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, May 14, 2026**
Meeting Time: **10:30 AM**

1. Site Plan for 85 Industrial Park Road, II, LLC, Assessor's Map G, lot 3-B, zoned CM, located at 85 Industrial Park Road. (Proposal is for exterior building renovations and site improvements including stormwater treatment and access reconstruction.) (SITE-2026-0004)

2. Site Plan for Cocheco Mills Holdings, LLC, Assessor's Map 2, Lot 37-A, zoned CBD-G, located at 383 Central Avenue. (Proposal is for a change of use to convert approximately 36,207 square feet of commercial space into 27 residential units.) (SITE-2026-0005)

3. Site Plan for Knox Marsh Realty, LLC, Assessor's Map H, Lot 37-A, zoned C, located at 239 Knox Marsh Road. (Proposal is for a commercial lodging building with 84 units and two (2), residential buildings totaling 66 units.) (SITE-2024-0019) *[This item was previously heard by the Planning Technical Review Committee on January 9, 2025.]*

PLAN SNAPSHOT REPORT SITE-2026-0004
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	04/22/2026
Work Class:	Alteration / Addition	**District:**	None	**Exp Date:**	06/26/2026
Status:	In Review	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: The project consists of exterior renovations to a portion of the existing building along its north side, with associated site improvements including reconstruction of truck access and loading, stormwater improvements, and pedestrian access to a new potential tenant entry point. Proposed work is to take place within pre-disturbed areas and will result in a net reduction of approximately 4,150 square feet of impervious surfaces. Stormwater treatment measures will be proposed to provide stormwater treatment for all redeveloped impervious surfaces which do not receive treatment in the existing condition.

Parcel:	G0003-B00000 Main	**Address:**	85 Industrial Park Rd 1230 Main Dover, NH	**Zone:**	CM(Non-Residential - Commercial Manuf

Applicant Benjamin Curcio 177 Corporate Drive Portsmouth, NH 03801 Business: (603) 294-9236	Engineer Benjamin Curcio 177 Corporate Drive Portsmouth, NH 03801 Business: (603) 294-9236	Applicant TItus Cramer 210 Commerce Way, Suite 300 Portsmouth, NH 03801 Business: (603) 559-9623 Mobile: (603) 219-3360	Engineer Neil Hansen Home: (603) 769-9471

Plan Custom Fields

Total2	0	Total3	0	Total	0
Total5	0	Total4	0	Total6	0
Total7	0	Total9	0	Total8	0
Street Classification Type	Municipal	Recording Number		Net Change in # Parking Spaces (+/-)	0
Water Service	Municipal	Sewer Service	Municipal	Deed Book	2390
Total Acres (GIS)	25.05	Deed Page	453	Total SQFT	1.09118e+006
Deed Date		Proposed Property Use	Commercial/Industsrial	Area of Parcel to be Developed (SQFT)	52000
Number of Parking Spaces Existing	200	Number of Parking Spaces Proposed	200	Type of Building to be Built	Existing
Estimated Construction Value	0.00	Refuse Removal	Private	Is there an existing Conservation Easement?	No
Existing Conservation Easement Details		Total of Impact Fees to be Assessed	0.00	TotalImpactFeeSDTOD	0.00
Sub Total Residential	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
TotalImpactFeeRIRCTOD	0.00	Sub Total Non-Residential	0.00	TotalImpactFeeOCSTOD	0.00
TotalImpactFeeITWCTOD	0.00	TotalImpactFeeNHALTOD	0.00	TotalImpactFeeOIUTOD	0.00
TotalImpactFeeAFAOTOD	0.00				

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Benjamin_Curcio_4/22/2026.jpg	04/22/2026 12:57	Curcio, Benjamin		Uploaded via CSS

PLAN SNAPSHOT REPORT (SITE-2026-0004)

Invoice No.	Fee		Fee Amount	Amount Paid
INV-2026001267	Planning General Application Fee		$200.00	$0.00
		Total for Invoice INV-2026001267	**$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		04/22/2026 16:56	
Confirm application complete v.1	Generic Action		04/22/2026 16:56
Technical Review Committee Meeting Agenda v.1	Task	04/22/2026 16:56	
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: 85 Industrial Park II, LLC Telephone # 603-430-4000

Address of Applicant: 210 Commerce Way, Suite 300

E-Mail Address: _____

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

Address of Property Owner: _____

PROPERTY INFORMATION

Address of Property: 85 Industrial Park Road

Assessor's Map # G-3 Lot(s) # B-0

Zoning District(s) CM Overlay District(s) _____

Size of Parcel: _____sq. ft. 25.05 ac. Property Deed: Book 2390 Page: 453

Existing Use of Property: Industrial

SITE PLAN INFORMATION

Describe Proposed Use: Industrial

Area of Parcel to be Developed: +/-52,000 sf (redevelopment) sq. ft.

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

If lodging: Number of Units _____ & number of Buildings _____

Number of Parking Spaces: Existing no change Proposed _____

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

Number of Employees Total: _____ In Maximum Shift: _____

Disposition of Parcel:

Building Footprint +/-288,000 sf sq. ft.

Total Building Area +/-287,000 sf sq. ft.

Paved Area +/-335,000 sf sq. ft.

Building Setbacks:

Front Yard no change ft.

Rear Yard no change ft.

Side Yard: Right N/A ft. Left N/A ft.

tcramer@kane.co

City Water? ✓ Yes ___ No How far is city water from the property? On lot

City Sewer? ✓ Yes ___ No How far is city sewer from the property? On lot

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 _____ units

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

_____

_____

_____

BUILDING INFORMATION

Type of Building to be Built: Building footprint reduction, facade renovation, fitup

Height of Building: TBD Finished Floor Elevation: 113.2'

Number of Seats (where applicable) _____

Estimated value of construction: TBD Refuse removal: Public / (Private) (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: 153-13A (19) - Traffic Impact Analysis

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

The project does not propose to change the current land use and results in a reduction in the gross floor area of the existing building. Therefore, the project is not anticipated to have a noticeable impact on surrounding traffic patterns. A traffic impact analysis would be impertinent.

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) GPI, Inc.

Address 44 Stiles Road, Salem, NH Telephone #: 603.374.7899

Professional License #: _____ E-mail address: acamm@gpinet.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Patrick Crimmins, Tighe & Bond

Address 177 Corporate Drive, Portsmouth, NH 03801 Telephone #: (603) 433-8818

Professional License #: PE No. 12378 E-mail address: PMCrimmins@tighebond.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Procon Inc.

Address 1359 Hooksett Rd Suite 16, Hooksett, NH 03106 Telephone #: (603) 518-2152

Professional License #: _____ E-mail address: mwirth@proconinc.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Ralph Gordon Leedy, Tighe & Bond

Address 177 Corporate Drive, Portsmouth, NH 03801 Telephone #: (603) 433-8818

Professional License #: LLA #007 E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) N/A

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: City of Dover Telephone # (603) 516-6000

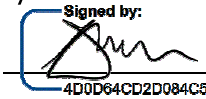
Address Easement Holder: 288 Central Ave, Dover, NH 03820

GLeedy@tighebond.com

Docusign Envelope ID: CA90D515-AE00-8C9E-81AB-0741DCB72318

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: 

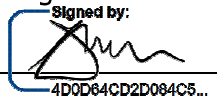
Date: 4/20/2026

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

Signature of Agent: _____ Date: _____

AUTHORIZATION TO ENTER SUBJECT PROPERTY

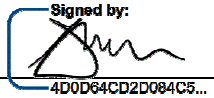
I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction 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: 4/20/2026

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.

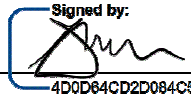
Signature of Property Owner: 

Date: 4/20/2026

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: 4/20/2026

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
Map G	3-B-0	85 Industrial Park II LLC	210 Commerce Way, Suite 300, Portsmouth, NH

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Alex Camm	GPI	
Patrick Crimmins	Tighe & Bond	177 Corporate Drive, Portsmouth, NH 03801
Matt Wirth	Procon	1359 Hooksett Rd Suite 16, Hooksett, NH 03106

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS
Map E	27-B-1	City of Dover	288 Central Ave, Dover, NH 03820

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 24, 2023)

Below are the fees associated with plan review and are subject to a nonrefundable application fee to cover administrative expenses. Please complete the information below and provide payment with your application submittal. **Plan review fees shall be paid prior to technical review committee (TRC) being scheduled.** For plans not requiring TRC review, **fees are due 21 days prior** to the Planning Board meeting. Staff will coordinate abutter/notice fees, which will be invoiced and must be paid 28 hours before the Planning Board meeting for an application to be heard. Fees shall be paid by cash or check made payable to "City of Dover".

A. Plan Review Fees

1. Application fee for the following (SELECT ALL THAT APPLY):

- ☐ SUBDIVISION Application fee $200.00 + $150.00 x # _____ new lots created = $_____
- ☐ LOT LINE ADJUSTMENT Application fee $200.00 + $100.00 X # ___ of lots involved = $_____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee $200.00 = $_____
- ☐ SITE REVIEW – RESIDENTIAL Application fee $200.00+ $100.00 x # __ per dwelling unit =$_____
- ☐ SITE REVIEW – NON-RESIDENTIAL Application fee $200.00 + (not to exceed $10,000)
  - New construction $.15 sq. ft. x # _____ sq. ft.= $_____
  - Additions (new floor space) $.10 per sq. ft. x # _____sq. ft.= $_____
- ☐ MOTEL/HOTEL $35.00 x # ___ per lodging unit= $_____
- ☐ CHANGE OF USE Application fee $200.00 + (not to exceed $5,000)
  - Existing floor spaces $.10 per sq. ft. x # _____ sq. ft. = $_____
- ☐ CONDITIONAL USE PERMIT Application fee $200.00 x # _____ per Application = $_____
- ☐ GRAVEL PIT/ EXCAVATIONS
  - Application fee $50.00= $_____
  - Permit fee $75.00= $_____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee $200.00 = $_____
- ☐ REQUEST FOR REZONING Application fee $200.00 = $_____
- ☐ DRIVEWAY WAIVER Application fee $200.00 = $_____
- ☐ **TOTAL IMPERVIOUS PAVED AREA** (for new development, roadways or additions to existing parking lots, (not to exceed $10,000)) Application fee of $200.00 is N/A if it is part of a Site Review or Subdivision Plan. $200.00 + $.07 per sq. ft. x # _____ sq. ft. = $_____

SUBTOTAL PLAN REVIEW FEE = $_____

AND

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will review the list for accuracy and provide to us the engineer, architect, licensed land surveyor (LLS), licensed landscape architect (LLA) and/or soil scientist whose professional seal appears on the plan with names and addresses for notices.

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
  - Certified letters fee # _____ of x $10.00= $_____
- ☐ Certified letters fee: # of abutters _____ X $10.00= $_____
- ☐ First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X $1.00= $_____
- ☐ Creating/Printing Abutter Labels in triplicate per sheet _____ x $10.00= $_____

C. Foster's newspaper public notice fee $120.00 x # _____ applications = $_____

SUBTOTAL = $_____

TOTAL INVOICE AMOUNT = $_____

PLAN REVIEW FEE COLLECTED/PAID = $ _____

BALANCE DUE = $ _____

The amount due must be paid 28 hours prior to the Planning Board Meeting, to be heard.

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: 85 Industrial Park II LLC File Number: _____

PROJECT TITLE: Proposed Truck Court Renovations

PROPERTY LOCATION: 85 Industrial Park Road Tax Map: G Lot: 3-B-0

	Where/How Provided	Reviewed
1. Completed and signed Application form	✓	
2. Plan Review Fees are provided	✓	
3. Electronic copy of the engineered/surveyed plan layout	✓	
4. Electronic copy of supplementary materials and application	✓	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	N/A - Waiver	
6. Waiver requests to the Site Plan Review Regulations, with written justification	✓	
7. Conditional Use Permit applications	✓	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	N/A	
9. A colored architectural plan showing all sides of buildings	✓	
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:	✓	
Location map at appropriate scale	✓	
Proposed Project name and title and Planning File #	✓	
Date, north arrow and scale	✓	
Names of all abutting property owners	✓	
Name and address of owners and/or applicants	✓	
Signature & stamp of NH licensed land surveyor and/or engineer	✓	
Zoning District boundaries, including any special or overlay districts	✓	
Location of Conservation District areas	N/A	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	✓	
Location and widths of existing & proposed easements & right of ways	✓	
Location and width of existing and proposed access/egress ways	✓	

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

REVIEWED BY: _____ DATE_____ TRC DATE_____

CITY OF DOVER PLANNING DEPARTMENT
Revised November 28, 2022

APPLICANT: _____ FILE NUMBER: _____

List of Common Site Plan Notes

The following list of commonly required notes is intended to be used as a guide to applicants and should not be construed as a comprehensive note requirement list for all projects. A preapplication conference with the Planning Department is suggested to help determine the actual notes that may be required.

1. The intent of this plan is to *(describe the purpose of the plan).*

2. Owners of Record are: Name
   Street address
   Municipality, State, Zip Code
   _____
   Authorized Signature

3. The parcel(*s*) is (*are*) shown as Lot No. _____, Map ____ of the City of Dover Tax Assessor's Maps.

4. The subject parcel(s) contains ____ acres or _____ sq. ft. area of land.

5. Title reference for the project parcel(*s*) is the Strafford County Registry of Deeds, Book No. ___, Page No. ___.

6. Reference Plans: (*List all reference plans and their SCRD #)*

7. All applicable right-of-way, conservation, slope, construction, power line, cross travel, or other easements shall be referenced in a note.

8. Current zoning dimensional and density requirements in effect are as follows:

   Required: Provided:

   a. Zoning district _____ sub-district _____
   b. Minimum lot size: _____ acres (sq. ft.)
   c. Minimum lot frontage: _____ ft.
   d. Minimum yard setbacks/build-to-lines:
      Front _____ft.
      Side _____ft.
      Rear _____ft.
      Abut-a-street _____ ft.
   e. Maximum/minimum lot coverage _____ %
   f. Minimum/maximum bldg. height _____ ft./stories

   This property falls within the following zoning overlay districts: *(List districts)*

9. 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.

10. Property line information has been obtained from a survey performed by *(surveyor)* on (*date*) with an error not greater than 1 in 10,000 (*or has been obtained from* _____ *Plan, prepared by (surveyor)*).

11. Subject parcel is (*is not*) located within a Federally designated flood hazard area (Community panel number 33017C0xxxD, Effective Date: September 30, 2015).

12. Wetlands were delineated by _____, Certified Wetlands Scientist, Certification Number ____, in accordance with Chapter 170-27.1 of the Zoning Ordinance, on _____, 20___.

13. As-built plans of the subdivision 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 if a street is proposed for City acceptance. As-built plans shall be prepared and certified correct by a L.L.S. or P.E. Digital files shall be geo-referenced to New Hampshire State Plane Coordinates NAD83 and shall be expressed in feet.

14. The installation of electric power, cable television and telephone lines shall be underground throughout the site for which development is proposed.

15. The subject parcel(s) is (are) served by municipal water and sewer (*or is served by on-site well and septic system*).

16. All construction shall conform with the State of New Hampshire Department of Transportation (NHDOT) "Standard Specifications for Road and Bridge Construction" 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 revegetating all disturbed areas on the site shall be submitted, and the approved construction sign installed prior to any earth disturbing activity occurs.

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 and Sunday 9 AM-4 PM. 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 Planning Director.

23. Building addresses (including apt/unit numbers if applicable) shall be assigned by the Building Official at the time of issuance of a building permit.

24. The proposed use for the site (structure) is _____. (More specific uses are encouraged, such as single family, duplex, multi-family, restaurant, hotel, doctor's office, etc. Should more than one use be proposed, an indication of the percentage of each use is suggested.)

25. The following federal and state permits have been issued for the subject property: (*List permit type, number and date of issuance.)*

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. 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

30. 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.

31. Fire department access road(s) shall be installed and maintained to support the imposed loads of fire apparatus in all weather conditions at all times.

32. The maximum parking space calculation is _____ (broken down) and ____ spaces are provided.

33. Exterior lighting shall be cut-off type fixtures per Chapter 153-14-E and shall provide lighting directed on-site only.

34. Topographic survey performed by _____ on *(dates)*.

35. Elevations are based on U.S.G.S. NVD 1988 datum. (**or** Elevations depicted are based on information obtained from the City Engineer's Office and was derived from coordinates for control stations _____ and _____. These coordinates have not been adjusted to 1983 datum).

36. A security system shall be installed as required by Chapter 45, Article I, section 45-2 of the Code of the City of Dover. (*If a business establishment or multi-family dwelling contained in a new, altered or repaired structure*)

37. Approved backflow preventers shall be provided for both fire and domestic water lines.

38. The (*existing or proposed*) structure 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.

39. 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.

40. 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.

41. The site layout is designed in compliance with applicable accessibility regulations. The proposed structure will be also be designed in accordance with applicable accessibility regulations. (i.e. IBC, ANSI-117.1) and NH RSA 155-A:5.

REMARKS:

Docusign Envelope ID: 736ABFB2-7A11-8953-83C6-F44FF3AC3E68

Letter of Authorization
85 Industrial Park Road, Dover, NH
Map/Lot G-3-B-0

The undersigned owner and applicant of the above-referenced property hereby authorize representatives of Tighe & Bond, Inc. to represent their interests, and to submit any and all materials related thereto on their behalf for any local and state permitting applications solely in connection with the truck court redevelopment project thereof.

85 Industrial Park II, LLC

By: Signed by: 4B0D64GD2EB864G5...

Name: Michael Kane

Title: Manager

Date: 4/22/2026

Tighe & Bond

Partnership with purpose

Proposed Truck Court
85 Industrial Park Road, Dover, NH

Site/Stormwater Operations and Maintenance Plan

85 Industrial Park II, LLC

April 14, 2026

Table of Contents

Section 1 Long-Term Operation & Maintenance Plan

1.1 Contact/Responsible Party 1-1
1.2 Maintenance Items 1-1
1.3 Overall Site Operation & Maintenance Schedule 1-2
1.3.1 Disposal Requirements 1-2
1.5 Contech Jellyfish Filter System Maintenance Requirements 1-3
1.6 Contech Cascade Unit Maintenance Requirements 1-3
1.7 Landscape Operations and Maintenance Requirements 1-4
1.8 Snow & Ice Management for Standard Asphalt and Walkways 1-6

Section 2 Invasive Species

Section 3 Annual Updates and Log Requirements

Appendices

Jellyfish Filter Owner's Manual

Cascade Separator Owner's Manual

Section 1
Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

85 Industrial Park II, LLC
210 Commerce Way, Suite 300
Portsmouth, NH 03801

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Contech Jellyfish Filtration System
- Contech CDS Units

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations
Contech CDS Units®	In accordance with Manufacturer's Recommendations

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.5 Contech Jellyfish Filter System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media and bypass condition	One (1) time annually and after any rainfall event exceeding 2.5" in a 24-hr period	Maintenance required for any of the following: - >4" of sediment on the vault floor - >1/4" of sediment on top of the cartridge - .4" of static water above the cartridge bottom more than 24 hours after a rain event - If pore space between media is absent. - If vault is in bypass condition during an average rainfall event.
Replace Cartridges	As required by inspection, 1–5 years.	- Remove filter cartridges per manufacturer methods. - Vacuum sediment from vault. - Install new cartridges per manufacturer methods

1.6 Contech Cascade Unit Maintenance Requirements

Contech Cascade Separator® Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Visual Inspection	Twice per year at a minimum (spring and fall)	-Visually inspect for blockages or obstruction in the inlet chamber, flumes or outlet channel - Sediment removal once 50% of maximum storage has been reached

1.7 Landscape Operations and Maintenance Requirements

WEEKLY TASKS - MAY 15 TO SEPTEMBER 15TH

1. Mow & edge lawn if ground conditions are suitable for access. Scheduling mowing to maintain a 3" mow height. Mow using appropriate machinery including push mower if area is too steep or too small for larger machinery. Do not remove cuttings unless excessive amounts hinder grass growth or if disease is present. Cuttings provide naturally occurring nitrogen fertilizer.
2. Mow to a height if 1/3 of grass blade using sharp blades. Maintain a minimum height of 3" tall to ward off weeds and withstand summer drought.
3. Manually remove weeds larger than 2" high or wide from plant beds. Use of chemical weed killer is not permitted.
4. Replace bark mulch which has been displaced or washed out from plant beds. Wash out of soil is to be repaired with new topsoil prior to placement of mulch. Bark mulch shall be primarily shredded granular outer bark of evergreen trees with a minimum of hardwood bark, partially decomposed. The mulch color is to dark brown. Mulch shall not contain chipped construction materials. No dyes are permitted.
5. Check plants for signs of stress, pest, or disease. upon approval & authorization from owner replace dead, dying, or diseased plants that cannot be treated. Consult a licensed arborist for tree diseases or to review tree damage and appropriate pruning or removal and replacement. Replacements are to match original plant species.
5. Sweep or blow clean hard surfaces including walkways, curbs, and gutters. Rake level stone dust path and fill depressions with moistened new stone dust and compact with tamper.
6. Check irrigation system components including valves, valve boxes etc. and make repairs and replacement as necessary. Check irrigation system during rainstorm events to ensure automatic shut off is working. Adjust irrigation times as necessary based on plant needs and weather conditions.
7. Complete items on the monthly check list noted below.

MONTHLY TASKS

JANUARY

During winter drought periods water newly planted trees and shrubs, especially evergreens. Tree bags are suggested when temperatures are above freezing.

FEBRUARY

Fertilize trees & shrubs as needed using deep root application with slow release fertilizer. Finish pruning shade trees, summer flowering shrubs, and hedges. Spring blooming shrubs may be pruned immediately after flowering. Prune shrubs in February based on species. Do not shear or form shrubs into balls or unnatural shapes unless otherwise noted.

MARCH

Apply shredded bark mulch at sizes noted to tree, shrub & perennial beds. Optional: Divide and replant summer & fall blooming perennials.

APRIL

Replace mulch which has been washed out by rains or snow melting run-off. Remove excess deicing salts from plant beds. Check irrigation system and return to normal service. During daylight operation monthly until October 15th check each irrigation zone of the system to ensure system is operating correctly to conserve water and to keep plant healthy.

MAY

Inspect shrubs for damage from snow and/or plowing. prune out winter damaged branches or plants that have not begun to grow in late May. Water new transplants and plant replacements unless rainfall is abundant.

JUNE

Vigorous, unwanted limbs should be removed or shortened on new trees. Watch for forks in the main trunk and remove the least desirable leader. Water plants as needed. Monitor irrigation system to make sure coverage and quantities are adequate.

JULY

Prune back groundcover overhanging curbs or sidewalks. Continue watering young plants.

AUGUST

Water planting areas thoroughly unless rainfall has been adequate. Check plants for sign of water stress, nutrient deficiency, or disease. Identify disease and treat as required. Prune hedges and shrubs if necessary, in late august. Fertilize young trees & shrubs.

SEPTEMBER

Check trees for signs of water stress, nutrient deficiency or disease and treat accordingly. Core aerate, top dress and over seed lawns if needed.

OCTOBER

Remove leaves and litter from parking lots, walkways and turf areas or mow with mulching mower. Prune groundcover overhanging curbs or sidewalks. Winterize irrigation system: drain the system and reprogram automatic controller.

NOVEMBER

Remove leaves from cool season grasses or mow with mulching mower. Remove leaves from tree, shrub, and perennial beds. Conduct soil tests to correct deficiencies before winter. Prune most trees & shrubs between November 15th & March 15th. Remove conflicting & crowded branches, dead limbs, double leaders, & unsightly branches. Remove diseased plant material from the landscape to reduce disease problem next year.

DECEMBER

Prune trees in parking lots and sidewalks that interfere with public safety. Continue leaf removal if needed. Continue pruning trees & shrubs on overall property.

1.8 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperatur e	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

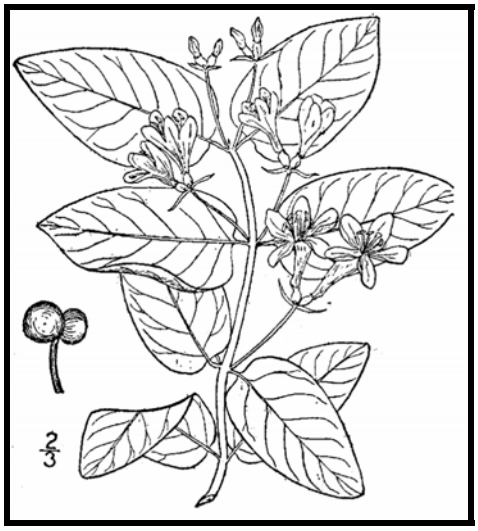
Section 2
Invasive Species

With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem is classified as an invasive species. Refer to the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

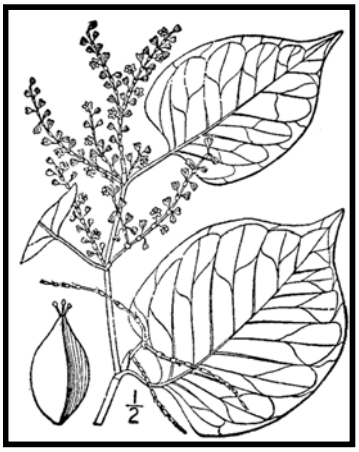
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
</td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
</td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time … but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.



Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.



Using tools to remove woody stems.





Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.



Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.



Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.



Injecting herbicide into the hollow stem of phragmites.

4. **Dry it/cook it**—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.



Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. ***Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.*** Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

   ME: Department of Environmental Protection
   www.state.me.us/dep/blwq/docstand/nrpapage.htm

   NH: Department of Environmental Services
   www.des.state.nh.us/wetlands/

   VT: Department of Environmental Conservation
   www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

   MA: Consult your local town conservation commission

   RI: Department of Environmental Management
   www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

   CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

Section 3
Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary. A sample operations and maintenance tracking log is included on the following page.

Site / Stormwater Operations and Maintenance Log						
Proposed Truck Court		**85 Industrial Park Road, Dover, NH**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Litter/Debris Removal						
Pavement Sweeping						
Landscaping						
Deep Sump CB's			❑Yes ❑No			
Jellyfish Filter Unit			❑Yes ❑No			
Cascade Unit			❑Yes ❑No			

Tighe & Bond

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CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual



Jellyfish® Filter

Table of Contents

Chapter 1
1.0 Owner Specific Jellyfish Product Information 4
Chapter 2
2.0 Jellyfish Filter System Operations & Functions 5
2.1 Components & Cartridges 6
2.2 Jellyfish Membrane Filtration Cartridges Assembly 7
2.3 Installation of Jellyfish Membrane Filtration Cartridges 7
Chapter 3
3.0 Inspection and Maintenance Overview 8
Chapter 4
4.0 Inspection Timing 8
Chapter 5
5.0 Inspection Procedure 8
5.1 Dry Weather Inspections 8
5.1 Wet Weather Inspections 9
Chapter 6
6.0 Maintenance Requirements 9
Chapter 7
7.0 Maintenance Procedure 9
7.1 Filter Cartridge Removal 9
7.2 Filter Cartridge Rinsing 9
7.3 Sediment and Flotables Extraction 10
7.4 Filter Cartridge Reinstallation and Replacement 10
7.5 Chemical Spills 10
5.6 Material Disposal 10

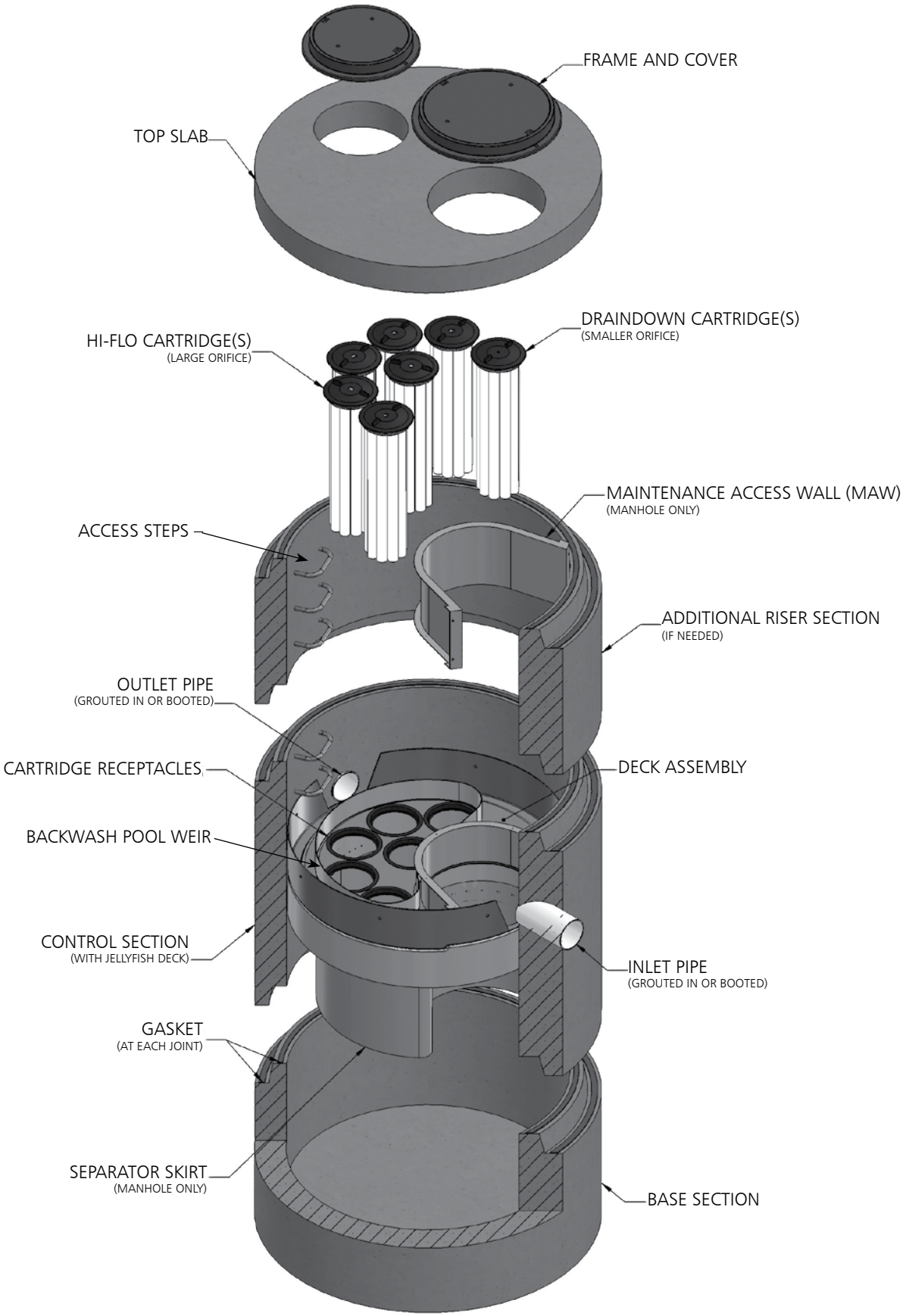
Jellyfish Filter Inspection and Maintenance Log 12

THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project's stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

Contech Engineered Solutions
9025 Centre Pointe Drive, Suite 400 | West Chester, OH 45069
513-645-7000 | 800-338-1122
www.ContechES.com
info@conteches.com


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

WARNINGS / CAUTION

1. FALL PROTECTION may be required.
2. WATCH YOUR STEP if standing on the Jellyfish Filter Deck at any time; Great care and safety must be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Filter Deck at all times to prevent stepping onto a lid, into or through a cartridge hole or slipping on the deck.
3. The Jellyfish Filter Deck can be SLIPPERY WHEN WET.
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK. The Jellyfish Filter Deck and Cartridge Receptacle Rings can be damaged under high impact loads. This type of activity voids all warranties. All damaged items to be replaced at owner's expense.
5. Maximum deck load 2 persons, total weight 450 lbs.

Safety Notice

Jobsite safety is a topic and practice addressed comprehensively by others. The inclusions here are intended to be reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Contech Engineered Solutions.

Confined Space Entry

Secure all equipment and perform all training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is staffed with trained and/or certified personnel, and all equipment is checked for proper operation and safety features prior to use.

- Fall protection equipment
- Eye protection
- Safety boots
- Ear protection
- Gloves
- Ventilation and respiratory protection
- Hard hat
- Maintenance and protection of traffic plan

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

Below you will find a reference page that can be filled out according to your Jellyfish Filter specification to help you easily inspect, maintain and order parts for your system.

Owner Name:	
Phone Number:	
Site Address:	
Site GPS Coordinates/unit location:	
Unit Location Description:	
Jellyfish Filter Model No.:	
Contech Project & Sequence Number	
No. of Hi-Flo Cartridges	
No. of Cartridges:	
Length of Draindown Cartridges:	
No. of Blank Cartridge Lids:	
Bypass Configuration (Online/Offline):	

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

The Jellyfish Filter is an engineered stormwater quality treatment technology that removes a high level and wide variety of stormwater pollutants. Each Jellyfish Filter cartridge consists of eleven membrane - encased filter elements ("filtration tentacles") attached to a cartridge head plate. The filtration tentacles provide a large filtration surface area, resulting in high flow and high pollutant removal capacity.

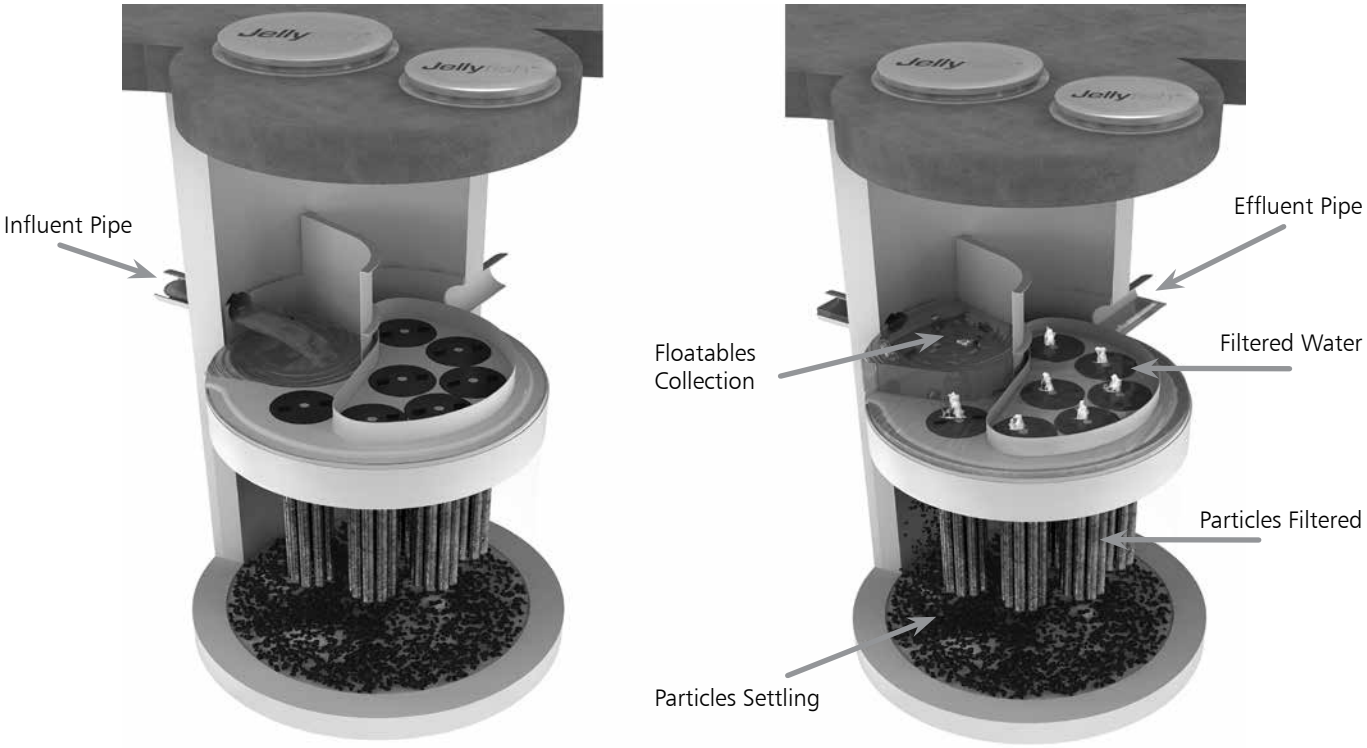
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



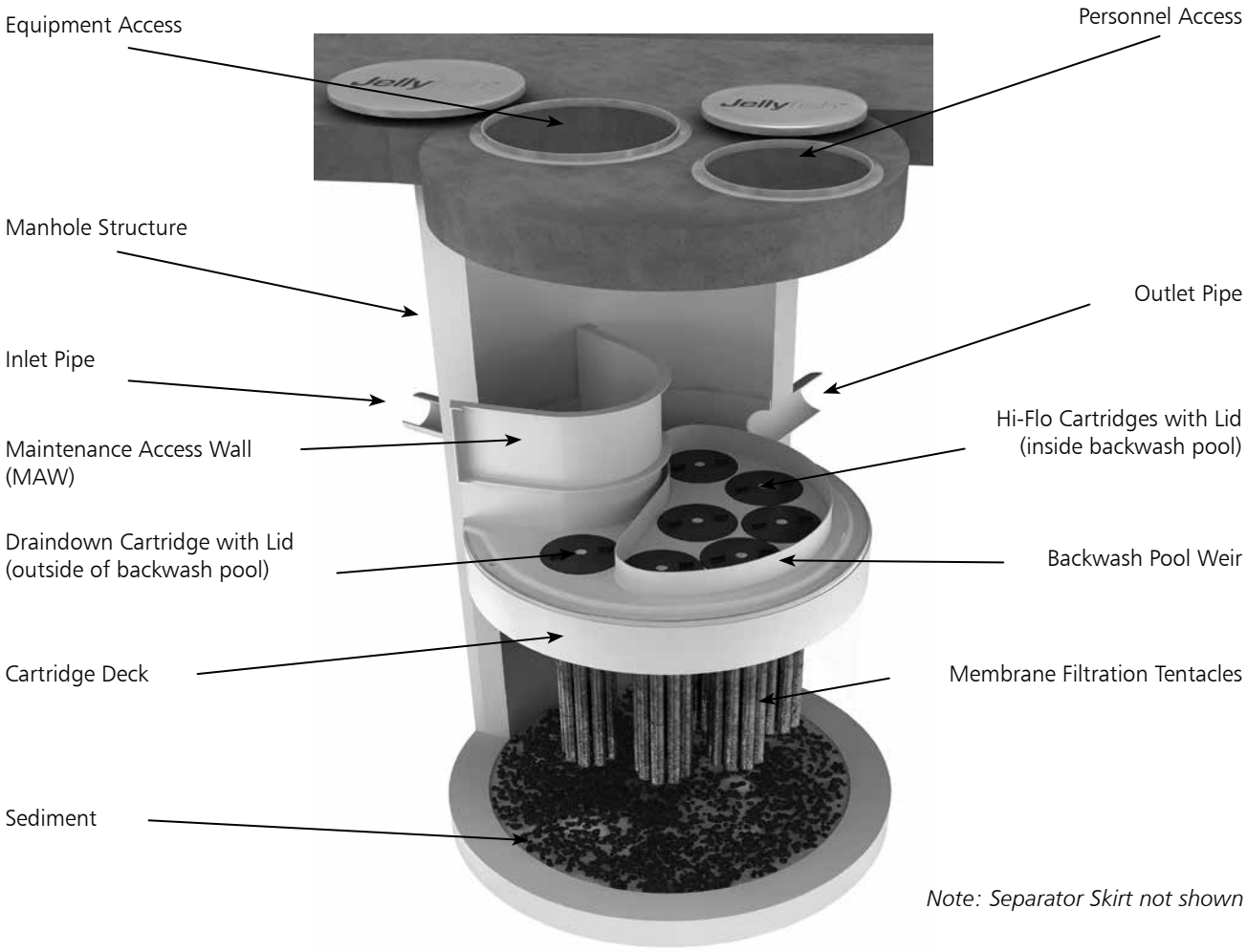
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at www.ContechES.com.

