JONES&BEACH
ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

March 18, 2024

Portsmouth Technical Advisory Committee
Attn: Peter Stith, Principal Planner
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Site Plan Application
635 Sagamore Avenue, Portsmouth, NH
Tax Map 222, Lot 19
JBE Project No. 18134.1

Dear Board Members,

Jones & Beach Engineers, Inc., respectfully submits a Site Plan Application on behalf of the applicant & owner, 635 Sagamore Development LLC. The intent of this application is to remove the 2 pre-existing non-conforming structures known as the Luster King, then construct a four-unit multi-family residential development.

The following items are provided in support of this Application:

1. Completed Site Plan Application (submitted online).
2. Site Plan Application Checklist.
3. Letter of Authorization.
4. Current Deed.
5. Wetland Delineation Letter.
6. Trip Generation Memorandum.
7. Test Pit Log.
8. One (1) Full Size Plan Set Folded.
9. One (1) Copy of Architectural Plans at End of Plan Set
10. One (1) Drainage Report.
11. One (1) Stormwater Operations and Maintenance Manual.

If you have any questions or need any additional information, please feel free to contact our office. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Daniel Meditz, P.E.
Project Engineer

cc: Michael Garrepy (via email)
Christopher Ward (via email)

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Applicant: 635 Sagamore Development, LLC Date Submitted: 3/18/24

Application # (in City's online permitting): _____

Site Address: 635 Sagamore Avenue Map: 222 Lot: 19

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**		N/A
☒	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Pending	
☒	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Architectural Plans	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Cover Sheet & Sheet C2	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Cover Sheet	N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Cover Sheet	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☒	List of reference plans. **(2.5.3.1H)**	C1	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Cover Sheet	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	C1, Note #3	N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	None Observed, Wetland Delineation Report Included	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	C1	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All Sheets	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	C1	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	C1	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architectural Plans	
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	C2 T1-T2	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	C2, Note #3	
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	C4	
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	C4 & P2	

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	C4	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	C2, Note #22	
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Snow Storage - C2 Everything Else - C3	
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	L2	
☒	**11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)**	Everywhere	
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	L1	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	C3	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	C2, Note #2	
☐	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	
☐	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☐	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Included with Submission	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	C3	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	C2, Note #23	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Included with Submission	
☒	Inspection and Maintenance Plan **(7.6.5)**	Included with Submission	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	C2, Note # 4 & 5	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Included with Submission	
☒	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Pending	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	C2, Note #5	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	C2, Note #21	N/A
☒	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	C2, Note #19 & 20	N/A

Applicant's Signature: Daniel Meditz **Date:** 3/14/2024

Letter of Authorization

635 Sagamore Development, LLC, owner of property located at 635 Sagamore Avenue in Portsmouth, NH, known as Tax Map 222, Lot 19, do hereby authorize Jones & Beach Engineers, Inc. ("JBE"), Garrepy Planning Consultants, LLC ("GPC"), and Hoefle, Phoenix, Gormley & Roberts, PLLC ("HPGR") to act on its behalf concerning the previously mentioned property.

I hereby appoint JBE, GPC and HPGR as agents to act on behalf of 635 Sagamore Development, LLC in the Planning Board and Zoning Board application process, to include any required signatures.

635 Sagamore Development, LLC

Timothy J. Black, Duly Authorized

January 5, 2022
Date

Book: 6332 Page: 1158

E # 21060614 09/24/2021 09:32:59 AM
Book 6332 Page 1158 Page 1 of 2
Register of Deeds, Rockingham County

Return to:

LCHIP	ROA585829	25.00
TRANSFER TAX	RO109828	5,807.00
RECORDING		14.00
SURCHARGE		2.00

WARRANTY DEED

KNOW ALL BY THESE PRESENTS, that I, **WILLIAM A. HINES**, married person, **TRUSTEE OF THE WILLIAM A. HINES FAMILY REVOCABLE TRUST** a/k/a The Hines Family Revocable Trust of 2006, of 635 Sagamore Avenue, Portsmouth, New Hampshire 03801, for consideration paid, hereby grant to **635 SAGAMORE DEVELOPMENT, LLC**, a New Hampshire limited liability company with a mailing address of 3612 Lafayette Road, Dept. 4, Portsmouth, New Hampshire 03801 with WARRANTY COVENANTS, the following described premises:

A certain tract of land with the buildings thereon, situate on Sagamore Avenue in said Portsmouth, more particularly described as follows:

Beginning at a point on Sagamore Avenue at land now or formerly of Arnold, thence running Westerly by said Arnold land three hundred (300) feet, more or less, to land now or formerly of W.W. and D.M. Johnston; thence turning and running Northwesterly by said Johnston land one hundred and twenty-four (124) feet; thence turning and running Northerly also by said Johnston land one hundred sixty-two (162) feet to land now or formerly of C.W. Walker; thence turning and running Easterly by said Walker land four hundred nineteen (419) feet to Sagamore Avenue; thence turning and running Easterly one hundred forty (140) feet; thence turning and running along said Sagamore Avenue thirty (30) feet to land of one Smith; thence turning and running Westerly one hundred forty (140) feet; thence turning and running Southerly ninety (90) feet; thence turning and running Easterly one hundred forty (140) feet to Sagamore Avenue; the last three bounds being land of Smith; thence turning running Southerly by said Sagamore Avenue one hundred sixty (160) feet to the point of beginning.

EXCEPTING AND RESERVING to the said William A. Hines and his wife Bonnie Hines a life estate in the above-described property permitting them to reside in the existing residential apartment on the property for the remainder of William A. Hines natural life, plus one year unless Bonne Hines shall have predeceased.

Meaning and intending to convey the same premises conveyed to the Grantor by deed of William A. Hines dated February 11, 2008 and recorded in the Rockingham County Registry of Deeds at Book 4885, Page 1538.

BY SIGNING BELOW, William A. Hines and Bonnie Hines release all homestead rights to the Premises.

TRUSTEE CERTIFICATE

I, William A. Hines, Trustee of the William A. Hines Family Revocable Trust A/K/A The Hines Family Revocable Trust of 2006, hereby covenant that said Trust is duly organized under the laws of the State of New Hampshire; that I am the sole trustee pursuant to said Declaration of Trust; that said Trust is still in full force and effect; that I have the power thereunder to convey as aforesaid; and that, in making this conveyance, I have, in all respects, acted pursuant to the authority vested in and granted to me therein and no purchaser or third party shall be bound to inquire whether the Trustee has said power or are properly exercising said power or to see to the application of any trust assets paid to the Trustee for a conveyance thereof.

Signed this 3rd day of September, 2021.

William A. Hines, Trustee of the William A. Hines Family Revocable Trust A/K/A The Hines Family Revocable Trust of 2006

Bonnie Hines

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

On this, the 3rd day of September, 2021, before me, the undersigned Officer, personally appeared William A. Hines, Trustee of the William A. Hines Family Revocable Trust A/K/A The Hines Family Revocable Trust of 2006, known to me, or satisfactorily proven, to be the person whose name is subscribed to the foregoing instrument, and acknowledged that he executed the same for the purposes set forth therein.

Justice of the Peace/Notary Public
My commission expires:

LAURA H. RAMSDELL
MY COMMISSION EXPIRES MAY 20, 2025
NOTARY PUBLIC
NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

On this, the 3rd day of September, 2021, before me, the undersigned Officer, personally appeared Bonnie Hines, known to me, or satisfactorily proven, to be the person whose name is subscribed to the foregoing instrument, and acknowledged that she executed the same for the purposes set forth therein.

Justice of the Peace/Notary Public
My commission expires:

LAURA H. RAMSDELL
MY COMMISSION EXPIRES MAY 20, 2025
NOTARY PUBLIC
NEW HAMPSHIRE

GOVE ENVIRONMENTAL SERVICES, INC.

November 8, 2021

Subject: Wetland Delineation Report
635 Sagamore Ave, Portsmouth, NH

Dear Michael Garrepy,

Per your request, this letter is to verify that Gove Environmental Services, Inc., performed a site inspection to identify wetlands on the subject properties located on Tax Map 222 Lots 19 on Sagamore Ave in Portsmouth, NH. Wetlands were evaluated utilizing the following standards:

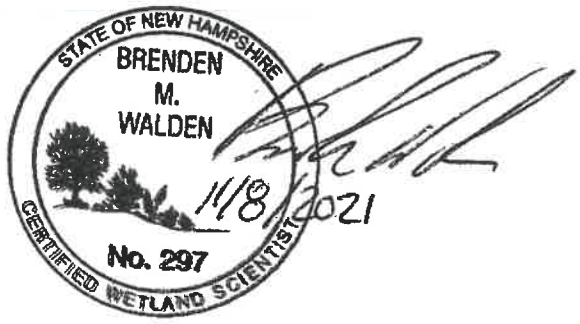
1. *US Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Technical Report ERDC/EL TR-12-1 (January 2012).
2. *Field Indicators for Identifying Hydric Soils in New England – Version 4, June 2020.* New England Hydric Soils Technical Committee.
3. *US Army Corps of Engineers National Wetland Plant List, 2018.*
4. *Classification of Wetlands and Deepwater Habitats of the United States.* USFW Manual FWS/OBS–79/31 (1979).

Brenden Walden performed the site inspection on 10/29/2021. The Subject property was reviewed in its entirety with careful attention paid to the area outlined southeast of the property on the City of Portsmouth's GIS website as being a wetland with a 100ft buffer that encroaches onto the property. During the site review it was determined, using the methods and standards above, that no areas on the property had any areas that would meet the criteria needed to be classified as a wetland. The area outside to the southeast of the property was also reviewed and was determined to also not have any characteristics of a wetland and thus would not have any buffer that would encroach on the subject property.

This concludes the wetland delineation report. If I can be of further assistance, please feel free to contact me at (603) 778-0644.

Sincerely,

Brenden Walden
Business Manager & Wetland Scientist
Gove Environmental Services, Inc.



Enc. Portsmouth GIS
Granitview Maps: Aerial
Aerial w/ Topography
Aerial w/ Topography & NWI

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Portsmouth, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 4/1/2019
Data updated 7/17/2019

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

Map Theme Legends

Wetlands

City of Portsmouth

Map by NH GRANIT

Legend

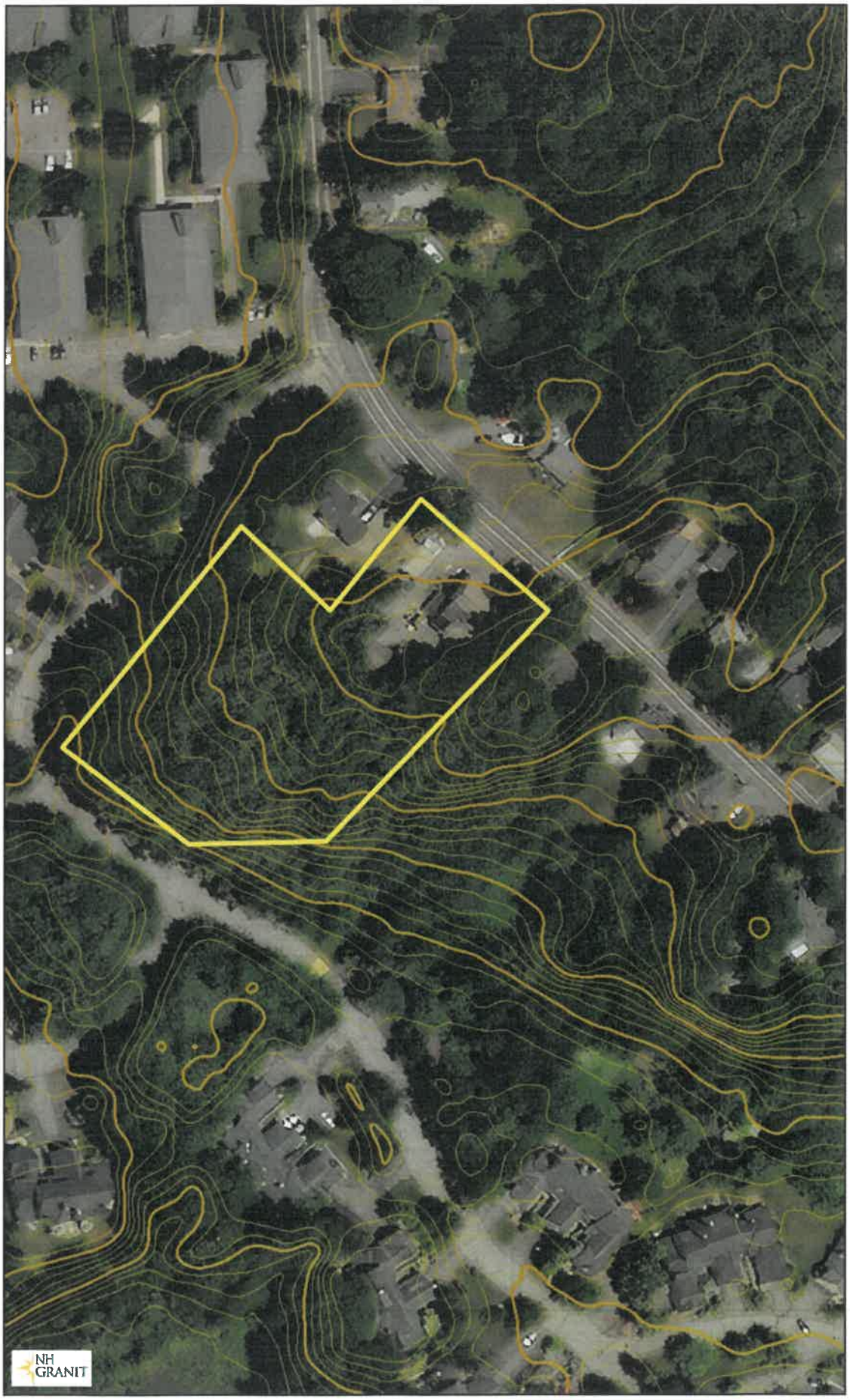
Map Scale

1: 1,624

Map Generated: 11/8/2021

Notes

Map by NH GRANIT



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Notes

NWI

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NWIPlus

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetlan
- Freshwater Pond
- Lake
- Other
- Riverine

Map Scale

1: 1,624

Map Generated: 11/8/2021

Notes

Stephen G. Pernaw & Company, Inc.

P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com

Transportation: Engineering • Planning • Design

MEMORANDUM

Ref: 2180A

To: Michael Garrepy

From: Stephen G. Pernaw, P.E., PTOE

Subject: Residential Development – 635 Sagamore Avenue
Portsmouth, New Hampshire

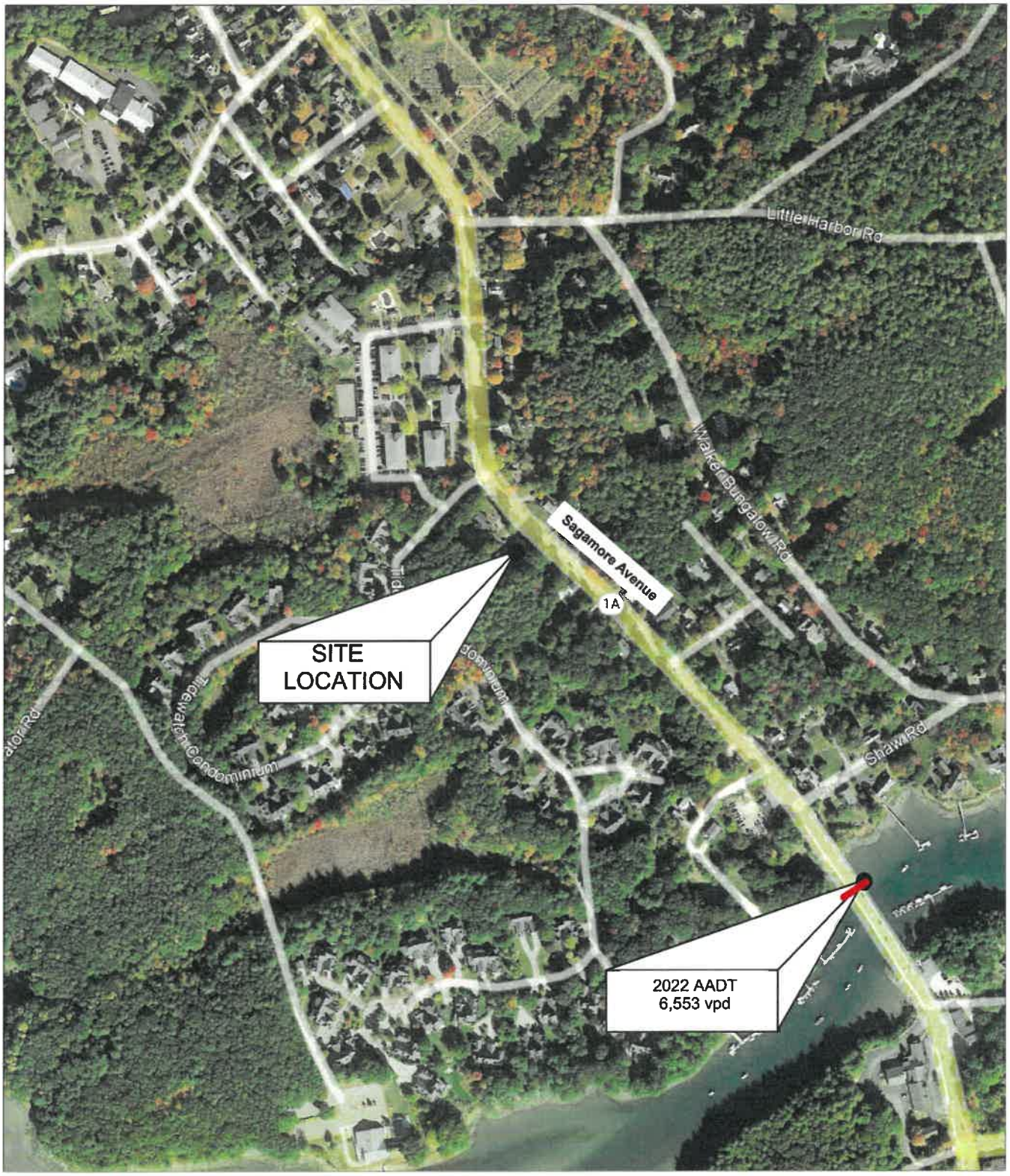
Date: August 8, 2023

Introduction - As requested, our office has conducted a trip generation analysis for the proposed change of use that will occur at 635 Sagamore Avenue (NH1A) in Portsmouth, New Hampshire. This analysis is based on the latest edition of the Institute of Transportation Engineers *"Trip Generation Manual"* and the results reflect average weekday conditions. We also researched available traffic count data at the New Hampshire Department of Transportation. Figure 1 shows the location of the subject site with respect to the area road system.

Proposed Development - The plan entitled *"ZBA Site Plan,"* prepared by Jones and Beach Engineers, Inc. dated 12/7/21 (revised 6/23/22), Scale 1" = 20', Sheet C2 shows that the existing Luster King Car Care business located on the west side of Sagamore Avenue will be razed and replaced by four single-family detached dwelling units. The wide-open curb cut that provides access to the current site will be replaced by a well-defined site access road. Access to the individual residences will be provided by driveways that intersect the site access road (see Attachment 1).

Existing Conditions - Sagamore Avenue is a two-lane state-maintained minor arterial roadway that is delineated with a four-inch double-yellow centerline and four-inch single white edge lines. The speed limit is posted at 30 mph in both directions.

Research at the NHDOT revealed that a short-term automatic traffic recorder count was conducted on Sagamore Avenue at Sagamore Creek in August 2022. This count station is located approximately 0.3 miles south of the subject site. The NHDOT estimates that the 2022 Annual Average Daily Traffic volume was 6,553 vehicles per day (see Attachment 2). The raw data collected in the month of August exceeded 7,000 vehicles per day. This data confirms that the highest traffic hours on Sagamore Avenue occurred from 8:00 to 9:00 AM and from 5:00 to 6:00 PM on weekdays (see Attachment 3)`.



= AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)

NORTH

2180A

Figure 1

Site Location

Traffic Evaluation, Proposed Residential Development, Portsmouth, New Hampshire

Trip Generation – To estimate the volume of traffic generated by the former use and the proposed residential development, Pernaw & Company, Inc. considered the standardized trip-generation rates and equations published by the Institute of Transportation Engineers (ITE)[1]. More specifically, ITE Land Use Code (LUC) 942 (Automobile Care Center) was selected for the former use and the number of service bays (3 bays) was utilized as the independent variable. ITE LUC 210 (Single-Family Detached Housing) was chosen for the residential development and the number of dwelling units was used as the independent variable. The results of the trip generation comparison are summarized in Table 1.

During the peak hour periods of the adjacent street system, the proposed residential development will generate approximately 3 vehicle-trips (1 arrival, 2 departures) during the AM peak hour, and 4 vehicle-trips (2 arrivals, 2 departures) during the PM peak hour. When compared to the car care center, the proposed development likely generates slightly fewer vehicle-trips during both the AM and PM peak hour periods. The trip generation computations are attached (see Attachments 4 - 8).

Table 1 — Trip Generation Comparison

		Current Use [1] (Car Care)	Proposed Use [2] (Residential)	Change
Weekday Peak Hour (24 hrs.)				
	Entering	NA	19 veh	NA
	Exiting	NA	19 veh	NA
	Total	NA	38 trips	NA
AM Peak Hour				
	Entering	3 veh	1 veh	-2 trips
	Exiting	2 veh	2 veh	0 trips
	Total	5 trips	3 trips	-2 trips
PM Peak Hour				
	Entering	3 veh	2 veh	-1 trips
	Exiting	4 veh	2 veh	-2 trips
	Total	7 trips	4 trips	-3 trips

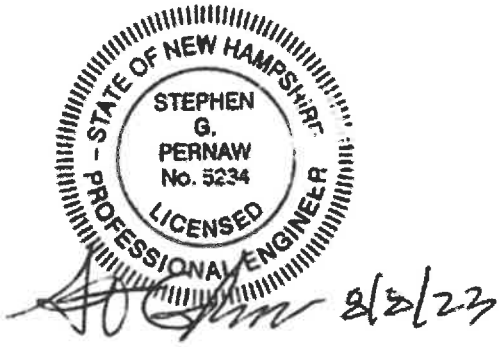
[1] ITE Land Use Code 942 - Automobile Care Center - 3 Service Bays - Trip Rate Method (PM directional distribution is estimated)

[2] ITE Land Use Code 210 - Single-Family Detached Housing - Trip Rate Method

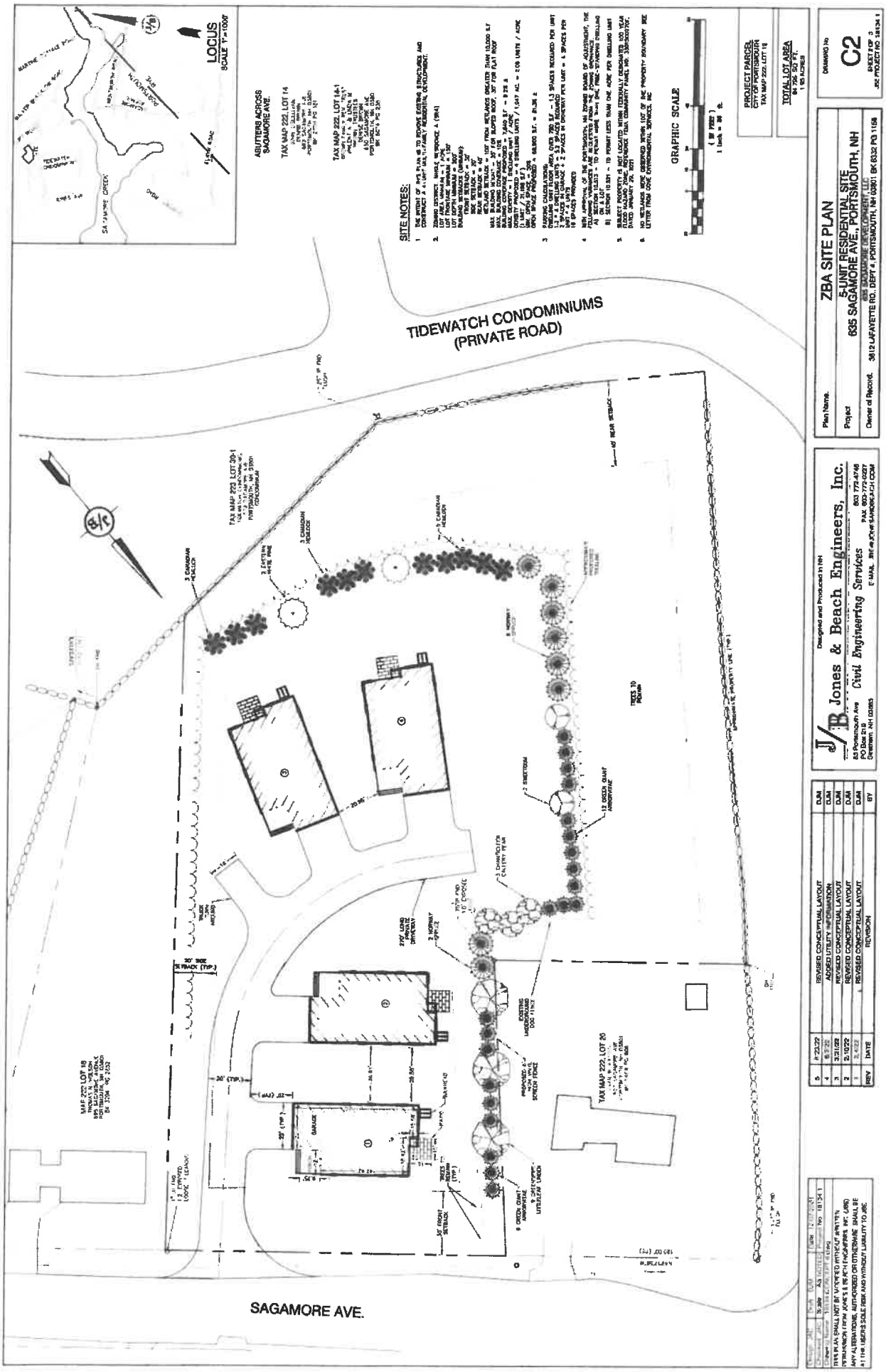
[1] Institute of Transportation Engineers, *Trip Generation*, eleventh edition (Washington, D.C., 2021)

Conclusions - Replacement of the Luster King car care business with four residential single-family dwelling units will likely result in a slight reduction in vehicle-trips that are generated during the weekday AM and PM peak hour periods. From this it is reasonable to conclude that off-site traffic impacts will be de minimis. The proposed closure of the wide-open curb cut on the highway, and replacing it with one well-defined site access road intersection on the state highway, represents a significant improvement from an access management and safety standpoint. In short, we find that the proposed redevelopment of the subject site to be reasonable and beneficial from a transportation engineering and traffic operations standpoint.

Attachments



ATTACHMENTS


ZBA SITE PLAN
5-UNIT RESIDENTIAL SITE
695 SAGAMORE AVE., PORTSMOUTH, NH
695 SAGAMORE DEVELOPMENT, LLC
3812 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6532 PG 1158
Jones & Beach Engineers, Inc.
Civil Engineering Services
LOCUS
SCALE 1"=1000'
GRAPHIC SCALE
SITE NOTES:
ABUTTERS ACROSS SAGAMORE AVE.
TIDEWATCH CONDOMINIUMS (PRIVATE ROAD)
SAGAMORE AVE.
PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19
TOTAL LOT AREA
84,795 SQ FT.
1.95 ACRES
DRAWING No
C2
SHEET 2 OF 2
JBE PROJECT NO. 18134.1
REVISED CONCEPTUAL LAYOUT
ADDED UTILITY INFORMATION
REVISED CONCEPTUAL LAYOUT
REVISED CONCEPTUAL LAYOUT
REVISED CONCEPTUAL LAYOUT
REVISION
DATE
REV

New Hampshire DOT Department of Transportation

MS2

Transportation Data Management System

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379151	**MPO ID**	
Type	SPOT	**HPMS ID**	
On NHS	No	**On HPMS**	No
LRS ID	S0000001A_	**LRS Loc Pt.**	
SF Group	04	**Route Type**	
AF Group	04	**Route**	NH 1A
GF Group	E	**Active**	Yes
Class Dist Grp	Default	**Category**	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	**Milepost**	
Located On	Sagamore Ave		
Loc On Alias	NH 1A (SAGAMORE AVE) AT SAGAMORE CREEK (SB-NB) (81379151-81379152)		

More Detail

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2022	6,553	702	11	54	6,250 (95%)	303 (5%)	
2021	6,633[3]		11	56	6,029 (91%)	604 (9%)	Grown from 2020
2020	5,981[3]		11	56	5,442 (91%)	539 (9%)	Grown from 2019
2019	7,086	763	11	56	6,489 (92%)	597 (8%)	
2018	7,823[3]		10	58	7,212 (92%)	611 (8%)	Grown from 2017

> | >>| 1-5 of 16

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 8/11/2022	60	7,538
	Wed 8/10/2022	60	7,434
	Tue 8/9/2022	60	7,490
	Thu 6/6/2019	60	8,374
	Wed 6/5/2019	60	8,121
	Tue 6/4/2019	60	8,151

VOLUME TREND

Year	Annual Growth
2022	-1%
2021	11%
2020	-16%
2019	-9%
2018	2%
2017	2%

New Hampshire DOT Department of Transportation

MS2 Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82379151	**Type:**	SPOT
Located On:	Sagamore Ave	:	
Direction:	2-WAY		
Community:	PORTSMOUTH	**Period:**	Mon 8/8/2022 - Sun 8/14/2022
AADT:	6553		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		33	19	29				27	0.4%
1:00 AM		10	8	12				10	0.1%
2:00 AM		5	0	6				4	0.0%
3:00 AM		6	1	6				4	0.1%
4:00 AM		13	16	18				16	0.2%
5:00 AM		48	48	46				47	0.6%
6:00 AM		143	127	142				137	1.8%
7:00 AM		298	289	313				300	4.0%
8:00 AM		404	434	425				421	5.6%
9:00 AM		467	470	419				452	6.0%
10:00 AM		438	480	428				449	6.0%
11:00 AM		541	546	504				530	7.1%
12:00 PM		533	582	516				544	7.3%
1:00 PM		521	536	541				533	7.1%
2:00 PM		559	538	533				543	7.3%
3:00 PM		575	563	582				573	7.7%
4:00 PM		573	639	630				614	8.2%
5:00 PM		693	644	702				680	9.1%
6:00 PM		539	476	566				527	7.0%
7:00 PM		440	403	377				407	5.4%
8:00 PM		306	269	367				314	4.2%
9:00 PM		198	190	220				203	2.7%
10:00 PM		110	99	93				101	1.3%
11:00 PM		37	57	63				52	0.7%
Total	**0**	**7,490**	**7,434**	**7,538**	**0**	**0**	**0**		
24hr Total		7490	7434	7538				7,487	
AM Pk Hr		11:00	11:00	11:00					
AM Peak		541	546	504				530	
PM Pk Hr		5:00	5:00	5:00					
PM Peak		693	644	702				680	
% Pk Hr		9.25%	8.66%	9.31%				9.07%	

Graph Look Up

Query

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
942

LAND USE GROUP:
(900-999) Services

LAND USE :
942 - Automobile Care Center

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

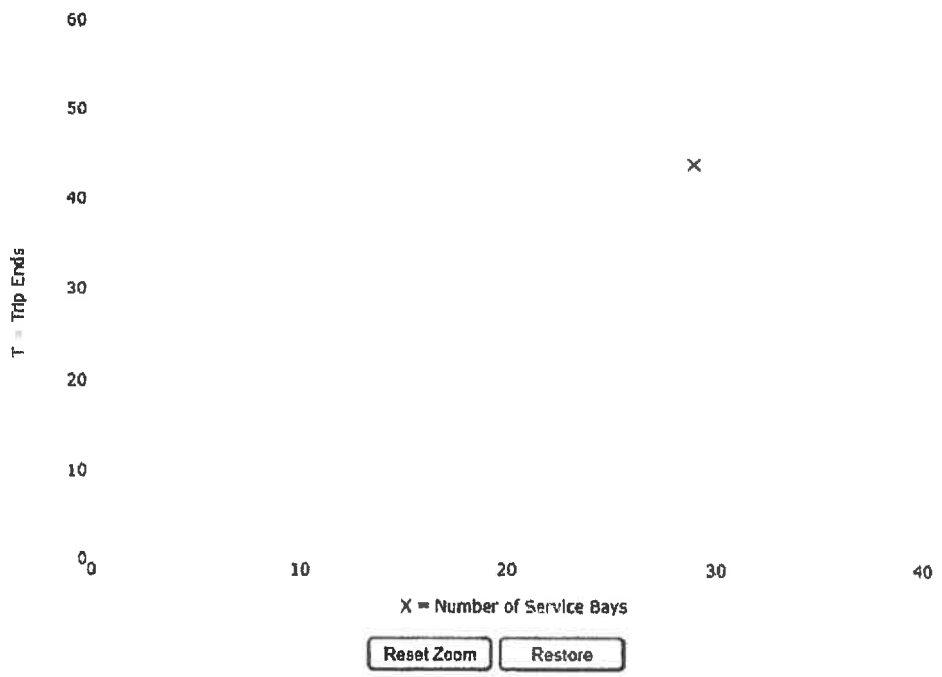
INDEPENDENT VARIABLE (IV):
Service Bays

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
3 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In

Caution – Small Sample Size

DATA STATISTICS

Land Use:
Automobile Care Center (942)

Independent Variable:
Service Bays

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
1

Avg. Num. of Service Bays
29

Average Rate
1.52

Range of Rates
1.52 - 1.52

Standard Deviation
****

Fitted Curve Equation:
Not Given

R^2
****

Directional Distribution:
68% entering, 32% exiting

Calculated Trip Ends:
Average Rate: 5 (Total), 3 (Entry), 2 (Exit)

Attachment 4

ITETripGen Web-based App

Help Stephen Pernav

Graph Look Up

Query

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
942

LAND USE GROUP:
(900-999) Services

LAND USE:
942 - Automobile Care Center

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

INDEPENDENT VARIABLE (IV):
Service Bays

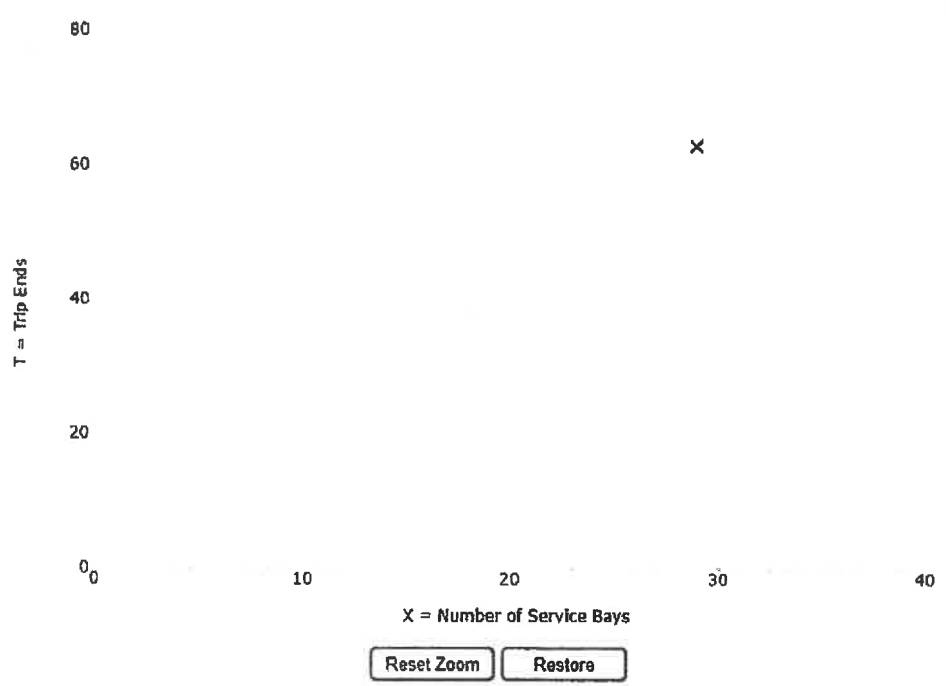
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
3 Calculate

Data Plot and Equation

Caution – Small Sample Size



DATA STATISTICS

Land Use:
Automobile Care Center (942)

Independent Variable:
Service Bays

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
1

Avg. Num. of Service Bays:
29

Average Rate:
2.17

Range of Rates:
2.17 - 2.17

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
Not available

Calculated Trip Ends:
Average Rate: 7 (Total)

Attachment 5

Graph Look Up

Query

DATA SOURCE:
Trip Generation Manual 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE :
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

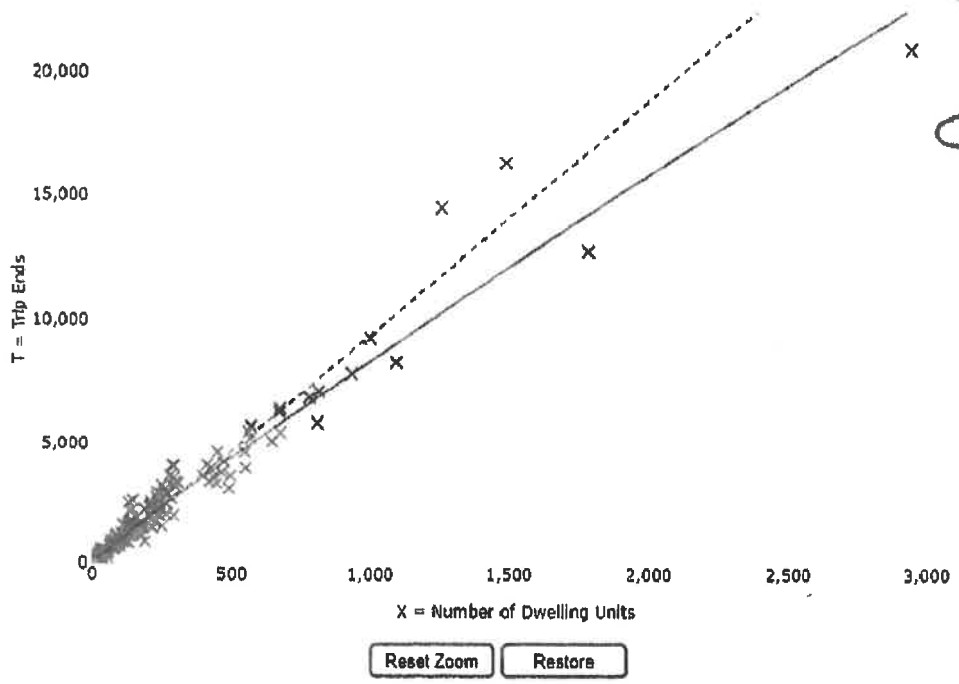
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
4 Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:
Single-Family, Detached Housing (210) for
Independent Variable:
Dwelling Units
Time Period:
Weekday
Setting/Location:
General Urban/Suburban
Trip Type:
Vehicle
Number of Studies:
174
Avg. Num. of Dwelling Units:
246
Average Rate:
9.43
Range of Rates:
4.45 - 22.61
Standard Deviation:
2.13
Fitted Curve Equation:
Ln(T) = 0.92 Ln(X) + 2.68
R^2:
0.95
Directional Distribution:
50% entering, 50% exiting
Calculated Trip Ends:
Average Rate: 38 (Total) 19 (Entry), 19 (Exit)
Fitted Curve: 52 (Total) 26 (Entry), 26 (Exit)

Attachment 6

Graph Look Up

Query

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE :
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

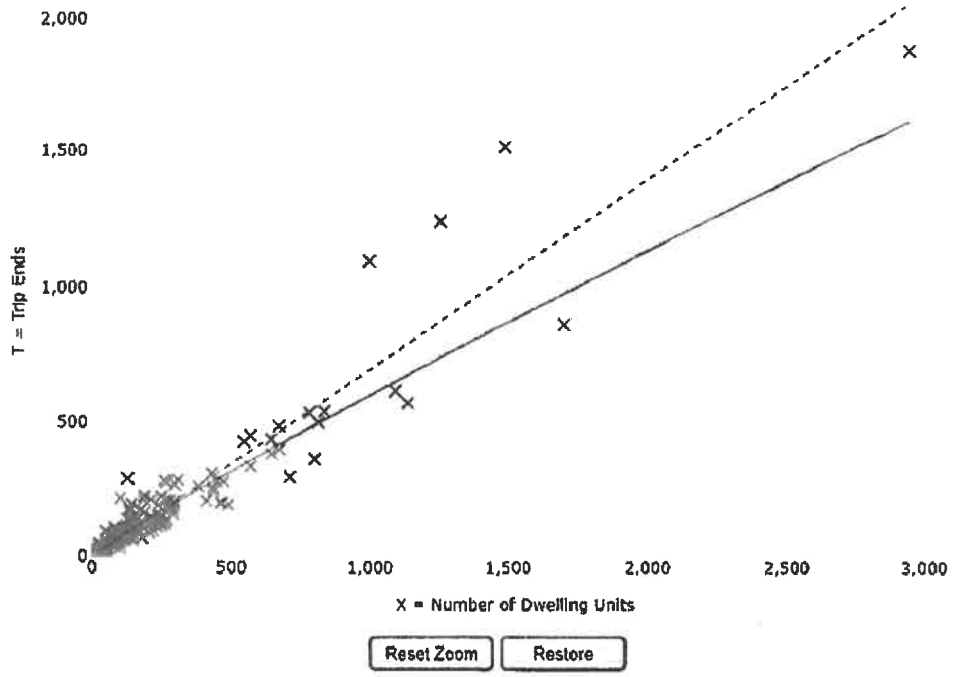
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
4 Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) Click for

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a m

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
192

Avg. Num. of Dwelling Units
226

Average Rate
0 70

Range of Rates.
0 27 - 2 27

Standard Deviation
0 24

Fitted Curve Equation:
Ln(T) = 0 91 Ln(X) + 0 12

R^2
0 90

Directional Distribution:
25% entering, 75% exiting

Calculated Trip Ends:
Average Rate: 3 (Total), 1 (Entry), 2 (Exit)
Fitted Curve: 4 (Total), 1 (Entry), 3 (Exit)

Attachment 7

Graph Look Up

Query

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE:
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

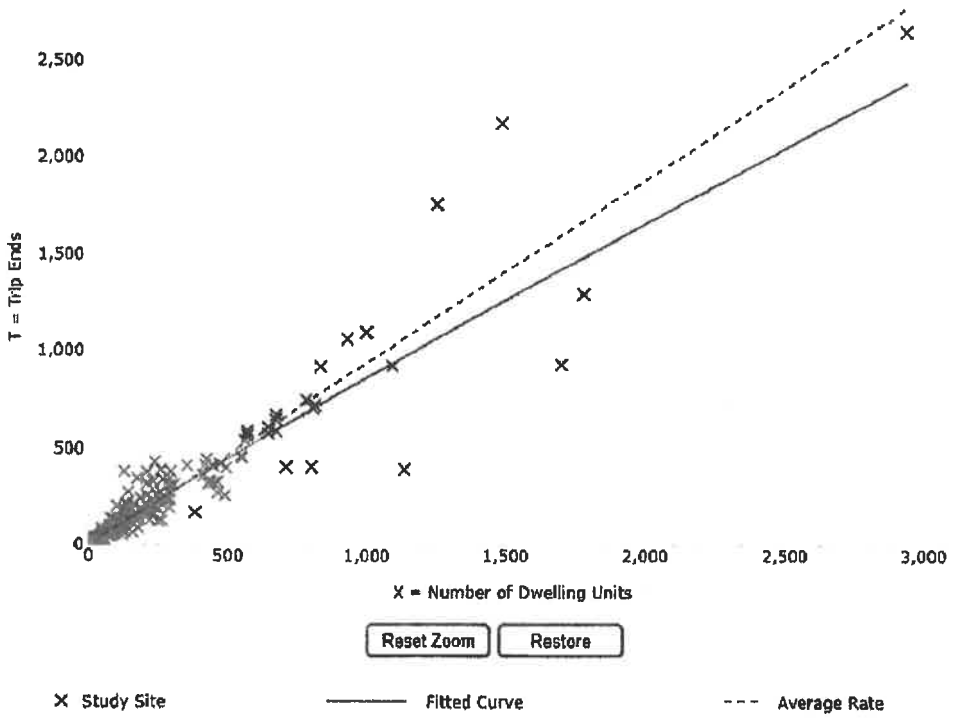
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: Vehicle
4 Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) Click for

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
208

Avg. Num. of Dwelling Units:
248

Average Rate
0.94

Range of Rates:
0.35 - 2.98

Standard Deviation:
0.31

Fitted Curve Equation:
Ln(T) = 0.94 Ln(X) + 0.27

R^2:
0.92

Directional Distribution:
63% entering, 37% exiting

Calculated Trip Ends:
Average Rate: 4 (Total), 2 (Entry), 2 (Exit)
Fitted Curve: 5 (Total), 3 (Entry), 2 (Exit)

Attachment 8

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project 635 Sagamore Ave
Client 635 Sagamore Development LLC
GES Project No. GES 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: n/a
Termination @ 15"
Refusal: 15" SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5"	10YR 3/2	FSL	GR	FR	NONE
5–15"	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 2
ESHWT: n/a
Termination @ 25"
Refusal: 25" SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5"	10YR 3/2	FSL	GR	FR	NONE
5–25"	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 3
ESHWT: n/a
Termination @ 25"
Refusal: 25" SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6"	10YR 3/2	FSL	GR	FR	NONE
6–25"	10YR 5/6	FSL	GR	FR	NONE

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No. 4
ESHWT: n/a
Termination @ 15"
Refusal: 15" SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–15"	10YR 3/2	FSL	GR	FR	NONE

Test Pit No. 5
ESHWT: 30"
Termination @ 36"
Refusal: 36" SCS Soil: Chatfield variant
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8"	10YR 3/2	FSL	GR	FR	NONE
8–30"	10YR 4/6	FSL	GR	FR	NONE
30–36"	2.5Y 5/3	FSL	GR	FR	10% Distinct

Test Pit No. 6
ESHWT: n/a
Termination @ 12"
Refusal: 12" SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12"	10YR 3/2	FSL	GR	FR	NONE

Test Pit No. 7
ESHWT: n/a
Termination @ 27"
Refusal: 27" SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–4"	10YR 3/2	FSL	GR	FR	NONE
4–27"	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 8
ESHWT: 35"
Termination @ 40"
Refusal: 40" SCS Soil: Chatfield variant
Obs. Water: none

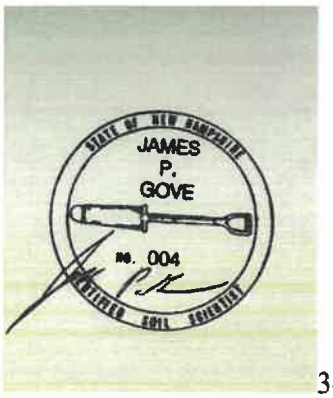
Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6"	10YR 3/2	FSL	GR	FR	NONE
6–35"	10YR 5/6	FSL	GR	FR	NONE
35–40"	2.5Y 5/3	FSL	OM	FI	10% Distinct

Test Pit No. 9
ESHWT: n/a
Termination @ 27"
Refusal: 27" SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–4"	10YR 3/2	FSL	GR	FR	NONE
4–27"	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 10
ESHWT: 35
Termination @ 62"
Refusal: 62" SCS Soil: Scituate
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10"	10YR 3/2	FSL	GR	FR	NONE
10–35"	10YR 5/6	FSL	GR	FR	NONE
35–62"	2.5Y 5/3	FSL	PL	FI	10%, Distinct



3-21-2022

Legend:

FSL = fine sandy loam
GR = granular
PL = platy
FI = firm

JONES&BEACH
ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

Luster Cluster
635 Sagamore Ave.
Portsmouth, NH 03801
Tax Map 222, Lot 19

Prepared for:

635 Sagamore Development LLC
3612 Lafayette Rd., Dept 4
Portsmouth, NH 03801

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
March 18, 2024
JBE Project No. 18134.1

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:

    a. Roadway and driveways
    b. Vegetation and landscaping
    c. Bioretention systems
    d. Catch Basins & Yard Drains
    e. Permeable Paver Patio
    f. Stone Drip Edges
    g. Culverts
    h. Rip-Rap Outlet Protection Aprons
    i. Swale

2. Maintenance of permanent measures shall follow the following schedule:

    a. Normal winter roadway maintenance including plowing and snow removal. Road sweeping at the end of every winter, preferably before the start of the spring rain season.

    b. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.

    c. Bioretention Systems:

        - Visually inspect monthly and repair erosion. Use small stones to stabilize erosion along drainage paths.
        - Check the pH once a year if grass is not surviving. Apply an alkaline product, such as limestone, if needed.
        - Re-seed any bare areas by hand as needed.
        - Immediately after the completion of cell construction, water grass for 14 consecutive days unless there is sufficient natural rainfall.

