CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room, City Hall, 288 Central Ave, Dover NH 03820
Meeting Date: **Thursday, January 2, 2025**
Meeting Time: **10:30 AM**

1. 10:30 AM – 11:15 AM: Site Plan for 239 Knox Marsh Realty, LLC, Assessor's Map H, Lot 37-A, zoned C, located at 239 Knox Marsh Road. (Proposal is for a ±15,097 commercial building with eighty-four (84) lodging units and two (2), ninety (90)-unit single occupancy residential buildings restricted to HUD Fair Market rental rates.) (SITE-2024-0019)

   (Related application regarding secondary groundwater recharge, see: COND-2024-0035, and for Transfer of Development Rights, see: TRAN-2024-0016.)

PLAN SNAPSHOT REPORT SITE-2024-0019
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	12/12/2024
Work Class:	New Construction	**District:**	None	**Exp Date:**	02/15/2025
Status:	Submitted - Online	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: Proposed 84 Lodging Unit Building and two, 90 unit single occupancy residential buildings restricted to HUD rates. TDR request for additional units above base commercial density.

Parcel:	H0037-A00000 Main	**Address:**	239 Knox Marsh Rd Main Dover, NH	**Zone:**	

Owner
Gil Aleixo
Mobile: (603) 349-0470

Architect
Nicholas Isaak
35 Oyster River Rd.,
Durham, NH 03824
Business: (603) 969-6711

Project Manager
Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825
Business: (603) 332-2863
Mobile: (603) 781-3403

Engineer
Kenneth Berry
Home: (603) 332-2863
Business: (603) 332-2863
Mobile: (603) 332-2863

Landscape Architect
Terrain Planning & Design, LLC
Business: (603) 491-2322

Surveyor
Kenneth Berry
Home: (603) 332-2863
Business: (603) 332-2863
Mobile: (603) 332-2863

Soil Scientist
John Hayes III
Home: (603) 205-4396
Business: (603) 205-4396
Mobile: (603) 205-4396

Applicant
Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825
Business: (603) 332-2863
Mobile: (603) 781-3403

Wetlands Scientist
Deidra Benjamin
Home: (603) 332-2863

Plan Custom Fields

Total	0	Total2	0	Total3	0
Total4	0	Total5	0	Total6	0
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	318	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	9.36
Deed Book	5138	Total SQFT	407722	Deed Page	73
Deed Date	9/18/23	Proposed Property Use	Proposed 84 Lodging Unit Building and two, 90 unit single occupancy residential buildings restricted to HUD rates. TDR request for additional units above base commercial density.	Area of Parcel to be Developed (SQFT)	302500
Number of Parking Spaces Existing	0	Number of Parking Spaces Proposed	318	Number of Employees Total	0
Number of Employees in Max Shift	0	Distance to City Water	0	Distance to City Sewer	0
Type of Building to be Built	Steel first level and wood upper levels	Estimated Construction Value	40000000.00	Refuse Removal	Private
Is there an existing Conservation Easement?	No	Existing Conservation Easement Details		TotalImpactFeeSDTOD	0.00
TotalImpactFeeTHTOD	0.00	TotalImpactFee23FTOD	0.00	TotalImpactFeeA4TOD	0.00
TotalImpactFeeMHTOD	0.00	TotalImpactFeeADUTOD	0.00	TotalImpactFeeAONRTOD	0.00
TotalImpactFeeAR55TOD	0.00	TotalImpactFeeAR62TOD	0.00	Sub Total Residential	0.00

PLAN SNAPSHOT REPORT (SITE-2024-0019)

TotalImpactFeeRIRCTOD 0.00	TotalImpactFeeOCSTOD 0.00	TotalImpactFeeITWCTOD 0.00
TotalImpactFeeNHALTOD 0.00	TotalImpactFeeOIUTOD 0.00	TotalImpactFeeAFAOTOD 0.00
Sub Total Non-Residential 0.00	Total of Impact Fees to be Assessed 0.00	

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Chris_Berry_12/12/2024.jpg	12/12/2024 11:27	Berry, Chris		Uploaded via CSS

Invoice No.	Fee	Fee Amount	Amount Paid
INV-00010360	Planning General Application Fee	$200.00	$0.00
	Total for Invoice INV-00010360	$200.00	$0.00
	Grand Total for Plan	$200.00	$0.00

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1			
Confirm application complete v.1	Generic Action		
Technical Review Committee Meeting Agenda v.1	Task		
Land Use Plan Technical Review v.1	Receive Submittal		
Technical Review Committee Meeting v.1	Hold Meeting		
Planning Board v.1			
Planning Board Agenda v.1	Task		
Invoice for Notices v.1	Task		
Send Notices v.1	Task		
Planner Creates Staff Recommendations v.1	Plan Activity		
Distribute Planning Board Materials v.1	Task		
Planning Board Hearing v.1	Hold Hearing		
Planning Board Decision v.1	Plan Activity		
NOD Sent to Applicant v.1	Create Report		
Final Plan v.1			
Land Use Plan Stamped and Signed v.1	Generic Action		
Recording v.1	Task		
Document Archival v.1	Generic Action		
Internal Notification of Plan Completion v.1	Generic Action		
Building Official Notifies Address v.1	Generic Action		
Pre-Con Meeting v.1	Hold Meeting		
Create/Link to Records v.1			
Create / Link to Permit - Building Major v.1	Create Sub Permit		
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit		

City of Dover, New Hampshire
SITE REVIEW APPLICATION

[Revision Date: July 1, 2021]

Office Use Only	Project #:		Date Received:	
	Amount Paid:		Time Received:	

APPLICANT AND OWNER INFORMATION

Name of Applicant: 239 Knox Marsh Realty, LLC Telephone #603-349-0470

Address of Applicant: P.O. Box 720, Middleton, MA 01949

E-Mail Address: Gilaleixo@gmail.com

Name of Property Owner (*if different from applicant*): _____ Telephone #_____

Address of Property Owner: _____

PROPERTY INFORMATION

Address of Property: 239 Knox Marsh Road

Assessor's Map # H Lot(s) # 37A

Zoning District(s) Commercial (C) Overlay District(s) Secondary Groundwater Recharge & Conservation District

Size of Parcel: 407,542 sq. ft. 9.36 ac. Property Deed: Book 5138 Page: 73

Existing Use of Property: Vacant/Former Single Family

SITE PLAN INFORMATION

Describe Proposed Use: Mixed-use

Area of Parcel to be Developed: 302,500 sq. ft.

If Multi-family Residential: Number of Units 180 & Buildings Proposed 2

If lodging: Number of Units 84 & number of Buildings 1

Number of Parking Spaces: Existing driveway Proposed 318

Highway Access (check where applicable): X City Street ____ State Highway

Number of Employees Total: TBD In Maximum Shift: TBD

Disposition of Parcel:

Building Footprint 15,097 sq. ft.

Total Building Area 58,901 sq. ft.

Paved Area 19,798 sq. ft.

Building Setbacks:

Front Yard 30 ft.

Rear Yard 15' ft.

Side Yard: Right 12 ft. Left 12 ft.

City Water? X Yes ___ No How far is city water from the property? At property

City Sewer? X Yes ___ No How far is city sewer from the property? At property

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION

Type of TRANSFER OF DEVELOPMENT RIGHT REQUEST (Check All That Apply):

☒ Residential ☐ Residential (reduced size) ☐ Industrial | ☐ Purchase ☐ Land Preservation

Relief sought (Check All That Apply):

☐ Lot Size ☐ Frontage ☒ Setback ☐ 30' Buffer ☒ Increase by 114 units

Describe Proposed Use or Activity that requires TDR; describe any impacts and document mitigation:

Please find attached narrative

BUILDING INFORMATION

Type of Building to be Built: Steel first level and wood upper levels

Height of Building: 44.5' Finished Floor Elevation: 98.6, 99.0, 99.35

Number of Seats (where applicable) N/A

Estimated value of construction: 40,000,000 Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: _____

Justification for waiver request(s) (*attach additional sheets as needed*):

157-32G, 157-40-B(5), 154-14-(3)(B)(4), 157-44, please find attached narrative

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kenneth A. Berry, PE, LLS

Address 335 Second Crown Point Road, Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 805 E-mail address: K.berry@berrysurveying.com
crberry@metrocast.net

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Kenneth A. Berry, PE, LLS

Address 335 Second Crown Point Road, Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 14243 E-mail address: K.berry@berrysurveying.com
crberry@metrocast.net

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Nick Isaak, AIA

Address 35 Oyster River Road, Durham, NH 03824 Telephone #: 603-969-6711

Professional License #: 3202 E-mail address: Nick@isaakdesign.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Terrain Planning & Design LLC
Eric Buck

Address 311 Kast Hill Road, Hopkinton NH 03229 Telephone #: 603-491-2322

Professional License #: 78 E-mail address:

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) Deidra Benjamin, CWS

Address 100 Leavitt Road, Pittsfield, NH 03263 Telephone #: 603-496-3307

Professional License #: 295 E-mail address: deidrabenjamin1@gmail.com

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: _____ Telephone #_____

Address Easement Holder: _____

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. Furthermore, I/we submit that the existing conditions sheet of the plan represents the lot in question, and that no alteration of the site shall take place during Planning Board review up to and including the pre-construction meeting. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: 11-26-24

Signature of Applicant (*if different from owner*): _____ Date: _____

Signature of Agent: _____ Date: 11-26-24

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 11-26-24

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

I, and my successors, hereby the City of Dover or its assigns to enter my property for the purpose of completing the site work as required by the approved plan should the letter or credit or other surety be called. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 11-26-24

Signature of Applicant (*if different from owner*): _____ Date: _____

CERTIFICATION OF FEES

I, and my successors, hereby certify that I understand that the City of Dover collects impact fees, utility investment fees and inspection fees for projects developed in Dover. Said fees must be paid before a Certificate of Occupancy can be obtained for a structure, unless a different payment schedule is agreed to by the applicant and the City prior to approvals being issued by the Dover Planning Board. Additionally, should the property be in "Current Use" it will be subject to the Land Use Change Tax.

Signature of Property Owner: _____ Date: 11-26-24

Signature of Applicant (*if different from owner*): _____ Date: _____

CITY OF DOVER SITE REVIEW
LIST OF ABUTTERS

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

City of Dover, New Hampshire
SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

This site plan review checklist, as required by Chapter 153-6-B(2), should be completed by the applicant. It is intended to assist the applicant in the planning process of preparing a Site Plan Review application for Planning Board action. The size of the project will determine the types of information required for review, therefore, a **pre-application conference** with the Planning Department to determine the list of items that must be completed is strongly encouraged.

The first step would be to appear before the Technical Review Committee, to apply, eight (8) folded copies of the site plan with scale of not less than 1"=50' or 1" =100' for larger site plans, need to be provided, along with payment of plan review fees.

Two weeks prior to Planning Board, three (3) full size and twelve (12) half size (11x17), folded, copies of the plan set and materials, including response to TRC comments, will be due. Abutter/Notice Fees will be invoiced and need to be paid 28 hours prior to the Planning Board meeting.

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: 239 Knox Marsh Realty, LLC File Number: _____

PROJECT TITLE: Residences & Lodges at Kelly Brook

PROPERTY LOCATION: 239 Knox Marsh Road Tax Map: H Lot: 37A

	Where/How Provided	Reviewed
1. Completed and signed Application form	X	
2. Plan Review Fees are provided	X	
3. Electronic copy of the engineered/surveyed plan layout	X	
4. Electronic copy of supplementary materials and application	X	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	X	
6. Waiver requests to the Site Plan Review Regulations, with written justification	X	
7. Conditional Use Permit applications	X	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	X	
9. A colored architectural plan showing all sides of buildings	X	
10. Folded copies of site plan w/scale of not less than 1"=50' or 1"=100' for larger site plans, for TRC. Plans shall contain the following items as appropriate:	X	
Location map at appropriate scale	X	
Proposed Project name and title and Planning File #	X	
Date, north arrow and scale	X	
Names of all abutting property owners	X	
Name and address of owners and/or applicants	X	
Signature & stamp of NH licensed land surveyor and/or engineer	X	
Zoning District boundaries, including any special or overlay districts	X	
Location of Conservation District areas	X	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	X	
Location and widths of existing & proposed easements & right of ways	X	
Location and width of existing and proposed access/egress ways	X	

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	X	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	X	
Existing and proposed topographic information at two foot intervals	X	
Existing and proposed buildings and structure locations	X	
Minimum building setbacks or build to lines on all lots	X	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	X	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	X	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	X	
Existing and proposed stormwater lines and facilities	X	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	X	
Location of Flood Hazard Zone	N/A	
Location of all bodies of water and watercourses	X	
Location of wetlands and buffers	X	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	X	
Existing natural features and/or significant vegetation on property	X	
Depict existing contours up to 100 ft. beyond project limits	X	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	X	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	X	
Location, material and size of existing and proposed pavement area	X	
Location of proposed fire lanes	X	
Specify finished floor elevations of buildings	X	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	X	
Depict all service, storage, loading bays and utility areas	X	
All applicable Dover Common Site Plan notes	X	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	X	
Stormwater Management System Operation and Maintenance Plan	X	
Letter to Serve from Public and Private Utilities	Will provide	
Erosion and Sedimentation Control Plan	X	
Landscape Operation and Maintenance Plan	X	
Proposed restrictive covenants or homeowners association documents	N/A	
Dates and permit numbers of all required state and federal permits	Will provide	
If wetland buffer, indicate placards locations, as applicable	X	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	X	
Location of proposed drive-in facilities	X	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Will provide as needed	

REVIEWED BY: _____ DATE_____ TRC DATE_____

City of Dover, New Hampshire
TRANSFER OF DEVELOPMENT RIGHTS APPLICATION

[Revision Date: September 26, 2024]

Office Use Only	Project #:		Date Received:	
	Amount Paid:		Time Received:	

APPLICANT AND OWNER INFORMATION

Name of Applicant: 239 Knox Marsh Realty, LLC Telephone # 603-349-0470

Address of Applicant: P.O. Box 720, Middleton, MA 01949

E-Mail Address: Gilaleixo@gmail.com

Name of Property Owner (if different from applicant): _____ Telephone #_____

Address of Property Owner: _____

PROPERTY INFORMATION

Assessor's Map # H Lot(s) # 37A

Address of Property: 239 Knox Marsh Road

Zoning District(s) Commercial (C) Overlay District(s) Secondary Groundwater Recharge Conservation District

Existing Use of Property: Vacant/Former Single Family

New impervious area (in s.f.): 158,234

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION

Type of TRANSFER OF DEVELOPMENT RIGHT REQUEST (Check All That Apply):

☒ Residential ☐ Residential (reduced size) ☐ Industrial | ☐ Purchase ☐ Land Preservation

Relief sought (Check All That Apply):

☒ Lot Size ☐ Frontage ☒ Setback ☒ Increase by 114 units

Describe Proposed Use or Activity that requires TDR; describe any impacts and document mitigation:

Please find attached narrative

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: NHDES Alteration of Terrain, NHDES Sewer Discharge, NHDOT Driveway Permit, EPA NOI (Not yet Submitted)

Name of Professional That Prepared TDR Plans: Kenneth A. Berry, PE, LLS

Address 335 Second Crown Point Road, Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 14243 (PE), 805 (LLS) E-mail address: K.berry@berrysurveying.com crberry@metrocast.net

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: 11-26-24

Signature of Applicant (if different from owner): _____ Date: _____

Signature of Agent: _____ Date: 11-26-24

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 11-26-24

CITY OF DOVER TRANSFER OF DEVELOPMENT RIGHTS
LIST OF ABUTTERS

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

BERRY SURVEYING & ENGINEERING
335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com

November 26, 2024

To: City of Dover Planning Department
Attn: Mrs. Donna Benton, AICP
Director of Department of Planning and Community Development
288 Central Ave
Dover, NH 03820

RE: "Residences and Lodges at Kelly Brook"
239 Knox Marsh Realty, LLC
239 Knox Marsh Road (NH Route 155)
Mixed-Use TDR Site Plan
Project Narrative
Map H, Lot 37A

Mrs. Benton and the Dover Planning Board,

Berry Surveying & Engineering (BS&E,) on behalf of 239 Knox Marsh Realty, LLC respectfully submits to Planning Board a proposed Mixed-Use TDR Site Plan application located at 239 Knox Marsh Road (NH Route 155) within the Commercial (C) Zoning District and Secondary Groundwater Recharge Overlay.

Background

239 Knox Marsh Realty, LLC owns the parcel known as 239 Knox Marsh Road, Map H, Lot 37A, consisting of 9.36 acres. Subject parcel development had been previously approved under SITE-2023-0010, consisting of two mixed-use buildings with 52 apartments at the front of the site, with 12 single family homes at the rear of the site, serviced by a roadway known as Tibetan Drive. Construction began on the previously approved design in 2023 and was halted in 2024 to redesign the project into the proposed format.

In the pre-existing/pre-development condition, there was a house and driveway that sat in the southeastern corner of the Lot. The lot was mostly open with two planted tree farms on either side of the house, and the main tree line running along the property line. Berry Surveying & Engineering has conducted a full boundary survey as well as a topographic analysis. In addition, a certified wetland scientist has been on site and delineated all wetlands (wetland found along the northern boundary line abutting the railroad). A soil scientist has also been on site and conducted a site-specific soil map (SSSM), in order to determine the soil types and slopes on site.

Project Proposal

The proposal is to construct a private roadway off Knox Marsh Road, known as "Tibetan Drive". The development proposal consists of an 84-unit lodging unit building, referred to as Lodging Building "A" and two 90-unit single occupancy unit buildings, referred to as Residential Buildings "B" and Residential Building "C". This results in a total of 180 single occupancy residential units. These buildings are 4 stories, with podium style parking on the first level, with the respective lodging or residential units on levels 2-4, with cantilevered overhang over level 1. All required accessible parking, EV parking spaces and motorcycle parking spaces are provided within the first level of the buildings.

In July of 2024, a zoning variance (ZONE-2024-0033) was received that allows for the commercial requirement of the site to be in a separate building from the residential units (still required to be 1/3 of the provided space). Also, allowing for building height of greater than 40' in the zone (44.5' proposed). A condition of this zoning approval is that all residential units are restricted to the applicable current HUD fair market rent value in perpetuity, which is what has been proposed.

Utilizing the Commercial Zoning District base density calculation, the parcel is calculated to be allowed 66 units by right. The proposal includes a Transfer of Development Rights Request of obtaining 114 single occupancy units HUD units to meet the 180 residential units proposed. A separate Transfer of Development Rights request narrative is included within the application package.

Site Operation

Tibetan Drive is proposed as a 24' wide roadway with sidewalks and crosswalks proposed throughout the development for connectivity. A loading zone is provided adjacent to Lodging Building "A" for deliveries. In parking areas, a full 24' lane is provided, including through the building parking garages. Full vehicle circulation lanes are provided around Lodging Building "A" and Residential Building "C", with at least three-sided fire truck access provided around all three of the buildings. Circulation locations without parking are provided as an 18' traveled way.

A parking lot provided on the western side of the site contains a hammerhead turnaround and a sidewalk connection to the area of active and passive recreation space. Passive recreation space includes a dog park with active recreation area including a bocce court and other usable space.

A robust Landscaping Plan has been provided with the submission. Around the perimeter of the parking lots, trees are proposed at 35' on center, with shrubs 5' on center in between. Internal landscaping islands are proposed through the site that exceed the internal landscaping requirements. Wetland buffer replanting and screening trees are proposed throughout the site. Snow storage is provided throughout the site in locations that do not conflict with the perimeter landscaping requirements. Landscaping has been offset from the parking lot to allow for this.

The first level of the buildings include elevator access to the upper levels, an entry vestibule on the northern side of each building, and various other egress doors around the buildings. The southern side of the buildings includes a 6' raised sidewalk adjacent to vehicle parking, with the northern side of the buildings containing a 5' sidewalk against the building, under the cantilever overhangs. Mail pickup is located on the first levels next to the entry vestibule. Refuse disposal will occur in the different dumpster locations on site, situated based on garbage truck accessibility.

Drainage

Drainage mitigation and treatment is proposed via a series of Detention Ponds and Gravel Wetlands. Gravel Wetlands provide stormwater treatment of total suspended solids (TSS), nitrogen, and phosphorous greater than the standards prescribed by the City of Dover in Chapter 153. An Environmental Conditional Use Permit is being requested for greater than 20% impervious within the Secondary Groundwater Recharge Overlay (40.2% proposed). The site had previously received an Environmental Conditional Use Permit for wetland buffer impact and for 33.8% impervious surface within this zone. This increased level of treatment from the gravel wetlands is beneficial for surface water discharge from the site, considering the on-site soil infiltration restrictions.

The soils across the site consists of silt loam soils with infiltration restrictions in the "B" and "C" soil horizons. This is relevant, as there are no soils on site with the capability of providing stormwater infiltration in accordance with NHDES Alteration of Terrain Standards. As a result, a waiver for Ground Water Recharge Volume (GRV) has previously been requested from Alteration of Terrain, and approved for the previous project, AoT-2183/2183-A. The project relies on extended detention of stormwater to provide compliance with regulations. A waiver has been requested for an increase in stormwater volume in one location, with an extensive justification provided within the waiver request. See Environmental Conditional Use Permit request for justifications regarding the project impervious percentage.

Utilities/Lighting

Sewer and water utilities have been partially installed on the project from the original approval. Sewer is provided as 8" SDR 35, with 8" SDR35/8" Schd. 40 services extending to each building. The proposed design flow is 27,492 GPD, whereas the prior approval was for 25,075 GPD (NHDES Sewer Discharge Permit D2022-0705).

The proposed site water is provided as 8" C.L.D.I. throughout the project, with 4" C.L.D.I domestic and fire suppression lines supplied to each building. The lighting design proposed is in compliance with Commercial Zone lighting standards. Pole lights around the property as proposed with a backlight control package in consideration of abutting properties. Electric utility is provided underground through out the project, with the exception of the drop poles along NH Route 155 requested by Eversource. A waiver request is included in the submission for this item. Heating and cooling for the buildings will be provided by roof top units that are screened from NH Route 155 by the building parapet. The buildings are proposed to include solar on the rooftop to satisfy the site plan review requirements.

Traffic

As part of this application, a Traffic assessment has been conducted by Kim Eric Hazarvartian, Ph.D, PE, PTOE of TEPP, LLC, showing the difference in trip generation from the proposed site to the previously approved site. From this assessment, it is seen that during the AM weekday peak hour an increase of 21 trips, decrease of 5 PM weekday peak hour trips and an increase of 46 Saturday peak hour trips. A new NHDOT driveway permit and approval will be required for the project.

Wildlife

The site was also designed in consideration of NHF&G requirements for wildlife and allow for small animal migration throughout the site. The design will feature the following elements: 3:1 or 4:1 side slopes, natural fiber matting, catch basins without sumps and outlet structures with crushed stone sumps. All of these methods have been used for similar projects in the past. All proper erosion and sediment control methods will be taken to ensure that no sediment is tracked onto Knox Marsh Road, abutting lots, wetlands or buffers. Upon start of construction, a construction entrance will be installed off Knox Marsh Road to prevent tracking. Perimeter control will be installed at the edge of construction to contain sediment within the construction zone.

The project requires the following approvals:

- Site Plan Approval
- TDR Approval for increased unit density
- Environmental CUP for % impervious
- EPA Notice of Intent (NOI)
- NHDES Alteration of Terrain Permit (to be amended)
- NHDES Sewer Discharge Permit (to be amended)
- NHDOT Driveway Permit (to be amended)

BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry
Principal, President

BERRY SURVEYING & ENGINEERING
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November 26, 2024

City of Dover Planning Board
Attention: Donna Benton, AICP, Director of Planning and Community Development
288 Central Ave
Dover, NH 03820

Re: Waiver Requests
"Residences and Lodges at Kelly Brook"
Mixed-Use TDR Site Plan
239 Knox Marsh Realty, LLC
239 Knox Marsh Road (NH Route 155)
Tax Map H, Lot 37A

Chairperson & Members of the Dover Planning Board:

In accordance with Subdivision Regulations Article 157-40-B(5), the following waivers (4) are hereby requested:

1. Identification of Waiver Request: Maximum road grade of 3% within 75' of an intersection per Dover Subdivision Regulation 157-32.G.

- Proposed road with a -4.0% grade off of Knox Marsh Road then flattening with a sag vertical curve to a positive 4% grade into the development.

1. Explanation:

The applicant is proposing to construct a private roadway, known as Tibetan Drive, off Knox Marsh Road to provide access to a mixed-use development. The NHDOT requires all proposed roadways to have a grade of -4% off of state-controlled roads to allow for plow trucks to not gouge and damage the driveway. This creates a roadway sag curve at station 0+45. The proposed 4% positive grade into the development provides elevation for the site that is required for stormwater management. A difference of 1% grade at the entrance allows the roadway crest curve of Tibetan Drive (station 1+90), to be closer to NH Route 155.

In this situation, an intersection grade into the development of less than 4% would result in additional stormwater runoff being conveyed south, to the NH Route 155 side of the project site for treatment. As discussed in Waiver Request #2, a drainage design objective is to minimize stormwater runoff conveyed south towards NH Route 155. This additional stormwater conveyed south to the NH Route 155 side of the

site would further exacerbate the volumetric waiver for drainage Point of Analysis (POA) Final Reach #400.

2. Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The intent of requiring a maximum road grade of 3% within 75' of an intersection is to ensure vehicular safety for all turning and stopping movements, in addition to site distance. In this case, the -4% proposed within 75' is the NHDOT standard, and therefore will carry out the purpose and intent of the regulation.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Requiring the applicant to meet the intersection grade requirement would cause the intersection to be incompliant with NHDOT standards for the -4% downgrade. The unnecessary hardship of not allowing the 4% positive grade into the site would be to further exacerbate the drainage volumetric waiver for POA Final Reach #400, which is discussed more in depth in the following waiver request.

2. Identification of Waiver Request: An increase of stormwater runoff volume at Final Reach #400 (under NH Route 155) 153-14-(3)(B)(4).

- Post-development stormwater runoff volume greater than pre-development stormwater runoff volume over a 24-hour span, 1 location, Final Reach #400.

1. Explanation:

The applicant is proposing a Mixed-Use TDR Site Plan using the general drainage scheme based upon approved previous project "Residences and Shops at Kelly Brook" (Dover SITE-2023-010 & NHDES Alteration of Terrain Permit AoT-2183/2183-A). The previously proposed subsurface gravel wetlands (#101, #103, & #104) have been constructed, and are proposed to be modified for this project. These stormwater best management practices (BMPs) have been located based upon the available site elevation and surface water discharge locations. The site contains silt loam soils with limited infiltration capacity in the "B" and "C" horizons. These BMPs discharge surface water to the following defined drainage points of analysis (POA): Final Reach #100, Final Reach #200, and Final Reach #400.

Subsurface Gravel Wetland #101 treats storm water and discharges as surface water to Final Reach #100, located in the northeastern portion of the parcel. Subsurface Gravel Wetland #103 treats storm water and discharges as surface water to Final Reach #200, located in the northern portion of the parcel. Subsurface Gravel Wetland #104 treats storm water and discharges as surface water to Final Reach #400, located in the southern portion of the parcel, analyzed as a culvert under NH Route 155.

Figure #1, from the provided Drainage Analysis, demonstrates the peak rates of stormwater runoff and stormwater volume, at the previously mentioned Final Reach drainage points of analysis for the pre-existing condition vs the proposed development condition:

3.0 FULL COMPARATIVE ANALYSIS

ANALYSIS COMPONENT PEAK RATE DISCHARGE (Cubic Feet / Second)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	2.23	4.83	7.01	9.12	11.66
	Proposed	1.15	2.16	2.98	4.90	9.71
Final Reach #200	Existing	4.02	9.00	13.30	17.49	22.58
	Proposed	1.43	5.90	12.39	17.30	22.33
Final Reach #400	Existing	0.83	2.67	4.35	5.52	6.30
	Proposed	0.59	2.02	3.39	4.26	4.97

ANALYSIS COMPONENT VOLUME (ACRE FEET) (OVER 24 HOURS)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	0.202	0.421	0.609	0.794	1.021
	Proposed	0.167	0.335	0.552	0.758	1.019
Final Reach #200	Existing	0.592	1.269	1.862	2.448	3.171
	Proposed	0.592	1.244	1.789	2.309	2.949
Final Reach #400	Existing	0.145	0.387	0.618	0.855	1.158
	Proposed	0.181	0.437	0.718	1.001	1.356

Figure 1: Drainage Comparative Analysis Table

As demonstrated in the comparative analysis for the pre-existing drainage condition vs the proposed condition: Final Reach #400 (Discharging under NH Route

155), shows a reduction in the peak rate of runoff across the 2YR-24HR through 100YR-24HR storm events. This an 28.9% decrease in the peak rate of runoff for the 2YR-24HR storm event, 24.3% decrease in the peak rate of stormwater runoff for the 10YR-24HR storm event, 22.1% decrease in the peak rate of runoff for the 25YR-24HR storm event, 22.8% decrease in the peak rate of runoff for the 50YR-24HR storm event, 21.1% decrease in the peak rate of runoff for the 100YR-24HR storm event.

This reduction in peak rate of stormwater runoff is relevant in relation to the stormwater volumetric increase that is shown at Final Reach #400. The reduction in the peak rates of runoff affects the capacity of the downstream receiving area. The increase in total runoff volume is received by the downstream area in a more controlled and delayed manner than the pre-existing condition (as shown by the reduction in peak rates of runoff and peak rate of runoff timing shown in Section 2A).

The site stormwater design is controlled by the existing discharge locations and elevations. As the site in the pre-existing condition lacks substantial grade change, stormwater routing is limited by this factor. An objective of the drainage design is to minimize the contributing area of the proposed development to Final Reach #400. This is achieved by conveying the maximum amount stormwater possible north to Final Reach #100 & #200. A driveway entrance profile proposed at 4% allows the crest in Tibetan Drive to be as far south as possible (station 1+90), allowing for elevation and conveyance of stormwater infrastructure associated with Final Reach #100 & #200, to the north of the site.

The only designed impervious areas contributing to Final Reach #400 are locations where there are physically no conveyance methods to direct stormwater to Final Reach #100 or Final Reach #200, while providing drainage pipe cover or positive swale drainage. Figure #2, from the W2-Proposed Conditions Drainage Plan, highlights the developed contributing area and the previously mentioned roadway crest curve in Tibetan Drive. The contributing area to Gravel Wetland #104 is traced on Figure #2 and referred to as Subcatchment #14. Subcatchment #16, which includes the majority of the parking lot in the front of residential building "B", conveyes north runoff towards Gravel Wetland #103 (Final Reach #200). Stormwater runoff on the western side of Tibetan Drive is able to be conveyed to Gravel Wetland #101 (Final Reach #100.) Tibetan Drive is not superevelated to the east due to icing concerns.

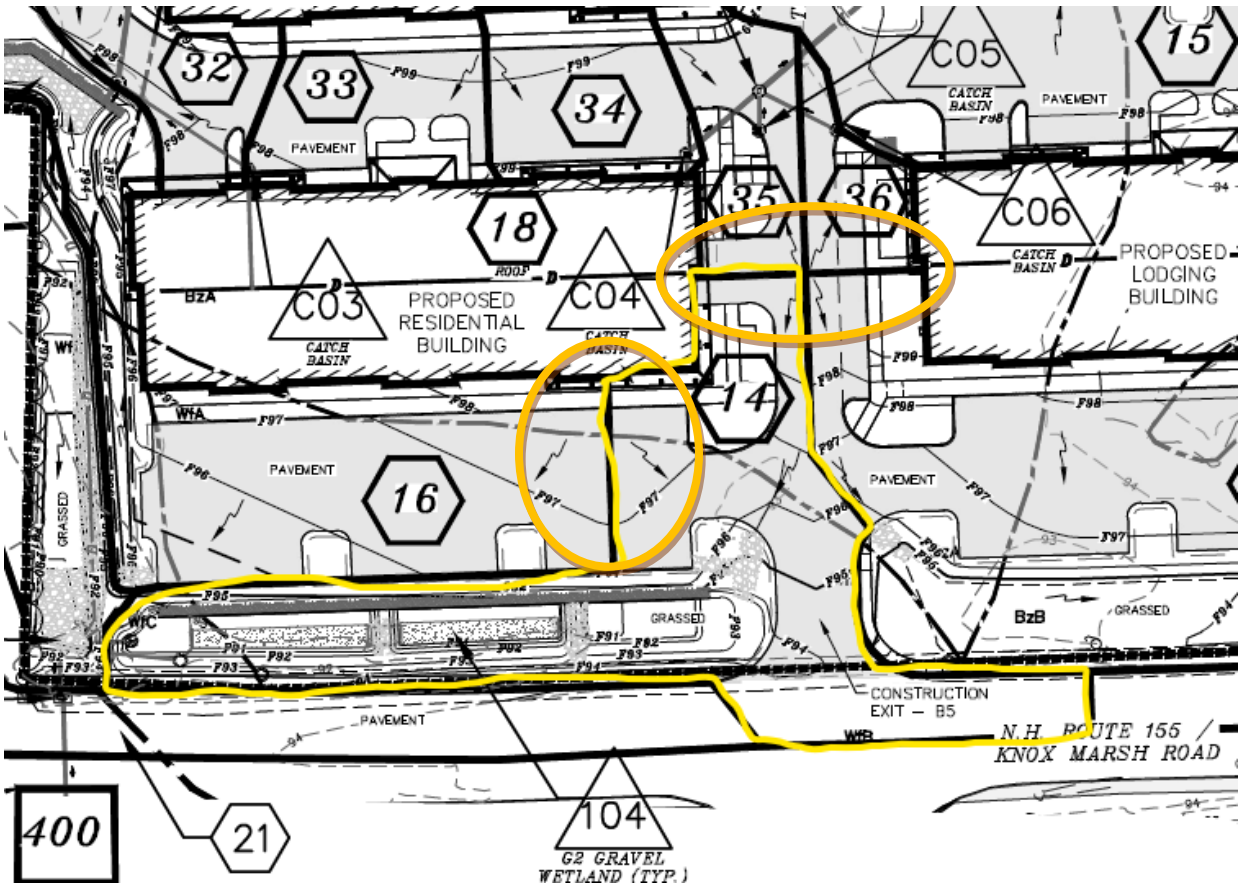

Figure 2: W2 Proposed Watershed Plan

The flow arrows in Figure #2 indicate the direction of stormwater runoff.

2. Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The purpose and intent of the regulation is to protect downstream properties from upstream development. The stormwater BMP proposed results with a greater than 20% reduction in the peak rate of runoff across all modeled storm events, resulting in the stormwater runoff volume reaching downstream areas at a reduced rate and different timing than the pre-existing condition. This reduced rate of stormwater runoff would allow downstream stormwater features to discharge other off-site received flow and reduce the opportunity for downstream capacity issues (extended detention). The discharge from the developed area to Final Reach #400, from Gravel Wetland #104, is controlled by an orifice, which results in a slow controlled "metering" of stormwater discharge of the BMP from the developed site. Figure #3, from the Proposed

Development HydroCAD model, demonstrates the slow "metering" of stormwater from the developed area, with the timing of the discharge of the peak rate of runoff over 10 hours later than the peak inflow rate for the 2Yr-24HR storm event.

24-034 Proposed Conditions Analysis *Type III 24-hr 2 YR - 24 HR Rainfall=3.60"*
Prepared by Berry Surveying & Engineering Printed 12/11/2024
HydroCAD® 10.00-25 s/n 07605 © 2019 HydroCAD Software Solutions LLC

Summary for Pond 104P: Gravel Wetland #104

Inflow Area =	0.506 ac, 53.15% Impervious,	Inflow Depth >	2.27"	for 2 YR - 24 HR event
Inflow =	1.32 cfs @ 12.09 hrs,	Volume=	0.096 af	
Outflow =	0.02 cfs @ 22.28 hrs,	Volume=	0.021 af,	Atten= 99%, Lag= 611.2 min
Primary =	0.02 cfs @ 22.28 hrs,	Volume=	0.021 af	
Secondary =	0.00 cfs @ 0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 92.20' @ 22.28 hrs Surf.Area= 6,174 sf Storage= 3,288 cf
Flood Elev= 94.00' Surf.Area= 10,045 sf Storage= 12,384 cf

Figure 3: Gravel Wetland #104 2YR-24HR Event

It is the opinion of Berry Surveying & Engineering that the increases in stormwater runoff volume to Final Reach #400 are mitigated by the decrease in the peak rate of stormwater runoff and the slowed and controlled manner of discharge from the Gravel Wetland of the developed area, properly carry out the purpose and intent of the regulations. The conclusion can also be drawn that the discharge of 0.02 CFS from Gravel Wetland #104, in relation to the Final Reach #400 2Yr-24HR peak rate of runoff (0.59CFS), indicates the contribution of off-site area is a factor.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Requiring strict conformity of the regulations would pose an unnecessary hardship to the applicant. The site physical constraints: including lack of elevation for stormwater conveyance and no soils located on site with infiltration capacity in accordance with NHDES Alteration of Terrain Regulations, present a difficulty for compliance with this regulation. As part of the previous Alteration of Terrain approval (AoT-2183/2183-A), a waiver for Ground Water Recharge Volume (GRV) was approved by NHDES. As mentioned, no on-site soils exist with the ability provide infiltration in accordance with NHDES regulations. It is also of note that the peak rates of runoff and volume provided in the comparative analysis are compliant with Alteration of Terrain Standards, including Channel Protection Volume (CPV). The 2Yr.-24Hr. peak rate of runoff is less than 2CFS from the developed area, allowed by Env-Wq 1507.05(b)(1)(b) for Channel Protection Volume purposes.

3. 1. Identification of Waiver Request: Minimum pipe cover per Subdivision Regulation 157-40-B(5)

- Proposed drainage pipes with less than 3' of cover where 3' is required. This Waiver Request is a result of Waiver Request #2.

2. Explanation:

The applicant proposes less than 3' of drain pipe cover for the following: Catch Basin #2 (for a few feet at the outlet), Catch Basin #3 (for a few feet at the outlet), Catch Basin #4, Catch Basin #5, Catch Basin #6, and Drain Manhole #4. This is due to elevation constraints and the physical features of the project site. In these locations, the culverts are proposed as RCP as opposed to HDPE N-12, which is specified in other locations of the project. The roadway crest curve of Tibetan Drive (Station 1+90) is situated in the location for drainage considerations previously discussed in Waiver Request #2. This roadway crest curve controls the elevation of the parking garage entrance on the eastern side of building "B".

The sag curve provided at station 2+42.75 provides a low point for drainage to be collected outside of the loading zone and outside of the proposed crosswalk. As Tibetan Drive reaches a second roadway crest curve at station 3+02.50, the adjacent intersection elevation is controlled by this factor. Catch Basins #2 & #3 to the north of building "B" are controlled by the elevation required to access the building "B" parking garage. As previously mentioned, this parking garage elevation is controlled by the elevation of the crest and sag curves of Tibetan Drive. Where possible on site, 3' of cover is provided in other locations with HDPE N-12 culverts. It is of note that the elevation of the discharge of Drain Manhole #4 is controlled by the bottom of Detention Pond #105, and the bottom of pond is controlled by the outlet elevation of Gravel Wetland #103. The elevations of Catch Basin #2 and Catch Basin #3 are controlled in the same manner by the outlet elevation of Gravel Wetland #103. Figure #4, from the W2 Proposed Watershed Plan, highlights the aforementioned culverts without 3' of drainage cover, showing the relationship between the crest curve. Figure #5, from the Grading & Drainage Plan, shows the Tibetan Drive roadway profile demonstrating the internal intersection.

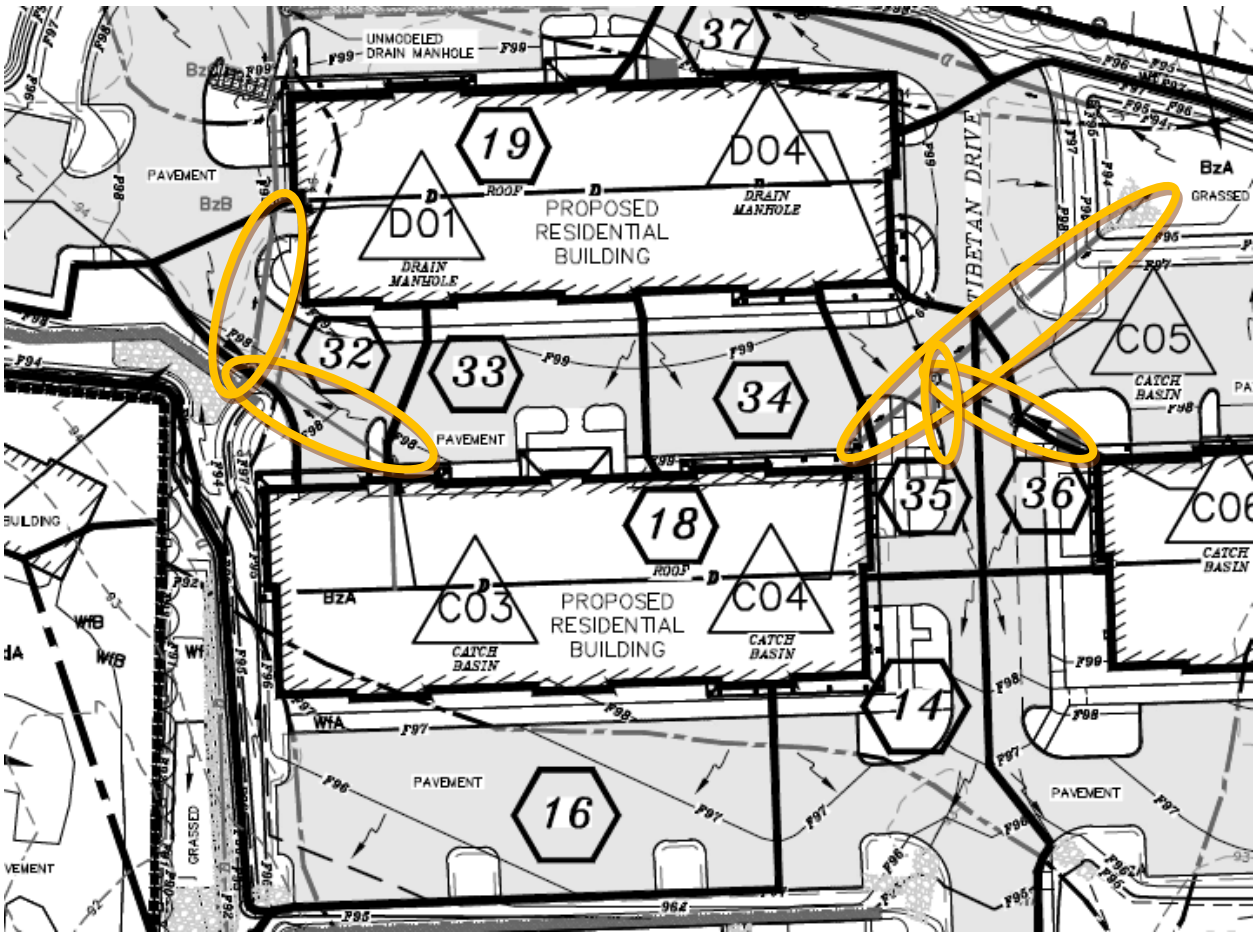

Figure 4: W2 Proposed Watershed Plan

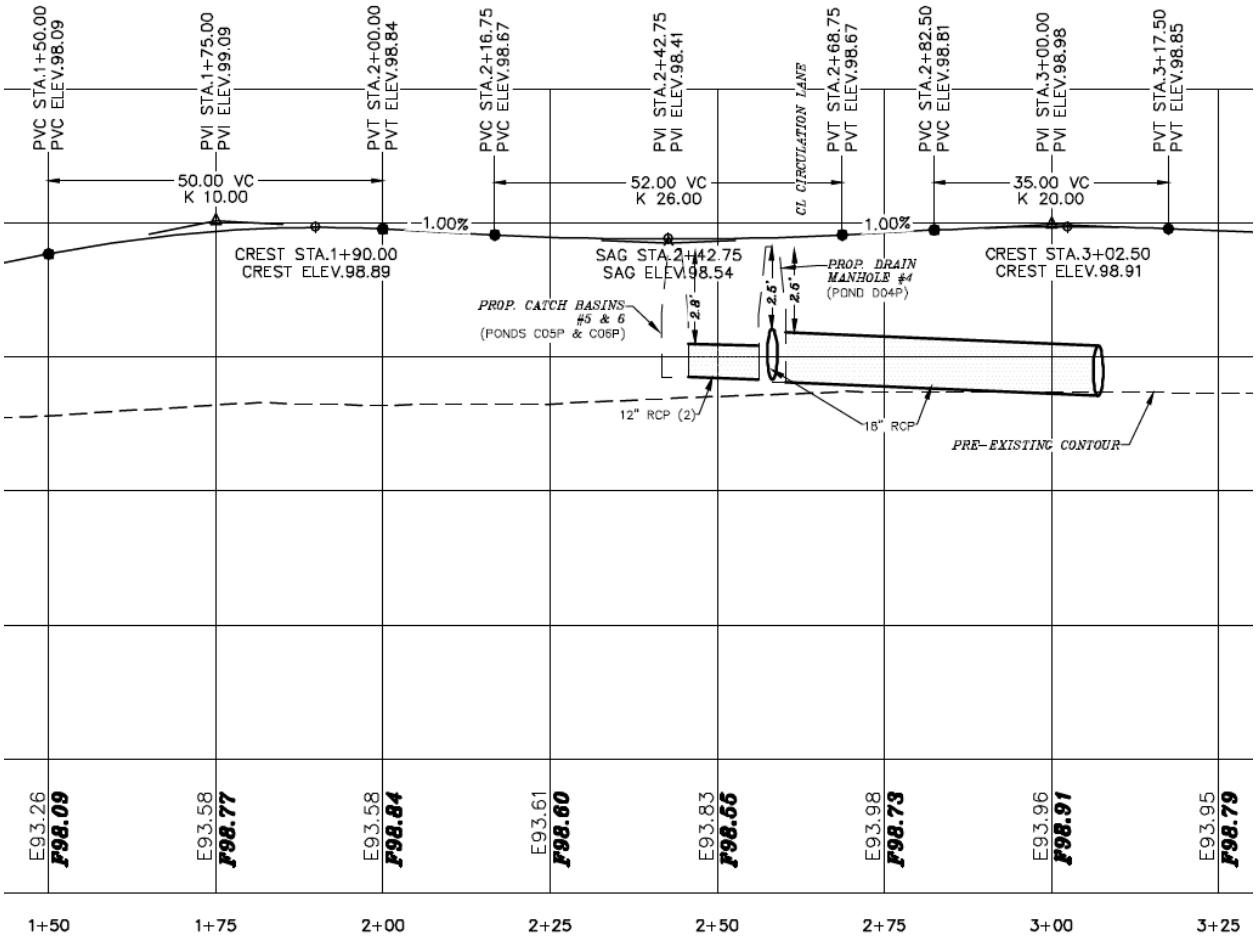

Figure 5: Tibetan Drive profile from Grading Plan sheet #13

3. Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The purpose and intent of this regulation is to provide long term pavement and pipe durability. With the exception of Catch Basin #4 (2' of cover), the remaining RCP locations are provided at least 2.5' of cover. The conversion of drainage pipes from HDPE N-12 to RCP provides a more durable product (designed for lower cover applications) with less than 3' of cover over vehicle traffic. The crown of the RCP culverts will still be below the invert of the pavement gravel select materials, ensuring a full-strength roadway section is provided still in these locations. Given the underlying silt loam soils, the heavier pipe will be more effective against pipe floating or heaving.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Requiring the applicant to provide 3' of cover would pose an unnecessary hardship on the applicant. To provide the required cover, the applicant would need to move the crest curve from 1+90 to a location further into Tibetan Drive, likely greater than 50'. As discussed in the Waiver Request #2, moving this crest curve to the north would further increase the runoff area contributing to Final Reach #400, discharging under NH Route 155. The RCP proposed with a minimum of 2' of cover, with more in most locations, is an effective balance of the elevation and drainage constraints the project faces.

4. Identification of Waiver Request: Proposed utility drop poles providing power service to the site above ground.

- One proposed drop pole on the southern side of NH Route 155 and two proposed drop poles on site adjacent to the NH Route 155 sidewalk per Eversource request.

1. Explanation:

The applicant is proposing a site plan with all utilities underground, with the exception of the proposed drop poles required by Eversource along NH Route 155.

2. Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The purpose and intent of the regulation is to create a visually appealing project that is not inhibited by visually unappealing utility items, specifically utility poles. With all other utilities proposed underground, this objective is achieved within the site. The utility drop poles are adjacent to NH Route 155, which is consistent with existing utility poles provided along NH Route 155. There is a pre-existing utility pole located at the front of the site that is proposed to remain and used as part of the development.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Requiring the applicant to meet this requirement would pose and unnecessary hardship to the applicant by causing difficulty with Eversource. These drop poles are what they have requested to provide power to the project.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry
Principal, President

City of Dover, New Hampshire
CONDITIONAL USE PERMIT APPLICATION

[Revision Date: October 19, 2020]

Office Use Only	Project #:		Date Received:	
	Amount Paid:		Time Received:	

APPLICANT AND OWNER INFORMATION

Name of Applicant: 239 Knox Marsh Realty, LLC Telephone # 603-349-0470

Address of Applicant: P.O. Box 720, Middleton, MA 01949

E-Mail Address: Gilaleixo@gmail.com

Name of Property Owner (if different from applicant): _____ Telephone #_____

Address of Property Owner: _____

PROPERTY INFORMATION

Assessor's Map # H Lot(s) # 37A

Address of Property: 239 Knox Marsh Road

Zoning District(s) Commercial (C) Overlay District(s) Secondary Groundwater Recharge

Existing Use of Property: Vacant/Former Single Family

CONDITIONAL USE PERMIT INFORMATION

Type of Conditional Use Permit (Check All That Apply):

☐ Conservation District	☐ RCM Use Overlay District	☐ Gateway District
☒ Groundwater Protection	☐ Off-Street Parking and Loading	☐ Alternative Treatment Center
☐ Wetland Protection District	☐ Central Business District	☐ Heritage Residential District

Describe Proposed Use or Activity That Requires Conditional Use Permit and Describe Any Impacts:

Please find attached narrative

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: NHDES Alteration of Terrain, NHDES Sewer Discharge, NHDOT Driveway Permit, EPA NOI (Not yet Submitted)

Name of Professional That Prepared Plans: Kenneth A. Berry, PE, LLS

Address 335 Second Crown Point Road, Barrington, NH 03825 Telephone #: 603-332-2863

Professional License #: 14243 (PE), 805 (LLS) E-mail address: K.berry@berrysurveying.com crberry@metrocast.net

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: 11-26-24

Signature of Applicant (if different from owner): _____ Date: _____

Signature of Agent: _____ Date: 11-26-24

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 11-26-24

CITY OF DOVER CONDITIONAL USE
LIST OF ABUTTERS

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

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November 26, 2024

To: City of Dover Planning Board
288 Central Ave
Dover, NH 03820

RE: "Residences and Lodges at Kelly Brook"
239 Knox Marsh Realty, LLC
239 Knox Marsh Road
Mixed-Use TDR Site Plan
Map H, Lot 37A
Environmental Conditional Use Permit Request

Mr. Hunt and the Dover Conservation Commission,

Berry Surveying & Engineering (BS&E,) on behalf of 239 Knox Marsh Realty, LLC respectfully requests the City of Dover Planning Board to accept the following Conditional Use Permit:

- More than 20% impervious (40.2%) within the secondary groundwater protection zone.
  -Conditional Use Permit P22-46 was previously approved for the subject parcel as 33.8% impervious.

1. Identification of Conditional Use Permit

Regulations in the zoning ordinance do not allow for more than 20% impervious cover in the secondary groundwater recharge zone. However, Section 170-33 states that a conditional use permit may be granted by the planning board, given the following standards, as shown below, are met.

Below we show the project's compliance with the standards required to grant a Conditional Use Permit, and we provide justification for its approval.

2. Compliance with the following standards

a) The proposed development plan incorporates a stormwater drainage plan, approved by the Planning Board and prepared by a professional engineer certified to practice in the State of New Hampshire

- **A full drainage analysis was conducted as part of the application. The drainage analysis was designed to be not**

only compliant with the City of Dover regulations but also with Alteration of Terrain (AoT) regulations. Alteration of Terrain Standards do not allow for infiltration on this particular subject parcel due to restrictive soil conditions and standards put forth by Env-Wq 1500 Alteration of Terrain. A waiver for Ground Water Recharge Volume (GRV) has been requested at the state level. Please find the AoT waiver request, located after part B, for further justification. This Site Plan proposes 40.2% impervious.

b) Groundwater Protection Zone of all development-generated stormwater runoff from a ten (10) year storm. Furthermore, the stormwater drainage plan shall provide for the removal of oil and gasoline from parking LOT runoff by use of treatment swales, oil/gas separators or other device, prior to retention and percolation of the runoff.

- **Swales and sediment forebays will be constructed as part of the development. These are designed to capture the runoff and retain any debris, sediment, and hydrocarbons before the runoff gets into the proposed ponds. If anything gets through the swales/forebays, the ponds will act as a second level of protection, preventing pollutants from getting to the final discharge points. Subsurface gravel wetlands are proposed on site, which provide a high level of nitrogen and phosphorous treatment in addition to other common pollutants found on this type of site.**

  With a waiver to GRV being requested at the state level, no infiltration is to take place on site and all site generated stormwater is to be discharged as surface water. Infiltration of stormwater generated by the 10-YR 24 Hr storm event is not able to occur due to site soil restrictions.

<u>The following paragraphs are the language submitted and approved by NHDES for the GRV waiver request.</u>

NHDES Alteration of Terrain GRV Waiver Request

"Identification of Waivers Requested:

1. Waiver requested to not satisfy Ground Water Recharge (GRV) requirement as put forth by Env-Wq 1507.04(b).

1) Explanation:

This waiver request is being submitted to allow for the Ground Water Recharge requirements put forth by Env-Wq 1507.04(b) due to soil conditions on site as shown in the Site Specific Soils Map (SSSM).

1) Waiver Justification:

a. Granting the request will not result in an adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact that would result from complying with the rule as written.

Granting this request will not result in adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact of complying with the rules as written. This is due to site conditions not allowing for compliance. On-Site soils that are being replaced with impervious surfaces are; Winsdor Variant, Buxton, and Scantic. The Windsor Variant has limited recognition across the state, primarily only being in Strafford County, which is why it is not found in the KSat Values for New Hampshire Soils (Ksat NH Manual). While the Windsor Variant experiences Ksat of 6-20 in/hr in the "B" horizon according the Ksat NH, a silt loam "C" horizon exists a silt loam "C" horizon exists with a significantly more restrictive Ksat.

Using the NH State-Wide Numerical Soil Legend (Key to the Soils of New Hampshire) 2011 Catena, the Windsor Variant is located within Section C, Marine or Glaciolacustrine Deposits, Soils Developed in Silt and Clay. From this section Eldridge soil contains similar textures and a restrictive "C" horizon. Using the Ksat NH Manual,
Eldridge soil has a "C" horizon Ksat of 0.06-0.6 in/hr. By applying this restrictive "C" horizon to the Windsor Variant, infiltration would be prohibited in the proposed condition.

Buxton consists of restrictive "B" and "C" horizons of 0.1-0.6 in/hr and 0.0-0.2 in/hr, respectively. Scantic consists of restrictive "B" and "C"

horizons as well, with 0.0-0.2 in/hr and 0.0-0.2 in/hr, respectively. With restrictive "B" and "C" horizons across the subject parcel, compliance with Env-Wq 1507.04(b) is not possible.

b. Granting the request is consistent with the intent and purposes of the rule being waived.

Utilizing the justification put forth in part a, granting this waiver request is consistent with the intent and purposes of the rule being waived. There is no location of site that is able to provide the minimum Ksat requirement of 0.5 in/hr in order to satisfy the GRV requirements of Env-Wq 1507.04(b)."

End of NHDES Alteration of Terrain GRV Waiver Request

3.) Section F Dover Performance Standards

a) Post-development Infiltrations Volumes shall be no greater than predevelopment volumes as determined by use of the Development Review Model as described in Subsection G below.

As a wavier for groundwater recharge volume is requested due to Alteration of Terrain Standards, post-development infiltration volumes infiltration volumes are not greater than the pre-development volumes, meeting the performance standard.

b) Stormwater shall be treated by the use of a stormwater treatment system designed to remove no less than 80% of the annual load of total suspended solids. The removal rate shall be accomplished using best management practices installed in advance of the final infiltration system.

Utilizing the NH Stormwater Manual Pollutant removals information, the following performance can be expected from subsurface gravel wetlands:

Subsurface Gravel Wetland:

- *Total Suspended Solids (TSS) reduction of 95%*
- *Total Nitrogen (TN) reduction of 85%*
- *Total Phosphorous (TP) reduction of 64%*

These removal efficiencies meet the performance standard.

c) No stormwater infiltration system shall be located within the 200-day travel time of an existing or proposed municipal well as depicted on the map referenced in Subsection B above. In absence of a defined 200-day-travel-time radius, the applicant shall submit a technical evaluation from a professional engineer, hydrologist or geologist that documents that the proposed discharge is consistent with the stated purposed and intent of this requirement.

As no infiltration systems are proposed on site due to NHDES Alteration of Terrain requirements, this performance standard is met.

BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry
Principal, President

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Drainage Analysis
&
Erosion and Sediment Control Plan

Prepared for:

239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

LOCATION

Proposed Mixed Use Site Plan
"Residences and Lodges at Kelly Brook"
Tibetan Drive
Tax Map H, Lot 37A
239 Knox Marsh Road, Dover, NH 03820
Previous NHDES Alteration of Terrain Permit
#: AoT-2183/AoT-2183-A

Prepared by:

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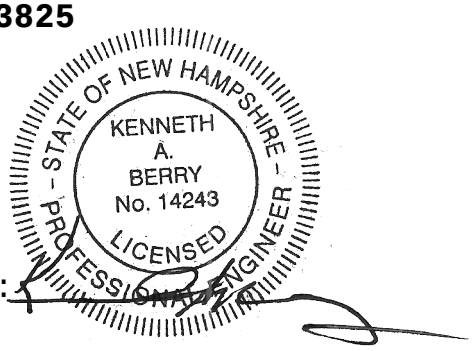

Project Number:
DB 2024-034

November 26, 2024

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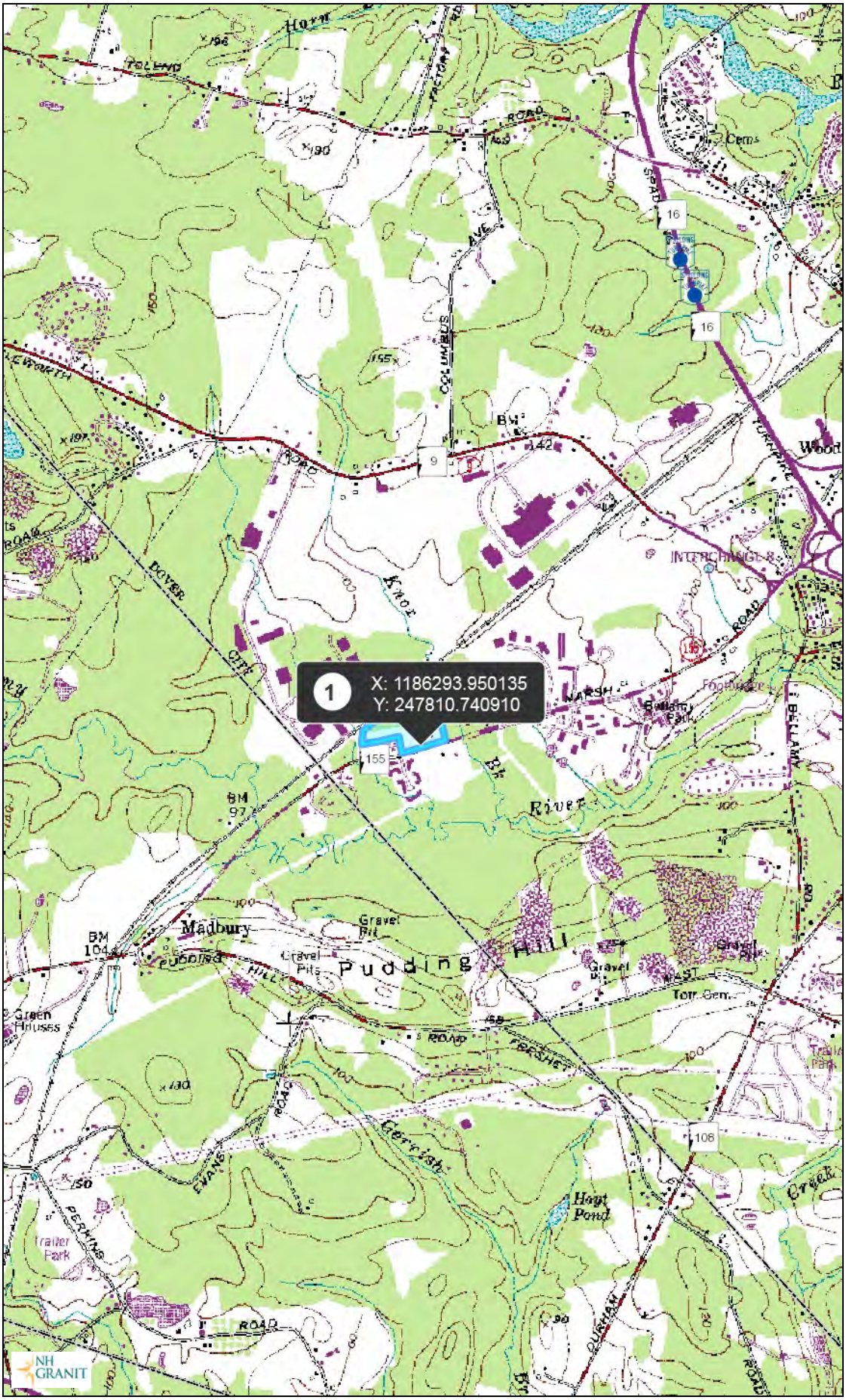
Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

1: 24,000

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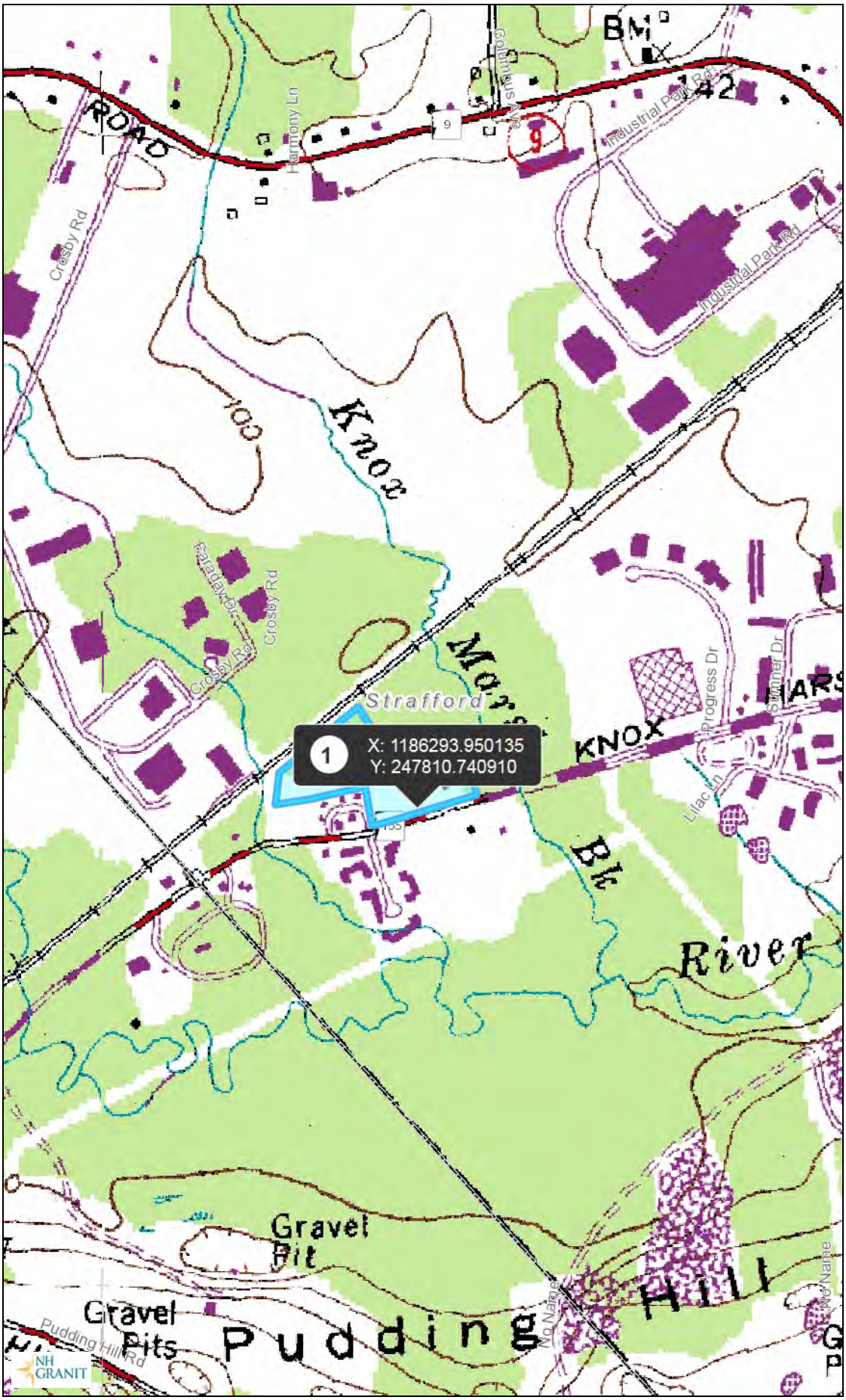
Map Generated: 12/19/2019

Notes

Map by NH GRANIT



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DESIGN METHOD OBJECTIVES

The owner / developer of Tax Map H, Lot 37A, 239 Knox Marsh Realty, LLC is proposing to develop the property at 239 Knox Marsh Road. The site was the location of a single residential structure, which has since been razed. Proposed development includes one building consisting of 84 lodging units, a road consisting of over 2,000 linear feet of roadway/circulation/parking lanes, and two buildings, each containing 90-single occupancy units.

Pre-Existing and Proposed Conditions analyses were conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate mitigation of drainage. There are three existing drainage discharge points which was identified in the existing analysis and duplicated in the proposed conditions analysis. Designing two watershed models we have compared the differences in these rates of peak run-off and surface water volume. Sheet W1, Existing Conditions Watershed Plan, outlines the characteristics of the site in its existing or pre-construction conditions. The second analysis displays the proposed (post-construction) conditions (See Sheet W2). The analysis was conducted using data for; 2 Yr – 24 Hr (3.60”), 10 Yr – 24 Hr (5.44”), 25 Yr -24 Hr (6.88”), 50 Yr – 24 Hr (8.23”), and 100 YR-24 Hr (9.84”) storm events. Storm event analysis was accomplished using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. Rainfall quantities are based on the Extreme Precipitation Table for this location from the Northeast Regional Climate Center / Cornell University (http://precip.eas.cornell.edu). As Dover is considered a part of the Coastal Region, a 15% escalation on rain fall depths has been applied to this application.

1.0 Pre-Existing Conditions Analysis:

Reference: Sheet W1 – Pre-Existing Conditions Watershed Plan (Enclosed)
Pre-Existing Conditions Plan

The parcel was previously used for residential and Christmas tree farm purposes. Since the original survey taking place in spring of 2020 multiple alterations of the site have taken place. Structures located on the parcel were razed in 2022. Clearing of the site was started in Fall of 2023 and concluded in Spring of 2024. Currently the site is cleared, leveled, and partially construction per AoT Permit #2183/#2183-A. The current conditions are shown on the Demolition Plan. The soils within the watershed are made up of multiple soil types, containing Hydrologic Soil Group (HSG) A, C & D. See Site Specific Soils Map and report for more information. The parcel consists of Windsor Variant Well Drained soils, Buxton Moderately Drained soils, and Scantic Poorly Drained soils.

The land area analyzed consists of 10.76 acres, 3.25 acres of which is offsite. The area is naturally divided into three subcatchments by existing topography. Each of the three existing subcatchments is analyzed with an individual final reach. The limit of the poorly drained jurisdictional wetlands is the limit of the drainage analysis to the north. The property sits between two separate receiving brooks with relating streams (the Kelly

Brook and Knox Marsh Brook, NHRIV600030903-08). **Final Reaches #100 & #200** below generally drain to a wetland that divides between the two streams.

Final Reach #100

Subcatchment #1 is land area in the eastern portion of the property and drains off site. **Final Reach #100** is a nonpoint reach to the north and east of the parcel, generally following the property line.

Final Reach #200

Subcatchment #2 is land area in the center portion of the property extending nearly to the edge of Knox Marsh Road and drains off site to the north. **Final Reach #200** is a nonpoint reach to the north and northeast of the parcel, along the delineated wetland line.

Final Reach #400

Subcatchment #4 is made up of a portion of Knox Marsh Road (NH Route 155) and the adjacent land extending just over the property line. Runoff flows toward a cross culvert near a southwestern corner of the parcel which flows to an inlet depression **(Pond #4)** and under Knox Marsh Road to an offsite outlet point being analyzed as **Final Reach #400**.

2.0 Proposed Conditions Analysis:

Reference: Sheet W2 - Proposed Conditions Watershed Plan (Enclosed)
Proposed Grading & Drainage Plan

The proposal for development includes one building consisting of 84 lodging units, a road consisting of over 2,000 linear feet of roadway/circulation/parking lanes, and two buildings, each containing 90-single occupancy units. The residential buildings will be referred to as "northern" or "southern" residential building. The proposal is supported by detention ponds, StormTech Chambers, and three subsurface gravel wetlands. A waiver for infiltration of the GRV had previously been approved by NHDES Alteration of Terrain due to site soil conditions. This waiver is requested again for the proposed application. Revisions to the completed construction are required as part of this application.

Final Reach #100

Subcatchment #1 is the area remaining, to the south and east of the parcel, after the proposed construction of the site plan, **Subsurface Gravel Wetland #101 (Pond #101)**, and the related discharge level spreader. Runoff still flows directly to **Final Reach #100**.

Subcatchment #11 is made up of the paved and grassed area in front of the lodging building, extending to Knox Marsh Road, and drains to **Subsurface Gravel Wetland #101** (**Pond #101P**) sediment forebay. Once runoff is treated in the gravel wetland it is directed to **Final Reach #100** through an outlet structure and level spreader.

Subcatchment #17 consists solely of the roof area of the lodging building, which is collected and drained directly into **Stormtech Detention Pond #106** (**Pond #106P**), which outlets to **Subsurface Gravel Wetland #101** (**Pond #101P)**.

Subcatchment #38 consists of grassed and paved area to the northeast of the lodging building and captured in **Catch Basin #8 (Pond #C08P)** which outlets to a sediment forebay within **Subsurface Gravel Wetland #101** (**Pond #101P)**.

Final Reach #200

Subcatchment #2 from the Existing Condition Analysis is divided into multiple subcatchments by the proposed site plan construction. The portion that remains as proposed **Subcatchment #2** is defined by the edge of the western parking lot and the outside berm of **Subsurface Gravel Wetland #103** (**Pond #103P)**. Runoff still flows directly to **Final Reach #200.**

Subcatchment #13 is the developed area to the north and west of the northern residential building, where **Subsurface Gravel Wetland #103 (Pond #103P)** is proposed to be constructed. This area consists of the grassed area of **Pond #103P** and the paved parking areas and circulation lane that flow directly into the sediment forebay of **Pond #103P**. Runoff is discharged from the pond to a level spreader and **Final Reach #200**.

Subcatchment #15 is made up of the paved land area to the north of the proposed lodging building and encompasses the grassed area of proposed **Detention Pond #105 (Pond #105P).** Runoff flows from **Pond #105** via outlet control structure and from there is directed through **Catch Basin #7 (Pond #C07P)** and **Drain Manhole #6 (Pond #D06P)** to **Pond #103P** and eventually to **Final Reach #200.** While no overflow is shown at the 100Yr-24-hour storm event, **Reaches #15 & #15A** are provided for an overflow of **Pond #105P** to **Final Reach #100**.

Subcatchment #16 consists of the paved area to the south and grassed area to the west of the southern residential building, which is routed via conveyance swale and berm to the **inlet sump #16** (**Pond #16P**). A ponding area is established by a berm to be constructed for the inlet sump. **Pond #16P** is discharged to **Pond #103P** via **Catch Basin #2** (**Pond C02P**) and **Drain Manhole #1** (**Pond D01P**).

Subcatchment #18 consists solely of the roof area of the southern residential building. Runoff is collected and routed to **Pond #105P** for detention before treatment

in **Pond #103P**. Runoff is routed **to Pond #105P** via **Catch Basin #4** (**Pond C04P**) and **Drain Manhole #4** (**Pond D04P**).

Subcatchment #19 consists solely of the roof area of the northern residential building, which is collected and drained directly into **Stormtech Detention Pond #102** (**Pond #102P**), which outlets to **Subsurface Gravel Wetland #103** (**Pond #103P)**.

Subcatchment #32 consists of the western portion of the circulation lane between the two residential buildings. Runoff is collected via **Catch Basin #2 (Pond #C02P)** and routed via **Drain Manhole #1 (Pond #D01P)** to **Pond #103P** for treatment.

Subcatchment #33 consists of the central portion of the circulation lane between the two residential buildings. Runoff is collected via **Catch Basin #3 (Pond #C03P)** and routed via **Catch Basin #2 (Pond #C02P)** and **Drain Manhole #1 (Pond #D01P)** to **Pond #103P** for treatment.

Subcatchment #34 consists of the eastern portion of the circulation lane between the two residential buildings. Runoff is collected via **Catch Basin #4 (Pond #C04P)** and routed via **Drain Manhole #4 (Pond #D04P)** to **Pond #105P** for detention prior to treatment in **Pond #103P**.

Subcatchment #35 consists of the western portion of Tibetan Drive near the second internal intersection. Runoff is collected via **Catch Basin #5 (Pond #C05P)** and routed via **Drain Manhole #4 (Pond #D04P)** to **Pond #105P** for detention prior to treatment in **Pond #103P**.

Subcatchment #36 consists of the eastern portion of Tibetan Drive near the second internal intersection. Runoff is collected via **Catch Basin #6 (Pond #C06P)** and routed via **Drain Manhole #4 (Pond #D04P)** to **Pond #105P** for detention prior to treatment in **Pond #103P**.

Subcatchment #37 consists of a portion of the circulation lane to the north of the northern residential building. Runoff is collected via **Catch Basin #7 (Pond #C07P)** and routed via **Drain Manhole #6 (Pond #D06P)** to **Pond #103P** for treatment.

Final Reach #400

Subcatchment #4 is reduced in size due to the proposed development and construction.

Subcatchment #14, consisting of a portion of the parking area in front of the southern residential building, flows to **Subsurface Gravel Wetland #104 (Pond #104)** which discharges through an outlet structure and level spreader into **Pond #4** prior to discharge through the existing NHDOT culvert and **Final Reach #400**.

Subcatchment #20 is made up of a small portion of land near the property line near the abutting development between the parcel and Route 155. Runoff is directed to a yard drain **(Pond #20P)** before it flows off the property. **Pond #20P** outlets to **Pond #4** through an underdrain pipe before flowing to **Final Reach #400.**

Subcatchment #21 consists of **Catch Basin #1 (Pond #C01P)**, receiving NH Route 155 pavement that is blocked by the proposed sidewalk/curbing and discharges to **Final Reach #400**.

Stormwater Treatment:

Treatment takes place within the subsurface gravel wetlands designed to support the development on site. Pre-treatment will be provided in the sediment forebays of the subsurface gravel wetlands as well as the isolator rows of the Stormtech detention systems. The water quality volume capability is treated within the provided treatment area of the practices, with ponds providing storage for additional stormwater treatment above the water quality volume. A Groundwater Recharge Volume waiver was approved by Alteration of Terrain for AoT#2183/#2183-A due to on-site soil conditions. This waiver is being requested again for the project. A waiver is also requested for the volumetric increase at Final Reach #400 in accordance with the Dover Site Review Regulations.

3.0 FULL COMPARATIVE ANALYSIS

ANALYSIS COMPONENT PEAK RATE DISCHARGE (Cubic Feet / Second)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	2.23	4.83	7.01	9.12	11.66
	Proposed	1.15	2.16	2.98	4.90	9.71
Final Reach #200	Existing	4.02	9.00	13.30	17.49	22.58
	Proposed	1.43	5.90	12.39	17.30	22.33
Final Reach #400	Existing	0.83	2.67	4.35	5.52	6.30
	Proposed	0.59	2.02	3.39	4.26	4.97

ANALYSIS COMPONENT VOLUME (ACRE FEET) (OVER 24 HOURS)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	0.202	0.421	0.609	0.794	1.021
	Proposed	0.167	0.335	0.552	0.758	1.019
Final Reach #200	Existing	0.592	1.269	1.862	2.448	3.171
	Proposed	0.592	1.244	1.789	2.309	2.949
Final Reach #400	Existing	0.145	0.387	0.618	0.855	1.158
	Proposed	0.181	0.437	0.718	1.001	1.356

4.0 EROSION and SEDIMENT CONTROL PLAN & BEST MANAGEMENT PRACTICES (BMP's)

Reference: Proposed Site Plans and Grading Plans
Erosion & Sediment Control Plan
Erosion & Sediment Control Details

The proposed site development is protected from erosion and the abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA). Any area disturbed by construction will be re-stabilized within 14 calendar days (**City of Dover**) and abutting properties will not be adversely affected by this development. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them. Reference is also made to the Stormwater System Management: Inspection & Maintenance Manual and included plan with attachments which has been written specifically for this project and available to the owner.

Perimeter Control (Silt Fence / Silt Soxx / Erosion Control Mix Berm)

The plan set demonstrates the location of perimeter sediment control. The Erosion and Sediment Control Details, Sheet E-101, has the specifications for installation and maintenance of the silt fence, Filtrexx mulch filled Silt Soxx (or approved equal), and Erosion Control Mix Berm. There are locations on the site, for example bio-media rain garden protection, where Silt Soxx protection is specified.

Detention Ponds

Description: Detention Ponds are also constructed ponds with the purpose of detaining runoff but not for infiltration purposes. The pond is equipped with an outlet structure and stage-discharge orifice system. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, Section 4-6, Conveyance Practices, 2. Detention Basins.

Maintenance Considerations:
Detention Ponds should be inspected at least twice annually and following any rainfall event exceeding 2.5 inches in a twenty-four hour period. Maintenance rehabilitation will be conducted as warranted by each inspection. Trash and debris will be removed at each inspection.

Any pilot channel within the detention pond and the sump in front of the primary discharge need to be maintained and kept clear of vegetated material.

Also on an annual basis the vegetation should be inspected to ensure healthy condition. Invasive species need to be removed along with dead or diseased vegetation.

Subsurface Gravel Wetland

Description: A Gravel Wetland (NHDES SWM 4-3 Treatment Practice 2D) or Subsurface Gravel Wetland consists of a forebay and multiple flow-through treatment cells. During smaller rain events, the surface water runoff is intended to pass from the forebay, into the gravel media through perforated pipes and structures where it passes through an anaerobic environment where the Water Quality Volume will have 24-72 hours of contact time. The forebay is required to contain 10% of the WQV and each of the two cell must contain 45% of the WQV. During larger storm events, the system works as a detention pond. The design of a Subsurface Gravel Wetland will be constructed in accordance with the most current version of the Design Specifications provided by the UNH Stormwater Center and SWM Volume 2, Section 4-3 Treatment Practices, 2d Gravel Wetlands.

Maintenance Considerations: The outlet configuration of the anaerobic subsurface gravel consists of a small discharge orifice that is located in a threaded cap. This goose-neck feature is designed to be disassembled to allow cleaning. This outlet orifice is located within a concrete outlet structure that also contains a control stack used to control and detain runoff in the system. Although this is designed to be "clean water" after the filtering process, the outlet structure in general is going to require periodic maintenance to ensure that it is discharging runoff properly. If the Subsurface Gravel Wetland retains runoff on the surface for more than 72 hours the performance is not correct and maintenance is required.

Debris will need to be removed from the inlet and outlet structures as well as any buildup of sediment. The surface of the ponded area is intended to have wetland plants which may require periodic replanting, depending on the sediment loading. Sediment buildup in the forebay must be removed to maintain the minimum required volume. See also 9 and 10 of the attached UNHSC Subsurface Gravel Wetland Design Specifications 2009, and / or UNHSC Subsurface Gravel Wetland Design Specifications 2016 with Maintenance Guidelines and Checklist. See also Design and Maintenance of Subsurface Gravel Wetlands, (for NHDOT) by UNHSC. (Check List, Page 24 & 25, Attached)

ADS StormTech Chamber: Detention System

Description: The StormTech Chamber System and Isolator Row are trademark products of the Advance Drainage System (ADS) company. The purchase and installation of this system will conform to ADS proprietary rights. The design engineer has specifically used the Isolator Row and StormTech Chamber specifications in the design of this installation. The design is based on the StormTech SC-740 Chambers with an Isolator Row for sediment isolation. The system is designed as a detention practice. The system has a series of perforated underdrains to collect and distribute runoff to the other structure. The volume in the washed crushed stone and in the specified chambers will act as detention in connection with the Outlet Structure discharge stack. Runoff that enters this system does so at the isolator row. P-102 contains 98 chambers in 5 rows of 14 chambers. P-106 contains 65 chambers in 5 rows of 13 chambers. The top of the outlet

structure stack is designed to pass larger storm events, with an orifice on the base of the internal stack for smaller storm events. Multiple inspection ports are located throughout the system.

Inspection: Semi-annual and severe rain storm event inspections will be conducted by a trained individual with the capability to observe the condition of the pre-treatment measures and the condition of the Isolator Row especially regarding the depth and extent of sediment buildup. The Isolator Row should initially be inspected semi-annually however this schedule may need to be adjusted based on findings, condition of the pre-treatment measures, and use of the parking facilities. See list of known qualified inspection / maintenance professionals below. The inlet structure and outlet structure must also be inspected. The inspection process requires the removal of Drain Manhole covers.

Maintenance Considerations: Sediment collected in the Isolator Row will be removed with the JetVac process, consisting of high-pressure water scouring and suction retrieval of the captured sediment and pollutants. The orifice cover plate installed to ensure that runoff is routed to the Isolator Row must be in place and if not re-installed to the original specifications. The stack in the outlet structure must be maintained to ensure that there is no buildup that prevents the proper operation of the outlet.

The stormwater practice should be dry within 72 hours of the end of a storm event.

A copy of the ADS StormTech SC-740 Chamber manual and ADS StormTech Isolator Row O&M Manual are attached.

After the system construction and before operation of the site, it is recommended that a long-term agreement for Inspection and Maintenance be established.

As for Isolator Row inspection and maintenance, Catch Basin maintenance, the regional ADS, Inc. representatives recommend using any of the following contacts:

Stormwater Compliance, LLC;
Attn: Nathan Marles, 1-877-271-9055; nmarles@lidtech.com
163 Thadeus Street, Portland, ME 04106
Info@stormwatercomp.com

Ted Berry Company;
Attn: Dave Beauchamp, 207-897-3348; david.beauchamp@tedberrycompany.com
521 Federal Road, Livermore, ME 04253
Info@tedberrycompany.com

Bellemore Septic Sewer & Drain
Attn: Ray Bellemore, 603-641-6640
raymond@bellemore.com
PO Box 10369

Bedford, NH 03110

ADS / StormTech Contact: Aaron Cheever, PE, Advance Drainage Systems, Inc.
aaron.cheever@ads-pipe.com 1-978-302-0650

Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of breaking ground. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specification and on Sheet E-102 using seeding mixture C, as follows:

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Conservation Mix

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Virginia Wild Rye	Native	FACW-
Little Bluestem	Native	FACU
Big Bluestem	Native	FAC
Red Fescue	Native	FACU
Switch Grass	Native	FAC
Partridge Pea	Native	FACU
Showy Tick Trefoil	Native	FAC
Butterfly Milkweed	Native	NI
Beggar Ticks	Native	FACW
Purple Joe Pye Weed	Native	FAC
Black Eyed Susan	Native	FACU-
Total	**25**	**0.57**

Conservation Mix will used to stabilize all 2:1 slopes and all land area disturbed within the wetland buffer. (If applicable).

Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be 3" coarse aggregate, and the pad itself constructed to a minimum length of 75' for the full width of the access road. The aggregate should be placed at least six

inches thick. A plan view and profile are shown on Sheet E-101- Erosion & Sediment Control Detail Plan. (If applicable).

Environmental Dust Control

Dust will be controlled on the site by the use of multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet E-102 using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions (If applicable).

Outlet Protection

Description: Outlet protection is typically provided at stormwater discharge conduits from structural best management practices to reduce the velocity of concentrated stormwater flows to prevent scour and minimize the potential for downstream erosion. Outlet protection is also provided where conduits discharge runoff into an in-ground stormwater management practice (e.g., pond or swale) to prevent scour where flow enters the BMP. See SWM Volume 2, 4-6.6 Conveyance Practices, Outlet Protection, page 172.

Level Spreader

Description: A level spreader is an outlet structure constructed at zero percent grade across a slope used to convert concentrated flow to "sheet flow." It disperses or "spreads" flow thinly over a receiving area, usually consisting of undisturbed, vegetated ground. The conversion of concentrated flow to shallow, sheet flow allows runoff to be discharged at non-erosive velocities onto natural ground. To stabilize the outlet, a stone berm is provided to dissipate flow energy, and help disperse flows along the length of the outlet. Level lips are not designed to remove pollutants from stormwater; however, some suspended sediment and associated phosphorous, nitrogen, metals and hydrocarbons will settle out of the runoff through settlement, filtration, infiltration, absorption, decomposition and volatilization. See SWM Volume 2, 4-6.6 Conveyance Practices, Stone Berm Level Spreader, page 162.

Maintenance Considerations: Inspect at least once annually for accumulation of sediment and debris and for signs of erosion within approach channel, spreader channel or down-slope of the spreader. Remove debris whenever observed during inspection. Remove sediment when accumulation exceeds 25% of spreader channel depth. Mow as

required by landscaping design. At a minimum, mow annually to control woody vegetation within the spreader. Snow should not be stored within or down-slope of the level spreader or its approach channel. Repair any erosion and re-grade or replace stone berm material, as warranted by inspection. Reconstruct the spreader if down-slope channelization indicates that the spreader is not level or that discharge has become concentrated, and corrections cannot be made through minor re-grading.

Rolled Erosion Control Blanket

Description: Rolled Erosion Control Blankets, such as North American Green BioNet series (or equal), consist of interlocking fiber mesh which is bio-degradable, used to stabilize sloping earth while vegetation is being established. The product comes in rolls that are laid out over the earth, normally over-lapped, and secured to the soil by the use of anchors or staples. The RECB may be anchored in the earth at the top of the slope to prevent wash-out. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 3, 4-1 Erosion Control Practices, Temporary Erosion Control Blanket. See the chart on E-102 for compatible products with given slopes.

Construction Considerations: It is recommended that the blanket be installed in the same direction as the water flow or perpendicular to the slope. The manufacturer will recommend the amount of over-lap from one row to the next and on longer slopes between sections. Care must be taken that the RECB is laid directly on the earth / topsoil and that any existing vegetation not cause tenting as this will cause an issue with the blanket not staying in place. The staples or stakes are to be placed according to the manufacturer based on the slope of the receiving soil and forces that may be encountered. Care must be taken to utilize the correct product as specified. The choice of product are all different and in most cases are not interchangeable. NHDES or NH F&G may specify that some RECBs not be used in some applications.

Maintenance Considerations: RECBs will be inspected during the regular inspection schedule and any construction corrections made if the blanket is compromised.

Stockpiled Sediment or Soil

Stockpiled materials including topsoil, excavated materials, borrow materials imported onto the site, construction aggregates, and sediment removed from temporary sediment traps will be located in designated areas at least 50 feet away form concentrated flows. All stockpiles will have erosion protection in the form of silt fence and diversion swales will be applied to protect the material and surrounding areas. Inactive stockpiles will be seeded for temporary stabilization. Erosion control measures will be inspected in accordance with the schedule for all other activities on site.

At a minimum, you must comply with following (EPA CGP 2022) "Do no hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any

stormwater conveyance (unless connected to a sediment basin, sediment trap, or similar effective control,) storm drain inlet, or surface water."

Construction Sequence

1.) Cut and remove trees in construction area only as required, relocate any project T.B.M.

2.) Construct and/or install temporary and permanent sediment erosion and detention control facilities as specified. Erosion and sediment control measures shall be installed prior to any soil land disturbance and must be reviewed and approved by the community services department.

3.) Erosion, sediment and detention control facility shall be installed & stabilized prior to directing runoff to them. Temporary diversions may be required. Post construction storm water management practices must be initiated and stabilized early in the process. Runoff must be directed to temporary practices until stormwater BMPs are stabilized.

4.) Clear, cut and dispose of debris in approved facility

5.) Construct temporary culverts as required, or directed

6.) Construct roadways for access to desired construction areas. All roads shall be stabilized immediately. See best management practices for blasting on sheet C-102.

7.) Install pipe and construction associated appurtenances as required or directed. Install stormwater BMPs. All disturbed areas shall stabilized immediately after grading.

8.) Start building construction.

9.) Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded or mulched as required, or directed. No area is allowed to be disturbed for a length of time that exceeds 45 days before being stabilized. Daily, or as required. All roadways and parking areas shall be stabilized within 72 hours of achieving finished grades. All cut and fill slopes shall be stabilized within 72 hours of achieving finished grades. Limit the length of exposure of unstabilized soil to 45 days or less.

10.) Construct temporary berms, drains ditches, silt fences, sediment traps, etc. Mulch and seed as required.

11.) Inspect and maintain all erosion and sediment control measures during construction. All SWPPP inspections must be conducted by a qualified professional such as a professional engineer (PE), a certified professional in erosion and sediment control (CPESC), a certified erosion sediment and storm water inspector (CESSWI), or a certified professional in storm water quality (CPSWQ). Inspection reports shall be

submitted to the community services department. Erosion and sediment control practices are to be inspected weekly and after 0.5" of rainfall.

12.) Complete permanent seeding and landscaping.

13.) Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete.

14.) Smooth and revegetate all disturbed areas.

15.) Finish paving all roadways.

Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.

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 shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4" of loam and seeded with not less than one pound of seed per 50 square yards of area. (see seed specifications this sheet)

4. All disturbed areas will be restabilized within 45 days. At any one time, no more than 5 acres, (217,800 Sq. Ft.) Will be disturbed.

5. Silt fences and perimeter barriers shall be inspected periodically and after every rain during the life of the project. All damaged areas shall be repaired, sediment deposits shall periodically be removed and disposed of.

6. After all disturbed areas have been stabilized, the temporary erosion and sediment control measures are to be removed and the area disturbed by the removal smoothed and re-vegetated.

7. Per the EPA CGP requirements there will be reports of the erosion control inspections IAW SWPPP prepared by BS&E. All erosion controls shall be inspected weekly and within 24 hours after 0.25" or greater rain event.

8. Ditches, swales, and basins shall be stabilized prior to directing runoff to them.

9. Do not traffic exposed soil surfaces with construction equipment. If feasible, perform excavations with equipment positioned outside the limits of the infiltration system.

10. Roadways, driveways and cut and fill slopes must be stabilized within 72 hours of achieving final grade.

11. Stabilization means:

11.1. A minimum of 85% of vegetative cover has been established.

11.2. A minimum of 3 inches of non-erosive material such as stone or rip rap has been installed, or

11.3. Erosion control blankets have been installed.

12. This project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and chapter AGR 3800 relative to invasive species.

13. The NHDES stormwater manual, in three volumes, dated December 2008, is a part of this plan set and the more restrictive will govern. (NH SWM)

Inspection and Maintenance Schedule

Fencing (if used) will be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass. Depending on SWPPP criteria, all controls will be inspected either once every 7 days and after storm events. Inspection reports must be submitted to City of Dover Engineering Department. See also Stormwater System Management: Inspection & Maintenance Manual published separately also by Berry Surveying & Engineering. See also Storm Water Pollution Prevention Plan (SWPPP) developed in accordance with EPA NPDES requirements & the City of Dover Stormwater regulations. Stabilization is required within 14 calendar days IAW Chapter 153-14, Site Development Criteria.

Corrective Action measures will be made in accordance with SWPPP requirements and records maintained on site by the Contractor.

5.0 Demonstration of Compliance with Dover Chapter 153-14

The following list of standards from chapter 153-14 are shown to demonstrate compliance with Dover stormwater regulations, starting with section 3: Design Standards. Our demonstration of compliance is *italicized* after each standard:

(3) Design standards.

(a) Minimum protections and management standards.

[1] Where applicable, all development must comply with the EPA Phase II Stormwater Rules and the City's MS4 permit, as amended.

Acknowledgement of project compliance with the EPA Phase II stormwater rules is shown in project specific notes, E&SC Notes, note #9. As the impact of the proposal is greater than one acre, a Stormwater Pollution

Prevention Plan (SWPPP) will be developed and a Notice of Intent (NOI) submitted to the EPA.

[2] Existing surface waters, including ponds, rivers, perennial and intermittent streams (natural or channelized), and wetlands (including vernal pools), shall be protected by the minimum buffer setback as specified in Chapter **170**, Zoning, § 170-27.1. Stormwater and erosion and sediment control best management practices (BMPs) shall be located outside the specified buffer zone unless otherwise approved by the Planning Board.

Please find Grading & Drainage/Watershed Plans showing stormwater BMPs locations. Conditional Use Permit approval was previously received for disturbance within the 50' wetland buffer.

[3] Low-impact development (LID) site planning and design strategies shall be used to the most extent practicable (MEP) in order to reduce the generation of the stormwater runoff volume for both new and redevelopment projects. An owner/applicant must document why LID strategies are not appropriate if not used to manage stormwater.

Please find subsurface gravel wetland designs. Reference is made to the US EPA Low Impact Development (LID) and green infrastructure resources.

[4] All proposed stormwater practices and measures shall be installed and maintained in accordance with manufacturers' specifications and performance specifications outlined in the New Hampshire Stormwater Management Manual Volume 2 (December 2008 or current revision) a copy of which can be found on the NHDES website.

Please find Inspection & Maintenance Manual included in the drainage binder. The NH Stormwater Manuals are referenced in the I & M Manual in the Introduction on Page 2.

[5] All storage facilities for fuel, chemicals, chemical or industrial wastes, and biodegradable raw materials shall meet the regulations of the NHDES, including but not limited to those involving underground storage tanks, aboveground storage tanks, hazardous waste and best management practices for groundwater protection (Part Env-Wq 401).

Please find note shown in project specific notes, E&SC Notes, note #8. Prior to construction, a stormwater pollution prevention plan will be developed in accordance with US EPA CGP 2022.

[6] Salt and other deicing materials shall be stored under cover or located such that no direct discharges to receiving waters are possible. Snow storage

areas shall be located such that no direct discharges to receiving waters are possible. See the NHDES guidance fact sheet on road salt and snow disposal.

Please find the topic Snow Storage Areas & Winter Maintenance within the Inspection & Maintenance Manual included in the drainage binder.

[7] The use of sodium-chloride-based materials for winter maintenance shall be the minimum necessary for safety. The use of sodium-chloride-based materials is discouraged within the groundwater protection districts.

Please find the topic Snow Storage Areas & Winter Maintenance within the Inspection & Maintenance Manual included in the drainage binder.

[8] Impervious surfaces for parking areas and roads shall be minimized to the extent possible.

Impervious surfaces for parking surfaces and roads are minimized to the extent practical, providing pavement only where required for the number of project parking spaces and circulation.

[9] Stormwater runoff from new impervious surfaces shall be directed to a best management practice for flow mitigation, treatment and/or infiltration.

Stormwater runoff is conveyed a series of detention basins and subsurface gravel wetlands for mitigation and treatment.

(b) Stormwater management for new development.

[1] Runoff of impervious surfaces shall be treated to provide 80% removal of total suspended solids (TSS) and 50% removal of both total nitrogen and phosphorus. Removal rates shall be determined using approved manufacturer's pollutant removal efficiency analysis or the pollutant removal efficiencies outlined in the New Hampshire Stormwater Management Manual Volume 1, Appendix E (December 2008 or current revision), a copy of which is available from the NHDES website.

Subsurface Gravel Wetland:

- *Total Suspended Solids (TSS) reduction of 95%*
- *Total Nitrogen (TN) reduction of 85%*
- *Total Phosphorous (TP) reduction of 64%*

[2] Rainfall amount shall be based on current extreme precipitation estimates obtained from the Northeast Regional Climate Center.

Extreme Precipitation Tables are included in the drainage binder and have been used for analysis.

[3] Measures shall be taken to control the post-development peak rate runoff so that it does not exceed predevelopment runoff for the two-, ten-, twenty-five- and fifty-year, twenty-four-hour storm events.

Please find comparative analysis, Section 3.3 of this document, for this demonstration at all final reaches.

[4] Measures shall be taken to control the post-development surface water runoff volume so that it does not exceed predevelopment runoff for the two-, ten-, twenty-five- and fifty-year, twenty-four-hour storm events. For sites where infiltration/recharge is limited or not practicable, the owner/applicant must demonstrate that the project will not cause or contribute to flooding or functional impairments to streets, adjacent properties, and downstream properties.

Please find comparative analysis, Section 3.3 of this document, for this demonstration of stormwater volumes. A waiver to this section has been proposed for Final Reach #400, where the peak rate of runoff is reduced from the existing condition.

[5] Infiltration rates for designing groundwater recharge practices shall be determined in accordance with Section Env-Wq 1504.14.

A waiver to Ground Water Recharge Volume was previously approved in the prior AoT Permit due to on-site soil conditions, which would be requested for this application. The waiver request is included within the drainage package.

[6] Stormwater conveyance practices shall be sized appropriately to convey the ten-year, twenty-four-hour storm event without overtopping or causing flooding on the property.

All Practices have been sized within these parameters. The grassed conveyance swales have been modeled, including ponding height, to confirm this.

[7] For large projects adding greater than or equal to 10 acres of impervious cover, or projects located in known areas of flooding concern, or specifically within areas with a 1% chance of being inundated by water in any given year, the owner/applicant shall submit a supplementary report that describes how the project will not increase the future flooding potential and complies with the AoT requirements pertaining to floodplain impacts as described in Section Env-Wq 1503.09, regardless of whether an AoT permit is required.

This standard is not applicable for this project.

[8] The design of the stormwater management systems shall take into account upstream and upgradient runoff that flows onto, over, or through the site to be developed or redeveloped and provide for this contribution of runoff.

Off-site stormwater flow has been accounted for in the project design. Please find watershed sheets within the drainage binder. It has been determined by topographic survey and on-site observations that with the exception of Final Reach #400, off-site runoff does not enter onto the locus parcel.

[9] Seasonal high-water table elevations must be accounted for in all BMP design criteria.

The seasonal high-water table elevations are shown in the test pit data.

[10] Access for maintenance of stormwater facilities must be included as part of the design, where necessary. Access easements may be required.

All practices have been designed to be maintained and located in open or paved areas. See the appropriate sections of the Inspection and Maintenance Manual for specified maintenance activity.

[11] Plantings in treatment areas shall be native grasses, shrubs and/or other native plants in sufficient numbers and density to prevent soil erosion and to achieve water-quality treatment.

See Section 4.0 Vegetative Stabilization, of this narrative, for BMP plantings and stabilization seeding descriptions. The applicant is following USDA NRCS seeding recommendations.

(c) Stormwater management for redevelopment. In order to determine the stormwater requirements for redevelopment projects, the percentage of the site covered by existing impervious areas must be calculated. Stormwater requirements for redevelopment will vary based upon the amount of site surface area that is covered by existing impervious surfaces.

[1] For sites meeting the definition of a redevelopment project and having less than 40% existing impervious surface coverage, the stormwater management requirements will be the same as new development projects, with the important distinction that the applicant can meet those requirements either on site or at an approved off-site location (i.e., off-site mitigation). The applicant must satisfactorily demonstrate that impervious area reduction, LID strategies and BMPs have been implemented on site to the MEP.

This standard is not applicable.

[2] For sites meeting the definition of a redevelopment project and having more than 40% existing impervious surface coverage, stormwater shall be managed in accordance with one or more of the following techniques, listed in order of preference:

This standard is not applicable for this project.

[a] Implement measures on site that result in mitigation and treatment of at least 30% of the existing impervious cover as well as 50% of the additional proposed impervious surfaces and pavement areas through the application of LID; or

[b] Implement other LID techniques on site to the MEP to provide mitigation and treatment for at least 50% of the entire site area.

This standard is not applicable for this project.

[3] The owner/applicant may utilize off-site mitigation to meet the redevelopment requirements when the following standards have been met:

This standard is not applicable for this project.

[a] The owner/applicant shall demonstrate, to the satisfaction of the Planning Board, that on-site treatment has been implemented to the MEP.

[b] The owner/applicant shall find an approved, off-site location within the same watershed as the project site or within the drainage area of the same receiving water body.

[c] Off-site mitigation shall be equivalent to no less than the total area of impervious cover not treated on site.

[d] The owner/applicant shall submit a full design of the proposed off-site measures for review and approval.

[e] The owner/applicant must also demonstrate that there is no downstream drainage or flooding impact as a result of not providing on-site management.

(d) Erosion control standards during construction. The following standards shall be applied in project planning and shall be implemented prior to and during construction activity:

[1] All proposed measures shall meet, at a minimum, the design standards for best management practices set forth in the New Hampshire Stormwater Management Manual Volume 3 (December 2008 or current revision), a copy of which is available from the NHDES website.

See Inspection & Maintenance Manual and note is shown in project specific notes, E&SC Notes, note #10A.

[2] When a project requires a stormwater permit from the EPA Construction General Permit (CGP) Program, copies of the stormwater pollution prevention plan (SWPPP) inspections shall be provided to the Community Services Department.

Copies will be provided when developed and published prior to NOI submittal and construction. Note is shown in project specific notes, E&SC Notes, note #10G.

[3] Stripping of vegetation shall be done in a manner that minimizes soil erosion. Whenever practical, natural vegetation shall be retained, protected, or supplemented.

There is to be no disturbance outside of the limit of construction. Erosion & sediment control measures are to be in place prior to the start of land grubbing. Note is shown in project specific notes, E&SC Notes, note #10B.

[4] The area of land disturbance shall be kept to a minimum and be limited to an area only large enough to accommodate construction activities for a particular construction phase.

This project phasing plan is to be followed and is shown as sheet #7 in the plan set.

[5] Off-site surface water and runoff from undisturbed areas shall be diverted away from disturbed areas where feasible, or measures to convey stormwater through the project area without causing erosion of sediment must be included. Integrity of downstream drainage systems shall be maintained.

Please find Erosion & Sediment Control Plans, sheets #27 & 28.

[6] Appropriate erosion and sediment control measures shall be installed prior to any soil land disturbance and must be reviewed and approved by the Community Services Department.

Note is shown in project specific notes, E&SC Notes, note #10B.

[7] Perimeter site controls shall not be placed within wetland areas, stream channels or wetland buffers.

No perimeter controls are shown within wetland areas or stream channels. Previous Conditional Use Approval was obtained for the wetland buffer impact areas.

[8] Disturbed soil areas shall be either temporarily or permanently stabilized. In areas where final grading has not occurred, temporary stabilization measures should be in place within seven calendar days for exposed soil areas that are within 100 feet of a surface water body or a wetland and no more than 14 calendar days for all other areas. Permanent stabilization should be in place within three calendar days following completion of final grading of exposed soil areas.

Note is shown in project specific notes, E&SC Notes, note #10C.

[9] All temporary erosion and sediment control measures shall be maintained in functioning condition until final site stabilization is accomplished. A proposed BMP inspection schedule shall be included in the submittal.

Note is shown in project specific notes, E&SC Notes, note #10D, and Inspection & Maintenance Manual.

[10] Additional temporary stabilization for the winter season consistent with NHDES guidelines shall be in place for disturbed areas that are not permanently stabilized by October 1, or at the discretion of the Community Services Department.

Please find winter stabilization note E22, sheet E-102.

[11] Special stabilization details shall be provided with the submission for any land disturbance on slopes equal to or steeper than 3:1.

Please find Rolled Erosion Control Blanket (RECB) Slope Stabilization Detail E21, sheet E-102.

[12] All temporary erosion and sediment control measures shall be removed after final site stabilization. Trapped sediment and other disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized within 30 calendar days unless conditions dictate otherwise.

Note is shown in project specific notes, E&SC Notes, note #10D, and find Inspection & Maintenance Manual containing this statement.

[13] For projects proposing to disturb and expose soils in areas of 10 acres or more at one time, a temporary (or permanent) sediment basin must be provided with storage for a calculated volume of runoff from a drainage area from a two-year, twenty-four-hour storm, or equivalent control measures, where

attainable, until final stabilization of the site. Alternatively, the sediment basin can be sized to provide 3,600 cubic feet of storage per acre of drainage area until final stabilization of the site. In determining appropriate locations and number of sediment basins needed, the operators may consider such factors as erodibility of site soils, slope lengths, available area on site, construction period and other unique site considerations.

This standard is not applicable for this project.

[14] Use of temporary sediment basins should avoid any additional vegetation clearing or site land disturbance not otherwise needed for post-construction. Sediment basin locations must be reviewed by the Community Services Department prior to construction and must consider the potential for off-site impacts, including public safety, especially as it relates to sediment movement and/or sediment basin failure, and alternative sediment controls must be used where site limitations preclude a safe design.

The limit of construction is not to be expanded beyond the staked construction limits. Note is shown in project specific notes, E&SC Notes, note #7.

(e) Installation and construction inspections. The owner/applicant shall be responsible for inspection requirements as follow:

[1] The Community Services Department or its designated agent shall have access to the site to complete routine inspections.

The applicant acknowledges this standard. Note is shown in project specific notes, E&SC Notes, note #10E.

[2] The Community Services Department shall be notified 24 hours prior to installation of a stormwater BMP in order to schedule an inspection. These inspections shall be completed during normal working hours.

Note is shown in project specific notes, E&SC Notes, note #10E.

[3] The Planning Board or Community Services Department may require the design engineer and/or an independent third party to provide inspection and oversight of the construction of the stormwater management facilities and erosion and sediment control measures at its discretion. Such oversight may be especially important for implementing techniques such as porous pavement or subsurface stormwater infiltration systems. The owner/applicant shall be responsible for all fees associated with third-party inspections.

Note is shown in project specific notes, E&SC Notes, note #10F.

[4] All SWPPP inspections must be conducted by a qualified professional such as a professional engineer (PE), a certified professional in erosion and sediment control (CPESC), a certified erosion sediment and stormwater inspector (CESSWI), or a certified professional in stormwater quality (CPSWQ). Inspection reports shall be submitted to the Community Services Department.

Note is shown in project specific notes, E&SC Notes, note #10G.

[5] The owner is ultimately responsible for the installation, construction, inspection, and disposition of all stormwater management and erosion control measures required by the provisions of these regulations.

Note is shown in project specific notes, E&SC Notes, note #10H.

(f) Stormwater management plan (SWMP) submittal requirements. At the discretion of the Planning Board or Community Services Department, a technical review by an independent third party may be required of any SWMP prepared under these regulations. Such a review shall be performed by a qualified professional consultant and the expense of which shall be the full responsibility of the owner/applicant.

Much of the standards required in the Stormwater Management Plan (SWMP) are already covered in the Erosion & Sediment Control Plan in Section 4 above. Some items are already covered in the Stormwater System Management: Inspection and Maintenance Manual which is an attached document. The Stormwater Pollution Prevention Plan, as required by the US EPA CGP must be prepared prior to the submittal of a Notice of Intent which is required for this project as it exceeds one-acre in area of disturbance. Note is shown in project specific notes, E&SC Notes, note #9.

[1] For projects requiring minimum protection standards, a plan including the following information shall be submitted:

[a] Description of erosion and sediment control measures as well as sequence for final stabilization of the project site.

Please find Erosion & Sediment Control Plan Section 4 of this document, specifically section 4.0.

[b] Proposed changes in impervious cover areas and any changes in pre- and post-development drainage patterns.

Please find W1 Pre-Existing watershed and W2 Proposed watershed plans within the drainage binder. This is covered in detail in Section 1 and Section 2 of this document.

[c] Description of LID proposed measures.

Please see Section 4.0 of this drainage narrative. Low impact development measures include the implementation of subsurface gravel wetlands for treatment.

[2] For projects requiring new development or redevelopment standards, a drainage report that contains the following items shall be submitted:

[a] Description of construction period and earth movement schedule, including anticipated project start and completion dates, sequence and duration of grading and construction activities, sequence and timing of installation and/or application of soil erosion and sediment control measures as well as sequence for final stabilization of the project site.

Please find Section 4.0 in this drainage narrative containing the construction sequence.

[b] Description of the on-site and adjacent wetlands, streams and other water resources, including methods used to identify these resources, and a description of any buffer setbacks that may apply, steep slopes, critical habitat, existing vegetation, areas with a 1% chance of being inundated by water in any given year, and whether any downstream water bodies are listed as impaired according to NHDES's most recent 303(d) list.

Please find Pre-Existing Conditions Plan. There is no flood zone or steep slope on site. A wetland has been identified in the northern portion of the site with a 50' buffer provided. A Conditional Use Permit was previously approved for disturbance within the wetland buffer.

[c] Soils information for proposed disturbed areas shall be delineated by a certified soil scientist. For all other areas that contribute runoff to the project site, soil types may be identified in accordance with Natural Resources Conservation Service (NRCS) countywide soil survey.

Please find Site Specific Soils Survey (sheet #6) and W-1 Pre-Existing Watershed Plans.

[d] Description of existing drainage patterns, receiving water bodies or drainage infrastructure and soil types for recharge potential.

Please find W-1 Pre-Existing Watershed Plan, Site Specific Soils Survey (sheet #6).

[e] Watershed area limits, including any off-site and upstream areas contributing flow to shared drainage channels and/or infrastructure.

Please find W-1 Pre-Existing Watershed Plan & W-2 Proposed Watershed Plan within the drainage binder.

[f] Description of proposed changes in impervious cover areas and any changes in pre- and post-development drainage patterns.

Please find sections 1.0 and 2.0 of this narrative as well as W-1 Pre-Existing Watershed Plan, Existing Drainage Analysis, W-2 Proposed Watershed Plan & Proposed Drainage Analysis. The pre-existing impervious area and proposed impervious area are documented on the Site Plan.

[g] Methods and assumptions used to calculate pre- and post-development runoff volume, peak discharge, and discharge velocity for the specified design storm events.

Please find Section 1.0 & 2.0 of this drainage narrative discussing the Pre-existing and proposed development conditions.

[h] Methods and assumptions used to calculate the pollutant load removal.

Subsurface Gravel Wetland:

- *Total Suspended Solids (TSS) reduction of 95%*
- *Total Nitrogen (TN) reduction of 85%*
- *Total Phosphorous (TP) reduction of 64%*

[i] Description of LID measures that are proposed to limit the development footprint, preserve existing vegetation and mimic existing hydrology to the extent feasible.

Please find Section 4.0 of this drainage narrative describing stormwater BMPs used for the design. Low impact development measures include the implementation of subsurface gravel wetlands and detention ponds.

[j] If not used, provide rationale why LID measures are not practical for the site.

Subsurface gravel wetlands are proposed on site and qualify as low impact development.

[k] Describe measures and calculations for proposed practices used to achieve no net increase in runoff volumes leaving the site.

Please find comparative analysis demonstrating the 2-100YR 24Hr storm events, Section 3.1. The descriptions of subcatchments, ponds, and final Reaches are in Section 2. A waiver has been requested for volume at Final Reach #400. See waiver request for justification.

[l] Provide calculations for the infiltration or exfiltration system.

A waiver was previously approved for groundwater recharge volume on site for the Alteration of Terrain Permit and will be applied for again. Waiver is attached in the drainage binder.

[m] If an increase in post-development runoff volume is anticipated due to limited applicability for LID measures and site constraints, provide an assessment and supporting calculations to demonstrate no adverse impacts to downstream infrastructure, adjacent properties or aquatic habitat.

Please find wavier request attached with the Site Plan submission for justification of the stormwater volume increase at Final Reach #400.

[n] Descriptions, details, and design criteria and calculations for all structural, nonstructural, permanent, and temporary erosion and sedimentation control measures and BMPs. This information should include seeding mixtures and rates, types of sod, methods of seedbed preparation, expected seeding dates (or limitations on seeding time frames), type and rate of lime and fertilizer application, and type and quantity of mulching for temporary and permanent control facilities.

Please find section 4.0 of this narrative, the Inspection & Maintenance Manual and Plan, as well as the Erosion & Sediment Control Plan. Type and rate of lime and fertilizer will be determined on site by testing the topsoil for requirements.

[o] Where proposed changes are anticipated within mapped limits of the areas with a 1% chance of being inundated by water in any given year, provide hydrologic and hydraulic analysis to show no net increase in flood elevations.

There is no disturbance proposed within any flood zones.

[p] Proposed schedule for the inspection and maintenance of all erosion control measures on site prior to achieving final site stabilization.

Please find Section 4.0 of this document, and the Stormwater System Operation: Inspection & Maintenance Manual. EPA and NHDES will require an inspection every 7 days and after a storm event greater than 0.25".

[q] Describe procedures for removing temporary erosion control measures and removal of accumulated sediment captured by such measures.

The maintenance requirements for each erosion and sediment control method are detailed within the Construction Detail on Sheets E-101 and E-102

[r] Any other specific study, calculation, or investigation as requested by the City.

No additional studies or investigations have been requested at this time.

[s] Describe procedures to limit and/or optimize the use of deicing materials and minimize off-site increases in chloride levels in adjacent surface water and groundwater.

Please find Inspection & Maintenance Manual.

[t] Provide a maintenance and inspection plan for post-construction monitoring of stormwater BMPs to ensure long-term performance and functionality, including details of who will be responsible for inspections and maintenance, proposed schedule, documentation, submittal procedures and contingency plans if future maintenance is required.

Please find Inspection & Maintenance Manual and plan.

[u] Provide copies of pertinent state and federal permits.

Copies of all state and federal permits will be provided when received.

(g) Long-term operation and maintenance. The owner shall be responsible for continued inspection and maintenance requirements.

[1] An operation and maintenance manual shall be created with the following information:

[a] The names of the responsible qualified professionals who will implement the required reporting, inspections, and maintenance activities.

Please find Inspection & Maintenance Manual.

[b] An inspection checklist, identifying item or BMP, inspection frequency, and components to be inspected. The list shall clearly outline performance thresholds and triggers for maintenance.

Please find Inspection & Maintenance Manual.

[c] Snow and ice removal shall be performed by a contractor certified by the "Green SnoPro" Program, or approved equivalent, following best management practices for the application of deicing materials.

Please find Inspection & Maintenance Manual.

[d] Deicing log to track amount and type of deicing material applied.

Please find Inspection & Maintenance Manual.

[e] A site plan clearly identifying the locations of all stormwater practices to be inspected and maintained.

Please find Inspection & Maintenance Plans within the drainage binder.

[f] Inspection and maintenance log to be submitted to the City of Dover Community Services Department on an annual basis. Documents shall be submitted no later than December 15 of each year.

Please find Inspection & Maintenance Manual.

[2] The owner of record shall record at the Registry of Deeds documentation sufficient to provide notice to all persons that may acquire any property subject to the requirements and responsibilities described in the approved stormwater management plan. The notice shall comply with the applicable requirements for recording contained in RSA 477 and 478. The notice need not set forth the requirements at length, so long as it is sufficient to provide notice to prospective purchasers of the requirements for maintenance and reporting.

Please find note #29 of project specific notes, sheet #2.

6.0 CONCLUSION

At all five storm events, peak rates of runoff are modeled to be reduced in the proposed analysis, as compared to the pre-existing peak rates of discharge at all three Final Reaches. A waiver to GRV has been requested. A waiver has been requested for the volumetric increase at Final Reach #400. All stormwater discharged from the site is in the form of surface water.

The volume of stormwater discharge from the site at the final reach is minimally increased at the two-year event due to the construction of the proposed building and paved area. The 2Yr.-24Hr. peak rate of runoff is less than 2CFS from the developed area, allowed by Env-Wq 1507.05(b)(1)(b) for Channel Protection Volume purposes.

A Site Specific, Terrain Alteration Permit (RSA 485: A-17) is required for this site plan due to the area of disturbance being greater than 100,000 SF. The impact is approximately 300,250 square feet (2 phases), so that an EPA Notice of Intent will be required to be filed prior to construction and a Stormwater Pollution Prevention Plan prepared.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

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Appendix I –Existing Conditions Analysis

25 Yr - 24 Hr. Full Summary
2 Yr - 24 Hr. Node Listing
10 Yr -24 Hr. Node Listing
25 Yr -24 Hr. Node Listing
50 Yr - 24 Hr. Node Listing
100 Yr -24 Hr. Node Listing

SOILS LEGEND

Site Specific Soils

Symbol	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wf	A,B,C	Windsor Variant	C
Bz	A,B,C	Buxton	C
Sc	A,B	Scantic	D

NRCS Soils

Symbol	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd	A	Windsor Loamy Sand	A
Wf	B	Windsor Loamy Sand	A
Bz	A	Buxton Silt Loam	C
Sc	A	Suffield Silt Loam	D

Slopes: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25- 50% F = 50%+

Denominators: /ED = Excessively Drained /MWD = Moderately Well Drained /SPD = Somewhat Poorly Drained /P = Poorly Drained /VP = Very Poorly Drained /Rk = Rocky

STATE OF NEW HAMPSHIRE · DEIDRA L. BENJAMIN · No. 295 · CERTIFIED WETLAND SCIENTIST

DEIDRA BENJAMIN, CWS #295

STATE OF NEW HAMPSHIRE · JOHN P. HAYES, III · CWS 18 · CERTIFIED WETLAND SCIENTIST

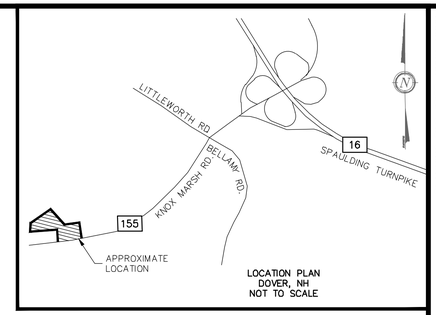
JOHN P. HAYES III, CSS #87

JURISDICTIONAL WETLANDS WERE DELINEATED BY DEIDRA BENJAMIN, CWS, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

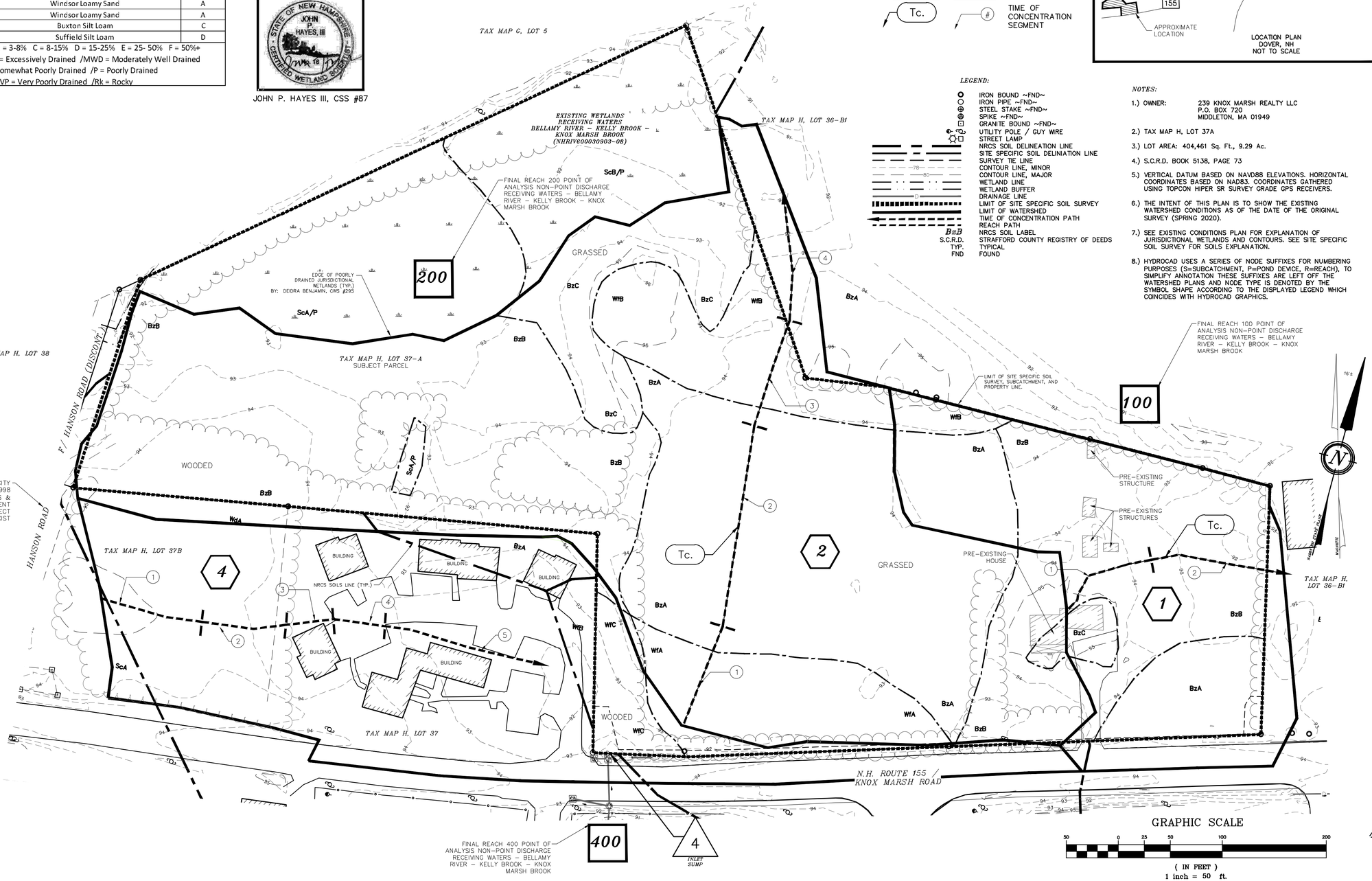
1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST: LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014–41:1–42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y–87–1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR–12–1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS–79/31.

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL
FLOW REACH SYMBOL
POND DEVICE SYMBOL
TIME OF CONCENTRATION SEGMENT



LOCATION PLAN
DOVER, NH
NOT TO SCALE



LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- STEEL STAKE ~FND~
- SPIKE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- STREET LAMP
- NRCS SOIL DELINEATION LINE
- SITE SPECIFIC SOIL DELINIATION LINE
- SURVEY TIE LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- WETLAND BUFFER
- DRAINAGE LINE
- LIMIT OF SITE SPECIFIC SOIL SURVEY
- LIMIT OF WATERSHED
- TIME OF CONCENTRATION PATH
- REACH PATH
- BzB — NRCS SOIL LABEL
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 404,461 Sq. Ft., 9.29 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING WATERSHED CONDITIONS AS OF THE DATE OF THE ORIGINAL SURVEY (SPRING 2020).

7.) SEE EXISTING CONDITIONS PLAN FOR EXPLANATION OF JURISDICTIONAL WETLANDS AND CONTOURS. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION.

8.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

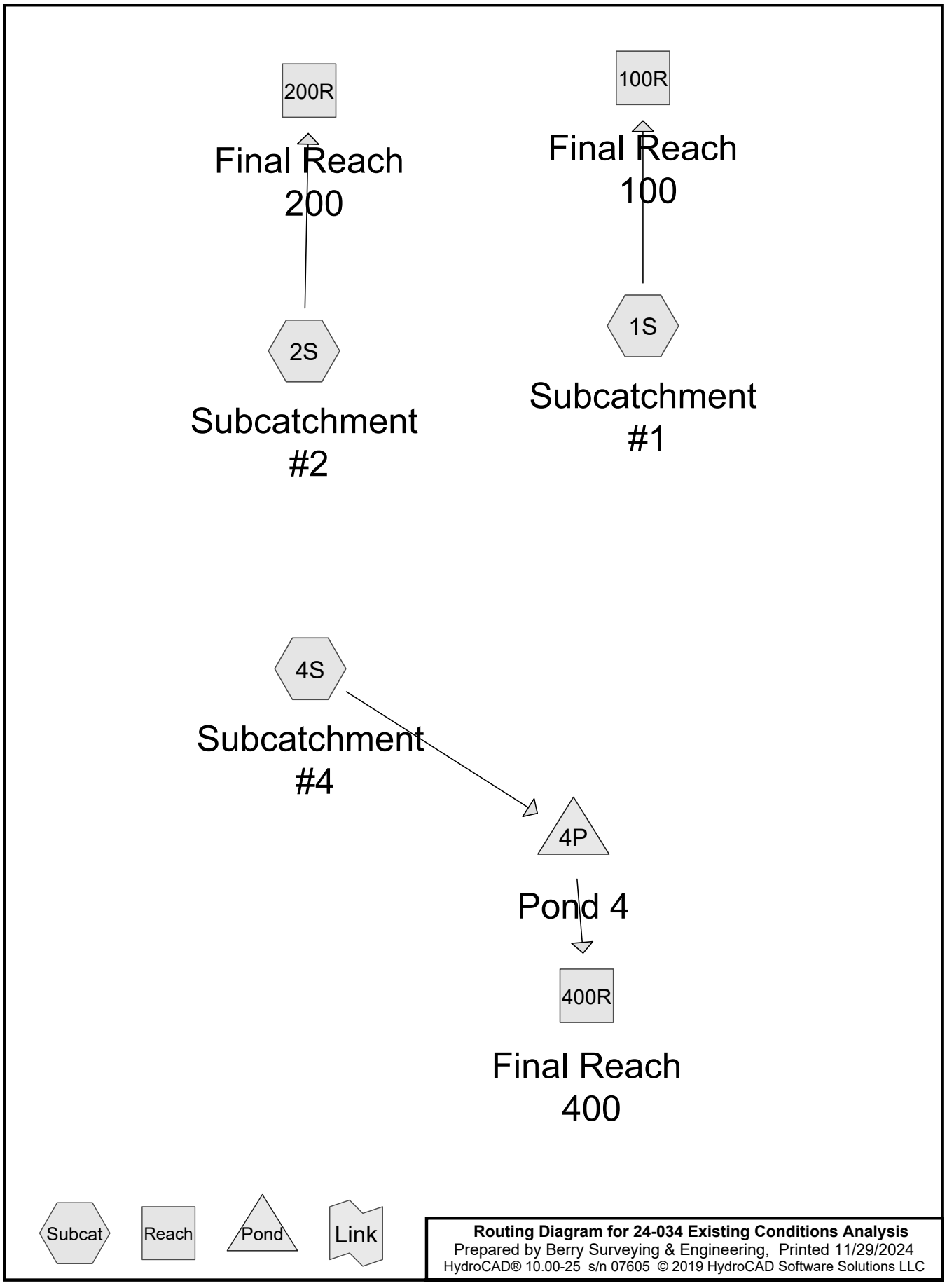
SWPPP EPA SITE MAP (PRE–EXISTING)
W–1 PRE–EXISTING WATERSHED PLAN

LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE · KENNETH A. BERRY · No. 14414 · LICENSED PROFESSIONAL ENGINEER



Routing Diagram for 24-034 Existing Conditions Analysis
Prepared by Berry Surveying & Engineering, Printed 11/29/2024
HydroCAD® 10.00-25 s/n 07605 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.837	39	>75% Grass cover, Good, HSG A (1S, 2S, 4S)
3.656	74	>75% Grass cover, Good, HSG C (1S, 2S, 4S)
0.036	80	>75% Grass cover, Good, HSG D (2S, 4S)
0.722	98	Paved parking, HSG A (1S, 4S)
0.091	98	Paved parking, HSG C (1S, 2S)
0.186	98	Roofs, HSG A (4S)
0.123	98	Roofs, HSG C (1S, 2S, 4S)
0.800	30	Woods, Good, HSG A (2S, 4S)
1.605	70	Woods, Good, HSG C (1S, 2S, 4S)
0.043	77	Woods, Good, HSG D (4S)
2.662	72	Woods/grass comb., Good, HSG C (1S, 2S)
10.762	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.545	HSG A	1S, 2S, 4S
0.000	HSG B	
8.138	HSG C	1S, 2S, 4S
0.079	HSG D	2S, 4S
0.000	Other	
10.762		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.837	0.000	3.656	0.036	0.000	4.529	>75% Grass cover, Good	1S, 2S, 4S
0.722	0.000	0.091	0.000	0.000	0.813	Paved parking	1S, 2S, 4S
0.186	0.000	0.123	0.000	0.000	0.309	Roofs	1S, 2S, 4S
0.800	0.000	1.605	0.043	0.000	2.449	Woods, Good	1S, 2S, 4S
0.000	0.000	2.662	0.000	0.000	2.662	Woods/grass comb., Good	1S, 2S
2.545	**0.000**	**8.138**	**0.079**	**0.000**	**10.762**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	4P	89.38	88.92	46.0	0.0100	0.024	15.0	0.0	0.0

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

Subcatchment 1S: Subcatchment #1 Runoff Area=81,039 sf 6.80% Impervious Runoff Depth>3.93"
Flow Length=230' Tc=12.0 min CN=74 Runoff=7.01 cfs 0.609 af

Subcatchment 2S: Subcatchment #2 Runoff Area=263,231 sf 0.62% Impervious Runoff Depth>3.70"
Flow Length=300' Tc=38.1 min CN=72 Runoff=13.30 cfs 1.862 af

Subcatchment 4S: Subcatchment #4 Runoff Area=124,509 sf 33.49% Impervious Runoff Depth>2.59"
Flow Length=431' Tc=35.4 min CN=61 Runoff=4.44 cfs 0.618 af

Reach 100R: Final Reach 100 Inflow=7.01 cfs 0.609 af
Outflow=7.01 cfs 0.609 af

Reach 200R: Final Reach 200 Inflow=13.30 cfs 1.862 af
Outflow=13.30 cfs 1.862 af

Reach 400R: Final Reach 400 Inflow=4.35 cfs 0.618 af
Outflow=4.35 cfs 0.618 af

Pond 4P: Pond 4 Peak Elev=91.17' Storage=196 cf Inflow=4.44 cfs 0.618 af
15.0" Round Culvert n=0.024 L=46.0' S=0.0100 '/' Outflow=4.35 cfs 0.618 af

Total Runoff Area = 10.762 ac Runoff Volume = 3.089 af Average Runoff Depth = 3.44"
89.58% Pervious = 9.640 ac 10.42% Impervious = 1.122 ac

Summary for Subcatchment 1S: Subcatchment #1

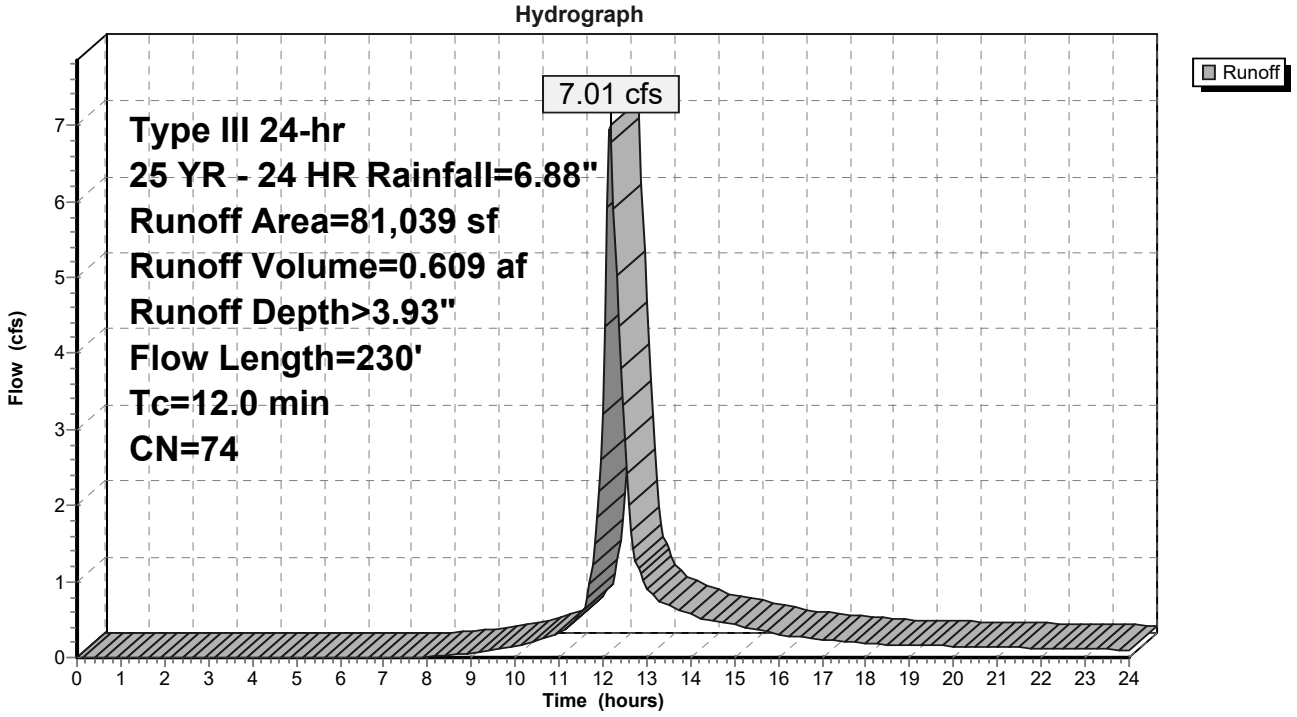
Runoff = 7.01 cfs @ 12.17 hrs, Volume= 0.609 af, Depth> 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
1,532	98	Roofs, HSG C
32,685	74	>75% Grass cover, Good, HSG C
3,645	98	Paved parking, HSG C
6,003	70	Woods, Good, HSG C
36,697	72	Woods/grass comb., Good, HSG C
140	39	>75% Grass cover, Good, HSG A
337	98	Paved parking, HSG A
81,039	74	Weighted Average
75,525		93.20% Pervious Area
5,514		6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0215	0.19		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.62"
3.1	130	0.0101	0.70		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
12.0	230	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

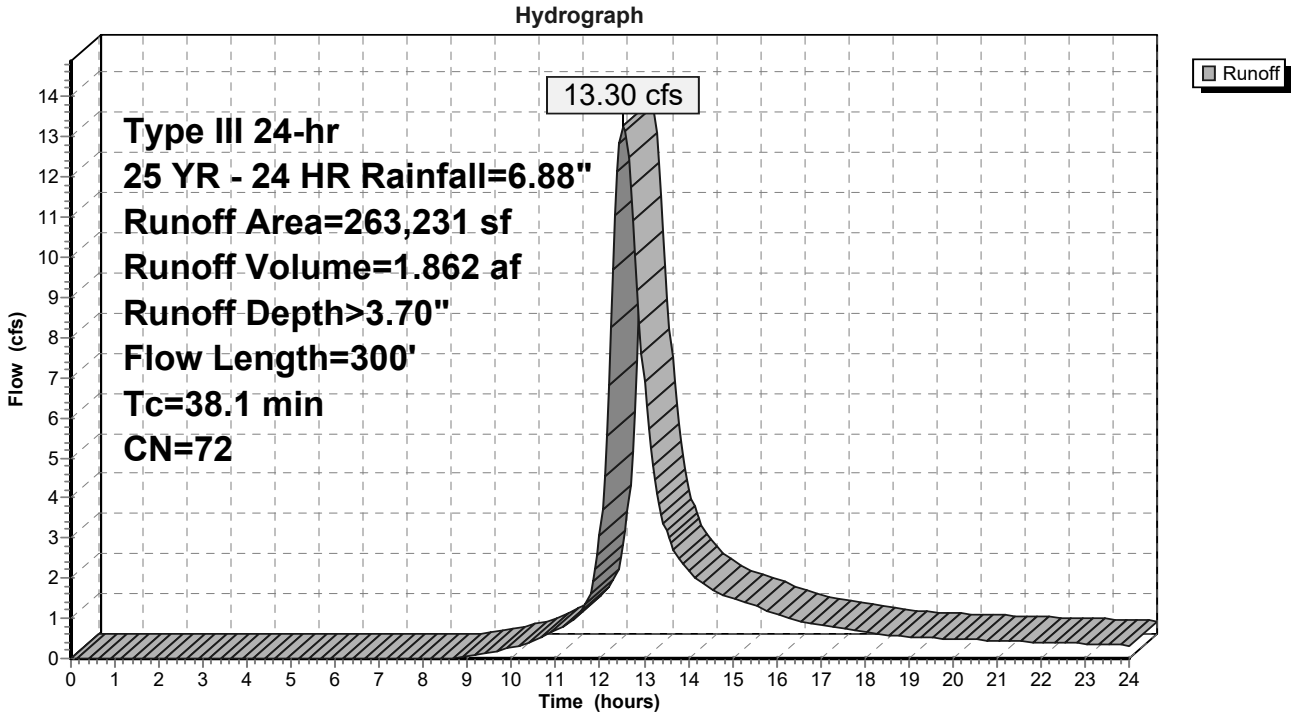
Runoff = 13.30 cfs @ 12.53 hrs, Volume= 1.862 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

	Area (sf)	CN	Description
*	1,307	98	Roofs, HSG C
*	51,801	74	>75% Grass cover, Good, HSG C
*	338	98	Paved parking, HSG C
*	21,772	70	Woods, Good, HSG C
*	79,263	72	Woods/grass comb., Good, HSG C
*	1,330	80	>75% Grass cover, Good, HSG D
	1,315	39	>75% Grass cover, Good, HSG A
	4,054	30	Woods, Good, HSG A
	69,204	74	>75% Grass cover, Good, HSG C
	32,847	70	Woods, Good, HSG C
	263,231	72	Weighted Average
	261,586		99.38% Pervious Area
	1,645		0.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.7	100	0.0065	0.05		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.62"
3.9	82	0.0049	0.35		**Shallow Concentrated Flow, Segment #3** Woodland Kv= 5.0 fps
2.5	118	0.0122	0.77		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
38.1	300	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 4S: Subcatchment #4

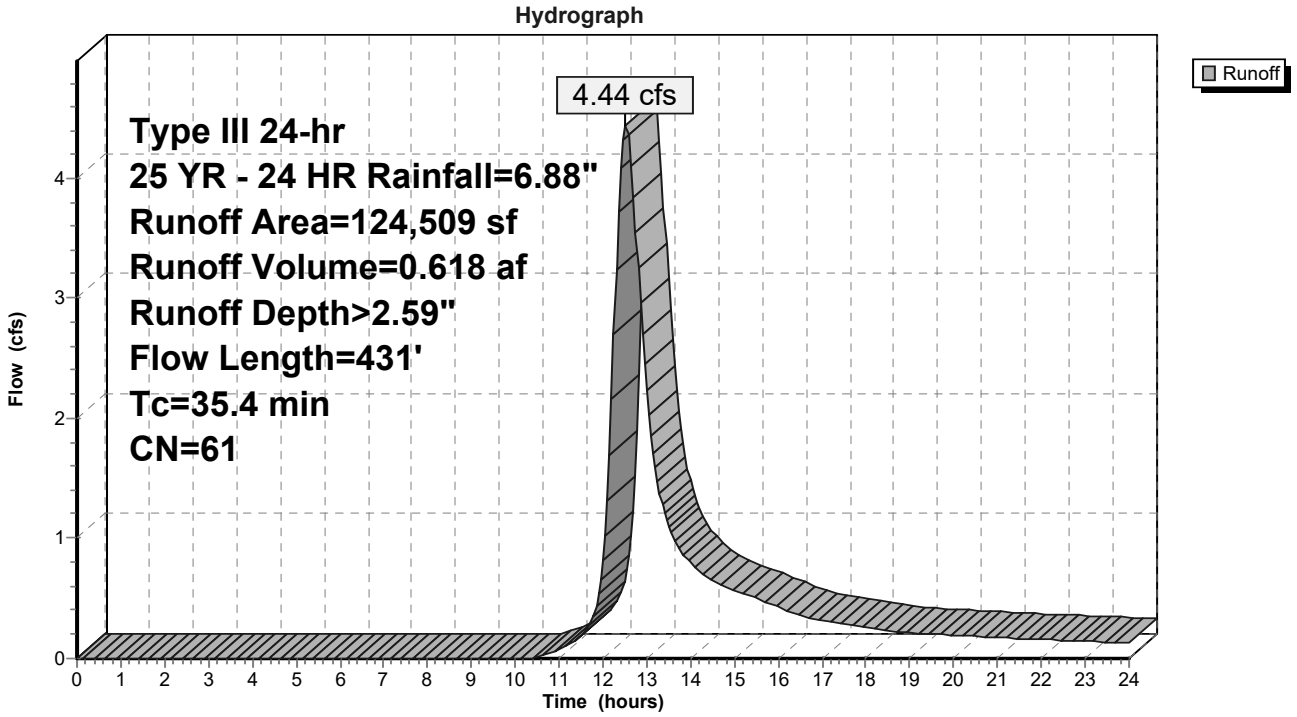
Runoff = 4.44 cfs @ 12.52 hrs, Volume= 0.618 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
8,104	98	Roofs, HSG A
31,095	98	Paved parking, HSG A
34,998	39	>75% Grass cover, Good, HSG A
30,806	30	Woods, Good, HSG A
2,499	98	Roofs, HSG C
5,578	74	>75% Grass cover, Good, HSG C
247	80	>75% Grass cover, Good, HSG D
9,302	70	Woods, Good, HSG C
1,880	77	Woods, Good, HSG D
124,509	61	Weighted Average
82,811		66.51% Pervious Area
41,698		33.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.6	100	0.0100	0.06		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.62"
2.7	81	0.0100	0.50		**Shallow Concentrated Flow, Segment 2** Woodland Kv= 5.0 fps
1.1	48	0.0100	0.70		**Shallow Concentrated Flow, Segment 3** Short Grass Pasture Kv= 7.0 fps
0.6	49	0.0050	1.44		**Shallow Concentrated Flow, Segment 4** Paved Kv= 20.3 fps
4.4	153	0.0070	0.59		**Shallow Concentrated Flow, Segment 5** Short Grass Pasture Kv= 7.0 fps
35.4	431	Total			

Subcatchment 4S: Subcatchment #4



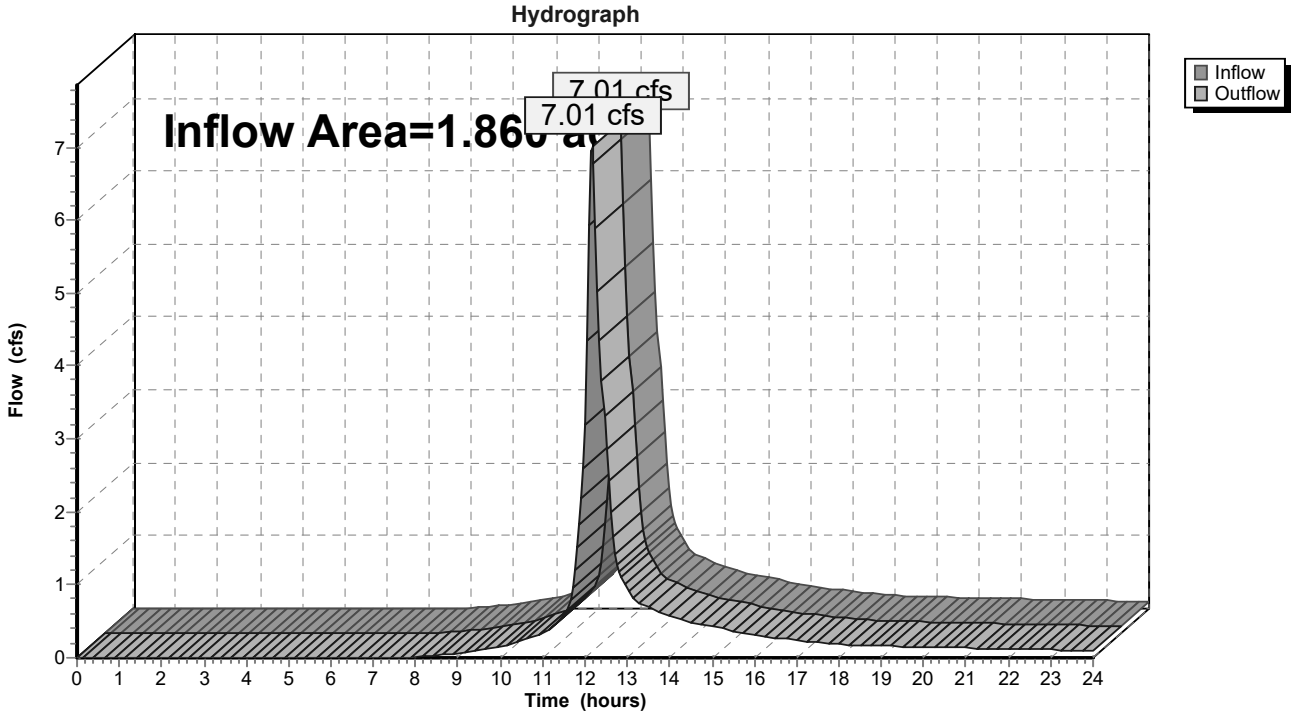
Summary for Reach 100R: Final Reach 100

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

Inflow Area = 1.860 ac, 6.80% Impervious, Inflow Depth > 3.93" for 25 YR - 24 HR event
Inflow = 7.01 cfs @ 12.17 hrs, Volume= 0.609 af
Outflow = 7.01 cfs @ 12.17 hrs, Volume= 0.609 af, Atten= 0%, Lag= 0.0 min

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

Reach 100R: Final Reach 100



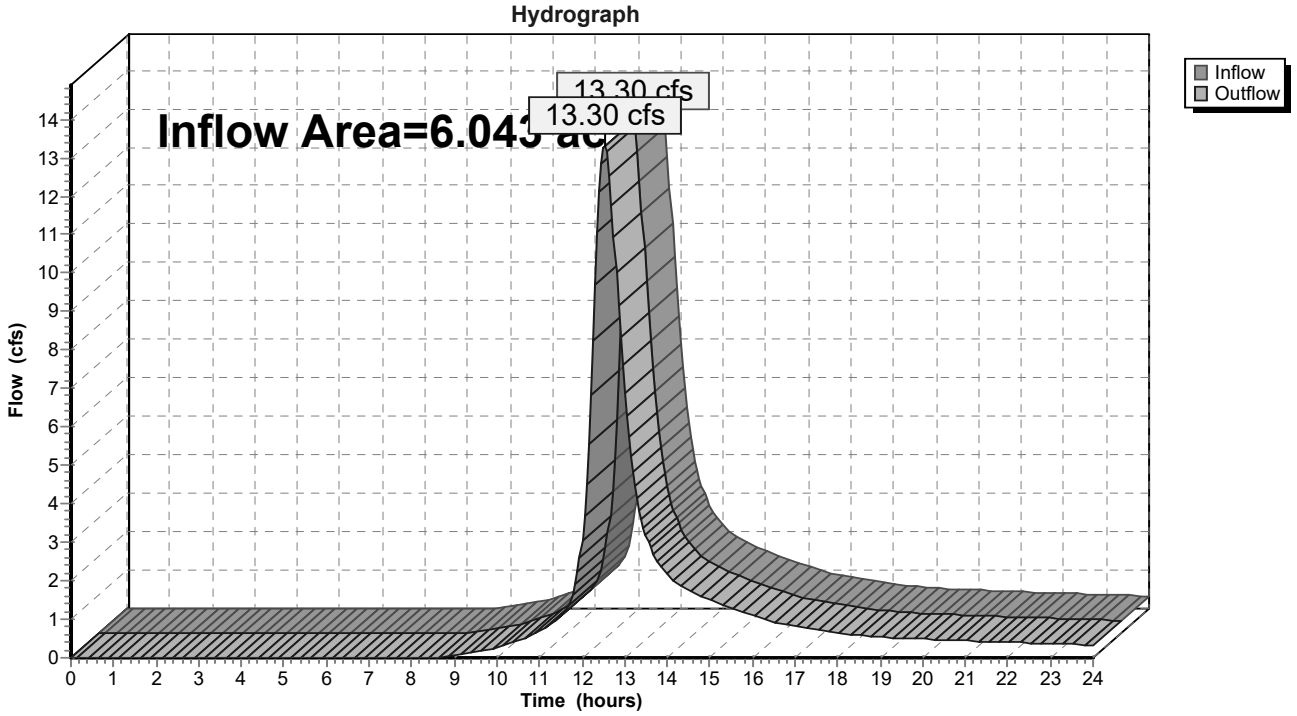
Summary for Reach 200R: Final Reach 200

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

Inflow Area = 6.043 ac, 0.62% Impervious, Inflow Depth > 3.70" for 25 YR - 24 HR event
Inflow = 13.30 cfs @ 12.53 hrs, Volume= 1.862 af
Outflow = 13.30 cfs @ 12.53 hrs, Volume= 1.862 af, Atten= 0%, Lag= 0.0 min

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

Reach 200R: Final Reach 200



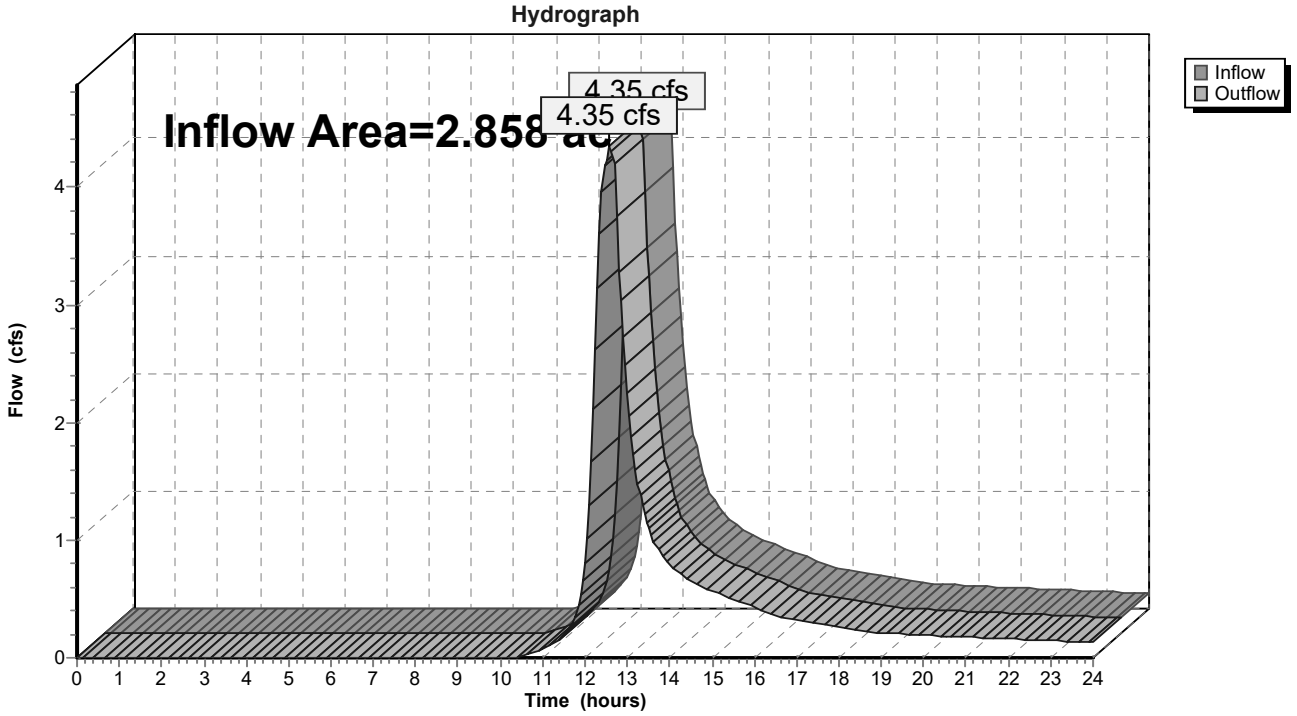
Summary for Reach 400R: Final Reach 400

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

Inflow Area = 2.858 ac, 33.49% Impervious, Inflow Depth > 2.59" for 25 YR - 24 HR event
Inflow = 4.35 cfs @ 12.59 hrs, Volume= 0.618 af
Outflow = 4.35 cfs @ 12.59 hrs, Volume= 0.618 af, Atten= 0%, Lag= 0.0 min

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

Reach 400R: Final Reach 400



Summary for Pond 4P: Pond 4

Inflow Area = 2.858 ac, 33.49% Impervious, Inflow Depth > 2.59" for 25 YR - 24 HR event
Inflow = 4.44 cfs @ 12.52 hrs, Volume= 0.618 af
Outflow = 4.35 cfs @ 12.59 hrs, Volume= 0.618 af, Atten= 2%, Lag= 3.9 min
Primary = 4.35 cfs @ 12.59 hrs, Volume= 0.618 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 91.17' @ 12.59 hrs Surf.Area= 571 sf Storage= 196 cf
Flood Elev= 93.00' Surf.Area= 32,300 sf Storage= 17,712 cf

Plug-Flow detention time= 0.3 min calculated for 0.616 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (874.5 - 874.3)

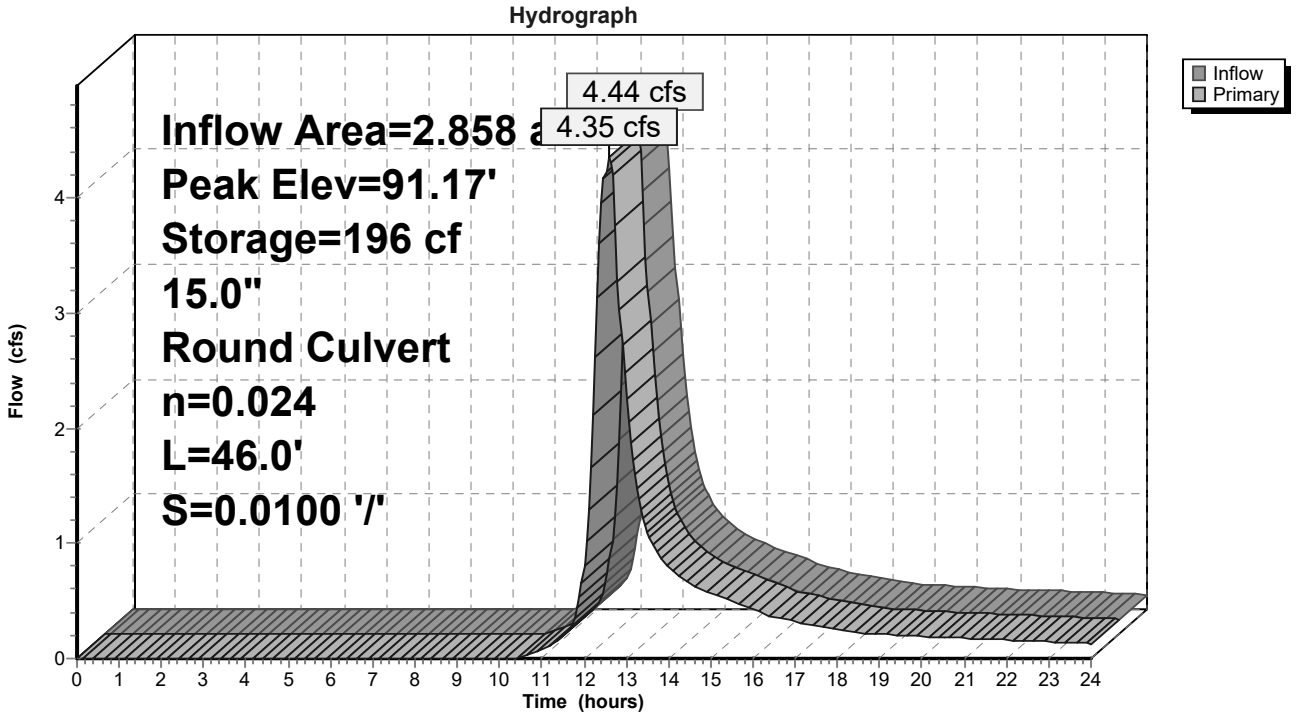
Volume	Invert	Avail.Storage	Storage Description
#1	89.38'	17,712 cf	**Open Water Storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
89.38	10	14.0	0	0	10
90.00	25	32.8	11	11	82
91.00	245	81.2	116	127	524
92.00	3,959	366.9	1,730	1,856	10,714
93.00	32,300	1,051.6	15,856	17,712	88,007

Device	Routing	Invert	Outlet Devices
#1	Primary	89.38'	**15.0" Round 15" CMP** L= 46.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.38' / 88.92' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 1.23 sf

Primary OutFlow Max=4.34 cfs @ 12.59 hrs HW=91.17' TW=0.00' (Dynamic Tailwater)
1=15" CMP (Barrel Controls 4.34 cfs @ 3.53 fps)

Pond 4P: Pond 4



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

Subcatchment 1S: Subcatchment #1 Runoff Area=81,039 sf 6.80% Impervious Runoff Depth>1.31"
Flow Length=230' Tc=12.0 min CN=74 Runoff=2.23 cfs 0.202 af

Subcatchment 2S: Subcatchment #2 Runoff Area=263,231 sf 0.62% Impervious Runoff Depth>1.17"
Flow Length=300' Tc=38.1 min CN=72 Runoff=4.02 cfs 0.592 af

Subcatchment 4S: Subcatchment #4 Runoff Area=124,509 sf 33.49% Impervious Runoff Depth>0.61"
Flow Length=431' Tc=35.4 min CN=61 Runoff=0.83 cfs 0.145 af

Reach 100R: Final Reach 100 Inflow=2.23 cfs 0.202 af
Outflow=2.23 cfs 0.202 af

Reach 200R: Final Reach 200 Inflow=4.02 cfs 0.592 af
Outflow=4.02 cfs 0.592 af

Reach 400R: Final Reach 400 Inflow=0.83 cfs 0.145 af
Outflow=0.83 cfs 0.145 af

Pond 4P: Pond 4 Peak Elev=89.93' Storage=9 cf Inflow=0.83 cfs 0.145 af
15.0" Round Culvert n=0.024 L=46.0' S=0.0100 '/' Outflow=0.83 cfs 0.145 af

Total Runoff Area = 10.762 ac Runoff Volume = 0.940 af Average Runoff Depth = 1.05"
89.58% Pervious = 9.640 ac 10.42% Impervious = 1.122 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=81,039 sf 6.80% Impervious Runoff Depth>2.71"
Flow Length=230' Tc=12.0 min CN=74 Runoff=4.83 cfs 0.421 af

Subcatchment 2S: Subcatchment #2 Runoff Area=263,231 sf 0.62% Impervious Runoff Depth>2.52"
Flow Length=300' Tc=38.1 min CN=72 Runoff=9.00 cfs 1.269 af

Subcatchment 4S: Subcatchment #4 Runoff Area=124,509 sf 33.49% Impervious Runoff Depth>1.62"
Flow Length=431' Tc=35.4 min CN=61 Runoff=2.67 cfs 0.387 af

Reach 100R: Final Reach 100 Inflow=4.83 cfs 0.421 af
Outflow=4.83 cfs 0.421 af

Reach 200R: Final Reach 200 Inflow=9.00 cfs 1.269 af
Outflow=9.00 cfs 1.269 af

Reach 400R: Final Reach 400 Inflow=2.67 cfs 0.387 af
Outflow=2.67 cfs 0.387 af

Pond 4P: Pond 4 Peak Elev=90.45' Storage=36 cf Inflow=2.67 cfs 0.387 af
15.0" Round Culvert n=0.024 L=46.0' S=0.0100 '/' Outflow=2.67 cfs 0.387 af

Total Runoff Area = 10.762 ac Runoff Volume = 2.077 af Average Runoff Depth = 2.32"
89.58% Pervious = 9.640 ac 10.42% Impervious = 1.122 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=81,039 sf 6.80% Impervious Runoff Depth>3.93"
Flow Length=230' Tc=12.0 min CN=74 Runoff=7.01 cfs 0.609 af

Subcatchment 2S: Subcatchment #2 Runoff Area=263,231 sf 0.62% Impervious Runoff Depth>3.70"
Flow Length=300' Tc=38.1 min CN=72 Runoff=13.30 cfs 1.862 af

Subcatchment 4S: Subcatchment #4 Runoff Area=124,509 sf 33.49% Impervious Runoff Depth>2.59"
Flow Length=431' Tc=35.4 min CN=61 Runoff=4.44 cfs 0.618 af

Reach 100R: Final Reach 100 Inflow=7.01 cfs 0.609 af
Outflow=7.01 cfs 0.609 af

Reach 200R: Final Reach 200 Inflow=13.30 cfs 1.862 af
Outflow=13.30 cfs 1.862 af

Reach 400R: Final Reach 400 Inflow=4.35 cfs 0.618 af
Outflow=4.35 cfs 0.618 af

Pond 4P: Pond 4 Peak Elev=91.17' Storage=196 cf Inflow=4.44 cfs 0.618 af
15.0" Round Culvert n=0.024 L=46.0' S=0.0100 '/' Outflow=4.35 cfs 0.618 af

Total Runoff Area = 10.762 ac Runoff Volume = 3.089 af Average Runoff Depth = 3.44"
89.58% Pervious = 9.640 ac 10.42% Impervious = 1.122 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=81,039 sf 6.80% Impervious Runoff Depth>5.12"
Flow Length=230' Tc=12.0 min CN=74 Runoff=9.12 cfs 0.794 af

Subcatchment 2S: Subcatchment #2 Runoff Area=263,231 sf 0.62% Impervious Runoff Depth>4.86"
Flow Length=300' Tc=38.1 min CN=72 Runoff=17.49 cfs 2.448 af

Subcatchment 4S: Subcatchment #4 Runoff Area=124,509 sf 33.49% Impervious Runoff Depth>3.59"
Flow Length=431' Tc=35.4 min CN=61 Runoff=6.26 cfs 0.856 af

Reach 100R: Final Reach 100 Inflow=9.12 cfs 0.794 af
Outflow=9.12 cfs 0.794 af

Reach 200R: Final Reach 200 Inflow=17.49 cfs 2.448 af
Outflow=17.49 cfs 2.448 af

Reach 400R: Final Reach 400 Inflow=5.52 cfs 0.855 af
Outflow=5.52 cfs 0.855 af

Pond 4P: Pond 4 Peak Elev=91.79' Storage=1,149 cf Inflow=6.26 cfs 0.856 af
15.0" Round Culvert n=0.024 L=46.0' S=0.0100 '/' Outflow=5.52 cfs 0.855 af

Total Runoff Area = 10.762 ac Runoff Volume = 4.097 af Average Runoff Depth = 4.57"
89.58% Pervious = 9.640 ac 10.42% Impervious = 1.122 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=81,039 sf 6.80% Impervious Runoff Depth>6.59"
Flow Length=230' Tc=12.0 min CN=74 Runoff=11.66 cfs 1.021 af

Subcatchment 2S: Subcatchment #2 Runoff Area=263,231 sf 0.62% Impervious Runoff Depth>6.30"
Flow Length=300' Tc=38.1 min CN=72 Runoff=22.58 cfs 3.171 af

Subcatchment 4S: Subcatchment #4 Runoff Area=124,509 sf 33.49% Impervious Runoff Depth>4.86"
Flow Length=431' Tc=35.4 min CN=61 Runoff=8.55 cfs 1.159 af

Reach 100R: Final Reach 100 Inflow=11.66 cfs 1.021 af
Outflow=11.66 cfs 1.021 af

Reach 200R: Final Reach 200 Inflow=22.58 cfs 3.171 af
Outflow=22.58 cfs 3.171 af

Reach 400R: Final Reach 400 Inflow=6.30 cfs 1.158 af
Outflow=6.30 cfs 1.158 af

Pond 4P: Pond 4 Peak Elev=92.28' Storage=3,634 cf Inflow=8.55 cfs 1.159 af
15.0" Round Culvert n=0.024 L=46.0' S=0.0100 '/' Outflow=6.30 cfs 1.158 af

Total Runoff Area = 10.762 ac Runoff Volume = 5.350 af Average Runoff Depth = 5.97"
89.58% Pervious = 9.640 ac 10.42% Impervious = 1.122 ac

Appendix II - Proposed Conditions Analysis

25 Yr - 24 Hr. Full Summary
2 Yr - 24 Hr. Node Listing
10 Yr -24 Hr. Node Listing
25 Yr -24 Hr. Node Listing
50 Yr - 24 Hr. Node Listing
100 Yr -24 Hr. Node Listing

SOILS LEGEND

Site Specific Soils

Symbol	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wf	A,B,C	Windsor Variant	C
Bz	A,B,C	Buxton	C
Sc	A,B	Scantic	D

NRCS Soils

Symbol	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd	A	Windsor Loamy Sand	A
Wf	B	Windsor Loamy Sand	A
Bz	A	Buxton Silt Loam	C
Sc	A	Suffield Silt Loam	D

Slopes: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25- 50% F = 50%+
Denominators: /ED = Excessively Drained /MWD = Moderately Well Drained /SPD = Somewhat Poorly Drained /P = Poorly Drained /VP = Very Poorly Drained /Rk = Rocky

DEIDRA BENJAMIN, CWS #295

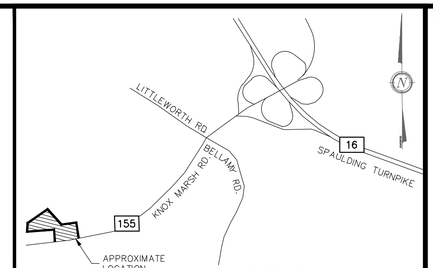
JOHN P. HAYES III, CSS #87

JURISDICTIONAL WETLANDS WERE DELINEATED BY DEIDRA BENJAMIN, CWS, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014-41:1-42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y-87-1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR-12-1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS-79/31.

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL
FLOW REACH SYMBOL
POND DEVICE SYMBOL
TIME OF CONCENTRATION SEGMENT

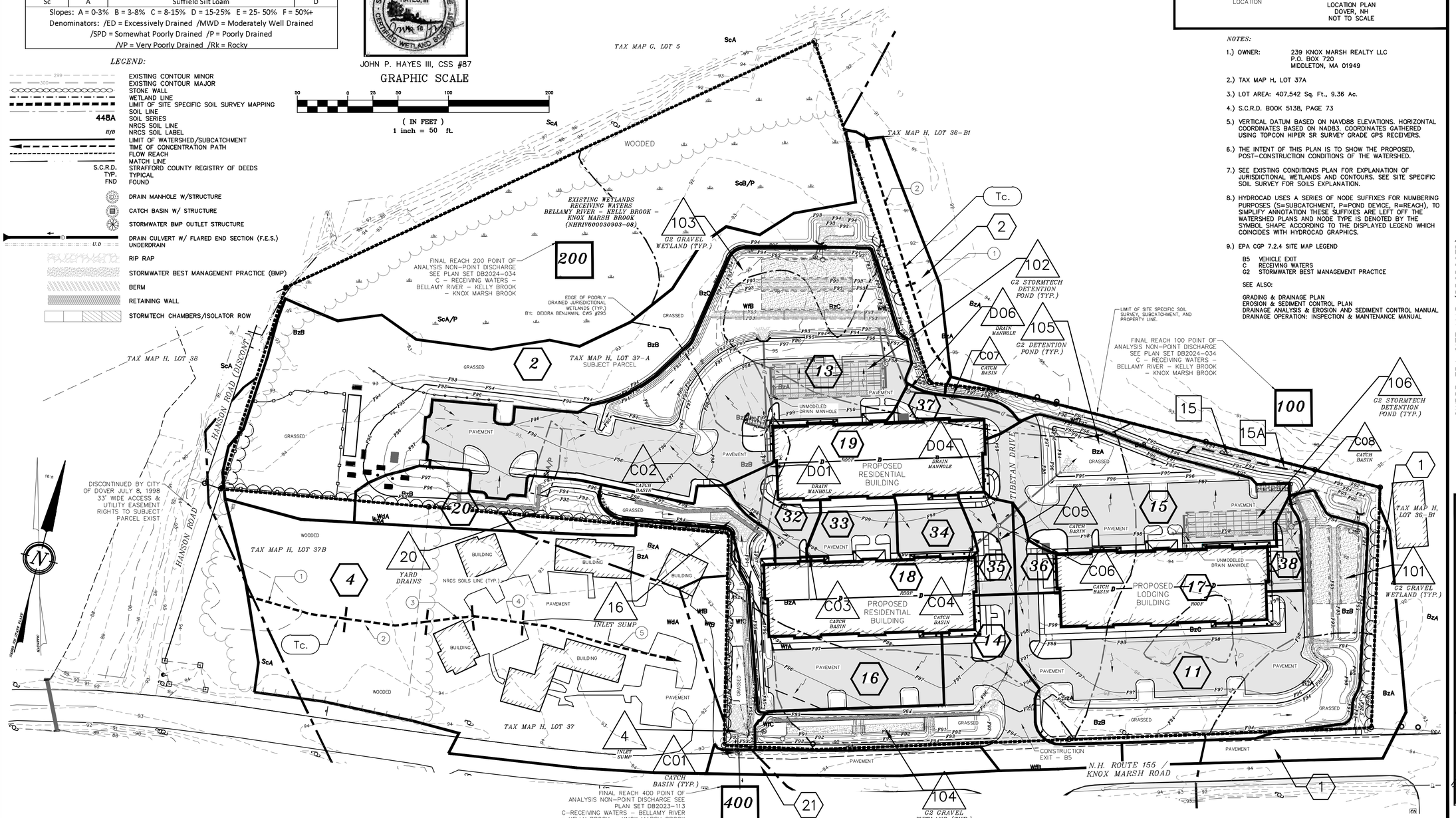


LOCATION PLAN
DOVER, NH
NOT TO SCALE

LEGEND:

EXISTING CONTOUR MINOR
EXISTING CONTOUR MAJOR
STONE WALL
WETLAND LINE
LIMIT OF SITE SPECIFIC SOIL SURVEY MAPPING SOIL LINE
448A SOIL SERIES
NRCS SOIL LINE
NRCS SOIL LABEL
LIMIT OF WATERSHED/SUBCATCHMENT
TIME OF CONCENTRATION PATH
FLOW REACH
MATCH LINE
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
DRAIN MANHOLE W/STRUCTURE
CATCH BASIN W/ STRUCTURE
STORMWATER BMP OUTLET STRUCTURE
DRAIN CULVERT W/ FLARED END SECTION (F.E.S.) UNDERDRAIN
RIP RAP
STORMWATER BEST MANAGEMENT PRACTICE (BMP)
BERM
RETAINING WALL
STORMTECH CHAMBERS/ISOLATOR ROW

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED, POST-CONSTRUCTION CONDITIONS OF THE WATERSHED.