2.1 – Components and Cartridges

The Jellyfish Filter and components are depicted in Figure 2 below.

FIGURE 2 **Jellyfish Filter Components**



Tentacles are available in various lengths as depicted in Table 1 below.

Table 1 – Cartridge Lengths / Weights and Cartridge Lid Orifice Diameters

Cartridge Lengths	Dry Weight	Hi-Flo Orifice Diameter	Draindown Orifice Diameter
15 inches (381 mm)	10 lbs (4.5 kg)	35 mm	20 mm
27 inches (686 mm)	14.5 lbs (6.6 kg)	45 mm	25 mm
40 inches (1,016 mm)	19.5 lbs (8.9 kg)	55 mm	30 mm
54 inches (1,372 mm)	25 lbs (11.4 kg)	70 mm	35 mm

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

The Jellyfish Filter utilizes multiple membrane filtration cartridges. Each cartridge consists of removable cylindrical filtration "tentacles" attached to a cartridge head plate. Each filtration tentacle has a threaded pipe nipple and o-ring. To attach, insert the top pipe nipples with the o-ring through the head plate holes and secure with locking nuts. Hex nuts to be hand tightened and checked with a wrench as shown below.

2.3 – Jellyfish Membrane Filtration Cartridge Installation

- Cartridge installation will be performed by trained individuals and coordinated with the installing site Contractor. Flow diversion devices are required to be in place until the site is stabilized (final paving and landscaping in place). Failure to address this step completely will reduce the time between required maintenance.
- Descend to the cartridge deck (see Safety Notice and page 3).
- Refer to Contech's submittal drawings to determine proper quantity and placement of Hi-Flo, Draindown and Blank cartridges with appropriate lids. Lower the Jellyfish membrane filtration cartridges into the cartridge receptacles within the cartridge deck. It is possible that not all cartridge receptacles will be filled with a filter cartridge. In that case, a blank headplate and blank cartridge lid (no orifice) would be installed.



Cartridge Assembly

Do not force the tentacles down into the cartridge receptacle, as this may damage the membranes. Apply downward pressure on the cartridge head plate to seat the lubricated rim gasket (thick circular gasket surrounding the circumference of the head plate) into the cartridge receptacle. (See Figure 3 for details on approved lubricants for use with rim gasket.)

- Examine the cartridge lids to differentiate lids with a small orifice, a large orifice, and no orifice.
  - Lids with a small orifice are to be inserted into the Draindown cartridge receptacles, outside of the backwash pool weir.
  - Lids with a large orifice are to be inserted into the Hi-Flo cartridge receptacles within the backwash pool weir.
  - Lids with no orifice (blank cartridge lids) and a blank headplate are to be inserted into unoccupied cartridge receptacles.
- To install a cartridge lid, align both cartridge lid male threads with the cartridge receptacle female threads before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation.

3.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.
Inspection activities are typically conducted from surface observations and include:

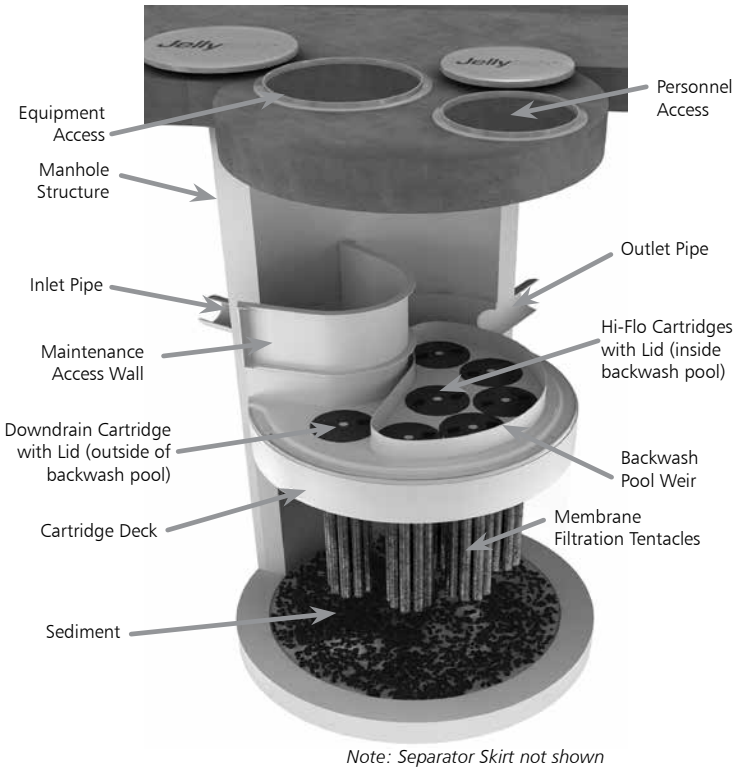
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed

4.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.



Note: Separator Skirt not shown

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

5.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

5.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

6.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

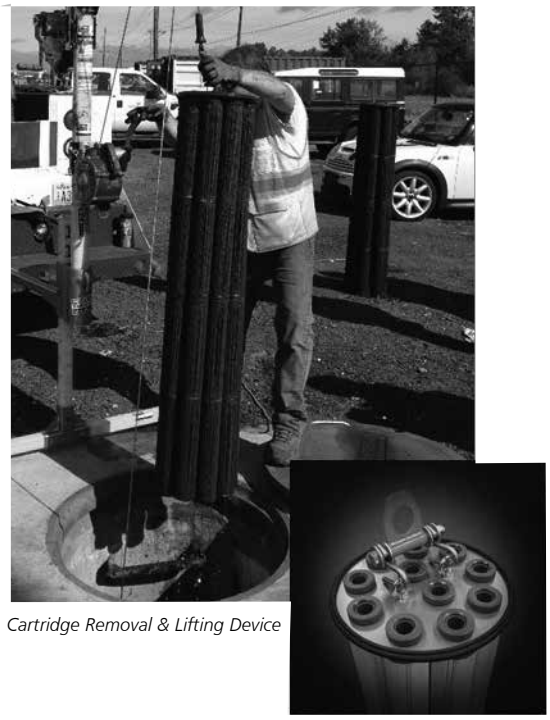
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs*.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane*.
4. Collected rinse water is typically removed by vacuum hose.

5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

7.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.
3. Pressure wash cartridge deck and receptacles to remove all



Rinsing Cartridge with Contech Rinse Tool

sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.

4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.
6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some



Vacuuming Sump Through MAW

vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

7.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. *Caution: Do not force the cartridge downward; damage may occur.*
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

7.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

7.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

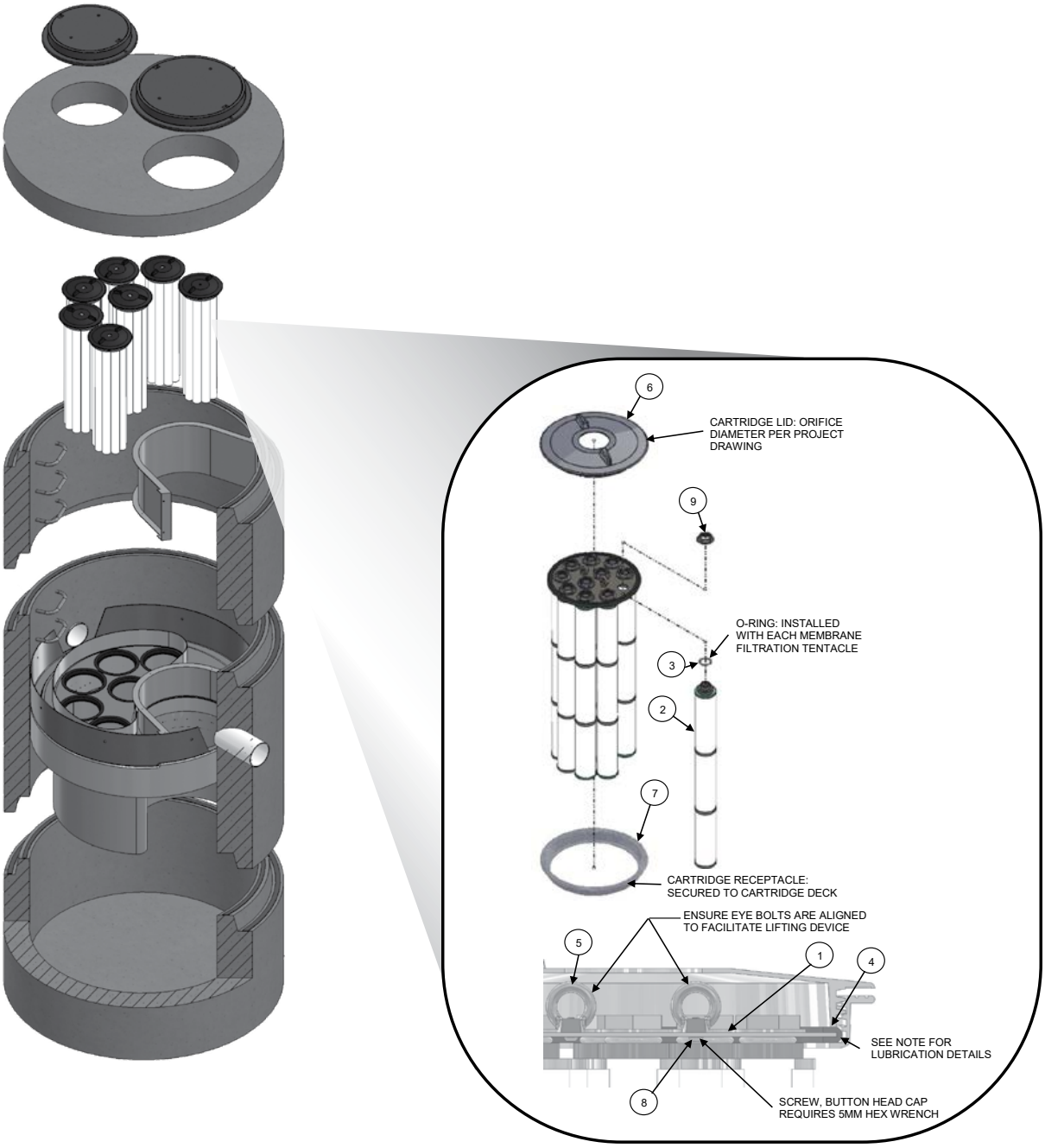


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lid (Item 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

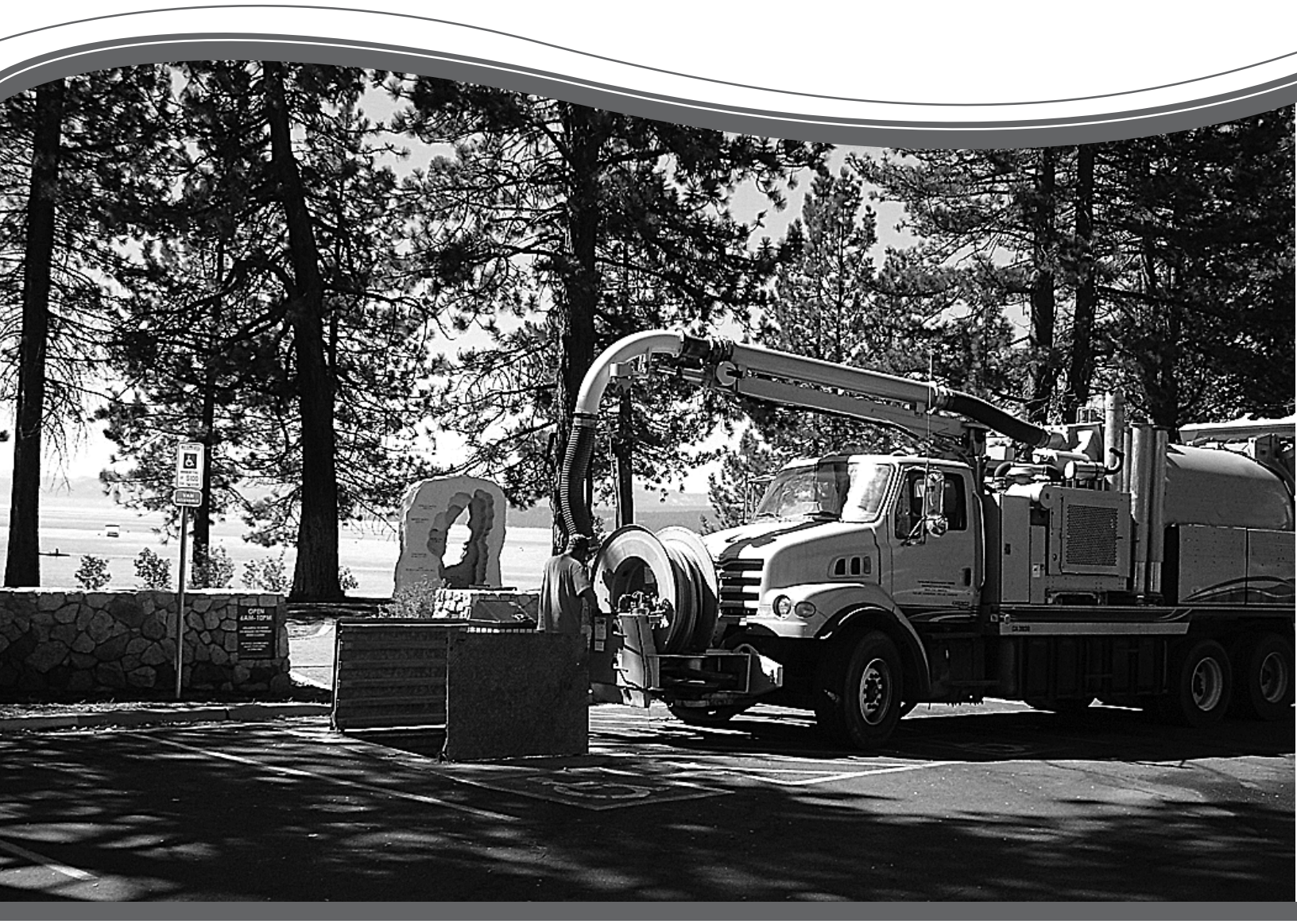
Land Use: Commercial:_____ Industrial: _____ Service Station:_____

Road/Highway:____ Airport: _____ Residential: _____ Parking Lot:_____

Date/Time:					
Inspector:					
Maintenance Contractor:					
Visible Oil Present: (Y/N)					
Oil Quantity Removed					
Floatable Debris Present: (Y/N)					
Floatable Debris removed: (Y/N)					
Water Depth in Backwash Pool					
Cartridges externally rinsed/re-commissioned: (Y/N)					
New tentacles put on Cartridges: (Y/N)					
Sediment Depth Measured: (Y/N)					
Sediment Depth (inches or mm):					
Sediment Removed: (Y/N)					
Cartridge Lids intact: (Y/N)					
Observed Damage:					
Comments:					

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Cascade Separator® Inspection and Maintenance Guide



CASCADE
separator®

Maintenance

The Cascade Separator® system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects sediment and debris will depend upon on-site activities and site pollutant characteristics. For example, unstable soils or heavy winter sanding will cause the sediment storage sump to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (i.e. spring and fall). However, more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment wash-down areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

A visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet chamber, flumes or outlet channel. The inspection should also quantify the accumulation of hydrocarbons, trash and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided in this Inspection and Maintenance Guide.

Access to the Cascade Separator unit is typically achieved through one manhole access cover. The opening allows for inspection and cleanout of the center chamber (cylinder) and sediment storage sump, as well as inspection of the inlet chamber and slanted skirt. For large units, multiple manhole covers allow access to the chambers and sump.

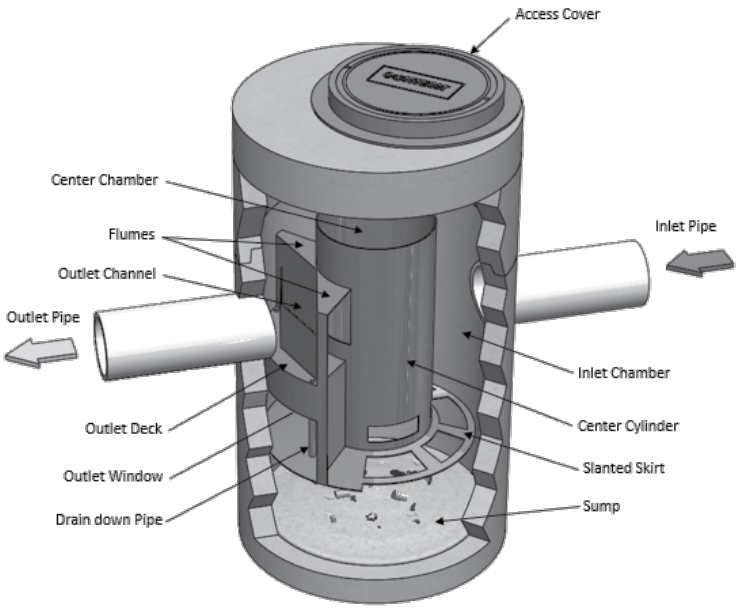
The Cascade Separator system should be cleaned before the level of sediment in the sump reaches the maximum sediment depth and/or when an appreciable level of hydrocarbons and trash has accumulated. If sorbent material is used, it must be replaced when significant discoloration has occurred. Performance may be impacted when maximum sediment storage capacity is exceeded. Contech recommends maintaining the system when sediment level reaches 50% of maximum storage volume. The level of sediment is easily determined by measuring the distance from the system outlet invert (standing water level) to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the chart in this document to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage.

Cleaning

Cleaning of a Cascade Separator system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole cover and insert the vacuum tube down through the center chamber and into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The areas outside the center chamber and the slanted skirt should also be washed off if pollutant build-up exists in these areas.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. Then the system should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and to ensure proper safety precautions. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the Cascade Separator system must be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal. If any components are damaged, replacement parts can be ordered from the manufacturer.



Cascade Separator® Maintenance Indicators and Sediment Storage Capacities

Model Number	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CS-3	3	0.9	1.5	0.5	0.4	0.3
CS-4	4	1.2	2.5	0.8	0.7	0.5
CS-5	5	1.3	3	0.9	1.1	0.8
CS-6	6	1.8	3.5	1	1.6	1.2
CS-8	8	2.4	4.8	1.4	2.8	2.1
CS-10	10	3.0	6.2	1.9	4.4	3.3
CS-12	12	3.6	7.5	2.3	6.3	4.8

Note: The information in the chart is for standard units. Units may have been designed with non-standard sediment storage depth.



A Cascade Separator unit can be easily cleaned in less than 30 minutes.



A vacuum truck excavates pollutants from the systems.

Cascade Separator® Inspection & Maintenance Log

Cascade Model:			Location:		
Date	Depth Below Invert to Top of Sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The depth to sediment is determined by taking a measurement from the manhole outlet invert (standing water level) to the top of the sediment pile. Once this measurement is recorded, it should be compared to the chart in the maintenance guide to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage. Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.
2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

SUPPORT

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from our engineers.

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Drainage Analysis
85 Industrial Park Road - Truck Court Improvements

TO: City of Dover Technical Review Committee

FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE

COPY: 85 Industrial Park II, LLC

DATE: April 14, 2026

1.0 Project Description

The proposed project is located at 85 Industrial Park Road in Dover, NH, on a parcel identified as Map G-3 Lot B-0 on the City of Dover tax maps. The project consists of exterior renovations to a portion of the existing building along the north side, with associated site improvements including reconstruction of truck access and loading, stormwater improvements, and pedestrian access to a new potential tenant entry point.

Under the existing condition, stormwater runoff within the work area is collected by two (2) catch basins that convey flows through underground drainage lines to a catch basins within the Industrial Park Road right-of-way. As part of the proposed work, two (2) catch basins and drain lines within the subject parcel will be removed and replaced by a greater number of catch basins along a similar conveyance route. Runoff from the redeveloped surfaces will be collected by these new closed drainage structures and conveyed through proprietary flow-through stormwater pre-treatment and treatment structures prior to discharging into the same point of connection (catch basin) at Industrial Park Road. The project proposes a decrease in impervious surface areas.

1.2 Drainage Analysis

The pre-development and post-development watershed areas have been analyzed at one (1) distinct points of analysis (PA-1). **Point of Analysis 1 (PA-1)** is located to south of the site and assesses flows that enter a catch basin identified along the edge of the Industrial Park Road right-of-way.

While the points of analysis have remained unchanged, the contributing sub-catchment areas vary between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant.

1.3 Calculation Methods

The design storms analyzed in this study are 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University.

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow, and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

2.1 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis.

Table 2.1 – Comparison of Pre- and Post- Development Flows

Point of Analysis	Pre/**Post** 2-Year Storm (cfs)	Pre/**Post** 10-Year Storm (cfs)	Pre/**Post** 25-Year Storm (cfs)	Pre/**Post** 50-Year Storm (cfs)
PA1	9.92/**9.81**	16.60/**16.51**	21.85/**21.78**	26.65/**26.60**

As shown in Table 2.1, the post-development flow rates contributing to the point of analysis have been determined to be reduced in comparison to the existing condition. Due to the reduction of impervious surfaces within the study area, this result was anticipated.

2.2 Stormwater Treatment

As a result of the proposed work, there is anticipated to be a net reduction of approximately 4,190 square feet of impervious surfaces that were previously untreated.

Stormwater runoff from redeveloped impervious areas are proposed to be treated by proprietary flow-through pre-treatment (Contech Cascade Separator) and treatment (Contech Jellyfish Filter) systems aligned in series. This arrangement of stormwater treatment is anticipated to remove total suspended solids (TSS), total nitrogen (TN), and total phosphorous (TP) above the minimum requirements required by the City of Dover.

Table 2.2.1 – Pollutant Removal Efficiencies			
BMP	**Total Suspended Solids**	**Total Nitrogen**	**Total Phosphorus**
Jellyfish Filter w/Pretreatment[1]	**85%**	**50%**	**55%**

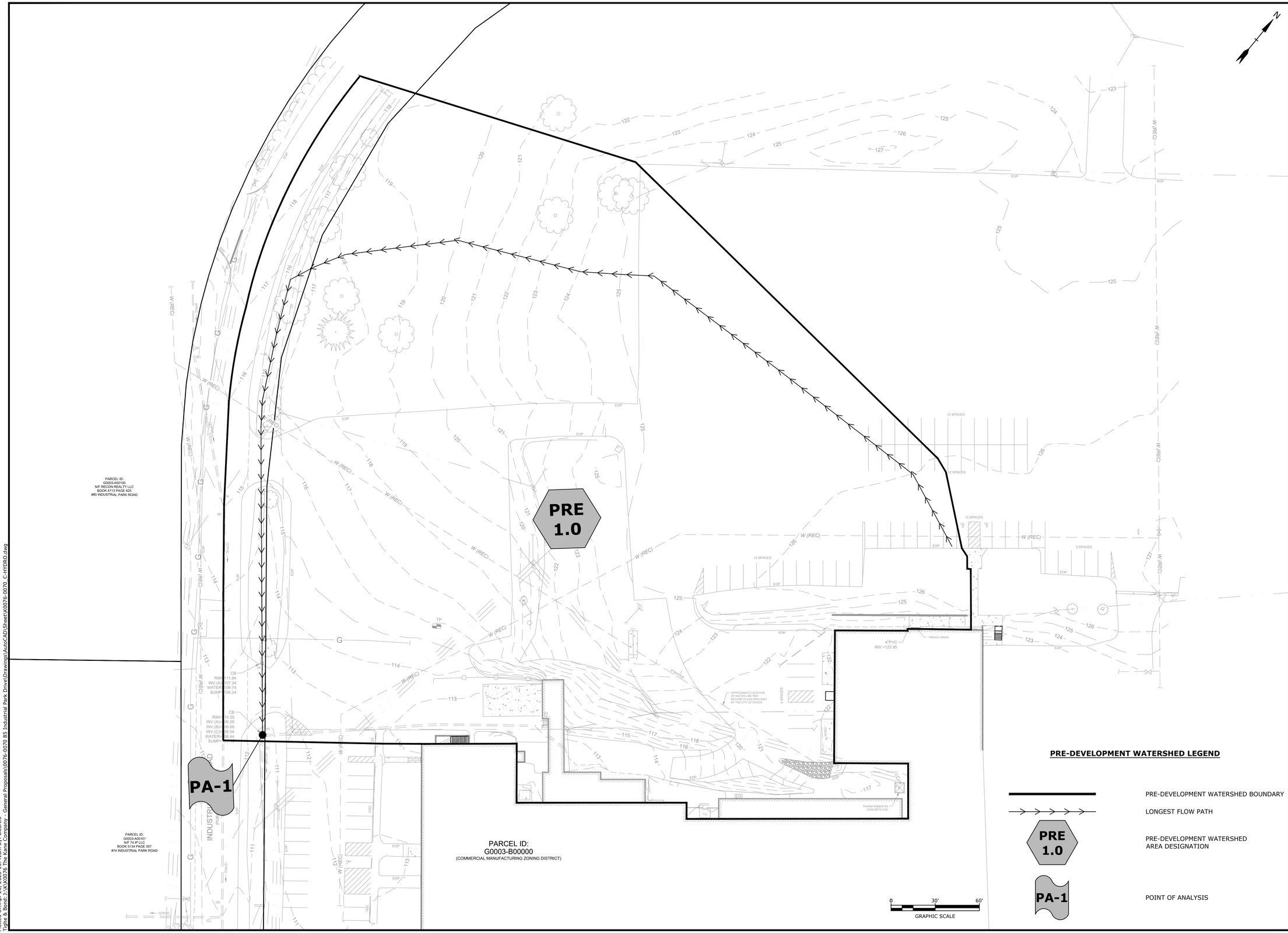
1. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment standard performance specifications. Pre-treatment upstream of the unit is assumed to be accounted for.

3.0 Conclusion

The proposed project will result in a reduction to the post-development peak runoff rates from the pre-development condition for the analyzed watershed. The proposed stormwater treatment system will treat about 35,000 SF of previously untreated impervious surface runoff from the project area prior to discharging into the drainage system within the right-of-way.

Enclosures

A Pre-development Drainage Watershed Plan
B Pre-development Calculations
C Post-Development Watershed Plan
D Post-Development Calculations
E Proprietary Stormwater Treatment Design Calculations
F Extreme Precipitation Tables



PRE-DEVELOPMENT WATERSHED LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- PRE 1.0 — PRE-DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS

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85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

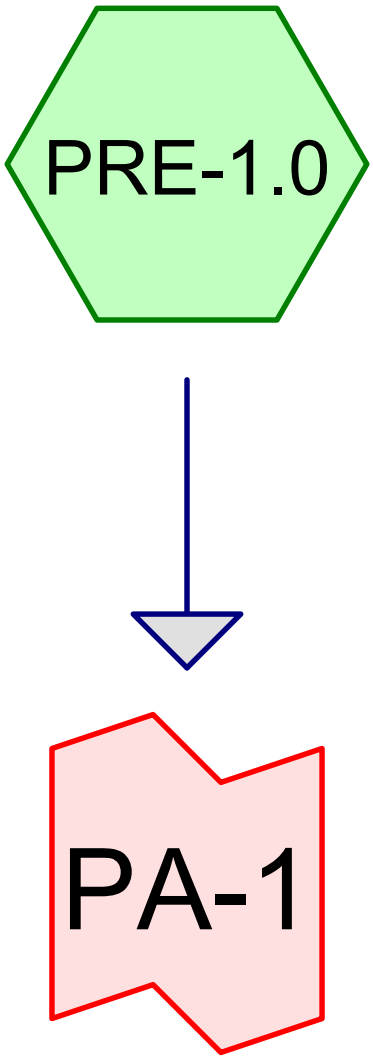
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DATE:	APRIL 14, 2025
FILE:	K0076-0070_C-HYDRO.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

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Subcat Reach Pond Link

Routing Diagram for K0076-070_PRE
Prepared by Tighe & Bond, Printed 4/9/2026
HydroCAD® 10.20-4c s/n 01453 © 2024 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
83,255	80	>75% Grass cover, Good, HSG D (PRE-1.0)
285	96	Gravel surface, HSG D (PRE-1.0)
94,350	98	Paved parking, HSG D (PRE-1.0)
3,915	98	Roofs, HSG D (PRE-1.0)
181,805	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
181,805	HSG D	PRE-1.0
0	Other	
181,805		**TOTAL AREA**

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

SubcatchmentPRE-1.0: Runoff Area=181,805 sf 54.05% Impervious Runoff Depth>2.11"
Flow Length=841' Tc=6.4 min CN=90 Runoff=9.92 cfs 31,986 cf

Link PA-1: Inflow=9.92 cfs 31,986 cf
Primary=9.92 cfs 31,986 cf

Total Runoff Area = 181,805 sf Runoff Volume = 31,986 cf Average Runoff Depth = 2.11"
45.95% Pervious = 83,540 sf 54.05% Impervious = 98,265 sf

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

SubcatchmentPRE-1.0: Runoff Area=181,805 sf 54.05% Impervious Runoff Depth>3.61"
Flow Length=841' Tc=6.4 min CN=90 Runoff=16.60 cfs 54,746 cf

Link PA-1: Inflow=16.60 cfs 54,746 cf
Primary=16.60 cfs 54,746 cf

Total Runoff Area = 181,805 sf Runoff Volume = 54,746 cf Average Runoff Depth = 3.61"
45.95% Pervious = 83,540 sf 54.05% Impervious = 98,265 sf

Summary for Subcatchment PRE-1.0:

Runoff = 16.60 cfs @ 12.09 hrs, Volume= 54,746 cf, Depth> 3.61"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.73"

Area (sf)	CN	Description
94,350	98	Paved parking, HSG D
83,255	80	>75% Grass cover, Good, HSG D
285	96	Gravel surface, HSG D
3,915	98	Roofs, HSG D
181,805	90	Weighted Average
83,540		45.95% Pervious Area
98,265		54.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.38		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.1	185	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	244	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	263	0.0130	3.62	19.93	**Trap/Vee/Rect Channel Flow,** Bot.W=0.50' D=1.00' Z= 5.0 '/' Top.W=10.50' n= 0.030 Earth, grassed & winding
0.3	49	0.0150	2.89	2.27	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
6.4	841	Total			

Summary for Link PA-1:

Inflow Area = 181,805 sf, 54.05% Impervious, Inflow Depth > 3.61" for 10-yr event
Inflow = 16.60 cfs @ 12.09 hrs, Volume= 54,746 cf
Primary = 16.60 cfs @ 12.09 hrs, Volume= 54,746 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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

SubcatchmentPRE-1.0: Runoff Area=181,805 sf 54.05% Impervious Runoff Depth>4.83"
Flow Length=841' Tc=6.4 min CN=90 Runoff=21.85 cfs 73,214 cf

Link PA-1: Inflow=21.85 cfs 73,214 cf
Primary=21.85 cfs 73,214 cf

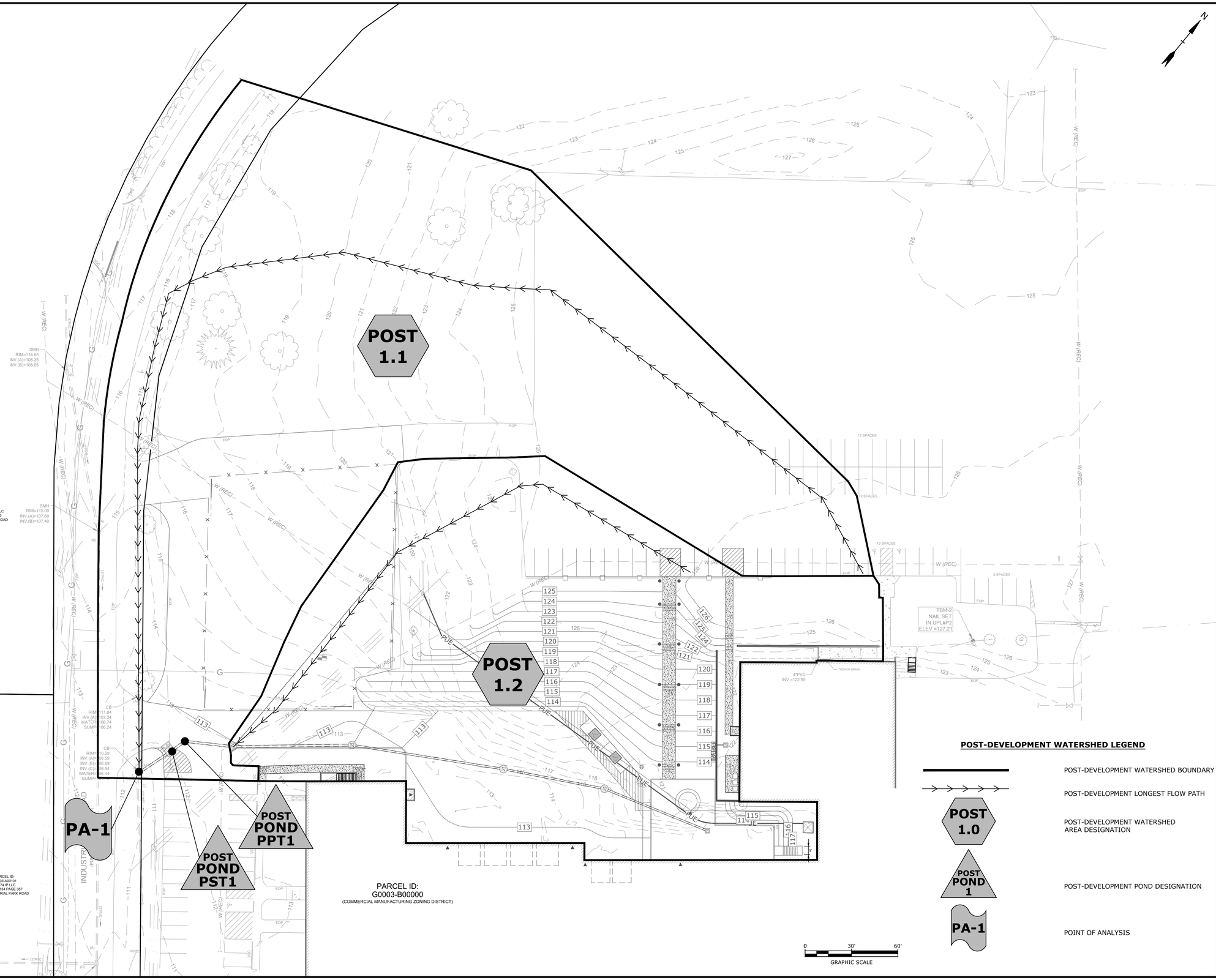
Total Runoff Area = 181,805 sf Runoff Volume = 73,214 cf Average Runoff Depth = 4.83"
45.95% Pervious = 83,540 sf 54.05% Impervious = 98,265 sf

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

SubcatchmentPRE-1.0: Runoff Area=181,805 sf 54.05% Impervious Runoff Depth>5.97"
Flow Length=841' Tc=6.4 min CN=90 Runoff=26.65 cfs 90,384 cf

Link PA-1: Inflow=26.65 cfs 90,384 cf
Primary=26.65 cfs 90,384 cf

Total Runoff Area = 181,805 sf Runoff Volume = 90,384 cf Average Runoff Depth = 5.97"
45.95% Pervious = 83,540 sf 54.05% Impervious = 98,265 sf



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85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