- Once a month (more frequently in the summer), the land owner or Association shall visually inspect vegetation for disease or pest problems and treat as required.
- During times of extended drought, look for physical features of stress. Water in the early morning as needed.
- Weed regularly, if needed.
- After rainstorms, inspect the cell and make sure that drainage paths are clear and that ponding water dissipates over 4-6 hours. (Water may pond for longer times during the winter and early spring.)
- Twice annually, inspect the outlet control structures to ensure that they are not clogged and correct any clogging found as needed.
- Any debris and sediment accumulations shall be removed from the outlet structures, overflow risers, and emergency spillways and disposed of properly.
- Inspect outlet structure for deterioration and or clogging.
- If erosion is evident on the berm or emergency spillway, stabilize the affected area by seeding. Trees must not be allowed to grow in these areas.
- KEEP IN MIND, THE BIORETENTION CELL IS NOT A POND. IT SHALL NOT PROVIDE A BREEDING GROUND FOR MOSQUITOES. MOSQUITOES NEED AT LEAST FOUR (4) DAYS OF STANDING WATER TO DEVELOP AS LARVA.

d. **Annual inspection** of catch basins and yard drains to determine if they need to be cleaned. Catch basins and yard drains are to be cleaned if the depth of deposits is greater than one-half the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin. If a catch basin or yard drain significantly exceeds the one-half depth standard during the inspection, then it shall be cleaned more frequently. If woody debris or trash accumulates in the catch basin or yard drain, then it shall be cleaned on a weekly basis. The catch basin or yard drain can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials shall be stored, treated, and disposed. Grease hoods are to be wiped clean and the rags disposed of properly. Debris obscuring the grate inlet shall also be removed.

e. Permeable Paver Patio:

Units 4 features a permeable paver patio for stormwater management while Units 1-3 feature standard paver patios. The following course of action will help assure that the pavers are maintained to preserve its hydrologic effectiveness for their special purpose.

Winter maintenance:

- Sanding for winter traction is prohibited. Deicing is permitted (NaCl, $MgCl_2$, or equivalent). Reduced salt application is possible and can be a cost savings

for winter maintenance. Nontoxic, organic deicers, applied either as blended, magnesium chloride-based liquid products or as pretreated salt, are preferable.

- Plow after each storm. Special plow blades may be used to prevent scarring. Do not raise blade of plow. Ice and light snow accumulation are generally not as problematic as for standard asphalt. Snow will accumulate during heavier storms and should be plowed after 2 to 4 inches of snow accumulate. Alternatively, snow may be blown or shoveled off of paver surface

Routine maintenance:

- Seal coating is absolutely forbidden. Surface seal coating is not reversible.
- The paver surface shall be vacuumed 2 or 3 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.
- Planted areas adjacent to permeable pavers shall be well maintained to prevent soil washout onto the pavers. If any bare spots or eroded areas are observed within the planted areas, they shall be replanted and/or stabilized at once.
- Immediately clean any soil deposited on pavers. Superficial dirt does not necessarily clog the paver voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles shall be prevented from tracking or spilling dirt onto the pavers.
- Do not allow construction staging, soil/mulch storage, etc. on unprotected paver surface. Contractor to lay down tarps, plywood or removable item and take care not to track material onto unprotected pavers.
- Repairs: Potholes or other surface blemishes shall be replaced in kind. Any required repair of drainage structures shall be done promptly to ensure continued proper functioning of the system.
- Written and verbal communication to the future owner shall make clear the pavers' special purpose and special maintenance requirements such as those listed here.

f. Stone Drip Edges:

In the spring and fall, visually inspect the area around the edges and repair any erosion. Use small stones to stabilize erosion along drainage paths. Inspect stone area to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation shall not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones.

g. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly.

h. Rock riprap shall be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged

state. Woody vegetation must not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water shall be kept clear of obstructions, debris, and sediment deposits

i. Swales - Inspect swales annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species. Perform periodic mowing; frequency depends on location and type of grass. Remove debris and accumulated sediment, based on inspection. Repair eroded areas, remove invasive species and dead vegetation, and reseed as warranted by inspection

See attached sample forms as a guideline.

Any inquiries in regards to the design, function, and/or maintenance of any one of the above-mentioned facilities or tasks shall be directed to the project engineer:

Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885

T#: (603) 772-4746
F#: (603) 772-0227

Commitment to maintenance requirements

I agree to complete and/or observe all of the required maintenance practices and their respective schedules as outlined above.

_____

Signature

_____

Print Name

_____

Title

_____

Date

Annual Operations and Maintenance Report

The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Roadway and Driveways			
Vegetation and Landscaping			
Bioretention #1			
Bioretention #2			
Catch Basins & Yard Drains			

Permeable Paver Patios (Unit 4)			
Stone Drip Edge			
Culverts			
Rip Rap Outlet Protection			
Swales			
Other (please note):			

Regular Inspection and Maintenance Guidance for Bioretention Systems / Tree Filters

Maintenance of bioretention systems and tree filters can typically be performed as part of standard landscaping. Regular inspection and maintenance is critical to the effective operation of bioretention systems and tree filters to insure they remain clear of leaves and debris and free draining. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of leaves from the system and bypass structure. Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Mulch and/or vegetation coverage is integral to the performance of the system, including infiltration rate and nutrient uptake. Vegetation care is important to system productivity and health.

ACTIVITY	FREQUENCY
A record should be kept of the time to drain for the system completely after a storm event. The system should drain completely within 72 hours.	After every major storm in the first few months, then biannually.
Check to insure the filter surface remains well draining after storm event. **Remedy**: If filter bed is clogged, draining poorly, or standing water covers more than 15% of the surface 48 hours after a precipitation event, then remove top few inches of discolored material. Till or rake remaining material as needed.	
Check inlets and outlets for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet and overflow if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
Check for animal burrows and short circuiting in the system **Remedy**: Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted.	
Check to insure the filter bed does not contain more than 2 inches accumulated material **Remedy**: Remove sediment as necessary. If 2 inches or more of filter bed has been removed, replace media with either mulch or a (50% sand, 20% woodchips, 20% compost, 10% soil) mixture.	
During extended periods without rainfall, inspect plants for signs of distress. **Remedy**: Plants should be watered until established (typical only for first few months) or as needed thereafter.	
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy**: Repair or replace any damaged structural parts, inlets, outlets, sidewalls.	Annually
Check for robust vegetation coverage throughout the system. **Remedy**: If at least 50% vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
Check for dead or dying plants, and general long term plant health. **Remedy**: This vegetation should be cut and removed from the system. If woody vegetation is present, care should be taken to remove dead or decaying plant Material. Separation of Herbaceous vegetation rootstock should occur when overcrowding is observed.	As needed

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JONES&BEACH ENGINEERS INC.

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1. Initial Inspection After Planting and Mulching			
Plants are stable, roots not exposed	S	U	
Surface is at design level, typically 4" below overpass	S	U	
Overflow bypass / inlet (if available) is functional	S	U	
2. Debris Cleanup (2 times a year minimum, Spring & Fall)			
Litter, leaves, and dead vegetation removed from the system	S	U	
Prune perennial vegetation	S	U	
3. Standing Water (1 time a year, After large storm events)			
No evidence of standing water after 72 hours	S	U	
4. Short Circuiting & Erosion (1 time a year, After large storm events)			
No evidence of animal burrows or other holes	S	U	
No evidence of erosion	S	U	
5. Drought Conditions (As needed)			
Water plants as needed	S	U	
Dead or dying plants			
6. Overflow Bypass / Inlet Inspection (1 time a year, After large storm events)			
No evidence of blockage or accumulated leaves	S	U	
Good condition, no need for repair	S	U	
7. Vegetation Coverage (once a year)			
50% coverage established throughout system by first year	S	U	
Robust coverage by year 2 or later	S	U	
8. Mulch Depth (if applicable)(once every 2 years)			
Mulch at original design depth after tilling or replacement	S	U	
9. Vegetation Health (once every 3 years)			
Dead or decaying plants removed from the system	S	U	
10. Tree Pruning (once every 3 years)			
Prune dead, diseased, or crossing branches	S	U	
Corrective Action Needed			**Due Date**
1.			
2.			
3.			

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JONES&BEACH ENGINEERS INC.

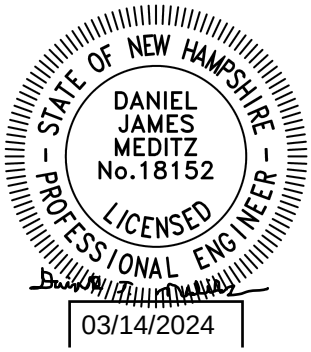
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

"Luster Cluster"
635 Sagamore Ave.
Portsmouth, NH 03801
Tax Map 222, Lot 19

Prepared for:

635 Sagamore Development LLC
3612 Lafayette Rd., Dept 4
Portsmouth, NH 03801



Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
March 14, 2024
JBE Project No. 18134.1

EXECUTIVE SUMMARY

635 Sagamore Development LLC proposes to demolish an existing commercial development and construct a 4-unit multi-family residential site on the subject parcel located at 635 Sagamore Ave. in Portsmouth, NH. In the existing condition, the subject parcel is home to two buildings and a paved parking area that used to comprise the "Luster King," a former auto detailing business that has since closed.

A drainage analysis of the entire site as well as offsite contributing watershed area was conducted for the purpose of estimating the peak rate of stormwater runoff and to subsequently design adequate drainage structures. Two models were compiled, one for the area in its existing (pre-construction) condition, and a second for its proposed (post-construction) condition. The analysis was conducted using data for the 2 Year – 24 Hour (3.70"), 10 Year – 24 Hour (5.61"), 25 Year – 24 Hour (7.12"), and 50 Year – 24 Hour (8.53") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region. A summary of the existing and proposed conditions peak rates of runoff in units of cubic feet per second (cfs) is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	0.75	0.35	1.33	0.67	1.78	0.93	2.21	1.17
Analysis Point #2	0.20	0.02	0.44	0.08	0.65	0.12	0.84	0.17
Analysis Point #3	0.51	0.50	1.74	1.63	2.94	2.94	4.17	4.17
Analysis Point #4	0.49	0.27	1.31	0.85	2.05	1.40	2.78	1.99

A similar summary of the existing and proposed peak volumes in units of acre-feet is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	0.054	0.025	0.098	0.048	0.133	0.068	0.167	0.087
Analysis Point #2	0.015	0.002	0.032	0.006	0.047	0.009	0.061	0.013
Analysis Point #3	0.069	0.130	0.186	0.293	0.300	0.451	0.417	0.611
Analysis Point #4	0.049	0.027	0.116	0.069	0.177	0.112	0.238	0.155

The subject parcel is located in the Single Residence A (SRA) Zoning District. The subject parcel currently consists of the aforementioned former commercial site which is proposed to be demolished. Despite impervious surface existing on the subject parcel now, the proposed development results in an increase in impervious surface on the subject parcel. The addition of the proposed impervious surfaces causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. In order to mitigate this potential, a stormwater management system has been designed, consisting of two bioretention systems, stone drip edges and an Eco-Paver patio. Due to the use of these stormwater management features, the peak flow will be reduced toward all analysis points during all analyzed storm events in the proposed condition as compared to the existing condition, the treatment requirements of the City of Portsmouth are met, and volumes of runoff directed toward three of the four analysis points will be reduced post-construction as well. The one analysis point toward which the volume of runoff is proposed to slightly

increase is Analysis Point 3, which represents a drainage ditch alongside and below the grade of the adjacent Tidewatch Condominium roadway. This is a low-risk analysis point as runoff is not directed toward pavement or a building. The ditch as well as the entire watershed directed toward it has been modelled in both the existing and proposed conditions analysis and it is shown to have plenty of freeboard up to the 50 year storm. The Tidewatch Condominium roadway itself is curbed with a closed drainage system so roadway runoff does not enter the ditch. Additionally, the NHDES Alteration of Terrain Bureau's groundwater recharge volume and channel protection requirements are met with the proposed development. **The stormwater management system as designed meets all requirements of the City of Portsmouth stormwater regulations per Section 7.1 and 7.4-7.6 of the Site Plan Review Regulations. Additionally, the stormwater management system as designed meets all requirements of the NHDES Alteration of Terrain (AOT) Bureau, even though an AOT permit is not necessary for this project due to the area of disturbance.**

The use of Best Management Practices per the NHDES Stormwater Manual have been applied to the design of this stormwater management system and will be observed during all stages of construction. All land disturbed during construction will be stabilized within thirty days of groundbreaking and abutting property owners will suffer minimal adversity resultant to this development.

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25 Year - 24 Hour Summary
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Appendix IV Site Specific Soil Survey and Map
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Appendix IX Pollutant Removal Calculations
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1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same area. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD 10.20-3c Stormwater Modeling System. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the 2 Year – 24 Hour (3.70”), 10 Year – 24 Hour (5.61”), 25 Year – 24 Hour (7.12"), and 50 Year – 24 Hour (8.53") storm events. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region.

The peak rates of runoff will be reduced from the existing condition, thereby minimizing any potential for a negative impact on abutting properties. This is accomplished through treatment of stormwater runoff and attenuation of peak flows and volumes resulting from storm events.

2.0 EXISTING CONDITIONS ANALYSIS

In the existing condition, the site consists of two commercial buildings as well as a shed and a paved parking area that comprise the former Luster King auto detailing business, which has since closed. Most of the area behind the existing commercial development is wooded with light underbrush and large ledge outcrops. Due to these features of the woodlands, the woods has been modelled as “fair” rather than “good” for the purposes of stormwater runoff calculations. There is some lawn space around the existing developed area as well.

The existing topography and roof ridges divide the subject parcel and offsite contributing watershed areas into four subcatchments, draining toward four analysis points, respectively. Subcatchment 1 represents the front of the subject parcel as well as a stretch of the northbound lane of Sagamore Avenue. This subcatchment is entirely developed in the existing condition, and it drains directly into the Sagamore Ave. right of way, modelled as Analysis Point 1.

Subcatchment 2S represents a small section of the developed portion of the property which drains to the north and on to abutting Tax Map 222, Lot 20, modelled as Analysis Point 2. It is very important that peak flows and volumes draining toward Analysis Points 1 and 2 are reduced in the post-construction condition, as these two analysis points represent a highway and a house lot, respectively.

The largest subcatchment is Subcatchment 3S. Subcatchment 3S is roughly the western quarter of the property and it consists primarily of woodland with large ledge outcrops. Subcatchment 3S drains toward an existing drainage ditch alongside and below the grade of the Tidewatch Condominium private roadway. This drainage ditch is modelled as Reach 1R and it drains toward Analysis Point 3, representing the immediate outlet point from the ditch.

Finally, a section of both developed and undeveloped land in the western end of the property drains into abutting woodland on the Tidewatch Condominium property, modelled as Analysis Point 4.

Existing soil types were determined through a Site Specific Soil Survey conducted by a Certified Soil Scientist. The pervious soils are categorized into Hydrologic Soil Group (HSG) B while the impervious areas of the subject parcel are modelled as Urban Land (SSS Symbol 699). The pervious sections of the property are represented as Chatfield-Hollis-Rock Outcrop complex and Chatfield

Variant (moderately well drained). According to "Ksat Values for New Hampshire Soils," Special Publication No. 5 sponsored by the Society of Soil Scientists of Northern New England (SSSNNE), Chatfield, Chatfield Variant, and Hollis soils all have identical saturated hydraulic conductivity ranges in the B and C horizons. The saturated hydraulic conductivity (Ksat) value for these soils ranges from 0.6 to 6.0 inches/hour within both the B and C horizons. Therefore, in accordance with standard engineering practice, the lowest published Ksat of 0.6 in/hr for these soils types was divided by two in order to determine an appropriate Ksat of **0.3 in/hr** to use for design.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the result being a potential increase in peak rates of runoff from the site. A stormwater management system was designed in order to mitigate this potential. The proposed development, consisting of the aforementioned four (4) residential units with associated paved roadway and driveways as well as stormwater management features divide the subject parcel into seventeen (17) subcatchments. Subcatchments 1S-4S drain directly toward Analysis Points 1-4, respectively, as previously outlined. The drainage ditch that outlets toward Analysis Point 3 which was modelled as Reach 1R in the existing conditions analysis is modelled as Reach 2R in the proposed conditions analysis. Subcatchment 5S represents a section of grass and roof that will drain directly toward bioretention pond #1, modelled as Pond 1P, in the proposed condition. Subcatchments 6S-8S drain through deep sump catch basins into a closed drainage system which outlets toward Reach 3R, representing a swale which leads toward Pond 1P. The deep sump catch basins provide pre-treatment of runoff in lieu of a sediment forebay. Subcatchment 9S drains into another deep sump catch basin, the outlet pipe of which is directed toward Pond 2P. Pond 2P is designed to infiltrate runoff directed toward it, while Pond 1P is designed to treat and then slowly release treated and attenuated stomwater toward Reach 2R. Any overflow from Pond 2P flows over an emergency spillway and through the backwoods of the site toward Reach 2R, as well.

Subcatchments 10S-12S consist of lawn and roof areas that drain toward yard drains 1-3, respectively. The runoff that is caught by these yard drains additionally enters the previously described closed drainage system that outlets toward Reach 3R and ultimately Pond 1P for treatment.

Subcatchments 13S-17S represent roof, deck and patio areas on Units 3-4 which are routed toward infiltration systems adjacent to the units such as stone drip edges, stone underneath a deck and a permeable paver patio. These devices are only featured in areas where the basement grade will be above the seasonal high water table and the top of ledge. These devices are modelled as Ponds 3P-7P.

Finally, Subcatchment 18S represents the grassed area that drains directly toward Pond 2P without passing through the closed drainage system in the proposed condition.

Peak flows are reduced toward all four analysis points during all analyzed storm events in the proposed condition as compared with the existing condition, as required. Whenever possible, it is good practice to reduce runoff volumes as well, though this is not always practicable. In this case, we are able to reduce runoff volumes toward Analysis Points 1, 2, and 4. Analysis Points 1 and 2 represent existing developed areas so it is critical to reduce volumes toward these analysis points. Incidentally, runoff volumes directed toward Analysis Point 4 are being reduced as well, which will help to prevent erosion of downstream wetlands. However, due to the preponderance of ledge throughout much of the site it is not feasible to reduce runoff volumes toward Analysis Point 3, which represents a drainage ditch alongside a private roadway. We are proposing infiltration practices wherever possible in order to

reduce runoff volumes to below what they would otherwise be: There are infiltration practices proposed adjacent to the foundations of Units 3 and 4 in areas where the basement grade will be above the top of ledge and the seasonal high water table, and a small unlined bioretention system (Pond 2P) is proposed to provide groundwater recharge as well. However, Pond 2P can only be made so large, as we need to maintain a wooded buffer behind the abutting property, Tax Map 222 Lot 20.

Pond 1P is situated such that the bottom of the stone media is below the top of ledge in some areas and therefore we cannot use it for infiltration. For these reasons, a slight increase in runoff volume toward Analysis Point 3 is unavoidable. However, the NHDES Alteration of Terrain Bureau allows an increase in runoff volume of up to 0.1 acre-feet during the 2-year 24-hour storm event. We are below this threshold and therefore this would be approvable by the AOT Bureau if the project needed an AOT permit (which it does not as the area of disturbance is below 100,000 SF). The same drainage ditch modelled as Reach 1R in the existing conditions analysis is modelled as Reach 2R in the proposed conditions analysis and Subcatchment 3S contains the entire watershed draining toward the ditch. Despite the increase in runoff volume, the 50-year peak elevation within the swale remains the same in the proposed condition as it is in the existing condition. Therefore, we have demonstrated that "There is sufficient on- and off-stie downstream channel or system capacity to carry the stormwater run-off volume nad flow without advere effects" (Site Plan Review Regulations Section 7.6.1.11).

Furthermore, the project as designed FAR exceeds the AOT Bureau's groundwater recharge volume requirement. A GRV worksheet is contained within the appendix of this report in order to illustrate this. Therefore, we have designed the drainage system to avoid adverse impacts to abutting infrastructure and the requirement per Section 7.1 of the Site Plan Review Regulations to "design practices **to the maximum extent practical (MEP)** to reduce stormwater runoff volumes, maintain predevelopment site hydrology, and protect water quality in receiving waters" is met. Furthermore, rain gardens (also known as bioretention systems) are recommended as a Low Impact Development practice in this same section of the regulations. We are using bioretention systems to treat and attenuate runoff from paved areas of the subject parcel in the proposed condition.

According to the NH Stormwater Manual, bioretention systems provide a pollutant removal efficiency of 90% for TSS and 65% for nitrogen, and drip edges provide a removal efficiency of 90% for TSS and 55% for nitrogen. The City of Portsmouth Site Plan Review Regulations stipulate that stormwater BMPs shall either be designed for 80% TSS removal and 50% nitrogen removal of stormwater runoff from impervious surfaces. This plan exceeds the requirements for pollutant removal because appropriate treatment / groundwater recharge systems are proposed and the Water Quality Volume is retained and treated. A breakdown of pollutant removal efficiencies for the entire site is contained within the appendix of this report.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, properties, and downstream wetlands by way of stormwater runoff or siltation. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of site grading, catch basins, yard drains, bioretention systems, and temporary erosion control measures including but not limited to silt fence and the use of a stabilized construction entrance. Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and their application will be enforced throughout the construction process. Peak rates of runoff from the site will be reduced toward all analysis points during all analyzed storm events.

This project disturbs less than 100,000 S.F. and does not require a NHDES Alteration of Terrain Permit.

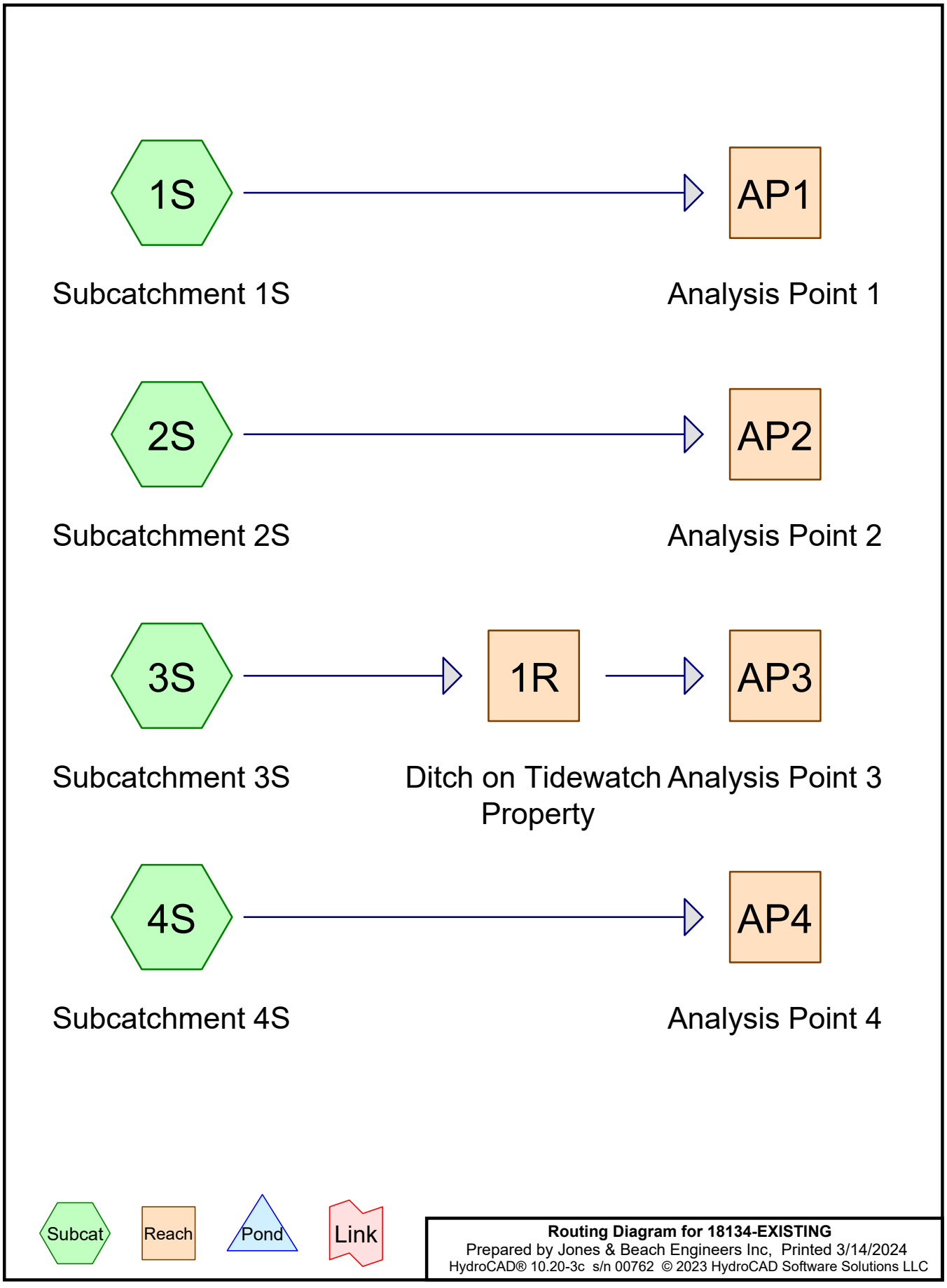
Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

Daniel Meditz, P.E
Project Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Complete 10 YEAR
Summary 25 YEAR
Complete 50 YEAR



Routing Diagram for 18134-EXISTING
Prepared by Jones & Beach Engineers Inc, Printed 3/14/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.547	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S)
0.230	98	Paved parking, HSG B (1S, 2S, 4S)
0.114	98	Roofs, HSG B (1S, 2S, 3S, 4S)
1.538	60	Woods, Fair, HSG B (2S, 3S, 4S)
2.429	**66**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.429	HSG B	1S, 2S, 3S, 4S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.429		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=13,001 sf 64.94% Impervious Runoff Depth>2.19"
Flow Length=187' Tc=6.0 min CN=85 Runoff=0.75 cfs 0.054 af

Subcatchment2S: Subcatchment2S Runoff Area=6,082 sf 32.08% Impervious Runoff Depth>1.31"
Flow Length=114' Tc=6.0 min CN=73 Runoff=0.20 cfs 0.015 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>0.62"
Flow Length=291' Tc=17.0 min CN=60 Runoff=0.51 cfs 0.069 af

Subcatchment4S: Subcatchment4S Runoff Area=28,091 sf 15.59% Impervious Runoff Depth>0.91"
Flow Length=216' Tc=11.5 min CN=66 Runoff=0.49 cfs 0.049 af

Reach 1R: Ditch on Tidewatch Property Avg. Flow Depth=0.18' Max Vel=1.77 fps Inflow=0.51 cfs 0.069 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=0.51 cfs 0.069 af

Reach AP1: Analysis Point 1 Inflow=0.75 cfs 0.054 af
Outflow=0.75 cfs 0.054 af

Reach AP2: Analysis Point 2 Inflow=0.20 cfs 0.015 af
Outflow=0.20 cfs 0.015 af

Reach AP3: Analysis Point 3 Inflow=0.51 cfs 0.069 af
Outflow=0.51 cfs 0.069 af

Reach AP4: Analysis Point 4 Inflow=0.49 cfs 0.049 af
Outflow=0.49 cfs 0.049 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.188 af Average Runoff Depth = 0.93"
85.86% Pervious = 2.085 ac 14.14% Impervious = 0.343 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=13,001 sf 64.94% Impervious Runoff Depth>3.93"
Flow Length=187' Tc=6.0 min CN=85 Runoff=1.33 cfs 0.098 af

Subcatchment2S: Subcatchment2S Runoff Area=6,082 sf 32.08% Impervious Runoff Depth>2.77"
Flow Length=114' Tc=6.0 min CN=73 Runoff=0.44 cfs 0.032 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>1.66"
Flow Length=291' Tc=17.0 min CN=60 Runoff=1.75 cfs 0.187 af

Subcatchment4S: Subcatchment4S Runoff Area=28,091 sf 15.59% Impervious Runoff Depth>2.15"
Flow Length=216' Tc=11.5 min CN=66 Runoff=1.31 cfs 0.116 af

Reach 1R: Ditch on Tidewatch Property Avg. Flow Depth=0.34' Max Vel=2.48 fps Inflow=1.75 cfs 0.187 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.74 cfs 0.186 af

Reach AP1: Analysis Point 1 Inflow=1.33 cfs 0.098 af
Outflow=1.33 cfs 0.098 af

Reach AP2: Analysis Point 2 Inflow=0.44 cfs 0.032 af
Outflow=0.44 cfs 0.032 af

Reach AP3: Analysis Point 3 Inflow=1.74 cfs 0.186 af
Outflow=1.74 cfs 0.186 af

Reach AP4: Analysis Point 4 Inflow=1.31 cfs 0.116 af
Outflow=1.31 cfs 0.116 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.432 af Average Runoff Depth = 2.14"
85.86% Pervious = 2.085 ac 14.14% Impervious = 0.343 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af, Depth> 3.93"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,476	98	Roofs, HSG B
6,967	98	Paved parking, HSG B
4,558	61	>75% Grass cover, Good, HSG B
13,001	85	Weighted Average
4,558		35.06% Pervious Area
8,443		64.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	46	0.1090	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.4	45	0.0670	2.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.4	96	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.3	187	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.032 af, Depth> 2.77"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
482	98	Roofs, HSG B
1,469	98	Paved parking, HSG B
3,981	61	>75% Grass cover, Good, HSG B
150	60	Woods, Fair, HSG B
6,082	73	Weighted Average
4,131		67.92% Pervious Area
1,951		32.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	53	0.0200	1.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
2.8	47	0.0810	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.1	14	0.2100	3.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	114	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.75 cfs @ 12.26 hrs, Volume= 0.187 af, Depth> 1.66"
Routed to Reach 1R : Ditch on Tidewatch Property

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
187	98	Roofs, HSG B
9,391	61	>75% Grass cover, Good, HSG B
49,051	60	Woods, Fair, HSG B
58,629	60	Weighted Average
58,442		99.68% Pervious Area
187		0.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	53	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
5.8	47	0.0968	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.2	15	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.0	291	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 1.31 cfs @ 12.17 hrs, Volume= 0.116 af, Depth> 2.15"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
2,809	98	Roofs, HSG B
1,571	98	Paved parking, HSG B
5,912	61	>75% Grass cover, Good, HSG B
17,799	60	Woods, Fair, HSG B
28,091	66	Weighted Average
23,711		84.41% Pervious Area
4,380		15.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	14	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
8.4	86	0.1280	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
1.0	87	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	29	0.2860	2.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.5	216	Total			

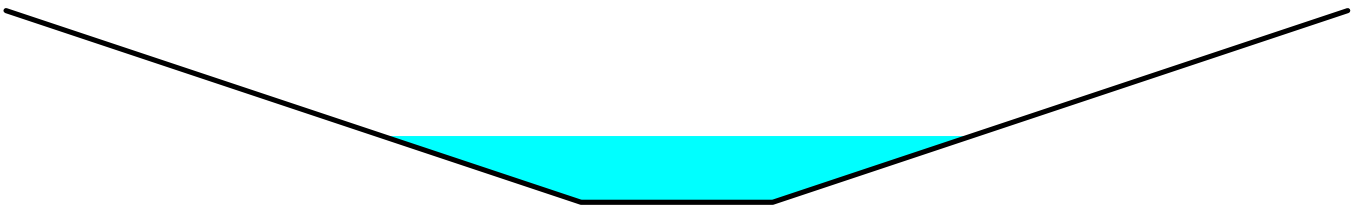
Summary for Reach 1R: Ditch on Tidewatch Property

Inflow Area = 1.346 ac, 0.32% Impervious, Inflow Depth > 1.66" for 10 Yr 24 Hr +15% event
Inflow = 1.75 cfs @ 12.26 hrs, Volume= 0.187 af
Outflow = 1.74 cfs @ 12.27 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.7 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.48 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 2.4 min

Peak Storage= 112 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 3.07'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 18.18 cfs

1.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 159.0' Slope= 0.0189 '/'
Inlet Invert= 38.00', Outlet Invert= 35.00'



Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.298 ac, 64.94% Impervious, Inflow Depth > 3.93" for 10 Yr 24 Hr +15% event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af
Outflow = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.140 ac, 32.08% Impervious, Inflow Depth > 2.77" for 10 Yr 24 Hr +15% event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.346 ac, 0.32% Impervious, Inflow Depth > 1.66" for 10 Yr 24 Hr +15% event
Inflow = 1.74 cfs @ 12.27 hrs, Volume= 0.186 af
Outflow = 1.74 cfs @ 12.27 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.645 ac, 15.59% Impervious, Inflow Depth > 2.15" for 10 Yr 24 Hr +15% event
Inflow = 1.31 cfs @ 12.17 hrs, Volume= 0.116 af
Outflow = 1.31 cfs @ 12.17 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=13,001 sf 64.94% Impervious Runoff Depth>5.36"
Flow Length=187' Tc=6.0 min CN=85 Runoff=1.78 cfs 0.133 af

Subcatchment2S: Subcatchment2S Runoff Area=6,082 sf 32.08% Impervious Runoff Depth>4.04"
Flow Length=114' Tc=6.0 min CN=73 Runoff=0.65 cfs 0.047 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>2.68"
Flow Length=291' Tc=17.0 min CN=60 Runoff=2.94 cfs 0.300 af

Subcatchment4S: Subcatchment4S Runoff Area=28,091 sf 15.59% Impervious Runoff Depth>3.29"
Flow Length=216' Tc=11.5 min CN=66 Runoff=2.05 cfs 0.177 af

Reach 1R: Ditch on Tidewatch Property Avg. Flow Depth=0.44' Max Vel=2.85 fps Inflow=2.94 cfs 0.300 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=2.94 cfs 0.300 af

Reach AP1: Analysis Point 1 Inflow=1.78 cfs 0.133 af
Outflow=1.78 cfs 0.133 af

Reach AP2: Analysis Point 2 Inflow=0.65 cfs 0.047 af
Outflow=0.65 cfs 0.047 af

Reach AP3: Analysis Point 3 Inflow=2.94 cfs 0.300 af
Outflow=2.94 cfs 0.300 af

Reach AP4: Analysis Point 4 Inflow=2.05 cfs 0.177 af
Outflow=2.05 cfs 0.177 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.658 af Average Runoff Depth = 3.25"
85.86% Pervious = 2.085 ac 14.14% Impervious = 0.343 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=13,001 sf 64.94% Impervious Runoff Depth>6.72"
Flow Length=187' Tc=6.0 min CN=85 Runoff=2.21 cfs 0.167 af

Subcatchment2S: Subcatchment2S Runoff Area=6,082 sf 32.08% Impervious Runoff Depth>5.28"
Flow Length=114' Tc=6.0 min CN=73 Runoff=0.84 cfs 0.061 af

Subcatchment3S: Subcatchment3S Runoff Area=58,629 sf 0.32% Impervious Runoff Depth>3.72"
Flow Length=291' Tc=17.0 min CN=60 Runoff=4.17 cfs 0.418 af

Subcatchment4S: Subcatchment4S Runoff Area=28,091 sf 15.59% Impervious Runoff Depth>4.44"
Flow Length=216' Tc=11.5 min CN=66 Runoff=2.78 cfs 0.238 af

Reach 1R: Ditch on Tidewatch Property Avg. Flow Depth=0.52' Max Vel=3.12 fps Inflow=4.17 cfs 0.418 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=4.17 cfs 0.417 af

Reach AP1: Analysis Point 1 Inflow=2.21 cfs 0.167 af
Outflow=2.21 cfs 0.167 af

Reach AP2: Analysis Point 2 Inflow=0.84 cfs 0.061 af
Outflow=0.84 cfs 0.061 af

Reach AP3: Analysis Point 3 Inflow=4.17 cfs 0.417 af
Outflow=4.17 cfs 0.417 af

Reach AP4: Analysis Point 4 Inflow=2.78 cfs 0.238 af
Outflow=2.78 cfs 0.238 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.884 af Average Runoff Depth = 4.37"
85.86% Pervious = 2.085 ac 14.14% Impervious = 0.343 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 2.21 cfs @ 12.09 hrs, Volume= 0.167 af, Depth> 6.72"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,476	98	Roofs, HSG B
6,967	98	Paved parking, HSG B
4,558	61	>75% Grass cover, Good, HSG B
13,001	85	Weighted Average
4,558		35.06% Pervious Area
8,443		64.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	46	0.1090	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.4	45	0.0670	2.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.4	96	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.3	187	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Depth> 5.28"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
482	98	Roofs, HSG B
1,469	98	Paved parking, HSG B
3,981	61	>75% Grass cover, Good, HSG B
150	60	Woods, Fair, HSG B
6,082	73	Weighted Average
4,131		67.92% Pervious Area
1,951		32.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	53	0.0200	1.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
2.8	47	0.0810	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.1	14	0.2100	3.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	114	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 4.17 cfs @ 12.24 hrs, Volume= 0.418 af, Depth> 3.72"
Routed to Reach 1R : Ditch on Tidewatch Property

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
187	98	Roofs, HSG B
9,391	61	>75% Grass cover, Good, HSG B
49,051	60	Woods, Fair, HSG B
58,629	60	Weighted Average
58,442		99.68% Pervious Area
187		0.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	53	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
5.8	47	0.0968	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.2	15	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.0	291	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 2.78 cfs @ 12.16 hrs, Volume= 0.238 af, Depth> 4.44"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
2,809	98	Roofs, HSG B
1,571	98	Paved parking, HSG B
5,912	61	>75% Grass cover, Good, HSG B
17,799	60	Woods, Fair, HSG B
28,091	66	Weighted Average
23,711		84.41% Pervious Area
4,380		15.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	14	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
8.4	86	0.1280	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
1.0	87	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	29	0.2860	2.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.5	216	Total			

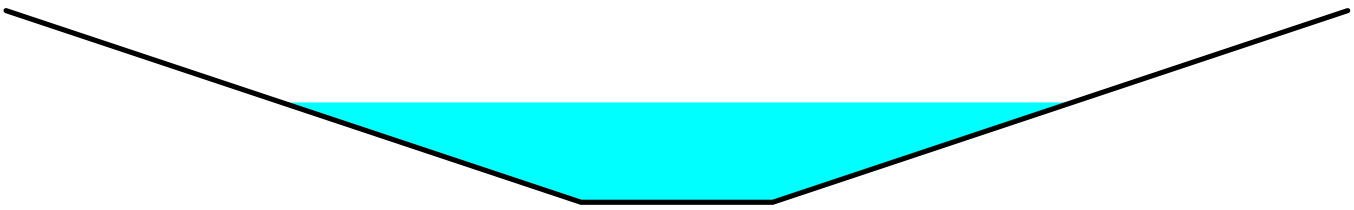
Summary for Reach 1R: Ditch on Tidewatch Property

Inflow Area = 1.346 ac, 0.32% Impervious, Inflow Depth > 3.72" for 50 Yr 24 Hr +15% event
Inflow = 4.17 cfs @ 12.24 hrs, Volume= 0.418 af
Outflow = 4.17 cfs @ 12.26 hrs, Volume= 0.417 af, Atten= 0%, Lag= 0.7 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.12 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 2.0 min

Peak Storage= 212 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 4.12'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 18.18 cfs

1.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 159.0' Slope= 0.0189 '/'
Inlet Invert= 38.00', Outlet Invert= 35.00'



Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.298 ac, 64.94% Impervious, Inflow Depth > 6.72" for 50 Yr 24 Hr +15% event
Inflow = 2.21 cfs @ 12.09 hrs, Volume= 0.167 af
Outflow = 2.21 cfs @ 12.09 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.140 ac, 32.08% Impervious, Inflow Depth > 5.28" for 50 Yr 24 Hr +15% event
Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.346 ac, 0.32% Impervious, Inflow Depth > 3.72" for 50 Yr 24 Hr +15% event
Inflow = 4.17 cfs @ 12.26 hrs, Volume= 0.417 af
Outflow = 4.17 cfs @ 12.26 hrs, Volume= 0.417 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

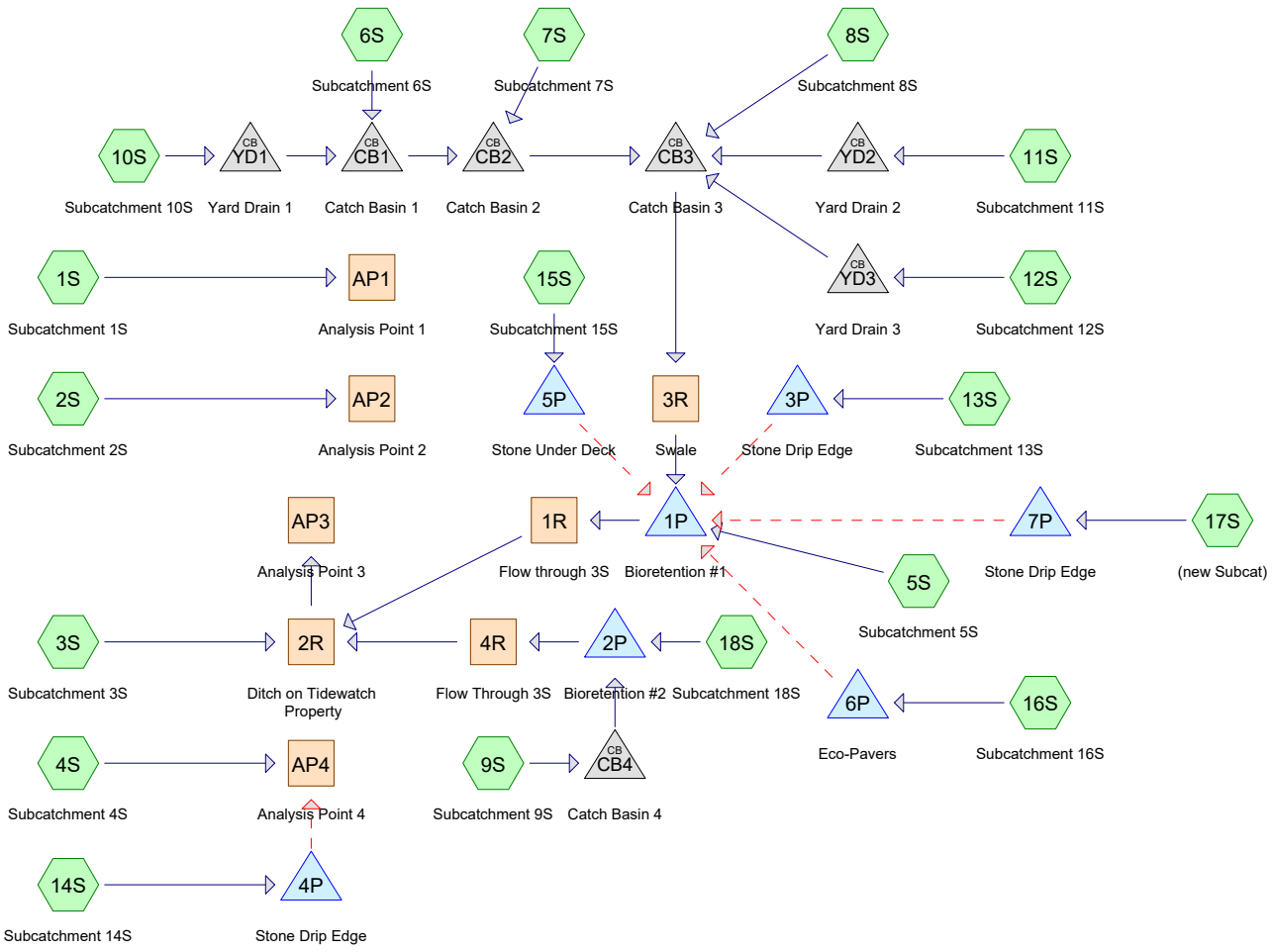
Inflow Area = 0.645 ac, 15.59% Impervious, Inflow Depth > 4.44" for 50 Yr 24 Hr +15% event
Inflow = 2.78 cfs @ 12.16 hrs, Volume= 0.238 af
Outflow = 2.78 cfs @ 12.16 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Complete 10 YEAR
Summary 25 YEAR
Complete 50 YEAR



