1.581 af
 Outflow = 11.41 cfs @ 12.20 hrs, Volume= 1.581 af, Atten= 16%, Lag= 5.0 min
 Primary = 11.41 cfs @ 12.20 hrs, Volume= 1.581 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 96.88' @ 12.20 hrs Surf.Area= 3,502 sf Storage= 2,711 cf

Plug-Flow detention time= 2.1 min calculated for 1.581 af (100% of inflow)

Center-of-Mass det. time= 2.0 min (1,011.5 - 1,009.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	6,851 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916
97.50	11,617	951.0	3,687	6,851	71,991

Device	Routing	Invert	Outlet Devices
#1	Primary	95.10'	18.0" Round Culvert X 2.00 L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.10' / 95.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	97.40'	400.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.41 cfs @ 12.20 hrs HW=96.88' TW=95.22' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 11.41 cfs @ 3.44 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=95.00' TW=94.50' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond CB1: CB2.2**

Inflow Area = 0.598 ac, 94.93% Impervious, Inflow Depth = 4.14" for 10-Yr Storm event
 Inflow = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af
 Outflow = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.65' @ 12.07 hrs

Flood Elev= 105.30'

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Device	Routing	Invert	Outlet Devices
#1	Primary	101.57'	15.0" Round Culvert L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.57' / 101.02' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.70 cfs @ 12.07 hrs HW=102.64' TW=102.05' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.70 cfs @ 3.24 fps)

Summary for Pond CB2: CB2.3

Inflow Area = 1.130 ac, 94.56% Impervious, Inflow Depth = 4.08" for 10-Yr Storm event
Inflow = 5.12 cfs @ 12.07 hrs, Volume= 0.384 af
Outflow = 5.12 cfs @ 12.07 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min
Primary = 5.12 cfs @ 12.07 hrs, Volume= 0.384 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 102.05' @ 12.07 hrs
Flood Elev= 105.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.77'	18.0" Round Culvert L= 155.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.77' / 100.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.08 cfs @ 12.07 hrs HW=102.05' TW=100.81' (Dynamic Tailwater)
1=Culvert (Barrel Controls 5.08 cfs @ 4.26 fps)

Summary for Pond CB3: CB2.5

Inflow Area = 2.180 ac, 80.62% Impervious, Inflow Depth = 3.91" for 10-Yr Storm event
Inflow = 7.53 cfs @ 12.11 hrs, Volume= 0.711 af
Outflow = 7.53 cfs @ 12.11 hrs, Volume= 0.711 af, Atten= 0%, Lag= 0.0 min
Primary = 7.53 cfs @ 12.11 hrs, Volume= 0.711 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 97.89' @ 12.12 hrs
Flood Elev= 103.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.13'	18.0" Round Culvert L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.13' / 95.41' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.51 cfs @ 12.11 hrs HW=97.89' TW=96.71' (Dynamic Tailwater)
1=Culvert (Barrel Controls 7.51 cfs @ 4.57 fps)

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Summary for Pond CB4: CB3.3

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 1.72" for 10-Yr Storm event
 Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af
 Outflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 122.39' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	121.42'	15.0" Round Culvert L= 102.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.42' / 119.38' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.40 cfs @ 12.08 hrs HW=122.39' TW=120.25' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.40 cfs @ 3.35 fps)**Summary for Pond CB5: CB3.4**

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 1.72" for 10-Yr Storm event
 Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af
 Outflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 120.25' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	119.28'	15.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.28' / 112.00' S= 0.0607 ' / S= 0.0607 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.40 cfs @ 12.08 hrs HW=120.25' TW=113.31' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.40 cfs @ 3.35 fps)**Summary for Pond CB6: CB1.10**

Inflow Area = 1.312 ac, 79.12% Impervious, Inflow Depth = 3.49" for 10-Yr Storm event
 Inflow = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af
 Outflow = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.85' @ 12.07 hrs

Flood Elev= 103.60'

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Device	Routing	Invert	Outlet Devices
#1	Primary	99.11'	15.0" Round Culvert L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.11' / 99.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.34 cfs @ 12.07 hrs HW=100.83' TW=99.47' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 5.34 cfs @ 4.35 fps)**Summary for Pond D2: DMH-RD2**

Inflow Area = 1.055 ac, 86.34% Impervious, Inflow Depth = 3.74" for 10-Yr Storm event
Inflow = 4.15 cfs @ 12.07 hrs, Volume= 0.329 af
Outflow = 4.15 cfs @ 12.07 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min
Primary = 4.15 cfs @ 12.07 hrs, Volume= 0.329 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 108.11' @ 12.07 hrs

Flood Elev= 113.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	15.0" Round Culvert L= 280.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 97.00' S= 0.0357 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.11 cfs @ 12.07 hrs HW=108.11' TW=96.52' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 4.11 cfs @ 3.58 fps)**Summary for Pond ED: EX DMH**

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth = 4.36" for 10-Yr Storm event
Inflow = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af
Outflow = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.0 min
Primary = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 125.64' @ 12.07 hrs

Flood Elev= 128.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.20'	10.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 124.20' / 122.95' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.64 cfs @ 12.07 hrs HW=125.62' TW=122.38' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 2.64 cfs @ 4.83 fps)

Post-Development EAST

Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Pond SF1: Soil Filter 1

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 3.32" for 10-Yr Storm event
 Inflow = 6.04 cfs @ 12.07 hrs, Volume= 0.427 af
 Outflow = 2.74 cfs @ 12.24 hrs, Volume= 0.427 af, Atten= 55%, Lag= 9.8 min
 Primary = 2.74 cfs @ 12.24 hrs, Volume= 0.427 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 99.76' @ 12.24 hrs Surf.Area= 5,128 sf Storage= 7,223 cf

Plug-Flow detention time= 449.8 min calculated for 0.427 af (100% of inflow)

Center-of-Mass det. time= 450.2 min (1,246.8 - 796.7)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' S= 0.0029 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.74 cfs @ 12.24 hrs HW=99.76' TW=96.86' (Dynamic Tailwater)

1=Culvert (Passes 2.74 cfs of 6.44 cfs potential flow)
 2=Exfiltration (Exfiltration Controls 0.09 cfs)
 3=Orifice/Grate (Weir Controls 2.65 cfs @ 1.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond SF2: Soil Filter 2

Inflow Area = 1.487 ac, 74.24% Impervious, Inflow Depth = 3.76" for 10-Yr Storm event
 Inflow = 6.29 cfs @ 12.07 hrs, Volume= 0.466 af
 Outflow = 4.85 cfs @ 12.13 hrs, Volume= 0.466 af, Atten= 23%, Lag= 3.7 min
 Primary = 4.85 cfs @ 12.13 hrs, Volume= 0.466 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.88' @ 12.13 hrs Surf.Area= 4,339 sf Storage= 6,709 cf

Plug-Flow detention time= 375.0 min calculated for 0.466 af (100% of inflow)
 Center-of-Mass det. time= 375.0 min (1,150.5 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	16,412 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,831	0	0
100.50	4,010	5,131	5,131
102.00	5,316	6,995	12,125
102.80	5,402	4,287	16,412

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	15.0" Round Culvert L= 73.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.13' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	99.00'	0.750 in/hr Exfiltration over Horizontal area Phase-In= 0.01'
#3	Device 1	100.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	101.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.83 cfs @ 12.13 hrs HW=100.88' TW=97.88' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.83 cfs of 9.53 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.08 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 4.76 cfs @ 2.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.00' TW=99.40' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W1: Wetland

Inflow Area =	4.370 ac, 36.61% Impervious, Inflow Depth = 1.31" for 10-Yr Storm event
Inflow =	5.16 cfs @ 12.11 hrs, Volume= 0.477 af
Outflow =	2.18 cfs @ 12.43 hrs, Volume= 0.477 af, Atten= 58%, Lag= 19.2 min
Primary =	2.18 cfs @ 12.43 hrs, Volume= 0.477 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.18' @ 12.43 hrs Surf.Area= 7,795 sf Storage= 4,614 cf

Plug-Flow detention time= 52.1 min calculated for 0.477 af (100% of inflow)
 Center-of-Mass det. time= 52.1 min (886.2 - 834.1)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	23,709 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	18.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 98.50' S= 0.0113 ' / S= 0.0113 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.18 cfs @ 12.43 hrs HW=100.17' TW=97.36' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 2.18 cfs @ 2.37 fps)**Summary for Pond W2: Wetland**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 1.47" for 10-Yr Storm event
 Inflow = 3.66 cfs @ 12.10 hrs, Volume= 0.662 af
 Outflow = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af, Atten= 1%, Lag= 1.1 min
 Primary = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.40' @ 12.12 hrs Surf.Area= 860 sf Storage= 200 cf

Plug-Flow detention time= 1.3 min calculated for 0.662 af (100% of inflow)

Center-of-Mass det. time= 1.1 min (873.8 - 872.8)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=3.61 cfs @ 12.12 hrs HW=97.40' TW=96.42' (Dynamic Tailwater)↑**1=Custom Weir/Orifice** (Weir Controls 3.61 cfs @ 2.04 fps)

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Time span=0.00-50.00 hrs, dt=0.02 hrs, 2501 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=101,414 sf 28.81% Impervious Runoff Depth=1.63" Flow Length=338' Tc=8.3 min CN=58 Runoff=3.76 cfs 0.317 af
Subcatchment 4.10:	Runoff Area=38,900 sf 100.00% Impervious Runoff Depth=5.56" Tc=5.0 min CN=98 Runoff=5.24 cfs 0.414 af
Subcatchment 4.11:	Runoff Area=15,561 sf 10.00% Impervious Runoff Depth=3.80" Tc=5.0 min CN=82 Runoff=1.63 cfs 0.113 af
Subcatchment 4.12:	Runoff Area=30,195 sf 94.29% Impervious Runoff Depth=5.44" Tc=5.0 min CN=97 Runoff=4.04 cfs 0.315 af
Subcatchment 4.13:	Runoff Area=7,038 sf 10.83% Impervious Runoff Depth=0.72" Tc=5.0 min CN=45 Runoff=0.08 cfs 0.010 af
Subcatchment 4.2:	Runoff Area=64,010 sf 24.27% Impervious Runoff Depth=1.26" Tc=5.0 min CN=53 Runoff=1.88 cfs 0.154 af
Subcatchment 4.3:	Runoff Area=57,153 sf 79.12% Impervious Runoff Depth=4.65" Tc=5.0 min CN=90 Runoff=7.06 cfs 0.509 af
Subcatchment 4.4:	Runoff Area=26,029 sf 94.93% Impervious Runoff Depth=5.33" Tc=5.0 min CN=96 Runoff=3.46 cfs 0.265 af
Subcatchment 4.5:	Runoff Area=23,192 sf 94.13% Impervious Runoff Depth=5.21" Tc=5.0 min CN=95 Runoff=3.06 cfs 0.231 af
Subcatchment 4.6:	Runoff Area=10,062 sf 0.00% Impervious Runoff Depth=3.40" Tc=5.0 min CN=78 Runoff=0.95 cfs 0.066 af
Subcatchment 4.7:	Runoff Area=45,242 sf 0.00% Impervious Runoff Depth=3.11" Tc=5.0 min CN=75 Runoff=3.92 cfs 0.269 af
Subcatchment 4.8:	Runoff Area=25,845 sf 0.00% Impervious Runoff Depth=3.31" Tc=5.0 min CN=77 Runoff=2.38 cfs 0.163 af
Subcatchment 4.9:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth=5.56" Tc=5.0 min CN=98 Runoff=3.36 cfs 0.265 af
Reach R1.1:	Avg. Flow Depth=0.39' Max Vel=4.05 fps Inflow=5.20 cfs 0.419 af n=0.030 L=300.0' S=0.0367 '/' Capacity=160.95 cfs Outflow=5.10 cfs 0.419 af
Reach R4.0: Stream	Avg. Flow Depth=0.98' Max Vel=6.40 fps Inflow=25.33 cfs 3.120 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=25.08 cfs 3.120 af
Pond C4.1: 18" HDPE	Peak Elev=104.02' Inflow=8.67 cfs 0.736 af 18.0" Round Culvert n=0.013 L=28.0' S=0.0571 '/' Outflow=8.67 cfs 0.736 af

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Pond C4.7: 15" HDPE

Peak Elev=97.21' Inflow=5.48 cfs 1.006 af
 Primary=5.48 cfs 1.006 af Secondary=1.23 cfs 0.029 af Outflow=5.48 cfs 1.006 af

Pond C4.8: Twin 18" HDPE

Peak Elev=97.42' Storage=6,007 cf Inflow=23.18 cfs 2.085 af
 Primary=15.10 cfs 2.069 af Secondary=3.59 cfs 0.017 af Outflow=18.69 cfs 2.085 af

Pond CB1: CB2.2

Peak Elev=102.89' Inflow=3.46 cfs 0.265 af
 15.0" Round Culvert n=0.013 L=110.0' S=0.0050 '/' Outflow=3.46 cfs 0.265 af

Pond CB2: CB2.3

Peak Elev=102.30' Inflow=6.52 cfs 0.497 af
 18.0" Round Culvert n=0.013 L=155.0' S=0.0050 '/' Outflow=6.52 cfs 0.497 af

Pond CB3: CB2.5

Peak Elev=99.56' Inflow=10.56 cfs 0.924 af
 18.0" Round Culvert n=0.013 L=145.0' S=0.0050 '/' Outflow=10.56 cfs 0.924 af

Pond CB4: CB3.3

Peak Elev=122.82' Inflow=5.20 cfs 0.419 af
 15.0" Round Culvert n=0.013 L=102.0' S=0.0200 '/' Outflow=5.20 cfs 0.419 af

Pond CB5: CB3.4

Peak Elev=120.68' Inflow=5.20 cfs 0.419 af
 15.0" Round Culvert n=0.013 L=120.0' S=0.0607 '/' Outflow=5.20 cfs 0.419 af

Pond CB6: CB1.10

Peak Elev=101.29' Inflow=7.06 cfs 0.509 af
 15.0" Round Culvert n=0.013 L=21.0' S=0.0052 '/' Outflow=7.06 cfs 0.509 af

Pond D2: DMH-RD2

Peak Elev=108.43' Inflow=5.30 cfs 0.424 af
 15.0" Round Culvert n=0.013 L=280.0' S=0.0357 '/' Outflow=5.30 cfs 0.424 af

Pond ED: EX DMH

Peak Elev=126.25' Inflow=3.36 cfs 0.265 af
 10.0" Round Culvert n=0.013 L=48.0' S=0.0260 '/' Outflow=3.36 cfs 0.265 af

Pond SF1: Soil Filter 1

Peak Elev=99.93' Storage=8,136 cf Inflow=8.01 cfs 0.574 af
 Primary=5.88 cfs 0.573 af Secondary=0.14 cfs 0.001 af Outflow=6.02 cfs 0.574 af

Pond SF2: Soil Filter 2

Peak Elev=100.98' Storage=7,170 cf Inflow=8.15 cfs 0.610 af
 Primary=6.98 cfs 0.610 af Secondary=0.00 cfs 0.000 af Outflow=6.98 cfs 0.610 af

Pond W1: Wetland

Peak Elev=100.48' Storage=7,120 cf Inflow=8.67 cfs 0.736 af
 18.0" Round Culvert n=0.013 L=80.0' S=0.0113 '/' Outflow=3.82 cfs 0.736 af

Pond W2: Wetland

Peak Elev=97.68' Storage=531 cf Inflow=5.92 cfs 1.006 af
 Outflow=5.48 cfs 1.006 af

Total Runoff Area = 10.780 ac Runoff Volume = 3.091 af Average Runoff Depth = 3.44"
50.78% Pervious = 5.474 ac 49.22% Impervious = 5.306 ac

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.1:

Runoff = 3.76 cfs @ 12.13 hrs, Volume= 0.317 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	29,214	98	Impervious
	26,743	39	>75% Grass cover, Good, HSG A
	2,976	80	>75% Grass cover, Good, HSG D
	10,780	77	Woods, Good, HSG D
	31,701	30	Woods, Good, HSG A
	101,414	58	Weighted Average
	72,200		71.19% Pervious Area
	29,214		28.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	40	0.1000	0.12		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"
2.3	30	0.5000	0.22		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	95	0.0260	8.47	135.53	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
0.1	28	0.0180	7.98	14.09	Pipe Channel, DE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.2	145	0.0510	11.86	189.82	Trap/Vee/Rect Channel Flow, EF Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
8.3	338	Total			

Summary for Subcatchment 4.10:

Runoff = 5.24 cfs @ 12.07 hrs, Volume= 0.414 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	38,900	98	Impervious
	38,900		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.11:

Runoff = 1.63 cfs @ 12.07 hrs, Volume= 0.113 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	1,556	98	Impervious
	14,005	80	>75% Grass cover, Good, HSG D
	15,561	82	Weighted Average
	14,005		90.00% Pervious Area
	1,556		10.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.12:

Runoff = 4.04 cfs @ 12.07 hrs, Volume= 0.315 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	28,472	98	Impervious
	1,723	80	>75% Grass cover, Good, HSG D
	30,195	97	Weighted Average
	1,723		5.71% Pervious Area
	28,472		94.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.13:

Runoff = 0.08 cfs @ 12.12 hrs, Volume= 0.010 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	762	98	Impervious
	6,276	39	>75% Grass cover, Good, HSG A
	7,038	45	Weighted Average
	6,276		89.17% Pervious Area
	762		10.83% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.2:

Runoff = 1.88 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 15,536	98	Impervious
48,474	39	>75% Grass cover, Good, HSG A
64,010	53	Weighted Average
48,474		75.73% Pervious Area
15,536		24.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.3:

Runoff = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 45,217	98	Impervious
5,466	39	>75% Grass cover, Good, HSG A
6,470	80	>75% Grass cover, Good, HSG D
57,153	90	Weighted Average
11,936		20.88% Pervious Area
45,217		79.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.4:

Runoff = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	24,710	98	Impervious
	821	39	>75% Grass cover, Good, HSG A
	498	80	>75% Grass cover, Good, HSG D
	26,029	96	Weighted Average
	1,319		5.07% Pervious Area
	24,710		94.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.5:

Runoff = 3.06 cfs @ 12.07 hrs, Volume= 0.231 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	21,831	98	Impervious
	1,322	39	>75% Grass cover, Good, HSG A
	39	80	>75% Grass cover, Good, HSG D
	23,192	95	Weighted Average
	1,361		5.87% Pervious Area
	21,831		94.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.6:

Runoff = 0.95 cfs @ 12.08 hrs, Volume= 0.066 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
	10,062	78	Meadow, non-grazed, HSG D
	10,062		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.7:

Runoff = 3.92 cfs @ 12.08 hrs, Volume= 0.269 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
25,292	73	Brush, Good, HSG D
19,950	77	Woods, Good, HSG D
45,242	75	Weighted Average
45,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.8:

Runoff = 2.38 cfs @ 12.08 hrs, Volume= 0.163 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
25,845	77	Woods, Good, HSG D
25,845		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.9:

Runoff = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Reach R1.1:

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 2.46" for 25-Yr Storm event
Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af
Outflow = 5.10 cfs @ 12.09 hrs, Volume= 0.419 af, Atten= 2%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 4.05 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 1.21 fps, Avg. Travel Time= 4.1 min

Peak Storage= 377 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.39'

Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 160.95 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 3.0 ' / ' Top Width= 14.00'

Length= 300.0' Slope= 0.0367 ' / '

Inlet Invert= 113.00', Outlet Invert= 102.00'



Summary for Reach R4.0: Stream

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth = 3.47" for 25-Yr Storm event
Inflow = 25.33 cfs @ 12.18 hrs, Volume= 3.120 af
Outflow = 25.08 cfs @ 12.19 hrs, Volume= 3.120 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 6.40 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.2 min

Peak Storage= 1,094 cf @ 12.19 hrs

Average Depth at Peak Storage= 0.98'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' / ' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 ' / '

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond C4.1: 18" HDPE

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 2.02" for 25-Yr Storm event
 Inflow = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af
 Outflow = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 104.02' @ 12.11 hrs

Flood Elev= 104.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.60'	18.0" Round Culvert L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 101.60' / 100.00' S= 0.0571 ' S= 0.0571 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.62 cfs @ 12.11 hrs HW=104.00' TW=100.19' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 8.62 cfs @ 4.88 fps)**Summary for Pond C4.7: 15" HDPE**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 2.23" for 25-Yr Storm event
 Inflow = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af
 Outflow = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af
 Secondary = 1.23 cfs @ 12.18 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.21' @ 12.22 hrs

Flood Elev= 97.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.20'	15.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.20' / 95.00' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=5.48 cfs @ 12.22 hrs HW=97.21' TW=95.44' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.48 cfs @ 4.47 fps)**Secondary OutFlow** Max=0.00 cfs @ 12.18 hrs HW=97.17' TW=95.48' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Summary for Pond C4.8: Twin 18" HDPE

Inflow Area = 5.371 ac, 69.00% Impervious, Inflow Depth = 4.66" for 25-Yr Storm event
 Inflow = 23.18 cfs @ 12.10 hrs, Volume= 2.085 af
 Outflow = 18.69 cfs @ 12.18 hrs, Volume= 2.085 af, Atten= 19%, Lag= 4.8 min
 Primary = 15.10 cfs @ 12.18 hrs, Volume= 2.069 af
 Secondary = 3.59 cfs @ 12.18 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 97.42' @ 12.18 hrs Surf.Area= 10,132 sf Storage= 6,007 cf

Plug-Flow detention time= 2.8 min calculated for 2.085 af (100% of inflow)
 Center-of-Mass det. time= 2.7 min (958.6 - 955.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	6,851 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916
97.50	11,617	951.0	3,687	6,851	71,991

Device	Routing	Invert	Outlet Devices
#1	Primary	95.10'	18.0" Round Culvert X 2.00 L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.10' / 95.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	97.40'	400.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.10 cfs @ 12.18 hrs HW=97.42' TW=95.47' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 15.10 cfs @ 4.27 fps)

Secondary OutFlow Max=3.53 cfs @ 12.18 hrs HW=97.42' TW=95.47' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 3.53 cfs @ 0.40 fps)

Summary for Pond CB1: CB2.2

Inflow Area = 0.598 ac, 94.93% Impervious, Inflow Depth = 5.33" for 25-Yr Storm event
 Inflow = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af
 Outflow = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 102.89' @ 12.07 hrs
 Flood Elev= 105.30'

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Device	Routing	Invert	Outlet Devices
#1	Primary	101.57'	15.0" Round Culvert L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.57' / 101.02' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.43 cfs @ 12.07 hrs HW=102.88' TW=102.29' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 3.43 cfs @ 3.31 fps)

Summary for Pond CB2: CB2.3

Inflow Area = 1.130 ac, 94.56% Impervious, Inflow Depth = 5.27" for 25-Yr Storm event
Inflow = 6.52 cfs @ 12.07 hrs, Volume= 0.497 af
Outflow = 6.52 cfs @ 12.07 hrs, Volume= 0.497 af, Atten= 0%, Lag= 0.0 min
Primary = 6.52 cfs @ 12.07 hrs, Volume= 0.497 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 102.30' @ 12.07 hrs
Flood Elev= 105.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.77'	18.0" Round Culvert L= 155.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.77' / 100.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.47 cfs @ 12.07 hrs HW=102.29' TW=100.94' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 6.47 cfs @ 4.48 fps)

Summary for Pond CB3: CB2.5

Inflow Area = 2.180 ac, 80.62% Impervious, Inflow Depth = 5.09" for 25-Yr Storm event
Inflow = 10.56 cfs @ 12.10 hrs, Volume= 0.924 af
Outflow = 10.56 cfs @ 12.10 hrs, Volume= 0.924 af, Atten= 0%, Lag= 0.0 min
Primary = 10.56 cfs @ 12.10 hrs, Volume= 0.924 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 99.56' @ 12.11 hrs
Flood Elev= 103.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.13'	18.0" Round Culvert L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.13' / 95.41' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=10.54 cfs @ 12.10 hrs HW=99.52' TW=97.22' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 10.54 cfs @ 5.97 fps)

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Summary for Pond CB4: CB3.3

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 2.46" for 25-Yr Storm event
 Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af
 Outflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 122.82' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	121.42'	15.0" Round Culvert L= 102.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.42' / 119.38' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.19 cfs @ 12.08 hrs HW=122.82' TW=120.68' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.19 cfs @ 4.23 fps)**Summary for Pond CB5: CB3.4**

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 2.46" for 25-Yr Storm event
 Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af
 Outflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 120.68' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	119.28'	15.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.28' / 112.00' S= 0.0607 ' / S= 0.0607 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.19 cfs @ 12.08 hrs HW=120.68' TW=113.39' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.19 cfs @ 4.23 fps)**Summary for Pond CB6: CB1.10**

Inflow Area = 1.312 ac, 79.12% Impervious, Inflow Depth = 4.65" for 25-Yr Storm event
 Inflow = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af
 Outflow = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 101.29' @ 12.07 hrs

Flood Elev= 103.60'

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Device	Routing	Invert	Outlet Devices
#1	Primary	99.11'	15.0" Round Culvert L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.11' / 99.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.04 cfs @ 12.07 hrs HW=101.27' TW=99.85' (Dynamic Tailwater)
1=Culvert (Barrel Controls 7.04 cfs @ 5.74 fps)

Summary for Pond D2: DMH-RD2

Inflow Area = 1.055 ac, 86.34% Impervious, Inflow Depth = 4.82" for 25-Yr Storm event
Inflow = 5.30 cfs @ 12.07 hrs, Volume= 0.424 af
Outflow = 5.30 cfs @ 12.07 hrs, Volume= 0.424 af, Atten= 0%, Lag= 0.0 min
Primary = 5.30 cfs @ 12.07 hrs, Volume= 0.424 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 108.43' @ 12.07 hrs
Flood Elev= 113.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	15.0" Round Culvert L= 280.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 97.00' S= 0.0357 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.26 cfs @ 12.07 hrs HW=108.42' TW=97.05' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.26 cfs @ 4.29 fps)

Summary for Pond ED: EX DMH

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth = 5.56" for 25-Yr Storm event
Inflow = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af
Outflow = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min
Primary = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 126.25' @ 12.07 hrs
Flood Elev= 128.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.20'	10.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 124.20' / 122.95' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=3.33 cfs @ 12.07 hrs HW=126.23' TW=122.80' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.33 cfs @ 6.11 fps)

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Summary for Pond SF1: Soil Filter 1

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 4.46" for 25-Yr Storm event
 Inflow = 8.01 cfs @ 12.07 hrs, Volume= 0.574 af
 Outflow = 6.02 cfs @ 12.14 hrs, Volume= 0.574 af, Atten= 25%, Lag= 4.0 min
 Primary = 5.88 cfs @ 12.14 hrs, Volume= 0.573 af
 Secondary = 0.14 cfs @ 12.14 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 99.93' @ 12.14 hrs Surf.Area= 5,324 sf Storage= 8,136 cf

Plug-Flow detention time= 350.7 min calculated for 0.574 af (100% of inflow)

Center-of-Mass det. time= 351.2 min (1,140.0 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.88 cfs @ 12.14 hrs HW=99.93' TW=97.38' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 5.88 cfs of 6.04 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.09 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 5.78 cfs @ 2.14 fps)

Secondary OutFlow Max=0.14 cfs @ 12.14 hrs HW=99.93' TW=97.38' (Dynamic Tailwater)↑ **4=Broad-Crested Rectangular Weir** (Weir Controls 0.14 cfs @ 0.46 fps)**Summary for Pond SF2: Soil Filter 2**

Inflow Area = 1.487 ac, 74.24% Impervious, Inflow Depth = 4.92" for 25-Yr Storm event
 Inflow = 8.15 cfs @ 12.07 hrs, Volume= 0.610 af
 Outflow = 6.98 cfs @ 12.12 hrs, Volume= 0.610 af, Atten= 14%, Lag= 2.9 min
 Primary = 6.98 cfs @ 12.12 hrs, Volume= 0.610 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.98' @ 12.12 hrs Surf.Area= 4,431 sf Storage= 7,170 cf

Plug-Flow detention time= 297.3 min calculated for 0.610 af (100% of inflow)
 Center-of-Mass det. time= 297.8 min (1,067.5 - 769.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	16,412 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,831	0	0
100.50	4,010	5,131	5,131
102.00	5,316	6,995	12,125
102.80	5,402	4,287	16,412

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	15.0" Round Culvert L= 73.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.13' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	99.00'	0.750 in/hr Exfiltration over Horizontal area Phase-In= 0.01'
#3	Device 1	100.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	101.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.63 cfs @ 12.12 hrs HW=100.98' TW=99.53' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 6.63 cfs @ 5.40 fps)
 ↑ **2=Exfiltration** (Passes < 0.08 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes < 6.90 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.00' TW=99.40' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W1: Wetland

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 2.02" for 25-Yr Storm event
 Inflow = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af
 Outflow = 3.82 cfs @ 12.39 hrs, Volume= 0.736 af, Atten= 56%, Lag= 16.8 min
 Primary = 3.82 cfs @ 12.39 hrs, Volume= 0.736 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.48' @ 12.39 hrs Surf.Area= 8,509 sf Storage= 7,120 cf

Plug-Flow detention time= 46.5 min calculated for 0.736 af (100% of inflow)
 Center-of-Mass det. time= 46.6 min (877.5 - 830.9)

Post-Development EAST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	23,709 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	18.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 98.50' S= 0.0113 ' / S= 0.0113 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.82 cfs @ 12.39 hrs HW=100.48' TW=97.66' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.82 cfs @ 2.80 fps)**Summary for Pond W2: Wetland**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 2.23" for 25-Yr Storm event
 Inflow = 5.92 cfs @ 12.10 hrs, Volume= 1.006 af
 Outflow = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af, Atten= 7%, Lag= 6.9 min
 Primary = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.68' @ 12.19 hrs Surf.Area= 1,564 sf Storage= 531 cf

Plug-Flow detention time= 1.4 min calculated for 1.006 af (100% of inflow)

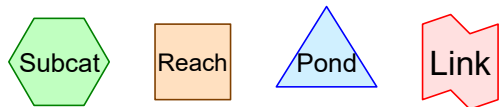
Center-of-Mass det. time= 1.1 min (865.1 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=7.97 cfs @ 12.22 hrs HW=97.68' TW=97.21' (Dynamic Tailwater)↑**1=Custom Weir/Orifice** (Weir Controls 7.97 cfs @ 2.52 fps)



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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7.0:	Runoff Area=307,321 sf 5.86% Impervious Runoff Depth>1.19" Flow Length=270' Tc=49.4 min CN=78 Runoff=4.24 cfs 0.697 af
Subcatchment 7.1:	Runoff Area=23,130 sf 11.66% Impervious Runoff Depth>0.87" Flow Length=115' Tc=6.5 min CN=72 Runoff=0.49 cfs 0.038 af
Subcatchment 7.2:	Runoff Area=458,111 sf 0.92% Impervious Runoff Depth>1.18" Flow Length=330' Tc=50.7 min CN=78 Runoff=6.23 cfs 1.038 af
Subcatchment 7.3:	Runoff Area=109,454 sf 16.90% Impervious Runoff Depth>0.71" Flow Length=275' Tc=39.9 min CN=69 Runoff=0.91 cfs 0.150 af
Subcatchment 7.4:	Runoff Area=76,277 sf 0.00% Impervious Runoff Depth>0.51" Flow Length=235' Tc=29.3 min CN=64 Runoff=0.45 cfs 0.074 af
Subcatchment 7.5:	Runoff Area=24,701 sf 21.31% Impervious Runoff Depth>0.97" Tc=5.0 min CN=74 Runoff=0.63 cfs 0.046 af
Subcatchment 8.1:	Runoff Area=22,593 sf 79.37% Impervious Runoff Depth>2.35" Tc=5.0 min CN=93 Runoff=1.43 cfs 0.101 af
Subcatchment 8.10:	Runoff Area=82,702 sf 61.99% Impervious Runoff Depth>1.91" Tc=5.0 min CN=88 Runoff=4.38 cfs 0.302 af
Subcatchment 8.11:	Runoff Area=73,887 sf 20.41% Impervious Runoff Depth>1.53" Tc=5.0 min CN=83 Runoff=3.13 cfs 0.216 af
Subcatchment 8.12:	Runoff Area=17,412 sf 91.40% Impervious Runoff Depth>2.65" Tc=5.0 min CN=96 Runoff=1.20 cfs 0.088 af
Subcatchment 8.2:	Runoff Area=28,897 sf 55.19% Impervious Runoff Depth>1.99" Tc=5.0 min CN=89 Runoff=1.59 cfs 0.110 af
Subcatchment 8.3:	Runoff Area=17,587 sf 86.61% Impervious Runoff Depth>2.55" Tc=5.0 min CN=95 Runoff=1.18 cfs 0.086 af
Subcatchment 8.4:	Runoff Area=9,852 sf 0.00% Impervious Runoff Depth>1.32" Tc=5.0 min CN=80 Runoff=0.36 cfs 0.025 af
Subcatchment 8.5:	Runoff Area=31,576 sf 89.50% Impervious Runoff Depth>2.65" Tc=5.0 min CN=96 Runoff=2.17 cfs 0.160 af
Subcatchment 8.6:	Runoff Area=15,257 sf 95.18% Impervious Runoff Depth>2.76" Tc=5.0 min CN=97 Runoff=1.07 cfs 0.080 af
Subcatchment 8.7:	Runoff Area=9,738 sf 100.00% Impervious Runoff Depth>2.87" Tc=5.0 min CN=98 Runoff=0.69 cfs 0.053 af

Post-Development WEST

Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Subcatchment 8.8:	Runoff Area=9,564 sf 0.00% Impervious Runoff Depth>1.32" Tc=5.0 min CN=80 Runoff=0.35 cfs 0.024 af
Subcatchment 8.9:	Runoff Area=25,455 sf 93.62% Impervious Runoff Depth>2.76" Tc=5.0 min CN=97 Runoff=1.79 cfs 0.134 af
Reach R7.1: Stream	Avg. Flow Depth=0.80' Max Vel=3.97 fps Inflow=12.05 cfs 3.064 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=12.01 cfs 3.054 af
Reach R7.3: Stream	Avg. Flow Depth=0.47' Max Vel=4.63 fps Inflow=7.49 cfs 2.211 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=7.49 cfs 2.209 af
Reach R7.4: Stream	Avg. Flow Depth=0.07' Max Vel=2.07 fps Inflow=0.45 cfs 0.074 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=0.45 cfs 0.074 af
Pond C1: CB5.3	Peak Elev=76.55' Inflow=1.43 cfs 0.101 af 12.0" Round Culvert n=0.013 L=80.0' S=0.0053 '/' Outflow=1.43 cfs 0.101 af
Pond C10: OCS4	Peak Elev=71.36' Inflow=2.60 cfs 0.202 af 24.0" Round Culvert n=0.013 L=63.0' S=0.0052 '/' Outflow=2.60 cfs 0.202 af
Pond C11: CB7.5	Peak Elev=73.27' Inflow=1.20 cfs 0.088 af 12.0" Round Culvert n=0.013 L=49.0' S=0.0143 '/' Outflow=1.20 cfs 0.088 af
Pond C2: CB5.5	Peak Elev=76.00' Inflow=3.02 cfs 0.211 af 15.0" Round Culvert n=0.013 L=209.0' S=0.0051 '/' Outflow=3.02 cfs 0.211 af
Pond C3: CB5.6	Peak Elev=74.98' Inflow=4.20 cfs 0.297 af 18.0" Round Culvert n=0.013 L=62.0' S=0.0052 '/' Outflow=4.20 cfs 0.297 af
Pond C4: CB6.3.1	Peak Elev=75.19' Inflow=2.86 cfs 0.213 af 15.0" Round Culvert n=0.013 L=31.0' S=0.0058 '/' Outflow=2.86 cfs 0.213 af
Pond C5: CB6.3	Peak Elev=75.35' Inflow=0.69 cfs 0.053 af 12.0" Round Culvert n=0.013 L=129.0' S=0.0056 '/' Outflow=0.69 cfs 0.053 af
Pond C6: CB6.4	Peak Elev=74.95' Inflow=3.93 cfs 0.294 af 15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=3.93 cfs 0.294 af
Pond C7: CB7.3	Peak Elev=73.91' Inflow=4.38 cfs 0.302 af 18.0" Round Culvert n=0.013 L=196.0' S=0.0098 '/' Outflow=4.38 cfs 0.302 af
Pond C7.1: CB7.3	Peak Elev=78.87' Inflow=0.49 cfs 0.038 af 15.0" Round Culvert n=0.013 L=88.0' S=0.0398 '/' Outflow=0.49 cfs 0.038 af
Pond C7.3:	Peak Elev=76.70' Inflow=7.49 cfs 2.211 af 36.0" Round Culvert w/ 1.0" inside fill n=0.013 L=55.0' S=0.0200 '/' Outflow=7.49 cfs 2.211 af
Pond C7.5: CB7.3	Peak Elev=80.19' Inflow=0.63 cfs 0.046 af 36.0" Round Culvert w/ 12.0" inside fill n=0.013 L=70.0' S=0.0563 '/' Outflow=0.63 cfs 0.046 af

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Pond C8: CB7.4

Peak Elev=72.32' Inflow=7.36 cfs 0.524 af
24.0" Round Culvert n=0.013 L=85.0' S=0.0051 ' /' Outflow=7.36 cfs 0.524 af

Pond C9: OCS3

Peak Elev=71.68' Inflow=1.29 cfs 0.105 af
18.0" Round Culvert n=0.013 L=77.0' S=0.0053 ' /' Outflow=1.29 cfs 0.105 af

Pond P1: Wetland

Peak Elev=83.63' Storage=12,495 cf Inflow=8.88 cfs 2.073 af
Outflow=6.84 cfs 2.062 af

Pond SF3: Soil Fliter

Peak Elev=74.66' Storage=6,216 cf Inflow=4.56 cfs 0.322 af
Primary=0.08 cfs 0.096 af Secondary=1.29 cfs 0.105 af Tertiary=0.00 cfs 0.000 af Outflow=1.37 cfs 0.201 af

Pond SF4: Soil Filter

Peak Elev=74.66' Storage=6,168 cf Inflow=4.28 cfs 0.318 af
Primary=0.07 cfs 0.103 af Secondary=1.32 cfs 0.097 af Tertiary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.201 af

Link AP8:

Inflow=14.39 cfs 4.196 af
Primary=14.39 cfs 4.196 af

Link 2-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce Inflow=6.65 cfs 1.035 af
Area= 10.780 ac 49.22% Imperv. Primary=6.65 cfs 1.035 af

Total Runoff Area = 30.843 ac Runoff Volume = 3.423 af Average Runoff Depth = 1.33"
80.92% Pervious = 24.957 ac 19.08% Impervious = 5.886 ac

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Summary for Subcatchment 7.0:

Runoff = 4.24 cfs @ 12.69 hrs, Volume= 0.697 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 18,020	98	Impervious
3,144	80	>75% Grass cover, Good, HSG D
36,715	73	Brush, Good, HSG D
249,442	77	Woods, Good, HSG D
307,321	78	Weighted Average
289,301		94.14% Pervious Area
18,020		5.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 2,697	98	Impervious
750	74	>75% Grass cover, Good, HSG C
12,331	65	Brush, Good, HSG C
7,352	73	Brush, Good, HSG D
23,130	72	Weighted Average
20,433		88.34% Pervious Area
2,697		11.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	15	0.2000	0.32		Sheet Flow, AB
					Range n= 0.130 P2= 3.10"
5.7	100	0.0600	0.29		Sheet Flow, BC
					Range n= 0.130 P2= 3.10"
6.5	115	Total			

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Summary for Subcatchment 7.2:

Runoff = 6.23 cfs @ 12.73 hrs, Volume= 1.038 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 4,195	98	Impervious
1,074	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
143,721	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
289,827	77	Woods, Good, HSG D
458,111	78	Weighted Average
453,916		99.08% Pervious Area
4,195		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD
					Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 0.91 cfs @ 12.64 hrs, Volume= 0.150 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 18,496	98	Impervious
4,537	30	Brush, Good, HSG A
9,423	73	Brush, Good, HSG D
21,947	30	Woods, Good, HSG A
55,051	77	Woods, Good, HSG D
109,454	69	Weighted Average
90,958		83.10% Pervious Area
18,496		16.90% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 0.45 cfs @ 12.52 hrs, Volume= 0.074 af, Depth> 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
19,947	30	Woods, Good, HSG A
3,125	70	Woods, Good, HSG C
53,205	77	Woods, Good, HSG D
76,277	64	Weighted Average
76,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 7.5:

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	5,263	98	Impervious
	567	74	>75% Grass cover, Good, HSG C
	14,440	65	Brush, Good, HSG C
	4,431	73	Brush, Good, HSG D
	24,701	74	Weighted Average
	19,438		78.69% Pervious Area
	5,263		21.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.1:

Runoff = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	17,932	98	Impervious
	3,258	74	>75% Grass cover, Good, HSG C
	1,403	80	>75% Grass cover, Good, HSG D
	22,593	93	Weighted Average
	4,661		20.63% Pervious Area
	17,932		79.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.10:

Runoff = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	51,270	98	Impervious
	4,732	74	>75% Grass cover, Good, HSG C
	26,700	70	Woods, Good, HSG C
	82,702	88	Weighted Average
	31,432		38.01% Pervious Area
	51,270		61.99% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.11:

Runoff = 3.13 cfs @ 12.08 hrs, Volume= 0.216 af, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 15,081	98	Impervious
2,598	74	>75% Grass cover, Good, HSG C
56,208	80	>75% Grass cover, Good, HSG D
73,887	83	Weighted Average
58,806		79.59% Pervious Area
15,081		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.12:

Runoff = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 15,914	98	Impervious
1,498	74	>75% Grass cover, Good, HSG C
17,412	96	Weighted Average
1,498		8.60% Pervious Area
15,914		91.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.2:

Runoff = 1.59 cfs @ 12.07 hrs, Volume= 0.110 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	15,948	98	Impervious
	6,561	74	>75% Grass cover, Good, HSG C
	6,388	80	>75% Grass cover, Good, HSG D
	28,897	89	Weighted Average
	12,949		44.81% Pervious Area
	15,948		55.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.3:

Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.086 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	15,232	98	Impervious
	1,109	74	>75% Grass cover, Good, HSG C
	1,246	80	>75% Grass cover, Good, HSG D
	17,587	95	Weighted Average
	2,355		13.39% Pervious Area
	15,232		86.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.4:

Runoff = 0.36 cfs @ 12.08 hrs, Volume= 0.025 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
	9,852	80	>75% Grass cover, Good, HSG D
	9,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 8.5:

Runoff = 2.17 cfs @ 12.07 hrs, Volume= 0.160 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	28,262	98	Impervious
	2,606	74	>75% Grass cover, Good, HSG C
	708	80	>75% Grass cover, Good, HSG D
	31,576	96	Weighted Average
	3,314		10.50% Pervious Area
	28,262		89.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.6:

Runoff = 1.07 cfs @ 12.07 hrs, Volume= 0.080 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	14,522	98	Impervious
	735	80	>75% Grass cover, Good, HSG D
	15,257	97	Weighted Average
	735		4.82% Pervious Area
	14,522		95.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.7:

Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	9,738	98	Impervious
	9,738		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.8:

Runoff = 0.35 cfs @ 12.08 hrs, Volume= 0.024 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
9,564	80	>75% Grass cover, Good, HSG D
9,564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.9:

Runoff = 1.79 cfs @ 12.07 hrs, Volume= 0.134 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 23,832	98	Impervious
1,212	74	>75% Grass cover, Good, HSG C
411	80	>75% Grass cover, Good, HSG D
25,455	97	Weighted Average
1,623		6.38% Pervious Area
23,832		93.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R7.1: Stream

Inflow Area = 33.714 ac, 19.05% Impervious, Inflow Depth > 1.09" for 2-Yr Storm event
Inflow = 12.05 cfs @ 12.77 hrs, Volume= 3.064 af
Outflow = 12.01 cfs @ 12.81 hrs, Volume= 3.054 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 8.9 min

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Peak Storage= 2,602 cf @ 12.81 hrs

Average Depth at Peak Storage= 0.80'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 1.11" for 2-Yr Storm event

Inflow = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af

Outflow = 7.49 cfs @ 12.93 hrs, Volume= 2.209 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.63 fps, Min. Travel Time= 1.3 min

Avg. Velocity= 1.97 fps, Avg. Travel Time= 3.0 min

Peak Storage= 574 cf @ 12.93 hrs

Average Depth at Peak Storage= 0.47'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



Summary for Reach R7.4: Stream

Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 0.51" for 2-Yr Storm event

Inflow = 0.45 cfs @ 12.52 hrs, Volume= 0.074 af

Outflow = 0.45 cfs @ 12.53 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.7 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 2.07 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 1.04 fps, Avg. Travel Time= 2.2 min

Peak Storage= 30 cf @ 12.53 hrs

Average Depth at Peak Storage= 0.07'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 '/'

Inlet Invert= 73.00', Outlet Invert= 67.00'



Summary for Pond C1: CB5.3

Inflow Area = 0.519 ac, 79.37% Impervious, Inflow Depth > 2.35" for 2-Yr Storm event

Inflow = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af

Outflow = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Primary = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.55' @ 12.08 hrs

Flood Elev= 80.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.80'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.80' / 75.38' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.38 cfs @ 12.07 hrs HW=76.54' TW=75.99' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 1.38 cfs @ 3.07 fps)

Summary for Pond C10: OCS4

Inflow = 2.60 cfs @ 12.37 hrs, Volume= 0.202 af

Outflow = 2.60 cfs @ 12.37 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary = 2.60 cfs @ 12.37 hrs, Volume= 0.202 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 71.36' @ 12.37 hrs

Flood Elev= 74.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	70.59'	24.0" Round Culvert L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.59' / 70.26' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.60 cfs @ 12.37 hrs HW=71.36' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 2.60 cfs @ 3.44 fps)**Summary for Pond C11: CB7.5**

Inflow Area = 0.400 ac, 91.40% Impervious, Inflow Depth > 2.65" for 2-Yr Storm event
Inflow = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af
Outflow = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.27' @ 12.07 hrs

Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.70'	12.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.70' / 72.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.07 hrs HW=73.27' TW=72.31' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.19 cfs @ 2.57 fps)**Summary for Pond C2: CB5.5**

Inflow Area = 1.182 ac, 65.80% Impervious, Inflow Depth > 2.15" for 2-Yr Storm event
Inflow = 3.02 cfs @ 12.07 hrs, Volume= 0.211 af
Outflow = 3.02 cfs @ 12.07 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min
Primary = 3.02 cfs @ 12.07 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.00' @ 12.08 hrs

Flood Elev= 79.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	74.89'	15.0" Round Culvert L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.89' / 73.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.97 cfs @ 12.07 hrs HW=75.99' TW=74.97' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 2.97 cfs @ 3.45 fps)

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Summary for Pond C3: CB5.6

Inflow Area = 1.586 ac, 71.10% Impervious, Inflow Depth > 2.25" for 2-Yr Storm event
 Inflow = 4.20 cfs @ 12.07 hrs, Volume= 0.297 af
 Outflow = 4.20 cfs @ 12.07 hrs, Volume= 0.297 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.20 cfs @ 12.07 hrs, Volume= 0.297 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.98' @ 12.07 hrs

Flood Elev= 78.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.82'	18.0" Round Culvert L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.82' / 73.50' S= 0.0052 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.17 cfs @ 12.07 hrs HW=74.97' TW=74.16' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 4.17 cfs @ 3.95 fps)

Summary for Pond C4: CB6.3.1

Inflow Area = 0.948 ac, 91.98% Impervious, Inflow Depth > 2.70" for 2-Yr Storm event
 Inflow = 2.86 cfs @ 12.07 hrs, Volume= 0.213 af
 Outflow = 2.86 cfs @ 12.07 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.86 cfs @ 12.07 hrs, Volume= 0.213 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.19' @ 12.08 hrs

Flood Elev= 77.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.88'	15.0" Round Culvert L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.88' / 73.70' S= 0.0058 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.65 cfs @ 12.07 hrs HW=75.16' TW=74.95' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 2.65 cfs @ 2.61 fps)

Summary for Pond C5: CB6.3

Inflow Area = 0.224 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2-Yr Storm event
 Inflow = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af
 Outflow = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.35' @ 12.10 hrs

Flood Elev= 79.10'

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Device	Routing	Invert	Outlet Devices
#1	Primary	74.60'	12.0" Round Culvert L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.60' / 73.88' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.56 cfs @ 12.07 hrs HW=75.31' TW=75.16' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.56 cfs @ 1.33 fps)**Summary for Pond C6: CB6.4**

Inflow Area = 1.299 ac, 92.84% Impervious, Inflow Depth > 2.72" for 2-Yr Storm event
Inflow = 3.93 cfs @ 12.07 hrs, Volume= 0.294 af
Outflow = 3.93 cfs @ 12.07 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.0 min
Primary = 3.93 cfs @ 12.07 hrs, Volume= 0.294 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.95' @ 12.07 hrs

Flood Elev= 76.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.70'	15.0" Round Culvert L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.70' / 73.30' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.87 cfs @ 12.07 hrs HW=74.95' TW=74.25' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 3.87 cfs @ 3.93 fps)**Summary for Pond C7: CB7.3**

Inflow Area = 1.899 ac, 61.99% Impervious, Inflow Depth > 1.91" for 2-Yr Storm event
Inflow = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af
Outflow = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min
Primary = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.91' @ 12.08 hrs

Flood Elev= 76.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.85'	18.0" Round Culvert L= 196.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.85' / 70.93' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.32 cfs @ 12.07 hrs HW=73.91' TW=72.31' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 4.32 cfs @ 4.56 fps)

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Summary for Pond C7.1: CB7.3

Inflow Area = 0.531 ac, 11.66% Impervious, Inflow Depth > 0.87" for 2-Yr Storm event
 Inflow = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af
 Outflow = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 78.87' @ 12.11 hrs

Flood Elev= 82.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	15.0" Round Culvert L= 88.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.50' / 75.00' S= 0.0398 ' S= 0.0398 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.48 cfs @ 12.11 hrs HW=78.86' TW=76.41' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 0.48 cfs @ 1.62 fps)

Summary for Pond C7.3:

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 1.11" for 2-Yr Storm event
 Inflow = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af
 Outflow = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.70' @ 12.92 hrs

Flood Elev= 84.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.48'	36.0" Round Culvert w/ 1.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.40' / 74.30' S= 0.0200 ' S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.01 sf

Primary OutFlow Max=7.49 cfs @ 12.92 hrs HW=76.70' TW=75.47' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 7.49 cfs @ 2.60 fps)

Summary for Pond C7.5: CB7.3

Inflow Area = 0.567 ac, 21.31% Impervious, Inflow Depth > 0.97" for 2-Yr Storm event
 Inflow = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af
 Outflow = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 80.19' @ 12.08 hrs

Flood Elev= 83.00'

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Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	36.0" Round Culvert w/ 12.0" inside fill L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.00' / 75.06' S= 0.0563 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf

Primary OutFlow Max=0.63 cfs @ 12.08 hrs HW=80.19' TW=76.38' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.63 cfs @ 1.12 fps)**Summary for Pond C8: CB7.4**

Inflow Area = 2.883 ac, 72.48% Impervious, Inflow Depth > 2.18" for 2-Yr Storm event
Inflow = 7.36 cfs @ 12.07 hrs, Volume= 0.524 af
Outflow = 7.36 cfs @ 12.07 hrs, Volume= 0.524 af, Atten= 0%, Lag= 0.0 min
Primary = 7.36 cfs @ 12.07 hrs, Volume= 0.524 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.32' @ 12.07 hrs

Flood Elev= 75.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	70.93'	24.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.93' / 70.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.30 cfs @ 12.07 hrs HW=72.31' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 7.30 cfs @ 4.44 fps)**Summary for Pond C9: OCS3**

Inflow = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af
Outflow = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 71.68' @ 12.39 hrs

Flood Elev= 74.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	18.0" Round Culvert L= 77.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.59' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.30 cfs @ 12.39 hrs HW=71.68' TW=71.36' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.30 cfs @ 2.43 fps)

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Summary for Pond P1: Wetland

Inflow Area = 21.297 ac, 25.37% Impervious, Inflow Depth > 1.17" for 2-Yr Storm event
 Inflow = 8.88 cfs @ 12.53 hrs, Volume= 2.073 af
 Outflow = 6.84 cfs @ 13.00 hrs, Volume= 2.062 af, Atten= 23%, Lag= 28.2 min
 Primary = 6.84 cfs @ 13.00 hrs, Volume= 2.062 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 83.63' @ 13.00 hrs Surf.Area= 20,135 sf Storage= 12,495 cf

Plug-Flow detention time= 23.7 min calculated for 2.060 af (99% of inflow)
 Center-of-Mass det. time= 20.5 min (885.8 - 865.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S= 0.0560 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=6.84 cfs @ 13.00 hrs HW=83.63' TW=76.70' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 6.84 cfs @ 3.09 fps)

↑ **1=Sharp-Crested Vee/Trap Weir** (Passes 6.84 cfs of 9.42 cfs potential flow)

Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 2.13" for 2-Yr Storm event
 Inflow = 4.56 cfs @ 12.07 hrs, Volume= 0.322 af
 Outflow = 1.37 cfs @ 12.39 hrs, Volume= 0.201 af, Atten= 70%, Lag= 19.2 min
 Primary = 0.08 cfs @ 12.39 hrs, Volume= 0.096 af
 Secondary = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 74.66' @ 12.39 hrs Surf.Area= 4,427 sf Storage= 6,216 cf

Plug-Flow detention time= 188.0 min calculated for 0.201 af (62% of inflow)
 Center-of-Mass det. time= 85.6 min (885.0 - 799.5)

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Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.39 hrs HW=74.66' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=1.29 cfs @ 12.39 hrs HW=74.66' TW=71.68' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 1.29 cfs @ 1.30 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SF4: Soil Filter**

Inflow Area =	1.518 ac, 79.42% Impervious, Inflow Depth > 2.51" for 2-Yr Storm event
Inflow =	4.28 cfs @ 12.07 hrs, Volume= 0.318 af
Outflow =	1.40 cfs @ 12.35 hrs, Volume= 0.201 af, Atten= 67%, Lag= 16.7 min
Primary =	0.07 cfs @ 12.35 hrs, Volume= 0.103 af
Secondary =	1.32 cfs @ 12.35 hrs, Volume= 0.097 af
Tertiary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.66' @ 12.35 hrs Surf.Area= 4,308 sf Storage= 6,168 cf

Plug-Flow detention time= 185.6 min calculated for 0.201 af (63% of inflow)

Center-of-Mass det. time= 83.3 min (857.1 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	18,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,128	0	0
74.50	4,186	5,486	5,486
75.00	4,566	2,188	7,674
76.00	5,370	4,968	12,642
77.00	6,231	5,801	18,442

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.35 hrs HW=74.66' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.07 cfs)**Secondary OutFlow** Max=1.32 cfs @ 12.35 hrs HW=74.66' TW=71.36' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 1.32 cfs @ 1.31 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Link AP8:**

Inflow Area = 41.623 ac, 26.89% Impervious, Inflow Depth > 1.21" for 2-Yr Storm event
 Inflow = 14.39 cfs @ 12.73 hrs, Volume= 4.196 af
 Primary = 14.39 cfs @ 12.73 hrs, Volume= 4.196 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link L1: EAST

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth > 1.15" for 2-Yr Storm event
 Inflow = 6.65 cfs @ 12.13 hrs, Volume= 1.035 af
 Primary = 6.65 cfs @ 12.13 hrs, Volume= 1.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

2-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7.0:	Runoff Area=307,321 sf 5.86% Impervious Runoff Depth>2.35" Flow Length=270' Tc=49.4 min CN=78 Runoff=8.65 cfs 1.381 af
Subcatchment 7.1:	Runoff Area=23,130 sf 11.66% Impervious Runoff Depth>1.89" Flow Length=115' Tc=6.5 min CN=72 Runoff=1.14 cfs 0.084 af
Subcatchment 7.2:	Runoff Area=458,111 sf 0.92% Impervious Runoff Depth>2.35" Flow Length=330' Tc=50.7 min CN=78 Runoff=12.69 cfs 2.059 af
Subcatchment 7.3:	Runoff Area=109,454 sf 16.90% Impervious Runoff Depth>1.65" Flow Length=275' Tc=39.9 min CN=69 Runoff=2.34 cfs 0.346 af
Subcatchment 7.4:	Runoff Area=76,277 sf 0.00% Impervious Runoff Depth>1.32" Flow Length=235' Tc=29.3 min CN=64 Runoff=1.43 cfs 0.192 af
Subcatchment 7.5:	Runoff Area=24,701 sf 21.31% Impervious Runoff Depth>2.05" Tc=5.0 min CN=74 Runoff=1.40 cfs 0.097 af
Subcatchment 8.1:	Runoff Area=22,593 sf 79.37% Impervious Runoff Depth>3.80" Tc=5.0 min CN=93 Runoff=2.26 cfs 0.164 af
Subcatchment 8.10:	Runoff Area=82,702 sf 61.99% Impervious Runoff Depth>3.29" Tc=5.0 min CN=88 Runoff=7.43 cfs 0.520 af
Subcatchment 8.11:	Runoff Area=73,887 sf 20.41% Impervious Runoff Depth>2.81" Tc=5.0 min CN=83 Runoff=5.77 cfs 0.398 af
Subcatchment 8.12:	Runoff Area=17,412 sf 91.40% Impervious Runoff Depth>4.13" Tc=5.0 min CN=96 Runoff=1.82 cfs 0.138 af
Subcatchment 8.2:	Runoff Area=28,897 sf 55.19% Impervious Runoff Depth>3.39" Tc=5.0 min CN=89 Runoff=2.66 cfs 0.187 af
Subcatchment 8.3:	Runoff Area=17,587 sf 86.61% Impervious Runoff Depth>4.02" Tc=5.0 min CN=95 Runoff=1.82 cfs 0.135 af
Subcatchment 8.4:	Runoff Area=9,852 sf 0.00% Impervious Runoff Depth>2.54" Tc=5.0 min CN=80 Runoff=0.70 cfs 0.048 af
Subcatchment 8.5:	Runoff Area=31,576 sf 89.50% Impervious Runoff Depth>4.13" Tc=5.0 min CN=96 Runoff=3.30 cfs 0.250 af
Subcatchment 8.6:	Runoff Area=15,257 sf 95.18% Impervious Runoff Depth>4.25" Tc=5.0 min CN=97 Runoff=1.61 cfs 0.124 af
Subcatchment 8.7:	Runoff Area=9,738 sf 100.00% Impervious Runoff Depth>4.36" Tc=5.0 min CN=98 Runoff=1.04 cfs 0.081 af

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Subcatchment 8.8:	Runoff Area=9,564 sf 0.00% Impervious Runoff Depth>2.54" Tc=5.0 min CN=80 Runoff=0.68 cfs 0.047 af
Subcatchment 8.9:	Runoff Area=25,455 sf 93.62% Impervious Runoff Depth>4.25" Tc=5.0 min CN=97 Runoff=2.69 cfs 0.207 af
Reach R7.1: Stream	Avg. Flow Depth=1.20' Max Vel=4.88 fps Inflow=24.59 cfs 6.113 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=24.53 cfs 6.100 af
Reach R7.3: Stream	Avg. Flow Depth=0.69' Max Vel=5.74 fps Inflow=14.67 cfs 4.363 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=14.67 cfs 4.359 af
Reach R7.4: Stream	Avg. Flow Depth=0.14' Max Vel=3.19 fps Inflow=1.43 cfs 0.192 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=1.43 cfs 0.192 af
Pond C1: CB5.3	Peak Elev=77.49' Inflow=2.26 cfs 0.164 af 12.0" Round Culvert n=0.013 L=80.0' S=0.0053 '/' Outflow=2.26 cfs 0.164 af
Pond C10: OCS4	Peak Elev=72.38' Inflow=10.82 cfs 0.566 af 24.0" Round Culvert n=0.013 L=63.0' S=0.0052 '/' Outflow=10.82 cfs 0.566 af
Pond C11: CB7.5	Peak Elev=73.47' Inflow=1.82 cfs 0.138 af 12.0" Round Culvert n=0.013 L=49.0' S=0.0143 '/' Outflow=1.82 cfs 0.138 af
Pond C2: CB5.5	Peak Elev=77.02' Inflow=4.92 cfs 0.352 af 15.0" Round Culvert n=0.013 L=209.0' S=0.0051 '/' Outflow=4.92 cfs 0.352 af
Pond C3: CB5.6	Peak Elev=75.49' Inflow=6.73 cfs 0.487 af 18.0" Round Culvert n=0.013 L=62.0' S=0.0052 '/' Outflow=6.73 cfs 0.487 af
Pond C4: CB6.3.1	Peak Elev=76.52' Inflow=4.34 cfs 0.331 af 15.0" Round Culvert n=0.013 L=31.0' S=0.0058 '/' Outflow=4.34 cfs 0.331 af
Pond C5: CB6.3	Peak Elev=76.64' Inflow=1.04 cfs 0.081 af 12.0" Round Culvert n=0.013 L=129.0' S=0.0056 '/' Outflow=1.04 cfs 0.081 af
Pond C6: CB6.4	Peak Elev=76.02' Inflow=5.95 cfs 0.455 af 15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=5.95 cfs 0.455 af
Pond C7: CB7.3	Peak Elev=74.43' Inflow=7.43 cfs 0.520 af 18.0" Round Culvert n=0.013 L=196.0' S=0.0098 '/' Outflow=7.43 cfs 0.520 af
Pond C7.1: CB7.3	Peak Elev=79.08' Inflow=1.14 cfs 0.084 af 15.0" Round Culvert n=0.013 L=88.0' S=0.0398 '/' Outflow=1.14 cfs 0.084 af
Pond C7.3:	Peak Elev=77.28' Inflow=14.67 cfs 4.363 af 36.0" Round Culvert w/ 1.0" inside fill n=0.013 L=55.0' S=0.0200 '/' Outflow=14.67 cfs 4.363 af
Pond C7.5: CB7.3	Peak Elev=80.33' Inflow=1.40 cfs 0.097 af 36.0" Round Culvert w/ 12.0" inside fill n=0.013 L=70.0' S=0.0563 '/' Outflow=1.40 cfs 0.097 af

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Pond C8: CB7.4

Peak Elev=72.83' Inflow=11.93 cfs 0.865 af
24.0" Round Culvert n=0.013 L=85.0' S=0.0051 '/' Outflow=11.93 cfs 0.865 af

Pond C9: OCS3

Peak Elev=72.83' Inflow=5.66 cfs 0.303 af
18.0" Round Culvert n=0.013 L=77.0' S=0.0053 '/' Outflow=5.66 cfs 0.303 af

Pond P1: Wetland

Peak Elev=84.50' Storage=34,069 cf Inflow=20.93 cfs 4.035 af
Outflow=13.08 cfs 4.016 af

Pond SF3: Soil Fliter

Peak Elev=74.92' Storage=7,419 cf Inflow=7.43 cfs 0.535 af
Primary=0.08 cfs 0.105 af Secondary=5.66 cfs 0.303 af Tertiary=0.00 cfs 0.000 af Outflow=5.74 cfs 0.408 af

Pond SF4: Soil Filter

Peak Elev=74.90' Storage=7,215 cf Inflow=6.63 cfs 0.501 af
Primary=0.08 cfs 0.113 af Secondary=5.17 cfs 0.264 af Tertiary=0.00 cfs 0.000 af Outflow=5.25 cfs 0.376 af

Link AP8:

Inflow=35.94 cfs 8.147 af
Primary=35.94 cfs 8.147 af

Link 10-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce Inflow=14.70 cfs 1.976 af
Area= 10.780 ac 49.22% Imperv. Primary=14.70 cfs 1.976 af

Total Runoff Area = 30.843 ac Runoff Volume = 6.457 af Average Runoff Depth = 2.51"
80.92% Pervious = 24.957 ac 19.08% Impervious = 5.886 ac

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Summary for Subcatchment 7.0:

Runoff = 8.65 cfs @ 12.68 hrs, Volume= 1.381 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	18,020	98	Impervious
	3,144	80	>75% Grass cover, Good, HSG D
	36,715	73	Brush, Good, HSG D
	249,442	77	Woods, Good, HSG D
	307,321	78	Weighted Average
	289,301		94.14% Pervious Area
	18,020		5.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	2,697	98	Impervious
	750	74	>75% Grass cover, Good, HSG C
	12,331	65	Brush, Good, HSG C
	7,352	73	Brush, Good, HSG D
	23,130	72	Weighted Average
	20,433		88.34% Pervious Area
	2,697		11.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	15	0.2000	0.32		Sheet Flow, AB
					Range n= 0.130 P2= 3.10"
5.7	100	0.0600	0.29		Sheet Flow, BC
					Range n= 0.130 P2= 3.10"
6.5	115	Total			

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Summary for Subcatchment 7.2:

Runoff = 12.69 cfs @ 12.69 hrs, Volume= 2.059 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 4,195	98	Impervious
1,074	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
143,721	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
289,827	77	Woods, Good, HSG D
458,111	78	Weighted Average
453,916		99.08% Pervious Area
4,195		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD
					Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 2.34 cfs @ 12.58 hrs, Volume= 0.346 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 18,496	98	Impervious
4,537	30	Brush, Good, HSG A
9,423	73	Brush, Good, HSG D
21,947	30	Woods, Good, HSG A
55,051	77	Woods, Good, HSG D
109,454	69	Weighted Average
90,958		83.10% Pervious Area
18,496		16.90% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 1.43 cfs @ 12.46 hrs, Volume= 0.192 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
19,947	30	Woods, Good, HSG A
3,125	70	Woods, Good, HSG C
53,205	77	Woods, Good, HSG D
76,277	64	Weighted Average
76,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 7.5:

Runoff = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	5,263	98	Impervious
	567	74	>75% Grass cover, Good, HSG C
	14,440	65	Brush, Good, HSG C
	4,431	73	Brush, Good, HSG D
	24,701	74	Weighted Average
	19,438		78.69% Pervious Area
	5,263		21.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.1:

Runoff = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	17,932	98	Impervious
	3,258	74	>75% Grass cover, Good, HSG C
	1,403	80	>75% Grass cover, Good, HSG D
	22,593	93	Weighted Average
	4,661		20.63% Pervious Area
	17,932		79.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.10:

Runoff = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	51,270	98	Impervious
	4,732	74	>75% Grass cover, Good, HSG C
	26,700	70	Woods, Good, HSG C
	82,702	88	Weighted Average
	31,432		38.01% Pervious Area
	51,270		61.99% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.11:

Runoff = 5.77 cfs @ 12.07 hrs, Volume= 0.398 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 15,081	98	Impervious
2,598	74	>75% Grass cover, Good, HSG C
56,208	80	>75% Grass cover, Good, HSG D
73,887	83	Weighted Average
58,806		79.59% Pervious Area
15,081		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.12:

Runoff = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 15,914	98	Impervious
1,498	74	>75% Grass cover, Good, HSG C
17,412	96	Weighted Average
1,498		8.60% Pervious Area
15,914		91.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.2:

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.187 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	15,948	98	Impervious
	6,561	74	>75% Grass cover, Good, HSG C
	6,388	80	>75% Grass cover, Good, HSG D
	28,897	89	Weighted Average
	12,949		44.81% Pervious Area
	15,948		55.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.3:

Runoff = 1.82 cfs @ 12.07 hrs, Volume= 0.135 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	15,232	98	Impervious
	1,109	74	>75% Grass cover, Good, HSG C
	1,246	80	>75% Grass cover, Good, HSG D
	17,587	95	Weighted Average
	2,355		13.39% Pervious Area
	15,232		86.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.4:

Runoff = 0.70 cfs @ 12.08 hrs, Volume= 0.048 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
	9,852	80	>75% Grass cover, Good, HSG D
	9,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 8.5:

Runoff = 3.30 cfs @ 12.07 hrs, Volume= 0.250 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	28,262	98	Impervious
	2,606	74	>75% Grass cover, Good, HSG C
	708	80	>75% Grass cover, Good, HSG D
	31,576	96	Weighted Average
	3,314		10.50% Pervious Area
	28,262		89.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.6:

Runoff = 1.61 cfs @ 12.07 hrs, Volume= 0.124 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	14,522	98	Impervious
	735	80	>75% Grass cover, Good, HSG D
	15,257	97	Weighted Average
	735		4.82% Pervious Area
	14,522		95.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.7:

Runoff = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	9,738	98	Impervious
	9,738		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.8:

Runoff = 0.68 cfs @ 12.08 hrs, Volume= 0.047 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
9,564	80	>75% Grass cover, Good, HSG D
9,564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.9:

Runoff = 2.69 cfs @ 12.07 hrs, Volume= 0.207 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 23,832	98	Impervious
1,212	74	>75% Grass cover, Good, HSG C
411	80	>75% Grass cover, Good, HSG D
25,455	97	Weighted Average
1,623		6.38% Pervious Area
23,832		93.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R7.1: Stream

Inflow Area = 33.714 ac, 19.05% Impervious, Inflow Depth > 2.18" for 10-Yr Storm event
Inflow = 24.59 cfs @ 12.69 hrs, Volume= 6.113 af
Outflow = 24.53 cfs @ 12.73 hrs, Volume= 6.100 af, Atten= 0%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.88 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 7.2 min

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Peak Storage= 4,318 cf @ 12.73 hrs

Average Depth at Peak Storage= 1.20'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 2.20" for 10-Yr Storm event

Inflow = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af

Outflow = 14.67 cfs @ 12.83 hrs, Volume= 4.359 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.74 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 2.42 fps, Avg. Travel Time= 2.4 min

Peak Storage= 907 cf @ 12.83 hrs

Average Depth at Peak Storage= 0.69'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



Summary for Reach R7.4: Stream

Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 1.32" for 10-Yr Storm event

Inflow = 1.43 cfs @ 12.46 hrs, Volume= 0.192 af

Outflow = 1.43 cfs @ 12.46 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.4 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.19 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 1.29 fps, Avg. Travel Time= 1.8 min

Peak Storage= 63 cf @ 12.46 hrs

Average Depth at Peak Storage= 0.14'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 '/'

Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: CB5.3**

Inflow Area = 0.519 ac, 79.37% Impervious, Inflow Depth > 3.80" for 10-Yr Storm event

Inflow = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af

Outflow = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.49' @ 12.09 hrs

Flood Elev= 80.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.80'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.80' / 75.38' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.07 hrs HW=77.22' TW=76.97' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.55 cfs @ 1.97 fps)**Summary for Pond C10: OCS4**

Inflow = 10.82 cfs @ 12.13 hrs, Volume= 0.566 af

Outflow = 10.82 cfs @ 12.13 hrs, Volume= 0.566 af, Atten= 0%, Lag= 0.0 min

Primary = 10.82 cfs @ 12.13 hrs, Volume= 0.566 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.38' @ 12.13 hrs

Flood Elev= 74.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	70.59'	24.0" Round Culvert L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.59' / 70.26' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.77 cfs @ 12.13 hrs HW=72.37' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 10.77 cfs @ 4.83 fps)**Summary for Pond C11: CB7.5**

Inflow Area = 0.400 ac, 91.40% Impervious, Inflow Depth > 4.13" for 10-Yr Storm event
Inflow = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af
Outflow = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Primary = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.47' @ 12.08 hrs

Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.70'	12.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.70' / 72.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.07 hrs HW=73.46' TW=72.82' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.74 cfs @ 3.78 fps)**Summary for Pond C2: CB5.5**

Inflow Area = 1.182 ac, 65.80% Impervious, Inflow Depth > 3.57" for 10-Yr Storm event
Inflow = 4.92 cfs @ 12.07 hrs, Volume= 0.352 af
Outflow = 4.92 cfs @ 12.07 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min
Primary = 4.92 cfs @ 12.07 hrs, Volume= 0.352 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.02' @ 12.08 hrs

Flood Elev= 79.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	74.89'	15.0" Round Culvert L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.89' / 73.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.78 cfs @ 12.07 hrs HW=76.98' TW=75.47' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 4.78 cfs @ 3.90 fps)

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Summary for Pond C3: CB5.6

Inflow Area = 1.586 ac, 71.10% Impervious, Inflow Depth > 3.68" for 10-Yr Storm event
 Inflow = 6.73 cfs @ 12.07 hrs, Volume= 0.487 af
 Outflow = 6.73 cfs @ 12.07 hrs, Volume= 0.487 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.73 cfs @ 12.07 hrs, Volume= 0.487 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.49' @ 12.08 hrs

Flood Elev= 78.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.82'	18.0" Round Culvert L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.82' / 73.50' S= 0.0052 ' / S= 0.0052 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.41 cfs @ 12.07 hrs HW=75.47' TW=74.85' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 6.41 cfs @ 4.11 fps)

Summary for Pond C4: CB6.3.1

Inflow Area = 0.948 ac, 91.98% Impervious, Inflow Depth > 4.19" for 10-Yr Storm event
 Inflow = 4.34 cfs @ 12.07 hrs, Volume= 0.331 af
 Outflow = 4.34 cfs @ 12.07 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.34 cfs @ 12.07 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.52' @ 12.09 hrs

Flood Elev= 77.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.88'	15.0" Round Culvert L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.88' / 73.70' S= 0.0058 ' / S= 0.0058 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.74 cfs @ 12.07 hrs HW=76.39' TW=75.99' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.74 cfs @ 3.05 fps)

Summary for Pond C5: CB6.3

Inflow Area = 0.224 ac, 100.00% Impervious, Inflow Depth > 4.36" for 10-Yr Storm event
 Inflow = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af
 Outflow = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.64' @ 12.11 hrs

Flood Elev= 79.10'

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Device	Routing	Invert	Outlet Devices
#1	Primary	74.60'	12.0" Round Culvert L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.60' / 73.88' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=76.24' TW=76.39' (Dynamic Tailwater)↑**1=Culvert** (Controls 0.00 cfs)**Summary for Pond C6: CB6.4**

Inflow Area = 1.299 ac, 92.84% Impervious, Inflow Depth > 4.20" for 10-Yr Storm event
Inflow = 5.95 cfs @ 12.07 hrs, Volume= 0.455 af
Outflow = 5.95 cfs @ 12.07 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min
Primary = 5.95 cfs @ 12.07 hrs, Volume= 0.455 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.02' @ 12.08 hrs

Flood Elev= 76.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.70'	15.0" Round Culvert L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.70' / 73.30' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.80 cfs @ 12.07 hrs HW=75.99' TW=74.84' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 5.80 cfs @ 4.72 fps)**Summary for Pond C7: CB7.3**

Inflow Area = 1.899 ac, 61.99% Impervious, Inflow Depth > 3.29" for 10-Yr Storm event
Inflow = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af
Outflow = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af, Atten= 0%, Lag= 0.0 min
Primary = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.43' @ 12.08 hrs

Flood Elev= 76.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.85'	18.0" Round Culvert L= 196.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.85' / 70.93' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.28 cfs @ 12.07 hrs HW=74.41' TW=72.82' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 7.28 cfs @ 4.91 fps)

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Summary for Pond C7.1: CB7.3

Inflow Area = 0.531 ac, 11.66% Impervious, Inflow Depth > 1.89" for 10-Yr Storm event
 Inflow = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af
 Outflow = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 79.08' @ 12.10 hrs

Flood Elev= 82.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	15.0" Round Culvert L= 88.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.50' / 75.00' S= 0.0398 ' / S= 0.0398 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.14 cfs @ 12.10 hrs HW=79.08' TW=76.67' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.14 cfs @ 2.04 fps)

Summary for Pond C7.3:

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 2.20" for 10-Yr Storm event
 Inflow = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af
 Outflow = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.28' @ 12.82 hrs

Flood Elev= 84.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.48'	36.0" Round Culvert w/ 1.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.40' / 74.30' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.01 sf

Primary OutFlow Max=14.67 cfs @ 12.82 hrs HW=77.28' TW=75.69' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 14.67 cfs @ 3.19 fps)

Summary for Pond C7.5: CB7.3

Inflow Area = 0.567 ac, 21.31% Impervious, Inflow Depth > 2.05" for 10-Yr Storm event
 Inflow = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af
 Outflow = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 80.33' @ 12.08 hrs

Flood Elev= 83.00'

Post-Development WEST

Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	36.0" Round Culvert w/ 12.0" inside fill L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.00' / 75.06' S= 0.0563 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf

Primary OutFlow Max=1.39 cfs @ 12.08 hrs HW=80.33' TW=76.64' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.39 cfs @ 1.45 fps)**Summary for Pond C8: CB7.4**

Inflow Area = 2.883 ac, 72.48% Impervious, Inflow Depth > 3.60" for 10-Yr Storm event
Inflow = 11.93 cfs @ 12.07 hrs, Volume= 0.865 af
Outflow = 11.93 cfs @ 12.07 hrs, Volume= 0.865 af, Atten= 0%, Lag= 0.0 min
Primary = 11.93 cfs @ 12.07 hrs, Volume= 0.865 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.83' @ 12.07 hrs

Flood Elev= 75.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	70.93'	24.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.93' / 70.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.84 cfs @ 12.07 hrs HW=72.82' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 11.84 cfs @ 4.98 fps)**Summary for Pond C9: OCS3**

Inflow = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af
Outflow = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min
Primary = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.83' @ 12.14 hrs

Flood Elev= 74.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	18.0" Round Culvert L= 77.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.59' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.50 cfs @ 12.13 hrs HW=72.81' TW=72.37' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 5.50 cfs @ 3.28 fps)

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Summary for Pond P1: Wetland

Inflow Area = 21.297 ac, 25.37% Impervious, Inflow Depth > 2.27" for 10-Yr Storm event
 Inflow = 20.93 cfs @ 12.41 hrs, Volume= 4.035 af
 Outflow = 13.08 cfs @ 13.04 hrs, Volume= 4.016 af, Atten= 38%, Lag= 37.6 min
 Primary = 13.08 cfs @ 13.04 hrs, Volume= 4.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 84.50' @ 13.04 hrs Surf.Area= 28,180 sf Storage= 34,069 cf

Plug-Flow detention time= 30.7 min calculated for 4.016 af (100% of inflow)
 Center-of-Mass det. time= 27.9 min (873.4 - 845.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S= 0.0560 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=13.08 cfs @ 13.04 hrs HW=84.50' TW=77.26' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 13.08 cfs @ 4.16 fps)

↑ **1=Sharp-Crested Vee/Trap Weir** (Passes 13.08 cfs of 27.77 cfs potential flow)

Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 3.54" for 10-Yr Storm event
 Inflow = 7.43 cfs @ 12.07 hrs, Volume= 0.535 af
 Outflow = 5.74 cfs @ 12.13 hrs, Volume= 0.408 af, Atten= 23%, Lag= 3.7 min
 Primary = 0.08 cfs @ 12.13 hrs, Volume= 0.105 af
 Secondary = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 74.92' @ 12.13 hrs Surf.Area= 4,656 sf Storage= 7,419 cf

Plug-Flow detention time= 129.0 min calculated for 0.408 af (76% of inflow)
 Center-of-Mass det. time= 46.6 min (833.2 - 786.6)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.13 hrs HW=74.92' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=5.64 cfs @ 12.13 hrs HW=74.92' TW=72.81' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 5.64 cfs @ 2.12 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SF4: Soil Filter**

Inflow Area =	1.518 ac, 79.42% Impervious, Inflow Depth > 3.96" for 10-Yr Storm event
Inflow =	6.63 cfs @ 12.07 hrs, Volume= 0.501 af
Outflow =	5.25 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 21%, Lag= 3.5 min
Primary =	0.08 cfs @ 12.13 hrs, Volume= 0.113 af
Secondary =	5.17 cfs @ 12.13 hrs, Volume= 0.264 af
Tertiary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.90' @ 12.13 hrs Surf.Area= 4,489 sf Storage= 7,215 cf

Plug-Flow detention time= 135.4 min calculated for 0.376 af (75% of inflow)

Center-of-Mass det. time= 49.5 min (814.1 - 764.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	18,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,128	0	0
74.50	4,186	5,486	5,486
75.00	4,566	2,188	7,674
76.00	5,370	4,968	12,642
77.00	6,231	5,801	18,442

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.13 hrs HW=74.90' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=5.14 cfs @ 12.13 hrs HW=74.90' TW=72.37' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 5.14 cfs @ 2.06 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Link AP8:**

Inflow Area = 41.623 ac, 26.89% Impervious, Inflow Depth > 2.35" for 10-Yr Storm event
 Inflow = 35.94 cfs @ 12.10 hrs, Volume= 8.147 af
 Primary = 35.94 cfs @ 12.10 hrs, Volume= 8.147 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link L1: EAST

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth > 2.20" for 10-Yr Storm event
 Inflow = 14.70 cfs @ 12.19 hrs, Volume= 1.976 af
 Primary = 14.70 cfs @ 12.19 hrs, Volume= 1.976 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

10-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7.0:	Runoff Area=307,321 sf 5.86% Impervious Runoff Depth>3.37" Flow Length=270' Tc=49.4 min CN=78 Runoff=12.42 cfs 1.980 af
Subcatchment 7.1:	Runoff Area=23,130 sf 11.66% Impervious Runoff Depth>2.83" Flow Length=115' Tc=6.5 min CN=72 Runoff=1.72 cfs 0.125 af
Subcatchment 7.2:	Runoff Area=458,111 sf 0.92% Impervious Runoff Depth>3.37" Flow Length=330' Tc=50.7 min CN=78 Runoff=18.24 cfs 2.951 af
Subcatchment 7.3:	Runoff Area=109,454 sf 16.90% Impervious Runoff Depth>2.53" Flow Length=275' Tc=39.9 min CN=69 Runoff=3.67 cfs 0.530 af
Subcatchment 7.4:	Runoff Area=76,277 sf 0.00% Impervious Runoff Depth>2.11" Flow Length=235' Tc=29.3 min CN=64 Runoff=2.40 cfs 0.307 af
Subcatchment 7.5:	Runoff Area=24,701 sf 21.31% Impervious Runoff Depth>3.01" Tc=5.0 min CN=74 Runoff=2.07 cfs 0.142 af
Subcatchment 8.1:	Runoff Area=22,593 sf 79.37% Impervious Runoff Depth>4.98" Tc=5.0 min CN=93 Runoff=2.91 cfs 0.215 af
Subcatchment 8.10:	Runoff Area=82,702 sf 61.99% Impervious Runoff Depth>4.43" Tc=5.0 min CN=88 Runoff=9.87 cfs 0.701 af
Subcatchment 8.11:	Runoff Area=73,887 sf 20.41% Impervious Runoff Depth>3.90" Tc=5.0 min CN=83 Runoff=7.94 cfs 0.552 af
Subcatchment 8.12:	Runoff Area=17,412 sf 91.40% Impervious Runoff Depth>5.32" Tc=5.0 min CN=96 Runoff=2.32 cfs 0.177 af
Subcatchment 8.2:	Runoff Area=28,897 sf 55.19% Impervious Runoff Depth>4.54" Tc=5.0 min CN=89 Runoff=3.51 cfs 0.251 af
Subcatchment 8.3:	Runoff Area=17,587 sf 86.61% Impervious Runoff Depth>5.21" Tc=5.0 min CN=95 Runoff=2.32 cfs 0.175 af
Subcatchment 8.4:	Runoff Area=9,852 sf 0.00% Impervious Runoff Depth>3.60" Tc=5.0 min CN=80 Runoff=0.98 cfs 0.068 af
Subcatchment 8.5:	Runoff Area=31,576 sf 89.50% Impervious Runoff Depth>5.32" Tc=5.0 min CN=96 Runoff=4.20 cfs 0.322 af
Subcatchment 8.6:	Runoff Area=15,257 sf 95.18% Impervious Runoff Depth>5.44" Tc=5.0 min CN=97 Runoff=2.04 cfs 0.159 af
Subcatchment 8.7:	Runoff Area=9,738 sf 100.00% Impervious Runoff Depth>5.56" Tc=5.0 min CN=98 Runoff=1.31 cfs 0.104 af

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Subcatchment 8.8:	Runoff Area=9,564 sf 0.00% Impervious Runoff Depth>3.60" Tc=5.0 min CN=80 Runoff=0.96 cfs 0.066 af
Subcatchment 8.9:	Runoff Area=25,455 sf 93.62% Impervious Runoff Depth>5.44" Tc=5.0 min CN=97 Runoff=3.41 cfs 0.265 af
Reach R7.1: Stream	Avg. Flow Depth=1.43' Max Vel=5.35 fps Inflow=34.07 cfs 8.851 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=33.98 cfs 8.836 af
Reach R7.3: Stream	Avg. Flow Depth=0.81' Max Vel=6.25 fps Inflow=19.42 cfs 6.300 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=19.42 cfs 6.296 af
Reach R7.4: Stream	Avg. Flow Depth=0.19' Max Vel=3.86 fps Inflow=2.40 cfs 0.307 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=2.40 cfs 0.307 af
Pond C1: CB5.3	Peak Elev=79.43' Inflow=2.91 cfs 0.215 af 12.0" Round Culvert n=0.013 L=80.0' S=0.0053 '/' Outflow=2.91 cfs 0.215 af
Pond C10: OCS4	Peak Elev=72.91' Inflow=15.31 cfs 0.875 af 24.0" Round Culvert n=0.013 L=63.0' S=0.0052 '/' Outflow=15.31 cfs 0.875 af
Pond C11: CB7.5	Peak Elev=73.76' Inflow=2.32 cfs 0.177 af 12.0" Round Culvert n=0.013 L=49.0' S=0.0143 '/' Outflow=2.32 cfs 0.177 af
Pond C2: CB5.5	Peak Elev=78.66' Inflow=6.42 cfs 0.466 af 15.0" Round Culvert n=0.013 L=209.0' S=0.0051 '/' Outflow=6.42 cfs 0.466 af
Pond C3: CB5.6	Peak Elev=76.02' Inflow=8.74 cfs 0.642 af 18.0" Round Culvert n=0.013 L=62.0' S=0.0052 '/' Outflow=8.74 cfs 0.642 af
Pond C4: CB6.3.1	Peak Elev=77.70' Inflow=5.51 cfs 0.425 af 15.0" Round Culvert n=0.013 L=31.0' S=0.0058 '/' Outflow=5.51 cfs 0.425 af
Pond C5: CB6.3	Peak Elev=77.90' Inflow=1.31 cfs 0.104 af 12.0" Round Culvert n=0.013 L=129.0' S=0.0056 '/' Outflow=1.31 cfs 0.104 af
Pond C6: CB6.4	Peak Elev=76.87' Inflow=7.55 cfs 0.584 af 15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=7.55 cfs 0.584 af
Pond C7: CB7.3	Peak Elev=75.70' Inflow=9.87 cfs 0.701 af 18.0" Round Culvert n=0.013 L=196.0' S=0.0098 '/' Outflow=9.87 cfs 0.701 af
Pond C7.1: CB7.3	Peak Elev=79.23' Inflow=1.72 cfs 0.125 af 15.0" Round Culvert n=0.013 L=88.0' S=0.0398 '/' Outflow=1.72 cfs 0.125 af
Pond C7.3:	Peak Elev=77.61' Inflow=19.42 cfs 6.300 af 36.0" Round Culvert w/ 1.0" inside fill n=0.013 L=55.0' S=0.0200 '/' Outflow=19.42 cfs 6.300 af
Pond C7.5: CB7.3	Peak Elev=80.43' Inflow=2.07 cfs 0.142 af 36.0" Round Culvert w/ 12.0" inside fill n=0.013 L=70.0' S=0.0563 '/' Outflow=2.07 cfs 0.142 af

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Pond C8: CB7.4

Peak Elev=73.29' Inflow=15.59 cfs 1.143 af
24.0" Round Culvert n=0.013 L=85.0' S=0.0051 '/' Outflow=15.59 cfs 1.143 af

Pond C9: OCS3

Peak Elev=73.85' Inflow=8.13 cfs 0.469 af
18.0" Round Culvert n=0.013 L=77.0' S=0.0053 '/' Outflow=8.13 cfs 0.469 af

Pond P1: Wetland

Peak Elev=85.31' Storage=59,432 cf Inflow=32.95 cfs 5.795 af
Outflow=16.95 cfs 5.770 af

Pond SF3: Soil Fliter

Peak Elev=75.04' Storage=7,964 cf Inflow=9.72 cfs 0.709 af
Primary=0.08 cfs 0.111 af Secondary=8.13 cfs 0.469 af Tertiary=0.19 cfs 0.001 af Outflow=8.40 cfs 0.582 af

Pond SF4: Soil Filter

Peak Elev=75.00' Storage=7,656 cf Inflow=8.51 cfs 0.650 af
Primary=0.08 cfs 0.118 af Secondary=7.18 cfs 0.406 af Tertiary=0.00 cfs 0.000 af Outflow=7.26 cfs 0.523 af

Link AP8:

Inflow=51.61 cfs 11.636 af
Primary=51.61 cfs 11.636 af

Link 25-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce Inflow=25.08 cfs 2.844 af
Area= 10.780 ac 49.22% Imperv. Primary=25.08 cfs 2.844 af

Total Runoff Area = 30.843 ac Runoff Volume = 9.091 af Average Runoff Depth = 3.54"
80.92% Pervious = 24.957 ac 19.08% Impervious = 5.886 ac

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 7.0:

Runoff = 12.42 cfs @ 12.68 hrs, Volume= 1.980 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	18,020	98	Impervious
	3,144	80	>75% Grass cover, Good, HSG D
	36,715	73	Brush, Good, HSG D
	249,442	77	Woods, Good, HSG D
	307,321	78	Weighted Average
	289,301		94.14% Pervious Area
	18,020		5.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	2,697	98	Impervious
	750	74	>75% Grass cover, Good, HSG C
	12,331	65	Brush, Good, HSG C
	7,352	73	Brush, Good, HSG D
	23,130	72	Weighted Average
	20,433		88.34% Pervious Area
	2,697		11.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	15	0.2000	0.32		Sheet Flow, AB
					Range n= 0.130 P2= 3.10"
5.7	100	0.0600	0.29		Sheet Flow, BC
					Range n= 0.130 P2= 3.10"
6.5	115	Total			

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 7.2:

Runoff = 18.24 cfs @ 12.68 hrs, Volume= 2.951 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 4,195	98	Impervious
1,074	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
143,721	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
289,827	77	Woods, Good, HSG D
458,111	78	Weighted Average
453,916		99.08% Pervious Area
4,195		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD
					Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 3.67 cfs @ 12.56 hrs, Volume= 0.530 af, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 18,496	98	Impervious
4,537	30	Brush, Good, HSG A
9,423	73	Brush, Good, HSG D
21,947	30	Woods, Good, HSG A
55,051	77	Woods, Good, HSG D
109,454	69	Weighted Average
90,958		83.10% Pervious Area
18,496		16.90% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 2.40 cfs @ 12.44 hrs, Volume= 0.307 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
19,947	30	Woods, Good, HSG A
3,125	70	Woods, Good, HSG C
53,205	77	Woods, Good, HSG D
76,277	64	Weighted Average
76,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 7.5:

Runoff = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	5,263	98	Impervious
	567	74	>75% Grass cover, Good, HSG C
	14,440	65	Brush, Good, HSG C
	4,431	73	Brush, Good, HSG D
	24,701	74	Weighted Average
	19,438		78.69% Pervious Area
	5,263		21.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.1:

Runoff = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af, Depth> 4.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	17,932	98	Impervious
	3,258	74	>75% Grass cover, Good, HSG C
	1,403	80	>75% Grass cover, Good, HSG D
	22,593	93	Weighted Average
	4,661		20.63% Pervious Area
	17,932		79.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.10:

Runoff = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	51,270	98	Impervious
	4,732	74	>75% Grass cover, Good, HSG C
	26,700	70	Woods, Good, HSG C
	82,702	88	Weighted Average
	31,432		38.01% Pervious Area
	51,270		61.99% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.11:

Runoff = 7.94 cfs @ 12.07 hrs, Volume= 0.552 af, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 15,081	98	Impervious
2,598	74	>75% Grass cover, Good, HSG C
56,208	80	>75% Grass cover, Good, HSG D
73,887	83	Weighted Average
58,806		79.59% Pervious Area
15,081		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.12:

Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af, Depth> 5.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 15,914	98	Impervious
1,498	74	>75% Grass cover, Good, HSG C
17,412	96	Weighted Average
1,498		8.60% Pervious Area
15,914		91.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.2:

Runoff = 3.51 cfs @ 12.07 hrs, Volume= 0.251 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	15,948	98	Impervious
	6,561	74	>75% Grass cover, Good, HSG C
	6,388	80	>75% Grass cover, Good, HSG D
	28,897	89	Weighted Average
	12,949		44.81% Pervious Area
	15,948		55.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.3:

Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.175 af, Depth> 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	15,232	98	Impervious
	1,109	74	>75% Grass cover, Good, HSG C
	1,246	80	>75% Grass cover, Good, HSG D
	17,587	95	Weighted Average
	2,355		13.39% Pervious Area
	15,232		86.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.4:

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 0.068 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
	9,852	80	>75% Grass cover, Good, HSG D
	9,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 8.5:

Runoff = 4.20 cfs @ 12.07 hrs, Volume= 0.322 af, Depth> 5.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	28,262	98	Impervious
	2,606	74	>75% Grass cover, Good, HSG C
	708	80	>75% Grass cover, Good, HSG D
	31,576	96	Weighted Average
	3,314		10.50% Pervious Area
	28,262		89.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.6:

Runoff = 2.04 cfs @ 12.07 hrs, Volume= 0.159 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	14,522	98	Impervious
	735	80	>75% Grass cover, Good, HSG D
	15,257	97	Weighted Average
	735		4.82% Pervious Area
	14,522		95.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.7:

Runoff = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	9,738	98	Impervious
	9,738		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.8:

Runoff = 0.96 cfs @ 12.07 hrs, Volume= 0.066 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
9,564	80	>75% Grass cover, Good, HSG D
9,564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.9:

Runoff = 3.41 cfs @ 12.07 hrs, Volume= 0.265 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 23,832	98	Impervious
1,212	74	>75% Grass cover, Good, HSG C
411	80	>75% Grass cover, Good, HSG D
25,455	97	Weighted Average
1,623		6.38% Pervious Area
23,832		93.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R7.1: Stream

Inflow Area = 33.714 ac, 19.05% Impervious, Inflow Depth > 3.15" for 25-Yr Storm event
Inflow = 34.07 cfs @ 12.67 hrs, Volume= 8.851 af
Outflow = 33.98 cfs @ 12.70 hrs, Volume= 8.836 af, Atten= 0%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.35 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 6.4 min

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Peak Storage= 5,465 cf @ 12.70 hrs

Average Depth at Peak Storage= 1.43'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 3.18" for 25-Yr Storm event

Inflow = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af

Outflow = 19.42 cfs @ 12.76 hrs, Volume= 6.296 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 6.25 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 2.72 fps, Avg. Travel Time= 2.2 min

Peak Storage= 1,103 cf @ 12.76 hrs

Average Depth at Peak Storage= 0.81'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



Summary for Reach R7.4: Stream

Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 2.11" for 25-Yr Storm event

Inflow = 2.40 cfs @ 12.44 hrs, Volume= 0.307 af

Outflow = 2.40 cfs @ 12.44 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.4 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.86 fps, Min. Travel Time= 0.6 min

Avg. Velocity= 1.49 fps, Avg. Travel Time= 1.6 min

Peak Storage= 87 cf @ 12.44 hrs

Average Depth at Peak Storage= 0.19'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 '/'

Inlet Invert= 73.00', Outlet Invert= 67.00'



Summary for Pond C1: CB5.3

Inflow Area = 0.519 ac, 79.37% Impervious, Inflow Depth > 4.98" for 25-Yr Storm event
Inflow = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af
Outflow = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min
Primary = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 79.43' @ 12.09 hrs

Flood Elev= 80.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.80'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.80' / 75.38' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.07 cfs @ 12.07 hrs HW=78.99' TW=78.55' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 2.07 cfs @ 2.64 fps)

Summary for Pond C10: OCS4

Inflow = 15.31 cfs @ 12.12 hrs, Volume= 0.875 af
Outflow = 15.31 cfs @ 12.12 hrs, Volume= 0.875 af, Atten= 0%, Lag= 0.0 min
Primary = 15.31 cfs @ 12.12 hrs, Volume= 0.875 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.91' @ 12.12 hrs

Flood Elev= 74.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	70.59'	24.0" Round Culvert L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.59' / 70.26' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=15.27 cfs @ 12.12 hrs HW=72.91' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 15.27 cfs @ 5.27 fps)**Summary for Pond C11: CB7.5**

Inflow Area = 0.400 ac, 91.40% Impervious, Inflow Depth > 5.32" for 25-Yr Storm event
Inflow = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af
Outflow = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Primary = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.76' @ 12.08 hrs

Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.70'	12.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.70' / 72.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.12 cfs @ 12.07 hrs HW=73.72' TW=73.27' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 2.12 cfs @ 3.29 fps)**Summary for Pond C2: CB5.5**

Inflow Area = 1.182 ac, 65.80% Impervious, Inflow Depth > 4.73" for 25-Yr Storm event
Inflow = 6.42 cfs @ 12.07 hrs, Volume= 0.466 af
Outflow = 6.42 cfs @ 12.07 hrs, Volume= 0.466 af, Atten= 0%, Lag= 0.0 min
Primary = 6.42 cfs @ 12.07 hrs, Volume= 0.466 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 78.66' @ 12.08 hrs

Flood Elev= 79.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	74.89'	15.0" Round Culvert L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.89' / 73.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=6.24 cfs @ 12.07 hrs HW=78.56' TW=76.00' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 6.24 cfs @ 5.08 fps)

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Summary for Pond C3: CB5.6

Inflow Area = 1.586 ac, 71.10% Impervious, Inflow Depth > 4.85" for 25-Yr Storm event
 Inflow = 8.74 cfs @ 12.07 hrs, Volume= 0.642 af
 Outflow = 8.74 cfs @ 12.07 hrs, Volume= 0.642 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.74 cfs @ 12.07 hrs, Volume= 0.642 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.02' @ 12.08 hrs

Flood Elev= 78.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.82'	18.0" Round Culvert L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.82' / 73.50' S= 0.0052 ' / S= 0.0052 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.53 cfs @ 12.07 hrs HW=76.00' TW=75.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 8.53 cfs @ 4.83 fps)

Summary for Pond C4: CB6.3.1

Inflow Area = 0.948 ac, 91.98% Impervious, Inflow Depth > 5.38" for 25-Yr Storm event
 Inflow = 5.51 cfs @ 12.07 hrs, Volume= 0.425 af
 Outflow = 5.51 cfs @ 12.07 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.51 cfs @ 12.07 hrs, Volume= 0.425 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.70' @ 12.09 hrs

Flood Elev= 77.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.88'	15.0" Round Culvert L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.88' / 73.70' S= 0.0058 ' / S= 0.0058 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.89 cfs @ 12.07 hrs HW=77.53' TW=76.84' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 4.89 cfs @ 3.99 fps)

Summary for Pond C5: CB6.3

Inflow Area = 0.224 ac, 100.00% Impervious, Inflow Depth > 5.56" for 25-Yr Storm event
 Inflow = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af
 Outflow = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.90' @ 12.10 hrs

Flood Elev= 79.10'

Post-Development_WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	74.60'	12.0" Round Culvert L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.60' / 73.88' S= 0.0056 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=77.33' TW=77.52' (Dynamic Tailwater)

↑1=Culvert (Controls 0.00 cfs)

Summary for Pond C6: CB6.4

Inflow Area = 1.299 ac, 92.84% Impervious, Inflow Depth > 5.40" for 25-Yr Storm event
Inflow = 7.55 cfs @ 12.07 hrs, Volume= 0.584 af
Outflow = 7.55 cfs @ 12.07 hrs, Volume= 0.584 af, Atten= 0%, Lag= 0.0 min
Primary = 7.55 cfs @ 12.07 hrs, Volume= 0.584 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.87' @ 12.07 hrs

Flood Elev= 76.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.70'	15.0" Round Culvert L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.70' / 73.30' S= 0.0051 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.42 cfs @ 12.07 hrs HW=76.84' TW=74.95' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 7.42 cfs @ 6.05 fps)

Summary for Pond C7: CB7.3

Inflow Area = 1.899 ac, 61.99% Impervious, Inflow Depth > 4.43" for 25-Yr Storm event
Inflow = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af
Outflow = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af, Atten= 0%, Lag= 0.0 min
Primary = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.70' @ 12.08 hrs

Flood Elev= 76.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.85'	18.0" Round Culvert L= 196.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.85' / 70.93' S= 0.0098 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.65 cfs @ 12.07 hrs HW=75.62' TW=73.27' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 9.65 cfs @ 5.46 fps)

Post-Development_WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond C7.1: CB7.3

Inflow Area = 0.531 ac, 11.66% Impervious, Inflow Depth > 2.83" for 25-Yr Storm event
 Inflow = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af
 Outflow = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 79.23' @ 12.10 hrs

Flood Elev= 82.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	15.0" Round Culvert L= 88.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.50' / 75.00' S= 0.0398 ' / S= 0.0398 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.72 cfs @ 12.10 hrs HW=79.23' TW=76.87' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.72 cfs @ 2.30 fps)

Summary for Pond C7.3:

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 3.18" for 25-Yr Storm event
 Inflow = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af
 Outflow = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.61' @ 12.75 hrs

Flood Elev= 84.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.48'	36.0" Round Culvert w/ 1.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.40' / 74.30' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.01 sf

Primary OutFlow Max=19.42 cfs @ 12.75 hrs HW=77.61' TW=75.81' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 19.42 cfs @ 3.52 fps)

Summary for Pond C7.5: CB7.3

Inflow Area = 0.567 ac, 21.31% Impervious, Inflow Depth > 3.01" for 25-Yr Storm event
 Inflow = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af
 Outflow = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 80.43' @ 12.08 hrs

Flood Elev= 83.00'

Post-Development WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	36.0" Round Culvert w/ 12.0" inside fill L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.00' / 75.06' S= 0.0563 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf

Primary OutFlow Max=2.06 cfs @ 12.08 hrs HW=80.43' TW=76.83' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 2.06 cfs @ 1.65 fps)**Summary for Pond C8: CB7.4**

Inflow Area = 2.883 ac, 72.48% Impervious, Inflow Depth > 4.76" for 25-Yr Storm event
Inflow = 15.59 cfs @ 12.07 hrs, Volume= 1.143 af
Outflow = 15.59 cfs @ 12.07 hrs, Volume= 1.143 af, Atten= 0%, Lag= 0.0 min
Primary = 15.59 cfs @ 12.07 hrs, Volume= 1.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.29' @ 12.07 hrs

Flood Elev= 75.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	70.93'	24.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.93' / 70.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=15.47 cfs @ 12.07 hrs HW=73.27' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 15.47 cfs @ 5.30 fps)**Summary for Pond C9: OCS3**

Inflow = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af
Outflow = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af, Atten= 0%, Lag= 0.0 min
Primary = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.85' @ 12.13 hrs

Flood Elev= 74.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	18.0" Round Culvert L= 77.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.59' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.91 cfs @ 12.12 hrs HW=73.81' TW=72.91' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 7.91 cfs @ 4.48 fps)

Post-Development WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond P1: Wetland

Inflow Area = 21.297 ac, 25.37% Impervious, Inflow Depth > 3.27" for 25-Yr Storm event
 Inflow = 32.95 cfs @ 12.48 hrs, Volume= 5.795 af
 Outflow = 16.95 cfs @ 13.10 hrs, Volume= 5.770 af, Atten= 49%, Lag= 37.2 min
 Primary = 16.95 cfs @ 13.10 hrs, Volume= 5.770 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 85.31' @ 13.10 hrs Surf.Area= 33,935 sf Storage= 59,432 cf

Plug-Flow detention time= 38.5 min calculated for 5.765 af (99% of inflow)
 Center-of-Mass det. time= 35.8 min (872.5 - 836.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S= 0.0560 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=16.95 cfs @ 13.10 hrs HW=85.31' TW=77.56' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 16.95 cfs @ 5.39 fps)

↑ **1=Sharp-Crested Vee/Trap Weir** (Passes 16.95 cfs of 52.28 cfs potential flow)

Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 4.70" for 25-Yr Storm event
 Inflow = 9.72 cfs @ 12.07 hrs, Volume= 0.709 af
 Outflow = 8.40 cfs @ 12.12 hrs, Volume= 0.582 af, Atten= 14%, Lag= 2.7 min
 Primary = 0.08 cfs @ 12.12 hrs, Volume= 0.111 af
 Secondary = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af
 Tertiary = 0.19 cfs @ 12.12 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 75.04' @ 12.12 hrs Surf.Area= 4,757 sf Storage= 7,964 cf

Plug-Flow detention time= 111.6 min calculated for 0.582 af (82% of inflow)
 Center-of-Mass det. time= 40.5 min (820.1 - 779.6)

Post-Development_WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.12 hrs HW=75.04' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=8.11 cfs @ 12.12 hrs HW=75.04' TW=73.81' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 8.11 cfs @ 2.40 fps)**Tertiary OutFlow** Max=0.18 cfs @ 12.12 hrs HW=75.04' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.49 fps)**Summary for Pond SF4: Soil Filter**

Inflow Area =	1.518 ac, 79.42% Impervious, Inflow Depth > 5.14" for 25-Yr Storm event
Inflow =	8.51 cfs @ 12.07 hrs, Volume= 0.650 af
Outflow =	7.26 cfs @ 12.12 hrs, Volume= 0.523 af, Atten= 15%, Lag= 2.8 min
Primary =	0.08 cfs @ 12.12 hrs, Volume= 0.118 af
Secondary =	7.18 cfs @ 12.12 hrs, Volume= 0.406 af
Tertiary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.00' @ 12.12 hrs Surf.Area= 4,563 sf Storage= 7,656 cf

Plug-Flow detention time= 120.1 min calculated for 0.523 af (80% of inflow)

Center-of-Mass det. time= 45.2 min (804.9 - 759.7)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	18,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,128	0	0
74.50	4,186	5,486	5,486
75.00	4,566	2,188	7,674
76.00	5,370	4,968	12,642
77.00	6,231	5,801	18,442

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.12 hrs HW=75.00' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=7.16 cfs @ 12.12 hrs HW=75.00' TW=72.91' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 7.16 cfs @ 2.30 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Link AP8:**

Inflow Area = 41.623 ac, 26.89% Impervious, Inflow Depth > 3.35" for 25-Yr Storm event
 Inflow = 51.61 cfs @ 12.10 hrs, Volume= 11.636 af
 Primary = 51.61 cfs @ 12.10 hrs, Volume= 11.636 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link L1: EAST

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth > 3.17" for 25-Yr Storm event
 Inflow = 25.08 cfs @ 12.19 hrs, Volume= 2.844 af
 Primary = 25.08 cfs @ 12.19 hrs, Volume= 2.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

25-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce

Appendix C:
Stormwater BMP Spillway and Draindown Calculations

SOIL FILTER SF1 25-YEAR SPILLWAY CALCULATION

Post-Development EAST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond SF1: Soil Filter 1

[80] Warning: Exceeded Pond CB6 by 0.80' @ 24.30 hrs (1.85 cfs 1.158 af)

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 4.46" for 25-Yr Storm event
 Inflow = 8.01 cfs @ 12.07 hrs, Volume= 0.574 af
 Outflow = 5.74 cfs @ 12.14 hrs, Volume= 0.391 af, Atten= 28%, Lag= 4.4 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 5.74 cfs @ 12.14 hrs, Volume= 0.391 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.26' @ 12.14 hrs Surf.Area= 5,690 sf Storage= 9,935 cf

Plug-Flow detention time= 173.9 min calculated for 0.391 af (68% of inflow)
 Center-of-Mass det. time= 78.8 min (867.6 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

1' OF
FREEBOARD
PROVIDED
WHEN PRIMARY
OUTLETS
CLOSED

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert X 0.00 L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

1=Culvert (Controls 0.00 cfs)
 2=Exfiltration (Controls 0.00 cfs)
 3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=5.72 cfs @ 12.14 hrs HW=100.26' TW=97.36' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Weir Controls 5.72 cfs @ 1.61 fps)

SOIL FILTER SF1 100-YEAR SPILLWAY CALCULATION

Post-Development EAST

Type III 24-hr 100-Yr Storm Rainfall=8.10"

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Summary for Pond SF1: Soil Filter 1

[80] Warning: Exceeded Pond CB6 by 0.80' @ 24.32 hrs (1.85 cfs 1.155 af)

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 6.69" for 100-Yr Storm event
 Inflow = 11.76 cfs @ 12.07 hrs, Volume= 0.860 af
 Outflow = 10.12 cfs @ 12.12 hrs, Volume= 0.677 af, Atten= 14%, Lag= 2.7 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 10.12 cfs @ 12.12 hrs, Volume= 0.677 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.42' @ 12.12 hrs Surf.Area= 5,872 sf Storage= 10,879 cf

Plug-Flow detention time= 140.0 min calculated for 0.677 af (79% of inflow)
 Center-of-Mass det. time= 61.6 min (840.1 - 778.5)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

BASIN DOES NOT OVERTOP WHEN PRIMARY OUTLETS CLOSED

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert X 0.00 L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

1=Culvert (Controls 0.00 cfs)
 2=Exfiltration (Controls 0.00 cfs)
 3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=10.09 cfs @ 12.12 hrs HW=100.42' TW=97.45' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Weir Controls 10.09 cfs @ 1.95 fps)

SOIL FILTER SF3 25-YEAR SPILLWAY CALCULATION

Post-Development WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond SF3: Soil Filter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 4.70" for 25-Yr Storm event
 Inflow = 9.72 cfs @ 12.07 hrs, Volume= 0.709 af
 Outflow = 8.45 cfs @ 12.12 hrs, Volume= 0.528 af, Atten= 13%, Lag= 2.6 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Tertiary = 8.45 cfs @ 12.12 hrs, Volume= 0.528 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.47' @ 12.12 hrs Surf.Area= 5,149 sf Storage= 10,107 cf

Plug-Flow detention time= 150.4 min calculated for 0.528 af (74% of inflow)

Center-of-Mass det. time= 64.9 min (844.5 - 779.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

1' OF FREEBOARD
 PROVIDED WHEN
 PRIMARY/SECONDARY
 OUTLETS CLOSED

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration X 0.00 over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate X 0.00 C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=71.00' (Dynamic Tailwater)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=8.42 cfs @ 12.12 hrs HW=75.47' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 8.42 cfs @ 1.79 fps)

SOIL FILTER SF3 100-YEAR SPILLWAY CALCULATION

Post-Development WEST

Type III 24-hr 100-Yr Storm Rainfall=8.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

HydroCAD® 10.00-26 s/n 08018 © 2020 HydroCAD Software Solutions LLC

Summary for Pond SF3: Soil Filter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 6.94" for 100-Yr Storm event
 Inflow = 14.10 cfs @ 12.07 hrs, Volume= 1.048 af
 Outflow = 12.67 cfs @ 12.11 hrs, Volume= 0.867 af, Atten= 10%, Lag= 2.3 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Tertiary = 12.67 cfs @ 12.11 hrs, Volume= 0.867 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.60' @ 12.11 hrs Surf.Area= 5,269 sf Storage= 10,795 cf

Plug-Flow detention time= 123.7 min calculated for 0.867 af (83% of inflow)

Center-of-Mass det. time= 54.3 min (824.7 - 770.4)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

**BASIN DOES NOT
OVERTOP WHEN
PRIMARY/SECONDARY
OUTLETS CLOSED**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration X 0.00 over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate X 0.00 C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=71.00' (Dynamic Tailwater)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=12.59 cfs @ 12.11 hrs HW=75.60' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 12.59 cfs @ 2.09 fps)

SOIL FILTER SF1 DRAINDOWN CALCULATION

Post-Development_EAST

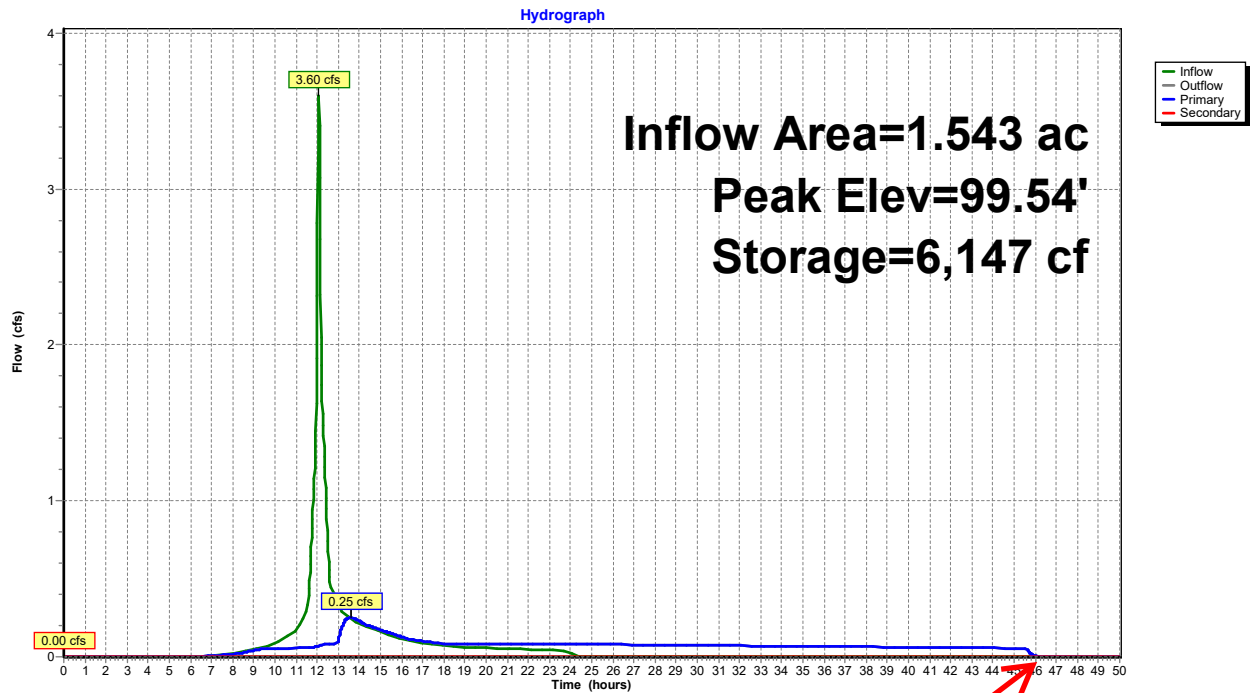
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

HydroCAD® 10.00-26 s/n 08018 © 2020 HydroCAD Software Solutions LLC

Pond SF1: Soil Filter 1



SOIL FILTER
DRAINS IN LESS
THAN 48 HOURS

SOIL FILTER SF3 DRAINDOWN CALCULATION

Post-Development_WEST

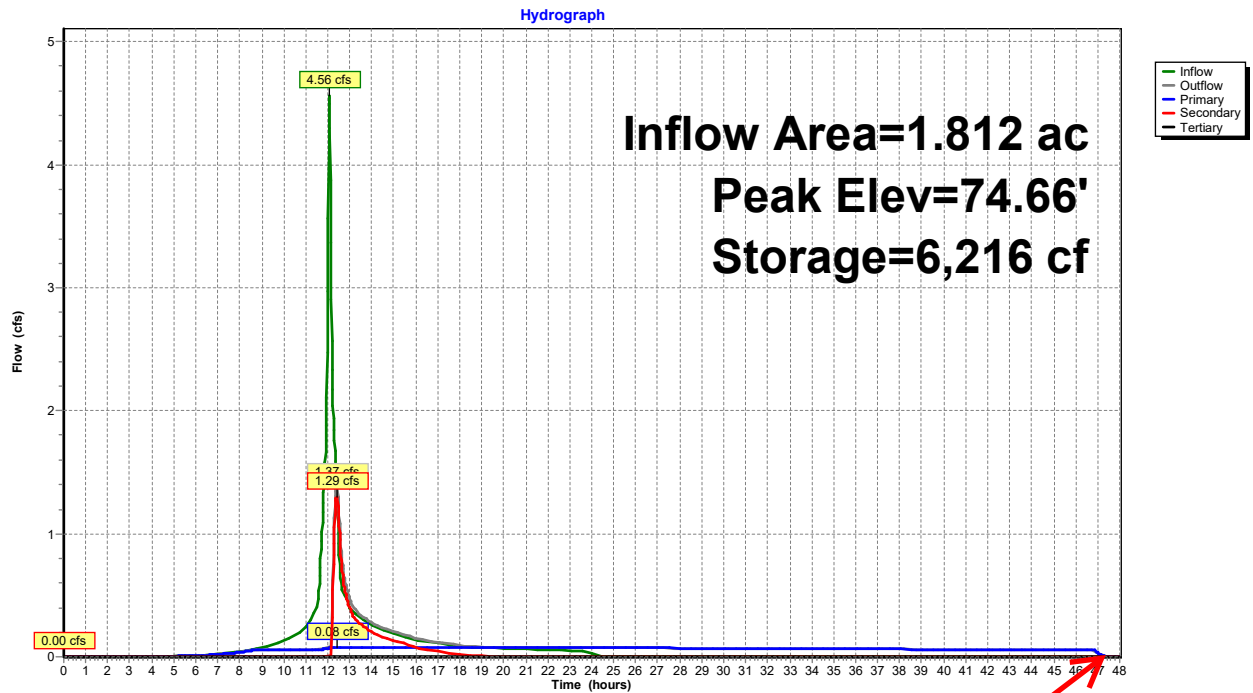
Prepared by Atlantic Resource Consultants

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

Printed 8/29/2023

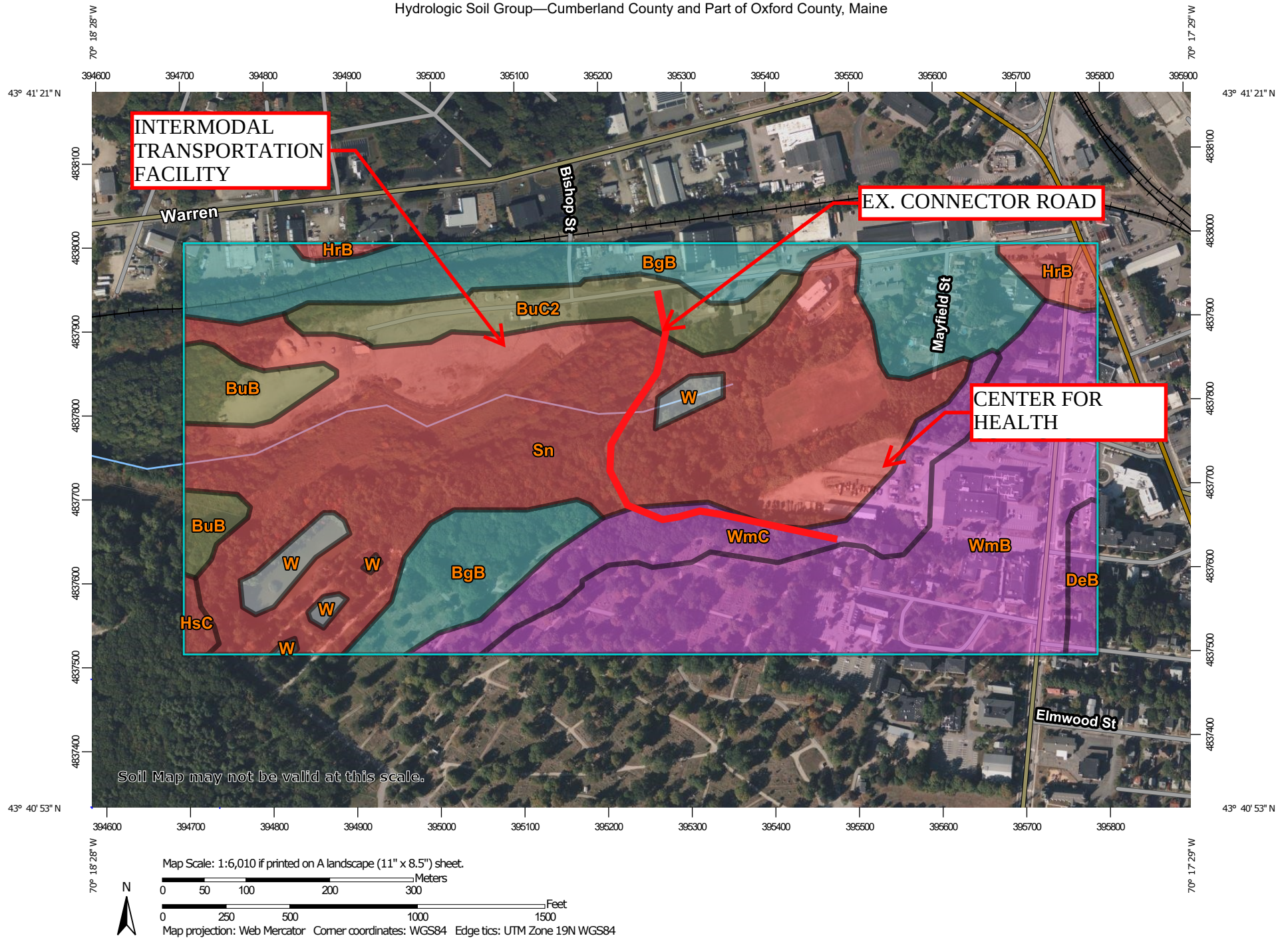
Pond SF3: Soil Fliter



SOIL FILTER
DRAINS IN LESS
THAN 48 HOURS

Appendix D:
USDA Soil Map

Hydrologic Soil Group—Cumberland County and Part of Oxford County, Maine



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
 Survey Area Data: Version 19, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BgB	Nicholville very fine sandy loam, 0 to 8 percent slopes	C	24.3	18.3%
BuB	Lamoine silt loam, 3 to 8 percent slopes	C/D	4.2	3.1%
BuC2	Buxton silt loam, 8 to 15 percent slopes	C/D	7.6	5.7%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	A	1.6	1.2%
HrB	Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky	D	2.2	1.6%
HsC	Lyman-Abram complex, 8 to 15 percent slopes, very rocky	D	0.6	0.5%
Sn	Scantic silt loam, 0 to 3 percent slopes	D	51.0	38.4%
W	Water		2.6	2.0%
WmB	Windsor loamy sand, 0 to 8 percent slopes	A	28.9	21.8%
WmC	Windsor loamy sand, 8 to 15 percent slopes	A	9.9	7.5%
Totals for Area of Interest			132.9	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix E:
Inspection & Maintenance Plan &
City of Portland Stormwater Maintenance Agreement

Inspection and Maintenance Plan For Stormwater Management Facilities

University of New England
Connector Drive
Bishop Street, Portland, Maine
September 2023

Stormwater management facilities include paved surfaces, catch basins, culverts, storm drain pipe, and ditches/swales. During construction activities and upon completion of construction, the operation and maintenance of all stormwater management facilities, the establishment of any contract services required to implement the program, and the keeping of records and maintenance log book will be the responsibility of the University of New England.

The University of New England shall enter into a Stormwater Drainage System Maintenance Agreement with the City of Portland to be recorded at the Cumberland County Registry of Deeds. A template for this agreement is included in this section and shall be completed upon final approval of the project.

At a minimum, the following maintenance activities for each stormwater management system shall be performed on a prescribed schedule.

Paved Surfaces

Accumulations of winter sand along paved surfaces shall be cleared at least once a year, preferably in the spring, and periodically during the year on an as-needed basis, to minimize transportation of sediment during rainfall events. Accumulations on pavement may be removed by pavement sweeping or vacuuming. Accumulations of sand along drive shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

Ditches and Swales

Open swales and ditches shall be inspected twice per year (in spring and fall) to assure that debris and/or sediments do not reduce the effectiveness of the system. Debris and sediments shall be removed at that time. Any sign of erosion or blockage shall be immediately repaired to assure a vigorous growth of vegetation for the stability of the ditches and slopes proper function. Maintenance shall include, but not be limited to, mowing, trimming and removal vegetation in the ditches and slopes as required in order to prevent vegetation from blocking or diverting storm flows, replacement of riprap channel lining to prevent scour of the channel invert, removing vegetation and debris from the culverts.

Vegetated ditches should be mowed at least monthly during the growing season. Larger brush or trees must not be allowed to become established in the channel. Any areas where the vegetation fails will be subject to erosion and should be reseeded and mulched immediately.

Riprap ditches and aprons where stone is displaced should be replaced and chinked to assure stability. With time, additional riprap may be added. Vegetation growing through riprap should be removed on an annual basis.

Catch Basins

All catch basins throughout the collection system shall be inspected twice per year (in spring and fall) to assure that the inlet entry and grates are clear of debris and will accept the intended flows. Any debris and sediments shall be cleared. Sediment should be removed from these structures when it accumulates within 12 inches of the lowest pipe invert. At a minimum, remove floating debris and hydrocarbons at the time of the inspection. The removed material must be disposed of in accordance with the Maine Solid Waste Disposal Rules. Confined space entry safety procedures shall be practiced should entry into these structures be required.

Culverts and Storm Drainage Pipes

Culverts and piped drainage systems shall be inspected on an annual basis to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the pipe inlet and outlet. Sediment should be removed when its level exceeds 20% of the pipe diameter. This may be accomplished by hydraulic flushing or any mechanical means; however, care should be taken to contain the sediment at the pipe outlet, and not flush the sediments into the stormwater filter or wetland areas as this will reduce the ponds capacity and ability to infiltrate runoff and will hasten the time when the pond must be cleaned or rehabilitated.

Riprap aprons where stone is displaced should be replaced and chinked to assure stability. With time, additional riprap may be added. Vegetation growing through riprap should be removed on an annual basis.

Disposal

Any sediment or debris removed during maintenance of the stormwater system must be disposed of in accordance with the Maine Solid Waste Disposal Rules.

Recordkeeping

University of New England will keep a written maintenance log that summarizes inspections, maintenance, and any corrective actions taken. The log shall include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediment or debris, the location where the sediment or debris was disposed after removal will be indicated. This log shall be made available to the City of Portland upon request.

[illegible]

**UNE Connector Drive
83 College Street, Portland, Maine**

INSPECTION / MAINTENANCE LOG

CATCH BASINS AND DRAIN PIPES

I: INSPECTED - C: CLEANED - R: REPAIRED

DATE	INITIALS	ACTION	COMMENT
3/28/22	JKL	I, C	EXAMPLE: Called ACME to clean the outlet structure in pond 1, cleaned debris from culvert inlet in pond 2.

83 C  9/22/2023 aine					
STORMWATER MANAGEMENT SYSTEM MAINTENANCE PROGRAM SUMMARY CHECKLIST					
Item	Commentary	Frequency			
		Month	Semi-Annual	Annual	Long-Term
Pavement	Review for damage and buildup of debris and sand.	X	X Sweep		
Swales, Ditches, and Riprap Aprons	Inspect for debris accumulation, erosion and excessive vegetation. Mow monthly, remove debris, repair and revegetate any area of erosion	X Mow		X	
Catch Basins, and Drain Pipes	Inspect for sediment buildup in pipe. Flush and remove as required.			X	

**STORMWATER DRAINAGE SYSTEM
MAINTENANCE AGREEMENT**

DRAFT

For SITE PLANS (THAT ARE NOT SUBDIVISIONS)

IN CONSIDERATION OF the site plan approval granted by the Planning Board/Planning Authority of the City of Portland for the proposed UNE Connector Drive project, project number TBD, and the associated Site Grading and Drainage Site Erosion and Sediment Control Plan (Exhibit A) submitted by University of New England, prepared by Site Design Associates, Inc. of 23 Whitney Way, Topsham, Maine 04086, dated TBD, and pursuant to a condition thereof, University of New England with a principal place of business in Portland, Maine, and having a mailing address of 11 Hills Beach Road, Biddeford, Maine 04005, 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 vegetated areas, catch basins, storm drain piping, and ditches (hereinafter collectively referred to as the “stormwater system”), as shown on the plans in Exhibit A and in strict compliance with the approved University of New England Inspection and Maintenance Plan of Stormwater Management Facilities prepared for the Owner by Site Design Associates (copy attached as Exhibit B) 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 site plan most recently and formally approved by the Planning Board/Planning Authority 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 Condominium Association or management company, and 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 lienied it or create a cause of action against the City.

Dated at Portland, Maine this ____ day of _____, 2021.

University of New England

Alan Thibeault, Vice President for University Operations

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 Grading, Drainage, and Erosion Control Plan

Exhibit B: University of New England Inspection and Maintenance Plan of Stormwater Management Facilities

Appendix F

Drainage Plans

I1.0 – Pre Development Impervious Area Plan

I2.0 – Post Development Impervious Area Plan

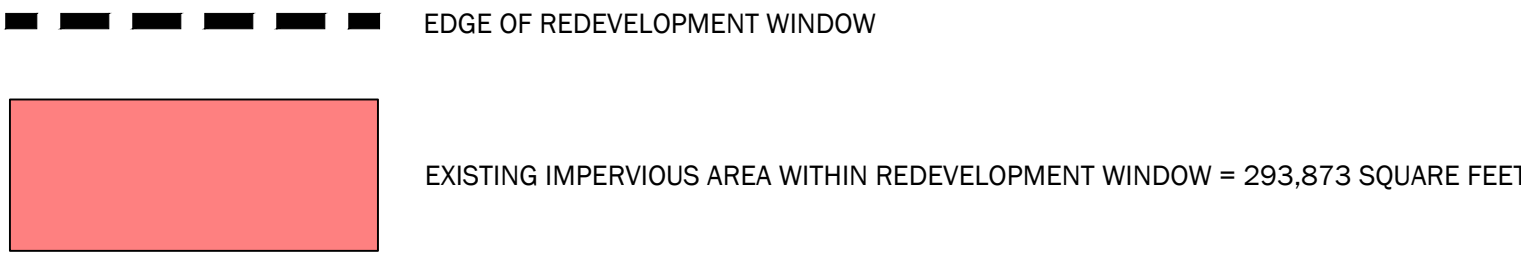
R1.0 – Pre Development Pollutant Loading Plan

R2.0 – Post Development Pollutant Loading Plan

D1.0 – Pre Development Drainage Plan

D2.0 – Post Development Drainage Plan

D3.0 – Stormwater Treatment Plan



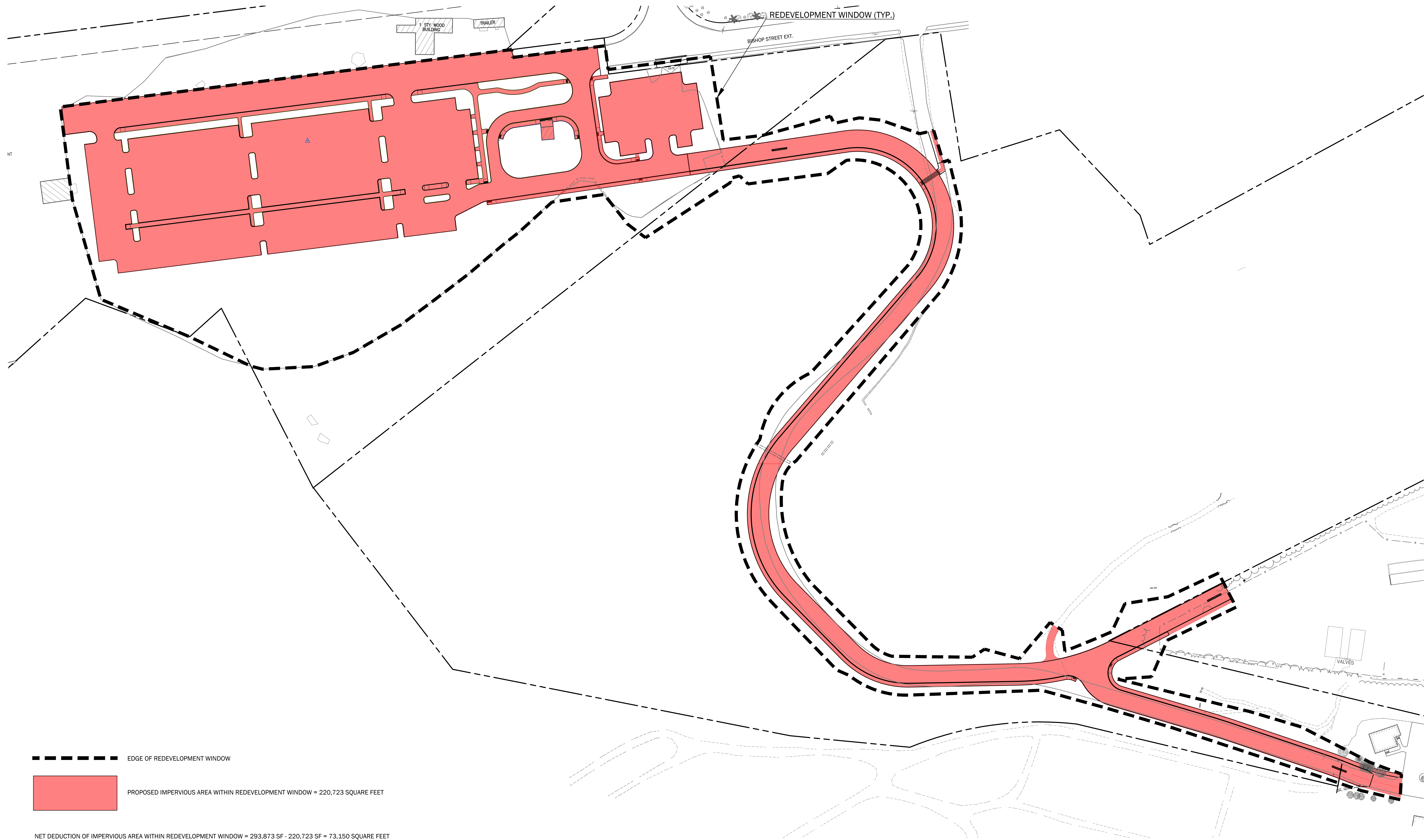
GRAPHIC SCALE

60 0 30 60 120 240

1 inch = 60 ft.

Site Design Associates
Consulting Engineering & Land
Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

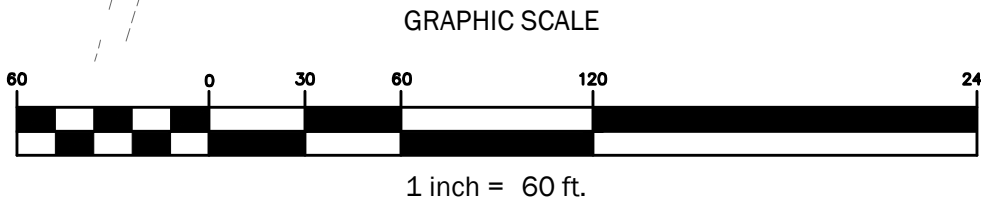
DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	PRE DEVELOPMENT		
	IMPERVIOUS AREA PLAN		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 60'	DWG. NO.	11.0	A



THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.



DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	POST DEVELOPMENT IMPERVIOUS AREA PLAN		
DATE: SEP, 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 60'	DWG. NO.	12.0	A



THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

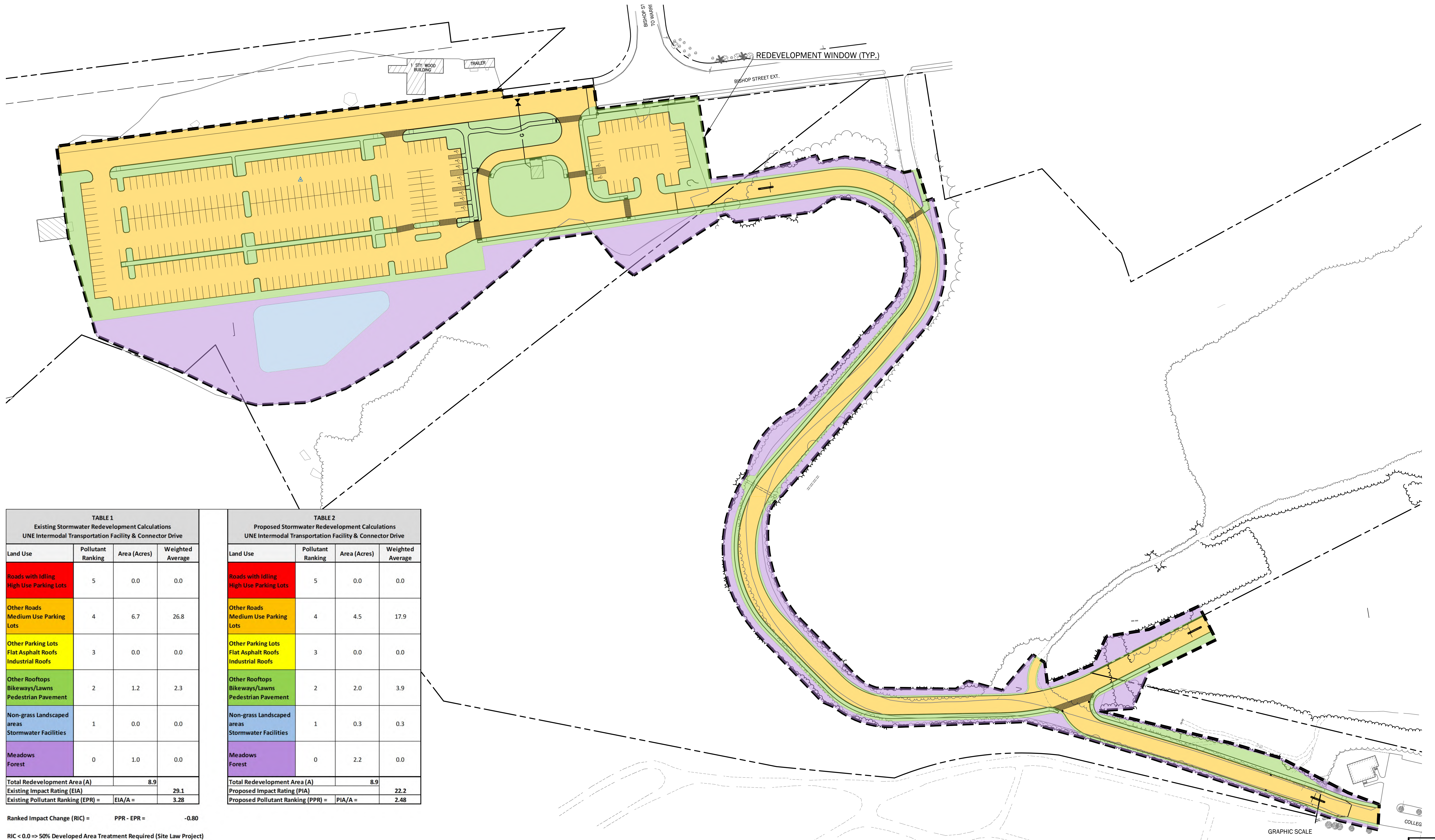


TABLE 1 Existing Stormwater Redevelopment Calculations UNE Intermodal Transportation Facility & Connector Drive			
Land Use	Pollutant Ranking	Area (Acres)	Weighted Average
Roads with Idling High Use Parking Lots	5	0.0	0.0
Other Roads Medium Use Parking Lots	4	6.7	26.8
Other Parking Lots Flat Asphalt Roofs Industrial Roofs	3	0.0	0.0
Other Rooftops Bikeways/Lawns Pedestrian Pavement	2	1.2	2.3
Non-grass Landscaped areas Stormwater Facilities	1	0.0	0.0
Meadows Forest	0	1.0	0.0
Total Redevelopment Area (A)		8.9	
Existing Impact Rating (EIA)			29.1
Existing Pollutant Ranking (EPR) =		EIA/A =	3.28

TABLE 2 Proposed Stormwater Redevelopment Calculations UNE Intermodal Transportation Facility & Connector Drive			
Land Use	Pollutant Ranking	Area (Acres)	Weighted Average
Roads with Idling High Use Parking Lots	5	0.0	0.0
Other Roads Medium Use Parking Lots	4	4.5	17.9
Other Parking Lots Flat Asphalt Roofs Industrial Roofs	3	0.0	0.0
Other Rooftops Bikeways/Lawns Pedestrian Pavement	2	2.0	3.9
Non-grass Landscaped areas Stormwater Facilities	1	0.3	0.3
Meadows Forest	0	2.2	0.0
Total Redevelopment Area (A)		8.9	
Proposed Impact Rating (PIA)			22.2
Proposed Pollutant Ranking (PPR) =		PIA/A =	2.48

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY
 ITERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

[illegible]

Site Design Associates

Consulting Engineering & Land

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

CLIENT:

UNIVERSITY OF NEW ENGLAND

UNIVERSITY OF NEW ENGLAND

11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.

DRAWN: DEPT.

[illegible]

DATE: SEP. 2023

SCALE: 1" = 60'

PROJECT: CONNECTOR DRIVE
83 COLLEGE STREET, PORTLAND, MAINE

POST DEVELOPMENT POLLUTANT LOADING PLAN

PROJ. NO.	21-216-00	REV.
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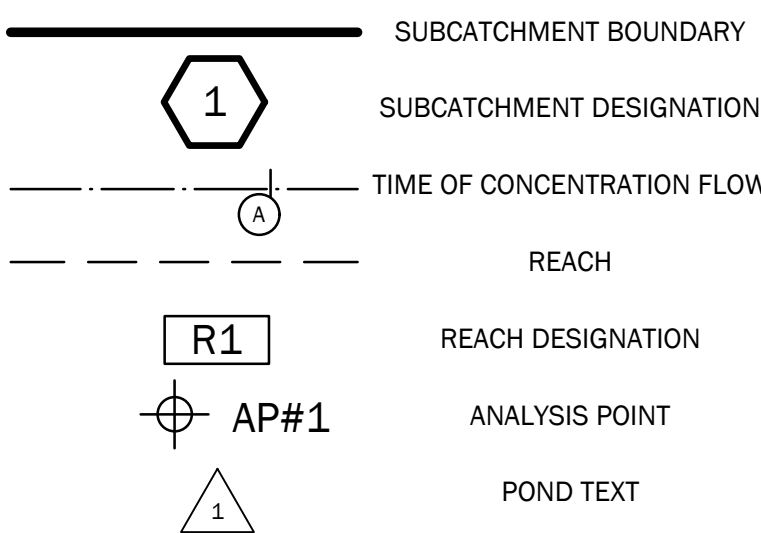
DWG.	B3.0	A
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TAX	MAP	I.D.
291	A001	
291	A005	
290	A003	
145	B014	

SOIL NOTES

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY, AVAILABLE ONLINE AT THE FOLLOWING LINK: HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/. ACCESSED 12/15/2022.

DRAINAGE LEGEND



Tc FLOW LINE DATA:

SUBCATCHMENT 7.0				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	46.6	150'	0.027	SHEET FLOW
BC	2.8	120'	0.080	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	37.3	150'	0.047	SHEET FLOW
BC	2.5	75'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.1	50'	0.050	TRAP FLOW

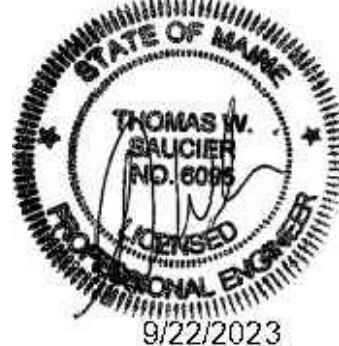
SUBCATCHMENT 7.4				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	27.4	110'	0.055	SHEET FLOW
BC	1.7	50'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.2	75'	0.015	TRAP FLOW

Tc FOR ALL REMAINING SUBCATCHMENTS = 5 MINUTES.



THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
A	9/22/2023	FOR DEVELOPMENT REVIEW									



Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT:
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	PRE DEVELOPMENT DRAINAGE PLAN (WEST)
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 60'	DWG. NO. D1.0

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT THE FOLLOWING LINK: [HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/](http://websoilsurvey.sc.egov.usda.gov/). ACCESSED 12/15/2022.

SUBCATCHMENT BOUNDARY
 SUBCATCHMENT DESIGNATION
 TIME OF CONCENTRATION FLOW
 REACH
 REACH DESIGNATION
 AP#1 ANALYSIS POINT
 POND TEXT

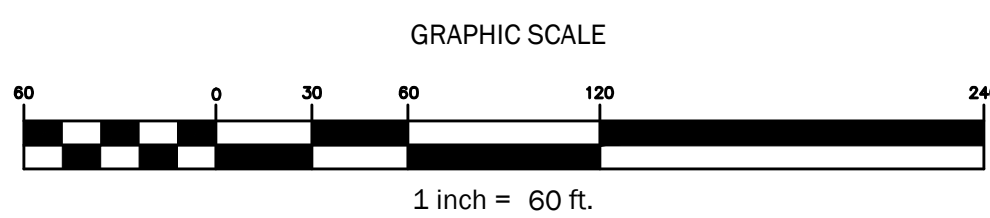
SUBCATCHMENT 4.1				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	12.4	110'	0.014	SHEET FLOW
BC	0.9	110'	0.160	SHALLOW CONCENTRATED FLOW
CD	0.5	300	0.017	TRAP FLOW

SUBCATCHMENT 4.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	10.0	80'	0.090	SHEET FLOW

SUBCATCHMENT 7.0				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	46.6	150'	0.027	SHEET FLOW
BC	2.8	120'	0.080	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	37.3	150'	0.047	SHEET FLOW
BC	2.5	75'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.1	50'	0.050	TRAP FLOW

[illegible]

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

CLIENT:

UNIVERSITY OF NEW ENGLAND

11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DATE: SEP. 2023

SCALE: 1" = 60'

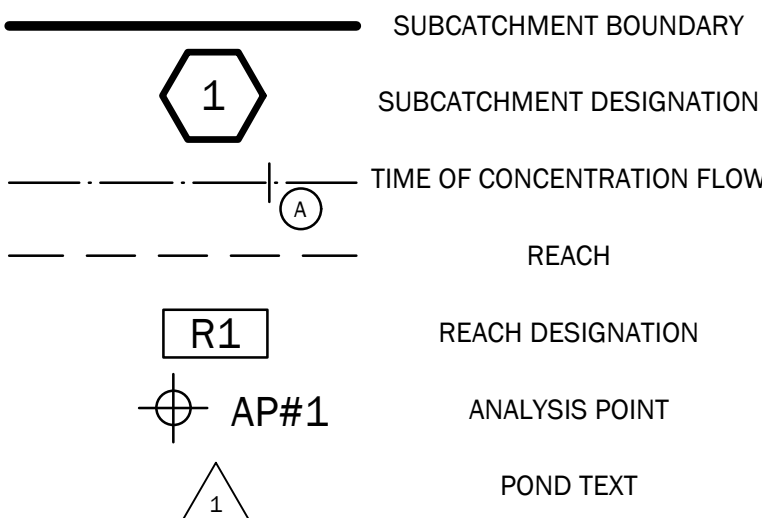
PROJ. NO.	21-216-00	RE
DWG. NO.	D1.1	A

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

SOIL NOTES

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT THE FOLLOWING LINK: HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/. ACCESSED 12/15/2022.

DRAINAGE LEGEND



To FLOW LINE DATA:

SUBCATCHMENT 7.0				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	46.6	150'	0.027	SHEET FLOW
BC	2.8	120'	0.080	SHALLOW CONCENTRATED FLOW

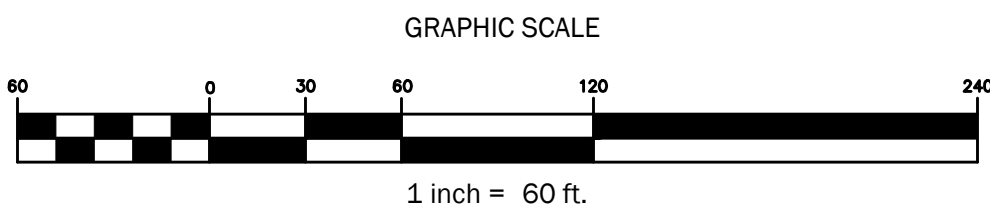
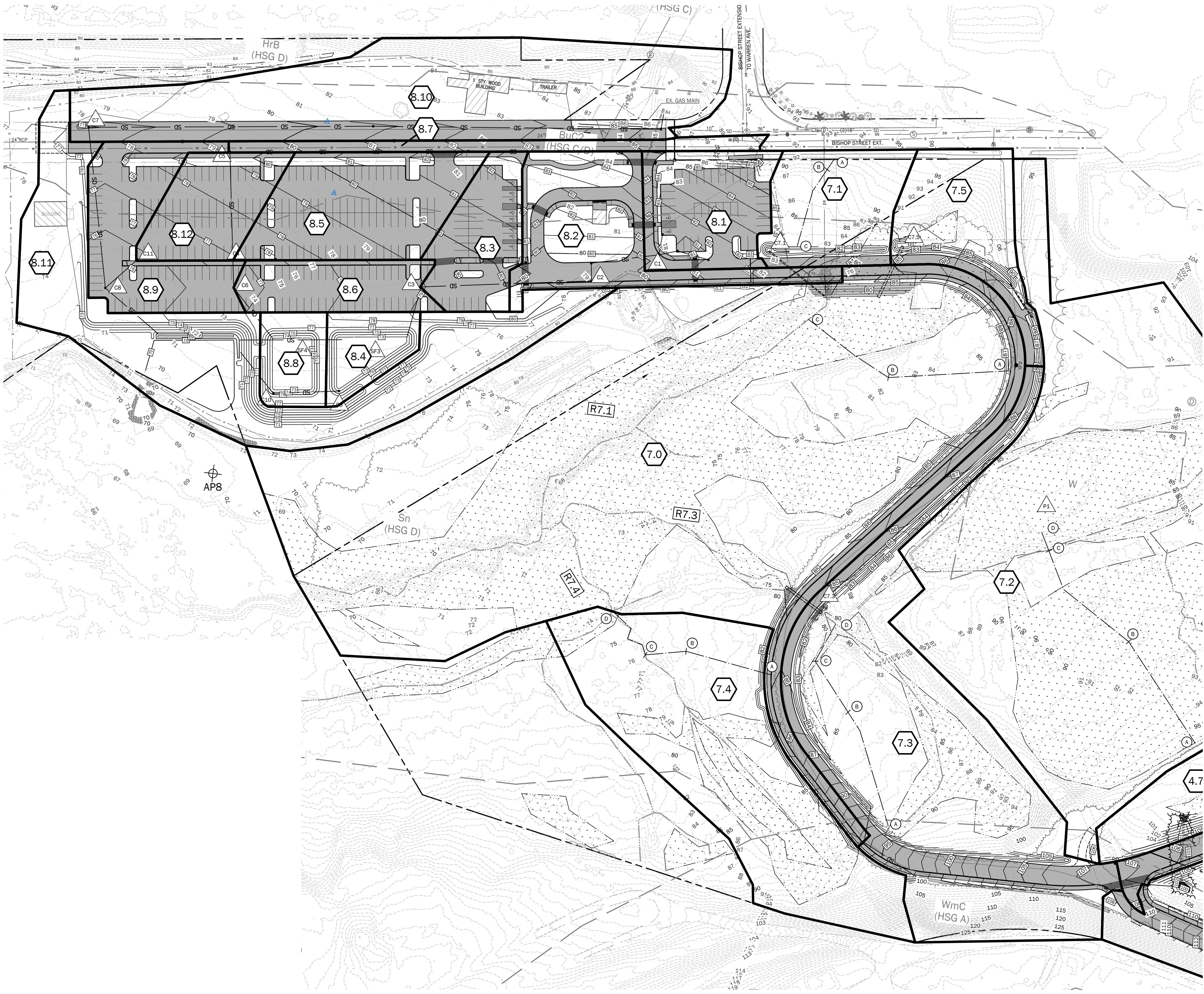
SUBCATCHMENT 7.1				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	0.8	15'	0.200	SHEET FLOW
BC	5.7	100'	0.060	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	37.3	150'	0.047	SHEET FLOW
BC	2.5	75'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.1	50'	0.050	TRAP FLOW

SUBCATCHMENT 7.4				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	27.4	110'	0.055	SHEET FLOW
BC	1.7	50'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.2	75'	0.015	TRAP FLOW

To FOR ALL REMAINING SUBCATCHMENTS = 5 MINUTES.



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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
A	9/22/2023	FOR DEVELOPMENT REVIEW									



Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

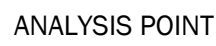
DESIGN: DEPT.
DRAWN: DEPT.
CHKD: TWS
DATE: SEP. 2023
SCALE: 1" = 60'

PROJECT: **CONNECTOR DRIVE**
83 COLLEGE STREET, PORTLAND, MAINE
POST DEVELOPMENT DRAINAGE PLAN (WEST)
PROJ. NO. **21-216-00**
DWG. NO. **D2.0**

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT THE FOLLOWING LINK: [HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/](http://websoilsurvey.sc.egov.usda.gov/). ACCESSED 12/15/2022.

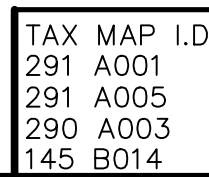
- SUBCATCHMENT BOUNDARY



SUBCATCHMENT 4.

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

T_C FOR ALL REMAINING SUBCATCHMENTS = 5 MINUTES.



23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

CLIENT: _____

UNIVERSITY OF NEW ENGLAND

11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DRAWN: DEPT.

CHKD: TWS

DATE: SEP. 2023

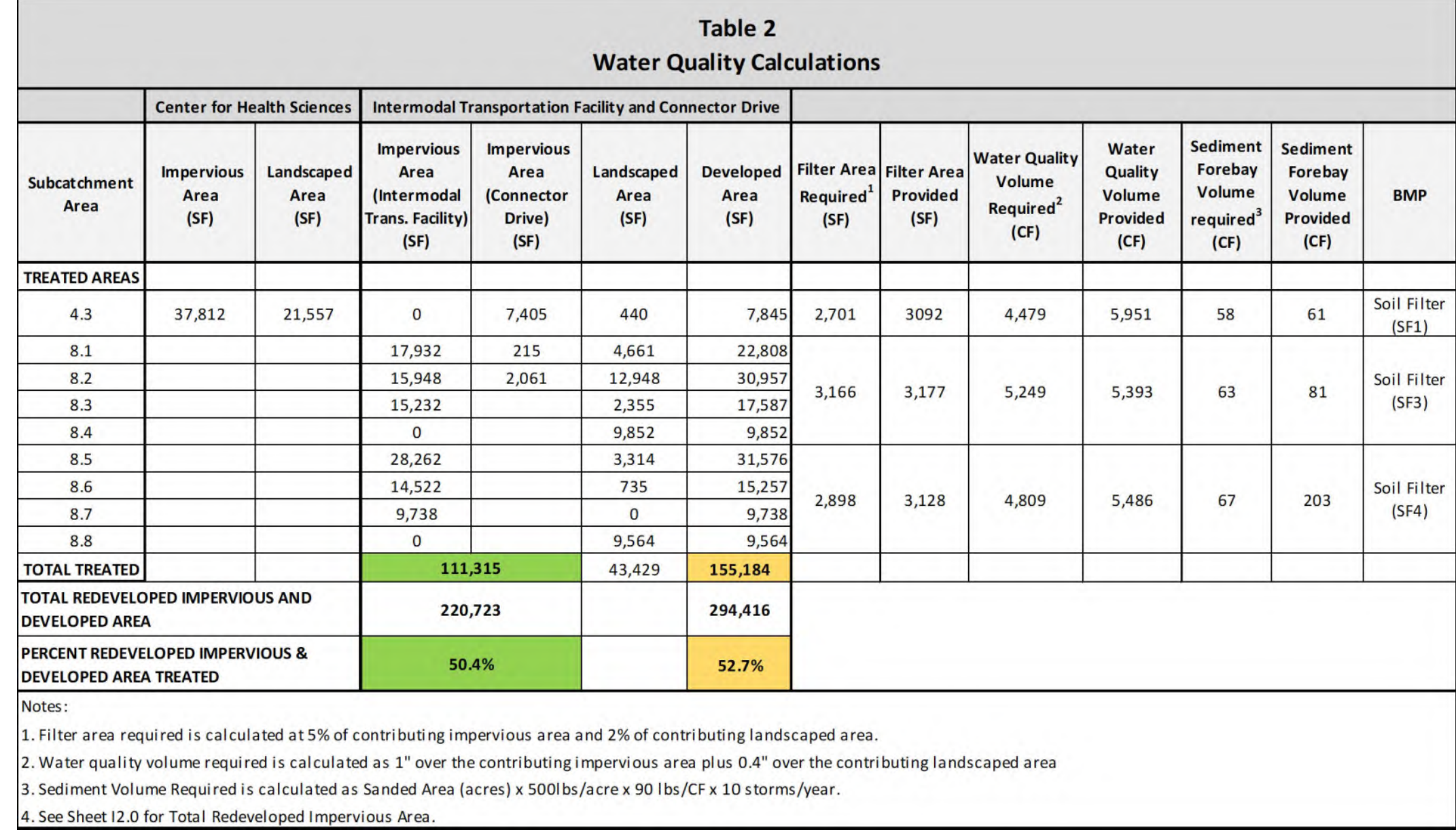
SCALE: 1" = 60'

83 COLLEGE STREET, PORTLAND, MAINE

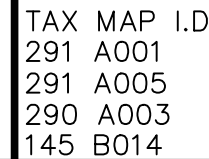
POST DEVELOPMENT DRAINAGE PLAN (EAST)

PROJ. NO.	21-216-00	REV.
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	DWG. NO.	D2.1	A
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THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY
MODIFICATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.



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 ☐ Planning Permit ☐ Metallic Mining	☐ Marine Oil Terminal ☒ Structure ☐ Subdivision	☐ Major Amendment ☒ Minor Amendment
1. Name of Applicant:	Andrew Philippe University of New England		6. Name of Agent (if applicable):	Tom Saucier Site Design Associates
2. Applicant's Mailing Address:	11 Hills Beach Road Biddeford, ME 04005		7. Agent's Mailing Address:	23 Whitney Way Topsham, ME 04086
3. Applicant's Daytime Phone #:	602-2365		8. Agent's Daytime Phone #:	207-449-4275
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):	aphilippe@une.edu		10. Agent's e-mail address (REQUIRED - license will be sent via e-mail):	tsaucier@sitedesignassociates.biz

PROJECT INFORMATION

11. Name of Development:		Connector Drive Reconstruction			
12. Map and Lot #'s:	Map #: see plans	Lot #:	13. Deed Reference #'s:	Book #: see attached	Page #:
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:	Reconstruction of an existing drive				
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:		unnamed wetlands			
21. Amount of Developed Area:	Total acres:	Existing Developed area: <u>7.86</u> acres		New Developed area: <u>6.76</u> acres	
22. Amount of Impervious Area:	Total acres:	Existing Impervious areas <u>6.75</u> acres		New Impervious area: <u>5.07</u> acres	
23. Development started prior to obtaining a license?:		☐ Yes ☒ No			
24. Development or any portion of the site subject to enforcement action?			☐ Yes ☒ No	If yes, name of enforcement staff involved?	
25. Common scheme of development?:	☐ Yes ☒ No	26. Title, Right or Interest:		☒ own ☐ lease	☐ purchase option ☐ written agreement
27. Natural Resources Protection Act permit required?:		☒ Yes ☐ No	If yes:	☒ PBR ☐ Tier 1 ☐ Tier 2	☐ Full Permit
28. Existing DEP Permit number (if applicable):					
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: _____ Tom Saucier _____
 Title Agent _____ Date: 09-21-23 _____

**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 _____ Tom Saucier _____ Date: 09-21-23 _____

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: Tom Saucier _____

Name (print): Thomas Saucier, P.E. _____

Date: 09-21-23 _____

Re/Cert/Lic No.: _____

Engineer 6095 _____

Geologist _____

Soil Scientist _____

Land Surveyor _____

Site Evaluator _____

Active Member of the Maine Bar _____

Professional Landscape Architect _____

Other _____



UNIVERSITY OF
NEW ENGLAND

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
(207) 283-0171 T

Portland Campus
716 Stevens Avenue
Portland, ME 04103
(207) 797-7261 T

September 20, 2023

Mr. Tom Saucier
Site Design Associates
23 Whitney Way
Topsham, ME 04086

TO WHOM IT MAY CONCERN:

This letter authorizes Tom Saucier to serve as an Agent and Owner's Representative for University of New England for the purpose of permitting the reconstruction of a drive connecting the campus with the Intermodal Transportation Facility.

Sincerely,

A handwritten signature in black ink, reading "alan thibeault", is displayed within a rectangular box. The signature is written in a cursive, lowercase style.

Alan Thibeault
Vice President for University Operations

83 COLLEGE STREET Section 1 Development Description



The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

0.25 Miles
1 inch = 0.28 miles

Date: 8/30/2022
Time: 10:03:31 AM

Project Description

On behalf of University of New England (UNE), Site Design Associates (SDA) is pleased to submit a major Site Plan Application the reconstruction of the existing connector drive between the Intermodal Transportation Facility (ITF) and the main campus. We understand the site plan application fee for a project of this size will be invoiced.

The project was reviewed with staff at a pre-application meeting on August 30, 2023. Based on feedback from staff at the meeting, the concept remains as discussed then.

The existing ITF provides parking for students, faculty, and guests, with a regular shuttle service to the main campus along the connector drive. The goals of the reconstruction project include increase safety through the installation of sidewalks, call boxes and cameras, widening of the existing drive to enhance circulation and improve safety, and installation of modern and ordinance compliant lighting.

The proposed drive will connect the Intermodal Transportation Facility (ITF) and the campus on Stevens Avenue. This new access drive will allow student, faculty, and staff vehicles, bicyclists and pedestrians, to travel between the core campus on Stevens Avenue and the ITF and on to Warren Avenue if so desired. This access drive will eliminate unnecessary trips on Stevens Avenue, Forest Avenue, Bishop Street and Warren Avenue by allowing UNE community members to enter and exit the campus at the location proximate to their origin/destination by either Bishop Street Extension or Stevens Avenue. More importantly, it will eliminate traffic that is currently routed through Morrill's Corner.

While the Morrill's Corner intersection is operating acceptably overall, there are some constraints for northbound left-turn movements off Forest Avenue. The plan to provide an internal campus connector road from the primary campus to the ITF will provide for reduced volumes at Morrill's Corner by allowing direct access to Warren Avenue, thus removing those campus trips from Morrill's Corner. The planned connector drive will remove trips from the arterials where the only capacity concerns have been identified. Additionally, the UNE service vehicles and the shuttle currently travel on Bishop Street from the existing connector drive to the ITF. The proposed drive will eliminate trips on Bishop Street.

The connector drive will be gated and access will only be for vehicles driven by UNE, faculty, and staff. Additionally, this connector could be utilized by non-UNE community pedestrians and bicyclists to commute between Stevens Avenue and Warren Avenue without navigating the congested Morrill's Corner, resulting in a significantly safer travel route. The existing access directly to Bishop Street will remain for bicycle and pedestrian use. The University has discussed allowing Portland Trails to utilize this reconstructed access road to connect their existing trail network proximate to the Evergreen Cemetery to the Warren Ave area as well.

One waiver is necessary for the proposed lighting, consistent with the waiver granted for the MEARNG, College of Osteopathic Medicine, and Bishop Street Intermodal facility projects.

Construction Management Plan
University of New England
Connector Drive

Overview: The Construction Management Plan depicts the overall planning, coordination, and control of the construction site. The goal for the construction management plan is to support a safe construction site and protect the public safety, accessibility, and welfare during construction. In addition, the construction management plan shall minimize construction impacts in their duration and magnitude to the surrounding area and develop an effective communication process for resolving concerns and conflicts.

The Connector Drive project consists of construction of a new connector road from UNE Campus and Parking to the Bishop Street parking lot all on UNE'S property. The construction consists of excavation, utilities, paving, landscaping, electrical systems.

Safety: Ledgewood Construction safety program is designed to guide our site management personnel in supervising our projects with safety as a prime concern. Ledgewood Construction subcontractors are required by their contracts to perform their work in a manner that provides a safe workplace for the public, their employees and other trades. Ledgewood promotes a jobsite culture of safety through constant and open communication of work and associated hazards. All subcontractors are required, in accordance with their contractual agreements, to comply with the requirements of Ledgewood Construction's Safety Program and code of conduct. A copy of the Ledgewood Safety program is attached.

Housekeeping on any construction site is essential in maintaining a safe workplace. The following guidelines will be adhered to: Adequate dumpsters will be provided by either the individual Subcontractor or Ledgewood Construction dependent on contract requirements. All construction debris will be picked up daily by all Subcontractors.

Fire Safety: Ledgewood's Fire Safety Program is attached. Up to date extinguishers will be posted and maintained at strategic locations throughout the site as required by OSHA regulations. Additional extinguishers will be required at high fire hazard activities. Emergency numbers will be posted in the site office and communicated at weekly meetings.

Construction operations will be limited to the areas indicated on the plans. Driveways, loading areas, and entrances serving premises will be kept clear and available to the University, University employees and students. Emergency vehicles access will always be maintained. Construction parking and storage of materials will be within the construction work limits. Deliveries will be directed to enter the site from the Bishops Street.

Contact information for the University of New England and Ledgewood Construction and personnel who are available 24 hours is attached.

A Construction Sign will be posted on the site with Contact Information for the University of New England and Ledgewood Construction.

On-Site Work will be performed during normal business hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. Limited weekend hours are expected. Weekend Hours will be 7:00 a.m. to 5:00 p.m.

Construction Parking: Adequate parking for construction workers will be provided on site at the UNE Bishop street parking lot.

Construction Administration and Communication

The University of New England and Ledgewood Construction will work closely with adjacent abutters, businesses, nearby construction sites, and all other stakeholders. All of these parties will be kept informed, as far in advance as possible, of scheduled work, particularly work anticipated to cause significant noise,

vibrations, or alterations to traditional travel paths.

High noise level construction activities are not anticipated. Construction worksites noise will be monitored and may be lowered by using commonly accepted engineering and administrative controls.

Vibration caused by construction activities are expected to be minimal due to the construction site location and there will be no pile driving operations, or any blasting activities. Roller compactors will likely be in use at certain times during the project. Geotechnical reports do not indicate conditions that would readily transmit excessive vibrations to surrounding structures. We will monitor this when these activities commence.

Dust will be controlled with periodic watering of the exposed soil surface with adequate watering to control dust from becoming airborne. Repetitive treatments of watering shall be applied as needed to control dust throughout construction until areas have been stabilized.

Rodent Control if needed will be performed by a professional exterminator and consistent with Chapter 22 of the City Code.

Snow Removal from the site is not anticipated. Snow in the work area will be stockpiled on site. Sand or Salt will be used as needed. All basin or drainage devices will be kept clear to help with snow melt and appropriate erosion and sediment controls will be in place.

Performance Guarantees, Inspection Fees, Preconstruction Meeting, and Permits: Prior to scheduling a preconstruction meeting and the issuance of any city required permits, the University of New England and Ledgewood Construction shall meet all the requirements contained in Section 14-530. Development review fees and post approval requirements and 14-532. General requirements and enforcement of Portland's Land Use Code

Other permits, as applicable, include

1. **Street Opening and Street Occupancy Permits:** Construction activity in the public right-of-way are controlled by Chapter 25 and sewer and stormwater system connections are controlled by Chapters 24 and 32 of the Land Use Code. All required permits shall be obtained through the Department of Public Works and the requests shall conform with the approved construction management plan.
2. **Building Code:** Employ the best practices, as applicable, of Chapter 33 Safeguards During Construction, from the 2009 International Building Code.

Construction activity that impacts the existing public street system are anticipated for utility connections. A Maintenance of Traffic (MOT) plan will be produced if needed once utility mains in the street are located and traffic impact is assessed.

Construction Activity in Public Streets: Construction activity in the public right-of-way is controlled by Chapter 25 Article VII of the City Code of Ordinances. Required licenses and permits, restrictions on activity, and fees & area are outlined in that Chapter. Rules and Regulations for Excavation Activity are available through the Street Opening Clerk at the Department of Public Works. At no time can construction activity including delivery vehicles close or block streets or affect public safety access without prior notice and approval of the Department of Public Works.



SAFETY PROGRAM

Revised April 2020

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Project Manager's Responsibilities	7	10/13
Superintendent's Responsibilities	8	10/13
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POLICY STATEMENT

Revised: October, 2013

Ledgewood Construction is proud of our employees and their commitment to excellence. Jobsite safety is an integral part of any project and we at Ledgewood Construction firmly believe that a safe work place is a productive work place.

Striving for excellence in safety means that we have set the highest possible standards for ourselves and all of the subcontractors who work with us. An accident free jobsite is within our reach and we are committed to achieving this goal every day.

Safety standards compliance is clearly the first priority of every Ledgewood Construction employee. As a result, Ledgewood Construction has one of the best safety records in the industry. Safety is, without question, key to the successful completion of each construction project and to the long-term success of our company and its employees. At Ledgewood Construction we understand and firmly believe that

A safe job is a more productive job.
A safe job is a cleaner job.
A safe job is a better working environment
and
Only a safe job can be a successful job.

Signed,



Peter J. Pelletier, LEED AP
President

SAFETY PROGRAM

Revised: October, 2013

Ledgewood Construction safety program is designed to guide our site management personnel in supervising our projects with safety as a prime concern. Ledgewood Construction subcontractors are required by their contracts to perform their work in a manner that provides a safe workplace for their employees and creates a safe area for other subcontractor employees to perform their work. Each subcontractor must work at safety with every other subcontractor to make safety work for everyone. All subcontractors are required, in accordance with their contractual agreements, to comply with the requirements of Ledgewood Construction's Safety Program.

The United States Congress recognized the importance of the prevention of accidental injuries and occupational illness by enacting the Occupational Safety and Health Act of 1970 (OSHA).

Current OSHA standards shall govern how workers are expected to perform their work in a safe manner. Supervisory personnel shall refer to the OSHA regulations when issues are raised regarding safety. This manual shall be the determining factor in resolving any such disputes.

OFFICIAL POLICY ON A DRUG-FREE WORKPLACE

Revised: October, 2013

Illegal drugs in the workplace are a danger to us all. They impair safety and health, promote crime, lower productivity and quality, and undermine public confidence in the work we do. We will not tolerate the use of illegal drugs. To comply with the federal Drug-Free Workplace Act and in order for Ledgewood Construction to be considered a “responsible source” for the award of Federal, State and Local contracts, Ledgewood Construction has developed the following policy.

Any location at which company business is conducted, whether at this or any other site, is declared to be a drug-free workplace. This means:

1. All employees are absolutely prohibited from unlawfully manufacturing, distributing, dispensing, possessing, transporting in company vehicles, or using controlled substances or alcohol in the workplace.
2. The following is a partial list of controlled substances.
 - Narcotics (heroin, morphine, etc.)
 - Cannabis (marijuana, hashish)
 - Stimulants (cocaine, diet pills, etc.)
 - Depressants (tranquilizers)
 - Hallucinogens (PCP, LCD, “designer drugs”, etc.)

Any employee violating the above policy is subject to discipline, up to and including termination, even for the first offense. Employees have the right to know the dangers of drug abuse in the workplace, Ledgewood Construction’s policy about them, and what help is available to combat drug problems. This document spells out Ledgewood Construction’s policy. To assist employees in overcoming drug abuse problems, Ledgewood Construction may offer rehabilitative help. See your supervisor for details on this.

Any employee convicted of violating a criminal drug statute in this workplace must inform Ledgewood Construction of such conviction (including pleas of guilty and nolocontendere) within five days of the conviction occurring. Failure to inform the company subjects the employee to disciplinary action, up to and including termination for the first offense.

Ledgewood Construction reserves the right to offer employees convicted of violating a criminal drug statute in the workplace participation in an approved rehabilitation or drug abuse assistance program as an alternative to discipline. If such a program is offered, and accepted by the employee, the employee must satisfactorily participate in the program as a condition of continued employment.

All employees are asked to acknowledge that they have read the above policy and agree to abide by it in all respects. By law, this acknowledgement and agreement are required of you as a condition of continued employment.

Please refer any questions on the above policy to your supervisor.

DRUG-FREE WORKPLACE STATEMENT

Revised: October, 2013

The illegal manufacture, distribution, dispensation, transportation, possession or use of a controlled substance is prohibited at this workplace. Employees who engage in any of the above actions at the workplace or who report to work under the influence of controlled drugs or alcohol will be disciplined and/or employment terminated.

Employees addicted to the use of controlled substances or alcohols are encouraged to participate in a program in order to receive rehabilitation and counseling.

As a condition of employment on this jobsite, employees are required to abide by the terms of this statement and to notify their employer, within five days of conviction, of any criminal drug statute or a drug related violation of law at the work site.

I have read and understood this Drug-Free Workplace Statement and agree to abide by the terms of this Statement.

Signature

Printed Name

Date

ALCOHOL-FREE WORKPLACE STATEMENT

Revised: October, 2013

The possession or consumption of alcoholic beverages in company vehicles or on the jobsite is strictly forbidden. Any employee found in violation of the above order shall be removed from the jobsite.

To assist employees in overcoming drug abuse problems, Ledgewood Construction may offer rehabilitative help. See your supervisor for details on this.

This policy shall be reviewed at the weekly safety meetings.

MANAGEMENT RESPONSIBILITIES

Revised: October, 2013

The Ledgewood Construction Management Team is committed to a safety program that is effective and clearly defines everyone's role.

1. Every employee shall be responsible for making the work place safe.
2. Impress upon all supervisory personnel the responsibility and accountability of each individual to maintain a safe work place.
3. The Project Executives and Project Managers will supervise and assist in the management of the safety program. Management personnel will help ensure the success of the program by checking on safety when visiting a jobsite.
4. Management will contractually require that the subcontractors abide by the Ledgewood Construction's Company's safety program.
5. On individual job sites, the Project Superintendent will be designated as the Project Safety Contact for Ledgewood Construction and all on site personnel, including Subcontractors, and be responsible for implementation and monitoring of all on site safety programs and procedures.

PROJECT MANAGER'S RESPONSIBILITIES

Revised: October, 2013

It is the Project Manager's responsibility to assist with the Safety Program on their respective projects. It is towards this end that the following responsibilities are directed:

1. Monitor and assist the Project Superintendent, who has responsibility for safety at his/her jobsite.
2. Maintain appropriate rules, regulations and codes at the jobsite. Distribute relevant reports, data and forms pertinent to the safety program.
3. The Project Manager reserves the right to back charge subcontractors for failure to follow job safety program policies and procedures that require corrective action.
4. Provide advance safety planning for all activities through the use of scheduling and administrative controls.
5. Periodically monitor all aspects of the program for effectiveness, and provide necessary assistance to the field personnel including maintaining an interested participation in safety and compliance.

SUPERINTENDENT'S RESPONSIBILITIES

Revised: October, 2013

- I. The Superintendent is the designated safety contact on the jobsite. The Superintendent will work to ensure full compliance with Ledgewood Construction's safety program for his/her project.
 - a. Plan and require that all work be done in compliance with the Company's Safety Program.
 - b. Impress upon all subcontractor's supervisory personnel, their responsibility and accountability for each individual to maintain a safe workplace and work in a safe manner.
 - c. Work closely with subcontractor foreman in reviewing jobsite safety issues.
 - d. Weekly subcontractor meetings shall include discussions of safety requirements as they apply to specific current and planned construction activities.
2. The Superintendent shall be responsible for routine inspections, making recommendations and notifying the subcontractors of any corrective action to be taken on safety violations. *Safety violation notices and recommended disciplinary action, if any, shall be recorded on the Disciplinary Action. These violations should also be noted in the daily job reports.*
 - a. Maintain a job file for all necessary documentation at the jobsite, i.e. material safety data sheets (MSDS), OSHA and company inspection reports, toolbox safety meeting forms, posters, notices, accident report logs, accident reports and company directives, instructions and educational materials, copies of all safety code manuals and materials, including Ledgewood Construction Safety Program, that are needed to carry out the Safety Program.
 - b. Ensure availability of all necessary personal protective equipment and first aid materials. The Superintendent shall ensure that all subcontractor personnel and visitors wear the necessary protective equipment as circumstances require.
 - c. Ensure the security of the jobsite at all times.
 - d. See that all accident victims are promptly cared for, and that the accident is promptly investigated and reported properly.
 - e. Notify the Project Manager and Project Executive of all bodily injury accidents and/or damage to property within a day of the occurrence. Immediate notification is required on incidents of a serious nature.

- f. The Superintendent shall accompany any and all outside agencies making an inspection of the project (Fire Department, OSHA Compliance Officer, Insurance Company Representatives, etc.).
- g. Insist on each visitor in an official capacity properly identifying himself/herself and his/her name being duly recorded in the visitor's log.
- h. Before starting an OSHA inspection, contact the Project Manager.
- i. Request from any outside agency making an inspection of the project a report stating violations and recommendations before leaving the premises. A copy of this report shall be provided to the Project Manager.
- j. Post emergency phone numbers at all jobsite telephones.
- k. Post daily sign in sheet.
- l. Daily job reports.
- m. E.A.D.
- n. Correspond with the Project Manager on all important matters regarding jobsite safety.
- o. Certified/trained in First Aid and CPR.
- p. Set a good example on matters of jobsite safety.
- q. Make arrangements with the Police and Fire Departments for emergency response and ambulance service at the start of the job.
- r. The Superintendent has the authority to shut down any operation that in his/her opinion is exposing workers or the public to imminent danger.
- s. The Superintendent shall appoint an alternate when leaving the jobsite for any period of time during operating hours. This is to be documented in the Superintendent's daily report.

SUBCONTRACTOR RESPONSIBILITIES

Revised: January, 2015

Each subcontractor has a contractual obligation to perform their work using safe methods in compliance with the Ledgewood Construction Safety Program, the current Occupational Safety and Health Administration Standards and all other Federal, State and Local Codes and Regulations.

All employees shall comply with all Federal, State and Local Codes and Regulations. Each Subcontractor shall ensure that their subcontractors and suppliers, regardless of tier, comply with Ledgewood Construction's Safety Program.

All costs to Ledgewood Construction of Federal, State or Local citations, fines, penalties and/or summonses resulting from any Subcontractor's operations may be back charged to the Subcontractor.

All Subcontractors shall provide their employees with all safety and personal protective equipment and weather protective gear required for the performance of their work and enforce the use of same.

Each Subcontractor shall enforce the wearing of hard hats and any other personal protective equipment necessary for the safety of their employees during the entire construction period of the Project as a condition of their contract.

Each Subcontractor shall have a scheduled safety inspection and maintenance program for all tools, equipment, and personal protective equipment. The inspection reports shall be on an approved form and shall be submitted to Ledgewood Construction's site Superintendent upon request.

Each Subcontractor office trailer shall be equipped with an approved First Aid Kit. If gang boxes are used in lieu of the office trailer, the gang box shall contain the First Aid Kit. Fire extinguishers are required in all office trailers and gang boxes.

If a Subcontractor must remove cables, barricades, or any other safety-related items in order to perform their work, it shall be the responsibility of that Subcontractor to guard the area until the safety item is replaced.

Subcontractors conducting hot work shall provide an approved fire extinguisher for each hot work site. Ledgewood Construction's fire extinguishers are for general fire-fighting and are not to be relied upon for Subcontractor hot work practices.

Each Subcontractor shall provide a copy of their Hazard Communications Program, including MSDS's, to the Ledgewood Construction's Superintendent and are to be kept in the Ledgewood Construction office trailer until the Subcontractor work at the site is concluded.

Each Subcontractor shall be responsible for maintaining general housekeeping in their work area, and all debris shall be placed in appropriate containers or as otherwise directed by Ledgewood Construction's Project Superintendent. Failure to abate any related problem (e.g., failure to clean up work area and remove debris) after 24 hour notice, in writing, (except that in an emergency, an immediate response is required) may result in a back charge to the Subcontractor(s) concerned for the cost of correcting the hazard.

ENTRY PERMIT CONFINED SPACES PROGRAM

Revised: January, 2015

As “entry permit” confined spaces are not located on all jobsites, training shall be given to those individuals specifically assigned to work in same.

Employees required to construct work in a: boiler, cupola, degreaser, furnace, pipeline, pit, pumping station, reaction or process vessel, septic tank, sewage digester, sewer, silo, storage tank, ship’s hold, utility vault, vat or similar type enclosure would be considered working in a confined space. A confined space is any space having any one of the following characteristics.

- Limited openings for entry and exit unfavorable natural ventilation.
- Not designed for continuous worker occupancy.

The purpose of Ledgewood Construction Entry Permit Confined Spaces Program, as outlined below, is to ensure that entrants (employees) are protected from permit space hazards. In this regard, Ledgewood Construction shall undertake the following measures.

RESPONSIBILITIES

Management:

Take deliberate steps once a confined space is identified to protect its employees while performing their respective duties within said spaces. To this end, a Confined Space Entry Permit form has been devised for use in ensuring a safe work environment. No employee is to enter a confined space until such time that an entry permit has been completed by the company’s Superintendent, the Project Foremen or other individual eligible to be in charge of entry, and the entrant has been authorized to enter such confined space.

- Provide training for Superintendent on confined space entry.
- Provide Superintendent with assistance as requested to carry out duties outlined.
- Provide personal protective equipment as required.

General Superintendent:

- Orientates Foreman on Company’s procedures for working in confined spaces. Evaluate, where feasible, confined space hazards and determine their severity.
- Prepare Confined Space Entry Permit, once an entry permit confined space has been identified.
- Provide on-site training for proposed entrants.
- Provide on-site training for proposed attendants.
- Provide on-site training for proposed individuals authorizing or in charge of entry.

Employee:

- Advise Foreman of any potential hazards once recognized.
- Participate in on-site training for confined space entry.
- Follow all instructions given on conduct relating to entry permit confined space.

Record Keeping:

1. This Entry Permit Confined Space Program shall be kept on-site at all times, and made available to any company employee.
2. Copies of all Confined Space Entry Permits shall be kept up-dated and on-site at all times, and made available to any company employee.
3. Copies of all Record Keeping documents listed above shall be provided to this Company's office.
4. The Company's office shall maintain records of confined space entry for a period of no less than three (3) years from the date of cancellation of Confined Space Entry Permits.

CONFINED SPACE ENTRY PERMIT

Revised: January, 2015

All blank spaces must be completed prior to entry.

Project Name and Location: _____

Location of Confined Space: _____

Purpose of Entry: _____

Is Hot Work Intended: _____

A. 1. Known Hazards: _____

2. Suspected Hazards: _____

3. Method of Isolating Confined Space: _____

4. Method of Removal and/or Control of Known/Suspected Hazards: _____

5. Method of Verifying Acceptable Environmental Conditions:_____

6. Testing/Monitoring Equipment for Maintaining Acceptable Environmental Conditions During Entry:_____

7. Rescue Services to be Utilized:_____

8. Specific Rescue Measures to be Used:_____

9. Communication Methods Used by Entrants and Attendants:_____

10. Personal Protective Equipment to be Used:_____

B. Date of Entry:_____ Authorized:_____

Duration:_____

Authorized Entrants:

Eligible Attendants:

Individuals Authorized or Charge of Entry:

Superintendent:_____

Project Foreman:_____

Others:_____

Others:_____

Names of Other Contractors Receiving this Information:_____

Name of Others Requesting this Information:_____

Note: This information must be available to employees at all times during entry operations.

Sign below verifying that: All actions and conditions necessary for safe entry into Permit Space have been performed.

Printed Name:_____ Signature:_____

Project Name:_____

Foreman:_____

TRAINING AND DUTIES OF INDIVIDUALS AUTHORIZING OR IN CHARGE OF ENTRY

Revised: January, 2015

The purpose of training “Individuals Authorizing or in Charge of Entry” is not only to ensure that Authorized Entrants, and Attendants, have been made aware of the hazard(s) that could be encountered during confined spaces operations, but also to ensure that all required documentation has been completed and records are being kept as identified in the Entry Permit Confined Spaces Program. To this end, the Superintendent and/or Foreman shall instruct/inform employees on the following:

Individuals authorizing or in charge of entry shall:

- Determine that the Entry Permit contains requisite information before authorizing or allowing entry.
- Determine that the necessary procedures, practices and equipment for safe entry are in effect before allowing entry.
- Determine, at appropriate intervals, that entry operations remain consistent with the terms of the Entry Permit, and that acceptable entry conditions are present.
- Cancel the entry authorization and terminate entry whenever acceptable entry conditions are not present.
- Take the necessary measure for concluding an entry operation, such as closing off a permit space and cancelling the permit, once the work authorized by the permit has been completed.
- When necessary, serve as Entrants or Attendants (after receiving proper training).
- When dealing with unauthorized personnel, individuals authorizing or in charge of entry shall take appropriate measures to remove unauthorized personnel who are in or near entry permit spaces.

Individuals authorizing or in charge of entry and Instructor must sign below, indicating that instruction has been given and a clear understanding exists on the procedures to be adhered to and duties to be carried out in ensuring safe entry into confined space, acceptable environmental conditions are maintained during entry, safe exit from confined space, and proper documentation is maintained for work performed under the Entry Permit.

Printed Name of Employee/Individual
Authorizing or in Charge of Entry

Date of Training

Signature of Individual
Authorizing or in Charge of Entry

Printed Name & Title of Person
Giving Instruction

Signature of Instructor

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ENTRY PERMIT CONFINED SPACES CHECKLIST

Revised: January, 2015

New Checklist Must be Used Daily

Individual Authorizing or in Charge of Entry:

Printed Name

Signature

Date of Checklist Use:_____

_____ The Entry Permit has been filled out completely.

_____ Training has been given to Authorized Entrants.

_____ Training has been given to Attendants.

_____ Necessary protective equipment is on-hand.

_____ Entry Permit is attached to this Checklist and a copy of Entry Permit has been given to Attendants.

_____ Distributed and collected Attendants records of Authorized Entrants working within confined spaces daily.

_____ All Training Forms are attached to this Checklist.

_____ Company (Ledgewood Construction) copy of this Checklist and all attachments has been turned into the office.

_____ Entry Permit has been cancelled upon completion of work.

Foreman, sign-off above form at the end of each day.

TRAINING AND DUTIES OF AUTHORIZED ENTRANTS

Revised: January, 2015

Project Name: _____

Foreman: _____

The purpose of training "Authorized Entrants" is to ensure employee safety while working within confined spaces on the jobsite. Much of the information needed to provide the proper instruction and give necessary information is outlined on the Confined Spaces Entry Permit. The Superintendent and/or Foreman shall inform/instruct employees on the following:

1. Known hazard(s) which may be faced during entry.
2. Recognition of signs and symptoms of exposure to the hazard(s).
3. Understanding the consequences of exposure to the hazard(s).
4. Understanding the method of maintaining contact with the attendant.
5. Responsibility of notifying attendant when entrant self-initiates evacuation of permit space.
6. Advise of personal protective equipment to be utilized (i.e. retrieval lines, respirators or clothing) needed for safe entry and exit. Protective equipment shall be provided by the company as required. At the time of issuance, the entrant shall be instructed on its care and use.
7. Advise of external barriers needed to protect entrants from external hazards of the proper use of those barriers.
8. Advise entrant of exit procedure (i.e. when attendant orders evacuation, at the end of shift, or when entrant perceives he/she is in danger).
9. Advise entrant of location of Entry Permit, Confined Space Program, Material Safety Data Sheets (MSDS) Program, and inform of their availability for review.

Authorized Entrant and Instructor must sign below, indicating that instruction has been given and a clear understanding exists on the procedures to be carried out to ensure safe entry into confined space, proper work methods while inside confined space and exit from the confined space.

Printed Name of Employee/Authorize Entrant

Date of Training

Signature of Authorize Entrant

Printed Name & Title of Person Giving Instruction

Signature of Instructor

TRAINING AND DUTIES OF ATTENDANTS

Revised: January, 2015

Project Name: _____

Foreman: _____

The purpose of training “Attendants” is to ensure the safety of Authorized Entrants during confined spaces entry operations. To this end, the Superintendent and/or Foreman shall inform/instruct employees on the following:

1. Attendant is to keep accurate records, at all times, of the number of Authorized Entrants working within a confined space.
2. The Attendant shall be advised of the hazard(s) and given information relative to the recognition of signs and symptoms of exposure.
3. The Attendant shall monitor activities inside and outside the permit space to determine if it is safe for Authorized Entrants to remain in the space.
4. The Attendant shall maintain continuous contact with Authorized Entrants during entry.
5. The Attendant shall ORDER Authorized Entrants to evacuate permit space immediately when:
 - The Attendant observes a condition which is not allowed in the entry permit.
 - The Attendant detects behavioral effects of hazard exposure.
 - The Attendant detects a situation outside the space which could endanger the entrants.
 - The Attendant detects an uncontrolled hazard within the permit space.
 - The Attendant is monitoring entry in more than one permit space and must focus attention to the rescue of Entrants from one of those spaces.
 - The Attendant must leave the work station.
 - The Attendant shall summon rescue and other emergency services as soon as the Attendant determines those Authorized Entrants need to escape from the permit space hazards.
1. The Attendant shall warn unauthorized persons away from the space.
2. The Attendant shall request unauthorized persons to exit immediately if they have entered the permit space.
3. The Attendant shall inform the Authorized Entrants and any other persons designated by the employer (i.e. Superintendent, Foreman, Project Manager, other contractors’ supervisors) if unauthorized persons have entered the permit space.

At no time shall the Attendant enter the confined space to assist in rescue operations of Entrants. The Attendant shall properly use an rescue equipment provided for use and perform any other assigned rescue and emergency duties, without entering the permit space.

TRAINING AND DUTIES OF ATTENDANTS (continued)

Revised: January, 2015

Attendant and Instructor must sign below, indicating that instruction has been given and a clear understanding exists on the procedures to be carried out to ensure safe entry into confined space, acceptable environmental conditions are maintained during entry, and safe exit from the confined space.

Printed Name of Employee/Attendant

Date of Training

Signature of Attendant

Printed Name & Title of Person Giving Instruction

Signature of Instructor

ATTENDANTS DAILY LOG OF AUTHORIZED ENTRANTS

Revised: January, 2015

Date of Log Use:_____

Printed Name of Attendant

Signature of Attendant

[illegible]

This form must be kept current at all times and turned over to the individual authorizing or in charge of enter at the end of each day.

Note: Complete and fax a copy of this report to main office as soon as possible.

- I. If work in a confined space is anticipated, the services of an Industrial Hygienist will be obtained, in advance, to perform necessary atmospheric testing prior to allowing workers to enter the space.

START-UP CHECKLIST FOR SAFETY AND JOB PLANNING

Revised: January, 2014

Written Hazardous Communication Program required of all Subcontractors on each Project and a copy will be kept in the Ledgewood Construction office trailer.

- I. Planning the Jobsite:
 - a. Communication systems (phone or radio) as needed.
 - b. Water (include drinking water) and sanitary facilities (for number of employees).
 - c. Arrange for security of jobsite (fencing, lights, etc.) to be handled by the Superintendent.
 - d. Temporary Power – All temporary power to be used by workers on Ledgewood Construction projects will be protected by Ground Fault Circuit Interrupters. Temporary lights will be serviced with Romex wire (open wiring not allowed). Branch circuits and all receptacle boxes exposed to the elements will be water tight.
 - e. Provide trash receptacles for water cups, snack and lunch wrappers.
 - f. Perimeter survey of existing conditions (utilities, streets, structures).
 - g. Traffic – Safe access, stairs, ladders, traffic pattern, sidewalk bridge; protection for abutters and general public, allow for setting up double gates.
 - h. Contact the local Fire Department, Police Department as needed to coordinate special traffic conditions and fire safety issues.
 - i. Ledgewood Construction's safety program and rules shall be adapted to the specific jobsite. Communicate Ledgewood Construction's commitment to a safe workplace to Subcontractors at pre-construction meeting and reinforce at weekly safety meetings.
 - j. If a storage area is needed for propane bottles, consider pouring a concrete pad when doing footings and have a chain link fence with lockable gate installed, as per OSHA guide lines and local jurisdiction.

2. Emergency Needs:

- a. First Aid trained personnel. This will usually be the Superintendent.
- b. First Aid supplies (checked at least weekly). A First Aid kit shall be located in LedgeWood Construction's site office, as well as an eyewash cabinet and blood borne pathogens kit.
- c. Fire extinguishers with a 2A rating 10 lb. ABC classification shall be located throughout the jobsite, strategically placed and numbers will be one for every 3,000 SF of construction space.
- d. Fire/Emergency evacuation plans shall be posted in the building reviewed at job safety meetings and updated as required. This will be done on large projects where exit egress is not readily apparent.
- e. Arrange for emergency medical services (ambulance, hospital, doctor). Emergency numbers shall be posted in the office trailers.

JOBSITE SECURITY

Revised: January, 2014

Security of people and property must be considered and planned prior to start of construction. Prevention of loss of equipment, supplies or in-place construction through theft or vandalism is vital to the success of every project.

The need and degree of security must be judged and designed by the Project Team to fit the construction job and its neighborhood.

The following is a checklist meant to meet most job needs:

1. Full time or off-hours guard service, as needed.
2. The site will be fenced in with chain and dual locks on all gates with key for the Fire Department.
3. Outside overnight lights at office trailers, storage trailers and other material storage areas.
4. Post signs, especially a sign with the Company name. Other signs such as "ALL VISITORS MUST REPORT TO LEDGEWOOD CONSTRUCTION'S FIELD OFFICE", "NO TRESSPASSING", and any other sign appropriate to the security of the site.
5. Post local telephone numbers of Company people in charge for guard service or police use in emergencies.
6. Notify and/or meet with local police. Request overnight roving checks by on-duty police officers. Leave names and numbers for emergency purposes.
7. Determine trailer locations for office and storage trailers for security.
8. Take inventory of the valuable tools and equipment that the Company has on site whether it be construction or office type equipment. Include description and appropriate serial numbers.
9. Food service vehicles are required to have liability insurance is they are going to drive on the site to serve the workers. Request that their company provide a Certificate of Insurance.
10. Provide for and maintain traffic control for trucks and equipment moving on and off the site as required. If Traffic Controllers are required they will wear traffic vests, carry flashlights during hours of darkness and must be trained if in a public area.
11. Identify and protect any exposed transmission lines and utilities prior to any excavating taking place.

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12. Public relations will go a long way for jobsite security, theft and vandalism. The Project Team should promote a “good neighbor” policy with the neighbors, Police, Fire Department and other interested private or public people having influence around the construction site. Any Public Relations issues will be coordinated through the Project Manager and the Project Executive.

INCLEMENT WEATHER

Revised: January, 2014

When there are warning signs of impending severe weather (heavy rains, strong winds, hurricanes, flood, etc.), conditions shall be monitored and appropriate precautions taken to protect personnel and property from the effects of severe weather.

Procedures shall include, but not be limited to:

1. Securing all loose materials that could be blown about by high winds.
2. In the event of extreme high winds, secure all structures from possible collapse.
3. Protect property and building materials from rain as needed.
4. Protect hazardous materials from spilling or spreading by securing same in a safe location. Do not store in an area that might flood.
5. Special care should be taken to ensure masonry staging is properly secured. If #9 wire is used that spreaders are in place and secure; that all scaffolding sections are secured with locking pins; also ensure additional tie ins are provided when tarps are affixed to scaffolds. Special care should be taken with scaffolding planks. Tie them down or remove them.
6. During winter months, special care should be given to icing conditions. Shovels, scrapers, ice melt and sand should be readily available on site to treat slippery areas. Special caution should be exercised early in the morning when frost is present on surfaces, especially on scaffold planks and roof areas.
7. Each Subcontractor shall be responsible for securing their equipment when inclement weather or high winds are forecast.

PROTECTION OF PUBLIC AND NON-PROJECT PROPERTY

Revised: January, 2014

A construction site should not have to be a dangerous condition to the general public living, working or traveling in the vicinity nor should it be a liability to adjacent non-project property.

Ledgewood Construction, and/or its Subcontractors will provide for the following:

1. Notification and pre-planning with City or Town traffic engineers on the potential impact on traffic patterns around the jobsite.
2. Design and installation of temporary protection to suit the needs of the surroundings of the site. Lights, signs, fences, barricades, and traffic control are just some of the requirements for protection. Windblown flying debris, falling objects, water, dust, welding sparks, etc. are just some of the dangers requiring safeguards.
3. Maintenance and change of the protection as required during the on-going progress and changing of jobsite conditions.
4. Ensuring the jobsite is secure to prevent off-hours injury to the general public and property. Generally, this will be accomplished by a walk thru by the Superintendent and his/her designee at the end of the work day.
5. Blasting, pile driving, deep foundations, de-watering, demolition, high rise structures, etc. are just some of the unique activities requiring inherent design for protection to the general public and to non-project property. All activities at each jobsite should be pre-planned and well thought out.

EXCAVATIONS

Revised: January, 2014

EXCAVATION PERMIT

Prior to the start of any work involving trenching or excavation operations the Subcontractor Foreman involved in the work must notify Ledgewood Construction's Superintendent, and provide the appropriate "Dig Safe" file number if necessary.

Trenching/excavating is one of the most dangerous operations on any construction site. It is the responsibility of the Ledgewood Construction Superintendent to assure that all excavations are conducted in accordance with OSHA Standards. Close monitoring of all trenching/excavation operations by the Subcontractor's Competent Person is an absolute must.

1. Any Subcontractor found excavating a trench improperly must be stopped immediately and not allowed to continue until proper corrective action has been taken to abate the hazard. A pre-excavation safety meeting will be held with the Superintendent and Foreman prior to any trenching operations taking place.
2. The Subcontractor conducting the excavation operation will designate the person competent to perform the work. The competent person will demonstrate to the Superintendent his/her knowledge of soil conditions and his/her ability to conduct a safe operation.
3. In excavations where oxygen deficiency (atmosphere containing less than 19.5 percent oxygen) or Hazardous Atmosphere exists or could reasonably be expected to exist, the atmosphere shall be tested before employees are allowed to enter.
4. Excavations 5 feet or greater in depth shall be protected by sloping, trench shields or shoring. The Competent Person shall determine the soil classification prior to any excavating taking place.
5. Ladders shall be positioned in excavations 4 feet or deeper so that no employee has to travel more than 25 feet to access such ladder.
6. During the excavating process, caution shall be taken to ensure that excavated material is placed no closer than 2 feet from the edge of the trench.
7. Excavations left open shall be inspected prior to the start of the next day's activities to ensure the continued stability of the walls of the excavation by the Competent Person.