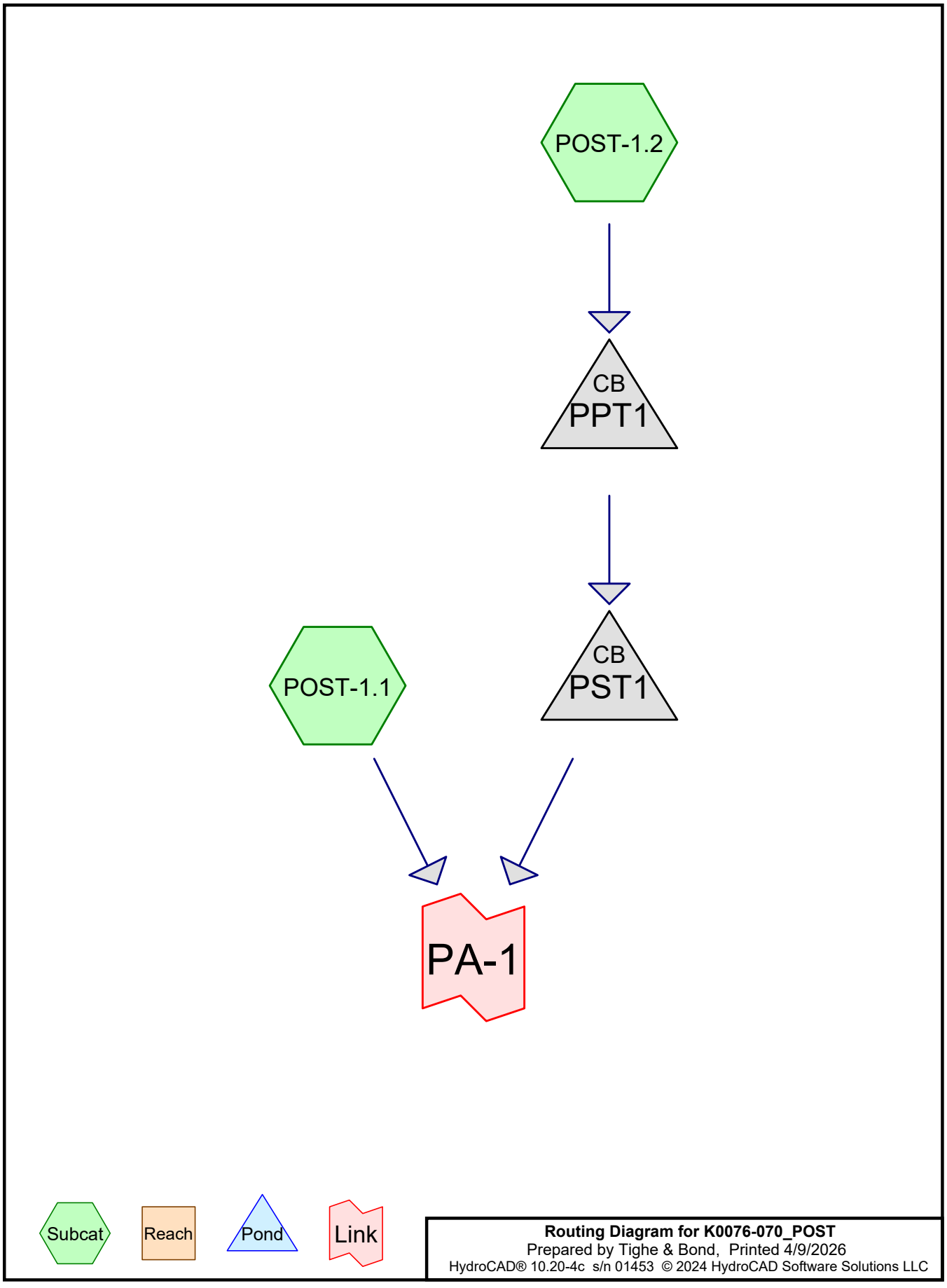
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DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

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Routing Diagram for K0076-070_POST
Prepared by Tighe & Bond, Printed 4/9/2026
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
87,730	80	>75% Grass cover, Good, HSG D (POST-1.1, POST-1.2)
94,075	98	Paved parking, HSG D (POST-1.1, POST-1.2)
181,805	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
181,805	HSG D	POST-1.1, POST-1.2
0	Other	
181,805		**TOTAL AREA**

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

SubcatchmentPOST-1.1: Runoff Area=110,875 sf 53.24% Impervious Runoff Depth>2.11"
Flow Length=841' Tc=6.4 min CN=90 Runoff=6.05 cfs 19,507 cf

SubcatchmentPOST-1.2: Runoff Area=70,930 sf 49.40% Impervious Runoff Depth>2.03"
Flow Length=387' Tc=6.0 min CN=89 Runoff=3.77 cfs 11,971 cf

Pond PPT1: Peak Elev=109.41' Inflow=3.77 cfs 11,971 cf
15.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=3.77 cfs 11,971 cf

Pond PST1: Peak Elev=109.04' Inflow=3.77 cfs 11,971 cf
Outflow=3.77 cfs 11,971 cf

Link PA-1: Inflow=9.81 cfs 31,478 cf
Primary=9.81 cfs 31,478 cf

Total Runoff Area = 181,805 sf Runoff Volume = 31,478 cf Average Runoff Depth = 2.08"
48.25% Pervious = 87,730 sf 51.75% Impervious = 94,075 sf

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

SubcatchmentPOST-1.1: Runoff Area=110,875 sf 53.24% Impervious Runoff Depth>3.61"
Flow Length=841' Tc=6.4 min CN=90 Runoff=10.12 cfs 33,387 cf

SubcatchmentPOST-1.2: Runoff Area=70,930 sf 49.40% Impervious Runoff Depth>3.51"
Flow Length=387' Tc=6.0 min CN=89 Runoff=6.39 cfs 20,755 cf

Pond PPT1: Peak Elev=110.38' Inflow=6.39 cfs 20,755 cf
15.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=6.39 cfs 20,755 cf

Pond PST1: Peak Elev=109.27' Inflow=6.39 cfs 20,755 cf
Outflow=6.39 cfs 20,755 cf

Link PA-1: Inflow=16.51 cfs 54,142 cf
Primary=16.51 cfs 54,142 cf

Total Runoff Area = 181,805 sf Runoff Volume = 54,142 cf Average Runoff Depth = 3.57"
48.25% Pervious = 87,730 sf 51.75% Impervious = 94,075 sf

Summary for Subcatchment POST-1.1:

Runoff = 10.12 cfs @ 12.09 hrs, Volume= 33,387 cf, Depth> 3.61"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.73"

Area (sf)	CN	Description
59,035	98	Paved parking, HSG D
51,840	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
0	98	Roofs, HSG D
110,875	90	Weighted Average
51,840		46.76% Pervious Area
59,035		53.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.38		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.1	185	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	244	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	263	0.0130	3.62	19.93	**Trap/Vee/Rect Channel Flow,** Bot.W=0.50' D=1.00' Z= 5.0 '/' Top.W=10.50' n= 0.030 Earth, grassed & winding
0.3	49	0.0150	2.89	2.27	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.025 Corrugated metal
6.4	841	Total			

Summary for Subcatchment POST-1.2:

Runoff = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf, Depth> 3.51"
Routed to Pond PPT1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.73"

Area (sf)	CN	Description
35,040	98	Paved parking, HSG D
35,890	80	>75% Grass cover, Good, HSG D
0	96	Gravel surface, HSG D
0	98	Roofs, HSG D
70,930	89	Weighted Average
35,890		50.60% Pervious Area
35,040		49.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0120	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.3	27	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	95	0.0670	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	165	0.0360	3.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	387	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond PPT1:

Inflow Area = 70,930 sf, 49.40% Impervious, Inflow Depth > 3.51" for 10-yr event
Inflow = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf
Outflow = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf
Routed to Pond PST1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 110.38' @ 12.10 hrs
Flood Elev= 112.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	106.95'	**15.0" Round Culvert** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 106.95' / 106.90' S= 0.0071 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.05 cfs @ 12.09 hrs HW=110.31' TW=109.26' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.05 cfs @ 4.93 fps)

Summary for Pond PST1:

Inflow Area = 70,930 sf, 49.40% Impervious, Inflow Depth > 3.51" for 10-yr event
Inflow = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf
Outflow = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.39 cfs @ 12.09 hrs, Volume= 20,755 cf
Routed to Link PA-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 109.27' @ 12.09 hrs
Flood Elev= 112.90'

Device	Routing	Invert	Outlet Devices
#1	Device 3	106.80'	**JF CSV File** Head (feet) 0.00 0.08 0.17 0.25 0.33 0.42 0.50 0.58 0.67 0.75 0.83 0.92 1.00 1.08 1.17 1.25 1.33 1.42 1.50 1.58 1.67 1.75 Disch. (cfs) 0.000 0.008 0.017 0.025 0.034 0.042 0.051 0.107 0.163 0.219 0.275 0.331 0.387 0.443 0.499 0.555 0.611 0.667 0.723 0.779 0.835 0.891

#2	Device 3	108.55'	**2.8' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Primary	106.80'	**15.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 106.80' / 106.70' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.24 cfs @ 12.09 hrs HW=109.26' TW=0.00' (Dynamic Tailwater)
└─**3=Culvert** (Passes 6.24 cfs of 8.00 cfs potential flow)
  ├─**1=JF CSV File** (Custom Controls 0.89 cfs)
  └─**2=Broad-Crested Rectangular Weir** (Weir Controls 5.35 cfs @ 2.69 fps)

Summary for Link PA-1:

Inflow Area = 181,805 sf, 51.75% Impervious, Inflow Depth > 3.57" for 10-yr event
Inflow = 16.51 cfs @ 12.09 hrs, Volume= 54,142 cf
Primary = 16.51 cfs @ 12.09 hrs, Volume= 54,142 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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

SubcatchmentPOST-1.1: Runoff Area=110,875 sf 53.24% Impervious Runoff Depth>4.83"
Flow Length=841' Tc=6.4 min CN=90 Runoff=13.32 cfs 44,650 cf

SubcatchmentPOST-1.2: Runoff Area=70,930 sf 49.40% Impervious Runoff Depth>4.72"
Flow Length=387' Tc=6.0 min CN=89 Runoff=8.47 cfs 27,913 cf

Pond PPT1: Peak Elev=111.40' Inflow=8.47 cfs 27,913 cf
15.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=8.47 cfs 27,913 cf

Pond PST1: Peak Elev=109.45' Inflow=8.47 cfs 27,913 cf
Outflow=8.47 cfs 27,913 cf

Link PA-1: Inflow=21.78 cfs 72,563 cf
Primary=21.78 cfs 72,563 cf

Total Runoff Area = 181,805 sf Runoff Volume = 72,563 cf Average Runoff Depth = 4.79"
48.25% Pervious = 87,730 sf 51.75% Impervious = 94,075 sf

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

SubcatchmentPOST-1.1: Runoff Area=110,875 sf 53.24% Impervious Runoff Depth>5.97"
Flow Length=841' Tc=6.4 min CN=90 Runoff=16.25 cfs 55,122 cf

SubcatchmentPOST-1.2: Runoff Area=70,930 sf 49.40% Impervious Runoff Depth>5.85"
Flow Length=387' Tc=6.0 min CN=89 Runoff=10.36 cfs 34,581 cf

Pond PPT1: Peak Elev=113.07' Inflow=10.36 cfs 34,581 cf
15.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=10.36 cfs 34,581 cf

Pond PST1: Peak Elev=110.48' Inflow=10.36 cfs 34,581 cf
Outflow=10.36 cfs 34,581 cf

Link PA-1: Inflow=26.60 cfs 89,703 cf
Primary=26.60 cfs 89,703 cf

Total Runoff Area = 181,805 sf Runoff Volume = 89,703 cf Average Runoff Depth = 5.92"
48.25% Pervious = 87,730 sf 51.75% Impervious = 94,075 sf

Jellyfish Filter Design Calculation

Contech Engineered Solutions, LLC Engineer:	JBS
Date Prepared:	**4/8/2026**

Site Information

Project Name	**85 Industrial Park Road Truck Court**	
Project City	**Dover**	
Project State	**NH**	
Site Designation	**JF Unit**	
Total Drainage Area, Ad	**1.63**	ac
Post Development Impervious Area, Ai	**0.80**	ac
Pervious Area, Ap	**0.83**	ac
% Impervious	**49%**	
Runoff Coefficient, Rc	**0.49**	
Upstream pretreatment credit	**50%**	

Mass Loading Calculations

Mean Annual Rainfall, P	**47**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**123,070**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**537**	lbs

Filter System

Filtration Brand	**Jellyfish**	
Cartridge Length	**54**	in

Jellyfish Sizing

Mass removed by pretreatment system	**269**	lbs
Mass load to filters after pretreatment	**269**	lbs
Mass to be Captured by System	**215**	lbs
Water Quality Flow	**0.81**	cfs

Method to Use **FLOW BASED**

Summary			
Flow	Treatment Flow Rate	0.89	cfs
	Required Size	**JFPD0406-4-2**	
	Mass Capture provided	626	lbs

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.187 degrees North
Longitude	70.904 degrees West
Elevation	30 feet
Date/Time	Fri Apr 03 2026 14:25:58 GMT-0400 (Eastern Daylight Time)

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	1.29	**2yr**	0.87	1.17	1.50	1.91	2.44	3.14	3.49	**2yr**	2.78	3.35	3.85	4.58	5.22	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.38	3.07	3.96	4.47	**5yr**	3.51	4.30	4.91	5.79	6.54	**5yr**
10yr	0.40	0.63	0.80	1.09	1.42	1.84	**10yr**	1.22	1.69	2.18	2.82	3.65	4.73	5.39	**10yr**	4.19	5.18	5.92	6.91	7.77	**10yr**
25yr	0.46	0.74	0.94	1.29	1.72	2.26	**25yr**	1.48	2.09	2.69	3.52	4.59	5.99	6.91	**25yr**	5.30	6.65	7.56	8.73	9.76	**25yr**
50yr	0.51	0.83	1.06	1.48	1.99	2.66	**50yr**	1.72	2.45	3.17	4.17	5.47	7.15	8.35	**50yr**	6.33	8.03	9.11	10.44	11.61	**50yr**
100yr	0.58	0.93	1.20	1.70	2.31	3.11	**100yr**	2.00	2.88	3.74	4.94	6.51	8.55	10.09	**100yr**	7.57	9.70	10.98	12.47	13.81	**100yr**
200yr	0.64	1.04	1.36	1.95	2.69	3.66	**200yr**	2.32	3.39	4.41	5.87	7.77	10.23	12.19	**200yr**	9.05	11.72	13.23	14.92	16.43	**200yr**
500yr	0.75	1.24	1.61	2.34	3.29	4.52	**500yr**	2.84	4.21	5.48	7.35	9.79	12.97	15.67	**500yr**	11.48	15.06	16.95	18.91	20.70	**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	0.61	0.74	0.90	**1yr**	0.64	0.88	0.91	1.25	1.55	2.07	2.47	**1yr**	1.83	2.38	2.92	3.36	4.05	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.15	1.36	1.83	2.36	3.04	3.39	**2yr**	2.69	3.26	3.74	4.46	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	4.12	**5yr**	3.28	3.96	4.59	5.40	6.10	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.82	2.45	3.13	4.26	4.78	**10yr**	3.77	4.59	5.31	6.24	7.00	**10yr**
25yr	0.44	0.67	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.85	3.66	5.02	5.79	**25yr**	4.44	5.57	6.48	7.55	8.41	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.19	**50yr**	1.52	2.14	2.35	3.20	4.12	5.75	6.68	**50yr**	5.09	6.42	7.53	8.72	9.65	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.51	**100yr**	1.74	2.46	2.63	3.59	4.60	6.58	7.71	**100yr**	5.82	7.41	8.75	10.06	11.05	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.88	**200yr**	1.98	2.81	2.93	4.02	5.15	7.52	8.89	**200yr**	6.65	8.55	10.16	11.62	12.67	**200yr**
500yr	0.70	1.04	1.34	1.94	2.76	3.46	**500yr**	2.38	3.39	3.40	4.66	5.99	8.93	10.73	**500yr**	7.91	10.31	12.39	14.07	15.13	**500yr**

Upper Confidence Limits

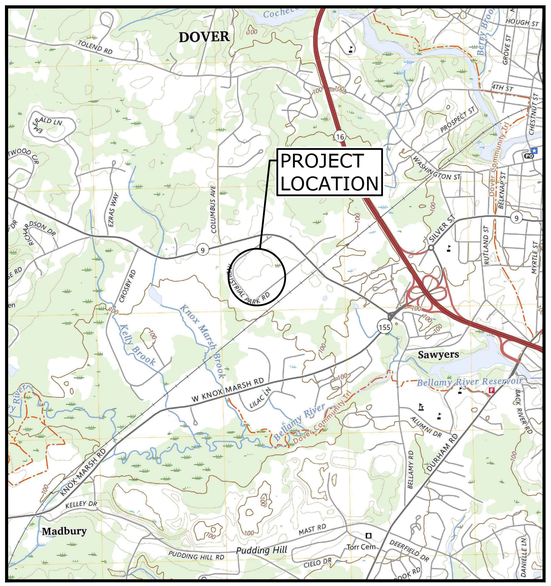
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.74	2.21	2.84	3.06	**1yr**	2.51	2.94	3.39	4.19	4.77	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.48	1.95	2.50	3.25	3.60	**2yr**	2.88	3.46	3.97	4.73	5.40	**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	4.81	**5yr**	3.74	4.63	5.25	6.19	6.96	**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	6.00	**10yr**	4.60	5.77	6.59	7.60	8.48	**10yr**
25yr	0.55	0.84	1.05	1.50	1.97	2.47	**25yr**	1.70	2.41	2.87	3.95	4.93	6.95	8.06	**25yr**	6.15	7.75	8.79	10.00	11.04	**25yr**
50yr	0.64	0.97	1.21	1.74	2.34	2.98	**50yr**	2.02	2.91	3.48	4.81	5.98	8.57	10.08	**50yr**	7.59	9.70	10.96	12.29	13.50	**50yr**
100yr	0.74	1.12	1.41	2.03	2.79	3.60	**100yr**	2.40	3.52	4.22	5.88	7.26	10.58	12.62	**100yr**	9.36	12.14	13.65	15.13	16.51	**100yr**
200yr	0.86	1.29	1.64	2.37	3.31	4.36	**200yr**	2.86	4.26	5.13	7.19	8.80	13.09	15.82	**200yr**	11.59	15.21	17.02	18.61	20.23	**200yr**
500yr	1.05	1.56	2.01	2.92	4.15	5.59	**500yr**	3.58	5.47	6.62	9.40	11.38	17.38	21.33	**500yr**	15.38	20.51	22.79	24.52	26.47	**500yr**

Powered by ACIS
Northeast Regional Climate Center

PROPOSED TRUCK COURT REDEVELOPMENT
85 INDUSTRIAL PARK ROAD
DOVER, NH

DATE: APRIL 14, 2026

DRAWING NO.	DRAWING TITLE	LAST REVISED
-	COVER SHEET	4/14/2026
G-100	GENERAL NOTES AND LEGENDS	4/14/2026
G-101	NEIGHBORHOOD PLAN	4/14/2026
C-100	DEMOLITION PLAN	4/14/2026
C-200	SITE PLAN	4/14/2026
C-300	GRADING, DRAINAGE, AND UTILITIES PLAN	4/14/2026
L-100	LANDSCAPE PLAN	4/14/2026
C-500	EROSION CONTROL NOTES AND DETAILS	4/14/2026
C-501	SITE DETAILS	4/14/2026
C-502	SITE DETAILS	4/14/2026
C-503	SITE DETAILS	4/14/2026
C-504	SITE DETAILS	4/14/2026
L-500	LANDSCAPE DETAILS	4/14/2026



LOCATION MAP
SCALE: 1" = 2000'

PREPARED BY:

Tighe & Bond
177 Corporate Drive
Portsmouth, NH 03801
T 603.433.8818

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – PATRICK CRIMMINS No. 12378 LICENSED
4/14/26

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – NEIL A. HANSEN No. 15227 LICENSED
4/14/26

PREPARED FOR:

OWNER/APPLICANT
85 INDUSTRIAL PARK II LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801

AUTHORIZED SIGNATURE

SURVEYOR
GREENMAN-PEDERSEN, INC.
21 DANIEL ST., SECOND FLOOR
PORTSMOUTH, NH 03801

TAC SUBMISSION
COMPLETE SET 13 SHEETS

Last Saved: 4/14/2026
Plotted: Oct 14, 2026–9:11am By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_C-COVR.dwg

CITY OF DOVER SITE PLAN NOTES

1. THE INTENT OF THIS PLAN IS TO IS TO DEPICT THE REDEVELOPMENT OF AN EXISTING LOADING ZONE ALONG THE WESTERN FACE OF AN EXISTING COMMERCIAL/INDUSTRIAL BUILDING. THE PLAN PROPOSES TO CONSTRUCT A NEW PAVED TRUCK COURT WITH ENHANCED ACCESS AND CIRCULATION. BUILDING GROSS FLOOR AREA IS PROPOSED TO BE REDUCED AND A NEW BUILDING FACADE CONSTRUCTED TO ALIGN WITH A NEW BUILDING ENTRY AND PATIO SPACE.
2. PROJECT OWNER OF RECORD:

   MAP G LOT 3-B-0:
   85 INDUSTRIAL PARK II LLC
   210 COMMERCE WAY
   PORTSMOUTH, NH 03801

   _____
   AUTHORIZED SIGNATURE

   PROJECT NAME: PROPOSED TRUCK COURT REDEVELOPMENT
   PROJECT ADDRESS: 85 INDUSTRIAL PARK ROAD
   DOVER,nh 03820
   PROJECT LATITUDE: 43°11'10"N
   PROJECT LONGITUDE: 70°54'17"W
3. THE PARCEL SHOWN AS LOT NO. G, MAP 3-B-0 OF THE CITY OF DOVER TAX ASSESSOR'S.
4. THE SUBJECT PARCEL CONTAINS 25.05 ACRES AREA OF LAND.
5. TITLE REFERENCE FOR THE PROJECT PARCEL(S) IS THE STRAFFORD COUNTY REGISTRY OF DEEDS, BOOK NO. 2390, PAGE NO. 453
7. RIGHT-OF-WAY, CONSERVATION, SLOPE, CONSTRUCTION, SLOPE, CONSTRUCTION, POWER LINE, CROSS TRAVEL OR OTHER EASEMENTS REFERENCES: N/A
8. WAIVERS GRANTED INCLUDE THE FOLLOWING:
   8.1. XXXXXXXXX
9. SPECIAL EXCEPTIONS REQUESTED BY THE ZONING BOARD OF ADJUSTMENT INCLUDE THE FOLLOWING: N/A
10. CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD INCLUDE THE FOLLOWING: N/A
11. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY GPI, DATED 9/26/2025.
4. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FEDERALLY DESIGNATED FLOOD HAZARD AREA (COMMUNITY PANEL NUMBER 33017C0320E, EFFECTIVE ON 9/30/2015.
5. THERE ARE NO ON-SITE WETLANDS WITHIN THE LIMITS OF WORK.
6. THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.
7. THE SUBJECT PARCEL IS SERVED BY MUNICIPAL WATER AND SEWER.
8. ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.
9. 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.
10. THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT. CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR ANY EARTH DISTURBING ACTIVITY OCCURS.
11. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
12. 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.
13. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY-FRIDAY 7 AM-6 PM, SATURDAY 9 AM-4 PM, AND NO HOURS ON SUNDAYS OR HOLIDAYS. 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.
14. THE EXISTING USE FOR THE SITE IS COMMERCIAL/INDUSTRIAL AND SHALL REMAIN COMMERCIAL/INDUSTRIAL.
15. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY: N/A
16. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
17. ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
18. ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
19. 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
20. 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.
21. FIRE DEPARTMENT ACCESS ROAD(S) SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.
22. EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.
23. ELEVATIONS ARE BASED ON U.S.G.S. NVD 1988 DATUM.
24. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL BE ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. (I.E. IBC, ANSI-117.1) AND NH RSA 155-A:5.

GENERAL NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
4. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION (E.G., EXISTING UTILITIES) SHOWN ON THESE DRAWINGS IS NOT GUARANTEED AND SOME SUBSURFACE INFORMATION MAY NOT BE SHOWN. DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL SUBSURFACE FEATURES WHICH MAY AFFECT CONSTRUCTION OPERATIONS BY TEST PIT OR OTHER METHODS, AS NECESSARY TO PREVENT DAMAGE TO UTILITIES AND OTHER SUBSURFACE FEATURES, AND/OR INTERRUPTIONS IN UTILITY SERVICE. PROVIDE DATA COLLECTED THROUGH THESE INVESTIGATIONS TO THE ENGINEER PRIOR TO CONSTRUCTING THE PROPOSED IMPROVEMENTS.
5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY UTILITIES IDENTIFIED DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE DRAWINGS OR THAT DIFFER IN SIZE OR MATERIAL
6. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY; COORDINATION WITH THE OWNER, ALL SUBCONTRACTORS, AND WITH OTHER CONTRACTORS WORKING WITHIN THE LIMITS OF WORK, THE MEANS AND METHODS OF CONSTRUCTING THE PROPOSED WORK.
7. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. THE CONTRACTOR SHALL COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF DOVER.
10. ALL WORK SHALL CONFORM TO THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
11. THE CONTRACTOR SHALL SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
12. BEFORE ANY DEWATERING IS PERFORMED A TEMPORARY DISCHARGE PERMIT FROM THE NHDES IS REQUIRED.
13. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR AND PEDESTRIAN ACCESS THROUGH THE WORK AREA, OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA. PERFORM TRAFFIC CONTROL IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED TRAFFIC CONTROL PLAN.
14. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL PROPERTIES WITHIN THE PROJECT AREA AT ALL TIMES DURING CONSTRUCTION.
15. NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITH THE PLANS OR BETWEEN THE PLANS AND ANY APPLICABLE LAW, REGULATION, CODE, STANDARD SPECIFICATION, OR MANUFACTURER'S INSTRUCTIONS.
16. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES, LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM TIGHE & BOND.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORT OF EXISTING UTILITIES AND REPAIR OR REPLACEMENT COSTS OF UTILITIES DAMAGED DURING CONSTRUCTION, WHETHER ABOVE OR BELOW GRADE. REPLACE DAMAGED UTILITIES IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER AND AT NO COST TO THE PROPERTY OWNER.
3. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY ARE ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
5. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
6. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, FOUNDATION, TREES AND LANDSCAPING.
7. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
9. THE CONTRACTOR SHALL COORDINATE; REMOVAL, RELOCATION, DISPOSAL, ABANDONMENT, OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK, UNLESS SPECIFICALLY IDENTIFIED OTHERWISE.
11. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
14. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.
15. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
16. THE CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
18. BOLD LINETYPES AND FEATURES SHOWN WITHIN THE LIMITS OF WORK INDICATE SITE FEATURES TO BE REMOVED, WHILE FADED LINETYPES AND FEATURES ARE TO REMAIN, UNLESS SPECIFICALLY IDENTIFIED OTHERWISE.

SITE NOTES:

1. PAVEMENT MARKINGS, INCLUDING BUT NOT LIMITED TO; PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS, AND CENTERLINES, SHALL BE CONSTRUCTED AS SHOWN ON THE DRAWINGS AND DETAILS, AND SHALL MEET THE FOLLOWING REQUIREMENTS:
   - ALL ON-SITE PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248 TYPE "F".
   - ALL PAVEMENT MARKINGS WITHIN PUBLIC RIGHT OF WAY SHALL CONFORM TO THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS, AND APPLICABLE DEPARTMENT OF TRANSPORTATION (DOT), STANDARD SPECIFICATIONS.
2. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" CURRENT EDITION, "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" CURRENT EDITION, AND THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), THE ARCHITECTURAL BARRIERS ACT (ABA), AS APPLICABLE.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
5. THE CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED.
6. COORDINATE ALL WORK ADJACENT TO BUILDINGS WITH BUILDING DRAWINGS/CONTRACTOR.
7. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
8. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
9. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING RETAINING WALL DESIGN FROM STRUCTURAL ENGINEER AND/OR WALL MANUFACTURER. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO CONSTRUCT WALL IN ACCORDANCE WITH DESIGN APPROVED BY THE ENGINEER. RETAINING WALL SHALL BE SEGMENTAL BLOCK WALL SYSTEM AS OUTLINED IN THE DETAILS.
11. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PUBLIC WALKS, DRIVES, AND PARKING AREAS ON-SITE. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.

GRADING AND DRAINAGE NOTES:

1. GENERAL COMPACTION REQUIREMENTS:
   - BELOW PAVED OR CONCRETE AREAS: 95%
   - TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL: 95%
   - BELOW LOAM AND SEED AREAS: 90%
     - ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. PROVIDE SITE GRADING AT ACCESSIBLE SIDEWALK RAMPS, SIDEWALKS, AND BUILDING ENTRANCES THAT IS CONSISTENT WITH THE RELEVANT ACCESS REQUIREMENTS OF THE ARCHITECTURAL BARRIERS ACT (ABA), AND THE AMERICANS WITH DISABILITIES ACT (ADA). SMALL CHANGES IN GRADE OVER RELATIVELY SHORT DISTANCES (E.G. AT PARKING SPACES, ACCESSIBLE ROUTES, AND RAMPS) MIGHT NOT BE CLEARLY DEPICTED WITHIN THE CONTOUR INTERVAL SHOWN. COMPLY WITH THE CRITERIA IN THESE STANDARDS. SELECT MAXIMUM SLOPE CRITERIA ARE REPRODUCED BELOW:
   - ACCESSIBLE PARKING STALLS AND PASSENGER LOADING ZONES (IN ANY DIRECTION) SHALL BE < 2.0%
   - LONGITUDINAL SLOPE ALONG ACCESSIBLE ROUTES SHALL BE < 5.0%
   - CROSS SLOPE ALONG ACCESSIBLE ROUTES SHALL BE < 2.0%
7. THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
9. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
10. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. THE CONTRACTOR SHALL VERIFY INVERTS OF EXISTING DRAIN LINES AND STRUCTURES AT PROPOSED DRAINAGE CONNECTION LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER - CITY OF DOVER
   - SEWER - CITY OF DOVER
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS
3. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
4. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
5. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF DOVER WATER DEPARTMENT.
6. ALL BELOW GRADE WATER VALVES AND FITTINGS SHALL HAVE MECHANICAL JOINT (MJ) ENDS. RESTRAIN ALL WATER VALVES AND FITTINGS JOINTS WITH RETAINER GLANDS, OR AS REQUIRED BY THE CITY OF DOVER WATER DEPARTMENT STANDARDS.
7. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO THE CITY OF DOVER WATER DEPARTMENT STANDARDS.
8. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF DOVER FIRE AND/OR WATER DEPARTMENT.
9. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
10. THE CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
11. EXISTING WATER AND SEWER UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE PROPERTY LINE PER THE CITY OF DOVER WATER DEPARTMENT AND CITY OF DOVER SEWER DEPARTMENT STANDARDS. ALL OTHER UTILITIES TO BE REMOVED SHALL BE CUT AND CAPPED PER EACH UTILITY COMPANY STANDARDS.
12. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, CURRENT EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
13. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
15. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
16. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
17. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
18. THE CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
19. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
20. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
21. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF DOVER SEWER DEPARTMENT.
22. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
23. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
24. THE CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
25. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
26. THE CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
27. FINAL LOCATION OF ALL WATER METER AND VALVE SHALL BE COORDINATED WITH THE CITY OF DOVER WATER DEPARTMENT PRIOR TO CONSTRUCTION.
28. THE CONTRACTOR SHALL VERIFY INVERTS OF EXISTING SEWER LINES AND STRUCTURES AT PROPOSED SEWER CONNECTION LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.

ABBREVIATIONS

ABDN('D)	ABANDON(ED)	FF	FINISH FLOOR	PRC	POINT OF REVERSE CURVATURE
AC	ASBESTOS CEMENT PIPE	FM	FORCE MAIN	PROT	PROTECT
APPROX	APPROXIMATE	G	GAS	PSF	POUNDS PER SQUARE FOOT
BC	BITUMINOUS CURB	GG	GAS GATE	PSI	POUNDS PER SQUARE INCH
BFP	BACK FLOW PREVENTOR	GRAN	GRANITE	PT	POINT OF TANGENCY
BIT	BITUMINOUS	HC	HANDICAP	PVC	POLYVINYLCHLORIDE
BL	BASELINE	HDPE	HIGH DENSITY POLYETHYLENE	PVMT	PAVEMENT
BLDG	BUILDING			R	RADIUS
BND	BOUND	HMA	HOT MIX ASPHALT	RCP	REINFORCED CONCRETE PIPE
BOC	BOTTOM OF CURB	HYD	HYDRANT	RD	ROOF DRAIN
BOT	BOTTOM	IN	INCHES	REV	REVISION
BS	BOTTOM OF STEP	INV	INVERT	ROW	RIGHT OF WAY
BW	BOTTOM OF WALL	IP	IRON PIN	RT	RIGHT
CATV	CABLE TELEVISION	L	LENGTH OF CURB	R&D	REMOVE AND DISPOSE
CB	CATCH BASIN	LP	LIGHT POLE	R&R	REMOVE AND RESET
CCW	CEMENT CONCRETE WALK	LT	LEFT	R&S	REMOVE AND STACK
CEM	CEMENT	MAX	MAXIMUM	S	SOUTH
CI	CAST IRON PIPE	MH	MANHOLE	SAN	SANITARY
CL	CENTERLINE	MIN	MINIMUM	SCH	SCHEDULE
CLF	CHAIN LINK FENCE	MISC	MISCELLANEOUS	SF	SQUARE FOOT
CO	CLEAN OUT	MON	MONUMENT	SMH	SEWER MANHOLE
CONC	CONCRETE	MJ	MECHANICAL JOINT	SS	STAINLESS STEEL
CPP	CORRUGATED POLYETHYLENE PIPE	N	NORTH	STA	STATION
		NITC	NOT IN THIS CONTRACT	STL	STEEL
CY	CUBIC YARD	NTS	NOT TO SCALE	STRM	STORM
DH	DRILL HOLE	N/A	NOT APPLICABLE	T	TANGENT LENGTH
DI	DUCTILE IRON PIPE	N/F	NOW OR FORMERLY	TC	TOP OF CURB
DIA	DIAMETER	OC	ON CENTER	TEL	TEL-DATA
DMH	DRAIN MANHOLE	OCS	OUTLET CONTROL STRUCTURE	TP	TEST PIT
E	EAST			TS	TOP OF STEP
EF	EACH FACE	OH	OVERHEAD	TW	TOP OF WALL
EG	EXISTING GRADE	PB	PLANT BED	TYP	TYPICAL
EL/ELEV	ELEVATION	PC	POINT OF CURVATURE	UP	UTILITY PO



IT: INNOVATIVE TECHNOLOGY

R-40: RURAL RESIDENTIAL

R-20: LOW-DENSITY RESIDENTIAL

CM: COMMERCIAL MANUFACTURING

PROJECT LOCATION

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 4/14/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

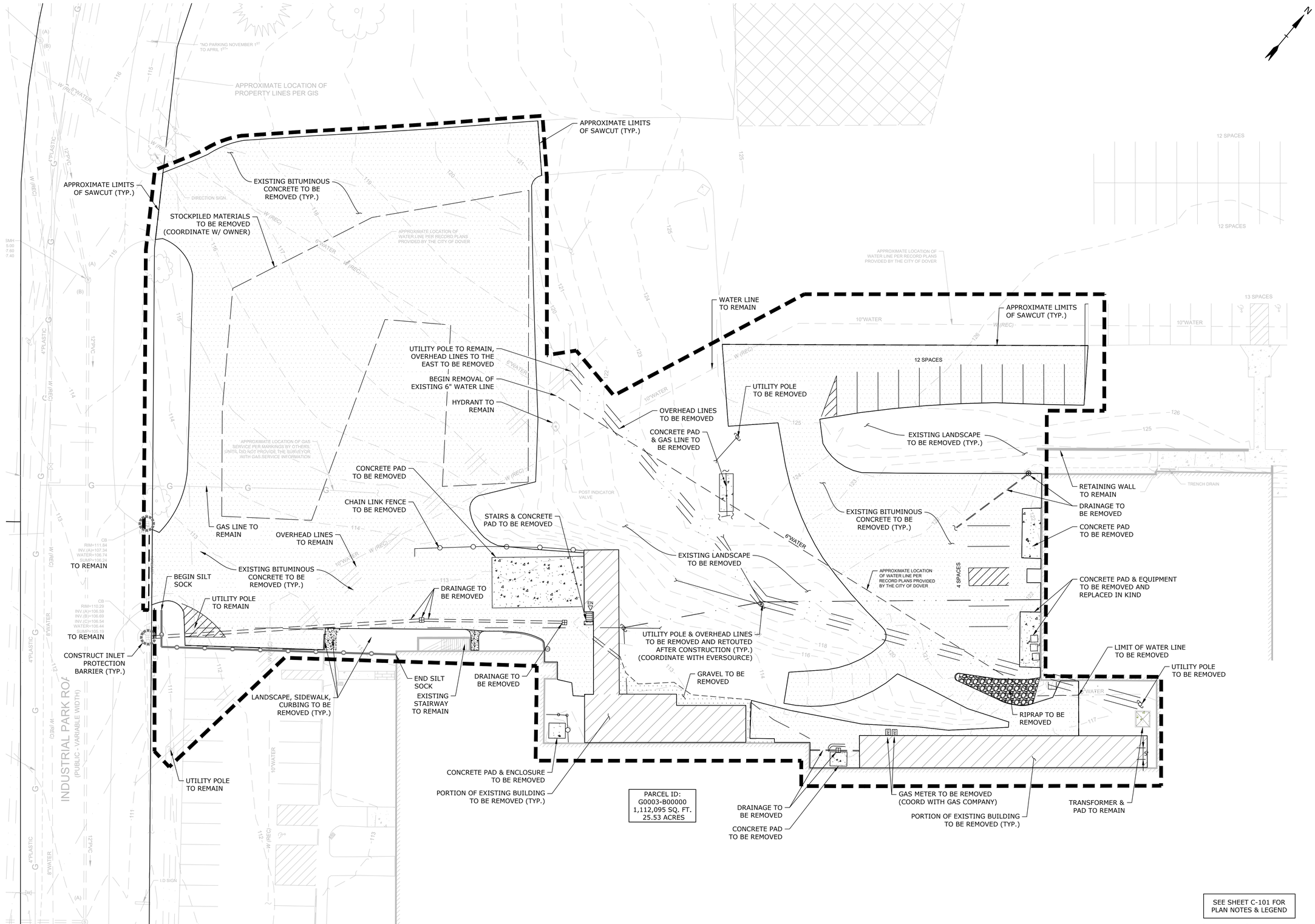
PROJECT NO:	K0076-0070
DATE:	APRIL 14, 2025
FILE:	K0076-0070_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

NEIGHBORHOOD PLAN

SCALE: AS SHOWN

G-101

Last Saved: 4/9/2026
Plotted: 4/14/2026 1:57pm By: MCurley
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_C-DSGN.dwg



Tighe & Bond

PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
4/14/26

NEIL A. HANSEN
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4/14/26

85 Industrial Park Road Truck Court

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Dover, NH

MARK	DATE	DESCRIPTION

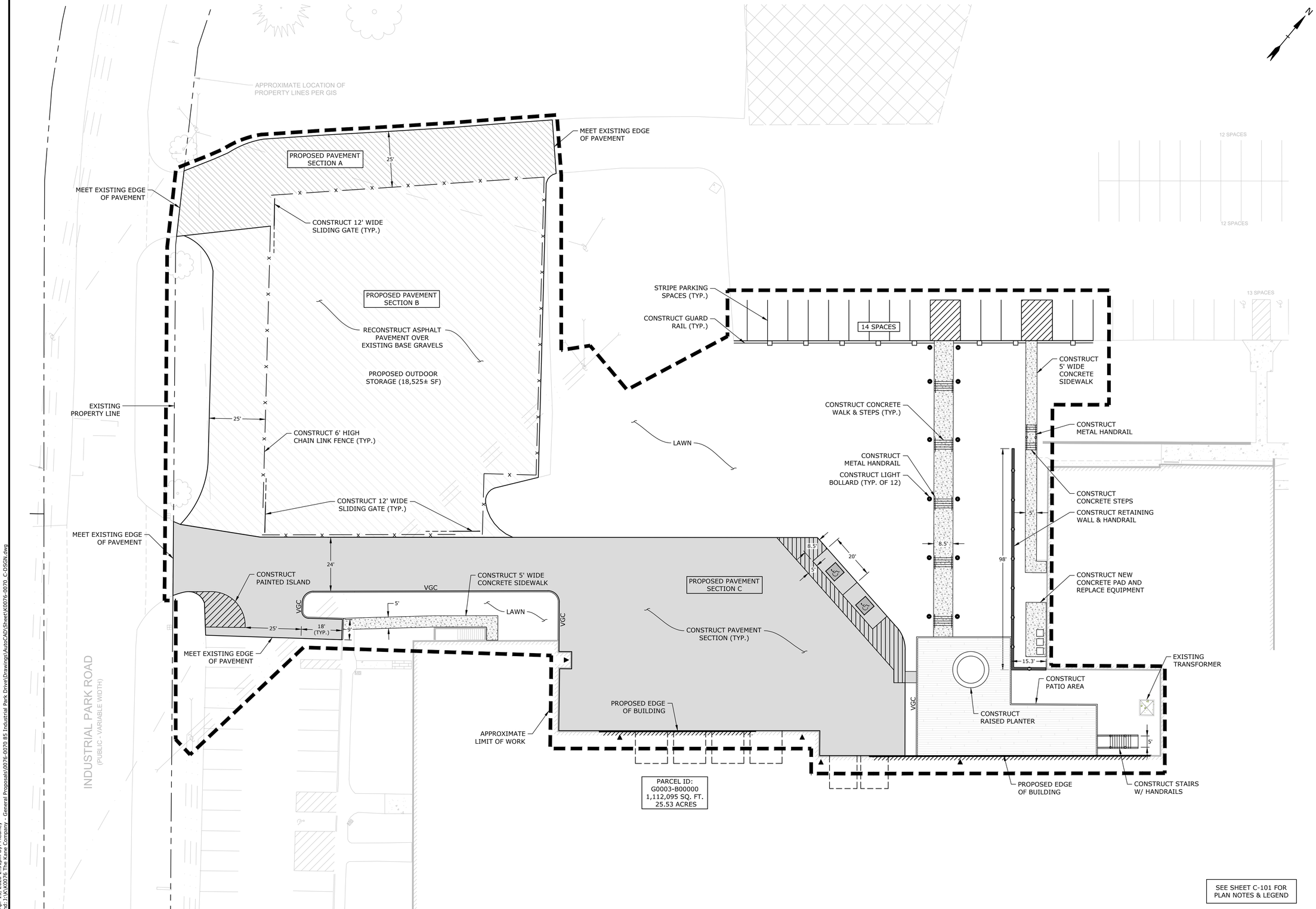
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DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-100

Last Saved: 4/9/2026
Plotted: Oct 13, 2026 - 2:05pm By: MCurley
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_C-DSGN.dwg



Tighe & Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
4/14/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
4/14/26

85 Industrial Park Road Truck Court

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Dover, NH

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FILE:	K0076-0070_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-200

Last Saved: 4/9/2026
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Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_C-DSGN.dwg

Tighe & Bond

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
4/14/26

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

PROJECT NO:	K0076-0070
DATE:	APRIL 14, 2025
FILE:	K0076-0070_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

GRADING, DRAINAGE, AND UTILITIES PLAN

SCALE: AS SHOWN

C-300

SEE SHEET C-101 FOR PLAN NOTES & LEGEND

0 20' 40'
GRAPHIC SCALE

Last Saved: 4/9/2026
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CODE	BOTANICAL NAME	COMMON NAME	SIZE	TOTAL
	DECIDUOUS TREES			
AF	ACER FREMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE	2 1/2"-3" CAL	12
QC	QUERCUS COCCINEA	SCARLET OAK	2 1/2"-3" CAL	2
TC	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LITTLELEAF LINDEN	2 1/2"-3" CAL	3
	EVERGREEN TREES			
TO	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVATAE	5'-6' HT	10
	SHRUBS			
BMW	BUXUS MICROPHYLLA 'WINTERGREEN'	WINTER GREEN BOXWOOD	18"-24" HT	80
POL	PHYSOCARPUS OPUCIFOLIUS 'LITTLE DEVIL'	LITTLE DEVIL NINE BARK	5 GAL.	1
PQF	PARTHENOCISSUS QUINQUEFOLIA	VIRGINIA CREEPER	2 GAL.	5
SLP	SPIREA JAPONICA 'LITTLE PRINCESS'	LITTLE PRINCESS SPIREA	5 GAL.	2
	PERENNIAL / GROUND COVER			
HOS	HOSTA 'SUM & SUBSTANCE'	HOSTA BIG DADDY	1 GAL.	25
OCN	OSMUNDA CINNAMOMEUM	CINNAMON FERN	2 GAL.	32
PTG	PACHYSANDRA TERMINALIS 'GREEN SHEEN'	GREEN SHEEN SPURG	0'-4"	12" OC

PLANTING LEGEND

TAG	DESCRIPTION	SYMBOL(S)	QTY
TREES, SHRUBS & PERENNIALS			
P1	DECIDUOUS SHADE TREE		17
P2	EVERGREEN TREE		10
P3	SHRUBS / PERENNIALS		
P4	PLANT BED		
SEED MIXES			
S1	LAWN SEED MIX[1]		

[1] REFER TO VEGETATION NOTE H ON C-500 FOR REQUIRED LAWN SEED MIX.