Subcat Reach Pond Link

Routing Diagram for 18134-PROPOSED
Prepared by Jones & Beach Engineers Inc, Printed 3/14/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.118	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 10S, 11S, 12S, 18S)
0.247	98	Paved parking, HSG B (1S, 6S, 7S, 8S, 9S, 10S, 11S)
0.221	98	Roofs, HSG B (3S, 4S, 5S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 17S)
0.017	98	Water Surface, HSG B (13S, 14S, 16S, 17S)
0.826	60	Woods, Fair, HSG B (3S, 4S)
2.429	**68**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.429	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.429		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=7,392 sf 50.61% Impervious Runoff Depth>1.79"
Flow Length=186' Tc=6.0 min CN=80 Runoff=0.35 cfs 0.025 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>0.66"
Flow Length=20' Slope=0.0500 '/' Tc=6.0 min CN=61 Runoff=0.02 cfs 0.002 af

Subcatchment3S: Subcatchment3S Runoff Area=38,661 sf 0.16% Impervious Runoff Depth>0.62"
Flow Length=291' Tc=17.0 min CN=60 Runoff=0.34 cfs 0.046 af

Subcatchment4S: Subcatchment4S Runoff Area=19,888 sf 3.66% Impervious Runoff Depth>0.71"
Flow Length=210' Tc=7.9 min CN=62 Runoff=0.27 cfs 0.027 af

Subcatchment5S: Subcatchment5S Runoff Area=14,610 sf 10.77% Impervious Runoff Depth>0.86"
Flow Length=138' Tc=6.8 min CN=65 Runoff=0.28 cfs 0.024 af

Subcatchment6S: Subcatchment6S Runoff Area=1,952 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment7S: Subcatchment7S Runoff Area=1,516 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment8S: Subcatchment8S Runoff Area=707 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment9S: Subcatchment9S Runoff Area=2,789 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.018 af

Subcatchment10S: Subcatchment10S Runoff Area=3,630 sf 29.12% Impervious Runoff Depth>1.25"
Flow Length=142' Tc=6.3 min CN=72 Runoff=0.11 cfs 0.009 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>1.72"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=79 Runoff=0.21 cfs 0.015 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>1.38"
Flow Length=51' Slope=0.0320 '/' Tc=6.0 min CN=74 Runoff=0.13 cfs 0.010 af

Subcatchment13S: Subcatchment13S Runoff Area=876 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment14S: Subcatchment14S Runoff Area=882 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment15S: Subcatchment15S Runoff Area=560 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment16S: Subcatchment16S Runoff Area=221 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.02 cfs 0.001 af

Subcatchment17S: (new Subcat) Runoff Area=876 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment18S: Subcatchment18S Runoff Area=1,220 sf 0.00% Impervious Runoff Depth>0.66"
Tc=6.0 min CN=61 Runoff=0.02 cfs 0.002 af

Reach 1R: Flow through 3S Avg. Flow Depth=0.02' Max Vel=1.32 fps Inflow=0.17 cfs 0.084 af
n=0.030 L=81.0' S=0.1568 '/' Capacity=498.58 cfs Outflow=0.17 cfs 0.084 af

Reach 2R: Ditch on Tidewatch Property Avg. Flow Depth=0.18' Max Vel=1.76 fps Inflow=0.51 cfs 0.130 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=0.50 cfs 0.130 af

Reach 3R: Swale Avg. Flow Depth=0.19' Max Vel=2.57 fps Inflow=0.79 cfs 0.061 af
n=0.030 L=95.0' S=0.0379 '/' Capacity=25.77 cfs Outflow=0.79 cfs 0.061 af

Reach 4R: Flow Through 3S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=275.0' S=0.1145 '/' Capacity=74.97 cfs Outflow=0.00 cfs 0.000 af

Reach AP1: Analysis Point 1 Inflow=0.35 cfs 0.025 af
Outflow=0.35 cfs 0.025 af

Reach AP2: Analysis Point 2 Inflow=0.02 cfs 0.002 af
Outflow=0.02 cfs 0.002 af

Reach AP3: Analysis Point 3 Inflow=0.50 cfs 0.130 af
Outflow=0.50 cfs 0.130 af

Reach AP4: Analysis Point 4 Inflow=0.27 cfs 0.027 af
Outflow=0.27 cfs 0.027 af

Pond 1P: Bioretention #1 Peak Elev=54.46' Storage=1,256 cf Inflow=1.07 cfs 0.085 af
Outflow=0.17 cfs 0.084 af

Pond 2P: Bioretention #2 Peak Elev=69.22' Storage=377 cf Inflow=0.24 cfs 0.020 af
Discarded=0.03 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.019 af

Pond 3P: Stone Drip Edge Peak Elev=64.62' Storage=0.004 af Inflow=0.07 cfs 0.006 af
Discarded=0.00 cfs 0.003 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.003 af

Pond 4P: Stone Drip Edge Peak Elev=63.42' Storage=0.003 af Inflow=0.07 cfs 0.006 af
Discarded=0.00 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.004 af

Pond 5P: Stone Under Deck Peak Elev=65.44' Storage=0.002 af Inflow=0.05 cfs 0.004 af
Discarded=0.00 cfs 0.003 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.003 af

Pond 6P: Eco-Pavers Peak Elev=65.61' Storage=0.001 af Inflow=0.02 cfs 0.001 af
Discarded=0.00 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Pond 7P: Stone Drip Edge Peak Elev=64.62' Storage=0.004 af Inflow=0.07 cfs 0.006 af
Discarded=0.00 cfs 0.003 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.003 af

Pond CB1: Catch Basin 1 Peak Elev=62.42' Inflow=0.27 cfs 0.022 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0053 '/' Outflow=0.27 cfs 0.022 af

Pond CB2: Catch Basin 2 Peak Elev=62.27' Inflow=0.39 cfs 0.032 af
12.0" Round Culvert n=0.012 L=130.0' S=0.0054 '/' Outflow=0.39 cfs 0.032 af

Pond CB3: Catch Basin 3 Peak Elev=61.62' Inflow=0.79 cfs 0.061 af
12.0" Round Culvert n=0.012 L=94.0' S=0.0053 '/' Outflow=0.79 cfs 0.061 af

Pond CB4: Catch Basin 4 Peak Elev=69.22' Inflow=0.23 cfs 0.018 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.23 cfs 0.018 af

Pond YD1: Yard Drain 1 Peak Elev=62.93' Inflow=0.11 cfs 0.009 af
6.0" Round Culvert n=0.012 L=2.0' S=0.0500 '/' Outflow=0.11 cfs 0.009 af

Pond YD2: Yard Drain 2 Peak Elev=67.62' Inflow=0.21 cfs 0.015 af
6.0" Round Culvert n=0.012 L=52.0' S=0.0096 '/' Outflow=0.21 cfs 0.015 af

Pond YD3: Yard Drain 3 Peak Elev=67.55' Inflow=0.13 cfs 0.010 af
6.0" Round Culvert n=0.012 L=13.0' S=0.0385 '/' Outflow=0.13 cfs 0.010 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.228 af Average Runoff Depth = 1.13"
80.04% Pervious = 1.944 ac 19.96% Impervious = 0.485 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=7,392 sf 50.61% Impervious Runoff Depth>3.43"
Flow Length=186' Tc=6.0 min CN=80 Runoff=0.67 cfs 0.048 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>1.75"
Flow Length=20' Slope=0.0500 '/' Tc=6.0 min CN=61 Runoff=0.08 cfs 0.006 af

Subcatchment3S: Subcatchment3S Runoff Area=38,661 sf 0.16% Impervious Runoff Depth>1.66"
Flow Length=291' Tc=17.0 min CN=60 Runoff=1.15 cfs 0.123 af

Subcatchment4S: Subcatchment4S Runoff Area=19,888 sf 3.66% Impervious Runoff Depth>1.83"
Flow Length=210' Tc=7.9 min CN=62 Runoff=0.85 cfs 0.069 af

Subcatchment5S: Subcatchment5S Runoff Area=14,610 sf 10.77% Impervious Runoff Depth>2.07"
Flow Length=138' Tc=6.8 min CN=65 Runoff=0.76 cfs 0.058 af

Subcatchment6S: Subcatchment6S Runoff Area=1,952 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment7S: Subcatchment7S Runoff Area=1,516 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.016 af

Subcatchment8S: Subcatchment8S Runoff Area=707 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment9S: Subcatchment9S Runoff Area=2,789 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.029 af

Subcatchment10S: Subcatchment10S Runoff Area=3,630 sf 29.12% Impervious Runoff Depth>2.67"
Flow Length=142' Tc=6.3 min CN=72 Runoff=0.25 cfs 0.019 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>3.33"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=79 Runoff=0.40 cfs 0.029 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>2.86"
Flow Length=51' Slope=0.0320 '/' Tc=6.0 min CN=74 Runoff=0.28 cfs 0.020 af

Subcatchment13S: Subcatchment13S Runoff Area=876 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment14S: Subcatchment14S Runoff Area=882 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment15S: Subcatchment15S Runoff Area=560 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment16S: Subcatchment16S Runoff Area=221 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment17S: (new Subcat) Runoff Area=876 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment18S: Subcatchment18S Runoff Area=1,220 sf 0.00% Impervious Runoff Depth>1.75"
Tc=6.0 min CN=61 Runoff=0.05 cfs 0.004 af

Reach 1R: Flow through 3S Avg. Flow Depth=0.04' Max Vel=1.84 fps Inflow=0.54 cfs 0.167 af
n=0.030 L=81.0' S=0.1568 '/' Capacity=498.58 cfs Outflow=0.54 cfs 0.167 af

Reach 2R: Ditch on Tidewatch Property Avg. Flow Depth=0.33' Max Vel=2.44 fps Inflow=1.64 cfs 0.293 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=1.63 cfs 0.293 af

Reach 3R: Swale Avg. Flow Depth=0.27' Max Vel=3.05 fps Inflow=1.45 cfs 0.111 af
n=0.030 L=95.0' S=0.0379 '/' Capacity=25.77 cfs Outflow=1.45 cfs 0.111 af

Reach 4R: Flow Through 3S Avg. Flow Depth=0.02' Max Vel=1.34 fps Inflow=0.11 cfs 0.003 af
n=0.030 L=275.0' S=0.1145 '/' Capacity=74.97 cfs Outflow=0.09 cfs 0.003 af

Reach AP1: Analysis Point 1 Inflow=0.67 cfs 0.048 af
Outflow=0.67 cfs 0.048 af

Reach AP2: Analysis Point 2 Inflow=0.08 cfs 0.006 af
Outflow=0.08 cfs 0.006 af

Reach AP3: Analysis Point 3 Inflow=1.63 cfs 0.293 af
Outflow=1.63 cfs 0.293 af

Reach AP4: Analysis Point 4 Inflow=0.85 cfs 0.069 af
Outflow=0.85 cfs 0.069 af

Pond 1P: Bioretention #1 Peak Elev=55.34' Storage=2,503 cf Inflow=2.21 cfs 0.169 af
Outflow=0.54 cfs 0.167 af

Pond 2P: Bioretention #2 Peak Elev=69.54' Storage=560 cf Inflow=0.40 cfs 0.033 af
Discarded=0.03 cfs 0.028 af Primary=0.11 cfs 0.003 af Outflow=0.14 cfs 0.031 af

Pond 3P: Stone Drip Edge Peak Elev=65.98' Storage=0.006 af Inflow=0.11 cfs 0.009 af
Discarded=0.00 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.004 af

Pond 4P: Stone Drip Edge Peak Elev=64.93' Storage=0.006 af Inflow=0.11 cfs 0.009 af
Discarded=0.00 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.005 af

Pond 5P: Stone Under Deck Peak Elev=65.97' Storage=0.003 af Inflow=0.07 cfs 0.006 af
Discarded=0.00 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.004 af

Pond 6P: Eco-Pavers Peak Elev=65.88' Storage=0.001 af Inflow=0.03 cfs 0.002 af
Discarded=0.00 cfs 0.002 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond 7P: Stone Drip Edge Peak Elev=65.98' Storage=0.006 af Inflow=0.11 cfs 0.009 af
Discarded=0.00 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.004 af

Pond CB1: Catch Basin 1 Peak Elev=62.57' Inflow=0.49 cfs 0.039 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0053 '/' Outflow=0.49 cfs 0.039 af

Pond CB2: Catch Basin 2 Peak Elev=62.42' Inflow=0.68 cfs 0.054 af
12.0" Round Culvert n=0.012 L=130.0' S=0.0054 '/' Outflow=0.68 cfs 0.054 af

Pond CB3: Catch Basin 3 Peak Elev=61.84' Inflow=1.45 cfs 0.111 af
12.0" Round Culvert n=0.012 L=94.0' S=0.0053 '/' Outflow=1.45 cfs 0.111 af

Pond CB4: Catch Basin 4 Peak Elev=69.54' Inflow=0.34 cfs 0.029 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.34 cfs 0.029 af

Pond YD1: Yard Drain 1 Peak Elev=63.07' Inflow=0.25 cfs 0.019 af
6.0" Round Culvert n=0.012 L=2.0' S=0.0500 '/' Outflow=0.25 cfs 0.019 af

Pond YD2: Yard Drain 2 Peak Elev=67.84' Inflow=0.40 cfs 0.029 af
6.0" Round Culvert n=0.012 L=52.0' S=0.0096 '/' Outflow=0.40 cfs 0.029 af

Pond YD3: Yard Drain 3 Peak Elev=67.70' Inflow=0.28 cfs 0.020 af
6.0" Round Culvert n=0.012 L=13.0' S=0.0385 '/' Outflow=0.28 cfs 0.020 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.483 af Average Runoff Depth = 2.39"
80.04% Pervious = 1.944 ac 19.96% Impervious = 0.485 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 3.43"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
3,741	98	Paved parking, HSG B
3,651	61	>75% Grass cover, Good, HSG B
7,392	80	Weighted Average
3,651		49.39% Pervious Area
3,741		50.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	56	0.1250	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.1	30	0.0670	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.2	14	0.0360	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.4	86	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	186	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af, Depth> 1.75"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,728	61	>75% Grass cover, Good, HSG B
1,728		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	20	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.15 cfs @ 12.26 hrs, Volume= 0.123 af, Depth> 1.66"
Routed to Reach 2R : Ditch on Tidewatch Property

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
60	98	Roofs, HSG B
10,778	61	>75% Grass cover, Good, HSG B
27,823	60	Woods, Fair, HSG B
38,661	60	Weighted Average
38,601		99.84% Pervious Area
60		0.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	53	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
5.8	47	0.0968	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.2	15	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.0	291	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.85 cfs @ 12.12 hrs, Volume= 0.069 af, Depth> 1.83"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
10,991	61	>75% Grass cover, Good, HSG B
8,169	60	Woods, Fair, HSG B
728	98	Roofs, HSG B
19,888	62	Weighted Average
19,160		96.34% Pervious Area
728		3.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	14	0.0357	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.9	14	0.1429	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.3	72	0.1333	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.0	80	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.2667	2.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.9	210	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.76 cfs @ 12.11 hrs, Volume= 0.058 af, Depth> 2.07"
Routed to Pond 1P : Bioretention #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
13,037	61	>75% Grass cover, Good, HSG B
1,573	98	Roofs, HSG B
14,610	65	Weighted Average
13,037		89.23% Pervious Area
1,573		10.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	43	0.0419	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	35	0.1714	0.35		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.4	23	0.1087	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.2	37	0.1892	3.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	138	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 5.37"
Routed to Pond CB1 : Catch Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,952	98	Paved parking, HSG B
1,952		100.00% Impervious Area

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

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 5.37"
Routed to Pond CB2 : Catch Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,516	98	Paved parking, HSG B
1,516		100.00% Impervious Area

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

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 5.37"
Routed to Pond CB3 : Catch Basin 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
707	98	Paved parking, HSG B
707		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 5.37"
Routed to Pond CB4 : Catch Basin 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
2,332	98	Paved parking, HSG B
457	98	Roofs, HSG B
2,789	98	Weighted Average
2,789		100.00% Impervious Area

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

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af, Depth> 2.67"
Routed to Pond YD1 : Yard Drain 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
796	98	Roofs, HSG B
2,573	61	>75% Grass cover, Good, HSG B
261	98	Paved parking, HSG B
3,630	72	Weighted Average
2,573		70.88% Pervious Area
1,057		29.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	42	0.1190	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.7	58	0.0650	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.4	42	0.0650	1.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	142	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 3.33"
Routed to Pond YD2 : Yard Drain 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,998	98	Roofs, HSG B
2,312	61	>75% Grass cover, Good, HSG B
261	98	Paved parking, HSG B
4,571	79	Weighted Average
2,312		50.58% Pervious Area
2,259		49.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	77	0.0396	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
5.6	77	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 2.86"
Routed to Pond YD3 : Yard Drain 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,318	98	Roofs, HSG B
2,416	61	>75% Grass cover, Good, HSG B
3,734	74	Weighted Average
2,416		64.70% Pervious Area
1,318		35.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	51	0.0320	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.4	51	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.37"
Routed to Pond 3P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
696	98	Roofs, HSG B
180	98	Water Surface, HSG B
876	98	Weighted Average
876		100.00% Impervious Area

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

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.37"
Routed to Pond 4P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
738	98	Roofs, HSG B
144	98	Water Surface, HSG B
882	98	Weighted Average
882		100.00% Impervious Area

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

Summary for Subcatchment 15S: Subcatchment 15S

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af, Depth> 5.37"
Routed to Pond 5P : Stone Under Deck

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
560	98	Roofs, HSG B
560		100.00% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af, Depth> 5.37"
Routed to Pond 6P : Eco-Pavers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
221	98	Water Surface, HSG B
221		100.00% Impervious Area

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

Summary for Subcatchment 17S: (new Subcat)

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.37"
Routed to Pond 7P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
696	98	Roofs, HSG B
180	98	Water Surface, HSG B
876	98	Weighted Average
876		100.00% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 1.75"
Routed to Pond 2P : Bioretention #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr +15% Rainfall=5.61"

Area (sf)	CN	Description
1,220	61	>75% Grass cover, Good, HSG B
1,220		100.00% Pervious Area

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

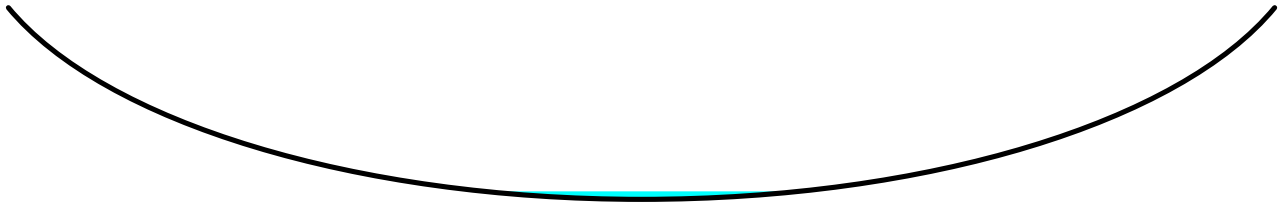
Summary for Reach 1R: Flow through 3S

Inflow Area = 0.705 ac, 33.80% Impervious, Inflow Depth > 2.84" for 10 Yr 24 Hr +15% event
Inflow = 0.54 cfs @ 12.52 hrs, Volume= 0.167 af
Outflow = 0.54 cfs @ 12.52 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.3 min
Routed to Reach 2R : Ditch on Tidewatch Property

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.84 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 1.4 min

Peak Storage= 24 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 10.32'
Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 498.58 cfs

50.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 81.0' Slope= 0.1568 '/'
Inlet Invert= 50.70', Outlet Invert= 38.00'



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Summary for Reach 2R: Ditch on Tidewatch Property

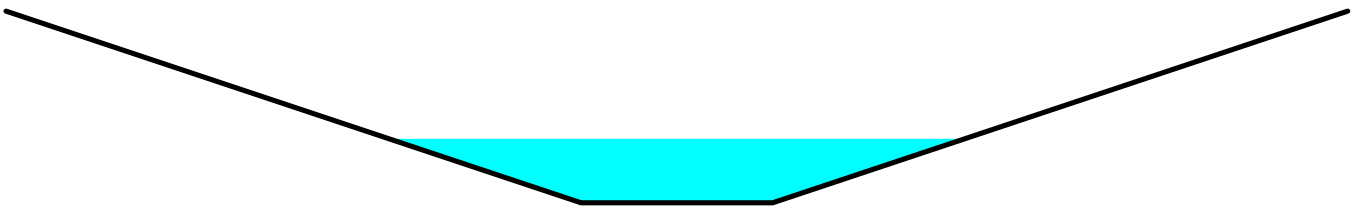
[62] Hint: Exceeded Reach 1R OUTLET depth by 0.29' @ 12.30 hrs
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.33' @ 12.25 hrs

Inflow Area = 1.685 ac, 18.03% Impervious, Inflow Depth > 2.09" for 10 Yr 24 Hr +15% event
Inflow = 1.64 cfs @ 12.29 hrs, Volume= 0.293 af
Outflow = 1.63 cfs @ 12.30 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.9 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.44 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 2.7 min

Peak Storage= 106 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 3.01'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 18.18 cfs

1.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 159.0' Slope= 0.0189 '/'
Inlet Invert= 38.00', Outlet Invert= 35.00'



Summary for Reach 3R: Swale

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.370 ac, 54.68% Impervious, Inflow Depth > 3.60" for 10 Yr 24 Hr +15% event
Inflow = 1.45 cfs @ 12.09 hrs, Volume= 0.111 af
Outflow = 1.45 cfs @ 12.10 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.4 min
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.05 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 1.8 min

Peak Storage= 45 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 2.59'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 25.77 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 95.0' Slope= 0.0379 '/'
Inlet Invert= 60.60', Outlet Invert= 57.00'

Summary for Reach 4R: Flow Through 3S

[80] Warning: Exceeded Pond 2P by 0.15' @ 15.95 hrs (0.00 cfs 0.000 af)

Inflow Area = 0.092 ac, 69.57% Impervious, Inflow Depth = 0.39" for 10 Yr 24 Hr +15% event
Inflow = 0.11 cfs @ 12.37 hrs, Volume= 0.003 af
Outflow = 0.09 cfs @ 12.44 hrs, Volume= 0.003 af, Atten= 12%, Lag= 4.1 min
Routed to Reach 2R : Ditch on Tidewatch Property

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.34 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 5.2 min

Peak Storage= 19 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 3.14'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 74.97 cfs

3.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 9.00'
Length= 275.0' Slope= 0.1145 '/'
Inlet Invert= 69.50', Outlet Invert= 38.00'

‡

Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.170 ac, 50.61% Impervious, Inflow Depth > 3.43" for 10 Yr 24 Hr +15% event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth > 1.75" for 10 Yr 24 Hr +15% event
Inflow = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af
Outflow = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.685 ac, 18.03% Impervious, Inflow Depth > 2.09" for 10 Yr 24 Hr +15% event
Inflow = 1.63 cfs @ 12.30 hrs, Volume= 0.293 af
Outflow = 1.63 cfs @ 12.30 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.457 ac, 3.66% Impervious, Inflow Depth > 1.83" for 10 Yr 24 Hr +15% event
Inflow = 0.85 cfs @ 12.12 hrs, Volume= 0.069 af
Outflow = 0.85 cfs @ 12.12 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Bioretention #1

Inflow Area = 0.705 ac, 33.80% Impervious, Inflow Depth > 2.87" for 10 Yr 24 Hr +15% event
Inflow = 2.21 cfs @ 12.10 hrs, Volume= 0.169 af
Outflow = 0.54 cfs @ 12.52 hrs, Volume= 0.167 af, Atten= 75%, Lag= 24.9 min
Primary = 0.54 cfs @ 12.52 hrs, Volume= 0.167 af
Routed to Reach 1R : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.34' @ 12.52 hrs Surf.Area= 1,655 sf Storage= 2,503 cf

Plug-Flow detention time= 80.2 min calculated for 0.167 af (99% of inflow)
Center-of-Mass det. time= 74.4 min (890.7 - 816.3)

Volume	Invert	Avail.Storage	Storage Description
#1	50.99'	6,061 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
50.99	924	0.0	0	0
51.00	924	40.0	4	4
52.49	924	40.0	551	554
52.50	924	15.0	1	556
53.99	924	15.0	207	762
54.00	924	100.0	9	772
56.00	2,012	100.0	2,936	3,708
57.00	2,643	100.0	2,328	6,035
57.01	2,643	100.0	26	6,061

Device	Routing	Invert	Outlet Devices
#1	Primary	51.00'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.00' / 50.70' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	51.00'	**1.9" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	55.60'	**3.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	56.10'	**2.5" W x 1.5" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 1	56.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.54 cfs @ 12.52 hrs HW=55.34' TW=50.74' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.54 cfs of 5.85 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.20 cfs @ 9.94 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.35 cfs @ 3.96 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)
  - **6=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

[80] Warning: Exceeded Pond CB4 by 0.92' @ 17.10 hrs (1.76 cfs 0.178 af)

Inflow Area = 0.092 ac, 69.57% Impervious, Inflow Depth > 4.27" for 10 Yr 24 Hr +15% event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.033 af
Outflow = 0.14 cfs @ 12.37 hrs, Volume= 0.031 af, Atten= 66%, Lag= 17.0 min
Discarded = 0.03 cfs @ 12.40 hrs, Volume= 0.028 af
Primary = 0.11 cfs @ 12.37 hrs, Volume= 0.003 af
Routed to Reach 4R : Flow Through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 69.54' @ 12.40 hrs Surf.Area= 621 sf Storage= 560 cf

Plug-Flow detention time= 178.7 min calculated for 0.031 af (96% of inflow)
Center-of-Mass det. time= 155.1 min (915.5 - 760.4)

Volume	Invert	Avail.Storage	Storage Description
#1	65.74'	884 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
65.74	153	0.0	0	0
65.75	153	40.0	1	1
66.99	153	40.0	76	77
67.00	153	15.0	0	77
68.49	153	15.0	34	111
68.50	153	100.0	2	112
69.00	464	100.0	154	267
70.00	755	100.0	610	876
70.01	755	100.0	8	884

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.74'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 65.58' Phase-In= 0.10'
#2	Primary	69.50'	**6.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.03 cfs @ 12.40 hrs HW=69.54' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.10 cfs @ 12.37 hrs HW=69.54' TW=69.52' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.41 fps)

Summary for Pond 3P: Stone Drip Edge

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 4' above existing grade and therefore 5.25' above ledge.

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.00 cfs @ 15.49 hrs, Volume= 0.004 af, Atten= 97%, Lag= 204.3 min
Discarded = 0.00 cfs @ 15.49 hrs, Volume= 0.004 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 65.98' @ 15.49 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 332.3 min calculated for 0.004 af (50% of inflow)
Center-of-Mass det. time= 201.5 min (947.3 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	0.006 af	**3.00'W x 60.00'L x 3.51'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	62.50'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 60.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 15.49 hrs HW=65.98' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' TW=50.99' (Dynamic Tailwater)

Summary for Pond 4P: Stone Drip Edge

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 4' above existing grade and therefore 5.25' above ledge.

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.00 cfs @ 14.94 hrs, Volume= 0.005 af, Atten= 96%, Lag= 171.1 min
Discarded = 0.00 cfs @ 14.94 hrs, Volume= 0.005 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP4 : Analysis Point 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 64.93' @ 14.94 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 331.1 min calculated for 0.005 af (56% of inflow)
Center-of-Mass det. time= 213.2 min (959.0 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	0.006 af	**3.25'W x 48.00'L x 4.01'H Prismatoid** 0.014 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	65.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	61.00'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 59.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 14.94 hrs HW=64.93' (Free Discharge)
↑**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=61.00' TW=0.00' (Dynamic Tailwater)

Summary for Pond 5P: Stone Under Deck

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 3.2' above existing grade and therefore 4.45' above ledge.

Inflow Area = 0.013 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af
Outflow = 0.00 cfs @ 15.02 hrs, Volume= 0.004 af, Atten= 96%, Lag= 176.3 min
Discarded = 0.00 cfs @ 15.02 hrs, Volume= 0.004 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 65.97' @ 15.02 hrs Surf.Area= 0.006 ac Storage= 0.003 af

Plug-Flow detention time= 294.9 min calculated for 0.004 af (62% of inflow)
Center-of-Mass det. time= 187.7 min (933.4 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.70'	0.004 af	**14.00'W x 20.00'L x 1.50'H Prismatoid** 0.010 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	64.70'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 61.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 15.02 hrs HW=65.97' (Free Discharge)
↑**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.70' TW=50.99' (Dynamic Tailwater)

Summary for Pond 6P: Eco-Pavers

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 3.2' above existing grade and therefore 4.45' above ledge.

Inflow Area = 0.005 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af
Outflow = 0.00 cfs @ 13.46 hrs, Volume= 0.002 af, Atten= 93%, Lag= 82.4 min
Discarded = 0.00 cfs @ 13.46 hrs, Volume= 0.002 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 65.88' @ 13.46 hrs Surf.Area= 0.005 ac Storage= 0.001 af

Plug-Flow detention time= 231.3 min calculated for 0.002 af (96% of inflow)
Center-of-Mass det. time= 206.5 min (952.3 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	65.20'	0.002 af	**13.00'W x 17.00'L x 1.00'H Prismatoid** 0.005 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	65.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 61.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 13.46 hrs HW=65.88' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=65.20' TW=50.99' (Dynamic Tailwater)

Summary for Pond 7P: Stone Drip Edge

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 4' above existing grade and therefore 5.25' above ledge.

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.00 cfs @ 15.49 hrs, Volume= 0.004 af, Atten= 97%, Lag= 204.3 min
Discarded = 0.00 cfs @ 15.49 hrs, Volume= 0.004 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 65.98' @ 15.49 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 332.3 min calculated for 0.004 af (50% of inflow)
Center-of-Mass det. time= 201.5 min (947.3 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	0.006 af	**3.00'W x 60.00'L x 3.51'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	62.50'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 60.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 15.49 hrs HW=65.98' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' TW=50.99' (Dynamic Tailwater)

Summary for Pond CB1: Catch Basin 1

Inflow Area = 0.128 ac, 53.91% Impervious, Inflow Depth > 3.62" for 10 Yr 24 Hr +15% event
Inflow = 0.49 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.49 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 12.09 hrs, Volume= 0.039 af
Routed to Pond CB2 : Catch Basin 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 62.57' @ 12.09 hrs
Flood Elev= 65.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.10'	**12.0" Round Culvert** L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.10' / 62.00' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.09 hrs HW=62.57' TW=62.41' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.48 cfs @ 1.97 fps)

Summary for Pond CB2: Catch Basin 2

Inflow Area = 0.163 ac, 63.75% Impervious, Inflow Depth > 3.99" for 10 Yr 24 Hr +15% event
Inflow = 0.68 cfs @ 12.09 hrs, Volume= 0.054 af
Outflow = 0.68 cfs @ 12.09 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 0.68 cfs @ 12.09 hrs, Volume= 0.054 af
Routed to Pond CB3 : Catch Basin 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 62.42' @ 12.09 hrs
Flood Elev= 65.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	61.90'	**12.0" Round Culvert** L= 130.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.90' / 61.20' S= 0.0054 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.67 cfs @ 12.09 hrs HW=62.41' TW=61.83' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.67 cfs @ 2.41 fps)

Summary for Pond CB3: Catch Basin 3

Inflow Area = 0.370 ac, 54.68% Impervious, Inflow Depth > 3.60" for 10 Yr 24 Hr +15% event
Inflow = 1.45 cfs @ 12.09 hrs, Volume= 0.111 af
Outflow = 1.45 cfs @ 12.09 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min
Primary = 1.45 cfs @ 12.09 hrs, Volume= 0.111 af
Routed to Reach 3R : Swale

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 61.84' @ 12.09 hrs
Flood Elev= 73.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	61.10'	**12.0" Round Culvert** L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.10' / 60.60' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.42 cfs @ 12.09 hrs HW=61.83' TW=60.86' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.42 cfs @ 2.30 fps)

Summary for Pond CB4: Catch Basin 4

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=85)

Inflow Area = 0.064 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr +15% event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.34 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 12.09 hrs, Volume= 0.029 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 69.54' @ 12.39 hrs
Flood Elev= 71.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.30'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.30' / 68.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.09 hrs HW=69.24' TW=69.22' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.34 cfs @ 0.44 fps)

Summary for Pond YD1: Yard Drain 1

Inflow Area = 0.083 ac, 29.12% Impervious, Inflow Depth > 2.67" for 10 Yr 24 Hr +15% event
Inflow = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af
Outflow = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af
Routed to Pond CB1 : Catch Basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 63.07' @ 12.10 hrs
Flood Elev= 65.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.70'	**6.0" Round Culvert** L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.70' / 62.60' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.25 cfs @ 12.10 hrs HW=63.07' TW=62.57' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.25 cfs @ 1.63 fps)

Summary for Pond YD2: Yard Drain 2

Inflow Area = 0.105 ac, 49.42% Impervious, Inflow Depth > 3.33" for 10 Yr 24 Hr +15% event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Primary = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af
Routed to Pond CB3 : Catch Basin 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 67.84' @ 12.09 hrs
Flood Elev= 69.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.30'	**6.0" Round Culvert** L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.30' / 66.80' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.39 cfs @ 12.09 hrs HW=67.83' TW=61.83' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.39 cfs @ 2.00 fps)

Summary for Pond YD3: Yard Drain 3

Inflow Area = 0.086 ac, 35.30% Impervious, Inflow Depth > 2.86" for 10 Yr 24 Hr +15% event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af
Routed to Pond CB3 : Catch Basin 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 67.70' @ 12.09 hrs
Flood Elev= 70.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.30'	**6.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.30' / 66.80' S= 0.0385 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.28 cfs @ 12.09 hrs HW=67.69' TW=61.84' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.28 cfs @ 1.68 fps)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=7,392 sf 50.61% Impervious Runoff Depth>4.80"
Flow Length=186' Tc=6.0 min CN=80 Runoff=0.93 cfs 0.068 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>2.79"
Flow Length=20' Slope=0.0500 '/' Tc=6.0 min CN=61 Runoff=0.12 cfs 0.009 af

Subcatchment3S: Subcatchment3S Runoff Area=38,661 sf 0.16% Impervious Runoff Depth>2.68"
Flow Length=291' Tc=17.0 min CN=60 Runoff=1.94 cfs 0.198 af

Subcatchment4S: Subcatchment4S Runoff Area=19,888 sf 3.66% Impervious Runoff Depth>2.89"
Flow Length=210' Tc=7.9 min CN=62 Runoff=1.40 cfs 0.110 af

Subcatchment5S: Subcatchment5S Runoff Area=14,610 sf 10.77% Impervious Runoff Depth>3.19"
Flow Length=138' Tc=6.8 min CN=65 Runoff=1.20 cfs 0.089 af

Subcatchment6S: Subcatchment6S Runoff Area=1,952 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.31 cfs 0.026 af

Subcatchment7S: Subcatchment7S Runoff Area=1,516 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment8S: Subcatchment8S Runoff Area=707 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment9S: Subcatchment9S Runoff Area=2,789 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.44 cfs 0.037 af

Subcatchment10S: Subcatchment10S Runoff Area=3,630 sf 29.12% Impervious Runoff Depth>3.93"
Flow Length=142' Tc=6.3 min CN=72 Runoff=0.37 cfs 0.027 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>4.69"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=79 Runoff=0.56 cfs 0.041 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>4.14"
Flow Length=51' Slope=0.0320 '/' Tc=6.0 min CN=74 Runoff=0.41 cfs 0.030 af

Subcatchment13S: Subcatchment13S Runoff Area=876 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment14S: Subcatchment14S Runoff Area=882 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment15S: Subcatchment15S Runoff Area=560 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment16S: Subcatchment16S Runoff Area=221 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.003 af

Subcatchment17S: (new Subcat) Runoff Area=876 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment18S: Subcatchment18S Runoff Area=1,220 sf 0.00% Impervious Runoff Depth>2.79"
Tc=6.0 min CN=61 Runoff=0.09 cfs 0.007 af

Reach 1R: Flow through 3S Avg. Flow Depth=0.05' Max Vel=2.13 fps Inflow=0.87 cfs 0.244 af
n=0.030 L=81.0' S=0.1568 '/' Capacity=498.58 cfs Outflow=0.87 cfs 0.244 af

Reach 2R: Ditch on Tidewatch Property Avg. Flow Depth=0.44' Max Vel=2.85 fps Inflow=2.93 cfs 0.451 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=2.94 cfs 0.451 af

Reach 3R: Swale Avg. Flow Depth=0.31' Max Vel=3.33 fps Inflow=2.00 cfs 0.153 af
n=0.030 L=95.0' S=0.0379 '/' Capacity=25.77 cfs Outflow=2.00 cfs 0.153 af

Reach 4R: Flow Through 3S Avg. Flow Depth=0.05' Max Vel=2.09 fps Inflow=0.35 cfs 0.009 af
n=0.030 L=275.0' S=0.1145 '/' Capacity=74.97 cfs Outflow=0.32 cfs 0.009 af

Reach AP1: Analysis Point 1 Inflow=0.93 cfs 0.068 af
Outflow=0.93 cfs 0.068 af

Reach AP2: Analysis Point 2 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach AP3: Analysis Point 3 Inflow=2.94 cfs 0.451 af
Outflow=2.94 cfs 0.451 af

Reach AP4: Analysis Point 4 Inflow=1.40 cfs 0.112 af
Outflow=1.40 cfs 0.112 af

Pond 1P: Bioretention #1 Peak Elev=56.00' Storage=3,698 cf Inflow=3.19 cfs 0.246 af
Outflow=0.87 cfs 0.244 af

Pond 2P: Bioretention #2 Peak Elev=69.59' Storage=589 cf Inflow=0.52 cfs 0.043 af
Discarded=0.03 cfs 0.032 af Primary=0.35 cfs 0.009 af Outflow=0.38 cfs 0.041 af

Pond 3P: Stone Drip Edge Peak Elev=66.01' Storage=0.006 af Inflow=0.14 cfs 0.012 af
Discarded=0.00 cfs 0.005 af Secondary=0.05 cfs 0.002 af Outflow=0.05 cfs 0.007 af

Pond 4P: Stone Drip Edge Peak Elev=65.01' Storage=0.006 af Inflow=0.14 cfs 0.012 af
Discarded=0.00 cfs 0.005 af Secondary=0.05 cfs 0.002 af Outflow=0.05 cfs 0.007 af

Pond 5P: Stone Under Deck Peak Elev=66.20' Storage=0.004 af Inflow=0.09 cfs 0.007 af
Discarded=0.00 cfs 0.004 af Secondary=0.01 cfs 0.001 af Outflow=0.01 cfs 0.005 af

Pond 6P: Eco-Pavers Peak Elev=66.13' Storage=0.001 af Inflow=0.03 cfs 0.003 af
Discarded=0.00 cfs 0.002 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond 7P: Stone Drip Edge Peak Elev=66.01' Storage=0.006 af Inflow=0.14 cfs 0.012 af
Discarded=0.00 cfs 0.005 af Secondary=0.05 cfs 0.002 af Outflow=0.05 cfs 0.007 af

Pond CB1: Catch Basin 1 Peak Elev=62.70' Inflow=0.68 cfs 0.053 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0053 '/' Outflow=0.68 cfs 0.053 af

Pond CB2: Catch Basin 2 Peak Elev=62.54' Inflow=0.92 cfs 0.073 af
12.0" Round Culvert n=0.012 L=130.0' S=0.0054 '/' Outflow=0.92 cfs 0.073 af

Pond CB3: Catch Basin 3 Peak Elev=62.04' Inflow=2.00 cfs 0.153 af
12.0" Round Culvert n=0.012 L=94.0' S=0.0053 '/' Outflow=2.00 cfs 0.153 af

Pond CB4: Catch Basin 4 Peak Elev=69.60' Inflow=0.44 cfs 0.037 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.44 cfs 0.037 af

Pond YD1: Yard Drain 1 Peak Elev=63.20' Inflow=0.37 cfs 0.027 af
6.0" Round Culvert n=0.012 L=2.0' S=0.0500 '/' Outflow=0.37 cfs 0.027 af

Pond YD2: Yard Drain 2 Peak Elev=68.11' Inflow=0.56 cfs 0.041 af
6.0" Round Culvert n=0.012 L=52.0' S=0.0096 '/' Outflow=0.56 cfs 0.041 af

Pond YD3: Yard Drain 3 Peak Elev=67.85' Inflow=0.41 cfs 0.030 af
6.0" Round Culvert n=0.012 L=13.0' S=0.0385 '/' Outflow=0.41 cfs 0.030 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.715 af Average Runoff Depth = 3.53"
80.04% Pervious = 1.944 ac 19.96% Impervious = 0.485 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=7,392 sf 50.61% Impervious Runoff Depth>6.12"
Flow Length=186' Tc=6.0 min CN=80 Runoff=1.17 cfs 0.087 af

Subcatchment2S: Subcatchment2S Runoff Area=1,728 sf 0.00% Impervious Runoff Depth>3.85"
Flow Length=20' Slope=0.0500 '/' Tc=6.0 min CN=61 Runoff=0.17 cfs 0.013 af

Subcatchment3S: Subcatchment3S Runoff Area=38,661 sf 0.16% Impervious Runoff Depth>3.72"
Flow Length=291' Tc=17.0 min CN=60 Runoff=2.75 cfs 0.275 af

Subcatchment4S: Subcatchment4S Runoff Area=19,888 sf 3.66% Impervious Runoff Depth>3.97"
Flow Length=210' Tc=7.9 min CN=62 Runoff=1.95 cfs 0.151 af

Subcatchment5S: Subcatchment5S Runoff Area=14,610 sf 10.77% Impervious Runoff Depth>4.32"
Flow Length=138' Tc=6.8 min CN=65 Runoff=1.63 cfs 0.121 af

Subcatchment6S: Subcatchment6S Runoff Area=1,952 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.031 af

Subcatchment7S: Subcatchment7S Runoff Area=1,516 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.024 af

Subcatchment8S: Subcatchment8S Runoff Area=707 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment9S: Subcatchment9S Runoff Area=2,789 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.044 af

Subcatchment10S: Subcatchment10S Runoff Area=3,630 sf 29.12% Impervious Runoff Depth>5.16"
Flow Length=142' Tc=6.3 min CN=72 Runoff=0.49 cfs 0.036 af

Subcatchment11S: Subcatchment11S Runoff Area=4,571 sf 49.42% Impervious Runoff Depth>6.00"
Flow Length=77' Slope=0.0396 '/' Tc=6.0 min CN=79 Runoff=0.71 cfs 0.052 af

Subcatchment12S: Subcatchment12S Runoff Area=3,734 sf 35.30% Impervious Runoff Depth>5.40"
Flow Length=51' Slope=0.0320 '/' Tc=6.0 min CN=74 Runoff=0.53 cfs 0.039 af

Subcatchment13S: Subcatchment13S Runoff Area=876 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af

Subcatchment14S: Subcatchment14S Runoff Area=882 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment15S: Subcatchment15S Runoff Area=560 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment16S: Subcatchment16S Runoff Area=221 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.004 af

Subcatchment17S: (new Subcat) Runoff Area=876 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af

Subcatchment18S: Subcatchment18S Runoff Area=1,220 sf 0.00% Impervious Runoff Depth>3.85"
Tc=6.0 min CN=61 Runoff=0.12 cfs 0.009 af

Reach 1R: Flow through 3S Avg. Flow Depth=0.07' Max Vel=2.44 fps Inflow=1.38 cfs 0.320 af
n=0.030 L=81.0' S=0.1568 '/' Capacity=498.58 cfs Outflow=1.37 cfs 0.320 af

Reach 2R: Ditch on Tidewatch Property Avg. Flow Depth=0.52' Max Vel=3.12 fps Inflow=4.17 cfs 0.611 af
n=0.030 L=159.0' S=0.0189 '/' Capacity=18.18 cfs Outflow=4.17 cfs 0.611 af

Reach 3R: Swale Avg. Flow Depth=0.35' Max Vel=3.54 fps Inflow=2.51 cfs 0.193 af
n=0.030 L=95.0' S=0.0379 '/' Capacity=25.77 cfs Outflow=2.52 cfs 0.193 af

Reach 4R: Flow Through 3S Avg. Flow Depth=0.07' Max Vel=2.61 fps Inflow=0.57 cfs 0.016 af
n=0.030 L=275.0' S=0.1145 '/' Capacity=74.97 cfs Outflow=0.56 cfs 0.016 af

Reach AP1: Analysis Point 1 Inflow=1.17 cfs 0.087 af
Outflow=1.17 cfs 0.087 af

Reach AP2: Analysis Point 2 Inflow=0.17 cfs 0.013 af
Outflow=0.17 cfs 0.013 af

Reach AP3: Analysis Point 3 Inflow=4.17 cfs 0.611 af
Outflow=4.17 cfs 0.611 af

Reach AP4: Analysis Point 4 Inflow=1.99 cfs 0.155 af
Outflow=1.99 cfs 0.155 af

Pond 1P: Bioretention #1 Peak Elev=56.52' Storage=4,849 cf Inflow=4.15 cfs 0.324 af
Outflow=1.38 cfs 0.320 af