7.) SEE EXISTING CONDITIONS PLAN FOR EXPLANATION OF JURISDICTIONAL WETLANDS AND CONTOURS. SEE SITE SPECIFIC SOIL SURVEY FOR SOILS EXPLANATION.

8.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

9.) EPA CGP 7.2.4 SITE MAP LEGEND

B5 VEHICLE EXIT
C RECEIVING WATERS
G2 STORMWATER BEST MANAGEMENT PRACTICE

SEE ALSO:

GRADING & DRAINAGE PLAN
EROSION & SEDIMENT CONTROL PLAN
DRAINAGE ANALYSIS & EROSION AND SEDIMENT CONTROL MANUAL
DRAINAGE OPERATION: INSPECTION & MAINTENANCE MANUAL

PLANNING FILE #SITE-XXXX-XXXX

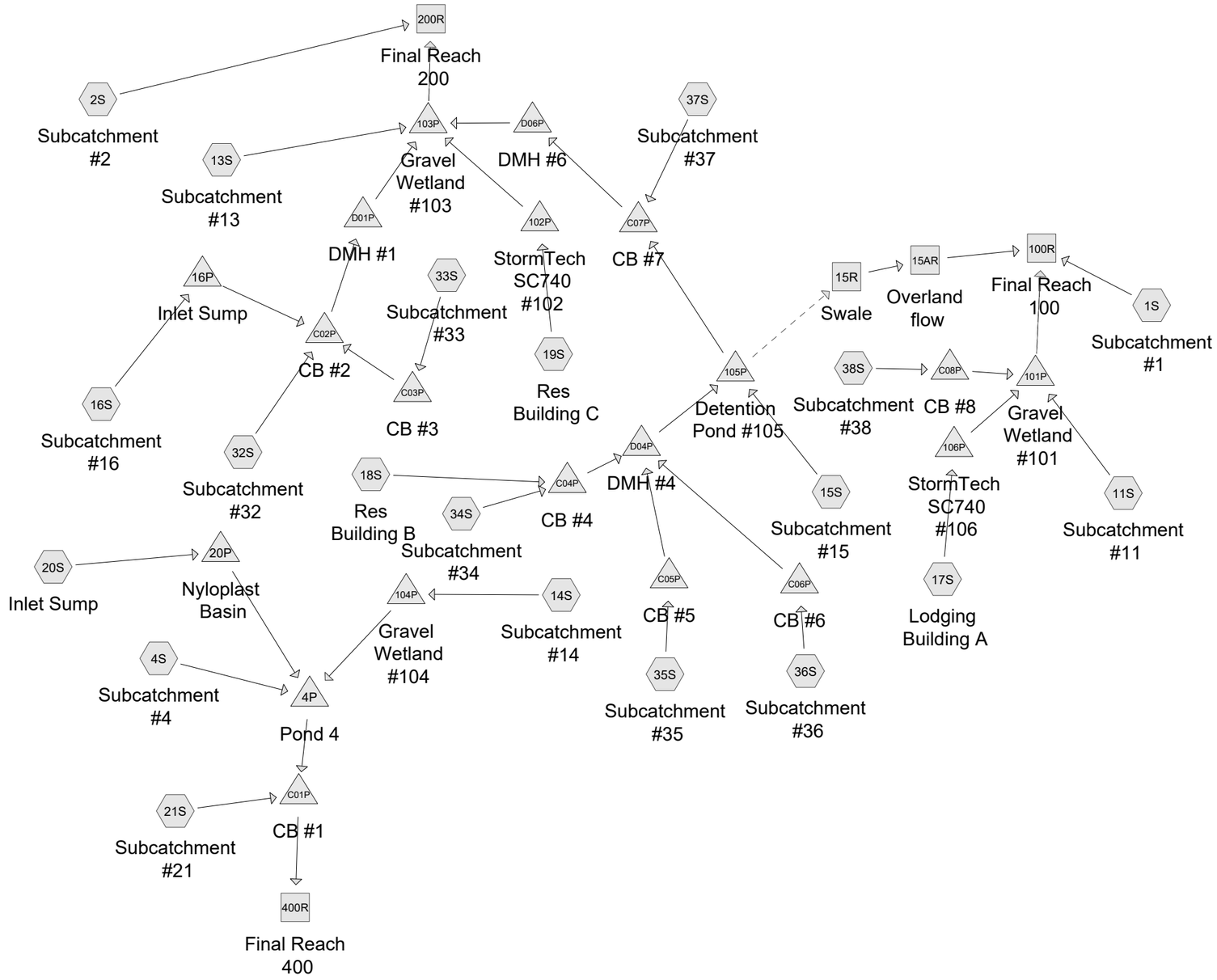
REVISION	DATE	DESCRIPTION

SWPPP EPA SITE MAP (PROPOSED)
W-2 PROPOSED WATERSHED PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE -



Routing Diagram for 24-034 Proposed Conditions Analysis

Prepared by Berry Surveying & Engineering, Printed 12/3/2024

HydroCAD® 10.00-25 s/n 07605 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.750	39	>75% Grass cover, Good, HSG A (4S, 20S)
3.936	74	>75% Grass cover, Good, HSG C (1S, 2S, 4S, 11S, 13S, 14S, 15S, 16S, 20S, 32S, 33S, 34S, 35S, 36S, 37S, 38S)
0.014	80	>75% Grass cover, Good, HSG D (4S, 20S)
0.119	96	Gravel surface, HSG C (2S, 11S, 13S, 14S, 15S, 16S, 20S)
0.000	96	Gravel surface, HSG D (13S)
0.807	98	Paved parking, HSG A (1S, 4S, 11S, 14S, 21S)
2.509	98	Paved parking, HSG C (1S, 2S, 11S, 13S, 14S, 15S, 16S, 32S, 33S, 34S, 35S, 36S, 37S, 38S)
0.022	98	Paved parking, HSG D (13S)
0.186	98	Roofs, HSG A (4S)
1.205	98	Roofs, HSG C (4S, 11S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 32S, 33S, 34S, 35S, 36S, 37S, 38S)
0.801	30	Woods, Good, HSG A (2S, 4S, 20S)
0.370	70	Woods, Good, HSG C (1S, 2S)
0.043	77	Woods, Good, HSG D (4S)
10.762	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.545	HSG A	1S, 2S, 4S, 11S, 14S, 20S, 21S
0.000	HSG B	
8.138	HSG C	1S, 2S, 4S, 11S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 32S, 33S, 34S, 35S, 36S, 37S, 38S
0.079	HSG D	4S, 13S, 20S
0.000	Other	
10.762		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.750	0.000	3.936	0.014	0.000	4.700	>75% Grass cover, Good	1S, 2S, 4S, 11S, 13S, 14S, 15S, 16S, 20S, 32S, 33S, 34S, 35S, 36S, 37S, 38S
0.000	0.000	0.119	0.000	0.000	0.119	Gravel surface	2S, 11S, 13S, 14S, 15S, 16S, 20S
0.807	0.000	2.509	0.022	0.000	3.338	Paved parking	1S, 2S, 4S, 11S, 13S, 14S, 15S, 16S, 21S, 32S, 33S, 34S, 35S, 36S, 37S, 38S
0.186	0.000	1.205	0.000	0.000	1.391	Roofs	4S, 11S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 32S, 33S, 34S, 35S, 36S, 37S, 38S

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.801	0.000	0.370	0.043	0.000	1.214	Woods, Good	1S, 2S, 4S, 20S
2.545	**0.000**	**8.138**	**0.079**	**0.000**	**10.762**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	4P	89.51	88.92	59.0	0.0100	0.024	15.0	0.0	0.0
2	16P	93.75	93.60	8.0	0.0188	0.012	18.0	0.0	0.0
3	20P	89.75	89.50	350.0	0.0007	0.012	8.0	0.0	0.0
4	101P	91.92	91.75	17.0	0.0100	0.010	6.0	0.0	0.0
5	101P	91.92	91.75	16.0	0.0106	0.010	12.0	0.0	0.0
6	102P	92.75	92.50	33.7	0.0074	0.012	18.0	0.0	0.0
7	103P	91.92	91.75	16.0	0.0106	0.012	6.0	0.0	0.0
8	103P	91.92	91.75	12.0	0.0142	0.012	15.0	0.0	0.0
9	104P	90.33	90.00	33.7	0.0098	0.012	6.0	0.0	0.0
10	104P	90.33	90.00	13.5	0.0244	0.012	12.0	0.0	0.0
11	105P	93.75	93.22	103.0	0.0051	0.012	18.0	0.0	0.0
12	106P	92.75	92.50	15.0	0.0167	0.012	18.0	0.0	0.0
13	C01P	89.34	88.92	42.0	0.0100	0.012	15.0	0.0	0.0
14	C02P	93.50	93.20	55.0	0.0055	0.012	18.0	0.0	0.0
15	C03P	93.90	93.60	53.5	0.0056	0.012	12.0	0.0	0.0
16	C04P	94.61	94.45	32.0	0.0050	0.012	18.0	0.0	0.0
17	C05P	94.51	94.45	10.7	0.0056	0.012	12.0	0.0	0.0
18	C06P	94.60	94.45	28.5	0.0053	0.012	12.0	0.0	0.0
19	C07P	93.12	92.92	40.0	0.0050	0.012	18.0	0.0	0.0
20	C08P	93.25	93.15	9.0	0.0111	0.012	12.0	0.0	0.0
21	D01P	93.10	92.50	120.0	0.0050	0.012	18.0	0.0	0.0
22	D04P	94.35	93.95	78.0	0.0051	0.012	18.0	0.0	0.0
23	D06P	92.82	92.50	62.5	0.0051	0.012	18.0	0.0	0.0

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

Subcatchment 1S: Subcatchment #1 Runoff Area=24,233 sf 27.47% Impervious Runoff Depth>4.58"
Tc=6.0 min CN=80 Runoff=2.90 cfs 0.212 af

Subcatchment 2S: Subcatchment #2 Runoff Area=67,977 sf 0.09% Impervious Runoff Depth>3.71"
Flow Length=251' Tc=25.7 min CN=72 Runoff=4.12 cfs 0.482 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,193 sf 30.27% Impervious Runoff Depth>2.31"
Flow Length=431' Tc=35.4 min CN=58 Runoff=3.31 cfs 0.469 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,072 sf 44.01% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=85 Runoff=6.20 cfs 0.462 af

Subcatchment 13S: Subcatchment #13 Runoff Area=60,719 sf 52.40% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=87 Runoff=8.25 cfs 0.623 af

Subcatchment 14S: Subcatchment #14 Runoff Area=22,059 sf 53.15% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=87 Runoff=3.00 cfs 0.226 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,560 sf 62.85% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=90 Runoff=4.05 cfs 0.312 af

Subcatchment 16S: Subcatchment #16 Runoff Area=20,779 sf 53.27% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=87 Runoff=2.82 cfs 0.213 af

Subcatchment 17S: Lodging Building A Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.192 af

Subcatchment 18S: Res Building B Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.192 af

Subcatchment 19S: Res Building C Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.192 af

Subcatchment 20S: Inlet Sump Runoff Area=12,580 sf 0.00% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=65 Runoff=0.99 cfs 0.072 af

Subcatchment 21S: Subcatchment #21 Runoff Area=6,962 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=1.05 cfs 0.088 af

Subcatchment 32S: Subcatchment #32 Runoff Area=4,612 sf 86.88% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.69 cfs 0.055 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,193 sf 77.18% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.76 cfs 0.060 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,481 sf 86.03% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.67 cfs 0.054 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,153 sf 78.57% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.61 cfs 0.048 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,332 sf 82.33% Impervious Runoff Depth>6.17"
Tc=6.0 min CN=94 Runoff=0.34 cfs 0.028 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,187 sf 74.65% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=92 Runoff=0.46 cfs 0.036 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,410 sf 89.54% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.36 cfs 0.029 af

Reach 15AR: Overland flow Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=30.0' S=0.0167 '/' Capacity=158.86 cfs Outflow=0.00 cfs 0.000 af

Reach 15R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=70.0' S=0.0071 '/' Capacity=31.36 cfs Outflow=0.00 cfs 0.000 af

Reach 100R: Final Reach 100 Inflow=2.98 cfs 0.552 af
Outflow=2.98 cfs 0.552 af

Reach 200R: Final Reach 200 Inflow=12.39 cfs 1.789 af
Outflow=12.39 cfs 1.789 af

Reach 400R: Final Reach 400 Inflow=3.39 cfs 0.718 af
Outflow=3.39 cfs 0.718 af

Pond 4P: Pond 4 Peak Elev=90.99' Storage=2,014 cf Inflow=3.61 cfs 0.634 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=3.26 cfs 0.629 af

Pond 16P: Inlet Sump Peak Elev=94.68' Storage=1,335 cf Inflow=2.82 cfs 0.213 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.60 cfs 0.211 af

Pond 20P: Nyloplast Basin Peak Elev=91.82' Storage=33 cf Inflow=0.99 cfs 0.072 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.85 cfs 0.072 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.03' Storage=12,605 cf Inflow=6.63 cfs 0.608 af
Primary=0.08 cfs 0.109 af Secondary=1.12 cfs 0.227 af Tertiary=0.13 cfs 0.004 af Outflow=1.33 cfs 0.340 af

Pond 102P: StormTech SC740 #102 Peak Elev=94.84' Storage=5,368 cf Inflow=2.28 cfs 0.192 af
Outflow=0.08 cfs 0.099 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.40' Storage=27,139 cf Inflow=14.51 cfs 1.710 af
Primary=0.20 cfs 0.251 af Secondary=4.56 cfs 0.876 af Tertiary=3.53 cfs 0.180 af Outflow=8.29 cfs 1.307 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.96' Storage=6,789 cf Inflow=3.00 cfs 0.226 af
Primary=0.12 cfs 0.093 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.093 af

Pond 105P: Detention Pond #105 Peak Elev=95.76' Storage=5,793 cf Inflow=7.91 cfs 0.633 af
Primary=3.32 cfs 0.626 af Secondary=0.00 cfs 0.000 af Outflow=3.32 cfs 0.626 af

Pond 106P: StormTech SC740 #106 Peak Elev=94.98' Storage=4,788 cf Inflow=2.28 cfs 0.192 af
Outflow=0.10 cfs 0.116 af

Pond C01P: CB #1 Peak Elev=90.34' Storage=13 cf Inflow=3.39 cfs 0.718 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=3.39 cfs 0.718 af

Pond C02P: CB #2 Peak Elev=94.60' Storage=0.000 af Inflow=2.89 cfs 0.327 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=2.89 cfs 0.327 af

Pond C03P: CB #3 Peak Elev=94.63' Storage=0.000 af Inflow=0.76 cfs 0.060 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.75 cfs 0.060 af

Pond C04P: CB #4 Peak Elev=95.82' Storage=0.000 af Inflow=2.95 cfs 0.246 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.94 cfs 0.246 af

Pond C05P: CB #5 Peak Elev=95.80' Storage=0.000 af Inflow=0.61 cfs 0.048 af
12.0" Round Culvert n=0.012 L=10.7' S=0.0056 '/' Outflow=0.59 cfs 0.048 af

Pond C06P: CB #6 Peak Elev=95.80' Storage=0.000 af Inflow=0.34 cfs 0.028 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.33 cfs 0.027 af

Pond C07P: CB #7 Peak Elev=94.77' Storage=21 cf Inflow=3.59 cfs 0.662 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=3.59 cfs 0.662 af

Pond C08P: CB #8 Peak Elev=94.03' Storage=10 cf Inflow=0.36 cfs 0.029 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.36 cfs 0.029 af

Pond D01P: DMH #1 Peak Elev=94.48' Storage=0.000 af Inflow=2.89 cfs 0.327 af
18.0" Round Culvert n=0.012 L=120.0' S=0.0050 '/' Outflow=2.89 cfs 0.327 af

Pond D04P: DMH #4 Peak Elev=95.80' Storage=0.000 af Inflow=3.87 cfs 0.321 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=3.86 cfs 0.321 af

Pond D06P: DMH #6 Peak Elev=94.54' Storage=0.000 af Inflow=3.59 cfs 0.662 af
18.0" Round Culvert n=0.012 L=62.5' S=0.0051 '/' Outflow=3.58 cfs 0.661 af

Total Runoff Area = 10.762 ac Runoff Volume = 4.045 af Average Runoff Depth = 4.51"
56.06% Pervious = 6.033 ac 43.94% Impervious = 4.729 ac

Summary for Subcatchment 1S: Subcatchment #1

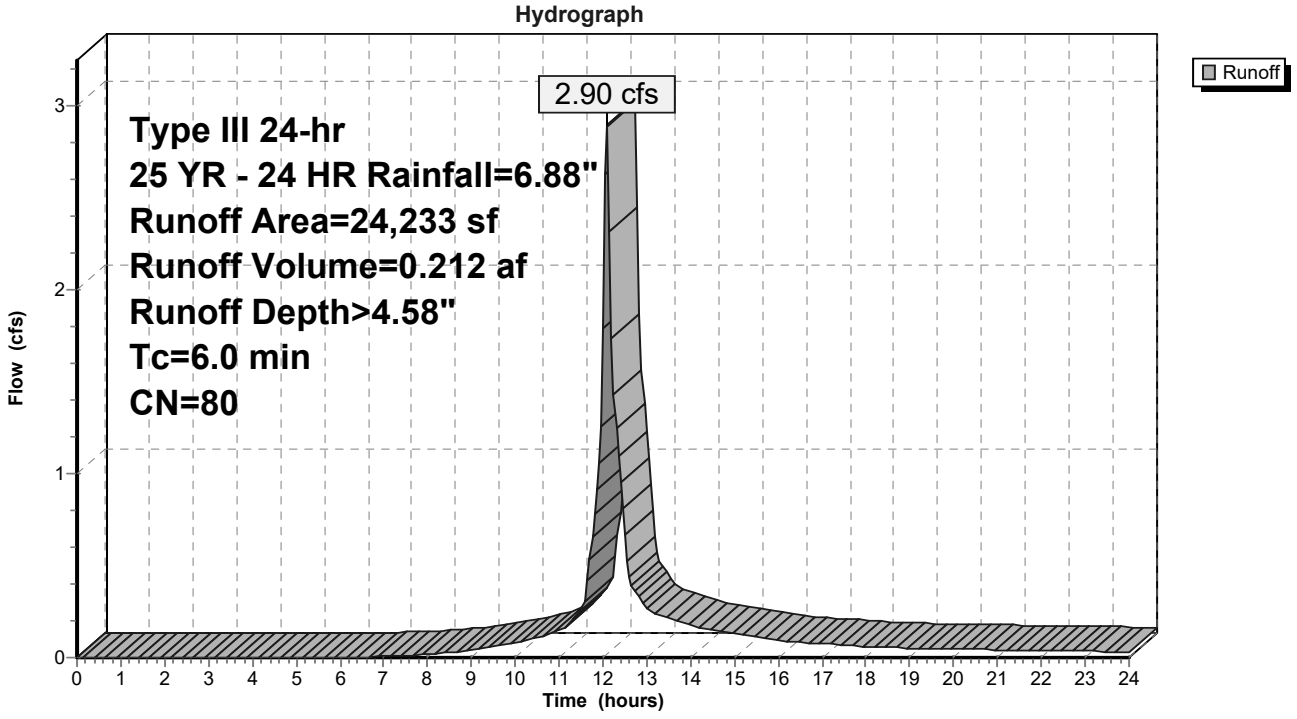
Runoff = 2.90 cfs @ 12.09 hrs, Volume= 0.212 af, Depth> 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
1,822	98	Paved parking, HSG A
4,834	98	Paved parking, HSG C
12,530	74	>75% Grass cover, Good, HSG C
5,047	70	Woods, Good, HSG C
24,233	80	Weighted Average
17,577		72.53% Pervious Area
6,656		27.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment #1**

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

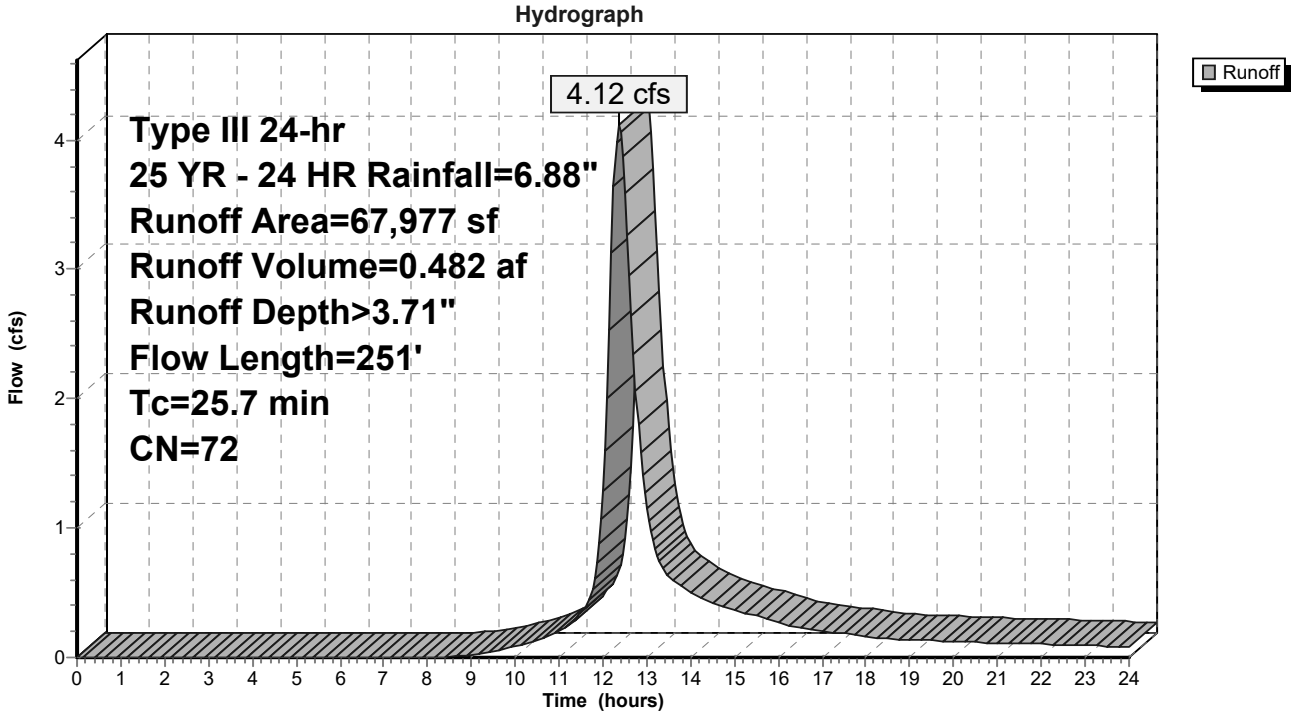
Runoff = 4.12 cfs @ 12.36 hrs, Volume= 0.482 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
2,447	30	Woods, Good, HSG A
53,685	74	>75% Grass cover, Good, HSG C
11,054	70	Woods, Good, HSG C
63	98	Paved parking, HSG C
728	96	Gravel surface, HSG C
67,977	72	Weighted Average
67,914		99.91% Pervious Area
63		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	100	0.0175	0.08		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.62"
4.4	151	0.0132	0.57		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
25.7	251	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 4S: Subcatchment #4

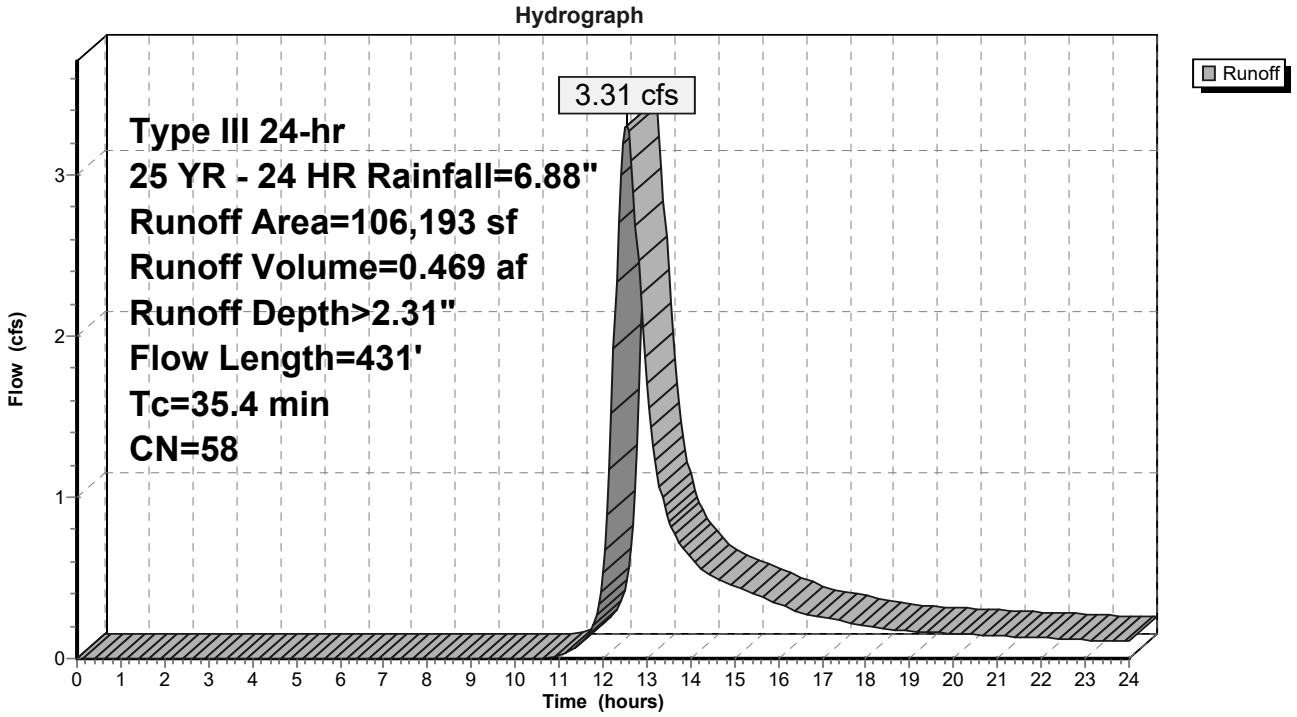
Runoff = 3.31 cfs @ 12.53 hrs, Volume= 0.469 af, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
8,104	98	Roofs, HSG A
21,545	98	Paved parking, HSG A
31,380	39	>75% Grass cover, Good, HSG A
30,806	30	Woods, Good, HSG A
2,499	98	Roofs, HSG C
9,732	74	>75% Grass cover, Good, HSG C
247	80	>75% Grass cover, Good, HSG D
1,880	77	Woods, Good, HSG D
106,193	58	Weighted Average
74,045		69.73% Pervious Area
32,148		30.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.6	100	0.0100	0.06		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.62"
2.7	81	0.0100	0.50		**Shallow Concentrated Flow, Segment 2** Woodland Kv= 5.0 fps
1.1	48	0.0100	0.70		**Shallow Concentrated Flow, Segment 3** Short Grass Pasture Kv= 7.0 fps
0.6	49	0.0050	1.44		**Shallow Concentrated Flow, Segment 4** Paved Kv= 20.3 fps
4.4	153	0.0070	0.59		**Shallow Concentrated Flow, Segment 5** Short Grass Pasture Kv= 7.0 fps
35.4	431	Total			

Subcatchment 4S: Subcatchment #4



Summary for Subcatchment 11S: Subcatchment #11

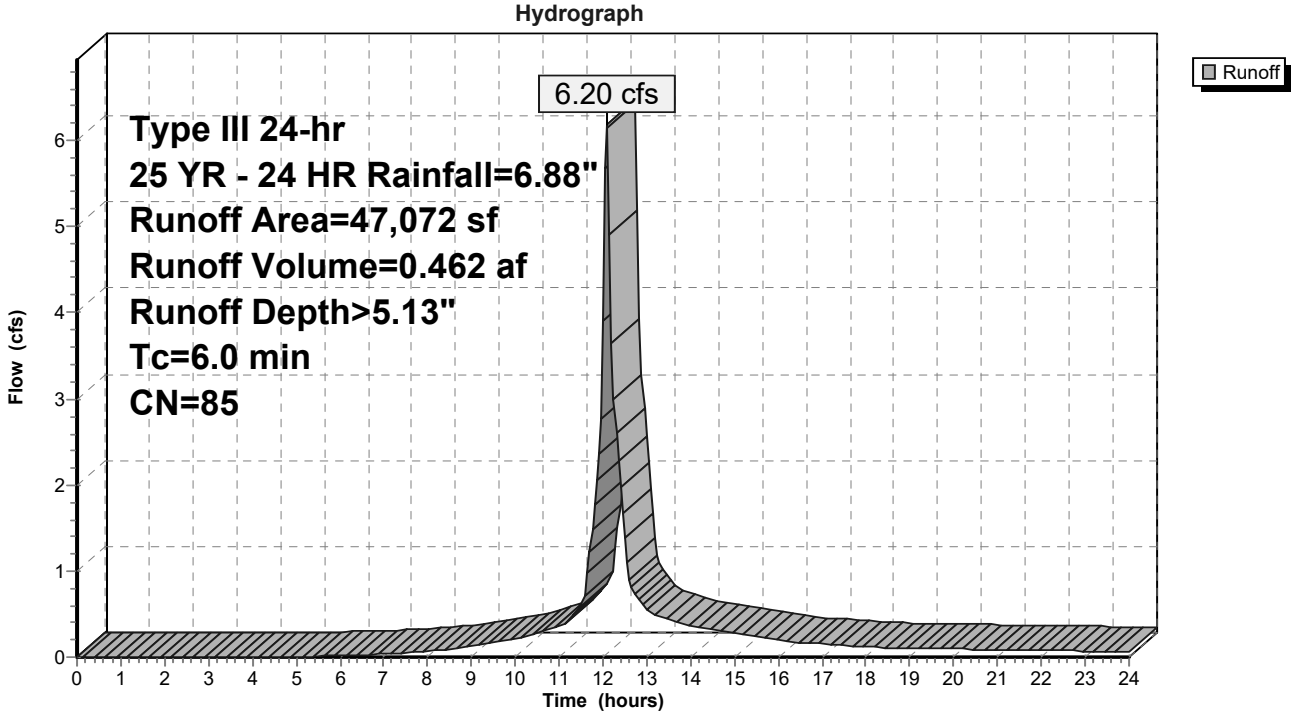
Runoff = 6.20 cfs @ 12.09 hrs, Volume= 0.462 af, Depth> 5.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
784	98	Paved parking, HSG A
19,507	98	Paved parking, HSG C
25,326	74	>75% Grass cover, Good, HSG C
1,031	96	Gravel surface, HSG C
424	98	Roofs, HSG C
47,072	85	Weighted Average
26,357		55.99% Pervious Area
20,715		44.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment #1**

Subcatchment 11S: Subcatchment #11



Summary for Subcatchment 13S: Subcatchment #13

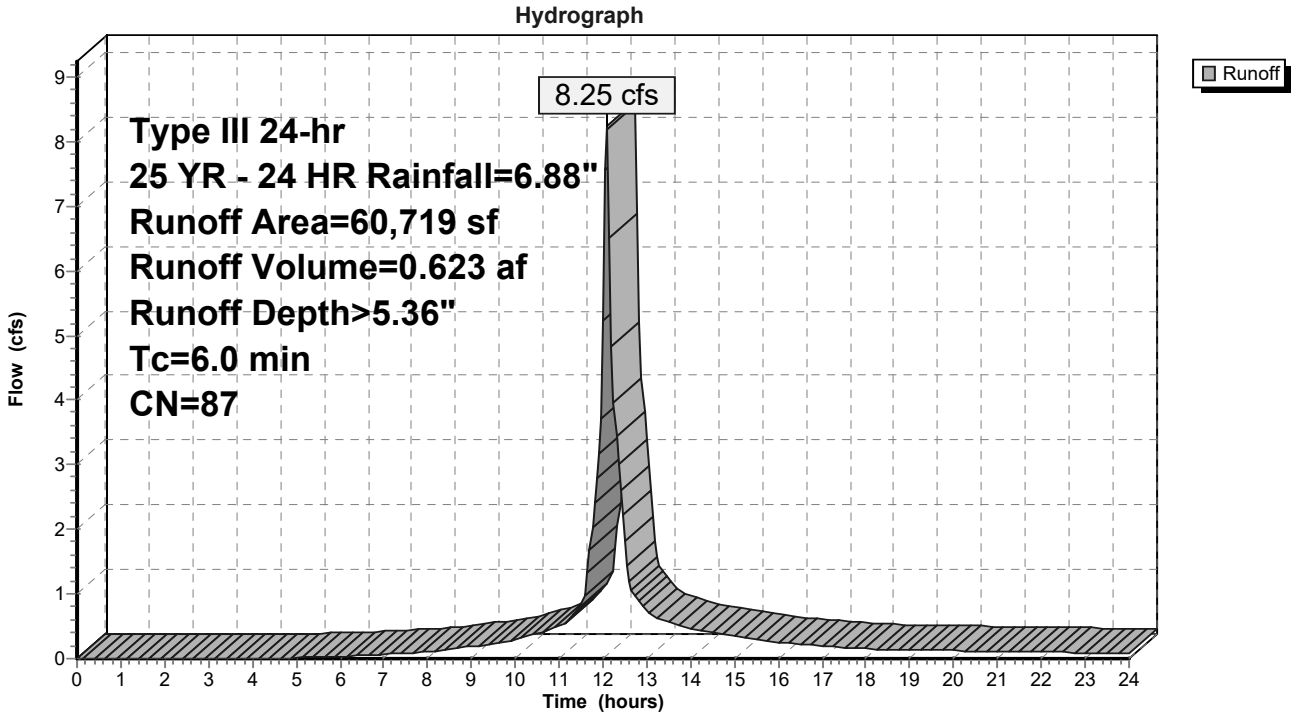
Runoff = 8.25 cfs @ 12.09 hrs, Volume= 0.623 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
27,691	74	>75% Grass cover, Good, HSG C
1,206	96	Gravel surface, HSG C
30,155	98	Paved parking, HSG C
3	96	Gravel surface, HSG D
947	98	Paved parking, HSG D
717	98	Roofs, HSG C
60,719	87	Weighted Average
28,900		47.60% Pervious Area
31,819		52.40% Impervious Area

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

Subcatchment 13S: Subcatchment #13



Summary for Subcatchment 14S: Subcatchment #14

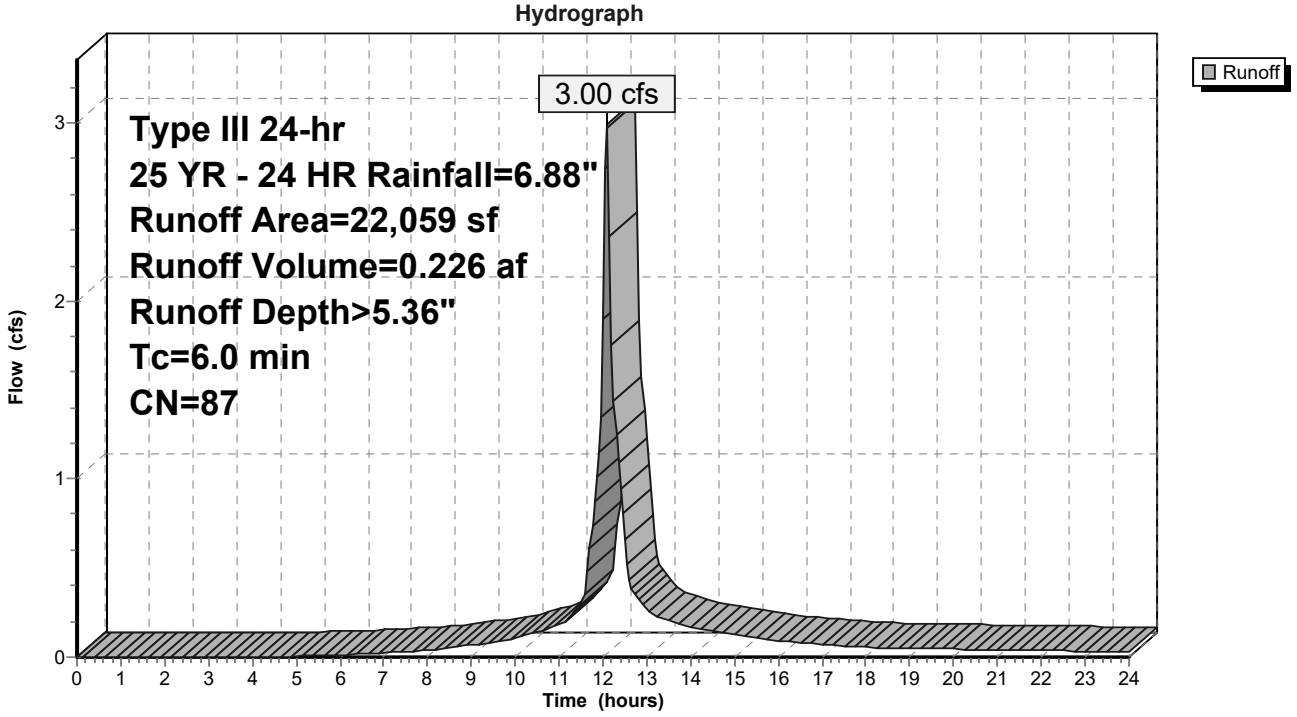
Runoff = 3.00 cfs @ 12.09 hrs, Volume= 0.226 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
4,053	98	Paved parking, HSG A
9,842	74	>75% Grass cover, Good, HSG C
493	96	Gravel surface, HSG C
7,279	98	Paved parking, HSG C
392	98	Roofs, HSG C
22,059	87	Weighted Average
10,335		46.85% Pervious Area
11,724		53.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment #1**

Subcatchment 14S: Subcatchment #14



Summary for Subcatchment 15S: Subcatchment #15

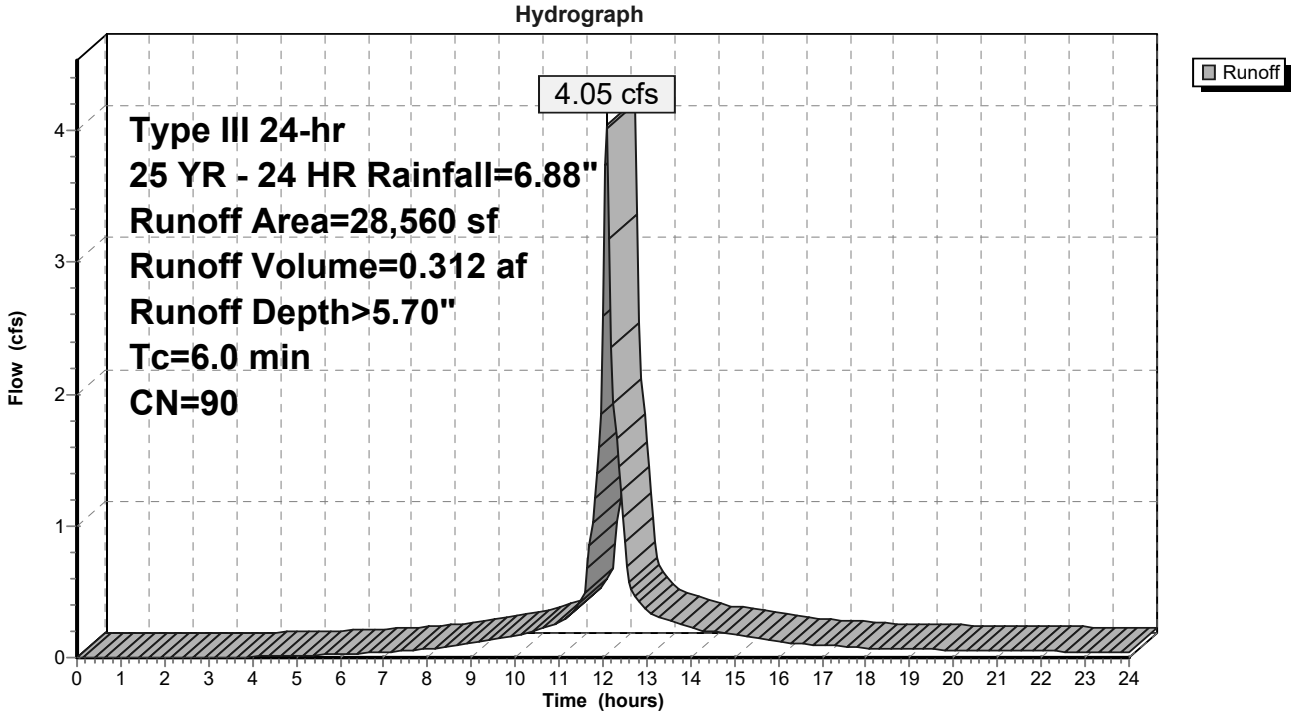
Runoff = 4.05 cfs @ 12.09 hrs, Volume= 0.312 af, Depth> 5.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
16,732	98	Paved parking, HSG C
9,785	74	>75% Grass cover, Good, HSG C
824	96	Gravel surface, HSG C
1,219	98	Roofs, HSG C
28,560	90	Weighted Average
10,609		37.15% Pervious Area
17,951		62.85% Impervious Area

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

Subcatchment 15S: Subcatchment #15



Summary for Subcatchment 16S: Subcatchment #16

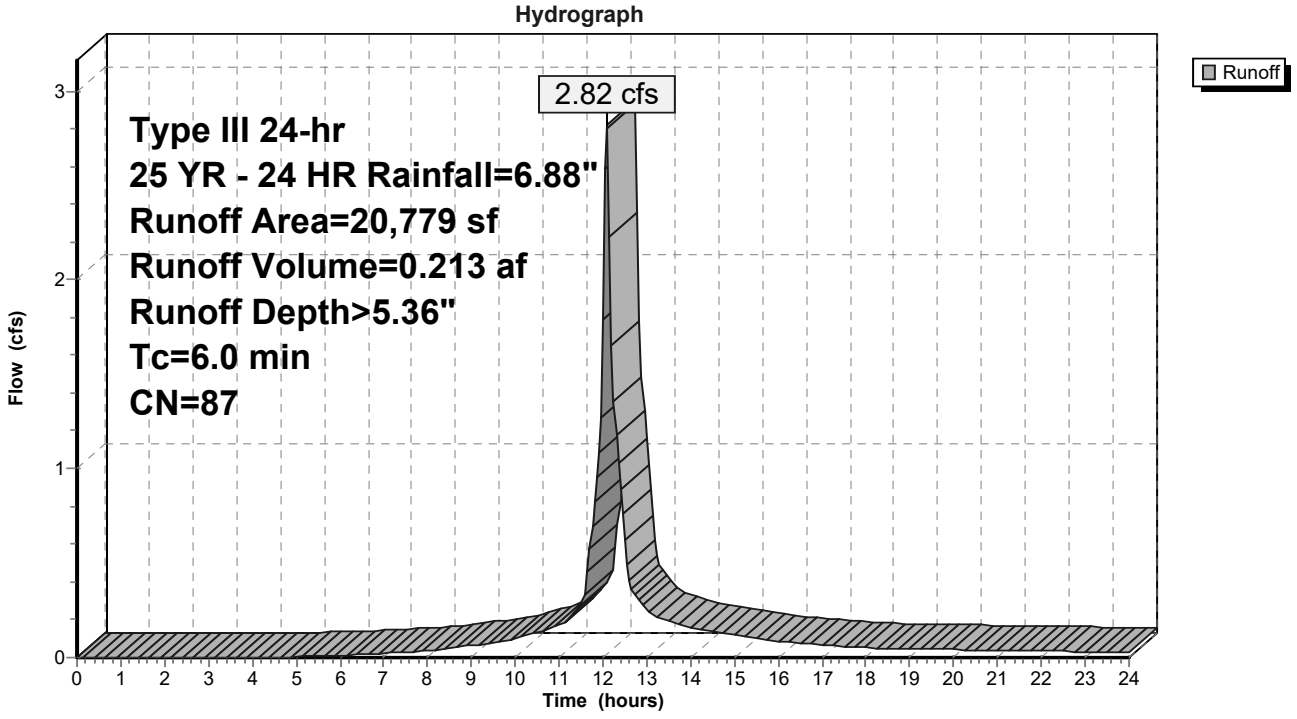
Runoff = 2.82 cfs @ 12.09 hrs, Volume= 0.213 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
10,785	98	Paved parking, HSG C
9,206	74	>75% Grass cover, Good, HSG C
503	96	Gravel surface, HSG C
285	98	Roofs, HSG C
20,779	87	Weighted Average
9,709		46.73% Pervious Area
11,070		53.27% Impervious Area

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

Subcatchment 16S: Subcatchment #16



Summary for Subcatchment 17S: Lodging Building A

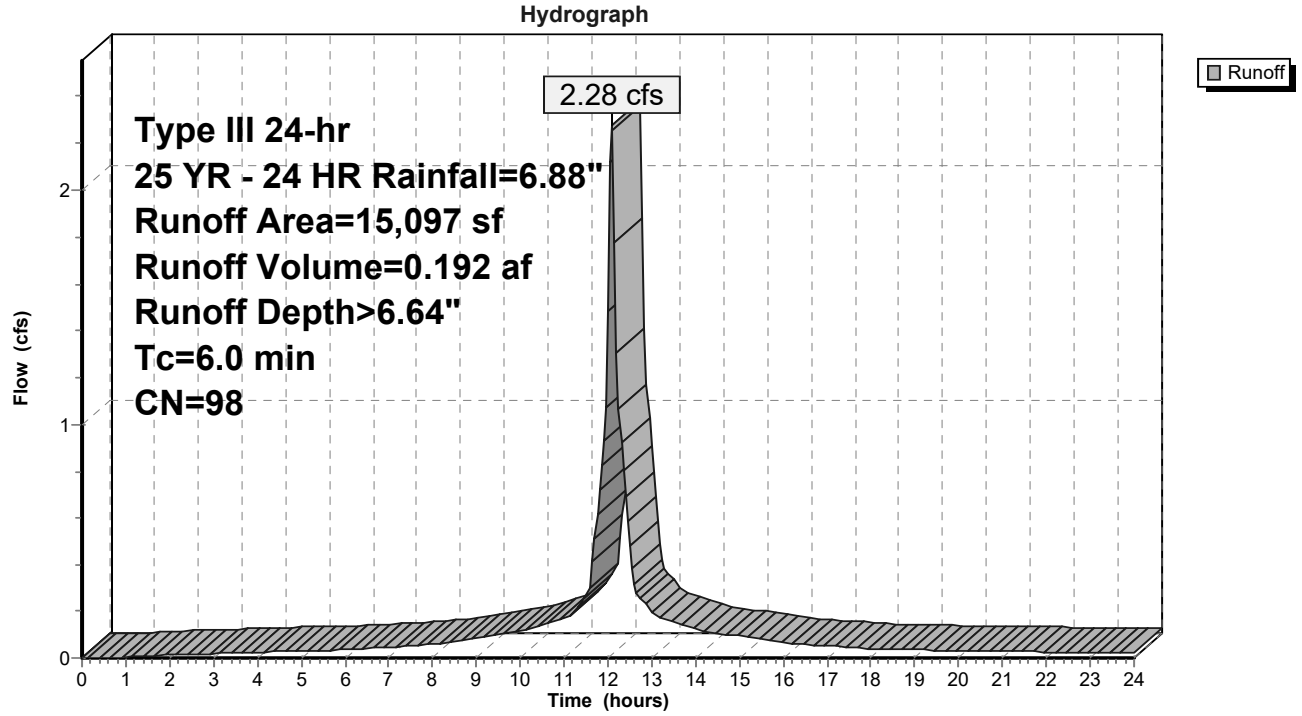
Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.192 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
15,097	98	Roofs, HSG C
15,097		100.00% Impervious Area

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

Subcatchment 17S: Lodging Building A



Summary for Subcatchment 18S: Res Building B

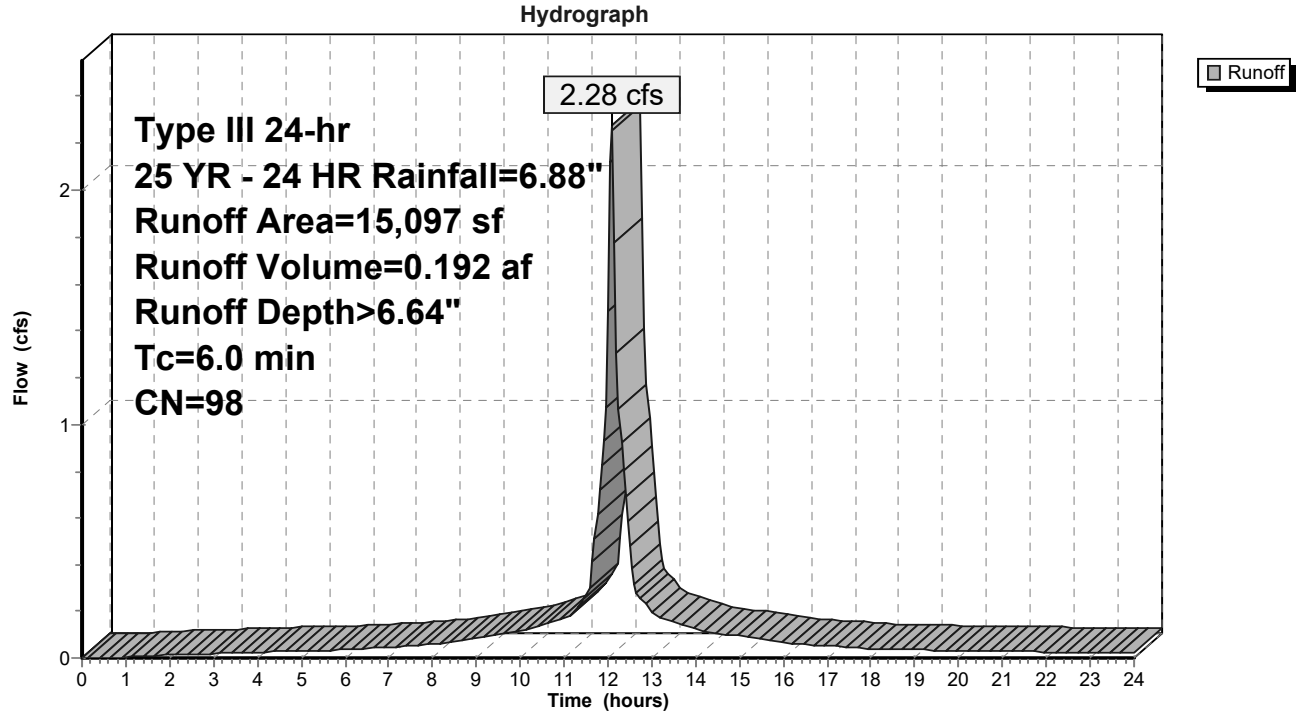
Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.192 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
15,097	98	Roofs, HSG C
15,097		100.00% Impervious Area

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

Subcatchment 18S: Res Building B



Summary for Subcatchment 19S: Res Building C

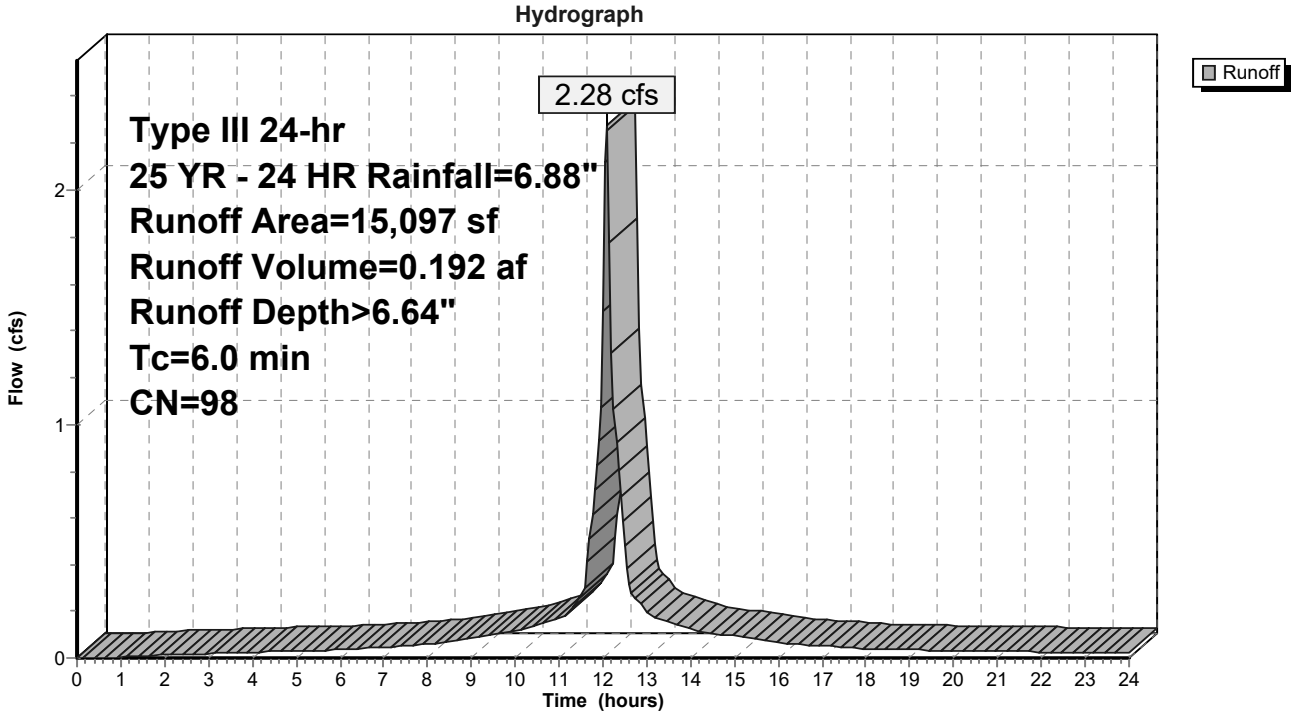
Runoff = 2.28 cfs @ 12.09 hrs, Volume= 0.192 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
15,097	98	Roofs, HSG C
15,097		100.00% Impervious Area

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

Subcatchment 19S: Res Building C



Summary for Subcatchment 20S: Inlet Sump

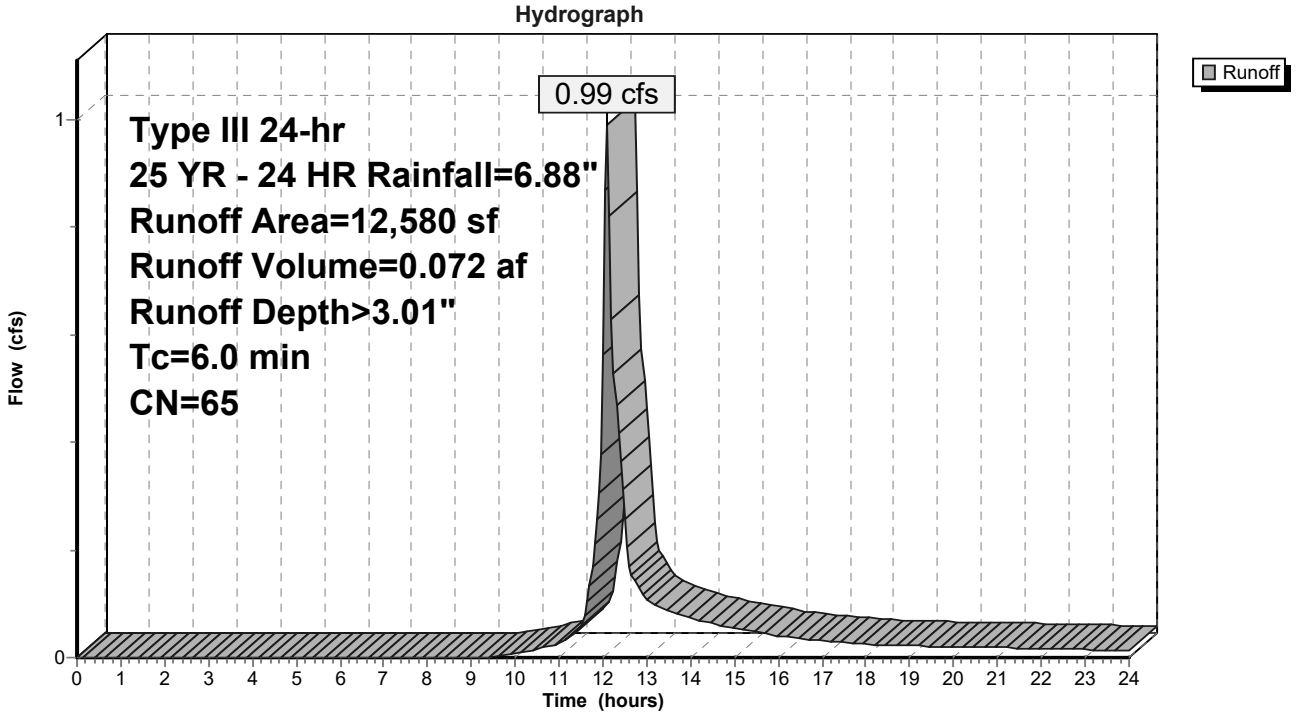
Runoff = 0.99 cfs @ 12.10 hrs, Volume= 0.072 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
1,307	39	>75% Grass cover, Good, HSG A
1,658	30	Woods, Good, HSG A
8,863	74	>75% Grass cover, Good, HSG C
389	96	Gravel surface, HSG C
363	80	>75% Grass cover, Good, HSG D
12,580	65	Weighted Average
12,580		100.00% Pervious Area

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

Subcatchment 20S: Inlet Sump



Summary for Subcatchment 21S: Subcatchment #21

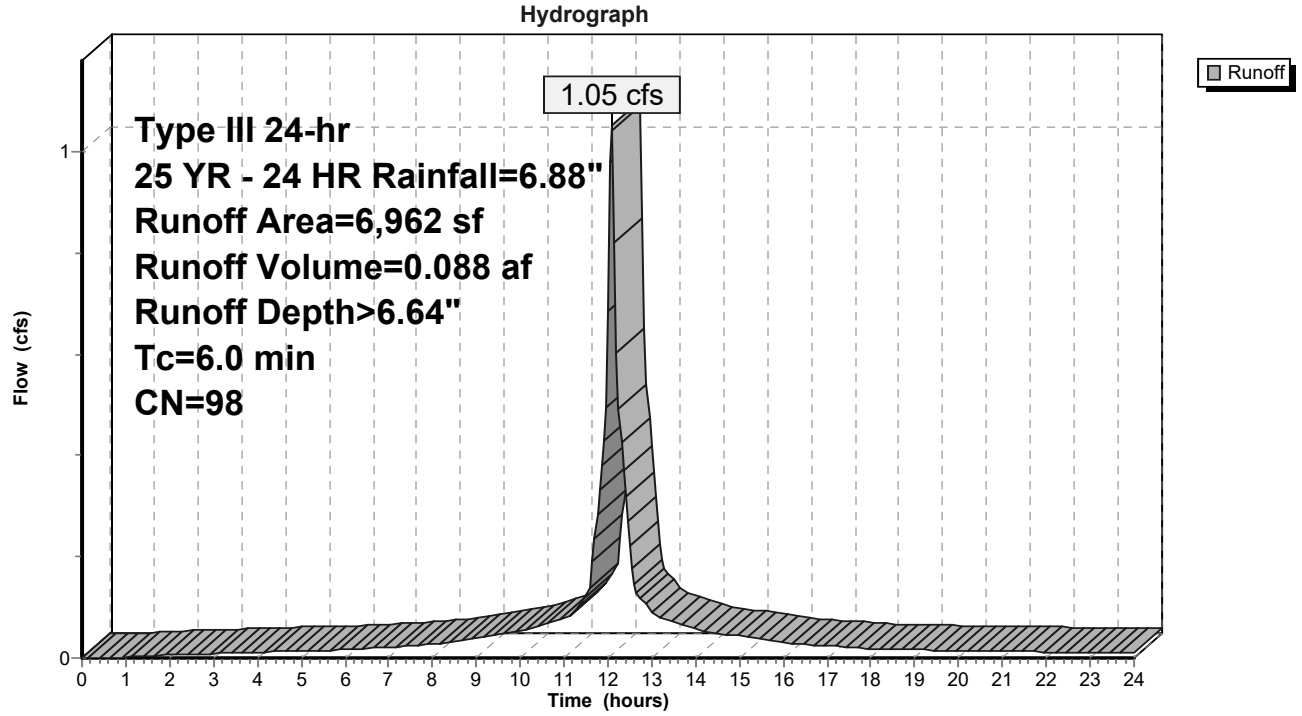
Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.088 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
6,962	98	Paved parking, HSG A
6,962		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment #1**

Subcatchment 21S: Subcatchment #21



Summary for Subcatchment 32S: Subcatchment #32

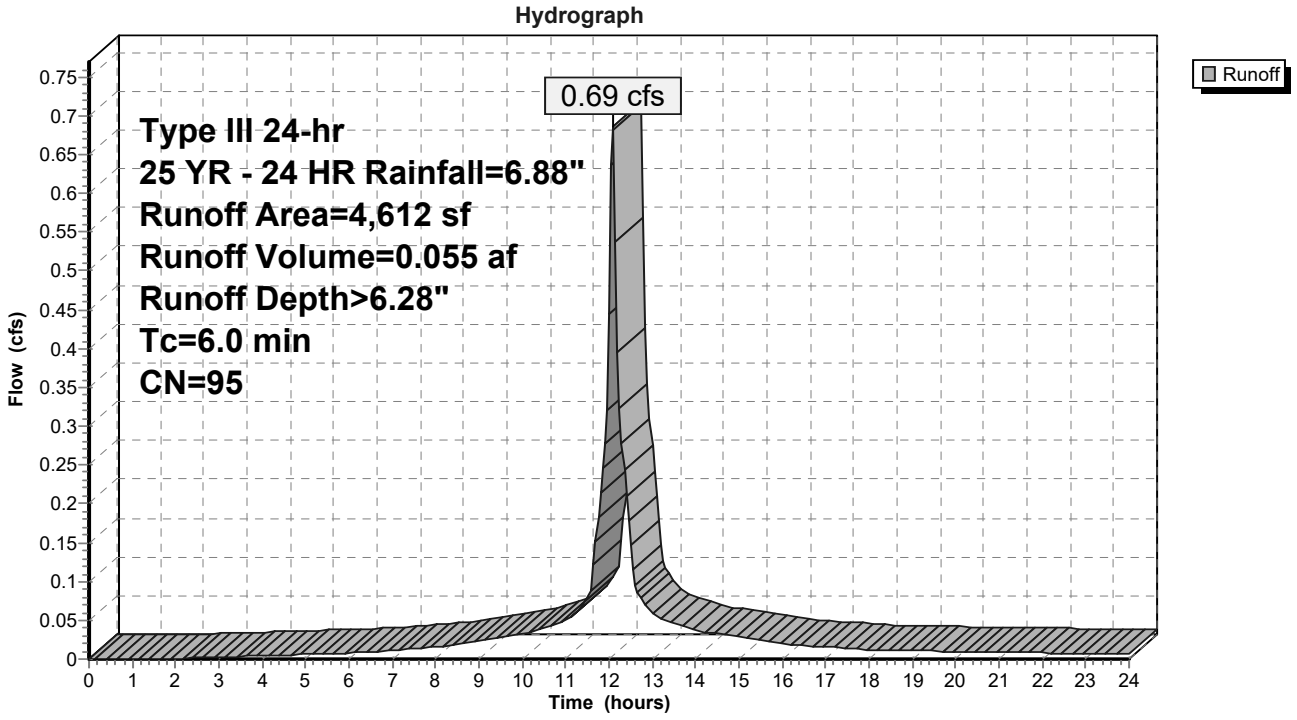
Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.055 af, Depth> 6.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
3,845	98	Paved parking, HSG C
605	74	>75% Grass cover, Good, HSG C
162	98	Roofs, HSG C
4,612	95	Weighted Average
605		13.12% Pervious Area
4,007		86.88% Impervious Area

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

Subcatchment 32S: Subcatchment #32



Summary for Subcatchment 33S: Subcatchment #33

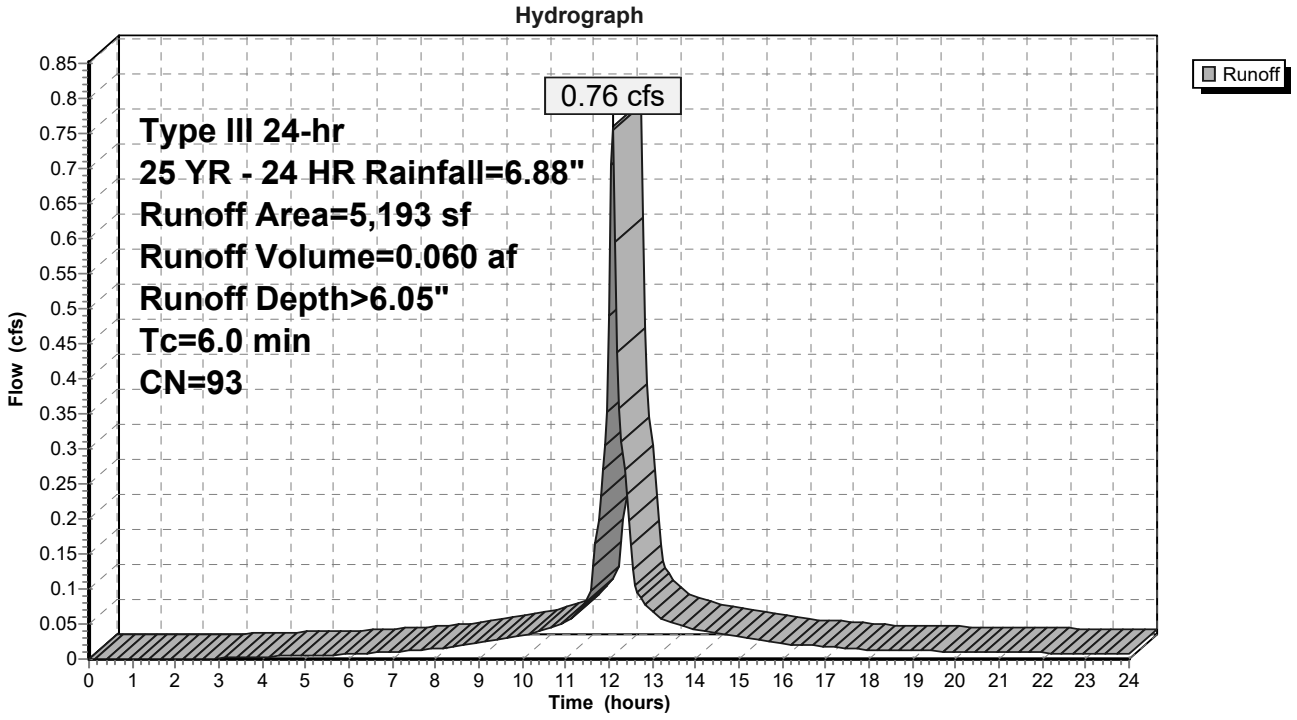
Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
3,609	98	Paved parking, HSG C
1,185	74	>75% Grass cover, Good, HSG C
399	98	Roofs, HSG C
5,193	93	Weighted Average
1,185		22.82% Pervious Area
4,008		77.18% Impervious Area

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

Subcatchment 33S: Subcatchment #33



Summary for Subcatchment 34S: Subcatchment #34

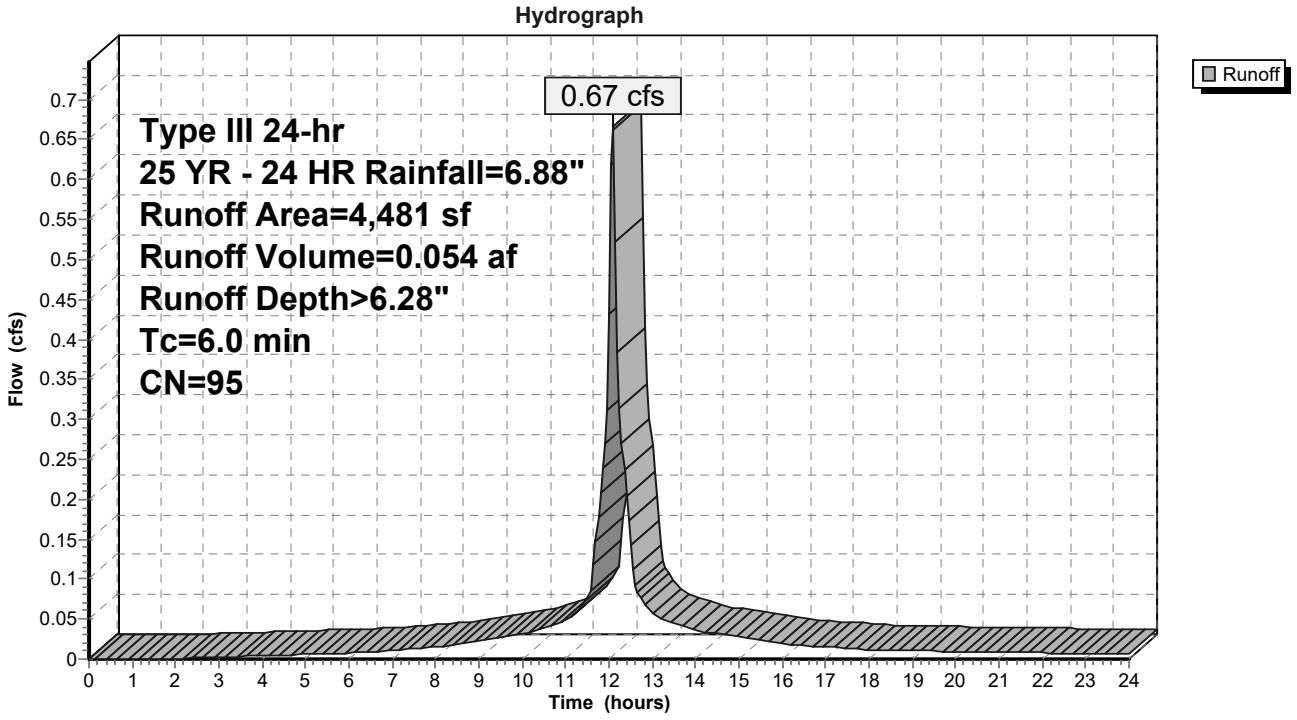
Runoff = 0.67 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 6.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
3,439	98	Paved parking, HSG C
626	74	>75% Grass cover, Good, HSG C
416	98	Roofs, HSG C
4,481	95	Weighted Average
626		13.97% Pervious Area
3,855		86.03% Impervious Area

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

Subcatchment 34S: Subcatchment #34



Summary for Subcatchment 35S: Subcatchment #35

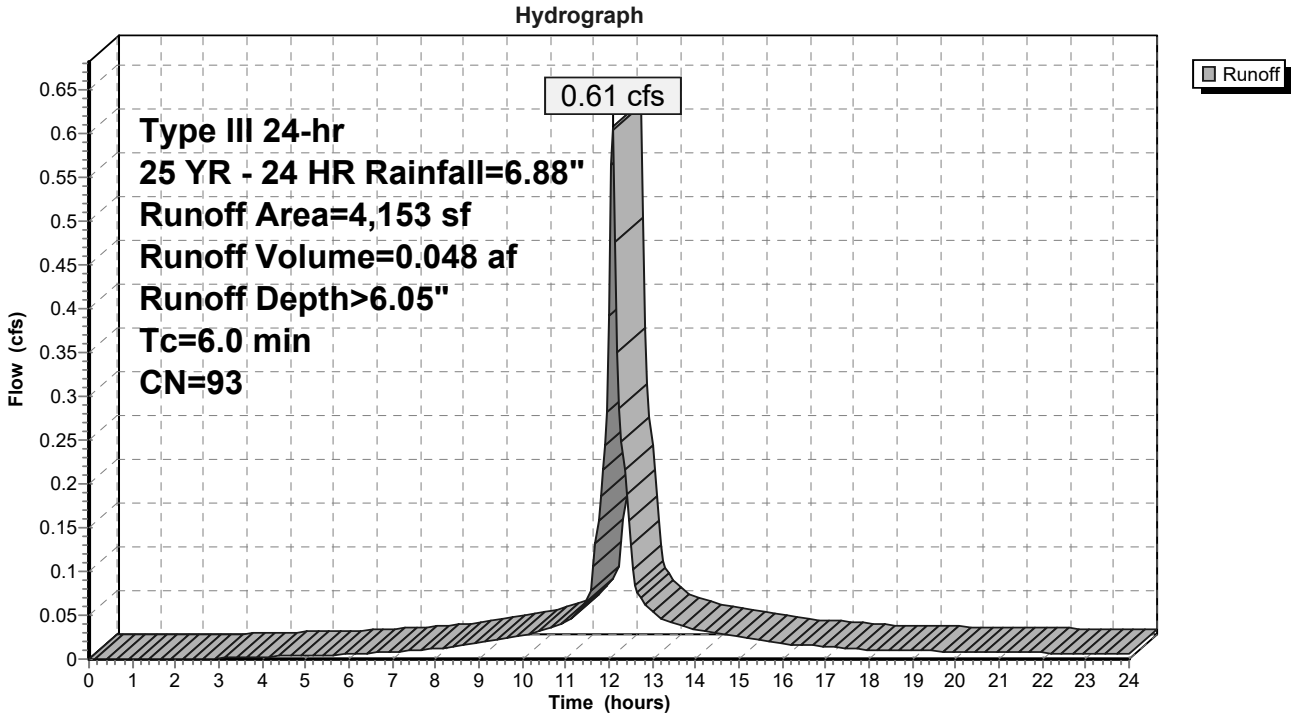
Runoff = 0.61 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
2,963	98	Paved parking, HSG C
890	74	>75% Grass cover, Good, HSG C
300	98	Roofs, HSG C
4,153	93	Weighted Average
890		21.43% Pervious Area
3,263		78.57% Impervious Area

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

Subcatchment 35S: Subcatchment #35



Summary for Subcatchment 36S: Subcatchment #36

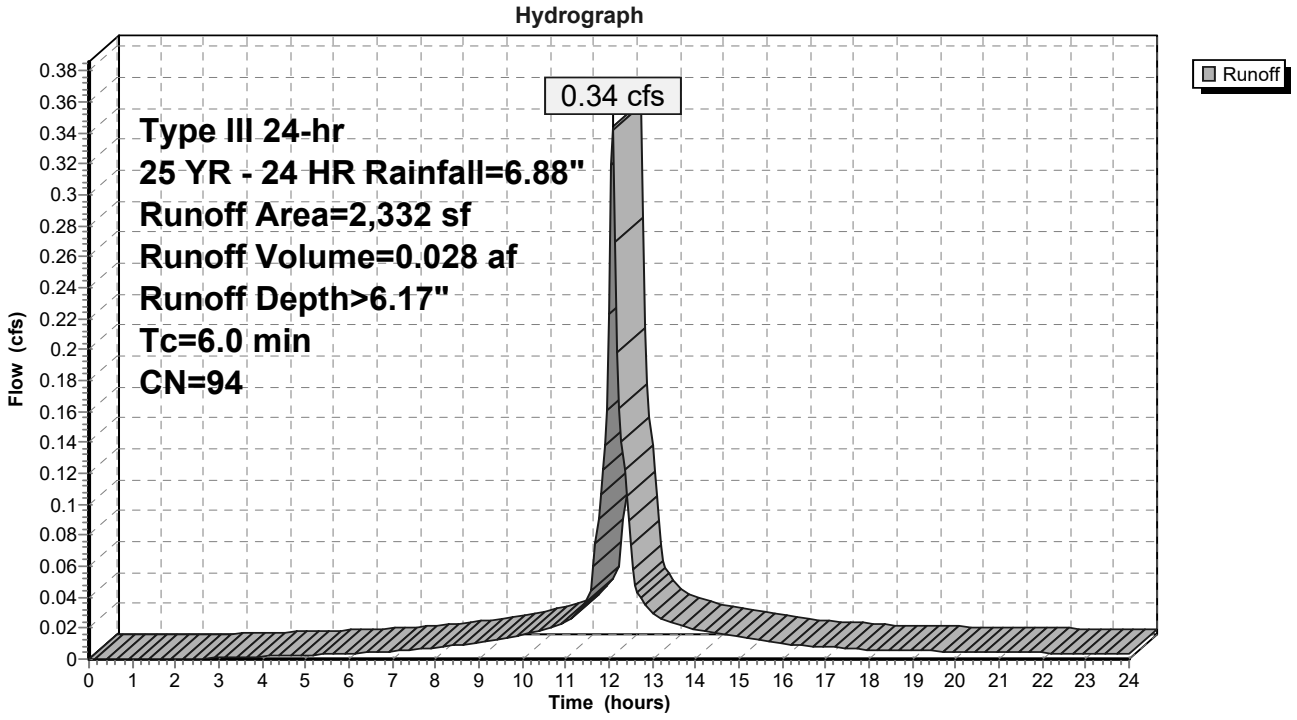
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 6.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
1,795	98	Paved parking, HSG C
412	74	>75% Grass cover, Good, HSG C
125	98	Roofs, HSG C
2,332	94	Weighted Average
412		17.67% Pervious Area
1,920		82.33% Impervious Area

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

Subcatchment 36S: Subcatchment #36



Summary for Subcatchment 37S: Subcatchment #37

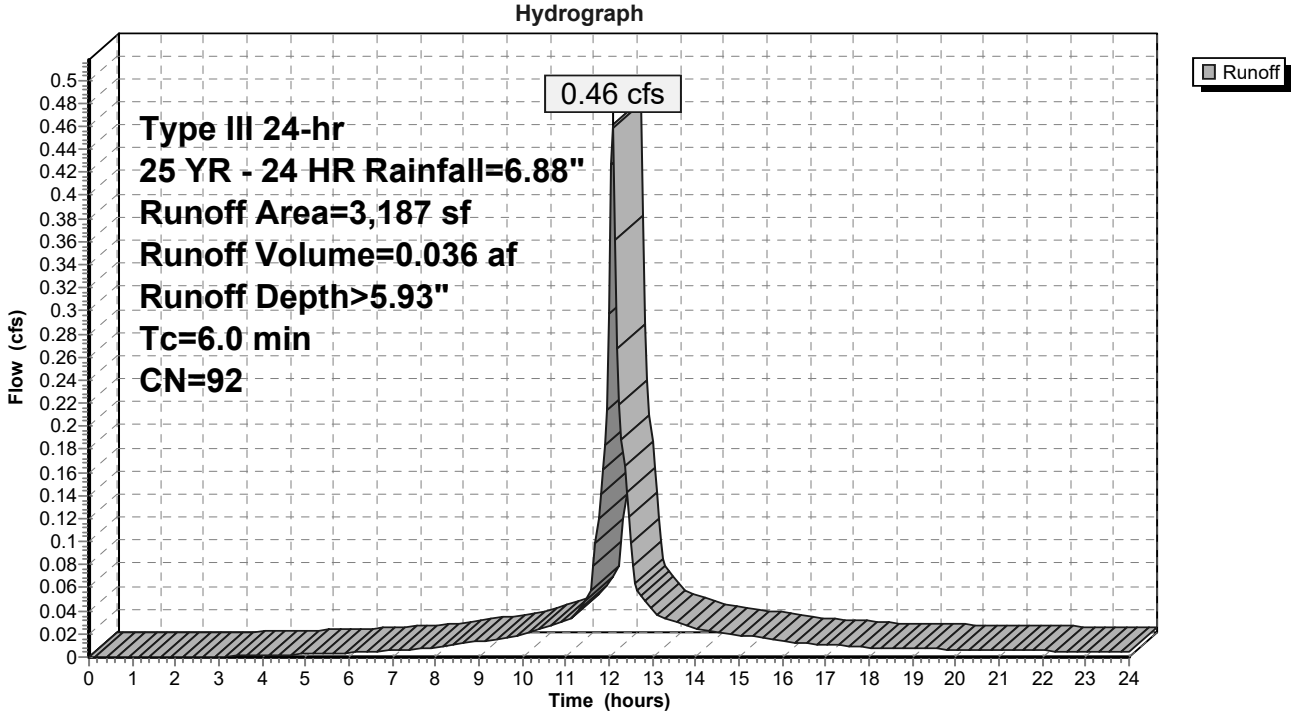
Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.036 af, Depth> 5.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
2,283	98	Paved parking, HSG C
808	74	>75% Grass cover, Good, HSG C
96	98	Roofs, HSG C
3,187	92	Weighted Average
808		25.35% Pervious Area
2,379		74.65% Impervious Area

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

Subcatchment 37S: Subcatchment #37



Summary for Subcatchment 38S: Subcatchment #38

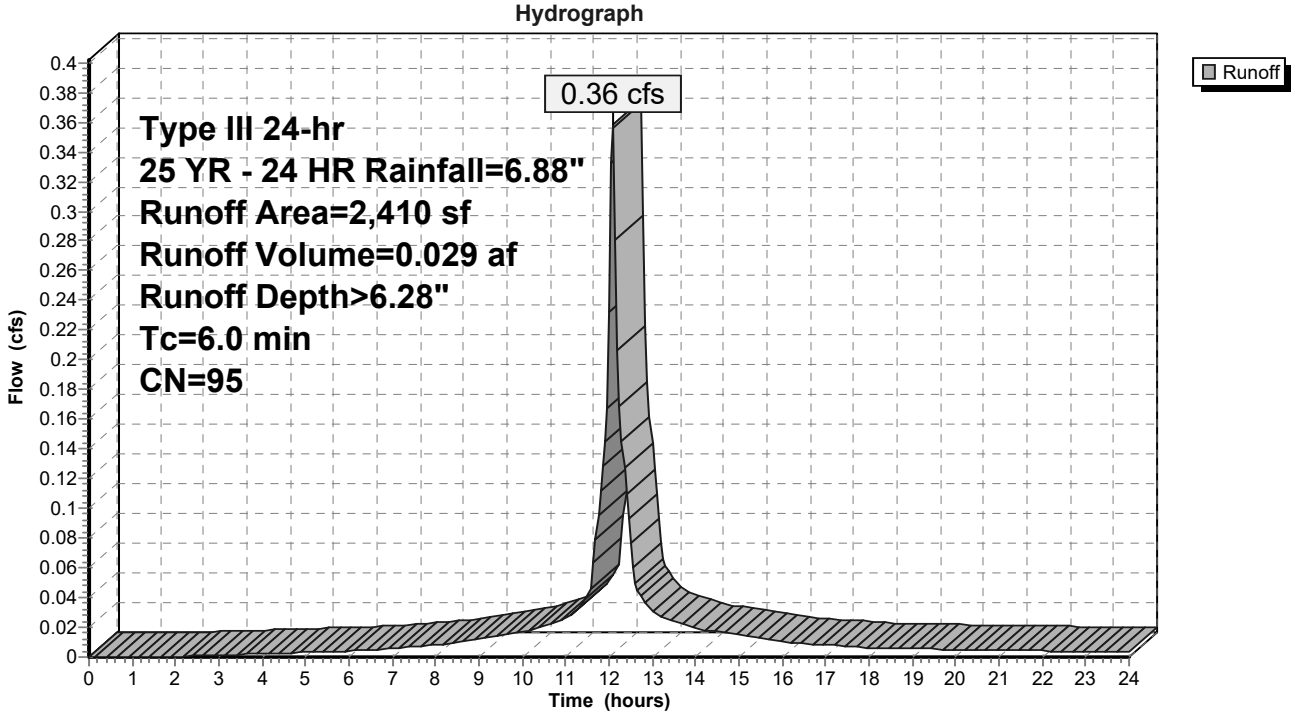
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 6.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR - 24 HR Rainfall=6.88"

Area (sf)	CN	Description
1,999	98	Paved parking, HSG C
252	74	>75% Grass cover, Good, HSG C
159	98	Roofs, HSG C
2,410	95	Weighted Average
252		10.46% Pervious Area
2,158		89.54% Impervious Area

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

Subcatchment 38S: Subcatchment #38



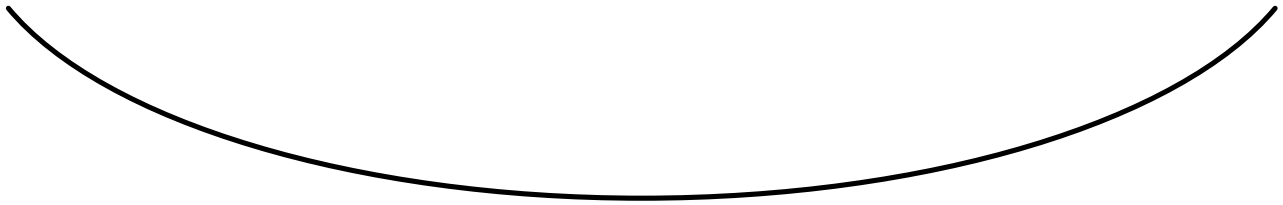
Summary for Reach 15AR: Overland flow

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

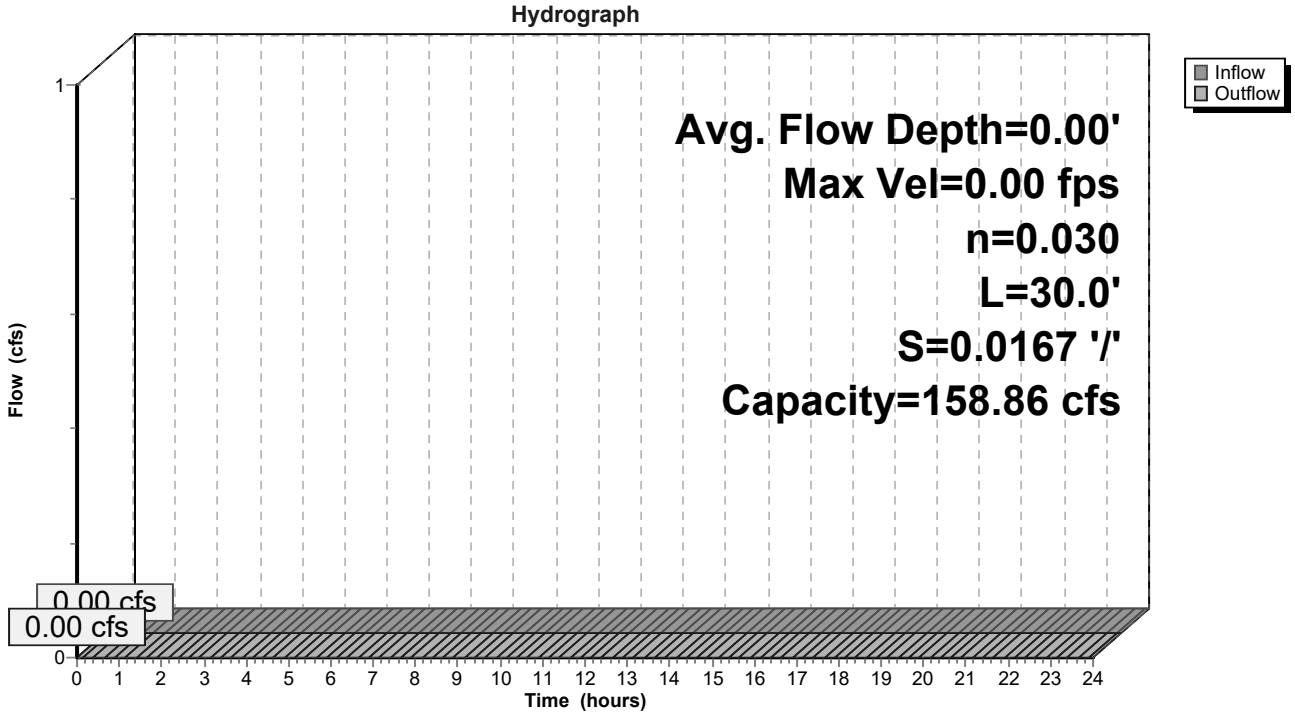
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.50' Flow Area= 25.0 sf, Capacity= 158.86 cfs

25.00' x 1.50' deep Parabolic Channel, n= 0.030 Earth, dense weeds
Length= 30.0' Slope= 0.0167 '/'
Inlet Invert= 92.50', Outlet Invert= 92.00'



‡

Reach 15AR: Overland flow



Summary for Reach 15R: Swale

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

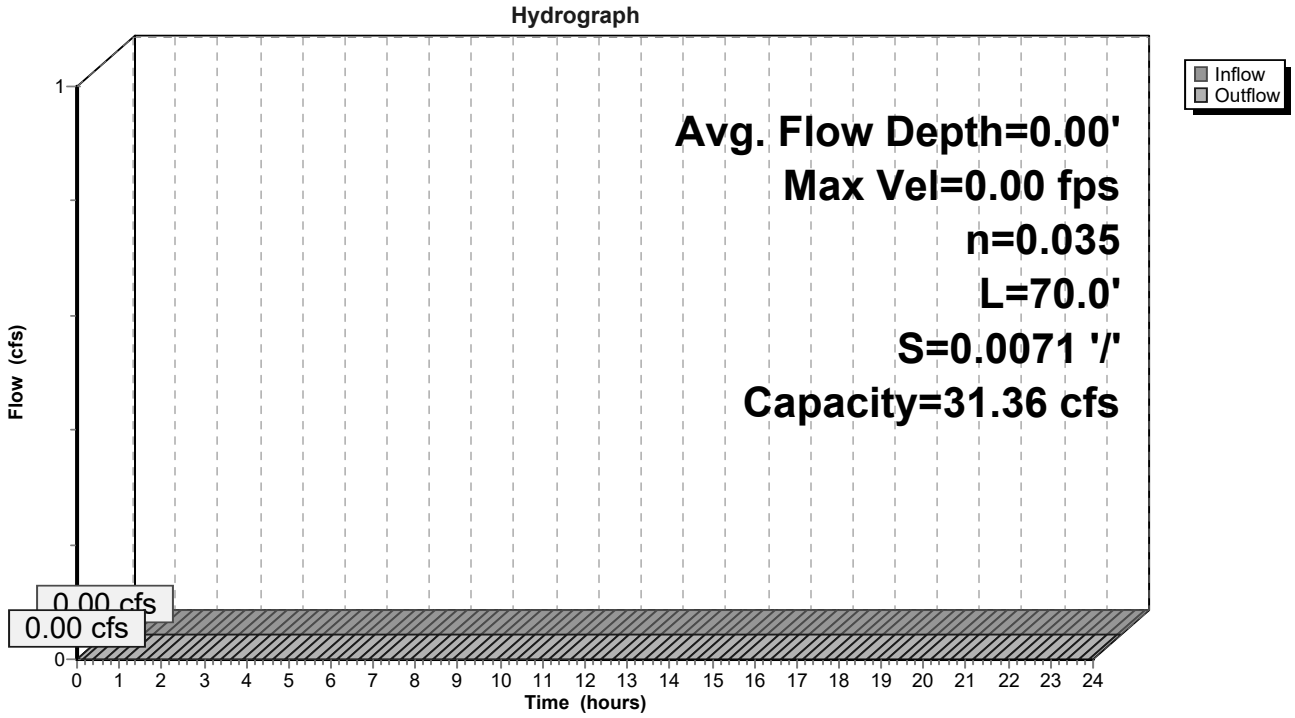
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 31.36 cfs

2.00' x 1.50' deep channel, n= 0.035 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 70.0' Slope= 0.0071 '/'
Inlet Invert= 93.00', Outlet Invert= 92.50'

‡

Reach 15R: Swale



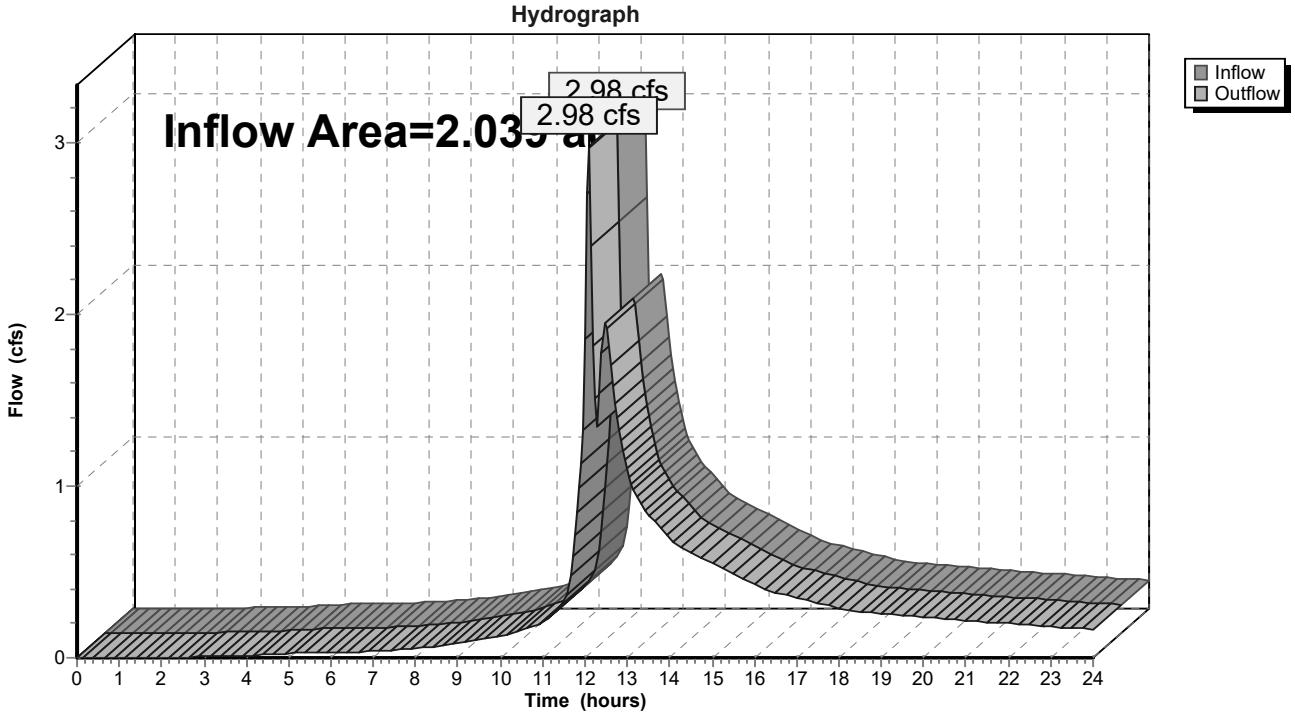
Summary for Reach 100R: Final Reach 100

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

Inflow Area = 2.039 ac, 50.25% Impervious, Inflow Depth > 3.25" for 25 YR - 24 HR event
Inflow = 2.98 cfs @ 12.09 hrs, Volume= 0.552 af
Outflow = 2.98 cfs @ 12.09 hrs, Volume= 0.552 af, Atten= 0%, Lag= 0.0 min

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

Reach 100R: Final Reach 100



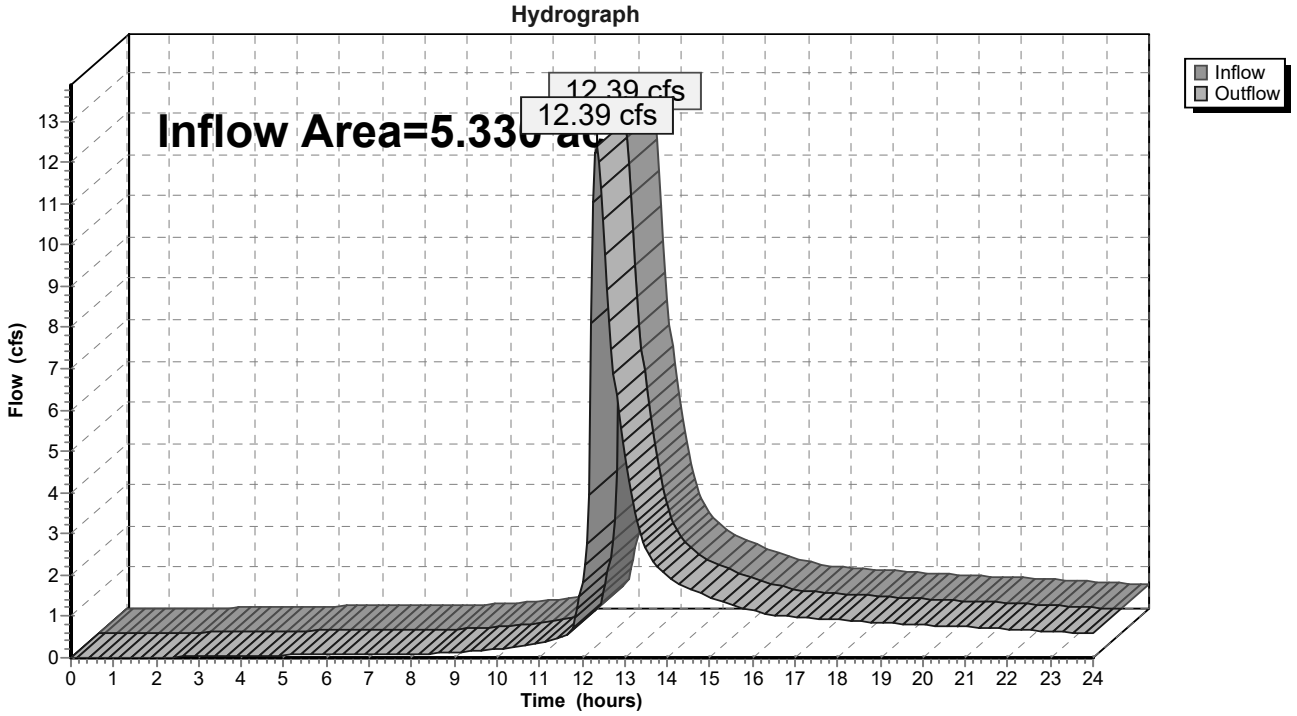
Summary for Reach 200R: Final Reach 200

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

Inflow Area = 5.330 ac, 47.60% Impervious, Inflow Depth > 4.03" for 25 YR - 24 HR event
Inflow = 12.39 cfs @ 12.34 hrs, Volume= 1.789 af
Outflow = 12.39 cfs @ 12.34 hrs, Volume= 1.789 af, Atten= 0%, Lag= 0.0 min

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

Reach 200R: Final Reach 200



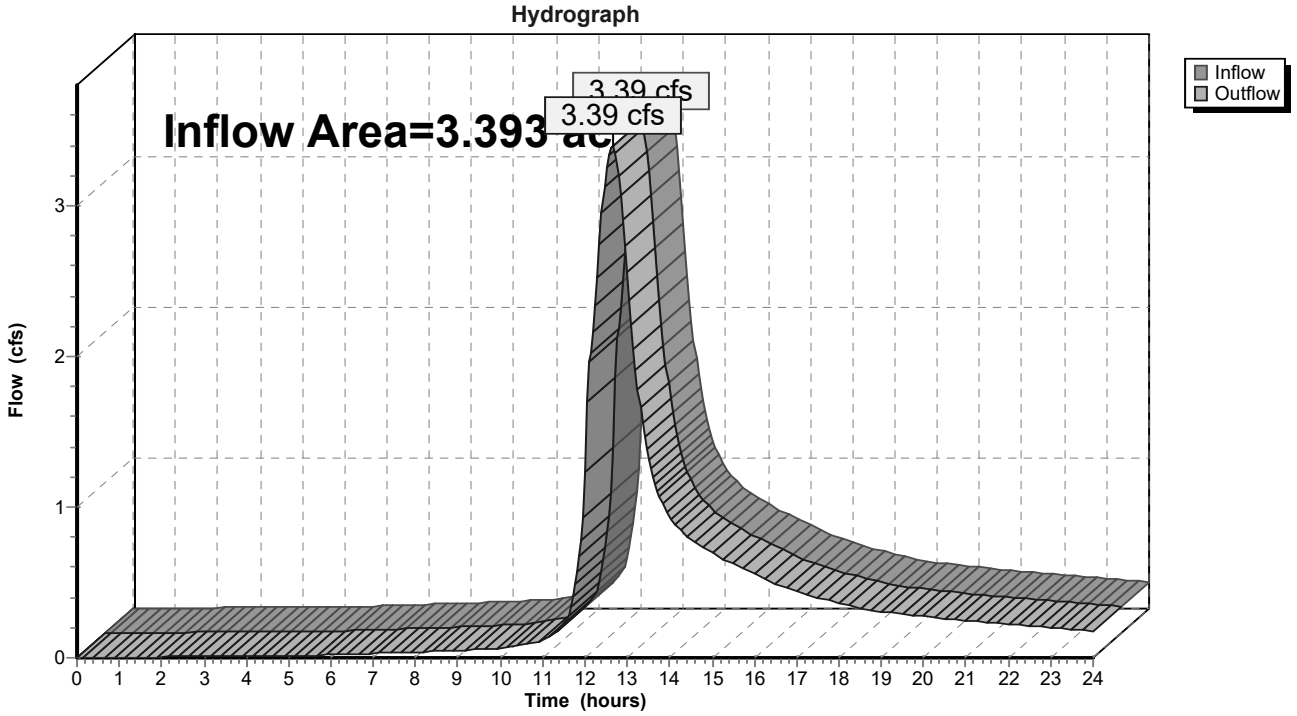
Summary for Reach 400R: Final Reach 400

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

Inflow Area = 3.393 ac, 34.40% Impervious, Inflow Depth > 2.54" for 25 YR - 24 HR event
Inflow = 3.39 cfs @ 12.64 hrs, Volume= 0.718 af
Outflow = 3.39 cfs @ 12.64 hrs, Volume= 0.718 af, Atten= 0%, Lag= 0.0 min

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

Reach 400R: Final Reach 400



Summary for Pond 4P: Pond 4

Inflow Area = 3.233 ac, 31.15% Impervious, Inflow Depth > 2.35" for 25 YR - 24 HR event
Inflow = 3.61 cfs @ 12.50 hrs, Volume= 0.634 af
Outflow = 3.26 cfs @ 12.65 hrs, Volume= 0.629 af, Atten= 10%, Lag= 8.9 min
Primary = 3.26 cfs @ 12.65 hrs, Volume= 0.629 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.99' @ 12.66 hrs Surf.Area= 1,974 sf Storage= 2,014 cf
Flood Elev= 92.50' Surf.Area= 14,979 sf Storage= 10,779 cf

Plug-Flow detention time= 13.8 min calculated for 0.628 af (99% of inflow)
Center-of-Mass det. time= 9.9 min (906.1 - 896.2)

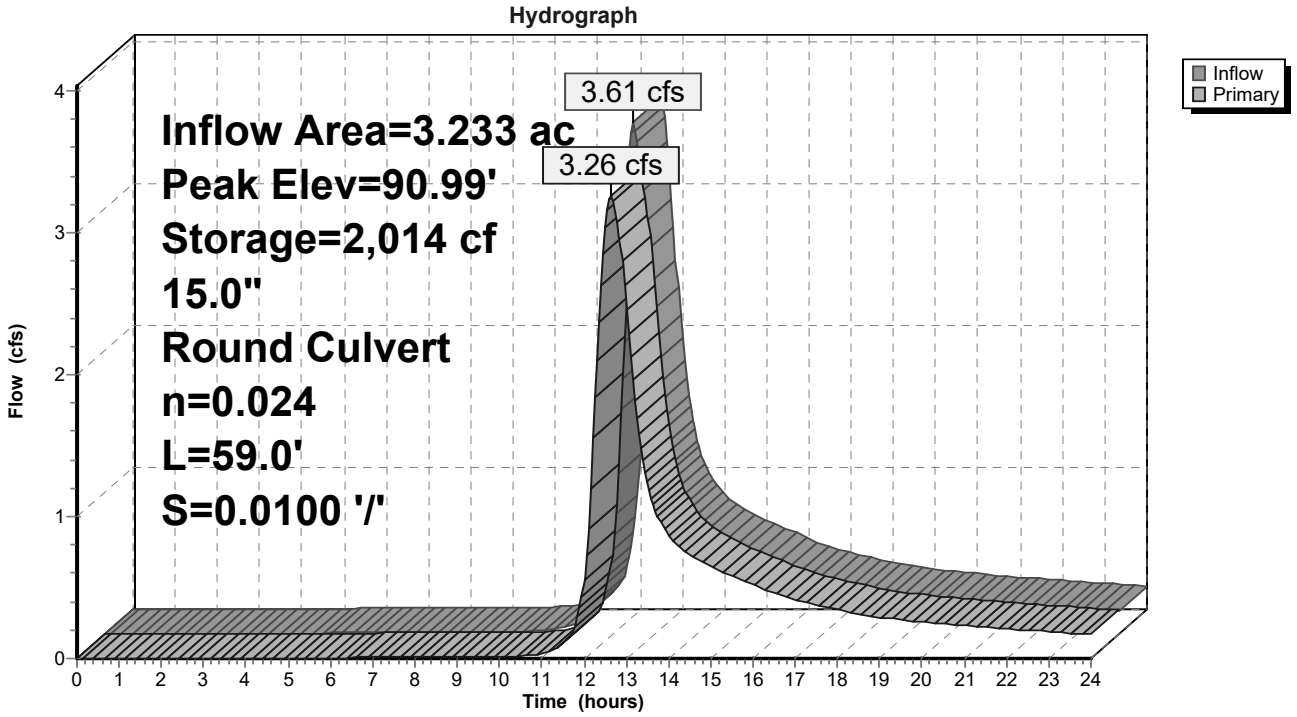
Volume	Invert	Avail.Storage	Storage Description
#1	89.50'	21,457 cf	**Open Water Storage (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
89.50	431	86.9	0	0	431
90.00	1,297	195.8	413	413	2,882
91.00	1,984	265.4	1,628	2,041	5,447
92.00	5,795	515.0	3,723	5,764	20,952
93.00	28,445	768.7	15,693	21,457	46,877

Device	Routing	Invert	Outlet Devices
#1	Primary	89.51'	**15.0" Round 15" CMP** L= 59.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.51' / 88.92' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 1.23 sf

Primary OutFlow Max=3.25 cfs @ 12.65 hrs HW=90.99' TW=90.34' (Dynamic Tailwater)
1=15" CMP (Outlet Controls 3.25 cfs @ 2.83 fps)

Pond 4P: Pond 4



Summary for Pond 16P: Inlet Sump

Inflow Area = 0.477 ac, 53.27% Impervious, Inflow Depth > 5.36" for 25 YR - 24 HR event
Inflow = 2.82 cfs @ 12.09 hrs, Volume= 0.213 af
Outflow = 1.60 cfs @ 12.20 hrs, Volume= 0.211 af, Atten= 43%, Lag= 6.5 min
Primary = 1.60 cfs @ 12.20 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.68' @ 12.22 hrs Surf.Area= 2,351 sf Storage= 1,335 cf
Flood Elev= 95.50' Surf.Area= 4,472 sf Storage= 4,101 cf

Plug-Flow detention time= 33.3 min calculated for 0.211 af (99% of inflow)
Center-of-Mass det. time= 28.6 min (818.1 - 789.5)

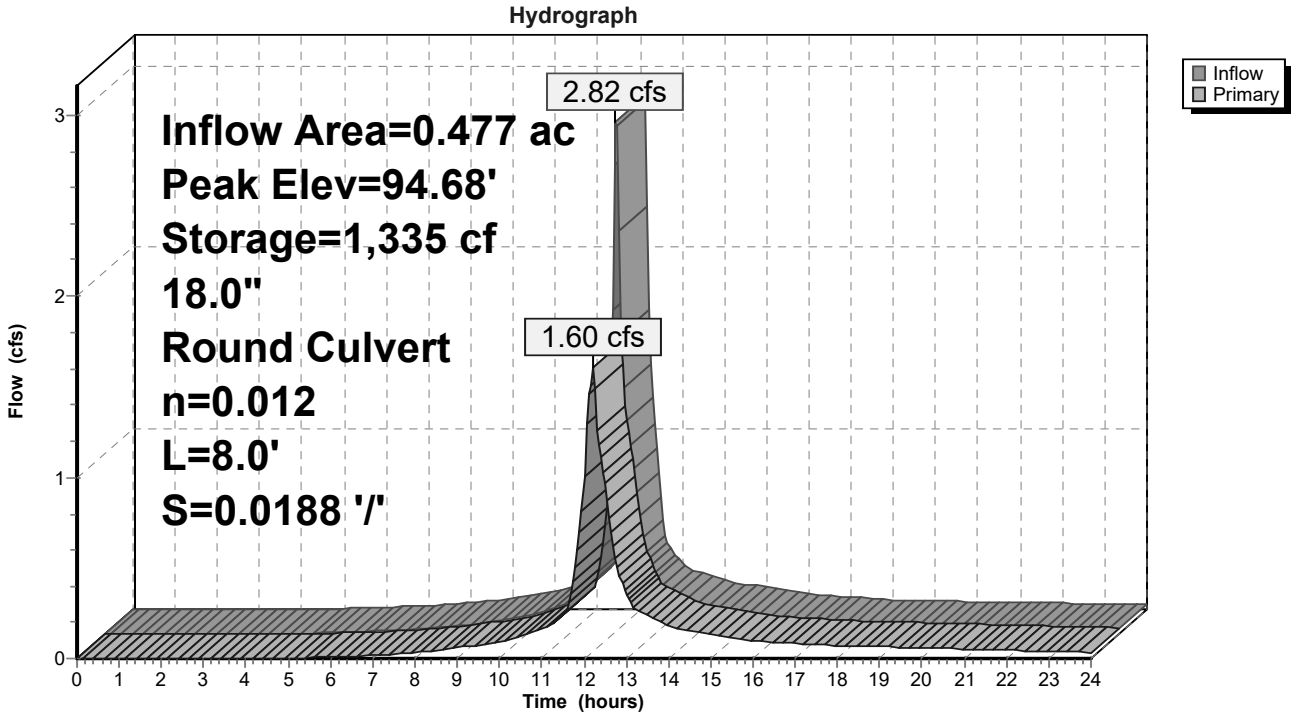
Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	4,101 cf	**Ponding Area (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	472	118.0	0	0	472
94.00	1,106	260.5	192	192	4,764
95.00	3,111	675.0	2,024	2,216	35,625
95.50	4,472	781.2	1,885	4,101	47,937

Device	Routing	Invert	Outlet Devices
#1	Primary	93.75'	**18.0" Round 18" RCP** L= 8.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 93.75' / 93.60' S= 0.0188 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.51 cfs @ 12.20 hrs HW=94.67' TW=94.58' (Dynamic Tailwater)
↑—**1=18" RCP** (Outlet Controls 1.51 cfs @ 1.89 fps)

Pond 16P: Inlet Sump



Summary for Pond 20P: Nyloplast Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=14)

Inflow Area = 0.289 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25 YR - 24 HR event
Inflow = 0.99 cfs @ 12.10 hrs, Volume= 0.072 af
Outflow = 0.85 cfs @ 12.09 hrs, Volume= 0.072 af, Atten= 14%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.09 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 91.82' @ 12.15 hrs Surf.Area= 454 sf Storage= 33 cf
Flood Elev= 93.00' Surf.Area= 1,367 sf Storage= 1,287 cf

Plug-Flow detention time= 0.4 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (842.5 - 842.2)

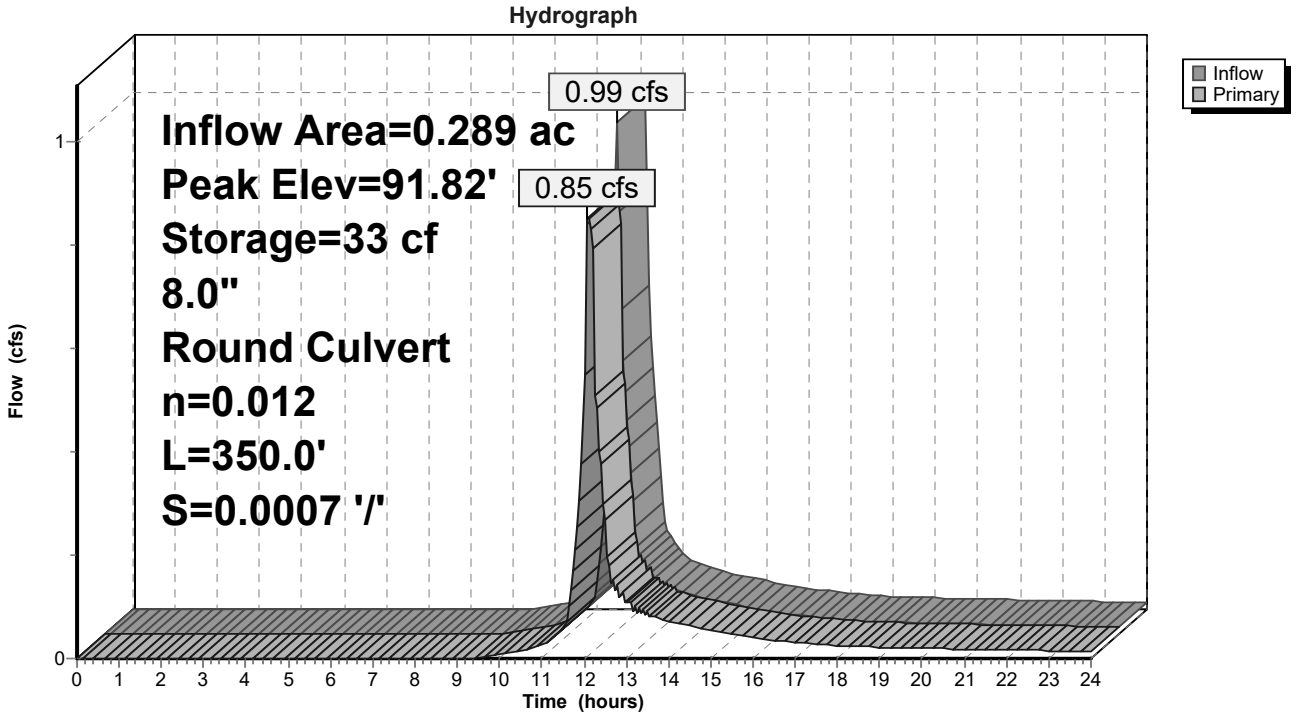
Volume	Invert	Avail.Storage	Storage Description
#1	91.75'	1,281 cf	**Ponding Area (Irregular)**Listed below (Recalc)
#2	89.75'	6 cf	**2.00'D x 2.00'H 2' Structure**
		1,287 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.75	341	90.1	0	0	341
92.00	814	151.8	140	140	1,529
92.50	1,199	181.3	500	640	2,315
93.00	1,364	207.9	640	1,281	3,145

Device	Routing	Invert	Outlet Devices
#1	Primary	89.75'	**8.0" Round 8" HDPE N-12** L= 350.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 89.75' / 89.50' S= 0.0007 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.83 cfs @ 12.09 hrs HW=91.78' TW=90.26' (Dynamic Tailwater)
↑**1=8" HDPE N-12** (Outlet Controls 0.83 cfs @ 2.37 fps)

Pond 20P: Nyloplast Basin



Summary for Pond 101P: Gravel Wetland #101

[80] Warning: Exceeded Pond C08P by 0.06' @ 12.20 hrs (0.45 cfs 0.114 af)

Inflow Area = 1.483 ac, 58.80% Impervious, Inflow Depth > 4.92" for 25 YR - 24 HR event
Inflow = 6.63 cfs @ 12.09 hrs, Volume= 0.608 af
Outflow = 1.33 cfs @ 12.54 hrs, Volume= 0.340 af, Atten= 80%, Lag= 27.1 min
Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.109 af
Secondary = 1.12 cfs @ 12.54 hrs, Volume= 0.227 af
Tertiary = 0.13 cfs @ 12.54 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.03' @ 12.54 hrs Surf.Area= 29,677 sf Storage= 12,605 cf
Flood Elev= 94.50' Surf.Area= 33,501 sf Storage= 19,418 cf

Plug-Flow detention time= 254.6 min calculated for 0.340 af (56% of inflow)
Center-of-Mass det. time= 115.3 min (934.4 - 819.1)

Volume	Invert	Avail.Storage	Storage Description
#1	91.92'	25 cf	**4.00'D x 1.98'H Outlet Structure**
#2	92.50'	370 cf	**Sediment Forebay #1 (Irregular)**Listed below (Recalc)
#3	92.50'	3,249 cf	**Sediment Forebay #2 (Irregular)**Listed below (Recalc)
#4	92.25'	2,154 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#5	92.25'	2,131 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#6	93.25'	4,294 cf	**Cell Open Water Storage (Irregular)**Listed below (Recalc)
#7	94.00'	7,194 cf	**Open Water Storage (Irregular)**Listed below (Recalc)
		19,418 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	79	45.1	0	0	79
93.00	199	61.4	67	67	220
94.00	421	85.4	303	370	510

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	82	38.6	0	0	82
93.00	595	166.0	150	150	2,157
93.25	2,096	217.7	317	467	3,736
94.00	5,605	521.1	2,782	3,249	21,576

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,400	183.9	0	0	1,400
92.50	2,122	256.6	437	437	3,949
93.00	2,345	265.0	1,116	1,553	4,321
93.25	2,462	267.1	601	2,154	4,432

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,279	177.2	0	0	1,279
92.50	2,037	252.7	411	411	3,862
93.00	2,374	258.9	1,102	1,513	4,145
93.25	2,572	262.9	618	2,131	4,324

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.25	5,490	320.3	0	0	5,490
94.00	5,965	332.3	4,294	4,294	6,160

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	12,409	830.5	0	0	12,409
94.50	16,463	1,069.1	7,194	7,194	48,480

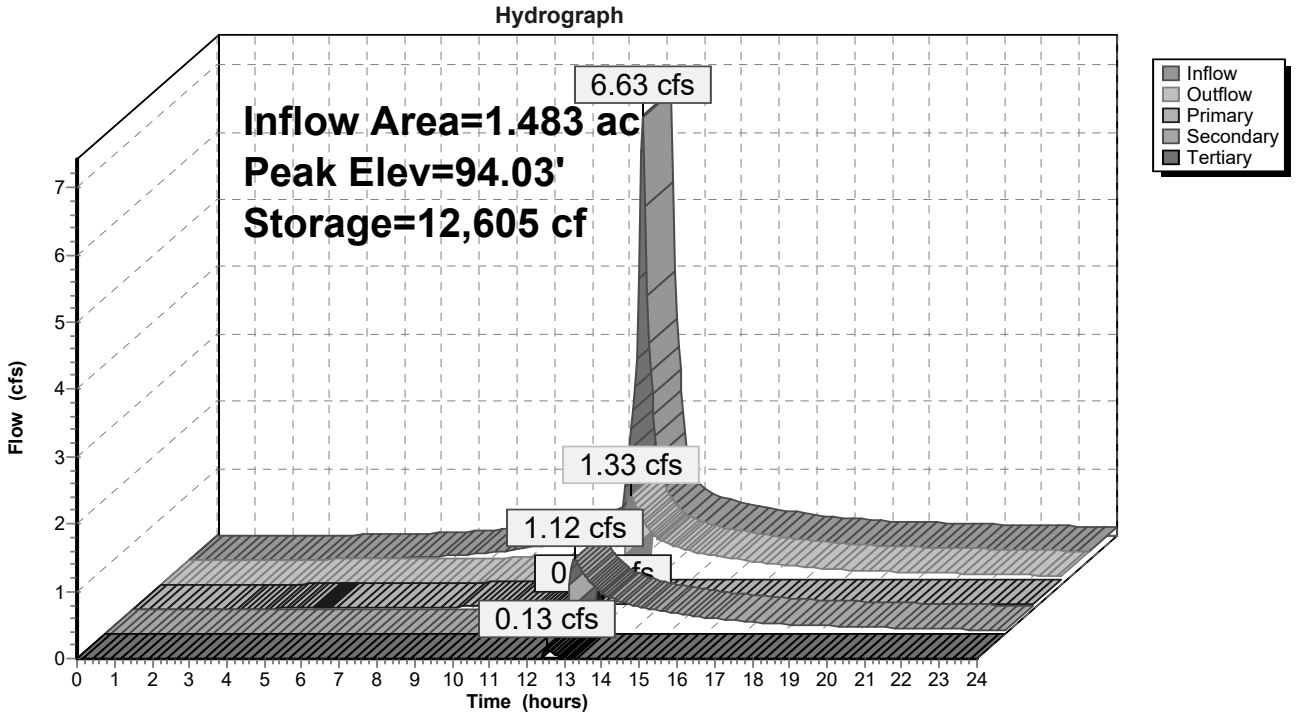
Device	Routing	Invert	Outlet Devices
#1	Primary	91.92'	**6.0" Round 6" HDPE N-12** L= 17.0' Ke= 0.500 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0100 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Secondary	91.92'	**12.0" Round 12" RCP** L= 16.0' Ke= 0.500 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0106 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Device 1	91.92'	**1.5" Vert. 1.5" Orifice Goose Neck** C= 0.600
#4	Device 2	93.94'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	94.00'	**10.0' long x 7.0' breadth 10' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=0.08 cfs @ 12.54 hrs HW=94.03' TW=0.00' (Dynamic Tailwater)
↑└─**1=6" HDPE N-12** (Passes 0.08 cfs of 1.29 cfs potential flow)
↑└─**3=1.5" Orifice Goose Neck** (Orifice Controls 0.08 cfs @ 6.89 fps)

Secondary OutFlow Max=1.11 cfs @ 12.54 hrs HW=94.03' TW=0.00' (Dynamic Tailwater)
↑└─**2=12" RCP** (Passes 1.11 cfs of 4.80 cfs potential flow)
↑└─**4=4' Structure** (Weir Controls 1.11 cfs @ 0.98 fps)

Tertiary OutFlow Max=0.13 cfs @ 12.54 hrs HW=94.03' TW=0.00' (Dynamic Tailwater)
↑└─**5=10' Emergency Spillway** (Weir Controls 0.13 cfs @ 0.42 fps)

Pond 101P: Gravel Wetland #101



Summary for Pond 102P: StormTech SC740 #102

Inflow Area = 0.347 ac,100.00% Impervious, Inflow Depth > 6.64" for 25 YR - 24 HR event
Inflow = 2.28 cfs @ 12.09 hrs, Volume= 0.192 af
Outflow = 0.08 cfs @ 16.03 hrs, Volume= 0.099 af, Atten= 96%, Lag= 236.4 min
Primary = 0.08 cfs @ 16.03 hrs, Volume= 0.099 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.84' @ 15.37 hrs Surf.Area= 3,807 sf Storage= 5,368 cf
Flood Elev= 96.25' Surf.Area= 3,807 sf Storage= 8,073 cf

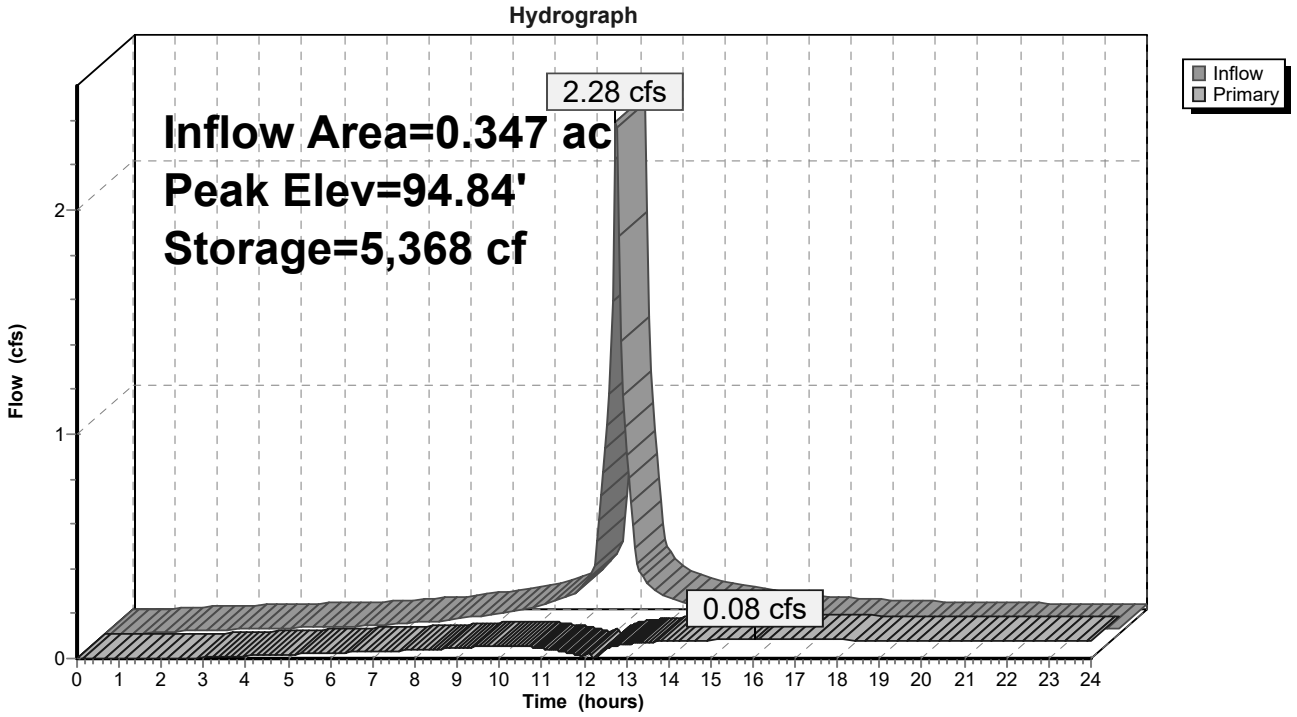
Plug-Flow detention time= 342.1 min calculated for 0.099 af (52% of inflow)
Center-of-Mass det. time= 213.9 min (956.7 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	3,502 cf	**34.75'W x 109.00'L x 3.50'H Stone** 13,257 cf Overall - 4,502 cf Embedded = 8,755 cf x 40.0% Voids
#2	93.25'	4,502 cf	**ADS_StormTech SC-740 +Cap** x 98 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	92.75'	98 cf	**5.00'D x 5.00'H Outlet Structure**
		8,102 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**18.0" Round 18" HDPE N-12** L= 33.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	92.75'	**2.0" Vert. 3" Orifice** C= 0.600
#3	Device 1	95.75'	**18.0" Horiz. 18" Int. Stack** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 16.03 hrs HW=94.83' TW=94.20' (Dynamic Tailwater)
└─**1=18" HDPE N-12** (Passes 0.08 cfs of 6.73 cfs potential flow)
  ├─**2=3" Orifice** (Orifice Controls 0.08 cfs @ 3.81 fps)
  └─**3=18" Int. Stack** (Controls 0.00 cfs)

Pond 102P: StormTech SC740 #102



Summary for Pond 103P: Gravel Wetland #103

[80] Warning: Exceeded Pond 102P by 0.12' @ 12.15 hrs (0.04 cfs 0.001 af)

Inflow Area = 3.770 ac, 67.27% Impervious, Inflow Depth > 5.44" for 25 YR - 24 HR event
Inflow = 14.51 cfs @ 12.10 hrs, Volume= 1.710 af
Outflow = 8.29 cfs @ 12.33 hrs, Volume= 1.307 af, Atten= 43%, Lag= 14.0 min
Primary = 0.20 cfs @ 12.33 hrs, Volume= 0.251 af
Secondary = 4.56 cfs @ 12.33 hrs, Volume= 0.876 af
Tertiary = 3.53 cfs @ 12.33 hrs, Volume= 0.180 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.40' @ 12.33 hrs Surf.Area= 31,366 sf Storage= 27,139 cf
Flood Elev= 95.00' Surf.Area= 32,983 sf Storage= 38,090 cf

Plug-Flow detention time= 200.5 min calculated for 1.304 af (76% of inflow)
Center-of-Mass det. time= 108.1 min (912.6 - 804.6)

Volume	Invert	Avail.Storage	Storage Description
#1	91.92'	28 cf	**4.00'D x 2.23'H Outlet Structure**
#2	92.25'	4,287 cf	**Cell 1 (Irregular)** Listed below (Recalc)
#3	92.25'	4,099 cf	**Cell 2 (Irregular)** Listed below (Recalc)
#4	93.50'	25,593 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	92.50'	4,083 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
		38,090 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,797	216.6	0	0	1,797
92.50	3,184	347.3	614	614	7,662
93.00	3,681	362.9	1,715	2,329	8,562
93.50	4,155	374.2	1,958	4,287	9,250

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,797	216.6	0	0	1,797
92.50	2,882	243.9	580	580	2,799
93.00	3,568	328.9	1,609	2,189	6,676
93.50	4,077	342.3	1,910	4,099	7,411

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.50	15,320	728.3	0	0	15,320
94.00	16,467	741.0	7,945	7,945	16,850
94.50	17,586	750.4	8,512	16,457	18,026
95.00	18,967	820.6	9,136	25,593	26,811

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	1,819	357.2	0	0	1,819
93.00	4,483	584.2	1,526	1,526	18,826
93.50	5,771	642.7	2,557	4,083	24,546

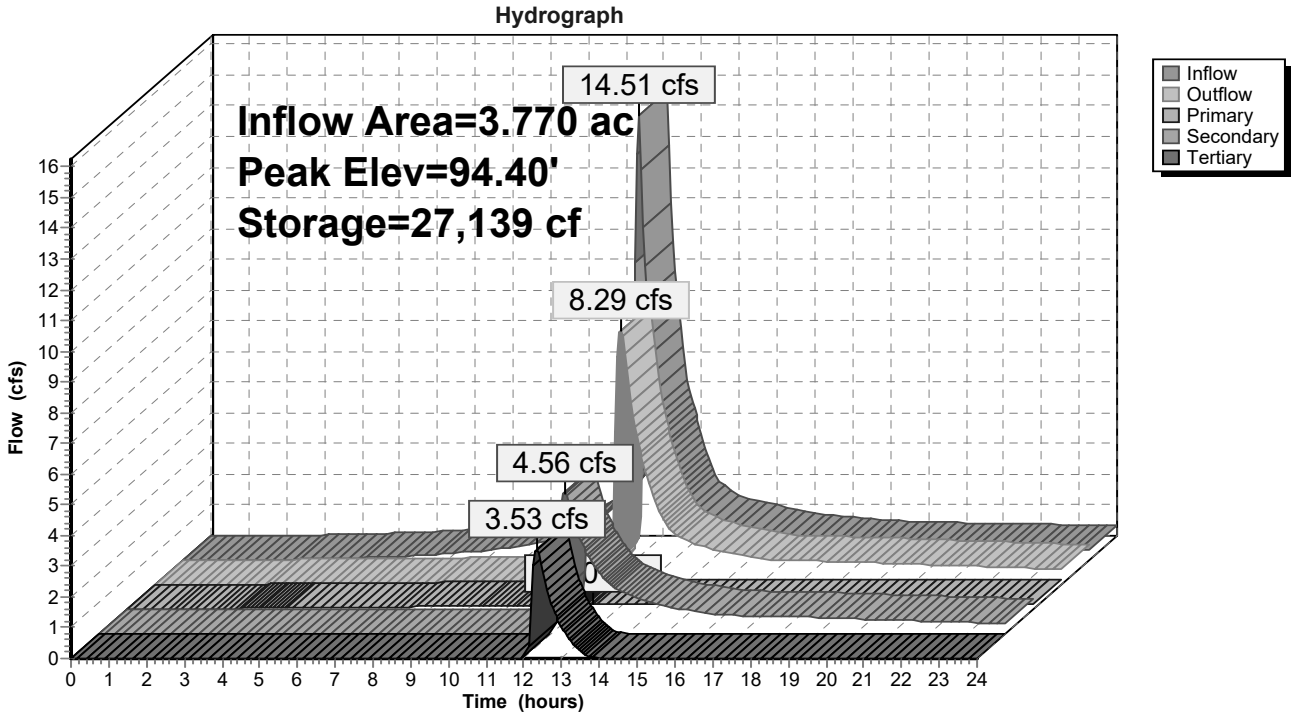
Device	Routing	Invert	Outlet Devices
#1	Primary	91.92'	**6.0" Round 6" HDPE N-12** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	91.92'	**15.0" Round 15" RCP** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 1	91.92'	**2.2" Vert. 2.25" Orifice Goose Neck** C= 0.600
#4	Device 2	93.50'	**4.0" Vert. 4" Orifice (2) X 2.00** C= 0.600
#5	Device 2	94.19'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads
#6	Tertiary	94.25'	**25.0' long x 11.0' breadth 25' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64

Primary OutFlow Max=0.20 cfs @ 12.33 hrs HW=94.40' TW=0.00' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.20 cfs of 1.11 cfs potential flow)
  └─**3=2.25" Orifice Goose Neck** (Orifice Controls 0.20 cfs @ 7.43 fps)

Secondary OutFlow Max=4.55 cfs @ 12.33 hrs HW=94.40' TW=0.00' (Dynamic Tailwater)
└─**2=15" RCP** (Passes 4.55 cfs of 6.35 cfs potential flow)
  ├─**4=4" Orifice (2)** (Orifice Controls 0.72 cfs @ 4.11 fps)
  └─**5=4' Structure** (Weir Controls 3.83 cfs @ 1.48 fps)

Tertiary OutFlow Max=3.51 cfs @ 12.33 hrs HW=94.40' TW=0.00' (Dynamic Tailwater)
└─**6=25' Emergency Spillway** (Weir Controls 3.51 cfs @ 0.97 fps)

Pond 103P: Gravel Wetland #103



Summary for Pond 104P: Gravel Wetland #104

Inflow Area = 0.506 ac, 53.15% Impervious, Inflow Depth > 5.36" for 25 YR - 24 HR event
Inflow = 3.00 cfs @ 12.09 hrs, Volume= 0.226 af
Outflow = 0.12 cfs @ 15.22 hrs, Volume= 0.093 af, Atten= 96%, Lag= 187.7 min
Primary = 0.12 cfs @ 15.22 hrs, Volume= 0.093 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 92.96' @ 15.22 hrs Surf.Area= 8,095 sf Storage= 6,789 cf
Flood Elev= 94.00' Surf.Area= 10,045 sf Storage= 12,384 cf

Plug-Flow detention time= 347.6 min calculated for 0.093 af (41% of inflow)
Center-of-Mass det. time= 223.1 min (1,012.6 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.33'	43 cf	**4.00'D x 3.42'H Outlet Structure**
#2	91.00'	1,416 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#3	91.00'	897 cf	**Cell 1 (Irregular)** Listed below (Recalc)
#4	91.00'	1,195 cf	**Cell 2 (Irregular)** Listed below (Recalc)
#5	92.00'	8,833 cf	**Open water storage (Irregular)** Listed below (Recalc)
		12,384 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	165	49.3	0	0	165
91.50	570	108.8	174	174	915
92.00	693	117.9	315	489	1,088
93.00	1,183	152.4	927	1,416	1,843

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	768	145.0	0	0	768
91.50	893	151.8	415	415	945
92.00	1,038	159.7	482	897	1,156

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	855	158.3	0	0	855
91.50	1,248	206.2	523	523	2,247
92.00	1,444	214.6	672	1,195	2,548

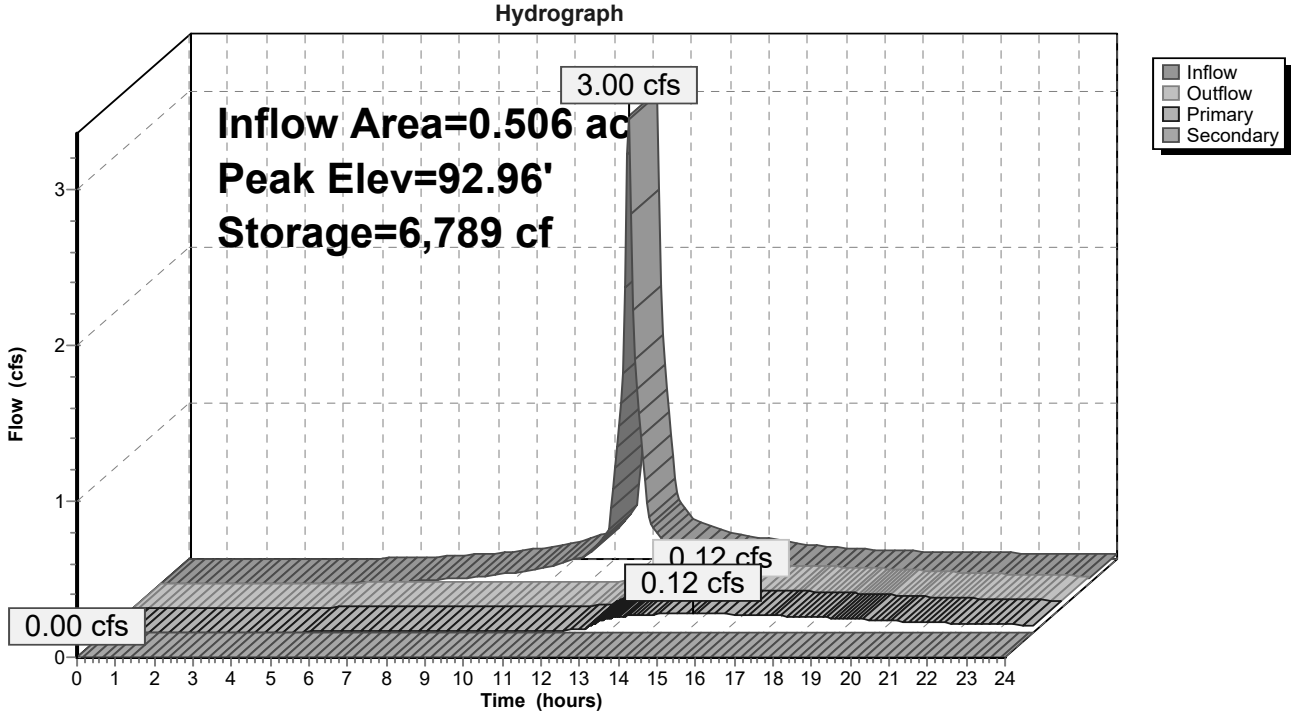
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.00	2,552	351.7	0	0	2,552
93.00	4,543	490.4	3,500	3,500	11,856
93.75	5,684	526.6	3,827	7,327	14,811
94.00	6,367	575.4	1,506	8,833	19,092

Device	Routing	Invert	Outlet Devices
#1	Primary	90.33'	**6.0" Round 6" HDPE N-12** L= 33.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 90.33' / 90.00' S= 0.0098 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	90.33'	**12.0" Round 12" RCP** L= 13.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 90.33' / 90.00' S= 0.0244 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Device 1	90.33'	**0.7" Vert. 0.75" Orifice Goose Neck** C= 0.600
#4	Device 1	92.65'	**3.0" Vert. 3" Orifice** C= 0.600
#5	Device 2	93.50'	**15.0" W x 3.0" H Vert. 3"T X 15"W Box Orifice** C= 0.600
#6	Device 2	93.79'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 15.22 hrs HW=92.96' TW=90.08' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.12 cfs of 1.15 cfs potential flow)
  ├─**3=0.75" Orifice Goose Neck** (Orifice Controls 0.02 cfs @ 7.76 fps)
  └─**4=3" Orifice** (Orifice Controls 0.10 cfs @ 2.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.33' TW=89.50' (Dynamic Tailwater)
└─**2=12" RCP** (Controls 0.00 cfs)
  ├─**5=3"T X 15"W Box Orifice** (Controls 0.00 cfs)
  └─**6=4' Structure** (Controls 0.00 cfs)

Pond 104P: Gravel Wetland #104



Summary for Pond 105P: Detention Pond #105

Inflow Area = 1.254 ac, 77.05% Impervious, Inflow Depth > 6.05" for 25 YR - 24 HR event
Inflow = 7.91 cfs @ 12.09 hrs, Volume= 0.633 af
Outflow = 3.32 cfs @ 12.21 hrs, Volume= 0.626 af, Atten= 58%, Lag= 7.3 min
Primary = 3.32 cfs @ 12.21 hrs, Volume= 0.626 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.76' @ 12.31 hrs Surf.Area= 4,540 sf Storage= 5,793 cf
Flood Elev= 97.00' Surf.Area= 6,791 sf Storage= 12,731 cf

Plug-Flow detention time= 40.7 min calculated for 0.626 af (99% of inflow)
Center-of-Mass det. time= 33.6 min (799.3 - 765.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	12,731 cf	**Open Water Storage (Irregular)** Listed below (Recalc)

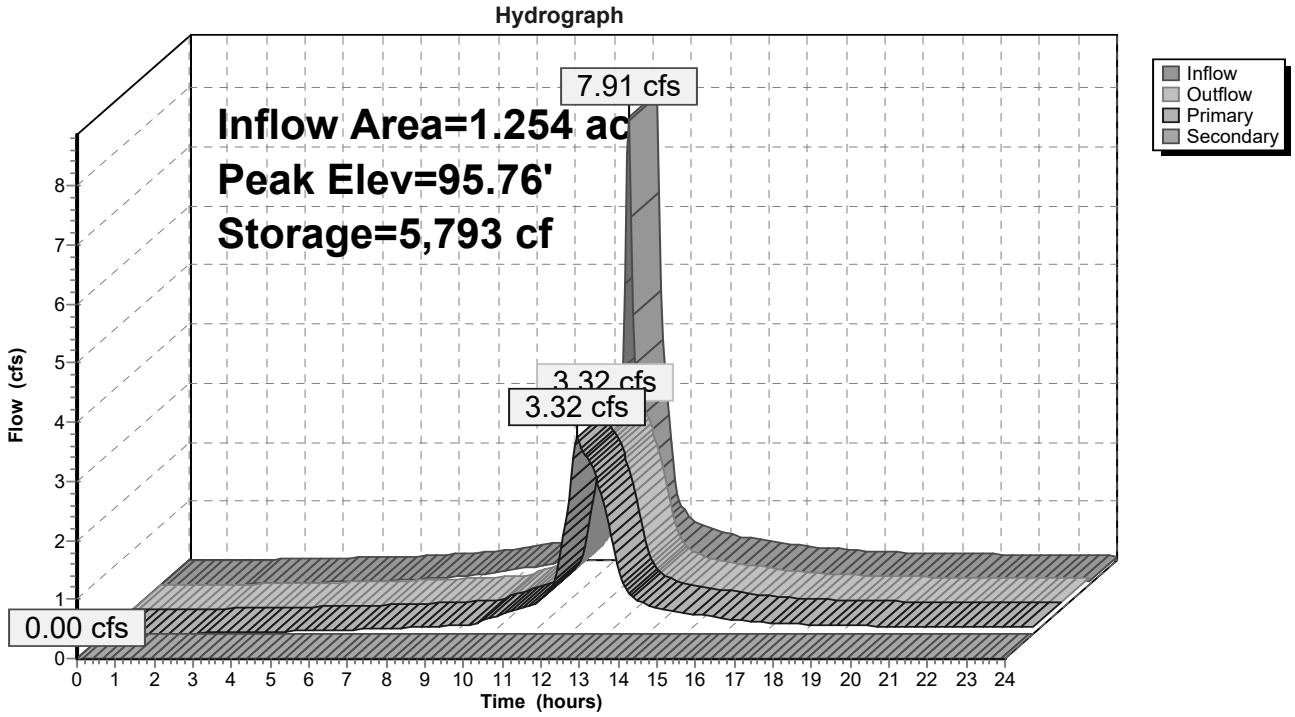
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	30	22.0	0	0	30
94.00	1,688	169.5	162	162	2,278
95.00	3,555	326.9	2,564	2,726	8,500
96.00	4,876	389.9	4,198	6,924	12,112
97.00	6,791	463.8	5,807	12,731	17,150

Device	Routing	Invert	Outlet Devices
#1	Primary	93.75'	**18.0" Round 18" HDPE N-12** L= 103.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 93.75' / 93.22' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	93.75'	**3.0" Vert. 3" Orifice** C= 0.600
#3	Device 1	94.30'	**6.0" Vert. 6" Orifice (3) X 3.00** C= 0.600
#4	Device 1	96.25'	**48.0" Horiz. 48" Outlet Structure** C= 0.600 Limited to weir flow at low heads
#5	Secondary	96.50'	**10.0' long x 7.0' breadth 10' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=3.20 cfs @ 12.21 hrs HW=95.72' TW=94.63' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Passes 3.20 cfs of 8.33 cfs potential flow)
  ├**2=3" Orifice** (Orifice Controls 0.25 cfs @ 5.02 fps)
  ├**3=6" Orifice (3)** (Orifice Controls 2.96 cfs @ 5.02 fps)
  └**4=48" Outlet Structure** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=93.75' TW=93.00' (Dynamic Tailwater)
└**5=10' Emergency Spillway** (Controls 0.00 cfs)

Pond 105P: Detention Pond #105



Summary for Pond 106P: StormTech SC740 #106

Inflow Area = 0.347 ac,100.00% Impervious, Inflow Depth > 6.64" for 25 YR - 24 HR event
Inflow = 2.28 cfs @ 12.09 hrs, Volume= 0.192 af
Outflow = 0.10 cfs @ 14.70 hrs, Volume= 0.116 af, Atten= 95%, Lag= 157.1 min
Primary = 0.10 cfs @ 14.70 hrs, Volume= 0.116 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.98' @ 14.56 hrs Surf.Area= 3,623 sf Storage= 4,788 cf
Flood Elev= 96.25' Surf.Area= 3,623 sf Storage= 6,905 cf

Plug-Flow detention time= 296.5 min calculated for 0.116 af (61% of inflow)
Center-of-Mass det. time= 185.6 min (928.3 - 742.8)

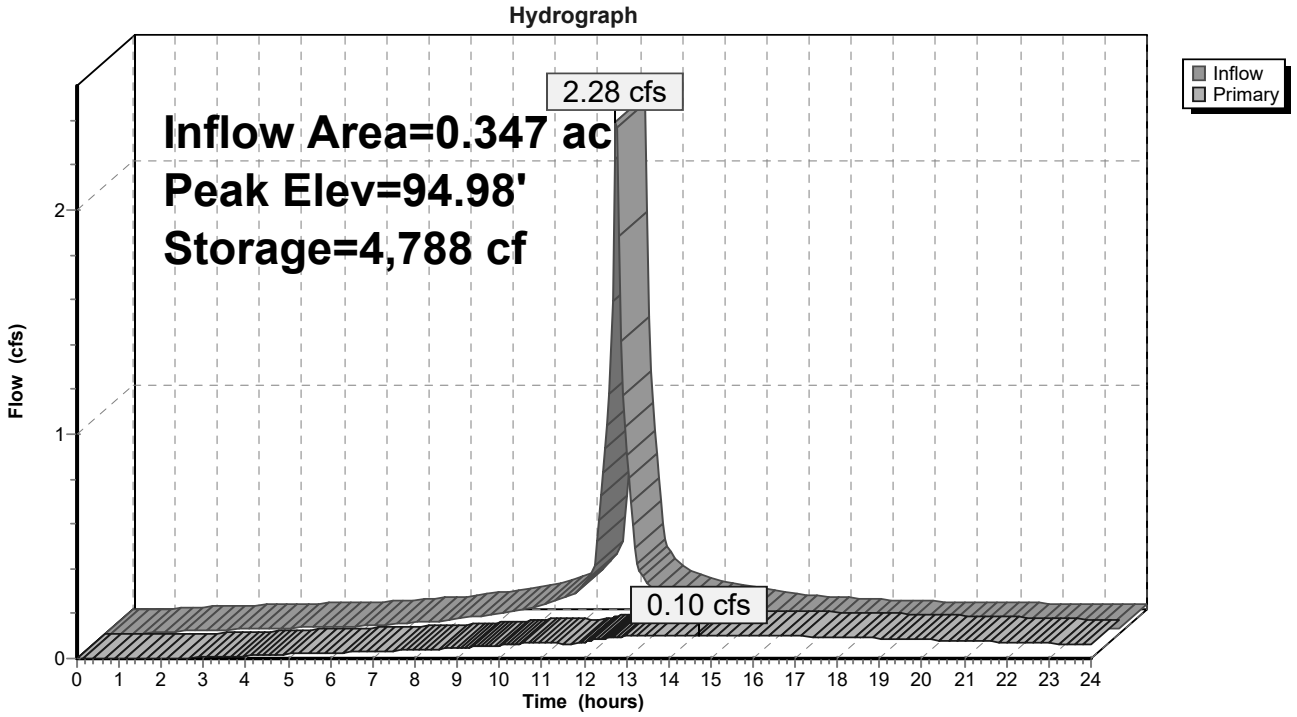
Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	3,850 cf	**Stone (Irregular)** Listed below (Recalc) 12,611 cf Overall - 2,986 cf Embedded = 9,624 cf x 40.0% Voids
#2	93.25'	2,986 cf	**ADS_StormTech SC-740 +Cap** x 65 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	92.75'	98 cf	**5.00'D x 5.00'H Outlet Structure**
		6,934 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.75	3,603	363.5	0	0	3,603
96.25	3,603	363.5	12,611	12,611	4,875

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**18.0" Round 18" HDPE N-12** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	92.75'	**2.0" Vert. 3" Orifice** C= 0.600
#3	Device 1	95.50'	**18.0" Horiz. 18" Int. Stack** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 14.70 hrs HW=94.98' TW=93.98' (Dynamic Tailwater)
↑**1=18" HDPE N-12** (Passes 0.10 cfs of 8.50 cfs potential flow)
↑**2=3" Orifice** (Orifice Controls 0.10 cfs @ 4.81 fps)
3=18" Int. Stack (Controls 0.00 cfs)

Pond 106P: StormTech SC740 #106



Summary for Pond C01P: CB #1

Inflow Area = 3.393 ac, 34.40% Impervious, Inflow Depth > 2.54" for 25 YR - 24 HR event
Inflow = 3.39 cfs @ 12.64 hrs, Volume= 0.718 af
Outflow = 3.39 cfs @ 12.64 hrs, Volume= 0.718 af, Atten= 0%, Lag= 0.0 min
Primary = 3.39 cfs @ 12.64 hrs, Volume= 0.718 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.34' @ 12.64 hrs Surf.Area= 13 sf Storage= 13 cf
Flood Elev= 93.14' Surf.Area= 13 sf Storage= 48 cf

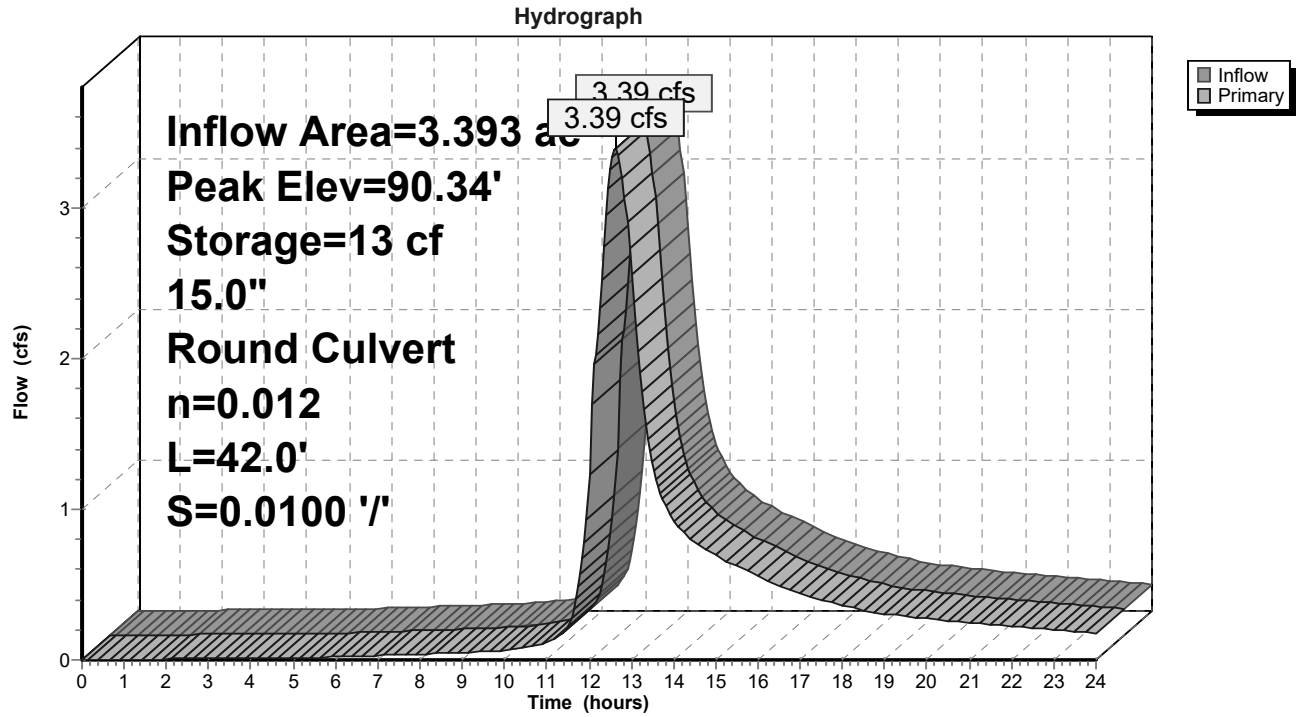
Plug-Flow detention time= 0.1 min calculated for 0.716 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (886.0 - 885.9)

Volume	Invert	Avail.Storage	Storage Description
#1	89.34'	48 cf	**4.00'D x 3.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	89.34'	**15.0" Round 15" RCP** L= 42.0' Ke= 0.500 Inlet / Outlet Invert= 89.34' / 88.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.39 cfs @ 12.64 hrs HW=90.34' TW=0.00' (Dynamic Tailwater)
↑**1=15" RCP** (Barrel Controls 3.39 cfs @ 4.40 fps)

Pond C01P: CB #1



Summary for Pond C02P: CB #2

Inflow Area = 0.702 ac, 62.40% Impervious, Inflow Depth > 5.59" for 25 YR - 24 HR event
Inflow = 2.89 cfs @ 12.10 hrs, Volume= 0.327 af
Outflow = 2.89 cfs @ 12.10 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
Primary = 2.89 cfs @ 12.10 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.60' @ 12.27 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 97.85' Surf.Area= 0.000 ac Storage= 0.001 af

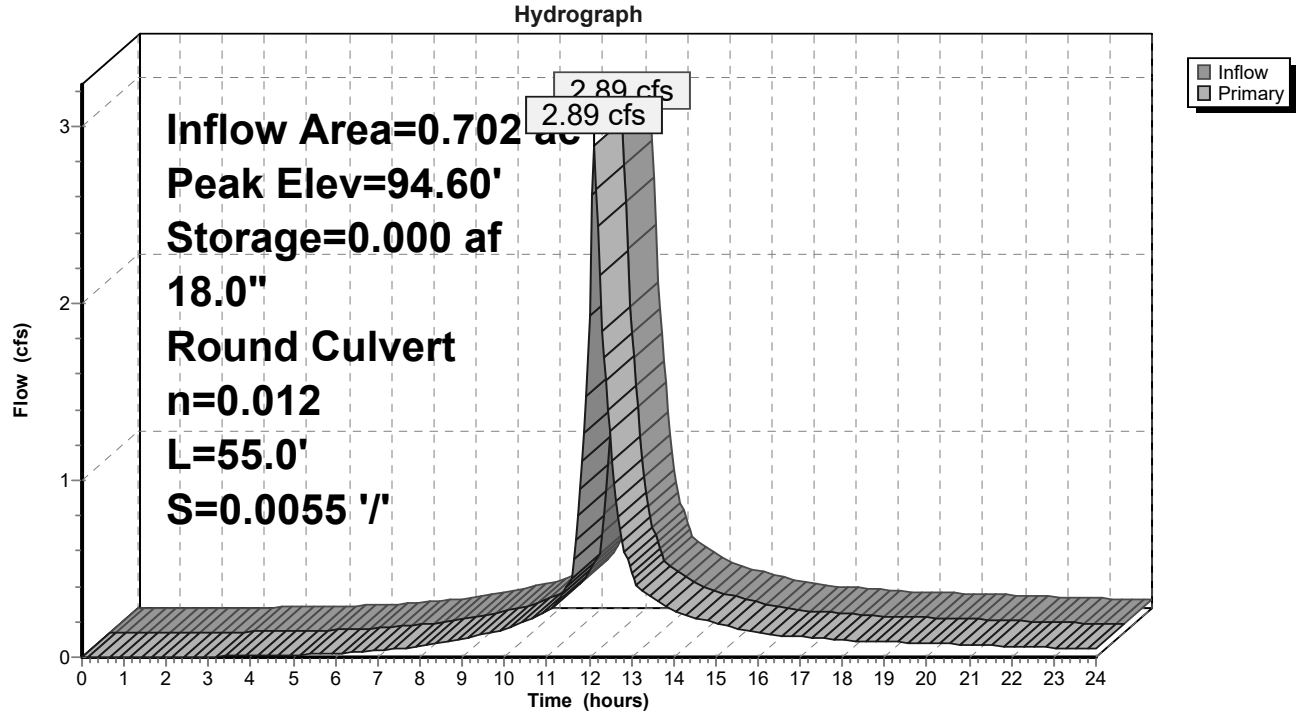
Plug-Flow detention time= 0.5 min calculated for 0.327 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (799.6 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	93.50'	0.001 af	**4.00'D x 4.35'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	93.50'	**18.0" Round 18" RCP** L= 55.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 93.50' / 93.20' S= 0.0055 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.42 cfs @ 12.10 hrs HW=94.55' TW=94.30' (Dynamic Tailwater)
↑**1=18" RCP** (Outlet Controls 2.42 cfs @ 2.59 fps)

Pond C02P: CB #2



Summary for Pond C03P: CB #3

Inflow Area = 0.119 ac, 77.18% Impervious, Inflow Depth > 6.05" for 25 YR - 24 HR event
Inflow = 0.76 cfs @ 12.09 hrs, Volume= 0.060 af
Outflow = 0.75 cfs @ 12.09 hrs, Volume= 0.060 af, Atten= 1%, Lag= 0.1 min
Primary = 0.75 cfs @ 12.09 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.63' @ 12.17 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 97.80' Surf.Area= 0.000 ac Storage= 0.001 af

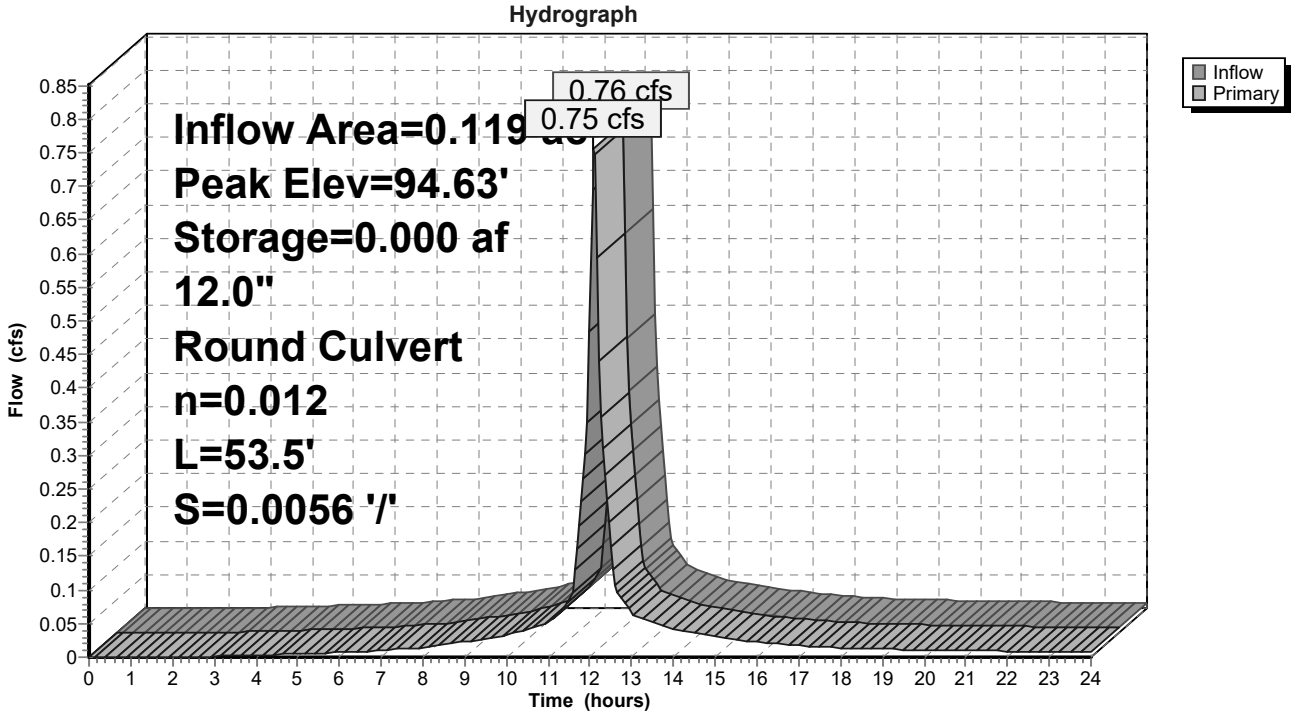
Plug-Flow detention time= 1.1 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (769.7 - 768.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	0.001 af	**4.00'D x 3.90'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	**12.0" Round 12" RCP** L= 53.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 93.90' / 93.60' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.09 hrs HW=94.57' TW=94.52' (Dynamic Tailwater)
1=12" RCP (Outlet Controls 0.40 cfs @ 1.01 fps)

Pond C03P: CB #3



Summary for Pond C04P: CB #4

Inflow Area = 0.449 ac, 96.80% Impervious, Inflow Depth > 6.56" for 25 YR - 24 HR event
Inflow = 2.95 cfs @ 12.09 hrs, Volume= 0.246 af
Outflow = 2.94 cfs @ 12.09 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min
Primary = 2.94 cfs @ 12.09 hrs, Volume= 0.246 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.82' @ 12.35 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.05' Surf.Area= 0.000 ac Storage= 0.001 af

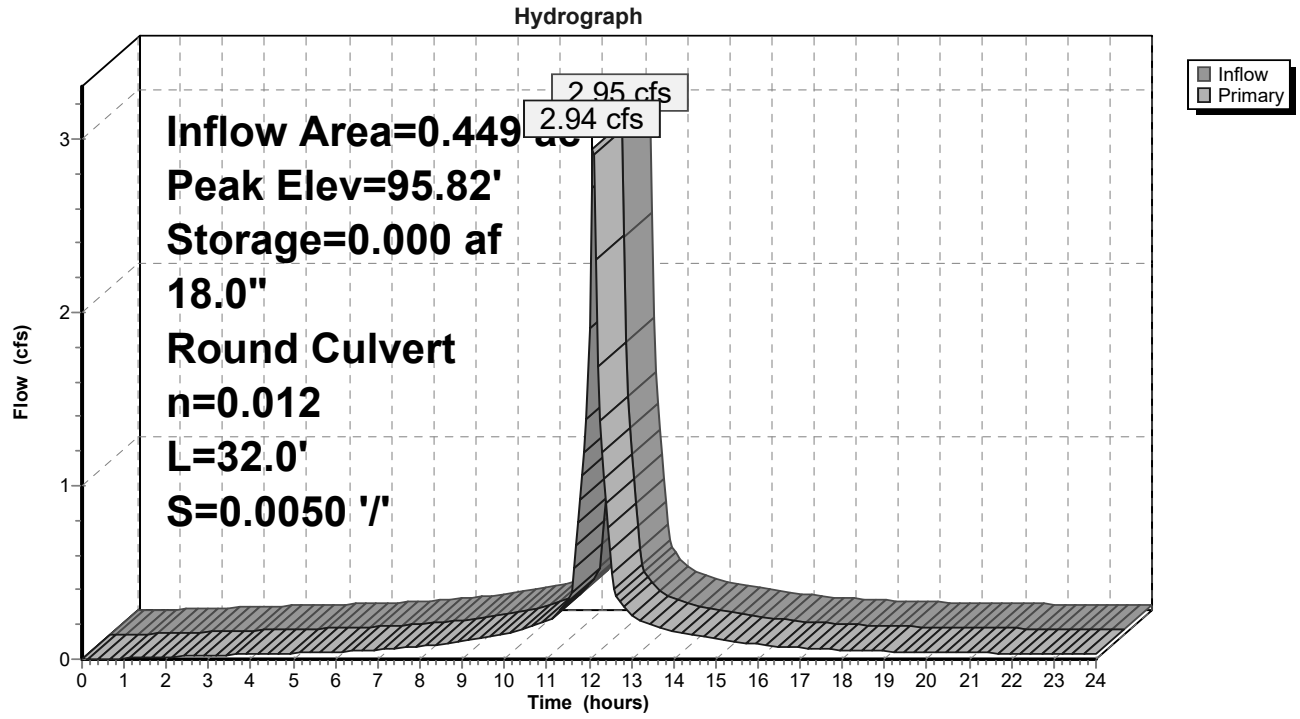
Plug-Flow detention time= 0.3 min calculated for 0.245 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (746.8 - 746.5)

Volume	Invert	Avail.Storage	Storage Description
#1	94.61'	0.001 af	**4.00'D x 3.44'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	94.61'	**18.0" Round 18" RCP** L= 32.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 94.61' / 94.45' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.89 cfs @ 12.09 hrs HW=95.71' TW=95.61' (Dynamic Tailwater)
↑**1=18" RCP** (Outlet Controls 1.89 cfs @ 1.89 fps)

Pond C04P: CB #4



Summary for Pond C05P: CB #5

Inflow Area = 0.095 ac, 78.57% Impervious, Inflow Depth > 6.05" for 25 YR - 24 HR event
Inflow = 0.61 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.59 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 2%, Lag= 0.1 min
Primary = 0.59 cfs @ 12.09 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.80' @ 12.37 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.25' Surf.Area= 0.000 ac Storage= 0.001 af

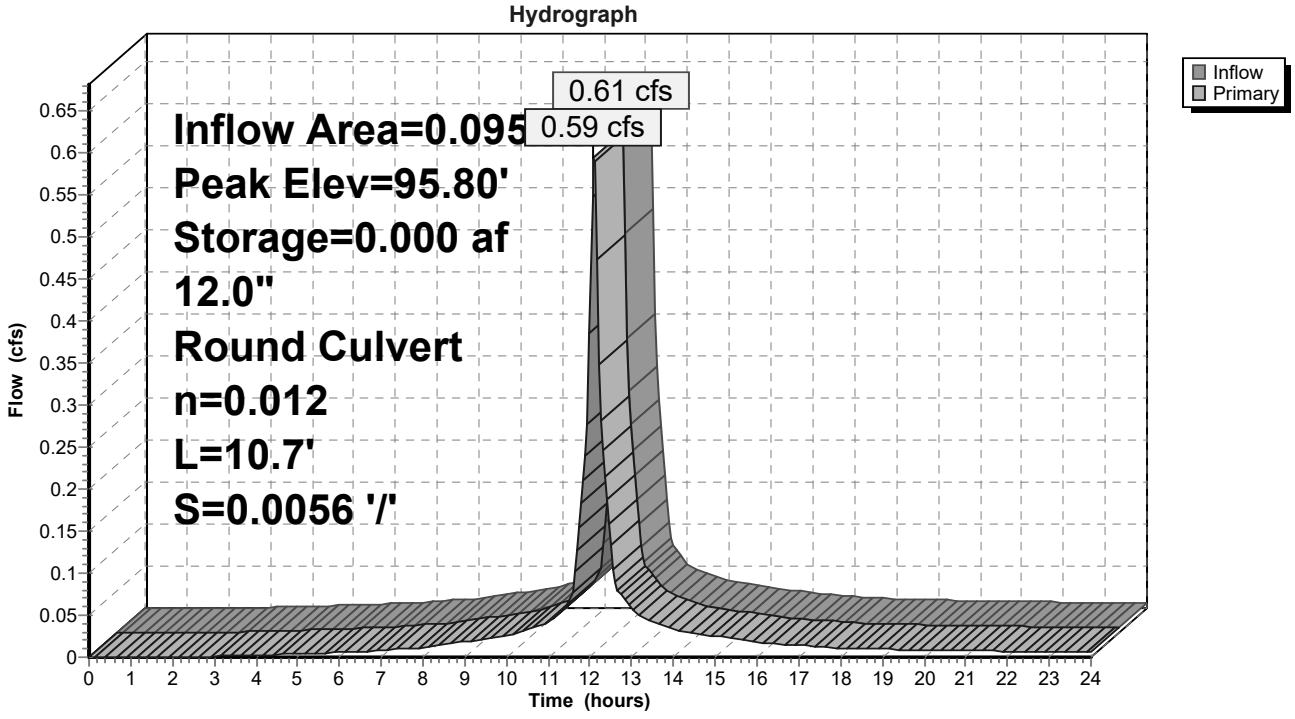
Plug-Flow detention time= 1.0 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (769.7 - 768.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.51'	0.001 af	**4.00'D x 3.74'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	94.51'	**12.0" Round 12" RCP** L= 10.7' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 94.51' / 94.45' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=95.49' TW=95.61' (Dynamic Tailwater)
↑**1=12" RCP** (Controls 0.00 cfs)

Pond C05P: CB #5



Summary for Pond C06P: CB #6

Inflow Area = 0.054 ac, 82.33% Impervious, Inflow Depth > 6.17" for 25 YR - 24 HR event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.028 af
Outflow = 0.33 cfs @ 12.09 hrs, Volume= 0.027 af, Atten= 4%, Lag= 0.1 min
Primary = 0.33 cfs @ 12.09 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.80' @ 12.37 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.25' Surf.Area= 0.000 ac Storage= 0.001 af

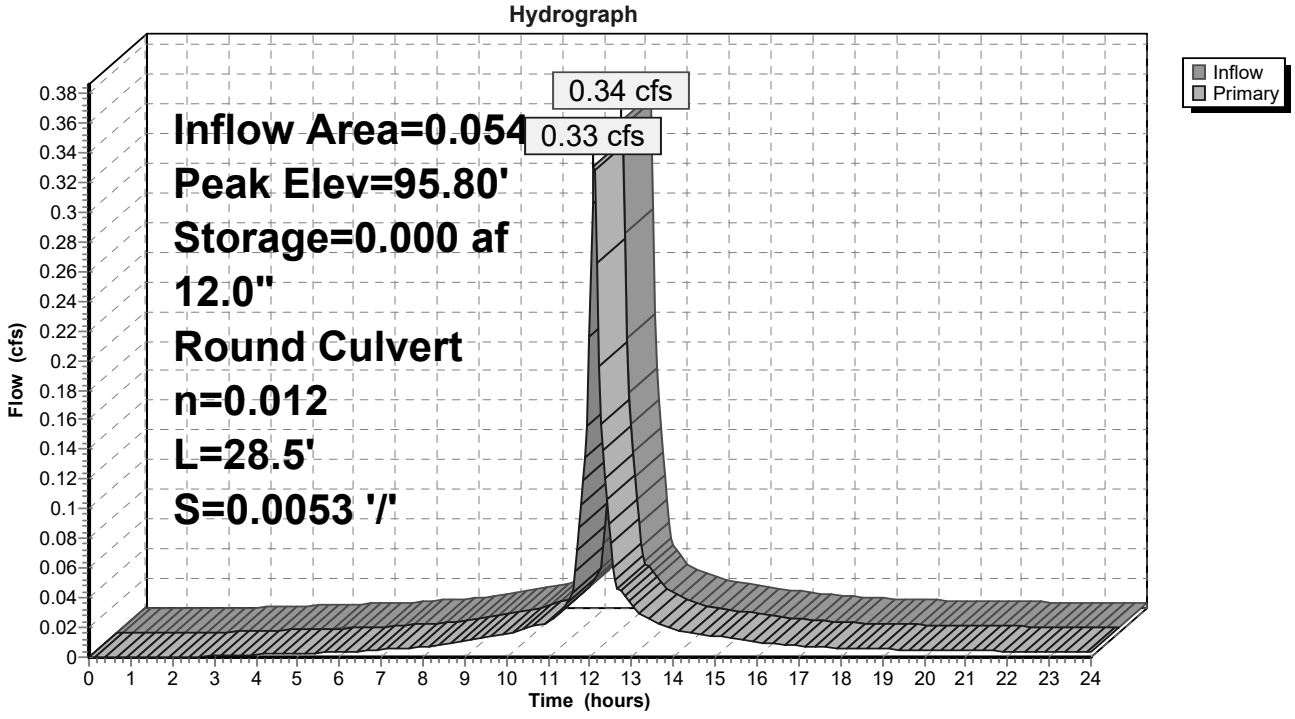
Plug-Flow detention time= 1.5 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.8 - 764.6)