REPRESENTATIVE TREE SPECIES

ABIES SPP.	FIR
ACER SPP.	MAPLE
AMELANCHIER SPP.	SERVICEBERRY
BETULA SPP.	BIRCH
CARPINUS SPP.	HORNBEAM
CERCIS SPP.	REDBUD
GLEDITSIA SPP.	HONEYLOCUST
JUNIPERUS SPP.	CEDAR
NYSSA SPP.	TUPELO
PICEA SPP.	SPRUCE
PINUS SPP.	PINE
QUERCUS SPP.	OAK
THUJA SPP.	ARBORVITAE

1. LANDSCAPE ARCHITECT TO APPROVE PLANT MATERIAL PRIOR TO DELIVERY TO SITE.
2. PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
3. NO SUBSTITUTIONS OF PLANT SPECIES WITHOUT LANDSCAPE ARCHITECT'S WRITTEN APPROVAL.
4. SUBSTITUTIONS OF PLANT SPECIES SHALL BE A PLANT OF EQUIVALENT OVERALL FORM, HEIGHT AND BRANCHING HABIT, FLOWER, LEAF AND FRUIT, COLOR AND TIME OF BLOOM, AS APPROVED BY LANDSCAPE ARCHITECT.
5. LOCATE AND VERIFY UTILITY LINE LOCATIONS PRIOR TO STAKING AND REPORT CONFLICTS TO LANDSCAPE ARCHITECT.
6. PLANTING DEMOLITION DEBRIS, GARBAGE, LUMPS OF CONCRETE, STEEL AND OTHER MATERIALS DELETERIOUS TO PLANT'S HEALTH AS DETERMINED BY LANDSCAPE ARCHITECT SHALL BE REMOVED FROM ALL PLANTING AREAS.
7. NO PLANTING TO BE INSTALLED BEFORE ACCEPTANCE OF ROUGH GRADING.
8. ALL PROPOSED TREE LOCATIONS SHALL BE STAKED OR LAID OUT IN THEIR APPROXIMATE LOCATION BY THE CONTRACTOR. REFER TO LAYOUT AND PLANTING SHEETS FOR LAYOUT INFORMATION. THE CONTRACTOR SHALL ADJUST THE LOCATIONS AS REQUESTED BY THE LANDSCAPE ARCHITECT TO ACCOUNT FOR SUBSURFACE UTILITIES AND OTHER FIELD CONDITIONS. FINAL LOCATIONS OF ALL PLANTS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.
9. INSTALL PLANTS WITH ROOT FLARES FLUSH WITH FINISHED GRADE. IMMEDIATELY REPLANT PLANTS THAT SETTLE OUT OF PLUMB OR BELOW FINISHED GRADE.
10. PLANT UNDER FULL TIME SUPERVISION OF CERTIFIED ARBORIST, NURSERYMAN, OR LICENSED LANDSCAPE ARCHITECT. PROVIDE WRITTEN VERIFICATION OF CERTIFICATION AND/OR LICENSE FOR LANDSCAPE ARCHITECT'S APPROVAL.
11. WATER PLANTS THOROUGHLY AFTER INSTALLATION, A MINIMUM OF TWICE WITHIN THE FIRST 24 HOURS.
12. REPAIR DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF LIMIT OF WORK
13. SOAK ALL PERENNIALS FOR 24 HOURS PRIOR TO INSTALLATION
14. MOWING HEIGHT TO BE NOT LESS THAN 3".

APPROXIMATE LOCATION OF PROPERTY LINES PER GIS

PARCEL ID:
G0003-B00000
1,112,095 SQ. FT.
25.53 ACRES

FFE=113.20±

FFE=113.20±

BMW
POL
PQF
OCN
PTG
SLP
TO
AF
QC
TC
HOS
ANNUALS
P1 TYP.
P2 TYP.
P3 TYP.
S1 TYP.

0 20' 40'
GRAPHIC SCALE

Tighe&Bond

LICENSED LANDSCAPE ARCHITECT
RALPH GORDON LEEDY, JR
007
STATE OF NEW HAMPSHIRE
4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

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LANDSCAPE PLAN

SCALE: AS SHOWN

L-100

Last Saved: 4/13/2026
Plotted On: 4/14/2026-8:27am By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_L-DSGN.dwg

GENERAL PROJECT INFORMATION
PROJECT APPLICANT: THE KANE COMPANY

PROJECT NAME: 85 INDUSTRIAL PARK ROAD TRUCK COURT

PROJECT ADDRESS: 85 INDUSTRIAL PARK ROAD
DOVER, NH 03820

PROJECT LATITUDE: 43°-11'-10" N
PROJECT LONGITUDE: 70°-54'-17" W

PROJECT DESCRIPTION
THE PROPOSED PROJECT INCLUDES THE REMOVAL OF PORTIONS OF THE EXISTING BUILDING AND THE ADDITION OF A NEWLY PAVED DRIVE AND TRUCK LOADING AREA. THE PROJECT WILL ALSO CONSIST OF ASSOCIATED SITE IMPROVEMENTS SUCH AS ADDITIONAL PARKING, RETAINING WALL, SIDEWALKS, STORMWATER MANAGEMENT, AND UTILITIES.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 77,680 SF (1.78 ACRES).

SOIL CHARACTERISTICS
BASED ON THE NRCS WEB SOIL SURVEY FOR STRAFFORD COUNTY - NEW HAMPSHIRE, THE SOILS ON SITE CONSIST OF BUXTON SOILS WHICH ARE MODERATELY WELL DRAINED SOILS WITH HYDROLOGIC SOIL GROUP RATING(S) OF C/D.

NAME OF RECEIVING WATERS
THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA OVERLAND FLOW AND CLOSED DRAINAGE TO A CATCH BASIN LOCATED WITHIN THE CITY OF DOVER RIGHT OF WAY.

CONSTRUCTION SEQUENCE PLAN OF MAJOR ACTIVITIES:
1. CONSTRUCT TEMPORARY AND PERMANENT PERIMETER EROSION CONTROLS, SEDIMENT CONTROLS AND DETENTION MEASURES, PRIOR TO ANY EARTH MOVING OPERATIONS THAT MAY AFFECT STORMWATER RUNOFF SUCH AS:
   - CONTROL OF DUST
   - CONSTRUCTION ROADWAYS, DRIVES, AND PARKING AREAS
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
2. CUT AND CLEAR TREES. GRUBBING SHALL NOT OCCUR UNTIL AFTER THE INSTALLATION OF PERIMETER CONTROLS.
3. CLEAR AND DISPOSE OF DEBRIS.
4. CONSTRUCT TEMPORARY WATER DIVERSION (SWALES, BASINS, ETC.) AS NECESSARY UNTIL AREAS ARE STABILIZED.
5. CONSTRUCT PONDS AND SWALES BEFORE ROUGH GRADING THE SITE.
6. ALL PERMANENT SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
7. CONSTRUCT REQUIRED UTILITIES AND BUILDING(S)
8. GRADE IN ROADWAYS, DRIVES, AND PARKING AREAS.
9. BEGIN PERMANENT AND TEMPORARY SEEDING, LOAMING AND MULCHING.
10. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
11. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
12. FINISH PAVING ALL ROADWAYS, DRIVES AND PARKING LOTS.
13. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
14. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
15. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:
1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE. THE AREA OF DISTURBANCE SHALL ONLY EXCEED FIVE (5) ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED IF AN ENVIRONMENTAL MONITOR IS EMPLOYED DURING CONSTRUCTION IN ACCORDANCE WITH Env-Wq 1505.03 AND AS DESCRIBED UNDER THE "ENVIRONMENTAL MONITORING NOTES" SECTION ON THIS SHEET.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:51-57 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES. ANY INVASIVE OR NOXIOUS PLANT SPECIES ENCOUNTERED DURING CONSTRUCTION SHALL BE CONTROLLED IN ACCORDANCE WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "ENV 1, MANUAL 1 – BEST MANAGEMENT PRACTICES FOR CONTROL OF INVASIVE AND NOXIOUS PLANT SPECIES", CURRENT EDITION.

EROSION CONTROL NOTES:
1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL EROSION AND SEDIMENT CONTROL MEASURES FOR APPROVAL.
3. AS THE FIRST ORDER OF WORK, PRIOR TO ANY EARTH DISTURBANCE, THE CONTRACTOR SHALL INSTALL ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BUT NOT LIMITED TO; INLET PROTECTION BARRIERS, SILT SOCKS, SILT FENCES, MULCH BERMS, AND STABILIZED CONSTRUCTION EXITS AS SHOWN ON THE DRAWINGS, AND AS REQUIRED BY ALL STATE AND LOCAL PERMITS AND APPROVALS.
4. INLET PROTECTION BARRIERS SHALL BE INSTALLED AT ALL EXISTING AND PROPOSED CATCH BASINS/CURB INLETS AND YARD DRAINS WITHIN THE LIMITS OF WORK AS WELL AS ANY CATCH BASINS/CURB INLETS AND YARD DRAINS THAT RECEIVE RUNOFF FROM ANY CONSTRUCTION ACTIVITIES. THESE MEASURES SHALL BE FULLY MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL ALL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. CONTRACTOR SHALL INSTALL EROSION CONTROL BLANKETS ON ALL STEEP SLOPE AREA (3:1 OR GREATER).
7. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES INCLUDE, BUT NOT LIMITED TO; MOISTEN EXPOSED SOIL SURFACES PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST, MECHANICAL SWEEPERS ON PAVED SURFACES, AND COVERING SURFACES WITH CRUSHED STONE OR COARSE GRAVEL.
8. THE CONTRACTOR SHALL HAVE ALL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING, BUT NOT LIMITED TO, INLET PROTECTION BARRIERS, PERIMETER SEDIMENT CONTROLS, AND STEEP SLOPE EROSION CONTROL BLANKETS INSPECTED BY A QUALIFIED PERSON AT LEAST ONCE A WEEK OR WITHIN 24 HOURS AFTER A RAIN EVENT OF 0.25 INCHES OR GREATER. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED, REPAIRED, MODIFIED, OR ADDITIONAL MEASURES INSTALLED AS NECESSARY TO ADDRESS EVOLVING CONDITIONS DURING CONSTRUCTION.
9. SEDIMENT CONTROL FILTER MEASURES SHALL BE REPLACED WHEN SEDIMENT REACHES 1/3 THE HEIGHT OF THE FILTER.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
11. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES
1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A STORM WATER POLLUTION PREVENTION PLAN (SWPPP). THE SWPPP SHALL BE PREPARED BY A QUALIFIED PERSON. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF A SWPPP:
   A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY A QUALIFIED PERSON AT LEAST ONCE A WEEK OR WITHIN 24 HOURS AFTER A RAIN EVENT OF 0.25 INCHES OR GREATER;
   B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
   C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
   D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.

STABILIZATION:
1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
      a. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, ITEM 304.2 HAVE BEEN INSTALLED.
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
2. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
3. ALL ROADS, DRIVES AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
4. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD, DRIVES, OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
   D. FOR OVER-WINTER PROTECTION, A DOUBLE ROW OF SEDIMENT BARRIERS (SILT FENCE BACKED WITH HAY BALES OR EROSION CONTROL MIX, ETC.) SHALL BE PLACED WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE AREA.
5. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
6. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
8. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:
1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:
1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:
1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION EXIT(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:
1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. PERMANENT MEASURES AND PLANTINGS:
   A. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
   B. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
   C. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
   D. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
   E. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
   F. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
   G. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
   H. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
CREEPING RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE

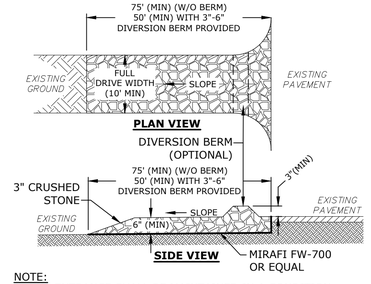
   IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.
3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:
1. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
2. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
3. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
4. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:
1. THE FOLLOWING ARE THE ONLY STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. FIRE-FIGHTING ACTIVITIES;
   B. FIRE HYDRANT FLUSHING;
   C. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
   D. WATER USED TO CONTROL DUST;
   E. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
   F. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
   G. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
   H. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
   I. UNCONTAMINATED GROUND WATER OR SPRING WATER;
   J. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
   K. UNCONTAMINATED EXCAVATION DEWATERING;
   L. LANDSCAPE IRRIGATION.

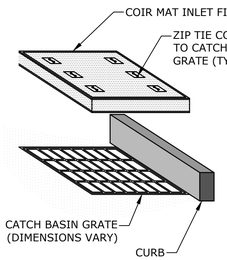
WASTE DISPOSAL:
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY ALL LOCAL, STATE AND FEDERAL REGULATIONS. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
         - SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
         - INSPECT FUEL STORAGE AREAS WEEKLY;
         - WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
         - COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
         - SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
         - THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
           (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
           (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
           (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
           (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
           (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
         - FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT. https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/dwgb-22-6.pdf
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
   a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
   b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
   c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
   d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
   e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
   f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

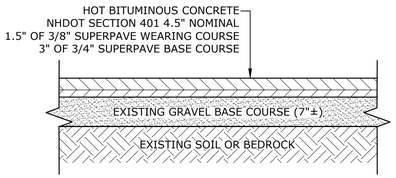


NOTE:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE

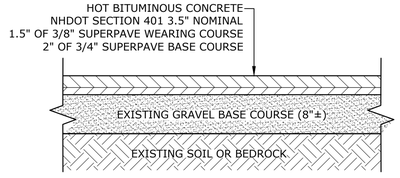


NOTES:
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INS



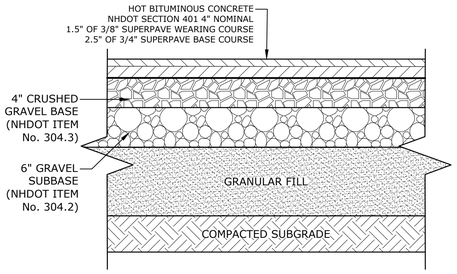
NOTES:
1. THIS SECTION EXISTING ASPHALT PAVEMENT TO BE REMOVED, EXISTING GRAVEL BASE PREPARED/COMPACTED, AND NEW BITUMINOUS CONCRETE BINDER AND FINISH COURSES ARE PLACED OVER THE PREPARED EXISTING GRAVEL BASE.

PAVEMENT SECTION A
NO SCALE



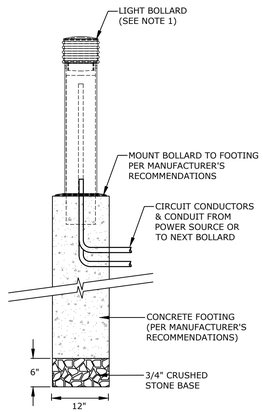
NOTES:
1. THIS SECTION EXISTING ASPHALT PAVEMENT TO BE REMOVED, EXISTING GRAVEL BASE PREPARED/COMPACTED, AND NEW BITUMINOUS CONCRETE BINDER AND FINISH COURSES ARE PLACED OVER THE PREPARED EXISTING GRAVEL BASE.

PAVEMENT SECTION B
NO SCALE



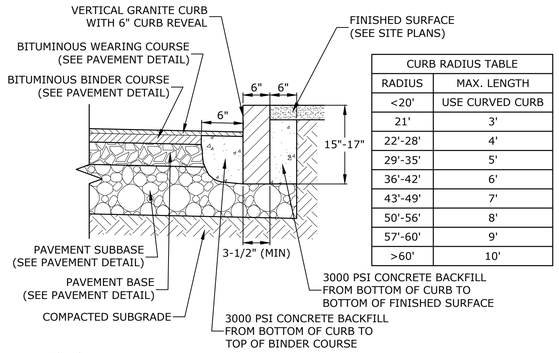
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE, AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

PAVEMENT SECTION C
NO SCALE



NOTE:
1. SITE ELECTRICAL CONTRACTOR SHALL SUBMIT LIGHT BOLLARD FIXTURE FOR APPROVAL BY THE OWNER.
2. COORDINATE COLOR OF BOLLARD WITH OWNER.
3. CONTRACTOR TO FURNISH AND INSTALL NECESSARY CONDUIT AND WIRING/CONDUCTORS BETWEEN EXISTING SITE ELECTRICAL SYSTEM TO ALL PROPOSED BOLLARDS IN ORDER TO RENDER THEM OPERATIONAL.

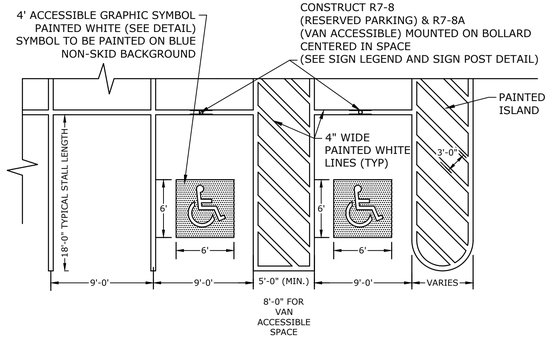
LIGHT BOLLARD
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX. LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

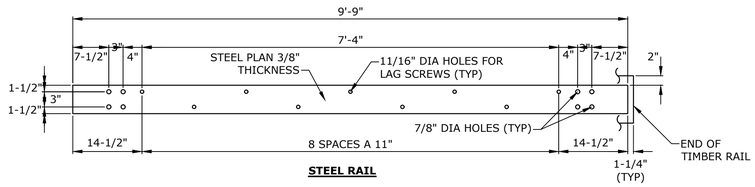
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
7. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

VERTICAL GRANITE CURB
NO SCALE



NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



STEEL RAIL

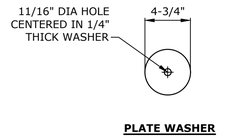
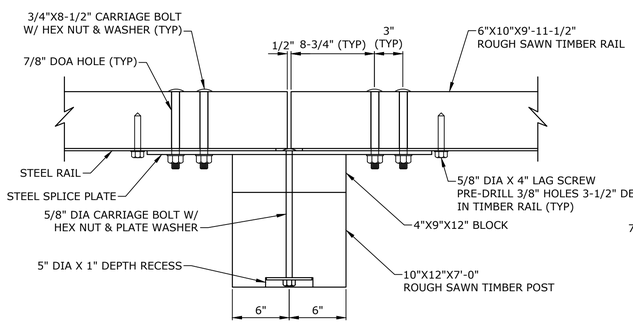
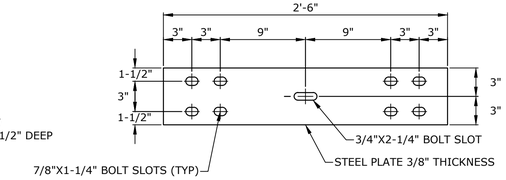


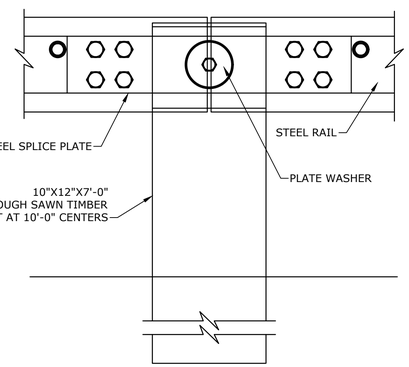
PLATE WASHER



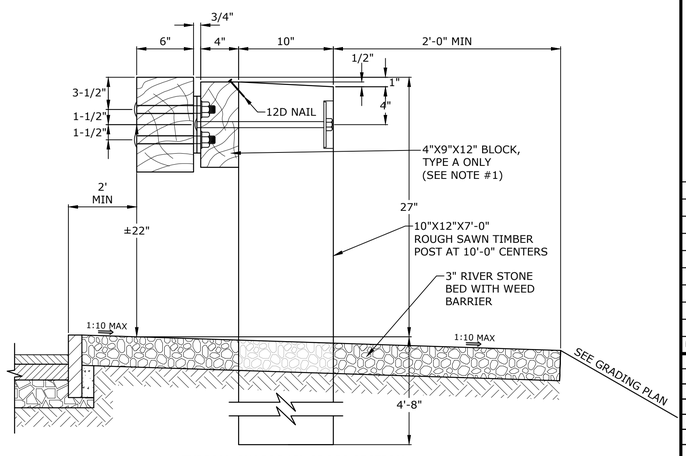
PLAN VIEW



STEEL SPLICE PLATE



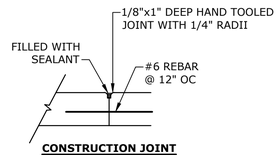
ELEVATION POST CONNECTION



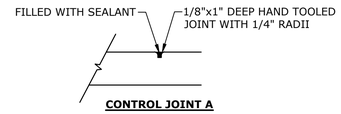
TYPICAL GUARDRAIL CROSS SECTION

NOTES
1. STEEL-BACKED TIMBER GUARDRAIL SYSTEM SHALL BE AMERICAN TIMBER AND STEEL OR EQUAL.

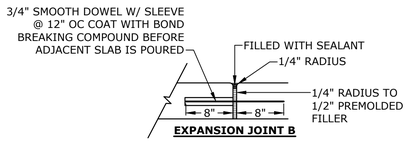
TYPICAL STEEL-BACKED TIMBER GUARDRAIL DETAIL
NO SCALE



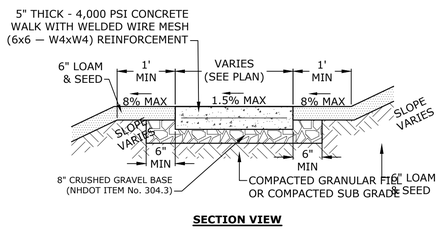
CONSTRUCTION JOINT



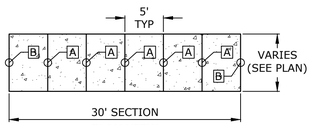
CONTROL JOINT A



EXPANSION JOINT B



SECTION VIEW



PLAN VIEW

NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
3. SIDEWALK SURFACE SHALL GIVEN A BROOM FINISH.
4. ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.
5. CONTRACTOR SHALL SUBMIT THE PROPOSED CONCRETE MIX DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION.
6. ALL WORK SHALL CONFORM TO THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.

CONCRETE SIDEWALK
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
4/14/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

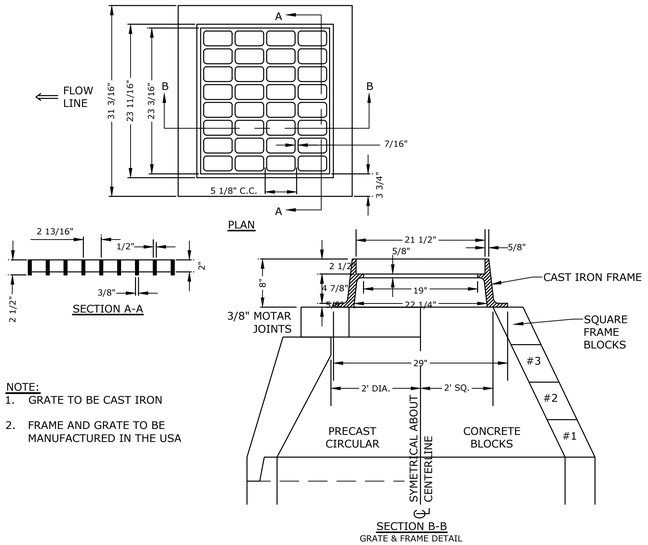
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FILE:	K0076-0070_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

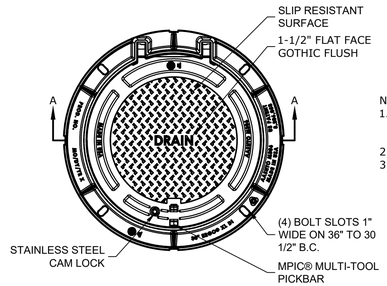
C-501

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Plotted: Wednesday, April 15, 2026 - 4:42pm By: MCurley
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NOTE:
1. GRATE TO BE CAST IRON
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

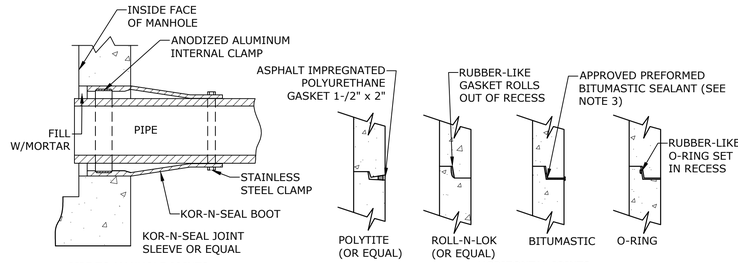
CATCH BASIN FRAME & GRATE
NO SCALE



SECTION A-A

NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE

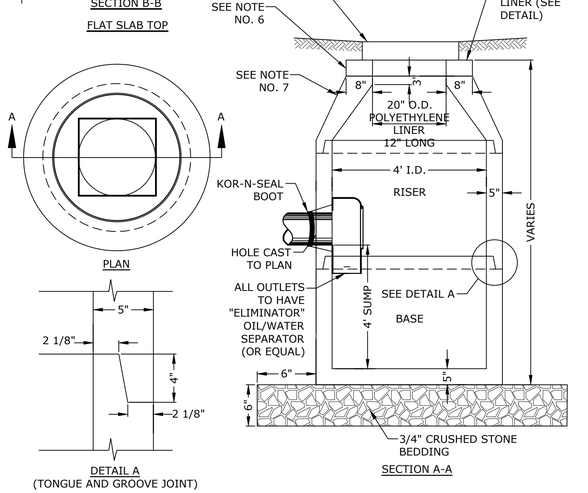


PIPE TO MANHOLE JOINTS

HORIZONTAL JOINTS

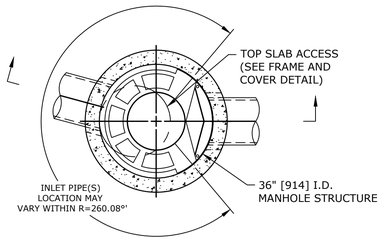
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF DOVER DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF DOVER STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

MANHOLE JOINTS
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE



PLAN VIEW B-B
NOT TO SCALE

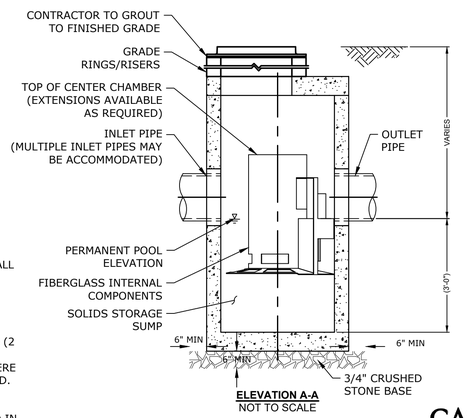
PROPOSED CASCADE SEPARATOR STRUCTURE SCHEDULE	
STRUCTURE ID#	STRUCTURE TYPE
PPT1	CS-3



FRAME AND COVER

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
B. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
C. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



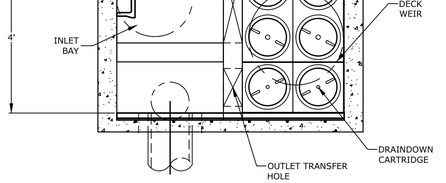
ELEVATION A-A
NOT TO SCALE

CASCADE separator™

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CASCADE SEPARATOR PRETREATMENT UNIT
NO SCALE

PROPOSED JFF STRUCTURE SCHEDULE	
STRUCTURE ID#	JFF TYPE
PTS1	JFPD0406-4-2



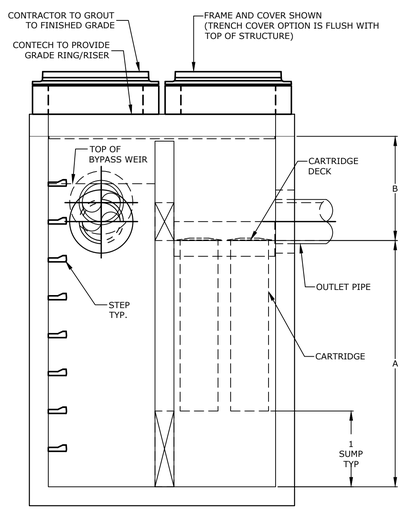
PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

Jellyfish Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,728, 8,221,618 & US 8,123,935. OTHER INTERNATIONAL PATENTS PENDING.



ELEVATION VIEW

CONTECH JELLYFISH STORMWATER FILTER (JFPD0808)
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER – 4/14/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

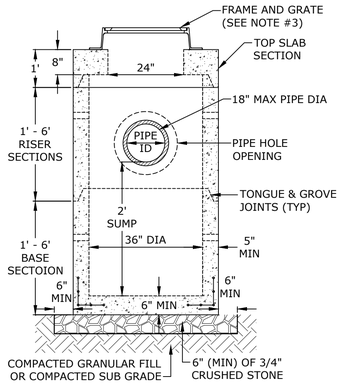
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DATE:	APRIL 14, 2025
FILE:	K0076-0070_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-502

Last Saved: 4/9/2026
Plotted: Apr 13, 2026-4:42pm By: MCurley
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_C-DTLS.dwg

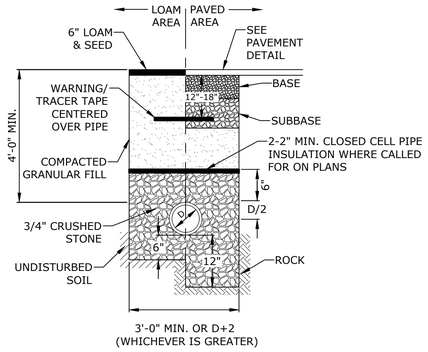


SECTION VIEW

NOTES

1. ALL PRECAST SECTIONS SHALL BE 4,000 PSI (MIN) CONCRETE DESIGNED FOR AASHTO H-20 LOADING CONFORMING TO ASTM C-478 AND AASHTO M-199.
2. STEEL REINFORCEMENT SHALL BE 0.12-IN^2/LF AND 0.12-IN^2 (BOTH WAYS) BASE BOTTOM CONFORMING TO ASTM A-615 AND ASTM A-185.
3. YARD / AREA DRAIN FRAME AND GRATES SHALL BE AS FOLLOWS:
   - NEENAH FOUNDRY R-2569 FRAME & GRATE TYPE Q, (±0.6 SF OPEN AREA OR EQUAL), FOR DRAINS LOCATED IN AREAS THAT REQUIRE ADA ACCESSIBILITY;
6. ADJUSTING FRAMES AND COVERS TO FINISHED GRADE SHALL BE DONE USING PRECAST REINFORCED CONCRETE GRADE RINGS OR CLAY BRICKS.
7. HORIZONTAL SECTION JOINTS SHALL BE TONGUE AND GROOVE JOINTS SEALED WITH ONE (1) STRIP OF FLEXIBLE BUTYL RUBBER JOINT SEALANT CONFORMING TO ASTM C-990.
   - JOINT SEALANT SHALL BE CONSEAL CS-102 (OR EQUAL)
8. PIPE TO MANHOLE CONNECTION JOINTS SHALL BE FLEXIBLE SLEEVE CONFORMING TO ASTM C-923.
   - FLEXIBLE SLEEVES SHALL BE KOR-N-SEAL (OR EQUAL).
9. PIPE HOLE OPENING(S) WITHIN PRECAST SECTIONS VARIES DEPENDING ON PIPE SIZE. PIPE OPENING SIZES SHALL BE COORDINATED WITH PRECASTER AND FLEXIBLE PIPE SLEEVE MANUFACTURERS
10. PRECAST CONCRETE YARD / AREA DRAINS SHALL BE PHOENIX PRECAST PRODUCTS - 3' DIA CATCH BASIN (OR EQUAL).

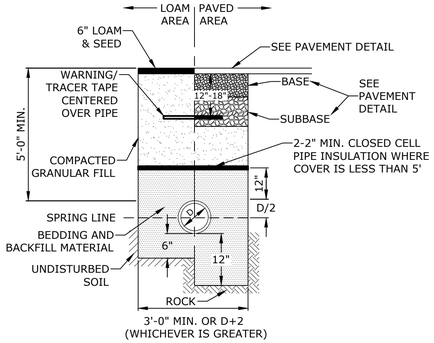
TYPICAL PRECAST CONCRETE YARD / AREA DRAIN
NO SCALE



NOTES:

1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF DOVER.

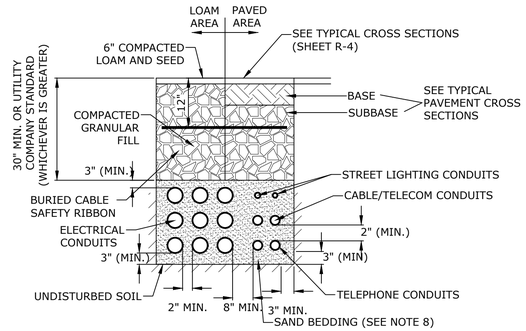
STORM DRAIN TRENCH
NO SCALE



NOTES:

1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF DOVER STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF DOVER.