PAPERWORK REQUIREMENTS

Revised: January, 2014

1. Current OSHA Standards will be located in Ledgewood Construction's office trailer.
2. Safety Bulletin Board to display safety posters, pamphlets, letters, etc.
3. Post all required Federal and State posters in the Ledgewood Construction office trailer.
4. Post emergency phone numbers, Fire, Police & Ambulance at all trailers. Include copies of directions to local hospital near the trailer door.
5. Post OSHA 300 Log.
6. Warning signs (Hard Hat, No Trespassing, Laser In Use, Danger, Caution, etc.). International symbols should be used where applicable.
7. Required certification and maintenance records for equipment (cranes, material hoists, welders, etc.). These certificates are required to be submitted to Ledgewood Construction before equipment is used on site.
8. Required approvals for deep trenches, high scaffolds, demolition surveys and shoring will be cleared with the Superintendent. (Dig Safe and local utility companies must be notified prior to any excavation taking place).
9. Proof of training and safety instructions must be provided by Subcontractor (lasers, power actuated tools, first aid, propane, hazardous substances, etc.).
10. Written respiratory protection programs (if respirators are in use) will be submitted to Ledgewood Construction.
11. Require special permits (burning, welding, traffic etc.) as required by the local Fire Department.
12. Accident report forms for jobsite injuries will be filled out by Subcontractors the day their employee is injured and forwarded to Ledgewood Construction. All work related injuries will be reported on the First Notice of Injury Report form for the State in which the worker was injured.
13. Safety meetings (records of meetings with Subcontractors) will be maintained by Ledgewood Construction and should be part of the weekly meetings.

PROTECTIVE EQUIPMENT REQUIRED

Revised: January, 2014

1. Hard hats – at all times. Long pants and work boots required. T-shirts at a minimum (no tank tops). Safety glasses as required.
2. Portable “Ground Fault Circuit Interrupter” cords shall be provided as needed by the Electrical Contractor.
3. Respirators – as needed. Nuisance masks when needed for sweeping or other dusty conditions are to be provided by each Subcontractor.
4. Ear protection (ear plugs) – as needed by each subcontractor.
5. Guarding material for perimeter, scaffolds and floor holes.
6. Safety cans for flammable and combustible liquids.
7. Safety harnesses, lifeline, lanyards or nets – as required by job specific hazards analysis.
8. Trench shields and excavation shoring materials.
9. Personal protective equipment for visitors will include hard hats and visitors safety glasses as required.
10. Atmospheric testers (carbon monoxide, oxygen, combustible gases, as special conditions warrant) shall be provided by subcontractor.
11. Flashers, signals, barricades, reflective clothing for traffic control – as needed, according to training guidelines.
12. Fire extinguishers, fire hoses, fire retardant blankets, water buckets, etc.
13. Grounded extension cords are required on Ledgewood Construction jobsites.

JOBSITE INSPECTION

Revised: January, 2014

Safety inspections are among the oldest accident prevention methods, and they constitute an integral part of an effective safety program. When conducted properly, they reveal unsafe acts and conditions that lead to accidents. Frequent informal inspections and follow-ups to correct noted deficiencies are essential for the smooth operation of a construction project.

1. The Superintendent will conduct routine inspections and institute correction of unsafe acts and/or unsafe conditions.
2. The Project Manager will report to the Superintendent any unsafe acts/conditions as he/she views them during his/her visits to the jobsite.
3. Company management personnel will assist by pointing out safety concerns during jobsite visits.
4. OSHA Compliance Officers visit construction sites normally without notice. They are to be received with courtesy. If an OSHA inspection results from an employee complaint, then the inspection will usually be limited to the scope of the complaint and not a wall to wall inspection. Superintendents are to immediately notify the Project Manager and to inform the OSHA Compliance Officer and will request that the OSHA Compliance Officer waits for his/her arrival to begin the inspection.

WEEKLY SAFETY AUDIT PROCEDURES

Revised: January, 2014

I. PURPOSE

- a. This weekly safety audit procedure will provide another avenue for communication between the Subcontractor and Ledgewood Construction. It will give all parties a chance to review our prospective “team” efforts relating to Construction Project Safety.
- b. The basis of this weekly review will be the attached “Jobsite Safety and Health Check List”. This form will be completed by the Superintendent.
- c. The previous week’s form shall be reviewed to ensure safety issues, noted at that time, have in fact been corrected.
- d. This should be recorded in Procore.

JOBSITE CLEANLINESS & HOUSEKEEPING

Revised: May, 2014

Good housekeeping on any construction site is absolutely essential in maintaining a safe workplace. The following guidelines will be adhered to:

1. Adequate dumpsters will be provided by either the individual Subcontractor or Ledgewood Construction dependent on contract requirements.
2. All construction debris will be picked up daily by all Subcontractors.
3. Each Subcontractor will be responsible for construction waste materials generated by their work.
4. Ledgewood Construction will monitor and enforce good housekeeping practices.
5. Failure of any Subcontractor to comply with this policy will result in Ledgewood Construction hiring laborers to clean and then back charging the delinquent Subcontractor(s).
6. Dust control shall be maintained at all times by watering affected areas for the safety of the public as well as the workers.
7. Indoor air quality should be reviewed. This is very important on occupied sites.

SUPERINTENDENT – SUBCONTRACTOR'S FOREMEN MEETINGS

Revised: May, 2014

1. Through the use of Safety Meetings, it is possible to reach employees who are Supervisors of the major trades involved on each project. At this time, the importance of project safety will be demonstrated to these Supervisors so they, in turn, can transmit this information to the personnel under their control.
2. The Safety Meetings, as part of the regular job meeting, will be held weekly at a predetermined time. These meetings will be documented on forms provided by the Superintendent.
3. In addition to helping reduce hazards, this forum also provides legal protection, in that safety items are included as part of the written safety meeting record and can be referred to in demonstrating Ledgewood Construction's interest and commitment to safety.
4. Procore should be used to document subcontractor meetings as well as safety items.

MEETING PROCEDURES

Revised: May, 2014

1. The Superintendent shall act as Chairman.
2. The subject matter for the “Weekly Safety Meeting” must be adapted to job conditions. Discussing actual conditions on each project will have more meaning and actually improve safety conditions on the job.
3. Special topics such as issues developed during weekly jobsite inspections, by the Superintendent can also serve as a valuable safety topic.
4. Any items or work that has been performed, that concern safety, shall be reviewed.
5. Any new criteria, amendments to OSHA regulations or safety in general, shall be reviewed.
6. Questions or recommendations from those in attendance shall be discussed. Comments and suggestions should be encouraged.
7. All attendees, including the Project Superintendent, must sign the form under the “Meeting Attended By” section with their name and their company’s name. Log onto Procore to track meetings.
8. Review any new Material Safety Data Sheets regarding hazardous products that may have been delivered to the site.

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Revised: May, 2014

FIRE PROTECTION PROGRAM

Revised: May, 2014

The Project Team shall be responsible for the development of a Fire Protection Program to fit the jobsite conditions. The following should be used as guidelines to set up such a program:

1. Review the current OSHA guidelines.
2. Request the Fire Chief to visit the site, acquaint him with the project and make any plans required in preparation for any potential emergency.
3. Locate and identify any existing hydrants in the project area for fire department water supply. Provide clear access to same. Any inoperative hydrants will be covered.
4. Activate any new on-site hydrants and interior fire water risers with hose connections for fire department use as soon as possible. Activate sprinklers as soon as possible.
5. Provide, maintain and conspicuously locate all-purpose ABC type of fire extinguishers on the jobsite. One 2A – 10 lb. ABC extinguishers for every 3,000 SF of construction space or portion thereof (i.e. 5,000 SF requires 2 fire extinguishers).
6. Fire department telephone number shall be posted at all jobsite telephones.
7. “No Smoking” signs shall be posted and enforced as required.
8. Cutting and welding operations should include the following: Floors should be swept free of combustibles within 35 feet of the work area and any flammable liquids should be removed from the area. Wet down the immediate area, where applicable. A fire watch, when necessary, should be available while work is being performed, at lunch time and at least 30 minutes after operation is shut down. Fire extinguishers will be required. The sweeping of floors, hosing down the area, the fire watch and the fire extinguishers all will be provided by the Subcontractor. (Prior to any burning taking place, a permit, if required, must be obtained).
9. Fuel for cutting and burning torches shall be stored in locations and protected as directed by Ledgewood Construction’s Superintendent, in conformance with local fire regulations and OSHA requirements.
10. Emergency evacuation plans shall be developed and implemented as needed. These shall be reviewed at each job meeting and posted in conspicuous places. This will be part of the Emergency Action plan for each site.
11. No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within the building except with the express approval of Ledgewood Construction’s Project Superintendent.

12. Bulk storage of volatile liquids shall be outside the building at a location determined by LedgeWood Construction's Project Superintendent and shall be posted as such. Permit for storage, if required, must be obtained by the Subcontractor from the Fire Department. In addition, the Subcontractor who is storing these materials shall furnish the proper type of fire extinguisher to be located within 50 feet of any point on the perimeter of the stored materials. Also, these areas are to be identified with signs restricting access and prohibiting sources of ignition.
13. Daily clean-up of scrap materials, sawdust, rags, oil and grease and other residue of construction operations will not only remove or reduce the fire hazard, but will promote general safety at the same time.
14. Improperly installed and controlled temporary heating devices could result in loss of life and property on construction sites from fire, asphyxiation and explosion. The following safe practices and procedures should be followed:
 - a. Temporary heating devices should not be installed or used by anyone on the job until authorized by the Project Superintendent and cleared with the local Fire Department.
 - b. Use only approved containers for fuel storage.
 - c. Adequate fire extinguishers should be provided (2A – 10 lb. ABC).
 - d. At least a 10-foot clearance should be maintained in any direction from any combustible materials.
 - e. Heating units should be well constructed with a stable base. Fireproof materials should be placed under the base.
 - f. When tarpaulins or canvas coverings are used near heating units, they must be U.L. listed. Fire Resistive Material per local Fire Department shall be used and at least a 10-foot clearance should be maintained. These materials should be securely fastened.
 - g. Heating devices should not be used in confined or unventilated spaces unless properly vented to the outside.
 - h. Kerosene, gasoline, oil or gas fired units should be shut down and cooled prior to refueling or moving them.
 - i. Liquid fueled heating devices should be provided with a manual shut-off system on the fuel line. The valve should be located at a safe distance from the unit.
 - j. All fuel tanks should be properly secured.
 - k. LPG gas cylinders should be stored away from the building out of doors. A cap should be provided to protect the valves on the stored cylinders.

- I. All bulk storage of flammable material listed above shall be reported to the Superintendent for approval.
- I5. Maintain fire prevention program by checking electrical equipment, use common sense, maintain good housekeeping, provide proper flammable liquid storage, provide proper refueling equipment and procedures, utilize cutting and welding fire watches, etc.
- I6. Provide security services if needed or required.
- I7. Provide fire instructions to all personnel:
- a. Install Exit signs.
 - b. Know how to get out. Learn what escape route to take from all work areas.
 - c. If you spot a fire, sound the alarm and get to safety, telling other about the fire as you go.
 - d. Know the location of the fire extinguishers and any other firefighting equipment.
 - e. Learn how to use a fire extinguisher.
 - f. Do not attempt to fight a fire that is too big for you.
 - g. And, if there is a fire, DON'T PANIC, follow your escape plan quickly and calmly.

PROTECTIVE CLOTHING AND FOOTWEAR

Revised: May, 2014

It is a strict requirement that all workers on LedgeWood Construction's projects adhere to the following code:

1. At the minimum, every worker shall have a T-shirt, long pants, and construction boots. It is strongly recommended that boots with steel toes to be worn. Sneakers will not be allowed at any time. Medical restrictions involving footwear will be decided by the Superintendent on a case by case basis.
2. Should specific operation involve materials that are hazardous, the Superintendent will be consulted and the required proper training will be provided by the Subcontractor. Protective clothing and personal protective equipment will be obtained prior to start up.
3. Hard hats shall be worn 100% of the time until the temporary certificate of occupancy has been issued or otherwise determined by the Superintendent.
4. On renovation projects, hard hats shall be required until the entire project is in the punch list stage.

GROUND FAULT PROTECTION

Revised: May, 2014

Ledgewood Construction shall provide, through their Electrical Subcontractor, the necessary equipment for a ground-fault protection program.

1. Any electrical equipment will be treated as if it were energized.
2. Only authorized licensed electricians under contract with Ledgewood Construction will be allowed to work on any electrical equipment whether it be activated or de-activated.
3. Any electrical equipment, panels, junction boxes that are energized will be posted. Live panels shall not be left unattended unless protective panel covers have been put back in place protecting workers from coming into contact with live parts.
4. Any energized equipment or electrical switch gear will be equipped with and fall under the current OSHA's guidelines lock out/tag out standard, (1926.417). A lock out/tag out program shall be developed, if needed utilizing the program established by Ledgewood Construction and the electrical contractor to assure that all employees are trained in the same manner following the same policies.
5. Should there be any questions as to the status of any electrical equipment, a licensed electrician will make that determination.
6. Construction workers shall not work next to electrical equipment until the area has been made safe.
7. Only approved three-wire grounded or double insulated tools shall be brought onto the jobsite. Only three-wire round extension cords are allowed.
8. Ground Fault Circuit Interrupters (GFCI) shall be the sole source of power available to employees on this site.
9. Although a (GFCI) Ground Fault Protection Program system will be in use, tools and electrical cords shall be maintained in good working order and condition. Electrical cords will be free of cuts. Cords with missing ground pins will be taken out of service immediately.
10. Employees shall visually inspect flexible cord sets and equipment connected by cord and plug before each day's use for external defects (deformed or missing pins, insulation damage and indication of possible internal damage). Where there is evidence of damage, the damaged item shall be taken out of service, by the employee, taken to his/her foreman who will tag the item "out of service", and removed from service until it is tested.

11. The Electrical Contractor shall test the GFCI system on a frequent basis and keep a record of such tests. Employees prior to connecting their tools or cords into the GFCI system will manually test the GFCI to ensure that it is operating.
12. The Electrical Contractor shall devise a method to continue providing GFCI protection after the permanent power has been activated in the building. If necessary, each Subcontractor will provide his or her employees with portable GFCI units.

FIRST AID AND MEDICAL SERVICES

Revised: May, 2014

Ledgewood Construction field office trailer is designed as the location for the first aid station under the control and supervision of the Project Superintendent. First aid kits with supplies meeting OSHA requirements are to be available and replenished as required. First aid treatment requiring further off-site medical attention shall be coordinated with the Project Superintendent.

Hospital / Emergency Room / Rescue Service

Emergency telephone numbers shall be posted in the field office on the card provided and at jobsite pay telephones established by the Company for construction worker's use. The Fire Rescue Department is the responding agency for Medical Emergencies at Ledgewood Construction jobsites.

Ledgewood Construction has designated the Superintendent as the General Contractor's on site Safety Representative. The Company urges each employee to obtain a certificate in first aid training in accordance with OSHA 1926.50(c).

EMERGENCY PROCEDURES

Revised: May, 2014

- Identify the on-site first aiders – List will be updated monthly.
- Provide the required first aid equipment:
 1. First Aid Kit in Ledgewood Construction Field Office.
 2. First Responder bag in Ledgewood Construction Field Office.
 3. Stretcher in Ledgewood Construction Field Office, if required.
- Emergency phone numbers at each phone location:
 1. Hospital:_____
 2. Fire Department:_____
 3. Police Department:_____
 4. Rescue:_____
 5. Poison Control:_____
 6. Ambulance:_____
- Name and location of preferred hospital:

NOTE ** A sketch and directions to the nearest medical facility are located in Ledgewood Construction field office.

- Keep records of first aid activity.
 1. To be recorded and discussed at weekly safety meeting.
- Establish and train for emergency procedures.
 1. Evacuation procedures to be reviewed at weekly safety meetings. NOTE ** Sketch of evacuation routes for all areas of the construction site will be posted throughout the jobsite. Any changes in evacuation procedures will be reviewed in advance at weekly safety and toolbox meetings.
 2. Changes in emergency fire procedures to be reviewed at weekly safety meetings.

INCIDENT NOTIFICATION PROCEDURE

Revised: May, 2014

Procedure:

1. Fire emergency on site. Be alert.
2. Stop all machinery and power tools.
3. Follow the direction of your foreman.
4. Be prepared to evacuate. If evacuation is necessary, use stairs and/or ladders only.
5. If necessary, assists in providing a clear entrance and exit for the Fire Department.
6. Assist in clearing street of all public traffic.
7. Await further instructions.

Emergency plans to ensure safety in the event of fire or other emergency shall be in accordance with current OSHA guidelines.

A site-specific emergency evacuation plan shall be posted throughout the building.

This Emergency Action plan shall include employee training to include instructing workers where to meet for a head count and what specific instructions to follow in the event of an emergency. A copy of this plan shall be posted in the field office.

INCIDENT REPORTING PROCEDURE

1. Any incident, whether it be an accident, near miss or an unsafe condition shall be reported to the Superintendent.
2. Accidents involving personal injury shall be reported to the Superintendent immediately.
3. Accidents involving damage to property or equipment shall be reported to the Superintendent immediately.
4. Damage to property or equipment, as a result of vandalism, shall be reported to the Superintendent as soon as possible. The Police Department will be notified.
5. Theft of construction materials or tools shall be reported to the Superintendent as soon as possible. A detailed list of materials and tools missing shall be provided to the Police Department.
6. Any unsafe condition shall be reported to the Superintendent so corrective actions can be instituted.
7. Take photos.

EMERGENCY SUBCONTRACTOR NOTIFICATION LIST

Revised: May, 2014

Please refer to the Emergency Action Plan.

POST-ACCIDENT OR LOSS REPORTING AND INVESTIGATION PROCEDURES

Revised: May, 2014

1. Purpose:

- a. To establish a standard procedure for all accident reporting and processing.

2. Reportable Cases:

- a. First Aid cases are defined as one time treatment and subsequent observation of minor scratches, cuts, burns, splinters and so forth, which do not ordinarily require medical care, even though provided by a physician or registered professional personnel.

3. Serious Accidents:

- a. Serious accidents are those which can be classified under any of the following:
 1. Occupational death(s), regardless of the time between injury and death, or the length of the illness; or
 2. Occupational illness or illness resulting in permanent or significant disabilities; or
 3. Occupational accidents that involve one or more of the following:
 - Minor – Those property damage accidents resulting in less than \$1,000 damage.
 - Large - \$1,000 to \$10,000 damage.
 - Major – Any property damage accident resulting in greater than \$10,000 damage.

All occurrences shall be investigated thoroughly. The proper investigation of a “near miss” will subsequently reduce the change of a re-occurrence and the possibility of an injury or an additional insurance claim. Do not limit investigations only to bodily injury (Workmen’s Compensation) accidents. An accident is an unwanted, unplanned event that interrupts the normal flow of scheduled activity. Investigated properly, the cause can be determined, corrected, and a re-occurrence eliminated.

Accident investigation records should not be concerned with the fixing of blame for an accident, but with determining the causes of an accident. It is the elimination of the causes and sub-causes of an accident that will lead to the prevention of future occurrences.

ACCIDENT REPORTING

Revised: May, 2014

1. Any injury, even of a minor type that is requiring a visit to an outpatient medical clinic for treatment must be reported on the Ledgewood Construction Accident Investigation Report form.
2. Any property damage accident, whether project property or non-project property, must also be reported on the Ledgewood Construction Accident Investigation Report form.
3. Verbally notify your Project Manager of any bodily injury accident and/or damage to property within two hours of its occurrence.
4. Submit written investigation reports to the Project Manager within 24 hours. Maintain a copy on file at the jobsite.
5. Any company owned automobile/truck accident, involving personal injury, must be verbally reported immediately to Ledgewood Construction's office. The accident must be reported on the Registry of Motor Vehicles' operator's report and sent to the main office along with police reports, witness statements, photographs, etc. within 48 hours of the accident.
6. Any instances of fire, theft or vandalism shall be verbally reported to the Project Manager as soon as possible.

ACCIDENT INVESTIGATION

Revised: May, 2014

The Project Superintendent shall investigate and provide a written report of all accidents.

1. Follow emergency procedure until the accident is stabilized.
2. Investigate the accident. Find out who, what, when, where and how.
3. Take photographs of the accident scene and the surrounding area. Indicate on the back of photographs the date the photograph was taken, date of incident, what the photograph depicts, and who took it.
 - a. All projects are to be equipped with one date camera, at a minimum.

Automobile Accidents:

1. Contractors, who have an automobile accident on jobsite property, involving their company-owned vehicle, must provide Ledgewood Construction's Superintendent with a completed automobile accident report within 24 hours of the accident. State Motor Vehicle procedures for reporting automobile accidents will be complied with by Ledgewood Construction and their Subcontractors.
2. Draw diagrams, mark-up drawings.
3. Record status of construction at the scene at the time of accident. Indicate what work was in place and what work was going on.
4. Determine how many Subcontractors were working in the area, with how many workers each, and what activity they were performing.
5. Identify witnesses and attempt to obtain telephone numbers. Record their names and employers. Try to interview them in private regarding accident description and cause. Ask them to sign a statement of description and cause.
6. Obtain copies of reports by others (Police, Fire Department, Subcontractors, doctors, etc.).
7. Describe any corrective action taken to prevent re-occurrence.
8. Provide written report as described below.
9. A copy of all reports including hospital, Fire, Police, etc. must be turned over to the Project Manager within twenty-four (24) hours of mishap.

10. A separate file containing accident/incident reports shall be kept in the field. A copy of all safety/accident/incident reports shall be forwarded to Ledgewood Construction's office.
11. The Daily Report in Procore should include a brief entry relative to the accident, for future reference.
12. Take photos.

PROCEDURE IF A LEDGEWOOD CONSTRUCTION EMPLOYEE IS INJURED

Revised: May, 2014

1. Notify the main office and the Project Manager. Next, begin your own investigation and fill out the LedgeWood Construction Accident Investigation Report.
2. The Superintendent must also fill out the "Employer's First Report of Injury" form. It is important that the form used is from the State in which the employee is "employed", which means the State to which he/she is paying payroll taxes, etc.
3. Send the original copy of the form to the Project Manager and attach to it the original of the LedgeWood Construction, Accident Investigation Report form along with any other pertinent information.

PROCEDURE IF A SUBCONTRACTOR EMPLOYEE IS INJURED

Revised: May, 2014

1. Ledgewood Construction Project Superintendent must be verbally notified by the Subcontractor's foreman immediately that an accident has taken place and that one or more of his/her employees have been injured.
2. Notify the main office and the Project Manager. Next, begin your own investigation and fill out the Ledgewood Construction Accident Investigation Report.
3. It is the responsibility of the Subcontractor's foreman or management to process the "Employer's First Report of Injury" form. The Subcontractor is obligated to provide the original of the completed form to the Ledgewood Construction Project Superintendent. Original will be sent to the Labor Department and copies to Ledgewood Construction.
4. Obtain same as soon as possible and attached to Ledgewood Construction Accident Investigation Report along with any other pertinent information, then submit a copy of all items to the Project Manager.
5. Injured worker can only return when he/she produces a full medical release from his/her doctor.

PROCEDURE IF A PUBLIC PERSON IS INJURED

Revised: May, 2014

1. Institute emergency procedures if appropriate providing emergency first aid and medical attention as required.
2. If emergency assistance is needed, coordinate and cooperate with Police, Fire, Rescue and other public officials having jurisdiction.
3. Notify the main office (Safety Director and Project Manager) by telephone that an accident took place and then begin an immediate investigation.
4. Complete the Ledgewood Construction Accident Investigation Report form and submit this and any other pertinent information to the Project Manager.
5. Obtain name and addresses of all injured people and witnesses.
6. A copy of all accident/incident reports shall be sent to the Safety Director.
7. Take photos.
8. Do statement of responsibility.

ACCIDENTS CAUSING PROPERTY DAMAGE TO PROJECT PROPERTY AND/OR NON-PROJECT PROPERTY

Revised: May, 2014

1. Institute immediately any emergency procedures required to make damaged property stable and safe to prevent further loss.
2. Notify the main office and the Project Manager by telephone that an accident took place and then begin an immediate investigation. Any MEDIA contact shall be coordinated with upper management.
3. Do not talk to the Press.
4. Take photos of the damage.

ACCIDENT RECORD KEEPING

Revised: June, 2014

1. Federal OSHA laws require accidents and illness of Company employees to be summarized and submitted in January of each year and posted in the project site offices each February (OSHA 300 Form). Failure to post same could result in our being fined by OSHA.
2. State laws require annual reports (OSHA 300-S form) summarizing totals from OSHA-300 to be submitted to the State Department of Labor each February.

PUBLIC RELATIONS FOLLOWING SERIOUS INJURY OR ACCIDENT

Revised: June, 2014

Statement of Policy:

In the event of fire, accidents or serious injuries, it is the policy of Ledgewood Construction to immediately restrict access to the site to only authorized personnel and to close the site to all unauthorized persons. All workers should be evacuated from the building and directed to safe areas. Company personnel are to aid the Police and Fire Departments. The project site must be secured at the earliest possible time.

No one is allowed on site except those required to aid in the resolution of the incident because of the hazards which may be involved.

The Project Superintendent, or his/her designated alternative, will take charge in the event of a major accident. The following is a checklist which should be followed in case of such an accident:

1. Stop work.
2. Call for assistance from the Fire Department, ambulance service, Police Department, main office, etc.
3. Initiate firefighting, if required; secure the building, etc.
4. Call for site evacuation, clear site access roads.
5. Issue instructions to foremen.
6. Set up security measures at the accident site.
7. Set up communications center in the field office.
8. Call in operators for heavy equipment, such as cranes, front-end loaders, backhoes, etc.
9. Other desirable actions as conditions warrant them.
10. Notify the Main Office and Project Manager.

IMPLEMENTATION OF POLICY FOLLOWING SERIOUS INCIDENT

Revised: June, 2014

Project personnel should be courteous to members of the public, reporters and photographers, but make no statements. There is to be no interference with reporters' and photographers' work outside the construction site. Access to jobsite by the Media will be handled by Ledgewood Construction upper management.

** NOTE: Any statements with respect to any accident made to person(s) not connected with the project will be handled through Ledgewood Construction corporate office.

OSHA regulations require that any incident resulting in the death of one or more workers or any single incident resulting in injury to 5 or more workers be reported to OSHA within 8 hours of the occurrence. This notification will be handled by the Project Manager or one acting in his/her capacity. The General Superintendent overseeing that project or any of the General Superintendents will be notified immediately. In addition, the President of Ledgewood Construction will be notified immediately.

The name and address of seriously or fatally injured construction workers shall not be released by project personnel.

No statements about monetary damages or information are to be made by anyone until a statement has been authorized by the President of Ledgewood Construction, or their authorized representative. Before such information is available, a courteous reply will be made that the amount of damage is not yet known and will be estimated as soon as possible.

To inquiries regarding cause, a reply will be made only when proper information has been reviewed and cleared by the President or their authorized representative. Whenever the cause is in doubt, the individual will courteously request inquiries to defer their questions until there has been time to gather more information.

DISCIPLINARY PROGRAM

Revised: June, 2014

1. Policy:

- a. A Safety Disciplinary Program has been incorporated so that consistency is maintained throughout the organization when disciplinary action is necessary. The purpose of the Safety Program is to channel all safety activities toward a single goal, (i.e. the elimination of accidents). The achievement of this goal can only be obtained through the efforts of all employees and to this end we have established a corporate disciplinary program that will be uniformly enforced throughout all corporate operations. All employees, including employees of Subcontractors, will be subject to disciplinary action if they violate Company Safety Standards and/or safety rules.

2. Scope:

- a. This policy applies to all employees of Ledgewood Construction, and employees of Subcontractors, at all Ledgewood Construction jobsites.

3. Responsibility:

- a. The Safety Program mandates that all supervisory employees accept their responsibility for the prevention of accidents on work under their direction and be responsible for the safety training and instructions of employees under their direct supervision. It then follows that these same supervisory employees are responsible for administering discipline when safety violations occur. Under all circumstances, the supervisors shall follow the disciplinary procedure so that consistency and fairness can be maintained.
- b. Project Managers / Superintendents are directly responsible for seeing that discipline is administered in a fair and consistent manner. The Project Executive shall provide direction and guidance to the management personnel in the administration of this program.

4. Procedure:

- a. Except in cases involving major violations of Company Safety Rules and Regulations, the company subscribes to a philosophy of progressive, constructive discipline. What this means is that discipline will be administered for the purpose of producing a corrective change in the employee's future behavior, but if the change does not occur then a more serious form of discipline will be administered. An example of a major safety violation would be the false report of injury to claim Workmen's Compensation benefits, fighting, use of drugs or alcohol on the jobsite, etc. These types of violations will result in the employee's immediate discharge.
- b. Rules of conduct have been established for project safety. All employees must follow these rules; violation of these safety rules will result in disciplinary action up to and including discharge.

- c. Safety Rules must be posted on the bulletin board(s) of each project so that all employees are made aware of each rule. Subcontractors should sign the Jobsite Rules and Policies Form.
- d. Safety Rules are “rules of conduct” based primarily upon the Safety Standards established for the company. The communication of the safety rules to employees is important but of equal importance is the enforcement of these safety rules in a fair and consistent manner. To maintain fairness and consistency, the supervisor must administer the proper discipline in accordance with the severity of the safety violation. Proper discipline is determined as follows:
 - 1. Has safety violation been verified?
 - 2. Is the violation deserving of a reprimand?
 - 3. Has a similar violation occurred before? If so, what discipline was administered?

If the supervisor can answer yes to (1) and (2) above, then it is fair to administer discipline. If the discipline administered is similar to that administered previously for similar offenses, then “consistency” is maintained.
- e. The typical disciplinary action pattern is as follows; however, the severity of a violation will determine the level of disciplinary action administered:
 - 1. Verbal Reprimand – The supervisor will inform the employee that he/she has committed a safety violation which, if repeated, could result in further disciplinary action.
 - 2. Written Reprimand – A formal written notice will be issued by the supervisor informing the employee of the safety violation and notifying the employee that future violations may result in suspension or discharge from work.
 - 3. Suspension – The employee’s supervisor will inform the employee that he/she is suspended from work without pay for a specific period of time for a violation of company safety rules or regulations and that a future violation may result in discharge.
 - 4. Discharge – Employment will be terminated as a result of a major safety violation or a pattern of safety violations.
- f. Documentation of Disciplinary Action. Whenever administered is, proper documentation of the action taken should be maintained. The documentation should state what Safety Rule was violated, the level of disciplinary action administered and any other comments the supervisor wishes to note relative to the incident. Documentation of disciplinary action involving Ledgewood Construction employees shall be placed in the individual’s personnel file.

JOBSITE RULES AND POLICIES

Revised: June, 2014

1. Safety head protection (hard hats) must be worn at all times while on the work site. Safety glasses must be worn whenever performing work that could result in eye injury.
2. Long pants, shirts and work shoes shall be worn at all times by all personnel on the work site. Shirt sleeves must be at least T-shirt length. No tank tops are allowed.
3. All injuries, accidents, and incidents will be reported immediately to a supervisor.
4. False claims of injury will result in discharge.
5. Personal protective equipment (respirators, earmuffs or plugs, gloves, boots, safety belts, etc.) will be used as required by the hazards involved in work assignments. This equipment must be worn when specified by project supervision or when conditions warrant their use.
6. Report defective machines, tools, etc. and have them taken out of service.
7. Reporting to work under the influence of alcohol, intoxicants, tranquilizers, narcotics, or other dangerous drugs, or possession of such is prohibited and will result in discharge.
8. No employee shall remove, displace, damage, destroy or alter any safety device or safeguard furnished or provided for use in any place of employment. Nor shall anyone interfere in any way with the use thereof.
9. Any employee who observes unsafe acts or unsafe conditions in a work area which might result in an accident or injury shall report such acts or conditions to his/her supervisor immediately.
10. Familiarize yourself with signs and posters bearing pertinent information, warnings, directions, and instructions. Know locations of fire extinguishers in your work areas.
11. Housekeeping, safety and productivity go hand in hand. You are responsible for keeping your work area clean.
12. Fighting, creating a disturbance or horseplay will not be tolerated.
13. Modify for each jobsite. Have Subcontractors sign and scan into Procore.

NOTE: Violation of Safety Rules or Safety Standards will result in disciplinary action.

Disciplinary Action Notice

Date_____

Name_____

Project_____

Subcontractor_____

Trade_____

Employer (Ledgewood Construction or Subcontractor)_____

Reason: (explain below)

Type of Disciplinary Action Taken:

- | | | | | | |
|----|-----------------|-----|----|------------|-----|
| 1. | Verbal Warning | () | 3. | Suspension | () |
| 2. | Written Warning | () | 4. | Discharge | () |

I have discussed the above cited reprimand with subject employee effective this date:

Supervisor_____
Date_____
Employee_____
Date_____
Superintendent
(Suspension or discharge only)_____
Date

Comments:

Copies: Employee, Personnel File or Subcontractor File and Project Manager.

CONTRACTOR MOBILE CRANE SAFETY PROCEDURE

Revised: June, 2014

I. Scope:

This on-site procedure outlines requirements for control, inspection and operation of on-site Contractor mobile cranes and rental cranes. This procedure does not relieve any Subcontractor or crane operator of their responsibility to comply with OSHA crane standards and other provisions of Industry Standards.

2. Responsibility:

Subcontractor supervisors and equipment operators are responsible for inspection, operation and control of mobile cranes as outlined in this procedure.

- a. If a qualified crane inspector is not present on-site to conduct a crane inspection and verification of crane operator's qualification as required in Subsection 3 and 4 below is not possible, Ledgewood Construction shall cause this requirement to be met by other means. For example:
 1. Instruct the Subcontractor to arrange for a qualified crane inspector to inspect the crane prior to start-up.
 2. Instruct the Subcontractor to secure the services of an independent crane inspection agency to verify the inspection/qualification requirements.

3. Inspection:

- a. Rental cranes must arrive on site in a safe operating condition.
- b. Upon arriving on the site, the crane operator will have available for examination both the crane certification records and the crane maintenance records.

4. Operator Qualification:

Subcontractors shall demonstrate to Ledgewood Construction's Superintendent that their crane operator is properly licensed.

- a. Trained signal person and rigger (hand and radio).
- b. Check subsurface conditions.
- c. Review soils conditions (build crane pad).

5. Crane Load Capacity Charts:

Crane load capacity charts shall be posted in the cab of each crane.

6. Critical Lifts:

a. Definition – A critical lift is when any of the following conditions exists:

1. The load exceeds 75% of the crane capacity as shown on applicable crane manufacture's load (capacity) charts for the configuration to be used.
2. Lifts involving more than one crane to handle a common load.
3. Use of crane or lifting device in an application that deviates from manufacturer's recommendations including, but not limited to:
 - a. Boom configuration not in accordance with the boom make-up chart.
 - b. Moving a crane with longer boom than recommended.
 - c. Exceeding capacities or restrictions shown on the load chart.

b. Written Critical Lift Plan:

The Subcontractor shall prepare a written critical lift plan for all critical lifts. The following information should be included:

1. Why the lift is critical.
2. Type of crane.
3. Boom length.
4. Boom angle.
5. Radius.
6. Weight of load (weighing may be necessary).
7. Dimensions of load.
8. Attachment points for rigging.
9. Obstructions in path of load.
10. Crane operator's qualifications.

c. Approvals:

If the crane operator anticipates any deviation from crane manufacturer's recommendations, the crane operator shall secure approval from the manufacturer.

Note: Cranes are rated while performing in a level position, on a solid surface, with no wind conditions considered.

7. Crane Operation:

a. Only the following qualified personnel shall operate cranes:

1. Designated operators complying with State or City laws.
2. Maintenance and test personnel when they have the specific training and hands on work experience to operate, test or maintain the type of crane that they are servicing.
3. Qualified Crane Inspectors.

b. Maintain continuous contact, visual or vocal, between the crane operator and one qualified signalman. If for any reason contact is lost, the crane operator shall stop all operations and not resume any crane function until full contact is restored.

c. The crane must have sufficient capacity and proper type (crawler, rough terrain, truck cranes, mechanical or hydraulic) to fulfill all requirements of the work without endangering personnel or equipment.

d. Outriggers on all truck cranes shall be fully extended and set for all lifts. Lifts shall not be attempted with outriggers partially extended and set. No pick and carry lifts are to be made with truck cranes.

e. Rough terrain cranes operated in stationary position shall have outriggers fully extended and set before any lift is made.

f. Pick and carry loads with rough terrain should be avoided. Where necessary to do so the following applies:

1. Use the load chart on truck cranes with rubber wheels.
2. Investigate route to be followed for solid and level footing.
3. Restrict travel speed to maintain control of the load.
4. Tie load to the frame of the crane.
5. Personnel will not touch the load for any reason. In addition to Item (6), tag lines will be used for control of the load, if required.

6. Where possible, outriggers should be extended and set within a few inches of ground level.
- g. Establish positively the weight of the load before handling. Check brakes and machine stability when load is still only inches above the ground.
- h. The operator must not attempt any lift he/she feels conditions are inadequate.
- i. Only qualified crane personnel shall direct the changing or disassembly of crane booms. Consideration should be given to having the manufacturer's representative present.
- j. The operator shall observe the following precautions when leaving the control station of a machine:
 1. Disengage the master clutch.
 2. Lower buck or crane load to the ground.
 3. Set safety pawls on all drums where these are operated manually.
 4. Set the swing brake and travel brakes to prevent machine movement when lifts unattended for short periods and operator remains in immediate area.
 5. When crane is left unattended for extended periods of time or the operator leaves the immediate area, all brakes and locks shall be engaged.
- k. Cranes shall be operated smoothly, avoiding sudden stops and starts.
- l. The hoist line must be vertical at all times.
- m. At no time shall personnel be positioned beneath suspended loads.
- n. No one is permitted to ride the hook or the load.
- o. The boom hoist drum pawl should be engaged at all times except when lowering the boom.
- p. Do not get on or off a machine when it is in motion. No adjustment, repair, or lubrication is permitted on moving machinery unless required by the manufacturers.
- q. Work within 15 feet of electric lines requires a special procedure and permit which must be posted in the cab.
- r. All loads require a tag line.
- s. No tool boxes, oil cans, choker racks, water coolers or similar additional may be placed in the radius of the swing of the counterweight where a person could conceivably be crushed.

- t. Swing radius of the counterweight must be barricaded.
- u. Lifts associated with steel erection and concrete bucket handling are the only crane operations where free-fall can be used.

8. Crane Work Near Overhead Electric or Hazardous Pipe Lines:

- a. Ledgewood Construction's site Superintendent and Subcontractor foreman shall review the scope of work.
- b. These individuals will decide whether:
 - 1. The line will be shut down;
 - 2. The crane will be grounded;
 - 3. If an electrical department stand-by man is necessary;
 - 4. If protective equipment must be worn.

Note: Employees handling tag lines or attaching or disconnecting loads must wear tested Linemen's gloves of adequate voltage rating with protectors and rubber footwear as per OSHA standards.

- c. No crane shall be operated under these conditions unless:
 - 1. A signal man is present whose sole function shall be to assure that clearances are maintained.
 - 2. Signs and barricades warning personnel to stay clear are posted around the crane.
 - 3. The crane operator is the only person on the rig under any high tension line. Booms must be lowered or tied off; using load line.

Precautions noted in this procedure apply to all electric lines. Similar considerations must be given to piping systems which contain potentially hazardous materials.

Correct identification of all overhead electric lines is vital since there is considerable resemblance between some high voltage lines and "telephone" lines.

All crane operators will be instructed to stay on the rig in case of contact with any electrical lines.

Fixed leads shall be provided which ladder and climbing devices, and adequate rings, or similar attachment points, so that the loft worker may engage his/her safety harness lanyard to the leads.

SCAFFOLDING

Revised: June, 2014

1. All Subcontractors who intend to utilize any type of scaffolding whether it be rolling scaffolds, tubular welded frame scaffolding, etc. shall appoint a competent person to supervise and be held accountable for the erection and maintenance of the scaffolding system per OSHA guidelines.
2. A tubular welded frame scaffolding shall be set on a firm base or mudsill, utilizing screw jacks on all frames for leveling and stability. Each frame shall be fully cross braced and locking pins shall be in place.
3. All planking shall be free of splits and dry rot. Planking shall be placed so it overlaps 12 inches. Planks shall extend over the end of the frame no less than 6 inches and no more than 12 inches. All planking shall be full 2 inch scaffold grade planking.
4. If an employee can fall 6 feet or more, the operation must be protected by guardrails, top rail 42 inches, intermediate rail 21 inches and toe-board if persons passing underneath or alongside could be struck by falling debris.
5. To prevent movement the scaffold will be secured to the building at intervals not to exceed 30 feet horizontally and 26 feet vertically. Additional tie-ins will be used in the event of high winds and/or when the scaffold is enclosed with tarps.
6. Ladders shall be provided for accessing scaffolds unless scaffold is designed for climbing. Workers shall not climb corners of scaffolding to access scaffold.
7. Free-standing mobile scaffolds shall not exceed four times the smallest base dimension.
8. Prior to the operation of so called scissors lifts and articulating boom platforms, Subcontractor foreman shall demonstrate to Ledgewood Construction Superintendent that personnel have been trained and are familiar with operation of the equipment. Must have card for that unit.
9. Personnel working in articulating boom platforms (Condors) shall wear a harness and lanyard secured to basket.
10. So called Baker scaffolds shall be equipped with guardrails if employee is exposed to a fall greater than 6 feet.

STEEL ERECTION

Revised: June, 2014

1. All Steel Erection shall take place in accordance with OSHA Regulations.
2. Crane operations during the erection of steel shall follow the guidelines set forth in this Safety Program.
3. All workers not directly involved with the actual initial connecting of beams shall be tied off when working more than 15 feet above any surface.
4. A safety railing of ½ inch wire rope shall be installed approximately 42 inches high around the periphery of all temporary metal decked floors. It shall be the responsibility of the steel erector to install a second wire rope prior to any other trades working on the floor. A toe-board or netting shall be installed when material could be subjected to falling through the opening. The wire rope connections shall be secured with at least three (3) Crosby clips.
5. No loads being carried by the crane will be swung over areas where employees are working.
6. Whenever the potential fall distance exceeds 15' above working surfaces they shall be protected from fall hazards by means of guardrail systems, safety nets, personal fall arrest systems, positioning device systems, or fall restraint systems.
7. Floor openings shall be addressed as they occur, including stairwell and elevator shafts which will be planked over every other floor during steel erection. Standard floor openings shall be covered with ¾" plywood or the equivalent and secured from accidental displacement. In addition the words "floor hole" shall be painted on the cover with orange paint.
8. Plumbing-up lines shall be secured with a minimum of (3) Crosby clips to prevent any slippage.
9. A fire extinguisher of at least 2A – 10 lb. ABC classification will be located with each welding or burning operation during steel erection.
10. Ladders to access floors and specific work areas will be tied off to prevent displacement at all times. Ladders will be of sufficient length to extend 36" above the surface being accessed. A clear landing surface, protected by safety rails, shall be available at the top of the ladder. Workers shall not be required to climb through cables or rails to access a floor.
11. If "Christmas Treeing", so called, is utilized during steel erection, a maximum of (3) pieces will be lifted at any time.
12. Metal decking shall not be left unsecured at the end of the work day to prevent displacement by unexpected high winds.

13. Bar joists shall not be placed on structural steel framework unless such framework is safely bolted or welded, not shall bar joists be put in place without securing to framework.
14. Impact wrenches shall be provided with a locking device to prevent displacement of the socket.
15. Commencement of steel erection: Steel erector shall not erect steel unless it has received written notification that the concrete in the footings, piers, and walls is either 75% of intended minimum compressive strength or sufficient to support the loads imposed during erection.
16. Columns shall be set on level finished floors, pre-grouted leveling plates, leveling nuts, or shim plates which are adequate to transfer the loads.
17. Anchor bolts shall not be repaired, replaced or field modified without approval of the Project Structural Engineer of record.
18. The perimeter columns shall not be erected unless they have holes or other devices in or attached at 42-45" AFF and the midpoint to permit installation of perimeter safety cables.
19. Site specific erection plan is good for all involved.

LOCKOUT / TAGOUT POLICY

Revised: January, 2015

NOTE: This section is the responsibility of the Electrical Contractor.

Purpose and Scope:

Purpose of these procedures is to establish an energy control program that includes (1) documented energy control procedures, (2) employee training, and (3) periodic inspection of the procedures.

There are two types of energy isolating devices: those capable of being locked and those that are not.

The lockout device provides protection by holding the energy-isolating device in the safe position, thus preventing the machine or equipment from being energized. The tagout device does so by identifying the energy-isolating device as a source of potential danger; it indicates that the energy-isolating device and the equipment being controlled may not be operated until the tagout is removed.

Lockout is a more reliable method of de-energizing equipment than tagout and is the preferred method used by Ledgewood Construction, however, when the energy-isolating device cannot be locked out, Ledgewood Construction employees will use tagout.

I. Responsibilities:

Management: Under the Federal Occupational Safety & Health Act, Management is responsible for planning deliberate energy control program to ensure that machines and equipment are isolated and inoperative before any employees perform servicing or maintenance where the unexpected energization, start up or release of stored energy could occur and cause injury; training a competent and safety-minded force; and maintaining records prescribed for accidents, illness and injuries.

Project Managers: Responsible for periodic inspections to assure that energy control procedures (locks and tags) continue to be implemented properly and that employees are familiar with their responsibilities under these procedures. The Project Manager will certify that the periodic inspections have been performed.

Superintendent/Foreman: Responsible for training dealing with the equipment, type(s) of energy, and hazard(s) specific to his/her particular jobsite. In addition, the Superintendent/Foreman will be responsible for obtaining from the Warehouse Manager the appropriate lockout-tagout devices.

Authorized Employee: Responsible for implementing the energy control procedures and performing the service or installation.

Affected Employees/Other Employees: Responsible for recognizing when the control procedure is being implemented, and understanding the purpose of the procedure and the importance of not attempting to start up or use the equipment that has been locked or tagged out.

2. Training:

Prior to starting work, each employee attends a health and safety orientation. At that time each employee will receive training in the purpose, function and restrictions of the energy control program. Each employee will sign a form verifying that they have received training in LedgeWood Construction energy control program.

Training for Authorized Employees will cover, at a minimum:

- a. Details about the type and magnitude of the hazardous energy sources present in the workplace, and
- b. The methods and means necessary to isolate and control those energy sources (i.e. the elements of the energy control procedures).

Training for Affected Employees and Other Employees will cover the following:

- a. Whenever there is a lockout or tagout device in place on an energy-isolating device, leave it alone and do not attempt to operate the equipment.

3. Application of Controls and Lockout/Tagout Devices:

Generally, the procedure for applying energy controls includes the following elements and actions that must be implemented in sequence. Procedures for shutting down specific pieces of equipment (pumps, boilers, air handling equipment, etc.) that LedgeWood Construction installs, starts-up and services are outlined in the Installation and Operation and Maintenance Manuals that accompany each piece of equipment at shipment and should be followed. Additionally, work that involves the transmission and distribution systems for gas, steam, water or petroleum products, valves will be locked in either the open or closed position (as appropriate) or, if the valve cannot be locked, the handle will be removed and tagged-out.

- a. Prepare for shut down.
- b. Shut down the machine or equipment.
- c. Apply the lockout or tagout device.
- d. Render safe all stored or residual energy.
- e. Verify the location and de-energization of the machine or equipment.

4. Removal of Locks and Tags:

Before lockout or tagout devices are removed, the Authorized Employee(s) will take the following actions or observe the following procedures:

- a. Inspect the work area to ensure that non-essential items have been removed and that machine or equipment components are intact and capable of operating properly;
- b. Check the area around the machine or equipment to ensure that all employees have been safely positioned or removed;
- c. Notify the Affected Employee(s) immediately after removing locks or tags and before starting equipment or machines; and
- d. Make sure that locks or tags are removed **ONLY** by those employees are attached them.
- e. Follow the manufacturer's start-up procedures outlined in the Installation Manuals and Operations and Maintenance Manuals, which accompany each piece of equipment at shipment.

5. Additional Safety Requirements:

a. Testing or Positioning of Machines:

Temporary removal of locks or tags and the re-energization of the machine or equipment is allowed **ONLY** when necessary under special conditions, (i.e. when power is needed for the testing or positioning of machines, equipment, or components). The re-energization must be conducted in accordance with the sequence of steps listed below:

1. Clear the machines or equipment of tools and materials.
2. Remove employees from the machines or equipment area.
3. Remove the lockout or tagout devices as specified above.
4. Energize and proceed with testing or positioning.
5. De-energize all systems, isolate the machine or equipment from the energy source, and re-apply lockout or tagout devices as specified.

b. Outside Personnel (Contractors, etc.):

Ledgewood Construction will inform other Contractors of our lockout/tagout procedures. Ledgewood Construction will ensure that their personnel will understand and comply with all restrictions and/or prohibitions of the other employer's energy control program.

c. Group Lockout or Tagout:

During all group lockout/tagout operations where the release of hazardous energy is possible, each Authorized Employee performing servicing or maintenance shall be protected by their own personal lockout or tagout device.

d. Shift or Personnel Changes:

Occasionally Ledgewood Construction works on a project that requires more than one work-shift during the day. On this type of project, there is an overlap of workers (both shifts on the job for a short period of time, usually one-half hour). During this overlap locks and tags will be removed by the Authorized Employee and replaced with the locks and tags of the Authorized Employee on the new shift. On the rare occasions that a worker working and a piece of equipment would leave the project (either to go to another project, or leaving Ledgewood Construction's employ) while the piece of equipment was still locked or tagged-out, the Superintendent/Foreman may remove the locks and/or tags by strictly following the procedures outlined above.

SANITATION FACILITIES

Revised: January, 2015

- I. Portable Sanitation Facilities for workers assigned to this project are located on the jobsite and are provided by Ledgewood Construction.

NEW HIRE INDOCTRINATION PROJECT RULES & SAFETY REGULATIONS

Revised: January, 2015

Project Rules:

1. At the Preconstruction Meeting, Ledgewood Construction will take the opportunity to familiarize Subcontractors with the Project Safety Rules.
2. A copy of the Project Safety Rules will be issued to each Ledgewood Construction employee. The employee will sign a form acknowledging that he/she has read and understands and agrees to abide by the Rules.
3. The following Rules and Safety Regulations will be incorporated with Ledgewood Construction "Project Safety Rules".
 - a. All vehicles and containers entering or leaving the jobsite, or vehicles located on the jobsite, are subject to security inspections.
 - b. Employees will be expected to perform a full day's work with a cooperative and willing attitude. Uncooperative, careless and neglectful work performance will not be tolerated.
 - c. Proper conduct on the job is essential to the common good of all employees and the daily progress of the job. Therefore, unsatisfactory conduct, including, but not limited to, the following violations, will be subject to appropriate disciplinary action or discharge.
 - Loafing on the job.
 - Dishonesty or fraud involving the company.
 - Sleeping on the job.
 - Failure to use or wear safety equipment.
 - Making or faking false injury claims.
 - Fighting or engaging in horseplay.
 - Damaging materials, tools or equipment, either willfully or carelessly.
 - Insubordination, refusing to accept work assignments and interfering with fellow workers or supervisors.
 - Gambling at any time on the jobsite.
4. The possession and/or use of alcohol or other intoxicants on site may result in immediate dismissal.

5. The possession or use of narcotics and/or being under the influence of non-prescription depressant or stimulant drugs on site at any time may result in immediate dismissal. If you are taking medication advise your supervisor.
6. Bringing firearms or weapons of any kind onto the site will result in dismissal.
7. Drinking water is available at all times. Used cups are to be disposed of in provided containers, as well as any cans, glass bottles, lunch bags, sandwich wrapping, etc.
8. Adequate sanitary facilities are provided on the jobsite. We request your cooperation in maintaining the facilities in a clean and orderly condition.
9. First aid facilities are available at the jobsite. A first aid kit will be located in the Ledgewood Construction field office.
10. All employees shall strictly comply with project and employer safety rules and regulations. Any employee in violation is subject to discharge.
11. Any solicitation or posting must have prior approval of Ledgewood Construction.

SAFETY REGULATIONS

Revised: January, 2015

All local and OSHA safety rules and regulations must be complied with including, but not limited to, the following:

1. Hard hats must be worn at all times.
2. The use of safety shoes is strongly recommended.
3. Riding material hoists, crane loads, or the hook will not be permitted.
4. Eye protection, hearing protection, and respiratory protection must be worn when the operation requires.
5. All ladders must be tied off or anchored extending 36" above working deck.
6. No smoking, except in designated areas, on this jobsite.
7. All gas and oxygen bottles must be stored in an upright position with caps attached and tied off. Storage facilities must comply with OSHA standards and local Fire Department Regulations.
8. All work areas must be free of debris and waste materials.
9. Where craft persons normally furnish their own tools, such tools shall conform to the prescribed requirements for safe and efficient work.
10. Safety harnesses, properly tied off, shall be worn when working at heights over 6 feet, unless an adequately constructed scaffold with a top rail, mid rail and toe board is provided.
11. All persons shall comply with the Federal OSHA safety standards and the safety requirements of the Division of Labor & Industries, pertaining to the construction industry.
12. Consult Ledgewood Construction for specific details of safety requirements.

PORTABLE TOOLS – FUELING REQUIREMENTS

Revised: January, 2015

1. Extreme caution should be exercised when fueling portable tools, generators, propane equipment, etc.
2. A fire extinguisher with a rating of 2A – 10 lb. ABC should be available in the event of a fire.
3. Only approved metal safety cans will be allowed on site. Containers shall be equipped with a spring loaded cap and a flash arrester in the spout.
4. Fueling within the confines of any building is prohibited.
5. Fuel storage permits, if required, will be obtained from the Local Fire Department.
6. All fuel containers will be properly labeled with the contents of the can.
7. All fuel operated equipment will be shut down and allowed to cool before any refueling is attempted.

HAZARD ANALYSIS FORM

Revised: January, 2015

Procedure for filling out form:

1. The Hazards Analysis form shall be filled out by each Subcontractor Foreman when requested by Ledgewood Construction. The completed form shall be reviewed with the Superintendent.
2. The purpose of the form is to identify and plan Safety issues in advance of the work taking place.
3. This exercise will enable both the Subcontractor foreman and the Superintendent to plan ahead and with the assistance of the Project Manager head off potential exposures to accidents and/or injuries.
4. See attached sample of the Hazard Analysis Form.

JOB HAZARD ANALYSIS

Revised: January, 2015

Project:_____

Operation: _____

Contractor:_____

Maximum # of Employees:_____

Foreman: _____

Date: _____

[illegible]

CONTRACTOR EMERGENCY EVACUATION PROCEDURE

Revised: January, 2015

Purpose:

To provide for the safe and orderly evacuation of all employees who may be in danger as the result of a fire, collapse or any unforeseen emergency.

1. Subcontractors:

- a. Review with Ledgewood Construction Superintendent, the detailed site emergency evacuation procedures for each location where Ledgewood Construction and their Subcontractors will be working on this project.
- b. Request that Ledgewood Construction and their Subcontractors conduct an immediate head count to determine if any employees are missing.

2. Contractor Site Superintendent:

Ledgewood Construction Superintendent Shall:

- a. Ensure that his/her Supervisory Personnel are completely familiar with the appropriate emergency evacuation procedures to follow each jobsite location where they have employees working.
- b. Respond to the scene of the emergency and direct Contractor employees to evacuate to the appropriate assembly point as required by the scope of the hazardous exposure(s).
- c. Conduct an employee headcount and immediately advise Rescue Personnel if any Ledgewood Construction or Subcontractor employees are missing.

3. Construction Employees:

- a. Each construction employee shall immediately stop work and leave his/her work area and assemble as directed by Ledgewood Construction Personnel or Subcontractor Foreman when a potential or actual hazardous condition exists.

4. Various Evacuation Routes and Assembly Points:

- a. Various evacuation routes and assembly points, as needed will be developed by Ledgewood Construction Safety Personnel for specific work locations throughout the project area.
- b. Evacuation route sketches, if needed, based on the above information shall be developed by Ledgewood Construction Superintendent.
- c. Evacuation procedures, including changes in evacuation routes and assembly points shall be reviewed at weekly safety meetings and this information will be covered at Subcontractor Toll Box Meetings.

POWDER-ACTUATED TOOLS

Revised: January, 2015

The following procedure shall be followed for the use of Powder-Actuated tools on this project:

1. Only qualified operators shall operate explosive-actuated tools. A qualified operator is one who has:
 - a. Been trained by an authorized instructor and provided with an authorized instructor's card by the tool manufacturer or by an authorized representative of the tool manufacturer.
 - b. Possesses a qualified operator's card supplied by the manufacturer and issued and signed by both the instructor and operator.
2. Each tool shall be provided with the following:
 - a. A lockable container.
 - b. Operator's instruction and service manual.
 - c. Powder load and fastener charts.
 - d. Tool inspection record.
 - e. Service tools and accessories.
3. Tool maintenance and inspection:
 - a. Daily inspection, cleaning and testing shall be performed as recommended by the manufacturer.
 - b. Explosive-actuated tools shall be inspected each day prior to use to check that safety devices are in proper working conditions.
4. Tool Security:
 - a. Explosive-actuated tools and the charges shall be secured at all times to prevent unauthorized possession or use.

- b. Explosive-actuated tools shall not be loaded until just prior to the intended firing time; neither loaded nor empty tools are to be pointed at anyone; hands are to be kept clear of the barrel end.
- c. All spent and any unspent charges shall be placed in containers kept for that purpose and removed from the jobsite on a daily basis. At no time will charges be allowed to remain unattended.
- d. When not being used, powder-actuated tools and charges will be kept under lock and key in a secure container such as a gang box. Only a sufficient number of charges shall be available in the work area to accomplish the planned work for any given day.
- e. Each Subcontractor required to use powder-actuated tools shall advise Ledgewood Construction Superintendent where they are storing their powder-actuated tools and charges. Each Subcontractor will keep an inventory of supplies brought onto the project and charges.

ENTRY PERMIT CONFINED SPACES PROGRAM

Revised: January, 2015

NOTE: This section has also been added to “Subcontractor Responsibilities” (Section #9)

As “entry permit” confined spaces are not located on all jobsites, training shall be given to those individuals specifically assigned to work in same.

Employees required to construct work in a: boiler, cupola, degreaser, furnace, pipeline, pit, pumping station, reaction or process vessel, septic tank, sewage digester, sewer, silo, storage tank, ship’s hold, utility vault, vat or similar type enclosure would be considered working in a confined space. A confined space is any space having any one of the following characteristics.

- Limited openings for entry and exit unfavorable natural ventilation.
- Not designed for continuous worker occupancy.

The purpose of Ledgewood Construction Entry Permit Confined Spaces Program, as outlined below, is to ensure that entrants (employees) are protected from permit space hazards. In this regard, Ledgewood Construction shall undertake the following measures.

RESPONSIBILITIES

Management:

Take deliberate steps once a confined space is identified to protect its employees while performing their respective duties within said spaces. To this end, a Confined Space Entry Permit form has been devised for use in ensuring a safe work environment. No employee is to enter a confined space until such time that an entry permit has been completed by the company’s Superintendent, the Project Foremen or other individual eligible to be in charge of entry, and the entrant has been authorized to enter such confined space.

- Provide training for Superintendent on confined space entry.
- Provide Superintendent with assistance as requested to carry out duties outlined.
- Provide personal protective equipment as required.

General Superintendent:

- Orientates Foreman on Company’s procedures for working in confined spaces. Evaluate, where feasible, confined space hazards and determine their severity.
- Prepare Confined Space Entry Permit, once an entry permit confined space has been identified.
- Provide on-site training for proposed entrants.
- Provide on-site training for proposed attendants.
- Provide on-site training for proposed individuals authorizing or in charge of entry.
-

Employee:

- Advise Foreman of any potential hazards once recognized.
- Participate in on-site training for confined space entry.
- Follow all instructions given on conduct relating to entry permit confined space.

Record Keeping:

1. This Entry Permit Confined Space Program shall be kept on-site at all times, and made available to any company employee.
2. Copies of all Confined Space Entry Permits shall be kept up-dated and on-site at all times, and made available to any company employee.
3. Copies of all Record Keeping documents listed above shall be provided to this Company's office.
4. The Company's office shall maintain records of confined space entry for a period of no less than three (3) years from the date of cancellation of Confined Space Entry Permits.

CONFINED SPACE ENTRY PERMIT

Revised: January, 2015

All blank spaces must be completed prior to entry.

Project Name and Location: _____

Location of Confined Space: _____

Purpose of Entry: _____

Is Hot Work Intended: _____

A. 1. Known Hazards: _____

2. Suspected Hazards: _____

3. Method of Isolating Confined Space: _____

4. Method of Removal and/or Control of Known/Suspected Hazards: _____

5. Method of Verifying Acceptable Environmental Conditions:_____

6. Testing/Monitoring Equipment for Maintaining Acceptable Environmental Conditions During Entry:_____

7. Rescue Services to be Utilized:_____

8. Specific Rescue Measures to be Used:_____

9. Communication Methods Used by Entrants and Attendants:_____

10. Personal Protective Equipment to be Used:_____

B. Date of Entry:_____ Authorized:_____

Duration:_____

Authorized Entrants:	Eligible Attendants:
_____	_____
_____	_____
_____	_____

Individuals Authorized or Charge of Entry:

Superintendent:_____	Project Foreman:_____
Others:_____	Others:_____

Names of Other Contractors Receiving this Information:_____

Name of Others Requesting this Information:_____

Note: This information must be available to employees at all times during entry operations.

Sign below verifying that: All actions and conditions necessary for safe entry into Permit Space have been performed.

Printed Name:_____ Signature:_____

Project Name:_____

Foreman:_____

TRAINING AND DUTIES OF INDIVIDUALS AUTHORIZING OR IN CHARGE OF ENTRY

Revised: January, 2015

The purpose of training “Individuals Authorizing or in Charge of Entry” is not only to ensure that Authorized Entrants, and Attendants, have been made aware of the hazard(s) that could be encountered during confined spaces operations, but also to ensure that all required documentation has been completed and records are being kept as identified in the Entry Permit Confined Spaces Program. To this end, the Superintendent and/or Foreman shall instruct/inform employees on the following:

Individuals authorizing or in charge of entry shall:

- Determine that the Entry Permit contains requisite information before authorizing or allowing entry.
- Determine that the necessary procedures, practices and equipment for safe entry are in effect before allowing entry.
- Determine, at appropriate intervals, that entry operations remain consistent with the terms of the Entry Permit, and that acceptable entry conditions are present.
- Cancel the entry authorization and terminate entry whenever acceptable entry conditions are not present.
- Take the necessary measure for concluding an entry operation, such as closing off a permit space and cancelling the permit, once the work authorized by the permit has been completed.
- When necessary, serve as Entrants or Attendants (after receiving proper training).
- When dealing with unauthorized personnel, individuals authorizing or in charge of entry shall take appropriate measures to remove unauthorized personnel who are in or near entry permit spaces.

Individuals authorizing or in charge of entry and Instructor must sign below, indicating that instruction has been given and a clear understanding exists on the procedures to be adhered to and duties to be carried out in ensuring safe entry into confined space, acceptable environmental conditions are maintained during entry, safe exit from confined space, and proper documentation is maintained for work performed under the Entry Permit.

Printed Name of Employee/Individual
Authorizing or in Charge of Entry

Date of Training

Signature of Individual
Authorizing or in Charge of Entry

Printed Name & Title of Person
Giving Instruction

Signature of Instructor

-52.5-

ENTRY PERMIT CONFINED SPACES CHECKLIST

Revised: January, 2015

New Checklist Must be Used Daily

Individual Authorizing or in Charge of Entry:

Printed Name

Signature

Date of Checklist Use:_____

_____ The Entry Permit has been filled out completely.

_____ Training has been given to Authorized Entrants.

_____ Training has been given to Attendants.

_____ Necessary protective equipment is on-hand.

_____ Entry Permit is attached to this Checklist and a copy of Entry Permit has been given to Attendants.

_____ Distributed and collected Attendants records of Authorized Entrants working within confined spaces daily.

_____ All Training Forms are attached to this Checklist.

_____ Company (Ledgewood Construction) copy of this Checklist and all attachments has been turned into the office.

_____ Entry Permit has been cancelled upon completion of work.

Foreman, sign-off above form at the end of each day.

TRAINING AND DUTIES OF AUTHORIZED ENTRANTS

Revised: January, 2015

Project Name: _____

Foreman: _____

The purpose of training "Authorized Entrants" is to ensure employee safety while working within confined spaces on the jobsite. Much of the information needed to provide the proper instruction and give necessary information is outlined on the Confined Spaces Entry Permit. The Superintendent and/or Foreman shall inform/instruct employees on the following:

1. Known hazard(s) which may be faced during entry.
2. Recognition of signs and symptoms of exposure to the hazard(s).
3. Understanding the consequences of exposure to the hazard(s).
4. Understanding the method of maintaining contact with the attendant.
5. Responsibility of notifying attendant when entrant self-initiates evacuation of permit space.
6. Advise of personal protective equipment to be utilized (i.e. retrieval lines, respirators or clothing) needed for safe entry and exit. Protective equipment shall be provided by the company as required. At the time of issuance, the entrant shall be instructed on its care and use.
7. Advise of external barriers needed to protect entrants from external hazards of the proper use of those barriers.
8. Advise entrant of exit procedure (i.e. when attendant orders evacuation, at the end of shift, or when entrant perceives he/she is in danger).
9. Advise entrant of location of Entry Permit, Confined Space Program, Material Safety Data Sheets (MSDS) Program, and inform of their availability for review.

Authorized Entrant and Instructor must sign below, indicating that instruction has been given and a clear understanding exists on the procedures to be carried out to ensure safe entry into confined space, proper work methods while inside confined space and exit from the confined space.

Printed Name of Employee/Authorize Entrant

Date of Training

Signature of Authorize Entrant

Printed Name & Title of Person Giving Instruction

Signature of Instructor

TRAINING AND DUTIES OF ATTENDANTS

Revised: January, 2015

Project Name: _____

Foreman: _____

The purpose of training “Attendants” is to ensure the safety of Authorized Entrants during confined spaces entry operations. To this end, the Superintendent and/or Foreman shall inform/instruct employees on the following:

1. Attendant is to keep accurate records, at all times, of the number of Authorized Entrants working within a confined space.
 2. The Attendant shall be advised of the hazard(s) and given information relative to the recognition of signs and symptoms of exposure.
 3. The Attendant shall monitor activities inside and outside the permit space to determine if it is safe for Authorized Entrants to remain in the space.
 4. The Attendant shall maintain continuous contact with Authorized Entrants during entry.
 5. The Attendant shall ORDER Authorized Entrants to evacuate permit space immediately when:
 - The Attendant observes a condition which is not allowed in the entry permit.
 - The Attendant detects behavioral effects of hazard exposure.
 - The Attendant detects a situation outside the space which could endanger the entrants.
 - The Attendant detects an uncontrolled hazard within the permit space.
 - The Attendant is monitoring entry in more than one permit space and must focus attention to the rescue of Entrants from one of those spaces.
 - The Attendant must leave the work station.
 - The Attendant shall summon rescue and other emergency services as soon as the Attendant determines those Authorized Entrants need to escape from the permit space hazards.
1. The Attendant shall warn unauthorized persons away from the space.
 2. The Attendant shall request unauthorized persons to exit immediately if they have entered the permit space.
 3. The Attendant shall inform the Authorized Entrants and any other persons designated by the employer (i.e. Superintendent, Foreman, Project Manager, other contractors’ supervisors) if unauthorized persons have entered the permit space.

At no time shall the Attendant enter the confined space to assist in rescue operations of Entrants. The Attendant shall properly use an rescue equipment provided for use and perform any other assigned rescue and emergency duties, without entering the permit space.

TRAINING AND DUTIES OF ATTENDANTS (continued)

Revised: January, 2015

Attendant and Instructor must sign below, indicating that instruction has been given and a clear understanding exists on the procedures to be carried out to ensure safe entry into confined space, acceptable environmental conditions are maintained during entry, and safe exit from the confined space.

Printed Name of Employee/Attendant

Date of Training

Signature of Attendant

Printed Name & Title of Person Giving Instruction

Signature of Instructor

ATTENDANTS DAILY LOG OF AUTHORIZED ENTRANTS

Revised: January, 2015

Date of Log Use:_____

Printed Name of Attendant

Signature of Attendant

[illegible]

This form must be kept current at all times and turned over to the individual authorizing or in charge of enter at the end of each day.

Note: Complete and fax a copy of this report to main office as soon as possible.

- I. If work in a confined space is anticipated, the services of an Industrial Hygienist will be obtained, in advance, to perform necessary atmospheric testing prior to allowing workers to enter the space.

FALL PROTECTION PROGRAM

Revised: January, 2015

I. Fall Protection Program:

- a. It is the policy of Ledgewood Construction to provide a safe workplace for all employees where fall hazards exist.
- b. It is Ledgewood Construction's position where fall hazards exist to either:
 - 1. Eliminate the hazard.
 - 2. Provide protection against the hazard.

Where elimination of the hazard is not possible, the company will provide Personal Protection Equipment (PPE), a guardrail system, a warning system, proper ladder use or job specific needs to deal with the existing fall hazards on each site.

- c. It is the intent of Ledgewood Construction's fall protection program to follow the standards set forth for fall protection.
- d. Fall protection training by a "competent" person will take place before any employee is placed in a fall hazard situation. The purpose of this training is:
 - 1. To identify the nature of fall protection.
 - 2. To correctly use and set up fall protection equipment.
 - 3. To identify the limitations of this equipment.
 - 4. To understand the correct handling and storage of this equipment.
 - 5. To learn the basic OSHA guidelines/regulations for fall protection in this construction industry.
- e. This fall protection program will be under ongoing review by the Safety Committee to meet the specific needs of each Ledgewood Construction project to better eliminate fall hazards and create a safer workplace for all employees.

2. Fall Protection Plan:

- a. The goal of this plan is to protect all Ledgewood Construction employees who need to work six feet or more above a lower level.
- b. This goal will be met by following the standards of OSHA for fall protection.

c. The Ledgewood Construction plan follows basic fall protection systems as follows:

1. Fall Arrest Systems:

- a. This is an engineered system, all components must work as one and the complete system is only as strong as its weakest part.
- b. Anchor or tie-off points must be capable of supporting 5,000 pounds per person.
- c. Ledgewood Construction requires only full body harnesses belts.
- d. Each employee should be rigged to free fall no more than six feet or before coming into contact with a lower level.
- e. D-rings, harnesses, ropes and self-locking snap-hooks shall be tested to a tensile load of 3,000 pounds.
- f. All equipment will be checked out properly for its intended use.

2. Guardrail System:

- a. The top rail must be 42" above the working level.
- b. This top rail must be secured properly and capable of withstanding a force of at least 200 pounds applied outward or inward upon it.
- c. A mid rail along with the toe board should be installed.
- d. All connection points in the system should be properly secured.

3. Warning Systems:

- a. Warning systems shall be rigged or supported so that the lowest point is no less than 34" and no higher than 39" from a working level.
- b. Stanchions with rope or chain are at the leading edge and around all openings.
- c. The rope or chain has a tensile strength of at least 500 pounds.
- d. Flagged at no more than 6' intervals with a highly visible material.

4. Ladders:

- a. Use the ladder only for its intended purpose.
- b. Foot or secure the ladder whenever possible.
- c. The angle of 75 degrees (1 in 4) should always be followed.
- d. The top of the ladder must extend past the landing area at least 36".
- e. The ladder must be tied off at the landing area.

BLOOD BORNE PATHOGENS EXPOSURE CONTROL PLAN

Revised: January, 2015

In accordance with OSHA blood borne pathogens the following exposure control plan has been developed for Ledgewood Construction.

1. Exposure Determination:

- a. Ledgewood Construction being a General Contractor in the building construction business may have employees exposed to blood or other potentially infectious materials. These employees in general are classified as: supervisors, carpenters and laborers. Their tasks in which exposure may occur is due to flesh injuries typical of the building trades industry.

2. Compliance Methods:

- a. Ledgewood Construction on its jobsites will use universal precautions to prevent contact with blood or other potentially infectious materials. All blood or other potentially infectious materials will be considered infectious regardless of the perceived status of the source individual. Exposure Control Kits are provided in each jobsite office trailer.
- b. Latex gloves and any other appropriate PPE will be used for any injury where blood or other potentially infectious materials are dripping and immediate first aid is necessary.
- c. In the event of blood being on floors, tools, etc. a 10% solution of chlorinated bleach will be used for disinfecting and clean-up.
- d. All employees who may have come in contact with blood or potentially infectious material need to thoroughly wash hands or possible infected areas as soon as possible.
- e. Latex gloves and other appropriate PPE will be carefully disposed of and the container sealed immediately as not to expose any other employee to blood or potentially infectious material.
- f. Any clothing exposed to blood or potentially infectious material will be removed as soon as possible and properly discarded in the same way as latex gloves and other appropriate PPE.
- g. Any equipment and/or tools that have blood or any other potentially infectious materials on it that cannot be immediately and appropriately cleaned will be packaged in a plastic bag and sent to the main office for decontamination or disposal procedures.

- h. The Project Manager will be immediately notified of a situation where blood or other potentially infectious materials are present. A list of all employees that may be exposed shall be given to the Project Manager so he/she can take record keeping and procedures initiated in this plan. At this time, the Project Manager will take over control of this plan.

3. Hepatitis B Vaccine:

- a. All employees who have been identified as having exposure to blood or other potentially infectious material will be offered the hepatitis B vaccine at no cost to the employee. This vaccine should be given within (10) ten days of potential exposure. Any employee who declines the vaccine will sign a waiver with Ledgewood Construction's President. If after signing the waiver the employee decides to have the vaccine, this will be provided at no cost to the employee.
- b. Training for all employees will be conducted prior to working and/or exposure to jobsite conditions. This training will include location of latex gloves, bleach and 10% mixture, how to clean up and dispose of blood soiled clothes and latex gloves. These items will be sealed in a plastic bag for proper disposal.

POST-EXPOSURE EVALUATION AND FOLLOW UP

Revised: January, 2015

When an employee incurs an exposure incident, it is reported to the Superintendent for that particular jobsite. The Project Manager will follow up. This follow up will include the following:

1. Documentation of the path of entry for each employee.
2. Identification of the source individual. The blood of the source individual will be tested (after consent) for HIV/HBV infection.
3. Results of testing of the source individual will be made available to the exposed individual(s).
4. The employee will be offered the option of having his/her blood collected for testing.
5. The employee will be offered post exposure prophylactics in accordance with the current recommendations of the U.S. Public Health Services (contact made by the Project Manager).
6. The employee will be given appropriate counseling concerning precautions to be taken during the period after the exposure. The employee will also be given information on what potential illness to be alert for and report any related experiences to the Project Manager.
7. The Project Manager has been designated to make certain that the policy outlined is carried out and recorded to maintain the proper records and the overall safety of the employee(s) who may be potentially exposed.

Training:

The training for all employees will be conducted prior to working and/or exposure to jobsite. The procedures outlined in the plan will be followed.

Recordkeeping:

All records required by OSHA standard will be maintained by the main office.

LEDGEWOOD CONSTRUCTION SUPERINTENDENT'S ACCIDENT REPORT

Revised: January, 2015

NOTE: Complete and fax a copy of this report to the main office as soon as possible.

Superintendent:_____ Today's Date:_____

Project:_____

Name of Injured:_____

Age:_____ Sex: Male / Female Time at Present Job:_____

Company Employed by:_____ Supervisor:_____

Date / Time of Accident:_____ Date Loss Reported:_____

Weather Conditions:_____

Exact Loss Location:_____ Secured for Investigation? Yes / No

Describe Nature of Injury:_____

Injured Transported to Hospital? Yes / No What Hospital?_____

Method of Transportation?_____

Injured Transported Home? Yes / No If Yes, by Whom?_____

Method of Transportation? (specify - Auto, Ambulance) _____

First Aid Given at Scene? Yes / No If Yes, by Whom?_____

Treatment (specify):_____

Has Injured Resumed Work? Yes / No

Date Returned:_____

List any Tools and/or Equipment or Other Evidence Involved with Accident:_____

Type (serial number, make & model):_____

Ownership:_____

User:_____

Tools and/or Equipment or Other Evidence Retained: Yes / No

Describe Accident: (Include loss description, full identification and employee affiliation of a witness, attach all photographs and statements of investigation)_____

Use Open Area for Sketch if needed:

Superintendent's Signature

Date

Distribution: Project Manager, Main Office, Subcontractor

Keeping Our Work Environments Safe

Revised: April, 2020

Ledgewood Construction is fully committed to protecting the health and welfare of our employees, subcontractors, clients and job sites. During this time of emergency, as outlined by state and local government, we are implementing the measures below to be followed by anyone who enters our job sites, effective immediately.

1. All workers to the maximum extent practical, must practice social distancing by maintaining a minimum distance of 6 feet from other individuals or wear face coverings where physical distancing measures are difficult to maintain.
2. All workers should know where the hand washing station is at each job site and utilize regularly.
3. All job site and crew meetings will be held in a place that allows everyone to follow social distancing.
4. All subcontractors must clean their area of usage each day, including any tools or equipment they may be using.
5. Prior to starting a shift, each subcontractor employee will self-certify to their supervisor that they:
 - Have no signs of a fever or a measured temperature above 100.3 degrees, no cough or trouble breathing in last 24 hours.
 - Have not had “close contact” with an individual DIAGNOSED WITH COVID-19. “Close contact” means:
 - Living in the same household as a person who has tested positive for COVID-19.
 - Caring for a person who has tested positive for COVID-19.
 - Being within 6 feet of a person who has tested positive for COVID-19 for 15 minutes or more.
 - Coming in direct contact with secretions from a person that has tested positive for COVID-19, while that person was symptomatic.
 - Have not been asked to self-isolate or quarantine by their Doctor, local public health.
 - Have not traveled outside of the United States in the last 14 days.

Any person exhibiting symptoms or unable to self-certify will be directed to notify their supervisor and the Site Superintendent, leave the work site immediately, seek a replacement for their work and medical attention to complete applicable testing by their health care provider. They will not be able to return to the work site until cleared by a medical professional.

Thank you for agreeing to follow these practices regularly while on our job sites.

(This section is blank)

Revised: January, 2015

FIRE PROTECTION PROGRAM

Revised: May, 2014

The Project Team shall be responsible for the development of a Fire Protection Program to fit the jobsite conditions. The following should be used as guidelines to set up such a program:

1. Review the current OSHA guidelines.
2. Request the Fire Chief to visit the site, acquaint him with the project and make any plans required in preparation for any potential emergency.
3. Locate and identify any existing hydrants in the project area for fire department water supply. Provide clear access to same. Any inoperative hydrants will be covered.
4. Activate any new on-site hydrants and interior fire water risers with hose connections for fire department use as soon as possible. Activate sprinklers as soon as possible.
5. Provide, maintain and conspicuously locate all-purpose ABC type of fire extinguishers on the jobsite. One 2A – 10 lb. ABC extinguishers for every 3,000 SF of construction space or portion thereof (i.e. 5,000 SF requires 2 fire extinguishers).
6. Fire department telephone number shall be posted at all jobsite telephones.
7. “No Smoking” signs shall be posted and enforced as required.
8. Cutting and welding operations should include the following: Floors should be swept free of combustibles within 35 feet of the work area and any flammable liquids should be removed from the area. Wet down the immediate area, where applicable. A fire watch, when necessary, should be available while work is being performed, at lunch time and at least 30 minutes after operation is shut down. Fire extinguishers will be required. The sweeping of floors, hosing down the area, the fire watch and the fire extinguishers all will be provided by the Subcontractor. (Prior to any burning taking place, a permit, if required, must be obtained).
9. Fuel for cutting and burning torches shall be stored in locations and protected as directed by Ledgewood Construction’s Superintendent, in conformance with local fire regulations and OSHA requirements.
10. Emergency evacuation plans shall be developed and implemented as needed. These shall be reviewed at each job meeting and posted in conspicuous places. This will be part of the Emergency Action plan for each site.
11. No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within the building except with the express approval of Ledgewood Construction’s Project Superintendent.

12. Bulk storage of volatile liquids shall be outside the building at a location determined by LedgeWood Construction's Project Superintendent and shall be posted as such. Permit for storage, if required, must be obtained by the Subcontractor from the Fire Department. In addition, the Subcontractor who is storing these materials shall furnish the proper type of fire extinguisher to be located within 50 feet of any point on the perimeter of the stored materials. Also, these areas are to be identified with signs restricting access and prohibiting sources of ignition.
13. Daily clean-up of scrap materials, sawdust, rags, oil and grease and other residue of construction operations will not only remove or reduce the fire hazard, but will promote general safety at the same time.
14. Improperly installed and controlled temporary heating devices could result in loss of life and property on construction sites from fire, asphyxiation and explosion. The following safe practices and procedures should be followed:
 - a. Temporary heating devices should not be installed or used by anyone on the job until authorized by the Project Superintendent and cleared with the local Fire Department.
 - b. Use only approved containers for fuel storage.
 - c. Adequate fire extinguishers should be provided (2A – 10 lb. ABC).
 - d. At least a 10-foot clearance should be maintained in any direction from any combustible materials.
 - e. Heating units should be well constructed with a stable base. Fireproof materials should be placed under the base.
 - f. When tarpaulins or canvas coverings are used near heating units, they must be U.L. listed. Fire Resistive Material per local Fire Department shall be used and at least a 10-foot clearance should be maintained. These materials should be securely fastened.
 - g. Heating devices should not be used in confined or unventilated spaces unless properly vented to the outside.
 - h. Kerosene, gasoline, oil or gas fired units should be shut down and cooled prior to refueling or moving them.
 - i. Liquid fueled heating devices should be provided with a manual shut-off system on the fuel line. The valve should be located at a safe distance from the unit.
 - j. All fuel tanks should be properly secured.
 - k. LPG gas cylinders should be stored away from the building out of doors. A cap should be provided to protect the valves on the stored cylinders.

- I. All bulk storage of flammable material listed above shall be reported to the Superintendent for approval.
15. Maintain fire prevention program by checking electrical equipment, use common sense, maintain good housekeeping, provide proper flammable liquid storage, provide proper refueling equipment and procedures, utilize cutting and welding fire watches, etc.
16. Provide security services if needed or required.
17. Provide fire instructions to all personnel:
- a. Install Exit signs.
 - b. Know how to get out. Learn what escape route to take from all work areas.
 - c. If you spot a fire, sound the alarm and get to safety, telling other about the fire as you go.
 - d. Know the location of the fire extinguishers and any other firefighting equipment.
 - e. Learn how to use a fire extinguisher.
 - f. Do not attempt to fight a fire that is too big for you.
 - g. And, if there is a fire, DON'T PANIC, follow your escape plan quickly and calmly.



University of New England

Bishop Street parking lot reconstruction project

Contact list

Ledgewood Construction

1. Mike Taylor
Project Manager
Cell number (207) 272-3592
3. Peter Reynolds
Project Manager
Cell number (207) 749-9358
4. Peter Pelletier
President
Cell number (207) 615-4443

University of New England

1. University of New England Security
(207) 602-2298
2. Steve Duhaime
Associate Director for Campus Planning
(207) 221-4133

Section 2 - Title, Right, or Interest

Doc#: 10603 Bk:29387 Pg: 289

WARRANTY DEED (Maine Statutory Short Form)

KNOW ALL MEN BY THESE PRESENTS, that **PIKE INDUSTRIES, INC.**, a Delaware corporation with a place of business and mailing address at 58 Main Street, Westbrook, Maine 04092 ("Grantor"), for consideration paid, hereby grants to **UNIVERSITY OF NEW ENGLAND**, a Maine non-profit corporation with a mailing address of 11 Hills Beach Road, Biddeford, Maine 04005 ("Grantee"), with **WARRANTY COVENANTS**, those certain lots or parcels of land, together with any buildings and improvements thereon, situated in Portland, Cumberland County, Maine, being more particularly described on **Exhibit A** attached hereto and incorporated herein by reference (the "Premises").

The following restrictions shall run with the land, shall inure to the benefit of the Grantor, and its successors and assigns, and shall be binding upon the Grantee, and its successors and assigns:

1. The Grantee covenants and agrees that the Premises shall not be used for excavation of earth materials, crushing of rock and other materials, production of hot-mix asphalt or other similar products (e.g., cement, ready mix concrete, etc.), storage of earth materials and/or hot-mix, cement or ready-mix products or the sale (retail or wholesale) and distribution of such materials from the Premises or the use of such material or existing processed material unless such excavation and/or use of such materials is for the benefit of the Grantee on the Premises or on contiguous land in common ownership of the Grantee.
2. In the event of a violation of any or all of this restrictive covenant, the Grantor, in addition to all other remedies available to it, may obtain an injunction against the Grantee issued by a court of competent jurisdiction enjoining such breach and shall be entitled to recover its costs and expenses, including, but not limited to, reasonable attorney's fees in the enforcement or defense of the restrictions or any of them.

Being parcels 2 and 3 in the deed of Oldcastle Materials, Inc. to Pike Industries, Inc. dated March 20, 2002, and recorded in the Cumberland County Registry of Deeds in Book 17835, Page 301.

IN WITNESS WHEREOF, the Grantor has caused this instrument to be signed and sealed this 28th day of February, 2012.

WITNESS:

PIKE INDUSTRIES, INC.

By: _____

Print/type name: Brian J. Donovan

Its: _____

Authorized Agent

STATE OF MAINE
CUMBERLAND, ss.

February 28, 2012

Then personally appeared the above named Brian J. Donovan, its Authorized Agent, of Pike Industries, Inc. who acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said Pike Industries, Inc.

Before me,

Peter J. Van Hemel
~~Notary Public~~ / Maine Attorney-at-Law
Name Printed: Peter J. Van Hemel
My Commission Expires: _____

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EXHIBIT A

TRACT 1

A certain lot or parcel of land in the Morrill's Corner region of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Commencing at a point or stake standing on the old southerly line of the Portland & Rochester Railroad, now the Portland Terminal Company, and at a point where the same intersects with land formerly of Franklin M. Purington,

THENCE South $65\frac{3}{4}^{\circ}$ West 108 Rods 15 Links, more or less, to land now owned by the City of Portland;

THENCE North $24\frac{1}{4}^{\circ}$ West 5 Rods 16 Links, more or less, to a stake;

THENCE South $65\frac{3}{4}^{\circ}$ West 34 Rods 9 Links, more or less, to a stake standing on land owned by said City;

THENCE North 11° West 11 Rods 7 Links, more or less, to a stake, standing on land formerly owned by Hiram Sawyer;

THENCE North $61\frac{1}{2}^{\circ}$ East 107 Rods, more or less, to line of said location of Portland & Rochester Railroad;

THENCE by the line of said Railroad on its southerly side as aforesaid $83\frac{1}{4}^{\circ}$ East 38 $\frac{1}{2}$ Rods, more or less, to the place of beginning.

EXCEPTING from the above described premises, the premises conveyed by Adam W. Wilson to City of Portland by deed dated March 25, 1889, and recorded in the Cumberland County Registry of Deeds in Book 556, Page 132; and the premises conveyed by Adam W. Wilson to Boston & Maine Railroad by deed dated April 4, 1907, and recorded in said Registry in Book 803, Page 232, and by deed dated August 5, 1910, and recorded in said Registry in Book 863, Page 137.

TRACT II

Another certain lot or parcel of land situated near Morrill's Corner in that part of Portland that was formerly Deering, in the County of Cumberland and State of Maine, lying adjacent to and lying northwesterly of the above described premises, being bounded and described as follows:

Beginning at the northwesterly corner of land formerly of one Smith, on the southerly side of land formerly of Portland & Rochester Railroad, now the Portland Terminal Company, and running South 62° West 106 Rods to land of Portland Cemetery;

THENCE northwesterly by said Cemetery lot 30 Rods to the Old Kenney lot;

THENCE North 52 1/2° East by said Kenney's lot 49 Rods 2 Links to the Portland Terminal Company railroad land, formerly of the Portland & Rochester Railroad;

THENCE southeasterly by said Portland Terminal Company location 70 Rods to the first mentioned bounds or place of beginning.

EXCEPTING, however, from the above described premises two certain pieces or parcels of land, that first being 200 feet in length by 28 feet in width and lying parallel with the above-mentioned railroad, said parcel being conveyed by F.O.J. Bodge to Boston & Maine Railroad by warranty deed November 20, 1907, and recorded in the Cumberland County Registry of Deeds in Book 817, Page 29; and the second being a strip along a portion of the southeasterly and southwesterly side thereof, being conveyed by Lewis Lumber Co. to Central Maine Power Company by deed dated November 23, 1951, and recorded in said Registry in Book 2067, Page 107.

Both tracts are conveyed subject to the rights acquired for a sewer by the City of Portland by taking dated May 26, 1944, and recorded in the office of the City Clerk of the City of Portland, Maine, in Vol. 66, Page 263.

Also excepting the land described in the deed from Tilcon Minerals, Inc. to the City of Portland dated November 22, 1996, recorded in the Cumberland County Registry of Deeds in Book 12886, Page 212.

The premises are conveyed subject to the following rights and easements:

1. Rights and easements granted by Warren Bros. Roads Co. to Central Maine Power Company by instrument dated June 19, 1952, and recorded in the Cumberland County Registry of Deeds in Book 2097, Page 221.
2. Rights and easements granted by Warren Brothers Roads Company to Central Maine Power Company and New England Telephone and Telegraph Company by instrument dated January 27, 1967, and recorded in the Cumberland County Registry of Deeds in Book 2996, Page 102.
3. Rights and easements granted by Warren Brothers Co. to Portland Water District by instrument dated December 15, 1977, and recorded in the Cumberland County Registry of Deeds in Book 4150, Page 72.
4. Rights and easements granted by Warren Bros., a Div. of Ashland-Warren Inc. to Central Maine Power Company and New England Telephone and Telegraph Company by instrument dated January 31, 1978, and recorded in the Cumberland County Registry of Deeds in Book 4239, Page 326.
5. Rights and easements granted by Tilcon Minerals, Inc. to the City of Portland by deed dated November 22, 1996, and recorded in the Cumberland County Registry of Deeds in Book 12886, Page 214.

6. Rights and easements granted by Lewis Lumber Company to Central Maine Power Company by instrument dated November 23, 1951, and recorded in the Cumberland County Registry of Deeds in Book 2067, Page 106.
7. Rights, easements, and exceptions set forth in deed from Rosa Lewis to Warren Brothers Roads Company dated May 26, 1962, recorded in said Registry of Deeds in Book 2676, Page 74.

H:\DOCS\RATTEY\Pike\UNE 39662\EXHIBIT A.docx

Received
Recorded Register of Deeds
Mar 02, 2012 11:36:47A
Cumberland County
Pamela E. Lovley

QUITCLAIM DEED

THE STATE OF MAINE DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT successor in interest to the **STATE OF MAINE**, acting by and through the Acting Adjutant General pursuant to 37-B M.R.S.A. § 264, (the "Grantor"), FOR CONSIDERATION PAID, grants to the **UNIVERSITY OF NEW ENGLAND**, a Maine non-profit corporation, whose mailing address is 716 Stevens Avenue Portland, ME 04103 (the "Grantee"), certain real property, together with any improvements thereon, located at 760-780 Stevens Avenue, in the City of Portland, County of Cumberland and State of Maine, more particularly describes as follows:

A certain lot or parcel of land with the buildings thereon situated on the westerly side of Stevens Avenue in the City of Portland in said County of Cumberland and State of Maine, being the same premises conveyed by Elizur B. Forbes to Portland and Forest Avenue Rail Road Company by deed dated March 22, 1864, and recorded in Cumberland County Registry of Deeds in Book 326, Page 212, in which deed said premises were bounded as follows:

"A certain parcel of land fronting on the principal street at Stevens's Plains in Westbrook aforesaid, bounded as follows; beginning on said street at the southeast corner of land formerly of Jeremiah Beedle, now of Woodbury Polleys; thence running North sixty-four and a half degrees West five hundred seven and a half feet; thence North twenty-five and a half degrees East, thirty three feet; thence North sixty-three degrees West one hundred twenty-five feet; thence South seventy-five degrees forty-five minutes West seven hundred twenty feet; thence South sixty-four degrees east nine hundred ten and a half feet; thence North twenty and a quarter degrees east one hundred forty and a half feet; thence South sixty-six and a half degrees east, three hundred twenty four feet to the street or Stevens's Plains road before mentioned; thence North (by the line of the Street) nineteen degrees and three quarters east, two hundred ninety feet to the place of beginning - estimated to contain about nine and one quarter acres."

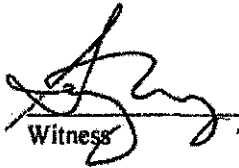
Meaning and intending to convey the same premises delineated on the Plan of Property in Portland, Maine made for the Adjutant General, Augusta, Maine prepared by H.I. & E.C. Jordan dated August 22, 1958.

For Grantor's source of title see: Warranty Deed from Portland Rail Road Company to the State of Maine dated October 14, 1940 and recorded at the York County Registry of Deeds in Book 1619, Page 299.

MAINE REAL ESTATE TAX PAID

By his signature hereon, the Acting Adjutant General certifies that the premises being conveyed in compliance with 37-B MRSA § 264, Section 6, Subsection 5 constitutes the Portland Armory, that he has designated an officer to inspect the premises, that he has determined the property to be unfit for military use, and has condemned the premises and furthermore that the premises are not being sold for less than appraised value as determined by a person licensed as a real estate appraiser under Title 32, chapter 123 and that the State of Maine Department of Defense, Veterans and Emergency Management is the successor in interest to the State Military Defense Commission of the State of Maine.

IN WITNESS WHEREOF, the State of Maine has caused this instrument to be executed in its name by Brigadier General Gerard F. Bolduc in his capacity as the Acting Adjutant General of the Maine National Guard, pursuant to 37-B M.R.S.A. § 264, this 11 day of June, 2015.

 JA.
Witness

STATE OF MAINE

By: 

Gerard F. Bolduc
Brigadier General, The Acting Adjutant General

State of Maine
County of Kennebec, ss

June 11, 2015

The personally appeared the above-named Brigadier General Gerard F. Bolduc, The Acting Adjutant General of the Maine National Guard, and acknowledged the foregoing instrument to be his free act and deed and, pursuant to authorization of the Maine Legislature as found in 37-B M.R.S.A. § 264, the free act and deed of the State of Maine.

Before me,



Notary Public/Attorney-at-Law

Commission Expires:

Print Name: STACY M. BRADBURY

Under authority of
37-B MRSA 390-C.
ATTORNEY AT LAW

Received
Recorded Register of Deeds
Jun 17, 2015 08:54:11A
Cumberland County
Nancy A. Lane

Abstract of Title to the following described land:

A certain lot or parcel of land with the building thereon, situated number 374 Stevens Avenue in that part of said Portland formerly Deering, and being bounded and described as follows:

~~Beginning at a stone post standing on the northerly side of College~~
Street, formerly Seminary Street, one hundred and fifty-eight (158) feet more or less from the northwesterly corner of said College Street and Stevens Avenue, and running north, twenty-four and one-fourth ($24 \frac{1}{4}$) degrees east, one hundred and forty-eight and one-half ($148 \frac{1}{2}$) feet to land now or late of Captain Sargent; thence south, seventy (70) degrees east by said Sargent's land one hundred and forty-one and one half ($141 \frac{1}{2}$) feet more or less to said Stevens Avenue; thence southerly by said Stevens Avenue seventy-four (74) feet to land now or late of Arabella W. Roberts; thence westerly by land now or late of said Roberts in a line parallel with said College Street one hundred (100) feet; thence southerly again by land now or late of said Roberts in a line parallel with said Stevens Avenue ninety (90) feet to said College Street; and thence westerly by said College Street to point of beginning; be any or all of said measurements more or less, or however otherwise bounded, measured or described.

Being the same premises conveyed by Lydia J. Snow to Thalia L. Clement, formerly Thalia L. Scamman, by warranty deed dated April 22, 1902, and recorded in Cumberland County Registry of Deeds, Book 716, Page 326.

bounded, measured or described.

Being the same premises conveyed by Lydia J. Snow to Thalia L. Clement, formerly Thalia L. Scamman, by warranty deed dated April 22, 1902, and recorded in Cumberland County Registry of Deeds, Book 716, Page 326.

Excepting that certain lot or parcel of land conveyed by the said Thalia L. Clement to Victor Brewster by warranty deed dated October 19, 1908, and recorded in Cumberland County Registry of Deeds, Book 831, Page 38.

WARRANTY OF DEEDS TO THE PORTLAND SAVINGS BANK

377-518.

(Elizur)

Eleazer B. Forbes to Joseph C. Snow;

Warranty; July 29, 1870;

Tract embracing lot described.

478-428.

Joseph C. Snow to Lydia J. Snow, wife;

Warranty; December 13, 1880;

Same tract as 377-518.

716-326.

Lydia J. Snow to Thalia L. Scamman;

Warranty, April 22, 1902.

721-20.

Thalia L. Scamman to Portland Savings Bank;

Mortgage; September 30, 1902; Discharged on margin

Mar. 2, 1905.

Thalia L. Clement to Portland Savings Bank, June 10, 1910.

Mortgage;

Discharged on margin September 22, 1914.

At the present time there are no encumbrances of record.

Dated at Portland, Maine, this fifth day of April,

A.D. 1919.

Quibbee Quibbee

Quit-Claim Deed

CORPORATION — WITH COVENANT

FROM

ALL SOULS UNIVERSALIST CHURCH OF
PORTLAND, MAINE
(ALL SOULS CHURCH PARISH)

TO

WESTBROOK SEMINARY AND JUNIOR COLLEGE

Dated February 9, 1940

State of Maine.

Cumberland ME Registry of Deeds

Received FEB 9 1940

at 2 H. 36, C. M., and

recorded in Book 1599 Page 276


REGISTER

FROM THE OFFICE OF

Bradley, Linnell, Nulty & Brown
192 Middle Street
Portland, Maine

MARTIN'S, PORTLAND, MAINE — LAW OFFICE SUPPLIES AND EQUIPMENT

MARTIN'S FORM NO. 9

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it, the said Westbrook Seminary and Junior College, its successors

~~And~~ and Assigns forever.

And the said Grantor Corporation does warrant with the said Westbrook Seminary and Junior College, its successors

~~And~~ and Assigns, that it will warrant and forever defend the premises to it, the said Grantee, its successors

~~And~~ and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said All Souls Universalist Church of Portland, Maine (All Souls Church Parish)

has caused this instrument to be sealed with its ~~corporate~~ seal

and signed in its corporate name by *Herbert B. Seal, President of its Board of Trustees,*

thereunto duly authorized, this *9th* day of February

in the year one thousand nine hundred and forty.

Signed, Sealed and Delivered
in presence of

E. F. Perkins

ALL SOULS UNIVERSALIST CHURCH OF
PORTLAND, MAINE
(ALL SOULS CHURCH PARISH)

By *Herbert B. Seal*
Its President of
Board of Trustees.

~~CORPORATE SEAL~~

State of Maine.

CUMBERLAND,

February 9, 1940.

Personally appeared the above named *Herbert B. Seal, President*
of the Board of Trustees of said Grantor Corporation
as aforesaid, and acknowledged the foregoing instrument to be his
free act and deed in his said capacity, and the free act and deed of
said corporation.



Before me,

Elliott P. Perkins
Justice of the Peace

W. L. Brown - 10/1/10
 10/1/10 - 10/1/10
 10/1/10 - 10/1/10
 10/1/10 - 10/1/10

Warranty Deed

FROM

WALTER G. WHITMAN

TO

WESTBROOK SEMINARY AND JUNIOR COLLEGE

Dated _____, 1940

State of Maine

Cumberland ss. Registry of Deeds

Received MAR 28 1940

at 4 H. 55 M. P. M., and

recorded in Book 1603 Page 98

Attest:
Charles C. Carville Register

FROM THE OFFICE OF

Bradley, Linnell, Nulty & Brown
 192 Middle Street
 Portland, Maine

MARTIN'S PORTLAND, MAINE - OFFICE FURNITURE AND SPECIALS
 TYPEWRITERS - ADDING MACHINES - FILING CABINETS - ETC - ETC
 MARTIN'S FORM NO. 1 - STANDARD REGISTRY FORM



Ende

Know all Men by these Presents

That ALL SOULS UNIVERSALIST CHURCH OF PORTLAND, MAINE, a religious society duly organized under the laws of the State of Maine and located at Portland, in the County of Cumberland and State of Maine, formerly known as and called ALL SOULS CHURCH PARISH,
~~a corporation organized and existing under the laws of the State~~

~~of~~

~~xxxxxxxxxxxx~~

~~xxxxxxxxxxxx~~

~~xxxxxxxxxxxx~~

in consideration of one dollar and other valuable consideration

paid by WESTBROOK SEMINARY AND JUNIOR COLLEGE, a corporation organized and existing under the laws of the State of Maine and located at said Portland,

the receipt whereof it does hereby acknowledge, does hereby remise,
 release, bargain, sell and convey, and forever quit-claim unto the said

Westbrook Seminary and Junior College, its successors

~~back~~ and assigns forever,

the following described premises situated in said Portland:

1. A certain lot or parcel of land situated in said Portland and bounded and described as follows: Beginning at an iron stake at the northwesterly corner of the lot of land conveyed by Ella Louise Fernald to Susie Whitman by deed dated May 11, 1908 and recorded in Cumberland County Registry of Deeds in Book 826, Page 72; thence by land conveyed to said Whitman as aforesaid and by land conveyed to said Whitman by Cordelia S. Pierce by deed dated August 3, 1892 and recorded in said Registry of Deeds, Book 593, Page 256, on a course of South sixty-four degrees forty-two minutes East (S. 64° 42' E.) two hundred thirty-three (233) feet to an iron stake; thence by other land of said Grantor on a course of North twenty-one degrees fifty-six minutes East (N. 21° 56' E.) sixty-eight and fifty-five hundredths (68.55) feet to the Southeasterly corner of the lot of land next hereinafter described and conveyed; thence by said lot of land next hereinafter described and conveyed on a course of North sixty-four degrees fifty-five minutes West (N. 64° 55' W.) two hundred twenty-one and three tenths (221.3) feet to other land of said Grantee; thence by land of said Grantee on a course of South thirty-one degrees forty-five minutes West (S. 31° 45' W.) sixty-eight and one tenth (68.1) feet to the point of beginning.

Said above described lot is subject to the life lease to Ella L. Perry as granted to her by All Souls Church Parish by lease dated October 17, 1924 and recorded in said Registry in Book 1204, Page 65.

2. A certain other lot or parcel of land in said Portland was devised and land which Cordelia S. Pierce devised to All Souls Universalist Church of Portland, Maine under the name of Society of All Souls Church by her last will and testament.

Westbrook Seminary and Junior College, its successors

hereby and assigns forever,

the following described premises situated in said Portland:

1. A certain lot or parcel of land situated in said Portland and bounded and described as follows: Beginning at an iron stake at the northwesterly corner of the lot of land conveyed by Ella Louise Fernald to Susie Whitman by deed dated May 11, 1908 and recorded in Cumberland County Registry of Deeds in Book 826, Page 72; thence by land conveyed to said Whitman as aforesaid and by land conveyed to said Whitman by Cordelia S. Pierce by deed dated August 3, 1892 and recorded in said Registry of Deeds, Book 593, Page 236, on a course of South sixty-four degrees forty-two minutes East (S. 64° 42' E.) two hundred thirty-three (233) feet to an iron stake; thence by other land of said Grantor on a course of North twenty-one degrees fifty-six minutes East (N. 21° 56' E.) sixty-eight and fifty-five hundredths (68.55) feet to the Southeasterly corner of the lot of land next hereinafter described and conveyed; thence by said lot of land next hereinafter described and conveyed on a course of North sixty-four degrees fifty-five minutes West (N. 64° 55' W.) two hundred twenty-one and three tenths (221.3) feet to other land of said Grantee; thence by land of said Grantee on a course of South thirty-one degrees forty-five minutes West (S. 31° 45' W.) sixty-eight and one tenth (68.1) feet to the point of beginning.

Said above described lot is subject to the life lease to Ella L. Perry as granted to her by All Souls Church Parish by lease dated October 17, 1924 and recorded in said Registry in Book 1204, Page 86.

2. A certain other lot or parcel of land in said Portland and bounded and described as follows: Beginning at a stake on the northerly line of the lot of land which Cordelia S. Pierce devised to All Souls Universalist Church of Portland, Maine under the name of Society of All Souls Church by her last will and testament, an abstract of which is recorded in Cumberland County Registry of Deeds in Book 757, Page 186, said stake being distant one hundred forty-five (145) feet westerly of the westerly line of Stevens Avenue as established by deed from Westbrook Seminary to the City of Portland dated May 29, 1917 and recorded in said Registry in Book 1086, Page 449; thence by other land of said Grantor on a course of South twenty-one degrees fifty-six minutes West (S. 21° 56' W.) sixty-eight and fifty-five hundredths (68.55) feet to the northerly line of the lot of land next hereinafter described and conveyed; thence by said lot of land next hereinafter described and conveyed on a course of North sixty-four degrees fifty-five minutes West (N. 64° 55' W.) two hundred twenty-one and three tenths (221.3) feet to land of said Grantee; thence by land of said Grantee on a course of North thirty-one degrees forty-five minutes East (N. 31° 45' E.) sixty-eight and one tenth (68.1) feet to a stake; thence by land of said Grantee on a course of South sixty-five degrees eight minutes East (S. 65° 08' E.) two hundred nine and sixty-four hundredths (209.64) feet to the point of beginning.

Said aforementioned courses are magnetic and of the date of 1935.

Being a part of the property devised to All Souls Universalist Church of Portland, Maine under the name of Society of All Souls Church by the last will and testament of Cordelia S. Pierce, an abstract thereof being recorded in said Registry of Deeds in Book 757, Page 136.

On Here and in With the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said

Westbrook Seminary and Junior College, its successors ~~heirs~~ and assigns, to its and their use and behoof forever.

And I do covenant with the said Grantee, its ^{successors} ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises, that they are free of all incumbrances; except as aforesaid;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will Warrant and Defend the same to the said Grantee, its ^{successors} ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons except as aforesaid.

In Witness Whereof, I, the said Walter G. Whitman,

and I, Grace B. Whitman,

wife of the said

Walter G. Whitman,

Joining in this deed as Grantor, and relinquishing and conveying all right by descent and all other rights in the above described premises, have hereunto set our hands and seals this 26th day of March in the year of our Lord one thousand nine hundred and forty.

Signed, Sealed and Delivered
in presence of

Sumner Y. Wheeler



Walter G. Whitman
Grace B. Whitman

premises, have not come
day of *March*

in the year of our Lord one thousand nine

hundred and forty.

Signed, Sealed and Delivered
in presence of

Sumner Y. Wheeler



Walter S. Whitman

Grace B. Whitman

COMMONWEALTH OF MASSACHUSETTS,
~~Essex, ss.~~

Essex,

ss.

March 26, 1940.

Personally appeared the above named

Walter G. Whitman

and acknowledged

the foregoing instrument to be his

free act and deed.

Before me,

Charles A. Metcalf

Justice of the Peace
Notary Public

My commission expires Apr. 28, 1940

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KNOW ALL MEN BY THESE PRESENTS, That the CITY OF PORTLAND, a body politic⁵ and corporate located in the County of Cumberland and State of Maine, in consideration of One Dollar (\$1.00) and other good and valuable considerations, paid by Westbrook College, a corporation organized and existing under the laws of the State of Maine and located at 716 Stevens Avenue in said Portland in said County and State, the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said Westbrook College, its successors and assigns forever, certain real estate located in said Portland, lying Westerly of College Street and Southerly of Bishop Street, bounded and described as follows:

Beginning at a point on the Northerly line of the land of Portland Railroad Company where the same intersects with land hereby conveyed and land formerly of George H. Smardon, commonly known as the Smardon Gravel Pit, formerly Read's Gravel Pit; thence from said point North 19° 30' East 28.68 rods; thence North 60° West Seven and thirty-two hundredths (7.32) rods to a point; thence South 74° 45' West Thirty-six and sixty-four hundredths (36.64) rods to a point; thence North 5° West Two and fifty-six hundredths (2.56) rods; thence North 30° West Twenty-four and four tenths (24.4) rods; thence South 65° West Forty-seven and twelve hundredths (47.12) rods to center of ditch; thence up the center of said ditch towards what is known as pasture Two Hundred Ninety-eight (298) feet; thence in a straight line to a point in line of Evergreen Cemetery indicated by a spruce stump, said stump being at the intersection between land of said Cemetery and land conveyed by Luther B. Roberts to the said City of Portland; thence from said stump North 80° 21' East Three Hundred Seventy-one and two tenths (372.2) feet to an angle; thence from said angle North 76° 8' East, Five Hundred Ninety-six and twenty-two hundredths (596.22) feet to an angle; thence from said last named angle at a right angle South 12° 52' East Seventy-five (75) feet to land of said Portland Railroad Company; thence about North 76° 8' East by said Portland Railroad Company's land to the point of beginning.

Also a certain other parcel of land, abutting the above described premises and bounded and described as follows: Beginning at the center of the ditch

Two Hundred Ninety-eight (298) feet; thence in a straight line to a point in line of Evergreen Cemetery indicated by a stump; said stump being on the intersection of the land of said Cemetery and land conveyed by Luther B. Roberts to the said City of Portland; thence from said stump North $80^{\circ} 21'$ East Three Hundred Seventy-one and two tenths (372.2) feet to an angle; thence from said angle North $76^{\circ} 8'$ East, Five Hundred Ninety-six and twenty-two hundredths (596.22) feet to an angle; thence from said last named angle at a right angle South $12^{\circ} 52'$ East Seventy-five (75) feet to land of said Portland Railroad Company; thence about North $76^{\circ} 8'$ East by said Portland Railroad Company's land to the point of beginning.

Also a certain other parcel of land, abutting the above described premises and bounded and described as follows: Beginning at the center of the ditch between the hereinabove described premises and the land hereby conveyed and in line of land now or formerly owned by Adam Wilson and running Southerly by land of said Wilson to the Westerly corner of land of Evergreen Cemetery; thence South Twenty-four (24°) degrees East by land of said Cemetery One hundred and seventy-five (175) feet to a point; thence by land formerly of Dennis F. Gulliver, and being the premises hereinabove described, in a straight line to a point in the center of said ditch; said point being Two Hundred Ninety-eight (298) feet from the point of beginning; thence down the center of said ditch to the point of beginning.

256

- 2 -

Excepting and reserving from the above described premises that portion thereof conveyed by the Grantor to Central Maine Power Company by deed dated February 26, 1967, recorded in said Registry of Deeds in Book 2989, Page 13.

This conveyance is made subject to the right-of-way or easement granted by the Grantor to Central Maine Power Company by deed dated December 13, 1951, recorded in said Registry of Deeds in Book 2055, Page 463.

Reserving to the Grantor, its successors and assigns, the right perpetually to enter at any and all times upon a strip of land fifty (50) feet in width lying equally on either side of the storm drain and upon a strip of land fifty (50) feet in width lying equally on either side of the brook presently located on the premises herein conveyed and the right perpetually to maintain, repair, rebuild, relocate, or remove said storm drain and brook with all necessary fixtures and appurtenances within said strips of land, granting to the Grantee, its successors and assigns, the use and enjoyment of said strips of land for such purposes only as will in no way interfere with the perpetual use thereof by the Grantor, its successors and assigns, for the purposes above mentioned, except that no buildings or structures may be erected within said strips of land. Also reserving to the Grantor, its successors and assigns, the right perpetually to enter at any and all times upon the premises herein conveyed for the purpose of access and egress by itself, its servants and/or agents to and from said strips of land.

Being the same premises conveyed to the Grantor by deed of James Gulliver, Administrator, d.b.n.c.t.a., of the Estate of Stephen Gulliver by deed dated August 23, 1935, recorded in said Registry of Deeds in Book 1476, Page 441.

Also a certain lot of land lying in the rear of College Street, in the City of Portland, bounded and described as follows, to wit:

Beginning at a point on the Northerly side line of College Street and at the Westerly corner of land belonging to Francis L. Stone; thence North 25° 22' east by land of said Stone eighty-seven and nineteen one hundredths (87.19) feet to land of the Portland Railroad Company; thence North 62° 26' west by land of said Portland Railroad Company four hundred and thirty-one and ninety three one hundredths (431.93) feet

Seventy-one and two tenths (372.2) feet to an angle; thence from said angle North $76^{\circ} 8'$ East, Five Hundred Ninety-six and twenty-two hundredths (596.22) feet to an angle; thence from said last named angle at a right angle South $12^{\circ} 52'$ East Seventy-five (75) feet to land of said Portland Railroad Company; thence about North $76^{\circ} 8'$ East by said Portland Railroad Company's land to the point of beginning.

Also a certain other parcel of land, abutting the above described premises and bounded and described as follows: Beginning at the center of the ditch between the hereinabove described premises and the land hereby conveyed and in line of land now or formerly owned by Adam Wilson and running Southerly by land of said Wilson to the Westerly corner of land of Evergreen Cemetery; thence South Twenty-four (24°) degrees East by land of said Cemetery One hundred and seventy-five (175) feet to a point; thence by land formerly of Dennis F. Gulliver, and being the premises hereinabove described, in a straight line to a point in the center of said ditch; said point being Two Hundred Ninety-eight (298) feet from the point of beginning; thence down the center of said ditch to the point of beginning.

Section 3 Financial Capacity



Office of Finance and Administration

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
U.S.A.
(207) 283-0171

Portland Campus
716 Stevens Avenue
Portland, ME 04103
U.S.A.
(207) 797-7261

www.une.edu

September 14, 2023

City of Portland
Planning Board
389 Congress St.
Portland, ME 04101

Dear Planning Board Members,

Please accept this letter as assurance that the University of New England (UNE) has the financial capacity to construct, equip, and operate the proposed Harold and Bibby Alfond Center for Health Sciences as well as the Bishop Street Connector Road.

From 2018 to 2023, UNE has experienced a total positive change in net assets of \$197.2 million. These surpluses have improved upon the University's liquidity position and overall financial capacity. Total net assets during the same period increased from \$320.5 million to \$517.7 million. This demonstrates UNE's continued commitment to sound management practices and financial sustainability.

To date, UNE has raised over \$39.4 million to construct and equip the proposed Harold and Bibby Alfond Center for Health Sciences. These fundraising efforts are continuing. Additionally, UNE holds A-level credit ratings from Moody's Investor Services and Fitch Ratings which has provided access to capital markets for project financing. The University issued the UNE Series 2021AB Revenue Bonds in December 2021 which included \$50 million dedicated to the design and construction of the Harold and Bibby Alfond Center for Health Sciences. Long range financial planning and cash flow projections provide further confirmation that the University can readily afford the construction and future direct and indirect operating costs of the proposed project.

Taking into consideration the funds raised, \$50 million of debt financing secured, and financial strength of the University, management is confident it has sufficient resources to complete the project.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jim Irwin", is written over a light blue horizontal line.

Jim Irwin
Senior Vice President for Finance and Administration
University of New England

Section 4 Technical Ability

Technical Ability

UNE has completed numerous projects on the campus in recent years, including:

- College of Pharmacy
- Innovation Hall
- Oral Health Center

UNE has retained a qualified team to permit, design, and construct the project, including:

Civil Engineer, Permitting & Survey

Site Design Associates
23 Whitney Way
Topsham, Maine 04086

Construction Manager

Ledgewood
27 Main St
South Portland, ME 04106

Section 5 Noise

Given the location and use of the connector drive, and the fact that it is an upgrade to an existing facility, there will be no noise impacts.

Section 6 Visual Quality and Scenice Character

The project generally follows the alignment of an existing drive. The short section where the new alignment will be created is undeveloped and industrial in nature. Therefore, there will be no impact on visual quality or scenic character.

Section 7 Wildlife and Fisheries

The project generally follows the alignment of an existing drive. An existing failing culvert will be replaced and installed with an earthen bottom per current standards. The attached letter has been sent to the Maine Department of Inland Fisheries and Wildlife.

Site Design Associates
Consulting Engineering and Land Planning

September 20, 2023

Mr. John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
353 Water Street, 41 SHS
Augusta, Maine 04333-0041

RE: Connector Drive Reconstruction
University of New England
83 College Street
Portland, Maine

Dear Mr. Perry:

On behalf of our client, University of New England (UNE), we are assisting with the preparation of a Maine Department of Environmental Protection Site Location of Development Act Minor Amendment application. The application is for reconstruction of an existing connector drive on UNE's Portland campus.

The goals of the reconstruction project include increase safety through the installation of sidewalks, call boxes and cameras, widening of the existing drive to enhance circulation and improve safety, and installation of modern and ordinance compliant lighting.

This letter and the enclosed location map serve as a means to notify you of the project and give you an opportunity to determine whether the proposed development would affect Endangered, Threatened, or Special Concern species or designated Essential or Significant Wildlife or Fisheries Habitats located in the vicinity of the site shown on the attached location map.

If you have any questions, please do not hesitate to contact me at tsaucier@sitedesignassociates.biz or 207-449-4275.

Thank you for your assistance and the generosity of your time to review this project.

Sincerely,
Site Design Associates



Tom Saucier, P.E.
President

Enclosure

83 COLLEGE STREET



The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

0.25
Miles
1 inch = 0.28 miles

Date: 8/30/2022
Time: 10:03:31 AM

Section 8 Historic Sites

There are no known historic or archaeological sites proximate to the connector drive. The attached letter has been forwarded to the Maine Historic Preservation Commission for confirmation.

Site Design Associates

Consulting Engineering and Land Planning

September 21, 2023

Mr. Kirk F. Mohny, SHPO
Maine Historical Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333-0065

RE: University of New England
Proposed connector Drive Improvements
83 College Street
Portland, Maine

On behalf of our client, University of New England (UNE), we are assisting with the preparation of Maine Department of Environmental Protection Natural Resources Protection Act and U.S. Army Corps of Engineers Permit applications. The applications are to improve an existing connector drive on UNE's Portland campus.

This letter and the enclosed location map serve as a means to notify you of the project and give you an opportunity to determine whether the proposed development would affect properties of religious and/or cultural significance. We request you research your data base to determine the presence of any sites in the area of historic architecture or archaeological significance, as defined by the National Historic Preservation Act of 1966.

Thank you for your assistance and the generosity of your time to review this project.

Sincerely,
Site Design Associates



Tom Saucier, P.E.
President

Enclosure

83 COLLEGE STREET



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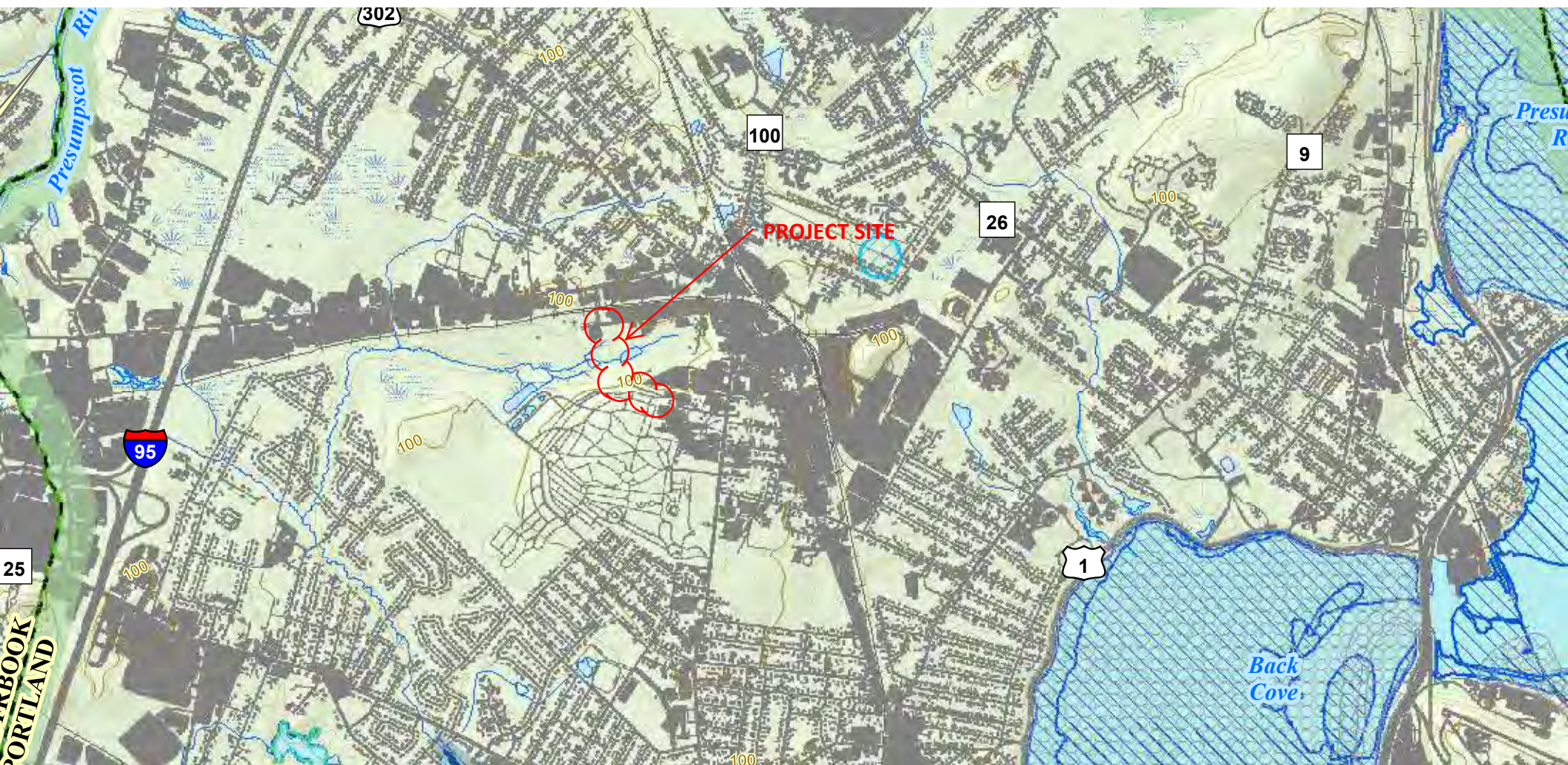
Miles

1 inch = 0.28 miles

Section 9 Unusual Natural Areas

Based on the attached mapping from the Maine Natural Areas Program, there are no high value plant and animal habitats in the vicinity of the project. The reconstruction will generally follow the alignment of the existing drive.

HIGH VALUE PLANT AND ANIMAL HABITATS



Section 10 Buffers

There are no buffers proposed.

Section 11 Soils

See the soils information included in the stormwater management report in section 12.

STORMWATER MANAGEMENT REPORT

UNE CONNECTOR DRIVE

83 College Street, Portland, Maine

September 22, 2023

Introduction

Site Design Associates (SDA) was retained to assist the University of New England (UNE) (Applicant) in the design and permitting for the reconstruction of the Connector Drive between the UNE Intermodal Transportation Facility (ITF) (currently under recently approved reconstruction) and the Harold and Bibby Alford Center for Health Sciences facility (CFHS) (currently under previously approved construction) at the UNE campus in Portland, Maine. The spur from the Connector Drive to College Street is also being reconstructed. The widening of the drive itself will result in 25,095 square feet of additional impervious area and a reduction of developed area by 4,707 square feet. However, the proposed project is considered an expansion of the redevelopment of the ITF because the drive is and always has been integral to the operation of the ITF. Together with the previously approved ITF reconstruction and reduction of impervious area, the overall project including the Connector Drive results in 8.9 acres of redeveloped area with a net reduction of 73,150 square feet of impervious area and a net reduction of 48,182 square feet of developed area.

This Stormwater Management Report assesses both pre-development and post-development peak runoff rates and stormwater treatment practices for the redevelopment area in accordance with the City of Portland land use code.

Methodology

The stormwater runoff analysis has been undertaken utilizing the HydroCAD Stormwater Modeling System software (Version 10.0) developed by the Applied Microcomputer Systems of Chocorua, New Hampshire. The program is based upon the TR-20 computer program and the TR-55 tabular method, both of which are based upon techniques developed by the USDA Soil Conservation Service. The analysis was undertaken for the 2, 10, and 25-year frequencies (3.1, 4.6, and 5.8 inches, respectively). Twenty-four hour storms with a Type III distribution were the basis for the analysis.

All storm drainage piping and stormwater treatment BMPs have been sized for the 25-year, 24-hour storm utilizing the HydroCAD program. Copies of the pre and post development HydroCAD output are included in Appendix A and Appendix B of this report, respectively.

Pre-Development Conditions

The existing Connector Drive currently runs between Bishop Street and College Street. The paved drive varies in width, but averages approximately 20 feet wide with varying width grassed shoulders on each side. Minor portions of the redevelopment area (primarily at the new tie-in points at either end) are currently undeveloped and forested. Multiple wetlands are located along

both sides of the existing drive. Once corroded 36-inch CMP stream crossing culvert is located approximately in the middle of the existing connector drive. As taken from the website of the *"Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey,"* the predominant soil types in the redevelopment area are Scantic silt loam (Sn) (HSG D), Buxton silt loam (Bu) (HSG C/D), and Windsor loamy sand (Wm) (HSG A). The USDA soil map is included in Appendix D of this report. The soil boundaries are shown on drawings D1.0 Pre-development Drainage Plan (West), D1.1 Pre-development Drainage Plan (East), D2.0 Post-development Drainage Plan (West) and D2.1 Post-development Drainage Plan (East) in Appendix F of this report.

Properly modeling the stormwater conditions for the Connector Drive reconstruction project require including portions of the previously approved predevelopment stormwater models from the CFHS project (subcatchments 4.1 – 4.4) and the ITF reconstruction project (subcatchments 7.0, 7.1, and 8.0). Generally, stormwater from the west side of the campus flows overland and into the large wetland east of the connector drive and then under the connector drive through the 36-inch CMP culvert, where it then continues to flow to the west through the wetland/stream complex and offsite at analysis point AP8. Stormwater from the west side of the campus flows directly into the wetland/stream complex west of the connector drive and offsite at analysis point AP8.

Stormwater peak runoff flow rates from the site for the 2, 10, and 25-year storm events were analyzed at analysis point AP8 and are summarized in Table 1 in the Stormwater Quantity section of this report. Pre-development HydroCAD calculations are included in Appendix A. Sheet D1.0 – Pre Development Drainage Plan (West) and D1.1 – Pre Development Drainage Plan (East) are included in Appendix F.

Post-Development Conditions

The proposed project includes the reconstruction and widening of the existing connector drive. The reconstructed drive will include a 24-foot wide paved drive with a curb and sidewalk on the west side. The reconstructed drive will generally follow the same path as the existing drive, except at the ends where it will connect directly to the ITF parking lot on the northwesterly end and directly to the CFHS facility on the southeasterly end. The spur that ties into College Street will also be reconstructed with a curb and a sidewalk on the west side.

The reconstruction and widening of the drive itself will result in 25,095 square feet of additional impervious area. However, the proposed project is considered an expansion of the redevelopment of the ITF because the drive is and always has been integral to the operation of the ITF. Together with the previously approved ITF reconstruction and reduction of impervious area, the overall project including the drive results in 8.9 acres of redeveloped area with a net reduction of 73,150 square feet of impervious area.

Stormwater will generally be collected in multiple catch basin and storm drain systems along the westerly curbed side of the drive. Stormwater from the east side will drain into a roadside ditch. Multiple culverts will be installed to allow water to cross under the drive. The existing corroded

36-inch CMP stream crossing culvert will be replaced with a 36-inch HDPE culvert with a buried invert.

Portions of the northwesterly and southeasterly ends of the connector drive will be collected in catch basin systems and directed to soil filters SF1 and SF3, which are currently being constructed as part of the Center of Health Sciences and ITF reconstruction projects, respectively. The soil filters were designed with additional capacity to treat the additional runoff from the reconstructed Connector Drive.

Post-development stormwater peak runoff flow rates for the 2, 10, and 25-year storm events at the analysis point are summarized in Table 1 in the Stormwater Quantity section of this report

Stormwater Quantity

Properly modeling the stormwater conditions for the Connector Drive reconstruction project require including portions of the previously approved post development stormwater models from the CFHS project (series 4 subcatchments) and the ITF reconstruction project (series 8 subcatchments).

The overall stormwater runoff volume from the campus is significantly reduced due to the reduction of 73,150 square feet of impervious area associated with the Connector Drive and ITF reconstruction projects and the additional reduction of 43,107 square feet from the CFHS. The total reduction of impervious area on campus results in 2.67 acres. Additional stormwater detention is provided within the four grassed underdrained soil filters (SF1-SF4) that were approved as part of the ITF reconstruction and CFHS projects.

Stormwater runoff from the ends of the Connector Drive are directed to soil filters SF1 and SF3, which were designed with additional capacity to handle the flow from the contributing areas of the reconstructed connector drive.

Stormwater runoff peak flow rates for the 2, 10, and 25-year storm events were analyzed at the analysis point for both the pre and post development conditions to verify that the peak flow rates are maintained or reduced in the post development condition. Table 1 below summarizes the peak flow rates at the analysis point.

Table 1			
Pre and Post Development Peak Runoff Rates (cfs)			
Storm Frequency	2-Year	10-Year	25-Year
AP8			
Pre-Development	25.5	42.1	56.0
Post-Development	14.4	35.9	51.6

As shown in Table 1, the peak runoff rate at the analysis point under the post-development conditions are less than the peak pre-development runoff rates for the 2, 10, and 25-year storm

events. Based on this analysis, we do not anticipate any adverse impact on downgradient drainage systems due to the proposed development.

Redevelopment and Stormwater Quality

The reconstruction and widening of the drive itself will result in 25,095 square feet of additional impervious area. However, the proposed project is considered an expansion of the redevelopment of the ITF because the drive is and always has been integral to the operation of the ITF. Together with the previously approved ITF reconstruction and reduction of impervious area, the overall project including the drive results in 8.9 acres of redeveloped area. Therefore, the City of Portland Redevelopment Standard is applicable to this project, which required treatment of 50% of the redeveloped impervious area. The Maine DEP SLODA redevelopment standard is also applicable to this project, which requires treatment of 50% of the redeveloped developed area.

The existing impervious area within the redevelopment window is 293,873 square feet. The proposed impervious area within the redevelopment window is 220,723 square feet, which results in a reduction of 73,150 square feet of impervious area in the redeveloped condition. See Sheets I1.0 – Pre Development Impervious Area Plan and I2.0 – Post Development Impervious Area Plan in Appendix F for the redevelopment impervious area calculations.

The existing developed area within the redevelopment window is 342,597 square feet. The proposed developed area within the redevelopment window is 294,415 square feet, which results in a reduction of 48,182 square feet of developed area in the redeveloped condition. Pollutant loading calculations have been performed for the pre and post development conditions within the redevelopment window in accordance with Maine DEP Chapter 500 methodology for redevelopment projects. It is assumed that a 2-foot wide grassed shoulder will be maintained beyond the edge of the drive and sidewalk and the remaining ditches and slopes will be returned to a meadow conditions and mowed not more than twice per year and considered undeveloped per Maine DEP Chapter 500 rules. Therefore, the total redeveloped developed area at the completion of the project will be 6.8± acres. The total impervious area will also be significantly reduced, therefore, the Ranked Impact Change (RIC) from the pre to post development condition is -0.8, which would typically mean that stormwater treatment is not required because the RIC is less than 0.0. However, since more than 5,000 square feet of non-roof impervious area will be reconstructed, the City of Portland requires that stormwater treatment is provided for a minimum of 50% of the total redeveloped impervious area. The Maine DEP also requires treatment of 50% of the overall redeveloped developed area for projects that trigger a SLODA permit. See Sheets R1.0 – Pre Development Pollutant Loading Plan and R2.0 – Post Development Pollutant Loading Plan in Appendix F for the redevelopment pollutant loading calculations.

Two grassed underdrained soil filters (SF3 and SF4) are being constructed to provide stormwater treatment at the site as part of the previously approved ITF project. Runoff from a small portion of the northwesterly end of the Connector Drive will be directed to SF3. Two grassed underdrained soil filters are being constructed as part of the previously approved CFHS project (SF1 and SF2). A portion of the southeasterly end of the Connector Drive will be directed to soil filter SF1. Soil filters SF1 and SF3 were designed with additional capacity to treat the contributing runoff from

the Connector Drive. The contributing areas to the stormwater filters are shown on Sheet D3.0 – Stormwater Treatment Plan in Appendix F.

The proposed stormwater management plan will collect and treat stormwater runoff from 111,315 square feet of impervious area, which results in treatment of 50.4% of the redeveloped impervious area associated with the ITF/Connector Drive project. The proposed stormwater management plan will collect and treat stormwater runoff from 155,184 square feet of developed area, which results in treatment of 52.7% of the redeveloped developed area associated with the ITF/Connector Drive project. Stormwater treatment calculations are summarized below in Table 2.

Table 2 Water Quality Calculations													
	Center for Health Sciences		Intermodal Transportation Facility and Connector Drive										
Subcatchment Area	Impervious Area (SF)	Landscaped Area (SF)	Impervious Area (Intermodal Trans. Facility) (SF)	Impervious Area (Connector Drive) (SF)	Landscaped Area (SF)	Developed Area (SF)	Filter Area Required ¹ (SF)	Filter Area Provided (SF)	Water Quality Volume Required ² (CF)	Water Quality Volume Provided (CF)	Sediment Forebay Volume required ³ (CF)	Sediment Forebay Volume Provided (CF)	BMP
TREATED AREAS													
4.3	37,812	21,557	0	7,405	440	7,845	2,701	3092	4,479	5,951	58	61	Soil Filter (SF1)
8.1			17,932	215	4,661	22,808	3,166	3,177	5,249	5,393	63	81	Soil Filter (SF3)
8.2			15,948	2,061	12,948	30,957							
8.3			15,232		2,355	17,587							
8.4			0		9,852	9,852	2,898	3,128	4,809	5,486	67	203	Soil Filter (SF4)
8.5			28,262		3,314	31,576							
8.6			14,522		735	15,257							
8.7			9,738		0	9,738							
8.8			0		9,564	9,564							
TOTAL TREATED			111,315		43,429	155,184							
TOTAL REDEVELOPED IMPERVIOUS AND DEVELOPED AREA			220,723			294,416							
PERCENT REDEVELOPED IMPERVIOUS & DEVELOPED AREA TREATED			50.4%			52.7%							
Notes:													
1. Filter area required is calculated at 5% of contributing impervious area and 2% of contributing landscaped area.													
2. Water quality volume required is calculated as 1" over the contributing impervious area plus 0.4" over the contributing landscaped area													
3. Sediment Volume Required is calculated as Sanded Area (acres) x 500lbs/acre x 90 lbs/CF x 10 storms/year.													
4. See Sheet I2.0 for Total Redeveloped Impervious Area.													

Urban Impaired Stream Standard

The project is located within the Capisic Brook Urban Impaired Stream (UIS) watershed, as identified by the Maine DEP. Previous projects and impervious area reductions on campus resulted in 7.30 banked UIS watershed credits to be applied to future projects (see previously approved ITF stormwater report). Since the Connector Drive project, by itself, results in a net increase of 25,095 square feet of impervious area from the previously approved ITF project, some of the banked UIS credits will be used to offset the development. The total landscaped area resulting from the Connector Drive project will be reduced, so no credit is required for the landscaped area associated with the Connector Drive.

Table 3 below summarizes the UIS mitigation credits used for this project based on the increase in impervious area per Maine DEP Chapter 501 standards.

Table 3 Urban Impaired Stream Compensation Credits Required				
Development Activity	Area (SF)	Area (AC)	Credit Per Acre	Credit Required
Creation of Non-Roof Impervious Area	25,095	0.58	0.5	0.29
Creation of Landscaped Area	0	0.00	0.5	0.00
Total Mitigation Credit Required				0.29
Total Campus UIS Mitigation Credit Achieved and Previously Banked for Future Development				7.30
Total Campus UIS Mitigation Credit Remaining and Banked for Future Development				7.01

As indicated in Table 3 above, the Connector Drive project requires 0.29 UIS mitigation credits. The table also shows the 7.30 previously achieved UIS credits from the recently permitted CFHS and ITF projects. The remaining total campus credit of 7.01 will be banked for potential future development projects onsite.

Erosion Control

BMPs such as stabilized construction entrances, silt fence and/or filter berms of erosion control mix, riprap pipe inlet and outlet protection, turf reinforcement matting, mulch, and permanent seeding will be used to prevent erosion and downstream migration of sediment during construction. The locations of temporary and permanent erosion control measures and erosion and sedimentation control notes and details are shown on the design drawing set.

Inspection & Maintenance

The University of New England will be responsible for maintaining the stormwater facilities for the project. An Inspection and Maintenance Plan is included as Appendix E. The plan includes a draft of a Stormwater Drainage System Maintenance Agreement, to be finalized and recorded as a condition of approval.

Conclusions

The HydroCAD calculations show that the peak runoff rates at the analysis points under post-development conditions are estimated to be less than the peak pre-development runoff rates for the 2, 10, and 25-year storm events. This meets the stormwater quantity requirements of the City of Portland ordinance. Previously approved stormwater treatment BMPs have been designed to treat stormwater runoff from more than 50% of the redeveloped impervious and more than 50% of the redeveloped developed area in compliance with the City of Portland ordinance and the Maine DEP Chapter 500 standards. Based on the information provided, no adverse impacts to downstream receiving bodies are anticipated.



SUPPORTING DATA AND CALCULATIONS

The following material presents calculations and copies of source material used during the analysis for this study.

Appendix A: Pre-Development HydroCAD Calculations

Appendix B: Post-Development HydroCAD Calculations

Appendix C: Stormwater BMP Spillway & Draindown Calculations

Appendix D: USDA NRCS Soil Map

Appendix E: Inspection & Maintenance Plan & City of Portland Maintenance Agreement

Appendix F: Drainage Plans

I1.0 – Pre Development Impervious Area Plan

I2.0 – Post Development Impervious Area Plan

R1.0 – Pre Development Pollutant Loading Plan

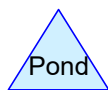
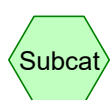
R2.0 – Post Development Pollutant Loading Plan

D1.0 – Pre Development Drainage Plan

D2.0 – Post Development Drainage Plan

D3.0 – Stormwater Treatment Plan

Appendix A:
Pre-Development HydroCAD Calculations



Routing Diagram for Pre-Development_ROAD

Prepared by Atlantic Resource Consultants, Printed 8/29/2023
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Pre-Development ROAD

Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

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Page 2

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=155,030 sf 42.26% Impervious Runoff Depth>0.59" Flow Length=520' Tc=13.8 min CN=66 Runoff=1.50 cfs 0.175 af
Subcatchment 4.2:	Runoff Area=154,566 sf 72.80% Impervious Runoff Depth>2.07" Tc=5.0 min CN=90 Runoff=8.84 cfs 0.613 af
Subcatchment 4.3:	Runoff Area=34,895 sf 0.00% Impervious Runoff Depth>1.14" Flow Length=80' Slope=0.0900 '/' Tc=10.0 min CN=77 Runoff=0.90 cfs 0.076 af
Subcatchment 4.4:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth>2.87" Tc=5.0 min CN=98 Runoff=1.78 cfs 0.137 af
Subcatchment 7.0:	Runoff Area=332,135 sf 2.58% Impervious Runoff Depth>1.07" Flow Length=270' Tc=49.4 min CN=76 Runoff=4.07 cfs 0.679 af
Subcatchment 7.1:	Runoff Area=23,135 sf 59.74% Impervious Runoff Depth>1.99" Tc=5.0 min CN=89 Runoff=1.27 cfs 0.088 af
Subcatchment 7.2:	Runoff Area=468,795 sf 1.99% Impervious Runoff Depth>1.18" Flow Length=330' Tc=50.7 min CN=78 Runoff=6.37 cfs 1.063 af
Subcatchment 7.3:	Runoff Area=79,357 sf 11.20% Impervious Runoff Depth>0.96" Flow Length=275' Tc=39.9 min CN=74 Runoff=0.96 cfs 0.146 af
Subcatchment 7.4:	Runoff Area=123,722 sf 9.46% Impervious Runoff Depth>0.37" Flow Length=235' Tc=29.3 min CN=60 Runoff=0.44 cfs 0.087 af
Subcatchment 8.0:	Runoff Area=336,062 sf 87.02% Impervious Runoff Depth>2.55" Tc=5.0 min CN=95 Runoff=22.54 cfs 1.636 af
Reach R1:	Avg. Flow Depth=0.24' Max Vel=2.90 fps Inflow=1.78 cfs 0.137 af n=0.022 L=300.0' S=0.0167 '/' Capacity=111.27 cfs Outflow=1.72 cfs 0.137 af
Reach R4.0: Stream	Avg. Flow Depth=0.53' Max Vel=4.64 fps Inflow=16.60 cfs 0.935 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=8.72 cfs 0.933 af
Reach R7.1: Stream	Avg. Flow Depth=1.22' Max Vel=4.93 fps Inflow=27.31 cfs 4.618 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=25.53 cfs 4.607 af
Reach R7.3: Stream	Avg. Flow Depth=0.46' Max Vel=4.62 fps Inflow=7.42 cfs 2.131 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=7.42 cfs 2.128 af
Reach R7.4: Stream	Avg. Flow Depth=0.07' Max Vel=2.05 fps Inflow=0.44 cfs 0.087 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=0.44 cfs 0.086 af
Pond C1: 15" CMP	Peak Elev=95.53' Storage=79 cf Inflow=0.90 cfs 0.076 af 15.0" Round Culvert n=0.025 L=20.0' S=0.0050 '/' Outflow=0.85 cfs 0.076 af

Pre-Development_ROAD

Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

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Pond C2: 8" HDPE

Peak Elev=98.04' Inflow=15.87 cfs 0.859 af
Primary=1.93 cfs 0.616 af Secondary=13.94 cfs 0.243 af Outflow=15.87 cfs 0.859 af

Pond C7.3:

Peak Elev=76.36' Inflow=7.42 cfs 2.131 af
36.0" Round Culvert w/ 6.0" inside fill n=0.025 L=55.0' S=0.0164 '/' Outflow=7.42 cfs 2.131 af

Pond P1: Wetland

Peak Elev=83.61' Storage=12,240 cf Inflow=10.17 cfs 1.996 af
Outflow=6.73 cfs 1.985 af

Pond W1: Wetland

Peak Elev=100.41' Storage=6,526 cf Inflow=2.63 cfs 0.312 af
Outflow=0.31 cfs 0.246 af

Pond W2: Wetland

Peak Elev=98.01' Storage=1,215 cf Inflow=8.96 cfs 0.859 af
Outflow=15.87 cfs 0.859 af

Link AP8:

Inflow=25.53 cfs 4.607 af
Primary=25.53 cfs 4.607 af

Total Runoff Area = 39.776 ac Runoff Volume = 4.700 af Average Runoff Depth = 1.42"
68.39% Pervious = 27.201 ac 31.61% Impervious = 12.575 ac

Pre-Development_ROAD

Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

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Page 4

Summary for Subcatchment 4.1:

Runoff = 1.50 cfs @ 12.23 hrs, Volume= 0.175 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	65,523	98	Impervious
	30,118	39	>75% Grass cover, Good, HSG A
	41,927	30	Woods, Good, HSG A
	17,462	77	Woods, Good, HSG D
	155,030	66	Weighted Average
	89,507		57.74% Pervious Area
	65,523		42.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	110	0.0140	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.10"
0.9	110	0.1600	2.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
0.5	300	0.0170	9.36	112.37	Trap/Vee/Rect Channel Flow, CD
					Bot.W=2.00' D=2.00' Z= 2.0 ' / Top.W=10.00'
					n= 0.022 Earth, clean & straight
13.8	520	Total			

Summary for Subcatchment 4.2:

Runoff = 8.84 cfs @ 12.07 hrs, Volume= 0.613 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	112,529	98	Impervious
	3,492	39	>75% Grass cover, Good, HSG A
	3,392	80	>75% Grass cover, Good, HSG D
	3,417	30	Brush, Good, HSG A
	31,736	77	Woods, Good, HSG D
	154,566	90	Weighted Average
	42,037		27.20% Pervious Area
	112,529		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Summary for Subcatchment 4.3:

Runoff = 0.90 cfs @ 12.15 hrs, Volume= 0.076 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
34,895	77	Woods, Good, HSG D
34,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	80	0.0900	0.13		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"

Summary for Subcatchment 4.4:

Runoff = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.0:

Runoff = 4.07 cfs @ 12.72 hrs, Volume= 0.679 af, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 8,574	98	Impervious
1,029	74	>75% Grass cover, Good, HSG C
19,605	65	Brush, Good, HSG C
48,667	73	Brush, Good, HSG D
1,406	70	Woods, Good, HSG C
252,854	77	Woods, Good, HSG D
332,135	76	Weighted Average
323,561		97.42% Pervious Area
8,574		2.58% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 1.27 cfs @ 12.07 hrs, Volume= 0.088 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 13,822	98	Impervious
5,192	74	>75% Grass cover, Good, HSG C
4,121	80	>75% Grass cover, Good, HSG D
23,135	89	Weighted Average
9,313		40.26% Pervious Area
13,822		59.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.2:

Runoff = 6.37 cfs @ 12.73 hrs, Volume= 1.063 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 9,333	98	Impervious
755	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
149,187	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
290,226	77	Woods, Good, HSG D
468,795	78	Weighted Average
459,462		98.01% Pervious Area
9,333		1.99% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 0.96 cfs @ 12.60 hrs, Volume= 0.146 af, Depth> 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
8,886	98	Impervious
1,670	39	>75% Grass cover, Good, HSG A
8,218	30	Woods, Good, HSG A
2,830	77	Woods, Good, HSG D
57,753	77	Woods, Good, HSG D
79,357	74	Weighted Average
70,471		88.80% Pervious Area
8,886		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 ' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 0.44 cfs @ 12.59 hrs, Volume= 0.087 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	11,706	98	Impervious
	5,496	39	>75% Grass cover, Good, HSG A
	2,160	74	>75% Grass cover, Good, HSG C
	45,486	30	Woods, Good, HSG A
	3,125	70	Woods, Good, HSG C
	55,749	77	Woods, Good, HSG D
	123,722	60	Weighted Average
	112,016		90.54% Pervious Area
	11,706		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 8.0:

Runoff = 22.54 cfs @ 12.07 hrs, Volume= 1.636 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	292,441	98	Impervious
	8,405	74	>75% Grass cover, Good, HSG C
	8,516	80	>75% Grass cover, Good, HSG D
	26,700	70	Woods, Good, HSG C
	336,062	95	Weighted Average
	43,621		12.98% Pervious Area
	292,441		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R1:

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2-Yr Storm event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af
 Outflow = 1.72 cfs @ 12.09 hrs, Volume= 0.137 af, Atten= 3%, Lag= 1.2 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 2.90 fps, Min. Travel Time= 1.7 min

Avg. Velocity = 0.83 fps, Avg. Travel Time= 6.0 min

Peak Storage= 178 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.24'

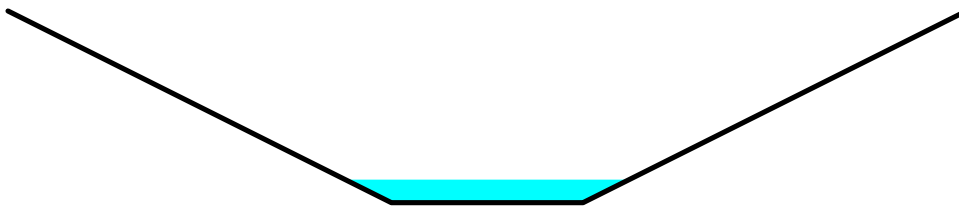
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 111.27 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 '/' Top Width= 10.00'

Length= 300.0' Slope= 0.0167 '/'

Inlet Invert= 108.00', Outlet Invert= 103.00'



Summary for Reach R4.0: Stream

Inflow Area = 8.481 ac, 54.95% Impervious, Inflow Depth > 1.32" for 2-Yr Storm event
Inflow = 16.60 cfs @ 12.12 hrs, Volume= 0.935 af
Outflow = 8.72 cfs @ 12.13 hrs, Volume= 0.933 af, Atten= 47%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.64 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.3 min

Peak Storage= 526 cf @ 12.13 hrs

Average Depth at Peak Storage= 0.53'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Summary for Reach R7.1: Stream

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 1.39" for 2-Yr Storm event
Inflow = 27.31 cfs @ 12.08 hrs, Volume= 4.618 af
Outflow = 25.53 cfs @ 12.11 hrs, Volume= 4.607 af, Atten= 6%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.93 fps, Min. Travel Time= 2.9 min

Avg. Velocity = 1.98 fps, Avg. Travel Time= 7.2 min

Peak Storage= 4,445 cf @ 12.11 hrs

Average Depth at Peak Storage= 1.22'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 1.21" for 2-Yr Storm event
Inflow = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af
Outflow = 7.42 cfs @ 12.88 hrs, Volume= 2.128 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.62 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 1.96 fps, Avg. Travel Time= 3.0 min

Peak Storage= 570 cf @ 12.88 hrs

Average Depth at Peak Storage= 0.46'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



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Summary for Reach R7.4: Stream

Inflow Area = 2.840 ac, 9.46% Impervious, Inflow Depth > 0.37" for 2-Yr Storm event
 Inflow = 0.44 cfs @ 12.59 hrs, Volume= 0.087 af
 Outflow = 0.44 cfs @ 12.60 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 2.05 fps, Min. Travel Time= 1.1 min

Avg. Velocity= 1.08 fps, Avg. Travel Time= 2.2 min

Peak Storage= 30 cf @ 12.60 hrs

Average Depth at Peak Storage= 0.07'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 ' / '

Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: 15" CMP**

Inflow Area = 0.801 ac, 0.00% Impervious, Inflow Depth > 1.14" for 2-Yr Storm event
 Inflow = 0.90 cfs @ 12.15 hrs, Volume= 0.076 af
 Outflow = 0.85 cfs @ 12.19 hrs, Volume= 0.076 af, Atten= 6%, Lag= 2.4 min
 Primary = 0.85 cfs @ 12.19 hrs, Volume= 0.076 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 95.53' @ 12.19 hrs Surf.Area= 446 sf Storage= 79 cf

Plug-Flow detention time= 0.5 min calculated for 0.076 af (100% of inflow)

Center-of-Mass det. time= 0.5 min (857.0 - 856.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	3,164 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916

Device	Routing	Invert	Outlet Devices
#1	Primary	94.90'	15.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900

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Inlet / Outlet Invert= 94.90' / 94.80' S= 0.0050 ' / n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=0.84 cfs @ 12.19 hrs HW=95.53' TW=94.99' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 0.84 cfs @ 2.00 fps)

Summary for Pond C2: 8" HDPE

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 1.34" for 2-Yr Storm event
 Inflow = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af
 Outflow = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.93 cfs @ 12.12 hrs, Volume= 0.616 af
 Secondary = 13.94 cfs @ 12.12 hrs, Volume= 0.243 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.04' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.60'	8.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.60' / 95.30' S= 0.0150 ' / n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.93 cfs @ 12.12 hrs HW=98.04' TW=95.03' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.93 cfs @ 5.52 fps)

Secondary OutFlow Max=13.94 cfs @ 12.12 hrs HW=98.04' TW=95.03' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 13.94 cfs @ 2.16 fps)

Summary for Pond C7.3:

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 1.21" for 2-Yr Storm event
 Inflow = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af
 Outflow = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.42 cfs @ 12.86 hrs, Volume= 2.131 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.36' @ 12.86 hrs

Flood Elev= 77.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.30'	36.0" Round Culvert w/ 6.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.80' / 73.90' S= 0.0164 ' / n= 0.025 Corrugated metal, Flow Area= 6.29 sf

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Primary OutFlow Max=7.42 cfs @ 12.86 hrs HW=76.36' TW=75.46' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 7.42 cfs @ 2.52 fps)**Summary for Pond P1: Wetland**

Inflow Area = 19.243 ac, 25.33% Impervious, Inflow Depth > 1.24" for 2-Yr Storm event
 Inflow = 10.17 cfs @ 12.14 hrs, Volume= 1.996 af
 Outflow = 6.73 cfs @ 12.96 hrs, Volume= 1.985 af, Atten= 34%, Lag= 49.5 min
 Primary = 6.73 cfs @ 12.96 hrs, Volume= 1.985 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 83.61' @ 12.96 hrs Surf.Area= 19,988 sf Storage= 12,240 cf

Plug-Flow detention time= 23.8 min calculated for 1.985 af (99% of inflow)
 Center-of-Mass det. time= 20.6 min (899.3 - 878.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=6.73 cfs @ 12.96 hrs HW=83.61' TW=76.36' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 6.73 cfs @ 3.08 fps)↑**1=Sharp-Crested Vee/Trap Weir** (Passes 6.73 cfs of 9.21 cfs potential flow)**Summary for Pond W1: Wetland**

Inflow Area = 4.132 ac, 50.27% Impervious, Inflow Depth > 0.91" for 2-Yr Storm event
 Inflow = 2.63 cfs @ 12.13 hrs, Volume= 0.312 af
 Outflow = 0.31 cfs @ 14.19 hrs, Volume= 0.246 af, Atten= 88%, Lag= 123.7 min
 Primary = 0.31 cfs @ 14.19 hrs, Volume= 0.246 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 100.41' @ 14.19 hrs Surf.Area= 8,342 sf Storage= 6,526 cf

Plug-Flow detention time= 279.0 min calculated for 0.245 af (79% of inflow)

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Center-of-Mass det. time= 191.2 min (1,028.8 - 837.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	99.40'	31,698 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022
102.50	17,962	697.0	7,988	31,698	41,371

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	6.0" Round Culvert L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Device 1	99.40'	18.0" Round Culvert L= 14.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.31 cfs @ 14.19 hrs HW=100.41' TW=97.24' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.31 cfs @ 1.56 fps)

2=Culvert (Passes 0.31 cfs of 2.15 cfs potential flow)

Summary for Pond W2: Wetland

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 1.34" for 2-Yr Storm event
 Inflow = 8.96 cfs @ 12.07 hrs, Volume= 0.859 af
 Outflow = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af, Atten= 0%, Lag= 2.8 min
 Primary = 15.87 cfs @ 12.12 hrs, Volume= 0.859 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.01' @ 12.11 hrs Surf.Area= 2,664 sf Storage= 1,215 cf

Plug-Flow detention time= 1.6 min calculated for 0.859 af (100% of inflow)

Center-of-Mass det. time= 1.3 min (871.5 - 870.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=98.01' TW=98.04' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Controls 0.00 cfs)

Summary for Link AP8:

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 1.39" for 2-Yr Storm event
Inflow = 25.53 cfs @ 12.11 hrs, Volume= 4.607 af
Primary = 25.53 cfs @ 12.11 hrs, Volume= 4.607 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1: Runoff Area=155,030 sf 42.26% Impervious Runoff Depth>1.46"
 Flow Length=520' Tc=13.8 min CN=66 Runoff=4.45 cfs 0.432 af

Subcatchment 4.2: Runoff Area=154,566 sf 72.80% Impervious Runoff Depth>3.49"
 Tc=5.0 min CN=90 Runoff=14.55 cfs 1.032 af

Subcatchment 4.3: Runoff Area=34,895 sf 0.00% Impervious Runoff Depth>2.29"
 Flow Length=80' Slope=0.0900 '/' Tc=10.0 min CN=77 Runoff=1.87 cfs 0.153 af

Subcatchment 4.4: Runoff Area=24,940 sf 100.00% Impervious Runoff Depth>4.36"
 Tc=5.0 min CN=98 Runoff=2.66 cfs 0.208 af

Subcatchment 7.0: Runoff Area=332,135 sf 2.58% Impervious Runoff Depth>2.18"
 Flow Length=270' Tc=49.4 min CN=76 Runoff=8.66 cfs 1.388 af

Subcatchment 7.1: Runoff Area=23,135 sf 59.74% Impervious Runoff Depth>3.39"
 Tc=5.0 min CN=89 Runoff=2.13 cfs 0.150 af

Subcatchment 7.2: Runoff Area=468,795 sf 1.99% Impervious Runoff Depth>2.35"
 Flow Length=330' Tc=50.7 min CN=78 Runoff=12.99 cfs 2.107 af

Subcatchment 7.3: Runoff Area=79,357 sf 11.20% Impervious Runoff Depth>2.03"
 Flow Length=275' Tc=39.9 min CN=74 Runoff=2.13 cfs 0.308 af

Subcatchment 7.4: Runoff Area=123,722 sf 9.46% Impervious Runoff Depth>1.06"
 Flow Length=235' Tc=29.3 min CN=60 Runoff=1.77 cfs 0.252 af

Subcatchment 8.0: Runoff Area=336,062 sf 87.02% Impervious Runoff Depth>4.02"
 Tc=5.0 min CN=95 Runoff=34.69 cfs 2.585 af

Reach R1: Avg. Flow Depth=0.30' Max Vel=3.31 fps Inflow=2.66 cfs 0.208 af
 n=0.022 L=300.0' S=0.0167 '/' Capacity=111.27 cfs Outflow=2.59 cfs 0.208 af

Reach R4.0: Stream Avg. Flow Depth=0.73' Max Vel=5.50 fps Inflow=18.05 cfs 1.646 af
 n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=14.98 cfs 1.644 af

Reach R7.1: Stream Avg. Flow Depth=1.61' Max Vel=5.67 fps Inflow=44.40 cfs 8.407 af
 n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=42.13 cfs 8.391 af

Reach R7.3: Stream Avg. Flow Depth=0.65' Max Vel=5.56 fps Inflow=13.21 cfs 4.036 af
 n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=13.21 cfs 4.032 af

Reach R7.4: Stream Avg. Flow Depth=0.16' Max Vel=3.45 fps Inflow=1.77 cfs 0.252 af
 n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=1.77 cfs 0.252 af

Pond C1: 15" CMP Peak Elev=95.80' Storage=271 cf Inflow=1.87 cfs 0.153 af
 15.0" Round Culvert n=0.025 L=20.0' S=0.0050 '/' Outflow=1.64 cfs 0.153 af

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Pond C2: 8" HDPE

Peak Elev=98.08' Inflow=16.90 cfs 1.493 af
Primary=1.94 cfs 0.957 af Secondary=14.95 cfs 0.536 af Outflow=16.90 cfs 1.493 af

Pond C7.3:

Peak Elev=76.84' Inflow=13.21 cfs 4.036 af
36.0" Round Culvert w/ 6.0" inside fill n=0.025 L=55.0' S=0.0164 '/' Outflow=13.21 cfs 4.036 af

Pond P1: Wetland

Peak Elev=84.26' Storage=27,654 cf Inflow=18.32 cfs 3.751 af
Outflow=11.79 cfs 3.727 af

Pond W1: Wetland

Peak Elev=101.30' Storage=14,973 cf Inflow=6.09 cfs 0.640 af
Outflow=0.51 cfs 0.462 af

Pond W2: Wetland

Peak Elev=98.21' Storage=1,832 cf Inflow=14.78 cfs 1.494 af
Outflow=16.90 cfs 1.493 af

Link AP8:

Inflow=42.13 cfs 8.391 af
Primary=42.13 cfs 8.391 af

Total Runoff Area = 39.776 ac Runoff Volume = 8.614 af Average Runoff Depth = 2.60"
68.39% Pervious = 27.201 ac 31.61% Impervious = 12.575 ac

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.1:

Runoff = 4.45 cfs @ 12.20 hrs, Volume= 0.432 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	65,523	98	Impervious
	30,118	39	>75% Grass cover, Good, HSG A
	41,927	30	Woods, Good, HSG A
	17,462	77	Woods, Good, HSG D
	155,030	66	Weighted Average
	89,507		57.74% Pervious Area
	65,523		42.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	110	0.0140	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.10"
0.9	110	0.1600	2.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
0.5	300	0.0170	9.36	112.37	Trap/Vee/Rect Channel Flow, CD
					Bot.W=2.00' D=2.00' Z= 2.0 ' / Top.W=10.00'
					n= 0.022 Earth, clean & straight
13.8	520	Total			

Summary for Subcatchment 4.2:

Runoff = 14.55 cfs @ 12.07 hrs, Volume= 1.032 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	112,529	98	Impervious
	3,492	39	>75% Grass cover, Good, HSG A
	3,392	80	>75% Grass cover, Good, HSG D
	3,417	30	Brush, Good, HSG A
	31,736	77	Woods, Good, HSG D
	154,566	90	Weighted Average
	42,037		27.20% Pervious Area
	112,529		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.3:

Runoff = 1.87 cfs @ 12.14 hrs, Volume= 0.153 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
34,895	77	Woods, Good, HSG D
34,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	80	0.0900	0.13		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"

Summary for Subcatchment 4.4:

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.0:

Runoff = 8.66 cfs @ 12.68 hrs, Volume= 1.388 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 8,574	98	Impervious
1,029	74	>75% Grass cover, Good, HSG C
19,605	65	Brush, Good, HSG C
48,667	73	Brush, Good, HSG D
1,406	70	Woods, Good, HSG C
252,854	77	Woods, Good, HSG D
332,135	76	Weighted Average
323,561		97.42% Pervious Area
8,574		2.58% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 2.13 cfs @ 12.07 hrs, Volume= 0.150 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 13,822	98	Impervious
5,192	74	>75% Grass cover, Good, HSG C
4,121	80	>75% Grass cover, Good, HSG D
23,135	89	Weighted Average
9,313		40.26% Pervious Area
13,822		59.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.2:

Runoff = 12.99 cfs @ 12.69 hrs, Volume= 2.107 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 9,333	98	Impervious
755	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
149,187	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
290,226	77	Woods, Good, HSG D
468,795	78	Weighted Average
459,462		98.01% Pervious Area
9,333		1.99% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 2.13 cfs @ 12.56 hrs, Volume= 0.308 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 8,886	98	Impervious
1,670	39	>75% Grass cover, Good, HSG A
8,218	30	Woods, Good, HSG A
2,830	77	Woods, Good, HSG D
57,753	77	Woods, Good, HSG D
79,357	74	Weighted Average
70,471		88.80% Pervious Area
8,886		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 1.77 cfs @ 12.47 hrs, Volume= 0.252 af, Depth> 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	11,706	98	Impervious
	5,496	39	>75% Grass cover, Good, HSG A
	2,160	74	>75% Grass cover, Good, HSG C
	45,486	30	Woods, Good, HSG A
	3,125	70	Woods, Good, HSG C
	55,749	77	Woods, Good, HSG D
	123,722	60	Weighted Average
	112,016		90.54% Pervious Area
	11,706		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 8.0:

Runoff = 34.69 cfs @ 12.07 hrs, Volume= 2.585 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	292,441	98	Impervious
	8,405	74	>75% Grass cover, Good, HSG C
	8,516	80	>75% Grass cover, Good, HSG D
	26,700	70	Woods, Good, HSG C
	336,062	95	Weighted Average
	43,621		12.98% Pervious Area
	292,441		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R1:

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth > 4.36" for 10-Yr Storm event
 Inflow = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af
 Outflow = 2.59 cfs @ 12.09 hrs, Volume= 0.208 af, Atten= 2%, Lag= 1.1 min

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.31 fps, Min. Travel Time= 1.5 min

Avg. Velocity = 0.94 fps, Avg. Travel Time= 5.3 min

Peak Storage= 235 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.30'

Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 111.27 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 '/' Top Width= 10.00'

Length= 300.0' Slope= 0.0167 '/'

Inlet Invert= 108.00', Outlet Invert= 103.00'



Summary for Reach R4.0: Stream

Inflow Area = 8.481 ac, 54.95% Impervious, Inflow Depth > 2.33" for 10-Yr Storm event

Inflow = 18.05 cfs @ 12.08 hrs, Volume= 1.646 af

Outflow = 14.98 cfs @ 12.11 hrs, Volume= 1.644 af, Atten= 17%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.50 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 1.73 fps, Avg. Travel Time= 2.7 min

Peak Storage= 762 cf @ 12.11 hrs

Average Depth at Peak Storage= 0.73'

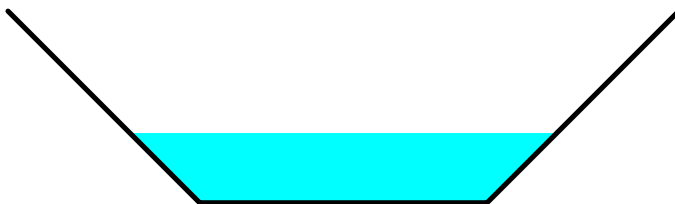
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Reach R7.1: Stream

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 2.54" for 10-Yr Storm event
Inflow = 44.40 cfs @ 12.08 hrs, Volume= 8.407 af
Outflow = 42.13 cfs @ 12.11 hrs, Volume= 8.391 af, Atten= 5%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 2.36 fps, Avg. Travel Time= 6.1 min

Peak Storage= 6,392 cf @ 12.11 hrs
Average Depth at Peak Storage= 1.61'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 860.0' Slope= 0.0093 '/'
Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 2.30" for 10-Yr Storm event
Inflow = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af
Outflow = 13.21 cfs @ 12.83 hrs, Volume= 4.032 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.56 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 2.5 min

Peak Storage= 844 cf @ 12.83 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 1.0 '/' Top Width= 7.00'
Length= 355.0' Slope= 0.0225 '/'
Inlet Invert= 75.00', Outlet Invert= 67.00'



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Summary for Reach R7.4: Stream

Inflow Area = 2.840 ac, 9.46% Impervious, Inflow Depth > 1.06" for 10-Yr Storm event
 Inflow = 1.77 cfs @ 12.47 hrs, Volume= 0.252 af
 Outflow = 1.77 cfs @ 12.48 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Max. Velocity= 3.45 fps, Min. Travel Time= 0.7 min
 Avg. Velocity= 1.47 fps, Avg. Travel Time= 1.6 min

Peak Storage= 72 cf @ 12.48 hrs
 Average Depth at Peak Storage= 0.16'
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
 Side Slope Z-value= 1.0 ' Top Width= 7.00'
 Length= 140.0' Slope= 0.0429 '
 Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: 15" CMP**

Inflow Area = 0.801 ac, 0.00% Impervious, Inflow Depth > 2.29" for 10-Yr Storm event
 Inflow = 1.87 cfs @ 12.14 hrs, Volume= 0.153 af
 Outflow = 1.64 cfs @ 12.20 hrs, Volume= 0.153 af, Atten= 12%, Lag= 3.6 min
 Primary = 1.64 cfs @ 12.20 hrs, Volume= 0.153 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.80' @ 12.20 hrs Surf.Area= 1,017 sf Storage= 271 cf

Plug-Flow detention time= 1.0 min calculated for 0.153 af (100% of inflow)
 Center-of-Mass det. time= 1.0 min (837.1 - 836.1)

Volume	Invert	Avail.Storage	Storage Description
#1	95.00'	3,164 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916

Device	Routing	Invert	Outlet Devices
#1	Primary	94.90'	15.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900

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Inlet / Outlet Invert= 94.90' / 94.80' S= 0.0050 ' / n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=1.64 cfs @ 12.20 hrs HW=95.80' TW=95.12' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 1.64 cfs @ 2.44 fps)

Summary for Pond C2: 8" HDPE

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 2.33" for 10-Yr Storm event
Inflow = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af
Outflow = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.08 hrs, Volume= 0.957 af
Secondary = 14.95 cfs @ 12.08 hrs, Volume= 0.536 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.08' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.60'	8.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.60' / 95.30' S= 0.0150 ' / n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.93 cfs @ 12.08 hrs HW=98.05' TW=95.19' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.93 cfs @ 5.53 fps)

Secondary OutFlow Max=14.29 cfs @ 12.08 hrs HW=98.06' TW=95.18' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 14.29 cfs @ 2.18 fps)

Summary for Pond C7.3:

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 2.30" for 10-Yr Storm event
Inflow = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af
Outflow = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af, Atten= 0%, Lag= 0.0 min
Primary = 13.21 cfs @ 12.82 hrs, Volume= 4.036 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.84' @ 12.82 hrs

Flood Elev= 77.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.30'	36.0" Round Culvert w/ 6.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.80' / 73.90' S= 0.0164 ' / n= 0.025 Corrugated metal, Flow Area= 6.29 sf

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Primary OutFlow Max=13.21 cfs @ 12.82 hrs HW=76.84' TW=75.65' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 13.21 cfs @ 3.04 fps)**Summary for Pond P1: Wetland**

Inflow Area = 19.243 ac, 25.33% Impervious, Inflow Depth > 2.34" for 10-Yr Storm event
 Inflow = 18.32 cfs @ 12.14 hrs, Volume= 3.751 af
 Outflow = 11.79 cfs @ 13.03 hrs, Volume= 3.727 af, Atten= 36%, Lag= 53.4 min
 Primary = 11.79 cfs @ 13.03 hrs, Volume= 3.727 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 84.26' @ 13.03 hrs Surf.Area= 26,516 sf Storage= 27,654 cf

Plug-Flow detention time= 28.6 min calculated for 3.724 af (99% of inflow)
 Center-of-Mass det. time= 25.1 min (892.8 - 867.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=11.79 cfs @ 13.03 hrs HW=84.26' TW=76.82' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 11.79 cfs @ 3.77 fps)↑**1=Sharp-Crested Vee/Trap Weir** (Passes 11.79 cfs of 22.04 cfs potential flow)**Summary for Pond W1: Wetland**

Inflow Area = 4.132 ac, 50.27% Impervious, Inflow Depth > 1.86" for 10-Yr Storm event
 Inflow = 6.09 cfs @ 12.16 hrs, Volume= 0.640 af
 Outflow = 0.51 cfs @ 14.88 hrs, Volume= 0.462 af, Atten= 92%, Lag= 163.3 min
 Primary = 0.51 cfs @ 14.88 hrs, Volume= 0.462 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 101.30' @ 14.88 hrs Surf.Area= 10,991 sf Storage= 14,973 cf

Plug-Flow detention time= 316.1 min calculated for 0.462 af (72% of inflow)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Center-of-Mass det. time= 216.5 min (1,046.8 - 830.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	99.40'	31,698 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022
102.50	17,962	697.0	7,988	31,698	41,371

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	6.0" Round Culvert L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Device 1	99.40'	18.0" Round Culvert L= 14.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.51 cfs @ 14.88 hrs HW=101.30' TW=97.30' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.51 cfs @ 2.58 fps)

2=Culvert (Passes 0.51 cfs of 5.85 cfs potential flow)

Summary for Pond W2: Wetland

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 2.33" for 10-Yr Storm event
 Inflow = 14.78 cfs @ 12.07 hrs, Volume= 1.494 af
 Outflow = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af, Atten= 0%, Lag= 0.6 min
 Primary = 16.90 cfs @ 12.08 hrs, Volume= 1.493 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.21' @ 12.11 hrs Surf.Area= 3,493 sf Storage= 1,832 cf

Plug-Flow detention time= 1.7 min calculated for 1.493 af (100% of inflow)

Center-of-Mass det. time= 1.4 min (872.4 - 871.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

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Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=10.66 cfs @ 12.08 hrs HW=98.19' TW=98.06' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Weir Controls 10.66 cfs @ 1.73 fps)

Summary for Link AP8:

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 2.53" for 10-Yr Storm event
Inflow = 42.13 cfs @ 12.11 hrs, Volume= 8.391 af
Primary = 42.13 cfs @ 12.11 hrs, Volume= 8.391 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1: Runoff Area=155,030 sf 42.26% Impervious Runoff Depth>2.29"
 Flow Length=520' Tc=13.8 min CN=66 Runoff=7.27 cfs 0.678 af

Subcatchment 4.2: Runoff Area=154,566 sf 72.80% Impervious Runoff Depth>4.65"
 Tc=5.0 min CN=90 Runoff=19.09 cfs 1.374 af

Subcatchment 4.3: Runoff Area=34,895 sf 0.00% Impervious Runoff Depth>3.30"
 Flow Length=80' Slope=0.0900 '/' Tc=10.0 min CN=77 Runoff=2.71 cfs 0.220 af

Subcatchment 4.4: Runoff Area=24,940 sf 100.00% Impervious Runoff Depth>5.56"
 Tc=5.0 min CN=98 Runoff=3.36 cfs 0.265 af

Subcatchment 7.0: Runoff Area=332,135 sf 2.58% Impervious Runoff Depth>3.17"
 Flow Length=270' Tc=49.4 min CN=76 Runoff=12.65 cfs 2.017 af

Subcatchment 7.1: Runoff Area=23,135 sf 59.74% Impervious Runoff Depth>4.54"
 Tc=5.0 min CN=89 Runoff=2.81 cfs 0.201 af

Subcatchment 7.2: Runoff Area=468,795 sf 1.99% Impervious Runoff Depth>3.37"
 Flow Length=330' Tc=50.7 min CN=78 Runoff=18.67 cfs 3.020 af

Subcatchment 7.3: Runoff Area=79,357 sf 11.20% Impervious Runoff Depth>2.99"
 Flow Length=275' Tc=39.9 min CN=74 Runoff=3.17 cfs 0.454 af

Subcatchment 7.4: Runoff Area=123,722 sf 9.46% Impervious Runoff Depth>1.78"
 Flow Length=235' Tc=29.3 min CN=60 Runoff=3.19 cfs 0.421 af

Subcatchment 8.0: Runoff Area=336,062 sf 87.02% Impervious Runoff Depth>5.21"
 Tc=5.0 min CN=95 Runoff=44.30 cfs 3.349 af

Reach R1: Avg. Flow Depth=0.34' Max Vel=3.56 fps Inflow=3.36 cfs 0.265 af
 n=0.022 L=300.0' S=0.0167 '/' Capacity=111.27 cfs Outflow=3.29 cfs 0.265 af

Reach R4.0: Stream Avg. Flow Depth=0.85' Max Vel=5.95 fps Inflow=21.45 cfs 2.195 af
 n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=19.41 cfs 2.192 af

Reach R7.1: Stream Avg. Flow Depth=1.88' Max Vel=6.11 fps Inflow=58.58 cfs 11.616 af
 n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=55.97 cfs 11.596 af

Reach R7.3: Stream Avg. Flow Depth=0.75' Max Vel=5.98 fps Inflow=16.81 cfs 5.632 af
 n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=16.81 cfs 5.628 af

Reach R7.4: Stream Avg. Flow Depth=0.23' Max Vel=4.27 fps Inflow=3.19 cfs 0.421 af
 n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=3.19 cfs 0.420 af

Pond C1: 15" CMP Peak Elev=95.98' Storage=501 cf Inflow=2.71 cfs 0.220 af
 15.0" Round Culvert n=0.025 L=20.0' S=0.0050 '/' Outflow=2.25 cfs 0.220 af

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Pond C2: 8" HDPE

Peak Elev=98.16' Inflow=19.70 cfs 1.974 af
Primary=1.98 cfs 1.130 af Secondary=17.72 cfs 0.844 af Outflow=19.70 cfs 1.974 af

Pond C7.3:

Peak Elev=77.11' Inflow=16.81 cfs 5.632 af
36.0" Round Culvert w/ 6.0" inside fill n=0.025 L=55.0' S=0.0164 '/' Outflow=16.81 cfs 5.632 af

Pond P1: Wetland

Peak Elev=84.85' Storage=44,412 cf Inflow=24.82 cfs 5.212 af
Outflow=14.87 cfs 5.178 af

Pond W1: Wetland

Peak Elev=102.01' Storage=23,799 cf Inflow=9.33 cfs 0.943 af
Outflow=0.62 cfs 0.601 af

Pond W2: Wetland

Peak Elev=98.37' Storage=2,472 cf Inflow=19.43 cfs 1.975 af
Outflow=19.70 cfs 1.974 af

Link AP8:

Inflow=55.97 cfs 11.596 af
Primary=55.97 cfs 11.596 af

Total Runoff Area = 39.776 ac Runoff Volume = 12.000 af Average Runoff Depth = 3.62"
68.39% Pervious = 27.201 ac 31.61% Impervious = 12.575 ac

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Summary for Subcatchment 4.1:

Runoff = 7.27 cfs @ 12.20 hrs, Volume= 0.678 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	65,523	98	Impervious
	30,118	39	>75% Grass cover, Good, HSG A
	41,927	30	Woods, Good, HSG A
	17,462	77	Woods, Good, HSG D
	155,030	66	Weighted Average
	89,507		57.74% Pervious Area
	65,523		42.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	110	0.0140	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.10"
0.9	110	0.1600	2.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
0.5	300	0.0170	9.36	112.37	Trap/Vee/Rect Channel Flow, CD
					Bot.W=2.00' D=2.00' Z= 2.0 ' Top.W=10.00'
					n= 0.022 Earth, clean & straight
13.8	520	Total			

Summary for Subcatchment 4.2:

Runoff = 19.09 cfs @ 12.07 hrs, Volume= 1.374 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	112,529	98	Impervious
	3,492	39	>75% Grass cover, Good, HSG A
	3,392	80	>75% Grass cover, Good, HSG D
	3,417	30	Brush, Good, HSG A
	31,736	77	Woods, Good, HSG D
	154,566	90	Weighted Average
	42,037		27.20% Pervious Area
	112,529		72.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.3:

Runoff = 2.71 cfs @ 12.14 hrs, Volume= 0.220 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
34,895	77	Woods, Good, HSG D
34,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	80	0.0900	0.13		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"

Summary for Subcatchment 4.4:

Runoff = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.0:

Runoff = 12.65 cfs @ 12.68 hrs, Volume= 2.017 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 8,574	98	Impervious
1,029	74	>75% Grass cover, Good, HSG C
19,605	65	Brush, Good, HSG C
48,667	73	Brush, Good, HSG D
1,406	70	Woods, Good, HSG C
252,854	77	Woods, Good, HSG D
332,135	76	Weighted Average
323,561		97.42% Pervious Area
8,574		2.58% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.201 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 13,822	98	Impervious
5,192	74	>75% Grass cover, Good, HSG C
4,121	80	>75% Grass cover, Good, HSG D
23,135	89	Weighted Average
9,313		40.26% Pervious Area
13,822		59.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 7.2:

Runoff = 18.67 cfs @ 12.68 hrs, Volume= 3.020 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 9,333	98	Impervious
755	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
149,187	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
290,226	77	Woods, Good, HSG D
468,795	78	Weighted Average
459,462		98.01% Pervious Area
9,333		1.99% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 3.17 cfs @ 12.55 hrs, Volume= 0.454 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 8,886	98	Impervious
1,670	39	>75% Grass cover, Good, HSG A
8,218	30	Woods, Good, HSG A
2,830	77	Woods, Good, HSG D
57,753	77	Woods, Good, HSG D
79,357	74	Weighted Average
70,471		88.80% Pervious Area
8,886		11.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 3.19 cfs @ 12.45 hrs, Volume= 0.421 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	11,706	98	Impervious
	5,496	39	>75% Grass cover, Good, HSG A
	2,160	74	>75% Grass cover, Good, HSG C
	45,486	30	Woods, Good, HSG A
	3,125	70	Woods, Good, HSG C
	55,749	77	Woods, Good, HSG D
	123,722	60	Weighted Average
	112,016		90.54% Pervious Area
	11,706		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 ' / Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 8.0:

Runoff = 44.30 cfs @ 12.07 hrs, Volume= 3.349 af, Depth> 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	292,441	98	Impervious
	8,405	74	>75% Grass cover, Good, HSG C
	8,516	80	>75% Grass cover, Good, HSG D
	26,700	70	Woods, Good, HSG C
	336,062	95	Weighted Average
	43,621		12.98% Pervious Area
	292,441		87.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R1:

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth > 5.56" for 25-Yr Storm event
 Inflow = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af
 Outflow = 3.29 cfs @ 12.09 hrs, Volume= 0.265 af, Atten= 2%, Lag= 1.0 min

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.56 fps, Min. Travel Time= 1.4 min

Avg. Velocity = 1.02 fps, Avg. Travel Time= 4.9 min

Peak Storage= 277 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.34'

Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 111.27 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 '/' Top Width= 10.00'

Length= 300.0' Slope= 0.0167 '/'

Inlet Invert= 108.00', Outlet Invert= 103.00'



Summary for Reach R4.0: Stream

Inflow Area = 8.481 ac, 54.95% Impervious, Inflow Depth > 3.11" for 25-Yr Storm event

Inflow = 21.45 cfs @ 12.10 hrs, Volume= 2.195 af

Outflow = 19.41 cfs @ 12.12 hrs, Volume= 2.192 af, Atten= 9%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.95 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 1.91 fps, Avg. Travel Time= 2.4 min

Peak Storage= 913 cf @ 12.12 hrs

Average Depth at Peak Storage= 0.85'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Reach R7.1: Stream

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 3.50" for 25-Yr Storm event
Inflow = 58.58 cfs @ 12.08 hrs, Volume= 11.616 af
Outflow = 55.97 cfs @ 12.10 hrs, Volume= 11.596 af, Atten= 4%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 6.11 fps, Min. Travel Time= 2.3 min

Avg. Velocity = 2.61 fps, Avg. Travel Time= 5.5 min

Peak Storage= 7,871 cf @ 12.10 hrs

Average Depth at Peak Storage= 1.88'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 3.21" for 25-Yr Storm event
Inflow = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af
Outflow = 16.81 cfs @ 12.81 hrs, Volume= 5.628 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.98 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 2.70 fps, Avg. Travel Time= 2.2 min

Peak Storage= 998 cf @ 12.81 hrs

Average Depth at Peak Storage= 0.75'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Reach R7.4: Stream

Inflow Area = 2.840 ac, 9.46% Impervious, Inflow Depth > 1.78" for 25-Yr Storm event
 Inflow = 3.19 cfs @ 12.45 hrs, Volume= 0.421 af
 Outflow = 3.19 cfs @ 12.46 hrs, Volume= 0.420 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.27 fps, Min. Travel Time= 0.5 min

Avg. Velocity= 1.71 fps, Avg. Travel Time= 1.4 min

Peak Storage= 104 cf @ 12.46 hrs

Average Depth at Peak Storage= 0.23'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 ' / '

Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: 15" CMP**

Inflow Area = 0.801 ac, 0.00% Impervious, Inflow Depth > 3.30" for 25-Yr Storm event
 Inflow = 2.71 cfs @ 12.14 hrs, Volume= 0.220 af
 Outflow = 2.25 cfs @ 12.21 hrs, Volume= 0.220 af, Atten= 17%, Lag= 4.4 min
 Primary = 2.25 cfs @ 12.21 hrs, Volume= 0.220 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 95.98' @ 12.21 hrs Surf.Area= 1,533 sf Storage= 501 cf

Plug-Flow detention time= 1.4 min calculated for 0.220 af (100% of inflow)

Center-of-Mass det. time= 1.4 min (827.0 - 825.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	3,164 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916

Device	Routing	Invert	Outlet Devices
#1	Primary	94.90'	15.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900

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Inlet / Outlet Invert= 94.90' / 94.80' S= 0.0050 '/' Cc= 0.900
n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=2.25 cfs @ 12.21 hrs HW=95.98' TW=95.22' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.25 cfs @ 2.67 fps)

Summary for Pond C2: 8" HDPE

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 3.08" for 25-Yr Storm event
Inflow = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af
Outflow = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af, Atten= 0%, Lag= 0.0 min
Primary = 1.98 cfs @ 12.10 hrs, Volume= 1.130 af
Secondary = 17.72 cfs @ 12.10 hrs, Volume= 0.844 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.16' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.60'	8.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.60' / 95.30' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.98 cfs @ 12.10 hrs HW=98.15' TW=95.33' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.98 cfs @ 5.66 fps)

Secondary OutFlow Max=17.45 cfs @ 12.10 hrs HW=98.15' TW=95.33' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 17.45 cfs @ 2.33 fps)

Summary for Pond C7.3:

Inflow Area = 21.065 ac, 24.11% Impervious, Inflow Depth > 3.21" for 25-Yr Storm event
Inflow = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af
Outflow = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af, Atten= 0%, Lag= 0.0 min
Primary = 16.81 cfs @ 12.80 hrs, Volume= 5.632 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.11' @ 12.80 hrs

Flood Elev= 77.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.30'	36.0" Round Culvert w/ 6.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 74.80' / 73.90' S= 0.0164 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.29 sf

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Primary OutFlow Max=16.81 cfs @ 12.80 hrs HW=77.11' TW=75.75' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 16.81 cfs @ 3.32 fps)**Summary for Pond P1: Wetland**

Inflow Area = 19.243 ac, 25.33% Impervious, Inflow Depth > 3.25" for 25-Yr Storm event
 Inflow = 24.82 cfs @ 12.12 hrs, Volume= 5.212 af
 Outflow = 14.87 cfs @ 13.10 hrs, Volume= 5.178 af, Atten= 40%, Lag= 58.4 min
 Primary = 14.87 cfs @ 13.10 hrs, Volume= 5.178 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 84.85' @ 13.10 hrs Surf.Area= 30,764 sf Storage= 44,412 cf

Plug-Flow detention time= 33.6 min calculated for 5.178 af (99% of inflow)
 Center-of-Mass det. time= 29.9 min (889.2 - 859.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=14.87 cfs @ 13.10 hrs HW=84.85' TW=77.08' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 14.87 cfs @ 4.73 fps)↑**1=Sharp-Crested Vee/Trap Weir** (Passes 14.87 cfs of 37.46 cfs potential flow)**Summary for Pond W1: Wetland**

Inflow Area = 4.132 ac, 50.27% Impervious, Inflow Depth > 2.74" for 25-Yr Storm event
 Inflow = 9.33 cfs @ 12.16 hrs, Volume= 0.943 af
 Outflow = 0.62 cfs @ 15.38 hrs, Volume= 0.601 af, Atten= 93%, Lag= 192.9 min
 Primary = 0.62 cfs @ 15.38 hrs, Volume= 0.601 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 102.01' @ 15.38 hrs Surf.Area= 14,118 sf Storage= 23,799 cf

Plug-Flow detention time= 338.3 min calculated for 0.600 af (64% of inflow)

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Center-of-Mass det. time= 227.5 min (1,052.0 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	31,698 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022
102.50	17,962	697.0	7,988	31,698	41,371

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	6.0" Round Culvert L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Device 1	99.40'	18.0" Round Culvert L= 14.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 99.40' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.62 cfs @ 15.38 hrs HW=102.01' TW=97.33' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.62 cfs @ 3.16 fps)

2=Culvert (Passes 0.62 cfs of 8.84 cfs potential flow)

Summary for Pond W2: Wetland

Inflow Area = 7.680 ac, 60.68% Impervious, Inflow Depth > 3.09" for 25-Yr Storm event
 Inflow = 19.43 cfs @ 12.07 hrs, Volume= 1.975 af
 Outflow = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af, Atten= 0%, Lag= 1.8 min
 Primary = 19.70 cfs @ 12.10 hrs, Volume= 1.974 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 98.37' @ 12.11 hrs Surf.Area= 4,260 sf Storage= 2,472 cf

Plug-Flow detention time= 1.8 min calculated for 1.973 af (100% of inflow)

Center-of-Mass det. time= 1.6 min (867.4 - 865.8)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

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Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=15.86 cfs @ 12.10 hrs HW=98.37' TW=98.15' (Dynamic Tailwater)

↑1=Custom Weir/Orifice (Weir Controls 15.86 cfs @ 2.15 fps)

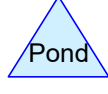
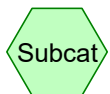
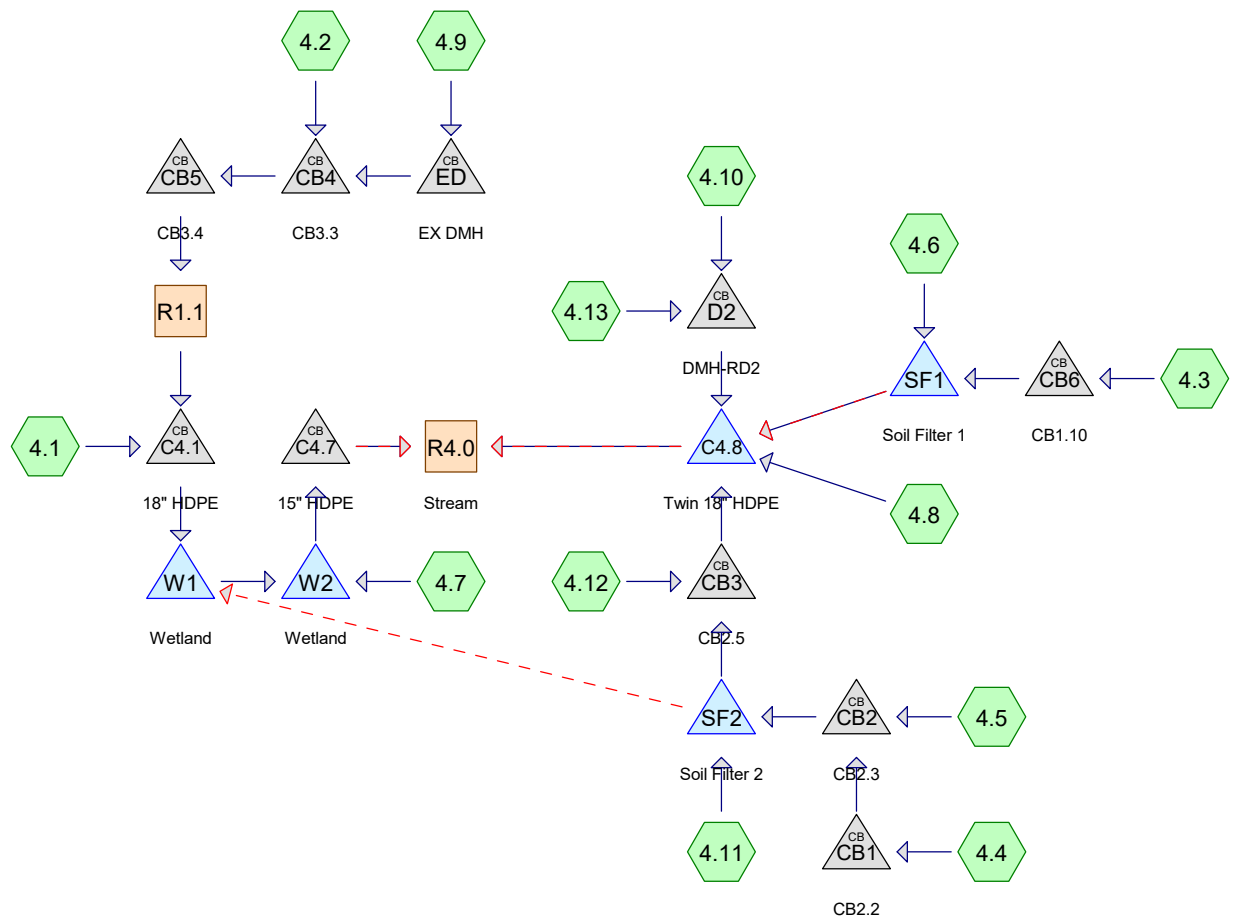
Summary for Link AP8:

Inflow Area = 39.776 ac, 31.61% Impervious, Inflow Depth > 3.50" for 25-Yr Storm event
Inflow = 55.97 cfs @ 12.10 hrs, Volume= 11.596 af
Primary = 55.97 cfs @ 12.10 hrs, Volume= 11.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Appendix B:

Post-Development HydroCAD Calculations



Routing Diagram for Post-Development EAST
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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Time span=0.00-50.00 hrs, dt=0.02 hrs, 2501 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=101,414 sf 28.81% Impervious Runoff Depth=0.31" Flow Length=338' Tc=8.3 min CN=58 Runoff=0.34 cfs 0.060 af
Subcatchment 4.10:	Runoff Area=38,900 sf 100.00% Impervious Runoff Depth=2.87" Tc=5.0 min CN=98 Runoff=2.77 cfs 0.213 af
Subcatchment 4.11:	Runoff Area=15,561 sf 10.00% Impervious Runoff Depth=1.46" Tc=5.0 min CN=82 Runoff=0.63 cfs 0.043 af
Subcatchment 4.12:	Runoff Area=30,195 sf 94.29% Impervious Runoff Depth=2.76" Tc=5.0 min CN=97 Runoff=2.12 cfs 0.159 af
Subcatchment 4.13:	Runoff Area=7,038 sf 10.83% Impervious Runoff Depth=0.03" Tc=5.0 min CN=45 Runoff=0.00 cfs 0.000 af
Subcatchment 4.2:	Runoff Area=64,010 sf 24.27% Impervious Runoff Depth=0.17" Tc=5.0 min CN=53 Runoff=0.08 cfs 0.021 af
Subcatchment 4.3:	Runoff Area=57,153 sf 79.12% Impervious Runoff Depth=2.08" Tc=5.0 min CN=90 Runoff=3.27 cfs 0.227 af
Subcatchment 4.4:	Runoff Area=26,029 sf 94.93% Impervious Runoff Depth=2.65" Tc=5.0 min CN=96 Runoff=1.79 cfs 0.132 af
Subcatchment 4.5:	Runoff Area=23,192 sf 94.13% Impervious Runoff Depth=2.55" Tc=5.0 min CN=95 Runoff=1.56 cfs 0.113 af
Subcatchment 4.6:	Runoff Area=10,062 sf 0.00% Impervious Runoff Depth=1.20" Tc=5.0 min CN=78 Runoff=0.33 cfs 0.023 af
Subcatchment 4.7:	Runoff Area=45,242 sf 0.00% Impervious Runoff Depth=1.03" Tc=5.0 min CN=75 Runoff=1.23 cfs 0.089 af
Subcatchment 4.8:	Runoff Area=25,845 sf 0.00% Impervious Runoff Depth=1.14" Tc=5.0 min CN=77 Runoff=0.80 cfs 0.056 af
Subcatchment 4.9:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth=2.87" Tc=5.0 min CN=98 Runoff=1.78 cfs 0.137 af
Reach R1.1:	Avg. Flow Depth=0.22' Max Vel=2.93 fps Inflow=1.78 cfs 0.158 af n=0.030 L=300.0' S=0.0367 '/' Capacity=160.95 cfs Outflow=1.72 cfs 0.158 af
Reach R4.0: Stream	Avg. Flow Depth=0.45' Max Vel=4.25 fps Inflow=6.69 cfs 1.274 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=6.65 cfs 1.274 af
Pond C4.1: 18" HDPE	Peak Elev=102.31' Inflow=1.87 cfs 0.217 af 18.0" Round Culvert n=0.013 L=28.0' S=0.0571 '/' Outflow=1.87 cfs 0.217 af

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Pond C4.7: 15" HDPE

Peak Elev=95.92' Inflow=1.61 cfs 0.306 af
 Primary=1.61 cfs 0.306 af Secondary=0.00 cfs 0.000 af Outflow=1.61 cfs 0.306 af

Pond C4.8: Twin 18" HDPE

Peak Elev=96.15' Storage=792 cf Inflow=5.81 cfs 0.968 af
 Primary=5.08 cfs 0.968 af Secondary=0.00 cfs 0.000 af Outflow=5.08 cfs 0.968 af

Pond CB1: CB2.2

Peak Elev=102.37' Inflow=1.79 cfs 0.132 af
 15.0" Round Culvert n=0.013 L=110.0' S=0.0050 '/' Outflow=1.79 cfs 0.132 af

Pond CB2: CB2.3

Peak Elev=101.75' Inflow=3.34 cfs 0.245 af
 18.0" Round Culvert n=0.013 L=155.0' S=0.0050 '/' Outflow=3.34 cfs 0.245 af

Pond CB3: CB2.5

Peak Elev=96.93' Inflow=2.18 cfs 0.448 af
 18.0" Round Culvert n=0.013 L=145.0' S=0.0050 '/' Outflow=2.18 cfs 0.448 af

Pond CB4: CB3.3

Peak Elev=122.07' Inflow=1.78 cfs 0.158 af
 15.0" Round Culvert n=0.013 L=102.0' S=0.0200 '/' Outflow=1.78 cfs 0.158 af

Pond CB5: CB3.4

Peak Elev=119.93' Inflow=1.78 cfs 0.158 af
 15.0" Round Culvert n=0.013 L=120.0' S=0.0607 '/' Outflow=1.78 cfs 0.158 af

Pond CB6: CB1.10

Peak Elev=100.25' Inflow=3.27 cfs 0.227 af
 15.0" Round Culvert n=0.013 L=21.0' S=0.0052 '/' Outflow=3.27 cfs 0.227 af

Pond D2: DMH-RD2

Peak Elev=107.85' Inflow=2.77 cfs 0.214 af
 15.0" Round Culvert n=0.013 L=280.0' S=0.0357 '/' Outflow=2.77 cfs 0.214 af

Pond ED: EX DMH

Peak Elev=125.08' Inflow=1.78 cfs 0.137 af
 10.0" Round Culvert n=0.013 L=48.0' S=0.0260 '/' Outflow=1.78 cfs 0.137 af

Pond SF1: Soil Filter 1

Peak Elev=99.54' Storage=6,147 cf Inflow=3.60 cfs 0.250 af
 Primary=0.25 cfs 0.250 af Secondary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.250 af

Pond SF2: Soil Filter 2

Peak Elev=100.64' Storage=5,706 cf Inflow=3.97 cfs 0.288 af
 Primary=1.16 cfs 0.288 af Secondary=0.00 cfs 0.000 af Outflow=1.16 cfs 0.288 af

Pond W1: Wetland

Peak Elev=99.84' Storage=2,144 cf Inflow=1.87 cfs 0.217 af
 18.0" Round Culvert n=0.013 L=80.0' S=0.0113 '/' Outflow=0.76 cfs 0.217 af

Pond W2: Wetland

Peak Elev=97.24' Storage=87 cf Inflow=1.63 cfs 0.306 af
 Outflow=1.61 cfs 0.306 af

Total Runoff Area = 10.780 ac Runoff Volume = 1.274 af Average Runoff Depth = 1.42"
50.78% Pervious = 5.474 ac 49.22% Impervious = 5.306 ac

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Summary for Subcatchment 4.1:

Runoff = 0.34 cfs @ 12.31 hrs, Volume= 0.060 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 29,214	98	Impervious
26,743	39	>75% Grass cover, Good, HSG A
2,976	80	>75% Grass cover, Good, HSG D
10,780	77	Woods, Good, HSG D
31,701	30	Woods, Good, HSG A
101,414	58	Weighted Average
72,200		71.19% Pervious Area
29,214		28.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	40	0.1000	0.12		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"
2.3	30	0.5000	0.22		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	95	0.0260	8.47	135.53	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
0.1	28	0.0180	7.98	14.09	Pipe Channel, DE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.2	145	0.0510	11.86	189.82	Trap/Vee/Rect Channel Flow, EF Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
8.3	338	Total			

Summary for Subcatchment 4.10:

Runoff = 2.77 cfs @ 12.07 hrs, Volume= 0.213 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 38,900	98	Impervious
38,900		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 4.11:

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 0.043 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	1,556	98	Impervious
	14,005	80	>75% Grass cover, Good, HSG D
	15,561	82	Weighted Average
	14,005		90.00% Pervious Area
	1,556		10.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.12:

Runoff = 2.12 cfs @ 12.07 hrs, Volume= 0.159 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	28,472	98	Impervious
	1,723	80	>75% Grass cover, Good, HSG D
	30,195	97	Weighted Average
	1,723		5.71% Pervious Area
	28,472		94.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.13:

Runoff = 0.00 cfs @ 15.60 hrs, Volume= 0.000 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	762	98	Impervious
	6,276	39	>75% Grass cover, Good, HSG A
	7,038	45	Weighted Average
	6,276		89.17% Pervious Area
	762		10.83% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.2:

Runoff = 0.08 cfs @ 12.39 hrs, Volume= 0.021 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 15,536	98	Impervious
48,474	39	>75% Grass cover, Good, HSG A
64,010	53	Weighted Average
48,474		75.73% Pervious Area
15,536		24.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.3:

Runoff = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 45,217	98	Impervious
5,466	39	>75% Grass cover, Good, HSG A
6,470	80	>75% Grass cover, Good, HSG D
57,153	90	Weighted Average
11,936		20.88% Pervious Area
45,217		79.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.4:

Runoff = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	24,710	98	Impervious
	821	39	>75% Grass cover, Good, HSG A
	498	80	>75% Grass cover, Good, HSG D
	26,029	96	Weighted Average
	1,319		5.07% Pervious Area
	24,710		94.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.5:

Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.113 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	21,831	98	Impervious
	1,322	39	>75% Grass cover, Good, HSG A
	39	80	>75% Grass cover, Good, HSG D
	23,192	95	Weighted Average
	1,361		5.87% Pervious Area
	21,831		94.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.6:

Runoff = 0.33 cfs @ 12.08 hrs, Volume= 0.023 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
	10,062	78	Meadow, non-grazed, HSG D
	10,062		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 4.7:

Runoff = 1.23 cfs @ 12.08 hrs, Volume= 0.089 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
25,292	73	Brush, Good, HSG D
19,950	77	Woods, Good, HSG D
45,242	75	Weighted Average
45,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.8:

Runoff = 0.80 cfs @ 12.08 hrs, Volume= 0.056 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
25,845	77	Woods, Good, HSG D
25,845		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.9:

Runoff = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Summary for Reach R1.1:

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 0.93" for 2-Yr Storm event
Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af
Outflow = 1.72 cfs @ 12.09 hrs, Volume= 0.158 af, Atten= 3%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 2.93 fps, Min. Travel Time= 1.7 min

Avg. Velocity = 0.92 fps, Avg. Travel Time= 5.4 min

Peak Storage= 176 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.22'

Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 160.95 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 3.0 '/' Top Width= 14.00'

Length= 300.0' Slope= 0.0367 '/'

Inlet Invert= 113.00', Outlet Invert= 102.00'



Summary for Reach R4.0: Stream

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth = 1.42" for 2-Yr Storm event
Inflow = 6.69 cfs @ 12.11 hrs, Volume= 1.274 af
Outflow = 6.65 cfs @ 12.13 hrs, Volume= 1.274 af, Atten= 1%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 4.25 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 1.23 fps, Avg. Travel Time= 3.8 min

Peak Storage= 437 cf @ 12.13 hrs

Average Depth at Peak Storage= 0.45'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Summary for Pond C4.1: 18" HDPE

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
 Inflow = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af
 Outflow = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.31' @ 12.10 hrs

Flood Elev= 104.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.60'	18.0" Round Culvert L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 101.60' / 100.00' S= 0.0571 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.86 cfs @ 12.10 hrs HW=102.31' TW=99.73' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.86 cfs @ 2.26 fps)

Summary for Pond C4.7: 15" HDPE

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 0.68" for 2-Yr Storm event
 Inflow = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af
 Outflow = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 95.92' @ 12.11 hrs

Flood Elev= 97.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.20'	15.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.20' / 95.00' S= 0.0100 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.61 cfs @ 12.11 hrs HW=95.92' TW=94.95' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 1.61 cfs @ 3.17 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.20' TW=94.50' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Summary for Pond C4.8: Twin 18" HDPE

Inflow Area = 5.371 ac, 69.00% Impervious, Inflow Depth = 2.16" for 2-Yr Storm event
 Inflow = 5.81 cfs @ 12.07 hrs, Volume= 0.968 af
 Outflow = 5.08 cfs @ 12.12 hrs, Volume= 0.968 af, Atten= 13%, Lag= 2.6 min
 Primary = 5.08 cfs @ 12.12 hrs, Volume= 0.968 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 96.15' @ 12.12 hrs Surf.Area= 1,870 sf Storage= 792 cf

Plug-Flow detention time= 1.6 min calculated for 0.968 af (100% of inflow)

Center-of-Mass det. time= 1.5 min (1,128.2 - 1,126.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	6,851 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916
97.50	11,617	951.0	3,687	6,851	71,991

Device	Routing	Invert	Outlet Devices
#1	Primary	95.10'	18.0" Round Culvert X 2.00 L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.10' / 95.00' S= 0.0050 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	97.40'	400.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.06 cfs @ 12.12 hrs HW=96.15' TW=94.95' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 5.06 cfs @ 2.70 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=95.00' TW=94.50' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond CB1: CB2.2**

Inflow Area = 0.598 ac, 94.93% Impervious, Inflow Depth = 2.65" for 2-Yr Storm event
 Inflow = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af
 Outflow = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.79 cfs @ 12.07 hrs, Volume= 0.132 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.37' @ 12.07 hrs

Flood Elev= 105.30'

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Device	Routing	Invert	Outlet Devices
#1	Primary	101.57'	15.0" Round Culvert L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.57' / 101.02' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.77 cfs @ 12.07 hrs HW=102.36' TW=101.75' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.77 cfs @ 3.08 fps)**Summary for Pond CB2: CB2.3**

Inflow Area = 1.130 ac, 94.56% Impervious, Inflow Depth = 2.60" for 2-Yr Storm event
Inflow = 3.34 cfs @ 12.07 hrs, Volume= 0.245 af
Outflow = 3.34 cfs @ 12.07 hrs, Volume= 0.245 af, Atten= 0%, Lag= 0.0 min
Primary = 3.34 cfs @ 12.07 hrs, Volume= 0.245 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 101.75' @ 12.07 hrs

Flood Elev= 105.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.77'	18.0" Round Culvert L= 155.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.77' / 100.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.32 cfs @ 12.07 hrs HW=101.75' TW=100.17' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 3.32 cfs @ 3.86 fps)**Summary for Pond CB3: CB2.5**

Inflow Area = 2.180 ac, 80.62% Impervious, Inflow Depth = 2.46" for 2-Yr Storm event
Inflow = 2.18 cfs @ 12.07 hrs, Volume= 0.448 af
Outflow = 2.18 cfs @ 12.07 hrs, Volume= 0.448 af, Atten= 0%, Lag= 0.0 min
Primary = 2.18 cfs @ 12.07 hrs, Volume= 0.448 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 96.93' @ 12.08 hrs

Flood Elev= 103.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.13'	18.0" Round Culvert L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.13' / 95.41' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.17 cfs @ 12.07 hrs HW=96.92' TW=96.09' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 2.17 cfs @ 3.33 fps)

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Summary for Pond CB4: CB3.3

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 0.93" for 2-Yr Storm event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af
 Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 122.07' @ 12.07 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	121.42'	15.0" Round Culvert L= 102.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.42' / 119.38' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=122.07' TW=119.93' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.76 cfs @ 2.74 fps)

Summary for Pond CB5: CB3.4

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 0.93" for 2-Yr Storm event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af
 Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.78 cfs @ 12.07 hrs, Volume= 0.158 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 119.93' @ 12.07 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	119.28'	15.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.28' / 112.00' S= 0.0607 ' / S= 0.0607 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=119.93' TW=113.22' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.76 cfs @ 2.74 fps)

Summary for Pond CB6: CB1.10

Inflow Area = 1.312 ac, 79.12% Impervious, Inflow Depth = 2.08" for 2-Yr Storm event
 Inflow = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af
 Outflow = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.27 cfs @ 12.07 hrs, Volume= 0.227 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.25' @ 12.07 hrs

Flood Elev= 103.60'

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Device	Routing	Invert	Outlet Devices
#1	Primary	99.11'	15.0" Round Culvert L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.11' / 99.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.25 cfs @ 12.07 hrs HW=100.24' TW=98.81' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.25 cfs @ 3.65 fps)

Summary for Pond D2: DMH-RD2

Inflow Area = 1.055 ac, 86.34% Impervious, Inflow Depth = 2.43" for 2-Yr Storm event
Inflow = 2.77 cfs @ 12.07 hrs, Volume= 0.214 af
Outflow = 2.77 cfs @ 12.07 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min
Primary = 2.77 cfs @ 12.07 hrs, Volume= 0.214 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 107.85' @ 12.07 hrs
Flood Elev= 113.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	15.0" Round Culvert L= 280.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 97.00' S= 0.0357 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.75 cfs @ 12.07 hrs HW=107.84' TW=96.09' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.75 cfs @ 3.13 fps)

Summary for Pond ED: EX DMH

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2-Yr Storm event
Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af
Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 1.78 cfs @ 12.07 hrs, Volume= 0.137 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 125.08' @ 12.07 hrs
Flood Elev= 128.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.20'	10.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 124.20' / 122.95' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.76 cfs @ 12.07 hrs HW=125.07' TW=122.07' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.76 cfs @ 3.23 fps)

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Summary for Pond SF1: Soil Filter 1

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 1.95" for 2-Yr Storm event
 Inflow = 3.60 cfs @ 12.07 hrs, Volume= 0.250 af
 Outflow = 0.25 cfs @ 13.57 hrs, Volume= 0.250 af, Atten= 93%, Lag= 89.6 min
 Primary = 0.25 cfs @ 13.57 hrs, Volume= 0.250 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 99.54' @ 13.57 hrs Surf.Area= 4,887 sf Storage= 6,147 cf

Plug-Flow detention time= 681.9 min calculated for 0.250 af (100% of inflow)

Center-of-Mass det. time= 682.2 min (1,493.3 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.25 cfs @ 13.57 hrs HW=99.54' TW=95.53' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.25 cfs of 6.93 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.08 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 0.17 cfs @ 0.66 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SF2: Soil Filter 2**

Inflow Area = 1.487 ac, 74.24% Impervious, Inflow Depth = 2.33" for 2-Yr Storm event
 Inflow = 3.97 cfs @ 12.07 hrs, Volume= 0.288 af
 Outflow = 1.16 cfs @ 12.39 hrs, Volume= 0.288 af, Atten= 71%, Lag= 19.3 min
 Primary = 1.16 cfs @ 12.39 hrs, Volume= 0.288 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.64' @ 12.39 hrs Surf.Area= 4,133 sf Storage= 5,706 cf

Plug-Flow detention time= 549.4 min calculated for 0.288 af (100% of inflow)
 Center-of-Mass det. time= 549.3 min (1,335.6 - 786.2)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	16,412 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,831	0	0
100.50	4,010	5,131	5,131
102.00	5,316	6,995	12,125
102.80	5,402	4,287	16,412

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	15.0" Round Culvert L= 73.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.13' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	99.00'	0.750 in/hr Exfiltration over Horizontal area Phase-In= 0.01'
#3	Device 1	100.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	101.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.16 cfs @ 12.39 hrs HW=100.64' TW=96.81' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.16 cfs of 9.94 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.07 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 1.09 cfs @ 1.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.00' TW=99.40' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W1: Wetland

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
 Inflow = 1.87 cfs @ 12.10 hrs, Volume= 0.217 af
 Outflow = 0.76 cfs @ 12.48 hrs, Volume= 0.217 af, Atten= 59%, Lag= 22.5 min
 Primary = 0.76 cfs @ 12.48 hrs, Volume= 0.217 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 99.84' @ 12.48 hrs Surf.Area= 6,613 sf Storage= 2,144 cf

Plug-Flow detention time= 61.6 min calculated for 0.217 af (100% of inflow)
 Center-of-Mass det. time= 61.7 min (892.9 - 831.3)

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Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	23,709 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	18.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 98.50' S= 0.0113 ' / S= 0.0113 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.76 cfs @ 12.48 hrs HW=99.84' TW=97.19' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.76 cfs @ 1.78 fps)**Summary for Pond W2: Wetland**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 0.68" for 2-Yr Storm event
 Inflow = 1.63 cfs @ 12.09 hrs, Volume= 0.306 af
 Outflow = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af, Atten= 1%, Lag= 0.9 min
 Primary = 1.61 cfs @ 12.11 hrs, Volume= 0.306 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.24' @ 12.11 hrs Surf.Area= 543 sf Storage= 87 cf

Plug-Flow detention time= 1.2 min calculated for 0.306 af (100% of inflow)

Center-of-Mass det. time= 1.2 min (884.5 - 883.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=1.61 cfs @ 12.11 hrs HW=97.24' TW=95.92' (Dynamic Tailwater)↑**1=Custom Weir/Orifice** (Weir Controls 1.61 cfs @ 1.58 fps)

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Time span=0.00-50.00 hrs, dt=0.02 hrs, 2501 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=101,414 sf 28.81% Impervious Runoff Depth=0.96" Flow Length=338' Tc=8.3 min CN=58 Runoff=1.96 cfs 0.185 af
Subcatchment 4.10:	Runoff Area=38,900 sf 100.00% Impervious Runoff Depth=4.36" Tc=5.0 min CN=98 Runoff=4.14 cfs 0.325 af
Subcatchment 4.11:	Runoff Area=15,561 sf 10.00% Impervious Runoff Depth=2.72" Tc=5.0 min CN=82 Runoff=1.18 cfs 0.081 af
Subcatchment 4.12:	Runoff Area=30,195 sf 94.29% Impervious Runoff Depth=4.25" Tc=5.0 min CN=97 Runoff=3.19 cfs 0.245 af
Subcatchment 4.13:	Runoff Area=7,038 sf 10.83% Impervious Runoff Depth=0.32" Tc=5.0 min CN=45 Runoff=0.02 cfs 0.004 af
Subcatchment 4.2:	Runoff Area=64,010 sf 24.27% Impervious Runoff Depth=0.68" Tc=5.0 min CN=53 Runoff=0.81 cfs 0.084 af
Subcatchment 4.3:	Runoff Area=57,153 sf 79.12% Impervious Runoff Depth=3.49" Tc=5.0 min CN=90 Runoff=5.38 cfs 0.382 af
Subcatchment 4.4:	Runoff Area=26,029 sf 94.93% Impervious Runoff Depth=4.14" Tc=5.0 min CN=96 Runoff=2.72 cfs 0.206 af
Subcatchment 4.5:	Runoff Area=23,192 sf 94.13% Impervious Runoff Depth=4.02" Tc=5.0 min CN=95 Runoff=2.39 cfs 0.179 af
Subcatchment 4.6:	Runoff Area=10,062 sf 0.00% Impervious Runoff Depth=2.38" Tc=5.0 min CN=78 Runoff=0.66 cfs 0.046 af
Subcatchment 4.7:	Runoff Area=45,242 sf 0.00% Impervious Runoff Depth=2.13" Tc=5.0 min CN=75 Runoff=2.67 cfs 0.184 af
Subcatchment 4.8:	Runoff Area=25,845 sf 0.00% Impervious Runoff Depth=2.29" Tc=5.0 min CN=77 Runoff=1.65 cfs 0.113 af
Subcatchment 4.9:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth=4.36" Tc=5.0 min CN=98 Runoff=2.66 cfs 0.208 af
Reach R1.1:	Avg. Flow Depth=0.32' Max Vel=3.59 fps Inflow=3.41 cfs 0.292 af n=0.030 L=300.0' S=0.0367 '/' Capacity=160.95 cfs Outflow=3.33 cfs 0.292 af
Reach R4.0: Stream	Avg. Flow Depth=0.72' Max Vel=5.47 fps Inflow=14.71 cfs 2.242 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=14.70 cfs 2.242 af
Pond C4.1: 18" HDPE	Peak Elev=102.93' Inflow=5.16 cfs 0.477 af 18.0" Round Culvert n=0.013 L=28.0' S=0.0571 '/' Outflow=5.16 cfs 0.477 af

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Pond C4.7: 15" HDPEPeak Elev=96.42' Inflow=3.62 cfs 0.662 af
Primary=3.62 cfs 0.662 af Secondary=0.00 cfs 0.000 af Outflow=3.62 cfs 0.662 af**Pond C4.8: Twin 18" HDPE**Peak Elev=96.88' Storage=2,711 cf Inflow=13.66 cfs 1.581 af
Primary=11.41 cfs 1.581 af Secondary=0.00 cfs 0.000 af Outflow=11.41 cfs 1.581 af**Pond CB1: CB2.2**Peak Elev=102.65' Inflow=2.72 cfs 0.206 af
15.0" Round Culvert n=0.013 L=110.0' S=0.0050 '/' Outflow=2.72 cfs 0.206 af**Pond CB2: CB2.3**Peak Elev=102.05' Inflow=5.12 cfs 0.384 af
18.0" Round Culvert n=0.013 L=155.0' S=0.0050 '/' Outflow=5.12 cfs 0.384 af**Pond CB3: CB2.5**Peak Elev=97.89' Inflow=7.53 cfs 0.711 af
18.0" Round Culvert n=0.013 L=145.0' S=0.0050 '/' Outflow=7.53 cfs 0.711 af**Pond CB4: CB3.3**Peak Elev=122.39' Inflow=3.41 cfs 0.292 af
15.0" Round Culvert n=0.013 L=102.0' S=0.0200 '/' Outflow=3.41 cfs 0.292 af**Pond CB5: CB3.4**Peak Elev=120.25' Inflow=3.41 cfs 0.292 af
15.0" Round Culvert n=0.013 L=120.0' S=0.0607 '/' Outflow=3.41 cfs 0.292 af**Pond CB6: CB1.10**Peak Elev=100.85' Inflow=5.38 cfs 0.382 af
15.0" Round Culvert n=0.013 L=21.0' S=0.0052 '/' Outflow=5.38 cfs 0.382 af**Pond D2: DMH-RD2**Peak Elev=108.11' Inflow=4.15 cfs 0.329 af
15.0" Round Culvert n=0.013 L=280.0' S=0.0357 '/' Outflow=4.15 cfs 0.329 af**Pond ED: EX DMH**Peak Elev=125.64' Inflow=2.66 cfs 0.208 af
10.0" Round Culvert n=0.013 L=48.0' S=0.0260 '/' Outflow=2.66 cfs 0.208 af**Pond SF1: Soil Filter 1**Peak Elev=99.76' Storage=7,223 cf Inflow=6.04 cfs 0.427 af
Primary=2.74 cfs 0.427 af Secondary=0.00 cfs 0.000 af Outflow=2.74 cfs 0.427 af**Pond SF2: Soil Filter 2**Peak Elev=100.88' Storage=6,709 cf Inflow=6.29 cfs 0.466 af
Primary=4.85 cfs 0.466 af Secondary=0.00 cfs 0.000 af Outflow=4.85 cfs 0.466 af**Pond W1: Wetland**Peak Elev=100.18' Storage=4,614 cf Inflow=5.16 cfs 0.477 af
18.0" Round Culvert n=0.013 L=80.0' S=0.0113 '/' Outflow=2.18 cfs 0.477 af**Pond W2: Wetland**Peak Elev=97.40' Storage=200 cf Inflow=3.66 cfs 0.662 af
Outflow=3.62 cfs 0.662 af**Total Runoff Area = 10.780 ac Runoff Volume = 2.242 af Average Runoff Depth = 2.50"**
50.78% Pervious = 5.474 ac 49.22% Impervious = 5.306 ac

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.1:

Runoff = 1.96 cfs @ 12.14 hrs, Volume= 0.185 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 29,214	98	Impervious
26,743	39	>75% Grass cover, Good, HSG A
2,976	80	>75% Grass cover, Good, HSG D
10,780	77	Woods, Good, HSG D
31,701	30	Woods, Good, HSG A
101,414	58	Weighted Average
72,200		71.19% Pervious Area
29,214		28.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	40	0.1000	0.12		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"
2.3	30	0.5000	0.22		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	95	0.0260	8.47	135.53	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
0.1	28	0.0180	7.98	14.09	Pipe Channel, DE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.2	145	0.0510	11.86	189.82	Trap/Vee/Rect Channel Flow, EF Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
8.3	338	Total			

Summary for Subcatchment 4.10:

Runoff = 4.14 cfs @ 12.07 hrs, Volume= 0.325 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 38,900	98	Impervious
38,900		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.11:

Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.081 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	1,556	98	Impervious
	14,005	80	>75% Grass cover, Good, HSG D
	15,561	82	Weighted Average
	14,005		90.00% Pervious Area
	1,556		10.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.12:

Runoff = 3.19 cfs @ 12.07 hrs, Volume= 0.245 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	28,472	98	Impervious
	1,723	80	>75% Grass cover, Good, HSG D
	30,195	97	Weighted Average
	1,723		5.71% Pervious Area
	28,472		94.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.13:

Runoff = 0.02 cfs @ 12.34 hrs, Volume= 0.004 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	762	98	Impervious
	6,276	39	>75% Grass cover, Good, HSG A
	7,038	45	Weighted Average
	6,276		89.17% Pervious Area
	762		10.83% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.2:

Runoff = 0.81 cfs @ 12.10 hrs, Volume= 0.084 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 15,536	98	Impervious
48,474	39	>75% Grass cover, Good, HSG A
64,010	53	Weighted Average
48,474		75.73% Pervious Area
15,536		24.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.3:

Runoff = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 45,217	98	Impervious
5,466	39	>75% Grass cover, Good, HSG A
6,470	80	>75% Grass cover, Good, HSG D
57,153	90	Weighted Average
11,936		20.88% Pervious Area
45,217		79.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.4:

Runoff = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	24,710	98	Impervious
	821	39	>75% Grass cover, Good, HSG A
	498	80	>75% Grass cover, Good, HSG D
	26,029	96	Weighted Average
	1,319		5.07% Pervious Area
	24,710		94.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.5:

Runoff = 2.39 cfs @ 12.07 hrs, Volume= 0.179 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	21,831	98	Impervious
	1,322	39	>75% Grass cover, Good, HSG A
	39	80	>75% Grass cover, Good, HSG D
	23,192	95	Weighted Average
	1,361		5.87% Pervious Area
	21,831		94.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.6:

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 0.046 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
	10,062	78	Meadow, non-grazed, HSG D
	10,062		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 4.7:

Runoff = 2.67 cfs @ 12.08 hrs, Volume= 0.184 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
25,292	73	Brush, Good, HSG D
19,950	77	Woods, Good, HSG D
45,242	75	Weighted Average
45,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.8:

Runoff = 1.65 cfs @ 12.08 hrs, Volume= 0.113 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
25,845	77	Woods, Good, HSG D
25,845		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.9:

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Reach R1.1:

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 1.72" for 10-Yr Storm event
Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af
Outflow = 3.33 cfs @ 12.10 hrs, Volume= 0.292 af, Atten= 2%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 3.59 fps, Min. Travel Time= 1.4 min

Avg. Velocity = 1.10 fps, Avg. Travel Time= 4.6 min

Peak Storage= 279 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.32'

Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 160.95 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 3.0 '/' Top Width= 14.00'

Length= 300.0' Slope= 0.0367 '/'

Inlet Invert= 113.00', Outlet Invert= 102.00'



Summary for Reach R4.0: Stream

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth = 2.50" for 10-Yr Storm event
Inflow = 14.71 cfs @ 12.18 hrs, Volume= 2.242 af
Outflow = 14.70 cfs @ 12.19 hrs, Volume= 2.242 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 5.47 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 1.38 fps, Avg. Travel Time= 3.4 min

Peak Storage= 752 cf @ 12.19 hrs

Average Depth at Peak Storage= 0.72'

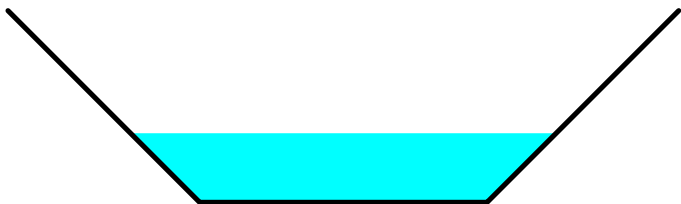
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Summary for Pond C4.1: 18" HDPE

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 1.31" for 10-Yr Storm event
 Inflow = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af
 Outflow = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.93' @ 12.11 hrs

Flood Elev= 104.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.60'	18.0" Round Culvert L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 101.60' / 100.00' S= 0.0571 ' S= 0.0571 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.12 cfs @ 12.11 hrs HW=102.93' TW=99.95' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.12 cfs @ 3.10 fps)**Summary for Pond C4.7: 15" HDPE**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 1.47" for 10-Yr Storm event
 Inflow = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af
 Outflow = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 96.42' @ 12.12 hrs

Flood Elev= 97.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.20'	15.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.20' / 95.00' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=3.61 cfs @ 12.12 hrs HW=96.42' TW=95.19' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.61 cfs @ 2.96 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=95.20' TW=94.50' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Summary for Pond C4.8: Twin 18" HDPE

Inflow Area = 5.371 ac, 69.00% Impervious, Inflow Depth = 3.53" for 10-Yr Storm event
 Inflow = 13.66 cfs @ 12.11 hrs, Volume= 1.581 af
 Outflow = 11.41 cfs @ 12.20 hrs, Volume= 1.581 af, Atten= 16%, Lag= 5.0 min
 Primary = 11.41 cfs @ 12.20 hrs, Volume= 1.581 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 96.88' @ 12.20 hrs Surf.Area= 3,502 sf Storage= 2,711 cf

Plug-Flow detention time= 2.1 min calculated for 1.581 af (100% of inflow)

Center-of-Mass det. time= 2.0 min (1,011.5 - 1,009.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	6,851 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916
97.50	11,617	951.0	3,687	6,851	71,991

Device	Routing	Invert	Outlet Devices
#1	Primary	95.10'	18.0" Round Culvert X 2.00 L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.10' / 95.00' S= 0.0050 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	97.40'	400.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.41 cfs @ 12.20 hrs HW=96.88' TW=95.22' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 11.41 cfs @ 3.44 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=95.00' TW=94.50' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond CB1: CB2.2**

Inflow Area = 0.598 ac, 94.93% Impervious, Inflow Depth = 4.14" for 10-Yr Storm event
 Inflow = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af
 Outflow = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.72 cfs @ 12.07 hrs, Volume= 0.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.65' @ 12.07 hrs

Flood Elev= 105.30'

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Device	Routing	Invert	Outlet Devices
#1	Primary	101.57'	15.0" Round Culvert L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.57' / 101.02' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.70 cfs @ 12.07 hrs HW=102.64' TW=102.05' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 2.70 cfs @ 3.24 fps)**Summary for Pond CB2: CB2.3**

Inflow Area = 1.130 ac, 94.56% Impervious, Inflow Depth = 4.08" for 10-Yr Storm event
Inflow = 5.12 cfs @ 12.07 hrs, Volume= 0.384 af
Outflow = 5.12 cfs @ 12.07 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min
Primary = 5.12 cfs @ 12.07 hrs, Volume= 0.384 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 102.05' @ 12.07 hrs

Flood Elev= 105.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.77'	18.0" Round Culvert L= 155.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.77' / 100.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.08 cfs @ 12.07 hrs HW=102.05' TW=100.81' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 5.08 cfs @ 4.26 fps)**Summary for Pond CB3: CB2.5**

Inflow Area = 2.180 ac, 80.62% Impervious, Inflow Depth = 3.91" for 10-Yr Storm event
Inflow = 7.53 cfs @ 12.11 hrs, Volume= 0.711 af
Outflow = 7.53 cfs @ 12.11 hrs, Volume= 0.711 af, Atten= 0%, Lag= 0.0 min
Primary = 7.53 cfs @ 12.11 hrs, Volume= 0.711 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.89' @ 12.12 hrs

Flood Elev= 103.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.13'	18.0" Round Culvert L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.13' / 95.41' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.51 cfs @ 12.11 hrs HW=97.89' TW=96.71' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 7.51 cfs @ 4.57 fps)

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Summary for Pond CB4: CB3.3

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 1.72" for 10-Yr Storm event
 Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af
 Outflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 122.39' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	121.42'	15.0" Round Culvert L= 102.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.42' / 119.38' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.40 cfs @ 12.08 hrs HW=122.39' TW=120.25' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.40 cfs @ 3.35 fps)**Summary for Pond CB5: CB3.4**

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 1.72" for 10-Yr Storm event
 Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af
 Outflow = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.41 cfs @ 12.08 hrs, Volume= 0.292 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 120.25' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	119.28'	15.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.28' / 112.00' S= 0.0607 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.40 cfs @ 12.08 hrs HW=120.25' TW=113.31' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.40 cfs @ 3.35 fps)**Summary for Pond CB6: CB1.10**

Inflow Area = 1.312 ac, 79.12% Impervious, Inflow Depth = 3.49" for 10-Yr Storm event
 Inflow = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af
 Outflow = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.38 cfs @ 12.07 hrs, Volume= 0.382 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.85' @ 12.07 hrs

Flood Elev= 103.60'

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Device	Routing	Invert	Outlet Devices
#1	Primary	99.11'	15.0" Round Culvert L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.11' / 99.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.34 cfs @ 12.07 hrs HW=100.83' TW=99.47' (Dynamic Tailwater)
1=Culvert (Barrel Controls 5.34 cfs @ 4.35 fps)

Summary for Pond D2: DMH-RD2

Inflow Area = 1.055 ac, 86.34% Impervious, Inflow Depth = 3.74" for 10-Yr Storm event
Inflow = 4.15 cfs @ 12.07 hrs, Volume= 0.329 af
Outflow = 4.15 cfs @ 12.07 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min
Primary = 4.15 cfs @ 12.07 hrs, Volume= 0.329 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 108.11' @ 12.07 hrs
Flood Elev= 113.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	15.0" Round Culvert L= 280.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 97.00' S= 0.0357 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.11 cfs @ 12.07 hrs HW=108.11' TW=96.52' (Dynamic Tailwater)
1=Culvert (Inlet Controls 4.11 cfs @ 3.58 fps)

Summary for Pond ED: EX DMH

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth = 4.36" for 10-Yr Storm event
Inflow = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af
Outflow = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.0 min
Primary = 2.66 cfs @ 12.07 hrs, Volume= 0.208 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 125.64' @ 12.07 hrs
Flood Elev= 128.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.20'	10.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 124.20' / 122.95' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.64 cfs @ 12.07 hrs HW=125.62' TW=122.38' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.64 cfs @ 4.83 fps)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Pond SF1: Soil Filter 1

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 3.32" for 10-Yr Storm event
 Inflow = 6.04 cfs @ 12.07 hrs, Volume= 0.427 af
 Outflow = 2.74 cfs @ 12.24 hrs, Volume= 0.427 af, Atten= 55%, Lag= 9.8 min
 Primary = 2.74 cfs @ 12.24 hrs, Volume= 0.427 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 99.76' @ 12.24 hrs Surf.Area= 5,128 sf Storage= 7,223 cf

Plug-Flow detention time= 449.8 min calculated for 0.427 af (100% of inflow)

Center-of-Mass det. time= 450.2 min (1,246.8 - 796.7)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' S= 0.0029 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.74 cfs @ 12.24 hrs HW=99.76' TW=96.86' (Dynamic Tailwater)

1=Culvert (Passes 2.74 cfs of 6.44 cfs potential flow)
 2=Exfiltration (Exfiltration Controls 0.09 cfs)
 3=Orifice/Grate (Weir Controls 2.65 cfs @ 1.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond SF2: Soil Filter 2

Inflow Area = 1.487 ac, 74.24% Impervious, Inflow Depth = 3.76" for 10-Yr Storm event
 Inflow = 6.29 cfs @ 12.07 hrs, Volume= 0.466 af
 Outflow = 4.85 cfs @ 12.13 hrs, Volume= 0.466 af, Atten= 23%, Lag= 3.7 min
 Primary = 4.85 cfs @ 12.13 hrs, Volume= 0.466 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.88' @ 12.13 hrs Surf.Area= 4,339 sf Storage= 6,709 cf

Plug-Flow detention time= 375.0 min calculated for 0.466 af (100% of inflow)
 Center-of-Mass det. time= 375.0 min (1,150.5 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	16,412 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,831	0	0
100.50	4,010	5,131	5,131
102.00	5,316	6,995	12,125
102.80	5,402	4,287	16,412

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	15.0" Round Culvert L= 73.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.13' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	99.00'	0.750 in/hr Exfiltration over Horizontal area Phase-In= 0.01'
#3	Device 1	100.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	101.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.83 cfs @ 12.13 hrs HW=100.88' TW=97.88' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.83 cfs of 9.53 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.08 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 4.76 cfs @ 2.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.00' TW=99.40' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W1: Wetland

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 1.31" for 10-Yr Storm event
 Inflow = 5.16 cfs @ 12.11 hrs, Volume= 0.477 af
 Outflow = 2.18 cfs @ 12.43 hrs, Volume= 0.477 af, Atten= 58%, Lag= 19.2 min
 Primary = 2.18 cfs @ 12.43 hrs, Volume= 0.477 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.18' @ 12.43 hrs Surf.Area= 7,795 sf Storage= 4,614 cf

Plug-Flow detention time= 52.1 min calculated for 0.477 af (100% of inflow)
 Center-of-Mass det. time= 52.1 min (886.2 - 834.1)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	23,709 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	18.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 98.50' S= 0.0113 ' / S= 0.0113 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.18 cfs @ 12.43 hrs HW=100.17' TW=97.36' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 2.18 cfs @ 2.37 fps)**Summary for Pond W2: Wetland**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 1.47" for 10-Yr Storm event
 Inflow = 3.66 cfs @ 12.10 hrs, Volume= 0.662 af
 Outflow = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af, Atten= 1%, Lag= 1.1 min
 Primary = 3.62 cfs @ 12.12 hrs, Volume= 0.662 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.40' @ 12.12 hrs Surf.Area= 860 sf Storage= 200 cf

Plug-Flow detention time= 1.3 min calculated for 0.662 af (100% of inflow)

Center-of-Mass det. time= 1.1 min (873.8 - 872.8)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=3.61 cfs @ 12.12 hrs HW=97.40' TW=96.42' (Dynamic Tailwater)↑**1=Custom Weir/Orifice** (Weir Controls 3.61 cfs @ 2.04 fps)

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Time span=0.00-50.00 hrs, dt=0.02 hrs, 2501 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 4.1:	Runoff Area=101,414 sf 28.81% Impervious Runoff Depth=1.63" Flow Length=338' Tc=8.3 min CN=58 Runoff=3.76 cfs 0.317 af
Subcatchment 4.10:	Runoff Area=38,900 sf 100.00% Impervious Runoff Depth=5.56" Tc=5.0 min CN=98 Runoff=5.24 cfs 0.414 af
Subcatchment 4.11:	Runoff Area=15,561 sf 10.00% Impervious Runoff Depth=3.80" Tc=5.0 min CN=82 Runoff=1.63 cfs 0.113 af
Subcatchment 4.12:	Runoff Area=30,195 sf 94.29% Impervious Runoff Depth=5.44" Tc=5.0 min CN=97 Runoff=4.04 cfs 0.315 af
Subcatchment 4.13:	Runoff Area=7,038 sf 10.83% Impervious Runoff Depth=0.72" Tc=5.0 min CN=45 Runoff=0.08 cfs 0.010 af
Subcatchment 4.2:	Runoff Area=64,010 sf 24.27% Impervious Runoff Depth=1.26" Tc=5.0 min CN=53 Runoff=1.88 cfs 0.154 af
Subcatchment 4.3:	Runoff Area=57,153 sf 79.12% Impervious Runoff Depth=4.65" Tc=5.0 min CN=90 Runoff=7.06 cfs 0.509 af
Subcatchment 4.4:	Runoff Area=26,029 sf 94.93% Impervious Runoff Depth=5.33" Tc=5.0 min CN=96 Runoff=3.46 cfs 0.265 af
Subcatchment 4.5:	Runoff Area=23,192 sf 94.13% Impervious Runoff Depth=5.21" Tc=5.0 min CN=95 Runoff=3.06 cfs 0.231 af
Subcatchment 4.6:	Runoff Area=10,062 sf 0.00% Impervious Runoff Depth=3.40" Tc=5.0 min CN=78 Runoff=0.95 cfs 0.066 af
Subcatchment 4.7:	Runoff Area=45,242 sf 0.00% Impervious Runoff Depth=3.11" Tc=5.0 min CN=75 Runoff=3.92 cfs 0.269 af
Subcatchment 4.8:	Runoff Area=25,845 sf 0.00% Impervious Runoff Depth=3.31" Tc=5.0 min CN=77 Runoff=2.38 cfs 0.163 af
Subcatchment 4.9:	Runoff Area=24,940 sf 100.00% Impervious Runoff Depth=5.56" Tc=5.0 min CN=98 Runoff=3.36 cfs 0.265 af
Reach R1.1:	Avg. Flow Depth=0.39' Max Vel=4.05 fps Inflow=5.20 cfs 0.419 af n=0.030 L=300.0' S=0.0367 '/' Capacity=160.95 cfs Outflow=5.10 cfs 0.419 af
Reach R4.0: Stream	Avg. Flow Depth=0.98' Max Vel=6.40 fps Inflow=25.33 cfs 3.120 af n=0.025 L=280.0' S=0.0196 '/' Capacity=91.72 cfs Outflow=25.08 cfs 3.120 af
Pond C4.1: 18" HDPE	Peak Elev=104.02' Inflow=8.67 cfs 0.736 af 18.0" Round Culvert n=0.013 L=28.0' S=0.0571 '/' Outflow=8.67 cfs 0.736 af

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Pond C4.7: 15" HDPE

Peak Elev=97.21' Inflow=5.48 cfs 1.006 af
 Primary=5.48 cfs 1.006 af Secondary=1.23 cfs 0.029 af Outflow=5.48 cfs 1.006 af

Pond C4.8: Twin 18" HDPE

Peak Elev=97.42' Storage=6,007 cf Inflow=23.18 cfs 2.085 af
 Primary=15.10 cfs 2.069 af Secondary=3.59 cfs 0.017 af Outflow=18.69 cfs 2.085 af

Pond CB1: CB2.2

Peak Elev=102.89' Inflow=3.46 cfs 0.265 af
 15.0" Round Culvert n=0.013 L=110.0' S=0.0050 '/' Outflow=3.46 cfs 0.265 af

Pond CB2: CB2.3

Peak Elev=102.30' Inflow=6.52 cfs 0.497 af
 18.0" Round Culvert n=0.013 L=155.0' S=0.0050 '/' Outflow=6.52 cfs 0.497 af

Pond CB3: CB2.5

Peak Elev=99.56' Inflow=10.56 cfs 0.924 af
 18.0" Round Culvert n=0.013 L=145.0' S=0.0050 '/' Outflow=10.56 cfs 0.924 af

Pond CB4: CB3.3

Peak Elev=122.82' Inflow=5.20 cfs 0.419 af
 15.0" Round Culvert n=0.013 L=102.0' S=0.0200 '/' Outflow=5.20 cfs 0.419 af

Pond CB5: CB3.4

Peak Elev=120.68' Inflow=5.20 cfs 0.419 af
 15.0" Round Culvert n=0.013 L=120.0' S=0.0607 '/' Outflow=5.20 cfs 0.419 af

Pond CB6: CB1.10

Peak Elev=101.29' Inflow=7.06 cfs 0.509 af
 15.0" Round Culvert n=0.013 L=21.0' S=0.0052 '/' Outflow=7.06 cfs 0.509 af

Pond D2: DMH-RD2

Peak Elev=108.43' Inflow=5.30 cfs 0.424 af
 15.0" Round Culvert n=0.013 L=280.0' S=0.0357 '/' Outflow=5.30 cfs 0.424 af

Pond ED: EX DMH

Peak Elev=126.25' Inflow=3.36 cfs 0.265 af
 10.0" Round Culvert n=0.013 L=48.0' S=0.0260 '/' Outflow=3.36 cfs 0.265 af

Pond SF1: Soil Filter 1

Peak Elev=99.93' Storage=8,136 cf Inflow=8.01 cfs 0.574 af
 Primary=5.88 cfs 0.573 af Secondary=0.14 cfs 0.001 af Outflow=6.02 cfs 0.574 af

Pond SF2: Soil Filter 2

Peak Elev=100.98' Storage=7,170 cf Inflow=8.15 cfs 0.610 af
 Primary=6.98 cfs 0.610 af Secondary=0.00 cfs 0.000 af Outflow=6.98 cfs 0.610 af

Pond W1: Wetland

Peak Elev=100.48' Storage=7,120 cf Inflow=8.67 cfs 0.736 af
 18.0" Round Culvert n=0.013 L=80.0' S=0.0113 '/' Outflow=3.82 cfs 0.736 af

Pond W2: Wetland

Peak Elev=97.68' Storage=531 cf Inflow=5.92 cfs 1.006 af
 Outflow=5.48 cfs 1.006 af

Total Runoff Area = 10.780 ac Runoff Volume = 3.091 af Average Runoff Depth = 3.44"
50.78% Pervious = 5.474 ac 49.22% Impervious = 5.306 ac

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.1:

Runoff = 3.76 cfs @ 12.13 hrs, Volume= 0.317 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 29,214	98	Impervious
26,743	39	>75% Grass cover, Good, HSG A
2,976	80	>75% Grass cover, Good, HSG D
10,780	77	Woods, Good, HSG D
31,701	30	Woods, Good, HSG A
101,414	58	Weighted Average
72,200		71.19% Pervious Area
29,214		28.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	40	0.1000	0.12		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.10"
2.3	30	0.5000	0.22		Sheet Flow, BC Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	95	0.0260	8.47	135.53	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
0.1	28	0.0180	7.98	14.09	Pipe Channel, DE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.2	145	0.0510	11.86	189.82	Trap/Vee/Rect Channel Flow, EF Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.030 Earth, grassed & winding
8.3	338	Total			

Summary for Subcatchment 4.10:

Runoff = 5.24 cfs @ 12.07 hrs, Volume= 0.414 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 38,900	98	Impervious
38,900		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.11:

Runoff = 1.63 cfs @ 12.07 hrs, Volume= 0.113 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	1,556	98	Impervious
	14,005	80	>75% Grass cover, Good, HSG D
	15,561	82	Weighted Average
	14,005		90.00% Pervious Area
	1,556		10.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.12:

Runoff = 4.04 cfs @ 12.07 hrs, Volume= 0.315 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	28,472	98	Impervious
	1,723	80	>75% Grass cover, Good, HSG D
	30,195	97	Weighted Average
	1,723		5.71% Pervious Area
	28,472		94.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.13:

Runoff = 0.08 cfs @ 12.12 hrs, Volume= 0.010 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	762	98	Impervious
	6,276	39	>75% Grass cover, Good, HSG A
	7,038	45	Weighted Average
	6,276		89.17% Pervious Area
	762		10.83% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.2:

Runoff = 1.88 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 15,536	98	Impervious
48,474	39	>75% Grass cover, Good, HSG A
64,010	53	Weighted Average
48,474		75.73% Pervious Area
15,536		24.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.3:

Runoff = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 45,217	98	Impervious
5,466	39	>75% Grass cover, Good, HSG A
6,470	80	>75% Grass cover, Good, HSG D
57,153	90	Weighted Average
11,936		20.88% Pervious Area
45,217		79.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.4:

Runoff = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	24,710	98	Impervious
	821	39	>75% Grass cover, Good, HSG A
	498	80	>75% Grass cover, Good, HSG D
	26,029	96	Weighted Average
	1,319		5.07% Pervious Area
	24,710		94.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.5:

Runoff = 3.06 cfs @ 12.07 hrs, Volume= 0.231 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	21,831	98	Impervious
	1,322	39	>75% Grass cover, Good, HSG A
	39	80	>75% Grass cover, Good, HSG D
	23,192	95	Weighted Average
	1,361		5.87% Pervious Area
	21,831		94.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.6:

Runoff = 0.95 cfs @ 12.08 hrs, Volume= 0.066 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
	10,062	78	Meadow, non-grazed, HSG D
	10,062		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 4.7:

Runoff = 3.92 cfs @ 12.08 hrs, Volume= 0.269 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
25,292	73	Brush, Good, HSG D
19,950	77	Woods, Good, HSG D
45,242	75	Weighted Average
45,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.8:

Runoff = 2.38 cfs @ 12.08 hrs, Volume= 0.163 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
25,845	77	Woods, Good, HSG D
25,845		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 4.9:

Runoff = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 24,940	98	Impervious
24,940		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Reach R1.1:

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 2.46" for 25-Yr Storm event
Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af
Outflow = 5.10 cfs @ 12.09 hrs, Volume= 0.419 af, Atten= 2%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 4.05 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 1.21 fps, Avg. Travel Time= 4.1 min

Peak Storage= 377 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.39'

Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 160.95 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 3.0 '/' Top Width= 14.00'

Length= 300.0' Slope= 0.0367 '/'

Inlet Invert= 113.00', Outlet Invert= 102.00'



Summary for Reach R4.0: Stream

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth = 3.47" for 25-Yr Storm event
Inflow = 25.33 cfs @ 12.18 hrs, Volume= 3.120 af
Outflow = 25.08 cfs @ 12.19 hrs, Volume= 3.120 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Max. Velocity= 6.40 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.2 min

Peak Storage= 1,094 cf @ 12.19 hrs

Average Depth at Peak Storage= 0.98'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 91.72 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 280.0' Slope= 0.0196 '/'

Inlet Invert= 94.50', Outlet Invert= 89.00'



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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond C4.1: 18" HDPE

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 2.02" for 25-Yr Storm event
 Inflow = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af
 Outflow = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 104.02' @ 12.11 hrs

Flood Elev= 104.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.60'	18.0" Round Culvert L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 101.60' / 100.00' S= 0.0571 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.62 cfs @ 12.11 hrs HW=104.00' TW=100.19' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 8.62 cfs @ 4.88 fps)

Summary for Pond C4.7: 15" HDPE

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 2.23" for 25-Yr Storm event
 Inflow = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af
 Outflow = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af
 Secondary = 1.23 cfs @ 12.18 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 97.21' @ 12.22 hrs

Flood Elev= 97.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.20'	15.0" Round Culvert L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.20' / 95.00' S= 0.0100 ' S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	97.40'	10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=5.48 cfs @ 12.22 hrs HW=97.21' TW=95.44' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 5.48 cfs @ 4.47 fps)

Secondary OutFlow Max=0.00 cfs @ 12.18 hrs HW=97.17' TW=95.48' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Summary for Pond C4.8: Twin 18" HDPE

Inflow Area = 5.371 ac, 69.00% Impervious, Inflow Depth = 4.66" for 25-Yr Storm event
 Inflow = 23.18 cfs @ 12.10 hrs, Volume= 2.085 af
 Outflow = 18.69 cfs @ 12.18 hrs, Volume= 2.085 af, Atten= 19%, Lag= 4.8 min
 Primary = 15.10 cfs @ 12.18 hrs, Volume= 2.069 af
 Secondary = 3.59 cfs @ 12.18 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 97.42' @ 12.18 hrs Surf.Area= 10,132 sf Storage= 6,007 cf

Plug-Flow detention time= 2.8 min calculated for 2.085 af (100% of inflow)
 Center-of-Mass det. time= 2.7 min (958.6 - 955.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	95.00'	6,851 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
95.00	0	0.0	0	0	0
96.00	1,595	626.0	532	532	31,186
97.00	3,831	882.0	2,633	3,164	61,916
97.50	11,617	951.0	3,687	6,851	71,991

Device	Routing	Invert	Outlet Devices
#1	Primary	95.10'	18.0" Round Culvert X 2.00 L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.10' / 95.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	97.40'	400.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.10 cfs @ 12.18 hrs HW=97.42' TW=95.47' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 15.10 cfs @ 4.27 fps)

Secondary OutFlow Max=3.53 cfs @ 12.18 hrs HW=97.42' TW=95.47' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 3.53 cfs @ 0.40 fps)

Summary for Pond CB1: CB2.2

Inflow Area = 0.598 ac, 94.93% Impervious, Inflow Depth = 5.33" for 25-Yr Storm event
 Inflow = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af
 Outflow = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.46 cfs @ 12.07 hrs, Volume= 0.265 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 102.89' @ 12.07 hrs
 Flood Elev= 105.30'

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Device	Routing	Invert	Outlet Devices
#1	Primary	101.57'	15.0" Round Culvert L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.57' / 101.02' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.43 cfs @ 12.07 hrs HW=102.88' TW=102.29' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 3.43 cfs @ 3.31 fps)

Summary for Pond CB2: CB2.3

Inflow Area = 1.130 ac, 94.56% Impervious, Inflow Depth = 5.27" for 25-Yr Storm event
Inflow = 6.52 cfs @ 12.07 hrs, Volume= 0.497 af
Outflow = 6.52 cfs @ 12.07 hrs, Volume= 0.497 af, Atten= 0%, Lag= 0.0 min
Primary = 6.52 cfs @ 12.07 hrs, Volume= 0.497 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 102.30' @ 12.07 hrs
Flood Elev= 105.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.77'	18.0" Round Culvert L= 155.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.77' / 100.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.47 cfs @ 12.07 hrs HW=102.29' TW=100.94' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 6.47 cfs @ 4.48 fps)

Summary for Pond CB3: CB2.5

Inflow Area = 2.180 ac, 80.62% Impervious, Inflow Depth = 5.09" for 25-Yr Storm event
Inflow = 10.56 cfs @ 12.10 hrs, Volume= 0.924 af
Outflow = 10.56 cfs @ 12.10 hrs, Volume= 0.924 af, Atten= 0%, Lag= 0.0 min
Primary = 10.56 cfs @ 12.10 hrs, Volume= 0.924 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 99.56' @ 12.11 hrs
Flood Elev= 103.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.13'	18.0" Round Culvert L= 145.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.13' / 95.41' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=10.54 cfs @ 12.10 hrs HW=99.52' TW=97.22' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 10.54 cfs @ 5.97 fps)

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Summary for Pond CB4: CB3.3

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 2.46" for 25-Yr Storm event
 Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af
 Outflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 122.82' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	121.42'	15.0" Round Culvert L= 102.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.42' / 119.38' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.19 cfs @ 12.08 hrs HW=122.82' TW=120.68' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.19 cfs @ 4.23 fps)**Summary for Pond CB5: CB3.4**

Inflow Area = 2.042 ac, 45.50% Impervious, Inflow Depth = 2.46" for 25-Yr Storm event
 Inflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af
 Outflow = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.20 cfs @ 12.08 hrs, Volume= 0.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 120.68' @ 12.08 hrs

Flood Elev= 125.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	119.28'	15.0" Round Culvert L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.28' / 112.00' S= 0.0607 ' / S= 0.0607 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.19 cfs @ 12.08 hrs HW=120.68' TW=113.39' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.19 cfs @ 4.23 fps)**Summary for Pond CB6: CB1.10**

Inflow Area = 1.312 ac, 79.12% Impervious, Inflow Depth = 4.65" for 25-Yr Storm event
 Inflow = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af
 Outflow = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.06 cfs @ 12.07 hrs, Volume= 0.509 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 101.29' @ 12.07 hrs

Flood Elev= 103.60'

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Device	Routing	Invert	Outlet Devices
#1	Primary	99.11'	15.0" Round Culvert L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.11' / 99.00' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.04 cfs @ 12.07 hrs HW=101.27' TW=99.85' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 7.04 cfs @ 5.74 fps)

Summary for Pond D2: DMH-RD2

Inflow Area = 1.055 ac, 86.34% Impervious, Inflow Depth = 4.82" for 25-Yr Storm event
Inflow = 5.30 cfs @ 12.07 hrs, Volume= 0.424 af
Outflow = 5.30 cfs @ 12.07 hrs, Volume= 0.424 af, Atten= 0%, Lag= 0.0 min
Primary = 5.30 cfs @ 12.07 hrs, Volume= 0.424 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 108.43' @ 12.07 hrs
Flood Elev= 113.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	15.0" Round Culvert L= 280.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 97.00' S= 0.0357 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.26 cfs @ 12.07 hrs HW=108.42' TW=97.05' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 5.26 cfs @ 4.29 fps)

Summary for Pond ED: EX DMH

Inflow Area = 0.573 ac, 100.00% Impervious, Inflow Depth = 5.56" for 25-Yr Storm event
Inflow = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af
Outflow = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min
Primary = 3.36 cfs @ 12.07 hrs, Volume= 0.265 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 126.25' @ 12.07 hrs
Flood Elev= 128.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.20'	10.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 124.20' / 122.95' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=3.33 cfs @ 12.07 hrs HW=126.23' TW=122.80' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 3.33 cfs @ 6.11 fps)

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond SF1: Soil Filter 1

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 4.46" for 25-Yr Storm event
 Inflow = 8.01 cfs @ 12.07 hrs, Volume= 0.574 af
 Outflow = 6.02 cfs @ 12.14 hrs, Volume= 0.574 af, Atten= 25%, Lag= 4.0 min
 Primary = 5.88 cfs @ 12.14 hrs, Volume= 0.573 af
 Secondary = 0.14 cfs @ 12.14 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 99.93' @ 12.14 hrs Surf.Area= 5,324 sf Storage= 8,136 cf

Plug-Flow detention time= 350.7 min calculated for 0.574 af (100% of inflow)

Center-of-Mass det. time= 351.2 min (1,140.0 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.88 cfs @ 12.14 hrs HW=99.93' TW=97.38' (Dynamic Tailwater)

1=Culvert (Passes 5.88 cfs of 6.04 cfs potential flow)
 2=Exfiltration (Exfiltration Controls 0.09 cfs)
 3=Orifice/Grate (Weir Controls 5.78 cfs @ 2.14 fps)

Secondary OutFlow Max=0.14 cfs @ 12.14 hrs HW=99.93' TW=97.38' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Weir Controls 0.14 cfs @ 0.46 fps)

Summary for Pond SF2: Soil Filter 2

Inflow Area = 1.487 ac, 74.24% Impervious, Inflow Depth = 4.92" for 25-Yr Storm event
 Inflow = 8.15 cfs @ 12.07 hrs, Volume= 0.610 af
 Outflow = 6.98 cfs @ 12.12 hrs, Volume= 0.610 af, Atten= 14%, Lag= 2.9 min
 Primary = 6.98 cfs @ 12.12 hrs, Volume= 0.610 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.98' @ 12.12 hrs Surf.Area= 4,431 sf Storage= 7,170 cf

Plug-Flow detention time= 297.3 min calculated for 0.610 af (100% of inflow)
 Center-of-Mass det. time= 297.8 min (1,067.5 - 769.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	16,412 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	2,831	0	0
100.50	4,010	5,131	5,131
102.00	5,316	6,995	12,125
102.80	5,402	4,287	16,412

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	15.0" Round Culvert L= 73.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.13' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	99.00'	0.750 in/hr Exfiltration over Horizontal area Phase-In= 0.01'
#3	Device 1	100.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	101.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.63 cfs @ 12.12 hrs HW=100.98' TW=99.53' (Dynamic Tailwater)

↑ **1=Culvert** (Outlet Controls 6.63 cfs @ 5.40 fps)
 ↑ **2=Exfiltration** (Passes < 0.08 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes < 6.90 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.00' TW=99.40' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond W1: Wetland

Inflow Area = 4.370 ac, 36.61% Impervious, Inflow Depth = 2.02" for 25-Yr Storm event
 Inflow = 8.67 cfs @ 12.11 hrs, Volume= 0.736 af
 Outflow = 3.82 cfs @ 12.39 hrs, Volume= 0.736 af, Atten= 56%, Lag= 16.8 min
 Primary = 3.82 cfs @ 12.39 hrs, Volume= 0.736 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 100.48' @ 12.39 hrs Surf.Area= 8,509 sf Storage= 7,120 cf

Plug-Flow detention time= 46.5 min calculated for 0.736 af (100% of inflow)
 Center-of-Mass det. time= 46.6 min (877.5 - 830.9)

Post-Development EAST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Volume	Invert	Avail.Storage	Storage Description
#1	99.40'	23,709 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.40	0	0.0	0	0	0
99.50	5,121	314.0	171	171	7,846
100.00	7,402	583.0	3,113	3,284	27,049
101.00	9,781	571.0	8,564	11,848	28,293
102.00	14,071	697.0	11,861	23,709	41,022

Device	Routing	Invert	Outlet Devices
#1	Primary	99.40'	18.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 99.40' / 98.50' S= 0.0113 ' / S= 0.0113 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.82 cfs @ 12.39 hrs HW=100.48' TW=97.66' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 3.82 cfs @ 2.80 fps)**Summary for Pond W2: Wetland**

Inflow Area = 5.409 ac, 29.58% Impervious, Inflow Depth = 2.23" for 25-Yr Storm event
 Inflow = 5.92 cfs @ 12.10 hrs, Volume= 1.006 af
 Outflow = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af, Atten= 7%, Lag= 6.9 min
 Primary = 5.48 cfs @ 12.22 hrs, Volume= 1.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 97.68' @ 12.19 hrs Surf.Area= 1,564 sf Storage= 531 cf

Plug-Flow detention time= 1.4 min calculated for 1.006 af (100% of inflow)

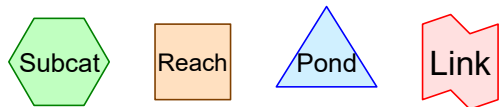
Center-of-Mass det. time= 1.1 min (865.1 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	6,210 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.00	209	106.0	0	0	209
98.00	2,637	405.0	1,196	1,196	12,370
99.00	7,853	571.0	5,014	6,210	25,272

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 Width (feet) 4.00 6.00 8.00

Primary OutFlow Max=7.97 cfs @ 12.22 hrs HW=97.68' TW=97.21' (Dynamic Tailwater)↑**1=Custom Weir/Orifice** (Weir Controls 7.97 cfs @ 2.52 fps)



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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7.0:	Runoff Area=307,321 sf 5.86% Impervious Runoff Depth>1.19" Flow Length=270' Tc=49.4 min CN=78 Runoff=4.24 cfs 0.697 af
Subcatchment 7.1:	Runoff Area=23,130 sf 11.66% Impervious Runoff Depth>0.87" Flow Length=115' Tc=6.5 min CN=72 Runoff=0.49 cfs 0.038 af
Subcatchment 7.2:	Runoff Area=458,111 sf 0.92% Impervious Runoff Depth>1.18" Flow Length=330' Tc=50.7 min CN=78 Runoff=6.23 cfs 1.038 af
Subcatchment 7.3:	Runoff Area=109,454 sf 16.90% Impervious Runoff Depth>0.71" Flow Length=275' Tc=39.9 min CN=69 Runoff=0.91 cfs 0.150 af
Subcatchment 7.4:	Runoff Area=76,277 sf 0.00% Impervious Runoff Depth>0.51" Flow Length=235' Tc=29.3 min CN=64 Runoff=0.45 cfs 0.074 af
Subcatchment 7.5:	Runoff Area=24,701 sf 21.31% Impervious Runoff Depth>0.97" Tc=5.0 min CN=74 Runoff=0.63 cfs 0.046 af
Subcatchment 8.1:	Runoff Area=22,593 sf 79.37% Impervious Runoff Depth>2.35" Tc=5.0 min CN=93 Runoff=1.43 cfs 0.101 af
Subcatchment 8.10:	Runoff Area=82,702 sf 61.99% Impervious Runoff Depth>1.91" Tc=5.0 min CN=88 Runoff=4.38 cfs 0.302 af
Subcatchment 8.11:	Runoff Area=73,887 sf 20.41% Impervious Runoff Depth>1.53" Tc=5.0 min CN=83 Runoff=3.13 cfs 0.216 af
Subcatchment 8.12:	Runoff Area=17,412 sf 91.40% Impervious Runoff Depth>2.65" Tc=5.0 min CN=96 Runoff=1.20 cfs 0.088 af
Subcatchment 8.2:	Runoff Area=28,897 sf 55.19% Impervious Runoff Depth>1.99" Tc=5.0 min CN=89 Runoff=1.59 cfs 0.110 af
Subcatchment 8.3:	Runoff Area=17,587 sf 86.61% Impervious Runoff Depth>2.55" Tc=5.0 min CN=95 Runoff=1.18 cfs 0.086 af
Subcatchment 8.4:	Runoff Area=9,852 sf 0.00% Impervious Runoff Depth>1.32" Tc=5.0 min CN=80 Runoff=0.36 cfs 0.025 af
Subcatchment 8.5:	Runoff Area=31,576 sf 89.50% Impervious Runoff Depth>2.65" Tc=5.0 min CN=96 Runoff=2.17 cfs 0.160 af
Subcatchment 8.6:	Runoff Area=15,257 sf 95.18% Impervious Runoff Depth>2.76" Tc=5.0 min CN=97 Runoff=1.07 cfs 0.080 af
Subcatchment 8.7:	Runoff Area=9,738 sf 100.00% Impervious Runoff Depth>2.87" Tc=5.0 min CN=98 Runoff=0.69 cfs 0.053 af

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Subcatchment 8.8: Runoff Area=9,564 sf 0.00% Impervious Runoff Depth>1.32"
Tc=5.0 min CN=80 Runoff=0.35 cfs 0.024 af

Subcatchment 8.9: Runoff Area=25,455 sf 93.62% Impervious Runoff Depth>2.76"
Tc=5.0 min CN=97 Runoff=1.79 cfs 0.134 af

Reach R7.1: Stream Avg. Flow Depth=0.80' Max Vel=3.97 fps Inflow=12.05 cfs 3.064 af
n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=12.01 cfs 3.054 af

Reach R7.3: Stream Avg. Flow Depth=0.47' Max Vel=4.63 fps Inflow=7.49 cfs 2.211 af
n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=7.49 cfs 2.209 af

Reach R7.4: Stream Avg. Flow Depth=0.07' Max Vel=2.07 fps Inflow=0.45 cfs 0.074 af
n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=0.45 cfs 0.074 af

Pond C1: CB5.3 Peak Elev=76.55' Inflow=1.43 cfs 0.101 af
12.0" Round Culvert n=0.013 L=80.0' S=0.0053 '/' Outflow=1.43 cfs 0.101 af

Pond C10: OCS4 Peak Elev=71.36' Inflow=2.60 cfs 0.202 af
24.0" Round Culvert n=0.013 L=63.0' S=0.0052 '/' Outflow=2.60 cfs 0.202 af

Pond C11: CB7.5 Peak Elev=73.27' Inflow=1.20 cfs 0.088 af
12.0" Round Culvert n=0.013 L=49.0' S=0.0143 '/' Outflow=1.20 cfs 0.088 af

Pond C2: CB5.5 Peak Elev=76.00' Inflow=3.02 cfs 0.211 af
15.0" Round Culvert n=0.013 L=209.0' S=0.0051 '/' Outflow=3.02 cfs 0.211 af

Pond C3: CB5.6 Peak Elev=74.98' Inflow=4.20 cfs 0.297 af
18.0" Round Culvert n=0.013 L=62.0' S=0.0052 '/' Outflow=4.20 cfs 0.297 af

Pond C4: CB6.3.1 Peak Elev=75.19' Inflow=2.86 cfs 0.213 af
15.0" Round Culvert n=0.013 L=31.0' S=0.0058 '/' Outflow=2.86 cfs 0.213 af

Pond C5: CB6.3 Peak Elev=75.35' Inflow=0.69 cfs 0.053 af
12.0" Round Culvert n=0.013 L=129.0' S=0.0056 '/' Outflow=0.69 cfs 0.053 af

Pond C6: CB6.4 Peak Elev=74.95' Inflow=3.93 cfs 0.294 af
15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=3.93 cfs 0.294 af

Pond C7: CB7.3 Peak Elev=73.91' Inflow=4.38 cfs 0.302 af
18.0" Round Culvert n=0.013 L=196.0' S=0.0098 '/' Outflow=4.38 cfs 0.302 af

Pond C7.1: CB7.3 Peak Elev=78.87' Inflow=0.49 cfs 0.038 af
15.0" Round Culvert n=0.013 L=88.0' S=0.0398 '/' Outflow=0.49 cfs 0.038 af

Pond C7.3: Peak Elev=76.70' Inflow=7.49 cfs 2.211 af
36.0" Round Culvert w/ 1.0" inside fill n=0.013 L=55.0' S=0.0200 '/' Outflow=7.49 cfs 2.211 af

Pond C7.5: CB7.3 Peak Elev=80.19' Inflow=0.63 cfs 0.046 af
36.0" Round Culvert w/ 12.0" inside fill n=0.013 L=70.0' S=0.0563 '/' Outflow=0.63 cfs 0.046 af

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Pond C8: CB7.4

Peak Elev=72.32' Inflow=7.36 cfs 0.524 af
24.0" Round Culvert n=0.013 L=85.0' S=0.0051 ' /' Outflow=7.36 cfs 0.524 af

Pond C9: OCS3

Peak Elev=71.68' Inflow=1.29 cfs 0.105 af
18.0" Round Culvert n=0.013 L=77.0' S=0.0053 ' /' Outflow=1.29 cfs 0.105 af

Pond P1: Wetland

Peak Elev=83.63' Storage=12,495 cf Inflow=8.88 cfs 2.073 af
Outflow=6.84 cfs 2.062 af

Pond SF3: Soil Fliter

Peak Elev=74.66' Storage=6,216 cf Inflow=4.56 cfs 0.322 af
Primary=0.08 cfs 0.096 af Secondary=1.29 cfs 0.105 af Tertiary=0.00 cfs 0.000 af Outflow=1.37 cfs 0.201 af

Pond SF4: Soil Filter

Peak Elev=74.66' Storage=6,168 cf Inflow=4.28 cfs 0.318 af
Primary=0.07 cfs 0.103 af Secondary=1.32 cfs 0.097 af Tertiary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.201 af

Link AP8:

Inflow=14.39 cfs 4.196 af
Primary=14.39 cfs 4.196 af

Link 2-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce Inflow=6.65 cfs 1.035 af
Area= 10.780 ac 49.22% Imperv. Primary=6.65 cfs 1.035 af

Total Runoff Area = 30.843 ac Runoff Volume = 3.423 af Average Runoff Depth = 1.33"
80.92% Pervious = 24.957 ac 19.08% Impervious = 5.886 ac

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Summary for Subcatchment 7.0:

Runoff = 4.24 cfs @ 12.69 hrs, Volume= 0.697 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	18,020	98	Impervious
	3,144	80	>75% Grass cover, Good, HSG D
	36,715	73	Brush, Good, HSG D
	249,442	77	Woods, Good, HSG D
	307,321	78	Weighted Average
	289,301		94.14% Pervious Area
	18,020		5.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	2,697	98	Impervious
	750	74	>75% Grass cover, Good, HSG C
	12,331	65	Brush, Good, HSG C
	7,352	73	Brush, Good, HSG D
	23,130	72	Weighted Average
	20,433		88.34% Pervious Area
	2,697		11.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	15	0.2000	0.32		Sheet Flow, AB
					Range n= 0.130 P2= 3.10"
5.7	100	0.0600	0.29		Sheet Flow, BC
					Range n= 0.130 P2= 3.10"
6.5	115	Total			

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Summary for Subcatchment 7.2:

Runoff = 6.23 cfs @ 12.73 hrs, Volume= 1.038 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 4,195	98	Impervious
1,074	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
143,721	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
289,827	77	Woods, Good, HSG D
458,111	78	Weighted Average
453,916		99.08% Pervious Area
4,195		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD
					Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 0.91 cfs @ 12.64 hrs, Volume= 0.150 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 18,496	98	Impervious
4,537	30	Brush, Good, HSG A
9,423	73	Brush, Good, HSG D
21,947	30	Woods, Good, HSG A
55,051	77	Woods, Good, HSG D
109,454	69	Weighted Average
90,958		83.10% Pervious Area
18,496		16.90% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 0.45 cfs @ 12.52 hrs, Volume= 0.074 af, Depth> 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
19,947	30	Woods, Good, HSG A
3,125	70	Woods, Good, HSG C
53,205	77	Woods, Good, HSG D
76,277	64	Weighted Average
76,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 7.5:

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	5,263	98	Impervious
	567	74	>75% Grass cover, Good, HSG C
	14,440	65	Brush, Good, HSG C
	4,431	73	Brush, Good, HSG D
	24,701	74	Weighted Average
	19,438		78.69% Pervious Area
	5,263		21.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.1:

Runoff = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	17,932	98	Impervious
	3,258	74	>75% Grass cover, Good, HSG C
	1,403	80	>75% Grass cover, Good, HSG D
	22,593	93	Weighted Average
	4,661		20.63% Pervious Area
	17,932		79.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.10:

Runoff = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	51,270	98	Impervious
	4,732	74	>75% Grass cover, Good, HSG C
	26,700	70	Woods, Good, HSG C
	82,702	88	Weighted Average
	31,432		38.01% Pervious Area
	51,270		61.99% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.11:

Runoff = 3.13 cfs @ 12.08 hrs, Volume= 0.216 af, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 15,081	98	Impervious
2,598	74	>75% Grass cover, Good, HSG C
56,208	80	>75% Grass cover, Good, HSG D
73,887	83	Weighted Average
58,806		79.59% Pervious Area
15,081		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.12:

Runoff = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 15,914	98	Impervious
1,498	74	>75% Grass cover, Good, HSG C
17,412	96	Weighted Average
1,498		8.60% Pervious Area
15,914		91.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.2:

Runoff = 1.59 cfs @ 12.07 hrs, Volume= 0.110 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

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	Area (sf)	CN	Description
*	15,948	98	Impervious
	6,561	74	>75% Grass cover, Good, HSG C
	6,388	80	>75% Grass cover, Good, HSG D
	28,897	89	Weighted Average
	12,949		44.81% Pervious Area
	15,948		55.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.3:

Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.086 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	15,232	98	Impervious
	1,109	74	>75% Grass cover, Good, HSG C
	1,246	80	>75% Grass cover, Good, HSG D
	17,587	95	Weighted Average
	2,355		13.39% Pervious Area
	15,232		86.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.4:

Runoff = 0.36 cfs @ 12.08 hrs, Volume= 0.025 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
	9,852	80	>75% Grass cover, Good, HSG D
	9,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 8.5:

Runoff = 2.17 cfs @ 12.07 hrs, Volume= 0.160 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	28,262	98	Impervious
	2,606	74	>75% Grass cover, Good, HSG C
	708	80	>75% Grass cover, Good, HSG D
	31,576	96	Weighted Average
	3,314		10.50% Pervious Area
	28,262		89.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.6:

Runoff = 1.07 cfs @ 12.07 hrs, Volume= 0.080 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	14,522	98	Impervious
	735	80	>75% Grass cover, Good, HSG D
	15,257	97	Weighted Average
	735		4.82% Pervious Area
	14,522		95.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.7:

Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	9,738	98	Impervious
	9,738		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.8:

Runoff = 0.35 cfs @ 12.08 hrs, Volume= 0.024 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
9,564	80	>75% Grass cover, Good, HSG D
9,564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.9:

Runoff = 1.79 cfs @ 12.07 hrs, Volume= 0.134 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Area (sf)	CN	Description
* 23,832	98	Impervious
1,212	74	>75% Grass cover, Good, HSG C
411	80	>75% Grass cover, Good, HSG D
25,455	97	Weighted Average
1,623		6.38% Pervious Area
23,832		93.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R7.1: StreamInflow Area = 33.714 ac, 19.05% Impervious, Inflow Depth > 1.09" for 2-Yr Storm event
Inflow = 12.05 cfs @ 12.77 hrs, Volume= 3.064 af
Outflow = 12.01 cfs @ 12.81 hrs, Volume= 3.054 af, Atten= 0%, Lag= 2.2 minRouting by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 8.9 min

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Peak Storage= 2,602 cf @ 12.81 hrs

Average Depth at Peak Storage= 0.80'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 1.11" for 2-Yr Storm event

Inflow = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af

Outflow = 7.49 cfs @ 12.93 hrs, Volume= 2.209 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 4.63 fps, Min. Travel Time= 1.3 min

Avg. Velocity= 1.97 fps, Avg. Travel Time= 3.0 min

Peak Storage= 574 cf @ 12.93 hrs

Average Depth at Peak Storage= 0.47'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



Summary for Reach R7.4: Stream

Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 0.51" for 2-Yr Storm event

Inflow = 0.45 cfs @ 12.52 hrs, Volume= 0.074 af

Outflow = 0.45 cfs @ 12.53 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.7 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 2.07 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 1.04 fps, Avg. Travel Time= 2.2 min

Peak Storage= 30 cf @ 12.53 hrs

Average Depth at Peak Storage= 0.07'

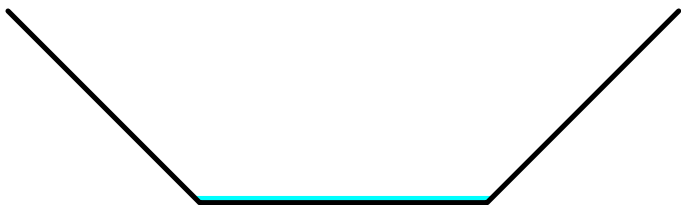
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 '/'

Inlet Invert= 73.00', Outlet Invert= 67.00'

**Summary for Pond C1: CB5.3**

Inflow Area = 0.519 ac, 79.37% Impervious, Inflow Depth > 2.35" for 2-Yr Storm event

Inflow = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af

Outflow = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Primary = 1.43 cfs @ 12.07 hrs, Volume= 0.101 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.55' @ 12.08 hrs

Flood Elev= 80.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.80'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.80' / 75.38' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.38 cfs @ 12.07 hrs HW=76.54' TW=75.99' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.38 cfs @ 3.07 fps)**Summary for Pond C10: OCS4**

Inflow = 2.60 cfs @ 12.37 hrs, Volume= 0.202 af

Outflow = 2.60 cfs @ 12.37 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary = 2.60 cfs @ 12.37 hrs, Volume= 0.202 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 71.36' @ 12.37 hrs

Flood Elev= 74.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	70.59'	24.0" Round Culvert L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.59' / 70.26' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.60 cfs @ 12.37 hrs HW=71.36' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 2.60 cfs @ 3.44 fps)**Summary for Pond C11: CB7.5**

Inflow Area = 0.400 ac, 91.40% Impervious, Inflow Depth > 2.65" for 2-Yr Storm event
Inflow = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af
Outflow = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.07 hrs, Volume= 0.088 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.27' @ 12.07 hrs

Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.70'	12.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.70' / 72.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.07 hrs HW=73.27' TW=72.31' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.19 cfs @ 2.57 fps)**Summary for Pond C2: CB5.5**

Inflow Area = 1.182 ac, 65.80% Impervious, Inflow Depth > 2.15" for 2-Yr Storm event
Inflow = 3.02 cfs @ 12.07 hrs, Volume= 0.211 af
Outflow = 3.02 cfs @ 12.07 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min
Primary = 3.02 cfs @ 12.07 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.00' @ 12.08 hrs

Flood Elev= 79.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	74.89'	15.0" Round Culvert L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.89' / 73.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.97 cfs @ 12.07 hrs HW=75.99' TW=74.97' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 2.97 cfs @ 3.45 fps)

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Summary for Pond C3: CB5.6

Inflow Area = 1.586 ac, 71.10% Impervious, Inflow Depth > 2.25" for 2-Yr Storm event
 Inflow = 4.20 cfs @ 12.07 hrs, Volume= 0.297 af
 Outflow = 4.20 cfs @ 12.07 hrs, Volume= 0.297 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.20 cfs @ 12.07 hrs, Volume= 0.297 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.98' @ 12.07 hrs

Flood Elev= 78.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.82'	18.0" Round Culvert L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.82' / 73.50' S= 0.0052 ' / S= 0.0052 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.17 cfs @ 12.07 hrs HW=74.97' TW=74.16' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 4.17 cfs @ 3.95 fps)

Summary for Pond C4: CB6.3.1

Inflow Area = 0.948 ac, 91.98% Impervious, Inflow Depth > 2.70" for 2-Yr Storm event
 Inflow = 2.86 cfs @ 12.07 hrs, Volume= 0.213 af
 Outflow = 2.86 cfs @ 12.07 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.86 cfs @ 12.07 hrs, Volume= 0.213 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.19' @ 12.08 hrs

Flood Elev= 77.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.88'	15.0" Round Culvert L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.88' / 73.70' S= 0.0058 ' / S= 0.0058 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.65 cfs @ 12.07 hrs HW=75.16' TW=74.95' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 2.65 cfs @ 2.61 fps)

Summary for Pond C5: CB6.3

Inflow Area = 0.224 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2-Yr Storm event
 Inflow = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af
 Outflow = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.35' @ 12.10 hrs

Flood Elev= 79.10'

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Device	Routing	Invert	Outlet Devices
#1	Primary	74.60'	12.0" Round Culvert L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.60' / 73.88' S= 0.0056 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.56 cfs @ 12.07 hrs HW=75.31' TW=75.16' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.56 cfs @ 1.33 fps)**Summary for Pond C6: CB6.4**

Inflow Area = 1.299 ac, 92.84% Impervious, Inflow Depth > 2.72" for 2-Yr Storm event
Inflow = 3.93 cfs @ 12.07 hrs, Volume= 0.294 af
Outflow = 3.93 cfs @ 12.07 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.0 min
Primary = 3.93 cfs @ 12.07 hrs, Volume= 0.294 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.95' @ 12.07 hrs

Flood Elev= 76.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.70'	15.0" Round Culvert L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.70' / 73.30' S= 0.0051 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.87 cfs @ 12.07 hrs HW=74.95' TW=74.25' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 3.87 cfs @ 3.93 fps)**Summary for Pond C7: CB7.3**

Inflow Area = 1.899 ac, 61.99% Impervious, Inflow Depth > 1.91" for 2-Yr Storm event
Inflow = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af
Outflow = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min
Primary = 4.38 cfs @ 12.07 hrs, Volume= 0.302 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.91' @ 12.08 hrs

Flood Elev= 76.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.85'	18.0" Round Culvert L= 196.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.85' / 70.93' S= 0.0098 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.32 cfs @ 12.07 hrs HW=73.91' TW=72.31' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 4.32 cfs @ 4.56 fps)

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Summary for Pond C7.1: CB7.3

Inflow Area = 0.531 ac, 11.66% Impervious, Inflow Depth > 0.87" for 2-Yr Storm event
 Inflow = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af
 Outflow = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.49 cfs @ 12.11 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 78.87' @ 12.11 hrs

Flood Elev= 82.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	15.0" Round Culvert L= 88.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.50' / 75.00' S= 0.0398 ' S= 0.0398 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.48 cfs @ 12.11 hrs HW=78.86' TW=76.41' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 0.48 cfs @ 1.62 fps)

Summary for Pond C7.3:

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 1.11" for 2-Yr Storm event
 Inflow = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af
 Outflow = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.49 cfs @ 12.92 hrs, Volume= 2.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.70' @ 12.92 hrs

Flood Elev= 84.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.48'	36.0" Round Culvert w/ 1.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.40' / 74.30' S= 0.0200 ' S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.01 sf

Primary OutFlow Max=7.49 cfs @ 12.92 hrs HW=76.70' TW=75.47' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 7.49 cfs @ 2.60 fps)

Summary for Pond C7.5: CB7.3

Inflow Area = 0.567 ac, 21.31% Impervious, Inflow Depth > 0.97" for 2-Yr Storm event
 Inflow = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af
 Outflow = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.08 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 80.19' @ 12.08 hrs

Flood Elev= 83.00'

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Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	36.0" Round Culvert w/ 12.0" inside fill L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.00' / 75.06' S= 0.0563 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf

Primary OutFlow Max=0.63 cfs @ 12.08 hrs HW=80.19' TW=76.38' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 0.63 cfs @ 1.12 fps)**Summary for Pond C8: CB7.4**

Inflow Area = 2.883 ac, 72.48% Impervious, Inflow Depth > 2.18" for 2-Yr Storm event
Inflow = 7.36 cfs @ 12.07 hrs, Volume= 0.524 af
Outflow = 7.36 cfs @ 12.07 hrs, Volume= 0.524 af, Atten= 0%, Lag= 0.0 min
Primary = 7.36 cfs @ 12.07 hrs, Volume= 0.524 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.32' @ 12.07 hrs

Flood Elev= 75.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	70.93'	24.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.93' / 70.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.30 cfs @ 12.07 hrs HW=72.31' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 7.30 cfs @ 4.44 fps)**Summary for Pond C9: OCS3**

Inflow = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af
Outflow = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 71.68' @ 12.39 hrs

Flood Elev= 74.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	18.0" Round Culvert L= 77.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.59' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.30 cfs @ 12.39 hrs HW=71.68' TW=71.36' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.30 cfs @ 2.43 fps)

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Summary for Pond P1: Wetland

Inflow Area = 21.297 ac, 25.37% Impervious, Inflow Depth > 1.17" for 2-Yr Storm event
 Inflow = 8.88 cfs @ 12.53 hrs, Volume= 2.073 af
 Outflow = 6.84 cfs @ 13.00 hrs, Volume= 2.062 af, Atten= 23%, Lag= 28.2 min
 Primary = 6.84 cfs @ 13.00 hrs, Volume= 2.062 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 83.63' @ 13.00 hrs Surf.Area= 20,135 sf Storage= 12,495 cf

Plug-Flow detention time= 23.7 min calculated for 2.060 af (99% of inflow)
 Center-of-Mass det. time= 20.5 min (885.8 - 865.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S= 0.0560 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=6.84 cfs @ 13.00 hrs HW=83.63' TW=76.70' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 6.84 cfs @ 3.09 fps)

↑ **1=Sharp-Crested Vee/Trap Weir** (Passes 6.84 cfs of 9.42 cfs potential flow)

Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 2.13" for 2-Yr Storm event
 Inflow = 4.56 cfs @ 12.07 hrs, Volume= 0.322 af
 Outflow = 1.37 cfs @ 12.39 hrs, Volume= 0.201 af, Atten= 70%, Lag= 19.2 min
 Primary = 0.08 cfs @ 12.39 hrs, Volume= 0.096 af
 Secondary = 1.29 cfs @ 12.39 hrs, Volume= 0.105 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 74.66' @ 12.39 hrs Surf.Area= 4,427 sf Storage= 6,216 cf

Plug-Flow detention time= 188.0 min calculated for 0.201 af (62% of inflow)
 Center-of-Mass det. time= 85.6 min (885.0 - 799.5)

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Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.39 hrs HW=74.66' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=1.29 cfs @ 12.39 hrs HW=74.66' TW=71.68' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 1.29 cfs @ 1.30 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SF4: Soil Filter**

Inflow Area =	1.518 ac, 79.42% Impervious, Inflow Depth > 2.51" for 2-Yr Storm event
Inflow =	4.28 cfs @ 12.07 hrs, Volume= 0.318 af
Outflow =	1.40 cfs @ 12.35 hrs, Volume= 0.201 af, Atten= 67%, Lag= 16.7 min
Primary =	0.07 cfs @ 12.35 hrs, Volume= 0.103 af
Secondary =	1.32 cfs @ 12.35 hrs, Volume= 0.097 af
Tertiary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.66' @ 12.35 hrs Surf.Area= 4,308 sf Storage= 6,168 cf

Plug-Flow detention time= 185.6 min calculated for 0.201 af (63% of inflow)

Center-of-Mass det. time= 83.3 min (857.1 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	18,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,128	0	0
74.50	4,186	5,486	5,486
75.00	4,566	2,188	7,674
76.00	5,370	4,968	12,642
77.00	6,231	5,801	18,442

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.35 hrs HW=74.66' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.07 cfs)**Secondary OutFlow** Max=1.32 cfs @ 12.35 hrs HW=74.66' TW=71.36' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 1.32 cfs @ 1.31 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Link AP8:**

Inflow Area = 41.623 ac, 26.89% Impervious, Inflow Depth > 1.21" for 2-Yr Storm event
 Inflow = 14.39 cfs @ 12.73 hrs, Volume= 4.196 af
 Primary = 14.39 cfs @ 12.73 hrs, Volume= 4.196 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link L1: EAST

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth > 1.15" for 2-Yr Storm event
 Inflow = 6.65 cfs @ 12.13 hrs, Volume= 1.035 af
 Primary = 6.65 cfs @ 12.13 hrs, Volume= 1.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

2-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7.0:	Runoff Area=307,321 sf 5.86% Impervious Runoff Depth>2.35" Flow Length=270' Tc=49.4 min CN=78 Runoff=8.65 cfs 1.381 af
Subcatchment 7.1:	Runoff Area=23,130 sf 11.66% Impervious Runoff Depth>1.89" Flow Length=115' Tc=6.5 min CN=72 Runoff=1.14 cfs 0.084 af
Subcatchment 7.2:	Runoff Area=458,111 sf 0.92% Impervious Runoff Depth>2.35" Flow Length=330' Tc=50.7 min CN=78 Runoff=12.69 cfs 2.059 af
Subcatchment 7.3:	Runoff Area=109,454 sf 16.90% Impervious Runoff Depth>1.65" Flow Length=275' Tc=39.9 min CN=69 Runoff=2.34 cfs 0.346 af
Subcatchment 7.4:	Runoff Area=76,277 sf 0.00% Impervious Runoff Depth>1.32" Flow Length=235' Tc=29.3 min CN=64 Runoff=1.43 cfs 0.192 af
Subcatchment 7.5:	Runoff Area=24,701 sf 21.31% Impervious Runoff Depth>2.05" Tc=5.0 min CN=74 Runoff=1.40 cfs 0.097 af
Subcatchment 8.1:	Runoff Area=22,593 sf 79.37% Impervious Runoff Depth>3.80" Tc=5.0 min CN=93 Runoff=2.26 cfs 0.164 af
Subcatchment 8.10:	Runoff Area=82,702 sf 61.99% Impervious Runoff Depth>3.29" Tc=5.0 min CN=88 Runoff=7.43 cfs 0.520 af
Subcatchment 8.11:	Runoff Area=73,887 sf 20.41% Impervious Runoff Depth>2.81" Tc=5.0 min CN=83 Runoff=5.77 cfs 0.398 af
Subcatchment 8.12:	Runoff Area=17,412 sf 91.40% Impervious Runoff Depth>4.13" Tc=5.0 min CN=96 Runoff=1.82 cfs 0.138 af
Subcatchment 8.2:	Runoff Area=28,897 sf 55.19% Impervious Runoff Depth>3.39" Tc=5.0 min CN=89 Runoff=2.66 cfs 0.187 af
Subcatchment 8.3:	Runoff Area=17,587 sf 86.61% Impervious Runoff Depth>4.02" Tc=5.0 min CN=95 Runoff=1.82 cfs 0.135 af
Subcatchment 8.4:	Runoff Area=9,852 sf 0.00% Impervious Runoff Depth>2.54" Tc=5.0 min CN=80 Runoff=0.70 cfs 0.048 af
Subcatchment 8.5:	Runoff Area=31,576 sf 89.50% Impervious Runoff Depth>4.13" Tc=5.0 min CN=96 Runoff=3.30 cfs 0.250 af
Subcatchment 8.6:	Runoff Area=15,257 sf 95.18% Impervious Runoff Depth>4.25" Tc=5.0 min CN=97 Runoff=1.61 cfs 0.124 af
Subcatchment 8.7:	Runoff Area=9,738 sf 100.00% Impervious Runoff Depth>4.36" Tc=5.0 min CN=98 Runoff=1.04 cfs 0.081 af

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Subcatchment 8.8:	Runoff Area=9,564 sf 0.00% Impervious Runoff Depth>2.54" Tc=5.0 min CN=80 Runoff=0.68 cfs 0.047 af
Subcatchment 8.9:	Runoff Area=25,455 sf 93.62% Impervious Runoff Depth>4.25" Tc=5.0 min CN=97 Runoff=2.69 cfs 0.207 af
Reach R7.1: Stream	Avg. Flow Depth=1.20' Max Vel=4.88 fps Inflow=24.59 cfs 6.113 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=24.53 cfs 6.100 af
Reach R7.3: Stream	Avg. Flow Depth=0.69' Max Vel=5.74 fps Inflow=14.67 cfs 4.363 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=14.67 cfs 4.359 af
Reach R7.4: Stream	Avg. Flow Depth=0.14' Max Vel=3.19 fps Inflow=1.43 cfs 0.192 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=1.43 cfs 0.192 af
Pond C1: CB5.3	Peak Elev=77.49' Inflow=2.26 cfs 0.164 af 12.0" Round Culvert n=0.013 L=80.0' S=0.0053 '/' Outflow=2.26 cfs 0.164 af
Pond C10: OCS4	Peak Elev=72.38' Inflow=10.82 cfs 0.566 af 24.0" Round Culvert n=0.013 L=63.0' S=0.0052 '/' Outflow=10.82 cfs 0.566 af
Pond C11: CB7.5	Peak Elev=73.47' Inflow=1.82 cfs 0.138 af 12.0" Round Culvert n=0.013 L=49.0' S=0.0143 '/' Outflow=1.82 cfs 0.138 af
Pond C2: CB5.5	Peak Elev=77.02' Inflow=4.92 cfs 0.352 af 15.0" Round Culvert n=0.013 L=209.0' S=0.0051 '/' Outflow=4.92 cfs 0.352 af
Pond C3: CB5.6	Peak Elev=75.49' Inflow=6.73 cfs 0.487 af 18.0" Round Culvert n=0.013 L=62.0' S=0.0052 '/' Outflow=6.73 cfs 0.487 af
Pond C4: CB6.3.1	Peak Elev=76.52' Inflow=4.34 cfs 0.331 af 15.0" Round Culvert n=0.013 L=31.0' S=0.0058 '/' Outflow=4.34 cfs 0.331 af
Pond C5: CB6.3	Peak Elev=76.64' Inflow=1.04 cfs 0.081 af 12.0" Round Culvert n=0.013 L=129.0' S=0.0056 '/' Outflow=1.04 cfs 0.081 af
Pond C6: CB6.4	Peak Elev=76.02' Inflow=5.95 cfs 0.455 af 15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=5.95 cfs 0.455 af
Pond C7: CB7.3	Peak Elev=74.43' Inflow=7.43 cfs 0.520 af 18.0" Round Culvert n=0.013 L=196.0' S=0.0098 '/' Outflow=7.43 cfs 0.520 af
Pond C7.1: CB7.3	Peak Elev=79.08' Inflow=1.14 cfs 0.084 af 15.0" Round Culvert n=0.013 L=88.0' S=0.0398 '/' Outflow=1.14 cfs 0.084 af
Pond C7.3:	Peak Elev=77.28' Inflow=14.67 cfs 4.363 af 36.0" Round Culvert w/ 1.0" inside fill n=0.013 L=55.0' S=0.0200 '/' Outflow=14.67 cfs 4.363 af
Pond C7.5: CB7.3	Peak Elev=80.33' Inflow=1.40 cfs 0.097 af 36.0" Round Culvert w/ 12.0" inside fill n=0.013 L=70.0' S=0.0563 '/' Outflow=1.40 cfs 0.097 af

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Pond C8: CB7.4

Peak Elev=72.83' Inflow=11.93 cfs 0.865 af
24.0" Round Culvert n=0.013 L=85.0' S=0.0051 '/' Outflow=11.93 cfs 0.865 af

Pond C9: OCS3

Peak Elev=72.83' Inflow=5.66 cfs 0.303 af
18.0" Round Culvert n=0.013 L=77.0' S=0.0053 '/' Outflow=5.66 cfs 0.303 af

Pond P1: Wetland

Peak Elev=84.50' Storage=34,069 cf Inflow=20.93 cfs 4.035 af
Outflow=13.08 cfs 4.016 af

Pond SF3: Soil Filter

Peak Elev=74.92' Storage=7,419 cf Inflow=7.43 cfs 0.535 af
Primary=0.08 cfs 0.105 af Secondary=5.66 cfs 0.303 af Tertiary=0.00 cfs 0.000 af Outflow=5.74 cfs 0.408 af

Pond SF4: Soil Filter

Peak Elev=74.90' Storage=7,215 cf Inflow=6.63 cfs 0.501 af
Primary=0.08 cfs 0.113 af Secondary=5.17 cfs 0.264 af Tertiary=0.00 cfs 0.000 af Outflow=5.25 cfs 0.376 af

Link AP8:

Inflow=35.94 cfs 8.147 af
Primary=35.94 cfs 8.147 af

Link 10-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce Inflow=14.70 cfs 1.976 af
Area= 10.780 ac 49.22% Imperv. Primary=14.70 cfs 1.976 af

Total Runoff Area = 30.843 ac Runoff Volume = 6.457 af Average Runoff Depth = 2.51"
80.92% Pervious = 24.957 ac 19.08% Impervious = 5.886 ac

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Summary for Subcatchment 7.0:

Runoff = 8.65 cfs @ 12.68 hrs, Volume= 1.381 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	18,020	98	Impervious
	3,144	80	>75% Grass cover, Good, HSG D
	36,715	73	Brush, Good, HSG D
	249,442	77	Woods, Good, HSG D
	307,321	78	Weighted Average
	289,301		94.14% Pervious Area
	18,020		5.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	2,697	98	Impervious
	750	74	>75% Grass cover, Good, HSG C
	12,331	65	Brush, Good, HSG C
	7,352	73	Brush, Good, HSG D
	23,130	72	Weighted Average
	20,433		88.34% Pervious Area
	2,697		11.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	15	0.2000	0.32		Sheet Flow, AB
					Range n= 0.130 P2= 3.10"
5.7	100	0.0600	0.29		Sheet Flow, BC
					Range n= 0.130 P2= 3.10"
6.5	115	Total			

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Summary for Subcatchment 7.2:

Runoff = 12.69 cfs @ 12.69 hrs, Volume= 2.059 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	4,195	98	Impervious
	1,074	39	>75% Grass cover, Good, HSG A
	5,637	74	>75% Grass cover, Good, HSG C
	143,721	80	>75% Grass cover, Good, HSG D
	13,657	70	Woods, Good, HSG C
	289,827	77	Woods, Good, HSG D
	458,111	78	Weighted Average
	453,916		99.08% Pervious Area
	4,195		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD
					Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 2.34 cfs @ 12.58 hrs, Volume= 0.346 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	18,496	98	Impervious
	4,537	30	Brush, Good, HSG A
	9,423	73	Brush, Good, HSG D
	21,947	30	Woods, Good, HSG A
	55,051	77	Woods, Good, HSG D
	109,454	69	Weighted Average
	90,958		83.10% Pervious Area
	18,496		16.90% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 1.43 cfs @ 12.46 hrs, Volume= 0.192 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
19,947	30	Woods, Good, HSG A
3,125	70	Woods, Good, HSG C
53,205	77	Woods, Good, HSG D
76,277	64	Weighted Average
76,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 7.5:

Runoff = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	5,263	98	Impervious
	567	74	>75% Grass cover, Good, HSG C
	14,440	65	Brush, Good, HSG C
	4,431	73	Brush, Good, HSG D
	24,701	74	Weighted Average
	19,438		78.69% Pervious Area
	5,263		21.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.1:

Runoff = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	17,932	98	Impervious
	3,258	74	>75% Grass cover, Good, HSG C
	1,403	80	>75% Grass cover, Good, HSG D
	22,593	93	Weighted Average
	4,661		20.63% Pervious Area
	17,932		79.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.10:

Runoff = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	51,270	98	Impervious
	4,732	74	>75% Grass cover, Good, HSG C
	26,700	70	Woods, Good, HSG C
	82,702	88	Weighted Average
	31,432		38.01% Pervious Area
	51,270		61.99% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.11:

Runoff = 5.77 cfs @ 12.07 hrs, Volume= 0.398 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 15,081	98	Impervious
2,598	74	>75% Grass cover, Good, HSG C
56,208	80	>75% Grass cover, Good, HSG D
73,887	83	Weighted Average
58,806		79.59% Pervious Area
15,081		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.12:

Runoff = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 15,914	98	Impervious
1,498	74	>75% Grass cover, Good, HSG C
17,412	96	Weighted Average
1,498		8.60% Pervious Area
15,914		91.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.2:

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.187 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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	Area (sf)	CN	Description
*	15,948	98	Impervious
	6,561	74	>75% Grass cover, Good, HSG C
	6,388	80	>75% Grass cover, Good, HSG D
	28,897	89	Weighted Average
	12,949		44.81% Pervious Area
	15,948		55.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.3:

Runoff = 1.82 cfs @ 12.07 hrs, Volume= 0.135 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	15,232	98	Impervious
	1,109	74	>75% Grass cover, Good, HSG C
	1,246	80	>75% Grass cover, Good, HSG D
	17,587	95	Weighted Average
	2,355		13.39% Pervious Area
	15,232		86.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.4:

Runoff = 0.70 cfs @ 12.08 hrs, Volume= 0.048 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
	9,852	80	>75% Grass cover, Good, HSG D
	9,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Subcatchment 8.5:

Runoff = 3.30 cfs @ 12.07 hrs, Volume= 0.250 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	28,262	98	Impervious
	2,606	74	>75% Grass cover, Good, HSG C
	708	80	>75% Grass cover, Good, HSG D
	31,576	96	Weighted Average
	3,314		10.50% Pervious Area
	28,262		89.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.6:

Runoff = 1.61 cfs @ 12.07 hrs, Volume= 0.124 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	14,522	98	Impervious
	735	80	>75% Grass cover, Good, HSG D
	15,257	97	Weighted Average
	735		4.82% Pervious Area
	14,522		95.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.7:

Runoff = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	9,738	98	Impervious
	9,738		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.8:

Runoff = 0.68 cfs @ 12.08 hrs, Volume= 0.047 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
9,564	80	>75% Grass cover, Good, HSG D
9,564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.9:

Runoff = 2.69 cfs @ 12.07 hrs, Volume= 0.207 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.60"

Area (sf)	CN	Description
* 23,832	98	Impervious
1,212	74	>75% Grass cover, Good, HSG C
411	80	>75% Grass cover, Good, HSG D
25,455	97	Weighted Average
1,623		6.38% Pervious Area
23,832		93.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R7.1: StreamInflow Area = 33.714 ac, 19.05% Impervious, Inflow Depth > 2.18" for 10-Yr Storm event
Inflow = 24.59 cfs @ 12.69 hrs, Volume= 6.113 af
Outflow = 24.53 cfs @ 12.73 hrs, Volume= 6.100 af, Atten= 0%, Lag= 2.6 minRouting by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.88 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 7.2 min

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Peak Storage= 4,318 cf @ 12.73 hrs

Average Depth at Peak Storage= 1.20'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 '/'

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 2.20" for 10-Yr Storm event

Inflow = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af

Outflow = 14.67 cfs @ 12.83 hrs, Volume= 4.359 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 5.74 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 2.42 fps, Avg. Travel Time= 2.4 min

Peak Storage= 907 cf @ 12.83 hrs

Average Depth at Peak Storage= 0.69'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 '/'

Inlet Invert= 75.00', Outlet Invert= 67.00'



Summary for Reach R7.4: Stream

Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 1.32" for 10-Yr Storm event

Inflow = 1.43 cfs @ 12.46 hrs, Volume= 0.192 af

Outflow = 1.43 cfs @ 12.46 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.4 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.19 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 1.29 fps, Avg. Travel Time= 1.8 min

Peak Storage= 63 cf @ 12.46 hrs

Average Depth at Peak Storage= 0.14'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 '/'

Inlet Invert= 73.00', Outlet Invert= 67.00'



Summary for Pond C1: CB5.3

Inflow Area = 0.519 ac, 79.37% Impervious, Inflow Depth > 3.80" for 10-Yr Storm event

Inflow = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af

Outflow = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary = 2.26 cfs @ 12.07 hrs, Volume= 0.164 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.49' @ 12.09 hrs

Flood Elev= 80.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.80'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.80' / 75.38' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.07 hrs HW=77.22' TW=76.97' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 1.55 cfs @ 1.97 fps)

Summary for Pond C10: OCS4

Inflow = 10.82 cfs @ 12.13 hrs, Volume= 0.566 af

Outflow = 10.82 cfs @ 12.13 hrs, Volume= 0.566 af, Atten= 0%, Lag= 0.0 min

Primary = 10.82 cfs @ 12.13 hrs, Volume= 0.566 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.38' @ 12.13 hrs

Flood Elev= 74.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	70.59'	24.0" Round Culvert L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.59' / 70.26' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.77 cfs @ 12.13 hrs HW=72.37' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 10.77 cfs @ 4.83 fps)**Summary for Pond C11: CB7.5**

Inflow Area = 0.400 ac, 91.40% Impervious, Inflow Depth > 4.13" for 10-Yr Storm event
Inflow = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af
Outflow = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Primary = 1.82 cfs @ 12.07 hrs, Volume= 0.138 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.47' @ 12.08 hrs

Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.70'	12.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.70' / 72.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.07 hrs HW=73.46' TW=72.82' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 1.74 cfs @ 3.78 fps)**Summary for Pond C2: CB5.5**

Inflow Area = 1.182 ac, 65.80% Impervious, Inflow Depth > 3.57" for 10-Yr Storm event
Inflow = 4.92 cfs @ 12.07 hrs, Volume= 0.352 af
Outflow = 4.92 cfs @ 12.07 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min
Primary = 4.92 cfs @ 12.07 hrs, Volume= 0.352 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.02' @ 12.08 hrs

Flood Elev= 79.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	74.89'	15.0" Round Culvert L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.89' / 73.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.78 cfs @ 12.07 hrs HW=76.98' TW=75.47' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 4.78 cfs @ 3.90 fps)

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Summary for Pond C3: CB5.6

Inflow Area = 1.586 ac, 71.10% Impervious, Inflow Depth > 3.68" for 10-Yr Storm event
 Inflow = 6.73 cfs @ 12.07 hrs, Volume= 0.487 af
 Outflow = 6.73 cfs @ 12.07 hrs, Volume= 0.487 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.73 cfs @ 12.07 hrs, Volume= 0.487 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.49' @ 12.08 hrs

Flood Elev= 78.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.82'	18.0" Round Culvert L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.82' / 73.50' S= 0.0052 ' / S= 0.0052 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.41 cfs @ 12.07 hrs HW=75.47' TW=74.85' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 6.41 cfs @ 4.11 fps)

Summary for Pond C4: CB6.3.1

Inflow Area = 0.948 ac, 91.98% Impervious, Inflow Depth > 4.19" for 10-Yr Storm event
 Inflow = 4.34 cfs @ 12.07 hrs, Volume= 0.331 af
 Outflow = 4.34 cfs @ 12.07 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.34 cfs @ 12.07 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.52' @ 12.09 hrs

Flood Elev= 77.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.88'	15.0" Round Culvert L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.88' / 73.70' S= 0.0058 ' / S= 0.0058 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.74 cfs @ 12.07 hrs HW=76.39' TW=75.99' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.74 cfs @ 3.05 fps)

Summary for Pond C5: CB6.3

Inflow Area = 0.224 ac, 100.00% Impervious, Inflow Depth > 4.36" for 10-Yr Storm event
 Inflow = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af
 Outflow = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 12.07 hrs, Volume= 0.081 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.64' @ 12.11 hrs

Flood Elev= 79.10'

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Device	Routing	Invert	Outlet Devices
#1	Primary	74.60'	12.0" Round Culvert L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.60' / 73.88' S= 0.0056 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=76.24' TW=76.39' (Dynamic Tailwater)↑**1=Culvert** (Controls 0.00 cfs)**Summary for Pond C6: CB6.4**

Inflow Area = 1.299 ac, 92.84% Impervious, Inflow Depth > 4.20" for 10-Yr Storm event
Inflow = 5.95 cfs @ 12.07 hrs, Volume= 0.455 af
Outflow = 5.95 cfs @ 12.07 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min
Primary = 5.95 cfs @ 12.07 hrs, Volume= 0.455 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.02' @ 12.08 hrs

Flood Elev= 76.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.70'	15.0" Round Culvert L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.70' / 73.30' S= 0.0051 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.80 cfs @ 12.07 hrs HW=75.99' TW=74.84' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 5.80 cfs @ 4.72 fps)**Summary for Pond C7: CB7.3**

Inflow Area = 1.899 ac, 61.99% Impervious, Inflow Depth > 3.29" for 10-Yr Storm event
Inflow = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af
Outflow = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af, Atten= 0%, Lag= 0.0 min
Primary = 7.43 cfs @ 12.07 hrs, Volume= 0.520 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.43' @ 12.08 hrs

Flood Elev= 76.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.85'	18.0" Round Culvert L= 196.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.85' / 70.93' S= 0.0098 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.28 cfs @ 12.07 hrs HW=74.41' TW=72.82' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 7.28 cfs @ 4.91 fps)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Pond C7.1: CB7.3

Inflow Area = 0.531 ac, 11.66% Impervious, Inflow Depth > 1.89" for 10-Yr Storm event
 Inflow = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af
 Outflow = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.14 cfs @ 12.10 hrs, Volume= 0.084 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 79.08' @ 12.10 hrs

Flood Elev= 82.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	15.0" Round Culvert L= 88.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.50' / 75.00' S= 0.0398 ' / S= 0.0398 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.14 cfs @ 12.10 hrs HW=79.08' TW=76.67' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.14 cfs @ 2.04 fps)

Summary for Pond C7.3:

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 2.20" for 10-Yr Storm event
 Inflow = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af
 Outflow = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.67 cfs @ 12.82 hrs, Volume= 4.363 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.28' @ 12.82 hrs

Flood Elev= 84.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.48'	36.0" Round Culvert w/ 1.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.40' / 74.30' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.01 sf

Primary OutFlow Max=14.67 cfs @ 12.82 hrs HW=77.28' TW=75.69' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 14.67 cfs @ 3.19 fps)

Summary for Pond C7.5: CB7.3

Inflow Area = 0.567 ac, 21.31% Impervious, Inflow Depth > 2.05" for 10-Yr Storm event
 Inflow = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af
 Outflow = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.40 cfs @ 12.08 hrs, Volume= 0.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 80.33' @ 12.08 hrs

Flood Elev= 83.00'

Post-Development WEST

Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	36.0" Round Culvert w/ 12.0" inside fill L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.00' / 75.06' S= 0.0563 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf

Primary OutFlow Max=1.39 cfs @ 12.08 hrs HW=80.33' TW=76.64' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.39 cfs @ 1.45 fps)**Summary for Pond C8: CB7.4**

Inflow Area = 2.883 ac, 72.48% Impervious, Inflow Depth > 3.60" for 10-Yr Storm event
Inflow = 11.93 cfs @ 12.07 hrs, Volume= 0.865 af
Outflow = 11.93 cfs @ 12.07 hrs, Volume= 0.865 af, Atten= 0%, Lag= 0.0 min
Primary = 11.93 cfs @ 12.07 hrs, Volume= 0.865 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.83' @ 12.07 hrs

Flood Elev= 75.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	70.93'	24.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.93' / 70.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.84 cfs @ 12.07 hrs HW=72.82' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 11.84 cfs @ 4.98 fps)**Summary for Pond C9: OCS3**

Inflow = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af
Outflow = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min
Primary = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.83' @ 12.14 hrs

Flood Elev= 74.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	18.0" Round Culvert L= 77.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.59' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.50 cfs @ 12.13 hrs HW=72.81' TW=72.37' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 5.50 cfs @ 3.28 fps)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Summary for Pond P1: Wetland

Inflow Area = 21.297 ac, 25.37% Impervious, Inflow Depth > 2.27" for 10-Yr Storm event
 Inflow = 20.93 cfs @ 12.41 hrs, Volume= 4.035 af
 Outflow = 13.08 cfs @ 13.04 hrs, Volume= 4.016 af, Atten= 38%, Lag= 37.6 min
 Primary = 13.08 cfs @ 13.04 hrs, Volume= 4.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 84.50' @ 13.04 hrs Surf.Area= 28,180 sf Storage= 34,069 cf

Plug-Flow detention time= 30.7 min calculated for 4.016 af (100% of inflow)
 Center-of-Mass det. time= 27.9 min (873.4 - 845.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S= 0.0560 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=13.08 cfs @ 13.04 hrs HW=84.50' TW=77.26' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 13.08 cfs @ 4.16 fps)

↑ **1=Sharp-Crested Vee/Trap Weir** (Passes 13.08 cfs of 27.77 cfs potential flow)

Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 3.54" for 10-Yr Storm event
 Inflow = 7.43 cfs @ 12.07 hrs, Volume= 0.535 af
 Outflow = 5.74 cfs @ 12.13 hrs, Volume= 0.408 af, Atten= 23%, Lag= 3.7 min
 Primary = 0.08 cfs @ 12.13 hrs, Volume= 0.105 af
 Secondary = 5.66 cfs @ 12.13 hrs, Volume= 0.303 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 74.92' @ 12.13 hrs Surf.Area= 4,656 sf Storage= 7,419 cf

Plug-Flow detention time= 129.0 min calculated for 0.408 af (76% of inflow)
 Center-of-Mass det. time= 46.6 min (833.2 - 786.6)

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Type III 24-hr 10-Yr Storm Rainfall=4.60"

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Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.13 hrs HW=74.92' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=5.64 cfs @ 12.13 hrs HW=74.92' TW=72.81' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 5.64 cfs @ 2.12 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond SF4: Soil Filter**

Inflow Area = 1.518 ac, 79.42% Impervious, Inflow Depth > 3.96" for 10-Yr Storm event
 Inflow = 6.63 cfs @ 12.07 hrs, Volume= 0.501 af
 Outflow = 5.25 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 21%, Lag= 3.5 min
 Primary = 0.08 cfs @ 12.13 hrs, Volume= 0.113 af
 Secondary = 5.17 cfs @ 12.13 hrs, Volume= 0.264 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 74.90' @ 12.13 hrs Surf.Area= 4,489 sf Storage= 7,215 cf

Plug-Flow detention time= 135.4 min calculated for 0.376 af (75% of inflow)

Center-of-Mass det. time= 49.5 min (814.1 - 764.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	18,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,128	0	0
74.50	4,186	5,486	5,486
75.00	4,566	2,188	7,674
76.00	5,370	4,968	12,642
77.00	6,231	5,801	18,442

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.13 hrs HW=74.90' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=5.14 cfs @ 12.13 hrs HW=74.90' TW=72.37' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 5.14 cfs @ 2.06 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Link AP8:**

Inflow Area = 41.623 ac, 26.89% Impervious, Inflow Depth > 2.35" for 10-Yr Storm event
 Inflow = 35.94 cfs @ 12.10 hrs, Volume= 8.147 af
 Primary = 35.94 cfs @ 12.10 hrs, Volume= 8.147 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link L1: EAST

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth > 2.20" for 10-Yr Storm event
 Inflow = 14.70 cfs @ 12.19 hrs, Volume= 1.976 af
 Primary = 14.70 cfs @ 12.19 hrs, Volume= 1.976 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

10-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 7.0:	Runoff Area=307,321 sf 5.86% Impervious Runoff Depth>3.37" Flow Length=270' Tc=49.4 min CN=78 Runoff=12.42 cfs 1.980 af
Subcatchment 7.1:	Runoff Area=23,130 sf 11.66% Impervious Runoff Depth>2.83" Flow Length=115' Tc=6.5 min CN=72 Runoff=1.72 cfs 0.125 af
Subcatchment 7.2:	Runoff Area=458,111 sf 0.92% Impervious Runoff Depth>3.37" Flow Length=330' Tc=50.7 min CN=78 Runoff=18.24 cfs 2.951 af
Subcatchment 7.3:	Runoff Area=109,454 sf 16.90% Impervious Runoff Depth>2.53" Flow Length=275' Tc=39.9 min CN=69 Runoff=3.67 cfs 0.530 af
Subcatchment 7.4:	Runoff Area=76,277 sf 0.00% Impervious Runoff Depth>2.11" Flow Length=235' Tc=29.3 min CN=64 Runoff=2.40 cfs 0.307 af
Subcatchment 7.5:	Runoff Area=24,701 sf 21.31% Impervious Runoff Depth>3.01" Tc=5.0 min CN=74 Runoff=2.07 cfs 0.142 af
Subcatchment 8.1:	Runoff Area=22,593 sf 79.37% Impervious Runoff Depth>4.98" Tc=5.0 min CN=93 Runoff=2.91 cfs 0.215 af
Subcatchment 8.10:	Runoff Area=82,702 sf 61.99% Impervious Runoff Depth>4.43" Tc=5.0 min CN=88 Runoff=9.87 cfs 0.701 af
Subcatchment 8.11:	Runoff Area=73,887 sf 20.41% Impervious Runoff Depth>3.90" Tc=5.0 min CN=83 Runoff=7.94 cfs 0.552 af
Subcatchment 8.12:	Runoff Area=17,412 sf 91.40% Impervious Runoff Depth>5.32" Tc=5.0 min CN=96 Runoff=2.32 cfs 0.177 af
Subcatchment 8.2:	Runoff Area=28,897 sf 55.19% Impervious Runoff Depth>4.54" Tc=5.0 min CN=89 Runoff=3.51 cfs 0.251 af
Subcatchment 8.3:	Runoff Area=17,587 sf 86.61% Impervious Runoff Depth>5.21" Tc=5.0 min CN=95 Runoff=2.32 cfs 0.175 af
Subcatchment 8.4:	Runoff Area=9,852 sf 0.00% Impervious Runoff Depth>3.60" Tc=5.0 min CN=80 Runoff=0.98 cfs 0.068 af
Subcatchment 8.5:	Runoff Area=31,576 sf 89.50% Impervious Runoff Depth>5.32" Tc=5.0 min CN=96 Runoff=4.20 cfs 0.322 af
Subcatchment 8.6:	Runoff Area=15,257 sf 95.18% Impervious Runoff Depth>5.44" Tc=5.0 min CN=97 Runoff=2.04 cfs 0.159 af
Subcatchment 8.7:	Runoff Area=9,738 sf 100.00% Impervious Runoff Depth>5.56" Tc=5.0 min CN=98 Runoff=1.31 cfs 0.104 af

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Subcatchment 8.8:	Runoff Area=9,564 sf 0.00% Impervious Runoff Depth>3.60" Tc=5.0 min CN=80 Runoff=0.96 cfs 0.066 af
Subcatchment 8.9:	Runoff Area=25,455 sf 93.62% Impervious Runoff Depth>5.44" Tc=5.0 min CN=97 Runoff=3.41 cfs 0.265 af
Reach R7.1: Stream	Avg. Flow Depth=1.43' Max Vel=5.35 fps Inflow=34.07 cfs 8.851 af n=0.025 L=860.0' S=0.0093 '/' Capacity=63.12 cfs Outflow=33.98 cfs 8.836 af
Reach R7.3: Stream	Avg. Flow Depth=0.81' Max Vel=6.25 fps Inflow=19.42 cfs 6.300 af n=0.025 L=355.0' S=0.0225 '/' Capacity=98.24 cfs Outflow=19.42 cfs 6.296 af
Reach R7.4: Stream	Avg. Flow Depth=0.19' Max Vel=3.86 fps Inflow=2.40 cfs 0.307 af n=0.025 L=140.0' S=0.0429 '/' Capacity=135.47 cfs Outflow=2.40 cfs 0.307 af
Pond C1: CB5.3	Peak Elev=79.43' Inflow=2.91 cfs 0.215 af 12.0" Round Culvert n=0.013 L=80.0' S=0.0053 '/' Outflow=2.91 cfs 0.215 af
Pond C10: OCS4	Peak Elev=72.91' Inflow=15.31 cfs 0.875 af 24.0" Round Culvert n=0.013 L=63.0' S=0.0052 '/' Outflow=15.31 cfs 0.875 af
Pond C11: CB7.5	Peak Elev=73.76' Inflow=2.32 cfs 0.177 af 12.0" Round Culvert n=0.013 L=49.0' S=0.0143 '/' Outflow=2.32 cfs 0.177 af
Pond C2: CB5.5	Peak Elev=78.66' Inflow=6.42 cfs 0.466 af 15.0" Round Culvert n=0.013 L=209.0' S=0.0051 '/' Outflow=6.42 cfs 0.466 af
Pond C3: CB5.6	Peak Elev=76.02' Inflow=8.74 cfs 0.642 af 18.0" Round Culvert n=0.013 L=62.0' S=0.0052 '/' Outflow=8.74 cfs 0.642 af
Pond C4: CB6.3.1	Peak Elev=77.70' Inflow=5.51 cfs 0.425 af 15.0" Round Culvert n=0.013 L=31.0' S=0.0058 '/' Outflow=5.51 cfs 0.425 af
Pond C5: CB6.3	Peak Elev=77.90' Inflow=1.31 cfs 0.104 af 12.0" Round Culvert n=0.013 L=129.0' S=0.0056 '/' Outflow=1.31 cfs 0.104 af
Pond C6: CB6.4	Peak Elev=76.87' Inflow=7.55 cfs 0.584 af 15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=7.55 cfs 0.584 af
Pond C7: CB7.3	Peak Elev=75.70' Inflow=9.87 cfs 0.701 af 18.0" Round Culvert n=0.013 L=196.0' S=0.0098 '/' Outflow=9.87 cfs 0.701 af
Pond C7.1: CB7.3	Peak Elev=79.23' Inflow=1.72 cfs 0.125 af 15.0" Round Culvert n=0.013 L=88.0' S=0.0398 '/' Outflow=1.72 cfs 0.125 af
Pond C7.3:	Peak Elev=77.61' Inflow=19.42 cfs 6.300 af 36.0" Round Culvert w/ 1.0" inside fill n=0.013 L=55.0' S=0.0200 '/' Outflow=19.42 cfs 6.300 af
Pond C7.5: CB7.3	Peak Elev=80.43' Inflow=2.07 cfs 0.142 af 36.0" Round Culvert w/ 12.0" inside fill n=0.013 L=70.0' S=0.0563 '/' Outflow=2.07 cfs 0.142 af

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Pond C8: CB7.4

Peak Elev=73.29' Inflow=15.59 cfs 1.143 af
24.0" Round Culvert n=0.013 L=85.0' S=0.0051 '/' Outflow=15.59 cfs 1.143 af

Pond C9: OCS3

Peak Elev=73.85' Inflow=8.13 cfs 0.469 af
18.0" Round Culvert n=0.013 L=77.0' S=0.0053 '/' Outflow=8.13 cfs 0.469 af

Pond P1: Wetland

Peak Elev=85.31' Storage=59,432 cf Inflow=32.95 cfs 5.795 af
Outflow=16.95 cfs 5.770 af

Pond SF3: Soil Fliter

Peak Elev=75.04' Storage=7,964 cf Inflow=9.72 cfs 0.709 af
Primary=0.08 cfs 0.111 af Secondary=8.13 cfs 0.469 af Tertiary=0.19 cfs 0.001 af Outflow=8.40 cfs 0.582 af

Pond SF4: Soil Filter

Peak Elev=75.00' Storage=7,656 cf Inflow=8.51 cfs 0.650 af
Primary=0.08 cfs 0.118 af Secondary=7.18 cfs 0.406 af Tertiary=0.00 cfs 0.000 af Outflow=7.26 cfs 0.523 af

Link AP8:

Inflow=51.61 cfs 11.636 af
Primary=51.61 cfs 11.636 af

Link 25-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce Inflow=25.08 cfs 2.844 af
Area= 10.780 ac 49.22% Imperv. Primary=25.08 cfs 2.844 af

Total Runoff Area = 30.843 ac Runoff Volume = 9.091 af Average Runoff Depth = 3.54"
80.92% Pervious = 24.957 ac 19.08% Impervious = 5.886 ac

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 7.0:

Runoff = 12.42 cfs @ 12.68 hrs, Volume= 1.980 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	18,020	98	Impervious
	3,144	80	>75% Grass cover, Good, HSG D
	36,715	73	Brush, Good, HSG D
	249,442	77	Woods, Good, HSG D
	307,321	78	Weighted Average
	289,301		94.14% Pervious Area
	18,020		5.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	150	0.0270	0.05		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
2.8	120	0.0800	0.71		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
49.4	270	Total			

Summary for Subcatchment 7.1:

Runoff = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	2,697	98	Impervious
	750	74	>75% Grass cover, Good, HSG C
	12,331	65	Brush, Good, HSG C
	7,352	73	Brush, Good, HSG D
	23,130	72	Weighted Average
	20,433		88.34% Pervious Area
	2,697		11.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	15	0.2000	0.32		Sheet Flow, AB
					Range n= 0.130 P2= 3.10"
5.7	100	0.0600	0.29		Sheet Flow, BC
					Range n= 0.130 P2= 3.10"
6.5	115	Total			

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Subcatchment 7.2:

Runoff = 18.24 cfs @ 12.68 hrs, Volume= 2.951 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 4,195	98	Impervious
1,074	39	>75% Grass cover, Good, HSG A
5,637	74	>75% Grass cover, Good, HSG C
143,721	80	>75% Grass cover, Good, HSG D
13,657	70	Woods, Good, HSG C
289,827	77	Woods, Good, HSG D
458,111	78	Weighted Average
453,916		99.08% Pervious Area
4,195		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.0	150	0.0330	0.06		Sheet Flow, AB
					Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	155	0.0200	0.35		Shallow Concentrated Flow, BC
					Forest w/Heavy Litter Kv= 2.5 fps
0.4	25	0.2000	1.12		Shallow Concentrated Flow, CD
					Forest w/Heavy Litter Kv= 2.5 fps
50.7	330	Total			

Summary for Subcatchment 7.3:

Runoff = 3.67 cfs @ 12.56 hrs, Volume= 0.530 af, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 18,496	98	Impervious
4,537	30	Brush, Good, HSG A
9,423	73	Brush, Good, HSG D
21,947	30	Woods, Good, HSG A
55,051	77	Woods, Good, HSG D
109,454	69	Weighted Average
90,958		83.10% Pervious Area
18,496		16.90% Impervious Area

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	150	0.0470	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
2.5	75	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.1	50	0.0500	16.06	192.72	Trap/Vee/Rect Channel Flow, CD Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.022 Earth, clean & straight
39.9	275	Total			

Summary for Subcatchment 7.4:

Runoff = 2.40 cfs @ 12.44 hrs, Volume= 0.307 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
19,947	30	Woods, Good, HSG A
3,125	70	Woods, Good, HSG C
53,205	77	Woods, Good, HSG D
76,277	64	Weighted Average
76,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	110	0.0550	0.07		Sheet Flow, AB Woods: Dense underbrush n= 0.800 P2= 3.10"
1.7	50	0.0400	0.50		Shallow Concentrated Flow, BC Forest w/Heavy Litter Kv= 2.5 fps
0.2	75	0.0150	5.43	32.56	Trap/Vee/Rect Channel Flow, CD Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.025 Earth, clean & winding
29.3	235	Total			

Summary for Subcatchment 7.5:

Runoff = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	5,263	98	Impervious
	567	74	>75% Grass cover, Good, HSG C
	14,440	65	Brush, Good, HSG C
	4,431	73	Brush, Good, HSG D
	24,701	74	Weighted Average
	19,438		78.69% Pervious Area
	5,263		21.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.1:

Runoff = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af, Depth> 4.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	17,932	98	Impervious
	3,258	74	>75% Grass cover, Good, HSG C
	1,403	80	>75% Grass cover, Good, HSG D
	22,593	93	Weighted Average
	4,661		20.63% Pervious Area
	17,932		79.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.10:

Runoff = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	51,270	98	Impervious
	4,732	74	>75% Grass cover, Good, HSG C
	26,700	70	Woods, Good, HSG C
	82,702	88	Weighted Average
	31,432		38.01% Pervious Area
	51,270		61.99% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.11:

Runoff = 7.94 cfs @ 12.07 hrs, Volume= 0.552 af, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 15,081	98	Impervious
2,598	74	>75% Grass cover, Good, HSG C
56,208	80	>75% Grass cover, Good, HSG D
73,887	83	Weighted Average
58,806		79.59% Pervious Area
15,081		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.12:

Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af, Depth> 5.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 15,914	98	Impervious
1,498	74	>75% Grass cover, Good, HSG C
17,412	96	Weighted Average
1,498		8.60% Pervious Area
15,914		91.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.2:

Runoff = 3.51 cfs @ 12.07 hrs, Volume= 0.251 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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	Area (sf)	CN	Description
*	15,948	98	Impervious
	6,561	74	>75% Grass cover, Good, HSG C
	6,388	80	>75% Grass cover, Good, HSG D
	28,897	89	Weighted Average
	12,949		44.81% Pervious Area
	15,948		55.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.3:

Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.175 af, Depth> 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	15,232	98	Impervious
	1,109	74	>75% Grass cover, Good, HSG C
	1,246	80	>75% Grass cover, Good, HSG D
	17,587	95	Weighted Average
	2,355		13.39% Pervious Area
	15,232		86.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.4:

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 0.068 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
	9,852	80	>75% Grass cover, Good, HSG D
	9,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Summary for Subcatchment 8.5:

Runoff = 4.20 cfs @ 12.07 hrs, Volume= 0.322 af, Depth> 5.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	28,262	98	Impervious
	2,606	74	>75% Grass cover, Good, HSG C
	708	80	>75% Grass cover, Good, HSG D
	31,576	96	Weighted Average
	3,314		10.50% Pervious Area
	28,262		89.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.6:

Runoff = 2.04 cfs @ 12.07 hrs, Volume= 0.159 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	14,522	98	Impervious
	735	80	>75% Grass cover, Good, HSG D
	15,257	97	Weighted Average
	735		4.82% Pervious Area
	14,522		95.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.7:

Runoff = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	9,738	98	Impervious
	9,738		100.00% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.8:

Runoff = 0.96 cfs @ 12.07 hrs, Volume= 0.066 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
9,564	80	>75% Grass cover, Good, HSG D
9,564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 8.9:

Runoff = 3.41 cfs @ 12.07 hrs, Volume= 0.265 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Yr Storm Rainfall=5.80"

Area (sf)	CN	Description
* 23,832	98	Impervious
1,212	74	>75% Grass cover, Good, HSG C
411	80	>75% Grass cover, Good, HSG D
25,455	97	Weighted Average
1,623		6.38% Pervious Area
23,832		93.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach R7.1: Stream

Inflow Area = 33.714 ac, 19.05% Impervious, Inflow Depth > 3.15" for 25-Yr Storm event
Inflow = 34.07 cfs @ 12.67 hrs, Volume= 8.851 af
Outflow = 33.98 cfs @ 12.70 hrs, Volume= 8.836 af, Atten= 0%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.35 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 6.4 min

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Peak Storage= 5,465 cf @ 12.70 hrs

Average Depth at Peak Storage= 1.43'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 63.12 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' ' Top Width= 7.00'

Length= 860.0' Slope= 0.0093 ' '

Inlet Invert= 76.00', Outlet Invert= 68.00'



Summary for Reach R7.3: Stream

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 3.18" for 25-Yr Storm event

Inflow = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af

Outflow = 19.42 cfs @ 12.76 hrs, Volume= 6.296 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 6.25 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 2.72 fps, Avg. Travel Time= 2.2 min

Peak Storage= 1,103 cf @ 12.76 hrs

Average Depth at Peak Storage= 0.81'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 98.24 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 ' ' Top Width= 7.00'

Length= 355.0' Slope= 0.0225 ' '

Inlet Invert= 75.00', Outlet Invert= 67.00'



Summary for Reach R7.4: Stream

Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 2.11" for 25-Yr Storm event

Inflow = 2.40 cfs @ 12.44 hrs, Volume= 0.307 af

Outflow = 2.40 cfs @ 12.44 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.4 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Max. Velocity= 3.86 fps, Min. Travel Time= 0.6 min

Avg. Velocity= 1.49 fps, Avg. Travel Time= 1.6 min

Peak Storage= 87 cf @ 12.44 hrs

Average Depth at Peak Storage= 0.19'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 135.47 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 1.0 '/' Top Width= 7.00'

Length= 140.0' Slope= 0.0429 '/'

Inlet Invert= 73.00', Outlet Invert= 67.00'



Summary for Pond C1: CB5.3

Inflow Area = 0.519 ac, 79.37% Impervious, Inflow Depth > 4.98" for 25-Yr Storm event

Inflow = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af

Outflow = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min

Primary = 2.91 cfs @ 12.07 hrs, Volume= 0.215 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 79.43' @ 12.09 hrs

Flood Elev= 80.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.80'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.80' / 75.38' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.07 cfs @ 12.07 hrs HW=78.99' TW=78.55' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 2.07 cfs @ 2.64 fps)

Summary for Pond C10: OCS4

Inflow = 15.31 cfs @ 12.12 hrs, Volume= 0.875 af

Outflow = 15.31 cfs @ 12.12 hrs, Volume= 0.875 af, Atten= 0%, Lag= 0.0 min

Primary = 15.31 cfs @ 12.12 hrs, Volume= 0.875 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 72.91' @ 12.12 hrs

Flood Elev= 74.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	70.59'	24.0" Round Culvert L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.59' / 70.26' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=15.27 cfs @ 12.12 hrs HW=72.91' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 15.27 cfs @ 5.27 fps)**Summary for Pond C11: CB7.5**

Inflow Area = 0.400 ac, 91.40% Impervious, Inflow Depth > 5.32" for 25-Yr Storm event
Inflow = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af
Outflow = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Primary = 2.32 cfs @ 12.07 hrs, Volume= 0.177 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.76' @ 12.08 hrs

Flood Elev= 75.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.70'	12.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.70' / 72.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.12 cfs @ 12.07 hrs HW=73.72' TW=73.27' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 2.12 cfs @ 3.29 fps)**Summary for Pond C2: CB5.5**

Inflow Area = 1.182 ac, 65.80% Impervious, Inflow Depth > 4.73" for 25-Yr Storm event
Inflow = 6.42 cfs @ 12.07 hrs, Volume= 0.466 af
Outflow = 6.42 cfs @ 12.07 hrs, Volume= 0.466 af, Atten= 0%, Lag= 0.0 min
Primary = 6.42 cfs @ 12.07 hrs, Volume= 0.466 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 78.66' @ 12.08 hrs

Flood Elev= 79.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	74.89'	15.0" Round Culvert L= 209.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.89' / 73.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=6.24 cfs @ 12.07 hrs HW=78.56' TW=76.00' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 6.24 cfs @ 5.08 fps)

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Summary for Pond C3: CB5.6

Inflow Area = 1.586 ac, 71.10% Impervious, Inflow Depth > 4.85" for 25-Yr Storm event
 Inflow = 8.74 cfs @ 12.07 hrs, Volume= 0.642 af
 Outflow = 8.74 cfs @ 12.07 hrs, Volume= 0.642 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.74 cfs @ 12.07 hrs, Volume= 0.642 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.02' @ 12.08 hrs

Flood Elev= 78.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.82'	18.0" Round Culvert L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.82' / 73.50' S= 0.0052 ' / S= 0.0052 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.53 cfs @ 12.07 hrs HW=76.00' TW=75.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 8.53 cfs @ 4.83 fps)

Summary for Pond C4: CB6.3.1

Inflow Area = 0.948 ac, 91.98% Impervious, Inflow Depth > 5.38" for 25-Yr Storm event
 Inflow = 5.51 cfs @ 12.07 hrs, Volume= 0.425 af
 Outflow = 5.51 cfs @ 12.07 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.51 cfs @ 12.07 hrs, Volume= 0.425 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.70' @ 12.09 hrs

Flood Elev= 77.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.88'	15.0" Round Culvert L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.88' / 73.70' S= 0.0058 ' / S= 0.0058 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.89 cfs @ 12.07 hrs HW=77.53' TW=76.84' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 4.89 cfs @ 3.99 fps)

Summary for Pond C5: CB6.3

Inflow Area = 0.224 ac, 100.00% Impervious, Inflow Depth > 5.56" for 25-Yr Storm event
 Inflow = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af
 Outflow = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.31 cfs @ 12.07 hrs, Volume= 0.104 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.90' @ 12.10 hrs

Flood Elev= 79.10'

Post-Development_WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	74.60'	12.0" Round Culvert L= 129.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.60' / 73.88' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=77.33' TW=77.52' (Dynamic Tailwater)

↑1=Culvert (Controls 0.00 cfs)

Summary for Pond C6: CB6.4

Inflow Area = 1.299 ac, 92.84% Impervious, Inflow Depth > 5.40" for 25-Yr Storm event
 Inflow = 7.55 cfs @ 12.07 hrs, Volume= 0.584 af
 Outflow = 7.55 cfs @ 12.07 hrs, Volume= 0.584 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.55 cfs @ 12.07 hrs, Volume= 0.584 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 76.87' @ 12.07 hrs

Flood Elev= 76.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	73.70'	15.0" Round Culvert L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.70' / 73.30' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.42 cfs @ 12.07 hrs HW=76.84' TW=74.95' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 7.42 cfs @ 6.05 fps)

Summary for Pond C7: CB7.3

Inflow Area = 1.899 ac, 61.99% Impervious, Inflow Depth > 4.43" for 25-Yr Storm event
 Inflow = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af
 Outflow = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.87 cfs @ 12.07 hrs, Volume= 0.701 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.70' @ 12.08 hrs

Flood Elev= 76.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	72.85'	18.0" Round Culvert L= 196.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 72.85' / 70.93' S= 0.0098 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.65 cfs @ 12.07 hrs HW=75.62' TW=73.27' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 9.65 cfs @ 5.46 fps)

Post-Development_WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond C7.1: CB7.3

Inflow Area = 0.531 ac, 11.66% Impervious, Inflow Depth > 2.83" for 25-Yr Storm event
 Inflow = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af
 Outflow = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.72 cfs @ 12.10 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 79.23' @ 12.10 hrs

Flood Elev= 82.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	78.50'	15.0" Round Culvert L= 88.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.50' / 75.00' S= 0.0398 ' / S= 0.0398 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.72 cfs @ 12.10 hrs HW=79.23' TW=76.87' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.72 cfs @ 2.30 fps)

Summary for Pond C7.3:

Inflow Area = 23.810 ac, 24.47% Impervious, Inflow Depth > 3.18" for 25-Yr Storm event
 Inflow = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af
 Outflow = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.42 cfs @ 12.75 hrs, Volume= 6.300 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 77.61' @ 12.75 hrs

Flood Elev= 84.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.48'	36.0" Round Culvert w/ 1.0" inside fill L= 55.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.40' / 74.30' S= 0.0200 ' / S= 0.0200 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.01 sf

Primary OutFlow Max=19.42 cfs @ 12.75 hrs HW=77.61' TW=75.81' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 19.42 cfs @ 3.52 fps)

Summary for Pond C7.5: CB7.3

Inflow Area = 0.567 ac, 21.31% Impervious, Inflow Depth > 3.01" for 25-Yr Storm event
 Inflow = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af
 Outflow = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.07 cfs @ 12.08 hrs, Volume= 0.142 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 80.43' @ 12.08 hrs

Flood Elev= 83.00'

Post-Development WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	36.0" Round Culvert w/ 12.0" inside fill L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.00' / 75.06' S= 0.0563 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 5.01 sf

Primary OutFlow Max=2.06 cfs @ 12.08 hrs HW=80.43' TW=76.83' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 2.06 cfs @ 1.65 fps)**Summary for Pond C8: CB7.4**

Inflow Area = 2.883 ac, 72.48% Impervious, Inflow Depth > 4.76" for 25-Yr Storm event
 Inflow = 15.59 cfs @ 12.07 hrs, Volume= 1.143 af
 Outflow = 15.59 cfs @ 12.07 hrs, Volume= 1.143 af, Atten= 0%, Lag= 0.0 min
 Primary = 15.59 cfs @ 12.07 hrs, Volume= 1.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.29' @ 12.07 hrs

Flood Elev= 75.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	70.93'	24.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.93' / 70.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=15.47 cfs @ 12.07 hrs HW=73.27' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 15.47 cfs @ 5.30 fps)**Summary for Pond C9: OCS3**

Inflow = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af
 Outflow = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 73.85' @ 12.13 hrs

Flood Elev= 74.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	18.0" Round Culvert L= 77.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.59' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.91 cfs @ 12.12 hrs HW=73.81' TW=72.91' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 7.91 cfs @ 4.48 fps)

Post-Development WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond P1: Wetland

Inflow Area = 21.297 ac, 25.37% Impervious, Inflow Depth > 3.27" for 25-Yr Storm event
 Inflow = 32.95 cfs @ 12.48 hrs, Volume= 5.795 af
 Outflow = 16.95 cfs @ 13.10 hrs, Volume= 5.770 af, Atten= 49%, Lag= 37.2 min
 Primary = 16.95 cfs @ 13.10 hrs, Volume= 5.770 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 85.31' @ 13.10 hrs Surf.Area= 33,935 sf Storage= 59,432 cf

Plug-Flow detention time= 38.5 min calculated for 5.765 af (99% of inflow)
 Center-of-Mass det. time= 35.8 min (872.5 - 836.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	82.70'	84,297 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.70	1,800	275.0	0	0	1,800
83.00	13,550	580.0	2,029	2,029	22,552
84.00	24,700	750.0	18,848	20,877	40,557
85.00	31,900	820.0	28,223	49,100	49,338
86.00	38,600	980.0	35,197	84,297	72,274

Device	Routing	Invert	Outlet Devices
#1	Device 2	82.70'	45.0 deg x 3.0' long x 3.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.56 (C= 3.20)
#2	Primary	82.30'	24.0" Round Culvert L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 82.30' / 80.90' S= 0.0560 ' S= 0.0560 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf

Primary OutFlow Max=16.95 cfs @ 13.10 hrs HW=85.31' TW=77.56' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 16.95 cfs @ 5.39 fps)

↑ **1=Sharp-Crested Vee/Trap Weir** (Passes 16.95 cfs of 52.28 cfs potential flow)

Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 4.70" for 25-Yr Storm event
 Inflow = 9.72 cfs @ 12.07 hrs, Volume= 0.709 af
 Outflow = 8.40 cfs @ 12.12 hrs, Volume= 0.582 af, Atten= 14%, Lag= 2.7 min
 Primary = 0.08 cfs @ 12.12 hrs, Volume= 0.111 af
 Secondary = 8.13 cfs @ 12.12 hrs, Volume= 0.469 af
 Tertiary = 0.19 cfs @ 12.12 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 75.04' @ 12.12 hrs Surf.Area= 4,757 sf Storage= 7,964 cf

Plug-Flow detention time= 111.6 min calculated for 0.582 af (82% of inflow)
 Center-of-Mass det. time= 40.5 min (820.1 - 779.6)

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.12 hrs HW=75.04' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=8.11 cfs @ 12.12 hrs HW=75.04' TW=73.81' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 8.11 cfs @ 2.40 fps)**Tertiary OutFlow** Max=0.18 cfs @ 12.12 hrs HW=75.04' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.49 fps)**Summary for Pond SF4: Soil Filter**

Inflow Area =	1.518 ac, 79.42% Impervious, Inflow Depth > 5.14" for 25-Yr Storm event
Inflow =	8.51 cfs @ 12.07 hrs, Volume= 0.650 af
Outflow =	7.26 cfs @ 12.12 hrs, Volume= 0.523 af, Atten= 15%, Lag= 2.8 min
Primary =	0.08 cfs @ 12.12 hrs, Volume= 0.118 af
Secondary =	7.18 cfs @ 12.12 hrs, Volume= 0.406 af
Tertiary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.00' @ 12.12 hrs Surf.Area= 4,563 sf Storage= 7,656 cf

Plug-Flow detention time= 120.1 min calculated for 0.523 af (80% of inflow)

Center-of-Mass det. time= 45.2 min (804.9 - 759.7)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	18,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,128	0	0
74.50	4,186	5,486	5,486
75.00	4,566	2,188	7,674
76.00	5,370	4,968	12,642
77.00	6,231	5,801	18,442

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.08 cfs @ 12.12 hrs HW=75.00' TW=0.00' (Dynamic Tailwater)↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)**Secondary OutFlow** Max=7.16 cfs @ 12.12 hrs HW=75.00' TW=72.91' (Dynamic Tailwater)↑**2=Orifice/Grate** (Weir Controls 7.16 cfs @ 2.30 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Link AP8:**

Inflow Area = 41.623 ac, 26.89% Impervious, Inflow Depth > 3.35" for 25-Yr Storm event
 Inflow = 51.61 cfs @ 12.10 hrs, Volume= 11.636 af
 Primary = 51.61 cfs @ 12.10 hrs, Volume= 11.636 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link L1: EAST

Inflow Area = 10.780 ac, 49.22% Impervious, Inflow Depth > 3.17" for 25-Yr Storm event
 Inflow = 25.08 cfs @ 12.19 hrs, Volume= 2.844 af
 Primary = 25.08 cfs @ 12.19 hrs, Volume= 2.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

25-Yr Storm Outflow Imported from Post-Development_EAST~Reach R4.0.hce

Appendix C:
Stormwater BMP Spillway and Draindown Calculations

SOIL FILTER SF1 25-YEAR SPILLWAY CALCULATION

Post-Development EAST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

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Summary for Pond SF1: Soil Filter 1

[80] Warning: Exceeded Pond CB6 by 0.80' @ 24.30 hrs (1.85 cfs 1.158 af)

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 4.46" for 25-Yr Storm event
 Inflow = 8.01 cfs @ 12.07 hrs, Volume= 0.574 af
 Outflow = 5.74 cfs @ 12.14 hrs, Volume= 0.391 af, Atten= 28%, Lag= 4.4 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 5.74 cfs @ 12.14 hrs, Volume= 0.391 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.26' @ 12.14 hrs Surf.Area= 5,690 sf Storage= 9,935 cf

Plug-Flow detention time= 173.9 min calculated for 0.391 af (68% of inflow)
 Center-of-Mass det. time= 78.8 min (867.6 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

1' OF
FREEBOARD
PROVIDED
WHEN PRIMARY
OUTLETS
CLOSED

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert X 0.00 L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

1=Culvert (Controls 0.00 cfs)
 2=Exfiltration (Controls 0.00 cfs)
 3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=5.72 cfs @ 12.14 hrs HW=100.26' TW=97.36' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Weir Controls 5.72 cfs @ 1.61 fps)

SOIL FILTER SF1 100-YEAR SPILLWAY CALCULATION

Post-Development EAST

Type III 24-hr 100-Yr Storm Rainfall=8.10"

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Summary for Pond SF1: Soil Filter 1

[80] Warning: Exceeded Pond CB6 by 0.80' @ 24.32 hrs (1.85 cfs 1.155 af)

Inflow Area = 1.543 ac, 67.27% Impervious, Inflow Depth = 6.69" for 100-Yr Storm event
 Inflow = 11.76 cfs @ 12.07 hrs, Volume= 0.860 af
 Outflow = 10.12 cfs @ 12.12 hrs, Volume= 0.677 af, Atten= 14%, Lag= 2.7 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 10.12 cfs @ 12.12 hrs, Volume= 0.677 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 100.42' @ 12.12 hrs Surf.Area= 5,872 sf Storage= 10,879 cf

Plug-Flow detention time= 140.0 min calculated for 0.677 af (79% of inflow)
 Center-of-Mass det. time= 61.6 min (840.1 - 778.5)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	15,804 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.00	3,092	0	0
99.50	4,842	5,951	5,951
101.00	6,522	8,523	14,474
101.20	6,781	1,330	15,804

BASIN DOES NOT OVERTOP WHEN PRIMARY OUTLETS CLOSED

Device	Routing	Invert	Outlet Devices
#1	Primary	95.50'	12.0" Round Culvert X 0.00 L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.50' / 95.40' S= 0.0029 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	98.00'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	99.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	99.90'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' TW=95.00' (Dynamic Tailwater)

1=Culvert (Controls 0.00 cfs)
 2=Exfiltration (Controls 0.00 cfs)
 3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=10.09 cfs @ 12.12 hrs HW=100.42' TW=97.45' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Weir Controls 10.09 cfs @ 1.95 fps)

SOIL FILTER SF3 25-YEAR SPILLWAY CALCULATION

Post-Development WEST

Type III 24-hr 25-Yr Storm Rainfall=5.80"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

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Summary for Pond SF3: Soil Fliter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 4.70" for 25-Yr Storm event
 Inflow = 9.72 cfs @ 12.07 hrs, Volume= 0.709 af
 Outflow = 8.45 cfs @ 12.12 hrs, Volume= 0.528 af, Atten= 13%, Lag= 2.6 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Tertiary = 8.45 cfs @ 12.12 hrs, Volume= 0.528 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.47' @ 12.12 hrs Surf.Area= 5,149 sf Storage= 10,107 cf

Plug-Flow detention time= 150.4 min calculated for 0.528 af (74% of inflow)

Center-of-Mass det. time= 64.9 min (844.5 - 779.6)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

1' OF FREEBOARD
 PROVIDED WHEN
 PRIMARY/SECONDARY
 OUTLETS CLOSED

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration X 0.00 over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate X 0.00 C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=71.00' (Dynamic Tailwater)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=8.42 cfs @ 12.12 hrs HW=75.47' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 8.42 cfs @ 1.79 fps)

SOIL FILTER SF3 100-YEAR SPILLWAY CALCULATION

Post-Development WEST

Type III 24-hr 100-Yr Storm Rainfall=8.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

HydroCAD® 10.00-26 s/n 08018 © 2020 HydroCAD Software Solutions LLC

Summary for Pond SF3: Soil Filter

Inflow Area = 1.812 ac, 62.22% Impervious, Inflow Depth > 6.94" for 100-Yr Storm event
 Inflow = 14.10 cfs @ 12.07 hrs, Volume= 1.048 af
 Outflow = 12.67 cfs @ 12.11 hrs, Volume= 0.867 af, Atten= 10%, Lag= 2.3 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Tertiary = 12.67 cfs @ 12.11 hrs, Volume= 0.867 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Peak Elev= 75.60' @ 12.11 hrs Surf.Area= 5,269 sf Storage= 10,795 cf

Plug-Flow detention time= 123.7 min calculated for 0.867 af (83% of inflow)

Center-of-Mass det. time= 54.3 min (824.7 - 770.4)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	19,064 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	3,078	0	0
74.50	4,290	5,526	5,526
75.00	4,722	2,253	7,779
76.00	5,628	5,175	12,954
77.00	6,591	6,110	19,064

**BASIN DOES NOT
OVERTOP WHEN
PRIMARY/SECONDARY
OUTLETS CLOSED**

Device	Routing	Invert	Outlet Devices
#1	Primary	73.00'	0.750 in/hr Exfiltration X 0.00 over Surface area Phase-In= 0.01'
#2	Secondary	74.50'	24.0" Horiz. Orifice/Grate X 0.00 C= 0.600 Limited to weir flow at low heads
#3	Tertiary	75.00'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=73.00' TW=71.00' (Dynamic Tailwater)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=12.59 cfs @ 12.11 hrs HW=75.60' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 12.59 cfs @ 2.09 fps)

SOIL FILTER SF1 DRAINDOWN CALCULATION

Post-Development_EAST

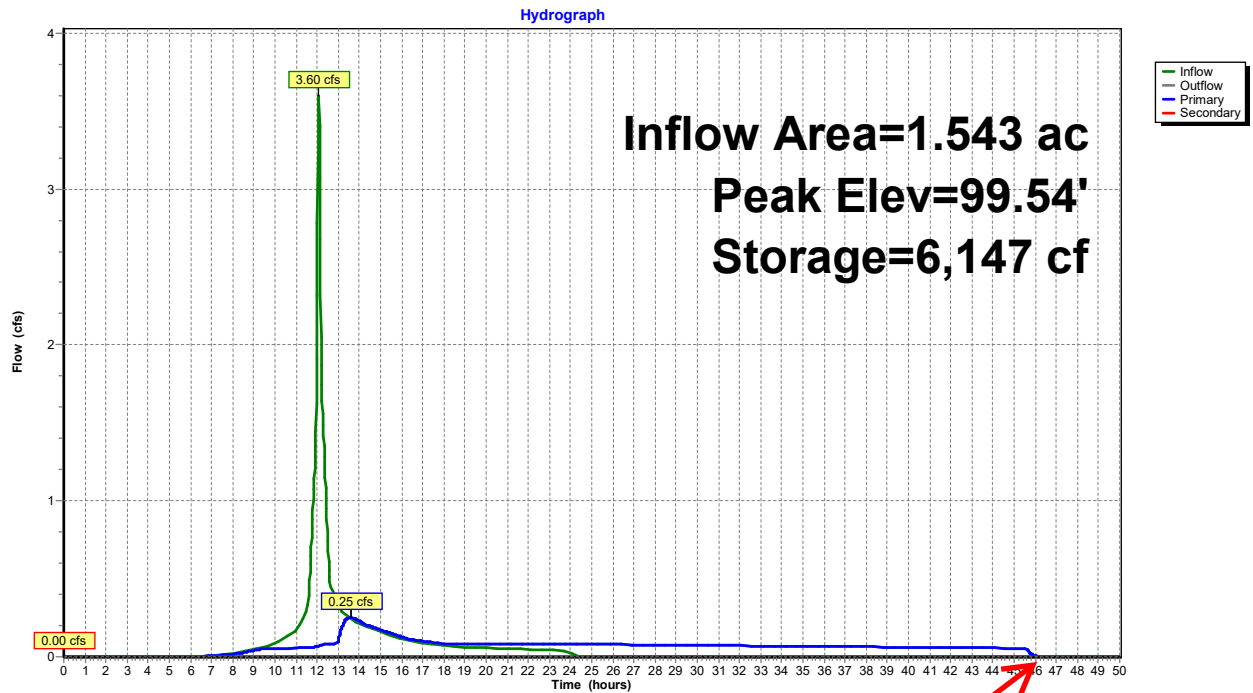
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

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Pond SF1: Soil Filter 1



SOIL FILTER
DRAINS IN LESS
THAN 48 HOURS

SOIL FILTER SF3 DRAINDOWN CALCULATION

Post-Development_WEST

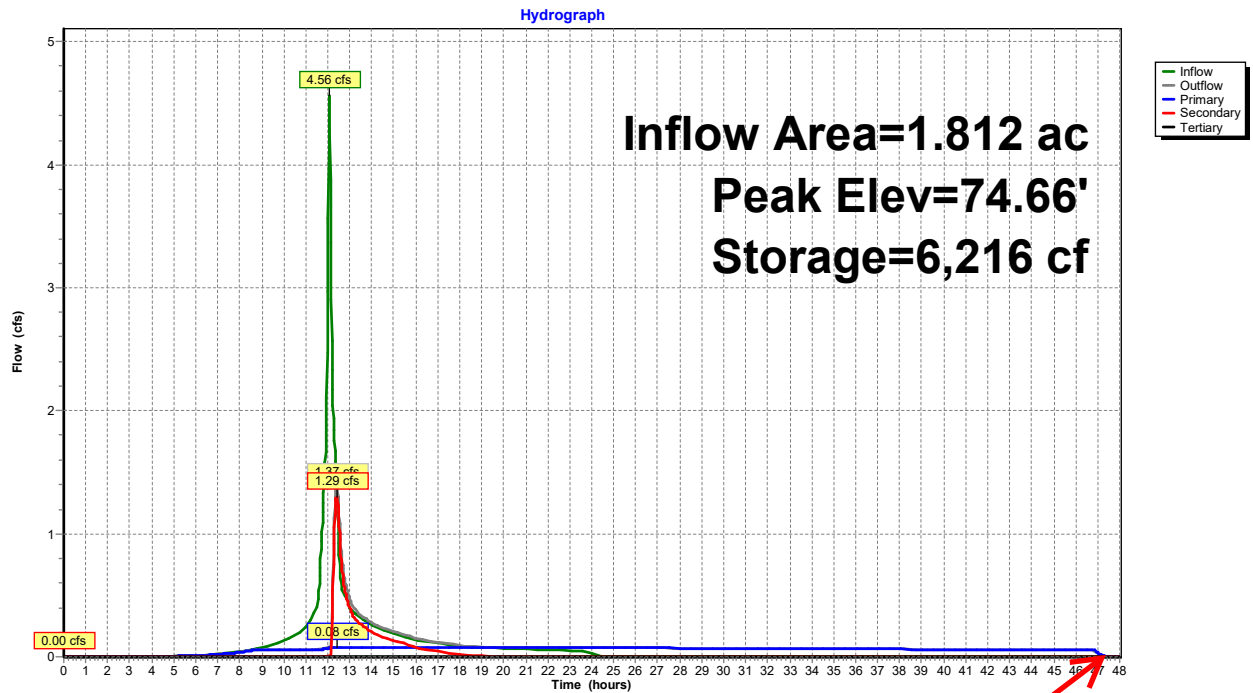
Type III 24-hr 2-Yr Storm Rainfall=3.10"

Prepared by Atlantic Resource Consultants

Printed 8/29/2023

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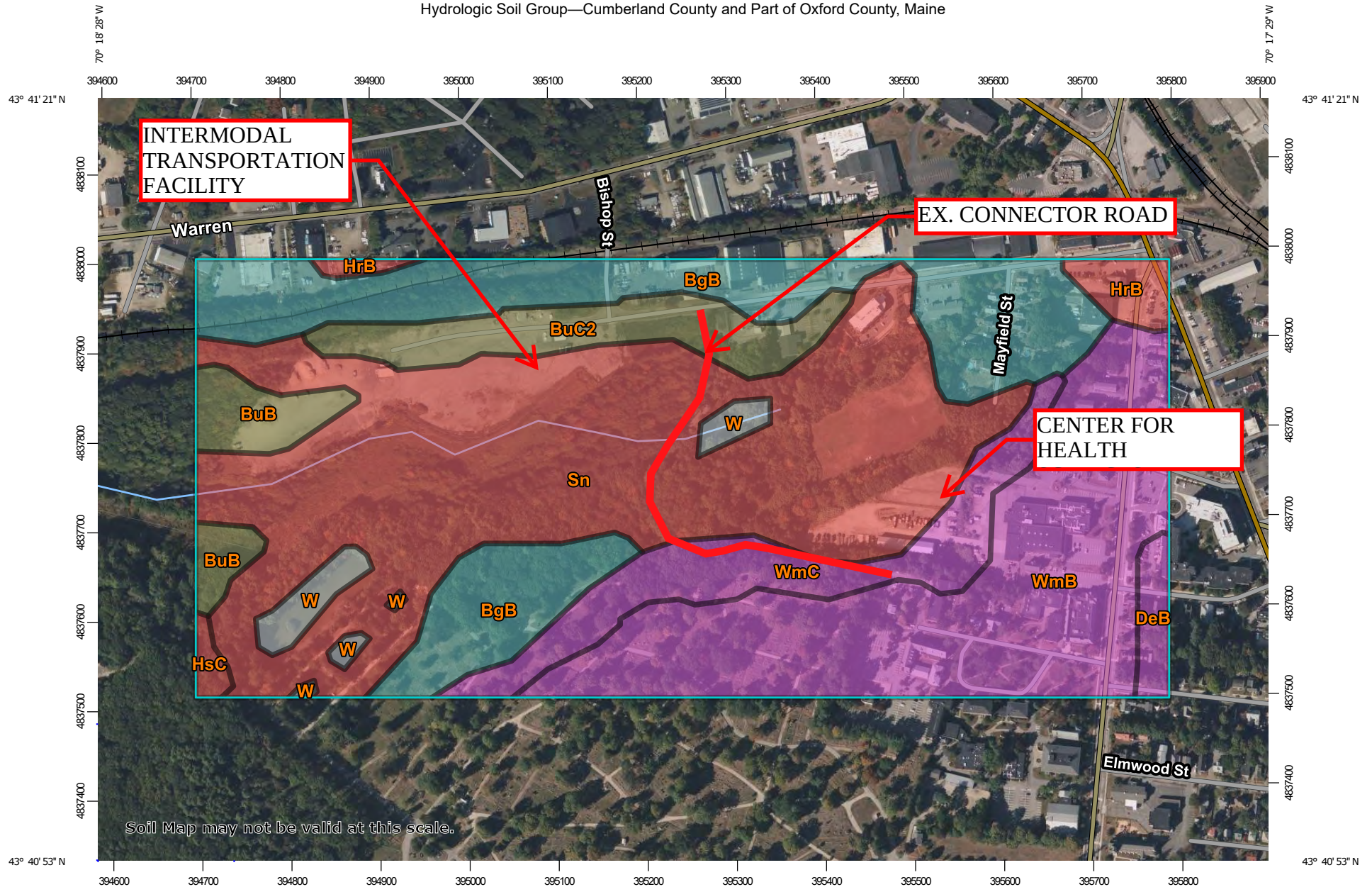
Pond SF3: Soil Fliter



SOIL FILTER
DRAINS IN LESS
THAN 48 HOURS

Appendix D:
USDA Soil Map

Hydrologic Soil Group—Cumberland County and Part of Oxford County, Maine



Map Scale: 1:6,010 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters

0 250 500 1000 1500 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey
Page 549

8/28/2023
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
 Survey Area Data: Version 19, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BgB	Nicholville very fine sandy loam, 0 to 8 percent slopes	C	24.3	18.3%
BuB	Lamoine silt loam, 3 to 8 percent slopes	C/D	4.2	3.1%
BuC2	Buxton silt loam, 8 to 15 percent slopes	C/D	7.6	5.7%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	A	1.6	1.2%
HrB	Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky	D	2.2	1.6%
HsC	Lyman-Abram complex, 8 to 15 percent slopes, very rocky	D	0.6	0.5%
Sn	Scantic silt loam, 0 to 3 percent slopes	D	51.0	38.4%
W	Water		2.6	2.0%
WmB	Windsor loamy sand, 0 to 8 percent slopes	A	28.9	21.8%
WmC	Windsor loamy sand, 8 to 15 percent slopes	A	9.9	7.5%
Totals for Area of Interest			132.9	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix E:
Inspection & Maintenance Plan &
City of Portland Stormwater Maintenance Agreement

Inspection and Maintenance Plan For Stormwater Management Facilities

University of New England
Connector Drive
Bishop Street, Portland, Maine
September 2023

Stormwater management facilities include paved surfaces, catch basins, culverts, storm drain pipe, and ditches/swales. During construction activities and upon completion of construction, the operation and maintenance of all stormwater management facilities, the establishment of any contract services required to implement the program, and the keeping of records and maintenance log book will be the responsibility of the University of New England.

The University of New England shall enter into a Stormwater Drainage System Maintenance Agreement with the City of Portland to be recorded at the Cumberland County Registry of Deeds. A template for this agreement is included in this section and shall be completed upon final approval of the project.

At a minimum, the following maintenance activities for each stormwater management system shall be performed on a prescribed schedule.

Paved Surfaces

Accumulations of winter sand along paved surfaces shall be cleared at least once a year, preferably in the spring, and periodically during the year on an as-needed basis, to minimize transportation of sediment during rainfall events. Accumulations on pavement may be removed by pavement sweeping or vacuuming. Accumulations of sand along drive shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

Ditches and Swales

Open swales and ditches shall be inspected twice per year (in spring and fall) to assure that debris and/or sediments do not reduce the effectiveness of the system. Debris and sediments shall be removed at that time. Any sign of erosion or blockage shall be immediately repaired to assure a vigorous growth of vegetation for the stability of the ditches and slopes proper function. Maintenance shall include, but not be limited to, mowing, trimming and removal vegetation in the ditches and slopes as required in order to prevent vegetation from blocking or diverting storm flows, replacement of riprap channel lining to prevent scour of the channel invert, removing vegetation and debris from the culverts.

Vegetated ditches should be mowed at least monthly during the growing season. Larger brush or trees must not be allowed to become established in the channel. Any areas where the vegetation fails will be subject to erosion and should be reseeded and mulched immediately.

Riprap ditches and aprons where stone is displaced should be replaced and chinked to assure stability. With time, additional riprap may be added. Vegetation growing through riprap should be removed on an annual basis.

Catch Basins

All catch basins throughout the collection system shall be inspected twice per year (in spring and fall) to assure that the inlet entry and grates are clear of debris and will accept the intended flows. Any debris and sediments shall be cleared. Sediment should be removed from these structures when it accumulates within 12 inches of the lowest pipe invert. At a minimum, remove floating debris and hydrocarbons at the time of the inspection. The removed material must be disposed of in accordance with the Maine Solid Waste Disposal Rules. Confined space entry safety procedures shall be practiced should entry into these structures be required.

Culverts and Storm Drainage Pipes

Culverts and piped drainage systems shall be inspected on an annual basis to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the pipe inlet and outlet. Sediment should be removed when its level exceeds 20% of the pipe diameter. This may be accomplished by hydraulic flushing or any mechanical means; however, care should be taken to contain the sediment at the pipe outlet, and not flush the sediments into the stormwater filter or wetland areas as this will reduce the ponds capacity and ability to infiltrate runoff and will hasten the time when the pond must be cleaned or rehabilitated.

Riprap aprons where stone is displaced should be replaced and chinked to assure stability. With time, additional riprap may be added. Vegetation growing through riprap should be removed on an annual basis.

Disposal

Any sediment or debris removed during maintenance of the stormwater system must be disposed of in accordance with the Maine Solid Waste Disposal Rules.

Recordkeeping

University of New England will keep a written maintenance log that summarizes inspections, maintenance, and any corrective actions taken. The log shall include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediment or debris, the location where the sediment or debris was disposed after removal will be indicated. This log shall be made available to the City of Portland upon request.

[illegible]

**UNE Connector Drive
83 College Street, Portland, Maine**

INSPECTION / MAINTENANCE LOG

CATCH BASINS AND DRAIN PIPES

I: INSPECTED - C: CLEANED - R: REPAIRED

DATE	INITIALS	ACTION	COMMENT
3/28/22	JKL	I, C	EXAMPLE: Called ACME to clean the outlet structure in pond 1, cleaned debris from culvert inlet in pond 2.

UNE Connector Drive 83 College Street, Portland, Maine					
STORMWATER MANAGEMENT SYSTEM MAINTENANCE PROGRAM SUMMARY CHECKLIST					
Item	Commentary	Frequency			
		Month	Semi-Annual	Annual	Long-Term
Pavement	Review for damage and buildup of debris and sand.	X	X Sweep		
Swales, Ditches, and Riprap Aprons	Inspect for debris accumulation, erosion and excessive vegetation. Mow monthly, remove debris, repair and revegetate any area of erosion	X Mow		X	
Catch Basins, and Drain Pipes	Inspect for sediment buildup in pipe. Flush and remove as required.			X	

Appendix F

Drainage Plans

I1.0 – Pre Development Impervious Area Plan

I2.0 – Post Development Impervious Area Plan

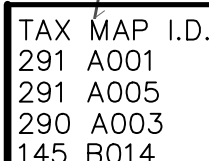
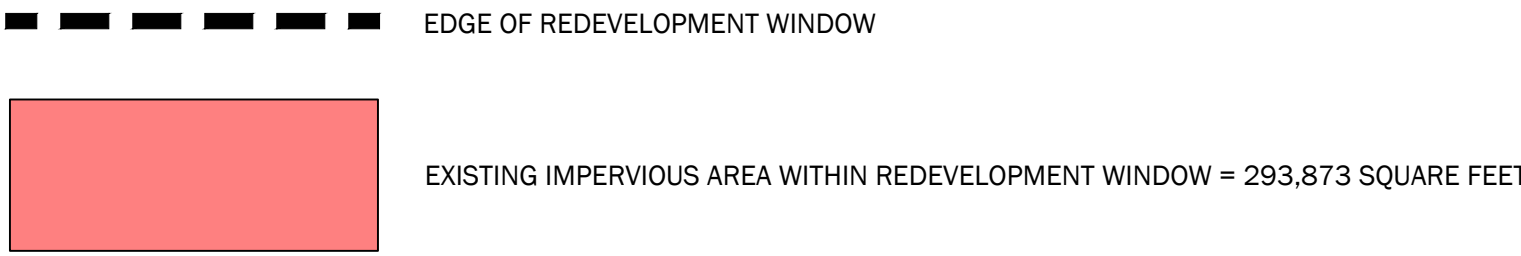
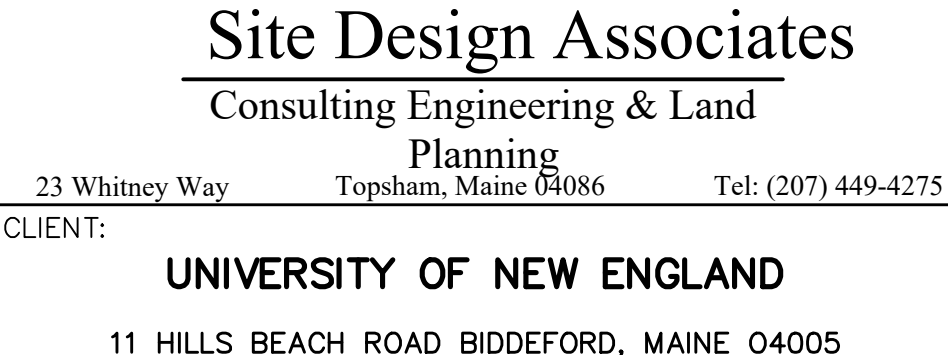
R1.0 – Pre Development Pollutant Loading Plan

R2.0 – Post Development Pollutant Loading Plan

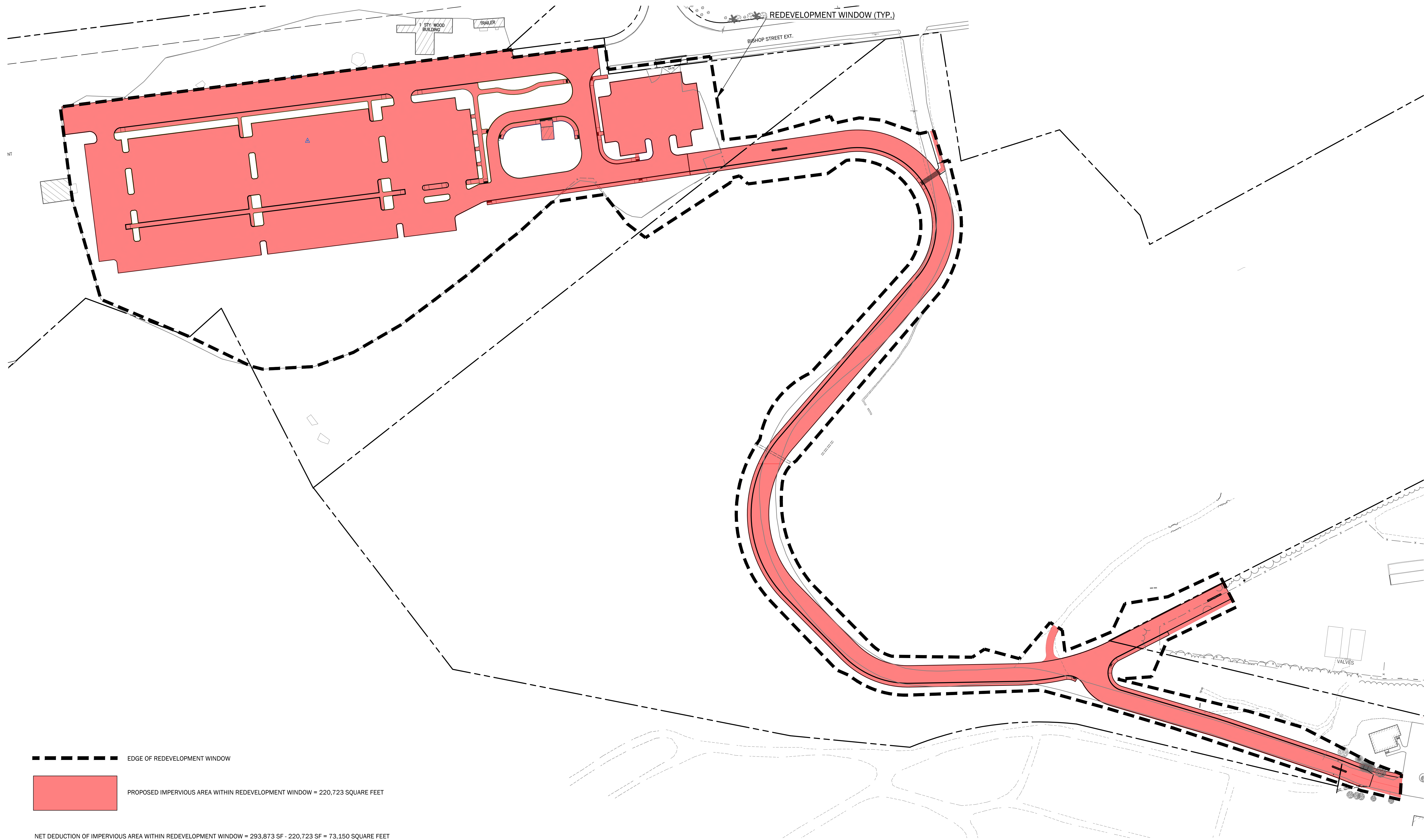
D1.0 – Pre Development Drainage Plan

D2.0 – Post Development Drainage Plan

D3.0 – Stormwater Treatment Plan

[illegible]

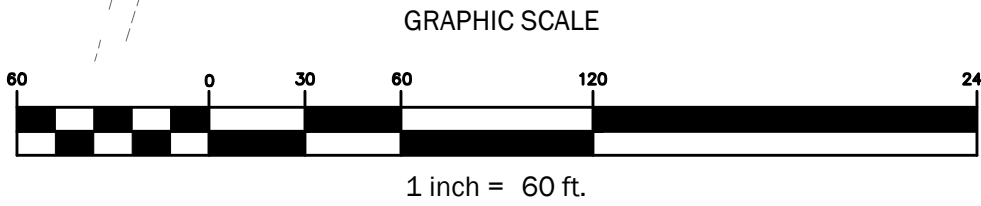
DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	PRE DEVELOPMENT IMPERVIOUS AREA PLAN		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 60'	DWG. NO.	11.0	A



THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.



DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	POST DEVELOPMENT IMPERVIOUS AREA PLAN		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 60'	DWG. NO.	12.0	A



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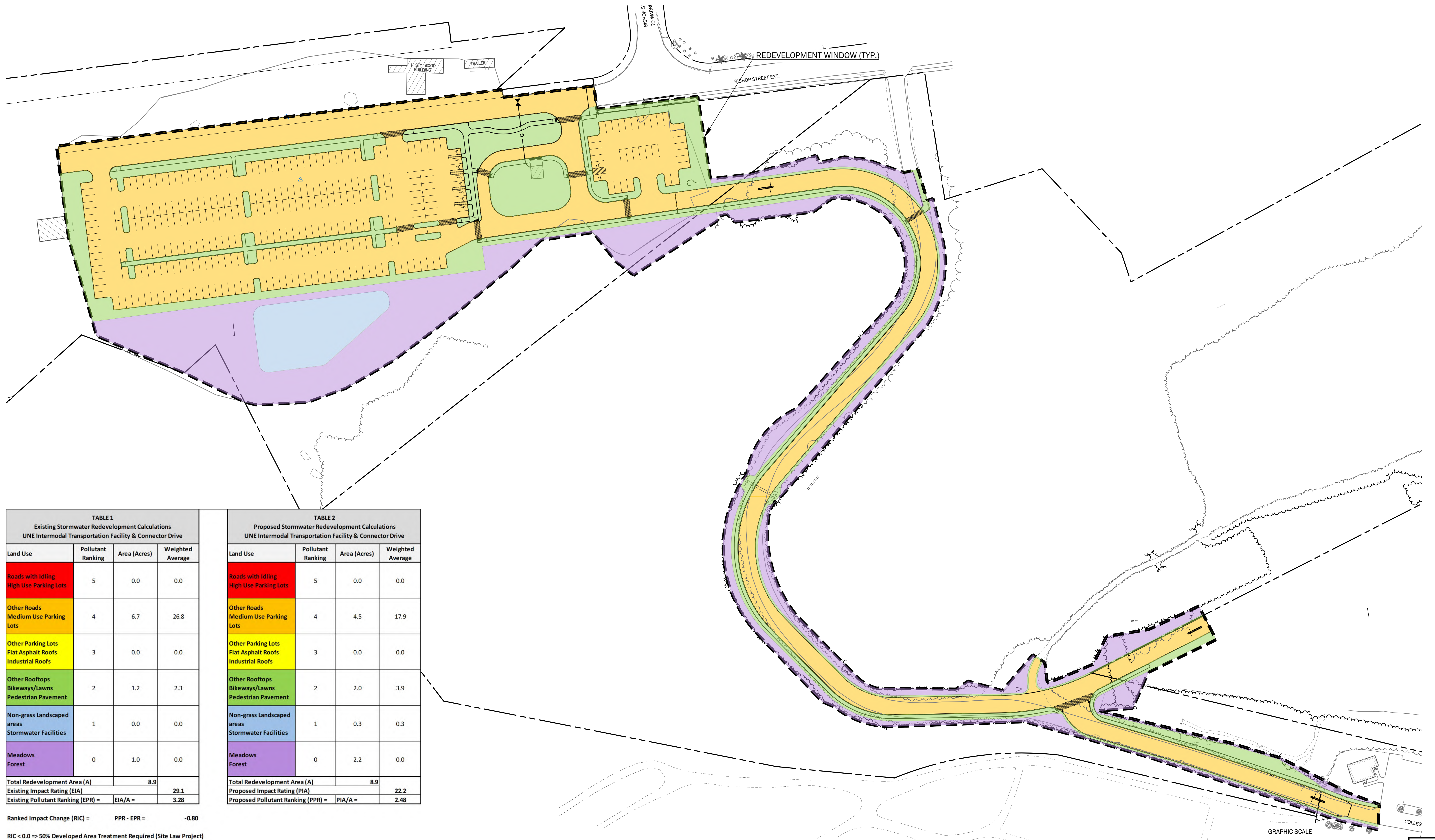


TABLE 1 Existing Stormwater Redevelopment Calculations UNE Intermodal Transportation Facility & Connector Drive			
Land Use	Pollutant Ranking	Area (Acres)	Weighted Average
Roads with Idling High Use Parking Lots	5	0.0	0.0
Other Roads Medium Use Parking Lots	4	6.7	26.8
Other Parking Lots Flat Asphalt Roofs Industrial Roofs	3	0.0	0.0
Other Rooftops Bikeways/Lawns Pedestrian Pavement	2	1.2	2.3
Non-grass Landscaped areas Stormwater Facilities	1	0.0	0.0
Meadows Forest	0	1.0	0.0
Total Redevelopment Area (A)		8.9	
Existing Impact Rating (EIA)			29.1
Existing Pollutant Ranking (EPR) =		EIA/A =	3.28

TABLE 2 Proposed Stormwater Redevelopment Calculations UNE Intermodal Transportation Facility & Connector Drive			
Land Use	Pollutant Ranking	Area (Acres)	Weighted Average
Roads with Idling High Use Parking Lots	5	0.0	0.0
Other Roads Medium Use Parking Lots	4	4.5	17.9
Other Parking Lots Flat Asphalt Roofs Industrial Roofs	3	0.0	0.0
Other Rooftops Bikeways/Lawns Pedestrian Pavement	2	2.0	3.9
Non-grass Landscaped areas Stormwater Facilities	1	0.3	0.3
Meadows Forest	0	2.2	0.0
Total Redevelopment Area (A)		8.9	
Proposed Impact Rating (PIA)			22.2
Proposed Pollutant Ranking (PPR) =		PIA/A =	2.48

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 ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

[illegible]

Site Design Associates

Consulting Engineering & Land

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

CLIENT:

UNIVERSITY OF NEW ENGLAND

11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.

DRAWN: DEPT.

CHKD: TWS

DATE: SEP. 2023

SCALE: 1" = 60'

PROJECT: CONNECTOR DRIVE
83 COLLEGE STREET, PORTLAND, MAINE

POST DEVELOPMENT POLLUTANT LOADING PLAN

PROJ. NO.	21-216-00	REV.
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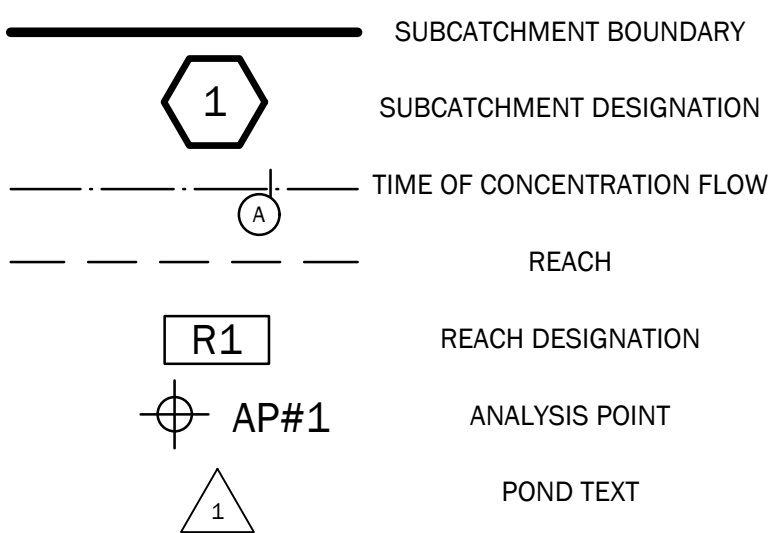
DWG.	B3.0	A
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AX	MAP	I.D.
91	A001	
91	A005	
90	A003	
45	B014	

SOIL NOTES

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY, AVAILABLE ONLINE AT THE FOLLOWING LINK: HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/. ACCESSED 12/15/2022.

DRAINAGE LEGEND



Tc FLOW LINE DATA:

SUBCATCHMENT 7.0				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	46.6	150'	0.027	SHEET FLOW
BC	2.8	120'	0.080	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	37.3	150'	0.047	SHEET FLOW
BC	2.5	75'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.1	50'	0.050	TRAP FLOW

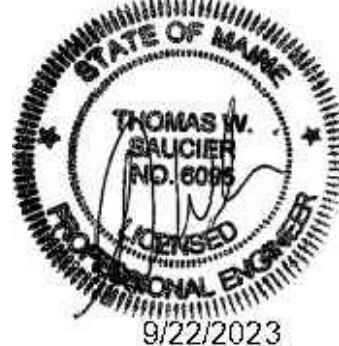
SUBCATCHMENT 7.4				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	27.4	110'	0.055	SHEET FLOW
BC	1.7	50'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.2	75'	0.015	TRAP FLOW

Tc FOR ALL REMAINING SUBCATCHMENTS = 5 MINUTES.



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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
A	9/22/2023	FOR DEVELOPMENT REVIEW									



Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT:
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	PRE DEVELOPMENT DRAINAGE PLAN (WEST)
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 60'	DWG. NO. D1.0

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT THE FOLLOWING LINK: [HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/](http://websoilsurvey.sc.egov.usda.gov/). ACCESSED 12/15/2022.

 SUBCATCHMENT BOUNDARY
 SUBCATCHMENT DESIGNATION
 TIME OF CONCENTRATION FLOW
 REACH
 REACH DESIGNATION
 AP#1 ANALYSIS POINT
 POND TEXT

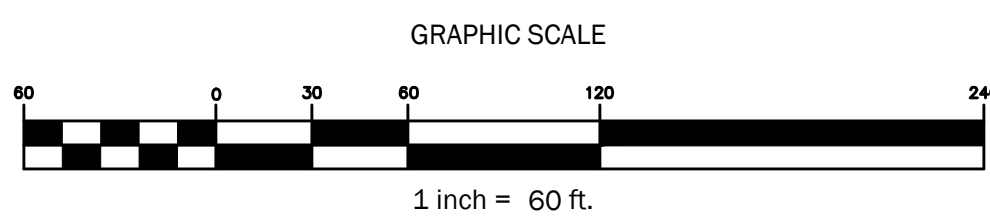
SUBCATCHMENT 4.1				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	12.4	110'	0.014	SHEET FLOW
BC	0.9	110	0.160	SHALLOW CONCENTRATED FLOW
CD	0.5	300	0.017	TRAP FLOW

SUBCATCHMENT 4.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	10.0	80'	0.090	SHEET FLOW

SUBCATCHMENT 7.0				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	46.6	150'	0.027	SHEET FLOW
BC	2.8	120'	0.080	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	37.3	150'	0.047	SHEET FLOW
BC	2.5	75'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.1	50'	0.050	TRAP FLOW

[illegible]

Site Design Associates
Consulting Engineering & Land
Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	PRE DEVELOPMENT DRAINAGE PLAN (EAST)		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 60'	DWG. NO.	D1.1	A

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT THE FOLLOWING LINK: [HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/](http://websoilsurvey.sc.egov.usda.gov/). ACCESSED 12/15/2022.

SUBCATCHMENT BOUNDARY



SUBCATCHMENT 7.0				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	46.6	150'	0.027	SHEET FLOW
BC	2.8	120'	0.080	SHALLOW CONCENTRATED FLOW

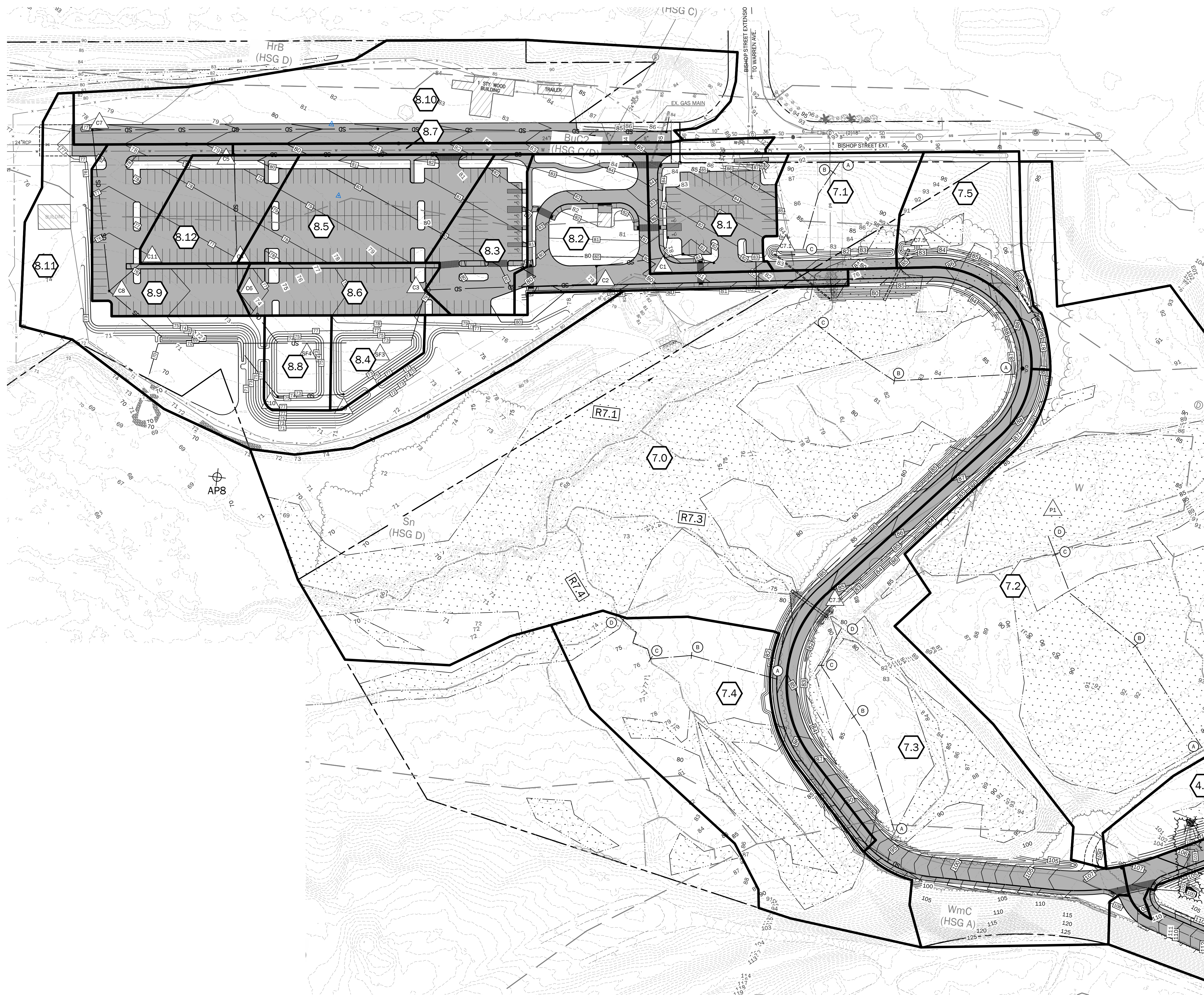
SUBCATCHMENT 7.1				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	0.8	15'	0.200	SHEET FLOW
BC	5.7	100'	0.060	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

SUBCATCHMENT 7.3				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	37.3	150'	0.047	SHEET FLOW
BC	2.5	75'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.1	50'	0.050	TRAP FLOW

SUBCATCHMENT 7.4				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	27.4	110'	0.055	SHEET FLOW
BC	1.7	50'	0.040	SHALLOW CONCENTRATED FLOW
CD	0.2	75'	0.015	TRAP FLOW

Tc FOR ALL REMAINING SUBCATCHMENTS = 5 MINUTES.



TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

[illegible]

Site Design Associates
Consulting Engineering & Land

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

CLIENT: _____

UNIVERSITY OF NEW ENGLAND

UNIVERSITY OF NEW ENGLAND

11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.

DRAWN: DEPT.

CHKD: TWS

DATE: SEP. 2023

00115 4" 001

PROJECT:	CONNECTOR DRIVE
----------	-----------------

83 COLLEGE STREET, PORTLAND, MAINE

POST DEVELOPMENT DRAINAGE PLAN (WEST)

PROJ. NO.	21-216-00
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DWG.	50.0
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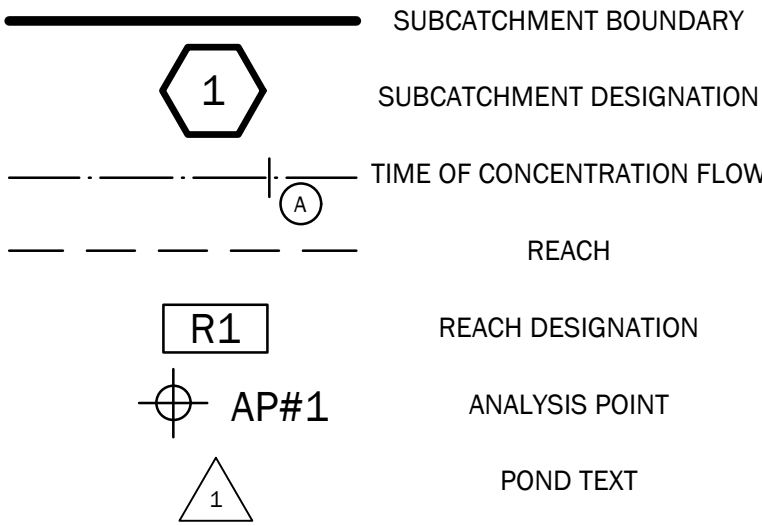
REV.

A

SOIL NOTES

SOIL TYPES AND BOUNDARIES OBTAINED FROM SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT THE FOLLOWING LINK: HTTP://WEBSOILSURVEY.SC.EGOV.USDA.GOV/. ACCESSED 12/15/2022.

DRAINAGE LEGEND

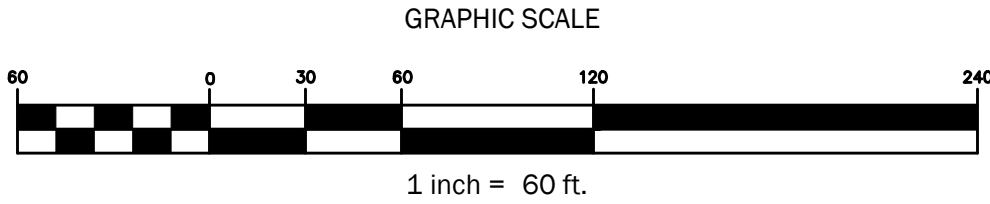
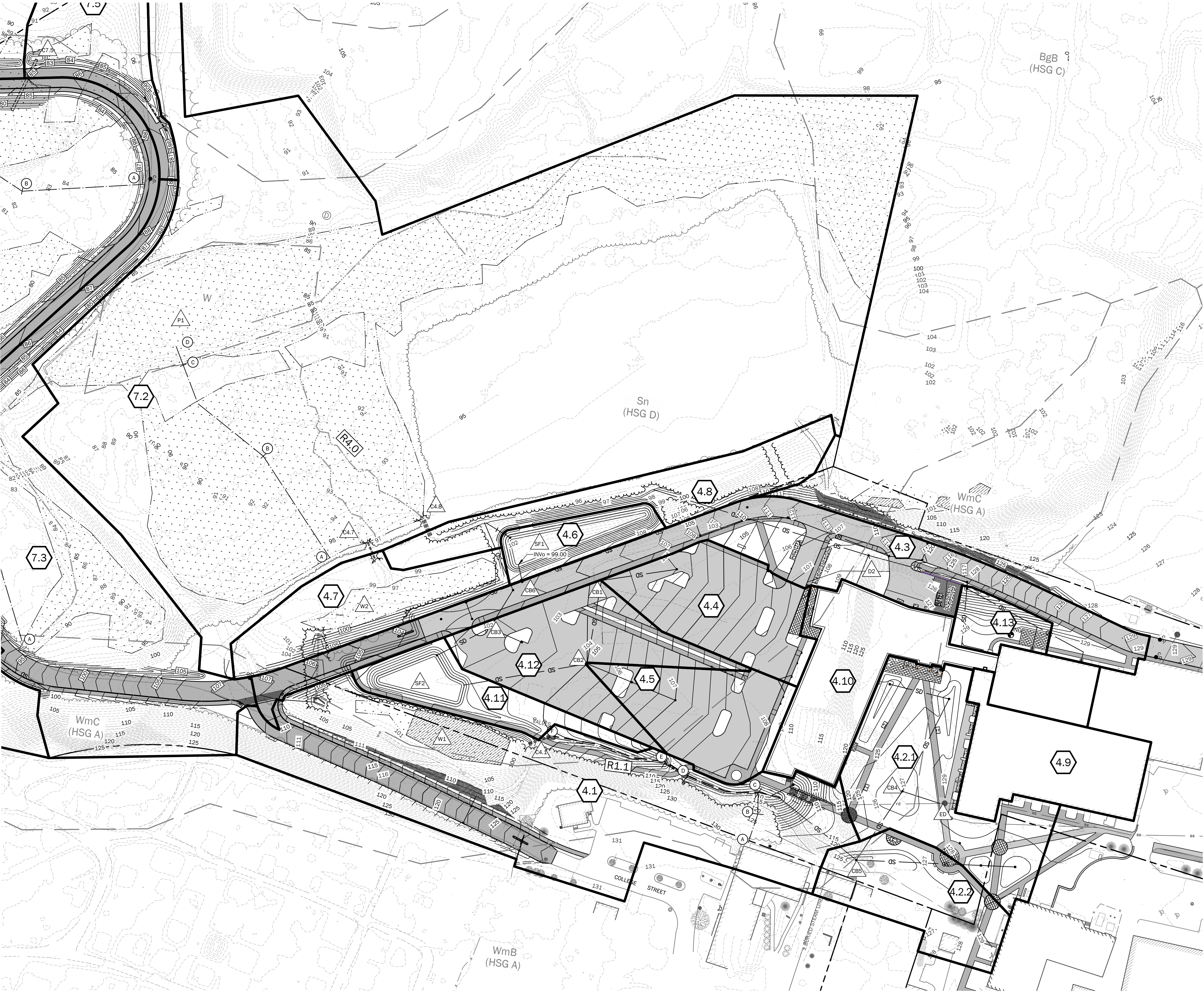


Tc FLOW LINE DATA:

SUBCATCHMENT 4.1				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	5.5	40'	0.100	SHEET FLOW
BC	2.3	30'	0.500	SHEET FLOW
CD	0.2	95'	0.026	TRAP FLOW
DE	0.1	28'	0.018	PIPE FLOW
EF	0.2	145'	0.051	TRAP FLOW

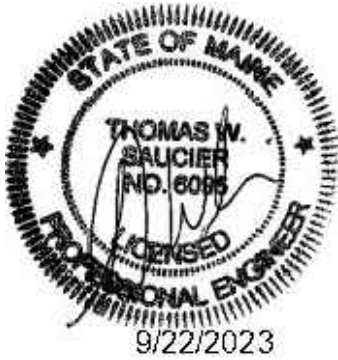
SUBCATCHMENT 7.2				
SEGMENT	TIME (MIN.)	LENGTH	SLOPE	FLOW TYPE
AB	43.0	150'	0.033	SHEET FLOW
BC	7.3	155'	0.020	SHALLOW CONCENTRATED FLOW
CD	0.4	25'	0.200	SHALLOW CONCENTRATED FLOW

Tc FOR ALL REMAINING SUBCATCHMENTS = 5 MINUTES.



THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
A	9/22/2023	FOR DEVELOPMENT REVIEW									



Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.
DRAWN: DEPT.
CHKD: TWS
DATE: SEP. 2023
SCALE: 1" = 60'

PROJECT:	CONNECTOR DRIVE
	83 COLLEGE STREET, PORTLAND, MAINE
	POST DEVELOPMENT DRAINAGE PLAN (EAST)
PROJ. NO.	21-216-00
DWG. NO.	D2.1

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

Section 13 Urban Impaired Stream

See the stormwater management report in section 12.

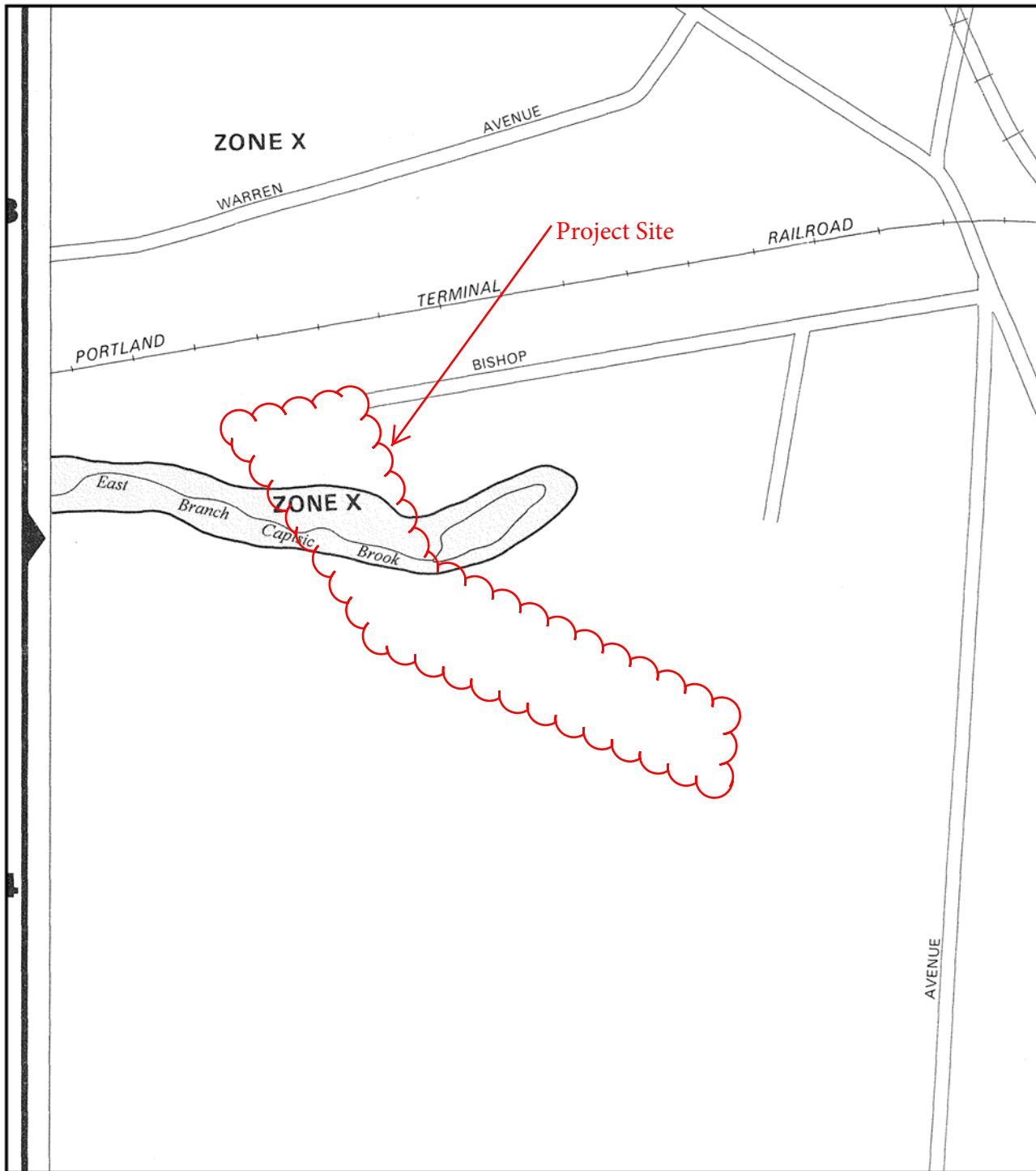
Section 14 Basic Standards

See section 12 and the drawings.

Sections 15 -18 Not Applicable

Section 19 Flooding

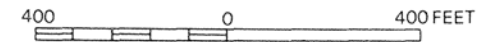
The project will not cause or increase flooding or cause an unreasonable flooding hazard to any structure. The project is not located within the 100 year flood plain. See the attached excerpt from FIRM which shows the 500 year flood plain.



To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.



APPROXIMATE SCALE



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND,
MAINE
CUMBERLAND COUNTY

PANEL 7 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0007 C

MAP REVISED:
DECEMBER 8, 1998


 Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at <https://msc.fema.gov>.

Section 20 Blasting

No blasting is anticipated.

Sections 21-25 Not Applicable

Site Design Associates
Consulting Engineering and Land Planning

December 12, 2023

Maya Balassa, Planner
City of Portland
Via email

**RE: University of New England
Major Site Plan Application for:
Connector Drive
PL-002666-2023
83 College Street
Responses to November 1 Staff Comments**

Dear Maya;

On behalf of University of New England (UNE), Site Design Associates (SDA) is pleased to provide this response to review comments provided by the city staff in your November 1, 2023 review memorandum. We have listed each of your “red” comments in the order they were presented followed by our responses.

1. Additional submissions requested:

Comment: *The address on Energov says 716 Stevens Ave. The documents and site plans utilize 83 College Street. Please alter the application materials to have a single address across*

Response: The city GIS mapping and assessor records refer to the majority of the parcel as 83 College Street. For some reason, the city staff set up the EPlan directory with the 716 Stevens Ave address. Please advise on how this will be handled.

2. Access and circulation:

Comment: *Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road.*

Response: A striped bike lane will not be included. The pavement markings will include sharrows laid out in accordance with the MUTCD per the attached memo from Diane Morabito, the traffic engineer.

Comment: *To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet.*

23 Whitney Way Topsham, Maine 04086
Phone: (207) 449-4275 email: info@sitedesignassociates.biz

Response: Please see the attached memo from the traffic engineer recommending that the 24 ft width be maintained. A NRPA Tier 1 permit has been issued by DEP for the wetland impacts. A copy of this permit is attached.

Comment: *Please clarify who specifically will have gate card access.*

Response: UNE's students, staff, and faculty will have gate access.