Volume	Invert	Avail.Storage	Storage Description
#1	94.60'	0.001 af	**4.00'D x 3.65'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	94.60'	**12.0" Round 12" RCP** L= 28.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 94.60' / 94.45' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=95.48' TW=95.61' (Dynamic Tailwater)
↑**1=12" RCP** (Controls 0.00 cfs)

Pond C06P: CB #6



Summary for Pond C07P: CB #7

Inflow Area = 1.327 ac, 76.92% Impervious, Inflow Depth > 5.98" for 25 YR - 24 HR event
Inflow = 3.59 cfs @ 12.18 hrs, Volume= 0.662 af
Outflow = 3.59 cfs @ 12.18 hrs, Volume= 0.662 af, Atten= 0%, Lag= 0.0 min
Primary = 3.59 cfs @ 12.18 hrs, Volume= 0.662 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.77' @ 12.36 hrs Surf.Area= 13 sf Storage= 21 cf
Flood Elev= 98.05' Surf.Area= 13 sf Storage= 62 cf

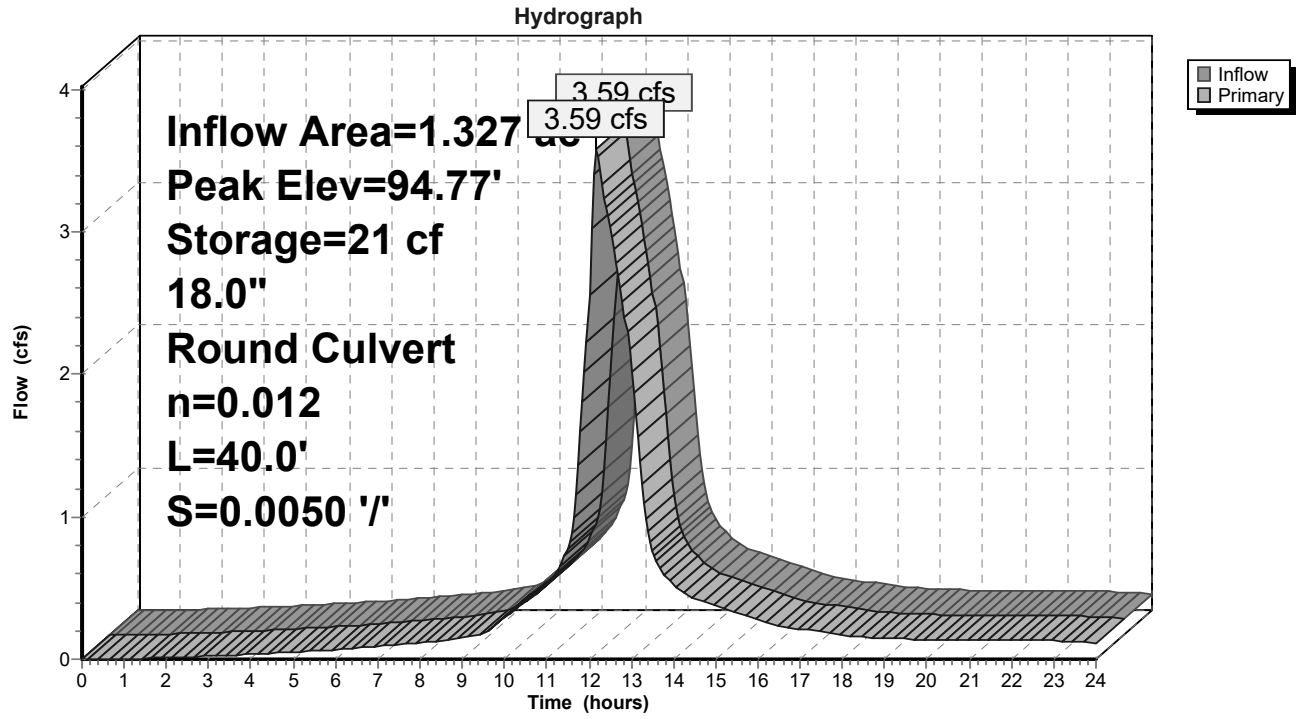
Plug-Flow detention time= 0.4 min calculated for 0.662 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (798.1 - 797.9)

Volume	Invert	Avail.Storage	Storage Description
#1	93.12'	62 cf	**4.00'D x 4.93'H 4' structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	93.12'	**18.0" Round 18" HDPE N-12** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 93.12' / 92.92' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.81 cfs @ 12.18 hrs HW=94.58' TW=94.40' (Dynamic Tailwater)
↑—**1=18" HDPE N-12** (Inlet Controls 2.81 cfs @ 1.60 fps)

Pond C07P: CB #7



Summary for Pond C08P: CB #8

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.055 ac, 89.54% Impervious, Inflow Depth > 6.28" for 25 YR - 24 HR event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 1%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.03' @ 12.59 hrs Surf.Area= 13 sf Storage= 10 cf
Flood Elev= 97.50' Surf.Area= 13 sf Storage= 53 cf

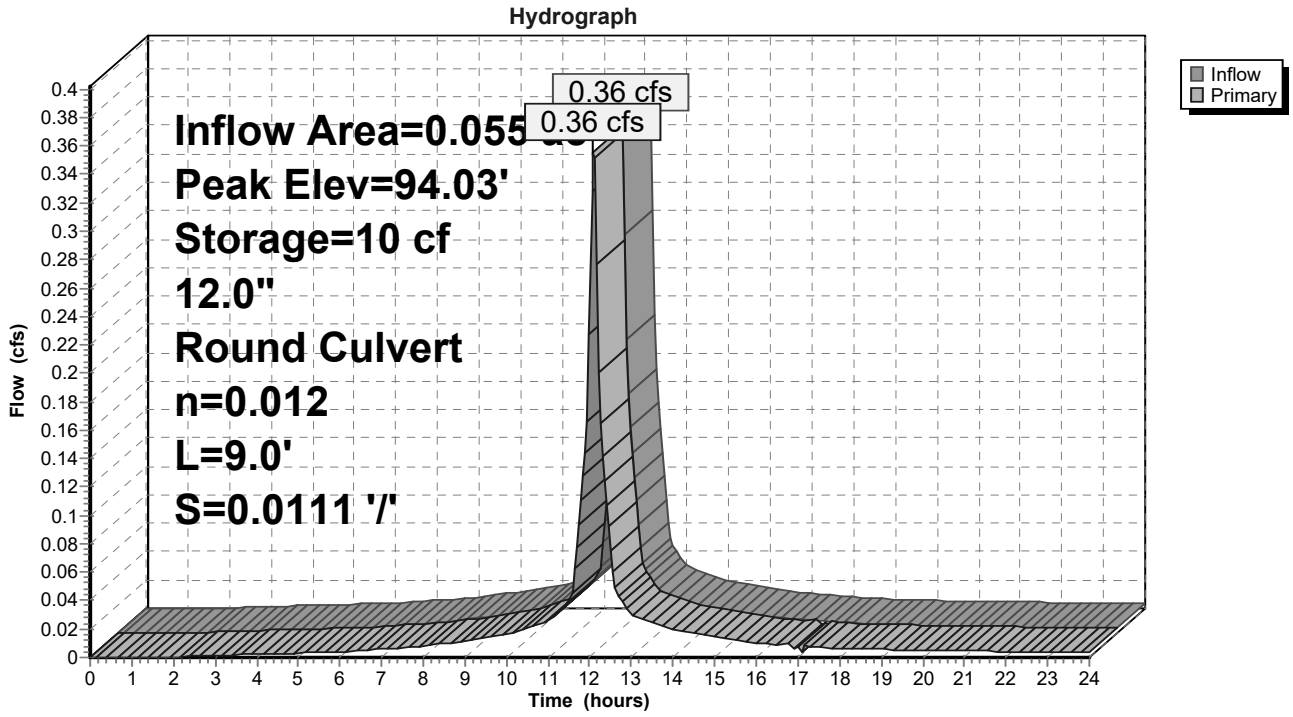
Plug-Flow detention time= 5.5 min calculated for 0.029 af (99% of inflow)
Center-of-Mass det. time= 0.7 min (760.7 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.25'	53 cf	**4.00'D x 4.25'H 4' structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	93.25'	**12.0" Round 12" HDPE N-12** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 93.25' / 93.15' S= 0.0111 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.08 cfs @ 12.09 hrs HW=93.64' TW=93.63' (Dynamic Tailwater)
1=12" HDPE N-12 (Outlet Controls 0.08 cfs @ 0.40 fps)

Pond C08P: CB #8



Summary for Pond D01P: DMH #1

Inflow Area = 0.702 ac, 62.40% Impervious, Inflow Depth > 5.59" for 25 YR - 24 HR event
Inflow = 2.89 cfs @ 12.10 hrs, Volume= 0.327 af
Outflow = 2.89 cfs @ 12.10 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
Primary = 2.89 cfs @ 12.10 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.48' @ 12.32 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 99.25' Surf.Area= 0.000 ac Storage= 0.002 af

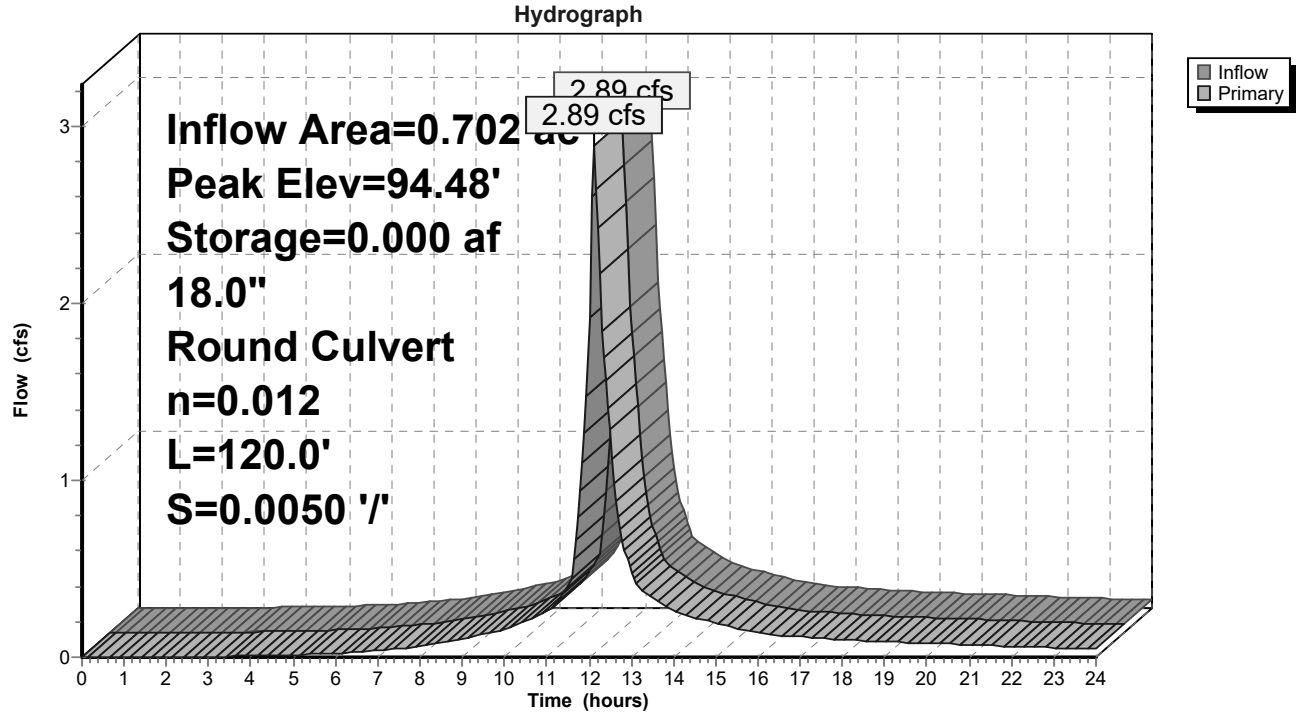
Plug-Flow detention time= 0.7 min calculated for 0.326 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (799.9 - 799.6)

Volume	Invert	Avail.Storage	Storage Description
#1	93.10'	0.002 af	**4.00'D x 6.15'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	93.10'	**18.0" Round 18" HDPE N-12** L= 120.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 93.10' / 92.50' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.16 cfs @ 12.10 hrs HW=94.30' TW=94.12' (Dynamic Tailwater)
↑—**1=18" HDPE N-12** (Outlet Controls 2.16 cfs @ 1.94 fps)

Pond D01P: DMH #1



Summary for Pond D04P: DMH #4

[80] Warning: Exceeded Pond C05P by 0.16' @ 12.05 hrs (1.53 cfs 0.036 af)
[80] Warning: Exceeded Pond C06P by 0.18' @ 12.05 hrs (1.33 cfs 0.032 af)

Inflow Area = 0.598 ac, 92.60% Impervious, Inflow Depth > 6.44" for 25 YR - 24 HR event
Inflow = 3.87 cfs @ 12.09 hrs, Volume= 0.321 af
Outflow = 3.86 cfs @ 12.09 hrs, Volume= 0.321 af, Atten= 0%, Lag= 0.0 min
Primary = 3.86 cfs @ 12.09 hrs, Volume= 0.321 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.80' @ 12.32 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.30' Surf.Area= 0.000 ac Storage= 0.001 af

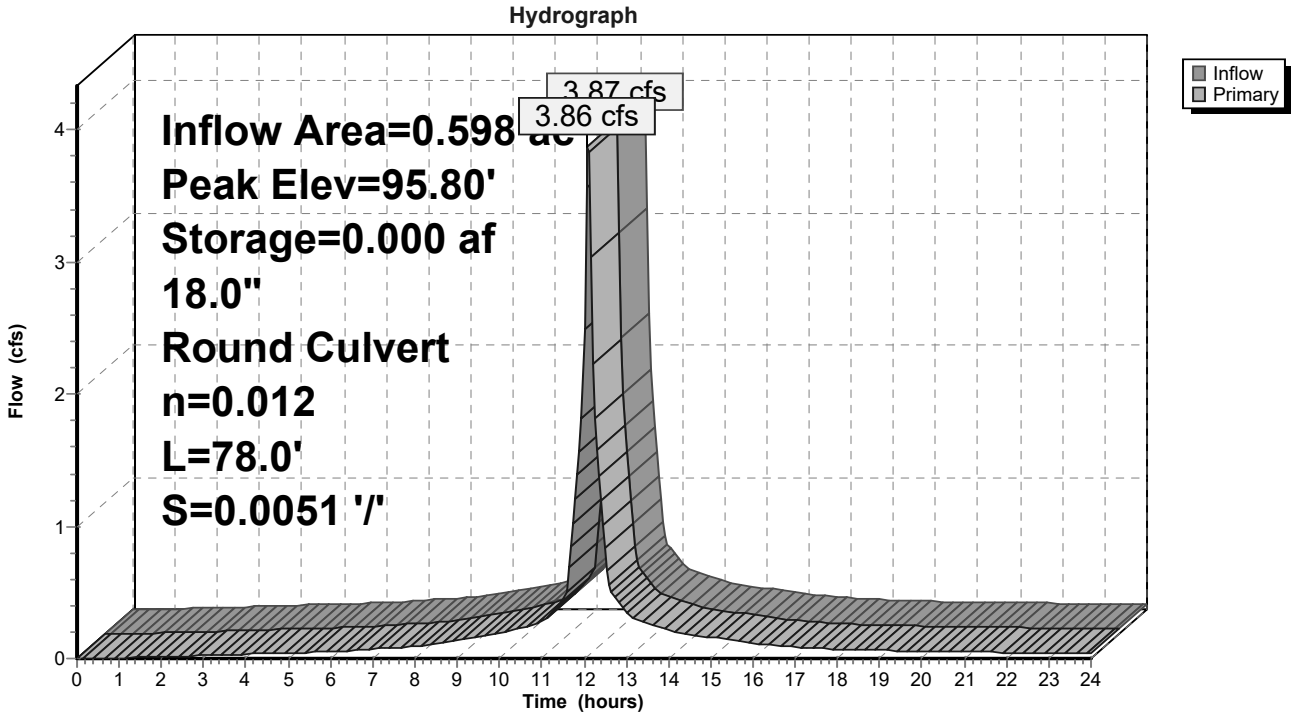
Plug-Flow detention time= 0.3 min calculated for 0.321 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (752.0 - 751.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.35'	0.001 af	**4.00'D x 3.95'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	94.35'	**18.0" Round 18" RCP** L= 78.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 94.35' / 93.95' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.65 cfs @ 12.09 hrs HW=95.61' TW=95.41' (Dynamic Tailwater)
1=18" RCP (Outlet Controls 2.65 cfs @ 2.27 fps)

Pond D04P: DMH #4



Summary for Pond D06P: DMH #6

Inflow Area = 1.327 ac, 76.92% Impervious, Inflow Depth > 5.98" for 25 YR - 24 HR event
Inflow = 3.59 cfs @ 12.18 hrs, Volume= 0.662 af
Outflow = 3.58 cfs @ 12.18 hrs, Volume= 0.661 af, Atten= 0%, Lag= 0.0 min
Primary = 3.58 cfs @ 12.18 hrs, Volume= 0.661 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.54' @ 12.35 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.05' Surf.Area= 0.000 ac Storage= 0.002 af

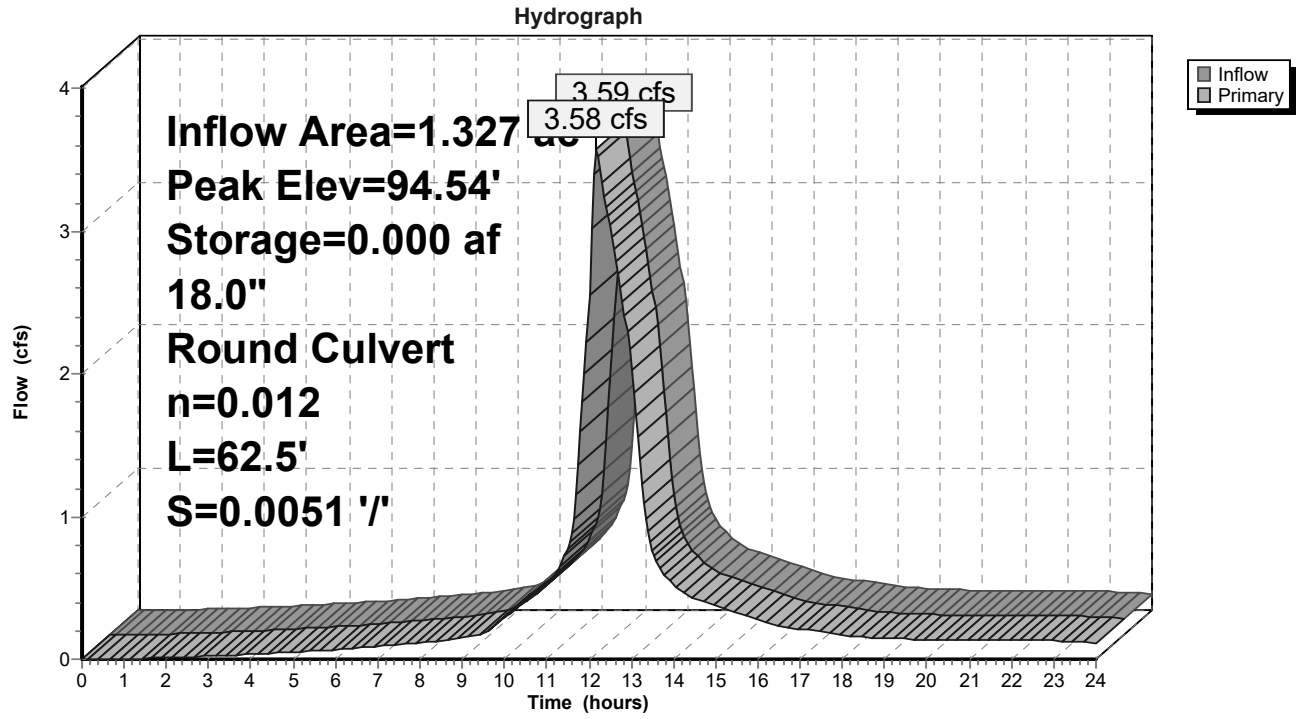
Plug-Flow detention time= 0.5 min calculated for 0.661 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (798.2 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	92.82'	0.002 af	**4.00'D x 5.86'H 4' Structure**

Device	Routing	Invert	Outlet Devices
#1	Primary	92.82'	**18.0" Round 18" HDPE N-12** L= 62.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 92.82' / 92.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.46 cfs @ 12.18 hrs HW=94.40' TW=94.31' (Dynamic Tailwater)
1=18" HDPE N-12 (Outlet Controls 2.46 cfs @ 1.64 fps)

Pond D06P: DMH #6



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

Subcatchment 1S: Subcatchment #1 Runoff Area=24,233 sf 27.47% Impervious Runoff Depth>1.71"
Tc=6.0 min CN=80 Runoff=1.09 cfs 0.079 af

Subcatchment 2S: Subcatchment #2 Runoff Area=67,977 sf 0.09% Impervious Runoff Depth>1.18"
Flow Length=251' Tc=25.7 min CN=72 Runoff=1.24 cfs 0.153 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,193 sf 30.27% Impervious Runoff Depth>0.49"
Flow Length=431' Tc=35.4 min CN=58 Runoff=0.50 cfs 0.099 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,072 sf 44.01% Impervious Runoff Depth>2.10"
Tc=6.0 min CN=85 Runoff=2.61 cfs 0.189 af

Subcatchment 13S: Subcatchment #13 Runoff Area=60,719 sf 52.40% Impervious Runoff Depth>2.27"
Tc=6.0 min CN=87 Runoff=3.62 cfs 0.264 af

Subcatchment 14S: Subcatchment #14 Runoff Area=22,059 sf 53.15% Impervious Runoff Depth>2.27"
Tc=6.0 min CN=87 Runoff=1.32 cfs 0.096 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,560 sf 62.85% Impervious Runoff Depth>2.54"
Tc=6.0 min CN=90 Runoff=1.88 cfs 0.139 af

Subcatchment 16S: Subcatchment #16 Runoff Area=20,779 sf 53.27% Impervious Runoff Depth>2.27"
Tc=6.0 min CN=87 Runoff=1.24 cfs 0.090 af

Subcatchment 17S: Lodging Building A Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=1.19 cfs 0.097 af

Subcatchment 18S: Res Building B Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=1.19 cfs 0.097 af

Subcatchment 19S: Res Building C Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=1.19 cfs 0.097 af

Subcatchment 20S: Inlet Sump Runoff Area=12,580 sf 0.00% Impervious Runoff Depth>0.80"
Tc=6.0 min CN=65 Runoff=0.23 cfs 0.019 af

Subcatchment 21S: Subcatchment #21 Runoff Area=6,962 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.045 af

Subcatchment 32S: Subcatchment #32 Runoff Area=4,612 sf 86.88% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=95 Runoff=0.35 cfs 0.027 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,193 sf 77.18% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=93 Runoff=0.37 cfs 0.028 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,481 sf 86.03% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=95 Runoff=0.34 cfs 0.026 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,153 sf 78.57% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=93 Runoff=0.30 cfs 0.022 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,332 sf 82.33% Impervious Runoff Depth>2.93"
Tc=6.0 min CN=94 Runoff=0.17 cfs 0.013 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,187 sf 74.65% Impervious Runoff Depth>2.73"
Tc=6.0 min CN=92 Runoff=0.22 cfs 0.017 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,410 sf 89.54% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=95 Runoff=0.18 cfs 0.014 af

Reach 15AR: Overland flow Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=30.0' S=0.0167 '/' Capacity=158.86 cfs Outflow=0.00 cfs 0.000 af

Reach 15R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=70.0' S=0.0071 '/' Capacity=31.36 cfs Outflow=0.00 cfs 0.000 af

Reach 100R: Final Reach 100 Inflow=1.15 cfs 0.167 af
Outflow=1.15 cfs 0.167 af

Reach 200R: Final Reach 200 Inflow=1.43 cfs 0.592 af
Outflow=1.43 cfs 0.592 af

Reach 400R: Final Reach 400 Inflow=0.59 cfs 0.181 af
Outflow=0.59 cfs 0.181 af

Pond 4P: Pond 4 Peak Elev=90.03' Storage=453 cf Inflow=0.56 cfs 0.139 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=0.51 cfs 0.136 af

Pond 16P: Inlet Sump Peak Elev=94.26' Storage=527 cf Inflow=1.24 cfs 0.090 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=0.81 cfs 0.090 af

Pond 20P: Nyloplast Basin Peak Elev=90.23' Storage=2 cf Inflow=0.23 cfs 0.019 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.23 cfs 0.019 af

Pond 101P: Gravel Wetland #101 Peak Elev=93.59' Storage=7,787 cf Inflow=2.88 cfs 0.263 af
Primary=0.07 cfs 0.088 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.088 af

Pond 102P: StormTech SC740 #102 Peak Elev=93.93' Storage=2,841 cf Inflow=1.19 cfs 0.097 af
Outflow=0.07 cfs 0.045 af

Pond 103P: Gravel Wetland #103 Peak Elev=93.88' Storage=18,444 cf Inflow=7.19 cfs 0.766 af
Primary=0.17 cfs 0.207 af Secondary=0.39 cfs 0.232 af Tertiary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.439 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.20' Storage=3,288 cf Inflow=1.32 cfs 0.096 af
Primary=0.02 cfs 0.021 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.021 af

Pond 105P: Detention Pond #105 Peak Elev=95.00' Storage=2,725 cf Inflow=3.85 cfs 0.297 af
Primary=2.14 cfs 0.296 af Secondary=0.00 cfs 0.000 af Outflow=2.14 cfs 0.296 af

Pond 106P: StormTech SC740 #106 Peak Elev=93.84' Storage=2,176 cf Inflow=1.19 cfs 0.097 af
Outflow=0.09 cfs 0.060 af

Pond C01P: CB #1 Peak Elev=89.70' Storage=4 cf Inflow=0.59 cfs 0.181 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=0.59 cfs 0.181 af

Pond C02P: CB #2 Peak Elev=94.11' Storage=0.000 af Inflow=1.42 cfs 0.145 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=1.42 cfs 0.144 af

Pond C03P: CB #3 Peak Elev=94.29' Storage=0.000 af Inflow=0.37 cfs 0.028 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.37 cfs 0.028 af

Pond C04P: CB #4 Peak Elev=95.34' Storage=0.000 af Inflow=1.52 cfs 0.123 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=1.52 cfs 0.123 af

Pond C05P: CB #5 Peak Elev=95.18' Storage=0.000 af Inflow=0.30 cfs 0.022 af
12.0" Round Culvert n=0.012 L=10.7' S=0.0056 '/' Outflow=0.29 cfs 0.022 af

Pond C06P: CB #6 Peak Elev=95.17' Storage=0.000 af Inflow=0.17 cfs 0.013 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.16 cfs 0.013 af

Pond C07P: CB #7 Peak Elev=94.02' Storage=11 cf Inflow=2.27 cfs 0.313 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=2.27 cfs 0.313 af

Pond C08P: CB #8 Peak Elev=93.59' Storage=4 cf Inflow=0.18 cfs 0.014 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.18 cfs 0.014 af

Pond D01P: DMH #1 Peak Elev=93.88' Storage=0.000 af Inflow=1.42 cfs 0.144 af
18.0" Round Culvert n=0.012 L=120.0' S=0.0050 '/' Outflow=1.42 cfs 0.144 af

Pond D04P: DMH #4 Peak Elev=95.17' Storage=0.000 af Inflow=1.97 cfs 0.159 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=1.97 cfs 0.159 af

Pond D06P: DMH #6 Peak Elev=93.88' Storage=0.000 af Inflow=2.27 cfs 0.313 af
18.0" Round Culvert n=0.012 L=62.5' S=0.0051 '/' Outflow=2.26 cfs 0.313 af

Total Runoff Area = 10.762 ac Runoff Volume = 1.612 af Average Runoff Depth = 1.80"
56.06% Pervious = 6.033 ac 43.94% Impervious = 4.729 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=24,233 sf 27.47% Impervious Runoff Depth>3.28"
Tc=6.0 min CN=80 Runoff=2.09 cfs 0.152 af

Subcatchment 2S: Subcatchment #2 Runoff Area=67,977 sf 0.09% Impervious Runoff Depth>2.53"
Flow Length=251' Tc=25.7 min CN=72 Runoff=2.79 cfs 0.329 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,193 sf 30.27% Impervious Runoff Depth>1.40"
Flow Length=431' Tc=35.4 min CN=58 Runoff=1.90 cfs 0.285 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,072 sf 44.01% Impervious Runoff Depth>3.77"
Tc=6.0 min CN=85 Runoff=4.62 cfs 0.340 af

Subcatchment 13S: Subcatchment #13 Runoff Area=60,719 sf 52.40% Impervious Runoff Depth>3.98"
Tc=6.0 min CN=87 Runoff=6.22 cfs 0.462 af

Subcatchment 14S: Subcatchment #14 Runoff Area=22,059 sf 53.15% Impervious Runoff Depth>3.98"
Tc=6.0 min CN=87 Runoff=2.26 cfs 0.168 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,560 sf 62.85% Impervious Runoff Depth>4.30"
Tc=6.0 min CN=90 Runoff=3.10 cfs 0.235 af

Subcatchment 16S: Subcatchment #16 Runoff Area=20,779 sf 53.27% Impervious Runoff Depth>3.98"
Tc=6.0 min CN=87 Runoff=2.13 cfs 0.158 af

Subcatchment 17S: Lodging Building A Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=1.80 cfs 0.150 af

Subcatchment 18S: Res Building B Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=1.80 cfs 0.150 af

Subcatchment 19S: Res Building C Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=1.80 cfs 0.150 af

Subcatchment 20S: Inlet Sump Runoff Area=12,580 sf 0.00% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=65 Runoff=0.63 cfs 0.047 af

Subcatchment 21S: Subcatchment #21 Runoff Area=6,962 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=0.83 cfs 0.069 af

Subcatchment 32S: Subcatchment #32 Runoff Area=4,612 sf 86.88% Impervious Runoff Depth>4.85"
Tc=6.0 min CN=95 Runoff=0.54 cfs 0.043 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,193 sf 77.18% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.59 cfs 0.046 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,481 sf 86.03% Impervious Runoff Depth>4.85"
Tc=6.0 min CN=95 Runoff=0.52 cfs 0.042 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,153 sf 78.57% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.47 cfs 0.037 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,332 sf 82.33% Impervious Runoff Depth>4.74"
Tc=6.0 min CN=94 Runoff=0.27 cfs 0.021 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,187 sf 74.65% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=92 Runoff=0.36 cfs 0.028 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,410 sf 89.54% Impervious Runoff Depth>4.85"
Tc=6.0 min CN=95 Runoff=0.28 cfs 0.022 af

Reach 15AR: Overland flow Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=30.0' S=0.0167 '/' Capacity=158.86 cfs Outflow=0.00 cfs 0.000 af

Reach 15R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=70.0' S=0.0071 '/' Capacity=31.36 cfs Outflow=0.00 cfs 0.000 af

Reach 100R: Final Reach 100 Inflow=2.16 cfs 0.335 af
Outflow=2.16 cfs 0.335 af

Reach 200R: Final Reach 200 Inflow=5.90 cfs 1.244 af
Outflow=5.90 cfs 1.244 af

Reach 400R: Final Reach 400 Inflow=2.02 cfs 0.437 af
Outflow=2.02 cfs 0.437 af

Pond 4P: Pond 4 Peak Elev=90.55' Storage=1,215 cf Inflow=2.07 cfs 0.372 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=1.91 cfs 0.368 af

Pond 16P: Inlet Sump Peak Elev=94.49' Storage=934 cf Inflow=2.13 cfs 0.158 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.31 cfs 0.157 af

Pond 20P: Nyloplast Basin Peak Elev=91.06' Storage=4 cf Inflow=0.63 cfs 0.047 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.63 cfs 0.047 af

Pond 101P: Gravel Wetland #101 Peak Elev=93.97' Storage=11,886 cf Inflow=4.97 cfs 0.448 af
Primary=0.08 cfs 0.104 af Secondary=0.23 cfs 0.079 af Tertiary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.183 af

Pond 102P: StormTech SC740 #102 Peak Elev=94.45' Storage=4,332 cf Inflow=1.80 cfs 0.150 af
Outflow=0.06 cfs 0.074 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.32' Storage=25,761 cf Inflow=11.41 cfs 1.291 af
Primary=0.19 cfs 0.237 af Secondary=2.52 cfs 0.636 af Tertiary=1.08 cfs 0.042 af Outflow=3.79 cfs 0.915 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.76' Storage=5,761 cf Inflow=2.26 cfs 0.168 af
Primary=0.04 cfs 0.040 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.040 af

Pond 105P: Detention Pond #105 Peak Elev=95.42' Storage=4,321 cf Inflow=6.14 cfs 0.484 af
Primary=2.89 cfs 0.482 af Secondary=0.00 cfs 0.000 af Outflow=2.89 cfs 0.482 af

Pond 106P: StormTech SC740 #106 Peak Elev=94.48' Storage=3,691 cf Inflow=1.80 cfs 0.150 af
Outflow=0.08 cfs 0.086 af

Pond C01P: CB #1 Peak Elev=90.06' Storage=9 cf Inflow=2.02 cfs 0.437 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=2.02 cfs 0.437 af

Pond C02P: CB #2 Peak Elev=94.36' Storage=0.000 af Inflow=2.30 cfs 0.246 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=2.30 cfs 0.246 af

Pond C03P: CB #3 Peak Elev=94.46' Storage=0.000 af Inflow=0.59 cfs 0.046 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.59 cfs 0.046 af

Pond C04P: CB #4 Peak Elev=95.58' Storage=0.000 af Inflow=2.33 cfs 0.192 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.32 cfs 0.192 af

Pond C05P: CB #5 Peak Elev=95.48' Storage=0.000 af Inflow=0.47 cfs 0.037 af
12.0" Round Culvert n=0.012 L=10.7' S=0.0056 '/' Outflow=0.46 cfs 0.037 af

Pond C06P: CB #6 Peak Elev=95.48' Storage=0.000 af Inflow=0.27 cfs 0.021 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.26 cfs 0.021 af

Pond C07P: CB #7 Peak Elev=94.53' Storage=18 cf Inflow=3.08 cfs 0.509 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=3.07 cfs 0.509 af

Pond C08P: CB #8 Peak Elev=93.97' Storage=9 cf Inflow=0.28 cfs 0.022 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.28 cfs 0.022 af

Pond D01P: DMH #1 Peak Elev=94.32' Storage=0.000 af Inflow=2.30 cfs 0.246 af
18.0" Round Culvert n=0.012 L=120.0' S=0.0050 '/' Outflow=2.29 cfs 0.246 af

Pond D04P: DMH #4 Peak Elev=95.48' Storage=0.000 af Inflow=3.04 cfs 0.250 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=3.04 cfs 0.250 af

Pond D06P: DMH #6 Peak Elev=94.40' Storage=0.000 af Inflow=3.07 cfs 0.509 af
18.0" Round Culvert n=0.012 L=62.5' S=0.0051 '/' Outflow=3.07 cfs 0.509 af

Total Runoff Area = 10.762 ac Runoff Volume = 2.934 af Average Runoff Depth = 3.27"
56.06% Pervious = 6.033 ac 43.94% Impervious = 4.729 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=24,233 sf 27.47% Impervious Runoff Depth>4.58"
Tc=6.0 min CN=80 Runoff=2.90 cfs 0.212 af

Subcatchment 2S: Subcatchment #2 Runoff Area=67,977 sf 0.09% Impervious Runoff Depth>3.71"
Flow Length=251' Tc=25.7 min CN=72 Runoff=4.12 cfs 0.482 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,193 sf 30.27% Impervious Runoff Depth>2.31"
Flow Length=431' Tc=35.4 min CN=58 Runoff=3.31 cfs 0.469 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,072 sf 44.01% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=85 Runoff=6.20 cfs 0.462 af

Subcatchment 13S: Subcatchment #13 Runoff Area=60,719 sf 52.40% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=87 Runoff=8.25 cfs 0.623 af

Subcatchment 14S: Subcatchment #14 Runoff Area=22,059 sf 53.15% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=87 Runoff=3.00 cfs 0.226 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,560 sf 62.85% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=90 Runoff=4.05 cfs 0.312 af

Subcatchment 16S: Subcatchment #16 Runoff Area=20,779 sf 53.27% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=87 Runoff=2.82 cfs 0.213 af

Subcatchment 17S: Lodging Building A Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.192 af

Subcatchment 18S: Res Building B Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.192 af

Subcatchment 19S: Res Building C Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.192 af

Subcatchment 20S: Inlet Sump Runoff Area=12,580 sf 0.00% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=65 Runoff=0.99 cfs 0.072 af

Subcatchment 21S: Subcatchment #21 Runoff Area=6,962 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=1.05 cfs 0.088 af

Subcatchment 32S: Subcatchment #32 Runoff Area=4,612 sf 86.88% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.69 cfs 0.055 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,193 sf 77.18% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.76 cfs 0.060 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,481 sf 86.03% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.67 cfs 0.054 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,153 sf 78.57% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.61 cfs 0.048 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,332 sf 82.33% Impervious Runoff Depth>6.17"
Tc=6.0 min CN=94 Runoff=0.34 cfs 0.028 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,187 sf 74.65% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=92 Runoff=0.46 cfs 0.036 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,410 sf 89.54% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.36 cfs 0.029 af

Reach 15AR: Overland flow Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=30.0' S=0.0167 '/' Capacity=158.86 cfs Outflow=0.00 cfs 0.000 af

Reach 15R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=70.0' S=0.0071 '/' Capacity=31.36 cfs Outflow=0.00 cfs 0.000 af

Reach 100R: Final Reach 100 Inflow=2.98 cfs 0.552 af
Outflow=2.98 cfs 0.552 af

Reach 200R: Final Reach 200 Inflow=12.39 cfs 1.789 af
Outflow=12.39 cfs 1.789 af

Reach 400R: Final Reach 400 Inflow=3.39 cfs 0.718 af
Outflow=3.39 cfs 0.718 af

Pond 4P: Pond 4 Peak Elev=90.99' Storage=2,014 cf Inflow=3.61 cfs 0.634 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=3.26 cfs 0.629 af

Pond 16P: Inlet Sump Peak Elev=94.68' Storage=1,335 cf Inflow=2.82 cfs 0.213 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.60 cfs 0.211 af

Pond 20P: Nyloplast Basin Peak Elev=91.82' Storage=33 cf Inflow=0.99 cfs 0.072 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.85 cfs 0.072 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.03' Storage=12,605 cf Inflow=6.63 cfs 0.608 af
Primary=0.08 cfs 0.109 af Secondary=1.12 cfs 0.227 af Tertiary=0.13 cfs 0.004 af Outflow=1.33 cfs 0.340 af

Pond 102P: StormTech SC740 #102 Peak Elev=94.84' Storage=5,368 cf Inflow=2.28 cfs 0.192 af
Outflow=0.08 cfs 0.099 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.40' Storage=27,139 cf Inflow=14.51 cfs 1.710 af
Primary=0.20 cfs 0.251 af Secondary=4.56 cfs 0.876 af Tertiary=3.53 cfs 0.180 af Outflow=8.29 cfs 1.307 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.96' Storage=6,789 cf Inflow=3.00 cfs 0.226 af
Primary=0.12 cfs 0.093 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.093 af

Pond 105P: Detention Pond #105 Peak Elev=95.76' Storage=5,793 cf Inflow=7.91 cfs 0.633 af
Primary=3.32 cfs 0.626 af Secondary=0.00 cfs 0.000 af Outflow=3.32 cfs 0.626 af

Pond 106P: StormTech SC740 #106 Peak Elev=94.98' Storage=4,788 cf Inflow=2.28 cfs 0.192 af
Outflow=0.10 cfs 0.116 af

Pond C01P: CB #1 Peak Elev=90.34' Storage=13 cf Inflow=3.39 cfs 0.718 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=3.39 cfs 0.718 af

Pond C02P: CB #2 Peak Elev=94.60' Storage=0.000 af Inflow=2.89 cfs 0.327 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=2.89 cfs 0.327 af

Pond C03P: CB #3 Peak Elev=94.63' Storage=0.000 af Inflow=0.76 cfs 0.060 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.75 cfs 0.060 af

Pond C04P: CB #4 Peak Elev=95.82' Storage=0.000 af Inflow=2.95 cfs 0.246 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.94 cfs 0.246 af

Pond C05P: CB #5 Peak Elev=95.80' Storage=0.000 af Inflow=0.61 cfs 0.048 af
12.0" Round Culvert n=0.012 L=10.7' S=0.0056 '/' Outflow=0.59 cfs 0.048 af

Pond C06P: CB #6 Peak Elev=95.80' Storage=0.000 af Inflow=0.34 cfs 0.028 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.33 cfs 0.027 af

Pond C07P: CB #7 Peak Elev=94.77' Storage=21 cf Inflow=3.59 cfs 0.662 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=3.59 cfs 0.662 af

Pond C08P: CB #8 Peak Elev=94.03' Storage=10 cf Inflow=0.36 cfs 0.029 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.36 cfs 0.029 af

Pond D01P: DMH #1 Peak Elev=94.48' Storage=0.000 af Inflow=2.89 cfs 0.327 af
18.0" Round Culvert n=0.012 L=120.0' S=0.0050 '/' Outflow=2.89 cfs 0.327 af

Pond D04P: DMH #4 Peak Elev=95.80' Storage=0.000 af Inflow=3.87 cfs 0.321 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=3.86 cfs 0.321 af

Pond D06P: DMH #6 Peak Elev=94.54' Storage=0.000 af Inflow=3.59 cfs 0.662 af
18.0" Round Culvert n=0.012 L=62.5' S=0.0051 '/' Outflow=3.58 cfs 0.661 af

Total Runoff Area = 10.762 ac Runoff Volume = 4.045 af Average Runoff Depth = 4.51"
56.06% Pervious = 6.033 ac 43.94% Impervious = 4.729 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=24,233 sf 27.47% Impervious Runoff Depth>5.84"
Tc=6.0 min CN=80 Runoff=3.66 cfs 0.271 af

Subcatchment 2S: Subcatchment #2 Runoff Area=67,977 sf 0.09% Impervious Runoff Depth>4.87"
Flow Length=251' Tc=25.7 min CN=72 Runoff=5.42 cfs 0.634 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,193 sf 30.27% Impervious Runoff Depth>3.25"
Flow Length=431' Tc=35.4 min CN=58 Runoff=4.78 cfs 0.661 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,072 sf 44.01% Impervious Runoff Depth>6.43"
Tc=6.0 min CN=85 Runoff=7.67 cfs 0.579 af

Subcatchment 13S: Subcatchment #13 Runoff Area=60,719 sf 52.40% Impervious Runoff Depth>6.67"
Tc=6.0 min CN=87 Runoff=10.15 cfs 0.775 af

Subcatchment 14S: Subcatchment #14 Runoff Area=22,059 sf 53.15% Impervious Runoff Depth>6.67"
Tc=6.0 min CN=87 Runoff=3.69 cfs 0.281 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,560 sf 62.85% Impervious Runoff Depth>7.03"
Tc=6.0 min CN=90 Runoff=4.93 cfs 0.384 af

Subcatchment 16S: Subcatchment #16 Runoff Area=20,779 sf 53.27% Impervious Runoff Depth>6.67"
Tc=6.0 min CN=87 Runoff=3.47 cfs 0.265 af

Subcatchment 17S: Lodging Building A Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=2.73 cfs 0.231 af

Subcatchment 18S: Res Building B Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=2.73 cfs 0.231 af

Subcatchment 19S: Res Building C Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=2.73 cfs 0.231 af

Subcatchment 20S: Inlet Sump Runoff Area=12,580 sf 0.00% Impervious Runoff Depth>4.08"
Tc=6.0 min CN=65 Runoff=1.35 cfs 0.098 af

Subcatchment 21S: Subcatchment #21 Runoff Area=6,962 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=1.26 cfs 0.106 af

Subcatchment 32S: Subcatchment #32 Runoff Area=4,612 sf 86.88% Impervious Runoff Depth>7.63"
Tc=6.0 min CN=95 Runoff=0.83 cfs 0.067 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,193 sf 77.18% Impervious Runoff Depth>7.39"
Tc=6.0 min CN=93 Runoff=0.92 cfs 0.073 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,481 sf 86.03% Impervious Runoff Depth>7.63"
Tc=6.0 min CN=95 Runoff=0.80 cfs 0.065 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,153 sf 78.57% Impervious Runoff Depth>7.39"
Tc=6.0 min CN=93 Runoff=0.73 cfs 0.059 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,332 sf 82.33% Impervious Runoff Depth>7.51"
Tc=6.0 min CN=94 Runoff=0.42 cfs 0.033 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,187 sf 74.65% Impervious Runoff Depth>7.27"
Tc=6.0 min CN=92 Runoff=0.56 cfs 0.044 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,410 sf 89.54% Impervious Runoff Depth>7.63"
Tc=6.0 min CN=95 Runoff=0.43 cfs 0.035 af

Reach 15AR: Overland flow Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=30.0' S=0.0167 '/' Capacity=158.86 cfs Outflow=0.00 cfs 0.000 af

Reach 15R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=70.0' S=0.0071 '/' Capacity=31.36 cfs Outflow=0.00 cfs 0.000 af

Reach 100R: Final Reach 100 Inflow=4.90 cfs 0.758 af
Outflow=4.90 cfs 0.758 af

Reach 200R: Final Reach 200 Inflow=17.30 cfs 2.309 af
Outflow=17.30 cfs 2.309 af

Reach 400R: Final Reach 400 Inflow=4.26 cfs 1.001 af
Outflow=4.26 cfs 1.001 af

Pond 4P: Pond 4 Peak Elev=91.59' Storage=3,787 cf Inflow=5.43 cfs 0.901 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=4.12 cfs 0.895 af

Pond 16P: Inlet Sump Peak Elev=94.86' Storage=1,806 cf Inflow=3.47 cfs 0.265 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.78 cfs 0.263 af

Pond 20P: Nyloplast Basin Peak Elev=92.08' Storage=213 cf Inflow=1.35 cfs 0.098 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.85 cfs 0.098 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.10' Storage=13,455 cf Inflow=8.18 cfs 0.756 af
Primary=0.09 cfs 0.113 af Secondary=2.54 cfs 0.350 af Tertiary=0.72 cfs 0.025 af Outflow=3.34 cfs 0.488 af

Pond 102P: StormTech SC740 #102 Peak Elev=95.30' Storage=6,487 cf Inflow=2.73 cfs 0.231 af
Outflow=0.11 cfs 0.121 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.47' Storage=28,343 cf Inflow=17.28 cfs 2.103 af
Primary=0.20 cfs 0.261 af Secondary=6.47 cfs 1.086 af Tertiary=6.33 cfs 0.328 af Outflow=12.99 cfs 1.675 af

Pond 104P: Gravel Wetland #104 Peak Elev=93.22' Storage=8,091 cf Inflow=3.69 cfs 0.281 af
Primary=0.18 cfs 0.142 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.142 af

Pond 105P: Detention Pond #105 Peak Elev=96.11' Storage=7,485 cf Inflow=9.56 cfs 0.772 af
Primary=3.40 cfs 0.760 af Secondary=0.00 cfs 0.000 af Outflow=3.40 cfs 0.760 af

Pond 106P: StormTech SC740 #106 Peak Elev=95.51' Storage=5,808 cf Inflow=2.73 cfs 0.231 af
Outflow=0.15 cfs 0.142 af

Pond C01P: CB #1 Peak Elev=90.51' Storage=15 cf Inflow=4.26 cfs 1.002 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=4.26 cfs 1.001 af

Pond C02P: CB #2 Peak Elev=94.79' Storage=0.000 af Inflow=3.36 cfs 0.403 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=3.36 cfs 0.403 af

Pond C03P: CB #3 Peak Elev=94.81' Storage=0.000 af Inflow=0.92 cfs 0.073 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.91 cfs 0.073 af

Pond C04P: CB #4 Peak Elev=96.16' Storage=0.000 af Inflow=3.54 cfs 0.296 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=3.53 cfs 0.296 af

Pond C05P: CB #5 Peak Elev=96.14' Storage=0.000 af Inflow=0.73 cfs 0.059 af
12.0" Round Culvert n=0.012 L=10.7' S=0.0056 '/' Outflow=0.72 cfs 0.059 af

Pond C06P: CB #6 Peak Elev=96.14' Storage=0.000 af Inflow=0.42 cfs 0.033 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.40 cfs 0.033 af

Pond C07P: CB #7 Peak Elev=94.93' Storage=23 cf Inflow=3.89 cfs 0.804 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=3.88 cfs 0.804 af

Pond C08P: CB #8 Peak Elev=94.10' Storage=11 cf Inflow=0.43 cfs 0.035 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.43 cfs 0.035 af

Pond D01P: DMH #1 Peak Elev=94.63' Storage=0.000 af Inflow=3.36 cfs 0.403 af
18.0" Round Culvert n=0.012 L=120.0' S=0.0050 '/' Outflow=3.35 cfs 0.403 af

Pond D04P: DMH #4 Peak Elev=96.14' Storage=0.001 af Inflow=4.64 cfs 0.388 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=4.64 cfs 0.388 af

Pond D06P: DMH #6 Peak Elev=94.65' Storage=0.001 af Inflow=3.88 cfs 0.804 af
18.0" Round Culvert n=0.012 L=62.5' S=0.0051 '/' Outflow=3.87 cfs 0.804 af

Total Runoff Area = 10.762 ac Runoff Volume = 5.123 af Average Runoff Depth = 5.71"
56.06% Pervious = 6.033 ac 43.94% Impervious = 4.729 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=24,233 sf 27.47% Impervious Runoff Depth>7.36"
Tc=6.0 min CN=80 Runoff=4.57 cfs 0.341 af

Subcatchment 2S: Subcatchment #2 Runoff Area=67,977 sf 0.09% Impervious Runoff Depth>6.31"
Flow Length=251' Tc=25.7 min CN=72 Runoff=6.99 cfs 0.821 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,193 sf 30.27% Impervious Runoff Depth>4.47"
Flow Length=431' Tc=35.4 min CN=58 Runoff=6.66 cfs 0.908 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,072 sf 44.01% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=85 Runoff=9.42 cfs 0.720 af

Subcatchment 13S: Subcatchment #13 Runoff Area=60,719 sf 52.40% Impervious Runoff Depth>8.24"
Tc=6.0 min CN=87 Runoff=12.39 cfs 0.958 af

Subcatchment 14S: Subcatchment #14 Runoff Area=22,059 sf 53.15% Impervious Runoff Depth>8.24"
Tc=6.0 min CN=87 Runoff=4.50 cfs 0.348 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,560 sf 62.85% Impervious Runoff Depth>8.62"
Tc=6.0 min CN=90 Runoff=5.97 cfs 0.471 af

Subcatchment 16S: Subcatchment #16 Runoff Area=20,779 sf 53.27% Impervious Runoff Depth>8.24"
Tc=6.0 min CN=87 Runoff=4.24 cfs 0.328 af

Subcatchment 17S: Lodging Building A Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=3.27 cfs 0.277 af

Subcatchment 18S: Res Building B Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=3.27 cfs 0.277 af

Subcatchment 19S: Res Building C Runoff Area=15,097 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=3.27 cfs 0.277 af

Subcatchment 20S: Inlet Sump Runoff Area=12,580 sf 0.00% Impervious Runoff Depth>5.42"
Tc=6.0 min CN=65 Runoff=1.80 cfs 0.131 af

Subcatchment 21S: Subcatchment #21 Runoff Area=6,962 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=1.51 cfs 0.128 af

Subcatchment 32S: Subcatchment #32 Runoff Area=4,612 sf 86.88% Impervious Runoff Depth>9.23"
Tc=6.0 min CN=95 Runoff=0.99 cfs 0.081 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,193 sf 77.18% Impervious Runoff Depth>8.99"
Tc=6.0 min CN=93 Runoff=1.11 cfs 0.089 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,481 sf 86.03% Impervious Runoff Depth>9.23"
Tc=6.0 min CN=95 Runoff=0.96 cfs 0.079 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,153 sf 78.57% Impervious Runoff Depth>8.99"
Tc=6.0 min CN=93 Runoff=0.88 cfs 0.071 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,332 sf 82.33% Impervious Runoff Depth>9.11"
Tc=6.0 min CN=94 Runoff=0.50 cfs 0.041 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,187 sf 74.65% Impervious Runoff Depth>8.86"
Tc=6.0 min CN=92 Runoff=0.68 cfs 0.054 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,410 sf 89.54% Impervious Runoff Depth>9.23"
Tc=6.0 min CN=95 Runoff=0.52 cfs 0.043 af

Reach 15AR: Overland flow Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=30.0' S=0.0167 '/' Capacity=158.86 cfs Outflow=0.00 cfs 0.000 af

Reach 15R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=70.0' S=0.0071 '/' Capacity=31.36 cfs Outflow=0.00 cfs 0.000 af

Reach 100R: Final Reach 100 Inflow=9.71 cfs 1.019 af
Outflow=9.71 cfs 1.019 af

Reach 200R: Final Reach 200 Inflow=22.33 cfs 2.949 af
Outflow=22.33 cfs 2.949 af

Reach 400R: Final Reach 400 Inflow=4.97 cfs 1.356 af
Outflow=4.97 cfs 1.356 af

Pond 4P: Pond 4 Peak Elev=92.15' Storage=6,772 cf Inflow=7.42 cfs 1.235 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=4.81 cfs 1.228 af

Pond 16P: Inlet Sump Peak Elev=95.06' Storage=2,395 cf Inflow=4.24 cfs 0.328 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=2.32 cfs 0.324 af

Pond 20P: Nyloplast Basin Peak Elev=92.42' Storage=549 cf Inflow=1.80 cfs 0.131 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.86 cfs 0.131 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.17' Storage=14,487 cf Inflow=10.02 cfs 0.947 af
Primary=0.09 cfs 0.117 af Secondary=4.63 cfs 0.494 af Tertiary=1.73 cfs 0.066 af Outflow=6.44 cfs 0.677 af

Pond 102P: StormTech SC740 #102 Peak Elev=95.80' Storage=7,381 cf Inflow=3.27 cfs 0.277 af
Outflow=0.30 cfs 0.153 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.54' Storage=29,718 cf Inflow=20.25 cfs 2.580 af
Primary=0.20 cfs 0.272 af Secondary=6.59 cfs 1.308 af Tertiary=10.16 cfs 0.548 af Outflow=16.95 cfs 2.128 af

Pond 104P: Gravel Wetland #104 Peak Elev=93.55' Storage=9,788 cf Inflow=4.50 cfs 0.348 af
Primary=0.23 cfs 0.191 af Secondary=0.05 cfs 0.006 af Outflow=0.28 cfs 0.197 af

Pond 105P: Detention Pond #105 Peak Elev=96.38' Storage=8,915 cf Inflow=11.52 cfs 0.939 af
Primary=5.09 cfs 0.923 af Secondary=0.00 cfs 0.000 af Outflow=5.09 cfs 0.923 af

Pond 106P: StormTech SC740 #106 Peak Elev=95.64' Storage=6,016 cf Inflow=3.27 cfs 0.277 af
Outflow=0.97 cfs 0.184 af

Pond C01P: CB #1 Peak Elev=90.67' Storage=17 cf Inflow=4.97 cfs 1.356 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=4.97 cfs 1.356 af

Pond C02P: CB #2 Peak Elev=94.97' Storage=0.000 af Inflow=3.88 cfs 0.495 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=3.87 cfs 0.494 af

Pond C03P: CB #3 Peak Elev=95.01' Storage=0.000 af Inflow=1.11 cfs 0.089 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=1.10 cfs 0.089 af

Pond C04P: CB #4 Peak Elev=96.48' Storage=0.001 af Inflow=4.24 cfs 0.356 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=4.22 cfs 0.356 af

Pond C05P: CB #5 Peak Elev=96.46' Storage=0.001 af Inflow=0.88 cfs 0.071 af
12.0" Round Culvert n=0.012 L=10.7' S=0.0056 '/' Outflow=0.86 cfs 0.071 af

Pond C06P: CB #6 Peak Elev=96.45' Storage=0.001 af Inflow=0.50 cfs 0.041 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.48 cfs 0.041 af

Pond C07P: CB #7 Peak Elev=95.55' Storage=31 cf Inflow=5.41 cfs 0.977 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=5.40 cfs 0.976 af

Pond C08P: CB #8 Peak Elev=94.18' Storage=12 cf Inflow=0.52 cfs 0.043 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.51 cfs 0.042 af

Pond D01P: DMH #1 Peak Elev=94.77' Storage=0.000 af Inflow=3.87 cfs 0.494 af
18.0" Round Culvert n=0.012 L=120.0' S=0.0050 '/' Outflow=3.87 cfs 0.494 af

Pond D04P: DMH #4 Peak Elev=96.45' Storage=0.001 af Inflow=5.57 cfs 0.468 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=5.55 cfs 0.468 af

Pond D06P: DMH #6 Peak Elev=94.94' Storage=0.001 af Inflow=5.40 cfs 0.976 af
18.0" Round Culvert n=0.012 L=62.5' S=0.0051 '/' Outflow=5.41 cfs 0.976 af

Total Runoff Area = 10.762 ac Runoff Volume = 6.442 af Average Runoff Depth = 7.18"
56.06% Pervious = 6.033 ac 43.94% Impervious = 4.729 ac

Appendix III - Calculations, Charts, & Graphs

Extreme Precipitation Tables
Rip Rap Calculations
AoT Stormwater Treatment Spreadsheets
NRCS USDA Web-Soil Map
Site Specific Soils Map & Report
Ksat Values in N.H., SSSNNE
Inspection and Maintenance Manual Stormwater System Management
UNHSC Gravel Wetland Inspection Documentation
Stormtech Sc-740 Chamber Submittal Documents
Watershed Report Card, 303(d) List, & ORW List
Filtrexx Silt Soxx Specification Sheets
Waiver for Groundwater Recharge Volume

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.911 degrees West
Latitude	43.178 degrees North
Elevation	0 feet
Date/Time	Thu, 29 Oct 2020 14:25:29 -0400

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	0.81	1.03	**1yr**	0.70	0.98	1.20	1.54	1.99	2.60	2.85	**1yr**	2.30	2.74	3.14	3.87	4.44	**1yr**
2yr	0.32	0.49	0.61	0.81	1.01	1.28	**2yr**	0.87	1.17	1.50	1.91	2.44	3.13	3.48	**2yr**	2.77	3.35	3.84	4.57	5.21	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.38	3.06	3.96	4.46	**5yr**	3.50	4.29	4.90	5.78	6.54	**5yr**
10yr	0.40	0.63	0.80	1.09	1.41	1.84	**10yr**	1.22	1.69	2.17	2.82	3.65	4.73	5.38	**10yr**	4.19	5.17	5.90	6.90	7.77	**10yr**
25yr	0.46	0.73	0.94	1.29	1.72	2.26	**25yr**	1.48	2.09	2.69	3.51	4.59	5.98	6.90	**25yr**	5.30	6.64	7.54	8.73	9.76	**25yr**
50yr	0.51	0.82	1.06	1.48	1.99	2.65	**50yr**	1.72	2.45	3.17	4.17	5.47	7.16	8.33	**50yr**	6.33	8.01	9.08	10.43	11.61	**50yr**
100yr	0.58	0.93	1.20	1.70	2.31	3.11	**100yr**	1.99	2.88	3.73	4.94	6.51	8.56	10.07	**100yr**	7.57	9.68	10.94	12.47	13.81	**100yr**
200yr	0.64	1.04	1.35	1.94	2.69	3.65	**200yr**	2.32	3.39	4.41	5.87	7.77	10.24	12.17	**200yr**	9.06	11.70	13.18	14.91	16.44	**200yr**
500yr	0.75	1.24	1.61	2.34	3.28	4.51	**500yr**	2.83	4.20	5.47	7.34	9.79	12.98	15.64	**500yr**	11.49	15.04	16.87	18.91	20.72	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.91	1.25	1.55	2.04	2.48	**1yr**	1.81	2.38	2.92	3.35	4.05	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.36	1.83	2.36	3.04	3.38	**2yr**	2.69	3.25	3.73	4.45	5.06	**2yr**
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.15	2.78	3.70	4.11	**5yr**	3.27	3.96	4.58	5.40	6.10	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.57	1.82	2.45	3.14	4.26	4.78	**10yr**	3.77	4.59	5.31	6.24	7.01	**10yr**
25yr	0.44	0.67	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.85	3.67	5.04	5.79	**25yr**	4.46	5.57	6.48	7.56	8.43	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.19	**50yr**	1.53	2.14	2.36	3.21	4.12	5.78	6.69	**50yr**	5.11	6.44	7.53	8.74	9.68	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.51	**100yr**	1.74	2.46	2.64	3.59	4.61	6.61	7.73	**100yr**	5.85	7.43	8.76	10.09	11.08	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.88	**200yr**	1.99	2.81	2.93	4.02	5.16	7.57	8.93	**200yr**	6.70	8.58	10.19	11.67	12.72	**200yr**
500yr	0.70	1.04	1.34	1.94	2.77	3.47	**500yr**	2.39	3.39	3.40	4.67	6.01	9.01	10.78	**500yr**	7.97	10.37	12.44	14.15	15.20	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.74	2.21	2.83	3.05	**1yr**	2.50	2.93	3.37	4.17	4.76	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.48	1.95	2.50	3.25	3.59	**2yr**	2.87	3.45	3.96	4.72	5.39	**2yr**
5yr	0.39	0.60	0.75	1.03	1.31	1.58	**5yr**	1.13	1.54	1.85	2.49	3.19	4.22	4.80	**5yr**	3.73	4.61	5.23	6.17	6.94	**5yr**
10yr	0.46	0.70	0.87	1.21	1.57	1.92	**10yr**	1.35	1.87	2.23	3.04	3.84	5.19	5.98	**10yr**	4.59	5.75	6.55	7.58	8.46	**10yr**
25yr	0.55	0.84	1.05	1.49	1.96	2.47	**25yr**	1.69	2.41	2.87	3.95	4.92	6.93	8.02	**25yr**	6.13	7.71	8.73	9.96	11.02	**25yr**
50yr	0.64	0.97	1.21	1.74	2.34	2.98	**50yr**	2.02	2.91	3.48	4.80	5.97	8.55	10.03	**50yr**	7.57	9.64	10.87	12.25	13.47	**50yr**
100yr	0.74	1.12	1.40	2.03	2.78	3.59	**100yr**	2.40	3.51	4.21	5.87	7.24	10.55	12.55	**100yr**	9.34	12.07	13.52	15.08	16.47	**100yr**
200yr	0.86	1.29	1.63	2.37	3.30	4.35	**200yr**	2.85	4.26	5.12	7.18	8.78	13.06	15.72	**200yr**	11.56	15.11	16.83	18.54	20.18	**200yr**
500yr	1.05	1.56	2.00	2.91	4.13	5.59	**500yr**	3.57	5.46	6.61	9.39	11.34	17.35	21.17	**500yr**	15.36	20.36	22.49	24.42	26.41	**500yr**

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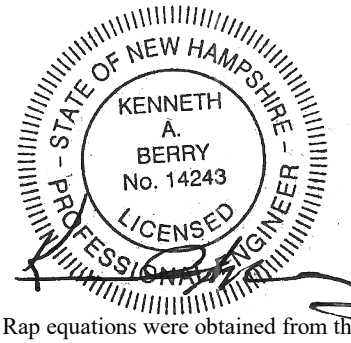

RIP RAP CALCULATIONS

24-034 239 Knox Marsh Realty LLC

Barrington, NH

Berry Surveying & Engineering

335 Second Crown Point Road

Barrington, NH

26-Nov-24

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire*. Rip Rap was sized for the 25 year storm event. (Some d50 sizes and T values have been modified)

TAILWATER < HALF THE Do

La = (1.8 x Q) / Do 1.5 + (7 x Do) Q = Peak Flow & Do is Pipe Diameter

W = La + 3*Do or defined channel width

d50 = (0.02 x Q4/3) / (Tw x Do) Tw = Tailwater Depth

T = Largest Stone Size x 1.5

Culvert or Catch Basin	Tailwater (Feet) Tw	Discharge (C.F.S.) Q	Diameter of Pipe Do	Length of Rip Rap La (feet)	Width of Rip Rap W (feet)	d50-Stone Rip Rap d50(ft.)	Actual Size	Thickness
12" RCP (Pond #101P)	0.20	1.20	1.00	8.4	11.4	0.13	0.50	1.20
15" RCP (Pond #103P)	0.25	4.79	1.25	13.3	17.1	0.49	0.50	1.20

TAILWATER > HALF THE Do

La = (3.0 x Q) / Do 3/2 + (7 x Do) Q = Peak Flow & Do is Pipe Diameter

W = 0.4La + 3*Do or defined channel width

d50 = (0.02 x Q4/3) / (Tw x Do) Tw = Tailwater Depth

T = Largest Stone Size x 1.5

Culvert or Catch Basin	Tailwater (Feet) Tw	Discharge (C.F.S.) Q	Diameter of Pipe Do	Length of Rip Rap La (feet)	Width of Rip Rap W (feet)	d50-Stone Rip Rap d50(ft.)	Actual Size	Thickness
18" HDPE (Pond #102P)	1.90	0.08	1.50	10.6	8.7	0.00	0.50	1.20
18" HDPE (Pond #D06P)	1.90	3.58	1.50	15.3	10.6	0.04	0.50	1.20
18" HDPE (Pond #D01P)	1.90	2.97	1.50	14.5	10.3	0.03	0.50	1.20
18" HDPE (Pond #16P)	0.95	2.82	1.50	14.3	10.2	0.05	0.50	1.20
18" RCP (Pond #D04P)	1.89	3.86	1.50	15.6	10.8	0.04	0.50	1.20
18" HDPE (Pond #106P)	1.53	0.10	1.50	10.6	8.8	0.00	0.50	1.20
12" HDPE (Pond #C08P)	0.88	0.36	1.00	7.7	6.1	0.01	0.50	1.20
12" RCP (Pond #104P)	0.99	0.12	1.00	7.2	5.9	0.00	0.50	1.20

Please note that the designer chose to use the 25 Year Event for the dimensional calculations.

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d50 Size =	0.5	Feet	6	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d50 Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland #101 (Pond 101P)**

Enter the node name in the drainage analysis if applicable.

1.48	ac	A = Area draining to the practice	
0.87	ac	A_I = Impervious area draining to the practice	
0.59	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.58	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.86	ac-in	WQV= 1" x Rv x A	
3,118	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
312	cf	10% x WQV (check calc for sediment forebay)	
1,403	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
3,734	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
2,154	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
2,131	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.07	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
92.97	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.06	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
28.87	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥ 3:1**
89.83	ft	Elevation of SHWT	
87.83	ft	SHWT - 2 feet	
91.92	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
17,15	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Angle	Grate	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
94.10	ft	Peak elevation of the 50-year storm event (E_{50})	
94.50	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan

Name, Profession: KAB/KRP

1. Volume stored above the wetland soil and below the high flow by-pass.

2. To ensure orifice is sized so that WQV is released at a relatively stable rate.

3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes: Ksat Buxton > than 0.015 in/hr. System to be lined w/ low perm material

Summary for Pond 101P: Gravel Wetland #101

[80] Warning: Exceeded Pond C08P by 0.08' @ 12.15 hrs (0.69 cfs 0.095 af)

Inflow Area = 1.483 ac, 58.80% Impervious, Inflow Depth > 6.12" for 50 YR - 24 HR event
Inflow = 8.18 cfs @ 12.09 hrs, Volume= 0.756 af
Outflow = 3.34 cfs @ 12.32 hrs, Volume= 0.488 af, Atten= 59%, Lag= 13.9 min
Primary = 0.09 cfs @ 12.32 hrs, Volume= 0.113 af
Secondary = 2.54 cfs @ 12.32 hrs, Volume= 0.350 af
Tertiary = 0.72 cfs @ 12.32 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.10' @ 12.32 hrs Surf.Area= 30,183 sf Storage= 13,455 cf
Flood Elev= 94.50' Surf.Area= 33,501 sf Storage= 19,418 cf

Plug-Flow detention time= 217.4 min calculated for 0.487 af (64% of inflow)
Center-of-Mass det. time= 91.3 min (906.3 - 815.0)

Volume	Invert	Avail.Storage	Storage Description
#1	91.92'	25 cf	**4.00'D x 1.98'H Outlet Structure**
#2	92.50'	370 cf	**Sediment Forebay #1 (Irregular)**Listed below (Recalc)
#3	92.50'	3,249 cf	**Sediment Forebay #2 (Irregular)**Listed below (Recalc)
#4	92.25'	2,154 cf	**Cell #1 (Irregular)** Listed below (Recalc)
#5	92.25'	2,131 cf	**Cell #2 (Irregular)** Listed below (Recalc)
#6	93.25'	4,294 cf	**Cell Open Water Storage (Irregular)**Listed below (Recalc)
#7	94.00'	7,194 cf	**Open Water Storage (Irregular)**Listed below (Recalc)
		19,418 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	79	45.1	0	0	79
93.00	199	61.4	67	67	220
94.00	421	85.4	303	370	510

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	82	38.6	0	0	82
93.00	595	166.0	150	150	2,157
93.25	2,096	217.7	317	467	3,736
94.00	5,605	521.1	2,782	3,249	21,576

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,400	183.9	0	0	1,400
92.50	2,122	256.6	437	437	3,949
93.00	2,345	265.0	1,116	1,553	4,321
93.25	2,462	267.1	601	2,154	4,432

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,279	177.2	0	0	1,279
92.50	2,037	252.7	411	411	3,862
93.00	2,374	258.9	1,102	1,513	4,145
93.25	2,572	262.9	618	2,131	4,324

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.25	5,490	320.3	0	0	5,490
94.00	5,965	332.3	4,294	4,294	6,160

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	12,409	830.5	0	0	12,409
94.50	16,463	1,069.1	7,194	7,194	48,480

Device	Routing	Invert	Outlet Devices
#1	Primary	91.92'	**6.0" Round 6" HDPE N-12** L= 14.5' Ke= 0.500 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0117 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Secondary	91.92'	**12.0" Round 12" RCP** L= 16.0' Ke= 0.500 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0106 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Device 1	91.92'	**1.5" Vert. 1.5" Orifice Goose Neck** C= 0.600
#4	Device 2	93.94'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	94.00'	**10.0' long x 7.0' breadth 10' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=0.09 cfs @ 12.32 hrs HW=94.10' TW=0.00' (Dynamic Tailwater)
↑└─**1=6" HDPE N-12** (Passes 0.09 cfs of 1.31 cfs potential flow)
  ↑└─**3=1.5" Orifice Goose Neck** (Orifice Controls 0.09 cfs @ 7.00 fps)

Secondary OutFlow Max=2.52 cfs @ 12.32 hrs HW=94.10' TW=0.00' (Dynamic Tailwater)
↑└─**2=12" RCP** (Passes 2.52 cfs of 4.89 cfs potential flow)
  ↑└─**4=4' Structure** (Weir Controls 2.52 cfs @ 1.29 fps)

Tertiary OutFlow Max=0.71 cfs @ 12.32 hrs HW=94.10' TW=0.00' (Dynamic Tailwater)
↑└─**5=10' Emergency Spillway** (Weir Controls 0.71 cfs @ 0.74 fps)

Stage-Area-Storage for Pond 101P: Gravel Wetland #101

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
91.92	0	92.98	3,186	94.04	12,726
91.94	0	93.00	3,296	94.06	12,982
91.96	1	93.02	3,408	94.08	13,241
91.98	1	93.04	3,522	94.10	13,503
92.00	1	93.06	3,639	94.12	13,768
92.02	1	93.08	3,758	94.14	14,036
92.04	2	93.10	3,879	94.16	14,307
92.06	2	93.12	4,004	94.18	14,582
92.08	2	93.14	4,132	94.20	14,859
92.10	2	93.16	4,262	94.22	15,140
92.12	3	93.18	4,396	94.24	15,424
92.14	3	93.20	4,533	94.26	15,711
92.16	3	93.22	4,674	94.28	16,002
92.18	3	93.24	4,818	94.30	16,296
92.20	4	93.26	4,970	94.32	16,593
92.22	4	93.28	5,129	94.34	16,893
92.24	4	93.30	5,289	94.36	17,197
92.26	31	93.32	5,451	94.38	17,504
92.28	87	93.34	5,616	94.40	17,814
92.30	145	93.36	5,781	94.42	18,128
92.32	206	93.38	5,949	94.44	18,446
92.34	268	93.40	6,119	94.46	18,766
92.36	333	93.42	6,291	94.48	19,090
92.38	400	93.44	6,464	94.50	**19,418**
92.40	470	93.46	6,640		
92.42	542	93.48	6,818		
92.44	617	93.50	6,997		
92.46	694	93.52	7,179		
92.48	773	93.54	7,363		
92.50	855	93.56	7,549		
92.52	942	93.58	7,737		
92.54	1,030	93.60	7,927		
92.56	1,119	93.62	8,120		
92.58	1,208	93.64	8,314		
92.60	1,298	93.66	8,511		
92.62	1,389	93.68	8,711		
92.64	1,481	93.70	8,912		
92.66	1,573	93.72	9,116		
92.68	1,667	93.74	9,322		
92.70	1,761	93.76	9,530		
92.72	1,857	93.78	9,741		
92.74	1,953	93.80	9,954		
92.76	2,050	93.82	10,170		
92.78	2,148	93.84	10,388		
92.80	2,247	93.86	10,609		
92.82	2,347	93.88	10,832		
92.84	2,448	93.90	11,058		
92.86	2,551	93.92	11,286		
92.88	2,654	93.94	11,516		
92.90	2,758	93.96	11,749		
92.92	2,864	93.98	11,985		
92.94	2,970	94.00	12,224		
92.96	3,078	94.02	12,473		

WQV = 3,118 CF
WQV Elev: = 92.97'

Stage-Discharge for Pond 101P: Gravel Wetland #101

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
91.92	0.00	0.00	0.00	0.00
91.97	0.00	0.00	0.00	0.00
92.02	0.01	0.01	0.00	0.00
92.07	0.02	0.02	0.00	0.00
92.12	0.02	0.02	0.00	0.00
92.17	0.03	0.03	0.00	0.00
92.22	0.03	0.03	0.00	0.00
92.27	0.03	0.03	0.00	0.00
92.32	0.03	0.03	0.00	0.00
92.37	0.04	0.04	0.00	0.00
92.42	0.04	0.04	0.00	0.00
92.47	0.04	0.04	0.00	0.00
92.52	0.04	0.04	0.00	0.00
92.57	0.05	0.05	0.00	0.00
92.62	0.05	0.05	0.00	0.00
92.67	0.05	0.05	0.00	0.00
92.72	0.05	0.05	0.00	0.00
92.77	0.05	0.05	0.00	0.00
92.82	0.05	0.05	0.00	0.00
92.87	0.06	0.06	0.00	0.00
92.92	0.06	0.06	0.00	0.00
92.97	0.06	0.06	0.00	0.00
93.02	0.06	0.06	0.00	0.00
93.07	0.06	0.06	0.00	0.00
93.12	0.06	0.06	0.00	0.00
93.17	0.06	0.06	0.00	0.00
93.22	0.07	0.07	0.00	0.00
93.27	0.07	0.07	0.00	0.00
93.32	0.07	0.07	0.00	0.00
93.37	0.07	0.07	0.00	0.00
93.42	0.07	0.07	0.00	0.00
93.47	0.07	0.07	0.00	0.00
93.52	0.07	0.07	0.00	0.00
93.57	0.07	0.07	0.00	0.00
93.62	0.08	0.08	0.00	0.00
93.67	0.08	0.08	0.00	0.00
93.72	0.08	0.08	0.00	0.00
93.77	0.08	0.08	0.00	0.00
93.82	0.08	0.08	0.00	0.00
93.87	0.08	0.08	0.00	0.00
93.92	0.08	0.08	0.00	0.00
93.97	0.30	0.08	0.21	0.00
94.02	1.08	0.08	0.93	0.07
94.07	2.46	0.09	1.93	0.44
94.12	4.22	0.09	3.14	1.00
94.17	6.30	0.09	4.53	1.68
94.22	7.65	0.09	5.07	2.49
94.27	8.66	0.09	5.14	3.43
94.32	9.78	0.09	5.21	4.47
94.37	11.00	0.09	5.28	5.63
94.42	12.35	0.09	5.35	6.91
94.47	**13.83**	**0.09**	**5.41**	**8.32**

WQV Elev: = 92.97'
WV Discharge = 0.06 CFS

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland #103 (Pond 103P)**

Enter the node name in the drainage analysis if applicable.

3.77	ac	A = Area draining to the practice	
2.54	ac	A_I = Impervious area draining to the practice	
0.67	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
2.47	ac-in	WQV= 1" x Rv x A	
8,970	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
897	cf	10% x WQV (check calc for sediment forebay)	
4,036	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
4,083	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
4,287	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
4,099	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.21	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
93.24	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.14	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
35.59	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥ 3:1**
93.75	ft	Elevation of SHWT	
91.75	ft	SHWT - 2 feet	
91.92	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
18, 18	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Angle	Grate	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
94.47	ft	Peak elevation of the 50-year storm event (E_{50})	
95.00	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan

Name, Profession: KAB/KRP

1. Volume stored above the wetland soil and below the high flow by-pass.

2. To ensure orifice is sized so that WQV is released at a relatively stable rate.

3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes: Ksat Buxton & Windsor > than 0.015 in/hr. System to be lined w/ low perm material

Summary for Pond 103P: Gravel Wetland #103

[80] Warning: Exceeded Pond 102P by 0.14' @ 12.00 hrs (0.04 cfs 0.002 af)

Inflow Area = 3.770 ac, 67.27% Impervious, Inflow Depth > 6.68" for 50 YR - 24 HR event
Inflow = 17.37 cfs @ 12.09 hrs, Volume= 2.099 af
Outflow = 13.03 cfs @ 12.20 hrs, Volume= 1.672 af, Atten= 25%, Lag= 6.5 min
Primary = 0.20 cfs @ 12.20 hrs, Volume= 0.262 af
Secondary = 6.47 cfs @ 12.20 hrs, Volume= 1.084 af
Tertiary = 6.37 cfs @ 12.20 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.47' @ 12.20 hrs Surf.Area= 31,525 sf Storage= 28,359 cf
Flood Elev= 95.00' Surf.Area= 32,983 sf Storage= 38,090 cf

Plug-Flow detention time= 173.5 min calculated for 1.672 af (80% of inflow)
Center-of-Mass det. time= 89.2 min (887.6 - 798.3)

Volume	Invert	Avail.Storage	Storage Description
#1	91.92'	28 cf	**4.00'D x 2.23'H Outlet Structure**
#2	92.25'	4,287 cf	**Cell 1 (Irregular)** Listed below (Recalc)
#3	92.25'	4,099 cf	**Cell 2 (Irregular)** Listed below (Recalc)
#4	93.50'	25,593 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	92.50'	4,083 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
		38,090 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,797	216.6	0	0	1,797
92.50	3,184	347.3	614	614	7,662
93.00	3,681	362.9	1,715	2,329	8,562
93.50	4,155	374.2	1,958	4,287	9,250

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.25	1,797	216.6	0	0	1,797
92.50	2,882	243.9	580	580	2,799
93.00	3,568	328.9	1,609	2,189	6,676
93.50	4,077	342.3	1,910	4,099	7,411

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.50	15,320	728.3	0	0	15,320
94.00	16,467	741.0	7,945	7,945	16,850
94.50	17,586	750.4	8,512	16,457	18,026
95.00	18,967	820.6	9,136	25,593	26,811

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	1,819	357.2	0	0	1,819
93.00	4,483	584.2	1,526	1,526	18,826
93.50	5,771	642.7	2,557	4,083	24,546

Device	Routing	Invert	Outlet Devices
#1	Primary	91.92'	**6.0" Round 6" HDPE N-12** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	91.92'	**15.0" Round 15" RCP** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 1	91.92'	**2.2" Vert. 2.25" Orifice Goose Neck** C= 0.600
#4	Device 2	93.50'	**4.0" Vert. 4" Orifice (2) X 2.00** C= 0.600
#5	Device 2	94.19'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads
#6	Tertiary	94.25'	**25.0' long x 11.0' breadth 25' Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64

Primary OutFlow Max=0.20 cfs @ 12.20 hrs HW=94.47' TW=0.00' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.20 cfs of 1.13 cfs potential flow)
  └─**3=2.25" Orifice Goose Neck** (Orifice Controls 0.20 cfs @ 7.54 fps)

Secondary OutFlow Max=6.46 cfs @ 12.20 hrs HW=94.47' TW=0.00' (Dynamic Tailwater)
└─**2=15" RCP** (Inlet Controls 6.46 cfs @ 5.27 fps)
  ├─**4=4" Orifice (2)** (Passes < 0.75 cfs potential flow)
  └─**5=4' Structure** (Passes < 5.93 cfs potential flow)

Tertiary OutFlow Max=6.36 cfs @ 12.20 hrs HW=94.47' TW=0.00' (Dynamic Tailwater)
└─**6=25' Emergency Spillway** (Weir Controls 6.36 cfs @ 1.18 fps)

Stage-Area-Storage for Pond 103P: Gravel Wetland #103

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
91.92	0	92.98	5,825	94.04	21,101
91.94	0	93.00	6,058	94.06	21,433
91.96	1	93.02	6,294	94.08	21,765
91.98	1	93.04	6,531	94.10	22,099
92.00	1	93.06	6,770	94.12	22,433
92.02	1	93.08	7,011	94.14	22,769
92.04	2	93.10	7,254	94.16	23,105
92.06	2	93.12	7,499	94.18	23,442
92.08	2	93.14	7,745	94.20	23,779
92.10	2	93.16	7,993	94.22	24,118
92.12	3	93.18	8,243	94.24	24,458
92.14	3	93.20	8,494	94.26	24,798
92.16	3	93.22	8,748	94.28	25,139
92.18	3	93.24	9,003	94.30	25,482
92.20	4	93.26	9,260	94.32	25,825
92.22	4	93.28	9,519	94.34	26,169
92.24	4	93.30	9,780	94.36	26,514
92.26	41	93.32	10,042	94.38	26,860
92.28	116	93.34	10,307	94.40	27,206
92.30	195	93.36	10,573	94.42	27,554
92.32	278	93.38	10,841	94.44	27,903
92.34	365	93.40	11,111	94.46	28,252
92.36	455	93.42	11,383	94.48	28,602
92.38	549	93.44	11,656	94.50	28,954
92.40	648	93.46	11,932	94.52	29,306
92.42	750	93.48	12,209	94.54	29,659
92.44	856	93.50	12,489	94.56	30,014
92.46	967	93.52	12,796	94.58	30,369
92.48	1,082	93.54	13,104	94.60	30,726
92.50	1,201	93.56	13,413	94.62	31,083
92.52	1,361	93.58	13,723	94.64	31,442
92.54	1,522	93.60	14,033	94.66	31,802
92.56	1,687	93.62	14,345	94.68	32,163
92.58	1,854	93.64	14,657	94.70	32,525
92.60	2,024	93.66	14,971	94.72	32,888
92.62	2,197	93.68	15,285	94.74	33,253
92.64	2,372	93.70	15,600	94.76	33,618
92.66	2,550	93.72	15,917	94.78	33,985
92.68	2,732	93.74	16,234	94.80	34,352
92.70	2,916	93.76	16,552	94.82	34,721
92.72	3,103	93.78	16,871	94.84	35,091
92.74	3,293	93.80	17,191	94.86	35,462
92.76	3,486	93.82	17,511	94.88	35,834
92.78	3,682	93.84	17,833	94.90	36,207
92.80	3,882	93.86	18,156	94.92	36,581
92.82	4,085	93.88	18,479	94.94	36,957
92.84	4,290	93.90	18,804	94.96	37,333
92.86	4,499	93.92	19,129	94.98	37,711
92.88	4,712	93.94	19,455	95.00	**38,090**
92.90	4,928	93.96	19,783		
92.92	5,147	93.98	20,111		
92.94	5,369	94.00	20,440	WQV = 8,970 CF	
92.96	5,595	94.02	20,770	WQV Elev: = 93.24'	

Stage-Discharge for Pond 103P: Gravel Wetland #103

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
91.92	0.00	0.00	0.00	0.00
92.02	0.02	0.02	0.00	0.00
92.12	0.04	0.04	0.00	0.00
92.22	0.06	0.06	0.00	0.00
92.32	0.07	0.07	0.00	0.00
92.42	0.08	0.08	0.00	0.00
92.52	0.09	0.09	0.00	0.00
92.62	0.10	0.10	0.00	0.00
92.72	0.11	0.11	0.00	0.00
92.82	0.11	0.11	0.00	0.00
92.92	0.12	0.12	0.00	0.00
93.02	0.13	0.13	0.00	0.00
93.12	0.13	0.13	0.00	0.00
93.22	0.14	0.14	0.00	0.00
93.32	0.15	0.15	0.00	0.00
93.42	0.15	0.15	0.00	0.00
93.52	0.16	0.16	0.00	0.00
93.62	0.23	0.16	0.07	0.00
93.72	0.36	0.17	0.20	0.00
93.82	0.50	0.17	0.33	0.00
93.92	0.60	0.18	0.42	0.00
94.02	0.68	0.18	0.50	0.00
94.12	0.75	0.18	0.57	0.00
94.22	1.03	0.19	0.84	0.00
94.32	3.97	0.19	2.61	1.17
94.42	9.89	0.20	5.26	4.43
94.52	15.70	0.20	6.56	8.95
94.62	21.45	0.21	6.72	14.52
94.72	28.26	0.21	6.88	21.17
94.82	36.12	0.21	7.04	28.87
94.92	**44.33**	**0.22**	**7.19**	**36.92**

WQV Elev: = 93.24'
WQV Discharge = 0.14 CFS

GRAVEL WETLAND DESIGN CRITERIA
(Env-Wq 1508.05)

Type/Node Name: **Gravel Wetland #104 (Pond 104P)**

Enter the node name in the drainage analysis if applicable.

0.51	ac	A = Area draining to the practice	
0.27	ac	A_I = Impervious area draining to the practice	
0.53	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.53	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.27	ac-in	WQV= 1" x Rv x A	
970	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
97	cf	10% x WQV (check calc for sediment forebay)	
437	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
1,416	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
897	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
1,195	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.02	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
91.45	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
53.91	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥ 3:1**
90.00	ft	Elevation of SHWT	
88.00	ft	SHWT - 2 feet	
90.33	ft	Epp = Elevation of the permanent pool (elevation of lowest orifice) [3]	**≤ E_{SHWT} - 2 ft**
58,65	ft	Length of the flow path between the inlet and outlet in each cell	**≥ 15 ft**
Angle	Grate	What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
93.22	ft	Peak elevation of the 50-year storm event (E_{50})	
94.00	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

Qualified professional that developed the planting plan

Name, Profession: KAB/KRP

1. Volume stored above the wetland soil and below the high flow by-pass.

2. To ensure orifice is sized so that WQV is released at a relatively stable rate.

3. 4" to 8" below the wetland soil. If lowest orifice is higher than (SHWT - 2 feet), and saturated hydraulic conductivity (Ksat) is greater than 0.015 in/hr, the system must be lined.

Designer's Notes: Ksat Windsor Variant > than 0.015 in/hr. System to be lined w/ low perm material

Summary for Pond 104P: Gravel Wetland #104

Inflow Area = 0.506 ac, 53.15% Impervious, Inflow Depth > 6.67" for 50 YR - 24 HR event
Inflow = 3.69 cfs @ 12.09 hrs, Volume= 0.281 af
Outflow = 0.18 cfs @ 14.50 hrs, Volume= 0.142 af, Atten= 95%, Lag= 144.6 min
Primary = 0.18 cfs @ 14.50 hrs, Volume= 0.142 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 93.22' @ 14.50 hrs Surf.Area= 8,546 sf Storage= 8,091 cf
Flood Elev= 94.00' Surf.Area= 10,045 sf Storage= 12,384 cf

Plug-Flow detention time= 344.1 min calculated for 0.142 af (51% of inflow)
Center-of-Mass det. time= 230.6 min (1,014.2 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1	90.33'	43 cf	**4.00'D x 3.42'H Outlet Structure**
#2	91.00'	1,416 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
#3	91.00'	897 cf	**Cell 1 (Irregular)** Listed below (Recalc)
#4	91.00'	1,195 cf	**Cell 2 (Irregular)** Listed below (Recalc)
#5	92.00'	8,833 cf	**Open water storage (Irregular)** Listed below (Recalc)
		12,384 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	165	49.3	0	0	165
91.50	570	108.8	174	174	915
92.00	693	117.9	315	489	1,088
93.00	1,183	152.4	927	1,416	1,843

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	768	145.0	0	0	768
91.50	893	151.8	415	415	945
92.00	1,038	159.7	482	897	1,156

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	855	158.3	0	0	855
91.50	1,248	206.2	523	523	2,247
92.00	1,444	214.6	672	1,195	2,548

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.00	2,552	351.7	0	0	2,552
93.00	4,543	490.4	3,500	3,500	11,856
93.75	5,684	526.6	3,827	7,327	14,811
94.00	6,367	575.4	1,506	8,833	19,092

Device	Routing	Invert	Outlet Devices
#1	Primary	90.33'	**6.0" Round 6" HDPE N-12** L= 33.7' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 90.33' / 90.00' S= 0.0098 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	90.33'	**12.0" Round 12" RCP** L= 13.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 90.33' / 90.00' S= 0.0244 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Device 1	90.33'	**0.7" Vert. 0.75" Orifice Goose Neck** C= 0.600
#4	Device 1	92.65'	**3.0" Vert. 3" Orifice** C= 0.600
#5	Device 2	93.50'	**15.0" W x 3.0" H Vert. 3"T X 15"W Box Orifice** C= 0.600
#6	Device 2	93.79'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.18 cfs @ 14.50 hrs HW=93.22' TW=90.23' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.18 cfs of 1.21 cfs potential flow)
  ├─**3=0.75" Orifice Goose Neck** (Orifice Controls 0.02 cfs @ 8.15 fps)
  └─**4=3" Orifice** (Orifice Controls 0.16 cfs @ 3.22 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.33' TW=89.50' (Dynamic Tailwater)
└─**2=12" RCP** (Controls 0.00 cfs)
  ├─**5=3"T X 15"W Box Orifice** (Controls 0.00 cfs)
  └─**6=4' Structure** (Controls 0.00 cfs)

Stage-Area-Storage for Pond 104P: Gravel Wetland #104

Elevation (feet)	Storage (cubic-feet)
90.33	0
90.38	1
90.43	1
90.48	2
90.53	3
90.58	3
90.63	4
90.68	4
90.73	5
90.78	6
90.83	6
90.88	7
90.93	8
90.98	8
91.03	63
91.08	157
91.13	256
91.18	358
91.23	465
91.28	577
91.33	693
91.38	814
91.43	940
91.48	1,072
91.53	1,208
91.58	1,347
91.63	1,487
91.68	1,631
91.73	1,776
91.78	1,924
91.83	2,074
91.88	2,226
91.93	2,381
91.98	2,539
92.03	2,701
92.08	2,870
92.13	3,044
92.18	3,224
92.23	3,409
92.28	3,600
92.33	3,797
92.38	4,000
92.43	4,209
92.48	4,424
92.53	4,645
92.58	4,873
92.63	5,106
92.68	5,347
92.73	5,593
92.78	5,847
92.83	6,107
92.88	6,373
92.93	6,647
92.98	6,928
93.03	7,179
93.08	7,411
93.13	7,646
93.18	7,885
93.23	8,128
93.28	8,374
93.33	8,625
93.38	8,879
93.43	9,136
93.48	9,398
93.53	9,664
93.58	9,933
93.63	10,206
93.68	10,483
93.73	10,765
93.78	11,050
93.83	11,342
93.88	11,640
93.93	11,945
93.98	**12,257**

WQV = 970 CF
WQV Elev: = 91.45'

Stage-Discharge for Pond 104P: Gravel Wetland #104

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
90.33	0.00	0.00	0.00
90.38	0.00	0.00	0.00
90.43	0.00	0.00	0.00
90.48	0.00	0.00	0.00
90.53	0.01	0.01	0.00
90.58	0.01	0.01	0.00
90.63	0.01	0.01	0.00
90.68	0.01	0.01	0.00
90.73	0.01	0.01	0.00
90.78	0.01	0.01	0.00
90.83	0.01	0.01	0.00
90.88	0.01	0.01	0.00
90.93	0.01	0.01	0.00
90.98	0.01	0.01	0.00
91.03	0.01	0.01	0.00
91.08	0.01	0.01	0.00
91.13	0.01	0.01	0.00
91.18	0.01	0.01	0.00
91.23	0.01	0.01	0.00
91.28	0.01	0.01	0.00
91.33	0.01	0.01	0.00
91.38	0.01	0.01	0.00
91.43	0.01	0.01	0.00
91.48	0.01	0.01	0.00
91.53	0.01	0.01	0.00
91.58	0.01	0.01	0.00
91.63	0.01	0.01	0.00
91.68	0.01	0.01	0.00
91.73	0.02	0.02	0.00
91.78	0.02	0.02	0.00
91.83	0.02	0.02	0.00
91.88	0.02	0.02	0.00
91.93	0.02	0.02	0.00
91.98	0.02	0.02	0.00
92.03	0.02	0.02	0.00
92.08	0.02	0.02	0.00
92.13	0.02	0.02	0.00
92.18	0.02	0.02	0.00
92.23	0.02	0.02	0.00
92.28	0.02	0.02	0.00
92.33	0.02	0.02	0.00
92.38	0.02	0.02	0.00
92.43	0.02	0.02	0.00
92.48	0.02	0.02	0.00
92.53	0.02	0.02	0.00
92.58	0.02	0.02	0.00
92.63	0.02	0.02	0.00
92.68	0.02	0.02	0.00
92.73	0.03	0.03	0.00
92.78	0.05	0.05	0.00
92.83	0.07	0.07	0.00
92.88	0.10	0.10	0.00
92.93	0.11	0.11	0.00
92.98	0.13	0.13	0.00
93.03	0.14	0.14	0.00
93.08	0.15	0.15	0.00
93.13	0.16	0.16	0.00
93.18	0.17	0.17	0.00
93.23	0.18	0.18	0.00
93.28	0.19	0.19	0.00
93.33	0.20	0.20	0.00
93.38	0.21	0.21	0.00
93.43	0.21	0.21	0.00
93.48	0.22	0.22	0.00
93.53	0.25	0.23	0.02
93.58	0.33	0.24	0.09
93.63	0.43	0.24	0.19
93.68	0.55	0.25	0.31
93.73	0.70	0.25	0.44
93.78	0.83	0.26	0.57
93.83	1.27	0.27	1.00
93.88	2.13	0.27	1.86
93.93	3.26	0.28	2.98
93.98	**4.58**	**0.28**	**4.29**

WQV Elev: = 91.45'
WQV Discharge = 0.01 CFS

Summary for Pond 102P: StormTech SC740 #102

Inflow Area = 0.347 ac,100.00% Impervious, Inflow Depth > 3.36" for 2 YR - 24 HR event
Inflow = 1.19 cfs @ 12.09 hrs, Volume= 0.097 af
Outflow = 0.07 cfs @ 11.92 hrs, Volume= 0.045 af, Atten= 94%, Lag= 0.0 min
Primary = 0.07 cfs @ 11.92 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 93.93' @ 16.25 hrs Surf.Area= 3,807 sf Storage= 2,829 cf
Flood Elev= 96.25' Surf.Area= 3,807 sf Storage= 8,073 cf

Plug-Flow detention time= 337.1 min calculated for 0.045 af (47% of inflow)
Center-of-Mass det. time= 204.1 min (957.7 - 753.6)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	3,502 cf	**34.75'W x 109.00'L x 3.50'H Stone** 13,257 cf Overall - 4,502 cf Embedded = 8,755 cf x 40.0% Voids
#2	93.25'	4,502 cf	**ADS_StormTech SC-740 +Cap** x 98 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	92.75'	98 cf	**5.00'D x 5.00'H Outlet Structure**
		8,102 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**18.0" Round 18" HDPE N-12** L= 33.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	92.75'	**2.0" Vert. 3" Orifice** C= 0.600
#3	Device 1	95.75'	**18.0" Horiz. 18" Int. Stack** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.07 cfs @ 11.92 hrs HW=93.28' TW=92.88' (Dynamic Tailwater)
└─**1=18" HDPE N-12** (Passes 0.07 cfs of 1.17 cfs potential flow)
  ├─**2=3" Orifice** (Orifice Controls 0.07 cfs @ 3.03 fps)
  └─**3=18" Int. Stack** (Controls 0.00 cfs)

Summary for Pond 106P: StormTech SC740 #106

Inflow Area = 0.347 ac,100.00% Impervious, Inflow Depth > 3.36" for 2 YR - 24 HR event
Inflow = 1.19 cfs @ 12.09 hrs, Volume= 0.097 af
Outflow = 0.09 cfs @ 12.11 hrs, Volume= 0.060 af, Atten= 93%, Lag= 1.6 min
Primary = 0.09 cfs @ 12.11 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 93.84' @ 13.89 hrs Surf.Area= 3,623 sf Storage= 2,176 cf
Flood Elev= 96.25' Surf.Area= 3,623 sf Storage= 6,905 cf

Plug-Flow detention time= 245.9 min calculated for 0.060 af (62% of inflow)
Center-of-Mass det. time= 140.0 min (893.6 - 753.6)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	3,850 cf	**Stone (Irregular)** Listed below (Recalc) 12,611 cf Overall - 2,986 cf Embedded = 9,624 cf x 40.0% Voids
#2	93.25'	2,986 cf	**ADS_StormTech SC-740 +Cap** x 65 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	92.75'	98 cf	**5.00'D x 5.00'H Outlet Structure**
		6,934 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.75	3,603	363.5	0	0	3,603
96.25	3,603	363.5	12,611	12,611	4,875

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**18.0" Round 18" HDPE N-12** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	92.75'	**2.0" Vert. 3" Orifice** C= 0.600
#3	Device 1	95.50'	**18.0" Horiz. 18" Int. Stack** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.08 cfs @ 12.11 hrs HW=93.51' TW=92.95' (Dynamic Tailwater)
↑**1=18" HDPE N-12** (Passes 0.08 cfs of 2.46 cfs potential flow)
↑**2=3" Orifice** (Orifice Controls 0.08 cfs @ 3.60 fps)
3=18" Int. Stack (Controls 0.00 cfs)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Strafford County, New Hampshire

January 19, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,810 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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 1:20,000.

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: Strafford County, New Hampshire
Survey Area Data: Version 20, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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
Be	Biddeford silty clay loam	3.6	5.9%
BzA	Buxton silt loam, 0 to 3 percent slopes	9.4	15.3%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	2.1	3.4%
Ml	Mixed alluvial land, wet	0.0	0.0%
ScA	Scantic silt loam, 0 to 3 percent slopes	16.2	26.5%
SfC	Suffield silt loam, 8 to 15 percent slopes	2.0	3.2%
WdA	Windsor loamy sand, 0 to 3 percent slopes	20.0	32.6%
WfB	Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes	8.1	13.1%
Totals for Area of Interest		**61.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Strafford County, New Hampshire

Be—Biddeford silty clay loam

Map Unit Setting

National map unit symbol: 9d6m
Elevation: 0 to 200 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Biddeford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Biddeford

Setting

Landform: Marine terraces
Parent material: Glaciomarine

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 26 inches: silty clay
H3 - 26 to 41 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scantic

Percent of map unit: 5 percent
Landform: Marine terraces

Hydric soil rating: Yes

BzA—Buxton silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d6n
Elevation: 0 to 280 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Buxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buxton

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 28 inches: silty clay loam
H3 - 28 to 43 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Minor Components

Scantic

Percent of map unit: 10 percent
Landform: Marine terraces

Hydric soil rating: Yes

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

DeB—Deerfield loamy fine sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xfg9
Elevation: 0 to 1,190 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Kame terraces, outwash plains, outwash terraces, outwash deltas
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear, concave
Across-slope shape: Concave, linear, convex
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water capacity: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash terraces, outwash deltas, kame terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, kame terraces, outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave, convex
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Kame terraces, outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

MI—Mixed alluvial land, wet

Map Unit Setting

National map unit symbol: 9d86
Elevation: 300 to 1,800 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Mixed alluvial land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mixed Alluvial Land

Setting

Landform: Flood plains

Typical profile

H1 - 0 to 5 inches: loam
H2 - 5 to 72 inches: very gravelly silt loam

Properties and qualities

Slope: 0 to 2 percent
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: FrequentNone
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydric soil rating: Yes

ScA—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d8s
Elevation: 0 to 260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scantic and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 23 inches: silty clay loam

H3 - 23 to 40 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Biddeford

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Swanton

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

SfC—Suffield silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d8v
Elevation: 0 to 250 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Suffield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffield

Typical profile

H1 - 0 to 19 inches: silt loam
H2 - 19 to 28 inches: silt loam
H3 - 28 to 41 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY017NH - Well Drained Lake Plain
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 9 percent
Hydric soil rating: No

Buxton

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

WdA—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Dunes, deltas, outwash terraces, outwash plains
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, outwash plains, eskers, kames

Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

WfB—Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d9b
Elevation: 0 to 280 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Windsor variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor Variant

Typical profile

H1 - 0 to 26 inches: loamy fine sand
H2 - 26 to 30 inches: loamy sand
H3 - 30 to 42 inches: silt loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

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2/18/20

Christopher Berry
Berry Surveying and Engineering
335 Second Crown Point Road
Barrington NH 03825

Job # 20-004

Site Specific Soil Survey 2/17/20
239 Know Marsh Road Dover, NH

Dear Chris,

This letter report presents the findings of a Site Specific Soil Survey conducted on the referenced property by John P. Hayes III, 0n February 7, 2020. The soil survey was conducted in accordance with the New Hampshire Supplement of the Site-Specific Soil Mapping Standard For New Hampshire and Vermont, Version 5.0, December 2017, Special Publication # 3, published by the Society of Soil Scientist of Northern New England.

The portion of the property that is subject of the soil survey is located on the northwest side of Knox Marsh road, and southeast of the railroad line, in Dover NH. The parcel is 9.36 acres in size. The plans used for these soil maps are a 50 scale plan, where 1 inch equals 50 feet, with two foot contours.

The purpose of the soil survey is to provide the client with soils information for urban and suburban or rural land planning. Soil characteristics on the property were evaluated through observation of numerous test holes and hand auger probes conducted throughout the property. Slope phases were determined with the use of the topography provided on the plan. The Site-specific Soil Map Units identified are taken from the New Hampshire State-Wide Numerical Soils Legend, Issue #10 January 2011, and are briefly described below. Official Series Descriptions (OSD) for each of these soil series are enclosed with this report. The soil map units comply with the Range In Characteristics described in the OSD. Dissimilar inclusions are noted above. Limits of the Site Specific mapping units are highlighted on the plan. Portions of the soil map with the map unit denominator P, are poorly drained soils.

MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
BzA (State No. 232)	**Buxton**	The Buxton series consists of very deep, moderately well drained soils that formed in glaciolacustrine or glaciomarine deposits on coastal lowlands and river valleys. Permeability is moderate or moderately slow in the surface horizon, moderately slow or slow in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum. The hydrologic soil group is C. Slope ranges from 0% to 3%.
BzB (State No. 232)	**Buxton**	The Buxton series consists of very deep, moderately well drained soils that formed in glaciolacustrine or glaciomarine deposits on coastal lowlands and river valleys. Permeability is moderate or moderately slow in the surface horizon, moderately slow or slow in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum. The hydrologic soil group is C. Slope ranges from 3% to 8%.
BzC (State No. 232)	**Buxton**	The Buxton series consists of very deep, moderately well drained soils that formed in glaciolacustrine or glaciomarine deposits on coastal lowlands and river valleys. Permeability is moderate or moderately slow in the surface horizon, moderately slow or slow in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum. The hydrologic soil group is C. Slope ranges from 8% to 15%.
ScA P (State No. 233)	**Scantic**	The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys.Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum. The hydrologic soil group is D. Slope ranges from 0% to 3%.
ScB P (State No. 233)	**Scantic**	The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys.Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum. The hydrologic soil group is D. Slope ranges from 3% to 8%.
WfA (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor Variant series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial landforms. Saturated hydraulic conductivity is high or very high. Due to the resrtictive subsoil layer in these soils, the hydrologic soil group is C. Slope ranges from 0% to 3%.

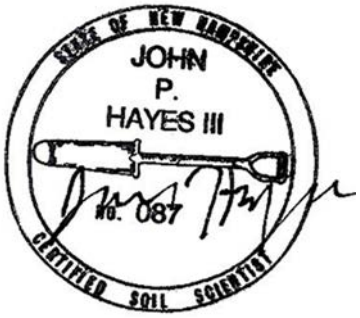
MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
WfB (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor Variant series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial landforms. Saturated hydraulic conductivity is high or very high. Due to the resrtictive subsoil layer in these soils, the hydrologic soil group is C. Slope ranges from 3% to 8%.
WfC (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor Variant series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial landforms. Saturated hydraulic conductivity is high or very high. Due to the resrtictive subsoil layer in these soils, the hydrologic soil group is C. Slope ranges from 8% to 15%.

Slope Phases

Alpha Slope Symbol	Range
A	**0 – 3%**
B	**3 – 8%**
C	**8 – 15%**
D	**15 – 25%**
E	**25 – 50%**
F	**> 50%**

I trust that this Soil Survey and report meet your current planning needs. Please do not hesitate to contact me if you have any questions.

Sincerely:



John P. Hayes III CSS, CWS

LOCATION WINDSOR CT+MA NH NY RI VT

Established Series
Rev. MFF-SMF-DCP
03/2014

WINDSOR SERIES

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 10 degrees C and mean annual precipitation is about 1092 mm.

TAXONOMIC CLASS: Mixed, mesic Typic Udipsamments

TYPICAL PEDON: Windsor loamy sand - forested, 3 percent slope, at an elevation of about 24 meters. (Colors are for moist soil.)

Oe--0 to 3 cm; black (10YR 2/1) moderately decomposed forest plant material; many very fine and fine roots; very strongly acid; abrupt smooth boundary. (0 to 8 cm thick.)

A--3 to 8 cm; very dark grayish brown (10YR 3/2) loamy sand; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary. (3 to 25 cm thick.)

Bw1--8 to 23 cm; strong brown (7.5YR 5/6) loamy sand; very weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

Bw2--23 to 53 cm; yellowish brown (10YR 5/6) loamy sand; very weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.

Bw3--53 to 64 cm; light yellowish brown (10YR 6/4) sand; single grain; loose; few coarse roots; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 23 to 86 cm.)

C--64 to 165 cm; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) sand; single grain; loose; few coarse roots; strongly acid.

TYPE LOCATION: Hartford County, Connecticut; town of South Windsor, 1100 feet northwest along Chapel Road from the intersection of Chapel Road and Ellington Road and 100 feet due south of Chapel Road. USGS Manchester, CT topographic quadrangle, Latitude 41 degrees, 48 minutes, 35 seconds N., Longitude 72 degrees, 36 minutes, 22 seconds W., NAD 1983

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 25 to 92 cm. Rock fragments, dominantly fine gravel, range from 0 through 10 percent by volume in the solum and from 0 to 15 percent in the substratum. Thin strata of gravel or thin subhorizons of coarse sand or loamy coarse sand are present in some pedons. Unless limed, reaction in the solum commonly is extremely acid to moderately acid, but the range includes slightly acid. Unless limed, reaction in the substratum commonly is very strongly acid to slightly acid, but the range includes neutral.

O horizons are present in some pedons.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. Many pedons have an Ap horizon up to 12 inches thick with value of 3 or 4 and chroma of 2 to 4. The A or Ap horizon is loamy fine sand, loamy sand, fine sand, or sand. It has weak or moderate granular structure and is very friable, friable, or loose.

Some pedons have a thin E horizon with hue 7.5YR or 10YR, value of 4 to 6, and chroma of 1 or 2.

The upper part of the Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part of Bw horizon has hue of 7.5YR to 5Y, value of 4 to 7, and chroma of 3 to 6. The Bw horizon is loamy sand or loamy fine sand in the upper part and loamy fine sand, loamy sand, fine sand, or sand in the lower part. The Bw horizon has weak granular or weak subangular blocky structure, or it is massive or single grain. Consistence is very friable or loose.

Some pedons have a BC horizon similar to the lower part of the Bw horizon.

The C horizon has hue of 5YR to 5Y, value of 4 to 7, and chroma of 1 to 6. It is fine sand, sand, coarse sand, loamy fine sand, or loamy sand. The horizon is massive or single grain and consistence is very friable or loose.

COMPETING SERIES: These are the Acquango, Aldo, Bigapple, Biltmore, Boplain, Breeze, Caesar, Chute, Dabney, Hodge, Oakville, Osolo, Pahuk, Penwood, Perks, Pinegrove, Plainfield, Poquonock, Ronda, Samoa, Sardak, Sarpy, Scotah, Spessard, Suncook, Tyner, and Wapanucket series. Aquango, Aldo, Biltmore, Boplain, Chute, Dabney, Hodge, Osolo, Pahuk, Perks, Ronda, Samoa, Sardak, Spessard, and Tyner soils are from outside of LRRs L, R, and S. Acquango soils are very slightly to moderately saline within the soil profile. Aldo soils have a water table and saturation within the series control section for as much as one month per year in 6 out of 10 years. Bigapple soils formed in human transported soil material from dredging activities. Biltmore and Spessard soils are well drained. Breeze soils formed in human transported sandy soil materials intermingled with construction debris. Caesar soils contain more coarse sand. Chute, Hodge, and Sarpy soils contain free carbonates and do not have a B horizon. Dabney soils do not have a B horizon and receive more than 152 cm of precipitation annually. Oakville soils typically average 50 percent or more fine sand in the subsoil. Osolo soils have a solum thicker than 1.5 m. Penwood soils have hue of 5YR or redder in the B horizon. Pahuk, Perks, Samoa, and Suncook soils do not have a B horizon. Plainfield soils are less moist in all parts of the control section for the 120 days following the summer solstice. Poquonock soils have a densic contact with in 1 m. Ronda soils formed in alluvium from residuum sources. Sardak soils formed in alluvium and are calcareous. Tyner soils have a thicker solum. Wapanucket soils are underlain by glaciolacustrine deposits with in the series control section.

GEOGRAPHIC SETTING: Windsor soils are nearly level through very steep soils typically on glaciofluvial landforms but include late-Wisconsin-aged dunes. The steeper slopes are typically on terrace escarpments. Slope ranges from 0 to 60 percent. The soils formed in outwash or eolian deposits of poorly graded sands and loamy sands derived mainly from crystalline rocks. Mean annual temperature ranges from 7 to 12 degrees C, and the mean annual precipitation typically ranges from 965 to 1270 mm, but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The growing season ranges from 120 to 190 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Deerfield, Hinckley, Merrimac, Quonset, Suncook, Agawam, Hadley, Haven, Occum, Pootatuck, Scarboro, Sudbury, Walpole, Wareham, and Winooski soils on nearby landscapes. The moderately well drained Deerfield and Sudbury, the somewhat poorly drained and poorly drained Walpole and Wareham, and the very poorly drained Scarboro soils are common drainage associates. Agawam and Haven soils are coarse-loamy over sandy or sandy-skeletal or coarse-loamy terrace associates, respectively. Hadley, Occum, Pootatuck, and Winooski soils are on nearby flood plains.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Excessively drained. Surface runoff is negligible to medium. Saturated hydraulic conductivity is high or very high.

USE AND VEGETATION: Most areas are forested or in low growing brushy vegetation. Some areas are used

for silage corn, hay, and pasture. Small areas, mostly irrigated, are used for shade tobacco, vegetables and nursery stock. Some areas are in community development. Common trees are white, black, and northern red oak, eastern white pine, pitch pine, gray birch, poplar, red maple, and sugar maple.

DISTRIBUTION AND EXTENT: Late Wisconsin glaciofluvial or eolian landforms in Connecticut, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont; MLRAs 101, 142, 144A, and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Connecticut Valley Area, 1899.

REMARKS: The use of the Windsor series in Maine, and in MLRAs 141, 144B, and 143 is relict to before temperature classes in soil taxoonomy. These have been removed from the SC file.

Diagnostic horizons and features recognized in this pedon include:
1. Ochric epipedon - the zone from 0 to 8 cm (Oe and A horizons).
2. Particle-size class - averages sandy in the control section from 25 to 100 cm.
3. No cambic horizon and development of color - the zone from 8 to 64 cm demonstrates development of color with no illuvial accumulation of material (Bw horizons).

ADDITIONAL DATA: Reference samples from pedons 54MA023005, 63VT011001, 63VT011002, 64NH017003, 64NH017004, 70CT003003, 70MA011003, 70VT017002, 73MA005003, 73MA005004, 91MA023006, 95NH013001, 96NH013004, 98NY045002, 98NY085002, S07VT011004.

National Cooperative Soil Survey
U.S.A.

LOCATION SCANTIC ME+MA NH NY VT

Established Series
Rev. KJL-GBJ-WDH
06/2016

SCANTIC SERIES

The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys. Slope ranges from 0 to 8 percent. Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum. Mean annual temperature is about 7 degrees C, and mean annual precipitation is about 1168 mm inches at the type location.

TAXONOMIC CLASS: Fine, illitic, nonacid, frigid Typic Epiaquepts

TYPICAL PEDON: Scantic silt loam, on a 1 percent slope in an idle field. (Colors are for moist soil unless otherwise noted.)

Ap1--0 to 10 cm; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; very friable; many very fine, fine, medium and coarse roots; moderately acid; abrupt smooth boundary.

Ap2--10 to 23 cm; dark grayish brown (2.5Y 4/2) silt loam, light brownish gray (2.5Y 6/2) dry; moderate very fine granular structure; very friable; common very fine, fine, medium and coarse roots; common medium distinct olive gray (5Y 5/2) irregularly shaped iron depletions throughout; moderately acid; abrupt wavy boundary. (Combined thickness of the Ap horizons is 13 to 23 cm.)

Eg--23 to 28 cm; olive gray (5Y 5/2) silt loam; weak medium platy structure parting to weak very fine subangular blocky; friable; common very fine, fine, medium and coarse roots; common medium prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix and along root channels; moderately acid; abrupt smooth boundary. (0 to 20 cm thick)

Bg1--28 to 41 cm; olive gray (5Y 5/2) silty clay loam; moderate thin platy structure; firm; common very fine, fine, and medium and few coarse roots; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix and along pores; many coarse prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix and along pores; common medium faint gray (5Y 6/1) irregularly shaped iron depletions in the matrix; light olive gray (5Y 6/2) silt coatings on walls of earthworm channels and on 50 percent of faces of peds; few medium dark gray (5Y 4/1) oxide coats on faces of peds; slightly acid; clear wavy boundary.

Bg2--41 to 56 cm; olive gray (5Y 5/2) silty clay; weak medium platy structure parting to moderate very fine subangular blocky; firm; few very fine and fine roots; few pores; common medium faint gray (5Y 6/1) irregularly shaped iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix and along pores; light olive gray (5Y 6/2) silt coatings on walls of earthworm channels and on 50 percent of faces of peds; few fine prominent dark reddish brown (5YR 2/2) oxide coats on faces of peds; slightly acid; gradual wavy boundary.

Bg3--56 to 74 cm; olive gray (5Y 4/2) silty clay; moderate very fine and fine subangular blocky structure; firm; few pores; common medium prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix

and along pores; common medium faint olive gray (5Y 5/2) irregularly shaped iron depletions in the matrix; gray (5Y 6/1) silt coatings on 50 percent of faces of peds and pores; common medium prominent dark reddish brown (5YR 2/2) oxide coats on 10 percent of faces of peds; slightly acid; clear wavy boundary. (Combined thickness of the Bg horizon is 23 to 89 cm.)

Cg--74 to 1165 cm; olive gray (5Y 4/2) clay; weak thick platy structure; firm; few medium prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; few fine faint gray (5Y 5/1) irregularly shaped iron depletions in the matrix; gray (5Y 6/1) silt coatings on 50 percent of faces of peds; many medium prominent dark reddish brown (5YR 2/2) oxide coats on 30 percent of faces of peds; slightly acid.

TYPE LOCATION: Washington County, Maine; Town of Whitneyville; 0.25 mile south of railroad track on U.S. Route 1A, and 200 feet northwest of the road; USGS Whitneyville topographic quadrangle; lat. 44 degrees 42 minutes 34 seconds N. and long. 67 degrees 31 minutes 29 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 63 to 127 cm. Depth to bedrock is more than 152 cm. The soil is commonly free of rock fragments but a few pedons contain up to 3 percent gravel. Stones cover from 0 to 3 percent of the surface. Reaction ranges from very strongly acid to slightly acid in the surface and subsurface horizons, unless limed, and from strongly acid to neutral in the upper part of the subsoil. The reaction in the lower part of the subsoil and in the substratum is moderately acid to neutral.

In undisturbed areas some pedons have an O horizon that ranges from 3 to 18 cm thick that is neutral or has a hue of 5YR to 10YR, value of 2 to 3 and a chroma of 0 to 2. It is muck or mucky peat.

The Ap horizon has hue of 10YR to 5Y, value of 3 to 5 and chroma of 1 or 2. It has weak or moderate, very fine to coarse granular structure. Undisturbed areas have an A horizon 5 to 13 cm thick, that has hue of 10YR, value of 3 and chroma of 1 or 2. It is silt loam, silty clay loam, or loam. Consistence is very friable or friable.

The Eg horizon, has hue of 2.5Y or 5Y, value of 4 or 5 and chroma of 1 or 2 and few or common redoximorphic features. It has weak or moderate, thin to thick platy, fine or medium granular or very fine subangular blocky structure. It is silt loam, silty clay loam, or loam. Consistence is very friable or friable.

The Bg horizon has hue of 2.5Y or 5Y, value of 4 to 6 and chroma of 1 or 2 and has faint to prominent redoximorphic features. It is silt loam, silty clay loam, or silty clay. It has subangular blocky or platy structure but some pedons have primary structure that is prismatic. Consistence is friable or firm.

The BCg horizon, where present, has hue of 2.5Y or 5Y, or 5BG value of 4 to 6 and chroma of 1 or 2 with faint to prominent redoximorphic features. It is silty clay loam, silty clay, or clay. It has platy or angular blocky structure but some pedons have primary structure that is prismatic. Consistence is friable to very firm.

The Cg horizon is neutral or has hue of 2.5Y, 5Y or 10Y, value of 4 to 6 and chroma of 0 to 2 and redoximorphic features are less abundant than in the B horizon or are lacking. It is silty clay loam, silty clay, or clay. Platy or prismatic structure is dominant but some pedons are massive. Consistence is firm or very firm. Patchy or discontinuous oxide coatings are common in the B and C horizons in pedons from marine deposits and are less common or lacking in those from lacustrine deposits.

COMPETING SERIES: There are currently no other series in the same family. The Lamoine, Swanton, and Swanville series are similar soils in related families. Lamoine soils have dominant chroma of 3 or more between the A or Ap horizon and 76 cm below the mineral soil surface. Swanton soils have a coarse-loamy over clayey particle-size class. Swanville soils have less clay in the particle-size control section.

GEOGRAPHIC SETTING: Scantic soils are on coastal lowlands and river valleys. Slope ranges from 0 to 8 percent. The soils formed in medium, moderately fine and fine textured glaciomarine or glaciolacustrine deposits. The climate is humid and cool temperate. Mean annual temperature ranges from about 6 to almost 8 degrees C , and mean annual precipitation ranges from 863 to 1219 mm. The frost-free season ranges from 90 to

160 days. Elevation ranges from about 2 to 275 m above mean sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Biddeford, Buxton, Elmwood, Lamoine, Melrose, Swanton, and Whately soils. The Biddeford, Buxton and Lamoine soils are members of a drainage sequence with Scantic soils on the same landscape, Buxton and Lamoine soils are in higher positions and Biddeford soils are in depressions. The Elmwood, Melrose, Swanton and Whately soils all have a coarse-loamy over clayey particle-size class. Elmwood and Melrose soils are in higher positions on the landscape. Swanton soils are in similar positions and Whately soils are in depressions.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Poorly drained. Surface runoff is slow. Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum.

USE AND VEGETATION: Mostly idle or woodland, some areas are used for growing hay and pasture. Common tree species include red maple, elm, gray birch, white ash, balsam fir, red and white spruce, tamarack, and some eastern white pine.

DISTRIBUTION AND EXTENT: MLRAs 142, 143, and 144B in Maine, Massachusetts, New Hampshire, New York, and Vermont. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Penobscot County, Maine, 1947.

REMARKS: Previous revisions reflect a change in classification from Typic Haplaquepts to conform with Keys To Soil Taxonomy, sixth edition, 1994. Historic correlations of Scantic may have occurred in presumed or isolated frigid areas in MLRAs 144A and 145.

Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - the zone from 0 to 28 cm (Ap and Eg horizons).
2. Cambic horizon - the zone from 28 to 89 cm (Bg horizon).
3. Nonacid - the pH is 5.0 or more in 0.01M calcium chloride in at least some part of the control section (25 to 100 cm).
4. Aquic conditions - redoximorphic features at 10 cm.
5. Episaturation - a perched water table.

ADDITIONAL DATA: Source of data used in establishing taxonomic class and range in characteristics is Maine Agricultural Experiment Station, Technical Bulletin 94, September 1979.
Soil interpretation record numbers for the Scantic series are: Scantic, ME0044; Scantic, stony, ME0062.

National Cooperative Soil Survey
U.S.A.

LOCATION BUXTON ME+MA NH NY VT

Established Series
Rev. GBJ-PAH-WDH-NRB
12/2015

BUXTON SERIES

The Buxton series consists of very deep, moderately well drained soils that formed in glaciolacustrine or glaciomarine deposits on coastal lowlands and river valleys. Slope ranges from 3 to 50 percent. Permeability is moderate or moderately slow in the surface horizon, moderately slow or slow in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum. Mean annual temperature is about 7 degrees C, and mean annual precipitation is about 1118 mm at the type location.

TAXONOMIC CLASS: Fine, illitic, frigid Aquic Dystric Eutrudepts

TYPICAL PEDON: Buxton silt loam, on a 13 percent slope in an abandoned hayfield. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 20 cm; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; strong medium granular structure; friable; many very fine and common fine and medium roots; moderately acid; abrupt smooth boundary. (13 to 25 cm thick)

Bw1--20 to 41 cm; dark yellowish brown (10YR 4/4) silt loam; moderate very fine and fine granular structure; friable; common very fine and few fine and medium roots; slightly acid; abrupt wavy boundary.

Bw2--41 to 53 cm; light olive brown (2.5Y 5/4) silty clay loam; moderate thin and medium platy structure parting to weak very fine angular blocky; firm; common very fine roots; common medium prominent olive gray (5Y 5/2) iron depletions, and common medium prominent brown (7.5YR 4/4) masses of iron accumulation; slightly acid; clear wavy boundary. (Combined thickness of the B horizon is 20 to 66 cm.)

BC--53 to 89 cm; olive (5Y 5/3) silty clay; weak very coarse prismatic structure parting to weak fine and medium angular blocky; firm; few very fine roots; light brownish gray (2.5Y 6/2) faces of prisms and a few faint silt films on faces of peds within prisms; common prominent dark reddish brown (5YR 2/2) oxide coatings on faces of peds within prisms; common medium faint olive gray (5Y 5/2) iron depletions, and common medium prominent brown (7.5YR 4/4) masses of iron accumulation; slightly acid; gradual wavy boundary. (13 to 51 cm thick)

C--89 to 165 cm; olive gray (5Y 4/2) silty clay; weak very coarse prismatic structure parting to weak fine and medium angular blocky; very firm; olive gray (5Y 5/2) faces of prisms; many prominent dark reddish brown (5YR 2/2) oxide coatings on faces of peds within prisms; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation that increase in size and abundance with depth; slightly acid.

TYPE LOCATION: Hancock County, Maine; Town of Hancock; 1 mile west of junction of U.S. Route 1 and Maine Route 182, 200 feet north of U.S. Route 1 in an abandoned hayfield; USGS Hancock topographic quadrangle; lat. 44 degrees 32 minutes 19 seconds N. and long. 68 degrees 20 minutes 22 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 46 to 140 cm. Depth to bedrock is more than 152 cm. Rock fragment content throughout the soil is less than 5 percent by volume. Stones cover from 0 to 3 percent of the surface. Iron depletions occur within 61 cm of the mineral soil surface. Reaction

ranges from very strongly acid to slightly acid in the surface horizon, unless limed, from strongly acid to neutral in the subsoil, and from moderately acid to neutral in the substratum.

The Ap horizon has hue of 7.5YR to 2.5Y, with value and chroma of 2 to 5. Some undisturbed areas have an A horizon 3 to 15 cm thick, that has hue of 7.5YR to 2.5Y, with value and chroma of 2 to 5. They are silt loam or silty clay loam. They have weak to strong, very fine to medium granular structure. Consistence is very friable or friable.

The B horizon has hue of 7.5YR to 5Y, value of 3 to 6 and chroma of 2 to 8, with chroma of 2 being inherited. It is silt loam, silty clay loam, or silty clay. It has weak or moderate, very fine to medium granular, very fine to coarse blocky or thin to thick platy structure. Consistence is friable or firm.

The BC horizon has hue of 2.5Y or 5Y, value of 4 to 6 and chroma of 2 to 4. It is silt loam, silty clay loam, or silty clay. It has blocky or platy structure or has primary structure that is prismatic. Consistence is firm or very firm.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 6 and chroma of 2 to 6. It is silty clay loam, silty clay, or clay. It has blocky, platy or prismatic structure, all of which are considered inherited, or the horizon is massive. Consistence is firm or very firm. Common or many black to dark reddish brown patchy oxide coatings are on faces of peds. Some pedons have films on faces of peds that appear to be silt.

COMPETING SERIES: There are currently no other series in the same family. Similar soils in related families are the Boothbay and Elmwood series. Boothbay soils have a fine-silty particle-size class. Elmwood soils have a coarse-loamy over clayey particle-size class.

GEOGRAPHIC SETTING: Buxton soils are on coastal lowlands and river valleys. Slope ranges from 3 to 50 percent. The soils formed in medium, moderately fine, and fine textured glaciolacustrine or glaciomarine deposits. The climate is humid and cool temperate. Mean annual precipitation ranges from 860 to 1220 mm, and mean annual temperature ranges from 6 to 8 degrees C. The frost-free season ranges from 90 to 160 days. Elevation ranges from 2 to 274 meters above mean sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Biddeford, Elmwood, Lamoine, Melrose, Scantic, Swanton and Whately soils. The very poorly drained Biddeford soils are in depressions on the landscape. The somewhat poorly drained Lamoine soils and poorly drained Scantic soils are in lower positions on the landscape. The Elmwood, Melrose, Swanton, and Whately soils all have a coarse-loamy over clayey particle-size class. Elmwood soils are in similar positions on the landscape; Melrose soils are in higher positions; Swanton soils are in lower positions and Whately soils are in depressions.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. Surface runoff is medium or rapid depending on slope. Saturated Hydraulic Conductivity is moderately high in the surface horizon and the upper part of the subsoil, and low to moderately low in the lower part of the subsoil and in the substratum.

USE AND VEGETATION: Cleared areas are used mainly for hay, forage crops, or pasture. Some areas are used for silage corn or vegetables. The remaining areas are forested. Common tree species include eastern white pine, balsam fir, paper birch, white spruce, eastern hemlock, and northern red oak.

DISTRIBUTION AND EXTENT: Maine, Massachusetts, New Hampshire, New York, and Vermont. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: York County, Maine, 1941.

S.S.S.M. SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
WfA	WINDSOR VARIANT	C
WfB	WINDSOR VARIANT	C
WfC	WINDSOR VARIANT	C
BzA	BUXTON MODERATELY DRAINED	C
BzB	BUXTON MODERATELY DRAINED	C
BzC	BUXTON MODERATELY DRAINED	C
ScA/P	SCANTIC POORLY DRAINED	D
ScB/P	SCANTIC POORLY DRAINED	D

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

NRCS SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
WdA	WINDSOR LOAMY SAND	A
WfB	WINDSOR LOAMY SAND	A
BzA	BUXTON SILT LOAM	C

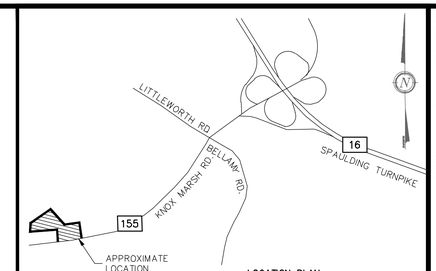
SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE/GUY WIRE
- BENCHMARK
- MATCH LINE & POINT
- WETLAND LINE
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- OFF SITE NRCS SOIL LINE
- SITE SPECIFIC SOIL DELINEATION
- LIMIT OF SOIL SURVEY

BzA SOIL LABEL
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBA TO BE ABANDONED



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

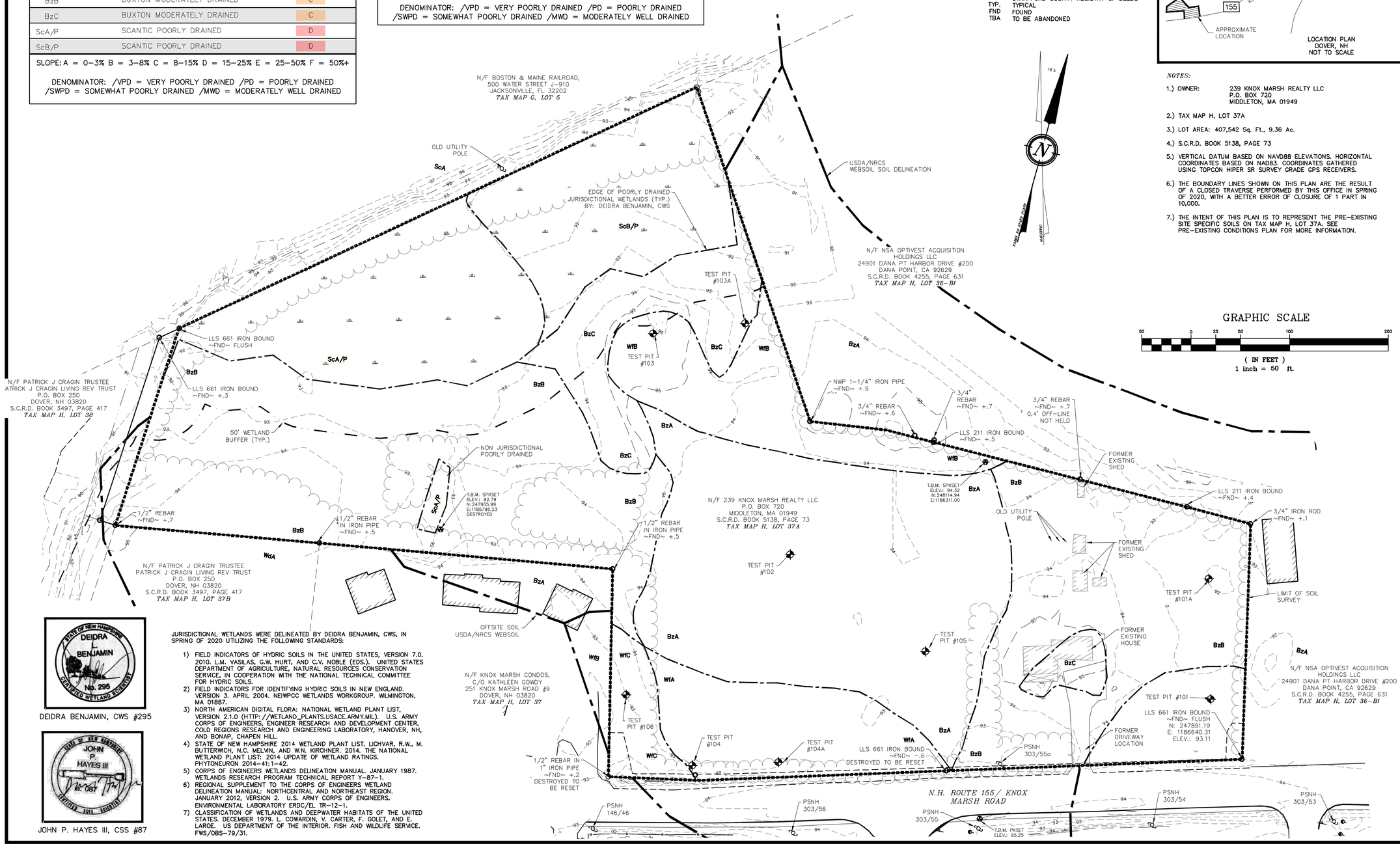
3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

6.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

7.) THE INTENT OF THIS PLAN IS TO REPRESENT THE PRE-EXISTING SITE SPECIFIC SOILS ON TAX MAP H, LOT 37A. SEE PRE-EXISTING CONDITIONS PLAN FOR MORE INFORMATION.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

JURISDICTIONAL WETLANDS WERE DELINEATED BY DEIDRA BENJAMIN, CWS, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014-41:1-42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y-87-1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR-12-1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS-79/31.

STATE OF NEW HAMPSHIRE
DEIDRA L BENJAMIN
No. 295
CERTIFIED WETLAND SCIENTIST

DEIDRA BENJAMIN, CWS #295

STATE OF NEW HAMPSHIRE
JOHN P. HAYES III
No. 87
CERTIFIED SOIL SCIENTIST

JOHN P. HAYES III, CSS #87

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

PRE-EXISTING SITE SPECIFIC SOILS MAP
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

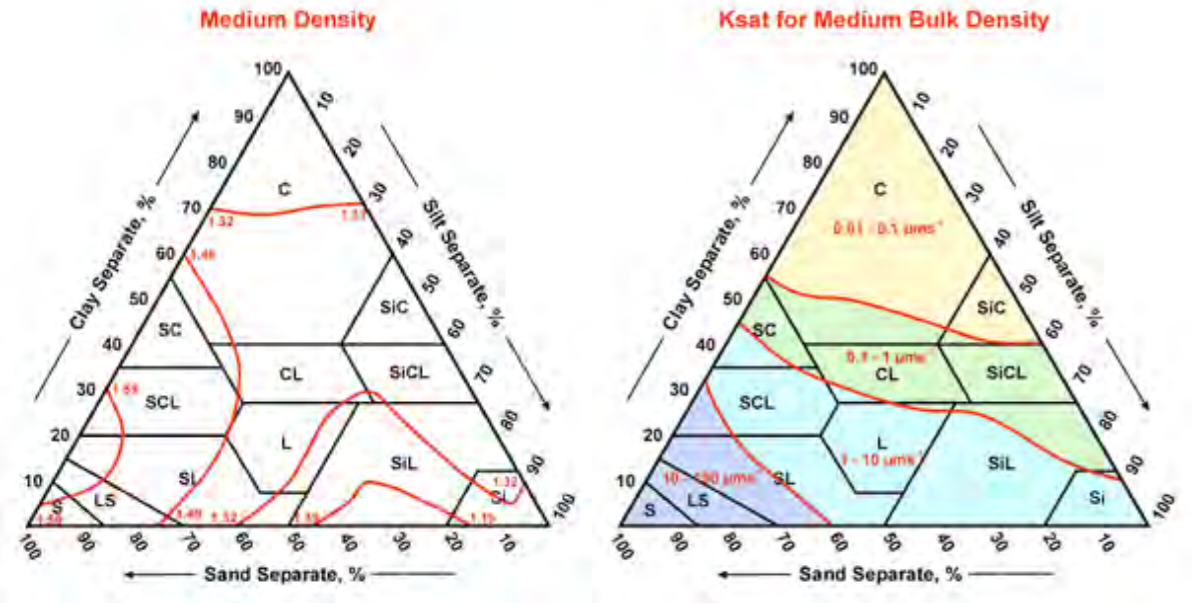
SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
No. 805
KENNETH A. BERRY
LICENSED LAND SURVEYOR
SIGNATURE

SHEET 6 OF 60

NOT FOR CONSTRUCTION

K_{sat} VALUES
FOR
NEW HAMPSHIRE SOILS
(Including Hydrologic and DES Soil Lot Sizing Groups)



From: **Guide for Estimating Ksat from Soil Properties** (**Exhibit 618-9**). (http://soils.usda.gov/technical/handbook/contents/part618ex.html)

Sponsored by the Society of Soil Scientists of Northern New England
SSSNNE Special Publication No. 5
September, 2009

K_{sat} VALUES FOR NEW HAMPSHIRE SOILS

ABOUT THE SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND

The Society of Soil Scientists of Northern New England (SSSNNE) is a non-profit professional organization of soil scientists, both in the private and public sectors, which is dedicated to the advancement of soil science. The Society fosters the profession of soil classification, mapping and interpretation, and encourages the dissemination of information concerning soil science. With the intent of contributing to the general human welfare, the Society seeks to educate the public on the wise use of soils and the associated natural resources.

INTRODUCTION

The publication "K_{sat} Values for New Hampshire Soils" is designed to assist soil scientists, engineers, and other professionals by assembling tables of existing data for all soil series currently on the state soil legend with regard to K_{sat} values and hydrologic groupings (Hyd.Grp.). The need for this information has become more important since the adoption by the New Hampshire Department of Environmental Services of the revised Alteration of Terrain rules for stormwater management. Additional information has been provided for each soil series with regard to landform, temperature regime (Temp.), soil textures, NHDES Soil Lot Size Groupings (Group), whether the soil is a Spodosol (Spodosol?) and other information which will be valuable to a variety of soil information users.

The data for each soil series has been sorted 3 ways for ease of searching:

Table A-Sorted by Numerical Legend
Table B-Sorted by Soil Series Name
Table C-Sorted by NHDES Soil Group for Establishing Lot Size

The report represents cumulative efforts by private soil scientists and NHDES staff with assistance from the USDA Natural Resource Conservation Service.

Comments or inquires on the information in this publication may be directed to the Board of Directors at the following address:

Society of Soil Scientists
of Northern New England
PO Box 76
Durham, NH 03824

SATURATED HYDRAULIC CONDUCTIVITY (K_{SAT})

K_{sat} refers to the ease with which pores in a saturated soil transmit water. The estimates presented here are expressed in terms of inches per hour (NRCS official data presents K_{sat} in both micrometers per second and inches per hour). K_{sat} values are based on soil characteristics observed in the field, particularly structure, consistence, porosity, and texture. (USDA NRCS, Web Soil Survey)

Saturated flow occurs when the soil water pressure is positive; that is, when the soil matric potential is zero (satiated wet condition). In most soils this situation takes place when about 95 percent of the total pore space is filled with water. The remaining 5 percent is filled with entrapped air. Saturated hydraulic conductivity cannot be used to describe water movement under unsaturated conditions. (Soil Survey Manual, 1993)

It is commonly known that soil features (and thus data) for a certain soil series name may be slightly different from one county soil survey to the next and the range in characteristics (via the Typical Pedon) may be slightly different. For example – a Marlow soil (series) in Carroll County may have a higher sand content in its B horizon as opposed to a Marlow soil (series) in Coos County; resulting in a slightly different Ksat range for the B horizon.

The K_{sat} data for this publication was obtained from the USDA-NRCS Soil Data Mart using the Typical Pedon from the county that best reflected the soil and/or had the most acres of that soil. This data is presented in B and C horizons only as it is assumed that the topsoil (A or A_p horizon) will be removed in typical construction practices.

References:

Web Soil Survey. *Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/.*

Soil Data Mart. *http://soildatamart.nrcs.usda.gov/.*

Soil Survey Manual. *Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.*

HYDROLOGIC SOIL GROUPS

Hydrologic group is a group of soils having the same runoff potential under similar storm and cover conditions.

Hydrologic groups are used in equations that estimate runoff from rainfall. These estimates are needed for solving hydrologic problems that arise in planning stormwater management, watershed protection, and flood-prevention projects and for planning or designing structures for the use, control, and disposal of water.

Classifications assigned to soils were based on the use of rainfall-runoff data from small watersheds and infiltrometer plots. From these data, relationships between soil properties and hydrologic groups were established. Assignment of soils to hydrologic groups is based on the relationship between soil properties and hydrologic groups. Wetness characteristics, permeability after prolonged wetting, and depth to very slowly permeable layers are properties that assist in estimating hydrologic groups. Minimum annual steady ponded infiltration rate for a bare ground surface determines the hydrologic soil groups.

Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonally high water table, intake rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. (The influence of ground cover is treated independently, not in hydrologic soil groups.).

The soils in the United States are placed into four groups, A, B, C, and D, and three dual classes, *A/D, B/D,* and *C/D.* In the definitions of the classes, infiltration rate is the rate at which water enters the soil at the surface and is controlled by the surface conditions. Transmission rate is the rate at which water moves in the soil and is controlled by soil properties. Definitions of the classes are as follows:

Group A- Saturated hydraulic conductivity is very high or in the upper half of high and internal free water occurrence is very deep. Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group A are as follows. The saturated hydraulic conductivity of all soil layers exceeds 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 10 micrometers per second (1.42 inches per hour).

Group B- Saturated hydraulic conductivity is in the lower half of high or in the upper half of moderately high and free water occurrence is deep or very deep. Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group B are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] ranges from 10.0 micrometers per second (1.42 inches per hour) to 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 4.0 micrometers per second (0.57 inches per hour) but is less than 10.0 micrometers per second (1.42 inches per hour).

Group C- Saturated hydraulic conductivity is in the lower half of moderately high or in the upper half of moderately low and internal free water occurrence is deeper than shallow. Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group C are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] is between 1.0 micrometers per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 0.40 micrometers per second (0.06 inches per hour) but is less than 4.0 micrometers per second (0.57 inches per hour). .

Group D- Saturated hydraulic conductivity is below the upper half of moderately low, and/or internal free water occurrence is shallow or very shallow and transitory through permanent. Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 50 centimeters [20 inches] and all soils with a water table within 60 centimeters [24 inches] of the surface are in this group, although some may have a dual classification, as described in the next section, if they can be adequately drained. The limits on the physical diagnostic characteristics of group D are as follows. For soils with a water impermeable layer at a depth between 50 centimeters and 100 centimeters [20 and 40 inches], the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 1.0 micrometers per second (0.14 inches per hour). For soils that are deeper than 100 centimeters [40 inches] to a restriction or water table, the saturated hydraulic

conductivity of all soil layers within 100 centimeters [40 inches] of the surface is less than or equal to 0.40 micrometers per second (0.06 inches per hour).

Dual hydrologic soil groups-Certain wet soils are placed in group D based solely on the presence of a water table within 60 centimeters [24 inches] of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups *(A/D, B/D,* and *C/D)* based on their saturated hydraulic conductivity and the water table depth when drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters [24 inches] below the surface in a soil where it would be higher in a natural state.

References:

National Engineering Handbook, Natural Resource Conservation Service, U.S. Department of Agriculture.

Soil Data Mart. *http://soildatamart.nrcs.usda.gov/*.

Soil Survey Manual. *Soil Survey Division Staff. 1993. Soil survey manual. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 18.*

TABLE A

NUMERICAL LEGEND

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Madawaska, aquentic	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	loamy over sandy, sandy-skeletal	yes	gravelly loamy sand in C
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Ricker	674	2.0	6.0	2.00	6.0	A	4	Organic over bedrock (up to 4" of mineral)	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep

no longer recognized

organic materials

TABLE B

SOIL SERIES

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Ricker	674	2.0	6.0	2.00	6.0	A	4	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep

no longer recognized
organic materials

TABLE C

NHDES SOIL GROUPINGS

SSSNNE
Special Publilcation No. 5
September, 2009

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Adams	36	1	6.0	20.0	20.00	99.0	A	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Caesar	526	1	20.0	100.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	coarse sand	no	
Champlain	35	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	gravelly sand	no	
Colton	22	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Gloucester	11	1	6.0	20.0	6.00	20.0	A	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hermon	55	1	2.0	20.0	6.00	20.0	A	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hoosic	510	1	2.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Masardis	23	1	6.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Merrimac	10	1	2.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Quonset	310	1	2.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Redstone	665	1	2.0	6.0	6.00	20.0	A	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Success	154	1	2.0	6.0	6.00	20.0	A	Sandy Till	frigid	sandy-skeletal	yes	cemented
Suncook	2	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Suncook	402	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Sunday	102	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Sunday	202	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Warwick	210	1	2.0	6.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Windsor	26	1	6.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	mesic	sandy	no	
Abenaki	501	2	0.6	2.0	6.00	99.0	B	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Agawam	24	2	6.0	20.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	2	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Bangor	572	2	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Berkshire	72	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bice	226	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	no	sandy loam
Canton	42	2	2.0	6.0	6.00	20.0	B	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Charlton	62	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Dutchess	366	2	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Fryeburg	208	2	0.6	2.0	2.00	6.0	B	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Groveton	27	2	0.6	2.0	0.60	6.0	B	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	2	0.6	2.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	2	0.6	2.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	2	0.6	2.0	0.20	2.0	B	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	2	0.6	2.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Houghtonville	795	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Lombard	259	2	0.6	6.0	2.00	20.0	C/D	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Monadnock	142	2	0.6	2.0	2.00	6.0	B	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Occum	1	2	0.6	2.0	6.00	20.0	B	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	2	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	2	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Salmon	630	2	0.6	2.0	0.60	2.0	B	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Stetson	523	2	0.6	6.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Unadilla	30	2	0.6	2.0	2.00	20.0	B	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Chichester	442	2	0.6	2.0	2.00	6.0	B	Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Acton	146	3	2.0	20.0	2.00	20.0	B	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Becket	56	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	3	0.6	2.0	0.06	2.0	B	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bernardston	330	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Boxford	32	3	0.1	0.2	0.00	0.2	C	Silt and Clay Deposits	mesic	fine	no	silty clay loam

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Buckland	237	3	0.6	2.0	0.06	0.2	C	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Buxton	232	3	0.1	0.6	0.00	0.2	C	Silt and Clay Deposits	frigid	fine	no	silty clay
Canterbury	166	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Chatfield Var.	289	3	0.6	6.0	0.60	6.0	B	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	3	0.6	2.0	0.02	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Colonel	927	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Croghan	613	3	20.0	100.0	20.00	100.0	B	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	3	0.6	2.0	0.06	0.6	B	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	3	6.0	20.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	3	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	3	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Eldridge	38	3	6.0	20.0	0.06	0.6	C	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elmridge	238	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116	3					C	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Gilmanton	478	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Henniker	46	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hitchcock	130	3	0.6	2.0	0.06	0.6	B	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Howland	566	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Lanesboro	228	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Lovewell	307	3	0.6	2.0	0.60	2.0	B	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Machias	520	3	2.0	6.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Madawaska	28	3	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	3	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Melrose	37	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Metacomet	458	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	3	6.0	100.0	6.00	100.0	B	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39	3					C	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Montauk	44	3	0.6	6.0	0.06	0.6	C	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Mundal	610	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Newfields	444	3	0.6	2.0	0.60	2.0	B	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	3	0.6	2.0	0.60	2.0	C	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	3	0.6	6.0	6.00	20.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Paxton	66	3	0.6	2.0	0.00	0.2	C	Firm, platy, loamy till	mesic	loamy	no	
Peru	78	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	
Pittstown	334	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	3	0.6	2.0	0.06	0.6	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	3	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Poocham	230	3	0.6	2.0	0.20	2.0	B	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	3	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Scio	531	3	0.6	2.0	0.60	2.0	B	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scituate	448	3	0.6	2.0	0.06	0.2	C	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Sheepscot	14	3	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Sudbury	118	3	2.0	6.0	2.00	20.0	B	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Suffield	536	3	0.6	2.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Sunapee	168	3	0.6	2.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	
Sunapee var	269	3	0.6	2.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Surplus	669	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Sutton	68	3	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	mesic	loamy	no	
Telos	123	3	0.6	2.0	0.02	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Waumbeck	58	3	2.0	20.0	6.00	20.0	B	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Winooski	103	3	0.6	6.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Woodbridge	29	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Winooski	9	3	0.6	6.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Canaan	663	4	2.0	20.0	2.00	20.0	C	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Cardigan	357	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Chatfield	89	4	0.6	6.0	0.60	6.0	B	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Elliottsville	128	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Glebe	671	4	2.0	6.0	2.00	6.0	C	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Glover	NA	4	0.6	2.0	0.60	2	D	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Hogback	91	4	2.0	6.0	2.00	6.0	C	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	4	0.6	6.0	0.60	6.0	C/D	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Kearsarge	359	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Lyman	92	4	2.0	6.0	2.00	6.0	A/D	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Macomber	252	4	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Millsite	251	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monson	133	4	0.6	2.0	0.60	2.0	D	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Pennichuck	460	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Rawsonville	98	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Ricker	674	4	2.0	6.0	2.00	6.0	A	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Saddleback	673	4	0.6	2.0	0.60	2.0	C/D	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Shapleigh	136	4					C/D	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Thorndike	84	4	0.6	2.0	0.60	2.0	C/D	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Tunbridge	99	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Winnecook	88	4	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Woodstock	93	4	2.0	6.0	2.00	6.0	C/D	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Au Gres	516	5					B	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bemis	224	5	0.6	0.2	0.00	0.2	C	Firm, platy, loamy till	cryic	loamy	no	
Binghamville	534	5	0.2	2.0	0.06	0.2	D	Terraces and glacial lake plains	mesic	silty	no	
Brayton	240	5	0.6	2.0	0.06	0.6	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Cabot	589	5	0.6	2.0	0.06	0.2	D	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Charles	209	5	0.6	100.0	0.60	100.0	C	Flood Plain (Bottom Land)	frigid	silty	no	
Cohas	505	5	0.6	2.0	0.60	100.0	C	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Grange	433	5	0.6	2.0	0.60	2.0	C	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Kinsman	614	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	frigid	sandy	yes	
Leicester	514	5	0.6	6.0	0.60	20.0	C	Loose till, loamy textures	mesic	loamy	no	
Lim	3	5	0.6	2.0	6.00	20.0	C	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	5	0.6	2.0	0.60	2.0	C	Flood Plain (Bottom Land)	mesic	silty	no	
Lyme	246	5	0.6	6.0	0.60	6.0	C	Loose till, sandy textures	frigid	loamy	no	
Mashpee	315	5	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	mesic	sandy	yes	
Monarda	569	5	0.2	2.0	0.02	0.2	D	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Moosilauke	414	5	6.0	20.0	6.00	20.0	C	Loose till, sandy textures	frigid	sandy	no	
Naumburg	214	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	frigid	sandy	yes	
Pemi	633	5	0.6	2.0	0.06	0.6	C	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	5	0.6	2.0	0.06	0.2	C	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314	5					B	Outwash and Stream Terraces	mesic	sandy	yes	
Raynham	533	5	0.2	2.0	0.06	0.2	C	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	5	0.6	2.0	6.00	100.0	D	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Ridgebury	656	5	0.6	6.0	0.00	0.2	C	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	5	0.6	6.0	6.00	20.0	C	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	5	0.2	2.0	0.06	0.6	C	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	5	0.6	6.0	6.00	20.0	C	Flood Plain (Bottom Land)	frigid	loamy	no	

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Saugatuck	16	5	0.06	0.2	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	5	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	frigid	fine	no	
Scitico	33	5	0.0	0.2	0.00	0.2	C	Silt and Clay Deposits	mesic	fine	no	
Shaker	439	5	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Squamscott	538	5	6.0	20.0	0.06	0.6	C	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stissing	340	5	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Swanton	438	5	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Walpole	546	5	2.0	6.0	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	no	
Wareham	34	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	no	
Biddeford	234	6	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	frigid	fine	no	organic over clay
Bucksport	895	6					D	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	6	0.2	6.0	0.02	0.2	D	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Catden	296	6					A/D	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Chocorua	395	6			6.00	20.0	D	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Greenwood	295	6					A/D	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Ipswich	397	6					D	Tidal Flat	mesic	hemic/sapric	no	deep organic
Matunuck	797	6			20.00	100.0	D	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	6	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	6	0.6	2.0	0.60	2.0	D	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Natchaug	496	6			0.20	2.0	D	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Ossipee	495	6			0.20	2.0	D	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497	6			20.00	100.0	D	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Peacham	549	6	0.6	2.0	0.00	0.2	D	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pondicherry	992	6			6.00	20.0	D	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Saco	6	6	0.6	2.0	6.00	20.0	D	Flood Plain (Bottom Land)	mesic	silty	no	strata
Scarboro	115	6	6.0	20.0	6.00	20.0	D	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Searsport	15	6	6.0	20.0	6.00	20.0	D	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Timakwa	393	6			6.00	100.0	D	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Vassalboro	150	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Waskish	195	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Westbrook	597	6			0.00	2.0	D	Tidal Flat	mesic	loamy	no	organic over loam
Whitman	49	6	0.0	0.2	0.00	0.2	D	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Wonsqueak	995	6			0.20	2.0	D	Organic Materials - Freshwater	frigid	loamy	no	organic over loam

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Stormwater System Management:

Inspection and Maintenance Manual

Prepared for:

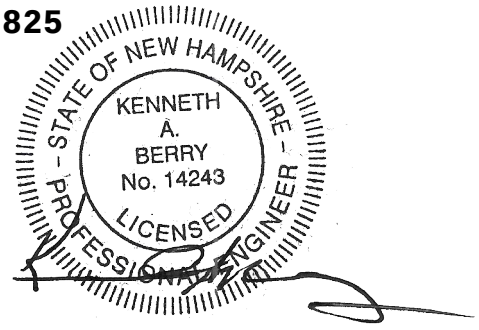
239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

LOCATION

Proposed Mixed Use Site Plan
"Residences and Lodges at Kelly Brook"
Tibetan Drive
Tax Map H, Lot 37A
239 Knox Marsh Road, Dover, NH 03820
Previous NHDES Alteration of Terrain Permit
#: AoT-2183/AoT-2183-A

Prepared by:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825



Project Number:
DB 2024-034

November 26, 2024

Inspection and Maintenance Manual

Stormwater System Management

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UNH Stormwater Center Subsurface Gravel Wetland Design Specifications 10 Pages
NHDOT Design and Maintenance of Subsurface Gravel Wetlands, 2/2015 43 Pages

Introduction

The Best Management Practices (BMP) described in this manual are specified in more detail within the plan set giving design details and specifications. The New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA) is included by reference to this manual. Additional details, construction specifications, and example drawings are provided within this reference. (http://des.nh.gov/organization/divisions/water/stormwater/)

The BMP's are covered below in the general order in which the stormwater flows. Each BMP has a description and maintenance consideration listed. A Check List table is proved after the narrative to summarize the maintenance responsibilities and schedule. A Log Form is also provided for the owners use.

For details regarding the design of the Stormwater System see also Drainage Analysis & Erosion and Sediment Control Plan, originally dated **November 26, 2024**, as revised. See also plan set completed for **239 Knox Marsh Realty, LLC**, originally dated **November 26, 2024**, as revised.

239 Knox Marsh Realty, LLC, Gil Aleixo, Managing Member as the operator, and heirs, successors, and assigns are responsible for the operation, inspection, and maintenance of the Stormwater Management System. A significant step in this responsibility is the inspection and maintenance of each component of the system. Ongoing, semi-annual, and annual inspection and maintenance requirement are documented below and must be followed diligently. Failure of any component of the system can result in surface water run-off ponding and/or freezing in the roadway and parking lots, leaving the developed site untreated, and/or causing violations to issued permits. The owner / developer must maintain, and have available, plans of the Stormwater System in order to properly inspect and maintain the system. (Reduced copies attached.) The responsible party will conduct the inspections, complete the required maintenance, maintain the Inspection & Maintenance Checklists and Logs, and provide copies with the Annual Report to the City of Dover, Community Services, DPW / Engineering Department and provided a copy to NHDES AoT by December 15th of each year. Upon sale or transfer of the project, copies of the Inspection & Maintenance Manual complete with attachments and plans must be transferred to the incoming management / ownership team and will require notification of NHDES Alteration of Terrain.

The owner of Tax Map H, Lot 37A, 239 Knox Marsh Realty, LLC, are proposing a Mixed-Use Site Development consisting of an 84-unit lodging building and two 90 single occupancy unit buildings. This includes nearly 2,000 linear feet of roadway/parking/circulation lanes, parking areas, three subsurface gravel wetlands, Stormtech Chamber Detention Ponds, and open water detention areas.

The following practices and drainage features will all require periodic inspections and maintenance based on this manual and drainage layout:

Conveyance Swales

Culvert Pipes, Flared End Sections, and Headwalls.

Catch Basins, Yard Drains, & Drain Manholes.

Internal Parking Trench Drains with cleanouts & retaining wall underdrains with cleanouts.

Detention Pond #105 with Outlet Structure and a spillway.

Stormtech SC740 Detention Pond #102 with isolator row, outlet structure with internal stack and control orifice, inlet structure w/ weir, underdrains, cleanouts.

Stormtech SC740 Detention Pond #106 with isolator row, outlet structure with internal stack and control orifice, inlet structure w/ weir, underdrains, cleanouts.

Sediment Forebays for Subsurface Gravel Wetlands #101, #103, and #104.

Subsurface Gravel Wetland #101 with inlets, clean-outs, outlet structure, and a spillway.

Subsurface Gravel Wetland #103 with inlets, clean-outs, outlet structure, and a spillway.

Subsurface Gravel Wetland #104 with inlets, clean-outs and outlet structure.

Rip Rap Level Spreaders.

Note: In addition to the inspection and maintenance requirements contained in this narrative, attached in the appendix is a NHDOT document entitled Design and Maintenance of Subsurface Gravel Wetlands, dated February 2015, which is a part of the inspection and maintenance requirements for the operation of a Subsurface Gravel Wetland.

Conveyance Swales & Treatment Swales

Description: "Swales are stabilized channels designed to convey runoff at non-erosive velocities." (NHDES SWM) They will be trapezoidal or parabolic in section view. A conveyance swale is intended to move surface water runoff from one point to another where as a treatment swale will slow the velocity to a point where sediment will settle out of the stormwater flow. A treatment swale will be constructed to a width of between four and eight feet and have a minimum length of 100 feet. The flow characteristics will also meet design criteria. See SWM Volume 2, 4.3 Treatment Practices, 5. Treatment Swales, page 123.

Project Intent: The swales are individually designed in the drainage analysis and specified on the design plans. The designed swales must have greater than 85% vegetated growth prior to receiving runoff. The bottom of a treatment swale must be above the seasonal high-water table.

Maintenance Considerations: Grassed swales will be inspected twice annually, removing accumulated sediment and gross solids. Grass will be mowed periodically but to a depth of not less than 4 inches. Any damage to the vegetation will be repaired and woody vegetation and invasive vegetation will be removed.

Culvert Pipes, Flared End Sections / Headwalls

Description: Culvert pipes are placed to route surface water runoff from catch basins to drain manholes, and drain manholes to a discharge point conveying the runoff in such a manner that erosion does not take place. Culvert pipes are often terminated with flared end sections or headwalls.

Maintenance Considerations: The entrance and exit of the culvert pipe should be cleaned of any trash and sediment build-up. The culvert should be clear to let runoff pass through the culvert unobstructed. Flared end sections and headwalls should be inspected for erosion and destabilization, with repairs made as required.

Catch Basins (Without Sumps), Yard Drains & Drain Manholes

Description: Catch Basins and Yard Drains are used throughout the site to capture and, along with culvert pipes and manhole, route surface water runoff to stormwater treatment and detention infrastructure. During construction the catch basins will be protected by inlet protection per the approved construction plans. The practice of street sweeping on a bi-annual basis will help reduce maintenance of these catch basins and culvert pipes.

Note: Deep sump catch basins are not allowed to be used on this proposed development due to wildlife concerns and any manufacturer sump resulting in a catch

basin must be filled with washed crushed stone. Sediment should be trapped in the sediment forebays but is also a concern in earlier structures. See construction details for specifications of these conveyance practices.

Maintenance Considerations: Sediment must be removed from Catch Basins, Yard Drains, and Drain Manholes on a regular basis, at least twice a year and more often if post-winter maintenance and street sweeping is not conducted. Inspections should be conducted periodically. At a minimum they should be cleaned after snow-melt and after leaf-drop. Disposal of all material, sediment, and debris must be done in accordance with state and federal regulations. Culvert pipes will be inspected to ensure that surface water runoff is capable of leaving the structures. Drain manholes will be inspected to make sure there is not sediment build-up or blockages.

Internal Parking Trench Drains w/ cleanouts & Retaining Wall Underdrains w/ Cleanouts

Description: In all three buildings, an internal trench drain run the length of the building to capture water or snow melt transported via vehicle into the building. Each of the slot drains is provided with a Nyloplast cleanout on the on the uphill and downhill ends, before discharge into the stormwater management system. Each retaining wall on-site is provided with an underdrain at the back of the wall, with a cleanout on the uphill end, that discharges to daylight. This underdrain will be provided with its own headwall or be connected to a larger headwall (See I&M Plan).

Maintenance Considerations: The exit of the culvert pipes should be cleaned of any trash and sediment build-up. Riprap outlet protection shall not prevent the outlet from being free flowing, as applicable. The culvert should be clear to let collected water pass through the culvert unobstructed. Flared end sections and headwalls should be inspected for erosion and destabilization, with repairs made as required. The underdrains will require yearly jetting to ensure full operation. The Nyloplast cleanout grate can be removed for sediment jetting. The trench drain grate has bolted grate segments that can be removed for maintenance as needed.

Detention Ponds

Description: Detention Ponds are also constructed ponds with the purpose of detaining runoff but not necessarily for infiltration purposes. During construction it is important that the ground surface not be exposed to traffic or construction equipment to preserve the infiltration capabilities of the existing soil. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, Section 4-6, Conveyance Practices, 2. Detention Basins.

Maintenance Considerations:
Detention Ponds should be inspected at least twice annually and following any rainfall event exceeding 0.25 inches in a twenty-four hour period. Maintenance rehabilitation will be conducted as warranted by each inspection. Trash and debris will be removed at each inspection.

Any pilot channel within the detention pond and the sump in front of the primary discharge need to be maintained and kept clear of vegetated material.

Also on an annual basis the vegetation should be inspected to ensure healthy condition. Invasive species need to be removed along with dead or diseased vegetation.

ADS StormTech Chamber: Detention System

Description: The StormTech Chamber System and Isolator Row are trademark products of the Advance Drainage System (ADS) company. The purchase and installation of this system will conform to ADS proprietary rights. The design engineer has specifically used the Isolator Row and StormTech Chamber specifications in the design of this installation. The design is based on the StormTech SC-740 Chambers with an Isolator Row for sediment isolation. The system is designed as a detention practice. The system has a series of perforated underdrains to collect and distribute runoff to the other structure. The volume in the washed crushed stone and in the specified chambers will act as detention in connection with the Outlet Structure discharge stack. Runoff that enters this system does so at the isolator row. P-102 contains 98 chambers in 5 rows of 14 chambers. P-106 contains 65 chambers in 5 rows of 13 chambers. The top of the outlet structure stack is designed to pass larger storm events, with an orifice on the base of the internal stack for smaller storm events. Multiple inspection ports are located throughout the system.

Inspection: Semi-annual and severe rain storm event inspections will be conducted by a trained individual with the capability to observe the condition of the pre-treatment measures and the condition of the Isolator Row especially regarding the depth and extent of sediment buildup. The Isolator Row should initially be inspected semi-annually however this schedule may need to be adjusted based on findings, condition of the pre-treatment measures, and use of the parking facilities. See list of known qualified inspection / maintenance professionals below. The inlet structure and outlet structure must also be inspected. The inspection process requires the removal of Drain Manhole covers.

Maintenance Considerations: Sediment collected in the Isolator Row will be removed with the JetVac process, consisting of high-pressure water scouring and suction retrieval of the captured sediment and pollutants. The orifice cover plate installed to ensure that

runoff is routed to the Isolator Row must be in place and if not re-installed to the original specifications. The stack in the outlet structure must be maintained to ensure that there is no buildup that prevents the proper operation of the outlet.

The stormwater practice should be dry within 72 hours of the end of a storm event.

A copy of the ADS StormTech SC-740 Chamber manual and ADS StormTech Isolator Row O&M Manual are attached.

After the system construction and before operation of the site, it is recommended that a long-term agreement for Inspection and Maintenance be established.

As for Isolator Row inspection and maintenance, Catch Basin maintenance, the regional ADS, Inc. representatives recommend using any of the following contacts:

Stormwater Compliance, LLC;
Attn: Nathan Marles, 1-877-271-9055; nmarles@lidtech.com
163 Thadeus Street, Portland, ME 04106
Info@stormwatercomp.com

Ted Berry Company;
Attn: Dave Beauchamp, 207-897-3348; david.beauchamp@tedberrycompany.com
521 Federal Road, Livermore, ME 04253
Info@tedberrycompany.com

Bellemore Septic Sewer & Drain
Attn: Ray Bellemore, 603-641-6640
raymond@bellemore.com
PO Box 10369
Bedford, NH 03110

ADS / StormTech Contact: Aaron Cheever, PE, Advance Drainage Systems, Inc.
aaron.cheever@ads-pipe.com 1-978-302-0650

Sediment Forebay

Description: A sediment forebay is designed to reduce the velocity of incoming surface water runoff allowing sediment to fall out of suspension initially pre-treating the runoff before it is sent to a treatment structure. This earthen basin will have vegetated side-slopes and a check dam to further reduce and pretreat the runoff. At the point of incoming runoff, the basin will be protected by rip rap outlet protection construction and the outgoing edge will be protected with rip rap. The check dam will be constructed from one side of the basin to the other and cause runoff to either go through or over. The volume of the forebay is generally 10% the volume of the Water

Quality Volume (WQV) for gravel wetlands, and 25% for rain gardens. A dewatering drain is designed into the two-foot berm of the forebay. Construction specifications are included in the plan set and New Hampshire Stormwater Manual, Volume 2, 4-4 Pretreatment Practices 1, Sediment Forebays.

Maintenance Considerations: The basin and slopes will be periodically mowed, at least twice per year ensuring that woody material does not get an opportunity to grow. Sediment accumulated in the basin will be removed and properly disposed of when it reaches half the height of the check dam. Erosion or other damage to the basin will be repaired and revegetated. (See Outlet Protection) Inspect and clean the dewatering drain to ensure runoff is not trapped for more than 72 hours in the forebay.

Subsurface Gravel Wetland

Description: A Gravel Wetland (NHDES SWM 4-3 Treatment Practice 2D) or Subsurface Gravel Wetland consists of a forebay and multiple flow-through treatment cells. During smaller rain events, the surface water runoff is intended to pass from the forebay, into the gravel media through perforated pipes and structures where it passes through an anaerobic environment where the Water Quality Volume will have 24-72 hours of contact time. The forebay is required to contain 10% of the WQV and each of the two cell must contain 45% of the WQV. During larger storm events, the system works as a detention pond. The design of a Subsurface Gravel Wetland will be constructed in accordance with the most current version of the Design Specifications provided by the UNH Stormwater Center and SWM Volume 2, Section 4-3 Treatment Practices, 2d Gravel Wetlands.

Maintenance Considerations: The outlet configuration of the anaerobic subsurface gravel consists of a small discharge orifice that is located in a threaded cap. This goose-neck feature is designed to be disassembled to allow cleaning. This outlet orifice is located within a concrete outlet structure that also contains a control stack used to control and detain runoff in the system. Although this is designed to be "clean water" after the filtering process, the outlet structure in general is going to require periodic maintenance to ensure that it is discharging runoff properly. If the Subsurface Gravel Wetland retains runoff on the surface for more than 72 hours the performance is not correct and maintenance is required.

Debris will need to be removed from the inlet and outlet structures as well as any buildup of sediment. The surface of the ponded area is intended to have wetland plants which may require periodic replanting, depending on the sediment loading. Sediment buildup in the forebay must be removed to maintain the minimum required volume. See also 9 and 10 of the attached UNHSC Subsurface Gravel Wetland Design Specifications 2009, and / or UNHSC Subsurface Gravel Wetland Design Specifications 2016 with Maintenance Guidelines and Checklist. See also Design and Maintenance of Subsurface Gravel Wetlands, dated February 2015, attached. Specifically Attachment B,

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device and Checklist for Inspection of Gravel Wetland. (NHDOT)

Rip Rap Outlet Protection, Level Spreaders, & Emergency Spillways

Description: Outlet Protection consists of a riprap apron or preformed scour hole that is designed to provide velocity reduction of the surface water run-off that is leaving a culvert. The design is dependent on the culvert size, soil conditions, velocity, and quantity of the run-off. There are to be no bend or curves at the intersection of the conduit and apron. Level spreaders are intended to provide a level lip where surface water runoff is allowed to continue downhill closer to sheet flow. The level lip is to be constructed as level as possible for the entire length. Emergency Spillways are rip rap reinforced outlets near the top of the berm that allow runoff to leave a practice during periods of very high flow. Ref.: NHDES SWM Volume 2, Section 4-6 Conveyance Practices, 6. Outlet Protection and 1. Detention Ponds, Note 3, Page 158.

Maintenance Considerations: The riprap outlet protection will be inspected annually for damage, which must be corrected immediately. Any sediment buildup will be removed and disposed of correctly. Sediment and subsequent vegetation will build up in the Level Spreader. This material will be cleaned out along with any gross solids and disposed of properly. (See invasive species below) Any rip rap that has been displaced from the original construction will be repaired, especially recreating the level lip.

Stabilization for Long Term Cover

Vegetated Stabilization – Original Planting

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of breaking ground. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specification and on Sheet E-102 using seeding mixture C, as follows:

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Conservation Mix

Virginia Wild Rye	Native	FACW-
Little Bluestem	Native	FACU
Big Bluestem	Native	FAC
Red Fescue	Native	FACU
Switch Grass	Native	FAC
Partridge Pea	Native	FACU
Showy Tick Trefoil	Native	FAC
Butterfly Milkweed	Native	NI
Beggar Ticks	Native	FACW
Purple Joe Pye Weed	Native	FAC
Black Eyed Susan	Native	FACU-
Total	**25**	**0.57**

Conservation Mix to be provided by New England Wetland Plants, Inc., Amherst, MA as outline in their New England Conservation / Wildlife Mix or approved equal. Mix to be applied at a rate of 25 lbs. per acre or one-lb. per 1750 square feet. Ratio of seed is proprietary and substitutions are not allowed.

Conservation Mix will used to stabilize all 2:1 slopes and all land area disturbed within the wetland buffer.