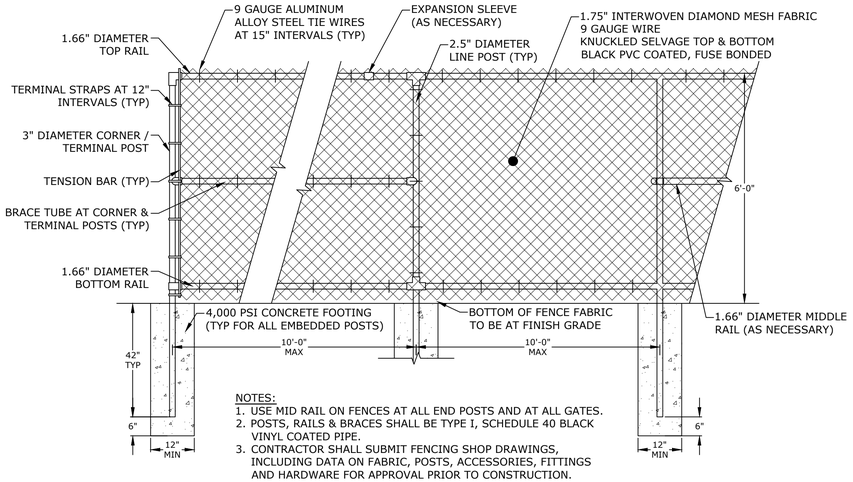
WATER TRENCH
NO SCALE



NOTES:

1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS.
2. CONDUIT ENCASEMENT FOR ELECTRICAL PRIMARIES AND SECONDARIES SHALL BE AS DIRECTED BY THE PROJECT ELECTRICAL DRAWINGS AND UTILITY COMPANY REQUIREMENTS.
3. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.

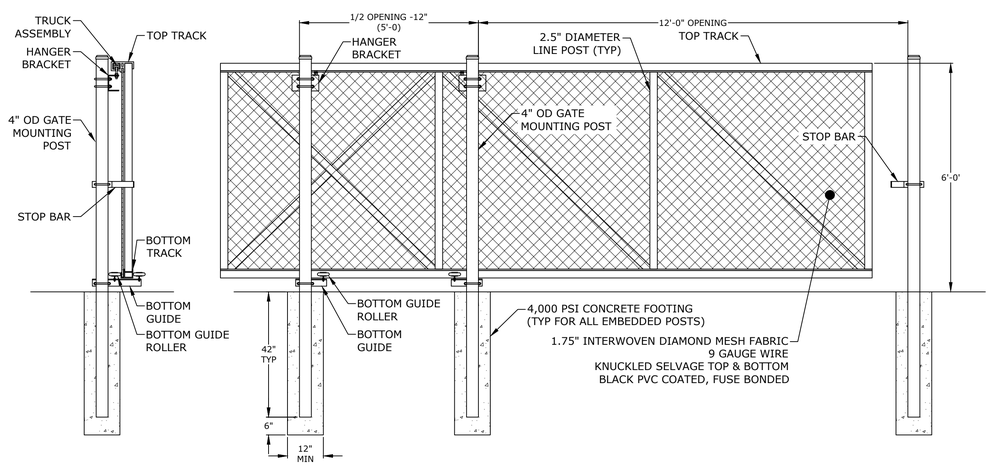
ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE



NOTES:

1. USE MID RAIL ON FENCES AT ALL END POSTS AND AT ALL GATES.
2. POSTS, RAILS & BRACES SHALL BE TYPE I, SCHEDULE 40 BLACK VINYL COATED PIPE.
3. CONTRACTOR SHALL SUBMIT FENCING SHOP DRAWINGS, INCLUDING DATA ON FABRIC, POSTS, ACCESSORIES, FITTINGS AND HARDWARE FOR APPROVAL PRIOR TO CONSTRUCTION.

TYPICAL CHAIN LINK FENCE
NO SCALE



12' WIDE SLIDING GATE
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
4/14/26

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

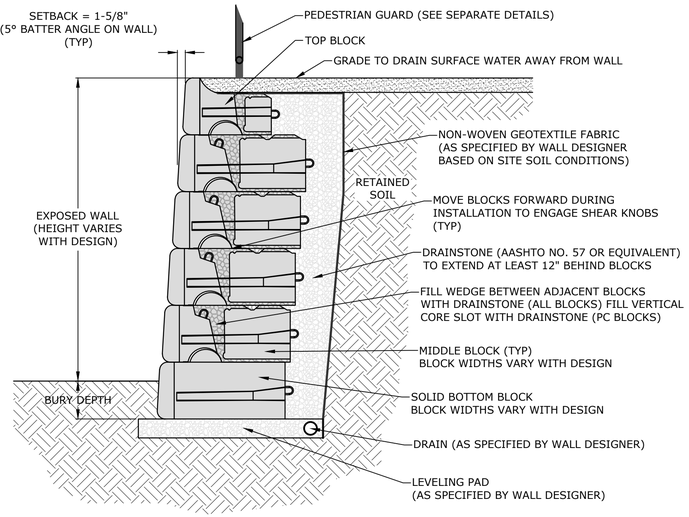
PROJECT NO:	K0076-0070
DATE:	APRIL 14, 2025
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DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

DETAILS SHEET

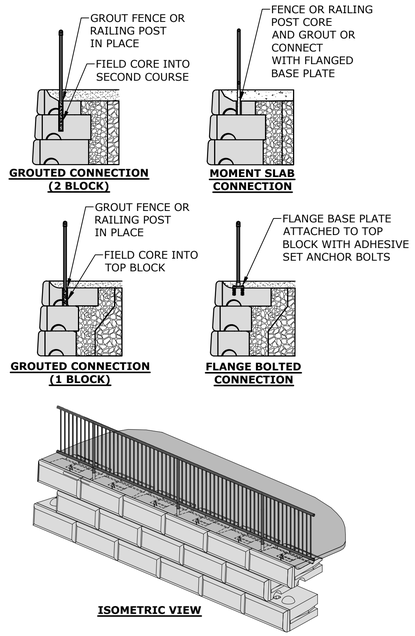
SCALE: AS SHOWN

C-503

Last Saved: 4/9/2026
Plotted: Wednesday, April 15, 2026 4:43pm By: MCurley
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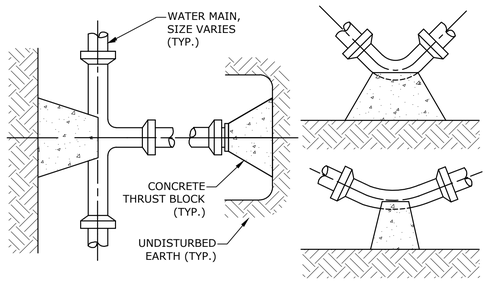
TYPICAL BLOCK RETAINING WALL SECTION
NO SCALE



NOTE
1. THESE GENERIC PEDESTRIAN GUARD AND FENCE DETAILS SHOW POTENTIAL OPTIONS FOR INSTALLATION ON THE TOP OF RETAINING WALL. IT IS THE WALL DESIGN ENGINEER'S RESPONSIBILITY TO FULLY DESIGN AND DETAIL THE CONNECTION OF THE GUARD POSTS TO THE RETAINING WALL BLOCKS AND ASSURE ACCEPTABLE RESISTANCE TO THE APPLIED FORCES.

TYPICAL FENCE OR PEDESTRIAN GUARD CONNECTION OPTIONS
NO SCALE

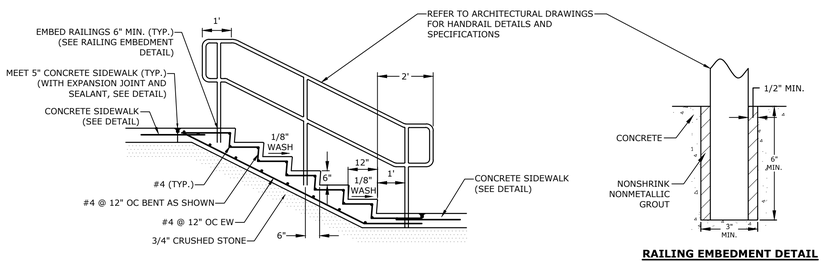
NOTES
1. RETAINING WALL SHALL BE REDI ROCK (BASIS OF DESIGN), VERSA-LOK, RECON WALL SYSTEMS, OR EQUAL.
2. THE CONTRACTOR SHALL SUBMIT DESIGN AND CALCULATIONS FOR THE RETAINING WALL THAT SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE. CALCULATIONS SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
3. MINIMUM DESIGN PARAMETERS:
   - GLOBAL STABILITY FACTOR OF SAFETY = 1.3
   - OVERTURNING FACTOR OF SAFETY UNDER STATIC LOADS = 1.5
   - SLIDING FACTOR OF SAFETY UNDER STATIC LOADS = 1.5
   - GEOGRID PULLOUT FACTOR OF SAFETY = 1.5
   - SEISMIC FACTOR OF SAFETY = 1.1
   - EQUIVALENT FLUID PRESSURE = 40 POUNDS PER CUBIC FOOT (PCF) FOR GRAVITY AND CANTILEVERED WALLS ABOVE GROUNDWATER AND WALLS WITH APPROPRIATE DRAINAGE BEHIND THE WALL.
   - HYDROSTATIC WATER PRESSURE ALONG THE HEIGHT OF THE WALL BELOW GROUNDWATER SHOULD BE INCLUDED IF DRAINAGE IS NOT PROVIDED.
   - WHERE THE CALCULATED EARTH PRESSURE BEHIND THE WALL IS LESS THAN 250 POUNDS PER SQUARE FOOT (PSF), IT SHOULD BE INCREASED TO 250 PSF TO ACCOUNT FOR STRESSES CREATED BY COMPACTION WITHIN 5 FEET OF THE WALL.
   - WALLS SHOULD BE DESIGNED FOR APPROPRIATE SLOPING BACKFILL.
   - WALLS SHOULD BE DESIGNED TO RESIST AN EARTHQUAKE FORCE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (IBC), CURRENT EDITION.
4. WALL DESIGNS SHALL CONSIDER EFFECTS OF SLOPE, TRAFFIC LOADS, BUILDING LOADS, STRUCTURES, UTILITIES, GUARDRAIL AND/OR FENCING AS REQUIRED.
5. WALL DESIGN ENGINEER SHALL CONSIDER HEIGHT AND SPECIFY SAFETY RAIL WHERE REQUIRED.
6. ALL INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION MANUAL AND THE WALL DESIGN ENGINEER'S DESIGN PLANS AND SPECIFICATIONS.
7. THE WALL DESIGN ENGINEER SHALL COMPLETE SUFFICIENT INSPECTIONS DURING CONSTRUCTION TO CERTIFY WORK IS COMPLETED IN ACCORDANCE WITH DESIGN.
8. CONTRACTOR SHALL DIRECT SURFACE RUNOFF AWAY FROM THE WALL DURING CONSTRUCTION.
9. ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT OR OTHER SURFACE TREATMENT SHALL BE INSTALLED IN THE AREA OF THE WALL IMMEDIATELY AFTER THE WALL IS COMPLETE OR OTHER MEASURES SHALL BE TAKEN TO PROTECT THE WALL FROM RUNOFF.
10. CONTRACTOR SHALL SUPPLY PRODUCT INFORMATION FOR BLOCK TYPE / TEXTURE AND COLOR CHOICE TO THE OWNER FOR APPROVAL PRIOR TO ORDERING MATERIALS.
11. RETAINING WALL DESIGN PLANS AND CALCULATIONS SHALL BE FROM THE WALL MANUFACTURER AND SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
12. FINAL STRUCTURAL DESIGN TO BE SUBMITTED TO THE ENGINEER WITH ALL REQUIRED CALCULATIONS AND PLANS.
13. STRUCTURAL DESIGN TO BE COMPLETED AND STAMPED BY A NEW HAMPSHIRE LICENSED STRUCTURAL ENGINEER. DESIGN ENGINEER SHALL INSPECT WALL DURING CONSTRUCTION AND CERTIFY THAT IT HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS SUBMITTED AS PART OF THE BUILDING PERMIT.
14. AN AS-BUILT PLAN SHOWING WALL LOCATION AND DIMENSIONS SHALL BE SUBMITTED TO THE OWNER AND ENGINEER UPON COMPLETION.
15. ANY UNSUITABLE SOIL SUCH AS FROZEN OR ORGANIC SOILS SHOULD BE REMOVED FROM BEHIND THE PROPOSED RETAINING WALLS AND REPLACED WITH FREE DRAINING BACKFILL SUCH AS GRAVEL BORROW.
16. EXISTING FILL SHOULD NOT BE USED WITHIN FIVE (5) FEET OF CANTILEVERED OR GRAVITY WALLS.
17. THESE DETAILS ARE FOR REFERENCE ONLY. DETERMINATION OF THE SUITABILITY AND/OR MANNER OF USE OF ANY DETAILS CONTAINED IN THIS DOCUMENT IS THE SOLE RESPONSIBILITY OF THE WALL DESIGN ENGINEER OF RECORD. FINAL PROJECT DESIGNS, INCLUDING ALL CONSTRUCTION DETAILS, SHALL BE PREPARED BY A NEW HAMPSHIRE LICENSED PROFESSIONAL ENGINEER USING THE ACTUAL CONDITIONS OF THE PROPOSED SITE.



TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL				
REACTION TYPE	PIPE SIZE				
	4"	6"	8"	10"	12"
A 90°	0.89	2.19	3.82	11.14	17.24
B 180°	0.65	1.55	2.78	8.38	12.00
C 45°	0.48	1.19	2.12	6.02	9.32
D 22-1/2°	0.25	0.60	1.06	3.08	4.74
E 11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF DOVER WATER DEPARTMENT STANDARDS.

THRUST BLOCKING DETAIL
NO SCALE



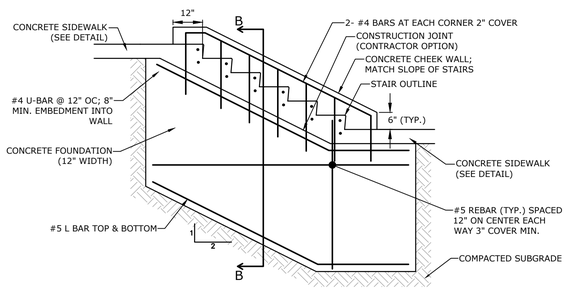
SECTION A-A

RAILING EMBEDMENT DETAIL

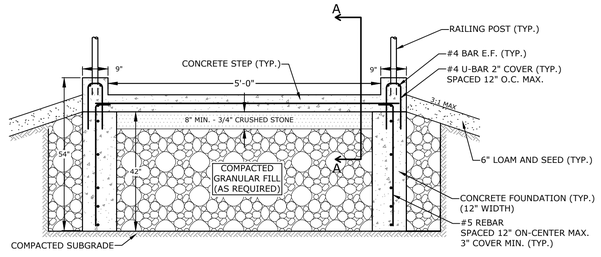
REINFORCEMENT:
1. DETAILING, FABRICATION, AND ERECTION OF REINFORCEMENT, UNLESS OTHERWISE NOTED, SHALL CONFORM TO ACI "BUIDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318)" AND ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI 315)", LATEST EDITION.
2. STEEL REINFORCEMENT, UNLESS OTHERWISE SHOWN, SHALL CONFORM TO ASTM A615 GRADE 60 MINIMUM (YIELD STRENGTH - 60,000 PSI). ALL STEEL REINFORCEMENT SHALL BE EPOXY COATED PER ASTM A775. BARS SHALL BE HANDLED AND REPAIRED WHERE NECESSARY IN ACCORDANCE WITH ASTM D3963.
3. PROVIDE ON SHOP DRAWINGS, ALL NECESSARY ACCESSORIES TO HOLD REINFORCEMENT SECURELY IN POSITION: MINIMUM REQUIREMENTS SHALL BE: HIGH CHAIRS, 4'-0" ON CENTER, #5 SUPPORT BAR FOR HIGH CHAIRS, SLAB BOLSTERS, 3'-6" ON CENTER, ALL WIRE CHAIRS AND BOLSTERS TO BE PLASTIC.
4. THE CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT SHALL BE 3" MINIMUM FOR CONCRETE CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND OTHERWISE 1-1/2" MINIMUM FOR NO. 5 BARS AND SMALLER AND 2" FOR NO. 6 BARS AND LARGER
5. WHERE CONTINUOUS BARS ARE CALLED FOR, THEY SHALL BE RUN CONTINUOUSLY AROUND CORNERS AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS.
6. WHERE REINFORCEMENT IS NOT SHOWN ON DRAWINGS, PROVIDE REINFORCEMENT IN ACCORDANCE WITH APPLICABLE TYPICAL DETAILS OR SIMILAR TO THAT SHOWN FOR MOST NEARLY SIMILAR SITUATIONS, AS DETERMINED BY THE ENGINEER. IN NO CASE SHALL REINFORCEMENT BE LESS THAN MINIMUM REINFORCEMENT PERMITTED BY THE APPLICABLE CODES.
7. WHERE REINFORCEMENT IS CALLED FOR IN SECTION, REINFORCEMENT IS CONSIDERED TYPICAL WHEREVER THE SECTION APPLIES.
8. REINFORCEMENT SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
9. REINFORCEMENT COUPLER SPLICES SHALL BE MECHANICAL DEVICES CAPABLE OF TRANSMITTING THE ULTIMATE TENSILE AND COMPRESSIVE STRENGTH OF THE BAR.
10. INSTALLATION OF REINFORCEMENT SHALL BE COMPLETED AT LEAST 24 HOURS PRIOR TO SCHEDULED CONCRETE PLACEMENT. NOTIFY ENGINEER OF COMPLETION AT LEAST 24 HOURS PRIOR TO SCHEDULED COMPLETION OF PLACEMENT OR REINFORCEMENT.
11. REINFORCEMENT SHALL BE SET BEFORE PLACING CONCRETE. SETTING ANY REINFORCEMENT INTO WET CONCRETE IS PROHIBITED.

CONCRETE:
1. CONCRETE WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318) AND SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDING (ACI 301).
2. CONCRETE SHALL BE CONTROLLED CONCRETE, PROPORTIONED, MIXED, AND PLACED UNDER THE SUPERVISION OF AN APPROVED CONCRETE TESTING AGENCY OR THE ENGINEER.
3. CONCRETE SHALL BE NORMAL WEIGHT CONCRETE AND SHALL HAVE A COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED, AND SHALL BE AIR ENTRAINED.
4. THE USE OF CONSTRUCTION JOINTS WHERE SHOWN ON THE DRAWINGS IS MANDATORY. OMISSIONS, ADDITIONS, OR CHANGES SHALL NOT BE MADE EXCEPT WITH THE SUBMISSION OF A WRITTEN REQUEST TOGETHER WITH DRAWINGS OF THE PROPOSED JOINT LOCATIONS FOR APPROVAL OF THE STRUCTURAL ENGINEER.
5. WHERE CONSTRUCTION JOINTS ARE NOT SHOWN, DRAWINGS SHOWING LOCATION OF CONSTRUCTION JOINTS AND CONCRETE PLACING SEQUENCE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PREPARATION OF THE REINFORCEMENT SHOP DRAWINGS.
6. CONCRETE SLABS SHALL BE CAST SO THAT THE SLAB THICKNESS IS AT NO POINT LESS THAN THAT INDICATED ON THE DRAWINGS.
7. CONCRETE SLABS AND WALLS SHALL BE CAST ALTERNATELY OR IN A CHECKERBOARD FASHION SO THAT ADJACENT SECTIONS ARE PLACED NO SOONER THAN THREE DAYS APART. AT LEAST TWO DAYS MUST ELAPSE AFTER PLACING CONCRETE IN WALLS BEFORE PLACING FLOOR SYSTEM SUPPORTED THEREON.
8. CONCRETE SHALL BE PLACED WITHOUT HORIZONTAL CONSTRUCTION JOINTS EXCEPT WHERE SHOWN OR NOTED.
9. EXPOSED EDGES OF CONCRETE ELEMENTS SHALL HAVE CHAMFERED CORNERS.
10. NOTIFY ENGINEER OF CONDITIONS FOUND AT FOOTING DEPTH PRIOR TO START OF CONSTRUCTION.

RAILINGS:
1. PLUMB POSTS, SET RAIL PANELS AND GROUT INTO CONCRETE STEPS (TYP).
2. WHERE RAILINGS ARE NOT SET INTO CONCRETE STEPS, PROVIDE CONCRETE FOUNDATION (DEPTH 6" MIN. AND WIDTH 3" MIN.) AND INSTALL RAILING. PROVIDE AND INSTALL BITUMINOUS CONCRETE PAVEMENT AND/OR LOAM AND SEED AS NECESSARY FOR RAILINGS NOT SENT IN CONCRETE STEPS.



PROFILE VIEW



SECTION B-B

CONCRETE STAIR WITH HANDRAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
4/14/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

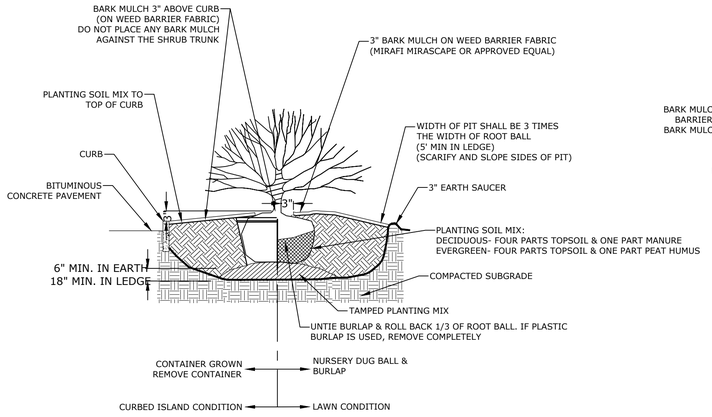
PROJECT NO:	K0076-0070
DATE:	APRIL 14, 2025
FILE:	K0076-0070_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

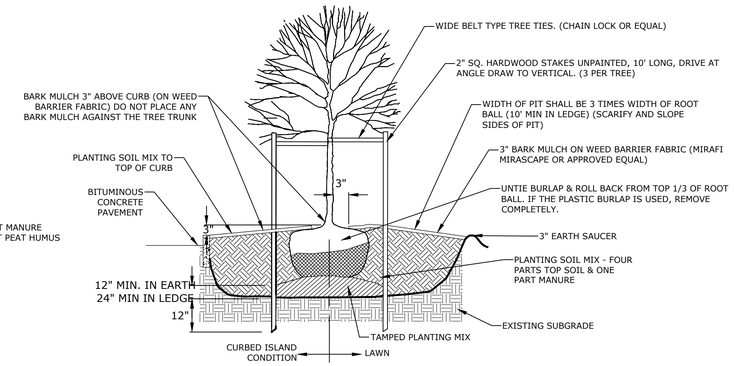
C-504

Last Saved: 4/9/2026
Plotted On: 4/14/2026 8:06-4:43pm By: MCurley
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_C-DTLS.dwg



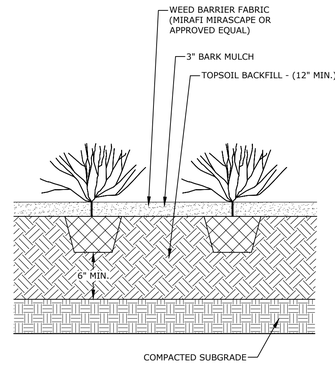
NOTE: PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

SHRUB PLANTING
NO SCALE

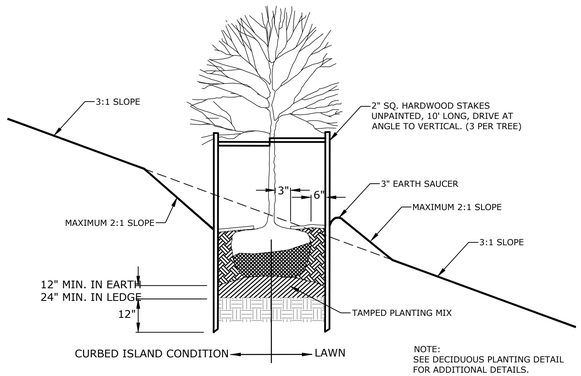


NOTE:
PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED OR WITHIN 2" ABOVE.

DECIDUOUS TREE PLANTING
NO SCALE

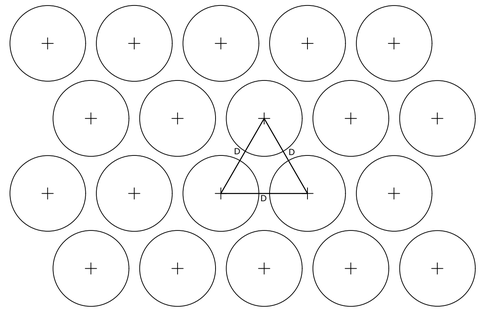


PERENNIAL PLANTING
NO SCALE



NOTE:
SEE DECIDUOUS PLANTING DETAIL
FOR ADDITIONAL DETAILS.

SLOPE PLANTING DETAIL
NO SCALE



NOTE:
D-DIMENSION OF PLANT SPACING
(SHRUB OR GROUND COVER AS
INDICATED ON PLANS)

TYPICAL BED PLANT SPACING
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
PATRICK CRIMMINS
No. 12378
LICENSED
4/14/26

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
NEIL A. HANSEN
No. 15227
LICENSED
4/14/26

85 Industrial Park Road Truck Court

85 Industrial Park II, LLC

Dover, NH

MARK	DATE	DESCRIPTION

PROJECT NO:	K0076-0070
DATE:	APRIL 14, 2025
FILE:	K0076-0070_L-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	BKC/NAH
APPROVED:	PMC

LANDSCAPE DETAILS

SCALE: AS SHOWN

L-500

Last Saved: 4/8/2026
Printed: 4/14/2026 4:44pm By: MCurley
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0070 85 Industrial Park Drive\Drawings\AutoCAD\Sheet\K0076-0070_L-DTLS.dwg









PLAN SNAPSHOT REPORT SITE-2026-0005
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	04/23/2026
Work Class:	Alteration / Addition	**District:**	None	**Exp Date:**	06/27/2026
Status:	In Review	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: To convert 36,207 s.f. of commercial space into 27 new residential units.

Parcel:	02037-A00000	Main	**Address:**	383 Central Av Dover, NH	Main	**Zone:**

Owner
Matt Assia
Home: (603) 969-9148
Mobile: (603) 969-9148

Applicant
Civilworks New England
Steve Haight
181 Watson Road PO Box 1166
Dover, NH 03820
Business: (603) 749-0443
Mobile: (603) 817-6651

Plan Custom Fields

Total2	0	Total3	0	Total	0
Total5	0	Total4	0	Total6	27
Total7	0	Total9	0	Total8	0
Street Classification Type	Municipal	Recording Number		Net Change in # Parking Spaces (+/-)	269
Water Service	Municipal	Sewer Service	Municipal	Deed Book	
Deed Page		Total SQFT	0	Deed Date	
Proposed Property Use	residential	Area of Parcel to be Developed (SQFT)	36207	Number of Parking Spaces Existing	269
Number of Parking Spaces Proposed	0	Type of Building to be Built	N/A	Estimated Construction Value	0.00
Refuse Removal	Private	Is there an existing Conservation Easement?	No	Existing Conservation Easement Details	
Total of Impact Fees to be Assessed	0.00	TotalImpactFeeSDTOD	0.00	Sub Total Residential	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	TotalImpactFeeRIRCTOD	0.00
Sub Total Non-Residential	0.00	TotalImpactFeeOCSTOD	0.00	TotalImpactFeeITWCTOD	0.00
TotalImpactFeeNHALTOD	0.00	TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOTOD	0.00

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Steve_Haight_4/23/2026.jpg	04/23/2026 12:14	Haight, Steve		Uploaded via CSS

Invoice No.	Fee		Fee Amount	Amount Paid
INV-2026001284	Planning General Application Fee		$200.00	$200.00
		Total for Invoice INV-2026001284	$200.00	$200.00
NOT INVOICED	Planning Residential Fee		$2,700.00	$0.00
		Total for Invoice NOT INVOICED	$2,700.00	$0.00
		Grand Total for Plan	**$2,900.00**	**$200.00**

PLAN SNAPSHOT REPORT (SITE-2026-0005)

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		04/24/2026 12:40	
Confirm application complete v.1	Generic Action		04/24/2026 12:40
Technical Review Committee Meeting Agenda v.1	Task	04/24/2026 12:40	04/29/2026 10:16
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: Cocheco Mills Holdings, LLC Telephone # 603-868-5995

Address of Applicant: 3 Penstock Way Newmarket, NH 03857

E-Mail Address: massia@chinburg.com

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

Address of Property Owner:

PROPERTY INFORMATION

Address of Property: Central Avenue, Washington & Main Streets

Assessor's Map # 2 Lot(s) # 37A

Zoning District(s) CB-G Overlay District(s)

Size of Parcel: 75,794.4 sq. ft. 1.74 ac. Property Deed: Book 3988 Page: 333

Existing Use of Property: Mixed-Use, Residential & Commercial/Office

SITE PLAN INFORMATION

Describe Proposed Use: To convert 36,207 s.f. of commercial space into 27 residential units

Area of Parcel to be Developed: 36,207 sq. ft.

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

If lodging: Number of Units N/A & number of Buildings N/A

Number of Parking Spaces: Existing Proposed

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

Number of Employees Total: N/A In Maximum Shift: N/A

Disposition of Parcel:

Building Footprint N/A sq. ft.

Total Building Area N/A sq. ft.

Paved Area N/A sq. ft.

Building Setbacks:

Front Yard N/A ft.

Rear Yard N/A ft.

Side Yard: Right N/A ft. Left N/A ft.

City Water? [X] Yes [ ] No How far is city water from the property? at street

City Sewer? [X] Yes [ ] No How far is city sewer from the property? at street

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION N/A

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 _____ units

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

BUILDING INFORMATION

Type of Building to be Built: N/A

Height of Building: N/A Finished Floor Elevation: N/A

Number of Seats (where applicable) N/A

Estimated value of construction: _____ 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*):

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) N/A

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Stephen J. Haight, PE - Civilworks New England

Address PO Box 1166 Dover, NH 03821 Telephone #: 603-749-0443

Professional License #: NH PE 7978 E-mail address: shaight@civilworksne.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) N/A

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) N/A

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) N/A

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: N/A 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: 4/23/26

Signature of Applicant (*if different from owner*): _____ Date: 4/23/26

Signature of Agent: _____ Date: _____

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: 4/23/26

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: 4/23/26

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: 4/23/26

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
2	37A	Cocheco Mills Holdings, LLC	3 Penstock Way Newmarket, NH 03857

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Stephen J. Haight, PE	Civilworks New England	PO Box 1166 Dover, NH 03821

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 24, 2023)

Below are the fees associated with plan review and are subject to a nonrefundable application fee to cover administrative expenses. Please complete the information below and provide payment with your application submittal. **Plan review fees shall be paid prior to technical review committee (TRC) being scheduled.** For plans not requiring TRC review, **fees are due 21 days prior** to the Planning Board meeting. Staff will coordinate abutter/notice fees, which will be invoiced and must be paid 28 hours before the Planning Board meeting for an application to be heard. Fees shall be paid by cash or check made payable to "City of Dover".

A. Plan Review Fees

1. Application fee for the following (SELECT ALL THAT APPLY):

- ☐ SUBDIVISION Application fee $200.00 + $150.00 x # _____ new lots created = $_____
- ☐ LOT LINE ADJUSTMENT Application fee $200.00 + $100.00 X # ___ of lots involved = $_____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee $200.00 = $_____
- ☒ SITE REVIEW – RESIDENTIAL Application fee $200.00+ $100.00 x # __ per dwelling unit =$_____
- ☐ SITE REVIEW – NON-RESIDENTIAL Application fee $200.00 + (not to exceed $10,000)
  - New construction $.15 sq. ft. x # _____ sq. ft.= $_____
  - Additions (new floor space) $.10 per sq. ft. x # _____sq. ft.= $_____
- ☐ MOTEL/HOTEL $35.00 x # ___ per lodging unit= $_____
- ☐ CHANGE OF USE Application fee $200.00 + (not to exceed $5,000)
  - Existing floor spaces $.10 per sq. ft. x # _____ sq. ft. = $_____
- ☐ CONDITIONAL USE PERMIT Application fee $200.00 x # _____ per Application = $_____
- ☐ GRAVEL PIT/ EXCAVATIONS
  - Application fee $50.00= $_____
  - Permit fee $75.00= $_____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee $200.00 = $_____
- ☐ REQUEST FOR REZONING Application fee $200.00 = $_____
- ☐ DRIVEWAY WAIVER Application fee $200.00 = $_____
- ☐ **TOTAL IMPERVIOUS PAVED AREA** (for new development, roadways or additions to existing parking lots, (not to exceed $10,000)) Application fee of $200.00 is N/A if it is part of a Site Review or Subdivision Plan. $200.00 + $.07 per sq. ft. x # _____ sq. ft. = $_____

SUBTOTAL PLAN REVIEW FEE = $_____

AND

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will review the list for accuracy and provide to us the engineer, architect, licensed land surveyor (LLS), licensed landscape architect (LLA) and/or soil scientist whose professional seal appears on the plan with names and addresses for notices.

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
  - Certified letters fee # _____ of x $10.00= $_____
- ☐ Certified letters fee: # of abutters _____ X $10.00= $_____
- ☐ First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X $1.00= $_____
- ☐ Creating/Printing Abutter Labels in triplicate per sheet _____ x $10.00= $_____

C. Foster's newspaper public notice fee $120.00 x # _____ applications = $_____

SUBTOTAL = $_____

TOTAL INVOICE AMOUNT = $_____

PLAN REVIEW FEE COLLECTED/PAID = $ _____

BALANCE DUE = $ _____

The amount due must be paid 28 hours prior to the Planning Board Meeting, to be heard.

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: Cocheco Mills Holdings, LLC File Number: SITE-2026-

PROJECT TITLE: Site Plan (for Change of Use)

PROPERTY LOCATION: Central Avenue, Washington & Main Streets Tax Map: 2 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	☐ N/A	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	☐ waiver requested	
9. A colored architectural plan showing all sides of buildings	☐ waiver requested	
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	☐ N/A	
Location of Conservation District areas	☐ N/A	
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	[ ] N/A	
Existing and proposed topographic information at two foot intervals	[ ] N/A	
Existing and proposed buildings and structure locations	[X]	
Minimum building setbacks or build to lines on all lots	[ ] N/A	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	[ ] N/A	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	[ ] N/A	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	[ ] N/A	
Existing and proposed stormwater lines and facilities	[ ] N/A	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	[ ] waiver requested	
Location of Flood Hazard Zone	[ ] N/A	
Location of all bodies of water and watercourses	[X]	
Location of wetlands and buffers	[ ] N/A	
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	[ ] N/A	
Depict existing contours up to 100 ft. beyond project limits	[ ] N/A	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	[ ] waiver requested	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	[X]	
Location, material and size of existing and proposed pavement area	[ ] N/A	
Location of proposed fire lanes	[ ] N/A	
Specify finished floor elevations of buildings	[ ] N/A	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	[ ] N/A	
Depict all service, storage, loading bays and utility areas	[ ] N/A	
All applicable Dover Common Site Plan notes	[ ] N/A	
11. Additional Information if appropriate	[ ]	
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	[ ] N/A	
Stormwater Management System Operation and Maintenance Plan	[ ] N/A	
Letter to Serve from Public and Private Utilities	[ ] N/A	
Erosion and Sedimentation Control Plan	[ ] N/A	
Landscape Operation and Maintenance Plan	[ ] N/A	
Proposed restrictive covenants or homeowners association documents	[ ] N/A	
Dates and permit numbers of all required state and federal permits	[ ] N/A	
If wetland buffer, indicate placards locations, as applicable	[ ] N/A	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	[ ] N/A	
Location of proposed drive-in facilities	[ ] N/A	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	[X]	

REVIEWED BY: _____ DATE_____ TRC DATE_____

PROJECT NARRATIVE

for

SITE PLAN REVIEW APPLICATION

Cocheco Mills Holdings, LLC

Tax Map 2, Lot 37A

Central Avenue, Main & Washington Streets

Dover Site Review Regulations: Section 153-4.C. Change of Use of Existing Structures

Site review will be required for a change in conforming use with a new use allowed in the zoning district in which the tract or structure is located. For the purposes of this subsection, the definition of a new use shall not include any uses which have previously existed on the site since the adoption of the Dover Zoning Ordinance (July 1948). The following criteria constitute a change in use:

(1) Development which causes a residential structure to be converted, resulting in an increase of five or more units.

(2) Proposals that would change the use of an existing structure containing 25,000 square feet or more of gross floor space. The proposed square footage shall be measured around the inside perimeter of the space to be changed, including all floors of a multi-floor structure. In the event that an existing structure is being subdivided and the new use in only a section of the new space is known, the entire original space must be considered in the calculation.

The proposed project is for conversion of 36,207 s.f. of existing commercial space within one building to 27 new residential units.

This pre-existing mill building was renovated and converted to commercial and residential units in 2012 and has all the necessary utilities (electrical, gas, communications, water, sewer, drainage) to support the current proposal to convert commercial spaces into additional residential units.

CHINBURG
DEVELOP. BUILD. MANAGE.

April 21, 2026

City of Dover
Planning & Development
288 Central Avenue Dover, NH 03820

Attn: Planning & Community Development

Re: Conditional Use Permit Application
Cocheco Mill Building
Tax Map 2, Lot 37A
Central Avenue, Washington & Main Streets – Dover, NH

Dear City Staff and Members of the Technical Review Committee,

In connection with the referenced application, this letter is written in response to the TRC's request to verify the condition of the existing sewer and certify that no roof drains or sump pumps discharge into it.

Chinburg has owned and managed the Property since 2012. Since acquiring the Property, Chinburg has completed renovations to convert vacant office space to 117 apartments. All the work, including public utility work, was inspected by the City and designed by licensed professionals. Chinburg's property management affirms that during its oversight of the Property that it has not observed roof drains nor sump drains tied into the existing sewer system.

Respectfully,

CHINBURG PROPERTIES
Agent for Cocheco Mills Holdings, LLC

Matt Assia
Executive Vice President, Development and Asset Management

WAIVER REQUEST

for

SITE PLAN REVIEW APPLICATION

Cocheco Mills Holdings, LLC

Tax Map 2, Lot 37A

Central Avenue, Main & Washington Streets

Dover Site Review Regulations: Section 153-13A (15) COLORED ARCHITECTURAL PLAN

A colored architectural plan showing all sides of new buildings, as prepared by a registered engineer or architect, who shall sign the plan and place his/her seal upon it.