Comment: *The Bishop Street driveway is to remain in place and gated. While the city supports a pedestrian/bicycle connection, we would suggest that the curb cut be closed.*

Response: The plans have been revised to show a reduction in the Bishop Street curb cut length to 10 ft, while maintaining access for cyclists and pedestrians. We decided on 10 ft for shared bicycle and pedestrian access. We hope this satisfactorily addresses this comment.

3. Landscape Preservation:

Comment: *Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.*

Response: Please see the attached memo from the traffic engineer recommending that the 24 ft width be maintained. A NRPA Tier 1 permit has been issued by DEP for the wetland impacts. A copy of this permit is attached.

Comment: *This survey indicates areas with tree canopy cover but not tree locations, size and species information. Per the City's Technical Manual Chapter 4.3.1, the survey should identify location, size and species of all existing trees 10" diameter at breast height (DBH) or greater on the site. Given the predominantly wooded nature of the project site, it is acceptable for the applicant to identify only trees proposed to be removed as part of this project, noting the size (in DBH) and species information for existing trees 10" DBH or greater.*

Response: Existing trees 10" DBH or over to be removed are now shown on the plans.

Comment: *The existing site has some notable patches of Japanese Knotweed. The applicant shall follow the requirements laid out in Technical Manual section 4.7.4 for the containment and removal of invasive plants in the limit of work to prevent*

them spreading into newly disturbed ground.

Response: A note has been added to the plans to address this comment.

Comment: *For existing trees being preserved that are adjacent to the limit of work, the applicant shall follow tree protection requirements described in Technical Manual chapter 4.3 and tree preservation detail IV-2*

Response: A note has been added to the plans to address this requirement.

Comment: *Areas around the carriage road that are being cleared of trees due to grading shall be replanted with native straight species trees and exposed soil shall be covered with undyed wood mulch and/or seeded with native shade-tolerant seed mixes where appropriate.*

Response: A landscape plan has been prepared to address this comment. Areas along the proposed carriage road which are proposed to be cleared of trees and provide a large enough area for replanting will be replanted with Sugar Maple saplings. These areas are primarily on 2:1 and 3:1 slopes. To enable a rootball to be planted on these slopes we are proposing ½" caliper saplings which will have a rootball approximately 12 inches in diameter x 9" deep. A tree planting detail showing a planting on a slope is provided on the Landscape Plan.

The slope areas are called out to be mulched with a 5" layer of erosion control mix as distributed by Casella Organics or approved equivalent. This layer of mulch will stabilize and protect the soil, and allow the saplings to establish themselves prior to competition from other plants.

4. Site Landscaping and Buffers:

Comment: *The area where gravel is being removed is currently proposed to be covered with loam and reseeded with "park mix" grass seed. The area in question is surrounded by woodland and is partly shaded. City staff suggest selecting a seed mix that is composed of native part shade- tolerant forbs that will fit into the woodland setting. The park mix grass seed is more appropriate for maintained lawn areas than forested woodlands.*

Response: A landscape plan has been prepared to address this comment. Open areas and the proposed swales are to be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Wet Sites. This mix contains a selection of native grasses and wildflowers designed to colonize generally moist, recently disturbed sites where quick growth of vegetation is desired to stabilize the soil. The plants in this mix can withstand moist, infrequently inundated sites as well as some shade. These areas will be mowed no more than two times per year to keep woody vegetation out.

Comment: *There are at least three existing footpaths/trails that connect to the carriage road which are not currently represented on the plans. Please locate the existing trails on the site plan and ensure the pathway connections are being maintained or improved as part of the carriage road improvement project. At least one of the trails is heavily used by pedestrians as a connection between Evergreen Cemetery and the UNE campus.*

Response: The existing trails are now shown on the drawings and Portland Trails confirmed the locations are accurate. We have discussed the access with Portland trails, and they have confirmed the locations are accurate. Our discussions with them continue in regards to potential signage.

5. Water Quality, Stormwater management, and Erosion Control:

Comment: *Overall SLOD – Additional clarity is needed on the area that is intended to be covered by the SLOD Application. As was noted on previous application reviews that highlighted the need for the SLOD permit, looking at the entire site as one is advantageous, allowing for treatment to be accounted for across the site to meet the required standards. The Applicant is proposing to do that here, but additional information is needed. The figures provided show the redevelopment evaluation of the Intermodal Transportation Facility and Connector Drive to determine the amount of treatment that will be required per the MaineDEP standards for redevelopment. The ultimate stormwater management scenario includes systems located within this area, but also a system within the Center for Health Sciences. As I understand the analysis, the Center for Health Services project area is not included as part of the SLOD calculations.*

Response: That is correct. The HBACHS project was completed before the campus exceeded the SLODA thresholds. Therefore, the HBACHS portion of the project is not included in the SLODA stormwater treatment calculations. The soil filter in the HBACHS area (SF1) that receives runoff from the new Connector Drive was oversized when it was originally designed/constructed to accommodate this future anticipated runoff from the Connector Drive. Calculations are provided on Table 2 within the stormwater management report showing that SF1 is properly sized to treat the additional runoff from the Connector Drive project. The HBACHS columns in Table 2 are only to indicate proper sizing of SF1. As indicated in the table the HBACHS areas are not included in calculating the general/redevelopment standards.

Comment: *As noted, our understanding of the project intent is that treatment from both the Intermodal Transportation Facility and the Center for Health Sciences is to be counted towards the requirement for the Connector Drive. Detail on the Intermodal Transportation Facility is included, but it is unclear how the Center for Health Sciences site's design fits into the area/treatment calculations.*

Response: As indicated in the report and Table 2, only the ITF and the Connector Drive projects are included in the general/redevelopment calculations for the city and the SLODA requirements for this project.

Comment: *The applicant shall prepare easement documents for the proposed expanded easement associated with the extension of the City's 36" Bishop Street storm-water outfall and provide information/details of how the existing 36" RCP pipe will be extended.*

Response: We will draft easement documents to address this comment. We are hopeful this could be considered as a staff recommended condition of approval.

Comment: *The applicant shall submit DEP permits for the proposed stream crossings and wetland impacts for review as part of this site plan review.*

Response: A copy of the NRPA permit for wetland impacts is attached. A NRPA PBR notification was filed with the NRPA application on September 23.

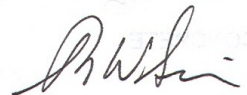
6. Exterior Lighting:

Comment: *The photometric plan shows a maximum foot-candle of 6.3 and an average foot-candle of 2.3 in the stat zone. The maximum foot-candle allowed is 5 for this use, with an average of 1.25. Please adjust the lighting plan to meet this standard.*

Response: A revised photometric plan which demonstrates compliance with this standard is included.

In closing, we would be happy to meet with staff and consultants to discuss any items which may require further clarification if necessary. If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,
Site Design Associates



Tom Saucier, P.E.
President

c: Andrew Philippe, Director for Campus Planning

November 14, 2023

Mr. Tom Saucier, P.E.
Site Design Associates
23 Whitney Way
Topsham, Maine 04086

RE: RECOMMENDATIONS FOR UNE CONNECTOR DRIVE

Dear Tom,

As requested, I have reviewed the comments issued by the City of Portland regarding the proposed connector drive on the UNE campus. This drive will connect the Bishop Street Intermodal Transportation Facility (ITF) to the core campus and College Street Extension. The currently proposed driveway is 24' wide with a 5' raised sidewalk. Some of the City comments and questions regarding this proposed cross section are as follows:

- Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road.
- To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet.
- Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.

Sewall has reviewed the above City comments and the Connector Drive plans, prepared by Site Design Associates, dated 9/22/2023.

The proposed drive section is to provide for both motor vehicles and bicycles since the 5' sidewalk cannot provide for both pedestrians and bicycles. The generally recommended minimum width for a multiuse path is 10'. A 10' multiuse path and a 22' wide travel way would result in a greater width of 32' with greater environmental impacts. Since 5' is generally considered the minimum sidewalk width, the proposed drive must provide for both bicycles and motor vehicles. For this reason, Sewall recommends that the 24' width be maintained. According to the AASHTO "Guide for the Development of Bicycle Facilities, 2012, Fourth Edition", roadways that have low volumes and low

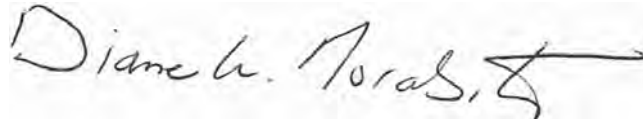
speeds are generally suitable for shared lanes. The guide indicates that roadways with lane widths of 13' or less require that motorists will encroach into the opposing lane to pass a bicyclist. By maintaining a 12' lane width this encroachment will be minimized. Given that motorists and bicyclists will be sharing the same lane, it is recommended that the drive be marked with sharrows, which are used to indicate a shared lane facility. This will alert drivers to the presence of bicyclists and the narrow lanes. Sharrows are typically used on roadways that are too narrow to provide separate marked bike lanes.

I also recommend that a "Bicycles May Use Full Lane" sign be placed on either end of the connector drive to supplement the sharrow markings.

Please don't hesitate to contact me if you or the City of Portland have any questions or need any additional information regarding my recommendations.



Sincerely,

A handwritten signature in black ink that reads "Diane W. Morabito" followed by a stylized flourish.

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

UNIVERSITY OF NEW ENGLAND	) NATURAL RESOURCES PROTECTION ACT
Portland, Cumberland County	) FRESHWATER WETLAND ALTERATION
CONNECTOR DRIVE	) WATER QUALITY CERTIFICATION
L-30525-TC-A-N (approval)	) FINDINGS OF FACT AND ORDER

Project Description: The applicant proposes to alter 11,187 square feet of forested, emergent and scrub shrub wetlands. The applicant proposes to reconstruct an existing connector drive between the University of New England's Intermodal Transportation Facility and the main campus as shown on a plan titled "Connector Drive," prepared by Site Design Associates, and dated September 2023. The reconstruction project includes an effort to increase the safety of the connector drive by installing sidewalks and call boxes as well as widening the existing drive to two 12-foot travel ways. The applicant has avoided and minimized wetland impacts to the greatest extent practicable by locating the reconstructed connector drive in the same location as the existing connector drive wherever possible. One section of the connector drive will be relocated so that it connects directly to the intermodal transportation facility rather onto a public street as it does currently. The side slopes of the connector drive will be increased from the standard 3H:1V slope to the maximum slope of 2H:1V to minimize wetland impacts. According to the Department's Geographic Information System (GIS), there are no mapped essential or significant wildlife habitats associated with the project site. The proposed project is located off College Street in the City of Portland.

Permit for: ☒ Tier 1

DEP Decision: ☒ Approved ☐ Denied (see attached letter)

Please note: A U. S. Army Corps of Engineers permit may also be required for your project. The Corps typically accepts a copy of your Maine DEP NRPA application, but you are responsible for submittal to the Corps. We encourage you to contact them directly at cenae-r-me@usace.army.mil or (207) 623-8367 to discuss their application process. Please note that no regulated work within Corps jurisdiction may be started until you receive a Corps permit.

Standard Conditions:

- 1) If construction or operation of the activity is not begun within four (4) years from the date signed, this permit shall lapse and the applicant shall reapply to the Department for a new permit. This permit is transferable only with prior approval from the Department. If the activity is associated with a larger project, starting any aspect of that project constitutes start of construction.
- 2) The project shall be completed according to the plans in the application. Any change in the project plans must be reviewed and approved by the Department.
- 3) Properly installed erosion control measures shall be installed prior to beginning the project, and all disturbed soil should be stabilized immediately upon project completion.

- 4) A copy of this approval will be sent to the City of Portland. Department approval of your activity does not supersede or substitute the need for any necessary local approvals.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 9th DAY OF NOVEMBER, 2023.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For: Melanie Loyzim, Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

SCarr/L30525AN/ATS#91509

FILED
November 9th, 2023
State of Maine
Board of Environmental Protection

WARRANTY DEED
(Maine Statutory Short Form)

KNOW ALL MEN BY THESE PRESENTS, that **PIKE INDUSTRIES, INC.**, a Delaware corporation with a place of business and mailing address at 58 Main Street, Westbrook, Maine 04092 ("Grantor"), for consideration paid, hereby grants to **UNIVERSITY OF NEW ENGLAND**, a Maine non-profit corporation with a mailing address of 11 Hills Beach Road, Biddeford, Maine 04005 ("Grantee"), with **WARRANTY COVENANTS**, those certain lots or parcels of land, together with any buildings and improvements thereon, situated in Portland, Cumberland County, Maine, being more particularly described on **Exhibit A** attached hereto and incorporated herein by reference (the "Premises").

The following restrictions shall run with the land, shall inure to the benefit of the Grantor, and its successors and assigns, and shall be binding upon the Grantee, and its successors and assigns:

1. The Grantee covenants and agrees that the Premises shall not be used for excavation of earth materials, crushing of rock and other materials, production of hot-mix asphalt or other similar products (e.g., cement, ready mix concrete, etc.), storage of earth materials and/or hot-mix, cement or ready-mix products or the sale (retail or wholesale) and distribution of such materials from the Premises or the use of such material or existing processed material unless such excavation and/or use of such materials is for the benefit of the Grantee on the Premises or on contiguous land in common ownership of the Grantee.
2. In the event of a violation of any or all of this restrictive covenant, the Grantor, in addition to all other remedies available to it, may obtain an injunction against the Grantee issued by a court of competent jurisdiction enjoining such breach and shall be entitled to recover its costs and expenses, including, but not limited to, reasonable attorney's fees in the enforcement or defense of the restrictions or any of them.

Being parcels 2 and 3 in the deed of Oldcastle Materials, Inc. to Pike Industries, Inc. dated March 20, 2002, and recorded in the Cumberland County Registry of Deeds in Book 17835, Page 301.

IN WITNESS WHEREOF, the Grantor has caused this instrument to be signed and sealed this 28th day of February, 2012.

WITNESS:

PIKE INDUSTRIES, INC.

By: Brian J. Donovan
Print/type name: Brian J. Donovan
Its: Authorized Agent

MAINE REAL ESTATE TAX PAID

STATE OF MAINE
CUMBERLAND, ss.

February 28, 2012

Then personally appeared the above named Brian J. Donovan, its Authorized Agent, of Pike Industries, Inc. who acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said Pike Industries, Inc.

Before me,

Peter J. Van Hemel
~~Notary Public~~ / Maine Attorney-at-Law
Name Printed: Peter J. Van Hemel
My Commission Expires: _____

H:\DOCS\RATTEYPIKE\UNE 39662\MSFWDEED3.DOC

EXHIBIT A

TRACT 1

A certain lot or parcel of land in the Morrill's Corner region of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Commencing at a point or stake standing on the old southerly line of the Portland & Rochester Railroad, now the Portland Terminal Company, and at a point where the same intersects with land formerly of Franklin M. Purington,

THENCE South $65\frac{3}{4}^{\circ}$ West 108 Rods 15 Links, more or less, to land now owned by the City of Portland;

THENCE North $24\frac{1}{4}^{\circ}$ West 5 Rods 16 Links, more or less, to a stake;

THENCE South $65\frac{3}{4}^{\circ}$ West 34 Rods 9 Links, more or less, to a stake standing on land owned by said City;

THENCE North 11° West 11 Rods 7 Links, more or less, to a stake, standing on land formerly owned by Hiram Sawyer;

THENCE North $61\frac{1}{2}^{\circ}$ East 107 Rods, more or less, to line of said location of Portland & Rochester Railroad;

THENCE by the line of said Railroad on its southerly side as aforesaid $83\frac{1}{4}^{\circ}$ East 38 $\frac{1}{2}$ Rods, more or less, to the place of beginning.

EXCEPTING from the above described premises, the premises conveyed by Adam W. Wilson to City of Portland by deed dated March 25, 1889, and recorded in the Cumberland County Registry of Deeds in Book 556, Page 132; and the premises conveyed by Adam W. Wilson to Boston & Maine Railroad by deed dated April 4, 1907, and recorded in said Registry in Book 803, Page 232, and by deed dated August 5, 1910, and recorded in said Registry in Book 863, Page 137.

TRACT II

Another certain lot or parcel of land situated near Morrill's Corner in that part of Portland that was formerly Deering, in the County of Cumberland and State of Maine, lying adjacent to and lying northwesterly of the above described premises, being bounded and described as follows:

Beginning at the northwesterly corner of land formerly of one Smith, on the southerly side of land formerly of Portland & Rochester Railroad, now the Portland Terminal Company, and running South 62° West 106 Rods to land of Portland Cemetery;

THENCE northwesterly by said Cemetery lot 30 Rods to the Old Kenney lot;

THENCE North 52 1/2° East by said Kenney's lot 49 Rods 2 Links to the Portland Terminal Company railroad land, formerly of the Portland & Rochester Railroad;

THENCE southeasterly by said Portland Terminal Company location 70 Rods to the first mentioned bounds or place of beginning.

EXCEPTING, however, from the above described premises two certain pieces or parcels of land, that first being 200 feet in length by 28 feet in width and lying parallel with the above-mentioned railroad, said parcel being conveyed by F.O.J. Bodge to Boston & Maine Railroad by warranty deed November 20, 1907, and recorded in the Cumberland County Registry of Deeds in Book 817, Page 29; and the second being a strip along a portion of the southeasterly and southwesterly side thereof, being conveyed by Lewis Lumber Co. to Central Maine Power Company by deed dated November 23, 1951, and recorded in said Registry in Book 2067, Page 107.

Both tracts are conveyed subject to the rights acquired for a sewer by the City of Portland by taking dated May 26, 1944, and recorded in the office of the City Clerk of the City of Portland, Maine, in Vol. 66, Page 263.

Also excepting the land described in the deed from Tilcon Minerals, Inc. to the City of Portland dated November 22, 1996, recorded in the Cumberland County Registry of Deeds in Book 12886, Page 212.

The premises are conveyed subject to the following rights and easements:

1. Rights and easements granted by Warren Bros. Roads Co. to Central Maine Power Company by instrument dated June 19, 1952, and recorded in the Cumberland County Registry of Deeds in Book 2097, Page 221.
2. Rights and easements granted by Warren Brothers Roads Company to Central Maine Power Company and New England Telephone and Telegraph Company by instrument dated January 27, 1967, and recorded in the Cumberland County Registry of Deeds in Book 2996, Page 102.
3. Rights and easements granted by Warren Brothers Co. to Portland Water District by instrument dated December 15, 1977, and recorded in the Cumberland County Registry of Deeds in Book 4150, Page 72.
4. Rights and easements granted by Warren Bros., a Div. of Ashland-Warren Inc. to Central Maine Power Company and New England Telephone and Telegraph Company by instrument dated January 31, 1978, and recorded in the Cumberland County Registry of Deeds in Book 4239, Page 326.
5. Rights and easements granted by Tilcon Minerals, Inc. to the City of Portland by deed dated November 22, 1996, and recorded in the Cumberland County Registry of Deeds in Book 12886, Page 214.

6. Rights and easements granted by Lewis Lumber Company to Central Maine Power Company by instrument dated November 23, 1951, and recorded in the Cumberland County Registry of Deeds in Book 2067, Page 106.
7. Rights, easements, and exceptions set forth in deed from Rosa Lewis to Warren Brothers Roads Company dated May 26, 1962, recorded in said Registry of Deeds in Book 2676, Page 74.

H:\DOCS\RATTEY\Pike\UNE 39662\EXHIBIT A.docx

Received
Recorded Register of Deeds
Mar 02, 2012 11:36:47A
Cumberland County
Pamela E. Lovley

QUITCLAIM DEED

THE STATE OF MAINE DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT successor in interest to the **STATE OF MAINE**, acting by and through the Acting Adjutant General pursuant to 37-B M.R.S.A. § 264, (the "Grantor"), FOR CONSIDERATION PAID, grants to the **UNIVERSITY OF NEW ENGLAND**, a Maine non-profit corporation, whose mailing address is 716 Stevens Avenue Portland, ME 04103 (the "Grantee"), certain real property, together with any improvements thereon, located at 760-780 Stevens Avenue, in the City of Portland, County of Cumberland and State of Maine, more particularly describes as follows:

A certain lot or parcel of land with the buildings thereon situated on the westerly side of Stevens Avenue in the City of Portland in said County of Cumberland and State of Maine, being the same premises conveyed by Elizur B. Forbes to Portland and Forest Avenue Rail Road Company by deed dated March 22, 1864, and recorded in Cumberland County Registry of Deeds in Book 326, Page 212, in which deed said premises were bounded as follows:

"A certain parcel of land fronting on the principal street at Stevens's Plains in Westbrook aforesaid, bounded as follows; beginning on said street at the southeast corner of land formerly of Jeremiah Beedle, now of Woodbury Polleys; thence running North sixty-four and a half degrees West five hundred seven and a half feet; thence North twenty-five and a half degrees East, thirty three feet; thence North sixty-three degrees West one hundred twenty-five feet; thence South seventy-five degrees forty-five minutes West seven hundred twenty feet; thence South sixty-four degrees east nine hundred ten and a half feet; thence North twenty and a quarter degrees east one hundred forty and a half feet; thence South sixty-six and a half degrees east, three hundred twenty four feet to the street or Stevens's Plains road before mentioned; thence North (by the line of the Street) nineteen degrees and three quarters east, two hundred ninety feet to the place of beginning - estimated to contain about nine and one quarter acres."

Meaning and intending to convey the same premises delineated on the Plan of Property in Portland, Maine made for the Adjutant General, Augusta, Maine prepared by H.I. & E.C. Jordan dated August 22, 1958.

For Grantor's source of title see: Warranty Deed from Portland Rail Road Company to the State of Maine dated October 14, 1940 and recorded at the York County Registry of Deeds in Book 1619, Page 299.

MAINE REAL ESTATE TAX PAID

By his signature hereon, the Acting Adjutant General certifies that the premises being conveyed in compliance with 37-B MRSA § 264, Section 6, Subsection 5 constitutes the Portland Armory, that he has designated an officer to inspect the premises, that he has determined the property to be unfit for military use, and has condemned the premises and furthermore that the premises are not being sold for less than appraised value as determined by a person licensed as a real estate appraiser under Title 32, chapter 123 and that the State of Maine Department of Defense, Veterans and Emergency Management is the successor in interest to the State Military Defense Commission of the State of Maine.

IN WITNESS WHEREOF, the State of Maine has caused this instrument to be executed in its name by Brigadier General Gerard F. Bolduc in his capacity as the Acting Adjutant General of the Maine National Guard, pursuant to 37-B M.R.S.A. § 264, this 11 day of June, 2015.

JA.
Witness

STATE OF MAINE

By: Gerard F. Bolduc

Gerard F. Bolduc
Brigadier General, The Acting Adjutant General

State of Maine
County of Kennebec, ss

June 11, 2015

The personally appeared the above-named Brigadier General Gerard F. Bolduc, The Acting Adjutant General of the Maine National Guard, and acknowledged the foregoing instrument to be his free act and deed and, pursuant to authorization of the Maine Legislature as found in 37-B M.R.S.A. § 264, the free act and deed of the State of Maine.

Before me,

Stacy M. Bradbury

Notary Public/Attorney-at-Law

Commission Expires:

Print Name: Stacy M. Bradbury

Under authority of
37-B MRSA 390-C.
Attorney at Law

Received
Recorded Register of Deeds
Jun 17, 2015 08:54:11A
Cumberland County
Nancy A. Lane

Abstract of Title to the following described land:

A certain lot or parcel of land with the building thereon, situated number 374 Stevens Avenue in that part of said Portland formerly Deering, and being bounded and described as follows:

~~Beginning at a stone post standing on the northerly side of College~~
Street, formerly Seminary Street, one hundred and fifty-eight (158) feet more or less from the northwesterly corner of said College Street and Stevens Avenue, and running north, twenty-four and one-fourth ($24 \frac{1}{4}$) degrees east, one hundred and forty-eight and one-half ($148 \frac{1}{2}$) feet to land now or late of Captain Sargent; thence south, seventy (70) degrees east by said Sargent's land one hundred and forty-one and one half ($141 \frac{1}{2}$) feet more or less to said Stevens Avenue; thence southerly by said Stevens Avenue seventy-four (74) feet to land now or late of Arabella W. Roberts; thence westerly by land now or late of said Roberts in a line parallel with said College Street one hundred (100) feet; thence southerly again by land now or late of said Roberts in a line parallel with said Stevens Avenue ninety (90) feet to said College Street; and thence westerly by said College Street to point of beginning; be any or all of said measurements more or less, or however otherwise bounded, measured or described.

Being the same premises conveyed by Lydia J. Snow to Thalia L. Clement, formerly Thalia L. Scamman, by warranty deed dated April 22, 1902, and recorded in Cumberland County Registry of Deeds, Book 716, Page 326.

bounded, measured or described.

Being the same premises conveyed by Lydia J. Snow to Thalia L. Clement, formerly Thalia L. Scamman, by warranty deed dated April 22, 1902, and recorded in Cumberland County Registry of Deeds, Book 716, Page 326.

Excepting that certain lot or parcel of land conveyed by the said Thalia L. Clement to Victor Brewster by warranty deed dated October 19, 1908, and recorded in Cumberland County Registry of Deeds, Book 831, Page 38.

APPROPRIATE OF LISTS TO THE BOTTOM ARE DESCRIBED TOP:

377-518.

(Elizur)

Eleazer B. Forbes to Joseph C. Snow;

Warranty; July 29, 1870;

Tract embracing lot described.

478-428.

Joseph C. Snow to Lydia J. Snow, wife;

Warranty; December 13, 1880;

Same tract as 377-518.

716-326.

Lydia J. Snow to Thalia L. Scamman;

Warranty, April 22, 1902.

721-20.

Thalia L. Scamman to Portland Savings Bank;

Mortgage; September 30, 1902; Discharged on margin

Mar. 2, 1905.

Thalia L. Clement to Portland Savings Bank, June 10, 1910.
Mortgage;
Discharged on margin September 22, 1914.

At the present time there are no encumbrances of record.

Dated at Portland, Maine, this fifth day of April,

A.D. 1919.

Quibbee Quibbee

Quit-Claim Deed

CORPORATION — WITH COVENANT

FROM

ALL SOULS UNIVERSALIST CHURCH OF
 PORTLAND, MAINE
 (ALL SOULS CHURCH PARISH)

TO

WESTBROOK SEMINARY AND JUNIOR COLLEGE

Dated February 9, 1940

State of Maine.

Cumberland ME Registry of Deeds

Received FEB 9 1940

at 2 P. M., 26, 27, and

recorded in Book 1599 Page 276

Attest
[Signature]
 REGISTER

FROM THE OFFICE OF

Bradley, Linnell, Nulty & Brown
 192 Middle Street
 Portland, Maine

MARTIN'S, PORTLAND, MAINE — LAW OFFICE SUPPLIES AND EQUIPMENT

MARTIN'S FORM NO. 9

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it, the said Westbrook Seminary and Junior College, its successors

~~Make~~ and Assigns forever.

And the said Grantor Corporation does warrant with the said Westbrook Seminary and Junior College, its successors

~~Make~~ and Assigns, that it will Warrant and Forever Defend the premises to it, the said Grantee, its successors

~~Make~~ and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said All Souls Universalist Church of Portland, Maine (All Souls Church Parish)

has caused this instrument to be sealed with its ~~corporate~~ seal

and signed in its corporate name by *Herbert B. Seal, President of its Board of Trustees,*

thereunto duly authorized, this *9th* day of February

in the year one thousand nine hundred and forty.

Signed, Sealed and Delivered
in presence of

E. F. Perkins

ALL SOULS UNIVERSALIST CHURCH OF
PORTLAND, MAINE
(ALL SOULS CHURCH PARISH)

By *Herbert B. Seal*
Its President of
Board of Trustees.

~~CORPORATE SEAL~~

State of Maine.

CUMBERLAND,

February 9, 1940.

Personally appeared the above named *Herbert B. Seal, President*
of the Board of Trustees of said Grantor Corporation
as aforesaid, and acknowledged the foregoing instrument to be his
free act and deed in his said capacity, and the free act and deed of
said corporation.



Before me,

Elliott P. Perkins
Justice of the Peace

Robinson was
 of the Liberator's Office -
 Secretary, March 17, 1876
 and was in office

East End

Deeds and Words

FROM

WALTER G. WHITMAN

10

WESTBROOK SEMINARY AND JUNIOR COLLEGE

Dated _____, 1940

Structure of Matter

BR. Registry of Deeds
Shimberland

Received MAR 28 1940 44

at 4 H, 55 M., 0 M., and

recorded in Book 1603 Page 98

Attest:
Maud L. Parille
Register.

FROM THE OFFICE OF

Bradley, Linnell, Nulty & Brown
192 Middle Street
Portland, Maine

MARTIN'S FORM NO. 1 — STANDARD REGISTRY FORM

5



Indeke

Know all Men by these Presents

That ALL SOULS UNIVERSALIST CHURCH OF PORTLAND, MAINE, a religious society duly organized under the laws of the State of Maine and located at Portland, in the County of Cumberland and State of Maine, formerly known as and called ALL SOULS CHURCH PARISH,
~~a corporation organized and existing under the laws of the State~~

~~of~~

~~xxxxxxxxxxxx~~

~~xxxxxxxxxxxx~~

~~xxxxxxxxxxxx~~

in consideration of one dollar and other valuable consideration

paid by WESTBROOK SEMINARY AND JUNIOR COLLEGE, a corporation organized and existing under the laws of the State of Maine and located at said Portland,

the receipt whereof it does hereby acknowledge, does hereby remise,
 release, bargain, sell and convey, and forever quit-claim unto the said

Westbrook Seminary and Junior College, its successors

~~back~~ and assigns forever,

the following described premises situated in said Portland:

1. A certain lot or parcel of land situated in said Portland and bounded and described as follows: Beginning at an iron stake at the northwesterly corner of the lot of land conveyed by Ella Louise Fernald to Susie Whitman by deed dated May 11, 1908 and recorded in Cumberland County Registry of Deeds in Book 826, Page 72; thence by land conveyed to said Whitman as aforesaid and by land conveyed to said Whitman by Cordelia S. Pierce by deed dated August 3, 1892 and recorded in said Registry of Deeds, Book 593, Page 236, on a course of South sixty-four degrees forty-two minutes East (S. 64° 42' E.) two hundred thirty-three (233) feet to an iron stake; thence by other land of said Grantor on a course of North twenty-one degrees fifty-six minutes East (N. 21° 56' E.) sixty-eight and fifty-five hundredths (68.55) feet to the Southeasterly corner of the lot of land next hereinafter described and conveyed; thence by said lot of land next hereinafter described and conveyed on a course of North sixty-four degrees fifty-five minutes West (N. 64° 55' W.) two hundred twenty-one and three tenths (221.3) feet to other land of said Grantee; thence by land of said Grantee on a course of South thirty-one degrees forty-five minutes West (S. 31° 45' W.) sixty-eight and one tenth (68.1) feet to the point of beginning.

Said above described lot is subject to the life lease to Ella L. Perry as granted to her by All Souls Church Parish by lease dated October 17, 1924 and recorded in said Registry in Book 1204, Page 65.

2. A certain other lot or parcel of land in said Portland was devised and land which Cordelia S. Pierce devised to All Souls Universalist Church of Portland, Maine under the name of Society of All Souls Church by her last will and testament.

Westbrook Seminary and Junior College, its successors

hereby and assigns forever,

the following described premises situated in said Portland:

1. A certain lot or parcel of land situated in said Portland and bounded and described as follows: Beginning at an iron stake at the northwesterly corner of the lot of land conveyed by Ella Louise Fernald to Susie Whitman by deed dated May 11, 1908 and recorded in Cumberland County Registry of Deeds in Book 826, Page 72; thence by land conveyed to said Whitman as aforesaid and by land conveyed to said Whitman by Cordelia S. Pierce by deed dated August 3, 1892 and recorded in said Registry of Deeds, Book 593, Page 236, on a course of South sixty-four degrees forty-two minutes East (S. 64° 42' E.) two hundred thirty-three (233) feet to an iron stake; thence by other land of said Grantor on a course of North twenty-one degrees fifty-six minutes East (N. 21° 56' E.) sixty-eight and fifty-five hundredths (68.55) feet to the Southeasterly corner of the lot of land next hereinafter described and conveyed; thence by said lot of land next hereinafter described and conveyed on a course of North sixty-four degrees fifty-five minutes West (N. 64° 55' W.) two hundred twenty-one and three tenths (221.3) feet to other land of said Grantee; thence by land of said Grantee on a course of South thirty-one degrees forty-five minutes West (S. 31° 45' W.) sixty-eight and one tenth (68.1) feet to the point of beginning.

Said above described lot is subject to the life lease to Ella L. Perry as granted to her by All Souls Church Parish by lease dated October 17, 1924 and recorded in said Registry in Book 1204, Page 86.

2. A certain other lot or parcel of land in said Portland and bounded and described as follows: Beginning at a stake on the northerly line of the lot of land which Cordelia S. Pierce devised to All Souls Universalist Church of Portland, Maine under the name of Society of All Souls Church by her last will and testament, an abstract of which is recorded in Cumberland County Registry of Deeds in Book 757, Page 136, said stake being distant one hundred forty-five (145) feet westerly of the westerly line of Stevens Avenue as established by deed from Westbrook Seminary to the City of Portland dated May 29, 1917 and recorded in said Registry in Book 1086, Page 449; thence by other land of said Grantor on a course of South twenty-one degrees fifty-six minutes West (S. 21° 56' W.) sixty-eight and fifty-five hundredths (68.55) feet to the northerly line of the lot of land next hereinafter described and conveyed; thence by said lot of land next hereinafter described and conveyed on a course of North sixty-four degrees fifty-five minutes West (N. 64° 55' W.) two hundred twenty-one and three tenths (221.3) feet to land of said Grantee; thence by land of said Grantee on a course of North thirty-one degrees forty-five minutes East (N. 31° 45' E.) sixty-eight and one tenth (68.1) feet to a stake; thence by land of said Grantee on a course of South sixty-five degrees eight minutes East (S. 65° 08' E.) two hundred nine and sixty-four hundredths (209.64) feet to the point of beginning.

Said aforementioned courses are magnetic and of the date of 1935.

Being a part of the property devised to All Souls Universalist Church of Portland, Maine under the name of Society of All Souls Church by the last will and testament of Cordelia S. Pierce, an abstract thereof being recorded in said Registry of Deeds in Book 757, Page 136.

On ~~Now~~ and in ~~Full~~ the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said

Westbrook Seminary and Junior College, its successors ~~heirs~~ and assigns, to its and their use and behoof forever.

And I do covenant with the said Grantee, its ^{successors} ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises, that they are free of all incumbrances; except as aforesaid;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will ~~Warrant and defend~~ the same to the said Grantee, its ^{successors} ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons except as aforesaid.

In ~~Witness Whereof~~. I, the said Walter G. Whitman,

and I, Grace B. Whitman,

wife of the said

Walter G. Whitman,

Joining in this deed as Grantor, and relinquishing and conveying all right by descent and all other rights in the above described premises, have hereunto set our hands and seals this 26th day of March in the year of our Lord one thousand nine hundred and forty.

Signed, Sealed and Delivered
in presence of

Sumner Y. Wheeler



Walter G. Whitman

Grace B. Whitman

premises, have not come
day of *March*

in the year of our Lord one thousand nine

hundred and forty.

Signed, Sealed and Delivered
in presence of

Sumner Y. Wheeler



Walter S. Whitman

Grace B. Whitman

COMMONWEALTH OF MASSACHUSETTS,
~~Essex, ss.~~

Essex,

ss.

March 26, 1940.

Personally appeared the above named

Walter G. Whitman

and acknowledged

the foregoing instrument to be his

free act and deed.

Before me,

Charles A. Metcalf

Justice of the Peace
Notary Public

My commission expires Apr. 28, 1940

00000

KNOW ALL MEN BY THESE PRESENTS, That the CITY OF PORTLAND, a body politic^o and corporate located in the County of Cumberland and State of Maine, in consideration of One Dollar (\$1.00) and other good and valuable considerations, paid by Westbrook College, a corporation organized and existing under the laws of the State of Maine and located at 716 Stevens Avenue in said Portland in said County and State, the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said Westbrook College, its successors and assigns forever, certain real estate located in said Portland, lying Westerly of College Street and Southerly of Bishop Street, bounded and described as follows:

Beginning at a point on the Northerly line of the land of Portland Railroad Company where the same intersects with land hereby conveyed and land formerly of George H. Smardon, commonly known as the Smardon Gravel Pit, formerly Read's Gravel Pit; thence from said point North 19° 30' East 28.68 rods; thence North 60° West Seven and thirty-two hundredths (7.32) rods to a point; thence South 74° 45' West Thirty-six and sixty-four hundredths (36.64) rods to a point; thence North 5° West Two and fifty-six hundredths (2.56) rods; thence North 30° West Twenty-four and four tenths (24.4) rods; thence South 65° West Forty-seven and twelve hundredths (47.12) rods to center of ditch; thence up the center of said ditch towards what is known as pasture Two Hundred Ninety-eight (298) feet; thence in a straight line to a point in line of Evergreen Cemetery indicated by a spruce stump, said stump being at the intersection between land of said Cemetery and land conveyed by Luther B. Roberts to the said City of Portland; thence from said stump North 80° 21' East Three Hundred Seventy-one and two tenths (372.2) feet to an angle; thence from said angle North 76° 8' East, Five Hundred Ninety-six and twenty-two hundredths (596.22) feet to an angle; thence from said last named angle at a right angle South 12° 52' East Seventy-five (75) feet to land of said Portland Railroad Company; thence about North 76° 8' East by said Portland Railroad Company's land to the point of beginning.

Also a certain other parcel of land, abutting the above described premises and bounded and described as follows: Beginning at the center of the ditch

Two Hundred Ninety-eight (298) feet; thence in a straight line to a point in line of Evergreen Cemetery indicated by a bridge stump; said stump being at the intersection of the land of said Cemetery and land conveyed by Luther B. Roberts to the said City of Portland; thence from said stump North $80^{\circ} 21'$ East Three Hundred Seventy-one and two tenths (372.2) feet to an angle; thence from said angle North $76^{\circ} 8'$ East, Five Hundred Ninety-six and twenty-two hundredths (596.22) feet to an angle; thence from said last named angle at a right angle South $12^{\circ} 52'$ East Seventy-five (75) feet to land of said Portland Railroad Company; thence about North $76^{\circ} 8'$ East by said Portland Railroad Company's land to the point of beginning.

Also a certain other parcel of land, abutting the above described premises and bounded and described as follows: Beginning at the center of the ditch between the hereinabove described premises and the land hereby conveyed and in line of land now or formerly owned by Adam Wilson and running Southerly by land of said Wilson to the Westerly corner of land of Evergreen Cemetery; thence South Twenty-four (24°) degrees East by land of said Cemetery One hundred and seventy-five (175) feet to a point; thence by land formerly of Dennis F. Gulliver, and being the premises hereinabove described, in a straight line to a point in the center of said ditch; said point being Two Hundred Ninety-eight (298) feet from the point of beginning; thence down the center of said ditch to the point of beginning.

256

- 2 -

Excepting and reserving from the above described premises that portion thereof conveyed by the Grantor to Central Maine Power Company by deed dated February 26, 1967, recorded in said Registry of Deeds in Book 2989, Page 13.

This conveyance is made subject to the right-of-way or easement granted by the Grantor to Central Maine Power Company by deed dated December 13, 1951, recorded in said Registry of Deeds in Book 2055, Page 463.

Reserving to the Grantor, its successors and assigns, the right perpetually to enter at any and all times upon a strip of land fifty (50) feet in width lying equally on either side of the storm drain and upon a strip of land fifty (50) feet in width lying equally on either side of the brook presently located on the premises herein conveyed and the right perpetually to maintain, repair, rebuild, relocate, or remove said storm drain and brook with all necessary fixtures and appurtenances within said strips of land, granting to the Grantee, its successors and assigns, the use and enjoyment of said strips of land for such purposes only as will in no way interfere with the perpetual use thereof by the Grantor, its successors and assigns, for the purposes above mentioned, except that no buildings or structures may be erected within said strips of land. Also reserving to the Grantor, its successors and assigns, the right perpetually to enter at any and all times upon the premises herein conveyed for the purpose of access and egress by itself, its servants and/or agents to and from said strips of land.

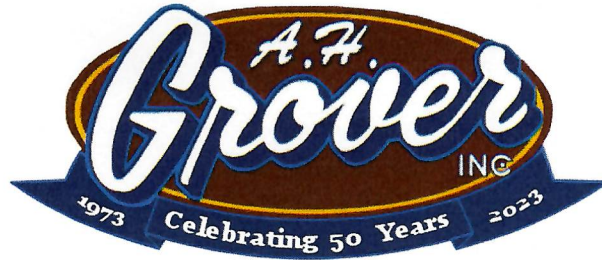
Being the same premises conveyed to the Grantor by deed of James Gulliver, Administrator, d.b.n.c.t.a., of the Estate of Stephen Gulliver by deed dated August 23, 1935, recorded in said Registry of Deeds in Book 1476, Page 441.

Also a certain lot of land lying in the rear of College Street, in the City of Portland, bounded and described as follows, to wit:

Beginning at a point on the Northerly side line of College Street and at the Westerly corner of land belonging to Francis L. Stone; thence North 25° 22' east by land of said Stone eighty-seven and nineteen one hundredths (87.19) feet to land of the Portland Railroad Company; thence North 62° 26' west by land of said Portland Railroad Company four hundred and thirty-one and ninety three one hundredths (431.93) feet

Seventy-one and two tenths (372.2) feet to an angle; thence from said angle North $76^{\circ} 8'$ East, Five Hundred Ninety-six and twenty-two hundredths (596.22) feet to an angle; thence from said last named angle at a right angle South $12^{\circ} 52'$ East Seventy-five (75) feet to land of said Portland Railroad Company; thence about North $76^{\circ} 8'$ East by said Portland Railroad Company's land to the point of beginning.

Also a certain other parcel of land, abutting the above described premises and bounded and described as follows: Beginning at the center of the ditch between the hereinabove described premises and the land hereby conveyed and in line of land now or formerly owned by Adam Wilson and running Southerly by land of said Wilson to the Westerly corner of land of Evergreen Cemetery; thence South Twenty-four (24°) degrees East by land of said Cemetery One hundred and seventy-five (175) feet to a point; thence by land formerly of Dennis F. Gulliver, and being the premises hereinabove described, in a straight line to a point in the center of said ditch; said point being Two Hundred Ninety-eight (298) feet from the point of beginning; thence down the center of said ditch to the point of beginning.



Project Location: UNE Connector Road

RE: Dewatering Plan

September 18, 2023

Plan:

The existing site is currently sloped to the sides of the roadway. An erosion control berm will be placed on either side of the work area. No pumping of water is planned for rainwater as the area already drains efficiently. During a rain event, no open trenches or holes will be present.

Based on the current conditions and the test pits completed on site, groundwater levels are below most working levels. If water must be pumped from excavation areas, we will use a two-inch pump equipped with a discharge hose and a filter bag. The discharge will be placed on a bed of crushed stone surrounded by crushed stone to filter further sediment and reduce the impact on existing ground.

DEP Erosion Control Specialists will be on site during all operations and maintain a log of all dewatering operations.

All BPMs for erosion control will be inspected daily and maintained as necessary to the design specifications. Any Silt and or spent filter media will be removed from the site and disposed of at one of our offsite locations.

A handwritten signature in black ink, appearing to read "Lee H. Ruby", with a long, sweeping underline.

Lee H. Ruby

Project Manager

Mailing Address | P.O. Box 307, Cumberland, ME 04021
Location Address | 82 Doughty Road, North Yarmouth, Maine

Telephone [207] 829-3373
Fax [207] 829-5502



Ultra-Dewatering Bags® Specifications

Material Specifications

Properties	ASTM Test	Value
Material: Non-Woven, Polyethylene Geotextile	-	-
Grab Tensile	D 4632	205 lbs
Elongation at break	D 4632	50%
Trapezoid Tear	D 4533	80 lbs
Puncture	D 4833	525 lbs
Mullen Burst	D 3786	420 psi
Permittivity	D 4491	1.5 sec ⁻¹
A.O.S. (U.S. sieve no.)/ mm	D 4781	80/0.18
UV Stability (strength retained %) 500 Hours	D 4355	70%
Fabric Weight (oz./yd²)(typical)	D 5261	8 oz/yd ²
Flow Rate	D 4491	90 gpm/ft ²

Install the Ultra-Dewatering Bag® on a slope so incoming water flows downhill through the Ultra-Dewatering Bag® without creating more erosion. Strap the neck of the Ultra-Dewatering Bag® tightly to the discharge hose. To increase the efficiency of filtration, place the bag on an aggregate or hay bale bed to maximize water flow through the surface area of the bag.

The Ultra-Dewatering Bag® is full when it no longer can efficiently filter sediment or pass water at a reasonable rate. Flow rates will vary depending on the size of the Ultra-Dewatering Bag®, the type and amount of sediment discharged into the Ultra-Dewatering Bag®, the type of ground, rock or other substance under the bag and the degree of the slope on which the bag lies. Under most circumstances Ultra-Dewatering Bag® will accommodate flow rates of 1500 gallons per minute. Use of excessive flow rates or overfilling Ultra-Dewatering Bag® with sediment will cause ruptures of the bags or failure of the hose attachment straps.

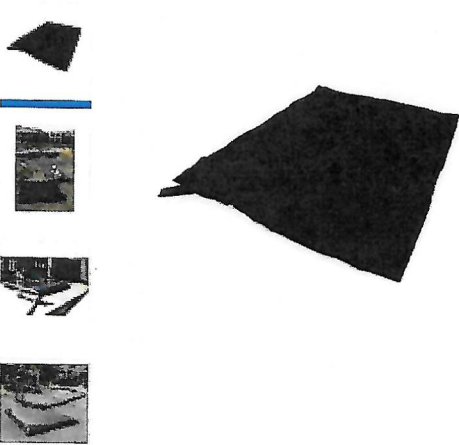
Dispose of the Ultra-Dewatering Bag® as directed by the site engineer. If allowed, the Ultra-Dewatering Bag® may be cut open and the contents seeded after removing visible fabric.

The facts stated and the recommendations made herein are offered free of charge and are accurate to the best of our knowledge. UltraTech International, Inc. assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. UltraTech disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, material, or information furnished herewith. Final determination of the use of any information or material, or how it is useful, and whether the use infringes any patents is the sole responsibility of the user.

Unit Specifications

Model	Fabric QTY	Max Flow Rate (GPM)	Sediment Capacity (Cu Ft)	Sediment Capacity (lbs.)	Oil Capacity
Oil & Sediment 3'x4' Part # 9729-O/S	24 sq ft	500	6	720	1.2 gal
Oil & Sediment 6'x6' Part # 9724-O/S	74 sq ft	500	36	4320	3.7 gal
Oil & Sediment 10'x15' Part # 9725-O/S	302 sq ft	1500	150	18000	15.1 gal
Oil & Sediment 15'x15' Part # 9727-O/S	452 sq ft	1500	225	27000	22.6 gal

Interstate Products Inc. 6561 Palmer Park Circle Sarasota, Florida 34238 USA
1-800-474-7294 1-941-377-8610 · store.interstateproducts.com



ULTRATECH Dewatering Bag: 4 ft L x 3 ft W, 500 gpm Max Flow Rate, 1.2 gal Oil Capacity

Item 3EWY6 Mfr. Model 9729-OS

Web Price 
\$45.67 / each

Qty

1

Add to Cart

☒ Ship

☐ Pickup

Expected to arrive
Wed. Aug 02.

Ship to 04021 | [Change](#)

Shipping Weight 1.65 lbs
[Ship Availability Terms](#)

☐ Compare

Product Details Catalog Page [1867](#)

- Color **Black**
- Diameter **4 in**
- For Use With **4 in Discharge Hose**
- Incinerable **No**
- Length **4 ft**
- Material **Polypropylene**
- Maximum Discharge Hose Size **4 in**
- Maximum Flow Rate **500 gpm**
- Micron Rating **100**
- Oil Capacity **1.2 gal**
- Recycled Content (%) **No Recycled Content**
- Reusable **No**
- Sediment Capacity **12 cu ft; 720 lb**
- Sediment Capacity (Volume) **12 cu ft**
- Sediment Capacity (Weight) **720 lb**
- Size **4 ft L x 3 ft W**
- Standards **40 CFR 122.26**
- Substances Filtered **Oil; Sediment**
- Width **3 ft**

[Add to List](#)

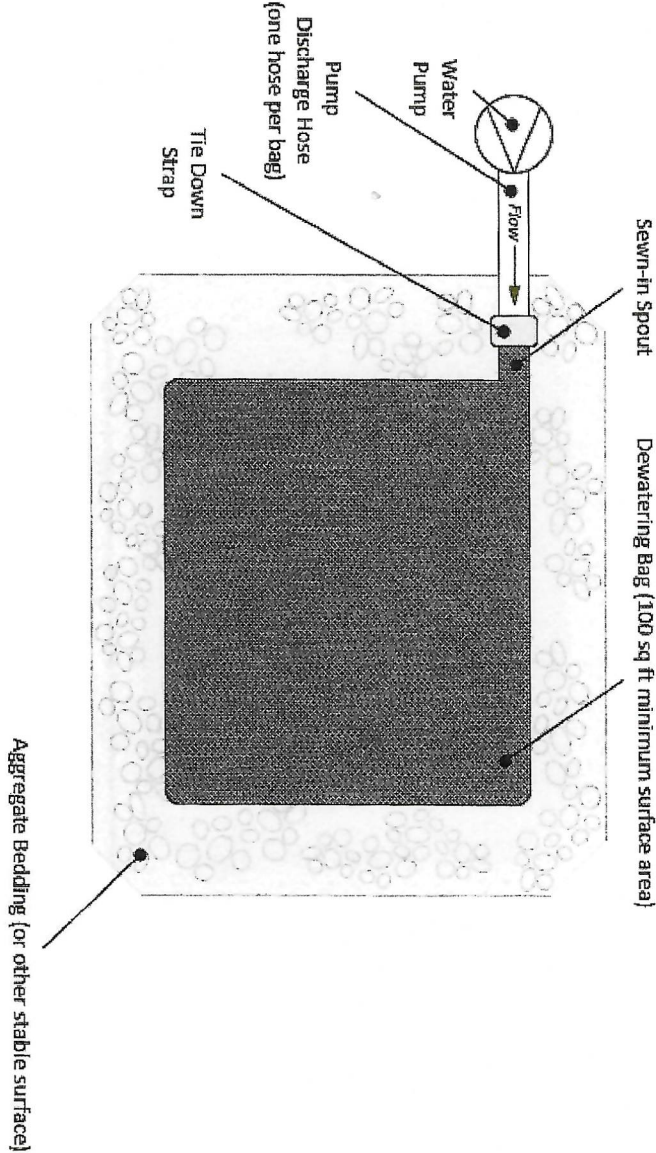
Documents

 [Ultratech Dewatering Bag Spec Sheet](#)

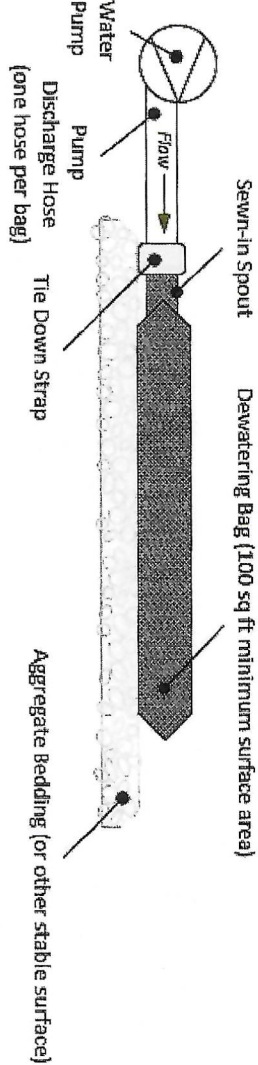
 [Chat with an Agent](#)

Figure 1:
Geotextile Filter Bag

PLAN VIEW



SIDE VIEW





Office of Finance and Administration

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
U.S.A.
(207) 283-0171

Portland Campus
716 Stevens Avenue
Portland, ME 04103
U.S.A.
(207) 797-7261

www.une.edu

September 14, 2023

City of Portland
Planning Board
389 Congress St.
Portland, ME 04101

Dear Planning Board Members,

Please accept this letter as assurance that the University of New England (UNE) has the financial capacity to construct, equip, and operate the proposed Harold and Bibby Alfond Center for Health Sciences as well as the Bishop Street Connector Road.

From 2018 to 2023, UNE has experienced a total positive change in net assets of \$197.2 million. These surpluses have improved upon the University's liquidity position and overall financial capacity. Total net assets during the same period increased from \$320.5 million to \$517.7 million. This demonstrates UNE's continued commitment to sound management practices and financial sustainability.

To date, UNE has raised over \$39.4 million to construct and equip the proposed Harold and Bibby Alfond Center for Health Sciences. These fundraising efforts are continuing. Additionally, UNE holds A-level credit ratings from Moody's Investor Services and Fitch Ratings which has provided access to capital markets for project financing. The University issued the UNE Series 2021AB Revenue Bonds in December 2021 which included \$50 million dedicated to the design and construction of the Harold and Bibby Alfond Center for Health Sciences. Long range financial planning and cash flow projections provide further confirmation that the University can readily afford the construction and future direct and indirect operating costs of the proposed project.

Taking into consideration the funds raised, \$50 million of debt financing secured, and financial strength of the University, management is confident it has sufficient resources to complete the project.

Respectfully submitted,

Jim Irwin
Senior Vice President for Finance and Administration
University of New England



UNIVERSITY OF
NEW ENGLAND

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
(207) 283-0171 T

Portland Campus
716 Stevens Avenue
Portland, ME 04103
(207) 797-7261 T

September 20, 2023

Mr. Tom Saucier
Site Design Associates
23 Whitney Way
Topsham, ME 04086

TO WHOM IT MAY CONCERN:

This letter authorizes Tom Saucier to serve as an Agent and Owner's Representative for University of New England for the purpose of permitting the reconstruction of a drive connecting the campus with the Intermodal Transportation Facility.

Sincerely,

A handwritten signature in black ink that reads "Alan Thibeault". The signature is written in a cursive style with a large, sweeping initial "A".

Alan Thibeault
Vice President for University Operations



Record Lighting Submittal Package

Project: UNE Alford Cener Site Lighting (22-63667-16)

Prepared For: Wesco – Portland, ME.

Prepared By: Kelly Beck

September 19, 2023

Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT



RSX2 LED Area Luminaire



Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

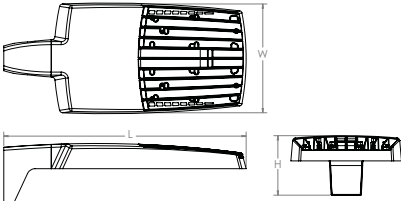
Introduction

The new RSX LED Area family delivers maximum value by providing significant energy savings, long life and outstanding photometric performance at an affordable price. The RSX2 delivers 11,000 to 31,000 lumens allowing it to replace 250W to 1000W HID luminaires.

The RSX features an integral universal mounting mechanism that allows the luminaire to be mounted on most existing drill hole patterns. This “no-drill” solution provides significant labor savings. An easy-access door on the bottom of mounting arm allows for wiring without opening the electrical compartment. A mast arm adaptor, adjustable integral slipfitter and other mounting configurations are available.

Specifications

EPA (ft²@0°):	0.69 ft² (0.06 m²)
Length:	29.3" (74.4 cm) (SPA mount)
Width:	13.4" (34.0 cm)
Height:	3.0" (7.6 cm) Main Body 7.2" (18.3 cm) Arm
Weight: (SPA mount)	30.0 lbs (13.6 kg)



Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.
*See ordering tree for details

Ordering Information

EXAMPLE: RSX2 LED P6 40K R3 MVOLT SPA DDBXD

RSX2 LED	P1	40K	R2	MVOLT	SPA
Series	Performance Package	Color Temperature	Distribution	Voltage	Mounting
RSX2 LED	P1 P2 P3 P4 P5 P6	30K 3000K 40K 4000K 50K 5000K	R2 Type 2 Wide R3 Type 3 Wide R3S Type 3 Short R4 Type 4 Wide R4S Type 4 Short R5 Type 5 Wide ¹ R5S Type 5 Short ¹ AFR Automotive Front Row AFRR90 Automotive Front Row Right Rotated AFRL90 Automotive Front Row Left Rotated	MVOLT (120V-277V) ² HVOLT (347V-480V) ³ XVOLT (277V-480V) ⁴ (use specific voltage for options as noted) 120 ³ 277 ⁵ 208 ³ 347 ⁵ 240 ³ 480 ⁵	SPA Square pole mounting (3.0" min. SQ pole for 1 at 90°, 3.5" min. SQ pole for 2, 3, 4 at 90°) RPA Round pole mounting (3.2" min. dia. RND pole for 2, 3, 4 at 90°, 3.0" min. dia. RND pole for 1 at 90°, 2 at 180°, 3 at 120°) MA Mast arm adaptor (fits 2-3/8" OD horizontal tenon) IS Adjustable slipfitter (fits 2-3/8" OD tenon) ⁶ WBA Wall bracket ¹ WBASC Wall bracket with surface conduit box AASP Adjustable tilt arm square pole mounting ⁶ AARP Adjustable tilt arm round pole mounting ⁶ AAWB Adjustable tilt arm with wall bracket ⁶ AAWSC Adjustable tilt arm wall bracket and surface conduit box ⁶

NLTAIR2 PIRHN			DBLXD	
Options			Finish	
Shipped Installed			Shipped Installed	
HS	House-side shield ⁷		*Standalone and Networked Sensors/Controls (factory default settings, see table page 9)	
PE	Photocontrol, button style ^{8,9}		NLTAIR2 PIRHN nLight AIR generation 2 ,with Networked, Bi-Level motion/ambient sensor ^{9,13,14,15}	
PER7	Seven-wire twist-lock receptacle only (no controls) ^{9, 10, 11}		BAA Buy America(n) Act Compliant	
SF	Single fuse (120, 277, 347) ⁵		CCE Coastal Construction ¹⁶	
DF	Double fuse (208, 240, 480) ⁵		*Note: NLTAIR2 PIRHN with nLight Air can be used as a standalone dimming sensor with out-of-box settings or as a wireless networked solution. See factory default settings table. Sensor coverage pattern is affected when luminaire is tilted.	
SPD20KV	20KV Surge pack (10KV standard)		Shipped Separately (requires some field assembly)	
FAO	Field adjustable output ⁹		EGS External glare shield ⁷	
DMG	0-10V dimming extend out back of housing for external control (control ordered separate) ⁹		EGFV External glare full visor (360° around light aperture) ⁷	
DS	Dual switching ^{9,12}		BS Bird spikes ¹⁷	
			DDBXD Dark Bronze	
			DBLXD Black	
			DNAXD Natural Aluminum	
			DWHXD White	
			DDBTXD Textured Dark Bronze	
			DBLTXD Textured Black	
			DNATXD Textured Natural Aluminum	
			DWHGXD Textured White	



One Lithonia Way • Conyers, Georgia 30012 • Phone: 1-800-705-SERV (7378) • www.acuitybrands.com
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Lithonia RSX2 Area LED
Rev. 04/20/23
Page 1 of 9

Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

Ordering Information

Accessories

Ordered and shipped separately.

RSX2HS	RSX2 House side shield (includes 2 shields)
RSX2EGS (FINISH) U	External glare shield (specify finish)
RSX2HSAFR (FINISH) U	RSX2 House side shields for AFR rotated optics (includes 2 shields)
RSX2EGFV (FINISH) U	External glare full visor (specify finish)
RSXRPA (FINISH) U	RSX Universal round pole adaptor plate (specify finish)
RSXWBA (FINISH) U	RSX WBA wall bracket (specify finish) ¹
RSXSCB (FINISH) U	RSX Surface conduit box (specify finish, for use with WBA, WBA not included)
DL127F 1.5 JU	Photocell -SSL twist-lock (120-277V) ¹⁸
DL1347F 1.5 CUL JU	Photocell -SSL twist-lock (347V) ¹⁸
DL1480F 1.5 CUL JU	Photocell -SSL twist-lock (480V) ¹⁸
DSHOT SBK U	Shorting cap ¹⁸

NOTES

- Any Type 5 distribution, is not available with WBA.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- HVOLT driver operates on any line voltage from 347-480V (50/60 Hz).
- XVOLT driver not available with P1. XVOLT driver operates on any line voltage from 277V-480V (50/60 Hz). XVOLT not available with fusing (SF or DF) and not available with PE.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Maximum tilt is 90° above horizontal.
- It may be ordered as an accessory.
- Requires MVOLT or 347V.
- Two or more of the following options cannot be combined including PE, DMG, PER7, FAO, DS and NLTAIR2 PIRHN. (Exception: PE and FAO can be combined; also PE and DMG can be combined.)
- Compatible with standard twist-lock photocells for dusk to dawn operation or advanced control nodes that provide 0-10V dimming signals. Wire 4/Wire 5 wired to dimming leads on driver. Wire6/Wire7 capped inside luminaire. Twistlock photocell ordered and shipped

- as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
- For units with option PER7, the mounting must be restricted to +/- 45° from horizontal aim per ANSI C136.10-2010.
- DS requires (2) separately switched circuits. DS provides 50/50 fixture operation via (2) different sets of leads using (2) drivers. DS only available with packages P5 and P6.
- Must be ordered with PIRHN.
- Requires MVOLT or HVOLT.
- Must be ordered with NLTAIR2. For additional information on PIRHN visit [here](#).
- CCE option not available with WBA, WBASC, AASP, AARP, AAWB, AAWBSC, EGS, EGVV and BS.
- Must be ordered with fixture for factory pre-drilling.
- Requires luminaire to be specified with PER7 option. Ordered and shipped as a separate line item from Acuity Brands Controls.

External Shields



House Side Shield



External Glare Shield

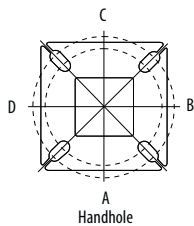


External 360 Full Visor

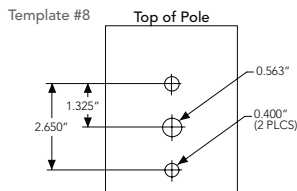
Pole/Mounting Information

Accessories including bullhorns, cross arms and other adapters are available under the accessories tab at Lithonia's Outdoor Poles and Arms product page. Click here to visit [Accessories](#).

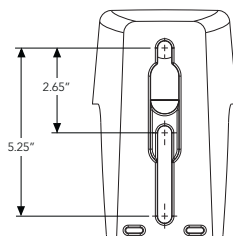
HANDHOLE ORIENTATION



RSX POLE DRILLING



RSX STANDARD ARM & ADJUSTABLE ARM



Round Tenon Mount - Pole Top Slipfitters

Tenon O.D.	RSX Mounting	Single	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2 - 3/8"	RPA, AARP	AS3-5190	AS3-5280	AS3-5290	AS3-5320	AS3-5390	AS3-5490
2 - 7/8"	RPA, AARP	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	RPA, AARP	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Drill/Side Location by Configuration Type

Drilling Template	Mounting Option	Single	2 @ 180	2 @ 90	3 @ 120	3 @ 90	4 @ 90
	Head Location	Side B	Side B & D	Side B & C	Round Pole Only	Side B, C & D	Side A, B, C & D
#8	Drill Nomenclature	DM19AS	DM28AS	DM29AS	DM32AS	DM39AS	DM49AS

RSX2 - Luminaire EPA

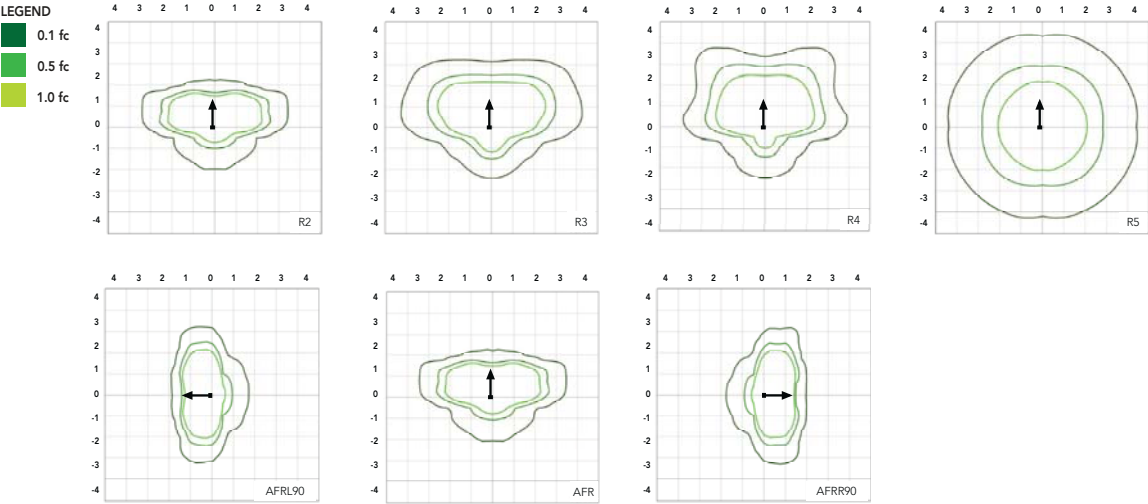
*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.

Fixture Quantity & Mounting Configuration		Single	2 @ 90	2 @ 180	3 @ 90	3 @ 120	4 @ 90	2 Side by Side	3 Side by Side	4 Side by Side
Mounting Type	Tilt									
SPA - Square Pole Adaptor	0°	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
RPA - Round Pole Adaptor		0.74	1.27	1.37	1.9	1.71	2.49	1.42	2.16	2.84
MA - Mast Arm Adaptor		0.61	1.14	1.11	1.64	1.45	2.23	1.29	1.9	2.58
IS - Integral Slipfitter AASP/AARP - Adjustable Arm Square/Round Pole	0°	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
	10°	0.53	1.06	1.05	1.58	1.37	2.08	1.06	1.59	2.12
	20°	0.52	1.02	1.03	1.52	1.33	2.02	1.03	1.55	2.07
	30°	0.64	1.11	1.18	1.63	1.45	2.21	1.27	1.91	2.54
	40°	0.81	1.21	1.35	1.74	1.65	2.39	1.62	2.43	3.23
	45°	0.91	1.25	1.5	1.81	1.75	2.48	1.82	2.73	3.64
	50°	1.34	1.83	2.17	2.61	2.56	3.62	2.68	4.02	5.36
	60°	2.2	2.97	3.57	4.24	4.17	5.89	4.41	6.61	8.82
	70°	2.86	4.13	4.7	5.89	5.71	8.21	5.71	8.57	11.42
	80°	3.4	5.13	5.67	7.34	7.09	10.21	6.79	10.19	13.59
	90°	3.85	5.96	6.55	8.58	8.31	11.88	7.70	11.56	15.41

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's RSX Area homepage.

Isofootcandle plots for the RSX2 LED P6 40K. Distances are in units of mounting height (30').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-50°C (32-122°F).

Ambient	Ambient	Lumen Multiplier
0°C	32°F	1.05
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97
45°C	113°F	0.96
50°C	122°F	0.95

Electrical Load

		Current (A)					
Performance Package	System Watts (W)	120V	208V	240V	277V	347V	480V
P1	71W	0.59	0.34	0.30	0.26	0.20	0.15
P2	111W	0.93	0.53	0.46	0.40	0.32	0.23
P3	147W	1.23	0.70	0.61	0.53	0.42	0.31
P4	187W	1.55	0.90	0.78	0.68	0.53	0.38
P5	210W	1.75	1.01	0.87	0.76	0.60	0.44
P6	244W	2.03	1.17	1.01	0.88	0.70	0.51

Projected LED Lumen Maintenance

Operating Hours	50,000	75,000	100,000
Lumen Maintenance Factor	>0.97	>0.95	>0.92

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

Submitted by:	Job Name:	Catalog Number:	Type:
 VISIBLE LIGHT MANUFACTURERS' REPRESENTATIVE	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

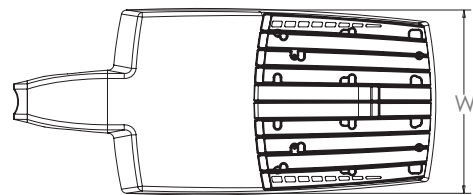
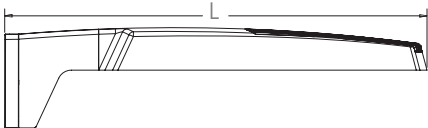
Performance Package	System Watts	Distribution Type	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	71W	R2	10,040	2	0	1	139	11,031	2	0	1	153	11,031	2	0	1	153
		R3	10,005	2	0	2	141	10,992	2	0	2	155	10,992	2	0	2	155
		R3S	10,271	2	0	2	143	11,285	2	0	2	157	11,285	2	0	2	157
		R4	10,136	2	0	2	143	11,136	2	0	2	157	11,136	2	0	2	157
		R4S	9,779	2	0	2	138	10,744	2	0	2	151	10,744	2	0	2	151
		R5	10,271	4	0	2	145	11,285	4	0	2	159	11,285	4	0	2	159
		R5S	10,544	3	0	1	149	11,585	3	0	2	163	11,585	3	0	2	163
		AFR	10,026	2	0	1	141	11,016	2	0	1	155	11,016	2	0	1	155
		AFRR90	10,122	3	0	2	140	11,121	3	0	2	154	11,121	3	0	2	154
		AFRL90	10,164	3	0	2	141	11,167	3	0	2	155	11,167	3	0	2	155
P2	111W	R2	15,712	2	0	2	138	17,263	2	0	2	151	17,263	2	0	2	151
		R3	15,657	2	0	3	141	17,202	3	0	3	155	17,202	3	0	3	155
		R3S	16,075	2	0	2	141	17,661	2	0	2	155	17,661	2	0	2	155
		R4	15,862	2	0	3	143	17,427	2	0	3	157	17,427	2	0	3	157
		R4S	15,304	2	0	2	138	16,815	2	0	2	151	16,815	2	0	2	151
		R5	16,075	4	0	2	145	17,661	5	0	3	159	17,661	5	0	3	159
		R5S	16,502	4	0	2	149	18,130	4	0	2	163	18,130	4	0	2	163
		AFR	15,691	2	0	2	141	17,240	2	0	2	155	17,240	2	0	2	155
		AFRR90	15,841	3	0	3	139	17,404	4	0	3	153	17,404	4	0	3	153
		AFRL90	15,907	3	0	3	139	17,477	4	0	3	153	17,477	4	0	3	153
P3	147W	R2	19,855	3	0	2	132	21,814	3	0	2	145	21,814	3	0	2	145
		R3	19,785	3	0	3	135	21,737	3	0	4	148	21,737	3	0	4	148
		R3S	20,312	3	0	3	135	22,317	3	0	3	149	22,317	3	0	3	149
		R4	20,044	3	0	3	136	22,022	3	0	4	150	22,022	3	0	4	150
		R4S	19,339	3	0	3	132	21,247	3	0	3	145	21,247	3	0	3	145
		R5	20,313	5	0	3	138	22,317	5	0	3	152	22,317	5	0	3	152
		R5S	20,852	4	0	2	142	22,910	4	0	2	156	22,910	4	0	2	156
		AFR	19,828	3	0	2	135	21,785	3	0	2	148	21,785	3	0	2	148
		AFRR90	20,017	4	0	3	133	21,992	4	0	3	147	21,992	4	0	3	147
		AFRL90	20,101	4	0	3	134	22,084	4	0	3	147	22,084	4	0	3	147
P4	187W	R2	22,836	3	0	2	120	25,090	3	0	2	132	25,090	3	0	2	132
		R3	22,756	3	0	4	122	25,002	3	0	4	134	25,002	3	0	4	134
		R3S	23,363	3	0	3	123	25,668	3	0	3	135	25,668	3	0	3	135
		R4	23,054	3	0	4	123	25,329	3	0	4	135	25,329	3	0	4	135
		R4S	22,243	3	0	3	119	25,059	3	0	3	134	25,059	3	0	3	134
		R5	23,363	5	0	3	125	25,669	5	0	4	137	25,669	5	0	4	137
		R5S	23,983	4	0	2	128	26,350	4	0	2	141	26,350	4	0	2	141
		AFR	22,806	3	0	2	122	25,056	3	0	2	134	25,056	3	0	2	134
		AFRR90	23,023	4	0	3	121	25,295	4	0	3	133	25,295	4	0	3	133
		AFRL90	23,120	4	0	3	122	25,401	4	0	3	134	25,401	4	0	3	134
P5	210W	R2	26,141	3	0	2	122	28,721	3	0	2	135	28,721	3	0	2	135
		R3	26,049	3	0	4	124	28,620	3	0	4	136	28,620	3	0	4	136
		R3S	26,744	3	0	3	125	29,383	3	0	4	138	29,383	3	0	4	138
		R4	26,390	3	0	4	126	28,994	3	0	4	138	28,994	3	0	4	138
		R4S	25,462	3	0	3	121	27,974	3	0	3	133	27,974	3	0	3	133
		R5	26,744	5	0	4	127	29,383	5	0	4	140	29,383	5	0	4	140
		R5S	27,454	4	0	2	131	30,163	4	0	2	144	30,163	4	0	2	144
		AFR	26,106	3	0	2	124	28,682	3	0	2	137	28,682	3	0	2	137
		AFRR90	26,354	4	0	3	123	28,955	5	0	3	136	28,955	5	0	3	136
		AFRL90	26,465	4	0	3	124	29,077	5	0	3	136	29,077	5	0	3	136
P6	244W	R2	27,646	3	0	2	112	30,374	3	0	2	123	30,374	3	0	2	123
		R3	27,549	3	0	4	113	30,267	3	0	4	124	30,267	3	0	4	124
		R3S	28,283	3	0	3	115	31,075	3	0	4	126	31,075	3	0	4	126
		R4	27,909	3	0	4	114	30,663	3	0	4	126	30,663	3	0	4	126
		R4S	26,928	3	0	3	110	29,585	3	0	3	121	29,585	3	0	3	121
		R5	28,284	5	0	4	116	31,075	5	0	4	127	31,075	5	0	4	127
		R5S	29,035	4	0	2	119	31,900	5	0	3	131	31,900	5	0	3	131
		AFR	27,608	3	0	2	112	30,332	3	0	2	123	30,332	3	0	2	123
		AFRR90	27,872	4	0	3	113	30,622	5	0	3	124	30,622	5	0	3	124
		AFRL90	27,989	4	0	3	113	30,751	5	0	3	125	30,751	5	0	3	125

Dimensions & Weights

Luminaire Weight by Mounting Type

Mounting Configuration	Total Luminaire Weight
SPA	30 lbs
RPA	32 lbs
MA	30 lbs
WBA	33 lbs
WBASC	36 lbs
IS	33 lbs
AASP	33 lbs
AARP	35 lbs
AAWB	36 lbs
AAWSC	39 lbs

RSX2 with Round Pole Adapter (RPA)


Length: 30.3" (77.0 cm)

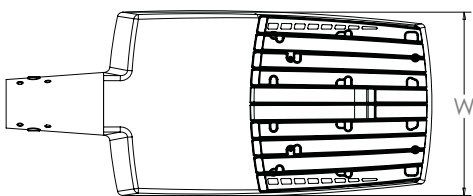
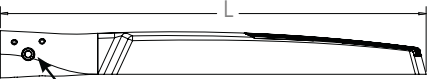
Width: 13.4" (34.0 cm)

Height: 3.0" (7.6 cm) Main Body
7.2" (18.3 cm) Arm

Note: RPA — Round Pole mount can also be used to mount on square poles by omitting the round pole adapter plate shown here.



RSX2 with Mast Arm Adapter (MA)

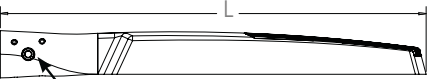




Length: 30.6" (77.7 cm)

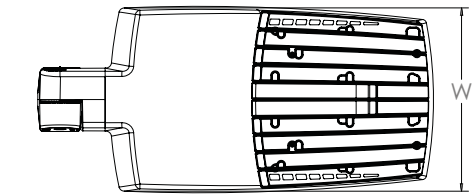
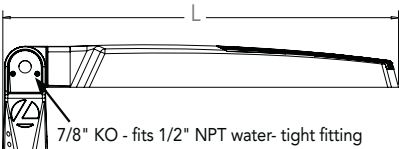
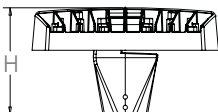
Width: 13.4" (34.0 cm)

Height: 3.0" (7.6 cm) Main Body
3.5" (8.9 cm) Arm

7/16" locking thru bolt/nut provided



RSX2 with Adjustable Slipfitter (IS)

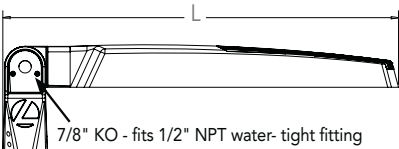




Length: 28.3" (71.9 cm)

Width: 13.4" (34.0 cm)

Height: 3.0" (7.6 cm) Main Body
7.6" (19.3 cm) Arm

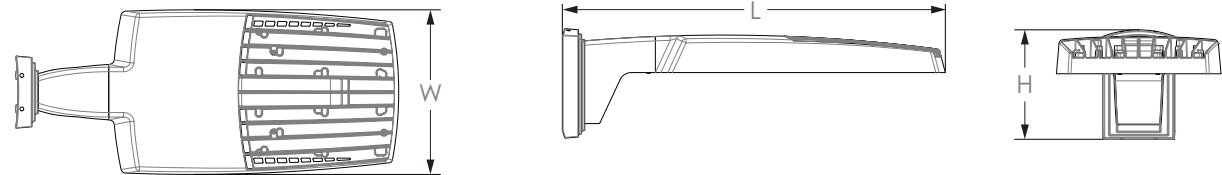
7/8" KO - fits 1/2" NPT water- tight fitting



Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

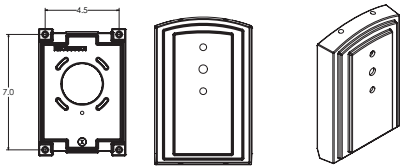
Dimensions

RSX2 with Wall Bracket (WBA)

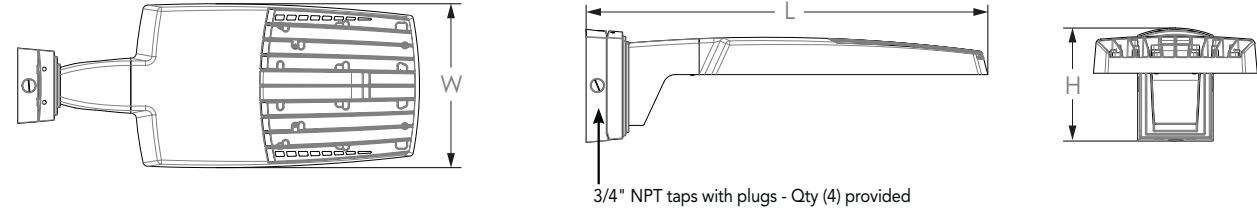


Length: 31.2" (79.2 cm)
 Width: 13.4" (41.7 cm)
 Height: 3.0" (7.6 cm) Main Body
 8.9" (22.6 cm) Arm

Wall Bracket (WBA) Mounting Detail

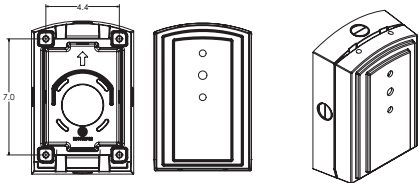


RSX2 with Wall Bracket with Surface Conduit Box (WBASC)



Length: 32.8" (83.3 cm)
 Width: 13.4" (41.7 cm)
 Height: 3.0" (7.6 cm) Main Body
 9.2" (23.4 cm) Arm

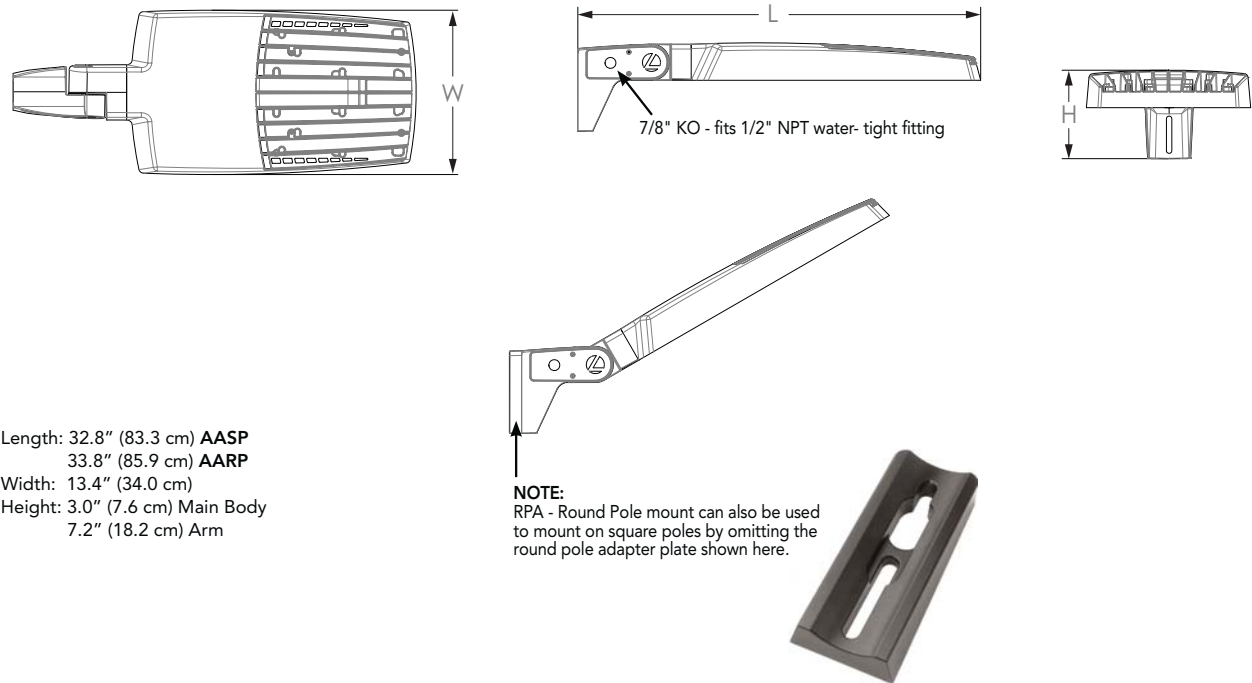
Surface Conduit Box (SCB) Mounting Detail



Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

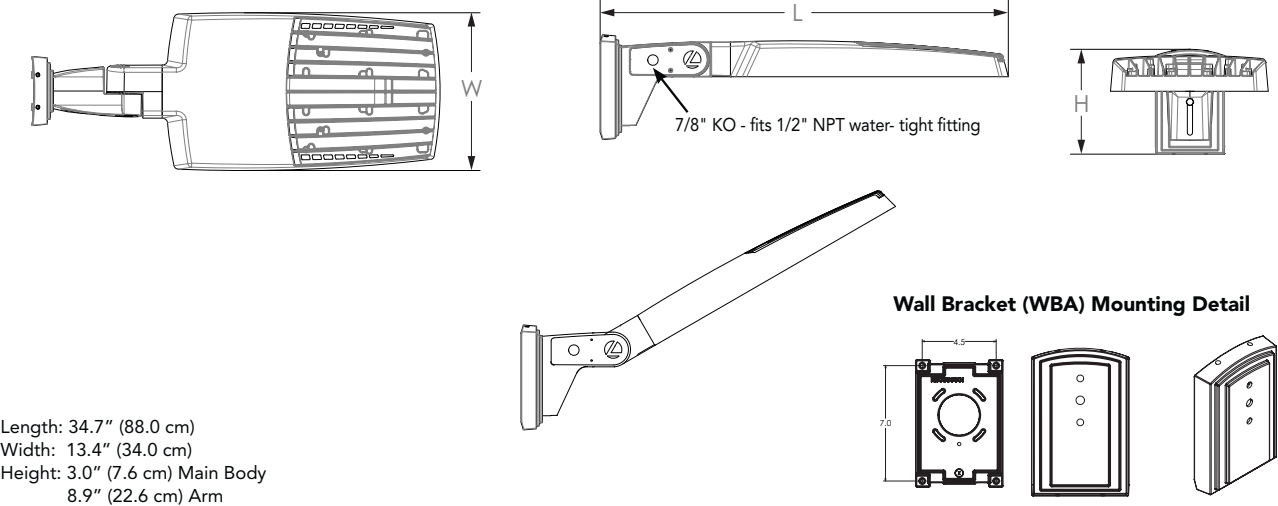
Dimensions

RSX2 with Adjustable Tilt Arm - Square or Round Pole (AASP or AARP)



Notes
 AASP: Requires 3.0" min. square pole for 1 at 90°. Requires 3.5" min. square pole for mounting 2, 3, 4 at 90°.
 AARP: Requires 3.2" min. dia. round pole for 2, 3, 4 at 90°. Requires 3.0" min. dia. round pole for mounting 1 at 90°, 2 at 180°, 3 at 120°.

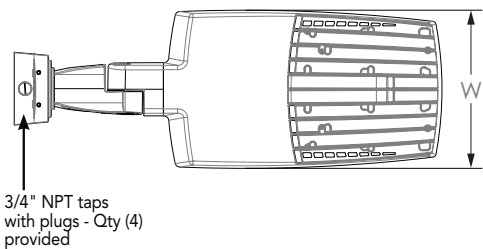
RSX2 with Adjustable Tilt Arm with Wall Bracket (AAWB)



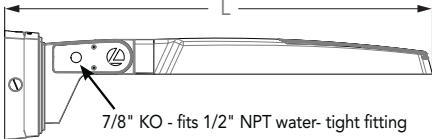
Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

Dimensions

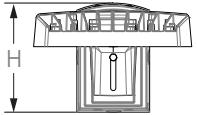
RSX2 with Adjustable Tilt Arm with Wall Bracket and Surface Conduit Box (AAWSC)

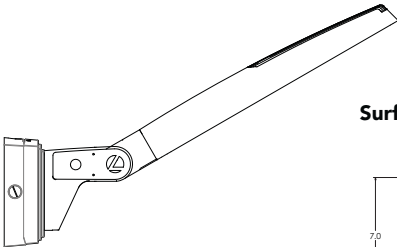


3/4" NPT taps with plugs - Qty (4) provided

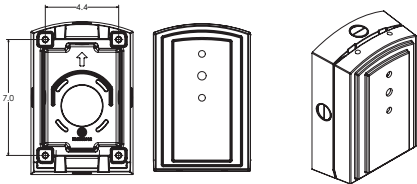


7/8" KO - fits 1/2" NPT water- tight fitting





Surface Conduit Box (SCB) Mounting Detail



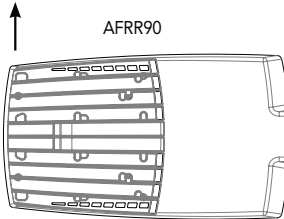
Length: 36.2" (91.9 cm)

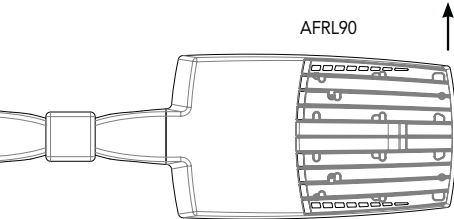
Width: 13.4" (40.0 cm)

Height: 3.0" (7.6 cm) Main Body

9.2" (23.4 cm) Arm

Automotive Front Row - Rotated Optics (AFRL90/R90)

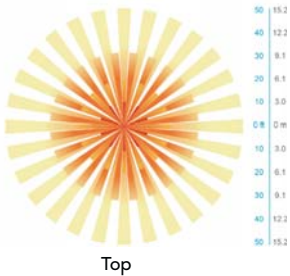
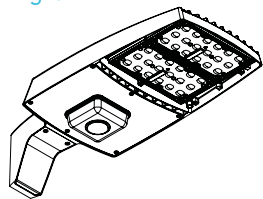




(Example: 2@180 - arrows indicate direction of light exiting the luminaire)

nLight Control - Sensor Coverage and Settings

NLTAIR2 PIRHN nLight
Sensor Coverage Pattern
nLight PIRHN



Top



Side

Motion Sensor Default Settings - Option PIRHN					
Option	Dimmed State (unoccupied)	High Level (when occupied)	Photocell Operation	Dwell Time (occupancy time delay)	Ramp-up Time (from unoccupied to occupied)
NLTAIR2 PIRHN	Approx. 30% Output	100% Output	Enabled @ 1.5FC	7.5 minutes	3 seconds

*Note: NLTAIR2 PIRHN default settings including photocell set-point, high/low dim rates, and occupancy sensor time delay are all configurable using the Clarity Pro App. Sensor coverage pattern shown with luminaire at 0°. Sensor coverage pattern is affected when luminaire is tilted.

FEATURES & SPECIFICATIONS

INTENDED USE

The RSX LED area family is designed to provide a long-lasting, energy-efficient solution for the one-for-one replacement of existing metal halide or high pressure sodium lighting. The RSX2 delivers 11,000 to 31,000 lumens and is ideal for replacing 250W to 1000W HID pole-mounted luminaires in parking lots and other area lighting applications.

CONSTRUCTION AND DESIGN

The RSX LED area luminaire features a rugged die-cast aluminum main body that uses heat-dissipating fins and flow-through venting to provide optimal thermal management that both enhances LED performance and extends component life. Integral "no drill" mounting arm allows the luminaire to be mounted on existing pole drillings, greatly reducing installation labor. The light engines and housing are sealed against moisture and environmental contaminants to IP66. The low-profile design results in a low EPA, allowing pole optimization. Vibration rated per ANSI C136.31: 3G Mountings: Include SPA, RPA, MA, IS, AASP, AARP rated for 3G vibration. 1.5G Mountings: Include WBA, WBASC, AAWB and AAWSC rated for 1.5G vibration.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures superior adhesion as well as a minimum finish thickness of 3 mils. The result is a high-quality finish that is warranted not to crack or peel.

OPTICS

Precision acrylic refractive lenses are engineered for superior application efficiency, distributing the light to where it is needed most. Available in short and wide pattern distributions including Type 2, Type 3, Type 3S, Type 4, Type 4S, Type 5, Type 5S, AFR (Automotive Front Row) and AFR rotated AFRR90 and ARFL90.

COASTAL CONSTRUCTION (CCE)

Optional corrosion resistant construction is engineered with added corrosion protection in materials and/or pre-treatment of base material under super durable paint. Provides additional corrosion protection for applications near coastal areas. Finish is salt spray tested to over 5,000 hours per ASTM B117 with scribe rating of 10. Additional lead-times apply.

ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted on metal-core circuit boards and aluminum heat sinks to maximize heat dissipation. Light engines are IP66 rated. LED lumen maintenance is >L92/100,000 hours. CCT's of 3000K, 4000K and 5000K (minimum 70 CRI) are available. Fixtures ship standard with 0-10v dimming driver. Class 1 electronic drivers ensure system power factor >90% and THD <20%. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

STANDARD CONTROLS

The RSX LED area luminaire has a wide assortment of control options. Dusk to dawn controls include MVOLT and 347V button-type photocells and NEMA twist-lock photocell receptacles.

nLIGHT AIR CONTROLS

The RSX LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing with photocontrol functionality and is suitable for mounting heights up to 40 feet. No commissioning is required when using factory default settings that provide basic stand-alone motion occupancy dimming that is switched on and off with a built-in photocell. See chart above for motion sensor default out-of-box settings. For more advanced wireless functionality, such as group dimming, nLight AIR can be commissioned using a smartphone and the easy-to-use CLAIRITY app. nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found [here](#).

INSTALLATION

Integral "no-drill" mounting arm allows for fast, easy mounting using existing pole drillings. Select the "SPA" option for square poles and the "RPA" option to mount to round poles. Note, the RPA mount can also be used for mounting to square poles by omitting the RPA adapter plate. Select the "MA" option to attach the luminaire to a 2 3/8" horizontal mast arm or the "IS" option for an adjustable slipfitter that mounts on a 2 3/8" OD tenon. The adjustable slipfitter has an integral junction box and offers easy installation. Can be tilted up to 90° above horizontal. Additional mountings are available including a wall bracket, adjustable tilt arm for direct-to-pole and wall and a surface conduit box for wall mount applications.

LISTINGS

CSA Certified to meet U.S. and Canadian standards. Suitable for wet locations. Rated for -40°C minimum ambient. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only. US Patent No. D882, 146S

BUY AMERICAN ACT

Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT regulations. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

SSP Square Non-Tapered Steel Poles

PROJECT NAME

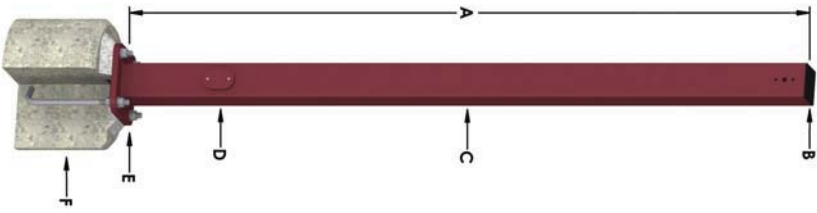
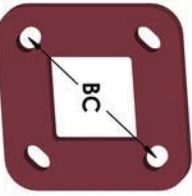
GENERATION DATE 11/4/2022

COMMENTS

LAB - Less Anchor Bolts

CATALOG NUMBER

SSP17 - 5 - 11 - F - DM10 - BC

		A — POLE SHAFT The pole shaft is single piece construction, being fabricated from a weldable grade carbon steel structural tubing and shall conform to ASTM A500 Grade C with a minimum yield strength of 50,000 psi. The pole shaft has a full-length longitudinal resistance weld and is uniformly square in cross-section with flat sides, small corner radii and excellent torsional properties. HEIGHT BASE OD GAUGE WEIGHT 17' 5" 11 191 lbs EPA MAX LOAD 90 MPH AASHTO 18.5	
B — MOUNTING DESIGNATION Drilled for 1 Luminaire 		C — FINISH Standard - The standard finish is a polyester thermosetting powder coating applied to the surface of the substrate to a minimum of 3 mils for all color finishes. FINISH TYPE Standard COLOR Finish To Be Determined	
D — HAND HOLE An oval reinforced gasketed handhole is located 1'-6" above base with a grounding provision located inside the ring. WIDTH 3" LENGTH 5" 		E — BASE PLATE The anchor base is fabricated from structural quality hot rolled carbon steel plate that meets or exceeds a minimum yield strength of 36,000 psi. All welds are performed in accordance with AWS D1.1, latest edition. BOLT CIRCLE 11" 	
F — ANCHOR BOLTS Anchor bolts are of commercial quality hot rolled carbon steel that meets or exceeds yield strength of 55,000 psi. Four properly sized anchor bolts come with all poles unless otherwise specified. Anchor bolts have the threaded end galvanized a minimum of 8 inches per ASTM A153. WIDTH 1" LENGTH 36" HOOK 4" 		OPTIONS Base Cover	

Submitted by:	 VISIBLE LIGHT MANUFACTURERS' REPRESENTATIVE	Job Name:	UNE Alford Center Site Lighting	Catalog Number:	SSP17-5,0-11-BLK-DM10-BC-LAB	Type:	D-ALT
SSP Terms and Conditions  TERMS Net 30 days from the date of Company's invoice unless otherwise specified. A 1-1/2% per month late charge will be added to accounts past due PRICES Published prices are subject to change without notice. Possession of price sheets in no way obligates Company to sell to the Purchaser possessing such price sheet. All orders are subject to final approval and acceptance by the Company. Once accepted and approved, orders will be billed at prices currently in effect at the time of invoicing, or at prices quoted by the Company and accepted by the Purchaser if the order involves an item or items covered by special quotation. THE MINIMUM INVOICE CHARGE SHALL BE \$50.00 NET DELIVERY All goods sold are deliverable F.O.B. KW Industries, Inc., Sugar Land, Texas 77478 FREIGHT All of the Company's products are priced and sold F.O.B. KW Industries, Inc., Sugar Land, Texas 77478. Transportation charges will be prepaid by the Company and added to the net sales price unless specified by the Purchaser. ROUTING The Company will specify the method and routing of all products to ensure the most efficient and economical shipment in behalf of the Purchaser. The Purchaser will assume charges for special services such as cartage, air freight, express or multiple deliveries on one order. CANCELLATION The written consent of the Company shall be obtained prior to a cancellation of any order. Cancellation of an order may subject the Purchaser to a cancellation charge based upon expenses already incurred and commitments made by the Company. RETURNED GOODS Specific written request and arrangements must be made in advance for Purchaser to obtain credit or replacement on material returned. On material accepted for return, Purchaser must prepay return shipment and pay minimum restocking charge of 40% plus any charge necessary to rework goods to a resaleable condition. Custom fabricated products by special order are not subject to return. DELAYS, DAMAGE OR LOSS The Company is not and shall not be liable for delays in shipment or delivery of its products when caused by strikes, riots, hurricanes, civil disorder, fires, material shortage, breakdown in manufacturing facilities or any other cause beyond its reasonable control. Any claims for damages, loss or shortage in transit must be made by the Purchaser to the delivering carrier. The risk of loss passes to the Purchaser upon delivery to the carrier. LIMITED WARRANTY The Company warrants to Purchaser that its products will be free from defects in material and workmanship for a period of one year from the date of shipment by the Company (the "Warranty Period"). This Warranty specifically excludes fatigue failure or similar phenomena resulting from induced vibration, harmonic oscillation or resonance associated with the movement of air currents around the product. If during the Warranty period, the product proves defective in material or workmanship, the Company shall correct any defect, at its option, either by repairing any defective parts or by making available at the Company's plant a repaired or replacement part at no charge to the Purchaser, if the Purchaser promptly notifies the Company and furnishes proof of Purchase. The liability of the Company under this Warranty, or for any loss or damage arising out of, or connected with, the design, manufacturing, sale or use of its products, whether the claim is based on contract or negligence, shall not exceed the price allocable to the value of the product or part which gives rise to the claim and upon expiration of the Warranty Period all such liability shall terminate. The Company shall not be liable for special or consequential damages including, but not limited to, loss of profits or revenue, loss of use of the product, cost of substitute products or labor charges to remove or reinstall the defective product, nor any product transportation expenses to and from the Company's plant if factory repair or replacement is necessary. No warranty is made with respect to parts or auxiliary equipment not manufactured by the Company. The foregoing Warranty is exclusive and in lieu of all other warranties whether written, oral, express or implied and shall constitute the sole and exclusive remedy of the Purchaser and liability of the Company. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. The Company's products are not sold as a "consumer product" under 15 U.S.C. 62301. GENERAL KW Industries, Inc. reserves the right to change any feature of its published specifications without notice to promote product improvement and/or allow for material availability. The contract for the sale of goods by KW shall be performable in Fort Bend County, Texas. Prices subject to change without notice.  KW INDUSTRIES, INC. 909 INDUSTRIAL BLVD, SUGAR LAND, TEXAS 77478 1-800-275-5944 KWINDUSTRIES.COM AREA LIGHTING SSP Square Non-Tapered Steel Poles PAGE 2 OF 2							

Page 625

Waiver Request

Standard to be waived:

Technical Manual Section 12.3.5, General Standards – Luminaire Types

All fixtures must be LED and shall not exceed 3000K Correlated Color Temperature (CCT). Screw in light fixtures must have LED lamps specified to be maximum of 3000K CCT.

Waiver sought and justification:

The 3000 CCT that is currently the Portland standard, will provide a very warm color with a large amount of yellow light emitted from the light fixtures. This CCT is generally used in homes, guest rooms of hotels, hotel lobbies dining areas, etc. where you want to create a warm and calming atmosphere. This CCT will also not provide accurate viewing of any of the primary colors. For example; a red car being lit with 3000 CCT will appear gray, and a blue shirt being viewed under 3000 CCT will appear black. Color distinction is very difficult.

Outdoor lighting, specifically in locations such as college campus parking lots where both vehicular-pedestrian traffic and security are of the utmost concern, is traditionally designed with a color temperature of 4000K-5000K. The higher CCT produces an increased amount of lighting in the blue wavelength range as opposed to the yellow light emitted from a 3000K light source. This leads to an increase in the alertness and visual acuity of the area's occupants, enhancing both the safety and security of the space. IESNA's RP-20 *Lighting for Parking Facilities* agree with the recommendation of using higher CCT, cooler lighting sources for alertness, safer vehicular traffic, and security in parking environments. A waiver from the city standard is requested, and was granted by staff for three recent UNE projects.

CITY OF PORTLAND
Planning & Urban Development Department

MAJOR SITE PLAN
GENERAL DOCUMENT AND DRAWINGS CHECKLIST

Please submit each document as a separate PDF file.
Please confirm by electronically checking the boxes in the left-hand column.

** PLEASE FILL OUT AND UPLOAD THE ZONING ASSESSMENT TABLE
AND WAIVER TABLE SEPARATELY AS NOTED BELOW **

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

GENERAL APPLICATION DOCUMENTS

☒ Yes	NA	Project Description Cover letter with detailed project description
☒ Yes	NA	Completed Checklist (this document)
☒ Yes	NA	Evidence of 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 (see Zoning Assessment Table) Summary of compliance with use and dimensional standards of the land use code
Yes	NA	Site Plan Standards Assessment (see Section 14.6 of the land use code) Summary of project compliance with site plan standards of the land use code
☒ Yes	NA	Summary of Existing and/or Proposed Easements or Covenants, applicable. Evidence of existing easements and any proposed easements, covenants, public or private rights-of-way
Yes	☒ NA	Waiver Requests (see Waiver Table) Written request for waiver describing request and compliance with applicable waiver standards
☒ 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

MAJOR 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	Impact on Surrounding Street Systems (14-14.6.1(A)) Describe incremental volume of traffic impacts and mitigation measures. If needed
Yes NA	Access and Circulation (14-14.6.1(B)) Identify and describe the following: - Site access and internal circulation, including ADA access - Drive-up features, if applicable - Loading and servicing needs, routes, and geometry, providing turning templates for delivery vehicles, if applicable - Sidewalks and condition along street frontages and internal walkways - Engineered details for ADA ramps and public sidewalks, meeting sidewalk material policy and construction requirements (Technical Manual, Section 1)
Yes NA	Public Transit (14-14.6.1(C)), if applicable Identify and describe the following: Existing available transit service and proposed transit improvements, including design details, such as easement, pad base, and shelter
Yes NA	Off-Street Parking (14-14.6.1(D)), if applicable Identify and describe the following: - Proposed vehicular and bicycle parking supply (including ADA-compliant parking) in relation to applicable parking requirements in Article 19 of the land use code - Curb cut separation and parking layout (Technical Manual, Section 1) - Construction details for bicycle racks - Management plan for snow storage and removal
Yes NA	Transportation Demand Management (TDM) (14-14.6.1(E)), if applicable Provide TDM plan drafted in accordance with Technical Manual Section 1 requirements

ENVIRONMENTAL		
Yes	NA	Preservation of Significant Natural Features (14-14.6.2(A)), if applicable Identify and describe the following: • High and moderate value waterfowl and wading habitat • Aquifers (for Casco Bay Islands) • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental compliance consultants and determinations from applicable state and federal agencies
Yes	NA	Landscape Preservation (14-14.6.2(B)) Identify and describe the following: • Measures to preserve trees, including within required zoning setbacks (Technical Manual, Section 4) • Measures to protect existing vegetation during construction
Yes	NA	Site Landscaping and Buffers (14-14.6.2(C)) Identify and describe the following: • Overall landscaping approach and consistency with standards • The use of screening and buffering of service areas and between non-residential and residential uses • Existing Heritage or Feature Trees on site and measures to preserve • Compliance with street tree requirements
Yes	NA	Water Quality, Stormwater Management, and Erosion Control (14-14.6.2(D)) Identify and describe the following: • Erosion and sedimentation control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater law, as applicable • Subsurface sanitary sewage disposal and groundwater protection measures

PUBLIC INFRASTRUCTURE AND COMMUNITY SAFETY		
Yes	NA	Consistency with City Master Plans (14-14.6.3(A)) Describe proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes	NA	Public Safety and Fire Prevention (14-14.6.3(B)) Identify and describe the following: - Compliance with Crime Prevention through Environmental Design (CPTED) requirements (Technical Manual, Section 3) - Emergency vehicle access - Consistency with public safety standards (Technical Manual, Section 3)
Yes	NA	Availability and Adequacy of Public Utilities (14-14.6.3(C)) (Technical Manual, Sections 2 & 9) Identify and describe the following: - Electrical services, including providing underground services - Existing and proposed connections for public utilities and required public utility upgrades - Sewer line connections
SITE DESIGN		
Yes	NA	Massing, Ventilations and Wind Impact (14-14.6.4(A)) Identify and describe the following: - Wind and ventilation impacts on adjoining structures and/or adjacent public spaces, including wind study, if applicable - Bulk, location, or height impacts on adjoining structures
Yes	NA	Shadows (14-14.6.4(B)), if applicable Provide shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes	NA	Snow and Ice Loading (14-14.6.4(C)) Describe building design measures to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes	NA	View Corridors (14-14.6.4(D)), if applicable Describe any protection of designated view corridors (Portland Design Manual, Appendix. 1)
Yes	NA	Historic Resources (14-14.6.4(E)), if applicable Identify and describe the following: - The site's status as a designated landmark, within a historic district or historic landscape district, or within 100 feet of any designated landmark, historic district, or historic landscape district - Compliance with standards for preservation and documentation of archaeological resources

Yes	NA	Exterior Lighting (14-14.6.4(F)) Describe how the proposed site lighting will adhere to photometrics requirements as it relates to light trespass and full cutoff fixture design, pursuant to Technical Manual Section 12
Yes	NA	Noise and Vibration (14-14.6.4(G)) Provide data on noise levels for HVAC and other mechanical equipment, such as design specifications, to demonstrate consistency with state and federal noise emissions requirements as well as City code
Yes	NA	Signage and Wayfinding (14-14.6.4(H)), if applicable - Provide signage plan showing the location, dimensions, height and setback of all existing and proposed signs - Provide drawings of all commercial and directional signage on site
Yes	NA	Zone-Related Design Standards (14-14.6.4(I)) Address any applicable design review standards by zone, including compliance with Design Manual

Project Description

On behalf of University of New England (UNE), Site Design Associates (SDA) is pleased to submit a major Site Plan Application the reconstruction of the existing connector drive between the Intermodal Transportation Facility (ITF) and the main campus. We understand the site plan application fee for a project of this size will be invoiced.

The project was reviewed with staff at a pre-application meeting on August 30, 2023. Based on feedback from staff at the meeting, the concept remains as discussed then.

The existing ITF provides parking for students, faculty, and guests, with a regular shuttle service to the main campus along the connector drive. The goals of the reconstruction project include increase safety through the installation of sidewalks, call boxes and cameras, widening of the existing drive to enhance circulation and improve safety, and installation of modern and ordinance compliant lighting.

The proposed drive will connect the Intermodal Transportation Facility (ITF) and the campus on Stevens Avenue. This new access drive will allow student, faculty, and staff vehicles, bicyclists and pedestrians, to travel between the core campus on Stevens Avenue and the ITF and on to Warren Avenue if so desired. This access drive will eliminate unnecessary trips on Stevens Avenue, Forest Avenue, Bishop Street and Warren Avenue by allowing UNE community members to enter and exit the campus at the location proximate to their origin/destination by either Bishop Street Extension or Stevens Avenue. More importantly, it will eliminate traffic that is currently routed through Morrill's Corner.

While the Morrill's Corner intersection is operating acceptably overall, there are some constraints for northbound left-turn movements off Forest Avenue. The plan to provide an internal campus connector road from the primary campus to the ITF will provide for reduced volumes at Morrill's Corner by allowing direct access to Warren Avenue, thus removing those campus trips from Morrill's Corner. The planned connector drive will remove trips from the arterials where the only capacity concerns have been identified. Additionally, the UNE service vehicles and the shuttle currently travel on Bishop Street from the existing connector drive to the ITF. The proposed drive will eliminate trips on Bishop Street.

The connector drive will be gated and access will only be for vehicles driven by UNE, faculty, and staff. Additionally, this connector could be utilized by non-UNE community pedestrians and bicyclists to commute between Stevens Avenue and Warren Avenue without navigating the congested Morrill's Corner, resulting in a significantly safer travel route. The existing access directly to Bishop Street will remain for bicycle and pedestrian use. The University has discussed allowing Portland Trails to utilize this reconstructed access road to connect their existing trail network proximate to the Evergreen Cemetery to the Warren Ave area as well.

One waiver is necessary for the proposed lighting, consistent with the waiver granted for the MEARNG, College of Osteopathic Medicine, and Bishop Street Intermodal facility projects.

Technical Ability

UNE has completed numerous projects on the campus in recent years, including:

- College of Osteopathic Medicine
- Bishop Street Parking Improvements
- Repair Facility

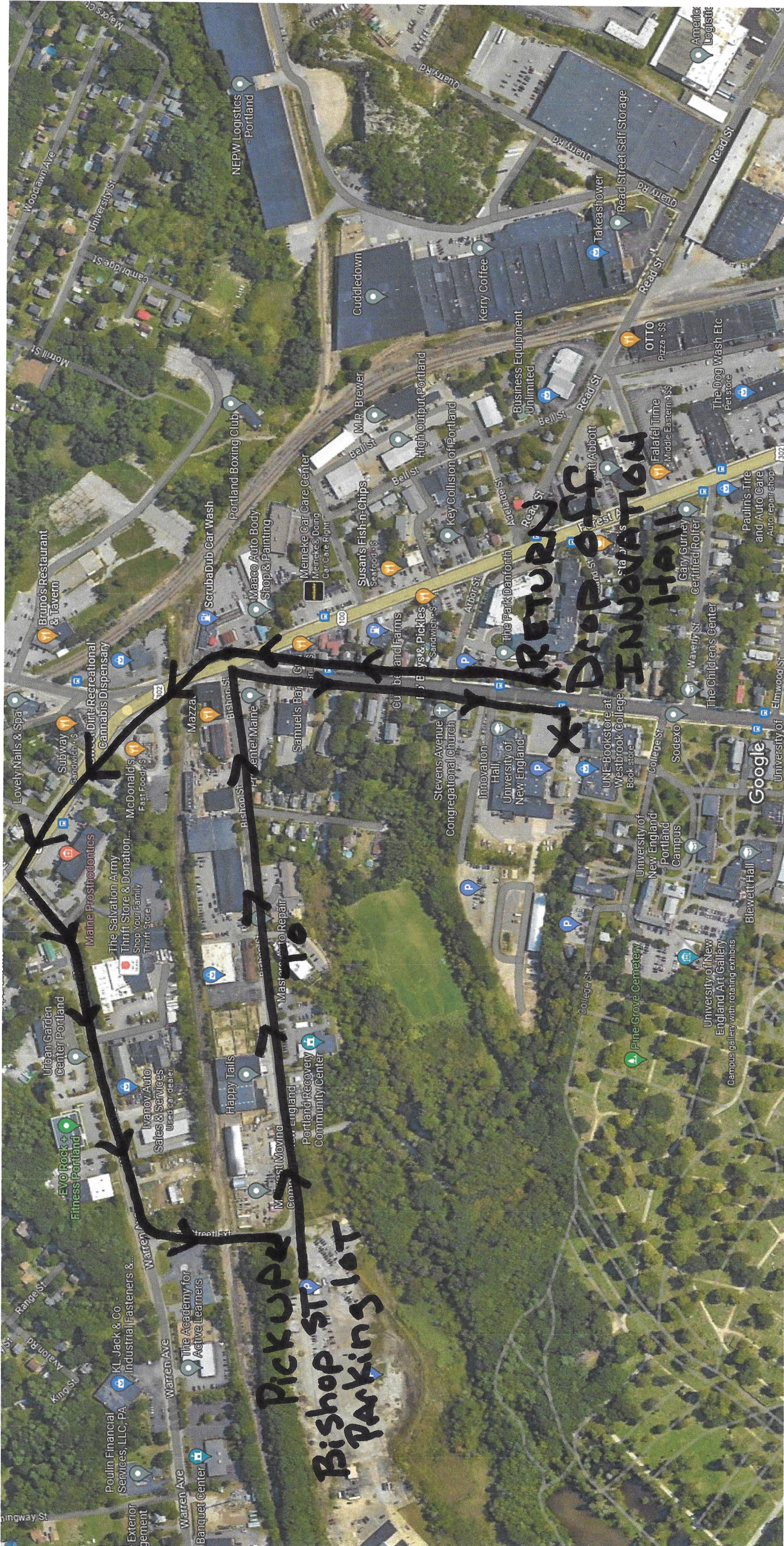
UNE has retained a qualified team to permit, design, and construct the project, including:

Civil Engineer, Permitting & Survey

Site Design Associates
23 Whitney Way
Topsham, Maine 04086

Construction Manager

Ledgewood
27 Main St
South Portland, ME 04106



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Portland, Maine



Yes. Life's good here.

Planning & Urban Development Department

ZONING ANALYSIS Relevant Zone(s) R3, R5

All Projects:

	Required	Proposed
Lot Size	2 acres	28.1 acres
Area Per Dwelling Unit	NA	NA
Minimum Street Frontage	50 ft	509 ft
Front Yard Minimum	NA	NA
Front Yard Maximum	NA	NA
Rear Yard	NA	NA
Yard Right	NA	NA
Yard Left	NA	NA
Side Street Setback	NA	NA
Step Back	NA	NA
Maximum Lot Coverage	35%	4.7%
Minimum Lot Coverage	NA	NA
Maximum Height	35 ft	NA
Open Space	NA	NA
Maximum Impervious Area	NA	NA
Pavement Setback	NA	NA
Floor Area Ratio	NA	NA
Off Street Parking Spaces	NA	NA
Loading Bays	NA	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):			

Applicable Site Plan Standards

University of New England (UNE) is planning on the reconstruction of the existing connector drive between the Intermodal Transportation Facility (ITF) and the main campus. The existing ITF provides parking for students, faculty, and guests, with a regular shuttle service to the main campus along the connector drive. The goals of the reconstruction project include increase safety through the installation of sidewalks, call boxes and cameras, widening of the existing drive to enhance circulation and improve safety, and installation of modern and ordinance compliant lighting.

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Section 14.6 of the Land Use Ordinance outlines the standards for Site Plan Approval. The following discussion documents compliance with the applicable standards.

14.6.1.A. Impact on Surrounding Street Systems. – No negative impact anticipated since there is no increase in enrollment associated with this project. As noted above, it is expected that the project will actually remove trips from the very busy Morrill's corner area.

14.6.1.B. Access and Circulation.

A goal of the project is to enhance the infrastructure to provide safe and reasonable access for all users. A curbed walkway will be constructed along the drive.

14.6.1.C. Public Transit Access – By its very nature, the connector drive connects the campus to the ITF and will be utilized by UNE students, faculty, and guests. There are currently public transit facilities on the main campus.

14.6.1.D. Parking – Parking is provided at the ITF and on campus. Snow storage will be along the drive as is typical for a project of this nature.

14.6.1.E. Transportation Demand Management – This was addressed in the previous application for the College of Osteopathic Medicine and the conclusions will not be impacted by the proposed reconstruction of the connector drive.

14.6.2.A. Preservation of Significant Natural Features – The project is generally located along an existing alignment. There will be minor wetlands impacts requiring a Tier 1 NRPA permit from MDEP.

14.6.2.B. Landscape Preservation – No significant trees will be removed to construct the project. An erosion and sedimentation control plan has been developed which will minimize both sedimentation and runoff.

14.6.2.C. Site Landscaping and Buffers – Given the nature of the reconstruction project, this section is not applicable.

14.6.2.D. Water Quality, Stormwater Management, and Erosion Control – See the Stormwater Management Plan.

14.6.3.A. Consistency with City Master Plans – We are unaware of any conflicts with city council approved master plans.

This project is in basic harmony with the City's Comprehensive Plan and the City's goals and policies expressed in that plan. UNE has been able to incorporate the City's Comprehensive Plan goals and policies while at the same time supporting the University's priorities for growth and for improving the quality of the education it provides to Portland's residents and the local region. The City's Comprehensive Plan for institutional growth has been put in place to "ensure that the growth of Portland's educational, medical and cultural institutions is integrated into Portland's urban fabric through the use of high-quality design, management of impacts, community partnerships, and innovative planning" (Comprehensive Plan, p.45). UNE has fully embraced this statement and has assimilated this vision into its development plans.

UNE has discussed its key institutional needs -- to upgrade and grow its programs on the Portland campus to support the continued requirements of the University to provide state of the art post-secondary and graduate studies in fields such as healthcare, dentistry and pharmacy to name a few. All of these programs have and will continue to support the growing need to deliver public services to the people of northern New England and in particular the City of Portland along with providing highly trained professionals to the local workforce. The City of Portland's 2030 Comprehensive Plan "promotes the orderly expansion of institutional uses, such as educational and hospital campuses, which are central to workforce development, employment,

and the health of the local and regional economies” (City of Portland’s Comprehensive Plan, p.45)

14.6.3.B. Public Safety and Fire Prevention – In regards to Crime Prevention Through Environmental Design (CPTED), UNE aims to create a safe environment for all in and around its campus. UNE’s Campus Safety and Security Department monitors UNE’s campuses through in-person patrols and CCTV cameras and provides response to any situations that may arise, 24 hours a day/7 days a week.

UNE has currently incorporated some or all of the following design strategies on its Portland campus that have been demonstrated to deter criminal activity. It is the intent to continue to integrate these strategies on future developments on the campus:

- Providing a clean and aesthetically pleasing campus environment that is designed with vandal-resistant materials
- Providing clear and properly-sized signs in safe locations to ensure safe wayfinding
- Ensuring that paths from transit stops, bike storage areas, and parking areas to main pedestrian entrances are well-lit, with clear sight lines
- Designing street-level elevations and landscaping areas to minimize potential hideouts
- Call boxes with blue lights for easy identification
- Installation of CCTV to monitor remote areas
- Insure adequate lighting levels on walkways, parking lots and roadways.

UNE’s Campus Safety and Security Department provides a yearly Clery Report that reports the past year’s offense/crime statistics on each of its campuses. Over the past 3 years there have been no events reported related to issues stemming from CPTED deficiencies on the Portland campus. The University feels that active CPTED during the planning of projects has contributed to this.

14.6.3.C. Public Utilities – There will be no public utilities impacted by the reconstruction of the connector drive.

14.6.4.A. Massing, Ventilation and Wind Impact – Not applicable.

14.6.4.B. Shadow – Not applicable.

14.6.4.C. Snow and Ice Loading – Not applicable.

14.6.4.D. View Corridors – Not applicable.

14.6.4.E. Historic Resources – Not applicable. Proposed work is not within 100 feet of a City of Portland identified Historic District.

No known archaeological resources have been identified within the limit work. If any such resource is discovered during construction, it will be documented and protected according to the City of Portland's Land Use Ordinance. The City of Portland's Historic Preservation Program and Maine Historic Preservation Commission will be notified if any discovery of such a resource is uncovered.

14.6.4.F. Exterior Lighting – The photometric plan is attached.

Exterior Lighting and Controls:

All new fixtures will utilize LED technology with a color temperature of 4000K and will be full-cutoff type as defined by Illuminating Engineering Society of North America (IESNA), in order to minimize light pollution into the night sky.

While it is understood that the City of Portland requires the use of 3000K color temperature in all exterior fixtures, outdoor lighting, specifically in locations such as college campus parking lots where both vehicular-pedestrian traffic and security are of the utmost concern, is traditionally designed with a color temperature of 4000K-5000K. The higher CCT produces an increased amount of lighting in the blue wavelength range as opposed to the yellow light emitted from a 3000K light source; this leads to an increase in the alertness and visual acuity of the area's occupants, enhancing both the safety and security of the space. IESNA's RP-20 *Lighting for Parking Facilities* agree with the recommendation of using higher CCT, cooler lighting sources for alertness, safer vehicular traffic, and security in parking environments. A waiver from the city standard is requested, and was granted by staff for two recent UNE projects.

14.6.4.G. Noise and Vibration – Not applicable.

14.6.4.H. Signage and Wayfinding – All proposed signage will be provided by the Owner and will be consistent with previously approved University of New England and City of Portland design standards and guidelines.

14.6.4.I. Design Standards – Not applicable.

Neighborhood Meeting Invitation

Dear Neighbor,

Please join us for a neighborhood meeting to discuss the University of New England's (UNE) plan to facilitate the expansion of the existing carriage road and sidewalk connecting the University's Portland Campus with its intermodal transportation facility at Bishop Street. Expansion of the carriage road will permit students, staff, and faculty to drive, cycle, or walk between the University's primary parking facility and campus without using public street facilities. This will also aid in reducing university-related traffic through Morrill's Corner.

This meeting will be held in-person and via Zoom on our Portland Campus. The in-person meeting will be held in the CHP Lecture Hall (Room 118), located in Proctor Hall (Building 10). There will also be a Zoom option for those who cannot attend in person. You can join the meeting at the scheduled time with the information listed below. If possible, please enter your full name and email address when signing into Zoom for this meeting. If you do not have access to a computer, and or prefer not to use Zoom, you can join the meeting by dialing in with a telephone using the dial-in phone number provided below and entering the meeting ID as prompted.

Meeting Date: Tuesday, November 7, 2023
Meeting Location: Proctor Hall – CHP Lecture Hall and Zoom
Meeting Dial-In Phone Number: 1-929-205-6099

Meeting Time: 6:00 p.m.
Meeting Link: <https://une.zoom.us/j/99364783436>
Meeting ID: 993 6478 3436

Minutes from the meeting and a list of attendees will be submitted to the City.

If you have any questions, please contact Andrew Philippe, Director of Campus Planning for UNE at 207-602-2365 or by email at aphilippe@une.edu.

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UNIVERSITY OF
NEW ENGLAND

Those in Attendance:

Contact Information

[illegible]

Site Design Associates

Consulting Engineering and Land Planning

December 12, 2023

Maya Balassa, Planner
City of Portland
Via email

**RE: University of New England
Major Site Plan Application for:
Connector Drive
PL-002666-2023
83 College Street
Responses to November 1 Staff Comments**

Dear Maya;

On behalf of University of New England (UNE), Site Design Associates (SDA) is pleased to provide this response to review comments provided by the city staff in your November 1, 2023 review memorandum. We have listed each of your “red” comments in the order they were presented followed by our responses.

1. Additional submissions requested:

Comment: *The address on Energov says 716 Stevens Ave. The documents and site plans utilize 83 College Street. Please alter the application materials to have a single address across*

Response: The city GIS mapping and assessor records refer to the majority of the parcel as 83 College Street. For some reason, the city staff set up the EPlan directory with the 716 Stevens Ave address. Please advise on how this will be handled.

2. Access and circulation:

Comment: *Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road.*

Response: A striped bike lane will not be included. The pavement markings will include sharrows laid out in accordance with the MUTCD per the attached memo from Diane Morabito, the traffic engineer.

Comment: *To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet.*

23 Whitney Way Topsham, Maine 04086
Phone: (207) 449-4275 email: info@sitedesignassociates.biz

Response: Please see the attached memo from the traffic engineer recommending that the 24 ft width be maintained. A NRPA Tier 1 permit has been issued by DEP for the wetland impacts. A copy of this permit is attached.

Comment: *Please clarify who specifically will have gate card access.*

Response: UNE's students, staff, and faculty will have gate access.

Comment: *The Bishop Street driveway is to remain in place and gated. While the city supports a pedestrian/bicycle connection, we would suggest that the curb cut be closed.*

Response: The plans have been revised to show a reduction in the Bishop Street curb cut length to 10 ft, while maintaining access for cyclists and pedestrians. We decided on 10 ft for shared bicycle and pedestrian access. We hope this satisfactorily addresses this comment.

3. Landscape Preservation:

Comment: *Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.*

Response: Please see the attached memo from the traffic engineer recommending that the 24 ft width be maintained. A NRPA Tier 1 permit has been issued by DEP for the wetland impacts. A copy of this permit is attached.

Comment: *This survey indicates areas with tree canopy cover but not tree locations, size and species information. Per the City's Technical Manual Chapter 4.3.1, the survey should identify location, size and species of all existing trees 10" diameter at breast height (DBH) or greater on the site. Given the predominantly wooded nature of the project site, it is acceptable for the applicant to identify only trees proposed to be removed as part of this project, noting the size (in DBH) and species information for existing trees 10" DBH or greater.*

Response: Existing trees 10" DBH or over to be removed are now shown on the plans.

Comment: *The existing site has some notable patches of Japanese Knotweed. The applicant shall follow the requirements laid out in Technical Manual section 4.7.4 for the containment and removal of invasive plants in the limit of work to prevent*

them spreading into newly disturbed ground.

Response: A note has been added to the plans to address this comment.

Comment: *For existing trees being preserved that are adjacent to the limit of work, the applicant shall follow tree protection requirements described in Technical Manual chapter 4.3 and tree preservation detail IV-2*

Response: A note has been added to the plans to address this requirement.

Comment: *Areas around the carriage road that are being cleared of trees due to grading shall be replanted with native straight species trees and exposed soil shall be covered with undyed wood mulch and/or seeded with native shade-tolerant seed mixes where appropriate.*

Response: A landscape plan has been prepared to address this comment. Areas along the proposed carriage road which are proposed to be cleared of trees and provide a large enough area for replanting will be replanted with Sugar Maple saplings. These areas are primarily on 2:1 and 3:1 slopes. To enable a rootball to be planted on these slopes we are proposing ½" caliper saplings which will have a rootball approximately 12 inches in diameter x 9" deep. A tree planting detail showing a planting on a slope is provided on the Landscape Plan.

The slope areas are called out to be mulched with a 5" layer of erosion control mix as distributed by Casella Organics or approved equivalent. This layer of mulch will stabilize and protect the soil, and allow the saplings to establish themselves prior to competition from other plants.

4. Site Landscaping and Buffers:

Comment: *The area where gravel is being removed is currently proposed to be covered with loam and reseeded with "park mix" grass seed. The area in question is surrounded by woodland and is partly shaded. City staff suggest selecting a seed mix that is composed of native part shade- tolerant forbs that will fit into the woodland setting. The park mix grass seed is more appropriate for maintained lawn areas than forested woodlands.*

Response: A landscape plan has been prepared to address this comment. Open areas and the proposed swales are to be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Wet Sites. This mix contains a selection of native grasses and wildflowers designed to colonize generally moist, recently disturbed sites where quick growth of vegetation is desired to stabilize the soil. The plants in this mix can withstand moist, infrequently inundated sites as well as some shade. These areas will be mowed no more than two times per year to keep woody vegetation out.

Comment: *There are at least three existing footpaths/trails that connect to the carriage road which are not currently represented on the plans. Please locate the existing trails on the site plan and ensure the pathway connections are being maintained or improved as part of the carriage road improvement project. At least one of the trails is heavily used by pedestrians as a connection between Evergreen Cemetery and the UNE campus.*

Response: The existing trails are now shown on the drawings and Portland Trails confirmed the locations are accurate. We have discussed the access with Portland trails, and they have confirmed the locations are accurate. Our discussions with them continue in regards to potential signage.

5. Water Quality, Stormwater management, and Erosion Control:

Comment: *Overall SLOD – Additional clarity is needed on the area that is intended to be covered by the SLOD Application. As was noted on previous application reviews that highlighted the need for the SLOD permit, looking at the entire site as one is advantageous, allowing for treatment to be accounted for across the site to meet the required standards. The Applicant is proposing to do that here, but additional information is needed. The figures provided show the redevelopment evaluation of the Intermodal Transportation Facility and Connector Drive to determine the amount of treatment that will be required per the MaineDEP standards for redevelopment. The ultimate stormwater management scenario includes systems located within this area, but also a system within the Center for Health Sciences. As I understand the analysis, the Center for Health Services project area is not included as part of the SLOD calculations.*

Response: That is correct. The HBACHS project was completed before the campus exceeded the SLODA thresholds. Therefore, the HBACHS portion of the project is not included in the SLODA stormwater treatment calculations. The soil filter in the HBACHS area (SF1) that receives runoff from the new Connector Drive was oversized when it was originally designed/constructed to accommodate this future anticipated runoff from the Connector Drive. Calculations are provided on Table 2 within the stormwater management report showing that SF1 is properly sized to treat the additional runoff from the Connector Drive project. The HBACHS columns in Table 2 are only to indicate proper sizing of SF1. As indicated in the table the HBACHS areas are not included in calculating the general/redevelopment standards.

Comment: *As noted, our understanding of the project intent is that treatment from both the Intermodal Transportation Facility and the Center for Health Sciences is to be counted towards the requirement for the Connector Drive. Detail on the Intermodal Transportation Facility is included, but it is unclear how the Center for Health Sciences site's design fits into the area/treatment calculations.*

Response: As indicated in the report and Table 2, only the ITF and the Connector Drive projects are included in the general/redevelopment calculations for the city and the SLODA requirements for this project.

Comment: *The applicant shall prepare easement documents for the proposed expanded easement associated with the extension of the City's 36" Bishop Street storm-water outfall and provide information/details of how the existing 36" RCP pipe will be extended.*

Response: We will draft easement documents to address this comment. We are hopeful this could be considered as a staff recommended condition of approval.

Comment: *The applicant shall submit DEP permits for the proposed stream crossings and wetland impacts for review as part of this site plan review.*

Response: A copy of the NRPA permit for wetland impacts is attached. A NRPA PBR notification was filed with the NRPA application on September 23.

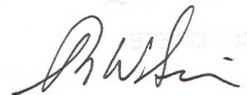
6. Exterior Lighting:

Comment: *The photometric plan shows a maximum foot-candle of 6.3 and an average foot-candle of 2.3 in the stat zone. The maximum foot-candle allowed is 5 for this use, with an average of 1.25. Please adjust the lighting plan to meet this standard.*

Response: A revised photometric plan which demonstrates compliance with this standard is included.

In closing, we would be happy to meet with staff and consultants to discuss any items which may require further clarification if necessary. If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,
Site Design Associates



Tom Saucier, P.E.
President

c: Andrew Philippe, Director for Campus Planning

November 14, 2023

Mr. Tom Saucier, P.E.
Site Design Associates
23 Whitney Way
Topsham, Maine 04086

RE: RECOMMENDATIONS FOR UNE CONNECTOR DRIVE

Dear Tom,

As requested, I have reviewed the comments issued by the City of Portland regarding the proposed connector drive on the UNE campus. This drive will connect the Bishop Street Intermodal Transportation Facility (ITF) to the core campus and College Street Extension. The currently proposed driveway is 24' wide with a 5' raised sidewalk. Some of the City comments and questions regarding this proposed cross section are as follows:

- Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road.
- To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet.
- Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.

Sewall has reviewed the above City comments and the Connector Drive plans, prepared by Site Design Associates, dated 9/22/2023.

The proposed drive section is to provide for both motor vehicles and bicycles since the 5' sidewalk cannot provide for both pedestrians and bicycles. The generally recommended minimum width for a multiuse path is 10'. A 10' multiuse path and a 22' wide travel way would result in a greater width of 32' with greater environmental impacts. Since 5' is generally considered the minimum sidewalk width, the proposed drive must provide for both bicycles and motor vehicles. For this reason, Sewall recommends that the 24' width be maintained. According to the AASHTO "Guide for the Development of Bicycle Facilities, 2012, Fourth Edition", roadways that have low volumes and low

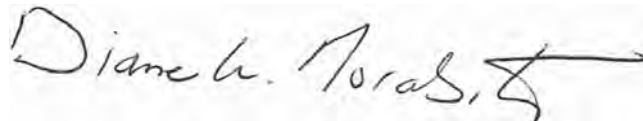
speeds are generally suitable for shared lanes. The guide indicates that roadways with lane widths of 13' or less require that motorists will encroach into the opposing lane to pass a bicyclist. By maintaining a 12' lane width this encroachment will be minimized. Given that motorists and bicyclists will be sharing the same lane, it is recommended that the drive be marked with sharrows, which are used to indicate a shared lane facility. This will alert drivers to the presence of bicyclists and the narrow lanes. Sharrows are typically used on roadways that are too narrow to provide separate marked bike lanes.

I also recommend that a "Bicycles May Use Full Lane" sign be placed on either end of the connector drive to supplement the sharrow markings.

Please don't hesitate to contact me if you or the City of Portland have any questions or need any additional information regarding my recommendations.



Sincerely,

A handwritten signature in black ink that reads "Diane W. Morabito" followed by a stylized flourish.

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

UNIVERSITY OF NEW ENGLAND	) NATURAL RESOURCES PROTECTION ACT
Portland, Cumberland County	) FRESHWATER WETLAND ALTERATION
CONNECTOR DRIVE	) WATER QUALITY CERTIFICATION
L-30525-TC-A-N (approval)	) FINDINGS OF FACT AND ORDER

Project Description: The applicant proposes to alter 11,187 square feet of forested, emergent and scrub shrub wetlands. The applicant proposes to reconstruct an existing connector drive between the University of New England's Intermodal Transportation Facility and the main campus as shown on a plan titled "Connector Drive," prepared by Site Design Associates, and dated September 2023. The reconstruction project includes an effort to increase the safety of the connector drive by installing sidewalks and call boxes as well as widening the existing drive to two 12-foot travel ways. The applicant has avoided and minimized wetland impacts to the greatest extent practicable by locating the reconstructed connector drive in the same location as the existing connector drive wherever possible. One section of the connector drive will be relocated so that it connects directly to the intermodal transportation facility rather onto a public street as it does currently. The side slopes of the connector drive will be increased from the standard 3H:1V slope to the maximum slope of 2H:1V to minimize wetland impacts. According to the Department's Geographic Information System (GIS), there are no mapped essential or significant wildlife habitats associated with the project site. The proposed project is located off College Street in the City of Portland.

Permit for: ☒ Tier 1
DEP Decision: ☒ Approved ☐ Denied (see attached letter)

Please note: A U. S. Army Corps of Engineers permit may also be required for your project. The Corps typically accepts a copy of your Maine DEP NRPA application, but you are responsible for submittal to the Corps. We encourage you to contact them directly at cenae-r-me@usace.army.mil or (207) 623-8367 to discuss their application process. Please note that no regulated work within Corps jurisdiction may be started until you receive a Corps permit.

Standard Conditions:

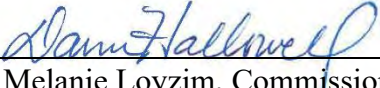
- 1) If construction or operation of the activity is not begun within four (4) years from the date signed, this permit shall lapse and the applicant shall reapply to the Department for a new permit. This permit is transferable only with prior approval from the Department. If the activity is associated with a larger project, starting any aspect of that project constitutes start of construction.
- 2) The project shall be completed according to the plans in the application. Any change in the project plans must be reviewed and approved by the Department.
- 3) Properly installed erosion control measures shall be installed prior to beginning the project, and all disturbed soil should be stabilized immediately upon project completion.

- 4) A copy of this approval will be sent to the City of Portland. Department approval of your activity does not supersede or substitute the need for any necessary local approvals.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 9th DAY OF NOVEMBER, 2023.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For: Melanie Loyzim, Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

SCarr/L30525AN/ATS#91509

FILED
November 9th, 2023
State of Maine
Board of Environmental Protection

ZONING INFORMATION

ZONING STANDARDS FROM CITY OF PORTLAND LAND
USE ORDINANCE, AMENDED FEBRUARY 6, 2023

- | | |
|--------------------|--------------------------------------|
| 1. CLASSIFICATION: | R3 & R5 - RESIDENTIAL ZONES |
| PERMITTED USES: | LITERARY & SCIENTIFIC (GRANDFATHERED |

R3 RESIDENTIAL ZONE STANDARDS*

1. MIN. LOT SIZE: 6,500 SQUARE FEET
EXISTING = 1,139,872 SQUARE FEET
PROPOSED = NO CHANGE
2. MIN. STREET FRONTAGE: 50 FEET
EXISTING = 75 FEET
PROPOSED = NO CHANGE

*STRUCTURE SETBACKS NOT SHOWN BECAUSE NO NEW BUILDINGS ARE PROPOSED

R5 RESIDENTIAL ZONE STANDARDS*

1. MIN. LOT SIZE: 6,000 SQUARE FEET
EXISTING = 1,139,872 SQUARE FEET
PROPOSED = NO CHANGE
2. MIN. STREET FRONTAGE: 50 FEET
EXISTING = 285 FEET
PROPOSED = NO CHANGE

*STRUCTURE SETBACKS NOT SHOWN BECAUSE NO NEW BUILDINGS ARE PROPOSED

PARCEL INFORMATION

1. OWNER OF RECORD: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD
BIDDEFORD, MAINE 04005
CCRD BOOK 3481, PAGE 255
CCRD BOOK 2796, PAGE 397
CCRD BOOK 1876, PAGE 271
CCRD BOOK 3450, PAGE 69
2. STREET ADDRESS: 83 COLLEGE STREET, PORTLAND, MAINE
3. PARCELS: CITY OF PORTLAND TAX MAPS
MAP 145 BLOCK B LOT 14
MAP 290 BLOCK A LOT 3
MAP 291 BLOCK A LOT 1
MAP 291 BLOCK A LOT 5

4. TOTAL AREA OF PARCEL: 1,139,872 SF (26.16 AC.)

SITE BENCHMARK: PROJECT BENCHMARK IS A MANHOLE RIM IN BISHOP STREET.

PLAN REFERENCES

1. TOPOGRAPHIC INFORMATION OBTAINED BY GROUND SURVEY CONDUCTED IN WINTER 2022 BY COLLIERS ENGINEERING & DESIGN OF BRUNSWICK, MAINE.
2. ELEVATIONS SHOWN ON THIS PLAN ARE ON THE CITY OF PORTLAND VERTICAL DATUM (NGVD29). PROJECT BENCHMARK IS A MANHOLE RIM IN BISHOP STREET.
3. HORIZONTAL DATUM IS BASED ON NAD83 STATE PLANE GRID WEST ZONE IN FEET.
4. UNDERGROUND UTILITIES WERE OBTAINED FROM SURFACE OBSERVATIONS AND TAKEN FROM PLANS OF SEVERAL SOURCES. SEE SURVEY PLAN REFERENCES.

GENERAL NOTES:

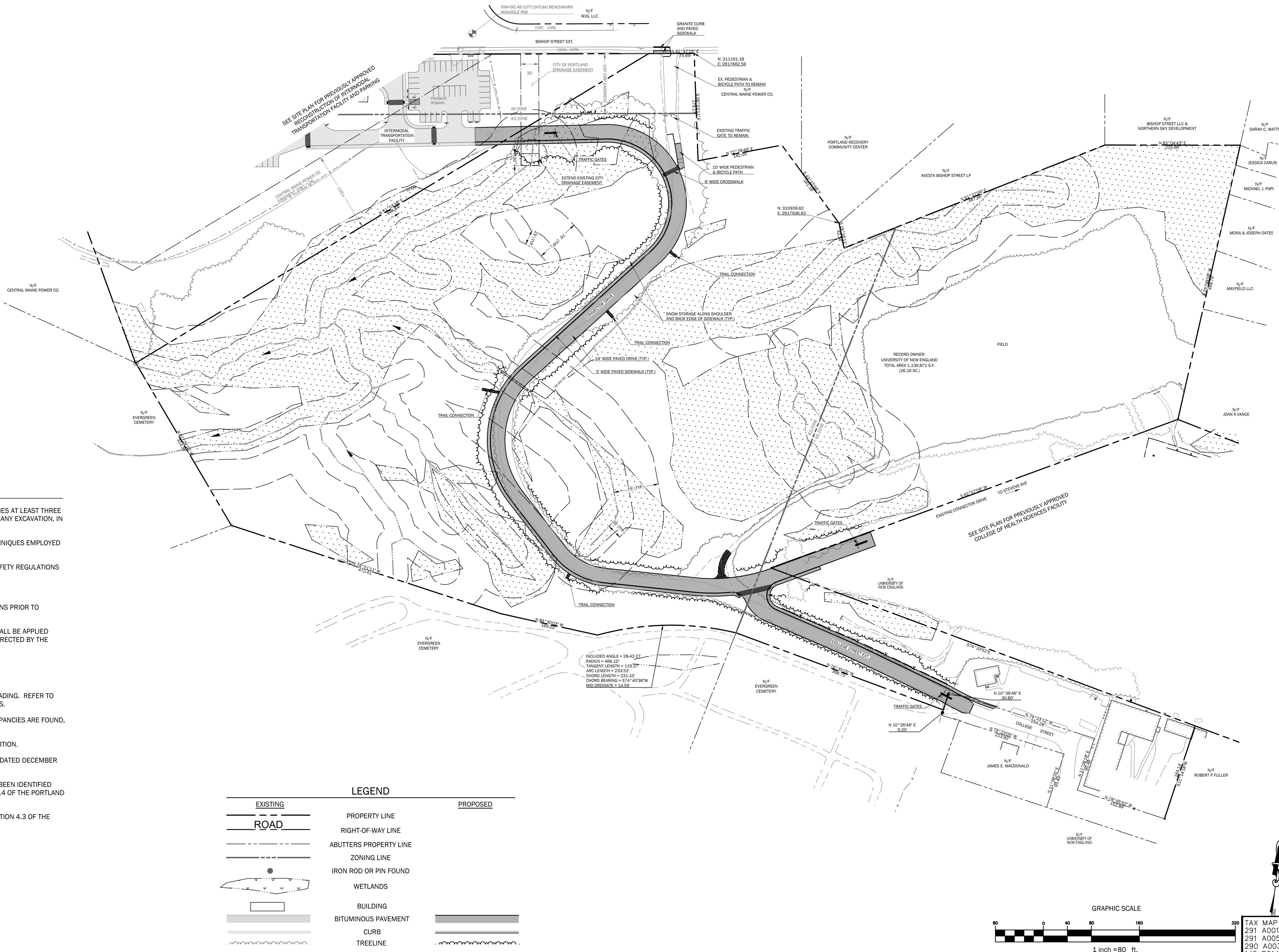
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING "DIG SAFE" AND LOCAL UTILITY COMPANIES AT LEAST THREE (3) BUSINESS DAYS, BUT NOT MORE THAN 30 CALENDAR DAYS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION, IN ACCORDANCE WITH MAINE STATE LAW. "DIG SAFE" TELEPHONE NUMBER IS 1-888-344-7233.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL AND ANY MEANS, METHODS, AND TECHNIQUES EMPLOYED TO PERFORM THE WORK SHOWN ON THE PLANS.
3. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING ALL SAFETY REGULATIONS (OSHA).
4. ALL WORK SHALL BE IN CONFORMANCE ALL UTILITY COMPANIES STANDARDS.
5. THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THE WORK SHOWN ON THESE PLANS PRIOR TO CONSTRUCTION.
6. ALL PAVEMENT/CONCRETE CUTS SHALL BE SAW CUT TO RESULT IN CLEAN EDGES. A TACK COAT SHALL BE APPLIED ALONG THE PAVEMENT CUT EDGES AND THE NEW PAVEMENT BUTTED TO IT, UNLESS OTHERWISE DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
7. ALL WORK SHALL COMPLY WITH THE CITY OF PORTLAND STREET OPENING PERMIT REQUIREMENTS.
8. ALL WORK SHALL COMPLY WITH THE CITY OF PORTLAND TECHNICAL MANUAL.
9. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR REGRADING. REFER TO THE EROSION CONTROL PLAN NOTES AND DRAWINGS FOR FURTHER EROSION CONTROL GUIDELINES.
10. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS SHOWN ON THE DRAWINGS. IF ANY DISCREPANCIES ARE FOUND THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IMMEDIATELY.
11. CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST EDITION.
12. A GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS PROJECT BY SUMMIT GEOENGINEERING, DATED DECEMBER 2021.
13. THE CONTRACTOR SHALL BE AWARE THAT INVASIVE SPECIES SUCH AS JAPANESE KNOTWEED HAVE BEEN IDENTIFIED WITHIN THE PROJECT AREA. THESE AREAS SHALL BE MANAGED IN ACCORDANCE WITH SECTION 4.7.4 OF THE PORTLAND TECHNICAL MANUAL AND APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
14. TREES TO BE PRESERVED AT THE EDGE OF WORK SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 4.3 OF THE PORTLAND TECHNICAL MANUAL.
15. MARK THE CONNECTOR DRIVE WITH SHARROWS LAID OUT PER THE MUTCD.

SNOW STORAGE:

1. SNOW WILL BE PLOWED INTO THE DRIVE SHOULDER/DITCH AND BEYOND THE BACK EDGE OF THE SIDEWALK.

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

B	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS															
A	9/22/2023	FOR DEVELOPMENT REVIEW	DEPT.	TWS	TWS															
REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS									BY	CHKD.	APPD.	



GRAPHIC SCALE

80 0 40 80 160 320

1 inch = 80 ft.

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

Site Design Associates
Consulting Engineering & Land Planning

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

UNIVERSITY OF NEW ENGLAND

UNIVERSITY OF NEW ENGLAND

11 HILLS BEACH ROAD, BIDDEFORD, MAINE 04005

DESIGN: DEPT.

DRAWN: DEPT.

CHKD: TWS

DATE: DEC. 20

SCALE: 1" =

PROJECT:	CONNECTOR DRIVE
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83 COLLEGE STREET, PORTLAND, MAINE

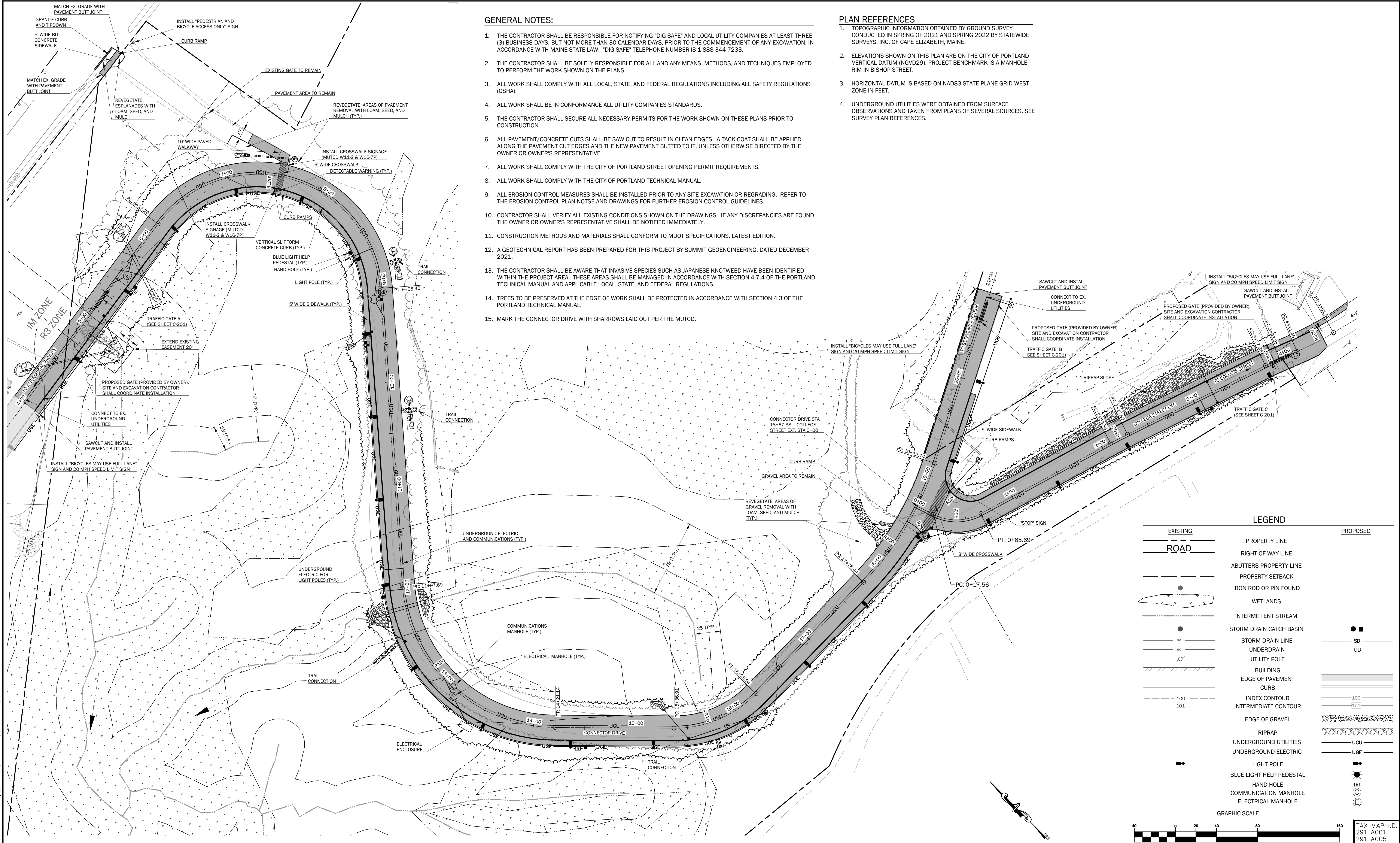
SITE PLAN

PROJ.	21-216-00
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DWG.	3 100
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REV.

B



GENERAL NOTES:

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15. MARK THE CONNECTOR DRIVE WITH SHARROWS LAID OUT PER THE MUTCD.

PLAN REFERENCES

1. TOPOGRAPHIC INFORMATION OBTAINED BY GROUND SURVEY CONDUCTED IN SPRING OF 2021 AND SPRING 2022 BY STATEWIDE SURVEYS, INC. OF CAPE ELIZABETH, MAINE.
2. ELEVATIONS SHOWN ON THIS PLAN ARE ON THE CITY OF PORTLAND VERTICAL DATUM (NGVD29). PROJECT BENCHMARK IS A MANHOLE RIM IN BISHOP STREET.
3. HORIZONTAL DATUM IS BASED ON NAD83 STATE PLANE GRID WEST ZONE IN FEET.
4. UNDERGROUND UTILITIES WERE OBTAINED FROM SURFACE OBSERVATIONS AND TAKEN FROM PLANS OF SEVERAL SOURCES. SEE SURVEY PLAN REFERENCES.

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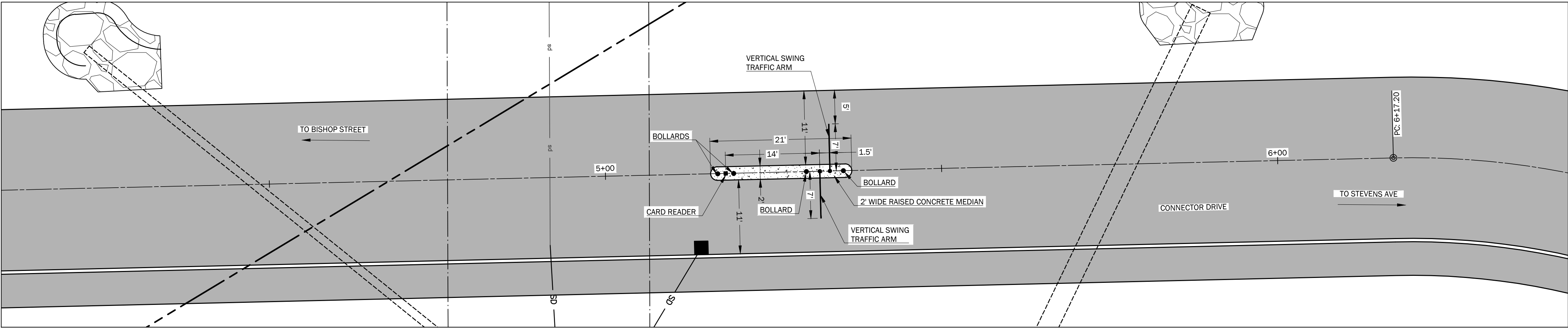
REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION									



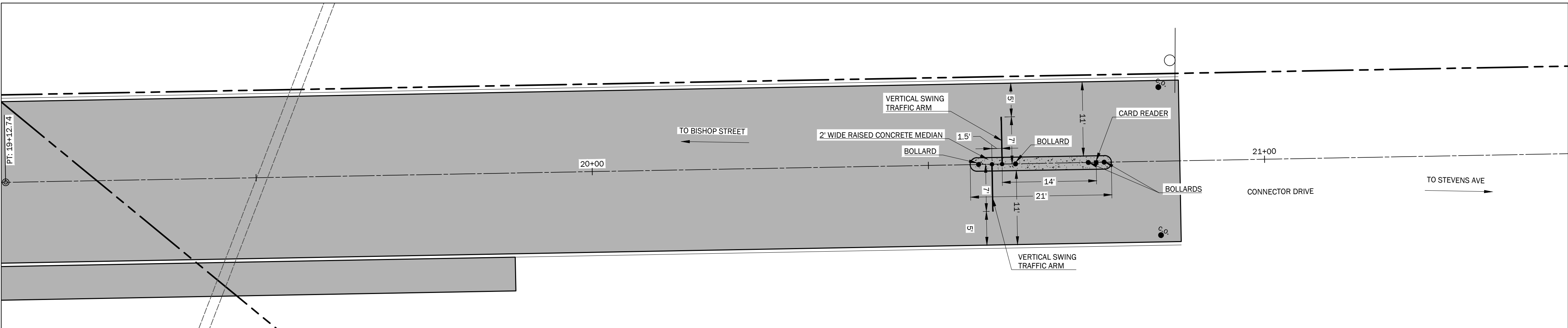
Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	SITE AND UTILITY PLAN
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 40'	DWG. NO. C-200

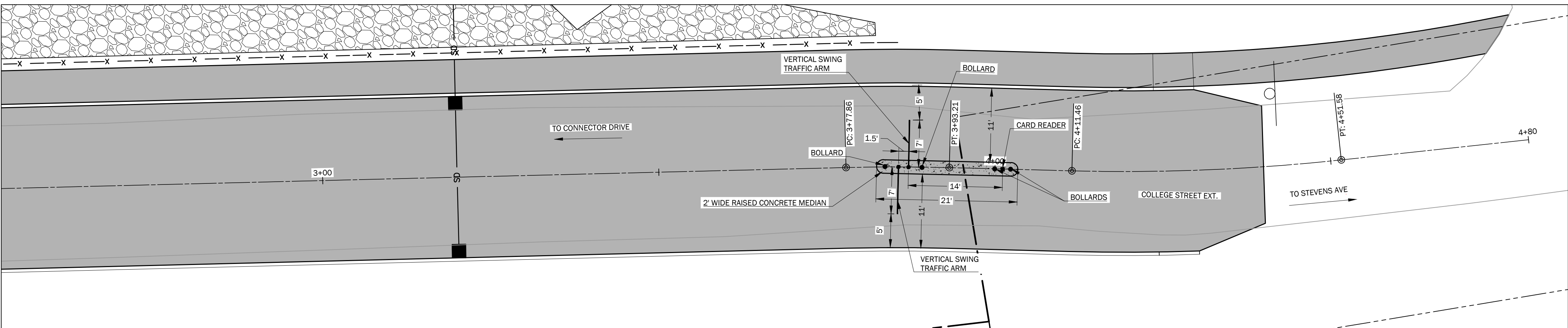
Drawing Name: C:\Users\Site\Documents\Drawings\21-216-00 Connector Road\Drawings\21-216-00 Connector Road.dwg Plot Date / Time: Dec. 6, 23 / 2:54 PM



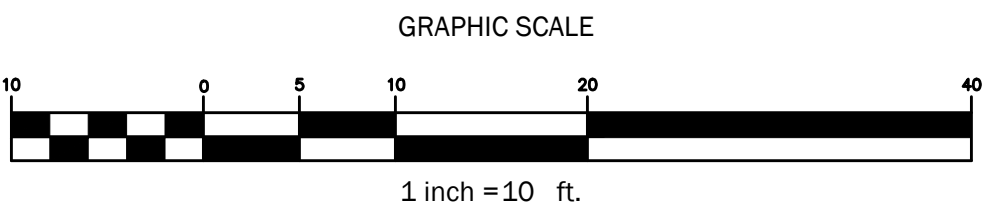
GATE A - (BISHOP STREET END)



GATE B - (CFHS BUILDING END)

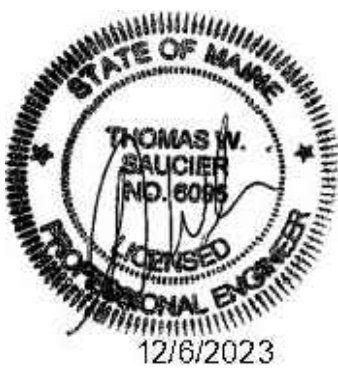


GATE C - (COLLEGE STREET)



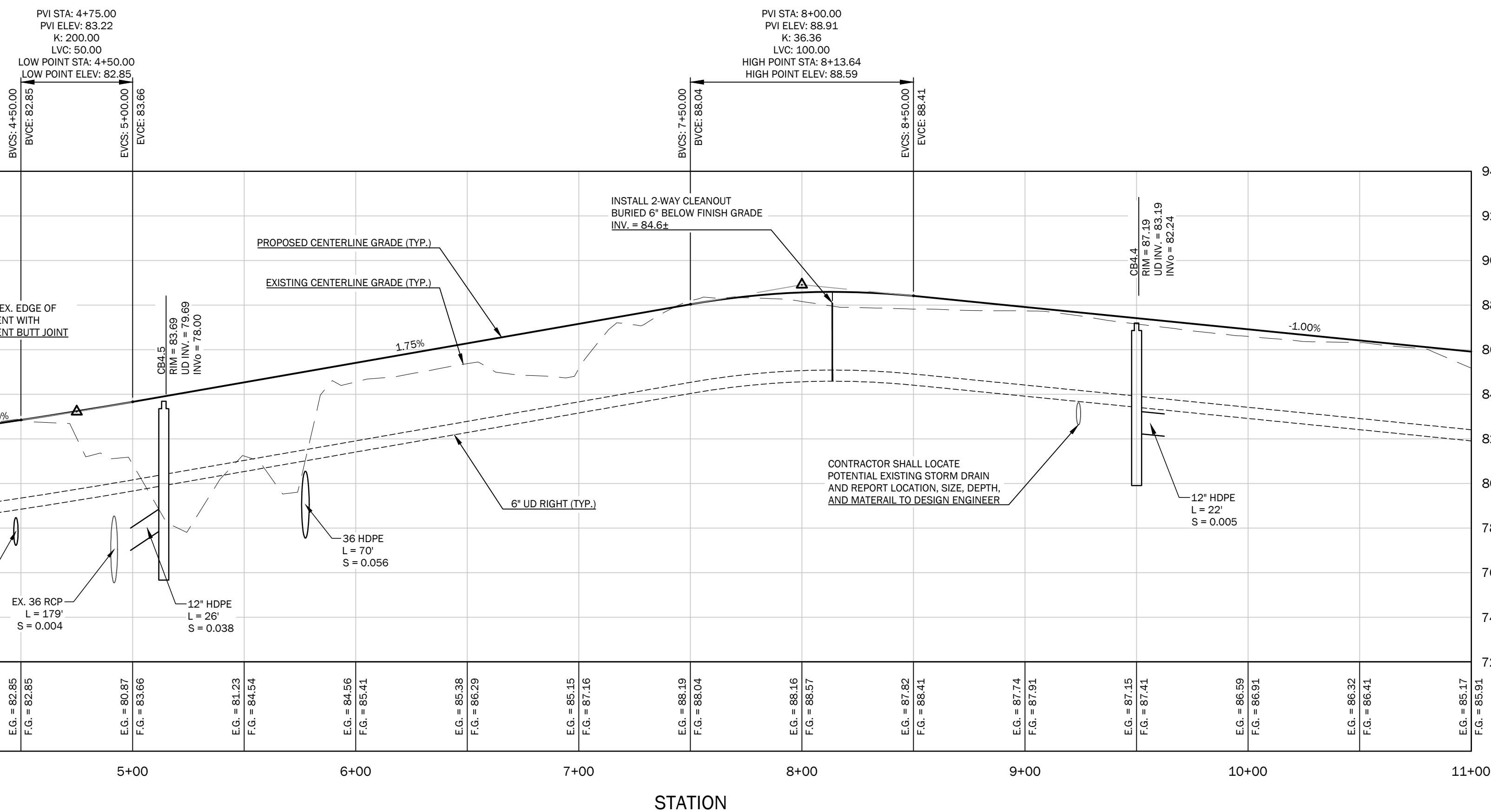
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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
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Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT:	CONNECTOR DRIVE TRAFFIC GATE PLAN	REV. C
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS			
DATE: SEP. 2023	PROJ. NO.	21-216-00	
SCALE: 1" = 10 FT	DWG. NO.	C-201	

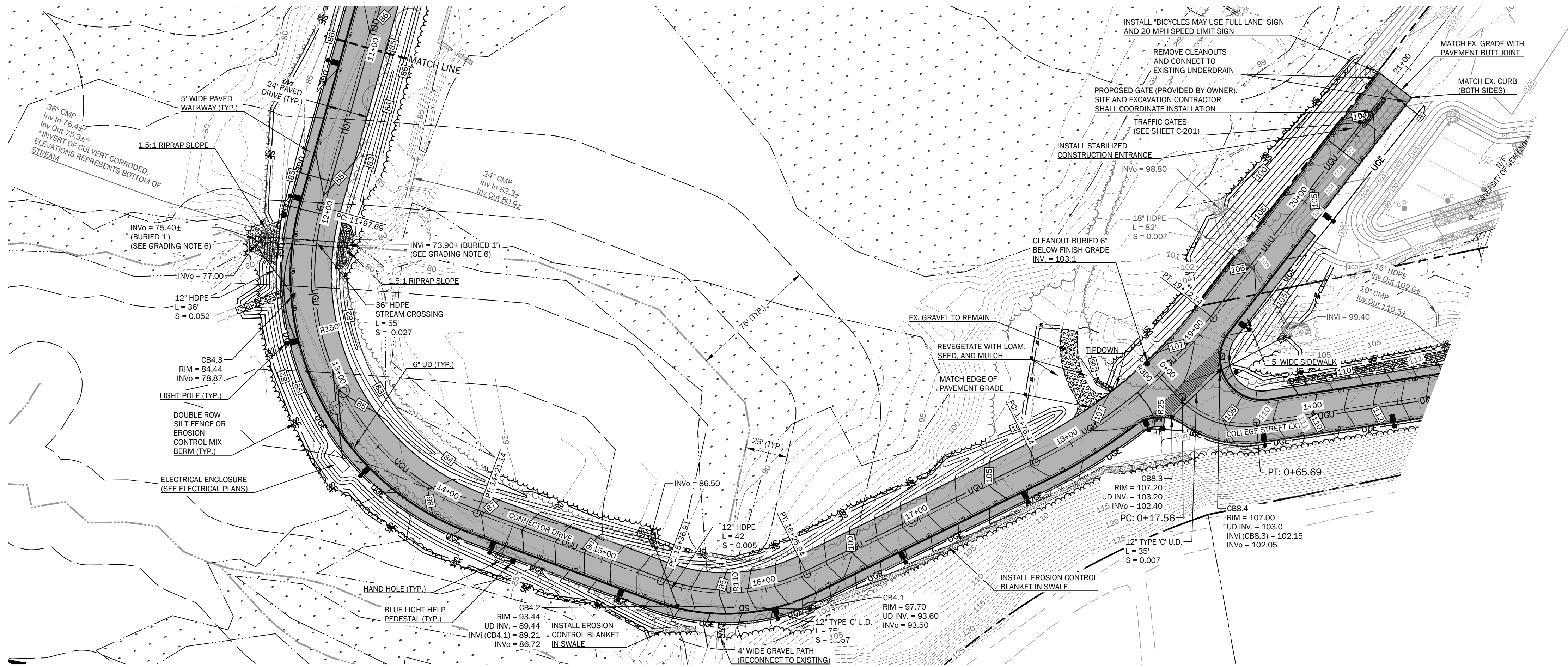


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C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS															
B	9/22/2023	FOR DEVELOPMENT REVIEW	DEPT.	TWS	TWS															
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS															
REV.	DATE	STATUS	BY	CHKD	APPD.	REV.	DATE	STATUS									BY	CHKD	APPD.	

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	CONNECTOR DRIVE PLAN & PROFILE (STA 4+00 TO 11+00)		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 40 FT	DWG. NO.	C-301	C

Drawing Name: C:\Users\Site\Documents\Drawings\21-216-00 Connector Drive\Drawings\21-216-00 Connector Drive.dwg Plot Date / Time: Dec. 6, 23 / 2:55 PM



GENERAL NOTES:

1. REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.

GRADING AND DRAINAGE NOTES:

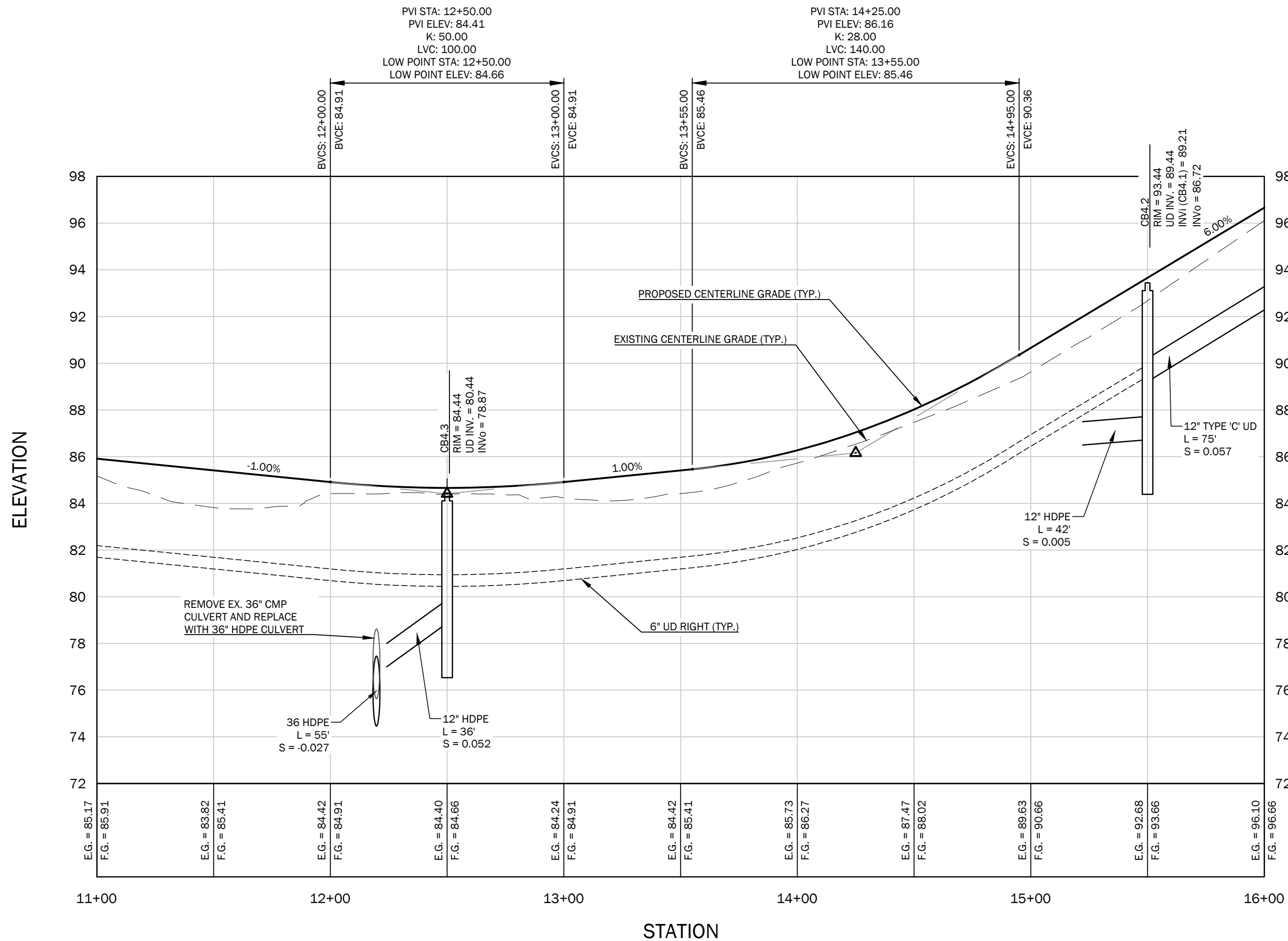
1. REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.
2. PRIOR TO ANY CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL VERIFY ALL AFFECTED GRADES. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE OWNER OR OWNER'S REPRESENTATIVE.
3. ALL AREAS NOT REQUIRING GRADING SHALL BE LEFT UNDISTURBED. CONTRACTOR SHALL NOT DISTURB THESE AREAS AND PRESERVE EXISTING VEGETATION.
4. GRADE ALL NEW WORK FOR POSITIVE DRAINAGE AND NO PUDDLING. MATCH EXISTING GRADES SMOOTHLY AND CONTINUOUSLY.
5. INSTALL RIPRAP APRONS AT ALL STORM DRAIN INLETS AND OUTLETS.
6. VERIFY EXISTING GRADE ELEVATIONS AT STREAM CROSSING CULVERT INLET AND OUTLET PRIOR TO INSTALLATION OF NEW CULVERT. CULVERT INVERTS SHALL BE SET 1 FOOT BELOW EXISTING GRADE AT INLET AND OUTLET LOCATIONS.

LEGEND

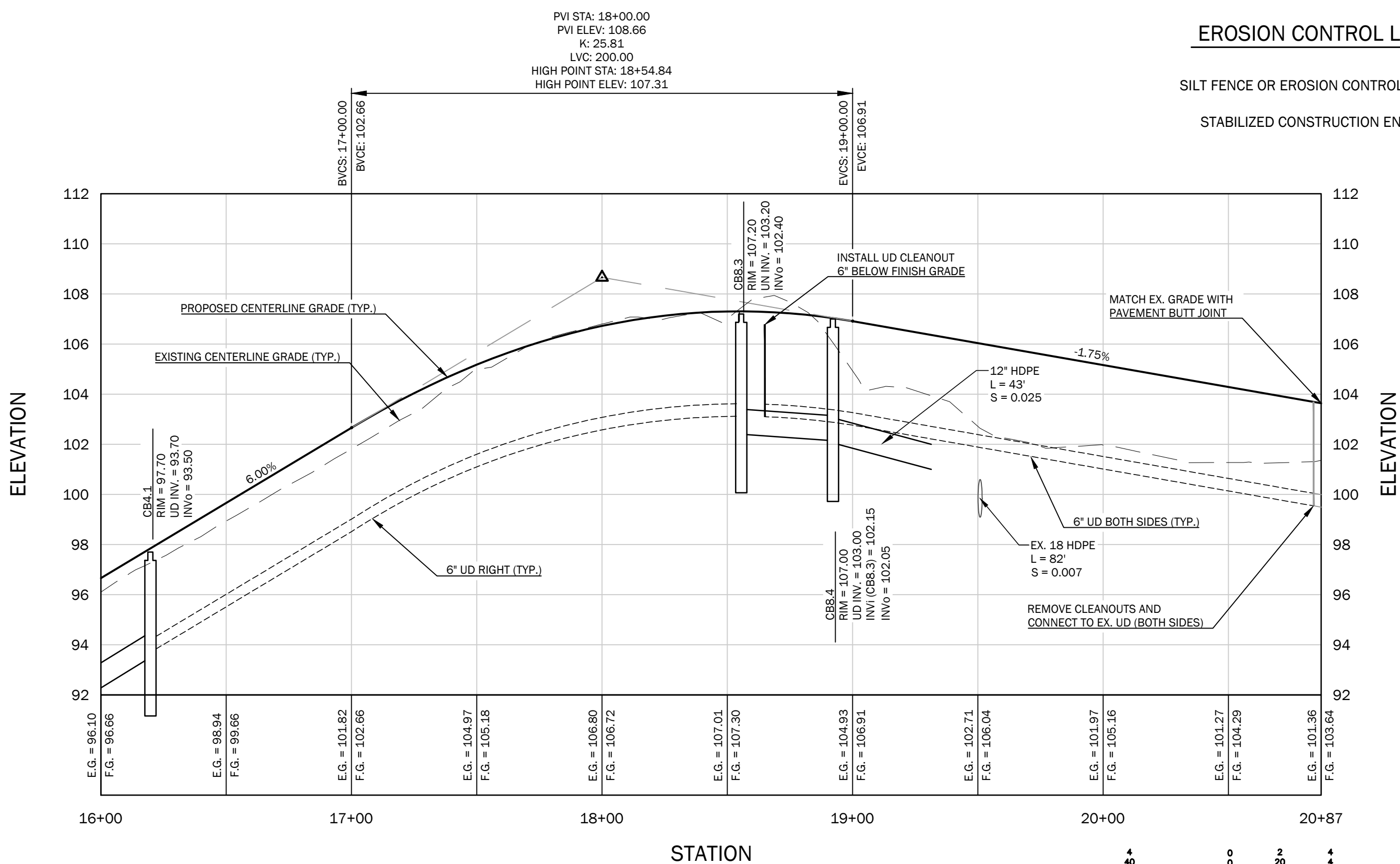
EXISTING	PROPOSED
ROAD	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ABUTTERS PROPERTY LINE
	PROPERTY SETBACK
	IRON ROD OR PIN FOUND
	WETLANDS
	INTERMITTENT STREAM
	STORM DRAIN CATCH BASIN
	STORM DRAIN LINE
	UNDERDRAIN
	UTILITY POLE
	BUILDING
	EDGE OF PAVEMENT
	CURB
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	EDGE OF GRAVEL
	RIPRAP
	UNDERGROUND UTILITIES
	UNDERGROUND ELECTRIC
	LIGHT POLE
	BLUE LIGHT HELP PEDESTAL
	HAND HOLE
	COMMUNICATION MANHOLE
	ELECTRICAL MANHOLE

EROSION CONTROL LEGEND

PROPOSED
SILT FENCE OR EROSION CONTROL MIX BERM
STABILIZED CONSTRUCTION ENTRANCE



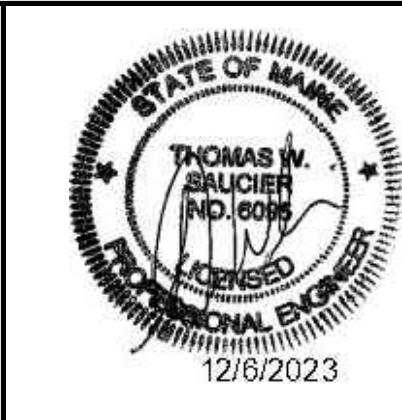
CONNECTOR DRIVE PROFILE



CONNECTOR DRIVE PROFILE

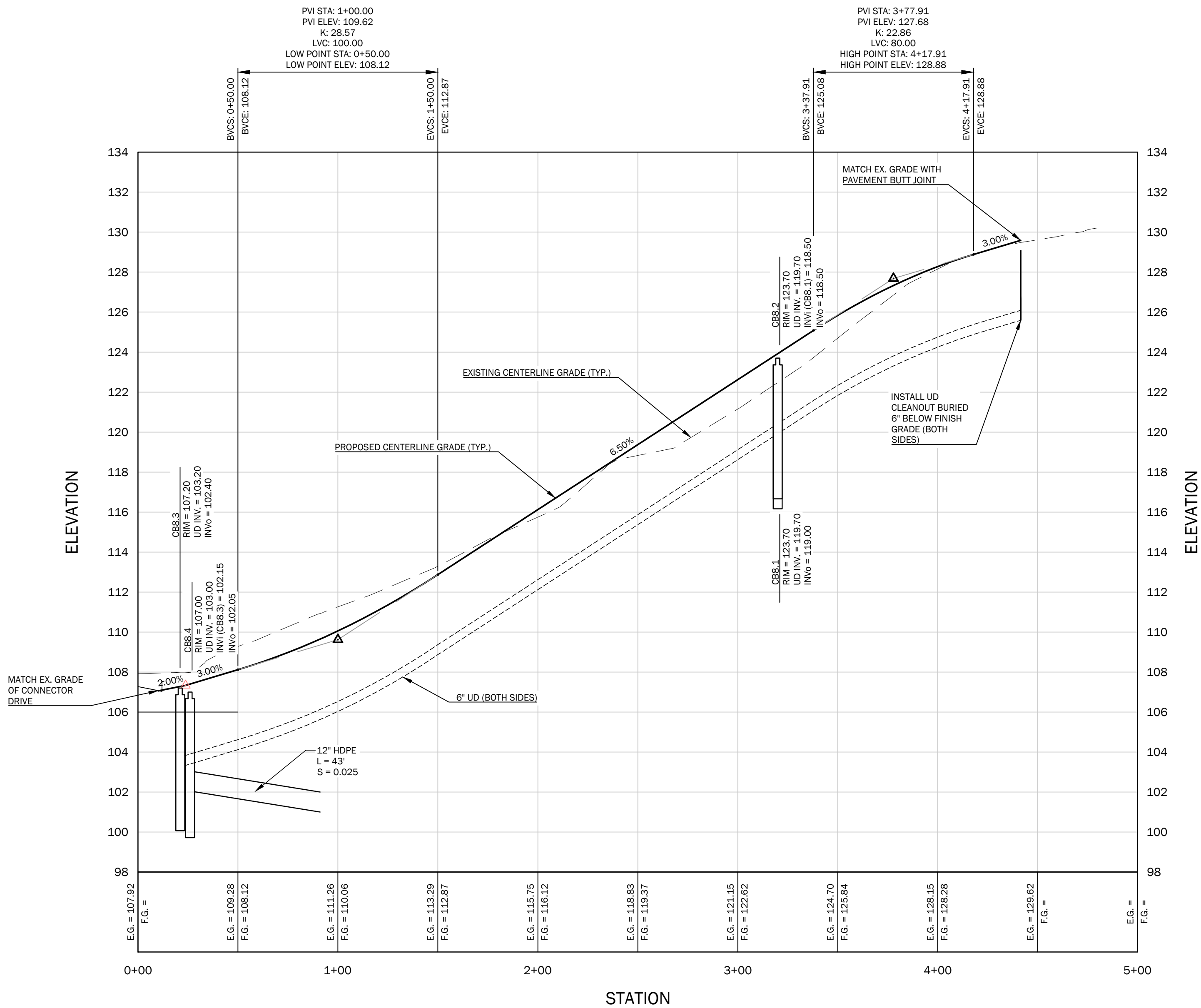
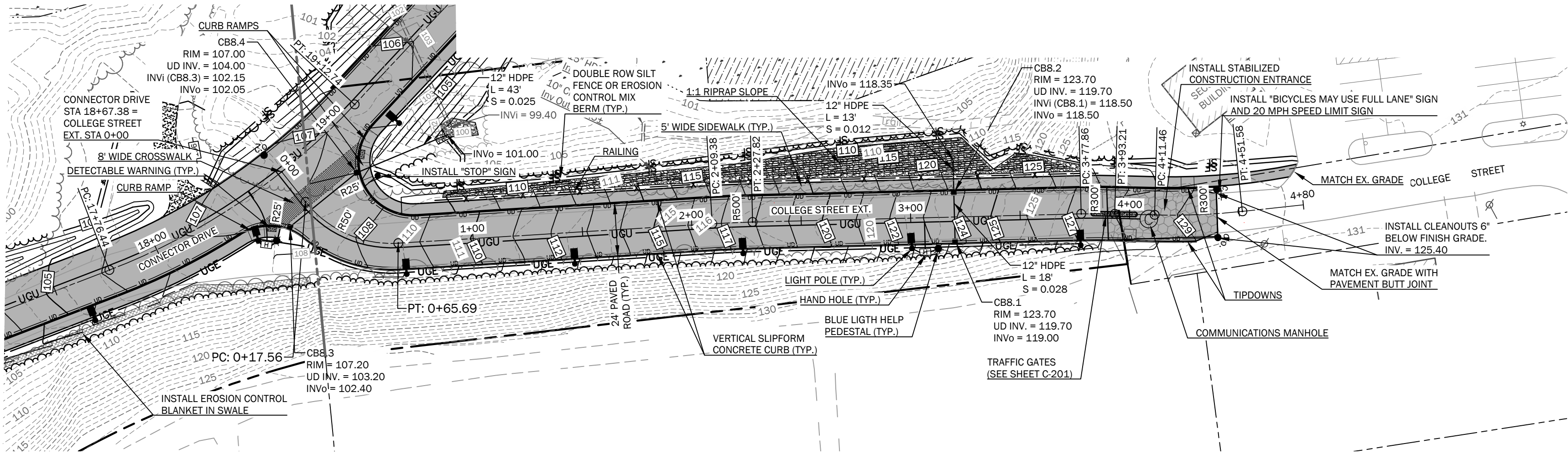
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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION									



Site Design Associates
Consulting Engineering & Land Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	CONNECTOR DRIVE PLAN & PROFILE (STA 11+00 TO 20+87)
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 40 FT	DWG. NO. C-302



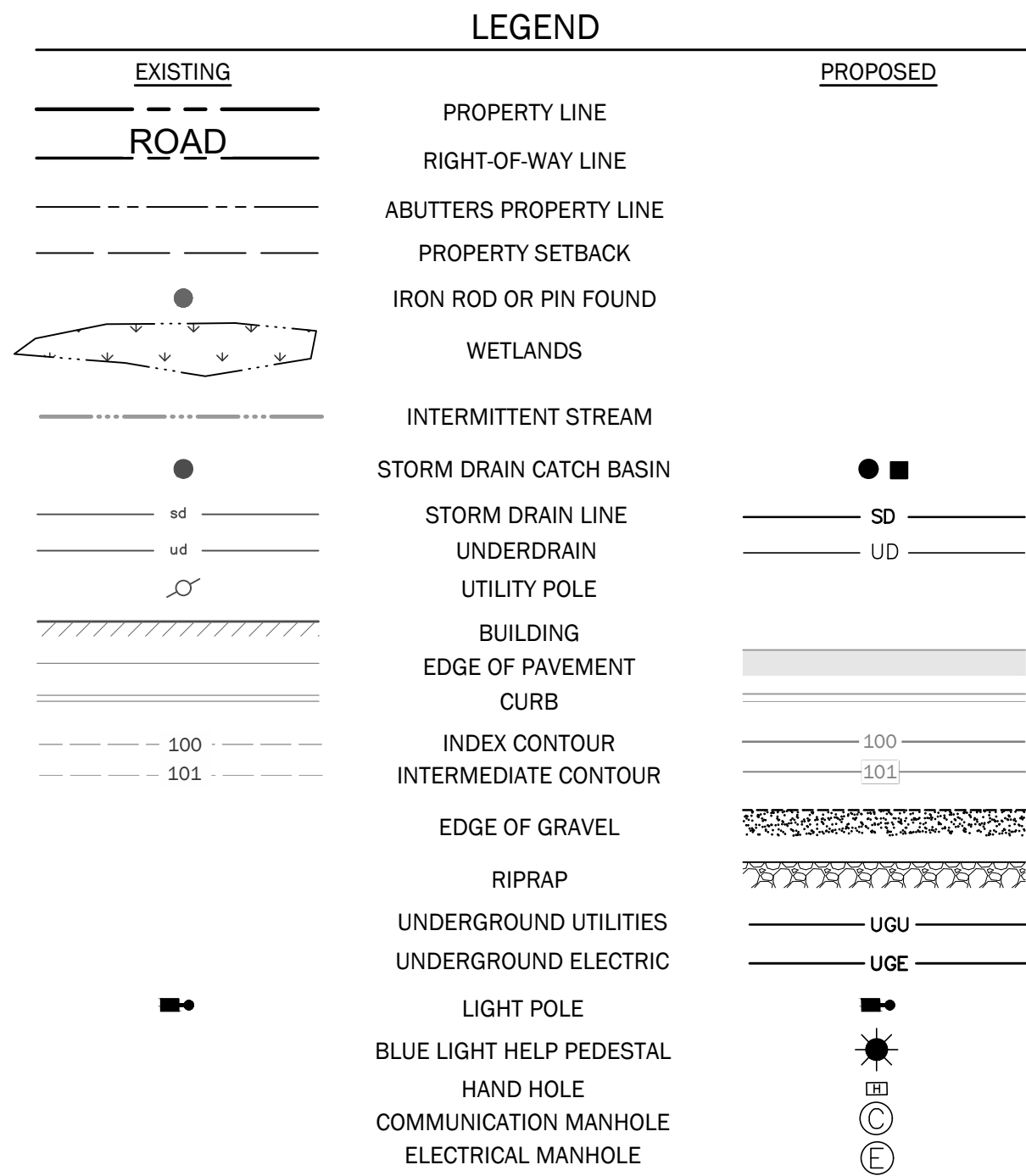
COLLEGE STREET EXT. PROFILE

GENERAL NOTES:

- REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.

GRADING AND DRAINAGE NOTES:

- REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.
- PRIOR TO ANY CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL VERIFY ALL AFFECTED GRADES. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE OWNER OR OWNER'S REPRESENTATIVE.
- ALL AREAS NOT REQUIRING GRADING SHALL BE LEFT UNDISTURBED. CONTRACTOR SHALL NOT DISTURB THESE AREAS AND PRESERVE EXISTING VEGETATION.
- GRADE ALL NEW WORK FOR POSITIVE DRAINAGE AND NO PUDDLING. MATCH EXISTING GRADES SMOOTHLY AND CONTINUOUSLY.
- INSTALL RIPRAP APRONS AT ALL STORM DRAIN INLETS AND OUTLETS.



EROSION CONTROL LEGEND



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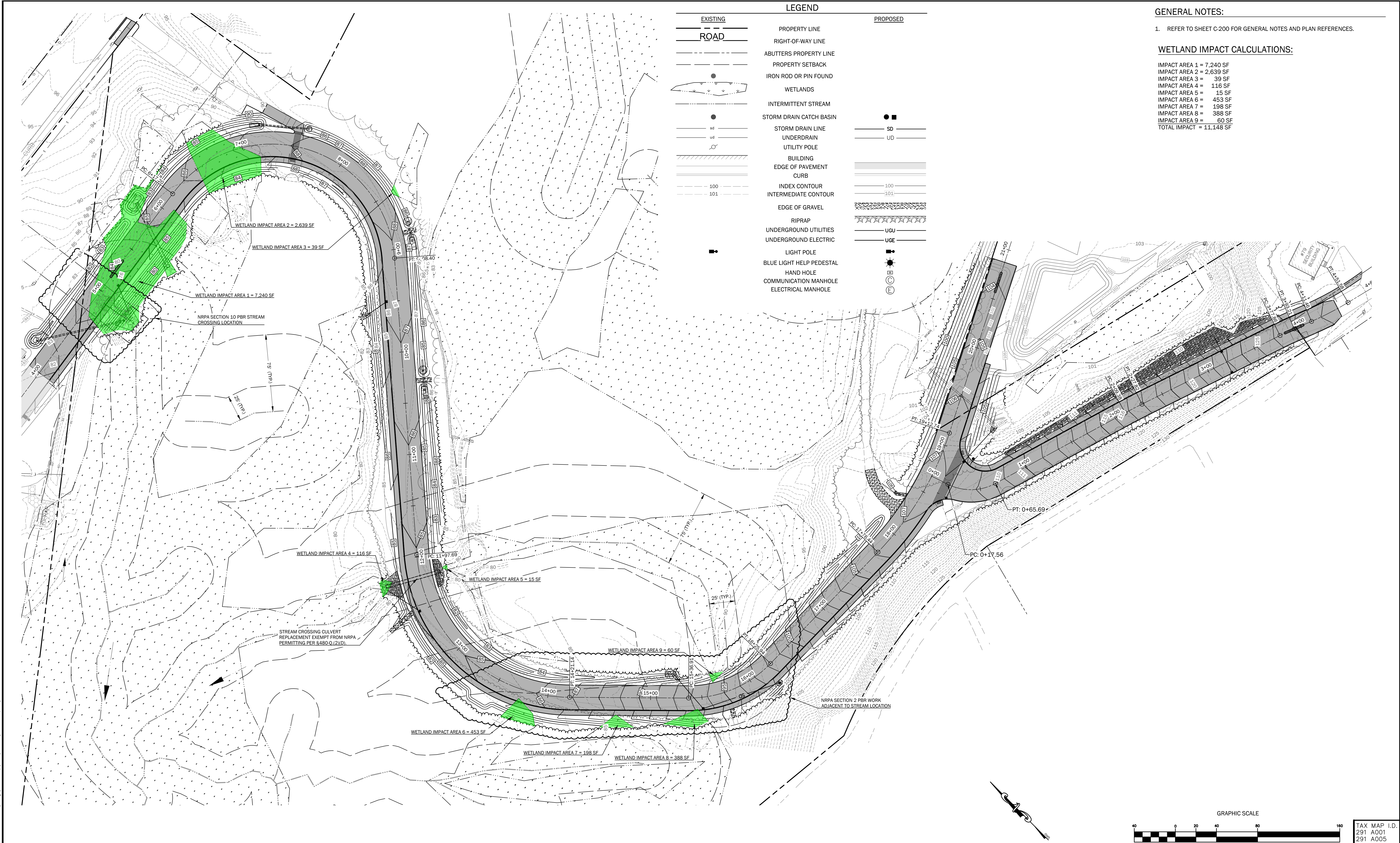
REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						
B	9/22/2023	FOR DEVELOPMENT REVIEW	DEPT.	TWS	TWS						
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						



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CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	COLLEGE STREET EXT. PLAN & PROFILE (STA 0+00 TO END)
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 40 FT	DWG. NO. C-303

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014



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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						
B	9/22/2023	FOR DEVELOPMENT REVIEW	DEPT.	TWS	TWS						
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						



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DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	WETLAND IMPACT PLAN
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 40'	DWG. NO. C-304

C:\Users\Site\Desktop\Drawings\21-216-00\21-216-00-03 Wetland Impact Plan.dwg / Date: 12/6/23 / Time: 2:55 PM

EROSION AND SEDIMENTATION CONTROL NOTES:

INTRODUCTION

THE FOLLOWING PLAN FOR CONTROLLING SEDIMENTATION AND EROSION IN THIS PROJECT IS BASED ON CONSERVATION PRACTICES FOUND IN THE MAINE EROSION & SEDIMENT CONTROL BMPs MANUAL, OCTOBER 2016, AND MAINE EROSION AND SEDIMENT CONTROL PRACTICE FIELD GUIDE FOR CONTRACTORS, REVISED 2014, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION. THE CONTRACTOR WHO IMPLEMENTS THIS PLAN SHALL BE FAMILIAR WITH THESE PUBLICATIONS AND ADHERE TO THEM AND THE PRACTICES PRESENTED HEREIN

REFERENCE IS MADE TO THE GRADING AND DRAINAGE PLANS (C-301 AND C-302) WITHIN THE PLAN SET, SHOWING THE LOCATIONS AND TYPES OF PROPOSED MEASURES TO BE IMPLEMENTED.

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES

THE FOLLOWING IS A LIST OF GENERAL EROSION CONTROL PRACTICES THAT WILL BE USED TO PREVENT EROSION AND SEDIMENTATION BEFORE, DURING AND AFTER THE CONSTRUCTION OF THIS PROJECT. IN ADDITION, SPECIAL CARE SHALL BE USED AT ALL TIMES TO:

- 1) CORRECT ANY EROSION PROBLEMS IMMEDIATELY
- 2) REGULARLY MONITOR THE IMPLEMENTED PRACTICES, ESPECIALLY AFTER EVERY RAINFALL
- 3) REVEGETATE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION
- 4) CONFORM TO ALL REQUIREMENTS/STANDARDS OF THE SITE'S MAINE DEP EROSION & SEDIMENT CONTROL BMP MANUAL.

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE DOWN GRADIENT SIDE OF THE PROPOSED GROUND DISTURBANCE AREAS PRIOR TO ANY CONSTRUCTION ACTIVITIES WHERE SLOPES EXCEED 8% OR THERE IS FLOWING WATER BOTH SILT FENCE AND EROSION CONTROL MATTING BERMS SHALL BE USED.

CATCH BASIN PROTECTION

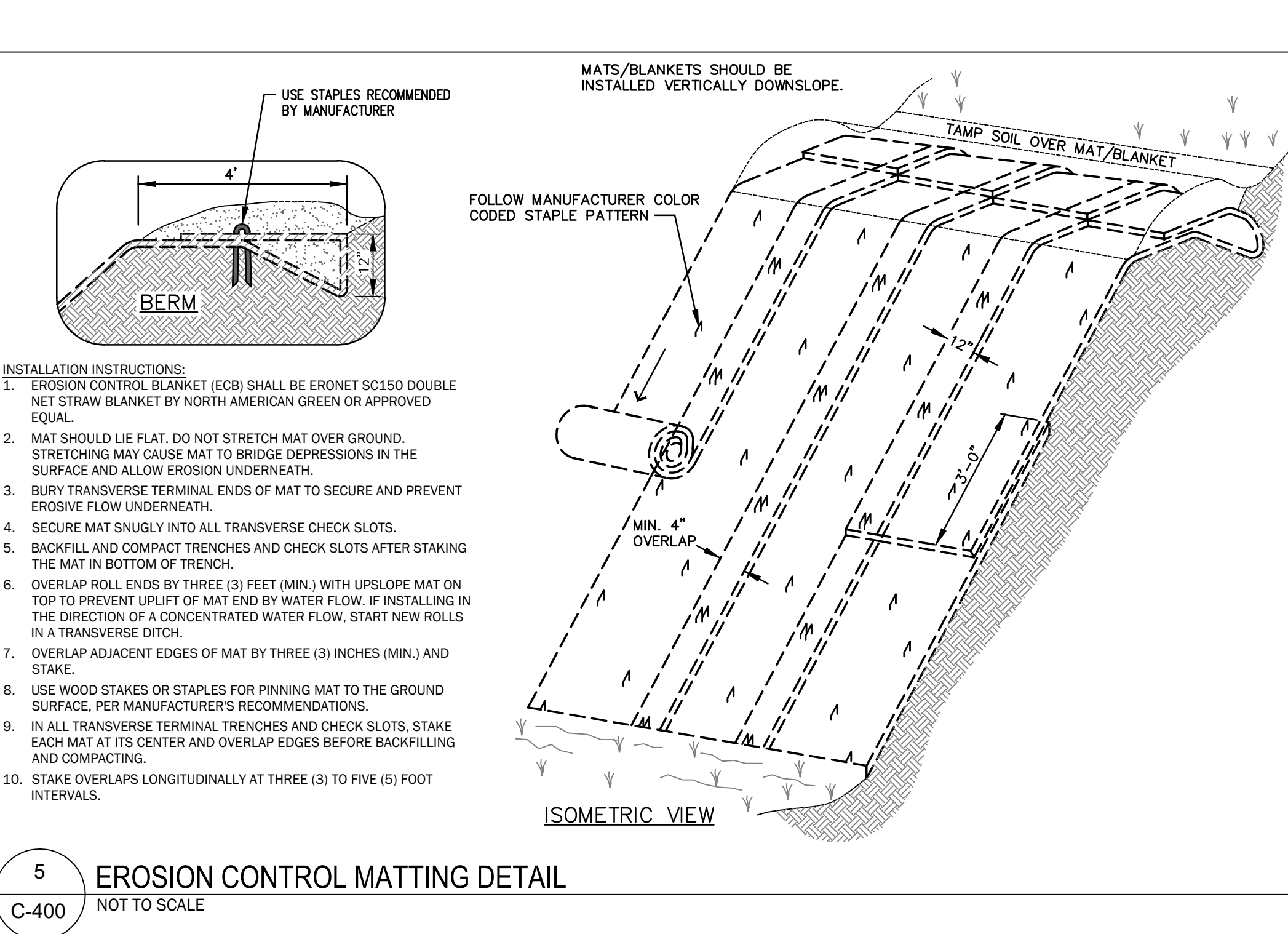
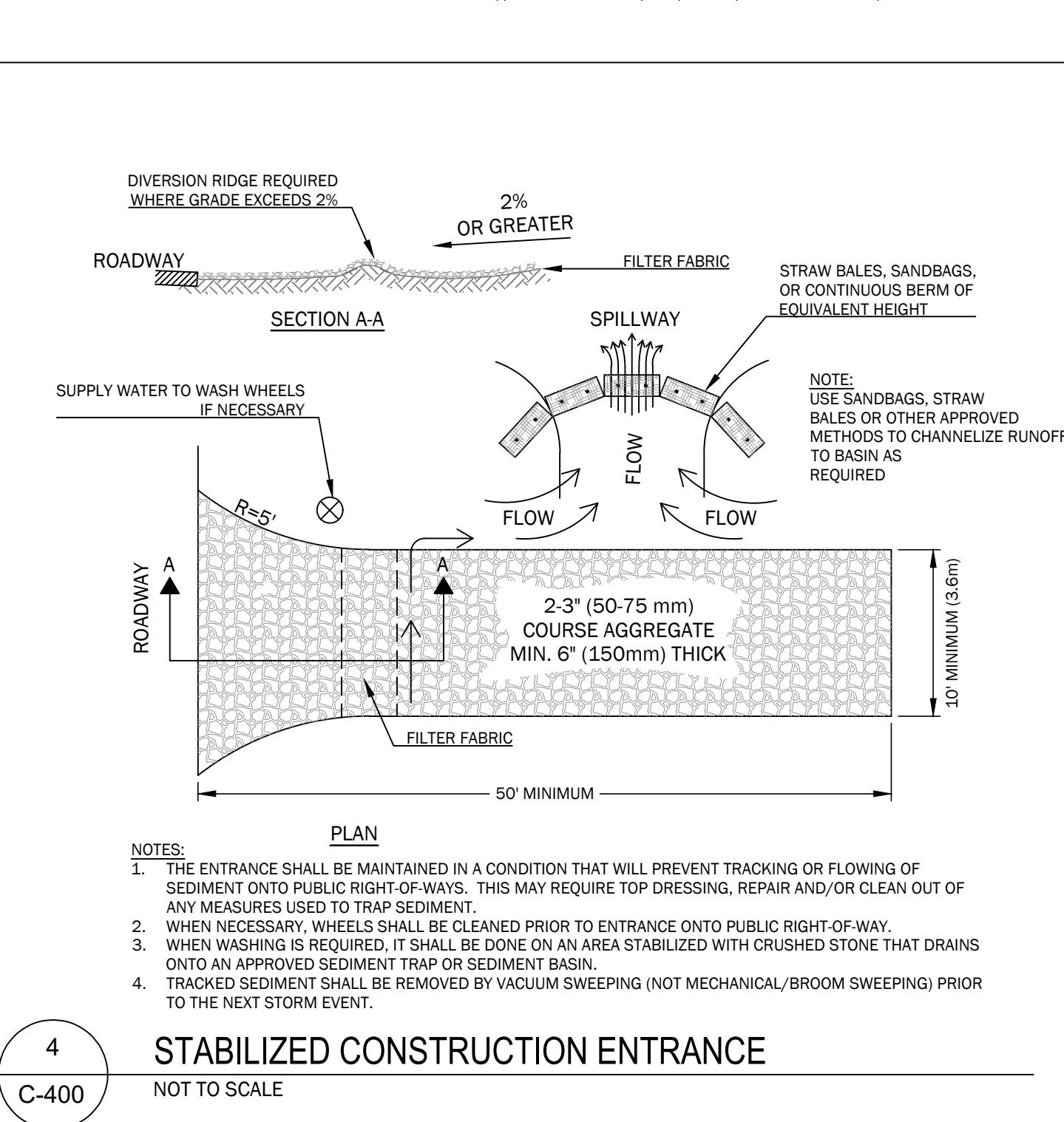
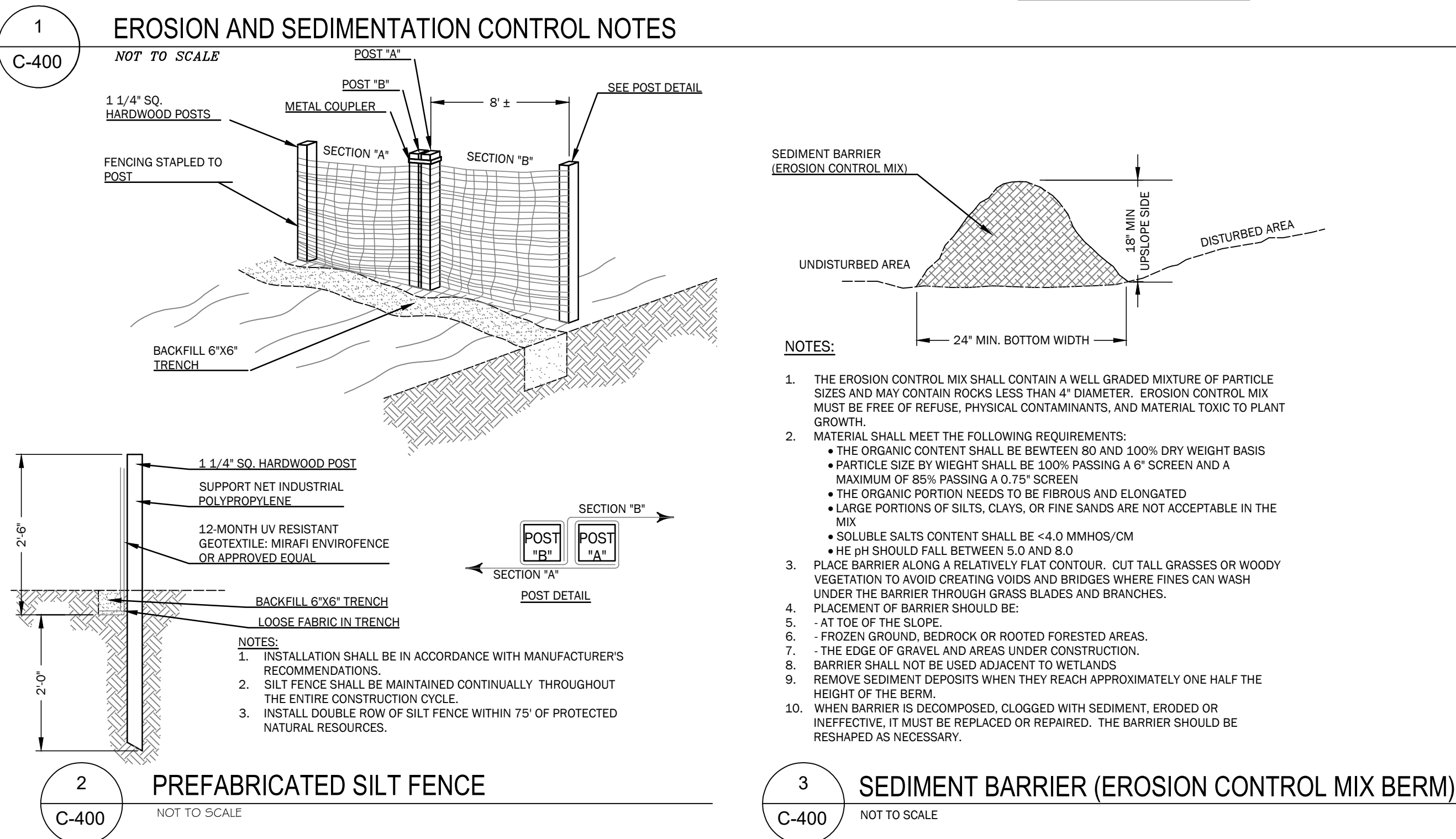
CATCH BASIN PROTECTION WILL BE INSTALLED AT THE FIRST DOWNGRADE CATCH BASIN IN STREET ADJACENT TO ANY CONSTRUCTION ACTIVITIES AND IN ALL ONSITE CATCH BASINS UNTIL SITE HAS BEEN COMPLETELY STABILIZED.