Stormwater BMP Mix:
The grass that is planted within a stormwater BMP will be a mix designed for both inundation and dry conditions such as Ernst Seeds, Retention Basin Floor Mix ERNMX-126.

Maintenance Considerations: Permanent seeded areas for long-term cover will be inspected on a periodic basis looking for signs of growth loss or erosion. Any areas found to be damaged will be repaired and replanted to reestablish the growth. The grass should be mowed at least twice per year and any dead material removed. Any woody growth that becomes established will need to be cut and removed.

Long-term maintenance of the land cover is critical and must be maintained at least 85% grass / vegetation coverage, must be inspected for concentrated flow, rills, and channels; and must be repaired as necessary to prevent erosion.

Street Sweeping

Description:
Street sweeping is a pollution prevention practice that removes sediment, debris and trash that accumulates along streets and roads from winter sanding practices and everyday use. Street sweeping is often performed to improve aesthetics and to reduce

the export of sand to the drainage network and receiving waters. In addition to sediment, debris and trash, other pollutants that may be minimized through street sweeping include some nutrients, oxygen-demanding substances and trace metals. See SWM Volume 2, 4-2, Source Control BMPS, Street Sweeping, page 52.
Maintenance Considerations: Inspect and maintain street sweeping equipment in accordance with manufacturer's recommendations.

Snow Removal & Winter Maintenance

Description: Drainage and stormwater systems need to be maintained during the winter months so that surface water runoff from a rain storm do not become a impounded and become an icing problem. Catch basins must remain viable and where sheet flow is a design factor, the edge of pavement and should to be maintained so that runoff can leave the pavement area. Sand and salt should be used at the rate that prevents sedimentation problems or excess salt deposited but yet enough to allow for protection for pedestrians and vehicles.

Maintenance Considerations: Catch basins are required to be kept viable by removing snow that is block surface water runoff from entering the structure. The edge of pavement where surface water sheet flow is designed to leave the paved area, the edge of pavement and shoulder need to be plowed to allow runoff to leave the pavement. Snow is to be piled in designated areas and removed from the site when the on-site storage locations have been exceeded. At the end of the winter season, sediment is to be swept from the paved surfaces and removed from the drainage system. (Sumps if provided, sediment forebays, swale lines.) (See catch basin and drainage pipe maintenance.) NHDES offers training (Green SnowPro Certification) for contractors and owners. https://www.des.nh.gov/land/roads/road-salt-reduction/green-snowpro-certification Please find attached NHDES Green SnoPro Utilization Chart which is required to be used.

Control of Invasive Plants

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;

- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Annual Report

Description: The owner is responsible to keep an **I & M Activity Log** that documents inspection, maintenance and repairs to the storm water management system, and a **Deicing Log** to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner (s) have copies of the Inspection & Maintenance Manual, Stormwater System Management, copies of past logs and check lists. This includes any owner association that might become involved with the property. The Annual Report will be prepared and submitted to the City of Dover Community Services Engineering Department / DPW with copies of both logs and check lists no later than December 15th of each year and provided to NHDES on that same date. Upon an ownership change, the Annual Report will include the Transfer of Ownership Responsibility Forms duplicated from the form found below.

The plan that accompanies this manual includes one sheet, "Stormwater System Management: Inspection, & Maintenance Plan". The owners and municipality will also maintain a complete set of the approved original design plans.

Respectfully,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer / Manager

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
Principal, VP – Technical Operations

STORMWATER SYSTEM: INSPECTION AND MAINTENANCE MANUAL

Inspection & Maintenance Manual Checklist

Proposed Mixed Use Site Plan
Residences & Lodges at Kelly Brook
Tibetan Drive

239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Pavement Sweeping	Three Times Per Year	N/A	N/A
		Litter/Trash Removal	Routinely	Inspect dumpsters, outdoor waste receptacles area, and yard areas.	Parcel will be free of litter/trash.
		Deicing Agents	N/A	N/A	Use salt as the primary agent for roadway safety during winter.
		Invasive Species	Two times per year.	Inspect for Invasive Species	Remove and dispose invasive species.
		Closed Drainage System:			
		Drainage Pipes & Inlet Sumps	2 times per year	Check for sediment accumulation & clogging.	Less than 2" sediment depth

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Yard Drains & Cleanouts	2 times per year	Check for sediment accumulation & clogging.	Less than 2" sediment depth
		Subsurface Gravel Wetland & system clean-outs.	Annually	72-Hour drawdown time evaluation and vegetation evaluation. Underdrain flushing.	Remove dead & diseased vegetation along with all debris, take corrective measures of filtration media if required. Flush underdrain clean-outs with a hose.
		ADS StormTech Chamber Pond	Annually	72-Hour drawdown time evaluation and vegetation evaluation. Underdrain flushing.	Remove all debris, take corrective measures of filtration media if required. Flush underdrain clean-outs with a hose.
		ADS Stormtech Chamber Pond	Annually	Evaluate the volume of sediment in the isolator row.	When required, vacuum the isolator row and remove the accumulated sediment.
		Riprap Outlet Protection	Annually	Check for sediment buildup and structure damage.	Remove excess sediment and repair damage.

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Internal Trench Drains and Retaining Wall Under Drains	2 times per year	Check for sediment and debris accumulation buildup. Ensure viability.	Remove sediment & debris when required. Remove Invasive Species. Jet drainage lines as required.
		Winter Maintenance	Ongoing	Remove snow as directed.	Ongoing
		Post Winter Maintenance	Annually	Remove excess sand, gross solids, and repair vegetation and plantings	Parcel will be free of excess sand, litter/trash. Vegetation per approved plans.
		Annual Report	1 time per year	Submit Annual Report to Dover Engineering Dept. / DPW, NHDES AoT, and kept on file by the owner.	Report to be submitted on or before December 15th each year. Copies submitted to NHDES by that date.

See also Design and Maintenance of Subsurface Gravel Wetlands, dated February 2015, attached. Specifically Attachment B, Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device and Checklist for Inspection of Gravel Wetland.

The following practices and drainage features will all require periodic inspections and maintenance based on this manual and drainage layout:

Conveyance Swales

Culvert Pipes, Flared End Sections, and Headwalls.

Catch Basins, Yard Drains, & Drain Manholes.

Internal Parking Trench Drains with cleanouts & retaining wall underdrains with cleanouts.

Detention Pond #105 with Outlet Structure and a spillway.

Stormtech SC740 Detention Pond #102 with isolator row, outlet structure with internal stack and control orifice, inlet structure w/ weir, underdrains, cleanouts.

Stormtech SC740 Detention Pond #106 with isolator row, outlet structure with internal stack and control orifice, inlet structure w/ weir, underdrains, cleanouts.

Sediment Forebays for Subsurface Gravel Wetlands #101, #103, and #104.

Subsurface Gravel Wetland #101 with inlets, clean-outs, outlet structure, and a spillway.

Subsurface Gravel Wetland #103 with inlets, clean-outs, outlet structure, and a spillway.

Subsurface Gravel Wetland #104 with inlets, clean-outs and outlet structure.

Rip Rap Level Spreaders.

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Proposed Mixed Use Site Plan
Residences & Lodges at Kelly Brook
Tibetan Drive

239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

BMP / System	Date Inspected	Inspector	Cleaning/Repair (List Items & Comments)	Repair Date	Performed By:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Deicing Log Form

Proposed Mixed Use Site Plan
Residences & Lodges at Kelly Brook
Tibetan Drive

239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

Date	Amount Applied	Performed By:	Date	Amount Applied	Performed By:

STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN CERTIFICATION

Owner	Responsibility
Name: 239 Knox Marsh Realty, LLC Gil Aleixo, Managing Member Address: P.O. Box 720 Middleton, MA 01949 Telephone: (603) 349-0470 (Mobile) E-mail Address: gilaleixo@gmail.com	The owner is responsible for the conduct of all construction activities, and ultimate compliance with all the provisions of the Stormwater System Operation & Maintenance Plan and the implementation of the Inspection and Maintenance Manual.

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Printed Name:

Representing:

Pavement Temp. (°F) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate (lbs/per 1000 sq.ft.)			
			Salt Prewetted/Pretreated with salt brine	Salt Prewetted/Pretreated with other blends	Dry salt	Winter sand
>30 ↑	Snow	Plow, treat intersections only				Not recommended
	Frz. Rain	Apply chemical				Not recommended
30 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				Not recommended
25 - 30 ↑	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				Not recommended
25 - 30 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
20 - 25 ↑	Snow or frz. Rain	Plow and Apply chemical				3.25 for frz. Rain
20 - 25 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
15 - 20 ↑	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
15 - 20 ↓	Snow or Frz. Rain	Plow and apply chemical				3.25 for frz. Rain
0 to 15 ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended		Not recommended	5.0 and spot-treat as needed
< 0	Snow	Plow, treat with blends, sand hazardous areas	Not recommended		Not recommended	5.0 and spot-treat as needed

Table 19. Application Rates for Deicing

These rates & table format are based on road application guidelines (Mn Snow & Ice Control Field Handbook, Manual 2005-1). Develop your own application rates by adjusting your current rates incrementally downward toward these guidelines. Where temperature categories overlap, select the rate most applicable to your situation.

Control of Invasive Plants

New Hampshire
Department of Agriculture,
Markets & Food
Douglas Cygan
603-271-3488
doug.cygan@agr.nh.gov

This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. **Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article.** Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.
Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.
Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.
Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.
MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.
Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may *applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.*

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.
Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum* obtusifolium). *Control:* (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.
Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.
Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.
Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.
Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.
Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)
Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.

Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.
Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.
Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

(1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.
(2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.
(3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.
(4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.
(5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
(6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.
(7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.
(8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.
(9) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.
(10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.
(11) FOLIAR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some

plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- P176 — CONTOUR MINOR, PROPOSED
- P175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

N/F BOSTON & MAINE RAILROAD,
IRON HORSE PARK
500 WATER STREET J-910
JACKSONVILLE, FL 32202
TAX MAP G, LOT 5

RIP RAP SPILLWAY

RIP RAP LEVEL SPREADER

PIPES IN HEADWALL (2)

OUTLET STRUCTURES #103 A&B
SEE P-103 FOR DETAILS

GRAVEL WETLAND #103
SEE P-103 FOR DETAILS

SEDIMENT FOREBAY

UNDER DRAIN CLEANOUTS

DRAIN MANHOLE W/ WEIR PLATE

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.)
BY: DEIDRA BENJAMIN, CWS

50' WETLAND BUFFER (TYP.)

DRAIN MANHOLE

SOLATOR ROW

INSPECTION PORTS

STORMTECH DETENTION POND #102
SEE P-102 FOR DETAILS

OUTLET STRUCTURE #102

DRAIN MANHOLE

CATCH BASIN

OUTLET STRUCTURE #105
DETENTION POND #105
SEE P-105 FOR DETAILS

RIP RAP SPILLWAY

RIP RAP LEVEL SPREADER

INSPECTION PORTS

SOLATOR ROW

STORMTECH DETENTION POND #106
SEE P-106 FOR DETAILS

OUTLET STRUCTURE #106

RETAINING WALL UD OUTLET

RIP RAP LEVEL SPREADER

DRAIN MANHOLE

UNDERDRAIN CLEANOUT

NYLOPLAST CLEANOUT

INTERNAL TRENCH DRAIN

PROPOSED 90 SINGLE OCCUPANCY UNITS BUILDING "C" GARAGE FF = 99.35

UNDERDRAIN CLEANOUT

INLET SUMP

YARD DRAIN WITH CULVERT

YARD DRAIN CLEANOUT

CATCH BASINS

PROPOSED 90 SINGLE OCCUPANCY UNITS BUILDING "E" PARKING FF = 99.00

CONVEYANCE SWALES

TIBETAN DRIVE

PROPOSED 84 SUITE LODGING UNITS BUILDING "A" PARKING FF = 98.60

CATCH BASIN

UNDER DRAIN CLEANOUTS

DRAIN MANHOLE W/ WEIR PLATE

CATCH BASIN

DRAIN MANHOLE

PIPES IN HEADWALL (2)

OUTLET STRUCTURES #101 A&B
SEE P-101 FOR DETAILS

RIP RAP SPILLWAY

SEDIMENT FOREBAY

GRAVEL WETLAND #101
SEE P-101 FOR DETAILS

UNDER DRAIN CLEANOUTS

RIP RAP LEVEL SPREADER / PLUNGE POOL

SEDIMENT FOREBAY

INLET SUMP

PIPES IN HEADWALL (4)

OUTLET STRUCTURE #104 A&B
SEE P-104 FOR DETAILS

N.H. ROUTE 155 / KNOX MARSH ROAD

UNDERDRAIN CLEANOUT

SEDIMENT FOREBAY

GRAVEL WETLAND #104
SEE P-104 FOR DETAILS

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE DRAINAGE INFRASTRUCTURE THAT REQUIRES PERIODIC INSPECTION AND MAINTENANCE. IT IS TO ACCOMPANY A DOCUMENT ENTITLES "INSPECTION AND MAINTENANCE MANUAL, STORMWATER SYSTEM MANAGEMENT PUBLISHED BY BERRY SURVEYING & ENGINEERING ON THE SAME DATE.

NOTE: HALF SCALE PLANS, (11-INCHES X 17-INCHES) WILL HAVE A SCALE THAT IS TWICE THE PUBLISHED SCALE.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

STORMWATER OPERATION: INSPECTION & MAINTENANCE PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14248
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

MAINTENANCE REQUIREMENTS

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
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 STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.	
VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

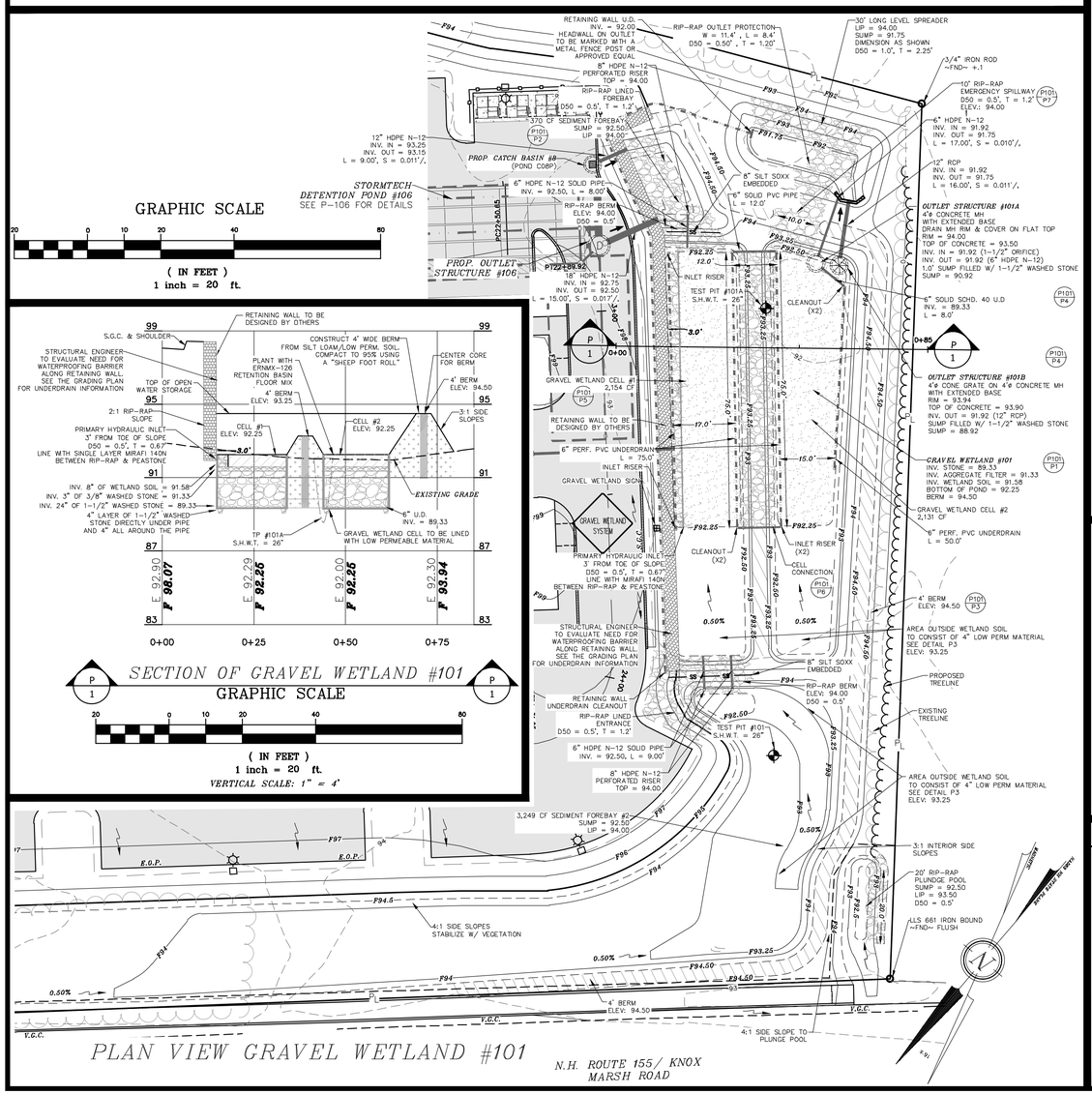
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10"	90 – 75
#100	40 – 50
#200	25 –50
SIEVE SIZE	**% PASSING TOLERANCES**
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

DESIGN REFERENCES

1 UNH STORMWATER CENTER

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

P1



SECTION OF GRAVEL WETLAND #101

GRAPHIC SCALE

20 0 10 20 40 80

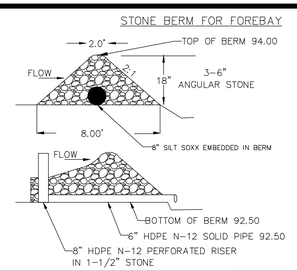
(IN FEET)

1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

P2

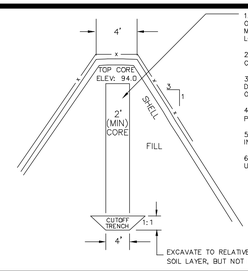
STONE BERM FOR FOREBAY



P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

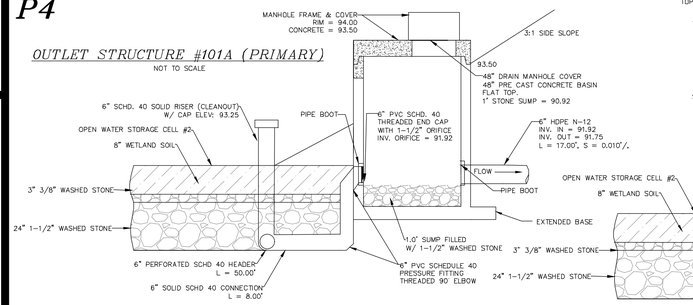
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

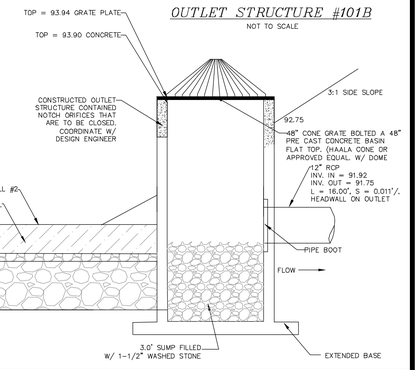
OUTLET STRUCTURE #101A (PRIMARY)

NOT TO SCALE



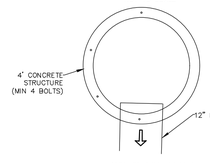
OUTLET STRUCTURE #101B

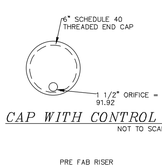
NOT TO SCALE



TOP VIEW (101B)

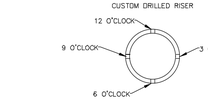
NOT TO SCALE

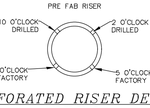




CAP WITH CONTROL ORIFICE (101A)

NOT TO SCALE

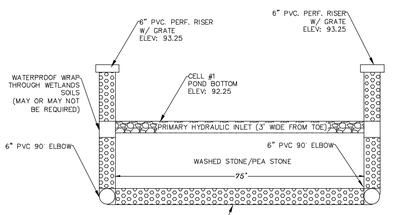




PERFORATED RISER DETAIL

NOT TO SCALE

P5

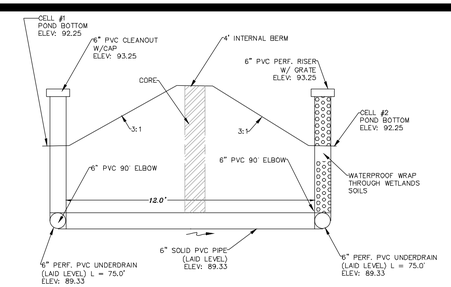


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6

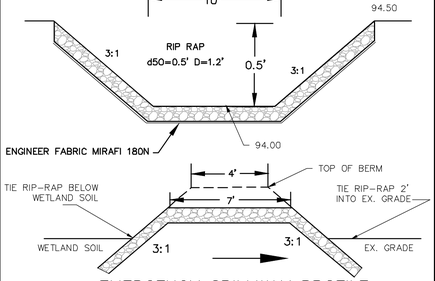


GRAVEL WETLAND CONNECTION SYSTEM

P7

SPILLWAY DETAILS

NOT TO SCALE



EMERGENCY SPILLWAY PROFILE

P8

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, 'Tioga*	Deertongue, 'Tioga	22.00
20.00 %	*Festuca ovina, Fults*	Alkaligrass, Fults	9.35
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.95
15.00 %	*Agrostis stolonifera, 'Penncross'*	Creeping Bentgrass, 'Penncross'	14.40
13.00 %	*Poa palustris*	Fowl Bluegrass	35.80
10.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype	28.80
3.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.98**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

PLANNING FILE #SITE--XXXX-XXXX

REVISION	DATE	DESCRIPTION

GRAVEL WETLAND #101
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14045
LICENSED PROFESSIONAL ENGINEER

P-101

NOT FOR CONSTRUCTION

P1

MAINTENANCE REQUIREMENTS

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
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 STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGUARTION.	
VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1–1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1–1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

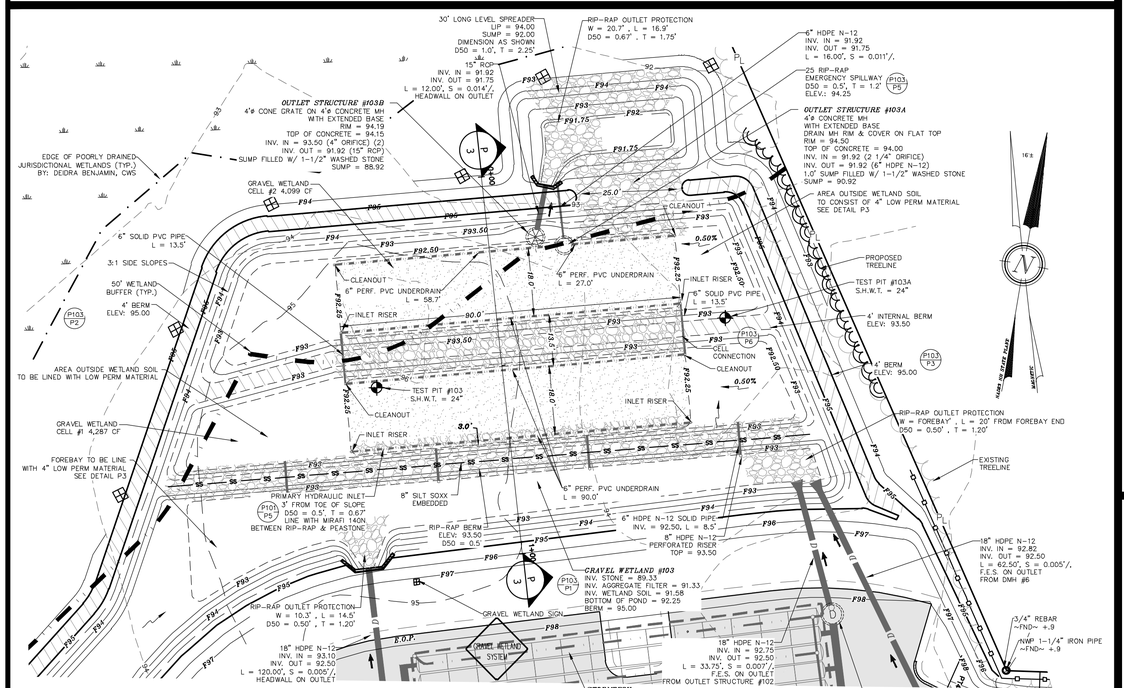
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10	90 – 75
#100	40 – 50
#200	25 –50

SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

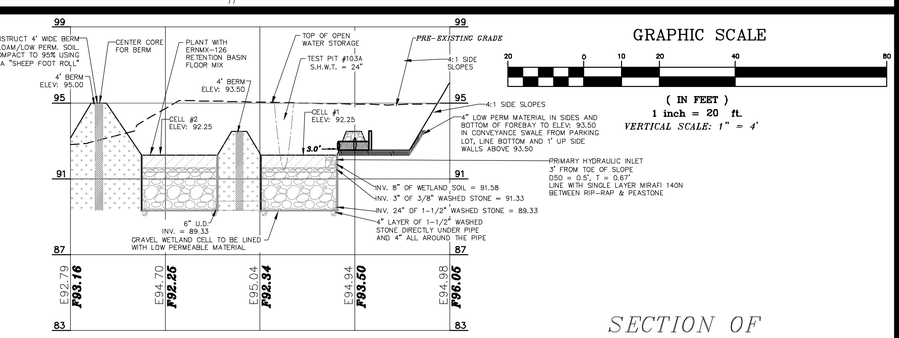
DESIGN REFERENCES

1 UNH STORMWATER CENTER

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER



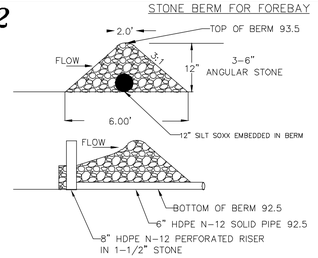
PLAN VIEW GRAVEL WETLAND #103



SECTION OF GRAVEL WETLAND #103

P2

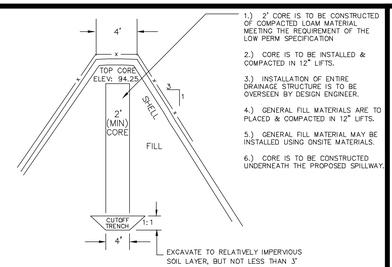
STONE BERM FOR FOREBAY



P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

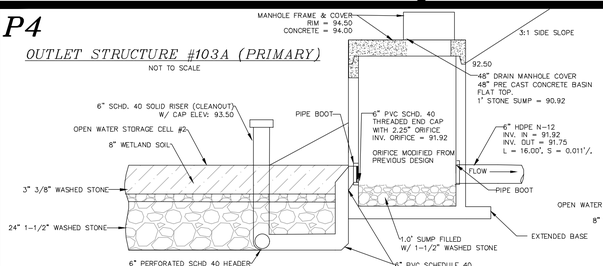
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

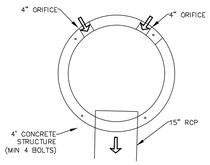
OUTLET STRUCTURE #103A (PRIMARY)

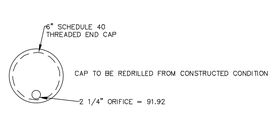
NOT TO SCALE



TOP VIEW (103B)

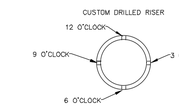
NOT TO SCALE

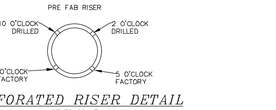




CAP WITH CONTROL ORIFICE

NOT TO SCALE



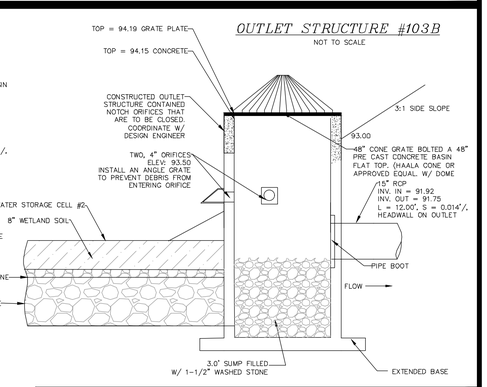


PERFORATED RISER DETAIL

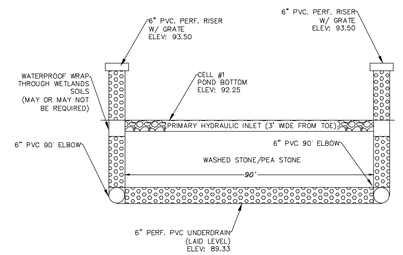
NOT TO SCALE

OUTLET STRUCTURE #103B

NOT TO SCALE



P5

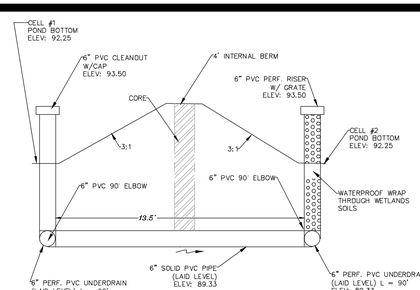


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6



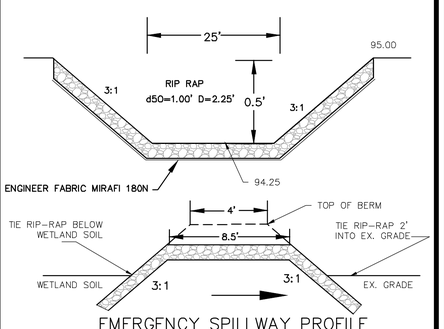
GRAVEL WETLAND CONNECTION SYSTEM

NOT TO SCALE

P7

SPILLWAY DETAILS

NOT TO SCALE



EMERGENCY SPILLWAY PROFILE

P8

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga	22.08
20.00 %	*Festuchella rbesus, Fults*	Alkaligrass, Fults	4.36
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.96
15.00 %	*Agrostis stolonifera, 'Penncross'*	Creeping Bentgrass, 'Penncross'	14.40
15.00 %	*Poa palustris*	Fowl Bluegrass	15.80
10.00 %	*Carex haleniodes, PA Ecotype*	Fox Sedge, PA Ecotype	25.80
3.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.90**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

P-103

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

GRAVEL WETLAND #103
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

P1

MAINTENANCE REQUIREMENTS

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
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 AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.	
VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 -15
3/8"	0 -5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10	90 – 75
#100	40 – 50
#200	25 -50
SIEVE SIZE	**% PASSING TOLERANCES**
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

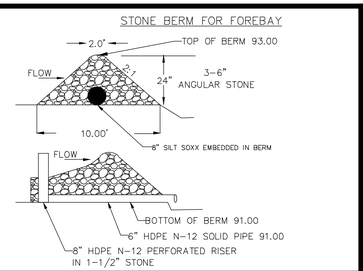
DESIGN REFERENCES

1 UNH STORMWATER CENTER

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

P2

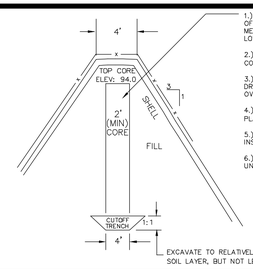
STONE BERM FOR FOREBAY



P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

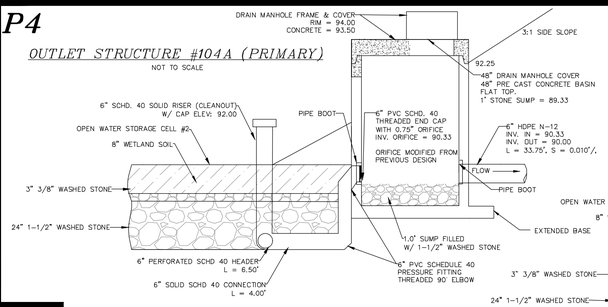
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

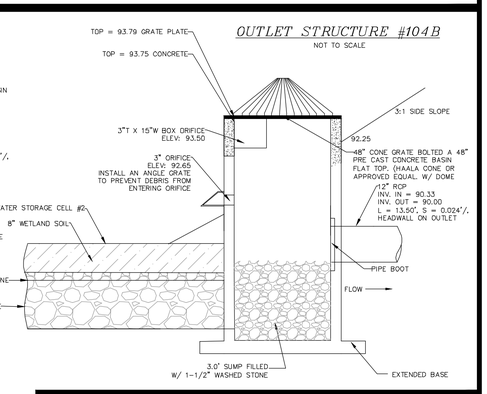
OUTLET STRUCTURE #104A (PRIMARY)

NOT TO SCALE



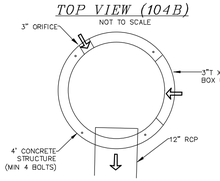
OUTLET STRUCTURE #104B

NOT TO SCALE



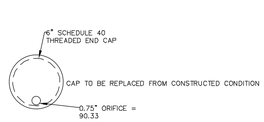
TOP VIEW (104B)

NOT TO SCALE



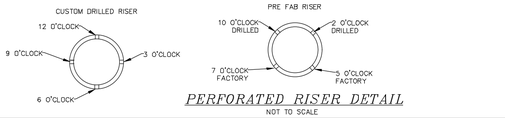
CAP WITH CONTROL ORIFICE

NOT TO SCALE

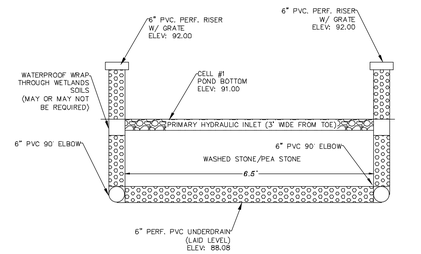


PERFORATED RISER DETAIL

NOT TO SCALE



P5

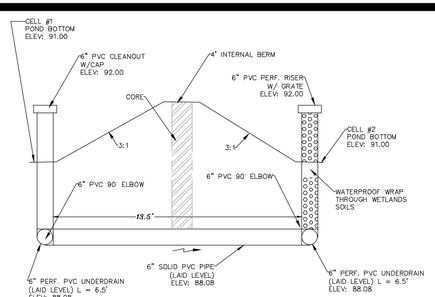


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6



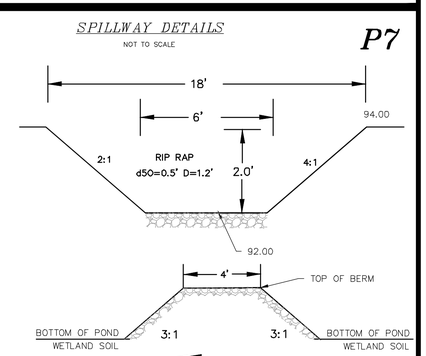
GRAVEL WETLAND CONNECTION SYSTEM

NOT TO SCALE

P7

SPILLWAY DETAILS

NOT TO SCALE



GRAVEL WETLAND CELL SPILLWAY PROFILE

P8

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

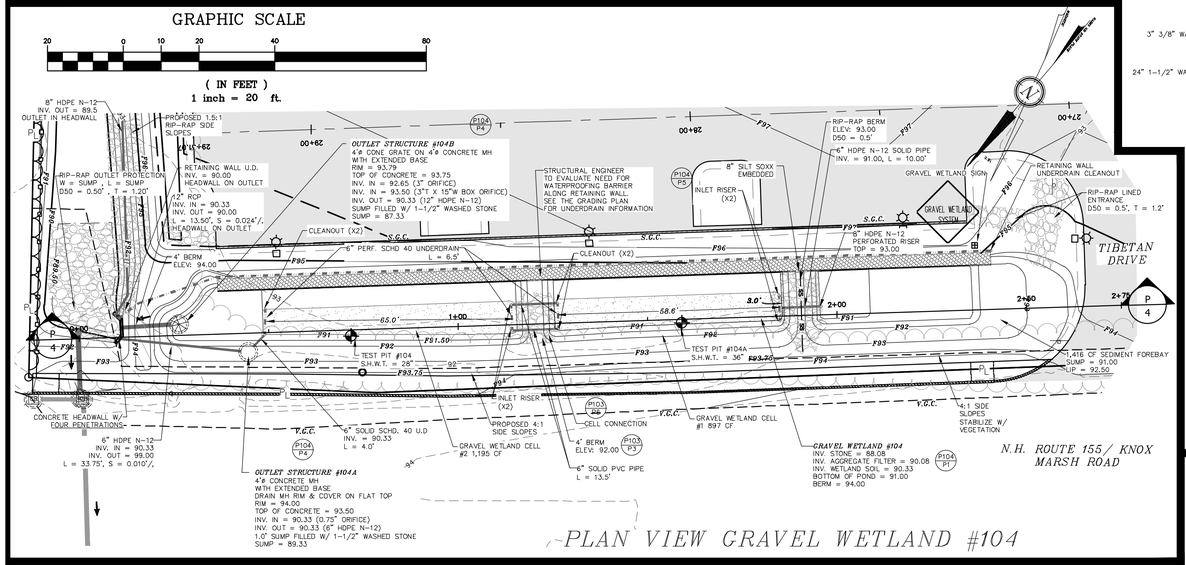
	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, 'Tioga*	Deertongue, 'Tioga	22.00
20.00 %	*Panicvalia dichana, Hutz*	Alkaligrass, Hutz	4.56
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.96
15.00 %	*Agrostis stolonifera, 'Pennacross'*	Creeping Bentgrass, 'Pennacross'	14.40
15.00 %	*Poa palustris*	Fowl Bluegrass	16.80
10.00 %	*Carex haltoidea, PA Ecotype*	Fox Sedge, PA Ecotype	28.80
1.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.98**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

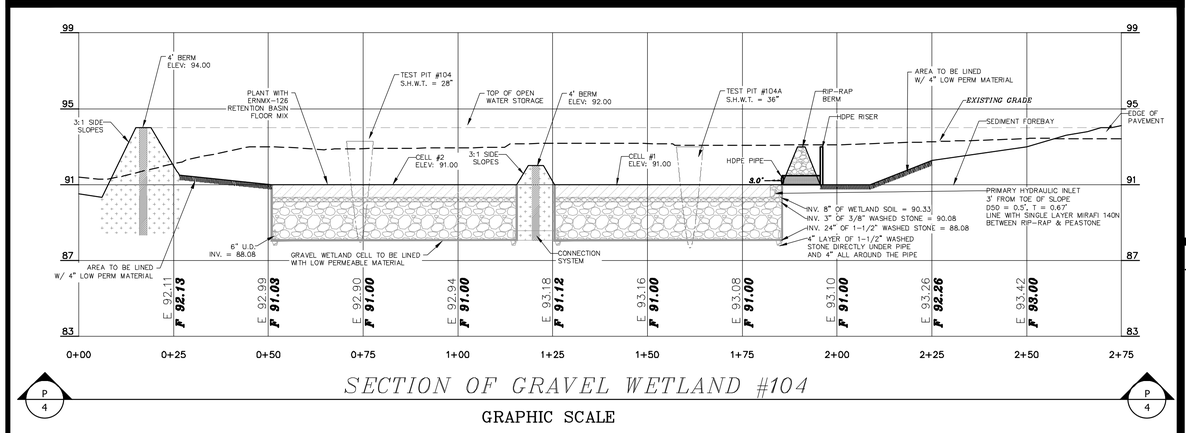
NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.



PLAN VIEW GRAVEL WETLAND #104



SECTION OF GRAVEL WETLAND #104

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

GRAVEL WETLAND #104
LAND OF
KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
PROFESSIONAL ENGINEER

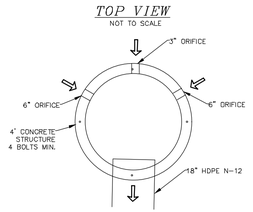
P-104

SHEET 21 OF 60

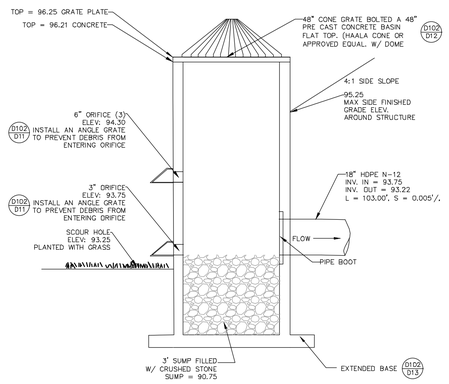
NOT FOR CONSTRUCTION

P1

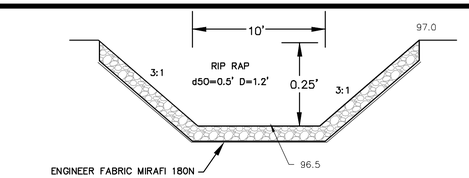
TOP VIEW
NOT TO SCALE

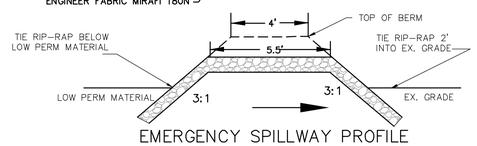


OUTLET STRUCTURE #105
NOT TO SCALE



P2



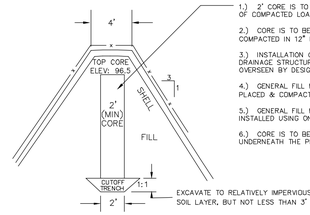


EMERGENCY SPILLWAY PROFILE

SPILLWAY DETAILS

NOT TO SCALE

P3



1.) 2' CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL.

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

EXCAVATE TO RELATIVELY IMPERVIOUS SOIL LAYER, BUT NOT LESS THAN 3'

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

P4

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga	22.68
20.00 %	*Perennials alaskana, Yukon*	Alkaligrass, Yukon	4.56
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.96
15.00 %	*Agrostis stolonifera, 'Penncross'*	Creeping Bentgrass, 'Penncross'	14.40
15.00 %	*Poa palustris*	Fowl Bluegrass	16.80
10.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype	28.80
1.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	83.60
1.00 %	*Juncus effusus*	Soft Rush	46.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.98**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

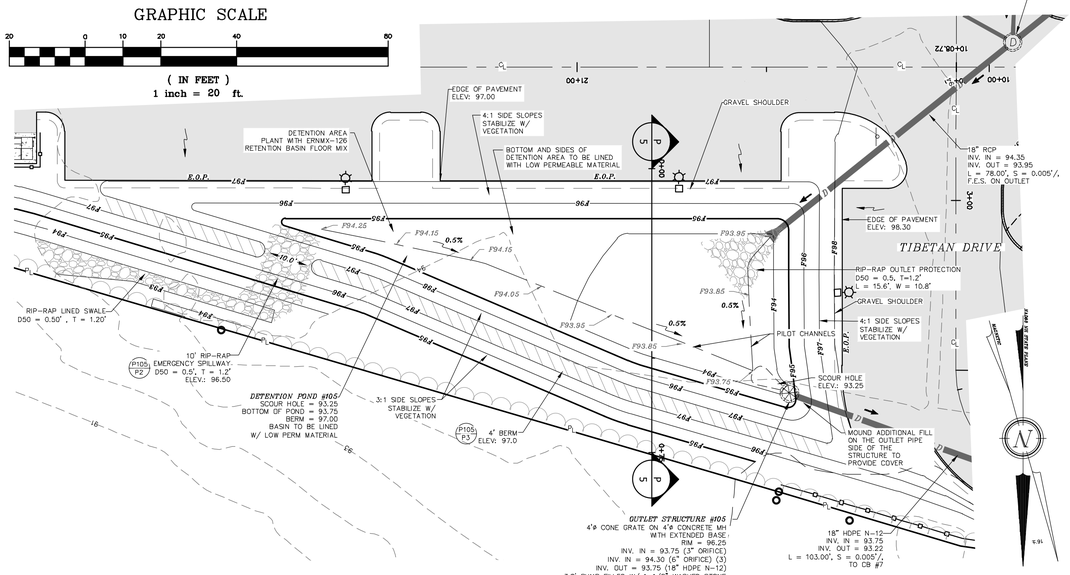
The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

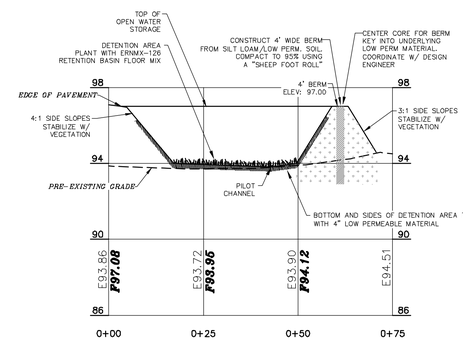
PLAN VIEW DETENTION POND #105

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.





SECTION OF DETENTION POND #105

SECTION OF DETENTION POND #102

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

P-105

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

DETENTION POND #105
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

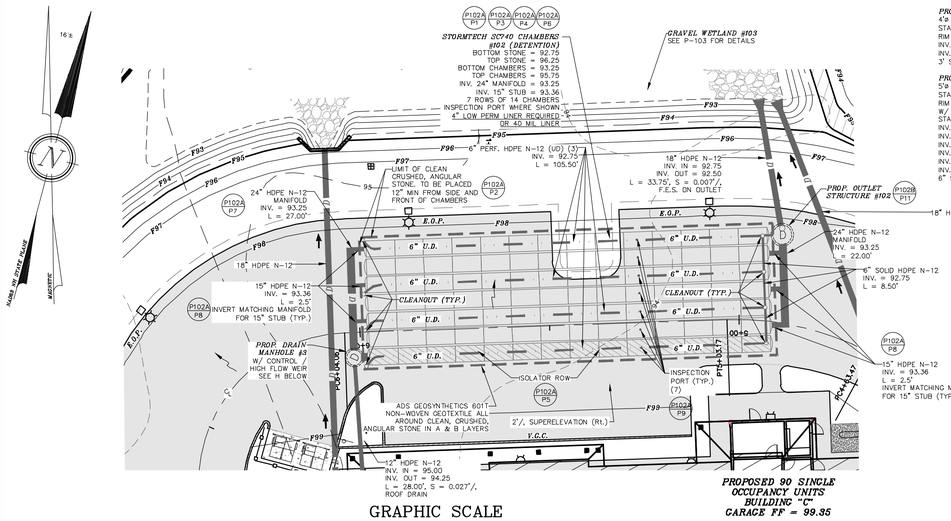
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 10675 LICENSED PROFESSIONAL ENGINEER

SHEET 22 OF 60

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

A REPRESENTATIVE FROM BS&E WILL BE ON SITE DURING THE CONSTRUCTION OF THE STORMTECH SYSTEM

PLAN VIEW STORMTECH SC-740 CHAMBERS DETENTION POND #102 SEE SHEET 102B FOR DETAILS

STRUCTURES TABLE:

PROP. DRAIN MANHOLE #3
4'ø STRUCTURE W/ NH STANDARD RIM
STA: 6+01.75 (Lt. 6.65')
RIM = 98.68 (FLUSH)
INV. IN = 94.25 (12" HDPE N-12) (BUILDING C ROOF)
INV. OUT = 93.25 (24" HDPE N-12) (2) (P-102)
3' SUMP = 90.25

PROP. OUTLET STRUCTURE #102 (POND 102P)
5'ø STRUCTURE W/ NH STANDARD RIM
STA: 4+91.35 (Rt. 23.10')
RIM = 98.10 (FLUSH)
W/ INTERNAL 18" STACK
STACK TOP = 95.75
INV. IN = 92.75 (2" ORIFICE AT BASE OF STACK)
INV. IN = 92.75 (6" HDPE UNDERDRAIN)
INV. IN = 93.36 (15" HDPE N-12) (MANIFOLD)
INV. IN = 93.25 (24" HDPE N-12) (MANIFOLD)
INV. IN = 92.75 (6" HDPE N-12) (U.D.)
INV. OUT = 92.75 (18" HDPE N-12) (GW #103)
6" SUMP FILLED W/ 1 1/2" STONE

P1

1. ALL DESIGN SPECIFICATIONS FOR STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE STORMTECH DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH)
2. THE INSTALLATION OF STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
3. THE CONTRACTOR IS ADVISED TO REVIEW AND UNDERSTAND THE INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLTION. CALL **1-888-892-2694** OR VISIT **WWW.STORMTECH.COM** TO RECIEVE A COPY OF THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
4. CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND LOAD FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SC-740 NOTES

P2

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

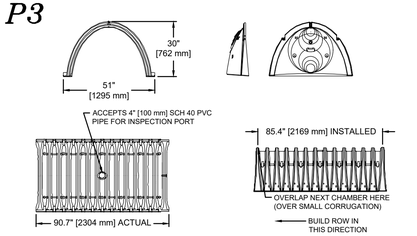
MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION[1]	COMPACTION/DENSITY REQUIREMENT
(D) FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
(C) FILL MATERIAL FOR LAYER 'C' STARTS FROM THE 18" (450 mm) ABOVE THE TOP OF THE CHAMBER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, < 35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTION AFTER 12" (305 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) LIFTS TO A MIN. 95% STANDARD PROCTOR DENSITY. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs [53 kN]. DYNAMIC FORCE NOT TO EXCEED 20,000 lbs [89 kN]
(B) EMBEDMENT STONE SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE UP TO LAYER 'C'	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
(A) FOUNDATION STONE BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 35, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY*.

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE.

2. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9in [229 mm] (MAX) LIFTS USING TWO FULL COVERAGES WITH AN APPROPRIATE COMPACTOR.

STORMTECH ACCEPTABLE FILL MATERIALS

P3



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	51.0" x 30.0" x 85.4" [1295 mm x 762 mm x 2169 mm]
CHAMBER STORAGE	45.9 CUBIC FEET [1.30 m3]
MINIMUM INSTALLED STORAGE	74.9 CUBIC FEET [2.12 m3]
WEIGHT	75 lbs. [33.6 kg]

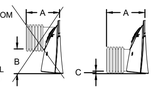
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740EPE06T	6" [150 mm]	10.90" [277 mm]	18.50" [470 mm]	N/A
SC740EPE06B	6" [150 mm]	10.90" [277 mm]	N/A	0.50" [13 mm]
SC740EPE08T	8" [200 mm]	12.20" [310 mm]	16.50" [419 mm]	N/A
SC740EPE08B	8" [200 mm]	12.20" [310 mm]	N/A	0.60" [15 mm]
SC740EPE10T	10" [250 mm]	13.40" [340 mm]	14.50" [368 mm]	N/A
SC740EPE10B	10" [250 mm]	13.40" [340 mm]	N/A	0.70" [18 mm]
SC740EPE12T	12" [300 mm]	14.70" [373 mm]	12.50" [318 mm]	N/A
SC740EPE12B	12" [300 mm]	14.70" [373 mm]	N/A	1.20" [30 mm]
SC740EPE15T	15" [375 mm]	18.40" [467 mm]	9.00" [229 mm]	N/A
SC740EPE15B	15" [375 mm]	18.40" [467 mm]	N/A	1.30" [33 mm]
SC740EPE18T	18" [450 mm]	19.70" [500 mm]	5.00" [127 mm]	N/A
SC740EPE18B	18" [450 mm]	19.70" [500 mm]	N/A	1.60" [41 mm]
*SC740EPE24B	24" [600 mm]	18.50" [470 mm]	N/A	0.10" [3 mm]

NOTE: ALL DIMENSIONS ARE NOMINAL

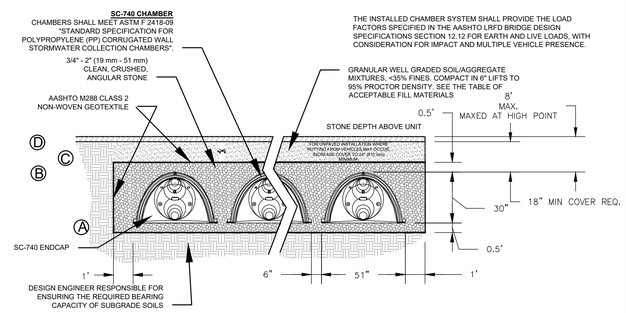
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*FOR THE SC740EPE24B THE 24" [600 mm] STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" [44 mm]. BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.



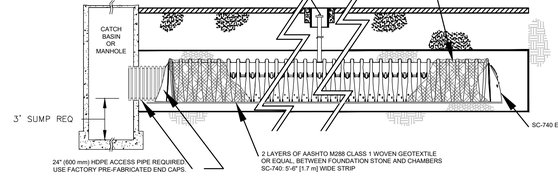
SC-740 TECHNICAL SPEC.

P4



SC-740 STANDARD CROSS SECTION

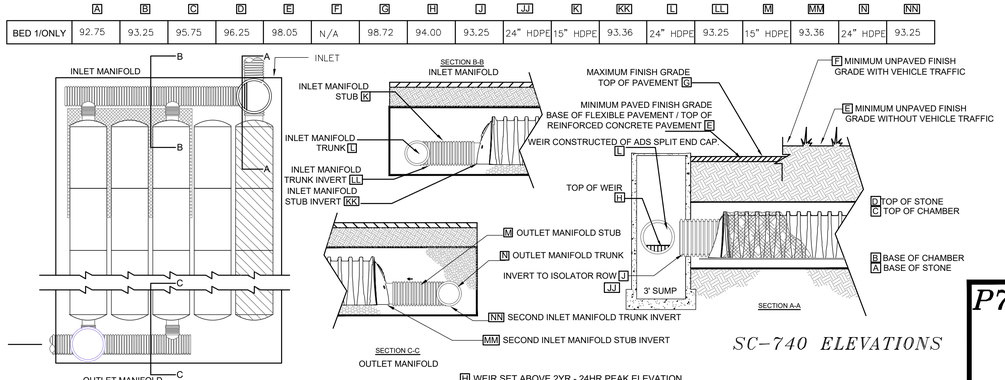
P5



SC-740 ISOLATOR ROW (TM) DETAIL

P6

	A	B	C	D	E	F	G	H	J	JJ	K	KK	L	LL	M	MM	N	NN
BED 1/ONLY	92.75	93.25	95.75	96.25	98.05	N/A	98.72	94.00	93.25	24" HDPE	15" HDPE	93.36	24" HDPE	93.25	15" HDPE	93.36	24" HDPE	93.25



SC-740 ELEVATIONS

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND CHAMBERS. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

EXISTING LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- STONE BOUND (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEMPORARY BENCHMARK
- TESTHOLE
- PERIMETER BOUNDARY LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES (OHU)
- EXISTING CONTOUR MINOR (116)
- EXISTING CONTOUR MAJOR (115)
- POORLY DRAINED WETLAND LINE
- 50' WETLAND BUFFER LINE
- TREE LINE
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

PROPOSED LEGEND:

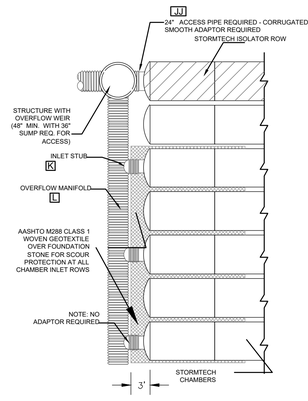
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 DETAIL SHEET / DETAIL
- P176 CONTOUR MINOR, PROPOSED
- P175 CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- UNDERDRAIN
- GUARD RAIL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

1-1/2" WASHED CRUSHED STONE * (AASHTO NO. 4)

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

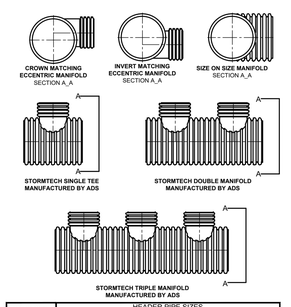
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

P7



SC-740 MANIFOLD DETAIL

P8



STUB SIZE	HEADER PIPE SIZES								
	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"
24"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-	-
18"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-
15"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-
10"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-
8"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
6"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

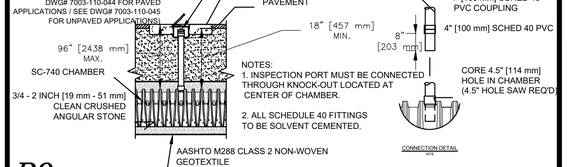
AVAIL - STANDARD HEADERS AVAILABLE

ADS 1-800-821-6710

MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS.
WHEN USING STANDARD END CAPS, CORRUGATED PIPE UP TO 18 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 24" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

MANIFOLDS

P9



SC-740 INSPECTION PORT DETAIL

P10

INSPECTION AND MAINTENANCE:

DUE TO THE CRITICAL NATURE OF INSPECTION AND MAINTENANCE STORMTECH SYSTEM AS DETAILED IN THE DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH) THE FOLLOWING THREE FIRMS ARE RECOMMENDED FOR THIS TASK. IT IS HIGHLY RECOMMENDED THAT THE OPERATOR OF THE PROPERTY HAVE A LONG TERM INSPECTION AND MAINTENANCE CONTACT WITH A FIRM THAT CAN COMPLETE THESE VITAL SERVICES.

AS FOR ISOLATOR ROW MAINTENANCE, CB MAINTENANCE, ETC., REGIONAL ADS REPRESENTATIVES RECOMMEND USING ANY OF THE FOLLOWING CONTACTS:

STORMWATER COMPLIANCE, LLC;
ATTN: NATHAN MARLES, 1-877-271-9055; NMARLES@LIDTECH.COM
163 THADEUS STREET, PORTLAND, ME 04106
INFO@STORMWATERCOMP.COM

TED BERRY COMPANY;
ATTN: DAVE BEAUCHAMP, 207-897-3348; DAVID.BEAUCHAMP@TEDBERRYCOMPANY.COM
521 FEDERAL ROAD, LIVERMORE, ME 04253
INFL@TEDBERRYCOMPANY.COM

BELLEMORE SEPTIC, SEWER, & DRAIN;
ATTN: RAY BELLEMORE, 603-641-6640; RAYMOND@BELLEMORE.COM
PO BOX 10369, BEDFORD, NH 03110

CONTACT AARON CHEEVER, P.E., ADVANCE DRAINAGE SYSTEMS, INC.
AARON.CHEEVER@ADS-PIPE.COM 1-978-302-0650
FOR PRODUCT AND PRICING

P-102A

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

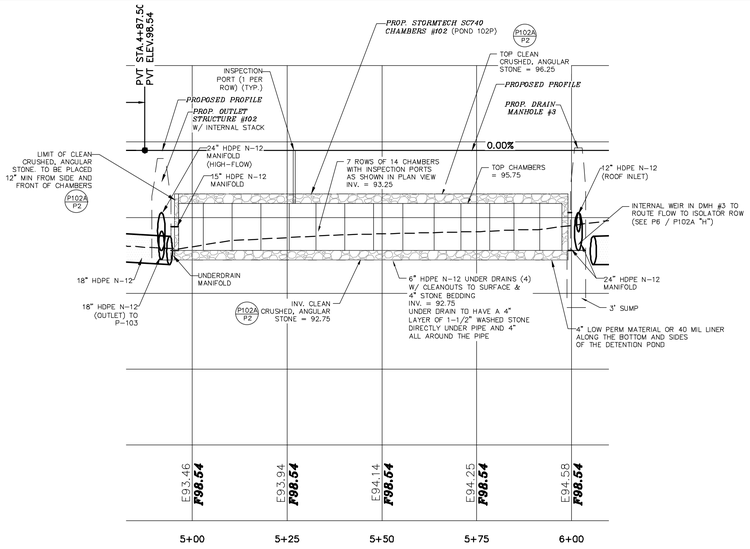
STORMTECH SC740 CHAMBER DETENTION POND #102A
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

KENNETH A. BERRY No. 14245 - STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SECTION OF STORMTECH DETENTION #102

A 102 — A 102

GRAPHIC SCALE

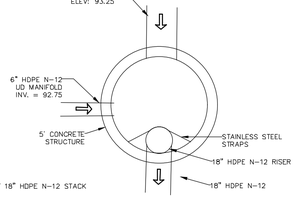
20 0 10 20 40 80

(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.

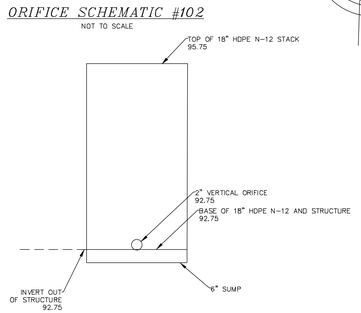
LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

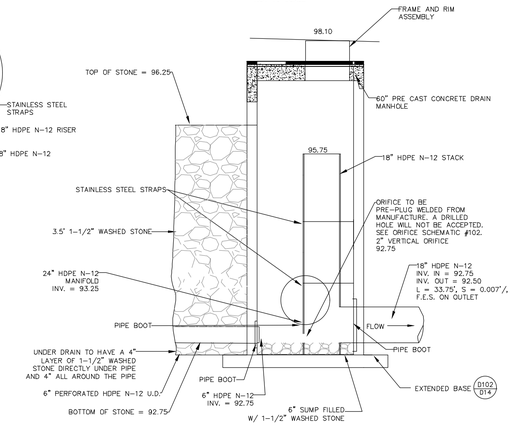
P11



TOP VIEW
NOT TO SCALE (NO FRAME AND RIM IN THIS VIEW)



ORIFICE SCHEMATIC #102
NOT TO SCALE



OUTLET STRUCTURE #102
NOT TO SCALE

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

STORMTECH SC740 CHAMBER DETENTION POND #102B DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

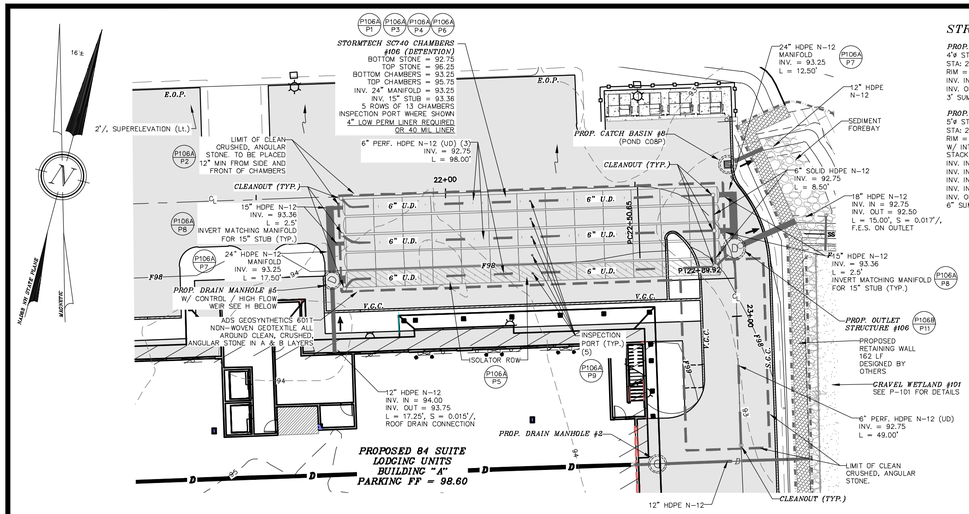
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

KENNETH A. BERRY No. 14015 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE

P-102B

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

A REPRESENTATIVE FROM BS&E WILL BE ON SITE DURING THE CONSTRUCTION OF THE STORMTECH SYSTEM

PLAN VIEW STORMTECH SC-740 CHAMBERS DETENTION POND #106 SEE SHEET 106B FOR DETAILS

STRUCTURES TABLE:

PROP. DRAIN MANHOLE #5
4'ø STRUCTURE W/ NH STANDARD RIM
STA: 21+69.305 (Rt. 21.90')
RIM = 98.05 (FLUSH)
INV. IN = 93.75 (12" HDPE N-12) (BUILDING A ROOF)
INV. OUT = 93.25 (24" HDPE N-12) (2) (P-106)
3" SUMP = 90.25

PROP. OUTLET STRUCTURE #106 (POND 106P)
5'ø STRUCTURE W/ NH STANDARD RIM
STA: 22+82.30 (Lt. 1.20')
RIM = 97.86 (FLUSH)
W/ INTERNAL 18" STACK
STACK TOP = 95.50
INV. IN = 92.75 (2" ORIFICE AT BASE OF STACK)
INV. IN = 93.36 (15" HDPE N-12) (MANIFOLD)
INV. IN = 93.25 (24" HDPE N-12) (MANIFOLD)
INV. IN = 92.75 (6" HDPE N-12) (2 U.D.)
INV. OUT = 92.75 (18" HDPE N-12) (GW #101)
6" SUMP FILLED W/ 1 1/2" STONE

P1

1. ALL DESIGN SPECIFICATIONS FOR STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE STORMTECH DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH)
2. THE INSTALLATION OF STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
3. THE CONTRACTOR IS ADVISED TO REVIEW AND UNDERSTAND THE INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLTION. CALL **1-888-892-2694** OR VISIT **WWW.STORMTECH.COM** TO RECIEVE A COPY OF THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
4. CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND LOAD FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SC-740 NOTES

P2

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

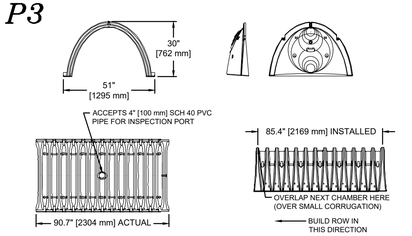
MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION[1]	COMPACTION/DENSITY REQUIREMENT
(D) FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
(C) FILL MATERIAL FOR LAYER 'C' STARTS FROM THE 12" (305 mm) OF STONE (9" (229 mm) FOR 12" (305 mm) SCHEDULE 40 HDPE) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTION AFTER 12" (305 mm) OF MATERIAL OVER THE CHAMBERS IS PLACED. 3 (200 mm) MAX LIFTS. LAYERS IN 6" (150 mm) LIFTS TO A MIN. 95% STANDARD PROCTOR DENSITY. ROLLER CONFIGURATION MUST NOT TO EXCEED 12,000 lbs [53 kN]. DYNAMIC FORCE NOT TO EXCEED 20,000 lbs [89 kN]
(B) EMBEDMENT STONE SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE OR LAYER 'A' TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
(A) FOUNDATION STONE BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 35, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY*.

PLEASE NOTE:
1. THE LISTED AASHTO DESSIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE.

2. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9in [229 mm] (MAX) LIFTS USING TWO FULL COVERAGES WITH AN APPROPRIATE COMPACTOR.

STORMTECH ACCEPTABLE FILL MATERIALS

P3



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	51.0" x 30.0" x 85.4" [1295 mm x 762 mm x 2169 mm]
CHAMBER STORAGE	45.9 CUBIC FEET [1.30 m3]
MINIMUM INSTALLED STORAGE	74.9 CUBIC FEET [2.12 m3]
WEIGHT	75 lbs. [33.6 kg]

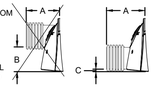
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740EPE06T	6" [150 mm]	10.90" [277 mm]	18.50" [470 mm]	N/A
SC740EPE06B	6" [150 mm]	10.90" [277 mm]	N/A	0.50" [13 mm]
SC740EPE08T	8" [200 mm]	12.20" [310 mm]	16.50" [419 mm]	N/A
SC740EPE08B	8" [200 mm]	12.20" [310 mm]	N/A	0.60" [15 mm]
SC740EPE10T	10" [250 mm]	13.40" [340 mm]	14.50" [368 mm]	N/A
SC740EPE10B	10" [250 mm]	13.40" [340 mm]	N/A	0.70" [18 mm]
SC740EPE12T	12" [300 mm]	14.70" [373 mm]	12.50" [318 mm]	N/A
SC740EPE12B	12" [300 mm]	14.70" [373 mm]	N/A	1.20" [30 mm]
SC740EPE15T	15" [375 mm]	18.40" [467 mm]	9.00" [229 mm]	N/A
SC740EPE15B	15" [375 mm]	18.40" [467 mm]	N/A	1.30" [33 mm]
SC740EPE18T	18" [450 mm]	19.70" [500 mm]	5.00" [127 mm]	N/A
SC740EPE18B	18" [450 mm]	19.70" [500 mm]	N/A	1.60" [41 mm]
*SC740EPE24B	24" [600 mm]	18.50" [470 mm]	N/A	0.10" [3 mm]

NOTE: ALL DIMENSIONS ARE NOMINAL

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*FOR THE SC740EPE24B THE 24" [600 mm] STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" [44 mm]. BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

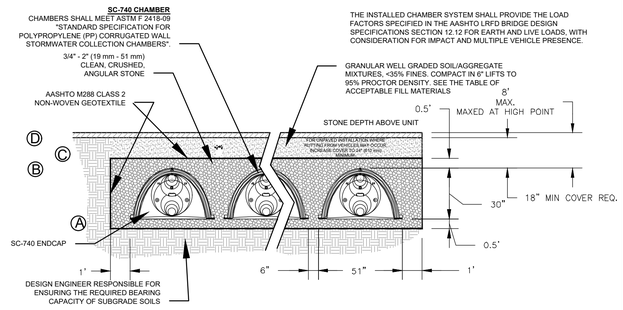


SC-740 TECHNICAL SPEC.

P4

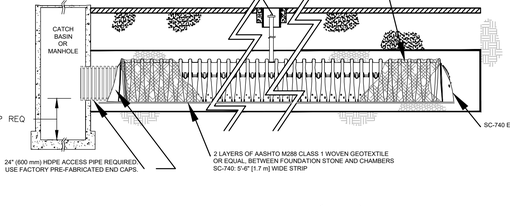
SC-740 CHAMBER
CHAMBERS SHALL MEET ASTM F 2418-09 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS, WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCE.



SC-740 STANDARD CROSS SECTION

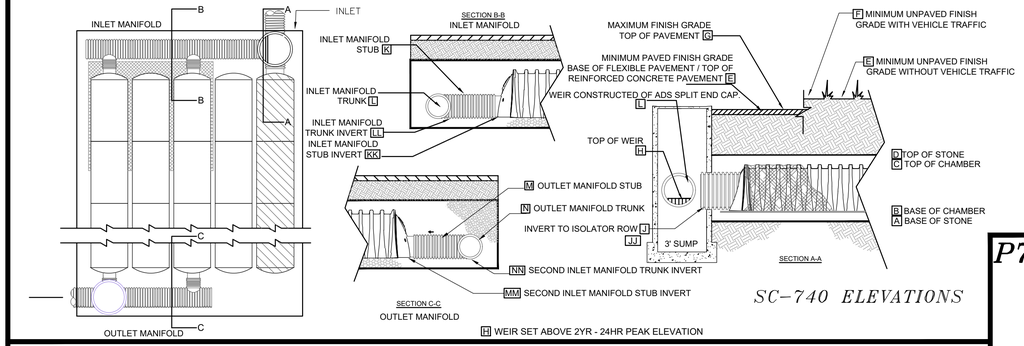
P5



SC-740 ISOLATOR ROW (TM) DETAIL

P6

	A	B	C	D	E	F	G	H	J	JJ	K	KK	L	LL	M	MM	N	NN
BED 1/ONLY	92.75	93.25	95.75	96.25	97.60	N/A	98.09	94.00	93.25	24" HDPE	15" HDPE	93.36	24" HDPE	93.25	15" HDPE	93.36	24" HDPE	93.25



H WEIR SET ABOVE 2YR - 24HR PEAK ELEVATION

SC-740 ELEVATIONS

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND CHAMBERS. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

EXISTING LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- STONE BOUND (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEMPORARY BENCHMARK
- TESTHOLE
- PERIMETER BOUNDARY LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES (OHU)
- EXISTING CONTOUR MINOR (116)
- EXISTING CONTOUR MAJOR (115)
- POORLY DRAINED WETLAND LINE
- 50' WETLAND BUFFER LINE
- TREE LINE
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

PROPOSED LEGEND:

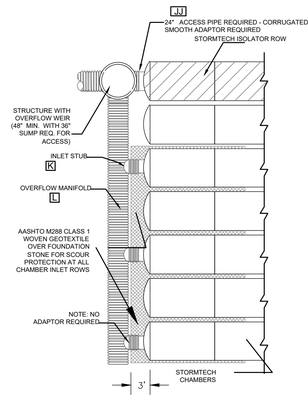
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 DETAIL SHEET / DETAIL
- P176 CONTOUR MINOR, PROPOSED
- P175 CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- D DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- U.D UNDERDRAIN
- GUARD RAIL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

1-1/2" WASHED CRUSHED STONE * (AASHTO NO. 4)

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

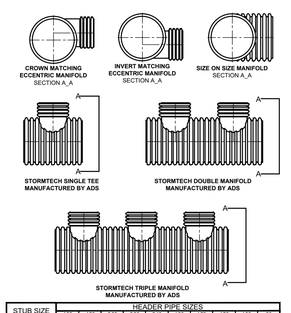
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

P7



SC-740 MANIFOLD DETAIL

P8



STUB SIZE	HEADER PIPE SIZES								
	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"
24"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-	-
18"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-
15"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-
10"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-
8"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
6"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

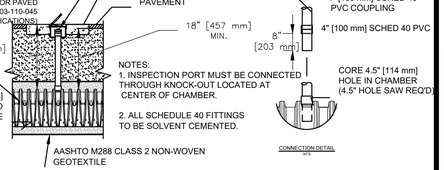
AVAIL - STANDARD HEADERS AVAILABLE

ADS 1-800-821-6710

MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS.
WHEN USING STANDARD END CAPS, CORRUGATED PIPE UP TO 18 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 24" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

MANIFOLDS

P9



SC-740 INSPECTION PORT DETAIL

P10

INSPECTION AND MAINTENANCE:

DUE TO THE CRITICAL NATURE OF INSPECTION AND MAINTENANCE STORMTECH SYSTEM AS DETAILED IN THE DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH) THE FOLLOWING THREE FIRMS ARE RECOMMENDED FOR THIS TASK. IT IS HIGHLY RECOMMENDED THAT THE OPERATOR OF THE PROPERTY HAVE A LONG TERM INSPECTION AND MAINTENANCE CONTACT WITH A FIRM THAT CAN COMPLETE THESE VITAL SERVICES.

AS FOR ISOLATOR ROW MAINTENANCE, CB MAINTENANCE, ETC., REGIONAL ADS REPRESENTATIVES RECOMMEND USING ANY OF THE FOLLOWING CONTACTS:

STORMWATER COMPLIANCE, LLC;
ATTN: NATHAN MARLES, 1-877-271-9055; NMARLES@LIDTECH.COM
163 THADEUS STREET, PORTLAND, ME 04106
INFO@STORMWATERCOMP.COM

TED BERRY COMPANY;
ATTN: DAVE BEAUCHAMP, 207-897-3348; DAVID.BEAUCHAMP@TEDBERRYCOMPANY.COM
521 FEDERAL ROAD, LIVERMORE, ME 04253
INFL@TEDBERRYCOMPANY.COM

BELLEMORE SEPTIC, SEWER, & DRAIN;
ATTN: RAY BELLEMORE, 603-641-6640; RAYMOND@BELLEMORE.COM
PO BOX 10369, BEDFORD, NH 03110

CONTACT AARON CHEEVER, P.E., ADVANCE DRAINAGE SYSTEMS, INC.
AARON.CHEEVER@ADS-PIPE.COM 1-978-302-0650
FOR PRODUCT AND PRICING

P-106A

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

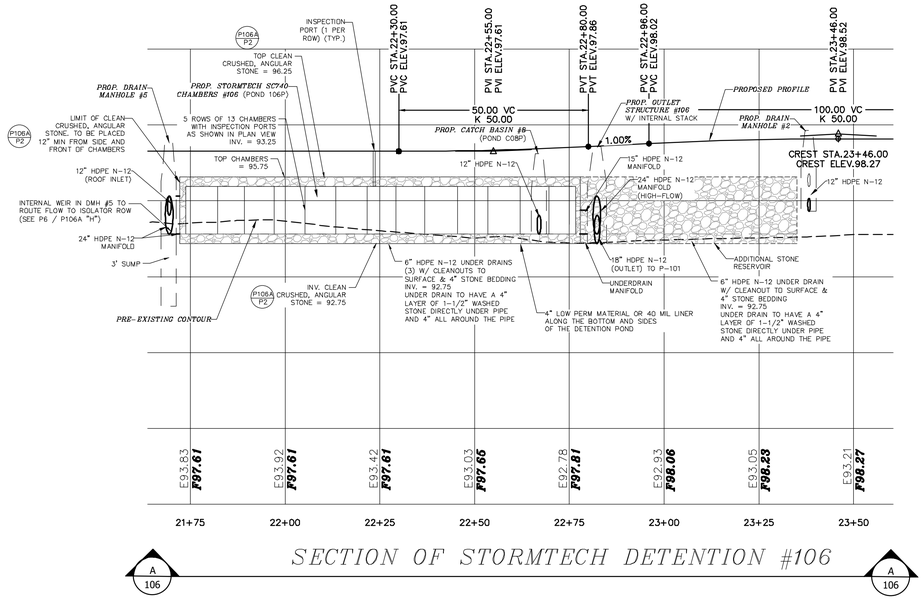
STORMTECH SC740 CHAMBER DETENTION POND #106A
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

KENNETH A. BERRY No. 14245 - STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SECTION OF STORMTECH DETENTION #106

GRAPHIC SCALE

20 0 10 20 40 80

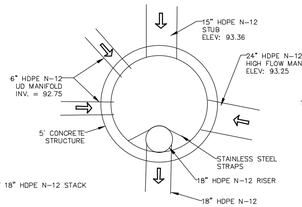
(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.

LOW PERMEABILITY MATERIAL GRADATION

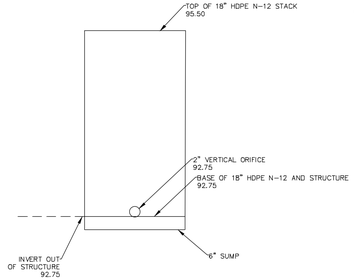
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 - 100
#40	60 - 95
#100	40 - 60
#200	25 - 45

P11

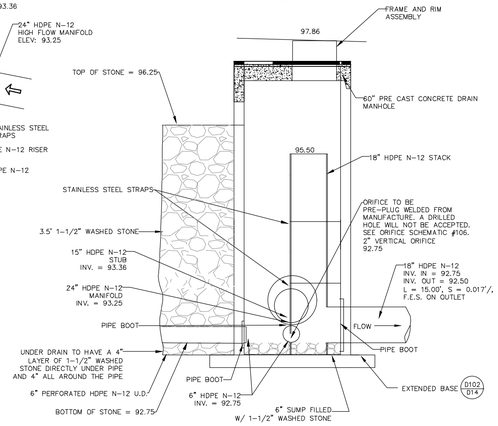
TOP VIEW
NOT TO SCALE (NO FRAME AND RIM IN THIS VIEW)



ORIFICE SCHEMATIC #106
NOT TO SCALE



OUTLET STRUCTURE #106
NOT TO SCALE



PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

STORMTECH SC740 CHAMBER DETENTION POND #106B DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14015
LICENSED PROFESSIONAL ENGINEER

P-106B

NOT FOR CONSTRUCTION

Welcome to New Hampshire's Watershed Report Cards built from the 2018, 305(b)/303(d)

Each Watershed Report Card covers a single 12 digit Hydrologic Unit Code (HUC12), on average a 34 square mile area. Each Watershed Report Card has three components;

1. REPORT CARD - A one page card that summarizes the overall use support for Aquatic Life Integrity, Primary Contact (i.e. Swimming), and Secondary Contact (i.e. Boating) Designated Uses on every Assessment Unit ID (AUID) within the HUC12.
2. HUC 12 MAP - A map of the watershed with abbreviated labels for each AUID within the HUC12.
3. ASSESSMENT DETAILS - Anywhere from one to forty pages with the detailed assessment information for each and every AUID in the Report Card and Map.

How are the Surface Water Quality Assessment determinations made?

All readily available data with reliable Quality Assurance/Quality Control is used in the biennial surface water quality assessments. For a full understanding of how the Surface Water Quality Standards (Env-Wq 1700) are translated into surface water quality assessments we urge the reader to review the 2018 Consolidated Assessment and Listing Methodology (CALM) at https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/documents/r-wd-19-04.pdf.

Where can I find more advanced mapping resources?

GIS files are available by assessment cycle at ftp://pubftp.nh.gov/DES/wmb/WaterQuality/SWQA/2018/GIS

I'd like to see the more raw water quality data?

The web mapping tool allows you to download the data used in the assessment of the primary contact and aquatic life designated uses by clicking on the "Data Access Waterbody Data (Aquatic Life and Swimming Uses)" link for any assessment unit. (https://www.des.nh.gov/organization/divisions/water/wmb/swqa/assessment-viewers.htm)

How are assessments coded in the report card?

Assessment outcomes are displayed on a color scale as well as an alpha numeric scale that provides additional distinctions for the designated use and parameter level assessments as outlined in the table below.

		Severe Not Supporting, Severe	**Poor** Not Supporting, Marginal	**Likely Bad** Insufficient Information – Potentially Not Supporting	**No Data** No Data	**Likely Good** Insufficient Information – Potentially Full Supporting	**Marginal** Full Support, Marginal	**Good** Full Support, Good
CATEGORY	**Description**							
Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL* Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL^ Needed	5-P	5-M or 5-T					

* TMDL stands for Total Maximum Daily Load studies (http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm)

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010600030903

HUC 12 NAME BELLAMY RIVER

(Locator map on next page only applies to this HUC12)

Assessment Cycle 2018

Good	Full Support Good
Marginal	Full Support Marginal
Likely Good	Insufficient Information – Potentially Full Support
No Data	No Data
Likely Bad	Insufficient Information – Potentially Not Support
Poor	Not Support Marginal
Severe	Not Support Severe

ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHEST600030903-01-01	E*01-01	BELLAMY RIVER NORTH	5-P	2-G	2-G	5-M
NHEST600030903-01-03	E*01-03	BELLAMY RIVER SOUTH CLEMENT POINT	5-P	2-G	2-G	5-M
NHEST600030903-01-04	E*01-04	BELLAMY RIVER SOUTH	5-P	2-G	2-G	5-M
NHIMP600030903-01	I*01	BELLAMY RIVER	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-02	I*02	BELLAMY RIVER - SAWYERS MILL DAM POND	5-M	5-M	3-ND	4A-M
NHIMP600030903-03	I*03	CANNEY BROOK - WILDLIFE POND	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-04	I*04	BELLAMY RIVER IV DAM	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-05	I*05	KNOX MARSH BROOK	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-06	I*06	UNNAMED BROOK - THORNWOOD COMMONS POND	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-07	I*07	UNNAMED BROOK - BELLAMY RIVER WILDLIFE POND	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-08	I*08	UNNAMED BROOK - FARM POND	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-09	I*09	UNNAMED BROOK - WEBSTER BROOK DAM	3-ND	3-ND	3-ND	4A-M
NHIMP600030903-10	I*10	UNNAMED BROOK - FARM POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030903-01	L*01	BARBADOES POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030903-02	L*02	BELLAMY RESERVOIR	5-M	3-ND	3-ND	4A-M
NHLAK600030903-03	L*03	SWAINS LAKE	5-P	3-PNS	3-ND	4A-M
NHLAK600030903-04	L*04	WINKLEY POND	5-P	3-ND	3-ND	4A-M
NHLAK600030903-05	L*05	BRANCH MALLEGO BROOK POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030903-06	L*06	FARM POND	3-ND	3-ND	3-ND	4A-M
NHLAK600030903-07	L*07	UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-01	R*01	MADLA BROOK	5-P	3-ND	3-ND	4A-M
NHRIV600030903-02	R*02	MALLEGO BROOK	5-P	3-ND	3-ND	4A-M
NHRIV600030903-03	R*03	CALEF BROOK	3-ND	3-PAS	3-PAS	4A-M
NHRIV600030903-05	R*05	UNNAMED BROOK - TO SWAINS LAKE	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-06	R*06	BELLAMY RIVER - UNNAMED BROOK	5-M	3-ND	3-ND	4A-M
NHRIV600030903-07	R*07	BELLAMY RIVER	5-P	4A-P	4A-P	4A-M
NHRIV600030903-08	R*08	BELLAMY RIVER - KELLY BROOK - KNOX MARSH BROOK	5-P	4A-P	3-PNS	4A-M
NHRIV600030903-09	R*09	BELLAMY RIVER - UNNAMED BROOK	5-M	4A-P	3-ND	4A-M

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010600030903

HUC 12 NAME BELLAMY RIVER

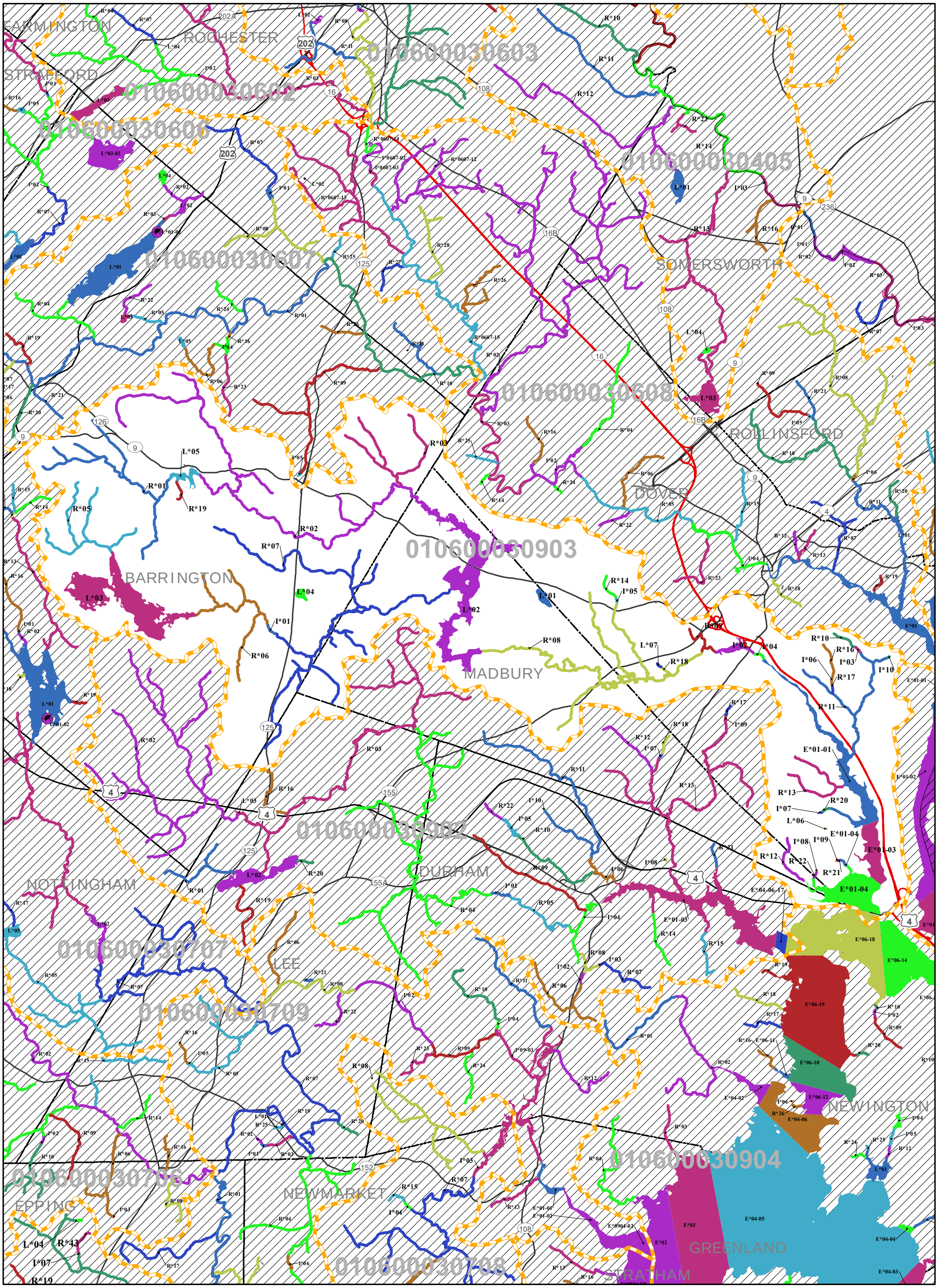
(Locator map on next page only applies to this HUC12)

Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe

ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHRIV600030903-10	R*10	CANNEY BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-11	R*11	VARNEY BROOK - CANNEY BROOK	3-ND	4A-P	4A-M	4A-M
NHRIV600030903-12	R*12	UNNAMED BROOK - TO BELLAMY RIVER ROYALLS COVE	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-13	R*13	GARRISON BROOK	3-ND	4A-P	3-ND	4A-M
NHRIV600030903-14	R*14	KNOX MARSH BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-16	R*16	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-17	R*17	VARNEY BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-18	R*18	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-19	R*19	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-20	R*20	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-21	R*21	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV600030903-22	R*22	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M

AUIDs For HUC12: 010600030903 - Bellamy River



Scale:1:78,820

Assessment Unit IDs are derived from the HUC12 they reside within. The labels have been shortened on this map for presentation purposes.
Example: the Label "L*03" in HUC12 = 010700060201 represents AUID = "NHLAK700060201-03"
In rare cases where an AUID extends beyond the boundary of a single HUC12, additional portions of the end of the HUC 12 number have also been replaced.

S:\WD-Watershed\WQ_Planning\305b_303d\2018\AUIDs\HUC12Maps

Assessment Unit ID NHRIV600030903-08 Size 9.4540 MILES

Assessment Unit Name BELLAMY RIVER - KELLY BROOK - KNOX MARSH Beach N

Primary Town MADBURY Assessment Unit Category*~ 5-P

2018, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	*Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority
Aquatic Life Integrity	5-P	ALKALINITY, CARBONATE AS CACO3	N	1990	1990	3-ND	
		AMMONIA (TOTAL)	N	1997	N/A	3-ND	
		ARSENIC	N	1990	N/A	3-ND	
		Aluminum	N	2017	2017	5-M	LOW
		Benthic-Macroinvertebrate Bioassessments (Streams)	N	2000	2000	5-P	LOW
		CADMIUM	N	1990	N/A	3-ND	
		CHLORIDE	N	2018	N/A	3-PAS	
		COPPER	N	2016	2016	3-PNS	
		DISSOLVED OXYGEN SATURATION	N	2018	2007	3-PAS	
		Fishes Bioassessments (Streams)	N			3-PAS	
		Habitat Assessment (Streams)	N	2000	2000	4C-P	
		IRON	N	1997	N/A	3-ND	
		LEAD	N	2000	2000	3-ND	
		NICKEL	N	1990	N/A	3-ND	
		OXYGEN, DISSOLVED	N	2018	2016	2-M	
		PHOSPHORUS (TOTAL)	N	2017	NLV	3-PAS	
		SELENIUM	N	1990	N/A	3-ND	
		TURBIDITY	N	2017	2008	3-PAS	
		ZINC	N	2016	1998	3-PAS	
		pH	N	2018	2017	5-M	LOW
Fish Consumption	4A-M	ARSENIC	N	1990	1990	3-ND	
		COPPER	N	2016	N/A	3-PNS	
		MANGANESE	N	1990	N/A	3-ND	
		Mercury	N			4A-M	
		NICKEL	N	1990	N/A	3-ND	
		SELENIUM	N	1990	N/A	3-ND	
		ZINC	N	2016	N/A	3-PNS	
Potential Drinking Water Supply	2-G	ARSENIC	N	1990	1990	3-ND	
		COPPER	N	2016	N/A	3-PAS	

Severe	Poor	Likely Bad	No Data	Likely Good	Marginal	Good
Not Supporting, Severe	Not Supporting, Marginal	Insufficient Information – Potentially Full Supporting	No Data	Insufficient Information – Potentially Full Supporting	Full Support, Marginal	Full Support, Good

*DES Categories; 2-G = Supports Parameter well above criteria, 2-M = Supports Parameter marginally above criteria, 2-OBS = Exceeds WQ criteria but natural therefore not a WQ exceedence, 3-ND = Insufficient Information/No data, 3-PAS= Insufficient Information/Potentially Attaining Standard, 3-PNS= Insufficient Information/Potentially Not Attaining Standard, (4A=Impaired/TMDL Completed, 4B=Impaired/Other Measure will rectify Impairment, 4C=Impaired/Non-Pollutant, 5=Impaired/TMDL needed) M=Marginal Impairment, P=Severe Impairment, T=Threatened (http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

Assessment Unit ID NHRIV600030903-08 Size 9.4540 MILES

Assessment Unit Name BELLAMY RIVER - KELLY BROOK - KNOX MARSH Beach N

Primary Town MADBURY Assessment Unit Category*~ 5-P

2018, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	*Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority
Potential Drinking Water Supply	2-G	ESCHERICHIA COLI	N	2017	2017	3-PNS	
		FECAL COLIFORM	N	1990	1990	3-ND	
		FLUORIDE	N	1997	N/A	3-ND	
		IRON	N	1997	1997	3-ND	
		MANGANESE	N	1990	N/A	3-ND	
		NICKEL	N	1990	N/A	3-ND	
		SELENIUM	N	1990	N/A	3-ND	
		SULFATES	N	2016	N/A	3-PAS	
		ZINC	N	2016	N/A	3-PAS	
Primary Contact Recreation	4A-P	CHLOROPHYLL-A	N	1990	N/A	3-ND	
		Escherichia coli	N	2017	2017	4A-P	
Secondary Contact Recreation	3-PNS	ESCHERICHIA COLI	N	2017	2016	3-PNS	
Wildlife	3-ND						

Severe	Poor	Likely Bad	No Data	Likely Good	Marginal	Good
Not Supporting, Severe	Not Supporting, Marginal	Insufficient Information – Potentially Full Supporting	No Data	Insufficient Information – Potentially Full Supporting	Full Support, Marginal	Full Support, Good

*DES Categories; 2-G = Supports Parameter well above criteria, 2-M = Supports Parameter marginally above criteria, 2-OBS = Exceeds WQ criteria but natural therefore not a WQ exceedence, 3-ND = Insufficient Information/No data, 3-PAS= Insufficient Information/Potentially Attaining Standard, 3-PNS= Insufficient Information/Potentially Not Attaining Standard, (4A=Impaired/TMDL Completed, 4B=Impaired/Other Measure will rectify Impairment, 4C=Impaired/Non-Pollutant, 5=Impaired/TMDL needed) M=Marginal Impairment, P=Severe Impairment, T=Threatened (http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

SWPPP Cut Sheet:

Filtrexx® Inlet Protection

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Inlet protection is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for storm drain **inlet protection** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons) on and around construction activities.

APPLICATION

Drain inlets are located in areas that receive runoff from surrounding lands, often exposed and disturbed soils, and are located at a low point, or in a sump. Inlet protection used around drain inlets (or *Drain* Inlet protection) should completely enclose the circumference of the drain and where possible should not be placed on a grade or slope. Inlet protection used around drain inlets should never be the only form of site sediment control and should be accompanied by erosion control/slope stabilization practices, such as Slope protection or rolled erosion control blankets (RECB). Inlet protection should never be placed where they divert runoff flow from the drain inlet, or on top of the inlet, which can cause flooding. Under high runoff and sediment loading conditions placement of 1-2 in (25-50 mm) diameter rock (AASHTO #2) may be placed around the outer circumference of the Inlet protection up to ½ the height of the Inlet protection. This will slow runoff velocity as it contacts the Inlet protection and will reduce sediment build-up and clogging of the Inlet protection.

Curb inlets are generally located on paved surfaces and are designed to rapidly drain storm runoff from roadways to prevent flooding that poses a hazard to vehicular traffic. Inlet protection devices should be placed in a manner which intercepts runoff prior to entering the inlet, but does not block or divert runoff from the inlet. To prevent diversion of runoff, Inlet protection used around curbs (or *Curb* Inlet protection) should be used in low points, or sumps, and minor slopes or grades. Inlet protection should never be placed in or on the curb inlet drain, or placed in a manner than obstructs vehicular traffic. Inlet protection height should be at least 1 in (25 mm) lower than top of curb inlet to allow for overflow into the drain and not over the curb. Maximum sediment removal efficiency occurs when minor ponding exists behind Inlet protection but should never lead to flooding.

Curb sediment containment systems are used to reduce the sediment and pollutant load flowing to a curb inlet. They are generally placed on paved surfaces perpendicular to runoff flow and should be lower than the height of the curb. Curb sediment containment systems should never cause flooding or placed where they are a hazard to vehicular traffic. Inlet protection used for curb sediment containment (or *Curb Sediment Containment* Inlet protection) can be placed on a grade but should never be placed directly upslope from curb inlet where it may inadvertently divert runoff from entering curb inlet.

INSTALLATION

1. Inlet protection used for inlet protection to reduce sediment and soluble pollutants entering storm drains shall meet Filtrexx® FilterSoxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be a Filtrexx® Certified™ Installer as determined by Filtrexx® International, LLC (440-926-2607 or visit web site at Filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (current list of installers can be found at www.filtrexx.com). Look for the Filtrexx® Certified™ Installer Seal.

3. Filtrexx® Inlet protection shall be placed at locations indicated on plans as directed by the Engineer. Inlet protection should be installed in a pattern that allows complete protection of the inlet area.
4. Installation of curb Inlet protection will ensure a minimal overlap of at least 1 ft (300mm) on either side of the opening being protected. The Inlet protection will be anchored to the soil behind the curb using staples, stakes or other devices capable of holding the Inlet protection in place.
5. Standard Inlet protection for curb inlet protection and curb sediment containment will use 8 in (200mm) diameter Inlet protection, and drain inlets on soil will use 12 in (300mm) or 18 in (450mm) diameter Inlet protection. In severe flow situations, larger Inlet protection may be specified by the Engineer. During curb installation, Inlet protection shall be compacted to be slightly shorter than curb height.
6. If Inlet protection becomes clogged with debris and sediment, they shall be maintained so as to assure proper drainage and water flow into the storm drain. In severe storm events, overflow of the Inlet protection may be acceptable in order to keep the area from flooding.
7. Curb and drain Inlet protection shall be positioned so as to provide a permeable physical barrier to the drain itself, allowing sediment to collect on the outside of the Inlet protection.
8. For drains and inlets that have only curb cuts, without street grates, a spacer is required in order to keep the Inlet protection away from the drain opening. This spacer should be a hog wire screen bent to overlap the grate opening and keep the sock from falling into the opening. Use at least one spacer for every 4 ft (1.2m) of curb drain opening. The wire grid also prevents other floatable waste from passing over the Inlet protection.
9. Stakes shall be installed through the middle of the drain Inlet protection on 5 ft (1.5m) centers, using 2 in (50mm) x 2 in (50mm) x 3 ft (1m) wood stakes.
10. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Inlet protection should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Inlet protection may be required or sediment removal may be necessary. Inlet protection shall be inspected until contributing drainage area has been permanently stabilized and construction activity has ceased

1. The Contractor shall maintain the Inlet protection in a functional condition at all times and it shall be routinely inspected.
2. If the Inlet protection has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Inlet protection when accumulation has reached 1/2 of the effective height of the Inlet protection, or as directed by the Engineer. Alternatively, for drain Inlet protection a new Soxx™ may be placed on top of the original increasing the sediment storage capacity without soil disturbance.
4. Inlet protection shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.
5. Regular maintenance includes lifting the Inlet protection and cleaning around and under them as sediment collects.
6. The FilterMedia™ will be removed from paved areas or dispersed on site soil or behind curb once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.

Table 2.4 Spacing for Curb Sediment Containment Systems.

Grade (%)	Spacing (ft)	Spacing (mm)
0.5	100	30
1.0	50	15
2.0	25	8
3.0	16	5
4.0	13	4
5.0	10	3

Source: Fifield, 2001.

Figure 2.1. Engineering Design Drawing for Curb and Drain Inlet Protection

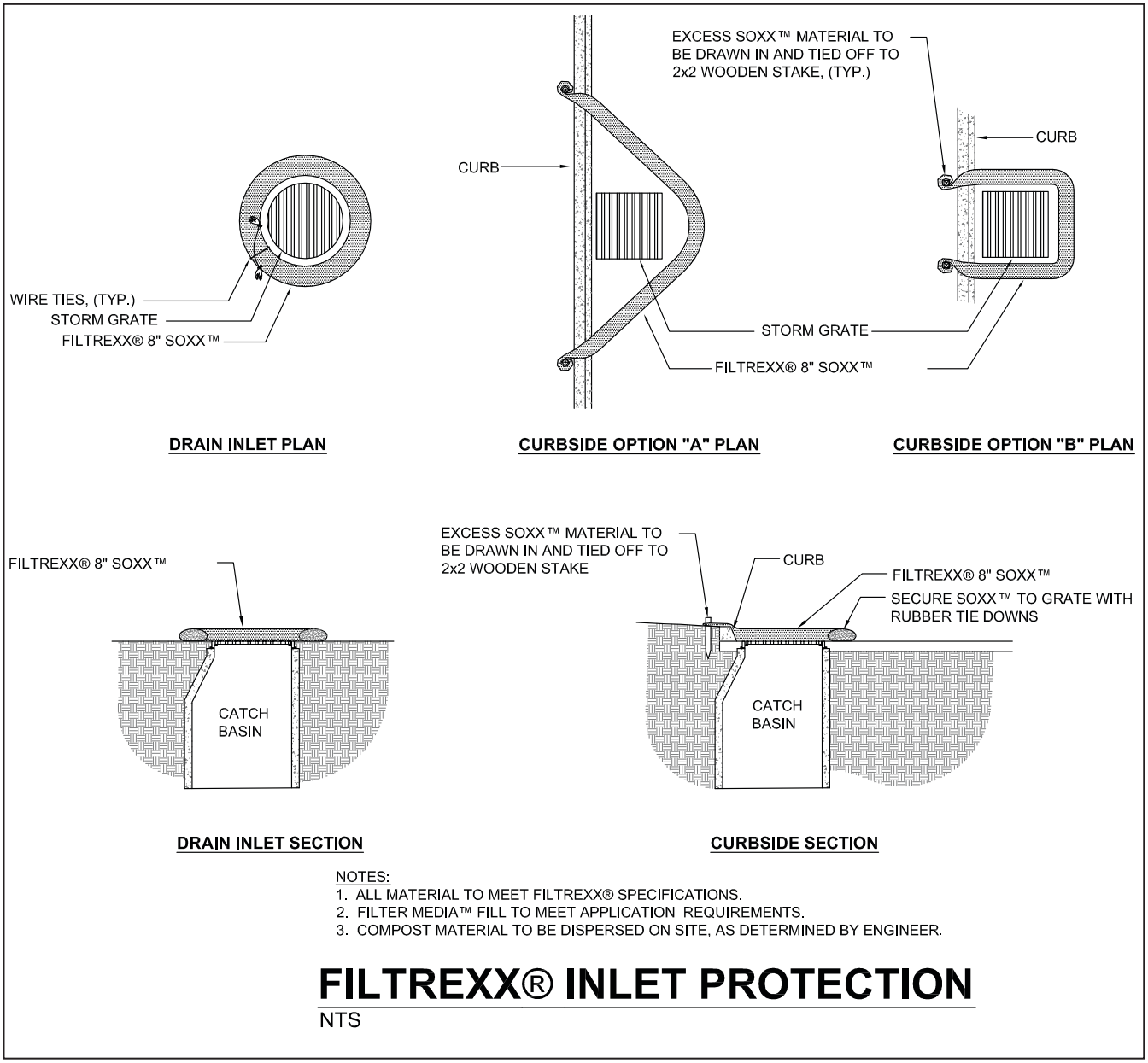
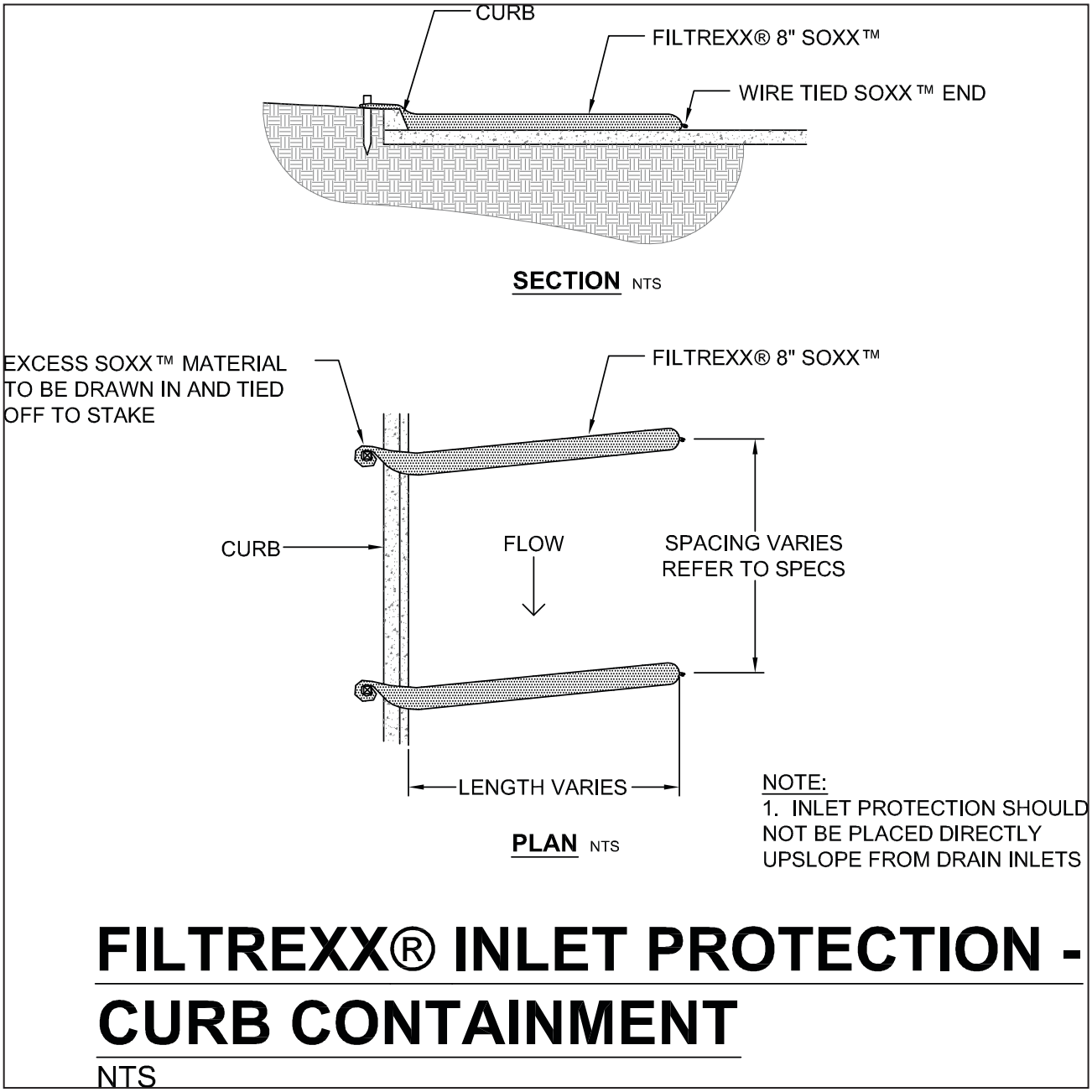


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



SWPPP Cut Sheet:

Filtrexx® Sediment Control

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Sediment control is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for **perimeter control** of sediment and other soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities.

APPLICATION

Filtrexx® Sediment control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Sediment control is effective when installed perpendicular to sheet or low concentrated flow. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation.
- On frozen ground where trenching of silt fence is impossible.
- On paved surfaces where trenching of silt fence is impossible.

INSTALLATION

1. Sediment control used for perimeter control of sediment and soluble pollutants in storm runoff shall meet Filtrexx® Soxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be Filtrexx® Certified™, or use pre-filled Filtrexx® Sediment control products manufactured by a Filtrexx® Certified Manufacturer™ as determined by Filtrexx® International, LLC (440-926-2607 or visit www.filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application. Look for the Filtrexx® Certified™ Seal.
3. Sediment control will be placed at locations indicated on plans as directed by the Engineer.
4. Sediment control should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second Sediment control shall be constructed at the top of the slope.
5. Effective Soxx™ height in the field should be as follows: 8" Diameter Sediment control = 6.5" high, 12" Diameter Sediment control = 9.5" high, 18" Diameter SiltSoxx™ = 14.5" high, 24" Diameter Sediment control = 19" high.
6. Stakes shall be installed through the middle of the Sediment control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) hard wood stakes. In the event staking is not possible, i.e., when Sediment control is used on pavement, heavy concrete blocks shall be used behind the Sediment control to help stabilize during rainfall/runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the Sediment control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for

establishment of permanent vegetation. The Engineer will specify seed requirements.

10. Filtrexx® Sediment control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct Filtrexx® Sediment control installation (Figure 1.1).

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased

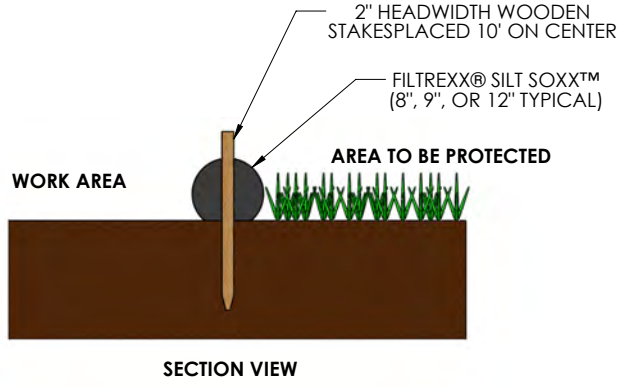
1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*				
	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	6.5 in (160 mm)**	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

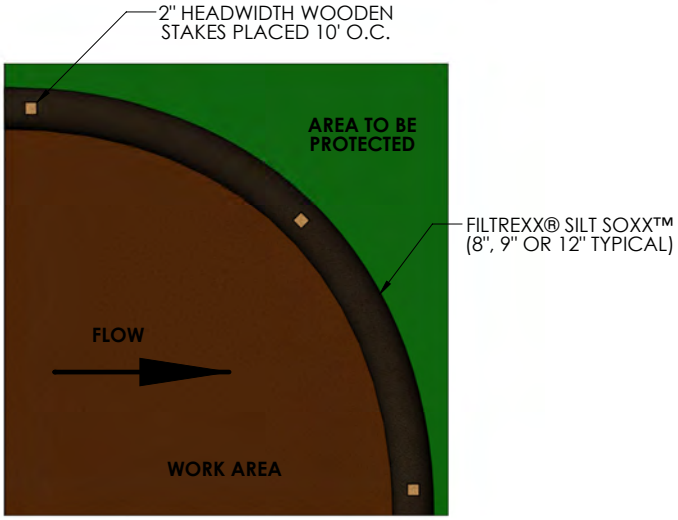
* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

FILTREXX® SILT SOXX™

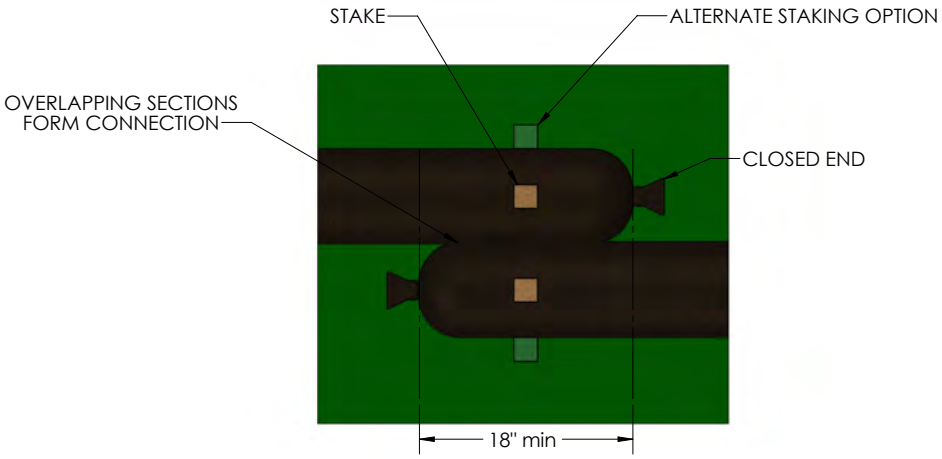


SECTION VIEW

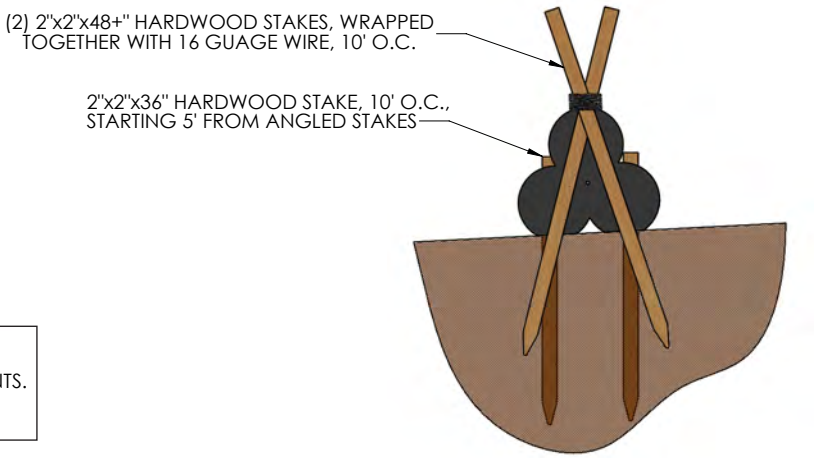


TOP VIEW

COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



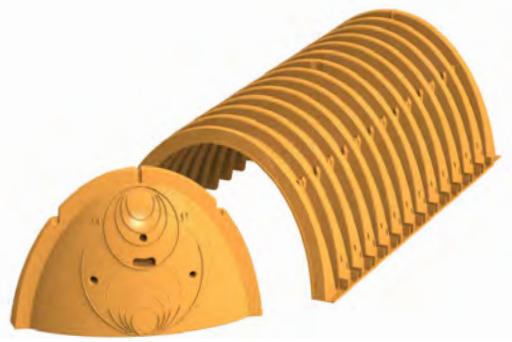
FILTREXX® PYRAMID STAKING DETAIL



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

StormTech® SC-740 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.



Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
85.4" x 51" x 30"
2,170 mm x 1,295 mm x 762 mm

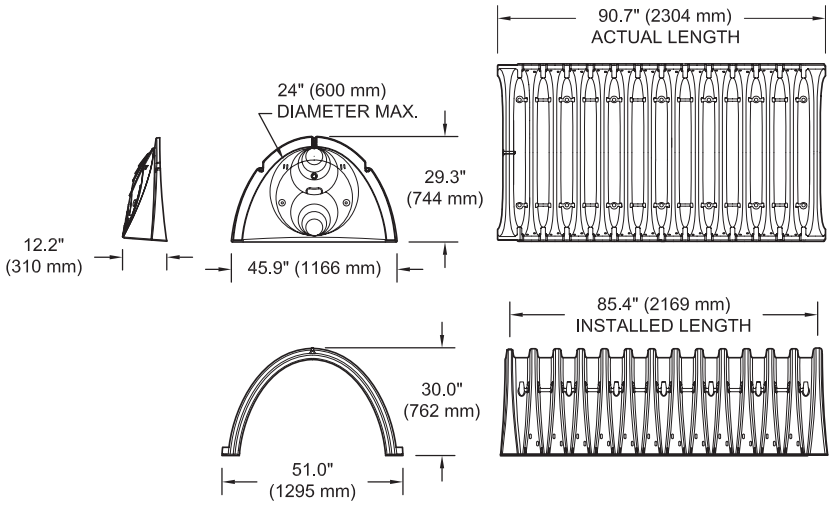
Chamber Storage
45.9 ft³ (1.30 m³)

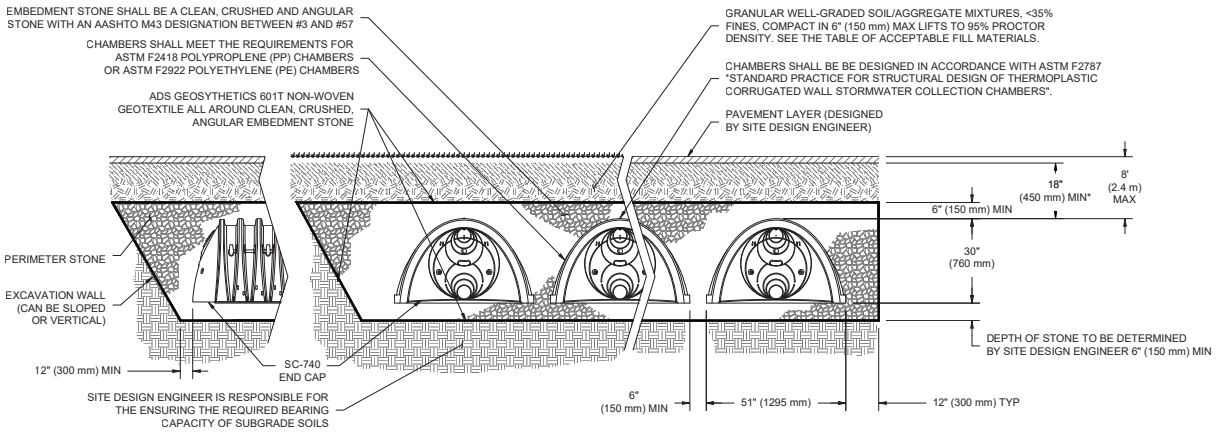
Min. Installed Storage*
74.9 ft³ (2.12 m³)

Weight
74.0 lbs (33.6 kg)

Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

*Assumes 6" (150 mm) stone above, below and between chambers and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

ADS StormTech™

StormTech SC-740 Specifications

Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6” (150 mm) Stone Base Under Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
42 (1067)	45.90 (1.300)	74.90 (2.121)
41 (1041)	45.90 (1.300)	73.77 (2.089)
40 (1016)	45.90 (1.300)	72.64 (2.057)
39 (991)	Stone Cover 45.90 (1.300)	71.52 (2.025)
38 (965)	45.90 (1.300)	70.39 (1.993)
37 (940)	45.90 (1.300)	69.26 (1.961)
36 (914)	45.90 (1.300)	68.14 (1.929)
35 (889)	45.85 (1.298)	66.98 (1.897)
34 (864)	45.69 (1.294)	65.75 (1.862)
33 (838)	45.41 (1.286)	64.46 (1.825)
32 (813)	44.81 (1.269)	62.97 (1.783)
31 (787)	44.01 (1.246)	61.36 (1.737)
30 (762)	43.06 (1.219)	59.66 (1.689)
29 (737)	41.98 (1.189)	57.89 (1.639)
28 (711)	40.80 (1.155)	56.05 (1.587)
27 (686)	39.54 (1.120)	54.17 (1.534)
26 (660)	38.18 (1.081)	52.23 (1.479)
25 (635)	36.74 (1.040)	50.23 (1.422)
24 (610)	35.22 (0.977)	48.19 (1.365)
23 (584)	33.64 (0.953)	46.11 (1.306)
22 (559)	31.99 (0.906)	44.00 (1.246)
21 (533)	30.29 (0.858)	1.85 (1.185)
20 (508)	28.54 (0.808)	39.67 (1.123)
19 (483)	26.74 (0.757)	37.47 (1.061)
18 (457)	24.89 (0.705)	35.23 (0.997)
17 (432)	23.00 (0.651)	32.96 (0.939)
16 (406)	21.06 (0.596)	30.68 (0.869)
15 (381)	19.09 (0.541)	28.36 (0.803)
14 (356)	17.08 (0.484)	26.03 (0.737)
13 (330)	15.04 (0.426)	23.68 (0.670)
12 (305)	12.97 (0.367)	21.31 (0.608)
11 (279)	10.87 (0.309)	18.92 (0.535)
10 (254)	8.74 (0.247)	16.51 (0.468)
9 (229)	6.58 (0.186)	14.09 (0.399)
8 (203)	4.41 (0.125)	11.66 (0.330)
7 (178)	2.21 (0.063)	9.21 (0.264)
6 (152)	0 (0)	6.76 (0.191)
5 (127)	0 (0)	5.63 (0.160)
4 (102)	Stone Foundation 0 (0)	4.51 (0.128)
3 (76)	0 (0)	3.38 (0.096)
2 (51)	0 (0)	2.25 (0.064)
1 (25)	0 (0)	1.13 (0.032)

Note: Add 1.13 ft³ (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber ft³ (m³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)		
		6 (150)	12 (300)	18 (450)
SC-740 Chamber	45.9 (1.3)	74.9 (2.1)	81.7 (2.3)	88.4 (2.5)

Note: Assumes 6” (150 mm) stone above chambers, 6” (150 mm) row spacing and 40% stone porosity.

Amount of Stone Per Chamber

English Tons (yds³)	Stone Foundation Depth		
	6”	12”	16”
SC-740	3.8 (2.8)	4.6 (3.3)	5.5 (3.9)
Metric Kilograms (m³)	**150 mm**	**300 mm**	**450 mm**
SC-740	3,450 (2.1)	4,170 (2.5)	4,490 (3.0)

Note: Assumes 6” (150 mm) of stone above and between chambers.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth		
	6 (150)	12 (300)	18 (450)
SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)

Note: Assumes 6” (150 mm) of row separation and 18” (450 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

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ADS StormTech™

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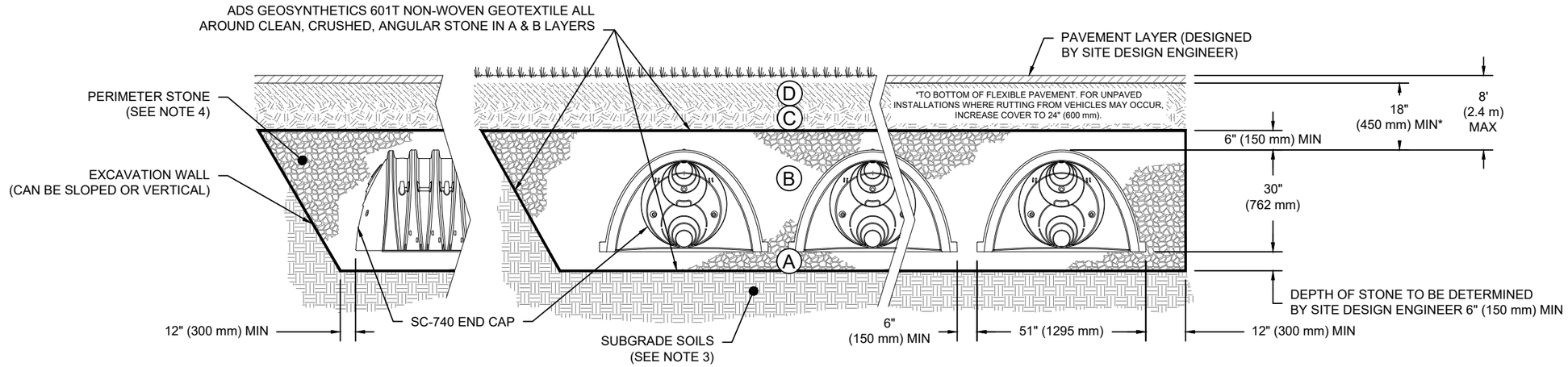
ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

SC-740
STANDARD CROSS SECTION
DATE: 9/12/22
DRAWN: KLJ
PROJECT #:
CHECKED: KLJ

DATE	DRWN	CHKD	DESCRIPTION

StormTech®
Chamber System
888-892-2694 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026

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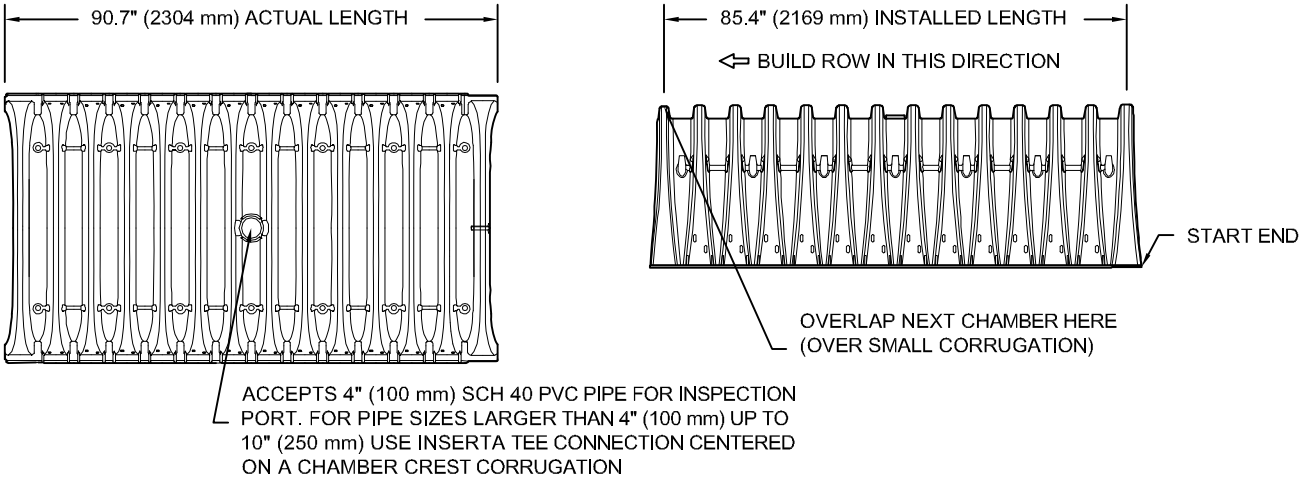
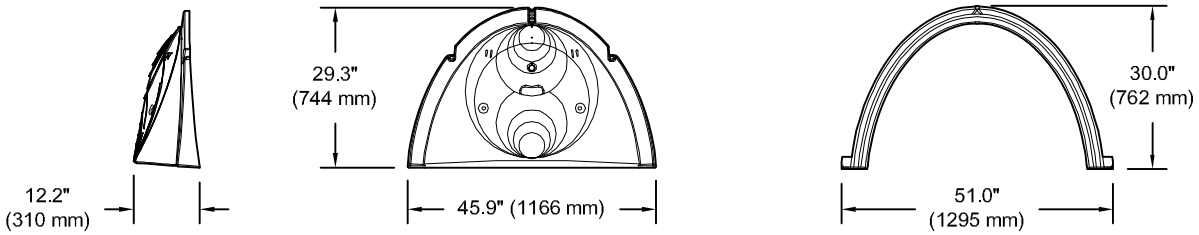
SC-740 TECHNICAL SPECIFICATION

NTS

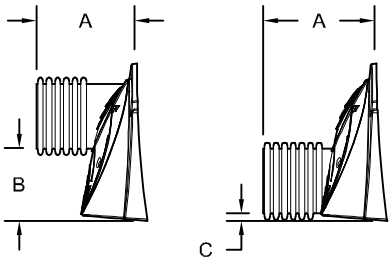




NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



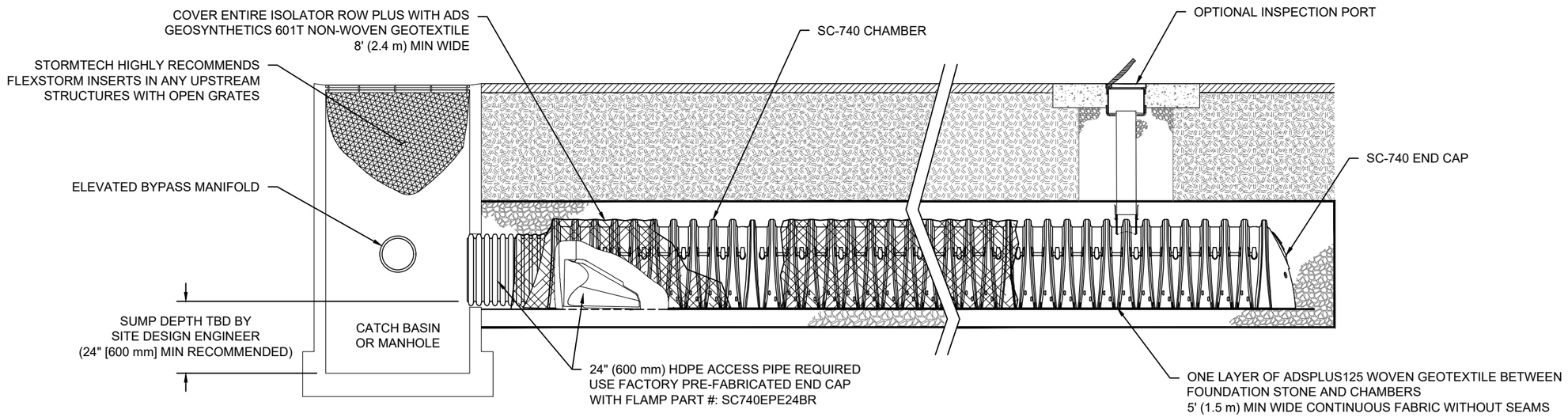
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	—
SC740EPE06B / SC740EPE06BPC			—	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	—
SC740EPE08B / SC740EPE08BPC			—	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	—
SC740EPE10B / SC740EPE10BPC			—	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	—
SC740EPE12B / SC740EPE12BPC			—	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	—
SC740EPE15B / SC740EPE15BPC			—	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	—
SC740EPE18B / SC740EPE18BPC			—	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	—	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL



SC-740 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

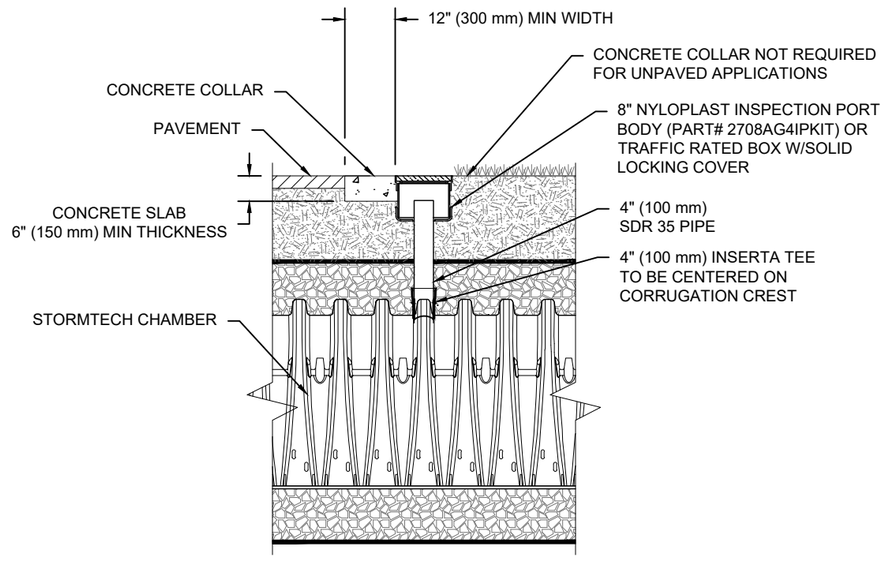
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL
(SC SERIES CHAMBER)
NTS

SC-740
ISOLATOR ROW PLUS DETAILS

DATE: 9/12/22 | DRAWN: KLJ | PROJECT #: | CHECKED: KLJ

DATE	DRWN	CHKD	DESCRIPTION

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Isolator® Row Plus
O&M Manual

ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

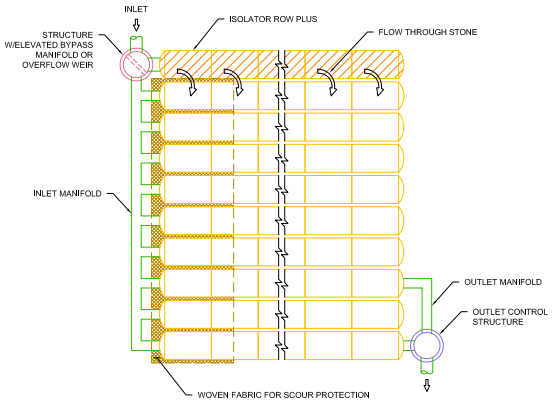
The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.

StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

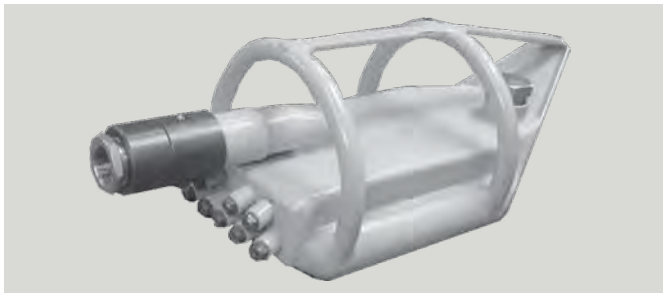
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

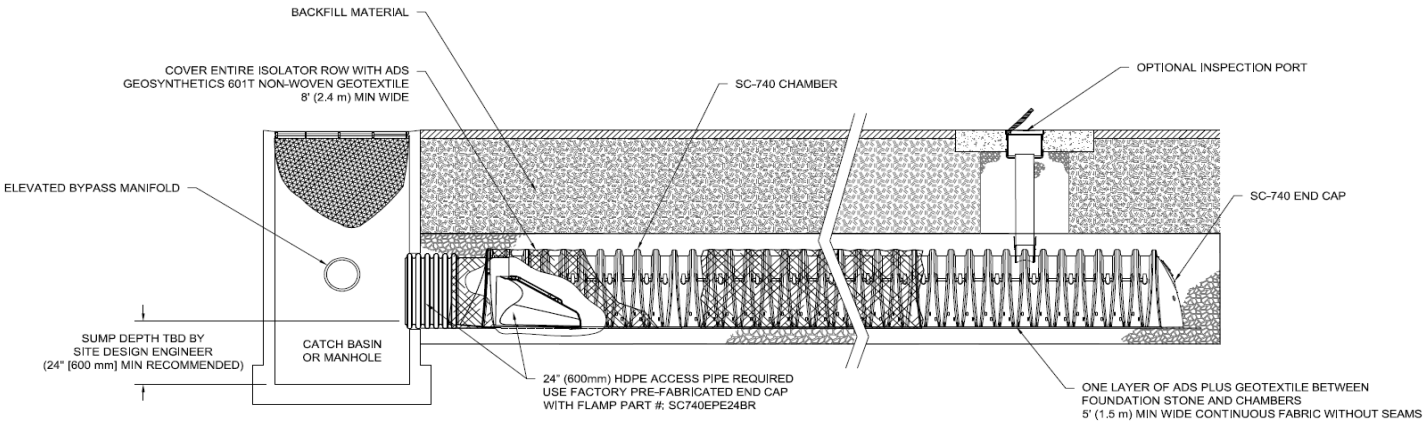
The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
- i. Remove lid from floor box frame
- ii. Remove cap from inspection riser
- iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
- iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
- i. Remove cover from manhole at upstream end of Isolator Row Plus
- ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
  1. Mirrors on poles or cameras may be used to avoid a confined space entry
  2. Follow OSHA regulations for confined space entry if entering manhole
- iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
  If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

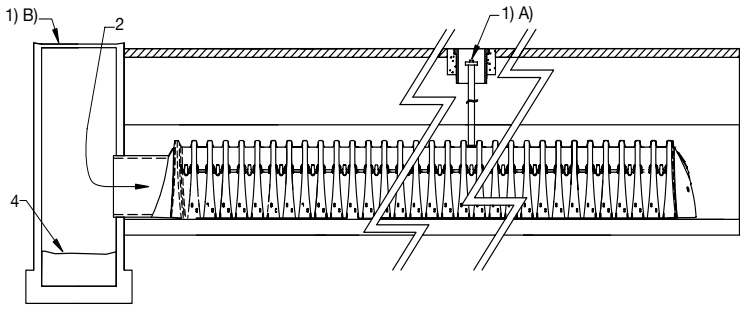
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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ADS StormTech® Installation Guide

SC-310/SC-740/DC-780

StormTech Installation Video

Required Materials and Equipment List

- Acceptable fill materials per Table 1
- ADS Plus and non-woven geotextile fabrics
- StormTech solid end caps and pre-cored end caps
- StormTech chambers
- StormTech manifolds and fittings

Important Notes:

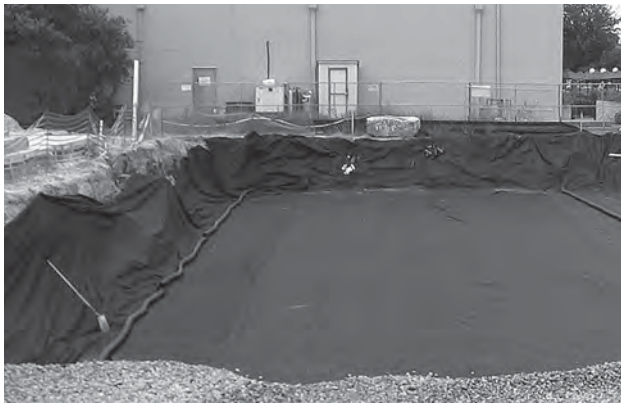
A. This installation guide provides the minimum requirements for proper installation of chambers. Non-adherence to this guide may result in damage to chambers during installation. Replacement of damaged chambers during or after backfilling is costly and very time consuming. It is recommended that all installers are familiar with this guide, and that the contractor inspects the chambers for distortion, damage and joint integrity as work progresses.

B. Use of a dozer to push embedment stone between the rows of chambers may cause damage to chambers and is not an acceptable backfill method. Any chambers damaged by using the "dump and push" method are not covered under the StormTech standard warranty.

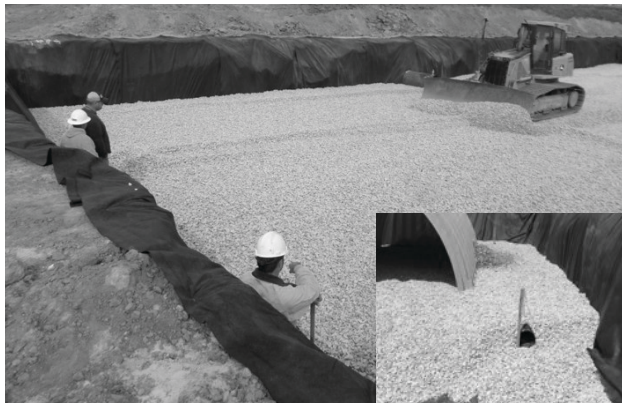
C. Care should be taken in the handling of chambers and end caps. Avoid dropping, prying or excessive force on chambers during removal from pallet and initial placement.

Requirements for System Installation

Excavate bed and prepare subgrade per engineer's plans.



Place non-woven geotextile over prepared soils and up excavation walls. Install underdrains if required.



Place clean, crushed, angular stone foundation 6" (150 mm) min. Compact to achieve a flat surface.

Manifold, Scour Fabric and Chamber Assembly

Install manifolds and lay out ADS Plus fabric at inlet rows (min. 12.5 ft (3.8 m)) at each inlet end cap. Place a continuous piece along entire length of Isolator® Plus Row(s).

Align the first chamber and end cap of each row with inlet pipes. Contractor may choose to postpone stone placement around end chambers and leave ends of rows open for easy inspection of chambers during the backfill process.

Continue installing chambers by overlapping chamber end corrugations. Chamber joints are labeled "Lower Joint – Overlap Here" and "Build this direction – Upper Joint" Be sure that the chamber placement does not exceed the reach of the construction equipment used to place the stone. Maintain minimum 6" (150 mm) spacing between rows.

Attaching the End Caps

Lift the end of the chamber a few inches off the ground. With the curved face of the end cap facing outward, place the end cap into the chamber's end corrugation.

Prefabricated End Caps

24" (600 mm) inlets are the maximum size that can fit into a SC-740/DC-780 end cap and must be prefabricated with a 24" (600 mm) pipe stub. SC-310 chambers with a 12" (300 mm) inlet pipe must use a prefabricated end cap with a 12" (300 mm) pipe stub. When used on an Isolator Row Plus, these end caps will contain a welded FLAMP (flared end ramp) that will lay on top of the ADS Plus fabric (shown above)

Isolator Row Plus

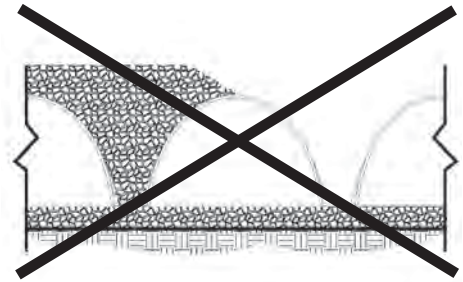
Place a continuous layer of ADS Plus fabric between the foundation stone and the Isolator Row Plus chambers, making sure the fabric lays flat and extends the entire width of the chamber feet. Drape a strip of ADS non-woven geotextile over the row of chambers (not required over DC-780). This is the same type of non-woven geotextile used as a separation layer around the angular stone of the StormTech system.

Initial Anchoring of Chambers – Embedment Stone

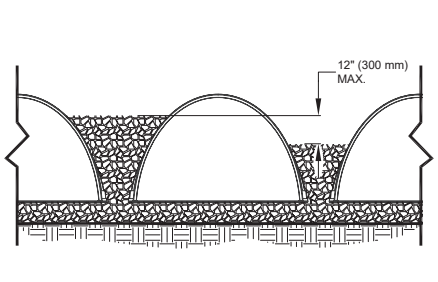
Initial embedment shall be spotted along the centerline of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.

No equipment shall be operated on the bed at this stage of the installation. Excavators must be located off the bed. Dump trucks shall not dump stone directly on to the bed. Dozers or loaders are not allowed on the bed at this time.

Backfill of Chambers – Embedment Stone

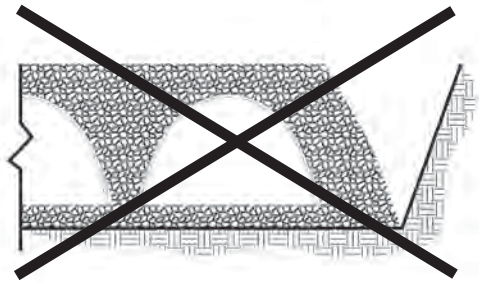


Uneven Backfill

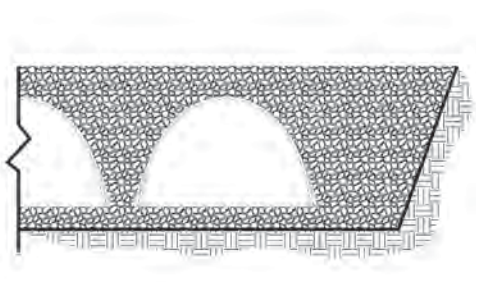


Even Backfill

Backfill chambers evenly. Stone column height should never differ by more than 12” (300 mm) between adjacent chamber rows or between chamber rows and perimeter.



Perimeter Not Backfilled



Perimeter Fully Backfilled

Perimeter stone must be brought up evenly with chamber rows. Perimeter must be fully backfilled, with stone extended horizontally to the excavation wall.

Backfill - Embedment Stone & Cover Stone

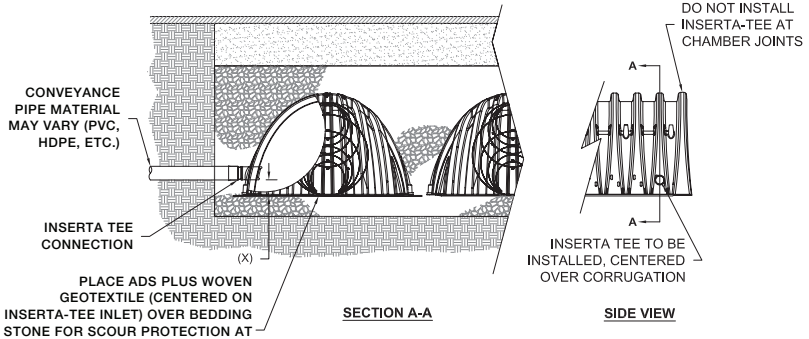
Continue evenly backfilling between rows and around perimeter until embedment stone reaches tops of chambers. Perimeter stone must extend horizontally to the excavation wall for both straight or sloped sidewalls. **Only after chambers have been backfilled to top of chamber and with a minimum 6" (150 mm) of cover stone on top of chambers can small dozers be used over the chambers for backfilling remaining cover stone.**

Small dozers and skid loaders may be used to finish grading stone backfill in accordance with ground pressure limits in Table 2. They must push material parallel to rows only. Never push perpendicular to rows. StormTech recommends that the contractor inspect chambers before placing final backfill. Any chambers damaged by construction shall be removed and replaced.

Final Backfill of Chambers – Fill Material

Install non-woven geotextile over stone. Geotextile must overlap 24" (600 mm) min. where edges meet. Compact each lift of backfill as specified in the site design engineer's drawings. Roller travel parallel with rows.

Inserta Tee Detail



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 36, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON.		

NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.

StormTech Isolator Row Plus Detail

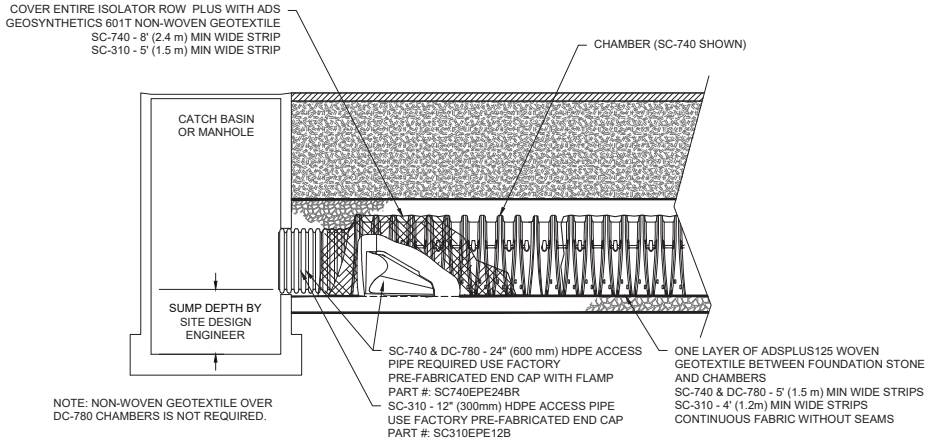


Table 1- Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation[1]	Compaction/Density Requirement
(D) **Final Fill:** Fill Material for layer 'D' starts from the top of the 'C' layer to the bottom of flexible pavement or unpaved finished grade above. Note that the pavement subbase may be part of the 'D' layer.	Any soil/rock materials, native soils or per engineer's plans. Check plans for pavement subgrade requirements.	N/A	Prepare per site design engineer's plans. Paved installations may have stringent material and preparation requirements.
(C) **Initial Fill:** Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 18" (450 mm) above the top of the chamber. Note that pavement subbase may be part of the 'C' layer.	Granular well-graded soil/aggregate mixtures, <35% fines or processed aggregate. Most pavement subbase materials can be used in lieu of this layer.	AASHTO M45 A-1, A-2-4, A-3 or AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after min. 12" (300 mm) of material over the chambers is reached. Compact additional layers in 6" (150 mm) max. lifts to a min. 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials. Roller gross vehicle weight not to exceed 12,000 lbs (53 kN). Dynamic force not to exceed 20,000 lbs (89 kN)
(B) **Embedment Stone:** Embedment Stone surrounding chambers from the foundation stone to the 'C' layer above.	Clean, crushed, angular stone	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	No compaction required.
(A) **Foundation Stone:** Foundation Stone below the chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone,	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	Place and compact in 6" (150 mm) lifts using two full coverages with a vibratory compactor.[2,3]

Please Note:

1. The listed AASHTO designations are for gradations only. The stone must also be clean, crushed, angular. For example, a specification for #4 stone would state: "clean, crushed, angular no. 4 (AASHTO M43) stone".
2. StormTech compaction requirements are met for 'A' location materials when placed and compacted in 6" (150 mm) (max) lifts using two full coverages with a vibratory compactor.
3. Where infiltration surfaces may be comprised by compaction, for standard installations and standard design load conditions, a flat surface may be achieved by raking or dragging without compaction equipment. For special load designs, contact StormTech for compaction requirements.

Figure 1- Inspection Port Detail

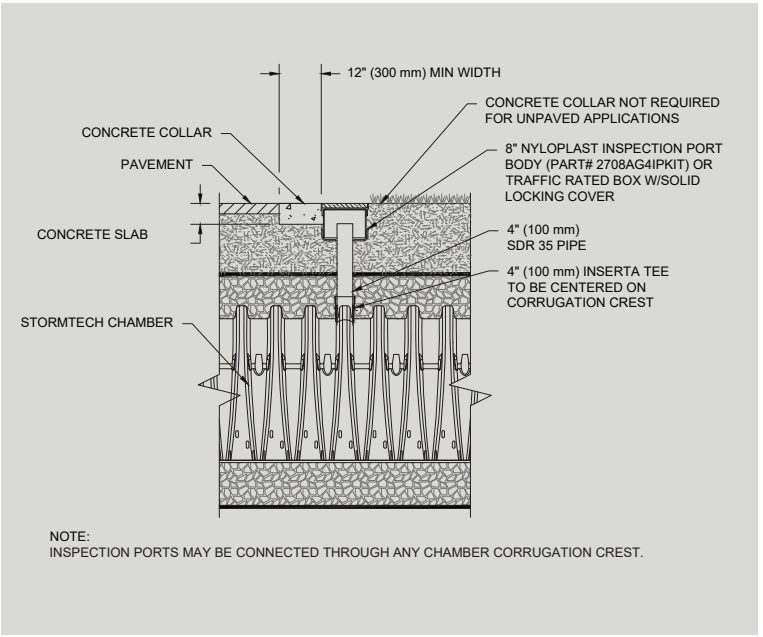
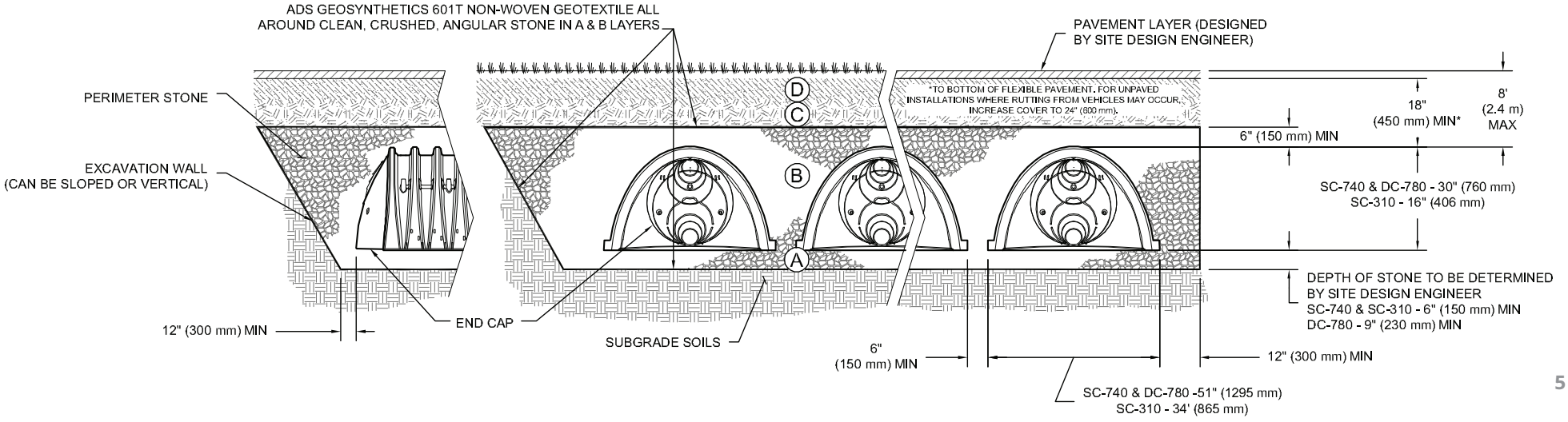


Figure 2 - Fill Material Locations



Notes:

1. 36” (900 mm) of stabilized cover materials over the chambers is recommended during the construction phase if general construction activities, such as full dump truck travel and dumping, are to occur over the bed.
2. During paving operations, dump truck axle loads on 18” (450 mm) of cover may be necessary. Precautions should be taken to avoid rutting of the road base layer, to ensure that compaction requirements have been met, and that a minimum of 18” (450 mm) of cover exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.
3. Ground pressure for track dozers is the vehicle operating weight divided by total ground contact area for both tracks. Excavators will exert higher ground pressures based on loaded bucket weight and boom extension.
4. Mini-excavators (< 8,000lbs/3,628 kg) can be used with at least 12” (300 mm) of stone over the chambers and are limited by the maximum ground pressures in Table 2 based on a full bucket at maximum boom extension.
5. Storage of materials such as construction materials, equipment, spoils, etc. should not be located over the StormTech system. The use of equipment over the StormTech system not covered in Table 2 (ex. soil mixing equipment, cranes, etc) is limited. Please contact StormTech for more information.
6. Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed.

Table 2 - Maximum Allowable Construction Vehicle Loads[6]

Material Location	Fill Depth over Chambers in. (mm)	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads[6]		Maximum Allowable Roller Loads
		Max Axle Load for Trucks lbs (kN)	Max Wheel Load for Loaders lbs (kN)	Track Width in. (mm)	Max Ground Pressure psf (kPa)	Max Drum Weight or Dynamic Force lbs (kN)
Ⓓ Final Fill Material	36” (900) Compacted	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	3880 (186) 2640 (126) 2040 (97) 1690 (81) 1470 (70)	38,000 (169)
Ⓒ Initial Fill Material	24” (600) Compacted	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2690 (128) 1880 (90) 1490 (71) 1280 (61) 1150 (55)	20,000 (89)
	24” (600) Loose/ Dumped	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2390 (114) 1700 (81) 1370 (65) 1190 (57) 1080 (51)	20,000 (89) Roller gross vehicle weight not toexceed 12,000 lbs. (53 kN)
	18” (450)	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2110 (101) 1510 (72) 1250 (59) 1100 (52) 1020 (48)	20,000 (89) Roller gross vehicle weight not to exceed 12,000 lbs. (53 kN)
Ⓑ Embedment Stone	12” (300)	16,000 (71)	NOT ALLOWED	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	1540 (74) 1190 (57) 1010 (48) 910 (43) 840 (40)	20,000 (89) Roller gross vehicle weight not to exceed 12,000 lbs. (53 kN)
	6” (150)	8,000 (35)	NOT ALLOWED	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	1070 (51) 900 (43) 800 (38) 760 (36) 720 (34)	NOT ALLOWED

Table 3 - Placement Methods and Descriptions

Material Location	Placement Methods/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Roller Load Restrictions
		See Table 2 for Maximum Construction Loads		
Ⓓ Final Fill Material	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2.	36” (900 mm) minimum cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows until 36” (900mm) compaced cover is reached.[4]	Roller travel parallel to rows only until 36” (900 mm) compacted cover is reached.
Ⓒ Initial Fill Material	Excavator positioned off bed recommended. Small excavator allowed over chambers. Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 18” (450 mm) above top of chambers.	Small LGP track dozers & skid loaders allowed to grade cover stone with at least 6” (150 mm) stone under tracks at all times. Equipment must push parallel to rows at all times.	Use dynamic force of roller only after compacted fill depth reaches 12” (300 mm) over chambers. Roller travel parallel to chamber rows only.
Ⓑ Embedment Stone	No equipment allowed on bare chambers. Use excavator or stone conveyor positioned off bed or on foundation stone to evenly fill around all chambers to at least the top of chambers.	No wheel loads allowed. Material must be placed outside the limits of the chamber bed.	No tracked equipment is allowed on chambers until a min. 6” (150 mm) cover stone is in place.	No rollers allowed.
Ⓐ Foundation Stone	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			

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StormTech® Standard Limited Warranty

STANDARD LIMITED WARRANTY OF STORMTECH LLC ("STORMTECH"): PRODUCTS

(A) This Limited Warranty applies solely to the StormTech chambers and end plates manufactured by StormTech and sold to the original purchaser (the "Purchaser"). The chambers and end plates are collectively referred to as the "Products."

(B) The structural integrity of the Products, when installed strictly in accordance with StormTech's written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech's corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech's liability specifically excludes the cost of removal and/or installation of the Products.

(C) THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

(D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.

(E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.

(F) Under no circumstances shall StormTech be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the Products, or the cost of other goods or services related to the purchase and installation of the Products. For this Limited Warranty to apply, the Products must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and StormTech's written installation instructions.

(G) THE LIMITED WARRANTY DOES NOT EXTEND TO INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES. STORMTECH SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS; LABOR AND MATERIALS; OVERHEAD COSTS; OR OTHER LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY. SPECIFICALLY EXCLUDED FROM LIMITED WARRANTY COVERAGE ARE DAMAGE TO THE PRODUCTS ARISING FROM ORDINARY WEAR AND TEAR; ALTERATION, ACCIDENT, MISUSE, ABUSE OR NEGLECT; THE PRODUCTS BEING SUBJECTED TO VEHICLE TRAFFIC OR OTHER CONDITIONS WHICH ARE NOT PERMITTED BY STORMTECH'S WRITTEN SPECIFICATIONS OR INSTALLATION INSTRUCTIONS; FAILURE TO MAINTAIN THE MINIMUM GROUND COVERS SET FORTH IN THE INSTALLATION INSTRUCTIONS; THE PLACEMENT OF IMPROPER MATERIALS INTO THE PRODUCTS; FAILURE OF THE PRODUCTS DUE TO IMPROPER SITING OR IMPROPER SIZING; OR ANY OTHER EVENT NOT CAUSED BY STORMTECH. A PRODUCT ALSO IS EXCLUDED FROM LIMITED WARRANTY COVERAGE IF SUCH PRODUCT IS USED IN A PROJECT OR SYSTEM IN WHICH ANY GEOTEXTILE PRODUCTS OTHER THAN THOSE PROVIDED BY ADVANCED DRAINAGE SYSTEMS ARE USED. THIS LIMITED WARRANTY REPRESENTS STORMTECH'S SOLE LIABILITY TO THE PURCHASER FOR CLAIMS RELATED TO THE PRODUCTS, WHETHER THE CLAIM IS BASED UPON CONTRACT, TORT, OR OTHER LEGAL THEORY.

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ADS 0601T/O NONWOVEN GEOTEXTILE SPECIFICATION

Scope

This specification describes ADS 0601T/O nonwoven geotextile.

Filter Fabric Requirements

ADS 0601T/O is an orange nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. ADS 0601T/O is inert to biological degradation and resists naturally encountered chemicals, alkali and acids. ADS 0601T/O conforms to the physical property values listed below:

Filter Fabric Properties

Property	Test Method	Unit	Typical Value[1] MD	Typical Value[1] CD
Grab Tensile Strength	ASTM D4632	lbs (N)	175 (779)	175 (779)
Grab Tensile Elongation	ASTM D4632	%	75	75
Trapezoid Tear Strength	ASTM D4533	lbs (N)	85 (378)	85 (378)
CBR Puncture Strength	ASTM D6241	lbs (N)	480 (2136)	480 (2136)
Permittivity	ASTM D4491	sec^{-1}	1.5	1.5
Flow Rate	ASTM D4491	gal/min/ft^2 (l/min/m^2)	105 (4278)	105 (4278)
UV Resistance (at 500 hours)[1]	ASTM D4355	% strength retained	80	80

Physical Properties

Property	Test Method	Unit	Typical Value[2]
Weight	ASTM D5161	oz/yd^2 (g/m^2)	6.5 (220)
Thickness	ASTM D5199	mils (mm)	65 (1.7)
Roll Dimensions (W x L)	-	ft (m)	15 x 300 (4.5 x 91)
Roll Area	-	yd^2 (m^2)	500 (418)
Estimated Roll Weight	-	lb (kg)	220 (100)

1 Modified, Minimum Test Value
2 ASTM D4439 Standard Terminology for Geosynthetics: typical value, n-*for geosynthetics*, the mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with on specific property.

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Separation

ADS 315W WOVEN GEOTEXTILE SPECIFICATION

Scope

This specification describes ADS 315W woven geotextile.

Filter Fabric Requirements

ADS 315W is manufactured using high-tenacity polypropylene yarns that are woven to form a dimensionally stable network, which allows the yarns to maintain their relative position. ADS 315W resists ultraviolet deterioration, rotting and biological degradation and is inert to commonly encountered soil chemicals. ADS 315W conforms to the physical property values listed below:

Filter Fabric Properties

Property	Test Method	Unit	M.A.R.V. (Minimum Average Roll Value)[2]
Tensile Strength (Grab)	ASTM D4632	lbs (N)	315 (1400)
Elongation	ASTM D4632	%	15
CBR Puncture	ASTM D6241	lbs (N)	900 (4005)
Puncture	ASTM D4833	lbs (N)	150 (667)
Mullen Burst	ASTM D3786	psi (kPa)	600 (4134)
Trapezoidal Tear	ASTM D4533	lbs (N)	120 (533)
UV Resistance (at 500 hours)	ASTM D4355	%	70
Apparent Opening Size (AOS)*	ASTM D4751	U.S. Sieve (mm)	40 (.425)
Permittivity	ASTM D4491	sec^{-1}	.05
Water Flow Rate	ASTM D4491	gpm/ft^2 ($l/min/m^2$)	4 (163)

* Maximum average roll value.

Packaging

Roll Dimensions (W x L) - ft. (m)	12.5 x 360/ 15 x 300 / 17.5 x 258 (3.81 x 109.8/ 4.57 x 91.5 / 5.33 x 78.6)

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Design and Maintenance of Subsurface Gravel Wetlands

February 4, 2015

The University of New Hampshire Stormwater Center conducted a design and maintenance review of subsurface gravel wetland systems for the New Hampshire Department of Transportation. The UNHSC utilized various NHDOT site and construction plans, construction photo documentation, cost and material specification sheets, and the NHDOT subsurface gravel wetland (SGW) design specification dated December 20, 2013. The UNHSC also conducted inspections of subsurface gravel wetland systems that were designed and installed by the NHDOT or its contractors in order to determine maintenance needs. The UNHSC prepared this report as a resource for SGW designers and installers to assist in the design, cost and material specification, and maintenance requirements to ensure a properly functioning SGW system.

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1.0 Introduction

The UNHSC appreciates the opportunity to provide Design and Maintenance Review services for the New Hampshire Department of Transportation. We have completed our review and site visits of NHDOT SGW installations and offer the following summary.

Information Reviewed:

- Various Site Plans prepared by NHDOT and various assisting engineering firms
- Construction Management photos provided by NHDOT
- Costs and material specifications compiled by NHDOT
- NHDOT Subsurface Gravel Wetland Design, dated December 20, 2013

2.0 Background

The subsurface gravel wetland (SGW) stormwater management system has been around for almost 20 years. It approximates the look and function of a natural wetland, effectively removing sediments and other pollutants commonly found in runoff while enhancing the visual appeal of the landscape by adding buffers or greenscape to urban areas. The SGW specification used by NHDOT represents the original specification developed by the University of New Hampshire Stormwater Center (UNHSC) and documented in the UNHSC SGW Design Specifications published in June of 2009. These specifications reflect findings from five years of study of the SGW originally designed and evaluated at UNHSC. The SGW is a horizontal-flow filtration system and should not be confused with stormwater wetlands that function more like ponds. Instead, the SGW includes a dense root mat in a wetland soil that forms a cover over crushed stone. The subsurface crushed stone is the primary flow path for stormwater and is an anaerobic microbe-rich environment for improving water quality. Like other filtration systems, it demonstrates a tremendous capacity to reduce runoff peak flows and improve water quality.

3.0 Implementation

Subsurface gravel wetlands can be used in many regions, with the exception of those that are too arid to support a wetland system. SGW systems have demonstrated exceptional stormwater quality treatment, in particular for nutrients, for a range of land uses including linear transportation environments. It should be noted that as implementation has progressed and coupled with an additional five years of research at the UNHSC, additional findings and design modifications have arisen. The initial design of the UNHSC SGW was to handle runoff from a commuter parking area, best represented by a high density commercial use. In such applications SGW systems are space intensive; however for linear transportation environments some flexibility is expected. Recommendations and comments provided herein reflect additional learning and research findings gathered since the original publication of the UNHSC 2009 SGW specification.

1.) The purpose of the NHDOT underdrain systems is to intercept and provide drainage for seasonal high ground water levels where deemed to be within 0.5' of the wetland soil surface elevation. The rationale is not well defined and requires justification. For systems that are installed within proximity to seasonal high groundwater (SHGW) it is unclear how the benefits of the flushing basins justify overall costs (average cost savings: $1,069 per system). The SGW low flow orifice not only controls the stormwater flow through the system, by this hydraulic control will also ultimately control SHGW elevation in the vicinity of the SGW in the same manner. An SGW may have a portion of the system built below the SHGW. The original SGW at the UNHSC site in Durham, NH is a case in point. A caution is noted in that groundwater flows should not be significant compared to the stormwater flows. Significant groundwater inflows could prevent the formation of the anaerobic zone in the crushed stone.

2.) Overall system sizing for NHDOT systems appears to be based on the UNHSC 2009 SGW drainage design guidance with respect to overall length to width (L:W) ratio. In some locations L:W ratio dominates design orientation. UNHSC researchers recommend that this design criterion not be considered the most critical design element. The critical design element with respect to configuration is to size the system to treat the desired design rainfall depth from the contributing drainage area (1" Water Quality Volume). Linear systems are fine (higher L:W), provided the minimum WQV: Internal Storage Reservoir (ISR) capacity ratio is 4:1 or 25% (WQV:ISR) and the minimum flow path in the crushed stone in each cell is 15 feet.

3.) Most inspected forebays appear to function as wet basins rather than the more desirable dry basin. Dry forebays promote aerobic transformations of nitrogen which is an important first step prior to the anaerobic zone. It is recommended that if forebays cannot be economically installed to operate dry then concrete inlet structures such as off-line deep sump catch basins be used for pre-treatment as opposed to a forebay structure. A deep sump catch basin or other precast inlet structure may also be easier to maintain. A very important function of any SGW forebay is that it be aerobic in order to convert most forms of nitrogen to nitrate or nitrite.

4.) Most forebay outlets lack low flow conveyance which causes them to function as wet basins as opposed to dry basins. It is important that regardless of the configuration of the pretreatment structure that the SGW system forebay contain an outlet with an invert at the same level as the wetland surface to eliminate ponding behind the forebay berm such that obligate wetland plant colonization (cattails) and the potential for anaerobic conditions do not occur. Other options are to design the forebays to convey low flows that draw the fore bay water level down between storm events.

5.) Hydraulic inlets (leaching chambers) appear to be oversized. There are many hydraulic inlet design configurations that may be able to replace existing designs with better function and maintenance capacity and diminished costs. NHDOT SGW systems observed in this study, small and large, seem to use similar hydraulic inlet configurations

with the same number of structures regardless of watershed area size or design treatment volume. UNHSC research indicates the hydraulic inlet configuration can be flexible provided it has a greater hydraulic capacity/efficiency than the primary outlet orifice control. Recent experience in UNHSC designs have used slotted hydraulic inlet pipes as a backup inlet with a primary inlet composed of woven geotextile laid on the subsurface pea stone and covered in 6”-8“ diameter stone around the outfall of the inlet pipe (see figures 1 and 2). This configuration protects the stone filter in the subsurface of the wetland system while also providing a more accessible and maintainable surface hydraulic inlet feature that will inevitably be easier and less costly to construct.

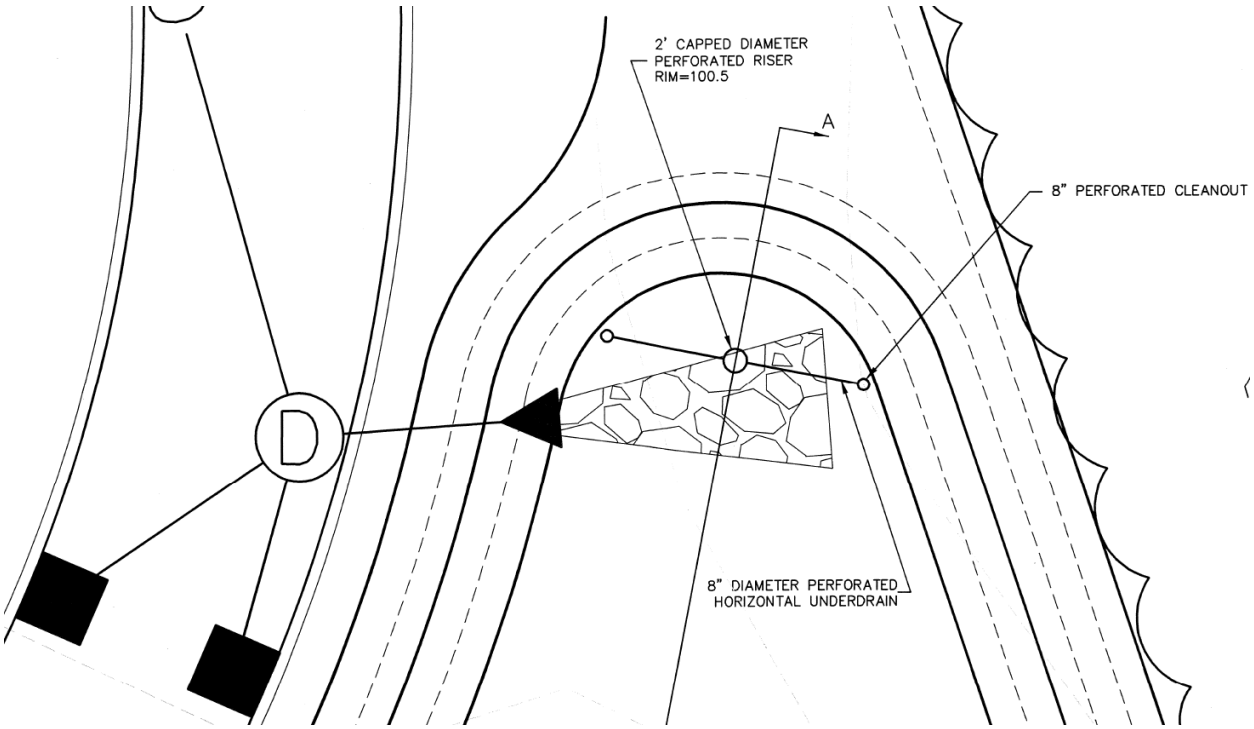

Figure 1: Typical plan view of multi-inlet configuration of a SGW system

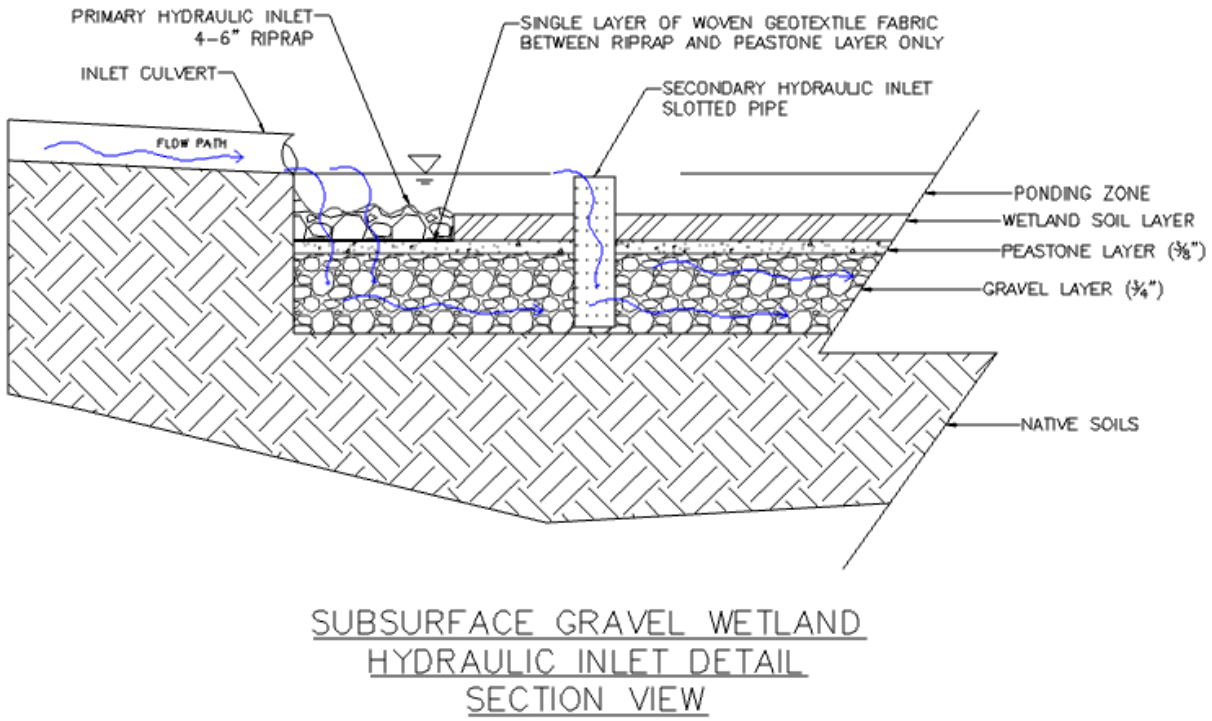

Figure 2: Typical profile view of multi-inlet configuration of a SGW system.