We respectfully request waivers from the above noted regulation sections, as this is a pre-existing and fully occupied mixed-use building. Conversion of use will only change commercial space for residential units and will affect the interior of the building only. The building exteriors will remain unchanged.

WAIVER REQUEST

for

SITE PLAN REVIEW APPLICATION

Cocheco Mills Holdings, LLC

Tax Map 2, Lot 37A

Central Avenue, Main & Washington Streets

Dover Site Review Regulations: Section 153-13A (17) COLORED STREETSCAPE ENDERING

A colored rendering of the streetscape that will be created along the existing public right-of-way. This sheet shall include a perspective of both sides of any existing roadway, any street or sidewalk improvements, proposed plantings and structures, as prepared by a registered engineer or architect, who shall sign the plan and place his/her seal upon it, as required.

We respectfully request waivers from the above noted regulation sections, as this is a pre-existing and fully occupied mixed-use building. Conversion of use will only change commercial space for residential units and will affect the interior of the building only. The building exteriors will remain unchanged.

WAIVER REQUEST

for

SITE PLAN REVIEW APPLICATION

Cocheco Mills Holdings, LLC

Tax Map 2, Lot 37A

Central Avenue, Main & Washington Streets

Dover Site Review Regulations: Section 153-13A (12) LANDSCAPE PLAN

A landscape plan that delineates the arrangement, species and dimensions of all existing and proposed landscaping materials. The landscape plan, in sufficient detail to indicate compliance with these regulations, shall be prepared by a professional landscape architect who is licensed by the State of New Hampshire. The licensed landscape architect shall sign the plan. The landscape plan shall be certified by the licensed landscape architect and include his/her State of New Hampshire license number.

Dover Site Review Regulations: Section 153-13A (20) LANDSCAPE O&M PLAN

A detailed landscape operations and maintenance plan, developed in accordance with the requirements of § 153-14G. Site plans shall provide for the proper management of landscaping, ensuring that landscaping is not unintentionally damaged as a result of snow removal or general traffic flow, pedestrian or otherwise.

We respectfully request waivers from the above noted regulation sections, as this is a pre-existing and fully occupied mixed-use building. Conversion of use will only change commercial space for residential units and will affect the interior of the building only. Landscaping will be maintain, as is, for all exterior spaces.

WAIVER REQUEST

for

SITE PLAN REVIEW APPLICATION

Cocheco Mills Holdings, LLC

Tax Map 2, Lot 37A

Central Avenue, Main & Washington Streets

Dover Site Review Regulations: Section 153- 14. E. OUTDOOR LIGHTING

We respectfully request waivers from the above noted regulation sections, as this is a pre-existing and fully occupied mixed-use building. Conversion of use will only change commercial space for residential units and will affect the interior of the building only. All outdoor lighting will remain unchanged.

CIVILWORKS NEW ENGLAND
181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443

TRIP DISTRIBUTION/ASSIGNMENT

All project-related trips will access the site from Main Steet and Central Avenue. The calculated vehicle trip generation for the development project relative to the number of vehicles already on Main Street, Central Avenue and Washington Street is such that area traffic operations are not sensitive to trip distribution/assignment of project vehicle trips.

POTENTIAL TRAFFIC IMPACTS

The calculations show an overall decrease in vehicle trips resulting from the unit conversion as:

- Daily (weekday) = 155.2 total trips (77.6 in and 77.6 out) proposed vs.
  479.4 existing trips (239.7 in and 239.7 out)
  Net Decrease = 324.2 (162.1 in and 162.1 out)

- AM peak hour (weekday) = 8.3 total trips (2.6 in and 5.7 out) proposed vs.
  69.8 existing trips (61.5 in and 8.3 out)
  Net Decrease = 61.5 (58.9 in and 2.6 out)

- PM peak hour (weekday) = 12.3 total trips (7 in and 5.3 out) proposed vs.
  71.4 existing trips (12.1 in and 59.3 out)
  Net Decrease = 59.1 (5.1 in and 54 out)

The total weekday trips presently account for only a small fraction of the current ADT on Central Avenue and Main Street which are expected to be lower with the proposed project. Therefore, the project is not anticipated to add any new traffic to the surrounding area, nor impact such in any way; and ultimately may result in a net improvement to the existing conditions in the project area.

CONCLUSION

In conclusion, the proposed project is expected to result in a reduction in traffic in the area.

CIVILWORKS NEW ENGLAND

Sincerely,

Stephen J. Haight, PE

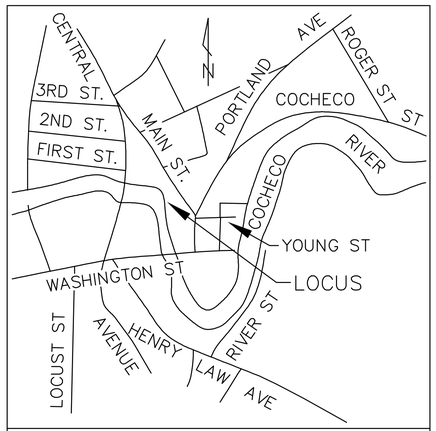


Cc: Cocheco Mills Holdings, LLC

SITE PLAN
CONVERSION OF COMMERCIAL SPACE TO RESIDENTIAL UNITS

TAX MAP 2, LOT 37A

CENTRAL AVENUE,
MAIN & WASHINGTON STREETS
DOVER, NH
APRIL 22, 2026



LOCATION PLAN
(NO SCALE)

OWNER/APPLICANT

COCHECO MILLS HOLDINGS, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

_____ _____
DATE

SITE CIVIL ENGINEER

CNE
CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

SHEET INDEX	SHEET
COVER SHEET	1
NEIGHBORHOOD PLAN	2
OVERALL PLAN	3
SITE PLAN	4
TRAIN STATION PARKING LOT EXHIBIT	EX-1
ARCHITECTURAL PLAN	A-0

DOVER PLANNING FILE NO.: SITE—2026—XXXX



ABUTTERS LIST
(WITHIN 200 FT)

TAX MAP	LOT NO.	NAME & ADDRESS
2	36	COCHECO FALLS DAM P.O. BOX 178 SOUTH BERWICK, ME 03908
2	37	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
2	37A	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
2	50-1	CUSACK GILLIAN P TRUSTEE CUSACK GILLIAN P REVOCABLE LIVING TRUST 392 CENTRAL AVE UNIT 1 DOVER, NH 03820
2	51	2 &2A WALDRON COURT LLC 11 GILL STREET EXETER, NH 03833
2	75-A	KING PROPERTIES LLC 400 CENTRAL AVE DOVER, NH 03820
2	78	HOLGATE LIMITED PARTNERSHIP 130 CENTRAL AVE DOVER, NH 03820
2	79	AIREY ROW ON CENTRAL LLC 376 CENTRAL AVE DOVER, NH 03820
2	80	AIREY ROW ON CENTRAL LLC 376 CENTRAL AVE DOVER, NH 03820
2	81	364 CENTRAL AVENUE ASSOCIATES LLC C/O AMSE PROPERTIES 80 NASHUA ROAD STE 24 LONDONBERRY, NH 03853
2	83-1	CITY OF DOVER 288 CENTRAL AVE DOVER, NH 03820
3	1	29 33 35 MAIN STREET LLC 61 AIRPORT DR #4 ROCHESTER, NH 03867
3	1-A	29 33 35 MAIN STREET LLC 61 AIRPORT DR #4 ROCHESTER, NH 03867
3	2	SEA SALT PROPERTIES LLC 22 MUIRFIELD DRIVE STRATHAM, NH 03885
3	12	79 SCHOOL STREET LLC 3 OLL LANE SUITE 107 BARRINGTON, NH 03825
3	13	GATZOULIS NINA & VASSILIOS A C/O WINSOR BROOK PROPERTY ADVISORS 385 SIXTH STREET DOVER, NH 03820
3	14	GRAY LYNN S TRUSTEE GRAY LYNN S REVOCABLE TRUST 39 SEA GLASS LANE RYE, NH 03870
3	15	GRAY LYNN S TRUSTEE GRAY LYNN S REVOCABLE TRUST 39 SEA GLASS LANE RYE, NH 03870
3	16	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 0385
3	18	MCCRACKEN MICHAEL BRIAN 28 HOUGH STREET DOVER,NH 03820
3	19	CARDO CASSANDRA M & MCCRACKEN MICHAEL B 43 MAIN STREET #1 DOVER, NH 03820
3	22	29 33 35 MAIN STREET LLC 61 AIRPORT DR #4 ROCHESTER, NH 03867
3	22-A	29 33 35 MAIN STREET LLC 61 AIRPORT DR #4 ROCHESTER, NH 03867
3	23	THOMPSON BROOK LLC 65 MAIN STREET STE 2 DOVER, NH 03820
3	23-1	CITY OF DOVER 288 CENTRAL AVE DOVER, NH 03820
3	25	CITY OF DOVER 288 CENTRAL AVE DOVER, NH 03820
3	31	BIG J REALTY INC 161 CLEMENT ROAD ROLLINSFORD, NH 03869
3	35	VARNEY BROOK LANDS LLC & 375 CENTRAL AVE DOVER LLC 340 CENTRAL AVE #202 DOVER, NH 03820

ABUTTERS LIST
(WITHIN 200 FT)

TAX MAP	LOT NO.	NAME & ADDRESS
3	35-A	VARNEY BROOK LANDS LLC & 375 CENTRAL AVE DOVER LLC 340 CENTRAL AVE #202 DOVER, NH 03820
3	42	FRANKLIN SQUARE APARTMENTS LLC 100 POST ROAD GREENLAND, NH 03840
3	63	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
3	63-A	PICKER HOUSE LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
3	63-B	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
3	64	PILLAR INVESTMENTS CORP 340 CENTRAL AVE #202 DOVER, NH 03820
3	66	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
3	67	421 CENTRAL AVENUE LLC 113 BUNKER HILL AVENUE STRATHAM, NH 03885
6	1	432 CENTRAL AVE LLC P.O. BOX 1384 HAMPTON, NH 03843
6	21-1	BUILD UPON LLC 32 JOCO DRIVE TYNGSBORO, MA 01879
6	21-2	MARKER 21 HOLDINGS LLC 130 CENTRAL AVE DOVER, NH 03820
6	21-3	CARTELLI'S LLC 15A MELISSA WAY LACONIA, NH 03246
6	21-A	HENRY PETER T 1141 N NORTON AVE TUCSON, AZ 85719
23	7	MELITUS JAMES & KATHLEEN L & MELITUS GEORGE 5 PORTLAND AVE DOVER, NH 03820-3521
23	8	TRAVIS ERIK M & TRAVIS LYDIA H 188 CHURCH STREET BARRINGTON, NH 03825
23	11	COCHECO MILLS HOLDING LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
23	14	WASHINGTON STREET MILL LLC 3 PENSTOCK WAY NEWMARKET, NH 03857
23	15	CITY OF DOVER C/O/ C/S RECREATION/GYM AND POOL 61 LOCUST STREET #124 DOVER, NH 03820-3753

ABUTTERS LIST
ADDITIONAL UNIT OWNERS 388 CENTRAL AVENUE

2	50-2	PAVILION PROPERTIES LLC 9 OVERLOOK DRIVE DOVER NH 03820
2	50-3	BAUMAN EMILY K 392 CENTRAL AVENUE UNIT 5 DOVER NH 03820
2	50-4	SMESTAD STEVEN A PO BOX 4333 PORTSMOUTH NH 03802
2	50-5	WILLIAMS EDWARD 3 WALDRON COURT DOVER NH 03820
2	50-6	DOROW MICHAEL 388 CENTRAL AVENUE UNIT 6 DOVER NH 03820
2	50-7	HOPPER TANNER 392 CENTRAL AVENUE UNIT 7 DOVER NH 03820
2	50-8	IOLITE PROPERTIES LLC 388 CENTRAL AVENUE DOVER NH 03820
2	50-9	IOLITE PROPERTIES LLC 388 CENTRAL AVENUE DOVER NH 03820
2	50-10	IOLITE PROPERTIES LLC 388 CENTRAL AVENUE DOVER NH 03820

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

DOVER PLANNING FILE NO.: SITE-2026-XXXX

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

NO.	REVISION	APP'D	DATE

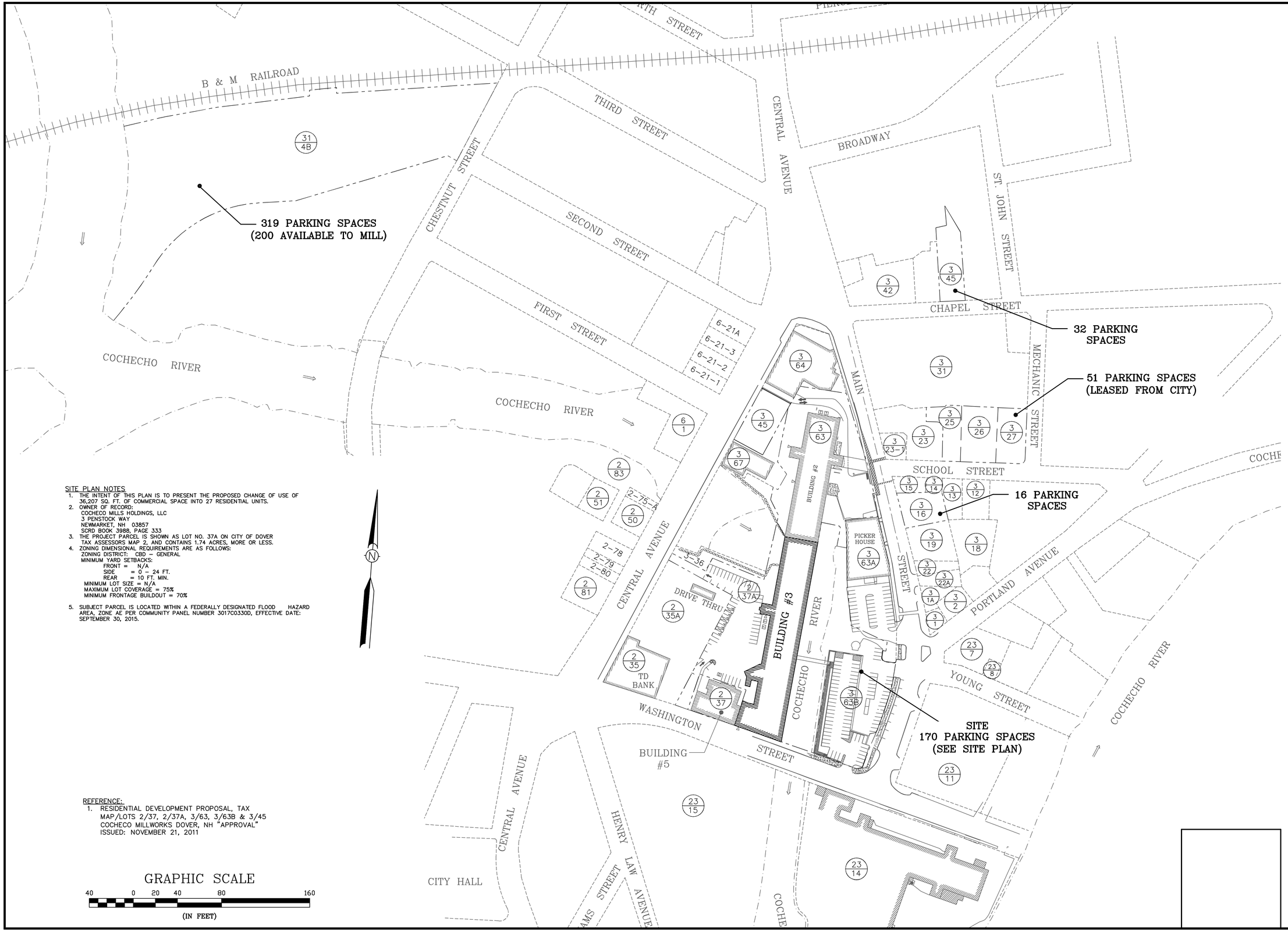
DATE: 4-22-26
SCALE: 1"=100'
DRAWN BY: SRD
DESIGN BY: SRD
APPROVED BY:SJH
PROJECT NO: 25141
FILE: SITE.DWG

NEIGHBORHOOD PLAN

COCHECO MILLS HOLDINGS, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

CONVERSION OF COMMERCIAL SPACE TO RESIDENTIAL UNITS
TAX MAP 2, LOT 37A
DOVER, NH

2



SITE PLAN NOTES

1. THE INTENT OF THIS PLAN IS TO PRESENT THE PROPOSED CHANGE OF USE OF 36,207 SQ. FT. OF COMMERCIAL SPACE INTO 27 RESIDENTIAL UNITS.
2. OWNER OF RECORD:
   COCHECO MILLS HOLDINGS, LLC
   3 PENSTOCK WAY
   NEWMARKET, NH 03857
   SCRD BOOK 3988, PAGE 333
3. THE PROJECT PARCEL IS SHOWN AS LOT NO. 37A ON CITY OF DOVER TAX ASSESSORS MAP 2, AND CONTAINS 1.74 ACRES, MORE OR LESS.
4. ZONING DIMENSIONAL REQUIREMENTS ARE AS FOLLOWS:
   ZONING DISTRICT: CBD – GENERAL
   MINIMUM YARD SETBACKS:
   FRONT = N/A
   SIDE = 0 – 24 FT.
   REAR = 10 FT. MIN.
   MINIMUM LOT SIZE = N/A
   MAXIMUM LOT COVERAGE = 75%
   MINIMUM FRONTAGE BUILDOUT = 70%
5. SUBJECT PARCEL IS LOCATED WITHIN A FEDERALLY DESIGNATED FLOOD HAZARD AREA, ZONE AE PER COMMUNITY PANEL NUMBER 3017C0330D, EFFECTIVE DATE: SEPTEMBER 30, 2015.

REFERENCE:

1. RESIDENTIAL DEVELOPMENT PROPOSAL, TAX MAP/LOTS 2/37, 2/37A, 3/63, 3/63B & 3/45 COCHECO MILLWORKS DOVER, NH "APPROVAL" ISSUED: NOVEMBER 21, 2011

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

GNE CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

NO.	REVISION	APP'D	DATE

DATE: 4-22-26
SCALE: 1"=100'
DRAWN BY: SRD
DESIGN BY: SRD
APPROVED BY:SJH
PROJECT NO: 25141
FILE: SITE.DWG

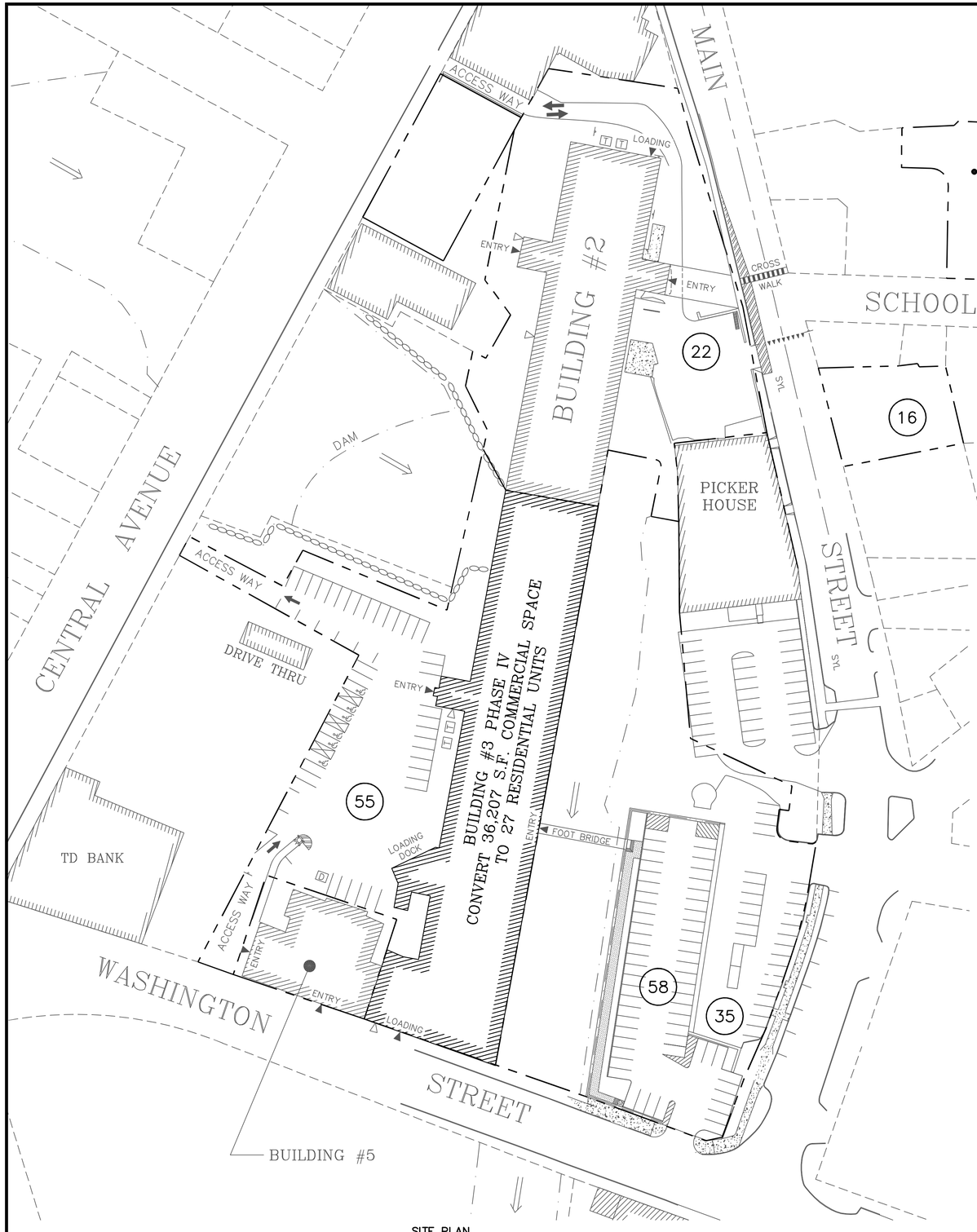
DOVER PLANNING FILE NO.: SITE-2026-XXXX

OVERALL SITE PLAN

COCHECO MILLS HOLDINGS, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

CONVERSION OF COMMERCIAL SPACE TO RESIDENTIAL UNITS
TAX MAP 2, LOT 37A
DOVER, NH

3



SITE PLAN
SCALE: 1"=50'

PARTIAL SITE PLAN
SCALE: 1"=50'

PARTIAL SITE PLAN
SCALE: 1"=80'

COCHECO MILLS PARKING ANALYSIS	
MAIN STREET	73
WASHINGTON STREET	113
SCHOOL STREET	51
CHAPEL STREET	32
TOTAL PROVIDED	269

PARKING CALCULATIONS	
EXISTING REQUIRED	117
ADDITIONAL REQUIRED	27
TOTAL REQUIRED	144

DOVER PLANNING FILE NO.: SITE-2026-XXXX

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CNE CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

NO.	REVISION	APP'D	DATE

DATE: 3-16-26
SCALE: AS SHOWN
DRAWN BY: SRD
DESIGN BY: SRD
APPROVED BY:SJH
PROJECT NO: 25141
FILE: SITE.DWG

SITE PLAN

COCHECO MILLS HOLDINGS, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

CONVERSION OF COMMERCIAL SPACE TO RESIDENTIAL UNITS
TAX MAP 2, LOT 37A
DOVER, NH

4



TRAIN STATION PARKING LOT
33 CHESTNUT STREET

96 YELLOW STRIPED SPACES

DOVER PLANNING FILE NO.: SITE–2026–XXXX

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)

PARKING LOT EXHIBIT

No.	Appd	Date

REVISIONS

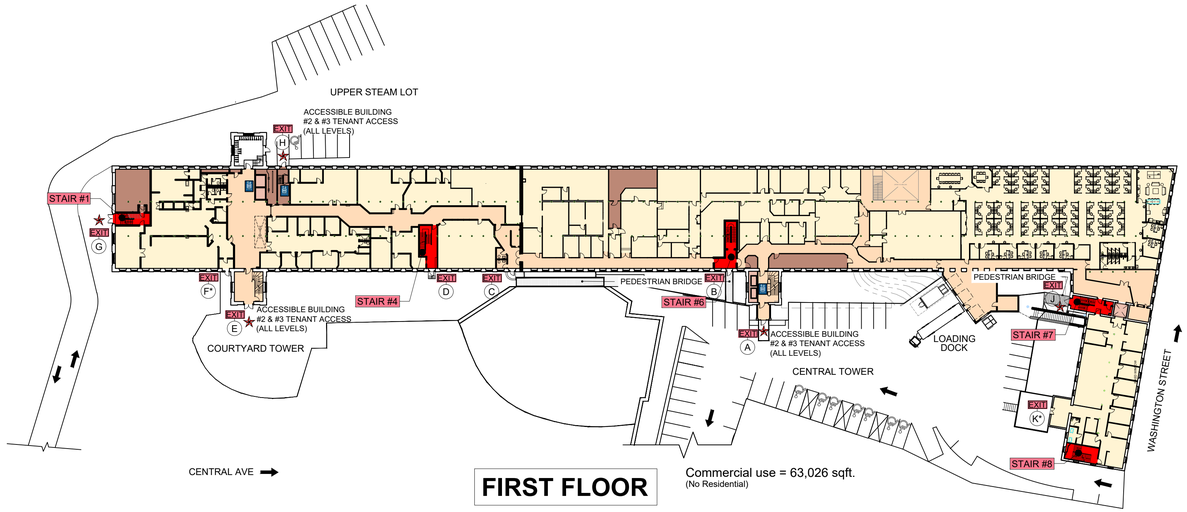
CONVERSION OF COMMERCIAL SPACE TO RESIDENTIAL UNITS
TAX MAP 2, LOT 37A
DOVER, NH

DATE: 4–22–26
SCALE: AS SHOWN
DESIGNED BY: SRD
DRAWN BY: SRD
APPROVED BY: SJH
PROJECT NO.: 25141
FILE: PRK LOT EXHIBIT

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

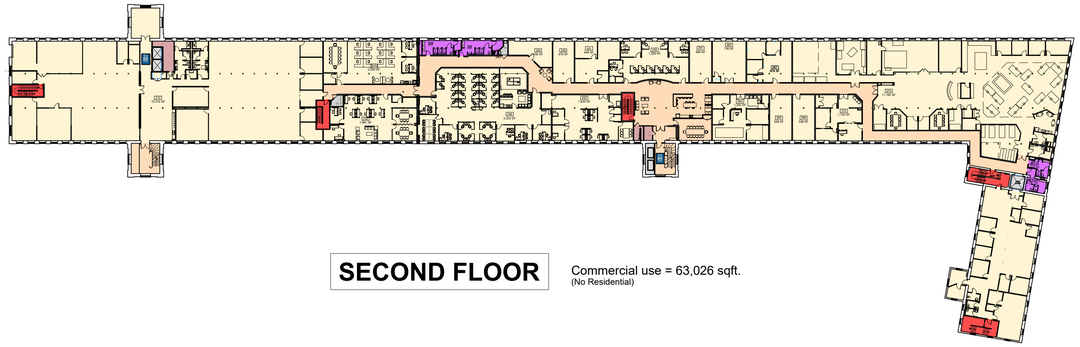
CNE CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

EX–1



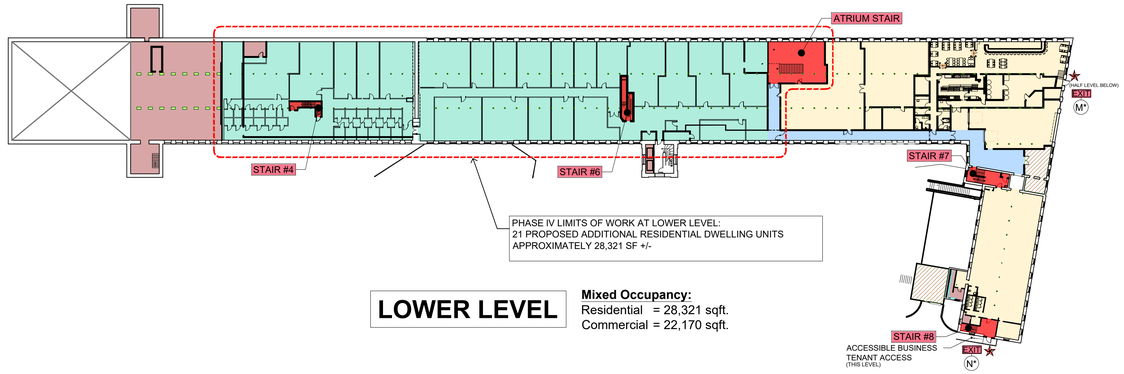
FIRST FLOOR

Commercial use = 63,026 sqft.
(No Residential)



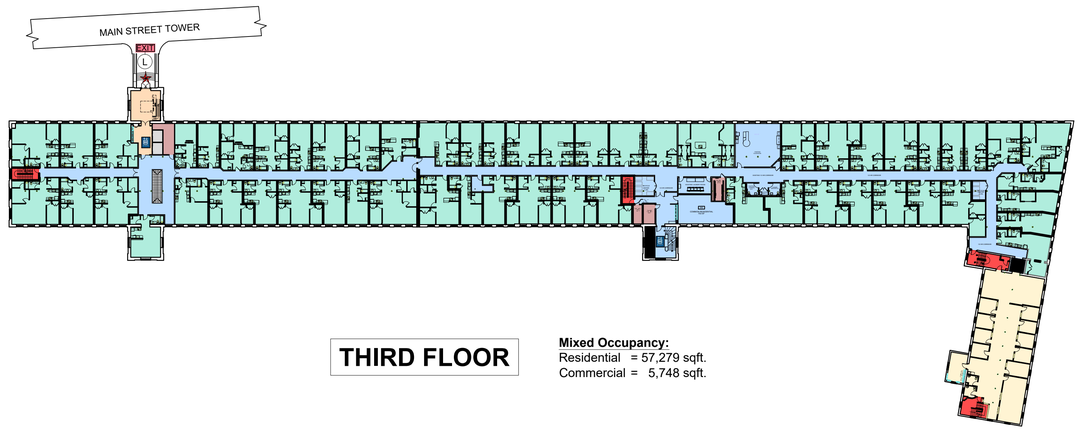
SECOND FLOOR

Commercial use = 63,026 sqft.
(No Residential)



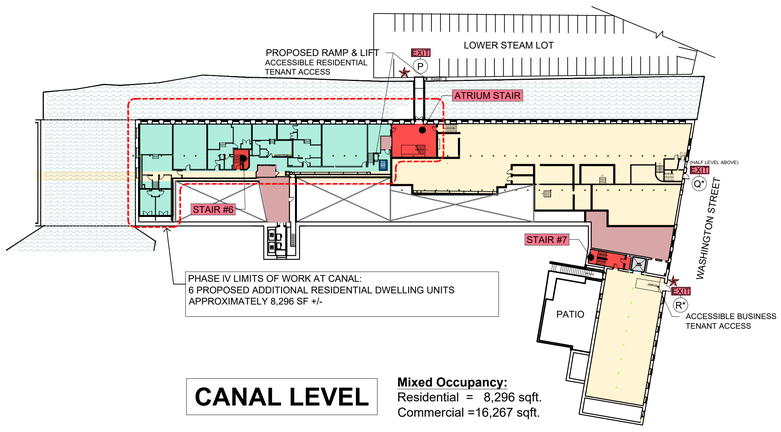
LOWER LEVEL

Mixed Occupancy:
Residential = 28,321 sqft.
Commercial = 22,170 sqft.



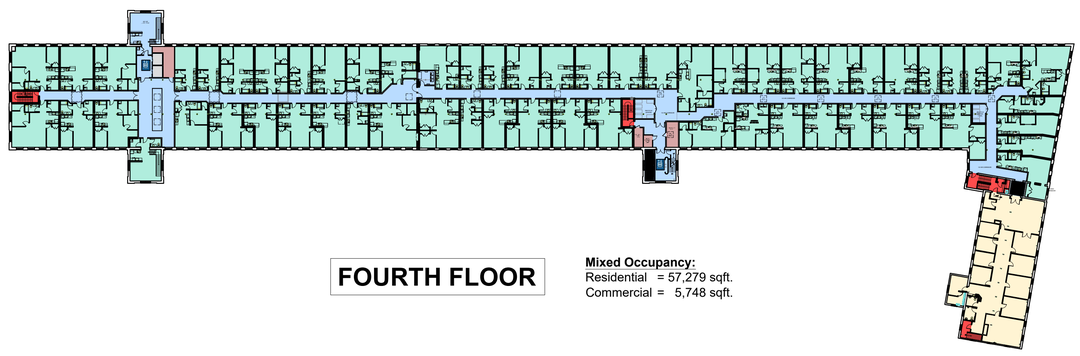
THIRD FLOOR

Mixed Occupancy:
Residential = 57,279 sqft.
Commercial = 5,748 sqft.



CANAL LEVEL

Mixed Occupancy:
Residential = 8,296 sqft.
Commercial =16,267 sqft.



FOURTH FLOOR

Mixed Occupancy:
Residential = 57,279 sqft.
Commercial = 5,748 sqft.

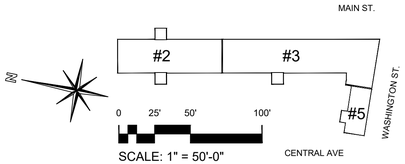
Total Gross Occupied Space: 327,159 sqft.

Residential use: 46.21% (151,174 sqft.)
Commercial use: 53.79 % (175,985 sqft.)

Note:
Area calculations are approximate and do not include common "house" mechanical rooms in low head room unconditioned spaces.

SPACE COLOR LEGEND
BUSINESS SPACE
COMMON
PUBLIC REST ROOM
EGRESS EXIT ACCESS
MECHANICAL
RESIDENTIAL COMMON
RESIDENTIAL SPACE

SYMBOL LEGEND	
★	BUILDING EGRESS / EXIT DISCHARGE (ACCESSIBLE ACCESS WHEN NOTED)
	ELEVATOR OR ACCESS LIFT
EXIT A	DOOR TAG REFERENCE ★ INDICATES EXIT DISCHARGE FROM TENANT SUITE
	HANDICAP PARKING
	DASHED LINE DENOTES AREA OF PROPOSED RESIDENTIAL DWELLING



PROJECT:	COCHECO FALLS MILLWORKS,
ADDRESS:	100 MAIN STREET DOVER, NH 03820

PHASE IV

BUILDINGS # 2,3,5	DATE: Jan 13, 2026
	DWG: CORE & SHELL
	SCALE: AS NOTED
	DRAWN: TFA
	sheet no. A-0

CHINBURG
DEVELOP. BUILD. MANAGE.

3 Penstock Way
Newmarket, NH 03857

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

Plan Type: Site Plan - Major
Work Class: New Construction
Status: In Review
Valuation: $0.00

Project:
District: None
Square Feet: 0.00
Assigned To: Blonigen, Rachel

App Date: 12/12/2024
Exp Date: 02/15/2025
Completed: NOT COMPLETED
Approval Expire Date:

Description: Proposed 84 Lodging Unit Building and two, 33 residential buildings containing 2-bedroom, 1-bedroom, and Studio units in each. The 66 residential units is the base density allowed in the Commercial Zone. Four story buildings proposed with podium style parking on the first levels with 221 parking spaces. No additional wetland buffer impact or additional impervious surface proposed that exceeds the originally approved environmental CUP's for the parcel. The use of TDR is not proposed for the parcel.

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

Owner
Gil Aleixo
P.O. Box 720
Middleton, MA 01949
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

Total2	13646	Total3	69209	Total	0
Total5	0	Total4	84	Total6	66
Total7	0	Total9	40938	Total8	0
Street Classification Type	Municipal	Recording Number		Net Change in # Parking Spaces (+/-)	221
Water Service	Municipal	Sewer Service	Municipal	Deed Book	5138
Total Acres (GIS)	9.36	Deed Page	73	Total SQFT	407722
Deed Date	9/18/23	Proposed Property Use	Proposed 84 Lodging Unit Building and two, 33 residential buildings containing 2-bedroom, 1-bedroom, and Studio units in each. The 66 residential units is the base density allowed in the Commercial Zone. Four story buildings proposed with podium style parking on the first levels with 221 parking spaces. No additional wetland buffer impact or additional impervious surface proposed that exceeds the originally approved environmental CUP's for the parcel. The		use of TDR is not proposed for the parcel."

PLAN SNAPSHOT REPORT (SITE-2024-0019)

Area of Parcel to be Developed (SQFT)	302500	Number of Parking Spaces Existing	0	Number of Parking Spaces Proposed	221
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	
Total of Impact Fees to be Assessed	0.00	TotalImpactFeeSDTOD	0.00	Sub Total Residential	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	TotalImpactFeeRIRCTOD	0.00
Sub Total Non-Residential	0.00	TotalImpactFeeOCSTOD	0.00	TotalImpactFeeITWCTOD	0.00
TotalImpactFeeNHALTOD	0.00	TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOTOD	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
2025.01.02_PlanningTechnicalReviewCommittee.Agenda.pdf	12/13/2024 15:12	Blonigen, Rachel		TRC Agenda
2024.01.09_PlanningTechnicalReviewCommittee.Agenda.Rev.pdf	01/02/2025 11:32	Blonigen, Rachel		Revised TRC Agenda
2025.01.09_PlanningTechnicalReviewCommittee.239KnoxMarsh_SITE-2024-0019.final.pdf	02/25/2025 11:44	Blonigen, Rachel		Final TRC minutes

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**
NOT INVOICED	Planning Non-Res/Mixed Use – New Construction	$2,046.90	$0.00
	Planning Residential Fee	$6,600.00	$0.00
	Planning Non-Residential - Lodging	$2,940.00	$0.00
	Planning Impervious Paved Area Fee	$4,844.63	$0.00
	Total for Invoice NOT INVOICED	**$16,431.53**	**$0.00**
	Grand Total for Plan	**$16,631.53**	**$0.00**

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	01/09/2025	Technical Review Committee Meeting

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	Requires Re-submit	12/13/2024	01/01/2025	01/15/2025	Yes	Yes

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Burdin, James	Requires Re-submit	12/13/2024	01/10/2025	01/03/2025

Comments: Please add more information about the amenities offered at the proposed hotel - current building layout is almost identical to the residential buildings.
Would hotel amenities be anticipated to have any impact on parking or traffic (e.g. due to event/meeting space)?
Has a hotel operator been identified?
Please add more architectural variety/interest, especially at ground level and street-facing facades. Suggest making the hotel architecturally distinct from the apartments in some way.
The space where the 2F footprint overhangs the parking podium feels odd and left over. Activating that space with hardscape and seating could make it more welcoming, especially on the residential buildings.
Placement of all 3 entrances towards the rear of the property feels inappropriate. Re-orienting the hotel to have the entrance face the street would improve visibility. If there is a reason not to face the residential entrances towards the street, orienting both internally could create a courtyard feel.
The location of the hotel loading zone feels more appropriate for delivery trucks in a mixed-use development. Loading/unloading space for hotel guests would typically be closer to the main entrance.
I didn't identify a narrative that spoke directly to the TDR criteria. Please provide one or clarify how it was submitted.