CONSTRUCTION PHASE

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION DURING CONSTRUCTION ON THIS PROJECT:

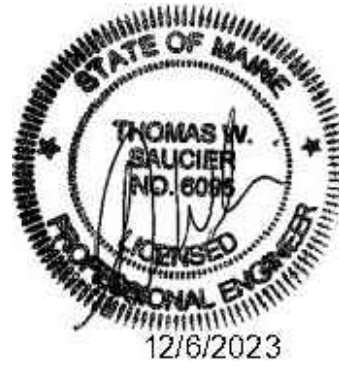
1. EROSION AND SEDIMENTATION CONTROL BMPs SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF EARTHWORK ACTIVITIES.
2. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. AN AREA NO LARGER THAN WHAT CAN BE MULCHED IN ONE DAY MAY BE OPEN AT ONCE. ONCE CONSTRUCTION OF AN AREA IS COMPLETE, FINAL GRADING, LOAMING AND SEEDING SHALL OCCUR IMMEDIATELY (REFER TO "POST CONSTRUCTION REVEGETATION" SECTION). IF DURING FINAL GRADING, LOAMING AND SEEDING CAN NOT OCCUR IMMEDIATELY, IT SHALL BE DONE PRIOR TO ANY STORM EVENT AND WITHIN 15 DAYS OF COMPLETING CONSTRUCTION IN THE AREA. IF FINAL GRADING, LOAMING AND SEEDING CANNOT OCCUR WITHIN 7 DAYS, OR IF THE AREA IS NOT UNDER ACTIVE CONSTRUCTION FOR A PERIOD LONGER THAN 7 DAYS, SEE ITEM NO. 4 BELOW.
3. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING SHALL BE INSTALLED ON DOWNGRADE PORTIONS OF THE SITE AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION.
4. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM EXISTING DRAINAGE AREAS AND WETLANDS. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
 - B. SEEDDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
 - C. STOCKPILES SHALL BE EITHER PLACED UPHILL OF AN EXISTING SEDIMENT BARRIER ON THE SITE OR ENCIRCLED BY A HAY BALE OR SILT FENCE BARRIER THE FIRST DAY THAT STOCKPILING COMMENCES.
5. ALL DISTURBED AREAS EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH STRAW AT A RATE OF 70-90 LBS. PER 1000 SQUARE FEET FROM 4/16 TO 10/1, OR AT A RATE OF 150-200 LBS. PER 1000 SQUARE FEET FROM 10/1 TO 4/15.
 - B. SEEDDED WITH CONSERVATION MIX OF PERENNIAL RYE GRASS (1.0 LBS./1000 SQ.FT.) AND MULCHED IMMEDIATELY. FROM 10/1 TO 4/15, FOLLOW THE SEEDING RATES AS OUTLINED BELOW IN SUB-SECTION 4.D. OF THE "POST CONSTRUCTION REVEGETATION" SECTION.
 - C. MONITORED EVERY TWO WEEKS UNTIL SEEDING CAN OCCUR AND REMULCHED AS NEEDED TO PROTECT SLOPES.
6. ALL GRADING WILL BE HELD TO A MAXIMUM 3:1 SLOPE WHERE PRACTICAL. GREATER SLOPES MAY BE USED WHERE THE BANKS ARE PROTECTED WITH SOFT ARMOUR MATTING, EROSION CONTROL MATTING, OR RIPRAP. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY AFTER FINAL GRADING IS COMPLETE. (IT IS UNDERSTOOD THAT IMMEDIATELY MEANS WITHIN 5 DAYS OF THE COMPLETION OF WORK. SEE POST-CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION).
7. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
8. CONSTRUCTION TRAFFIC WILL BE DIRECTED OVER THE EXISTING SITE ENTRANCE. THE ROAD SHALL BE SWEEPED AND VACUUMED DAILY SHOULD SEDIMENT BE TRACKED ONTO IT.
9. ALL AREAS DRAINING TO A STORMWATER FILTER OR BMP SHALL BE STABILIZED PRIOR TO CONSTRUCTION OF FILTER MEDIA TO PREVENT SEDIMENT FROM CLOGGING MEDIA.
10. THE UNDERDRAINED SOIL FILTERS WILL BE CONSTRUCTED SIMULTANEOUSLY WITH YOUNG'S LANE. THE FILTERS WILL BE USED AS TEMPORARY SEDIMENT TRAPS UNTIL THEIR DRAINAGE AREA IS PERMANENTLY STABILIZED.
11. THE AREAS ASSOCIATED WITH THE BUILDINGS AND THEIR DRIVEWAYS CAN BE DISTURBED BY GRUBBING NO EARLIER THAN TWO WEEKS BEFORE THE STARTING DATE OF THEIR CONSTRUCTION.

EROSION AND SEDIMENTATION CONTROL NOTES



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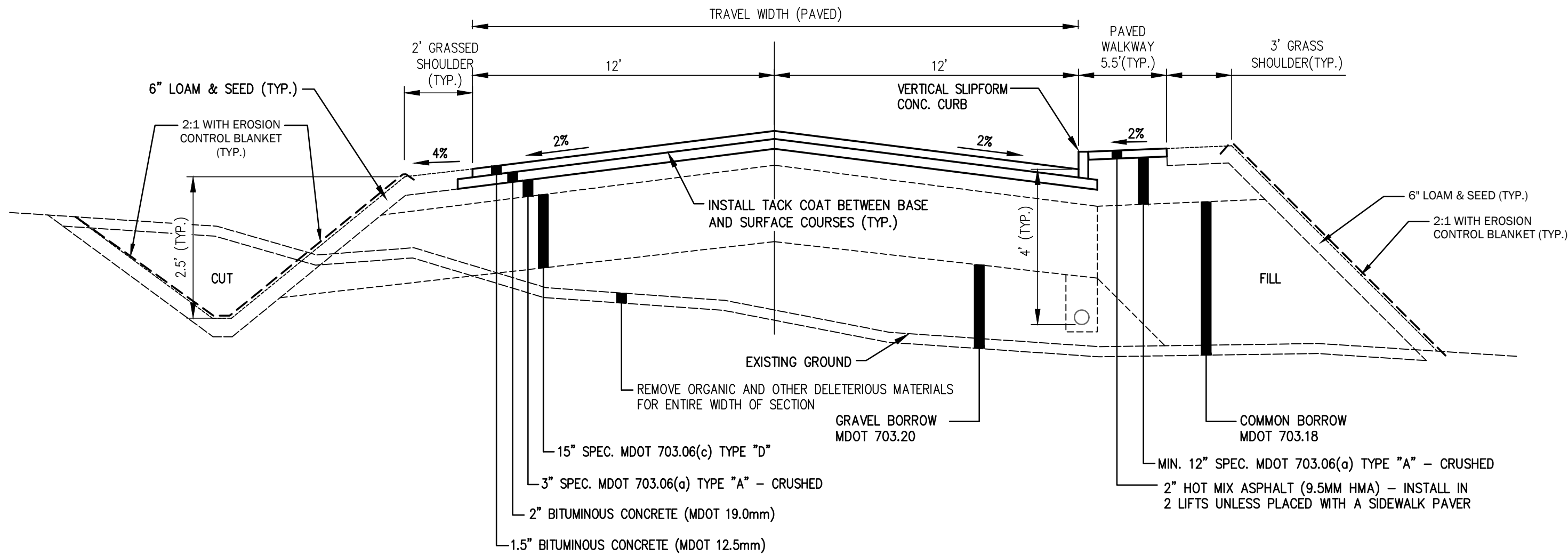


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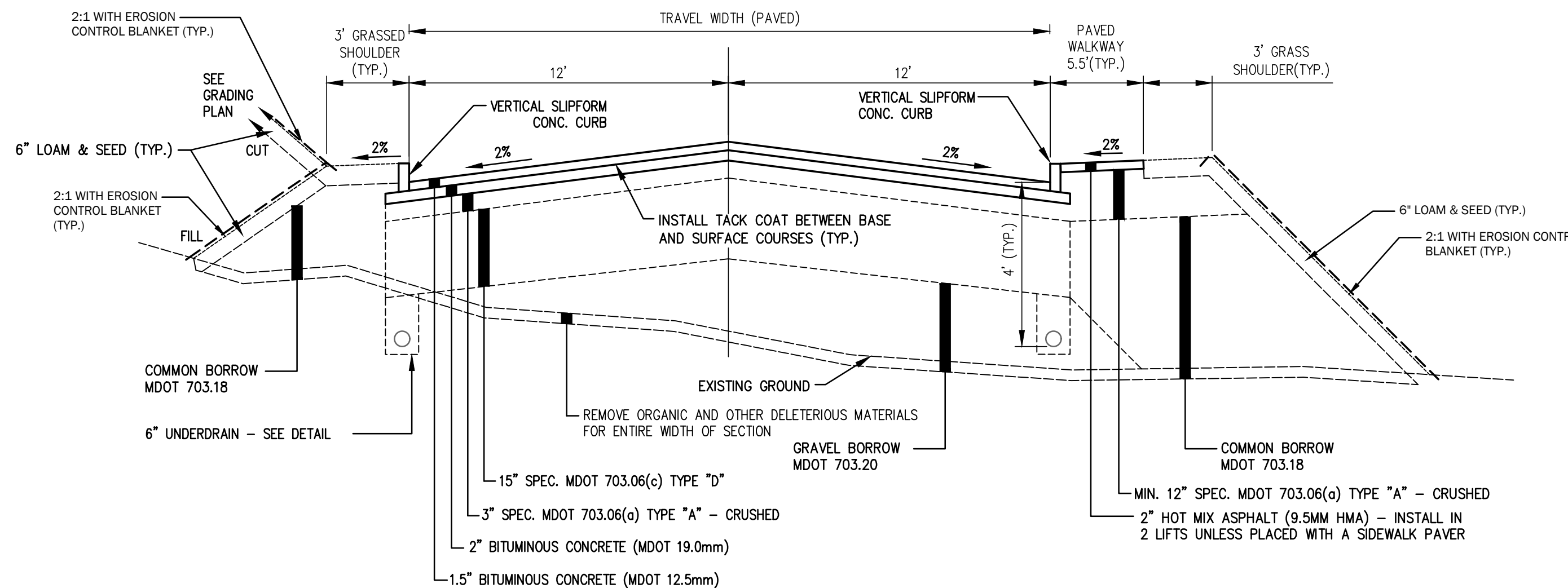
23 Whitney Way
Topsham, Maine 04086
Tel: (207) 449-4275
CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	EROSION AND SEDIEMENTATION CONTROL NOTES AND DETAILS
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: AS NOTED	DWG. NO. C-400

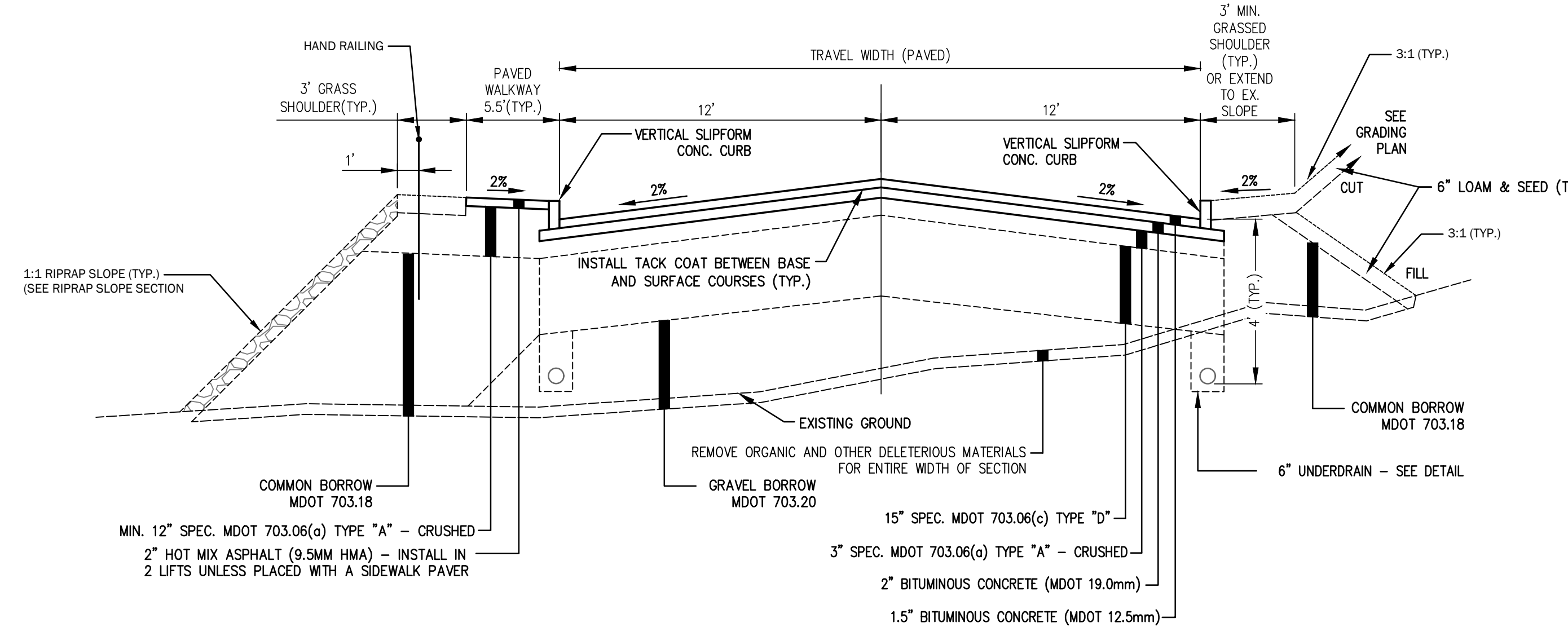
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1 CONNECTOR DRIVE SECTION (STA 4+00 TO 18+40)
C-402 NOT TO SCALE



2 CONNECTOR DRIVE SECTION (STA 18+40 TO 20+87)
C-402 NOT TO SCALE

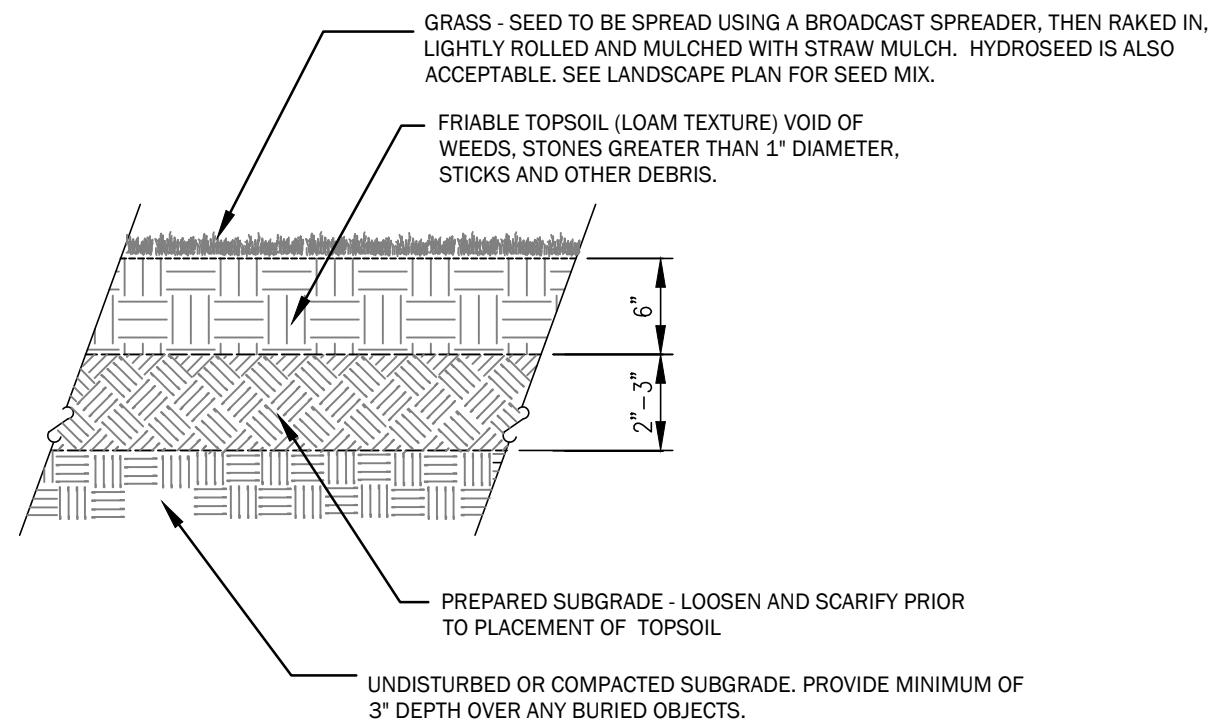


3 COLLEGE STREET EXT. SECTION
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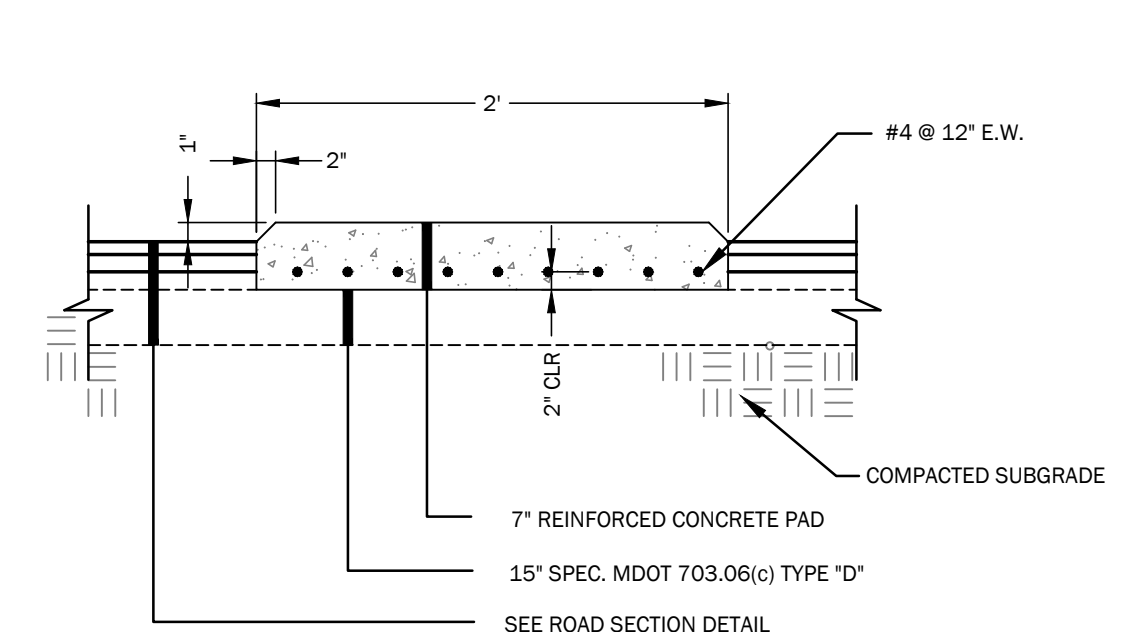
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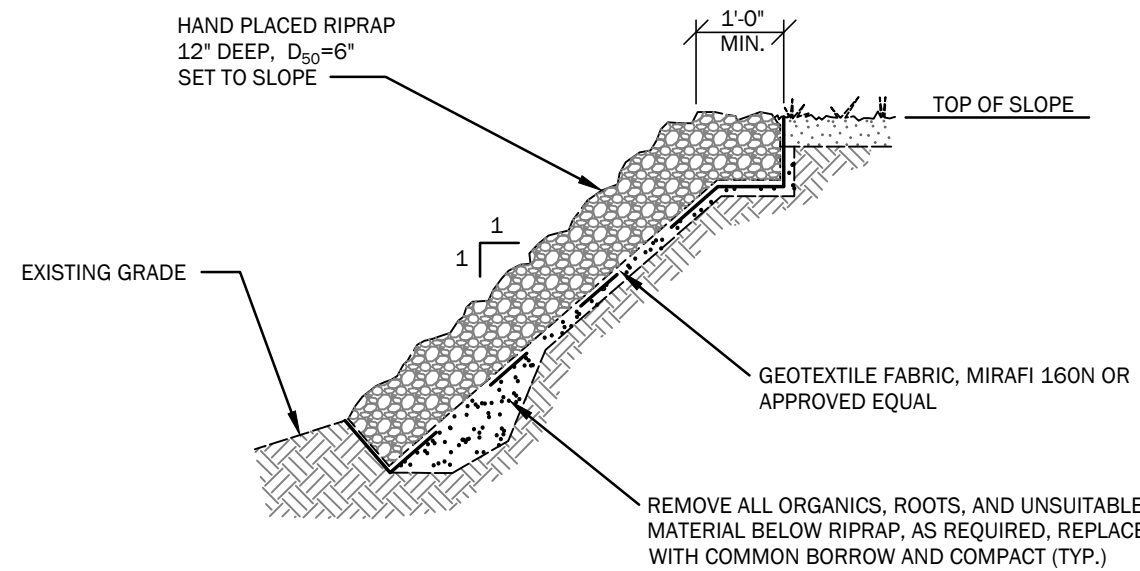
- NOTES:
- THE CONTRACTOR SHALL PROVIDE TOPSOIL (LOAM) MEETING THE FOLLOWING SPECIFICATIONS.
 - NATURAL, FERTILE LOAM TYPICAL OF CULTIVATED TOPSOIL OF THE LOCALITY, CONTAINING NOT LESS THAN 3.5 PERCENT OR MORE THAN 8 PERCENT BY WEIGHT, OF DECAVED ORGANIC MATTER (HUMUS) AS DETERMINED BY ASTM F1547.
 - OBTAIN FROM A WELL DRAINABLE SITE, FREE OF SUBSOIL, EARTH CLODS, LARGE STONES, STICKS, STUMPS, CLAY LUMPS, ROOTS, OR OTHER OBJECTIONABLE, EXTRANEOUS MATTER OR DEBRIS, SCREEN TOPSOIL TO A MAXIMUM STONE SIZE OF ONE INCH.
 - TOPSOIL SHALL BE FREE OF QUACK-GRASS RHIZOMES, AGROPYRON REPEMS, AND THE NUT-LIKE TUBERS OF NUTGRASS, CYPERUS ESCULENTUS, AND ALL OTHER PRIMARY NOXIOUS WEEDS.
 - TOPSOIL SHALL HAVE A PH OF NOT LESS THAN 6.0 OR GREATER THAN 6.8. AMEND WITH LIME AS REQUIRED.
 - TOPSOIL SHALL HAVE A LOAM TEXTURE CLASSIFICATION. TOPSOIL (LOAM) SHALL CONFORM TO THE FOLLOWING PARTICLE SIZE DISTRIBUTION, AS DETERMINED BY PIPETTE METHOD IN COMPLIANCE WITH ASTM F1632.
 - SAND: 40-60 PERCENT.
 - SILT: 30-40 PERCENT.
 - CLAY: 5-20 PERCENT.
 - DO NOT DELIVER OR USE TOPSOIL WHILE IN A FROZEN OR MUDDY CONDITION.
- IN LIEU OF PROVIDING AND FOLLOWING THE SOIL ANALYSIS REQUIRED IN NOTE 1 ABOVE THE CONTRACTOR CAN INSTEAD ELECT TO INCORPORATE THE FOLLOWING INTO THE TOP 6 INCHES OF TOPSOIL: 20 LBS. OF 10-20-10 FERTILIZER PER 1,000 S.F., 70 LBS. OF MAGNESIUM LIME PER 1,000 S.F., AND 3 CUBIC YARDS OF COMPOST PER 1,000 S.F.



4 LAWN INSTALLATION DETAIL
C-402 NOT TO SCALE

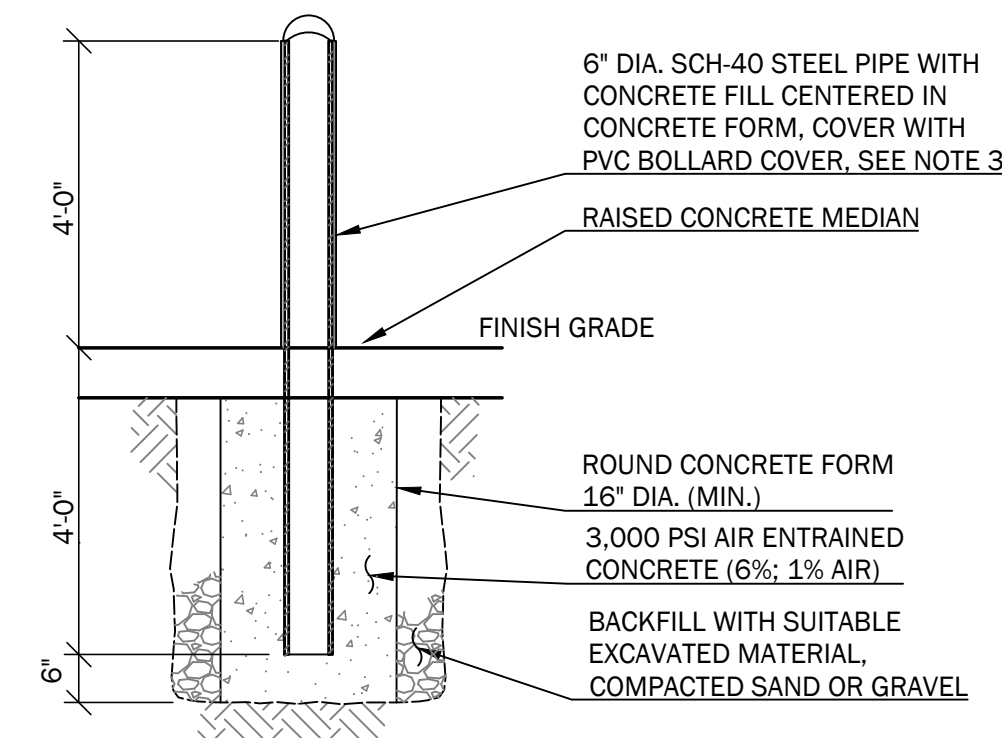


5 RAISED CONCRETE MEDIAN
C-402 NOT TO SCALE



6 RIPRAP SLOPE SECTION
C-402 NOT TO SCALE

- NOTES:
- PRIOR TO PLACING BOLLARD IN FORM, PAINT BOLLARD WITH A "RUST INHIBITIVE" STEEL PRIMER EQUAL TO RUSTOLEUM 7769 RUSTY METAL PRIMER OR 7780 CLEAN METAL PRIMER AS APPROPRIATE AND 1 COAT OF RUSTOLEUM TOP COAT OR SHERWIN WILLIAMS "RUST TOUGH" PRIMER, AND 1 TOP COAT OF SHERWIN WILLIAMS "SUPER PAINT".
 - SUPPORT BOLLARD FROM ABOVE GROUND PRIOR TO PLACING CONCRETE IN THE ROUND CONCRETE FORM. DO NOT SUPPORT VERTICALLY WITH AN OBJECT PLACED IN THE FORM.
 - ONCE INSTALLED, COVER WITH A POLYETHYLENE SLEEVE EQUAL TO THAT MANUFACTURED BY EAGLE, TRIMMED TO FIT BOLLARD HEIGHT SPECIFIED. COLOR TO BE SELECTED BY OWNER. SUBMIT COLOR SAMPLES.



7 STEEL BOLLARD DETAIL
C-402 NOT TO SCALE



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DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	SITE DETAILS
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: AS NOTED	DWG. NO. C-402

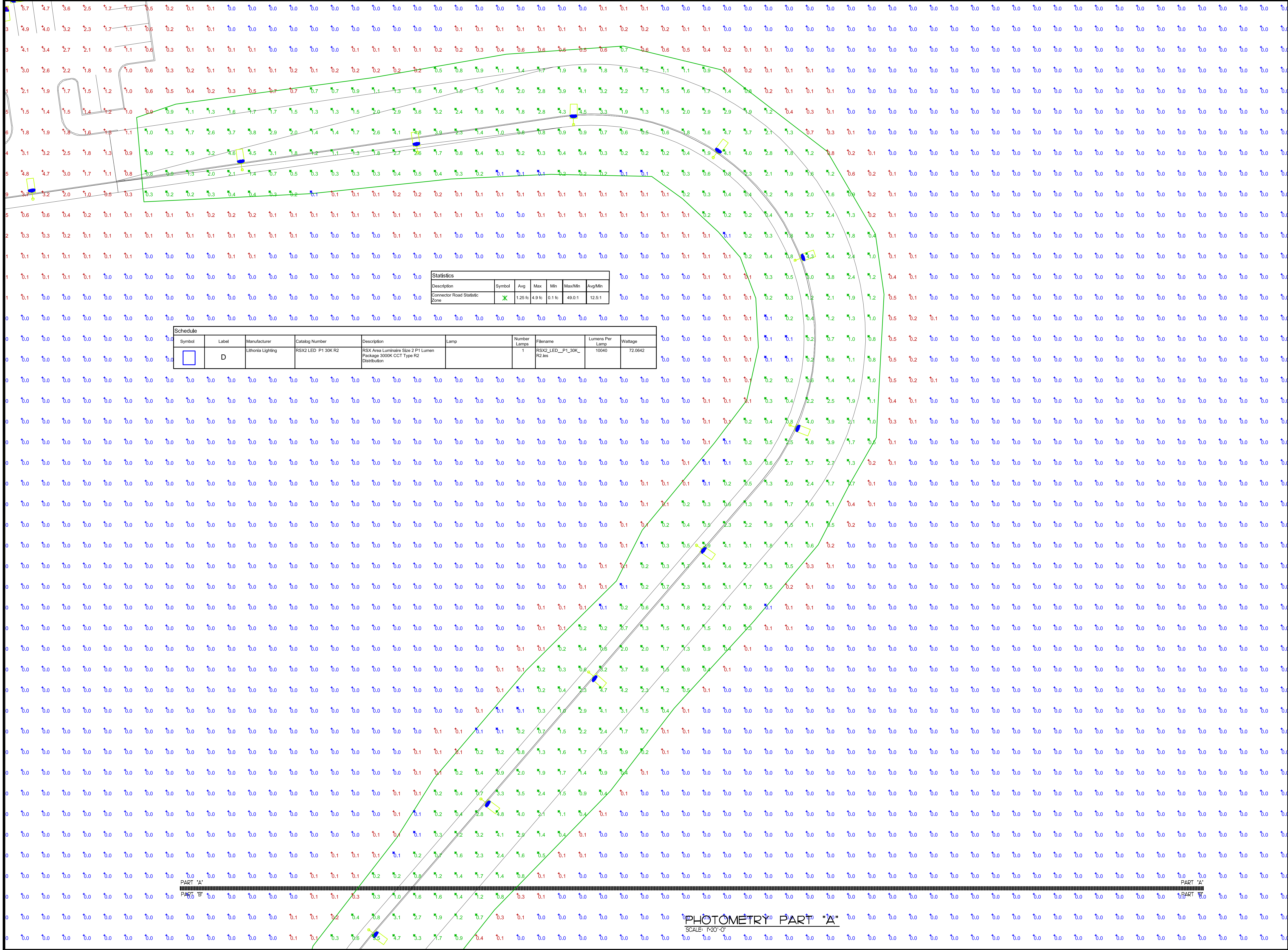
TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014



TAX	MAP I.D.
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291	A005
290	A003
145	B014

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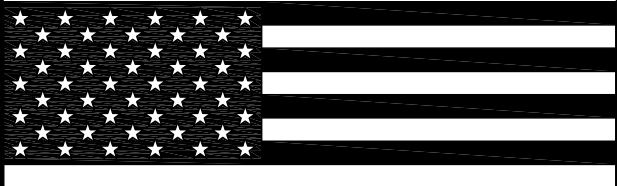


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		Avg/Min			
		12.5:1			

Schedule					
Symbol	Label	Manufacturer	Catalog Number	Description	Lamp
□	D	Lithonia Lighting	RSX2 LED P1 30K R2	RSX Area Luminaire Size 2 P1 Lumen Package 3000K CCT Type R2 Distribution	
		Number Lamps		Filename	Lumens Per Lamp
		1		RSX2_LED_P1_30K_R2.lvs	10040
				Wattage	
				72.0542	



VINCENT A. DIORIO, INC.
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Norwood, MA 02062
(781)255-9754 | vadjr@vadeng.com
www.vadeng.com



REVISIONS:		
REV.	DATE	DESCRIPTION



37 Jordan Avenue, Brunswick, ME 04011 • PH: 207-725-2005

CLIENT:

UNIVERSITY OF
NEW ENGLAND

PROJECT:

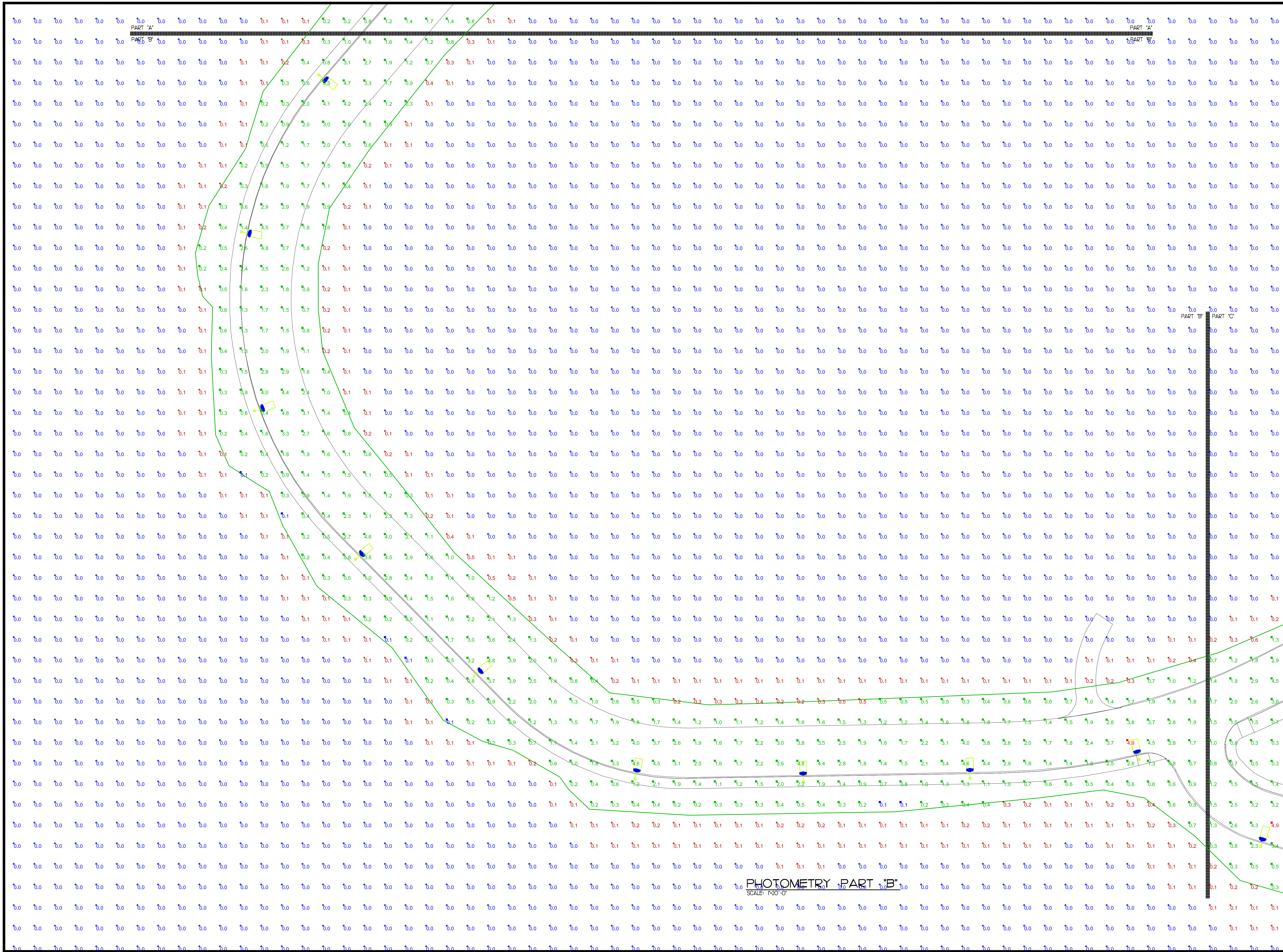
Intermodal Transportation,
Facility, Parking Lot
Improvements

DRAWING TITLE

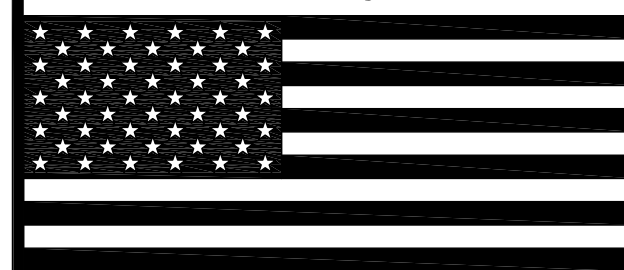
CONNECTOR ROAD
PHOTOMETRY PART "A"

DRAWN:	CWQ
CHECKED:	VAD Jr
SCALE:	1"=20'=0"
DATE:	NOVEMBER 13, 2023

PH2.1A



est. 1972
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Norwood, MA 02062
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REVISIONS:

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37 Jordan Avenue, Brunswick, ME 04011 • PH: 207-725-2005

CLIENT:

UNIVERSITY OF
NEW ENGLAND

PROJECT:

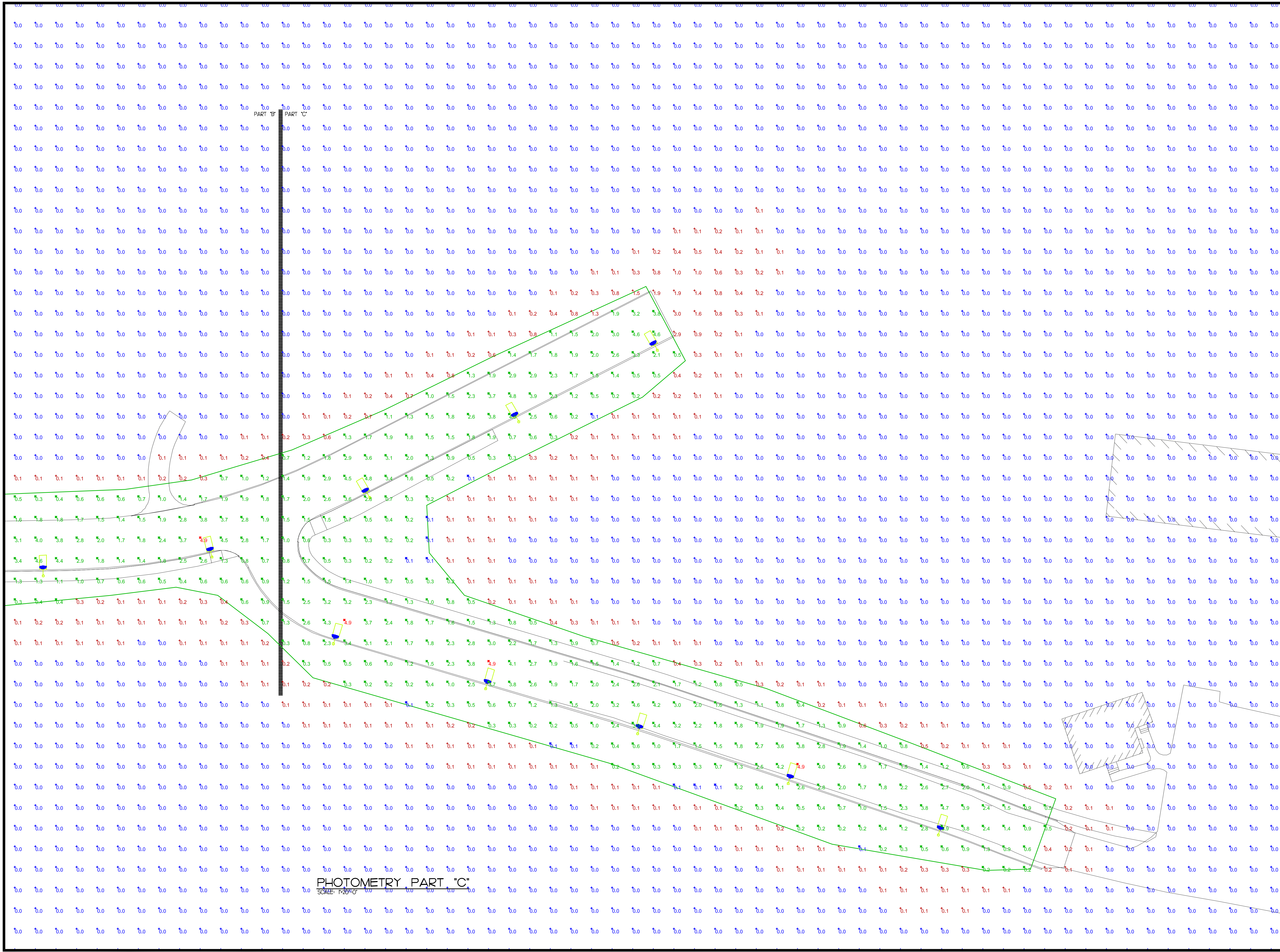
Intermodal Transportation,
Facility, Parking Lot
Improvements

DRAWING TITLE

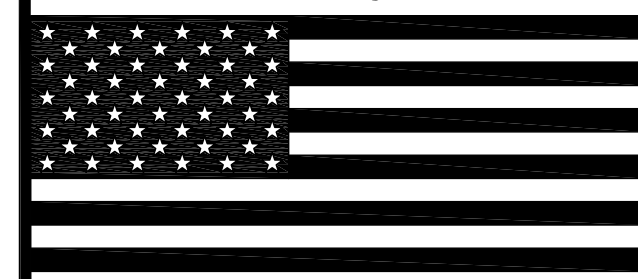
CONNECTOR ROAD
PHOTOMETRY PART "B"

DRAWN: CWQ
CHECKED: VAD Jr
SCALE: 1"=20'-0"
DATE: NOVEMBER 13, 2023

PH2.1B



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REVISIONS:		
REV.	DATE	DESCRIPTION



CLIENT:
**UNIVERSITY OF
NEW ENGLAND**

PROJECT:
**Intermodal Transportation,
Facility, Parking Lot
Improvements**

DRAWING TITLE
**CONNECTOR ROAD
PHOTOMETRY PART "C"**

DRAWN: CWQ
CHECKED: VAD Jr
SCALE: 1"=20'=0"
DATE: NOVEMBER 13, 2023

PH2.1C

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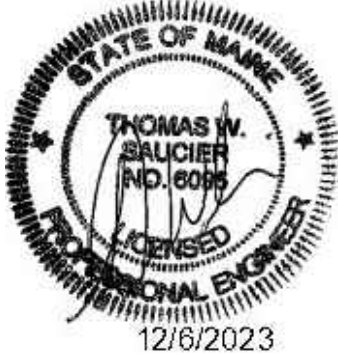
LEGEND	
	EXISTING ROAD
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	RIGHT-OF-WAY LINE
	ABUTTERS PROPERTY LINE
	PROPERTY SETBACK
	IRON ROD OR PIN FOUND
	WETLANDS
	INTERMITTENT STREAM
	STORM DRAIN MANHOLE
	STORM DRAIN CATCH BASIN
	STORM DRAIN LINE
	UTILITY POLE
	BUILDING
	EDGE OF PAVEMENT
	CURB
	INDEX CONTOUR
	INTERMEDIATE CONTOUR

GENERAL NOTES:

- REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.
- LOCATION OF INDIVIDUAL TREES EQUAL TO OR GREATER THAN 10-INCH DBH WITHIN CLEARING AREA ARE APPROXIMATE.

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C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION									



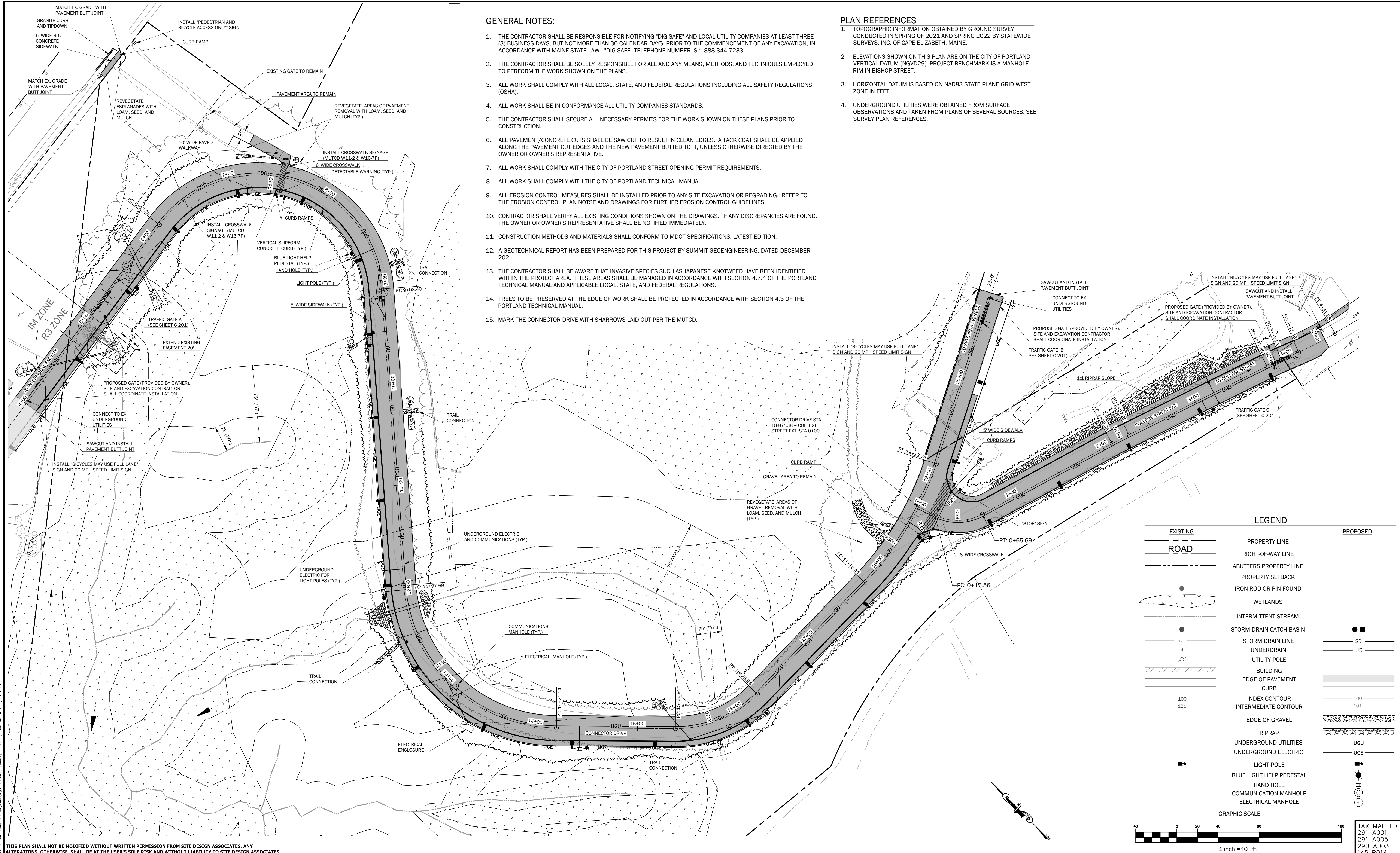
Site Design Associates
Consulting Engineering & Land Planning

23 Whitney Way
Topsham, Maine 04086
Tel: (207) 449-4275

CLIENT:
UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	EXISTING CONDITIONS AND REMOVALS PLAN		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 40'	DWG. NO.	C-100	C

C:\Users\Site\Desktop\Drawings\21-216-00 Connector Drive\Drawings\21-216-00 Connector Drive.dwg / Plot Date / Time: Dec. 6, 23 / 2:54 PM



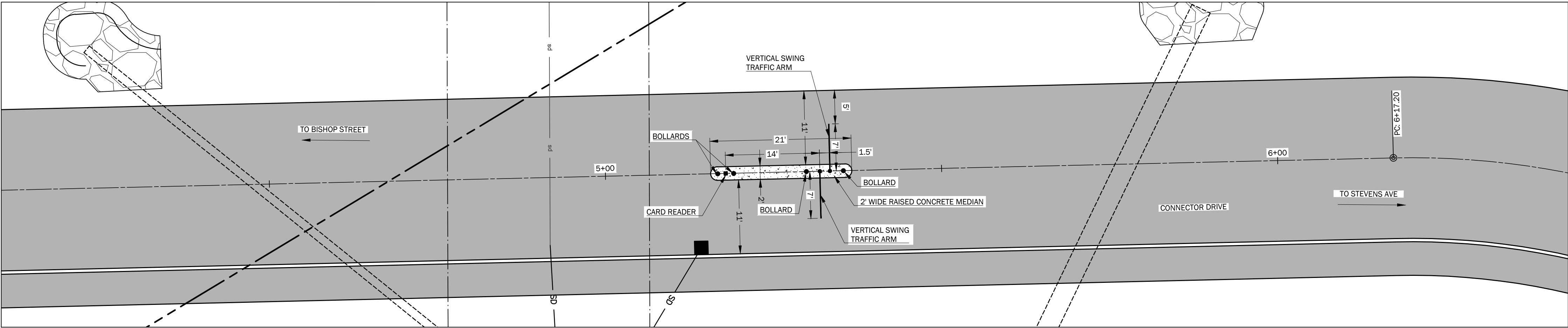
GENERAL NOTES:

PLAN REFERENCES

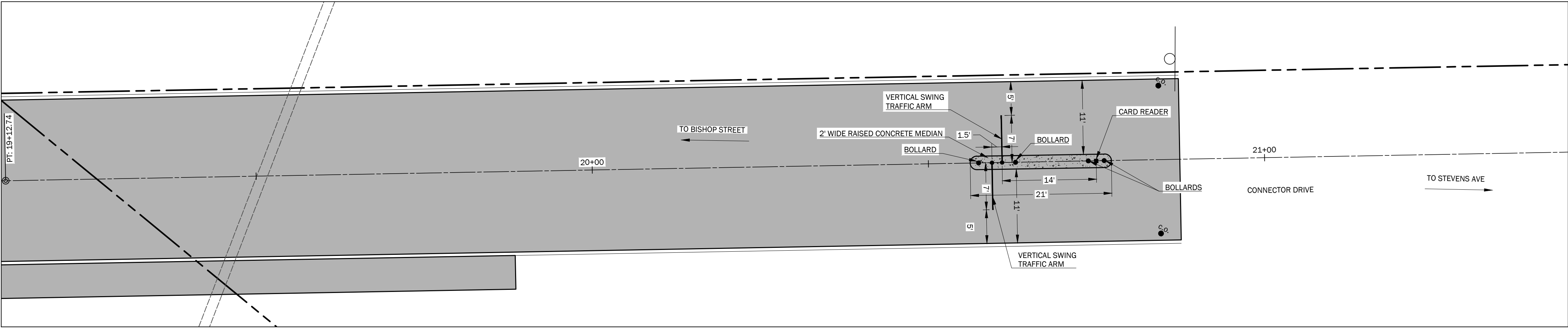
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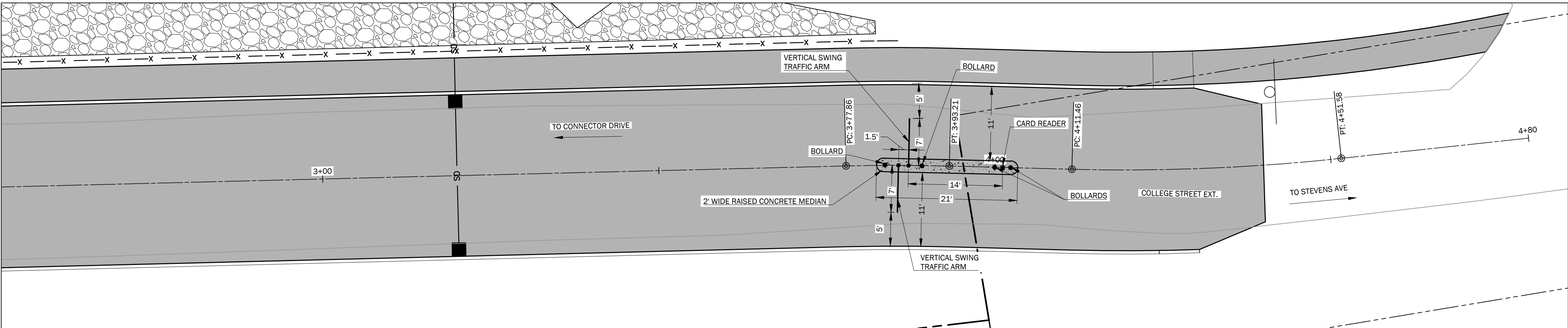
DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		15-0014
DRAWN: DEPT.			83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	SITE AND UTILITY PLAN		
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 40'	DWG. NO.	C-200	C



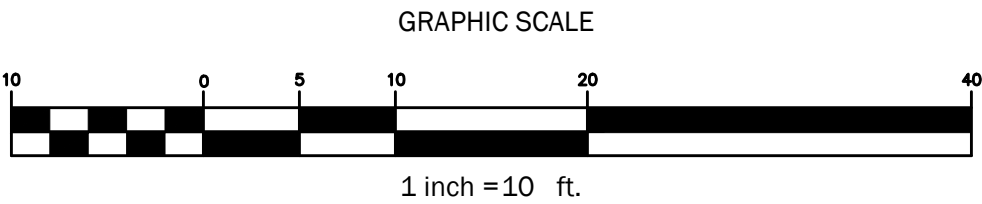
GATE A - (BISHOP STREET END)



GATE B - (CFHS BUILDING END)

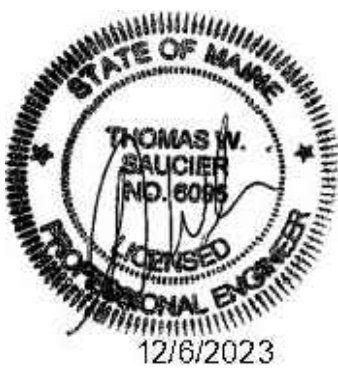


GATE C - (COLLEGE STREET)



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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION									



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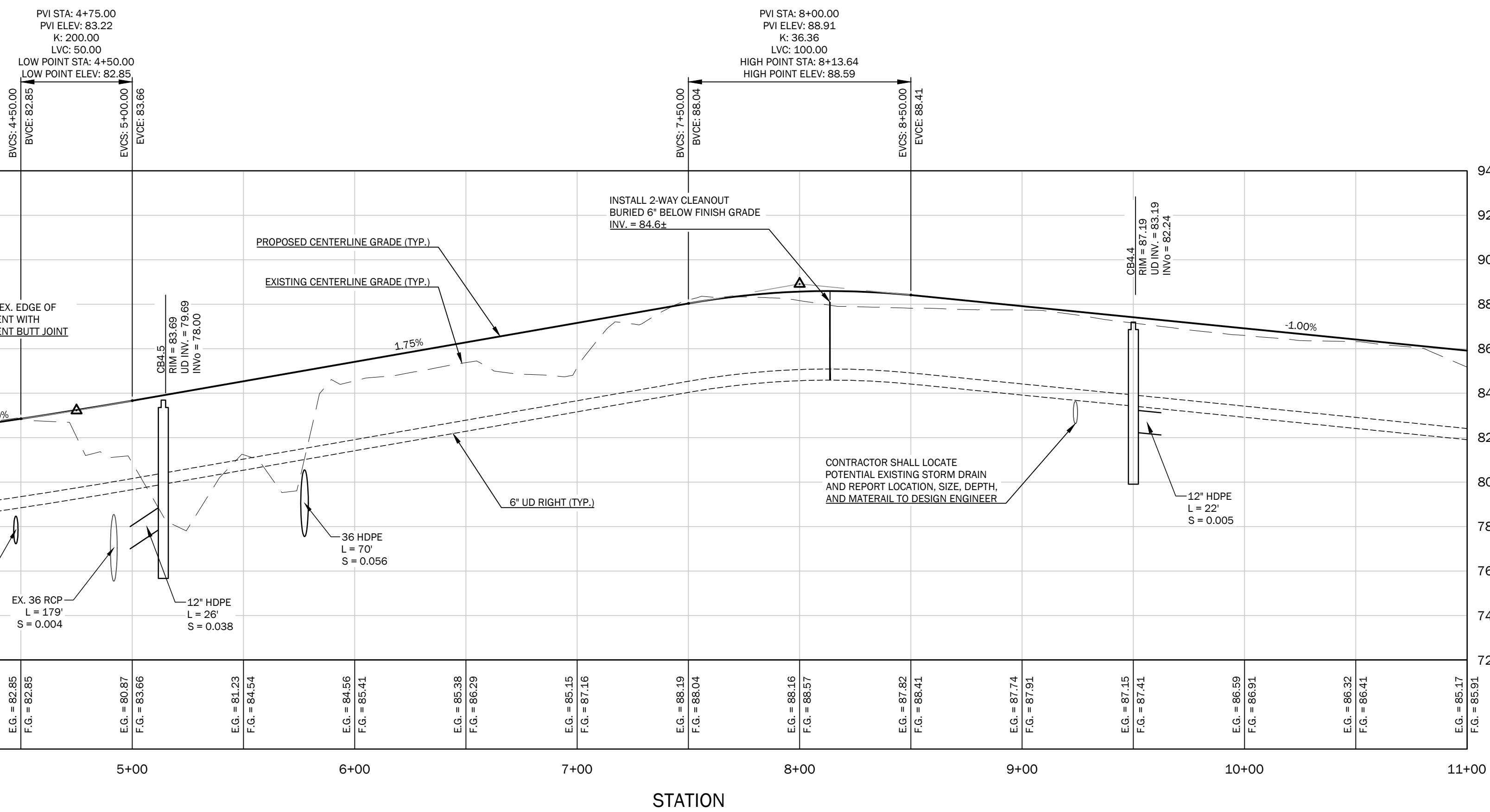
23 Whitney Way
Topsham, Maine 04086
Tel: (207) 449-4275

CLIENT:

UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT:	CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE	
CHKD: TWS	CONNECTOR DRIVE TRAFFIC GATE PLAN	
DATE: SEP. 2023	PROJ. NO.	21-216-00
SCALE: 1" = 10 FT	DWG. NO.	C-201

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014



1 inch = 4 ft. VERT.
1 inch = 40 ft. HORIZ.

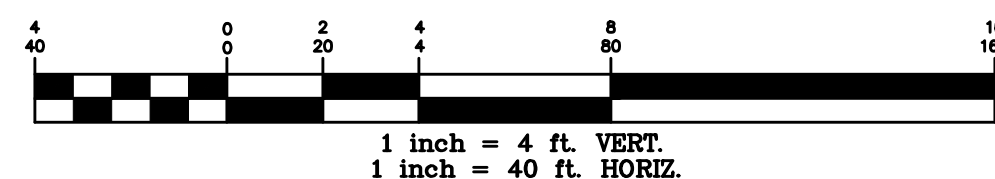
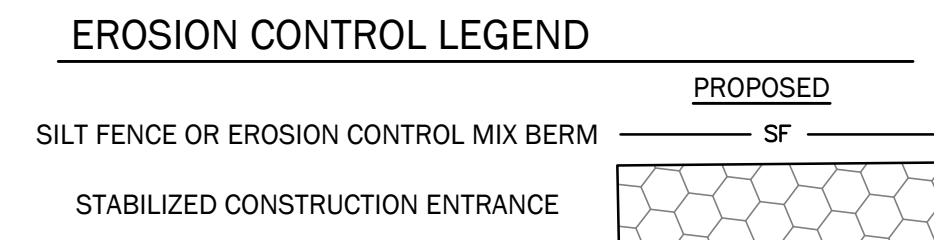
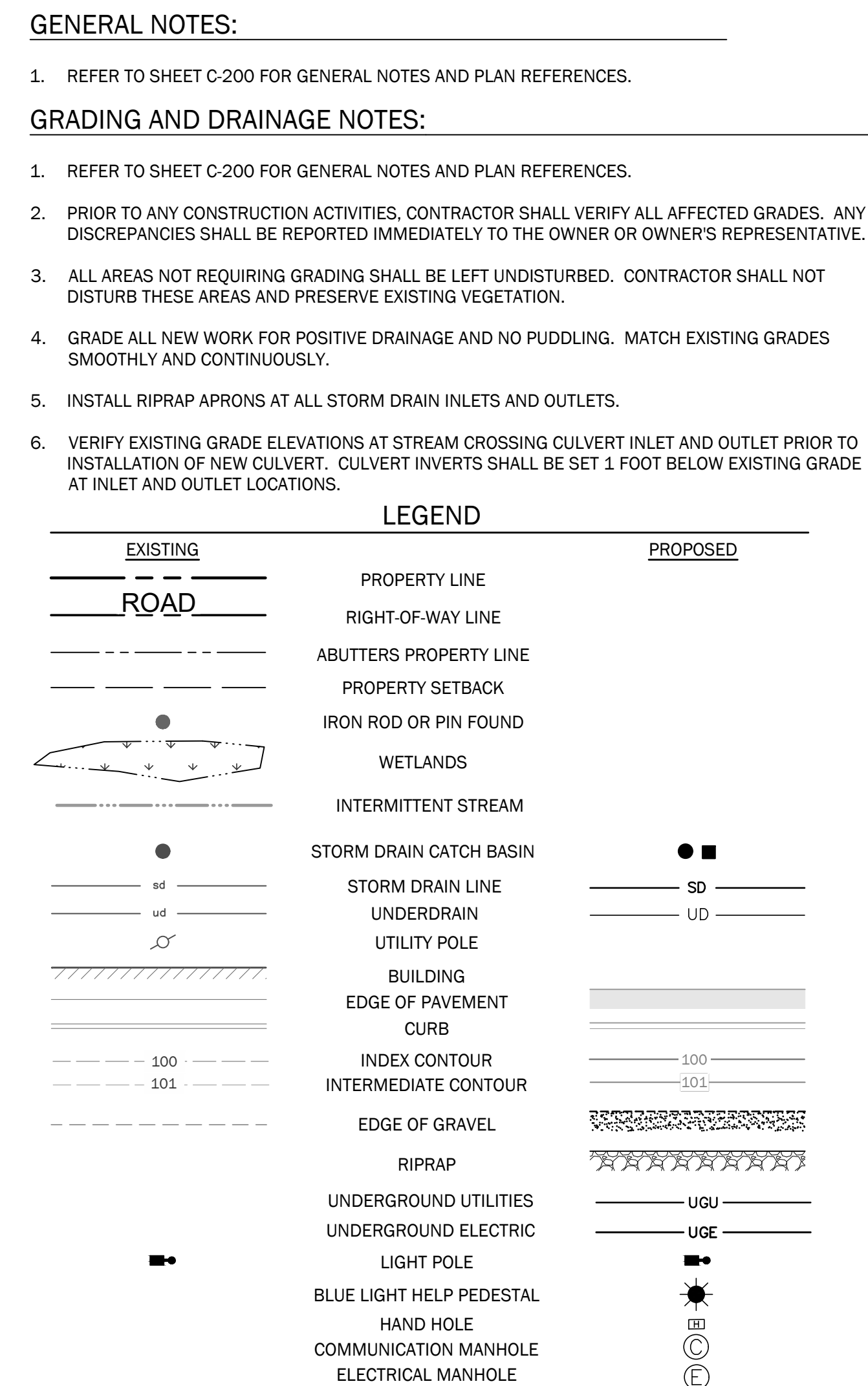
6. VERIFY EXISTING GRADE ELEVATIONS AT STREAM CROSSING CULVERT INLET AND OUTLET PRIOR TO INSTALLATION OF NEW CULVERT. CULVERT INVERTS SHALL BE SET 1 FOOT BELOW EXISTING GRADE AT INLET AND OUTLET LOCATIONS.

EROSION CONTROL LEGEND

PROPOSED
SILT FENCE OR EROSION CONTROL MIX BERM ——— SF ———
STABILIZED CONSTRUCTION ENTRANCE

[illegible]

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE		
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE		
CHKD: TWS	CONNECTOR DRIVE PLAN & PROFILE (STA 4+00 TO 11+00)		
DATE: SEP, 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 40 FT	DWG. NO.	C-301	C



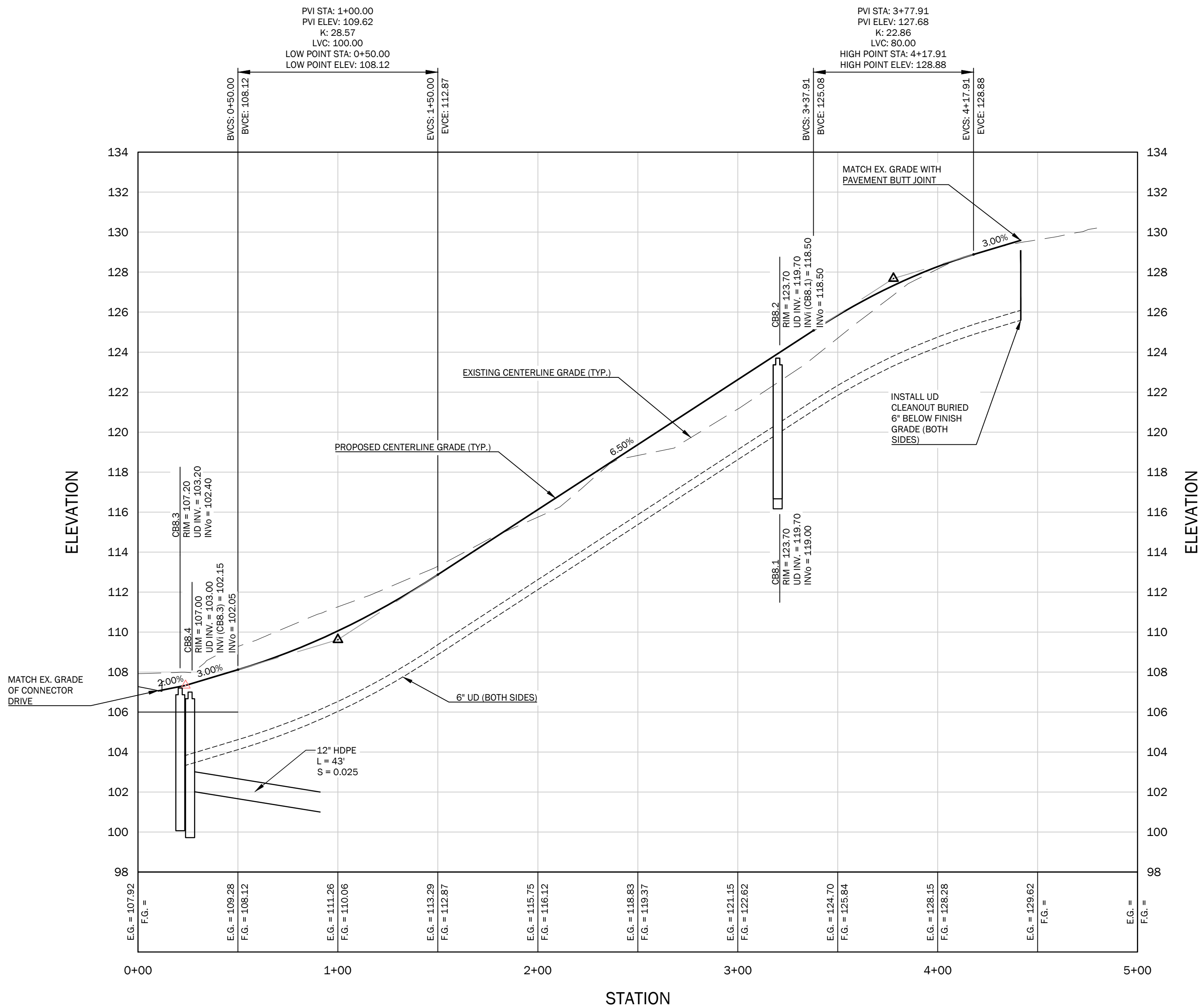
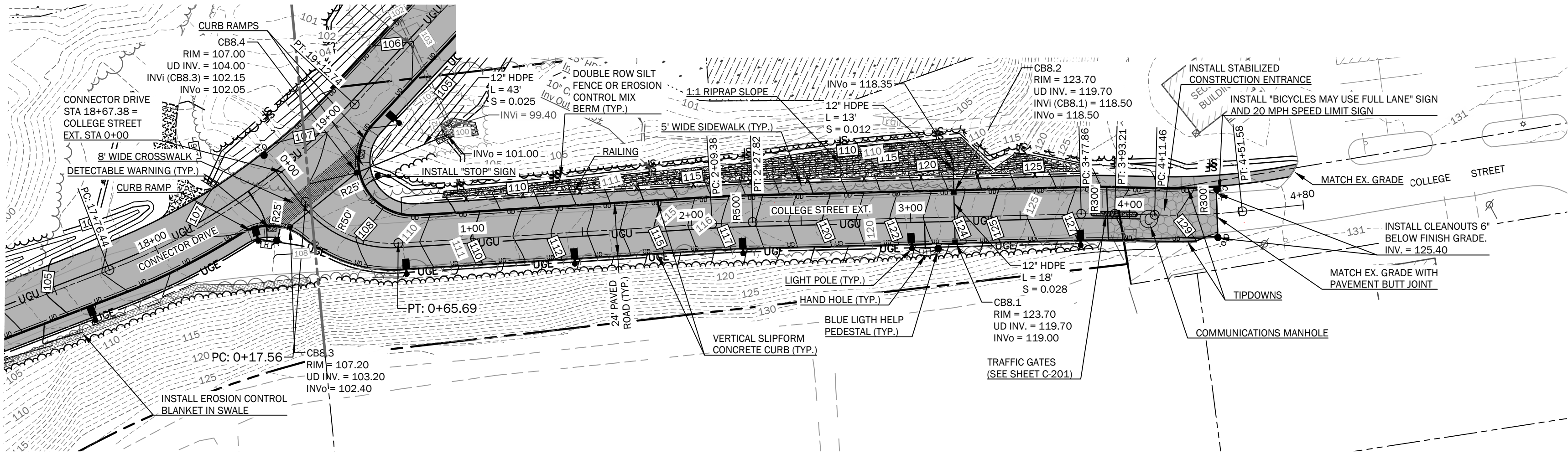
CONNECTOR DRIVE PROFILE

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Consulting Engineering & Land Planning

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CLIENT: **UNIVERSITY OF NEW ENGLAND**
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE 83 COLLEGE STREET, PORTLAND, MAINE CONNECTOR DRIVE PLAN & PROFILE (STA 11+00 TO 20+87)		
DRAWN: DEPT.			
CHKD: TWS			
DATE: SEP. 2023	PROJ. NO.	21-216-00	REV.
SCALE: 1" = 40 FT	DWG. NO.	C-302	C



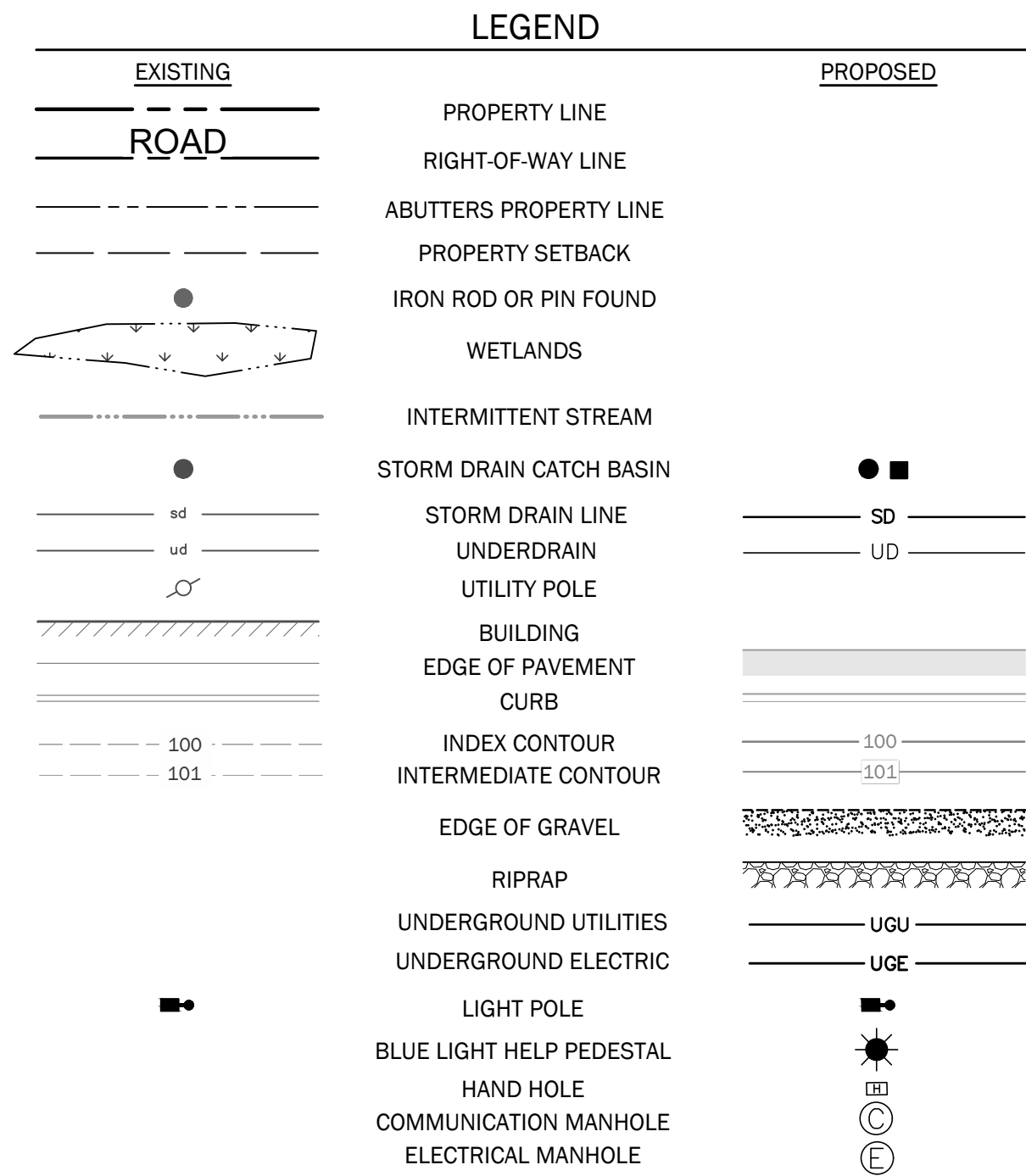
COLLEGE STREET EXT. PROFILE

GENERAL NOTES:

1. REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.

GRADING AND DRAINAGE NOTES:

1. REFER TO SHEET C-200 FOR GENERAL NOTES AND PLAN REFERENCES.
2. PRIOR TO ANY CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL VERIFY ALL AFFECTED GRADES. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE OWNER OR OWNER'S REPRESENTATIVE.
3. ALL AREAS NOT REQUIRING GRADING SHALL BE LEFT UNDISTURBED. CONTRACTOR SHALL NOT DISTURB THESE AREAS AND PRESERVE EXISTING VEGETATION.
4. GRADE ALL NEW WORK FOR POSITIVE DRAINAGE AND NO PUDDLING. MATCH EXISTING GRADES SMOOTHLY AND CONTINUOUSLY.
5. INSTALL RIPRAP APRONS AT ALL STORM DRAIN INLETS AND OUTLETS.



EROSION CONTROL LEGEND



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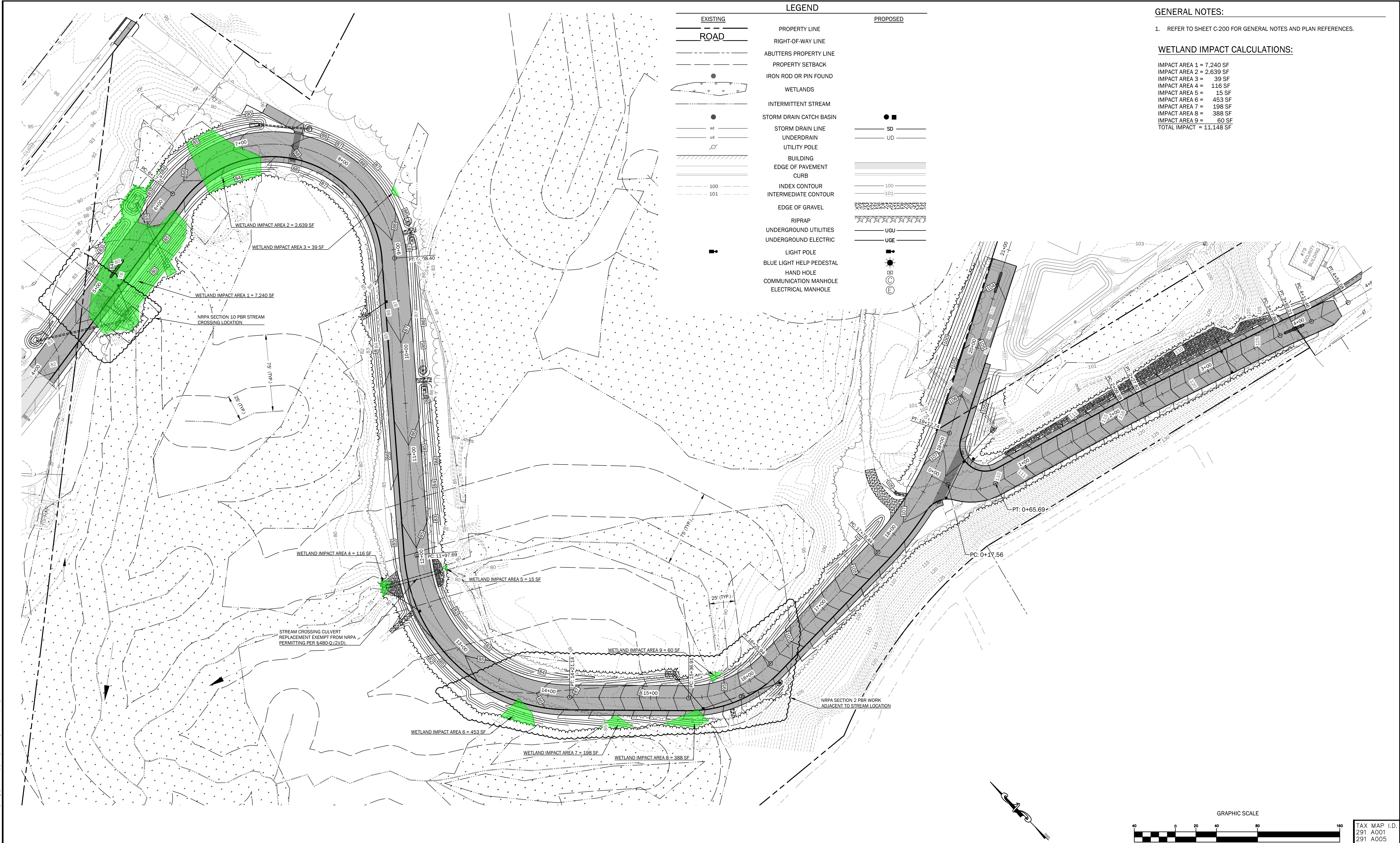
REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						
B	9/22/2023	FOR DEVELOPMENT REVIEW	DEPT.	TWS	TWS						
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						



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CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	COLLEGE STREET EXT. PLAN & PROFILE (STA 0+00 TO END)
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 40 FT	DWG. NO. C-303

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014



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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						
B	9/22/2023	FOR DEVELOPMENT REVIEW	DEPT.	TWS	TWS						
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION	DEPT.	TWS	TWS						



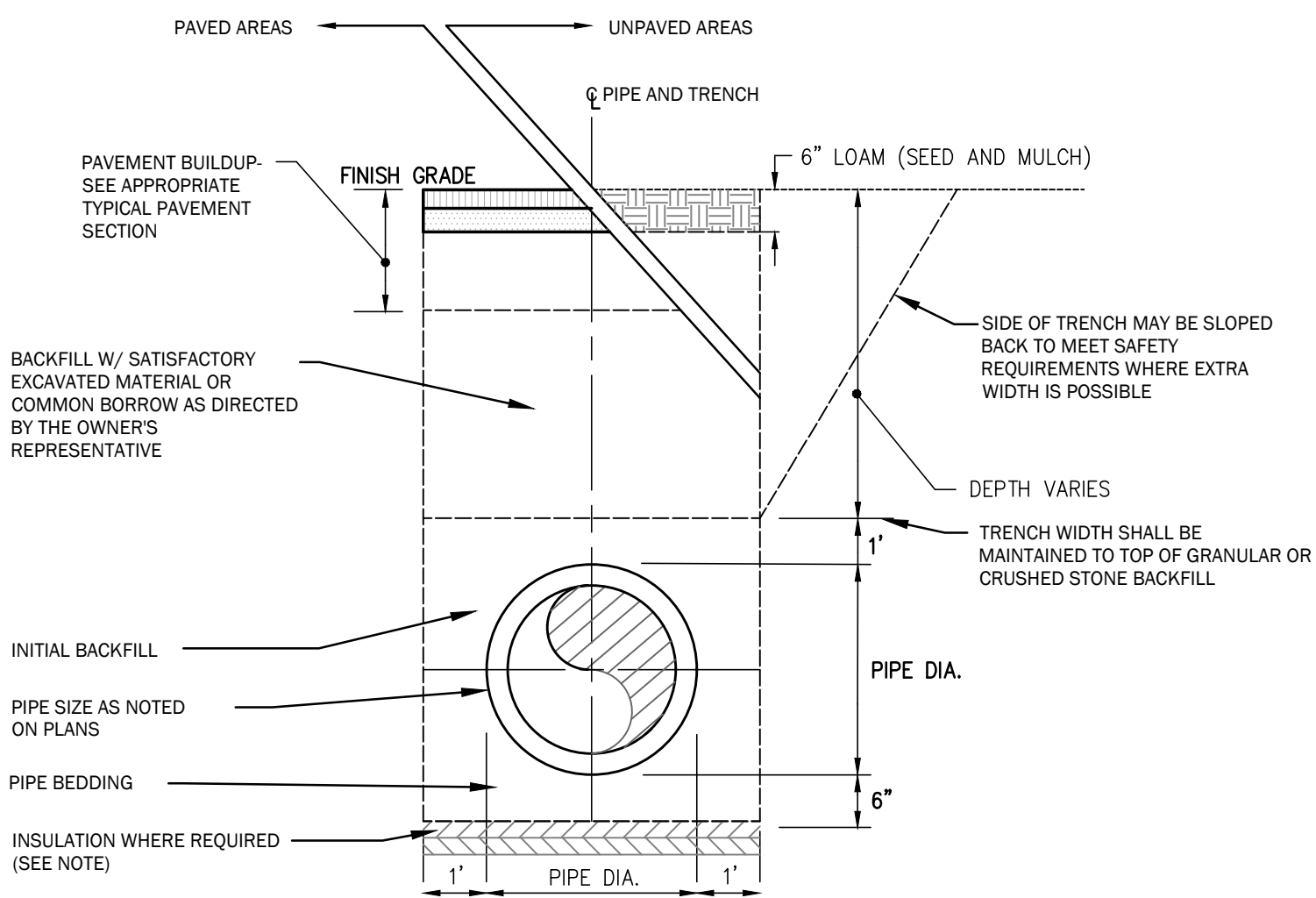
Site Design Associates
Consulting Engineering & Land Planning

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	WETLAND IMPACT PLAN
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: 1" = 40'	DWG. NO. C-304

C:\Users\Site\Desktop\Drawings\21-216-00\21-216-00-03 Wetland Impact Plan.dwg / Date: 12/6/23 / Time: 2:55 PM

Drawing Name: C:\Users\Site\Documents\Drawings\21-216-001_UHE_Connector_Road\Drawings\21-216-001_UHE_Connector_Road.dwg / Title: Dec. 6, 23 / 2:26 PM



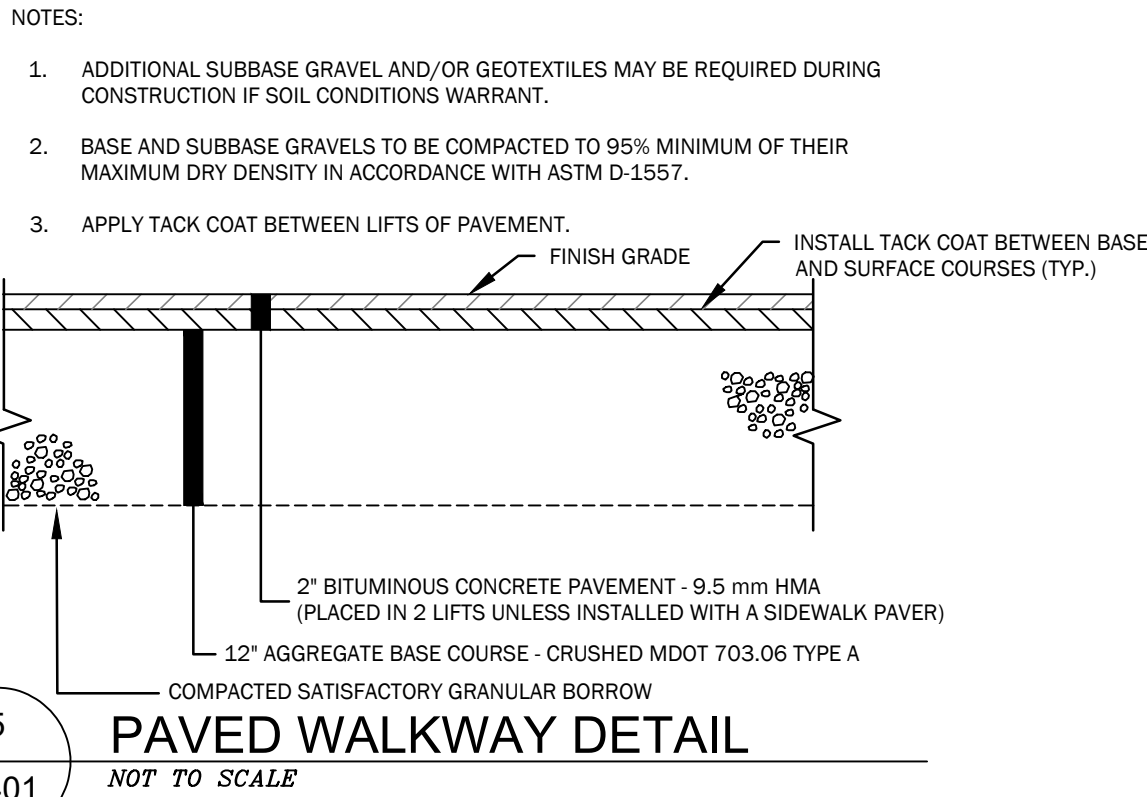
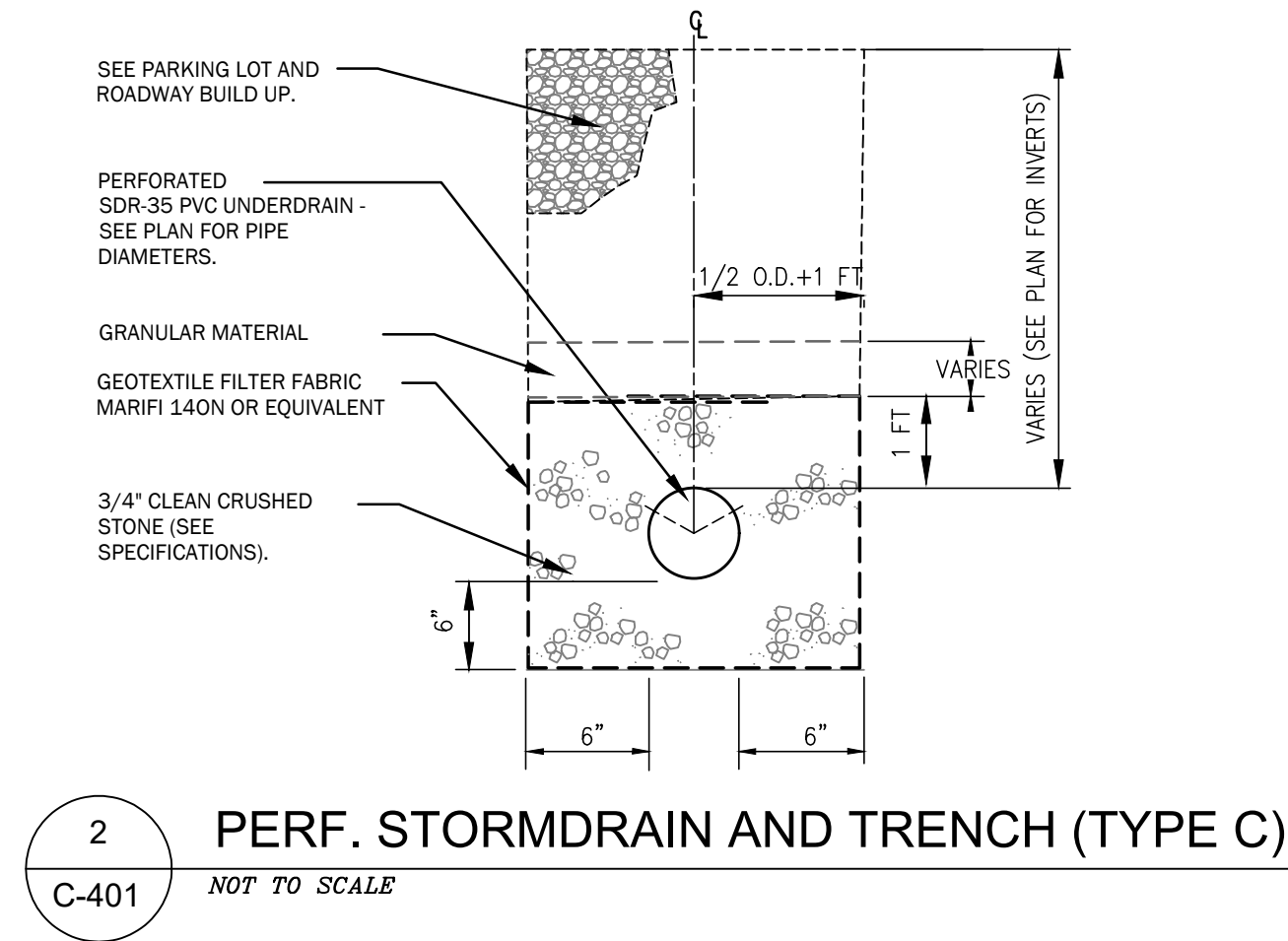
TRENCH BACKFILL SCHEDULE

PIPE MATERIAL	BEDDING MATERIAL	INITIAL BACKFILL	BACKFILL MATERIAL
HDPE	3/4" CRUSHED STONE	3/4" CRUSHED STONE	**EXCAVATED MATERIAL OR GRANULAR BORROW
PVC	SAND	3/4" CRUSHED STONE	**EXCAVATED MATERIAL OR GRANULAR BORROW
CMP	**EXCAVATED MATERIAL OR GRANULAR BORROW	**EXCAVATED MATERIAL OR GRANULAR BORROW	**EXCAVATED MATERIAL OR GRANULAR BORROW
DUCTILE IRON	GRANULAR MATERIAL	GRANULAR MATERIAL	**EXCAVATED MATERIAL OR GRANULAR BORROW

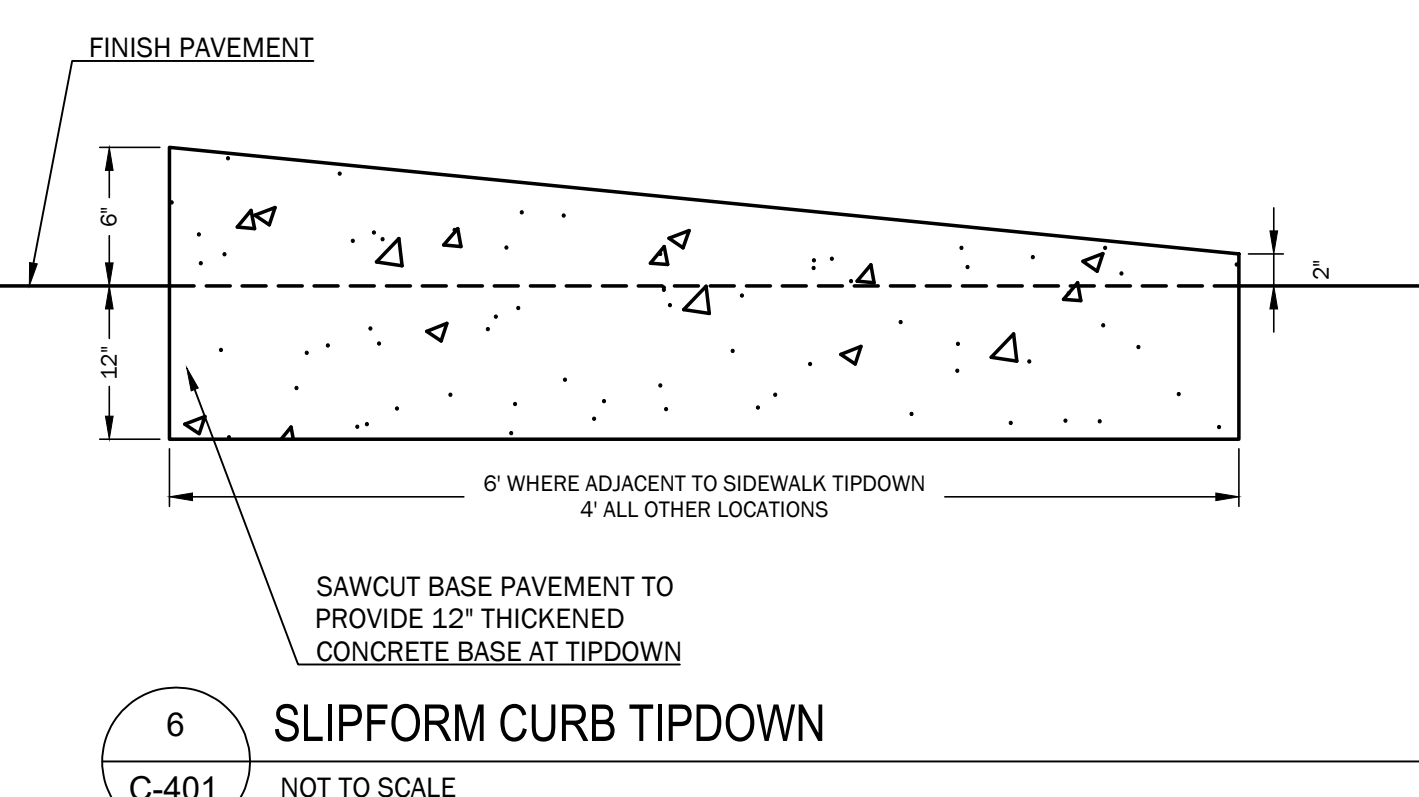
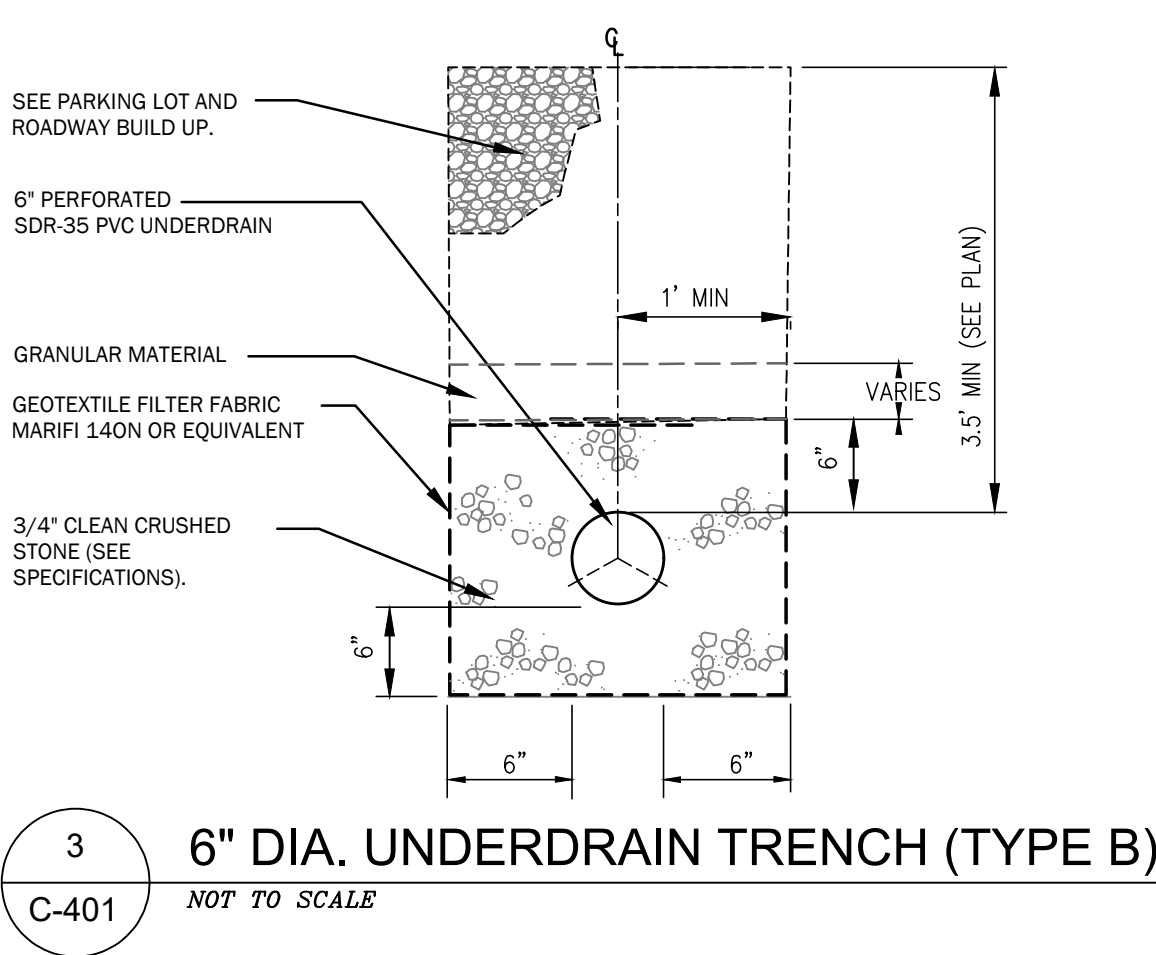
** EXCAVATED MATERIAL MUST BE REVIEWED AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

GRANULAR MATERIAL TO BE SAND OR GRAVEL.

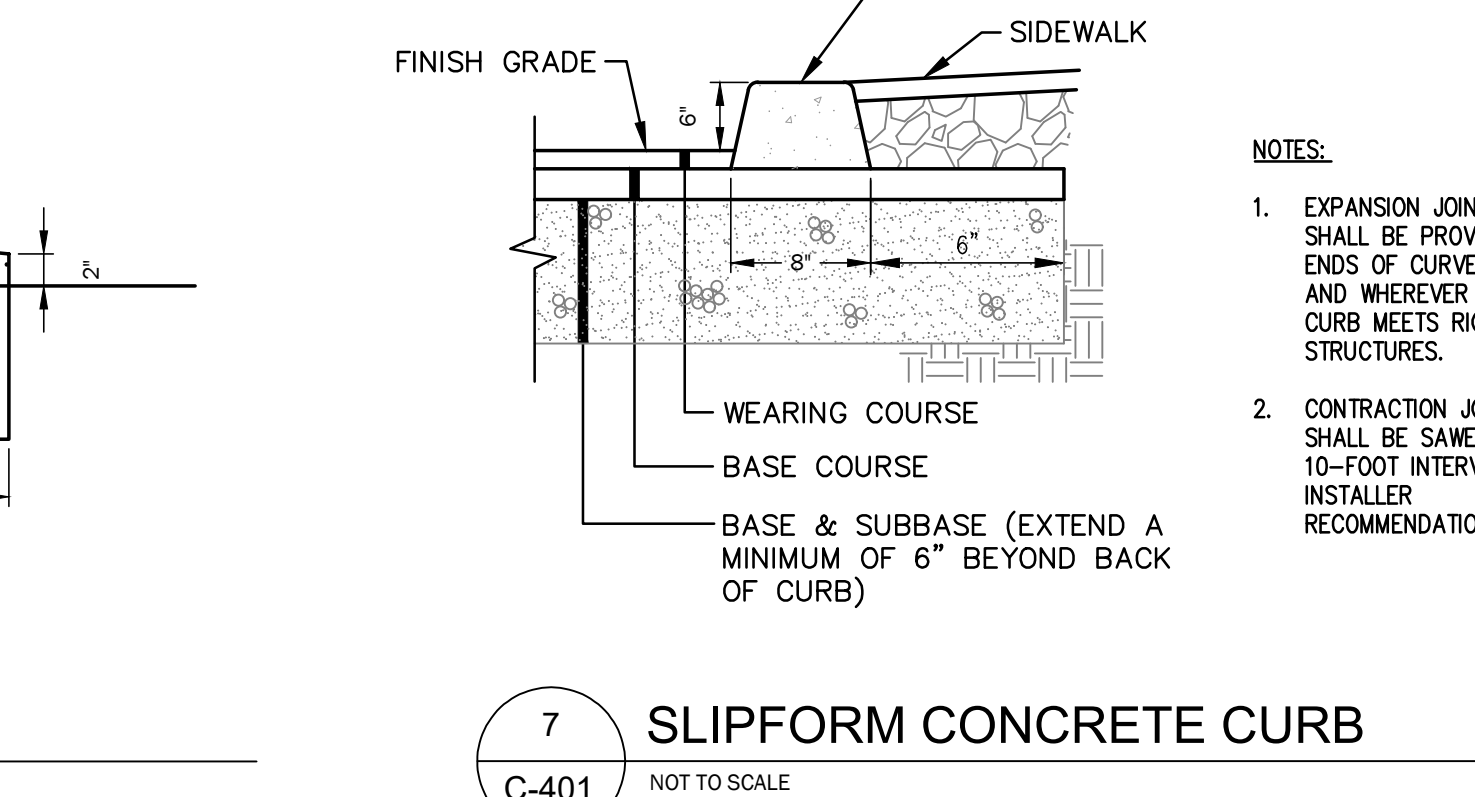
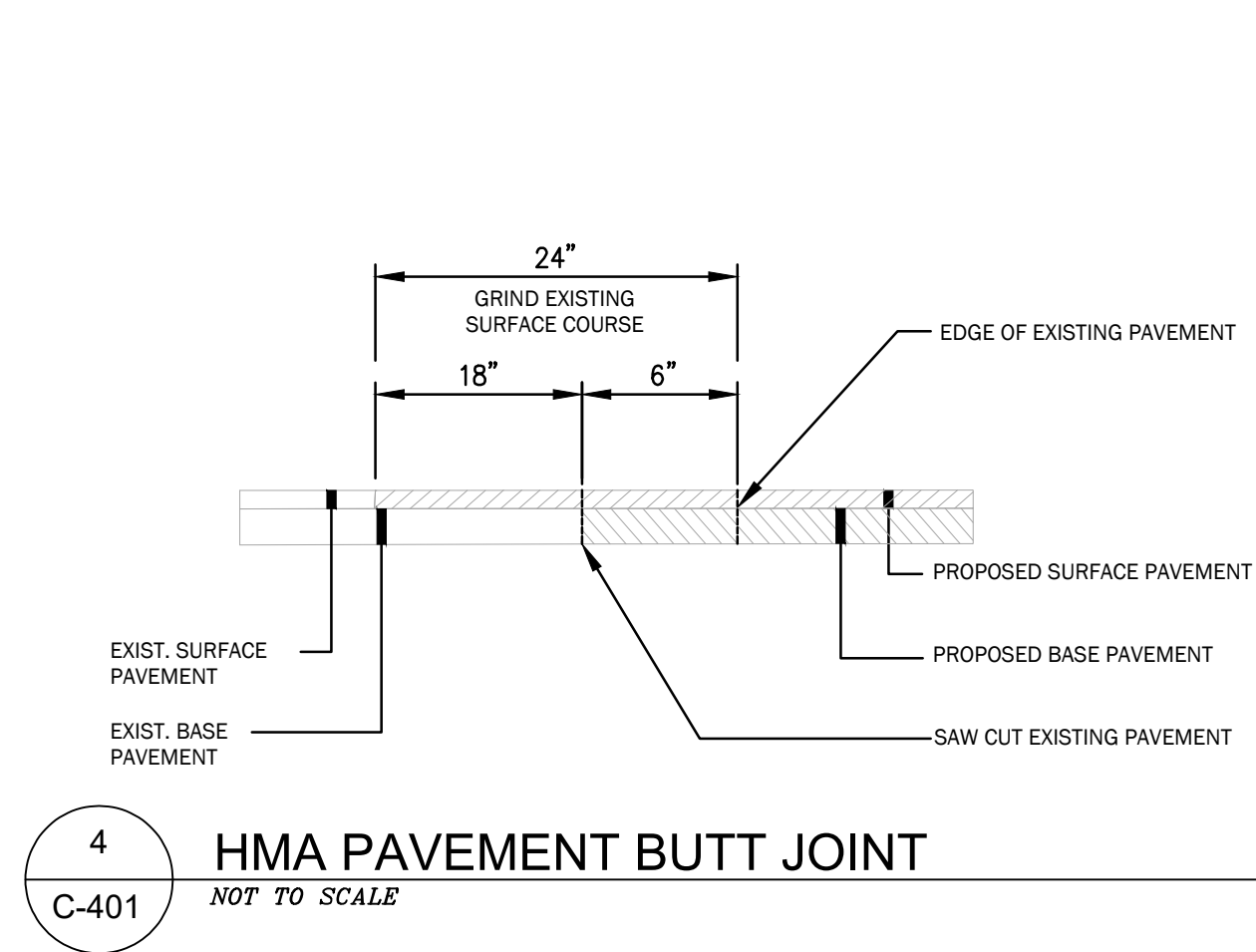
1 TYPICAL TRENCH SECTION
C-401 NOT TO SCALE



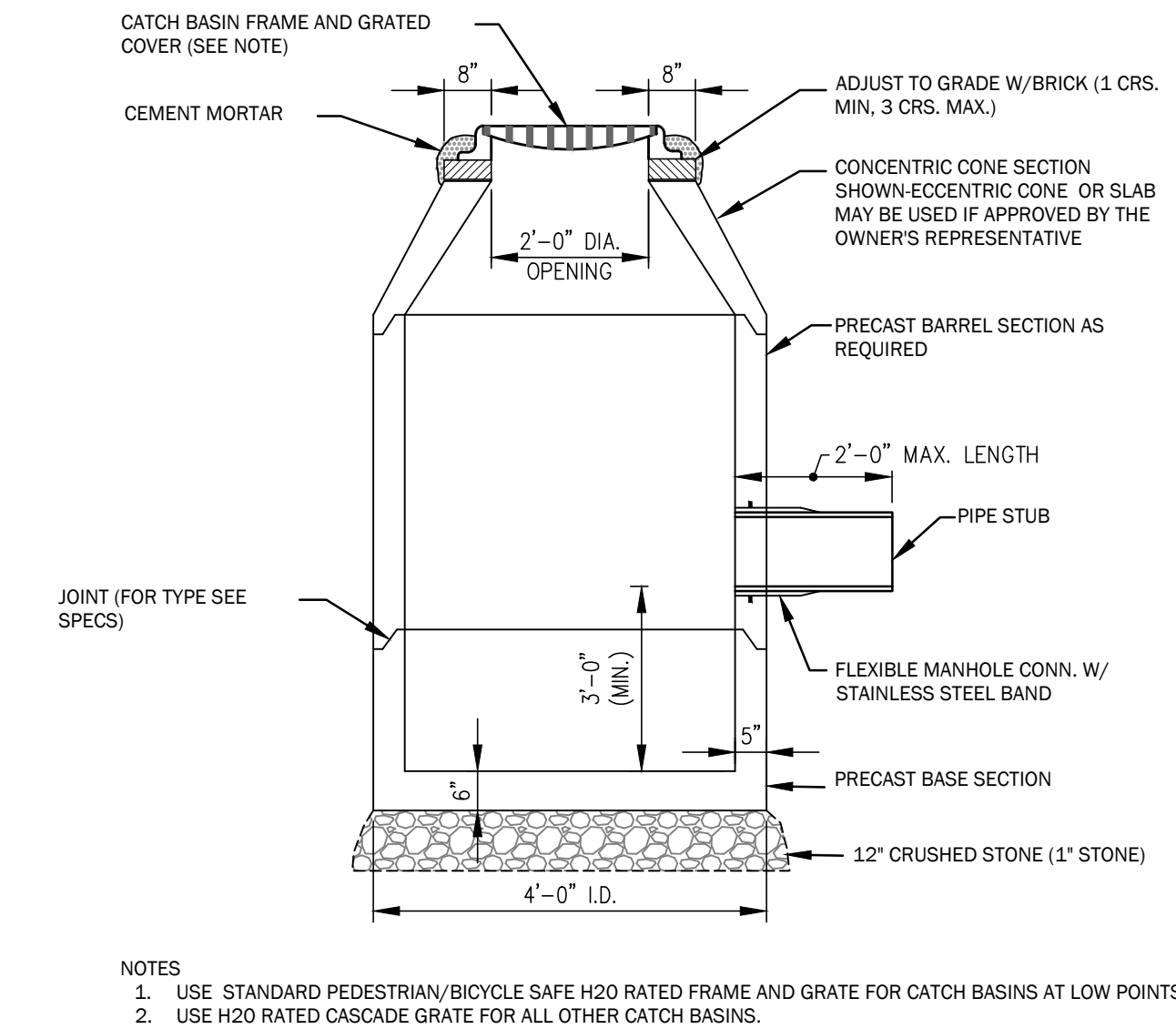
5 PAVED WALKWAY DETAIL
C-401 NOT TO SCALE



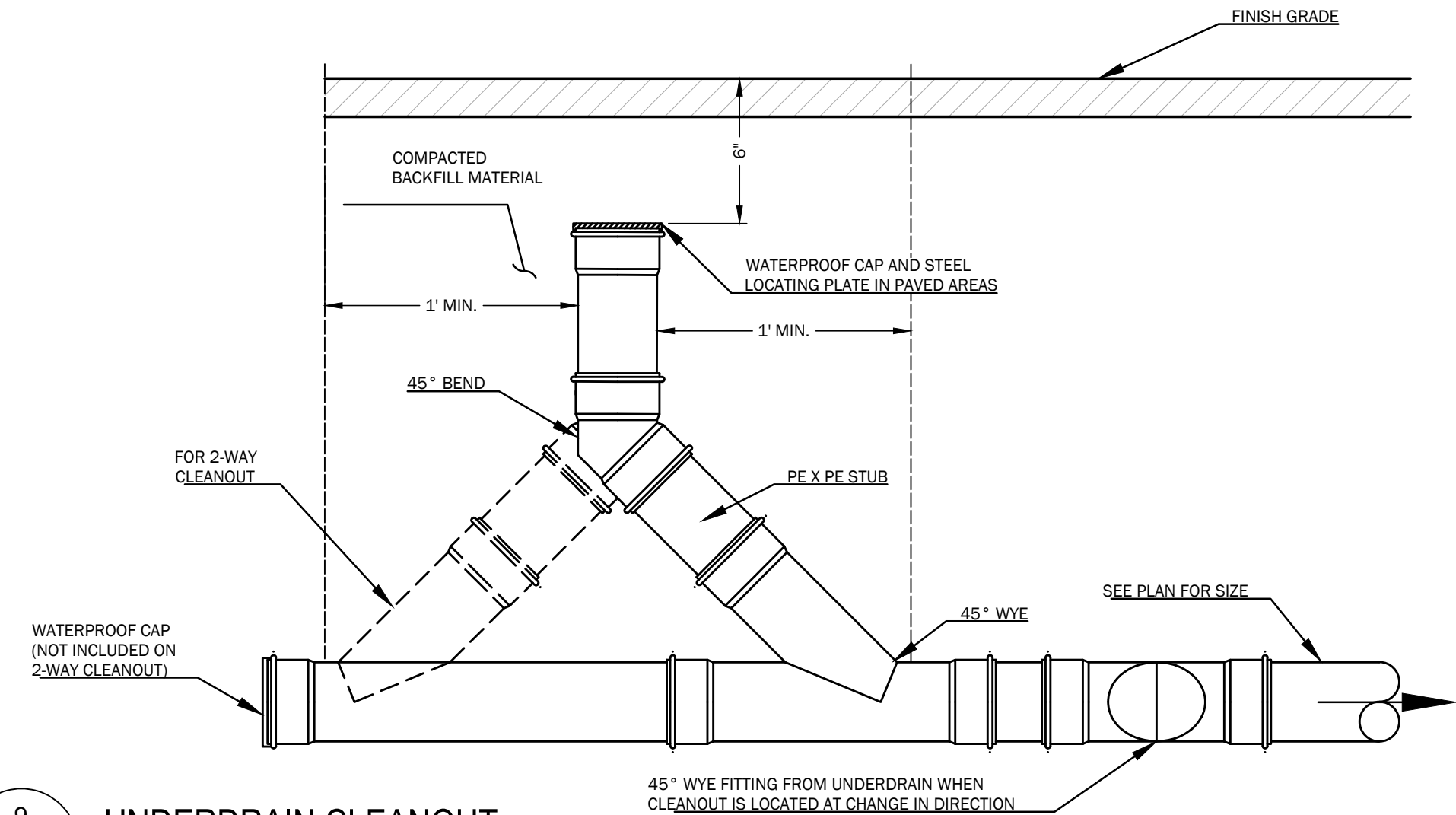
6 SLIPFORM CURB TIPDOWN
C-401 NOT TO SCALE



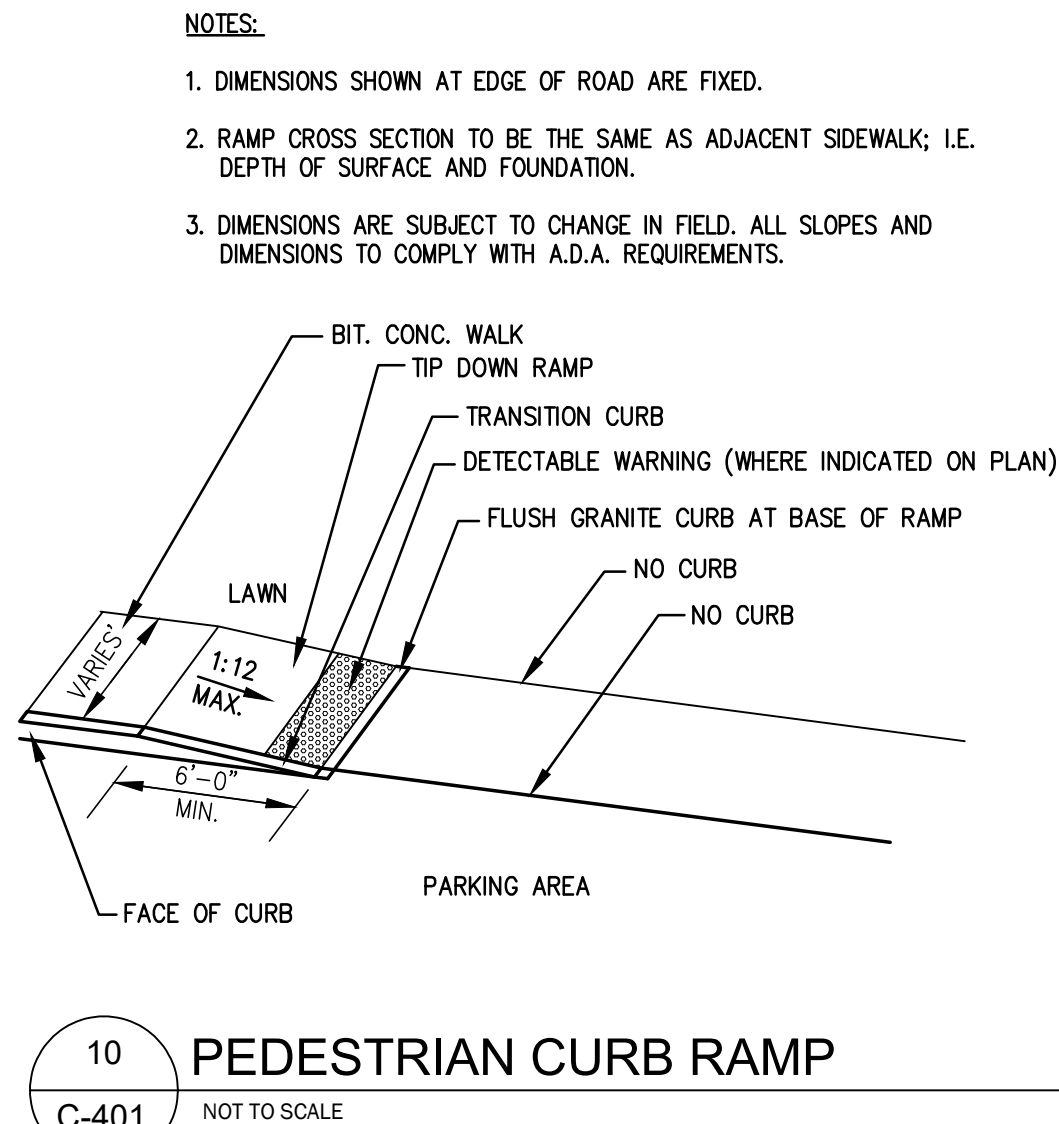
7 SLIPFORM CONCRETE CURB
C-401 NOT TO SCALE



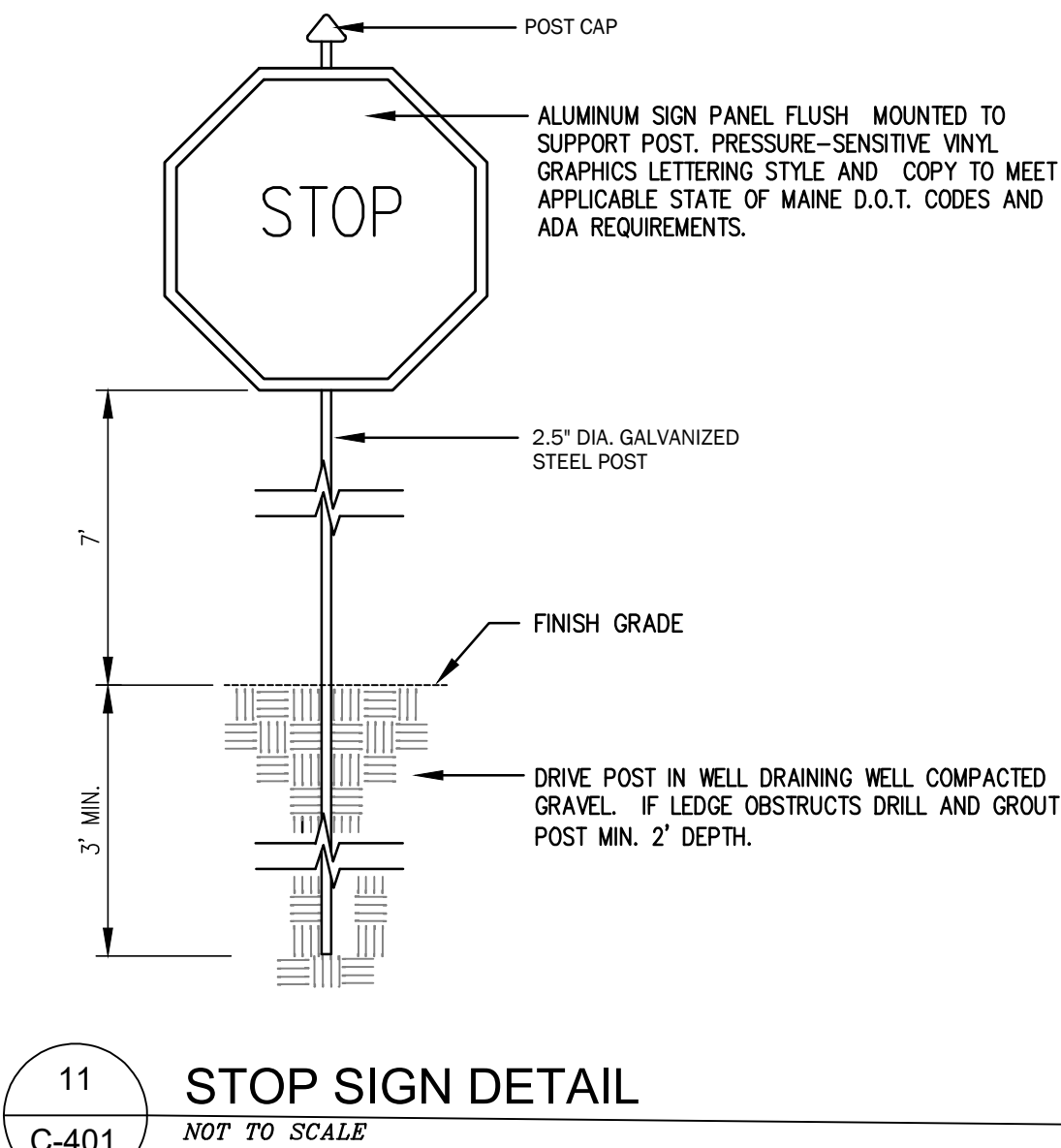
8 CATCH BASIN DETAIL
C-401 NOT TO SCALE



9 UNDERDRAIN CLEANOUT
C-401 NOT TO SCALE



10 PEDESTRIAN CURB RAMP
C-401 NOT TO SCALE



11 STOP SIGN DETAIL
C-401 NOT TO SCALE

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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
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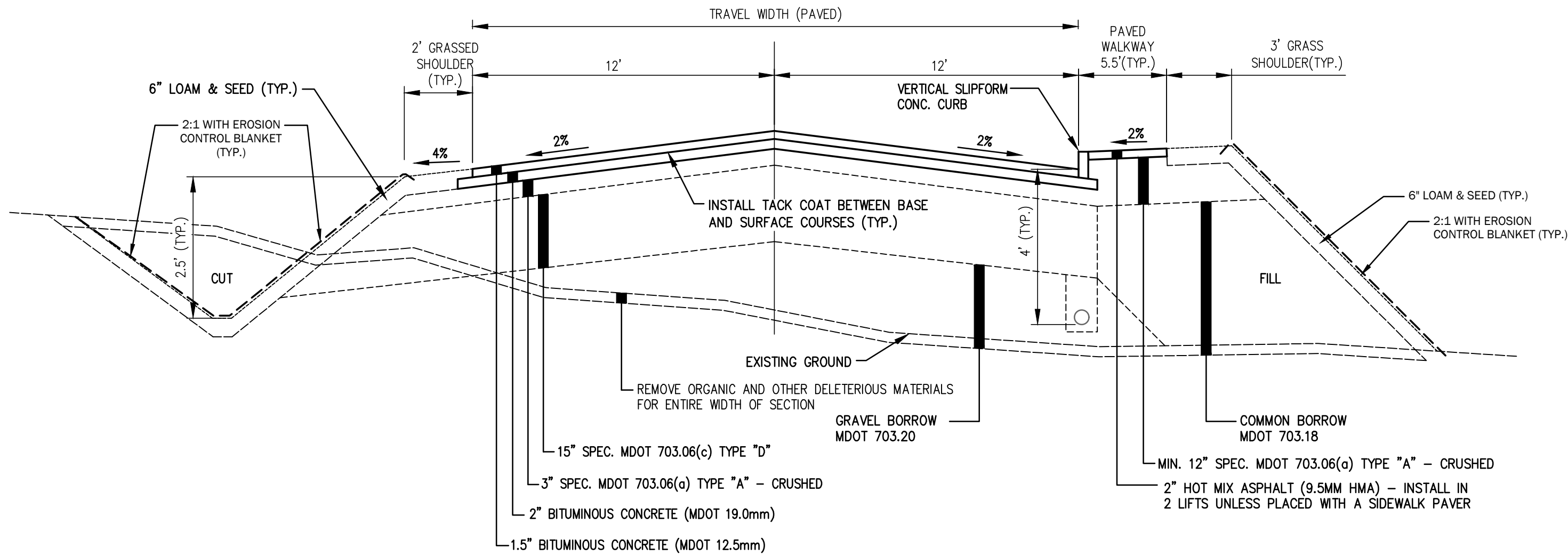


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Consulting Engineering & Land Planning
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11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

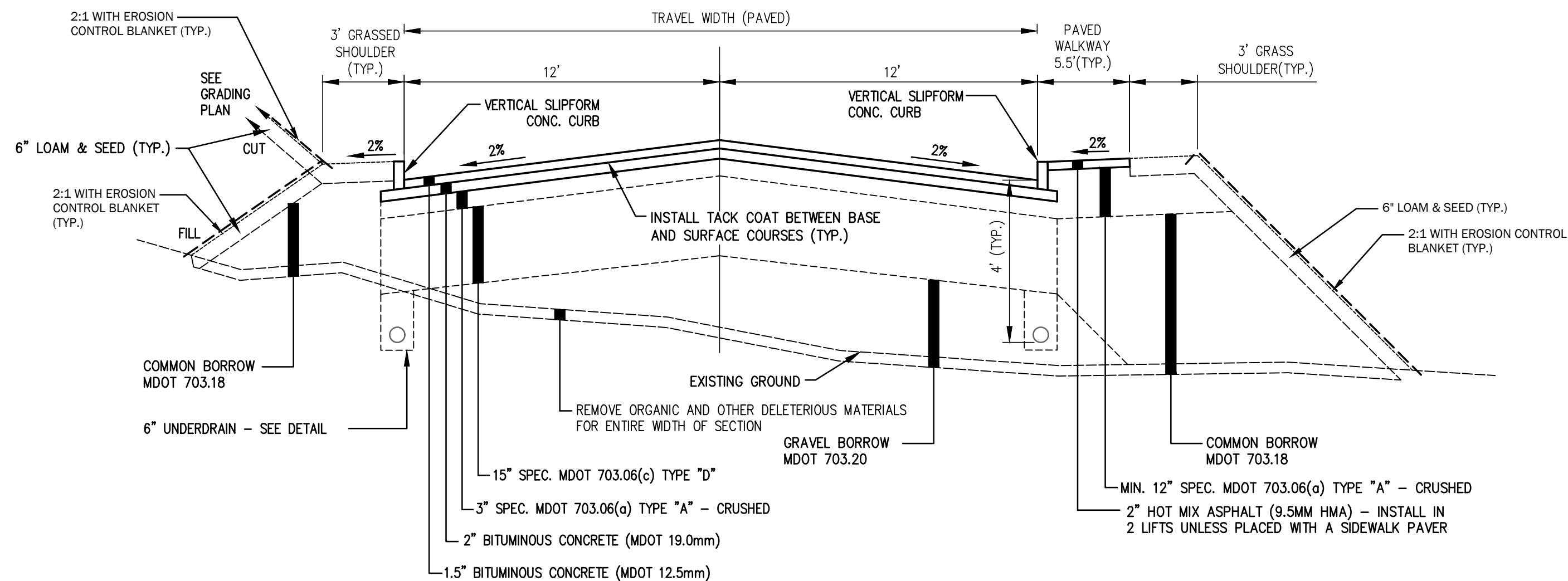
DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	SITE DETAILS
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: AS NOTED	DWG. NO. C-401

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014

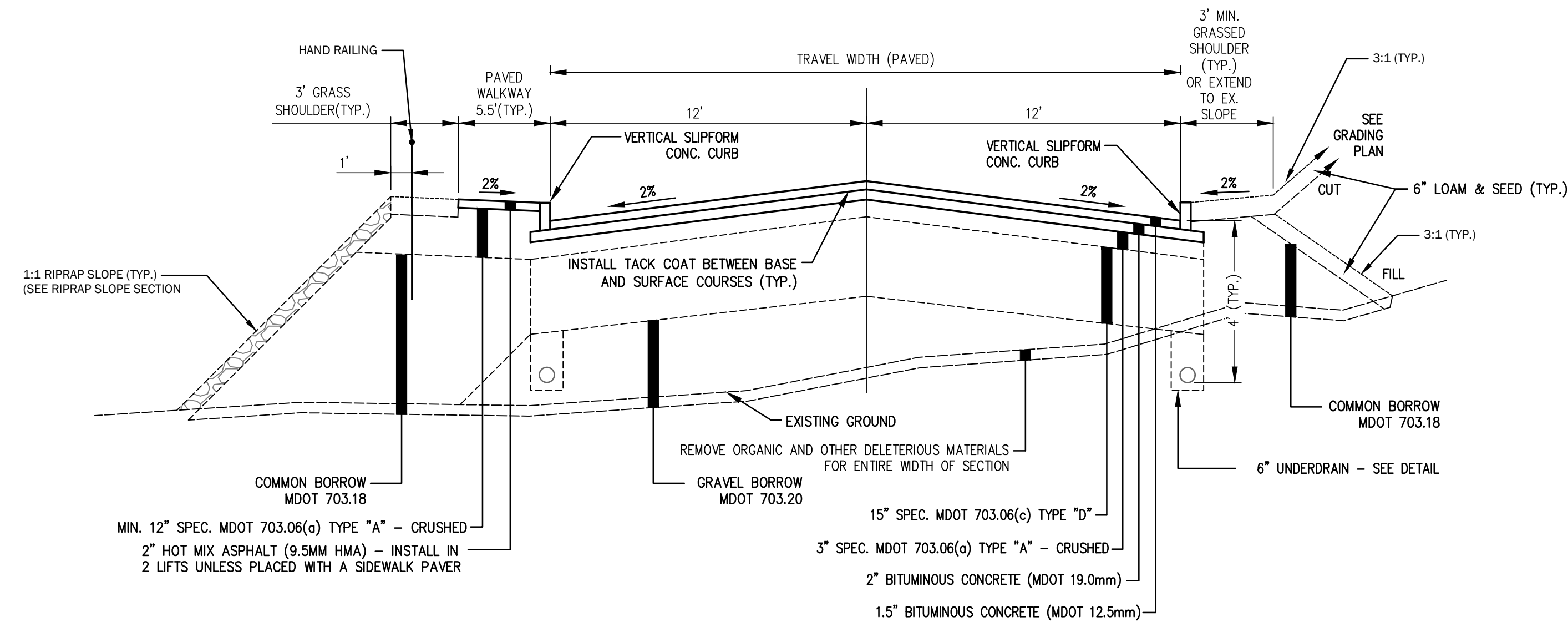
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1 CONNECTOR DRIVE SECTION (STA 4+00 TO 18+40)
C-402 NOT TO SCALE



2 CONNECTOR DRIVE SECTION (STA 18+40 TO 20+87)
C-402 NOT TO SCALE

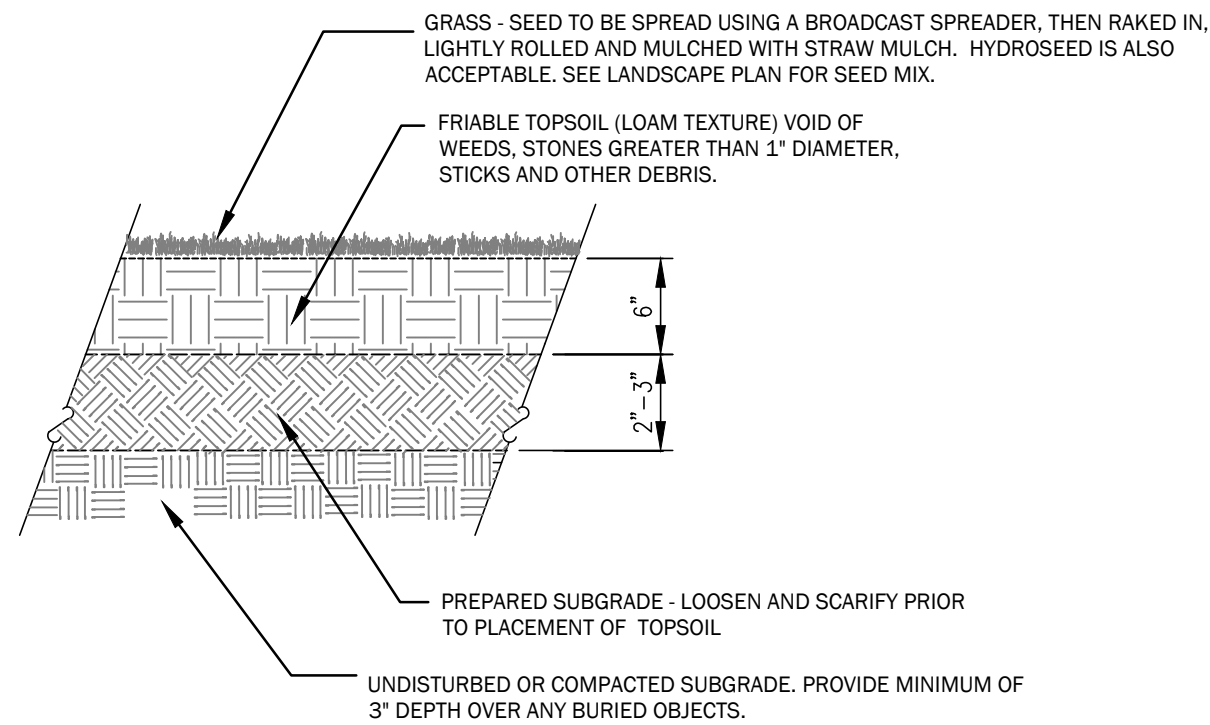


3 COLLEGE STREET EXT. SECTION
C-402 NOT TO SCALE

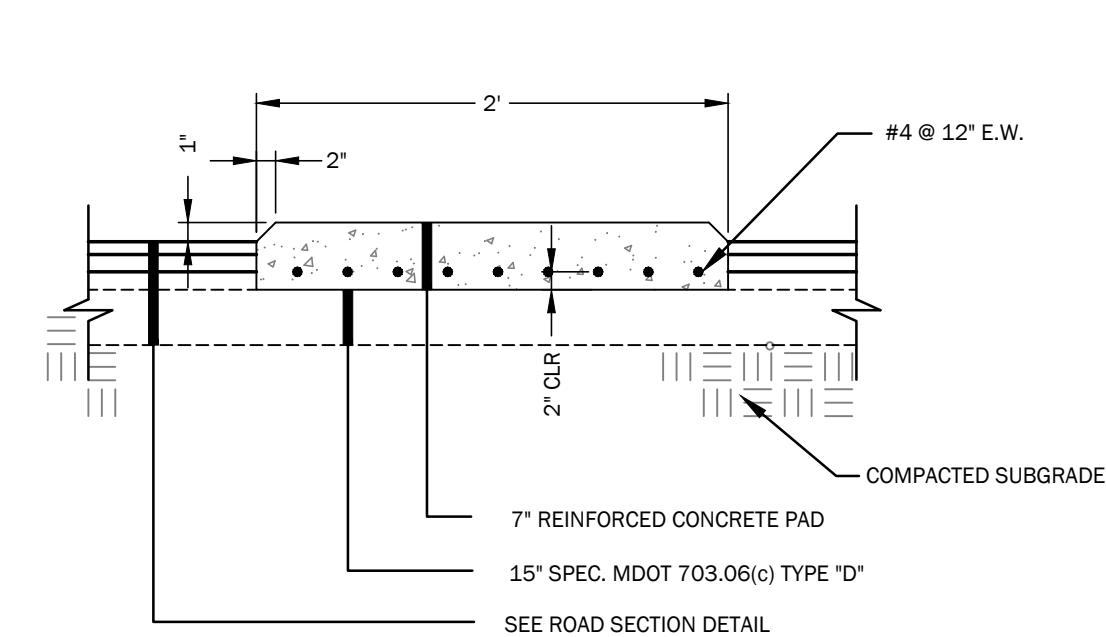
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REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
C	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
B	9/22/2023	FOR DEVELOPMENT REVIEW									
A	2/22/2023	FOR PRICING ONLY - NOT FOR CONSTRUCTION									

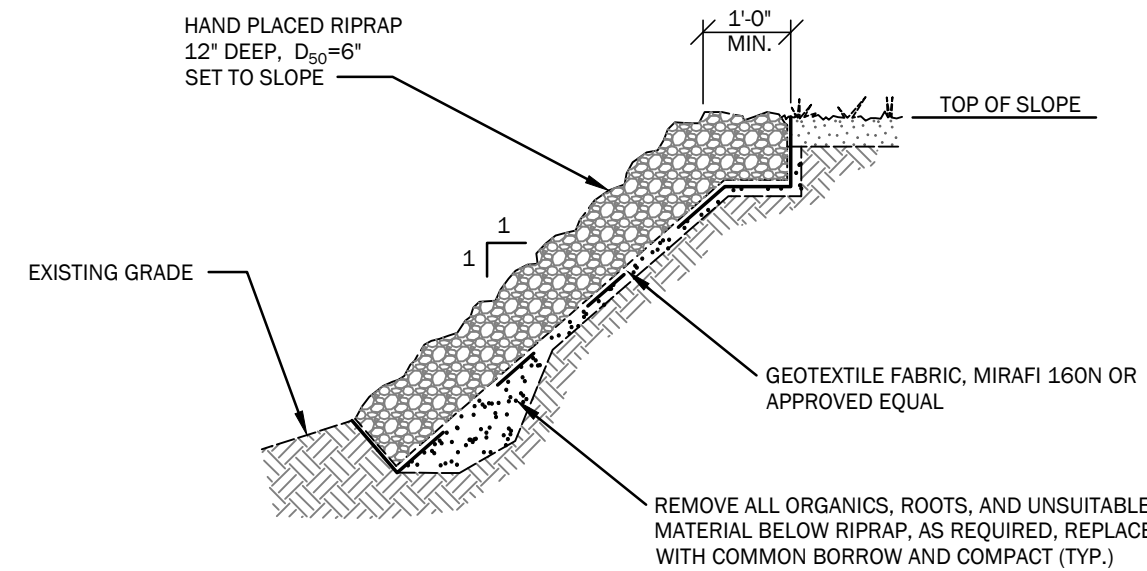
- NOTES:
- THE CONTRACTOR SHALL PROVIDE TOPSOIL (LOAM) MEETING THE FOLLOWING SPECIFICATIONS.
 - NATURAL, FERTILE LOAM TYPICAL OF CULTIVATED TOPSOIL OF THE LOCALITY, CONTAINING NOT LESS THAN 3.5 PERCENT OR MORE THAN 8 PERCENT BY WEIGHT, OF DECAHED-ORGANIC MATTER (HUMUS) AS DETERMINED BY ASTM F1547.
 - OBTAIN FROM A WELL DRAINABLE SITE, FREE OF SUBSOIL, EARTH CLODS, LARGE STONES, STICKS, STUMPS, CLAY LUMPS, ROOTS, OR OTHER OBJECTIONABLE, EXTRANEOUS MATTER OR DEBRIS, SCREEN TOPSOIL TO A MAXIMUM STONE SIZE OF ONE INCH.
 - TOPSOIL SHALL BE FREE OF QUACK-GRASS RHIZOMES, AGROPYRON REPEMS, AND THE NUT-LIKE TUBERS OF NUTGRASS, CYPERUS ESCULENTUS, AND ALL OTHER PRIMARY NOXIOUS WEEDS.
 - TOPSOIL SHALL HAVE A PH OF NOT LESS THAN 6.0 OR GREATER THAN 6.8. AMEND WITH LIME AS REQUIRED.
 - TOPSOIL SHALL HAVE A LOAM TEXTURE CLASSIFICATION. TOPSOIL (LOAM) SHALL CONFORM TO THE FOLLOWING PARTICLE SIZE DISTRIBUTION, AS DETERMINED BY PIPETTE METHOD IN COMPLIANCE WITH ASTM F1632.
 - SAND: 40-60 PERCENT.
 - SILT: 30-40 PERCENT.
 - CLAY: 5-20 PERCENT.
 - DO NOT DELIVER OR USE TOPSOIL WHILE IN A FROZEN OR MUDDY CONDITION.
- IN LIEU OF PROVIDING AND FOLLOWING THE SOIL ANALYSIS REQUIRED IN NOTE 1 ABOVE THE CONTRACTOR CAN INSTEAD ELECT TO INCORPORATE THE FOLLOWING INTO THE TOP 6 INCHES OF TOPSOIL: 20 LBS. OF 10-20-10 FERTILIZER PER 1,000 S.F., 70 LBS. OF MAGNESIUM LIME PER 1,000 S.F., AND 3 CUBIC YARDS OF COMPOST PER 1,000 S.F.



4 LAWN INSTALLATION DETAIL
C-402 NOT TO SCALE

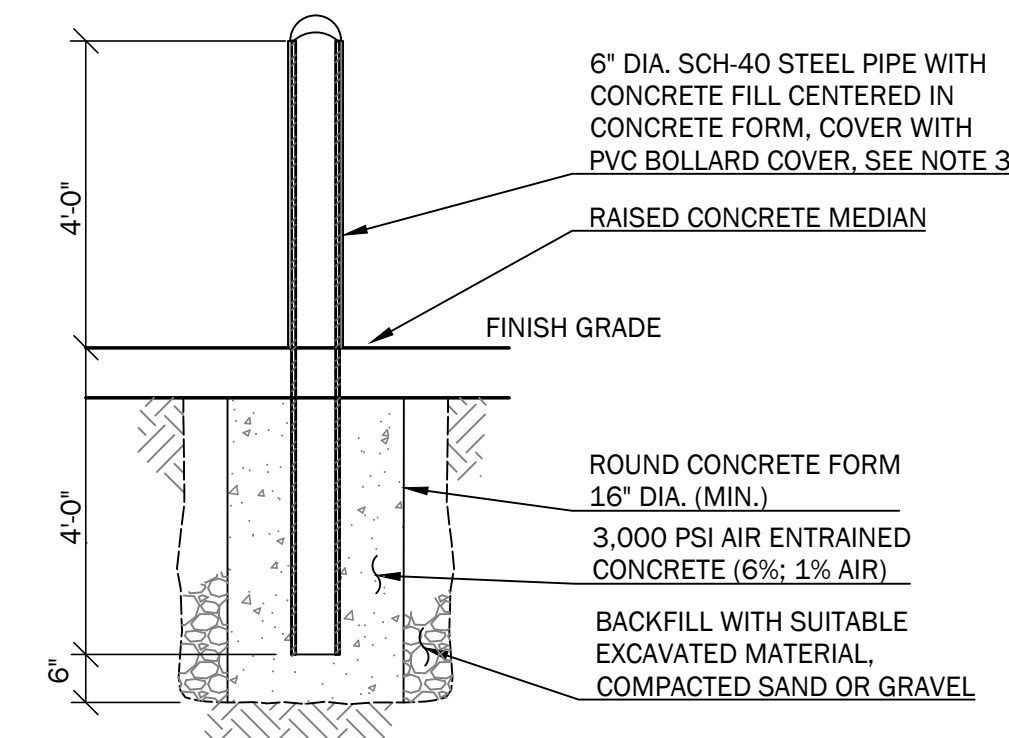


5 RAISED CONCRETE MEDIAN
C-402 NOT TO SCALE



6 RIPRAP SLOPE SECTION
C-402 NOT TO SCALE

- NOTES:
- PRIOR TO PLACING BOLLARD IN FORM, PAINT BOLLARD WITH A "RUST INHIBITIVE" STEEL PRIMER EQUAL TO RUSTOLEUM 7769 RUSTY METAL PRIMER OR 7780 CLEAN METAL PRIMER AS APPROPRIATE AND 1 COAT OF RUSTOLEUM TOP COAT OR SHERWIN WILLIAMS "RUST TOUGH" PRIMER, AND 1 TOP COAT OF SHERWIN WILLIAMS "SUPER PAINT".
 - SUPPORT BOLLARD FROM ABOVE GROUND PRIOR TO PLACING CONCRETE IN THE ROUND CONCRETE FORM. DO NOT SUPPORT VERTICALLY WITH AN OBJECT PLACED IN THE FORM.
 - ONCE INSTALLED, COVER WITH A POLYETHYLENE SLEEVE EQUAL TO THAT MANUFACTURED BY EAGLE, TRIMMED TO FIT BOLLARD HEIGHT SPECIFIED. COLOR TO BE SELECTED BY OWNER. SUBMIT COLOR SAMPLES.



7 STEEL BOLLARD DETAIL
C-402 NOT TO SCALE



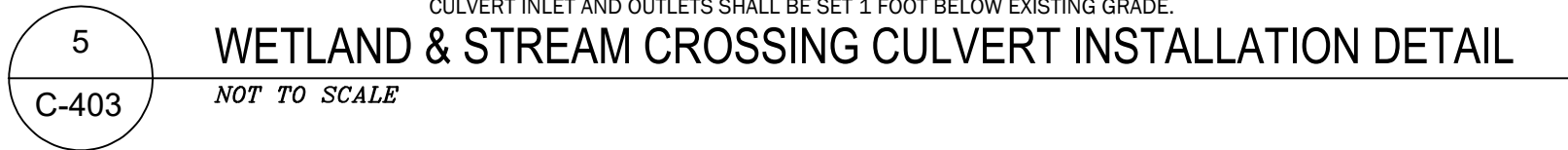
Site Design Associates
Consulting Engineering & Land

Planning
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275

CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.	PROJECT: CONNECTOR DRIVE
DRAWN: DEPT.	83 COLLEGE STREET, PORTLAND, MAINE
CHKD: TWS	SITE DETAILS
DATE: SEP. 2023	PROJ. NO. 21-216-00
SCALE: AS NOTED	DWG. NO. C-402

TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014



TAX	MAP I.D.
291	A001
291	A005
290	A003
145	B014

[illegible]

Site Design Associates

Consulting Engineering and Land Planning

December 12, 2023

Maya Balassa, Planner
City of Portland
Via email

**RE: University of New England
Major Site Plan Application for:
Connector Drive
PL-002666-2023
83 College Street
Responses to November 1 Staff Comments**

Dear Maya;

On behalf of University of New England (UNE), Site Design Associates (SDA) is pleased to provide this response to review comments provided by the city staff in your November 1, 2023 review memorandum. We have listed each of your “red” comments in the order they were presented followed by our responses.

1. Additional submissions requested:

Comment: *The address on Energov says 716 Stevens Ave. The documents and site plans utilize 83 College Street. Please alter the application materials to have a single address across*

Response: The city GIS mapping and assessor records refer to the majority of the parcel as 83 College Street. For some reason, the city staff set up the EPlan directory with the 716 Stevens Ave address. Please advise on how this will be handled.

2. Access and circulation:

Comment: *Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road.*

Response: A striped bike lane will not be included. The pavement markings will include sharrows laid out in accordance with the MUTCD per the attached memo from Diane Morabito, the traffic engineer.

Comment: *To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet.*

23 Whitney Way Topsham, Maine 04086
Phone: (207) 449-4275 email: info@sitedesignassociates.biz

Response: Please see the attached memo from the traffic engineer recommending that the 24 ft width be maintained. A NRPA Tier 1 permit has been issued by DEP for the wetland impacts. A copy of this permit is attached.

Comment: *Please clarify who specifically will have gate card access.*

Response: UNE's students, staff, and faculty will have gate access.

Comment: *The Bishop Street driveway is to remain in place and gated. While the city supports a pedestrian/bicycle connection, we would suggest that the curb cut be closed.*

Response: The plans have been revised to show a reduction in the Bishop Street curb cut length to 10 ft, while maintaining access for cyclists and pedestrians. We decided on 10 ft for shared bicycle and pedestrian access. We hope this satisfactorily addresses this comment.

3. Landscape Preservation:

Comment: *Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.*

Response: Please see the attached memo from the traffic engineer recommending that the 24 ft width be maintained. A NRPA Tier 1 permit has been issued by DEP for the wetland impacts. A copy of this permit is attached.

Comment: *This survey indicates areas with tree canopy cover but not tree locations, size and species information. Per the City's Technical Manual Chapter 4.3.1, the survey should identify location, size and species of all existing trees 10" diameter at breast height (DBH) or greater on the site. Given the predominantly wooded nature of the project site, it is acceptable for the applicant to identify only trees proposed to be removed as part of this project, noting the size (in DBH) and species information for existing trees 10" DBH or greater.*

Response: Existing trees 10" DBH or over to be removed are now shown on the plans.

Comment: *The existing site has some notable patches of Japanese Knotweed. The applicant shall follow the requirements laid out in Technical Manual section 4.7.4 for the containment and removal of invasive plants in the limit of work to prevent*

them spreading into newly disturbed ground.

Response: A note has been added to the plans to address this comment.

Comment: *For existing trees being preserved that are adjacent to the limit of work, the applicant shall follow tree protection requirements described in Technical Manual chapter 4.3 and tree preservation detail IV-2*

Response: A note has been added to the plans to address this requirement.

Comment: *Areas around the carriage road that are being cleared of trees due to grading shall be replanted with native straight species trees and exposed soil shall be covered with undyed wood mulch and/or seeded with native shade-tolerant seed mixes where appropriate.*

Response: A landscape plan has been prepared to address this comment. Areas along the proposed carriage road which are proposed to be cleared of trees and provide a large enough area for replanting will be replanted with Sugar Maple saplings. These areas are primarily on 2:1 and 3:1 slopes. To enable a rootball to be planted on these slopes we are proposing ½" caliper saplings which will have a rootball approximately 12 inches in diameter x 9" deep. A tree planting detail showing a planting on a slope is provided on the Landscape Plan.

The slope areas are called out to be mulched with a 5" layer of erosion control mix as distributed by Casella Organics or approved equivalent. This layer of mulch will stabilize and protect the soil, and allow the saplings to establish themselves prior to competition from other plants.

4. Site Landscaping and Buffers:

Comment: *The area where gravel is being removed is currently proposed to be covered with loam and reseeded with "park mix" grass seed. The area in question is surrounded by woodland and is partly shaded. City staff suggest selecting a seed mix that is composed of native part shade- tolerant forbs that will fit into the woodland setting. The park mix grass seed is more appropriate for maintained lawn areas than forested woodlands.*

Response: A landscape plan has been prepared to address this comment. Open areas and the proposed swales are to be seeded with New England Erosion Control/Restoration Mix for Detention Basins and Wet Sites. This mix contains a selection of native grasses and wildflowers designed to colonize generally moist, recently disturbed sites where quick growth of vegetation is desired to stabilize the soil. The plants in this mix can withstand moist, infrequently inundated sites as well as some shade. These areas will be mowed no more than two times per year to keep woody vegetation out.

Comment: *There are at least three existing footpaths/trails that connect to the carriage road which are not currently represented on the plans. Please locate the existing trails on the site plan and ensure the pathway connections are being maintained or improved as part of the carriage road improvement project. At least one of the trails is heavily used by pedestrians as a connection between Evergreen Cemetery and the UNE campus.*

Response: The existing trails are now shown on the drawings and Portland Trails confirmed the locations are accurate. We have discussed the access with Portland trails, and they have confirmed the locations are accurate. Our discussions with them continue in regards to potential signage.

5. Water Quality, Stormwater management, and Erosion Control:

Comment: *Overall SLOD – Additional clarity is needed on the area that is intended to be covered by the SLOD Application. As was noted on previous application reviews that highlighted the need for the SLOD permit, looking at the entire site as one is advantageous, allowing for treatment to be accounted for across the site to meet the required standards. The Applicant is proposing to do that here, but additional information is needed. The figures provided show the redevelopment evaluation of the Intermodal Transportation Facility and Connector Drive to determine the amount of treatment that will be required per the MaineDEP standards for redevelopment. The ultimate stormwater management scenario includes systems located within this area, but also a system within the Center for Health Sciences. As I understand the analysis, the Center for Health Services project area is not included as part of the SLOD calculations.*

Response: That is correct. The HBACHS project was completed before the campus exceeded the SLODA thresholds. Therefore, the HBACHS portion of the project is not included in the SLODA stormwater treatment calculations. The soil filter in the HBACHS area (SF1) that receives runoff from the new Connector Drive was oversized when it was originally designed/constructed to accommodate this future anticipated runoff from the Connector Drive. Calculations are provided on Table 2 within the stormwater management report showing that SF1 is properly sized to treat the additional runoff from the Connector Drive project. The HBACHS columns in Table 2 are only to indicate proper sizing of SF1. As indicated in the table the HBACHS areas are not included in calculating the general/redevelopment standards.

Comment: *As noted, our understanding of the project intent is that treatment from both the Intermodal Transportation Facility and the Center for Health Sciences is to be counted towards the requirement for the Connector Drive. Detail on the Intermodal Transportation Facility is included, but it is unclear how the Center for Health Sciences site's design fits into the area/treatment calculations.*

Response: As indicated in the report and Table 2, only the ITF and the Connector Drive projects are included in the general/redevelopment calculations for the city and the SLODA requirements for this project.

Comment: *The applicant shall prepare easement documents for the proposed expanded easement associated with the extension of the City's 36" Bishop Street storm-water outfall and provide information/details of how the existing 36" RCP pipe will be extended.*

Response: We will draft easement documents to address this comment. We are hopeful this could be considered as a staff recommended condition of approval.

Comment: *The applicant shall submit DEP permits for the proposed stream crossings and wetland impacts for review as part of this site plan review.*

Response: A copy of the NRPA permit for wetland impacts is attached. A NRPA PBR notification was filed with the NRPA application on September 23.

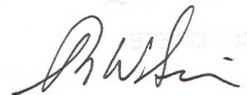
6. Exterior Lighting:

Comment: *The photometric plan shows a maximum foot-candle of 6.3 and an average foot-candle of 2.3 in the stat zone. The maximum foot-candle allowed is 5 for this use, with an average of 1.25. Please adjust the lighting plan to meet this standard.*

Response: A revised photometric plan which demonstrates compliance with this standard is included.

In closing, we would be happy to meet with staff and consultants to discuss any items which may require further clarification if necessary. If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,
Site Design Associates



Tom Saucier, P.E.
President

c: Andrew Philippe, Director for Campus Planning

November 14, 2023

Mr. Tom Saucier, P.E.
Site Design Associates
23 Whitney Way
Topsham, Maine 04086

RE: RECOMMENDATIONS FOR UNE CONNECTOR DRIVE

Dear Tom,

As requested, I have reviewed the comments issued by the City of Portland regarding the proposed connector drive on the UNE campus. This drive will connect the Bishop Street Intermodal Transportation Facility (ITF) to the core campus and College Street Extension. The currently proposed driveway is 24' wide with a 5' raised sidewalk. Some of the City comments and questions regarding this proposed cross section are as follows:

- Please clarify if this project will have a striped bike lane? The applicant shall provide documentation on how bicycle traffic will be accommodated on the proposed road.
- To minimize wetland impacts, we support reducing travel lane widths from 12 feet to 11 feet.
- Planning and Parks are strongly in support of narrowing the proposed roadway as much as possible to limit the degree of site disturbance and tree removal required. In particular, widening the road at the College Street extension as currently shown results in extensive tree clearing to be replaced with bleak expanses of rip-rap 1:1 slopes. Narrowing the carriage road to 22' with a 5' sidewalk allows for more limited clearing and regrading and could support slower speeds through this short shuttle connection to the multi-modal parking lot.

Sewall has reviewed the above City comments and the Connector Drive plans, prepared by Site Design Associates, dated 9/22/2023.

The proposed drive section is to provide for both motor vehicles and bicycles since the 5' sidewalk cannot provide for both pedestrians and bicycles. The generally recommended minimum width for a multiuse path is 10'. A 10' multiuse path and a 22' wide travel way would result in a greater width of 32' with greater environmental impacts. Since 5' is generally considered the minimum sidewalk width, the proposed drive must provide for both bicycles and motor vehicles. For this reason, Sewall recommends that the 24' width be maintained. According to the AASHTO "Guide for the Development of Bicycle Facilities, 2012, Fourth Edition", roadways that have low volumes and low

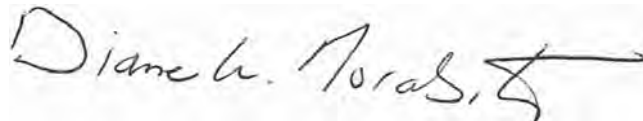
speeds are generally suitable for shared lanes. The guide indicates that roadways with lane widths of 13' or less require that motorists will encroach into the opposing lane to pass a bicyclist. By maintaining a 12' lane width this encroachment will be minimized. Given that motorists and bicyclists will be sharing the same lane, it is recommended that the drive be marked with sharrows, which are used to indicate a shared lane facility. This will alert drivers to the presence of bicyclists and the narrow lanes. Sharrows are typically used on roadways that are too narrow to provide separate marked bike lanes.

I also recommend that a "Bicycles May Use Full Lane" sign be placed on either end of the connector drive to supplement the sharrow markings.

Please don't hesitate to contact me if you or the City of Portland have any questions or need any additional information regarding my recommendations.



Sincerely,

A handwritten signature in black ink that reads "Diane W. Morabito" followed by a stylized flourish.

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

UNIVERSITY OF NEW ENGLAND	) NATURAL RESOURCES PROTECTION ACT
Portland, Cumberland County	) FRESHWATER WETLAND ALTERATION
CONNECTOR DRIVE	) WATER QUALITY CERTIFICATION
L-30525-TC-A-N (approval)	) FINDINGS OF FACT AND ORDER

Project Description: The applicant proposes to alter 11,187 square feet of forested, emergent and scrub shrub wetlands. The applicant proposes to reconstruct an existing connector drive between the University of New England's Intermodal Transportation Facility and the main campus as shown on a plan titled "Connector Drive," prepared by Site Design Associates, and dated September 2023. The reconstruction project includes an effort to increase the safety of the connector drive by installing sidewalks and call boxes as well as widening the existing drive to two 12-foot travel ways. The applicant has avoided and minimized wetland impacts to the greatest extent practicable by locating the reconstructed connector drive in the same location as the existing connector drive wherever possible. One section of the connector drive will be relocated so that it connects directly to the intermodal transportation facility rather onto a public street as it does currently. The side slopes of the connector drive will be increased from the standard 3H:1V slope to the maximum slope of 2H:1V to minimize wetland impacts. According to the Department's Geographic Information System (GIS), there are no mapped essential or significant wildlife habitats associated with the project site. The proposed project is located off College Street in the City of Portland.

Permit for: ☒ Tier 1
DEP Decision: ☒ Approved ☐ Denied (see attached letter)

Please note: A U. S. Army Corps of Engineers permit may also be required for your project. The Corps typically accepts a copy of your Maine DEP NRPA application, but you are responsible for submittal to the Corps. We encourage you to contact them directly at cenae-r-me@usace.army.mil or (207) 623-8367 to discuss their application process. Please note that no regulated work within Corps jurisdiction may be started until you receive a Corps permit.

Standard Conditions:

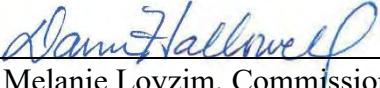
- 1) If construction or operation of the activity is not begun within four (4) years from the date signed, this permit shall lapse and the applicant shall reapply to the Department for a new permit. This permit is transferable only with prior approval from the Department. If the activity is associated with a larger project, starting any aspect of that project constitutes start of construction.
- 2) The project shall be completed according to the plans in the application. Any change in the project plans must be reviewed and approved by the Department.
- 3) Properly installed erosion control measures shall be installed prior to beginning the project, and all disturbed soil should be stabilized immediately upon project completion.

- 4) A copy of this approval will be sent to the City of Portland. Department approval of your activity does not supersede or substitute the need for any necessary local approvals.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 9th DAY OF NOVEMBER, 2023.

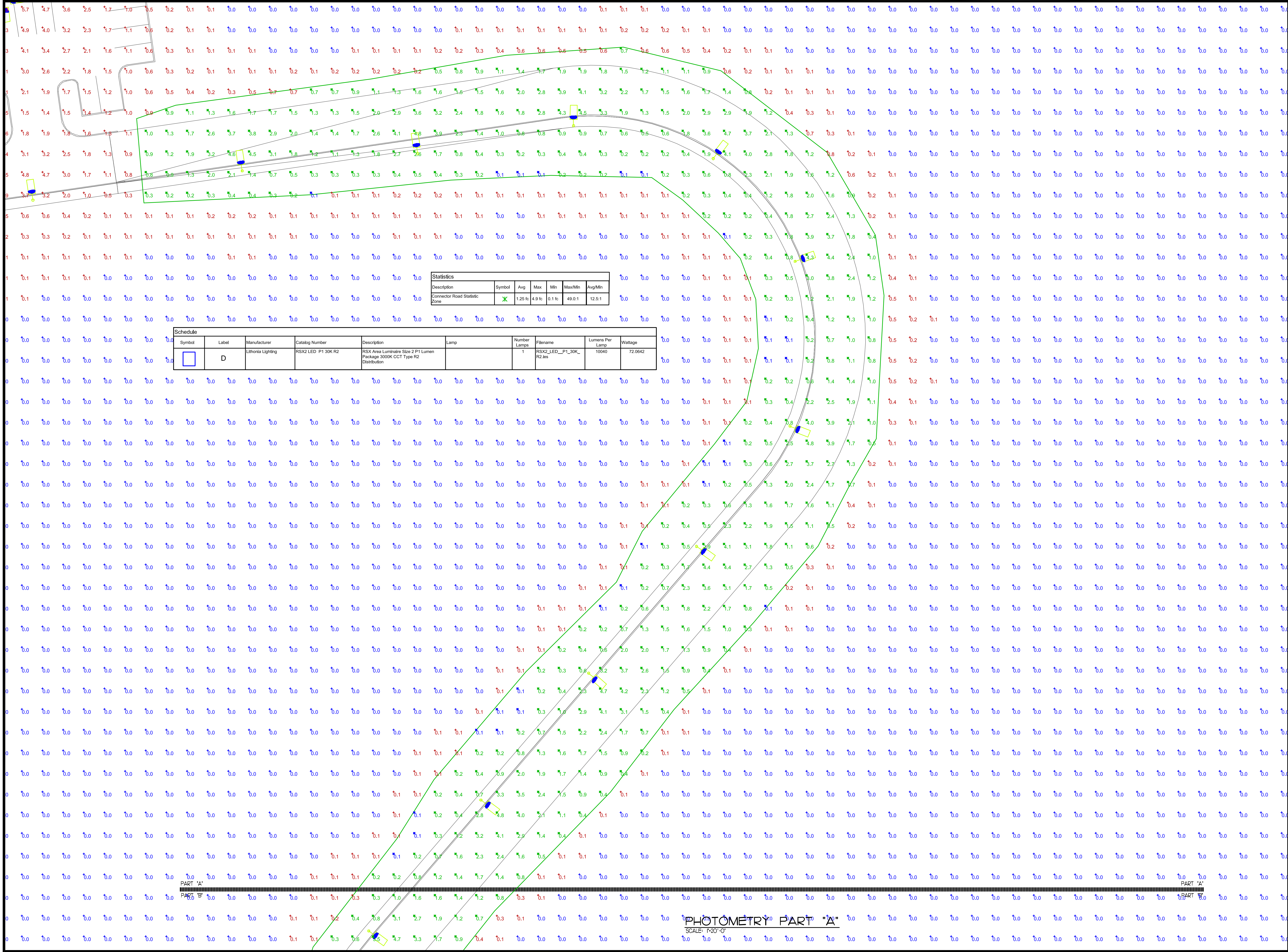
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For: Melanie Loyzim, Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

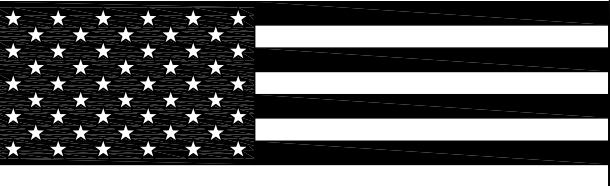
SCarr/L30525AN/ATS#91509

FILED
November 9th, 2023
State of Maine
Board of Environmental Protection





est. 1972
VINCENT A. DIORIO, INC.
CONSULTING ENGINEERS
89 Access Rd. Suite 18
Norwood, MA 02062
(781)255-9754 | vadjr@vadeng.com
www.vadeng.com



REVISIONS:
REV. | DATE | DESCRIPTION:



37 Jordan Avenue, Brunswick, ME 04011 • PH: 207-725-2005

CLIENT:
**UNIVERSITY OF
NEW ENGLAND**

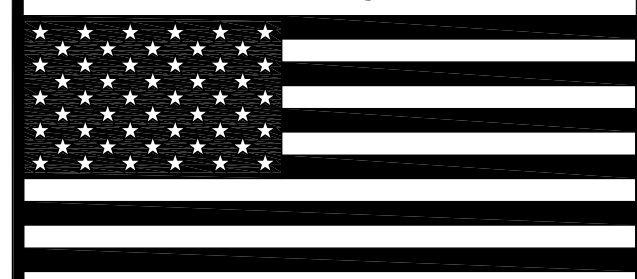
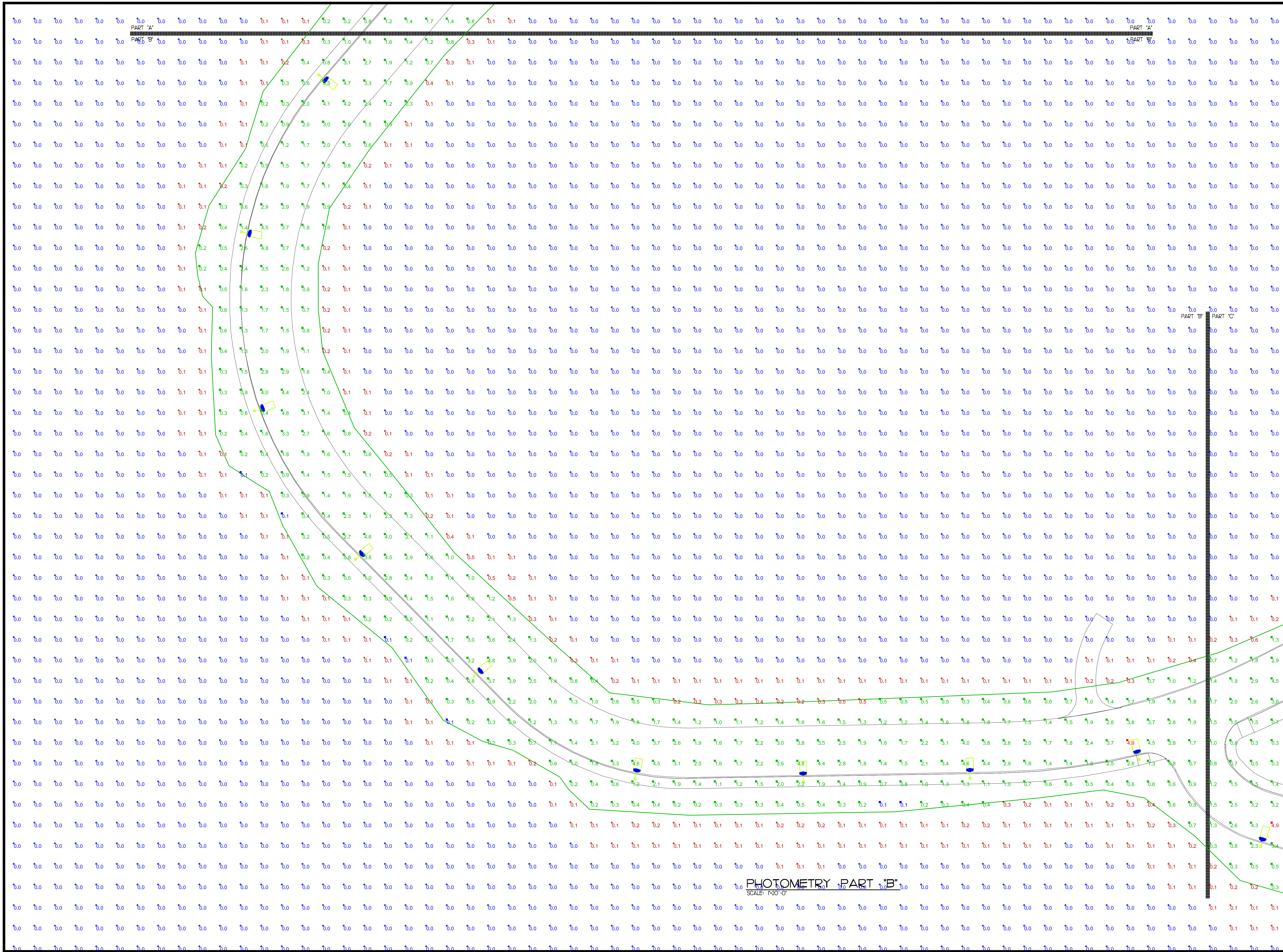
PROJECT:
**Intermodal Transportation,
Facility, Parking Lot
Improvements**

DRAWING TITLE
**CONNECTOR ROAD
PHOTOMETRY PART "A"**

DRAWN: CWQ
CHECKED: VAD Jr
SCALE: 1"=20'=0"
DATE: NOVEMBER 13, 2023

PH2.1A

PHOTOMETRY PART "A"
SCALE: 1"=20'=0"



REVISIONS:		
REV.	DATE	DESCRIPTION



CLIENT:
**UNIVERSITY OF
NEW ENGLAND**

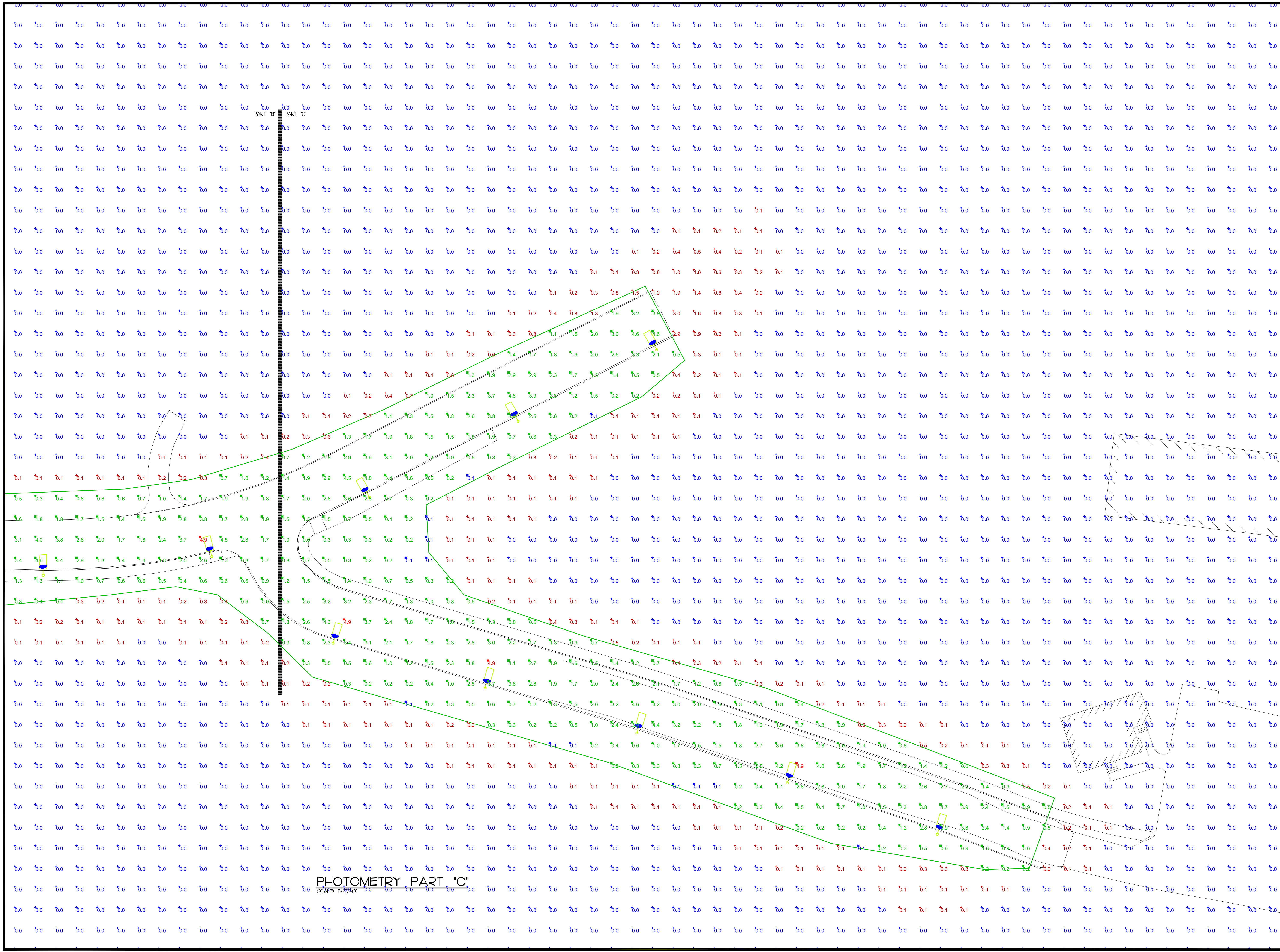
PROJECT:
**Intermodal Transportation,
Facility, Parking Lot
Improvements**

DRAWING TITLE
**CONNECTOR ROAD
PHOTOMETRY PART "B"**

DRAWN: CWQ
CHECKED: VAD Jr
SCALE: 1"=20'-0"
DATE: NOVEMBER 13, 2023

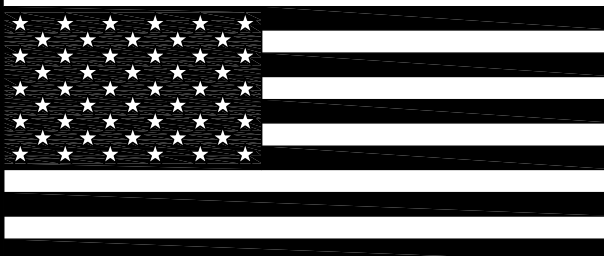
PH2.1B

PHOTOMETRY PART "B"
SCALE: 1"=20'-0"





est. 1972
VINCENT A. DIORIO, INC.
CONSULTING ENGINEERS
89 Access Rd. Suite 18
Norwood, MA 02062
(781)255-9754 | vadjr@vadeng.com
www.vadeng.com



REVISIONS:		
REV.	DATE	DESCRIPTION



37 Jordan Avenue, Brunswick, ME 04011 • PH: 207-725-2005

CLIENT:
**UNIVERSITY OF
NEW ENGLAND**

PROJECT:
**Intermodal Transportation,
Facility, Parking Lot
Improvements**

DRAWING TITLE
**CONNECTOR ROAD
PHOTOMETRY PART "C"**

DRAWN:	CWQ
CHECKED:	VAD Jr
SCALE:	1"=20'-0"
DATE:	NOVEMBER 13, 2023

PH2.1C

ZONING INFORMATION

ZONING STANDARDS FROM CITY OF PORTLAND LAND
USE ORDINANCE, AMENDED FEBRUARY 6, 2023
1. CLASSIFICATION: R3 & R5 - RESIDENTIAL ZONES
PERMITTED USES: LITERARY & SCIENTIFIC (GRANDFATHERED)

R3 RESIDENTIAL ZONE STANDARDS*

1. MIN. LOT SIZE: 6,500 SQUARE FEET
EXISTING = 1,139,872 SQUARE FEET
PROPOSED = NO CHANGE
2. MIN. STREET FRONTAGE: 50 FEET
EXISTING = 75 FEET
PROPOSED = NO CHANGE

*STRUCTURE SETBACKS NOT SHOWN BECAUSE NO NEW BUILDINGS ARE PROPOSED.

R5 RESIDENTIAL ZONE STANDARDS*

1. MIN. LOT SIZE: 6,000 SQUARE FEET
EXISTING = 1,139,872 SQUARE FEET
PROPOSED = NO CHANGE
2. MIN. STREET FRONTAGE: 50 FEET
EXISTING = 285 FEET
PROPOSED = NO CHANGE

*STRUCTURE SETBACKS NOT SHOWN BECAUSE NO NEW BUILDINGS ARE PROPOSED.

PARCEL INFORMATION:

1. OWNER OF RECORD: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD
BIDDEFORD, MAINE 04005
CCRD BOOK 3481, PAGE 255
CCRD BOOK 2796, PAGE 397
CCRD BOOK 1876, PAGE 271
CCRD BOOK 3450, PAGE 69
2. STREET ADDRESS: 83 COLLEGE STREET, PORTLAND, MAINE
3. PARCELS: CITY OF PORTLAND TAX MAPS
MAP 145 BLOCK B LOT 14
MAP 290 BLOCK A LOT 3
MAP 291 BLOCK A LOT 1
MAP 291 BLOCK A LOT 5
4. TOTAL AREA OF PARCEL: 1,139,872 SF (26.16 AC.)

SITE BENCHMARK: PROJECT BENCHMARK IS A MANHOLE RIM IN BISHOP STREET.

PLAN REFERENCES

1. TOPOGRAPHIC INFORMATION OBTAINED BY GROUND SURVEY
CONDUCTED IN WINTER 2022 BY COLLIER ENGINEERING & DESIGN
OF BRUNSWICK, MAINE.
2. ELEVATIONS SHOWN ON THIS PLAN ARE ON THE CITY OF PORTLAND
VERTICAL DATUM (NGVD29). PROJECT BENCHMARK IS A MANHOLE
RIM IN BISHOP STREET.
3. HORIZONTAL DATUM IS BASED ON NAD83 STATE PLANE GRID WEST
ZONE IN FEET.
4. UNDERGROUND UTILITIES WERE OBTAINED FROM SURFACE
OBSERVATIONS AND TAKEN FROM PLANS OF SEVERAL SOURCES. SEE
SURVEY PLAN REFERENCES.

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING "DIG SAFE" AND LOCAL UTILITY COMPANIES AT LEAST THREE
(3) BUSINESS DAYS, BUT NOT MORE THAN 30 CALENDAR DAYS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION, IN
ACCORDANCE WITH MAINE STATE LAW. "DIG SAFE" TELEPHONE NUMBER IS 1-888-344-7233.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL AND ANY MEANS, METHODS, AND TECHNIQUES EMPLOYED
TO PERFORM THE WORK SHOWN ON THE PLANS.
3. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING ALL SAFETY REGULATIONS
(OSHA).
4. ALL WORK SHALL BE IN CONFORMANCE ALL UTILITY COMPANIES STANDARDS.
5. THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THE WORK SHOWN ON THESE PLANS PRIOR TO
CONSTRUCTION.
6. ALL PAVEMENT/CONCRETE CUTS SHALL BE SAW CUT TO RESULT IN CLEAN EDGES. A TACK COAT SHALL BE APPLIED
ALONG THE PAVEMENT CUT EDGES AND THE NEW PAVEMENT BUTTED TO IT, UNLESS OTHERWISE DIRECTED BY THE
OWNER OR OWNER'S REPRESENTATIVE.
7. ALL WORK SHALL COMPLY WITH THE CITY OF PORTLAND STREET OPENING PERMIT REQUIREMENTS.
8. ALL WORK SHALL COMPLY WITH THE CITY OF PORTLAND TECHNICAL MANUAL.
9. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR REGRADING. REFER TO
THE EROSION CONTROL PLAN NOTSE AND DRAWINGS FOR FURTHER EROSION CONTROL GUIDELINES.
10. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS SHOWN ON THE DRAWINGS. IF ANY DISCREPANCIES ARE FOUND,
THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IMMEDIATELY.
11. CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST EDITION.
12. A GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS PROJECT BY SUMMIT GEOENGINEERING, DATED DECEMBER
2021.
13. THE CONTRACTOR SHALL BE AWARE THAT INVASIVE SPECIES SUCH AS JAPANESE KNOTWEED HAVE BEEN IDENTIFIED
WITHIN THE PROJECT AREA. THESE AREAS SHALL BE MANAGED IN ACCORDANCE WITH SECTION 4.7.4 OF THE PORTLAND
TECHNICAL MANUAL AND APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
14. TREES TO BE PRESERVED AT THE EDGE OF WORK SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 4.3 OF THE
PORTLAND TECHNICAL MANUAL.
15. MARK THE CONNECTOR DRIVE WITH SHARROWS LAID OUT PER THE MUTCD.

SNOW STORAGE:

1. SNOW WILL BE PLOWED INTO THE DRIVE SHOULDER/DITCH AND
BEYOND THE BACK EDGE OF THE SIDEWALK.

C:\Users\Site\Documents\Drawings\21-216-00 Connector Road\Drawings\21-216-00 Connector Road.dwg / Plot Date / Time: Dec 6, 23 / 2:54 PM

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY
ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

REV.	DATE	STATUS	BY	CHKD.	APPD.	REV.	DATE	STATUS	BY	CHKD.	APPD.
B	12/6/2023	REVISED PER CITY COMMENTS - NOT FOR CONSTRUCTION									
A	9/22/2023	FOR DEVELOPMENT REVIEW									

LEGEND

EXISTING	PROPOSED
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ABUTTERS PROPERTY LINE
	ZONING LINE
	IRON ROD OR PIN FOUND
	WETLANDS
	BUILDING
	BITUMINOUS PAVEMENT
	CURB
	TREELINE



Site Design Associates
Consulting Engineering & Land Planning

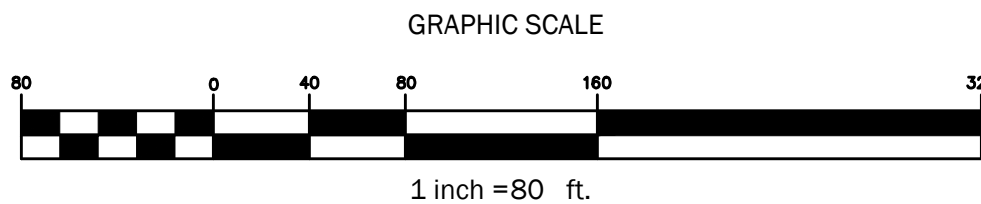
23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275
CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: DEPT.
DRAWN: DEPT.
CHKD: TWS

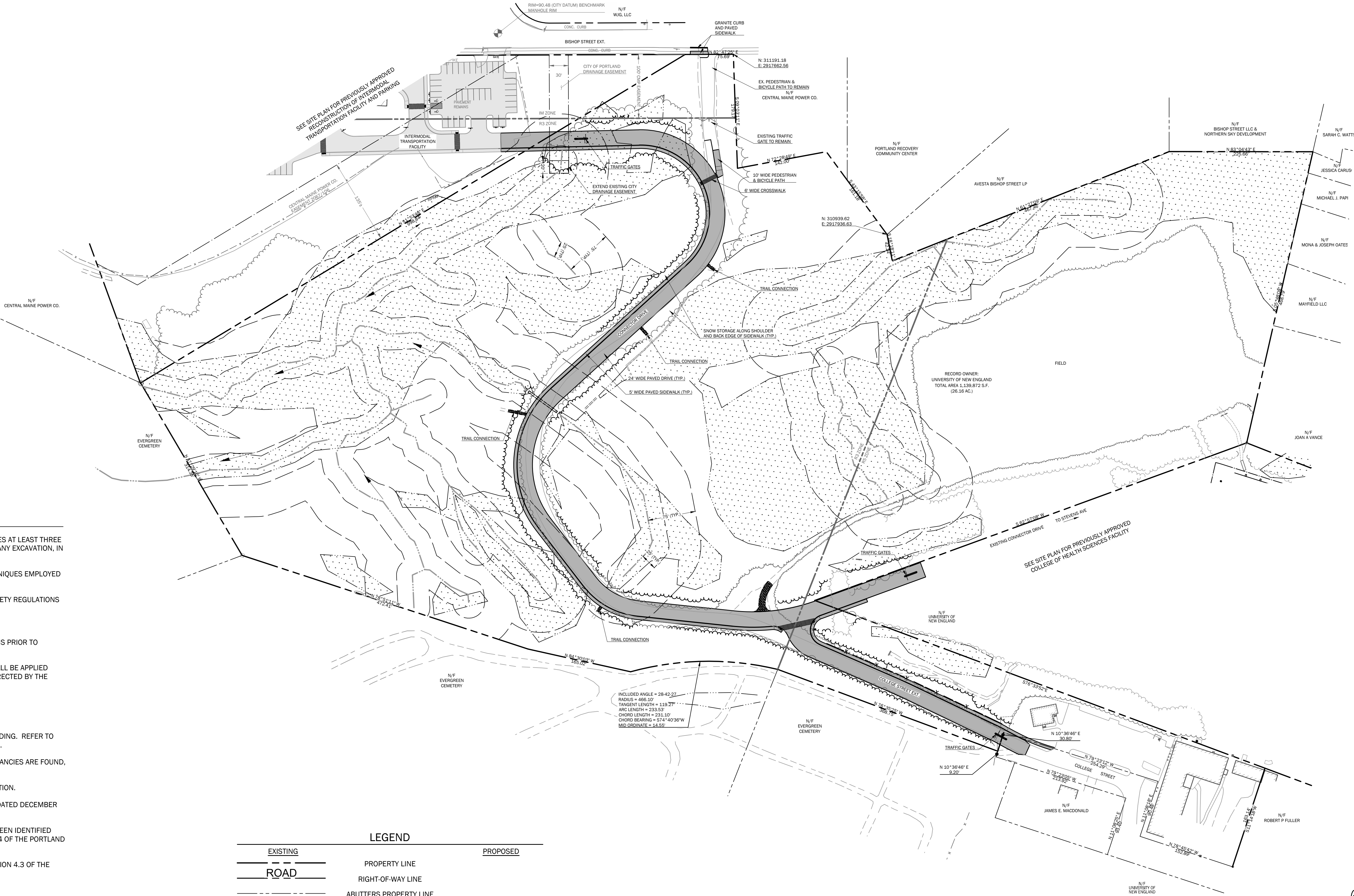
DATE: DEC. 2022
SCALE: 1" = 80'

PROJECT: CONNECTOR DRIVE
83 COLLEGE STREET, PORTLAND, MAINE
SITE PLAN
PROJ. NO. 21-216-00
DWG. NO. S-100

REV. B



TAX MAP I.D.
291 A001
291 A005
290 A003
145 B014



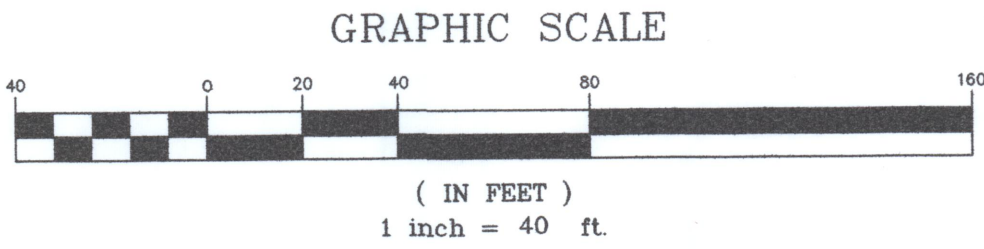
SURVEYOR'S NOTES

- 1 THIS SURVEY PLAN IS ONLY VALID IF AUTHENTIC EMBOSSED SEAL AND SIGNATURE OF CERTIFYING PROFESSIONAL APPEAR ON THE FACE OF THIS SURVEY PLAN.
- 2 NO CERTIFICATION IS MADE TO THE EXISTENCE OR NONEXISTENCE OF HAZARDOUS SUBSTANCES, ENVIRONMENTALLY SENSITIVE AREAS, UNDERGROUND UTILITIES, UNDERGROUND STRUCTURES, ZONING REGULATIONS OR REAL ESTATE TITLE.
- 3 HORIZONTAL DATUM BASED UPON 1983 N.A.D. MAINE STATE PLANE GRID WEST ZONE. VERTICAL DATUM BASED UPON N.G.V.D. 1929.
- 4 ON THE BASIS OF MY KNOWLEDGE, INFORMATION AND BELIEF I CERTIFY TO THE CLIENT THAT THIS SURVEY PLAN, MADE TO THE NORMAL STANDARD OF CARE, CONFORMS TO THE MAINE BOARD OF LICENSURE FOR LAND SURVEYOR STANDARDS CATEGORY I, CONDITION III, EXCEPTING FROM THESE STANDARDS DEED DESCRIPTION AND SURVEY REPORT.
- 5 THE PROPERTY SURVEYED IS DESCRIBED IN A DEED TO THE STATE OF MAINE FROM THE CUMBERLAND COUNTY POWER AND LIGHT COMPANY DATED 10-14-40 AND IS RECORDED IN THE CUMBERLAND REGISTRY OF DEEDS IN BOOK 1607, PAGE 418.
- 6 THE PROPERTY IS DEPICTED ON THE CITY ASSESSOR'S MAP 145 BLOCK B AS LOT 18.
- 7 THE PROPERTY SURVEYED IS BENEFITED BY A SEWER LINE EASEMENT AS DESCRIBED IN A DEED FROM WESTBROOK COLLEGE TO THE STATE OF MAINE DATED 11-15-93 AND RECORDED IN DEED BOOK 11094, PAGE 270.
- 8 AN UNDERGROUND STEAM LINE FOR HEATING PURPOSES CROSSES THE SURVEYED PROPERTY, AND WAS LOCATED PER DIG SAFE MARKINGS AND IS DEPICTED HEREON.
- 9 REFERENCE IS MADE TO COLLEGE STREET LINE DATED DECEMBER 18, 1975 BY THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT.
- 10 REFERENCE IS MADE TO PLAN OF STEVENS PLAINS AVENUE CITY OF DEERING FROM FOREST AVENUE TO PLEASANT STREET AS RELOCATED BY H.W. FOSTER JULY 1896 RECORDED IN CUMBERLAND COUNTY COMMISSIONERS RECORDS VOLUME 16 PAGE 951.
- 11 REFERENCE IS MADE TO PLAN OF LAND IN PORTLAND, MAINE FOR WESTBROOK COLLEGE DATED 8-20-74 BY OWEN HASKELL, INC.
- 12 REFERENCE IS MADE TO PLAN OF A SURVEY FOR FRED E. BRIGGS DATED MAY 1913 BY E.C. JORDAN & CO. AND RECORDED IN CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 12 PAGE 68.
- 13 REFERENCE IS MADE TO PLAN SHOWING WESTBROOK COLLEGE PROPERTY LINES DATED OCTOBER 26, 1981 BY WELLS ENGINEERING INC.
- 14 REFERENCE IS MADE TO PLAN OF (MORRILLS) CAR BARN LOT DEERING, ME. P.R.R. BY HSLEY & CUMMINGS IN PORTLAND, MAINE. ON FILE AT THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT IN FILE 798/14.
- 15 INFORMATION IN PARENTHESES IS ON FILE AT A PUBLIC REPOSITORY.
- 16 THE PROPERTY IS DEPICTED ON THE CITY ASSESSOR'S MAP 145-B-18 (K6SE).
- 17 DIG SAFE MUST BE CONTACTED AND CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND DIMENSIONS OF ALL UTILITIES PRIOR TO EXCAVATION.
- 18 REFERENCE IS MADE TO THE CONTRACTUAL AGREEMENT BETWEEN THE PROFESSIONAL LAND SURVEYOR AND THE CLIENT.
- 19 THIS SURVEY PLAN IS SUBJECT TO POSSIBLE REVISION UPON RECEIPT OF A CERTIFIED TITLE OPINION.
- 20 ON THE BASIS OF MY KNOWLEDGE, INFORMATION AND BELIEF I CERTIFY EXCLUSIVELY TO THE CLIENT THAT THIS SURVEY PLAN, MADE TO THE NORMAL STANDARD OF CARE, SUBSTANTIALLY CONFORMS TO THE MAINE BOARD OF LICENSURE FOR LAND SURVEYOR STANDARDS.
- 21 THIS SURVEY PLAN IS COPYRIGHT PROTECTED. THIS PLAN IS THE PROPERTY OF BOUNDARY POINTS, AND SHALL NOT BE USED FOR ANY PURPOSE WITHOUT THE WRITTEN CONSENT OF AN AUTHORIZED AGENT OF BOUNDARY POINTS. ALL RIGHTS RESERVED.