Pond 2P: Bioretention #2 Peak Elev=69.63' Storage=614 cf Inflow=0.65 cfs 0.053 af
Discarded=0.03 cfs 0.035 af Primary=0.57 cfs 0.016 af Outflow=0.61 cfs 0.051 af

Pond 3P: Stone Drip Edge Peak Elev=66.01' Storage=0.006 af Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.005 af Secondary=0.11 cfs 0.004 af Outflow=0.11 cfs 0.009 af

Pond 4P: Stone Drip Edge Peak Elev=65.01' Storage=0.006 af Inflow=0.17 cfs 0.014 af
Discarded=0.00 cfs 0.006 af Secondary=0.12 cfs 0.004 af Outflow=0.13 cfs 0.009 af

Pond 5P: Stone Under Deck Peak Elev=66.20' Storage=0.004 af Inflow=0.11 cfs 0.009 af
Discarded=0.00 cfs 0.004 af Secondary=0.04 cfs 0.002 af Outflow=0.05 cfs 0.006 af

Pond 6P: Eco-Pavers Peak Elev=66.20' Storage=0.002 af Inflow=0.04 cfs 0.004 af
Discarded=0.00 cfs 0.003 af Secondary=0.01 cfs 0.000 af Outflow=0.01 cfs 0.003 af

Pond 7P: Stone Drip Edge Peak Elev=66.01' Storage=0.006 af Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.005 af Secondary=0.11 cfs 0.004 af Outflow=0.11 cfs 0.009 af

Pond CB1: Catch Basin 1 Peak Elev=62.84' Inflow=0.86 cfs 0.067 af
12.0" Round Culvert n=0.012 L=19.0' S=0.0053 '/' Outflow=0.86 cfs 0.067 af

Pond CB2: Catch Basin 2 Peak Elev=62.71' Inflow=1.14 cfs 0.091 af
12.0" Round Culvert n=0.012 L=130.0' S=0.0054 '/' Outflow=1.14 cfs 0.091 af

Pond CB3: Catch Basin 3 Peak Elev=62.31' Inflow=2.51 cfs 0.193 af
12.0" Round Culvert n=0.012 L=94.0' S=0.0053 '/' Outflow=2.51 cfs 0.193 af

Pond CB4: Catch Basin 4 Peak Elev=69.66' Inflow=0.52 cfs 0.044 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=0.52 cfs 0.044 af

Pond YD1: Yard Drain 1 Peak Elev=63.38' Inflow=0.49 cfs 0.036 af
6.0" Round Culvert n=0.012 L=2.0' S=0.0500 '/' Outflow=0.49 cfs 0.036 af

Pond YD2: Yard Drain 2 Peak Elev=68.46' Inflow=0.71 cfs 0.052 af
6.0" Round Culvert n=0.012 L=52.0' S=0.0096 '/' Outflow=0.71 cfs 0.052 af

Pond YD3: Yard Drain 3 Peak Elev=68.05' Inflow=0.53 cfs 0.039 af
6.0" Round Culvert n=0.012 L=13.0' S=0.0385 '/' Outflow=0.53 cfs 0.039 af

Total Runoff Area = 2.429 ac Runoff Volume = 0.947 af Average Runoff Depth = 4.68"
80.04% Pervious = 1.944 ac 19.96% Impervious = 0.485 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.087 af, Depth> 6.12"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
3,741	98	Paved parking, HSG B
3,651	61	>75% Grass cover, Good, HSG B
7,392	80	Weighted Average
3,651		49.39% Pervious Area
3,741		50.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	56	0.1250	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.1	30	0.0670	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.2	14	0.0360	1.26		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.4	86	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	186	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 0.013 af, Depth> 3.85"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,728	61	>75% Grass cover, Good, HSG B
1,728		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	20	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 2.75 cfs @ 12.24 hrs, Volume= 0.275 af, Depth> 3.72"
Routed to Reach 2R : Ditch on Tidewatch Property

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
60	98	Roofs, HSG B
10,778	61	>75% Grass cover, Good, HSG B
27,823	60	Woods, Fair, HSG B
38,661	60	Weighted Average
38,601		99.84% Pervious Area
60		0.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	53	0.0415	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
5.8	47	0.0968	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.2	15	0.0968	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	54	0.0741	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	122	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.0	291	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 1.95 cfs @ 12.12 hrs, Volume= 0.151 af, Depth> 3.97"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
10,991	61	>75% Grass cover, Good, HSG B
8,169	60	Woods, Fair, HSG B
728	98	Roofs, HSG B
19,888	62	Weighted Average
19,160		96.34% Pervious Area
728		3.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	14	0.0357	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.9	14	0.1429	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.3	72	0.1333	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.0	80	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.2667	2.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.9	210	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 1.63 cfs @ 12.10 hrs, Volume= 0.121 af, Depth> 4.32"
Routed to Pond 1P : Bioretention #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
13,037	61	>75% Grass cover, Good, HSG B
1,573	98	Roofs, HSG B
14,610	65	Weighted Average
13,037		89.23% Pervious Area
1,573		10.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	43	0.0419	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	35	0.1714	0.35		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.4	23	0.1087	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.2	37	0.1892	3.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	138	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 8.28"
Routed to Pond CB1 : Catch Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,952	98	Paved parking, HSG B
1,952		100.00% Impervious Area

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

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 8.28"
Routed to Pond CB2 : Catch Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,516	98	Paved parking, HSG B
1,516		100.00% Impervious Area

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

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 8.28"
Routed to Pond CB3 : Catch Basin 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
707	98	Paved parking, HSG B
707		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 0.044 af, Depth> 8.28"
Routed to Pond CB4 : Catch Basin 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
2,332	98	Paved parking, HSG B
457	98	Roofs, HSG B
2,789	98	Weighted Average
2,789		100.00% Impervious Area

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

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.49 cfs @ 12.10 hrs, Volume= 0.036 af, Depth> 5.16"
Routed to Pond YD1 : Yard Drain 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
796	98	Roofs, HSG B
2,573	61	>75% Grass cover, Good, HSG B
261	98	Paved parking, HSG B
3,630	72	Weighted Average
2,573		70.88% Pervious Area
1,057		29.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	42	0.1190	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.7	58	0.0650	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.4	42	0.0650	1.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	142	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.71 cfs @ 12.09 hrs, Volume= 0.052 af, Depth> 6.00"
Routed to Pond YD2 : Yard Drain 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,998	98	Roofs, HSG B
2,312	61	>75% Grass cover, Good, HSG B
261	98	Paved parking, HSG B
4,571	79	Weighted Average
2,312		50.58% Pervious Area
2,259		49.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	77	0.0396	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
5.6	77	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.039 af, Depth> 5.40"
Routed to Pond YD3 : Yard Drain 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,318	98	Roofs, HSG B
2,416	61	>75% Grass cover, Good, HSG B
3,734	74	Weighted Average
2,416		64.70% Pervious Area
1,318		35.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	51	0.0320	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.4	51	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 8.28"
Routed to Pond 3P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
696	98	Roofs, HSG B
180	98	Water Surface, HSG B
876	98	Weighted Average
876		100.00% Impervious Area

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

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 8.28"
Routed to Pond 4P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
738	98	Roofs, HSG B
144	98	Water Surface, HSG B
882	98	Weighted Average
882		100.00% Impervious Area

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

Summary for Subcatchment 15S: Subcatchment 15S

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 8.28"
Routed to Pond 5P : Stone Under Deck

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
560	98	Roofs, HSG B
560		100.00% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 8.28"
Routed to Pond 6P : Eco-Pavers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
221	98	Water Surface, HSG B
221		100.00% Impervious Area

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

Summary for Subcatchment 17S: (new Subcat)

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 8.28"
Routed to Pond 7P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
696	98	Roofs, HSG B
180	98	Water Surface, HSG B
876	98	Weighted Average
876		100.00% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth> 3.85"
Routed to Pond 2P : Bioretention #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr +15% Rainfall=8.53"

Area (sf)	CN	Description
1,220	61	>75% Grass cover, Good, HSG B
1,220		100.00% Pervious Area

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

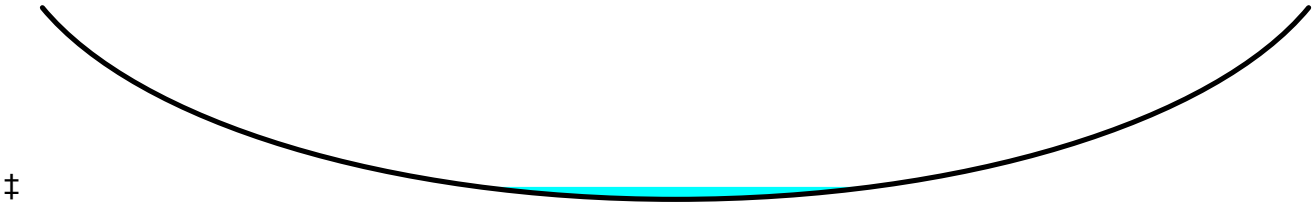
Summary for Reach 1R: Flow through 3S

Inflow Area = 0.705 ac, 33.80% Impervious, Inflow Depth > 5.44" for 50 Yr 24 Hr +15% event
Inflow = 1.38 cfs @ 12.45 hrs, Volume= 0.320 af
Outflow = 1.37 cfs @ 12.46 hrs, Volume= 0.320 af, Atten= 1%, Lag= 0.5 min
Routed to Reach 2R : Ditch on Tidewatch Property

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.44 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 1.2 min

Peak Storage= 45 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 12.80'
Bank-Full Depth= 1.00' Flow Area= 33.3 sf, Capacity= 498.58 cfs

50.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight
Length= 81.0' Slope= 0.1568 '/'
Inlet Invert= 50.70', Outlet Invert= 38.00'



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Summary for Reach 2R: Ditch on Tidewatch Property

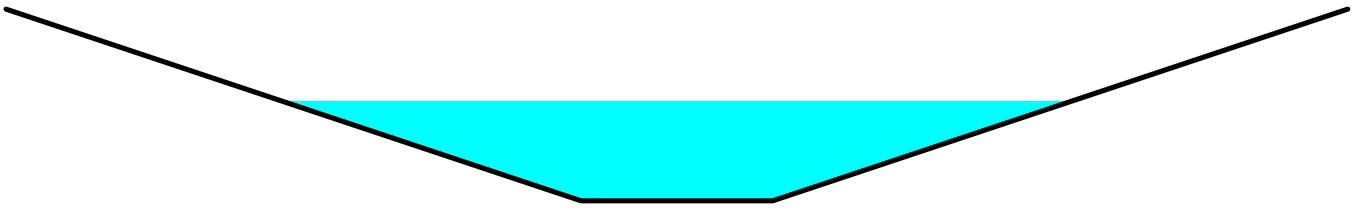
[62] Hint: Exceeded Reach 1R OUTLET depth by 0.46' @ 12.25 hrs
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.47' @ 12.30 hrs

Inflow Area = 1.685 ac, 18.03% Impervious, Inflow Depth > 4.35" for 50 Yr 24 Hr +15% event
Inflow = 4.17 cfs @ 12.24 hrs, Volume= 0.611 af
Outflow = 4.17 cfs @ 12.25 hrs, Volume= 0.611 af, Atten= 0%, Lag= 0.6 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.12 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 2.2 min

Peak Storage= 212 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 4.13'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 18.18 cfs

1.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 159.0' Slope= 0.0189 '/'
Inlet Invert= 38.00', Outlet Invert= 35.00'



Summary for Reach 3R: Swale

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.370 ac, 54.68% Impervious, Inflow Depth > 6.26" for 50 Yr 24 Hr +15% event
Inflow = 2.51 cfs @ 12.09 hrs, Volume= 0.193 af
Outflow = 2.52 cfs @ 12.10 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.4 min
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.54 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 1.5 min

Peak Storage= 68 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 3.09'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 25.77 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 95.0' Slope= 0.0379 '/'
Inlet Invert= 60.60', Outlet Invert= 57.00'

Summary for Reach 4R: Flow Through 3S

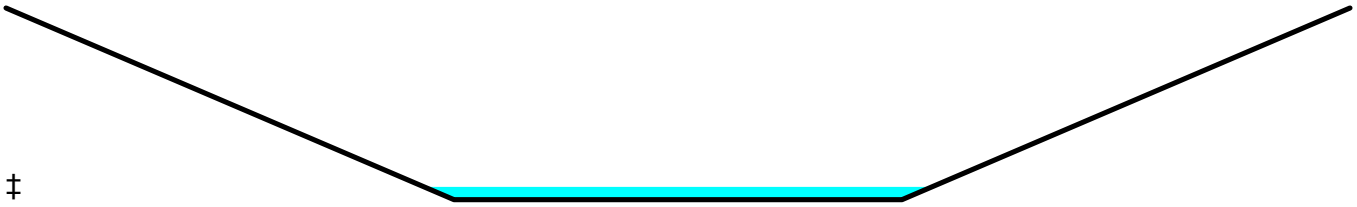
[80] Warning: Exceeded Pond 2P by 0.13' @ 17.35 hrs (0.00 cfs 0.000 af)

Inflow Area = 0.092 ac, 69.57% Impervious, Inflow Depth = 2.10" for 50 Yr 24 Hr +15% event
Inflow = 0.57 cfs @ 12.12 hrs, Volume= 0.016 af
Outflow = 0.56 cfs @ 12.16 hrs, Volume= 0.016 af, Atten= 3%, Lag= 2.3 min
Routed to Reach 2R : Ditch on Tidewatch Property

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.61 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 4.5 min

Peak Storage= 58 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 3.40'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 74.97 cfs

3.00' x 1.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 9.00'
Length= 275.0' Slope= 0.1145 '/'
Inlet Invert= 69.50', Outlet Invert= 38.00'



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Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.170 ac, 50.61% Impervious, Inflow Depth > 6.12" for 50 Yr 24 Hr +15% event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 0.087 af
Outflow = 1.17 cfs @ 12.09 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth > 3.85" for 50 Yr 24 Hr +15% event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 0.013 af
Outflow = 0.17 cfs @ 12.10 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.685 ac, 18.03% Impervious, Inflow Depth > 4.35" for 50 Yr 24 Hr +15% event
Inflow = 4.17 cfs @ 12.25 hrs, Volume= 0.611 af
Outflow = 4.17 cfs @ 12.25 hrs, Volume= 0.611 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.457 ac, 3.66% Impervious, Inflow Depth > 4.07" for 50 Yr 24 Hr +15% event
Inflow = 1.99 cfs @ 12.13 hrs, Volume= 0.155 af
Outflow = 1.99 cfs @ 12.13 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Bioretention #1

Inflow Area = 0.705 ac, 33.80% Impervious, Inflow Depth > 5.51" for 50 Yr 24 Hr +15% event
Inflow = 4.15 cfs @ 12.10 hrs, Volume= 0.324 af
Outflow = 1.38 cfs @ 12.45 hrs, Volume= 0.320 af, Atten= 67%, Lag= 21.1 min
Primary = 1.38 cfs @ 12.45 hrs, Volume= 0.320 af
Routed to Reach 1R : Flow through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.52' @ 12.45 hrs Surf.Area= 2,343 sf Storage= 4,849 cf

Plug-Flow detention time= 77.0 min calculated for 0.319 af (99% of inflow)
Center-of-Mass det. time= 69.4 min (872.7 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	50.99'	6,061 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
50.99	924	0.0	0	0
51.00	924	40.0	4	4
52.49	924	40.0	551	554
52.50	924	15.0	1	556
53.99	924	15.0	207	762
54.00	924	100.0	9	772
56.00	2,012	100.0	2,936	3,708
57.00	2,643	100.0	2,328	6,035
57.01	2,643	100.0	26	6,061

Device	Routing	Invert	Outlet Devices
#1	Primary	51.00'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.00' / 50.70' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	51.00'	**1.9" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	55.60'	**3.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	56.10'	**2.5" W x 1.5" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 1	56.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.37 cfs @ 12.45 hrs HW=56.52' TW=50.77' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.37 cfs of 6.69 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.22 cfs @ 11.23 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.57 cfs @ 6.56 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.32 cfs @ 4.22 fps)
  ├─**5=Orifice/Grate** (Orifice Controls 0.08 cfs @ 2.89 fps)
  └─**6=Orifice/Grate** (Weir Controls 0.19 cfs @ 0.50 fps)

Summary for Pond 2P: Bioretention #2

[80] Warning: Exceeded Pond CB4 by 0.93' @ 18.70 hrs (1.77 cfs 0.220 af)

Inflow Area = 0.092 ac, 69.57% Impervious, Inflow Depth > 6.93" for 50 Yr 24 Hr +15% event
Inflow = 0.65 cfs @ 12.09 hrs, Volume= 0.053 af
Outflow = 0.61 cfs @ 12.12 hrs, Volume= 0.051 af, Atten= 6%, Lag= 2.2 min
Discarded = 0.03 cfs @ 12.14 hrs, Volume= 0.035 af
Primary = 0.57 cfs @ 12.12 hrs, Volume= 0.016 af
Routed to Reach 4R : Flow Through 3S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 69.63' @ 12.14 hrs Surf.Area= 646 sf Storage= 614 cf

Plug-Flow detention time= 140.8 min calculated for 0.051 af (96% of inflow)
Center-of-Mass det. time= 116.3 min (873.1 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	65.74'	884 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
65.74	153	0.0	0	0
65.75	153	40.0	1	1
66.99	153	40.0	76	77
67.00	153	15.0	0	77
68.49	153	15.0	34	111
68.50	153	100.0	2	112
69.00	464	100.0	154	267
70.00	755	100.0	610	876
70.01	755	100.0	8	884

Device	Routing	Invert	Outlet Devices
#1	Discarded	65.74'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 65.58' Phase-In= 0.10'
#2	Primary	69.50'	**6.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.03 cfs @ 12.14 hrs HW=69.62' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.53 cfs @ 12.12 hrs HW=69.62' TW=69.56' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.53 cfs @ 0.72 fps)

Summary for Pond 3P: Stone Drip Edge

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 4' above existing grade and therefore 5.25' above ledge.

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.11 cfs @ 12.20 hrs, Volume= 0.009 af, Atten= 32%, Lag= 6.6 min
Discarded = 0.00 cfs @ 12.15 hrs, Volume= 0.005 af
Secondary = 0.11 cfs @ 12.20 hrs, Volume= 0.004 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.01' @ 12.15 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 220.2 min calculated for 0.009 af (64% of inflow)
Center-of-Mass det. time= 113.7 min (853.7 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	0.006 af	**3.00'W x 60.00'L x 3.51'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	62.50'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 60.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 12.15 hrs HW=66.01' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.20 hrs HW=66.01' TW=56.18' (Dynamic Tailwater)

Summary for Pond 4P: Stone Drip Edge

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 4' above existing grade and therefore 5.25' above ledge.

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.13 cfs @ 12.17 hrs, Volume= 0.009 af, Atten= 23%, Lag= 5.3 min
Discarded = 0.00 cfs @ 12.15 hrs, Volume= 0.006 af
Secondary = 0.12 cfs @ 12.17 hrs, Volume= 0.004 af
Routed to Reach AP4 : Analysis Point 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 65.01' @ 12.15 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 227.9 min calculated for 0.009 af (67% of inflow)
Center-of-Mass det. time= 126.9 min (867.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	0.006 af	**3.25'W x 48.00'L x 4.01'H Prismatoid** 0.014 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	65.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	61.00'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 59.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 12.15 hrs HW=65.01' (Free Discharge)
↑**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.17 hrs HW=65.01' TW=0.00' (Dynamic Tailwater)

Summary for Pond 5P: Stone Under Deck

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 3.2' above existing grade and therefore 4.45' above ledge.

Inflow Area = 0.013 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.05 cfs @ 12.30 hrs, Volume= 0.006 af, Atten= 56%, Lag= 13.1 min
Discarded = 0.00 cfs @ 12.25 hrs, Volume= 0.004 af
Secondary = 0.04 cfs @ 12.30 hrs, Volume= 0.002 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.20' @ 12.25 hrs Surf.Area= 0.006 ac Storage= 0.004 af

Plug-Flow detention time= 224.3 min calculated for 0.006 af (66% of inflow)
Center-of-Mass det. time= 122.1 min (862.1 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.70'	0.004 af	**14.00'W x 20.00'L x 1.50'H Prismatoid** 0.010 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	64.70'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 61.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 12.25 hrs HW=66.20' (Free Discharge)
↑**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.30 hrs HW=66.20' TW=56.42' (Dynamic Tailwater)

Summary for Pond 6P: Eco-Pavers

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 3.2' above existing grade and therefore 4.45' above ledge.

Inflow Area = 0.005 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.04 cfs @ 12.09 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.46 hrs, Volume= 0.003 af, Atten= 71%, Lag= 22.7 min
Discarded = 0.00 cfs @ 12.40 hrs, Volume= 0.003 af
Secondary = 0.01 cfs @ 12.46 hrs, Volume= 0.000 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.20' @ 12.40 hrs Surf.Area= 0.005 ac Storage= 0.002 af

Plug-Flow detention time= 244.3 min calculated for 0.003 af (81% of inflow)
Center-of-Mass det. time= 169.3 min (909.3 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	65.20'	0.002 af	**13.00'W x 17.00'L x 1.00'H Prismatoid** 0.005 af Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.20'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	65.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 61.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 12.40 hrs HW=66.20' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.46 hrs HW=66.20' TW=56.52' (Dynamic Tailwater)

Summary for Pond 7P: Stone Drip Edge

Ledge surface modelled 15" below original grade based on TP 1 and TP 4. Proposed grade is approximately 4' above existing grade and therefore 5.25' above ledge.

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.11 cfs @ 12.20 hrs, Volume= 0.009 af, Atten= 32%, Lag= 6.6 min
Discarded = 0.00 cfs @ 12.15 hrs, Volume= 0.005 af
Secondary = 0.11 cfs @ 12.20 hrs, Volume= 0.004 af
Routed to Pond 1P : Bioretention #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 66.01' @ 12.15 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 220.2 min calculated for 0.009 af (64% of inflow)
Center-of-Mass det. time= 113.7 min (853.7 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	0.006 af	**3.00'W x 60.00'L x 3.51'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	66.01'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	62.50'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 60.75' Phase-In= 0.10'

Discarded OutFlow Max=0.00 cfs @ 12.15 hrs HW=66.01' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.20 hrs HW=66.01' TW=56.18' (Dynamic Tailwater)

Summary for Pond CB1: Catch Basin 1

Inflow Area = 0.128 ac, 53.91% Impervious, Inflow Depth > 6.25" for 50 Yr 24 Hr +15% event
Inflow = 0.86 cfs @ 12.09 hrs, Volume= 0.067 af
Outflow = 0.86 cfs @ 12.09 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.09 hrs, Volume= 0.067 af
Routed to Pond CB2 : Catch Basin 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 62.84' @ 12.09 hrs
Flood Elev= 65.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.10'	**12.0" Round Culvert** L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.10' / 62.00' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.09 hrs HW=62.83' TW=62.69' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.84 cfs @ 1.92 fps)

Summary for Pond CB2: Catch Basin 2

Inflow Area = 0.163 ac, 63.75% Impervious, Inflow Depth > 6.69" for 50 Yr 24 Hr +15% event
Inflow = 1.14 cfs @ 12.09 hrs, Volume= 0.091 af
Outflow = 1.14 cfs @ 12.09 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.09 hrs, Volume= 0.091 af
Routed to Pond CB3 : Catch Basin 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 62.71' @ 12.09 hrs
Flood Elev= 65.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	61.90'	**12.0" Round Culvert** L= 130.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.90' / 61.20' S= 0.0054 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.12 cfs @ 12.09 hrs HW=62.69' TW=62.28' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.12 cfs @ 2.31 fps)

Summary for Pond CB3: Catch Basin 3

Inflow Area = 0.370 ac, 54.68% Impervious, Inflow Depth > 6.26" for 50 Yr 24 Hr +15% event
Inflow = 2.51 cfs @ 12.09 hrs, Volume= 0.193 af
Outflow = 2.51 cfs @ 12.09 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min
Primary = 2.51 cfs @ 12.09 hrs, Volume= 0.193 af
Routed to Reach 3R : Swale

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 62.31' @ 12.09 hrs
Flood Elev= 73.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	61.10'	**12.0" Round Culvert** L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.10' / 60.60' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.46 cfs @ 12.09 hrs HW=62.28' TW=60.94' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.46 cfs @ 3.13 fps)

Summary for Pond CB4: Catch Basin 4

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=75)

Inflow Area = 0.064 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr +15% event
Inflow = 0.52 cfs @ 12.09 hrs, Volume= 0.044 af
Outflow = 0.52 cfs @ 12.09 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.09 hrs, Volume= 0.044 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 69.66' @ 12.12 hrs
Flood Elev= 71.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	68.30'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.30' / 68.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.09 hrs HW=69.63' TW=69.60' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.51 cfs @ 0.65 fps)

Summary for Pond YD1: Yard Drain 1

Inflow Area = 0.083 ac, 29.12% Impervious, Inflow Depth > 5.16" for 50 Yr 24 Hr +15% event
Inflow = 0.49 cfs @ 12.10 hrs, Volume= 0.036 af
Outflow = 0.49 cfs @ 12.10 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 12.10 hrs, Volume= 0.036 af
Routed to Pond CB1 : Catch Basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 63.38' @ 12.10 hrs
Flood Elev= 65.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.70'	**6.0" Round Culvert** L= 2.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.70' / 62.60' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.48 cfs @ 12.10 hrs HW=63.37' TW=62.83' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.48 cfs @ 2.46 fps)

Summary for Pond YD2: Yard Drain 2

Inflow Area = 0.105 ac, 49.42% Impervious, Inflow Depth > 6.00" for 50 Yr 24 Hr +15% event
Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.052 af
Outflow = 0.71 cfs @ 12.09 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 12.09 hrs, Volume= 0.052 af
Routed to Pond CB3 : Catch Basin 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 68.46' @ 12.09 hrs
Flood Elev= 69.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.30'	**6.0" Round Culvert** L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.30' / 66.80' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=68.42' TW=62.28' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.69 cfs @ 3.54 fps)

Summary for Pond YD3: Yard Drain 3

Inflow Area = 0.086 ac, 35.30% Impervious, Inflow Depth > 5.40" for 50 Yr 24 Hr +15% event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.53 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.09 hrs, Volume= 0.039 af
Routed to Pond CB3 : Catch Basin 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 68.05' @ 12.09 hrs
Flood Elev= 70.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	67.30'	**6.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 67.30' / 66.80' S= 0.0385 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=68.03' TW=62.28' (Dynamic Tailwater)
↑└**1=Culvert** (Inlet Controls 0.52 cfs @ 2.64 fps)

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project 635 Sagamore Ave
Client 635 Sagamore Development LLC
GES Project No. GES 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: n/a
Termination @ 15”
Refusal: 15” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5”	10YR 3/2	FSL	GR	FR	NONE
5–15”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 2
ESHWT: n/a
Termination @ 25”
Refusal: 25” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5”	10YR 3/2	FSL	GR	FR	NONE
5–25”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 3
ESHWT: n/a
Termination @ 25”
Refusal: 25” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6”	10YR 3/2	FSL	GR	FR	NONE
6–25”	10YR 5/6	FSL	GR	FR	NONE

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No. 4
ESHWT: n/a
Termination @ 15”
Refusal: 15” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–15”	10YR 3/2	FSL	GR	FR	NONE

Test Pit No. 5
ESHWT: 30”
Termination @ 36”
Refusal: 36” SCS Soil: Chatfield variant
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8”	10YR 3/2	FSL	GR	FR	NONE
8–30”	10YR 4/6	FSL	GR	FR	NONE
30–36”	2.5Y 5/3	FSL	GR	FR	10% Distinct

Test Pit No. 6
ESHWT: n/a
Termination @ 12”
Refusal: 12” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12”	10YR 3/2	FSL	GR	FR	NONE

Test Pit No. 7
ESHWT: n/a
Termination @ 27”
Refusal: 27” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–4”	10YR 3/2	FSL	GR	FR	NONE
4–27”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 8
ESHWT: 35”
Termination @ 40”
Refusal: 40” SCS Soil: Chatfield variant
Obs. Water: none

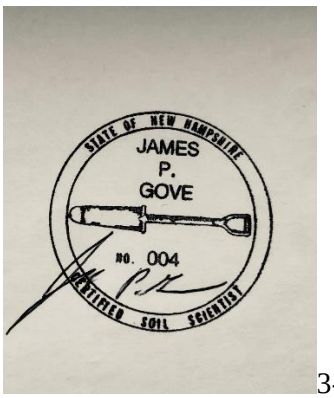
Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6”	10YR 3/2	FSL	GR	FR	NONE
6–35”	10YR 5/6	FSL	GR	FR	NONE
35–40”	2.5Y 5/3	FSL	OM	FI	10% Distinct

Test Pit No. 9
ESHWT: n/a
Termination @ 27”
Refusal: 27” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–4”	10YR 3/2	FSL	GR	FR	NONE
4–27”	10YR 5/6	FSL	GR	FR	NONE

Test Pit No. 10
ESHWT: 35
Termination @ 62”
Refusal: 62” SCS Soil: Scituate
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10”	10YR 3/2	FSL	GR	FR	NONE
10–35”	10YR 5/6	FSL	GR	FR	NONE
35–62”	2.5Y 5/3	FSL	PL	FI	10%, Distinct



3-21-2022

Legend:

FSL = fine sandy loam
GR = granular
PL = platy
FI = firm

APPENDIX IV

Site Specific Soil Survey Report and Map

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
635 Sagamore Avenue, Portsmouth, NH
By
GES, Inc.
Project # 2021308
Date: 02-20-2024

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced 2-20-2024; prepared by JP Gove, CSS #004, GES, Inc.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1" = 20'.

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on sloping hillside that is bedrock controlled. Rock outcrops are numerous. At the top of the hill, adjacent Sagamore Avenue, is an existing commercial building and paved areas. Behind the impervious areas to the south, the hillside slopes downward. The area is forested in white pines. There are no wetlands on the site.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 3-18-2022

Date(s) of test pits: 3-18-2922

Test pits recorded by: JP Gove, CSS # 004

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Portsmouth, NH

Location: Tax Map 222 Lot 19

Size of area: Approximately 2 acres

Was the map for the entire lot? Yes

If no, where was the mapping conducted on the parcel: n/a

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? No

If no, what was the purpose of the map? City of Portsmouth requirements

Who was the map prepared for? Jones & Beach Engineers, Inc.

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
41	Chatfield-Hollis-Rock Outcrop complex	228	B
289	Chatfield Variant (moderately well drained)	327	B
699	Urban Land	n/a	Impervious

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 41

CORRELATED SOIL SERIES: Chatfield-Hollis-Rock Outcrop complex

LANDSCAPE SETTING: Sloping to very steep hillside.

CHARACTERISTIC SURFACE FEATURES: Numerous rock outcrops

DRAINAGE CLASS: Well drained

PARENT MATERIAL: Glacial Till

NATURE OF DISSIMILAR INCLUSIONS: With a complex, several similar soils are present. While the major soil is the moderately deep Chatfield, the shallow Hollis and the exposed ledge of the Rock Outcrop, are large minor components. Chatfield is 50%, Hollis is 25%, and Rock Outcrop is 25%. A few deeper soil areas are present in hollow in the bedrock.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: less than 5%.

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Test Pit No. 3
ESHWT: n/a
Termination @ 25”
Refusal: 25” SCS Soil: Chatfield
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–6”	10YR 3/2	FSL	GR	FR	NONE
6–25”	10YR 5/6	FSL	GR	FR	NONE

No OBSWT, no ESHWT, lithic contact at 25”, 20% rock fragments.

Test Pit No. 1
ESHWT: n/a
Termination @ 15”
Refusal: 15” SCS Soil: Hollis
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–5”	10YR 3/2	FSL	GR	FR	NONE
5–15”	10YR 5/6	FSL	GR	FR	NONE

No OBSWT, no ESHWT, lithic contact at 15”, 20% rock fragments.

SITE-SPECIFIC MAP UNIT: 289

CORRELATED SOIL SERIES: Chatfield Variant (moderately well drained)

LANDSCAPE SETTING: At the top of the slope, a slightly deeper soil area on the northwest corner of the site.

CHARACTERISTIC SURFACE FEATURES: Fewer outcrops than the rest of the site.

DRAINAGE CLASS: Moderately well drained.

PARENT MATERIAL: Glacial till.

NATURE OF DISSIMILAR INCLUSIONS: Scituate soils with a hard pan above the bedrock,

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Test Pit No. 5
ESHWT: 30”
Termination @ 36”
Refusal: 36” SCS Soil: Chatfield variant
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8”	10YR 3/2	FSL	GR	FR	NONE
8–30”	10YR 4/6	FSL	GR	FR	NONE
30–36”	2.5Y 5/3	FSL	GR	FR	10% Distinct

ESHWT is 30”, no OBSWT, lithic contact at 36”, 20% rock fragments.

SITE-SPECIFIC MAP UNIT: 699

CORRELATED SOIL SERIES: Urban land

LANDSCAPE SETTING: Top of slope adjacent to Sagamore Avenue.

CHARACTERISTIC SURFACE FEATURES: Impervious.

DRAINAGE CLASS: N/A

PARENT MATERIAL: N/A

NATURE OF DISSIMILAR INCLUSIONS: N/A

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: N/A

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

N/A ---- Pavement and buildings.

8. RESPONSIBLE SOIL SCIENTIST

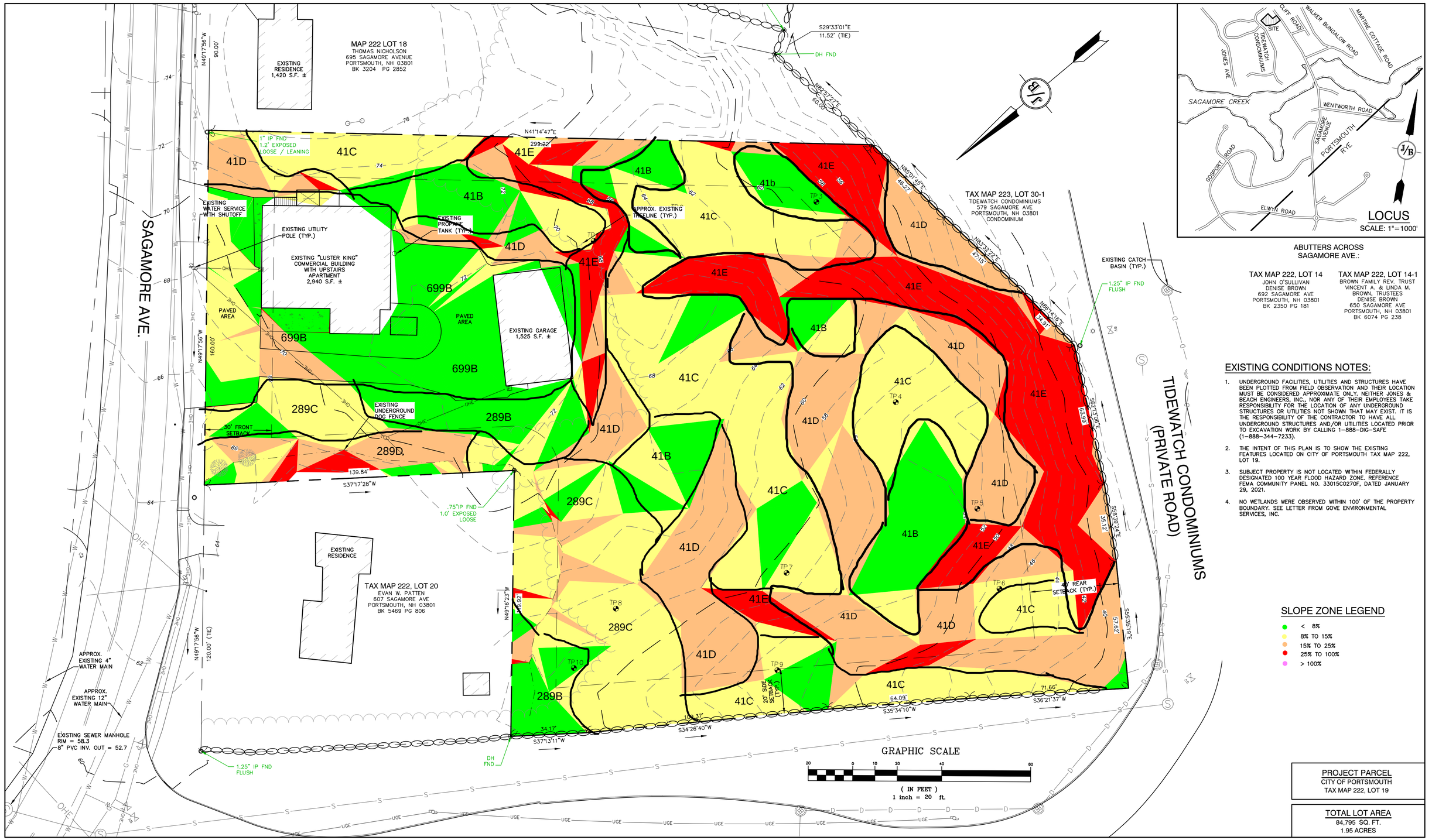
Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Yes, with exception of existing development.

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz



ABUTTERS ACROSS SAGAMORE AVE.:

TAX MAP 222, LOT 14
JOHN O'SULLIVAN
DENISE BROWN
692 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 2350 PG 181

TAX MAP 222, LOT 14-1
BROWN FAMILY REV. TRUST
VINCENT A. & LINDA M. BROWN, TRUSTEES
DENISE BROWN
650 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 6074 PG 238

EXISTING CONDITIONS NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE (1-888-344-7233).
2. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING FEATURES LOCATED ON CITY OF PORTSMOUTH TAX MAP 222, LOT 19.
3. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
4. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.

SLOPE ZONE LEGEND

- < 8%
- 8% TO 15%
- 15% TO 25%
- 25% TO 100%
- > 100%

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: JAC	Draft: DJM	Date: 12/07/2021
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134-CONCEPT-8.dwg		

REV.	DATE	REVISION	BY
11	1/31/24	MINOR REVISIONS TO SIGHT DISTANCE PLAN AND PROFILE	DJM
10	10/27/23	MINOR REVISIONS	DJM
9	10/20/23	MINOR REVISIONS	DJM
8	9/27/23	REVISED PER TAC COMMENTS	DJM
7	9/5/23	ISSUED TO TAC	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EXISTING CONDITIONS PLAN

Project: 4-UNIT RESIDENTIAL SITE
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT, LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C1
SHEET 2 OF 8
JBE PROJECT NO. 18134.1

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(635 Sagamore Ave.)

Map Scale: 1:893 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	0.7	30.5%
140D	Chatfield-Hollis-Canton complex, 15 to 35 percent slopes, rocky	1.6	69.5%
Totals for Area of Interest		**2.3**	**100.0%**

APPENDIX VI

Extreme Precipitation Estimates

Extreme Precipitation in New York & New England

An Interactive Web Tool for Extreme Precipitation Analysis

About this Project | Data & Products | Daily Monitoring | Documentation

Select Product

- Extreme Precipitation Tables - HTML
- Extreme Precipitation Tables - Text/CSV
- Partial Duration Series - by Point
- Partial Duration Series - by Station
- Distribution Curves - Graphical
- Distribution Curves - Text/TBL
- Intensity Frequency Duration Graphs
- Precipitation Frequency Duration Graphs
- GIS Data Files
- Regional/State Maps

Select Location *Double-click map to place a marker, or enter address or latitude/longitude.*

Hybrid | Map | Satellite | Terrain

Locate by Address: 635 Sagamore Avenue,

Locate by Lat/Lon: 43.05 °N -70.75 °W

Locate by State/County:

Select Options

Smoothing: Yes

Delivery: Popup

Submit

Version 2.0 Copyright 2010-2022
This project is a joint collaboration between:
Northeast Regional Climate Center (NRCC)
Natural Resources Conservation Service (NRCS)
Cornell University
Contact: precip@cornell.edu

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.058 degrees North
Longitude	70.753 degrees West
Elevation	10 feet
Date/Time	Wed Feb 21 2024 09:41:54 GMT-0500 (Eastern Standard Time)

+15% due to location in Coastal/Great Bay Region
2yr: 3.22*1.15 = 3.70 in
10yr: 4.88*1.15 = 5.16 in
25yr: 6.19*1.15 = 7.12 in
50yr: 7.42*1.15 = 8.53 in

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.67	2.94	**1yr**	2.36	2.82	3.24	3.96	4.57
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.08	4.60	**5yr**	3.61	4.42	5.07	5.96	6.73
10yr	0.41	0.65	0.82	1.12	1.46	1.90	**10yr**	1.26	1.73	2.24	2.90	3.76	4.88	5.55	**10yr**	4.32	5.34	6.12	7.14	8.01
25yr	0.48	0.76	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.76	6.19	7.13	**25yr**	5.48	6.86	7.85	9.07	10.09
50yr	0.54	0.86	1.11	1.55	2.08	2.77	**50yr**	1.80	2.54	3.31	4.35	5.69	7.42	8.62	**50yr**	6.57	8.29	9.48	10.87	12.02
100yr	0.60	0.97	1.25	1.78	2.43	3.28	**100yr**	2.10	2.99	3.93	5.19	6.80	8.89	10.42	**100yr**	7.87	10.02	11.46	13.04	14.33
200yr	0.68	1.11	1.44	2.06	2.85	3.86	**200yr**	2.46	3.54	4.65	6.17	8.12	10.65	12.60	**200yr**	9.43	12.12	13.85	15.64	17.09
500yr	0.81	1.33	1.73	2.51	3.51	4.80	**500yr**	3.03	4.41	5.81	7.76	10.28	13.54	16.21	**500yr**	11.98	15.59	17.81	19.90	21.58

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.62	0.86	0.93	1.33	1.69	2.26	2.51	**1yr**	2.00	2.41	2.88	3.20	3.93
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.33	3.07	3.47	**2yr**	2.72	3.33	3.84	4.56	5.11
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.11	2.73	3.80	4.21	**5yr**	3.36	4.05	4.74	5.56	6.27
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.38	3.05	4.39	4.88	**10yr**	3.88	4.70	5.48	6.45	7.23
25yr	0.44	0.67	0.83	1.19	1.57	1.90	**25yr**	1.35	1.86	2.10	2.74	3.52	4.77	5.92	**25yr**	4.22	5.70	6.70	7.85	8.73
50yr	0.48	0.73	0.92	1.32	1.77	2.17	**50yr**	1.53	2.12	2.35	3.06	3.91	5.40	6.84	**50yr**	4.78	6.58	7.79	9.11	10.08
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.39	4.33	6.08	7.90	**100yr**	5.38	7.60	9.07	10.60	11.64
200yr	0.59	0.89	1.13	1.64	2.29	2.82	**200yr**	1.97	2.75	2.94	3.75	4.76	6.83	9.12	**200yr**	6.05	8.77	10.54	12.34	13.47
500yr	0.69	1.02	1.32	1.92	2.72	3.37	**500yr**	2.35	3.29	3.42	4.28	5.41	7.97	11.03	**500yr**	7.06	10.61	12.87	15.13	16.32

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	2.99	3.18	**1yr**	2.64	3.05	3.59	4.38	5.06
2yr	0.34	0.52	0.64	0.87	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.72	**2yr**	3.03	3.57	4.10	4.86	5.64
5yr	0.40	0.62	0.77	1.05	1.34	1.63	**5yr**	1.16	1.59	1.89	2.54	3.25	4.36	4.98	**5yr**	3.85	4.79	5.40	6.40	7.18
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.94	2.29	3.11	3.96	5.36	6.22	**10yr**	4.74	5.98	6.84	7.87	8.78
25yr	0.58	0.88	1.09	1.56	2.06	2.58	**25yr**	1.77	2.52	2.96	4.08	5.17	7.77	8.36	**25yr**	6.87	8.04	9.18	10.37	11.44
50yr	0.67	1.03	1.28	1.84	2.48	3.15	**50yr**	2.14	3.08	3.61	5.01	6.35	9.71	10.48	**50yr**	8.60	10.08	11.48	12.76	14.00
100yr	0.80	1.20	1.51	2.17	2.98	3.83	**100yr**	2.57	3.75	4.39	6.18	7.80	12.14	13.13	**100yr**	10.74	12.62	14.35	15.74	17.13
200yr	0.93	1.40	1.78	2.57	3.58	4.69	**200yr**	3.09	4.58	5.36	7.61	9.60	15.22	16.46	**200yr**	13.47	15.83	17.96	19.40	20.96
500yr	1.16	1.72	2.22	3.22	4.58	6.09	**500yr**	3.95	5.95	6.96	10.07	12.65	20.54	22.22	**500yr**	18.18	21.36	24.18	25.57	27.38

Powered by ACIS Northeast Regional Climate Center

APPENDIX VII

Rip Rap Calculations

RIP RAP CALCULATIONS
"Luster Cluster"
635 Sagamore Ave.
Portsmouth, NH

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
14-Mar-24

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.*
Aprons are sized for the 10-Year storm event.

TAILWATER < HALF THE D_o

$L_a = (1.8 \times Q) / D_0^{3/2} + (7 \times D_o)$
$W = L_a + (3 \times D_o)$ or defined channel width
$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
1P Outlet Pipe	0.29	0.87	1	8.6	12	0.06
CB4 Outlet Pipe	0.27	0.44	1	7.8	11	0.02

TAILWATER > HALF THE D_o

$L_a = (3.0 \times Q) / D_0^{3/2} + (7 \times D_o)$
$W = (0.4 \times L_a) + (3 \times D_o)$ or defined channel width
$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
CB3 Outlet Pipe	0.62	2	1	13.0	8	0.08

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.25	Feet	3	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.5	Feet	6	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

APPENDIX VIII

BMP Worksheets

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: **Bioretention #1 (1P)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.71	ac	A = Area draining to the practice	
0.24	ac	A_I = Impervious area draining to the practice	
0.34	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.35	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.25	ac-in	WQV= 1" x Rv x A	
906	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
227	cf	25% x WQV (check calc for sediment forebay volume)	
680	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump CBs		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
54.15	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.10	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
5.04	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
52.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
51.00	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
56.52	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
57.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
4,215	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	D4	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

SHWT and bedrock elevations are irrelevant as system is lined.