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	Requires Re-submit	12/13/2024	01/01/2025	01/15/2025

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Planning	Planning	Bassegio, Erin	Requires Re-submit	12/13/2024	01/10/2025	01/15/2025

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Zoning Administrator	Planning	Crouser, Paul	Requires Re-submit	12/13/2024	01/01/2025	01/15/2025

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
IS Building Official	Planning / Inspection Services	Maxfield, Jim	Requires Re-submit	12/13/2024	01/01/2025	12/20/2024

Comments: 1) Discuss and clarify the number of TDR units being sought.
2) Did not appear to see narrative attached regarding TDR unit request.
3) The 3 proposed structures are residential uses and the mixed use has been removed from the project from Inspection Services and code viewpoints. Clarify and justify removing the mixed use component of the project.
4) Discuss the overall number of parking spaces based on the use.
5) With the obvious increase in vehicular volume provide supporting data to support not having a center turn lane, a deceleration lane and acceleration lane. Provide a detailed traffic analysis.
6) Discuss the additional pedestrian traffic and provide sidewalk to Progress Drive.
7) Provide a second fire access road as one entrance/exit for 264 units does not provide adequate vehicular mobility for the site.
8) As previously mentioned for the currently approved plan the speed limit should be reduced along this section of the corridor.

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Traffic	Police	Speidel, Marn	Requires Re-submit	12/13/2024	01/01/2025	01/15/2025

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		12/13/2024 15:20	
Confirm application complete v.1	Generic Action		12/13/2024 15:20
Technical Review Committee Meeting Agenda v.1	Task	12/13/2024 15:20	12/13/2024 15:21
Land Use Plan Technical Review v.1	Receive Submittal	12/13/2024 0:00	01/15/2025 14:47
Land Use Plan Technical Review v.2	Receive Submittal	01/15/2025 0:00	
Technical Review Committee Meeting v.1	Hold Meeting	01/02/2025 11:35	01/15/2025 14:47
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 66 & Buildings Proposed 2

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

Number of Parking Spaces: Existing driveway Proposed 221

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

Number of Employees Total: TBD In Maximum Shift: TBD

Disposition of Parcel:

Building Footprint 13,646 sq. ft.

Total Building Area 46,643 sq. ft.

Paved Area 69,209 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 _____ units

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

No TDR proposed

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, 153-14-C(2) 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

ENGINEER INFORMATION

crberry@metrocast.net

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

ARCHITECT INFORMATION

crberry@metrocast.net

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: 4-22-26

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

Signature of Agent: _____ Date: 4-22-26

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: 4-22-26

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: 4-22-26

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: 4-22-26

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

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 24, 2023)

Below are the fees associated with plan review and are subject to a nonrefundable application fee to cover administrative expenses. Please complete the information below and provide payment with your application submittal. **Plan review fees shall be paid prior to technical review committee (TRC) being scheduled.** For plans not requiring TRC review, **fees are due 21 days prior** to the Planning Board meeting. Staff will coordinate abutter/notice fees, which will be invoiced and must be paid 28 hours before the Planning Board meeting for an application to be heard. Fees shall be paid by cash or check made payable to "City of Dover".

A. Plan Review Fees

1. Application fee for the following (SELECT ALL THAT APPLY):

- ☐ SUBDIVISION Application fee $200.00 + $150.00 x # _____ new lots created = $_____
- ☐ LOT LINE ADJUSTMENT Application fee $200.00 + $100.00 X # ___ of lots involved = $_____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee $200.00 = $_____
- ☐ SITE REVIEW – RESIDENTIAL Application fee $200.00+ $100.00 x # __ per dwelling unit =$_____
- ☐ SITE REVIEW – NON-RESIDENTIAL Application fee $200.00 + (not to exceed $10,000)
  - New construction $.15 sq. ft. x # _____ sq. ft.= $_____
  - Additions (new floor space) $.10 per sq. ft. x # _____sq. ft.= $_____
- ☐ MOTEL/HOTEL $35.00 x # ___ per lodging unit= $_____
- ☐ CHANGE OF USE Application fee $200.00 + (not to exceed $5,000)
  - Existing floor spaces $.10 per sq. ft. x # _____ sq. ft. = $_____
- ☐ CONDITIONAL USE PERMIT Application fee $200.00 x # _____ per Application = $_____
- ☐ GRAVEL PIT/ EXCAVATIONS
  - Application fee $50.00= $_____
  - Permit fee $75.00= $_____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee $200.00 = $_____
- ☐ REQUEST FOR REZONING Application fee $200.00 = $_____
- ☐ DRIVEWAY WAIVER Application fee $200.00 = $_____
- ☐ **TOTAL IMPERVIOUS PAVED AREA** (for new development, roadways or additions to existing parking lots, (not to exceed $10,000)) Application fee of $200.00 is N/A if it is part of a Site Review or Subdivision Plan. $200.00 + $.07 per sq. ft. x # _____ sq. ft. = $_____

SUBTOTAL PLAN REVIEW FEE = $_____

AND

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will review the list for accuracy and provide to us the engineer, architect, licensed land surveyor (LLS), licensed landscape architect (LLA) and/or soil scientist whose professional seal appears on the plan with names and addresses for notices.

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
  - Certified letters fee # _____ of x $10.00= $_____
- ☐ Certified letters fee: # of abutters _____ X $10.00= $_____
- ☐ First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X $1.00= $_____
- ☐ Creating/Printing Abutter Labels in triplicate per sheet _____ x $10.00= $_____

C. Foster's newspaper public notice fee $120.00 x # _____ applications = $_____

SUBTOTAL = $_____

TOTAL INVOICE AMOUNT = $_____

PLAN REVIEW FEE COLLECTED/PAID = $ _____

BALANCE DUE = $ _____

The amount due must be paid 28 hours prior to the Planning Board Meeting, to be heard.

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

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2024-0019

Application Type:	Site Review
Applicant(s):	239 Knox Marsh Realty, LLC
Owner(s):	239 Knox Marsh Realty, LLC
Location:	239 Knox Marsh Rd. (Assessor's Map H, Lot 37-A)
Date:	January 9, 2025

INTENT: Proposal is for a ±15,097 square foot 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.

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

LOTS/UNITS PROPOSED: 180 residential units (all restricted to HUD Fair Market Rate) and an 84-unit hotel.

AGENDA ITEM #: 2

ACREAGE: ±9.36 acres

ZONING DISTRICT: Commercial, Secondary Groundwater Recharge Overlay

EXISTING USE: Vacant

PROPOSED USE: Mixed-use

SURROUNDING USE: Residential, Commercial

ZBA ACTION: ZONE-2024-0033, Variance granted on July 18, 2024, to permit the one-third requirement for commercial space to be located entirely within one (1) building with the proposed two-thirds residential use to be in two (2) separate buildings, and to permit the three buildings within the Commercial District to be greater than 40' in height.

PERMITS REQUIRED: City of Dover CUP for greater than 20% impervious within the Secondary Groundwater Recharge Overlay (40.2% proposed)
NHDES AoT, Sewer Discharge Permit, Driveway Permit
EPA Notice of Intent

WAIVERS REQUESTED:

- §157-32.G - requesting relief from maximum road grade of 3% within 75' of an intersection.
- §153-14A(3)(b)[4]- requesting an increase of stormwater runoff volume at Final Reach #400.
- §157-40.B(5) - requesting relief from three-foot minimum cover over all pipes.
- Proposed utility drop poles providing power service to the site above ground.

ATTENDANCE:
Donna Benton, Planning
Paul Crouser, Zoning
Jim Maxfield, Inspection Services
Marn Speidel, Police Department
Ken Mavrogeorge, Engineering
Craig Chabot, Fire Department
James Burdin, Business Development
Tom Clark, Planning Board

Others:
Krystian Kozlowski, Assistant City Engineer
Ryan Crosby, Dover Housing Authority
Chris Berry, Berry Surveying and Engineering
Gil Aleixo, Owners

PLAN REVIEW:
Planning:

- Reminder: water and sewer investment fees.
- Parking calculation should be calculated using the "Residential, Non-CBD-G" numbers found in §153-14D.
- Please provide TDR narrative that explains how the proposal meets the criteria.
- A full traffic analysis is requested.
    - Staff would prefer the calculation using multi-family use.
    - If 1.25 spaces per unit calc is used, a narrative shall be submitted explaining its applicability and efficacy.
- Include note on plan referencing previously-approved CUPs and this project's compliance with them (no additional impacts, etc.)
- 24' aisle width is smallest allowable for a project of this density
    - Permitted w/ waiver assuming acceptance by Fire Dept.
- Is there a target demographic for studio apartments? Could there be a diversity of apartment units- 1-3 bedroom?
- Add note to plan that any change of use to Building A (hotel) may be subject to Planning Dept. and Planning Board review.
- HUD Fair Market Rental Rates shall be deed-restricted.
- NHDOT permit required.
- Provide additional screening for residential abutters.

- Discuss active and passive recreation uses with Planning Dept.
  - Address area allocation of rec space to maximize usage of the rec space.
- Consider extending sidewalk.

Engineering:

- General Comment:
  - Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf
- Project Narrative
  - Concerned about sewer impact to Charles St PS for 84-unit lodging building and two 90-unit single occupancy buildings; significant I&I in this area.
  - Defer to Fire and IS on minimum width for emergency vehicles. Typically, 20 ft is minimum.
- Cover Sheet:
  - Provide an overlay sheet in this set to show the previous design and how it compares to this one. In particular, how the impervious surface and utilities compare.
- Projects Notes (Sheet 2 of 60):
  - Numbering is all off and needs to be revised or formatted better.
  - Check for spelling errors.
  - Note 22 to read "…by the City Engineer or Director of Planning and Community Development."
- Boundary Plan
  - Did the City grant property line (N 03º01'12" E 194.48')? City has water and sewer here.
- Pre-Existing Conditions Plan
  - City still requires an easement at Hanson Rd.
- Site Plan West
  - Is the passive recreation/dog park area open to the public?
- Overview Grading Plan
  - Does the proposed grade at the bocce court meet bocce standards?
  - Will the dog park be regraded?
- Overview Utility Plan
  - Are (2) 4" diameter water lines provided?
  - Is (1) 2" diameter water line sufficient for domestic?
  - Show gate at west entry near dog park.
- Utility Plan and Profile Tibetan Drive 4+00 to End
  - Pipe should on profile not found in plan.
  - Pipe and structure do no align in profile.

Police:

- This revised project has **49% higher** Weekday Daily vehicle trips, and **136% higher** Saturday Daily vehicle trips, compared to the previous development proposal. This should warrant a complete update of the Traffic Assessment - particularly relating to turning warrants – instead of the simple summary that is provided, along with a fresh review of the driveway permit by NHDOT. The previous Traffic Impact Assessment concluded that a left turn treatment for the eastbound approach would be warranted by 2032 for both the AM and PM peak traffic volumes, yet the developer has planned only for a right turn deceleration lane.
- The police department is strongly against approval of a project of this scale on this segment of Knox Marsh Road without provision for a left turn treatment and reduction of speed limit as endorsed by the Transportation Advisory Commission on August 22, 2022. A 15-year summary of crash data, previously provided to NHDOT, is available for the applicant's own analysis.

Inspection Services:

- Discuss and clarify the number of TDR units being sought.

- Did not appear to see narrative attached regarding TDR unit request. The 3 proposed structures are residential uses and the mixed use has been removed from the project from Inspection Services and code viewpoints. Clarify and justify removing the mixed use component of the project.
- Discuss the overall number of parking spaces based on the use.
- With the obvious increase in vehicular volume provide supporting data to support not having a center turn lane, a deceleration lane and acceleration lane. Provide a detailed traffic analysis.
- Discuss the additional pedestrian traffic and provide sidewalk to Progress Drive.
- Note on plan showing how 1 ingress/egress meets NFPA 1 requirements.

Fire Department:

- Possibly adding a third hydrant located at Building A. Any emergency incident that would require a water supply at Building A would necessitate the use of the hydrant at Building B. This will create access issues for emergency vehicles as well as any other vehicle access.
- Does the widening of Rt 155 include a deceleration lane west bound as well as turning lane east bound?
- No Parking/ Fire Lane signs in aisles less than 24'.
- Turning template looks good.

Business Development:

- Please add more information about the amenities offered at the proposed hotel - current building layout is almost identical to the residential buildings. Would hotel amenities be anticipated to have any impact on parking or traffic (e.g. due to event/meeting space)? Has a hotel operator been identified?
- Please add more architectural variety/interest, especially at ground level and street-facing facades. Suggest making the hotel architecturally distinct from the apartments in some way. The space where the 2F footprint overhangs the parking podium feels odd and left over. Activating that space with hardscape and seating could make it more welcoming, especially on the residential buildings.
- Placement of all 3 entrances towards the rear of the property feels inappropriate. Re-orienting the hotel to have the entrance face the street would improve visibility. If there is a reason not to face the residential entrances towards the street, orienting both internally could create a courtyard feel.
- The location of the hotel loading zone feels more appropriate for delivery trucks in a mixed-use development. Loading/unloading space for hotel guests would typically be closer to the main entrance.
- I didn't identify a narrative that spoke directly to the TDR criteria. Please provide one or clarify how it was submitted.

Planning Board:

- Has hotel operator been identified
- Clarify need for runoff and minimum cover waiver requests.

Next Steps: Revise plans per comments above and resubmit for second TRC.

Adjournment: M. Speidel moved to adjourn the meeting at **12:29** p.m. Seconded by K. Mavrogeorge Vote: U/A

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

February 15, 2026

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

Re: Site Plan Review
TRC #1 Response Letter
239 Knox Marsh Road
Tax Map H, Lot 37-A
Dover File #SITE-2024-0019

Based on comments from the Technical Review Committee Minutes from January 9, 2025 we respectfully submit the following comments and revisions. Our comments are in **bold**. Comments in *italic* are remaining comments from TRC #1.

PLANNING COMMENTS

• Reminder: water and sewer investment fees.
Applicant acknowledges comment.

• Parking calculation should be calculated using the "Residential, Non-CBD-G" numbers found in §153-14D.
Parking calculations have been revised per project modifications.

• Please provide TDR narrative that explains how the proposal meets the criteria.
Comment no longer applicable. The applicant is proposing a project without the use of TDR.

• A full traffic analysis is requested.

- Staff would prefer the calculation using multi-family use

- If 1.25 spaces per unit calc is used a narrative shall be submitted explaining its applicability and efficacy.

A traffic impact analysis is now provided based upon the revised project layout.

• Include note on plan referencing previously-approved CUPs and this project's compliance with them (no additional impacts, etc.)
This language has been added to Site Plan Note #16 on the project notes sheet, #2.

• 24' aisle width is smallest allowable for a project of this density
- Permitted w/ waiver assuming acceptance by Fire Dept.
Please find attached waiver request based upon the revised project density.

• Is there a target demographic for studio apartments? Could there be a diversity of apartment units- 1-3 bedroom?
The project as revised proposes a majority of 2-bedroom units with a few studio and 1-bedroom units in each building.

• Add note to plan that any change of use to Building A (hotel) may be subject to Planning Dept. and Planning Board review.
This language has been added to Site Plan Note #15 on the project notes sheet, #2.

• HUD Fair Market Rental Rates shall be deed-restricted.
The project is no longer proposed as TDR and no longer proposes HUD rates.

• NHDOT permit required.
Applicant acknowledges comment.

• Provide additional screening for residential abutters.
Please find landscaping plans, sheets #37 & #38 with additional tree plantings in addition to the vinyl fence proposed.

• Discuss active and passive recreation uses with Planning Dept.

- Address area allocation of rec space to maximize usage of the rec space.
Extensive revisions and increase in recreation area have been provided on the Site Plan. The dog park is still included for passive recreation. The active recreation area has been revised to also include a large, generally flat area for outdoor activities with other amenities.

• Consider extending sidewalk.

As the project residential density has reverted to the original approved density, the applicant is not proposing any further sidewalk extension beyond what was originally required and constructed along NH Route 155.

ENGINEERING COMMENTS

• General Comment:

- Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf
Applicant acknowledges comment.

• Project Narrative

- Concerned about sewer impact to Charles St PS for 84-unit lodging building and two 90-unit single occupancy buildings; significant I&I in this area.
The project revision now proposes a sewerage design flow of 27,418 GPD, which is a 9.3% increase from the original approval under NHDES Sewer Discharge Permit D2022-0705 of 25,075 GPD.

- Defer to Fire and IS on minimum width for emergency vehicles. Typically, 20 ft is minimum.
Please find attached waiver request.

• Cover Sheet:

- Provide an overlay sheet in this set to show the previous design and how it compares to this one. In particular, how the impervious surface and utilities compare.
These overlay sheets are included as an addendum with the resubmission. Plans have not been added to the plan set as they are color overlay plans.

• Projects Notes (Sheet 2 of 60):

- Numbering is all off and needs to be revised or formatted better.

- Check for spelling errors.

- Note 22 to read "…by the City Engineer or Director of Planning and Community Development."

These revisions have been made, see project notes sheet, #2.

• Boundary Plan

- Did the City grant property line (N 03º01'12" E 194.48')? City has water and sewer here.

See response below.

• Pre-Existing Conditions Plan

- City still requires an easement at Hanson Rd.

The annotation style has changed on this sheet and the Boundary Plan to clarify that Hanson Road was discontinued, however a 33' wide access and utility easement still exists.

• Site Plan West

- Is the passive recreation/dog park area open to the public?

The dog park is not proposed to be open to the public as part of the Site Plan.

• Overview Grading Plan

- Does the proposed grade at the bocce court meet bocce standards?

See sheet #18 for Bocce court grading note.

- Will the dog park be regraded?

Notes for both of these comments have been added to sheet #18.

• Overview Utility Plan

- Are (2) 4" diameter water lines provided?

See below response.

- Is (1) 2" diameter water line sufficient for domestic?
There are no 2" waterlines proposed on the project. Each building is supported by 4" C.L.D.I. domestic and fire lines.

- Show gate at west entry near dog park.
This is now noted on the Detail Site Plan West, sheet #11.

• Utility Plan and Profile Tibetan Drive 4+00 to End

- Pipe shown on profile not found in plan.
Plans have been revised.

- Pipe and structure do not align in profile.
Plans have been revised.

POLICE DEPARTMENT COMMENTS

• This revised project has **49% higher** Weekday Daily vehicle trips, and **136% higher** Saturday Daily vehicle trips, compared to the previous development proposal. This should warrant a complete update of the Traffic Assessment - particularly relating to turning warrants – instead of the simple summary that is provided, along with a fresh review of the driveway permit by NHDOT. The previous Traffic Impact Assessment concluded that a left turn treatment for the eastbound approach would be warranted by 2032 for both the AM and PM peak traffic volumes, yet the developer has planned only for a right turn deceleration lane.

• The police department is strongly against approval of a project of this scale on this segment of Knox Marsh Road without provision for a left turn treatment and reduction of speed limit as endorsed by the Transportation Advisory Commission on August 22, 2022. A 15-year summary of crash data, previously provided to NHDOT, is available for the applicant's own analysis.
Please find Traffic Impact Analysis for the revised site layout.

INSPECTION SERVICES COMMENTS

• Discuss and clarify the number of TDR units being sought.
Comment no longer applicable.

• Did not appear to see narrative attached regarding TDR unit request. The 3 proposed structures are residential uses and the mixed use has been removed from the project from Inspection Services and code viewpoints. Clarify and justify removing the mixed-use component of the project.
This is no longer a TDR project.

• Discuss the overall number of parking spaces based on the use.
Parking calculation has been revised using the Site Review parking table based on the revised project density.

• With the obvious increase in vehicular volume provide supporting data to support not having a center turn lane, a deceleration lane and acceleration lane. Provide a detailed traffic analysis.
Please find Traffic Impact Analysis for the revised site layout.

• Discuss the additional pedestrian traffic and provide sidewalk to Progress Drive.
See response to Planning Department sidewalk comment.

• Note on plan showing how 1 ingress/egress meets NFPA 1 requirements.
There are multiple ingress/egress points for each building as demonstrated on the architectural plans.

FIRE DEPARTMENT COMMENTS

• Possibly adding a third hydrant located at Building A. Any emergency incident that would require a water supply at Building A would necessitate the use of the hydrant at Building B. This will create access issues for emergency vehicles as well as any other vehicle access.
A fire hydrant has been added to the rear of Building A, see sheets #28 & 31.

• Does the widening of Rt 155 include a deceleration lane west bound as well as turning lane east bound?
The completed NH Rt 155 widening included a widened shoulder for deceleration west bound only.

• No Parking/ Fire Lane signs in aisles less than 24'.
Two have been added to the Site Plan behind building C and two along Building A.

• Turning template looks good.

BUSINESS DEVELOPMENT COMMENTS

• Please add more information about the amenities offered at the proposed hotel - current building layout is almost identical to the residential buildings. Would hotel amenities be anticipated to have any impact on parking or traffic (e.g. due to event/meeting space)? Has a hotel operator been identified?

This is proposed as a microtel with minimal additional amenities. An operator has not been identified at this time.

• Please add more architectural variety/interest, especially at ground level and street-facing facades. Suggest making the hotel architecturally distinct from the apartments in some way. The space where the 2F footprint overhangs the parking podium feels odd and left over. Activating that space with hardscape and seating could make it more welcoming, especially on the residential buildings.

Please find revised architectural package.

• Placement of all 3 entrances towards the rear of the property feels inappropriate. Re-orienting the hotel to have the entrance face the street would improve visibility. If there is a reason not to face the residential entrances towards the street, orienting both internally could create a courtyard feel.

The lodging building has been rotated 180 degrees to have the entry vestibule facing NH Route 155.

• The location of the hotel loading zone feels more appropriate for delivery trucks in a mixed-use development. Loading/unloading space for hotel guests would typically be closer to the main entrance.

This loading zone is not intended for hotel guests, but for hotel deliveries.

• I didn't identify a narrative that spoke directly to the TDR criteria. Please provide one or clarify how it was submitted.

Comment no longer applicable.

PLANNING BOARD COMMENSTS

• Has hotel operator been identified

An operator has not been identified at this time.

• Clarify need for runoff and minimum cover waiver requests.
See justifications provided within the respective waiver requests.

Respectfully,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
VP-Engineering Operations

Christopher R. Berry, LLS
Principal, President

Kenneth A. Berry, PE, LLS
VP – Emeritus
Engineer of Record

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November 26, 2024/February 15, 2026

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 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 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 33-unit residential buildings, referred to as Residential Buildings "B" and Residential Building "C". This results in a total of 66 single primarily 2-bedroom units with 6 studio units and 12 1-bedroom units mixed in. 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. Utilizing the Commercial Zoning District base density calculation, the parcel is calculated to be allowed 66 units by right.

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).

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.

To the west of Building "C", passive recreation space includes a fenced in dog park with active recreation area including a bocce court and other usable space. This includes a gravel path from the building area to the dog park and active recreation area. Square footages are provided in excess of the recreation space requirements. The large open portion of the active recreation area is intended as a grassed field/play area.

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 includes elevator access to the upper levels, an entry vestibule on the northern side of the residential building and southern side of the lodging 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 was previously approved for greater than 20% impervious within the Secondary Groundwater Recharge Overlay (33.8% previous). The revised Site Plan provides an impervious percentage of 31.6%, so a new Environmental CUP is not required. 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 27,418 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. No waivers for statistical zones are required for this submission. 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 Impact Analysis has been conducted by VHB, who is currently working with NHDOT on a scope of improvements to NH Route 155. See attached Traffic Impact Analysis. 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
- 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
VP-Engineering Operations

Christopher R. Berry, LLS
Principal, President

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335 Second Crown Pt. Rd., Barrington, NH 03825
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Memorandum

To: Lucas Miller
NHDOT District 6
271 Main Street PO Box 740
Durham, NH 03824

Date: March 13, 2026

Project #: 53193.00

From: Jenn Conley, PE
Evan Haugh

Re: Revised Traffic Impact Study
Proposed Residences and Hotel
239 Knox Marsh Road, Dover, New Hampshire

Introduction

Vanasse Hangen Brustlin, Inc. (VHB) has prepared this Traffic Impact Study to summarize the anticipated transportation impacts associated with the proposed land development project to be located at 239 Knox Marsh Road in Dover, New Hampshire. The site location is identified on **Figure 1**. The proposed development will consist of 180 multifamily units and an 84-room hotel. Access is proposed to be provided via a full access driveway along the north side of NH Route 155 as the fourth leg to the existing intersection with the FW Webb western driveway.

Based on a review of the Institute of the Transportation Engineers (ITE) Trip Generation Manual, it was estimated that the proposed development will generate over 100 additional trips during weekend and weekday peak hours at the site driveway intersection. Traffic generated by the proposed development is not expected to exceed 100 peak hour trips at any additional intersections beyond the site driveway.

Figure 1 Site Location



Engineers | Scientists | Planners | Designers
2 Bedford Farms Drive, Suite 200, Bedford, New Hampshire 03110
P 603.391.3900 **F** 603.518.7495 www.vhb.com

Existing Conditions

The proposed project will be accessed via a single driveway across from the FW Webb western driveway on NH Route 155. The existing volume, speed and classification of traffic at that location were reviewed for both daily and peak hour time frames.

Traffic Volume Data

Automatic traffic recorders (ATRs) collected volume and speed data on NH Route 155 immediately west of the site driveway for a continuous 66 hour period. The count period spanned from Wednesday, June 4th at 10:00 pm to Saturday, June 7th at 4:15 pm (2025). During this period, 36,000 vehicles were counted on NH Route 155, approximately 50% eastbound and 50% westbound.

The ATR was used to identify peak hours. The weekday AM peak hour occurred from 7:15-8:15 am, the weekday PM peak hour occurred from 4:45-5:45 pm, and the Saturday peak hour occurred from 11:30-12:30 pm. Turning movement count data was collected at the intersection of Knox Marsh Road and the primary (west) FW Webb driveway from 7:00-9:00 am and 4:15-6:15 pm on Thursday, June 5th, and from 11:00 am -1:00 pm on Saturday, June 7th, 2025. During the AM peak hour, heavy trucks accounted for 3.5% of the traffic stream. During the PM peak hour, less than 1% of vehicles were trucks.

Over the course of the day, the 85th percentile speed, or the speed that 85% of the traffic is traveling at or less than, was found to be 53 miles per hour, 3 miles per hour over the posted speed. The 85th percentile speed remained consistent during each of the peak hours. The average speed was 48 mph.

Adjustments

An annual average traffic-growth percentage and seasonal adjustment factor was determined based on NHDOT historical traffic volume data from a permanent count station located along Dover Point Road in Dover.[1] The NHDOT volumes and factors are provided attached to this document.

- Seasonal adjustment to peak-month conditions:
  - June = increase traffic counts by a factor of 1.05
- Annual adjustment to reflect future baseline conditions:
  - 2003-2023 Average = 1.08% annual decrease
  - 2013-2023 Average = 1.48% annual decrease
  - Although moderate decreases have been observed, the NHDOT standard was followed, which requires growth rates to be positive and at least 1.00 percent per year.

Although other projects were identified in the site area, and discussed during the NHDOT scoping meeting, per the discussion, the traffic associated with these projects was not included in this TIAS . Those projects included:

- Large project on Littleworth Road – no submission has been made to NHDOT
- 99 Knox Marsh Road – no official TIAS has been filed.

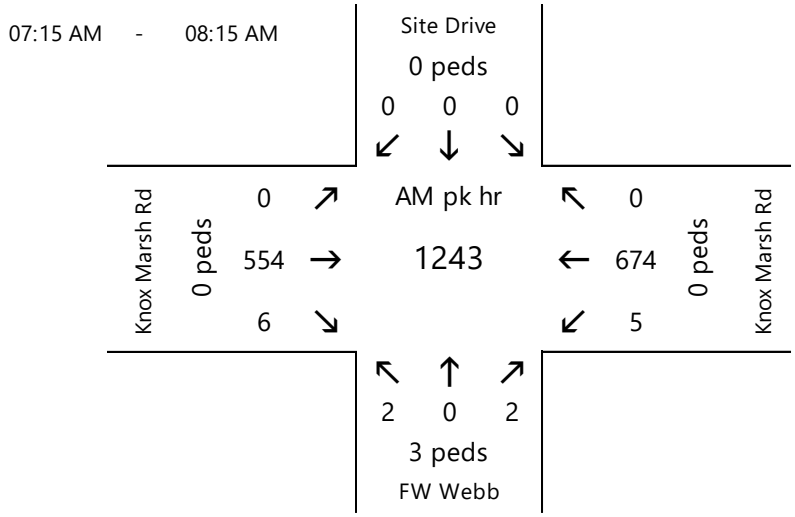
[1] NHDOT Bureau of Traffic. Dover Point Road south of Middlebrook Road, Dover. (Location ID: 02125001).

Memorandum

- Dover Fields Development on Mast Road and Durham Road – no study area overlap
- NHDOT Project 41373 multi-use path – no traffic volume impact anticipated (site amenity)

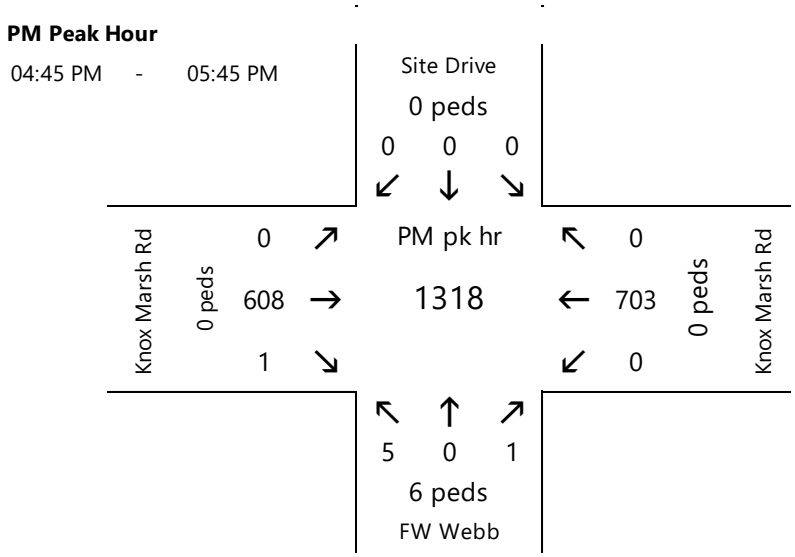
The 2027 No Build volumes are presented in **Figure 2**, **Figure 3**, and **Figure 4**.

Figure 2 2027 No Build AM Peak



	Approach Direction			
%	SB	WB	NB	EB
auto	100%	97%	100%	96%
heavy	0%	3%	0%	4%
% trucks	4% (Overall)			
PHF	1.00	0.85	0.50	0.92

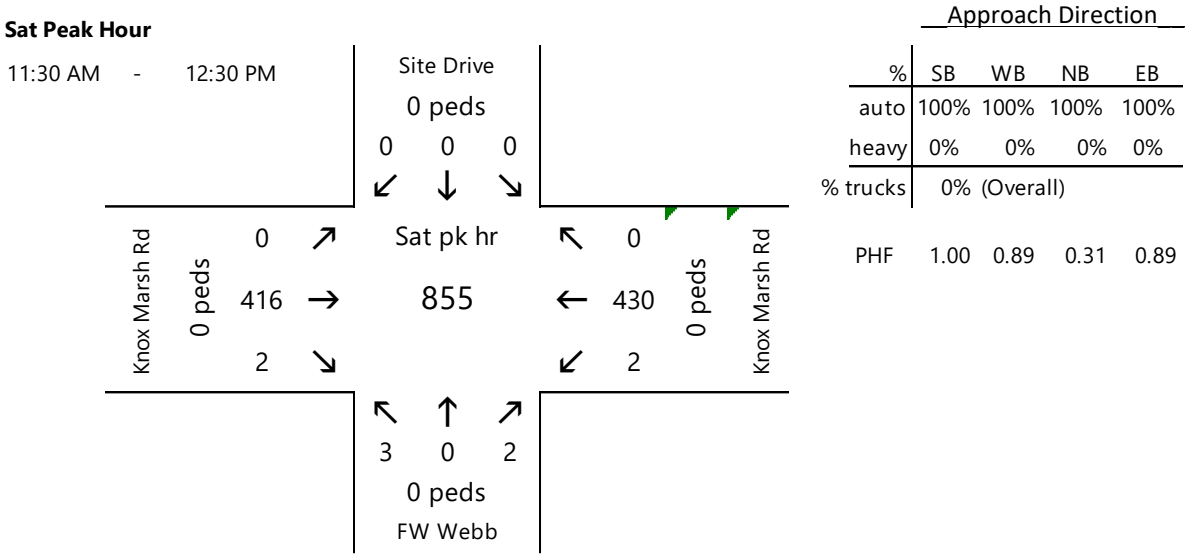
Figure 3 2027 No Build PM Peak



	Approach Direction			
%	SB	WB	NB	EB
auto	100%	99%	100%	99%
heavy	0%	1%	0%	1%
% trucks	1% (Overall)			
PHF	1.00	0.84	0.38	0.86

Memorandum

Figure 4 2027 No Build Saturday Peak



Crash Data

Five years of crash data from 2019-2023 were obtained for the frontage of the development parcel. In this time, two crashes occurred. The first crash was a single-vehicle crash striking a utility pole during icy conditions in 2020. The second crash was a two-vehicle crash in 2022 that produced a suspected serious injury. Both crashes occurred in front of the 239 Knox Marsh Road parcel but not at or adjacent to the proposed driveway. A spreadsheet is provided in Appendix H.

Sight Distances

The NHDOT driveway policy requires 400 feet of sight distance. To the east of the driveway, Knox Marsh Road is straight and level and sight distance easily exceeds 400 feet. To the west, Knox Marsh Road is straight and level until it enters a horizontal curve approximately 380 feet west of the driveway. Although this is slightly less than the requirement, the FW Webb driveway is already in this location and no crashes have been reported at that location. The high density of driveways in this area, including a large apartment complex immediately adjacent to that horizontal curve, has likely accustomed drivers to expect turning and entering traffic along Route 155.

While it would be possible to shift the driveway to achieve a 400 foot sight distance, the proposed location mirroring FW Webb's driveway is preferred for safety and operations.

Proposed Project

The trips anticipated to be generated by the proposed development were calculated based on industry standards. The trips were distributed to the roadway network based on existing traffic patterns and US Census Journey to Work data.

Trip Generation

To estimate the volume of traffic to be generated by the proposed project, trip rates were reviewed that are published in the Institute of Transportation Engineers (ITE) Trip Generation Manual.[2] **Table 1** summarizes the ITE trip-generation estimates for the proposed development as stand-alone uses. **Table 1** also presents the trip generation associated with the previously permitted development. The trip-generation calculations are provided as an attachment to this document.

Table 1 Peak Hour Trip Generation Summary

Peak Hour/Direction	Residential Trips [a]	Hotel Trips [b]	Total Trips	Previously Permitted Trips
Weekday AM				
Enter	16	19	35	27
Exit	52	15	67	28
Total	68	34	102	55
Weekday PM				
Enter	43	17	60	32
Exit	28	17	45	36
Total	71	34	105	68
Saturday Midday				
Enter	37	36	73	28
Exit	36	28	64	27
Total	73	64	137	55

a ITE Land Use Code 221 (Multifamily Housing [Mid-Rise]) for 180 dwelling units.
b ITE Land Use Code 310 (Hotel) for 84 rooms.

The project is anticipated to generate 102 trips during the weekday AM peak hour, 105 trips during the weekday PM peak hour, and 137 trips during the Saturday midday peak hour. As shown in Table 1, this is an increase relative to the previous development program.

Trip Distribution

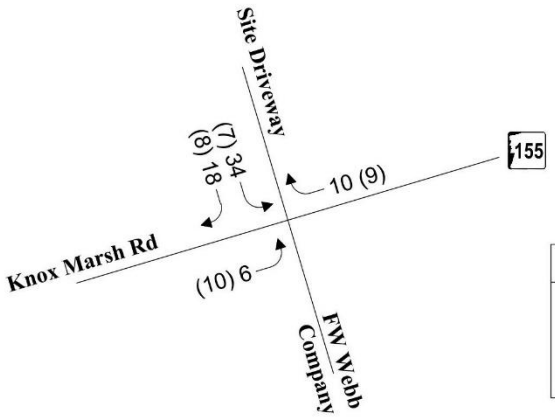
The directional distribution of the residential site trips was assigned based on United States Census Bureau Journey-to-Work data with the City of Dover as the place of residency. Accordingly, a 35/65 west/east distribution was used along NH Route 155. The distribution of the proposed hotel site trips was based on the traffic split along NH Route 155. Similar to historic data, the recent peak hour data indicates that peak hour traffic volumes are approximately 50/50 during all peak hours (only as directional as 52/48 at most). The site generated traffic volumes were distributed based on these travel patterns as reflected in **Figure 5**.

[2] Institute of Transportation Engineers. Trip Generation Manual, 11th ed. Washington, DC, Sept. 2021.