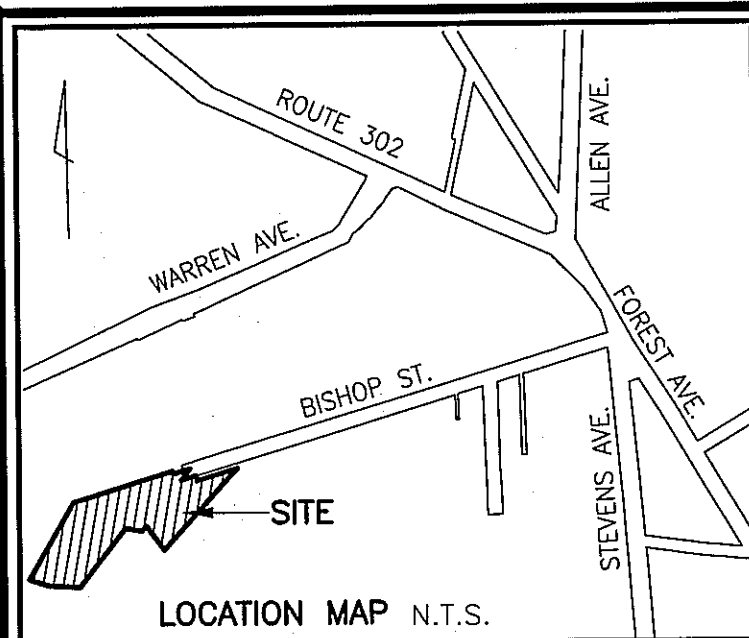
LEGEND

EXISTING	DESCRIPTION	PROPOSED
---	PROPERTY/ROW	---
---	EASEMENT	---
---	CENTERLINE	---
---	MONUMENT	---
---	IRON PIPE/ROD	---
---	5/8" IRON REBAR SET 2001	---
---	CURVE/LINE NO. BUILDING	---
---	SIGN	---
---	EDGE PAVEMENT	---
---	GRAVEL ROAD	---
---	CURBLINE	---
---	TREELINE	---
---	CONTOURS	---
---	GAS	---
---	WATER	---
---	SEWER	---
---	STORM DRAIN	---
---	OVERHEAD ELEC. & TEL.	---
---	UNDERGROUND ELEC. & TEL.	---
---	UTILITY VALVE	---
---	LIGHT POLE	---
---	UTILITY POLE	---
---	HYDRANT	---
---	MANHOLE	---
---	CATCH BASIN	---
---	CULVERT	---
---	SPOT GRADE	---
---	CHAIN LINK FENCE	---
---	DECIDUOUS TREE	---
---	CONIFEROUS TREE	---
---	GUARDRAIL	---

EVERGREEN CEMETERY

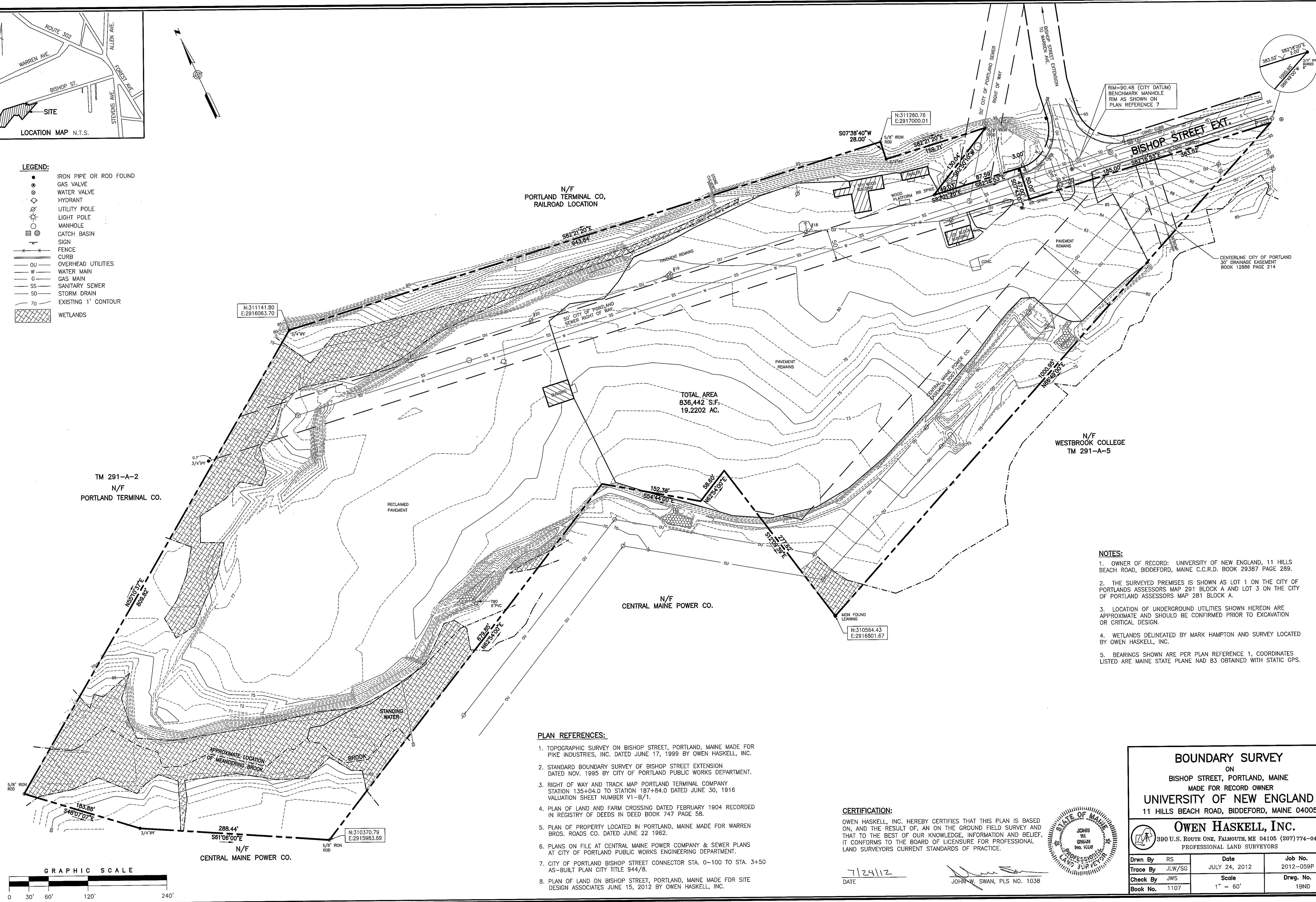


		Scale: 1" = 40'
		Project No: 201608
		AutoCAD Release: 2011
		Drawn By: DB
2	MAINE STATE GRID PLANE COORDINATES ADDED	6-15-16
1	ADDITIONAL TOPO BASED ON 1929 NGVD	3-9-16
No.	Revision	Date
		Plan Date: 3-14-16
THIS PLAN IS PROVIDED EXCLUSIVELY FOR THE CLIENT STATED HEREON. ANY USE OR ALTERATION OF THIS PLAN BY OTHERS SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO BOUNDARY POINTS, LLC.		
EXISTING CONDITIONS & BOUNDARY SURVEY FOR SITE DESIGN ASSOCIATES OF 772 STEVENS AVENUE PROPERTY PORTLAND MAINE		
Boundary Points		
PROFESSIONAL LAND SURVEYING, LLC P.O. BOX 175 CUMBERLAND MAINE 04021-0175 207-854-1015		
© 2016 BOUNDARY POINTS		



LEGEND:

- IRON PIPE OR ROD FOUND
- GAS VALVE
- WATER VALVE
- HYDRANT
- UTILITY POLE
- LIGHT POLE
- MANHOLE
- CATCH BASIN
- SIGN
- FENCE
- CURB
- OVERHEAD UTILITIES
- WATER MAIN
- GAS MAIN
- SANITARY SEWER
- STORM DRAIN
- EXISTING 1' CONTOUR
- WETLANDS



PLAN REFERENCES:

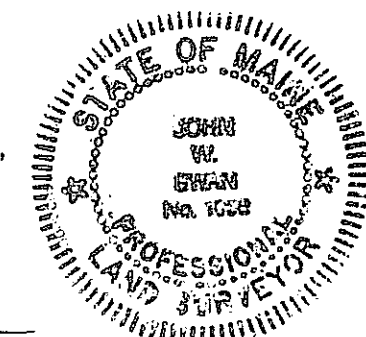
- TOPOGRAPHIC SURVEY ON BISHOP STREET, PORTLAND, MAINE MADE FOR PIKE INDUSTRIES, INC. DATED JUNE 17, 1999 BY OWEN HASKELL, INC.
- STANDARD BOUNDARY SURVEY OF BISHOP STREET EXTENSION DATED NOV. 1995 BY CITY OF PORTLAND PUBLIC WORKS DEPARTMENT.
- RIGHT OF WAY AND TRACK MAP PORTLAND TERMINAL COMPANY STATION 135+04.0 TO STATION 187+84.0 DATED JUNE 30, 1916 VALUATION SHEET NUMBER V1-B/1.
- PLAN OF LAND AND FARM CROSSING DATED FEBRUARY 1904 RECORDED IN REGISTRY OF DEEDS IN DEED BOOK 747 PAGE 58.
- PLAN OF PROPERTY LOCATED IN PORTLAND, MAINE MADE FOR WARREN BROS. ROADS CO. DATED JUNE 22 1962.
- PLANS ON FILE AT CENTRAL MAINE POWER COMPANY & SEWER PLANS AT CITY OF PORTLAND PUBLIC WORKS ENGINEERING DEPARTMENT.
- CITY OF PORTLAND BISHOP STREET CONNECTOR STA. 0+100 TO STA. 3+50 AS-BUILT PLAN CITY TITLE 944/B.
- PLAN OF LAND ON BISHOP STREET, PORTLAND, MAINE MADE FOR SITE DESIGN ASSOCIATES JUNE 15, 2012 BY OWEN HASKELL, INC.

CERTIFICATION:

OWEN HASKELL, INC. HEREBY CERTIFIES THAT THIS PLAN IS BASED ON, AND THE RESULT OF, AN ON THE GROUND FIELD SURVEY AND THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, IT CONFORMS TO THE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS CURRENT STANDARDS OF PRACTICE.

DATE 7/24/12

JOHN W. SWAN, PLS NO. 1038



BOUNDARY SURVEY

ON
BISHOP STREET, PORTLAND, MAINE
MADE FOR RECORD OWNER
UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD, BIDDEFORD, MAINE 04005

OWEN HASKELL, INC.

390 U.S. ROUTE ONE, FAIRMOUTH, ME 04105 (207) 774-0424
PROFESSIONAL LAND SURVEYORS

Drawn By	RS	Date	Job No.
Trace By	JLW/SG	JULY 24, 2012	2012-059P
Check By	JWS	Scale	Drwg. No.
Book No.	1107	1" = 60'	19ND



Record Lighting Submittal Package

Project: UNE Alford Cener Site Lighting (22-63667-16)

Prepared For: Wesco – Portland, ME.

Prepared By: Kelly Beck

September 19, 2023

Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT



RSX2 LED Area Luminaire



Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

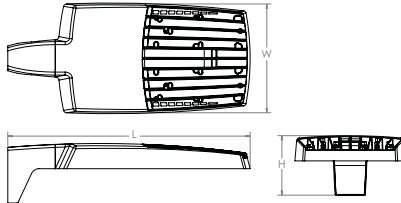
Introduction

The new RSX LED Area family delivers maximum value by providing significant energy savings, long life and outstanding photometric performance at an affordable price. The RSX2 delivers 11,000 to 31,000 lumens allowing it to replace 250W to 1000W HID luminaires.

The RSX features an integral universal mounting mechanism that allows the luminaire to be mounted on most existing drill hole patterns. This “no-drill” solution provides significant labor savings. An easy-access door on the bottom of mounting arm allows for wiring without opening the electrical compartment. A mast arm adaptor, adjustable integral slipfitter and other mounting configurations are available.

Specifications

EPA (ft²@0°):	0.69 ft² (0.06 m²)
Length:	29.3" (74.4 cm) (SPA mount)
Width:	13.4" (34.0 cm)
Height:	3.0" (7.6 cm) Main Body 7.2" (18.3 cm) Arm
Weight: (SPA mount)	30.0 lbs (13.6 kg)



Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.
*See ordering tree for details

Ordering Information

EXAMPLE: RSX2 LED P6 40K R3 MVOLT SPA DDBXD

RSX2 LED	P1	40K	R2	MVOLT	SPA
Series	Performance Package	Color Temperature	Distribution	Voltage	Mounting
RSX2 LED	P1	30K 3000K 40K 4000K 50K 5000K	R2 Type 2 Wide R3 Type 3 Wide R3S Type 3 Short R4 Type 4 Wide R4S Type 4 Short R5 Type 5 Wide ¹ R5S Type 5 Short ¹ AFR Automotive Front Row AFRR90 Automotive Front Row Right Rotated AFRL90 Automotive Front Row Left Rotated	MVOLT (120V-277V) ² HVOLT (347V-480V) ³ XVOLT (277V-480V) ⁴ (use specific voltage for options as noted) 120 ³ 277 ⁵ 208 ³ 347 ⁵ 240 ³ 480 ⁵	SPA Square pole mounting (3.0" min. SQ pole for 1 at 90°, 3.5" min. SQ pole for 2, 3, 4 at 90°) RPA Round pole mounting (3.2" min. dia. RND pole for 2, 3, 4 at 90°, 3.0" min. dia. RND pole for 1 at 90°, 2 at 180°, 3 at 120°) MA Mast arm adaptor (fits 2-3/8" OD horizontal tenon) IS Adjustable slipfitter (fits 2-3/8" OD tenon) ⁶ WBA Wall bracket ¹ WBASC Wall bracket with surface conduit box AASP Adjustable tilt arm square pole mounting ⁶ AARP Adjustable tilt arm round pole mounting ⁶ AAWB Adjustable tilt arm with wall bracket ⁶ AAWSC Adjustable tilt arm wall bracket and surface conduit box ⁶

NLTAIR2 PIRHN				DBLXD
Options				Finish
Shipped Installed HS House-side shield ⁷ PE Photocontrol, button style ^{8,9} PER7 Seven-wire twist-lock receptacle only (no controls) ^{9,10,11} SF Single fuse (120, 277, 347) ⁵ DF Double fuse (208, 240, 480) ⁵ SPD20KV 20KV Surge pack (10KV standard) FAO Field adjustable output ⁹ DMG 0-10V dimming extend out back of housing for external control (control ordered separate) ⁹ DS Dual switching ^{9,12}				DDBXD Dark Bronze DBLXD Black DNAXD Natural Aluminum DWHXD White DDBTXD Textured Dark Bronze DBLTXD Textured Black DNATXD Textured Natural Aluminum DWHGXD Textured White
Shipped Installed *Standalone and Networked Sensors/Controls (factory default settings, see table page 9) NLTAIR2 PIRHN nLight AIR generation 2 ,with Networked, Bi-Level motion/ambient sensor ^{9,13,14,15} BAA Buy America(n) Act Compliant CCE Coastal Construction ¹⁶ *Note: NLTAIR2 PIRHN with nLight Air can be used as a standalone dimming sensor with out-of-box settings or as a wireless networked solution. See factory default settings table. Sensor coverage pattern is affected when luminaire is tilted. Shipped Separately (requires some field assembly) EGS External glare shield ⁷ EGFV External glare full visor (360° around light aperture) ⁷ BS Bird spikes ¹⁷				



COMMERCIAL OUTDOOR

One Lithonia Way • Conyers, Georgia 30012 • Phone: 1-800-705-SERV (7378) • www.acuitybrands.com
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Lithonia RSX2 Area LED
Rev. 04/20/23
Page 1 of 9

Ordering Information

Accessories

Ordered and shipped separately.

RSX2HS	RSX2 House side shield (includes 2 shields)
RSX2EGS (FINISH) U	External glare shield (specify finish)
RSX2HSAFR (FINISH) U	RSX2 House side shields for AFR rotated optics (includes 2 shields)
RSX2EGFV (FINISH) U	External glare full visor (specify finish)
RSXRPA (FINISH) U	RSX Universal round pole adaptor plate (specify finish)
RSXWBA (FINISH) U	RSX WBA wall bracket (specify finish) ¹
RSXSCB (FINISH) U	RSX Surface conduit box (specify finish, for use with WBA, WBA not included)
DL1127F 1.5 JU	Photocell -SSL twist-lock (120-277V) ¹⁸
DL1347F 1.5 CUL JU	Photocell -SSL twist-lock (347V) ¹⁸
DL1480F 1.5 CUL JU	Photocell -SSL twist-lock (480V) ¹⁸
DSHORT SBK U	Shorting cap ¹⁸

NOTES

- Any Type 5 distribution, is not available with WBA.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- HVOLT driver operates on any line voltage from 347-480V (50/60 Hz).
- XVOLT driver not available with P1. XVOLT driver operates on any line voltage from 277V-480V (50/60 Hz). XVOLT not available with fusing (SF or DF) and not available with PE.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Maximum tilt is 90° above horizontal.
- It may be ordered as an accessory.
- Requires MVOLT or 347V.
- Two or more of the following options cannot be combined including PE, DMG, PER7, FAO, DS and NLTAR2 PIRHN. (Exception: PE and FAO can be combined; also PE and DMG can be combined.)
- Compatible with standard twist-lock photocells for dusk to dawn operation or advanced control nodes that provide 0-10V dimming signals. Wire 4/Wire 5 wired to dimming leads on driver. Wire6/Wire7 capped inside luminaire. Twistlock photocell ordered and shipped

- as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
- For units with option PER7, the mounting must be restricted to +/- 45° from horizontal aim per ANSI C136.10-2010.
 - DS requires (2) separately switched circuits. DS provides 50/50 fixture operation via (2) different sets of leads using (2) drivers. DS only available with packages P5 and P6.
 - Must be ordered with PIRHN.
 - Requires MVOLT or HVOLT.
 - Must be ordered with NLTAR2. For additional information on PIRHN visit [here](#).
 - CCE option not available with WBA, WBASC, AASP, AARP, AAWB, AAWBSC, EGS, EGVV and BS.
 - Must be ordered with fixture for factory pre-drilling.
 - Requires luminaire to be specified with PER7 option. Ordered and shipped as a separate line item from Acuity Brands Controls.

External Shields



House Side Shield



External Glare Shield

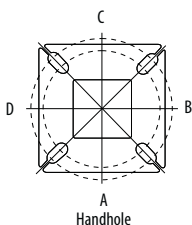


External 360 Full Visor

Pole/Mounting Information

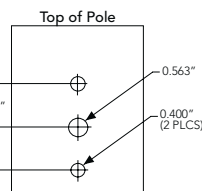
Accessories including bullhorns, cross arms and other adapters are available under the accessories tab at Lithonia's Outdoor Poles and Arms product page. Click here to visit [Accessories](#).

HANDHOLE ORIENTATION

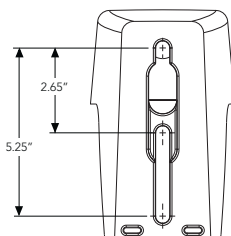


RSX POLE DRILLING

Template #8



RSX STANDARD ARM & ADJUSTABLE ARM



Round Tenon Mount - Pole Top Slipfitters

Tenon O.D.	RSX Mounting	Single	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2 - 3/8"	RPA, AARP	AS3-5190	AS3-5280	AS3-5290	AS3-5320	AS3-5390	AS3-5490
2 - 7/8"	RPA, AARP	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	RPA, AARP	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Drill/Side Location by Configuration Type

Drilling Template	Mounting Option	Single	2 @ 180	2 @ 90	3 @ 120	3 @ 90	4 @ 90
	Head Location	Side B	Side B & D	Side B & C	Round Pole Only	Side B, C & D	Side A, B, C & D
#8	Drill Nomenclature	DM19AS	DM28AS	DM29AS	DM32AS	DM39AS	DM49AS

RSX2 - Luminaire EPA

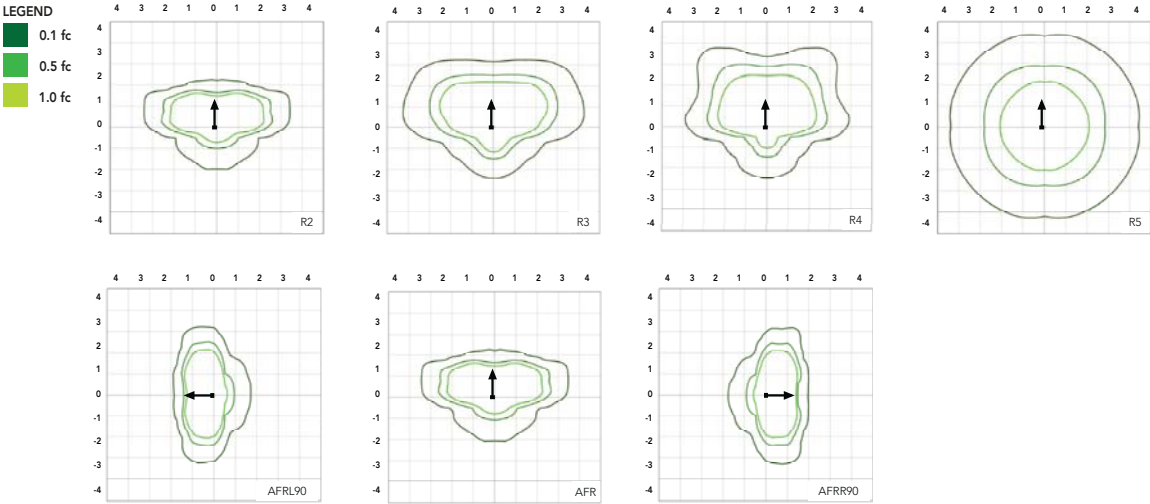
*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.

Fixture Quantity & Mounting Configuration		Single	2 @ 90	2 @ 180	3 @ 90	3 @ 120	4 @ 90	2 Side by Side	3 Side by Side	4 Side by Side
Mounting Type	Tilt									
SPA - Square Pole Adaptor	0°	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
RPA - Round Pole Adaptor		0.74	1.27	1.37	1.9	1.71	2.49	1.42	2.16	2.84
MA - Mast Arm Adaptor		0.61	1.14	1.11	1.64	1.45	2.23	1.29	1.9	2.58
IS - Integral Slipfitter AASP/AARP - Adjustable Arm Square/Round Pole	0°	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
	10°	0.53	1.06	1.05	1.58	1.37	2.08	1.06	1.59	2.12
	20°	0.52	1.02	1.03	1.52	1.33	2.02	1.03	1.55	2.07
	30°	0.64	1.11	1.18	1.63	1.45	2.21	1.27	1.91	2.54
	40°	0.81	1.21	1.35	1.74	1.65	2.39	1.62	2.43	3.23
	45°	0.91	1.25	1.5	1.81	1.75	2.48	1.82	2.73	3.64
	50°	1.34	1.83	2.17	2.61	2.56	3.62	2.68	4.02	5.36
	60°	2.2	2.97	3.57	4.24	4.17	5.89	4.41	6.61	8.82
	70°	2.86	4.13	4.7	5.89	5.71	8.21	5.71	8.57	11.42
	80°	3.4	5.13	5.67	7.34	7.09	10.21	6.79	10.19	13.59
	90°	3.85	5.96	6.55	8.58	8.31	11.88	7.70	11.56	15.41

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's RSX Area homepage.

Isofootcandle plots for the RSX2 LED P6 40K. Distances are in units of mounting height (30').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-50°C (32-122°F).

Ambient	Ambient	Lumen Multiplier
0°C	32°F	1.05
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97
45°C	113°F	0.96
50°C	122°F	0.95

Electrical Load

Performance Package	System Watts (W)	Current (A)					
		120V	208V	240V	277V	347V	480V
P1	71W	0.59	0.34	0.30	0.26	0.20	0.15
P2	111W	0.93	0.53	0.46	0.40	0.32	0.23
P3	147W	1.23	0.70	0.61	0.53	0.42	0.31
P4	187W	1.55	0.90	0.78	0.68	0.53	0.38
P5	210W	1.75	1.01	0.87	0.76	0.60	0.44
P6	244W	2.03	1.17	1.01	0.88	0.70	0.51

Projected LED Lumen Maintenance

Operating Hours	50,000	75,000	100,000
Lumen Maintenance Factor	>0.97	>0.95	>0.92

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

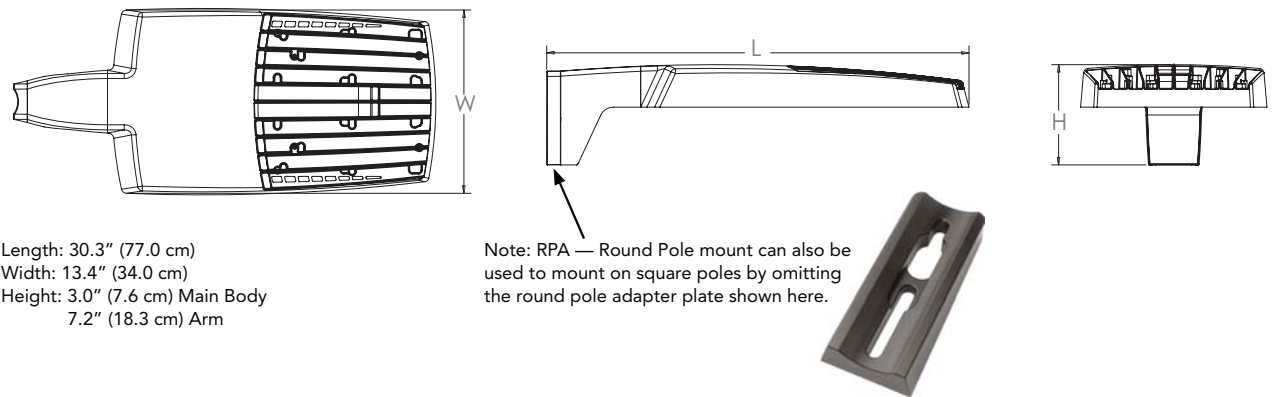
Performance Package	System Watts	Distribution Type	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	71W	R2	10,040	2	0	1	139	11,031	2	0	1	153	11,031	2	0	1	153
		R3	10,005	2	0	2	141	10,992	2	0	2	155	10,992	2	0	2	155
		R3S	10,271	2	0	2	143	11,285	2	0	2	157	11,285	2	0	2	157
		R4	10,136	2	0	2	143	11,136	2	0	2	157	11,136	2	0	2	157
		R4S	9,779	2	0	2	138	10,744	2	0	2	151	10,744	2	0	2	151
		R5	10,271	4	0	2	145	11,285	4	0	2	159	11,285	4	0	2	159
		R5S	10,544	3	0	1	149	11,585	3	0	2	163	11,585	3	0	2	163
		AFR	10,026	2	0	1	141	11,016	2	0	1	155	11,016	2	0	1	155
		AFRR90	10,122	3	0	2	140	11,121	3	0	2	154	11,121	3	0	2	154
		AFRL90	10,164	3	0	2	141	11,167	3	0	2	155	11,167	3	0	2	155
P2	111W	R2	15,712	2	0	2	138	17,263	2	0	2	151	17,263	2	0	2	151
		R3	15,657	2	0	3	141	17,202	3	0	3	155	17,202	3	0	3	155
		R3S	16,075	2	0	2	141	17,661	2	0	2	155	17,661	2	0	2	155
		R4	15,862	2	0	3	143	17,427	2	0	3	157	17,427	2	0	3	157
		R4S	15,304	2	0	2	138	16,815	2	0	2	151	16,815	2	0	2	151
		R5	16,075	4	0	2	145	17,661	5	0	3	159	17,661	5	0	3	159
		R5S	16,502	4	0	2	149	18,130	4	0	2	163	18,130	4	0	2	163
		AFR	15,691	2	0	2	141	17,240	2	0	2	155	17,240	2	0	2	155
		AFRR90	15,841	3	0	3	139	17,404	4	0	3	153	17,404	4	0	3	153
		AFRL90	15,907	3	0	3	139	17,477	4	0	3	153	17,477	4	0	3	153
P3	147W	R2	19,855	3	0	2	132	21,814	3	0	2	145	21,814	3	0	2	145
		R3	19,785	3	0	3	135	21,737	3	0	4	148	21,737	3	0	4	148
		R3S	20,312	3	0	3	135	22,317	3	0	3	149	22,317	3	0	3	149
		R4	20,044	3	0	3	136	22,022	3	0	4	150	22,022	3	0	4	150
		R4S	19,339	3	0	3	132	21,247	3	0	3	145	21,247	3	0	3	145
		R5	20,313	5	0	3	138	22,317	5	0	3	152	22,317	5	0	3	152
		R5S	20,852	4	0	2	142	22,910	4	0	2	156	22,910	4	0	2	156
		AFR	19,828	3	0	2	135	21,785	3	0	2	148	21,785	3	0	2	148
		AFRR90	20,017	4	0	3	133	21,992	4	0	3	147	21,992	4	0	3	147
		AFRL90	20,101	4	0	3	134	22,084	4	0	3	147	22,084	4	0	3	147
P4	187W	R2	22,836	3	0	2	120	25,090	3	0	2	132	25,090	3	0	2	132
		R3	22,756	3	0	4	122	25,002	3	0	4	134	25,002	3	0	4	134
		R3S	23,363	3	0	3	123	25,668	3	0	3	135	25,668	3	0	3	135
		R4	23,054	3	0	4	123	25,329	3	0	4	135	25,329	3	0	4	135
		R4S	22,243	3	0	3	119	25,059	3	0	3	134	25,059	3	0	3	134
		R5	23,363	5	0	3	125	25,669	5	0	4	137	25,669	5	0	4	137
		R5S	23,983	4	0	2	128	26,350	4	0	2	141	26,350	4	0	2	141
		AFR	22,806	3	0	2	122	25,056	3	0	2	134	25,056	3	0	2	134
		AFRR90	23,023	4	0	3	121	25,295	4	0	3	133	25,295	4	0	3	133
		AFRL90	23,120	4	0	3	122	25,401	4	0	3	134	25,401	4	0	3	134
P5	210W	R2	26,141	3	0	2	122	28,721	3	0	2	135	28,721	3	0	2	135
		R3	26,049	3	0	4	124	28,620	3	0	4	136	28,620	3	0	4	136
		R3S	26,744	3	0	3	125	29,383	3	0	4	138	29,383	3	0	4	138
		R4	26,390	3	0	4	126	28,994	3	0	4	138	28,994	3	0	4	138
		R4S	25,462	3	0	3	121	27,974	3	0	3	133	27,974	3	0	3	133
		R5	26,744	5	0	4	127	29,383	5	0	4	140	29,383	5	0	4	140
		R5S	27,454	4	0	2	131	30,163	4	0	2	144	30,163	4	0	2	144
		AFR	26,106	3	0	2	124	28,682	3	0	2	137	28,682	3	0	2	137
		AFRR90	26,354	4	0	3	123	28,955	5	0	3	136	28,955	5	0	3	136
		AFRL90	26,465	4	0	3	124	29,077	5	0	3	136	29,077	5	0	3	136
P6	244W	R2	27,646	3	0	2	112	30,374	3	0	2	123	30,374	3	0	2	123
		R3	27,549	3	0	4	113	30,267	3	0	4	124	30,267	3	0	4	124
		R3S	28,283	3	0	3	115	31,075	3	0	4	126	31,075	3	0	4	126
		R4	27,909	3	0	4	114	30,663	3	0	4	126	30,663	3	0	4	126
		R4S	26,928	3	0	3	110	29,585	3	0	3	121	29,585	3	0	3	121
		R5	28,284	5	0	4	116	31,075	5	0	4	127	31,075	5	0	4	127
		R5S	29,035	4	0	2	119	31,900	5	0	3	131	31,900	5	0	3	131
		AFR	27,608	3	0	2	112	30,332	3	0	2	123	30,332	3	0	2	123
		AFRR90	27,872	4	0	3	113	30,622	5	0	3	124	30,622	5	0	3	124
		AFRL90	27,989	4	0	3	113	30,751	5	0	3	125	30,751	5	0	3	125

Dimensions & Weights

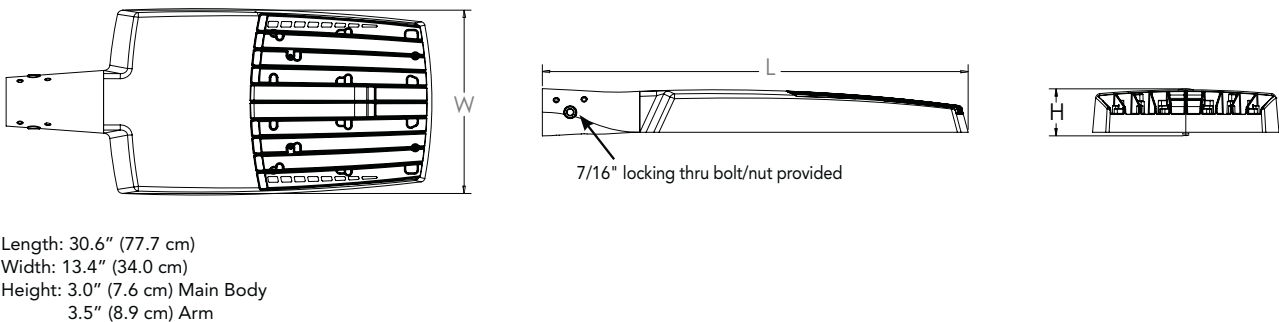
Luminaire Weight by Mounting Type

Mounting Configuration	Total Luminaire Weight
SPA	30 lbs
RPA	32 lbs
MA	30 lbs
WBA	33 lbs
WBASC	36 lbs
IS	33 lbs
AASP	33 lbs
AARP	35 lbs
AAWB	36 lbs
AAWSC	39 lbs

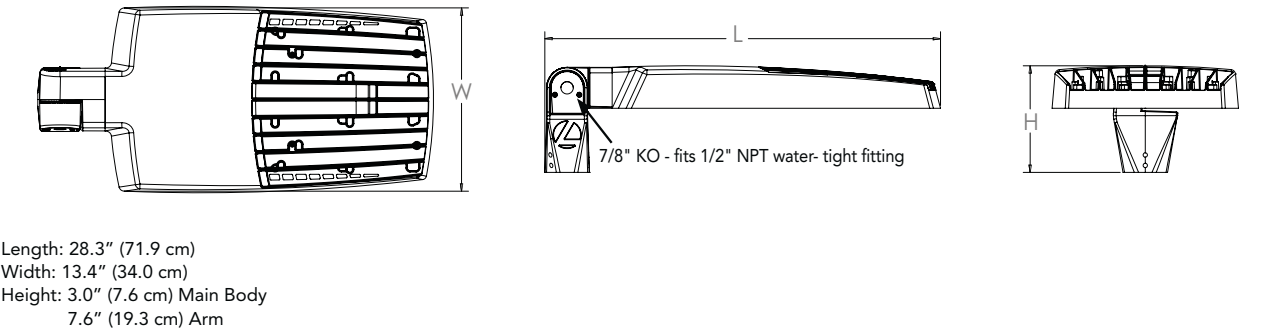
RSX2 with Round Pole Adapter (RPA)



RSX2 with Mast Arm Adapter (MA)



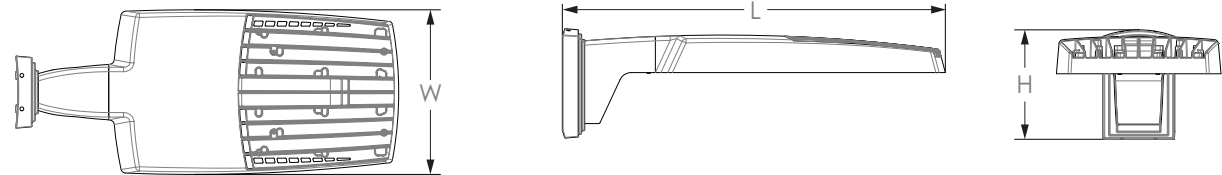
RSX2 with Adjustable Slipfitter (IS)



Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

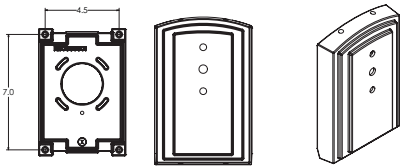
Dimensions

RSX2 with Wall Bracket (WBA)

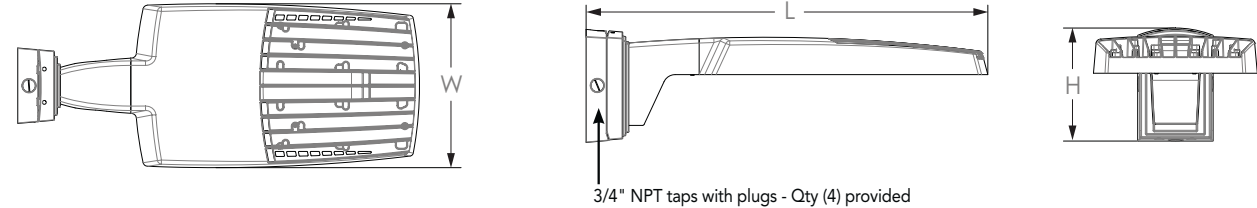


Length: 31.2" (79.2 cm)
 Width: 13.4" (41.7 cm)
 Height: 3.0" (7.6 cm) Main Body
 8.9" (22.6 cm) Arm

Wall Bracket (WBA) Mounting Detail

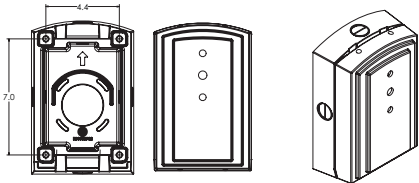


RSX2 with Wall Bracket with Surface Conduit Box (WBASC)



Length: 32.8" (83.3 cm)
 Width: 13.4" (41.7 cm)
 Height: 3.0" (7.6 cm) Main Body
 9.2" (23.4 cm) Arm

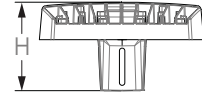
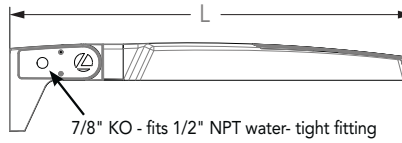
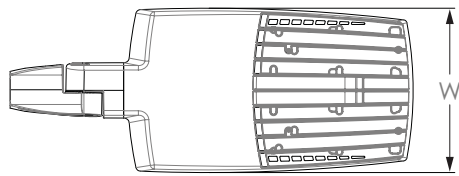
Surface Conduit Box (SCB) Mounting Detail



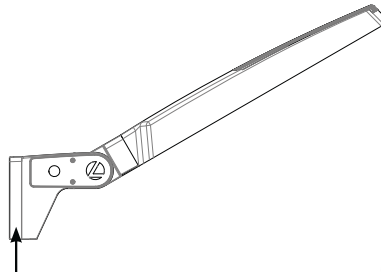
Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

Dimensions

RSX2 with Adjustable Tilt Arm - Square or Round Pole (AASP or AARP)



Length: 32.8" (83.3 cm) AASP
 33.8" (85.9 cm) AARP
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 7.2" (18.2 cm) Arm



NOTE:
 RPA - Round Pole mount can also be used to mount on square poles by omitting the round pole adapter plate shown here.

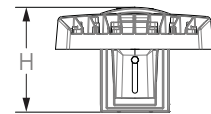
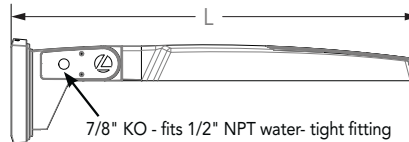
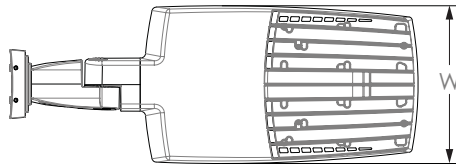


Notes

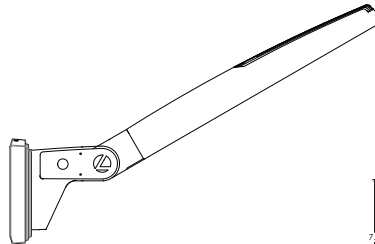
AASP: Requires 3.0" min. square pole for 1 at 90°. Requires 3.5" min. square pole for mounting 2, 3, 4 at 90°.

AARP: Requires 3.2" min. dia. round pole for 2, 3, 4 at 90°. Requires 3.0" min. dia. round pole for mounting 1 at 90°, 2 at 180°, 3 at 120°.

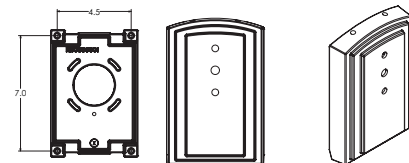
RSX2 with Adjustable Tilt Arm with Wall Bracket (AAWB)



Length: 34.7" (88.0 cm)
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 8.9" (22.6 cm) Arm



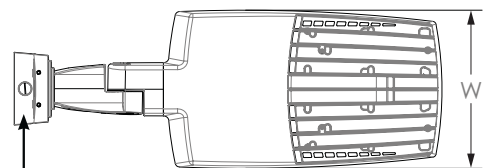
Wall Bracket (WBA) Mounting Detail



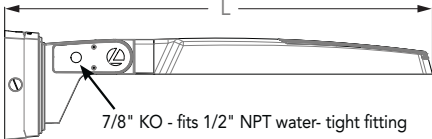
Submitted by:	Job Name:	Catalog Number:	Type:
	UNE Alford Center Site Lighting	RSX2 LED P1 40K R2 MVOLT SPA NLTAIR2 PIRHN DBLXD	D-ALT

Dimensions

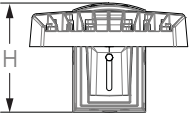
RSX2 with Adjustable Tilt Arm with Wall Bracket and Surface Conduit Box (AAWSC)

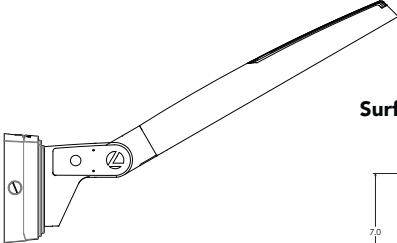


3/4" NPT taps with plugs - Qty (4) provided

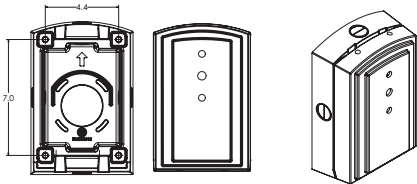


7/8" KO - fits 1/2" NPT water- tight fitting





Surface Conduit Box (SCB) Mounting Detail



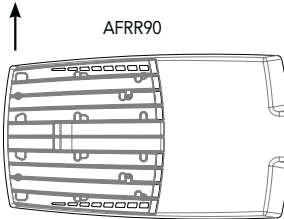
Length: 36.2" (91.9 cm)

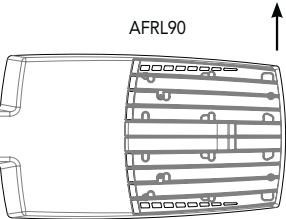
Width: 13.4" (40.0 cm)

Height: 3.0" (7.6 cm) Main Body

9.2" (23.4 cm) Arm

Automotive Front Row - Rotated Optics (AFRL90/R90)

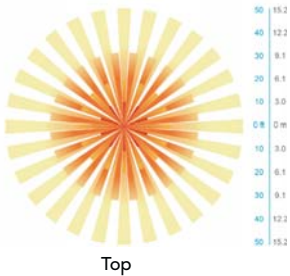
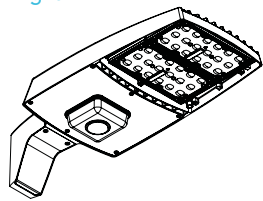




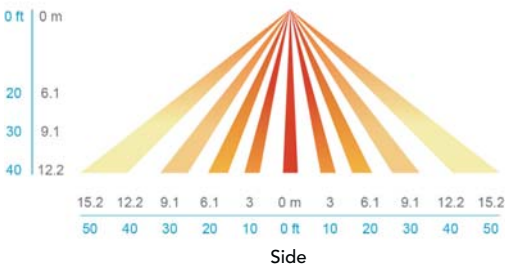
(Example: 2@180 - arrows indicate direction of light exiting the luminaire)

nLight Control - Sensor Coverage and Settings

NLTAIR2 PIRHN nLight
Sensor Coverage Pattern
nLight PIRHN



Top



Side

Motion Sensor Default Settings - Option PIRHN						
Option	Dimmed State (unoccupied)	High Level (when occupied)	Photocell Operation	Dwell Time (occupancy time delay)	Ramp-up Time (from unoccupied to occupied)	Ramp-down Time (from occupied to unoccupied)
NLTAIR2 PIRHN	Approx. 30% Output	100% Output	Enabled @ 1.5FC	7.5 minutes	3 seconds	5 minutes

*Note: NLTAIR2 PIRHN default settings including photocell set-point, high/low dim rates, and occupancy sensor time delay are all configurable using the Clarity Pro App. Sensor coverage pattern shown with luminaire at 0°. Sensor coverage pattern is affected when luminaire is tilted.

FEATURES & SPECIFICATIONS

INTENDED USE

The RSX LED area family is designed to provide a long-lasting, energy-efficient solution for the one-for-one replacement of existing metal halide or high pressure sodium lighting. The RSX2 delivers 11,000 to 31,000 lumens and is ideal for replacing 250W to 1000W HID pole-mounted luminaires in parking lots and other area lighting applications.

CONSTRUCTION AND DESIGN

The RSX LED area luminaire features a rugged die-cast aluminum main body that uses heat-dissipating fins and flow-through venting to provide optimal thermal management that both enhances LED performance and extends component life. Integral "no drill" mounting arm allows the luminaire to be mounted on existing pole drillings, greatly reducing installation labor. The light engines and housing are sealed against moisture and environmental contaminants to IP66. The low-profile design results in a low EPA, allowing pole optimization. Vibration rated per ANSI C136.31: 3G Mountings: Include SPA, RPA, MA, IS, AASP, AARP rated for 3G vibration. 1.5G Mountings: Include WBA, WBASC, AAWB and AAWSC rated for 1.5G vibration.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures superior adhesion as well as a minimum finish thickness of 3 mils. The result is a high-quality finish that is warranted not to crack or peel.

OPTICS

Precision acrylic refractive lenses are engineered for superior application efficiency, distributing the light to where it is needed most. Available in short and wide pattern distributions including Type 2, Type 3, Type 3S, Type 4, Type 4S, Type 5, Type 5S, AFR (Automotive Front Row) and AFR rotated AFRR90 and ARFL90.

COASTAL CONSTRUCTION (CCE)

Optional corrosion resistant construction is engineered with added corrosion protection in materials and/or pre-treatment of base material under super durable paint. Provides additional corrosion protection for applications near coastal areas. Finish is salt spray tested to over 5,000 hours per ASTM B117 with scribe rating of 10. Additional lead-times apply.

ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted on metal-core circuit boards and aluminum heat sinks to maximize heat dissipation. Light engines are IP66 rated. LED lumen maintenance is >L92/100,000 hours. CCT's of 3000K, 4000K and 5000K (minimum 70 CRI) are available. Fixtures ship standard with 0-10v dimming driver. Class 1 electronic drivers ensure system power factor >90% and THD <20%. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

STANDARD CONTROLS

The RSX LED area luminaire has a wide assortment of control options. Dusk to dawn controls include MVOLT and 347V button-type photocells and NEMA twist-lock photocell receptacles.

nLIGHT AIR CONTROLS

The RSX LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing with photocontrol functionality and is suitable for mounting heights up to 40 feet. No commissioning is required when using factory default settings that provide basic stand-alone motion occupancy dimming that is switched on and off with a built-in photocell. See chart above for motion sensor default out-of-box settings. For more advanced wireless functionality, such as group dimming, nLight AIR can be commissioned using a smartphone and the easy-to-use CLAIRITY app. nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found [here](#).

INSTALLATION

Integral "no-drill" mounting arm allows for fast, easy mounting using existing pole drillings. Select the "SPA" option for square poles and the "RPA" option to mount to round poles. Note, the RPA mount can also be used for mounting to square poles by omitting the RPA adapter plate. Select the "MA" option to attach the luminaire to a 2 3/8" horizontal mast arm or the "IS" option for an adjustable slipfitter that mounts on a 2 3/8" OD tenon. The adjustable slipfitter has an integral junction box and offers easy installation. Can be tilted up to 90° above horizontal. Additional mountings are available including a wall bracket, adjustable tilt arm for direct-to-pole and wall and a surface conduit box for wall mount applications.

LISTINGS

CSA Certified to meet U.S. and Canadian standards. Suitable for wet locations. Rated for -40°C minimum ambient. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only. US Patent No. D882, 146S

BUY AMERICAN ACT

Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT regulations. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

SSP Square Non-Tapered Steel Poles

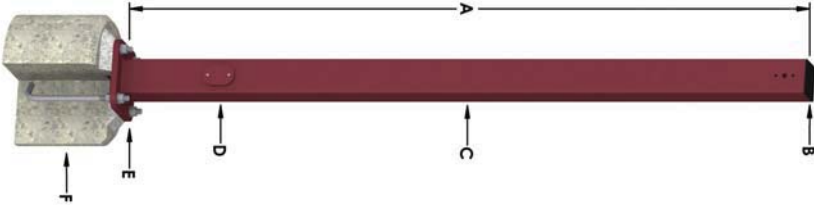
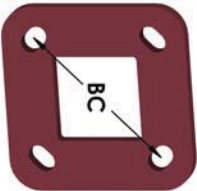
PROJECT NAME

GENERATION DATE 11/4/2022

COMMENTS

CATALOG NUMBER SSP17 - 5 - 11 - F - DM10 - BC

LAB - Less Anchor Bolts

		A — POLE SHAFT The pole shaft is single piece construction, being fabricated from a weldable grade carbon steel structural tubing and shall conform to ASTM A500 Grade C with a minimum yield strength of 50,000 psi. The pole shaft has a full-length longitudinal resistance weld and is uniformly square in cross-section with flat sides, small corner radii and excellent torsional properties. HEIGHT BASE OD GAUGE WEIGHT <table><tr><td>17'</td><td>5"</td><td>11</td><td>191 lbs</td></tr></table> EPA MAX LOAD 90 MPH AASHTO 18.5		17'	5"	11	191 lbs
17'	5"	11	191 lbs				
B — MOUNTING DESIGNATION Drilled for 1 Luminaire  		C — FINISH Standard - The standard finish is a polyester thermosetting powder coating applied to the surface of the substrate to a minimum of 3 mils for all color finishes. FINISH TYPE Standard COLOR Finish To Be Determined					
D — HAND HOLE An oval reinforced gasketed handhole is located 1'-6" above base with a grounding provision located inside the ring. WIDTH 3" LENGTH 5" 		E — BASE PLATE The anchor base is fabricated from structural quality hot rolled carbon steel plate that meets or exceeds a minimum yield strength of 36,000 psi. All welds are performed in accordance with AWS D1.1, latest edition. BOLT CIRCLE 11"  					
F — ANCHOR BOLTS Anchor bolts are of commercial quality hot rolled carbon steel that meets or exceeds yield strength of 55,000 psi. Four properly sized anchor bolts come with all poles unless otherwise specified. Anchor bolts have the threaded end galvanized a minimum of 8 inches per ASTM A153. WIDTH 1" LENGTH 36" HOOK 4" 		OPTIONS Base Cover					



KW INDUSTRIES, INC. | 909 INDUSTRIAL BLVD, SUGAR LAND, TEXAS 77478 | 1-800-275-5944 | KWINDUSTRIES.COM

AREA LIGHTING

SSP | Square Non-Tapered Steel Poles | PAGE 1 OF 2

Submitted by:	 VISIBLE LIGHT MANUFACTURERS' REPRESENTATIVE	Job Name:	UNE Alford Center Site Lighting	Catalog Number:	SSP17-5,0-11-BLK-DM10-BC-LAB	Type:	D-ALT
 Terms and Conditions  TERMS Net 30 days from the date of Company's invoice unless otherwise specified. A 1-1/2% per month late charge will be added to accounts past due PRICES Published prices are subject to change without notice. Possession of price sheets in no way obligates Company to sell to the Purchaser possessing such price sheet. All orders are subject to final approval and acceptance by the Company. Once accepted and approved, orders will be billed at prices currently in effect at the time of invoicing, or at prices quoted by the Company and accepted by the Purchaser if the order involves an item or items covered by special quotation. THE MINIMUM INVOICE CHARGE SHALL BE \$50.00 NET DELIVERY All goods sold are deliverable F.O.B. KW Industries, Inc., Sugar Land, Texas 77478 FREIGHT All of the Company's products are priced and sold F.O.B. KW Industries, Inc., Sugar Land, Texas 77478. Transportation charges will be prepaid by the Company and added to the net sales price unless specified by the Purchaser. ROUTING The Company will specify the method and routing of all products to ensure the most efficient and economical shipment in behalf of the Purchaser. The Purchaser will assume charges for special services such as cartage, air freight, express or multiple deliveries on one order. CANCELLATION The written consent of the Company shall be obtained prior to a cancellation of any order. Cancellation of an order may subject the Purchaser to a cancellation charge based upon expenses already incurred and commitments made by the Company. RETURNED GOODS Specific written request and arrangements must be made in advance for Purchaser to obtain credit or replacement on material returned. On material accepted for return, Purchaser must prepay return shipment and pay minimum restocking charge of 40% plus any charge necessary to rework goods to a resaleable condition. Custom fabricated products by special order are not subject to return. DELAYS, DAMAGE OR LOSS The Company is not and shall not be liable for delays in shipment or delivery of its products when caused by strikes, riots, hurricanes, civil disorder, fires, material shortage, breakdown in manufacturing facilities or any other cause beyond its reasonable control. Any claims for damages, loss or shortage in transit must be made by the Purchaser to the delivering carrier. The risk of loss passes to the Purchaser upon delivery to the carrier. LIMITED WARRANTY The Company warrants to Purchaser that its products will be free from defects in material and workmanship for a period of one year from the date of shipment by the Company (the "Warranty Period"). This Warranty specifically excludes fatigue failure or similar phenomena resulting from induced vibration, harmonic oscillation or resonance associated with the movement of air currents around the product. If during the Warranty period, the product proves defective in material or workmanship, the Company shall correct any defect, at its option, either by repairing any defective parts or by making available at the Company's plant a repaired or replacement part at no charge to the Purchaser, if the Purchaser promptly notifies the Company and furnishes proof of Purchase. The liability of the Company under this Warranty, or for any loss or damage arising out of, or connected with, the design, manufacturing, sale or use of its products, whether the claim is based on contract or negligence, shall not exceed the price allocable to the value of the product or part which gives rise to the claim and upon expiration of the Warranty Period all such liability shall terminate. The Company shall not be liable for special or consequential damages including, but not limited to, loss of profits or revenue, loss of use of the product, cost of substitute products or labor charges to remove or reinstall the defective product, nor any product transportation expenses to and from the Company's plant if factory repair or replacement is necessary. No warranty is made with respect to parts or auxiliary equipment not manufactured by the Company. The foregoing Warranty is exclusive and in lieu of all other warranties whether written, oral, express or implied and shall constitute the sole and exclusive remedy of the Purchaser and liability of the Company. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. The Company's products are not sold as a "consumer product" under 15 U.S.C. 62301. GENERAL KW Industries, Inc. reserves the right to change any feature of its published specifications without notice to promote product improvement and/or allow for material availability. The contract for the sale of goods by KW shall be performable in Fort Bend County, Texas. Prices subject to change without notice.  KW INDUSTRIES, INC. 909 INDUSTRIAL BLVD, SUGAR LAND, TEXAS 77478 1-800-275-5944 KWINDUSTRIES.COM AREA LIGHTING SSP Square Non-Tapered Steel Poles PAGE 2 OF 2							

Planning Board Report

Planning & Urban Development Department



1901 Forest Avenue
Conditional Use Application (CU-002683-2023)
M&G Auto Repair, Applicant

Submitted to:	Portland Planning Board	Prepared By:	Sean King, Urban Designer
Public Hearing Date:	January 09, 2024	Date:	January 05, 2024

I. INTRODUCTION

M&G Auto Repair has submitted a conditional use application to operate a used automobile dealership adjacent to the Applicants existing automobile repair shop at 1901 Forest Avenue in the Riverside neighborhood. This application is being referred to the Planning Board for compliance with the City of Portland's Land Use Code Conditional Use Standards, Section 6.5.1.A.

The Planning and Urban Development Department mailed 70 notices advertising this meeting to property owners within 500 feet of the site. A legal advertisement ran in the December 28 and 29, 2023 editions of the *Portland Press Herald*.

Applicant: Majid Majeed, M&G Auto Repair
Applicant Ghassan Abdullah, M&G Auto Repair
Representatives:



Figure 1: Aerial of property site, view towards the north

II. REQUIRED REVIEWS

<i>Review</i>	<i>Applicable Standards</i>
General conditional use	Section 6.5.2
Supplemental use-specific conditional use	Section 6.5.6.A (Automobile dealership)

III. PROJECT DATA

Existing Zoning	B-2 Community Business
Property Size	.75 acres

Existing Use	Automobile repair shop
Proposed Use	Automobile dealership

IV. EXISTING CONDITIONS AND SURROUNDING AREA

The subject property is located at 1901 Forest Avenue (CBL 327A A003001) and is currently occupied by a 9,040-square-foot commercial building. The surrounding land uses are primarily commercial, including retail and auto service stations, and residential, including apartment-style multi-family buildings consisting of Portland Housing Authority's Riverton Park and Terrace Pond Apartments, and single-family homes. A 7-Eleven gas station and convenience store is adjacent to the subject property to the west. Hannaford grocery store is located immediately north of the subject property.

The property is currently being used as both an auto repair shop and an inspection station.



Figure 2: Photograph of property frontage along Forest Avenue, view towards the west

V. PROPOSED USE

The proposed conditional use would transform the current auto repair shop into an auto dealership to specialize in rebuilding salvage vehicles for sale.

VI. RIGHT, TITLE, & INTEREST

The owner of the property is M4 LLC by deed recorded May 04, 2023 in the Cumberland County Registry of Deeds in book 40108 page 140. The property is being rented by the Applicant.

VII. ZONING ANALYSIS

The subject property is located in the B-2 Community Business zone

B-2 dimensional standards under Table 7-E below:

<i>B-2 Community Business</i>	<i>Required</i>	<i>Existing</i>
Lot Area (min.)	N/A	N/A
Lot area per dwelling unit (min.)	1,000 sq. feet	N/A
Street Frontage (min.)	20 feet	140 feet
Front Setback (max.)	10 feet	30 feet

Rear Setback (min.)	10 feet	35 feet
Side Setback (min.)	None	14 feet
Stepbacks (above 35 feet when property line abuts a residential zone)	N/A	N/A
Length of building wall at maximum setback (min.)	N/A	N/A
Length of undifferentiated blank wall along publicly accessible way (max.)	N/A	N/A
Floor area (max.)	N/A	N/A
Structure Height	65 feet	<20 feet
Lot coverage (max.)	N/A	N/A
Impervious surface ratio (max.)	Residential: None Other uses: 80%	<80%

Auto, boat, and related dealerships are permitted in the B-2 zone as a conditional use according to Table 6-C of the Land Use Code. Applications for conditional use are required to be reviewed against the general conditional use standards specified in Section 6.5.2 and supplemental conditional use standards for automobile dealerships specified in Section 6.5.6.A.

VIII. GENERAL CONDITIONAL USE – AUTOMOBILE DEALERSHIP (Section 6.5.2)

As required under Section 6.5.1.A of the City's Land Use Code, the Zoning Board of Appeals shall review all conditional use applications, with the exception that the Planning Board shall review all conditional use applications for specific uses for which the Planning Board is identified as the review authority under section 6.5.6.

The ordinance under Section 6.5.2 requires the review authority shall find the following standards satisfied:

- 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.*

The City's Consulting Traffic Engineer has reviewed the application materials and finds the change in use would not be expected to generate substantially more traffic or parking spaces than current or nearby uses.

The Applicant has indicated hours of operation from 9am to 5pm, with no expansion of pavement or increase to the existing 30 parking spaces.

- 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.*

City staff finds the proposed use will not create unsanitary or harmful conditions. The Applicant has indicated there is no water inside the unit, stating that the drain inlets and lines were sealed off from the City's sewer system.

- 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.

City staff finds the operations of the proposed use will not have a substantially greater effect/impact on the surrounding properties than those associated with surrounding uses or other allowable uses in the zone.

- D. The proposed use will meet any additional zone or use-specific standards identified in Tables 6-A to 6-F and Subsections 6.5.6 and 6.5.7.*

The proposed use is subject to the Supplemental Conditional Use standards for Automobile dealership, listed under Section 6.5.6.A.

IX. SUPPLEMENTAL CONDITIONAL USE – AUTOMOBILE DEALERSHIP (Section 6.5.6.A)

As required under Section 6.5.6 of the City's Land Use Code, in addition to the general conditional use standards, the following applicable standards shall apply to specific conditional use:

A. Automobile, boat, and related dealerships and auto service stations:

- 1. The Planning Board shall be the review authority.*

The Planning Board is the review authority for this application.

- 2. Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed, and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.*

City staff finds the existing sign location to not adversely affect visibility at intersection or access drive. In addition, the Applicant is not proposing any new signage.

- 3. No ingress and egress driveways shall be located within 30 feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.*

The applicant proposes to retain the existing driveway, which City staff finds appropriate to support ingress and egress to and from the property. The existing driveway is not located within 30 feet of an intersection and does not pose a threat or potential danger to the safety of the public.

- 4. A landscaped buffer, no less than five feet wide, shall be located along street frontages (excluding driveways). The buffer shall consist of a variety of plantings in accordance with the City of Portland Technical Manual.*

The site currently contains a grass strip with wooden guardrail along its Forest Avenue frontage.

- 5. Car washes shall be designed to avoid the tracking of residual waters into the street.*

Not applicable. The applicant is not proposing a car wash.

X. PROPOSED MOTIONS

A. CONDITIONAL USE – AUTOMOBILE DEALERSHIP

On the basis of the application, report and other information submitted by the applicant; findings and recommendations contained in the Planning Board Report for the public hearing on January 09, 2024 for application CU-002683-2023 relevant to the Land Use Code Section 6.5.2 and Section 6.5.6(A) and the testimony presented at the Planning Board hearing, the Planning Board [finds/does not find] that the plan is in conformance with the conditional use standards of the Land Use Code.

XI. ATTACHMENTS

REPORT ATTACHMENTS

- Att. 1 City Consulting Civil Engineer comments 12-06-2023
- Att. 2 City Consulting Traffic Engineer comments 12-11-2023
- Att. 3 DPW Transportation review 12-11-2023
- Att. 4 Planning Staff correspondence 12-23-2023

APPLICANT SUBMITTAL

- A. Project description

1901 Forest Ave Conditional Use

Lauren Swett <lswett@woodardcurran.com>
To: Sean King <sking@portlandmaine.gov>

Wed, Dec 6, 2023 at 10:17 AM

Hi Sean,

Att. 1

There isn't really anything for me to review for 1901 Forest Ave Conditional Use application, but one thing that I'll mention, for this type of use, floor drainage needs to be to an oil water separator that connects to sewer and not stormdrain. With the expansion of the use into another unit, they should confirm that any floor drain systems in the newly used area are set up correctly.

Thanks,

Lauren

Lauren Swett, PE*
Technical Manager | Principal



 207.558.3763  207.219.3591  woodardcurran.com

 lswett@woodardcurran.com

 12 Mountfort St, Portland, ME 04101



*Licensed in Maine, New Hampshire, and Georgia

1901 Forest Avenue - Traffic Review

Tom Errico <thomas.errico@tylin.com>

Mon, Dec 11, 2023 at 8:27 AM

To: Sean King <sking@portlandmaine.gov>

Cc: Jeremiah Bartlett <JBartlett@portlandmaine.gov>, Janine Ba <janineba@portlandmaine.gov>

Att. 2

Hi Sean – I have reviewed the proposed application and my comment as it relates to the Conditional Use Application regarding transportation is noted below.

- According to trip generation information contained in the [Trip Generation Manual](#), Institute of Transportation Engineers, a Used Auto Sales facility would be expected to generate 3.75 trips during the PM peak hour per 1,000 square feet of gross floor area. An Auto Care facility would be expected to generate 3.11 trips during the PM peak hour per 1,000 square feet of gross floor area. Based upon the approximate size of the building, the change in use would not be expected to generate substantially more traffic or parking spaces than current or nearby uses.

Please contact me if you have any questions.

Best regards,

Tom Errico, P.E.

NE TRAFFIC ENG. DIRECTOR

T +1 207.347.4354

M +1 207.400.0719

thomas.errico@tylin.com

TYLin

[12 Northbrook Drive](#)

Building A, Suite One

Falmouth, ME 04105, United States

[TYLin.com](#)



CU-002683-2023 1901 Forest Ave DPW Comments

Janine Ba <janineba@portlandmaine.gov>

Mon, Dec 11, 2023 at 1:14 PM

To: Sean King <sking@portlandmaine.gov>

Cc: Justin Pellerin <jrp@portlandmaine.gov>, Keith Gray <kgray@portlandmaine.gov>, Benjamin Pearson <bnp@portlandmaine.gov>, Lauren Swett <lswett@woodardcurran.com>, Tom Errico <thomas.errico@tylin.com>

Att. 3

Sean,

Below are DPW's comments for CU-002683-2023 1901 Forest Ave. Let me know if you have any questions.

CU-002683-2023**1901 Forest Ave****DPW Development Review Comments****12/11/2023**

- DPW Transportation
 - No comments at this time.
- DPW Water Resources
 - Comments to follow.

--

Janine Ba
Project Engineer
City of Portland Department of Public Works
[212 Canco Rd. Suite B](#)
[Portland, ME 04103](#)
janineba@portlandmaine.gov
Desk: 207-874-8463
Cell: 207-245-2074

Conditional Use-PB CU-002683-2023, 1901 FOREST AVE

Sean King <sking@portlandmaine.gov>
To: Majid Hameed <majid3120022@yahoo.com>

Fri, Dec 22, 2023 at 2:19 PM

Att. 4

Hello Majid,

Thank you for sharing the information in your response. Please note that you and/or Mohammed will need to participate in a public hearing meeting with the Planning Board, our City department has scheduled 1901 Forest Avenue for Tuesday, January 9, 2023, with a time after 5:30pm. This public meeting is hybrid to allow for participation in person at Portland City Hall, room 24 or virtually by Zoom. Please respond with your availability for me to prepare your conditional use application for the used automobile dealership.

Thank you, Sean

Sean King, PLA
Urban Designer
389 Congress Street, 4th Floor
Portland, Maine 04101
(207) 874-8901
sking@portlandmaine.gov
(he/him/his)



On Wed, Dec 20, 2023 at 1:52 PM Majid Hameed <majid3120022@yahoo.com> wrote:

Hi there

It maybe useful to repeat that unit one 1 was doing business as usual

And unit 2 also has been dear with cars that are involved in accidents and we also do business with two other dealerships who brings their car to be fixed

So the only addition is that we are looking to buy cards from the Auction and fix them and put them for resale

Please take in your consideration that we have been paying for additional rent for unit one. Three months now around monthly \$2500 between rent and utilities . Thus, we really appreciate it if you help expedite the process of application

Anyhow, for the answering Gora email dated December 18 number one. The hours of operation is from 9 am to 5 pm
the pavement is the same no change the number of parking lots is around 30 cars

2. there is no increase in the noise, clear and dust, see which disposal

3. Regarding loading loading and deliveries would be the same. We have been receiving deliveries from Towing companies. The trash would be the same. Each unit has its own trash container and they are picked every other week.

4. The access to the garage. It is the main entrance and exit from Forest Avenue and there is also an entrance from Riverside and this road is easement road from Hannaford.

5. regarding water separator all units in this building 1901 the separators have been sealed from the City years ago, so there is no water in inside the unit

6. the buffers are available in the unit. There is steel aluminium buffer in front of the building and there is the wooden buffer on the other side next to the gas station 7-Eleven.

Yours sincerely
Majid H Majeed

2074090518

Sent from Yahoo Mail for iPhone

On Monday, December 18, 2023, 11:00 AM, Sean King <sking@portlandmaine.gov> wrote:

Hello 1901 Forest Avenue conditional use applicants,

My name is Sean King, and I've been designated as the Planner to facilitate this review to prepare your application for the Planning Board. The conditional use application (CU-002683) requires the Planning Board to be the review authority under Section 6.5.6 of the City's Land Use Code. There are several departments and peer reviewers that evaluate conditional use applications, and the follow questions below will assist the City in its review. Please answer these questions to the best of your ability and communicate any questions.

For the proposed automobile dealership at 1901 Forest Ave, Unit 1, please provide:

1. The volume and type of vehicle traffic to be generated, please indicate if the automobile dealership anticipates more patrons that would cause more traffic on Forest Ave.
 - a. Hours of operation,
 - b. The expanse of pavement, if new,
 - c. The number of parking spaces
2. Please communicate if you there may be an increase by any reason of noise, glare, dust, sewage disposal, emissions to the air, odor, lighting, or litter.
3. Please communicate any new landscaping, screening, signs, loading, deliveries, trash or waste generation, arrangement of structures, and materials storage for the proposed automobile dealership.
4. Please indicate driveway access into the property, the primary driveway exists from Forest Ave. Please clarify the functional use of the existing driveway from Riverside Street
5. Please indicate an oil water separator exists at Unit 1 that connects to sewer and not storm drain. With the expansion of the automobile dealership at Unit 1, the City must confirm that floor drain systems is set up properly to avoid pollution into the storm drain system.
6. A landscaped buffer, no less than five feet wide, shall be located along street frontages (excluding driveways) to consist of a variety of plantings following the City of Portland Technical Manual. The existing condition appears to show pavement within five feet of the sidewalk, provide new shrubs shall be approximately three (3) feet in mature height and shall be spaced six (6) to eight (8) feet apart as necessary. The City can provide recommendations for shrubs or an acceptable landscape buffer if needed.

Thank you, Sean

Sean King, PLA
Urban Designer
389 Congress Street, 4th Floor
Portland, Maine 04101
(207) 874-8901
sking@portlandmaine.gov
(he/him/his)



On Fri, Nov 24, 2023 at 11:19 AM Majid Hameed <majid3120022@yahoo.com> wrote:

Dear sirs

Our business and my neighbors businesses are all auto related
Mechanics/ body shop
Even the previous owner of unit 1 which we bought is a mechanic
Furthermore there is no major modifications or site changes
The only addition is we are going to buy and sell cars which bring more business to other garages also
Anyhow you can check if a neighborhood meeting is applicable or not

MaJid Majeed
2074090518

[Sent from Yahoo Mail for iPhone](#)

On Wednesday, November 22, 2023, 1:54 PM, noreply@portlandmaine.gov wrote:

Dear Applicant,

Your application has been deemed complete, distributed to reviewers and assigned to a Planner. The next step, if applicable to your project, is to schedule a neighborhood meeting per the requirements of the Land Use Code. Please refer to [the Neighborhood Meeting Packet](#) for instructions and to see if this requirement is applicable to your project.

If you have any questions or need assistance, please contact our office.

City of Portland, Department of Planning and Urban Development
389 Congress St., 4th Floor, Portland, ME 04101

Jennifer Munson, Office Manager
jmy@portlandmaine.gov | (207) 874-8719 | Fax (207) 756-8258

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.

I am writing to propose an expansion of our business, M and G Auto Repair, which has been operating successfully at Unit 2 for nearly 10 years. Our proposal is to merge with Unit 1, which we recently acquired, and establish a used car dealership alongside our existing auto repair services.

Currently, our business primarily focuses on repairing salvage cars (accident-damaged vehicles) as well as providing services for regular automobiles. Over the years, we have developed a reputation for our high-quality repairs. However, the recent economic recession has had a noticeable impact on our business. To counter these challenges, we intend to expand by engaging in the buying and selling of vehicles.

Here is a brief overview of our proposal:

1.Expansion Plan: We have recently acquired Unit 1, which is adjacent to our existing location in Unit 2. Our plan is to combine these two units to create a space suitable for both auto repair and used car sales.

2.Volume of Cars: The volume of vehicles we handle is not expected to change significantly.

3.Owner's Approval: We have already obtained the owner of the building's approval for this expansion.

4.Used Car Dealership and Recycling: We seek your approval to operate as a used car dealership and recycler, specifically for salvage cars that have been in accidents. We have a decade-long track record of working with insurance companies to repair their clients' vehicles after accidents. The difference now is that we can purchase cars from Auto Auctions, perform the necessary repairs, and offer them for sale in compliance with Maine Motor Vehicle regulations.

We believe that this expansion will not only enhance our business's sustainability but also contribute positively to the local economy by creating new job opportunities and providing a convenient location for customers to buy and sell used cars.

We kindly request your approval for this proposal and would welcome the opportunity to discuss it further with you at your earliest convenience.

Thank you for considering our proposal, and we look forward to your response.

Sincerely,

Majid Majeed

M and G Auto Repair

19 West Street
Major Site Plan and Conditional Use
PL-002614-2023, CU-002693-2023
Jack Soley and Ali Malone, Applicant

Submitted to:	Portland Planning Board	Prepared By:	Maya Balassa
Public Hearing Date:	January 9, 2024	Date:	January 5, 2024

I. INTRODUCTION

Carleton West, LLC has submitted a Major Site Plan and Conditional Use application to facilitate the development of two, two-unit townhomes, the renovation of an existing building into a three story, five-unit residential building, and the renovation of a parking lot on a 37,361 square foot lot. All nine units are proposed as condominiums. The townhomes along Carleton Street will each have a garage, accessed from the rear. There are 18 parking spaces proposed for the residential buildings onsite, eight garage spaces are proposed for the townhomes along Carleton Street and 10 surface parking spaces are proposed for the five-unit building. 23 condo parking spaces for nearby residents in the existing parking lot accessed off of West Street is proposed.

This application is being referred to the Planning Board for compliance with the City of Portland's Land Use Code Site Plan Standards, Section 14.6 and Conditional Use Standards, Section 6.5.2.

The Planning and Urban Development Department mailed 422 notices advertising this meeting to property owners within 500 feet of the site. A legal advertisement ran in the December 28 and 29, 2023 editions of the *Portland Press Herald*.

The Planning Board held a workshop on November 10, 2023.

Applicant: Jack Soley and Ali Malone, Carleton West, LLC
Applicant Terradyn Consulting, LLC
Representatives:

II. REQUIRED REVIEWS

I. Review	<i>Applicable Standards</i>
Site Plan	Section 14.6
Conditional Use Review	General Conditional Use standards Section 6.5.2 and/or Supplemental conditional use standards 6.5.6

<i>Waiver Requests</i>	<i>Applicable Standards</i>
The applicant is requesting a two-way parking lot drive aisle width of 20' in the parking lot located on the east side of the site.	Technical Manual Section 1.10.3 requires a minimum two-way drive aisle width of 24 feet for standard right-angle parking.
The applicant is requesting an 18' wide driveway to serve the proposed parking lot off West Street.	Technical Manual Section 1.5.1.B requires a 20-foot minimum width.

IV. PROJECT DATA

Existing Zoning	R-6 Residential
Historic District	West End Historic District
Property Size	37,361 square feet
Existing Use	Office/Parking
Proposed Use	Residential/Parking

	<i>Existing</i>	<i>Proposed</i>	<i>Net Change</i>
Building Footprint	3,930 square feet	8,250 square feet	+4,320
Building Floor Area	11,790 square feet	27,589 square feet	+15,799
Impervious Surface Area	33,230 square feet	32,281 square feet	-949
Parking Spaces	62	33	-29
Bicycle Parking Spaces	0	9	+9

V. BACKGROUND AND EXISTING CONDITIONS



Figure 1 Street view from Carleton Street

The parcel is located along Carleton Street and West Street in the West End neighborhood. The site comprises existing off-street parking, with an existing two-story, approximately 30-foot tall office building. There are two existing driveways, with one located off of West Street and the other off of Carleton Street. There are two active easements on the property including a sewer easement and a common use easement with the adjoining property for the “purposes of passage, light and air, and is never to be obstructed in any way or to be made a place of storage or deposit” (Book 691, Page 284). The site is located less than 500 feet from a bus stop for METRO Line 8. The nearby properties are largely residential, however there are commercial businesses nearby, including Chaval Restaurant, the Ronald McDonald House, Seracare Life

Sciences, and the Cumberland Farms gas station. The Ronald McDonald House currently utilizes some of the parking spaces in the parking lot close to Carleton Street.

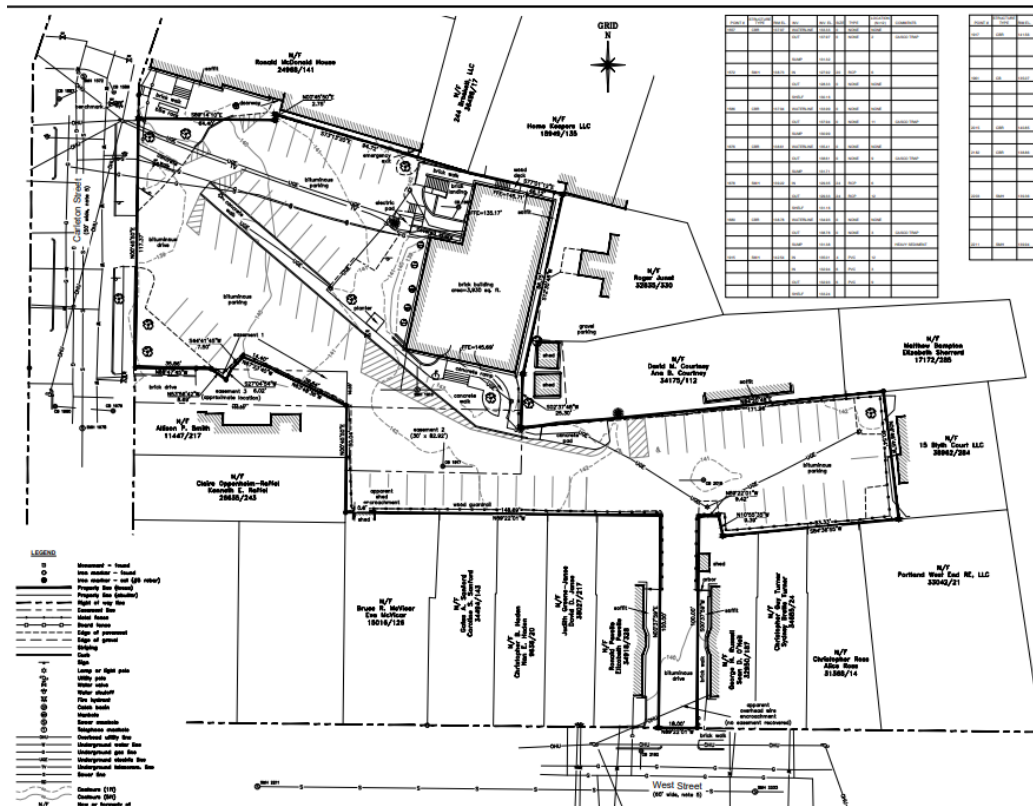


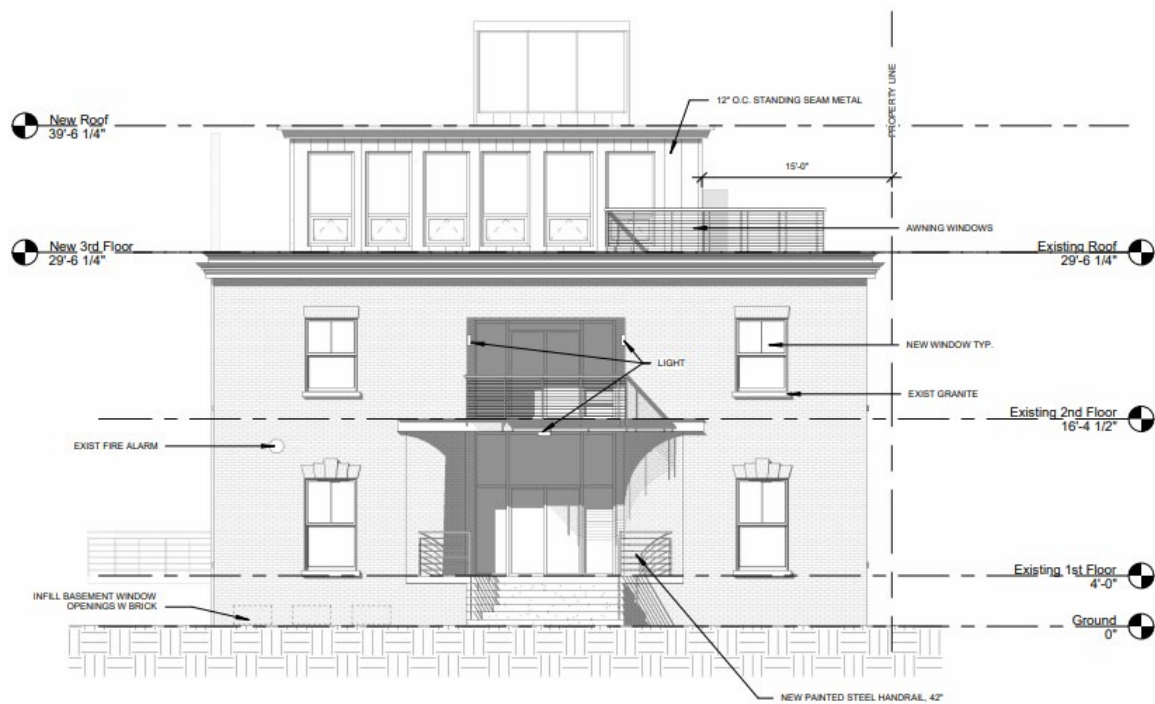
Figure 2 Existing conditions plan of 19 West Street

VI. PROPOSED DEVELOPMENT

The proposed Major Site Plan application would facilitate the development of two new two-unit townhouses along Carleton Street and the redevelopment of an existing two-story building into a three story, five-unit building. Each townhouse will have a two-car garage, accessed from the rear, and there are ten proposed surface parking spaces. All vehicular traffic associated with the proposed residential development will access the site via Carleton Street. Additionally, the existing parking lot accessed off of West Street will remain and is proposed to be repaved, with the 23 remaining parking spaces. The spaces are proposed to be converted to condo parking spaces, and sold individually. Vehicular and pedestrian access between the residential portion of the site, and 23-space parking area being reserved for area-wide residents, is proposed to be restricted by a small landscaped area with raised granite curbing and gate.



Figure 3 Carleton St elevation of the two townhouses



1 | 19 WEST NEW SOUTH ELEVATION
1/8" = 1'-0"

Figure 4 Renovated medical office building elevation

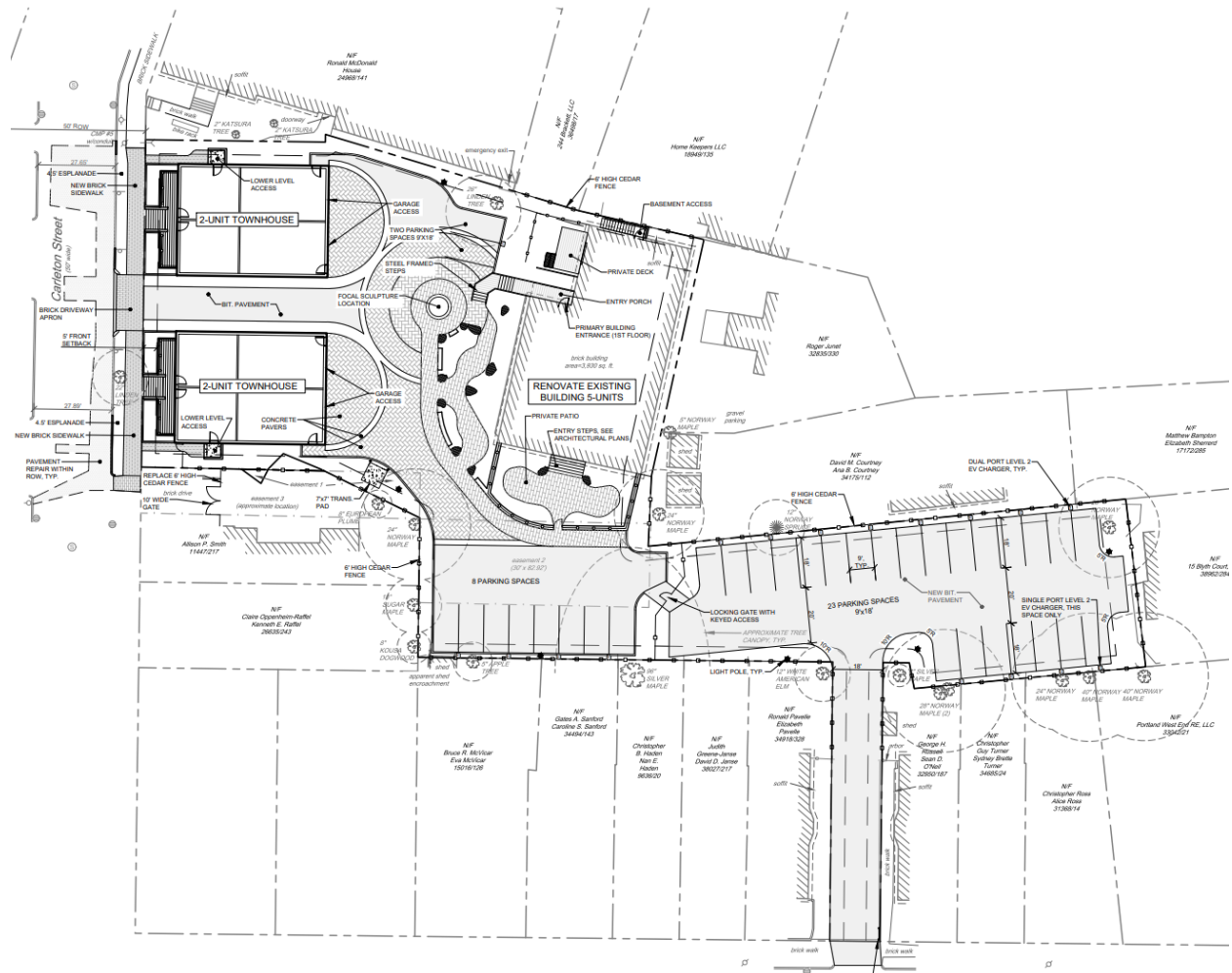


Figure 5 Proposed Site Plan

VII. PREVIOUS WORKSHOPS

The Planning Board held a workshop for this project on November 10, 2023.

During the workshop, staff indicated that the applicant needed to provide a parking study to justify the number of proposed off-street parking spaces, and also noted that the open-air easement appeared to prohibit parking within the easement area. After further review, Staff, including the City's Zoning Administrator, have confirmed that the proposed townhouses fronting Carleton Street are in conformance with the R-6 dimensional standards. Stairs are proposed within the front setback along Carleton Street, since the stairs do not exceed 50 square feet and are within six feet of the porch they meet zoning requirements per Section 7.5.5.C.

VIII. RIGHT, TITLE, & INTEREST

The deed has been submitted showing Carlton West LLC as the owners of the property. Titcomb Associates completed an existing conditions survey, dated March 15, 2023. Three easements were identified and are shown on the survey. The first easement was released. There is also a second easement encumbering the parcel which benefits the adjoining property owners for the passage, light, and air, and which cannot be obstructed in any way or used for storage. Parking is proposed in the

easement area. Corporation Counsel reviewed the easement and has noted that parking would not be permitted within the easement area, as written. The applicant has been asked to secure a written amendment or release of the easement from the benefitting abutters which confirms parking is allowed in the easement area. Any such amendment or release will need to be recorded in the Cumberland County Registry of Deeds. A condition to this effect has been drafted for the Board's consideration.

IX. FINANCIAL & TECHNICAL CAPACITY

A letter from Norway Savings Bank has been submitted to demonstrate financial capacity. Technical capacity has been provided through the applicant team of Archetype Architecture, Terradyn Consultants, and Titcomb Associates.

X. ZONING ANALYSIS

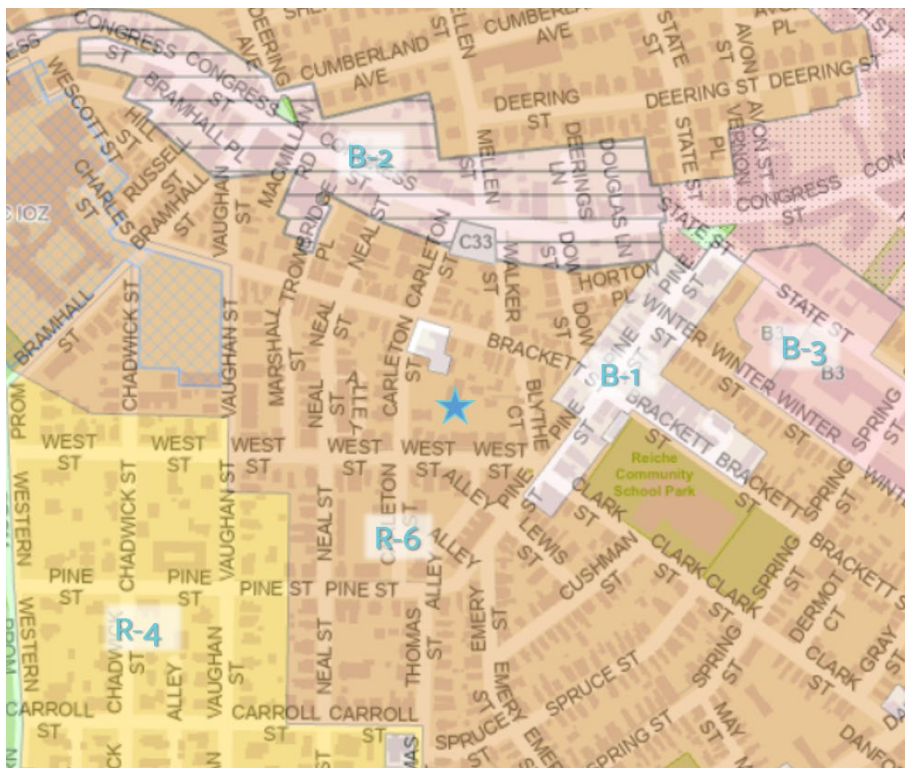


Figure 6 Zoning map

The project is located in the R-6 Residential zone and is also located in the West End Historic District. Per Table 6-A, single-family, two-family, and multi-family dwellings are permitted uses in the R-6 zone. According to Table 6-A and Section 6.5.6(H)(2) off-street parking for passenger cars for uses permitted in the R-6 zone is listed as a conditional use in the R-6 zone and is required to meet the general conditional use standards in Section 6.5.2. The applicant has submitted a conditional use application for the off-street parking proposed off of West Street for 23 condo parking spaces.

The R-6 zone limits residential density by requiring a minimum of 725 square feet of lot area per dwelling unit and further requires a minimum lot area of 2,000 square feet for residential uses. Maximum height in the R-6 zone is 45 feet. Buildings that are over 35 feet in height are required to have a 10-foot setback

from side property lines and 15-foot stepback from a rear property line. Minimum street frontage and lot width is 20 feet. The minimum front setback is five feet or the average depth of adjacent front yards. For the purposes of this review, staff have identified Carleton Street as the property's frontage, which is considered the basis for applicable front, side and rear setback requirements. The minimum rear setback is 10 feet and the minimum side setback is five feet except that a side setback in the R-6 zone may be reduced to zero, provided that the cumulative side yards are not less than 10 ft. Maximum lot coverage is 60% and the minimum landscaped open space ratio is 20%. The minimum off-street parking requirement is calculated as one space per dwelling unit as specified in Table 19-A. However, within the R-6 zone, no off-street parking is required for the first three dwelling units as described in Table 19-B. Therefore, the minimum zoning requirement for the proposed project is six parking spaces.

According to the applicant's submitted plans, the two townhouse buildings are proposed to be 39' 10" in height. Further, the applicant is proposing to have outdoor decks with stairwell access associated with the townhomes. The renovated building is proposed to have a new height of 39' 6-1/4" after the addition of a third story. The third story is proposed to be stepped back 15 feet from the east side of the building to meet rear setback requirements, since Carleton is designated as the front yard.

Zoning Summary Table		
Zoning Requirements	R-6 Residential	Proposed
Minimum Lot Size	2,000 square feet	37,361 square feet
Front Yard	5 feet. or avg	5 feet *
Minimum Side Yard	5 feet	8.5 feet
Minimum Rear Yard	10 feet	3.7 feet (existing)
Open Space	20%	18.4%
Maximum Height	45 feet	39.83 feet
Step Back	15 feet rear, 10 feet side	Left: 10 feet Right: 10 feet Rear: 15 feet
Parking	9 spaces (1 space per unit)	18 residential spaces 23 condo spaces

*Stairs are proposed within the front setback along Carleton Street- the stairs do not exceed 50 square feet and are within 6 feet of the porch, therefore, they meet zoning requirements via Section 7.5.5.C of the Land Use Code.

XI. SITE PLAN STANDARDS (Section 14.6)

The proposed development has been reviewed by staff for conformance with the relevant review standards of the City of Portland's Site Plan Ordinance, Section 14.6. Staff comments are below.

1. Transportation Standards (Section 14.6.1)

A. Impact on surrounding street systems

The applicant proposes to retain the existing driveways off of Carleton Street and West Street.

Residents of the proposed buildings will access their units from the driveway off of Carleton Street.

The separate 23-space parking area will be accessed from the existing driveway off of West Street. The proposal includes renovating the sidewalk along the entire Carleton Street frontage.

B. Access and circulation

All proposed off street parking for residential units will be accessed off of Carleton Street via a 20-foot-wide driveway. All proposed parking for off-site uses will be accessed off of West Street via an existing 18-foot-wide driveway.

In response to City comments, the applicant is proposing a 12-foot wide driveway with a 4-foot wide flush paver walkway on either side of the driveway for pedestrian movement off of Carleton Street.

WAIVER REQUESTS

Two waivers are proposed for this project. Both waivers are in relation to the existing parking lot located off of West Street, which is being proposed as condominium parking. The Technical Manual requires a minimum driveway width of 20 feet, and the existing conditions, for which the applicant is seeking a waiver, is 18 feet. Given that this is an existing condition, and that the lot does not have space to accommodate increased width, staff support this waiver request.

The second waiver is for the two-way drive aisle width within the parking lot accessed off of West Street. The minimum width is 24 feet in the Technical Manual, and the applicant is proposing 20 feet. Due to low turnover and urban infill condition, staff support this waiver request.

C. Public transit access

Not applicable. The site is less than 500 feet from a METRO bus stop on Line 8, and therefore no additional improvements are required to comply with this site plan standard.

D. Parking

With respect to off-street parking requirements for new development, the City considers the 18 parking spaces being proposed in association with the proposed residential units to be separate and distinct from the 23 parking spaces being proposed off of West Street, which will be located on a separate lot, and managed as a condominium, with spaces being individually sold to nearby residents. As off-street parking is a conditional use within the R-6 zone, the applicant has submitted a separate conditional use application to formalize off-street parking as a principal use for this lot. (Report Attachment 2)

Regarding the proposed residential parking, Table 19-A of the Land Use Code sets the parking minimum for single/two/multi-family units at 1 space/ dwelling unit, with a zone-based vehicular exception in Table 19-B permitting no off-street parking required for the first three dwelling units in the R-6 zone. The minimum number of parking spaces per this table for the site is 6 spaces, though given the development's proximity to nearby public transit, the project would be eligible for the transit-based parking exemption listed in Table 19-B, which requires no off-street parking for uses located within a quarter mile of fixed public transit. The applicant is providing 2 spaces per unit for a total of 18 spaces (10 surface parking spaces and 8 garage parking spaces).

Per Sec. 14.6.1.D.1.C. "Developments proposing to exceed minimum parking requirements by 10% or more must demonstrate through a parking study that the amount of parking is appropriate for the proposed use of the site." Since the development is proposing over 100% more parking than what is required, the applicant is required to submit a parking study to support the number of spaces being proposed. Staff found the methodology in the parking study, prepared by Terradyn Consultants, LLC, to be reasonable (Applicant Submittal W). The data showed that nine residential units were expected

to generate the need for 15 parking spaces. Given that four of the residential units will have garage spaces, staff are requesting that the surface parking lot be reduced to match the demand found in the parking study, which is 1.6 spaces per unit, or rounded to eight surface parking spaces for the five units. Staff are requesting that the Board consider a condition of approval, which would require the applicant to revise their site plan and reduce the number of surface parking spaces by two spaces, as supported by the applicant's parking study.

For the townhouses, bike parking is proposed in the garages. For the redeveloped building, private bike parking storage is proposed in the basement of the building.

To meet the 20% EV charging standard, four of the residential parking spaces and five of the condo spaces will have Level 2 EV chargers installed and all spaces will be EV ready.

E. Transportation demand management (TDM)

Not applicable. A transportation demand management plan is not required.

2. **Environmental Quality Standards (Section 14.6.2)**

A. Preservation of significant natural features

No significant natural features have been identified on site.

B. Landscape preservation

In response to City comments, the applicant has identified the location, species, size, and dripline of trees onsite and trees on abutting properties that have root systems within the parcel. The applicant has added preservation details, per staff request, to ensure safety during construction.

An existing conditions and demolition site plan show the removal of six trees onsite. Within the setback, three trees with a DBH of 10 inches or greater are proposed to be removed, and two are proposed to be preserved- meeting the preservation standard.

There is one Linden tree onsite that meet the criteria for the Heritage Tree Ordinance. The removal of the 26-inch Linden tree requires either replacement with 13 native trees or a fee-in-lieu of \$14,898.00. The applicant has chosen to replant 14 trees including 10 Thornless Hawthorns, 2 American Hornbeams, and 2 White Oaks. The proposal meets the standards.

The applicant has been working with the City Arborist to retain the 22-inch DBH Linden (not large enough to meet the Heritage Tree Ordinance) in the road verge along Carleton Street. In the most recent storm, that Linden tree fell down. The City Arborist is requesting that the applicant replace the fallen tree with an American Hornbeam.

C. Site landscaping and buffers

The landscaping plan proposes five street trees along Carleton Street, including the fallen Linden. A total of nine street trees are required for the development, at a ratio of one tree per unit. The applicant will need to pay into the street tree fund for the five additional street trees needed, at a rate of \$400 per tree, or add additional street trees. A condition has been added.

The landscaping plan shows a combination of trees, shrubs and perennials around the property. Staff find the landscaping plan to meet Tech Manual Landscaping Standards.

D. Water quality/storm water management/erosion control

The project is subject to the Maine DEP Chapter 500 and City of Portland Technical Manual Section 5 for stormwater management. The site plan shows erosion and sediment control measures that comply with the basic standard of Maine DEP Chapter 500. Even though the project is decreasing non-roof impervious, much of the redevelopment proposes changes that exceed the maintenance threshold and therefore are subject to the redevelopment standard which requires 50% of redevelopment non-roof impervious surface over 5,000 square feet. The applicant is proposing a Storm Basin and R-Tank subsurface system to store and treat stormwater for a 1-inch rainfall of 7,020 square feet, over 50% of the redeveloped non-roof impervious surface.

The applicant will be required to submit a Stormwater Maintenance Agreement for the proposed stormwater system.

3. Public Infrastructure and Community Safety Standards (Section 14.6.3)

A. Consistency with City Master Plans

The nine residential units being added to the area are in line with zoning and therefore is consistent with the City's master plan.

B. Public safety and fire prevention

The project is located within proximity to a fire hydrant at the corner of Carleton Street. The proposed buildings will be fully sprinkled. Staff find the standard to be met.

C. Availability and capacity of public utilities

Staff have received ability to serve confirmation from Water Resources. Staff are waiting on ability to serve confirmation from Portland Water District and Central Maine Power (CMP). A condition has been added.

4. Site Design Standards (Section 14.6.4)

A. Massing, ventilation, and wind impact

The HVAC is proposed to be located on the roof of each building. Rooftop HVAC equipment will be screened. Staff find the standard to be met.

B. Shadows

Not applicable. There are no shadow impacts anticipated on a significant public resource.

C. Snow and ice loading

Snow storage is proposed in landscaped and paved areas on-site. The standard is being met.

D. View corridors

Not applicable. The site is not located in a view corridor in the Downtown Vision View Corridor Protection Plan.

E. Historic resources

This project is located within the West End Historic District and is being reviewed by the Historic Preservation Board. The applicant had an initial workshop for the proposed project with the Historic Preservation Board on May 17, 2023 and a public hearing for the Certificate of Appropriateness on

January 3, 2024 (<https://portlandme.portal.civicclerk.com/event/6703/files/14159>), where the HP Board unanimously approved the application.

F. Exterior lighting

A photometric plan has been provided that shows conformity with the City's site lighting standards related to foot candle ratio, maximum illumination, and the use of full cut-off light fixtures. There is lighting proposed at the rear and side of the townhouses, as well as the entrances of the 5-unit residential building. One light is proposed for the 8 parking spaces associated with the 5-unit building. Three lights are proposed for the 23 condo parking spaces. Staff have found that the exterior lighting as proposed meets the City's site lighting requirements.

G. Noise and vibration

Adverse noise and vibration impacts are not anticipated to result from this development.

H. Signage and wayfinding

Any proposed signage will be reviewed by Historic Preservation staff as well as the Office of Permitting and Inspection as part of a separate sign permit application.

I. Zoning-related design standards

This project is within the West End Historic District and is being reviewed by the Historic Preservation Board for a certificate of appropriateness. The applicant had an initial workshop for the proposed project with the Historic Preservation Board on May 17, 2023, and the Certificate of Appropriateness was unanimously approved by the HP Board on January 3, 2024.

XII. CONDITIONAL USE STANDARDS

Off-street parking is a conditional use in the R-6 Residential zone and will be reviewed against the General Condition Use Standards specified in Section 6.5.2 of the Land Use Code.

General Conditional Use Standards Section 6.5.2

- 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.**

The proposed off-street parking spaces will serve existing uses within the neighborhood. The applicant has proposed for the spaces to be sold individually as condo spaces to existing residents of the neighborhood.

- 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.**

The site is currently a parking lot that serves a medical office building. The parking will not create unsanitary or harmful conditions with respect to noise, glare, dust, sewage disposal, emissions to the air, odor, lighting, or litter. The proposed site lighting for the parking lot meets Tech Manual lighting standards for light trespass and fixtures are all full cut-off. All gas-powered vehicles produce emissions, however their impact at this location is not anticipated to be any more impactful than at other locations within the City or R-6 Residential zone.

- 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.

The parking lot will be managed and maintained by a condo association.

Landscaping is proposed around the perimeter of the parking lot and the lot is screened with a six-foot-high fence. A small sign is proposed at the driveway entrance on West Street.

No deliveries, loading, or materials storage will take place on the site, and no trash or waste will be generated. Snow may be hauled from the site if needed, as it is from other residential parking areas throughout the neighborhood.

- D. The proposed use will meet any additional zone or use-specific standards identified in Tables 6A to 6-F and Subsections 6.5.6 and 6.5.7.

Per the supplemental use-specific conditional use standards, Section 6.5.6.H(2), it is stated that “In the R-6 zone, off-street parking shall be for passenger cars for uses permitted in the R-6 zone”.

According to the applicant the proposed off-street parking spaces will be sold individually.

Residential uses are a permitted use in the R-6 zone, therefore this standard is met. A condition of approval for the conditional use will be added for the public hearing stipulating that the parking spaces will be sold for uses permitted in the R-6 Residential zone.

XIII. NEIGHBORHOOD MEETING & PUBLIC COMMENT

The applicant held a neighborhood meeting on September 27th at the Reiche School. The meeting notes and attendance documentation has been submitted (Applicant Submittal R). There has been one public comment submitted to the city with concerns around the easement and proposed parking.

XIV. STAFF RECOMMENDATION

Subject to the proposed motions and conditions of approval listed below, Planning & Urban Development Department staff recommends to the Planning Board that the project at 19 West Street meets the applicable standards of Portland’s Land Use Code.

XV. PROPOSED MOTIONS

A. WAIVERS

On the basis of the application, plans, reports and other information submitted by the applicant, findings and recommendations contained in the Planning Board Report for the public hearing January 9, 2024 for application #PL-002614-2023 relevant to the Site Plan Standards of the Land Use Code and Portland’s Technical and Design Standards, and other regulations, and testimony presented at the Planning Board public hearing:

1. Two-Way Drive Aisle Width

The Planning Board [**finds/does not find**] based upon the third-party traffic engineers’ review, that extraordinary conditions exist or undue hardship may result from strict compliance with the Technical Manual standard 1.10.3, which requires a minimum two-way drive aisle width of 24 feet, that substantial justice and the public interest are secured with the proposed variation in this standard, and that variation is consistent with the intent of the ordinance. The Planning Board

[waives/does not waive] the Technical Manual standard Section 1.10.3 to allow for a drive aisle width of 20 feet in the parking lot off of West Street.

2. **Two-Way Driveways**

The Planning Board **[finds/does not find]** based upon the third-party traffic engineers' Review, that extraordinary conditions exist or undue hardship may result from strict compliance with the Technical Manual standard 1.5.1.B which requires two-way drive ways to have a minimum width of 20 feet, that substantial justice and the public interest are secured with the proposed variation in this standard, and that variation is consistent with the intent of the ordinance. The Planning Board **[waives/does not waive]** the Technical Manual standard Section 1.5.1.B to allow a driveway width of 18 feet from West Street.

B. CONDITIONAL USE

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 January 9, 2024 for application #CU-002693-2023 at 19 West Street relevant to Portland's Zoning ordinance Section 6.5.H.2 and the testimony presented at the Planning Board hearing, the Planning Board finds that the plan **is/is not** in conformance with the conditional use standards of the Land Use Code, subject to the standard conditions of approval.

PRIOR TO ISSUANCE OF THE BUILDING PERMIT

1. The applicant shall submit draft condominium documents for the proposed off-street parking condominium located at 19 West Street. These documents shall stipulate that spaces may only be sold to residents and/or to other users of a legally permitted use that is located within the R-6 zone. These condominium documents shall be reviewed and approved by the Planning Authority and Corporation Counsel.

C. 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 January 9, 2024 for application #PL-002614-2023 at 19 West 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 APPLYING FOR A BUILDING PERMIT

1. The applicant shall submit ability to serve confirmation to the Planning Authority from CMP and Portland Water District.
2. The applicant shall update the site plan to reduce two of the parking spaces proposed for the onsite residential units. The revised site plan shall be reviewed and approved by the Planning Authority.

PRIOR TO ISSUANCE OF A BUILDING PERMIT

3. The applicant shall submit an amendment or release of easement 2 that confirms parking is permitted within the easement area to the satisfaction of corporation counsel and record the same in the Cumberland County Registry of Deeds.

4. The applicant shall submit the third-party testing information for the stormwater cartridge proposed for review and approval of the Planning Authority.

PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY

5. The applicant shall pay \$1,600 into the Street Tree Fund for the four additional street trees required, or pay \$1,200 and replace the fallen Linden with an approved alternative.

D. PLANNING BOARD DECISION

On the basis of the findings, conclusions and recommendations contained in the Planning Board report for the public hearing on January 9, 2024 related to application PL-002614-2023 at 19 West Street, which is attached to the draft approval letter and incorporated therein, the Planning Board [adopts/does not adopt] the approval letter as drafted as the Planning Board's decision for application PL-002614-2023, and authorizes the Planning Board Chair to sign the approval letter as drafted.

XVI. ATTACHMENTS

APPLICANT SUBMITTAL

- A. Development Description
- B. Title, Right, Interest
- C. State-Federal Permits
- D. Land Ordinance Review
- E. Easements
- F. Natural Features
- G. Stormwater Management
- H. Master Plans
- I. Utilities
- J. Fire Safety
- K. Site Plan Standards
- L. HVAC
- M. Comment Response Letter
- N. Comment Response Letter 12.29.23
- O. Financial Capacity Letter
- P. Major Site Plan Checklist
- Q. Zoning Analysis Table
- R. Neighborhood Meeting
- S. Redevelopment and stormwater Standards
- T. Waiver Table
- U. Conditional Use Standards
- V. Carleton West Condo Association Structure
- W. Parking Study

PLANS

- P1. Survey
- P2. Cover Sheet
- P3. Gen Notes and Legend
- P4. EC Demo
- P5. Overall Site Plan

- P6. Detailed Site plan
- P7. Overall Grading Plan
- P8. Detailed Grading Plan
- P9. Utility Plan
- P10. Photometric plan
- P11. Photometric Details
- P12. Site Details
- P13. Utility Details
- P14. Utility Details
- P15. Erosion Control Details
- P16. Parking Turning Analysis
- P17. Landscape Plan
- P18. Landscape Plan
- P19. Townhouse Floor Plans
- P20. 19 West New Floor Plans
- P21. Townhouse Elevations
- P22. 19 West New Elevations
- P23. Construction Management Plans
- P24. R-Tank Details
- P25. R- Tank Details

REPORT ATTACHMENTS

1. City Staff Comment Letter 12.1.23
2. Memo to Planning Board _ Ann Machado on Conditional Use

PUBLIC COMMENT

- PC 1. Trevor Watson 9.6.23



Dear Applicant,

We have completed our review of your application (PL-002614-2023) proposing to develop 9 residential condominium units, 18 off-street parking spaces for the onsite units, and a 23-space condo parking lot in the R-6 Residential zone. This development triggers major site plan review and conditional use review, and is subject to the following regulations:

- Site Plan – Article 14.6
- Conditional Use – Article 6.5
- Zoning – Table 6C, and Table 7E

An overview of the City’s review can be viewed in the attached project review worksheets and peer review comments.

Next Steps

Please review all feedback and reach out to the project review manager if you have any questions or would like to discuss this feedback in more detail. In order to proceed, the applicant shall prepare a written response to all feedback, and shall update plans, documents and other materials as necessary to address the above listed comments. The applicant shall notify the project review manager when a resubmission is uploaded to ProjectDox. Once received, the project review manager will notify the applicant of their scheduled review timeline for this resubmission.

Based upon the City’s findings related to your application, the City will advance this application for a workshop with the Planning Board on **Tuesday, January 9, 2024**. Please let me know at your earliest convenience if there are any conflicts with proposed date.

Sincerely,

Maya Balassa

Attachments

1. Site Plan Worksheet
2. Zoning Worksheet

City Staff and Third-Party Peer Reviewers have completed the latest review of this application based off of the most recent submissions. Comments below have been provided to the Planning & Urban Development Department from the Department of Public Works, Water Resources, Zoning, and Third-Party Consulting Engineers (Stormwater + Traffic).

Please submit a written response to the comments below and upload the response, revised submissions, and new material to Project Dox (make sure all submissions maintain the same file naming format to allow for versioning). Once uploaded, please send an email to mbalassa@portlandmaine.gov notifying the planner of the resubmission.

Be advised that additional comments may be forthcoming and other changes may still be required if the comments are not addressed adequately. If you have any questions, please do not hesitate to ask.

Green signifies that the standard is being met, red signifies the standard is not yet met.

General Review Comments		
Review	Discussion	Status
RTI	Overview: The deed has been submitted showing Carlton West LLC as the owners of the property.	
	Comments: The site plan shows parking in Easement 2- staff and the applicant are meeting next week to discuss.	
Financial & Technical Capacity	Overview: A letter has been submitted from to show financial capacity from the Norway Savings Bank. Technical capacity has been provided through the applicant team of Archetype Architecture, Terradyn Consultants, and Titcomb Associates.	
	Comments:	
Permits / Other Requirements	Overview:	
	Comments:	
Zoning	Overview: The site resides in the R-6 zone. A zoning summary has been submitted and shows relationship with dimensional zoning standards. Off-street parking, not associated with the proposed residential units, is proposed. A conditional use application has been submitted.	
	Comments: - Since the porches are being built as part of the new townhouses and the porches meets the minimum setback of 5' as shown on the site plan, as long as the stairs don't extend more than 6' off the front of the porch, and their footprint does not exceed 50 sf, section 7.5.5.C is being met. I would like a plan that shows the exact dimensions of the footprint of the stairs to confirm that they don't exceed 50 sf. - The revised front elevation (A2.01) shows the 10' stepback from the left side property line but it does not show the 10' stepback from the right side property line. Please revise the plan.	

	- The roof plan for the townhouse A1.05 shows a smaller footprint for the stair towers on the townhouses but the stairs appear to be a spiral stair (round figure) but the fourth floor does not show a spiral stair. Also, what is the line that divides the two decks? It can't be a wall higher than 45' from grade at the top. - Plan A1.25 shows what appears to be a spiral stair accessing the roof deck on the 19 West building (round figure). How does it change to a spiral stair from the fourth floor?	
Additional Submissions Requested:		

14.6.1: Transportation Standards

Standard	Discussion	Status
Impact on Surrounding Street Systems	Overview: The site proposes to retain the existing driveways off of Carleton Street and West Street. Residents will access their units from the driveway off of Carleton Street. The West Street driveway will be how the condo parking spaces will be accessed. The proposal includes renovating the sidewalk along the Carleton Street frontage of the property. Comments: - Staff support a waiver for driveway width (20 feet vs 24 feet) given low traffic volumes to be generated to site. - The aisle width for the 8 parking spaces is 22 feet and does not meet city standards. Given low vehicle turnover, staff support a waiver. - Please note that the existing parking lot also needs a waiver for aisle width (20 feet vs 24 feet), and I support this waiver given that it is an existing condition, and no impact would be expected to the public street system. - Please update the waiver table to show all waivers needed.	
Access and Circulation	Overview: All proposed off street parking for the townhomes and apartments will be accessed off Carleton Street. A 4-foot pedestrian delineation is proposed on both sides of the driveway off of Carleton Street. Turning templates have been provided to show adequate space for accessing the garages and parking spaces for the residences. Comments: The applicant notes that the driveway will provide two 4-foot pedestrian areas and one 12-foot travel aisle. Staff would prefer one 4-foot pedestrian pathway and a 16-foot travel way.	
Public Transit Access	Overview: The site is within 500 feet of a transit stop at the corner of West Street and Carleton Street.	
Parking	Overview: Two spaces are proposed per dwelling unit. There are ten surface parking spaces proposed for the renovated building with five units and eight garage spaces provided for the four townhomes along Carleton. All spaces will be accessed off of Carleton Street.	

	An existing parking lot accessed from West Street is proposed to be renovated to contain 23 condo spaces. The existing drive aisle connecting the parking lot off of West Street from the proposed residential will be gates for solely pedestrian access. 20% of the parking spaces will have Level 2 EV chargers installed, with 100% EV ready. The applicant has provided a parking study for providing over 10% of the parking minimums. The parking study is still being reviewed.	
	<u>Comments:</u>	
Transportation Demand Management	<u>Overview:</u> Not applicable.	
<u>Additional Submissions Requested:</u>		

14.6.2: Environmental Quality Standards		
Standard	Discussion	Status
Preservation of Significant Natural Features	<u>Overview:</u> No significant natural features have been identified.	
Landscape Preservation	<u>Overview:</u> A existing conditions and demolition site plan show five trees within the property line proposed to be removed with DBH's larger than 10 inches, one as large as 38 inches. The project is within the West End Historic District and the site is subject to the heritage tree ordinance. <u>Comments:</u> - Tree Removals 24" Linden in SW corner already removed as hazard tree 1:1 replacement tree is generally applied to heritage trees that need to be removed due to safety reasons 26" Linden in SW corner, otherwise healthy → Heritage Tree Penalty - Replacement trees only 26" DBH / 2" caliper = 13 replacement trees - Replacement trees for Heritage Tree Removals need to be planted in the interior of the lot and not in the public right of way - Payment in lieu only 26" DBH * \$573/inch = \$14,898.00 - Some combination of the payment and replanting/replacing 20" Linden tree in NW corner as hazard with significant trunk wounding and decay - No penalty or replanting requirement 38" Norway Maple in center of lot in advanced state of decline - No penalty or replanting requirement - It is strongly encouraged to retain the 26" Linden Tree in the SW corner of the property	

	• The Heritage Tree replanting/replacement plantings are a separate requirement from the street tree requirement associated with new residential development • A comprehensive tree preservation plan is needed to detail tree protection zones, general restrictions and prohibitions within tree protection zones, general restrictions and prohibitions within the biologically sensitive areas of individual trees if they are not entirely contained within a tree protection area, and specific construction methods to be employed within sensitive areas of individual trees to be preserved • ANSI A300 (2019) Chapter 5 details the procedure for tree preservation during site development and construction • Various technical guides and books are available to guide the general process of formulating a tree preservation plan • Many aspects will be site plan/tree specific and require specific knowledge from an arborist experienced in tree preservation projects • Removal of the wooden guard rail and existing perimeter fence will require special care in the vicinity of trees to be preserved • The installation of the locking gate and accompanying fence across the parking lot under the dripline of the 96" silver maple will require special attention and techniques to limit disturbance • PENN State has a publicly available general guide for tree preservation during construction to supplement the above resources • https://extension.psu.edu/a-guide-to-preserving-trees-in-development-projects • Please remove red maple from the proposed landscape plan and replace with one of the other non-maple species listed in the 24"+ category of the heritage tree ordinance • The urban canopy in Portland is over-saturated with members of the maple genus which creates a high degree of susceptibility to some concerning insect pests • The heritage tree ordinance is available here (the tree list is on page 2): • https://content.civicplus.com/api/assets/4db3e0df-de22-40fa-9654-69160b3fbab3?cache=1800 • Sheet L1.0 - The Tilia americana species proposed for street tree placement - department would require a fastigiat cultivar that would not exceed 30' canopy dia to reduce overhead line conflicts. • Sheet L 1.0 - Ensure proper spacing is provided for mature forms of plant materials, and provide further cultivar information if a plant with specific habit or size is being proposed that is notably different from the straight species cultivar. Some species, like the myrica plantings, appear to be densely spaced and in confined locations that will require more frequent maintenance to ensure mature size tendencies of the species does not overgrown or negatively impact adjacent plantings, pathways, or other areas. • Sheet L 1.0 - Any fruiting species planting overwalks and near entrances will increase slipping hazards or tracking of crush fruits inside buildings, while not required to be substituted by statute, applicant is encouraged to be aware of those issues and select species with smaller	
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	fruits or no fruits to reduce those issues, or anticipate that in property maintenance planning. Sheet L 1.0 / General comment - Cornus Mas plant symbol in plans does not accurately represent full canopy size of a small tree, if applicant intends to utilize plantings as a hedge, a clarifying note would be beneficial	
Site Landscaping and Buffers	Overview: Nine street trees are required for the nine units proposed. Five street are proposed along Carleton Street. A landscaping plan has been provided with species list.	
	Comments: To meet the street tree requirement of nine, the applicant will need to pay into the street tree fund for the remaining four trees.	
Water Quality, Stormwater Management and Erosion Control	Overview: The site drains into the combined sewer/stormwater system in Carleton Street. The applicant is proposing onsite detention and treatment for 50% of the redeveloped nonroof impervious surface area over 5,000 square feet. The applicant has provided the required treatment in the parking lot proposed as condo spaces off of West Street.	
	Comments: - The Applicant has provided a figure that shows the redevelopment areas to support the calculation of treatment areas. Based on the proposed system layout, the area treated will be outside of the redevelopment area, but includes the more polluted parking lot area, which is appropriate. The treated area should be highlighted on the stormwater figure as well to confirm that site grading encompasses all of the area that is proposed to be treated. - Design information and calculations should be provided to confirm the sizing for the proposed Storm Basin and R-Tank systems, as well as confirmation of the design from the manufacturers. Staff note that we don't believe the Storm Basin is an approved proprietary BMP on the MaineDEP's list, but with more information, we may be able to confirm its equivalency to a system that is listed. - Details should be provided for the proposed stormwater systems. - The weir elevation for the Storm Basin will be 1.3' below the rim elevation of structure. Staff would suggest confirming that this will provide adequate depth for flow in larger storms. - Stormwater inspection and maintenance requirements should be provided, specific to the proposed systems. A stormwater maintenance agreement will be required. - The applicant appears to have satisfied DPW's detention volume requirement with the following comments: - Details should be provided for the proposed R-tank system and outlet control structure for review. - HydroCad calculations should be provided to confirm the proposed stormwater storage volume.	

Transportation Demand Management	<u>Overview:</u> Not applicable	
<u>Additional Submissions Requested:</u> •		

14.6.3: Public Infrastructure + Community Safety Standards

Standard	Discussion	Status
Public Safety and Fire Prevention	<u>Overview:</u> The project is located within proximity to a fire hydrant at the corner of Carleton Street. The proposed buildings will be fully sprinkled.	
Public Utilities	<u>Overview:</u> All ability to serve letters from utilities have not been provided.	
	<u>Comments:</u> - The Applicant has noted utility requirements and proposed locations. Confirmation of ability to serve will be required once received. - The utility plan should be updated to match the storm drain infrastructure depicted on the revised grading and drainage plan.	
<u>Additional Submissions Requested:</u>		

14.6.4: Site Design Standards

Standard	Discussion	Status
Massing, Ventilation and Wind Impact	<u>Overview:</u> Negative impacts not expected	
Shadow	<u>Overview:</u> Not applicable.	
Snow and Ice Loading	<u>Overview:</u> Snow storage is proposed to be clumped in landscaped areas.	
View Corridors	<u>Overview:</u> Not applicable.	
Historic Resources	<u>Overview:</u> The project is subject to Historic Preservation Board Review. The project has gone to workshop.	
	<u>Comments:</u>	

Exterior Lighting	Overview: A photometric plan has been provided that show conformity to ratio, max illumination, and full cutoff standards.	
Noise and Vibration	Overview: HVAC has been shown on the elevations and are shown to be screened.	
	Comments:	
Signage and Wayfinding	Overview:	
	Comments: Please be advised that any proposed signage is reviewed by Permitting.	
Design Standards	Overview: The design is being reviewed by the Historic Preservation Department and Board.	
Additional Submissions Requested:		

Zoning Use Review (Article 6)				
Use Permissions (Table 6-A – Table 6-F)				
Proposed Use	Permitted, Conditional or Accessory Use	Zone	Use Std	
Residential	Permitted	R-6		
Off-street parking	Conditional	R-6		
Zoning Dimensional Review (Article 7)				
Dimensional Standards (Table 7-A – Table 7-H)				
Standard	Requirement 1	Requirement 2	Proposed	Finding
Lot Size (SF)	2,000 SF		37,361 SF	
Area per D.U.	725 SF/DU		4,151 SF/DU	
Street Frontage	20 ft		135 ft	
Front Setback (Min)	5 ft or avg		5 ft	
Front Setback (Max)				
Rear Setback	10 ft		3.7 ft (existing)	
Side Setback	5 ft		8.5 ft	
Pavement Setback				
Stepback	15 ft rear, 20 ft side		Left: 10 ft Right: 10 ft Read: 15 ft	
Building Height	45 ft		39.83 ft	
Lot Coverage	60%		24%	
Impervious Surface Ratio	20%		18.4% (existing)	



TO: Planning Board Chair and Members

FROM: Ann Machado, Zoning Administrator

SUBJECT: Address - 19 West Street , CBL - 055 B013

DATE: January 5,2024

RE: CU-002693-2023- Off-street Parking in the R-6 Zone

The existing use of the property at 19 West Street is medical offices and accessory parking.

The new owners submitted a major site plan (PL-002614-2023) to redevelop the lot. The Project Description submitted with the site plan proposes the following changes to the lot. A third floor will be added to the current office building and the use will be changed to residential uses. Two, 2-unit townhouse buildings will be constructed on the western side of the lot, and the eastern portion of the lot *will be re-paved and will contain 23 condo parking spaces to be sold to residents in the neighborhood* (section 1.3.1).

It appears that the previous owner was leasing some of the parking spaces at the east end of the lot to residents in the area. These parking spaces were originally created as accessory to the use of the building as medical offices. With the redevelopment of the lot and the new proposed uses including the eastern part of the lot being a separate commercial condo with the 23 spaces being sold separately, these spaces are no longer considered accessory to the rest of the lot. A separate use as off-street parking has been created. Under Table 6-A, off-street parking is a conditional use and needs to be reviewed as a Conditional Use by the Planning Board under section 6.5.1.A.2.



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August 4, 2023

Project #23-020

City of Portland
 Planning & Urban Development
 389 Congress Street
 Portland, ME 04101

**Major Site Plan Application
 West Street Redevelopment
 19 West Street, Portland, Maine**

1 DEVELOPMENT DESCRIPTION

1.1 OVERVIEW

Carleton West, LLC intends to construct two 2-unit townhouses and renovate an existing building into 5 residential units on a 0.86 acre parcel located at 19 West Street in Portland's R-6 Zone. The project site is depicted on the City of Portland's Parcel map as 55-B-13. The site is currently developed with a vacant 2-story brick office building and paved parking. Driveways enter the site from both West Street and Carleton Street. The paved parking on the eastern portion of the site is currently leased.

1.2 EXISTING CONDITIONS

The existing site is located on both West and Carleton Streets abutting other residential buildings in Portland's R-6 zone. The site surface is primarily pavement and building roof. An 18' wide paved driveway enters the southeastern portion of the site from West Street extending to the paved parking area behind lots fronting on West Street. The western portion of the site fronts on Carleton Street where there is second driveway. Underground utilities in Carleton Street include water, gas, and combined storm/sewer. Overhead power and telecom services are on poles located on Carleton Street. Existing underground utilities extend onto the site from Carleton Street.

Street Name	Description	On-street Parking	Sidewalk	Notes
Carleton Street	Approximately 27' wide paved public way. One-way traffic in one lane.	Both sides	Brick both sides, granite curb	

Single or multi-family residences abut the site to the east, south and west. The Ronald McDonald House abuts the site to the north. West Street is south of the site beyond residential properties, and Carleton Street is west of the site. The site's frontage is on Carleton Street.

The site has a high point in the center of the site adjacent to the existing building and slopes approximately 4' towards Carleton Street and approximately 3' towards West Street. Drainage infrastructure exists on the site. The site is fully developed.

1.3 PROPOSED DEVELOPMENT

The development program includes the following components:

1.3.1 ON-SITE

Two new 2-unit townhouse buildings are proposed along the Carleton Street frontage. Each building will have a 2,379 square foot footprint and include four-stories plus a roof deck. The first floor includes basement space and a garage accessed from the back of the building. The second, third and fourth floors are living space and each unit has roof access to a roof deck. A driveway is located between the townhouses to access the rest of the site and the parking. Each townhouse unit has 2 parking spaces in a basement level garage.

The existing 2-story building will be renovated, and a third story will be added. The building footprint is 4,180 square feet and contains five units. The existing building will contain a basement, two units on the first floor, two units on the second floor, and one unit on the third floor with a roof deck. Each unit has outdoor space in the form of a patio or deck. An elevator and stairwell will access each floor from the residential lobby on the first floor. The basement contains unit storage, an exercise room and mechanical space. Each of the units will have 2 on site parking spaces.

The driveway from Carleton Street provides access to a central courtyard with shared pedestrian and vehicle use. The townhouse garages and 10 residential parking spaces will be accessed from this shared courtyard. The majority of the courtyard will be hardscaped with pavers with pockets of landscaping.

The western portion of the site contains a paved parking lot accessed from West Street. This parking lot will be re-paved and will contain 23 condo parking spaces to be sold to residents in the neighborhood. This parking lot will not provide vehicle or pedestrian access to the residential development on the rest of the site except with a gated walkway for residents.

1.4.2 OFF-SITE IMPROVEMENTS

The Carleton Street sidewalk along the parcel frontage will be reconstructed with a 6' wide brick sidewalk and 4.5' wide esplanade. There will be a brick driveway apron and the one existing street tree will be protected. Four additional trees will be planted along the sidewalk on site in front of the townhouses. Pavement repair in Carleton Street will also be necessary to install new utilities.

1.5 TRAFFIC

The minimal amount of traffic that will be generated by the project is not expected to have a significant effect on the surrounding street network.

1.6 PARKING

1 Space/dwelling unit is required for the R-6 Zone, with the first 3 units exempt. The residential portion of the project includes 10 surface parking spaces (2 space/existing building dwelling unit) and 8 garage spaces (2 spaces/townhouse dwelling unit). This parking is accessed by the proposed driveway from Carleton Street.

The parking lot portion of the project includes 23 surface parking spaces to be sold to residents in the neighborhood and be structured as a parking condominium.

1.7 UTILITIES AND STORMWATER

The proposed project will include the installation of new utility services to the proposed buildings. All new utility services will be provided from the existing utilities available within Carleton Street. The proposed locations of the new utility services are shown on the Utility Plan (Sheet C-6.0).

Post-development stormwater runoff will closely follow existing runoff patterns. Runoff will be captured in a series of on-site catch basins and connected to the City's combined storm/sewer in Carleton Street. The proposed redevelopment of the site will result in a reduction in impervious area, a reduction in non-roof impervious area, and a reduction in peak stormwater flows leaving the site.

2 RIGHT, TITLE and INTEREST

2.1 OVERVIEW

The applicant and owner is Carleton West, LLC by deed recorded in the Cumberland County Registry of Deeds in book 39876 page 44. A copy of the property deed is attached in attachment 2-A.

2.2 ATTACHMENTS

Attachment 2-A – Property Deed

ATTACHMENT 2-A

Title, Right, or Interest Documentation

DLN: 1002240219866**SHORT FORM QUITCLAIM DEED WITH COVENANT**

MAINEHEALTH f/k/a MAINE MEDICAL CENTER, a Maine nonprofit corporation having a mailing address of 22 Bramhall Street, Portland, Maine 04102 ("Grantor"), FOR CONSIDERATION PAID, grants to CARLETON WEST LLC, a Maine limited liability company having a mailing address of 9 Gould Road, Lewiston, ME 04240 ("Grantee"), WITH QUITCLAIM COVENANTS, condominium units Nos. 1, 2, 3, 4 and 5, in the Nineteen West Street Office Condominium located in the City of Portland, County of Cumberland, State of Maine more particularly described on Exhibit A attached hereto and made a part hereof.

Dated this 30th day of November, 2022.

WITNESS:

Erica P. Thompson

MAINEHEALTH
f/k/a MAINE MEDICAL CENTER

By: *Lugene A. Inzana*
Lugene A. Inzana
Its: CFO, Maine Medical Center
Assoc. CFO, MaineHealth

STATE OF MAINE
CUMBERLAND, SS.

November 30, 2022

Personally appeared the above-named Lugene A. Inzana, Chief Financial Officer of MaineHealth f/k/a Maine Medical Center and Associate Chief Financial Officer of MaineHealth as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said MaineHealth f/k/a Maine Medical Center.

Before me,

Judith C. Goldman
Notary Public/Attorney-at-Law

Print Name: *Judith C. Goldman*
My commission expires: *12/03/26*

MAINE REAL ESTATE TAX-Paid

EXHIBIT A

Unites No. 1, 2, 3, 4 and 5 (hereinafter referred to as the "Units") in NINETEEN WEST STREET OFFICE CONDOMINIUM (hereinafter referred to as the "Condominium") situated on West and Carleton Streets in the City of Portland, County of Cumberland and State of Maine, as more particularly described in the Declaration of Nineteen West Street Office Condominium dated October 22, 1991, and recorded in the Cumberland County Registry of Deeds in Book 9761, Page 53, as the same may be amended from time to time in accordance with its terms and the Act (herein referred to as the "Declaration"), and on the Plat and Plans incorporated into the Declaration and recorded in the Cumberland County Registry of Deeds in Plan Book 191, Pages 153 and 154, as the same may be amended from time to time in accordance with the Declaration and the Act (herein referred to as the "Plat and Plans"), by virtue of the recording of which Declaration, Plat and Plans, West Street Medical Associates, as Declarant, created the Condominium pursuant to the Maine Condominium Act, Title 33 of the Maine Revised Statutes of 1964, as amended, Chapter 31, Sections 1601-101, et seq., as amended (hereinafter referred to as the "Act");

TOGETHER WITH an undivided interest in the Common Elements of the Condominium, the liability for Common Expenses of the Condominium, and Votes in the Association of Unit Owners of the Condominium allocated to the Units pursuant to the Declaration;

TOGETHER WITH the rights to use the Limited Common Elements allocated to the Units as described, specified and allocated pursuant to the Declaration;

TOGETHER WITH an easement in common with the Owners of other units, to use the Common Elements of the Condominium for purposes of ingress and egress in accordance with the Declaration and the exclusive right and easement for the use, occupancy and enjoyment of the Units;

TOGETHER WITH an easement in common with all other unit Owners to use all pipes, wires, ducts, cables, conduits, public utility lines and other Common Elements serving the Units and located in any of the other units;

TOGETHER WITH an easement, to the extent necessary, for structural and subjacent support over every other unit and over the Common Elements;

TOGETHER WITH all other rights, easements, rights-of-way, interests, Allocated Interests, privileges and appurtenances as more particularly described, located, defined, allocated or referred to in the Declaration, the Plat and Plans, and the By-Laws described in the Declaration, as the said By-Laws may be amended from time to time in accordance with the Declaration and the Act (herein referred to as the "By-Laws"), all of which are incorporated herein by reference thereto;

SUBJECT TO the matters affecting title described in the Declaration and the Plat and Plans and the terms, covenants, agreements, easements and provisions of the Declarations and

By-Laws, which terms, covenants, agreements, easements and provisions shall constitute covenants running with the land and shall bind the Grantee and any person having at any time any interest or estate in the Units, as though such provisions were recited and stipulated at length herein;

SUBJECT ALSO TO an easement in common with the Owners of other units to use all pipes, wires, ducts, cables, conduits, public utility lines and other Common Elements serving the other units and located in the Units and to an easement for structural and lateral support in favor of every other unit.

AND, by the recording of or by acceptance of this deed, the Grantee does accept and agree for itself, its heirs and assigns, to be bound by and subject to all of the provisions, terms, covenants, agreements, easements and provisions of the Act, the Declaration, the By-Laws and the Plat and Plans.

Being the same premises conveyed to Maine Medical Center by deed of Cardiovascular Consultants Real Estate Partnership, dated May 31, 2000 and recorded in the Cumberland County Registry of Deeds in Book 15505, Page 91 and deed of Kathleen H. Nowicki dated May 31, 2000 and recorded in the Cumberland County Registry of Deeds in Book 15505, Page 88.

Being the same premises conveyed to MMC Realty Corp. by deed of Maine Medical Center, dated March 28, 2001 and recorded in the Cumberland County Registry of Deeds in Book 16145, Page 285.

Being the same premises conveyed to Maine Medical Center by deed of MMC Realty Corp., dated March 7, 2005 and recorded in the Cumberland County Registry of Deeds in Book 22473, Page 287.

3 STATE AND FEDERAL PERMITS

The development is subject to Major Site Plan approval by the City of Portland and Building Permit(s) are also required. No additional State or Federal Permits are required.

4 LAND ORDINANCE REVIEW

4.1 OVERVIEW

The property currently lies within the City of Portland R-6 Zone. The following Space and Bulk requirements apply to the R-6 Zone:

R-6 Zone Summary Dimensional and Parking Requirements Applied to 19 West Street		
Zoning Requirements	R-6	Provided
Minimum Lot Size	2,000 sf	37,361 sf
Minimum Street Frontage	20 ft	135 ft
Front Yard	5 ft, or avg.	5 ft
Minimum Side Yard	5 ft	8.5 ft
Minimum Rear Yard	10 ft	3.7 ft (existing)
Maximum Lot Coverage	60%	24%
Open Space	20%	14%
Maximum Structure Height	45 ft	39.83 ft
Step Back	15 ft rear, 10 ft side	N/A rear, 10 ft side
Parking	6 spaces	18 residential spaces 23 condo spaces (for sale)

4.2 SHORELAND ZONING

The site is not located within the Shoreland Zoning District.

5 EASEMENTS OR OTHER BURDENS

5.1 OVERVIEW

Titcomb Associates completed an existing conditions survey, most recently dated March 15, 2023. Three easements were identified and are shown on the survey. The first easement was released. The second is applicable and outlined below. The third is a sewer easement for the existing building that will no longer be used after redevelopment of the site.

2) Parcel is subject to a common use easement "with the owners of adjoining property for the purposes of passage, light and air, and is never to be obstructed in any way or to be made a place of storage or deposit" as described in a deed to James C. Hamlen and Jeremiah W. Tabor recorded in Book 691, Page 284.

6 NATURAL FEATURES

6.1 OVERVIEW

The development site is currently fully developed and does not contain any significant natural features including wetlands, vernal pools or other protected resources or wildlife habitats.

7 STORMWATER MANAGEMENT

The following information is provided in accordance with the City of Portland Code of Ordinances Chapter 14 Land Use, Section 14.6.2.D.

7.1 OVERVIEW

The existing project site is fully developed and has a surface primarily of pavement and building roof. The site slopes from a central high point adjacent to the existing building down towards Carleton Street and West Street. Stormwater runoff from the project site primarily drains to on-site catch basins that are connected to the City's combined storm/sewer network. Existing impervious area on site is approximately 33,230 SF (29,300 SF non-roof impervious).

Post development stormwater runoff will generally follow existing patterns. Stormwater runoff from the buildings and site areas will be captured in new on-site catch basins and directed to the City's combined storm/sewer network in Carleton Street. The proposed post-development impervious area is 32,281 SF (23,441 non-roof impervious). Redevelopment of the site is expected to result in a decrease in impervious area by approximately 950 SF, and a decrease in non-roof impervious area by approximately 5,859 SF.

Redevelopment projects resulting in a decrease in non-roof impervious area are not required to meet the Maine DEP Chapter 500 general or flooding standards, but must meet the basic erosion and sedimentation control standards required for all development. An erosion and sedimentation control plan is included directly on the plan set, along with Housekeeping documentation.

The project is not expected to cause ponding, flooding, or erosion problems on or downstream of the site. The amount of runoff entering the city's storm drain network is expected to be reduced as a result of the project. A Stormwater Management Plan is included in Attachment 7-A.

7.2 ATTACHMENTS

Attachment 7-A – Stormwater Management Plan

ATTACHMENT 7-A

Stormwater Management Plan

STORMWATER MANAGEMENT REPORT

19 West Street

The following information is provided in accordance with the City of Portland Code of Ordinances Chapter 14 Land Use, Section 14.6.2.D.

1. OVERVIEW

Carleton West, LLC intends to redevelop the project site located at 19 West Street in Portland, Maine. The project includes redevelopment of an existing 2-story building and the construction of two new residential townhouse buildings with associated site and utility improvements. This narrative describes the stormwater runoff patterns and methods of stormwater management for the existing (pre-development) and proposed (post-development) conditions.

2. EXISTING CONDITIONS

The project site is 37,361 square feet in area and is currently developed with an existing vacant 2-story building and a 61-space (+/-) surface parking lot. The existing site has 3,3230 square feet of impervious surface comprised of roof and paved areas.

246 Eastern Prom Existing Conditions	
Total Site Area	37,361 sf
Impervious Area	33,230 sf
Roof Area	3,930 sf
Non-Roof Impervious	29,300 sf

The lot has frontage on Carleton Street and a driveway connect to West Street in Portland. The site generally slopes from a central high point adjacent to the existing building towards Carleton Street and West Street. Catch basins exist on site and capture a portion of the parking lot runoff and direct it to the City's combined storm/sewer in Carleton Street. Some stormwater runoff also currently drains overland towards Carleton Street, and the 18'-wide driveway in the southeast portion of the site drains directly to West Street. All site runoff is ultimately tributary to the public storm drain network in Carleton Street.

The NRCS Medium Intensity Soil Survey identifies native soils on the site as Hinkley Loamy Sand, an excessively drained, HSG A soil.

3. PROPOSED PROJECT

The proposed project includes a residential development on the western portion of the site and a surface parking lot in the eastern portion of the site. The residential development includes the redevelopment of the existing building and construction of two new buildings with associated site improvements. The two new townhouse buildings include covered parking on the ground level. A 20' wide driveway will enter the site from Carleton Street and provide access to a central hardscaped and landscaped courtyard, the buildings, and the parking areas. This portion of the site redevelopment results in a reduction of impervious area and a reduction of non-roof impervious area.

The existing surface parking lot on the eastern portion of the site will remain a similar size and be repaved to create 23 condo parking spaces. The proposed post-development condition will have 32,281 square feet of impervious area.

246 Eastern Prom Proposed Conditions	
Total Site Area	37,361 sf
Impervious Area	32,281 sf
Roof Area	8,840 sf
Non-Roof Impervious	23,441 sf

Stormwater runoff in the proposed condition will continue to ultimately drain to the public stormdrain system in Carleton Street. The three buildings will feature flat roofs and will drain by internal roof drains. A new on-site storm drain network will collect runoff from the surface parking area and will convey it into the existing public combined storm/sewer system in Carleton Street. The two driveways will continue to drain overland towards the surrounding street ROWs.

The proposed development will result in a reduction in non-roof impervious area by approximately 5,859 square feet. Overall impervious area will also be reduced by approximately 949 square feet. Per Section 5.II.D of the City of Portland Technical Manual, the project is not required to provide stormwater treatment in accordance with the General Standard.

4. FLOODING STANDARD

Stormwater Quantity control is required as part of city requirements for this project. The proposed development has been designed to minimize stormwater runoff from the site in excess of the natural pre-development conditions. A hydrologic analysis of pre-development and post-development conditions was 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). For Cumberland County, Maine a 24-hour SCS Type III Storm distribution was used for the analysis using the following storm frequencies and rainfall amounts, per Maine DEP Chapter 500:

Storm Event	24-Hour Rainfall
2-Year Storm	3.1 inches
10-Year Storm	4.6 inches
25-Year Storm	5.8 inches

Runoff curve numbers, time of concentration, and travel time data were established based on methods outlined in the USDA TR-55 manual. A minimum time of concentration of 5 minutes and a maximum sheet flow distance of 150 linear feet was used in the models.

4.1 Pre-Development Conditions

The pre-development HydroCAD model includes one sub-catchment, draining to a single Study Point representing the existing public combined storm/sewer system in Carleton Street.

The Pre-Development Watershed Map (Sheet WS-1) shows the sub-watershed boundaries and study point. A minimum time of concentration of 5 minutes was used due to the paved site conditions. The watershed map is attached in Appendix 1.

The Pre-Development HydroCAD model is attached in Appendix 3.

Pre-Development peak rates of runoff at the Study Point are listed in the table below.

Pre-Development Peak Rates of Runoff (cfs)	
Storm Event	Peak Rate of Runoff
2-Year Storm	2.38
10-Year Storm	3.62
25-Year Storm	4.61

4.2 Post-Development Conditions

The post-development HydroCAD model includes one sub-catchment, tributary to the same Study Point described in Section 4.1. The Post-Development Watershed Map (Sheet WS-2) and HydroCAD model are attached in Appendix 2 and 4, respectively.

Post-Development peak rates of runoff at the Study Point are listed in the table below.

Post-Development Peak Rates of Runoff (cfs)	
Storm Event	Peak Rate of Runoff
2-Year Storm	2.32
10-Year Storm	3.58
25-Year Storm	4.57

4.3 Peak Flow Analysis

In order to determine the impact of the proposed site re-development on the peak rate of runoff leaving the project site, the results of the pre-development and post-development stormwater models were directly compared and are compiled in the table below.

Peak Runoff Flow Rates Comparison		
Storm Event	Pre-Development (cfs)	Post-Development (cfs)
2-Year	2.38	2.32
10-Year	3.62	3.58
25-Year	4.61	4.57

The peak rate of runoff entering the municipal combined storm/sewer network in Carleton Street is expected to decrease slightly as a result of the proposed re-development project.

5. CONCLUSIONS

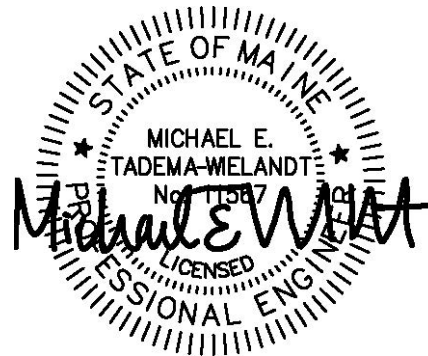
The proposed redevelopment project will reduce the impervious area by approximately 949 square feet and reduce non-roof impervious area by approximately 5,859 square feet. A stormwater management system was designed to ensure:

- Stormwater draining onto or across the project site in the pre-development condition will not be impeded or redirected so as to create ponding on, or flooding of, adjacent lots.
- The decrease in volume or rate of stormwater draining from the project site into the city's combined storm/sewer system may be accommodated in the system without creating downstream problems or exceeding the capacity of the storm sewer system.

Appendices

- 1 Pre-Development Watershed Map
- 2 Post-Development Watershed Map
- 3 Pre-Development HydroCAD Model
- 4 Post-Development HydroCAD Model

Prepared By:
Michael Tadema-Wielandt, P.E.
Maine License #11567
TERRADYN CONSULTANTS, LLC



APPENDIX 1

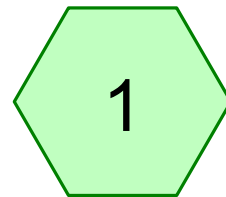
Pre-Development Watershed Map

APPENDIX 2

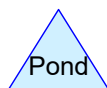
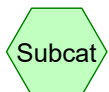
Pre-Development HydroCAD Model



End



PRE-WS



Routing Diagram for 23-020 PRE

Prepared by Terradyn Consultants LLC, Printed 8/4/2023
HydroCAD® 10.20-3c s/n 10466 © 2023 HydroCAD Software Solutions LLC

23-020 PRE

Prepared by Terradyn Consultants LLC

Printed 8/4/2023

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.113	80	Grass (1)
0.703	98	Impervious (1)

23-020 PRE

Prepared by Terradyn Consultants LLC

HydroCAD® 10.20-3c s/n 10466 © 2023 HydroCAD Software Solutions LLC

West Street Stormwater Analysis

Type III 24-hr 2-yr Rainfall=3.10"

Printed 8/4/2023

Page 3

Summary for Subcatchment 1: PRE-WS

Runoff = 2.38 cfs @ 12.07 hrs, Volume= 0.170 af, Depth> 2.50"
 Routed to Link SP1 : End

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
*	4,926	80	Grass
*	30,614	98	Impervious
	35,540	96	Weighted Average
	4,926		13.86% Pervious Area
	30,614		86.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, A-B

Summary for Link SP1: End

Inflow Area = 0.816 ac, 86.14% Impervious, Inflow Depth > 2.50" for 2-yr event
 Inflow = 2.38 cfs @ 12.07 hrs, Volume= 0.170 af
 Primary = 2.38 cfs @ 12.07 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

23-020 PRE

Prepared by Terradyn Consultants LLC

HydroCAD® 10.20-3c s/n 10466 © 2023 HydroCAD Software Solutions LLC

West Street Stormwater Analysis

Type III 24-hr 10-yr Rainfall=4.60"

Printed 8/4/2023

Page 4

Summary for Subcatchment 1: PRE-WS

Runoff = 3.62 cfs @ 12.07 hrs, Volume= 0.264 af, Depth> 3.89"
 Routed to Link SP1 : End

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.60"

	Area (sf)	CN	Description
*	4,926	80	Grass
*	30,614	98	Impervious
	35,540	96	Weighted Average
	4,926		13.86% Pervious Area
	30,614		86.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, A-B

Summary for Link SP1: End

Inflow Area = 0.816 ac, 86.14% Impervious, Inflow Depth > 3.89" for 10-yr event
 Inflow = 3.62 cfs @ 12.07 hrs, Volume= 0.264 af
 Primary = 3.62 cfs @ 12.07 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

23-020 PRE

Prepared by Terradyn Consultants LLC

HydroCAD® 10.20-3c s/n 10466 © 2023 HydroCAD Software Solutions LLC

West Street Stormwater Analysis

Type III 24-hr 25-yr Rainfall=5.80"

Printed 8/4/2023

Page 5

Summary for Subcatchment 1: PRE-WS

Runoff = 4.61 cfs @ 12.07 hrs, Volume= 0.339 af, Depth> 4.99"
 Routed to Link SP1 : End

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
*	4,926	80	Grass
*	30,614	98	Impervious
	35,540	96	Weighted Average
	4,926		13.86% Pervious Area
	30,614		86.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, A-B

Summary for Link SP1: End

Inflow Area = 0.816 ac, 86.14% Impervious, Inflow Depth > 4.99" for 25-yr event
 Inflow = 4.61 cfs @ 12.07 hrs, Volume= 0.339 af
 Primary = 4.61 cfs @ 12.07 hrs, Volume= 0.339 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

APPENDIX 3

Post-Development Watershed Map



POST DEVELOPMENT

- | | |
|---|--------------------|
|  | WATERSHED BOUNDARY |
|  | Tc FLOWPATH |
|  | REACH PATH |
|  | SOILS BOUNDARY |
|  | SUBCATCHMENT |
|  | POND |
|  | REACH |
|  | STUDY POINT |
|  | Tc LABEL |
|  | GRASS AREA |

DEVELOPMENT AREAS

Pre-Development Areas	
Grass	4,926
Impervious	30,614
Total	35,540
Post-Development Areas	
Grass	6,263
Impervious	29,277
Total	35,540



DATE:	8/4/2023
PE:	MICHAEL TADEMA-WIELANDT

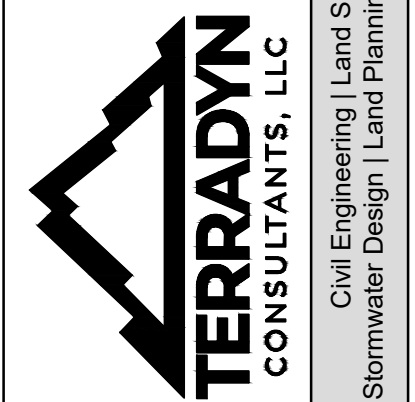
[illegible]

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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:
WEST STREET REDEVELOPMENT
19 WEST STREET, PORTLAND, ME

SHEET TITLE:
POST-DEVELOPMENT WATERSHED MAP

CLIENT: CARLETON WEST, LLC

DATE:	8/4/2023
SCALE:	1" = 20'
JOB NO:	23-020
SHEET:	W/C 2

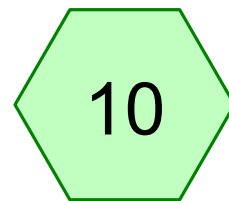
WS-2

APPENDIX 4

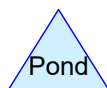
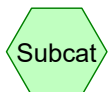
Post-Development HydroCAD



End



POST-WS



Routing Diagram for 23-020 POST

Prepared by Terradyn Consultants LLC, Printed 8/4/2023
HydroCAD® 10.20-3c s/n 10466 © 2023 HydroCAD Software Solutions LLC

23-020 POST

Prepared by Terradyn Consultants LLC

Printed 8/4/2023

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.144	80	Grass (10)
0.672	98	Impervious (10)

23-020 POST

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West Street Stormwater Analysis

Type III 24-hr 2-yr Rainfall=3.10"

Printed 8/4/2023

Page 3

Summary for Subcatchment 10: POST-WS

Runoff = 2.32 cfs @ 12.07 hrs, Volume= 0.164 af, Depth> 2.41"
 Routed to Link SP10 : End

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
*	6,263	80	Grass
*	29,277	98	Impervious
	35,540	95	Weighted Average
	6,263		17.62% Pervious Area
	29,277		82.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, A-B

Summary for Link SP10: End

Inflow Area = 0.816 ac, 82.38% Impervious, Inflow Depth > 2.41" for 2-yr event
 Inflow = 2.32 cfs @ 12.07 hrs, Volume= 0.164 af
 Primary = 2.32 cfs @ 12.07 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

23-020 POST

Prepared by Terradyn Consultants LLC

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West Street Stormwater Analysis
Type III 24-hr 10-yr Rainfall=4.60"

Printed 8/4/2023

Page 4

Summary for Subcatchment 10: POST-WS

Runoff = 3.58 cfs @ 12.07 hrs, Volume= 0.258 af, Depth> 3.79"
 Routed to Link SP10 : End

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.60"

	Area (sf)	CN	Description
*	6,263	80	Grass
*	29,277	98	Impervious
	35,540	95	Weighted Average
	6,263		17.62% Pervious Area
	29,277		82.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, A-B

Summary for Link SP10: End

Inflow Area = 0.816 ac, 82.38% Impervious, Inflow Depth > 3.79" for 10-yr event
 Inflow = 3.58 cfs @ 12.07 hrs, Volume= 0.258 af
 Primary = 3.58 cfs @ 12.07 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

23-020 POST

Prepared by Terradyn Consultants LLC

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West Street Stormwater Analysis

Type III 24-hr 25-yr Rainfall=5.80"

Printed 8/4/2023

Page 5

Summary for Subcatchment 10: POST-WS

Runoff = 4.57 cfs @ 12.07 hrs, Volume= 0.333 af, Depth> 4.90"
 Routed to Link SP10 : End

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
*	6,263	80	Grass
*	29,277	98	Impervious
	35,540	95	Weighted Average
	6,263		17.62% Pervious Area
	29,277		82.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, A-B

Summary for Link SP10: End

Inflow Area = 0.816 ac, 82.38% Impervious, Inflow Depth > 4.90" for 25-yr event
 Inflow = 4.57 cfs @ 12.07 hrs, Volume= 0.333 af
 Primary = 4.57 cfs @ 12.07 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

8 CONSISTENCY WITH CITY MASTER PLANS

8.1 OVERVIEW

Our office is not aware of any applicable Master Plans created for the project site.

9 UTILITIES

9.1 OVERVIEW

The proposed project will involve installation of new utility services to the proposed building. All new utility services will be provided from the franchise utilities available within Carleton Street. The proposed locations of the new utility services are shown on the Utility Plan (Sheet C-6.0).

9.2 WATER SUPPLY

The proposed project will receive its water supply from the Portland Water District's (PWD) public water supply system. Separate fire and domestic services will be installed to each of the three buildings from PWD's existing main in Carleton Street.

9.3 WASTEWATER DISPOSAL

The proposed project will be connected to the Portland Water District's and City of Portland's wastewater collection and conveyance systems.

9.5 STORMWATER MANAGEMENT

The proposed project will have a stormwater management system requiring a pipe connection to the Carleton Street combined sewer network. The site has a stormwater connection today and we will be replacing it with new infrastructure as part of this project. Impervious area on site is expected to decrease as a result of this redevelopment and stormwater flows are expected to be similar to existing conditions.

9.4 ELECTRICITY SUPPLY

CMP currently maintains overhead utilities in the area. Electric utilities for the proposed buildings are expected to be installed underground from the Carleton Street pole at the northwestern corner of the property. A new transformer is expected to be installed on site to serve the three buildings.

9.5 NATURAL GAS SUPPLY

Natural gas services are proposed for each of the three new buildings from the natural gas line in Carleton Street.

10 FIRE SAFETY

10.1 OVERVIEW

The applicant and project team will provide the Portland Fire Department with the information required in the PFD Site Review Checklist, as well as a basic review of NFPA 1 and City of Portland Technical Standards related to public safety.

The residential project site will be accessed from Carleton Street, which is improved with a 27' paved surface. The site driveway is 20' wide. There is one nearby fire hydrant; located near the site's northwestern corner on Carleton Street. The parking lot development is accessed from the 18' wide driveway from West Street.

The front side of the proposed townhouses will be fully accessible from Carleton Street. One side of each townhouse and the rear of both townhouses will be accessible from the project driveway. The existing building will be accessible on two sides from the site driveway. The proposed building will be fully sprinkled in compliance with all applicable codes.

11 CONFORMITY WITH APPLICABLE DESIGN STANDARDS

11.1 OVERVIEW

This project conforms to all applicable Site Plan Review Standards of Section 14.6 of the city's Land Use Ordinance as described in the following narrative.

14.6.1 Transportation Standards

A. Impact on Surrounding Street Systems:

The project will not have a significant impact on the surrounding street system. Vehicles will access the residential project site from an existing driveway location on Carleton Street, and vehicles will access the parking lot condo site from an existing driveway location on West Street. The estimated number of new vehicle trips generated by the project is insignificant compared to existing trips on surrounding streets.

B. Access and Circulation:

1. In General

- a. Vehicular access to the residential development will be at the proposed driveway from Carleton Street and vehicles will circulate in the 20' wide driveway providing access to the residential parking spaces. Pedestrian access is directly from the Carleton Street sidewalk to the townhouse front porches or along the shared 20' wide driveway to the existing redeveloped building at the center of the site. Vehicle and pedestrian access to the parking lot condo site will be at the existing 18' wide driveway from West Street.
- b. Walkways connect the townhouse doors to the Carleton Street sidewalk. The 20' wide shared driveway provides pedestrian connection to the parking spaces and existing redeveloped building.
- c. Points of access and egress have been designed to avoid conflicts with turning movements and traffic flows.
- d. The only vehicular access to the residential portion of the site is for the 18 residential parking spaces so stacking is not applicable. The driveway into the parking lot condo can provide stacking if necessary for the parking use.

2. Loading and Servicing

The development is not expected to be served by delivery or other service vehicles. It is a residential use.

3. Curb and Sidewalks.

- a. The existing Carleton Street sidewalk along the site frontage will be reconstructed with brick and granite curb as part of this project.
- b. The reconstructed sidewalk will meet the design standards of the Technical Manual.
- c. NA
- d. NA

C. Public Transit Access:

Metro Bus Route 8 runs along West Streets in the vicinity of the project site with a stop at the intersection of Carleton and West Streets. The project does not meet the minimum threshold to require a new transit facility.

D. Parking:

1. Vehicular Parking:

- a. The residential project requires 6 parking space per R-6 Zone requirements. 18 residential parking spaces are proposed for the 9 residential units. The parking lot condo project contains 23 parking spaces.
- b. A parking study is not required for this project.
- c. The project includes 2 parking spaces per residential unit. The townhouses contain 3-5 bedrooms and the 2 parking spaces per unit are located in basement level garages. The existing building units are 2-3 bedrooms and the 2 parking spaces per unit are located on the site adjacent to the building. Street parking is limited due to the volume of surrounding single and multi-family residential uses.
- d. The proposed parking spaces meet the dimensional standards as detailed in the street design standard of the technical manual. The proposed on-site parking will be constructed of bituminous pavement.

2. Bicycle Parking Spaces:

- a. Bicycle parking spaces are located in the townhouse garages and in the basement of the existing redeveloped building.

3. Snow Storage:

- a. Snow will be stored in landscaped areas adjacent to the paved parking and driveways on the project site as shown on the project site plans.

- b. Snow storage does not encroach on parking or pedestrian area, nor does it adversely impact the functionality of stormwater management systems.

4. Electric Vehicle (EV) Charging:

- a. All of the 18 residential parking spaces will be EV ready and at least 4 spaces (20% of the spaces) will have Level 2 EV chargers installed. All of the 23 parking condo spaces will be EV ready and at least 5 spaces (20% of the spaces) will have Level 2 EV chargers installed. EV charger locations are shown on the project site plans.

E. Transportation Demand Management (TDM):

A TDM plan is not required for this project.

14.6.2 Environmental Quality Standards

A. Preservation of Significant Natural Features:

1. Preserve and protect significant natural features
 - a. No endangered or threatened plants have been identified on the project site.
 - b. No habitat for endangered or threatened species have been identified on the project site.
 - c. No waterfowl and wading bird habitat is located on the project site.
 - d. NA
 - e. No wetlands, watercourses, SVPs or floodplains are located on the project site.
2. NA
3. NA

B. Landscape Preservation:

1. An existing street tree will be preserved on Carleton Street. An existing 26" tree adjacent to the parking lot on the eastern portion of the site will be preserved.
2. The majority of the site was previously developed and contains pavement and building roof.
3. Parking lots and buildings currently exist in the majority of on-site setback areas.
4. Waiver: The majority of the existing trees on site will be impacted by building and site construction and preservation would compromise the development of the site. We anticipate that five trees over 10" DBH will be removed from the project site for the construction of the townhouse buildings and internal circulation areas.
5. One street tree on Carleton Street exists today and will be preserved. Four new street trees along the Carleton Street frontage but on the project site are proposed. Additional trees and landscaping will be provided on site. The project landscape plan indicates location and species for street trees and other plantings.

C. Site Landscaping

1. Landscaped beds including four street trees are proposed in front of the townhouse buildings along Carleton Street. Interior site plantings include an extensive program of trees, shrubs and perennials along the perimeter of the site and within the hardscaped areas at the center of the site. Plantings and new trees are also proposed surrounding the parking lot condo on the eastern portion of the site. The project landscape plan prepared by the landscape architect indicates location and species.
2. Buffers
 - a. NA
 - b. NA
 - c. NA
3. Parking and vehicle display lot landscaping
 - a. All of the parking is screened from the public ROWs. The residential parking is broken up on site with landscaping adjacent to parking areas. The parking lot condo includes existing and proposed tree and shrub landscaping.
 - b. Uninterrupted pavement does not exceed forty parking spaces.
 - c. NA
4. Street Trees
 - a. There is one (1) existing street tree on Carleton Street that will be preserved. Four (4) new street trees are proposed along the site frontage.
 - b. The project includes nine (9) residential units and only five (5) street trees are provided, so the applicant will make a contribution for four (4) street trees to the City's Tree Fund.

D. Water Quality, Stormwater Management and Erosion Control:

1. Stormwater:

The existing project site is fully developed with approximately 30,614 SF of impervious area (26,684 SF non-roof impervious). Redevelopment of the project site will result in a decrease of approximately 174 SF of impervious area and a decrease in non-roof impervious area by approximately 5,182 SF. The post-development impervious area is approximately 30,440 SF (21,502 SF non-roof impervious). The project is a Major Site Plan so it is required to meet the Basic Standards of the MDEP Chapter 500 Rules for Stormwater Management.

Post development stormwater runoff will generally follow existing patterns. Stormwater runoff from the buildings and hardscape areas will be captured in on-site catch basins and directed to the City's combined storm/sewer system in Carleton Street. Post-development stormwater volumes entering the City's system are expected to be less than in existing conditions. A Stormwater Management Plan is included in Section 7.

- a. Stormwater runoff patterns and volumes are expected to be less than in existing conditions. Ponding on or flooding of adjacent lots is not expected as a result of this project.

- b. Volumes and rates of stormwater runoff leaving the site are expected to be less than in existing conditions. The project is not expected to result in ponding, flooding, or other drainage problems within Carleton Street, West Street, or the abutting parcels.
 - c. Volumes and rates of stormwater runoff into the city's storm drain network are expected to be less than existing volumes and rates. The project is not expected to result in problems downstream or exceed the capacity of the system.
- 2. The stormwater management system was designed to meet the requirements of the Technical Manual.
- 3. The development is not expected to pose a risk to groundwater contamination during or post-construction. Housekeeping notes are included on the project plan set.

14.6.3 Public Infrastructure and Community Safety Standards.

- A. Consistency with City Master Plans:
 - 1. The project has been designed to be consistent with the City of Portland Land Use Ordinance and off-premises infrastructure.
 - 2. Not applicable.
- B. Public Safety and Fire Prevention:
 - 1. The site has been designed to promote safety and security for the residents. Site lighting will provide added security. Access to the townhouse units will be through the front entrances for each individual residence. Access to the existing redeveloped building will be controlled with appropriate access controls for a multi-family residential building. The site includes fencing at many of the property lines and is not publicly accessible. The residential portion of the site will not be accessible from the parking lot condo portion of the site.
 - 2. Emergency vehicle access for the residential development will be via Carleton Street and the project's 20' wide driveway between the townhouse buildings. Emergency vehicle access for the parking lot condo will be via West Street and the existing 18' wide parking lot driveway.
- C. Public Utilities:
 - 1. The project will be served by new water and sewer utilities.
 - 2. Overhead electrical and telecommunications utilities exist along Carleton Street. The buildings will be served by underground electrical and telecommunication utilities. A new ground mounted transformer is proposed on site and will be served from an existing pole on Carleton Street.
 - 3. All new utility infrastructure will meet the provisions of the Technical Manual.

4. The proposed building will be connected to the public sewer system within Carleton Street.
5. NA

14.6.4 Site Design Standards

A. Massing, Ventilation and Wind Impact:

1. The bulk, location and height of the proposed building will not result in adverse impacts to abutting properties.
2. The bulk, location and height of the proposed building will not substantially reduce the value or utility of adjacent structures.
3. The HVAC equipment will be located on the building roofs and exhaust away from adjacent residential properties.

B. Shadows:

The project is not expected to cause shadows on publicly available open space, or have an adverse effect on vegetation as a result of shadows cast from the proposed building.

C. Snow and Ice Loading:

Accumulated snow and ice will not fall onto adjacent properties or public ways.

D. View Corridors:

The project site is located outside of any protected view corridors.

E. Historic Resources:

1. The development is located within the West End historic district.
2. The development is generally compatible with the major character-defining elements of the West End historic district.
3. There are no known archaeological resources on the site.

F. Exterior Lighting:

1. Site Lighting

- a. Exterior site lighting will be provided by building mounted lights along the exterior of the three buildings. The light fixtures are full cutoff. Additional pedestrian scale site lighting will be provided along walkways with downlights recessed in the proposed 18" tall stone walls.
- b. The photometric plan in the project plan set shows how the exterior site lighting meets the standards of the Technical Manual.

2. Architectural and Specialty Lighting: NA – there is no architectural or specialty lighting or up-lighting proposed.

3. Street Lighting: existing cobra head style street light are located on two nearby utility poles located on Carleton Street along the site's frontage. An existing cobra head style street light is located on a utility pole at the parking lot driveway entrance on West Street. No street lighting is proposed.

G. Noise and Vibration:

Noise levels are expected to meet the permitted levels for the R-6 Zone.

HVAC and Mechanical Equipment: All heating, ventilation and air conditioning equipment (HVAC), air handling units (AHU), and similar equipment shall meet applicable state and federal emissions requirements and shall be located on the roof, away from abutting residential properties. No emergency generator is proposed for this project.

H. Signage and Wayfinding:

Not Applicable.

I. Design Standards:

1. Developments of certain types and/or proposed in certain zones, as specified below, are subject to the design standards of the City of Portland Design Manual:
 - a. NA
 - b. NA
 - c. NA
 - d. NA
 - e. Residential developments shall integrate with and respect the character of the surrounding residential developments – the proposed 19 West Street building integrates with the surrounding buildings in terms of architectural form, landscaping and open space, façade materials, roof pitch, massing, and height.

12 VERIFICATION OF PROPOSED HVAC EQUIPMENT

12.1 OVERVIEW

All heating, ventilation and air conditioning equipment (HVAC), air handling units (AHU), emergency generators, and similar equipment shall meet applicable state and federal emissions requirements and shall be located on the building roofs, away from abutting residential properties.



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October 20, 2023
 REVISED NOVEMBER 8, 2023

RESPONSE TO REVIEW COMMENTS

**PL-002614-2023 | 19 West Street
 Portland, Maine 04101
 Project #23-020**

Maya Balassa, Planner
 389 Congress Street, 4th Floor
 Portland, ME 04101

Dear Maya:

We have received and reviewed the staff comments on the proposed redevelopment of 19 West Street (City of Portland Project #PL-002614-2023), dated September 22, 2023. The project design team has prepared the following responses to the comments. For clarity, each comment is repeated below, followed by our response in **bold text**.

GENERAL REVIEW COMMENTS

RTI:

- The site plan shows parking in Easement 2, please explain how you feel the easement is being met.

Applicant Response: The easement located south of the existing brick building, identified as “Easement 2” on the Existing Conditions Survey prepared by Titcomb Associates is for “the purposes of passage, light and air, and is never to be obstructed in any way or to be made a place of storage or deposit.” The applicant has been advised that parking of vehicles does not obstruct the easement and is not considered storage or deposit. Vehicles will come and go on a regular basis.

Zoning:

- The 20% open space zoning requirement is not being met.

Applicant Response: The existing site is legally non-conforming relative to the 20% open space requirement in the R-6 Zoning District. The proposed project will result in an increase in open space on the site. Existing and proposed open space areas are tabulated below.

	Existing Site	Proposed Site
Total Site Area	37,408 S.F.	37,408 S.F.
Landscaped Area (Open Space)	5,821 S.F.	6,875 S.F.
Open Space Percentage	15.6%	18.4%

Revised Drawing: C-1.1

- Please clarify which street is being considered the “front yard” for zoning review.

Applicant Response: The Carleton Street frontage is the “front yard” of the site.

Proposed townhouses:

- 1. With Carleton as the front yard, the front setback is 5'. The front porch and the principal part of each townhouse are meeting the 5' setback but the front steps are not. There is the potential to average the front yards of the buildings (principal structures) at 59 Carleton and 41 & 43 Carleton to get closer to the front property line but the front steps need to be within this setback

Applicant Response: Section 7.5.5.C of the Land Use Code allows for certain porches to project into required setback areas. The code allows for a one-story entrance porch not enclosed, with or without a roof, if the area of the porch does not exceed 50 square feet nor the projection from the building exceed six feet. The proposed porch stairs projecting into the front setback meet these criteria.

- 2. The maximum height in the R-6 zone is 45' but the height needs to be stepped back if the abutting property is a residential zone. The side setback is 10' from the side property line, so within 10' of the side property line the building can't be higher than 35'. The elevations for the townhouses show the buildings above the third floor stepping in for the fourth floor. The setbacks are quite tight, and it is hard for me to scale the amount that the fourth floor set back from the property line to confirm that the 10' setback is being met. Please submit a revised front elevation sheet (A2.0) that shows the vertical line of the side property line and the distance from it to the fourth floor wall.

Applicant Response: Updated elevation drawings that demonstrate how the proposed design meets the setback requirements have been prepared and submitted.

Revised Plans: A2.01

- 3. As stated above the maximum height for a building in the R-6 zone is 45' which is measured to the roof beam in a flat roof. The top of the fourth floor is given as 39'10", so it is below the maximum height of 45'. The concern is the proposed stair tower and partition wall between the two rooftop decks on each building. Section 7.5.1.G list certain appurtenances that can exceed the maximum height. We understand that you are proposing a stairway to access the decks from the fourth floor. A stair tower is allowed to exceed the maximum height but the area of the stair tower on the roof exceeds what is necessary to access the deck from the top stair. More than half of the enclosed area could be considered habitable space. The size of the stair tower needs to be reduced to include

the smallest, code compliant landing at the top of the stairs to open the door and step on to the roof. Please submit a revised rooftop drawing that is compliant. The other concern is the wall that is shown that divides the two roof decks. the top of the wall may not exceed 45'. In addition to adding the vertical lines on the front elevation drawings. Please also include a line that shows the maximum height of 45' and the that the wall between the two decks does not exceed 45'.

Applicant Response: The access to the roof has been revised to address the size of the interior access and the access for the two units has been separated so there is no center wall exceeding the allowable height.

Revised Plans: A1.05

Existing Building:

There are similar concerns with the addition and rooftop structures to the existing building.

- 1. The existing building is legally nonconforming to the rear and side setbacks. The proposed third floor addition needs to meet the side property line stepback of 10' and the rear property line stepback of 15'. Please submit a revised south elevation sheet (A2.21) that shows the vertical line of the rear property line and the distance from it to the third floor wall and a revised west elevation sheet (A2.22) that shows the vertical line of the side property line to the fourth floor wall.

Applicant Response: Proposed Elevations for the existing building have been revised to meet the setback requirements.

Revised Plans: A2.21, A2.24

- 2. The proposed stairway enclosure on the rooftop plan not only exceeds the necessary area for a code compliant landing at the top of the stairs to open the door and step on to the roof; it also includes habitable space. Please submit a revised rooftop top plan that reduces the enclosed stair tower on the roof to include the smallest, code compliant landing at the top of the stairs to open the door and step on to the roof.

Applicant Response: The stairway enclosure on the rooftop has been revised accordingly.

Revised Plans: A1.25

Use Of the West End of Property:

- The property is located in the R-6 Residential Zone. Table 6-A lists off-street parking as a conditional use in the R-6 zone. Since the Planning Board is reviewing the site plan, under section 6.5.1.A.2, the Planning Board will review the Conditional Use appeal for off-street parking. Section 6.5.2 outlines the general conditional use standards that need to be met for the conditional use appeal. The criteria in section 6.5.6.H,2 also needs to be met.

Applicant Response: Conditional Use Standards for the off-street parking have been submitted through E-Plan.

- The applicants need to submit a conditional use application to the Planning Board to allow the off-street parking use they are proposing.

Applicant Response: A conditional use application has been submitted through the Citizen Self Service Portal.

14.6.1: TRANSPORTATION STANDARDS

Impact on Surrounding Street Systems:

- The limited spot grades provided does not allow me to confirm that the proposed sidewalks are compliant (meet the min. cross slope and running slope). The applicant shall update the plans to provide spot grades and slopes at grade breaks for the proposed sidewalks, driveways and at the end of the limits of the proposed improvements for the property.

Applicant Response: Additional spot grades and notes have been added to the Detailed Grading Plan.

Revised Plans: C-5.1

- Confirm that the existing sidewalk grades at the property line are compliant. If not, then the limits of sidewalk replacement shall be extended to include a 5-foot minimum transition zone from the proposed 2% to the existing sidewalk slope.

Applicant Response: The existing sidewalk cross slopes at the property lines are believed to be in compliance with the maximum slope requirement (<2% cross slope). Spot grades have been added to the Detailed Grading Plan in these two areas.

Revised Plans: C-5.1

- Proposed improvements and existing conditions in the City ROW shall be dimensions on the plan view sheets. For example, ROW, street, lanes sidewalk, esplanade driveways (and other improvements) widths as well as when a width changes.

Applicant Response: Additional dimensions of existing and proposed improvements in the Carleton Street ROW have been added to the plans.

Revised Plans: C-3.0, C-4.0, C-4.1

- The finish floor elevation for all buildings shall be shown on the plan

Applicant Response: Finished floor elevations are shown for all buildings on Sheets C-5.0 and C-5.1.

- Note on the plans that the existing signs shall be protected in place.

Applicant Response: A sign protection note has been added to the plans as requested.

Revised Plans: C-3.0

Access and Circulation:

- The main driveway is 20 feet wide but lacks a designated pedestrian facility into and out of the site. Please show safe pedestrian routing from Carleton Street to the entryway of the apartments. The third party traffic engineer and city staff would suggest the two 2-foot concrete pavers be combined to allocate a 4-foot-wide pedestrian pathway.

Applicant Response: The strips of concrete pavers have been widened on both sides of the driveway from 2' to 4'. The proposed driveway now consists of a 12'-wide bituminous travel lane with 4'-wide flush paver strips on both sides.

Revised Drawing: C-4.1

Parking:

- Since the project is proposing more than 10% of the required parking spaces, a transportation study is required.

Applicant Response: The existing site includes approximately 64 surface parking spaces. The paved parking on the east side of the site will be repaved and 23 parking spaces will be restriped and sold individually to the public. This off-street parking is an existing use that will be continued as part of the proposed plan.

The 4 proposed townhouse units adjacent to Carleton Street will feature 8 parking spaces within garages under the buildings, accessed from the rear of the buildings. Each unit will have 2 garage parking spaces.

Ten surface parking spaces will be created on the site for the 5 proposed units in the existing brick building. Each of the 5 units will be allocated 2 parking spaces.

Sales data suggest that, due to the relatively large size of the proposed units, it is important to provide 2 off-street parking spaces for each unit. Fewer parking spaces will hamper the developers' ability to sell the units.

The project will result in a net decrease in off-street surface parking of 31 spaces. The design team made efforts to incorporate surface parking into the plan in a way that screens the parking from abutters and the surrounding public rights-of-way. The 8 surface parking spaces located south of the existing brick building are located where existing parking is currently located.

In summary, it is important for the applicant to provide two parking spaces for each new residential unit to meet the demands of the current market. Surface parking on the site is located in areas where parking exists today and in areas where additional building development is infeasible.

- All parking lot dimensions for the existing lot shall be provided and a formal request for waivers from the city's technical standards shall be provided.

Applicant Response: Dimensions of the existing parking lot in the eastern part of the site have been added to the Existing Conditions & Demolition Plan. Additional dimensions for the rebuilt parking lot have been added to the Overall Site Plan.

Parking space and drive aisle dimensions will remain unchanged from the existing condition. A formal waiver request for reduced access aisle width will be submitted.

Revised Drawings: C-3.0, C-4.0

- The applicant should note how parking spaces will be allocated and managed.

Applicant Response: Townhouse residents will utilize garage parking within their building. Each of the five residential units proposed within the existing building will be allocated two surface parking spaces as limited common elements (10 parking spaces for the 5 units). The residential condominium association will manage and maintain the 10 surface parking spaces.

The twenty-three parking spaces on the east side of the property, accessed from West Street, will be sold individually to residents of the surrounding neighborhood or anyone wishing to own a parking space on the site. A parking condominium association, made up of parking space owners, will manage and maintain the 23-space parking lot.

- The driveway to the existing parking lot does not meet city standards and accordingly a formal request for a waiver shall be provided.

Applicant Response: The existing parking area in the eastern part of the site is accessed through an 18' wide strip of land, which is entirely paved. This condition will remain as part of the proposed project. A formal waiver request for this condition will be submitted.

- Vehicle turning templates shall be provided for vehicle movements into and out of the garage access. If trucks are anticipated, turning templates shall be provided for those vehicles.

Applicant Response: A Parking Turning Analysis drawing has been created to show how passenger vehicles will access the townhouse garages.

New Drawing: C-9.0

14.6.2: ENVIRONMENTAL QUALITY STANDARDS

Landscape Preservation

- General comment - per chapter 4, section 4.3 of the technical manual, please update plans to show species of trees on plans and include trees in abutting properties that have drip lines along, within, or adjacent to project demolition and work areas.

Applicant Response: The revised plans show the plant species and drip lines with added off-site tree locations.

Revised Drawings: C-3.0, C-4.0, C-4.1

- EC / Demo sheet - Several existing trees shown on plans that appear to fall under chapter 29 guidelines and requirements for the Heritage Tree ordinance in Portland Historic districts. Species is important to show on plans to verify if tree removal permit and approval process will be required. Applicant is advised to be in coordination with the Historic preservation manager AND the city of Portland Forestry department for these removals and any impact fees.

Applicant Response: The City Forester/arborist has met on site with the project landscape architect and applicant and discussed the tree removal process. The applicant is aware of the required permits for tree removal and will work with the City as required.

- EC/ Demo Sheet - Note that two trees in particular are not shown on butting properties to the south of the town homes (I believe either Smith or Oppenheim - Raffel property, and south of the existing brick building parking lot (McVicar or Sanford or Holden property) The silver maple south of the existing brick building is an extremely large tree that merits particular attention to preservation measures. Confirm that silver maple is NOT listed in the Big Tree list as defined in section 4.1 of technical manual, and City Arborist, or their designee, is consulted about appropriate actions to take around the existing silver maple.

Applicant Response: Trees on abutting properties have been added to the project drawings, and the project landscape architect has met with the city arborist to discuss the trees in question. Although the large silver maple may not be on the Big Tree list, the owner has agreed to do what is necessary to protect the tree.

Revised Drawings: C-3.0, C-4.0, C-4.1

- EC/ Demo sheet - 24" tree at south east corner of existing structure on abutting property has high likelihood of construction impacts from fence and light pole removals, as does the two existing trees on abutting properties not shown on the EC plan. Please show protection measures on plan for all existing tree species being preserved, and ensure appropriate detailing for tree protection is followed in compliance with chapter 4 of the technical manual requirements (including prohibition of stockpiling and parking in dripline/feeder root zone of preserved trees)

Applicant Response: Tree protection measures have been added to the project drawings.

Revised Drawings: C-1.1, C-3.0, C-3.1

- EC / Demo sheet - Ensure any overhanging branches of preserved trees within construction areas and travel lanes are pruned appropriately to prevent damage by equipment in work areas. For existing fence, existing fence footing removals, trenching and utility work within existing drip lines, applicants are strongly encouraged to utilize air spade excavation techniques in coordination with a certified arborist to minimize damage to feeder roots and structural root areas of existing trees in abutting properties growing adjacent to existing fence areas.

Applicant Response: The revised drawings show the drip lines of all the trees including the off-site trees directly abutting the site. The project team discussed

existing tree protection both on and adjacent to the site during a meeting with the city of Portland arborist. Tree protection notes have been added to the project drawings.

Revised Drawings: C-1.1, C-3.0, C-3.1

- EC/Demo / site plans - Please clarify if applicant anticipates / intends to demo and replace existing brick walk along Carleton Street, and if new walk will be on impervious subbase (eg bituminous base, etc.) If a walkway is being replaced, for areas / portions of walkway within existing preserved tree drip line or feeder roots, applicants are encouraged to excavate removal walkway and associated materials with air spade or other low impact methods that will preserve root structure to the extent possible. Further coordination with the Forestry department is requested for rebuilt pathway materials that would be made over these existing root areas. Similar treatment is requested for underground trenching or utility impacts within preserved tree driplines.

Applicant Response: The public sidewalk on Carleton Street will be replaced. The typical city detail, including a bituminous base, is proposed. Tree protection notes have been added to the project drawings.

Revised Drawings: C-3.0, C-1.1

Site Landscaping and Buffers:

- Site plans - update all plans with location of existing silver maple and other significant existing trees along south of project work area line and property boundary.

Applicant Response: The site plans have been updated to show species for all on-site trees as well as those off-site to the south, including the silver maple.

Revised Drawings: C-3.0, C-4.0, C-4.1, C-5.0, C-5.1, C-6.0

- L1.1 landscape plan - Applicant shows cornus mas species planted in proposed light area.

Applicant Response: The planting plan has been revised/corrected by moving the proposed plant.

Revised Drawings: L-1.1

- L1 and L 1.1. - applicant is strongly encouraged to provide root barrier materials between proposed tree and large shrub species and adjacent electrical and other utility line conditions on site.

Applicant Response: Root barrier has been specified as recommended.

Revised Drawing: C-1.1

- L1.0 - switch grass plantings appear to be shown within paved area, please clarify intent of plantings shown, eg: plantings to be in containers?

Applicant Response: The proposed switch grass will be located within a planting bed. The patio design has been revised on the project drawings.

Revised Drawings: C-4.1, L-1.0

- L1.0 - Viburnum planting on north boundary between townhouse and renovated brick building patio area is planted on proposed light element, please adjust plantings to not be on or immediately adjacent to footings or large site elements that will impact either elements or performance of the plant material.

Applicant Response: The proposed plantings have been adjusted.

Revised Drawings: L-1.0

- L1.0 - Street tree rhythm - while applicant is showing additional trees within 20' of the public R.O.W along Carlton, department encourages applicant to consider enhancing the rhythm and character of the existing neighborhood and street trees by utilizing esplanade area for an additional street tree in esplanade between walk and road in northern most town house unit, if utility conditions allow and in coordination with city arborist.

Applicant Response: An additional street tree has been added in the esplanade, as suggested.

Revised Drawings: L-1.0

- 50% of the proposed plantings are required to be native, please confirm that the landscaping plan is meeting this requirement.

Applicant Response: The project landscape architect confirms that more than 50% of the proposed plantings are native.

Water Quality, Stormwater Management & Erosion Control

- The project is required to meet the requirements of Maine DEP Chapter 500 and City of Portland Technical Manual Section 5 for stormwater management. The project includes the redevelopment of an existing site.

Applicant Response: The project was designed to meet the referenced standards.

- Basic Standard – The plans should show locations of erosion control measures. A detail sheet was provided, but I did not see a sheet with the locations shown.

Applicant Response: Erosion control measures are shown on the Construction Management Plan (Sheet C-3.1)

- **Redevelopment Standard** – The City's Section 5 standards for redevelopment require stormwater treatment for 50% of redeveloped non-roof impervious surface over 5,000 SF. While the project notes it is reducing redeveloped non-roof area on the site, there are areas that would be considered redeveloped (and not simply maintenance), and would need to be considered for stormwater treatment. I would suggest that the southeast parking area could be considered maintenance, but other areas internal to the site that are being regraded and constructed with different surfaces should be considered towards the redeveloped non-roof impervious surface area – the applicant should evaluate these areas to determine what treatment may be required.

Applicant Response: A stormwater treatment system has been designed in accordance with the Section 5 redevelopment standards. Information on the system is in a separate document, entitled “Redevelopment & Stormwater Standards”, which has been uploaded to E-Plan.

Revised Drawings: C-5.0, C-5.1

- The demolition plan accounts for sawcuts for utility installation. The site plan should similarly show locations of required paving and curbing replacement for utility installations.

Applicant Response: Limits of pavement repair and curb replacement have been added to the Site Plans.

Revised Drawings: C-4.0, C-4.1

- The plans provide for covered parking for the townhomes. If any internal drainage is provided for these parking areas, oil water separators should be utilized, and this should be connected to the sewer.

Applicant Response: No internal drainage is proposed within the townhouse garages.

- Section 2.2.3 of the City's Technical Manual requires DPW Water Resources approval when rain water is being proposed to discharge into a sewer which conveys sanitary waste. Prior to authorizing a new stormwater connection into the combined sewer, DPW will require that the applicant provide an on-site stormwater detention volume equal to the greater of: 1” of rainfall over the entire project redeveloped area being proposed on the parcel, or the projected average 24 hour daily sanitary sewer flow being added to the combined sewer system by the project.

Applicant Response: A stormwater detention system has been designed in accordance with the DPW's requirements. Information on the system is in a separate document, entitled “Redevelopment & Stormwater Standards”, which has been uploaded to E-Plan.

Revised Drawings: C-5.0, C-5.1

- Stormwater discharge rates into the combined sewer system must be controlled to a maximum flow rate of 0.1 CFS per acre of watershed drainage area draining through the system until the design storage capacity is reached. Once the design storage is maximized, excess flow rates can be directed to the combined sewer through the use of a flow control structure or device.

Applicant Response: Additional stormwater management comments will be addressed under separate cover.

- New connections into the combined sewer system shall be equipped with backflow prevention in accordance with Section 2.6.10 of the City's Technical Manual

Applicant Response: A backflow preventer has been specified on the Utility Plan.

Revised Drawing: C-6.0

- DPW would recommend and prefer that an inserta tee be utilized to connect the proposed 6" sewer service into the public 24" RCP combined sewer line in Carleton Street. This is allowable under technical manual standard 2.6.7.

Applicant Response: An inserta tee connection has been specified on the Utility Plan.

Revised Drawing: C-6.0

- ESC devices should be depicted on the grading plan or on a dedicated ESC plan sheet.

Applicant Response: Erosion & Sedimentation Control BMP locations are shown on the Construction Management Plan.

14.6.3: PUBLIC INFRASTRUCTURE + COMMUNITY SAFETY STANDARDS

Public Utilities

- The Applicant has noted utility requirements and proposed locations. Confirmation of ability to serve will be required.

Applicant Response: The Department of Public Works has provided a letter confirming that the public sewer system has the capacity to convey the estimated wastewater flows from the project. A copy of the letter is attached.

Terradyn consultants is continuing to work with the Portland Water District on the water supply design for the project. Final approval and confirmation of ability to serve the project will be provided when it is received.

14.6.4: SITE DESIGN STANDARDS

Noise and Vibration

- Please show HVAC on the elevations for review against standards.

Applicant Response: HVAC equipment has been added to the applicable elevation views.

Revised Drawings: A2.01, A2.24

The project team is looking forward to forward to the upcoming Planning Board Workshop. In the interim, please contact me with additional questions or comments.

Sincerely,

TERRADYN CONSULTANTS, LLC



Michael Tadema-Wielandt, P.E.
Vice President

cc. Jack Soley
Tim Hebert
Ali Malone
David Lloyd, Archetype
Katherine Lermond, Archetype

Attachments:

Wastewater Capacity Letter

Updated Plans:

A1.05 Townhouses Roof Plan
A1.25 19 West New Roof Plan
A2.01 Townhouses Front Elevations
A2.21 19 West New South Elevation
A2.24 19 West New East Elevation
C-1.1 General Notes & Legend
C-3.0 Existing Conditions & Demolition Plan
C-3.1 Construction Management Plan
C-4.0 Overall Site Plan
C-4.1 Detailed Site Plan
C-5.0 Overall Grading Plan
C-5.1 Detailed Grading Plan
C-6.0 Utility Plan
C-9.0 Parking Turning Analysis
L-1.0 Landscape Plan
L-1.1 Landscape Plan

Date: September 12, 2023
Re: Wastewater Capacity Authorization
Address: 19 West Street
Applicant: Carleton West, LLC
Planner: Maya Balassa

Estimate of Anticipated Wastewater Flows				
Development	Unit Size	Number of Units	Gallons per Day per Unit	Total Gallons per Day
Existing Flow to be Removed				
Vacant				
Proposed Flow				
Multiple Family Dwelling Units	2-Bedroom	4	180	720
Multiple Family Dwelling Units	3-Bedroom	1	270	270
Multiple Family Dwelling Units	5-Bedroom	4	450	1800
Net Change				+ 2,790
*Values based on STATE OF MAINE: SUBSURFACE WASTEWATER DISPOSAL RULES, most recent edition				

Comments:

The Department of Public Works, which includes the Water Resource Division, have reviewed and determined that the downstream sewers from the project address have the capacity to convey the estimated dry weather wastewater flows which will be generated from this development.

However, storm drainage and sanitary sewer flows in this project area drain to the City's combined sewer system. Lack of wet weather capacity results in frequent system wide combined sewer overflows. City wide mitigation of combined sewer overflows is required as part of the City's CSO consent decree administered by the EPA and Maine DEP.

Section 2.2.3 of the City's Technical Manual requires DPW Water Resources approval when rain water is being proposed to discharge into a sewer which conveys sanitary waste. Prior to authorizing a new stormwater connection into the combined sewer, DPW will require that the

applicant provide an on-site stormwater detention volume equal to the greater of: 1" of rainfall over the entire project redeveloped area being proposed on the parcel, or the projected average 24 hour daily sanitary sewer flow being added to the combined sewer system by the project.

You are also reminded that new connections into the combined sewer system shall be equipped with backflow prevention in accordance with Section 2.6.10 of the City's Technical Manual.

If the City can be of further assistance, please contact me at all 874-8840 or brad@portlandmaine.gov

Sincerely,

A handwritten signature in dark ink, reading "Bradley A. Roland", is displayed on a light gray rectangular background.

Bradley A. Roland, P.E.,
Senior Project Engineer



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 info@terradynconsultants.com
 www.terradynconsultants.com

December 12, 2023

RESPONSE TO REVIEW COMMENTS #2

**PL-002614-2023 | 19 West Street
 Portland, Maine 04101
 Project #23-020**

Maya Balassa, Planner
 389 Congress Street, 4th Floor
 Portland, ME 04101

Dear Maya:

We have received and reviewed the staff comments on the proposed redevelopment of 19 West Street (City of Portland Project #PL-002614-2023), dated December 1, 2023. The project design team has prepared the following responses to the comments. For clarity, each comment is repeated below, followed by our response in **bold text**.

GENERAL REVIEW COMMENTS

Zoning:

- The 2 the porches are being built as part of the new townhouses and the porches meets the minimum setback of 5' as shown on the site plan, as long as the stairs don't extend more than 6' off the front of the porch, and their footprint does not exceed 50 sf, section 7.5.5.C is being met. I would like a plan that shows the exact dimensions of the footprint of the stairs to confirm that they don't exceed 50 sf.

Applicant Response: The width of the stairs has been revised so the footprint is just under the allowed 50 sf.

Revised Plans: A1.02, A2.01, C-4.1

- The revised front elevation (A2.01) shows the 10' stepback from the left side property line but it does not show the 10' stepback from the right side property line. Please revise the plan.

Applicant Response: The stepback distance has been added to the plan, as suggested.

Revised Plans: A2.01

- The roof plan for the townhouse A1.05 shows a smaller footprint for the stair towers on the townhouses but the stairs appear to be a spiral stair (round figure) but the fourth floor does not show a spiral stair. Also, what is the line that divides the two decks? It can't be a wall higher than 45' from grade at the top.

Applicant Response: The roof plan has been revised, see A1.04 and A1.05. The roof accesses for the units have now been joined, see A2.01. The wall dividing the decks is a 42" wall which places it at 43'-6" above grade.

Revised Plans: A1.04, A1.05, A2.01

- Plan A1.25 shows what appears to be a spiral stair accessing the roof deck on the 19 West building (round figure). How does it change to a spiral stair from the fourth floor?

Applicant Response: We have switched to the straight runs with a pitched roof to the access tower.

Revised Plans: A1.25, A2.23

14.6.1: TRANSPORTATION STANDARDS

Impact on Surrounding Street Systems:

- Please update the waiver table to show all waivers needed.

Applicant Response: We believe that the only two waivers required are for the existing parking lot on the east side of the site and relate to the driveway width and the drive aisle width for 90-degree parking. The driveway and parking area for the residential development on the Carleton Street side of the site meet all dimensional requirements of the Technical Manual.

Attachment: Waiver Table

Access and Circulation:

- The applicant notes that the driveway will provide two 4-foot pedestrian areas and one 12-foot travel aisle. Staff would prefer one 4-foot pedestrian pathway and a 16-foot travel way.

Applicant Response: The applicant would prefer the symmetry of the two 4' flush paver strips on either side of the driveway but will defer to the Planning Board on the final design.

14.6.2: ENVIRONMENTAL QUALITY STANDARDS

Landscape Preservation

Tree Removals

- 24" Linden in SW corner already removed as hazard tree
1:1 replacement tree is generally applied to heritage trees that need to be removed due to safety reasons

Applicant Response: An American Hornbeam tree is proposed to be planted in the Carleton Street esplanade as a replacement tree.

Revised Plans: L-1.0, L-1.1

- 26" Linden in SW corner, otherwise healthy → Heritage Tree Penalty
Replacement trees only: 26" DBH / 2" caliper = 13 replacement trees
Replacement trees for Heritage Tree Removals need to be planted in the interior of the lot and not in the public right of way

Payment in lieu only: 26" DBH * \$573/inch = \$14,898.00
Some combination of the payment and replanting/replacing

Applicant Response: The plan includes 14 proposed trees on the site of species that are included on the Heritage Tree list, including 10 Thornless Hawthorns, 2 American Hornbeams, and 2 White Oaks. We believe that these 14 trees qualify as "replacement trees" for the healthy 26" Linden that will be removed.

Revised Plans: L-1.0, L1.1

- 20" Linden tree in NW corner as hazard with significant trunk wounding and decay
No penalty or replanting requirement

Applicant Response: No response necessary

- 38" Norway Maple in center of lot in advanced state of decline
No penalty or replanting requirement

Applicant Response: No response necessary

- It is strongly encouraged to retain the 26" Linden Tree in the SW corner of the property

Applicant Response: The existing Linden tree is less than 5' from the proposed townhouse building and has multiple underground utilities proposed within its root zone, including natural gas, electrical, and water services. It is not feasible to retain this tree.

- A comprehensive tree preservation plan is needed to detail tree protection zones, general restrictions and prohibitions within tree protection zones, general restrictions and prohibitions within the biologically sensitive areas of individual trees if they are not entirely contained within a tree protection area, and specific construction methods to be employed within sensitive areas of individual trees to be preserved

ANSI A300 (2019) Chapter 5 details the procedure for tree preservation during site development and construction

Various technical guides and books are available to guide the general process of formulating a tree preservation plan

Many aspects will be site plan/tree specific and require specific knowledge from an arborist experienced in tree preservation projects

Removal of the wooden guard rail and existing perimeter fence will require special care in the vicinity of trees to be preserved

The installation of the locking gate and accompanying fence across the parking lot under the dripline of the 96" silver maple will require special attention and techniques to limit disturbance

PENN State has a publicly available general guide for tree preservation during construction to supplement the above resources:

<https://extension.psu.edu/a-guide-to-preserving-trees-in-development-projects>

Applicant Response: The tree preservation guidelines have been added to the Construction Management Plan (C-3.1). A note regarding the removal of site features within the leaf canopy of existing trees has also been added to the Existing Conditions and Demolition Plan (Sheet C-3.0), specifically for removal of the wood guardrail and perimeter fence.

Revised Plans: C-3.0, C-3.1

- Please remove red maple from the proposed landscape plan and replace with one of the other non-maple species listed in the 24"+ category of the heritage tree ordinance. The urban canopy in Portland is over-saturated with members of the maple genus which creates a high degree of susceptibility to some concerning insect pests. The heritage tree ordinance is available here (the tree list is on page 2):
<https://content.civicplus.com/api/assets/4db3e0df-de22-40fa-9654-69160b3fbab3?cache=1800>

Applicant Response: The proposed maple tree has been changed to white oak, which is native and is on the heritage tree list.

Revised Plans: L-1.1

- Sheet L1.0 - The *Tilia americana* species proposed for street tree placement - department would require a fastigiat cultivar that would not exceed 30' canopy dia to reduce overhead line conflicts.

Applicant Response: The proposed street tree species has been changed to American Hornbeam.

Revised Plans: L-1.0, L-1.1

- Sheet L 1.0 - Ensure proper spacing is provided for mature forms of plant materials, and provide further cultivar information if a plant with specific habit or size is being proposed that is notably different from the straight species cultivar. Some species, like the myrica plantings, appear to be densely spaced and in confined locations that will require more frequent maintenance to ensure mature size tendencies of the species does not overgrown or negatively impact adjacent plantings, pathways, or other areas.

Applicant Response: The spacing of Myrica has been increased from 4.5-5' to 7', and Viburnum to 7'. This reduced the plant numbers.

Revised Plans: L-1.0

- Sheet L 1.0 - Any fruiting species planting overwalks and near entrances will increase slipping hazards or tracking of crush fruits inside buildings, while not required to be substituted by statute, applicant is encouraged to be aware of those issues and select species with smaller fruits or no fruits to reduce those issues, or anticipate that in property maintenance planning.

Applicant Response: The plants on either side of the southern entry of the existing building have been changed to Mockorange in lieu of Viburnum due to fruit issues on steps.

Revised Plans: L-1.0, L-1.1

- Sheet L 1.0 / General comment-Cornus Mas plant symbol in plans does not accurately represent full canopy size of a small tree, if applicant intends to utilize plantings as a hedge, a clarifying note would be beneficial.

Applicant Response: The canopy size has been revised to a 10'-12' span.

Revised Plans: L-1.0

Site Landscaping and Buffers:

- To meet the street tree requirement of nine, the applicant will need to pay into the street tree fund for the remaining four trees.

Applicant Response: The applicant will pay into the street tree fund, as required.

Water Quality, Stormwater Management & Erosion Control

- The Applicant has provided a figure that shows the redevelopment areas to support the calculation of treatment areas. Based on the proposed system layout, the area treated will be outside of the redevelopment area, but includes the more polluted parking lot area, which is appropriate. The treated area should be highlighted on the stormwater figure as well to confirm that site grading encompasses all of the area that is proposed to be treated.

Applicant Response: The figure has been updated to show the treatment area outlined in red. Contours and spot grades surrounding the treatment area are also shown.

Attachment: Redevelopment Figure

- Design information and calculations should be provided to confirm the sizing for the proposed Storm Basin and R-Tank systems, as well as confirmation of the design from the manufacturers. Staff note that we don't believe the Storm Basin is an approved

proprietary BMP on the MaineDEP's list, but with more information, we may be able to confirm its equivalency to a system that is listed.

Applicant Response: HydroCAD calculations showing the sizing of the r-tank system and outlet control structure are attached. Ferguson Waterworks reviewed the design and provided confirmation of the design in the two letters attached. Ferguson also prepared site-specific details, which have been added as Detail Sheets in the plan set. The Storm Basin was designed as a standard basin with 3 cartridges. Flow rate information used for sizing can be found in the HydroCAD report and the letter from Ferguson. Ferguson also confirmed in their letter that the Storm Basin unit is to provide water quality treatment for the 1-inch storm event and provided detailed information on the treatment provided by the filter cartridges.

Revised Plans: C-8.4, C-8.5

Attachments: HydroCAD Report, Letters from Ferguson Waterworks

- Details should be provided for the proposed stormwater systems.

Applicant Response: Site specific details for the Storm Basin and the R-Tank system were provided by Ferguson Waterworks and have been added to the project drawings. The outlet control structure detail is included on sheet C-8.2 of the civil plan set.

Revised Plans: C-8.2, C-8.4, C-8.5

- The weir elevation for the Storm Basin will be 1.3' below the rim elevation of structure. Staff would suggest confirming that this will provide adequate depth for flow in larger storms.

Applicant Response: The outlet control structure weir wall elevation provides adequate depth for flow over it in larger storms. The 25-year storm results in flow overtopping the weir wall by approximately 1.4", and the 100-year storm event results in flow overtopping the weir wall by approximately 1.9".

- Stormwater inspection and maintenance requirements should be provided, specific to the proposed systems. A stormwater maintenance agreement will be required.

Applicant Response: A site-specific Stormwater Inspection and Maintenance Manual has been prepared and is attached. The applicant intends to contract with Northeast Stormwater Services for stormwater inspection and maintenance. A stormwater maintenance agreement will be prepared for review by the City.