Stage-Area-Storage for Pond 1P: Bioretention #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
50.99	924	0
51.09	924	37
51.19	924	74
51.29	924	111
51.39	924	148
51.49	924	185
51.59	924	222
51.69	924	259
51.79	924	296
51.89	924	333
51.99	924	370
52.09	924	407
52.19	924	444
52.29	924	480
52.39	924	517
52.49	924	554
52.59	924	568
52.69	924	582
52.79	924	596
52.89	924	610
52.99	924	624
53.09	924	638
53.19	924	651
53.29	924	665
53.39	924	679
53.49	924	693
53.59	924	707
53.69	924	721
53.79	924	735
53.89	924	748
53.99	924	762
54.09	973	857
54.19	1,027	957
54.29	1,082	1,062
54.39	1,136	1,173
54.49	1,191	1,290
54.59	1,245	1,411
54.69	1,299	1,539
54.79	1,354	1,671
54.89	1,408	1,809
54.99	1,463	1,953
55.09	1,517	2,102
55.19	1,571	2,256
55.29	1,626	2,416
55.39	1,680	2,581
55.49	1,735	2,752
55.59	1,789	2,928
55.69	1,843	3,110
55.79	1,898	3,297
55.89	1,952	3,490
55.99	2,007	3,687
56.09	2,069	3,891

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
56.19	2,132	4,101
56.29	2,195	4,318
56.39	2,258	4,540
56.49	2,321	4,769
56.59	2,384	5,004
56.69	2,447	5,246
56.79	2,510	5,494
56.89	2,574	5,748
56.99	**2,637**	**6,009**

Bottom of Filter Course El. = 52.50
Storage below = 554 cf
Overflow El. = 56.50
Storage Below = 4,769 cf
WQV Required = 906 cf
WQV Provided = 4769-554 = 4,215 cf

WQV Required = 906 cf
El(WQV) = 54.15 +/-

Stage-Discharge for Pond 1P: Bioretention #1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
50.99	0.00	53.59	0.15	56.19	0.99
51.04	0.00	53.64	0.15	56.24	1.03
51.09	0.01	53.69	0.15	56.29	1.06
51.14	0.02	53.74	0.15	56.34	1.09
51.19	0.03	53.79	0.16	56.39	1.12
51.24	0.04	53.84	0.16	56.44	1.14
51.29	0.04	53.89	0.16	56.49	1.17
51.34	0.05	53.94	0.16	56.54	1.61
51.39	0.05	53.99	0.16	56.59	2.63
51.44	0.06	54.04	0.16	56.64	3.98
51.49	0.06	54.09	0.16	56.69	5.59
51.54	0.06	54.14	0.17	56.74	6.83
51.59	0.07	54.19	0.17	56.79	6.87
51.64	0.07	54.24	0.17	56.84	6.90
51.69	0.07	54.29	0.17	56.89	6.93
51.74	0.08	54.34	0.17	56.94	6.96
51.79	0.08	54.39	0.17	56.99	**7.00**
51.84	0.08	54.44	0.17		
51.89	0.09	54.49	0.18		
51.94	0.09	54.54	0.18		
51.99	0.09	54.59	0.20		
52.04	0.09	54.64	0.22		
52.09	0.10	54.69	0.26		
52.14	0.10	54.74	0.29		
52.19	0.10	54.79	0.33		
52.24	0.10	54.84	0.36		
52.29	0.10	54.89	0.38		
52.34	0.11	54.94	0.41		
52.39	0.11	54.99	0.43		
52.44	0.11	55.04	0.45		
52.49	0.11	55.09	0.46		
52.54	0.11	55.14	0.48		
52.59	0.12	55.19	0.50		
52.64	0.12	55.24	0.51		
52.69	0.12	55.29	0.53		
52.74	0.12	55.34	0.54		
52.79	0.12	55.39	0.55		
52.84	0.13	55.44	0.57		
52.89	0.13	55.49	0.58		
52.94	0.13	55.54	0.59		
52.99	0.13	55.59	0.61		
53.04	0.13	55.64	0.62		
53.09	0.13	55.69	0.65		
53.14	0.14	55.74	0.68		
53.19	0.14	55.79	0.72		
53.24	0.14	55.84	0.77		
53.29	0.14	55.89	0.81		
53.34	0.14	55.94	0.84		
53.39	0.14	55.99	0.87		
53.44	0.15	56.04	0.90		
53.49	0.15	56.09	0.92		
53.54	0.15	56.14	0.95		

El(WQV) = 52.15 +/- per Stage Storage Table
Q(WQV) = 0.10 cfs

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention #2 (2P)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.09	ac	A = Area draining to the practice	
0.06	ac	A_I = Impervious area draining to the practice	
0.70	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.68	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.06	ac-in	WQV= 1" x Rv x A	
226	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
56	cf	25% x WQV (check calc for sediment forebay volume)	
169	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump CB		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
153	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
N/A	Yes/No	(Use the calculations below)	
59.0	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
67.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
65.58	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
65.17	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
67.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
1.83	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.42	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
69.63	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
70.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
452	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	D4	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

High existing contour in filtration section = 68.50

Per Test Pit 8: SHWT Depth = 35" & Bedrock Depth = 40"

SHWT El. = 68.50-(35/12) = 65.58

Bedrock El. = 68.50-(40/12) = 65.17

Stage-Area-Storage for Pond 2P: Bioretention #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
65.74	153	0
65.79	153	3
65.84	153	6
65.89	153	9
65.94	153	12
65.99	153	15
66.04	153	18
66.09	153	21
66.14	153	24
66.19	153	28
66.24	153	31
66.29	153	34
66.34	153	37
66.39	153	40
66.44	153	43
66.49	153	46
66.54	153	49
66.59	153	52
66.64	153	55
66.69	153	58
66.74	153	61
66.79	153	64
66.84	153	67
66.89	153	70
66.94	153	73
66.99	153	77
67.04	153	78
67.09	153	79
67.14	153	80
67.19	153	81
67.24	153	82
67.29	153	83
67.34	153	85
67.39	153	86
67.44	153	87
67.49	153	88
67.54	153	89
67.59	153	90
67.64	153	91
67.69	153	93
67.74	153	94
67.79	153	95
67.84	153	96
67.89	153	97
67.94	153	98
67.99	153	99
68.04	153	101
68.09	153	102
68.14	153	103
68.19	153	104
68.24	153	105
68.29	153	106
68.34	153	107
68.39	153	109
68.44	153	110
68.49	153	111
68.54	178	119
68.59	209	129
68.64	240	140
68.69	271	153
68.74	302	167
68.79	333	183
68.84	364	200
68.89	396	219
68.94	427	240
68.99	458	262
69.04	476	285
69.09	490	310
69.14	505	335
69.19	519	360
69.24	534	386
69.29	548	414
69.34	563	441
69.39	577	470
69.44	592	499
69.49	607	529
69.54	621	560
69.59	636	591
69.64	650	623
69.69	665	656
69.74	679	690
69.79	694	724
69.84	708	759
69.89	723	795
69.94	738	831
69.99	**752**	**869**

Bottom of Filter Course El. = 67.00
Storage below = 77 cf
Spillway El. = 69.50
Storage Below = 529 cf
WQV Required = 226 cf
WQV Provided = 529-77 = 452 cf

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.12	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = Weighted groundwater recharge depth	
0.031	ac-in	GRV = AI * Rd	
113	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Stone Drip Edges, 40% Stone Voids:

((3 ft * 60 ft * 3.5 ft)*2+(3.25 ft * 48 ft * 4 ft))*0.4 = 754 cf

Eco Paver, 30% Voids: (13 ft * 17 ft * 1 ft)*0.3 = 66 cf

Bioretention #2: 529 cf GRV provided below spillway per stage storage table

GRV Provided = 754+66+529 = 1,349 cf >> 113 cf

APPENDIX IX

Pollutant Removal Calculations

POLLUTANT REMOVAL CALCULATIONS

BMP	Drip Edge	Bioretention	Nothing	Total	Required
Acres Impervious	0.073	0.303	0.016	0.392	
TSS Removal (%)	90%	90%	0%	**86%**	**80%**
TN Removal (%)	55%	65%	0%	**65%**	**50%**

Calculations are based on post-construction impervious surfaces on the subject parcel.
TSS removal of 86% provided exceeds 80% requirement
TN removal of 65% provided exceeds 50% requirement

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Stormwater Ponds	Wet Pond		B, F	70%	35%	45%
	Wet Extended Detention Pond		A, B	80%	55%	68%
	Micropool Extended Detention Pond	TBA				
	Multiple Pond System	TBA				
	Pocket Pond	TBA				
Stormwater Wetlands	Shallow Wetland		A, B, F, I	80%	55%	45%
	Extended Detention Wetland		A, B, F, I	80%	55%	45%
	Pond/Wetland System	TBA				
	Gravel Wetland		H	95%	85%	64%
Infiltration Practices	Infiltration Trench (≥75 ft from surface water)		B, D, I	90%	55%	60%
	Infiltration Trench (<75 ft from surface water)		B, D, I	90%	10%	60%
	Infiltration Basin (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Infiltration Basin (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Dry Wells			90%	55%	60%
	Drip Edges			90%	55%	60%
Filtering Practices	Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Aboveground or Underground Sand Filter with underdrain		A, I, F, G, H	85%	10%	45%
	Tree Box Filter	TBA				
	Bioretention System		I, G, H	90%	65%	65%
	Permeable Pavement that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Permeable Pavement that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Permeable Pavement with underdrain		Use TN and TP values for sand filter w/ underdrain and outlet pipe	90%	10%	45%

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Treatment Swales	Flow Through Treatment Swale	TBA				
Vegetated Buffers	Vegetated Buffers		A, B, I	73%	40%	45%
Pre-Treatment Practices	Sediment Forebay	TBA				
	Vegetated Filter Strip		A, B, I	73%	40%	45%
	Vegetated Swale		A, B, C, F, H, I	65%	20%	25%
	Flow-Through Device - Hydrodynamic Separator		A, B, G, H	35%	10%	5%
	Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU)		G, H	72%	10%	9%
	Other Flow-Through Devices	TBA				
	Off-line Deep Sump Catch Basin		J, K, L, M	15%	5%	5%

APPENDIX X

Stormwater Operations and Maintenance Manual

JONES & BEACH ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

Luster Cluster
635 Sagamore Ave.
Portsmouth, NH 03801
Tax Map 222, Lot 19

Prepared for:

635 Sagamore Development LLC
3612 Lafayette Rd., Dept 4
Portsmouth, NH 03801

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
March 8, 2024
JBE Project No. 18134.1

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:

    a. Roadway and driveways
    b. Vegetation and landscaping
    c. Bioretention systems
    d. Catch Basins & Yard Drains
    e. Permeable Paver Patio
    f. Stone Drip Edges
    g. Culverts
    h. Rip-Rap Outlet Protection Aprons
    i. Swale

2. Maintenance of permanent measures shall follow the following schedule:

    a. Normal winter roadway maintenance including plowing and snow removal. Road sweeping at the end of every winter, preferably before the start of the spring rain season.

    b. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.

    c. Bioretention Systems:

        - Visually inspect monthly and repair erosion. Use small stones to stabilize erosion along drainage paths.
        - Check the pH once a year if grass is not surviving. Apply an alkaline product, such as limestone, if needed.
        - Re-seed any bare areas by hand as needed.
        - Immediately after the completion of cell construction, water grass for 14 consecutive days unless there is sufficient natural rainfall.

- Once a month (more frequently in the summer), the land owner or Association shall visually inspect vegetation for disease or pest problems and treat as required.
- During times of extended drought, look for physical features of stress. Water in the early morning as needed.
- Weed regularly, if needed.
- After rainstorms, inspect the cell and make sure that drainage paths are clear and that ponding water dissipates over 4-6 hours. (Water may pond for longer times during the winter and early spring.)
- Twice annually, inspect the outlet control structures to ensure that they are not clogged and correct any clogging found as needed.
- Any debris and sediment accumulations shall be removed from the outlet structures, overflow risers, and emergency spillways and disposed of properly.
- Inspect outlet structure for deterioration and or clogging.
- If erosion is evident on the berm or emergency spillway, stabilize the affected area by seeding. Trees must not be allowed to grow in these areas.
- KEEP IN MIND, THE BIORETENTION CELL IS NOT A POND. IT SHALL NOT PROVIDE A BREEDING GROUND FOR MOSQUITOES. MOSQUITOES NEED AT LEAST FOUR (4) DAYS OF STANDING WATER TO DEVELOP AS LARVA.

d. **Annual inspection** of catch basins and yard drains to determine if they need to be cleaned. Catch basins and yard drains are to be cleaned if the depth of deposits is greater than one-half the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin. If a catch basin or yard drain significantly exceeds the one-half depth standard during the inspection, then it shall be cleaned more frequently. If woody debris or trash accumulates in the catch basin or yard drain, then it shall be cleaned on a weekly basis. The catch basin or yard drain can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials shall be stored, treated, and disposed. Grease hoods are to be wiped clean and the rags disposed of properly. Debris obscuring the grate inlet shall also be removed.

e. Permeable Paver Patio:

Units 4 features a permeable paver patio for stormwater management while Units 1-3 feature standard paver patios. The following course of action will help assure that the pavers are maintained to preserve its hydrologic effectiveness for their special purpose.

Winter maintenance:

- Sanding for winter traction is prohibited. Deicing is permitted (NaCl, $MgCl_2$, or equivalent). Reduced salt application is possible and can be a cost savings

for winter maintenance. Nontoxic, organic deicers, applied either as blended, magnesium chloride-based liquid products or as pretreated salt, are preferable.

- Plow after each storm. Special plow blades may be used to prevent scarring. Do not raise blade of plow. Ice and light snow accumulation are generally not as problematic as for standard asphalt. Snow will accumulate during heavier storms and should be plowed after 2 to 4 inches of snow accumulate. Alternatively, snow may be blown or shoveled off of paver surface

Routine maintenance:

- Seal coating is absolutely forbidden. Surface seal coating is not reversible.
- The paver surface shall be vacuumed 2 or 3 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.
- Planted areas adjacent to permeable pavers shall be well maintained to prevent soil washout onto the pavers. If any bare spots or eroded areas are observed within the planted areas, they shall be replanted and/or stabilized at once.
- Immediately clean any soil deposited on pavers. Superficial dirt does not necessarily clog the paver voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles shall be prevented from tracking or spilling dirt onto the pavers.
- Do not allow construction staging, soil/mulch storage, etc. on unprotected paver surface. Contractor to lay down tarps, plywood or removable item and take care not to track material onto unprotected pavers.
- Repairs: Potholes or other surface blemishes shall be replaced in kind. Any required repair of drainage structures shall be done promptly to ensure continued proper functioning of the system.
- Written and verbal communication to the future owner shall make clear the pavers' special purpose and special maintenance requirements such as those listed here.

f. Stone Drip Edges:

In the spring and fall, visually inspect the area around the edges and repair any erosion. Use small stones to stabilize erosion along drainage paths. Inspect stone area to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation shall not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones.

g. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly.

h. Rock riprap shall be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged

state. Woody vegetation must not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water shall be kept clear of obstructions, debris, and sediment deposits

i. Swales - Inspect swales annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species. Perform periodic mowing; frequency depends on location and type of grass. Remove debris and accumulated sediment, based on inspection. Repair eroded areas, remove invasive species and dead vegetation, and reseed as warranted by inspection

See attached sample forms as a guideline.

Any inquiries in regards to the design, function, and/or maintenance of any one of the above-mentioned facilities or tasks shall be directed to the project engineer:

Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885

T#: (603) 772-4746
F#: (603) 772-0227

Commitment to maintenance requirements

I agree to complete and/or observe all of the required maintenance practices and their respective schedules as outlined above.

_____

Signature

_____

Print Name

_____

Title

_____

Date

Annual Operations and Maintenance Report

The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Roadway and Driveways			
Vegetation and Landscaping			
Bioretention #1			
Bioretention #2			
Catch Basins & Yard Drains			

Permeable Paver Patios (Unit 4)			
Stone Drip Edge			
Culverts			
Rip Rap Outlet Protection			
Swales			
Other (please note):			

Regular Inspection and Maintenance Guidance for Bioretention Systems / Tree Filters

Maintenance of bioretention systems and tree filters can typically be performed as part of standard landscaping. Regular inspection and maintenance is critical to the effective operation of bioretention systems and tree filters to insure they remain clear of leaves and debris and free draining. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less, frequent maintenance needs, depending on a variety of factors including the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of leaves from the system and bypass structure. Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Mulch and/or vegetation coverage is integral to the performance of the system, including infiltration rate and nutrient uptake. Vegetation care is important to system productivity and health.

ACTIVITY	FREQUENCY
A record should be kept of the time to drain for the system completely after a storm event. The system should drain completely within 72 hours.	After every major storm in the first few months, then biannually.
Check to insure the filter surface remains well draining after storm event. **Remedy**: If filter bed is clogged, draining poorly, or standing water covers more than 15% of the surface 48 hours after a precipitation event, then remove top few inches of discolored material. Till or rake remaining material as needed.	
Check inlets and outlets for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet and overflow if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
Check for animal burrows and short circuiting in the system **Remedy**: Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted.	
Check to insure the filter bed does not contain more than 2 inches accumulated material **Remedy**: Remove sediment as necessary. If 2 inches or more of filter bed has been removed, replace media with either mulch or a (50% sand, 20% woodchips, 20% compost, 10% soil) mixture.	
During extended periods without rainfall, inspect plants for signs of distress. **Remedy**: Plants should be watered until established (typical only for first few months) or as needed thereafter.	
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy**: Repair or replace any damaged structural parts, inlets, outlets, sidewalls.	Annually
Check for robust vegetation coverage throughout the system. **Remedy**: If at least 50% vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
Check for dead or dying plants, and general long term plant health. **Remedy**: This vegetation should be cut and removed from the system. If woody vegetation is present, care should be taken to remove dead or decaying plant Material. Separation of Herbaceous vegetation rootstock should occur when overcrowding is observed.	As needed

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1. Initial Inspection After Planting and Mulching			
Plants are stable, roots not exposed	**S**	**U**	
Surface is at design level, typically 4" below overpass	**S**	**U**	
Overflow bypass / inlet (if available) is functional	**S**	**U**	
2. Debris Cleanup (2 times a year minimum, Spring & Fall)			
Litter, leaves, and dead vegetation removed from the system	**S**	**U**	
Prune perennial vegetation	**S**	**U**	
3. Standing Water (1 time a year, After large storm events)			
No evidence of standing water after 72 hours	**S**	**U**	
4. Short Circuiting & Erosion (1 time a year, After large storm events)			
No evidence of animal burrows or other holes	**S**	**U**	
No evidence of erosion	**S**	**U**	
5. Drought Conditions (As needed)			
Water plants as needed	**S**	**U**	
Dead or dying plants			
6. Overflow Bypass / Inlet Inspection (1 time a year, After large storm events)			
No evidence of blockage or accumulated leaves	**S**	**U**	
Good condition, no need for repair	**S**	**U**	
7. Vegetation Coverage (once a year)			
50% coverage established throughout system by first year	**S**	**U**	
Robust coverage by year 2 or later	**S**	**U**	
8. Mulch Depth (if applicable)(once every 2 years)			
Mulch at original design depth after tilling or replacement	**S**	**U**	
9. Vegetation Health (once every 3 years)			
Dead or decaying plants removed from the system	**S**	**U**	
10. Tree Pruning (once every 3 years)			
Prune dead, diseased, or crossing branches	**S**	**U**	
Corrective Action Needed			**Due Date**
1.			
2.			
3.			

1/15/2011, University of New Hampshire Stormwater Center

APPENDIX XI

Pre- and Post-Construction Watershed Plans

Design: DJM	Draft: DJM	Date: 2/26/2024
Checked: PSL	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134-WATERSHED.dwg		

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
03/14/2024

REV.	DATE	REVISION	BY
0	3/8/24	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING WATERSHED PLAN
Project:	"LUSTER CLUSTER" 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 18134.1

Design: DJM	Draft: DJM	Date: 2/26/2024
Checked: PSL	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134-WATERSHED.dwg		

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
03/14/2024

REV.	DATE	REVISION	BY
0	3/8/24	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: PROPOSED WATERSHED PLAN

Project: "LUSTER CLUSTER"
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

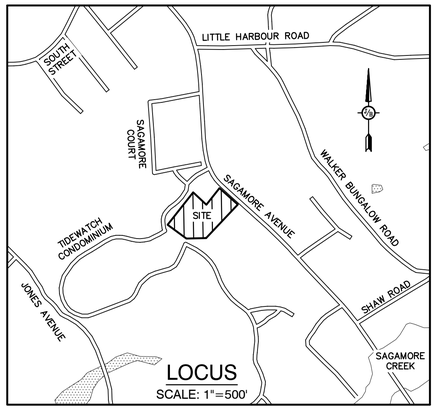
DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 18134.1

SINGLE FAMILY CONDOMINIUM
"LUSTER CLUSTER"
TAX MAP 222, LOT 19
635 SAGAMORE AVE., PORTSMOUTH, NH

Know what's **below**
811 before you dig

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		TREE LINE
		STONEWALL
		BARBED WIRE FENCE
		SOIL BOUNDARY
		EASEMENT
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
VGC	VGC	EDGE OF PAVEMENT
SGC	SGC	VERTICAL GRANITE CURB
		SLOPE GRANITE CURB
X	X	SILT FENCE
D	D	DRAINAGE LINE
S	S	SEWER LINE
FM	FM	SEWER FORCE MAIN
G	G	GAS LINE
W	W	WATER LINE
WS	WS	WATER SERVICE
OHE	OHE	OVERHEAD ELECTRIC
UGE	UGE	UNDERGROUND ELECTRIC
UD	UD	UNDERDRAIN
	W	THRUST BLOCK
		IRON PIPE/IRON ROD
		DRILL HOLE
		IRON ROD/DRILL HOLE
		STONE/GRANITE BOUND
100x0	100x0	SPOT GRADE
100.00	100.00	PAVEMENT SPOT GRADE
100.00 / 99.50	100.00 / 99.50	CURB SPOT GRADE
		BENCHMARK (TBM)
		DOUBLE POST SIGN
		SINGLE POST SIGN
		WELL
		TEST PIT
		TREES AND BUSHES
		UTILITY POLE
		DRAIN MANHOLE
		SEWER MANHOLE
		HYDRANT
		WATER GATE
		WATER SHUT OFF
		REDUCER
		SINGLE GRATE CATCH BASIN
		TRANSFORMER
		CULVERT W/STRAIGHT HEADWALL
		STONE CHECK DAM
		DRAINAGE FLOW DIRECTION
		RIPRAP
		PAVEMENT HATCH
		STABILIZED CONSTRUCTION ENTRANCE
		CONCRETE
		GRAVEL
		SNOW STORAGE
		RETAINING WALL



SHEET INDEX

CS	COVER SHEET
C1	EXISTING CONDITIONS PLAN
DM1	DEMOLITION PLAN
C2	SITE PLAN
C3	GRADING AND DRAINAGE PLAN
C4	UTILITY PLAN
L1	LIGHTING PLAN
L2	LANDSCAPE PLAN
P1	DRIVEWAY PLAN AND PROFILE
P2	SEWER PLAN AND PROFILE
H1	HIGHWAY ACCESS PLAN
T1-T2	TRUCK TURNING PLAN
D1-D5	DETAIL SHEET
E1	EROSION AND SEDIMENT CONTROL DETAILS
	ARCHITECTURAL PLANS

CIVIL ENGINEER / SURVEYOR
JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: JOSEPH CORONATI
EMAIL: JCORONATI@JONESANDBEACH.COM

TRAFFIC ENGINEER
STEPHEN G. PERNAW & COMPANY, INC.
P.O. BOX 1721
CONCORD, NH 03302
(603) 731-8500
CONTACT: STEPHEN PERNAW

SOILS CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DRIVE, BLDG 2, UNIT H
EXETER, NH 03833-7507
(603) 418-7260
CONTACT: JAMES GOVE
EMAIL: JGOVE@GESINC.BIZ

LANDSCAPE DESIGNER
LM LAND DESIGN, LLC
11 SOUTH ROAD
BRENTWOOD, NH 03833
(603) 770-7728
CONTACT: LISE MCNAUGHTON

WATER
CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 427-1530

SEWER
CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 766-1421

LIGHTING DESIGN
EXPOSURE LIGHTING
501 ISLINGTON STREET,UNIT 1A
PORTSMOUTH, NH 03801
CONTACT: KEN SWEENEY

ELECTRIC
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
(800) 662-7764

TELEPHONE
CONSOLIDATED COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(800) 427-5525

CABLE TV
COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON _____ DATE _____

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	COVER SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
CS
SHEET 1 OF19
JBE PROJECT NO. 18134.1

635 SAGAMORE AVE, PORTSMOUTH, NH
JBE # 18134.1 REVISION 0, 3/18/24

PLAN REFERENCES:

1. "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
2. "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H.: DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
3. "BOUNDARY SURVEY LOCATED IN PORTSMOUTH, NH. PREPARED FOR TIDEWATCH ASSOCIATES, INC. DATED MARCH 13, 1986. PREPARED BY KIMBALL CHASE COMPANY, INC. R.C.R.D. 14771.

SOIL NOTE

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

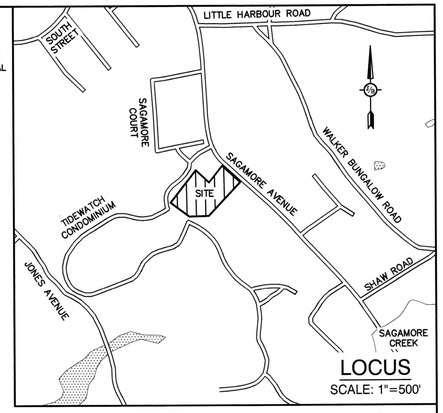
THE SITE SPECIFIC SOIL MAP WAS PRODUCED 2-20-2024, AND WAS PREPARED BY JAMES P. GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC.

SOIL IDENTIFICATION LEGEND

MAP UNIT SYMBOL	MAP UNIT NAME	HISS SYMBOL	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	228	B
289	CHATFIELD VARIANT (MODERATELY WELL DRAINED)	327	B
699	URBAN LAND	N/A	IMPERVIOUS

SLOPE PHASE:

0–8%	B	8–15%	C	15–25%	D
25%–50%	E	50%+	F		



ABUTTERS ACROSS 635 SAGAMORE AVE.:

TAX MAP 222, LOT 14
JOHN O'SULLIVAN
DENISE BROWN
692 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 2350 PG 181

TAX MAP 222, LOT 14-1
BROWN FAMILY REV. TRUST
VINCENT A. & LINDA M. BROWN, TRUSTEES
LOUISE BROWN
650 SAGAMORE AVE
PORTSMOUTH, NH 03801
BK 6074 PG 238

EXISTING CONDITIONS NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE (1-888-344-7233).
2. ZONING DISTRICT: SINGLE RESIDENCE A.
3. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING FEATURES LOCATED ON CITY OF PORTSMOUTH TAX MAP 222, LOT 19.
4. VERTICAL DATUM: NAVD88. HORIZONTAL DATUM: NH STATE PLANE
5. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
6. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.
16. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.

CERTIFICATION:

PURSUANT TO RSA 676:18–III AND RSA 672:14

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE — No. 1030 — MATTHEW J. SALVUCCI — LICENSED LAND SURVEYOR — SIGNATURE

3/18/24
MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

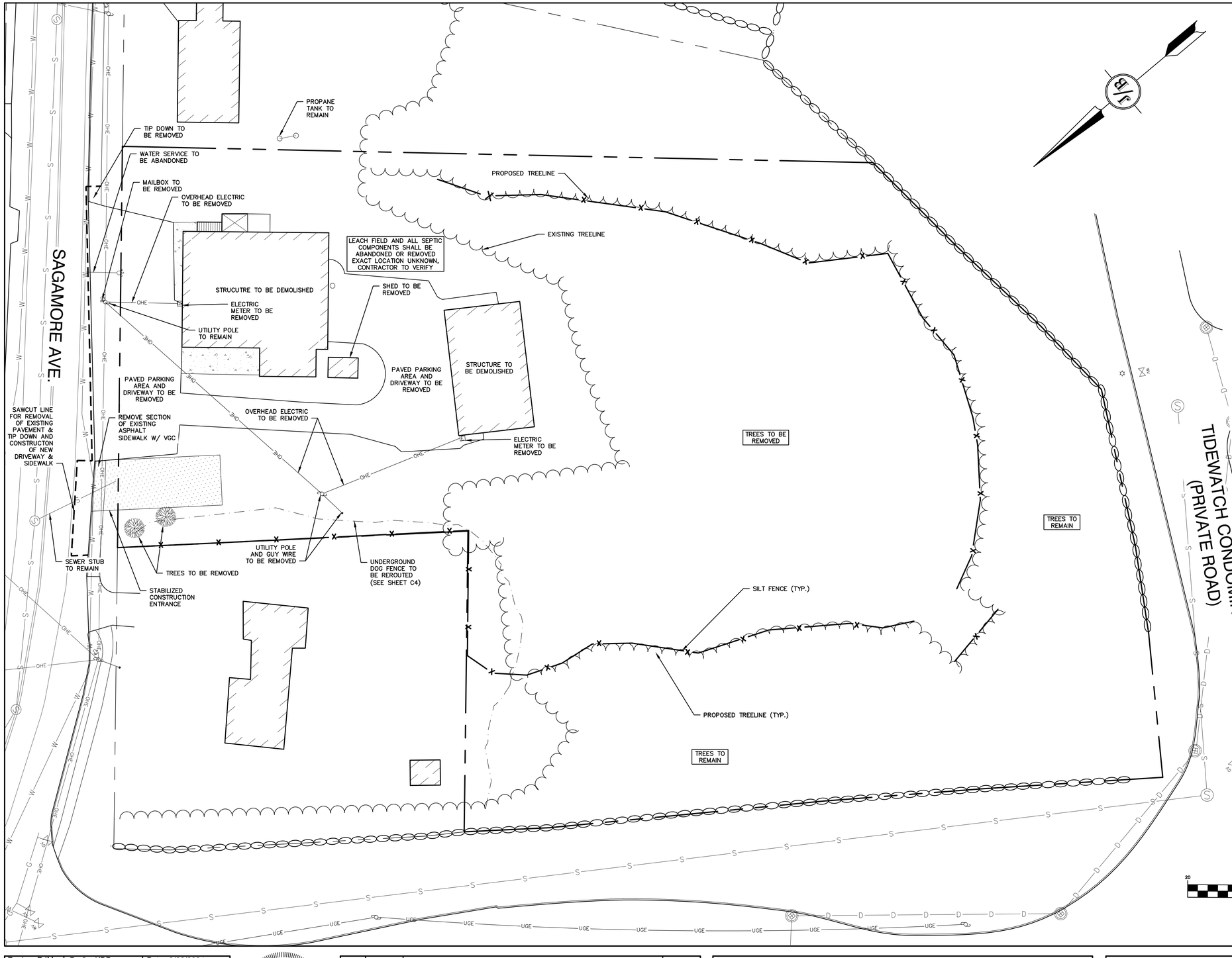
STATE OF NEW HAMPSHIRE — DANIEL JAMES MEDITZ No.18152 — LICENSED PROFESSIONAL ENGINEER — 3/18/24

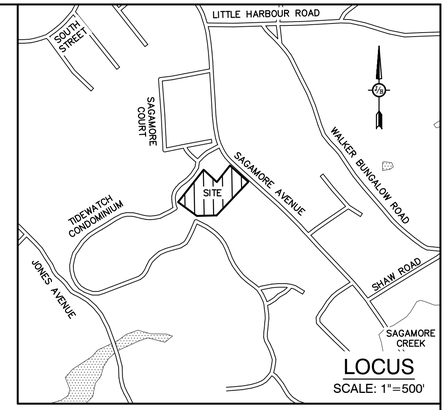
REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EXISTING CONDITIONS PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C1
SHEET 2 OF 19
JBE PROJECT NO. 18134.1





DEMOLITION NOTES:

1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR SITE DEMOLITION. IT SHOULD BE NOTED THAT ALL MANMADE FEATURES, PAVEMENT, SIGNS, POLES, CURBING, CONCRETE WALKS, UTILITIES, ETC., SHALL BE REMOVED AS NECESSARY TO CONSTRUCT WORK, UNLESS OTHERWISE NOTED TO REMAIN. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCIES FROM DATA AS SHOWN ON DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
3. ALL EXISTING STRUCTURES WITHIN THE CONSTRUCTION AREA, UNLESS OTHERWISE NOTED TO REMAIN, SHALL BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES. ANY BURNING ON-SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.
4. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL CONTAMINATED MATERIAL LOCATED IN THE AREA OF EXISTING LEACHFIELDS IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
5. ALL CURBING, CONCRETE, PAVEMENT, BUILDINGS AND SUBBASE MATERIALS LOCATED WITHIN PROPOSED LANDSCAPED AREAS SHALL BE REMOVED AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPING IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS. (SEE ALSO LANDSCAPE PLAN).
6. THE CONTRACTOR SHALL OBTAIN TREE CLEARING PERMIT FROM LOCAL AND STATE AUTHORITIES PRIOR TO START OF CONSTRUCTION (IF REQUIRED).
7. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
8. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ANY EARTH MOVING OPERATIONS. SILT FENCE SHALL BE INSTALLED AT THE LIMITS OF IMPACT AREAS ACCORDING TO THE DETAILS SHOWN ON SHEET E1.
9. EXCAVATED MATERIALS WILL BE PLACED WITHIN UPLAND AREAS AS FILL MATERIAL OR HAULED OFF-SITE FOR DISPOSAL IN AN APPROPRIATE UPLAND LOCATION.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

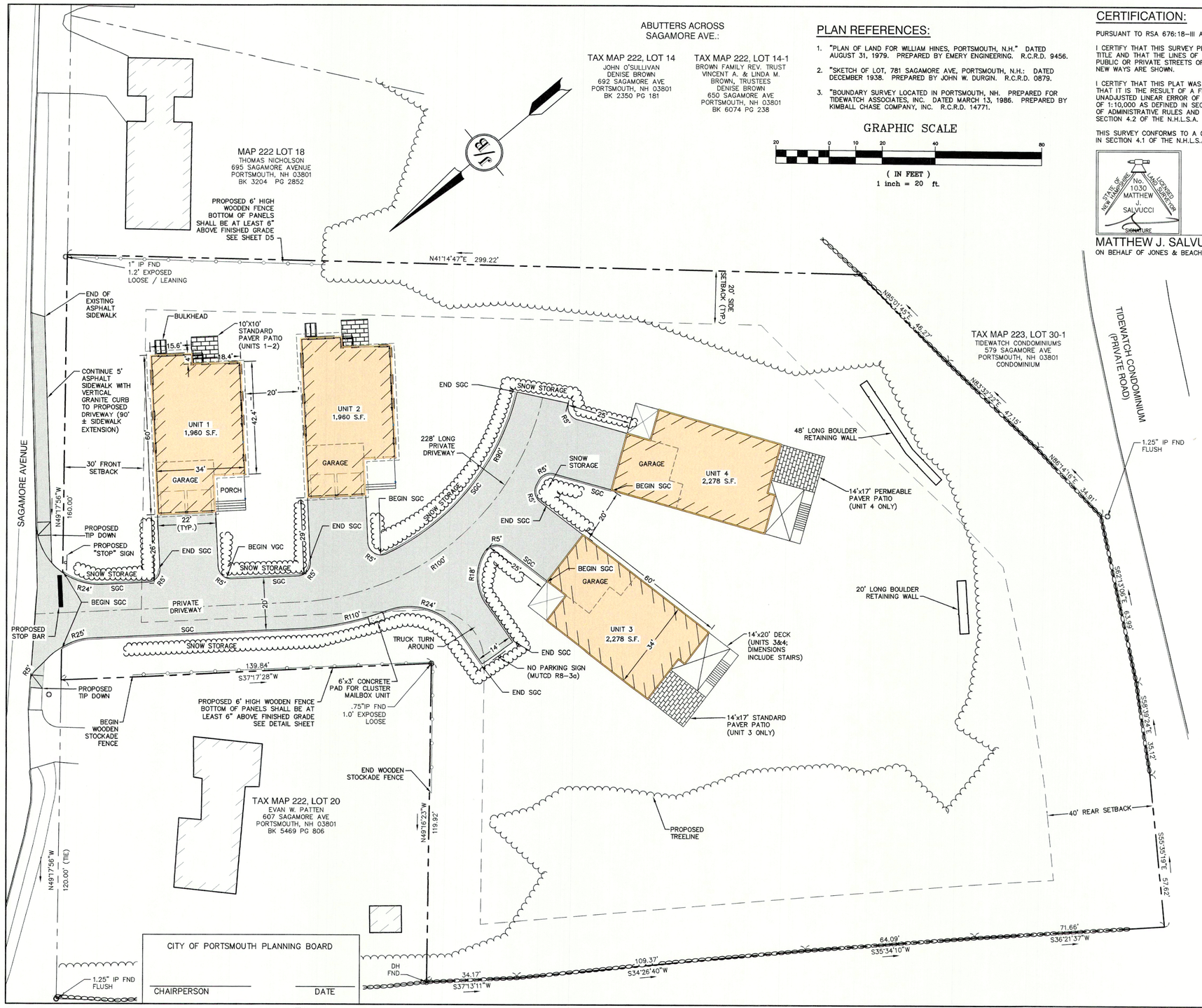
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: DEMOLITION PLAN

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
DM-1
SHEET 3 OF19
JBE PROJECT NO. 18134.1



PLAN REFERENCES:

1. "PLAN OF LAND FOR WILLIAM HINES, PORTSMOUTH, N.H." DATED AUGUST 31, 1979. PREPARED BY EMERY ENGINEERING. R.C.R.D. 9456.
2. "SKETCH OF LOT, 781 SAGAMORE AVE, PORTSMOUTH, N.H.: DATED DECEMBER 1938. PREPARED BY JOHN W. DURGIN. R.C.R.D. 0879.
3. "BOUNDARY SURVEY LOCATED IN PORTSMOUTH, NH. PREPARED FOR TIDEWATCH ASSOCIATES, INC. DATED MARCH 13, 1986. PREPARED BY KIMBALL CHASE COMPANY, INC. R.C.R.D. 14771.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

CERTIFICATION:

PURSUANT TO RSA 676:18-III AND RSA 672:14

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

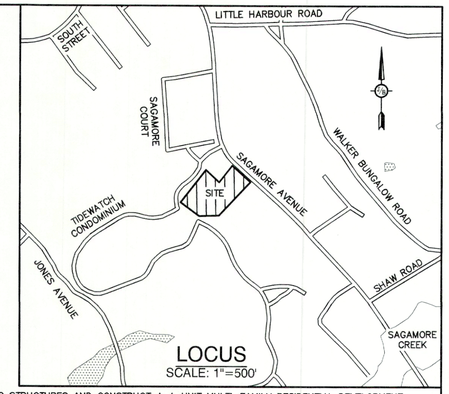
I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE — No. 1030 — MATTHEW J. SALVUCCI — LICENSED LAND SURVEYOR — SIGNATURE

MATTHEW J. SALVUCCI, LLS 1030
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

DATE: 3/8/24



SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE EXISTING STRUCTURES AND CONSTRUCT A 4-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT.
2. ZONING DISTRICT: SINGLE RESIDENCE A (SRA)
   LOT AREA MINIMUM = 1 ACRE
   LOT FRONTAGE MINIMUM = 150'
   LOT DEPTH MINIMUM = 200'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 30'
   SIDE SETBACK = 20'
   REAR SETBACK = 40'
   WETLAND SETBACK = 100' FROM WETLANDS GREATER THAN 10,000 S.F.
   MAX. BUILDING HEIGHT = 35' FOR SLOPED ROOF; 30' FOR FLAT ROOF
   MAX. BUILDING COVERAGE = 10%
   BUILDING COVERAGE PROPOSED = 8,476 S.F. = JUST UNDER 10%
   MAX. DENSITY = 1 DWELLING UNIT / ACRE
   DENSITY PROPOSED = 4 DWELLING UNITS / 1.947 AC. = 2.05 UNITS / ACRE
   (1 UNIT / 21,248 S.F.)
   MIN. OPEN SPACE = 50%
   OPEN SPACE PROPOSED = 68,700 S.F. = 80.0%
3. PARKING CALCULATIONS:
   DWELLING UNIT FLOOR AREA OVER 750 S.F. - 1.3 SPACES REQUIRED PER UNIT
   1.3 * 4 DWELLING UNITS = 5.2 SPACES REQUIRED
   2 SPACES IN GARAGE + 2 SPACES IN DRIVEWAY PER UNIT = 4 SPACES PER UNIT * 4 UNITS
   16 SPACES PROVIDED
   ONE BICYCLE SPACE PROVIDED IN EACH GARAGE (1 REQUIRED FOR EVERY 5 DWELLING UNITS PER ZONING)
4. ON MAY 23, 2023, THE PORTSMOUTH, NH ZONING BOARD OF ADJUSTMENT VOTED TO APPROVE VARIANCES FROM THE FOLLOWING SECTIONS OF THE ZONING ORDINANCE:
   A) SECTION 10.513 - TO PERMIT MORE THAN ONE FREE-STANDING DWELLING ON A LOT
   B) SECTION 10.521 - TO PERMIT LESS THAN ONE ACRE PER DWELLING UNIT
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
6. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.
7. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED. CONTRACTOR TO ALWAYS CONTACT DIG SAFE PRIOR TO DIGGING ONSITE OR OFFSITE TO ENSURE SAFETY AND OBEY THE LAW.
8. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
9. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
10. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
11. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.P.). THIS DOCUMENT IS TO BE KEPT ONSITE AT ALL TIMES AND UPDATED AS REQUIRED.
12. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
13. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND NHDOT STANDARDS AND SPECIFICATIONS (NON-REFLECTORIZED PAVEMENT MARKINGS), UNLESS OTHERWISE NOTED.
14. ALL STOP BARS SHALL BE 18" IN WIDTH IN A COLOR OF WHITE; ALL TRAFFIC ARROWS SHALL BE PAINTED IN A COLOR OF WHITE.
15. ALL BUILDING DIMENSIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PROVIDED BY THE OWNER. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER PRIOR TO THE START OF CONSTRUCTION. BUILDING DIMENSIONS AND AREAS TO BE TO OUTSIDE OF MASONRY, UNLESS OTHERWISE NOTED.
16. SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
17. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
18. AN ACCESS EASEMENT SHALL BE GRANTED TO THE CITY OF PORTSMOUTH FOR ACCESS AND LEAK DETECTION OF THE WATER MAIN, SHUTOFFS, AND METERS ON THE PROPERTY. EASEMENT DESCRIPTION MUST BE APPROVED BY THE CITY'S LEGAL DEPARTMENT AND ACCEPTED BY THE CITY COUNCIL.
19. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THE SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
20. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
21. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
22. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
23. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A WELLHEAD PROTECTION OR AQUIFER PROTECTION AREA PER NHDES ONESTOP DATA.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

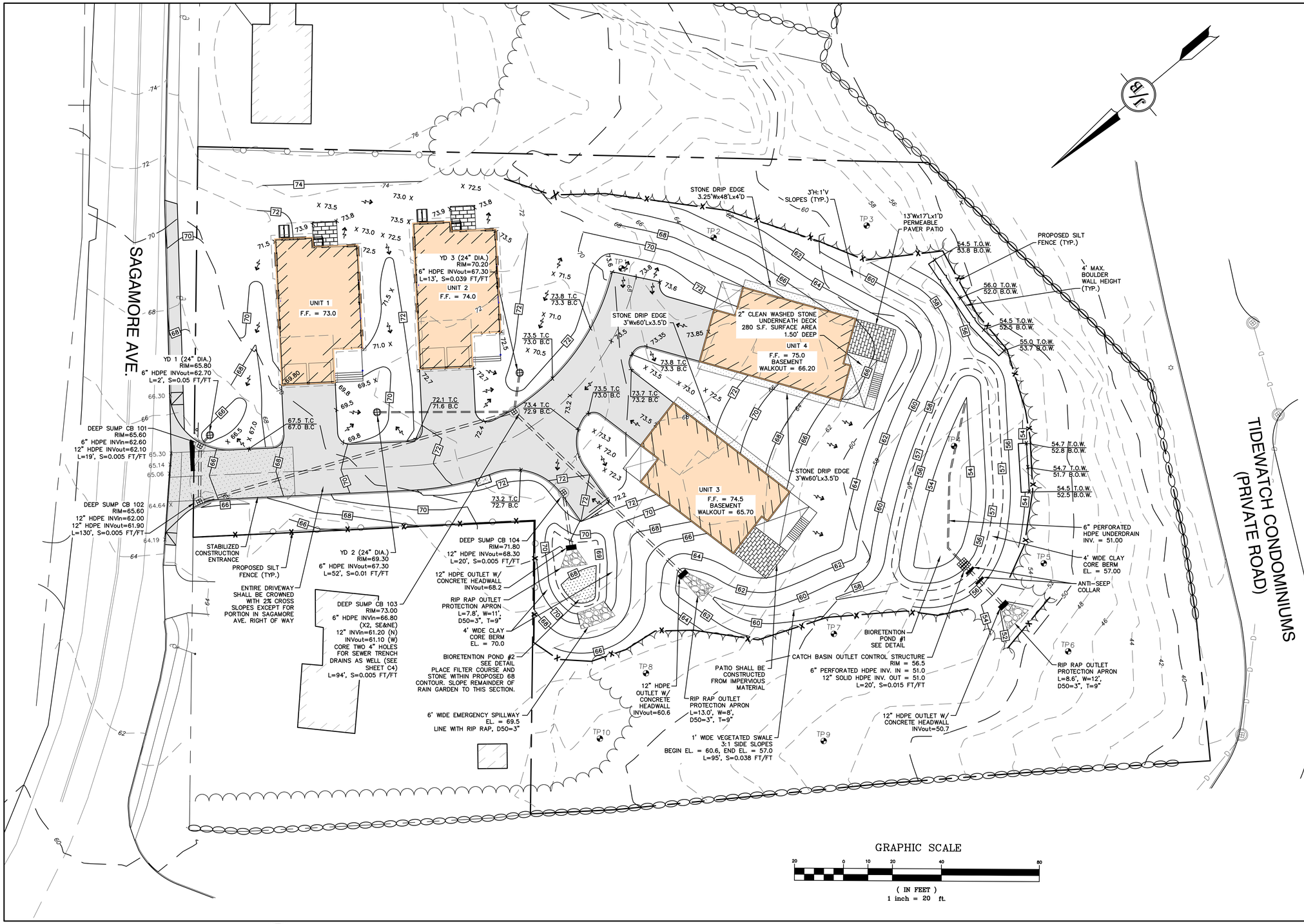
STATE OF NEW HAMPSHIRE — DANIEL JAMES MEDITZ No.18152 LICENSED PROFESSIONAL ENGINEER — 3/18/24