6.) Cleanout structures (leaching chambers) need not be as large since their primary function is for emergency access to the subsurface header pipe that directs flow either to the second wetland chamber or the outlet structure. Cleanout structures can be capped or be installed at the wetland surface grade with a manhole cover to ensure that the cleanouts are accessible, water tight, and does not short circuit system hydraulics.

7.) Some of the outlet control structures have slotted inlets (4" high by 12" wide) to allow for drainage of high flows. These slots need to be protected by covering them with 6-8" stone or some type of trash screen. This will prevent trash, leaves, or other debris from clogging the outlet orifice.

4.0 Costs

For this project NHDOT produced itemized costs associated with the bid prices for the materials and installation of thirteen SGW systems. In meetings with NHDOT personnel several items were determined to be irrelevant to this project and were thus eliminated from the spreadsheet. These items are itemized in the list below:

- 206.1 (Common Structure Excavation) and 206.2 (Rock Structure Excavation) were determined to be unique and not standard items and eliminated

- 209.1 (Granular Backfill) was determined to reflect typical stabilization for bedding material and were eliminated
- 593.331 (Geotextile, Stabilization, Class 3, Non-woven) was determined to be no longer used, and was replaced with Item 585.7 (Stone Fill, Class G) and thus eliminated
- 593.411 (Geotextile, Permeability Control, Class 1, Non-woven), 593.421 (Geotextile, Permeability Control, Class 2, Non-woven), 593.431 (Geotextile, Permeability Control, Class 3, Non-woven) were determined to be erosion control items and were eliminated
- 603.83206 (6" Plastic Pipe, Smooth Interior), 605.906 (6" Pipe Underdrain, Contractors' Option) were determined to be irrelevant to the SGW construction costs and were thus eliminated.

To compare costs, all original capital construction costs were converted to 2014 dollars using consumer price index inflation rates (USDOL, 2014). Average SGW materials and installation costs from the range of assessed projects (see attachment A for the raw costs) was $32,462 per impervious acre treated ($0.75/sf) with a maximum cost of $68,893 per impervious acre treated ($1.47/sf) and a minimum cost of $12,210 per impervious acre treated ($0.28/sf). As a comparison, for the SGW studied at the UNH field facility, costs were calculated at $28,079 per impervious acre treated ($0.64/sf). Cost details are illustrated in Table 1.

Table 1: Comparison of unit costs from all reviewed NHDOT SGW materials cost data and reference information documented by UNHSC. Note all costs are in 2014 dollars

Total Price Statistics	Contributing Impervious Area (A)	Construction Cost per Impervious Area ($/A)	Construction Cost per Impervious Area ($/sf)	UNHSC Costs ($/A)	UNHSC Costs ($/sf)
Minimum	1.90	$ 12,210	$ 0.28	-	-
Average	4.56	$ 32,462	$ 0.75	$28,079	$ 0.64
Maximum	8.40	$ 63,893	$ 1.47	-	-

Results of the cost assessment indicate room for potential savings with respect to design. In light of the detailed recommendations outlined in the Implementation section of this report, cost adjustments and justifications include:

Eliminate items 605.79 and 605.82251-24 (perimeter dewatering controls) for use if SHGW is within 0.5' of SGW surface. There is no data or clear rationale for any threat from SHGW in SGW systems. SHGW levels are often intermittent and would ultimately be controlled by the outlet orifice which is typically 0.5 to 0.67' below SGW surface. Therefore this item is redundant and further justification is necessary to validate the additional expense. Cost savings is estimated at 3.3% or $1,069 per system.

Reduce the number of item numbers 604.921 and 604.922 (alt: 604.193, 604.393, and 604.912) leaching chambers. Hydraulic inlet controls could be reduced if not eliminated in the future as linear routing through the system is adapted in future designs. Other hydraulic inlet controls such as suggested in the Implementation section of this report may be less expensive and offer

greater maintainability. There is no clear rationale for these structures at the end of each wetland cell as their only function is to provide access to the perforated header pipe in the subsurface as a potential clean out. At the end of the wetland cell these can simply be solid risers capped at the wetland surface. At the upstream end of each wetland cell, hydraulic inlets should be reduced to two if not eliminated and replaced with alternative inlet structures. Hydraulic inlet capacity need only exceed that of the outlet orifice. Cost savings is estimated at 10% or $3,201 per system.

Items 647.1 (Humus) and 647.29 (Wetland Humus) incurred high variability with respect to cost and in some systems had some of the largest percent costs (>12%) than any additional line items. There is no specification for the wetland humus in the NHDOT SGW design guidelines dated December 20, 2013 and the wetland soil specification in the UNHSC 2009 guidance is weak without sufficient detail to allow for accurate and cost effective bidding. Subsequent to this report UNHSC has worked to develop a particle size distribution for use in specifying wetland humus in future SGW systems. The proposed PSD for wetland humus is provided in Table 2 and reflects a poorly drained soil with a d50 of 0.15 mm and is a clay or silt loam in the soil textural triangle. We feel that this will allow for more cost effective bidding of appropriate soil types with the potential to even employ appropriate onsite excavated materials into select humus mixes thereby further reducing costs. We believe with these additional specifications it is not unrealistic to assume a future price of $15/CY, which represents the 25% quartile cost of the original line item. Cost savings is estimated at 0.5% or $164 per system.

Table 2: Particle size distribution and testing tolerances for wetland humus for the subsurface gravel wetland system

US Standard Sieve Size in/mm	Percent Passing	Percent Passing Testing Tolerances
0.5/12.5	100	± 10.0
#10/2.00	90 - 75	± 5.0
#100/0.15	40-50	± 5.0
#200/0.75	25-50	± 5.0

Relative cost savings are summarized in table 3.

Table 3: Comparison of unit costs from all reviewed SGW materials cost data with projected cost savings from recommended itemized design modifications. Note all costs are amortized to reflect 2014 dollars.

Total Price Statistics	Contributing Impervious Area (A)	Construction Cost per Impervious Area ($/A)	Construction Cost per Impervious Area ($/sf)	UNHSC Costs ($/A)	UNHSC Costs ($/sf)
Minimum	1.90	$ 7,895	$ 0.18	-	-
Average	4.56	$ 27,320	$ 0.63	$28,079	$0.64
Maximum	8.40	$ 53,780	$ 1.23	-	-

5.0 Maintenance

Inspection and maintenance is a critical component of the long term function and effectiveness of any stormwater control measure. Overall the UNHSC inspections of the facilities proved that the SGW systems were largely functioning properly and were well designed and constructed. The UNHSC has produced operation and maintenance guidelines as well as an inspection checklist which have been provided in attachment A of this report. Inspection is critical to assess as built functionality in addition to identifying unique maintenance tasks that may be less general in nature and more site specific. Overall the inspections conducted and provided as an attachment to this report (attachment B) indicates that routine biannual inspection (annual as a minimum) should be initiated at these facilities as a standard of practice. Post construction inspections are critical just after newly constructed SGW system is placed online. While some long-term maintenance items are due to system aging and processing of polluted runoff, some operation issues are a result of construction and installation practices not fully aligned with design specifications. These items are often quickly identifiable. In our assessment of eight NHDOT SGW systems two main issues were identified associated with installation or construction. First numerous pre-treatment forebays in observed systems held ponding water. This impacts the overall chemical function and processing of dissolved inorganic nitrogen species as these ponded forebay areas often turn into anaerobic areas of obligate wetland plants. Second on one particular system (NHDOT # 14633F BMP 19) three to five inches of standing water was observed within the entire system. The final water elevation was being controlled by an outlet pipe invert that was installed above the overall wetland soil elevation. This has resulted in sparse vegetation and likely was not part of the original design.

Beyond construction and installation issues the primary maintenance need identified through these inspections is simple maintenance of the established wetland vegetation. Numerous facilities are in need of this type of maintenance which involves cutting the existing plants down to the base and removing it from the system to prevent breakdown and rerelease of nitrogen.

Attachment A: Raw Item Costs

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SUBSURFACE GRAVEL WETLANDS (13933C/ DB 920)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	16,603	$4.75	$78,864.25
Item 203.6 - Embankment-in-Place (CY)	245	$8.95	$2,192.75
Item 203. 52 - Impervious Material (CY)	500	$14.00	$7,000.00
Item 585.3- Stone Fill, Class C (CY)	83	$18.00	$1,494.00
Item 585.5 - Stone Fill, Class E (CY)	900	$18.00	$16,200.00
Item 585.7 - Stone Fill, Class G (CY)	120	$24.00	$2,880.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	215	$2.10	$451.50
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	283	$33.00	$9,339.00
Item 604.91X - Outlet Control Structure (U)	2	$5,800.00	$11,600.00
Item 604.193 - Special Catch Basin (3' Dia) (U)	8	$3,300.00	$26,400.00
Item 604.393 - Specia Drain Manhole 3'x 3' (U)	3	$2,600.00	$7,800.00
Item 605.508 - 8" Perf. Corr. Poly. Pipe Underdrain (LF)	592	$22.00	$13,024.00
Item 605.79 - Underdrain Flushing Basins (EA)	10	$660.00	$6,600.00
Item 605.906 - 6" Pipe Underdrain (Contractor's Option)	506	$16.00	$8,096.00
Item 646.3 - Turf Establishment w/ Mulch & Tackifiers (A)	0.48	$1,650.00	$792.00
Item 647.1 - Humus (CY)	1,900	$15.00	$28,500.00
Item 647.29 - Wetland Humus (CY)	330	$15.00	$4,950.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$225.00	$225.00
Total			**$226,408.50**

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SUBSURFACE GRAVEL WETLANDS (13455A/ GW)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	5,776	$9.75	$56,316.00
Item 203.2 - Rock Excavation (CY)	2,241	$29.00	$64,989.00
Item 203.6 - Embankment-in-Place (CY)	317	$6.25	$1,981.25
Item 203. 53 - Low Permeability Fill (CY)	255	$8.80	$2,244.00
Item 520.1 - Concrete Class A (CY)	6	$375.00	$2,250.00
Item 585.3- Stone Fill, Class C (CY)	131	$34.50	$4,519.50
Item 585.5 - Stone Fill, Class E (CY)	370	$31.00	$11,470.00
Item 585.7 - Stone Fill, Class G (CY)	62	$34.25	$2,123.50
Item 593.421 - Geotextile, Perm. Control, Cl. 2, Non-woven (SY)	502	$2.00	$1,004.00
Item 603.80012 - 12" Plastic Pipe (LF)	31	$40.00	$1,240.00
Item 604.91X - Outlet Control Structure (U)	1	$4,850.00	$4,850.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,700.00	$10,200.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,850.00	$9,250.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	204	$19.50	$3,978.00
Item 647.1 - Humus (CY)	244	$14.00	$3,416.00
Item 647.29 - Wetland Humus (CY)	123	$16.00	$1,968.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$250.00	$250.00
Total			**$182,049.25**

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SUBSURFACE GRAVEL WETLANDS (10620L/ GW)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203. 52 - Impervious Material (CY)	1,919	$18.05	$34,637.95
Item 585.2 - Stone Fill, Class B (CY)	56	$19.15	$1,072.40
Item 585.3- Stone Fill, Class C (CY)	278	$40.25	$11,189.50
Item 585.5 - Stone Fill, Class E (CY)	46	$45.90	$2,111.40
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	200	$6.00	$1,200.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	50	$32.15	$1,607.50
Item 604.91X - Outlet Control Structure (U)	1	$2,045.00	$2,045.00
Item 604.921 - Leaching Chamber, Type 1 (U)	4	$3,080.00	$12,320.00
Item 604.922 - Leaching Chamber, Type 2 (U)	4	$2,950.00	$11,800.00
Item 605.512 - 12" Perf. Corr. Poly. Pipe Underdrain (LF)	187	$15.75	$2,945.25
Item 647.29 - Wetland Humus (CY)	93	$35.00	$3,255.00
Total			**$84,184.00**

There was no earthwork specifcally attributable to the gravel wetland. It is essentially constructed on top of the existing ground between the Rte. 16 NB slope work and the Exit 15 on ramp slope work.

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SUBSURFACE GRAVEL WETLANDS (10418G/ GW)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	5,978	$8.00	$47,824.00
Item 203.6 - Embankment-in-Place (CY)	8	$5.00	$40.00
Item 203. 52 - Impervious Material (CY)	1,415	$18.00	$25,470.00
Item 206.1 - Common Structure Excavation (CY)	1,225	$16.00	$19,600.00
Item 585.3- Stone Fill, Class C (CY)	21	$30.00	$630.00
Item 585.5 - Stone Fill, Class E (CY)	1,141	$30.00	$34,230.00
Item 593.331 - Geotextile, Stabilization, Cl. 3, Non-woven (SY)	1,711	$3.00	$5,133.00
Item 603.83206 - 6" Plastic Pipe (Smooth Interior) (LF)	55	$24.00	$1,320.00
Item 604.91X - Outlet Control Structure (U)	1	$2,400.00	$2,400.00
Item 604.921 - Leaching Chamber, Type 1 (U)	4	$3,000.00	$12,000.00
Item 604.922 - Leaching Chamber, Type 2 (U)	2	$3,000.00	$6,000.00
Item 605.906 - 6" Pipe Underdrain (Contractors Option) (LF)	602	$16.00	$9,632.00
Item 605.79 - Underdrain Flushing Basins (EA)	8	$600.00	$4,800.00
Item 647.29 - Wetland Humus (CY)	380	$25.00	$9,500.00
Total			**$178,579.00**

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SUBSURFACE GRAVEL WETLANDS (11238L/ BMP 1590)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	3,933	$4.00	$15,732.00
Item 203.6 - Embankment-in-Place (CY)	184	$2.00	$368.00
Item 203. 52 - Impervious Material (CY)	1,530	$15.00	$22,950.00
Item 206.2- Rock Structure Excavation (CY)	27	$30.00	$810.00
Item 520.1 - Concrete Class A (CY)	5	$500.00	$2,700.00
Item 585.3- Stone Fill, Class C (CY)	90	$30.00	$2,700.00
Item 585.5 - Stone Fill, Class E (CY)	182	$28.00	$5,096.00
Item 585.7 - Stone Fill, Class G (CY)	30	$40.00	$1,200.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	192	$2.25	$432.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	20	$32.00	$640.00
Item 604.91X - Outlet Control Structure (U)	1	$3,000.00	$3,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,250.00	$7,500.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,250.00	$6,250.00
Item 605.512 - 12" Perf. Corr. Poly. Pipe Underdrain (LF)	125	$25.00	$3,125.00
Item 646.31 - Turf Establishment w/ Mulch & Tackifiers (SY)	1,482	$0.35	$518.70
Item 647.1 - Humus (CY)	78	$20.00	$1,560.00
Item 647.29 - Wetland Humus (CY)	103	$35.00	$3,605.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$78,686.70**

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SUBSURFACE GRAVEL WETLANDS (11238L/ BMP 922)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	3,822	$4.00	$15,288.00
Item 203.6 - Embankment-in-Place (CY)	467	$2.00	$934.00
Item 206.1 - Common Structure Excavation (CY)	5	$30.00	$150.00
Item 520.1 - Concrete Class A (CY)	4	$500.00	$2,000.00
Item 585.3- Stone Fill, Class C (CY)	22	$30.00	$660.00
Item 585.5 - Stone Fill, Class E (CY)	420	$28.00	$11,760.00
Item 585.7 - Stone Fill, Class G (CY)	69	$40.00	$2,760.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	96	$2.25	$216.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	41	$32.00	$1,312.00
Item 604.91X - Outlet Control Structure (U)	1	$3,000.00	$3,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,250.00	$7,500.00
Item 604.922 - Leaching Chamber, Type 2 (U)	6	$1,250.00	$7,500.00
Item 605.512 - 12" Perf. Corr. Poly. Pipe Underdrain (LF)	306	$25.00	$7,650.00
Item 605.79 - Underdrain Flushing Basins (EA)	2	$500.00	$1,000.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	565	$25.00	$14,125.00
Item 646.31 - Turf Establishment w/ Mulch & Tackifiers (SY)	3,262	$0.35	$1,141.70
Item 647.1 - Humus (CY)	89	$20.00	$1,780.00
Item 647.29 - Wetland Humus (CY)	304	$35.00	$10,640.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$89,916.70**

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SUBSURFACE GRAVEL WETLANDS (14633F/ BMP 19)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	2,396	$4.00	$9,584.00
Item 203.6 - Embankment-in-Place (CY)	468	$3.15	$1,474.20
Item 203. 52 - Impervious Material (CY)	582	$15.00	$8,730.00
Item 520.1 - Concrete Class A (CY)	10	$180.00	$1,800.00
Item 585.3- Stone Fill, Class C (CY)	108	$26.00	$2,808.00
Item 585.5 - Stone Fill, Class E (CY)	267	$25.00	$6,675.00
Item 585.7 - Stone Fill, Class G (CY)	44	$35.00	$1,540.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	281	$3.00	$843.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	50	$21.00	$1,050.00
Item 604.91X - Outlet Control Structure (U)	1	$4,000.00	$4,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$980.00	$5,880.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$960.00	$4,800.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	192	$15.00	$2,880.00
Item 605.79 - Underdrain Flushing Basins (EA)	2	$300.00	$600.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	429	$20.00	$8,580.00
Item 647.1 - Humus (CY)	233	$20.00	$4,660.00
Item 647.29 - Wetland Humus (CY)	292	$12.50	$3,650.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$110.00	$110.00
Total			**$69,664.20**

SUBSURFACE GRAVEL WETLANDS (14633E/ BMP 17)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	7,638	$3.75	$28,642.50
Item 203.2 - Rock Excavation (CY)	1,923	$10.75	$20,672.25
Item 203.6 - Embankment-in-Place (CY)	4,211	$4.90	$20,633.90
Item 203. 52 - Impervious Material (CY)	1,746	$12.00	$20,952.00
Item 520.1 - Concrete Class A (CY)	23	$525.00	$12,075.00
Item 585.3- Stone Fill, Class C (CY)	194	$25.00	$4,850.00
Item 585.5 - Stone Fill, Class E (CY)	317	$30.00	$9,510.00
Item 585.7 - Stone Fill, Class G (CY)	52	$40.00	$2,080.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	580	$2.00	$1,160.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	38	$24.00	$912.00
Item 604.91X - Outlet Control Structure (U)	1	$2,900.00	$2,900.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,115.00	$6,690.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,070.00	$5,350.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	369	$10.50	$3,874.50
Item 605.79 - Underdrain Flushing Basins (EA)	6	$240.00	$1,440.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	718	$21.00	$15,078.00
Item 647.29 - Wetland Humus (CY)	289	$20.00	$5,780.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$163,100.15**

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SUBSURFACE GRAVEL WETLANDS (14633F/ BMP 16)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	3,498	$4.00	$13,992.00
Item 203.2 - Rock Excavation (CY)	3,532	$9.00	$31,788.00
Item 203.6 - Embankment-in-Place (CY)	25	$3.15	$78.75
Item 203. 52 - Impervious Material (CY)	3,435	$15.00	$51,525.00
Item 206.2- Rock Structure Excavation (CY)	39	$17.00	$663.00
Item 209.1 - Granular Backfill (CY)	7	$28.00	$196.00
Item 520.1 - Concrete Class A (CY)	7	$180.00	$1,260.00
Item 585.2 - Stone Fill, Class B (CY)	202	$20.00	$4,040.00
Item 585.3- Stone Fill, Class C (CY)	106	$26.00	$2,756.00
Item 585.5 - Stone Fill, Class E (CY)	667	$25.00	$16,675.00
Item 585.7 - Stone Fill, Class G (CY)	111	$35.00	$3,885.00
Item 593.411 - Geotextile, Perm. Control, Cl. 1, Non-woven (SY)	222	$3.00	$666.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	273	$3.00	$819.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	72	$21.00	$1,512.00
Item 604.91X - Outlet Control Structure (U)	2	$4,000.00	$8,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$980.00	$5,880.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$960.00	$4,800.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	360	$15.00	$5,400.00
Item 605.79 - Underdrain Flushing Basins (EA)	6	$300.00	$1,800.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	1,016	$20.00	$20,320.00
Item 647.1 - Humus (CY)	434	$20.00	$8,680.00
Item 647.29 - Wetland Humus (CY)	314	$12.50	$3,925.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$110.00	$110.00
Total			**$188,770.75**

SUBSURFACE GRAVEL WETLANDS (14633E/ BMP 14)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	4,570	$3.75	$17,137.50
Item 203.2 - Rock Excavation (CY)	572	$10.75	$6,149.00
Item 203.6 - Embankment-in-Place (CY)	23	$4.90	$112.70
Item 203. 52 - Impervious Material (CY)	1,049	$12.00	$12,588.00
Item 520.1 - Concrete Class A (CY)	16	$525.00	$8,400.00
Item 585.3- Stone Fill, Class C (CY)	183	$25.00	$4,575.00
Item 585.5 - Stone Fill, Class E (CY)	210	$30.00	$6,300.00
Item 585.7 - Stone Fill, Class G (CY)	35	$40.00	$1,400.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	550	$2.00	$1,100.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	34	$24.00	$816.00
Item 604.91X - Outlet Control Structure (U)	1	$2,900.00	$2,900.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$1,115.00	$6,690.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$1,070.00	$5,350.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	296	$10.50	$3,108.00
Item 605.79 - Underdrain Flushing Basins (EA)	2	$240.00	$480.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	256	$21.00	$5,376.00
Item 647.29 - Wetland Humus (CY)	106	$20.00	$2,120.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$500.00	$500.00
Total			**$85,102.20**

P. Salo

SUBSURFACE GRAVEL WETLANDS (14633F/ BMP 13)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	8,865	$4.00	$35,460.00
Item 203.2 - Rock Excavation (CY)	1,679	$9.00	$15,111.00
Item 203.6 - Embankment-in-Place (CY)	568	$3.15	$1,789.20
Item 203. 52 - Impervious Material (CY)	4,102	$15.00	$61,530.00
Item 206.2- Rock Structure Excavation (CY)	64	$17.00	$1,088.00
Item 209.1 - Granular Backfill (CY)	9	$28.00	$252.00
Item 520.1 - Concrete Class A (CY)	8	$180.00	$1,440.00
Item 585.3- Stone Fill, Class C (CY)	159	$26.00	$4,134.00
Item 585.5 - Stone Fill, Class E (CY)	922	$25.00	$23,050.00
Item 585.7 - Stone Fill, Class G (CY)	165	$35.00	$5,775.00
Item 593.431 - Geotextile, Perm. Control, Cl. 3, Non-woven (SY)	447	$3.00	$1,341.00
Item 603.83212 - 12" Plastic Pipe (Smooth Interior) (LF)	72	$21.00	$1,512.00
Item 604.91X - Outlet Control Structure (U)	2	$4,000.00	$8,000.00
Item 604.921 - Leaching Chamber, Type 1 (U)	6	$980.00	$5,880.00
Item 604.922 - Leaching Chamber, Type 2 (U)	5	$960.00	$4,800.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	384	$15.00	$5,760.00
Item 605.79 - Underdrain Flushing Basins (EA)	5	$300.00	$1,500.00
Item 605.82251 - 24" Agg. Und. Type 2 w/ 6" Perf. Corr. PE Pipe (LF)	994	$20.00	$19,880.00
Item 647.1 - Humus (CY)	640	$20.00	$12,800.00
Item 647.29 - Wetland Humus (CY)	467	$12.50	$5,837.50
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$110.00	$110.00
Total			**$217,049.70**

P. Salo 12/3/2013

SUBSURFACE GRAVEL WETLANDS (13742B/ GW #2)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	2,172	$5.00	$10,860.00
Item 203.6 - Embankment-in-Place (CY)	51	$5.00	$255.00
Item 203. 52 - Impervious Material (CY)	462	$14.00	$6,468.00
Item 585.3- Stone Fill, Class C (CY)	93	$27.00	$2,511.00
Item 585.5 - Stone Fill, Class E (CY)	82	$34.00	$2,788.00
Item 585.7 - Stone Fill, Class G (CY)	14	$51.00	$714.00
Item 593.421 - Geotextile, Perm. Control, Cl. 2, Non-woven (SY)	314	$2.50	$785.00
Item 603.80012 - 12" Plastic Pipe (LF)	36	$27.00	$972.00
Item 604.91X - Outlet Control Structure (U)	1	$4,000.00	$4,000.00
Item 604.921 - Leaching Chamber Type 1 (U)	6	$1,350.00	$8,100.00
Item 604.912 - Leaching Chamber Type 2 (U)	5	$1,350.00	$6,750.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	109	$15.50	$1,689.50
Item 646.3 - Turf Establishment w/ Mulch & Tackifiers (A)	0.50	$1,775.00	$887.50
Item 647.29 - Wetland Humus (CY)	256	$19.00	$4,864.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$170.00	$170.00
Total			**$51,814.00**

P. Salo 12/3/2013

SUBSURFACE GRAVEL WETLANDS (13742B/ GW #1)			
Item	**Quantity**	**Bid Price**	**Total**
Item 203.1 - Common Excavation (CY)	1,150	$5.00	$5,750.00
Item 203.6 - Embankment-in-Place (CY)	831	$5.00	$4,155.00
Item 203. 52 - Impervious Material (CY)	924	$14.00	$12,936.00
Item 585.3- Stone Fill, Class C (CY)	98	$27.00	$2,646.00
Item 585.5 - Stone Fill, Class E (CY)	178	$34.00	$6,052.00
Item 585.7 - Stone Fill, Class G (CY)	30	$51.00	$1,530.00
Item 593.421 - Geotextile, Perm. Control, Cl. 2, Non-woven (SY)	333	$2.50	$832.50
Item 603.80012 - 12" Plastic Pipe (LF)	28	$27.00	$756.00
Item 604.91X - Outlet Control Structure (U)	1	$4,000.00	$4,000.00
Item 604.921 - Leaching Chamber Type 1 (U)	6	$1,350.00	$8,100.00
Item 604.912 - Leaching Chamber Type 2 (U)	5	$1,350.00	$6,750.00
Item 605.506 - 6" Perf. Corr. Poly. Pipe Underdrain (LF)	188	$15.50	$2,914.00
Item 646.3 - Turf Establishment w/ Mulch & Tackifiers (A)	0.40	$1,775.00	$710.00
Item 647.1 - Humus (CY)	330	$18.00	$5,940.00
Item 647.29 - Wetland Humus (CY)	60	$19.00	$1,140.00
Item 670.01 - Sediment Sump Measuring Post (EA)	1	$170.00	$170.00
Total			**$64,381.50**

Attachment B: Subsurface Gravel Wetland Inspection and Maintenance Guidance

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**U**	
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	**U**	
No evidence of erosion	**S**	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**S**	**U**	
Dead or dying plants	**S**	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S**	**U**	
Good condition, no need for repair	**S**	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S**	**U**	
Robust coverage by year 2 or later	**S**	**U**	
6. Inlet and Outlet Controls			
Flow is unobstructed in openings (grates, orifices, etc)	**S**	**U**	
Structures are operational with no evidence of deterioration	**S**	**U**	
7. Vegetation removal (once every 3 years)			
Prune dead, diseased, or decaying plants	**S**	**U**	

Corrective Action Needed	Due Date
1.	
2.	
3.	

Attachment C: Results of Subsurface Gravel Wetland Inspections

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 NB & SB Exit 5 Area DOT#: 14633F BMP 19 Inspector: Tim Puls
Date: 7/18/14 Time: 1:00PM Site Conditions: Poor
Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	Constructed 2013-2014
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**U**	Standing water in fore bay & both cells, approx. 3-5”
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	**U**	
No evidence of erosion	**S**	**U**	
3. Drought Conditions (As needed)			Too much water. Plants are thin in areas where water has been pooling.
Water plants as needed	**S**	**U**	
Dead or dying plants	**S**	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S**	**U**	
Good condition, no need for repair	**S**	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S**	**U**	NA
Robust coverage by year 2 or later	**S**	**U**	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**S**	**U**	
Structures are operational with no evidence of deterioration	**S**	**U**	
7. Vegetation removal (once every 3 years)			
Prune dead, diseased, or decaying plants	**S**	**U**	NA

Corrective Action Needed	Due Date
1. Outlet pipe invert is above the wetland soil elevation which keeps the system flooded. Could bring the soil up another 6-8”.	ASAP
COMMENT: Area of system is smaller than other BMPs but has the same number of structures.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 NB, East side DOT#: 14633F BMP 18 Inspector: Tim Puls
Date: 7/18/14 Time: 1:45PM Site Conditions: Fair, Draining
Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	**S** U	Constructed 2013-2014
Vegetation is established and thriving	**S** U	
No evidence of holes in the wetland soil causing short-circuiting	**S** U	
No evidence of erosion at inlet and outlet structures	**S** U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	S **U**	Standing water in fore bay & both cells, approx. 3-5”
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	**S** U	
No evidence of erosion	**S** U	
3. Drought Conditions (As needed)		Too much water. Plants are thin in areas where water has been pooling.
Water plants as needed	S **U**	
Dead or dying plants	S **U**	
4. Sedimentation Chamber or Forebay Inlet Inspection		
No evidence of sediment accumulation, trash, and debris.	**S** U	
Good condition, no need for repair	**S** U	
5. Vegetation Coverage		
50 % coverage established throughout system by first year	S **U**	NA
Robust coverage by year 2 or later	S U	
6. Inlet and Outlet Controls:		A piece of trash was blocking outlet orifice. Blockage cleared and system began to drain.
Flow is unobstructed in openings (grates, orifices, etc)	S **U**	
Structures are operational with no evidence of deterioration	**S** U	
7. Vegetation removal (once every 3 years)		
Prune dead, diseased, or decaying plants	S U	NA

Corrective Action Needed	Due Date
1. Outlet control structure has slotted inlets (4” x 12”) that are unprotected. Bring rip rap up over the inlet slots to keep trash out of structure.	ASAP
COMMENT: Area of system is smaller than other BMPs but has the same number of structures.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 5 NB Off Ramp Area DOT#: 14633F | Inspector: Tim Puls

Date: 7/18/14 | Time: 12:30AM | Site Conditions: Very Good

Date of Last Rain Event: 7/16/14 | Two systems – BMP 13, BMP 16

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	S U	New systems – BMP 13 approx. 1.5 years old and BMP 16 is approx. 6 months. GC is Severino Construction
Vegetation is established and thriving	S U	
No evidence of holes in the wetland soil causing short-circuiting	S U	
No evidence of erosion at inlet and outlet structures	S U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	S U	None
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	S U	
No evidence of erosion	S U	
3. Drought Conditions (As needed)		
Water plants as needed	S U	
Dead or dying plants	S U	
4. Sedimentation Chamber or Forebay Inlet Inspection		
No evidence of sediment accumulation, trash, and debris.	S U	
Good condition, no need for repair	S U	
5. Vegetation Coverage		
50 % coverage established throughout system by first year	S U	
Robust coverage by year 2 or later	S U	
6. Inlet and Outlet Controls:		
Flow is unobstructed in openings (grates, orifices, etc)	S U	
Structures are operational with no evidence of deterioration	S U	
7. Vegetation removal (once every 3 years)		
Prune dead, diseased, or decaying plants	S U	

Corrective Action Needed	Due Date
COMMENT: Both BMPs drain to a central 48" line. Could reduce number of hydraulic inlets and cleanout structures.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 5 NB On Ramp DOT#: 14633E BMP 17 Inspector: Tim Puls
Date: 7/18/14 Time: 1:30PM Site Conditions: Good
Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	NA System constructed in 2008-2009
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**(U)**	Fore bay has pooled water. Full of cattails.
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**(S)**	**U**	
No evidence of erosion	**(S)**	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**(S)**	**U**	
Dead or dying plants	**(S)**	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**(S)**	**U**	
Good condition, no need for repair	**(S)**	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**(S)**	**U**	
Robust coverage by year 2 or later	**(S)**	**U**	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**(S)**	**U**	
Structures are operational with no evidence of deterioration	**(S)**	**U**	
7. Vegetation removal (once every 3 years)			No maintenance has been done to date.
Prune dead, diseased, or decaying plants	**S**	**(U)**	

Corrective Action Needed	Due Date
1. Cut vegetation down to base and remove from system.	ASAP
COMMENT: Area of system is larger than other BMPs but has the same number of structures. 6 hydraulic inlets, 5 leach basins, 1 outlet	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 5 SB On Ramp DOT#: 14633E BMP 14 Inspector: Tim Puls

Date: 7/18/14 Time: 1:20PM Site Conditions: Good

Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	**S**	**U**	NA System constructed in 2008-2009
Vegetation is established and thriving	**S**	**U**	
No evidence of holes in the wetland soil causing short-circuiting	**S**	**U**	
No evidence of erosion at inlet and outlet structures	**S**	**U**	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	**U**	Fore bay is dry
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	**U**	
No evidence of erosion	**S**	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**S**	**U**	
Dead or dying plants	**S**	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S**	**U**	
Good condition, no need for repair	**S**	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S**	**U**	
Robust coverage by year 2 or later	**S**	**U**	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**S**	**U**	
Structures are operational with no evidence of deterioration	**S**	**U**	
7. Vegetation removal (once every 3 years)			No maintenance has been done to date.
Prune dead, diseased, or decaying plants	**S**	**U**	

Corrective Action Needed	Due Date
1. Cut vegetation down to base and remove from system.	ASAP
COMMENT: Area of system is smaller than other BMPs but has the same number of structures. 6 hydraulic inlets, 5 leach basins, 1 outlet	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 1 NB Off Ramp DOT#: 13933C | Inspector: Tim Puls

Date: 7/18/14 | Time: 11:00AM | Site Conditions: Very Good

Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	S	U	NA – This system was constructed in 2007
Vegetation is established and thriving	S	U	
No evidence of holes in the wetland soil causing short-circuiting	S	U	
No evidence of erosion at inlet and outlet structures	S	U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	**S**	U	None
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S**	U	
No evidence of erosion	**S**	U	
3. Drought Conditions (As needed)			
Water plants as needed	**S**	U	
Dead or dying plants	**S**	U	
4. Sedimentation Chamber or Forebay Inlet Inspection			Some trash has accumulated
No evidence of sediment accumulation, trash, and debris.	**S**	U	
Good condition, no need for repair	**S**	U	
5. Vegetation Coverage			Plants are in good condition. Treatment cells are densely vegetated.
50 % coverage established throughout system by first year	**S**	U	
Robust coverage by year 2 or later	**S**	U	
6. Inlet and Outlet Controls:			Concrete outlet structure 8' x 10'
Flow is unobstructed in openings (grates, orifices, etc)	**S**	U	
Structures are operational with no evidence of deterioration	**S**	U	
7. Vegetation removal (once every 3 years)			No maintenance has been done to date.
Prune dead, diseased, or decaying plants	S	**U**	

Corrective Action Needed	Due Date
1. Maintain vegetation = cut down to base of plant and remove vegetation from system	
COMMENT: This is an extremely large system. RRoseen advised them to replace "E Stone" with 3/8" pea stone during construction.	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

Regular inspection and maintenance is critical to the effective operation of Gravel Wetland systems. It is the responsibility of the owner to maintain the Gravel Wetland in accordance with the minimum design standards. 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 any changes or redevelopment in the upstream land use.

ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: Rt. 16 NB Exit 5 Inspector: Jamie Houle, Tim Puls

Date: 6/20/14 Time: 10:00AM Site Conditions: Good

Date of Last Rain Event: 6/13/14 (0.75")

Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)			
Plants are stable, roots not exposed	S	U	NA System constructed in 2010-2011
Vegetation is established and thriving	S	U	
No evidence of holes in the wetland soil causing short-circuiting	S	U	
No evidence of erosion at inlet and outlet structures	S	U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)			
1. Standing Water			
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	(S)	U	Fore bay has pooled water. Some cattails.
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	(S)	U	
No evidence of erosion	(S)	U	
3. Drought Conditions (As needed)			
Water plants as needed	(S)	U	
Dead or dying plants	(S)	U	
4. Sedimentation Chamber or Forebay Inlet Inspection			Wet fore bay w/ evidence of anaerobic conditions, i.e. standing water, cattails, and algae.
No evidence of sediment accumulation, trash, and debris.	S	(U)	
Good condition, no need for repair	S	(U)	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	(S)	U	
Robust coverage by year 2 or later	(S)	U	
6. Inlet and Outlet Controls:			Inlet is obstructed due to high elevation of fore bay control. Need low flow outlet from fore bay.
Flow is unobstructed in openings (grates, orifices, etc)	(S)	U	
Structures are operational with no evidence of deterioration	(S)	U	
7. Vegetation removal (once every 3 years)			
Prune dead, diseased, or decaying plants	(S)	U	

Corrective Action Needed	Due Date
1. Fore bay needs to be drained. 2.2ft of standing water.	ASAP
COMMENT:	

Regular Inspection and Maintenance Guidance for Gravel Wetland Stormwater Management Device

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ACTIVITIES

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. Vegetation coverage is integral to the performance of the system and vegetation care is important to system productivity and health. A gravel wetland is a subsurface horizontal filtration system and does not rely upon the surface soils for treatment. As such, surface infiltration rates are expected to be low and not a criterion for cleaning. Rather, stormwater access to subsurface treatment is by way of inlet standpipes. It is important to ensure these inlets are performing properly.

1ST YEAR POST-CONSTRUCTION ACTIVITY	FREQUENCY
1. Check that plants have adequate water, are well established and healthy. **Remedy:** Water plants as necessary, remove or treat diseased vegetation as necessary and re-vegetate poorly established plants as necessary	After every major storm in the first few months, then biannually.
2. Check for erosion in the system and short circuiting (holes) in the surface wetland soils. **Remedy:** Soil piping, erosion, and holes should be filled, lightly compacted, and reseeded.	
POST-CONSTRUCTION ACTIVITY	**FREQUENCY**
3. Check inlets outlets and stand pipes for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet, outlets and standpipes if obstructed.	Quarterly initially, biannually, frequency adjusted as needed after 3 inspections
4. 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	
5. Check that the depth of accumulated sediment in the sedimentation chamber is less than 12 inches or 10 percent of the pretreatment volume. **Remedy:** The sedimentation chamber, forebay, and treatment cells outlet devices should be cleaned when drawdown times exceed 36 hours. Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.	
6. 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 and outlets.	Annually
7. 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.	
8. Cut and remove vegetation from the Gravel Wetland System and forebay in order to maintain nitrogen removal performance. **Remedy:** The vegetation should be cut and removed from the system to prevent nitrogen from cycling back into the system.	Once every 3 years

CHECKLIST FOR INSPECTION OF GRAVEL WETLAND

Location: I93 Exit 2 Park & Ride. DOT#: 10418G | Inspector: Tim Puls

Date: 7/18/14 | Time: 10:30AM | Site Conditions: Very Good

Date of Last Rain Event: 7/16/14

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	S U	NA – This system was constructed in 2007
Vegetation is established and thriving	S U	
No evidence of holes in the wetland soil causing short-circuiting	S U	
No evidence of erosion at inlet and outlet structures	S U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	(S) U	Plunge pools around the 3 inlet locations
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	(S) U	
No evidence of erosion	(S) U	
3. Drought Conditions (As needed)		
Water plants as needed	(S) U	
Dead or dying plants	(S) U	
4. Sedimentation Chamber or Forebay Inlet Inspection		Some trash has accumulated
No evidence of sediment accumulation, trash, and debris.	(S) U	
Good condition, no need for repair	(S) U	
5. Vegetation Coverage		Plants are in good condition. Forebay is >95% cattails. Treatment cells are densely vegetated.
50 % coverage established throughout system by first year	(S) U	
Robust coverage by year 2 or later	(S) U	
6. Inlet and Outlet Controls		
Flow is unobstructed in openings (grates, orifices, etc)	(S) U	
Structures are operational with no evidence of deterioration	(S) U	
7. Vegetation removal (once every 3 years)		No maintenance has been done to date.
Prune dead, diseased, or decaying plants	S (U)	

Corrective Action Needed	Due Date
1. Maintain vegetation = cut down to base of plant and remove vegetation from system	
COMMENT: Perimeter ground water drainage is a 6" PUD in 2'x3' stone trench. Flow is directed to inlets.	

BERRY SURVEYING & ENGINEERING
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January 31, 2022

Ms. Bethann McCarthy, PE
Alteration of Terrain Bureau
NHDES
PO Box 95
Concord, NH 03302

RE: Alteration of Terrain Permit Application AoT #210802-119
"Residences and Shops at Kelly Brook"
Tax Map H, Lot 37A
Dover, NH

Dear Ms. McCarthy:

The following waivers are hereby requested:

Identification of Waivers Requested:

1. Waiver requested to not satisfy Ground Water Recharge (GRV) requirement as put forth by Env-Wq 1507.04(b).

1) Explanation:

This waiver request is being submitted to allow for the Ground Water Recharge requirements put forth by Env-Wq 1507.04(b) due to soil conditions on site as shown in the Site Specific Soils Map (SSSM).

1) Waiver Justification:

a. Granting the request will not result in an adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact that would result from complying with the rule as written.

Granting this request will not result in adverse impact on the environment, public health, public safety, or abutting properties that is more significant than the impact of complying with the rules as written. This is due to site conditions not allowing for compliance. On-Site soils that are being replaced with impervious surfaces are; Winsdor Variant, Buxton, and Scantic. The Windsor Variant has limited recognition across the state, primarily only being in Strafford County, which is why it is not found in the KSat Values for New Hampshire Soils (Ksat NH Manual). While the Windsor Variant

experiences Ksat of 6-20 in/hr in the "B" horizon according the Ksat NH, a silt loam "C" horizon exists with a significantly more restrictive Ksat.

Using the NH State-Wide Numerical Soil Legend (Key to the Soils of New Hampshire) 2011 Catena, the Windsor Variant is located within Section C, Marine or Glaciolacustrine Deposits, Soils Developed in Silt and Clay. From this section Eldridge soil contains similar textures and a restrictive "C" horizon. Using the Ksat NH Manual, Eldridge soil has a "C" horizon Ksat of 0.06-0.6 in/hr. By applying this restrictive "C" horizon to the Windsor Variant, infiltration would be prohibited in the proposed condition and is therefore limited in the existing condtion.

Buxton consists of restrictive "B" and "C" horizons of 0.1-0.6 in/hr and 0.0-0.2 in/hr, respectively. Scantic consists of restrictive "B" and "C" horizons as well, with 0.0-0.2 in/hr and 0.0-0.2 in/hr, respectively. With restrictive "B" and "C" horizons across the subject parcel, compliance with Env-Wq 1507.04(b) is not possible.

b. Granting the request is consistent with the intent and purposes of the rule being waived.

Utilizing the justification put forth in part a, granting this waiver request is consistent with the intent and purposes of the rule being waived. There is no location of site that is able to provide the minimum Ksat requirement of 0.5 in/hr in order to satisfy the GRV requirements of Env-Wq 1507.04(b).

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, EIT
Project Engineer
k.poulin@berrysurveying.com

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
VP – Technical Operations
k.berry@berrysurveying.com

SOILS & DEWATERING:

WfA	*WINDSOR*	*VARIANT*	*K= 0.17*
WfB	*WINDSOR*	*VARIANT*	*K= 0.17*
WfC	*WINDSOR*	*VARIANT*	*K= 0.17*
BtxA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BtxB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BtxC	*BUXTON*	*SILT LOAM*	*K= 0.49*
ScA-P	*SCANTIC*	*POORLY DRAINED*	*K= 0.49*
ScB-P	*SCANTIC*	*POORLY DRAINED*	*K= 0.43*

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. &
ROCKINGHAM COUNTTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2022 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED FEBRUARY 17, 2022 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIEST OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E–101 AND E–102.

THE CONSTRUCTION SCHEDULE WILL BE MANAGED SO THAT ALL STORMWATER STRUCTURES WILL BE BUILT AND STABILIZED PRIOR TO RECEIVING SURFACE WATER RUNOFF. CONTRACTOR TO BE RESPONSIBLE FOR ALL DIVERSIONS DURING CONSTRUCTION AND FOR INTERIM SEDIMENT AND EROSION CONTROL MEASURES.

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac..

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

6.) SEE PHASING PLAN FOR MORE INFORMATION.

7.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E–101 AND E–102 OF THE CONSTRUCTION DETAILS.

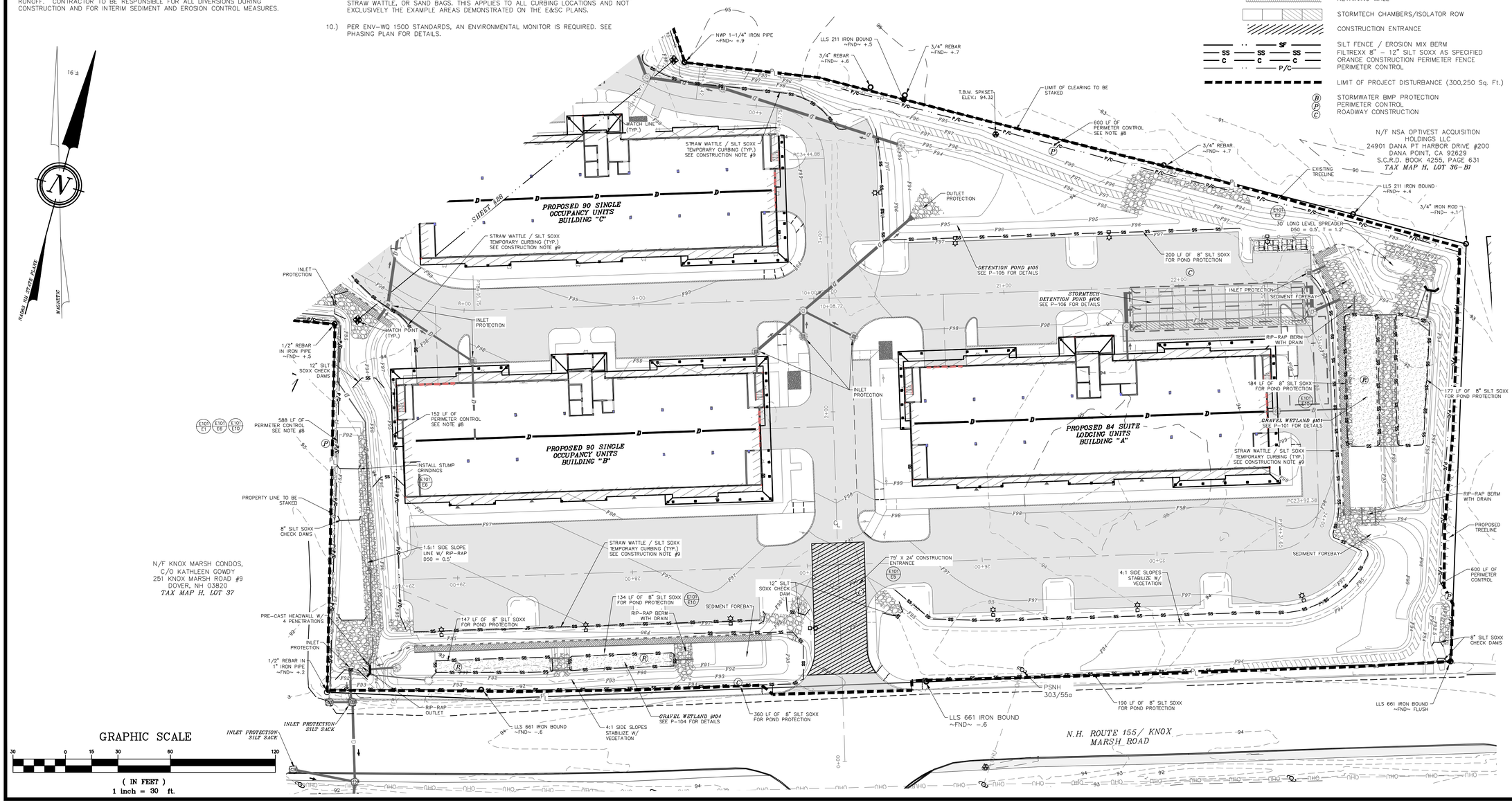
8.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL GRADE IS GREATER THAN 5%. MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL GRADE IS 5% OR LESS.

9.) TEMPORARY CURBING WILL BE INSTALLED AFTER ROADWAY CONSTRUCTION BECOMES IMPERVIOUS, EITHER COMPACTED GRAVEL OR BASE PAVEMENT TO ENSURE THAT CATCH BASINS ARE BROUGHT ON LINE AND SURFACE WATER RUNOFF IS ROUTED TO THE INTENDED TREATMENT. TEMPORARY CURBING CAN BE IN THE FORM OF SILT SOXX, STRAW WATTLE, OR SAND BAGS. THIS APPLIES TO ALL CURBING LOCATIONS AND NOT EXCLUSIVELY THE EXAMPLE AREAS DEMONSTRATED ON THE E&SC PLANS.

10.) PER ENV–WQ 1500 STANDARDS, AN ENVIRONMENTAL MONITOR IS REQUIRED. SEE PHASING PLAN FOR DETAILS.

LEGEND:

- IRON BOUND ~FND~
- EXISTING/PROPOSED CATCH BASIN W/ STRUCTURE
- PROPOSED STORMWATER BMP OUTLET STRUCTURE
- PROPOSED DRAIN MANHOLE W/ STRUCUTRE
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- 50' WETLAND BUFFER
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- CENTER LINE
- EXISTING DRAINAGE LINE
- PROPOSED DRAINAGE LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- CONSTRUCTION ENTRANCE
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" – 12" SILT SOXX AS SPECIFIED
- ORANGE CONSTRUCTION PERIMETER FENCE
- PERIMETER CONTROL
- LIMIT OF PROJECT DISTURBANCE (300,250 Sq. Ft.)
- STORMWATER BMP PROTECTION
- PERIMETER CONTROL
- ROADWAY CONSTRUCTION



GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN EAST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

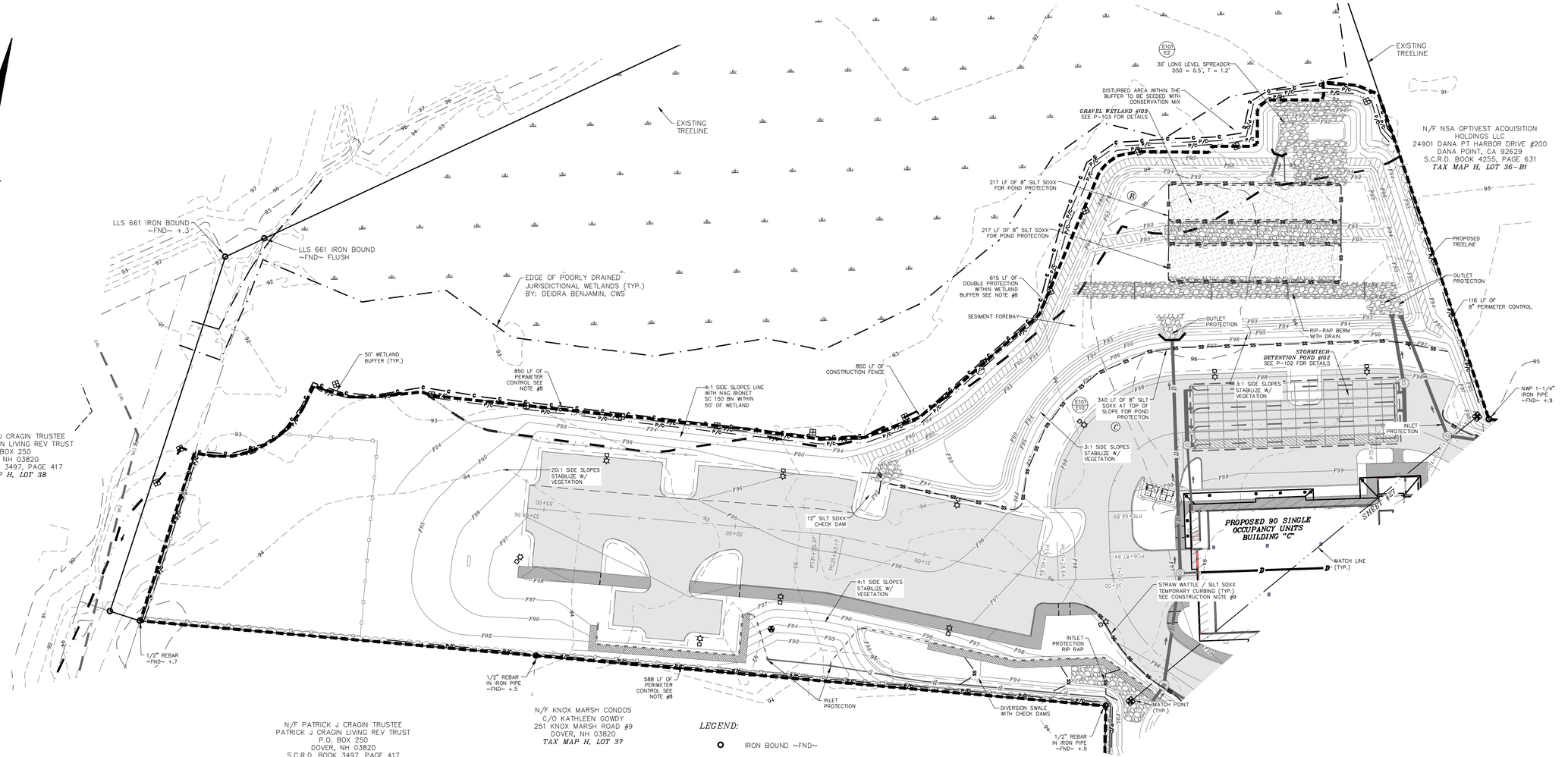
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

SHEET 27 OF 60

NOT FOR CONSTRUCTION



LEGEND:

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- PROPOSED STORMWATER BMP OUTLET STRUCTURE
- PROPOSED DRAIN MANHOLE W/ STRUCUTRE
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- BERM
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- STORMTECH CHAMBERS/ISOLATOR ROW
- CONSTRUCTION ENTRANCE
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" – 12" SILT SOXX AS SPECIFIED
- ORANGE CONSTRUCTION PERIMETER FENCE
- PERIMETER CONTROL
- LIMIT OF PROJECT DISTURBANCE (300,250 Sq. Ft.)
- STORMWATER BMP PROTECTION
- PERIMETER CONTROL
- ROADWAY CONSTRUCTION

SOILS & DEWATERING:

WfA	*WINDSOR*	*VARIANT*	*K= 0.17*
WfB	*WINDSOR*	*VARIANT*	*K= 0.17*
WfC	*WINDSOR*	*VARIANT*	*K= 0.17*
BsA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BsB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BsC	*BUXTON*	*SILT LOAM*	*K= 0.49*
ScA–P	*SCANTIC*	*POORLY DRAINED*	*K= 0.49*
ScB–P	*SCANTIC*	*POORLY DRAINED*	*K= 0.43*

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. & ROCKINGHAM COUNTTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

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P.O. BOX 720
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2.) TAX MAP H, LOT 37A

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10.) PER ENV-WQ 1500 STANDARDS, AN ENVIRONMENTAL MONITOR IS REQUIRED. SEE PHASING PLAN FOR DETAILS.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN WEST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14244
LICENSED PROFESSIONAL ENGINEER

SHEET 28 OF 60

NOT FOR CONSTRUCTION

TEPP LLC TRANSPORTATION ENGINEERING, PLANNING AND POLICY

MEMORANDUM

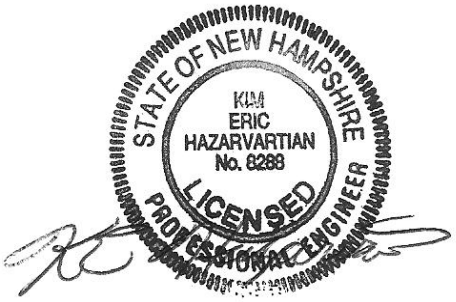
93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
800 Turnpike Street, Suite 300, North Andover, Massachusetts 01845 USA
Phone (603) 212-9133 and Fax (603) 226-4108
Email tepp@teppllc.com and Web www.teppllc.com

Ref: 1698

Subject: Traffic Assessment
239 Knox Marsh Road
Dover, New Hampshire

From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
keh@teppllc.com

Date: December 11, 2024



INTRODUCTION

TEPP LLC has prepared this traffic-assessment memorandum regarding a proposed development at 239 Knox Marsh Road in the City of Dover, New Hampshire. The previous development program consisted of:

- 52 apartments
- 12 attached dwelling units
- 23,000 square feet (sf) of commercial floor area[1]

The current development program consists of:

- 180 single-room-occupancy affordable dwelling units
- an 84-room hotel

TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative *Trip Generation Manual*.[2] This information is based on empirical data for a variety of land uses including:

- land use 223, affordable housing, based on residents[3]
- land use 310, hotel, based on rooms[4]

[1] Stephen G. Pernaw & Company, Inc. (SGP), *Traffic Impact Assessment, Proposed Mixed-Use Development, Dover, New Hampshire* (Concord, New Hampshire, April 28, 2021).

[2] ITE, *Trip Generation Manual*, 11th Edition (Washington DC, September 2021).

[3] ITE, Volume 3, pages 337 to 357.

Table 1 shows differences in calculated trip generation for current development program versus previous development program as:

Table 1. Calculated trip generation.

	Vehicle-Trips				
		Current Program			
	Previous Program[a]	Affordable Housing[b]	Hotel[c]	Total	Difference[d]
Weekday Daily	672	329	671	1,000	328
Weekday AM-Street-Peak Hour					
In	27	13	19	32	5
Out	28	28	16	44	16
Total	55	41	35	76	21
Weekday PM-Street-Peak Hour					
In	32	21	17	38	6
Out	36	8	17	25	-11
Total	68	29	34	63	-5
Saturday Daily	426	329	678	1,007	581
Saturday Site-Peak Hour					
In	28	21	34	55	27
Out	27	20	36	46	19
Total	55	41	60	101	46

[a] From SGP, page 10.

[b] Based on ITE, land use 223, affordable housing (income limits), 225 residents (180 rooms with an average of 1.25 residents per room).

[c] Based on ITE, land use 310, hotel, 84 rooms. Used weekday daily to estimate Saturday daily. Used weekday AM-street-peak hour to estimate Saturday site-peak hour.

[d] Current versus previous development program.

- weekday daily, 328 vehicle-trips (total of in and out)
- weekday AM-street-peak hour, 21 vehicle-trips (5 in and 16 out)
- weekday PM-street-peak hour, -5 vehicle-trips (6 in and -11 out)
- Saturday daily, 581 vehicle-trips (total of in and out)
- Saturday site-peak hour, 46 vehicle-trips (27 in and 19 out)

[4] ITE, Volume 3, pages 499 to 526.

# Single Occupancy Units	90	Full Velocity (Manning Equation)	
# Single Occupancy Bedrooms	90	V=(1.486/n)*(R^2/3)*(S^1/2)	
Flow Received from Single Occupancy Units (gpm)		n	0.011
GPM=(107GPD * #BR * 6)/1440min/day		R	0.167
38.63		Pipe Dia (in)	8
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		Area (ft^2)	0.349
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day		8" SDR 35	
0.009		Inv In (SMH #3)	89.06
Cumulative Infiltration (gpm)		Inv Out (SMH #4)	88.20
0.009		Outlet Pipe Length (ft)	191.00
Total Flow Received (BR Flow + INF) (gpm)		Slope	0.0045
38.63		Full Velocity (ft/s)	2.75
SMH #3		Discharge Rate (gpm)	429.89
Rim Elev	98.86	SMH #3 Inlet Pipe Length (ft)	27.00
Inv In (Residential Building C)	89.16		
Inv Out (Prop. SMH #4)	89.06		
Depth SMH	9.80		

# Single Occupancy Units	90	Full Velocity (Manning Equation)	
# Single Occupancy Bedrooms	90	V=(1.486/n)*(R^2/3)*(S^1/2)	
Flow Received from Single Occupancy Units (gpm)		n	0.011
GPM=(107GPD * #BR * 6)/1440min/day		R	0.167
38.63		Pipe Dia (in)	8
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		Area (ft^2)	0.349
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day		8" SDR 35	
0.013		Inv In (SMH #5)	88.43
Cumulative Infiltration (gpm)		Inv Out (SMH #4)	88.20
0.013		Outlet Pipe Length (ft)	56.90
Total Flow Received (BR Flow + INF) (gpm)		Slope	0.004
38.64		Full Velocity (ft/s)	2.60
SMH #5		Discharge Rate (gpm)	407.32
Rim Elev	97.20	SMH #5 Inlet Pipe Length (ft)	40.00
Inv In (Residential Building B)	83.53		
Inv Out (Prop. SMH #4)	88.43		
Depth SMH	8.77		

# Single Occupancy Units	90	Full Velocity (Manning Equation)	
# Single Occupancy Bedrooms	90	V=(1.486/n)*(R^2/3)*(S^1/2)	
Flow Received from Single Occupancy Units (gpm)		n	0.011
GPM=(107GPD * #BR * 6)/1440min/day		R	0.167
38.63		Pipe Dia (in)	8
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		Area (ft^2)	0.349
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day		8" SDR 35	
0.018		Inv In (SMH #4)	88.10
Cumulative Infiltration (gpm)		Inv Out (SMH #6)	87.86
0.039		Outlet Pipe Length (ft)	56.75
Total Flow Received (BR Flow + INF) (gpm)		Slope	0.004
38.66		Full Velocity (ft/s)	2.66
SMH #4		Discharge Rate (gpm)	416.63
Rim Elev	96.76		
Inv In (SMH #3)	88.20		
Inv In (SMH #5)	88.20		
Inv Out (SMH #6)	88.10		
Depth SMH	8.66		

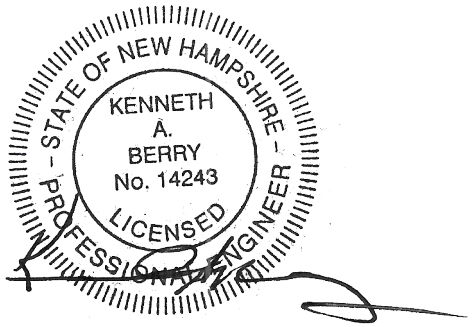
# Single Occupancy Units	180	Full Velocity (Manning Equation)	
# Single Occupancy Bedrooms	180	V=(1.486/n)*(R^2/3)*(S^1/2)	
# Lodging Units	84	n	0.011
# Lodging Employees	6	R	0.167
Flow Received from Single Occupancy Units (gpm)		Pipe Dia (in)	8
GPM=(107GPD * #BR * 6)/1440min/day		Area (ft^2)	0.349
77.25		8" SDR 35	
Flow Received from Logding Units (gpm)		Inv In (SMH #6)	87.76
GPM=(200GPD * #Suites * 6)/1440min/day		Inv Out (SMH #7)	86.91
37.10		Outlet Pipe Length (ft)	212.50
Flow Received from Logding Employees (gpm)		Slope	0.004
GPM=(10GPD * #Employees * 6)/1440min/day		Full Velocity (ft/s)	2.59
0.20		Discharge Rate (gpm)	405.19
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		SMH #6 Inlet Pipe Length (ft)	40.67
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day			
0.018			
Cumulative Infiltration (gpm)			
0.057			
Total Flow Received (BR Flow + INF) (gpm)			
114.61			
SMH #6			
Rim Elev	97.18		
Inv In (Lodging Building A)	87.86		
Inv In (SMH #4)	87.86		
Inv Out (SMH #7)	87.76		
Depth SMH	9.42		

# Single Occupancy Units	180	Full Velocity (Manning Equation)	
# Single Occupancy Bedrooms	180	V=(1.486/n)*(R^2/3)*(S^1/2)	
# Lodging Units	84	n	0.011
# Lodging Employees	6	R	0.167
Flow Received from Single Occupancy Units (gpm)		Pipe Dia (in)	8
GPM=(107GPD * #BR * 6)/1440min/day		Area (ft^2)	0.349
77.25		8" SDR 35	
Flow Received from Logding Units (gpm)		Inv In (SMH #7)	86.81
GPM=(200GPD * #Suites * 6)/1440min/day		Inv Out (SMH Dover GIS #2864)	86.54
37.10		Outlet Pipe Length (ft)	50.40
Flow Received from Logding Employees (gpm)		Slope	0.005
GPM=(10GPD * #Employees * 6)/1440min/day		Full Velocity (ft/s)	2.99
0.20		Discharge Rate (gpm)	468.92
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)			
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day			
0.067			
Cumulative Infiltration (gpm)			
0.124			
Total Flow Received (BR Flow + INF) (gpm)			
114.67			
SMH #7			
Rim Elev	94.00		
Inv In (SMH #6)	86.91		
Inv Out (SMH Dover GIS #2864)	86.81		
Depth SMH	7.19		

# Single Occupancy Units	180
# Single Occupancy Bedrooms	180
# Lodging Units	84
# Lodging Employees	6
Flow Received from Single Occupancy Units (gpm)	
GPM=(107GPD * #BR * 6)/1440min/day	
77.25	
Flow Received from Logding Units (gpm)	
GPM=(200GPD * #Suites * 6)/1440min/day	
37.10	
Flow Received from Logding Employees (gpm)	
GPM=(10GPD * #Employees * 6)/1440min/day	
0.20	
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.016	
Cumulative Infiltration (gpm)	
0.140	
Total Flow Received (BR Flow + INF) (gpm)	
114.69	
Ex. SMH Dover GIS #2864 (Flow From Site Only)	
Rim Elev	94.76
Inv In (SMH #7)	86.54
Inv In (Ex. 12" ACP)	86.54
Inv Out (Ex. 12" ACP)	86.44
Depth SMH	8.32

24-034 Sewer Calculations: The Residences & Lodges at Kelly Brook, 239 Knox Marsh Road, Dover, NH		Assumptions:
Peaking Factor	6	
Flow/Bedroom Single Occupancy Unit (gpd)	103	Metcalf & Eddy/AECOM Table 3-2
Flow/Lodging Unit (gpd)	106	Metcalf & Eddy/AECOM Table 3-3, Average of 2 guest/room, 53 GPD/guest
Flow/Lodging Building Employee (gpd)	8	Assumptions: 6 Employees
Total 8" SDR 35/21 (Ft):	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
675.22	27,492	114.35
	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	202	0.14
	Total Flow Received (GPD):	Total Flow Received (GPM):
	27,694	114.69
It is not anticipated that this pipe will ever flow full		
Berry Surveying & Engineering: November 26, 2024		

PREVIOUS APPROVAL UNDER NHDES SEWER DISCHARGE PERMIT D2022-0705 WAS FOR 25,075 GPD. NEW APPROVAL REQUIRED.



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*DENOTES THAT A PLAN IS TO BE RECORDED AT THE S.C.R.D.

''RESIDENCES & LODGES AT KELLY BROOK''
MIXED–USE TRANSFER OF DEVELOPMENT RIGHTS SITE PLAN
FOR
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

NOTE:

BERRY SURVEYING & ENGINEERING HAS PREPARED AN INSPECTION & MAINTENANCE MANUAL AS PART OF THIS PROJECTS DOCUMENTATION. ALL USERS ARE BOUND TO THIS DOCUMENT AS PART OF THE APPROVAL OF THE PLANNING BOARD. COPIES OF THE YEARLY INSPECTIONS ARE TO BE DELIVERED TO THE CITY OF DOVER COMMUNITY SERVICES DEPARTMENT.

SURVEYOR OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332–2863

ENGINEER OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332–2863

WETLAND SCIENTIST: DEIDRA BENJAMIN, CWS #295
100 LEAVITT ROAD
PITTSFIELD, NH 03263

SOIL SCIENTIST: JOHN P. HAYES, III CWS #18, CSS #87
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 205–4396

LANDSCAPE ARCHITECT: ERIC R. BUCK #87
TERRAIN PLANNING & DESIGN
311 KAST HILL ROAD
HOPKINTON, NH 03229

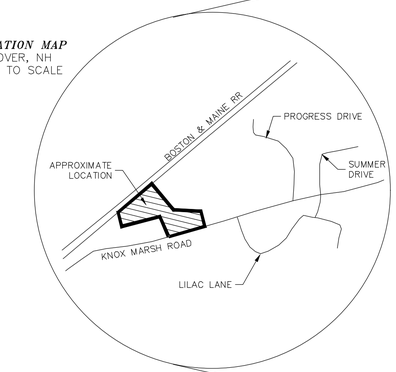
ARCHITECT: NICK ISAAK, AIA
ISAAK DESIGN, PLLC
35 OYSTER RIVER ROAD
DURHAM, NH 03824

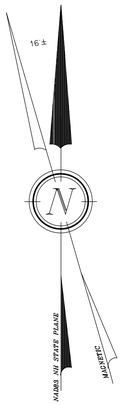
OWNER & APPLICANT:

239 KNOX MARSH REALTY, LLC
P.O. BOX 720
MIDDLETON, MA 01949

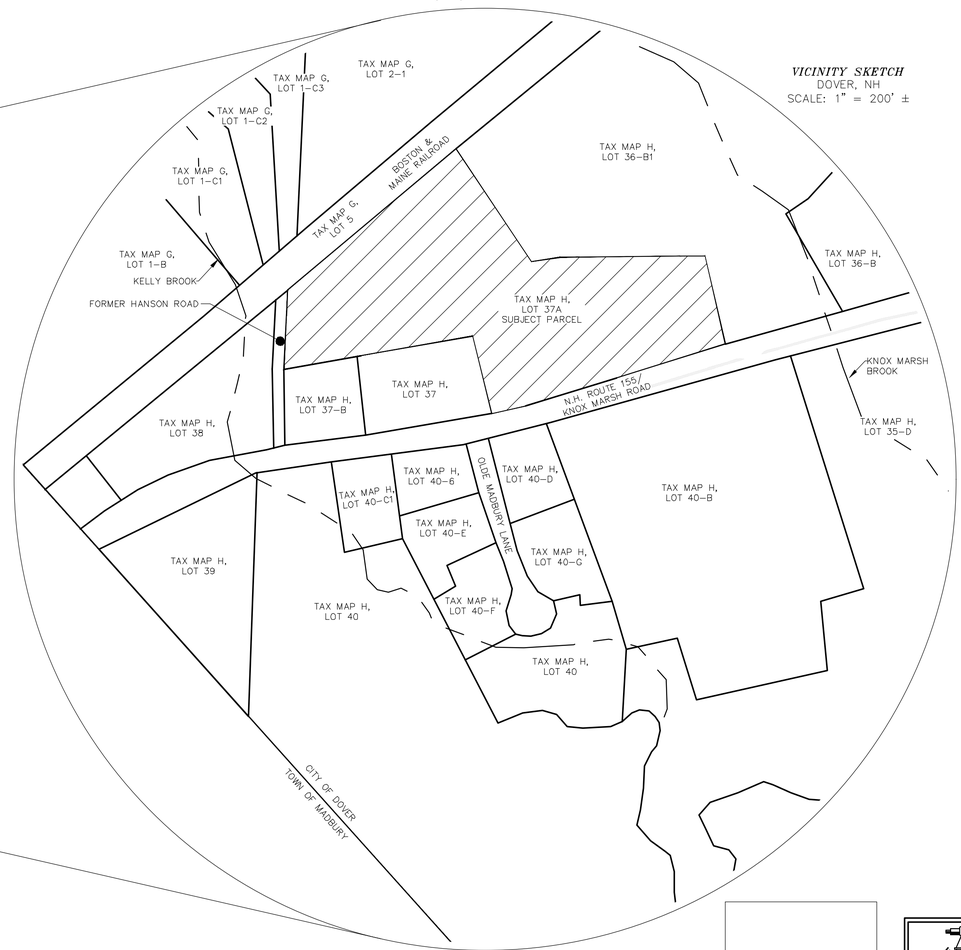
OWNER'S SIGNATURE DATE

LOCATION MAP
DOVER, NH
NOT TO SCALE





VICINITY SKETCH
DOVER, NH
SCALE: 1" = 200' ±



NEW HAMPSHIRE FISH AND GAME NOTES:

1.) ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603–271–2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV, EMAIL SUBJECT LINE: NHB22–0387, "RESIDENCES AND SHOPS AT KELLY BROOK", WILDLIFE SPECIES OBSERVATION. PHOTOGRAPHS SHALL BE PROVIDED FOR VERIFICATION AS FEASIBLE

2.) IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHFG AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHFG, IF ANY, TO ASSURE THE PROJECT DOES NOT APPRECIABLY JEOPARDIZE THE CONTINUED EXISTENCE OF THREATENED AND ENDANGERED SPECIES AS DEFINED IN FIS 1002.04. THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

3.) ALL MANUFACTURED EROSION AND SEDIMENT CONTROL PRODUCTS, WITH THE EXCEPTION OF TURF REINFORCEMENT MATS, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, INLET PROTECTION, CHECK DAMS, AND SEDIMENT TRAPS SHALL NOT CONTAIN PLASTIC, OR MULTI–FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES.

4.) NORTHERN BLACK RACERS SHALL BE REPORTED IMMEDIATELY TO NHFG WILDLIFE BIOLOGISTS MELISSA WINTERS (603–479–1129) OR BRENDAN CLIFFORD (603–944–0885). IMMEDIATE REPORTING OF OBSERVATIONS IS CRITICAL AS NHFG BIOLOGISTS WILL NEED TO COLLECT DATA ON THE INDIVIDUAL.

5.) TURTLES MAY BE ATTRACTED TO DISTURBED GROUND DURING NESTING SEASON (MAY 15 – JUNE 30). ALL TURTLE SPECIES NESTS ARE PROTECTED BY NH LAWS. IF A NEST IS OBSERVED OR SUSPECTED, OPERATORS SHALL CONTACT MELISSA WINTERS (603–479–1129) OR JOSH MEGYESY (978–578–0802) AT NHFG IMMEDIATELY FOR FURTHER CONSULTATION.

REQUIRED PERMITS:

~ NHDES SEWER DISCHARGE PERMIT	D2022–0705 (TO BE AMENDED)
~ NHDES ALTERATION OF TERRAIN PERMIT	AoT–2183–A (TO BE AMENDED)
~ US EPA NOI & SWPPP	NHR1001UU (SWPPP ADDENDUM REQUIRED)
~ NATURAL HERITAGE BUREAU	NHB22–0387
~ NH DIVISION OF HISTORICAL RESOURCES	DHR #10630
~ NHDOT DRIVEWAY PERMIT	06–125–415 (TO BE AMENDED)

GENERAL PLAN SET NOTES:

1.) 11x17" PLANS ARE TWICE THE PUBLISHED SCALE.

2.) ALL PLANS ARE CONSIDERED TO BE NOT FOR CONSTRUCTION UNLESS THEY CONTAIN THE APPROVAL STAMP OF THE CITY OF DOVER.

WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SITE PLAN, THE SITE PLAN APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS AND SPECIFICATIONS OF THE CITY OF DOVER LAND SITE PLAN REGULATIONS AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL, UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED, IN ANY PARTICULAR, BELOW. NON – ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FOR SITE PLAN APPROVAL.

APPROVED DOVER

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 805 KENNETH A. BERRY SIGNATURE

PLANNING FILE #SITE–XXX–XXXX

REVISION	DATE	DESCRIPTION

MIXED–USE TRANSFER OF DEVELOPMENT RIGHTS SITE PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : AS SHOWN
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

ABBREVIATION LEGEND:

E.O.P.	EDGE OF PAVEMENT
V.G.C.	VERTICAL GRANITE CURB
S.G.C.	SLOPED GRANITE CURB
BITUM.	BITUMINOUS
E.S.H.W.T	ESTIMATED SEASONAL HIGH WATER TABLE
TYP	TYPICAL
U.G.E	UNDER GROUND ELECTRIC / UTILITIES
O.H.U.	OVERHEAD ELECTRIC / UTILITIES
CLDI	CONCRETE LINED DUCTILE IRON
DI	DUCTILE IRON
F.P.	FIRE PROTECTION
FDC	FIRE DEPARTMENT CONNECTION
U.D.	UNDER DRAIN
C.O.	CLEAN OUT
TYP.	INVERT
ELEV.	ELEVATION
HDPE	HIGH DENSITY POLYETHYLENE
RCP	REINFORCED CONCRETE PIPE
RECB	ROLLED EROSION CONTROL BLANKET
F.G.	FINISHED GRADE
E.G.	EXISTING GRADE
E.T.W.	EDGE OF TRAVELED WAY
T.B.R.	TO BE REMOVED
PL	PROPERTY LINE
EL	EASEMENT LINE
CL	CENTER LINE
CF	CUBIC FEET
P.C.	POINT OF CURVATURE
P.T.	POINT OF TANGENCY
P.V.C.	POINT OF VERTICAL CURVE
P.V.I.	POINT OF VERTICAL INTERSECTION
P.V.T.	POINT OF VERTICAL TANGENCY
EX.	EXISTING
PROP.	PROPOSED
STA.	STATION
BMP	BEST MANAGEMENT PRACTICE
'/,	FEET / FEET
TP	TEST PIT
FND	FOUND
TBS	TO BE SET

{ } SSL ( ) ~ {SIZE} SINGLE SOLID LINE (COLOR W=WHITE, Y=YELLOW)
{ } DSL ( ) ~ {SIZE} DOUBLE SOLID LINE (COLOR W=WHITE, Y=YELLOW)
{ } SSB ( ) ~ {SIZE} SINGLE SOLID W/ BROKEN LINE (COLOR W=WHITE, Y=YELLOW)
{ } SBL ( ) ~ {SIZE} SINGLE BROKEN LINE (COLOR W=WHITE, Y=YELLOW)
{ } DBL ( ) ~ {SIZE} DOUBLE BROKEN LINE (COLOR W=WHITE, Y=YELLOW)

EXISTING LEGEND:

- IRON BOUND/REBAR ~FND~
- UTILITY POLE
- GUY WIRE
- SIGNAGE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- WELL
- BUILDING SETBACK LINE
- POORLY DRAINED JURISDICTIONAL WETLAND LINE
- 50' POORLY DRAINED WETLAND BUFFER
- NRCS SOIL DELINEATION LINE
- SITE SPECIFIC SOIL LINE
- LIMIT OF SOIL SURVEY
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- TREELINE
- GATE VALVE
- FIRE HYDRANT
- CATCH BASIN
- SEWER MANHOLE
- DRAIN MANHOLE
- ABUTTING PROPERTY LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING DRAIN LINE
- OVERHEAD UTILITIES
- MATCH LINE
- MATCH POINT
- **448A** SOIL SERIES
- *CsB* NRCS SOIL LABEL
- **S.C.R.D.** STRAFFORD COUNTY REGISTRY OF DEEDS
- **TYP** TYPICAL
- **FND** FOUND
- POORLY DRAINED JURISDICTIONAL WETLAND HATCH

PROPOSED LEGEND:

- E101 / E6 — DETAIL SHEET / DETAIL
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- UNDERDRAIN
- GUARD RAIL
- PAVEMENT SEAM
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UNDERGROUND UTILITY
- GATE VALVE
- FIRE HYDRANT
- THRUST BLOCKS
- FIRE DEPARTMENT CONNECTION
- SEWER MANHOLE W/ STRUCTURE
- PROPOSED WATER MAIN LINE
- PROPOSED WATER SERVICE
- PROPOSED SEWER MAIN
- EXISTING SPOT GRADE
- PROPOSED SPOT GRADE
- FLOW ARROW
- SAW CUT & MILL
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" - 12" SILT SOXX AS SPECIFIED
- PERIMETER CONTROL (SEE E-101)
- CONSTRUCTION FENCE
- FENCE
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- WETLAND BUFFER PLACARD
- SNOW STORAGE
- RECREATION SPACE
- BITUMINOUS CONCRETE
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE

LANDSCAPING LEGEND:

TREES:

- AR — RED MAPLE
- CC — PAGODA DOGWOOD
- QP — PIN OAK
- ZS — JAPANESE ZELKOVA
- WS — WHITE SPRUCE
- PG — DWARF ALBERTA SPRUCE

BUSHES:

- IC — SOFT TOUCH HOLLY
- AK — AZALEAS
- VD — ARROWWOOD
- MK — MISS KIM LILAC
- SC — ELDERBERRY
- LB — SPICEBUSH
- JC — BLUE POINT JUNIPER
- KL — MOUNTAIN LAUREL
- VA — MAPLE LEAF VIBURNUM
- TC — DWARF GOLDEN JAPANESE YEW
- VC — HIGHBUSH BLUEBERRY

GRASSES:

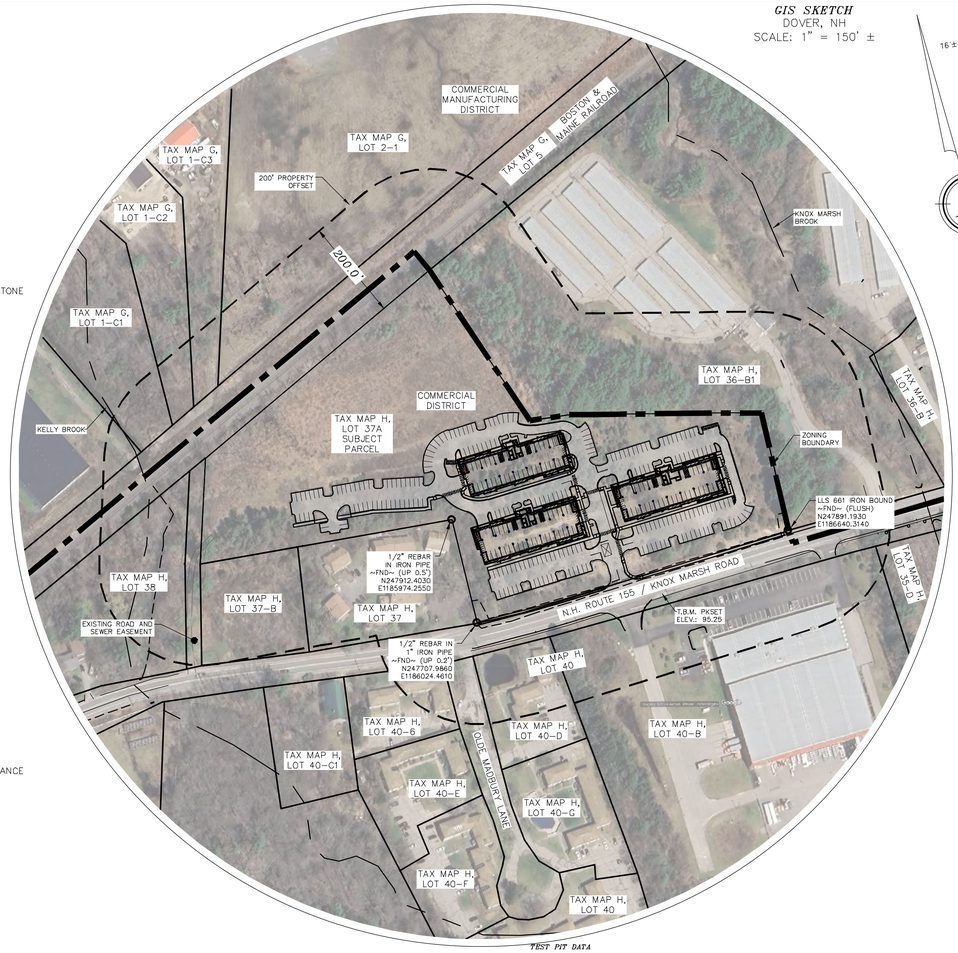
- KF — FEATHER REED GRASS

PLANTS:

- PL— A MIX OF BLACK-EYED SUSAN, NEW ENGLAND ASTER, ANISE HYSSOP & CRANESBILL

GIS SKETCH

DOVER, NH
SCALE: 1" = 150' ±



ABUTTERS WITHIN 200':

N/F NSA-OPTIVEST ACQUISITION HOLDINGS, LLC
24901 DANA PT HARBOR DR #200
DANA POINT, CA 92629
TAX MAP H, LOT 36-B1
S.C.R.D. BOOK 4225, PAGE 631

N/F KNOX MARSH CONDOS
C/O KATHLEEN GOWDY
251 KNOX MARSH RD #9
DOVER, NH 03820
TAX MAP H, LOT 37

N/F SAI REAL ESTATE LLC
12 LEE ROAD
MADBURY, NH 03823
TAX MAP H, LOT 37-2
S.C.R.D. BOOK 4692, PAGE 771

N/F CASSANDRA JEANNE MACLELLAN
251 KNOX MARSH ROAD, UNIT 3
DOVER, NH 03820
TAX MAP H, LOT 37-3
S.C.R.D. BOOK 4933, PAGE 688

N/F RICHARD KEAYS
4 KNOX MARSH ROAD
DOVER, NH 03820
TAX MAP H, LOT 37-4
S.C.R.D. BOOK 1442, PAGE 536

N/F JONATHAN C. MADDEN
P.O. BOX 896
DOVER, NH 03821
TAX MAP H, LOT 37-5
S.C.R.D. BOOK 4723, PAGE 077

ABUTTERS WITHIN 200':

N/F SETH PETERS
23 OLD MILL ROAD
LEE, NH 03861
TAX MAP H, LOT 37-6
S.C.R.D. BOOK, 4547, PAGE 449

N/F GANESH VENKATA RAMA REDDY TADI & ARCHANA VELAGALA
251 KNOX MARSH ROAD, UNIT 8
DOVER, NH 03820
TAX MAP H, LOT 37-8
S.C.R.D. BOOK 4815, PAGE 968

N/F LIZ A. FRASER
95250 GERALD CIRCLE
FENANDINA BEACH, FL 32034
TAX MAP H, LOT 37-10
S.C.R.D. BOOK 3940, PAGE 708

N/F PENN CHARTER REALTY TRUST
LAWRENCE K. CUSHING
251 KNOX MARSH ROAD, UNIT 11
DOVER, NH 03820
TAX MAP H, LOT 37-11
S.C.R.D. BOOK 4357, PAGE 527

N/F GARY P. NOEL
29 S HAMPTON RD
AMESBURY, MA 01913
TAX MAP H, LOT 37-12
S.C.R.D. BOOK 1574, PAGE 770

ABUTTERS WITHIN 200' CONT.:

N/F NATALIE HEBERT REV LIV TST
NATALIE HEBERT, TRUSTEE
462 SIXTH ST
DOVER, NH 03820
TAX MAP H, LOT 37-14
S.C.R.D. BOOK, 4519, PAGE 327

N/F NICOLE L. & THOMAS M. MILLER
19 DOYLE DRIVE
NEWBURYPORT, MA 01950
TAX MAP H, LOT 37-16
S.C.R.D. BOOK 5080, PAGE 057

N/F PATRICK J CRAGIN LIV REV TST
PATRICK J. CRAGIN, TRUSTEE
PO BOX 250
DOVER, NH 03820
TAX MAP H, LOT B
TAX MAP H, LOT 38
S.C.R.D. BOOK, 3497, PAGE 417

N/F BOSTON & MAINE RR
500 WATER STREET J-910
JACKSONVILLE, FL 32202
TAX MAP G, LOT 5

N/F OLDE MADBURY LANE INC
PO BOX 250
DOVER, NH 03820
TAX MAP H, LOT 40-D
S.C.R.D. BOOK 3684, PAGE 740

N/F 237 ALBANY STREET INV. LLC
ABEL AND BRUNELLE ASSOC
160 MIDDLESEX TURNPIKE
BEDFORD, MA 01730
TAX MAP H, LOT 40-B
S.C.R.D. BOOK 4112, PAGE 770

TEST PIT DATA

TEST PIT #101
0-8" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8-18 10YR 4/6 DARK YELLOWISH BROWN, LOAMY FINE SAND, GRANULAR, FRIABLE
18-26 2.5Y 5/4 LIGHT OLIVE BROWN, FINE SAND, GRANULAR, FRIABLE
26-44 2.5Y 5/3 LIGHT OLIVE BROWN, VERY FINE SAND WITH REDOXIMORPHIC FEATURES PRESENT, GRANULAR, FRIABLE
42-72 5Y 5/3 OLIVE, SILT LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
TERMINATED: 72"
E.S.H.W.T.: 26"
RESTRICTIVE LAYER: 42"
REFUSAL: NONE
GROUND WATER OBSERVED: 64"
PERC RATE: 10 MIN./IN.

TEST PIT #101A
0-10" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10-18" 10YR 4/6 DARK YELLOWISH BROWN, LOAMY FINE SAND, GRANULAR, FRIABLE
18-26" 2.5Y 5/4 LIGHT OLIVE BROWN, NFINE SAND, GRANULAR, FRIABLE
26-38" 2.5Y 5/3 LIGHT OLIVE BROWN, VERY FINE SAND WITH REDOXIMORPHIC FEATURES PRESENT, GRANULAR, FRIABLE
38-72" 5Y 5/3 OLIVE, SILT LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
TERMINATED: 72"
E.S.H.W.T.: 26"
RESTRICTIVE LAYER: 38"
REFUSAL: N/A
GROUND WATER OBSERVED: 50"
PERC RATE: 8 MIN./IN.

TEST PIT #102
0-10" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10-18" 10YR 4/6 DARK YELLOWISH BROWN, LOAMY FINE SAND, GRANULAR, FRIABLE
18-24" 2.5Y 5/4 LIGHT OLIVE BROWN, FINE SAND, GRANULAR, FRIABLE
24-46" 2.5Y 5/3 LIGHT OLIVE BROWN, VERY FINE SAND WITH REDOXIMORPHIC FEATURES PRESENT, GRANULAR, FRIABLE
46-72" 5Y 5/3 OLIVE, SILT LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
TERMINATED: 72"
E.S.H.W.T.: 24"
RESTRICTIVE LAYER: 46"
REFUSAL: N/A
GROUND WATER OBSERVED: 44"
PERC RATE: 10 MIN./IN.

TEST PIT #103
0-6" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6-18" 10YR 4/6 DARK YELLOWISH BROWN, LOAMY FINE SAND, GRANULAR, FRIABLE
18-24" 2.5Y 5/4 LIGHT OLIVE BROWN, FINE SAND, GRANULAR, FRIABLE
24-48" 2.5Y 5/3 LIGHT OLIVE BROWN, NVERY FINE SAND WITH REDOXIMORPHIC FEATURES PRESENT, GRANULAR, FRIABLE
48-72" 5Y 5/3 OLIVE, SILT LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
TERMINATED: 72"
E.S.H.W.T.: 24"
RESTRICTIVE LAYER: 48"
REFUSAL: NONE
GROUND WATER OBSERVED: 65"
PERC RATE: 10 MIN./IN.

TEST PIT DATA

TEST PIT #103A
0-6" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
6-18" 10YR 4/6 DARK YELLOWISH BROWN, LOAMY FINE SAND, GRANULAR, FRIABLE
18-24" 2.5Y 5/4 LIGHT OLIVE BROWN, FINE SAND, GRANULAR, FRIABLE
24-50" 2.5Y 5/3 LIGHT OLIVE BROW, NVERY FINE SAND WITH REDOXIMORPHIC FEATURES PRESENT, GRANULAR, FRIABLE
50-72" 5Y 5/3 OLIVE, SILT LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
TERMINATED: 72"
E.S.H.W.T.: 24"
RESTRICTIVE LAYER: 50"
REFUSAL: N/A
GROUND WATER OBSERVED: 48"
PERC RATE: 10 MIN./IN.

TEST PIT #104
0-12" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12-24" 10YR 5/6 YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
24-28" 2.5Y 5/4 LIGHT OLIVE BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
28-60" 2.5Y 5/3 LIGHT OLIVE BROWN, VERY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
60-70" 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FIRM
TERMINATED: 70"
E.S.H.W.T.: 28"
RESTRICTIVE LAYER: 60"
REFUSAL: LEDGE N/A
GROUND WATER OBSERVED: 55"
PERC RATE: 6 MIN./IN.

TEST PIT #104A
0-10" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10-20" 10YR 4/6 DARK YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
20-36" 2.5Y 5/4 LIGHT OLIVE BROWN, LOAMY FINE SAND, GRANULAR, FRIABLE
36-42" 5Y 4/3 OLIVE, VERY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FIRM
42-52" 2.5Y 6/3 LIGHT YELLOWISH BROWN, SAND WITH REDOXIMORPHIC FEATURES PRESENT, GRANULAR, FRIABLE
52-70" 5Y 5/3 OLIVE, SILT LOAM WITH REDOXIMORPHIC FEATURES PRESENT, BLOCKY, FIRM
TERMINATED: 70"
E.S.H.W.T.: 36"
RESTRICTIVE LAYER: 36"
REFUSAL: LEDGE N/A
GROUND WATER OBSERVED: N/A
PERC RATE: 6 MIN./IN.

TEST PIT #105
0-14" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14-28" 10YR 5/6 YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
28-32" 2.5Y 5/4 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM, GRANULAR, FRIABLE
32-64" 2.5Y 5/3 LIGHT OLIVE BROWN, GRAVELLY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
TERMINATED: 64"
E.S.H.W.T.:32"
RESTRICTIVE LAYER: N/A
REFUSAL: NONE
GROUND WATER OBSERVED: 40"
PERC RATE: 4 MIN./IN.

TEST PIT #106
0-14" 10YR 3/3 DARK BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
14-24" 10YR 5/6 YELLOWISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
24-30" 2.5Y 5/4 LIGHT OLIVE BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
30-62" 2.5Y 5/3 LIGHT OLIVE BROWN, VERY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FRIABLE
62-72" 2.5Y 5/2 GRAYISH BROWN, GRAVELLY FINE SANDY LOAM WITH REDOXIMORPHIC FEATURES PRESENT, MASSIVE, FIRM
TERMINATED: 72"
E.S.H.W.T.: 36"
RESTRICTIVE LAYER: 60"
REFUSAL: LEDGE N/A
GROUND WATER OBSERVED: 55"
PERC RATE: 4 MIN./IN.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

NEIGHBORHOOD PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14014 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER / APPLICANT: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, NH 01949

MANAGING MEMBER

2.) TAX MAP H, LOT 37A

3.) S.C.R.D. BOOK 5138, PAGE 73

4.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

5.) ZONING: (C) COMMERCIAL,
SECONDARY GROUNDWATER RECHARGE

	5.) PROVIDED:
MINIMUM FRONTAGE = 125'	642.79'
MINIMUM LOT SIZE = 20,000 Sq. Ft.	407,542 Sq.Ft.
FRONT SETBACK = 30'	36'
REAR SETBACK = 15'	15'
SIDE SETBACK = 12'	12'
WETLANDS BUFFER = 50.0'	50' CUP P21-05 PREVIOUS APPROVAL
MAX. BUILDING HEIGHT: 40'	44'9"-CASE ZONE-2024-0033 WAS APPROVED ON JULY 18, 2024
MAX. LOT COVERAGE: 50%	40.2%
MAX. IMPERVIOUS COVERAGE: 20%	40.2%-PREVIOUS CUP APPROVED FOR 33.8% (P22-46) NEW APPROVAL REQUIRED.

6.) THE INTENT OF THIS PLAN IS TO SHOW A MIXED-USE TRANSFER OF DEVELOPMENT RIGHTS PROJECT IN THE COMMERICAL ZONE LOCATED ON TAX MAP H, LOT 37A. THIS SITE PLAN REFERENCES PREVIOUSLY APPROVED MIXED-USE SITE PLAN "RESIDENCES AND SHOPS AT KELLY BROOK" DOVER SITE-2023-010.

7.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PROPERTY DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF: FEMA, COMMUNITY #330145, MAP #33017C0320E, DATED: SEPTEMBER 30, 2015.

8.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS. TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN SPRING OF 2020 AND NOVEMBER OF 2024.

9.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

10.) MAIL DELIVERY IS PROPOSED INSIDE THE RESIDENTIAL BUILDINGS NEAR THE ENTRY VESTIBULE AND TO THE OFFICE OF THE LODGING BUILDING.

11.) THIS SITE IS SERVICED BY MUNICIPAL SEWER AND WATER.

12.) WETLANDS WERE DELINEATED BY DEIDRA BENJAMIN, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, IN THE SPRING OF 2020.

13.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE, INCLUDING THE CASE NUMBER AND DATE OF DECISION AND ANY CONDITIONS.
-CASE ZONE-2024-0033 WAS APPROVED ON JULY 18, 2024, WHICH PERMITS THAT 1/3RD REQUIREMENT FOR COMMERCIAL SPACE TO BE LOCATED ENTIRELY WITHIN ONE (1) BUILDING WITH THE PROPOSED 2/3RDS RESIDENTIAL USE BE IN TWO (2) SEPARATE BUILDINGS, AND TO PERMIT THE THREE BUILDINGS WITHIN THE C DISTRICT TO BE GREATER THAN 40' IN HEIGHT. THIS APPROVAL IS CONDITIONAL UPON THE FOLLOWING CRITERIA BEING MET:

1) ALL THREE (3) BUILDINGS, IN COMBINATION, MUST MAINTAIN THE SAME, OR GREATER, PERCENTAGE OF COMMERCIAL USE (2/3RD IN PERPETUITY). OTHERWISE, AN ADDITIONAL VARIANCE(S) WOULD BE REQUIRED;

2) THE COMMERCIAL BUILDINGS (INN) BE UNDER CONSTRUCTION (MEANING BUILDING PERMITS ISSUED, FOUNDATION POURED, WALLS BEING FRAMED, ECT.) PRIOR TO THE BUILDING PERMITS BEING ISSUED FOR THE RESIDENTIAL BUILDINGS; AND

3) ALL RESIDENTIAL UNITS SHALL BE RESTRICTED TO THE APPLICABLE CURRENT HUD FAIR MARKET RENT VALUE IN PERPETUITY.

CONDITIONAL USE PERMIT-P21-05 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 10,699 Sq. Ft. OF WETLAND BUFFER DISTURBANCE

CONDITIONAL USE PERMIT-P22-46 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 33.8% IMPERVIOUS SURFACE WHERE ONLY 20% IS ALLOWED WITHIN THE SECONDARY GROUNDWATER PROTECTION ZONE. NEW CUP APPROVAL IS REQUIRED FOR PROPOSED SITE PLAN

14.) AS-BUILT PLANS OF THE SITE DESIGN SHALL BE SUBMITTED ON PAPER AND IN DIGITAL FORMAT AUTOCAD DWG, AUTOCAD DXF OR ESRI FORMAT TO THE CITY OF DOVER ENGINEER'S OFFICE UPON COMPLETION OF PROJECT. AS-BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A LLS. OR P.E. DIGITAL FILES SHALL BE GEO-REFERENCED TO NEW HAMPSHIRE STATE PLANE COORDINATES NAD83 AND SHALL BE EXPRESSED IN FEET.

15.) THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED, WITH THE EXCEPTION OF THE PROPOSED PULL POLES REQUIRED BY EVERSOURCE, WHERE A WAIVER IS REQUESTED..

16.) ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2016" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.

17.) ALL EROSION CONTROL NOTES SHALL INCLUDE PROVISIONS FOR CONSTRUCTION SEQUENCING, TEMPORARY EROSION CONTROL MEASURES, AND PERMANENT STANDARDS SUCH AS LOAM SPREAD RATE FOR DISTURBED AREAS, RATES OF LIME, TYPE AND RATES FOR FERTILIZER, AND SEED AND MULCH MIXTURE WITH RATES OF APPLICATION.

18.) THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT. OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR ANY EARTH DISTURBING ACTIVITY OCCURS.

19.) ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.

20.) A LETTER OF CREDIT FOR THE COST OF RE-VEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS. THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES AND WILL DISTURB 300,250 Sq.Ft. 6.89 Ac. (SEE NOTE #43)

21.) A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE CITY ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.

22.) SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY 7 AM-6 PM, SATURDAY 8AM - 5PM, NO SUNDAY HOURS OR FEDERAL HOLIDAY CONSTRUCTION HOURS ALLOWED. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR. SAID SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR ASSISTANT CITY MANAGER.

23.) BUILDING ADDRESSES SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

24.) THE PROPOSED USE FOR THE SITE IS 84 SUITE LODGING UNITS IN ONE BUILDING AND 180 SINGLE OCCUPANCY UNIT BETWEEN TWO BUILDINGS (90 EACH). THE PROPOSED BUILDINGS ARE 4 STORIES WITH PODIUM STYLE PARKING ON THE FIRST LEVEL, INCLUDING ALL REQUIRED EV AND ACCESSIBLE PARKING SPACES. LEVELS 2-4 CONTAIN THE RESPECTIVE RESIDENTIAL OR LODGING UNIT, WITH LEVELS 2-4 CANTILEVERED OVER THE PARKING LEVEL.

25.) THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY: (TO BE UPDATED)

~	NHDES SEWER DISCHARGE PERMIT	D2022-0705 (TO BE AMENDED)
~	NHDES ALTERATION OF TERRAIN PERMIT	As1-2183-A (TO BE AMENDED)
~	US EPA NOI & SWPPP	NHR1001UU (SWPPP ADDENDUM REQUIRED)
~	NATURAL HERITAGE BUREAU	NHB22-0387
~	NH DIVISION OF HISTORICAL RESOURCES	DHR #06630
~	NHDOT DRIVEWAY PERMIT	06-125-415 (TO BE AMENDED)

26.) COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

27.) ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

28.) ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

29.) THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS/ENTITIES THAT MAY ACQUIRE ANY PROPERTY SUBJECT TO THE REQUIREMENTS AND RESPONSIBILITIES DESCRIBED IN THE APPROVED STORMWATER MANAGEMENT PLAN. THE NOTICE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR RECORDING CONTAINED IN RSA 477 AND 478. THE NOTICE NEED NOT SET FORTH THE REQUIREMENTS AT LENGTH, SO LONG AS IT IS SUFFICIENT TO PROVIDE NOTICE TO PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.

30.) FIRE DEPARTMENT ACCESS ROADS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.

31.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

32.) APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR DOMESTIC WATER LINES.

33.) SITE IS TO COMPLY WITH NFPA 1 CHAPTER 18.

34.) TIBETAN DRIVE IS PROPOSED TO BE PRIVATE. REFER TO THE DEVELOPMENT AGREEMENT FOR ROAD & DRAINAGE RESPONSIBILITIES. TIBETAN DRIVE WILL ALWAYS BE PRIVATE AND WILL NEVER BE ACCEPTED BY THE CITY OF DOVER.

35.) APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL. **HTTPS://WWW.UNH.EDU/UNHSC/PTAPP**

NOTES CONTINUED:

36.) THE PROPOSED STRUCTURES SHALL BE SERVED BY A SPRINKLER SYSTEM AS REQUIRED BY CHAPTER 81-30 OF THE CODE OF THE CITY OF DOVER AND THE ADOPTED STATE OF NH BUILDING AND FIRE CODES.

37.) SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED AND APPROVED BY INSPECTION SERVICES PRIOR TO CONNECTION OF THE BACKFLOW DEVICE.

38.) FIRE DEPARTMENT CONNECTION(S) SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13. ACCESS TO THE FDC SHALL MAINTAIN A CLEAR AND UNOBSTRUCTED PATH AT ALL TIMES.

39.) THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURES WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS (I.E. IBC, ANSI-117.1) AND NH RSA 155-A:5.

40.) PRIVATE TRASH PICKUP WILL BE DONE THROUGH THE USE OF DUMPSTER(S) ON PADS, WITH SCREENING AND WILL BE COLLECTED THROUGH A PRIVATE WASTE PICK UP COMPANY.

41.) HEATING & COOLING FOR PROPOSED UNITS IS TO BE DONE VIA UNITS LOCATED ON THE ROOFS, SCREENED BY PARAPET.

42.) THE BUILDINGS ARE DESIGNED AS SLAB ON GRADE CONSTRUCTION WITH STANDARD 4' FROST WALLS.

43.) PROJECT DISTURBANCE: TOTAL 300,250 Sq. Ft. (6.89 Ac.) NOTE THAT THE PROJECT IS SUBJECT TO THE EPA NPDES PHASE II. THE NOTICE OF INTENT (NOI) MUST BE FILED ALONG WITH A STORMWATER POLLUTION PREVENTION PLAN (SWPPP). EROSION AND SEDIMENT CONTROL INSPECTIONS TO BE CONDUCTED ONCE PER EVERY SEVEN DAYS AND AT AN INCREASED FREQUENCY INCLUDING WITHIN 24-HOURS OF A 0.25 INCH RAIN EVENT. INSPECTIONS TO BE CONDUCTED BY A "QUALIFIED PERSON" AS DEFINED BY EPA CGP 4.1.1 AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN 24 HOURS IN ACCORDANCE WITH CGP 4.1.7 AND MAINTAINED BY THE OWNER FOR A PERIOD OF THREE YEARS AFTER THE PROJECT IS COMPLETED. SEE ALSO CITY OF DOVER ADDITIONAL INSPECTION REQUIREMENTS BELOW.
SEE PHASING PLAN FOR ADDITIONAL INFORMATION. PER ENV-WQ 1500 STANDARDS, AN ENVIRONMENTAL MONITOR IS REQUIRED.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

44.) PRE-EXISTING COVERAGE:
BUILDING IMPERVIOUS AREA: 2,631 Sq. Ft. (0.7%)
PAVED IMPERVIOUS AREA: 2,701 Sq. Ft. (0.7%)
TOTAL PRE-EXISTING IMPERVIOUS COVER IS 5,532 Sq. Ft. (1.4%)

PROPOSED COVERAGE:
BUILDING IMPERVIOUS AREA: 50,356 Sq. Ft. (12.36%)
ROAD & PARKING LOTS: 94,842 Sq. Ft. (23.2%)
IMPERVIOUS AREA (CURB, SHOULDER, WALKS, RETAINING WALLS, CONCRETE PADS & GRAVEL WALKWAY): 18,568 Sq. Ft. (4.56%)
TOTAL PROPOSED IMPERVIOUS COVER IS 163,766 Sq. Ft. (40.2%) (REVISED ENVIRONMENTAL CUP REQUIRED, 33.8% PREVIOUS)

45.) SIXTEEN (16) EV PARKING SPACES ARE PROVIDED.

46.) THE OWNERS AND THEIR SUCCESSORS ARE RESPONSIBLE FOR THE LIFETIME MAINTENANCE OF ALL BUFFERING AND INTERNAL LANDSCAPING.

47.) THE PERIMETER BOUNDARY WILL BE STAKED OUT BY BERRY SURVEYING & ENGINEERING PRIOR TO THE START OF CONSTRUCTION.

48.) THE APPLICANT IS TO PROVIDE SURETY WITHIN THE CONFINES OF NH RSA 674:36.

49.) DURING PERIODS OF HEAVY SNOW AND WHEN TEMPORARY PILES ARE USED ON SITE, SNOW IS TO BE LOADED INTO TRUCKS AND REMOVED FROM THE SITE. SNOW IS TO BE DISPOSED OF ON AN APPROVED SNOW DUMP.

GRADING NOTES:

1.) THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS DATED 2016. CURRENT STANDARD PLANS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE PROPOSAL.

2.) CONTRACTOR SHALL TAKE SPECIAL CARE IN NOT DISTURBING EXISTING MONUMENTS BOUNDS, AND OR BENCHMARKS WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.

3.) WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

4.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. LIMIT OF GRADING SHOULD NOT BE EXPANDED WITHOUT CONSULTING THE DESIGN ENGINEER. SEE ALSO E&SC PLAN.

5.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCES AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

6.) ALL INTERNAL BUILDING PARKING LEVEL SLOPES ARE TO BE LESS THAN 2% IN ALL DIRECTIONS, PROVIDING AN ACCESSIBLE ROUTE FROM THE INTERNAL ACCESSIBLE PARKING SPACES.

7.) ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM PLACED AND SEEDED. THE LOAM SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.

8.) ALL ELEVATIONS TO BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE DESIGN ENGINEER IS TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY. TEMPORARY BENCHMARKS (T.B.M.) ARE TO BE PROVIDED BY THE DESIGN ENGINEER.

9.) WRITTEN DIMENSION ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR IS TO CONFIRM ALL ELEVATIONS. CONFLICTS WILL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO CONSTRUCTION.

10.) THIS DESIGN ASSUMED THAT THE BUILDING ROOFS ARE GUTTERED TO BE RESPECTIVE DISCHARGE POINTS. GUTTERS TO BE DESIGNED BY OTHERS.

11.) DESIGN ENGINEER OF RECORD SHALL PROVIDE SIGNED LETTER TO CITY ENGINEER CERTIFYING THAT THE STORMWATER MANAGEMENT SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS. DESIGN ENGINEER OR DESIGN ENGINEERS REPRESENTATIVE IS TO BE PERIODICALLY ON SITE AND INSPECT DURING CONSTRUCTION PROCESS. CONTRACTOR IS TO PROVIDE 24-48 HOURS NOTICES PRIOR TO INSPECTION REQUESTS.

12.) UPON FINAL COMPLETION AND 85% STABILIZATION THE DRAINAGE SYSTEM IS TO BE CLEANED OF ALL DEBRIS TO INCLUDE THE PUMPING OF THE BASINS. SEE SHEET E102, DETAIL E18 FOR DEFINITION OF STABLE. ALSO TO BE DONE ONCE A YEAR DURING THE CONSTRUCTION PROCESS.

13.) ALL DRAINAGE PIPE IS TO BE HDPE N-12. INDIVIDUAL PIPE SIZES ARE SPECIFIED, RECYCLED PIPE IS APPROVED FOR PROJECT SITE. RECYCLED HDPE PIPE "GREEN PIPE" IS ACCEPTABLE FOR THIS PROJECT SITE.

14.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE UFTIMATE R-1743-LM FRAMES AND GRATES MADE IN NORTH AMERICA. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

15.) DESIGN ENGINEER OF RECORD SHALL PROVIDE SIGNED LETTER TO CITY ENGINEER CERTIFYING THAT THE STORMWATER MANAGEMENT SYSTEM AND UTILITY INFRASTRUCTURE HAVE BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS. DESIGN ENGINEER OR DESIGN ENGINEERS REPRESENTATIVE IS TO BE PERIODICALLY ON SITE AND INSPECT DURING CONSTRUCTION PROCESS. CONTRACTOR IS TO PROVIDE 24-48 HOURS NOTICES PRIOR TO INSPECTION REQUESTS.

16.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCES AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

17.) SEE STORMWATER BMP PLANS FOR RETAINING WALL WATERPROOFING CONSIDERATIONS.

EROSION & EROSION CONTROL NOTES:

1.) CONTRACTOR IS TO INSTALL A CONSTRUCTION ENTRANCE PRIOR TO EARTH DISTURBING ACTIVITIES, UTILIZING 3" ANGULAR STONE UNDERLAID WITH ENGINEER FABRIC.

2.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ROADWAY, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO KNOX MARSH ROAD OR THE SURROUNDING ROADWAYS.

3.) CONTRACTOR IS RESPONSIBLE FOR CLEANING AND MAINTAINING THE INLET PROTECTION ONCE INSTALLED.

4.) FUGITIVE DUST IS TO BE CONTROLLED THROUGHOUT THE CONSTRUCTION PROCESS IN ACCORDANCE WITH ENV-A 1000.

5.) CONTRACTOR IS TO MEET THE REQUIREMENTS SPECIFIED IN RSA 430:51-57 AND AGR 3800, RELATING TO INVASIVE SPECIES.

6.) CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE WATER QUALITY FROM ANY RUN OFF DURING THE CONSTRUCTION PROCESS, IN ACCORDANCE WITH ENV-WQ 1507, IN ORDER TO PREVENT VIOLATIONS OF THE STORM WATER QUALITY STANDARDS.

7.) CONTRACTOR AY USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. THE CONTRACTOR IS NOT THE EXPAND CONSTRUCTION BEYOND THE STAKED OUT LIMITS OF DISTURBANCE.

8.) ALL STORAGE FACILITIES FOR FUEL, CHEMICALS, CHEMICAL OR INDUSTRIAL WASTES, AND BIODEGRADABLE RAW MATERIALS SHALL MEET THE REGULATIONS OF THE NHDES, INCLUDING BUT NOT LIMITED TO THOSE INVOLVING UNDERGROUND STORAGE TANKS, ABOVE GROUND STORAGE TANKS, HAZARDOUS WASTE AND BEST MANAGEMENT PRACTICES FOR GROUND WATER PROTECTION (PART ENV-WQ 401).

9.) ALL DEVELOPMENT MUST COMPLY WITH THE EPA PHASE II STORMWATER RULES AND THE CITY'S MS4 PERMIT, AS AMENDED.

10.) CITY OF DOVER: IN ACCORDANCE WITH SITE PLAN REVIEW REGULATIONS (153-14) THE FOLLOWING STORMWATER MEASURES ARE REQUIRED.

A.) ALL PROPOSED BMPs WILL CONFORM TO THE NH STORMWATER MANUAL VOLUME 3.
B.) EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY COMMUNITY SERVICE.
C.) TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN CALENDAR DAYS FOR EXPOSED SOILS AREAS THAT ARE WITHIN ONE HUNDRED FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.
D.) ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL STABILIZATION IS ACCOMPLISHED. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 CALENDAR DAYS UNLESS CONDITIONS DICTATE OTHERWISE.
E.) COMMUNITY SERVICES DEPARTMENT OR THEIR DESIGNATED AGENT SHALL HAVE ACCESS TO THE SITE TO COMPLETE ROUTINE INSPECTIONS AND SHALL BE NOTIFIED 24-HOURS PRIOR TO INSTALLATION OF A STORMWATER BMP IN ORDER TO SCHEDULE AN INSPECTION, DURING NORMAL WORKING HOURS.
F.) THE PLANNING BOARD OR COMMUNITY SERVICES MAY REQUIRE THE DESIGN ENGINEER AND/OR AN INDEPENDENT, THIRD-PARTY INSPECTION AND OVERSIGHT OF THE CONSTRUCTION OF STORMWATER MANAGEMENT FACILITIES AND EROSION AND SEDIMENT CONTROL AT THEIR DISCRETION. THE OWNER / APPLICANT IS RESPONSIBLE FOR ALL FEES ASSOCIATED WITH INSPECTIONS.
G.) ALL SWPPP/SWMP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORMWATER INSPECTOR (CESSWI), OR A CERTIFIED PROFESSIONAL IN STORMWATER QUALITY (CPSWQ). INSPECTION REPORTS WILL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT.
H.) THE OWNER IS ULTIMATELY RESPONSIBLE FOR THE INSTALLATION, CONSTRUCTION, INSPECTION, AND DISPOSITION OF ALL STORMWATER MANAGEMENT AND EROSION CONTROL MEASURES REQUIRED BY THE PROVISIONS OF THESE REGULATIONS.
I.) STORMWATER MANAGEMENT PLAN (SWMP) SUBMITTAL REQUIREMENTS. AT THE DISCRETION OF THE PLANNING BOARD OR COMMUNITY SERVICES DEPARTMENT, A TECHNICAL REVIEW BY AN INDEPENDENT THIRD PARTY MAY BE REQUIRED OF ANY SWMP PREPARED UNDER THESE REGULATIONS. SUCH A REVIEW SHALL BE PERFORMED BY A QUALIFIED PROFESSIONAL CONSULTANT AND THE EXPENSE OF WHICH SHALL BE THE FULL RESPONSIBILITY OF THE OWNER/APPLICANT.

UTILITY NOTES:

1.) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVE AND BELOW GROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITY CONFLICTS SHOULD BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.

2.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3.) PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES, TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EGFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL MEETING THE ENGINEERS SPECIFIC RECOMMENDED CRITERIA.

4.) IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER (NOT ALLOWED IN CITY R.O.W.), EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATION. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.

5.) PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.

6.) FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE DOVER DPW.

7.) CONTRACTOR TO CONTACT DOVER DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY CONSTRUCTION TO COORDINATE ALL WORK CONCERNING INSTALLATION OF ANY PROPOSED WATER LINE IMPROVEMENTS.

8.) ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL CONFORM TO CITY OF DOVER STANDARDS. ALL HIGHWAY CONSTRUCTION WILL MEET THE CITY OF DOVER STANDARDS.

9.) CONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSTALLATIONS WITH EVERSOURCE AT (800) 662-7764. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL. A 48-HOUR MINIMUM NOTICE IS REQUIRED.

10.) CONTRACTOR SHALL COORDINATE ALL TELECOMMUNICATIONS INSTALLATIONS WITH FAIRPOINT COMMUNICATIONS AT (603) 427-5525.

11.) CONTRACTOR SHALL COORDINATE ALL CABLE INSTALLATIONS WITH COMCAST.

12.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED.

13.) ALL SEWER MAN HOLE RIMS & COVERS ARE TO BE LIFTMATE-R-1743-LM.

14.) ALL WATER SERVICES ARE TO BE WITNESSED WITH A 2"x4" PAINTED BLUE. ALL SEWER SERVICES ARE TO BE WITNESSED WITH A 2"x4" PAINTED YELLOW. IS STUBBED PRIOR TO BUILD

PLAN REFERENCES CONTINUED:

3.) "AS BUILT PLAN FOR KNOX MARSH CONDOMINIUMS, KNOX MARSH ROAD, DOVER, NH"
BY: KIMBALL CHASE COMPANY INC.
DATED: MARCH 21, 1985
S.C.R.D.: PLAN # 27A–23

4.) "AMENDED SITE PLAN FOR KNOX MARSH CONDOMINIUMS, KNOX MARSH ROAD, DOVER, NH"
BY: KIMBALL CHASE COMPANY INC.
DATED:DECEMBER 9, 1985
S.C.R.D.: PLAN # 23–87

5.) PLAN OF LOT, ESTATE OF GLADYS D. McCRONE HEIRS, JANET C. VARNEY, LOIS A. McCRONE, GLADYS M. SMITH, ROBERT W. McCRONE, DOVER, NH"
BY: ROBERT W. McCRONE, LLS
DATED: NOVEMBER 2, 1993
S.C.R.D.: PLAN # 26A–43

6.) "LOT LINE ADJUSTMENT PLAN, ROUTE 155 – KNOX MARSH ROAD, DOVER, N.H., FOR SOUTHWEST PARTNERS REALTY L.L.C."
BY: NORWAY PLAINS ASSOCIATES, INC.
DATED: APRIL 2000
FILE NUMBER 303
S.C.R.D.: PLAN # 59–47

7.) PLAN OF LAND FOR LOIS L. McCRONE, KNOX MARSH ROAD, DOVER, NEW HAMPSHIRE"
BY: ROBERT W. McCRONE, LLS #221
DATED DECEMBER 2, 2002
S.C.R.D.: PLAN # 68–29

8.) RIGHT–OF–WAY AND TRACK MAP, BOSTON AND MAINE R.R.
OPERATED BY THE BOSTON AND MAINE R.R.,
STATION 3390+17 TO STATION 3442+97 V2N.H./63
STATION 3442+97 TO STATION 3495+77 V2N.H./64
DATED JUNE 30, 1914
ON FILE WITH PAN AM AND AT BS&E

9.) BOUNDARY PLAN LAND OF EQUINE PROPERTIES LLC, 239 KNOX MARSH ROAD, DOVER, NH, TAX MAP H, LOT 37A"
BY: BERRY SURVEYING & ENGINEERING
DATED JANUARY 21, 2021
FILE #DB2020–066
S.C.R.D. PLAN #12920

10.) EASEMENT PLAN LAND OF EQUINE PROPERTIES LLC, 239 KNOX MARSH ROAD, DOVER, NH, TAX MAP H, LOT 37A"
BY: BERRY SURVEYING & ENGINEERING
DATED JANUARY 21, 2021
FILE #DB2020–066
NOT RECORDED

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

16°±
MAGNETIC
MAR83 NH STATE PLANE

N/F BOSTON & MAINE RAILROAD,
IRON HORSE PARK
500 WATER STREET, J–910
JACKSONVILLE, FL 32202
TAX MAP C, LOT 5

NWP 1–1/2" IRON PIPE
~FND~ +2
0.12' OFF LINE
NOT HELD
SEE DETAIL "A"

LLS 211 1–1/4" IRON PIPE
~FND~ +1.1
N: 248406.07
E: 1185930.20
ELEV.: 92.87
SEE DETAIL "A"

OLD UTILITY POLE

N/F NSA OPTIVEST ACQUISITION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36–B1

N50°00'59"E
578.45'

EXISTING PERIMETER BOUNDARY

S35°43'13"E
357.58'

DETAIL "A"
SCALE 1"=10'
LLS 211 1–1/4" IRON PIPE
~FND~ +1.1
N: 248406.07
E: 1185930.20
ELEV.: 92.87
NWP 1–1/2" IRON PIPE
~FND~ +2
0.12' OFF LINE
NOT HELD
N50°00'59"E
578.45'
S35°43'13"E
357.58'

N50°00'30"E
22.57'

LLS 661 IRON BOUND
~FND~ FLUSH

LLS 661 IRON BOUND
~FND~ +.3

N03°01'12"E
194.48'

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 38

N/F 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949
S.C.R.D. BOOK 5138, PAGE 73
TAX MAP H, LOT 37A

NWP 1–1/4" IRON PIPE
~FND~ +.9

N89°30'59"E
49.94'

N81°26'28"E
77.37'

3/4" REBAR
~T.B.S.~

LLS 211 IRON BOUND
~FND~ +.5
HELD
SEE DETAIL "B"

3/4" REBAR
~FND~ +.6
2.01' OFF LINE
NOT HELD
SEE DETAIL "B"

3/4" REBAR
~FND~ +.7
2.4' OFF LINE
NOT HELD
SEE DETAIL "B"

DETAIL "B"
SCALE 1"=10'
3/4" REBAR
~FND~ +.7
2.4' OFF LINE
NOT HELD
N89°30'59"E
49.94'
3/4" REBAR
~FND~ +.6
2.01' OFF LINE
NOT HELD
N89°19'26"E
265.05'
LLS 211 IRON BOUND
~FND~ +.5

N89°19'26"E
265.05'

3/4" REBAR
~FND~ +.7
0.4' OFF–LINE
NOT HELD
SEE DETAIL "C"

FORMER EXISTING SHED

DETAIL "C"
SCALE 1"=10'
N89°19'26"E
265.05'
3/4" REBAR
~FND~ +.7
0.4' OFF–LINE
NOT HELD
FORMER EXISTING SHED

LLS 211 IRON BOUND
~FND~ +.4

N89°49'54"E
66.73'

3/4" IRON ROD
~FND~ +.1

OLD UTILITY POLE

FORMER EXISTING SHED

N/F NSA OPTIVEST ACQUISITION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36–B1

FORMER EXISTING HOUSE

FORMER DRIVEWAY LOCATION

S12°55'13"E
238.77'

1/2" REBAR
~FND~ +.7

N87°01'49"W
16.54'

S80°01'53"W
207.44'

1/2" REBAR
IN IRON PIPE
~FND~ +.5

S80°01'48"W
298.49'

1/2" REBAR
IN IRON PIPE
~FND~ +.5

HANSON ROAD

DISCONTINUED BY CITY OF DOVER JULY 8, 1998
33' WIDE ACCESS & UTILITY EASEMENT RIGHTS TO SUBJECT PARCEL EXIST

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 37B

EXISTING BUILDING
EXISTING BUILDING
EXISTING BUILDING
EXISTING BUILDING
EXISTING BUILDING

N/F KNOX MARSH CONDOS,
C/O KATHLEEN COWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

N13°37'57"W
210.49'

EASEMENT TO BE GRANTED TO NHDOT PER EXISTING PERMIT

LLS 661 IRON BOUND
~FND~ –.6
APPARENTLY DISTURBED
5.2' OFF–LINE
DESTROYED 2024

3/4" REBAR
~T.B.S.~

LLS 661 IRON BOUND
~FND~ –.6
DESTROYED 2024
TO BE RESET

LLS 661 IRON BOUND
~FND~ FLUSH
N: 247891.19
E: 1186640.31
ELEV.: 93.11

3/4" IRON ROD
~FND~ +.1

3/4" IRON ROD
~FND~ +.1

EXISTING MONUMENT

EVERSOURCE
303/62A

PSNH
303/62

PSC NH
303/62

PSNH 303/61

NET
146/48

1/2" REBAR IN
1" IRON PIPE
~FND~ +.2
DESTROYED
2024
TO BE RESET

91.59'
S77°25'30"W
251.12'
S72°45'55"W
300.08'
S72°46'28"W

PSNH
303/55a

FORMER E.O.P.

VZ 48

PSNH
303/59

PSNH
303/56

PSNH
303/55

PSNH
303/54

PSNH
303/53

N.H. ROUTE 155/ KNOX MARSH ROAD

OLDE MADBURY LANE

PSNH
146/46

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3574, PAGE 653
TAX MAP H, LOT 40–C1

N/F OLDE MADBURY LANE INC
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 1790, PAGE 536
TAX MAP H, LOT 40–6

N/F OLDE MADBURY LANE INC
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 1790, PAGE 536
TAX MAP H, LOT 40–D

N/F 237 ALBANY STREET INVESTMENTS LLC
& ABEL AND BRUNELLE ASSOCIATES
160 MIDDLESEX TURNPIKE
BEDFORD, MA 01730
S.C.R.D. BOOK 4112, PAGE 770
TAX MAP H, LOT 40–B

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES OF TAX MAP H, LOT 37A AS OF THE DATE OF THE SURVEY, SPRING 2020, IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT AND ORIGINAL LEGAL DESCRIPTIONS, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

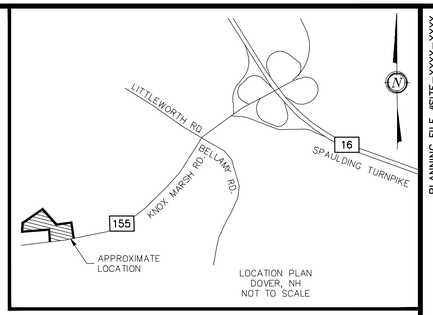
7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING 2020 WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

8.) THE SITE CONDITIONS SHOWN ARE AS OF THE DATE OF THE FIELD SURVEY: SPRING 2020.

PLAN REFERENCES:

1.) "SUBDIVISION PLAN, N.H. ROUTE 155 – KNOX MARSH ROAD, DOVER, N.H., FOR SOUTHWEST PARTNERS REALTY L.L.C."
BY: NORWAY PLAINS ASSOCIATES, INC.
DATED: NOVEMBER 1996
FILE NUMBER 303
S.C.R.D.: PLAN # 50–65

2.) "STANDARD BOUNDARY SURVEY AND LOT LINE ADJUSTMENT, PLAN OF LAND, LOTS 38 & 37B, TAX ASSESSOR'S MAP H, N.H. ROUTE 155 / KNOX MARSH ROAD, DOVER, N.H., COUNTY OF STRAFFORD"
BY: CIVILWORKS, PAUL J. CONNOLLY, LLS
DATED: SEPTEMBER 15, 1998
S.C.R.D.: PLAN # 54–41 & PLAN # 54–44
SEE REFERENCE PLAN NOTE # 5 REGARDING HANSON ROAD DISCONTINUANCE.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

LEGEND:

- ● 3/4" REBAR W/ID CAP (TO BE SET)
- ○ IRON BOUND/IRON ROD (FND)
- ○ IRON PIPE (FND)
- UTILITY POLE / GUY WIRE
- BOUNDARY LINE
- APPROX. ABUTTING PROPERTY LINE
- RIGHT OF WAY LINE
- T.B.S. TO BE SET
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

BOUNDARY PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
No. 805
KENNETH A. BERRY
LICENSED LAND SURVEYOR
SIGNATURE

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.

KENNETH A. BERRY L.L.S. 805 DATE

NOT FOR CONSTRUCTION

JURISDICTIONAL WETLANDS WERE DELINEATED BY DEIDRA BENJAMIN, CWS, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014–41:1–42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y–87–1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR–12–1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS–79/31.

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- UTILITY POLE / GUY WIRE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- WETLAND BUFFER
- SEWER LINE
- DRAINAGE LINE

BzB — NRCS SOIL LABEL
S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. — TYPICAL
FND — FOUND

STATE OF NEW HAMPSHIRE — DEIDRA L BENJAMIN — No. 295 — CERTIFIED WETLAND SCIENTIST

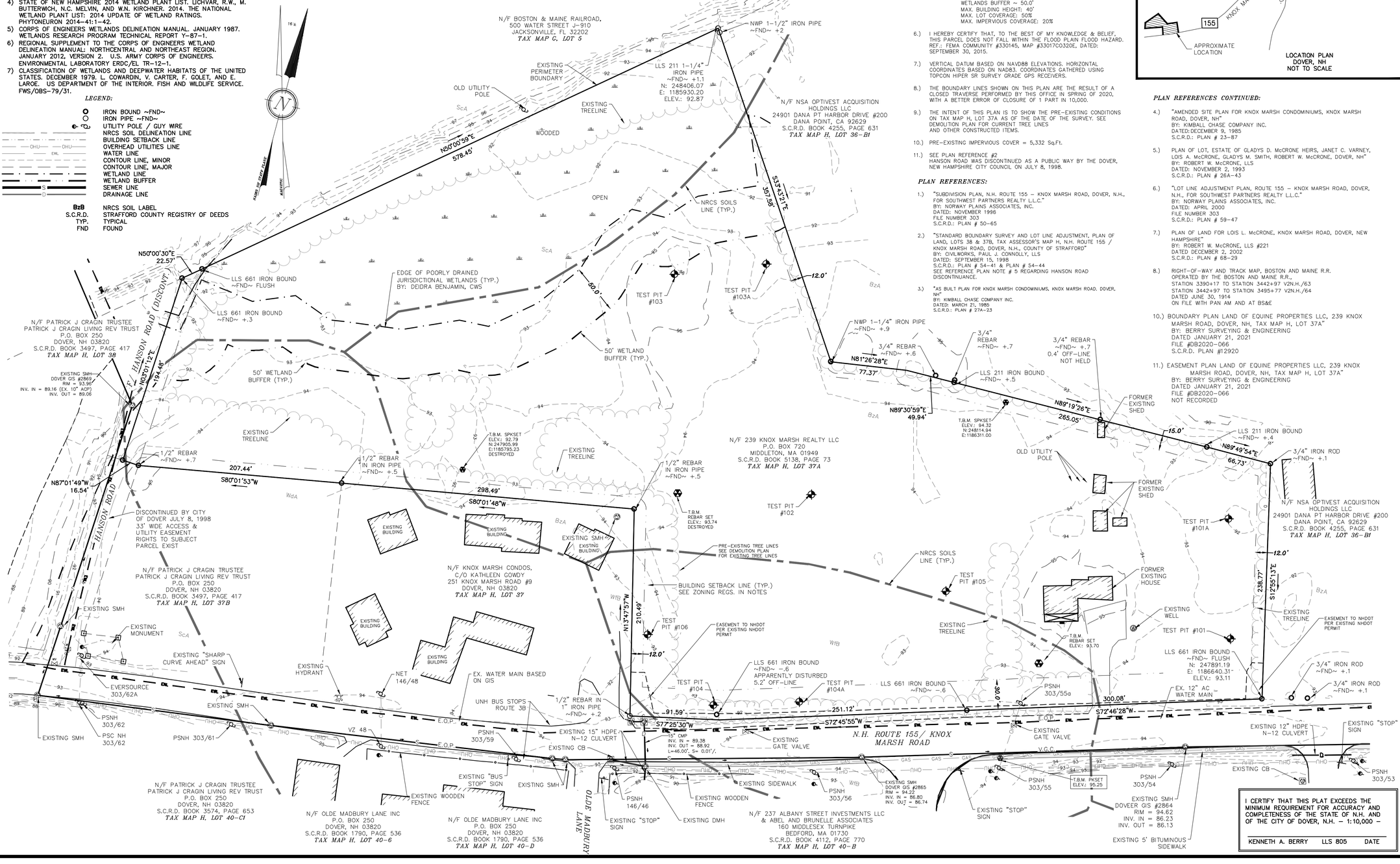
DEIDRA BENJAMIN, CWS #295

SOILS:

BzA – BUXTON SILT LOAM, 0 TO 3 PERCENT SLOPES
WfB – WINDSOR LOAMY SAND, 3 TO 8 PERCENT SLOPES
WdA – WINDSOR LOAMY SAND, 0 TO 3 PERCENT SLOPES
ScA – SCANTIC SILT LOAM, 0 TO 3 PERCENT SLOPES

SEE WEBSOIL USDA–NRCS

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) (C) COMMERCIAL SECONDARY GROUNDWATER RECHARGE
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 30'
REAR SETBACK ~ 15'
SIDE SETBACK ~ 12'
WETLANDS BUFFER ~ 50.0'
MAX. BUILDING HEIGHT: 40'
MAX. LOT COVERAGE: 50%
MAX. IMPERVIOUS COVERAGE: 20%

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD. REF.: FEMA COMMUNITY #330145, MAP #33017C0320E, DATED: SEPTEMBER 30, 2015.

7.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

8.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

9.) THE INTENT OF THIS PLAN IS TO SHOW THE PRE–EXISTING CONDITIONS ON TAX MAP H, LOT 37A AS OF THE DATE OF THE SURVEY. SEE DEMOLITION PLAN FOR CURRENT TREE LINES AND OTHER CONSTRUCTED ITEMS.

10.) PRE–EXISTING IMPERVIOUS COVER = 5,332 Sq.Ft.

11.) SEE PLAN REFERENCE #2
HANSON ROAD WAS DISCONTINUED AS A PUBLIC WAY BY THE DOVER, NEW HAMPSHIRE CITY COUNCIL ON JULY 8, 1998.

PLAN REFERENCES:

1.) "SUBDIVISION PLAN, N.H. ROUTE 155 – KNOX MARSH ROAD, DOVER, N.H., FOR SOUTHWEST PARTNERS REALTY L.L.C."
BY: NORWAY PLAINS ASSOCIATES, INC.
DATED: NOVEMBER 1996
FILE NUMBER 303
S.C.R.D.: PLAN # 50–65

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DATED: SEPTEMBER 15, 1998
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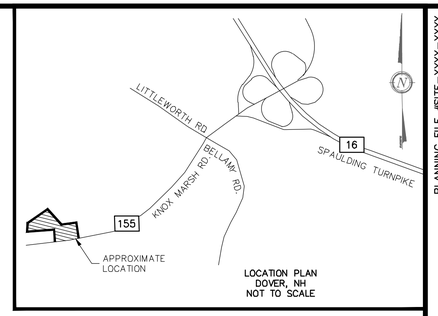
SEE REFERENCE PLAN NOTE # 5 REGARDING HANSON ROAD DISCONTINUANCE.

3.) "AS BUILT PLAN FOR KNOX MARSH CONDOMINIUMS, KNOX MARSH ROAD, DOVER, NH"
BY: KIMBALL CHASE COMPANY INC.
DATED: MARCH 21, 1985
S.C.R.D.: PLAN # 27A–23



LOCATION PLAN
DOVER, NH
NOT TO SCALE

PLAN REFERENCES CONTINUED:

4.) "AMENDED SITE PLAN FOR KNOX MARSH CONDOMINIUMS, KNOX MARSH ROAD, DOVER, NH"
BY: KIMBALL CHASE COMPANY INC.
DATED:DECEMBER 9, 1985
S.C.R.D.: PLAN # 23–87

5.) PLAN OF LOT, ESTATE OF GLADYS D. McCRONE HEIRS, JANET C. VARNEY, LOIS A. McCRONE, GLADYS M. SMITH, ROBERT W. McCRONE, DOVER, NH"
BY: ROBERT W. McCRONE, LLS
DATED: NOVEMBER 2, 1993
S.C.R.D.: PLAN # 26A–43

6.) "LOT LINE ADJUSTMENT PLAN, ROUTE 155 – KNOX MARSH ROAD, DOVER, N.H., FOR SOUTHWEST PARTNERS REALTY L.L.C."
BY: NORWAY PLAINS ASSOCIATES, INC.
DATED: APRIL 2000
FILE NUMBER 303
S.C.R.D.: PLAN # 59–47

7.) PLAN OF LAND FOR LOIS L. McCRONE, KNOX MARSH ROAD, DOVER, NEW HAMPSHIRE"
BY: ROBERT W. McCRONE, LLS #221
DATED DECEMBER 2, 2002
S.C.R.D.: PLAN # 68–29

8.) RIGHT–OF–WAY AND TRACK MAP, BOSTON AND MAINE R.R.
OPERATED BY THE BOSTON AND MAINE R.R.,
STATION 3390+17 TO STATION 3442+97 V2N.H./63
STATION 3442+97 TO STATION 3495+77 V2N.H./64
DATED JUNE 30, 1914
ON FILE WITH PAN AM AND AT BS&E

10.) BOUNDARY PLAN LAND OF EQUINE PROPERTIES LLC, 239 KNOX MARSH ROAD, DOVER, NH, TAX MAP H, LOT 37A"
BY: BERRY SURVEYING & ENGINEERING
DATED JANUARY 21, 2021
FILE #DB2020–066
S.C.R.D. PLAN #12920

11.) EASEMENT PLAN LAND OF EQUINE PROPERTIES LLC, 239 KNOX MARSH ROAD, DOVER, NH, TAX MAP H, LOT 37A"
BY: BERRY SURVEYING & ENGINEERING
DATED JANUARY 21, 2021
FILE #DB2020–066
NOT RECORDED

I CERTIFY THAT THIS PLAT EXCEEDS THE MINIMUM REQUIREMENT FOR ACCURACY AND COMPLETENESS OF THE STATE OF N.H. AND OF THE CITY OF DOVER, N.H. – 1:10,000 –

KENNETH A. BERRY LLS 805 DATE

PLANNING FILE #SITE–XXX–XXXX

REVISION	DATE	DESCRIPTION

PRE–EXISTING CONDITIONS PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE — No. 805 — KENNETH A. BERRY — LICENSED LAND SURVEYOR — SIGNATURE

SHEET 4 OF 60

NOT FOR CONSTRUCTION

LEGEND:

- ● 3/4" REBAR W/ID CAP (TO BE SET)
- ○ IRON BOUND/IRON ROD (FND)
- ○ IRON PIPE (FND)
- UTILITY POLE / GUY WIRE
- EXISITNG BOUNDARY LINE
- PROPOSED EASEMENT LINE

T.B.S. TO BE SET
FND FOUND
TYP TYPICAL
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

16°±

NADB83 NH STATE PLANE

MAGNETIC

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

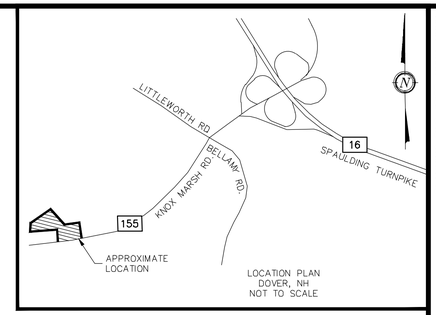
2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EASEMENT RELATING TO THE PROPOSED SITE PLAN.

6.) SEE BOUNDARY PLAN FOR ALL OTHER STANDARD NOTES, ZONING NOTES AND PLAN REFERENCES.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

EXISTING BUILDING

N/F KNOX MARSH CONDOS,
C/O KATHLEEN GOWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

S13°47'57"E 165.81'

EXISTING BOUNDARY LINE

1/2" REBAR W/ ID CAP ~TBS~ (TYP.)

S76°12'03"W 14.10'

S13°47'57"E 44.68'

N27°48'37"W 4.24'

1/2" REBAR W/ ID CAP ~TBS~ (TYP.)

S75°23'51"W 85.84'

1/2" REBAR W/ ID CAP ~TBS~ (TYP.)

LLS 661 IRON BOUND ~FND~ -.6 APPARENTLY DISTURBED 5.2' OFF-LINE

PROPOSED SIDEWALK MAINTENANCE AND DRAINAGE ACCESS EASEMENT 3,583 Sq. Ft.

PROPOSED EASEMENT LINE

1/2" REBAR IN 1" IRON PIPE ~FND~ +.2 DESTROYED TO BE RESET

N77°25'30"E 91.59'

N72°45'55"E 251.12'

EXISTING BOUNDARY LINE

FORMER EDGE OF PAVEMENT LOCATION

LLS 661 IRON BOUND ~FND~ -.6 DESTROYED TO BE RESET

S73°17'34"W 515.69'

PSNH 303/55a

N72°46'28"E 300.08'

N/F 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949
S.C.R.D. BOOK 5138, PAGE 73
TAX MAP H, LOT 37A

FORMER EXISTING SHED

FORMER EXISTING HOUSE

FORMER DRIVEWAY

N/F NSA OPTIVEST ACQUISITION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36-B1

N12°55'13"W 202.41'

EXISTING BOUNDARY LINE

S77°04'47"W 11.37'

S17°18'04"W 9.88'

1/2" REBAR W/ ID CAP ~TBS~ (TYP.)

1/2" REBAR W/ ID CAP ~TBS~ (TYP.)

S12°28'36"E 28.21'

N12°55'13"W 36.36'

3/4" IRON ROD ~FND~ +.1

3/4" IRON ROD ~FND~ +.1

LLS 661 IRON BOUND ~FND~ FLUSH
N: 247891.19
E: 1186640.31
ELEV.: 93.11

N.H. ROUTE 155 / KNOX MARSH ROAD

OLDE MADBURY LANE

PSNH 146/46

N/F OLDE MADBURY LANE INC
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 1790, PAGE 536
TAX MAP H, LOT 40-D

F.W. WEBB DRIVEWAY

PSNH 303/56

PSNH 303/55

N/F 237 ALBANY STREET INVESTMENTS LLC
& ABEL AND BRUNELLE ASSOCIATES
160 MIDDLESEX TURNPIKE
BEDFORD, MA 01730
S.C.R.D. BOOK 4112, PAGE 770
TAX MAP H, LOT 40-B

PSNH 303/54

F.W. WEBB DRIVEWAY

PSNH 303/53

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.

KENNETH A. BERRY L.L.S. 805 DATE

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

EASEMENT PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 805
KENNETH A. BERRY
SIGNATURE

NOT FOR CONSTRUCTION

S.S.S.M. SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
WfA	WINDSOR VARIANT	C
WfB	WINDSOR VARIANT	C
WfC	WINDSOR VARIANT	C
BzA	BUXTON MODERATELY DRAINED	C
BzB	BUXTON MODERATELY DRAINED	C
BzC	BUXTON MODERATELY DRAINED	C
ScA/P	SCANTIC POORLY DRAINED	D
ScB/P	SCANTIC POORLY DRAINED	D

SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

NRCS SOILS LEGEND

SYMBOL	SOIL TAXONOMIC NAME	HYDROLOGIC SOIL GROUP
WdA	WINDSOR LOAMY SAND	A
WfB	WINDSOR LOAMY SAND	A
BzA	BUXTON SILT LOAM	C

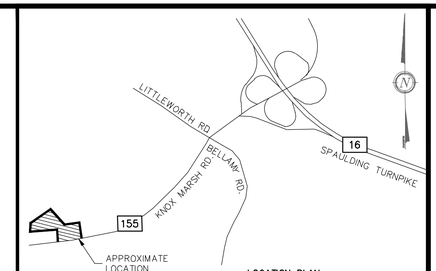
SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

DENOMINATOR: /VPD = VERY POORLY DRAINED /PD = POORLY DRAINED /SWPD = SOMEWHAT POORLY DRAINED /MWD = MODERATELY WELL DRAINED

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE/GUY WIRE
- BENCHMARK
- MATCH LINE & POINT
- WETLAND LINE
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- OFF SITE NRCS SOIL LINE
- SITE SPECIFIC SOIL DELINEATION
- LIMIT OF SOIL SURVEY

BzA SOIL LABEL
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBA TO BE ABANDONED



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

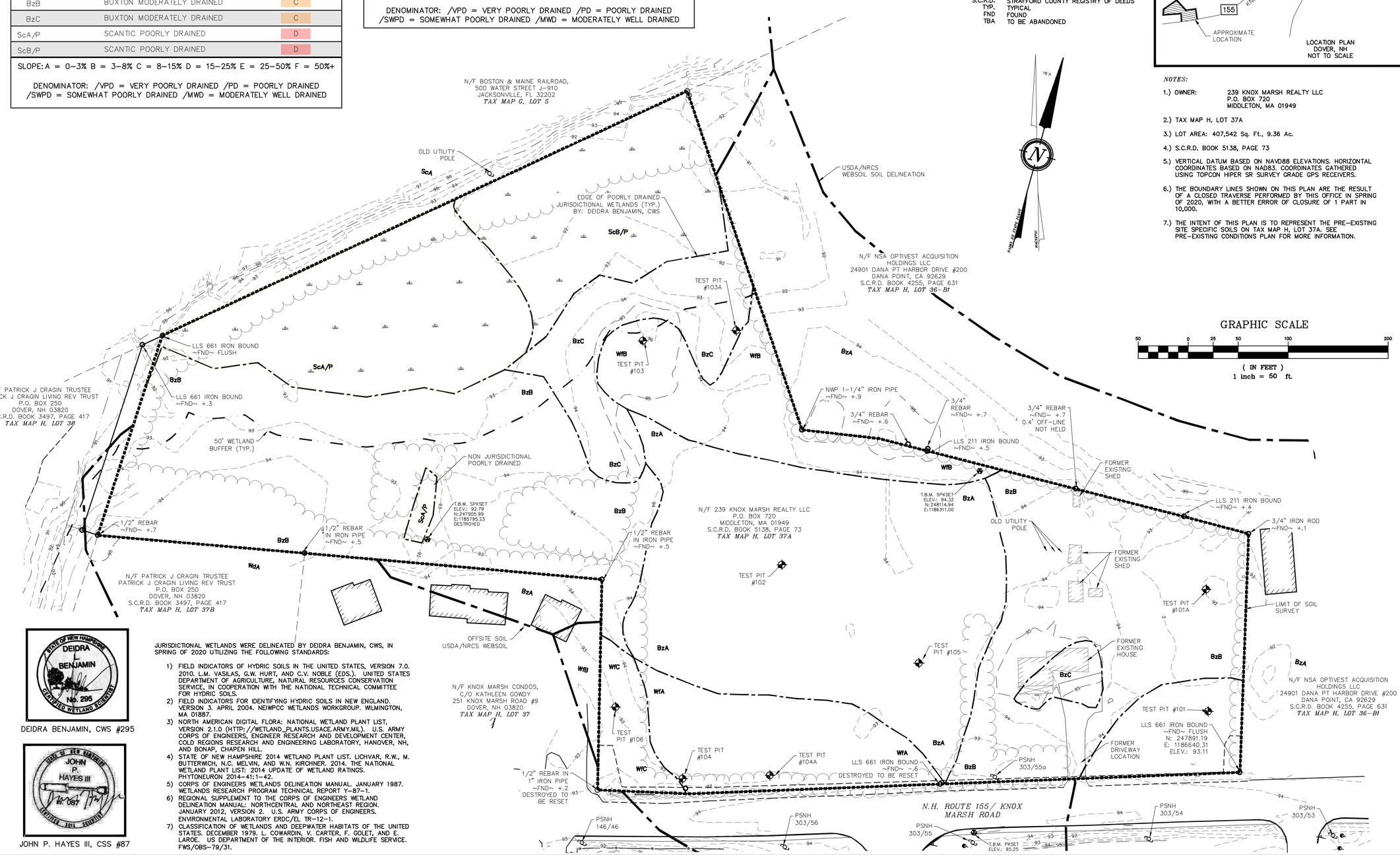
3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

6.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING OF 2020, WITH A BETTER ERROR OF CLOSURE OF 1 PART IN 10,000.

7.) THE INTENT OF THIS PLAN IS TO REPRESENT THE PRE-EXISTING SITE SPECIFIC SOILS ON TAX MAP H, LOT 37A. SEE PRE-EXISTING CONDITIONS PLAN FOR MORE INFORMATION.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

JURISDICTIONAL WETLANDS WERE DELINEATED BY DEIDRA BENJAMIN, CWS, IN SPRING OF 2020 UTILIZING THE FOLLOWING STANDARDS:

1) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0. 2010. L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.
2) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 3. APRIL 2004. NEIWPCC WETLANDS WORKGROUP. WILMINGTON, MA 01887.
3) NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.1.0 (HTTP://WETLAND_PLANTS.USACE.ARMY.MIL). U.S. ARMY CORPS OF ENGINEERS, ENGINEER RESEARCH AND DEVELOPMENT CENTER, COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, NH, AND BONAP, CHAPEN HILL.
4) STATE OF NEW HAMPSHIRE 2014 WETLAND PLANT LIST. LICHVAR, R.W., M. BUTTERWICH, N.C. MELVIN, AND W.N. KIRCHNER. 2014. THE NATIONAL WETLAND PLANT LIST: 2014 UPDATE OF WETLAND RATINGS. PHYTONEURON 2014-41:1-42.
5) CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. JANUARY 1987. WETLANDS RESEARCH PROGRAM TECHNICAL REPORT Y-87-1.
6) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. JANUARY 2012, VERSION 2. U.S. ARMY CORPS OF ENGINEERS. ENVIRONMENTAL LABORATORY ERDC/EL TR-12-1.
7) CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. DECEMBER 1979. L. COWARDIN, V. CARTER, F. GOLET, AND E. LAROE. US DEPARTMENT OF THE INTERIOR. FISH AND WILDLIFE SERVICE. FWS/OBS-79/31.

STATE OF NEW HAMPSHIRE — DEIDRA L BENJAMIN — No. 295 — CERTIFIED WETLAND SCIENTIST

DEIDRA BENJAMIN, CWS #295

STATE OF NEW HAMPSHIRE — JOHN P. HAYES III — 087 — CERTIFIED SOIL SCIENTIST

JOHN P. HAYES III, CSS #87

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

PRE-EXISTING SITE SPECIFIC SOILS MAP
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — No. 805 — KENNETH A. BERRY — SIGNATURE

SHEET 6 OF 60

NOT FOR CONSTRUCTION

NOTES:

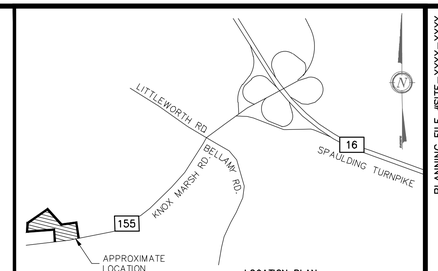
1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PHASES FOR THE PROPOSED DEVELOPMENT.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

DISTURBANCE PER PHASES:

PHASE 1A:

- CONSTRUCTION OF ALL PROJECT INFRASTRUCTURE WITH THE EXCEPTION OF RESIDENTIAL BUILDINGS "B" & "C"

PHASE 1B:

- CONSTRUCTION OF RESIDENTIAL BUILDINGS "B" & "C"

–PER ZBA APPROVAL CASE ZONE–2024–0033,

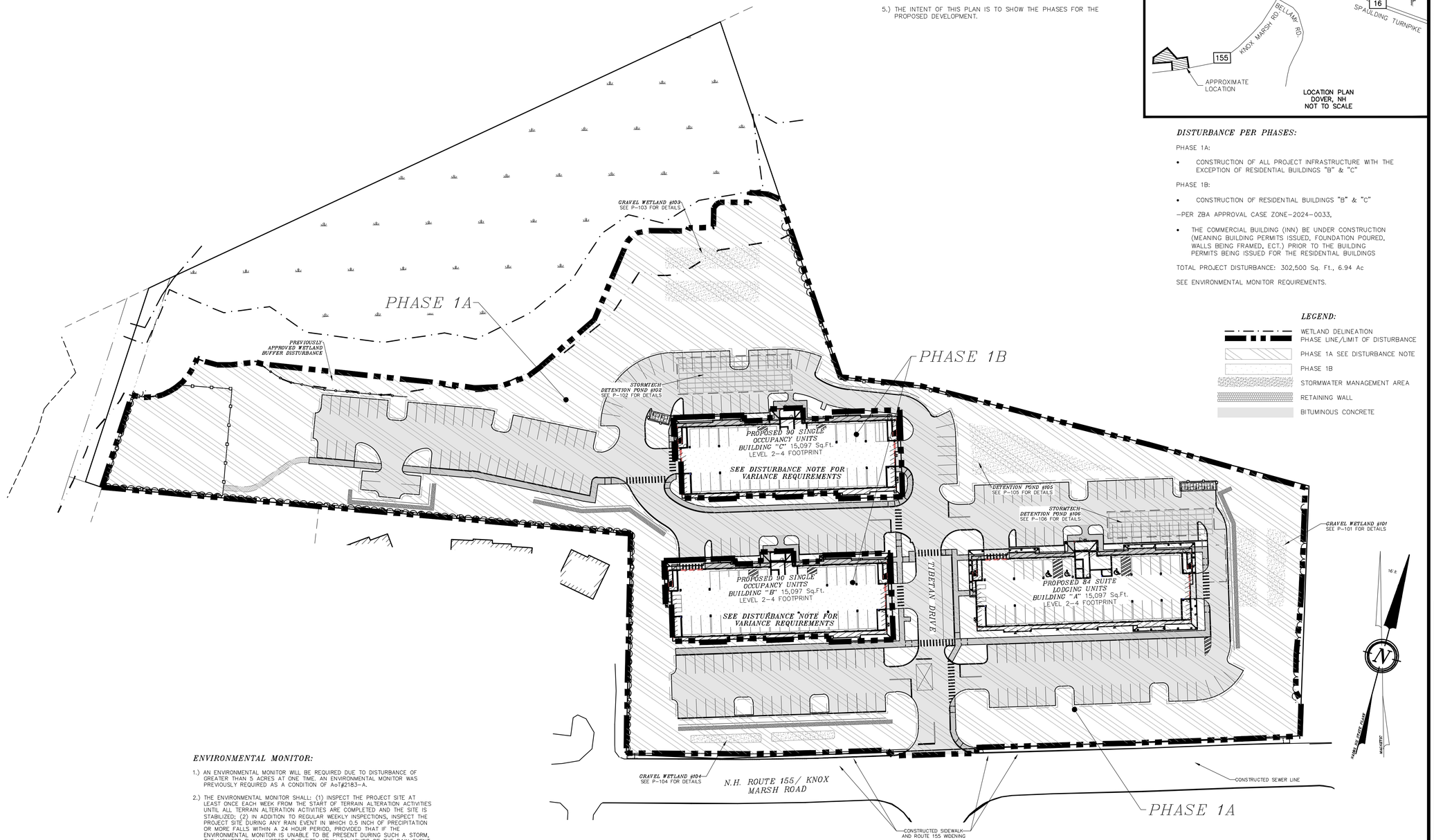
- THE COMMERCIAL BUILDING (INN) BE UNDER CONSTRUCTION (MEANING BUILDING PERMITS ISSUED, FOUNDATION POURED, WALLS BEING FRAMED, ECT.) PRIOR TO THE BUILDING PERMITS BEING ISSUED FOR THE RESIDENTIAL BUILDINGS

TOTAL PROJECT DISTURBANCE: 302,500 Sq. Ft., 6.94 Ac

SEE ENVIRONMENTAL MONITOR REQUIREMENTS.

LEGEND:

- WETLAND DELINEATION
- PHASE LINE/LIMIT OF DISTURBANCE
- PHASE 1A SEE DISTURBANCE NOTE
- PHASE 1B
- STORMWATER MANAGEMENT AREA
- RETAINING WALL
- BITUMINOUS CONCRETE



ENVIRONMENTAL MONITOR:

1.) AN ENVIRONMENTAL MONITOR WILL BE REQUIRED DUE TO DISTURBANCE OF GREATER THAN 5 ACRES AT ONE TIME. AN ENVIRONMENTAL MONITOR WAS PREVIOUSLY REQUIRED AS A CONDITION OF AoT#2183–A.

2.) THE ENVIRONMENTAL MONITOR SHALL: (1) INSPECT THE PROJECT SITE AT LEAST ONCE EACH WEEK FROM THE START OF TERRAIN ALTERATION ACTIVITIES UNTIL ALL TERRAIN ALTERATION ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED; (2) IN ADDITION TO REGULAR WEEKLY INSPECTIONS, INSPECT THE PROJECT SITE DURING ANY RAIN EVENT IN WHICH 0.5 INCH OF PRECIPITATION OR MORE FALLS WITHIN A 24 HOUR PERIOD, PROVIDED THAT IF THE ENVIRONMENTAL MONITOR IS UNABLE TO BE PRESENT DURING SUCH A STORM, THE MONITOR SHALL INSPECT THE SITE WITHIN 24 HOURS OF THE RAIN EVENT; (3) SUBMIT A WRITTEN REPORT, STAMPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, TO THE DEPARTMENT WITHIN 24 HOURS OF EACH INSPECTION THAT: A. DESCRIBES THE PROGRESS OF THE PROJECT, INCLUDING WHETHER ALL CONDITIONS OF THE PERMIT ARE BEING MET AND, IF NOT, WHICH REQUIREMENTS ARE NOT BEING MET; B. IF ANY REQUIREMENTS ARE NOT BEING MET, AN EXPLANATION OF THE CORRECTIVE ACTION(S) THAT WILL BE OR ARE BEING TAKEN TO BRING THE PROJECT INTO COMPLIANCE WITH APPLICABLE REQUIREMENTS AND THE DEADLINE BY WHICH SUCH ACTIONS WILL BE COMPLETED; AND C. INCLUDES PHOTOGRAPHS OF THE SITE THAT ARE REPRESENTATIVE OF THE PROJECT; AND (4) RETAIN A COPY OF THE REPORT PREPARED PURSUANT TO (3), ABOVE, ON–SITE FOR REVIEW DURING SITE INSPECTIONS BY FEDERAL, STATE, AND LOCAL OFFICIALS.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

CONSTRUCTION PHASING PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE :	1 IN. EQUALS 50 FT.
DATE :	NOVEMBER 26, 2024
FILE NO. :	DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

LEGEND:

- UTILITY POLE/GUY WIRE
- TEMPORARY BENCHMARK (T.B.M.)
- CONTOUR MINOR, PRE-EXISTING
- CONTOUR MAJOR, PRE-EXISTING
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- BUILDING SETBACK LINE
- TREELINE
- EXISTING DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- EXISTING SEWER MAIN
- EXISTING SEWER MAIN (T.B.R.)
- EXISTING WATER MAIN
- EXISTING WATER MAIN (T.B.R.)
- EXISTING EDGE OF CRUSHED GRAVEL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- DRAIN MANHOLE
- CATCH BASIN
- STORMWATER BMP OUTLET STRUCTURE
- SEWER MANHOLE
- GATE VALVE
- FIRE HYDRANT
- T.B.R. TO BE REMOVED

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

UTILITY NOTE:

THE UNDERGROUND UTILITIES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR NOR THE ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE.

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS SHOW THE DEMOLITION OF DRAINAGE, CURBING, AND UTILITIES FOR THE PROPOSED SITE PLAN.

6.) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVE AND BELOW GROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITY CONFLICTS SHOULD BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.

7.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

8.) SEE UTILITY PLAN FOR SEWER DESIGN.
IF PIPE SLOPES ARE LESS THAN 0.004'/, (NHDES MINIMUM SLOPE REQUIREMENT 8" LINE) LINE IS TO BE RESET. TO BE FIELD VERIFIED.

9.) GRAVEL WETLANDS #101, #103 & #104 TO REMAIN WITH MINOR MODIFICATIONS TO OUTLET STRUCTURES AND INCLUDES NEW RETAINING WALLS.

N/F BOSTON & MAINE RAILROAD,
500 WATER STREET, J-910
JACKSONVILLE, FL 32202
TAX MAP G, LOT 5

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 37B

N/F KNOX MARSH CONDOS,
C/O KATHLEEN GOWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

N/F NSA OPTIVEST ACQUISTION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36-B1

N.H. ROUTE 155/ KNOX MARSH ROAD

TIBETAN DRIVE

GRAVEL WETLAND #103

GRAVEL WETLAND #104

GRAVEL WETLAND #101

DETENTION POND #105

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

DEMOLITION PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

UNIT DENSITY CALCULATION:

COMMERCIAL DISTRICT ZONING TABLE

- DENSITY CALCULATION
  - •• LOT AREA = 407,542 Sq.Ft.
  - •• WETLANDS = 77,264 Sq.Ft.
  - •• UPLANDS = 327,583 Sq.Ft.
  - •• NUMBER OF UNITS = 327,583 Sq.Ft./5,000 Sq.Ft. PER UNIT = 66 UNITS

TOTAL ALLOWED = 66 UNITS
TOTAL PROPOSED = 180 SINGLE OCCUPANCY UNITS (ALL HUD RESTRICTED, PER VARIANCE REQUEST)
SEE TRANSFER OF DEVELOPMENT RIGHTS REQUEST

TRANSFER OF DEVELOPMENT RIGHTS REQUEST:
114 UNITS TO BE OBTAINED VIA TDR (HUD RATE): PENDING
A TOTAL OF 180 UNITS PROPOSED (66 UNITS ALLOWED BY RIGHT) ALL UNITS ARE TO BE RESTRICTED TO HUD FAIR MARKET RENT IN PERPETUITY IN CONFORMANCE WITH THE RECEIVED VARIANCE (ZONE-2024-0033)

ENVIRONMENTAL CONDITIONAL USE PERMITS:
CONSTRUCTION WITHIN THE 50' BUFFER (7,003 Sq. Ft. PROPOSED): PREVIOUSLY APPROVED
TEMPORARY IMPACT WITHIN THE 50' BUFFER (UTILITY CONSTRUCTION)(456 Sq. Ft.): PREVIOUSLY APPROVED
40.2% IMPERVIOUS COVERAGE IN THE SECONDARY GROUNDWATER RECHARGE ZONE: (PREVIOUSLY APPROVED FOR 33.8%) NEW APPROVAL REQUIRED: PENDING

WAIVER REQUESTS:
ROAD GRADE STEEPER THAN 3% WITHIN 75' OF AN INTERSECTION (157-32C): (PREVIOUSLY APPROVED) NEW WAIVER NEEDED FOR INTERSECTION MODIFICATION: PENDING
DRAINAGE PIPE COVER (157-40-B(6)): PENDING
STORMWATER RUNOFF VOLUME (153-14-(3)(B)(4)): PENDING
UTILITY DROP POLES ABOVE GROUND (157-44): PENDING

RECREATION SPACE REQUIREMENTS (DOVER CODE ARTICLE V , 170-15.)
PROPOSED NUMBER OF BEDROOMS: 180
OPEN SPACE REQUIREMENT (100 SF PER BEDROOM): 18,000 SF
½ RECREATION SPACE FOR PASSIVE USE: 9,858 SF (SATISFIED ON SITE)
½ RECREATION SPACE FOR ACTIVE USE: 10,713 SF (SATISFIED ON SITE)

PARKING REQUIREMENTS:

RESIDENTIAL (AT THE DISCRETION OF THE DOVER PLANNER)

- •• RESIDENTIAL (NON-CBD-G) 1.25 SPACES PER UNIT (SINGLE OCCUPANCY):
  - ••• 180 SRO UNITS x 1.25 SPACES = 225 SPACES
  - ••• LODGING = 1 SPACE PER UNIT + 1 PER STAFF + 1PER 500 SF COMMON AREA -> 84 UNITS = +/- 93 SPACES

TOTAL CALCULATION = 318 SPACES
TOTAL PROPOSED = 318 SPACES
ACCESSIBLE SPACES REQUIRED = 8
ACCESSIBLE SPACES PROVIDED = 9 (3 IN EACH BUILDING)
EVSE SPACE REQUIREMENT (5%) = 16 SPACES
EVSE SPACES PROVIDED = 16 SPACES (5 BUILDING "A" LODGING, 6 BUILDING "B", 5 BUILDING "C")
BICYCLE SPACES (5%) = 16 SPACES
BICYCLE SPACES PROVIDED = 21 SPACES
MOTORCYCLE SPACES = 9 SPACES (NOT INCLUDED IN SPACE CALCULATIONS)
85 SPACES AT FRONT OF SITE
233 TO THE SIDE OR REAR (PODIUM STYLE CONSIDERED REAR)

PARKING ALLOCATION REQUIREMENT:
70% REQUIRED TO BE AT THE SIDE OR REAR OF THE STRUCTURE COUNTING PODIUM STYLE AS REAR OF BUILDING, 233 SPACES ARE TO THE REAR OR SIDE = 73.3%

SNOW STORAGE CALCULATION:

- STORAGE CALCULATION (6:1 RATIO USED)
  - •• PLOWABLE AREA = 105,027 Sq.Ft. / 6 = 17,505 Sq.Ft.
  - •• >19,798 Sq.Ft. PROVIDED
  - ••• SNOW SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS ONCE IDENTIFIED AREAS ARE FULL.

LOT COVERAGE:

PRE-EXISTING COVERAGE:
BUILDING IMPERVIOUS AREA: 2,831 Sq. Ft. (0.7%)
PAVED IMPERVIOUS AREA: 2,701 Sq. Ft. (0.7%)
TOTAL PRE-EXISTING IMPERVIOUS COVER IS 5,532 Sq. Ft. (1.4%)

PROPOSED COVERAGE:
BUILDING IMPERVIOUS AREA: 50,356 Sq. Ft. (12.36%)
ROAD & PARKING LOTS: 94,842 Sq. Ft. (23.2%)
IMPERVIOUS AREA (CURB, SHOULDER, WALKS, RETAINING WALL, CONCRETE PADS & GRAVEL WALKWAY): 18,568 Sq. Ft. (4.56%)
TOTAL PROPOSED IMPERVIOUS COVER IS 163,766 Sq. Ft. (40.2%)
(REVISED ENVIRONMENTAL CUP REQUIRED, 33.8% PREVIOUS)

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WETLAND LINE
- WETLAND BUFFER
- FORMER ROAD R.O.W.
- ABUTTING PROPERTY LINE
- EXISTING TREELINE
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

PROPOSED LEGEND:

- E101 / E6 DETAIL SHEET / DETAIL
- 6 # OF PARKING SPACES
- TRANSFORMER & PAD
- SIGNAGE
- FIRE HYDRANT
- SHOULDER
- CENTER LINE
- TREELINE
- FENCE
- GUARD RAIL
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- WETLAND BUFFER PLACARD
- SNOW STORAGE
- RECREATION SPACE
- STORMWATER MANAGEMENT AREA
- RETAINING WALL
- BITUMINOUS CONCRETE
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) ZONING: (C) COMMERCIAL, SECONDARY GROUNDWATER RECHARGE PROVIDED:

MINIMUM FRONTAGE ~ 125'	642.79'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.	407,542 Sq.Ft.
FRONT SETBACK ~ 30'	30'
REAR SETBACK ~ 15'	15'
SIDE SETBACK ~ 12'	12'
WETLANDS BUFFER ~ 50.0'	50'-CUP P21-05 PREVIOUSLY APPROVED
MAX. BUILDING HEIGHT: 40'	44'6"-CASE ZONE-2024-0033 APPROVED ON JULY 18, 2024
MAX. LOT COVERAGE: 50%	40.2%
MAX. IMPERVIOUS: 20%	~40.2%-PREVIOUS CUP APPROVED FOR 33.8% (P22-46) NEW APPROVAL REQUIRED.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW SITE PLAN FOR TAX MAP H, LOT 37A.

7.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE:
VARIANCE-CASE ZONE-2024-0033 WAS APPROVED ON JULY 18, 2024, WHICH PERMITS THAT 1/3RD REQUIREMENT FOR COMMERCIAL SPACE TO BE LOCATED ENTIRELY WITHIN ONE (1) BUILDING WITH THE PROPOSED 2/3RDS RESIDENTIAL USE BE IN TWO (2) SEPARATE BUILDINGS, AND TO PERMIT THE THREE BUILDINGS WITHIN THE C DISTRICT TO BE GREATER THAN 40' IN HEIGHT. THIS APPROVAL IS CONDITIONAL UPON THE FOLLOWING CRITERIA BEING MET:

1) ALL THREE (3) BUILDINGS, IN COMBINATION, MUST MAINTAIN THE SAME, OR GREATER, PERCENTAGE OF COMMERCIAL USE (2/3RD IN PERPETUITY). OTHERWISE, AN ADDITIONAL VARIANCE(S) WOULD BE REQUIRED;

2) THE COMMERCIAL BUILDINGS (INN) BE UNDER CONSTRUCTION (MEANING BUILDING PERMITS ISSUED, FOUNDATION POURED, WALLS BEING FRAMED, ECT.) PRIOR TO THE BUILDING PERMITS BEING ISSUED FOR THE RESIDENTIAL BUILDINGS; AND

3) ALL RESIDENTIAL UNITS SHALL BE RESTRICTED TO THE APPLICABLE CURRENT HUD FAIR MARKET RENT VALUE IN PERPETUITY.