Attachments: Stormwater Management System Inspection & Maintenance Plan

- The applicant appears to have satisfied DPW's detention volume requirement with the following comments:
- Details should be provided for the proposed R-tank system and outlet control structure for review.

Applicant Response: Details of the underground detention system and outlet control structure have been added to the plan set.

Revised Plans: C-8.2, C-8.4, C-8.5

- HydroCad calculations should be provided to confirm the proposed stormwater storage volume.

Applicant Response: HydroCAD calculations are attached.

14.6.3: PUBLIC INFRASTRUCTURE + COMMUNITY SAFETY STANDARDS

Public Utilities

- The Applicant has noted utility requirements and proposed locations. Confirmation of ability to serve will be required once received.

Applicant Response: An ability to serve letter from the city's Water Resources Division (Wastewater) has been previously submitted. Ability to serve from the Portland Water District will be provided when received.

- The utility plan should be updated to match the storm drain infrastructure depicted on the revised grading and drainage plan.

Applicant Response: The Utility Plan has been updated and submitted.

Revised Plans: C-6.0

The project team is looking forward to the upcoming Planning Board Hearing. In the interim, please contact me with additional questions or comments.

Sincerely,

TERRADYN CONSULTANTS, LLC



Michael Tadema-Wielandt, P.E.
Vice President

cc. Jack Soley
Tim Hebert
Ali Malone
David Lloyd, Archetype
Katherine Lermond, Archetype

Attachments:

- 1 - Waiver Table
- 2 - Redevelopment Figure
- 3 - Furgeson Waterworks Design Letters
- 4 - Stormwater Inspection & Maintenance Manual
- 5 - HydroCAD Calculations

Updated Plans:

- C-3.0 Existing Conditions & Demo Plan
- C-3.1 Construction Management Plan
- C-4.0 Overall Site Plan
- C-4.1 Detailed Site Plan
- C-5.0 Overall Grading Plan
- C-5.1 Detailed Grading Plan
- C-6.0 Utility Plan
- C-8.0 Site Details
- C-8.1 Utility Details
- C-8.2 Utility Details
- C-8.4 Cartridge & R-Tank Details
- C-8.5 Construction Equipment Detail & R-Tank Spec. Notes
- L-1.0 Landscape Plan
- L-1.1 Landscape Plan

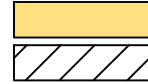
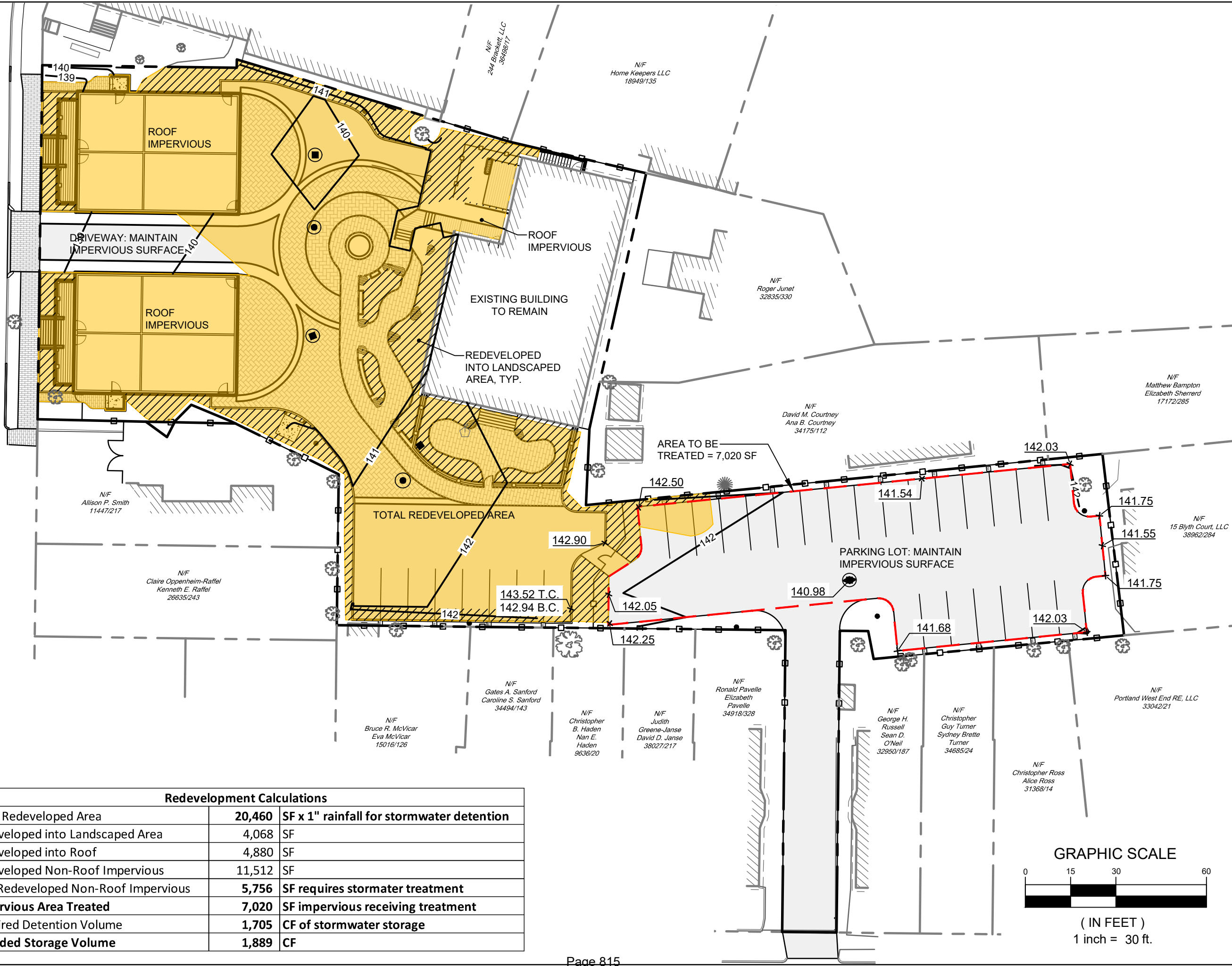
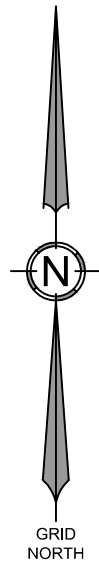
ATTACHMENT 1

Waiver Table

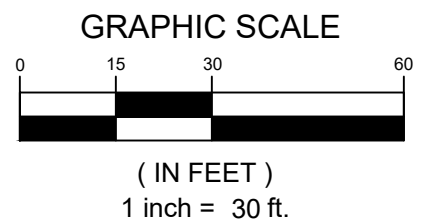
Standard to be Waived: Cite Ordinance or Technical Manual Standard	Cite Standard Language: Cite specific language of applicable Ordinance or Technical Manual Standard	Waiver Being Sought: Describe waiver being sought. Ex. – We are requesting a two-way parking lot drive aisle width of 20' feet.	Justification for Waiver: Address specific waiver criteria, if applicable, and document reasons for the waiver request.
Technical Manual Section 1.10.3	The minimum two-way drive aisle width is 24' for standard, right-angle parking	The applicant is requesting a two-way parking lot drive aisle width of 20' in the existing parking lot located on the east side of the site.	This is an existing parking lot that is being repaved. Existing dimensions will be maintained. Lot dimensions and constraints do not allow for a full 24' drive aisle. Spaces will be owned and used by the same individuals, not a transient population
Technical Manual Section 1.5.1.B	For two-way driveways (preferred): 20 feet minimum, 24 feet maximum for residential / commercial uses	The applicant is requesting an 18' wide driveway to serve the existing parking lot off West Street.	The 18' wide driveway is existing, and will continue to serve the same purpose it does today. The width of the project parcel along the driveway is only 18' wide, so a wider driveway is not possible.

ATTACHMENT 2

Redevelopment Figure



Redevelopment Calculations			
Total Redeveloped Area	20,460	SF x 1" rainfall for stormwater detention	
Redeveloped into Landscaped Area	4,068	SF	
Redeveloped into Roof	4,880	SF	
Redeveloped Non-Roof Impervious	11,512	SF	
50% Redeveloped Non-Roof Impervious	5,756	SF requires stormater treatment	
Impervious Area Treated	7,020	SF impervious receiving treatment	
Required Detention Volume	1,705	CF of stormwater storage	
Provided Storage Volume	1,889	CF	



ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260
PHONE:
(207) 926-5111
WEB SITE:
www.terradynconsultants.com

TERRADYN
CONSULTANTS, LLC

Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

SHEET DESCRIPTION:
REDEVELOPMENT FIGURE
19 WEST STREET, PORTLAND, ME

PREPARED FOR:
CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240

JOB NO:
23-020

DATE:
12-07-2023

SCALE:
1" = 30'

SHEET:
1

OF:
1

ATTACHMENT 3

Furgeson Waterworks Design Letters

Ferguson Waterworks
94 Pleasant Ave
South Portland, ME 04106



Adrienne Fine, PE
Terradyn Consultants, LLC
565 Congress Street, Suite 201
Portland, ME 04101

December 4th, 2023

SUBJECT: West Street Redevelopment – Portland, ME
R-Tank Subsurface System Design Review

Dear Adrienne,

Thank you for forwarding the plans for the proposed West Street Redevelopment project in Portland, Maine to Ferguson Waterworks for review. Our team has reviewed Plan Sheets C-5.0, C-5.1, Stormwater Management Standards doc and modeling data dated August 4, 2023, which shows the following R-Tank system:

- 130 total R-TankHD Double+Mini chambers (27.5' x 21.1' excavation dimensions)

Ferguson provides the following review comments:

The R-Tank system appears to be located beneath an asphalt parking lot, with adequate cover over the system (min. 20" for HS20 load rating). Finished grade over the system does not exceed the maximum allowable cover over the R-Tank units, and includes the minimum 24" side backfill required for R-Tank systems. Recommend adding bottom and top of tank elevations on sheet C-5.1 in addition to the bottom and top of stone elevations currently shown.

Manufacturer requires the R-Tank units to be configured to allow for the "long side" (dimensioned at 28.15") to be facing the stone backfill surrounding the units where possible. It is also recommended to show tank layout on the site plans in an effort to provide direction for the installation team when on site. Layout drawings can be requested from Ferguson to show system specific layouts and details.

To accommodate the orientation of the units required by the manufacturer (long sides facing out towards the excavation) the R-Tank units are configured in a way that provide more units than what the civil plans and modeling call for (135 total units). An R-Tank Treatment Row is included in the design as well, sized accordingly to handle the inflow capacity provided in the hydrocad modeling.

Top, bottom and sides of R-Tank units and excavation to be wrapped in 8oz Non-woven geotextile fabric.

Based on Hydrocad Modeling received the R-Tank system appears to be appropriately sized to contain the first 1" of runoff volume over the required area (7,030sf).

Total volume is calculated as 1,949 cf (135 total units) and includes storage from the R-Tank^{HD} Double+Mini units, 3" of base stone, 24" of side backfill, and 12" of stone on top of the R-Tank units.

Overall, Ferguson takes no exceptions to the location and application of the R-Tank system for this project.

With regard to the installation, Ferguson Waterworks will host a preconstruction meeting with the site contractor and can be on-site during the entire installation to ensure that the installation is being conducted in accordance with our standard installation procedures.

Please review and contact me with any questions from your office. We look forward to working with you on this project.

Sincerely,

Brett Keszczyk
Green Stormwater Infrastructure Engineer – Ferguson Waterworks

Cc: Rob Woodman,
National Urban Green Infrastructure Manager
Maggie Chase, PE
Green Stormwater Infrastructure Specialist (New England)

Ferguson Waterworks
94 Pleasant Ave
South Portland, ME 04106



Adrienne Fine, PE
Terradyn Consultants, LLC
565 Congress Street, Suite 201
Portland, ME 04101

December 4, 2023

SUBJECT: West Street Redevelopment – Portland, ME
Fabco StormBasin Design Review

Dear Adrienne,

Our team has reviewed Plan Sheets C-5.0, C-5.1, Stormwater Management Standards doc, modeling data dated August 4, 2023, and the peak flow rates provided to Ferguson by Terradyn Consultants.

The existing catch basin (CB-3) is in an asphalt parking lot and is proposed to be replaced as a part of the West Street Redevelopment Project. The basin will receive parking lot runoff.

Ferguson provides the following review comments:

The purpose of the StormBasin unit is to provide water quality treatment for the 1-inch storm event. The StormBasin unit will provide pretreatment of runoff upstream of the proposed subsurface R-Tank detention system. The proposed 36" StormBasin unit has three standard cartridges (Fabco Dwg. No PBM36-1-000 Rev. A) with a filtered flow rate of 0.78 CFS. The standard cartridge is configured to effectively treat a broad spectrum of pollutants commonly associated with surface runoff: sediments/debris, bacteria/pathogens, oils/hydrocarbons, and heavy metals. The standard cartridge has been tested by third parties for TSS removal. The relevant reports can be provided upon request.

The StormBasin unit has capacity to treat the water quality volume, which is the 1-inch runoff storm event. The filtered flow rate of the proposed StormBasin unit (0.78 CFS) exceeds the peak flows of the 1-inch storm (0.14 CFS) and the 10-year storm (0.73 CFS).

The bypass flow rate of the StormBasin unit (4.3 CFS) exceeds the 25-year storm event peak flow (0.92 CFS). Overall, Ferguson takes no exceptions to the application of the FABCO StormBasin for this project.

Sincerely,

Maggie Chase

Green Stormwater Infrastructure Specialist – Ferguson Waterworks

Cc: Rob Woodman,
National Urban Green Infrastructure Manager
Maggie Chase, PE
Green Stormwater Infrastructure Specialist (New England)

ATTACHMENT 4

Stormwater Inspection & Maintenance Manual



WEST STREET REDEVELOPMENT PORTLAND, MAINE

STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN

Project Owner/Developer: Carleton West, LLC
9 Gould Road
Lewiston, Maine 04240
(207) 783-2091

Responsible Party: Carleton West, LLC

Prepared By: Terradyn Consultants, LLC
565 Congress Street, Suite 201
Portland, ME 04101
(207) 926-5111

INTRODUCTION:

Regular inspection and maintenance of the entire stormwater management system is crucial to the long-term effectiveness of the system. The responsible party must provide regular inspection and maintenance of all permanent erosion control measures and stormwater management structures, establish any contract services required to implement the program, and keep records and a maintenance log book of inspection and maintenance activities. At a minimum, the inspection and maintenance activities outlined herein should be performed at the recommended intervals. A rainfall event of 1" in a 24 hour period would trigger a wet weather post-construction inspection.

All measures must be maintained in effective operating condition. A person with knowledge of erosion and sedimentation practices, stormwater management, and the standards and conditions of all local, state and federal permits for the project shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected.

INSPECTION TASKS

1. Inspect **vegetated areas**, particularly slopes and embankments, early in the growing season or after heavy rains 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.
2. Inspect **ditches, swales and other open stormwater channels** in the spring, late fall and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, control vegetated growth that could obstruct flow and repair any erosion of the ditch lining. Vegetated ditches must 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. The channel must receive routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.
3. Inspect **culverts** in the spring, in late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris at the inlet, the outlet and within the culvert. Repair any erosion damage at the culvert's inlet and outlet.
4. Inspect and clean out **catch basins**. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).
5. 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. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder.
6. Inspect StormBasin and R-Tank BMPs per the manufacturer requirements, outlined below.

STORMBASIN

The Fabco StormBasin requires regular maintenance to remain efficient as a stormwater filter. Fabco Industries recommends inspection and cleaning out the unit at least two to three times per year. See the attached StormBasin inspection & maintenance manual, which includes a specific maintenance log.

R-TANK

The R-Tank must be inspected regularly to ensure continued functionality and optimum performance of the system. Inspection is recommended every six months during the first year of operation, and annually after that. See attached R-tank Operation, Inspection & Maintenance documents, which include a specific maintenance log.

DOCUMENTATION

Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to City staff and a copy provided to the City upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.

The log attached at the end of this plan is from the *Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers (May 2016)*. The log may be used or adapted for this project. The StormBasin attachment and R-Tank attachment also each contain specific maintenance logs that may be used or adapted for this project.

ATTACHMENTS:

Stormwater Management Facilities Inspection & Maintenance Log
StormBasin Operations, Inspection & Maintenance Guide
R-tank Operations, Inspection & Maintenance document

**Stormwater Management Facilities
Post Construction Inspection & Maintenance Log
West Street Redevelopment, Portland, Maine**

General Information:

Inspected by:	Date:	Weather:
---------------	-------	----------

Reason for Inspection: (Regular Inspection) (Major Rain Event, 1" in 24 hours)

BMP	Conditions Observed	Repairs Needed?
1. Vegetated Areas		
2. Ditches, Swales, Open Channels		
3. Culverts		
4. Catch Basins		
5. StormBasin		
6. R-Tank System		

Detailed Repair Notes:

BMP Type	Date	Description of Repairs & Sediment Disposal

Notes:

If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. A copy of this log shall be retained for a period of at least five years from the completion of permanent stabilization. The log must be made accessible to Department of Environmental Protection staff and a copy provided to the Department upon request.

OPERATION, INSPECTION AND MAINTENANCE GUIDE

STORMBASIN

BY: **FABCO INDUSTRIES**

INSPECTION AND MAINTENANCE

The Fabco StormBasin, like other storm water remediation devices, requires regular maintenance to remain efficient as a stormwater filter. By their nature, filters are meant to retain materials whether its coarse debris, dissolved pollutants or even bacteria. Eventually this collection of “stuff” must be removed, and the spent filtering media exchanged. In general, Fabco Industries recommends inspection and cleaning out the unit(s) at least two to three times per year.



CARTRIDGE TYPES:

Part #	Cartridge Type	Effectiveness	Ring Color
9718-1	Standard	Good All-purpose cartridge for common surface runoff that may contain a little bit of everything.	Red
9718-2	Pathogens	2x's more pathogen treatment vs. Std Cartridge. Use near sensitive water ways to keep beaches and shell fishing areas open.	Yellow
9718-3	HV Hydrocarbon	25% more hydrocarbon filter media Vs Std cartridge. Excellent for vehicle or maintenance related applications.	Blue
9718-4	HV Metals	Uses unique FABLITE filter media for HV metals. Suggested for industrial usage where persistent HV metals have been identified in surface runoff	Grey
9718-5	Standard Short	Reduced height version of std Cart.	Mint
9718-6	Nutrients	Uses proprietary FABPHOS media for nutrients. Highly effective on the critical dissolved Ortho- Phosphates. Helps reduce algae blooms keeping the water clean and healthy.	Green

INSPECTION PROCEDURE

1. Remove the grate. CAUTION: Grates can be extremely heavy. Some type of lifting mechanism is highly recommended.
2. Visually inspect for heavy sediment, trash, and debris loading.
3. Some telltale signs that cleaning or replacement is necessary are as follows:
 - Waterline marks within a couple inches from the bypass openings.
 - Standing water in the unit because it was designed to drain down after a storm.
 - Cannot see the cartridge(s) because they are covered with sediment, trash, and debris, etc.
4. Record observations and comments on the maintenance log sheet. Include any necessary photos and/or sketches to maintain the most accurate records.

MAINTENANCE PROCEDURE

1. Remove the grate.
2. Remove all sediment, oils, liquid, and debris from the structure. It is recommended that a vacuum device be utilized to remove accumulated material. It is not necessary to remove the unit from the inlet.
3. Remove the cartridge(s) by firmly grasping the plastic outer rim of the cartridge body just below the foam. Twist the cartridge body counterclockwise about $\frac{1}{4}$ turn until it stops. Lift the cartridge straight up to remove.
4. Install the replacement cartridges, see the table above for additional information on the different cartridge types.
 - The StormBasin filter cartridge(s) install through a hole in the bottom of the collection basin. The hole has four (4) slots that accept 4 tabs molded into the underside of the cartridge body.
 - Insert the StormBasin cartridge down through the hole in the base of the unit. The colored ring on the cartridge should be facing upwards. Push the cartridge all the way through the hole until it rests on the bottom. Slowly turn the cartridge in a clockwise direction until the tabs align with the slots and the cartridge body drops about $\frac{1}{4}$ ' further down.
 - Once the Tabs fall through the slots, continue turning firmly in a clockwise direction until the Tabs contact the stops.
5. For StormBasin Plus units, replace the used filter media boom.
6. Dispose of all liquid, oils, sediment, debris, trash and other accumulates in accordance with local, state, and federal regulations.
7. Finish the maintenance by placing the grate back into the structure and securing it as necessary.





R-TANK OPERATION, INSPECTION & MAINTENANCE

Operation

Your ACF R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspection frequency for your system must be determined based on the contributing drainage area, but should never exceed one year between inspections (six months during the first year of operation).

Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment your inspection and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you **MUST** follow all local/regional requirements as well as OSHA standards.

R-Tank Systems may incorporate Inspection Ports, Maintenance Ports, and/or adjoining manholes. Each of these features are easily accessed by removing the lid at the surface. With the cover removed, a visual inspection can be performed to identify sediment deposits within the structure. Using a flashlight, ALL access points should be examined to complete a thorough inspection.

Inspection Ports

Usually located centrally in the R-Tank System, these perforated columns are designed to give the user a base-line sediment depth across the system floor.

Maintenance Ports

Usually located near the inlet and outlet connections, you'll likely find deeper deposits of heavier sediments when compared to the Inspection Ports.

Manholes

Most systems will include at least two manholes - one at the inlet and another at the outlet. There may be more than one location where stormwater enters the system, which would result in additional manholes to inspect.

Bear in mind that these manholes often include a sump below the invert of the pipe connecting to the R-Tank. These sumps are designed to capture sediment before it reaches the R-Tank, and they should be kept clean to ensure they function properly. However, existence of sediment in the sump does **NOT** necessarily mean sediment has accumulated in the R-Tank.

After inspecting the bottom of the structure, use a mirror on a pole (or some other device) to check for sediment or debris in the pipe connecting to the R-Tank.

R-TANK OPERATION INSPECTION & MAINTENANCE

If sediment or debris is observed in any of these structures, you should determine the depth of the material. This is typically accomplished with a stadia rod, but you should determine the best way to obtain the measurement.

All observations and measurements should be recorded on an Inspection Log kept on file. We've included a form you can use at the end of this guideline.

Maintenance

The R-Tank System should be back-flushed once sediment accumulation has reached 6" or 15% of the total system height. Use the chart below as a guideline to determine the point at which maintenance is required on your system.

R-Tank Unit	Height	Max Sediment Dept
Mini	9.5"	1.5"
Single	17"	3"
Double	34"	5"
Triple	50"	6"
Quad	67"	6"
Pent	84"	6"

Before any maintenance is performed on your system, be sure to plug the outlet pipe to prevent contamination of the adjacent systems.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. Water should be pumped into ALL Maintenance Ports. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out.

If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

Once removed, sediment-laden water may be captured for disposal or pumped through a Dirtbag™ (if permitted by the locality).



2831 Cardwell Road
Richmond, Virginia, 23234
800.448.3636
FAX 804.743.7779
acfenvironmental.com

Step-By-Step Inspection & Maintenance Routine

1) Inspection

- a. Inspection Port
 - i. Remove Cap
 - ii. Use flashlight to detect sediment deposits
 - iii. If present, measure sediment depth with stadia rod
 - iv. Record results on Maintenance Log
 - v. Replace Cap
- b. Maintenance Port/s
 - i. Remove Cap
 - ii. Use flashlight to detect sediment deposits
 - iii. If present, measure sediment depth with stadia rod
 - iv. Record results on Maintenance Log
 - v. Replace Cap
 - vi. Repeat for ALL Maintenance Ports
- c. Adjacent Manholes
 - i. Remove Cover
 - ii. Use flashlight to detect sediment deposits
 - iii. If present, measure sediment depth with stadia rod, accounting for depth of sump (if present)
 - iv. Inspect pipes connecting to R-Tank
 - v. Record results on Maintenance Log
 - vi. Replace Cover
 - vii. Repeat for ALL Manholes that connect to the R-Tank

2) Maintenance

- a. Plug system outlet to prevent discharge of back-flush water
- b. Determine best location to pump out back-flush water
- c. Remove Cap from Maintenance Port
- d. Pump water as rapidly as possible (without over-topping port) into system until at least 1" of water covers system bottom
- e. Replace Cap
- f. Repeat at ALL Maintenance Ports
- g. Pump out back-flush water to complete back-flushing
- h. Vacuum all adjacent structures and any other structures or stormwater pre-treatment systems that require attention
- i. Sediment-laden water may be captured for disposal or pumped through a Dirtbag™.
- j. Replace any remaining Caps or Covers
- k. Record the back-flushing event in your Maintenance Log with any relevant specifics



Company Responsible for Maintenance:

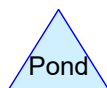
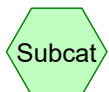
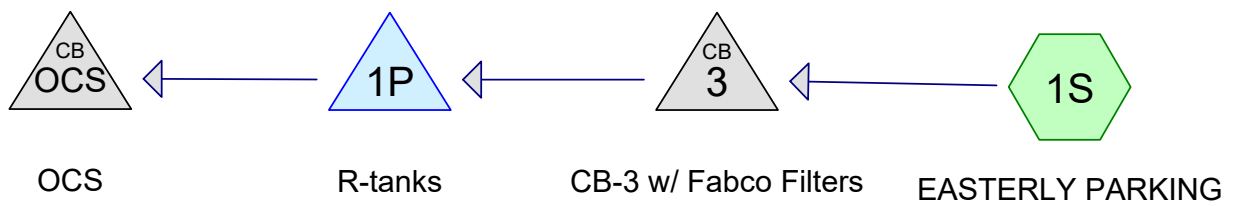
Contact: _____

Phone Number: _____

[illegible]

ATTACHMENT 5

HydroCAD Calculations



Routing Diagram for 23-020 POST

Prepared by {enter your company name here}, Printed 12/4/2023
 HydroCAD® 10.10-5a s/n 11715 © 2020 HydroCAD Software Solutions LLC

23-020 POST

Prepared by {enter your company name here}

Printed 12/4/2023

HydroCAD® 10.10-5a s/n 11715 © 2020 HydroCAD Software Solutions LLC

Page 2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.161	98	PAVED (1S)
0.161	98	TOTAL AREA

23-020 POST*Type III 24-hr 1 inch Rainfall=1.00"*

Prepared by {enter your company name here}

Printed 12/4/2023

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Page 3

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EASTERLY PARKING Runoff Area=7,020 sf 100.00% Impervious Runoff Depth=0.79"
Tc=5.0 min CN=98 Runoff=0.14 cfs 0.011 af

Pond 1P: R-tanks Peak Elev=135.31' Storage=0.003 af Inflow=0.14 cfs 0.011 af
12.0" Round Culvert n=0.012 L=7.0' S=0.0114 '/' Outflow=0.10 cfs 0.009 af

Pond 3: CB-3 w/ Fabco Filters Peak Elev=136.66' Inflow=0.14 cfs 0.011 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0100 '/' Outflow=0.14 cfs 0.011 af

Pond OCS: OCS Peak Elev=138.23' Inflow=0.10 cfs 0.009 af
Outflow=0.10 cfs 0.009 af

Total Runoff Area = 0.161 ac Runoff Volume = 0.011 af Average Runoff Depth = 0.79"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.161 ac

23-020 POST

Type III 24-hr 1 inch Rainfall=1.00"

Prepared by {enter your company name here}

Printed 12/4/2023

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Page 4

Summary for Subcatchment 1S: EASTERLY PARKING

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 0.011 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 inch Rainfall=1.00"

	Area (sf)	CN	Description
*	7,020	98	PAVED
	7,020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Pond 1P: R-tanks

[79] Warning: Submerged Pond 3 Primary device # 1 OUTLET by 0.17'

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 0.79" for 1 inch event
 Inflow = 0.14 cfs @ 12.07 hrs, Volume= 0.011 af
 Outflow = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af, Atten= 28%, Lag= 4.9 min
 Primary = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 135.31' @ 12.15 hrs Surf.Area= 0.013 ac Storage= 0.003 af

Plug-Flow detention time= 118.6 min calculated for 0.009 af (87% of inflow)
 Center-of-Mass det. time= 62.6 min (849.5 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.89'	0.012 af	21.06'W x 27.46'L x 4.79'H Field A 0.064 af Overall - 0.033 af Embedded = 0.031 af x 40.0% Voids
#2A	135.14'	0.031 af	ACF R-Tank HD 2.5 x 130 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 130 Chambers in 13 Rows
		0.043 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.14'	12.0" Round Culvert L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.14' / 135.06' S= 0.0114 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.10 cfs @ 12.15 hrs HW=135.31' (Free Discharge)

1=Culvert (Barrel Controls 0.10 cfs @ 1.81 fps)

23-020 POST

Type III 24-hr 1 inch Rainfall=1.00"

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Summary for Pond 3: CB-3 w/ Fabco Filters

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 0.79" for 1 inch event
 Inflow = 0.14 cfs @ 12.07 hrs, Volume= 0.011 af
 Outflow = 0.14 cfs @ 12.07 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.14 cfs @ 12.07 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 136.66' @ 12.07 hrs

Flood Elev= 140.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.48'	12.0" Round Culvert L= 134.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.48' / 135.14' S= 0.0100 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 12.07 hrs HW=136.66' (Free Discharge)

↑1=Culvert (Inlet Controls 0.14 cfs @ 1.44 fps)

Summary for Pond OCS: OCS

[81] Warning: Exceeded Pond 1P by 2.92' @ 12.15 hrs

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 0.69" for 1 inch event
 Inflow = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af
 Outflow = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 138.23' @ 12.15 hrs

Flood Elev= 141.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.06'	12.0" Round Culvert L= 54.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.06' / 134.65' S= 0.0075 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	135.06'	1.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	139.68'	5.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.10 cfs @ 12.15 hrs HW=138.20' (Free Discharge)

↑1=Culvert (Passes 0.10 cfs of 5.85 cfs potential flow)

↑2=Orifice/Grate (Orifice Controls 0.10 cfs @ 8.45 fps)

↑3=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

23-020 POST*Type III 24-hr 2-yr Rainfall=3.10"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EASTERLY PARKING Runoff Area=7,020 sf 100.00% Impervious Runoff Depth=2.87"
Tc=5.0 min CN=98 Runoff=0.49 cfs 0.039 af

Pond 1P: R-tanks Peak Elev=135.50' Storage=0.005 af Inflow=0.49 cfs 0.039 af
12.0" Round Culvert n=0.012 L=7.0' S=0.0114 '/' Outflow=0.41 cfs 0.037 af

Pond 3: CB-3 w/ Fabco Filters Peak Elev=136.83' Inflow=0.49 cfs 0.039 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0100 '/' Outflow=0.49 cfs 0.039 af

Pond OCS: OCS Peak Elev=139.75' Inflow=0.41 cfs 0.037 af
Outflow=0.41 cfs 0.037 af

Total Runoff Area = 0.161 ac Runoff Volume = 0.039 af Average Runoff Depth = 2.87"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.161 ac

23-020 POST

Type III 24-hr 2-yr Rainfall=3.10"

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Summary for Subcatchment 1S: EASTERLY PARKING

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.49 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (sf)	CN	Description
*	7,020	98	PAVED
	7,020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Pond 1P: R-tanks

[79] Warning: Submerged Pond 3 Primary device # 1 OUTLET by 0.35'

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
 Inflow = 0.49 cfs @ 12.07 hrs, Volume= 0.039 af
 Outflow = 0.41 cfs @ 12.12 hrs, Volume= 0.037 af, Atten= 15%, Lag= 3.2 min
 Primary = 0.41 cfs @ 12.12 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 135.50' @ 12.12 hrs Surf.Area= 0.013 ac Storage= 0.005 af

Plug-Flow detention time= 57.1 min calculated for 0.037 af (96% of inflow)
 Center-of-Mass det. time= 36.5 min (792.6 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.89'	0.012 af	21.06'W x 27.46'L x 4.79'H Field A 0.064 af Overall - 0.033 af Embedded = 0.031 af x 40.0% Voids
#2A	135.14'	0.031 af	ACF R-Tank HD 2.5 x 130 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 130 Chambers in 13 Rows
		0.043 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.14'	12.0" Round Culvert L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.14' / 135.06' S= 0.0114 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.12 hrs HW=135.49' (Free Discharge)

1=Culvert (Barrel Controls 0.40 cfs @ 2.41 fps)

23-020 POST

Type III 24-hr 2-yr Rainfall=3.10"

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Summary for Pond 3: CB-3 w/ Fabco Filters

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
 Inflow = 0.49 cfs @ 12.07 hrs, Volume= 0.039 af
 Outflow = 0.49 cfs @ 12.07 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.49 cfs @ 12.07 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 136.83' @ 12.07 hrs
 Flood Elev= 140.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.48'	12.0" Round Culvert L= 134.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.48' / 135.14' S= 0.0100 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.07 hrs HW=136.82' (Free Discharge)
 ↑ **1=Culvert** (Inlet Controls 0.47 cfs @ 1.99 fps)

Summary for Pond OCS: OCS

[81] Warning: Exceeded Pond 1P by 4.35' @ 11.85 hrs

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 2.77" for 2-yr event
 Inflow = 0.41 cfs @ 12.12 hrs, Volume= 0.037 af
 Outflow = 0.41 cfs @ 12.12 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.41 cfs @ 12.12 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 139.75' @ 12.12 hrs
 Flood Elev= 141.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.06'	12.0" Round Culvert L= 54.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.06' / 134.65' S= 0.0075 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	135.06'	1.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	139.68'	5.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.40 cfs @ 12.12 hrs HW=139.74' (Free Discharge)
 ↑ **1=Culvert** (Passes 0.40 cfs of 7.42 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 10.35 fps)
 ↑ **3=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.27 cfs @ 0.83 fps)

23-020 POST*Type III 24-hr 10-yr Rainfall=4.60"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EASTERLY PARKING Runoff Area=7,020 sf 100.00% Impervious Runoff Depth=4.36"
Tc=5.0 min CN=98 Runoff=0.73 cfs 0.059 af

Pond 1P: R-tanks Peak Elev=135.60' Storage=0.006 af Inflow=0.73 cfs 0.059 af
12.0" Round Culvert n=0.012 L=7.0' S=0.0114 '/' Outflow=0.64 cfs 0.057 af

Pond 3: CB-3 w/ Fabco Filters Peak Elev=136.91' Inflow=0.73 cfs 0.059 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0100 '/' Outflow=0.73 cfs 0.059 af

Pond OCS: OCS Peak Elev=139.78' Inflow=0.64 cfs 0.057 af
Outflow=0.64 cfs 0.057 af

Total Runoff Area = 0.161 ac Runoff Volume = 0.059 af Average Runoff Depth = 4.36"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.161 ac

23-020 POST

Type III 24-hr 10-yr Rainfall=4.60"

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Summary for Subcatchment 1S: EASTERLY PARKING

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.73 cfs @ 12.07 hrs, Volume= 0.059 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.60"

	Area (sf)	CN	Description
*	7,020	98	PAVED
	7,020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Pond 1P: R-tanks

[79] Warning: Submerged Pond 3 Primary device # 1 OUTLET by 0.46'

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 4.36" for 10-yr event
 Inflow = 0.73 cfs @ 12.07 hrs, Volume= 0.059 af
 Outflow = 0.64 cfs @ 12.12 hrs, Volume= 0.057 af, Atten= 12%, Lag= 2.8 min
 Primary = 0.64 cfs @ 12.12 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 135.60' @ 12.12 hrs Surf.Area= 0.013 ac Storage= 0.006 af

Plug-Flow detention time= 44.2 min calculated for 0.057 af (98% of inflow)
 Center-of-Mass det. time= 29.2 min (777.7 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.89'	0.012 af	21.06'W x 27.46'L x 4.79'H Field A 0.064 af Overall - 0.033 af Embedded = 0.031 af x 40.0% Voids
#2A	135.14'	0.031 af	ACF R-Tank HD 2.5 x 130 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 130 Chambers in 13 Rows
		0.043 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.14'	12.0" Round Culvert L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.14' / 135.06' S= 0.0114 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.12 hrs HW=135.59' (Free Discharge)↑ **1=Culvert** (Barrel Controls 0.62 cfs @ 2.65 fps)

23-020 POST

Type III 24-hr 10-yr Rainfall=4.60"

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Summary for Pond 3: CB-3 w/ Fabco Filters

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 4.36" for 10-yr event
 Inflow = 0.73 cfs @ 12.07 hrs, Volume= 0.059 af
 Outflow = 0.73 cfs @ 12.07 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.73 cfs @ 12.07 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 136.91' @ 12.07 hrs

Flood Elev= 140.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.48'	12.0" Round Culvert L= 134.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.48' / 135.14' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.70 cfs @ 12.07 hrs HW=136.90' (Free Discharge)

1=Culvert (Inlet Controls 0.70 cfs @ 2.22 fps)

Summary for Pond OCS: OCS

[81] Warning: Exceeded Pond 1P by 4.35' @ 12.60 hrs

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 4.26" for 10-yr event
 Inflow = 0.64 cfs @ 12.12 hrs, Volume= 0.057 af
 Outflow = 0.64 cfs @ 12.12 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.64 cfs @ 12.12 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 139.78' @ 12.12 hrs

Flood Elev= 141.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.06'	12.0" Round Culvert L= 54.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.06' / 134.65' S= 0.0075 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	135.06'	1.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	139.68'	5.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.60 cfs @ 12.12 hrs HW=139.77' (Free Discharge)

1=Culvert (Passes 0.60 cfs of 7.44 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.13 cfs @ 10.39 fps)

3=Sharp-Crested Vee/Trap Weir (Weir Controls 0.48 cfs @ 1.01 fps)

23-020 POST*Type III 24-hr 25-yr Rainfall=5.80"*

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EASTERLY PARKING Runoff Area=7,020 sf 100.00% Impervious Runoff Depth=5.56"
Tc=5.0 min CN=98 Runoff=0.92 cfs 0.075 af

Pond 1P: R-tanks Peak Elev=135.67' Storage=0.007 af Inflow=0.92 cfs 0.075 af
12.0" Round Culvert n=0.012 L=7.0' S=0.0114 '/' Outflow=0.82 cfs 0.073 af

Pond 3: CB-3 w/ Fabco Filters Peak Elev=136.97' Inflow=0.92 cfs 0.075 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0100 '/' Outflow=0.92 cfs 0.075 af

Pond OCS: OCS Peak Elev=139.80' Inflow=0.82 cfs 0.073 af
Outflow=0.82 cfs 0.073 af

Total Runoff Area = 0.161 ac Runoff Volume = 0.075 af Average Runoff Depth = 5.56"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.161 ac

23-020 POST

Type III 24-hr 25-yr Rainfall=5.80"

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Summary for Subcatchment 1S: EASTERLY PARKING[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.92 cfs @ 12.07 hrs, Volume= 0.075 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, $dt=0.05$ hrs
Type III 24-hr 25-yr Rainfall=5.80"

	Area (sf)	CN	Description
*	7,020	98	PAVED
	7,020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Pond 1P: R-tanks

[79] Warning: Submerged Pond 3 Primary device # 1 OUTLET by 0.53'

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
 Inflow = 0.92 cfs @ 12.07 hrs, Volume= 0.075 af
 Outflow = 0.82 cfs @ 12.11 hrs, Volume= 0.073 af, Atten= 11%, Lag= 2.7 min
 Primary = 0.82 cfs @ 12.11 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, $dt=0.05$ hrs
 Peak Elev= 135.67' @ 12.11 hrs Surf.Area= 0.013 ac Storage= 0.007 af

Plug-Flow detention time= 36.8 min calculated for 0.073 af (98% of inflow)
 Center-of-Mass det. time= 25.5 min (770.2 - 744.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.89'	0.012 af	21.06'W x 27.46'L x 4.79'H Field A 0.064 af Overall - 0.033 af Embedded = 0.031 af x 40.0% Voids
#2A	135.14'	0.031 af	ACF R-Tank HD 2.5 x 130 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 130 Chambers in 13 Rows
		0.043 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.14'	12.0" Round Culvert L= 7.0' CPP, square edge headwall, $K_e=0.500$ Inlet / Outlet Invert= 135.14' / 135.06' S= 0.0114 ' S= 0.0114 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.11 hrs HW=135.66' (Free Discharge)

1=Culvert (Barrel Controls 0.80 cfs @ 2.80 fps)

23-020 POST

Type III 24-hr 25-yr Rainfall=5.80"

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Summary for Pond 3: CB-3 w/ Fabco Filters

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
 Inflow = 0.92 cfs @ 12.07 hrs, Volume= 0.075 af
 Outflow = 0.92 cfs @ 12.07 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.92 cfs @ 12.07 hrs, Volume= 0.075 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 136.97' @ 12.07 hrs

Flood Elev= 140.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.48'	12.0" Round Culvert L= 134.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.48' / 135.14' S= 0.0100 ' / ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 12.07 hrs HW=136.96' (Free Discharge)

1=Culvert (Inlet Controls 0.89 cfs @ 2.36 fps)

Summary for Pond OCS: OCS

[81] Warning: Exceeded Pond 1P by 4.35' @ 12.70 hrs

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-yr event
 Inflow = 0.82 cfs @ 12.11 hrs, Volume= 0.073 af
 Outflow = 0.82 cfs @ 12.11 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.82 cfs @ 12.11 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 139.80' @ 12.11 hrs

Flood Elev= 141.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.06'	12.0" Round Culvert L= 54.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.06' / 134.65' S= 0.0075 ' / ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	135.06'	1.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	139.68'	5.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.79 cfs @ 12.11 hrs HW=139.80' (Free Discharge)

1=Culvert (Passes 0.79 cfs of 7.46 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.13 cfs @ 10.41 fps)

3=Sharp-Crested Vee/Trap Weir (Weir Controls 0.66 cfs @ 1.12 fps)



August 7, 2023

Christine Grimando
Planning Director
City of Portland, Maine
389 Congress Street St. 4th Floor
Portland, ME 04101

Re: Carleton West Project – Financial Capacity

Dear Christine:

On behalf of Norway Savings Bank, I am pleased to provide this letter of support of Carleton West LLC on their plans to develop the property at 19 West Street, Portland, Maine. Based on our review of financials and our understanding of the project, I believe Jack Soley and Tim Hebert have the financially capacity and technical expertise to successfully complete this project.

While this letter is not a commitment to lend, Carleton West LLC and its principals have been customers of Norway Savings Bank for over 12 years. We have worked successfully with them on similar projects in the past and believe they have the financial capacity and management skills to develop this site and complete the project.

With permission from our client, I am happy to provide additional information you may require. I can be reached at ldarcy@NorwaySavingsBank.com or at (207)482-7959.

Norway Savings Bank looks forward to working with Carleton West LLC as this project moves forward in the development process.

Sincerely,

A handwritten signature in blue ink that reads "Larissa Darcy".

Larissa Darcy
Vice President
Commercial Lending

cc: Jack Soley
Tim Hebert

CITY OF PORTLAND
Planning & Urban Development Department

MAJOR SITE PLAN GENERAL DOCUMENT AND DRAWINGS CHECKLIST Please submit each document as a separate PDF file. Please confirm by electronically checking the boxes in the left-hand column. ** PLEASE FILL OUT AND UPLOAD THE ZONING ASSESSMENT TABLE AND WAIVER TABLE SEPARATELY AS NOTED BELOW ** At the time of application submission, please contact the Department of Public Works regarding E-911 addressing for your project.		
GENERAL APPLICATION DOCUMENTS		
☒	NA	Project Description Cover letter with detailed project description
☒	NA	Completed Checklist (this document)
☒	NA	Evidence of Right, Title, and Interest Deeds, leases, or purchase and sales agreements
Yes	☒	Evidence of State or Federal Approvals Permits or letters of non-jurisdiction, if applicable
☒	NA	Zoning Assessment (see Zoning Assessment Table) Summary of compliance with use and dimensional standards of the land use code
☒	NA	Site Plan Standards Assessment (see Section 14.6 of the land use code) Summary of project compliance with site plan standards of the land use code
☒	NA	Summary of Existing and/or Proposed Easements or Covenants, applicable. Evidence of existing easements and any proposed easements, covenants, public or private rights-of-way
Yes	☒	Waiver Requests (see Waiver Table) Written request for waiver describing request and compliance with applicable waiver standards
☒	NA	Financial Capability Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
☒	NA	Technical Capability Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

MAJOR 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	Impact on Surrounding Street Systems (14-14.6.1(A)) Describe incremental volume of traffic impacts and mitigation measures. If needed
Yes	NA	Access and Circulation (14-14.6.1(B)) Identify and describe the following: - Site access and internal circulation, including ADA access - Drive-up features, if applicable - Loading and servicing needs, routes, and geometry, providing turning templates for delivery vehicles, if applicable - Sidewalks and condition along street frontages and internal walkways - Engineered details for ADA ramps and public sidewalks, meeting sidewalk material policy and construction requirements (Technical Manual, Section 1)
Yes	NA	Public Transit (14-14.6.1(C)), if applicable Identify and describe the following: Existing available transit service and proposed transit improvements, including design details, such as easement, pad base, and shelter
Yes	NA	Off-Street Parking (14-14.6.1(D)), if applicable Identify and describe the following: - Proposed vehicular and bicycle parking supply (including ADA-compliant parking) in relation to applicable parking requirements in Article 19 of the land use code - Curb cut separation and parking layout (Technical Manual, Section 1) - Construction details for bicycle racks - Management plan for snow storage and removal
Yes	NA	Transportation Demand Management (TDM) (14-14.6.1(E)), if applicable Provide TDM plan drafted in accordance with Technical Manual Section 1 requirements

ENVIRONMENTAL		
Yes	NA	Preservation of Significant Natural Features (14-14.6.2(A)), if applicable Identify and describe the following: • High and moderate value waterfowl and wading habitat • Aquifers (for Casco Bay Islands) • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental compliance consultants and determinations from applicable state and federal agencies
Yes	NA	Landscape Preservation (14-14.6.2(B)) Identify and describe the following: • Measures to preserve trees, including within required zoning setbacks (Technical Manual, Section 4) • Measures to protect existing vegetation during construction
Yes	NA	Site Landscaping and Buffers (14-14.6.2(C)) Identify and describe the following: • Overall landscaping approach and consistency with standards • The use of screening and buffering of service areas and between non-residential and residential uses • Existing Heritage or Feature Trees on site and measures to preserve • Compliance with street tree requirements
Yes	NA	Water Quality, Stormwater Management, and Erosion Control (14-14.6.2(D)) Identify and describe the following: • Erosion and sedimentation control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater law, as applicable • Subsurface sanitary sewage disposal and groundwater protection measures

PUBLIC INFRASTRUCTURE AND COMMUNITY SAFETY		
Yes	NA	Consistency with City Master Plans (14-14.6.3(A)) Describe proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes	NA	Public Safety and Fire Prevention (14-14.6.3(B)) Identify and describe the following: - Compliance with Crime Prevention through Environmental Design (CPTED) requirements (Technical Manual, Section 3) - Emergency vehicle access - Consistency with public safety standards (Technical Manual, Section 3)
Yes	NA	Availability and Adequacy of Public Utilities (14-14.6.3(C)) (Technical Manual, Sections 2 & 9) Identify and describe the following: - Electrical services, including providing underground services - Existing and proposed connections for public utilities and required public utility upgrades - Sewer line connections
SITE DESIGN		
Yes	NA	Massing, Ventilations and Wind Impact (14-14.6.4(A)) Identify and describe the following: - Wind and ventilation impacts on adjoining structures and/or adjacent public spaces, including wind study, if applicable - Bulk, location, or height impacts on adjoining structures
Yes	NA	Shadows (14-14.6.4(B)), if applicable Provide shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes	NA	Snow and Ice Loading (14-14.6.4(C)) Describe building design measures to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes	NA	View Corridors (14-14.6.4(D)), if applicable Describe any protection of designated view corridors (Portland Design Manual, Appendix. 1)
Yes	NA	Historic Resources (14-14.6.4(E)), if applicable Identify and describe the following: - The site's status as a designated landmark, within a historic district or historic landscape district, or within 100 feet of any designated landmark, historic district, or historic landscape district - Compliance with standards for preservation and documentation of archaeological resources

Yes	NA	Exterior Lighting (14-14.6.4(F)) Describe how the proposed site lighting will adhere to photometrics requirements as it relates to light trespass and full cutoff fixture design, pursuant to Technical Manual Section 12
Yes	NA	Noise and Vibration (14-14.6.4(G)) Provide data on noise levels for HVAC and other mechanical equipment, such as design specifications, to demonstrate consistency with state and federal noise emissions requirements as well as City code
Yes	NA	Signage and Wayfinding (14-14.6.4(H)), if applicable - Provide signage plan showing the location, dimensions, height and setback of all existing and proposed signs - Provide drawings of all commercial and directional signage on site
Yes	NA	Zone-Related Design Standards (14-14.6.4(I)) Address any applicable design review standards by zone, including compliance with Design Manual

MAJOR SITE PLAN DRAWINGS CHECKLIST

Please upload the following **DRAWINGS** with the listed details into e-Plan as separate pdfs.

All drawings must be submitted in a 24 x 36 sheet size.

BOUNDARY SURVEY (stamped by a Maine Licensed Surveyor and drawn as per Technical Manual Sec. 13)

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

All sheets – Include a title block with project title and the following information:

- Project street address
- Name and address of property owner & applicant
- Licensed design professional, incl firm that produced plans
- North arrow
- Date of preparation and revision history block
- Tax parcel (chart, block, and lot) number

Existing Conditions Plan with the following:

- Existing structures, with distance from primary building façade(s) to the property line
- Approximate location of structures on abutting properties
- All streets and intersections adjacent to the site
- Existing driveways, pedestrian ways, and bicycle infrastructure, including dimensions and materials
- Existing public transit infrastructure
- Existing vehicle & bicycle parking areas
- Existing utilities on site and within adjacent rights-of-way
- Existing grades (two-foot contours preferred)
- Location of water courses, wetlands, and vegetation, or other significant natural features
- Existing soil conditions and location of test pits and borings
- Zoning boundary lines, including overlays
- Location of all existing easements and rights-of-way

Proposed Site Plan with the following:

- Proposed structures, including distance from primary building façade(s) to property lines
- Ground floor area, and finished floor elevations for all buildings
- Any proposed geometric modifications to streets and intersections adjacent to site
- Location, dimensions and materials of all 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, including turning templates
- Proposed transit infrastructure with dimensions/ engineering specifications
- Location of vehicle and bicycle parking with dimensions and engineering specifications
- Location of all snow storage areas
- Exterior lighting (please see Technical Manual Sec. 12 for photometrics requirements)

• Location of fire hydrants • Location of solid waste management receptacles • Location of all proposed HVAC and mechanical equipment, including proposed screening, where applicable • Location of proposed easements and rights-of-way, including dimensions • Please utilize color-coding and/or hatches and shading to delineate changes between the pre and post development condition as needed
UTILITY PLAN including:
• Proposed electrical infrastructure • Location, sizing and directional flows of all proposed sewer and stormwater infrastructure • Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site • Electric utility infrastructure
GRADING AND DRAINAGE PLAN including:
• Proposed grades • Proposed stormwater management measures meeting Technical Manual (Section 5) standards • Any proposed alteration of a watercourse or wetlands • Any groundwater protection measures • Proposed buffers and preservation measures for wetlands or significant natural features
LANDSCAPE PLAN including:
• Existing vegetation to be preserved and preservation measures • Proposed landscaping, screening, and street trees, including caliper widths for trees • Planting schedule, including street trees
ARCHITECTURAL PLANS AND RENDERINGS including:
• Exterior building elevations, color renderings, illustrations of all sides • Axonometric and street-level views for structures greater than three stories in height • Provide context drawings, if applicable (Design Manual, page 1) • Floor plans
CONSTRUCTION MANAGEMENT PLAN including:
• Specifics on traffic control, sidewalk sheds, and pedestrian rerouting • Include a drawing and written narrative
OTHER
• Details and cross-sections, as necessary



ZONING ANALYSIS Relevant Zone(s) R6

All Projects:

	Required	Proposed
Lot Size	2,000 SF	37,361 SF
Area Per Dwelling Unit	725 SF	4,151 SF
Minimum Street Frontage	20 FT	135 FT
Front Yard Minimum	5 FT	5 FT
Front Yard Maximum	-	-
Rear Yard	10 FT	3.7 FT. (EXIST)
Yard Right	5 FT	9 FT
Yard Left	5 FT	8.5 FT
Side Street Setback	0 FT	-
Step Back	10 FT / 15 FT	10 FT / NA
Maximum Lot Coverage	60%	24%
Minimum Lot Coverage	-	-
Maximum Height	45 FT	
Open Space	20%	14%
Maximum Impervious Area	-	-
Pavement Setback	-	-
Floor Area Ratio	-	-
Off Street Parking Spaces	6	18
Loading Bays	N/A	
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):			

Neighborhood Meeting Sign-In Sheet

Date of Meeting: September 27, 2023 from 6-7 PM

Location of Meeting: Reiche School, Portland

Project Name/Address: Carleton West LLC redevelopment at 19 West St, Portland

Developer and Consultant Team in Attendance:

Name:	Email:	Organization:
Ali Malone	ali.malone@gmail.com	Carleton West LLC
Jack Soley	jsoley@easttownrows.com	Carleton West LLC
Tim Hebert	thebert@hebertconstruction.com	Carleton West LLC
Bethina Reece	bethina@waypointbrokers.com	Carleton West LLC

Members of the Public in Attendance:

Name	Email:	Address (optional):
Will Groves	hmporland@rmhcmaine.org	250 Brackett St Ronald McDonald House
Mary Doughty	marydoughty@maine.rr.com	28 Carleton Street

NAME	EMAIL	ADDRESS
ANNE PENKIE - WANA	ANNE.PENKIE.MO@gmail.com	44 NEAR ST
DEREK JASKULSKI	DEREKJ@USA.NET	50 Carleton St
E. B.		72 Pine St
Bethna Leese	Bethna.leese@gmail.com	15117 Blyth
EVA McVICAR	evamcvicar@gmail.com	29 WEST
Clara Dymhryn	Dfelixy@gmail.com	41 Carleton St.
MICHAEL NAPLES		129 PINE STREET
ERZABETH & RON FARKAS		21 WEST ST
AD Farkas	farkas.ada@gmail.com	6 Houlton
Georg Russell	grussel@yaho.com	17 West
Tom Richards	Tom	54-56 Carleton
Kiran Mahal	Kiran Mahal@gmail.com	285 Graceth → Eastmont copy please
MONTY HAGEN	MontyHagen@gmail.com	17 West. Stnd

Carleton West LLC Neighborhood Meeting
September 27th, 2023
Reiche School
6pm-7:30pm

Jack, Ali and Tim, Kathryn, Bettina

Jack reviewed overall site plan

Betty Pervell- 21 West Street – Asked about the easement from West Street to Carleton Street. Jack spoke about a “light and air” easement where they cannot build so parking will be there instead. We will send her the easements. It has been submitted as public record as well, but hard to find.

George Russel- 17 West Street- Fire access rules between 17/19 for fire access. CW-According to survey they have 18 feet right now. 20 is standard. He needs to take it up with an attorney, as George believes it is 16 feet, but their fence encroaches on 19 West property.

Will Gross- House manager- Ronald McDonald- Asking how far off from the property line does the building sit. CW-There will be 10 feet from the pins. If RMD is 3 feet from pin that is 13 feet from the RMD. Top portion of town house will be plus 5 feet, so a total of 18 feet. Will it be an alley way, will it be cut off? There are some emergency exits they are concerned with blocking. Minimum 5-foot path.

Pam Richards 56 Carleton- What is going to be on top of the 3rd floor on the town house? CW- Small roof deck, with stair access. There will be a structure for the stairs only. The deck is getting smaller per zoning.

Derek J – 50 Carleton- Why can't there be a gate between the parking area close to Carlton Street. CW-Working with emergency services. We don't want it to feel like a road where people are driving or walking through the new residence yards.

George Russell- Traffic will be concentrated between 17 and 19 coming through that new entrance to the parking area, he's concerned. CW- There will be 23 spaces. Some percentage of that will be electric charging stations, so however much traffic that will amount to. Likely in the morning and evening.

Andrew Farkas- 6 Houlton St.- Pedestrians walking through the property to go from Carleton and West. CW- The parking will be a condo association so they will need to be the ones that make the decision.

Jack addressed: No issue with vagrants using the property. Put up no trespassing signs and motion sensor lights. Hasn't had any complaints in a week or so.

Kathryn discussed the design and plans for the existing building. 5 units total in the existing building. Jack discussed the landscaping plan. Trying to create a courtyard oasis. Sculptures

Anne Pringle: Can you show the access to the parking for the existing building. 10 spots – 2 spaces per unit for the 5 units in the existing building.

George Russell- Confused about the safety. Turning radius for the fire truck. Civil engineer will work with the fire department to make sure the turning radius will work. There will a study done.

Monty – 5 West Street – What will the impact to the people coming in on West Street? 23 Spaces total, so how often will people use that.

George Russell- Snow removal, in years past the snow was plowed to the end of the parking near Houlton and Blyth Ct. CW-We will have to have a snow dump area, which will be outlined in the civil plan. Snow will have to be removed, not just piled up in the spaces as it has been in the past. The condo association will be handling the cost of snow removal.

Anne Pringle- Asking about the prices of the condo'd parking spaces. No answers yet.

George Russell- If there is a tremendous demand how will you determined who gets the parking spots? CW-We can keep a list, please reach out if you are interested in getting a space. We can do reservations prior to the groundbreaking.

Eva McVicar- 29 West- Question about the time frame when will construction begins? Hoping to start in the Spring/Summer. We hope to start it all at once. June start- 12 -13 months

Monty- Are the buildings going to add to the neighborhood, are the buildings going to be more modern? What makes them more modern. We are contributing building beautiful buildings. Using top notch materials, bricks, detailed with historic references, trying our best to make the landscape a beautiful one in the West End.

Andrew Farkas- Will this be one association or multiple, one per building? CW-Likely to have an overarching association for landscaping and building maintenance. Working through that right now. Probably will have mini associations.

Will Gross- Asking about the parking for free for RMD house. This will eliminate all the parking for our patients and for our staff, and volunteer. CW will need to continue to discuss how this might work. Currently donating spaces to the RMD. We are supporters of the RMD. We can relocate some spots as we go through construction.

September 15th, 2023

Dear Neighbor:

Please join us for a neighborhood meeting to discuss our plans for Carleton West LLC located at 19 West Street.

Meeting Location: Reiche School
Meeting Date: September 27th, 2023
Meeting Time: 6-7pm

(The Land Use Code requires that neighboring property owners and residents on an “interested parties list” be invited to participate in this neighborhood meeting. A sign-in sheet will be circulated and a record of the meeting will be taken. Both the sign-in sheet and record will be submitted to the Planning Board.)

If you have any questions, please call (207) 772-6022
carletonwestllc@gmail.com

Signed,
Carleton West Team
9/15/23

Note: Under the City of Portland land use code, an applicant for a major site plan, master development plan, subdivision of over five lots, or zoning map amendment is required to hold a neighborhood meeting within 30 days of an application being deemed complete and no less than seven calendar days before a public hearing. Should you wish to offer additional comments on this proposed development, you may forward them by e-mail to planning@portlandmaine.gov or by mail to the Planning and Urban Development Department, Planning Division, 4th Floor, 389 Congress Street Portland, ME 04101.

Neighborhood Meeting Certification

I, Alessandra Malone, for Carleton West LLC, hereby certify that a neighborhood meeting was held on September 27th, 2023, at Reiche School from 6-7pm for the proposed project located at 19 West Street. I also certify that on Friday September 15th notices were 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 (1,000 feet for subdivisions within an industrial zone or industrial zone changes).
2. Residents on the “interested parties” list.

Signed,

DocuSigned by:
Alessandra Malone
F8177C55D8774EC...

November 7th, 2023

Attachments:

1. Copy of the notice sent
2. Sign-in sheet
3. Record of feedback



Redevelopment & Stormwater Management Standards 19 West Street

We received water quality and stormwater management comments relating in the 9/22/23 site plan review comment memo. The proposed Center West Condos development triggers the City's Section 5 standards for redevelopment and Section 2.2.3 of the City's Technical Manual requires on-site stormwater detention. The following narrative describes how the proposed stormwater management system meets these requirements and satisfies the comments received from City staff. Each comment is listed below in *italics*, followed by the response.

Redevelopment Standards – Water Quality

The City's Section 5 standards for redevelopment require stormwater treatment for 50% of redeveloped non-roof impervious surface over 5,000 SF.

The proposed project includes the redevelopment of over 5,000 SF of non-roof impervious area so stormwater treatment is required. The majority of the project site is being redeveloped; however, the easterly parking lot and the westerly site driveway areas are considered maintenance and not redevelopment. These areas are impervious today and will be repaired at similar elevations to the existing condition and remain impervious. The existing building will also remain.

The total redeveloped area of the site is 20,460 SF. Approximately 4,068 SF of this redeveloped area is redeveloped into landscaped area. Approximately 4,880 SF of this redeveloped area is redeveloped into roof. This results in 11,512 SF of redeveloped non-roof impervious area. These areas are shown on the attached redevelopment figure.

50% of the redeveloped non-roof impervious area requires stormwater treatment, so we must treat at least 5,756 SF of impervious area. We are proposing to treat 7,020 SF of impervious surface with a filter cartridge storm basin designed to treat the 1" storm event.

Redevelopment Calculations		
Total Redeveloped Area	20,460	SF x 1" rainfall for stormwater detention
Redeveloped into Landscaped Area	4,068	SF
Redeveloped into Roof	4,880	SF
Redeveloped Non-Roof Impervious	11,512	SF
50% Redeveloped Non-Roof Impervious	5,756	SF requires stormwater treatment
Impervious Area Treated	7,020	SF impervious receiving treatment
Required Detention Volume	1,705	CF of stormwater storage
Provided Storage Volume	1,889	CF of stormwater storage provided

Stormwater Management Standards

Section 2.2.3 of the City's Technical Manual requires DPW Waer Resources approval when rain water is being proposed to discharge into a sewer which conveys sanitary waste. Prior to authorizing a new stormwater connection into a combined sewer, DPW will require that the applicant provide an on-site stormwater detention volume equal to 1" of rainfall over the entire project redeveloped area.

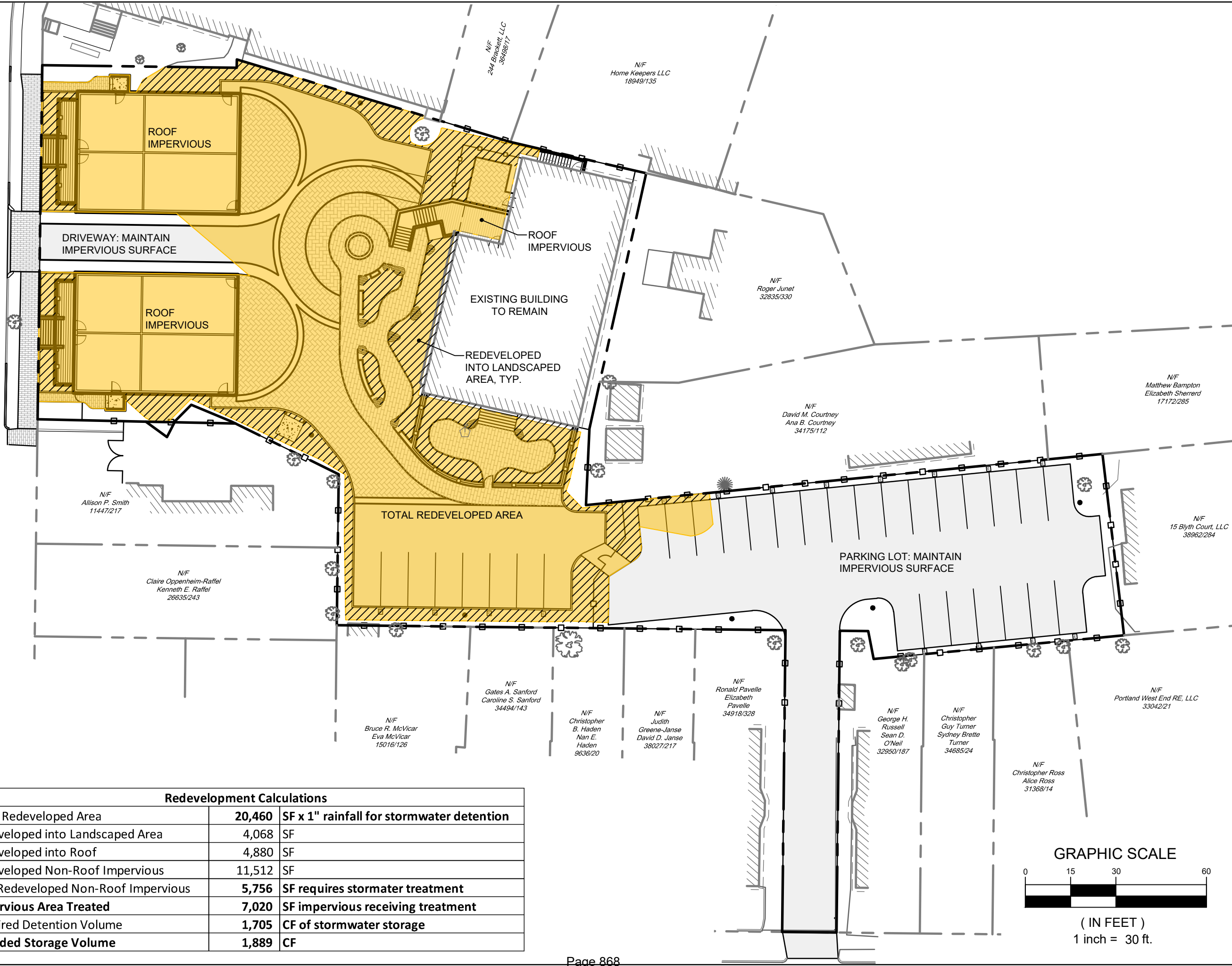
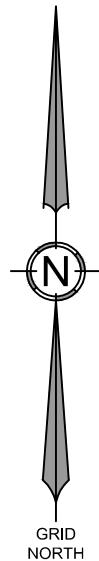
The proposed development includes a stormwater connection into the combined sewer in Carleton Street. We have designed a stormwater detention system with a volume equal to 1" of rainfall of the 20,460 SF project redeveloped area. After stormwater is treated in the storm basin, it will be routed to underground stormwater storage in an R-tank system with a treatment row. The required volume is 1,705 CF and we are providing 1,889 CF of storage. This system is shown on the revised Grading & Drainage Plan C-5.0.

Stormwater discharge rates into the combined sewer system must be controlled to a maximum flow rate of 0.1 CFS until the design storage capacity is reached.

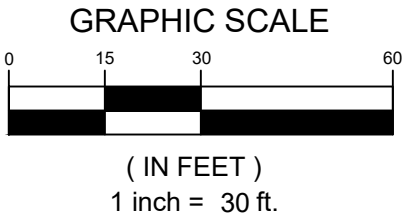
The R-tank storage system will outlet into an outlet control manhole with a weir wall to control discharge rates from the system. The outlet control structure includes a weir wall with a 0.9" orifice, which allows stormwater to leave the system at a rate of 0.1 CFS until the R-tank storage capacity of 1,889 CF is reached. The weir wall elevation is set to maximize the R-tank storage before flow rates increase beyond 0.1 CFS. This structure is shown on the revised Grading & Drainage Plan C-5.0 and an outlet control structure detail will be added to the plan set. The outlet control structure HydroCAD summary showing orifice sizing to control the flow rate is attached.

Enc.

Redevelopment Figure
Outlet Control Structure Sizing



Redevelopment Calculations			
Total Redeveloped Area	20,460	SF x 1" rainfall for stormwater detention	
Redeveloped into Landscaped Area	4,068	SF	
Redeveloped into Roof	4,880	SF	
Redeveloped Non-Roof Impervious	11,512	SF	
50% Redeveloped Non-Roof Impervious	5,756	SF requires stormater treatment	
Impervious Area Treated	7,020	SF impervious receiving treatment	
Required Detention Volume	1,705	CF of stormwater storage	
Provided Storage Volume	1,889	CF	



ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260
PHONE:
(207) 926-5111
WEB SITE:
www.terradync consultants.com

**TERRADYN
CONSULTANTS, LLC**
Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

SHEET DESCRIPTION:
REDEVELOPMENT FIGURE
19 WEST STREET, PORTLAND, ME

PREPARED FOR:
CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240

JOB NO:
23-020

DATE:
11-08-2023

SCALE:
1" = 30'

SHEET:
1

OF:
1

23-020 POST

Type III 24-hr 1 inch Rainfall=1.00"

Prepared by {enter your company name here}

Printed 11/8/2023

HydroCAD® 10.10-5a s/n 11715 © 2020 HydroCAD Software Solutions LLC

Summary for Pond 6P: OCS

[57] Hint: Peaked at 139.68' (Flood elevation advised)

[81] Warning: Exceeded Pond 5P by 4.38' @ 12.10 hrs

Inflow Area = 0.161 ac, 100.00% Impervious, Inflow Depth = 0.69" for 1 inch event
 Inflow = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af
 Outflow = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.10 cfs @ 12.15 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 139.68' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.06'	12.0" Round Culvert L= 54.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.06' / 134.65' S= 0.0075 ' / ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	135.06'	0.9" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	139.68'	5.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.09 cfs @ 12.15 hrs HW=139.68' (Free Discharge)

1=Culvert (Passes 0.09 cfs of 7.36 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.09 cfs @ 10.31 fps)**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.00 cfs @ 0.20 fps)

Standard to be Waived: Cite Ordinance or Technical Manual Standard	Cite Standard Language: Cite specific language of applicable Ordinance or Technical Manual Standard	Waiver Being Sought: Describe waiver being sought. Ex. – We are requesting a two-way parking lot drive aisle width of 20' feet.	Justification for Waiver: Address specific waiver criteria, if applicable, and document reasons for the waiver request.
Technical Manual Section 1.10.3	The minimum two-way drive aisle width is 24' for standard, right-angle parking	The applicant is requesting a two-way parking lot drive aisle width of 20' in the existing parking lot located on the east side of the site.	This is an existing parking lot that is being repaved. Existing dimensions will be maintained. Lot dimensions and constraints do not allow for a full 24' drive aisle. Spaces will be owned and used by the same individuals, not a transient population
Technical Manual Section 1.5.1.B	For two-way driveways (preferred): 20 feet minimum, 24 feet maximum for residential / commercial uses	The applicant is requesting an 18' wide driveway to serve the existing parking lot off West Street.	The 18' wide driveway is existing, and will continue to serve the same purpose it does today. The width of the project parcel along the driveway is only 18' wide, so a wider driveway is not possible.



Conditional Use Standards

Off Street Parking, 19 West Street

The following narrative describes how the proposed off-street parking meets the applicable Conditional Use Standards of the Land Use Code. Each applicable standard is listed below in *italics*, followed by the explanation of how the proposed use meets the standard.

6.5.2 General Conditional Use Standards

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.

The proposed off-street parking lot will serve the existing uses within the neighborhood. Spaces will be sold individually and are expected to be used by existing residents of the neighborhood. The parking itself will not generate traffic, but the volume and type of vehicles using the parking spaces will be typical of what occurs in the neighborhood because it will be used by existing neighborhood 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.

The proposed off-street parking lot is located on an existing parking lot that once served the old medical office use on the site. The lot will be repaved, landscaped, and appropriately lit with site lighting. The lot will also be actively managed and maintained by a condominium association. The use will not create unsanitary or harmful conditions. The parking of vehicles will not create excessive noise, dust, air emissions, odors, or litter. Site lighting has been designed to prevent glare, and no sewage will be generated by the use.

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.

The proposed off-street parking lot is located behind existing residential buildings on West Street. The perimeter of the parking lot will be thoughtfully landscaped and screened with a solid 6'-high fence around its perimeter. The majority of the parking lot will not be visible from any surrounding public rights of way. A small sign is proposed at the driveway entrance on West Street to identify the site and prevent mistaken entry. No deliveries, loading, or materials storage will take place on the site, and no trash or waste will be generated. Snow may be hauled from the site if needed, as it is from other residential parking areas throughout the neighborhood.

D. The proposed use will meet any additional zone or use-specific standards identified in Tables 6-A to 6-F and Subsections 6.5.6 and 6.5.7.

See below.

6.5.6 Supplemental Use-Specific Conditional Use Standards

H.2 Off Street Parking in the R-6 zone: Off-street parking shall be for passenger cars for uses permitted in the R-6 zone.

The proposed parking spaces will be limited to passenger vehicles and will be used by residents of the neighborhood.

Proposed Condominium Structure for Carleton West Condo Project

Applicant Carleton West, LLC has applied for Major Site Plan approval of a project with nine residential condominium units within three buildings, and twenty-three parking condominium units, sharing a 0.86 acre parcel at 19 West Street, Portland (Tax Map 55, Block B, Lot 13). City Planning Staff has requested a narrative synopsis of the intended legal ownership and operational structure envisioned for the condominiums comprising the completed development.

Applicant proposes to declare two separate condominiums on the property. The larger northerly and westerly portion of the property will be declared as a residential condominium. The smaller southerly and easterly portion will be declared as a parking condominium. The two condominiums will be separated by a fence with a controlled-access gate.

The relationship between the residential condominium and the parking condominium will be governed by Applicant's (non-condominium) declaration administered by representatives of the respective condominium associations. This declaration will delineate responsibility for maintenance and repair of any shared infrastructure; terms of cross-easements for access, utilities and maintenance; allocation of costs for shared utilities or services; regulation of uses within either condominium which might adversely affect the other; and administrative and governance authority of the respective associations (including a dispute resolution mechanism).

The residential condominium will include an existing building to be redeveloped into five residential units upon the upper three floors, above a basement with storage space and exercise facilities. There will be ten surface parking spaces available to serve residential units. Two new two-unit townhouses will be constructed on either side of the Carleton Street access driveway, comprising four residential units. Each townhouse unit will have three floors of living space above a basement garage with parking for two cars for that unit.

The residential condominium will allocate association voting rights equally among all nine units. The association will enforce general rules and regulations regarding use and maintenance standards applicable to all three buildings. Each unit's common element interest ownership will vary based upon unit square footage or other relevant factors specified in the condominium declaration. For units with a limited common element exclusive to that unit, such as a deck or balcony, the cost of maintenance shall be born exclusively by the benefitted unit. The structure, foundation, roof, exterior, mechanical systems, common utilities, and common hallways and other amenities serving exclusively the existing building or either of the two new townhouse buildings will be designated as limited common elements shared only by the units within that building. Accordingly, the costs of building maintenance, building repairs or other building-specific services for each building will be assessed only against the units within that building, and will not be borne by units in the other two buildings. The costs of common elements or shared services benefitting all nine residential units, such as the Carleton Street driveway, driving lanes and walkways, the surface parking lot; perimeter fencing; general landscaping; association administrative costs; and common utilities and services, will be assessed against all

nine units based upon the percentage of common element ownership allocated to each unit. Thus, condominium assessments for any particular unit will typically reflect the association's budget for (i) maintenance of limited common elements exclusive to the assessed unit, (ii) maintenance of those limited common elements which serve only the units within the assessed unit's building, or otherwise shared by the assessed unit with less than all nine residential units, and (iii) administrative costs and maintenance of common elements benefitting all residential units.

The parking condominium will create twenty-three parking spaces which will be declared as parking units. The parking units will be entirely independent of any parking spaces in the residential condominium (*though available for purchase as additional parking by residential condominium unit owners*). Vehicular access to the parking condominium will be via an existing driveway off West Street. Pedestrian access to and from the residential condominium will be through a controlled-access gate in the perimeter fence separating the condominiums. A parking unit owner may elect to have installed an additional charging station for the exclusive benefit of that unit. Such additional charging stations will be installed at the parking unit owner's expense and be treated as a limited common element of the unit.

The parking condominium will allocate association voting rights equally among all twenty-three parking units. Common element interest ownership and association assessments will be equal among all parking units. The association will manage and maintain the common elements benefitting all twenty-three parking units, including the West Street driveway; travel lanes and walkways; common charging stations, perimeter fencing; landscaping; administrative costs; and any common utilities and services. Electricity for charging stations will be billed to the association and allocated by actual use among parking unit owners by user cards or code readers. Thus, condominium assessments for any particular parking unit will typically reflect the association's budget for (i) allocation of consumed electricity costs, (ii) maintenance of any limited common elements exclusive to the assessed parking unit, and (iii) administrative costs and maintenance of common elements serving all parking units.



PARKING STUDY

**PL-002614-2023 | 19 West Street
 PORTLAND, MAINE 04101
 Project #23-020**

The following Parking Study was prepared for Carleton West, LLC, who is proposing to construct two 2-unit townhouses and renovate an existing building into 5 residential units at 19 West Street in Portland's West End neighborhood. The parcel is identified as 55-B-13 on the City of Portland's Parcel map and is located in the R-6 zone. The redevelopment will result in 18 parking spaces: 10 surface spaces and 8 garage spaces to be used by residents. The City of Portland, as part of the approval process, requested a parking study be conducted to assess the impact of the new parking infrastructure. This study will provide an overview of existing and proposed conditions, analyze parking demand and compare it to City of Portland requirements and estimates available through the Institute of Transportation Engineers (ITE) parking data, and provide concluding thoughts.

1. EXISTING CONDITIONS

The existing site is located in Portland West End at the corner of West and Carleton Streets, abutting other residential buildings in Portland's R-6 zone. The site contains an existing two-story brick building, previously housing medical offices, and approximately 60 surface parking spaces. The primary site entrance is along Carleton Street, which is one-way, and an 18'-wide paved driveway between 17 and 21 West Street provides secondary access to the site and connects to the back portion of the parking lot. An existing conditions figure is shown in Attachment 1.

Located in a dense urban area, there are plentiful pedestrian accommodations to travel safely around the local neighborhood and downtown. There is also a Portland Metro Transit stop located at the intersection of West and Carleton Street, and a regional rail and bus line located 1.5 miles away at the Portland Transportation Center. These multimodal transportation options provide ample transportation opportunities for residents without relying on single occupancy vehicles.

2. PROPOSED CONDITIONS

Two new 2-unit townhouse buildings are proposed along the Carleton Street frontage. Each building will have a 2,379 square foot footprint and include four-stories plus a roof deck. The first floor includes basement space and a garage accessed from the back of the building. The second, third and fourth floors are living space, and each unit has roof access to a roof deck. A driveway will be constructed between the townhouses to access the rest of the site and parking for the residential units. Each townhouse unit has 2 parking spaces in a basement level garage.

The existing 2-story building will be renovated, and a third story will be added. The building has a footprint of 4,180 square feet and will contain five residential units. The existing building will

contain a basement, two units on the first floor, two units on the second floor, and one unit on the third floor with a roof deck. Each of the units will have 2 on-site surface parking spaces.

The driveway from Carleton Street provides access to a central courtyard with shared pedestrian and vehicle use. The townhouse garages and 10 residential surface parking spaces will be accessed from this shared courtyard. A Parking Turning Analysis for the garage spaces was provided via a Response to Review Comments dated November 8th, 2023.

The surface parking in the eastern portion of the site will be re-paved and will contain 23 parking spaces that will be sold to residents in the neighborhood. Access to the parking will be maintained from the existing 18'-wide paved driveway off West Street. The owner is seeking Conditional Use approval from the Portland Planning Board for the parking lot. Gated pedestrian access will be provided between the 23-space parking lot and the residential units on Carleton Street.

Overall, 18 parking spaces will be provided for the 9 proposed residential units (10 surface and 8 garage parking spaces), and 23 condo parking spaces will be sold to neighborhood residents. A proposed conditions figure is shown in Attachment 2. The project will result in a net decrease of 19 parking spaces for the entire parcel. Finally, 4,068 sf of impervious area will be redeveloped to landscaped area in the proposed site design plan.

3. PARKING DEMAND

Parking demand for the 9 residential units was calculated in accordance with the City of Portland Technical Manual. The 23-space parking lot in the eastern part of the site is considered a separate use and was not considered in the parking demand or supply analysis. The number of spaces proposed for this project was compared to the City of Portland's Parking requirements as well as parking demand data provided by ITE to determine if adequate parking infrastructure is provided.

City of Portland:

The proposed project is located in the R-6 zoning district. Per Table 19-A: Off-Street Parking Minimums: the number of parking spaces required for single, two or multi-family units is 1 space per dwelling unit. Off-street parking for the first three dwelling units is not required for residential units in the R-6 Zone per Table 19-B: Categorical Exceptions to Off-Street Parking Minimums. Therefore, out of the 9 proposed units, only 6 require parking accommodation, which would be a total of 6 spaces based on Portland's Ordinance.

ITE Parking Demand Data:

The Institute of Transportation Engineers (ITE) Parking Generation Manual is another method to estimate parking other than zoning requirements provided by municipalities. Information is based on crowd sourced parking generation studies submitted by public agencies, developers, consulting firms, and other associations to estimate parking demand of a proposed development. This data is presented in a web application that allows users to identify parking demand by a particular use, time of day, location, development, and other filtering methods. Based on the ITEParkGen web app¹, the following Land Use Code (LUC) was used for the parking demand estimate: **LUC 220 - Multifamily Housing – 2+ BR (Low-Rise²) – Not close to Rail Transit³ – Dense Multi-Use Urban.**

¹ <https://iteparkgen.org/index.html>

² Low-Rise is described as 2-3 floors of residence.

³ Not close to transit is farther than ½ mile of a rail transit station.

Based on the LUC, the table below provides parking demand estimates based on the weighted average, average, and 85th percentile for a typical weekday and Saturday period. The weighted average value is calculated based on the distribution of data and often provides a more accurate picture of the data set. Data sets with large variance will skew the average rate if not weighted. The 85th percentile represents the point at which 85 percent of the values fall below and is often used with data sets with few data points. Parking generation graphs for Monday-Friday and Saturday demand are shown in Attachment 3.

Parking Demand

LUC	Unit	Monday-Friday Demand				Saturday Demand			
		Range of Rates	Weighted Average	Average	85 th Percentile	Range of Rates	Weighted Average	Average	85 th Percentile
220	9	0.5-2.8	10	11	15	0.67-1.05	8	8	9

For 9 low-rise multi-family housing units, not close to transit and within a dense multi-use urban area, the parking demand is estimated to be 10 vehicles during the week and 9 vehicles on Saturday. The weighted average was used for the weekday period based on the high number of studies and the 85th percentile was used for the Saturday period based on the small number of studies. Rates range between 0.5 to 2.8 spaces per dwelling unit during the week and 0.67 to 1.05 spaces per dwelling unit on Saturday. This shows that parking demand varies significantly during the week depending on the study.

Based on these values, the number of proposed parking spaces (18) exceeds the average demand for similar developments but is still within the observed range of parking demand for similar developments.

4. CONCLUSION

Based on the parking demand data provided by ITE for a typical weekday (Monday-Friday) and Saturday, as well as parking requirements by the City of Portland, the 18 parking spaces provided for the proposed 9-unit development is expected to accommodate parking demand.

It must be noted that many municipalities are starting to move away from parking minimum requirements in an effort to reduce costs, improve walkability and multimodal transit use, and reduce emissions and congestion. This approach also allows developers more flexibility in their designs and leads to better parking infrastructure and less impervious area. While the City of Portland still has minimum parking requirements, it also discourages the creation of excess parking. While the proposed development will provide more parking than the minimum required by code, the project will still provide an overall benefit for the following reasons:

1. While there are 18 spots, 8 are garage spots that don't add to the overall impervious area footprint.
2. There is an overall reduction in 19 surface parking spaces from the existing condition due to the proposed development which improves the overall site design and layout.
3. There is an overall reduction in impervious area and increase landscaped area due to the redevelopment.

In summary, the proposed project will provide adequate off-street parking to meet the demand of the residential development, will reduce overall parking on the site by 19 spaces, and will result in a reduction in impervious area.

Prepared by:
TERRADYN CONSULTANTS LLC

Matthew Pelletier, P.E.
Design Engineer

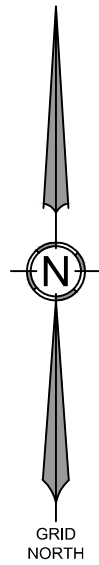


Attachments

- Attachment 1 – Parking Generation Existing Conditions
- Attachment 2 – Parking Generation Proposed Conditions
- Attachment 3 – Parking Generation Graphs

ATTACHMENT 1

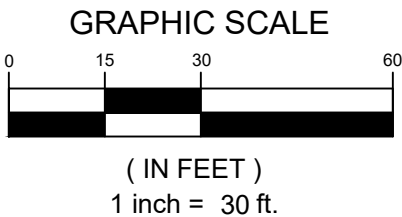
PARKING GENERATION EXISTING CONDITIONS



CARLETON STREET



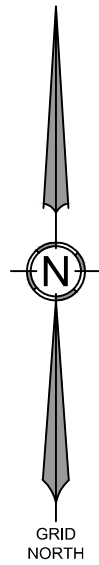
WEST STREET



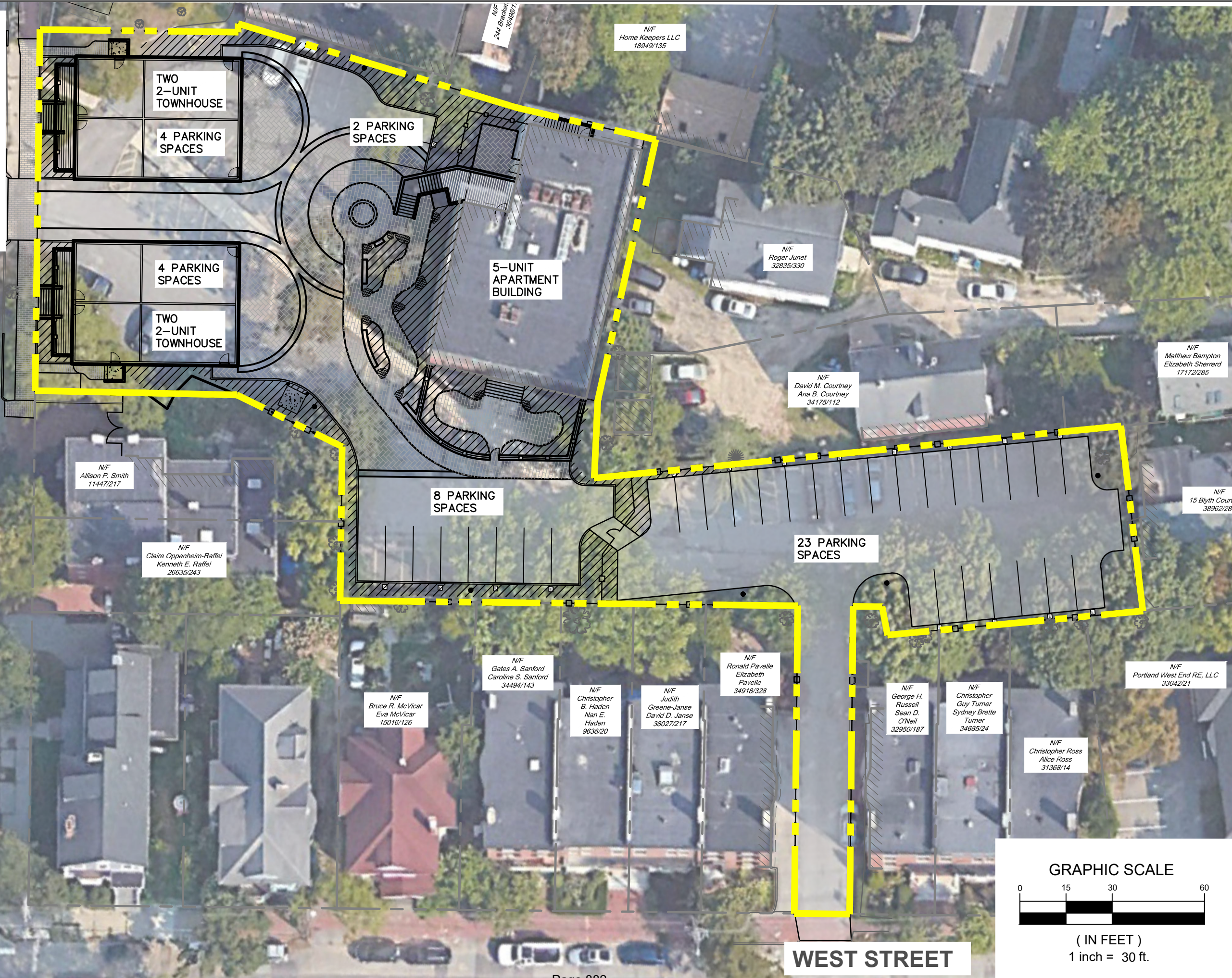
ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260 PHONE: (207) 926-5111 WEB SITE: www.terradync consultants.com TERRADYN CONSULTANTS, LLC Civil Engineering Land Surveying Geomatics Stormwater Design Land Planning Environmental Permitting	
SHEET DESCRIPTION: PARKING GENERATION EXISTING CONDITIONS 19 WEST STREET, PORTLAND, ME	
JOB NO:	23-020
DATE:	11-08-2023
SCALE:	1" = 30'
SHEET:	1
OF:	2
PREPARED FOR: CARLETON WEST, LLC 9 GOULD ROAD LEWISTON, ME 04240	

ATTACHMENT 2

PARKING GENERATION PROPOSED CONDITIONS



CARLETON STREET



TWO
2-UNIT
TOWNHOUSE

4 PARKING
SPACES

2 PARKING
SPACES

5-UNIT
APARTMENT
BUILDING

4 PARKING
SPACES

TWO
2-UNIT
TOWNHOUSE

8 PARKING
SPACES

23 PARKING
SPACES

N/F
Allison P. Smith
11447/217

N/F
Claire Oppenheim-Raffel
Kenneth E. Raffel
26635/243

N/F
Bruce R. McVicar
Eva McVicar
15016/126

N/F
Gates A. Sanford
Caroline S. Sanford
34494/143

N/F
Christopher
B. Haden
Nan E.
Haden
9636/20

N/F
Judith
Greene-Janse
David D. Janse
38027/217

N/F
Ronald Pavelle
Elizabeth
Pavelle
34918/328

N/F
George H.
Russell
Sean D.
O'Neil
32950/187

N/F
Christopher
Guy Turner
Sydney Brette
Turner
34685/24

N/F
Christopher Ross
Alice Ross
31368/14

N/F
Portland West End RE, LLC
33042/21

N/F
Matthew Bampton
Elizabeth Sherrerd
17172/285

N/F
15 Blyth Court, L
38962/284

N/F
Roger Junet
32835/330

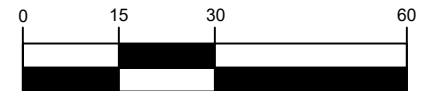
N/F
David M. Courtney
Ana B. Courtney
34175/112

N/F
Home Keepers LLC
18949/135

N/F
244 Brackett
38498/11

WEST STREET

GRAPHIC SCALE



(IN FEET)
1 inch = 30 ft.

ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260
PHONE:
(207) 926-5111
WEB SITE:
www.terradync consultants.com
Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

**TERRADYN
CONSULTANTS, LLC**

SHEET DESCRIPTION: PARKING GENERATION PROPOSED CONDITION 19 WEST STREET, PORTLAND, ME	
PREPARED FOR: CARLETON WEST, LLC 9 GOULD ROAD LEWISTON, ME 04240	
JOB NO:	23-020
DATE:	11-08-2023
SCALE:	1" = 30'
SHEET:	2
OF:	2

ATTACHMENT 3

PARKING GENERATION GRAPHS

Multifamily Housing - 2+ BR (Low-Rise) - Not Close to Rail Transit (220)

Peak Period Parking Demand vs: Dwelling Units

On a: Weekday (Monday - Friday)

Setting/Location: Dense Multi-Use Urban

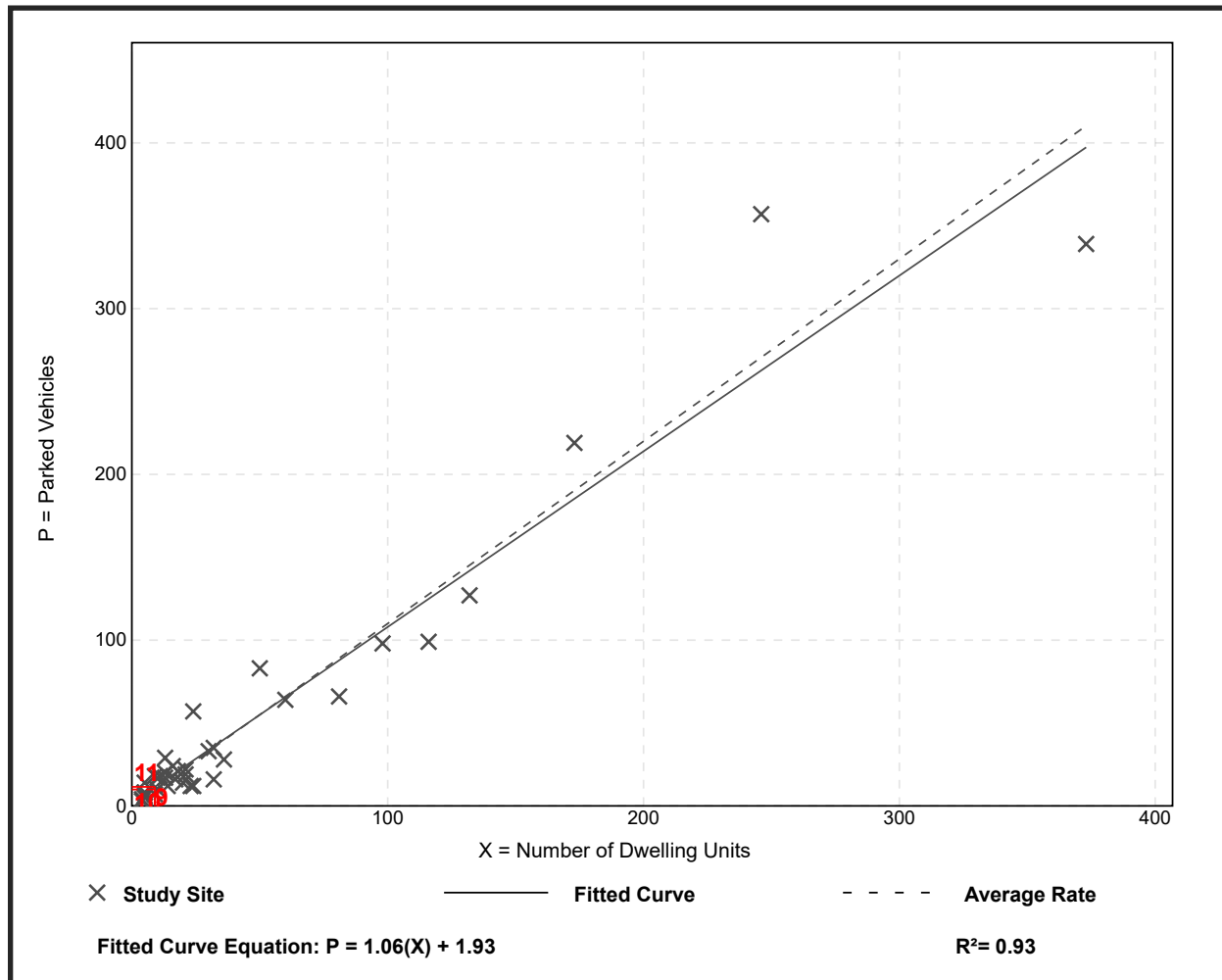
Number of Studies: 39

Avg. Num. of Dwelling Units: 46

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.10	0.50 - 2.80	0.95 / 1.66	0.99 - 1.21	0.35 (32%)

Data Plot and Equation



Parking Generation Manual, 6th Edition • Institute of Transportation Engineers

Multifamily Housing - 2+ BR (Low-Rise) - Not Close to Rail Transit (220)

Peak Period Parking Demand vs: Dwelling Units

On a: Saturday

Setting/Location: Dense Multi-Use Urban

Number of Studies: 4

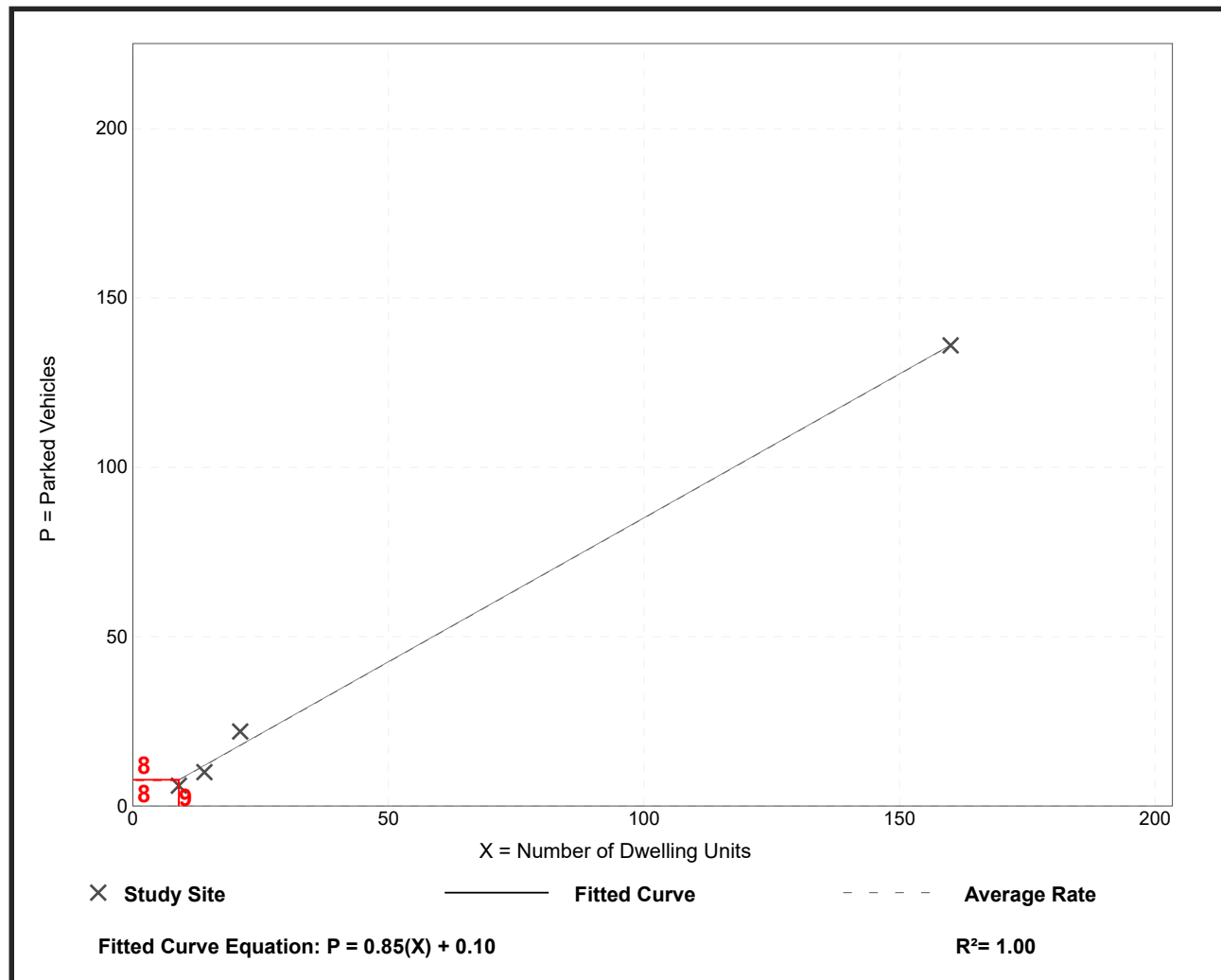
Avg. Num. of Dwelling Units: 51

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.85	0.67 - 1.05	0.70 / 1.05	***	0.09 (11%)

Data Plot and Equation

Caution – Small Sample Size



Parking Generation Manual, 6th Edition • Institute of Transportation Engineers

On Wed, Sep 6, 2023 at 10:50 AM Trevor Watson <trevor.watson@knickerbockergroup.com> wrote:

Ann,

I'm emailing you in a personal capacity. I've met with the owners of 19 West a few times and I am very supportive and excited of its conversion to residential, it will add to the neighborhood as well as liven up that area in off hours, which has become a bit of a nuisance.

That said, and I've raised this multiple times to parties involved, I don't believe their proposal works given an existing easement burdening the lot (Easement #2). I could be wrong, however nobody has followed up to tell me the resolution as well as the fact the easement is graphically represented on the current survey leads me to believe it was never abandoned and in fact, still burdening the parcel. We'd need to find the recorded deed unburdening the easement and it would be nearly impossible to track down the owners and heirs of the benefitting parcels to verify they have no claim, so I believe the easement stands as drawn.

I've attached the site plan I downloaded from CSS. I attached my edited version highlighting the area of encroachment and I've attached the deed where I highlighted the relevant portion.

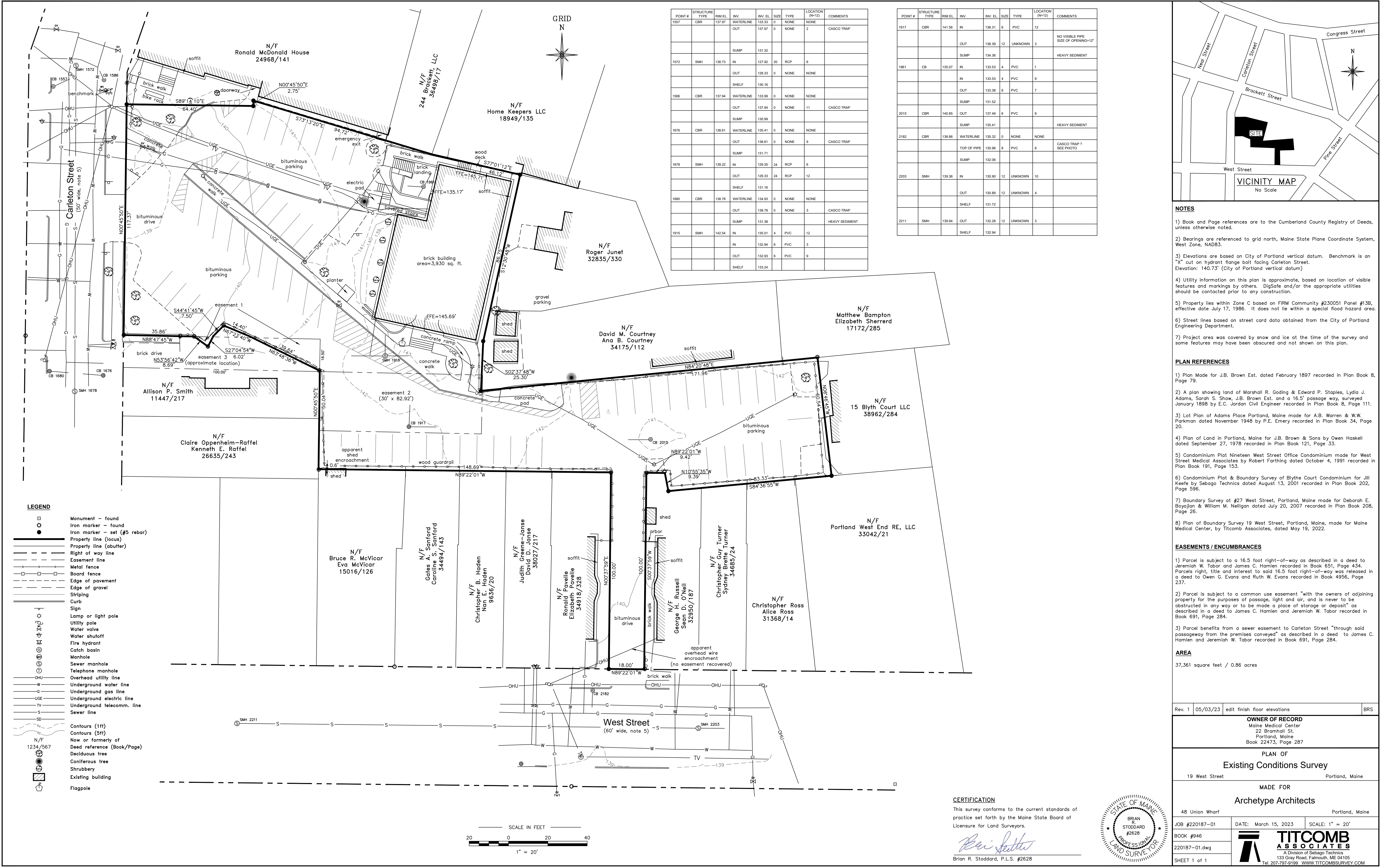
Parking a car is 'storing' or 'depositing' as such it violates the easement.

Thanks!

Trevor E Watson
Design Studio Leader, Architecture

KNICKERBOCKER GROUP
+ COVE BY KNICKERBOCKER GROUP®
Boothbay | Portland
207.633.3818
knickerbockergroup.com
covebykg.com

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.



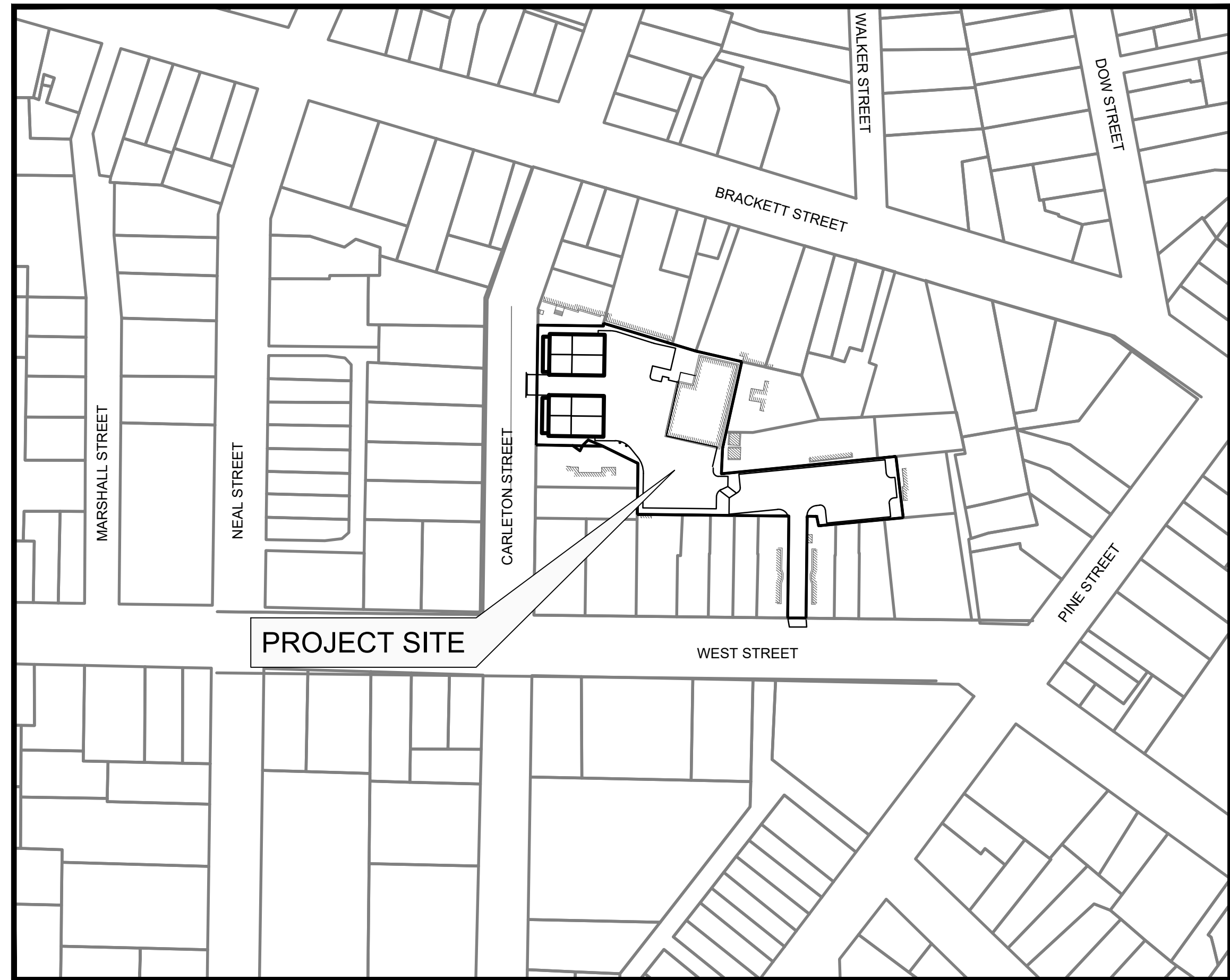
APPLICANT:
CARLETON WEST, LLC
150 MILL STREET
LEWISTON, MAINE 04240

PROJECT PARCEL

CITY OF PORTLAND TAX ASSESSOR'S MAP, BLOCK, & LOT NUMBERS

<u>MAP</u> 55	<u>BLOCK</u> B	<u>LOT</u> 13	CURRENT OWNER CARLETON WEST, LLC
------------------	-------------------	------------------	-------------------------------------

C-1.0	COVER SHEET AND LOCATION MAP
C-1.1	GENERAL NOTES AND LEGEND
1	BOUNDARY AND TOPOGRAPHIC SURVEY - BY OTHERS
C-2.0	RECORDING PLAT - IN PROGRESS
C-3.0	EXISTING CONDITIONS AND DEMOLITION PLAN
C-3.1	CONSTRUCTION MANAGEMENT PLAN
C-4.0	OVERALL SITE PLAN
C-4.1	DETAILED SITE PLAN
C-5.0	OVERALL GRADING AND DRAINAGE PLAN
C-5.1	DETAILED GRADING AND DRAINAGE PLAN
C-6.0	UTILITY PLAN
C-7.0	PHOTOMETRIC PLAN
C-7.1	PHOTOMETRIC DETAILS
C-8.0	SITE DETAILS
C-8.1	UTILITY DETAILS
C-8.2	UTILITY DETAILS
C-8.3	EROSION & SEDIMENTATION CONTROL DETAILS
L-1.00	LANDSCAPE PLAN
L-1.01	LANDSCAPE PLAN



SCALE: 1" = 100'

TYPE OF PERMIT	GOVERNING BODY	STATUS
MAJOR SITE PLAN	CITY OF PORTLAND PLANNING AUTHORITY CITY HALL, 389 CONGRESS STREET PORTLAND, ME 04101 TEL. 207.874.8722	SUBMITTED 8/4/2023
BUILDING PERMIT	CITY OF PORTLAND CODE ENFORCEMENT OFFICE CITY HALL, 389 CONGRESS STREET PORTLAND, ME 04101 TEL. 207.874.8900	TO BE SUBMITTED BY BUILDING CONTRACTOR
UTILITY/STREET OPENING	CITY OF PORTLAND PUBLIC SERVICES DIVISION 55 PORTLAND STREET PORTLAND, ME 04101 TEL. 207.874.8801	TO BE FILED BY SITE CONTRACTOR

1. THIS PROJECT IS SUBJECT TO THE TERMS AND CONDITIONS OF ALL REGULATIONS ADMINISTERED BY THE LOCAL UTILITY COMPANIES AND THE CITY OF PORTLAND.
2. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF THE ENTRANCES, EXITS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY ENTRANCE POINTS.
3. ALL REQUIRED AND NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL SERVICE CONNECTIONS.
4. 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 (1-888-DIGSAFE). IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS, AT NO EXTRA EXPENSE TO THE OWNER.
5. MAINTENANCE OF EROSION CONTROL MEASURES IS OF PARAMOUNT IMPORTANCE TO THE OWNER 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 OR THEIR REPRESENTATIVES AT NO ADDITIONAL COST TO THE OWNER.
6. 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.
7. ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO PROJECT CONTRACT SPECIFICATIONS, AND THE CITY OF PORTLAND TECHNICAL MANUAL STANDARDS, WHICHEVER IS MORE STRINGENT.
8. TOPOGRAPHIC AND BOUNDARY INFORMATION IS BASED ON A PLAN ENTITLED "EXISTING CONDITIONS SURVEY 19 WEST STREET PORTLAND, MAINE" BY TITCOMB ASSOCIATES WITH A LATEST REVISION DATE OF MAY 3, 2023.
9. FEMA MAP COMMUNITY PANEL NUMBER 230051 0013 B. THE SITE IS LOCATED IN A C ZONE.
10. THE PROPERTY SHOWN ON THIS PLAN MAY BE DEVELOPED AND USED ONLY AS DEPICTED IN THIS APPROVED PLAN. ALL ELEMENTS AND FEATURES OF THE PLAN AND ALL THE PROPERTY WHICH APPEARS IN THE RECORD OF THE PLANNING BOARD PROCEEDINGS ARE CONDITIONS OF THE APPROVAL. NO CHANGE FROM THE CONDITION OF APPROVALS IS PERMITTED UNLESS AN AMENDED PLAN IS FIRST SUBMITTED TO AND APPROVED BY THE PLANNING AUTHORITY.
11. ALL SIGNAGE SHALL CONFORM TO THE STANDARDS FOR SIZE, HEIGHT, LOCATION AND REFLECTIVITY SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
12. ALL CURB SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS AS NOTED ON THE PLANS: GRANITE CURB SHALL MEET THE REQUIREMENTS OF MaineDOT SPECIFICATIONS 609.03 AND CITY OF PORTLAND TECHNICAL STANDARDS.
13. ALL DIMENSIONING UNLESS OTHERWISE NOTED IS TO THE FACE OF CURB OR FACE OF BUILDING.
14. THE FACILITY IS SERVICED BY PUBLIC WATER, SEWER, AND UNDERGROUND POWER. THE PROJECT INCLUDES UPDATES TO THE POWER SERVICE INCLUDING THE INSTALLATION OF NEW UNDERGROUND SYSTEM. SEE SITE ELECTRICAL PLANS FOR DETAILS.
15. THE CONTRACTOR IS REQUIRED TO NOTIFY THE CITY OF PORTLAND PUBLIC WORKS INSPECTION SERVICES DIVISION (674-8300 EXT. 8838), CODE ENFORCEMENT OFFICE AND DEVELOPMENT REVIEW COORDINATOR IN WRITING THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION. A PRE-CONSTRUCTION MEETING MAY BE REQUIRED TO INCLUDE THE PUBLIC WORKS AUTHORITY OR DEVELOPMENT REVIEW COORDINATOR.
16. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.
17. WARNING SIGNS, MARKERS, BARRICADES OR FLAGMEN MUST BE EMPLOYED ON ADJACENT STREETS AS NECESSARY. THE CONTRACTOR SHALL COORDINATE AND SEEK APPROVAL FROM THE PUBLIC SERVICE DIVISION FOR THE PLACEMENT/PARKING OF EQUIPMENT WITHIN THE PUBLIC RIGHT OF WAY.
18. CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED AND DISPOSED OF IN ACCORDANCE WITH THE CITY OF PORTLAND'S SOLID WASTE ORDINANCE CHAPTER 12. ALL DEMOLITION MATERIAL FROM THE PROJECT SITES SHALL BE TAKEN TO THE RIVERSIDE RECYCLING FACILITY OR AS OTHERWISE DIRECTED PENDING THE RESULTS OF A HAZARDOUS BUILDING MATERIALS SURVEY AS AUTHORIZED AND COORDINATED BY THE OWNER. ALL SALVAGED MATERIAL WITHIN THE PUBLIC R.O.W.(SIDEWALKS, BRICKS, GRANITE CURB) NOT REUSED SHALL BE DISPOSED OF AS DIRECTED BY THE PORTLAND PUBLIC SERVICE DEPARTMENT AT NO EXTRA COST TO THE OWNER.
19. ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE.
20. PROPERTY MARKERS AND STREET LINE MONUMENTS SHALL BE PROPERLY PROTECTED AT ALL TIMES DURING CONSTRUCTION TO INSURE INTEGRITY. IF DISTURBED THEY SHALL BE REPLACED BY A SURVEYOR REGISTERED IN THE STATE OF MAINE AT THE CONTRACTOR'S EXPENSE.
21. A STREET OPENING PERMIT MUST BE OBTAINED FROM THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT PRIOR TO BEGINNING ANY WORK WITHIN THE CITY RIGHT-OF-WAY. ALL WORK WITHIN THE PUBLIC RIGHT OF WAY SHALL BE COMPLETED IN CONFORMANCE TO THE CITY'S RULES AND REGULATIONS FOR EXCAVATION ACTIVITIES IN PUBLIC RIGHT OF WAYS.
22. CONTRACTOR MUST MAINTAIN THROUGH TRAFFIC ON ADJACENT STREETS AT ALL TIMES.
23. ALL METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS IDENTIFIED HEREIN SHALL CONFORM TO THE CITY OF PORTLAND CONSTRUCTION AND TECHNICAL STANDARDS AND SPECIFICATIONS AND/OR CURRENT MaineDOT STANDARDS AND SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
24. SITE WORK FOR BUILDING SHALL INCLUDE GRADING THE BUILDING PAD AREA (DEFINED AS THE BUILDING FOOTPRINT PLUS 5'-0" BEYOND THE EXTERIOR WALL) TO A GRADE 18" BELOW THE GROUND FLOOR FINISH ELEVATION. ALL WORK SHALL INCLUDE EXCAVATION (INCLUDING ROCK REMOVAL AND EXISTING FOUNDATION DEMOLITION) AND BACKFILL OF ALL FOOTINGS AND FOUNDATIONS, INSTALLATION OF PERIMETER FOUNDATION DRAINS, EXCAVATION AND BACKFILL OF ALL UNDERSLAB UTILITIES AND PLACEMENT OF ALL AGGREGATES BELOW THE FLOOR SLAB AND ADJACENT FOUNDATION WALLS IN ACCORDANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS. (SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR ADDITIONAL DETAILS PERTAINING TO ANY BUILDING RELATED FOUNDATION WORK).
25. RECORD DRAWINGS MUST INCLUDE ALL BURIED UTILITIES INCLUDING, BUT NOT LIMITED TO, BENDS, APPURTENANCES, AND OTHER FEATURES, TO BE LOCATED IN THE FIELD BY GIS AND RECORDED AS AN AS-BUILT PLAN BY THE CONTRACTOR AT THE END OF THE PROJECT. THIS PLAN SHALL ALSO BE PROVIDED TO THE OWNER.

- ELEVATIONS ON THE PLAN ARE BASED ON THE CITY OF PORTLAND VERTICAL DATUM.
MARKER IS AN "X" CUT ON HYDRANT FLANGE BOLT FACING CARLETON STREET.
ELEVATION: 140.73 (CITY OR PORTLAND VERTICAL DATUM)
2. ALL STORM DRAIN PIPE SHALL BE SMOOTH BORE INTERIOR PROVIDING A MANNINGS
ROUGHNESS COEFFICIENT OF $n = 0.013$ OR LESS. UNLESS A SPECIFIC PIPE MATERIAL IS
CALLED FOR ON THE CONTRACT DRAWINGS. PVC PIPING SHALL NOT BE USED IN AREAS
OF EXPOSED SUNLIGHT.
3. SLOPE PROTECTION IS TO BE PROVIDED PER THE DESIGN PLANS AND MAY INCLUDE
RIPRAP, SOD OR MULCH.
4. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EARTHWORK
OPERATIONS TO INSURE THAT DISTURBANCE TO ANY STEEP SLOPE AREAS ARE
MINIMIZED TO THE EXTENT PRACTICABLE.
5. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN ARE BASED
ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY
OTHERS. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE.
THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT
NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR
DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.
6. ALL PAVING WITHIN THE PUBLIC R.O.W. SHALL BE PERFORMED IN ACCORDANCE WITH THE
CITY OF PORTLAND RULES AND REGULATIONS FOR EXCAVATION ACTIVITIES IN THE
PUBLIC R.O.W.
7. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY
EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.
8. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION
OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT/ENGINEER AND/OR
CLIENT/OWNER.
9. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO
PROTECT EXISTING STRUCTURES AND PHYSICAL FEATURES THAT ARE OUTSIDE THE
SCOPE OF WORK. THE CONTRACTOR SHALL MAINTAIN SITE STABILITY DURING
CONSTRUCTION TO AVOID EROSION AND SEDIMENT TRANSPORT. CONTRACTOR SHALL
RESTORE ALL AREAS TO A FINAL STABILIZED CONDITION AS DIRECTED BY DESIGN
DRAWINGS.
10. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO
FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE
REPORTED TO THE ENGINEER.
11. EXTERIOR GRADES AROUND PROPOSED STRUCTURE SHALL BE COORDINATED WITH
FINAL BUILDING PLANS AND PROVIDE FOR ALL ACCESS OPENINGS.

1. ALL CONSTRUCTION SHALL COMPLY WITH 2009 NFPA 1 CHAPTER 16 SAFE GUARDS DURING BUILDING CONSTRUCTION, ALTERATION AND DEMOLITION OPERATIONS.
2. ANY CUTTING AND WELDING WORK PERFORMED ONSITE SHALL REQUIRE A "HOT WORK" PERMIT FROM THE PORTLAND FIRE DEPARTMENT.
3. THE GENERAL CONTRACTOR SHALL POST EMERGENCY CONTACT INFORMATION ON THE PROJECT SITE PROPERTY DURING CONSTRUCTION IN THE EVENT OF AN AFTER HOURS EMERGENCY. THIS CONTACT INFORMATION SHALL ALSO BE PROVIDED TO THE PORTLAND FIRE DEPARTMENT.
4. IF THE SITE IS SECURED BY TEMPORARY OR PERMANENT FENCING WITH LOCKED GATES, THEN THE APPLICANT OR ASSIGNED REPRESENTATIVE SHALL PURCHASE A KNOX PADLOCK FROM THE PORTLAND FIRE DEPARTMENT TO ALLOW ACCESS BY THE PORTLAND FIRE DEPARTMENT.
5. STREETS SHALL MAINTAIN A 20' WIDTH FOR FIRE DEPARTMENT ACCESS AT ALL TIMES.
6. FIRE HYDRANTS SHALL NOT BE BLOCKED OR ENCLOSED BY FENCING. A 3' CLEARANCE SHALL BE MAINTAINED AT ALL TIMES AROUND FIRE HYDRANTS.

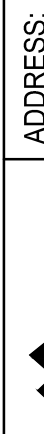
1. EXISTING TREES TO BE PRESERVED ARE SHOWN ON THE EXISTING CONDITIONS AND DEMOLITION PLAN.
2. FENCING OR OTHER PROTECTIVE BARRIERS AND SIGNAGE SHALL BE ERECTED OUTSIDE THE DRIPLINE OF INDIVIDUAL, GROUPINGS OF OR PERIMETER TREES TO BE PRESERVED.
3. NO STORAGE OF CONSTRUCTION EQUIPMENT OR MATERIALS SHALL BE PERMITTED WITHIN THE DRIPLINE OF TREES TO BE PRESERVED.
4. AREAS OF TREES OR OTHER VEGETATION TO BE PRESERVED SHALL NOT BE USED FOR TEMPORARY STORMWATER RUNOFF STORAGE DURING CONSTRUCTION.
5. ROOT BARRIER SHALL BE USED BETWEEN NEW UTILITY TRENCHES AND EXISTING LARGE TREES.
6. THE CONTRACTOR IS ENCOURAGED TO USE AIR SPADE EXCAVATION TECHNIQUES IN COORDINATION WITH A CERTIFIED ARBORIST FOR TRENCING OR EXCAVATION WITHIN THE TREE PROTECTION AREAS TO MINIMIZE DAMAGE TO FEEDER ROOTS AND STRUCTURAL ROOT AREAS.
7. PROTECTIVE BARRIERS AND SIGNAGE SHALL REMAIN IN PLACE UNTIL COMPLETION OF THE PROJECT.

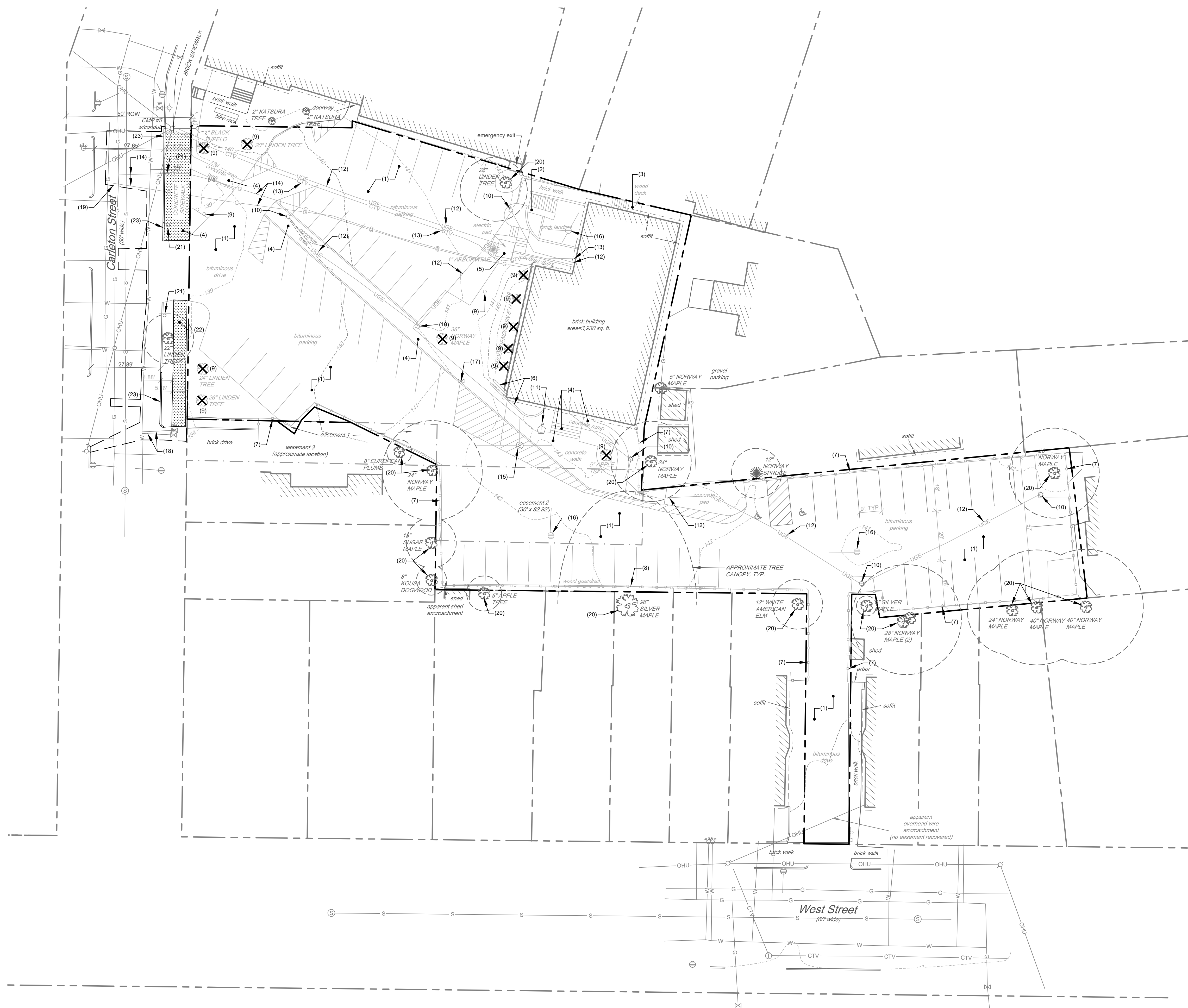
1. ALL REQUIRED UTILITIES SERVING THE PROJECT SHALL BE COORDINATED BETWEEN THE SITE WORK CONTRACTOR AND DIVISION 22/26 CONTRACTOR(S). THE SITE WORK CONTRACTOR SHALL BE RESPONSIBLE TO EXTEND ALL PROPOSED UTILITIES TO WITHIN FIVE (5) FEET OF THE BUILDING TO A LOCATION COORDINATED WITH THE MECHANICAL AND ELECTRICAL SUBCONTRACTORS. THE BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UTILITIES WITHIN FIVE (5) FEET AND INSIDE THE BUILDING OR UNDER SLAB.
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. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRIC SERVICE WITH CENTRAL MAINE POWER, THE TELECOMMUNICATIONS SERVICE WITH CONSOLIDATED COMMUNICATIONS, AND THE CABLE SERVICE WITH SPECTRUM. ALL WORK SHALL CONFORM TO THE PROJECT SPECIFICATIONS OR UTILITY COMPANY STANDARDS, WHICHEVER IS MORE STRINGENT.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE AT NO ADDITIONAL EXPENSE TO THE OWNER.
5. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
6. 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.
7. 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.
8. THE CONTRACTOR SHALL 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.
9. CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY ELECTRICAL SERVICES IN CONDUIT TO SITE LIGHTING, COMPLYING WITH APPLICABLE CODES. COORDINATE WITH OWNER, SITE ELECTRICAL, ARCHITECTURAL AND CMP PLANS.
10. ALL SANITARY SERVICES AND APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT. ALL SANITARY SERVICES AND APPURTENANCES TO BE ABANDONED SHALL BE PROPERLY RECORDED WITH PORTLAND PUBLIC WORKS ENGINEERING DEPARTMENT. A DIGITAL VIDEOTAPE SHALL BE MADE OF SANITARY SEWER SYSTEMS TO BE UTILIZED PRIOR TO CONSTRUCTION; UPSTREAM PIPES INTENDED FOR ABANDONMENT SHALL BE INSPECTED TO VERIFY THAT THEY NO LONGER SERVE OTHER FACILITIES.
11. THE PORTION OF THE 4" AND 6" WATER SERVICES WITHIN THE RIGHT OF WAY SHALL BE DUCTILE IRON WITH RESTRAINED JOINTS IN ACCORDANCE WITH PORTLAND WATER DISTRICT STANDARDS.
12. THE 2" WATER SERVICES SHALL BE TYPE K COPPER TUBING

1. THIS PROJECT IS SUBJECT TO THE TERMS AND CONDITIONS OF THE SITE PLAN REVIEW PERMIT FROM THE CITY OF PORTLAND WHICH WILL BE MADE A PART OF THE CONTRACT BID DOCUMENTS. THE CONSTRUCTION WILL BE GOVERNED BY THE ZONING ORDINANCES WHICH ARE AVAILABLE FOR VIEWING AT THE OFFICE OF THE ENGINEER OR THE MUNICIPAL OFFICE.

DIMENSIONAL REQUIREMENTS (R-6 ZONE)		
STANDARD	R-6 ZONE REQUIRED	PROVIDED
MIN. LOT SIZE	NONE	37,361 SF
MIN. LOT AREA PER DWELLING UNIT	725 SF	4,151 SF
MAX. LOT COVERAGE	60%	24.00%
STREET FRONTAGE	20 FT	135 FT
FRONT YARD	5 FT	5 FT
MIN. SIDE YARD	5 FT	8.5 FT
MIN. REAR YARD	10 FT	3.7 FT (EXISTING CONDITION)
MAX. BUILDING HEIGHT	45 FT	40.65 Ft
STEP BACK	15 FT REAR, 10 FT SIDE	10 FT SIDE
OPEN SPACE	20%	15.6% (EXISTING CONDITION) 18.4% PROPOSED
PARKING	1 SPACE PER UNIT, FIRST 3 UNITS EXEMPT (6 SPACES)	41
BICYCLE PARKING	2 SPACES FOR EVERY 5 UNITS (4 SPACES)	9 SPACES

	EXISTING PROPERTY LINE
	PROJECT SITE BOUNDARY
	SETBACK LINE
	PROPOSED EASEMENT
	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	PROPOSED CONTOUR
	EXISTING STORMDRAIN
	PROPOSED STORMDRAIN
	EXISTING SANITARY SEWER
	PROPOSED SANITARY SEWER
	EXISTING WATER LINE
	PROPOSED WATER LINE
	EXISTING GAS
	PROPOSED GAS
	EXISTING OVERHEAD ELECTRIC & TELEPHONE
	EXISTING UNDERGROUND ELECTRIC
	PROPOSED UNDERGROUND ELECTRIC
	EXISTING UNDERGROUND TELEPHONE
	PROPOSED UNDERGROUND TELEPHONE & CABLE TV
	EXISTING EDGE OF PAVEMENT
	PROPOSED EDGE OF PAVEMENT
	EXISTING EDGE OF GRAVEL
	PROPOSED EDGE OF GRAVEL
	EXISTING CURB
	PROPOSED CURB
	PROPOSED DECORATIVE METAL FENCE
	PROPOSED PRIVACY FENCE
	SILT FENCE
	TEST PIT
	EXISTING VALVE
	PROPOSED VALVE
	EXISTING HYDRANT
	EXISTING LIGHT POLE
	PROPOSED BUILDING LIGHT
	EXISTING UTILITY POLE
	EXISTING CATCH BASIN
	PROPOSED CATCH BASIN
	EXISTING DRAIN MANHOLE
	PROPOSED DRAIN MANHOLE
	EXISTING SEWER MANHOLE
	EXISTING SPOT GRADE
	PROPOSED SPOT GRADE
	SURVEY CONTROL POINT
	EXISTING MONUMENT
	EXISTING IRON PIPE
	EXISTING SIGN
	PROPOSED SIGN
	EXISTING BUILDING
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED PAVEMENT
	PROPOSED BRICK

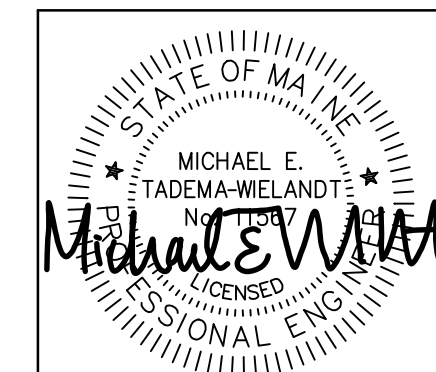
		DATE: 10/20/2023 PE: MICHAEL TADEMA-WIELANDT	
PROJECT:	WEST STREET REDEVELOPMENT	ADDRESS:	41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260
SCALE:		PHONE:	(207) 926-5111
JOB NO:	23-020	WEB SITE:	www.terradynconsultants.com
SHEET:	C-1.1		
DATE: 8/4/2023		CLIENT: CARLETON WEST, LLC 9 GOULD ROAD LEWISTON, ME 04240	
SHEET TITLE: GENERAL NOTES AND LEGEND		PERMIT DRAWING NOT FOR CONSTRUCTION	
SCALE: N.T.S.		CIVIL ENGINEERING LAND SURVEYING GEOMATICS STORMWATER DESIGN LAND PLANNING ENVIRONMENTAL PERMITTING	
JOB NO: 23-020		REVISED IN RESPONSE TO STAFF REVIEW COMMENTS	
SHEET:		NO. DATE REVISIONS	
1 10/20/2023		REVISED IN RESPONSE TO STAFF REVIEW COMMENTS	



EXISTING	DESCRIPTION
	LOCUS PROPERTY LINE
	PROPERTY LINE
	SETBACK LINE
	EASEMENT LINE
	STREET / SITE SIGN
	BUILDING
	BUILDING OVERHANG
	BITUMINOUS PAVEMENT
	CURBING
	CONCRETE PAVEMENT
	CHAIN LINK FENCE
	STOCKADE FENCE
	WOOD GUARDRAIL
	SD
	STORM DRAIN
	CATCH BASIN
	DRAINAGE MANHOLE
	S
	SANITARY SEWER
	SANITARY MANHOLE
	W
	WATER LINE
	WATER VALVE
	HYDRANT
	OHU
	OVERHEAD UTILITY
	UGE
	UNDERGROUND ELECT.
	TRANSFORMER
	LIGHT POLE
	UTILITY POLE
	GUY WIRE
	E
	ELECTRIC METER
	H
	HVAC UNIT
	E
	ELECTRICAL MANHOLE
	T
	TELEPHONE MANHOLE
	G
	GAS LINE
	M
	GAS METER
	V
	GAS VALVE
	G
	GAS MANHOLE

- (1) REMOVE ALL PAVEMENT ON SITE
- (2) REMOVE BRICK LANDING, WALKWAY AND STAIRS
- (3) REMOVE WOOD DECK AND STEPS
- (4) REMOVE CONCRETE WALK, RAMP AND STAIRS
- (5) REMOVE ELECTRIC PAD
- (6) REMOVE WALL
- (7) REMOVE PERIMETER FENCE *
- (8) REMOVE WOOD GUARDRAIL *
- (9) REMOVE TREE/SHRUB
- (10) REMOVE LIGHT/POWER POLE
- (11) REMOVE FLAGPOLE TO REMAIN
- (12) REMOVE UNDERGROUND ELECTRIC LINE
- (13) REMOVE UNDERGROUND CABLE TV LINE
- (14) REMOVE UNDERGROUND GAS LINE
- (15) REMOVE SEWER MANHOLE AND SEWER LINE
- (16) REMOVE CATCH BASIN AND DRAINAGE LINE
- (17) REMOVE GATE VALVE
- (18) RETIRE EXISTING WATER SERVICES IN ACCORDANCE
WITH WATERSHED WATER DISTRICT REQUIREMENTS
- (19) SAWCUT PAVEMENT
- (20) EMPLOY TREE PROTECTION MEASURES
- (21) PROTECT EXISTING STREET SIGNS
- (22) REMOVE EXISTING BRICK SIDEWALK, STOCKPILE BRICK
FOR REUSE
- (23) REMOVE AND RESET GRANITE CURB FOR UTILITY
INSTALLATION

* CARE SHALL BE TAKEN WHEN REMOVING SITE FEATURES WITHIN THE DRIPLINE OF EXISTING TREES. SEE CONSTRUCTION MANAGEMENT PLAN (SHEET C-3.1) FOR TREE PROTECTION MEASURES.



DATE:	12/12/2023
PE:	MICHAEL TADEMA-WIELANDT

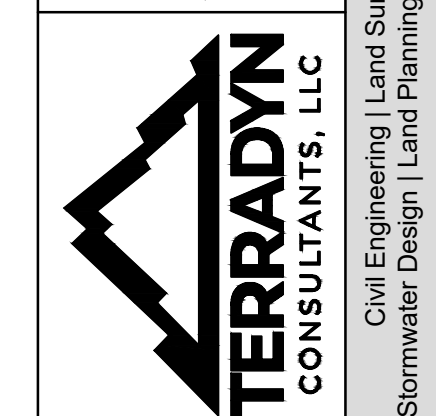
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ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

PHONE:
(207) 926-5111

WEB SITE:
www.terradynconsultants.com

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PROJECT: WEST STREET REDEVELOPMENT
10 WEST STREET, PORTLAND, ME

SHEET TITLE: EXISTING CONDITIONS & DEMOLITION PLAN

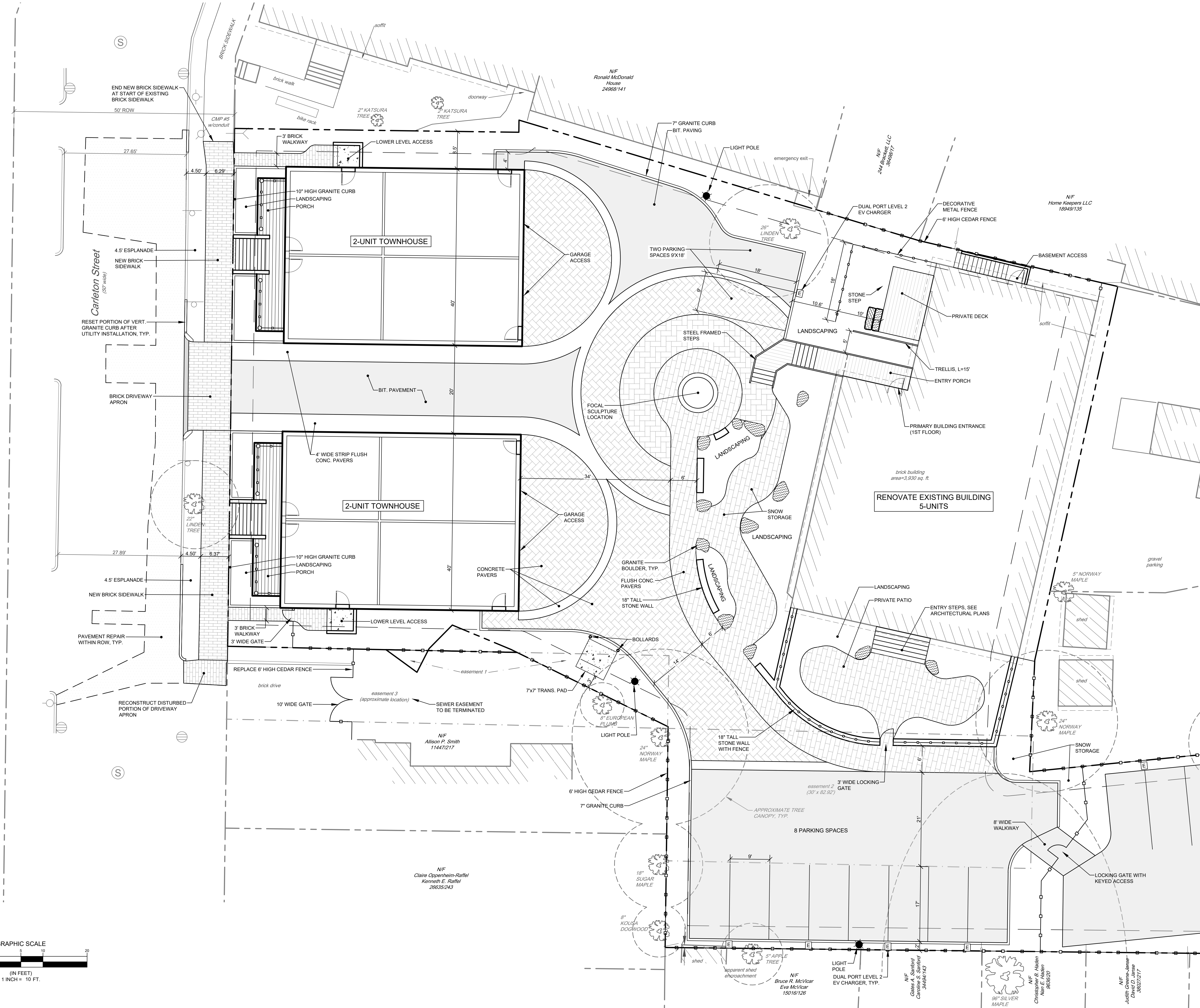
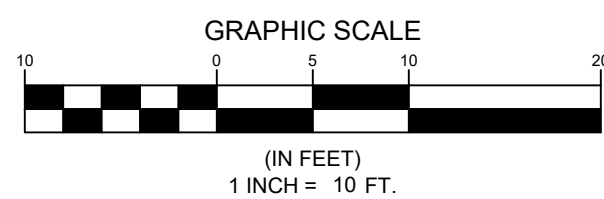
CLIENT: CARLETON WEST, LLC
79 GOULD ROAD
LEWISTON, ME 04240

DATE:	8/4/2023
SCALE:	1" = 20'
JOB NO:	23-020
SHEET:	000

C-3.0



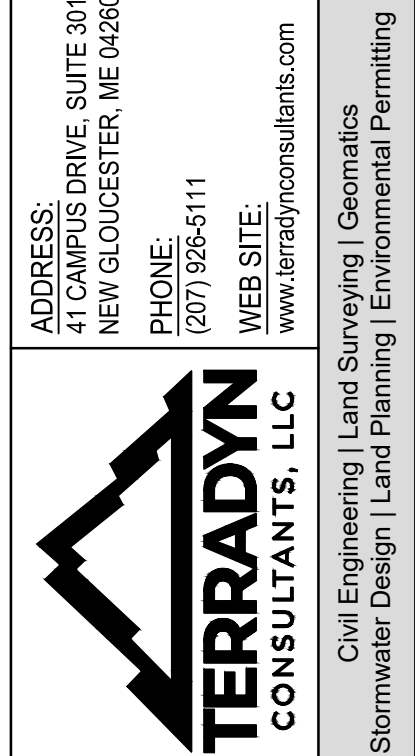
C-4.0



DATE: 12/12/2023
PE: MICHAEL TADEMA-WIELANDT

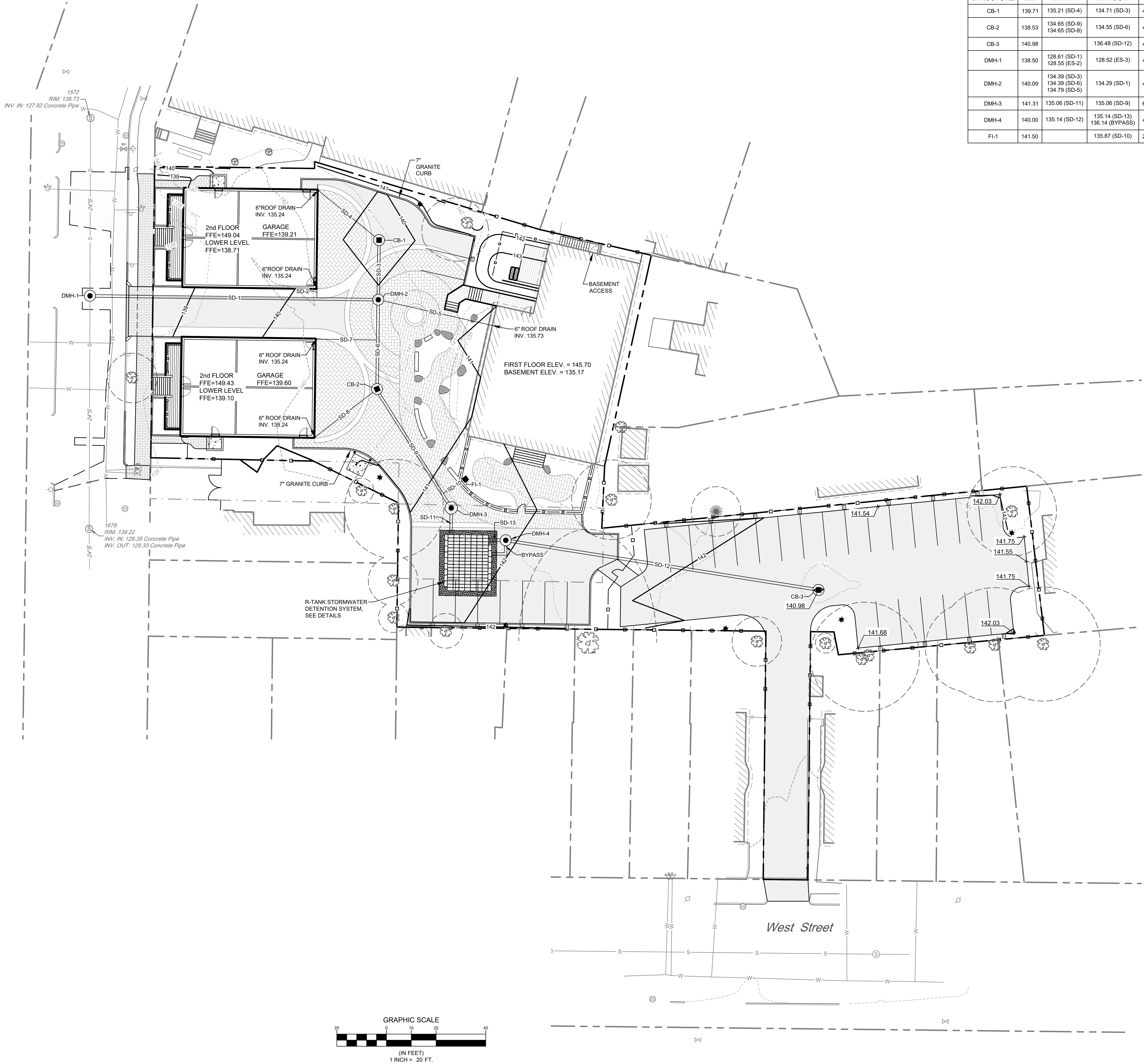
NO.	DATE	REVISIONS
1	10/20/2023	REVISED IN RESPONSE TO STAFF COMMENTS
2	11/18/2023	STORMWATER MANAGEMENT SYSTEM ADDED
3	12/14/2023	SUBMITTED TO HP BOARD
4	12/12/2023	REVISED IN RESPONSE TO STAFF COMMENTS

ADDRESS:	41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260
PHONE:	(207) 926-5111
WEB SITE:	www.terradyndesign.com

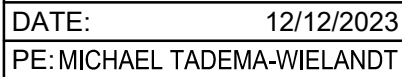


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PROJECT:	WEST STREET REDEVELOPMENT
CLIENT:	CARLETON WEST, LLC
DATE:	8/4/2023
SCALE:	1" = 10'
JOB NO:	23-020
SHEET:	C-4.1



STORM DRAIN PIPE DATA			
NAME	SIZE	LENGTH	SLOPE
SD-1	12"	112'	5.06%
SD-2	6"	4'	2.00%
SD-3	12"	20'	1.60%
SD-4	6"	30'	2.00%
SD-5	6"	45'	2.09%
SD-6	12"	32'	0.50%
SD-7	6"	24'	2.00%
SD-8	6"	30'	2.00%
SD-9	12"	52'	0.79%
SD-11	12"	8'	0.97%
SD-12	12"	124'	1.08%
SD-13	12"	5'	0.00%

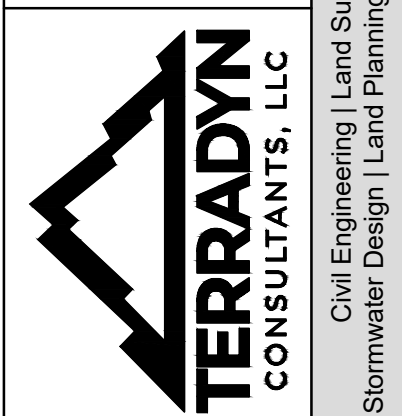
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ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

PHONE:
(207) 926-5111

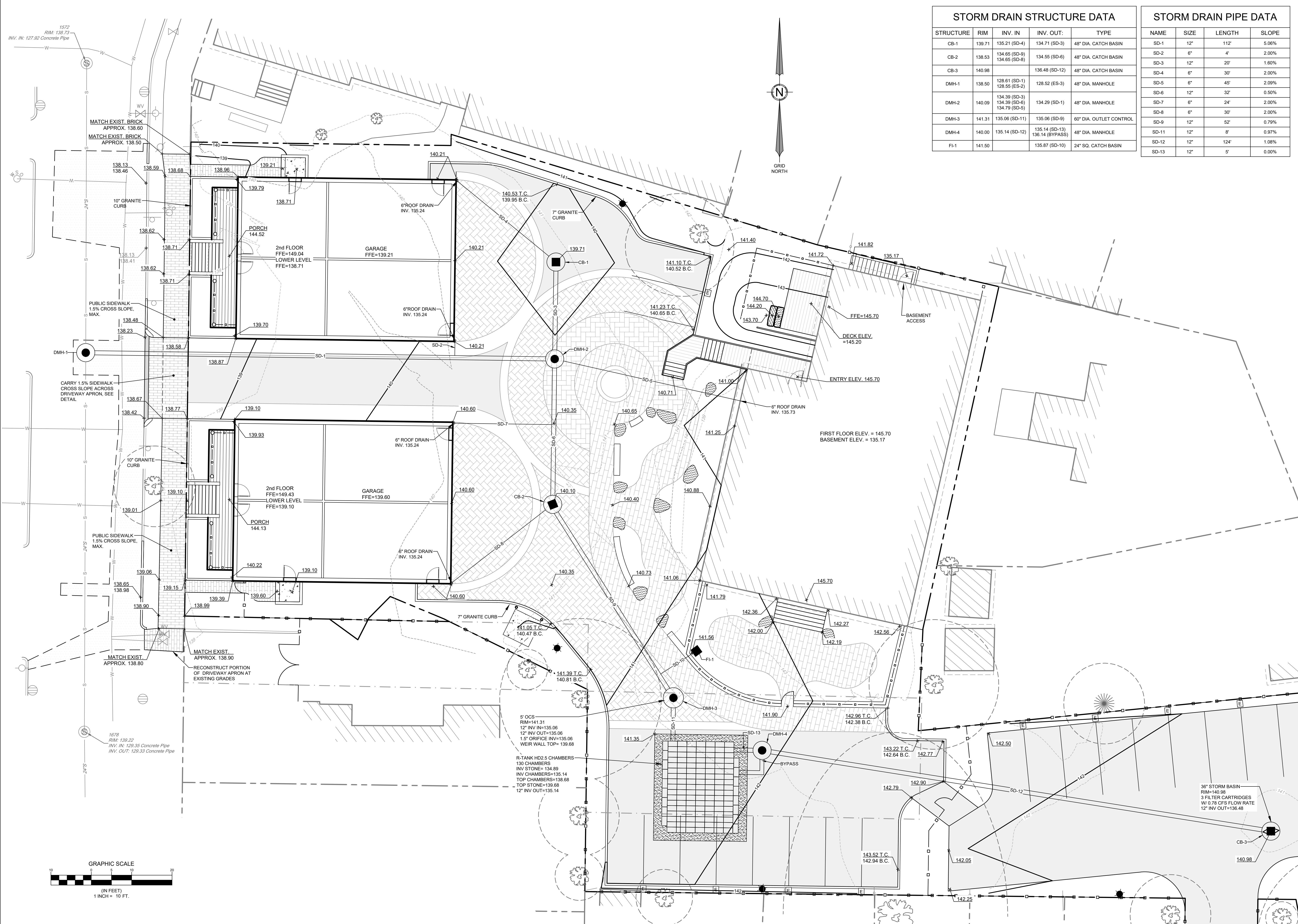
WEB SITE:
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NOT FOR CONSTRUCTION

PROJECT: WEST STREET REDEVELOPMENT 19 WEST STREET, PORTLAND, ME	
SHEET TITLE: OVERALL GRADING & DRAINAGE PLAN	
DATE:	8/4/2023
SCALE:	1" = 20'
JOB NO:	23-020
SHEET:	C-5.0
CLIENT: CARLETON WEST, LLC 9 GOULD ROAD LEWISTON, ME 04240	



STORM DRAIN STRUCTURE DATA				
STRUCTURE	RIM	INV. IN	INV. OUT	TYPE
CB-1	139.71	135.21 (SD-4)	134.71 (SD-3)	48" DIA. CATCH BASIN
CB-2	138.53	134.65 (SD-9) 134.65 (SD-6)	134.55 (SD-6)	48" DIA. CATCH BASIN
CB-3	140.98		136.48 (SD-12)	48" DIA. CATCH BASIN
DMH-1	138.50	128.61 (SD-1) 128.55 (ES-2)	128.52 (ES-3)	48" DIA. MANHOLE
DMH-2	140.09	134.39 (SD-3) 134.39 (SD-6) 134.79 (SD-5)	134.29 (SD-1)	48" DIA. MANHOLE
DMH-3	141.31	135.06 (SD-11)	135.06 (SD-9)	60" DIA. OUTLET CONTROL
DMH-4	140.00	135.14 (SD-12)	135.14 (SD-13) 136.14 (BYPASS)	48" DIA. MANHOLE
FI-1	141.50		135.87 (SD-10)	24" SQ. CATCH BASIN

STORM DRAIN PIPE DATA			
NAME	SIZE	LENGTH	SLOPE
SD-1	12"	112'	5.06%
SD-2	6"	4'	2.00%
SD-3	12"	20'	1.60%
SD-4	6"	30'	2.00%
SD-5	6"	45'	2.09%
SD-6	12"	32'	0.50%
SD-7	6"	24'	2.00%
SD-8	6"	30'	2.00%
SD-9	12"	52'	0.79%
SD-11	12"	8'	0.97%
SD-12	12"	124'	1.08%
SD-13	12"	5'	0.00%

STATE OF MAINE
MICHAEL E. TADEMA-WIELANDT
LICENSED PROFESSIONAL ENGINEER

DATE: 12/12/2023
PE: MICHAEL TADEMA-WIELANDT

REVISIONS

NO.	DATE	REVISIONS
1	10/20/2023	REVISED IN RESPONSE TO STAFF REVIEW COMMENTS
2	11/19/2023	STORMWATER MANAGEMENT SYSTEM ADDED
3	12/14/2023	SUBMITTED TO HP BOARD
4	12/12/2023	REVISED IN RESPONSE TO STAFF COMMENTS

ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

PHONE:
(207) 926-5111

WEB SITE:
www.terradynconsultants.com

TERRADYN
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Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

PROJECT:
WEST STREET REDEVELOPMENT
19 WEST STREET, PORTLAND, ME

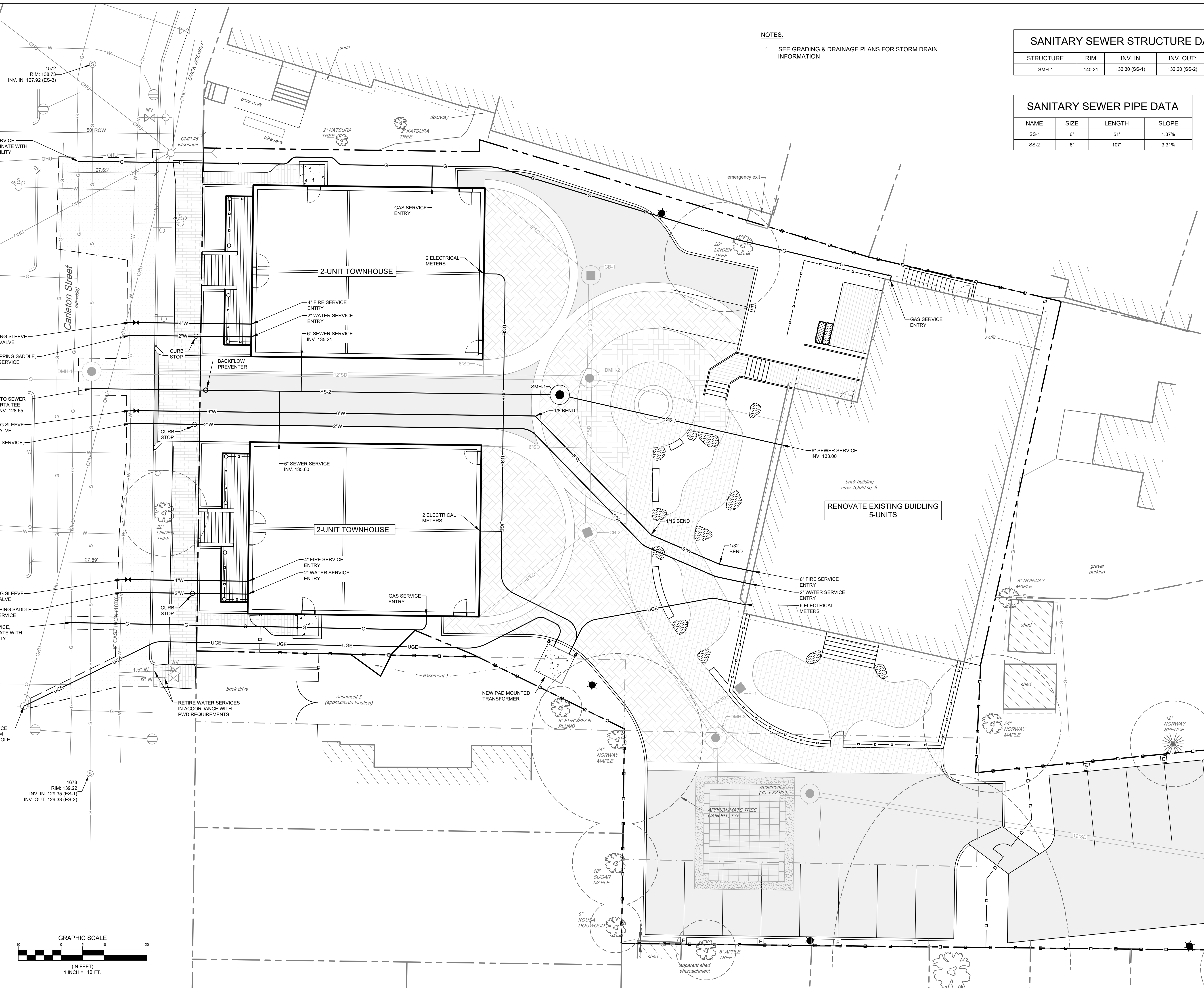
SHEET TITLE:
DETAILED GRADING & DRAINAGE PLAN

CLIENT:
CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240

DATE: 8/4/2023
SCALE: 1" = 10'
JOB NO: 23-020
SHEET: C-5.1

PERMIT DRAWING
NOT FOR CONSTRUCTION

Page 894



1. SEE GRADING & DRAINAGE PLANS FOR STORM DRAIN INFORMATION

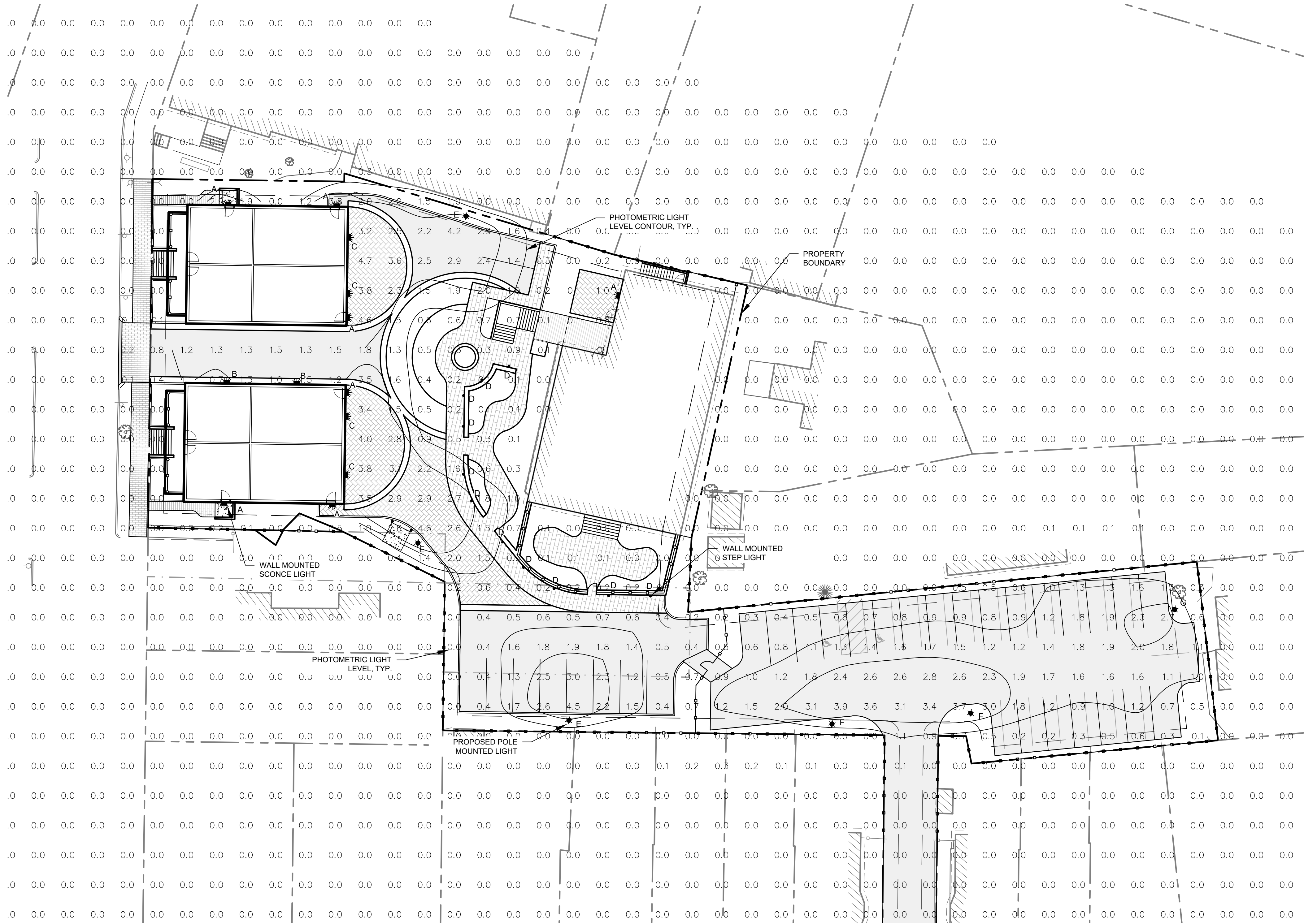
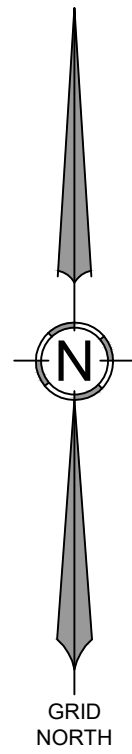
SANITARY SEWER PIPE DATA			
NAME	SIZE	LENGTH	SLOPE
SS-1	6"	51'	1.37%
SS-2	6"	107'	3.31%

[illegible]

	ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260 PHONE: (207) 926-5111 WEB SITE: www.terradync consultants.com	Civil Engineering Land Surveying Geomatics Stormwater Design Land Planning Environmental Permitting
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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:	WEST STREET REDEVELOPMENT 19 WEST STREET, PORTLAND, ME
SHEET TITLE:	UTILITY PLAN
CLIENT:	CARLETON WEST, LLC 9 GOULD ROAD LEWISTON, ME 04240
DATE:	8/4/2023
SCALE:	1" = 10'
JOB NO.	23-020
SHEET:	



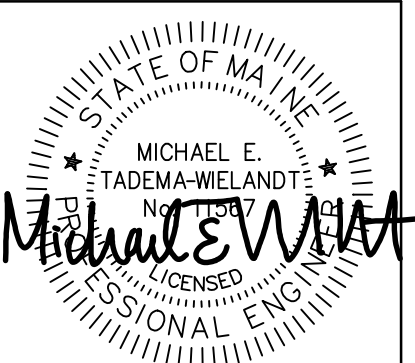
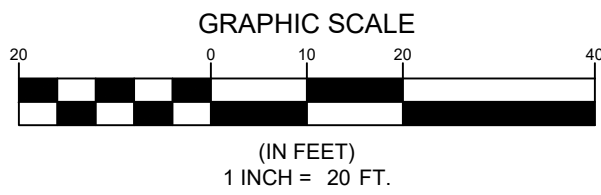
LIGHT FIXTURE TABLE

LABEL	LIGHT FIXTURE	MANUFACTURER	MANUFACTURERS ID	LUMENS	WATTAGE	FULL CUT OFF	NUMBER OF LIGHTS	MOUNTING HEIGHT	MOUNTING LOCATION	TIMING DEVICE	PROPOSED HOURS
A	EURO XANE	POSSINI	KYLW0408LAJENBK_3000K_IES	650	9	YES	7	7'	WALL	TIMER	DUSK TO DAWN
B	RATIO WALL	BEACON	RWL1-48L-10-3K7-3	1,303	10	YES	2	9'	WALL	TIMER	DUSK TO DAWN
C	RATIO WALL	BEACON	RWL1-48L-10-3K7-4W	1,285	10	YES	4	7'	WALL	TIMER	DUSK TO DAWN
D	BRICK STAR	B-K LIGHTING	ITL86653	60	5	YES	11	2'	WALL	TIMER	DUSK TO DAWN
E	VIPER	BEACON	VP-1-160L-35-3K7-4F-HSS-90-B	5,500	35	YES	3	14'	POLE	TIMER	DUSK TO DAWN
F	VIPER	BEACON	VP-1-160L-50-3K7-3-HSS-90-B	7,500	50	YES	2	18'	POLE	TIMER	DUSK TO DAWN
G	VIPER	BEACON	VP-1-160L-35-3K7-4F-HSS-90-B	5,500	35	YES	1	18'	POLE	TIMER	DUSK TO DAWN

NOTES:
1. LIGHTING PLAN PREPARED USING DESIGN MASTER PHOTOMETRICS SOFTWARE
2. DEPRECIATION FACTOR FOR LED IS 0.90

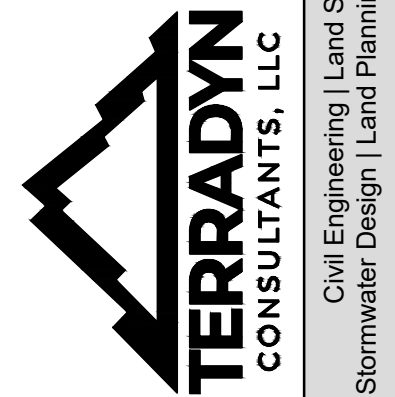
PORTLAND LIGHTING STANDARDS

STANDARD	REQUIRED VALUE	PROVIDED VALUE
UNIFORMITY RATIO (MAX TO MIN)	20 FC	19 FC
MAX ILLUMINATION	5.0 FC	4.7 FC
MINIMUM ILLUMINATION	0.2 FC	0.2 FC
AVERAGE ILLUMINATION	1.25 FC	1.55 FC



DATE: 8/4/2023
PE: MICHAEL TADEMA-WIELANDT

ADDRESS: 41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260
PHONE: (207) 926-5111
WEB SITE: www.terradynconsultants.com



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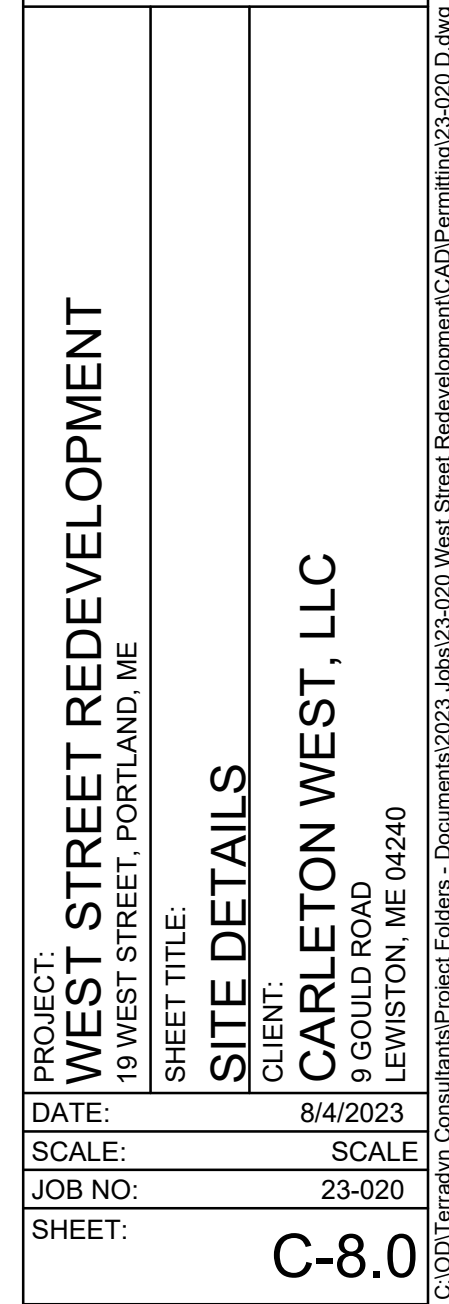
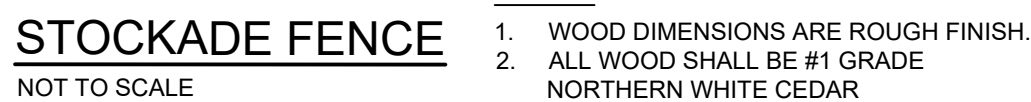
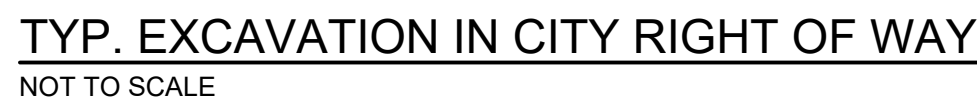
PROJECT: WEST STREET REDEVELOPMENT
19 WEST STREET, PORTLAND, ME

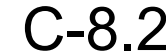
SHEET TITLE: PHOTOMETRIC PLAN

CLIENT: CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240

DATE: 8/4/2023
SCALE: 1" = 20'
JOB NO: 23-020
SHEET: C-7.0

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EROSION AND SEDIMENT CONTROL PLAN

PRE-CONSTRUCTION PHASE
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 38 MRSA § 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. THE SITE MUST BE MAINTAINED TO PREVENT UNREASONABLE EROSION AND SEDIMENTATION. MINIMIZE DISTURBED AREAS AND PROTECT NATURAL DOWNGRAIDENT BUFFER AREAS TO THE EXTENT PRACTICABLE.

BMP CONSTRUCTION PHASE
THE SEDIMENT BARRIERS, PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, PROPERLY INSTALL SEDIMENT BARRIERS AT THE EDGE OF ANY DOWNGRAIDENT DISTURBED AREA AND ADJACENT TO ANY DRAINAGE CHANNELS WITHIN THE PROPOSED DISTURBED AREA. MAINTAIN THE SEDIMENT BARRIERS UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.

B. CONSTRUCTION ENTRANCE: PRIOR TO ANY CLEARING OR GRUBBING, A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT THE INTERSECTION WITH THE PROPOSED ACCESS DRIVE AND THE EXISTING ROADWAY TO AVOID TRACKING OF MUD, DUST AND DEBRIS FROM THE SITE.

C. RIPRAP: SINCE RIPRAP IS USED WHERE EROSION POTENTIAL IS HIGH, CONSTRUCTION MUST BE SEQUENCED SO THAT THE RIPRAP IS PUT IN PLACE WITH THE MINIMUM DELAY. DISTURBANCE OF AREAS WHERE RIPRAP IS TO BE PLACED SHOULD BE UNDERTAKEN ONLY WHEN FINAL PREPARATION AND PLACEMENT OF THE RIPRAP CAN FOLLOW IMMEDIATELY BEHIND THE INITIAL DISTURBANCE. WHERE RIPRAP IS USED FOR OUTLET PROTECTION, THE RIPRAP SHOULD BE PLACED BEFORE OR IN CONJUNCTION WITH THE CONSTRUCTION OF THE PIPE OR CHANNEL SO THAT IT IS IN PLACE WHEN THE PIPE OR CHANNEL BEGINS TO OPERATE. MAINTAIN TEMPORARY RIPRAP, SUCH AS TEMPORARY CHECK DAMS UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.

D. TEMPORARY STABILIZATION. STABILIZE WITH TEMPORARY SEEDING, MULCH, OR OTHER NONERODABLE COVER ANY EXPOSED SOILS THAT WILL REMAIN UNWORKED FOR MORE THAN 14 DAYS EXCEPT, STABILIZE AREAS WITHIN 100 FEET OF A WETLAND OR WATERBODY WITHIN 7 DAYS OR PRIOR TO A PREDICTED STORM EVENT, WHICHEVER COMES FIRST. IF HAY OR STRAW MULCH IS USED, THE APPLICATION RATE MUST BE 2 BALES (70-90 POUNDS) PER 1000 SF OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. HAY MULCH MUST BE KEPT MOIST OR ANCHORED TO PREVENT WIND BLOWING. AN EROSION CONTROL BLANKET OR MAT SHALL BE USED AT THE BASE OF GRASSED WATERWAYS, STEEP SLOPES (15% OR GREATER) AND ON ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS AND WETLANDS. GRADING SHALL BE PLANNED SO AS TO MINIMIZE THE LENGTH OF TIME BETWEEN INITIAL SOIL EXPOSURE AND FINAL GRADING. ON LARGE PROJECTS THIS SHOULD BE ACCOMPLISHED BY PHASING THE OPERATION AND COMPLETING THE FIRST PHASE UP TO FINAL GRADING AND SEEDING BEFORE STARTING THE SECOND PHASE, AND SO ON.

E. VEGETATED WATERWAY. UPON FINAL GRADING, THE DISTURBED AREAS SHALL BE IMMEDIATELY SEEDED TO PERMANENT VEGETATION AND MULCHED AND WILL NOT BE USED AS OUTLETS UNTIL A DENSE, VIGOROUS VEGETATIVE COVER HAS BEEN OBTAINED. ONCE SOIL IS EXPOSED FOR WATERWAY CONSTRUCTION, IT SHOULD BE IMMEDIATELY SHAPED, GRADED AND STABILIZED. VEGETATED WATERWAYS NEED TO BE STABILIZED EARLY DURING THE GROWING SEASON (PRIOR TO SEPTEMBER 15). IF FINAL SEEDING OF WATERWAYS IS DELAYED PAST SEPTEMBER 15, EMERGENCY PROVISIONS SUCH AS SOD OR RIPRAP MAY BE REQUIRED TO STABILIZE THE CHANNEL. WATERWAYS SHOULD BE FULLY STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.

PERMANENT STABILIZATION DEFINED
A. SEEDED AREAS. FOR SEEDED AREAS, PERMANENT STABILIZATION MEANS AN 90% COVER OF THE DISTURBED AREA WITH MATURE, HEALTHY PLANTS WITH NO EVIDENCE OF WASHING OR RILLING OF THE TOPSOIL.

B. SODDED AREAS. FOR SODDED AREAS, PERMANENT STABILIZATION MEANS THE COMPLETE BINDING OF THE SOD ROOTS INTO THE UNDERLYING SOIL WITH NO SLUMPING OF THE SOD OR DIE-OFF.

C. PERMANENT MULCH. FOR MULCHED AREAS, PERMANENT MULCHING MEANS TOTAL COVERAGE OF THE EXPOSED AREA WITH AN APPROVED MULCH MATERIAL. EROSION CONTROL MIX MAY BE USED AS MULCH FOR PERMANENT STABILIZATION ACCORDING TO THE APPROVED APPLICATION RATES AND LIMITATIONS.

D. RIPRAP. FOR AREAS STABILIZED WITH RIPRAP, PERMANENT STABILIZATION MEANS THAT SLOPES STABILIZED WITH RIPRAP HAVE AN APPROPRIATE BACKING OF A WELL-GRADED GRAVEL OR APPROVED GEOTEXTILE TO PREVENT SOIL MOVEMENT FROM BEHIND THE RIPRAP. STONE MUST BE SIZED APPROPRIATELY. IT IS RECOMMENDED THAT ANGULAR STONE BE USED.

E. AGRICULTURAL USE. FOR CONSTRUCTION PROJECTS ON LAND USED FOR AGRICULTURAL PURPOSES (E.G., PIPELINES ACROSS CROP LAND), PERMANENT STABILIZATION MAY BE ACCOMPLISHED BY RETURNING THE DISTURBED LAND TO AGRICULTURAL USE.

F. PAVED AREAS. FOR PAVED AREAS, PERMANENT STABILIZATION MEANS THE PLACEMENT OF THE COMPACTED GRAVEL SUBBASE IS COMPLETED.

G. DITCHES, CHANNELS, AND SWALES. FOR OPEN CHANNELS, PERMANENT STABILIZATION MEANS THE CHANNEL IS STABILIZED WITH MATURE VEGETATION AT LEAST THREE INCHES IN HEIGHT, WITH WELL-GRADED RIPRAP, OR WITH ANOTHER NONERODING LINING CAPABLE OF WITHSTANDING THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHOUT RELIANCE ON CHECK DAMS TO SLOW FLOW. THERE MUST BE NO EVIDENCE OF SLUMPING OF THE LINING, UNDERCUTTING OF THE BANKS, OR DOWN-CUTTING OF THE CHANNEL.

GENERAL CONSTRUCTION PHASE
THE FOLLOWING EROSION CONTROL MEASURES SHALL BE FOLLOWED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION OF THIS PROJECT:

A. ALL TOPSOIL SHALL BE COLLECTED, STOCKPILED, SEEDED WITH RYE AT 3 POUNDS/1,000 SF AND MULCHED, AND REUSED AS REQUIRED. SILT FENCING SHALL BE PLACED DOWN GRADIENT FROM THE STOCKPILED LOAM. STOCKPILE TO BE LOCATED BY DESIGNATION OF THE OWNER AND INSPECTING ENGINEER.

B. THE INSPECTING ENGINEER AT HIS/HER DISCRETION, MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES AND/OR SUPPLEMENTAL VEGETATIVE PROVISIONS TO MAINTAIN STABILITY OF EARTHWORKS AND FINISH GRADED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ANY SUPPLEMENTAL MEASURES AS DIRECTED BY THE INSPECTING ENGINEER. FAILURE TO COMPLY WITH THE ENGINEER'S DIRECTIONS WILL RESULT IN DISCONTINUATION OF CONSTRUCTION ACTIVITIES.

C. EROSION CONTROL MESH SHALL BE APPLIED IN ACCORDANCE WITH THE PLANS OVER ALL FINISH SEEDED AREAS AS SPECIFIED ON THE DESIGN PLANS.

D. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN UNTIL THEY ARE ADEQUATELY STABILIZED.

E. ALL EROSION, AND SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.

F. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIALS.

G. AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 INCHES PRIOR TO PLACEMENT OF TOPSOIL.

H. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC., SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

I. ALL FILLS SHALL BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 8 INCHES IN THICKNESS.

J. EXCEPT FOR APPROVED LANDFILLS OR NON-STRUCTURAL FILLS, FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY LIFTS.

K. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILL SLOPES OR STRUCTURAL FILLS.

L. FILL SHALL NOT BE PLACED ON A FROZEN FOUNDATION.

M. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED APPROPRIATELY.

N. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.

O. REMOVE ANY TEMPORARY CONTROL MEASURES, SUCH AS SILT FENCE, WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED. REMOVE ANY ACCUMULATED SEDIMENTS AND STABILIZE.

PERMANENT VEGETATION
PERMANENT VEGETATIVE COVER SHOULD BE ESTABLISHED ON DISTURBED AREAS WHERE PERMANENT, LONG LIVED VEGETATIVE COVER IS NEEDED TO STABILIZE THE SOIL, TO REDUCE DAMAGES FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE ENVIRONMENT.

SEEDBED PREPARATION
A. GRADE AS FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION AND ANCHORING, AND MAINTENANCE.

B. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TESTS SUCH AS THOSE OFFERED BY THE UNIVERSITY OF MAINE SOIL TESTING LABORATORY. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL COOPERATIVE EXTENSION SERVICE OFFICE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 POUNDS PER ACRE OR 18.4 POUNDS PER 1,000 SQUARE FEET USING 10-20-20 (N-P20S-K2O) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB. PER 1,000 SQ. FT).

C. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.D. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLODS, LUMPS OR OTHER UNSUITABLE MATERIAL.

E. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.

F. PERMANENT SEEDING SHOULD BE MADE 45 DAYS PRIOR TO THE FIRST KILLING FROST OR AS A DORMANT SEEDING WITH MULCH AFTER THE FIRST KILLING FROST AND BEFORE SNOWFALL. WHEN CROWN VETCH IS SEEDED IN LATER SUMMER, AT LEAST 35% OF THE SEED SHOULD BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SEEDING DATES, MULCH ACCORDING TO THE TEMPORARY MULCHING BMP AND OVERWINTER STABILIZATION AND CONSTRUCTION TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

G. FOLLOWING SEED BED PREPARATION, SWALE AREAS, FILL AREAS AND BACK SLOPES SHALL BE SEEDED AT A RATE OF 3 LBS./1,000 S.F. WITH A MIXTURE OF 35% CREEPING RED H. FESCUE, 6% RED TOP, 24% KENTUCKY BLUEGRASS, 10% PERENNIAL RYEGRASS, 20% ANNUAL RYEGRASS AND 5% WHITE DUTCH CLOVER.

I. AREAS WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHALL BE MULCHED IMMEDIATELY FOLLOWING SEEDING.

J. AREAS WHICH CANNOT BE SEEDED WITHIN THE GROWING SEASON SHALL BE MULCHED FOR OVER-WINTER PROTECTION AND THE AREA SHOULD BE SEEDED AT THE BEGINNING OF THE GROWING SEASON.

WINTER CONSTRUCTION PHASE
IF AN AREA IS NOT STABILIZED WITH TEMPORARY OR PERMANENT MEASURES BY NOVEMBER 15, THEN THE SITE MUST BE PROTECTED WITH ADDITIONAL STABILIZATION MEASURES.

A. PERMANENT STABILIZATION CONSISTS OF AT LEAST 90% VEGETATION, PAVEMENT/GRAVEL BASE OR RIPRAP.

B. DO NOT EXPOSE SLOPES OR LEAVE SLOPES EXPOSED OVER THE WINTER OR FOR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY PROTECTED WITH MULCH.

C. APPLY HAY MULCH AT TWICE THE STANDARD RATE (150 LBS. PER 1,000 SF). THE MULCH MUST BE THICK ENOUGH SUCH THAT THE GROUND SURFACE WILL NOT BE VISIBLE AND MUST BE ANCHORED.

D. USE MULCH AND MULCH NETTING OR AN EROSION CONTROL MULCH BLANKET OR ALL SLOPES GREATER THAN 8 % OR OTHER AREAS EXPOSED TO DIRECT WIND.

E. INSTALL AN EROSION CONTROL BLANKET IN ALL DRAINAGEWAYS (BOTTOM AND SIDES) WITH A SLOPE GREATER THAN 3 %.

F. SEE THE VEGETATION MEASURES FOR MORE INFORMATION ON SEEDING DATES AND TYPES.

G. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SO THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.

H. AN AREA WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIER.

I. TEMPORARY MULCH MUST BE APPLIED WITHIN 7 DAYS OF SOIL EXPOSURE OR PRIOR TO ANY STORM EVENT, BUT AFTER EVERY WORKDAY IN AREAS WITHIN 100 FEET FROM A PROTECTED NATURAL RESOURCE.

J. AREAS THAT HAVE BEEN BROUGHT TO FINAL GRADE MUST BE PERMANENTLY MULCHED THAT SAME DAY.

K. IF SNOWFALL IS GREATER THAN 1 INCH (FRESH OR CUMULATIVE), THE SNOW SHALL BE REMOVED FROM THE AREAS DUE TO BE SEEDED AND MULCHED.

L. LOAM SHALL BE FREE OF FROZEN CLUMPS BEFORE IT IS APPLIED.

M. ALL VEGETATED DITCH LINES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1, OR WILL BE WORKED DURING THE WINTER CONSTRUCTION PERIOD, MUST BE STABILIZED WITH AN APPROPRIATE STONE LINING BACKED BY AN APPROPRIATE GRAVEL BED OR GEOTEXTILE UNLESS SPECIFICALLY RELEASED FROM THIS STANDARD BY THE DEPARTMENT.

MAINTENANCE AND INSPECTION PHASE
A. MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE

B. A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. MAJOR OBSERVATIONS MUST INCLUDE: BMPS THAT NEED TO BE MAINTAINED; LOCATION(S) OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION; AND LOCATION(S) WHERE ADDITIONAL BMPS ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION. FOLLOW-UP TO CORRECT DEFICIENCIES OR ENHANCE CONTROLS MUST ALSO BE INDICATED IN THE LOG AND DATED, INCLUDING WHAT ACTION WAS TAKEN AND WHEN.

DEWATERING
A DEWATERING PLAN IS NEEDED TO ADDRESS EXCAVATION DE-WATERING FOLLOWING HEAVY RAINFALL EVENTS OR WHERE THE EXCAVATION MAY INTERCEPT THE GROUNDWATER TABLE DURING CONSTRUCTION. THE COLLECTED WATER NEEDS TREATMENT AND A DISCHARGE POINT THAT WILL NOT CAUSE DOWNGRAIDENT EROSION AND OFFSITE SEDIMENTATION OR WITHIN A RESOURCE. PLEASE FOLLOW THE DETAILS OF SUCH A PLAN.

HOUSEKEEPING

1. SPILL PREVENTION. CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM CONSTRUCTION AND WASTE MATERIALS STORED ON SITE TO ENTER STORMWATER, WHICH INCLUDES STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER. THE SITE CONTRACTOR OR OPERATOR MUST DEVELOP, AND IMPLEMENT AS NECESSARY, APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING MEASURES.

NOTE: ANY SPILL OR RELEASE OF TOXIC OR HAZARDOUS SUBSTANCES MUST BE REPORTED TO THE DEPARTMENT FOR OIL SPILLS. CALL 1-800-482-0777 WHICH IS AVAILABLE 24 HOURS A DAY. FOR SPILLS OF TOXIC OR HAZARDOUS MATERIAL, CALL 1-800-452-4864 WHICH IS AVAILABLE 24 HOURS A DAY. FOR MORE INFORMATION, VISIT THE DEPARTMENT'S WEBSITE AT : HTTP://WWW.MAINE.GOV/DEP/SPILLS/EMERGSPIILLRESP/

2. GROUNDWATER PROTECTION. DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAMMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.

3. FUGITIVE SEDIMENT AND DUST. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL, BUT OTHER WATER ADDITIVES MAY BE CONSIDERED AS NEEDED. A STABILIZED CONSTRUCTION ENTRANCE (SCE) SHOULD BE INCLUDED TO MINIMIZE TRACKING OF MUD AND SEDIMENT. IF OFF-SITE TRACKING OCCURS, PUBLIC ROADS SHOULD BE SWEPT IMMEDIATELY AND NO LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS. OPERATIONS DURING DRY MONTHS, THAT EXPERIENCE FUGITIVE DUST PROBLEMS, SHOULD WET DOWN UNPAVED ACCESS ROADS ONCE A WEEK OR MORE FREQUENTLY AS NEEDED WITH A WATER ADDITIVE TO SUPPRESS FUGITIVE SEDIMENT AND DUST.

4. DEBRIS AND OTHER MATERIALS. MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS, TRASH, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

NOTE: TO PREVENT THESE MATERIALS FROM BECOMING A SOURCE OF POLLUTANTS, CONSTRUCTION AND POST-CONSTRUCTION ACTIVITIES RELATED TO A PROJECT MAY BE REQUIRED TO COMPLY WITH APPLICABLE PROVISION OF RULES RELATED TO SOLID, UNIVERSAL AND HAZARDOUS WASTE, INCLUDING, BUT NOT LIMITED TO, THE MAINE SOLID WASTE AND HAZARDOUS WASTE MANAGEMENT RULES; MAINE HAZARDOUS WASTE MANAGEMENT RULES; MAINE OIL CONVEYANCE AND STORAGE RULES; AND MAINE PESTICIDE REQUIREMENTS.

5. EXCAVATION DE-WATERING. EXCAVATION DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, MUST BE SPREAD THROUGH NATURAL WOODDED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE ENGINEER AND OWNER.

NOTE: DEWATERING CONTROLS ARE DISCUSSED IN THE "MAINE EROSION AND SEDIMENT CONTROL BMPS, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION."

6. AUTHORIZED NON-STORMWATER DISCHARGES. IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES, WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:

(a) DISCHARGES FROM FIREFIGHTING ACTIVITY;

(b) FIRE HYDRANT FLUSHINGS;

(c) VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);

(d) DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND SECTION 3 ABOVE;

(e) ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;

(f) PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;

(g) UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;

(h) UNCONTAMINATED GROUNDWATER OR SPRING WATER;

(i) FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;

(j) UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN SECTION 5 ABOVE);

(k) POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND

(l) LANDSCAPE IRRIGATION.