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SITE PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C2
SHEET 4 OF 19
JBE PROJECT NO. 18134.1



GRADING AND DRAINAGE NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
2. VERTICAL DATUM: NAVD88.
3. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
4. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
5. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
6. ALL SWALES AND STORMWATER PONDS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
7. PROPOSED RIM ELEVATIONS OF DRAINAGE STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES.
8. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS. CATCH BASINS SHALL HAVE 4' DEEP SUMPS WITH GREASE HOODS, UNLESS OTHERWISE NOTED.
9. ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DETAIL SHEETS FOR DRAINAGE DETAILS.
10. ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
11. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
12. ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
13. STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
14. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
15. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
16. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
17. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
18. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
19. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
20. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
21. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
22. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
23. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
24. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
25. CB = CATCH BASIN, YD = YARD DRAIN

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
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Drawing Name: 18134.1-PLAN.dwg	

DANIEL JAMES MEDITZ No.18152 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
03/18/2024

REV.	DATE	REVISION	BY
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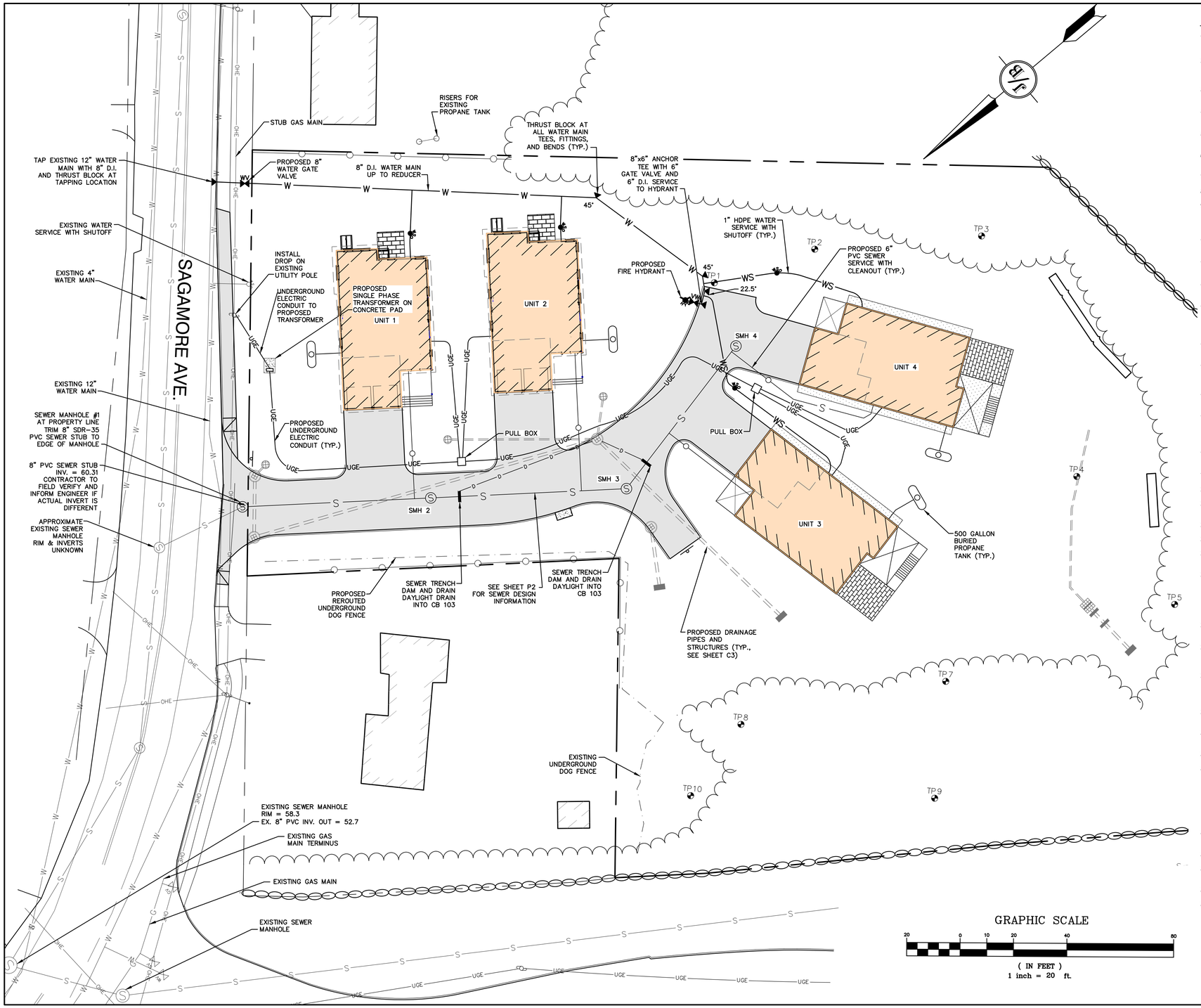
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: GRADING AND DRAINAGE PLAN

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C3
SHEET 5 OF 19
JBE PROJECT NO. 18134.1



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
2. THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
3. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, WATER, AND SEWER).
4. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT-RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
5. ALL CONSTRUCTION SHALL CONFORM TO THE CITY STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS OTHERWISE SPECIFIED.
6. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
7. BUILDINGS TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
8. AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
9. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE THROUGH CHANNEL UNDERLAYMENT OF INVERT, AND SHELF SHALL CONSIST OF BRICK MASONRY.
10. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA, CLEAR OPENING. THE WORD "SEWER" SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
11. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H20 LOADS. (THIS APPLIES TO SMH 1)
12. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
13. SANITARY SEWER FLOW CALCULATIONS:
    2 – THREE BEDROOM UNITS & 2 – FOUR BEDROOM UNITS @ 150 GPD/BEDROOM PER METCALF & EDDY TABLE 3-2
    2*3 = 2*4 = 14 BEDROOMS * 150 GPD/BEDROOM = 2,100 GPD
    TOTAL FLOW = 2,100 GPD
14. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
15. PROPOSED RIM ELEVATIONS OF DRAINAGE AND SANITARY MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, AND OTHER UTILITIES TO FINISH GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
16. ALL WATER MAINS AND SERVICE PIPES SHALL HAVE A MINIMUM 12" VERTICAL AND 24" HORIZONTAL SEPARATION TO MANHOLES, OR CONTRACTOR SHALL INSTALL BOARD INSULATION FOR FREEZING PROTECTION.
17. WATER MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR LEAKAGE PRIOR TO ACCEPTANCE. WATERMAINS SHALL BE TESTED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICH EVER IS GREATER. TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600. WATERMAINS SHALL BE DISINFECTED AFTER THE ACCEPTANCE OF THE PRESSURE AND LEAKAGE TESTS ACCORDING TO AWWA STANDARD C 651.
18. ALL WATER AND SANITARY LEADS TO BUILDING(S) SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLANS AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT END.
19. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
20. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
21. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHOULD BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
22. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
23. ALL WATER LINES SHALL HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
24. ALL GRAVITY SEWER PIPE, MANHOLES, AND FORCE MAINS SHALL BE TESTED ACCORDING TO NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER TREATMENT FACILITIES, CHAPTER ENV-WQ 700. ADOPTED ON 10-15-14.
25. ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING: GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY USE OF LOW-PRESSURE AIR TESTS CONFORMING WITH ASTM F1417-92(2005) OR UNI-B-6. LINES SHALL BE CLEANED AND VISUALLY INSPECTED AND TRUE TO LINE AND GRADE. DEFLECTION TESTS SHALL TAKE PLACE AFTER 30 DAYS FOLLOWING INSTALLATION AND THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
26. ENV-WQ 704.17 SEWER MANHOLE TESTING: SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST PRIOR TO BACKFILLING AND PLACEMENT OF SHELVES AND INVERTS.
27. SANITARY SEWER LINES SHALL BE LOCATED AT LEAST TEN (10) FEET HORIZONTALLY FROM AN EXISTING OR PROPOSED WATER LINE. WHEN A SEWER LINE CROSSES UNDER A WATER LINE, THE SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATERMAIN. THE SEWER LINE SHALL ALSO MAINTAIN A VERTICAL SEPARATION OF NOT LESS THAN 18 INCHES.
28. SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6 FEET BELOW GRADE IN ALL ROADWAY LOCATIONS, AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS-COUNTRY LOCATIONS. PROVIDE TWO-INCHES OF R-10 FOAM BOARD INSULATION 2-FOOT WIDE TO BE INSTALLED 6-INCHES OVER SEWER PIPE IN AREAS WHERE DEPTH IS NOT ACHIEVED. A WAIVER FROM THE DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER ENGINEERING BUREAU IS REQUIRED PRIOR TO INSTALLING SEWER AT LESS THAN MINIMUM COVER.
29. THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY THE CITY SEWER DEPARTMENT.
30. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
31. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
32. DISINFECTION OF WATER MAINS SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH AWWA STANDARD C651, LATEST EDITION. THE BASIC PROCEDURE TO BE FOLLOWED FOR DISINFECTING WATER MAINS IS AS FOLLOWS:
    a. PREVENT CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR.
    b. REMOVE, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAINS.
    c. CHLORINATE ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSH THE CHLORINATED WATER FROM THE MAIN.
    d. PROTECT THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW DUE TO HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
    e. DETERMINE THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
    f. MAKE FINAL CONNECTION OF THE APPROVED NEW WATER MAIN TO THE ACTIVE DISTRIBUTION SYSTEM
33. DOMESTIC SHUTOFFS & VALVES SHALL BE PAINTED BLUE. FIRE SERVICE SHUTOFFS & VALVES SHALL BE PAINTED RED. COORDINATE WITH CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS FOR EXACT COLORS.
34. SEWER TRENCH DAMS SHALL BE INSTALLED EVERY 75' ALONG GRAVITY SEWER PIPE.
35. IF IRRIGATION IS TO BE USED, THE PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY THE PORTSMOUTH CITY PLANNER, CITY ENGINEER, AND THE WATER DEPARTMENT PRIOR TO INSTALLATION.
36. WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
37. AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

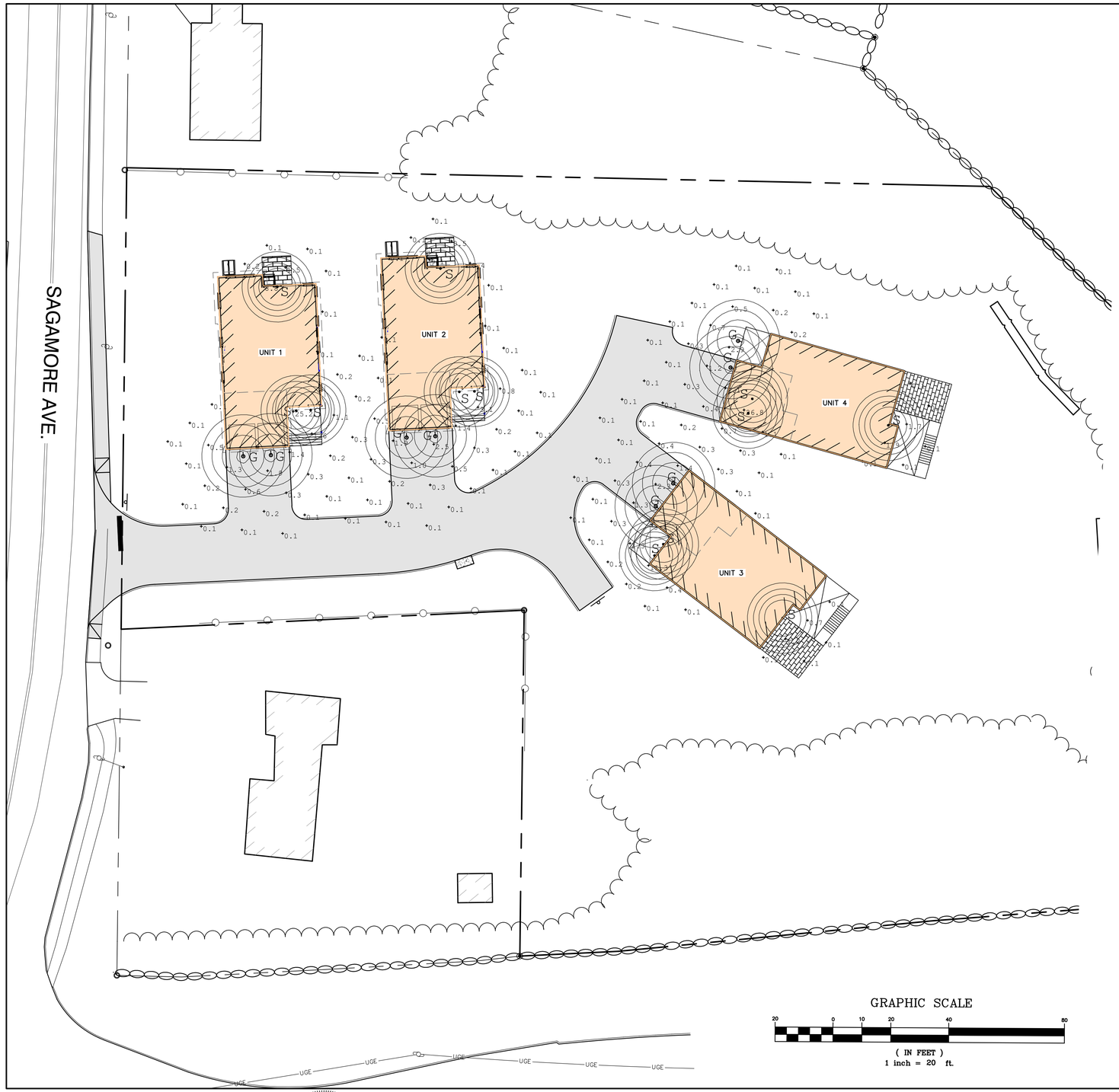
STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

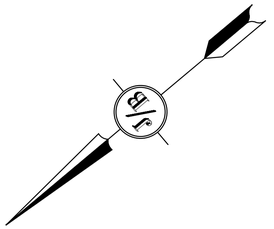
REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: UTILITY PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
C4
SHEET 6 OF 19
JBE PROJECT NO. 18134.1





LIGHTING AND ELECTRICAL NOTES:

1. SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.
2. CONTRACTOR SHALL INSTALL PROPOSED LIGHT POLES ACCORDING TO TOWN REGULATIONS.
3. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON-OPERATIONAL VALUES PER TOWN REGULATIONS.
4. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
5. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT-CANDLES.
6. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY.
7. ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF DARK-SKY COMPLIANT, UNLESS OTHERWISE NOTED.
8. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY EXPOSURE LIGHTING, 501 ISLINGTON ST, UNIT 1A, PORTSMOUTH, NH 03801, ATTENTION KEN SWEENEY. ALL LIGHTS SHOULD BE PURCHASED FROM THIS COMPANY, OR AN EQUAL LIGHTING DESIGN SHALL BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
⊖	8	G	Single	UAA-30146-29W-2-1-W27-01	MOUNTED OVER GARAGE DOORS	LIGMAN
⊙	12	S	Single	UCI-30131-21W-VW-W27-01	MOUNTED AT HOUSE DOORS	LIGMAN

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

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STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
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03/18/2024

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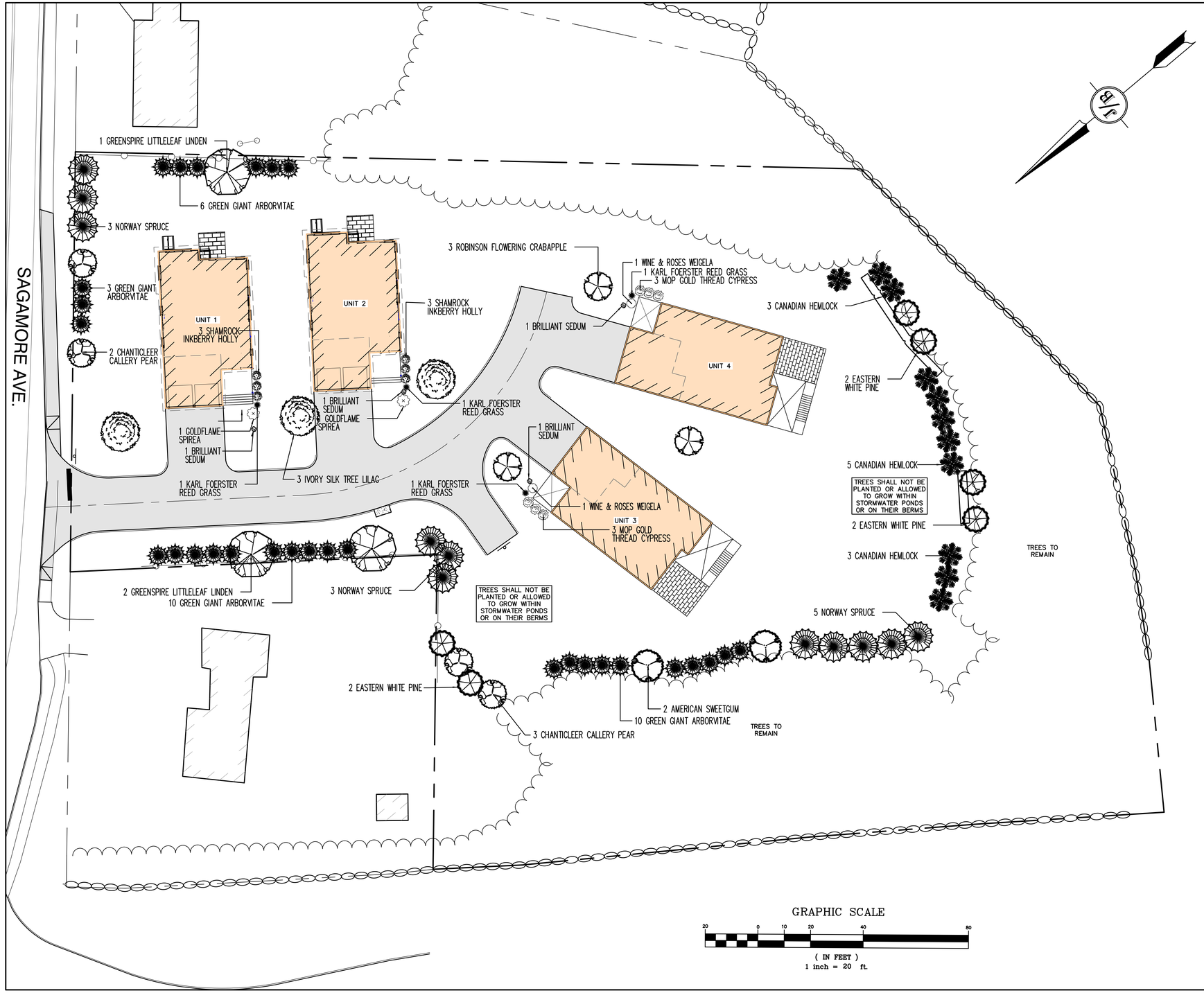
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	LIGHTING PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
L1
SHEET 7 OF19
JBE PROJECT NO. 18134.1



LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING FOR CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
5. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
6. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN COMPLETED.
7. ALL WORK AND PLANTS SHALL BE DONE, INSTALLED AND DETAILED IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
8. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON.
9. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION, EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS SPECIFIED.
10. ALL TREES AND SHRUBS SHALL BE PLANTED IN MULCH BEDS WITH EDGE STRIPS TO SEPARATE TURF GRASS AREAS.
11. THE CONTRACTOR SHALL REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC. FROM ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE. GRASS SEED OR PINE BARK MULCH SHALL BE APPLIED AS DEPICTED ON PLANS.
12. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE DRIPLINE OF THE TREE. THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
13. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH OVER A 10 MIL WEED MAT EQUAL TO 'WEEDBLOCK' BY EASY GARDENER OR DEWITT WEED BARRIER.
14. ALL LANDSCAPED AREAS SHALL HAVE SELECT MATERIALS REMOVED TO A DEPTH OF AT LEAST 9" BELOW FINISH GRADE. THE RESULTING VOID IS TO BE FILLED WITH A MINIMUM OF 9" HIGH-QUALITY SCREENED LOAM AMENDED WITH 3" OF AGED ORGANIC COMPOST.
15. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL/SITE DRAWINGS FOR OTHER SITE CONSTRUCTION INFORMATION.
16. IRRIGATION PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.
17. WITH AUTHORIZATION OF THE PROJECT ENGINEER, PROPOSED TREES ALONG EDGE OF WOODED BUFFER SHALL BE PLACED WHEREVER NECESSARY IN ORDER TO COVER GAPS IN EXISTING WOODED BUFFER IN ORDER TO BLOCK VISIBILITY FROM TIDEWATCH CONDOMINIUM PROPERTY.
18. TREES MUST NOT BE PLANTED ON BERMS OF STORMWATER PONDS UNDER ANY CIRCUMSTANCES.

Quantity	Botanical Name	Common Name	Size
4	Calamagrostis x acutiflora 'Karl Foerster'	KARL FOERSTER REED GRASS	2 Gallon
6	Chamaecyparis pisifera 'Mop'	MOP GOLD THREAD CYPRESS	5 Gallon
6	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY	5 Gallon
2	Liquidambar styraciflua	AMERICAN SWEETGUM	3" Caliper
3	Malus x 'Robinson'	ROBINSON FLOWERING CRABAPPLE	2" Caliper
11	Picea abies	NORWAY SPRUCE	8-9 Ft. Ht.
6	Pinus strobus	EASTERN WHITE PINE	8-9 Ft. Ht.
4	Pyrus calleryana 'Chanticleer'	CHANTICLEER CALLERY PEAR	2.5" Caliper
4	Sedum spectabile 'Brilliant'	BRILLIANT SEDUM	1 Gallon
2	Spiraea japonica 'Goldflame'	GOLDFLAME SPIREA	5 Gallon
3	Syringa reticulata 'Ivory Silk'	IVORY SILK TREE LILAC	2" Caliper
29	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE	7-8 Ft. Ht.
3	Tilia cordata 'Greenspire'	GREENSPIRE LITTLELEAF LINDEN	3" Caliper
11	Tsuga canadensis	CANADIAN HEMLOCK	8-9 Ft. Ht.
2	Weigela florida 'Alexandra'	WINE & ROSES WEIGELA	5 Gallon

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR	Date: 2/26/2024	
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1	
Drawing Name: 18134.1-PLAN.dwg			

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

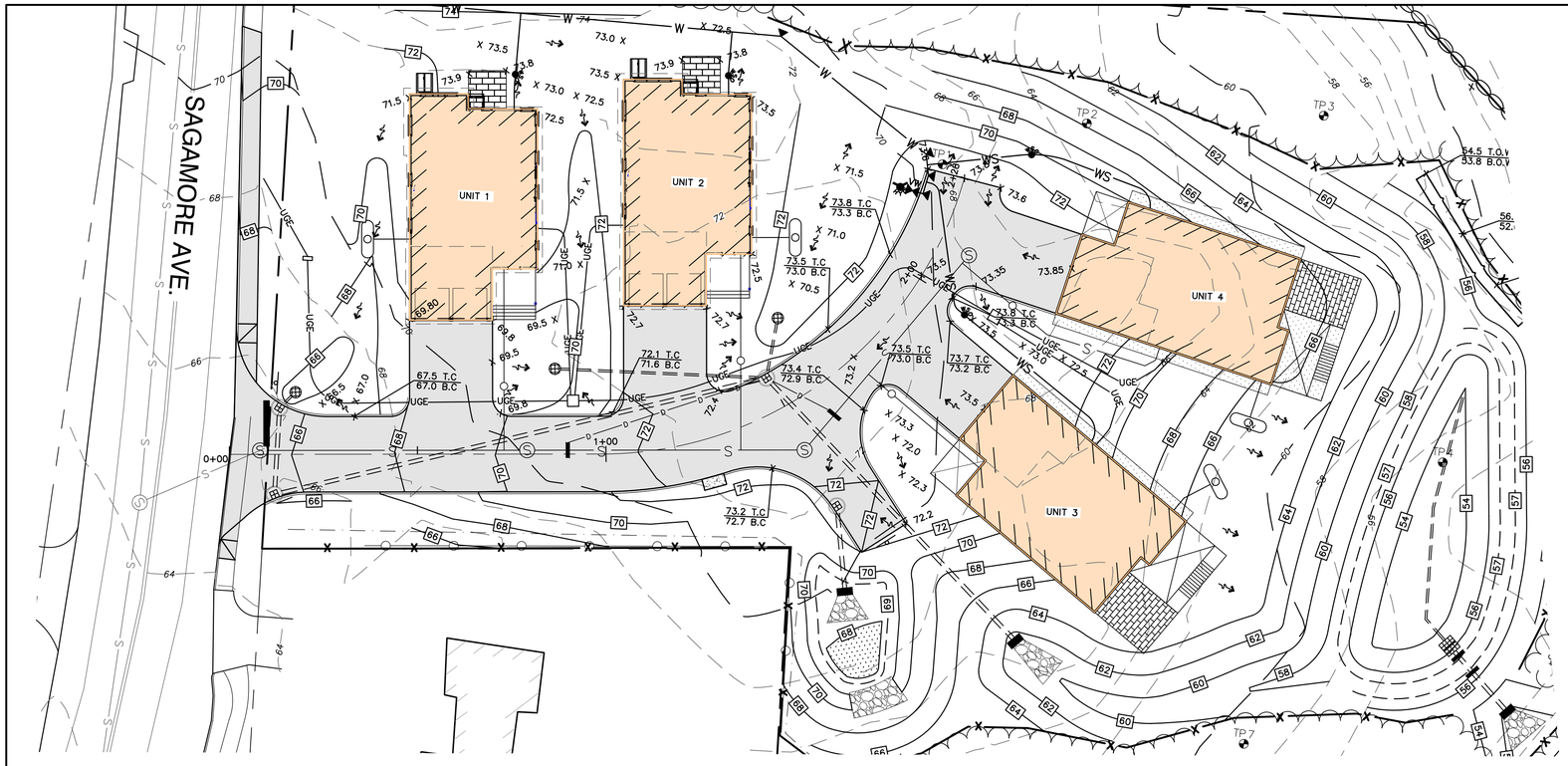
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

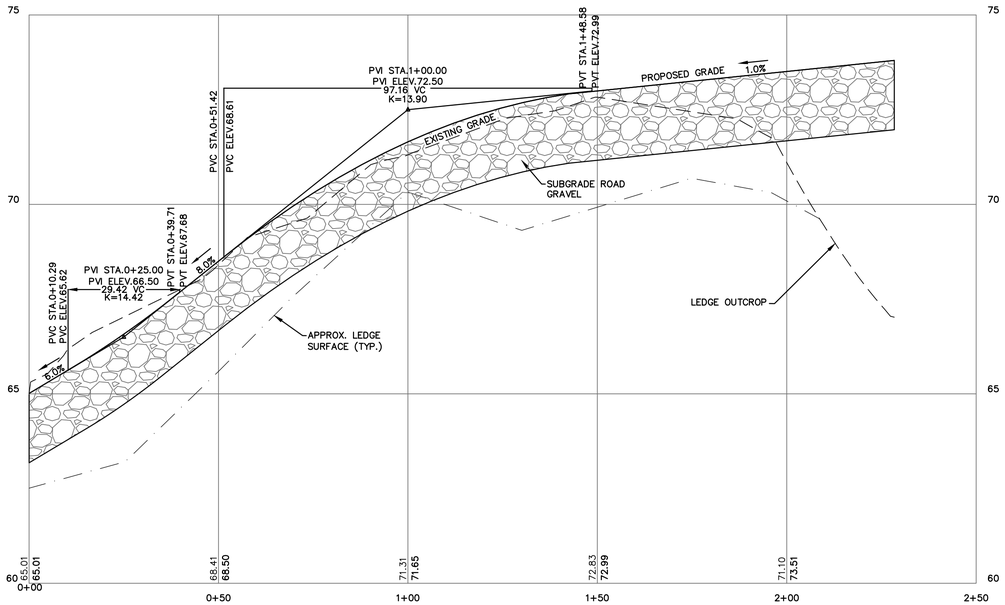
Plan Name: LANDSCAPE PLAN

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

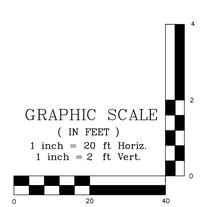
DRAWING No.
L1
SHEET 8 OF19
JBE PROJECT NO. 18134.1





NOTES:

1. THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
   B. ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
2. ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE CITY, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
3. AS-BUILT PLANS TO BE SUBMITTED TO THE CITY PRIOR TO ACCEPTANCE OF THE ROADWAY.
4. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
5. THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
6. SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
7. ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
8. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
9. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
10. DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. SEDIMENT BUILD UP IN SWALES WILL BE REMOVED IF IT IS DEEPER THAN SIX INCHES, AND IS TO BE REMOVED FROM SUMPS BELOW THE INLET OF CULVERTS SEMIANNUALLY, AS WELL AS FROM CATCH BASINS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE, TRASH TRACK AND EMERGENCY SPILL WAY. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
11. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
12. BIORETENTION PONDS REQUIRE TIMELY MAINTENANCE AND SHOULD BE INSPECTED AFTER EVERY MAJOR STORM EVENT, AS WELL AS FREQUENTLY DURING THE FIRST YEAR OF OPERATION, AND ANNUALLY THEREAFTER. EVERY FIVE YEARS, THE SERVICES OF A PROFESSIONAL ENGINEER SHOULD BE RETAINED TO PERFORM A THOROUGH INSPECTION OF THE BIORETENTION POND AND ITS INFRASTRUCTURE. ANY DEBRIS AND SEDIMENT ACCUMULATIONS SHOULD BE REMOVED FROM THE OUTLET STRUCTURE(S) AND EMERGENCY SPILLWAY(S) AND DISPOSED OF PROPERLY. BIORETENTION POND BERMS SHOULD BE MOWED AT LEAST ONCE ANNUALLY SO AS TO PREVENT THE ESTABLISHMENT OF WOODY VEGETATION. TREES SHOULD NEVER BE ALLOWED TO GROW ON A BIORETENTION POND BERM, AS THEY MAY DESTABILIZE THE STRUCTURE AND INCREASE THE POTENTIAL FOR FAILURE. AREAS SHOWING SIGNS OF EROSION OR THIN OR DYING VEGETATION SHOULD BE REPAIRED IMMEDIATELY BY WHATEVER MEANS NECESSARY, WITH THE EXCEPTION OF FERTILIZER. RODENT BORROWS SHOULD BE REPAIRED IMMEDIATELY AND THE ANIMALS SHOULD BE TRAPPED AND RELOCATED IF THE PROBLEM PERSISTS.
13. IN THOSE AREAS WHERE THE BERMS OF THE BIORETENTION SYSTEMS MUST BE CONSTRUCTED BY THE PLACEMENT OF FILL, THE ENTIRE EMBANKMENT AREA OF THE BIORETENTION PONDS SHALL BE EXCAVATED TO PROPOSED GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 95% AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. IN THE EVENT THE FOUNDATION MATERIAL EXPOSED DOES NOT ALLOW THE SPECIFIED COMPACTION, AN ADDITIONAL ONE FOOT (1') OF EXCAVATION AND THE PLACEMENT OF A ONE FOOT (1') THICK, TWELVE FOOT (12') WIDE PAD OF THE MATERIAL DESCRIBED IN THE NOTE BELOW, COMPACTED TO 95% OF ASTM D-1557 MAY BE NECESSARY. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHOULD BE PLACED WITHIN FOR ANY REASON.
14. EMBANKMENT IS TO HAVE 3:1 SIDE SLOPES (MAX.) AND IS TO BE BROUGHT TO SPECIFIED GRADES PRIOR TO THE ADDITION OF LOAM (4" MINIMUM) SO AS TO ALLOW FOR THE COMPACTION OF THE STRUCTURE OVER TIME WHILE MAINTAINING THE PROPER BERM ELEVATION.
15. COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION, AND ON THE FOUNDATION OF THE BERM AND ON EVERY LIFT OF NEWLY PLACED MATERIAL.



Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

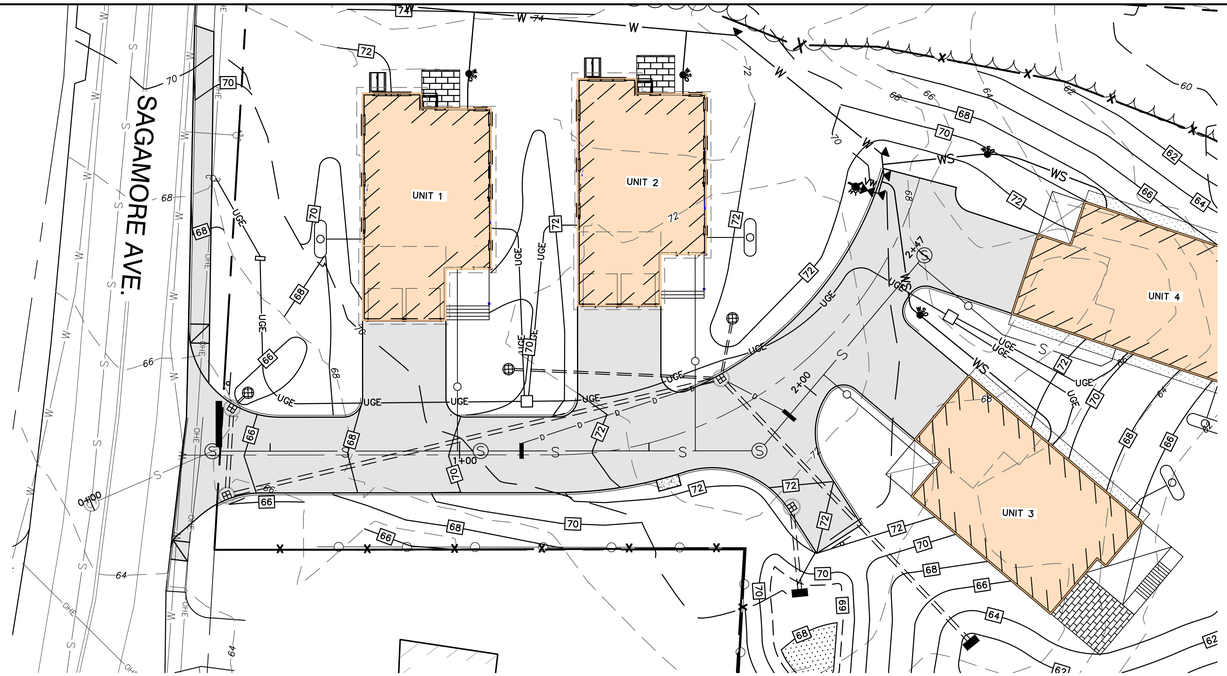
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

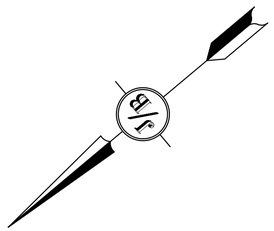
Plan Name: DRIVEWAY PLAN AND PROFILE

Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH

Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

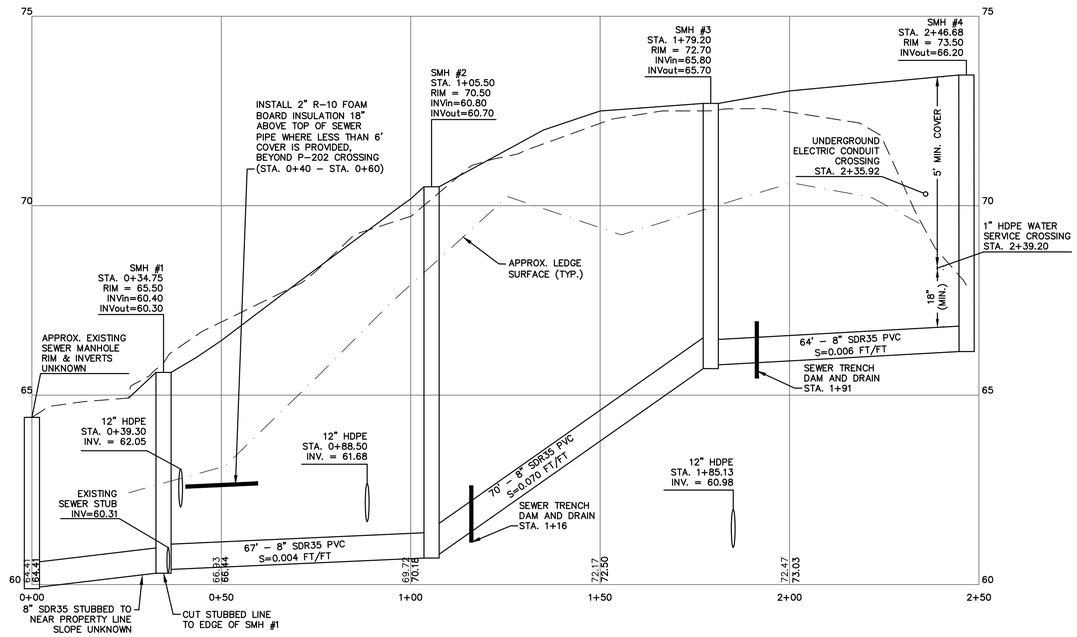
DRAWING No.
P1
SHEET 9 OF19
JBE PROJECT NO. 18134.1

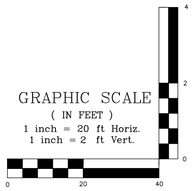




NOTES:

1. PROPOSED GRADES SHOWN HEREON ARE APPROXIMATE. REFER TO SHEETS C3 AND P1 FOR GRADING OF SITE AND DRIVEWAY. SET RIM ELEVATIONS OF SEWER STRUCTURES FLUSH WITH PROPOSED GRADE.
2. STATIONS REFER TO CENTERLINE OF SEWER STRUCTURE OR CROSSING DRAINAGE/WATER PIPE.
3. CONTRACTOR TO CONFIRM ACTUAL EXISTING INVERT OF STUB IN THE FIELD AND NOTIFY ENGINEER IF IT IS MORE THAN 0.1' DIFFERENT FROM THE STATED INVERT.





Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

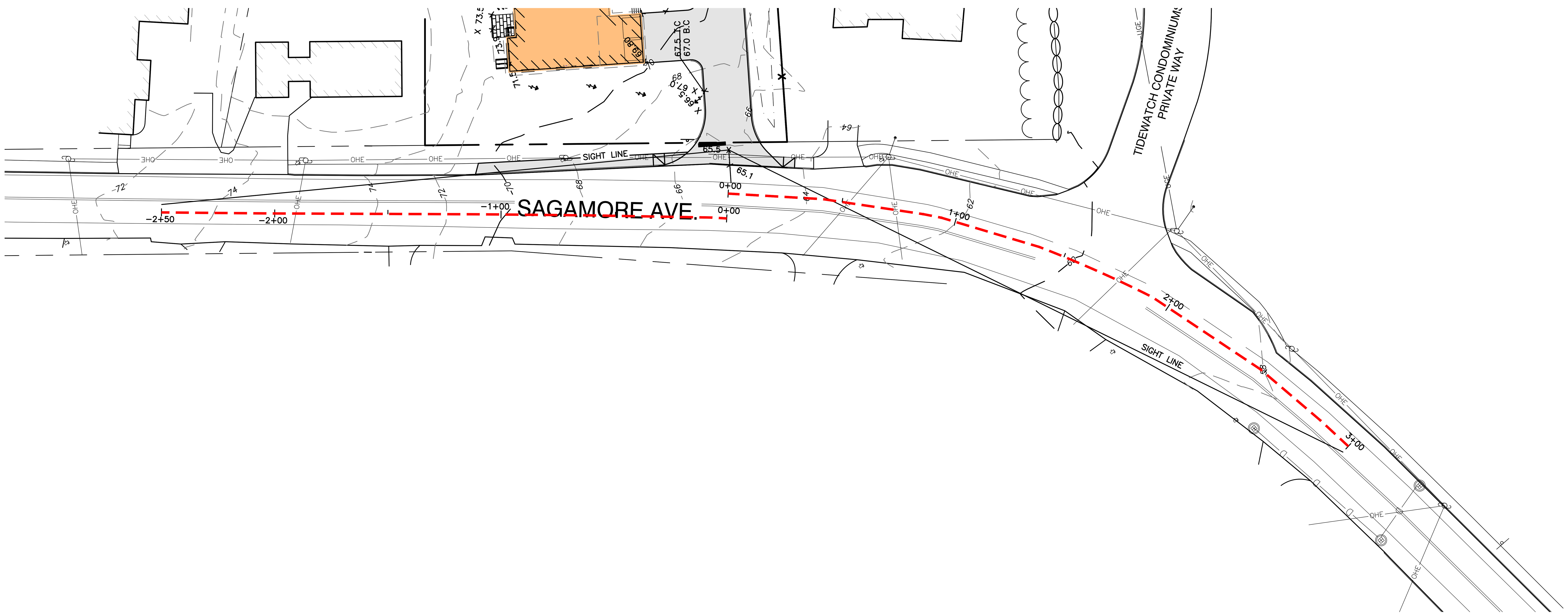
STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – PROFESSIONAL ENGINEER – LICENSED
03/18/2024

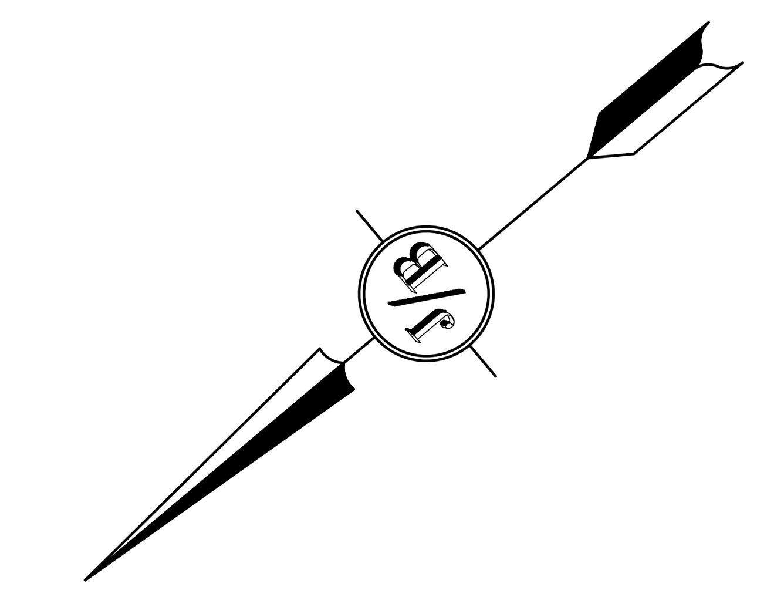
0	3/18/24	ISSUED FOR REVIEW	KDR
REV.	DATE	REVISION	BY

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SEWER PLAN AND PROFILE
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
P2
SHEET 10 OF19
JBE PROJECT NO. 18134.1





$$S = 1.47V(2.5) + \frac{V^2}{30\left[0.347826 \pm \left(\frac{G}{100}\right)\right]}$$

Where:

S = Stopping sight distance on grade (ft)
V = Design speed (mph)
G = Grade (%)

Stopping Sight Distance on Grades
Exhibit 1260-3

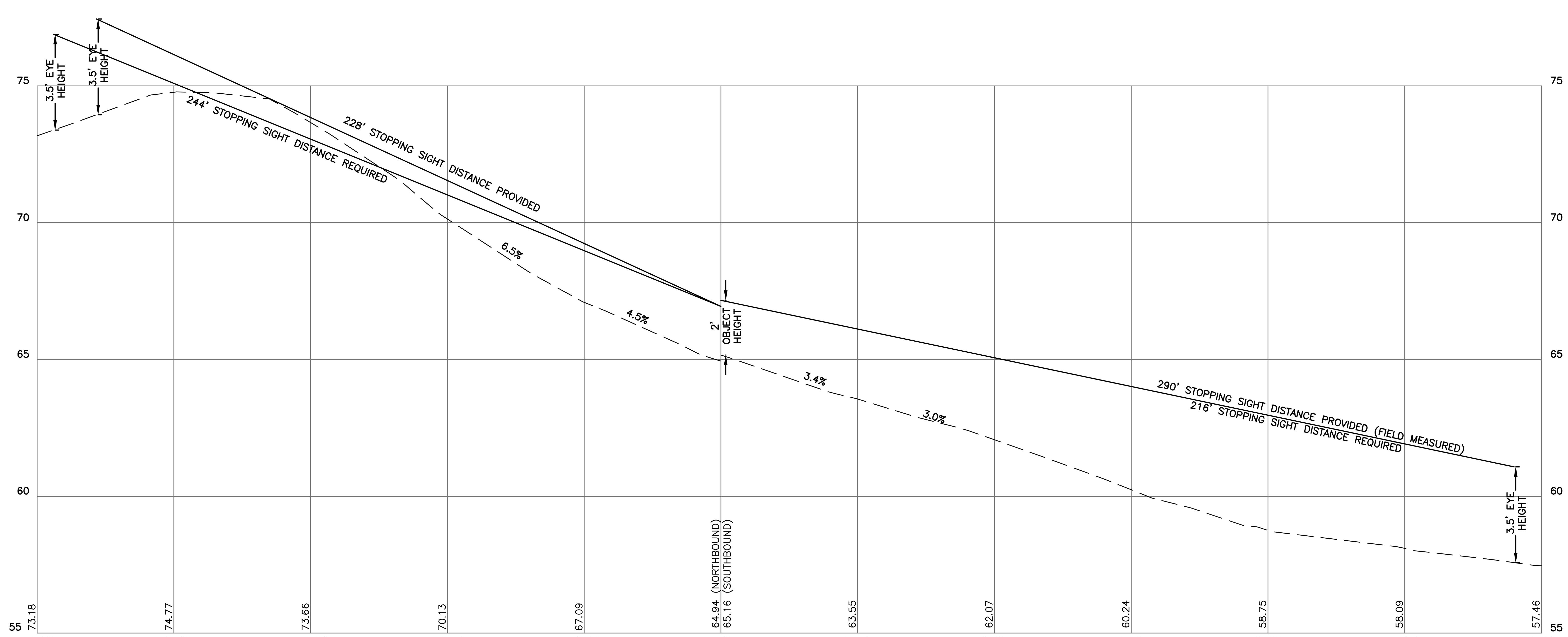
PER AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS:

NORTHBOUND APPROACH
DESIGN SPEED: 33 MPH
AVERAGE ROAD GRADE OVER FIRST 100 FEET: –5.2% (5.2' DROP OVER 100 FEET)
REQUIRED SIGHT DISTANCE:
1.47(33)(2.5)+((33)^2/(30*(0.347826–(5.2/100)))) = 244' SIGHT DISTANCE REQUIRED

SOUTHBOUND APPROACH
DESIGN SPEED: 33 MPH
AVERAGE ROAD GRADE OVER FIRST 100 FEET: 3.3% (3.3' GAIN OVER 100 FEET)
REQUIRED SIGHT DISTANCE:
1.47(33)(2.5)+((33)^2/(30*(0.347826+(3.3/100)))) = 216' SIGHT DISTANCE REQUIRED

PORTSMOUTH SITE PLAN REVIEW REGULATIONS SECTION 3.3.2.1

ACCESSWAYS AND DRIVEWAYS SHALL, WHERE PRACTICAL, HAVE AN ALL–SEASON SAFE SIGHT DISTANCE (ACCORDING TO AASHTO STANDARDS) IN BOTH DIRECTIONS ALONG THE PUBLIC STREET. WHERE ONLY A LESSER SIGHT DISTANCE IS OBTAINABLE, NO MORE THAN ONE ACCESSWAY PER SINGLE PARCEL SHALL BE ALLOWED.