CONDITIONAL USE PERMIT-P21-05 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 10,699 Sq. Ft. OF WETLAND BUFFER DISTURBANCE

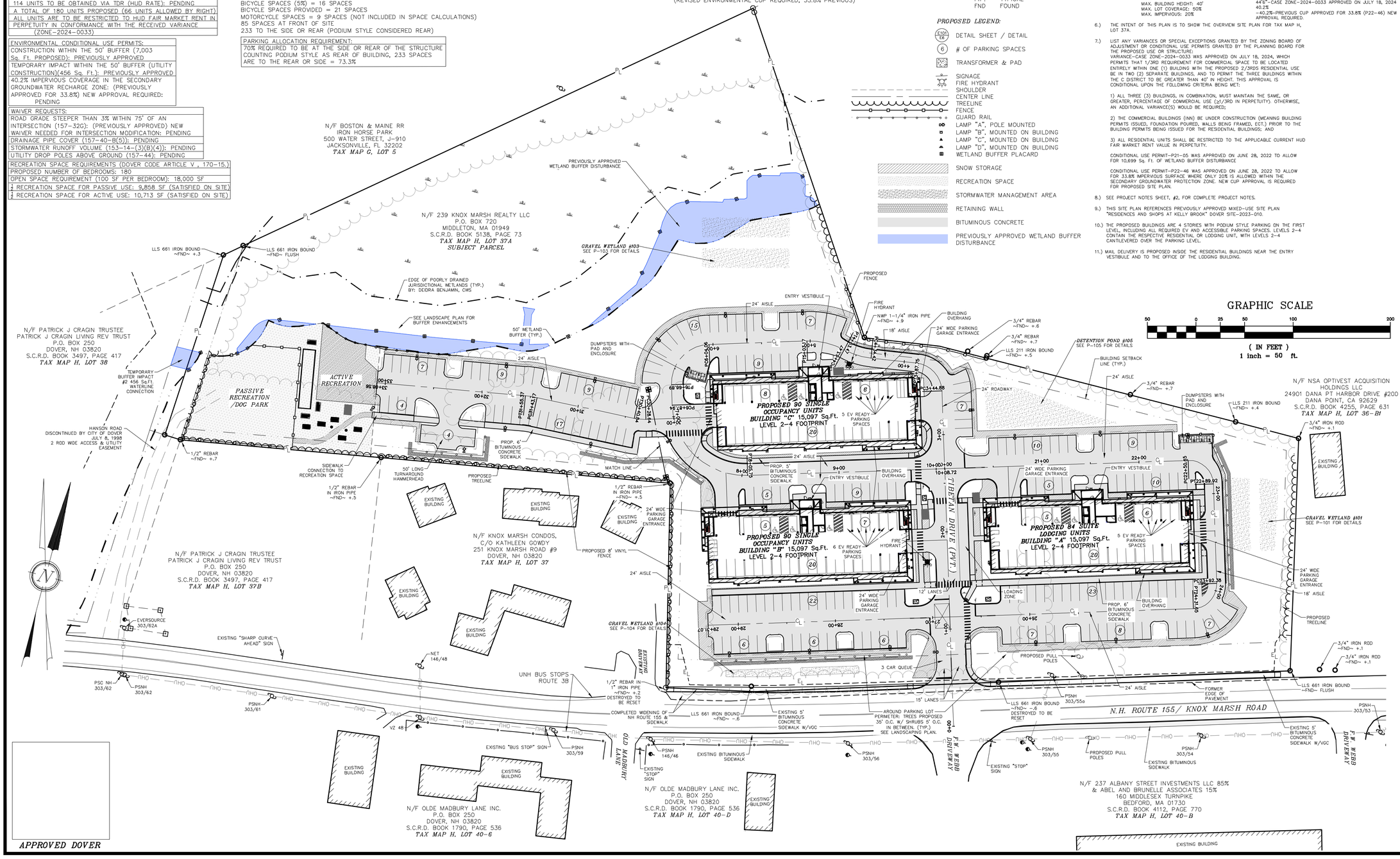
CONDITIONAL USE PERMIT-P22-46 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 33.8% IMPERVIOUS SURFACE WHERE ONLY 20% IS ALLOWED WITHIN THE SECONDARY GROUNDWATER PROTECTION ZONE. NEW CUP APPROVAL IS REQUIRED FOR PROPOSED SITE PLAN.

8.) SEE PROJECT NOTES SHEET, #2, FOR COMPLETE PROJECT NOTES.

9.) THIS SITE PLAN REFERENCES PREVIOUSLY APPROVED MIXED-USE SITE PLAN "RESIDENCES AND SHOPS AT KELLY BROOK" DOVER SITE-2023-010.

10.) THE PROPOSED BUILDINGS ARE 4 STORIES WITH PODIUM STYLE PARKING ON THE FIRST LEVEL, INCLUDING ALL REQUIRED EV AND ACCESSIBLE PARKING SPACES. LEVELS 2-4 CONTAIN THE RESPECTIVE RESIDENTIAL OR LODGING UNIT, WITH LEVELS 2-4 CANTILEVERED OVER THE PARKING LEVEL.

11.) MAIL DELIVERY IS PROPOSED INSIDE THE RESIDENTIAL BUILDINGS NEAR THE ENTRY VESTIBULE AND TO THE OFFICE OF THE LODGING BUILDING.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PLANNING FILE #SITE-XXX-XXXX

REVISION	DATE	DESCRIPTION

OVERVIEW SITE PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

SHEET 9 OF 60

APPROVED DOVER

NOT FOR CONSTRUCTION

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NOTE: SEE GRADING PLANS FOR FULL SPOT GRADES, ACCESSIBLE ROUTES, SIDEWALK TIPDOWNS & RAMPS, AND MEANS OF EGRESS FROM THE BUILDINGS

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WETLAND LINE
- WETLAND BUFFER
- FORMER ROAD R.O.W.
- ABUTTING PROPERTY LINE
- EXISTING TREELINE
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

PROPOSED LEGEND:

- DETAIL SHEET / DETAIL
- # OF PARKING SPACES
- TRANSFORMER & PAD
- SIGNAGE
- FIRE HYDRANT
- SHOULDER
- CENTER LINE
- TREELINE
- FENCE
- GUARD RAIL
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- WETLAND BUFFER PLACARD
- SNOW STORAGE
- RECREATION SPACE
- STORMWATER MANAGEMENT AREA
- RETAINING WALL
- BITUMINOUS CONCRETE
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) ZONING: (C) COMMERCIAL, SECONDARY GROUNDWATER RECHARGE

	PROVIDED:
MINIMUM FRONTAGE ~ 125'	642.79'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.	407,542 Sq.Ft.
FRONT SETBACK ~ 30'	30'
REAR SETBACK ~ 15'	15'
SIDE SETBACK ~ 12'	12'
WETLANDS BUFFER ~ 50.0'	50'-CUP P21-05 PREVIOUSLY APPROVED
MAX. BUILDING HEIGHT: 40'	44'6"-CASE ZONE-2024-0033 APPROVED ON JULY 18, 2024
MAX. LOT COVERAGE: 50%	40.2%
MAX. IMPERVIOUS: 20%	~40.2%-PREVIOUS CUP APPROVED FOR 33.8% (P22-46) NEW APPROVAL REQUIRED.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW SITE PLAN FOR TAX MAP H, LOT 37A.

7.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE:
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3) ALL RESIDENTIAL UNITS SHALL BE RESTRICTED TO THE APPLICABLE CURRENT HUD FAIR MARKET RENT VALUE IN PERPETUITY.

CONDITIONAL USE PERMIT-P21-05 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 10,699 Sq. Ft. OF WETLAND BUFFER DISTURBANCE

CONDITIONAL USE PERMIT-P22-46 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 33.8% IMPERVIOUS SURFACE WHERE ONLY 20% IS ALLOWED WITHIN THE SECONDARY GROUNDWATER PROTECTION ZONE. NEW CUP APPROVAL IS REQUIRED FOR PROPOSED SITE PLAN.

8.) SEE PROJECT NOTES SHEET, #2, FOR COMPLETE PROJECT NOTES.

9.) THIS SITE PLAN REFERENCES PREVIOUSLY APPROVED MIXED-USE SITE PLAN "RESIDENCES AND SHOPS AT KELLY BROOK" DOVER SITE-2023-010.

10.) THE PROPOSED BUILDINGS ARE 4 STORIES WITH PODIUM STYLE PARKING ON THE FIRST LEVEL, INCLUDING ALL REQUIRED EV AND ACCESSIBLE PARKING SPACES. LEVELS 2-4 CONTAIN THE RESPECTIVE RESIDENTIAL OR LODGING UNIT, WITH LEVELS 2-4 CANTILEVERED OVER THE PARKING LEVEL.

11.) MAIL DELIVERY IS PROPOSED INSIDE THE RESIDENTIAL BUILDINGS NEAR THE ENTRY VESTIBULE AND TO THE OFFICE OF THE LODGING BUILDING.

GRAVEL WETLAND #103
SEE P-103 FOR DETAILS

STORMTECH DETENTION POND #102
SEE P-102 FOR DETAILS

DETENTION POND #105
SEE P-105 FOR DETAILS

STORMTECH DETENTION POND #106
SEE P-106 FOR DETAILS

GRAVEL WETLAND #101
SEE P-101 FOR DETAILS

GRAVEL WETLAND #104
SEE P-104 FOR DETAILS

BUILDING "A"

BUILDING "B"

BUILDING "C"

TIBETAN DRIVE

N.H. ROUTE 155 / KNOX MARSH ROAD

N/F KNOX MARSH CONDOS,
C/O KATHLEEN COWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

N/F NSA OPTIVEST ACQUISITION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36-B1

APPROVED DOVER

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

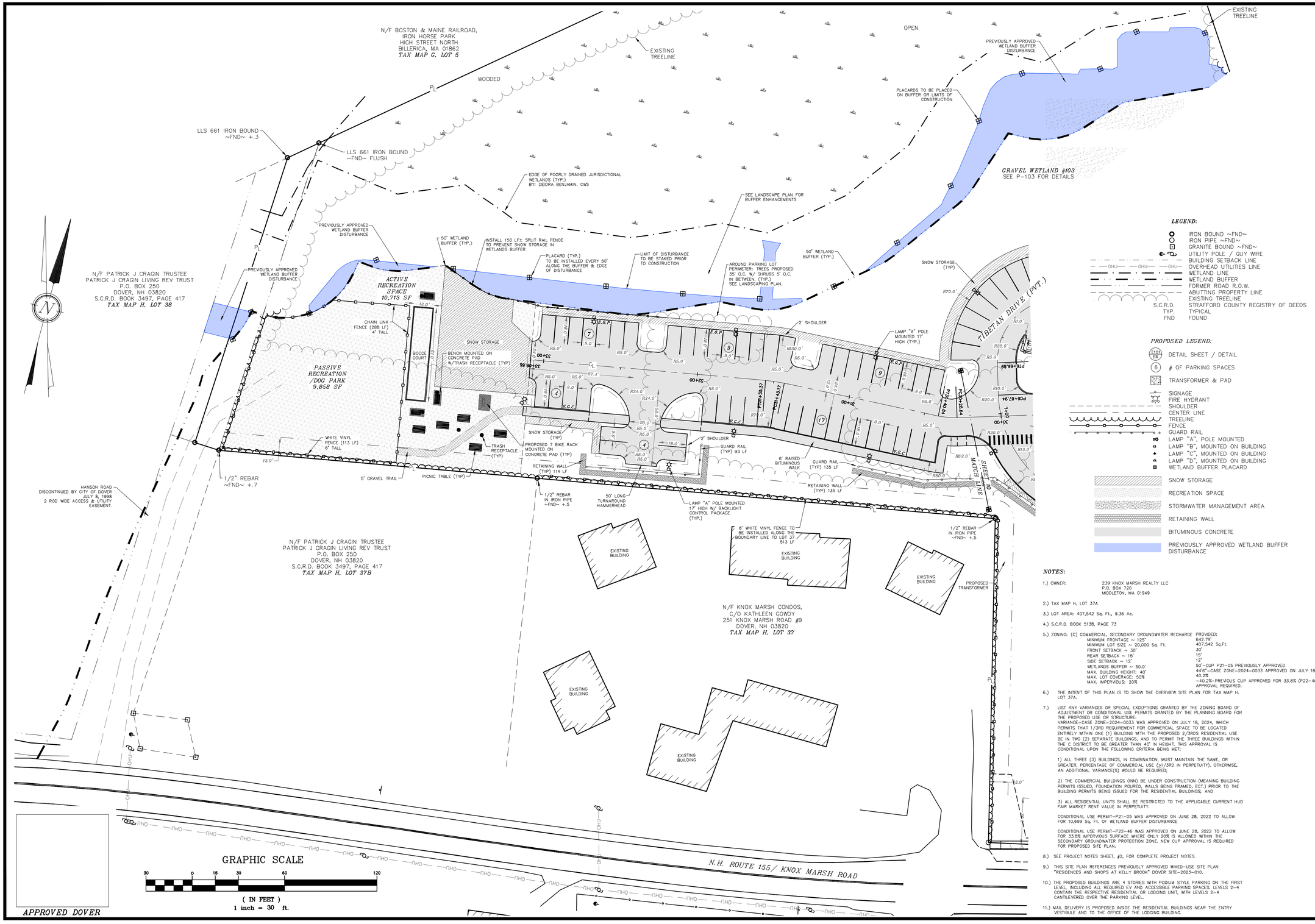
SITE PLAN EAST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES LINE
- WETLAND LINE
- WETLAND BUFFER
- FORMER ROAD R.O.W.
- ABUTTING PROPERTY LINE
- EXISTING TREELINE
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND

PROPOSED LEGEND:

- E101 / E6 DETAIL SHEET / DETAIL
- 6 # OF PARKING SPACES
- TRANSFORMER & PAD
- SIGNAGE
- FIRE HYDRANT
- SHOULDER
- CENTER LINE
- TREELINE
- FENCE
- GUARD RAIL
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- WETLAND BUFFER PLACARD
- SNOW STORAGE
- RECREATION SPACE
- STORMWATER MANAGEMENT AREA
- RETAINING WALL
- BITUMINOUS CONCRETE
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) ZONING: (C) COMMERCIAL, SECONDARY GROUNDWATER RECHARGE

	PROVIDED:
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MINIMUM LOT SIZE ~ 20,000 Sq. Ft.	407,542 Sq.Ft.
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REAR SETBACK ~ 15'	15'
SIDE SETBACK ~ 12'	12'
WETLANDS BUFFER ~ 50.0'	50'-CUP P21-05 PREVIOUSLY APPROVED
MAX. BUILDING HEIGHT: 40'	44'6"-CASE ZONE-2024-0033 APPROVED ON JULY 18, 2024
MAX. LOT COVERAGE: 50%	40.2%
MAX. IMPERVIOUS: 20%	~40.2%-PREVIOUS CUP APPROVED FOR 33.8% (P22-46) NEW APPROVAL REQUIRED.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW SITE PLAN FOR TAX MAP H, LOT 37A.

7.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE:
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8.) SEE PROJECT NOTES SHEET, #2, FOR COMPLETE PROJECT NOTES.

9.) THIS SITE PLAN REFERENCES PREVIOUSLY APPROVED MIXED-USE SITE PLAN "RESIDENCES AND SHOPS AT KELLY BROOK" DOVER SITE-2023-010.

10.) THE PROPOSED BUILDINGS ARE 4 STORIES WITH PODIUM STYLE PARKING ON THE FIRST LEVEL, INCLUDING ALL REQUIRED EV AND ACCESSIBLE PARKING SPACES. LEVELS 2-4 CONTAIN THE RESPECTIVE RESIDENTIAL OR LODGING UNIT, WITH LEVELS 2-4 CANTILEVERED OVER THE PARKING LEVEL.

11.) MAIL DELIVERY IS PROPOSED INSIDE THE RESIDENTIAL BUILDINGS NEAR THE ENTRY VESTIBULE AND TO THE OFFICE OF THE LODGING BUILDING.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

SITE PLAN WEST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- P176 — CONTOUR MINOR, PROPOSED
- P175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- E175.31 — EXISTING SPOT GRADE
- F175.31 — PROPOSED SPOT GRADE
- FLOW ARROW
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE

GRADING PLANS TABLE OF CONTENTS:

SHEET #12: OVERVIEW GRADING & DRAINAGE PLAN
SHEET #13: P&P TIBETAN DRIVE 0+00–4+00
SHEET #14: P&P TIBETAN DRIVE 4+00–7+00
SHEET #15: P&P TIBETAN DRIVE 7+00–END
SHEET #16: P&P BUILDING "A" REAR 20+00–24+00
SHEET #17: P&P BUILDINGS "A" & "B" FRONT 24+00–END
SHEET #18: P&P WESTERN PARKING LOT 30+00–END
SHEETS #19–#26: STORMWATER BMPs #101–#106
SHEETS #27–#28: EROSION & SEDIMENT CONTROL PLAN
SHEETS #46–#47: EROSION & SEDIMENT CONTROL DETAILS E-101–E102
SHEETS #48–#51: CONSTRUCTION DETAILS C-101–C104
SHEETS #52–#54: DRAINAGE CONSTRUCTION DETAILS D-101–D103

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE AN OVERVIEW OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NHDOT TYPE "A" FRAMES AND GRATES MADE IN NORTH AMERICA. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET #2 FOR GRADING AND DRAINAGE NOTES.

7.) THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES PER CITY OF DOVER CONDITIONS OF VARIANCE APPROVAL. SEE PHASING PLAN FOR ADDITIONAL INFORMATION. SEE PHASING PLAN FOR ENVIRONMENTAL MONITOR REQUIREMENTS.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

8.) THIS GRADING PLAN REFERENCES ITEMS PREVIOUSLY APPROVED AND CONSTRUCTED FROM DOVER APPROVED PROJECT "RESIDENCES AND SHOPS AT KELLY BROOK", DOVER #SITE-2023-0010 AND ALTERATION OF TERRAIN PERMIT AoT-2183/AoT-2183-A.

9.) THIS DESIGN ASSUMED THAT THE BUILDING ROOFS ARE GUTTERED TO BE RESPECTIVE DISCHARGE POINTS. GUTTERS TO BE DESIGNED BY OTHERS.

10.) ALL INTERNAL BUILDING PARKING LEVEL SLOPES ARE TO BE LESS THAN 2% IN ALL DIRECTIONS, PROVIDING AN ACCESSIBLE ROUTE FROM THE INTERNAL ACCESSIBLE PARKING SPACES.

11.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCES AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

N/F BOSTON & MAINE RAILROAD,
300 WATER STREET, J-910
JACKSONVILLE, FL 32202
TAX MAP G, LOT 5

TAX MAP H, LOT 37-A
SUBJECT PARCEL

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 38

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 37B

N/F KNOX MARSH CONDOS,
C/O KATHLEEN GOWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

N/F NSA OPTIVEST ACQUISITION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36-B1

HANSON ROAD
DISCONTINUED BY CITY OF
DOVER JULY 8, 1998
2 ROD WIDE ACCESS &
UTILITY EASEMENT

N.H. ROUTE 155 / KNOX MARSH ROAD

TIBETAN DRIVE

PROPOSED 90 SINGLE OCCUPANCY UNITS BUILDING "C" GARAGE FF = 99.35 SEE SHEET #16 FOR INTERNAL TRENCH DRAIN DESIGN

PROPOSED 90 SINGLE OCCUPANCY UNITS BUILDING "B" PARKING FF = 99.00 SEE SHEET #16 FOR INTERNAL TRENCH DRAIN DESIGN

PROPOSED 84 SUITE LODGING UNITS BUILDING "A" PARKING FF = 98.60 SEE SHEET #16 FOR INTERNAL TRENCH DRAIN DESIGN

OUTLET STRUCTURE #103A & B SEE P-103 FOR DETAILS TO REMAIN AND BE MODIFIED

GRAVEL WETLAND #103 SEE P-103 FOR DETAILS

OUTLET STRUCTURE #102 SEE P-102 FOR DETAILS

STORMTECH DETENTION POND #102 SEE P-102 FOR DETAILS

DETENTION POND #105 SEE P-105 FOR DETAILS

OUTLET STRUCTURE #105 SEE P-105 FOR DETAILS

OUTLET STRUCTURE #106 SEE P-106 FOR DETAILS

STORMTECH DETENTION POND #106 SEE P-106 FOR DETAILS

OUTLET STRUCTURE #101A & B SEE P-101 FOR DETAILS TO REMAIN & BE MODIFIED

GRAVEL WETLAND #101 SEE P-101 FOR DETAILS

OUTLET STRUCTURE #104A & B SEE P-104 FOR DETAILS TO REMAIN AND BE MODIFIED

GRAVEL WETLAND #104 SEE P-104 FOR DETAILS

PROP. DRAIN MANHOLE #6 (POND D06P)
PROP. DRAIN MANHOLE #3 (POND D03P)
PROP. DRAIN MANHOLE #1 (POND D01P)
PROP. DRAIN MANHOLE #4 (POND D04P)
PROP. DRAIN MANHOLE #5 (POND C05P)
PROP. DRAIN MANHOLE #2 (POND C02P)
PROP. CATCH BASIN #8 (POND C08P)
PROP. CATCH BASIN #7 (POND C07P)
PROP. CATCH BASIN #6 (POND C06P)
PROP. CATCH BASIN #4 (POND C04P)
PROP. CATCH BASIN #2 (POND C02P)
PROP. CATCH BASIN #3 (POND C03P)
PROP. CATCH BASIN #1 (POND C01P)
INLET SUMP POND #16P
YARD DRAINS POND #20P
SEDIMENT FOREBAY
STONE BERM LEVEL SPREADER
4' BERM ELEV: 95.00
4' BERM ELEV: 97.00
4' BERM ELEV: 94.00
2' BERM
PROPOSED TREELINE
EXISTING TREELINE
GUARD RAIL (TYP.)
BLOCK RETAINING WALL (TYP.)
RIP-RAP LINED SWALE
RIP-RAP PLUNGE POOL
PROPOSED 1.5:1 RIP-RAP SIDE SLOPES
CONSTRUCTED SIDEWALK AND NH ROUTE 155 WIDENING
EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: DEIDRA BENJAMIN, CWS
PREVIOUSLY APPROVED WETLAND BUFFER IMPACT
50' WETLAND BUFFER (TYP.)
MATCH LINE & POINT (TYP.)
EXISTING POND
EX. 15" CMP
15" RCP
12" HDPE N-12 ROOF DISCHARGE
8" HDPE DISCHARGE
8" HDPE N-12
CONCRETE HEADWALL W/ FOUR PENETRATIONS
INTERNAL SLOT DRAIN
T.B.M. SPKSET ELEV.: 92.79
OLD UTILITY POLE #3
VERSOURCE 303/62A
PSNH 303/62
PSC NH 303/62
PSNH 303/61
PSNH 303/59
PSNH 146/46
PSNH 303/55
PSNH 303/55a
PSNH 303/54
PSNH 303/53
NET 146/48
VZ 48

LLS 211 1-1/4" IRON PIPE ~FND~ +1.1
~NWP 1-1/2" IRON PIPE ~FND~ +2
LLS 661 IRON BOUND ~FND~ FLUSH
LLS 661 IRON BOUND ~FND~ +.3
1/2" REBAR ~FND~ +.7
1/2" REBAR IN IRON PIPE ~FND~ +.5
1/2" REBAR IN 1" IRON PIPE ~FND~ +.2 DESTROYED
LLS 661 IRON BOUND ~FND~ -.8 DESTROYED
LLS 661 IRON BOUND ~FND~ -.6 DESTROYED
~NWP 1-1/4" IRON PIPE ~FND~ +.9
3/4" REBAR ~FND~ +.6
LLS 211 IRON BOUND ~FND~ +.5
3/4" REBAR ~FND~ +.7
3/4" REBAR ~FND~ +.7
LLS 211 IRON BOUND ~FND~ +.4
3/4" IRON ROD ~FND~ +.1
1/2" HDPE N-12
3/4" IRON ROD ~FND~ +.1
3/4" IRON ROD ~FND~ +.1
LLS 661 IRON BOUND ~FND~ FLUSH

SHEET #12
SHEET #13
SHEET #14
SHEET #15
SHEET #16
SHEET #17
SHEET #18

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

OVERVIEW GRADING & DRAINAGE PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

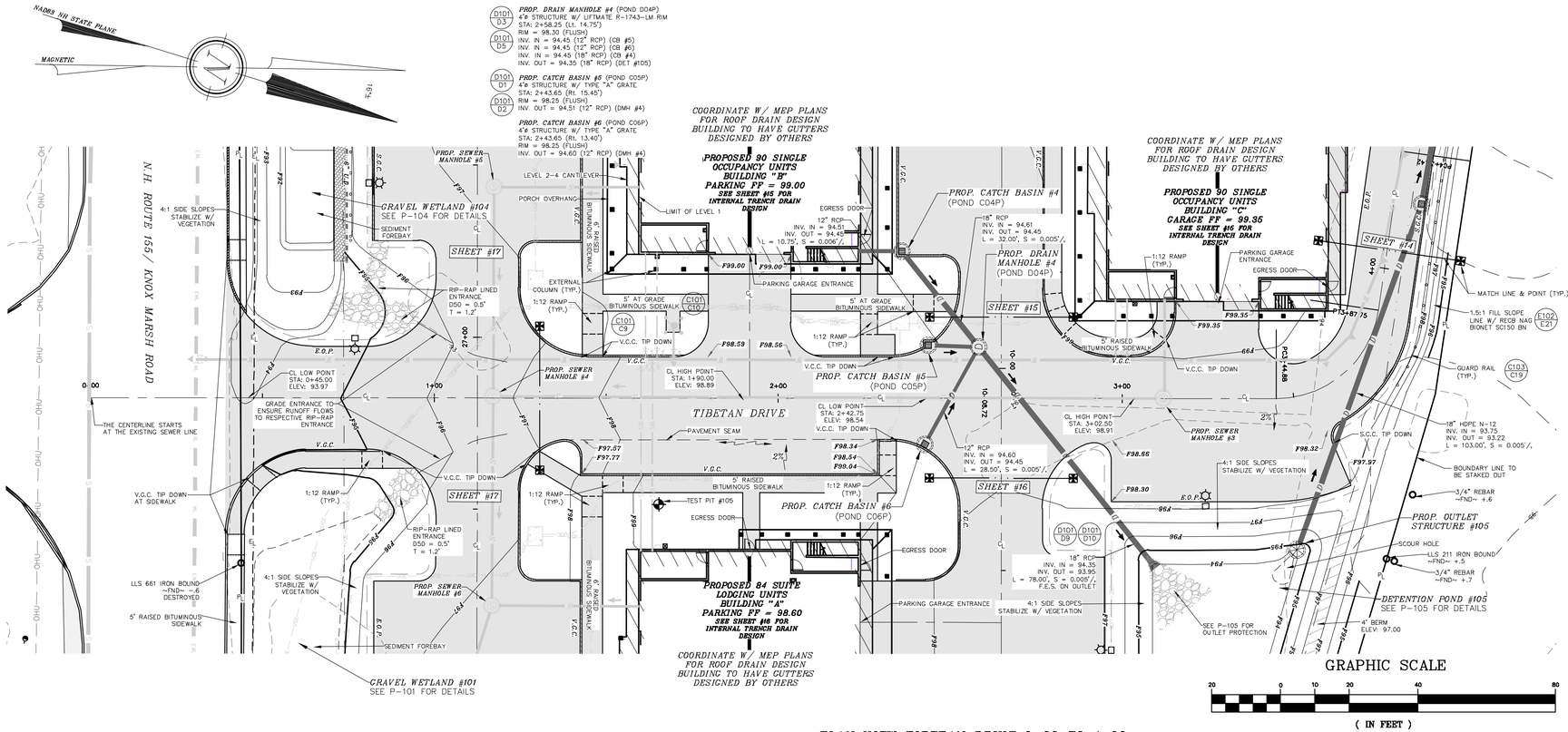
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

SHEET 12 OF 60

NOT FOR CONSTRUCTION



PLAN VIEW TIBETAN DRIVE 0+00 TO 4+00

STRUCTURES TABLE:

D101 D3 — *PROP. DRAIN MANHOLE #4* (POND D04P)
4'ø STRUCTURE W/ LIFTMATE R-1743-LM RIM
STA: 2+58.25 (Lt. 14.75')
RIM = 98.30 (FLUSH)
INV. IN = 94.45 (12" RCP) (CB #5)
INV. IN = 94.45 (12" RCP) (CB #6)
INV. IN = 94.45 (18" RCP) (CB #4)
INV. OUT = 94.35 (18" RCP) (DET #105)

D101 D1 — *PROP. CATCH BASIN #5* (POND C05P)
4'ø STRUCTURE W/ TYPE "A" GRATE
STA: 2+43.65 (Rt. 15.45')
RIM = 98.25 (FLUSH)
D101 D2 — INV. OUT = 94.51 (12" RCP) (DMH #4)

PROP. CATCH BASIN #6 (POND C06P)
4'ø STRUCTURE W/ TYPE "A" GRATE
STA: 2+43.65 (Rt. 13.40')
RIM = 98.25 (FLUSH)
INV. OUT = 94.60 (12" RCP) (DMH #4)

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NHDOT TYPE "A" FRAMES AND GRATES MADE IN NORTH AMERICA. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET #2 FOR GRADING AND DRAINAGE NOTES.

7.) THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES PER CITY OF DOVER CONDITIONS OF VARIANCE APPROVAL. SEE PHASING PLAN FOR ADDITIONAL INFORMATION. SEE PHASING PLAN FOR ENVIRONMENTAL MONITOR REQUIREMENTS.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

8.) THIS GRADING PLAN REFERENCES ITEMS PREVIOUSLY APPROVED AND CONSTRUCTED FROM DOVER APPROVED PROJECT "RESIDENCES AND SHOPS AT KELLY BROOK", DOVER #SITE-2023-0010 AND ALTERATION OF TERRAIN PERMIT AoT-2183/AoT-2183-A.

9.) THIS DESIGN ASSUMED THAT THE BUILDING ROOFS ARE GUTTERED TO BE RESPECTIVE DISCHARGE POINTS. GUTTERS TO BE DESIGNED BY OTHERS.

10.) ALL INTERNAL BUILDING PARKING LEVEL SLOPES ARE TO BE LESS THAN 2% IN ALL DIRECTIONS, PROVIDING AN ACCESSIBLE ROUTE FROM THE INTERNAL ACCESSIBLE PARKING SPACES.

11.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCES AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

LEGEND:

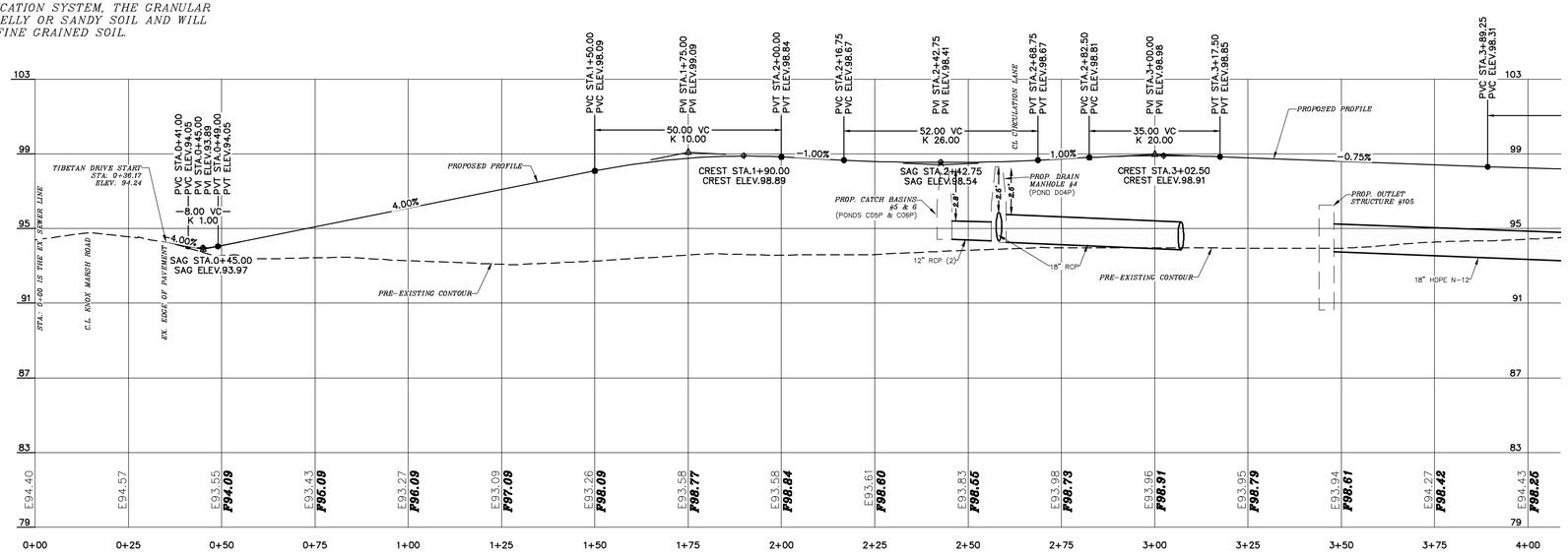
- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- F176 — CONTOUR MINOR, PROPOSED
- F175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- E175.31 — EXISTING SPOT GRADE
- F175.31 — PROPOSED SPOT GRADE
- FLOW ARROW
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

ROAD NOTE:

GRANULAR FILL REQUIRED WITHIN 12" OF SELECT MATERIALS. COMPACT ALL ROAD FILL MATERIALS IN 6" LIFTS. UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM, THE GRANULAR FILL BE GRAVELLY OR SANDY SOIL AND WILL NOT BE ANY FINE GRAINED SOIL.

PROFILE VIEW TIBETAN DRIVE 0+00 TO 4+00



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

PLAN AND PROFILE TIBETAN DRIVE 0+00 TO 4+00
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14293 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

STRUCTURES TABLE:

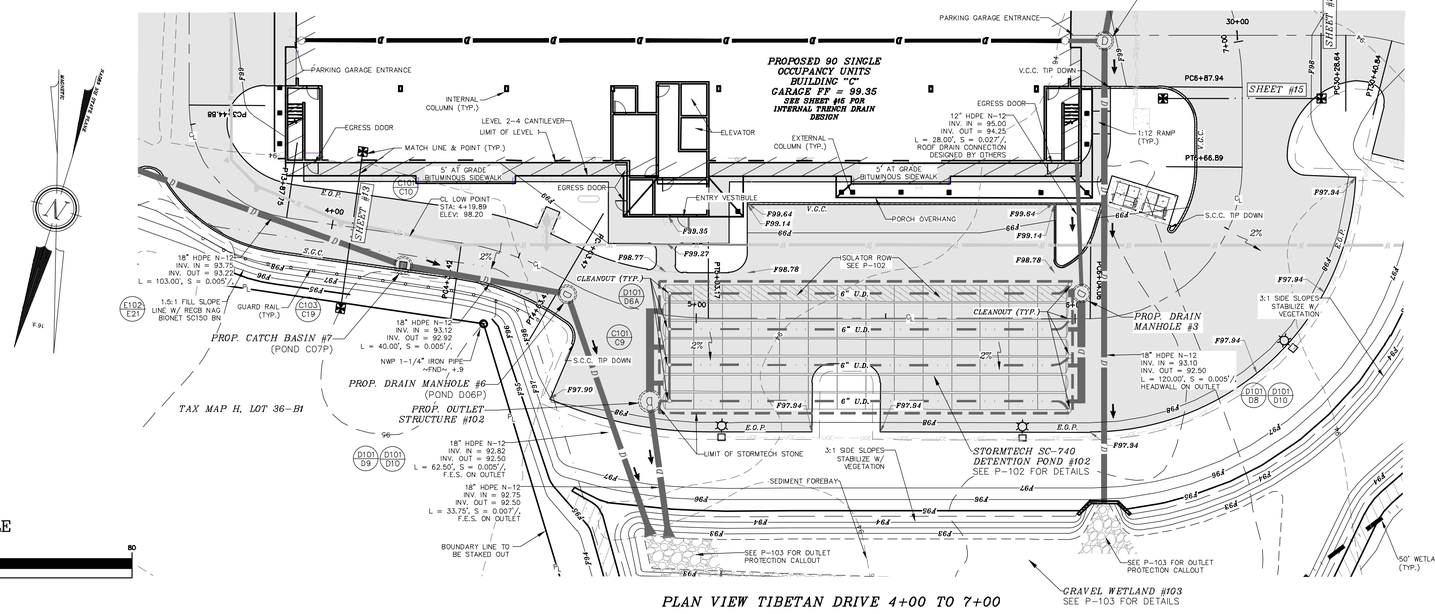
PROP. DRAIN MANHOLE #3 (D101 D3)
4'ø STRUCTURE W/ LIFTMATE R-1743-LM RIM
STA: 6+01.75 (LT. 6.65')
RIM = 98.68 (FLUSH)
INV. IN = 94.25 (12" HDPE N-12) (BUILDING C ROOF) (D101 D5)
INV. OUT = 93.25 (24" HDPE N-12) (2) (P-102)
3" SUMP = 90.25

PROP. OUTLET STRUCTURE #102 (POND 102P) (P102 P11)
5'ø STRUCTURE W/ LIFTMATE R-1743-LM RIM
STA: 4+91.35 (Rt. 23.10')
RIM = 98.10 (FLUSH)
W/ INTERNAL 18" STACK
STACK TOP = 95.75
INV. IN = 92.75 (2" ORIFICE AT BASE OF STACK)
INV. IN = 92.75 (6" HDPE UNDERDRAIN)
INV. IN = 93.36 (15" HDPE N-12) (MANIFOLD)
INV. IN = 93.25 (24" HDPE N-12) (MANIFOLD)
INV. IN = 92.75 (6" HDPE N-12) (U.D.)
INV. OUT = 92.75 (18" HDPE N-12) (GW #103)
6" SUMP FILLED W/ 1 1/2" STONE

PROP. CATCH BASIN #7 (POND C07P) (D101 D1)
4'ø STRUCTURE W/ TYPE "A" GRATE
STA: 4+20.00 (Rt. 8.35') (D101 D2)
RIM = 98.05 (FLUSH)
INV. IN = 93.22 (18" HDPE N-12) (OS #105)
INV. OUT = 93.12 (18" HDPE N-12) (CB #7)

PROP. DRAIN MANHOLE #6 (POND D06P)
4'ø STRUCTURE W/ LIFTMATE R-1743-LM RIM
STA: 4+66.00 (Rt. 3.10')
RIM = 98.68 (FLUSH)
INV. IN = 92.92 (18" HDPE N-12) (CB #7)
INV. OUT = 92.82 (18" HDPE N-12) (P-103)

COORDINATE W/ MEP PLANS FOR ROOF DRAIN DESIGN BUILDING TO HAVE GUTTERS DESIGNED BY OTHERS



GRAPHIC SCALE

20 0 10 20 40 80

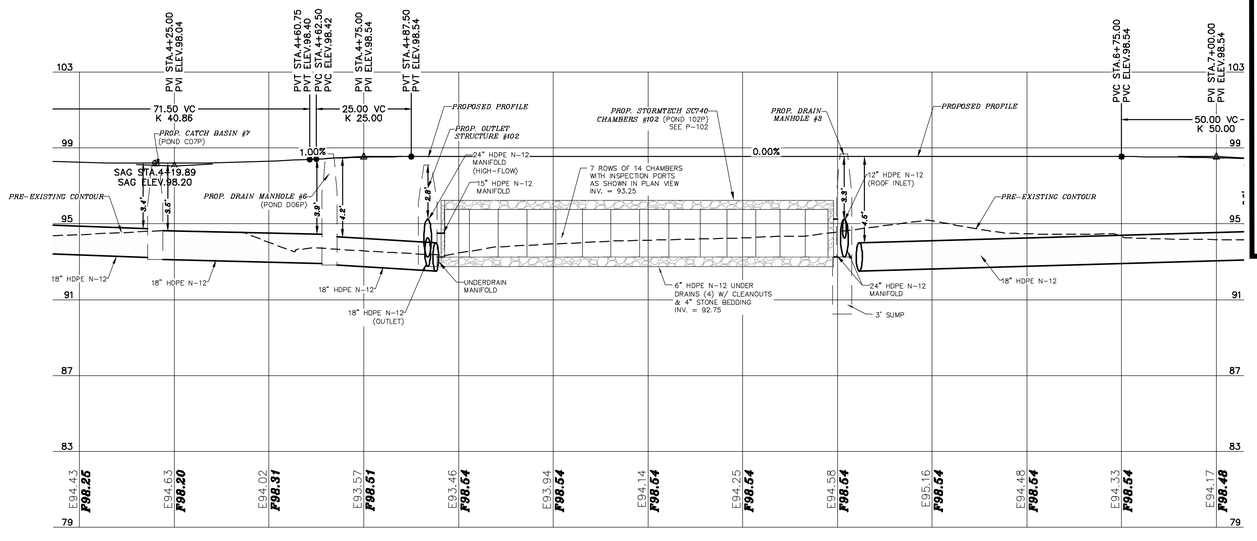
(IN FEET)
1 inch = 20 ft.

PLAN VIEW TIBETAN DRIVE 4+00 TO 7+00

ROAD NOTE:

GRANULAR FILL REQUIRED WITHIN 12" OF SELECT MATERIALS. COMPACT ALL ROAD FILL MATERIALS IN 6" LIFTS. UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM, THE GRANULAR FILL BE GRAVELLY OR SANDY SOIL AND WILL NOT BE ANY FINE GRAINED SOIL.

PROFILE VIEW TIBETAN DRIVE 4+00 TO 7+00



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NHDOT TYPE "A" FRAMES AND GRATES MADE IN NORTH AMERICA. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET #2 FOR GRADING AND DRAINAGE NOTES.

7.) THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES PER CITY OF DOVER CONDITIONS OF VARIANCE APPROVAL. SEE PHASING PLAN FOR ADDITIONAL INFORMATION. SEE PHASING PLAN FOR ENVIRONMENTAL MONITOR REQUIREMENTS.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

8.) THIS GRADING PLAN REFERENCES ITEMS PREVIOUSLY APPROVED AND CONSTRUCTED FROM DOVER APPROVED PROJECT "RESIDENCES AND SHOPS AT KELLY BROOK", DOVER #SITE-2023-0010 AND ALTERATION OF TERRAIN PERMIT AoT-2183/AoT-2183-A.

9.) THIS DESIGN ASSUMED THAT THE BUILDING ROOFS ARE GUTTERED TO BE RESPECTIVE DISCHARGE POINTS. GUTTERS TO BE DESIGNED BY OTHERS.

10.) ALL INTERNAL BUILDING PARKING LEVEL SLOPES ARE TO BE LESS THAN 2% IN ALL DIRECTIONS, PROVIDING AN ACCESSIBLE ROUTE FROM THE INTERNAL ACCESSIBLE PARKING SPACES.

11.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCES AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- (E101 E6) DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 CONTOUR MINOR, EXISTING
- 175 CONTOUR MAJOR, EXISTING
- F176 CONTOUR MINOR, PROPOSED
- F175 CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- GUARD RAIL
- D DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- E175.31 EXISTING SPOT GRADE
- F175.31 PROPOSED SPOT GRADE
- FLOW ARROW
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

PLAN AND PROFILE TIBETAN DRIVE 4+00 TO 7+00
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

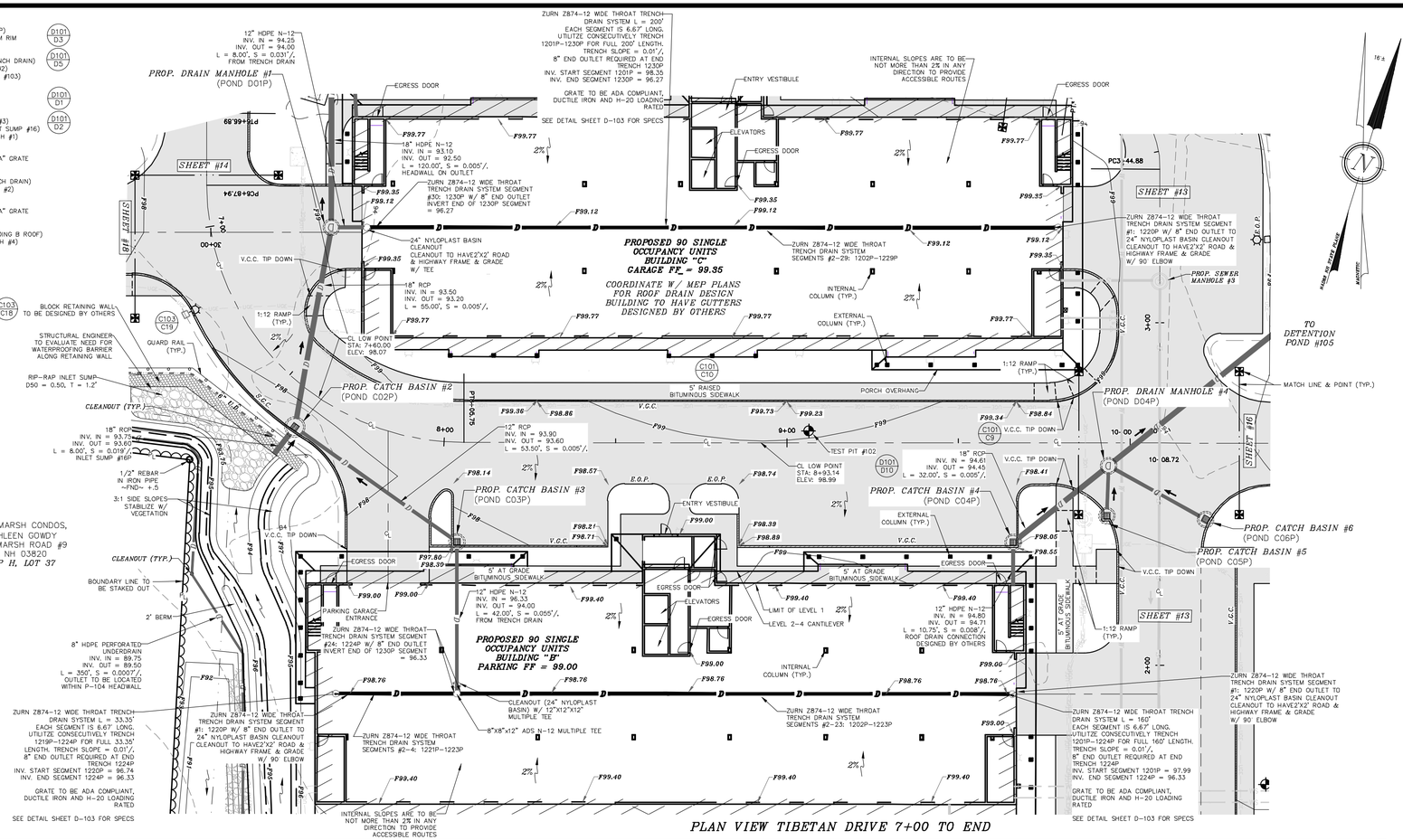
STRUCTURES TABLE:

PROP. DRAIN MANHOLE #1 (POND D01P) — D101 D3
4'ø STRUCTURE W/ UFTMATE R-1743-LM RIM
STA: 7+10.90 (Rt. 2.65')
RIM = 99.15 (FLUSH)
INV. IN = 94.90 (12" HDPE N-12) (TRENCH DRAIN)
INV. IN = 93.20 (18" HDPE N-12) (CB #2) — D101 D5
INV. OUT = 93.10 (18" HDPE N-12) (GW #103)

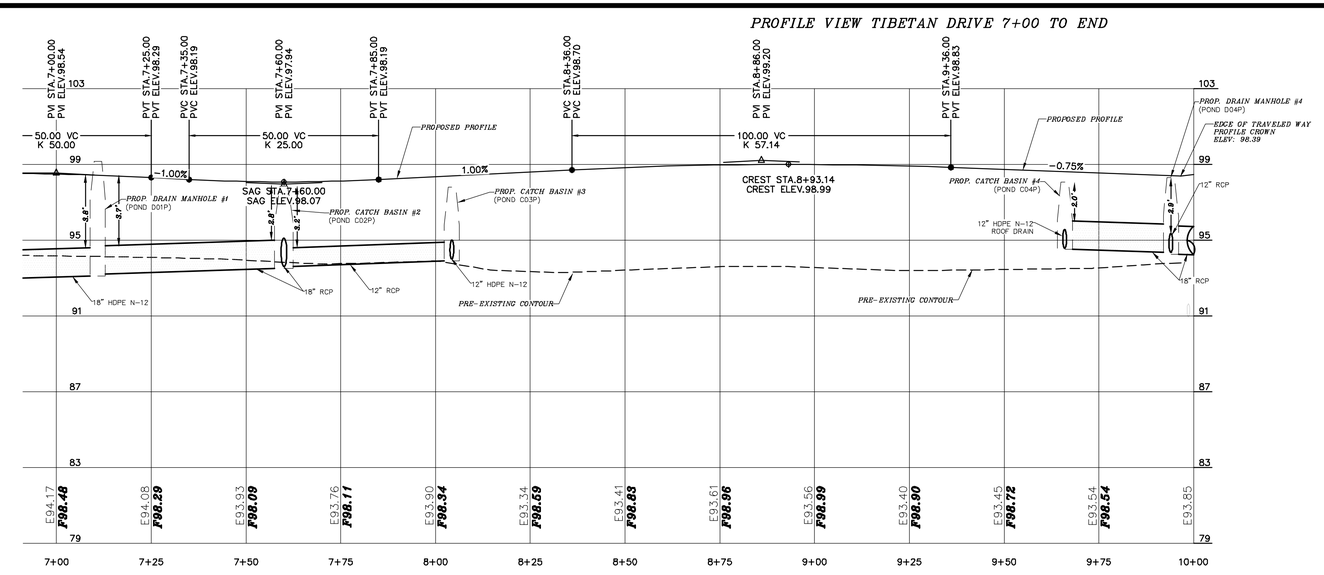
PROP. CATCH BASIN #2 (POND C02P) — D101 D1
5'ø STRUCTURE W/ TYPE "A" GRATE
STA: 7+60.00 (Rt. 11.00')
RIM = 97.85 (FLUSH)
INV. IN = 93.60 (12" HDPE N-12) (CB #3) — D101 D2
INV. IN = 93.60 (18" HDPE N-12) (INLET SUMP #16)
INV. OUT = 93.50 (18" HDPE N-12) (DMH #1)

PROP. CATCH BASIN #3 (POND C03P)
4'ø STRUCTURE W/ FLAT TOP & TYPE "A" GRATE
STA: 8+04.30 (Rt. 29.00')
RIM = 97.80 (FLUSH)
INV. IN = 94.00 (8" HDPE N-12) (TRENCH DRAIN)
INV. OUT = 93.90 (12" HDPE N-12) (CB #2)

PROP. CATCH BASIN #4 (POND C04P)
4'ø STRUCTURE W/ FLAT TOP & TYPE "A" GRATE
STA: 9+66.00 (Rt. 29.00')
RIM = 98.05 (FLUSH)
INV. IN = 94.71 (12" HDPE N-12) (BUILDING B ROOF)
INV. OUT = 94.61 (18" HDPE N-12) (DMH #4)



PLAN VIEW TIBETAN DRIVE 7+00 TO END



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

5.) ALL BASINS AND DRAINS ARE PROPOSED WITH NO SUMPS OR HOODS. OUTLET CONTROL STRUCTURES WILL NOT HAVE SUMPS. IF REQUIRED TO BE INSTALLED DURING THE PRE-CASTING PROCESS, THEY ARE TO BE FILLED WITH STONE ON SITE. BASINS ARE TO HAVE NHDOT TYPE "A" FRAMES AND GRATES MADE IN NORTH AMERICA. GRATES ARE TO BE INSTALLED BINDER FLUSH PRIOR TO BASE PAVE. UPON PROJECT COMPLETION FRAMES AND GRATES ARE TO BE CUT AND RIM RAISED TO FINAL PAVEMENT SURFACE. THIS IS TO ENSURE STORMWATER ENTERS THE SYSTEM AS DESIGN DURING THE INTERIM CONSTRUCTION PERIOD.

6.) SEE SHEET #2 FOR GRADING AND DRAINAGE NOTES.

7.) THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES PER CITY OF DOVER CONDITIONS OF VARIANCE APPROVAL. SEE PHASING PLAN FOR ADDITIONAL INFORMATION. SEE PHASING PLAN FOR ENVIRONMENTAL MONITOR REQUIREMENTS.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

8.) THIS GRADING PLAN REFERENCES ITEMS PREVIOUSLY APPROVED AND CONSTRUCTED FROM DOVER APPROVED PROJECT "RESIDENCES AND SHOPS AT KELLY BROOK", DOVER #SITE-2023-0010 AND ALTERATION OF TERRAIN PERMIT AoT-2183/AoT-2183-A.

9.) THIS DESIGN ASSUMED THAT THE BUILDING ROOFS ARE GUTTERED TO BE RESPECTIVE DISCHARGE POINTS. GUTTERS TO BE DESIGNED BY OTHERS.

10.) ALL INTERNAL BUILDING PARKING LEVEL SLOPES ARE TO BE LESS THAN 2% IN ALL DIRECTIONS, PROVIDING AN ACCESSIBLE ROUTE FROM THE INTERNAL ACCESSIBLE PARKING SPACES.

11.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCE AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- F176 — CONTOUR MINOR, PROPOSED
- F175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- E175.31 — EXISTING SPOT GRADE
- F175.31 — PROPOSED SPOT GRADE
- FLOW ARROW
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

ROAD NOTE:

GRANULAR FILL REQUIRED WITHIN 12" OF SELECT MATERIALS. COMPACT ALL ROAD FILL MATERIALS IN 6" LIFTS. UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM, THE GRANULAR FILL BE GRAVELLY OR SANDY SOIL AND WILL NOT BE ANY FINE GRAINED SOIL.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

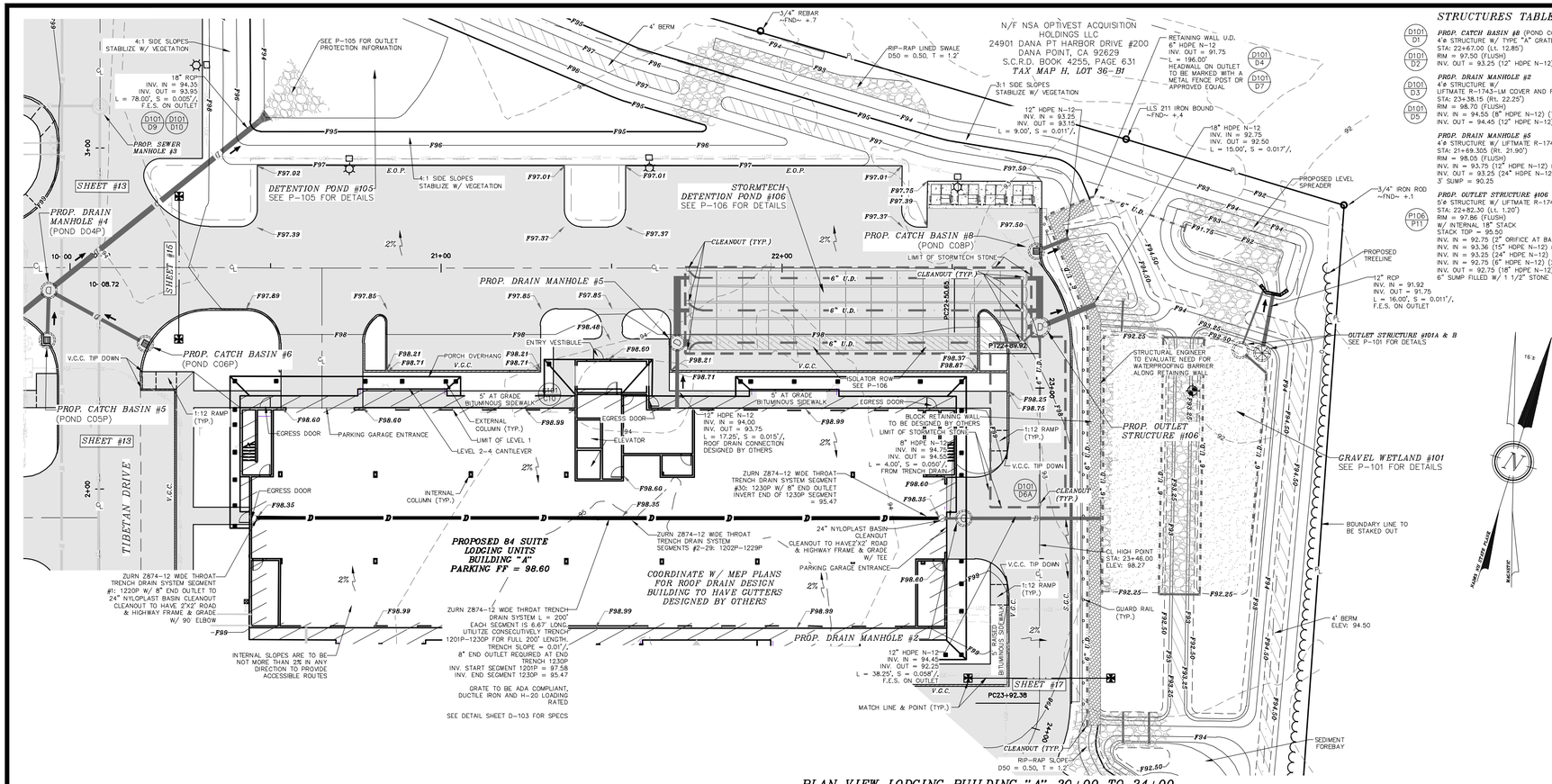
PLAN AND PROFILE TIBETAN DRIVE 7+00 TO END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37-A

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



STRUCTURES TABLE:

D101 D1 / D101 D2 — PROP. CATCH BASIN #8 (POND C08P)
4'ø STRUCTURE W/ TYPE "A" GRATE
STA: 22+67.00 (Lt. 12.85')
RIM = 97.50 (FLUSH)
INV. OUT = 93.25 (12" HDPE N-12) (GW #101)

D101 D3 / D101 D5 — PROP. DRAIN MANHOLE #2
4'ø STRUCTURE W/ LIFTMATE R-1743-LM COVER AND FRAME
STA: 23+38.15 (Rt. 22.25')
RIM = 98.70 (FLUSH)
INV. IN = 94.55 (8" HDPE N-12) (TRENCH DRAIN)
INV. OUT = 94.45 (12" HDPE N-12) (GW #101)

PROP. DRAIN MANHOLE #5
4'ø STRUCTURE W/ LIFTMATE R-1743-LM RIM
STA: 21+69.305 (Rt. 21.90')
RIM = 98.05 (FLUSH)
INV. IN = 93.75 (12" HDPE N-12) (BUILDING A ROOF)
INV. OUT = 93.25 (24" HDPE N-12) (2) (P-106)
3' SUMP = 90.25

P106 P11 — PROP. OUTLET STRUCTURE #106
5'ø STRUCTURE W/ LIFTMATE R-1743-LM RIM
STA: 22+82.30 (Lt. 1.20')
RIM = 97.86 (FLUSH)
W/ INTERNAL 18" STACK
STACK TOP = 95.50
INV. IN = 92.75 (2" ORIFICE AT BASE OF STACK)
INV. IN = 93.36 (15" HDPE N-12) (MANIFOLD)
INV. IN = 93.05 (24" HDPE N-12) (MANIFOLD)
INV. IN = 92.75 (6" HDPE N-12) (2 U.D.)
INV. OUT = 92.75 (18" HDPE N-12) (GW #101)
6" SUMP FILLED W/ 1 1/2" STONE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

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6.) SEE SHEET #2 FOR GRADING AND DRAINAGE NOTES.

7.) THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES PER CITY OF DOVER CONDITIONS OF VARIANCE APPROVAL. SEE PHASING PLAN FOR ADDITIONAL INFORMATION. SEE PHASING PLAN FOR ENVIRONMENTAL MONITOR REQUIREMENTS.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

8.) THIS GRADING PLAN REFERENCES ITEMS PREVIOUSLY APPROVED AND CONSTRUCTED FROM DOVER APPROVED PROJECT "RESIDENCES AND SHOPS AT KELLY BROOK", DOVER #SITE-2023-0010 AND ALTERATION OF TERRAIN PERMIT AoT-2183/AoT-2183-A.

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LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- F976 — CONTOUR MINOR, PROPOSED
- F975 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- E175.31 — EXISTING SPOT GRADE
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- FLOW ARROW
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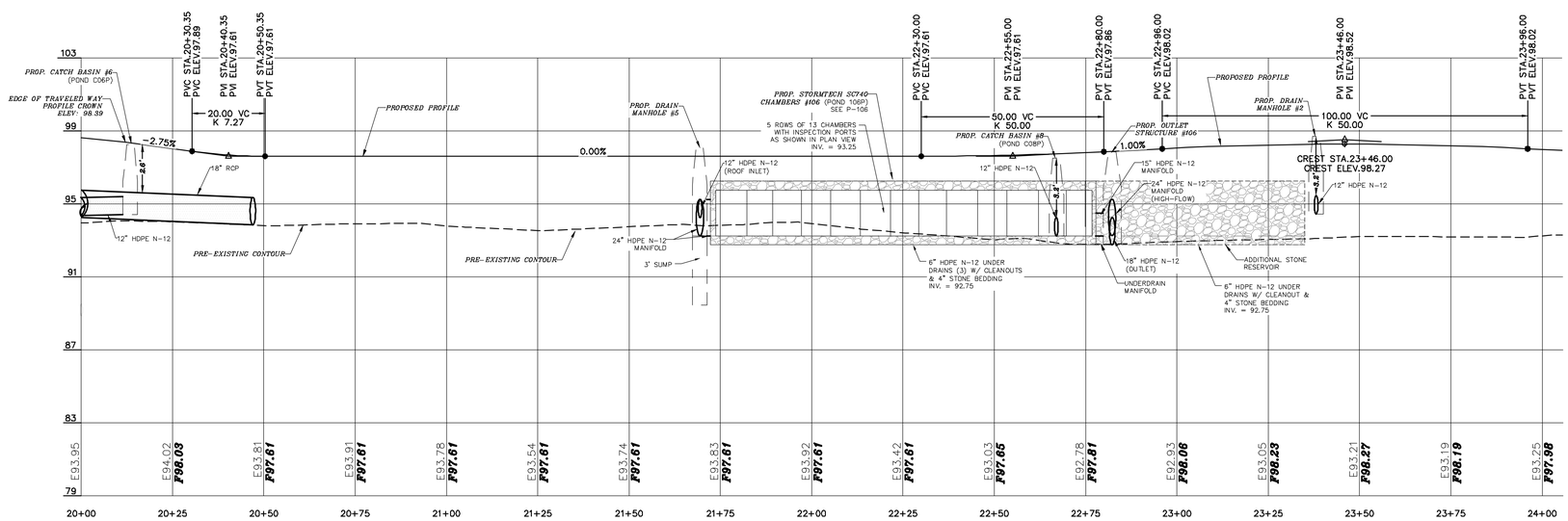
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PLAN VIEW LODGING BUILDING "A" 20+00 TO 24+00

PROFILE VIEW LODGING BUILDING "A" 20+00 TO 24+00



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

ROAD NOTE:

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PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

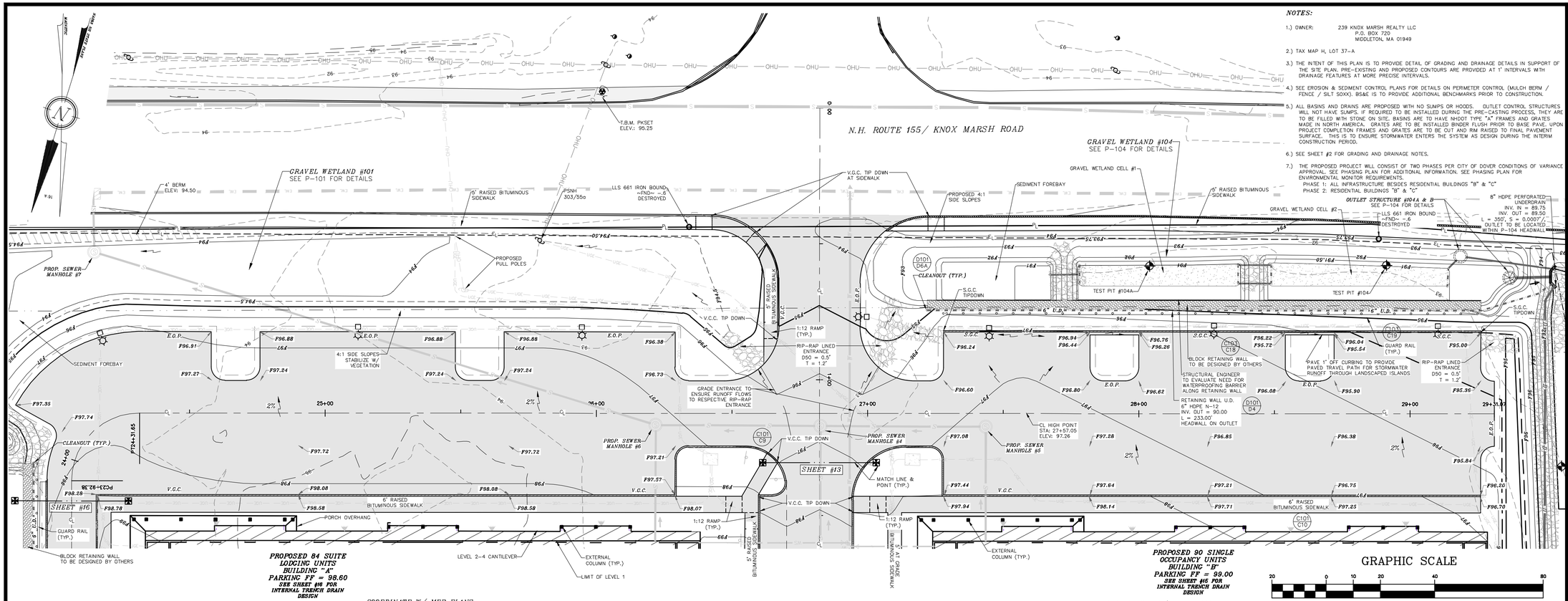
PLAN AND PROFILE LODGING BUILDING "A" 20+00 TO 24+00
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



PLAN VIEW LODGING BUILDING "A" 24+00 TO END & FRONT RESIDENTIAL BUILDING "B"

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
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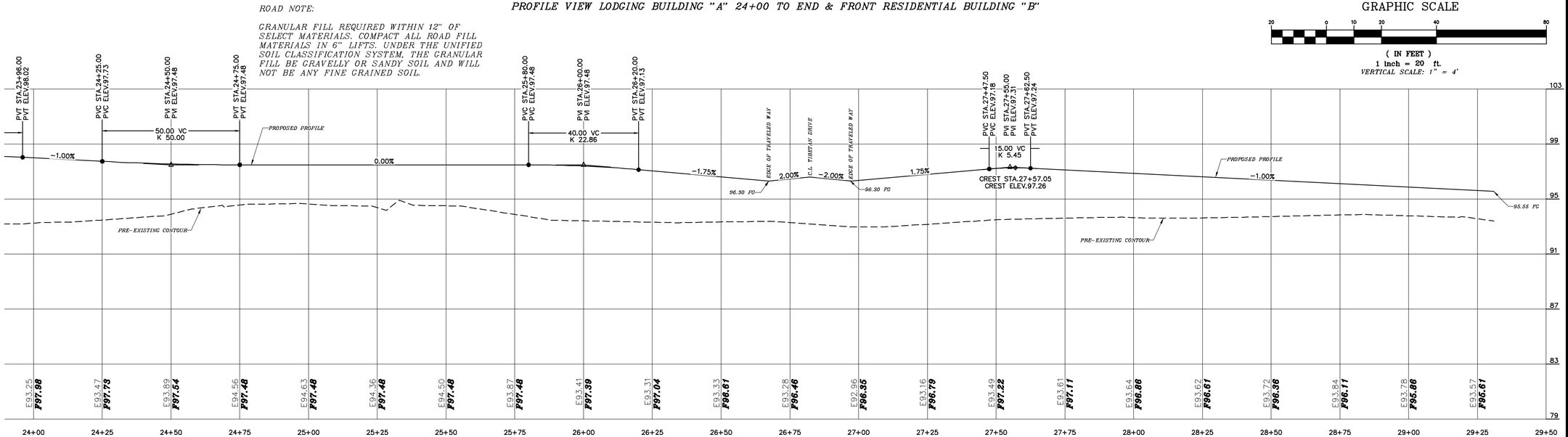
PROFILE VIEW LODGING BUILDING "A" 24+00 TO END & FRONT RESIDENTIAL BUILDING "B"



GRAPHIC SCALE

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(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

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PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

REVISION	DATE	DESCRIPTION

PLANNING FILE #SITE-XXXX-XXXX

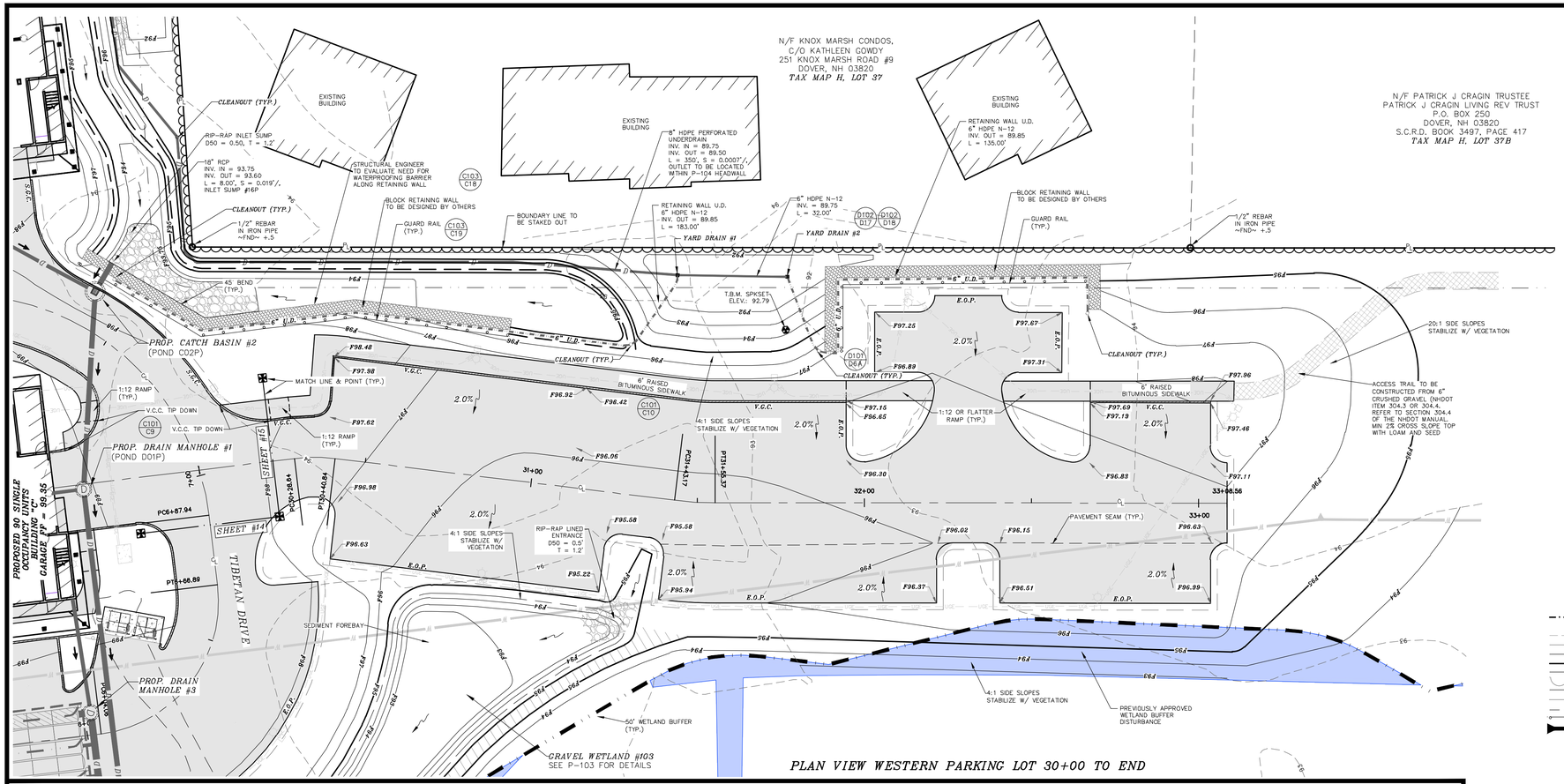
PLAN AND PROFILE BUILDINGS "A" & "B" FRONT 24+00-END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

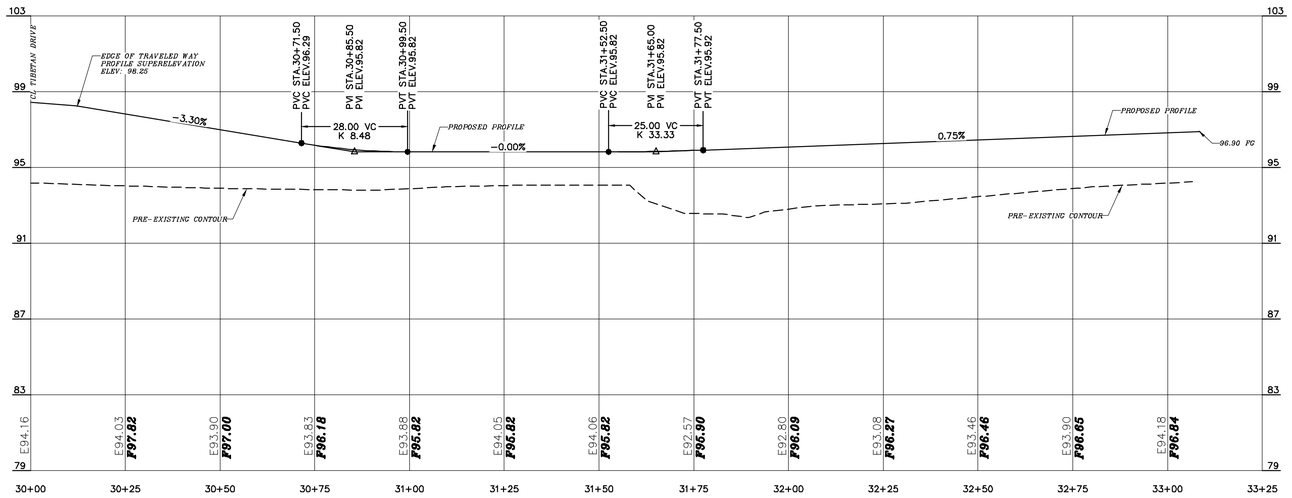
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION





NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37-A

3.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF GRADING AND DRAINAGE DETAILS IN SUPPORT OF THE SITE PLAN. PRE-EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

4.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX). BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

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PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "B" & "C"

8.) THIS GRADING PLAN REFERENCES ITEMS PREVIOUSLY APPROVED AND CONSTRUCTED FROM DOVER APPROVED PROJECT "RESIDENCES AND SHOPS AT KELLY BROOK", DOVER #SITE-2023-0010 AND ALTERATION OF TERRAIN PERMIT AoT-2183/AoT-2183-A.

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11.) THE FINISHED FLOOR ELEVATIONS SHOWN REFLECT THE ELEVATION OF THE PARKING GARAGE ENTRANCES AND ELEVATION OF THE VESTIBULE THRESHOLD. SPOT GRADES WITHIN THE LEVEL 1 PARKING AREA VARY FROM THE SHOWN FINISHED FLOOR ELEVATION BASED INTERNAL SLOPES TO THE PROPOSED TRENCH DRAIN WITHIN EACH BUILDING.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- F176 — CONTOUR MINOR, PROPOSED
- F175 — CONTOUR MAJOR, PROPOSED
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- TREELINE
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- E175.31 — EXISTING SPOT GRADE
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- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
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VERTICAL SCALE: 1" = 4'

ROAD NOTE:

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PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

PLAN AND PROFILE WESTERN PARKING LOT 30+00 TO END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

MAINTENANCE REQUIREMENTS

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
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 STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.	
VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 - 100
# 4	22 - 55
# 8	0 - 10

* EQUIVALENT TO STANDARD WASHED STONE - SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 - 100
1"	20 - 55
1/2"	0 -15
3/8"	0 -5

* EQUIVALENT TO STANDARD WASHED STONE - SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

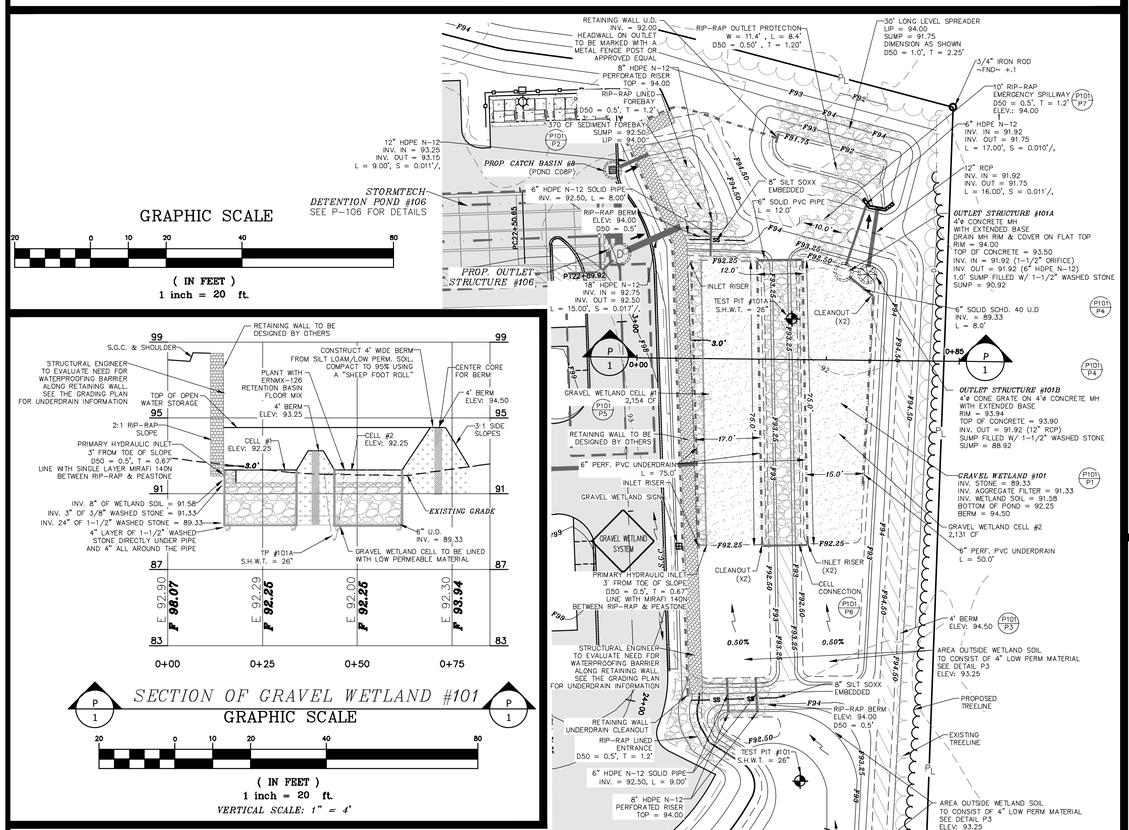
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10"	90 - 75
#100	40 - 50
#200	25 -50
SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

DESIGN REFERENCES

1 UNH STORMWATER CENTER

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

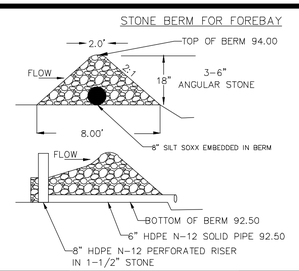
P1



SECTION OF GRAVEL WETLAND #101

P2

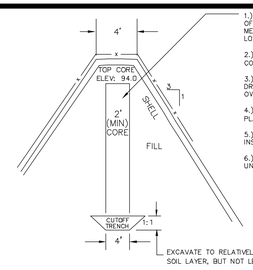
STONE BERM FOR FOREBAY



P3

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 - 100
#40	60 - 95
#100	40 - 60
#200	25 - 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

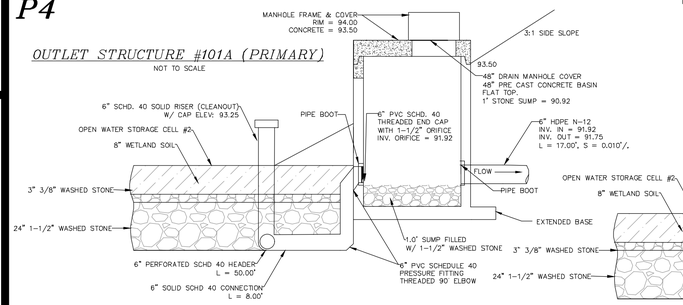
4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

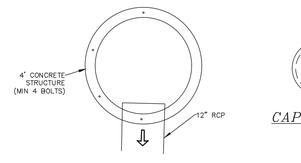
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

OUTLET STRUCTURE #101A (PRIMARY)
NOT TO SCALE



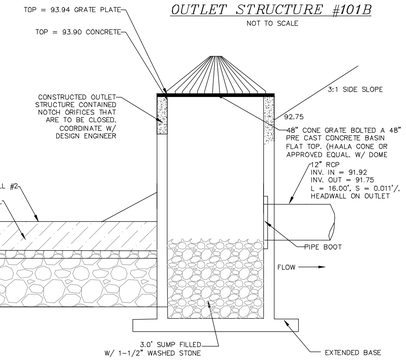
TOP VIEW (101B)
NOT TO SCALE



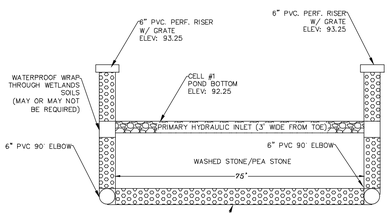
CAP WITH CONTROL ORIFICE (101A)
NOT TO SCALE

PERFORATED RISER DETAIL
NOT TO SCALE

OUTLET STRUCTURE #101B
NOT TO SCALE



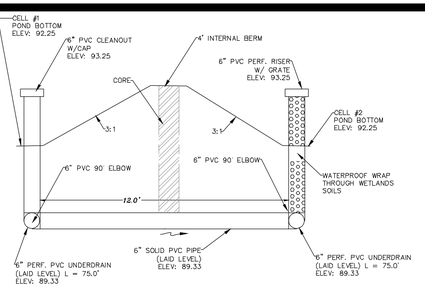
P5



GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

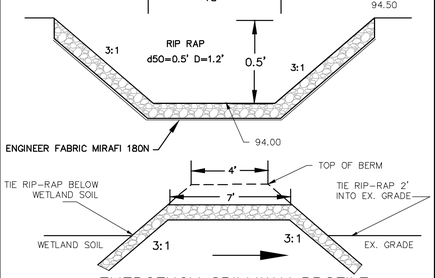
P6



GRAVEL WETLAND CONNECTION SYSTEM

P7

SPILLWAY DETAILS
NOT TO SCALE



EMERGENCY SPILLWAY PROFILE

P8

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, 'Tioga*	Deertongue, 'Tioga	22.00
20.00 %	*Festuca alsatica, Fults*	Alkaligrass, Fults	9.35
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.95
15.00 %	*Agrostis stolonifera, 'Penncross'*	Creeping Bentgrass, 'Penncross'	14.40
13.00 %	*Poa palustris*	Fowl Bluegrass	35.80
10.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype	28.80
3.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.98**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

P-101

PLANNING FILE #SITE--XXXX-XXXX

REVISION	DATE	DESCRIPTION

GRAVEL WETLAND #101
LAND OF
GRAVEL WETLAND REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14263
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

P1

MAINTENANCE REQUIREMENTS

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
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 STRUCTUAL PARTS, INLETS AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGUARTION.	
VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1–1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1–1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL

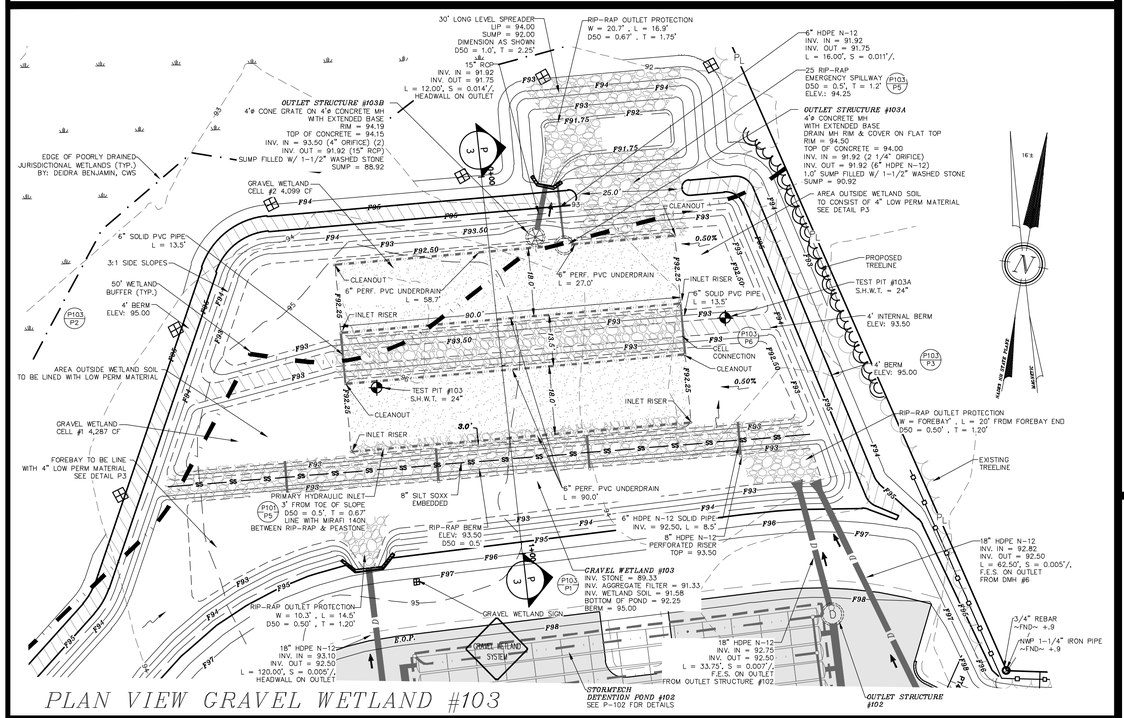
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10	90 – 75
#100	40 – 50
#200	25 –50

SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

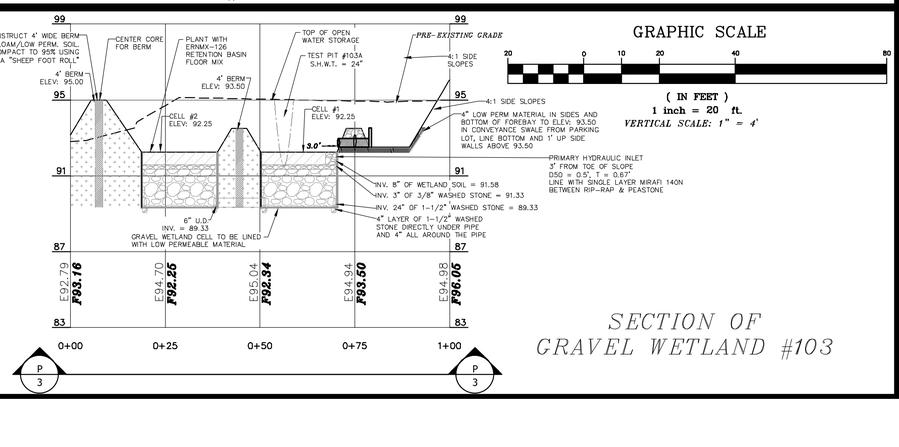
DESIGN REFERENCES

1 UNH STORMWATER CENTER

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER



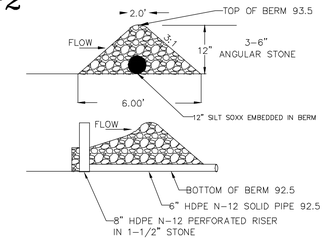
PLAN VIEW GRAVEL WETLAND #103



SECTION OF GRAVEL WETLAND #103

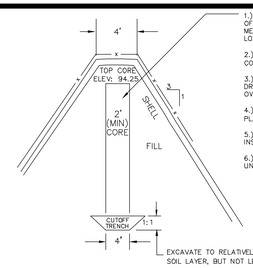
P2

STONE BERM FOR FOREBAY



P3

LOW PERMEABILITY MATERIAL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

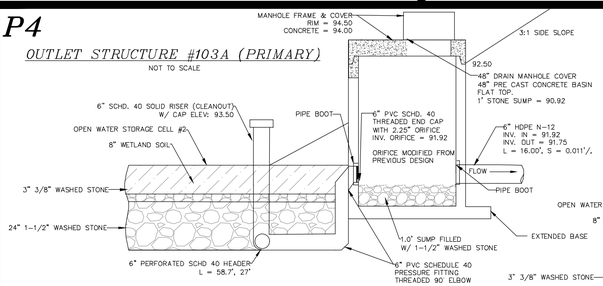
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

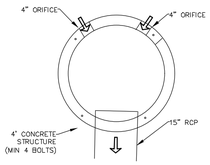
EXCAVATE TO RELATIVELY IMPERVIOUS SOIL LAYER, BUT NOT LESS THAN 3'

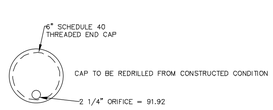
P4

OUTLET STRUCTURE #103A (PRIMARY)
NOT TO SCALE

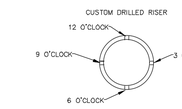


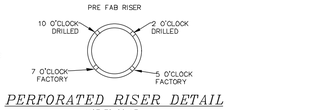
TOP VIEW (103B)
NOT TO SCALE





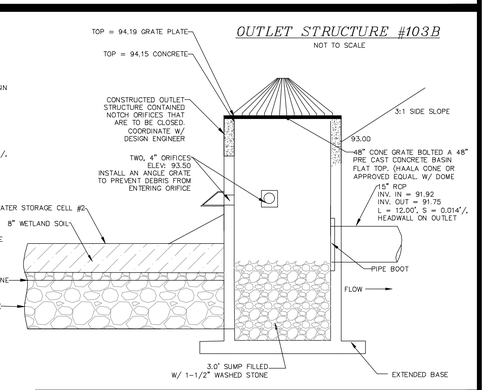
CAP WITH CONTROL ORIFICE
NOT TO SCALE



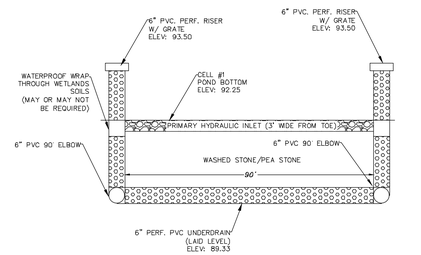


PERFORATED RISER DETAIL
NOT TO SCALE

OUTLET STRUCTURE #103B
NOT TO SCALE



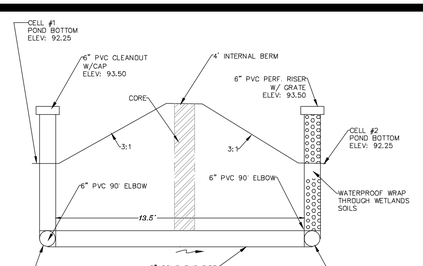
P5



GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

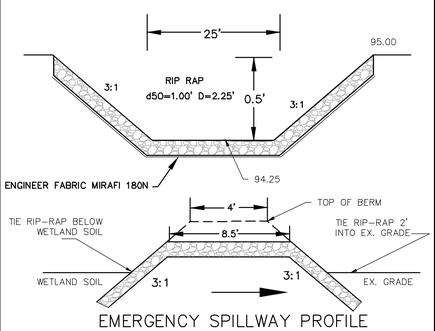
P6



GRAVEL WETLAND CONNECTION SYSTEM
NOT TO SCALE

P7

SPILLWAY DETAILS
NOT TO SCALE



EMERGENCY SPILLWAY PROFILE

P8

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga	22.05
20.00 %	*Festuchella rbesus, Fults*	Alkaligrass, Fults	4.35
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	5.96
15.00 %	*Agrostis stolonifera, 'Penncross'*	Creeping Bentgrass, 'Penncross'	14.40
15.00 %	*Poa palustris*	Fowl Bluegrass	15.80
10.00 %	*Carex haleniodes, PA Ecotype*	Fox Sedge, PA Ecotype	25.80
1.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.90**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

P-103

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

GRAVEL WETLAND #103
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

P1

MAINTENANCE REQUIREMENTS

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
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 AND OUTLETS. CLEAR OR REMOVE DEBRIS OR RESTRICTIONS.	ANNUALLY, MORE FREQUENTLY IN THE FIRST YEAR OF OPERATION
CHECK FOR INTERNAL EROSION, EVIDENCE OF SHORT-CIRCUITING, AND ANIMAL BURROWS. REMEDY: SOIL EROSION FROM SHORT-CIRCUITING OR ANIMAL BOROUGHS SHOULD BE REPAIRED WHEN THEY OCCUR.	
CHECK THAT THE SYSTEM IS FULLY DRAINING WITHIN A 24-48 HOUR PERIOD AFTER RAIN EVENTS. REMEDY: REPAIR OR RESTORE HYDRAULIC INLET OR OUTLET CONFIGURATION.	
VEGETATION	
CHECK FOR ROBUST VEGETATION COVERAGE THROUGHOUT THE SYSTEM AND DEAD OR DYING PLANTS REMEDY: VEGETATION SHOULD COVER > 75% OF THE SYSTEM AND SHOULD BE RESEEDED AND CARED FOR AS NEEDED	ANNUALLY, OR AS NEEDED
CUT AND REMOVE VEGETATION FROM GRAVEL WETLAND SYSTEM AND FOREBAY IN ORDER TO MAINTAIN NITROGEN REMOVAL PERFORMANCE REMEDY: THE VEGETATION SHOULD BE CUT AND REMOVED FROM THE SYSTEM TO PREVENT NITROGEN FROM CYCLING BACK INTO THE SYSTEM	ONCE EVERY 3 YEARS

3/8" WASHED CRUSHED STONE*	
SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 - 100
# 4	22 - 55
# 8	0 - 10

* EQUIVALENT TO STANDARD WASHED STONE - SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

1-1/2" WASHED CRUSHED STONE*	
SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 - 100
1"	20 - 55
1/2"	0 -15
3/8"	0 -5

* EQUIVALENT TO STANDARD WASHED STONE - SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

WETLAND SOIL	
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10	90 - 75
#100	40 - 50
#200	25 -50
SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

DESIGN REFERENCES

1 UNH STORMWATER CENTER

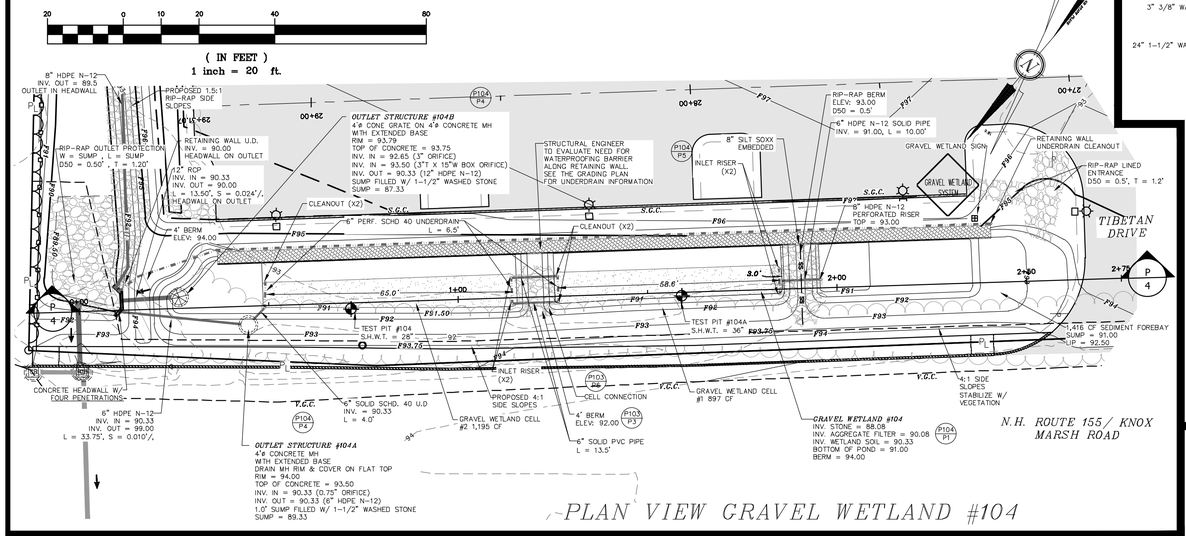
CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

GRAPHIC SCALE

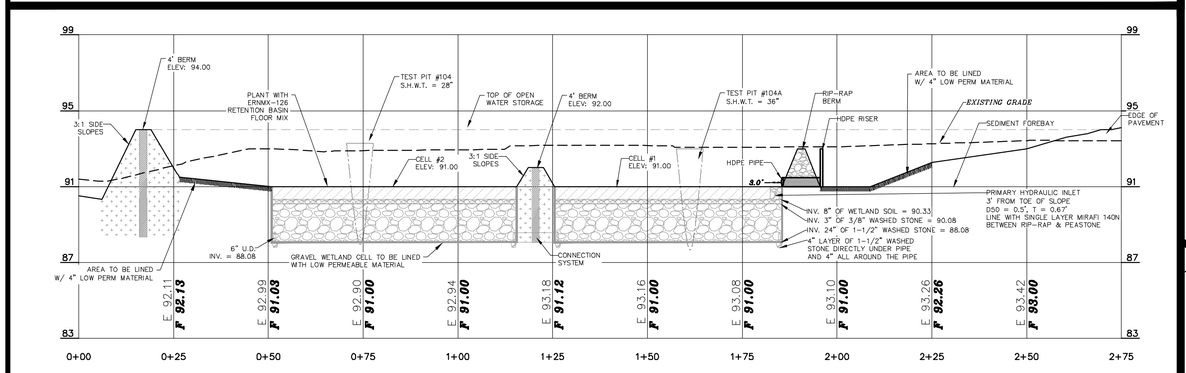
20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.



PLAN VIEW GRAVEL WETLAND #104



SECTION OF GRAVEL WETLAND #104

GRAPHIC SCALE

20 0 10 20 40 80

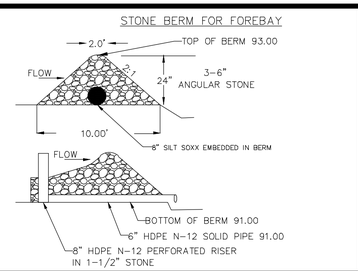
(IN FEET)

1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

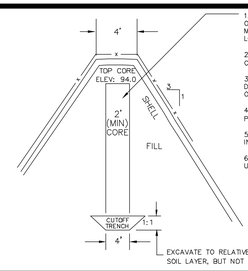
P2

STONE BERM FOR FOREBAY



P3

LOW PERMEABILITY MATERIAL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 - 100
#40	60 - 95
#100	40 - 60
#200	25 - 45



1.) 2" CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL MEETING THE REQUIREMENT OF THE LOW PERM SPECIFICATION

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

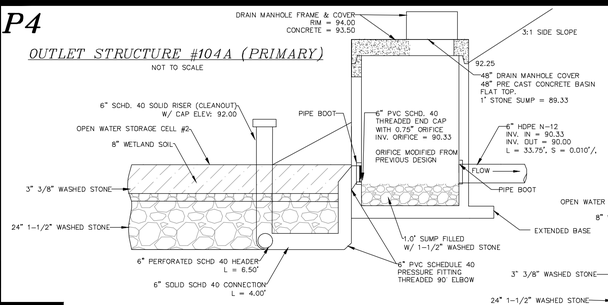
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

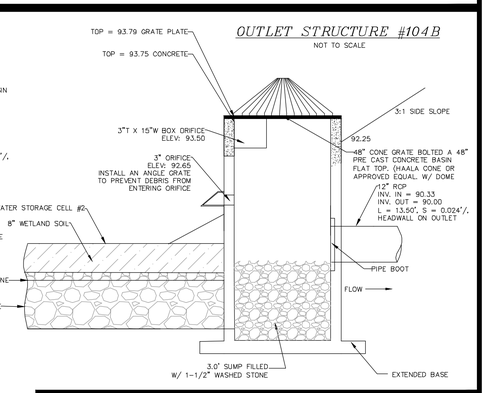
OUTLET STRUCTURE #104A (PRIMARY)

NOT TO SCALE



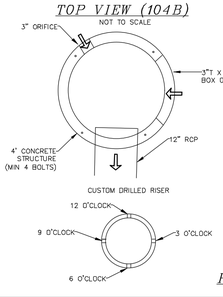
OUTLET STRUCTURE #104B

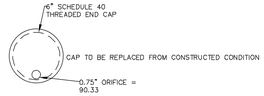
NOT TO SCALE



TOP VIEW (104B)

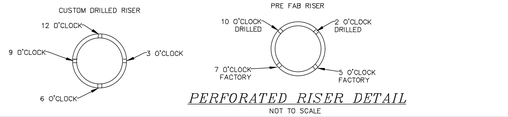
NOT TO SCALE





CAP WITH CONTROL ORIFICE

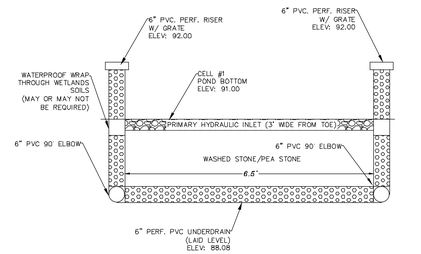
NOT TO SCALE



PERFORATED RISER DETAIL

NOT TO SCALE

P5

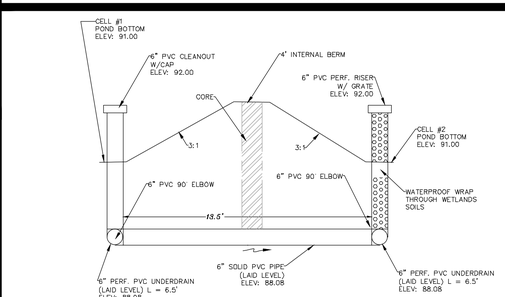


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6



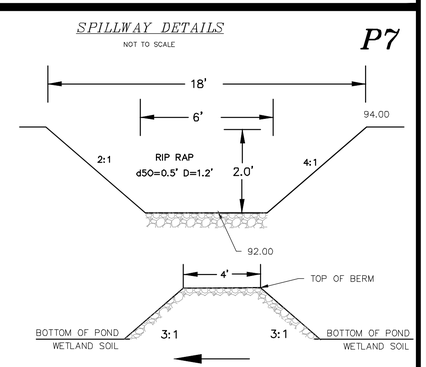
GRAVEL WETLAND CONNECTION SYSTEM

NOT TO SCALE

P7

SPILLWAY DETAILS

NOT TO SCALE



GRAVEL WETLAND CELL SPILLWAY PROFILE

P8

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, 'Tioga*	Deertongue, 'Tioga	22.00
20.00 %	*Panicvirgatum, Alamo, Nutz*	Alkalygrass, Nutz	4.56
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.96
15.00 %	*Agrostis stolonifera, 'Pennacross'*	Creeping Bentgrass, 'Penncross'	14.40
15.00 %	*Asa yakusimi*	Fowl Mannagrass	16.80
10.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype	28.80
1.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		Mix Price/Lb Bulk:	$15.98

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

PLANNING FILE #SITE-XXX-XXX

REVISION	DATE	DESCRIPTION

GRAVEL WETLAND #104
LAND OF
GRAVEL WETLAND REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

P-104

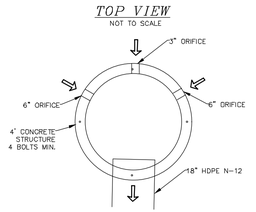
SHEET 21 OF 60

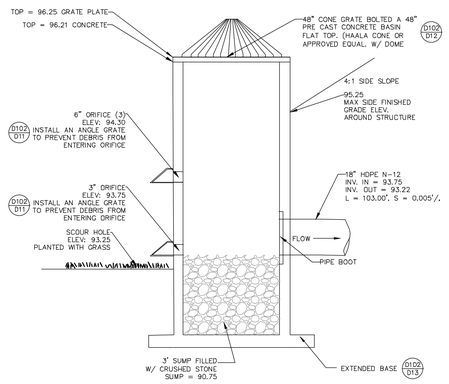
NOT FOR CONSTRUCTION

P1

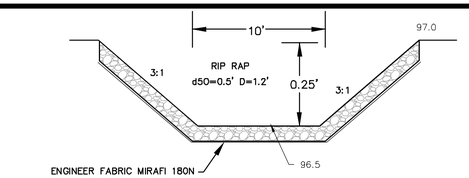
OUTLET STRUCTURE #105

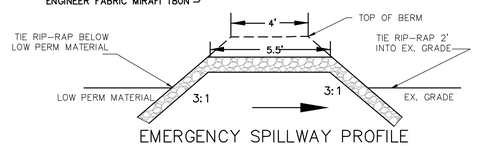
NOT TO SCALE





P2



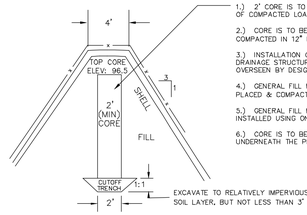


EMERGENCY SPILLWAY PROFILE

SPILLWAY DETAILS

NOT TO SCALE

P3



1.) 2' CORE IS TO BE CONSTRUCTED OF COMPACTED LOAM MATERIAL.

2.) CORE IS TO BE INSTALLED & COMPACTED IN 12" LIFTS.

3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

EXCAVATE TO RELATIVELY IMPERVIOUS SOIL LAYER, BUT NOT LESS THAN 3'

LOW PERMEABILITY MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

P4

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga	22.68
20.00 %	*Perennials alabaxs, Fults*	Alkaligrass, Fults	4.56
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	9.96
15.00 %	*Agrostis stolonifera, 'Penncross'*	Creeping Bentgrass, 'Penncross'	14.40
15.00 %	*Poa palustris*	Fowl Bluegrass	16.80
10.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype	28.80
1.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	83.60
1.00 %	*Juncus effusus*	Soft Rush	46.00
100.00 %		**Mix Price/Lb Bulk:**	**$15.98**

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

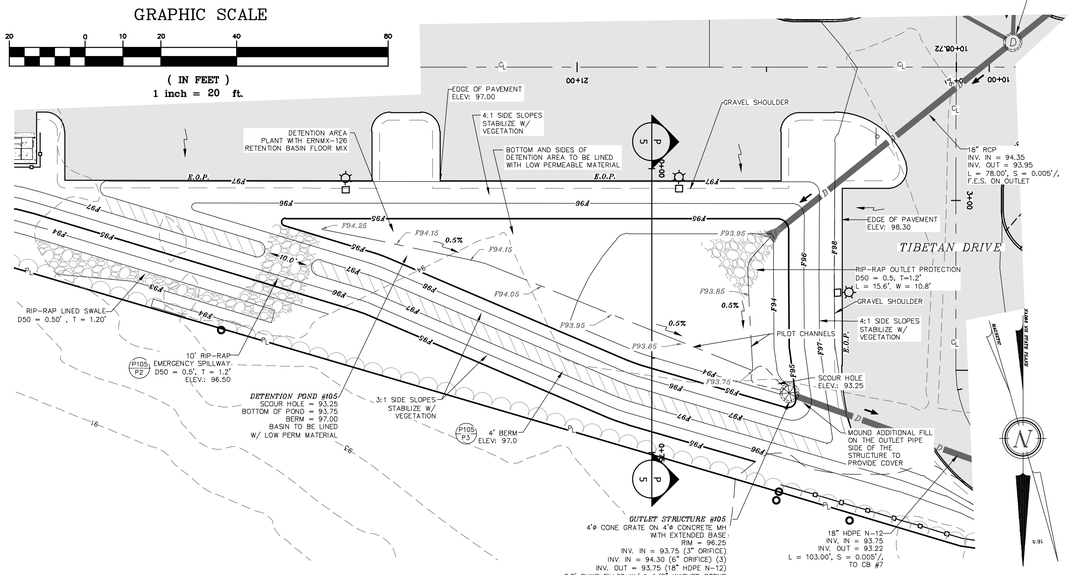
The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

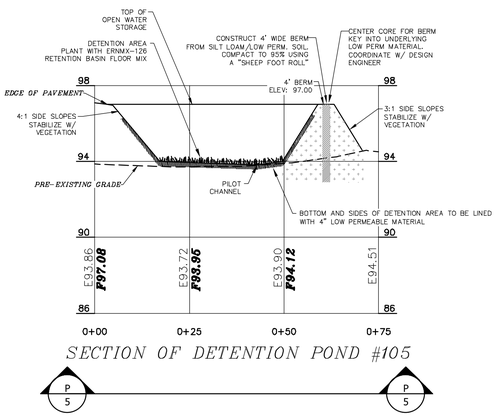
PLAN VIEW DETENTION POND #105

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.





SECTION OF DETENTION POND #105

P 5

SECTION OF DETENTION POND #102

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

P 5

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

DETENTION POND #105
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

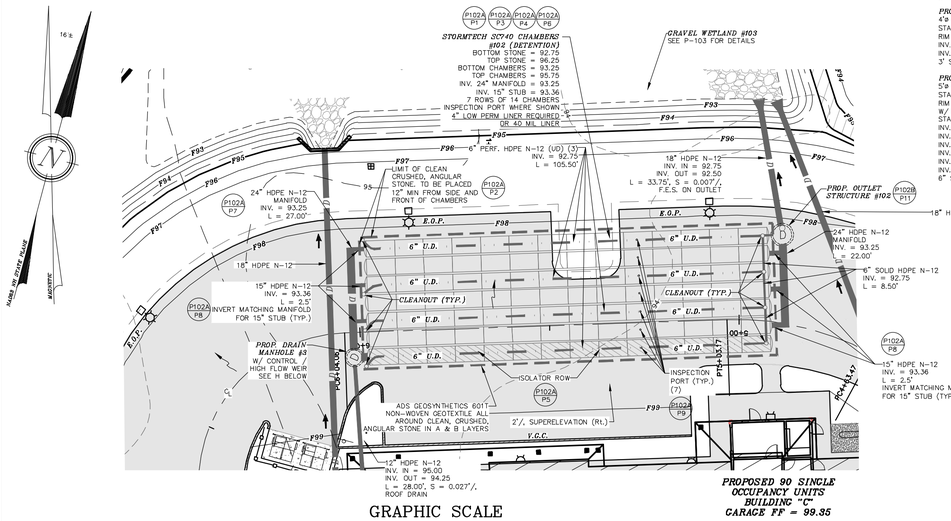
SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

P-105

SHEET 22 OF 60

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

A REPRESENTATIVE FROM BS&E WILL BE ON SITE DURING THE CONSTRUCTION OF THE STORMTECH SYSTEM

PLAN VIEW STORMTECH SC-740 CHAMBERS DETENTION POND #102 SEE SHEET 102B FOR DETAILS

STRUCTURES TABLE:

PROP. DRAIN MANHOLE #3
4'ø STRUCTURE W/ NH STANDARD RIM
STA: 6+01.75 (Lt. 6.65')
RIM = 98.68 (FLUSH)
INV. IN = 94.25 (12" HDPE N-12) (BUILDING C ROOF)
INV. OUT = 93.25 (24" HDPE N-12) (2) (P-102)
3' SUMP = 90.25

PROP. OUTLET STRUCTURE #102 (POND 102P)
5'ø STRUCTURE W/ NH STANDARD RIM
STA: 4+91.35 (Rt. 23.10')
RIM = 98.10 (FLUSH)
W/ INTERNAL 18" STACK
STACK TOP = 95.75
INV. IN = 92.75 (2" ORIFICE AT BASE OF STACK)
INV. IN = 92.75 (6" HDPE UNDERDRAIN)
INV. IN = 93.35 (15" HDPE N-12) (MANIFOLD)
INV. IN = 93.25 (24" HDPE N-12) (MANIFOLD)
INV. IN = 92.75 (6" HDPE N-12) (U.D.)
INV. OUT = 92.75 (18" HDPE N-12) (GW #103)
6" SUMP FILLED W/ 1 1/2" STONE

P1

1. ALL DESIGN SPECIFICATIONS FOR STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE STORMTECH DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH)
2. THE INSTALLATION OF STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
3. THE CONTRACTOR IS ADVISED TO REVIEW AND UNDERSTAND THE INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLTION. CALL **1-888-892-2694** OR VISIT **WWW.STORMTECH.COM** TO RECIEVE A COPY OF THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
4. CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND LOAD FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SC-740 NOTES

P2

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

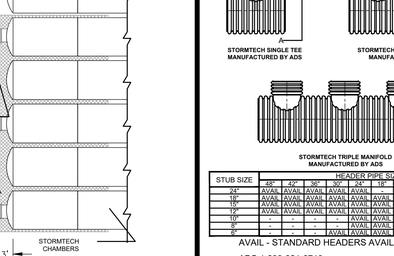
	MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION[1]	COMPACTION/DENSITY REQUIREMENT
D	FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS, CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE 'B' LAYER TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, < 35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTION AFTER 12" (305 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" TO 12" (150 mm TO 300 mm) LIFTS TO A MIN. 95% STANDARD PROCTOR DENSITY. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs [53 kN]. DYNAMIC FORCE NOT TO EXCEED 20,000 lbs [89 kN]
B	EMBEDMENT STONE SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE UP TO LAYER 'C'.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 35, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY*.

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE.

2. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9in [229 mm] (MAX) LIFTS USING TWO FULL COVERAGES WITH AN APPROPRIATE COMPACTOR.

STORMTECH ACCEPTABLE FILL MATERIALS

P3



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	51.0" x 30.0" x 85.4" [1295 mm x 762 mm x 2169 mm]
CHAMBER STORAGE	45.9 CUBIC FEET [1.30 m3]
MINIMUM INSTALLED STORAGE	74.9 CUBIC FEET [2.12 m3]
WEIGHT	75 lbs. [33.6 kg]

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740EPE06T	6" [150 mm]	10.90" [277 mm]	18.50" [470 mm]	N/A
SC740EPE06B	6" [150 mm]	10.90" [277 mm]	N/A	0.50" [13 mm]
SC740EPE08T	8" [200 mm]	12.20" [310 mm]	N/A	N/A
SC740EPE08B	8" [200 mm]	12.20" [310 mm]	N/A	0.60" [15 mm]
SC740EPE10T	10" [250 mm]	13.40" [340 mm]	14.50" [368 mm]	N/A
SC740EPE10B	10" [250 mm]	13.40" [340 mm]	N/A	0.70" [18 mm]
SC740EPE12T	12" [300 mm]	14.70" [373 mm]	12.50" [318 mm]	N/A
SC740EPE12B	12" [300 mm]	14.70" [373 mm]	N/A	1.20" [30 mm]
SC740EPE15T	15" [375 mm]	18.40" [467 mm]	9.00" [229 mm]	N/A
SC740EPE15B	15" [375 mm]	18.40" [467 mm]	N/A	1.30" [33 mm]
SC740EPE18T	18" [450 mm]	19.70" [500 mm]	5.00" [127 mm]	N/A
SC740EPE18B	18" [450 mm]	19.70" [500 mm]	N/A	1.60" [41 mm]
*SC740EPE24B	24" [600 mm]	18.50" [470 mm]	N/A	0.10" [3 mm]

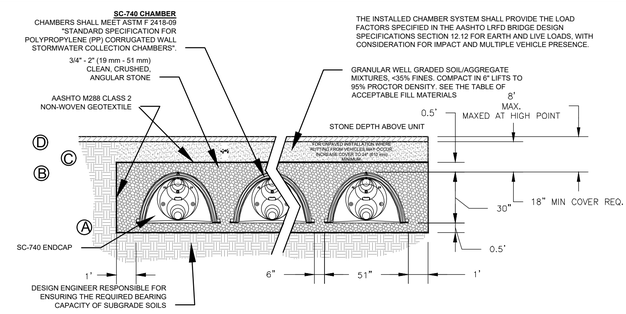
NOTE: ALL DIMENSIONS ARE NOMINAL

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*FOR THE SC740EPE24B THE 24" [600 mm] STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" [44 mm]. BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

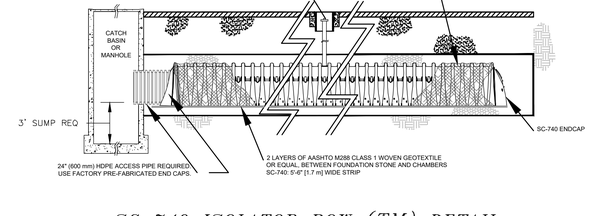
SC-740 TECHNICAL SPEC.

P4



SC-740 STANDARD CROSS SECTION

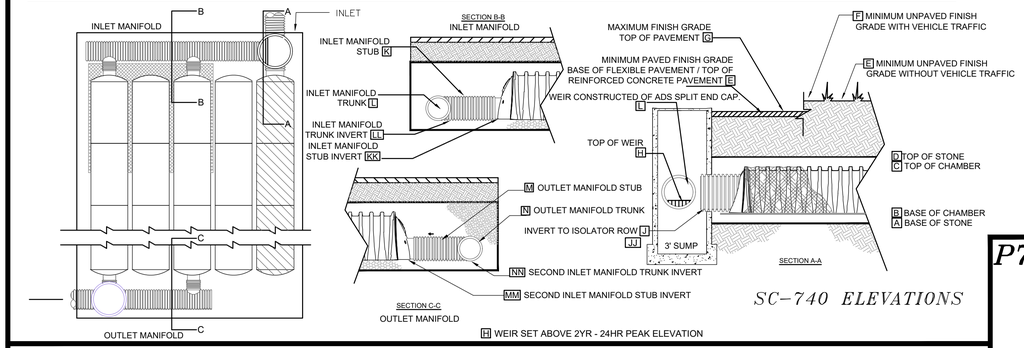
P5



SC-740 ISOLATOR ROW (TM) DETAIL

P6

	A	B	C	D	E	F	G	H	J	JJ	K	KK	L	LL	M	MM	N	NN
BED 1/ONLY	92.75	93.25	95.75	96.25	98.05	N/A	98.72	94.00	93.25	24" HDPE	15" HDPE	93.36	24" HDPE	93.25	15" HDPE	93.36	24" HDPE	93.25



SC-740 ELEVATIONS

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND CHAMBERS. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

EXISTING LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- STONE BOUND (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEMPORARY BENCHMARK
- TESTHOLE
- PERIMETER BOUNDARY LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES (OHU)
- EXISTING CONTOUR MINOR (116)
- EXISTING CONTOUR MAJOR (115)
- POORLY DRAINED WETLAND LINE
- 50' WETLAND BUFFER LINE
- TREE LINE
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

PROPOSED LEGEND:

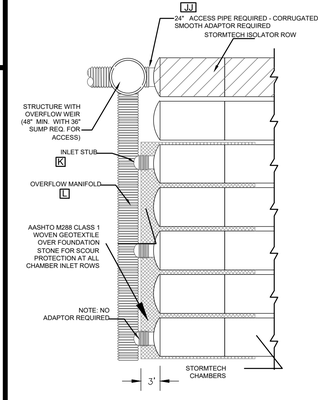
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 DETAIL SHEET / DETAIL
- P176 CONTOUR MINOR, PROPOSED
- P175 CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- UNDERDRAIN
- GUARD RAIL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

1-1/2" WASHED CRUSHED STONE * (AASHTO NO. 4)

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

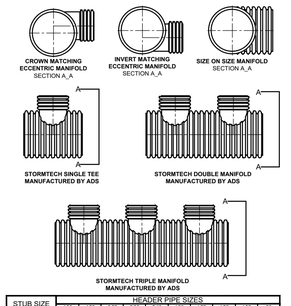
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

P7



SC-740 MANIFOLD DETAIL

P8



STUB SIZE	HEADER PIPE SIZES								
	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"
24"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-	-
18"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-
15"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-
10"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-
8"	-	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
6"	-	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

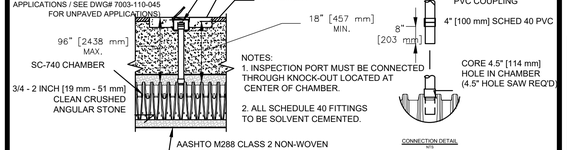
AVAIL - STANDARD HEADERS AVAILABLE

ADS 1-800-821-6710

MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS.
WHEN USING STANDARD END CAPS, CORRUGATED PIPE UP TO 18 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 24" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

MANIFOLDS

P9



SC-740 INSPECTION PORT DETAIL

P10

INSPECTION AND MAINTENANCE:

DUE TO THE CRITICAL NATURE OF INSPECTION AND MAINTENANCE STORMTECH SYSTEM AS DETAILED IN THE DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH) THE FOLLOWING THREE FIRMS ARE RECOMMENDED FOR THIS TASK. IT IS HIGHLY RECOMMENDED THAT THE OPERATOR OF THE PROPERTY HAVE A LONG TERM INSPECTION AND MAINTENANCE CONTACT WITH A FIRM THAT CAN COMPLETE THESE VITAL SERVICES.

AS FOR ISOLATOR ROW MAINTENANCE, CB MAINTENANCE, ETC., REGIONAL ADS REPRESENTATIVES RECOMMEND USING ANY OF THE FOLLOWING CONTACTS:

STORMWATER COMPLIANCE, LLC;
ATTN: NATHAN MARLES, 1-877-271-9055; NMARLES@LIDTECH.COM
163 THADEUS STREET, PORTLAND, ME 04106
INFO@STORMWATERCOMP.COM

TED BERRY COMPANY;
ATTN: DAVE BEAUCHAMP, 207-897-3348; DAVID.BEAUCHAMP@TEDBERRYCOMPANY.COM
521 FEDERAL ROAD, LIVERMORE, ME 04253
INFL@TEDBERRYCOMPANY.COM

BELLEMORE SEPTIC, SEWER, & DRAIN;
ATTN: RAY BELLEMORE, 603-641-6640; RAYMOND@BELLEMORE.COM
PO BOX 10369, BEDFORD, NH 03110

CONTACT AARON CHEEVER, P.E., ADVANCE DRAINAGE SYSTEMS, INC.
AARON.CHEEVER@ADS-PIPE.COM 1-978-302-0650
FOR PRODUCT AND PRICING

P-102A

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

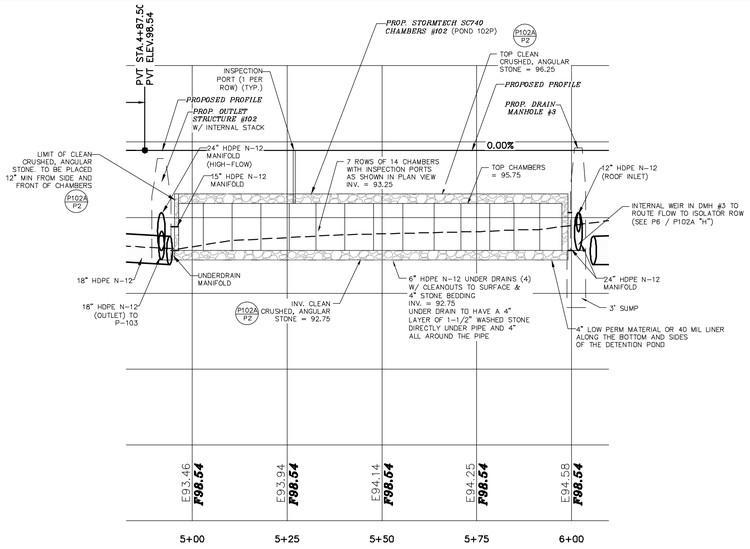
STORMTECH SC740 CHAMBER DETENTION POND #102A
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SECTION OF STORMTECH DETENTION #102

A 102 — A 102

GRAPHIC SCALE

20 0 10 20 40 80

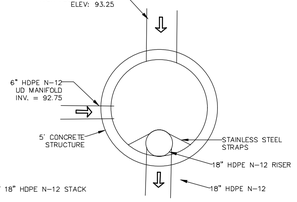
(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.

LOW PERMEABILITY MATERIAL GRADATION

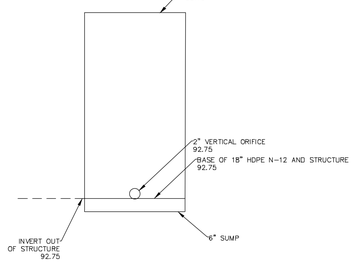
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

P11

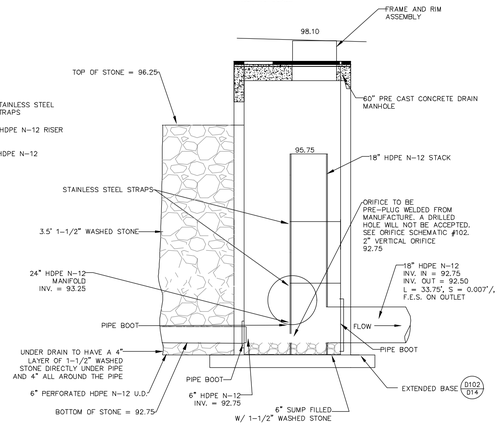
TOP VIEW
NOT TO SCALE (NO FRAME AND RIM IN THIS VIEW)



ORIFICE SCHEMATIC #102
NOT TO SCALE



OUTLET STRUCTURE #102
NOT TO SCALE



PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

STORMTECH SC740 CHAMBER DETENTION POND #102B DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

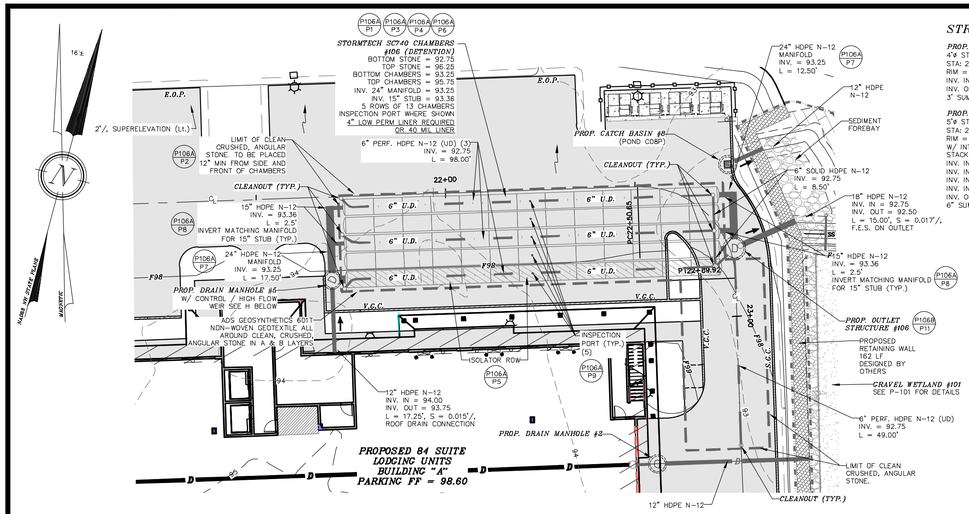
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14263
LICENSED PROFESSIONAL ENGINEER

P-102B

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

A REPRESENTATIVE FROM BS&E WILL BE ON SITE DURING THE CONSTRUCTION OF THE STORMTECH SYSTEM

PLAN VIEW STORMTECH SC-740 CHAMBERS DETENTION POND #106 SEE SHEET 106B FOR DETAILS

STRUCTURES TABLE:

PROP. DRAIN MANHOLE #5
4'ø STRUCTURE W/ NH STANDARD RIM
STA: 21+69.305 (Rt. 21.90')
RIM = 98.05 (FLUSH)
INV. IN = 93.75 (12" HDPE N-12) (BUILDING A ROOF)
INV. OUT = 93.25 (24" HDPE N-12) (2) (P-106)
3" SUMP = 90.25

PROP. OUTLET STRUCTURE #106 (POND 106P)
5'ø STRUCTURE W/ NH STANDARD RIM
STA: 22+82.30 (Lt. 1.20')
RIM = 97.86 (FLUSH)
W/ INTERNAL 18" STACK
STACK TOP = 95.50
INV. IN = 92.75 (2" ORIFICE AT BASE OF STACK)
INV. IN = 93.36 (15" HDPE N-12) (MANIFOLD)
INV. IN = 93.25 (24" HDPE N-12) (MANIFOLD)
INV. IN = 92.75 (6" HDPE N-12) (2 U.D.)
INV. OUT = 92.75 (18" HDPE N-12) (GW #101)
6" SUMP FILLED W/ 1 1/2" STONE

P1

1. ALL DESIGN SPECIFICATIONS FOR STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE STORMTECH DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH)
2. THE INSTALLATION OF STORMTECH SC-740 CHAMBERS SHALL BE IN ACCORDANCE WITH THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
3. THE CONTRACTOR IS ADVISED TO REVIEW AND UNDERSTAND THE INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLTION. CALL **1-888-892-2694** OR VISIT **WWW.STORMTECH.COM** TO RECIEVE A COPY OF THE LATEST STORMTECH INSTALLATION INSTRUCTIONS
4. CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND LOAD FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SC-740 NOTES

P2

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

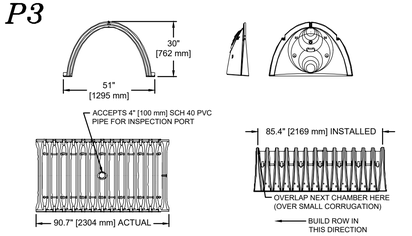
	MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION[1]	COMPACTION/DENSITY REQUIREMENT
D	FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	FILL MATERIAL FOR LAYER 'C' STARTS FROM THE 12" (305 mm) OF STONE (6" (150 mm) FOR 12" (305 mm) SCH 40 HDPE) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, < 35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTION AFTER 12" (305 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) LIFTS TO A MIN. 95% STANDARD PROCTOR DENSITY. ROLLER CONFIGURATION MUST NOT TO EXCEED 12,000 lbs [53 kN]. DYNAMIC FORCE NOT TO EXCEED 20,000 lbs [89 kN]
B	EMBEDMENT STONE SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE OR LAYER 'A' TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH [19 - 51 mm]	3, 35, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY*.

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE.

2. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9in [229 mm] (MAX) LIFTS USING TWO FULL COVERAGES WITH AN APPROPRIATE COMPACTOR.

STORMTECH ACCEPTABLE FILL MATERIALS

P3



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	51.0" x 30.0" x 85.4" [1295 mm x 762 mm x 2169 mm]
CHAMBER STORAGE	45.9 CUBIC FEET [1.30 m3]
MINIMUM INSTALLED STORAGE	74.9 CUBIC FEET [2.12 m3]
WEIGHT	75 lbs. [33.6 kg]

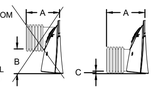
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740EPE06T	6" [150 mm]	10.90" [277 mm]	18.50" [470 mm]	N/A
SC740EPE06B	6" [150 mm]	10.90" [277 mm]	N/A	0.50" [13 mm]
SC740EPE08T	8" [200 mm]	12.20" [310 mm]	16.50" [419 mm]	N/A
SC740EPE08B	8" [200 mm]	12.20" [310 mm]	N/A	0.60" [15 mm]
SC740EPE10T	10" [250 mm]	13.40" [340 mm]	14.50" [368 mm]	N/A
SC740EPE10B	10" [250 mm]	13.40" [340 mm]	N/A	0.70" [18 mm]
SC740EPE12T	12" [300 mm]	14.70" [373 mm]	12.50" [318 mm]	N/A
SC740EPE12B	12" [300 mm]	14.70" [373 mm]	N/A	1.20" [30 mm]
SC740EPE15T	15" [375 mm]	18.40" [467 mm]	9.00" [229 mm]	N/A
SC740EPE15B	15" [375 mm]	18.40" [467 mm]	N/A	1.30" [33 mm]
SC740EPE18T	18" [450 mm]	19.70" [500 mm]	5.00" [127 mm]	N/A
SC740EPE18B	18" [450 mm]	19.70" [500 mm]	N/A	1.60" [41 mm]
*SC740EPE24B	24" [600 mm]	18.50" [470 mm]	N/A	0.10" [3 mm]

NOTE: ALL DIMENSIONS ARE NOMINAL

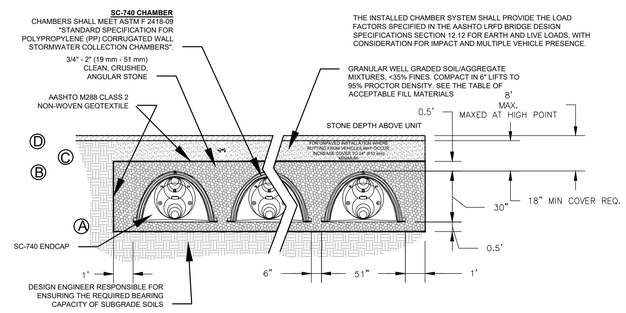
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*FOR THE SC740EPE24B THE 24" [600 mm] STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" [44 mm]. BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.



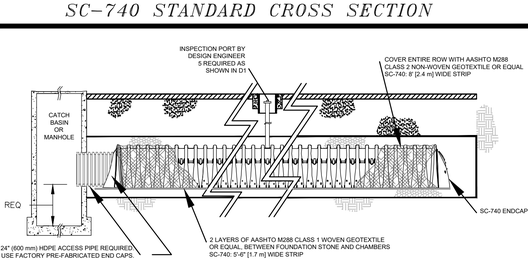
SC-740 TECHNICAL SPEC.

P4



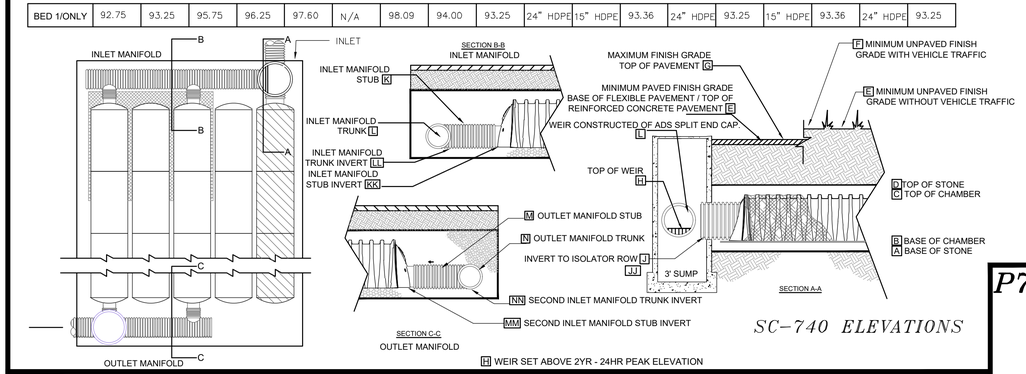
SC-740 STANDARD CROSS SECTION

P5



SC-740 ISOLATOR ROW (TM) DETAIL

P6



SC-740 ELEVATIONS

H WEIR SET ABOVE 2YR - 24HR PEAK ELEVATION

	A	B	C	D	E	F	G	H	J	JJ	K	KK	L	LL	M	MM	N	NN
BED 1/ONLY	92.75	93.25	95.75	96.25	97.60	N/A	98.09	94.00	93.25	24" HDPE	15" HDPE	93.36	24" HDPE	93.25	15" HDPE	93.36	24" HDPE	93.25

CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND CHAMBERS. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

EXISTING LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- STONE BOUND (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEMPORARY BENCHMARK
- TESTHOLE
- PERIMETER BOUNDARY LINE
- BUILDING SETBACK LINE
- OVERHEAD UTILITIES (OHU)
- EXISTING CONTOUR MINOR (116)
- EXISTING CONTOUR MAJOR (115)
- POORLY DRAINED WETLAND LINE
- 50' WETLAND BUFFER LINE
- TREE LINE
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS

PROPOSED LEGEND:

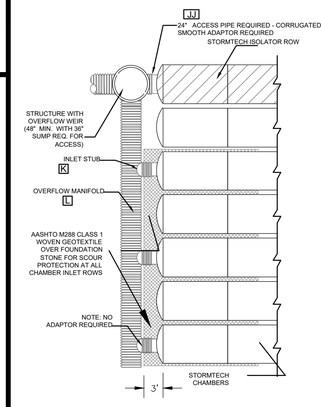
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 DETAIL SHEET / DETAIL
- P176 / P175 CONTOUR MINOR, PROPOSED / CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- U.D UNDERDRAIN
- GUARD RAIL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE

1-1/2" WASHED CRUSHED STONE * (AASHTO NO. 4)

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	90 – 100
1"	20 – 55
1/2"	0 –15
3/8"	0 –5

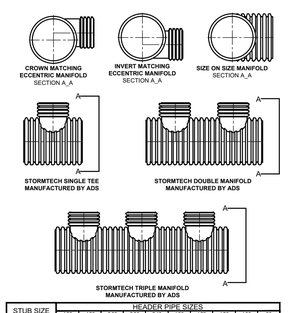
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

P7



SC-740 MANIFOLD DETAIL

P8



STUB SIZE	HEADER PIPE SIZES								
	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"
24"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-	-
18"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-	-
15"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-	-
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-	-
10"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	-
8"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
6"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

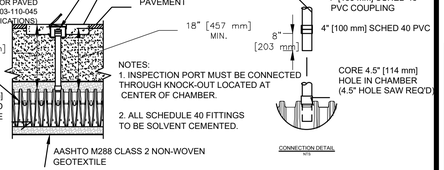
AVAIL - STANDARD HEADERS AVAILABLE

ADS 1-800-821-6710

MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS.
WHEN USING STANDARD END CAPS, CORRUGATED PIPE UP TO 18 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 24" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

MANIFOLDS

P9



SC-740 INSPECTION PORT DETAIL

P10

INSPECTION AND MAINTENANCE:

DUE TO THE CRITICAL NATURE OF INSPECTION AND MAINTENANCE STORMTECH SYSTEM AS DETAILED IN THE DESIGN MANUAL, ADVANCED DRAINAGE SYSTEM, INC (ADS STORMTECH) THE FOLLOWING THREE FIRMS ARE RECOMMENDED FOR THIS TASK. IT IS HIGHLY RECOMMENDED THAT THE OPERATOR OF THE PROPERTY HAVE A LONG TERM INSPECTION AND MAINTENANCE CONTACT WITH A FIRM THAT CAN COMPLETE THESE VITAL SERVICES.

AS FOR ISOLATOR ROW MAINTENANCE, CB MAINTENANCE, ETC., REGIONAL ADS REPRESENTATIVES RECOMMEND USING ANY OF THE FOLLOWING CONTACTS:

STORMWATER COMPLIANCE, LLC;
ATTN: NATHAN MARLES, 1-877-271-9055; NMARLES@LIDTECH.COM
163 THADEUS STREET, PORTLAND, ME 04106
INFO@STORMWATERCOMP.COM

TED BERRY COMPANY;
ATTN: DAVE BEAUCHAMP, 207-897-3348; DAVID.BEAUCHAMP@TEDBERRYCOMPANY.COM
521 FEDERAL ROAD, LIVERMORE, ME 04253
INFL@TEDBERRYCOMPANY.COM

BELLEMORE SEPTIC, SEWER, & DRAIN;
ATTN: RAY BELLEMORE, 603-641-6640; RAYMOND@BELLEMORE.COM
PO BOX 10369, BEDFORD, NH 03110

CONTACT AARON CHEEVER, P.E., ADVANCE DRAINAGE SYSTEMS, INC.
AARON.CHEEVER@ADS-PIPE.COM 1-978-302-0650
FOR PRODUCT AND PRICING

P-106A

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

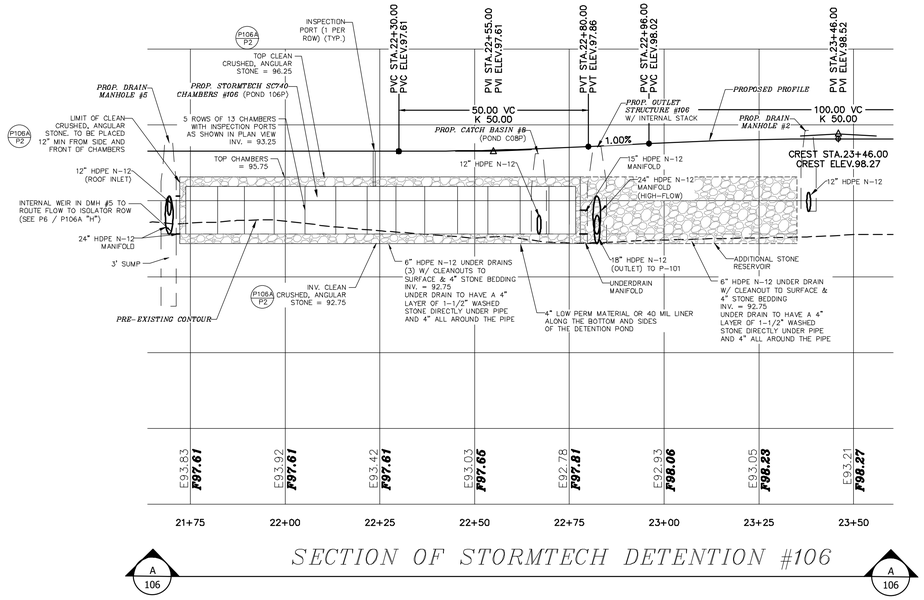
STORMTECH SC740 CHAMBER DETENTION POND #106A
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14738
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SECTION OF STORMTECH DETENTION #106

A 106 A 106

GRAPHIC SCALE

20 0 10 20 40 80

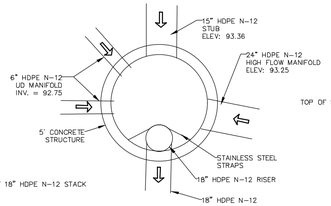
(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.

LOW PERMEABILITY MATERIAL GRADATION

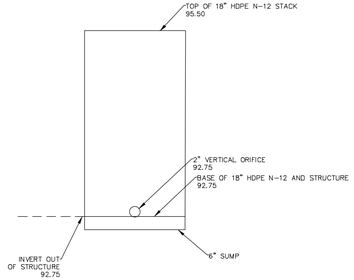
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

P11

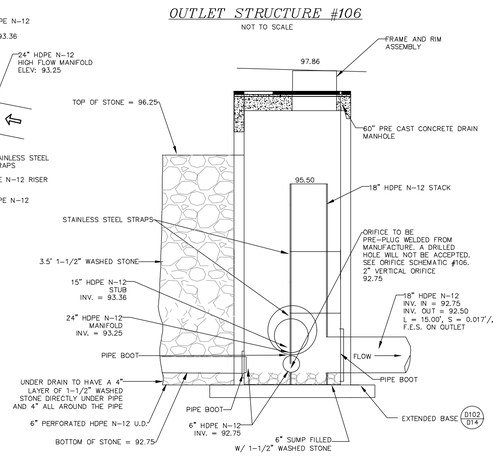
TOP VIEW
NOT TO SCALE (NO FRAME AND RIM IN THIS VIEW)



ORIFICE SCHEMATIC #106
NOT TO SCALE



OUTLET STRUCTURE #106
NOT TO SCALE



PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

STORMTECH SC740 CHAMBER DETENTION POND #106B DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14268 LICENSED PROFESSIONAL ENGINEER

P–106B

SHEET 26 OF 60

NOT FOR CONSTRUCTION

SOILS & DEWATERING:

WfA	*WINDSOR*	*VARIANT*	*K= 0.17*
WfB	*WINDSOR*	*VARIANT*	*K= 0.17*
WfC	*WINDSOR*	*VARIANT*	*K= 0.17*
BtxA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BtxB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BtxC	*BUXTON*	*SILT LOAM*	*K= 0.49*
ScA-P	*SCANTIC*	*POORLY DRAINED*	*K= 0.49*
ScB-P	*SCANTIC*	*POORLY DRAINED*	*K= 0.43*

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. & ROCKINGHAM COUNTTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2022 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED FEBRUARY 17, 2022 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIEST OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E–101 AND E–102.

THE CONSTRUCTION SCHEDULE WILL BE MANAGED SO THAT ALL STORMWATER STRUCTURES WILL BE BUILT AND STABILIZED PRIOR TO RECEIVING SURFACE WATER RUNOFF. CONTRACTOR TO BE RESPONSIBLE FOR ALL DIVERSIONS DURING CONSTRUCTION AND FOR INTERIM SEDIMENT AND EROSION CONTROL MEASURES.

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac..

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

6.) SEE PHASING PLAN FOR MORE INFORMATION.

7.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E–101 AND E–102 OF THE CONSTRUCTION DETAILS.

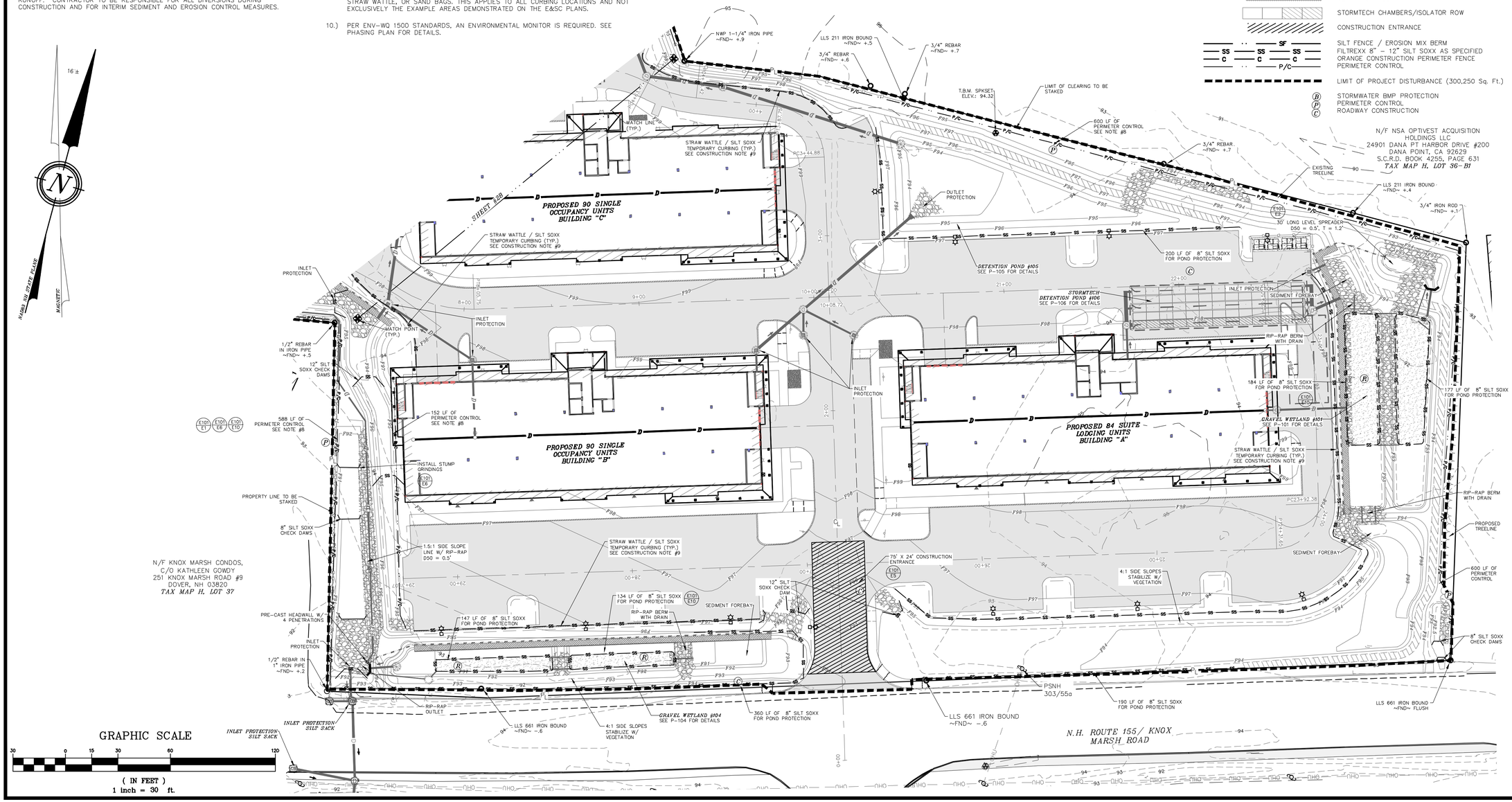
8.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL GRADE IS GREATER THAN 5%. MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL GRADE IS 5% OR LESS.

9.) TEMPORARY CURBING WILL BE INSTALLED AFTER ROADWAY CONSTRUCTION BECOMES IMPERVIOUS, EITHER COMPACTED GRAVEL OR BASE PAVEMENT TO ENSURE THAT CATCH BASINS ARE BROUGHT ON LINE AND SURFACE WATER RUNOFF IS ROUTED TO THE INTENDED TREATMENT. TEMPORARY CURBING CAN BE IN THE FORM OF SILT SOXX, STRAW WATTLE, OR SAND BAGS. THIS APPLIES TO ALL CURBING LOCATIONS AND NOT EXCLUSIVELY THE EXAMPLE AREAS DEMONSTRATED ON THE E&SC PLANS.

10.) PER ENV–WQ 1500 STANDARDS, AN ENVIRONMENTAL MONITOR IS REQUIRED. SEE PHASING PLAN FOR DETAILS.

LEGEND:

- IRON BOUND ~FND~
- EXISTING/PROPOSED CATCH BASIN W/ STRUCTURE
- PROPOSED STORMWATER BMP OUTLET STRUCTURE
- PROPOSED DRAIN MANHOLE W/ STRUCUTRE
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- 50' WETLAND BUFFER
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- CENTER LINE
- EXISTING DRAINAGE LINE
- PROPOSED DRAINAGE LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- CONSTRUCTION ENTRANCE
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" – 12" SILT SOXX AS SPECIFIED ORANGE CONSTRUCTION PERIMETER FENCE
- PERIMETER CONTROL
- LIMIT OF PROJECT DISTURBANCE (300,250 Sq. Ft.)
- (B) STORMWATER BMP PROTECTION
- (P) PERIMETER CONTROL
- (C) ROADWAY CONSTRUCTION



GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN EAST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

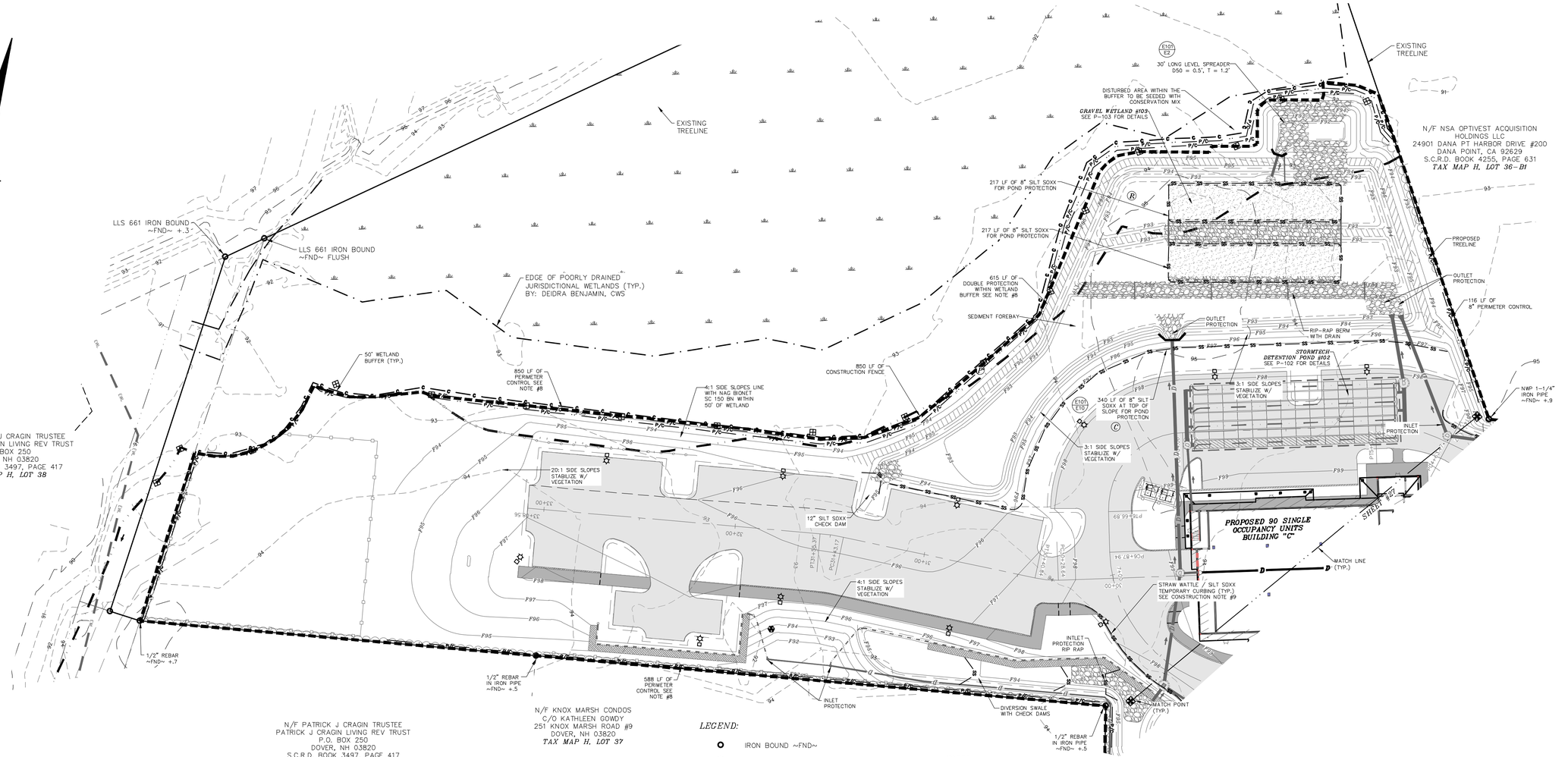
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14736
LICENSED PROFESSIONAL ENGINEER

SHEET 27 OF 60

NOT FOR CONSTRUCTION



LEGEND:

- IRON BOUND ~FND~
- EXISTING/PROPOSED CATCH BASIN W/ STRUCTURE
- PROPOSED STORMWATER BMP OUTLET STRUCTURE
- PROPOSED DRAIN MANHOLE W/ STRUCUTRE
- TEMPORARY BENCHMARK (T.B.M.)
- E101 E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- 50' WETLAND BUFFER
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- CENTER LINE
- EXISTING DRAINAGE LINE
- PROPOSED DRAINAGE LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- CONSTRUCTION ENTRANCE
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" – 12" SILT SOXX AS SPECIFIED
- ORANGE CONSTRUCTION PERIMETER FENCE
- PERIMETER CONTROL
- LIMIT OF PROJECT DISTURBANCE (300,250 Sq. Ft.)
- STORMWATER BMP PROTECTION
- PERIMETER CONTROL
- ROADWAY CONSTRUCTION

SOILS & DEWATERING:

WfA	*WINDSOR*	*VARIANT*	*K= 0.17*
WfB	*WINDSOR*	*VARIANT*	*K= 0.17*
WfC	*WINDSOR*	*VARIANT*	*K= 0.17*
BsA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BsB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BsC	*BUXTON*	*SILT LOAM*	*K= 0.49*
ScA–P	*SCANTIC*	*POORLY DRAINED*	*K= 0.49*
ScB–P	*SCANTIC*	*POORLY DRAINED*	*K= 0.43*

SEE SITE SPECIFIC SOILS MAP (SSSM)
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. & ROCKINGHAM COUNTTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2022 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED FEBRUARY 17, 2022 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIEST OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E-101 AND E-102.

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NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac..

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED EROSION & SEDIMENT CONTROL MEASURES OF THE PROPOSED SITE PLAN.

6.) SEE PHASING PLAN FOR MORE INFORMATION.

7.) SEE EROSION AND SEDIMENT CONTROL NOTES LOCATED ON SHEET 2 OF THE PLAN SET. SEE SPECIFIC DEWATERING DETAILS ON THE DEWATERING PLAN SHEET. SEE EROSION AND SEDIMENT CONTROL DETAILS ON PLAN SHEET E-101 AND E-102 OF THE CONSTRUCTION DETAILS.

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9.) TEMPORARY CURBING WILL BE INSTALLED AFTER ROADWAY CONSTRUCTION BECOMES IMPERVIOUS, EITHER COMPACTED GRAVEL OR BASE PAVEMENT TO ENSURE THAT CATCH BASINS ARE BROUGHT ON LINE AND SURFACE WATER RUNOFF IS ROUTED TO THE INTENDED TREATMENT. TEMPORARY CURBING CAN BE IN THE FORM OF SILT SOXX, STRAW WATTLE, OR SAND BAGS. THIS APPLIES TO ALL CURBING LOCATIONS AND NOT EXCLUSIVELY THE EXAMPLE AREAS DEMONSTRATED ON THE E&SC PLANS.

10.) PER ENV-WQ 1500 STANDARDS, AN ENVIRONMENTAL MONITOR IS REQUIRED. SEE PHASING PLAN FOR DETAILS.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

EROSION AND SEDIMENT CONTROL PLAN WEST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14248
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- P176 — CONTOUR MINOR, PROPOSED
- P175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- S — PROPOSED SEWER LINE

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 80 ft.

UTILITY PLANS TABLE OF CONTENTS:

SHEET #29: OVERVIEW UTILITY PLAN
SHEET #30: UTILITY P&P TIBETAN DRIVE 0+00–4+00
SHEET #31: UTILITY P&P TIBETAN DRIVE 4+00–7+00
SHEET #32: UTILITY P&P TIBETAN DRIVE 7+00–END
SHEET #33: UTILITY P&P BUILDING "A" 20+00–24+00
SHEET #34: SEWER CONNECTION PROFILE
SHEET #35: UTILITY P&P WESTERN PARKING LOT 30+00–END
SHEET #36: WATERLINE EXTENSION P&P HANSON ROAD
SHEETS #55–#56: UTILITY CONSTRUCTION DETAILS U-101–U102

SEE SHEET #8 DEMOLITION PLAN FOR ITEMS TO BE RETAINED

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED OVERVIEW UTILITY DESIGN.

6.) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVE AND BELOW GROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITY CONFLICTS SHOULD BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.

7.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

8.) PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES, TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOGF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAGFIC IN SENSITIVE AREAS, AND MAINTAINING AN EGFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL MEETING THE ENGINEERS SPECIFIC RECOMMENDED CRITERIA.

9.) IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER (NOT ALLOWED IN CITY R.O.W.), EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATION. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.

10.) PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIGFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION. VOIDS BETWEEN STONES AND CLUMPS OF MATERIAL SHALL BE FILLED WITH FINE MATERIALS.

11.) FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE DOVER DPW.

12.) CONTRACTOR TO CONTACT DOVER DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY CONSTRUCTION TO COORDINATE ALL WORK CONCERNING INSTALLATION OF ANY PROPOSED WATER LINE IMPROVEMENTS.

NOTES CONTINUED:

13.) ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL CONFORM TO CITY OF DOVER STANDARDS. ALL HIGHWAY CONSTRUCTION WILL MEET THE CITY OF DOVER STANDARDS.

14.) CONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSTALLATIONS WITH EVERSOURCE AT (800) 662-7764. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL. A 48-HOUR MINIMUM NOTICE IS REQUIRED.

15.) CONTRACTOR SHALL COORDINATE ALL TELECOMMUNICATIONS INSTALLATIONS WITH FAIRPOINT COMMUNICATIONS AT (603) 427-5525.

16.) CONTRACTOR SHALL COORDINATE ALL CABLE INSTALLATIONS WITH COMCAST.

17.) CONTRACTOR SHALL COORDINATE ALL GAS INSTALLATIONS WITH UNITIL.

18.) ALL SEWER MAN HOLE RIMS & COVERS ARE TO BE NH STANDARD.

19.) ALL WATER SERVICES ARE TO BE WITNESSED WITH A 2"X4" PAINTED BLUE. ALL SEWER SERVICES ARE TO BE WITNESSED WITH A 2"X4" PAINTED YELLOW, IS STUBBED PRIOR TO BUILDING CONSTRUCTION.

20.) CURB BOXES SHOULD BE PLACED IN THE LAWN AREA, OR IF PLACED IN PAVEMENT, A ROAD BOX IS REQUIRED.

21.) SEE EXISTING CONDTIONS PLAN FOR DATUM. VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUS BASED ON NAD83 STATE PLANE COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS.

22.) MINIMUM SLOPE FOR ALL SEWER SERVICE CONNECTIONS IS TO BE NO LESS THAN 0.01'/'.

23.) ALL SEWER INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF NHDES & DOVER DPW SEWER DIVISION STANDARDS. ALL PVC SEWER PIPE IS TO CONFORM WITH ENV-WQ 704.05 (c)-(e) FOR SDR 35 GRAVITY SEWER PIPE, CONFORM WITH ENV-WQ 704.08 FOR SDR 21 / 11 / 9 FORCE MAIN PRESSURE PIPE, AND CONFORM WITH ASTM D3034. PVC JOINT SEALS SHALL CONFORM WITH ASTM D3121. THE FORCE MAIN SHALL BE TESTED IN ACCORDANCE WITH ENV-WQ 704.09.

24.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS HORIZONTAL COORDINATES BASED ON NAD83. COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS RECEIVERS.

25.) CONTRACTOR TO TRANSFER TEMPORARY BENCHMARK TO A SUITABLE BENCHMARK TO CONTROL CONSTRUCTION. ANY ELEVATION DISCREPANCIES ARE TO BE REPORTED TO THE THE DESIGN ENGINEER IMMEDIATELY.

26.) ALL SEWER AND WATER CROSSINGS ARE TO MAINTAIN A 1.5' OF SEPARATION. OTHERWISE, 2" RIGID INSULATION WILL BE REQUIRED.

27.) EXISTING WATER MAIN IN KNOX MARSH ROAD IS ASBESTOS CONCRETE PIPE. CONTRACTOR TO HIRE ASBESTOS CERTIFIED PROFESSIONALS TO TAP INTO THE EXISTING WATER MAIN.

28.) FOR CONSTRUCTION UNDER EXISTING AC WATERMAIN, FLOWABLE FILL IS REQUIRED FOR PIPE SUPPORT.

29.) THE FOLLOWING DESIGN FLOWS ARE UTILIZED:

180, SINGLE OCCUPANCY UNITS (103 GPD PER METCALF & EDDY/AECOM TABLE 3-2) = 18,540 GPD
+
84, LODGING UNITS (53 GPD PER GUEST METCALF & EDDY/AECOM TABLE 3-3) ASSUMED AVERAGE OF 2 GUESTS/SUITE = 8,904 GPD
+
6 ASSUMED EMPLOYEES (8 GPD PER EMPLOYEE METCALF & EDDY/AECOM TABLE 3-3) = 48 GPD

TOTAL DESIGN FLOW = 27,492 GPD
PREVIOUS APPROVAL UNDER NHDES SEWER DISCHARGE PERMIT D2022-0705 WAS FOR 25,075 GPD. NEW APPROVAL REQUIRED.

TAX MAP G, LOT 5

KNOX MARSH PLACE

KNOX MARSH ROAD

TAX MAP H, LOT 37B

TAX MAP H, LOT 37

TAX MAP H, LOT 36-B1

LLS 211 1-1/4" IRON PIPE ~FND~ +1.1

OLD UTILITY POLE #2

GRAVEL WETLAND #103 SEE P-103 FOR DETAILS

LLS 661 IRON BOUND ~FND~ FLUSH

LLS 661 IRON BOUND ~FND~ +.3

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: DEDRA BENJAMIN, CWS

8" CLDI CL 52 W/ POLYWRAP

MATCH LINE & POINT (TYP.)

50' WETLAND BUFFER (TYP.)

EX. 12" AC WATER MAIN GIS LOCATED

LAMP "A" (TYP.)

SHEET #36

SHEET #35

SHEET #31

SHEET #30

SHEET #33

SHEET #32

SHEET #34

SHEET #37

STORMTECH DETENTION POND #102 SEE P-102 FOR DETAILS

PROPOSED HYDRANT

NWP 1-1/4" IRON PIPE ~FND~ +0.9

3/4" REBAR ~FND~ +.6

3/4" REBAR ~FND~ +.7

LLS 211 IRON BOUND ~FND~ +.5

T.B.M. SPKSET ELEV.: 94.32

DETENTION POND #105 SEE P-105 FOR DETAILS

STORMTECH DETENTION POND #106 SEE P-106 FOR DETAILS

LLS 211 IRON BOUND ~FND~ +.4

3/4" IRON ROD ~FND~ +.1

TRANSFORMER & PAD

PROPOSED 90 SINGLE OCCUPANCY UNITS BUILDING "C" GARAGE FF = 99.35

F.D.C.