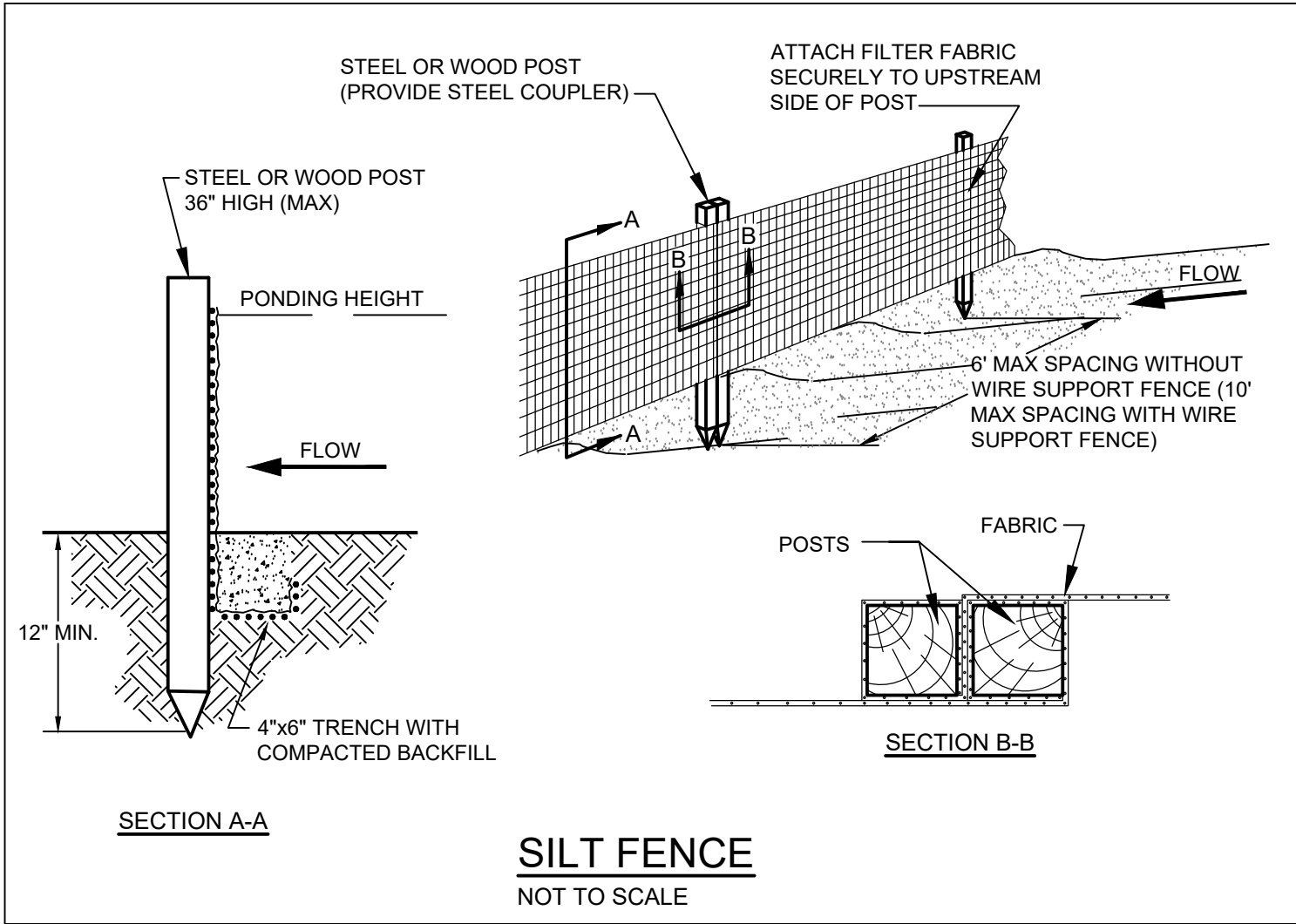
7. UNAUTHORIZED NON-STORMWATER DISCHARGES. THE FOLLOWING NON-STORMWATER DISCHARGES ARE PROHIBITED:

(a) WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;

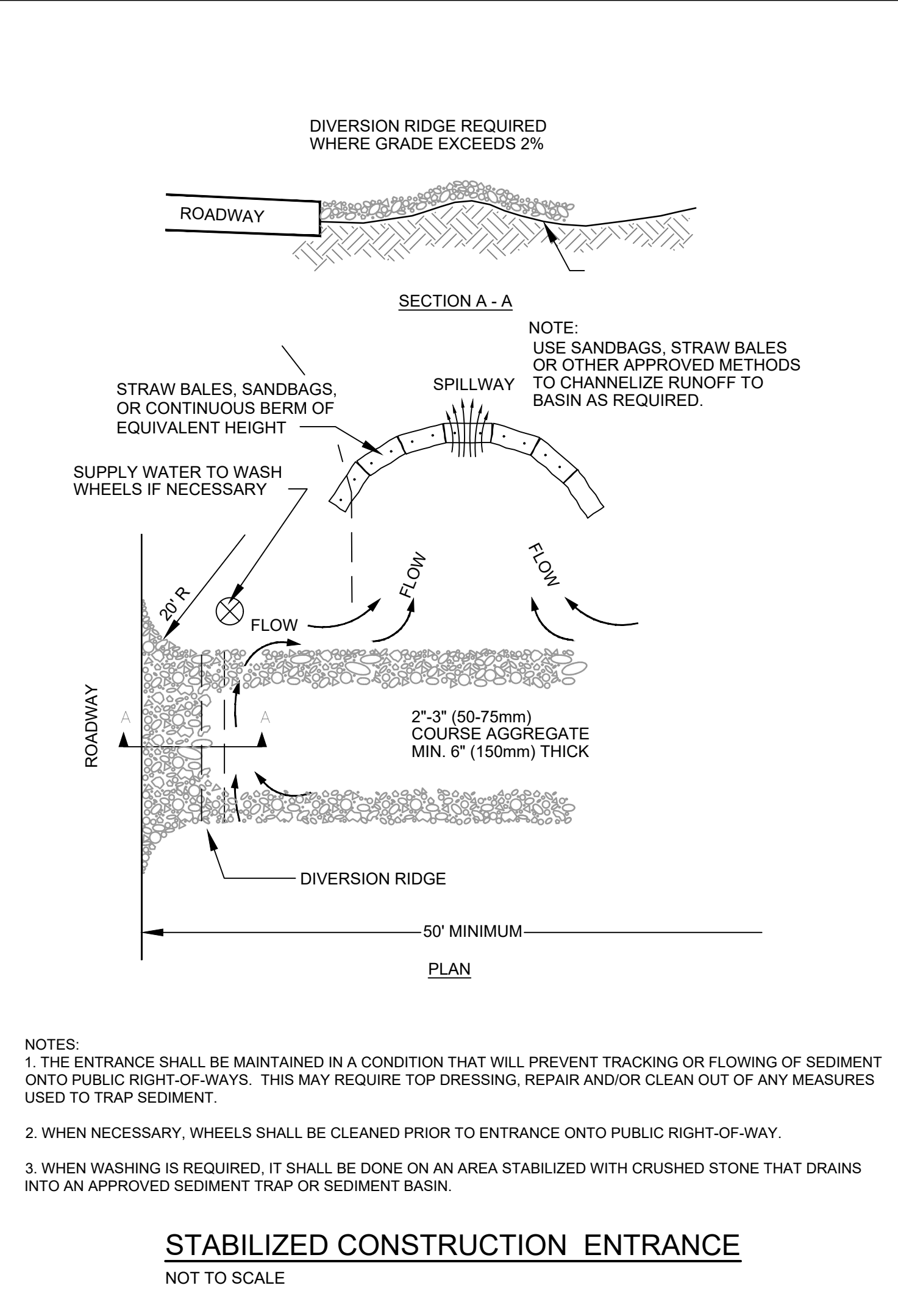
(b) FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;

(c) SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND

(d) TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

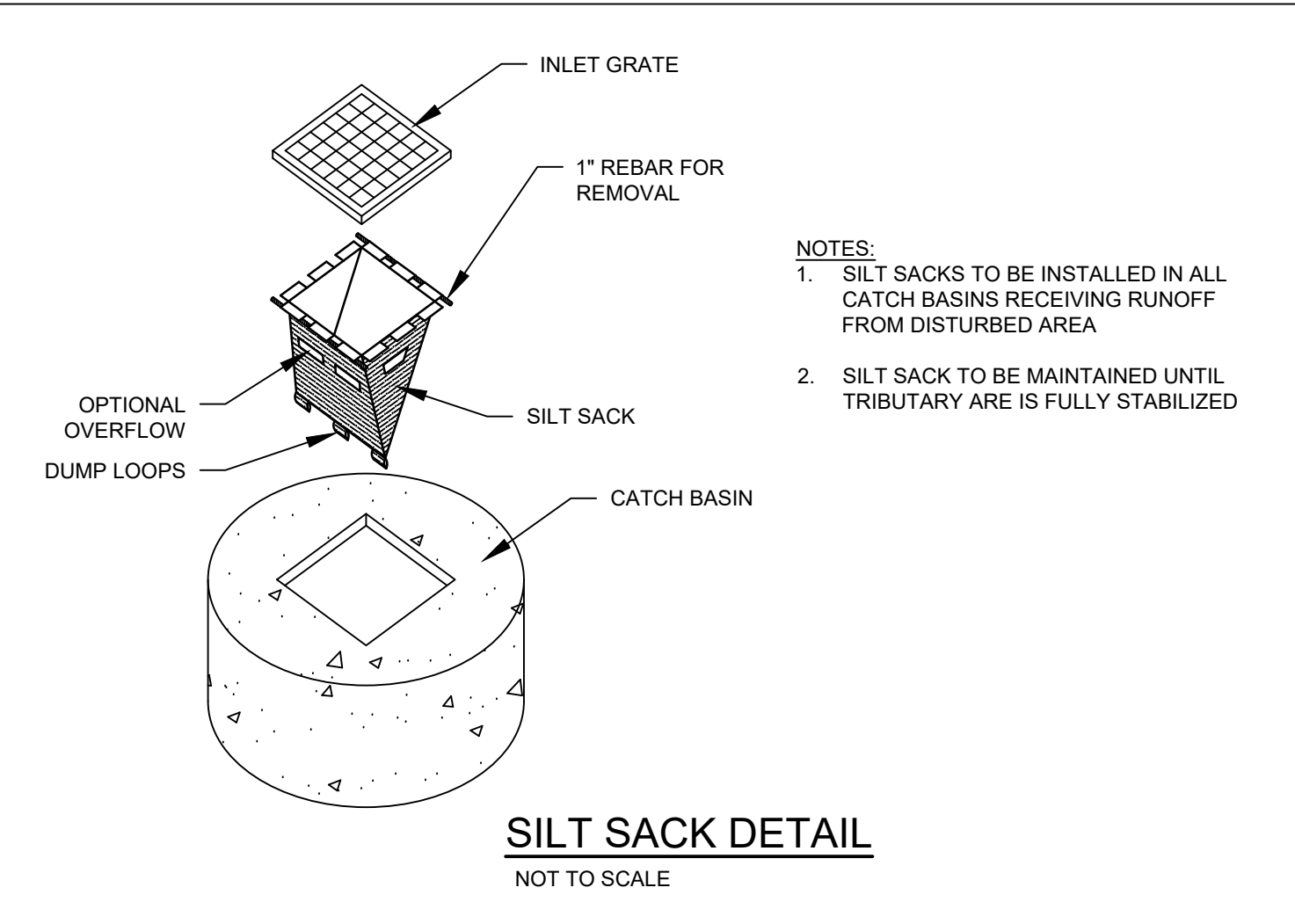


SILT FENCE
NOT TO SCALE



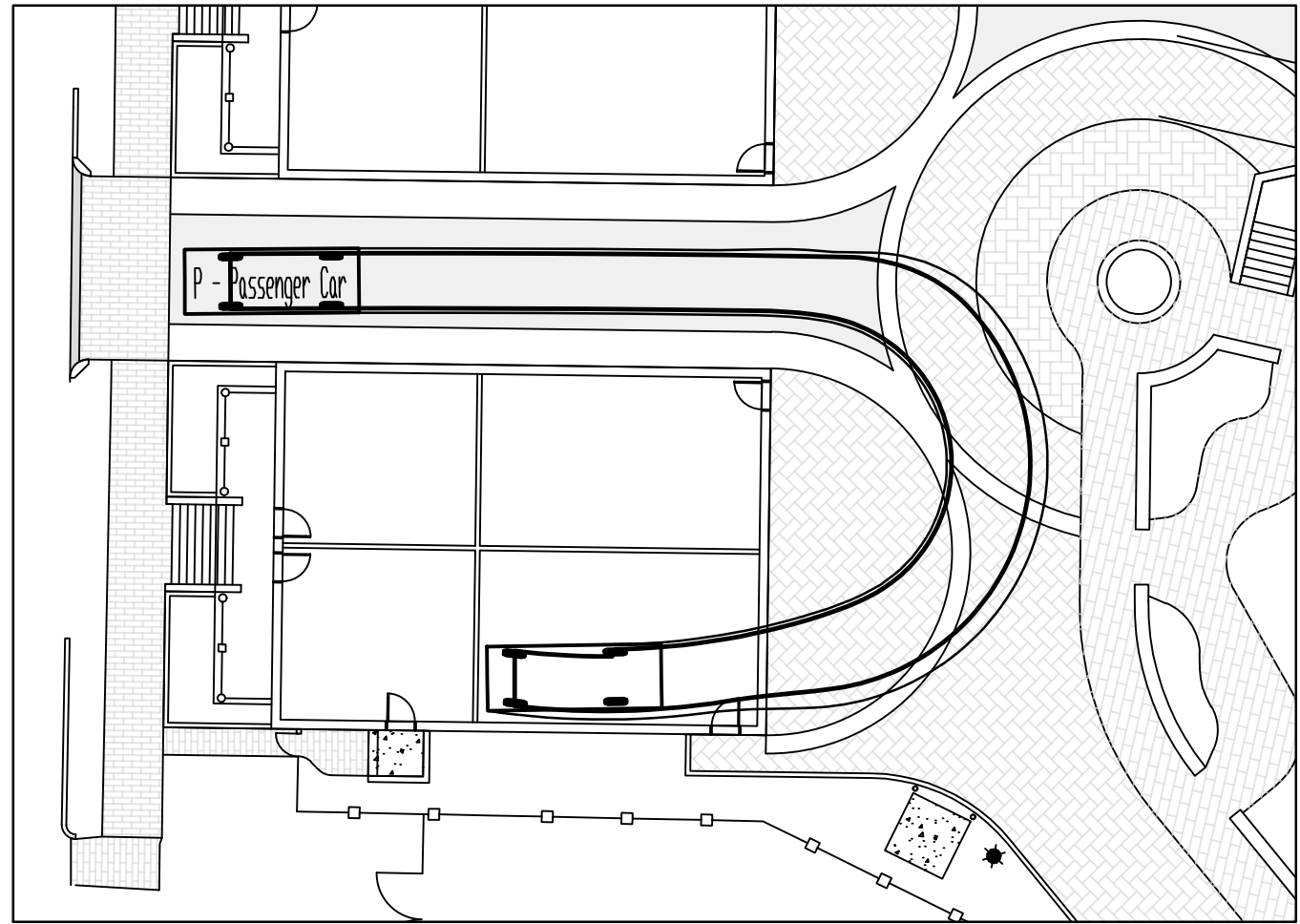
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

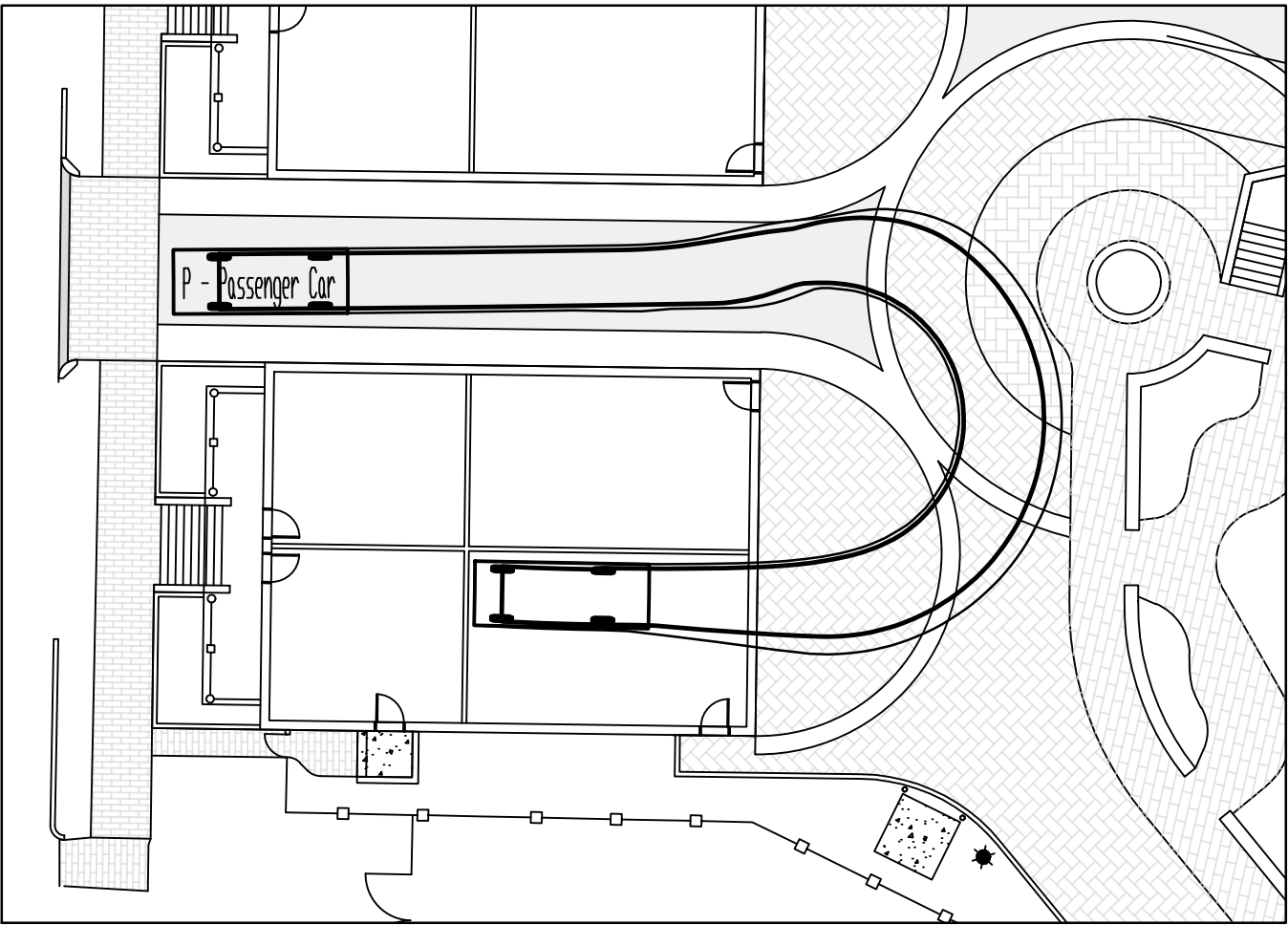


SILT SACK DETAIL
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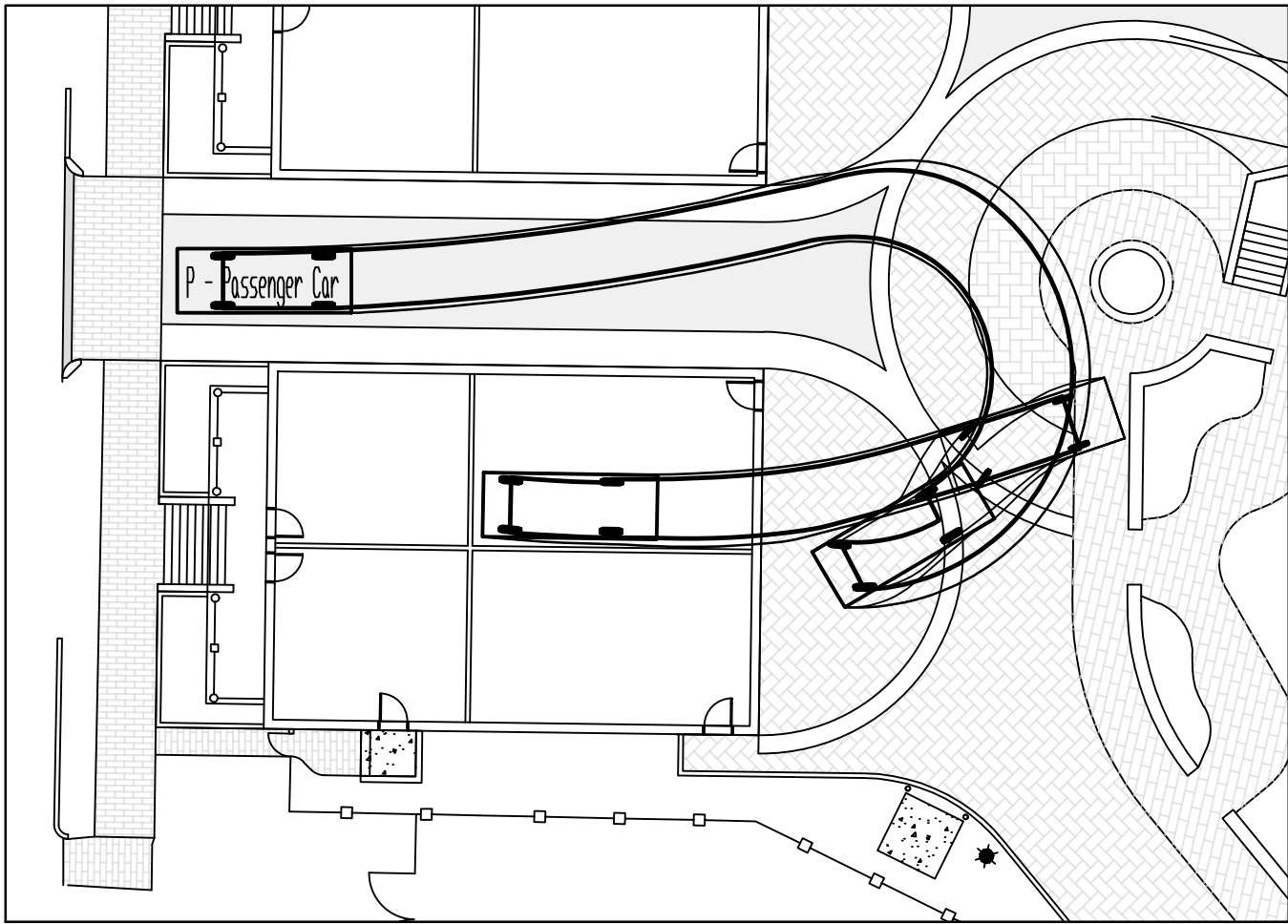
DATE: 8/4/2023	
PE: MICHAEL TADEMA-WIELANDT	
REVISIONS	
DATE	
NO	
ADDRESS: 41 CAMPUS DRIVE, SUITE 301, NEW GLOUCESTER, ME 04260	
PHONE: (207) 926-5111	
WEB SITE: www.terradynconsultants.com	
TERRADYN CONSULTANTS, LLC	
Civil Engineering Land Surveying Geomatics	
Stormwater Design Land Planning Environmental Permitting	
PERMIT DRAWING NOT FOR CONSTRUCTION	
PROJECT: WEST STREET REDEVELOPMENT	
SHEET TITLE: EROSION & SEDIMENT CONTROL DETAILS	
CLIENT: CARLETON WEST, LLC	
9 GOULD ROAD, LEWISTON, ME 04240	
DATE: 8/4/2023	
SCALE: SCALE	
JOB NO: 23-020	
SHEET: C-8.3	



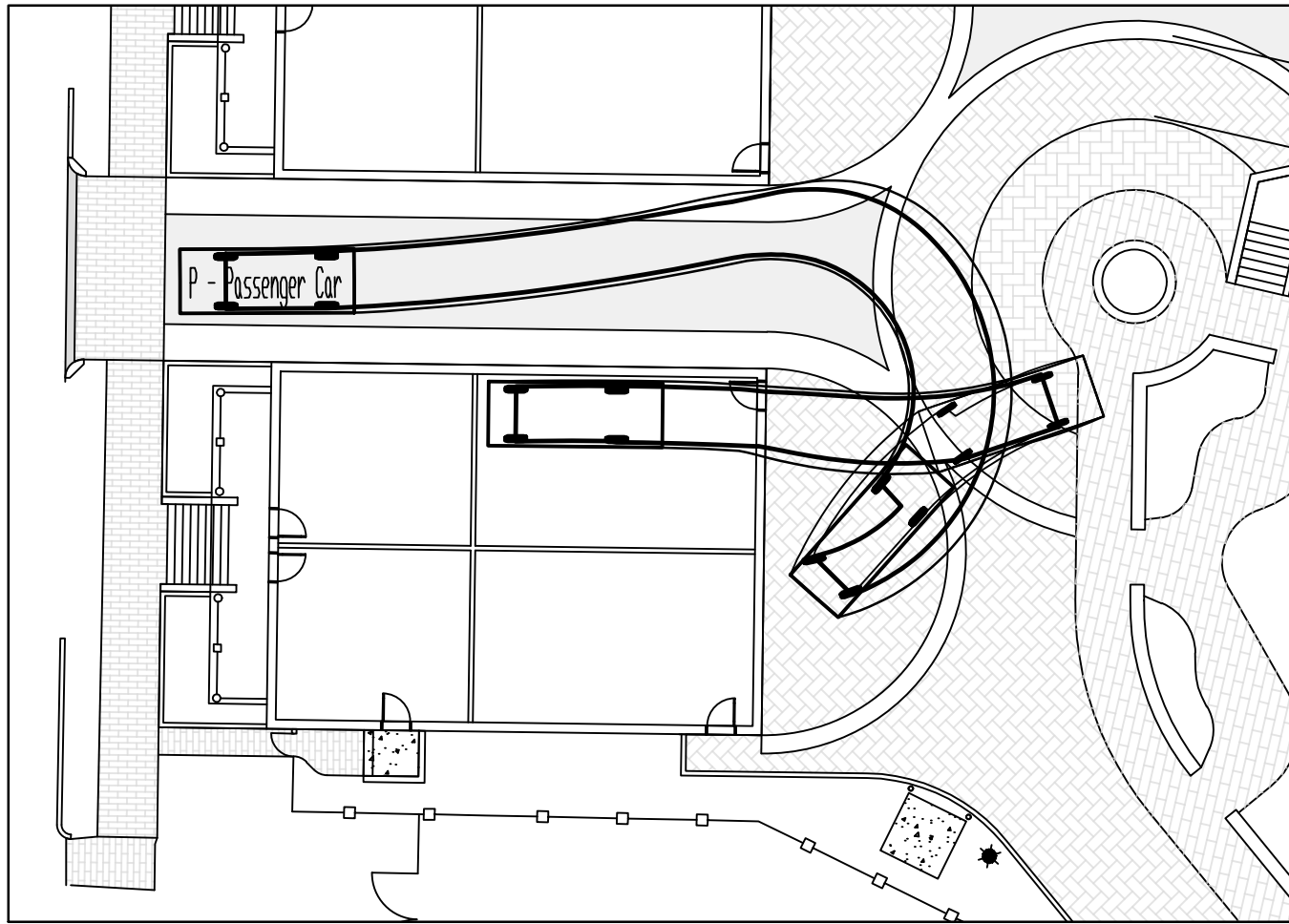
VEHICLE ENTERING SPOT 1



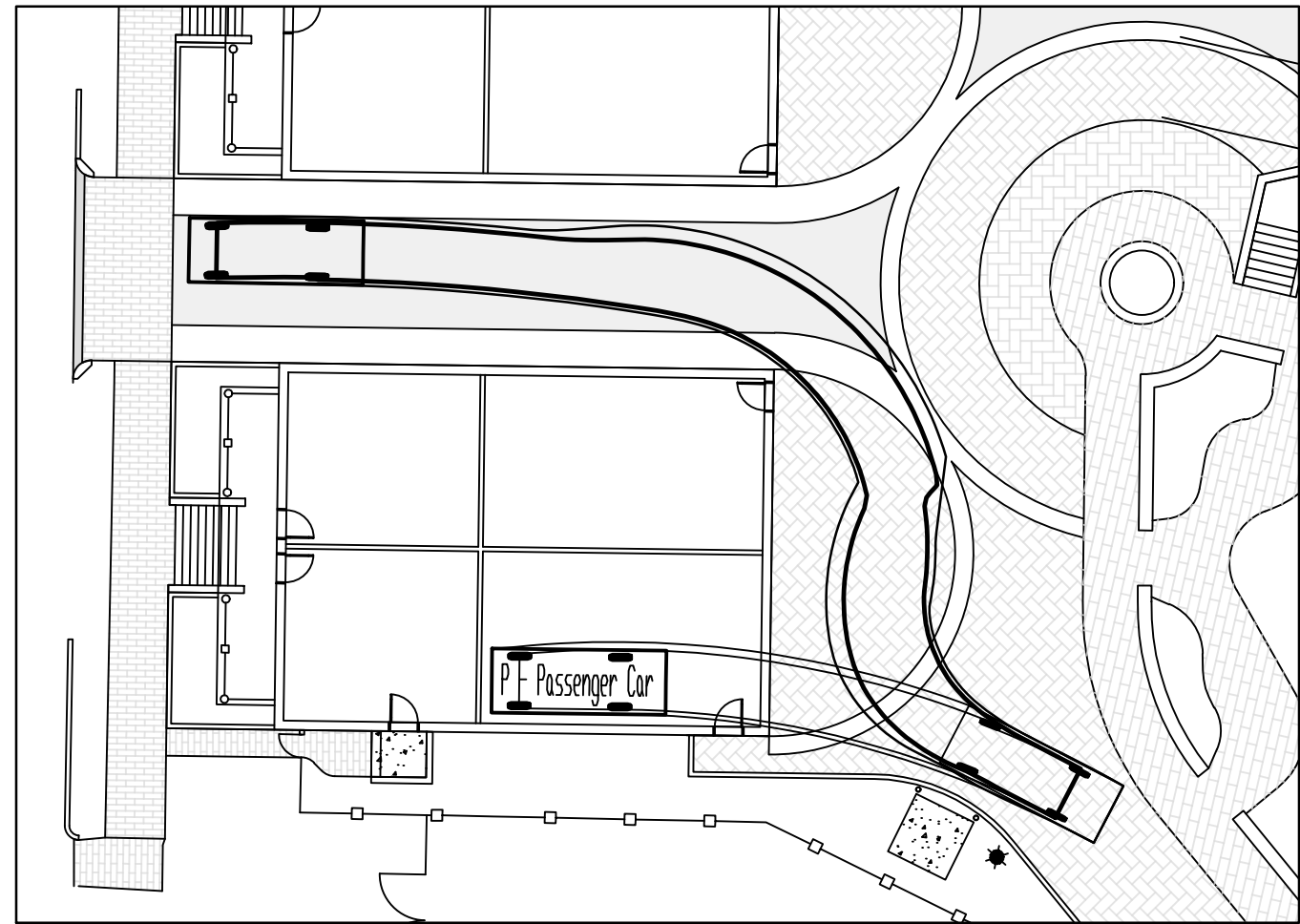
VEHICLE ENTERING SPOT 2



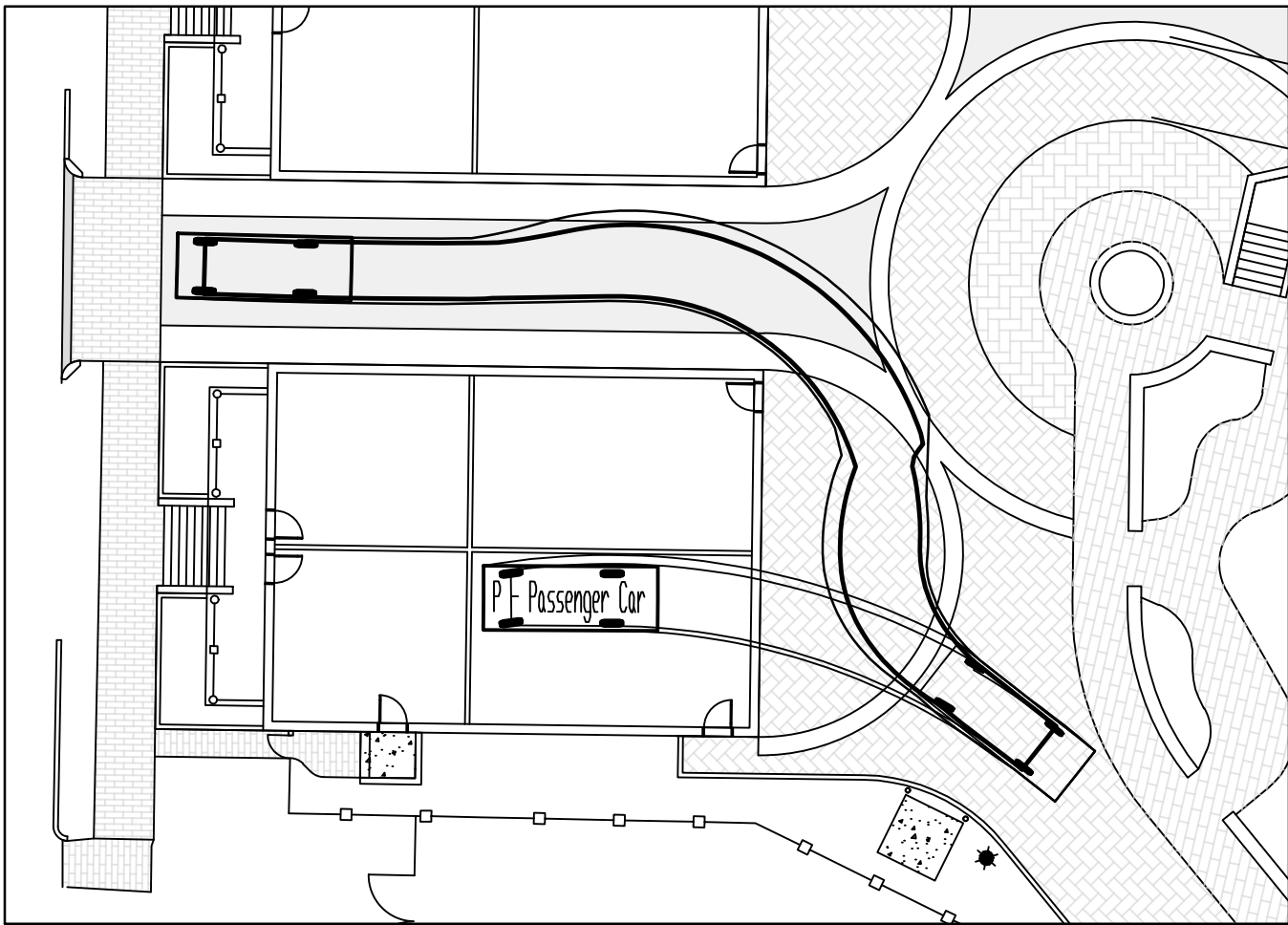
VEHICLE ENTERING SPOT 3



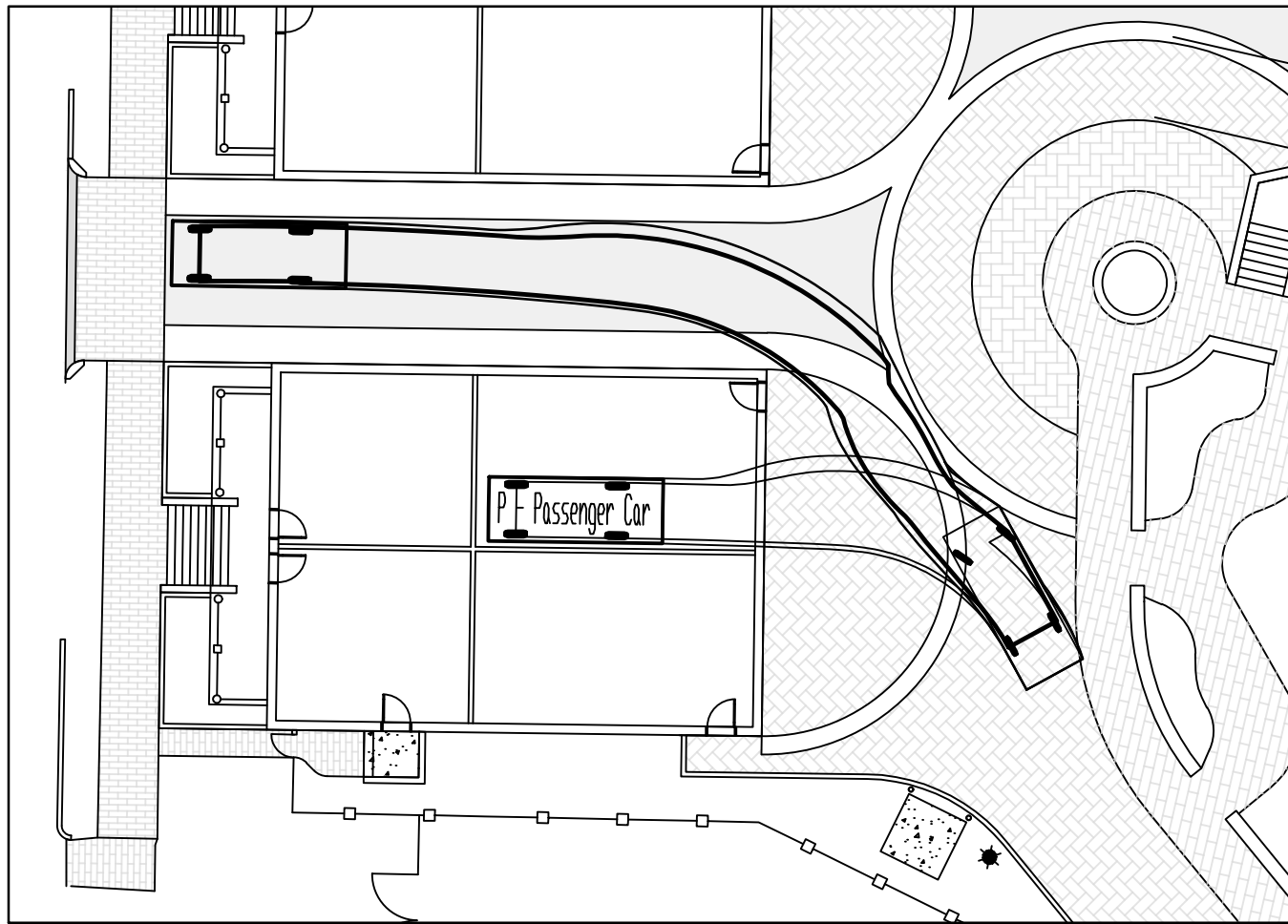
VEHICLE ENTERING SPOT 4



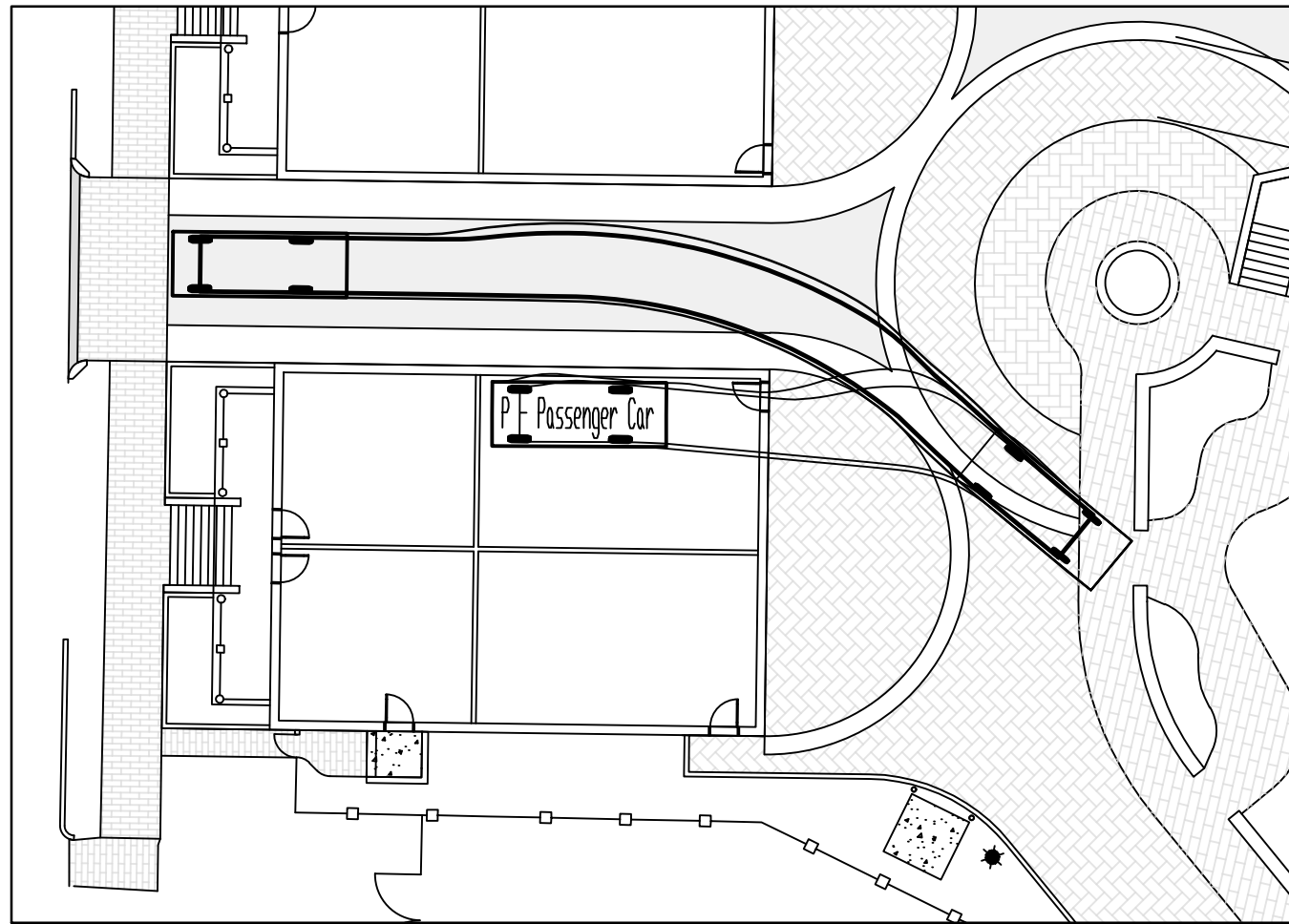
VEHICLE LEAVING SPOT 1



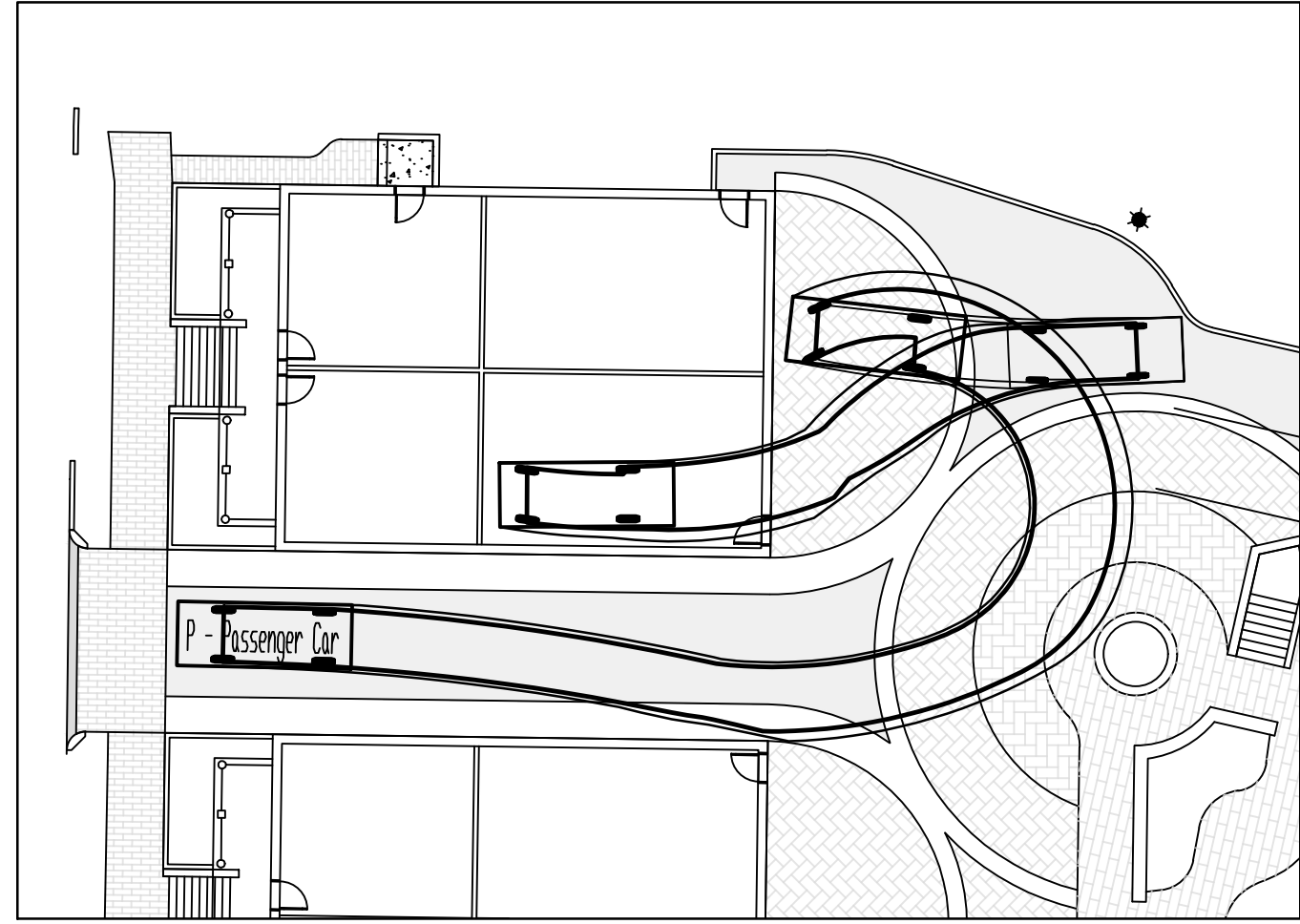
VEHICLE LEAVING SPOT 2



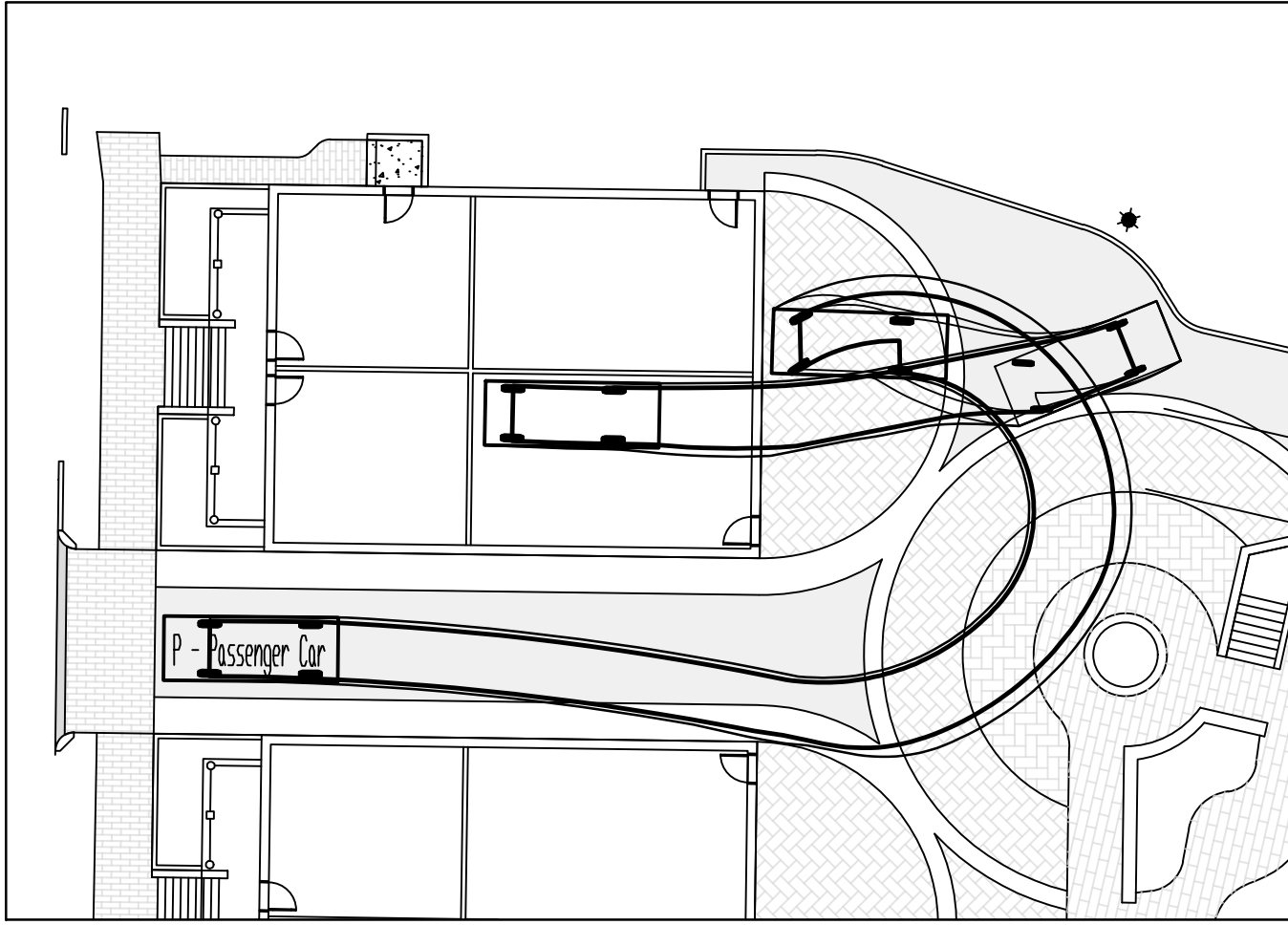
VEHICLE LEAVING SPOT 3



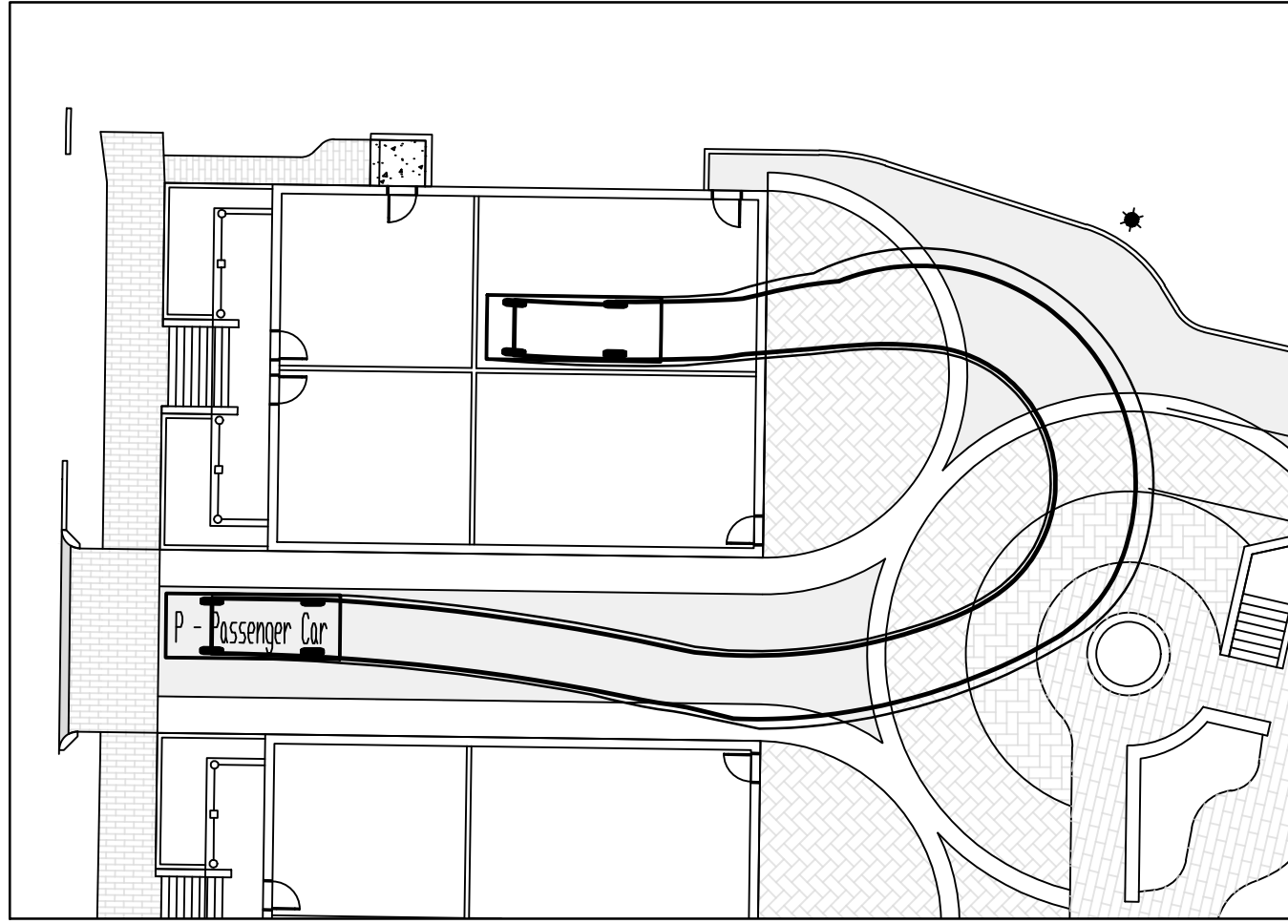
VEHICLE LEAVING SPOT 4



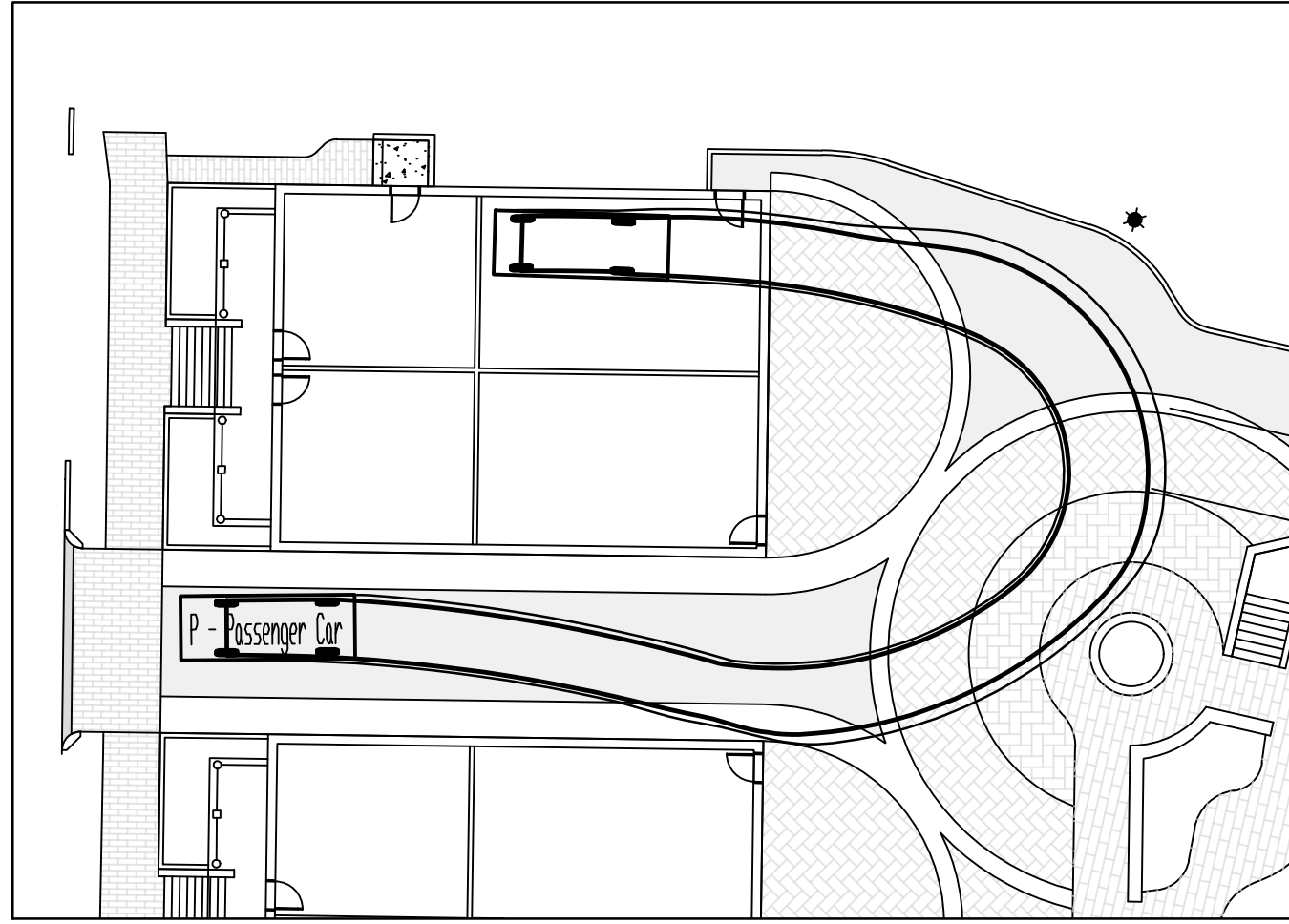
VEHICLE ENTERING SPOT 5



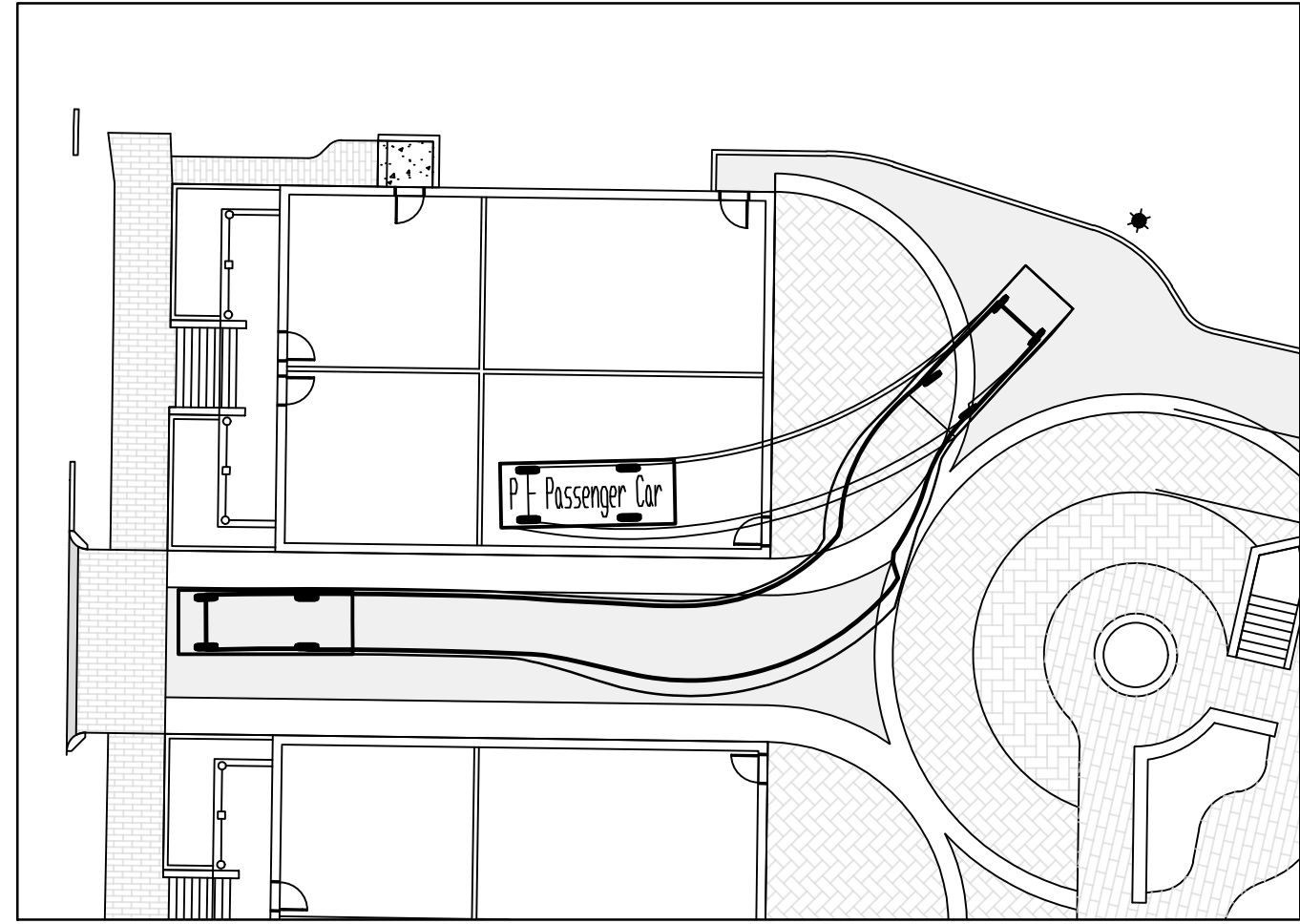
VEHICLE ENTERING SPOT 6



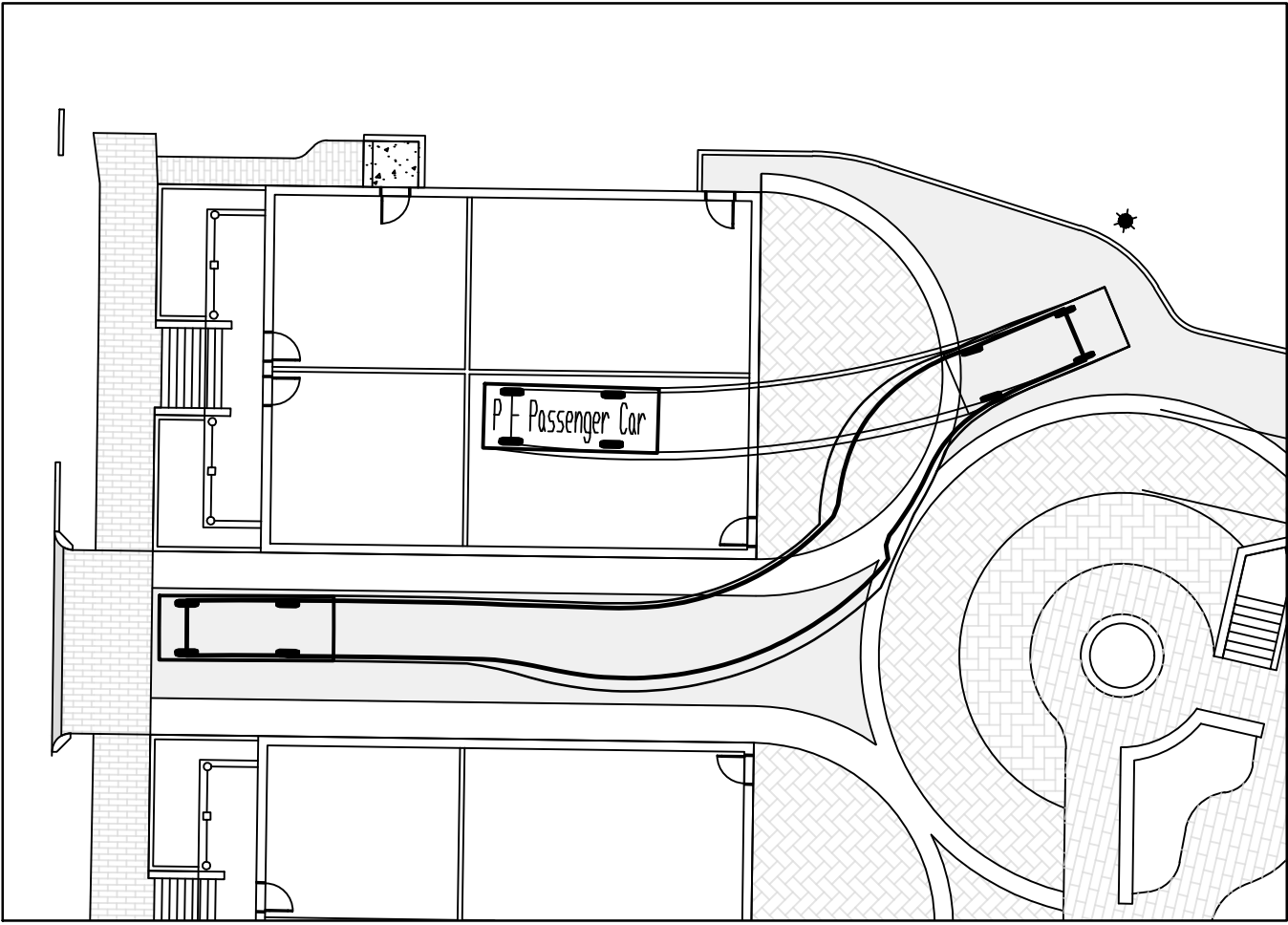
VEHICLE ENTERING SPOT 7



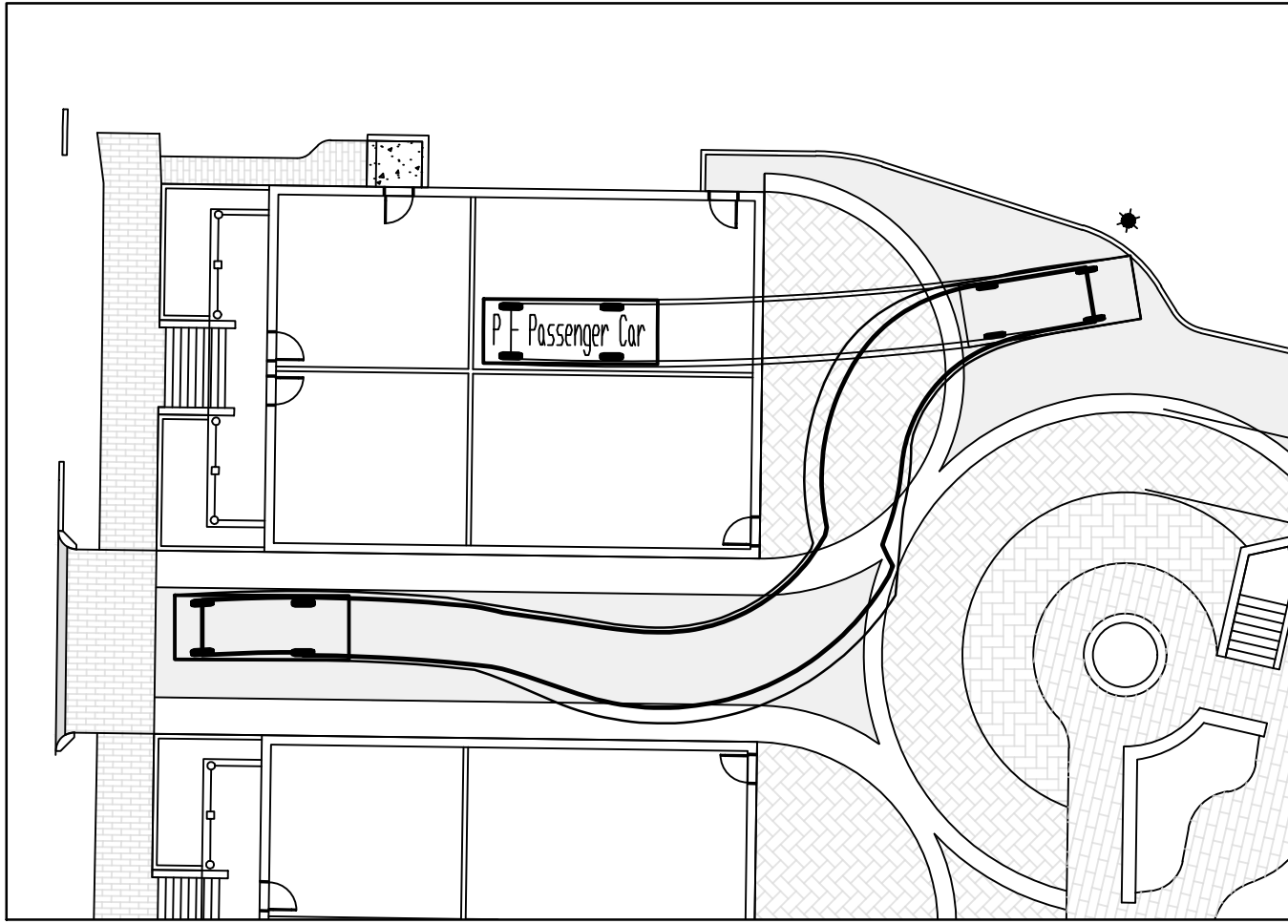
VEHICLE ENTERING SPOT 8



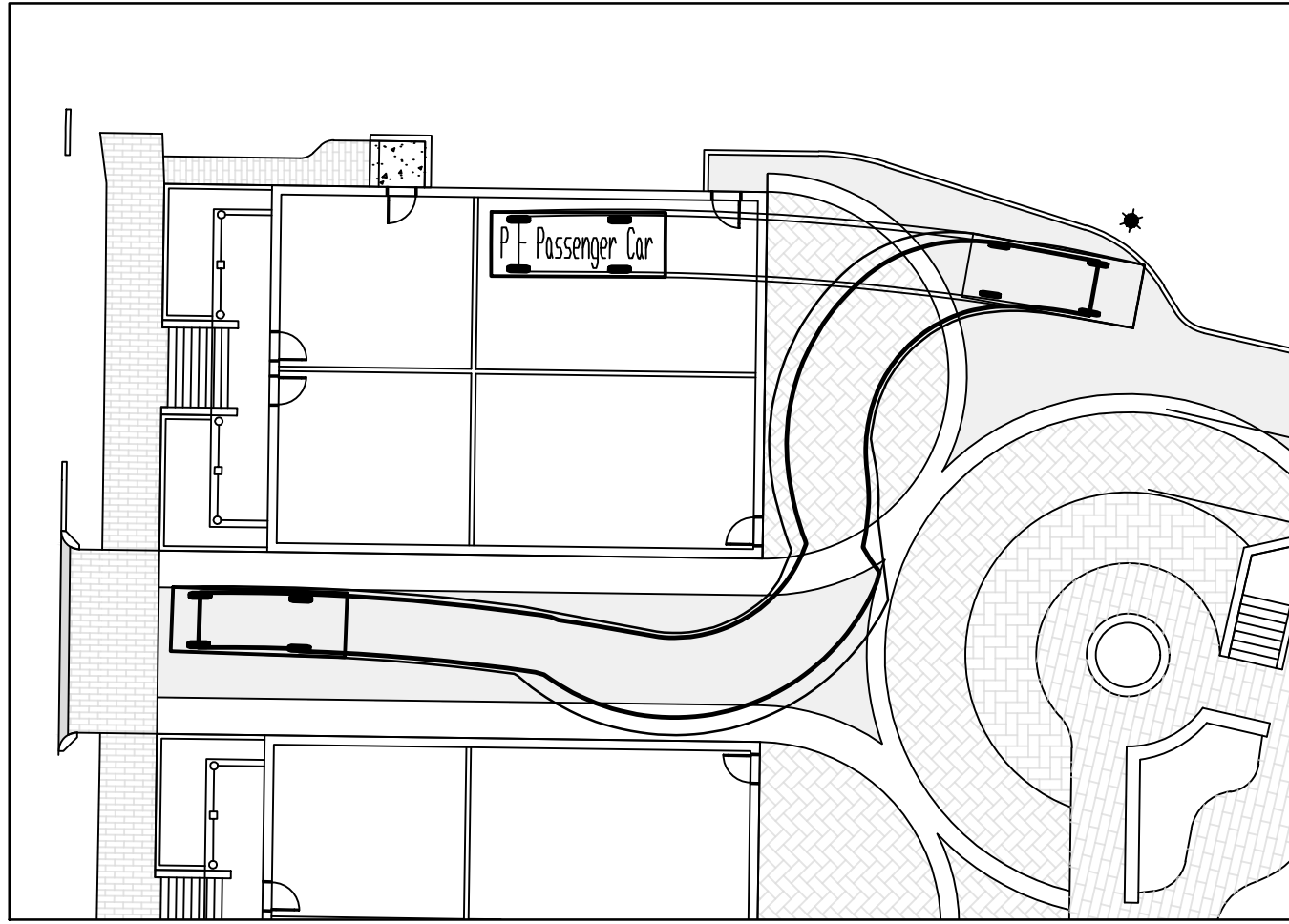
VEHICLE LEAVING SPOT 5



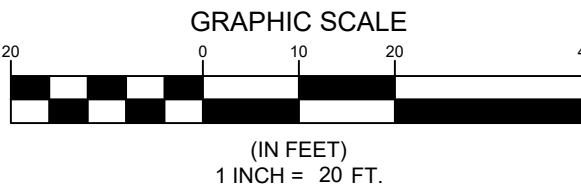
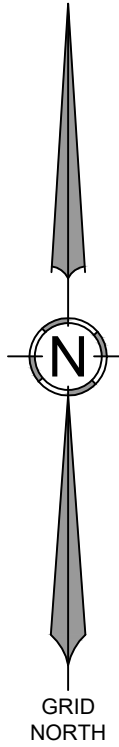
VEHICLE LEAVING SPOT 6



VEHICLE LEAVING SPOT 7



VEHICLE LEAVING SPOT 8



STATE OF MAINE

MICHAEL E. TADEMA-WIELANDT

REGISTERED PROFESSIONAL ENGINEER

DATE: 10/20/2023
PE: MICHAEL TADEMA-WIELANDT

PROJECT:
WEST STREET REDEVELOPMENT
19 WEST STREET, PORTLAND, ME

SHEET TITLE:
PARKING TURNING ANALYSIS

CLIENT:
CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240

ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260
PHONE:
(207) 926-5111
WEB SITE:
www.terradynconsultants.com

TERRADYN
CONSULTANTS, LLC
Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

DATE: 8/4/2023
SCALE: 1" = 20'
JOB NO: 23-020
SHEET: C-9.0

REVISED IN RESPONSE TO STAFF REVIEW COMMENTS

10/20/2023

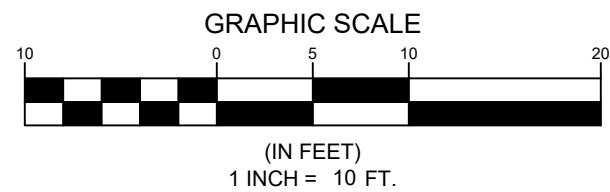
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DATE

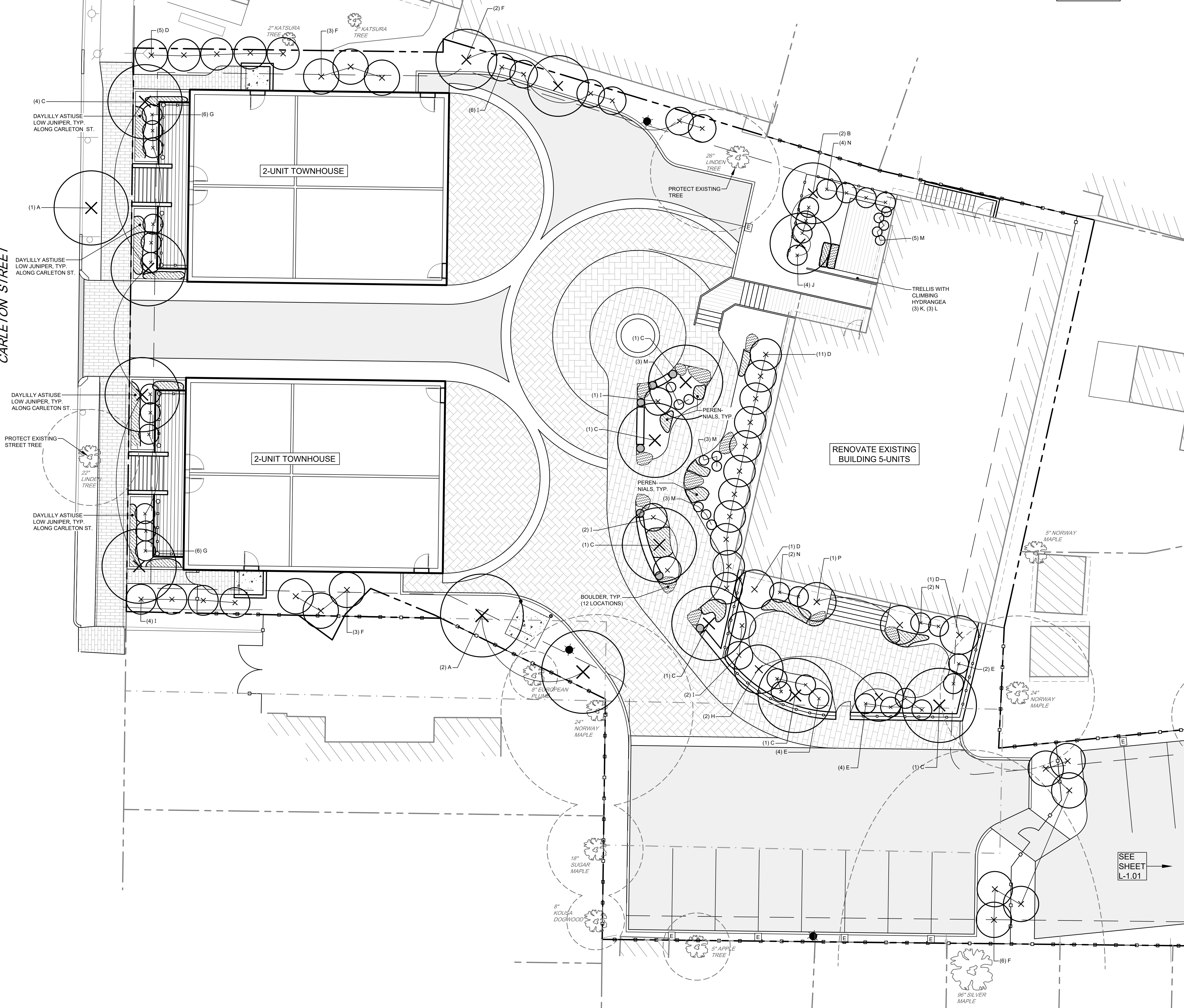
REVISIONS

C:\001\Terradyn Consultants\Project Folders - Documents\2023_Joes\23-020 West Street Redevelopment\CAD\Permitting\23-020 Turning.dwg

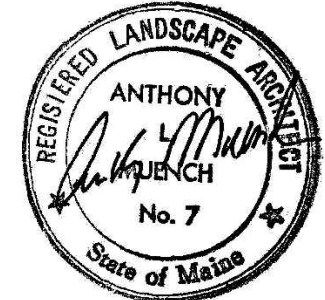
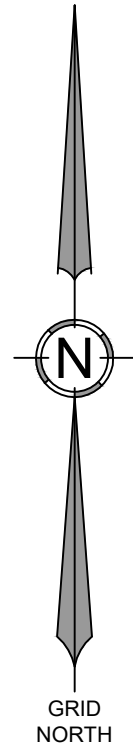
Page 902



CARLETON STREET



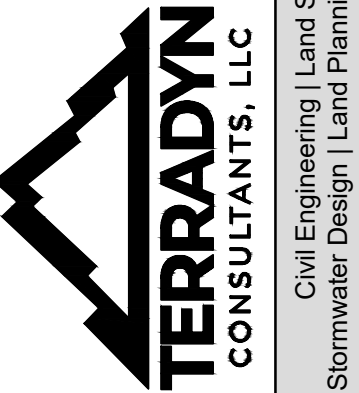
SEE SHEET
L-1.01 FOR
PLANT LIST



DATE: 12/12/2023
PE: MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
1	10/20/2023	REVISED IN RESPONSE TO STAFF REVIEW COMMENTS
2	11/19/2023	STORMWATER MANAGEMENT SYSTEM ADDED
3	12/14/2023	SUBMITTED TO HP BOARD
4	12/12/2023	REVISED IN RESPONSE TO STAFF COMMENTS

ADDRESS: 41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260
PHONE: (207) 926-5111
WEB SITE: www.terradynconsultants.com

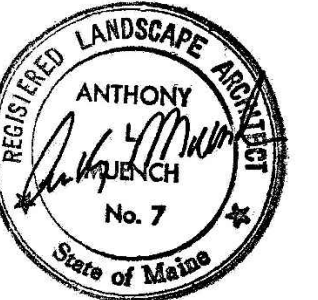
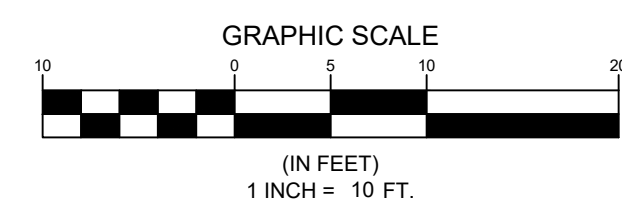


PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: WEST STREET REDEVELOPMENT
19 WEST STREET, PORTLAND, ME
SHEET TITLE: LANDSCAPE PLAN
CLIENT: CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240
DATE: 8/4/2023
SCALE: 1" = 10'
JOB NO: 23-020
SHEET: L-1.0



Key	Common & Botanical Name	Size	Root	Qty	Notes
A.	American Hornbeam <i>Carpinus Caroliniana</i>	2 ½" Cal.	B&B		Single trunk 7 ½" clear under- story
B.	Street Keeper Honey Locust <i>Gleditsia Triacanthos</i> var. <i>inermis</i> 'Street Keeper'	2 ½" Cal.	B&B		Single trunk 7 ½" clear under- story
C.	Cockspur Thornless Hawthorn <i>Crataegus</i> <i>Crossgill</i> var. <i>'Inermis'</i>	2 ½" Cal.	B&B		Single trunk 7 ½" clear under- story
D.	Arrowwood <i>Viburnum</i> <i>V. Dentatum</i>	3'-4" Ht.	B&B		
E.	Mapleleaf Viburnum <i>V. Asenifolium</i>	#3	Cont.		
F.	Blackhaw Viburnum <i>V. Prunifolium</i>	4'-5" Ht.	B&B		
G.	Summer Snowflake <i>Viburnum</i> [Shasta] <i>V. Plicatum</i> var. <i>Tomentosum</i> 'summer snowflake'	#5	Cont.		
H.	Cornelian Cherry <i>Cornus Mas</i>	1.5 " Cal.	B&B		Shrub form 3 trunk
I.	Northern Bayberry <i>Myrica Pennsylvanica</i>	#5	Cont.		
J.	Bush Honeysuckle <i>Dierilla Lonicera</i>	18"-24"	Cont.		
K.	Virginia Creeper <i>Parthenocissus Quinquefolia</i>	2 yr. ptd	Cont.		
L.	Climbing Hydrangea <i>H. Anomala</i> <i>Petiolaris</i>	#5	Cont.		
M.	Switch Grass <i>Panicum</i> <i>Varieties</i>	-----	Cont.		
N.	Hydrangea 'Little Quicksire' <i>Hydrangea paniculata</i> 'Little Quicksire'	#5	Cont.		
O.	White Oak <i>Quercus Alba</i>	2 ½" Cal.	B&B		8' clear understory
P.	Mockorange <i>Philadelphus</i> 'Minnesota Snowflake'	#5	Cont.		
PB.	Planting Beds for Assorted Perennials @ 15" deep – prepared parental soil				



DATE: 12/12/2023
PE: MICHAEL TADEMA-WIELANDT

[illegible]

ADDRESS:
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

PHONE:
(207) 926-5111

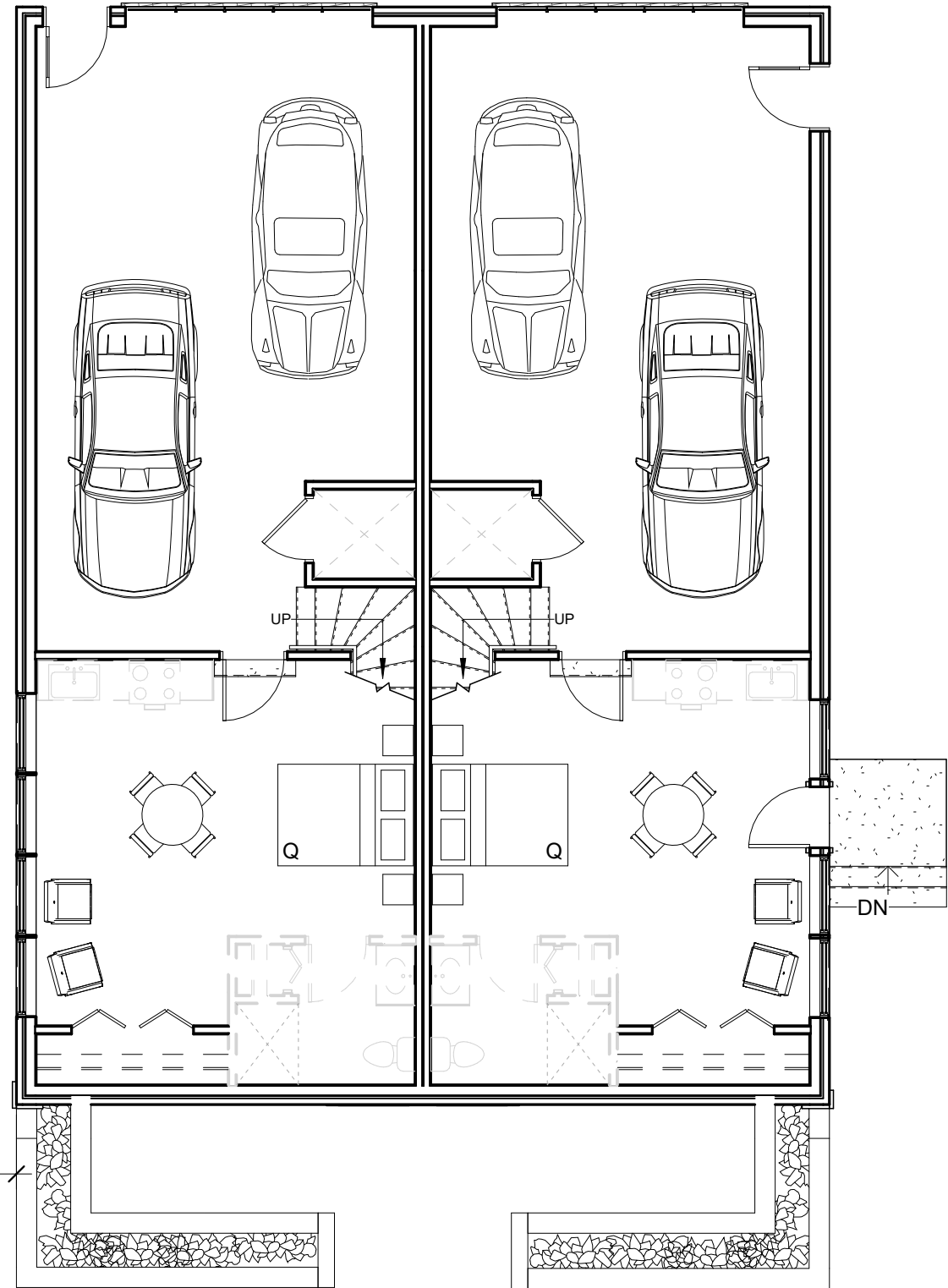
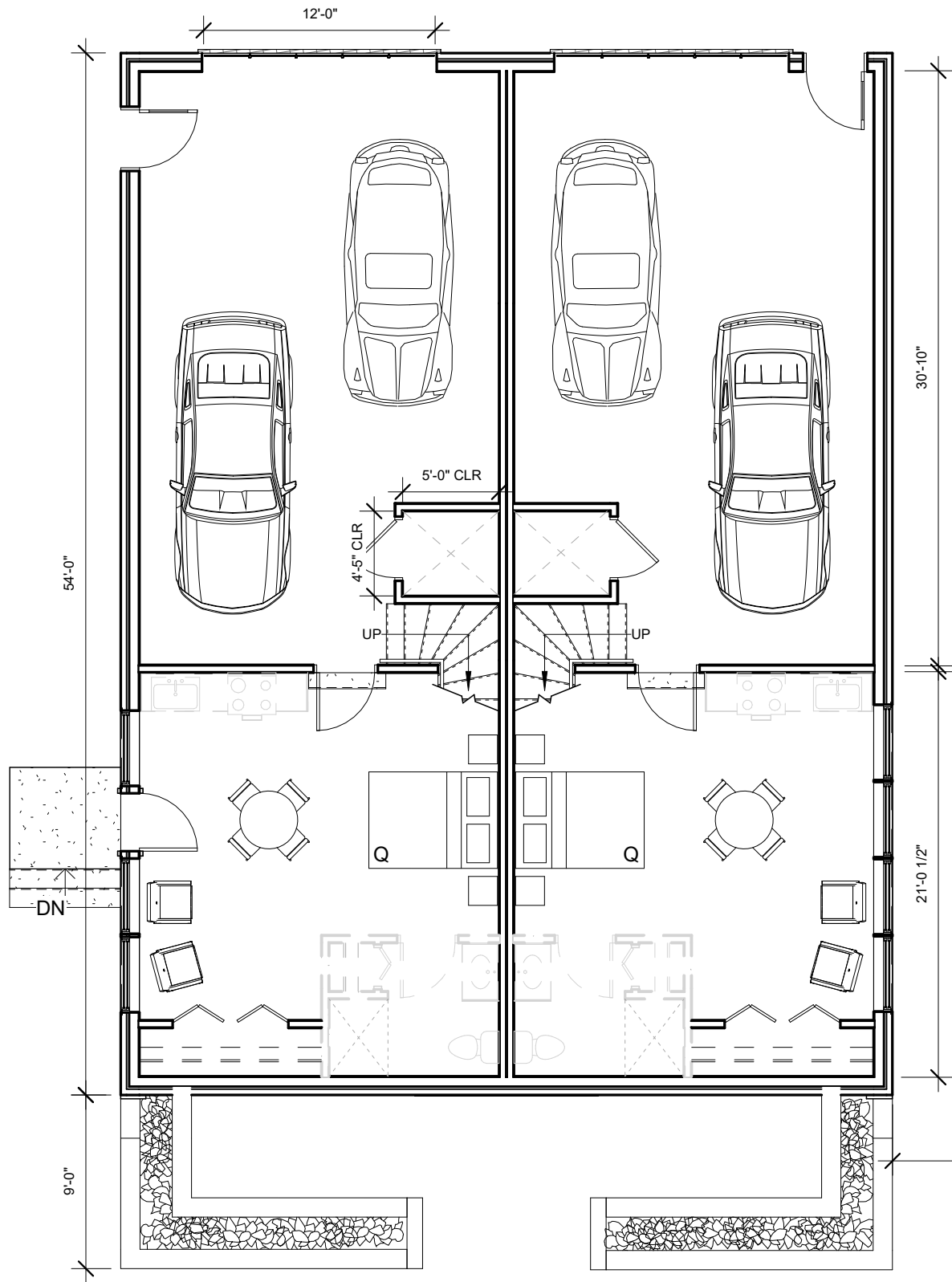
WEB SITE:
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| Environmental Permitting



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PROJECT:	WEST STREET REDEVELOPMENT
LOCATION:	19 WEST STREET, PORTLAND, ME
DATE:	8/4/2023
SCALE:	1" = 10'
DRAW NO.:	23-020
SHEET:	1
CUSTOMER:	CARLETON WEST, LLC
ADDRESS:	9 GOULD ROAD LEWISTON, ME 04240
SHEET TITLE:	LANDSCAPE PLAN



CARLETON STREET ▼

FIRST FLOOR SQUARE FOOTAGE PER UNIT:
GARAGE - 638 SQ.FT.
ROOM - 442 SQ.FT.

1 | FIRST FLOOR

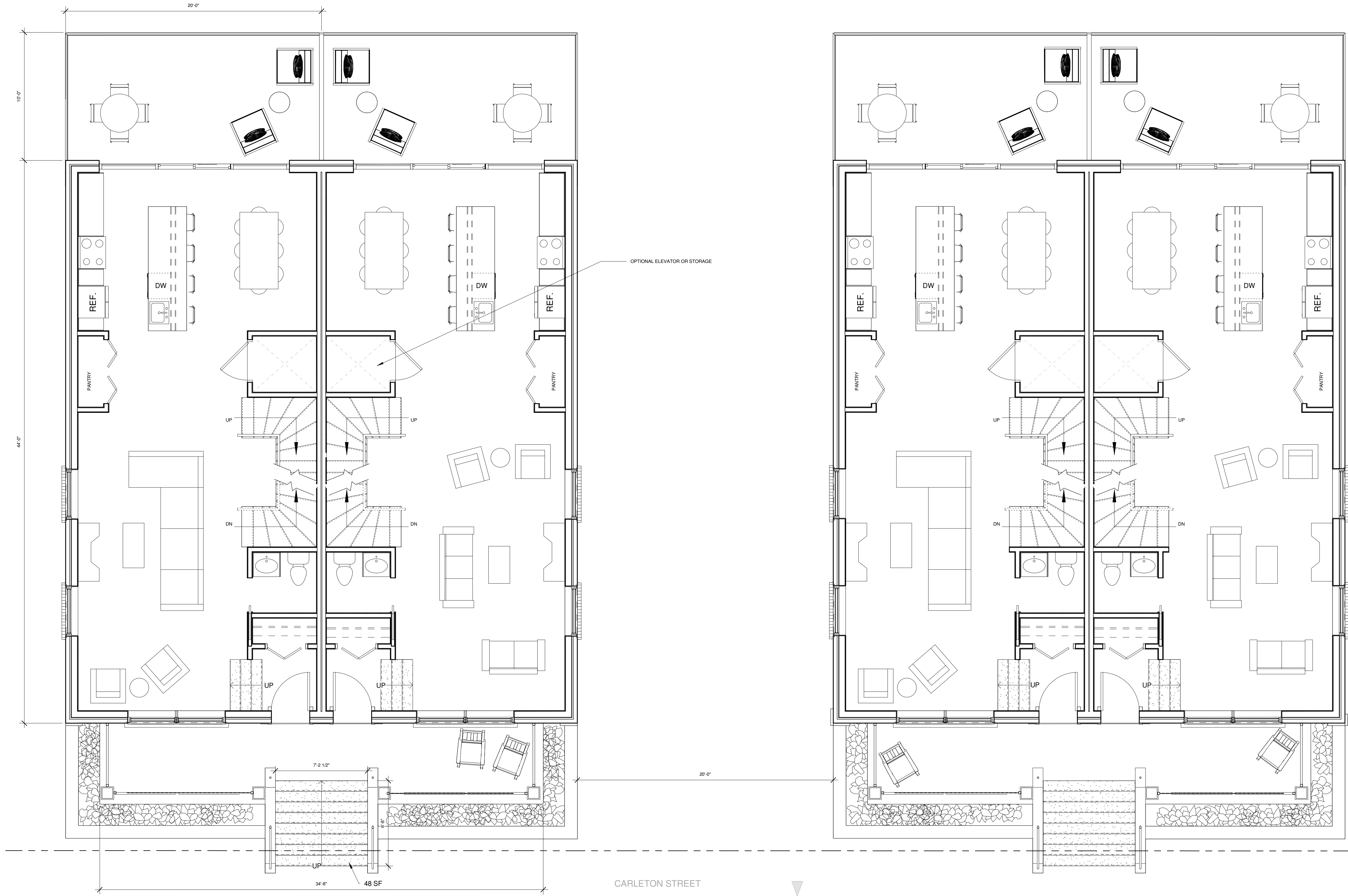
1/8" = 1'-0"

Architect:
ARCHETYP
architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 7-19-2023
Scale: 1/8" = 1'-0"
TOWNHOUSES FIRST
FLOOR PLAN

Project:
19 WEST ST.
PORTLAND, MAINE

A1.01



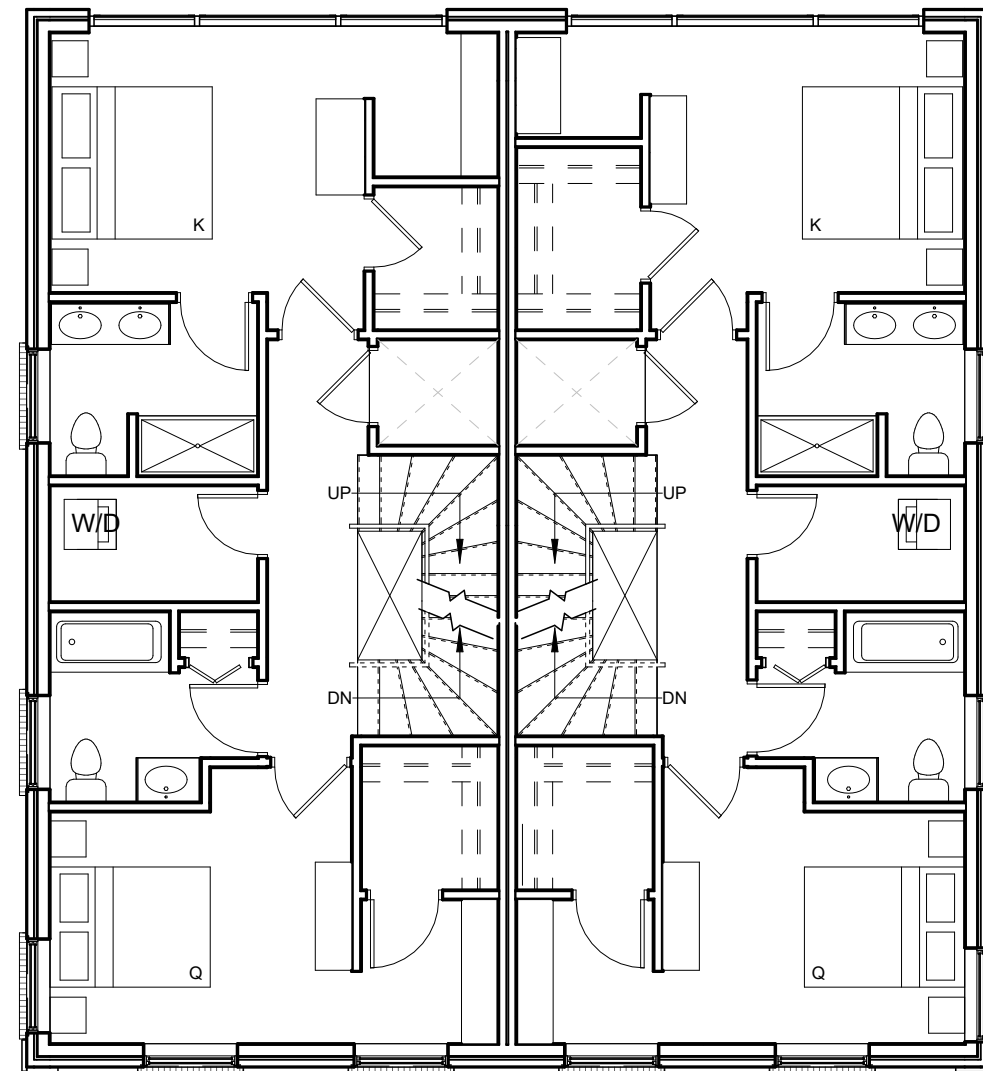
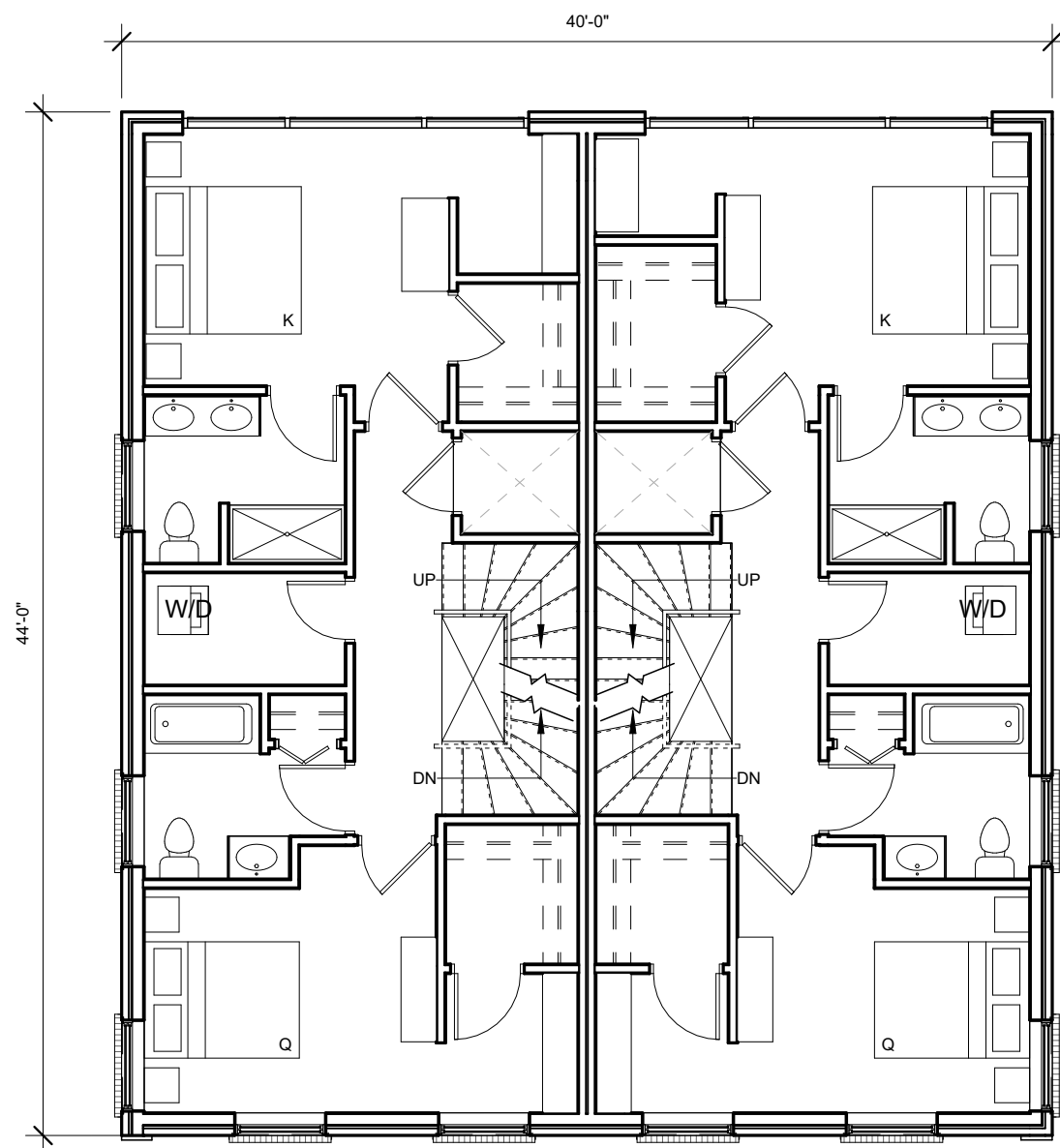
1 | SECOND FLOOR
1/4" = 1'-0"

SECOND FLOOR SQUARE FOOTAGE PER UNIT:
DECK - 200 SQ.FT.
FLOOR - 880 SQ.FT.

Date: 12-4-2023	Scale: 1/4" = 1'-0"	Revisions:	Project: 19 WEST ST. PORTLAND, MAINE	Architect: ARCHETYPE ARCHITECTS 48 Union Wharf Portland, Maine 04101 207.772.6022 archetype@archetypepa.com	Consultant:	Prepared For:	Address City, State

Townhouses Second Floor
Plan

A1.02



CARLETON STREET ▼

THIRD FLOOR SQUARE FOOTAGE PER UNIT:
880 SQ.FT.

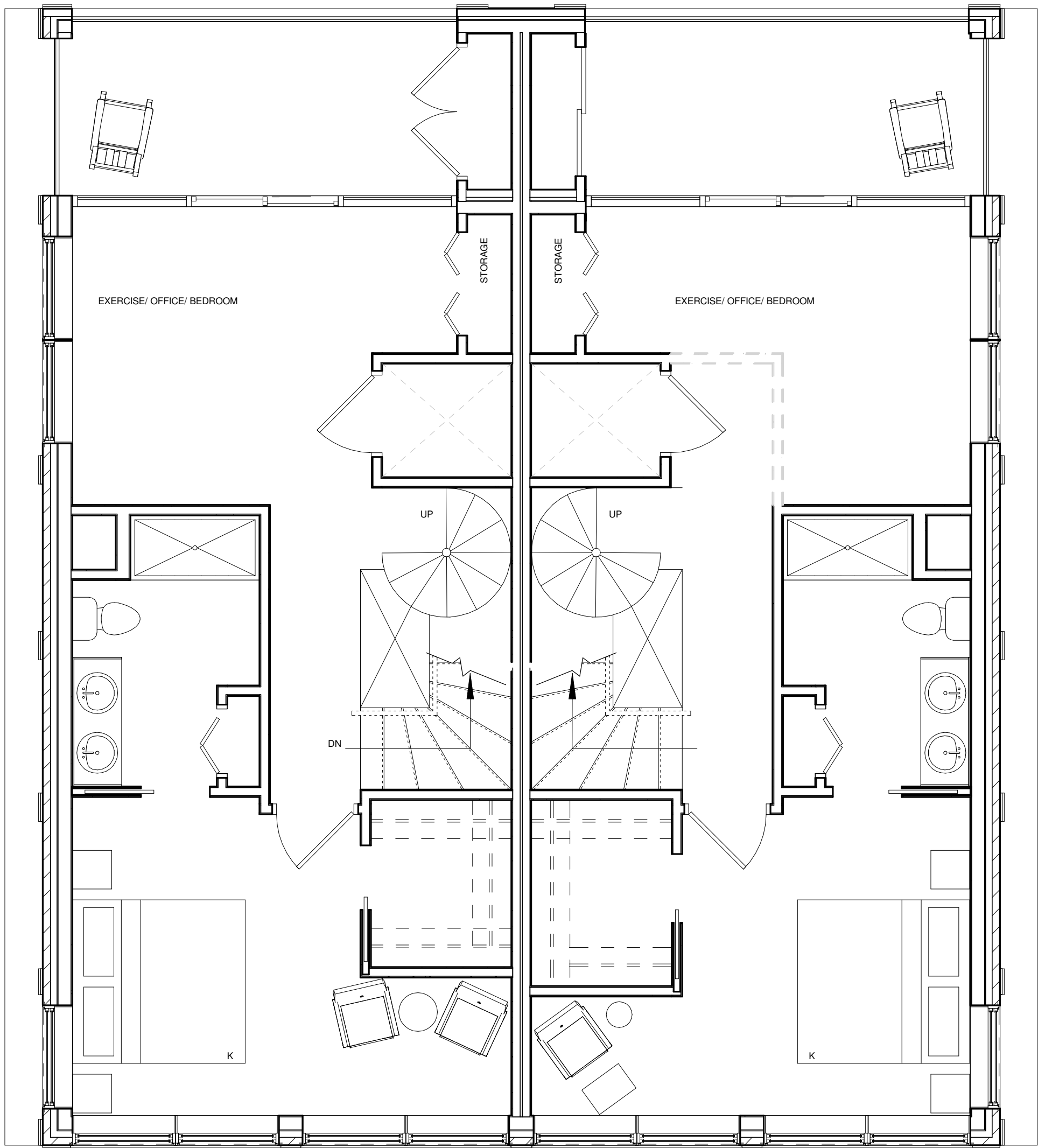
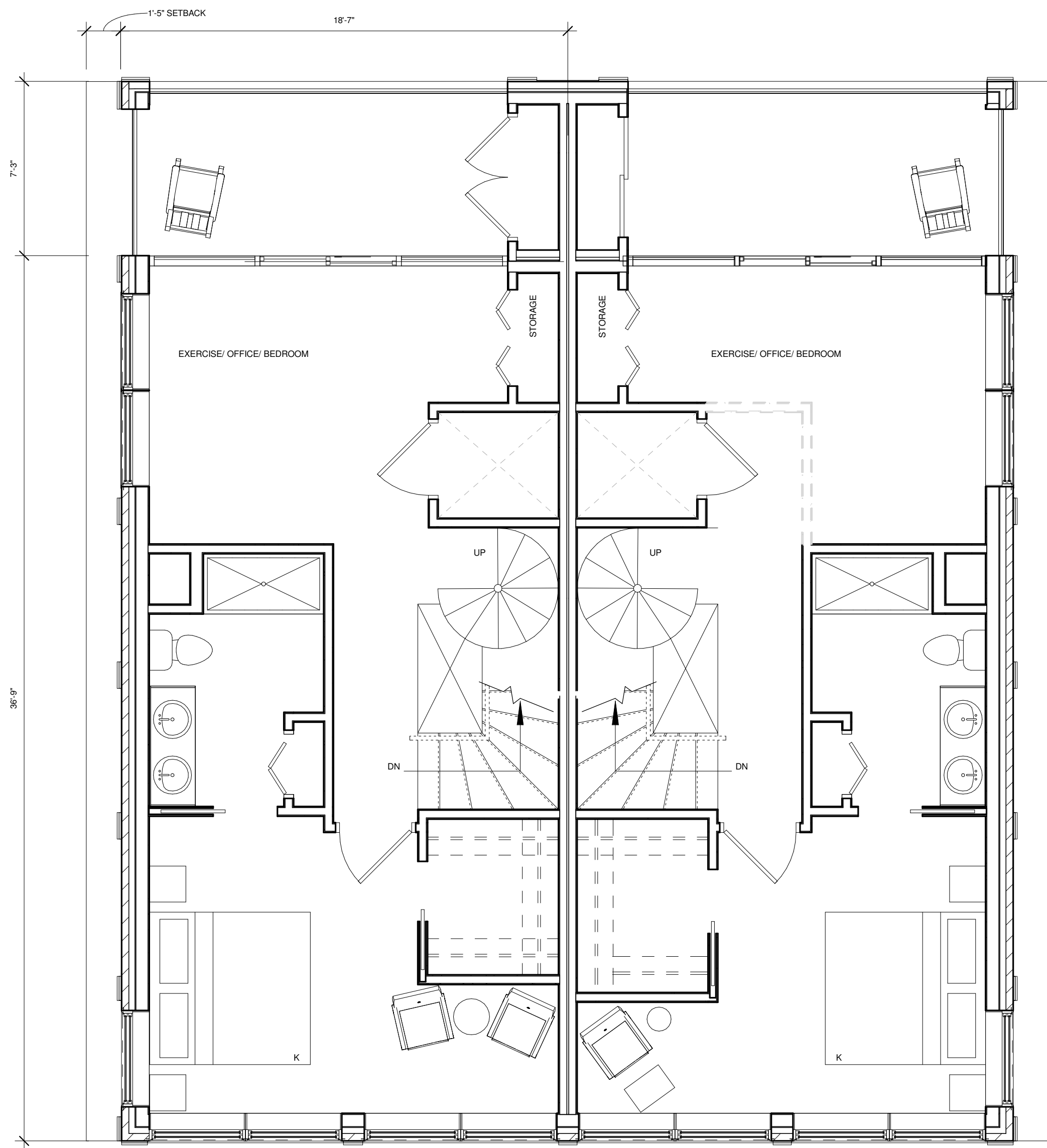
1 | THIRD FLOOR

1/8" = 1'-0"

Architect:
ARCHETYPE
architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
Scale: 1/8" = 1'-0"
Project: 19 WEST ST.
PORTLAND, MAINE
TOWNHOUSES THIRD
FLOOR PLAN

A1.03



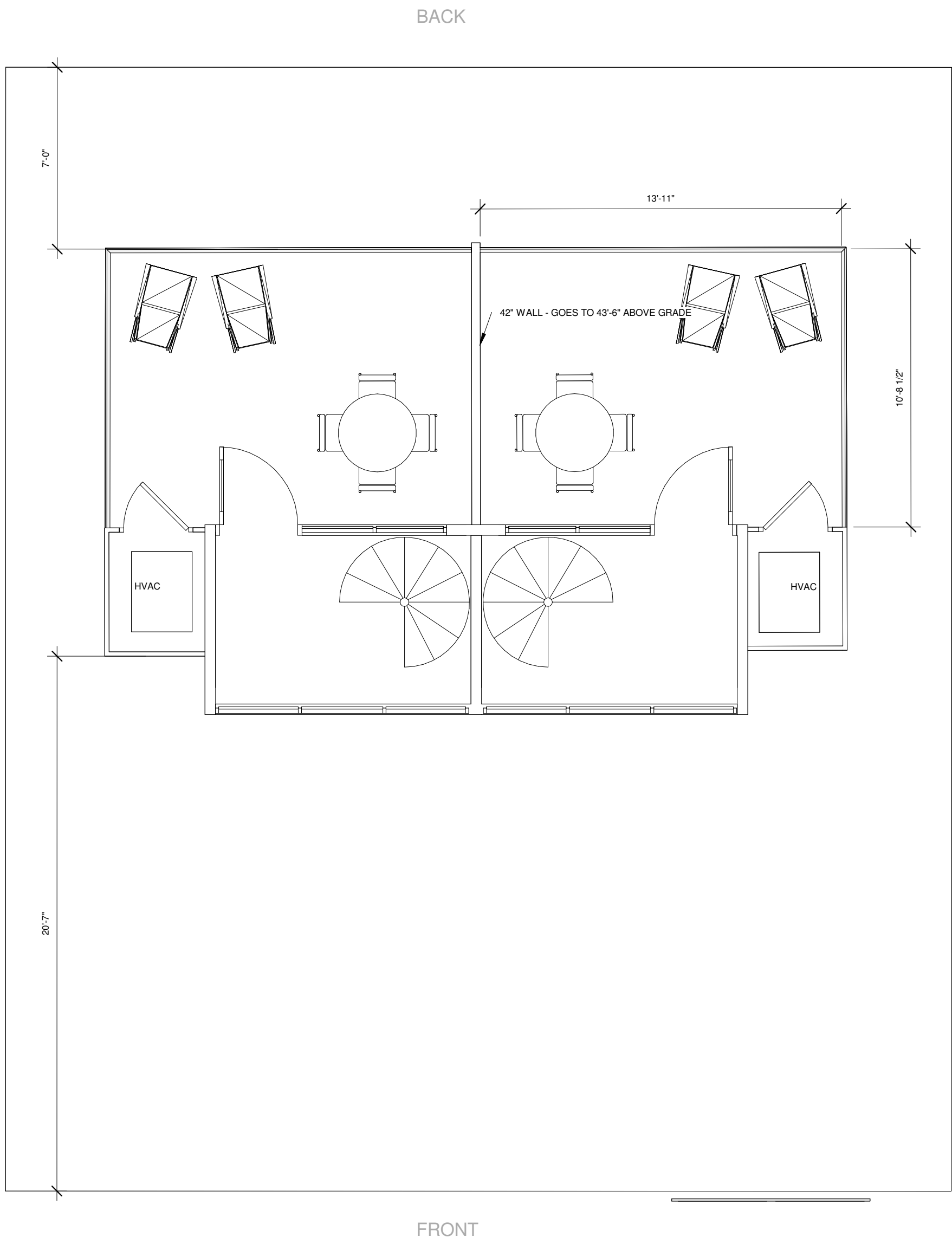
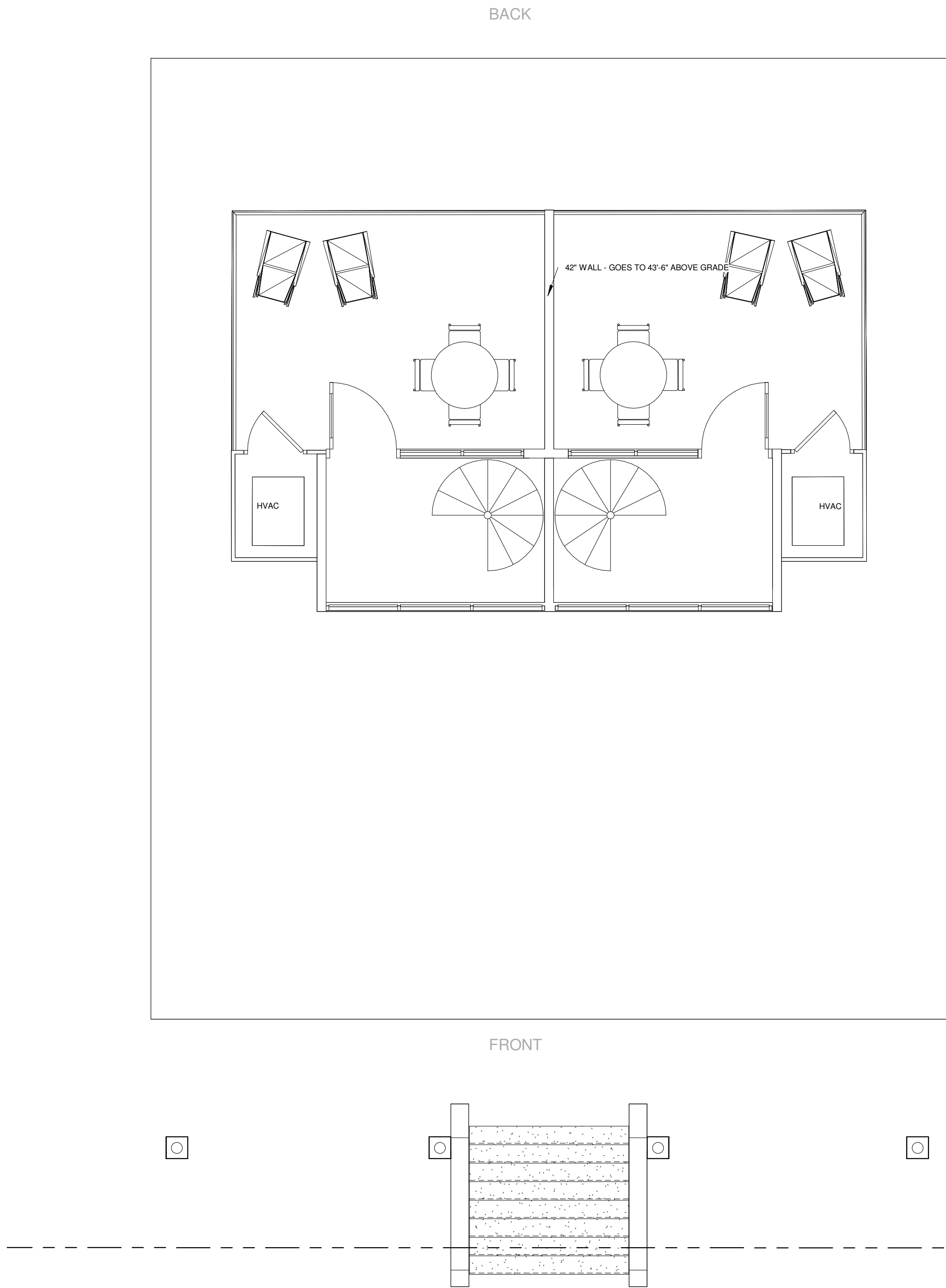
CARLETON STREET



FOURTH FLOOR SQUARE FOOTAGE PER UNIT:
DECK - 134 SQ. FT.
FLOOR - 681 SQ. FT.

1 | FOURTH FLOOR
1/4" = 1'-0"

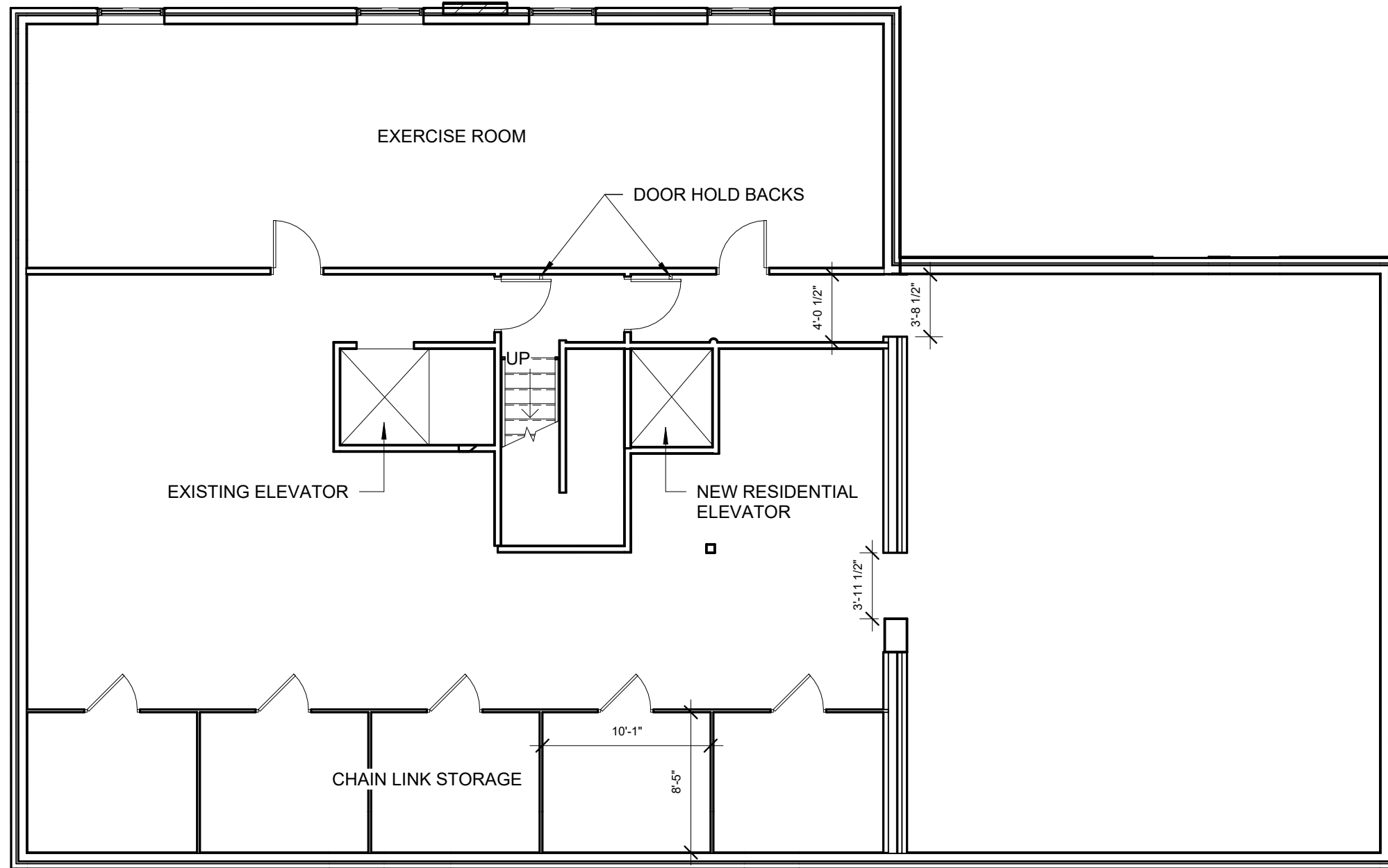
Date: 12-4-2023	Scale: 1/4" = 1'-0"	Revisions:	Project: 19 WEST ST. PORTLAND, MAINE	Architect: ARCHETYPE ARCHITECTS 48 Union Wharf Portland, Maine 04101 207.772.6022 archetype@archetypepa.com	Prepared For:	
					Address City, State	
Townhouses Fourth Floor Plan			A1.04			



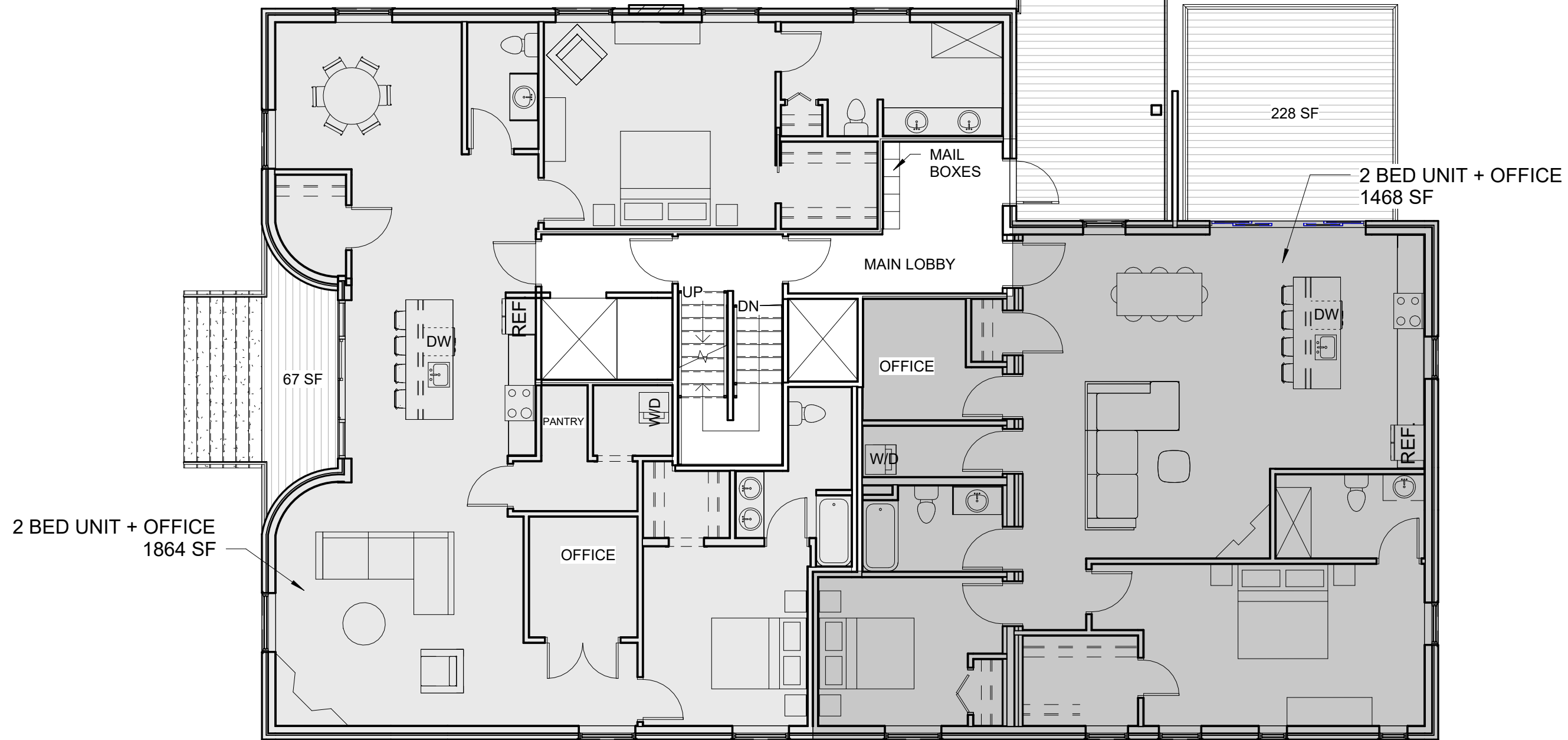
1 | Townhouse Roof Plan
1/4" = 1'-0"

ROOF SQUARE FOOTAGE PER UNIT:
DOGHOUSE - 60 SQ.FT.
DECK - 150 SQ.FT.

Prepared For:		Consultant:		Architect: ARCHETYPE ARCHITECTS 48 Union Wharf Portland, Maine 04101 207.772.6022 archetype@archetypepa.com	Project: 19 WEST ST. PORTLAND, MAINE	Revisions:	Date: 12-4-2023	Scale: 1/4" = 1'-0"	Townhouses Roof Plan	A1.05



1 | 19 WEST NEW BASEMENT FLOOR PLAN
1/8" = 1'-0"



1 | 19 WEST NEW FIRST FLOOR PLAN

1/8" = 1'-0"

GROSS SQ. FT. SHOWN

Architect:
ARCHETYPE
 architects
 48 Union Wharf Portland, Maine 04101
 (207) 772-6022 Fax (207) 772-4056

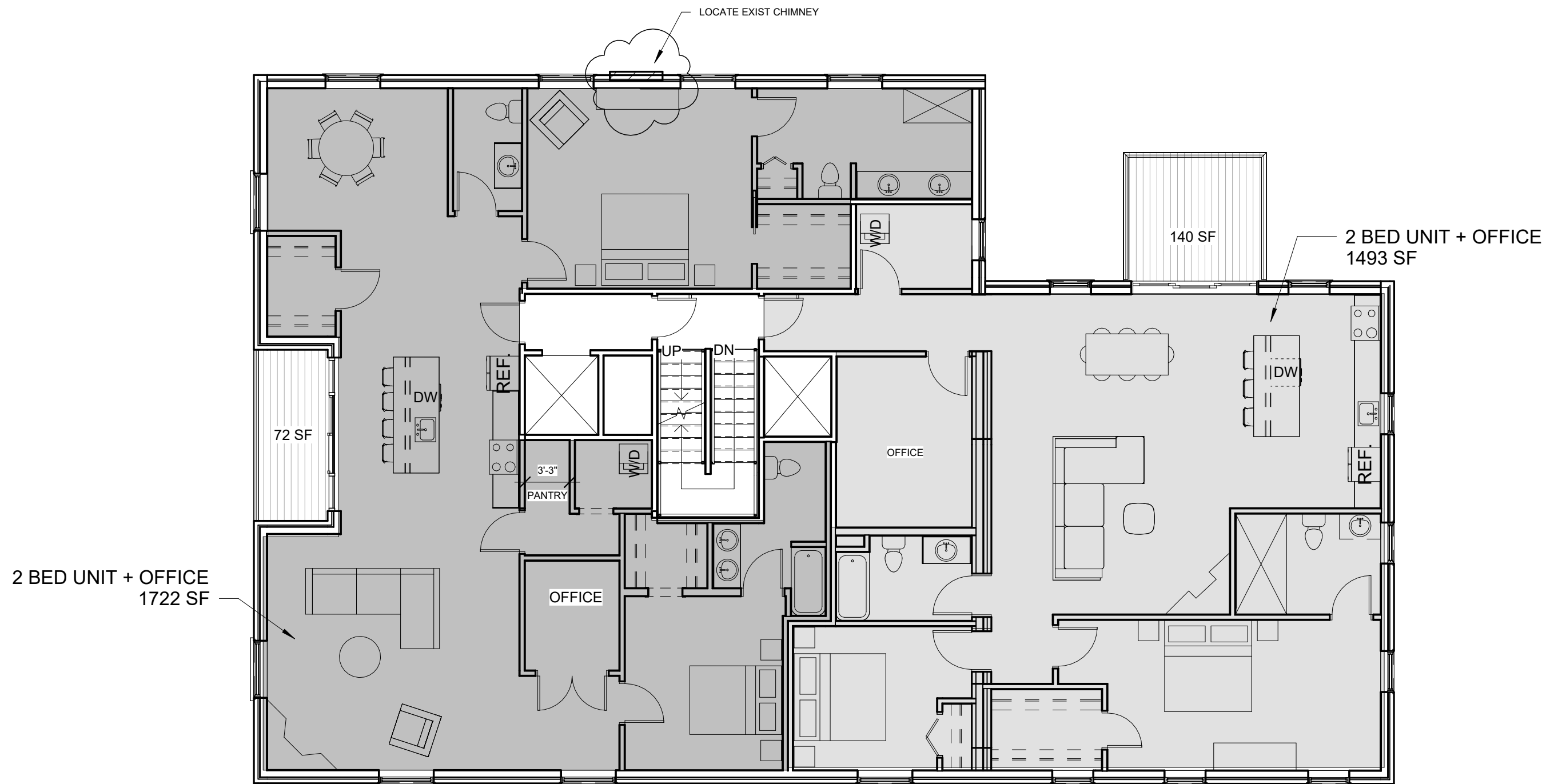
Date: 06/28/2023
 Scale: 1/8" = 1'-0"

19 WEST NEW FIRST
 FLOOR PLAN

Project: 19 WEST ST.

PORTLAND, MAINE

A1.22



GROSS SQ. FT. SHOWN

1 | 19 WEST NEW SECOND FLOOR PLAN

1/8" = 1'-0"

Architect:

ARCHETYPE
architects

48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023

Scale: 1/8" = 1'-0"

19 WEST NEW SECOND
FLOOR PLAN

Project:

19 WEST ST.

PORTLAND, MAINE

A1.23



GROSS SQ. FT. SHOWN

1 | 19 WEST NEW THIRD FLOOR PLAN
1/8" = 1'-0"

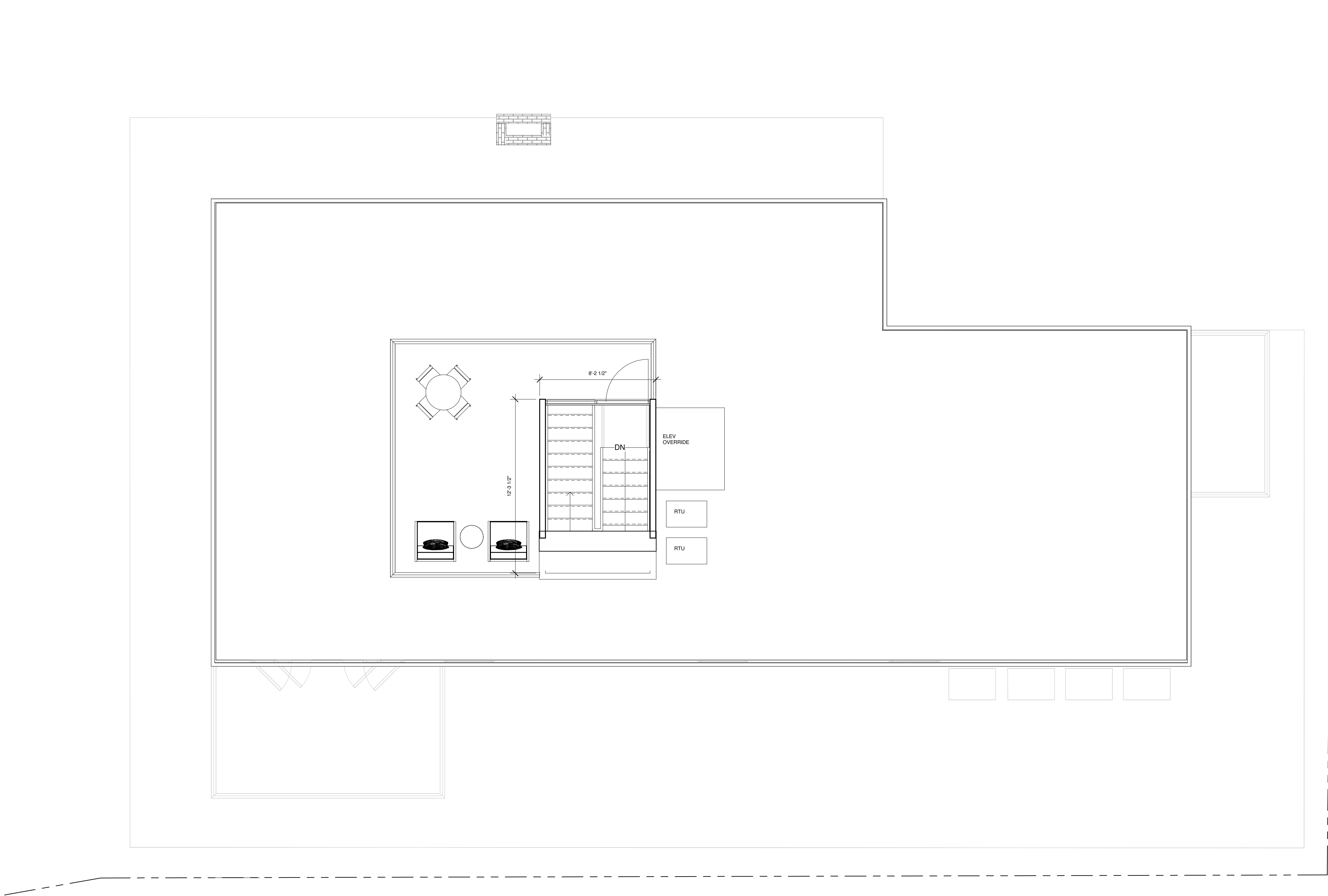
Architect: **ARCHETYPE** architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023	Scale: 1/8" = 1'-0"
19 WEST NEW THIRD FLOOR PLAN	
Project: 19 WEST ST.	PORTLAND, MAINE

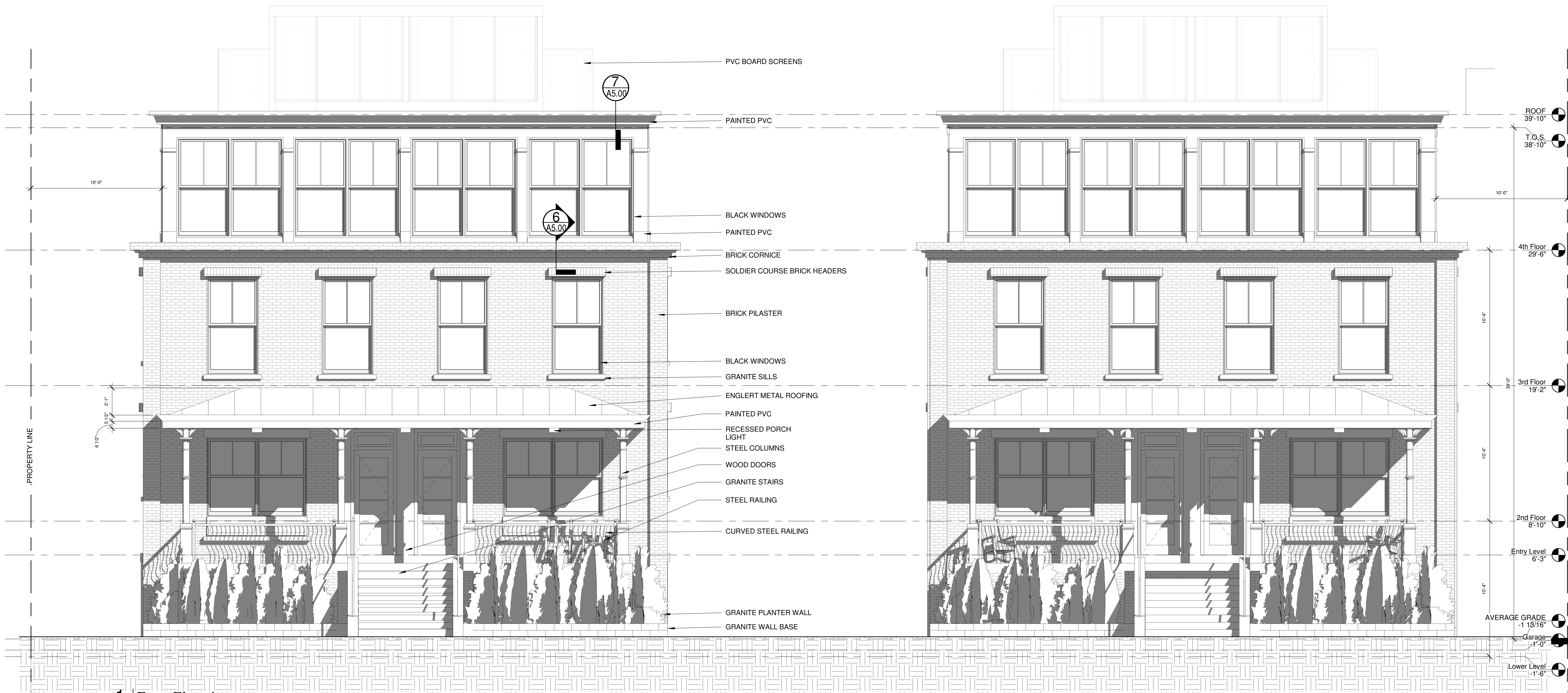
A1.24

1 | 19 WEST NEW ROOF PLAN

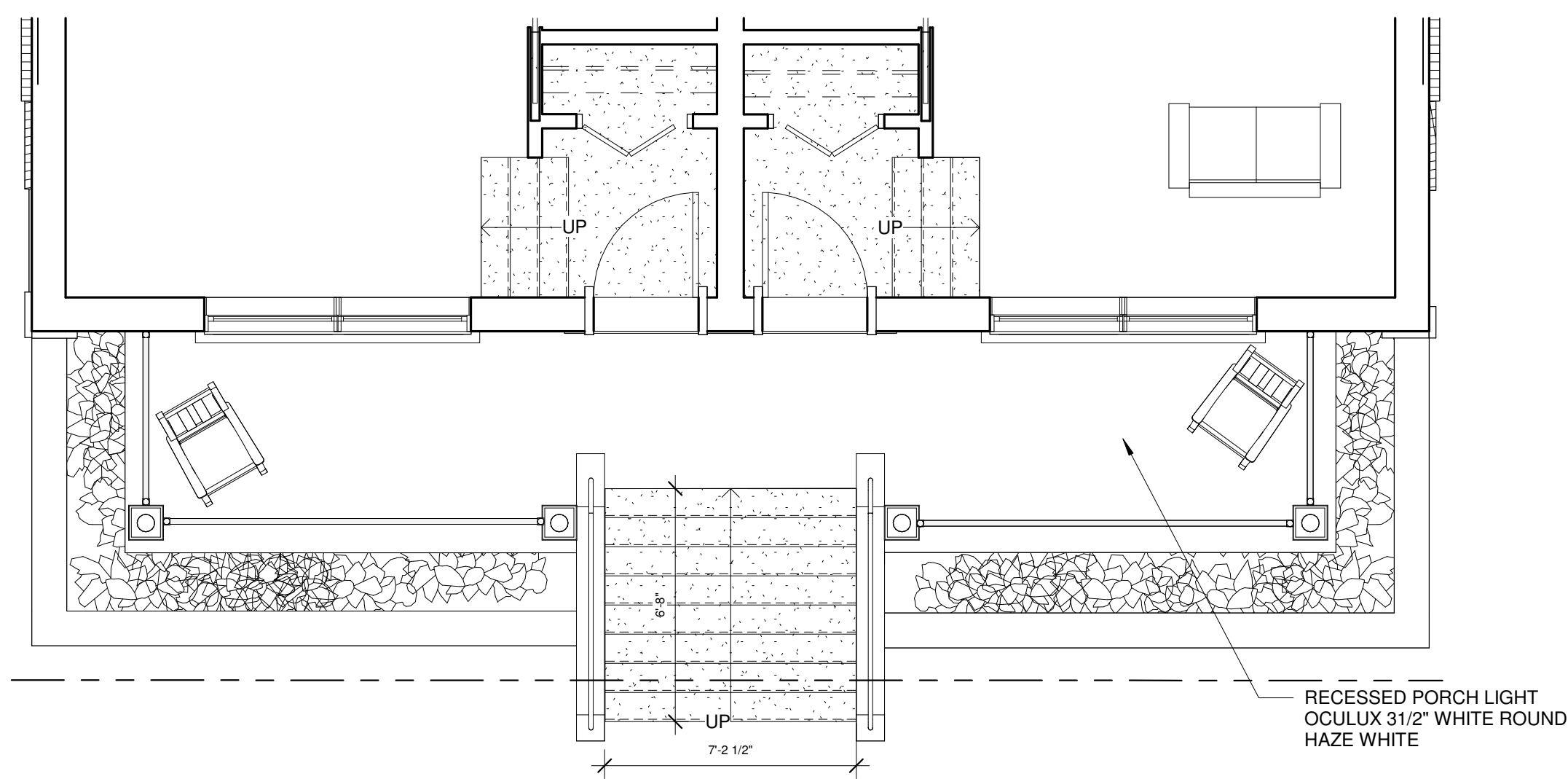
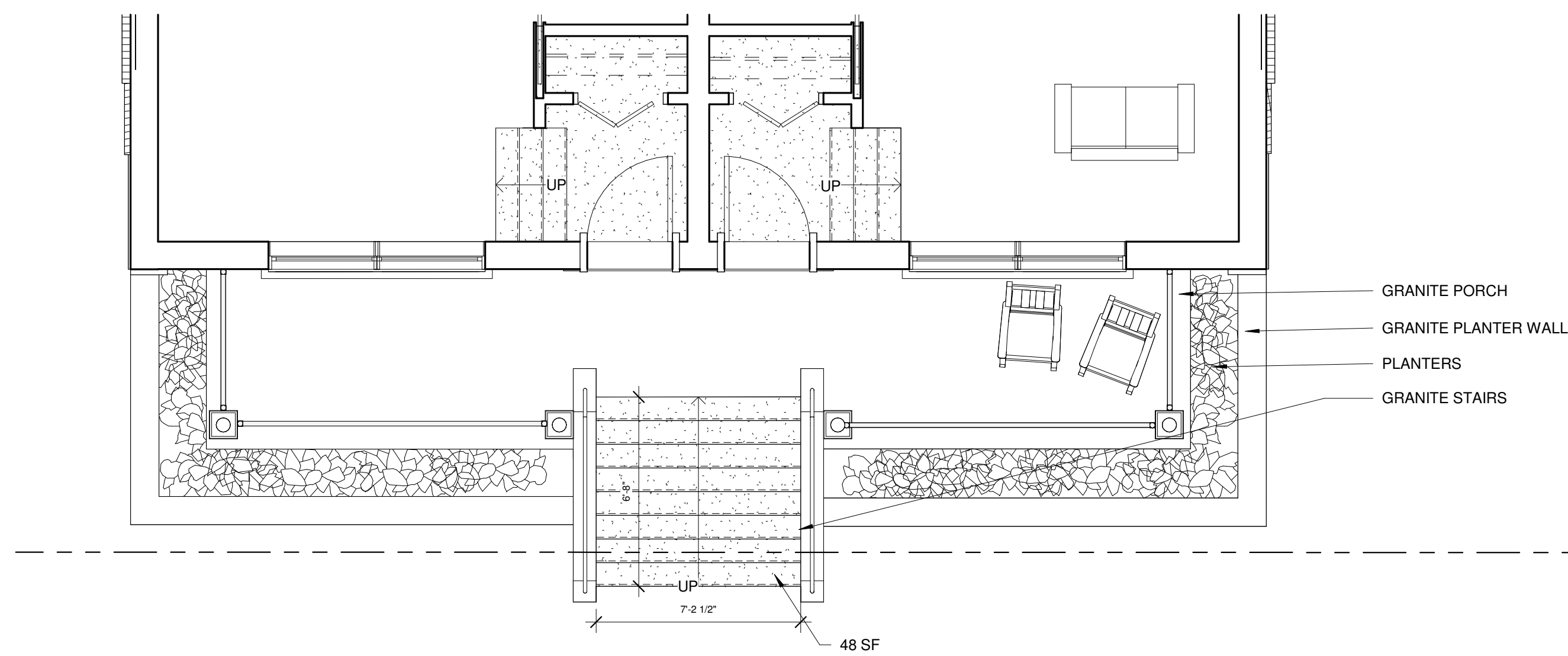
1/4" = 1'-0"



A1.25		Date: 12-4-2023	Scale: 1/4" = 1'-0"	Revisions:	Project: 19 WEST ST. PORTLAND, MAINE	Architect: ARCHETYPE ARCHITECTS 48 Union Wharf Portland, Maine 04101 207.772.6022 archetype@archetypepa.com	Consultant:		Prepared For:	Address City, State



1 Front Elevation
1/4" = 1'-0"



Prepared For:

Consultant:

Architect:

Project:

Revisions:

Date:
12-4-2023

Scale:
1/4" = 1'-0"

Townhouses Front
Elevations

19 WEST ST.

PORTLAND, MAINE

**ARCHETYPE
ARCHITECTS**

48 Union Wharf Portland, Maine 04101
207.772.6022
archetype@archetypepa.com

Address

City, State

A2.01



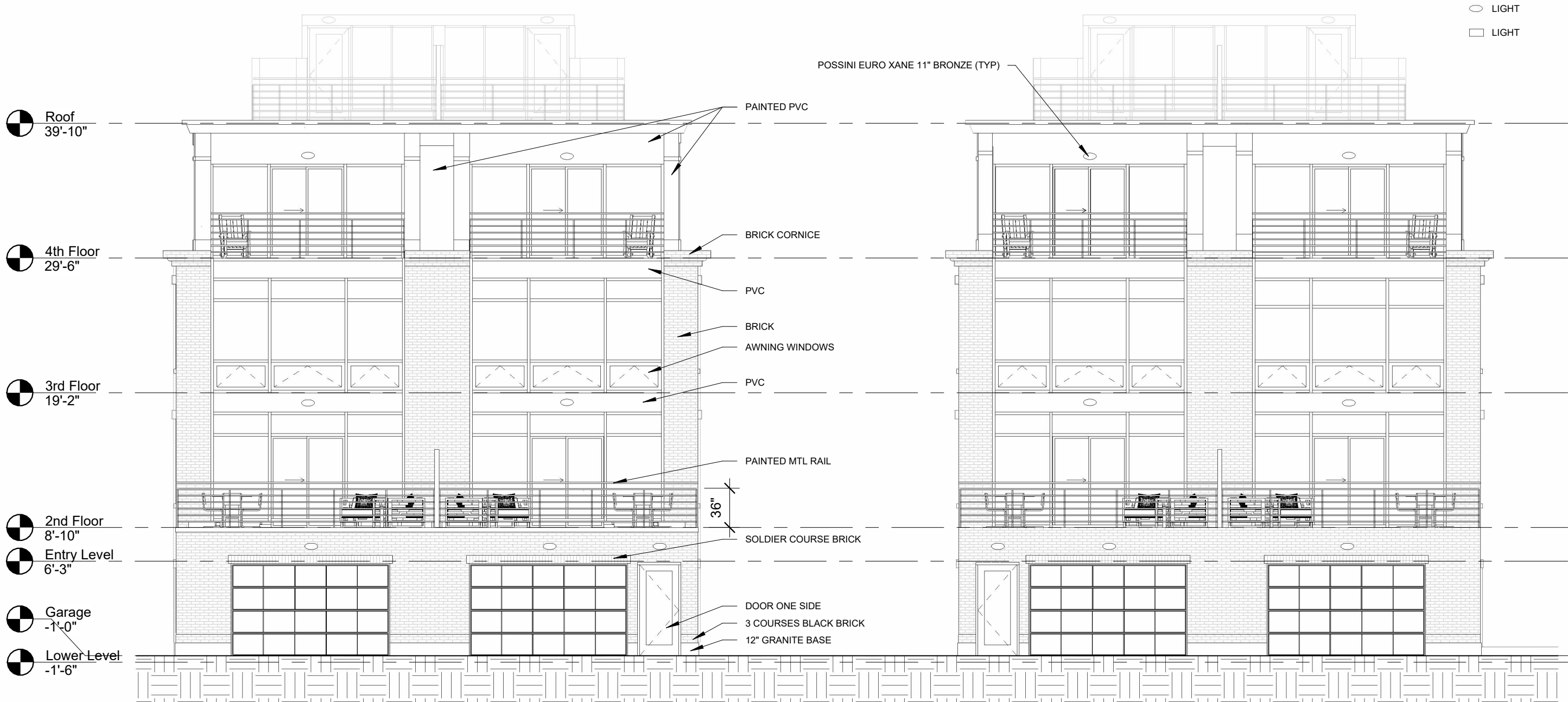
1 | CARLETON STREET ELEVATION
1/16" = 1'-0"

Architect: **ARCHETYPE**
architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023 Scale: 1/16" = 1'-0"
CARLETON STREET
ELEVATION

Project: 19 WEST ST.
PORTLAND, MAINE

A2.02



1 | TOWNHOUSES REAR ELEVATIONS

1/8" = 1'-0"

Architect:
ARCHETTYPE
 architects
 48 Union Wharf Portland, Maine 04101
 (207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
 Scale: 1/8" = 1'-0"
**TOWNHOUSES REAR
 ELEVATIONS**

Project:
19 WEST ST.

PORTLAND, MAINE

A2.03



1 | TOWNHOUSE DRIVE SIDE ELEVATION
1/8" = 1'-0"

Architect: **ARCHETYPE**
a r c h i t e c t s
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
Scale: 1/8" = 1'-0"
TOWNHOUSE DRIVE
SIDE ELEVATION

Project: 19 WEST ST.
PORTLAND, MAINE

A2.04



1 | TOWNHOUSE SIDE ELEVATION
1/8" = 1'-0"

Architect: **ARCHETYPE**
Architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
Scale: 1/8" = 1'-0"
TOWNHOUSE SIDE ELEVATION

Project: **19 WEST ST.**
PORTLAND, MAINE

A2.05



1 | 19 WEST NEW SOUTH ELEVATION
1/8" = 1'-0"

Architect:
ARCHETYPE
architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
Scale: 1/8" = 1'-0"
19 WEST NEW SOUTH
ELEVATION

Project: 19 WEST ST.
PORTLAND, MAINE

A2.21



1 | 19 WEST NEW WEST ELEVATION
1/8" = 1'-0"

Architect: **ARCHETYP**
Architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
Scale: 1/8" = 1'-0"
19 WEST NEW WEST
ELEVATION

Project: 19 WEST ST.
PORTLAND, MAINE

A2.22



1 | 19 West North Elevation
1/4" = 1'-0"

Prepared For:		Consultant:	
Date: 12-4-2023		Project: 19 WEST ST. PORTLAND, MAINE	
Revisions:		Architect: ARCHETYPE ARCHITECTS 48 Union Wharf Portland, Maine 04101 207.772.6022 archetype@archetypepa.com	
New North Elevation		A2.23	



1 | 19 WEST NEW EAST ELEVATION
1/8" = 1'-0"

Architect: **ARCHETYPE**
Architects
48 Union Wharf Portland, Maine 04101
(207) 772-6022 Fax (207) 772-4056

Date: 06/28/2023
Scale: 1/8" = 1'-0"
19 WEST NEW EAST
ELEVATION

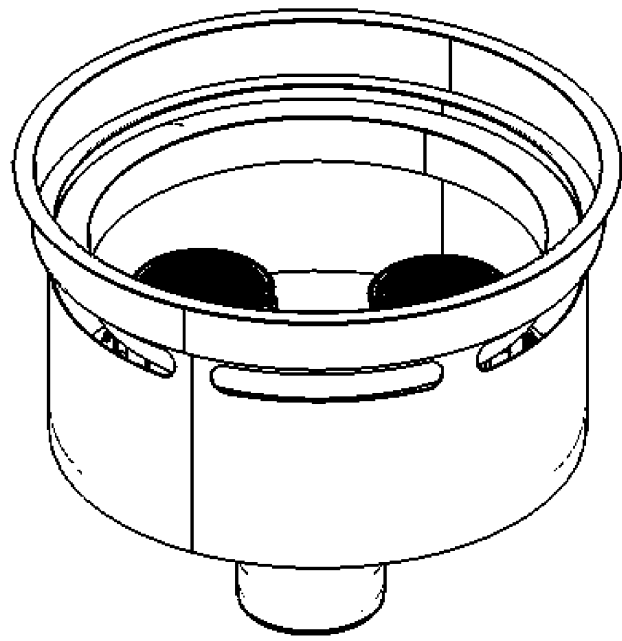
Project: 19 WEST ST.
PORTLAND, MAINE

A2.24

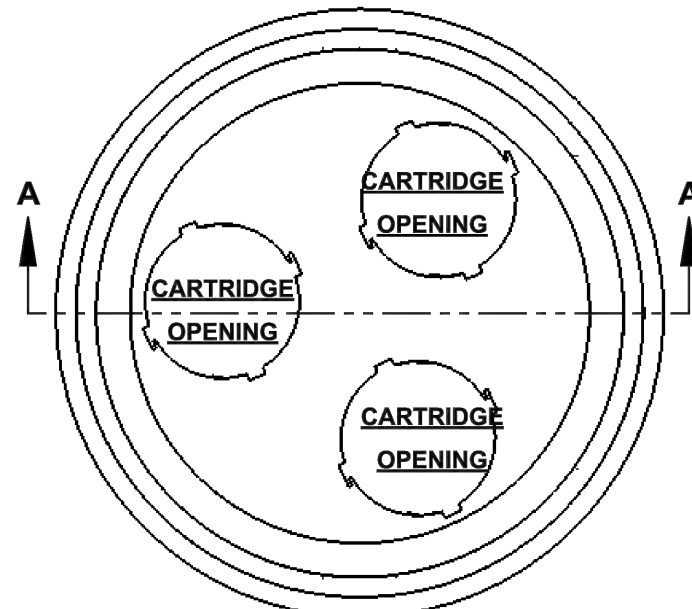
NOTES:

1. TOTAL WEIGHT, EMPTY: 40 LBS (EST), NO CARTRIDGES
2. MATERIALS:
 1. FRAME/BASIN: ALUMINUM ALLOY, 5000 SERIES
3. PERFORMANCE CHARACTERISTICS:
 1. DEBRIS CAPACITY: 5.2 CU. FT
 2. FILTERED FLOWRATE (STANDARD CARTS): 345 GPM (0.78 CFS)
 3. BYPASS FLOWRATE: 1930 GPM (4.3 CFS)
4. FOR CLEAR OPENING: 36" DIAMETER
5. TYPICAL INSTALLATION:

CAREFULLY REMOVE THE STORM GRATE, MEASURE CATCH BASIN FRAME CLEAR OPENING AND VERIFY SUPPORT FLANGE WILL REST ON GRATE SUPPORT LEDGE. INSTALL STORMBASIN AND VERIFY THAT THE FLANGE IS SECURE AND THE UNIT IS SNUG WITH LITTLE MOVEMENT IN THE DRAIN. REINSTALL THE STORM GRATE DIRECTLY ON THE STORMBASIN SUPPORT FLANGE.
6. RECOMMENDED MINIMUM VAULT DEPTH 2" BELOW CARTRIDGE
7. USE ONLY WITH FABCO REPLACEABLE MEDIA CARTRIDGES



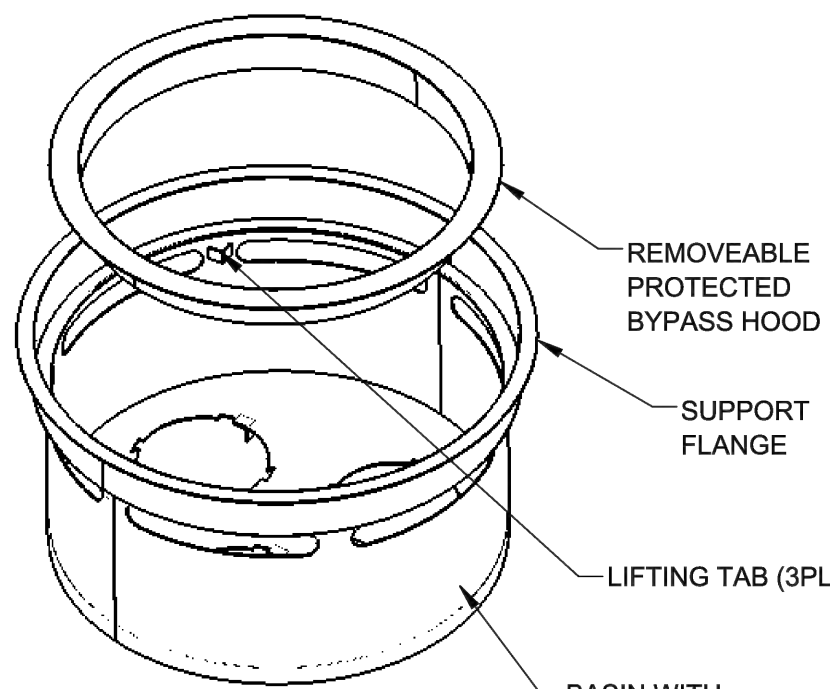
REFERENCE VIEW



SECTION A-A

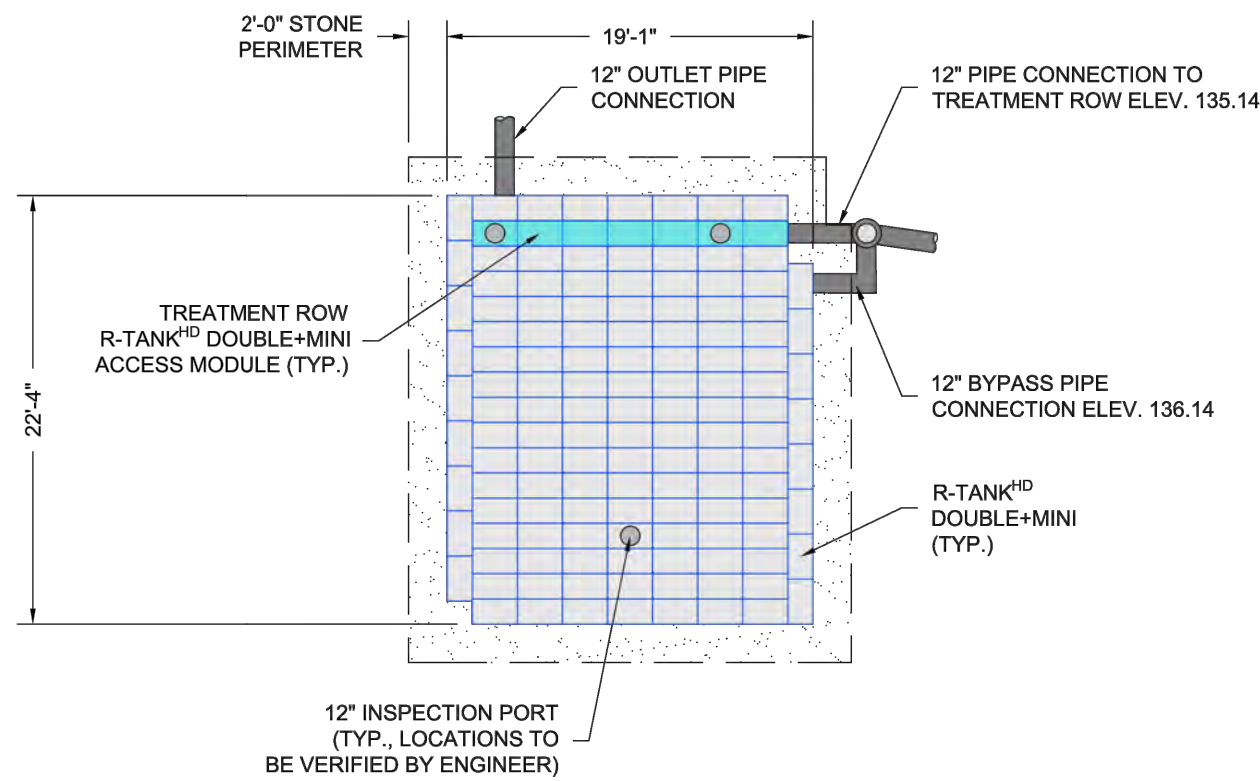
STORM BASIN CARTRIDGE

NOT TO SCALE



REFERENCE VIEW
(EXPLODED)

STANDARD CARTRIDGE
SHOWN FOR REFERENCE

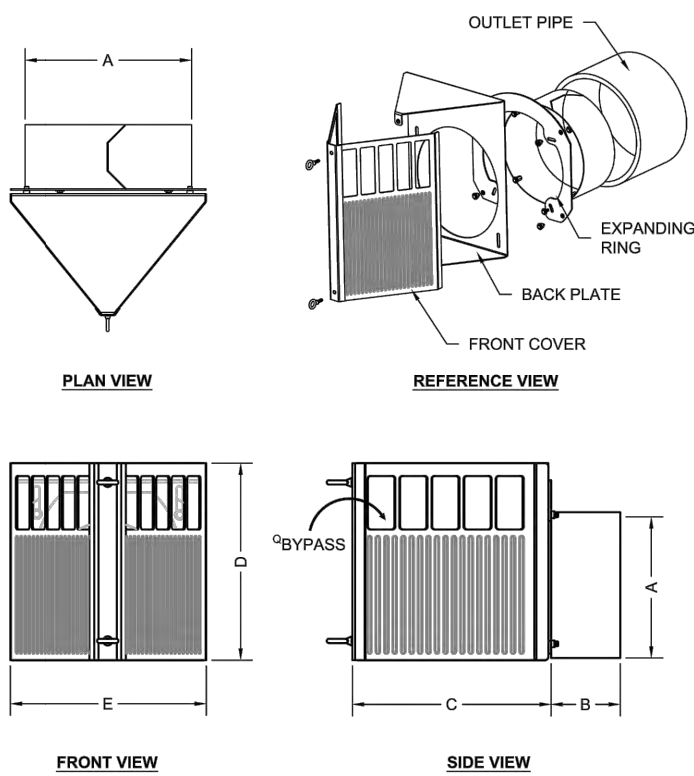


R-TANK SYSTEM LAYOUT

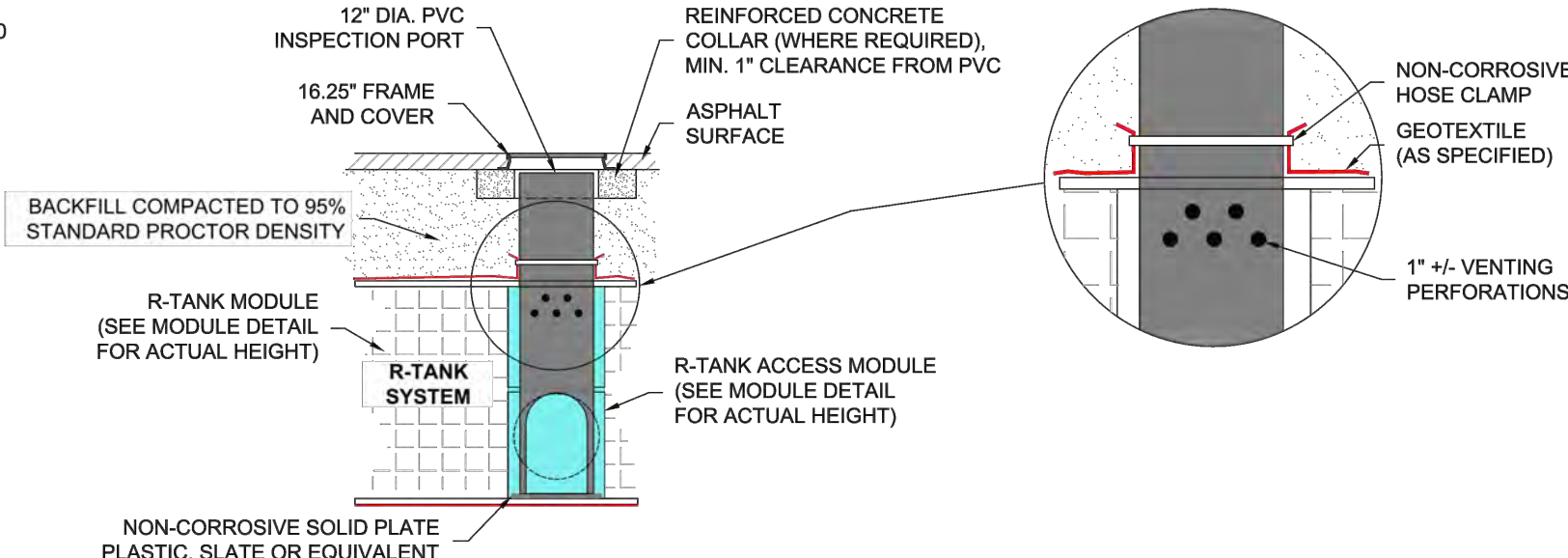
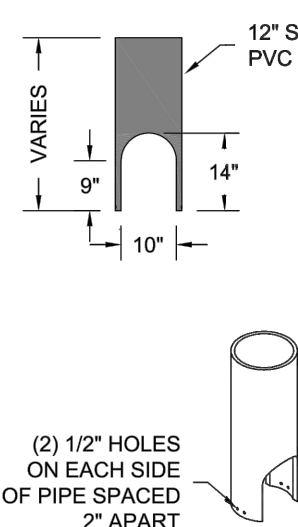
NOT TO SCALE

R-TANK QUANTITIES		
R-TANK [®] MODULE TYPE		DOUBLE-MINI
TRAFFIC LOAD	HS-20	
# OF DOUBLE-MINI R-TANKS		128
# OF DOUBLE-MINI R-TANK ACCESS MODULES		7
TOTAL SYSTEM STORAGE		1,949 CF
R-TANK STORAGE VOLUME		1,399 CF
STONE STORAGE VOLUME (40% VOID RATIO)		550 CF
STONE BED FOOTPRINT		599 SF
STONE QUANTITY		51 CF
N080 NON-WOVEN GEOTEXTILE TANK WRAP		144 SY
N080 NON-WOVEN GEOTEXTILE EXCAVATION WRAP		214 SY
8 OZ. NON-WOVEN GEOTEXTILE TREAT. ROW WRAP		19 SY
S300 WOVEN GEOTEXTILE TREAT. ROW BASE FABRIC		6 SY
ACF BX-12 GEOSAND		119 SY
12" INSPECTION PORTS		3
GEOTEXTILE PIPE BOOTS (12")		3
STORMRING CPS (12")		1
NOTE: STONE QUANTITY INCLUDES 12" OF COVER AND 3" OF BASE.		
NOTE: GEOTEXTILE / LINER QUANTITIES INCLUDE A 15% WASTE FACTOR.		

R-TANK ELEVATIONS	
DESCRIPTION	ELEVATION
BASE INV.	134.89
TANK INV.	135.14
TOP OF TANK	136.68
GEOSAND	139.68
MIN. ALLOW. FINAL GRADE	140.35
MAX. ALLOW. FINAL GRADE	145.67



STORMRING CPS PRETREATMENT DETAIL



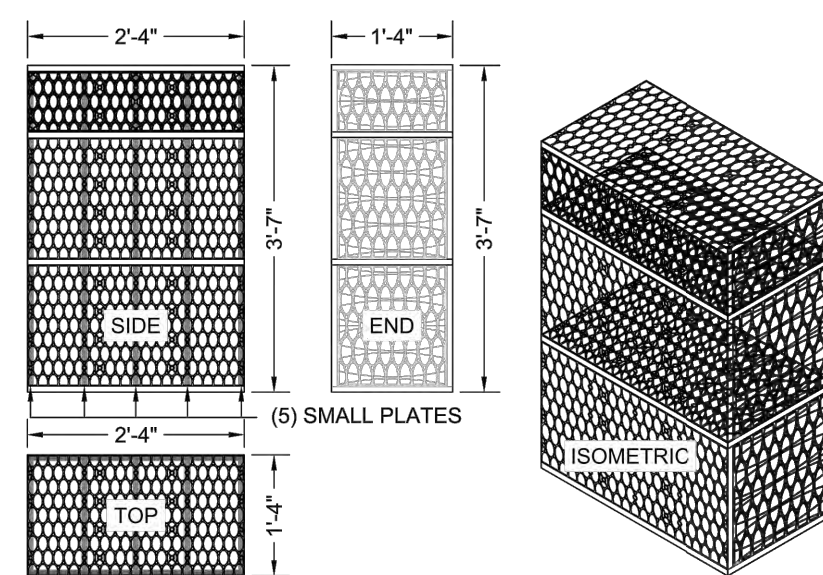
R-TANK TYPICAL VEHICULAR LOAD RATED INSPECTION PORT

NOTES:

1. THE INSPECTION PORT IS USED IN THE ACCESS MODULE TO INSPECT THE LEVEL OF SEDIMENT ACCUMULATION.
2. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
3. R-TANK[®], R-TANK[®], R-TANK[®] AND R-TANK[®] MAY BE USED IN TRAFFIC APPLICATIONS.
4. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.
5. IF INSPECTION PORT IS LOCATED IN A NON-TRAFFIC AREA, A PLASTIC CAP CAN BE USED IN LIEU OF A FRAME AND COVER WITH CONCRETE COLLAR.

R-TANK SYSTEM DETAILS

NOT TO SCALE

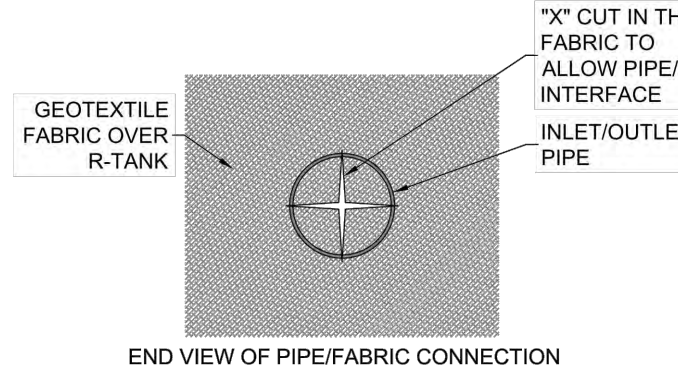


MODULE DATA	
GEOMETRY:	
LENGTH = 28.15 IN. (715 MM)	
WIDTH = 15.75 IN. (400 MM)	
HEIGHT = 42.52 IN. (1080 MM)	
TANK VOLUME = 10.91 CF	
STORAGE VOLUME = 10.36 CF	
VOID INTERNAL VOLUME: 95%	
VOID SURFACE AREA: 90%	
LOAD RATING:	
33.4 PSI. (MODULE ONLY)	
HS20/HS25 - SEE SPEC FOR COVER REQUIREMENTS	
MATERIAL:	
100% RECYCLED POLYPROPYLENE	
SMALL PLATES REQUIRED:	
5/SEGMENT, 15/MODULE	

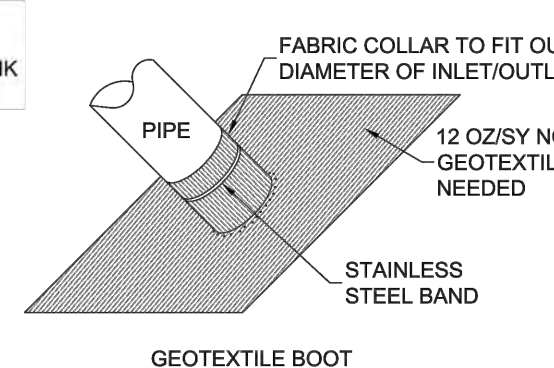
DOUBLE + MINI R-TANK[®] - MODULE DETAIL

- NOTE:
- PIPE BOOTS ARE AVAILABLE IN THE FOLLOWING STANDARD SIZES: 8" | 12" | 15" | 18" | 24".
 - LARGER SPECIAL ORDER, CUSTOM SIZES ARE AVAILABLE.

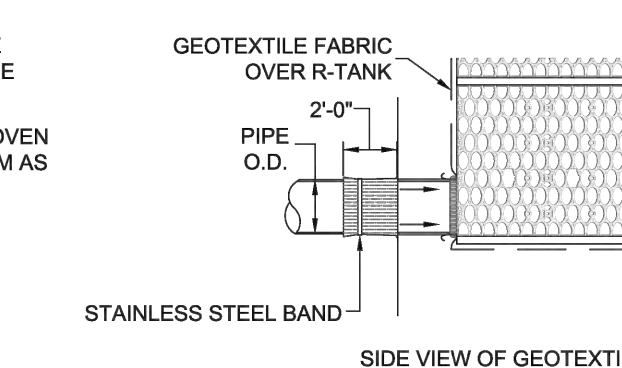
CUT AN "X" IN THE FABRIC ENVELOPE THAT IS SLIGHTLY LARGER THAN THE PIPE. PULL THE FABRIC FLAPS AROUND THE PIPE, AND SEAL WITH A STAINLESS STEEL BAND.



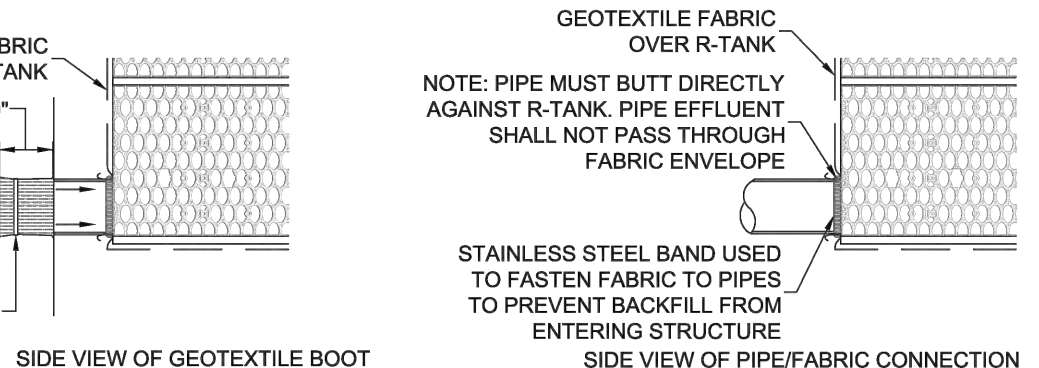
END VIEW OF PIPE/FABRIC CONNECTION



GEOTEXTILE BOOT



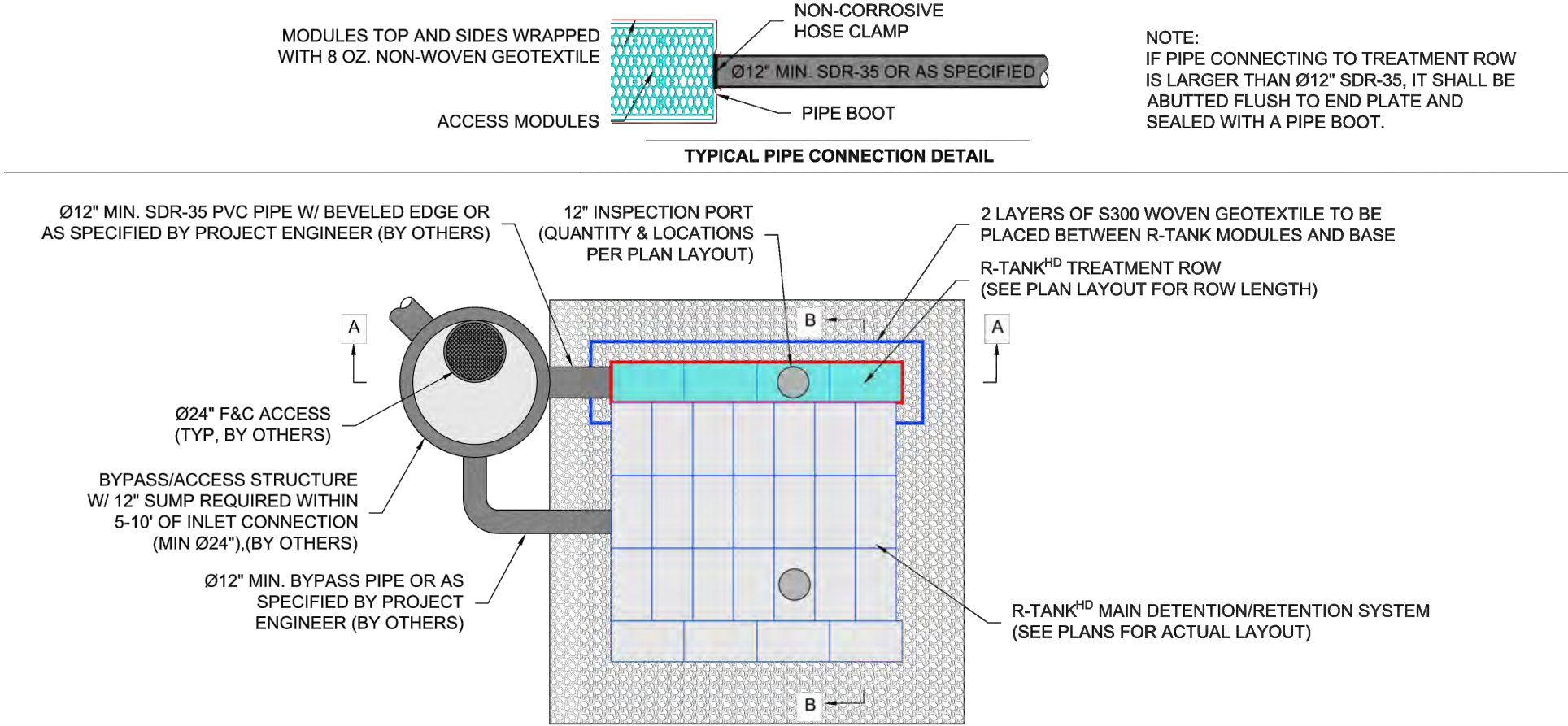
SIDE VIEW OF PIPE/FABRIC CONNECTION



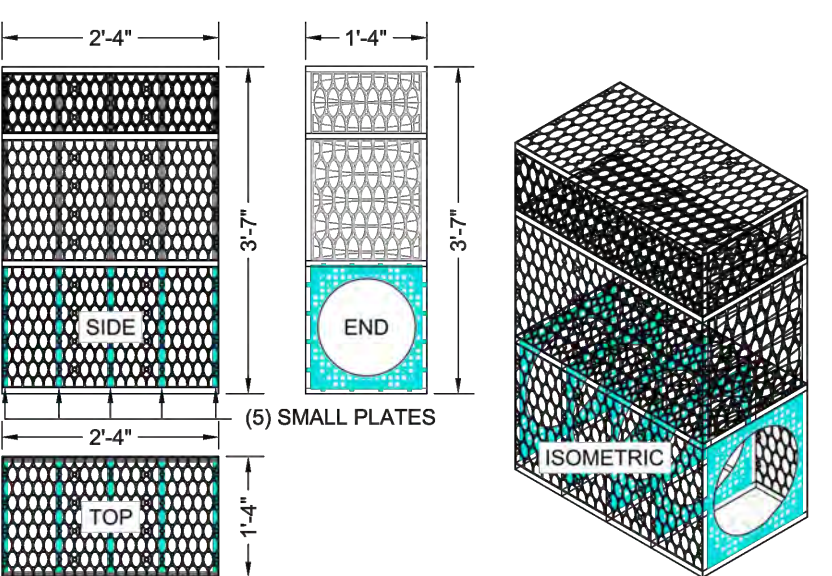
R-TANK TYPICAL TANK INLET/OUTLET W/ GEOTEXTILE PIPE BOOT DETAIL

R-TANK SYSTEM DETAILS

NOT TO SCALE

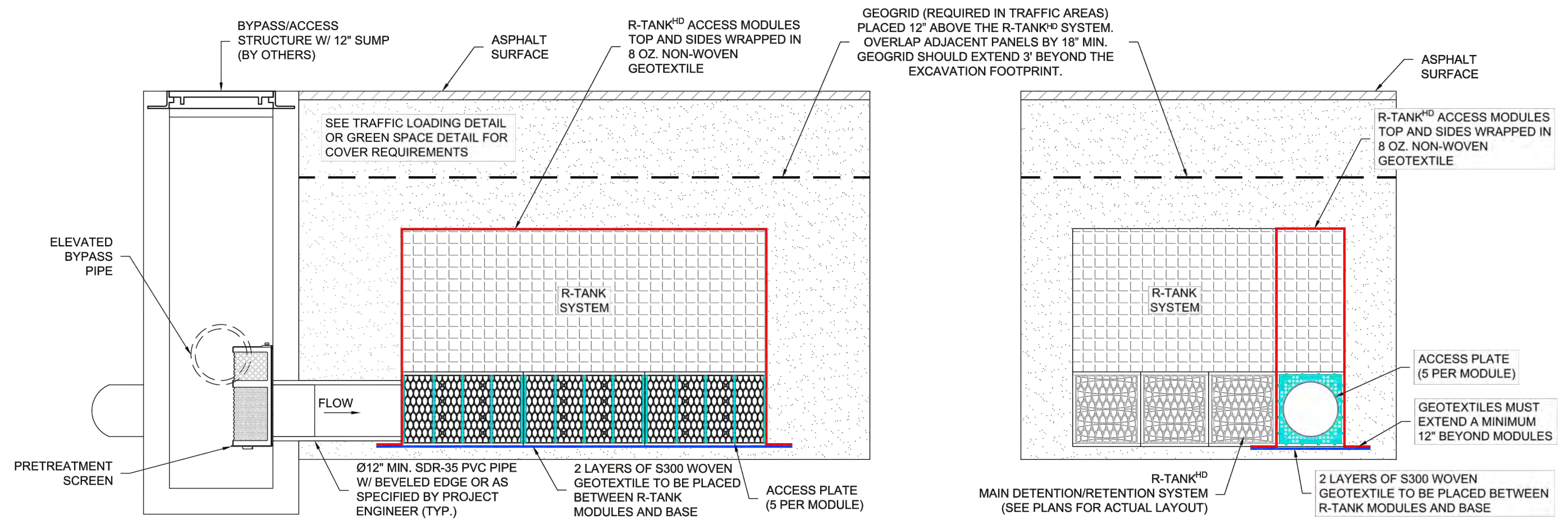


R-TANK[®] TREATMENT ROW WITH PRECAST INLET/ACCESS STRUCTURE



DOUBLE + MINI R-TANK[®] ACCESS MODULE DETAIL

(FOR MODULE DATA, SEE STANDARD MODULE DETAIL)

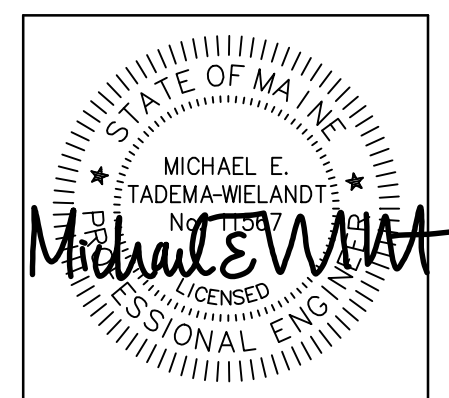


R-TANK[®] TREATMENT ROW SECTION A-A

R-TANK[®] TREATMENT ROW SECTION B-B

R-TANK SYSTEM DETAILS

NOT TO SCALE



DATE: 12/12/2023
PE: MICHAEL TADEMA-WIELANDT

REVISIONS	DATE	REVISION
1	10/20/2023	REVISED IN RESPONSE TO STAFF REVIEW COMMENTS
2	11/18/2023	STORMWATER MANAGEMENT SYSTEM ADDED
3	12/12/2023	SUBMITTED TO HP BOARD
4	12/12/2023	REVISED IN RESPONSE TO STAFF COMMENTS

ADDRESS: 2000 S. DRIVE SUITE 301
NEW GLOUCESTER, ME 04260

PHONE: (207) 926-6111
WEB SITE: www.terradynconsultants.com

TERRADYN CONSULTANTS, LLC

Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

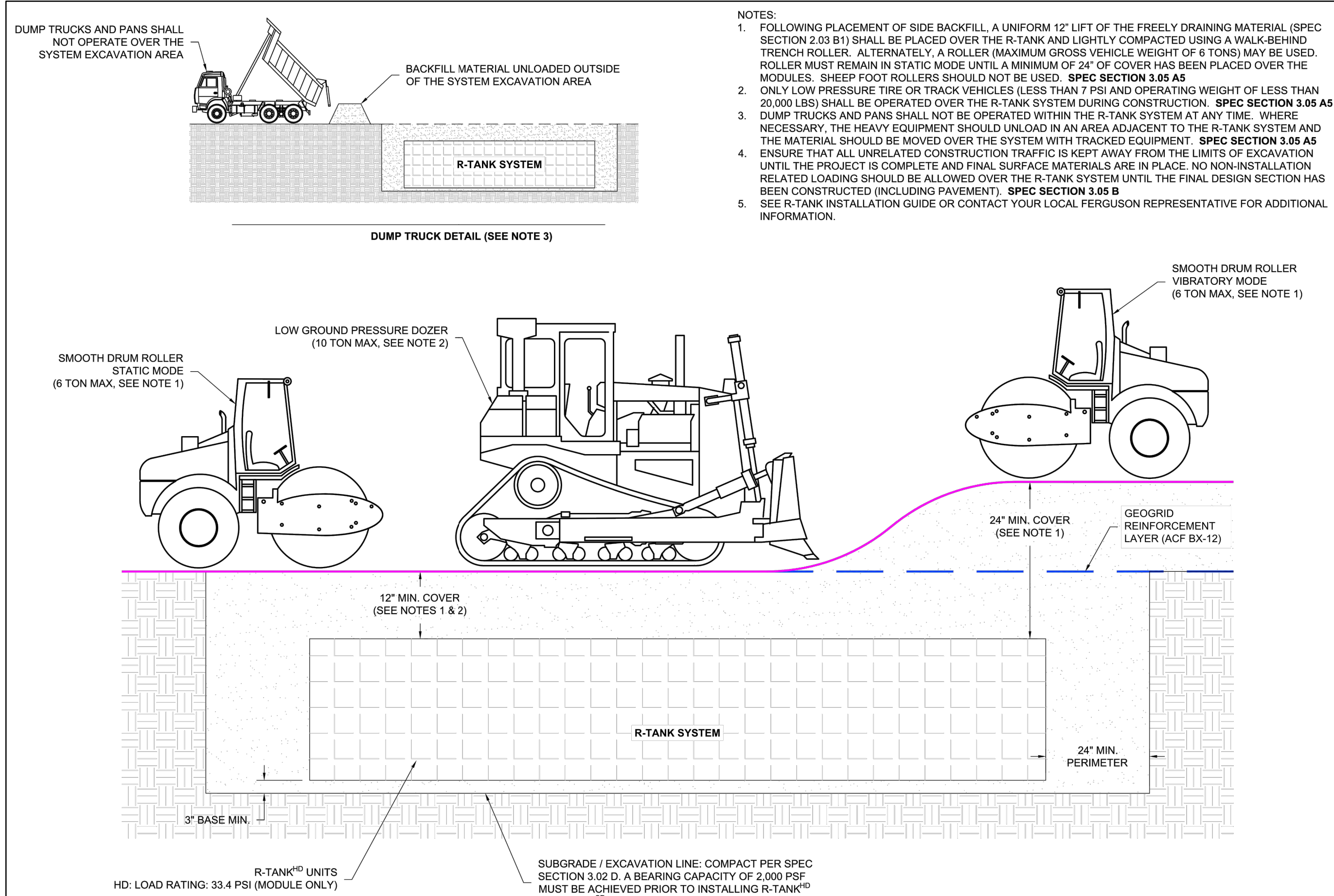
PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: WEST STREET REDEVELOPMENT
19 WEST STREET, PORTLAND, ME

SHEET TITLE: CARTRIDGE AND R-TANK DETAILS

CLIENT: CARLETON WEST, LLC
9 GOULD ROAD
LEWISTON, ME 04240

DATE: 8/4/2023
SCALE: 23-020
JOB NO: 23-020
SHEET: C-8.4



CONSTRUCTION EQUIPMENT COVER DETAIL
NOT TO SCALE

- PART 1 - GENERAL**
- 1.01 RELATED DOCUMENTS**
- A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section.
- 1.02 DESCRIPTION OF WORK INCLUDING**
- A. Provide excavation and base preparation per geotechnical engineer's recommendations and/or as shown on the design drawings, to provide adequate support for project design loads and safety from excavation sidewall collapse. Excavations shall be in accordance with the owner's and OSHA requirements.
- B. Provide and install R-Tank/LD, R-Tank/HD, R-Tank/SD, or R-Tank/UD system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, inlet and outlet pipe with connections per the manufacturer's installation guidelines provided in this section.
- C. Provide and construct the cover of the R-Tank system including, stone backfill, structural fill cover, and pavement section as specified.
- D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.
- 1.03 QUALITY CONTROL**
- A. All materials shall be manufactured in ISO certified facilities.
- B. Installation Contractor shall demonstrate the following experience:
1. A minimum of three R-Tank or equivalent projects completed within 2 years; and,
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
- C. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.
- C. Installation Personnel: Performed only by skilled workers with satisfactory record of performance on bulk earthworks, pipe, chamber, or pond/tandfill construction projects of comparable size and quality.
- D. Contractor must have manufacturer's representative available for site review if requested by Owner.
- 1.04 SUBMITTALS**
- A. Submit proposed R-Tank layout drawings. Drawings shall include typical section details as well as the required base elevation of stone and tanks, minimum cover requirements and tank configuration.
- B. Submit manufacturer's product data, including compressive strength and unit weight.
- C. Submit manufacturer's installation instructions.
- D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.
- E. Submit material certificates for geotextile, geogrid, base course and backfill materials.
- F. Submit required experience and personnel requirements as specified in Section 1.03.
- G. Any proposed equal alternative product substitution to this specification must be submitted for review and approved prior to bid opening. Review package should include third party reviewed performance data that meets or exceeds criteria in Table 2.01 B.
- 1.05 DELIVERY, STORAGE, AND HANDLING**
- A. Protect R-Tank and other materials from damage during delivery, and store UV sensitive materials under tarp to protect from sunlight when time from delivery to installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris.
- B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.
- C. Cold weather:
1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated or muddy subgrade.
- 1.06 PREINSTALLATION CONFERENCE.**
- A. Prior to the start of the installation, a preinstallation conference shall occur with the representatives from the design team, the general contractor, the excavation contractor, the R-Tank installation contractor, and the manufacturer's representative.
- 1.07 PROJECT CONDITIONS**
- A. Coordinate installation for the R-Tank system with other on-site activities to eliminate all non-installation related construction traffic over the completed R-Tank system. No loads heavier than the design loads shall be allowed over the system, and in no case shall loads higher than a standard AASHTO HS20 (or HS25, depending on design criteria) be allowed on the system at any time.
- B. Protect adjacent work from damage during R-Tank system installation.
- C. All pre-treatment systems to remove debris and heavy sediments must be in place and functional prior to operation of the R-Tank system. Additional pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.
- D. Contractor is responsible for any damage to the system during construction.

- PART 2 - PRODUCTS**
- 2.01 R-TANK UNITS**
- A. R-Tank - Injection molded plastic tank plates assembled to form a 95% void modular structure of predesigned height (custom for each project).
- B. R-Tank units shall meet the following Physical & Chemical Characteristics:
- | PROPERTY | DESCRIPTION | R-Tank ^{HD} VALUE | R-Tank ^{SD} VALUE | R-Tank ^{LD} VALUE | R-Tank ^{UD} VALUE |
|-------------------------------|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Total Area | Volume available for water storage | 95% | 95% | 95% | 95% |
| Surface Void Area | Percentage of surface available for infiltration | 90% | 90% | 90% | 90% |
| Vertical Compressive Strength | ASTM D 2412 / ASTM F 2418 | 30.0 psi | 30.0 psi | 40.0 psi | 134.2 psi |
| Lateral Compressive Strength | ASTM D 2412 / ASTM F 2418 | 20.0 psi | 22.4 psi | 28.0 psi | N/A |
| HD SD Minimum Cover | Cover required to support HS 20 loads | N/A | 2' 0" | 1' 0" | 1' 0" (STONE BACKFILL) |
| LD SD Minimum Cover | Cover required to support HS 20 loads | N/A | 2' 0" | 1' 0" | 1' 0" (STONE BACKFILL) |
| Maximum Cover | Maximum allowable cover depth | 3.0 feet | < 7 feet | < 10 feet | 3.0 feet |
| Unit Weight | Weight of plastic plate and backfill tank | 8.0 lbs/sq ft | 8.0 lbs/sq ft | 8.0 lbs/sq ft | 4.2 lbs/sq ft |
| Min Thickness | Thickness of load-bearing members | 0.18 inches | 0.18 inches | 0.18 inches | N/A |
| Max Thickness | Thickness of load-bearing members | 0.18 inches | 0.18 inches | 0.18 inches | N/A |
| Service Temperature | Service temperature range for use | -14 - 167°F | -14 - 167°F | -14 - 167°F | -14 - 167°F |
- C. Supplier: Ferguson Waterworks 2831 Cardwell Road Richmond, VA 23234 (T): 800-448-3636; (F): 804-743-7779 www.ferguson.com

- 2.02 GEOSYNTHETICS**
- A. Geotextile: A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.
- B. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (ACF N080 or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven nonfilament (ACF M200 or equivalent) shall be used.
- C. Geogrid: For installations subject to traffic loads and/or when required by project plans, install geogrid (ACF BX12 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-Tank/UD installations, and is often not required for non-traffic load applications.
- 2.03 BACKFILL & COVER MATERIALS**
- A. Bedding Materials: Stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System) shall be used below the R-Tank system (3" minimum). Material must be free from lumps, debris, and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation. For infiltration applications bedding material shall be free draining.
- B. Side and Top Backfill: Material must be free from lumps, debris and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.
1. Traffic Applications - Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system.
- a. For HD and SD modules, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).
- b. For UD modules with less than 14" of top cover, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter). The use of soil backfill on the sides and top of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of 14" or more. Top backfill material (from top of module to bottom of pavement base or 12" maximum) must be consistent with side backfill.
2. Non-Traffic / Green Space Applications - For all R-Tank modules installed in green spaces and not subjected to vehicular loads, backfill materials may either follow the guidelines for Traffic Applications above, or the top backfill layer (12" minimum) may consist of AASHTO #57 stone blended with 30-40% (by volume) topsoil to aid in establishing vegetation.
- C. Additional Cover Materials: Structural Fill shall consist of granular materials meeting the gradational requirements of SM, SP, SW, GM, GP or GW as classified by the Unified Soil Classification System. Structural fill shall have a maximum of 25 percent passing the No. 200 sieve, shall have a maximum dry unit weight of 10 percent and a maximum Plasticity Index of 4. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation.
- 2.04 OTHER MATERIALS**
- A. Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

- PART 3 - EXECUTION**
- 3.01 ASSEMBLY OF R-TANK UNITS**
- A. Assembly of modules shall be performed in accordance with the R-Tank Installation Manual, Section 2.
- 3.02 LAYOUT AND EXCAVATION**
- A. Installer shall stake out, excavate, and prepare the subgrade area to the required plan grades and dimensions, ensuring that the excavation is at least 2 feet greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials.
- B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.
- C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, or other means until construction is complete.
- D. Base of the excavation shall be uniform, level, and free of lumps or debris and soft or yielding subgrade areas. A minimum 2,000 pounds per square foot bearing capacity is required.
- E. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.
- F. Unsuitable Soils or Conditions: All questions about the base of the excavation shall be directed to the owner's engineer, who will approve the subgrade conditions prior to placement of stone. The owner's engineer shall determine the required bearing capacity of the R-Tank subgrade; however in no case shall a bearing capacity of less than 2,000 pounds per square foot be provided.
1. If unsuitable soils are encountered at the subgrade, or if the subgrade is pumping or appears excessively soft, repair the area in accordance with contract documents and/or as directed by the owner's engineer.
2. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations.
3. Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the owner's engineer.
- 3.03 PREPARATION OF BASE**
- A. Place a thin layer (3" unless otherwise specified) of bedding material (Section 2.03 A), over the subgrade to establish a level working platform for the R-Tank modules. Level to within 1/2" (4/16") or as shown on the plans. Native subgrade soils or other materials may be used if determined to meet the requirements of 2.03 A and are accepted by the owner's engineer.
1. Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unyielding.
2. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents.
- B. Outline the footprint of the R-Tank system on the excavation floor using spray paint or chalk line to ensure a 2' perimeter is available around the R-Tank system for proper installation and compaction of backfill.
- 3.04 INSTALLATION OF THE R-TANKS**
- A. Where a geotextile wrap is specified on the stone base, cut strips to length and install in excavation, removing wrinkles so material lays flat. Overlap geotextile a minimum 12" or as recommended by manufacturer. Use tape, special adhesives, sandbags or other ballast to secure overlaps. As geotextiles can be damaged by extreme heat, smoking is not permissible on/near the geotextile, and tools using a flame to tack the overlaps, such as propane torches, are prohibited.
- B. Where an impervious liner (for containment) is specified, install the liner per manufacturer's recommendations and the contract documents. The R-Tank units shall be separated from impervious liner by a non-woven geotextile fabric installed accordance with Section 3.04A.
- C. Install R-Tank modules by placing side by side, in accordance with the design drawings. No lateral connections are required. It is advisable to use a string line to form square corners and straight edges along the perimeter of the R-Tank system. The modules are to be oriented as per the design drawing with required depth as shown on plans.
1. For LD, HD, and SD installations, the large side plate of the tank should be placed on the perimeter of the system. This will typically require that the two ends of the tank area will have a row of tanks placed perpendicular to all other tanks. If this is not shown in the construction drawings, it is a simple field adjustment that will have minimal effect on the overall system footprint. Refer to R-Tank Installation Guide for more details.
2. For UD installations, there is no perpendicular end row required.
- D. Wrap the R-Tank top and sides in specified geotextile. Cut strips of geotextile so that it will cover the sides and top, encapsulating the entire system to prevent backfill entry into the system. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious liner) during placement.
- E. Identify locations of inlet, outlet and any other penetrations of the geotextile (and optional liner). These connections should be installed flush (butted up to the R-Tank) and the geotextile fabric shall be cut to enable hydraulic continuity between the connections and the R-Tank units. These connections shall be secured using pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile. Impervious liner (if specified) or pipe. Connecting pipes at 90 degree angles facilitates construction, unless otherwise specified. Ensure end of pipe is installed snug against R-Tank system.
- F. Install Inspection and Maintenance Ports in locations noted on plans. At a minimum one maintenance port shall be installed within 10' of each inlet & outlet connection, and with a maximum spacing of one maintenance port for every 2,500 square feet. Install all ports as noted in the R-Tank Installation Guide.
- G. If required, install ventilation pipes and vents as specified on drawings to provide ventilation for proper hydraulic performance. The number of pipes and vents will depend on the size of the system. Vents are often installed using a 90 degree elbow with PVC pipe into a landscaped area with 12" sand or venting ballast to inhibit the ingress of debris. A ground level concrete or steel cover can be used.

- 3.05 BACKFILLING OF THE R-TANK UNITS**
- A. Backfill and fill with recommended materials as follows:
1. Place freely draining backfill materials (Section 2.03 B) around the perimeter in lifts with a maximum thickness of 12". Each lift shall be placed around the entire perimeter such that each lift is no more than 24" higher than the side backfill along any other location on the perimeter of the R-Tank system. No fill shall be placed over top of tanks until the side backfill has been completed.
2. Each lift shall be compacted at the specified moisture content to a minimum of 95% of the Standard Proctor Density until no further densification is observed (for self-compacting stone materials). The side lifts must be compacted with walk-behind compaction equipment. Even when "self-compacting" backfill materials are selected, a walk-behind vibratory compactor must be used.
3. Take care to ensure that the compaction process does not allow the machinery to come into contact with the modules due to the potential for damage to the geotextile and R-Tank units.
4. No compaction equipment is permissible to operate directly on the R-Tank modules.
5. Top Backfill: Only low pressure track vehicles shall be operated over the R-Tank system during construction. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Heavy equipment should not be used in an area adjacent to the R-Tank system and the material should be moved over the system using tracked equipment with an operating weight of less than 10 tons.
- a. Typical Applications: Install a 12" (or as shown on plans) lift of freely draining material (Section 2.03 B) over the R-Tank Units, maintaining 12" between equipment tracks and R-Tank System. Lightly compacted using a walk-behind trench roller. Alternatively, a roller (maximum gross vehicle weight of 6 tons) may be used. Roller must remain in static mode until a minimum of 24" of cover has been placed over the modules. Sheep foot rollers should not be used.
6. If required, install a geogrid as shown on plans. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
7. Following placement and compaction of the initial cover, subsequent lifts of structural fill (Section 2.03 C) shall be placed at the specified moisture content and compacted to a minimum of 95% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement of fill above the system, unless otherwise specified, a uniform elevation of fill shall be maintained to within 12" across the footprint of the R-Tank system. Do not exceed maximum cover depths listed in Table 2.01 B.
8. Place additional layers of geotextile and/or geogrid at elevations as specified in the design details. Each layer of geosynthetic reinforcement placed above the R-Tank system shall extend a minimum of 3 feet beyond the limits of the excavation wall.
9. Ensure that all unrelated construction traffic is kept away from the limits of excavation until the project is complete and final surface materials are in place. No non-installation related loading should be allowed over the R-Tank system until the final design section has been constructed (including pavement).
- C. Place surfacing materials, such as groundcovers (no large trees), or paving materials over the structure with care to avoid displacement of cover fill and damage to surrounding areas.
- D. Backfill depth over R-Tank system must be within the limitations shown in the table in Section 2.01 B. If the total backfill depth does not comply with this table, contact engineer or manufacturer's representative for assistance.
- 3.06 MAINTENANCE REQUIREMENTS**
- A. A routine maintenance effort is required to ensure proper performance of the R-Tank system. The Maintenance program should be focused on pretreatment systems. Ensuring these structures are clean and functioning properly will reduce the risk of contamination of the R-Tank system and stormwater released from the site. Pre-treatment systems shall be inspected yearly, or as directed by the regulatory agency and by the manufacturer (for proprietary systems). Maintain as needed using acceptable practices or following manufacturer's guidelines (for proprietary systems).
- B. All inlet pipes and inspection and/or Maintenance Ports in the R-Tank system will need to be inspected for accumulation of sediments at least quarterly through the first year of operation and at least yearly thereafter.
- C. If sediment has accumulated to the level noted in the R-Tank Maintenance Guide or beyond a level acceptable to the Owner's engineer, the R-Tank system should be flushed.
- D. All inspection and maintenance activities should be performed in accordance with the R-Tank Operation, Inspection & Maintenance Manual.

R-TANK SPECIFICATION NOTES

DATE: 12/12/2023 PE: MICHAEL TADEMA-WIELANDT		
PROJECT: WEST STREET REDEVELOPMENT 19 WEST STREET, PORTLAND, ME		
SHEET TITLE: CONST. EQUIP. DETAIL & R-TANK SPEC. NOTES		
CLIENT: CARLETON WEST, LLC 9 GOULD ROAD LEWISTON, ME 04240		
DATE: 8/4/2023		
SCALE: SCALE		
JOB NO: 23-020		
SHEET: C-8.5		
REVISIONS		
NO.	DATE	REVISIONS
4	12/12/2023	REVISED IN RESPONSE TO STAFF COMMENTS
3	12/12/2023	SUBMITTED TO HP BOARD
2	11/16/2023	STORMWATER MANAGEMENT SYSTEM ADDED
1	10/20/2023	REVISED IN RESPONSE TO STAFF REVIEW COMMENTS
TERRADYN CONSULTANTS, LLC Civil Engineering Land Surveying Geomatics Stormwater Design Land Planning Environmental Permitting www.terradyngconsultants.com 207.926.6111 www.terradyng.com		