STOPPING SIGHT DISTANCE PLAN & PROFILE

GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft Horiz.
1 inch = 3 ft Vert.

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

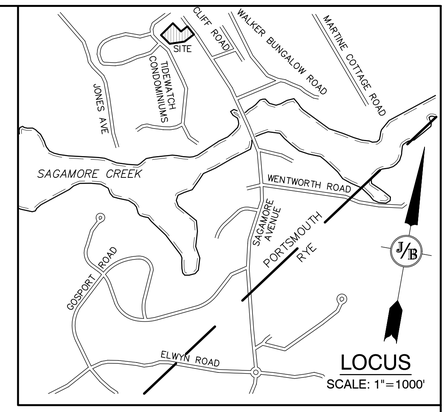
STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: HIGHWAY ACCESS PLAN
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
H1
SHEET 11 OF 19
JBE PROJECT NO. 18134.1

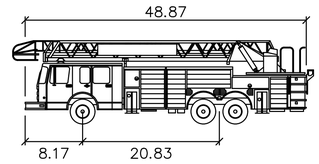


LOCUS
SCALE: 1"=1000'

SAGAMORE AVE.

TIDEWATCH CONDOMINIUMS (PRIVATE ROAD)

Portsmouth Fire Truck



Portsmouth Fire Truck

	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

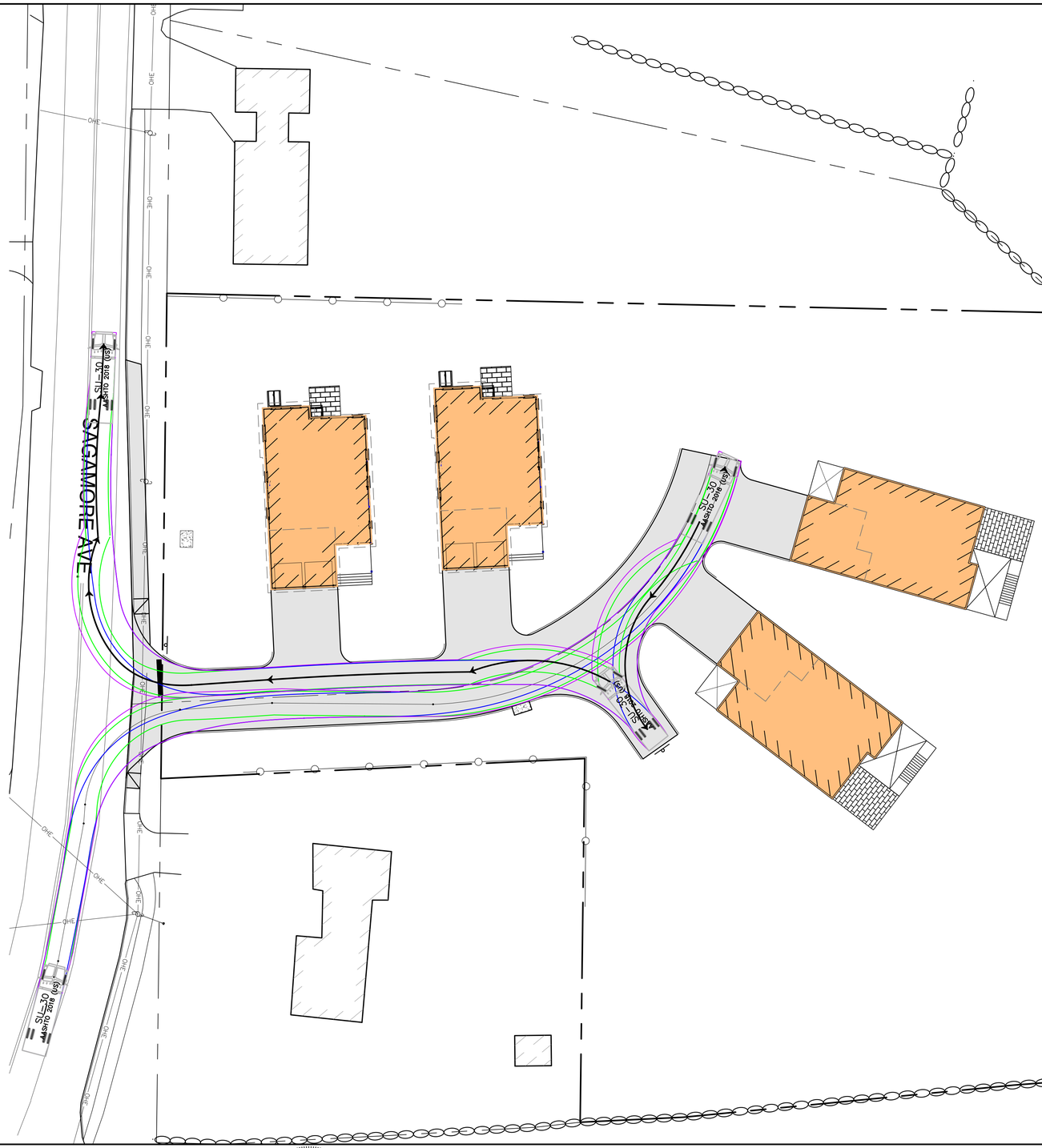
STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

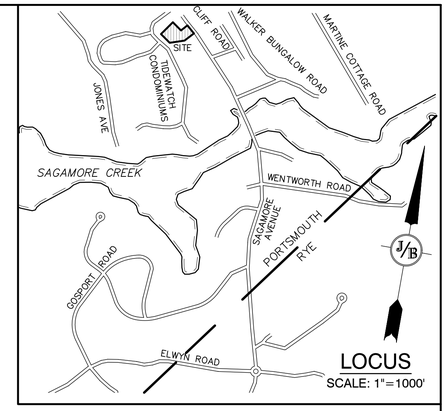
REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

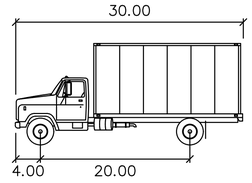
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
T1
SHEET 12 OF 19
JBE PROJECT NO. 18134.1







SU–30

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 222, LOT 19

TOTAL LOT AREA
84,795 SQ. FT.
1.95 ACRES

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

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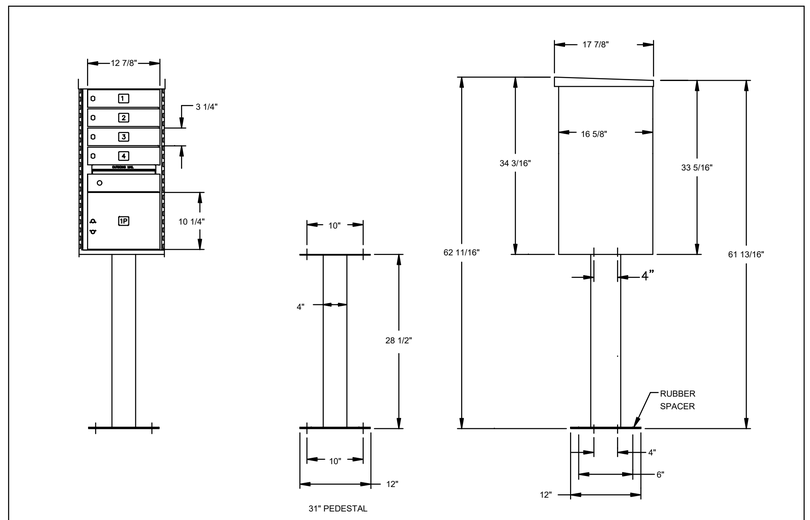
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

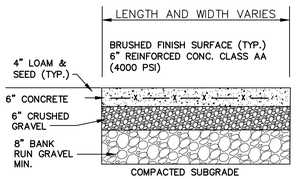
DRAWING No.
T2
SHEET 13 OF 19
JBE PROJECT NO. 18134.1



POSTAL PRODUCTS UNLIMITED, INC.™ A Division of American Postal Manufacturing, Inc. Phone: 1-800-229-4500 600 W. Oklahoma Ave. Milwaukee, WI 53207-3249	Product: Type II CBU with Pedestal – Front Loading – N1027875			
	Distribution: USPS Approved		Finish: Powder Coat	
	Mounting: Pedestal		Total Mailboxes: 12 Doors – 1 Locker	
	Date: 02/02/06	Scale: NONE	Drawn By: CDO	Checked By: AJK

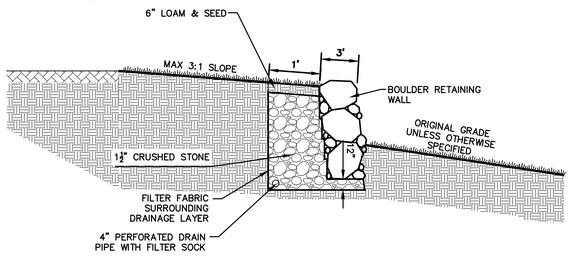
CLUSTER MAILBOX UNIT DETAIL

NOT TO SCALE



CONCRETE PAD DETAIL

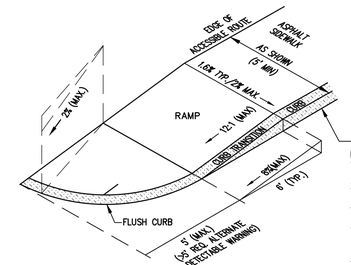
NOT TO SCALE



THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LISENCED IN THE STATE OF NEW HAMPSHIRE TO DESIGN ANY WALL THAT HAS A HEIGHT OVER 4.0'. JONES & BEACH ENGINEERS, INC. DOES NOT ACCEPT ANY LIABILITY FOR THE STRUCTURAL DESIGN AND/OR INSTALLATION OF ANY RETAINING WALL OF ANY TYPE ABOVE THIS HEIGHT. THIS DETAIL IS INTENDED TO PROVIDE AN EXAMPLE OF THE RETAINING WALL FOR PLANNING PURPOSES ONLY AND IS SPECIFICALLY NOT INTENDED FOR USE BY THE CONTRACTOR IN ANY CONSTRUCTION–RELATED ACTIVITY FOR A WALL GREATER THAN 4.0' IN HEIGHT.

BOULDER RETAINING WALL CROSS SECTION

NOT TO SCALE



NHDOT ITEM 609.01
VERTICAL GRANITE CURB

NOTES:
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) CURB RAMPS SHALL BE 8%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (i.e., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SECTION FOR RAMP CONSTRUCTION.

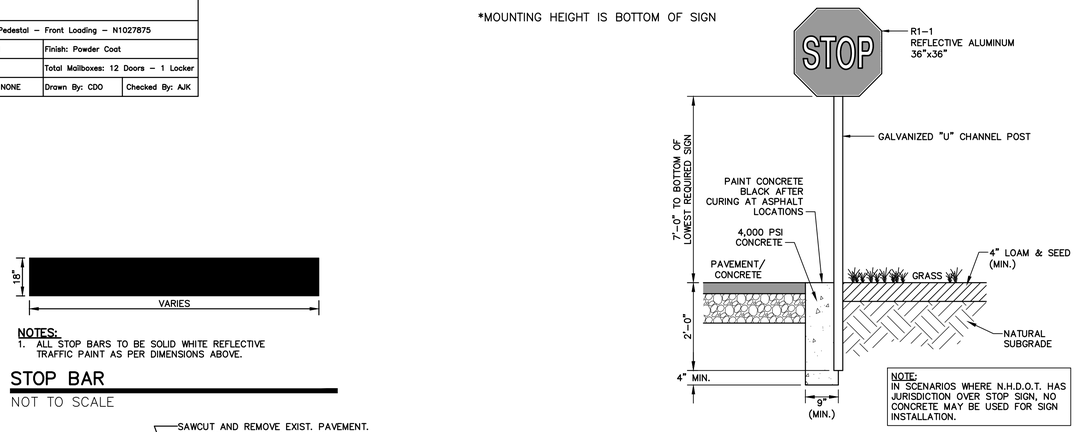
ACCESSIBLE CURB RAMP (TYPE 'B')

NOT TO SCALE

TRAFFIC CONTROL SCHEDULE

SIGN NUMBER	SIGN	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	DESCRIPTION	MOUNT TYPE	MOUNT HEIGHT	REMARKS
R1–1	STOP	30"	30"	WHITE ON RED	CHANNEL	7'–0"	REFLECTORIZED SIGN
R4–7A	KEEP RIGHT	12"	18"	RED ON WHITE	CHANNEL	7'–0"	REFLECTORIZED SIGN

*MOUNTING HEIGHT IS BOTTOM OF SIGN



NOTE:
IN SCENARIOS WHERE N.H.D.O.T. HAS JURISDICTION OVER STOP SIGN, NO CONCRETE MAY BE USED FOR SIGN INSTALLATION.

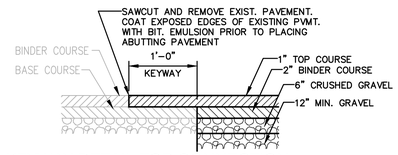
STOP SIGN (R1-1)

NOT TO SCALE

NOTES:
1. ALL STOP BARS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.

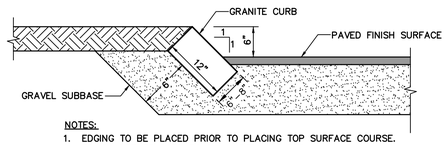
STOP BAR

NOT TO SCALE



KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

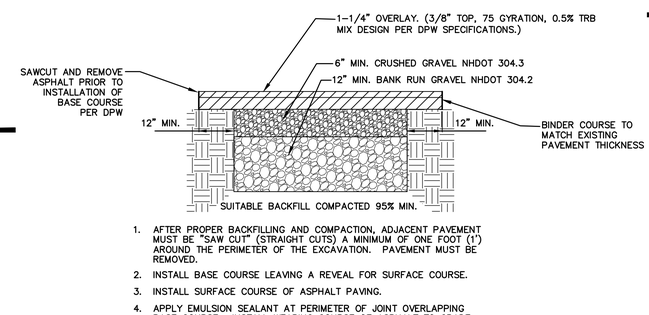
NOT TO SCALE



NOTES:
1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. SALVAGE GRANITE CURBS ON–SITE AND RESET TO THE EXTENT POSSIBLE.

SLOPED GRANITE CURB

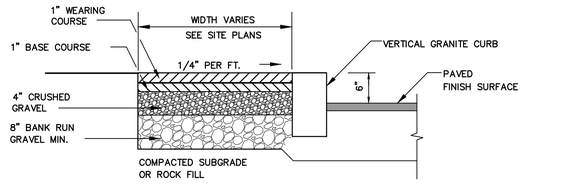
NOT TO SCALE



1. AFTER PROPER BACKFILLING AND COMPACTION, ADJACENT PAVEMENT MUST BE "SAW CUT" (STRAIGHT CUTS) A MINIMUM OF ONE FOOT (1') AROUND THE PERIMETER OF THE EXCAVATION. PAVEMENT MUST BE REMOVED.
2. INSTALL BASE COURSE LEAVING A REVEAL FOR SURFACE COURSE.
3. INSTALL SURFACE COURSE OF ASPHALT PAVING.
4. APPLY EMULSION SEALANT AT PERIMETER OF JOINT OVERLAPPING BASE COURSE. INSTALL WEARING COURSE OF ASPHALT TO GRADE. APPLY LIGHT SAND TO ABSORB EXCESS JOINT SEALANT.
5. GRAVEL COMPACTIONS TO MEET 95% MINIMUM.

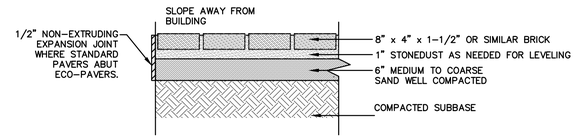
TYPICAL PAVEMENT REPAIR DETAIL

NOT TO SCALE



BIT. SIDEWALK W/ VERTICAL GRANITE CURB

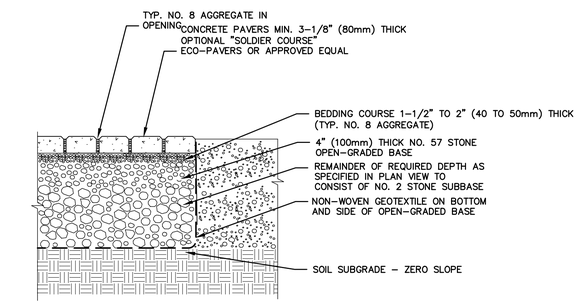
NOT TO SCALE



THIS DETAIL IS FOR CONSTRUCTION OF PAVER PATIOS ON UNITS 1–3. REFER TO PERMEABLE PAVER DETAIL FOR CONSTRUCTION OF PERMEABLE PAVER PATIO ON UNIT 4.

STANDARD BRICK PAVER

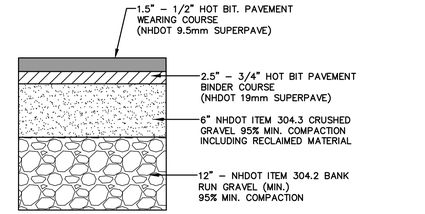
NOT TO SCALE



NOTES:
1. 2 3/8" (60 MM) THICK PAVERS MAY BE USED IN PEDESTRIAN APPLICATIONS.
2. NO. 2 STONE SUBBASE THICKNESS VARIES WITH DESIGN. CONSULT ICPI PERMEABLE INTERLOCKING CONCRETE PAVEMENT MANUAL.
3. INSTALLATION TO BE PERFORMED TO MANUFACTURER'S GUIDLINES AND THE PERMEABLE INTERLOCKING CONCRETE PAVEMENT SPECIFICATIONS.
4. THE EXISTING NATIVE SUBGRADE MATERIAL SHALL NOT BE OVER COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE PLACEMENT. IF STONE OR SUBGRADE IS OVER COMPACTED, DISTURBED, OR CONTAMINATED BY FOREIGN OR DELETERIOUS MATERIALS OR LIQUIDS, REMOVE THE STONE AND CONTAMINATION; RESTORE THE SUBGRADE AS DIRECTED BY ENGINEER AND REPLACE CONTAMINATED STONE WITH NEW STONE THAT MEETS THE SPECIFICATIONS.
5. THIS DETAIL IS FOR CONSTRUCTION OF PERMEABLE PATIO ON UNIT 4 WHERE WATER TABLE AND LEDGE ELEVATIONS ALLOW. REFER TO STANDARD PAVER DETAIL FOR CONSTRUCTION OF PATIOS ON UNITS 1–3.

PERMEABLE CONCRETE PAVER DETAIL (FULL EXFILTRATION)

NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 2/26/2024
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1
Drawing Name: 18134.1-PLAN.dwg		

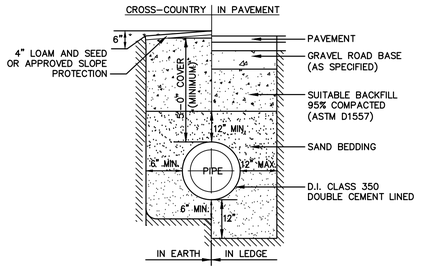
STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ No.18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

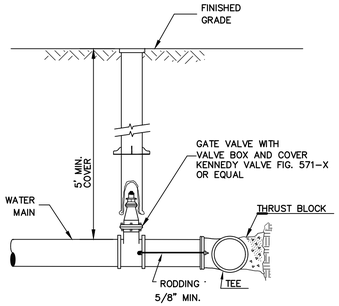
Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D1
SHEET 14 OF19
JBE PROJECT NO. 18134.1



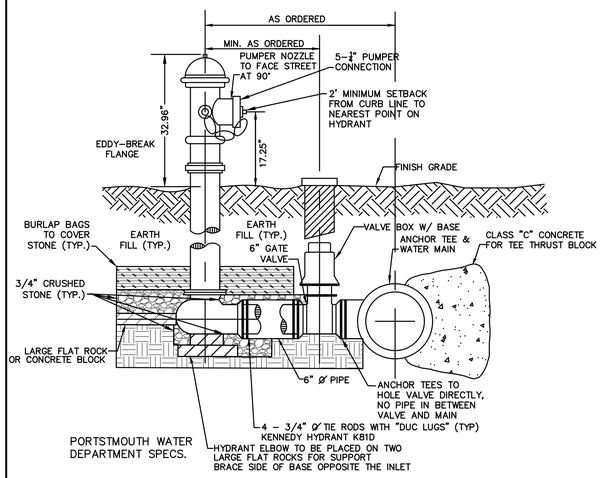
WATER SYSTEM TRENCH

NOT TO SCALE



BURIED GATE VALVE DETAIL

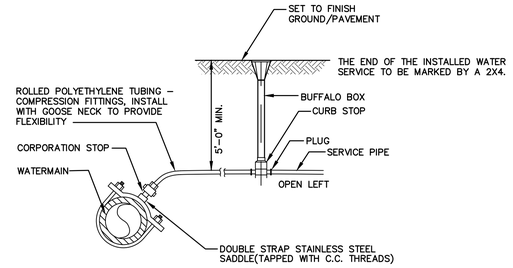
NOT TO SCALE



NOTES
1. ALL PIPE FITTINGS TO BE D.I. PRESSURE CLASS 350, THICKNESS CLASS 52.
2. HYDRANT TO BE PAINTED RED WITH WHITE "REFLECTOR" PAINT ON BONNET.
3. MECHANICAL JOINTS SHALL HAVE MEGALUG RETAINING GLANDS AS MADE BY EBBA OR APPROVED EQUAL.
4. NATIONAL STANDARD THREAD.
5. HYDRANT AND ALL VALVES SHALL OPEN RIGHT
6. ANCHOR TEES SHALL HOLD VALVE DIRECTLY WITH NO PIPE IN BETWEEN VALVE AND MAIN.

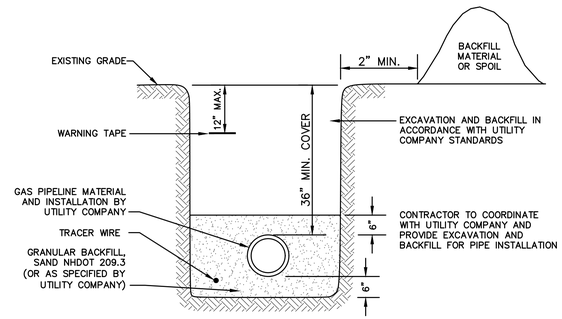
HYDRANT INSTALLATION

NOT TO SCALE



WATER SERVICE CONNECTION-POLYETHYLENE

NOT TO SCALE



GAS TRENCH

NOT TO SCALE

SUBMITTALS
SHOP DRAWINGS, INCLUDING SPECIFICATIONS, CATALOG CUTS, DATA SHEETS, DRAWINGS AND OTHER DESCRIPTIVE MATERIAL SHALL BE SUPPLIED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. A CERTIFICATE OF COMPLIANCE FROM THE MANUFACTURER INDICATING CONFORMANCE WITH THE SPECIFIED REQUIREMENTS FOR DUCTILE IRON PIPE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

DELIVERY, HANDLING, AND STORAGE
ALL PIPE AND APPURTENANCES ARE SUBJECT TO INSPECTION BY THE ENGINEER AT THE POINT OF DELIVERY. MATERIAL FOUND TO BE DEFECTIVE DUE TO MANUFACTURE OR DAMAGE IN SHIPMENT SHALL BE REJECTED OR RECORDED ON THE BILL OF LADING AND REMOVED FROM THE JOB SITE. ALL MATERIALS, IF STORED, SHALL BE KEPT SAFE FROM ANY POTENTIAL DAMAGE.

SAND BEDDING
SAND BLANKET SHALL CONSIST OF CLEAN SAND THAT IS FREE FROM ORGANIC MATTER AND GRADED SO THAT 90–100% PASSES A 1/2" SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE.

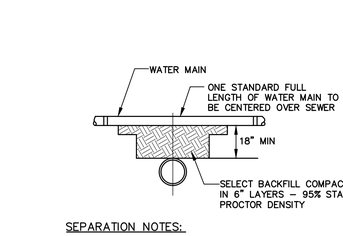
BACKFILL
SUITABLE MATERIAL FOR BACKFILL IN ROADS, ROAD SHOULDERS, AND WALKWAYS SHALL BE THE NATURAL MATERIAL REMOVED DURING THE COURSE OF TRENCH EXCAVATION, BUT SHALL EXCLUDE ANY DEBRIS, PAVEMENT, ORGANIC MATTER, LOAM, WET OR SOFT MUCK, PEAT, OR CLAY. BACKFILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO 95% OF ASTM–1557 AT OPTIMUM MOISTURE CONTENT.

DUCTILE IRON PIPE–CLASS 52
JOINTS SHALL BE OF "PUSH–ON" TYPE UNLESS OTHERWISE SPECIFIED. PIPE SHALL HAVE A DOUBLE CEMENT LINING WITH SEAL COATING INSIDE AND BITUMINOUS COATING OUTSIDE THAT MEETS OR EXCEEDS THE REQUIREMENTS OF AWWA/ANSI C104/A21.4. GASKETS FOR DUCTILE IRON PIPE SHALL BE OIL–RESISTANT RUBBER WHICH MEETS OR EXCEEDS THE REQUIREMENTS OF AWWA/ANSI C111/A21.11. PIPE SHALL BE FURNISHED COMPLETE WITH ALL GASKETS AND LUBRICANT.

WATERMAIN TESTING
ALL WATER MAINS WILL BE CLEANED AND HYDROSTATICALLY TESTED AT A MINIMUM PRESSURE OF 150psi AT THE HIGHEST POINT ALONG THE TEST SECTION. THE HYDROSTATIC TEST SHALL BE CONDUCTED FOR A MINIMUM OF TWO HOURS DURING WHICH TEST PRESSURE SHALL NOT VARY MORE THAN ±5psi. LEAKAGE CALCULATIONS WILL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICAN WATER WORKS ASSOCIATION. DISINFECTION WILL BE REQUIRED PER THE SPECIFICATIONS OF ANSI/AWWA C651. WITHIN 24 HOURS OF DISINFECTION, ALL NEWLY INSTALLED MAINS SHALL BE FLUSHED.

NOTES
1. CONTRACTOR TO INSTALL 2" RIGID INSULATION BETWEEN THE PROPOSED WATERMAIN(S) AND DRAINAGE LINES IN ALL AREAS WHERE SEPARATION IS TO BE IN 4' OR LESS.
2. ALL PIPE, FITTINGS, HYDRANTS, AND WORKMANSHIP SHALL BE INSPECTED AND APPROVED BY THE MUNICIPAL WATER/SEWER DEPARTMENT.
4. ALL CONSTRUCTION AND TESTING SHALL COMPLY WITH THE REGULATIONS OF THE MUNICIPAL, THE STATE, AND THE AMERICAN WATER WORKS ASSOCIATION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UNFORESEEN UTILITY FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION. ANY APPROPRIATE REMEDIAL ACTION MUST BE AGREED TO BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG–SAFE" AT 1–888–344–7233 AT LEAST 72 HOURS BEFORE DIGGING.
6. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 2000 PSI AFTER 28 DAYS.
7. CONTRACTOR TO INSTALL CORPORATION FITTINGS AT EACH CONNECTION TO THE WATER MAIN FOR TESTING PURPOSES. CORPORATIONS SHALL BE REMOVED AND PLUGGED AT THE COMPLETION OF TESTING.
8. CONTRACTOR TO OBSERVE ALL APPROPRIATE BEST MANAGEMENT PRACTICES.
9. ALL GATE VALVES TO BE MUELLER RESILIENT WEDGE (OPEN RIGHT).
10. ALL TEES TO BE ANCHOR TEES.
11. THE TERMINAL 36' OF ALL "DEAD END" WATERMAINS AND ALL BENDS AND TEES ARE TO BE FITTED WITH MECHANICAL RESTRAINING JOINTS, "MEGALUG" OR APPROVED EQUAL AND THRUST BLOCKS.
12. INSTALL THRUST BLOCKS AT ALL TEES, BENDS, AND FITTINGS.

WATER LINE TECHNICAL SPECIFICATIONS

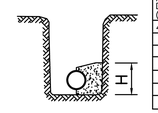


SEPARATION NOTES:

1. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN PIPES. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

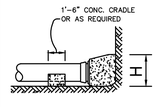
TYPICAL WATER / SEWER SEPARATION

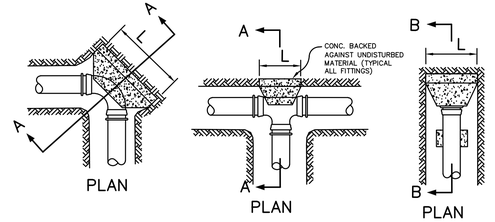
NOT TO SCALE



CONCRETE THRUST BLOCK DIMENSIONS								
PIPE DIA. (IN.)	TEE		90° BEND OR STUB		45° BEND		22.5° BEND	
	H	L	H	L	H	L	H	L
4"/6"	1'–6"	1'–6"	1'–6"	2'–0"	1'–6"	1'–6"	1'–6"	1'–6"
8"	2'–0"	2'–0"	2'–0"	3'–0"	1'–6"	2'–0"	1'–6"	1'–6"
10"	2'–0"	3'–0"	2'–6"	3'–6"	2'–0"	2'–6"	1'–6"	2'–0"
12"	2'–6"	3'–6"	3'–0"	4'–0"	2'–0"	3'–6"	1'–6"	2'–6"
15"	3'–0"	4'–6"	3'–6"	5'–6"	3'–0"	3'–6"	2'–0"	2'–6"
18"	4'–0"	5'–0"	4'–6"	6'–0"	3'–6"	4'–0"	2'–6"	3'–0"
24"	5'–0"	7'–0"	6'–0"	8'–0"	4'–0"	6'–0"	3'–0"	4'–6"

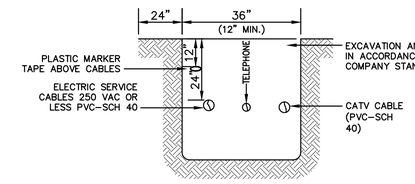
PIPING W/ MECHANICAL JOINT FITTINGS SHALL HAVE RETAINING GLANDS





THRUST BLOCK DETAILS

NOT TO SCALE



NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

UTILITY TRENCH

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 2/26/2024	
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1	
Drawing Name: 18134.1-PLAN.dwg			

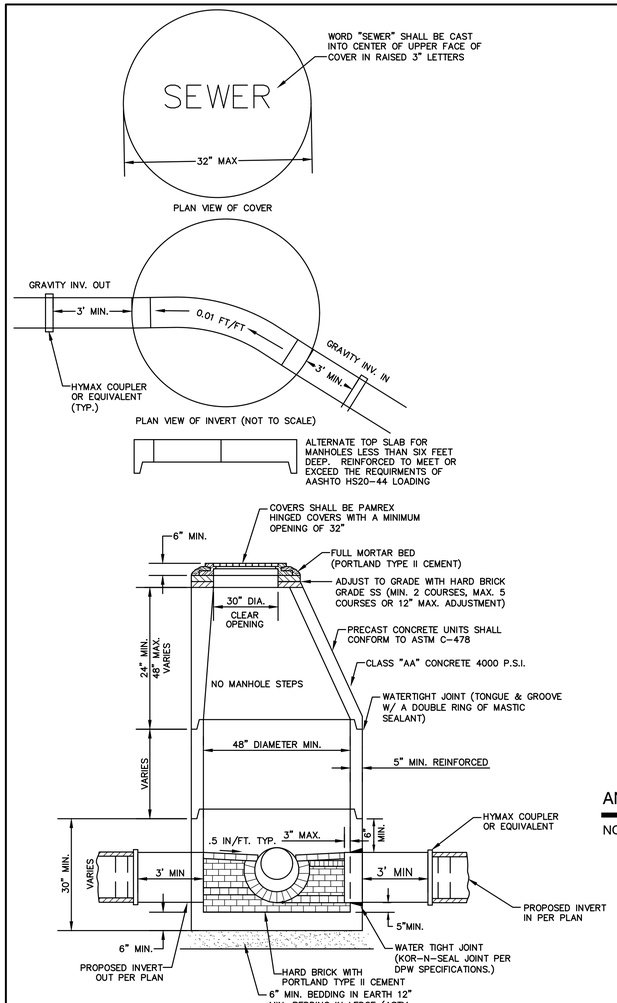
STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 – LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219
Stratham, NH 03885
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D2
SHEET 15 OF19
JBE PROJECT NO. 18134.1

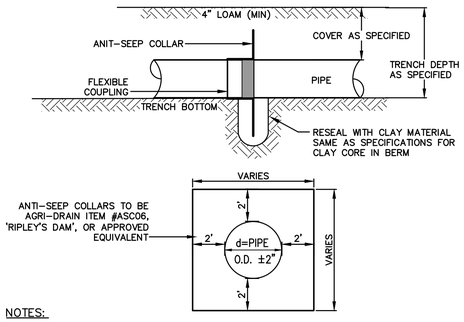


NOTES:

1. PER NHDES ENV-WQ 704.13(C), THE MORTAR SPECIFICATION SHALL BE AS FOLLOWS:
   1. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
   2. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
      A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      B. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
   3. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
   4. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 'STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES';
   5. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 'STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES';
2. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
3. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
4. SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48 WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (a).
5. ALL ASBESTOS CONTAINING WASTE MATERIALS MUST BE PROPERLY IDENTIFIED, PACKAGED AND DELIVERED TO A LANDFILL LICENCED BY THE NHDES SOLID WASTE MANAGEMENT PROGRAM FOR DISPOSAL. CALL (603) 271-2925 FOR MORE INFORMATION.
6. PORTSMOUTH STANDARD SEWER MANHOLE SHALL BE USED.
7. CONTRACTOR TO PURCHASE SEWER MANHOLE COVERS FROM THE CITY OF PORTSMOUTH DIRECTLY.
8. MANHOLE BASE SECTIONS SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE THE HIGHEST INCOMING SEWER PIPE PER ENV-WQ 704.12 (e).
9. MANHOLE CASTINGS SHALL CONFORM TO ASTM A48 PER ENV-WQ 704.13 (a) (8).

PORTSMOUTH SEWER MANHOLE

NOT TO SCALE

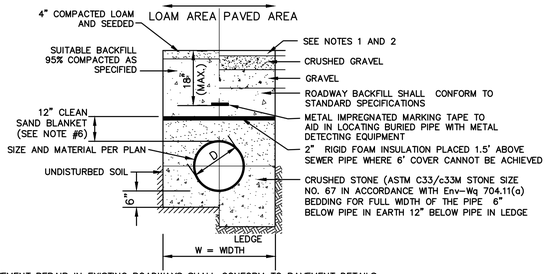


NOTES:

1. CONTRACTOR SHALL INSTALL COLLAR(S) PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR SHALL ENSURE A WATERTIGHT SEAL BETWEEN THE COLLAR(S) AND PIPE(S).
3. ANTI-SEEP COLLARS SHALL BE PLACED ±15' AND ±25' DOWNSTREAM OF THE CULVERT INLETS, UNLESS OTHERWISE SPECIFIED. WHEN A CLAY CORE IS SPECIFIED, A COLLAR SHALL BE INSTALLED ON BOTH SIDES OF THE CORE.

ANTI-SEEP COLLAR

NOT TO SCALE

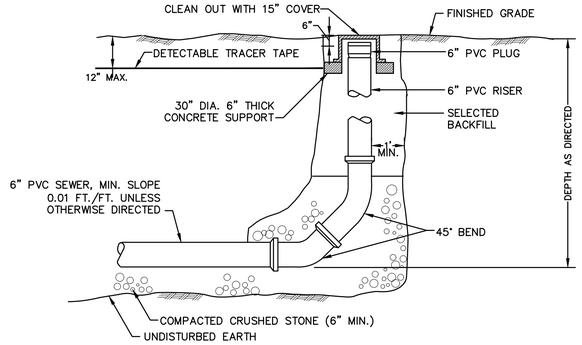


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO PAVEMENT DETAILS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. TRENCH BACKFILL SHALL CONFORM WITH ENV. Wq 704.11(h) AND BE FREE OF DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE OR ROCKS OVER SIX INCHES.
4. W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, WIDTH SHALL BE NO MORE THAN 36"; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, WIDTH SHALL BE 24 INCHES PLUS PIPE O.D. WIDTH SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
5. RIGID FOAM INSULATION TO BE PROVIDED WHERE COVER IN THE ROADWAY IS LESS THAN 6' AND CROSS COUNTRY IS LESS THAN 4', PURSUANT TO DES WAIVER BEING ISSUED.
6. PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES A 1/2 " SIEVE AND A MAXIMUM OF 15% PASSES A #200 SIEVE IN ACCORDANCE WITH Env-Wq 704.11(b).
7. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL AND CERTIFIED BY THE MANUFACTURER AS CONFORMING TO THE ASTM D3212 STANDARD IN EFFECT WHEN THE JOINT SEALS WERE MANUFACTURED, AND SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE PER Env-Wq 704.05 (e).
8. PVC PIPE SHALL CONFORM WITH ASTM D3034 AND ASTM D2412.

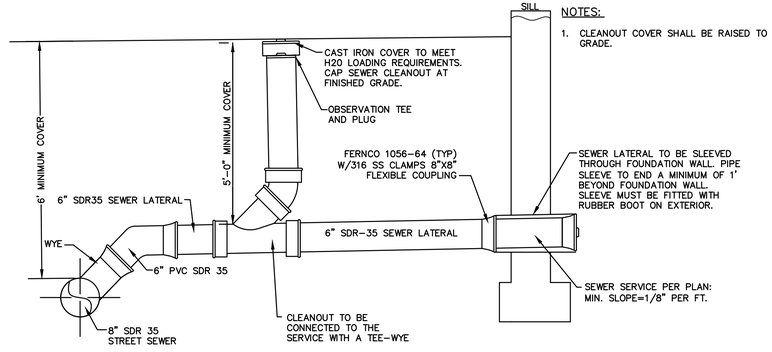
GRAVITY SEWER TRENCH

NOT TO SCALE



SEWER CLEAN OUT

NOT TO SCALE

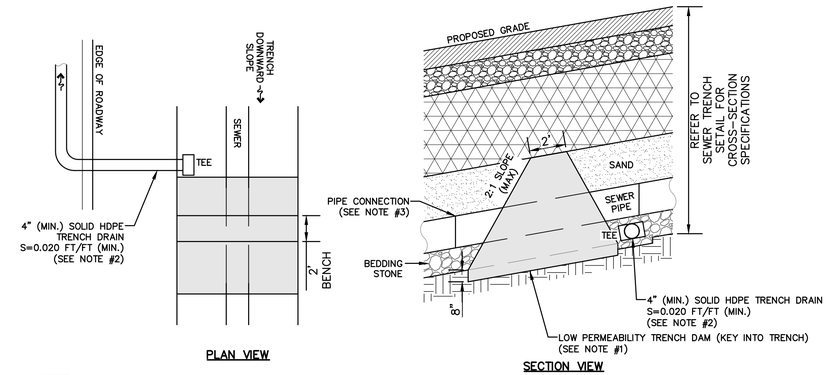


NOTES:

1. CLEANOUT COVER SHALL BE RAISED TO GRADE.

HOUSE SEWER SERVICE

NOT TO SCALE



NOTES:

1. LOW PERMEABILITY SOIL USED FOR TRENCH DAM SHALL MEET THE FOLLOWING SPECIFICATION: CLAYEY SOIL – MIN. 15% PASSING THE #200 SEIVE AND A MIN. PERMEABILITY OF $1x10^{-5}$ CM/SEC
2. DRAINS SHALL DAYLIGHT TO NEAREST AT-GRADE POINT, TIE INTO A DRAINAGE STRUCTURE, OR INTO A NETWORK OR TRENCH DRAINS.
3. CONTRACTOR SHALL NOT LOCATE A PIPE CONNECTION WITHIN THE LIMITS OF THE TRENCH DAM. A 2' SEPARATION BETWEEN LIMIT OF TRENCH DAM AND CONNECTION IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL DAMS & DRAINS AT A MAXIMUM. 75' SPACING. REFER TO PROJECT PLANS.

SEWER TRENCH DAM & DRAIN

NOT TO SCALE

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No.18152
LICENSED PROFESSIONAL ENGINEER
03/18/2024

0	3/18/24	ISSUED FOR REVIEW	KDR
REV.	DATE	REVISION	BY

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D3
SHEET 16 OF19
JBE PROJECT NO. 18134.1

BIORETENTION SYSTEM ELEVATIONS		
ELEVATION	SYSTEM #1	SYSTEM #2
A	57.00	70.00
B	54.00	68.50
C	52.50	67.00
D	52.25	66.75
E	51.00	65.75
BOTTOM SURFACE AREA (S.F.)	924	153

SAND SPECIFICATION

SIEVE SIZE	% BY WEIGHT
3"	100
#4	95–100
#8	80–100
#16	50–85
#30	25–60
#60	10–30
#100	2–10
#200	0–5

TOPSOIL SPECIFICATION

LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.

MULCH SPECIFICATION

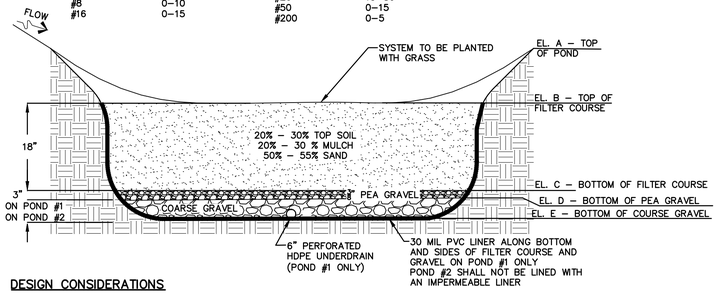
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

PEA GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	100
¾"	85–100
#4	10–30
#8	0–10
#16	0–15

COARSE GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	90–100
2"	75–100
#4	50–100
#20	15–80
#50	0–15
#200	0–5



DESIGN CONSIDERATIONS

1. DO NOT PLACE BIORETENTION SYSTEMS INTO SERVICE UNTIL THE BMP HAS BEEN SEEDED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN–OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
4. REMOVE LEDGE TO AT LEAST 6" BELOW BOTTOM OF COARSE GRAVEL LAYER IF ENCOUNTERED.
5. IN ADDITION TO DESIGN CRITERIA LISTED HERE, REFER TO GUIDELINES LISTED IN UNIVERSITY OF NEW HAMPSHIRE (UNH) STORMWATER CENTER BIORETENTION SOIL SPECIFICATION.
7. UPSTREAM DEEP SUMP CATCH BASINS PROVIDE PRE–TREATMENT IN LIEU OF A SEDIMENT FOREBAY.
8. 30 MIL PVC LINER AND UNDERDRAIN ARE ONLY APPLICABLE TO POND #1. POND #2 SHALL NOT BE LINED OR UNDERDRAINED.