4" CLDI CL 52 W/ POLYWRAP

ELECTRIC METERS

PROP. SMH #3

8" SDR 35

3+00

4+00

4+44.68

9+00

10+00

10+38.72

8" CLDI CL 52 W/ POLYWRAP

ELECTRIC MANHOLE

UNDERGROUND ELECTRIC TO CREATE LOOP

21+00

22+00

22+89.92

PROPOSED 90 SINGLE OCCUPANCY UNITS BUILDING "B" PARKING FF = 99.00

PROPOSED 84 SUITE LODGING UNITS BUILDING "A" PARKING FF = 98.60

PROP. SMH #4

PROP. SMH #6

PROP. SMH #5

PROP. SMH #7

28+00

29+00

GRAVEL WETLAND #104 SEE P-104 FOR DETAILS

GRAVEL WETLAND #101 SEE P-101 FOR DETAILS

1/2" REBAR IN 1" IRON PIPE ~FND~ +.2 DESTROYED TO BE RESET

1/2" REBAR ~FND~ +.7

1/2" REBAR IN IRON PIPE ~FND~ +.5

T.B.M. SPKSET ELEV.: 92.79

EX. SEWER MANHOLE

EVERSOURCE 303/62A

EXISTING HYDRANT

NET 146/48

PSNH 303/62

PSC NH 303/62

PSNH 303/61

VZ 48

PSNH 303/59

PSNH 146/46

PSNH 303/56

EXISTING SMH DOVER GIS #2865

N.H. ROUTE 155 / KNOX MARSH ROAD

AC WATERLINE TAP. SEE NOTES FOR SAFETY SPECIFICATIONS. INSTALLED 2023

T.B.M. PKSET ELEV.: 95.25

PSNH 303/55a PULL POLE

PSNH 303/55

PROPOSED UTILITY POLE

EX. 12" ACP

EX. 12" AC WATER MAIN LOCATION FROM GIS

8" SDR 21

PSNH 303/54

EXISTING SMH DOVER GIS #2864

PROPOSED PULL POLE

LLS 661 IRON BOUND ~FND~ FLUSH

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

OVERVIEW UTILITY PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14768 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

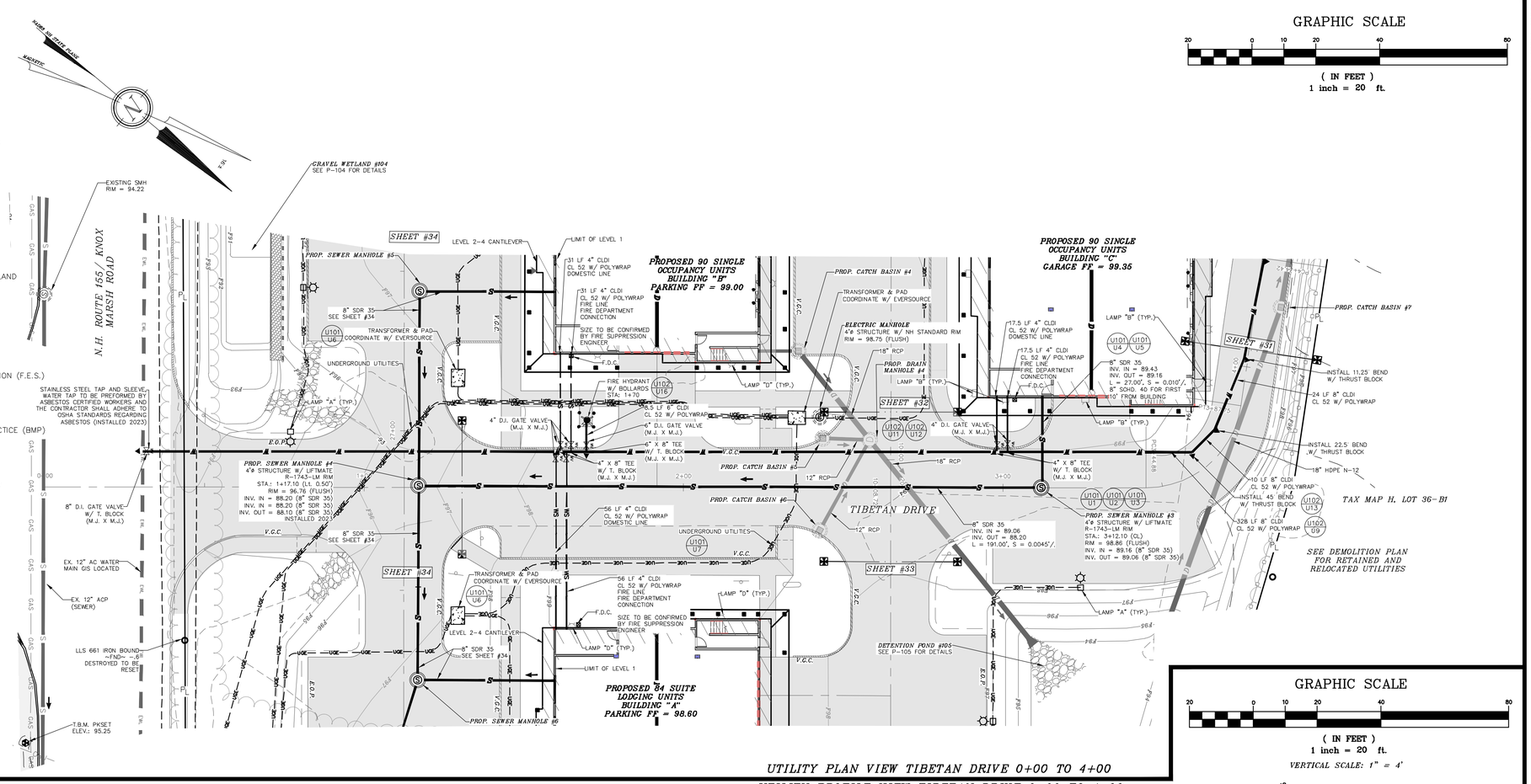
5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- S — PROPOSED SEWER LINE

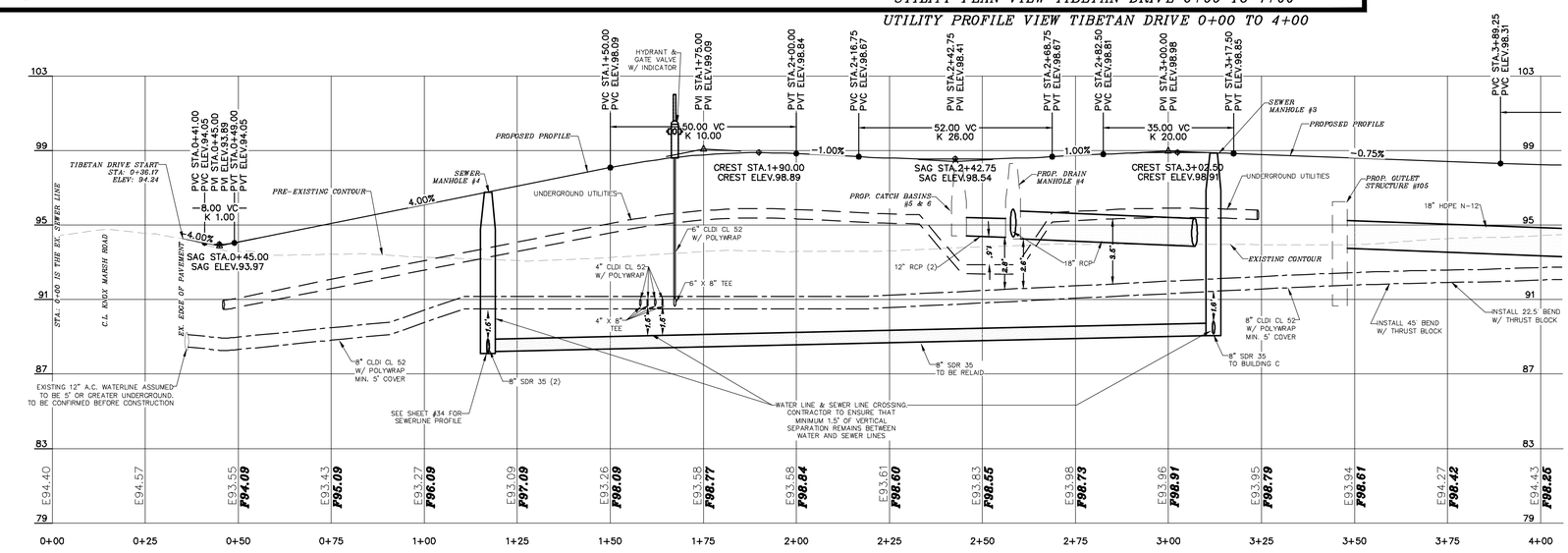


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

UTILITY PLAN VIEW TIBETAN DRIVE 0+00 TO 4+00



UTILITY PROFILE VIEW TIBETAN DRIVE 0+00 TO 4+00

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

UTILITY PLAN AND PROFILE TIBETAN DRIVE 0+00 TO 4+00
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

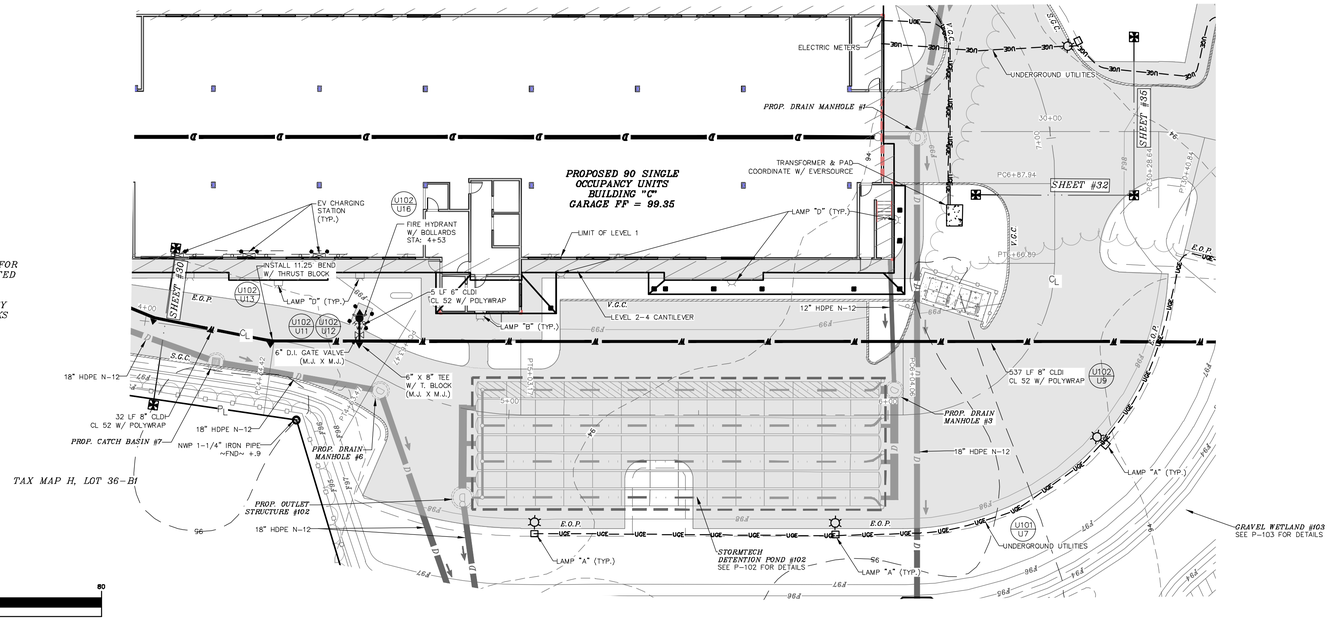
SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14748
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

SEE DEMOLITION PLAN FOR RETAINED AND RELOCATED UTILITIES

SEE OVERVIEW UTILITY PLAN FOR BENCHMARKS



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

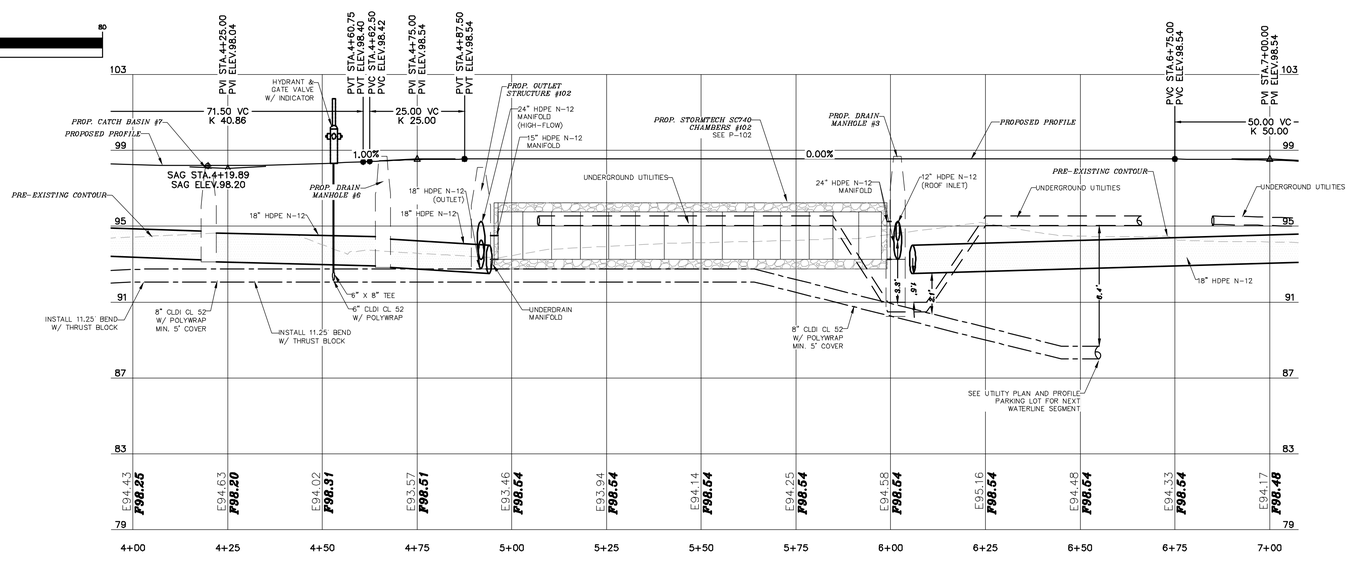
UTILITY PLAN VIEW TIBETAN DRIVE 4+00 TO 7+00

UTILITY PROFILE VIEW TIBETAN DRIVE 4+00 TO 7+00

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- 176 — CONTOUR MINOR, PROPOSED
- F175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- S — PROPOSED SEWER LINE

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

UTILITY PLAN AND PROFILE TIBETAN DRIVE 4+00 TO END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

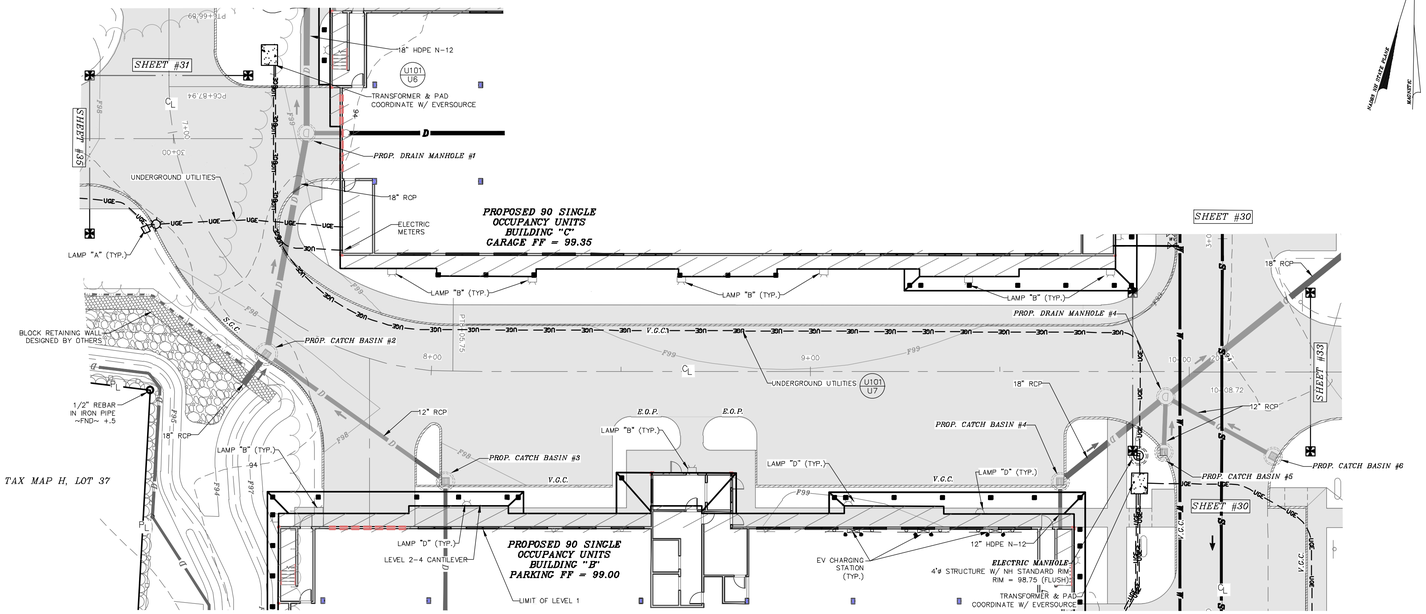
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14218
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

GRAPHIC SCALE

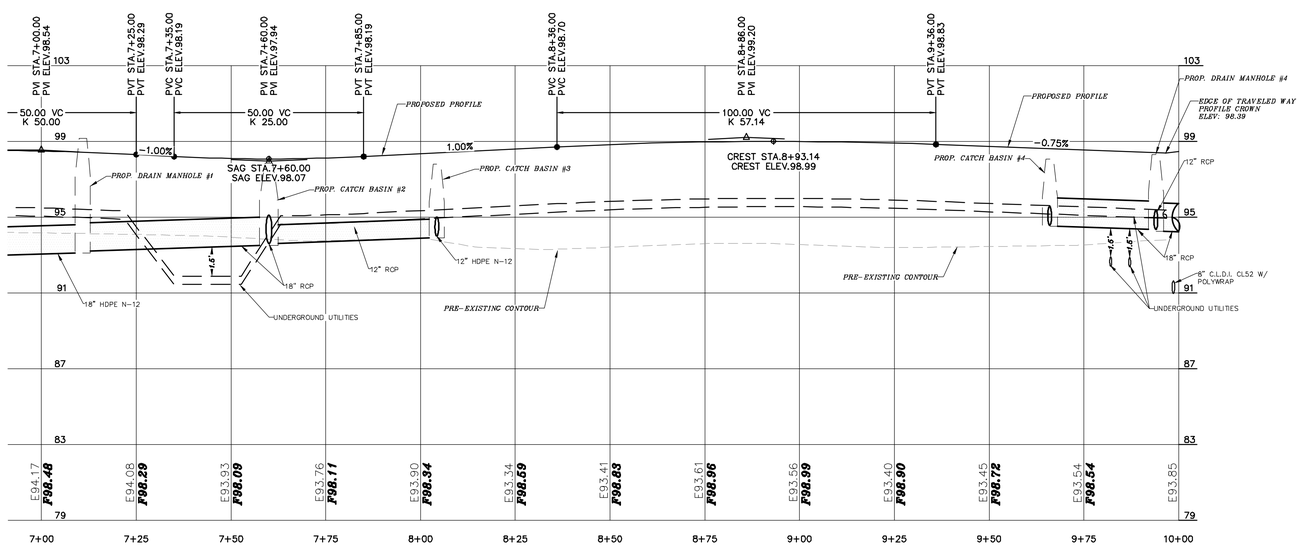
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



UTILITY PLAN VIEW TIBETAN DRIVE 7+00 TO END

UTILITY PROFILE VIEW TIBETAN DRIVE 7+00 TO END



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- PROPOSED WATER MAIN
- PROPOSED WATER SERVICE
- PROPOSED SEWER LINE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

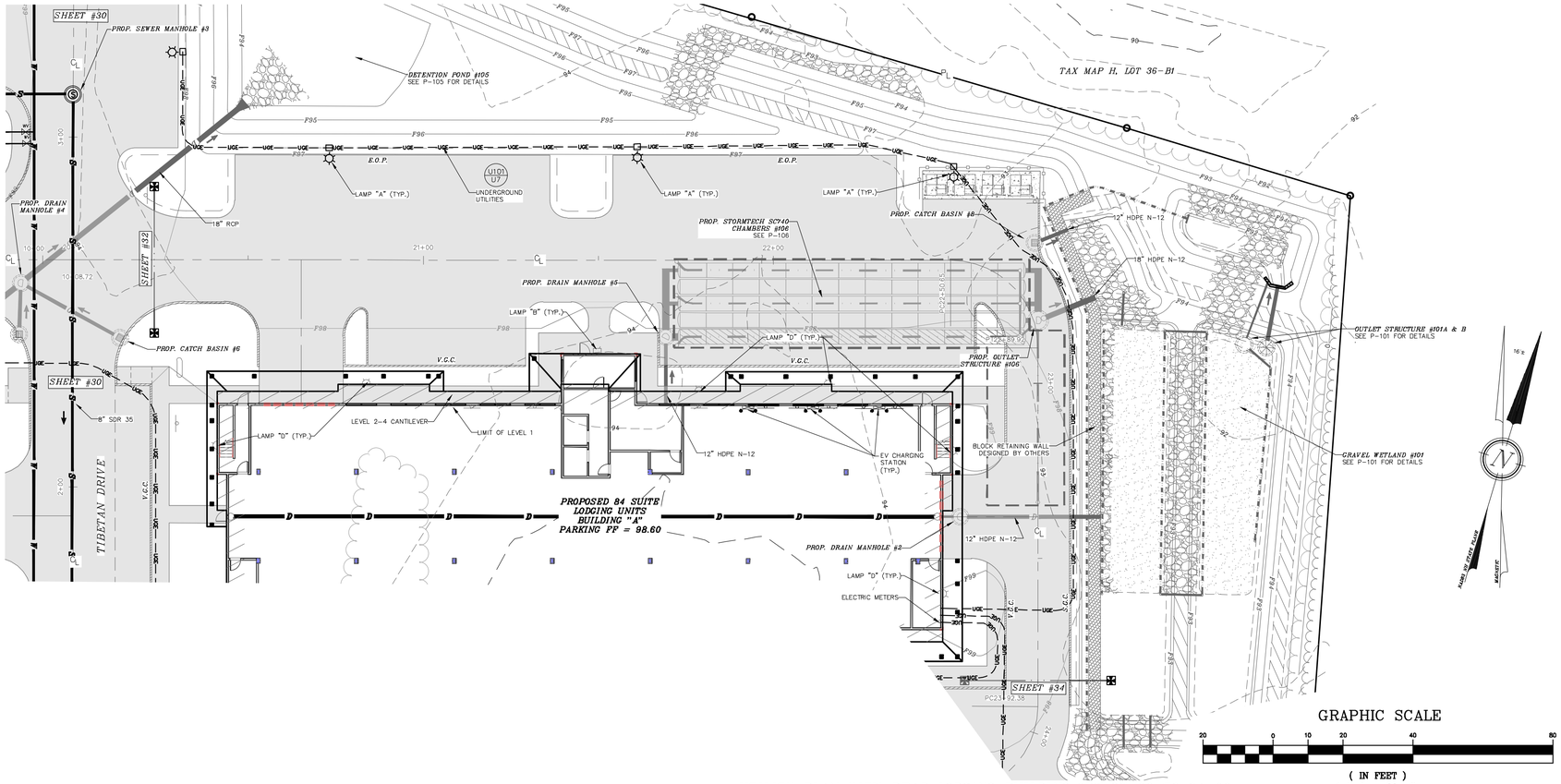
UTILITY PLAN AND PROFILE TIBETAN DRIVE 7+00 TO END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14748
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

UTILITY PLAN VIEW REAR LODGING BUILDING "A" 20+00 TO 24+00

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

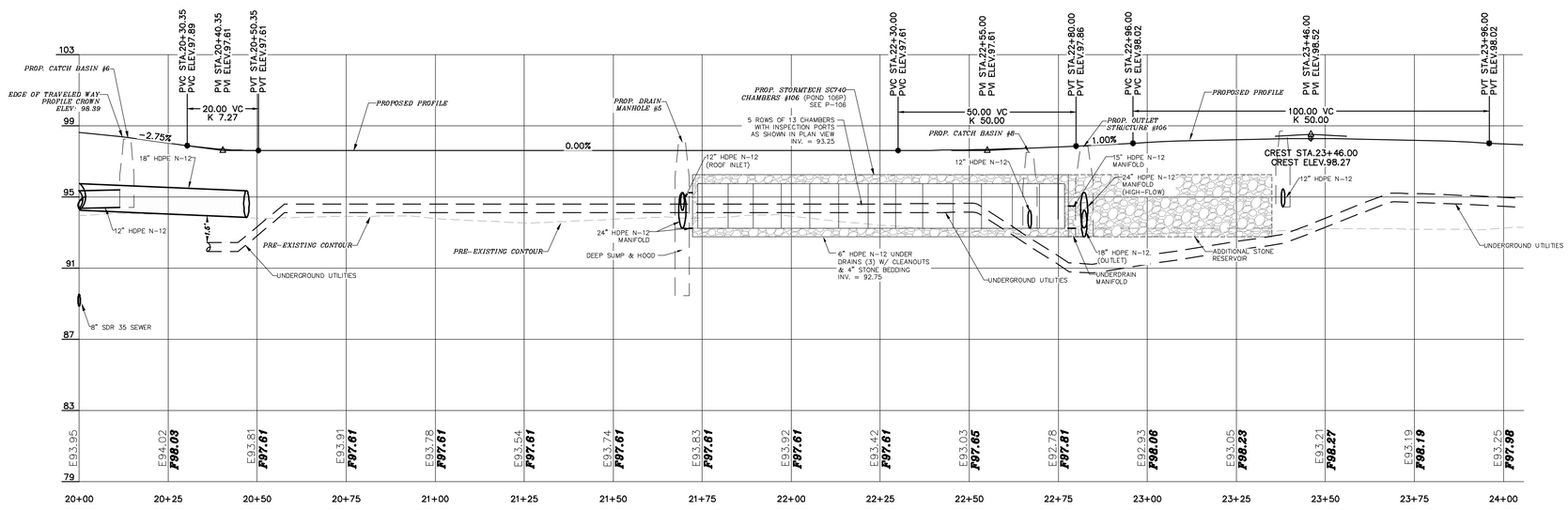
6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- F176 — CONTOUR MINOR, PROPOSED
- F175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
  UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — W — PROPOSED WATER MAIN
- WS — WS — PROPOSED WATER SERVICE
- S — S — PROPOSED SEWER LINE

UTILITY PROFILE VIEW REAR LODGING BUILDING "A" 20+00 TO 24+00



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

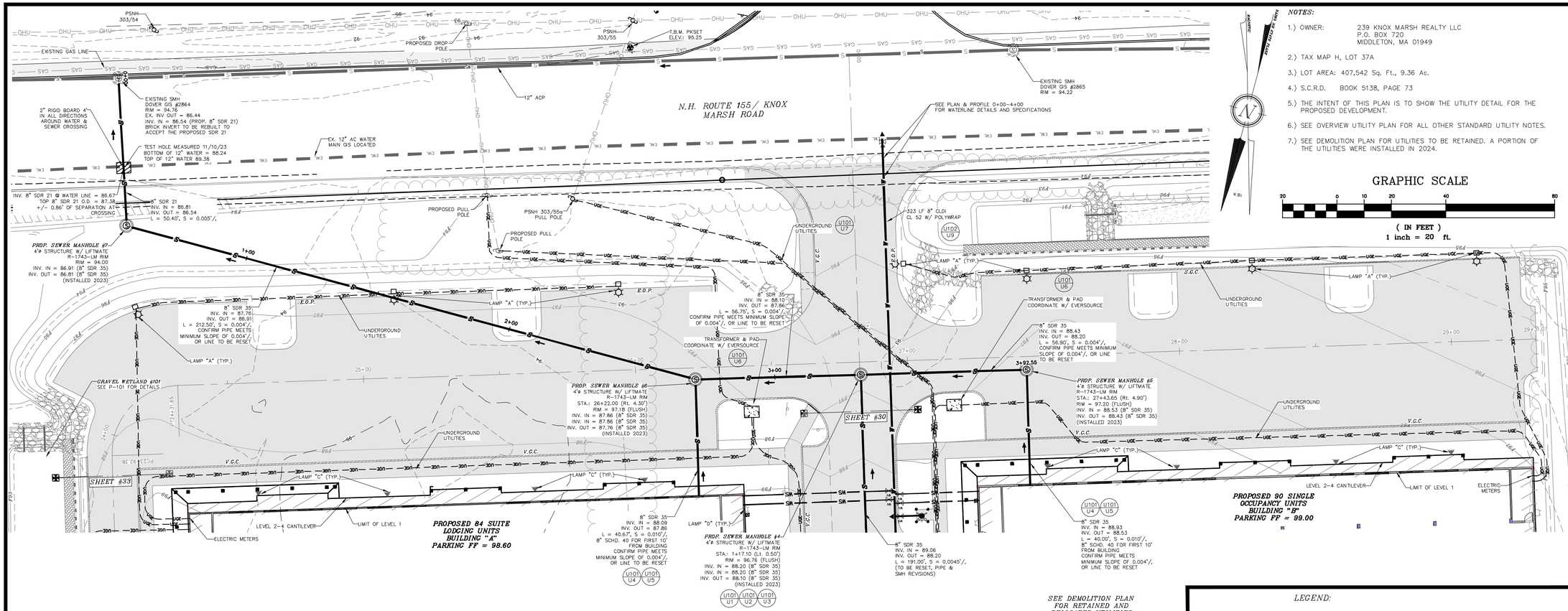
PLAN AND PROFILE LODGING BUILDING "A" 20+00 TO 24+00
UTILITY
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14248
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PLAN VIEW EX. SMH #2864 TO PROP. SMH #5

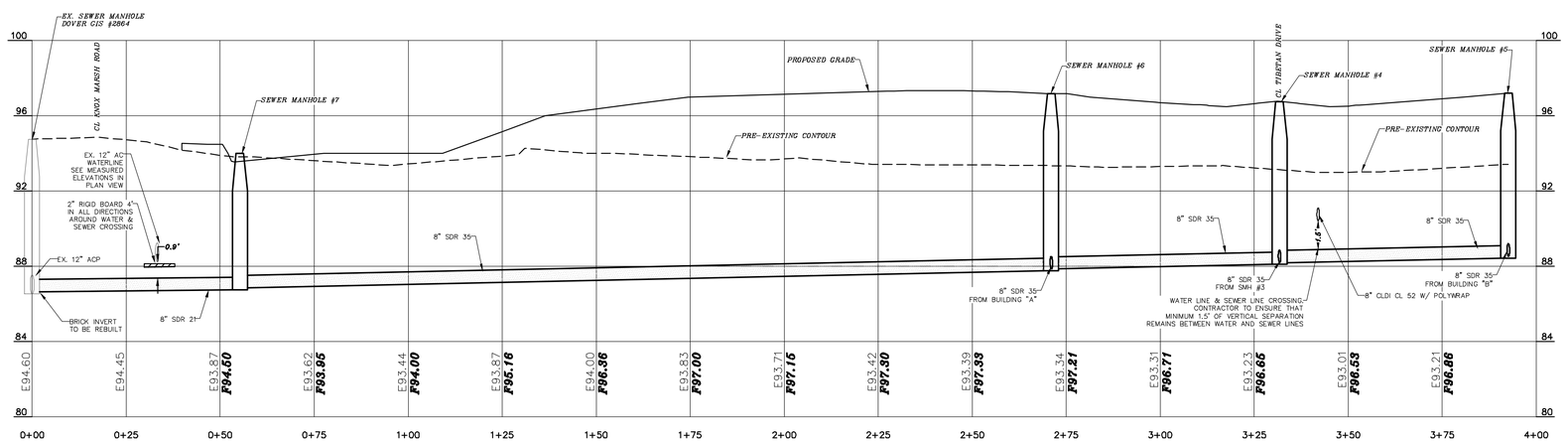
PROFILE VIEW EX. SMH #2864 TO PROP. SMH #5

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'



LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- PP76 — CONTOUR MINOR, PROPOSED
- PP75 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — W — PROPOSED WATER MAIN
- WS — WS — PROPOSED WATER SERVICE
- S — S — PROPOSED SEWER LINE

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

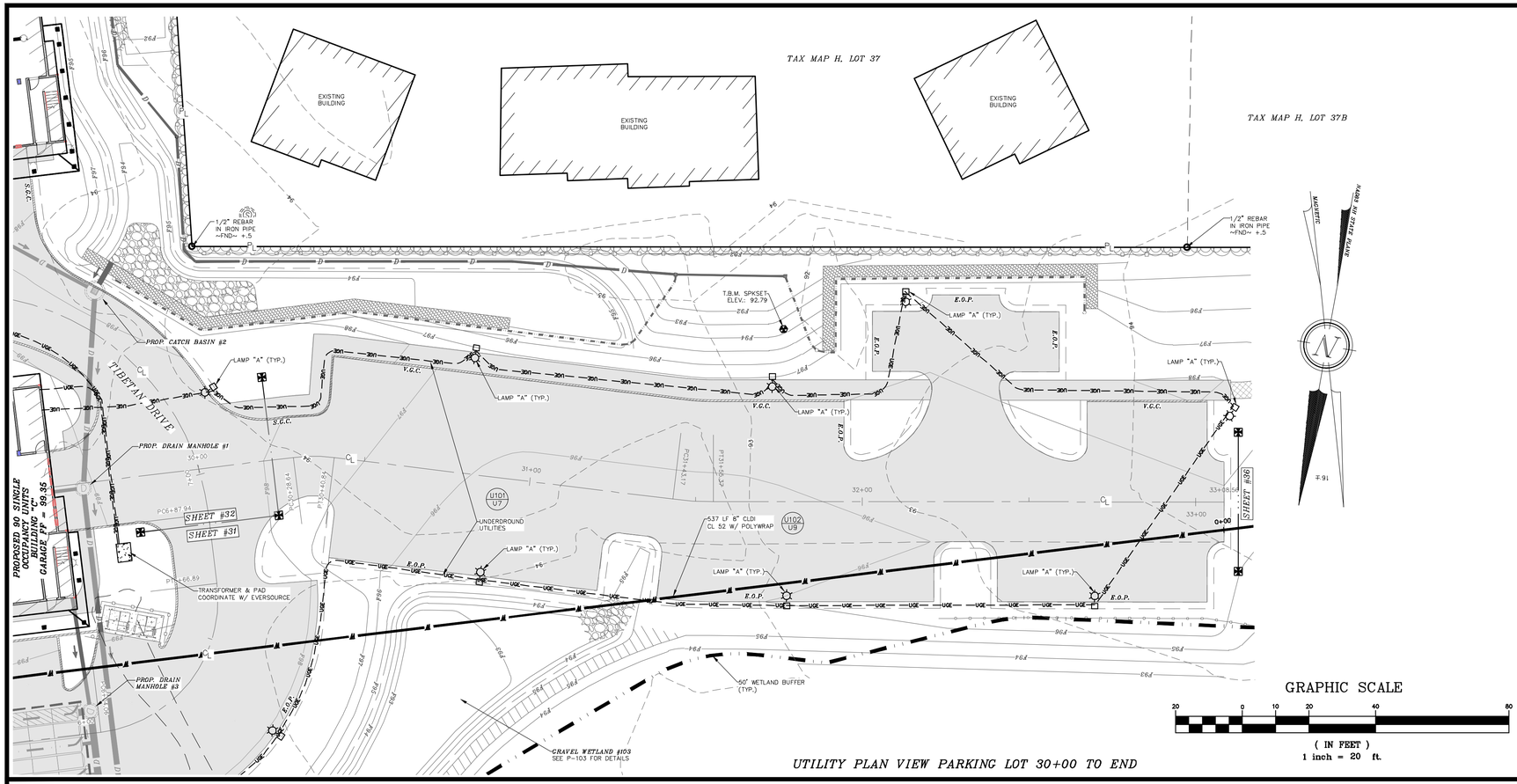
MIXED USE BUILDING UTILITY & SEWER PROFILE
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14288 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

UTILITY PLAN VIEW PARKING LOT 30+00 TO END

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- F176 — CONTOUR MINOR, PROPOSED
- F175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CB — CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- S — PROPOSED SEWER LINE

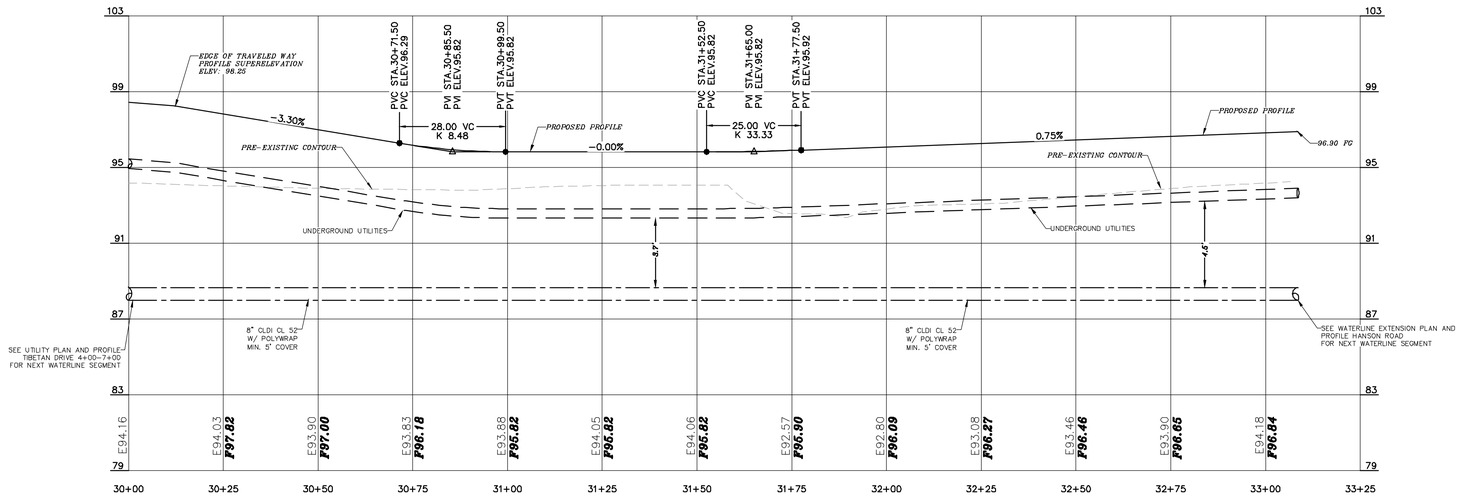
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

UTILITY PROFILE VIEW PARKING LOT 30+00 TO END



PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

UTILITY PLAN AND PROFILE WESTERN PARKING LOT 30+00-END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14748
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

LEGEND:

- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- 176 — CONTOUR MINOR, EXISTING
- 175 — CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- PI175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- GUARD RAIL
- D — DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- BITUMINOUS CONCRETE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- RETAINING WALL
- STORMTECH CHAMBERS/ISOLATOR ROW
- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- UGE — TRANSFORMER / J.BOX UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", MOUNTED ON BUILDING
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- SEWER MANHOLE W/ STRUCTURE
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- S — PROPOSED SEWER LINE

GRAPHIC SCALE

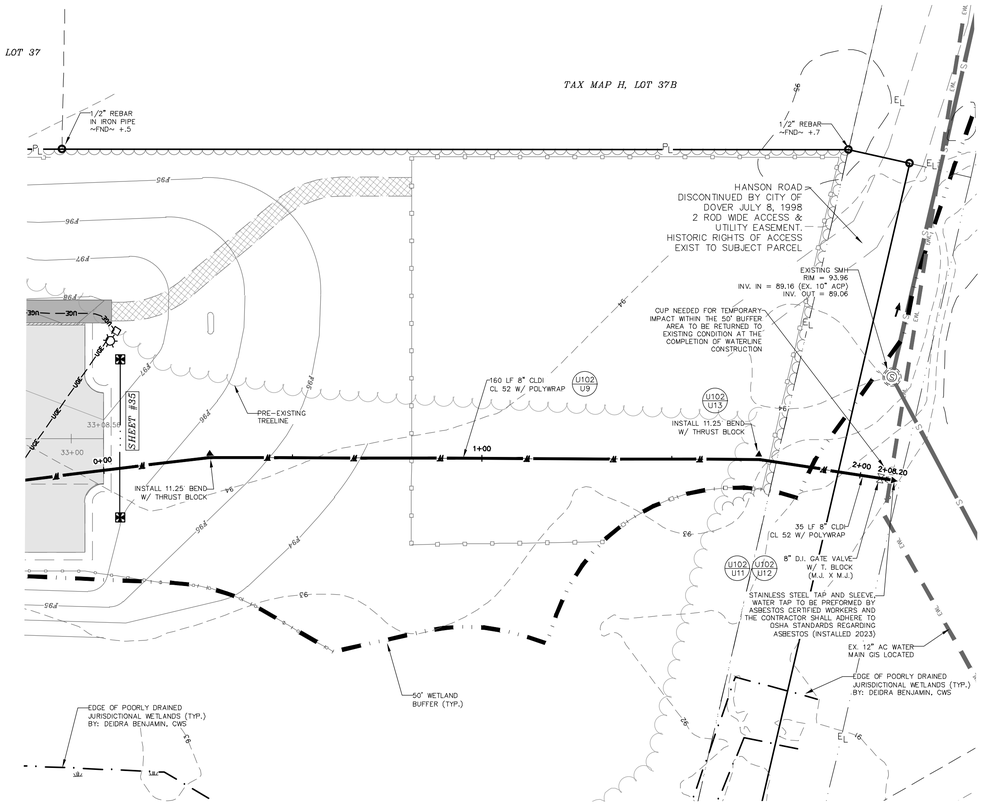
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NORTH (MAGNETIC) / NORTH (GRID)

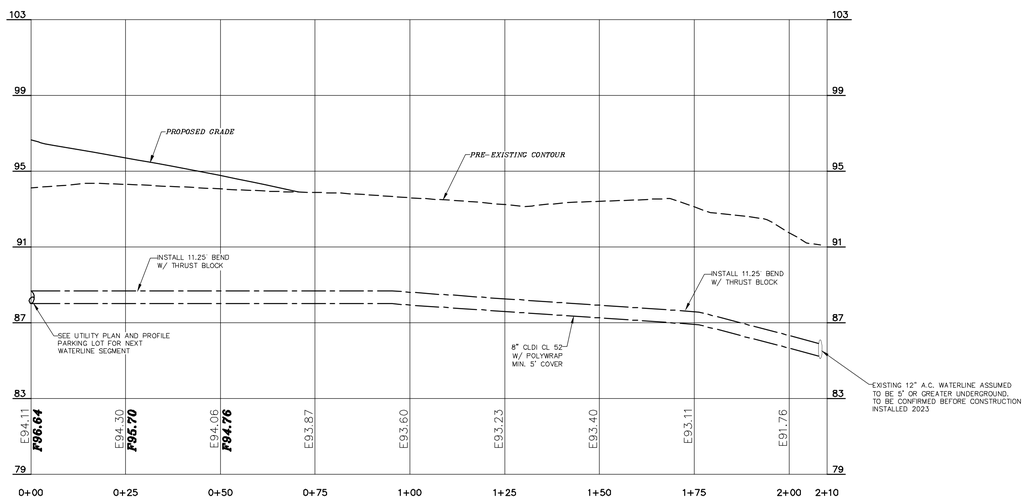
TAX MAP H, LOT 37

TAX MAP H, LOT 37B



PLAN VIEW WATER LINE EXTENSION TO HANSON ROAD

PROFILE VIEW WATER LINE EXTENSION TO HANSON ROAD



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

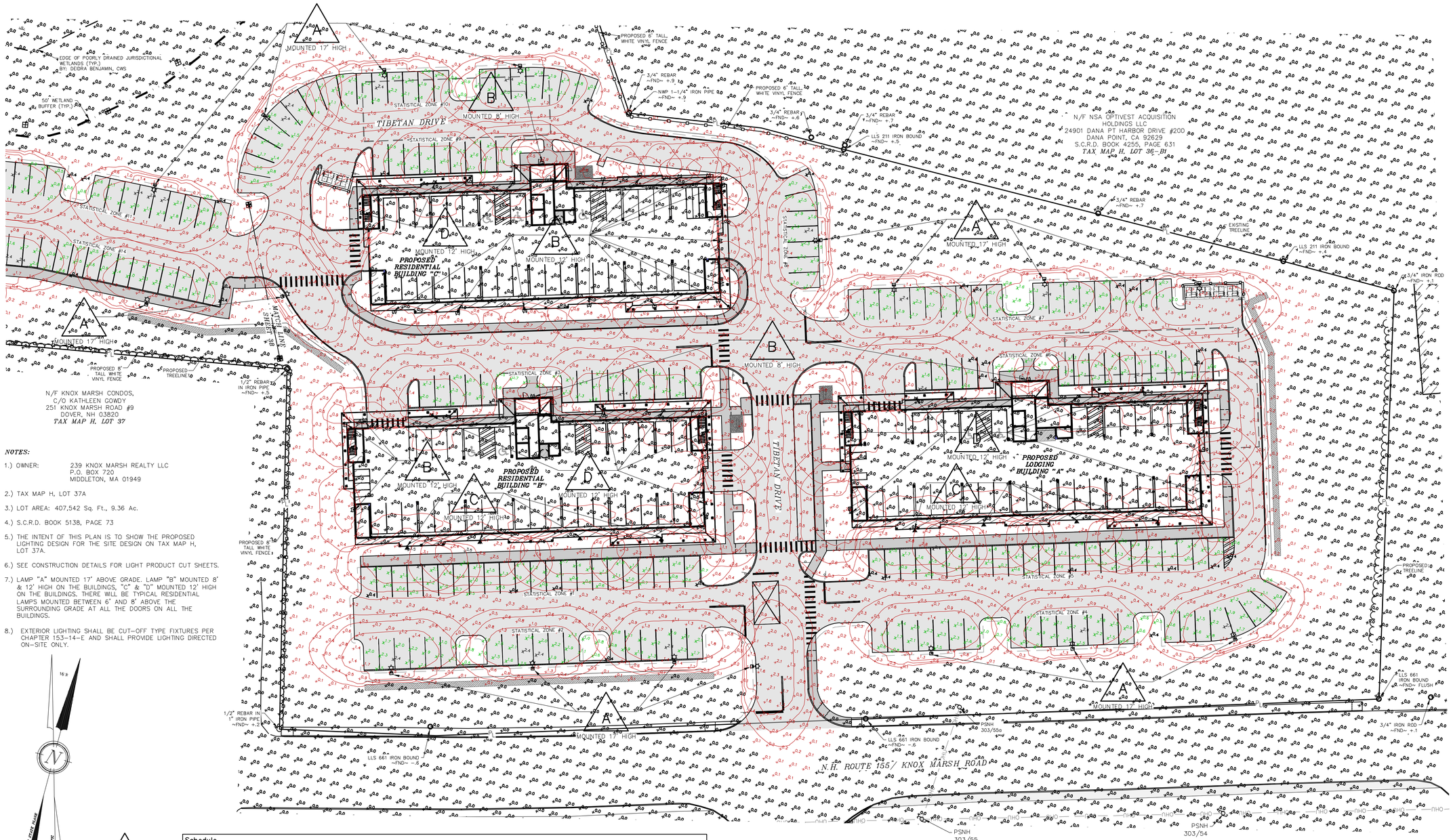
WATERLINE EXTENSION PLAN & PROFILE HANSON ROAD
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14286 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

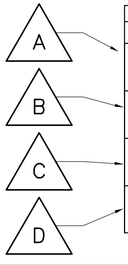
4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED LIGHTING DESIGN FOR THE SITE DESIGN ON TAX MAP H, LOT 37A.

6.) SEE CONSTRUCTION DETAILS FOR LIGHT PRODUCT CUT SHEETS.

7.) LAMP "A" MOUNTED 17' ABOVE GRADE, LAMP "B" MOUNTED 8' & 12' HIGH ON THE BUILDINGS, "C" & "D" MOUNTED 12' HIGH ON THE BUILDINGS. THERE WILL BE TYPICAL RESIDENTIAL LAMPS MOUNTED BETWEEN 6' AND 8' ABOVE THE SURROUNDING GRADE AT ALL THE DOORS ON ALL THE BUILDINGS.

8.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.



Schedule

Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power
	A		22	Lithonia Lighting	DSX0 LED P1 30K BLC MVOLT G1	DSX0 LED P1 30K BLC ALL HAVE BACKLIGHT CONTROL	1	3585	1	38
	B		19	Lithonia Lighting	WDGE2 LED P0 30K 70CRI T3M	WDGE2 LED WITH P0 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 MEDIUM OPTIC	1	763	1	6.8946
	C		8	Lithonia Lighting	WDGE2 LED P4 30K 70CRI T3M	WDGE2 LED WITH P4 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 MEDIUM OPTIC	1	4471	1	46.6589
	D		15	Lithonia Lighting	WDGE2 LED P3 30K 80CRI T4M	WDGE2 LED WITH P3 - PERFORMANCE PACKAGE, 3000K, 80CRI, TYPE 4 MEDIUM OPTIC	1	2997	1	32.1375

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Stat Zone #1	X	1.1 fc	2.4 fc	0.4 fc	6.0:1	2.8:1
Stat Zone #2	X	1.5 fc	2.4 fc	0.4 fc	6.0:1	3.8:1
Stat Zone #3	X	1.4 fc	2.4 fc	0.4 fc	6.0:1	3.5:1
Stat Zone #4	X	1.4 fc	2.4 fc	0.4 fc	6.0:1	3.5:1
Stat Zone #5	X	1.1 fc	2.4 fc	0.4 fc	6.0:1	2.8:1
Stat Zone #6	X	1.3 fc	2.4 fc	0.4 fc	6.0:1	3.3:1
Stat Zone #7	X	1.3 fc	2.4 fc	0.4 fc	6.0:1	3.3:1
Stat Zone #8	X	1.5 fc	2.4 fc	0.4 fc	6.0:1	3.8:1
Stat Zone #9	X	1.4 fc	2.4 fc	0.4 fc	6.0:1	3.5:1
Stat Zone #10	X	1.5 fc	2.4 fc	0.4 fc	6.0:1	3.8:1
Stat Zone #11	X	1.3 fc	2.4 fc	0.4 fc	6.0:1	3.3:1
Stat Zone #12	X	1.3 fc	2.4 fc	0.4 fc	6.0:1	3.3:1
Stat Zone #13	X	1.4 fc	2.4 fc	0.4 fc	6.0:1	3.5:1
Stat Zone #14	X	1.3 fc	2.4 fc	0.4 fc	6.0:1	3.3:1

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

LIGHTING PLAN EAST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE KENNETH A. BERRY No. 14740 LICENSED PROFESSIONAL ENGINEER

SHEET 37 OF 60

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED LIGHTING DESIGN FOR THE SITE DESIGN ON TAX MAP H, LOT 37A.

6.) SEE CONSTRUCTION DETAILS FOR LIGHT PRODUCT CUT SHEETS.

7.) LAMP "A" MOUNTED 17' ABOVE GRADE, LAMP "B" MOUNTED 8' & 12' HIGH ON THE BUILDINGS, "C" & "D" MOUNTED 12' HIGH ON THE BUILDINGS. THERE WILL BE TYPICAL RESIDENTIAL LAMPS MOUNTED BETWEEN 6' AND 8' ABOVE THE SURROUNDING GRADE AT ALL THE DOORS ON ALL THE BUILDINGS.

8.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

N/F BOSTON & MAINE RR
IRON HORSE PARK
500 WATER STREET, J-910
JACKSONVILLE, FL 32202
TAX MAP G, LOT 5

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 38

HANSON ROAD
DISCONTINUED BY CITY OF DOVER JULY 8, 1998
2 ROD WIDE ACCESS & UTILITY EASEMENT.

N/F PATRICK J CRAGIN TRUSTEE
PATRICK J CRAGIN LIVING REV TRUST
P.O. BOX 250
DOVER, NH 03820
S.C.R.D. BOOK 3497, PAGE 417
TAX MAP H, LOT 37B

N/F KNOX MARSH CONDOS
C/O KATHLEEN COWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

N.H. ROUTE 155 / KNOX MARSH ROAD

TIBETAN DRIVE

PROPOSED RESIDENTIAL BUILDING "C"

PROPOSED RESIDENTIAL BUILDING "B"

ACTIVE & PASSIVE RECREATION /DOG PARK

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: DEIDRA BENJAMIN, CWS

50' WETLAND BUFFER (TYP.)

STATISTICAL ZONE #11

STATISTICAL ZONE #14

EXISTING TREELINE

PROPOSED TREELINE

PROPOSED 8' TALL WHITE VINYL FENCE

EXISTING BUILDING

MOUNTED 17' HIGH

LLS 661 IRON BOUND ~FND~ FLUSH

LLS 661 IRON BOUND ~FND~ +.3

1/2" REBAR W/IN IRON PIPE ~FND~ +.5

1/2" REBAR IN IRON PIPE ~FND~ +.5

1/2" REBAR IN 1" IRON PIPE ~FND~ +.2

LLS 661 IRON BOUND ~FND~ -.6

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

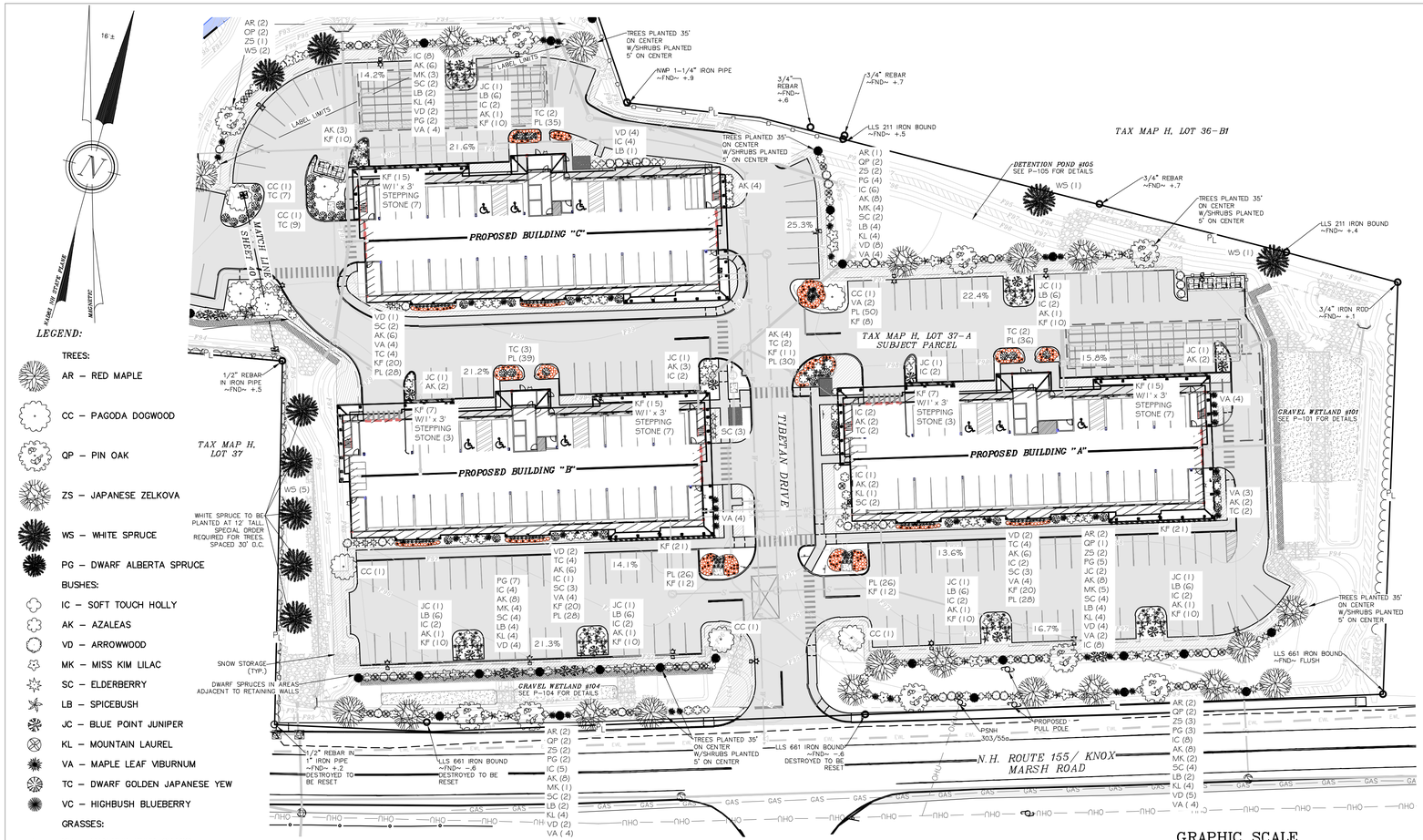
LIGHTING PLAN WEST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1. CALL DIG SAFE PRIOR TO BEGINNING WORK. (1–888–344–7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.
2. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING.
3. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS. VARIATIONS IN QUANTITIES ARE TO BE APPROVED BY THE DESIGN ENGINEER.
4. PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.
5. ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN
6. ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.
7. ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.
8. ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.
9. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.
10. NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.
11. ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH
12. WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL–ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.
13. MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWING AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.
14. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.
15. THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWING SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.
16. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.
17. ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.
18. SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.
19. ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.
20. TREES ARE TO BE 6' TALL AT PLANTING.
21. ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)
22. 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY–PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.
23. PLANT–PIT BACK–FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON–SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.
24. ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.
25. TOPSOIL WILL BE TESTED FOR FERTILIZATION REQUIREMENTS, AND SLOW RELEASE ENVIRONMENTALLY FRIENDLY FERTILIZER WILL BE APPLIED AT THE RECOMMENDED RATES.
26. ALL DISTURBED WETLAND BUFFER AREAS, EXCEPT FOR AREAS THAT ARE PART OF THE DRAINAGE SYSTEM, ARE TO BE RESEEDED WITH A CONSERVATION SEED MIX AND ONLY MOWED TWICE PER YEAR.
27. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
28. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ONGOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
29. 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.
30. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NO LESS THAN ONE FULL YEAR FROM THE TIME OF INSTALLATION. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE OWNER IN WRITING OR OTHERWISE FORFEIT HIS CLAIM.
31. BY THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAS DIED, THAT HAS LOST NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESS PRUNING OR INADEQUATE OR IMPROPER CARE, OR IS, IN THE OPINION OF THE OWNER, IN UNHEALTHY OR UNSIGHTLY CONDITION.
32. THE CONTRACTOR IS TO USE TEMPORARY MEASURES FOR WATERING PLANTS DURING THE ESTABLISHMENT PERIOD. INCLUDING CONNECTING TEMPORARY HOSES TO THE STRUCTURE WATER SUPPLY LINE AND UTILIZING SPRINKLERS UNTIL 85% GROWTH OCCURS.

PLANTING NOTES

1. CONTRACTOR SHALL OBTAIN APPROVAL FROM L.A. PRIOR TO PURCHASING &/OR INSTALLING SUBSTITUTE PLANT MATERIAL PRIOR TO PURCHASE OF ANY SUBSTITUTE MATERIALS.
2. CONSTRUCTION ACCESS WILL BE AS DIRECTED BY L.A. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ACCESS ROUTE AND ALL AREAS DISTURBED BY PLANTING OPERATIONS UPON COMPLETION OF CONSTRUCTION OPERATIONS, AT NO ADDITIONAL COST TO THE OWNER.
3. LAYOUT OF ALL PLANTING BEDS AND LOCATION OF PLANTS TO BE APPROVED BY L.A. ON SITE PRIOR TO CONSTRUCTION AND INSTALLATION.
4. CONTRACTOR TO REMOVE ALL DEBRIS GENERATED BY PLANT INSTALLATION. DEBRIS TO BE DISPOSED OF IN A LEGAL MANNER.
5. ALL PLANT MATERIAL SHALL BE GUARANTEED TO BE IN GOOD, HEALTHY & FLOURISHING CONDITION FOR ONE YEAR FROM THE DATE OF FINAL INSTALLATION APPROVAL BY L.A. CONTRACTOR SHALL REPLACE, WITHOUT COST TO OWNER, AND AS SOON AS WEATHER CONDITIONS PERMIT, ALL DEAD AND NON–FLOURISHING PLANTS AS DETERMINED BY THE L.A. REPLACEMENT PLANTS SHALL BE BE GUARANTEED IDENTICALLY TO ORIGINAL PLANTS, TIME PERIOD COMMENCING FROM DATE OF REPLACEMENT PLANTING APPROVAL BY L.A.
6. ALL BEDS TO BE MULCHED WITH 3" DEPTH SHREDDED BARK MULCH UNLESS NOTED OTHERWISE.
7. CONTRACTOR TO PROVIDE NECESSARY TEMPORARY IRRIGATION IF NEEDED BASED ON TIME OF YEAR THE PROJECT IS IMPLEMENTED.
8. ALL PLANT MATERIAL TO COMPLY WITH THE CITY OF DOVER'S SITE REVIEW REGULATIONS, 149–14(G), SUCH THAT THERE SHALL BE DECIDUOUS SHADE TREES PLANTED 40 FEET O.C. ALONG THE PERIMETER OF THE PARKING LOTS AND SHRUBS PLANTED 5 FEET O.C. WITHIN THE PERIMETER BUFFER. SEE PLANT LIST FOR SPECIES AND SIZE OF PLANTS.

TEMPORARY WATERING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR MAKING SURE ALL PLANT MATERIAL HAS ADEQUATE WATER DURING THE ESTABLISHMENT PERIOD.
2. THE USE OF GATOR BAGS, SOAKER HOSE, HAND WATERING AND OTHER TECHNIQUES SHOULD BE USED TO ASSURE PROPER HYDRATION OF THE PLANTINGS IS MAINTAINED.
3. TEMPORARY IRRIGATION SYSTEMS CAN BE SET UP TO ASSIST IN WATERING ACTIVITIES.

PLANTING SCHEDULE
239 KNOX MARSH ROAD, DOVER NH

Botanical Name/ Common Name	Size	Qty	Label
Trees			
Acer rubrum / Red Maple	4" cal.	13	AR
Cornus Controversa / Pagoda Dogwood	4" cal.	8	CC
Zelkova serrata / Japanese Zelkova	4" cal.	13	ZS
Quercus palustris / Pin Oak	4" cal.	18	QP
Picea Glauca / White Spruce	4" cal.	16	WS
Picea Glauca / White Spruce	12' TALL	5	WS
Picea Glauca 'Conica' /Dwarf Alberta Spruce	3 gal.	42	PG
Shrubs			
Viburnum Dentatum / Arrowwood Viburnum	24"	41	VD
Taxus cuspidata 'Nana Aurescents"/ Dwarf Golden Japanese Yew	24"	47	TC
Viburnum aceriflolium/ Maple Leaf Viburnum	24"	49	VA
Sambucus Canadensis/ American Elderberry	24"	40	SC
Vaccinium Corymbosum / Highbush Blueberry	24"	53	VC
Lindera Benzoin/ Northern Spicebush	24"	74	LB
Syringa Pubescens Subsp. Patula 'Miss Kim'/ Miss Kim Lilac	24"	42	MK
Kalmia latifolia/ Mountain Laurel	24"	36	KL
Juniperus chinensis 'Blue Point'/ Blue Point Juniper	24"	17	JC
Azalea 'Karen'/ Karen Azalea	24"	109	AK
Ilex crenata 'Soft Touch'/ Soft Touch Holly	24"	83	IC
Plants			
Black-Eyed Susan, New England Aster, Anise Hyssop & Cranesbill	3" pot	326	PL
Grasses			
Calamagrostis acutiflola 'Karl Foerster' / Feather Reed Grass	#2	306	KF

terrain
planning & design llc

General Plant Maintenance Guide

General Plant Bed Maintenance:
- All plant maintenance should be performed by a qualified horticulturalist or licensed arborist. Cleaning the dead material out of the planting bed in the fall helps keep litter from building up around the plants and in some cases killing the plants. Watering the first year during dry periods will help get the plants established. Mulching every year is not necessary. Raking the old mulch and turning it over is all that is needed. When necessary only install one inch of mulch and do not place the mulch closer than 3" to the trunks or stems of woody plants.

Trees
- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the trunk.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after trees have dropped their leaves for the year.
- Prune dead wood once a year.
- Depending on the amount of compaction the bed area receives, deep root aeration may be needed over time

Woody Shrubs
- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the stems.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after shrubs have dropped their leaves or gone dormant for the year.
- Prune dead wood once a year.

Grasses
- Grasses only need to be clipped back at the end of the growing season and all the clippings removed from the area.
- Do not over mulch. Too much mulch will prohibit the grass from developing into a strong clump.

Perennials
- All perennials need to be pruned back after the first or second hard frost. A two-step method; first dead head all the flower heads and let drop to the ground for re-seeding. Second cut the stems back to 3" above the ground and remove the stem and leaf litter and place in compost. Do not over mulch. Too much mulch will prohibit the growth and development
- Fertilizing perennials once in the spring with a low phosphate fertilizer will help the plants to get started in the spring.

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311 kast hill road
hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

239 KNOX MARSH ROAD

Site Location:
239 KNOX MARSH ROAD
Dover, NH
Tax Map: H, Lot 37-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE: NOVEMBER 26, 2024

SCALE: 1" = 40'

PROJECT #: 24-034

Drawn By: JDB

Checked By: ERB

REVISIONS: DATE:
Issued for Client Review

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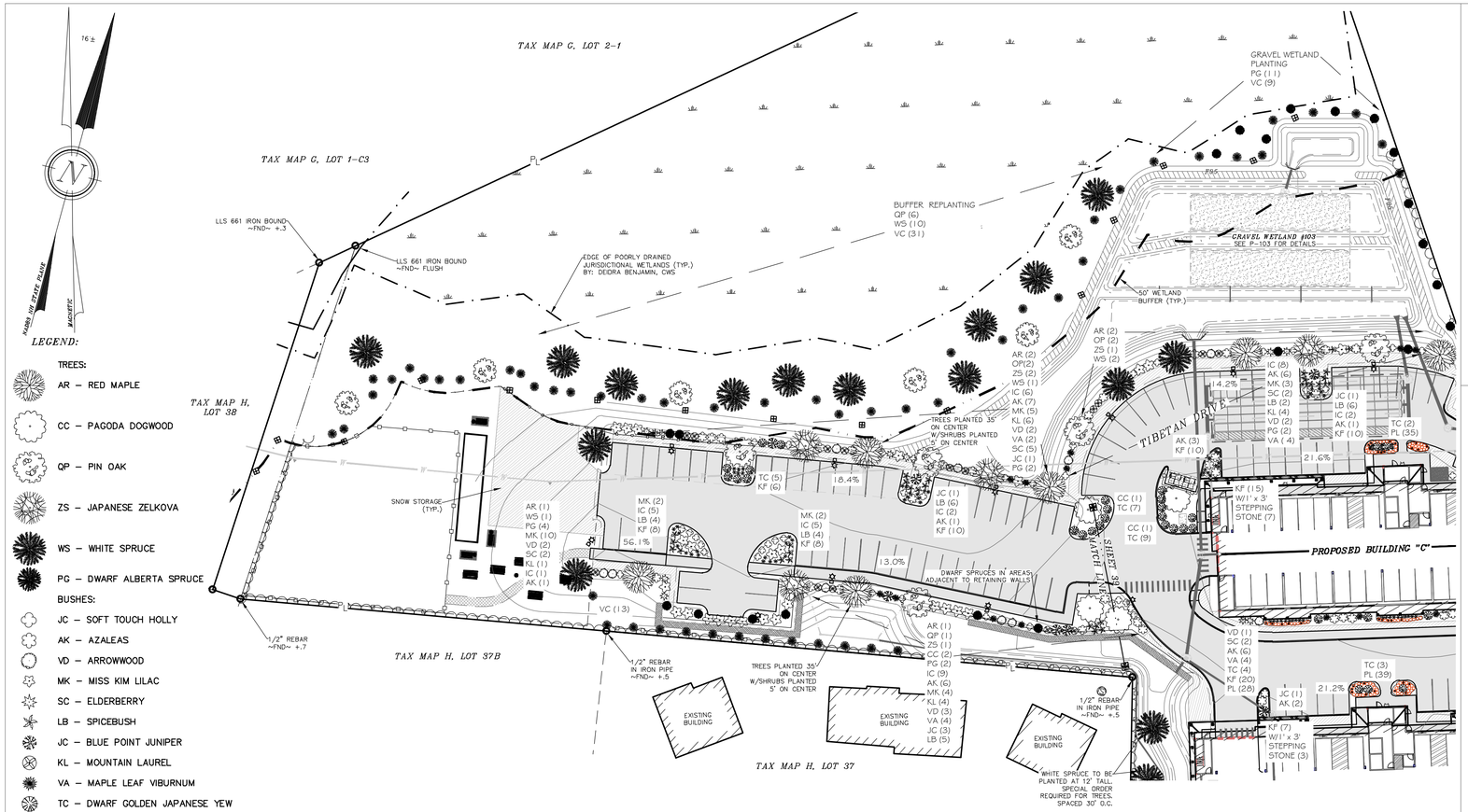
L - 01

SHEET 39 OF 60

ERIC R BUCK 078 LICENSED LANDSCAPE ARCHITECT STATE OF NEW HAMPSHIRE

NOT FOR CONSTRUCTION



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND:

TREES:
- AR – RED MAPLE
- CC – PAGODA DOGWOOD
- QP – PIN OAK
- ZS – JAPANESE ZELKOVA
- WS – WHITE SPRUCE
- PG – DWARF ALBERTA SPRUCE

BUSHES:
- JC – SOFT TOUCH HOLLY
- AK – AZALEAS
- VD – ARROWWOOD
- MK – MISS KIM LILAC
- SC – ELDERBERRY
- LB – SPICEBUSH
- JC – BLUE POINT JUNIPER
- KL – MOUNTAIN LAUREL
- VA – MAPLE LEAF VIBURNUM
- TC – DWARF GOLDEN JAPANESE YEW
- VC – HIGHBUSH BLUEBERRY

GRASSES:
- KF – FEATHER REED GRASS

PLANTS:
- PL– A MIX OF BLACK–EYED SUSAN, NEW ENGLAND ASTER, ANISE HYSSOP & CRANESBILL

SEE NEIGHBORHOOD PLAN (SHEET #1) FOR SITE & GRADING SYMBOLS.

NOTES:

1. CALL DIG SAFE PRIOR TO BEGINNING WORK. (1–888–344–7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.
2. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING.
3. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS. VARIATIONS IN QUANTITIES ARE TO BE APPROVED BY THE DESIGN ENGINEER.
4. PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.
5. ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN
6. ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.
7. ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.
8. ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.
9. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.
10. NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.
11. ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH
12. WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL–ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.
13. MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWING AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.
14. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.
15. THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWING SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.
16. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.
17. ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.
18. SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.
19. ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.
20. TREES ARE TO BE 6' TALL AT PLANTING.
21. ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)
22. 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY–PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.
23. PLANT–PIT BACK–FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON–SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.
24. ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.
25. TOPSOIL WILL BE TESTED FOR FERTILIZATION REQUIREMENTS, AND SLOW RELEASE ENVIRONMENTALLY FRIENDLY FERTILIZER WILL BE APPLIED AT THE RECOMMENDED RATES.
26. ALL DISTURBED WETLAND BUFFER AREAS, EXCEPT FOR AREAS THAT ARE PART OF THE DRAINAGE SYSTEM, ARE TO BE RESEEDED WITH A CONSERVATION SEED MIX AND ONLY MOWED TWICE PER YEAR.
27. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
28. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ONGOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
29. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWNG SEASON. ROOT–BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
30. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NO LESS THAN ONE FULL YEAR FROM THE TIME OF INSTALLATION. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE OWNER IN WRITING OR OTHERWISE FORFEIT HIS CLAIM.
31. BY THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAS DIED, THAT HAS LOST NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESS PRUNING OR INADEQUATE OR IMPROPER CARE, OR IS, IN THE OPINION OF THE OWNER, IN UNHEALTHY OR UNSIGHTLY CONDITION.
32. THE CONTRACTOR IS TO USE TEMPORARY MEASURES FOR WATERING PLANTS DURING THE ESTABLISHMENT PERIOD. INCLUDING CONNECTING TEMPORARY HOSES TO THE STRUCTURE WATER SUPPLY LINE AND UTILIZING SPRINKLERS UNTIL 85% GROWTH OCCURS.

PLANTING NOTES

1. CONTRACTOR SHALL OBTAIN APPROVAL FROM L.A. PRIOR TO PURCHASING &/OR INSTALLING SUBSTITUTE PLANT MATERIAL PRIOR TO PURCHASE OF ANY SUBSTITUTE MATERIALS.
2. CONSTRUCTION ACCESS WILL BE AS DIRECTED BY L.A. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ACCESS ROUTE AND ALL AREAS DISTURBED BY PLANTING OPERATIONS UPON COMPLETION OF CONSTRUCTION OPERATIONS, AT NO ADDITIONAL COST TO THE OWNER.
3. LAYOUT OF ALL PLANTING BEDS AND LOCATION OF PLANTS TO BE APPROVED BY L.A. ON SITE PRIOR TO CONSTRUCTION AND INSTALLATION.
4. CONTRACTOR TO REMOVE ALL DEBRIS GENERATED BY PLANT INSTALLATION. DEBRIS TO BE DISPOSED OF IN A LEGAL MANNER.
5. ALL PLANT MATERIAL SHALL BE GUARANTEED TO BE IN GOOD, HEALTHY & FLOURISHING CONDITION FOR ONE YEAR FROM THE DATE OF FINAL INSTALLATION APPROVAL BY L.A. CONTRACTOR SHALL REPLACE, WITHOUT COST TO OWNER, AND AS SOON AS WEATHER CONDITIONS PERMIT, ALL DEAD AND NON–FLOURISHING PLANTS AS DETERMINED BY THE L.A. REPLACEMENT PLANTS SHALL BE BE GUARANTEED IDENTICALLY TO ORIGINAL PLANTS, TIME PERIOD COMMENCING FROM DATE OF REPLACEMENT PLANTING APPROVAL BY L.A.
6. ALL BEDS TO BE MULCHED WITH 3" DEPTH SHREDDED BARK MULCH UNLESS NOTED OTHERWISE.
7. CONTRACTOR TO PROVIDE NECESSARY TEMPORARY IRRIGATION IF NEEDED BASED ON TIME OF YEAR THE PROJECT IS IMPLEMENTED.
8. ALL PLANT MATERIAL TO COMPLY WITH THE CITY OF DOVER'S SITE REVIEW REGULATIONS, 149–14(G), SUCH THAT THERE SHALL BE DECIDUOUS SHADE TREES PLANTED 40 FEET O.C. ALONG THE PERIMTERE OF THE PARKING LOTS AND SHRUBS PLANTED 5 FEET O.C. WITHIN THE PERIMETER BUFFER. SEE PLANT LIST FOR SPECIES AND SIZE OF PLANTS.

TEMPORARY WATERING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR MAKING SURE ALL PLANT MATERIAL HAS ADEQUATE WATER DURING THE ESTABLISHMENT PERIOD.
2. THE USE OF GATOR BAGS, SOAKER HOSE, HAND WATERING AND OTHER TECHNIQUES SHOULD BE USED TO ASSURE PROPER HYDRATION OF THE PLANTINGS IS MAINTAINED.
3. TEMPORARY IRRIGATION SYSTEMS CAN BE SET UP TO ASSIST IN WATERING ACTIVITIES.

PLANTING SCHEDULE
239 KNOX MARSH ROAD, DOVER NH
Botanical Name/ Common Name

	Size	Qty	Label
Trees			
Acer rubrum / Red Maple	4" cal.	13	AR
Cornus Controversa / Pagoda Dogwood	4" cal.	8	CC
Zelkova serrata / Japanese Zelkova	4" cal.	13	ZS
Quercus palustris / Pin Oak	4" cal.	18	QP
Picea Glauca / White Spruce	4" cal.	16	WS
Picea Glauca / White Spruce	12' TALL	5	WS
Picea Glauca 'Conica' /Dwarf Alberta Spruce	3 gal.	42	PG
Shrubs			
Viburnum Dentatum / Arrowwood Viburnum	24"	41	VD
Taxus cuspidata 'Nana Aurescents" / Dwarf Golden Japanese Yew	24"	47	TC
Viburnum acerifolium / Maple Leaf Viburnum	24"	49	VA
Sambucus Canadensis/ American Elderberry	24"	40	SC
Vaccinium Corymbosum / Highbush Blueberry	24"	53	VC
Lindera Benzoin/ Northern Spicebush	24"	74	LB
Syringa Pubescens Subsp. Patula 'Miss Kim'/ Miss Kim Lilac	24"	42	MK
Kalmia latifolia/ Mountain Laurel	24"	36	KL
Juniperus chinensis 'Blue Point'/ Blue Point Juniper	24"	17	JC
Azalea 'Karen'/ Karen Azalea	24"	109	AK
Ilex crenata 'Soft Touch'/ Soft Touch Holly	24"	83	IC
Plants			
Black-Eyed Susan, New England Aster, Anise Hyssop & Cranesbill	3" pot	326	PL
Grasses			
Calamagrostis acutifolia 'Karl Foerster' / Feather Reed Grass	#2	306	KF

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General Plant Maintenance Guide

General Plant Bed Maintenance:

- All plant maintenance should be performed by a qualified horticulturalist or licensed arborist. Cleaning the dead material out of the planting bed in the fall helps keep litter from building up around the plants and in some cases killing the plants. Watering the first year during dry periods will help get the plants established. Mulching every year is not necessary. Raking the old mulch and turning it over is all that is needed. When necessary only install one inch of mulch and do not place the mulch closer than 3" to the trunks or stems of woody plants.

Trees

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the trunk.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after trees have dropped their leaves for the year.
- Prune dead wood once a year.
- Depending on the amount of compaction the bed area receives, deep root aeration may be needed over time

Woody Shrubs

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the stems.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after shrubs have dropped their leaves or gone dormant for the year.
- Prune dead wood once a year.

Grasses

- Grasses only need to be clipped back at the end of the growing season and all the clippings removed from the area.
- Do not over mulch. Too much mulch will prohibit the grass from developing into a strong clump.

Perennials

- All perennials need to be pruned back after the first or second hard frost. A two-step method; first dead head all the flower heads and let drop to the ground for re-seeding. Second cut the stems back to 3" above the ground and remove the stem and leaf litter and place in compost. Do not over mulch. Too much mulch will prohibit the growth and development
- Fertilizing perennials once in the spring with a low phosphate fertilizer will help the plants to get started in the spring.

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311 kast hill road
hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

239 KNOX MARSH ROAD

Site Location:
239 KNOX MARSH ROAD
Dover, NH
Tax Map: H, Lot 37-A

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE: NOVEMBER 26, 2024

SCALE: 1" = 40'

PROJECT #: 24-034

Drawn By: JDB

Checked By: ERB

REVISIONS: DATE:
Issued for Client Review

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L - 02

SHEET 40 OF 60

LICENSED LANDSCAPE ARCHITECT
ERIC R BUCK
078
STATE OF NEW HAMPSHIRE

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) THIS IS PROPOSED TO BE A RESIDENTIAL AND COMMERCIAL DRIVEWAY.

6.) EXISTING CONDITIONS INFORMATION IS BASED ON A SURVEY PERFORMED BY BERRY SURVEYING & ENGINEERING AND IS ENCLOSED IN THIS PACKAGE.

7.) THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS DATED 2016. CURRENT STANDARD PLANS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE PROPOSAL.

8.) CONTRACTOR SHALL TAKE SPECIAL CARE IN NOT DISTURBING EXISTING MONUMENTS BOUNDS, AND OR BENCHMARKS WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.

NOTES CONT.:

9.) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.

10.) WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

11.) THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

12.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

13.) THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R & R)

NOTES CONT.:

14.) ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.

15.) ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM PLACED AND SEEDED. THE LOAM SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.

16.) THE SPEED LIMIT ON KNOX MARSH ROAD IS CURRENTLY 50MPH. IT IS REQUESTED BY THE CITY OF DOVER THAT THE SPEED LIMIT IN THE SECTION OF NH ROUTE 155 BE REDUCED TO 40 MPH.

17.) WORK WITHIN NHDOT R.O.W. WILL REQUIRE PROFESSIONAL FLAGGING SERVICES.

18.) DESIGN ENGINEER TO PROVIDE INSPECTION & OVERSIGHT OF ALL WORK WITHIN R.O.W.

CLEAR ZONE CALCULATION:

POSTED SPEED: 50 MPH / 85TH PERCENTILE 50 MPH (ACCURATE COUNTS)

WESTBOUND DESIGN ADT (2019): 6,273 (ACCURATE COUNTS)

FROM AASHTO ROADSIDE DESIGN GUIDE (2011) TABLE 3.1 PAGE 3-3

CLEAR ZONE REQUIRED TO BE 24-28 FEET (1V:6H OR FLATTER)
-24 FEET HAS BEEN SELECTED

TURN LANE CLEAR ZONE ASSUMED DECELERATION SPEED: 35 MPH

CLEAR ZONE REQUIRED TO BE 16-18 FEET (1V:4H OR FLATTER)
-16 FEET HAS BEEN SELECTED

SIGHT DISTANCE REQUIREMENT:

POSTED SPEED: 50 MPH / 85TH 50 MPH (ACCURATE COUNTS)

WESTBOUND: DOWNGRADE <3%, 423.8 FEET REQUIRED (425 FEET PROVIDED)
EASTBOUND: UPGRADE <3%, 423.8 FEET REQUIRED (425 FEET PROVIDED)

FROM AASHTO GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (2011) EXHIBIT 3.1

400' REQUIRED BY NHDOT

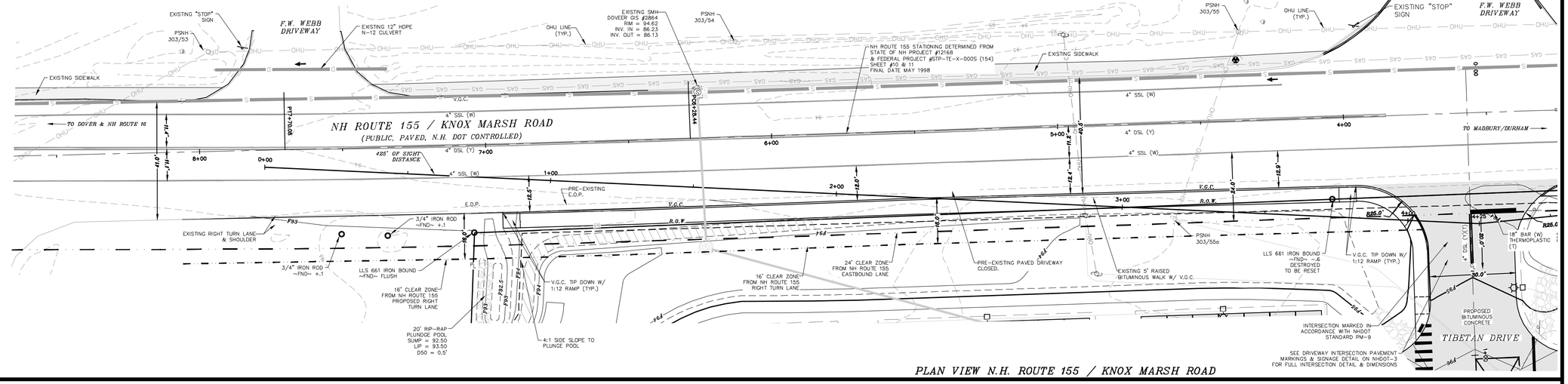
LEGEND:

- PERIMETER BOUNDARY
- OHU — OHU — OVERHEAD UTILITIES LINE
- 236 — CONTOUR LINE, MINOR
- 235 — CONTOUR LINE, MAJOR
- D — EXISTING DRAIN LINE
- SAWCUT & MILL LINE
- SHOULDER
- CENTER LINE
- CLEAR ZONE LINE
- IRON BOUND ~FND~
- NHHD BOUND ~FND~
- UTILITY POLE
- SINGLE SIGN POST
- CATCH BASIN/DRAIN MANHOLE/SEWER MANHOLE W/ STRUCTURE
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. TYPICAL
- FND FOUND
- PL PROPERTY LINE
- R.O.W. RIGHT OF WAY
- E.O.P. EDGE OF PAVEMENT
- SSL (W) SINGLE SOLID LINE (WHITE)
- DSL (Y) DOUBLE SOLID LINE (YELLOW)

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



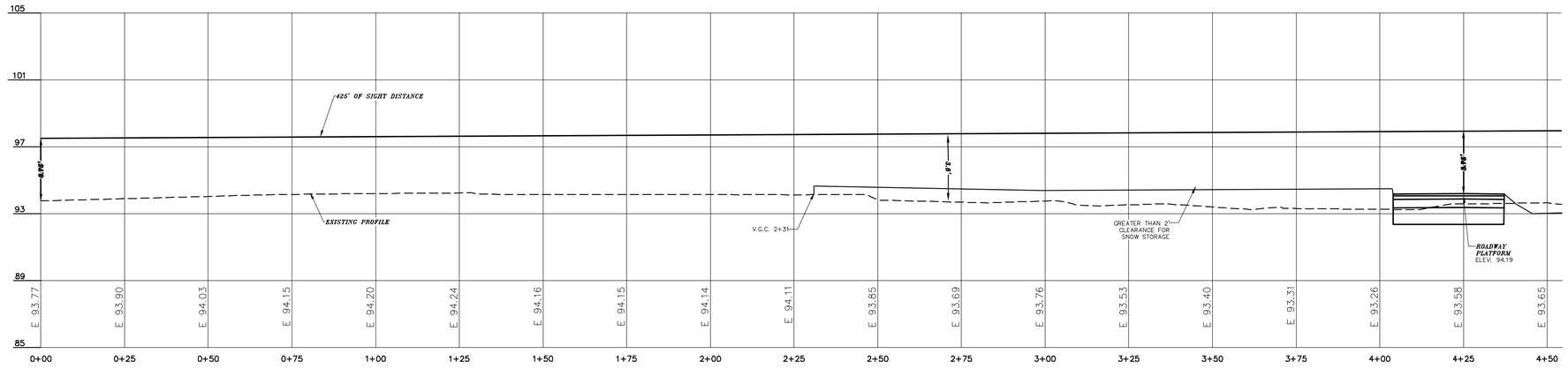
PLAN VIEW N.H. ROUTE 155 / KNOX MARSH ROAD

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

PROFILE VIEW SIGHT LINE



NHDOT-1

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

SIGHT DISTANCE PLAN TIBETAN DRIVE (30') WESTBOUND
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14249
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

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CLEAR ZONE CALCULATION:

POSTED SPEED: 50 MPH / 85TH PERCENTILE 50 MPH
(ACCURATE COUNTS)

WESTBOUND DESIGN ADT (2019): 6,273 (ACCURATE COUNTS)

FROM AASHTO ROADSIDE DESIGN GUIDE (2011) TABLE 3.1 PAGE 3-3

CLEAR ZONE REQUIRED TO BE 24-28 FEET (1V:6H OR FLATTER)
-24 FEET HAS BEEN SELECTED

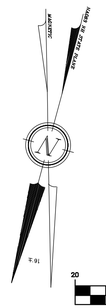
SIGHT DISTANCE REQUIREMENT:

POSTED SPEED: 50 MPH / 85TH 50 MPH (ACCURATE COUNTS)

WESTBOUND: DOWNGRADE <3%, 423.8 FEET REQUIRED (425 FEET PROVIDED)
EASTBOUND: UPGRADE <3%, 423.8 FEET REQUIRED (425 FEET PROVIDED)

FROM AASHTO GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (2011) EXHIBIT 3.1

400' REQUIRED BY NHDOT

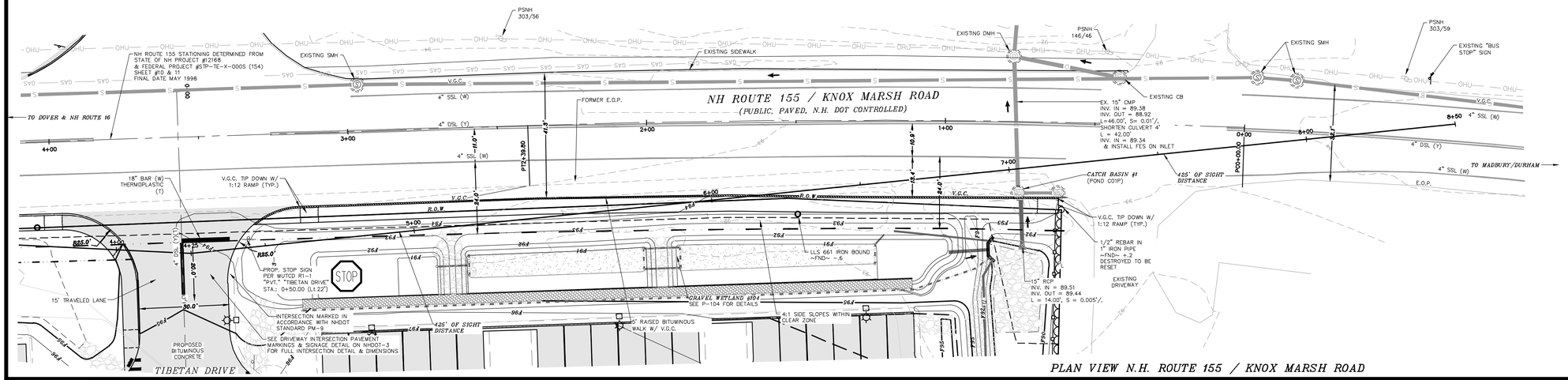


LEGEND:

- PERIMETER BOUNDARY
- OHU — OHU — OVERHEAD UTILITIES LINE
- 236 — CONTOUR LINE, MINOR
- 235 — CONTOUR LINE, MAJOR
- D — EXISTING DRAIN LINE
- SAWCUT & MILL LINE
- SHOULDER
- CENTER LINE
- CLEAR ZONE LINE
- IRON BOUND ~FND~
- NHHD BOUND ~FND~
- UTILITY POLE
- SINGLE SIGN POST
- CATCH BASIN/DRAIN MANHOLE/SEWER MANHOLE W/ STRUCTURE

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
PL PROPERTY LINE
R.O.W. RIGHT OF WAY
E.O.P. EDGE OF PAVEMENT
SSL (W) SINGLE SOLID LINE (WHITE)
DSL (Y) DOUBLE SOLID LINE (YELLOW)

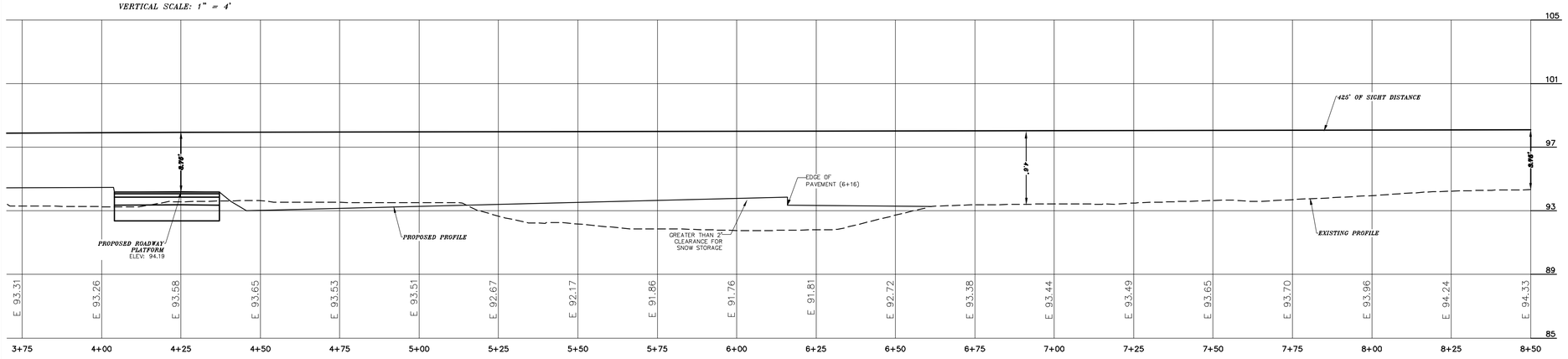
GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



PLAN VIEW N.H. ROUTE 155 / KNOX MARSH ROAD

PROFILE VIEW SIGHT LINE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



NHDOT-2

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

SIGHT DISTANCE PLAN TIBETAN DRIVE (30') EASTBOUND
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

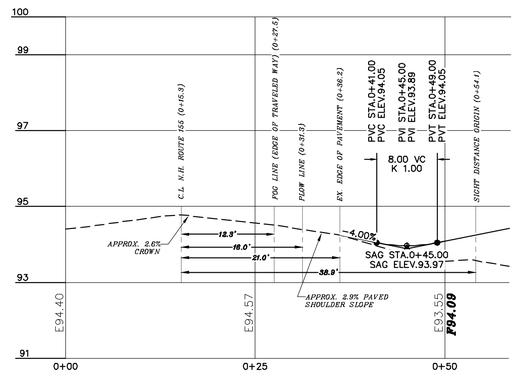
DETAIL–1

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.
VERTICAL SCALE: 1" = 2'

PROFILE VIEW TIBETAN DRIVE (30')



DETAIL–2

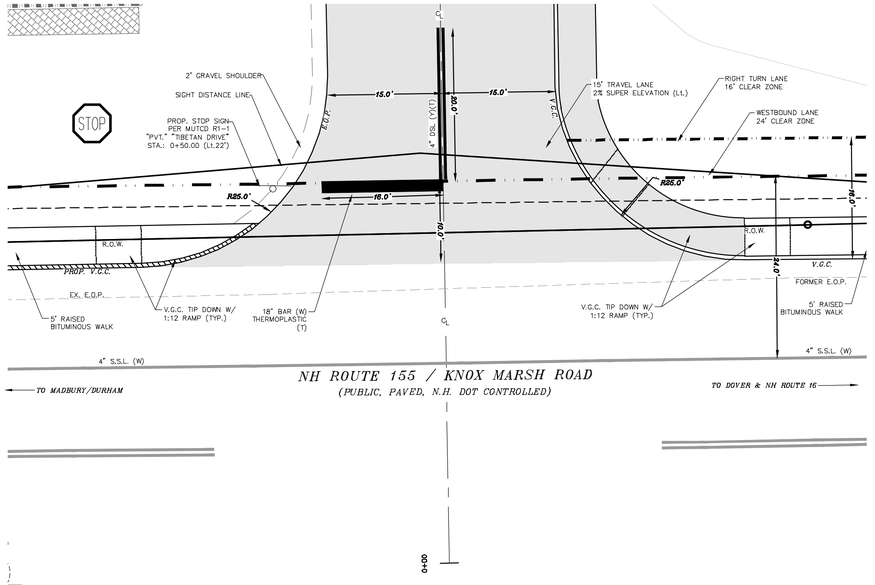
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

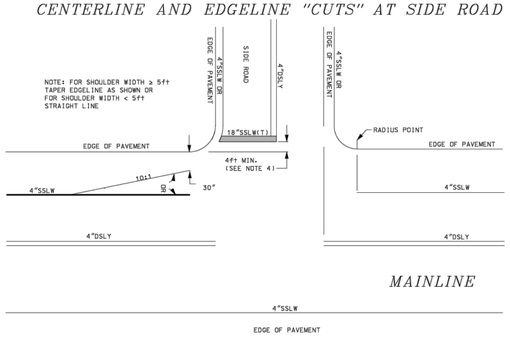
TIBETAN DRIVE (30') INTERSECTION PAVEMENT MARKINGS & SIGNAGE DETAILS

TIBETAN DRIVE (PVT.)



DETAIL–3

CENTERLINE AND EDGELINE "CUTS" AT SIDE ROAD



PM–9 GENERAL NOTES

1.) EDGELINE DETAILS ARE SHOWN FOR MAINLINE ROADWAYS WITHOUT TURN LANE. THE PRESENCE OF TURN LANES MAY REQUIRE DIFFERENT EDGELINE TREATMENTS.

2.) EDGELINES ON THE SIDE ROADS, WHEN CALLED FOR, SHALL FOLLOW THE ABOVE MAINLINE TYPICALS. EDGELINES SHALL NOT BE CONTINUOUS AROUND THE MAINLINE/SIDE ROAD RADIUS. EDGELINES SHALL END AT STOP BARS.

3.) CENTERLINE AND EDGELINE SHALL BE CONTINUOUS PAST RESIDENTIAL DRIVEWAYS. CENTERLINE AND EDGELINE SHALL BREAK FOR COMMERCIAL DRIVES W/TRAFFIC CONTROLS, MINOR SIDE ROADS, OR PRIVATE INTERSECTIONS.

4.) LOCATION OF THE STOP LINE MAY VARY DUE TO INTERSECTION SIGHT DISTANCE AND VEHICLE TURNING RADIUS AND MAY NOT ALWAYS COINCIDE WITH THE LOCATION OF THE STOP SIGN.

5.) IF THERE IS NO EDGELINE, END STOP BAR 12" FROM EDGE OF PAVEMENT.

6.) STOP BARS, WORDS, LANE LINES, SYMBOLS AND ARROWS SHALL BE THERMOPLASTIC (T).

NHDOT–3

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

ROADWAY ACCESS DETAIL SHEET
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

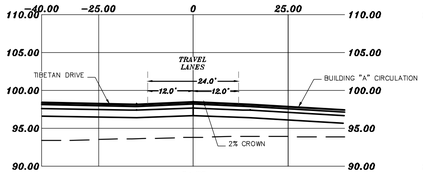
SCALE : 1 IN. EQUALS 10 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

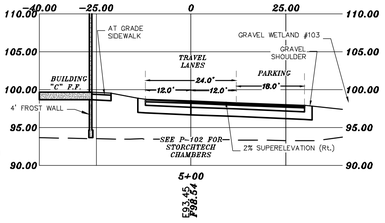
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14249
LICENSED PROFESSIONAL ENGINEER

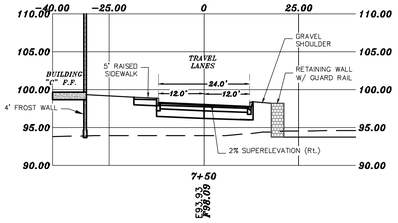
NOT FOR CONSTRUCTION

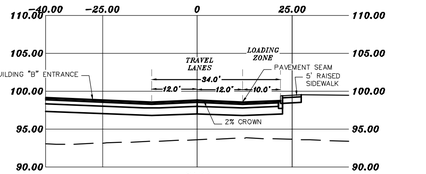
NOTE: *CURBING IS V.G.C. ALONG SIDEWALKS AND S.G.C. IN NON-SIDEWALK AREAS*

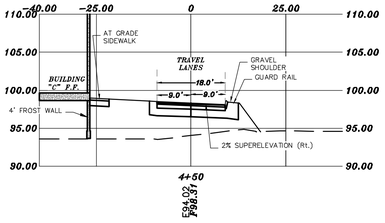
TIBETAN DRIVE 0+00-END

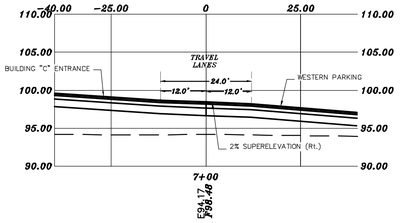


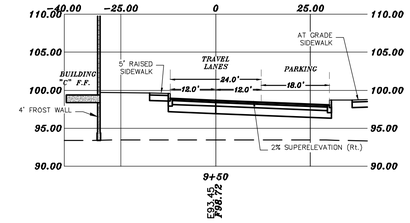


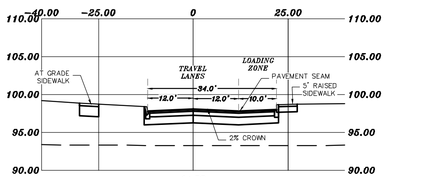


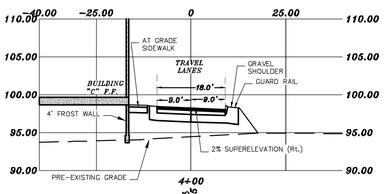


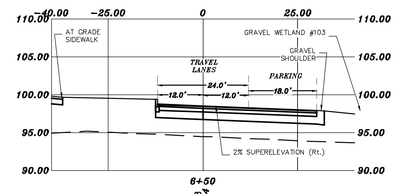


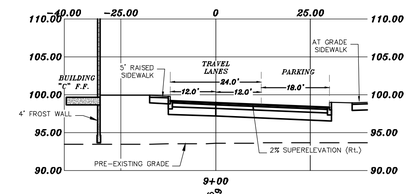


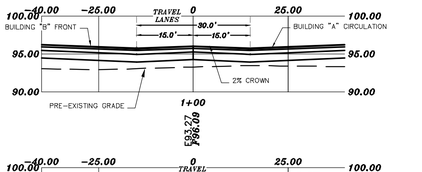


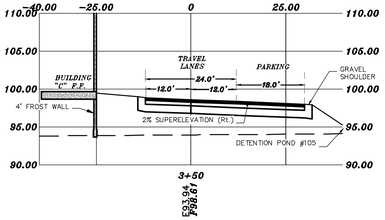


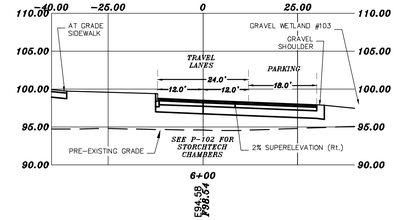


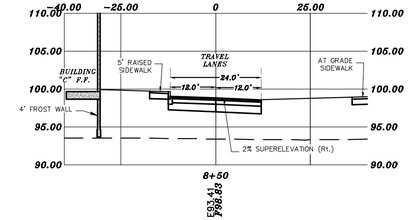


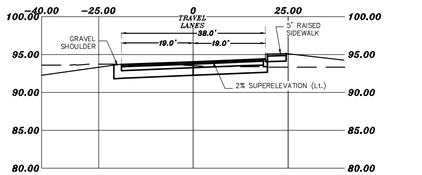


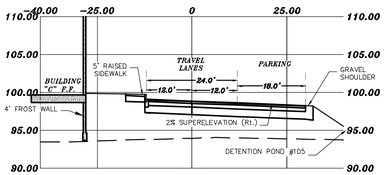


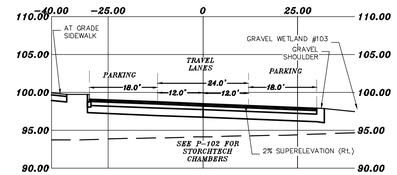


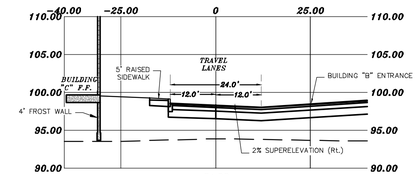












GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale 10

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

CROSS SECTIONS TIBETAN DRIVE 0+00-END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

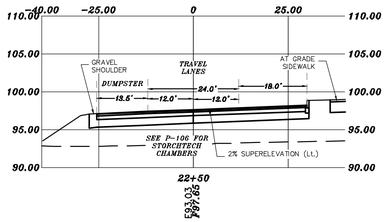
SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

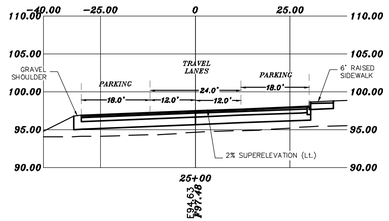
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

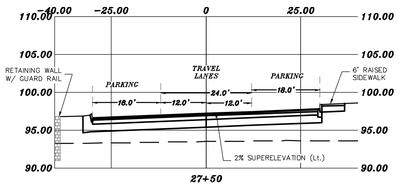
NOT FOR CONSTRUCTION

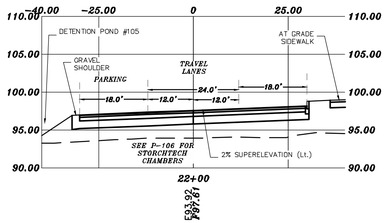
NOTE: *CURBING IS V.G.C. ALONG SIDEWALKS AND S.G.C. IN NON-SIDEWALK AREAS*

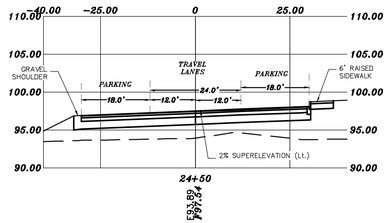
BUILDING "A" CIRCULATION AND BUILDING "B" FRONT 20+00-END

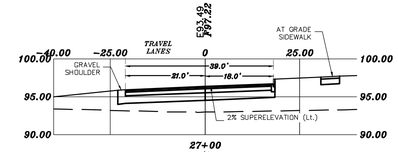


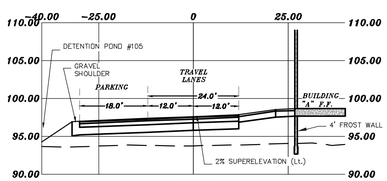


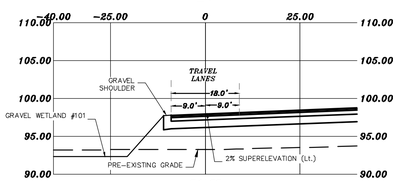


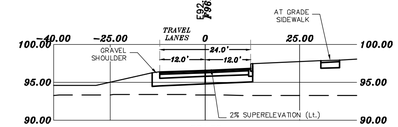


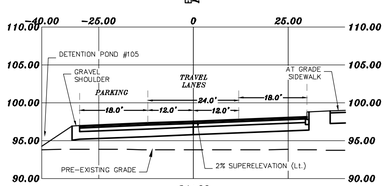


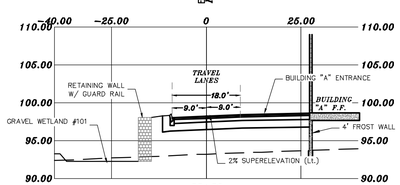


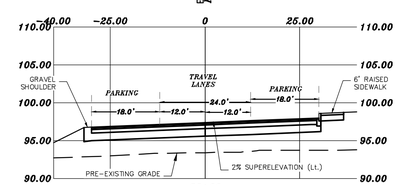


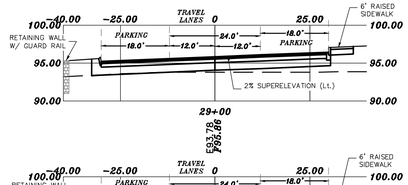


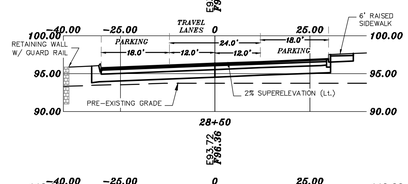


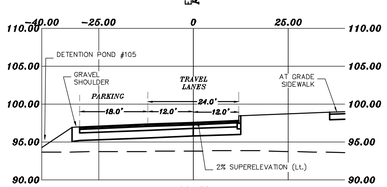


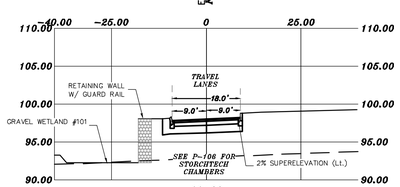


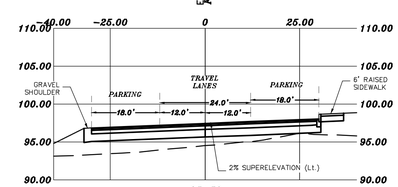


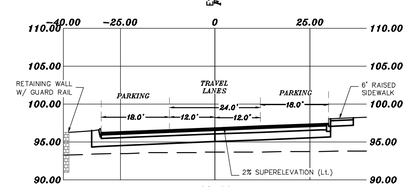






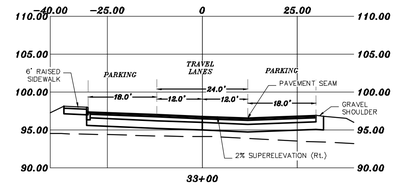


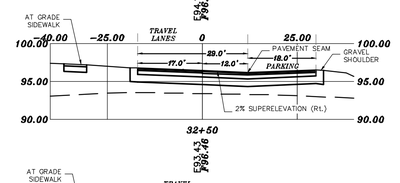


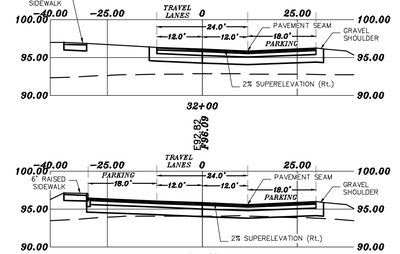


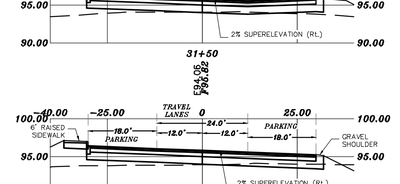
NOTE: *CURBING IS V.G.C. ALONG SIDEWALKS AND S.G.C. IN NON-SIDEWALK AREAS*

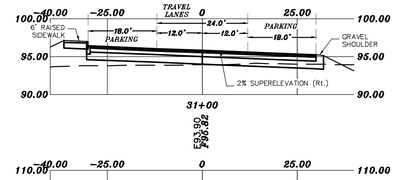
WESTERN PARKING LOT 30+00-END

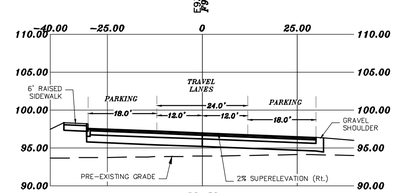












GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale 10

PLANNING FILE #SITE-XXXX-XXXX

DESCRIPTION	DATE	REVISION

CROSS SECTIONS 20+00-END & 30+00-END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

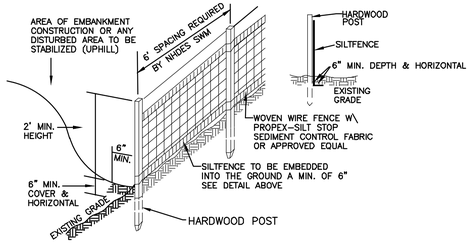
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14249 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

E1



SILT FENCE CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES AND FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP MID AND BOTTOM SECTIONS AND BE EMBEDDED INTO GROUND A MINIMUM OF 8" THE FENCE POSTS SHALL BE A MINIMUM 48" LONG, SPACED A MAXIMUM 6' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF. SEE MAINTENANCE NOTE BELOW.
4. REMOVAL OF SEDIMENT REQUIRED AT A DEPTH OF 6-INCHES.
4. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
5. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER.
6. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE-VEGETATED.
7. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, SILT FENCE, PAGE 90.

SILT FENCE 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 MADE 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 REMOVED WHEN THEY REACH SIX-INCHES IN DEPTH.
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 DETAIL
NOT TO SCALE

E2

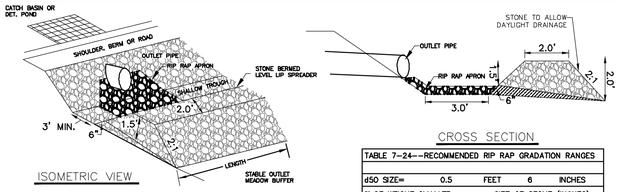
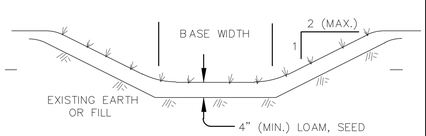


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

1. CONSTRUCT THE LEVEL SPREADER LIP ON A 0% GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING EXCELSIOR ENFORCER MATTING BENEATH THE STONE. EACH STRIP SHALL OVERLAP BY AT LEAST SIX INCHES.
4. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
5. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE LIP HAS BEEN DAMAGED AND THE DESIGN CONDITIONS HAVE NOT CHANGED. ANY DETRIMENTAL SEDIMENT ACCUMULATION SHOULD BE REMOVED. IF STONE REMOVAL HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED.
6. REFERENCE IS MADE TO NHDES SWM VOL. 2, 4-6, STONE BERM LEVEL SPREADERS, PAGE 162

STONE BERM LEVEL SPREADER
NOT TO SCALE

E3



GRASS CONVEYANCE SWALE
NOT TO SCALE

INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATIONS, VEGETATION LOSS, & INVASIVE SPECIES. REPAIR AS NECESSARY.

MOW GRASS ANNUALLY TO A DEPTH OF 4".

INSTALL STABILIZATION MATTING DURING CONSTRUCATION

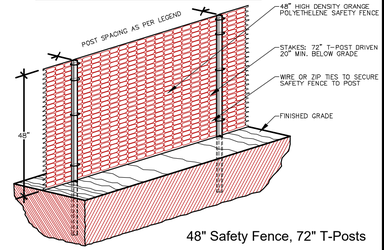
TO BE CONSTRUCTED IAW NH SWM #2 CHAPTER 4, #5 TREATMENT SWALES, PAGE 123.

E4

CONSTRUCTION SAFETY FENCE
NOT TO SCALE

LEGEND

SAF12	48" ORANGE FENCE, 12 FEET O.C.
SAF11	48" ORANGE FENCE, 11 FEET O.C..
SAF10	48" ORANGE FENCE, 10 FEET O.C.
SAF9	48" ORANGE FENCE, 9 FEET O.C.
SAF8	48" ORANGE FENCE, 8 FEET O.C..
SAF7	48" ORANGE FENCE, 7 FEET O.C.
SAF6	48" ORANGE FENCE, 6 FEET O.C.

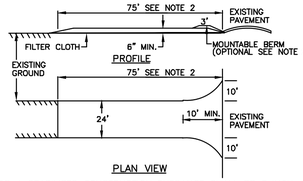


48" Safety Fence, 72" T-Posts

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
3. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
4. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS.
5. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

E5

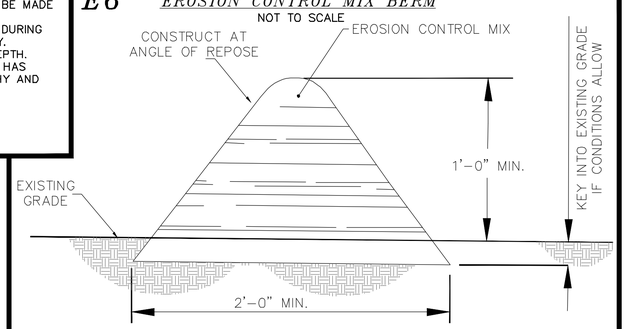
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH ANGULAR STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE 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, WHICH EVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING
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 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 PUBLIC RIGHTS-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 PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CONSTRUCTION EXIT, PAGE 124.

E6

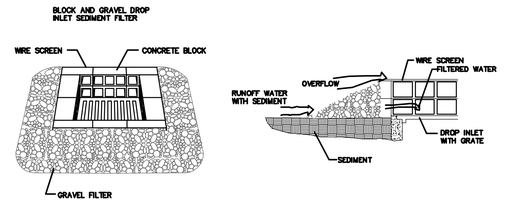
EROSION CONTROL MIX BERM
NOT TO SCALE



EROSION CONTROL MIX BERMS SHALL BE USED ONLY AS FOLLOWS:

1. BERMS SHALL BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE BERM.
2. THE BERMS SHALL BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSLY AS POSSIBLE.
3. THE BERMS SHALL BE INSTALLED ON SLOPES LESS THAN 5%.
4. SUBJECT TO (E), BELOW, THE MIX SHALL HAVE AN ORGANIC PORTION BETWEEN 80 AND 100% DRY WEIGHT BASIS, AND BE FIBROUS AND ELONGATED SUCH AS FROM SHREDDED BARK, STUMP GRINDINGS, COMPOSED BARK, OR EQUIVALENT MANUFACTURED PRODUCTS.
5. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSED WOOD PRODUCTS SHALL NOT BE USED AS ORGANIC MATERIAL.
6. THE MIX SHALL NOT CONTAIN SILTS, CLAY, OR FINE SANDS.
7. THE MIX SHALL HAVE A PARTICLE SIZE BY WEIGHT OF 70 TO 85% PASSING A 6-INCH SCREEN AND A MAXIMUM OF 85% PASSING THE 0.75-INCH SCREEN.
8. THE MIX PH SHALL BE BETWEEN 5.0 AND 8.0.
9. THE BERM SHALL BE AT LEAST 12 INCHES HIGH AND AT LEAST 2 FEET WIDE.
10. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, EROSION CONTROL MIX BERMS, PAGE 106.

E7



MAINTENANCE

ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM 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 OF IN A SUITABLE 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.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER
NOT TO SCALE

1) TO BE USED ONLY IN ALL AREAS WHERE THERE WILL BE NO TRAFFIC.

2) TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

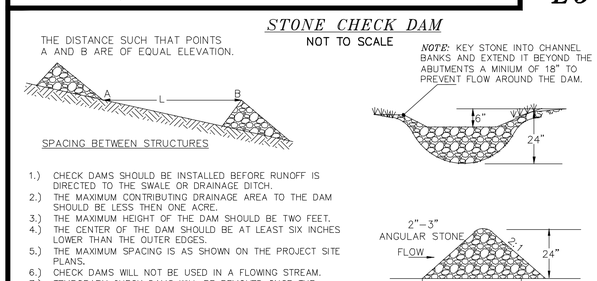
E8

TEMPORARY EROSION CONTROL MEASURES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME.
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 SHALL BE RETURNED TO ORIGINAL GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. (SEE SEED SPECIFICATIONS THIS SHEET)
4. ALL DISTURBED AREAS WILL BE RESTABILIZED WITHIN 45 DAYS. AT ANY ONE TIME, NO MORE THAN 5 ACRES, (217,800 Sq. Ft.) WILL BE DISTURBED.
5. SILT FENCES AND PERIMETER BARRIERS SHALL BE INSPECTED PERIODICALLY AND AFTER EVERY RAIN DURING THE LIFE OF THE PROJECT. ALL DAMAGED AREAS SHALL BE REPAIRED, SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
6. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
7. PER THE EPA CGP REQUIREMENTS THERE WILL BE REPORTS OF THE EROSION CONTROL INSPECTIONS IAW SWPPP PREPARED BY BS&E. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OR GREATER RAIN EVENT.
8. DITCHES, SWALES, AND BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
10. ROADWAYS, DRIVEWAYS AND CUT AND FILL SLOPES MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINAL GRADE.
11. STABILIZATION MEANS:
    - 11.1. A MINIMUM OF 85% OF VEGETATIVE COVER HAS BEEN ESTABLISHED.
    - 11.2. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED, OR
    - 11.3. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
12. THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
13. THE NHDES STORMWATER MANUAL, IN THREE VOLUMES, DATED DECEMBER 2008, IS A PART OF THIS PLAN SET AND THE MORE RESTRICTIVE WILL GOVERN. (NH SWM)

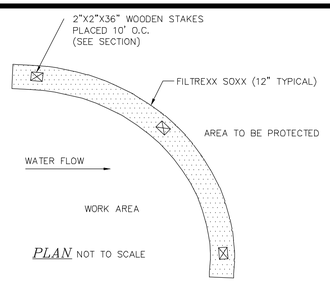
E9

STONE CHECK DAM
NOT TO SCALE



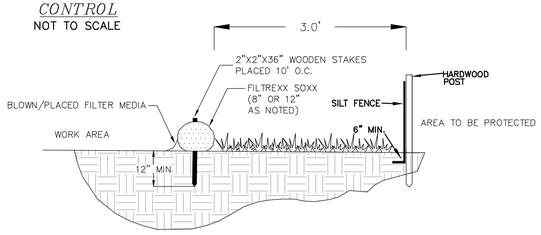
1.) CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2.) THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THEN ONE ACRE.
3.) THE MAXIMUM HEIGHT OF THE DAM SHOULD BE TWO FEET.
4.) THE CENTER OF THE DAM SHOULD BE AT LEAST SIX INCHES LOWER THAN THE OUTER EDGES.
5.) THE MAXIMUM SPACING IS AS SHOWN ON THE PROJECT SITE PLANS.
6.) CHECK DAMS WILL NOT BE USED IN A FLOWING STREAM.
7.) TEMPORARY CHECK DAMS WILL BE REMOVED ONCE THE SWALE OR DITCH IS DETERMINED STABLE.
8.) TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CHECK DAMS, PAGE 114.

E10



PLAN NOT TO SCALE

FILTREXX SEDIMENT CONTROL
NOT TO SCALE



NOTES

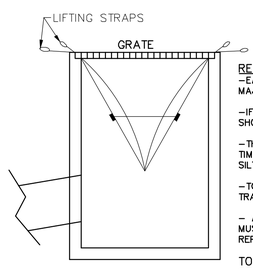
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIRMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. SILTSOXX MAY BE USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
5. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIRMENTS OF THE SPECIFIC APPLICATION.
6. FILTREXX SOXX IS A REGISTERED TRADEMARK OF FILTREXXIN TERNATIONAL, LLC.
7. SILT FENCE IS NOT A SUBSTITUTION FOR SILT SOXX AND ANY EQUAL SUBSTITUTION TO BE APPROVED.
8. TO BE CONSTRUCTED IAW FILTREXX, SECTION 1:EROSION & SEDIMENT CONTROL (PAGE 323) - CONSTRUCTION ACTIVITIES, SWPPP CUT SHEET: FILTREXX SEDIMENT CONTROL

Filtrexx International, LLC
35481 Grafton Eastern Rd | Grafton, Oh 44044
440-926-2607 | fax: 440-926-4021
WWW.FILTREXX.COM
OR APPROVED EQUAL

NOTE: FOR AREAS REQUIRING DOUBLE PERIMETER CONTROL WITHIN 50' OF JURISDICTIONAL WETLANDS AND NOT FOR ALL SILT SOXX APPLICATIONS. THIS DUPLICATION MAY BE SPECIFIED AS 12" SILT SOXX OR ORANGE CONSTRUCTION FENCE AS NOTED.

SECTION NOT TO SCALE

E11



RECOMMENDED MAINTENANCE SCHEDULE

-EACH SILTSACK SHOULD BE INSPECTED AFTER EVERY MAJOR RAIN EVENT, AND MUST BE MAINTAINED.

-IF THERE HAVE BEEN NO MAJOR EVENTS, SILTSACK SHOULD BE INSPECTED EVERY 2-3 WEEKS.

-THE RESTRAINT CORD SHOULD BE VISIBLE AT ALL TIMES. IF CORD IS COVERED WITH SEDIMENT, THE SILTSACK SHOULD BE EMPTIED.

-TO BE USED IN ALL AREAS WHERE THERE WILL BE TRAFFIC.

- ARE SUBJECT TO DAMAGE BY SNOW PLOWS, AND MUST BE INSPECTED AFTER ANY SNOW EVENT AND REPLACED AS REQUIRED.

TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

SILTSACK DETAIL
NOT TO SCALE

PLANNING FILE #SITE--XXXX-XXXX

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

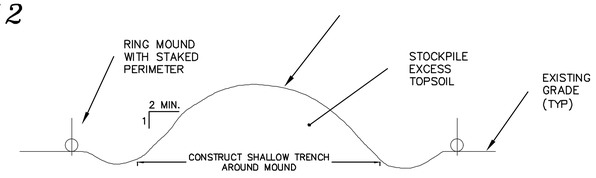
SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

E-101

NOT FOR CONSTRUCTION

E12



TO BE CONSTRUCTED IAW NH SWM #3 4-1 EROSION CONTROL PRACTICES, SOIL STOCKPILE PRACTICES, PAGE 46.

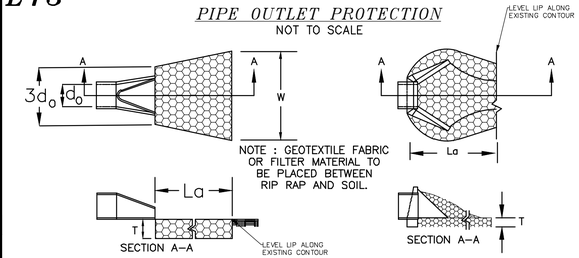
TOPSOIL STOCKPILE MOUND

NOT TO SCALE

E13

PIPE OUTLET PROTECTION

NOT TO SCALE



PIPE OUTLET PROTECTION
CONSTRUCTION SPECIFICATIONS

SPECIFIED GRADATION.

2. THE ROCK OR GRAVEL USED FOR FILTER OF RIP RAP SHALL CONFORM TO NHDOT SECTION 583.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP 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. TO BE CONSTRUCTED IAW NH SWM #2 4-6 CONVEYANCE PRACTICES, 6. OUTLET PROTECTION, PAGE 172.

E14

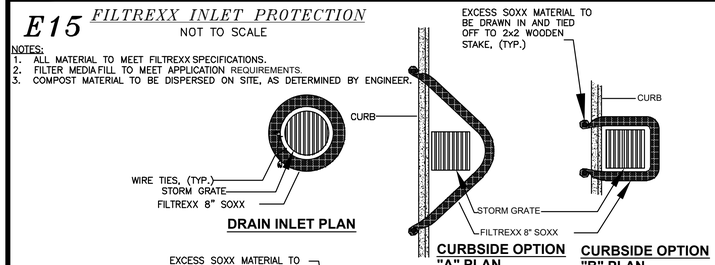
TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

E15

FILTREXX INLET PROTECTION

NOT TO SCALE

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.



New England Conservation/Wildlife Mix

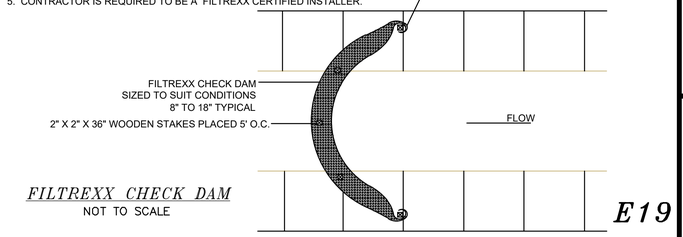
Botanical Name	Common Name	Indicator
Elymus virginicus	Virginia Wild Rye	FACW-
Schizachyrium scoparium	Little Bluestem	FACU
Andropogon gerardii	Big Bluestem	FAC
Festuca rubra	Red Fescue	FACU
Sorghastrum nutans	Indian Grass	UPL
Panicum virgatum	Switch Grass	FAC
Chamaecrista fasciculata	Partridge Pea	FACU
Dermodium canadense	Showy Tick Trefoil	FAC
Asclepias tuberosa	Butterfly Milkweed	NI
Bidens frondosa	Beggar Ticks	FACW
Eupatorium purpureum (Eutrochium maculatum)	Purple Joe Pye Weed	FAC
Rudbeckia hirta	Black Eyed Susan	FACU-
Aster pilosus (Symphyotrichum pilosum)	Heath (or Hairy) Aster	UPL
Solidago juncea	Early Goldenrod	

PRICE PER LB. $39.50 MIN. QUANITY 2 LBS. TOTAL: $79.00 APPLY: 25 LBS/ACRE :1750 sq ft/lb

CONSERVATION MIX TO BE PROVIDED BY NEW ENGLAND WETLAND PLANTS, INC, OR APPROVED EQUAL

NOTE: CONSERVATION MIX TO BE USED ON ALL 2:1 SLOPES LINED WITH RECB.

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. CHECK DAM SHOULD BE USED IN AREAS THAT DRAIN 1 ACRE OR LESS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
4. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.
5. CONTRACTOR IS REQUIRED TO BE A FILTREXX CERTIFIED INSTALLER.

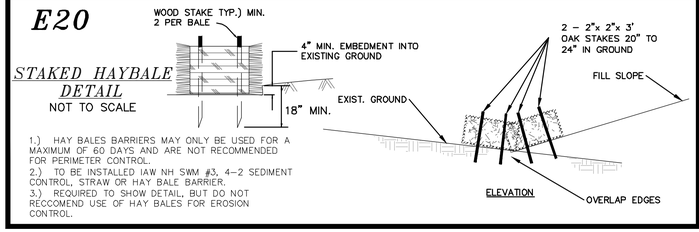


FILTREXX CHECK DAM

NOT TO SCALE

E19

E20



STAKED HAYBALE DETAIL

NOT TO SCALE

1.) HAY BALES BARRIERS MAY ONLY BE USED FOR A MAXIMUM OF 60 DAYS AND ARE NOT RECOMMENDED FOR PERIMETER CONTROL.
2.) TO BE INSTALLED IAW NH SWM #3, 4-2 SEDIMENT CONTROL, STRAW OR HAY BALE BARRIER.
3.) REQUIRED TO SHOW DETAIL, BUT DO NOT RECCOMEND USE OF HAY BALES FOR EROSION CONTROL.

NOTE: Temporary seed mix for stabilization of soil shall be winter rye or oats at a rate of 2.5 lbs. per 1000 s.f. and shall be applied prior to OCT. 15, if permanent seeding not yet complete.

NOTE: THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

E16

SEEDING GUIDE

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	GOOD	GOOD	EXCELLENT
	E	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	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
	D	FAIR	GOOD	GOOD	EXCELLENT
PLAY AREAS AND athletic FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	F	FAIR	EXCELLENT	EXCELLENT	2/
	G	FAIR	EXCELLENT	EXCELLENT	2/

RECOMMENDED

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 7-36.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

SEEDING RATES

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	24	0.55
CREEPING RED FESCUE	24	0.55
BIRDS FOOT TREFOIL	REMOVED	REMOVED
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

*

Retention Basin Floor Mix - Low Maintenance - ERNMX-126

	Botanical Name	Common Name	Price/Lb
20.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga	22.68
20.00 %	*Poccinellia distans, Fults*	Alkaligrass, Fults	4.56
18.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype	8.96
15.00 %	*Agrostis stolonifera, Pennacross'*	Creeping Bentgrass, 'Penacross'	14.40
15.00 %	*Poa palustris*	Fowl Bluegrass	15.80
10.00 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedges, PA Ecotype	28.80
1.00 %	*Carex scoparia, PA Ecotype*	Blunt Broom Sedge, PA Ecotype	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00
100.00 %		Mix Price/Lb Bulk:	$15.98

Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the folowing: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

NOTE: TO BE USED FOR STORMWATER BMPS

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1;3:1 SLOPES OR FLATTER ARE PREFERRED.
   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 SEED BED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN 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 KINDS 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 100LBS. PER 1,000 SQ.FT.
   NITROGEN(N), 50LBS. PER ACRE OR 1.1LBS. PER 1,000 SQ.FT.
   PHOSPHATE(P2O5), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   POTASH(K2O), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   (NOTE: THIS IS THE EQUIVALENT OF 500LBS. PER ACRE OF 10-20-20 FERTILIZER
   OR 1,000LBS. 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 TABLE(G-E1 THIS SHEET) FOR APPROPRIATE SEED MIXTURES AND TABLE(H-E1 THIS SHEET) FOR RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT TREFOIL, AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
   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 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
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 90LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREA 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 PERENNIAL STAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.
6. TO BE CONSTRUCTED IAW NH SWM #3 4-1 EROSION CONTROL PRACTICES, PERMANENT VEGETATION, PAGE 60.
7. SEE STORMWATER BMP DETAIL SHEETS FOR SPECIFIC PLANTING INSTRUCTIONS AND SEEDING.

E17

CONSTRUCTION SEQUENCE:

1.) CUT AND REMOVE TREES IN CONSTRUCTION AREA ONLY AS REQUIRED, RELOCATE ANY PROJECT T.B.M.

2.) CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITIES AS SPECIFIED. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY THE COMMUNITY SERVICES DEPARTMENT.

3.) EROSION, SEDIMENT AND DETENTION CONTROL FACILITY SHALL BE INSTALLED & STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM. TEMPORARY DIVERSIONS MAY BE REQUIRED. POST CONSTRUCTION STORM WATER MANAGEMENT PRACTICES MUST BE INITIATED AND STABILIZED EARLY IN THE PROCESS. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPs ARE STABILIZED.

4.) CLEAR, CUT AND DISPOSE OF DEBRIS IN APPROVED FACILITY

5.) CONSTRUCT TEMPORARY CULVERTS AS REQUIRED, OR DIRECTED

6.) CONSTRUCT ROADWAYS FOR ACCESS TO DESIRED CONSTRUCTION AREAS. ALL ROADS SHALL BE STABILIZED IMMEDIATELY. SEE BEST MANAGEMENT PRACTICES FOR BLASTING ON SHEET C-102.

7.) INSTALL PIPE AND CONSTRUCTION ASSOCIATED APPURTENANCES AS REQUIRED OR DIRECTED. INSTALL STORMWATER BMPS. ALL DISTURBED AREAS SHALL STABILIZED IMMEDIATELY AFTER GRADING.

8.) START BUILDING CONSTRUCTION.

9.) BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED OR MULCHED AS REQUIRED, OR DIRECTED. NO AREA IS ALLOWED TO BE DISTURBED FOR A LENGTH OF TIME THAT EXCEEDS 45 DAYS BEFORE BEING STABILIZED, DAILY, OR AS REQUIRED. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES. LIMIT THE LENGTH OF EXPOSURE OF UNSTABILIZED SOIL TO 45 DAYS OR LESS.

10.) CONSTRUCT TEMPORARY BERMS, DRAINS DITCHES, SILT FENCES, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED.

11.) INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION. ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORM WATER INSPECTOR (CESSW), OR A CERTIFIED PROFESSIONAL IN STORM WATER QUALITY (CPSWQ) INSPECTION REPORTS SHALL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT. EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSPECTED WEEKLY AND AFTER 0.5" OF RAINFALL.

12.) COMPLETE PERMANENT SEEDING AND LANDSCAPING.

13.) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE.

14.) SMOOTH AND REVEGETATE ALL DISTURBED AREAS.

15.) FINISH PAVING ALL ROADWAYS.

E18

DEFINITION OF STABLE:

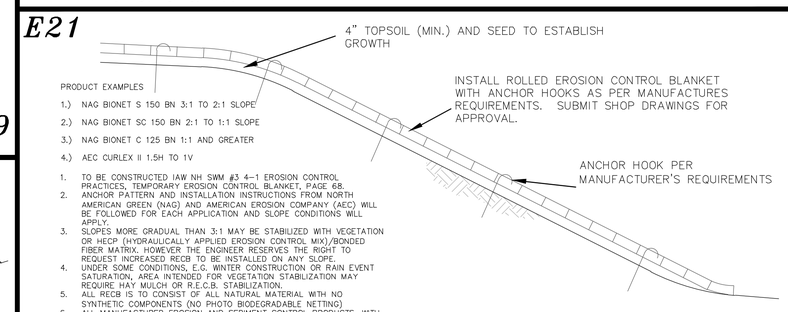
PER ENV-WQ 1500 ALTERATION OF TERRAIN

1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
2. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED..
3. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED.
4. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

ADDITION STABILIZATION NOTES:

5. HAY MULCH OR OTHER APPROVED METHODS SHALL BE USED TO CONTROL EROSION OF NEWLY GRADED AREAS. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS AFTER THEIR CONSTRUCTION.
6. DISTURBED SOIL AREAS SHALL BE EITHER TEMPORARILY OR PERMANENTLY STABILIZED. IN AREAS WHERE FINAL GRADING HAS NOT OCCURRED, TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN (7) CALENDAR DAYS FOR EXPOSED SOIL AREAS THAT ARE WITHIN ONE HUNDRED (100) FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE (3) CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.

E21



PRODUCT EXAMPLES

1.) NAG BIONET S 150 BN 3:1 TO 2:1 SLOPE
2.) NAG BIONET SC 150 BN 2:1 TO 1:1 SLOPE
3.) NAG BIONET C 125 BN 1:1 AND GREATER
4.) AEC CURLEX II 1.5H TO 1V

1. TO BE CONSTRUCTED IAW NH SWM #3 4-1 EROSION CONTROL PRACTICES, TEMPORARY EROSION CONTROL BLANKET, PAGE 68.
2. ANCHOR PATTERN AND INSTALLATION INSTRUCTIONS FROM NORTH AMERICAN GREEN (NAG) AND AMERICAN EROSION COMPANY (AEC) WILL BE FOLLOWED FOR EACH APPLICATION AND SLOPE CONDITIONS WILL APPLY.
3. SLOPES MORE GRADUAL THAN 3:1 MAY BE STABILIZED WITH VEGETATION OR HECP (HYDRAULICALLY APPLIED EROSION CONTROL MIX)/BONDED FIBER MATRIX. HOWEVER THE ENGINEER RESERVES THE RIGHT TO REQUEST INCREASED RECB TO BE INSTALLED ON ANY SLOPE.
4. UNDER SOME CONDITIONS, E.G. WINTER CONSTRUCTION OR RAIN EVENT SATURATION, AREA INTENDED FOR VEGETATION STABILIZATION MAY REQUIRE HAY MULCH OR R.E.C.B. STABILIZATION.
5. ALL RECB IS TO CONSIST OF ALL NATURAL MATERIAL WITH NO SYNTHETIC COMPONENTS (NO PHOTO BIODEGRADABLE NETTING)
6. ALL MANUFACTURED EROSION AND SEDIMENT CONTROL PRODUCTS, WITH THE EXCEPTION OF TURF REINFORCEMENT MATS, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, INLET PROTECTION, CHECK DAMS, AND SEDIMENT TRAPS SHALL NOT CONTAIN PLASTIC, OR MULTIFILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES.

ROLLED EROSION CONTROL BLANKET (RECB)
SLOPE STABILIZATION DETAIL

NOT TO SCALE

E22

1. ALL DISTURBED AREAS THAT DO NOT HAVE AT LEAST 85% VEGETATIVE COVERAGE PRIOR TO OCTOBER 15TH SHALL BE STABILIZED BY APPLYING MULCH AT A RATE OF 3-4 TONS PER ACRE. ALL SIDE SLOPES, STEEPER THAN 4:1, THAT ARE NOT DIRECTED TO SWALES OR DETENTION BASINS, SHALL BE LINED WITH BIODEGRADABLE/PHOTODEGRADABLE "JUTE MATTING" (EXCELSIOR'S CURLEX II OR EQUAL). ALL OTHER SLOPES SHALL BE MULCHED AND TACKED AT A RATE OF 3-4 TONS PER ACRE. THE APPLICATION OF MULCH AND/OR JUTE MATTING SHALL NOT OCCUR OVER EXISTING SNOW COVER. IF THE SITE IS ACTIVE AFTER OCTOBER 15TH, ANY SNOW THAT ACCUMULATES ON DISTURBED AREAS SHALL BE REMOVED. PRIOR TO SPRING THAW ALL AREAS WILL BE STABILIZED, AS DIRECTED ABOVE.

2. ALL SWALES THAT DO NOT HAVE FULLY ESTABLISHED VEGETATION SHALL BE EITHER LINED WITH TEMPORARY JUTE MATTING OR TEMPORARY STONE CHECK DAMS (APPROPRIATELY SPACED). STONE CHECK DAMS WILL BE MAINTAINED THROUGHOUT THE WINTER MONTHS. IF THE SWALES ARE TO BE MATTED WITH PERMANENT LINERS OR RIPRAP WITH ENGINEERING FABRIC, THIS SHALL BE COMPLETED PRIOR TO WINTER SHUTDOWN OR AS SOON AS THEY ARE PROPERLY GRADED AND SHAPED.

3. PRIOR TO OCT. 15TH ALL ROADWAY AND PARKING AREAS SHALL BE BROUGHT UP TO AND THROUGH THE BANK RUN GRAVEL APPLICATION. IF THESE AREAS' ELEVATIONS ARE PROPOSED TO REMAIN BELOW THE PROPOSED SUBGRADE ELEVATION, THE SUBGRADE MATERIAL SHALL BE ROUGHLY CROWNED AND A 3" LAYER OF CRUSHED GRAVEL SHALL BE PLACED AND COMPACTED. THIS WILL ALLOW THE SUBGRADE TO SHED RUNOFF AND WILL REDUCE ROADWAY EROSION. THIS CRUSHED GRAVEL DOES NOT HAVE TO CONFORM TO NH DOT 304.3, BUT SHALL HAVE BETWEEN 15-25% PASSING THE #200 SIEVE AND THE LARGEST STONE SIZE SHALL BE 2". IF THE SITE IS ACTIVE AFTER OCTOBER 15TH, ANY ACCUMULATED SNOW SHALL BE REMOVED FROM ALL ROADWAY AND PARKING AREAS.

4. AFTER OCTOBER 15TH, THE END OF NEW HAMPSHIRE'S AVERAGE GROWING SEASON, NO ADDITIONAL LOAM SHALL BE SPREAD ON SIDE SLOPES AND SWALES. THE STOCKPILES THAT WILL BE LEFT UNDISTURBED UNTIL SPRING SHALL BE SEEDED BY THIS DATE. AFTER OCTOBER 15TH, ANY NEW OR DISTURBED PILES SHALL BE MULCHED AT A RATE OF 3-4 TONS PER ACRE. ALL STOCKPILES THAT WILL REMAIN THROUGHOUT THE WINTER SHALL BE SURROUNDED WITH SILT FENCING.

5. ENV-WQ 1505.06 COLD WEATHER SITE STABILIZATION (B)(1) LIMITS ARE OF EXPOSURE TO ONE ACRE OF UNSTABILIZED SOIL WITHOUT OBTAINING A WAIVER AND WINTER CONSTRUCTION PLAN.

WINTER STABILIZATION NOTES

E-102

PLANNING FILE #SITE--XXXX--XXXX

REVISION	DATE	DESCRIPTION

EROSION & SEDIMENT CONTROL DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

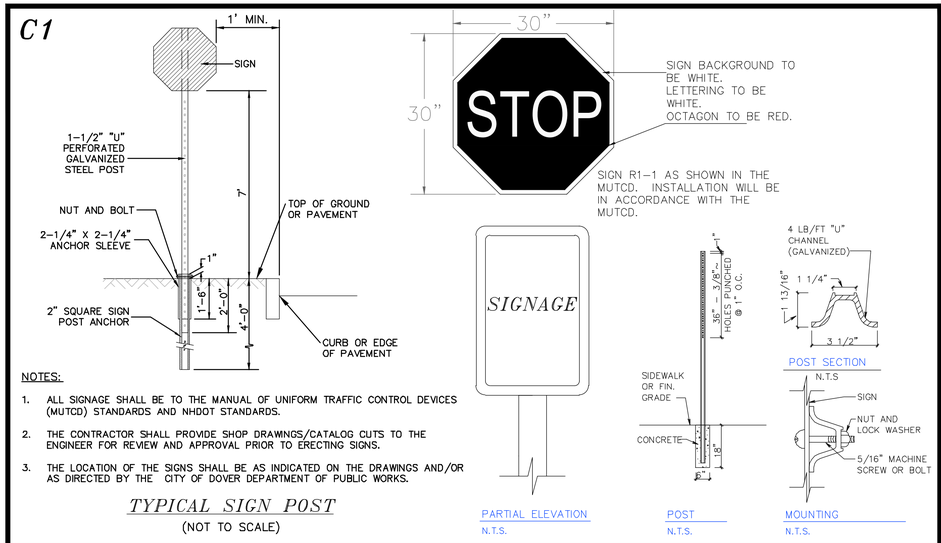
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

C1



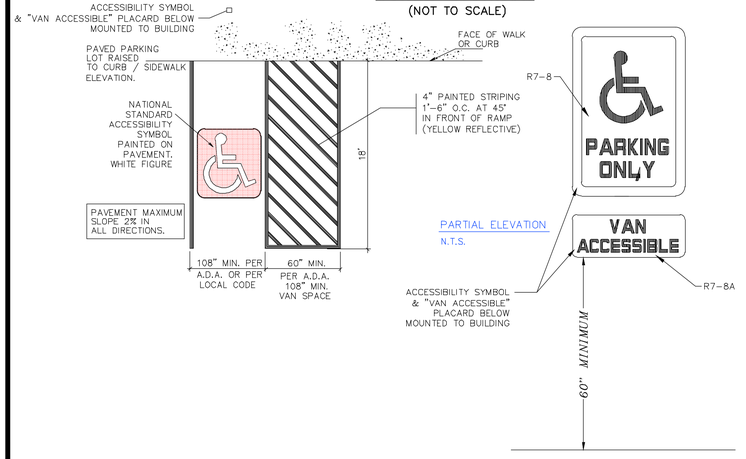
NOTES:

1. ALL SIGNAGE SHALL BE TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND NHDOT STANDARDS.
2. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS/CATALOG CUTS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ERECTING SIGNS.
3. THE LOCATION OF THE SIGNS SHALL BE AS INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS.

TYPICAL SIGN POST
(NOT TO SCALE)

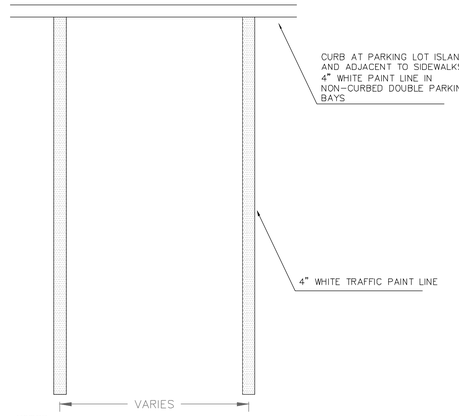
C2

ACCESSIBLE PARKING STALL SIGNAGE
(NOT TO SCALE)



C3

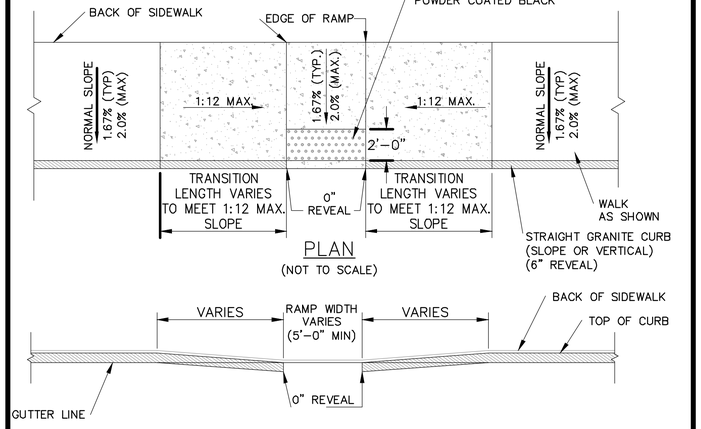
PARKING SPACE DETAIL
NOT TO SCALE



NOTES:

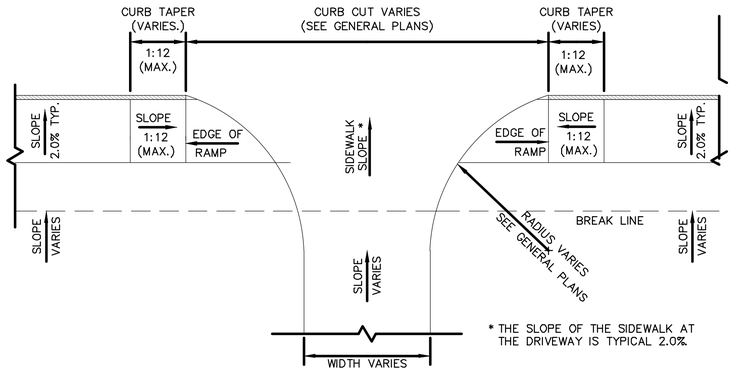
1.) PROVIDE TWO COATS OF PAINT ON ALL PARKING LINES.
2.) SEE PROPOSED SITE PLANS FOR LOCATION OF PARKING SPACES.
3.) PAINTED SPACES ONLY WHERE MARKED ON SITE PLAN

C4



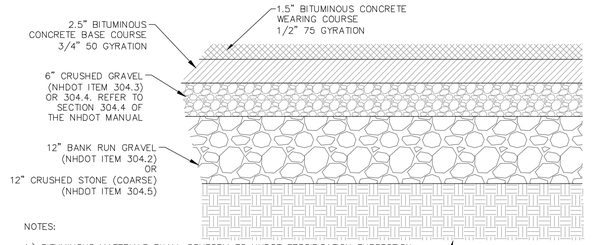
TYPICAL DETAIL FOR WHEELCHAIR RAMP

C5



PLAN VIEW (INTERSECTION & SIDEWALK)
NOT TO SCALE

C6



NOTES:

1.) BITUMINOUS MATERIALS SHALL CONFORM TO NHDOT SPECIFICATION SUBSECTION 401.3.6.

2.) PAVEMENT BASE COURSE AGGEGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.3 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.

3.) PAVEMENT SUBBASE COURSE AGGREGATE AND AGGREGATE FOR SUBGRADE REPAIR AREAS SHALL BE SUITABLE FOR USE AS STRUCTURAL FILL AND BE PROOFROLLED AND COMPABED TO 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.

BITUMINOUS CONCRETE PAVEMENT SECTION
NOT TO SCALE

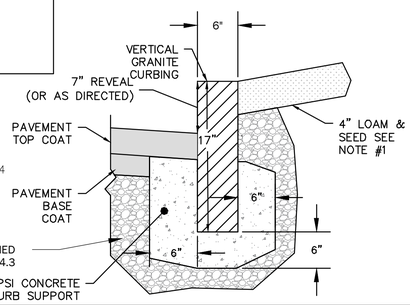
C7

RADIUS	MAX LENGTH
< 21'	USE CURVED CURB
12'	3'
22' – 28'	4'
29' – 35'	5'
36' – 42'	6'
43' – 49'	7'
50' – 56'	8'
57' – 60'	9'
OVER 60'	10'

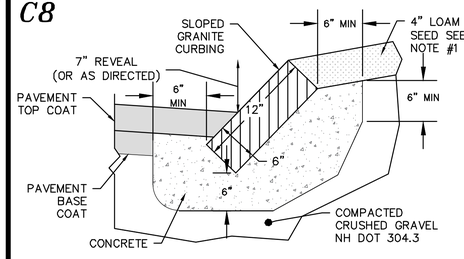
NOTES:

1. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

VERTICAL GRANITE CURB DETAIL
NOT TO SCALE

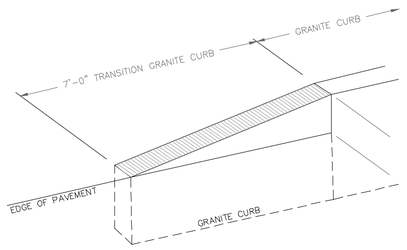


C8



SLOPE GRANITE CURB DETAIL
NOT TO SCALE

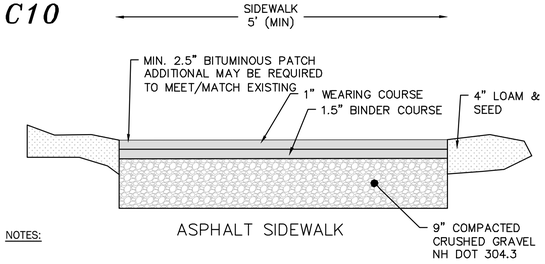
C9



CURB TRANSITION DETAIL
NOT TO SCALE

TO BE USED FOR TRANSITION FROM GRANITE CURB TO EDGE OF PAVEMENT

C10



NOTES:

1. MATERIALS SHALL BE IN ACCORDANCE WITH THE CITY OF DOVER STANDARDS SPECIFICATIONS.
2. SIDEWALK AND DRIVEWAY WIDTHS SHALL BE EQUAL TO EXISTING WIDTHS OR AS APPROVED AND SHALL SLOPE TO MATCH EXISTING ELEVATIONS.
3. BASE FOR THE SIDEWALKS AND DRIVEWAYS SHALL BE 9-INCHES OF CRUSHED GRAVEL.

BITUMINOUS SIDEWALK RAISED
NOT TO SCALE

C-101

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

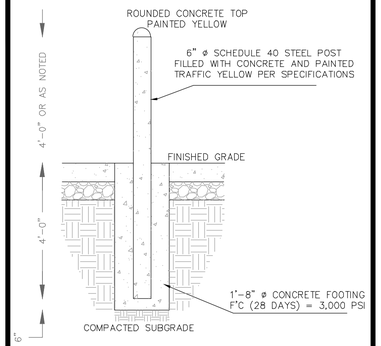
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

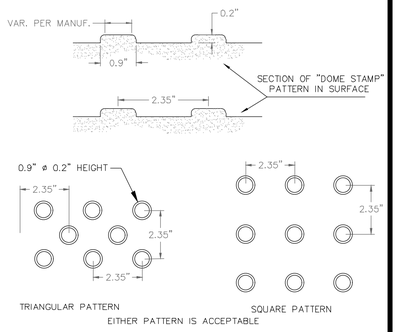
C10



BOLLARD DETAIL

NOT TO SCALE

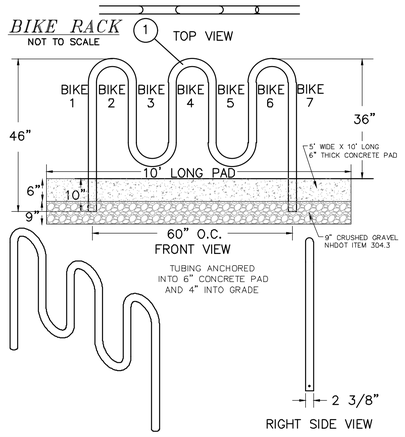
C11



DETECTABLE WARNING SURFACE

NOT TO SCALE

C12



C13

Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat

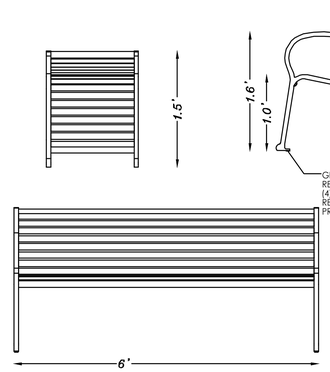
Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat
Product Drawing

www.landscapeforms.com

Date: 5/19/2010
Ph: 800.521.2546

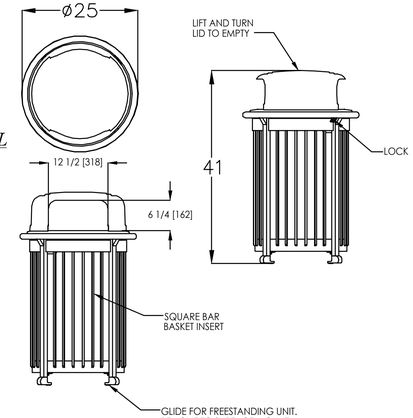
BENCH DETAIL

(NOT TO SCALE)



BIN DETAIL

(NOT TO SCALE)



landscapeforms

Drawing: SC173-02
Dimensions are in inches [mm]

landscapeforms

Drawing: SC173-02
Dimensions are in inches [mm]

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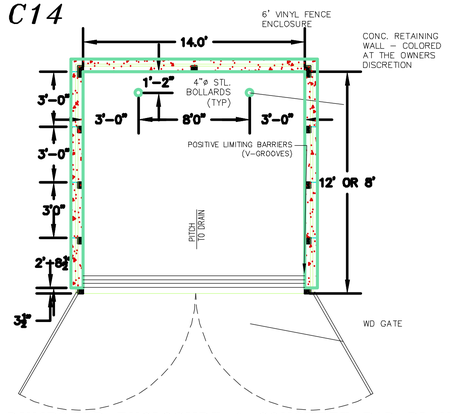
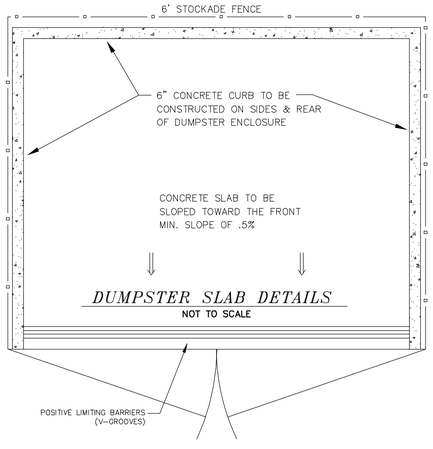
C14



DUMPSTER ENCLOSURE & CONCRETE PAD PLAN

NOT TO SCALE



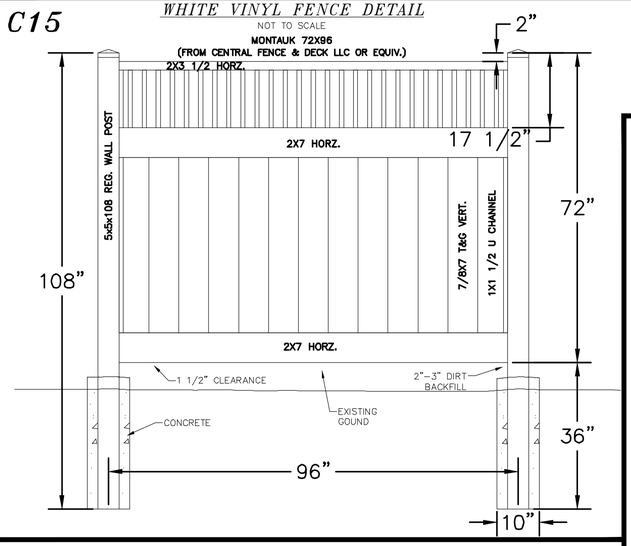
DUMPSTER SLAB DETAILS

NOT TO SCALE

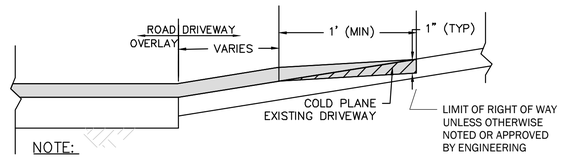
C15

WHITE VINYL FENCE DETAIL

NOT TO SCALE



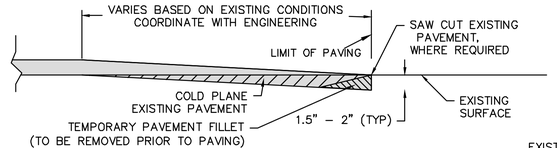
C16



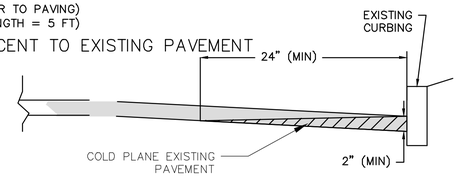
NOTE:

CONTRACTOR MAY SAWCUT DRIVEWAY TRANSITION AT HIS OPTION.
PAVEMENT SHALL BE REMOVED AND REPLACED TO MATCH EXISTING.

ADJACENT TO EXISTING DRIVEWAY



ADJACENT TO EXISTING PAVEMENT



ADJACENT TO EXISTING CURB

NOTES:

1. THE LENGTH OF THE TAPER MAY BE ADJUSTED AS ORDERED TO PROVIDE FOR VARYING FIELD CONDITIONS OR CHANGES IN SINGLE COURSE DEPTH.

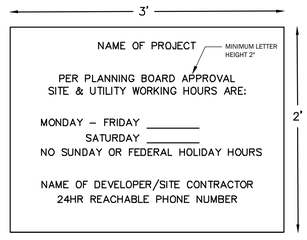
PAVEMENT OVERLAY

NOT TO SCALE

C17

REQUIRED PROJECT INFORMATION SIGN

NOT TO SCALE



NOTES:

1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND
3. TO BE PLACED AT THE INTERSECTION OF KNOX MARSH ROAD/TIBETAN DRIVE.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 12243
LICENSED PROFESSIONAL ENGINEER

C-102

NOT FOR CONSTRUCTION

C18

See Redi-Rock.com for Detailed Section Drawings of Each Condition Shown in the Design Charts

NOTE: RETAINING WALL TO BE DESIGNED BY A LICENSED PROFESSIONAL GEOTECHNICAL/STRUCTURAL ENGINEER.

NOTES:

1.) USE THE 41" BOTTOM BLOCK TO INSTALL THE FIRST COURSE. NOTE EMBEDMENT REQUIREMENT. COURSE DEPTH IS 1.5'

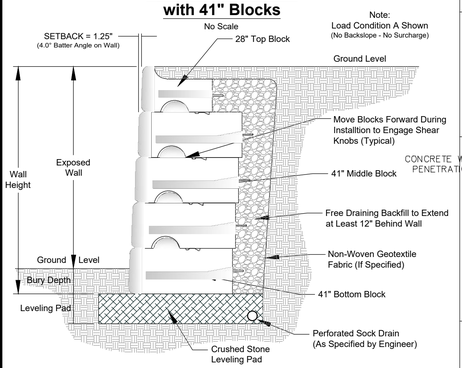
3.) USE 41" MIDDLE BLOCK FOR MIDDLE ROWS, APPROXIMATELY 7 COURSES DEPENDING ON WALL HEIGHT.

4.) USE 41" TOP BLOCK ALONG TOP OF WALL. NOTE WALL DROPS ARE TO BE FULL BLOCK DEPTHS.

5.) USE 41" HALF BLOCKS FOR RADIAL TURNS AND END SECTIONS.

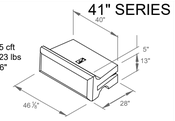
6.) THE WALL MANUFACTURER TYPICALLY PROVIDES WALL PROFILE AND BLOCK COUNT TO THE CONTRACTOR AS REQUIRED FOR CONSTRUCTION. THIS IS TO BE REVIEWED BY BOTH DPW AND DESIGN ENGINEER FOR CORRELATION WITH PROJECT SITE PLANS AND IS TO BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER (OTHERS).

Typical Gravity Wall with 41" Blocks

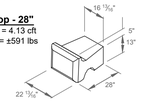


Note:
Load Condition A Shown
(No Backslope - No Surcharge)

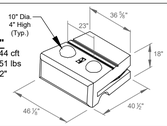
41" SERIES BLOCKS



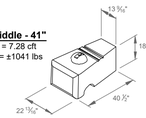
Top - 28"
Volume = 8.55 cft
Weight = ±1223 lbs
C of G = 15.06"



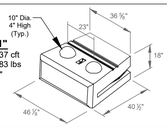
Half Top - 28"
Volume = 4.13 cft
Weight = ±591 lbs



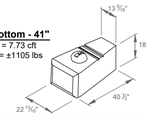
Middle - 41"
Volume = 16.44 cft
Weight = ±2351 lbs
C of G = 20.92"



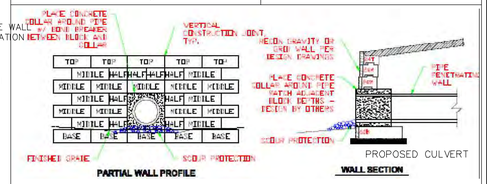
Half Middle - 41"
Volume = 7.28 cft
Weight = ±1041 lbs



Bottom - 41"
Volume = 17.37 cft
Weight = ±2483 lbs
C of G = 21.3"



Half Bottom - 41"
Volume = 7.73 cft
Weight = ±1105 lbs



CONCRETE WALL PENETRATION DETAIL

NOTES:

Volume and Center of Gravity (C of G) calculations are based on the blocks as shown.

Center of Gravity is measured from the back of the block.

Half blocks may include a fork lift slot on one side.

Actual weights and volumes may vary.

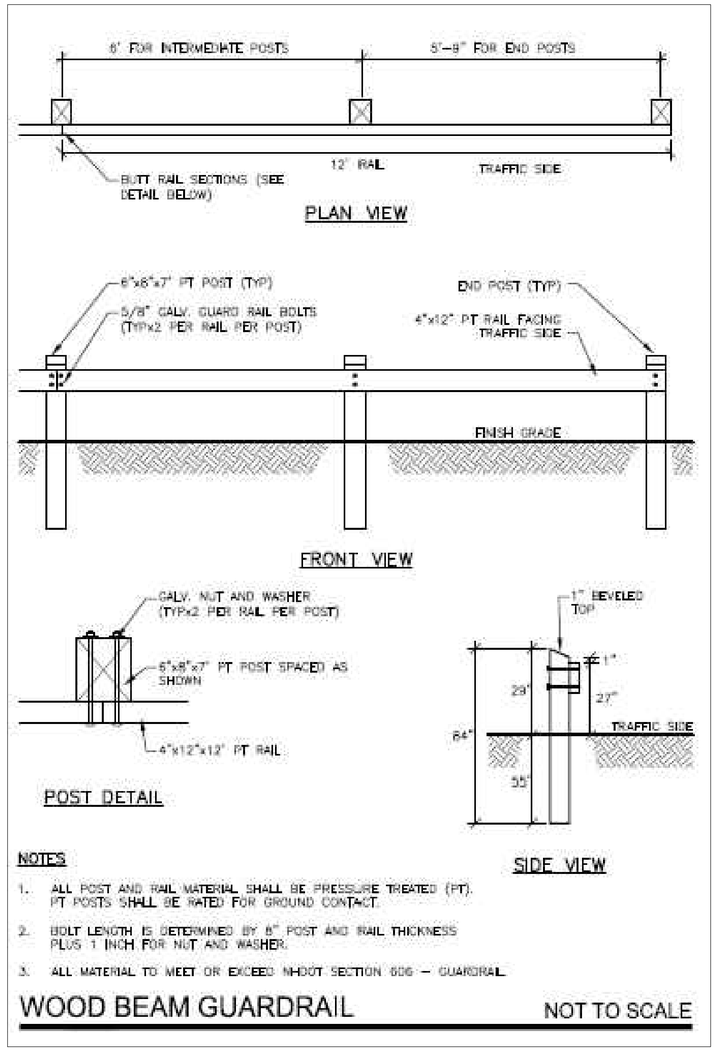
Weight shown is based on 143 pcf concrete.

Redi-Rock® International, LLC

RETAINING WALL DETAIL

NOT TO SCALE

C19



NOTES

1. ALL POST AND RAIL MATERIAL SHALL BE PRESSURE TREATED (PT). PT POSTS SHALL BE RATED FOR GROUND CONTACT.
2. BOLT LENGTH IS DETERMINED BY 6" POST AND RAIL THICKNESS PLUS 1 INCH FOR NUT AND WASHER.
3. ALL MATERIAL TO MEET OR EXCEED NHDOT SECTION 606 – GUARDRAIL

WOOD BEAM GUARDRAIL NOT TO SCALE

GUARD RAIL
(NOT TO SCALE)

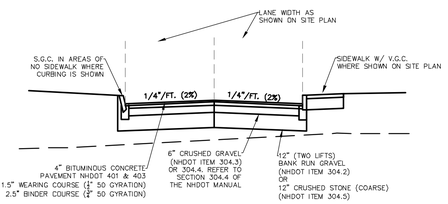
C20

CROSS SECTION NOTES

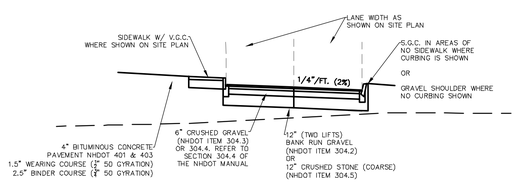
1. ALL ROADWAY FILL TO BRING ROAD TO SUBGRADE SHALL BE INSTALLED IN LIFTS NO GREATER THAN 12".

2. ALL FILL SHALL BE COMPACTED TO 95% MINIMUM. COMPACTION TESTS TO BE CONDUCTED AT THE START OF THE PROJECT AND NO FURTHER THAN 100 FEET APART.

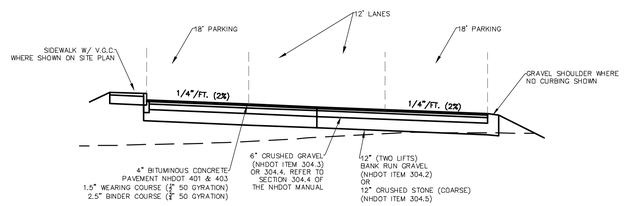
COMPACTED SUBGRADE – CONTRACTOR SHALL SCARIFY SUBGRADE TO A DEPTH OF 30 INCHES BELOW F-GRADE. ALL STONES GREATER THAN 6" IN DIAMETER SHALL BE REMOVED FROM THE SCARIFIED LAYER. ANY IMPORTED FILL SHALL BE FREE OF ORGANICS AND FROST AND SHALL HAVE NO ROCKS LARGER THAN 6" IN DIAMETER. FILL MATERIAL SHALL BE APPROVED BY THE TOWNS AGENT AND/OR THE TOWNS ENGINEER.



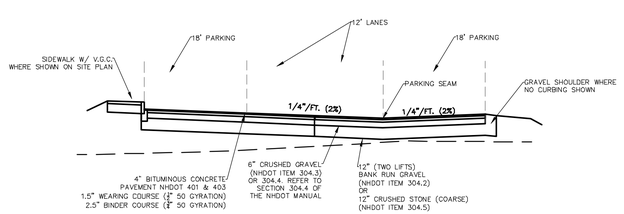
TYPICAL CROWNED ROADWAY SECTION
NOT TO SCALE



TYPICAL SUPERELEVATED ROADWAY SECTION
NOT TO SCALE



TYPICAL SUPERELEVATED PARKING LOT SECTION
NOT TO SCALE



TYPICAL SUPERELEVATED PARKING LOT SECTION W/ SEAM
NOT TO SCALE

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

C-103

NOT FOR CONSTRUCTION

C21

D-Series Size 0
LED Area Luminaire

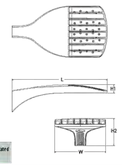
d-series

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	0.44 ft² (0.04 m²)
Length:	26.18" (66.5 cm)
Width:	14.06" (35.7 cm)
Height H1:	2.26" (5.7 cm)
Height H2:	7.45" (18.9 cm)
Weight:	23 lbs (9.4 kg)



Design Select option indicated by this color background.

Introduction

The modern styling of the D-Series features a highly refined aesthetic that blends seamlessly with its environment. The D-Series offers the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.
The photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. D-Series outstanding photometry aids in reducing the number of poles required in area lighting applications, with typical energy savings of 70% and expected service life of over 100,000 hours.

design select

Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.
*See ordering tree for details

Ordering Information

EXAMPLE: DSX0 LED P6 40K 70CRI T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED

Series	LEDs	Color temperature	Color rendering index	Distribution	Voltage	Mounting
DSX0 LED	Power and optics P1 P5 P2 P6 P3 P7 P4 Rotated optics P10 P12 P11 P13	(this section BLANK for only, extended lead times apply) 27K 2700K 30K 3000K 35K 3500K 40K 4000K 50K 5000K	70CRI 80CRI	AFR Automotive front TS Type I short T2M Type II medium T3M Type III medium T3S Type III low glare[1] T4M Type IV medium T4S Type IV low glare[1] TFTM Forward throw medium T5M Type V medium T5S Type V low glare T5W Type V wide RCCL Type III backlight control[2] LCCO Left corner cutoff[1] RCCO Right corner cutoff[1]	MVOLT (120V-277V)[3] VOLT (347V-480V)[3] HVOLT (277V-480V)[3] 120 V[4] 208 V[4] 240 V[4] 277 V[4] 347 V[4] 480 V[4]

Mounting	Shipped included
SPA Square pole mounting, (4) drilling, 3.5" min. (SQ poles)	
RPA Round pole mounting (4) drilling, 3" min. (RD poles)	
SPA90 Square pole mounting (4) drilling, 3" min. (SQ poles)[5]	
RPA90 Round pole mounting (4) drilling, 3" min. (RD poles)[5]	
SPA90 Square screw jack mounting (4) drilling, 3" min. (SQ poles)	
WBA Wall bracket[6]	
MA Mast arm adapter (mounts on 2 3/8" OD horizontal tenon)	

Control options	Other options	Finish (required)
Shipped installed NLTAIR2 PIRHN nLight AIR gen 2 enabled with bi-level motion & ambient sensor, 8–15' mounting height, ambient sensor enabled at 25 fc[7,8,9] PIR High/low, motion & ambient sensor, 8–15' mounting height, ambient sensor enabled at 25 fc[7,8,9] PER NEMA twist-lock receptacle only (controls ordered separately)[10] PERS Five-pin receptacle only (controls ordered separately)[10]	PE57 Seven-pinreceptacle only (controls ordered separately)[4,10] FAO Field adjustable output[11,12] BL30 Bi-level switched dimming, 30%[9,13] BL50 Bi-level switched dimming, 50%[9,13] DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)[9] DCE Bottom conduit entry for back box (PIRHN). Total of 4 entry points. CCE Coastal Construction[9]	Shipped installed HS Housing-side shield (black finish standard)[14] LNS Left notched optics[9] RNS Right notched optics[9] CCE Coastal Construction[9] WH 50°C ambient operation[15] BAA Buy American Act and/or Build America Buy America Qualified SF Single fuse (120, 277, 347V)[9] DF Double fuse (208, 240, 480V)[9] Shipped separately BSSR External Glare Shield (reversible, field install required, matches housing finish) BSSH Bird Spikes (field install required)

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white

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DSX0 LED
Rev. 11.15.24
Page 1 of 9

LAMP "A" MOUNTED 17'

C22

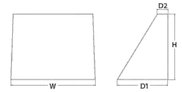
WDGE2 LED
Architectural Wall Sconce
Precision Refractive Optic

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight (without options)	13.5 lbs



Introduction

The WDGE LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDGE family provides additional energy savings and code compliance.
WDGE2 with industry leading precision refractive optics provides great uniform distribution and optical control. When combined with multiple integrated emergency battery backup options, including an 18W cold temperature option, the WDGE2 becomes the ideal wall-mounted lighting solution for pedestrian scale applications in any environment.

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*See ordering tree for details

WDGE LED Family Overview

Luminaire	Optics	Replaces 400W, QT	Color Rnd. -30°C	Neutral	Approximate Lumens (4000K, 80CRI)						
					P0	P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--	--
WDGE2 LED	Visual Comfort	10W	10W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000	--
WDGE2 LED	Precision Refractive	10W	10W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	--	2,500	8,500	10,000	12,000	--	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI T3M MVOLT SRM DDBXD

Series	Package	Color temperature	CRI	Distribution	Voltage	Mounting
WDGE2 LED	P0[16] P1[17] P2[17] P3[17] P4[17]	27K 2700K 30K 3000K 40K 4000K 50K 5000K AMB[18] Amber	70CRI 80CRI LW[19] Limited Wavelength	T1S Type I Short T2M Type II Medium T3M Type III Medium PIRR Type IV Medium TFTM Forward Throw Medium	MVOLT 347[20] 480[20]	Shipped included BSW Surface mounting bracket SCW Wall mount Corrugated Washer bracket (dry/damp locations only)[21]

Shipped separately
AWS 3/8inch Architectural wall spacer[2]
PBBW Surface-mounted back box (top, left, right conduit entry). Use when 1/2in junction box available[2]

Options	Finish
E10WH Emergency battery backup, Certified in CA Title 20 MAEDBS (10W, 0°C min) E20WC Emergency battery backup, Certified in CA Title 20 MAEDBS (10W, -20°C min) PE Photocell, Button Type[9] DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately)[9] DCE Bottom conduit entry for back box (PIRBW). Total of 4 entry points. CCE Coastal Construction[9]	Standalone Sensors/Controls PIR Bi-level (100/35%) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching. PIRH Bi-level (100/35%) motion sensor for 15-30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching. PIR1FC3V Bi-level (100/35%) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation. PIRHFC3V Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation. Networked Sensors/Controls NLTAIR2 PIR Embedded wireless controls by nLight with Passive Infrared Occ sensor and on/off photocell for 8-15' mounting heights. NLTAIR2 PIRH Embedded wireless controls by nLight with Passive Infrared Occ sensor and on/off photocell for 15-30' mounting heights. NLTAIRE2 PIR Embedded wireless controls by nLight with UL924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 8-15' mounting heights. NLTAIRE2 PIRH Embedded wireless controls by nLight with UL924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 15-30' mounting heights. See page 4 for out of box functionality	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSXD Sandstone DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone

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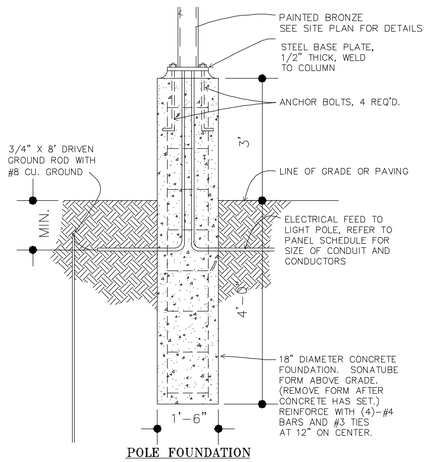
WDGE2 LED
Rev. 07/08/24

LAMP "B" MOUNTED 8' & 12'

C25



LIGHT BASE DETAIL
NOT TO SCALE

C23

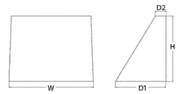
WDGE2 LED
Architectural Wall Sconce
Precision Refractive Optic

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight (without options)	13.5 lbs



Introduction

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WDGE LED Family Overview

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					P0	P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--	--
WDGE2 LED	Visual Comfort	10W	10W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000	--
WDGE2 LED	Precision Refractive	10W	10W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	--	2,500	8,500	10,000	12,000	--	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDGE2 LED P3 40K 80CRI T3M MVOLT SRM DDBXD

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Shipped separately
AWS 3/8inch Architectural wall spacer[2]
PBBW Surface-mounted back box (top, left, right conduit entry). Use when 1/2in junction box available[2]

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WDGE2 LED
Rev. 07/08/24

LAMP "C" MOUNTED 12'

C24

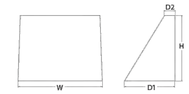
WDGE2 LED
Architectural Wall Sconce
Precision Refractive Optic

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight (without options)	13.5 lbs



Introduction

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WDGE2 LED
Rev. 07/08/24

LAMP "D" MOUNTED 12'

PLANNING FILE #SITE--XXXX--XXXX

REVISION	DATE	DESCRIPTION

CONSTRUCTION DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

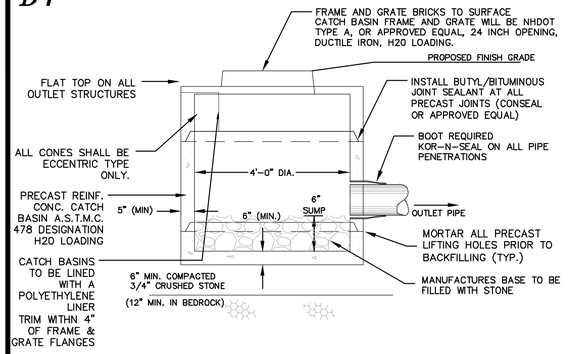
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

C–104

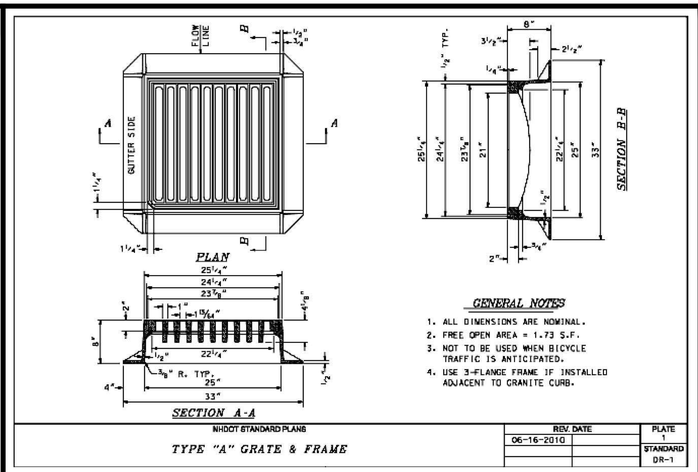
SHEET 51 OF 60

NOT FOR CONSTRUCTION

D1

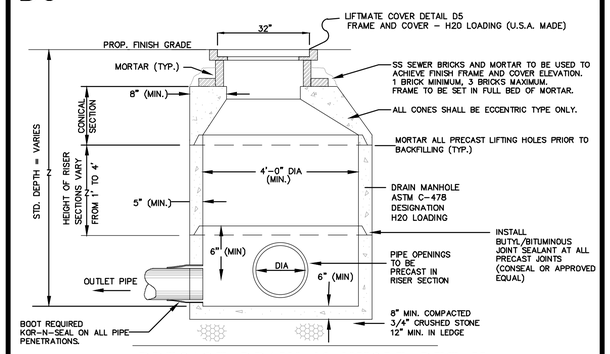


CATCH BASIN DETAIL
NOT TO SCALE



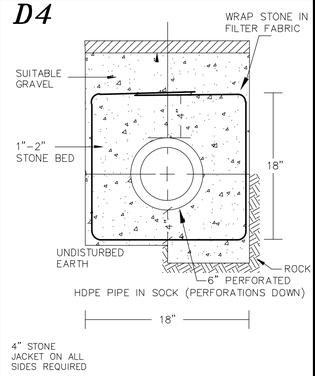
D2 *CATCH BASIN GRATE*
NOT TO SCALE

D3



PRECAST DRAIN MANHOLE DETAIL
NOT TO SCALE

D4



UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

D5

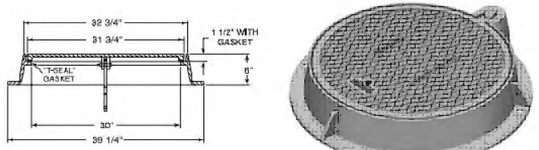
R-1743-LM
LiftMate Frame, Solid Gasketed Lid

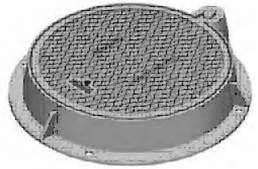
Heavy Duty

Furnished with four 1" anchor holes on 36-7/8" diameter bolt circle.

Hinge plug available for self-seal application.

See p. 13 for LiftMate information.

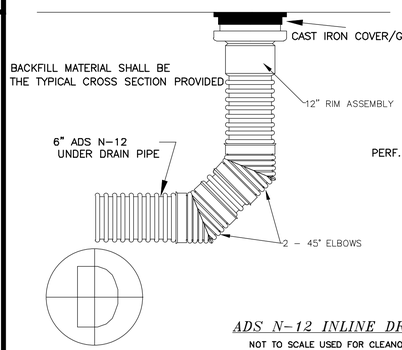




DRAIN MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

DRAIN MANHOLE COVER DETAIL
NOT TO SCALE

D6A

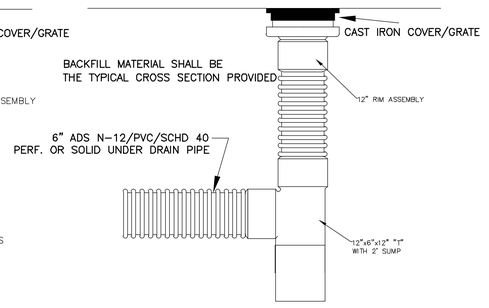


12" CAST IRON COVER
NOT TO SCALE

CASTINGS ARE RATED FOR H20 WHEEL LOAD TRAFFIC

PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT

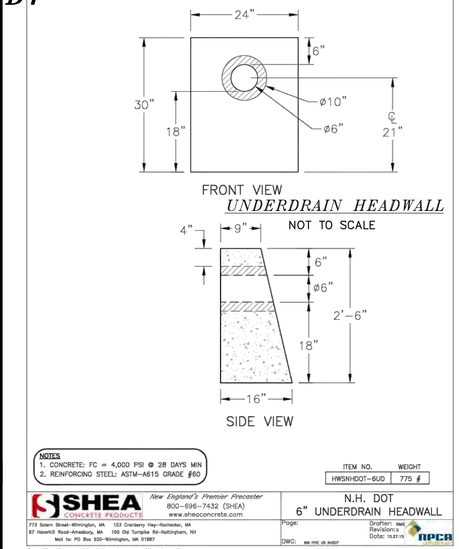
D6B



ADS N-12 INLINE DRAIN
NOT TO SCALE USED FOR CLEANOUTS

ADS N-12, PVC, SCHD. 40 INLINE DRAIN
NOT TO SCALE USED FOR GRAVEL WETLAND CLEANOUTS

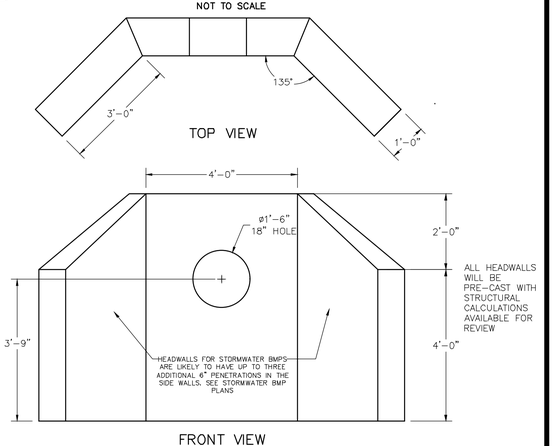
D7



FRONT VIEW
UNDERDRAIN HEADWALL
NOT TO SCALE

D8

HEADWALL (CONCRETE)
NOT TO SCALE

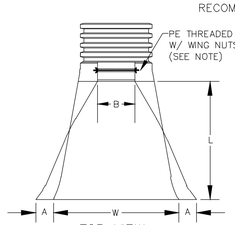


NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.

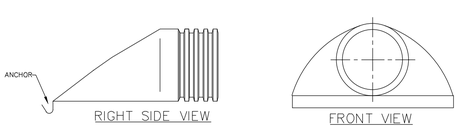
D9

PART No.	PIPE SIZE	A	B(MAX)	H	L	W
1510-NP	15" 375 mm	6.5" 165 mm	10" 254 mm	6.5" 165 mm	25" 635 mm	29" 735 mm
1810-NP	18" 450 mm	7.5" 190 mm	15" 380 mm	6.5" 165 mm	32" 812 mm	35" 890 mm
2410-NP	24" 600 mm	7.5" 190 mm	18" 450 mm	6.5" 165 mm	36" 900 mm	45" 1140 mm
3010-NP	30" 750 mm	10.5" 266 mm	N/A	7.0" 178 mm	53" 1345 mm	68" 1725 mm
3610-NP	36" 900 mm	10.5" 266 mm	N/A	7.0" 178 mm	53" 1345 mm	68" 1725 mm

NOTE: PE THREADED ROD W/ WING NUTS PROVIDED FOR END SECTIONS 15"-24". 30" & 36" END SECTIONS TO BE WELDED PER MANUFACTURER'S RECOMMENDATIONS.

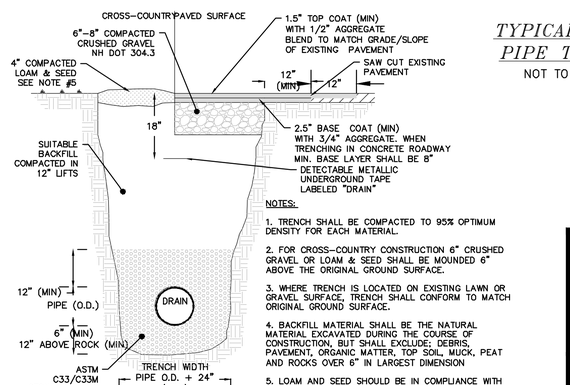


ADS N-12 FLARED END SECTIONS
NOT TO SCALE (ALL DIMENSIONS ARE NOMINAL)



FLARED END SECTIONS WILL BE ANCHORED

D10



TYPICAL DRAIN PIPE TRENCH
NOT TO SCALE

NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
5. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

REFERENCE IS MADE TO A LONG TERM MAINTENANCE MANUAL PREPARED BY BERRY SURVEYING & ENGINEERING, WHICH IS ON FILE AT THE CITY OF ROCHESTER PLANNING DEPARTMENT, AND CAN BE FOUND AT THE OFFICE OF BERRY SURVEYING & ENGINEERING. (603) 332-2863

D-101

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

DRAINAGE DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

D11

CONE GRATE
NOT TO SCALE

NOTE:
MUST BE HAALA INDUSTRIES INC.
OR EQUAL.

Cone Grates Top Mount

CG12TM
Part No. CG12TM

Save Trees

Top Mount Cone Grates are designed to mount on the top of round manhole inlet or outlet structures to keep debris from entering the storm water system. Top mount cone grates are easy to install and allow for at grade manhole installations but can be used in a variety of applications. Grates 96" and larger are made as a two piece, bolt together design.

- Plate and bar hybrid design is both clean and cost effective
- Made from 1/2" plate with 3/4" or 1" round bars depending on grate size
- Anti vortex plate can be added upon request
- Hinged and lockable access doors can be added upon request
- Galvanized steel construction. Can be made from aluminum or stainless steel.

D12

ANGLE GRATE
NOT TO SCALE

NOTE:
MUST BE HAALA INDUSTRIES INC.
OR EQUAL

Angle Grates For Manholes

AG0808-58
Part No. AG0808-58

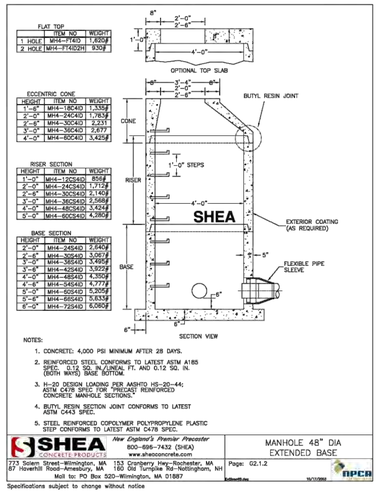
Save Trees

Angle Grates are designed to cover inlet orifices and prevent small to medium debris from passing through. The top angled design helps to minimize the amount of debris that settles on top after the water receeds. All grates are made from plate for a clean and smooth contact surface.

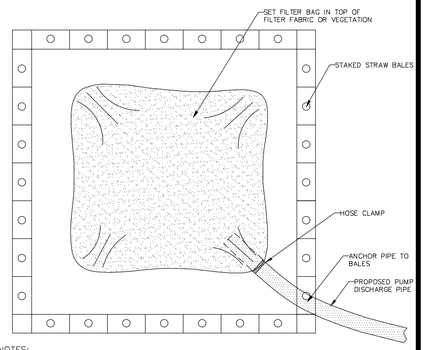
- Plate design for a clean appearance
- Standard 2" openings (other sizes can be made)
- Angled top/front plate to maximize debris deflection
- Mounting flanges on 3 sides allows grate to be mounted at floor level inverts
- Galvanized steel construction. Can be made from aluminum or stainless steel.

D13

48" MANHOLE ROUND EXTENDED BASE
NOT TO SCALE



D14



NOTES:

1.) ENSURE DISCHARGE POINT IS STABILIZED WITH VEGETATION OR PROPER EROSION AND SEDIMENT CONTROL PRACTICES.

2.) USE DIFFUSER NOZZLE OR LOW DISCHARGE RATE TO PREVENT SCOURING.

3.) TO BE PLACED AT AN UPLAND LOCATION THAT WILL ALLOW WATER TO DRAIN INTO THE GROUND.

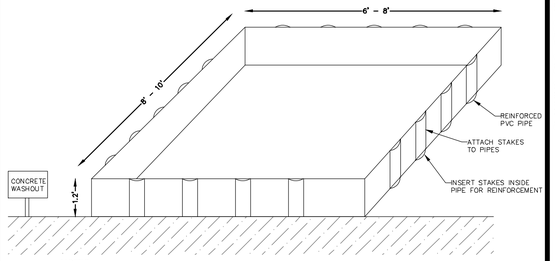
4.) SIZE OF DE-WATERING AREA TO BE 10' X 10', ADJUST SIZE DEPENDING ON VOLUME AND USE.

5.) ADDITIONAL BALES MAY BE USED TO INCREASE RETENTION AND FILTERING.

6.) SEE 2022 CGP FOR DEWATERING REPORTING REQUIREMENTS.

DE-WATERING BASIN
NOT TO SCALE

D15



NOTES:

1.) CONCRETE WASHOUT SHALL BE INSTALLED PRIOR TO ANY CONCRETE POURS.

2.) SIGNS SHALL BE INSTILLED TO CLEARLY INDICATE WHERE THE LOCATION OF THE WASHOUT AREA IS.

3.) CONTRACTOR IS IRRESPONSIBLE TO MAINTAIN AND REPLACE WASHOUT AREA AS NEEDED.

4.) RESIDUE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

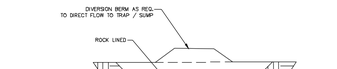
5.) DO NOT WASH CONCRETE TRUCKS OUT INTO DRAINAGE AREAS, SWALES, STREETS OR UNDISTURBED AREAS.

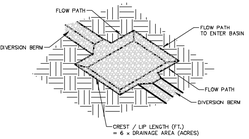
6.) WASHOUT AREA SHALL BE PLACED AWAY FROM DRAINAGE FEATURES AND OUTSIDE AND WETLAND BUFFERS.

CONCRETE WASHOUT
NOT TO SCALE

D16

1. TRAP TO BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. THE TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.



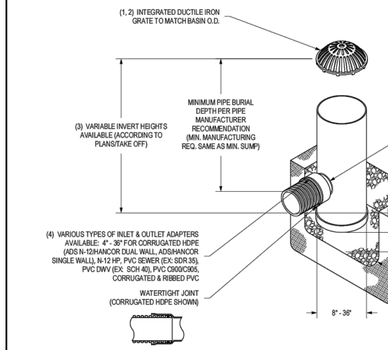


SIEVE DESIGNATION	SIZE OF STONE (INCHES)
100%	12
84-100%	6
68-83%	3
42-55%	1
8-12%	NO. 4

STONE LINED SEDIMENT TRAP
NOT TO SCALE

D17

NYLOPLAST DRAIN BASIN WITH DOME GRATE



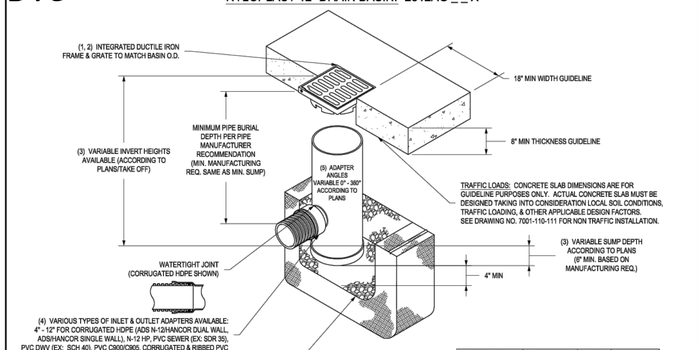
1 - 8"-30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-040.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 64" DUE TO 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" - 30").
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.

THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONFER, TRANSFER, OR LICENSE THE USE OF THE DESIGN OR TECHNICAL INFORMATION SHOWN HEREIN REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN, OR MANUFACTURE OF ANY ARTICLE HEREFROM, FOR THE DISCLOSURE TO OTHERS IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM NYLOPLAST. ©2013 NYLOPLAST	DRAWN BY EBC DATE 03-25-10 REVISED BY NMH DATE 06-12-18 DWG SIZE A	MATERIAL PROJECT NO./NAME SCALE 1:40 SHEET 1 OF 1	Nyloplast 3125 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-3490 www.nyloplast-us.com TITLE DRAIN BASIN WITH DOME GRATE QUICK SPEC INSTALLATION DETAIL DWG NO. 7001-110-397 REV E

NYLOPLAST DOME GRATE
NOT TO SCALE

D18

NYLOPLAST 12" DRAIN BASIN: 2812AG _ _ X



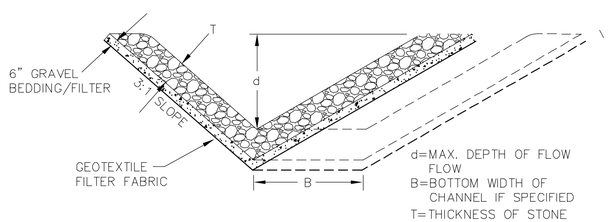
GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	1296OGP	7001-110-202
STANDARD	MEETS H-20	1296OGS	7001-110-203
SOLID COVER	MEETS H-20	1296OSC	7001-110-204
PEDESTRIAN BRONZE	N/A	1296OGPB	7001-110-205
DOME	N/A	1296OGD	7001-110-206
DROP IN GRATE	LIGHT DUTY	1201DI	7001-110-02*

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05, WITH THE EXCEPTION OF THE BRONZE GRATE.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 64" 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.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONFER, TRANSFER, OR LICENSE THE USE OF THE DESIGN OR TECHNICAL INFORMATION SHOWN HEREIN REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN, OR MANUFACTURE OF ANY ARTICLE HEREFROM, FOR THE DISCLOSURE TO OTHERS IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM NYLOPLAST. ©2013 NYLOPLAST	DRAWN BY EBC DATE 03-29-06 REVISED BY NMH DATE 03-11-16 DWG SIZE A	MATERIAL PROJECT NO./NAME SCALE 1:20 SHEET 1 OF 1	Nyloplast 3126 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-3490 www.nyloplast-us.com TITLE 12 IN DRAIN BASIN QUICK SPEC INSTALLATION DETAIL DWG NO. 7001-110-189 REV E

12" NYLOPLAST DRAIN BASIN
NOT TO SCALE

D19



TYPICAL SECTION FOR A RIPRAP LINED CHANNEL
NOT TO SCALE

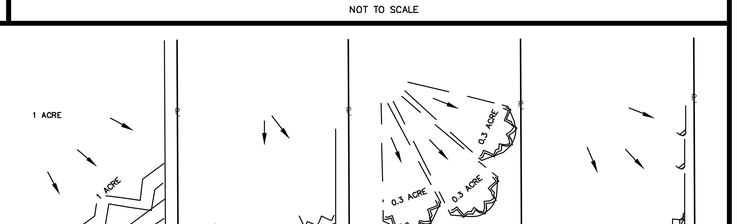
D20

DESIGN CONSIDERATIONS:

1. THE MAXIMUM LENGTH OF SLOPE ABOVE PERIMETER CONTROL IS 100 FEET.
2. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL IS GREATER THAN 5% (50% SLOPE MAX). MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL IS 5% OR LESS.
3. THE MAXIMUM CONTRIBUTING DRAINAGE AREA OF ONE-QUARTER ACRE PER 100-FEET OF PRACTICE LENGTH.
4. PERIMETER CONTROL IS TO BE INSTALLED PRIOR TO EARTH MOVING ACTIVITIES, INCLUDING GRUBBING AND CLEARING.

NOTES

1. DO NOT LAYOUT PERIMETER CONTROL ALONG SLOPING PROPERTY PERIMETER WITHOUT INSTALLING "J HOOKS" AT HIGH CONCENTRATION AREAS. RUNOFF WILL CONCENTRATE AND CAUSE FAILURES ALONG THE PERIMETER.
2. "J HOOKS" CAN BE USED TO HELP LIMIT THE CONCENTRATION OF RUNOFF AND PROVIDE MORE STABILITY TO THE PERIMETER.
3. SILT FENCE AND EROSION CONTROL MULCH BERM MAY BE USED INTERCHANGEABLY. IN SPECIFIED AREA, SILT FENCE MAY NOT BE SUBSTITUTED FOR FILTREXX SILT SOXX OR APPROVED ALTERNATIVE.
4. SEE HAMPSHIRE STORM WATER MANUAL: VOLUME 3, PAGE 99 FOR FURTHER DETAILS AND SPECIFICATIONS



PERIMETER CONTROL
NOT TO SCALE

D-102

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

DRAINAGE DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

SHEET 53 OF 60

NOT FOR CONSTRUCTION

D21

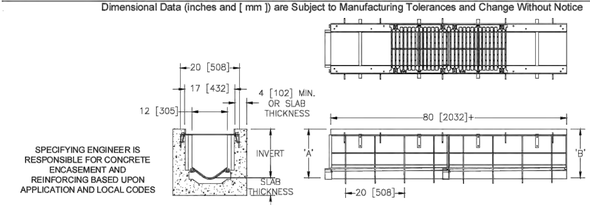
Z874-12

12 [305] WIDE THROAT TRENCH DRAIN SYSTEM

SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



\+ Actual High Density Polyethylene channel length is 82 [2083] to allow for overlap, with frame attached the length is 84-1/2 [2146] with the exception of P.N. 1201P and 1230P.

ENGINEERING SPECIFICATION: Zurn Z874-12
Channels shall be 80 [2032] long, 17 [432] wide reveal and have a 12 [305] wide throat. Modular channel sections shall be made of 0% water absorbent High Density Polyethylene (HDPE). Shall have a positive mechanical connection between channel sections that will not separate during the installation and shall mechanically lock into the concrete surround every 10 [254]. Channels shall weigh less than 6.6 lbs. [3 kg] per linear foot, have smooth 3.5 [89] radiused self cleaning bottom with a Manning's coefficient of .009 and 1.00% or neutral 0% built-in slope. Channels are available with inverts ranging from 9.25 [235] to 34.21 [869]. Channel shall have all grates locked down. Channels come with clips attached to the frame to accommodate vertical re-bar for positioning and anchoring purposes. Shall be provided with the standard DGC grate, Zurn 16-1/4 [413] wide Ductile Iron Slotted Grate, which locks down to the frame with 4 individual bolt anchors per grate. Ductile Iron conforms to ASTM specification A536-84, Grade 80-55-06. Ductile Iron grate is rated class C per the DIN EN1433 top load classifications. Supplied in 20 [608] nominal lengths with 13/16 [21] wide slots, and 1-3/4 [44] bearing depth. Grate has an open area of 118 sq. in. per ft. [249779] sq. mm per meter]. The 1/4 [6] thick Carbon Steel Frame Assembly conforms to ASTM specification A36 with 10 - 4 [102] long concrete anchors per 80 [2032]. The frame is supplied with a powder coated finish. All welds must be performed by a certified welder per ASTM standard AWS D1.1. Frames shall be produced in the USA.

Trench #	'A' Shallow Inv.	'B' Deep Inv.	Flow (gpm)	(lps)	(cfs)
1201P	9.250 [235]	10.082 [256]	1475	93	3.306
1202P	10.082 [256]	10.914 [277]	1758	111	3.941
1203P	10.914 [277]	11.746 [298]	2046	129	4.589
1204P	11.746 [298]	12.578 [319]	2341	148	5.248
1205P	12.578 [319]	13.410 [341]	2639	166	5.915
1205NP	13.410 [341]	13.410 [341]	-	-	-
1206P	13.410 [341]	14.242 [362]	2939	185	6.589
1207P	14.242 [362]	15.074 [383]	3243	205	7.268
1208P	15.074 [383]	15.906 [404]	3548	224	7.953
1209P	15.906 [404]	16.738 [425]	3855	243	8.641
1210P	16.738 [425]	17.570 [446]	4164	263	9.333
1211P	17.570 [446]	18.402 [467]	4474	282	10.028
1212P	18.402 [467]	19.234 [489]	4785	302	10.726
1213P	19.234 [489]	20.066 [510]	5098	322	11.426
1214P	20.066 [510]	20.898 [531]	5411	341	12.128
1215P	20.898 [531]	21.730 [552]	5725	361	12.832
1215NP	21.730 [552]	21.730 [552]	-	-	-
1216P	21.730 [552]	22.562 [573]	6040	381	13.538
1217P	22.562 [573]	23.394 [594]	6355	401	14.244
1218P	23.394 [594]	24.226 [615]	6671	421	14.953
1219P	24.226 [615]	25.058 [636]	6988	441	15.662
1220P	25.058 [636]	25.890 [658]	7304	461	16.372
1221P	25.890 [658]	26.722 [679]	7622	481	17.084
1222P	26.722 [679]	27.554 [700]	7940	501	17.796
1223P	27.554 [700]	28.386 [721]	8258	521	18.509
1224P	28.386 [721]	29.218 [742]	8576	541	19.223
1225P	29.218 [742]	30.05 [763]	8895	561	19.937
1226NP	30.05 [763]	30.05 [763]	-	-	-
1226P	30.05 [763]	30.882 [784]	9214	581	20.652
1227P	30.882 [784]	31.714 [806]	9533	601	21.367
1228P	31.714 [806]	32.546 [827]	9852	622	22.083
1229P	32.546 [827]	33.378 [848]	10172	642	22.800
1230P	33.378 [848]	34.210 [869]	10492	662	23.517

(Neutral channels available for all section numbers)

PREFIX

____ Z 80 [2032] High Density Polyethylene Channel, Heavy-Duty Frame with Anchor Studs*

SUFFIX OPTIONS (Check/specify appropriate options)

Adapters

___ -E1 Closed End Cap
___ -E4 4 [102] No-Hub End Outlet
___ -E6 6 [152] No-Hub End Outlet
___ -E8 8 [203] No-Hub End Outlet
___ -E10 10 [254] No-Hub End Outlet
___ -U4 4 [102] No-Hub Bottom Outlet
___ -U6 6 [152] No-Hub Bottom Outlet
___ -U8 8 [203] No-Hub Bottom Outlet
___ -U12 12 [305] No-Hub Bottom Outlet

Grade Options (Load Classifications are per DIN EN1433)

___ -DCC Ductile Iron Solid Cover - Class C
___ -DGC Ductile Iron Slotted Grate - Class C*
___ -DGF Ductile Iron Slotted Grate - Class F
___ -GDC Galvanized Ductile Iron Grate - Class C
___ -GDF Galvanized Ductile Iron Grate - Class F
___ -GG Fiberglass Grate
___ -HPD Heel-Proof Longitudonal Ductile Iron Grate - Class C

Miscellaneous Options

___ -RC Rebar Clips (Set of 2)
___ -VP Vandal-Proof Lockdown

MADE in the U.S.A. (Load Classifications are per DIN EN1433)

___ -ADA-USA Meets Americans with Disabilities Act Requirements - Class C
___ -DGC-USA Ductile Iron Slotted Grate - Class C
___ -DGF-USA Ductile Iron Slotted Grate-Class F
___ -GADA-USA Galvanized Ductile ADA Slotted Grate - Class C
___ -GDC-USA Galvanized Ductile Slotted Grate - Class C
___ -GDF-USA Galvanized Ductile Slotted Grate - Class F

MADE in the U.S.A. Miscellaneous Options

___ -CBF Black Acid Resistant Coated Frame
___ -DB Bottom Dome Strainer
___ -SF Type 304 Stainless Steel Top Frame

REV. Q DATE: 05/05/11 C.N. 121231

DWG. NO. 64183 PRODUCT NO. Z874-12

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

ZURN INDUSTRIES, LLC ◆ SPECIFICATION DRAINAGE OPERATION ◆ 1801 Pittsburgh Ave. ◆ Erie, PA 16514
Phone: 814\455-0921 ◆ Fax: 814\454-7929 ◆ World Wide Web: www.zurn.com
In Canada: ZURN INDUSTRIES LIMITED ◆ 3544 Nashua Drive ◆ Mississauga, Ontario L4V1L2 ◆ Phone: 905\405-8272 Fax: 905\405-1292

ZURN TRENCH DRAIN DETAIL

NOT TO SCALE

NOTES:

1.) CONCRETE ENCASEMENT TO BE 1' AROUND THE SIDES AND BOTTOM OF TRENCH DRAIN.

D22

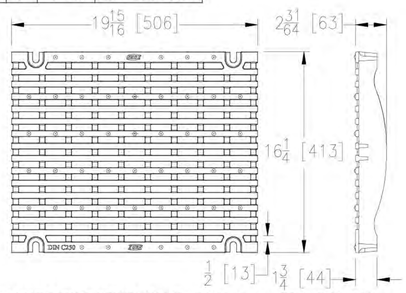
P874-12-ADA-USA

12[305] Wide Throat Domestic Grate

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice

Back to Index

Please Check ✓	Item No.	Part Number	Item I.D.
	1	94528	P874-12-ADA-USA



ADA-USA GRATE ENGINEERING SPECIFICATION: The Zurn P874-12-ADA-USA ADA Compliant, Ductile Iron Grate, is 16-1/4" [413mm] wide by 19-15/16"[506mm] long, weighing 26.5lbs per linear foot [39.4 kg/m]. The grate has an open area of 66 square inches per linear foot [1398 cm²/m], DIN Rating of C, ANSI Rating of Heavy-Duty, ADA compliant, H-20 Load Rated. Ductile Iron Conforms to ASTM Specification A536, Grade 80-55-06.

ADA-USA- ADA Compliant	
Material:	Ductile Iron
DIN Rating:	Class C
Weight:	26.5 lbs/ft. [39.4 kg/m]
Open Area:	66 sq. in²/ft.[1398cm²/m]
ANSI Rating:	Heavy-Duty
Application:	Roadway, ADA
Slot Width/Hole Size:	1/2" [13 cm]
ADA:	Yes
H-20:	Yes
FAA:	No

MADE IN THE USA

Zurn Industries, LLC | Specification Drainage Operation
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 - Ph. 855-663-9876, Fax 814-454-7929
In Canada | Zurn Industries Limited
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 - Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. H
Date: 05/07/15
C.N. No. 132632
Form No. FT797

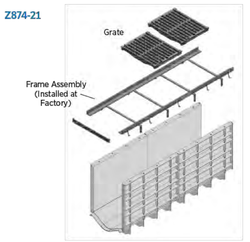
D23

Z874 Perma-Trench®

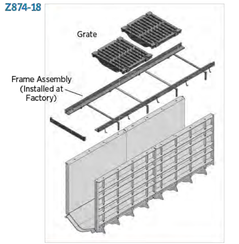
HDPE Drain Systems (12", 18", 21.25" Throat)

Z874-12

Z874-21

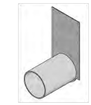


Z874-18



*4-corner bolt lockdown on all systems.

Closed End Cap (E1)



End Outlet
Z874-12 (4", 6", 8" NH)
Z874-18 (4", 6", 8", 12" NH)
Z874-21 (4", 6", 8", 12", 18" NH)

Bottom Outlet
Z874-12 (4", 6", 8" NH)
Z874-18 (4", 6", 8", 12" NH)
Z874-21 (4", 6", 8", 12", 18" NH)

Z874-12, Z874-18, Z874-21 Applications

- Airports
- Airplane Hangars
- Chemical Plants
- Highways
- Industrial Parks
- Industrial Plants
- Parking Lots
- Port Facilities

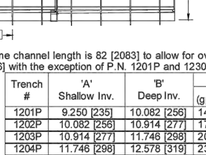
Features and Benefits

- 8' pre-engineered modular sections
- 1.00% built-in slope – handles greater flows, uniform slope
- Radiused bottom – Better flow rate, less solids build-up
- Constructed with HDPE to provide a durable and lightweight solution
- 4-corner grate lock down for dynamic loading situations
- Rebar clips provided with system for elevation set
- Frame available in coated steel, stainless steel, or galvanized steel

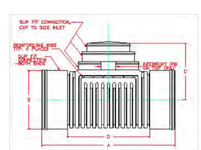
D24

MULTIPLE TEE

PART #	PIPE SIZE	A	B	C	D
0644AA	6 in (150 mm)	11.5 in (292 mm)	7.4 in (187 mm)	9.5 in (241 mm)	5.8 in (148 mm)
0844AA	8 in (200 mm)	18.8 in (476 mm)	9.9 in (251 mm)	10.5 in (266 mm)	13.0 in (330 mm)
1044AA	10 in (250 mm)	21.0 in (533 mm)	12.3 in (311 mm)	11.8 in (299 mm)	15.0 in (381 mm)
1244AA	12 in (300 mm)	27.4 in (695 mm)	15.3 in (387 mm)	14.3 in (362 mm)	20.5 in (521 mm)



PART #	PIPE SIZE	A	B	C	D
1247AA	12 in (300 mm)	26.1 in (664 mm)	14.7 in (373 mm)	15.0 in (381 mm)	20.3 in (514 mm)
1547AA	15 in (375 mm)	29.6 in (753 mm)	18.0 in (457 mm)	18.4 in (467 mm)	22.3 in (565 mm)
1847AA	18 in (450 mm)	35.4 in (899 mm)	21.6 in (549 mm)	20.5 in (521 mm)	24.8 in (629 mm)



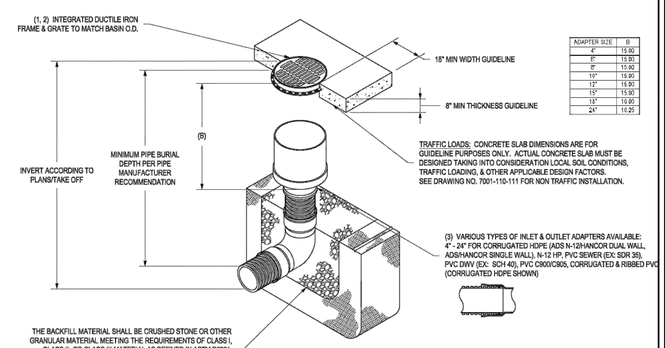
NOTE: ALL DIMENSIONS ARE NOMINAL

© 2021 Advanced Drainage Systems, Inc.

DRAWING #:	1035	
DRAWN BY:	CRM	09.11.06
APPROVED BY:	JCB	06.26.07
REVISIONS:	TJR	09/02/11

D25

NYLOPLAST 24 " INLINE DRAIN: 2724AG _ _ X



ADAPTER SIZE	B
4"	15.90
6"	15.90
8"	15.90
10"	15.90
12"	15.90
15"	15.90
18"	15.90
24"	16.25

GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	2456CGP	7601-110-216
STANDARD	MEETS H-20	2456CGS	7601-110-212
BOLT-DOWN	MEETS H-20	2456CGC	7601-110-218
DOME	N/A	2456CGD	7601-110-219
DROP 'N GRATE	LIGHT DUTY	2421D	7601-110-215

1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-40-06.
3 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
4 - DIMENSIONS ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY.
5 - DIMENSIONS ARE IN INCHES
6 - SEE DRAWING NO. 7001-110-275 FOR ADS N-12 & HANCOR DUAL WALL BELL INFORMATION & DRAWING NO. 7001-110-384 FOR N-12 HP BELL INFORMATION.

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DRAWN BY	EBC	MATERIAL	
DATE	04-03-06		
REVISED BY	NMH	PROJECT NO./NAME	
DATE	03-15-16		
DWG SIZE	A	SCALE 1:40	SHEET 1 OF 1

ADS Nyloplast — 3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2486 www.nyloplast-us.com

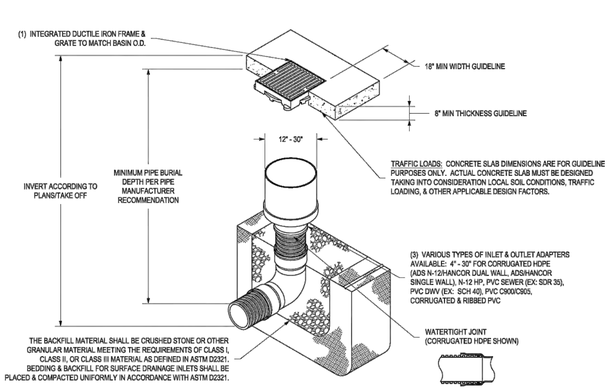
TITLE: 24 IN INLINE DRAIN QUICK SPEC INSTALLATION DETAIL

DWG NO. 7003-110-028 REV E

D26

8

NYLOPLAST INLINE DRAIN WITH 2 FT X 2 FT ROAD & HIGHWAY FRAME & GRATE



1 - 12" - 30" FRAMES & GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12HANCOR DUAL WALL), N-12 HP, & PVC SEWER (8" - 24").
3 - ROAD & HIGHWAY GRATE SHALL MEET H-20 LOAD RATING.

THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONFER, TRANSFER, OR LICENSE THE USE OF THE DESIGN OR TECHNICAL INFORMATION SHOWN HEREIN. REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN, OR MANUFACTURE OF ANY ARTICLE HEREFROM, FOR THE DISCLOSURE TO OTHERS IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM NYLOPLAST. ©2013 NYLOPLAST

DRAWN BY	EBC	MATERIAL	
DATE	3-29-07		
REVISED BY	NMH	PROJECT NO./NAME	
DATE	03-16-16		
DWG SIZE	A	SCALE 1:40	SHEET 1 OF 1

ADS Nyloplast — 3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2486 www.nyloplast-us.com

TITLE: INLINE DRAIN WITH 2 FT X 2 FT ROAD & HIGHWAY FRAME & GRATE QUICK SPEC INSTALLATION DETAIL

DWG NO. 7003-110-036 REV D

REFERENCE IS MADE TO A LONG TERM MAINTENANCE MANUAL PREPARED BY BERRY SURVEYING & ENGINEERING, WHICH IS ON FILE AT THE CITY OF DOVER PLANNING DEPARTMENT, AND CAN BE FOUND AT THE OFFICE OF BERRY SURVEYING & ENGINEERING. (603) 332-2863

D-103

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

DRAINAGE DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 10243 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

NOTES ON MANHOLE AND SEWER CONSTRUCTION:

1) IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT AND ADEQUATE JOINTING. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND HS-20-44 LOADING, INCLUDING THE COVER. ALL SMH CONSTRUCTION AND MATERIALS WILL BE IAW ENV.-WQ 704.13 ADOPTED OCTOBER 15, 2014

2) BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE. (IAW ENV.-WQ 704.12 (d))

3) SEWER MANHOLE DIAMETER SHALL BE AS INDICATED ON THE PLANS.

4) PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.

5) GRAVITY SEWER PIPE TESTING WILL BE IN ACCORDANCE WITH ENV.-WQ 704.06 AND MAN HOLE TESTING IAW ENV.-WQ 704.17 DATED OCTOBER 15, 2014.

6) INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. INVERT BRICKS SHALL BE LAID ON EDGE AND THE BASE SECTION SHALL BE FULL. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. (IAW ENV.-WQ 704.13 (a) (9)), MORTAR SHALL CONFORM WITH REQUIREMENTS OF IAW ENV.-WQ 704.13 (c).

   FRAMES AND COVERS: MANHOLES FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. 3-INCH (MINIMUM HEIGHT) LETTERS WITH THE WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH MANHOLE COVER. (IAW ENV.-WQ 704.13 (a) (4-6)) SEWER MAN HOLE COVERS ARE TO BE LIFTMATE R-1743-LM.

7) PER ENV-WQ 704.12(M), MANHOLES MUST BE CAPABLE OF SUPPORTING HS-20 LOADS.

8) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE DOVER DPW, WHICH TYPE SHALL IN GENERAL DEPEND FOR WATERTIGHTNESS UPON A DOUBLE ROW OF AN OVERLAPPING TYPE ELASTOMERIC OR MASTIC-LIKE GASKET. APPROVED ELASTOMERIC SEALANTS ARE: RAM-NEK, KENT SEAL NO. 2, EZ, OR EQUAL.

9) IN CROSS COUNTRY AREAS OUTSIDE OF THE PAVED ROADWAY SURFACE, THE MANHOLE FRAME ELEVATION SHALL BE A MINIMUM OF 6" ABOVE FINISHED GRADE. GRADE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE MANHOLE. SEE TYPICAL TRENCH DETAIL U5.

11.) ALL FRAMES AND GRATES ARE TO BE U.S.A. MADE. MANHOLE STEPS ARE REQUIRED IN THIS MUNICIPALITY AND MUST CONFORM TO THE REQUIREMENTS OF ENV-WQ 704.14. STEPS ARE TO BE PLASTIC.

12.) THE CONTRACTOR TO WORK WITH CITY OF DOVER REVIEW ENGINEER AND SEWER DEPARTMENT ON THE MEANS AND METHODS USED TO INSTALL ALL SEWER STRUCTURES.

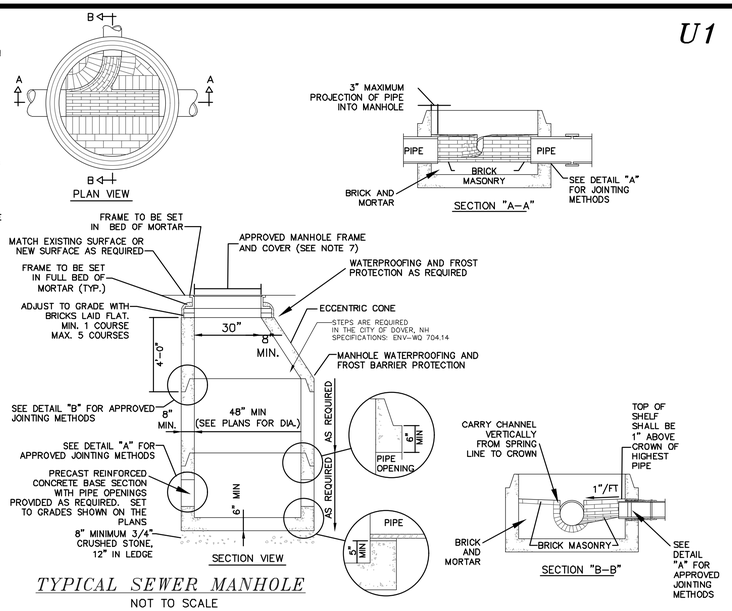
13.) ANY WORK INVOLVING THE CUTTING INTO THE EXISTING A.C. PIPE SHALL MEET THE REQUIREMENTS OF ENV-A 1800.

14.) THE "CITY OF DOVER, NEW HAMPSHIRE, DEPARTMENT OF COMMUNITY SERVICES, CONSTRUCTION GUIDELINES, PERMITS, RULES, AND REGULATIONS" (DATED MARCH 13, 2018) ARE A PART OF THE CONSTRUCTION DETAILS AND TO BE FOLLOWED.

15.) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STANDARD AND ENV-WQ 704.17.

16.) SEWER MANHOLES WILL REQUIRE AT A MINIMUM 1' RISER SECTION AND ADDITIONAL BRICK AND MORTAR TO BRING THE RIM TO GRADE, DUE TO DIFFERENCES IN PREVIOUS DESIGN FINISHED GRADES.

U1



TYPICAL SEWER MANHOLE
NOT TO SCALE

U2

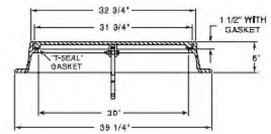
R-1743-LM
LiftMate Frame, Solid Gasketed Lid

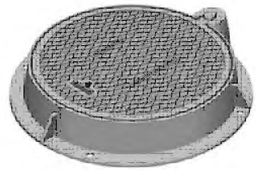
Heavy Duty

Furnished with four 1" anchor holes on 36-7/8" diameter bolt circle.

Hinge plug available for self-seal application.

See p. 13 for LiftMate information.

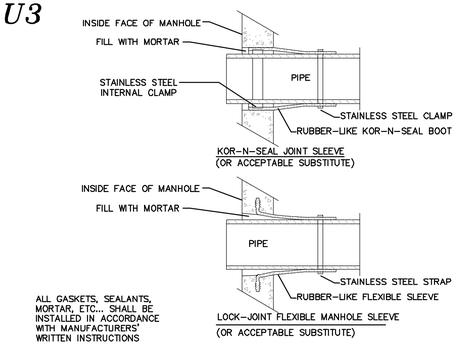




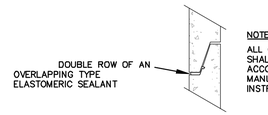
SEWER MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

SEWER MANHOLE COVER DETAIL
NOT TO SCALE

U3



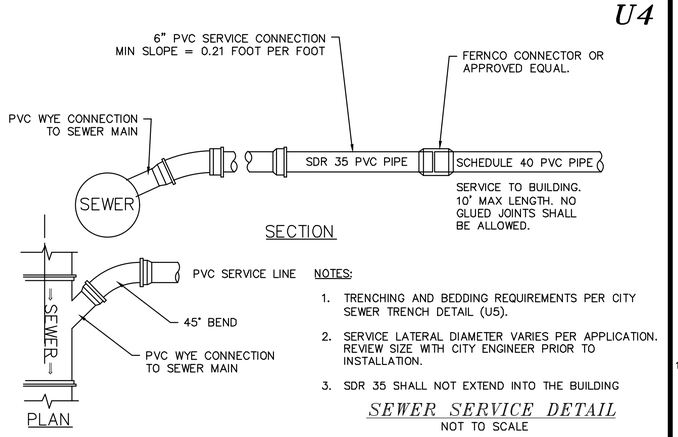
DETAIL "A" - PIPE TO MANHOLE JOINTS
NOT TO SCALE



NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

DETAIL "B" HORIZONTAL JOINTS
NOT TO SCALE

U4

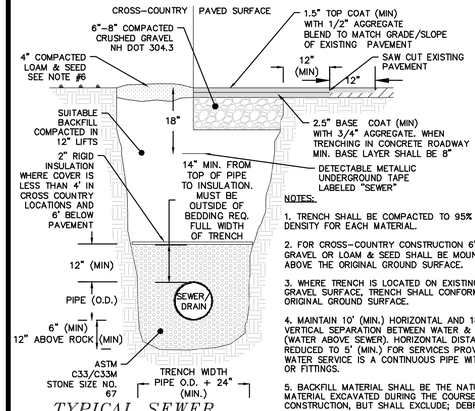


NOTES:

1. TRENCHING AND BEDDING REQUIREMENTS PER CITY SEWER TRENCH DETAIL (U5).
2. SERVICE LATERAL DIAMETER VARIES PER APPLICATION. REVIEW SIZE WITH CITY ENGINEER PRIOR TO INSTALLATION.
3. SDR 35 SHALL NOT EXTEND INTO THE BUILDING

SEWER SERVICE DETAIL
NOT TO SCALE

U5

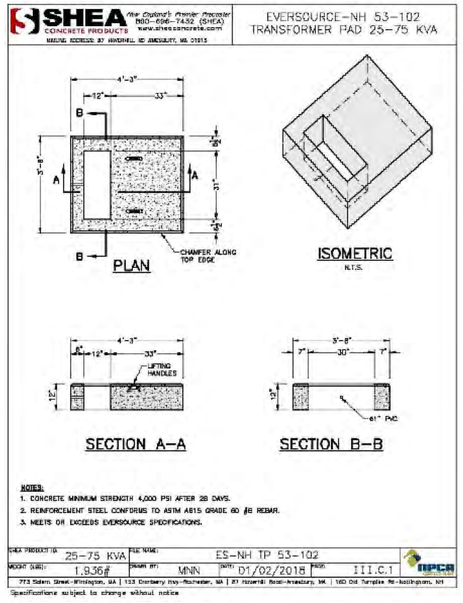


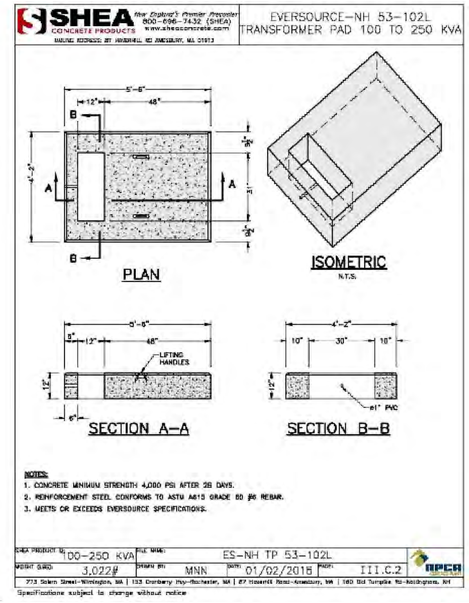
NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.
5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
6. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.
7. SEWER TRENCH INSULATION SHALL NOT BE PLACED WITHIN LIMITS OF BEDDING/BLANKET REQUIREMENT.

TYPICAL SEWER PIPE TRENCH
NOT TO SCALE

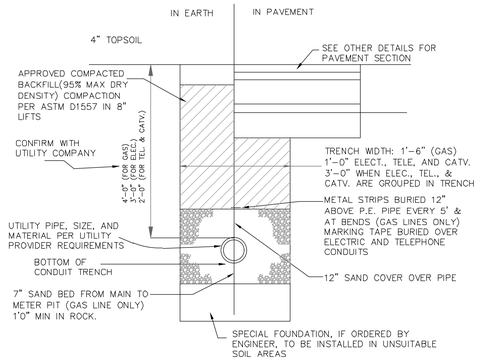
U6





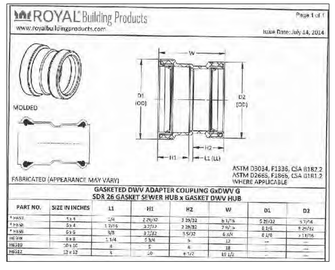
TRANSFORMER AND PAD DETAIL
NOT TO SCALE

U7



ELECTRICAL, TELEPHONE, AND GAS TRENCH
NOT TO SCALE

U8



PART NO.	SIZE IN INCHES	L1	H1	R2	W	O1	O3
4 inch	4 x 4	n/A	2.75/90	3 19/32	6 1/16	3.30/32	3 1/16
6 inch	6 x 4	1 1/16	3.27/32	3 39/32	7 9/16	4.5/16	4 29/32
8 inch	8 x 6	1/8	4 7/32	5 9/32	9 3/8	6 1/8	5 13/16
HE10X	10 x 6	1 1/4	4 3/8	5	12	—	—
HE12X	12 x 10	4	5	6	14	—	—
HE15X	15 x 12	5	6	8 1/2	17 1/2	—	—

COUPLING DETAIL
NOT TO SCALE

U-101

PLANNING FILE #SITE--XXXX--XXXX

REVISION	DATE	DESCRIPTION

UTILITY DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

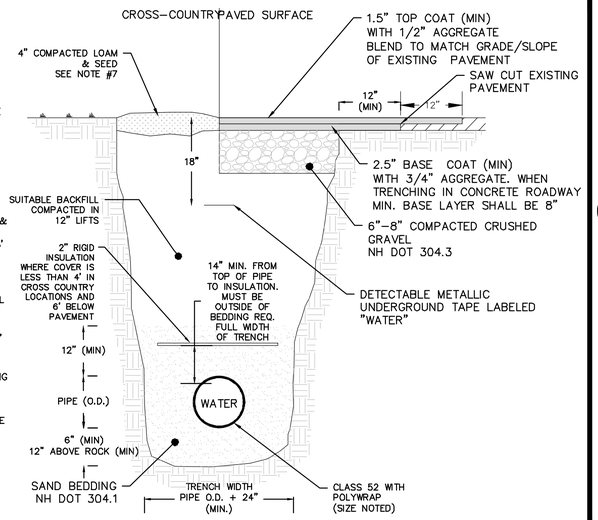
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

U9

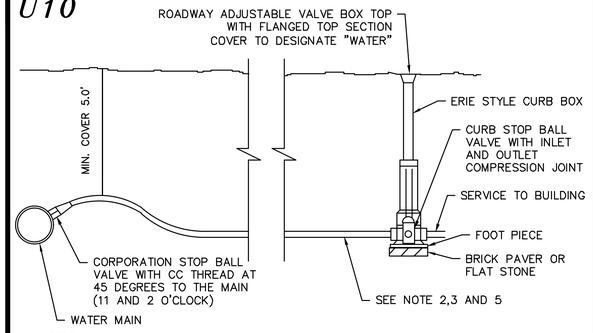
NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.
5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT, AND ROCKS OVER 6" IN LARGEST DIMENSION
6. PROVIDE MINIMUM 5' OF COVER. ENGINEERING APPROVAL REQUIRED FOR LESS THAN 5' OF COVER.
7. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.



WATER PIPE TRENCH
NOT TO SCALE

U10

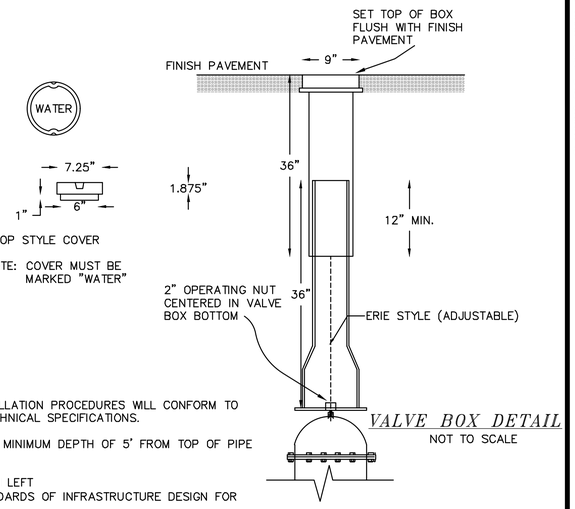


NOTES:

1. ALL WATER LINES 4" OR GREATER SHALL BE DUCTILE IRON WITH AN 8 MIL POLYETHYLENE WRAP, INCLUDING TEE AND OTHER CONNECTIONS.
2. WATER SERVICE LINES SHALL BE COPPER TUBING (TYPE K) BETWEEN MAIN AND CURB STOP.
3. SERVICE BETWEEN CURB STOP AND BUILDING MAY BE (BLUE OR BLACK) CTS SDR 9 PLASTIC POLYETHYLENE RATED FOR 250 psi.
4. CAM-LOCK REQUIRED FOR CTS OR IPS, MJ ADAPTER REQUIRED FOR HDPE
5. ¾"- COPPER, CTS
   1"- COPPER, CTS
   2"- CTS, HDPE, IPS

WATER SERVICE CONNECTION
NOT TO SCALE

U11

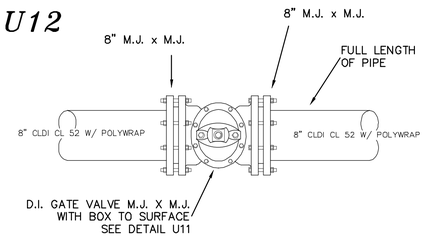


NOTES:

1.) ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO LOCAL WATER WORKS TECHNICAL SPECIFICATIONS.
2.) ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3.) ALL VALVES ARE TO OPEN LEFT
4.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

VALVE BOX DETAIL
NOT TO SCALE

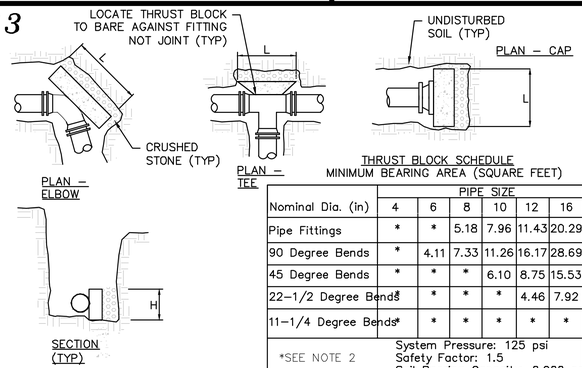
U12



SHUTOFF VALVE DETAIL
NOT TO SCALE

1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

U13



THRUST BLOCK SCHEDULE
MINIMUM BEARING AREA (SQUARE FEET)

	PIPE SIZE					
Nominal Dia. (in)	4	6	8	10	12	16
Pipe Fittings	*	*	5.18	7.96	11.43	20.29
90 Degree Bends	*	4.11	7.33	11.26	16.17	28.69
45 Degree Bends	*	*	*	6.10	8.75	15.53
22-1/2 Degree Bends	*	*	*	*	4.46	7.92
11-1/4 Degree Bends	*	*	*	*	*	*

*SEE NOTE 2

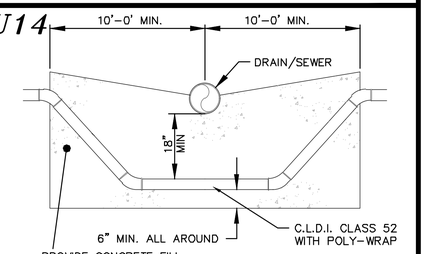
System Pressure: 125 psi
Safety Factor: 1.5
Soil Bearing Capacity: 2,000 psf

NOTES:

1. ALL THRUST BLOCKS SHALL BE PRE-CAST CONCRETE UNLESS APPROVED BY THE CITY ENGINEER.
2. 2'X2'X2' MINIMUM THRUST BLOCK REQUIRED, ANY BEARING AREA OVER 4SF REQUIRES THRUST BLOCKS, RESTRAINED JOINTS AND CALCULATIONS ASSOCIATED WITH THE JOINT.
3. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 125 PSI. IF THE SYSTEM PRESSURE IS ABOVE 125 PSI, INCREASE THE NOTED AREAS PROPORTIONALLY TO THE ACTUAL SYSTEM PRESSURE.
4. FOR MINIMUM BEARING AREAS OVER 4 SF, THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE HEIGHT (H).
5. PLACE CRUSHED STONE BEHIND THRUST BLOCK AGAINST UNDISTURBED SOIL.
6. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
7. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.
8. USE OF THRUST BLOCKS DOES NOT ELIMINATE THE REQUIREMENT OF OTHER RESTRAINTS OR VICE VERSA.

THRUST BLOCKS
NOT TO SCALE

U14

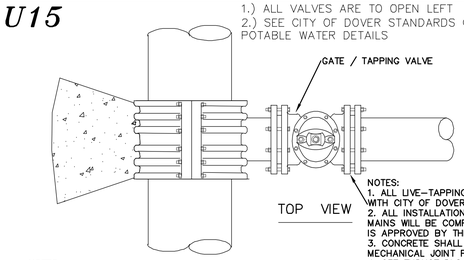


1.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

WATER MAIN INSTALLATION - BELOW DRAIN & SEWER
NOT TO SCALE

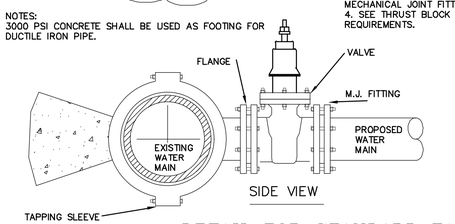
U15

1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS



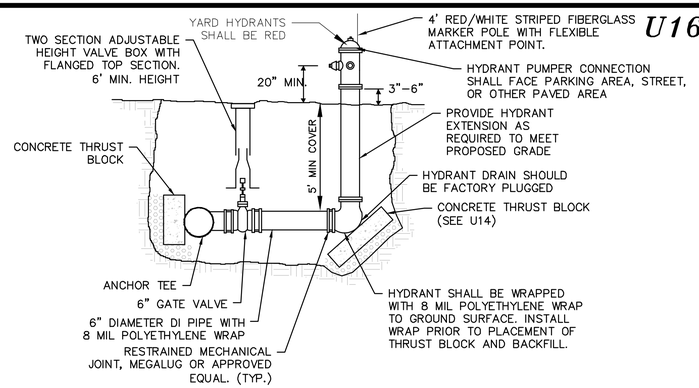
NOTES:
1. ALL LIVE-TAPPING WILL BE COMPLETED IN ACCORDANCE WITH CITY OF DOVER WATER DEPARTMENT REGULATIONS.
2. ALL INSTALLATION AND TAPPING OF EXISTING WATER MAINS WILL BE COMPLETED BY AN INDIVIDUAL OR FIRM THAT IS APPROVED BY THE CITY OF DOVER ENGINEERING
3. CONCRETE SHALL NOT CONTACT BOLTS OR END OF MECHANICAL JOINT FITTINGS.
4. SEE THRUST BLOCK TABLES FOR AREA OF CONCRETE REQUIREMENTS.

NOTES:
3000 PSI CONCRETE SHALL BE USED AS FOOTING FOR DUCTILE IRON PIPE.



DETAIL FOR STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
NOT TO SCALE

U16

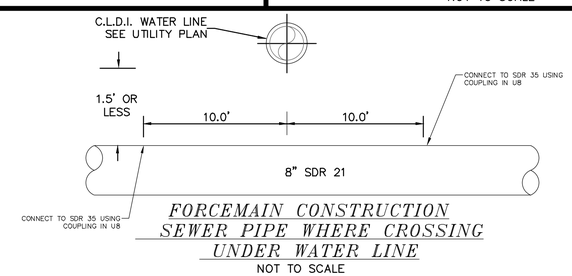


NOTES:

1. FIRE HYDRANTS SHALL BE FACTORY SEALED EDDY STYLE 2641.
2. HYDRANT SHALL BE PAINTED RED WITH EPOXY PAINT AS RECOMMENDED BY THE HYDRANT MANUFACTURER.
3. HYDRANT SHALL OPEN LEFT.

FIRE HYDRANT
NOT TO SCALE

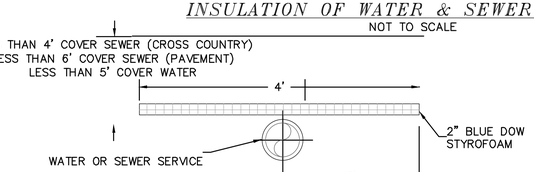
U17



FORCEMAIN CONSTRUCTION SEWER PIPE WHERE CROSSING UNDER WATER LINE
NOT TO SCALE

U18

INSULATION OF WATER & SEWER SERVICES
NOT TO SCALE



U-102

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

UTILITY DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

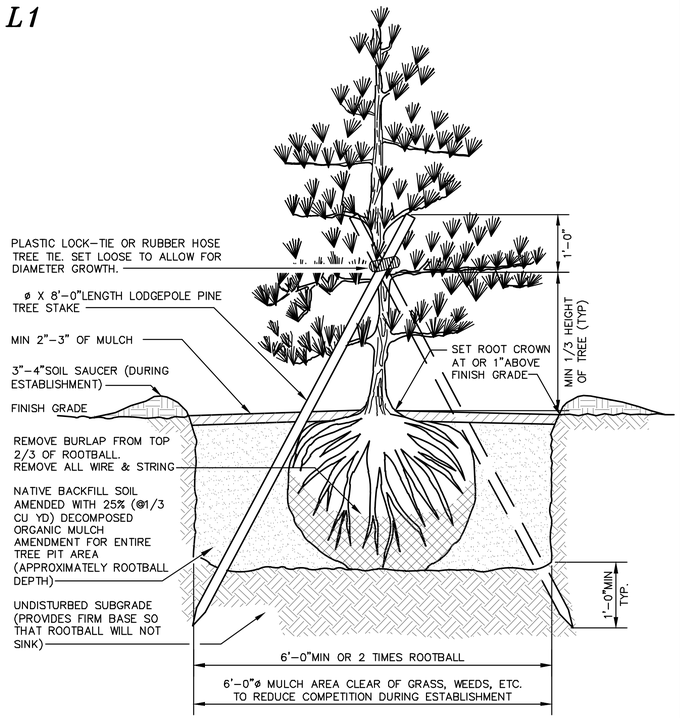
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14242 LICENSED PROFESSIONAL ENGINEER

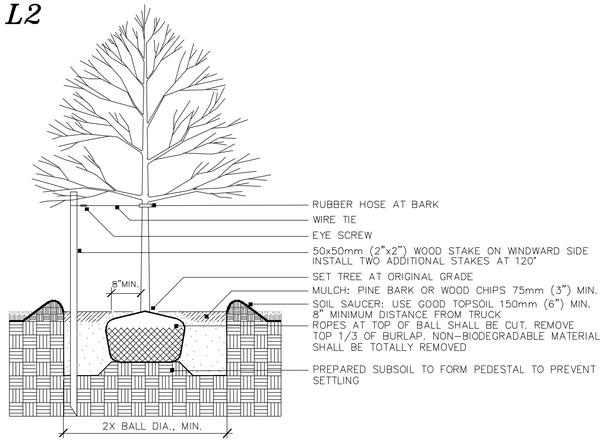
NOT FOR CONSTRUCTION

L1



CONIFEROUS TREE PLANTING

L2



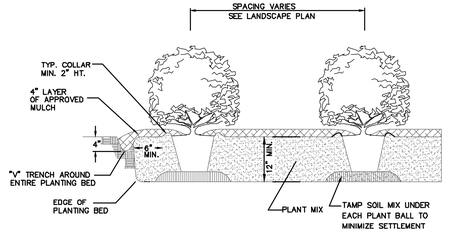
DECIDUOUS TREE PLANTING

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

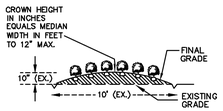
L3

NOTES:

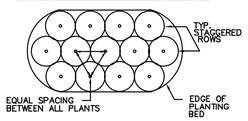
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL



TYPICAL BED CROWNING

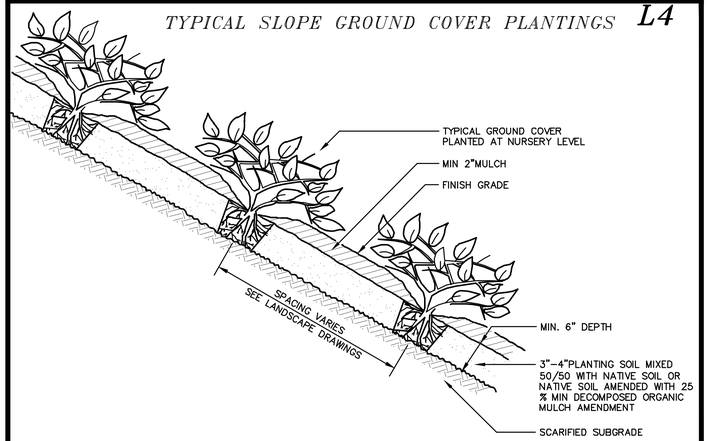


TYPICAL PLANTING BED PLAN

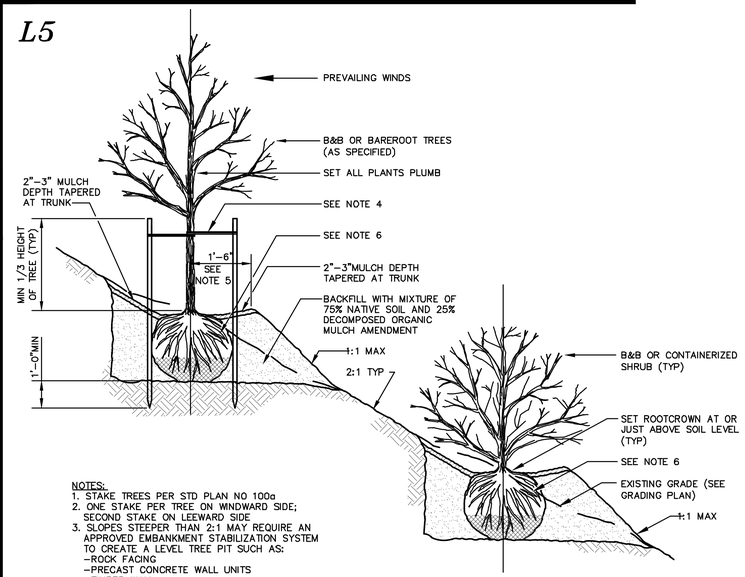
SHRUB & HEDGE PLANTING

L4

TYPICAL SLOPE GROUND COVER PLANTINGS



L5



NOTES:
1. STAKE TREES PER STD PLAN NO 100a
2. ONE STAKE PER TREE ON WINDWARD SIDE; SECOND STAKE ON LEEWARD SIDE
3. SLOPES STEEPER THAN 2:1 MAY REQUIRE AN APPROVED EMBANKMENT STABILIZATION SYSTEM TO CREATE A LEVEL TREE PIT SUCH AS:
   –ROCK FACING
   –PRECAST CONCRETE WALL UNITS
   –TIMBER WALL
   –MANUFACTURED SLOPE RETENTION UNITS
4. CHAINLOCK TREE TIE. LOOP EACH TIE AROUND TREE LOOSELY TO PROVIDE 1" SLACK FOR DIAMETER GROWTH.
5. SHAPE SOIL TO PROVIDE 3' DIAMETER OR ROOTBALL DIAMETER, WHICHEVER IS GREATER, WATERING RING.
6. REMOVE ALL WIRE AND STRING. REMOVE TOP 2/3 OF BURLAP.

TREE PLANTING ON SLOPES

L6

NOTES:

1.) CALL DIG SAFE PRIOR TO BEGINNING WORK. (1–888–344–7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.

2.) CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING.

3.) PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.

4.) ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

5.) ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.

6.) ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.

7.) ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.

8.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.

9.) NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.

10.) ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH.

11.) WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL–ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.

12.) MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWING AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.

13.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.

14.) THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWING SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.

15.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.

16.) ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.

17.) SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.

18.) ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.

19.) TREES ARE TO BE 3.5" CALIPER 6" OFF THE ROOT BALL.

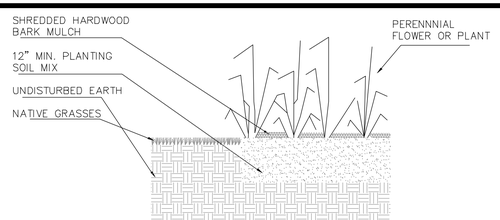
20.) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)

21.) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY–PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.

22.) PLANT–PIT BACK–FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON–SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.

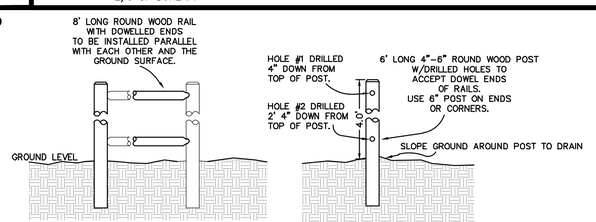
23.) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.

L7



PERENNIAL PLANTING DETAIL

L8



TYPICAL POST & RAIL FENCE DETAIL

NOT TO SCALE

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

LANDSCAPING DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

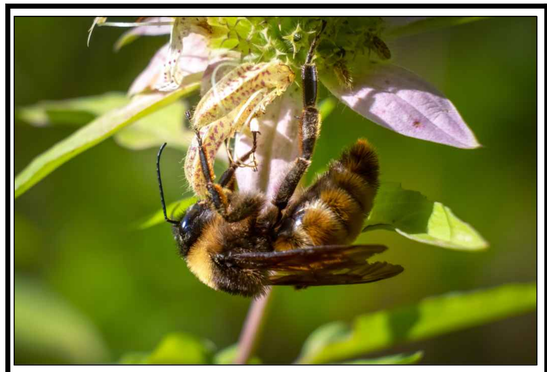
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14044
LICENSED PROFESSIONAL ENGINEER

L–101

NOT FOR CONSTRUCTION



AMERICAN BUMBLE BEE

IDENTIFICATION/DESCRIPTION:

BOMBUS PENSYLVANICUS IS A LARGE BUMBLE BEE WITH THE QUEEN MEASURING 1 IN, THE WORKER FROM 0.5 IN, AND THE MALE FROM 0.75 IN IN LENGTH. THE QUEEN IS MOSTLY BLACK, INCLUDING THE LEGS, SPURS AND TEGULAE (BASE OF WING). TERGITE 1, OR THE MOST ANTERIOR BACK PORTION OF THE QUEEN IS OFTEN YELLOW ESPECIALLY IN THE MIDDLE. WORKER BEES' MIDDLE TERGITES ARE YELLOW, THE TAIL BLACK, AND FACE LONG. THEIR CHEEKS ARE SLIGHTLY LONGER THAN BROAD, AND THE CLYPEUS (NOSE) HAS LARGE PUNCTURES EXCEPT ON THE MID LINE. THE HAIR ON THE TOP OF THE HEAD IS BLACK, SHORT AND EVEN. MALES HAVE A YELLOW ABDOMEN WITH A BLACK HEAD AND BLACK STRIPING IN THE LOWER THORAX.

SILVER HAIRED BAT

IDENTIFICATION/DESCRIPTION:

THE SILVER-HAIRED BAT IS A MEDIUM-SIZED BAT WITH VERY DARK FUR TIPPED WITH SILVER OR WHITE. THE WINGS AND TAIL MEMBRANE ARE BLACK. EARS ARE SHORT AND ROUND WITH A SHORT, BLUNT-TIPPED TRAGUS. THE DORSAL SURFACE OF THE TAIL MEMBRANE IS PARTIALLY FURRED AND THE CALCAR LACKS A KEEL

NORTHERN BLACK RACER

IDENTIFICATION/DESCRIPTION:

A SLENDER BLACK SNAKE MEASURING 36-60 INCHES. BLACK RACERS ARE GLOSSY BLACK ON THE TOP AND BOTTOM WITH A WHITE THROAT AND CHIN. YOUNG RACERS ARE PATTERNED WITH BROWN OR REDDISH PATCHES ON A LIGHTER BASE OF GRAY.

SMOOTH GREEN SNAKE

IDENTIFICATION/DESCRIPTION:

A THIN, SLENDER BRIGHT-GREEN SNAKE MEASURING 10-20 INCHES. THE UNDERSIDE IS WHITE OR A PALE YELLOW.

LITTLE BROWN BAT

IDENTIFICATION/DESCRIPTION:

THE LITTLE BROWN BAT IS A SMALL MAMMAL WITH A BODY LENGTH OF 2 1/2 – 4" AND WEIGHING APPROXIMATELY 1/8 TO 1/2 AN OUNCE. THE WINGSPAN OF LITTLE BROWN BATS RANGE FROM 9 – 11". BATS ARE THE ONLY MAMMALS THAT ENGAGE IN TRULY ACTIVE FLIGHT, AS THEIR NAME SUGGESTS THEY ARE GLOSSY BROWN ABOVE WITH A LIGHTER GRAY COLOR BELOW. THESE BATS CAN LIVE 20 TO 30 YEARS.

NORTHERN LONG-EARED BAT

IDENTIFICATION/DESCRIPTION:

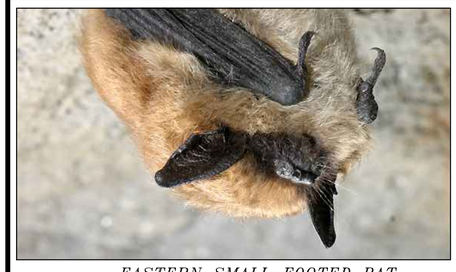
THE NORTHERN LONG-EARED BAT IS A MEDIUM-SIZED BAT WITH A BODY LENGTH OF 3 TO 3.7 INCHES BUT A WINGSPAN OF 9 TO 10 INCHES. THEIR FUR COLOR CAN BE MEDIUM TO DARK BROWN ON THE BACK AND TAWNY TO PALE-BROWN ON THE UNDERSIDE. AS ITS NAME SUGGESTS, THIS BAT IS DISTINGUISHED BY ITS LONG EARS, PARTICULARLY AS COMPARED TO OTHER BATS IN ITS GENUS, MYOTIS

NEW-ENGLAND COTTON TAIL

IDENTIFICATION/DESCRIPTION:

ALSO CALLED THE BRUSH RABBIT, WOODS RABBIT, OR CONEY, THE NEW ENGLAND COTTONTAIL IS 15 TO 17 INCHES LONG AND WEIGHS AROUND 2 POUNDS -20 PERCENT SMALLER THAN THE EASTERN COTTONTAIL.

THE NEW ENGLAND COTTONTAIL HAS A GRAYISH BROWN PELT FLECKED WITH BLACK, AND A WHITE TAIL. THE NEW ENGLAND COTTONTAIL LOOKS MUCH LIKE THE EASTERN COTTONTAIL. HOWEVER, MOST NEW ENGLAND COTTONTAILS HAVE A SMALL BLACK SPOT ON THE FOREHEAD, WHEREAS ABOUT HALF OF ALL EASTERN COTTONTAILS HAVE A WHITE SPOT IN THE SAME PLACE. THE NEW ENGLAND COTTONTAIL'S EARS ARE SLIGHTLY SHORTER THAN THOSE OF THE EASTERN COTTONTAIL AND HAVE A LINE OF BLACK FUR ALONG THE OUTER EDGE.



EASTERN SMALL-FOOTED BAT

IDENTIFICATION/DESCRIPTION:

THE EASTERN SMALL-FOOTED BAT HAS BROWNISH FUR, OFTEN WITH A GOLDEN SHEEN, THAT CONTRASTS WITH ITS BLACKISH FACE AND EARS, AND BLACKISH-BROWN WINGS AND TAIL MEMBRANE. IT CAN BE DISTINGUISHED FROM OTHER MYOTIS SPECIES BY ITS BLACK MASK AND SMALL SIZE. THE BODY IS LITTLE MORE THAN 3½ INCHES LONG, INCLUDING A 1½-INCH TAIL. ITS SMALL FEET, WHICH PROVIDE THE COMMON NAME, ARE LESS THAN A HALF-INCH AND ITS WINGSPAN RANGES FROM 8¼ TO 9¾INCHES. THIS SPECIES FLIES SLOWLY AND ERRATICALLY, USUALLY ABOUT ONE TO THREE YARDS ABOVE THE GROUND.

PLEASE REPORT OBSERVATIONS OF RARE TURTLES

The NH Fish & Game Department is requesting observations of the following turtle species

Turtles may be attracted to disturbed ground during nesting season (May 15th – June 30th)

Turtles are most active from April 15th - October 15th

Blanding's turtle
(State Endangered)

Large, dark/black domed shell with lighter speckles.

Distinct yellow throat/chin.

Aquatic but often moves on land.

Spotted turtle
(State Threatened)

Small, mostly aquatic with black or dark brown with yellow spots.

Fairly flat shell compared to Blanding's turtle.

Spots vary in color and number.

Fis 1401.03 (a) No person shall take or possess a spotted turtle (*Clemmys guttata*)...Blanding's turtle (*Emydoidea blandingii*)...or any egg or part thereof.

Report sightings immediately to NHFG Wildlife Division at 603-271-2461 (M-F 8-4) or to NHFG Wildlife Biologist Melissa Winters 603-479-1129 (cell) anytime.

Please report promptly, noting specific location and date – Photographs strongly encouraged

Wood Turtle

(New Hampshire Species of Special Concern)

Turtles may be attracted to disturbed ground during nesting season (**May 15th – June 30th**)

Turtles are most active from **April 15th - October 15th**

Identifying traits

- Neck and forelimbs are orange.
- Characterized by its highly sculpted shell with each large scute taking on an irregular pyramidal shape.
- Adults can be 5-8 inches long.

Habitat Use

- wooded areas near streams
- uplands surrounding streams

NOTE: It is illegal to remove a wood turtle from the wild.

Observations shall be reported to NH Fish & Game at NHFGReview@wildlife.nh.gov or at 603-271-2461
Photo documentation, location and date/time of observation is helpful.

State laws pertaining to this species RSA 207:1, FIS 804.02, Fis 1401.03 (a)

W-101

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

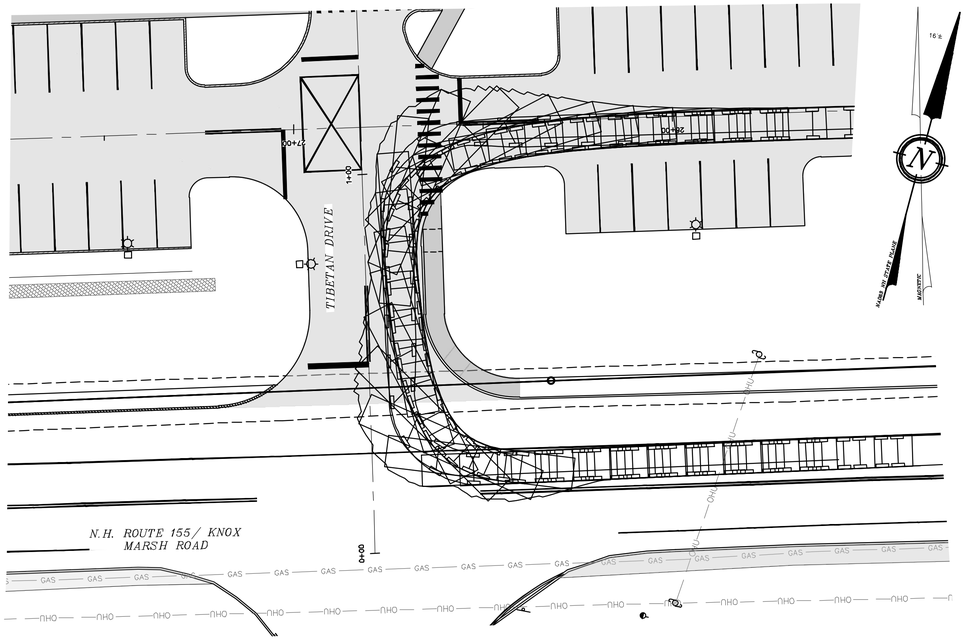
WILDLIFE IDENTIFICATION PLAN
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

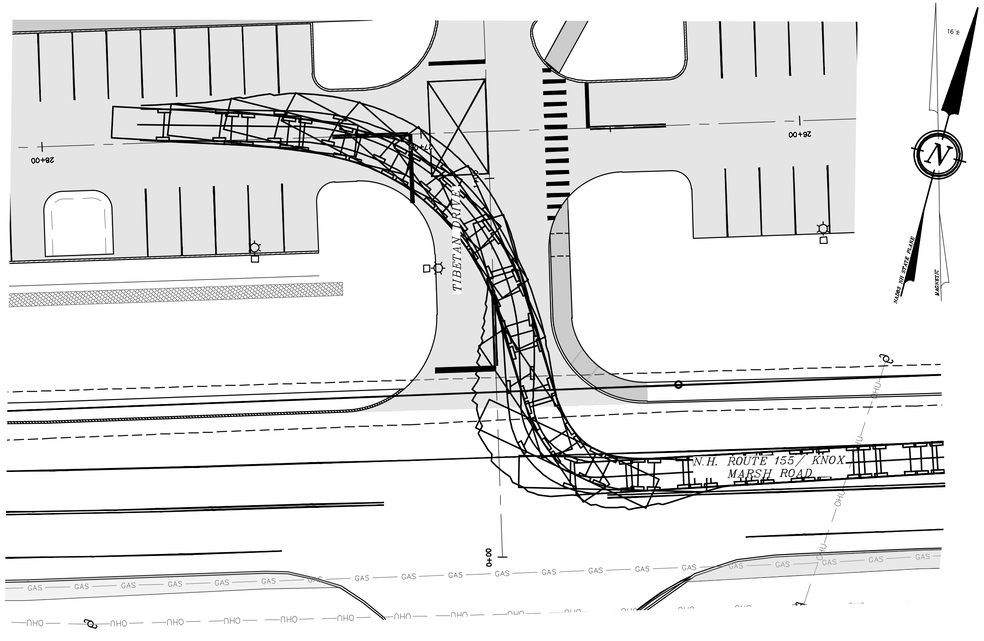


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TRUCK TURNING ENTRANCE RIGHT FROM EAST

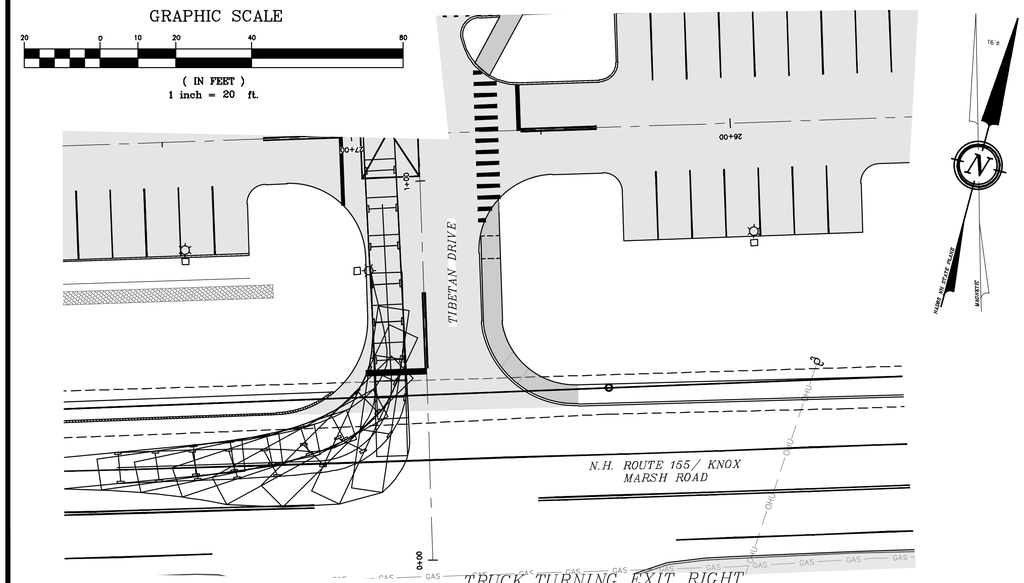


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TRUCK TURNING ENTRANCE LEFT FROM EAST



GRAPHIC SCALE

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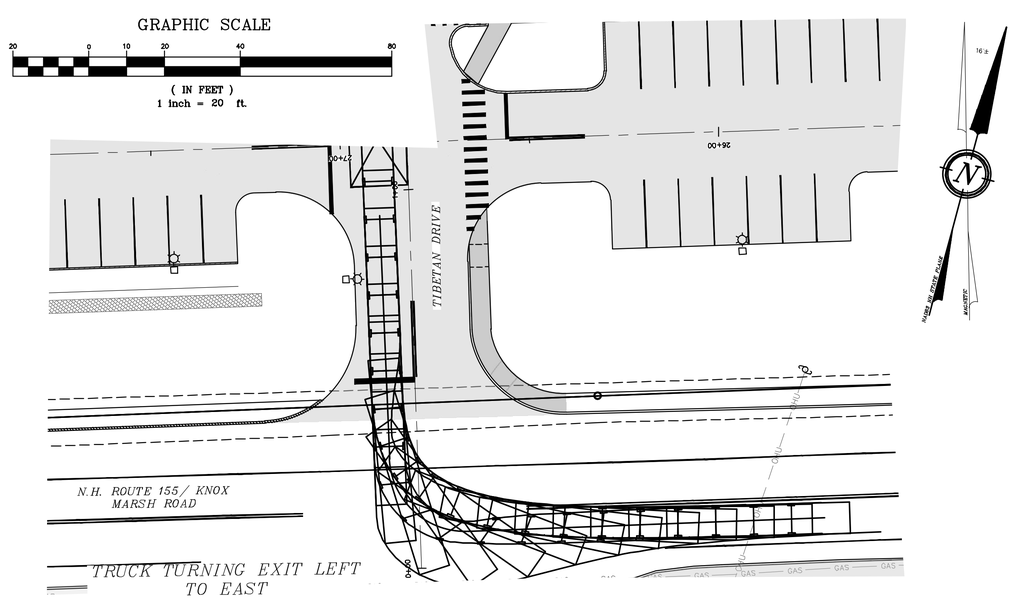
(IN FEET)
1 inch = 20 ft.

TRUCK TURNING EXIT RIGHT TO WEST



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TRUCK TURNING EXIT LEFT TO EAST

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

TRUCK TURNING ENTRANCE DOVER, NH FIRE T1 TEMPLATE
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

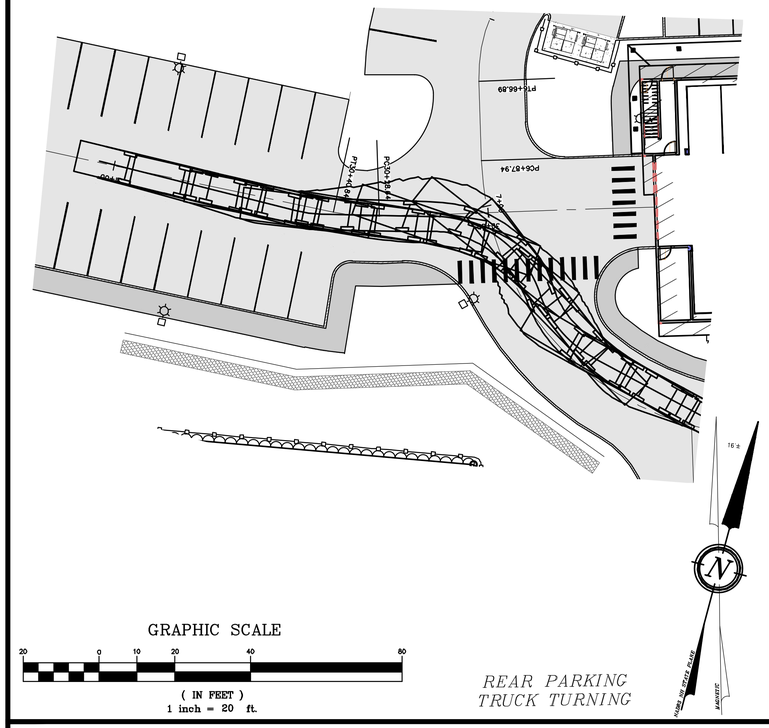
TRUCK TURNING SITE CITY OF DOVER, NH FIRE T1 TEMPLATE

LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

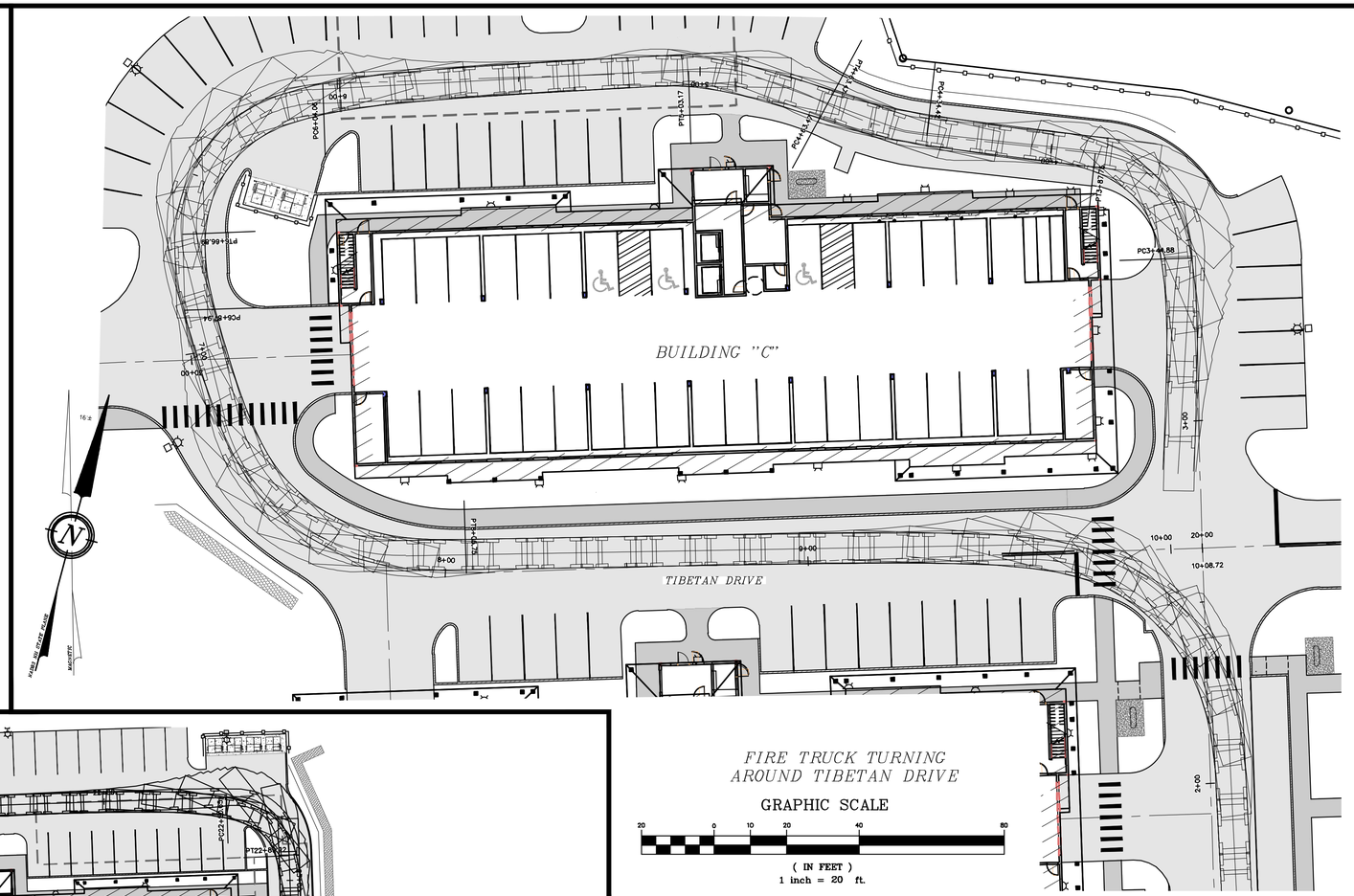
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

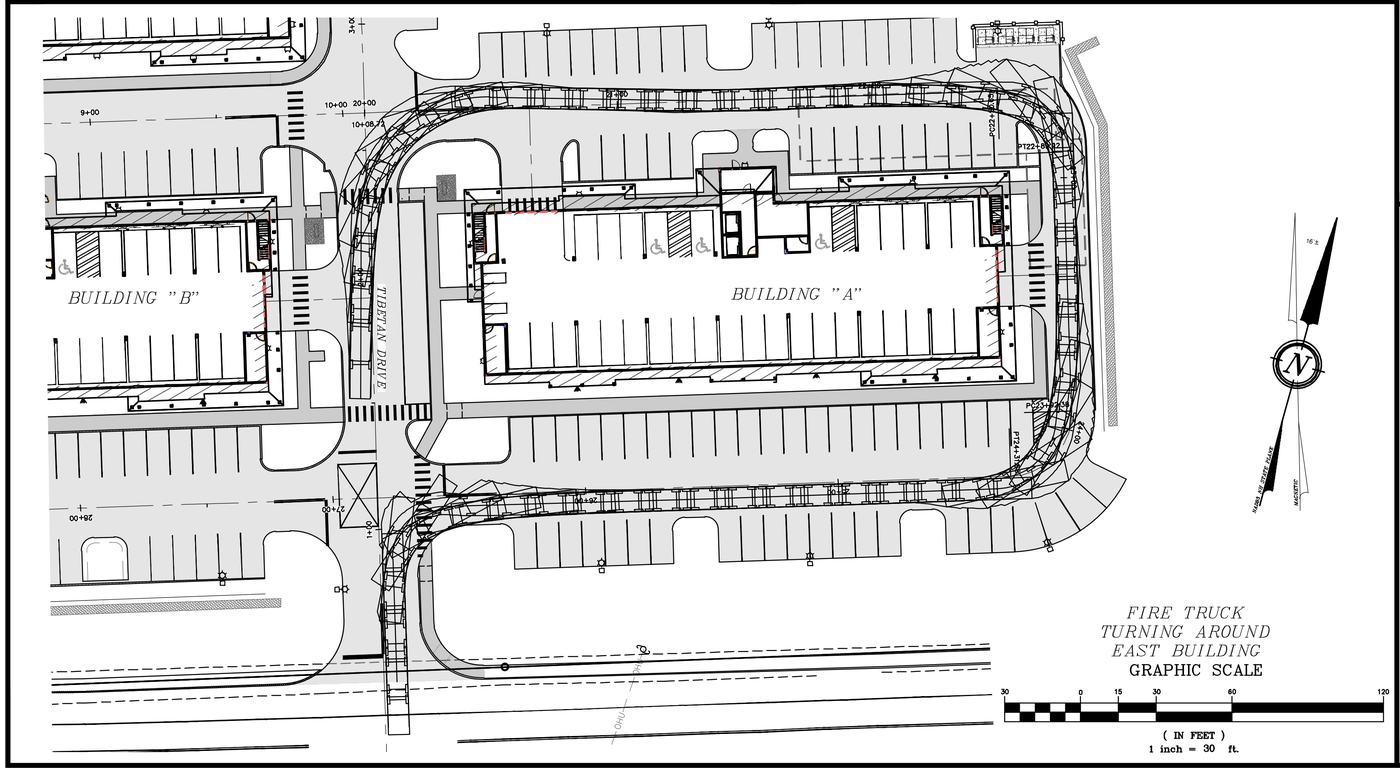
SCALE : AS SHOWN
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

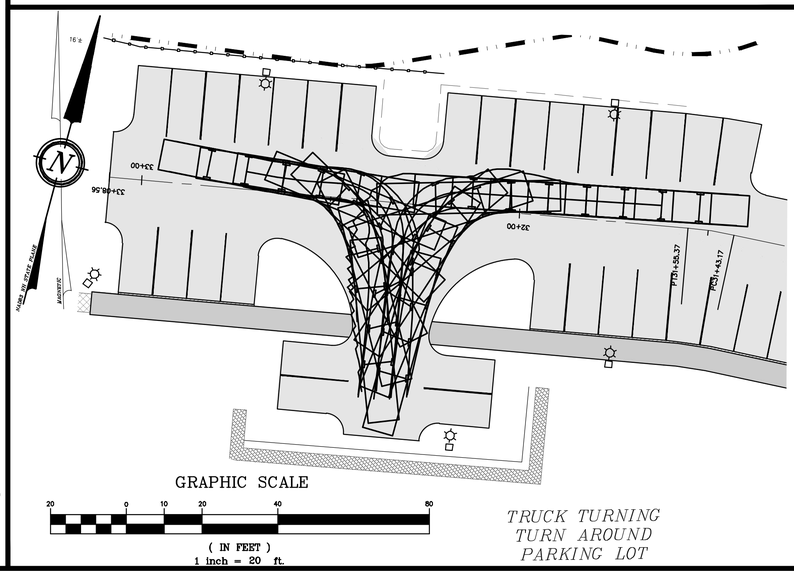
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER



REAR PARKING TRUCK TURNING







TRUCK TURNING TURN AROUND PARKING LOT

SHEET 60 OF 60

NOT FOR CONSTRUCTION

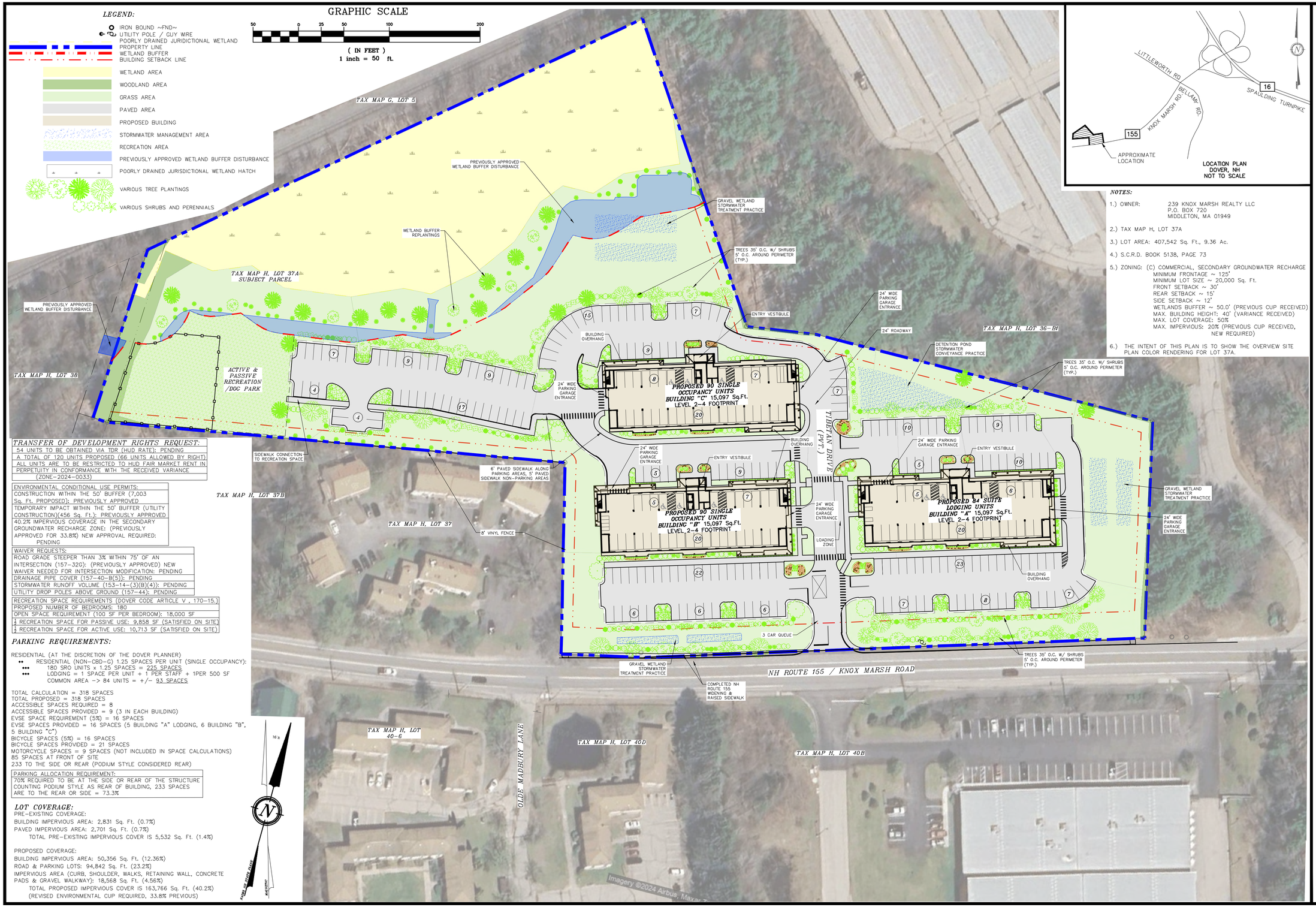
LEGEND:

- IRON BOUND ~FND~
- UTILITY POLE / GUY WIRE
- POORLY DRAINED JURIDICTIONAL WETLAND
- PROPERTY LINE
- WETLAND BUFFER
- BUILDING SETBACK LINE
- WETLAND AREA
- WOODLAND AREA
- GRASS AREA
- PAVED AREA
- PROPOSED BUILDING
- STORMWATER MANAGEMENT AREA
- RECREATION AREA
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE
- POORLY DRAINED JURISDICTIONAL WETLAND HATCH
- VARIOUS TREE PLANTINGS
- VARIOUS SHRUBS AND PERENNIALS

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) ZONING: (C) COMMERCIAL, SECONDARY GROUNDWATER RECHARGE
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 30'
REAR SETBACK ~ 15'
SIDE SETBACK ~ 12'
WETLANDS BUFFER ~ 50.0' (PREVIOUS CUP RECEIVED)
MAX. BUILDING HEIGHT: 40' (VARIANCE RECEIVED)
MAX. LOT COVERAGE: 50%
MAX. IMPERVIOUS: 20% (PREVIOUS CUP RECEIVED, NEW REQUIRED)

6.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW SITE PLAN COLOR RENDERING FOR LOT 37A.

TRANSFER OF DEVELOPMENT RIGHTS REQUEST:

54 UNITS TO BE OBTAINED VIA TDR (HUD RATE): PENDING
A TOTAL OF 120 UNITS PROPOSED (66 UNITS ALLOWED BY RIGHT)
ALL UNITS ARE TO BE RESTRICTED TO HUD FAIR MARKET RENT IN PERPETUITY IN CONFORMANCE WITH THE RECEIVED VARIANCE (ZONE-2024-0033)

ENVIRONMENTAL CONDITIONAL USE PERMITS:
CONSTRUCTION WITHIN THE 50' BUFFER (7,003 Sq. Ft. PROPOSED): PREVIOUSLY APPROVED
TEMPORARY IMPACT WITHIN THE 50' BUFFER (UTILITY CONSTRUCTION)(456 Sq. Ft.): PREVIOUSLY APPROVED
40.2% IMPERVIOUS COVERAGE IN THE SECONDARY GROUNDWATER RECHARGE ZONE: (PREVIOUSLY APPROVED FOR 33.8%) NEW APPROVAL REQUIRED: PENDING

WAIVER REQUESTS:
ROAD GRADE STEEPER THAN 3% WITHIN 75' OF AN INTERSECTION (157-32G): (PREVIOUSLY APPROVED) NEW WAIVER NEEDED FOR INTERSECTION MODIFICATION: PENDING
DRAINAGE PIPE COVER (157-40-B(5)): PENDING
STORMWATER RUNOFF VOLUME (153-14-(3)(B)(4)): PENDING
UTILITY DROP POLES ABOVE GROUND (157-44): PENDING

RECREATION SPACE REQUIREMENTS (DOVER CODE ARTICLE V , 170-15.)
PROPOSED NUMBER OF BEDROOMS: 180
OPEN SPACE REQUIREMENT (100 SF PER BEDROOM): 18,000 SF
½ RECREATION SPACE FOR PASSIVE USE: 9,858 SF (SATISFIED ON SITE)
½ RECREATION SPACE FOR ACTIVE USE: 10,713 SF (SATISFIED ON SITE)

PARKING REQUIREMENTS:

RESIDENTIAL (AT THE DISCRETION OF THE DOVER PLANNER)
•• RESIDENTIAL (NON-CBD-G) 1.25 SPACES PER UNIT (SINGLE OCCUPANCY):
••• 180 SRO UNITS x 1.25 SPACES = 225 SPACES
••• LODGING = 1 SPACE PER UNIT + 1 PER STAFF + 1PER 500 SF COMMON AREA -> 84 UNITS = +/- 93 SPACES

TOTAL CALCULATION = 318 SPACES
TOTAL PROPOSED = 318 SPACES
ACCESSIBLE SPACES REQUIRED = 8
ACCESSIBLE SPACES PROVIDED = 9 (3 IN EACH BUILDING)
EVSE SPACE REQUIREMENT (5%) = 16 SPACES
EVSE SPACES PROVIDED = 16 SPACES (5 BUILDING "A" LODGING, 6 BUILDING "B", 5 BUILDING "C")
BICYCLE SPACES (5%) = 16 SPACES
BICYCLE SPACES PROVIDED = 21 SPACES
MOTORCYCLE SPACES = 9 SPACES (NOT INCLUDED IN SPACE CALCULATIONS)
85 SPACES AT FRONT OF SITE
233 TO THE SIDE OR REAR (PODIUM STYLE CONSIDERED REAR)

PARKING ALLOCATION REQUIREMENT:
70% REQUIRED TO BE AT THE SIDE OR REAR OF THE STRUCTURE COUNTING PODIUM STYLE AS REAR OF BUILDING, 233 SPACES ARE TO THE REAR OR SIDE = 73.3%

LOT COVERAGE:

PRE-EXISTING COVERAGE:
BUILDING IMPERVIOUS AREA: 2,831 Sq. Ft. (0.7%)
PAVED IMPERVIOUS AREA: 2,701 Sq. Ft. (0.7%)
TOTAL PRE-EXISTING IMPERVIOUS COVER IS 5,532 Sq. Ft. (1.4%)

PROPOSED COVERAGE:
BUILDING IMPERVIOUS AREA: 50,356 Sq. Ft. (12.36%)
ROAD & PARKING LOTS: 94,842 Sq. Ft. (23.2%)
IMPERVIOUS AREA (CURB, SHOULDER, WALKS, RETAINING WALL, CONCRETE PADS & GRAVEL WALKWAY): 18,568 Sq. Ft. (4.56%)
TOTAL PROPOSED IMPERVIOUS COVER IS 163,766 Sq. Ft. (40.2%)
(REVISED ENVIRONMENTAL CUP REQUIRED, 33.8% PREVIOUS)

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

OVERVIEW MIXED-USE TDR SITE PLAN COLOR RENDERING
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

NOT FOR CONSTRUCTION

PREVIOUSLY APPROVED WETLAND BUFFER IMPACT

EDGE OF POORLY DRAINAGE JURISDICTIONAL WETLANDS

WETLAND BUFFER REPLANTINGS

GRAVEL WETLAND STORMWATER TREATMENT PRACTICE

TREES 35' O.C. W/ SHRUBS 5' O.C. AROUND PERIMETER (TYP.)

24' AISLE

BUILDING SETBACK LINE (TYP.)

ENTRY VESTIBULE

TREES 35' O.C. W/ SHRUBS 5' O.C. AROUND PERIMETER (TYP.)

24' WIDE PARKING GARAGE ENTRANCE

DETENTION POND STORMWATER CONVEYANCE PRACTICE

TAX MAP H, LOT 36-B1

24' ROADWAY

9'X18' PARKING SPACE (TYP.)

24' WIDE PARKING GARAGE ENTRANCE

VARIOUS SHRUBS AND PERENNIALS (TYP.)

PROPOSED 90 SINGLE OCCUPANCY UNITS
BUILDING "C" 15,097 Sq.Ft.
LEVEL 2-4 FOOTPRINT
LEVEL 1 PARKING

TAX MAP H, LOT 37A
SUBJECT PARCEL

TREES 35' O.C. W/ SHRUBS 5' O.C. AROUND PERIMETER (TYP.)

GRAVEL WETLAND STORMWATER TREATMENT PRACTICE

24' AISLE

LANDSCAPED AREA (TYP.)

24' AISLE

SIDEWALK CONNECTION TO RECREATION SPACE

VARIOUS SHRUBS AND PERENNIALS (TYP.)

STORMWATER AREA (TYP.)

6' PAVED SIDEWALK ALONG PARKING AREAS, 5' PAVED SIDEWALK NON-PARKING AREAS

ENTRY VESTIBULE

24' WIDE PARKING GARAGE ENTRANCE

24' WIDE PARKING GARAGE ENTRANCE

ENTRY VESTIBULE

8' VINYL FENCE

LOADING ZONE

PROPOSED 90 SINGLE OCCUPANCY UNITS
BUILDING "B" 15,097 Sq.Ft.
LEVEL 2-4 FOOTPRINT
LEVEL 1 PARKING

EDGE OF LEVEL 1 PARKING STRUCTURE (TYP.)

24' WIDE PARKING GARAGE ENTRANCE

PROPOSED 84 SUITE LODGING UNITS
BUILDING "A" 15,097 Sq.Ft.
LEVEL 2-4 FOOTPRINT
LEVEL 1 PARKING

VARIOUS SHRUBS AND PERENNIALS (TYP.)

5' SIDEWALK UNDER UPPER LEVEL CANTILEVER OVERHANG (REAR BUILDING TYP.)

TAX MAP H, LOT 37

VARIOUS SHRUBS AND PERENNIALS (TYP.)

TIBETAN DRIVE (PVT.)

24' WIDE PARKING GARAGE ENTRANCE

18' AISLE

LEVEL 2-4 CANTILEVER OVERHANG (TYP.)

PORCH OVERHANG (TYP.)

6' SIDEWALK (FRONT BUILDING TYP.)

24' AISLE

TREES 35' O.C. W/ SHRUBS 5' O.C. AROUND PERIMETER (TYP.)

3 CAR QUEUE

GRAVEL WETLAND STORMWATER TREATMENT PRACTICE

TREES 35' O.C. W/ SHRUBS 5' O.C. AROUND PERIMETER (TYP.)

NH ROUTE 155 / KNOX MARSH ROAD

COMPLETED NH ROUTE 155 WIDENING & RAISED SIDEWALK

TREES 35' O.C. W/ SHRUBS 5' O.C. AROUND PERIMETER (TYP.)

TAX MAP H, LOT 40B

LEGEND:

- IRON BOUND ~FND~
- UTILITY POLE / GUY WIRE
- POORLY DRAINED JURIDICTIONAL WETLAND
- PROPERTY LINE
- WETLAND BUFFER
- BUILDING SETBACK LINE
- WETLAND AREA
- WOODLAND AREA
- GRASS AREA
- PAVED AREA
- PROPOSED BUILDING
- STORMWATER MANAGEMENT AREA
- RECREATION AREA
- PREVIOUSLY APPROVED WETLAND BUFFER DISTURBANCE
- POORLY DRAINED JURISDICTIONAL WETLAND HATCH
- VARIOUS TREE PLANTINGS
- VARIOUS SHRUBS AND PERENNIALS

NOTES:

1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

2.) TAX MAP H, LOT 37A

3.) LOT AREA: 407,542 Sq. Ft., 9.36 Ac.

4.) S.C.R.D. BOOK 5138, PAGE 73

5.) ZONING: (C) COMMERCIAL, SECONDARY GROUNDWATER RECHARGE
MINIMUM FRONTAGE ~ 125'
MINIMUM LOT SIZE ~ 20,000 Sq. Ft.
FRONT SETBACK ~ 30'
REAR SETBACK ~ 15'
SIDE SETBACK ~ 12'
WETLANDS BUFFER ~ 50.0' (PREVIOUS CUP RECEIVED)
MAX. BUILDING HEIGHT: 40' (VARIANCE RECEIVED)
MAX. LOT COVERAGE: 50%
MAX. IMPERVIOUS: 20% (PREVIOUS CUP RECEIVED, NEW REQUIRED)

6.) THE INTENT OF THIS PLAN IS TO SHOW THE DETAIL SITE PLAN COLOR RENDERING FOR LOT 37A.

7.) SEE OVERVIEW SHEET FOR OTHER NOTES AND CALCULATIONS.

PLANNING FILE #SITE-XXXX-XXXX

REVISION	DATE	DESCRIPTION

MIXED-USE TDR SITE PLAN COLOR RENDERING
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

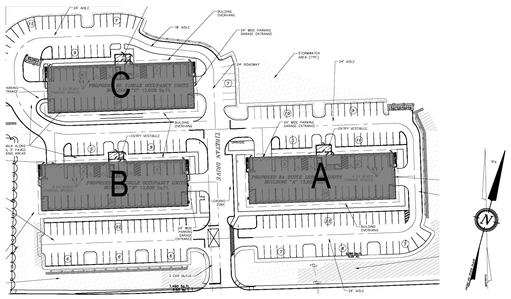
NOT FOR CONSTRUCTION

EXTERIOR FINISH LEGEND

6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE

2 BUILDING A - WEST
1/8" = 1'-0"

1 BUILDING A - EAST
1/8" = 1'-0"



NOT FOR CONSTRUCTION

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING A - ELEVATIONS

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A201

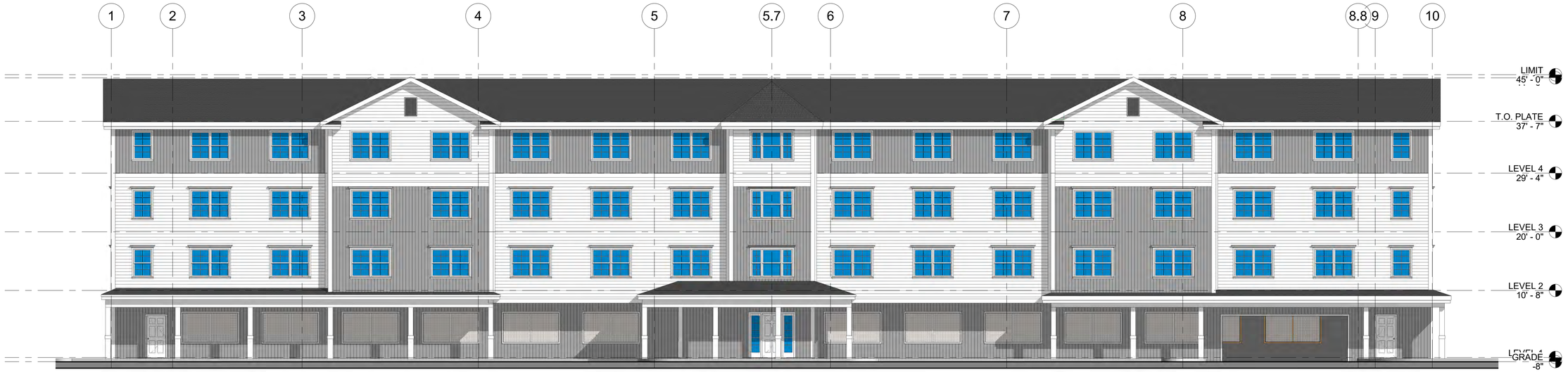
Scale As indicated

12/7/2024 3:29:13 PM

EXTERIOR FINISH LEGEND

6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE

2 BUILDING A - SOUTH
1/8" = 1'-0"



1 BUILDING A - NORTH
1/8" = 1'-0"

NOT FOR CONSTRUCTION

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING A - ELEVATIONS

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A202

Scale	1/8" = 1'-0"

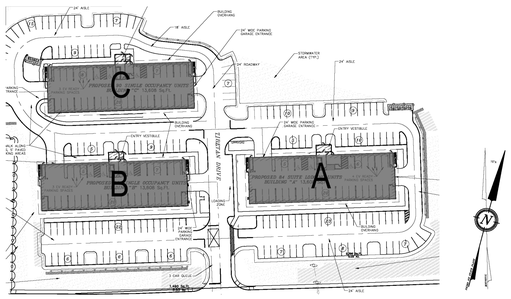
12/7/2024 3:29:21 PM

EXTERIOR FINISH LEGEND

6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE

2 BUILDING B - WEST
1/8" = 1'-0"

1 BUILDING B - EAST
1/8" = 1'-0"



NOT FOR CONSTRUCTION

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URBAN DESIGN
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NICK@ISAAKDESIGN.COM

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING B - ELEVATIONS

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

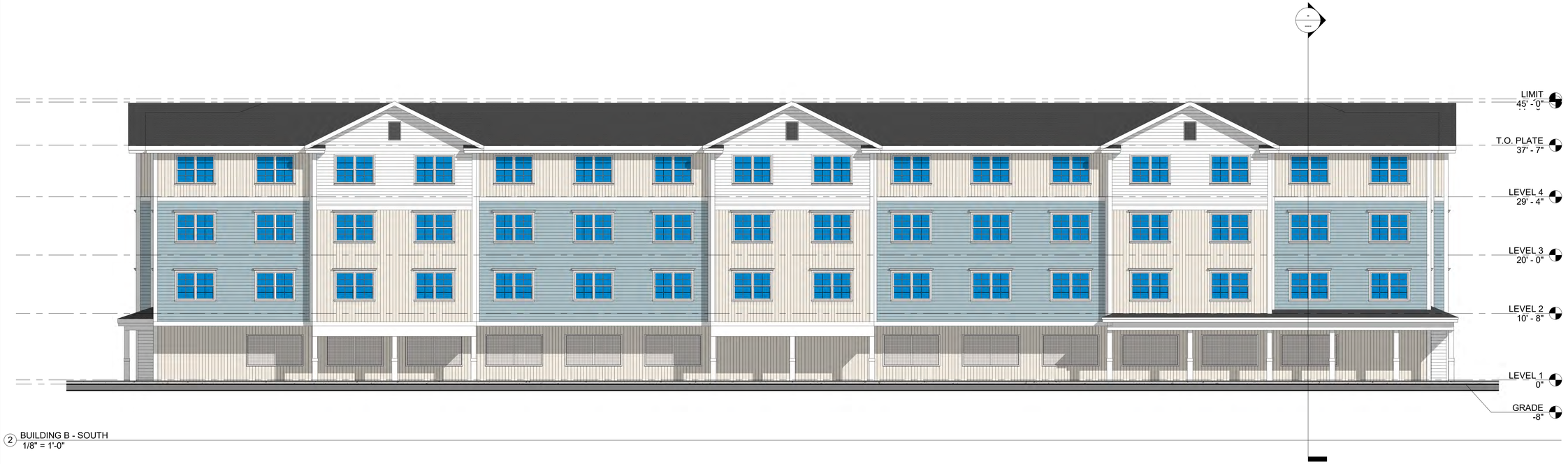
A211

Scale As indicated

12/7/2024 3:29:26 PM

EXTERIOR FINISH LEGEND

6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE



2 BUILDING B - SOUTH
1/8" = 1'-0"

1 BUILDING B - NORTH
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING B - ELEVATIONS

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A212

Scale 1/8" = 1'-0"

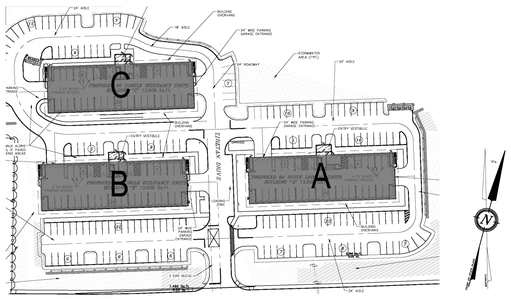
12/7/2024 3:29:34 PM

EXTERIOR FINISH LEGEND

6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE

2 BUILDING C - WEST
1/8" = 1'-0"

1 BUILDING C - EAST
1/8" = 1'-0"



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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING C - ELEVATIONS

Project number	2430
Date	12/09/24
Drawn by	CS
Checked by	NI

A221

Scale As indicated

12/7/2024 3:29:38 PM

EXTERIOR FINISH LEGEND

6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE

2 BUILDING C - SOUTH
1/8" = 1'-0"

1 BUILDING C - NORTH
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

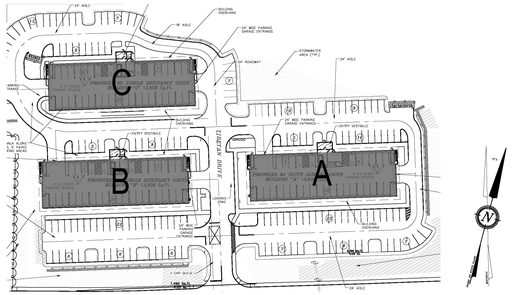
BUILDING C - ELEVATIONS

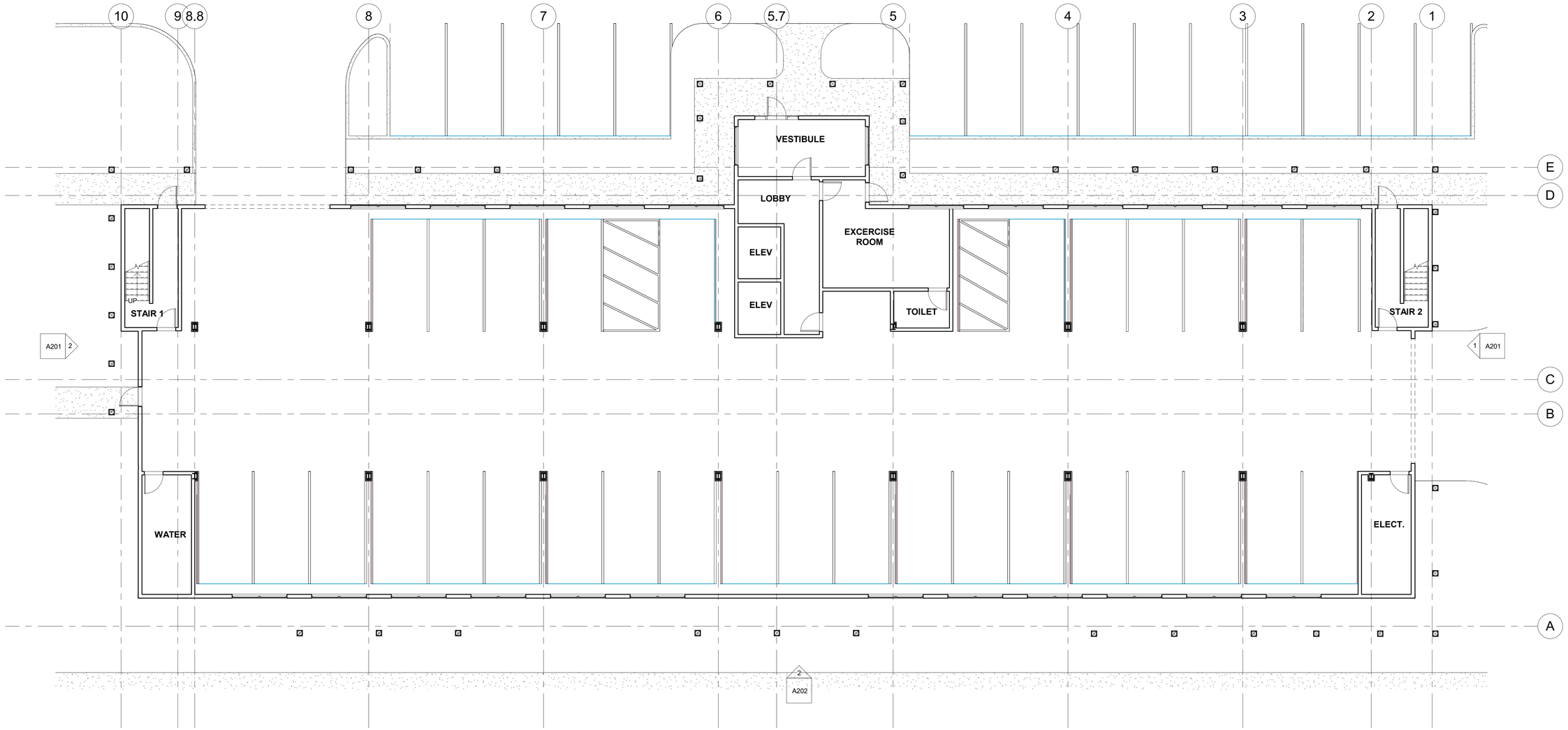
Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A222

Scale 1/8" = 1'-0"

12/7/2024 3:29:46 PM





1 BUILDING A - LEVEL 1
1/8" = 1'-0"

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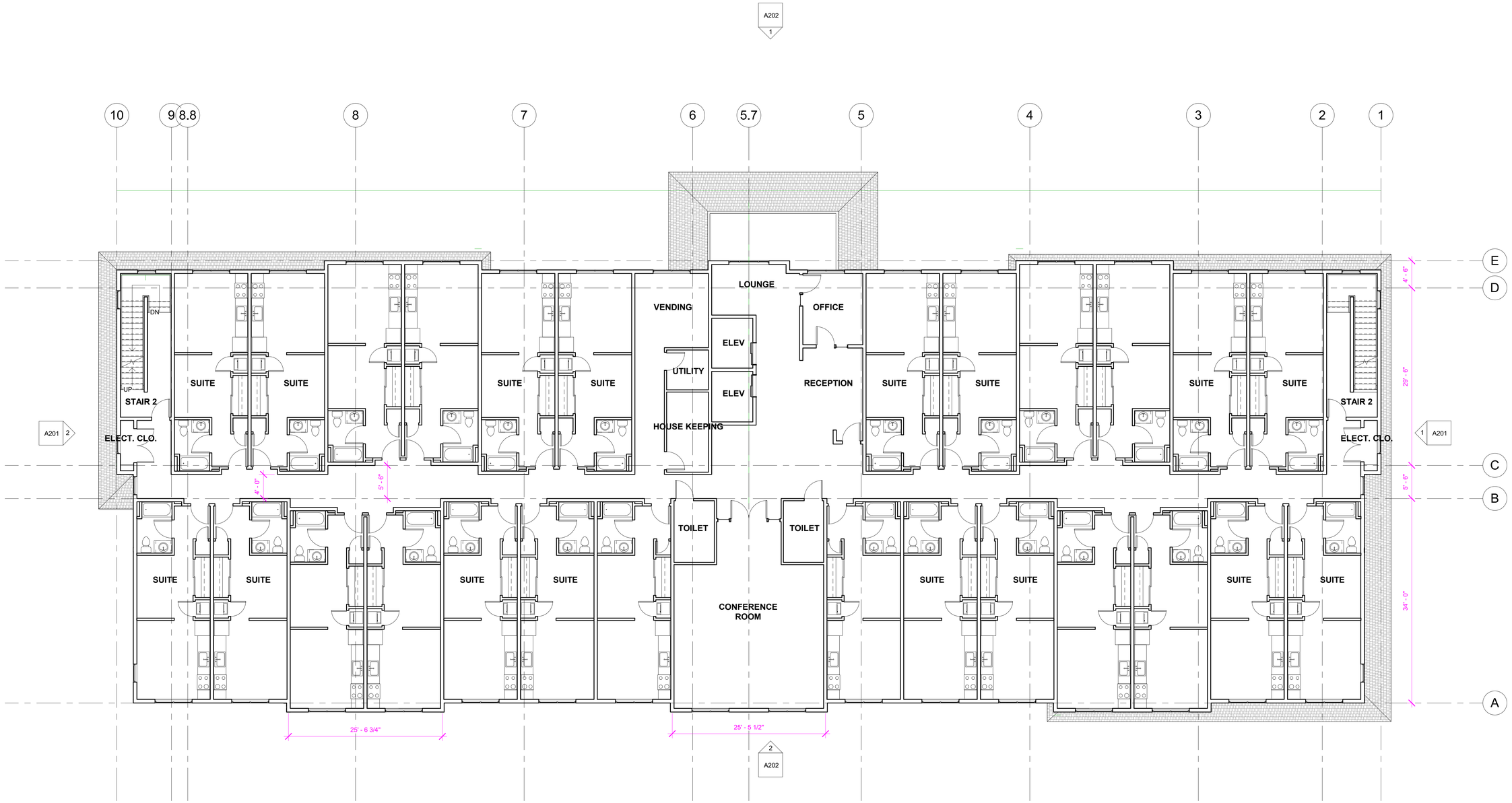
No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING A - LEVEL 1

Project number	2430
Date	12/09/24
Drawn by	CS
Checked by	NI
	A101
Scale	As indicated

12/7/2024 3:29:00 PM



1 BUILDING A - LEVEL 2
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

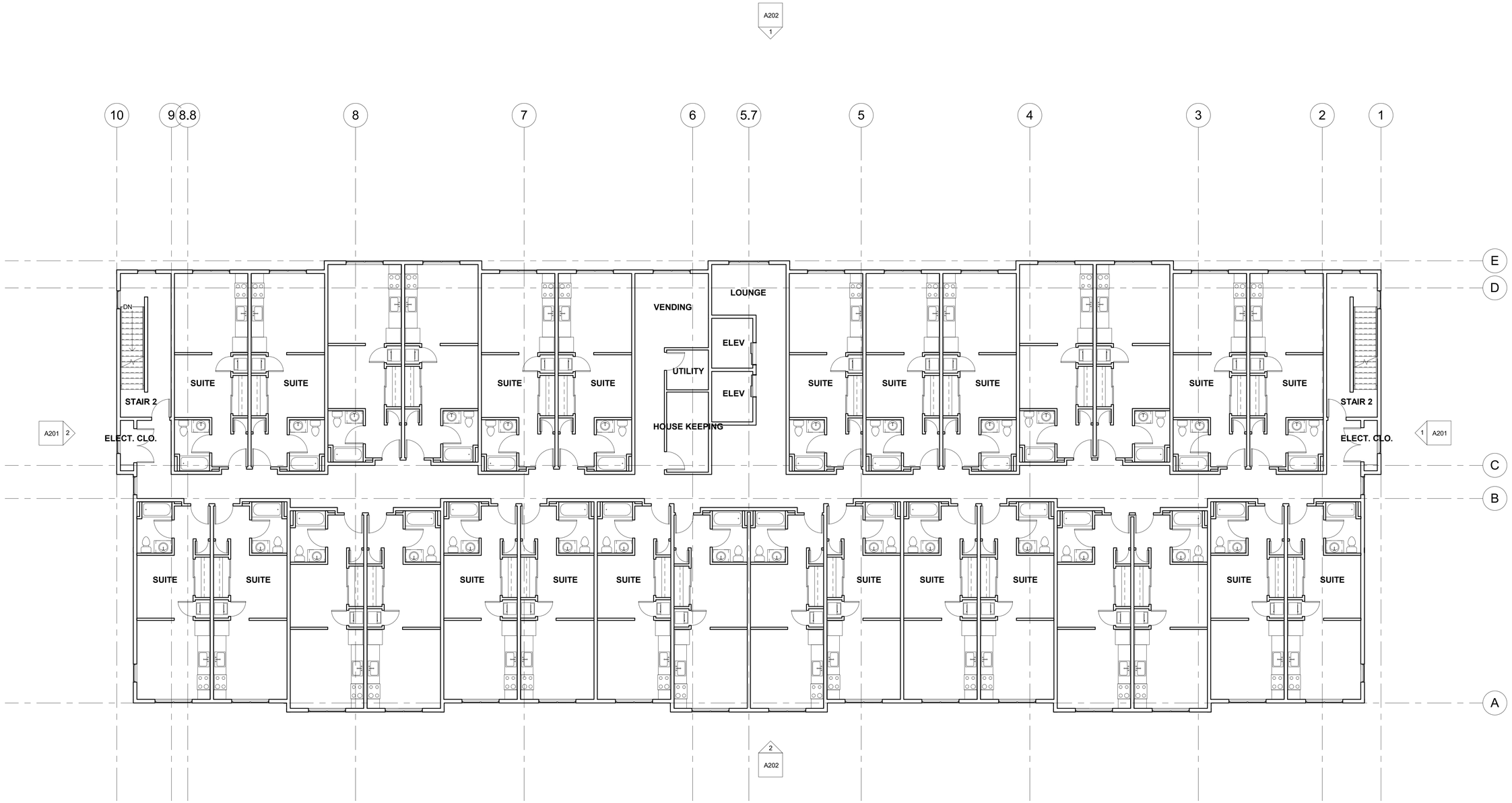
BUILDING A - LEVEL 2

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A102

Scale 1/8" = 1'-0"

12/7/2024 3:29:01 PM



1 BUILDING A - LEVEL 3
1/8" = 1'-0"

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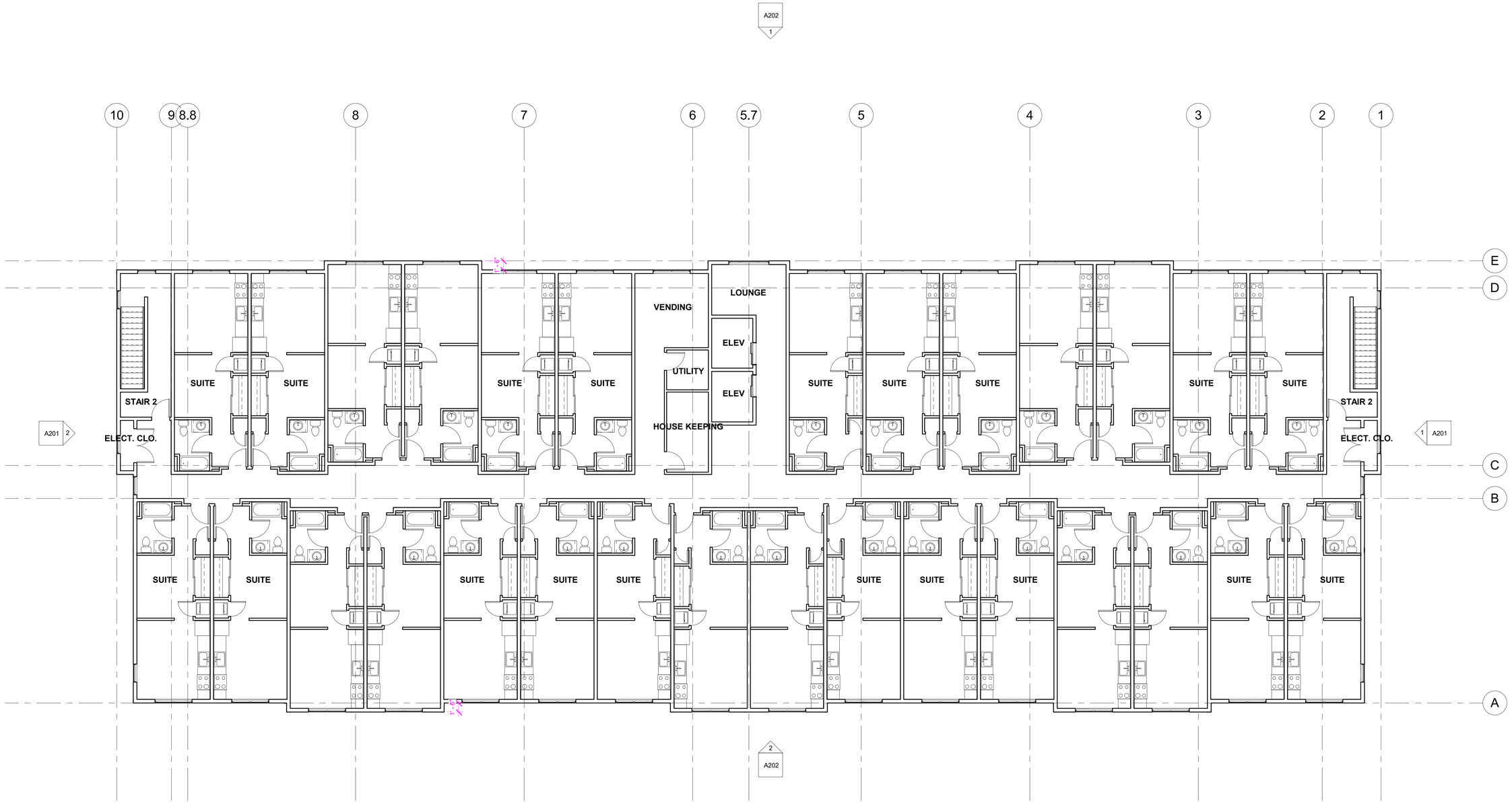
BUILDING A - LEVEL 3

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A103

Scale 1/8" = 1'-0"

12/7/2024 3:29:02 PM



1 BUILDING A - LEVEL 4
1/8" = 1'-0"

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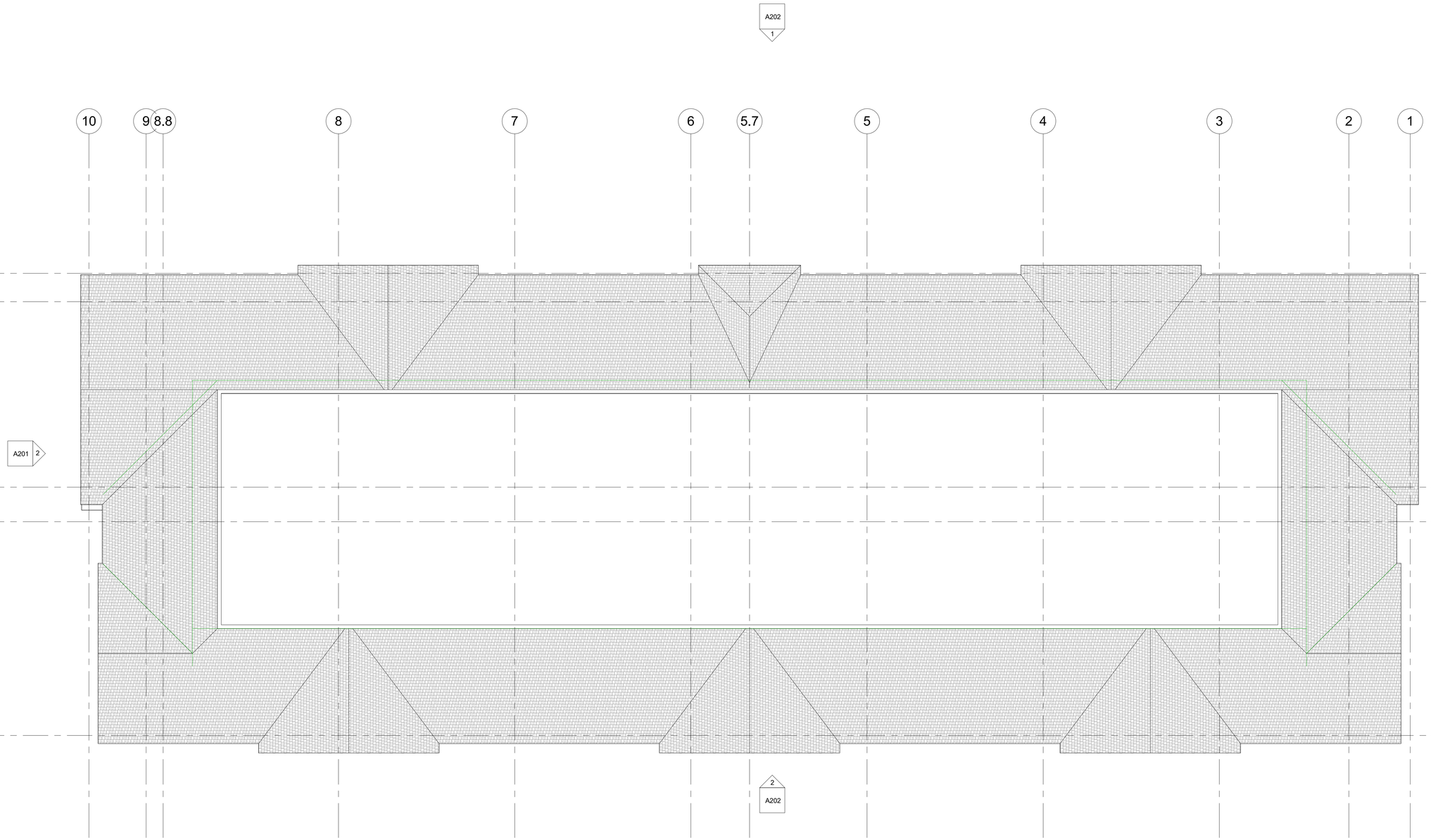
BUILDING A - LEVEL 4

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A104

Scale 1/8" = 1'-0"

12/7/2024 3:29:03 PM



1 Roof Plan
1/8" = 1'-0"

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239 KNOX MARSH RD.
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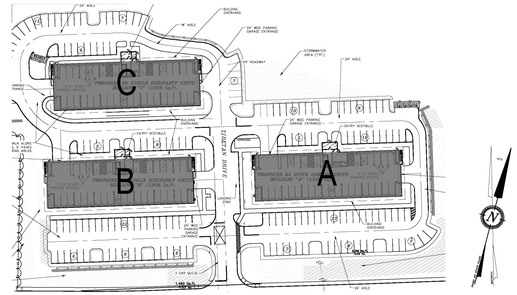
ROOF PLAN

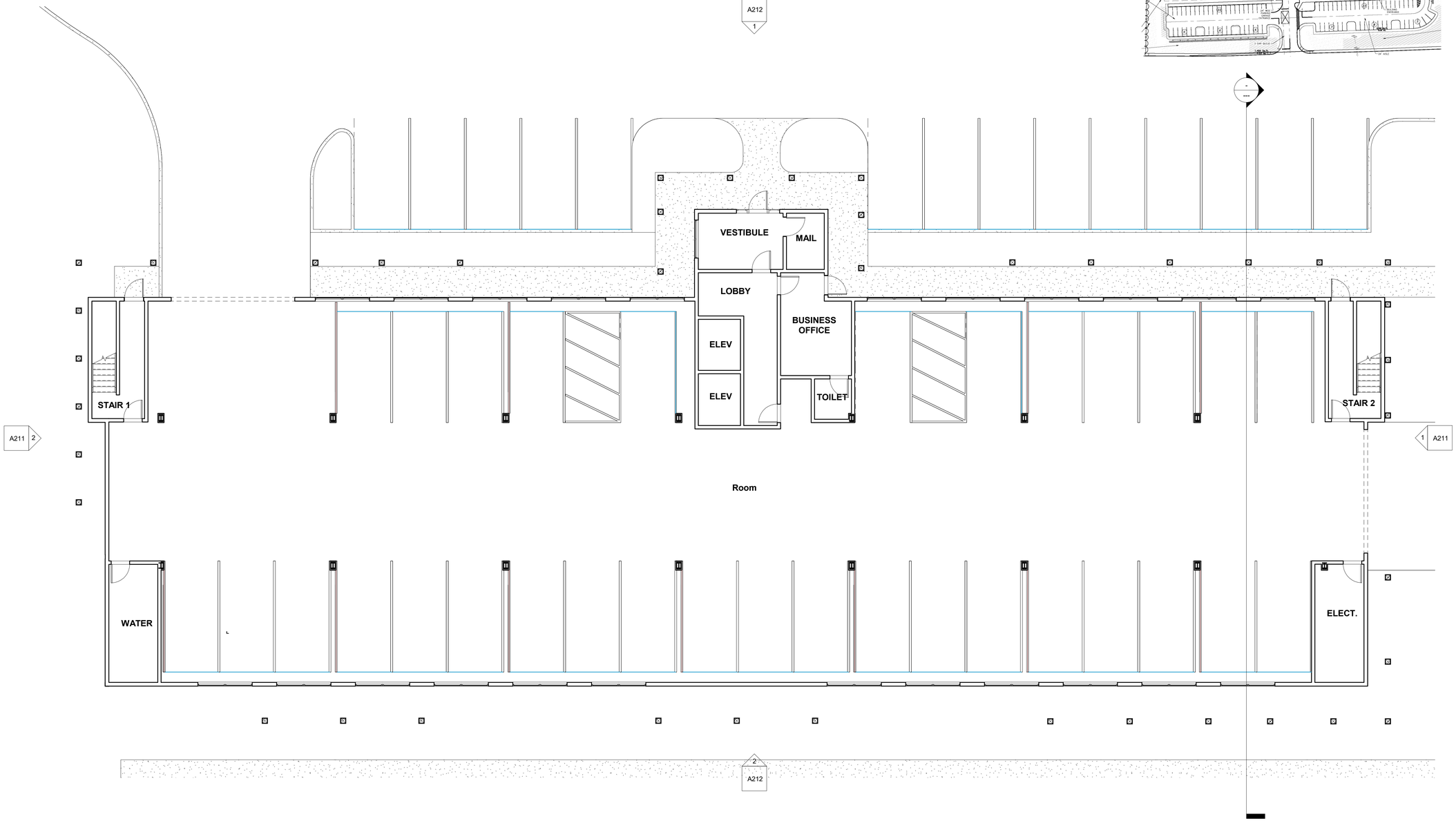
Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A105

Scale 1/8" = 1'-0"

12/7/2024 3:29:04 PM





1 BUILDING B - LEVEL 1
1/8" = 1'-0"

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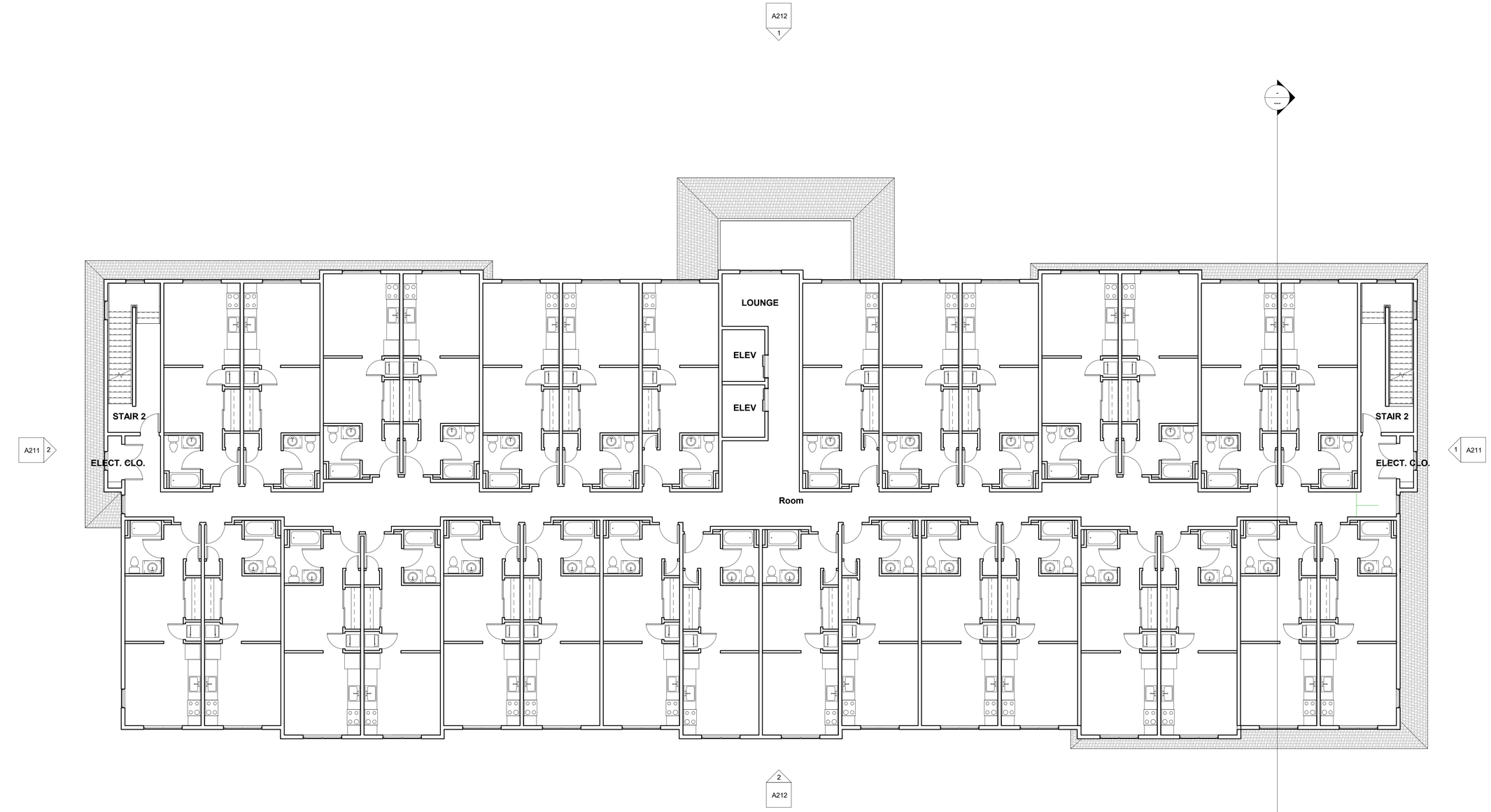
BUILDING B - LEVEL 1

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker
	A111
Scale	As indicated

12/7/2024 3:29:04 PM



1 BUILDING B - LEVEL 2
1/8" = 1'-0"

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No.	Description	Date

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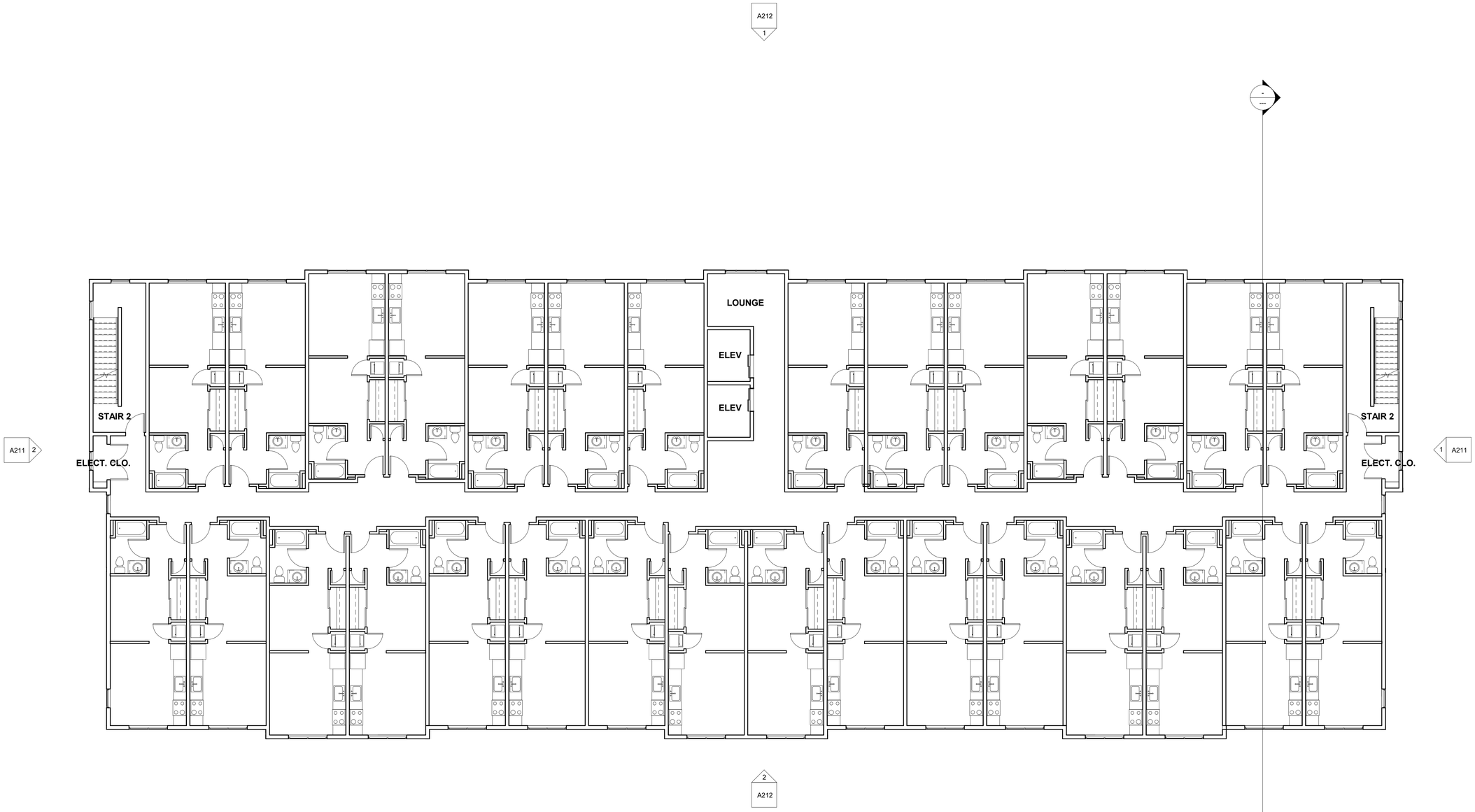
BUILDING B - LEVEL 2

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A112

Scale 1/8" = 1'-0"

12/7/2024 3:29:05 PM



1 BUILDING B - LEVEL 3
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING B - LEVEL 3

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A113

Scale 1/8" = 1'-0"

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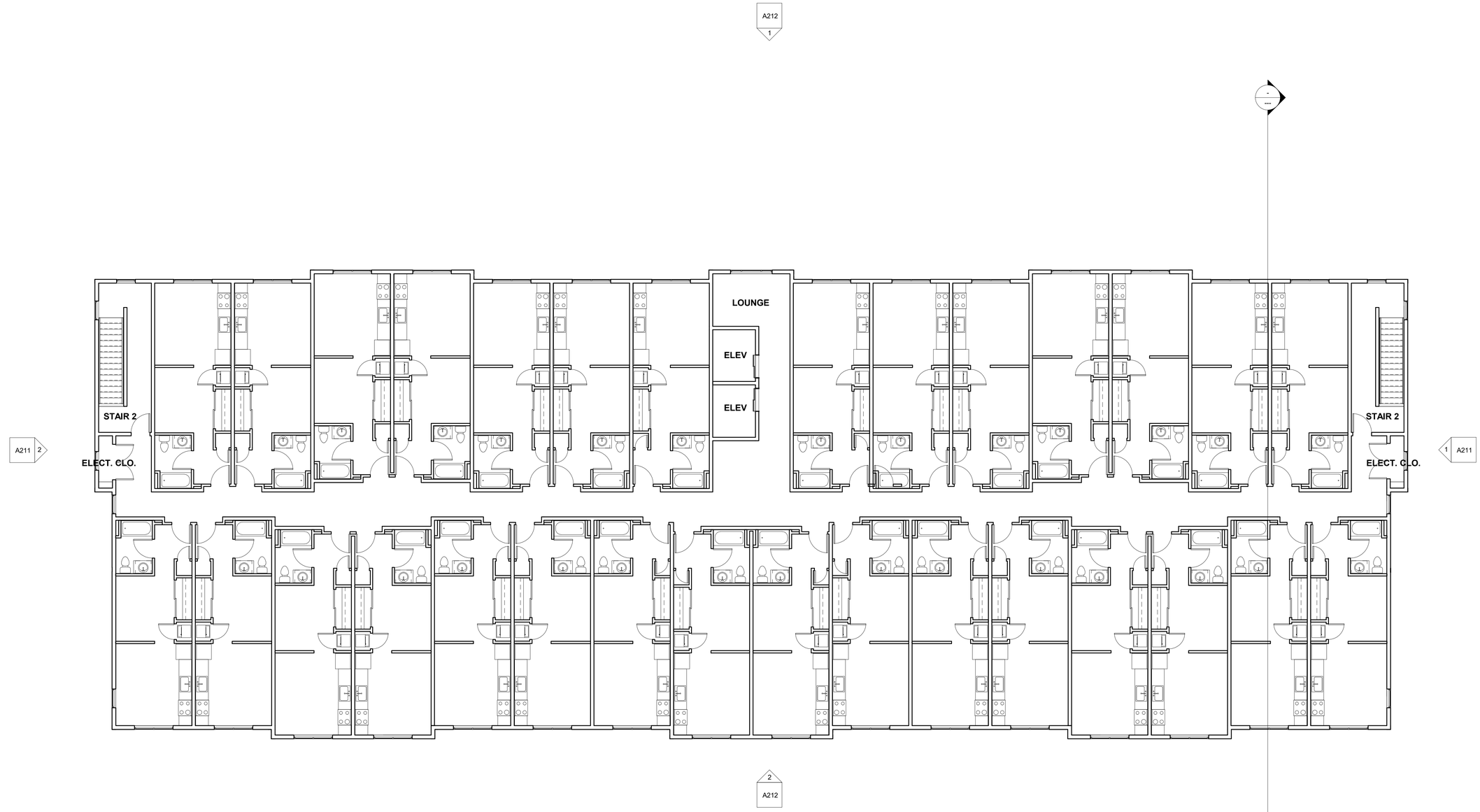

1 BUILDING B - LEVEL 4
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

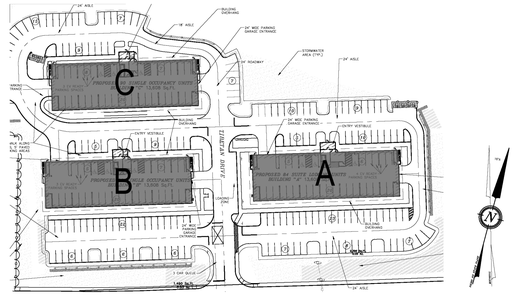
BUILDING B - LEVEL 4

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A114

Scale 1/8" = 1'-0"

12/7/2024 3:29:05 PM



A222
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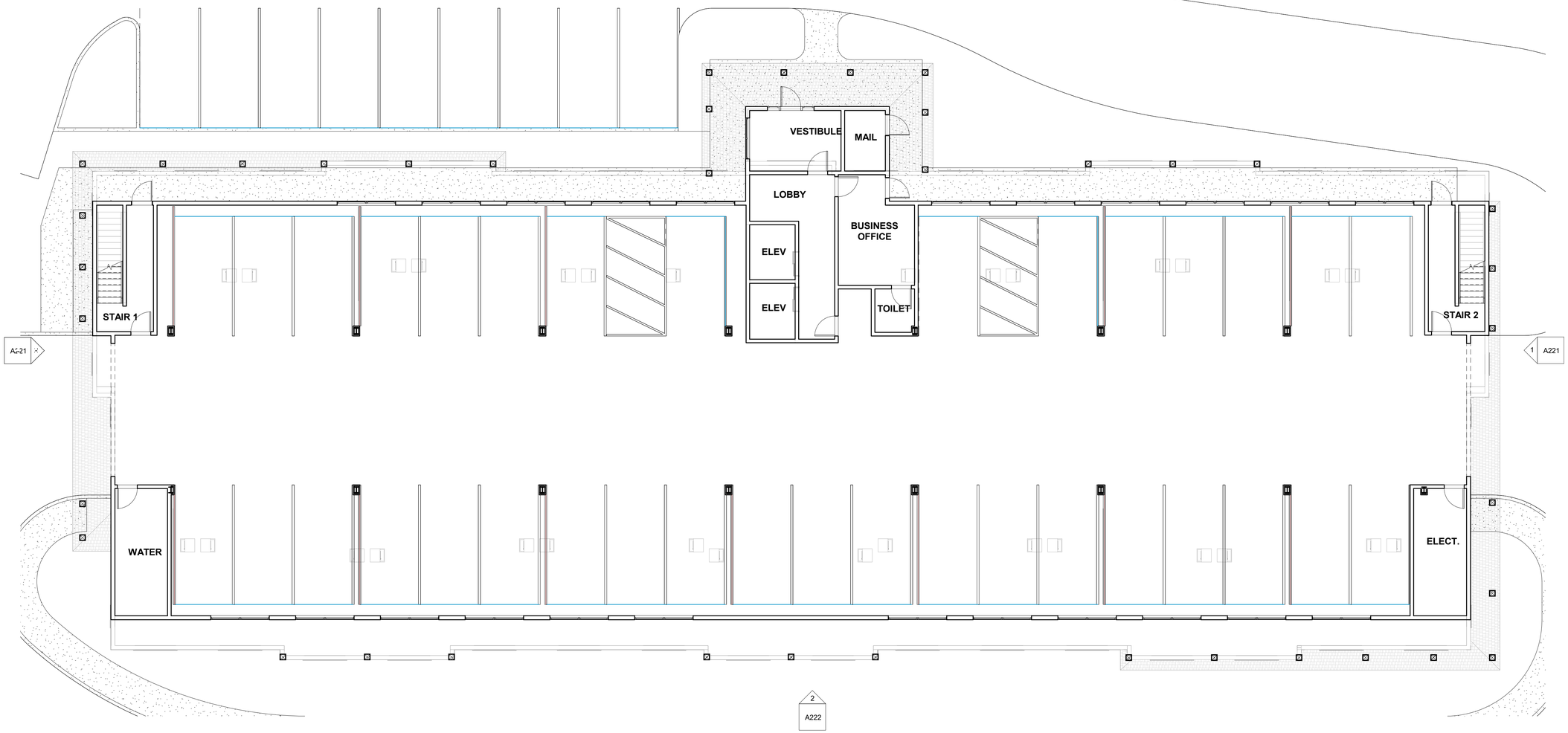

1 BUILDING C - LEVEL 1
1/8" = 1'-0"

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No.	Description	Date

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DOVER, NH

BUILDING C - LEVEL 1

Project number	2430
Date	12/09/24
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Checked by	Checker

A121

Scale As indicated

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A222
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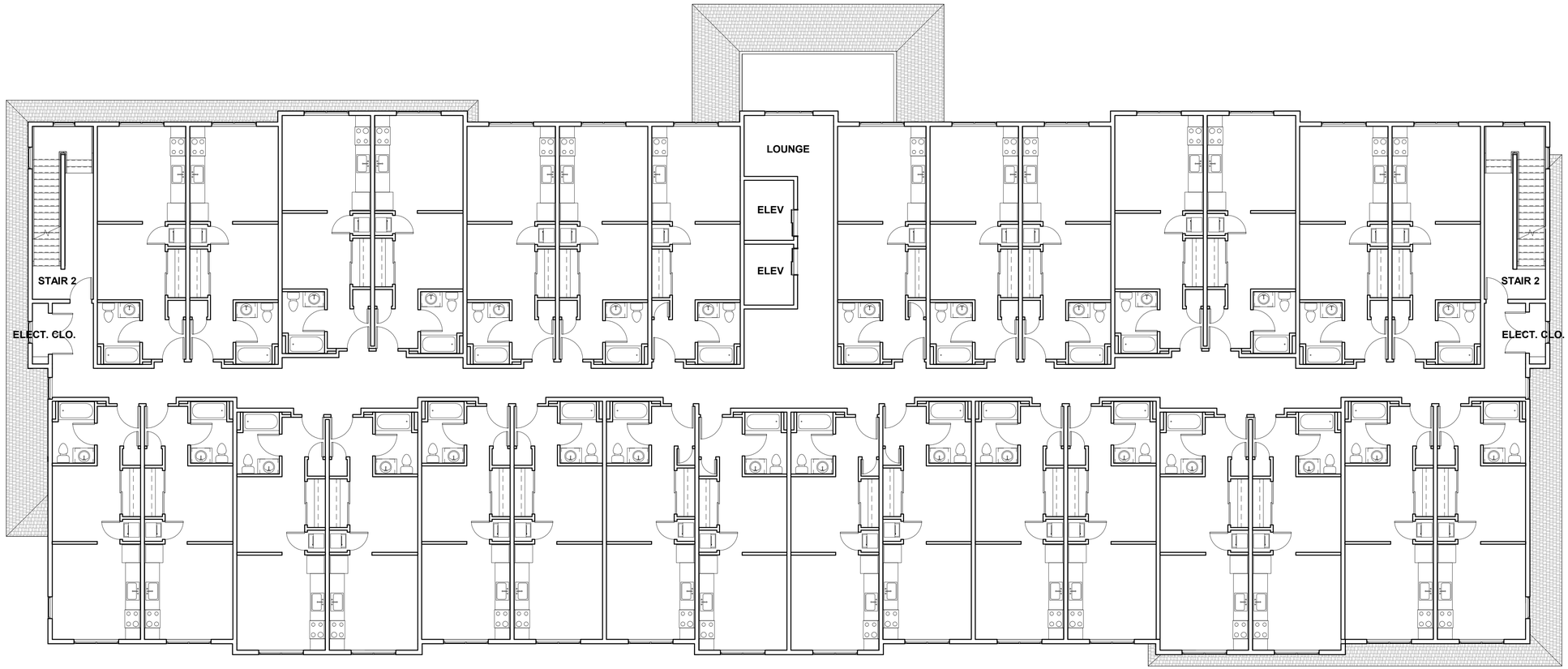

2
A222

1 BUILDING C - LEVEL 2
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING C - LEVEL 2

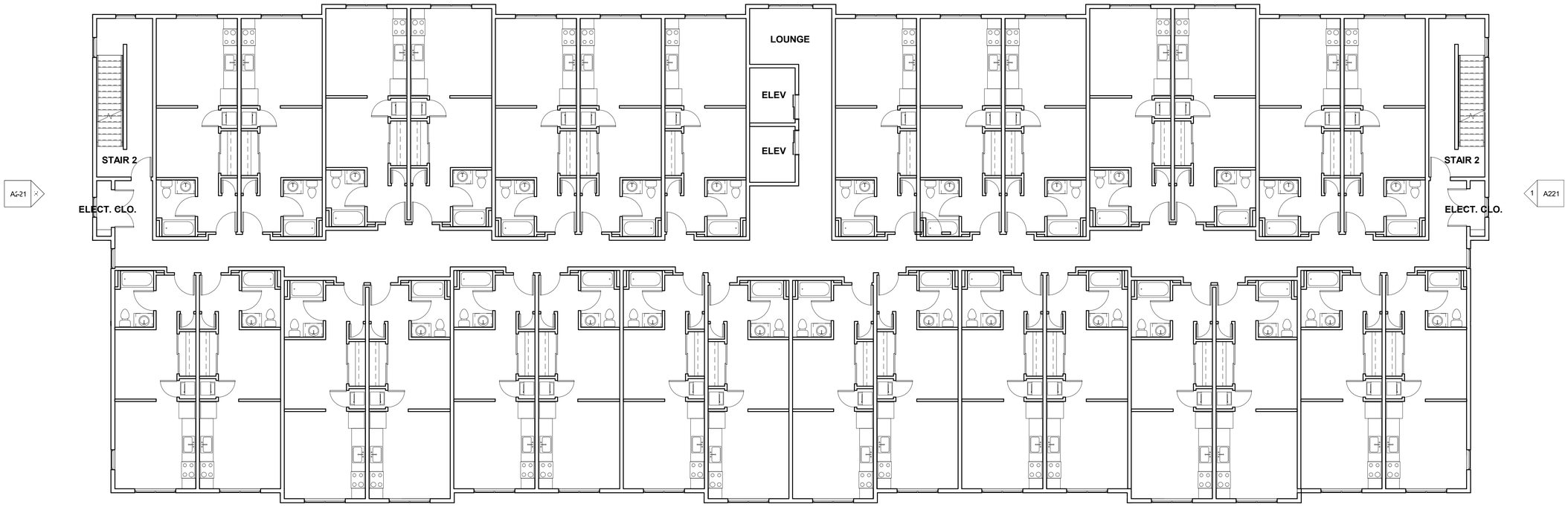
Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A122

Scale 1/8" = 1'-0"

12/7/2024 3:29:08 PM

A222
1



2
A222

1 BUILDING C - LEVEL 3
1/8" = 1'-0"

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No.	Description	Date

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BUILDING C - LEVEL 3

Project number	2430
Date	12/09/24
Drawn by	Author
Checked by	Checker

A123

Scale 1/8" = 1'-0"

12/7/2024 3:29:08 PM

A222
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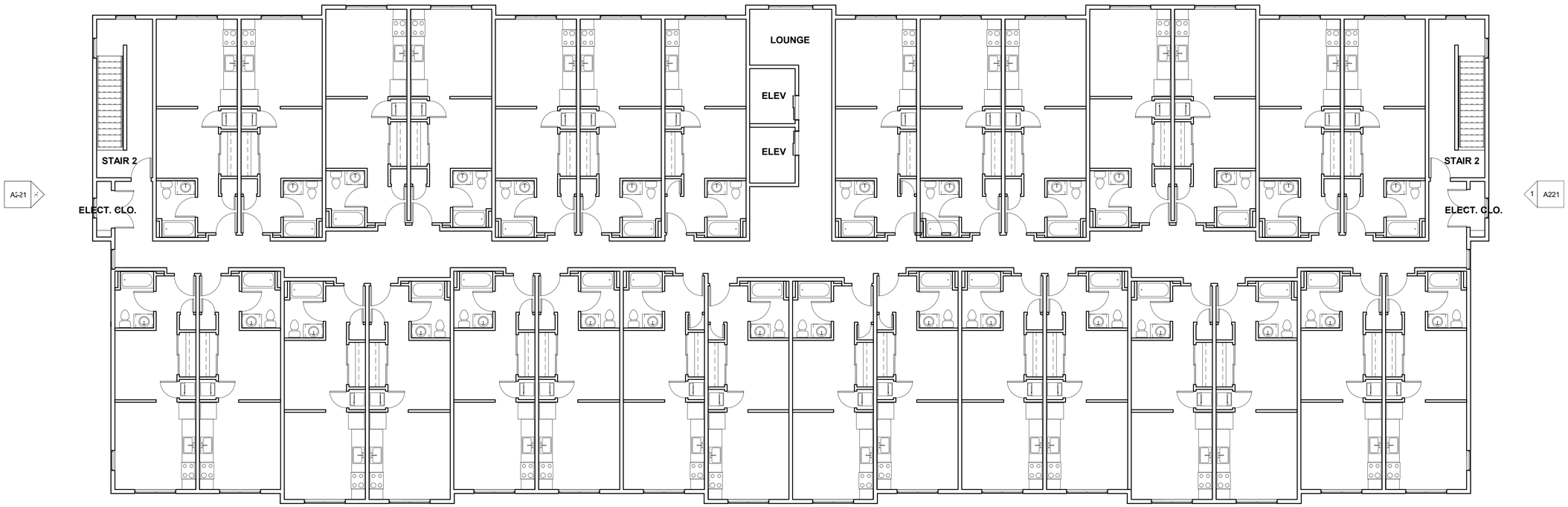

2
A222

1 BUILDING C - LEVEL 4
1/8" = 1'-0"

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

BUILDING C - LEVEL 4

Project number	2430
Date	12/09/24
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A124

Scale 1/8" = 1'-0"

12/7/2024 3:29:09 PM

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