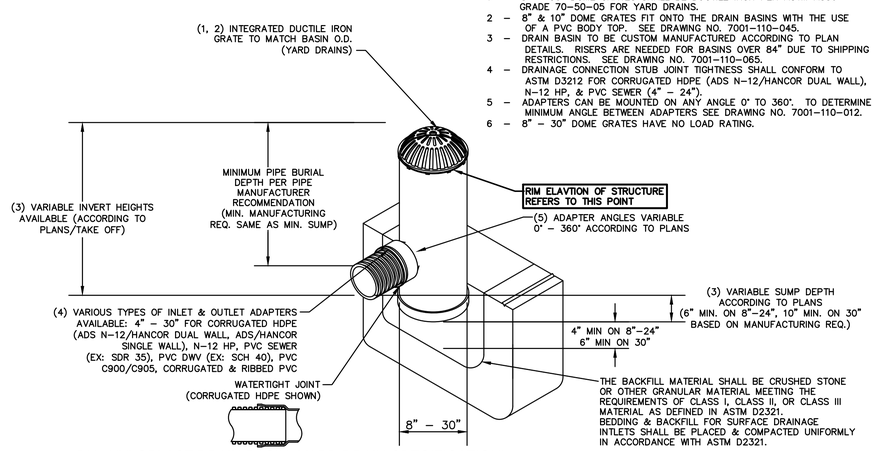
MAINTENANCE REQUIREMENTS:

1. SYSTEMS SHALL BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
2. PRETREATMENT MEASURES SHALL BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
3. TRASH AND DEBRIS SHALL BE REMOVED AT EACH INSPECTION.
4. AT LEAST ONCE ANNUALLY, SYSTEM SHALL BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72 HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHALL ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
5. VEGETATION SHALL BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.
6. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

BIORETENTION SYSTEM WITH UNDERDRAIN

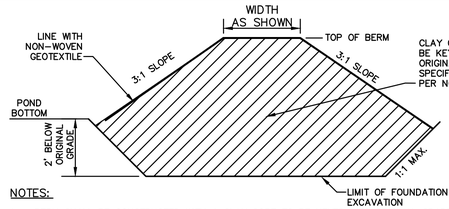
NOT TO SCALE

NOTES:
1 – 8" – 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70–50–05 FOR YARD DRAINS.
2 – 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001–110–045.
3 – DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001–110–065.
4 – DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N–12/HANCOR DUAL WALL), N–12 HP, & PVC SEWER (4" – 24").
5 – ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001–110–012.
6 – 8" – 30" DOME GRATES HAVE NO LOAD RATING.



24" DIA. NYLOPLAST DRAIN BASIN (YARD DRAIN SPECIFICATION)

NOT TO SCALE

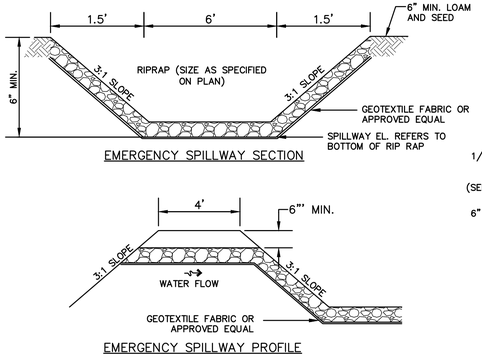


NOTES:

1. BERM SHALL BE CONSTRUCTED WITH A CLAY CORE TO BE KEYED INTO ORIGINAL GRADE, AS WELL AS A FINE GEOTEXTILE, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THE EARTHEN DIVIDER
2. THE ENTIRE EMBANKMENT AREA OF THE BIORETENTION AREA SHALL BE EXCAVATED A MINIMUM 2' BELOW THE ORIGINAL GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 92% OF ASTM D–1557, AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHALL BE PLACED FOR ANY REASON.
3. CLAY CORE MATERIAL SHALL BE CLEAN SILTY–CLAY BORROW FREE OF ROOTS, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES, AND SHALL CONTAIN NO ROCKS OR LUMPS OVER THREE INCHES (3") IN DIAMETER. THIS MATERIAL SHALL BE INSTALLED IN 6" LIFTS COMPACTED TO 92% OF ASTM D–1557, AND SHALL MEET THE FOLLOWING SPECIFICATIONS: 6" PASSING 100%, #4 SIEVE 95–100%, #40 SIEVE 60–90%, #100 SIEVE 40–60%, #200 SIEVE 25–45% (OF THE FRACTION PASSING THE #4 SIEVE). THE CLAY COMPONENT SHALL HAVE A PLASTICITY INDEX OF AT LEAST 8 AND A HYDRAULIC CONDUCTIVITY OF 10 TO THE –6 CM/SEC.
4. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

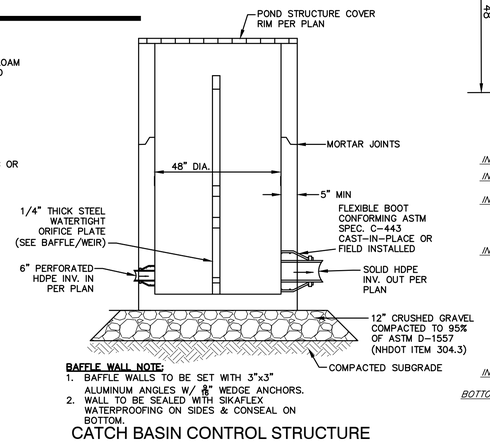
CLAY CORE BERM

NOT TO SCALE



EMERGENCY SPILLWAY

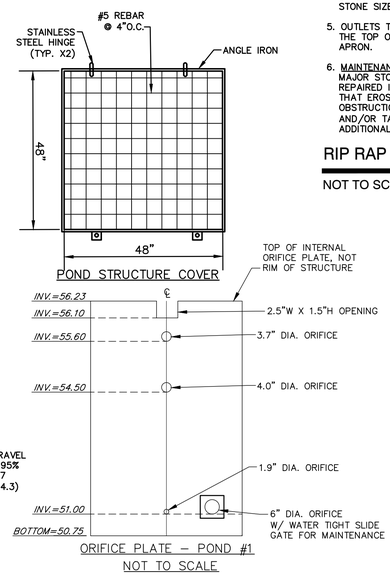
NOT TO SCALE



BAFFLE WALL NOTE:
1. BAFFLE WALLS TO BE SET WITH 3"x3" ALUMINUM ANGLES W/ ⅜" WEDGE ANCHORS.
2. WALL TO BE SEALED WITH SIKAFLEX WATERPROOFING ON SIDES & CONSEAL ON BOTTOM.

CATCH BASIN CONTROL STRUCTURE

NOT TO SCALE



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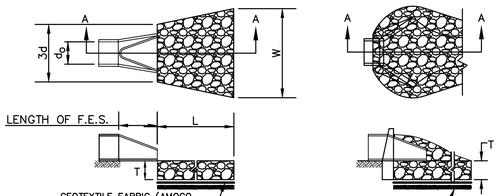


SECTION A–A
PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

SECTION A–A
PIPE OUTLET TO WELL–DEFINED CHANNEL

TABLE 7–24––RECOMMENDED RIP RAP GRADATION RANGES		
THICKNESS OF RIP RAP = 1.5 FEET		
d50 SIZE= 0.25 FEET	3 INCHES	
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO
100%	5	6
85%	4	5
50%	3	5
15%	1	2

NOTES:

1. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. OUTLETS TO A DEFINED CHANNEL SHALL HAVE 2:1 OR FLATTER SIDE SLOPES AND SHOULD BEGIN AT THE TOP OF THE CULVERT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.
6. MAINTENANCE: THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 2/26/2024	
Checked: JAC	Scale: AS NOTED	Project No.: 18134.1	
Drawing Name: 18134.1-PLAN.dwg			

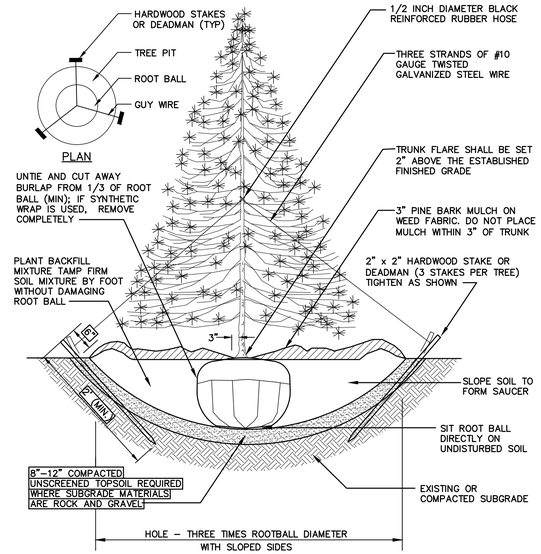
STATE OF NEW HAMPSHIRE – DANIEL JAMES MEDITZ No.18152 LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	LUSTER CLUSTER 635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record:	635 SAGAMORE DEVELOPMENT LLC 3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D4
SHEET 17 OF19
JBE PROJECT NO. 18134.1



EVERGREEN PLANTING

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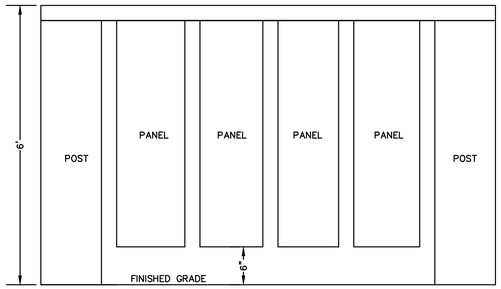
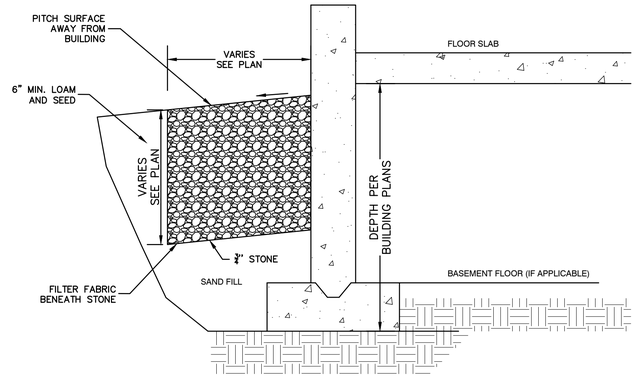


1. THE INTENT OF THIS DETAIL IS TO SHOW THE REQUIRED CLEARANCE FROM FINISHED GRADE TO THE BOTTOM OF THE WOODEN PANELS ON THE PROPOSED FENCE. THIS DETAIL SHALL NOT CONSTRUE A REQUIREMENT WITH REGARDS TO POST OR PANEL PLACEMENT ALONG THE LENGTH OF THE FENCE.

6' HIGH WOODEN STOCKADE FENCE DETAIL

NOT TO SCALE



STONE DRIP EDGE DETAIL

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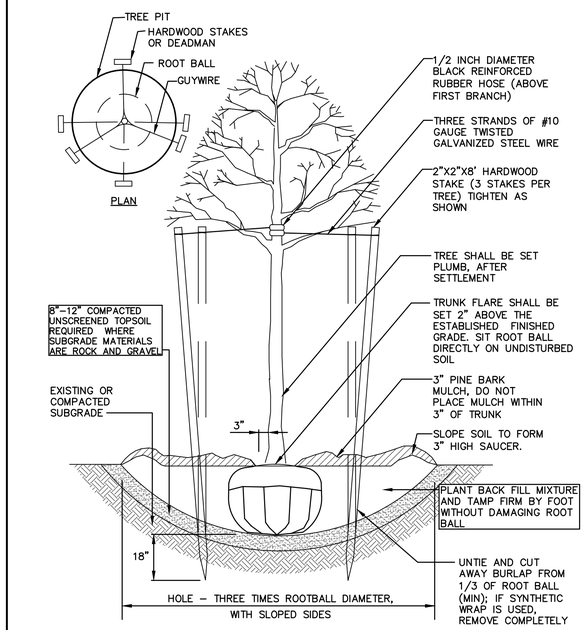
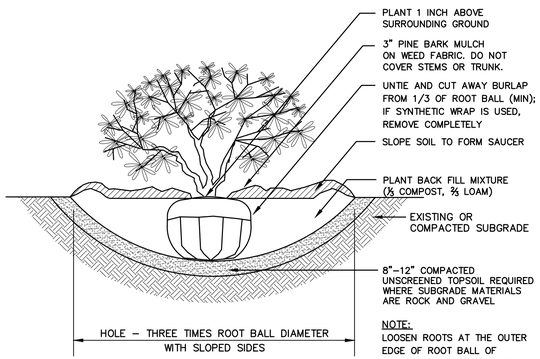


TREE PLANTING (FOR TREES UNDER 4" CALIPER)

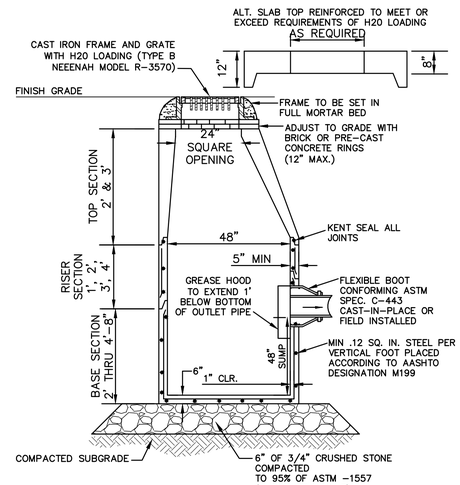
NOT TO SCALE



NOTE:
LOOSEN ROOTS AT THE OUTER EDGE OF ROOT BALL OF CONTAINER GROWN SHRUBS.

SHRUB PLANTING

NOT TO SCALE

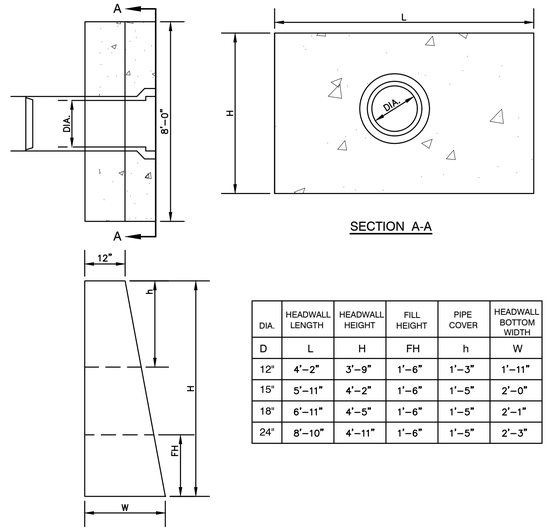


NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
4. FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H20 LOADING
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. STANDARD CATCH BASIN FRAME AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM, BUT NO MORE THAN 12"), OR PRECAST CONCRETE 'DONUTS'.
8. CATCH BASINS SHALL HAVE A 48" SUMP AS SHOWN.

CATCH BASIN

NOT TO SCALE



DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
12"	4'–2"	3'–9"	1'–6"	1'–3"	1'–11"
15"	5'–11"	4'–2"	1'–6"	1'–5"	2'–0"
18"	6'–11"	4'–5"	1'–6"	1'–5"	2'–1"
24"	8'–10"	4'–11"	1'–6"	1'–5"	2'–3"

LONGITUDINAL SECTION

NOTES:

1. ALL DIMENSIONS GIVEN IN FEET & INCHES.
2. PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
3. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS. CEMENT TO BE TYPE III PER ASTM C–150. REINFORCING TO MEET OR EXCEED ASTM A–615 GRADE 60 DEFORMED BARS.
4. 1" THREADED INSERTS PROVED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

NOT TO SCALE

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	

Date: 2/26/2024
Project No.: 18134.1

STATE OF NEW HAMPSHIRE — DANIEL JAMES MEDITZ No.18152 — LICENSED PROFESSIONAL ENGINEER
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

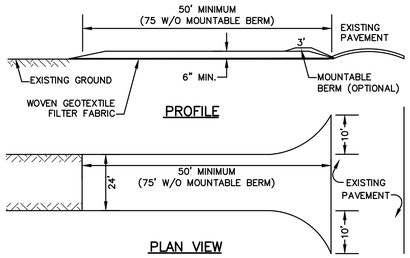
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: DETAIL SHEET
F:\DRAWINGS\PRECAST-HEADWALL-18".dwg
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
D5
SHEET 18 OF19
JBE PROJECT NO. 18134.1

TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.5" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER OCTOBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
    b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    c. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
    d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.



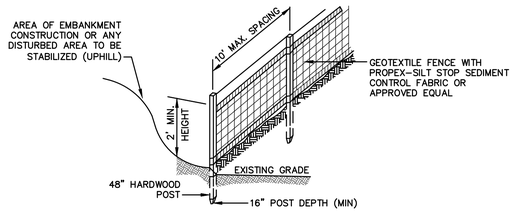
PLAN VIEW

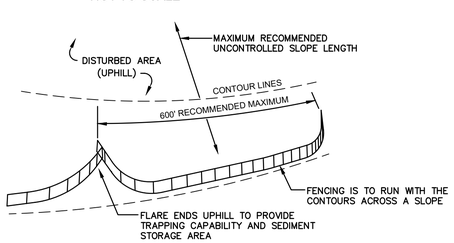
NOTES:

1. STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, 75' WITHOUT A MOUNTABLE BERM, AND EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS, OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A STONE BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE





CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCE SHALL REMAIN IN PLACE FOR 24 MONTHS.
7. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED, OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE

NOT TO SCALE

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
   B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
      AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
      NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
      PHOSPHATE(P2O5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      POTASH(K2O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

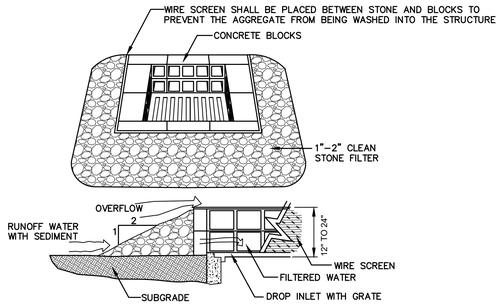
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
* C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES



MAINTENANCE NOTE:

1. ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED IN A SUITABLE UPLAND AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

TEMPORARY CATCH BASIN INLET PROTECTION
(Block and Gravel Drop Inlet Sediment Filter)

NOT TO SCALE

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
3. INSTALL SILT FENCING, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
4. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
5. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
6. STRIP LOAM AND PAVEMENT PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
7. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
8. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
9. INSTALL INLET PROTECTION AT ALL CATCH BASINS AS THEY ARE CONSTRUCTED IN ACCORDANCE WITH DETAILS.
10. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
11. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS AND/OR PROPERTY.
12. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
13. PAVE ROADWAY AND DRIVEWAYS WITH INITIAL 'BASE COURSE'.
14. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
15. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
16. FINISH PAVING ROADWAY AND DRIVEWAYS WITH 'FINISH' COURSE.
17. ROADWAY AND DRIVEWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
18. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
19. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
20. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
21. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
22. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
23. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY QUARTER-INCH OF RAINFALL.
24. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

Design: DJM	Draft: KDR
Checked: JAC	Scale: AS NOTED
Drawing Name: 18134.1-PLAN.dwg	Date: 2/26/2024
	Project No.: 18134.1

STATE OF NEW HAMPSHIRE - DANIEL JAMES MEDITZ No. 18152 - PROFESSIONAL ENGINEER - LICENSED
03/18/2024

REV.	DATE	REVISION	BY
0	3/18/24	ISSUED FOR REVIEW	KDR

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS
Project: LUSTER CLUSTER
635 SAGAMORE AVE., PORTSMOUTH, NH
Owner of Record: 635 SAGAMORE DEVELOPMENT LLC
3612 LAFAYETTE RD., DEPT 4, PORTSMOUTH, NH 03801 BK 6332 PG 1158

DRAWING No.
E1
SHEET 19 OF19
JBE PROJECT NO. 18134.1

Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.ArtformHomePlans.com to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Artform.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Artform
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

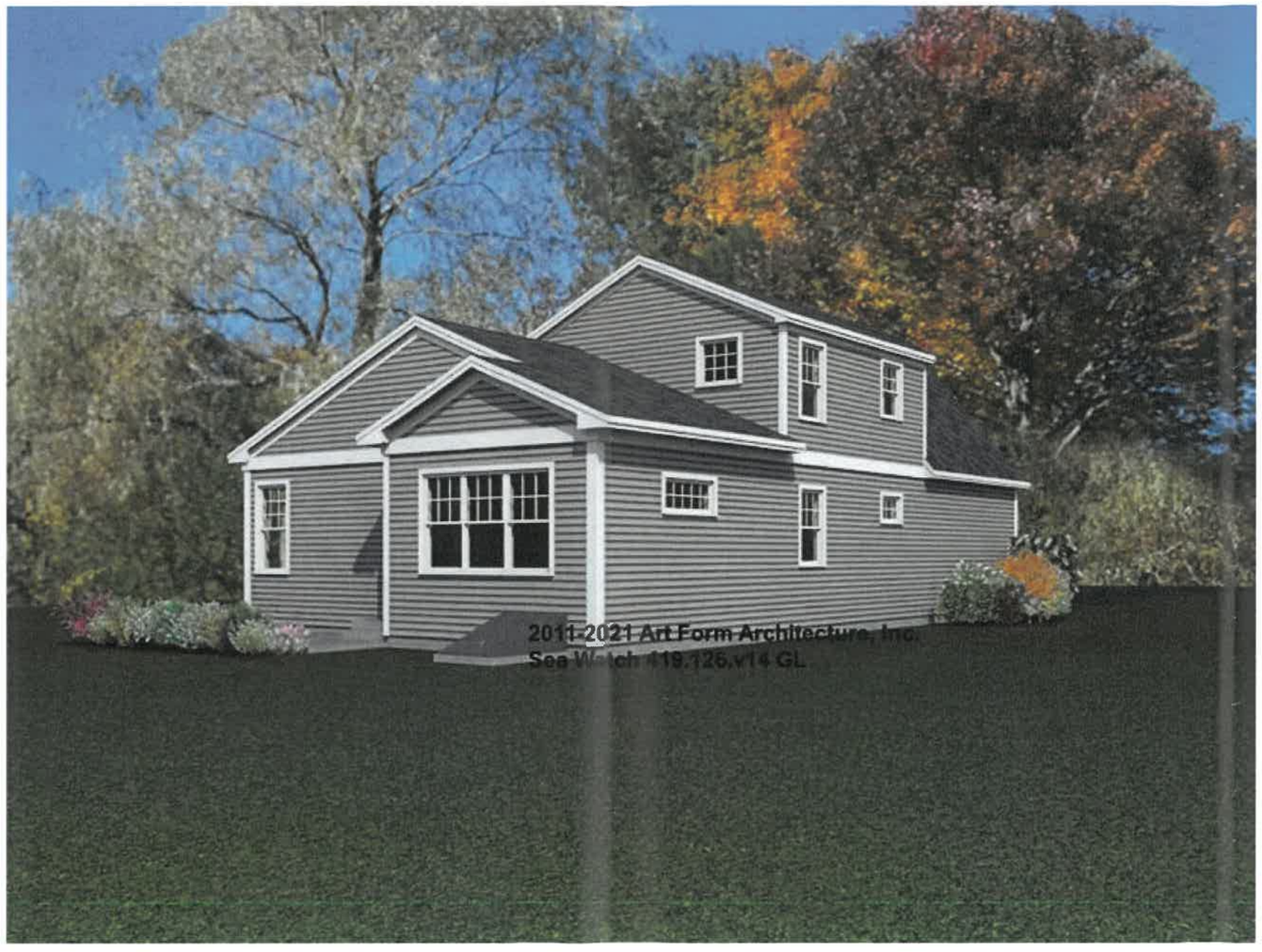
Units 1&2

EXHIBIT B

Sea Watch

419.126.v14 GL (1/27/2022)

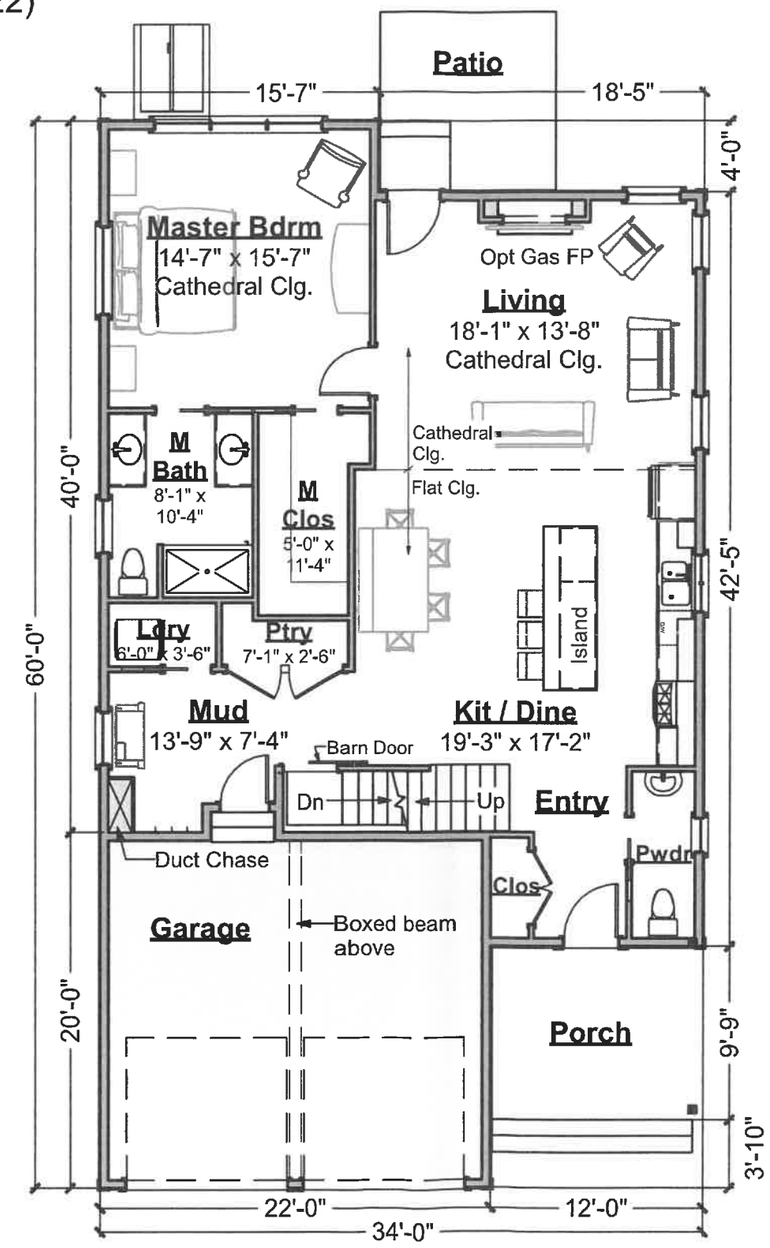
Artform Home Plans
603-431-9559



Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559



Living Area This Floor: 1370 sq ft

9 ft Ceilings, unless noted otherwise

First Floor Plan

Scale: 3/32" = 1'-0"

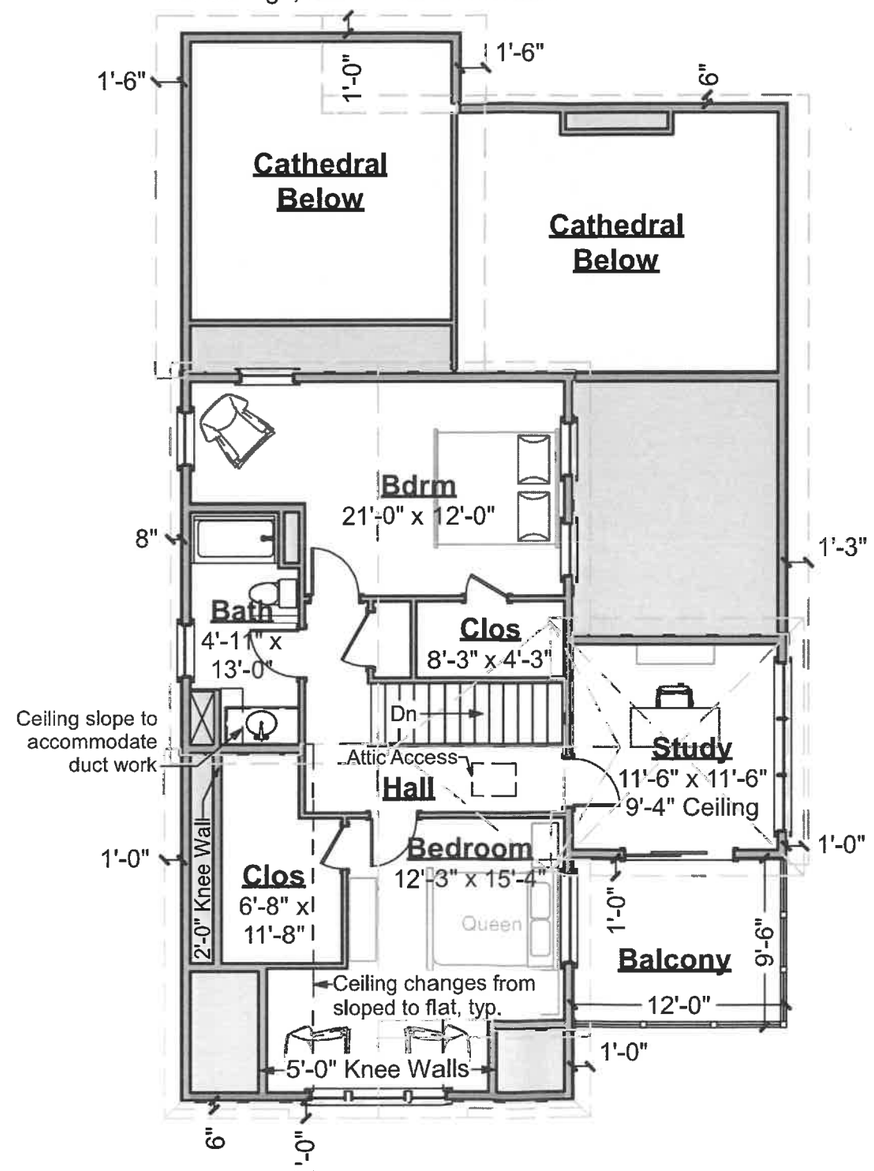
Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559

Living Area This Floor: 979 sq ft

8 ft Ceilings, unless noted otherwise



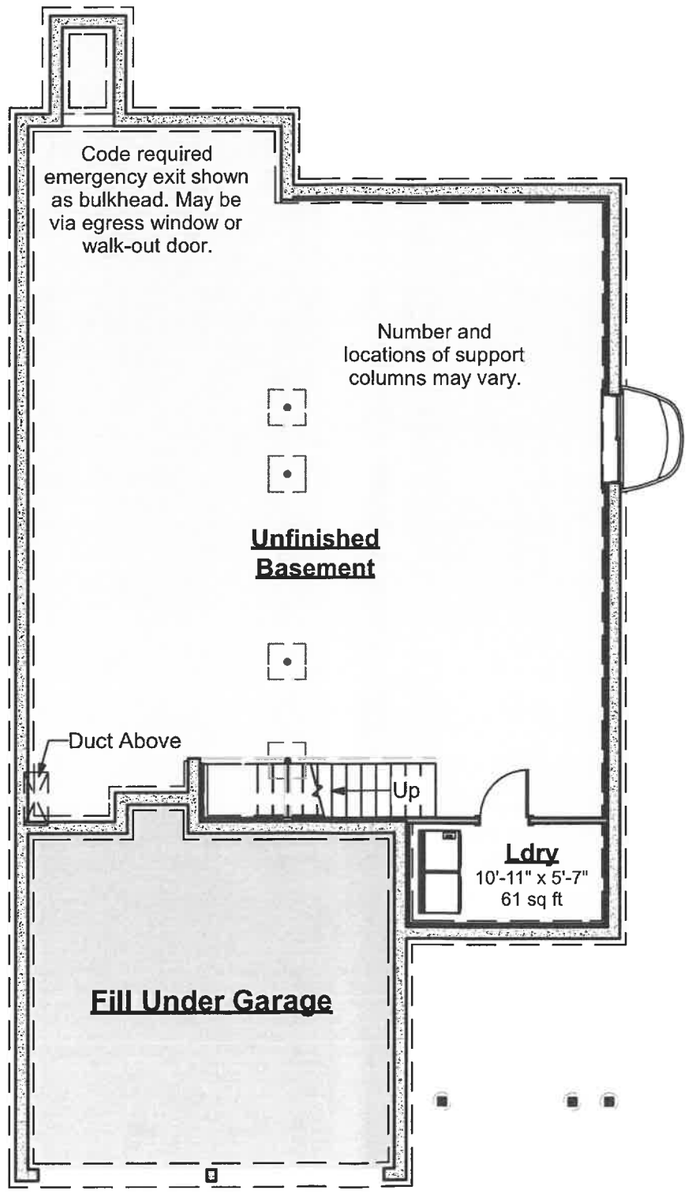
Second Floor Plan

Scale: 3/32" = 1'-0"

Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559



Foundation Plan

Scale: 3/32" = 1'-0"

Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559

Front Elevation

Scale: 1/8" = 1'-0"

Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559

Right Elevation

Scale: 1/8" = 1'-0"

Sea Watch

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603-431-9559

Rear Elevation

Scale: 1/8" = 1'-0"

Sea Watch

419.126.v14 GL (1/27/2022)

Artform Home Plans
603-431-9559

Left Elevation

Scale: 1/8" = 1'-0"

Sea Watch

419.126.v14 GL (1/27/2022)

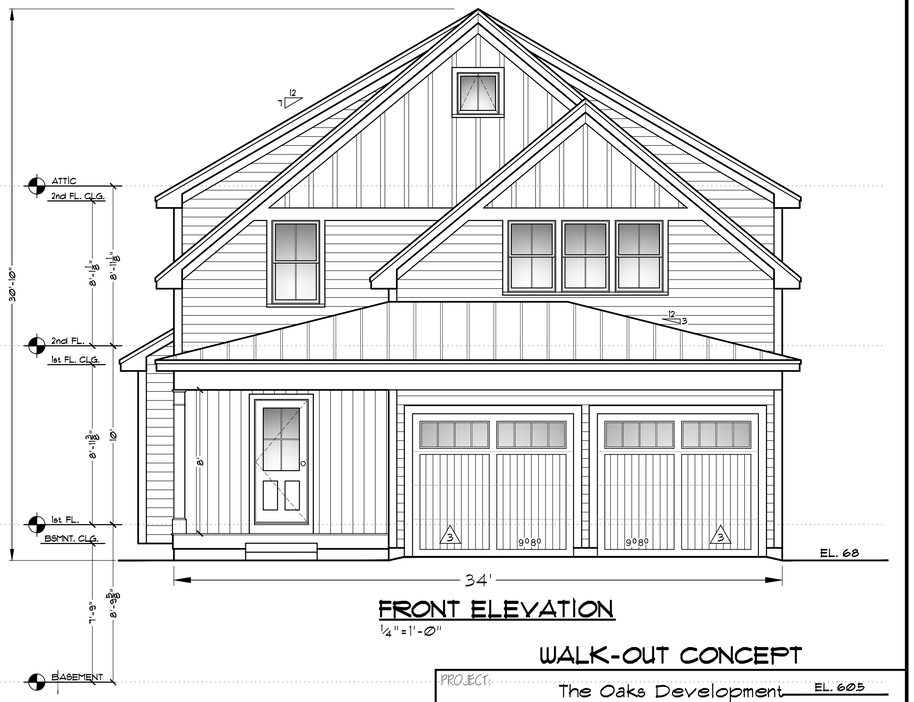
Artform Home Plans
603-431-9559

Interior Views

RIGHT SIDE ELEVATION
¼"=1'-0"

REAR ELEVATION
¼"=1'-0"

LEFT SIDE ELEVATION
¼"=1'-0"



FRONT ELEVATION
¼"=1'-0"

WALK-OUT CONCEPT

Units 3&4

PROJECT: The Oaks Development — EL. 605
635 Sagamore Road, Portsmouth, NH 03801

E-mail: tech-ill2@comcast.net
Phone: 603-964-1300
Fax: 603-580-1414
Technical Illustrations
ARCHITECTURAL DRAFTING SERVICE
196 Bunker Hill Ave. Stratham, NH 03885

DATE: 1-30-24
REVISED:
DWG. NO. 1

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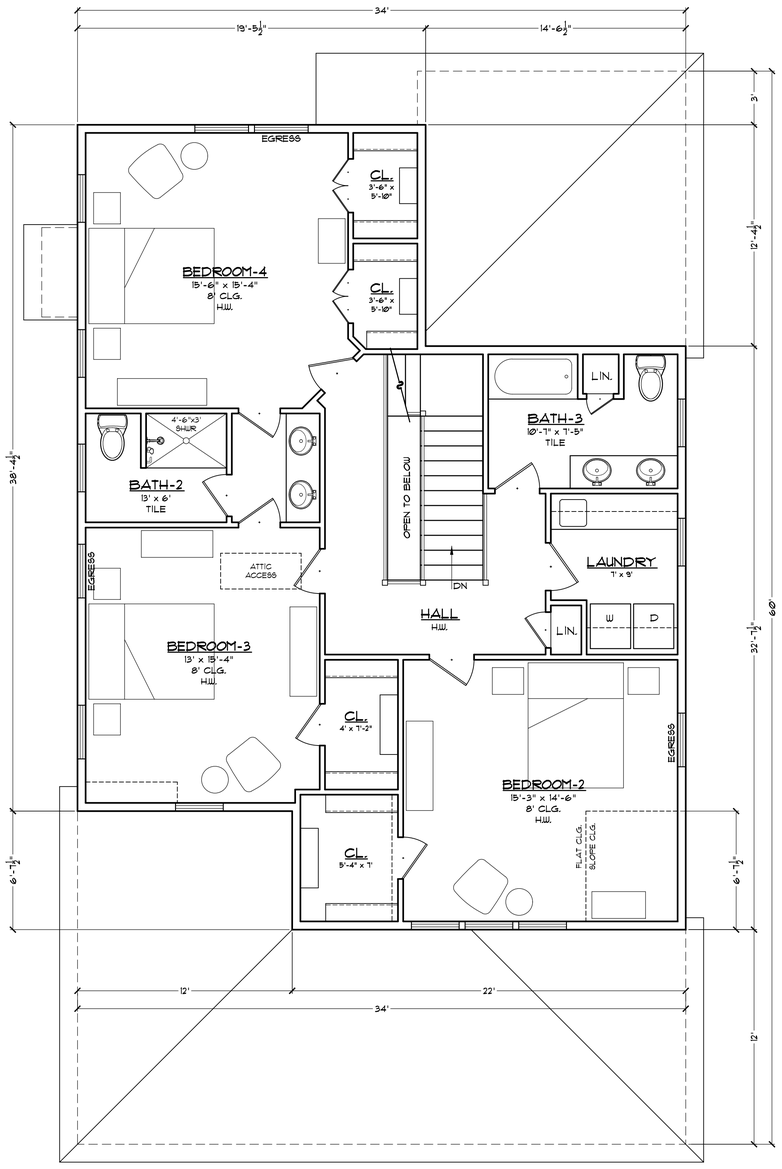
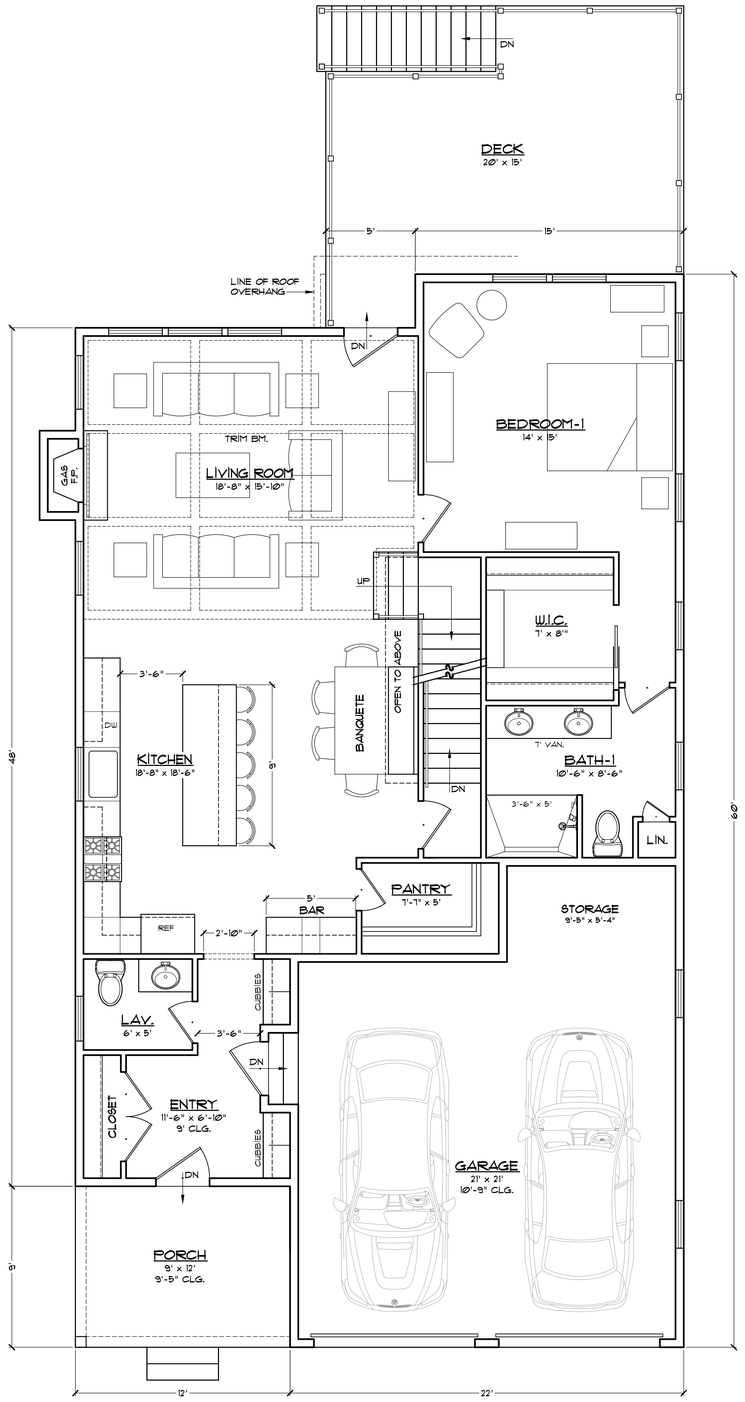


SECOND FLOOR PLAN

¼"=1'-0"

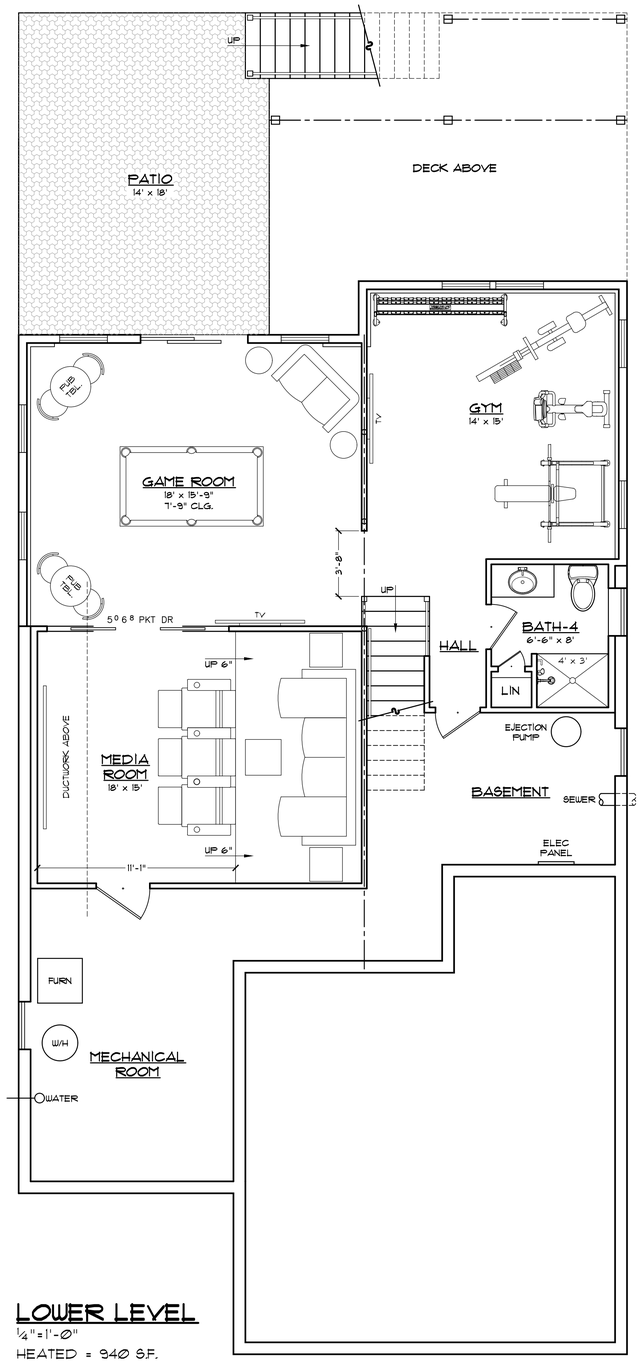
HEATED = 1270 S.F.
(INCLUDES 67 S.F. OF STAIRWELL)



FIRST FLOOR PLAN

¼"=1'-0"

HEATED = 1,347 S.F.
GARAGE = 528 S.F.
FRONT PORCH = 108 S.F.
DECK = 280 S.F.
TOTAL HEATED =3,557 S.F.



LOWER LEVEL

¼"=1'-0"

HEATED = 940 S.F.
PATIO = 248 S.F.

WALK-OUT CONCEPT

PROJECT:
The Oaks Development
635 Sagamore Road, Portsmouth, NH 03801

E-mail: tech-1112@comcast.net
Phone: 603-964-1300
Fax: 603-580-1414
Technical Illustrations
ARCHITECTURAL DRAFTING SERVICE
196 Bunker Hill Ave.
Stratham, NH 03885

DATE: 1-30-24
REVISED:
DWG. NO. 3

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