Memorandum

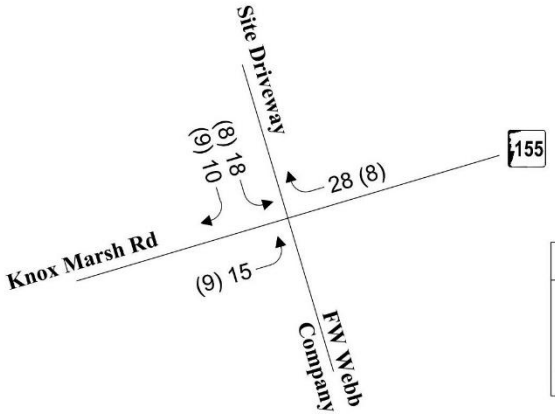
Figure 5 Trip Distribution

Weekday Morning



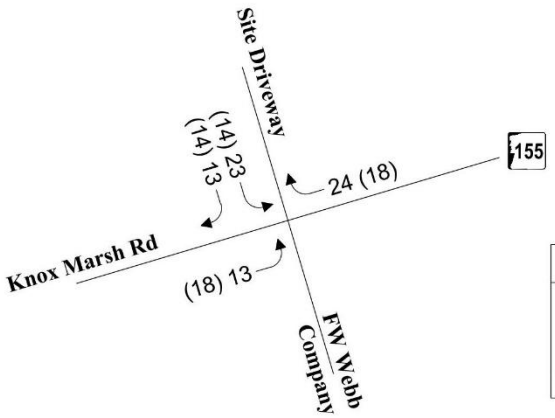
SITE		
	Multifamily	Hotel
IN	16	(19)
OUT	52	(15)
TOTAL	68	(34)

Weekday Evening



SITE		
	Multifamily	Hotel
IN	43	(17)
OUT	28	(17)
TOTAL	71	(34)

Saturday Midday



SITE		
	Multifamily	Hotel
IN	37	(36)
OUT	36	(28)
TOTAL	73	(64)

Build Volumes

Traffic volumes under No Build and Build conditions for 2027 and 2037 are provided below:

Table 2 Weekday AM Peak Hour Volumes

	Weekday AM Peak Hour											
	Northbound (FW Webb Driveway)			Southbound (Site Driveway)			Eastbound (Knox Marsh Rd)			Westbound (Knox Marsh Rd)		
Scenario	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
June 2025 Count	2	0	2	0	0	0	0	554	6	5	674	0
2025 Average	2	0	2	0	0	0	0	537	6	5	654	0
2025 Peak	2	0	2	0	0	0	0	582	6	5	708	0
2027 No Build	2	0	2	0	0	0	0	593	6	5	722	0
2037 No Build	2	0	2	0	0	0	0	655	6	5	797	0
Trip Generation	0	0	0	41	0	26	16	0	0	0	0	19
2027 Build	2	0	2	41	0	26	16	593	6	5	722	19
2037 Build	2	0	2	41	0	26	16	655	6	5	797	19

Table 3 Weekday PM Peak Hour Volumes

	Weekday PM Peak Hour											
	Northbound (FW Webb Driveway)			Southbound (Site Driveway)			Eastbound (Knox Marsh Rd)			Westbound (Knox Marsh Rd)		
Scenario	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
June 2025 Count	5	0	1	0	0	0	0	608	1	0	703	0
2025 Average	5	0	1	0	0	0	0	590	1	0	682	0
2025 Peak	5	0	1	0	0	0	0	638	1	0	738	0
2027 No Build	5	0	1	0	0	0	0	651	1	0	753	0
2037 No Build	5	0	1	0	0	0	0	719	1	0	832	0
Trip Generation	0	0	0	26	0	19	24	0	0	0	0	36
2027 Build	5	0	1	26	0	19	24	651	1	0	753	36
2037 Build	5	0	1	26	0	19	24	719	1	0	832	36

Table 4 Saturday Peak Hour Volumes

	Saturday Peak Hour											
	Northbound (FW Webb Driveway)			Southbound (Site Driveway)			Eastbound (Knox Marsh Rd)			Westbound (Knox Marsh Rd)		
Scenario	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
June 2025 Count	3	0	2	0	0	0	0	416	2	2	430	0
2025 Average	3	0	2	0	0	0	0	404	2	2	417	0
2025 Peak	3	0	2	0	0	0	0	437	2	2	452	0
2027 No Build	3	0	2	0	0	0	0	446	2	2	461	0
2037 No Build	3	0	2	0	0	0	0	492	2	2	509	0
Trip Generation	0	0	0	37	0	27	31	0	0	0	0	42
2027 Build	3	0	2	37	0	27	31	446	2	2	461	42
2037 Build	3	0	2	37	0	27	31	492	2	2	509	42

Turn Lane Evaluation

The recommended design for the intersection of NH Route 155 and FW Webb and the proposed site driveway was investigated. Left and right turn evaluations were conducted for this location using volumes for each of the peak hours during each of the horizon years, 2027 and 2037 and criteria provided in NCHRP 457. For the turn lane evaluations, volumes were seasonally adjusted to average conditions by applying a factor of 0.97.

In both years and in all three peak hours, left and right turn lanes into the site are warranted. The NCHRP criteria find that a single exiting lane on the site driveway will be sufficient in each scenario. All backup data is provided in Attachment C. Based on this finding, the Build with Mitigation Condition was analyzed with left and right turn lanes into the site.

At the scoping meeting, NHDOT noted that the City of Dover has considered proposing a 40 mph speed limit in this area. If the 85th percentile speed were reduced, the left and right turn lane warrants would adjust. Even at 40 mph, the only scenarios that no longer meet warrants are AM and Saturday peak hours for the right turn lane. Reducing operating speeds so significantly would likely require more substantial changes to the roadway than reducing the speed limit alone.

Capacity Analysis

An intersection capacity analysis was performed for NH Route 155 and FW Webb and the proposed site driveway. Levels of service (LOS) were calculated based on the criteria published in the Highway Capacity Manual 6th Edition. Levels of service range from A to F with LOS A representing generally free flowing operating conditions and LOS F representing congested conditions.

Three scenarios were developed: No Build, Build, and Build with Mitigation which adds eastbound left and westbound right turn lanes to the Knox Marsh Road approaches. **Table 5** summarizes traffic operations at the Study Intersection during the 2027 weekday and Saturday peak hours. **Table 6** summarizes traffic operations at the Study Intersection during the 2037 weekday and Saturday peak hours.

In 2027, the mainline approaches consistently maintain a LOS A, with little to no delay from turning vehicles. Queuing is also minimal. Under the Build conditions, the site driveway approach will operate at a LOS F, however queues do not exceed three vehicles. The delay at the FW Webb driveway increases, however this affects minimal traffic (4 vehicles in the AM and 6 in the PM) whose drivers can use FW Webb's second driveway as a relief route if necessary. The maximum queue length exiting the site is approximately 3 vehicles.

In the 2037 Build condition, greater background traffic adds to the delay leaving the site, primarily for left turns. Driveway exits during the AM and PM peak hours operate at a LOS F. Turning traffic is light enough to avoid queues (greater than one vehicle) on Knox Marsh Road, however turn lanes are still recommended given the speeds on the road and that the proposed development is a larger trip generator than nearby driveways. With turn lanes, turning traffic does not impose any delay on through vehicles and queues can be easily stored in short turn lanes.

Table 5 2027 Unsignalized Intersection Capacity Analysis - NH Route 155/ FW Webb/ Site Driveway

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	Delay[1]	LOS[2]	Q95[3]	Delay[1]	LOS[2]	Q95[3]	Delay[1]	LOS[2]	Q95[3]
2027 No Build									
Site Driveway, SB	-	-	-	-	-	-	-	-	-
FW Webb, NB	23.2	C	3	38.2	E	10	16.3	C	5
NH Route 155, EB	0	A	0	0	A	0	0	A	0
NH Route 155, WB	0.1	A	0	0	A	0	0	A	0
Overall Intersection	0.2	A		0.4	A		0.3	A	
2027 Build									
Site Driveway, SB	73.6	F	78	75	F	58	25.7	D	30
FW Webb, NB	33.6	D	5	69.6	F	20	21.8	C	5
NH Route 155, EB	0.3	A	3	0.4	A	3	0.6	A	3
NH Route 155, WB	0.1	A	0	0	A	0	0	A	0
Overall Intersection	3.7	A		2.9	A		2.1	A	
2027 Build w/Mitigation									
Site Driveway, SB	69.3	F	75	68.2	F	53	24.3	C	28
FW Webb, NB	33.3	D	5	67.4	F	18	21.6	C	5
NH Route 155, EB	0.3	A	3	0.4	A	3	0.6	A	3
NH Route 155, WB	0.1	A	0	0	A	0	0	A	0
Overall Intersection	3.5	A		2.7	A		2	A	

Notes

1: Delay expressed in seconds per vehicle

2: Level of Service (Delay Range: A: 0-10, B: >10-15, C: >15-25, D: >25-35, E: >35-50, F: >50)

3: 95th percentile queue length expressed in feet

Table 6 2037 Unsignalized Intersection Capacity Analysis - NH Route 155/ FW Webb/ Site Driveway

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	Delay[1]	LOS[2]	Q95[3]	Delay[1]	LOS[2]	Q95[3]	Delay[1]	LOS[2]	Q95[3]
2037 No Build									
Site Driveway, SB	-	-	-	-	-	-	-	-	-
FW Webb, NB	26	D	3	38.8	E	5	17.3	C	3
NH Route 155, EB	0	A	0	0	A	0	0	A	0
NH Route155, WB	0.1	A	0	0	A	0	0	A	0
Overall Intersection	0.1	A		0.1	A		0.1	A	
2037 Build									
Site Driveway, SB	103.1	F	95	86.4	F	63	29.6	D	35
FW Webb, NB	37.9	E	3	67.7	F	8	23.4	C	3
NH Route 155, EB	0.2	A	3	0.3	A	3	0.5	A	3
NH Route155, WB	0.1	A	0	0	A	0	0	A	0
Overall Intersection	4.6	A		2.7	A		2	A	
2037 Build w/Mitigation									
Site Driveway, SB	91.8	F	90	80.3	F	60	28.1	D	33
FW Webb, NB	37.3	E	3	66.6	F	8	23.1	C	3
NH Route 155, EB	0.2	A	3	0.3	A	3	0.5	A	3
NH Route155, WB	0.1	A	0	0	A	0	0	A	0
Overall Intersection	4.2	A		2.5	A		1.9	A	

Notes

1: Delay expressed in seconds per vehicle

2: Level of Service (Delay Range: A: 0-10, B: >10-15, C: >15-25, D: >25-35, E: >35-50, F: >50)

3: 95th percentile queue length expressed in feet

Conclusions

The potential traffic impacts associated with the development of 239 Knox Marsh Road into a mixed use development consisting of a residential component and a hotel were evaluated. Site-generated traffic was added to the NH Route 155 traffic conditions anticipated in both 2027 and 2037, and the findings indicate the following:

- The site is anticipated to generate a maximum of 137 peak hour trips (during the Saturday peak hour). The AM and PM peak hours generate 102 and 105 trips, respectively.
- The additional trips have minimal impact on mainline (NH Route 155) traffic operations. Delay increases for the driveway approaches, which each operate at LOS E/F for all weekday peak periods.
- Turn lane warrants were evaluated for projected 2027 traffic volumes and a design speed of 53 mph (matching the measured 85th percentile speed). Both left and right turn lanes into the site were warranted at opening year.
- The intersection of NH Route 155 at FW Webb and the proposed site driveway operates at an overall LOS A. It is anticipated to maintain a LOS A once site-generated trips are added, both with and without mitigation. Turn lanes are still recommended per warrants and for safer operation.

Attachments

A. Traffic Adjustment Factors
B. Trip Generation
C. Turn Lane Evaluation
D. Intersection Capacity Analysis
E. Turn Lane Sketch
F. Traffic Count
G. Scoping Meeting Minutes
H. Crash History
I. Speed Study
J. Trip Distribution (Journey to Work) Data

Attachment A

Traffic Adjustment Factors

Year 2023 Monthly Data

Town: Dover
Station: 02125001
Location: Dover Point Rd south of Thornwood Ln
Group: 4

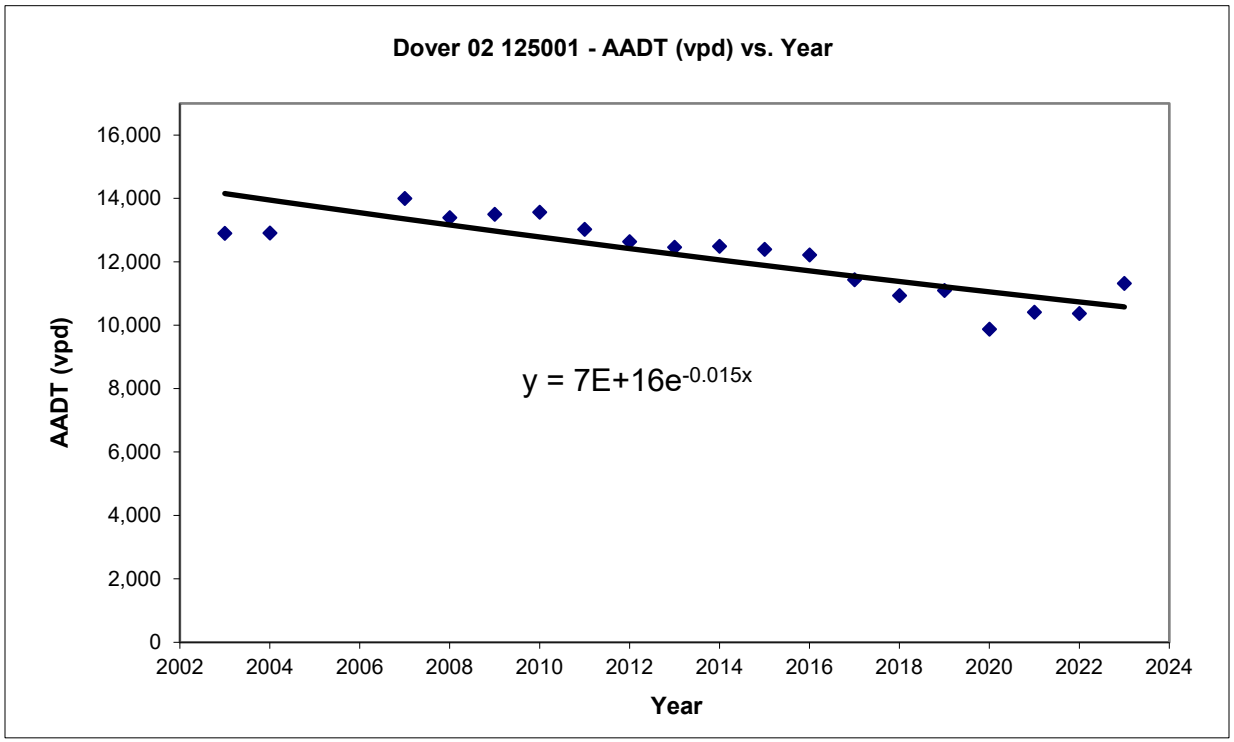
Month	MADT	Adjustment to Average	Adjustment to Peak
January	9,913	1.15	1.25
February	10,056	1.13	1.23
March	10,132	1.13	1.22
April	10,935	1.04	1.13
May	11,958	0.95	1.03
June	11,760	0.97	1.05
July	11,932	0.96	1.04
August	12,253	0.93	1.01
September	12,083	0.94	1.02
October	11,841	0.96	1.04
November	12,371	0.92	1.00
December	11,592	0.98	1.07

AADT: 11,402
Peak Month: 12,371

Station 02125001
Dover - Dover Point Road south of Middlebrook Road
Group 4
Region E
FC 4

Year	AADT	Annual Change
2003	12901	
2004	12912	0.09%
2005		
2006		
2007	14000	
2008	13393	-4.34%
2009	13500	0.80%
2010	13567	0.50%
2011	13024	-4.00%
2012	12639	-2.96%
2013	12461	-1.41%
2014	12490	0.23%
2015	12396	-0.75%
2016	12219	-1.43%
2017	11436	-6.41%
2018	10938	-4.35%
2019	11100	1.48%
2020	9876	-11.03%
2021	10410	5.41%
2022	10373	-0.36%
2023	11319	9.12%

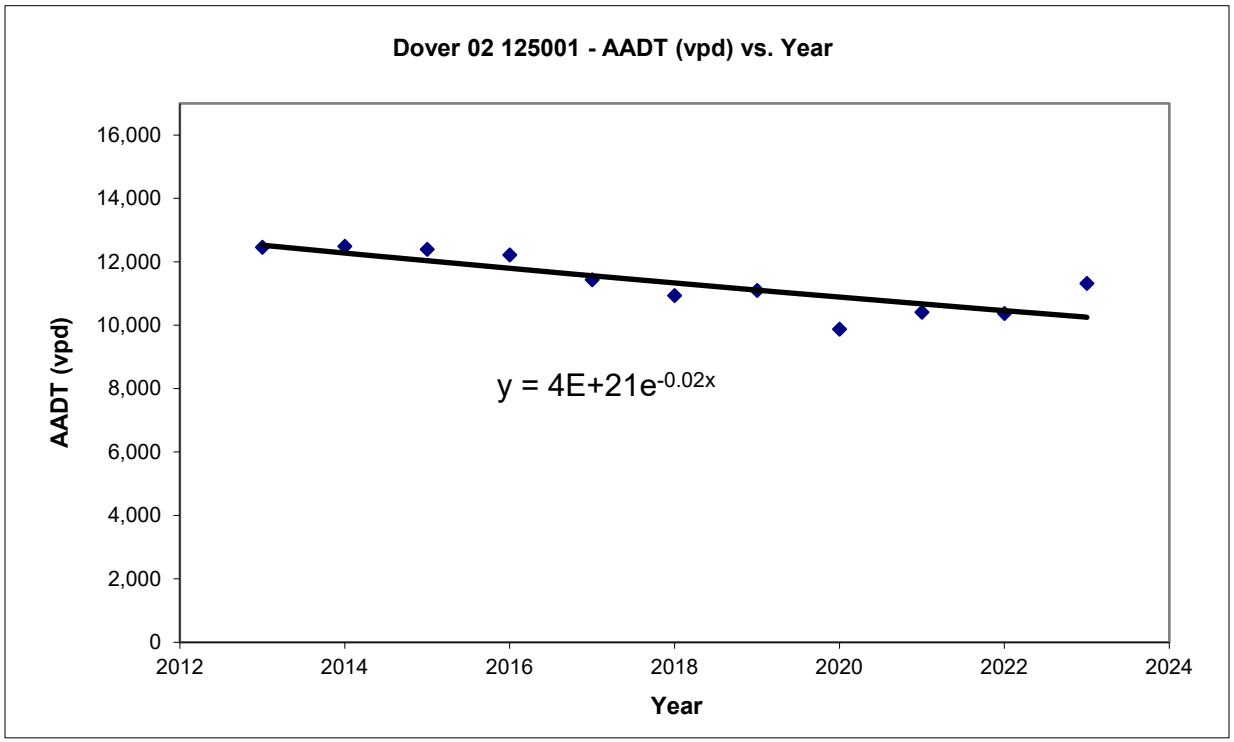
CAGR	-0.65%
Exp	-1.50%
Avg	-1.08%



Station 02125001
Dover - Dover Point Road south of Middlebrook Road
Group 4
Region E
FC 4

Year	AADT	Annual Change
2013	12461	
2014	12490	0.23%
2015	12396	-0.75%
2016	12219	-1.43%
2017	11436	-6.41%
2018	10938	-4.35%
2019	11100	1.48%
2020	9876	-11.03%
2021	10410	5.41%
2022	10373	-0.36%
2023	11319	9.12%

CAGR	-0.96%
Exp	-2.00%
Avg	-1.48%



Attachment B

Trip Generation

ITE TRIP GENERATION WORKSHEET
(11th Edition, Updated 2021)

LANDUSE: Multifamily Housing (Mid-Rise) - Not Close to Rail Transit: *4-10 stories*
LANDUSE CODE: 221 Independent Variable --- Number of Dwelling Units
SETTING/LOCATION: General Urban/Suburban
JOB NAME: 180 dwelling units
JOB NUMBER:

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	11	0.93	4.54	3.76	5.40	201	60	330	50%	50%
AM PEAK OF GENERATOR	23	0.89	0.35	0.13	0.53	226	21	1,168	26%	74%
PM PEAK OF GENERATOR	22	0.93	0.39	0.19	0.60	221	21	1,168	60%	40%
AM PEAK (ADJACENT ST)	30	0.91	0.37	0.15	0.53	173	26	490	23%	77%
PM PEAK (ADJACENT ST)	31	0.91	0.39	0.19	0.57	169	26	490	61%	39%

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	818	409	409	814	407	407
AM PEAK OF GENERATOR	63	16	47	63	16	47
PM PEAK OF GENERATOR	70	42	28	73	44	29
AM PEAK (ADJACENT ST)	67	15	51	68	16	52
PM PEAK (ADJACENT ST)	70	43	27	71	43	28

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	5	0.91	4.57	4.03	5.31	250	140	330	50%	50%
PEAK OF GENERATOR	5	0.92	0.39	0.34	0.43	250	140	330	51%	49%

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	824	412	412	830	415	415
PEAK OF GENERATOR	70	36	34	72	37	36

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	5	0.85	3.77	3.06	4.24	250	140	330	50%	50%
PEAK OF GENERATOR	5	0.79	0.32	0.26	0.42	250	140	330	55%	45%

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	680	340	340	674	337	337
PEAK OF GENERATOR	58	32	26	65	36	29

ITE TRIP GENERATION WORKSHEET
(11th Edition, Updated 2021)

LANDUSE: Hotel
LANDUSE CODE: 310
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Rooms

84 rooms

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	7	0.85	7.99	5.31	9.53	148	100	260	50%	50%
AM PEAK OF GENERATOR	33	0.64	0.53	0.25	1.42	282	86	575	53%	47%
PM PEAK OF GENERATOR	32	0.69	0.60	0.22	0.97	285	86	575	58%	42%
AM PEAK (ADJACENT ST)	28	0.84	0.46	0.20	0.84	182	74	426	56%	44%
PM PEAK (ADJACENT ST)	31	0.78	0.59	0.26	1.06	186	74	426	51%	49%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	672	336	336	488	244	244
AM PEAK OF GENERATOR	45	24	21	51	27	24
PM PEAK OF GENERATOR	50	29	21	51	30	22
AM PEAK (ADJACENT ST)	39	22	17	35	19	15
PM PEAK (ADJACENT ST)	50	25	24	34	17	17

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	9	0.93	8.07	6.35	9.79	202	100	355	50%	50%
PEAK OF GENERATOR	10	0.80	0.72	0.49	1.23	192	100	355	56%	44%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	678	339	339	488	244	244
PEAK OF GENERATOR	60	34	27	64	36	28

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	9	0.90	5.94	4.01	8.48	202	100	355	50%	50%
PEAK OF GENERATOR	9	0.86	0.57	0.39	0.72	202	100	355	48%	52%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	499	249	249	193	97	97
PEAK OF GENERATOR	48	23	25	34	16	18

Attachment C

Turn Lane Evaluation

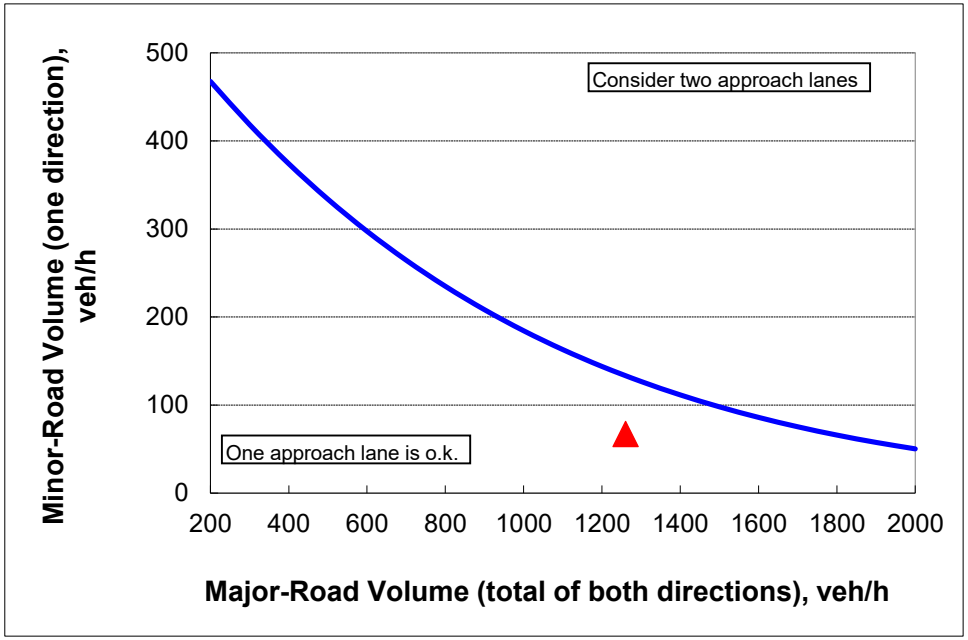
Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1261
Percentage of right-turns on minor road, %:	38.8%
Minor-road volume (one direction), veh/h:	67

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	133
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	



CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

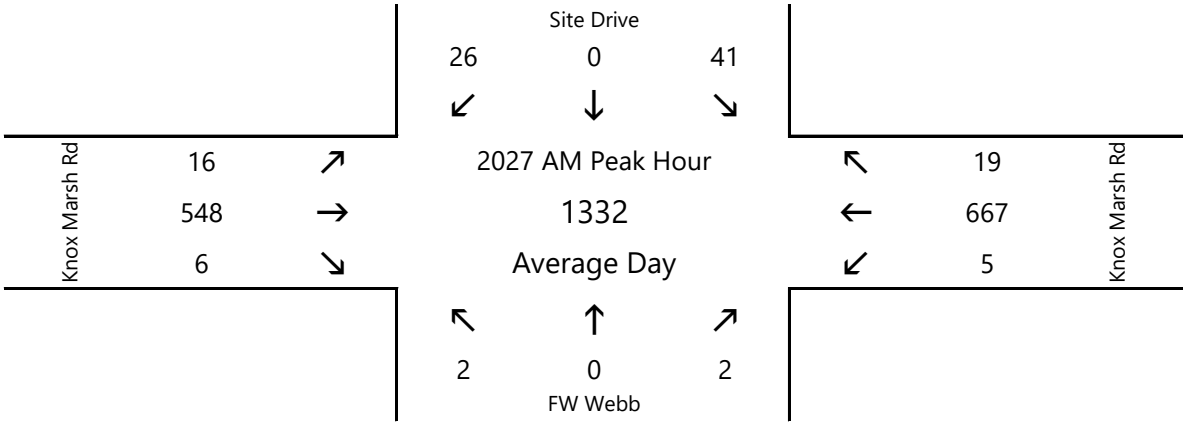


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

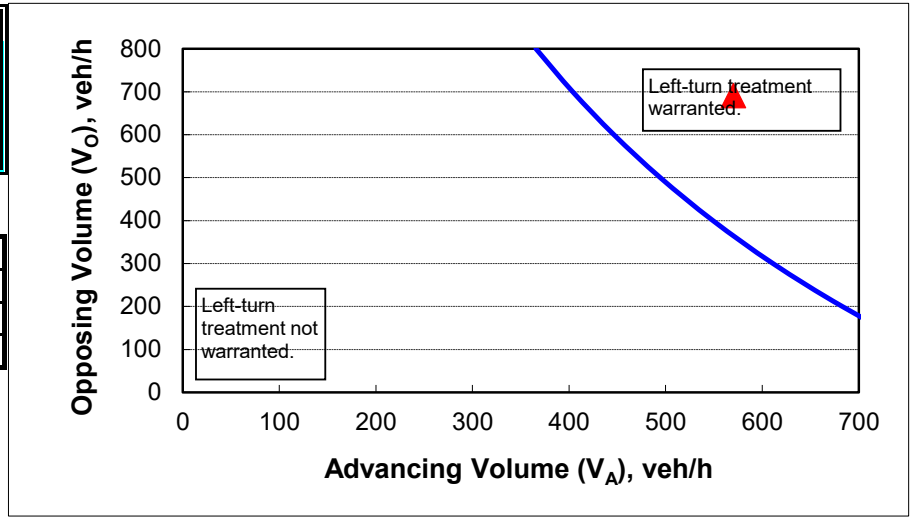
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	53
Percent of left-turns in advancing volume (V_A), %:	2.8%
Advancing volume (V_A), veh/h:	570
Opposing volume (V_O), veh/h:	691

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	407
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

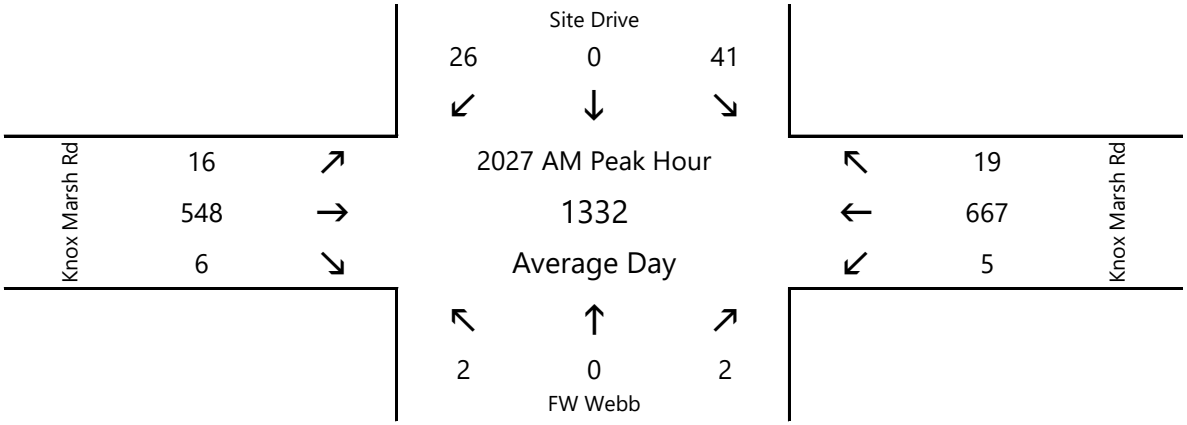


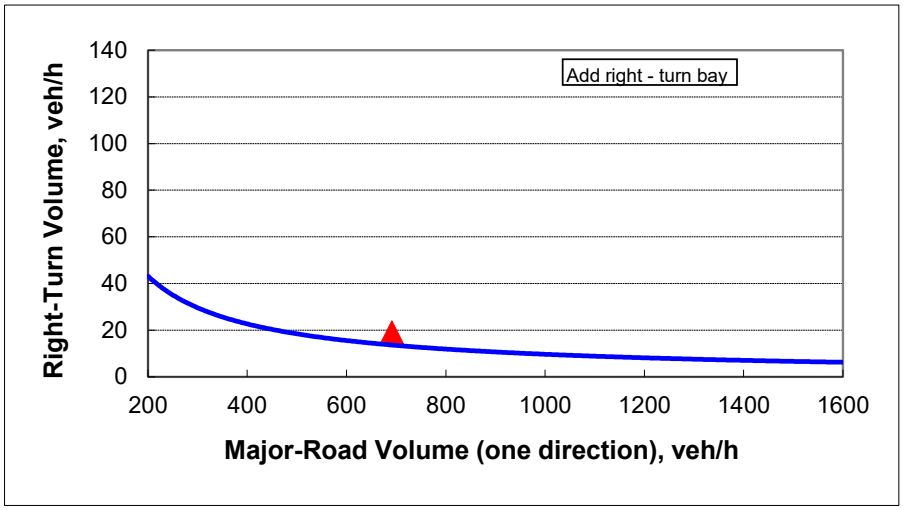
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	53
Major-road volume (one direction), veh/h:	691
Right-turn volume, veh/h:	19

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	14
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



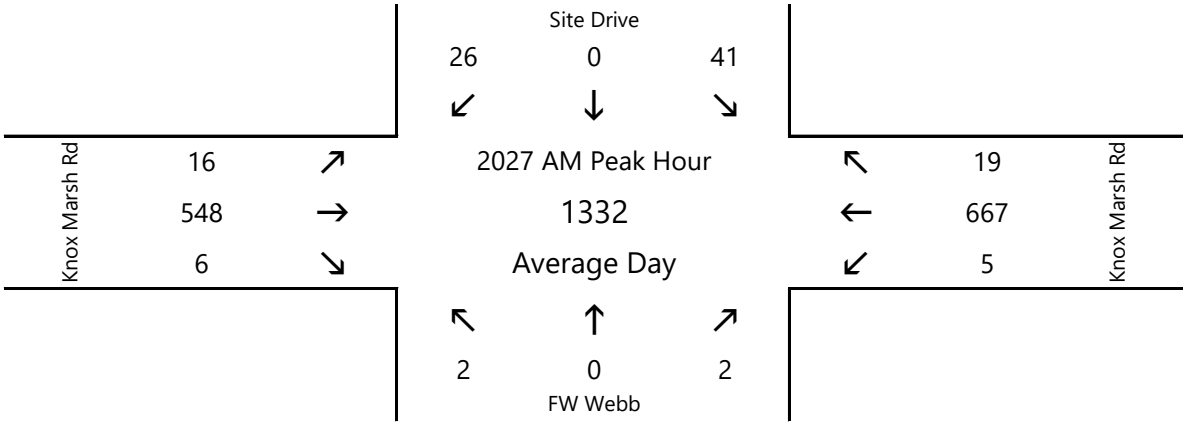


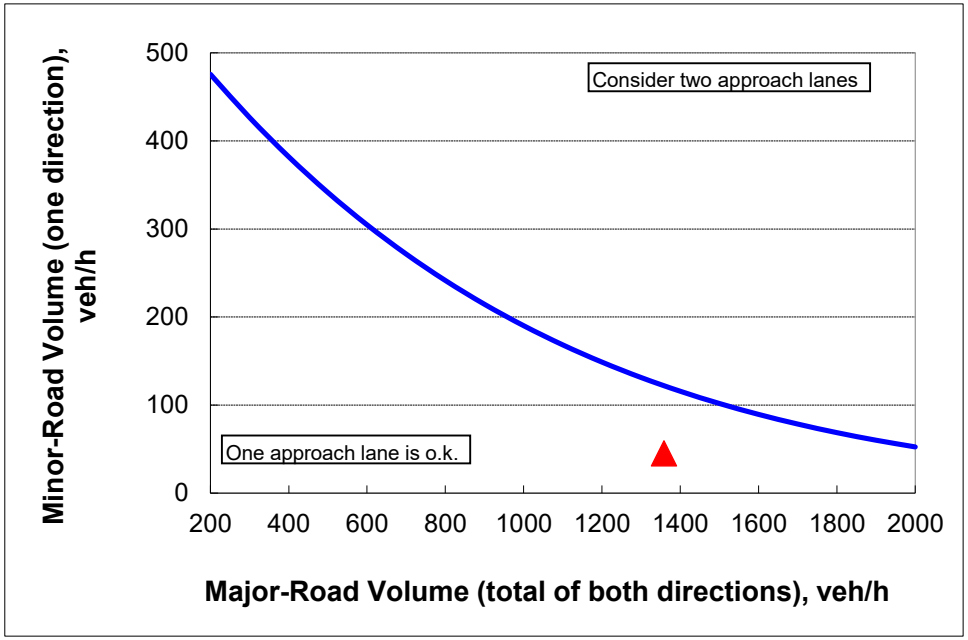
Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1359
Percentage of right-turns on minor road, %:	42.2%
Minor-road volume (one direction), veh/h:	45

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	122
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	



CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

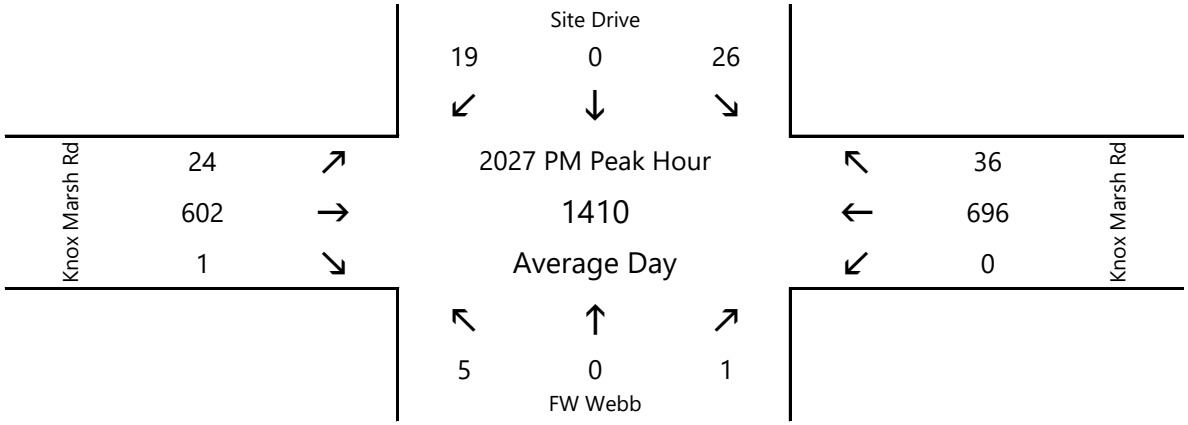


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

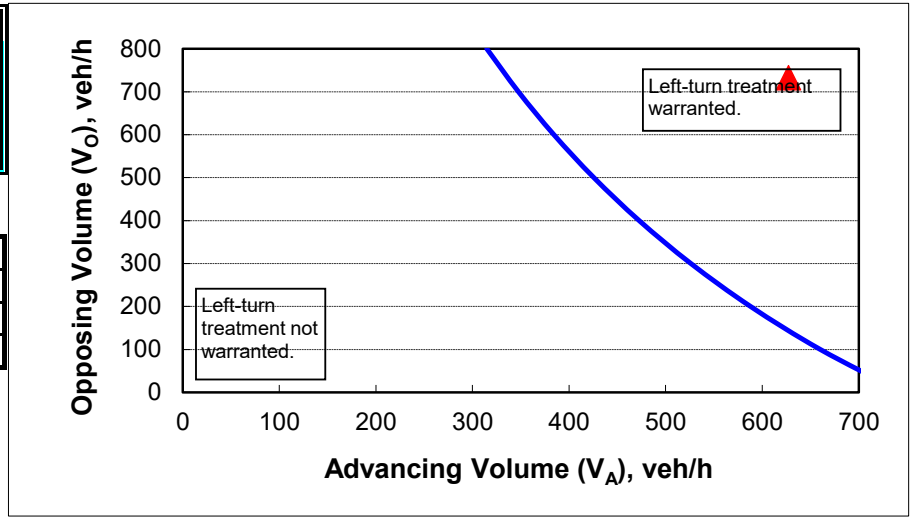
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	53
Percent of left-turns in advancing volume (V_A), %:	3.8%
Advancing volume (V_A), veh/h:	627
Opposing volume (V_O), veh/h:	732

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	337
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

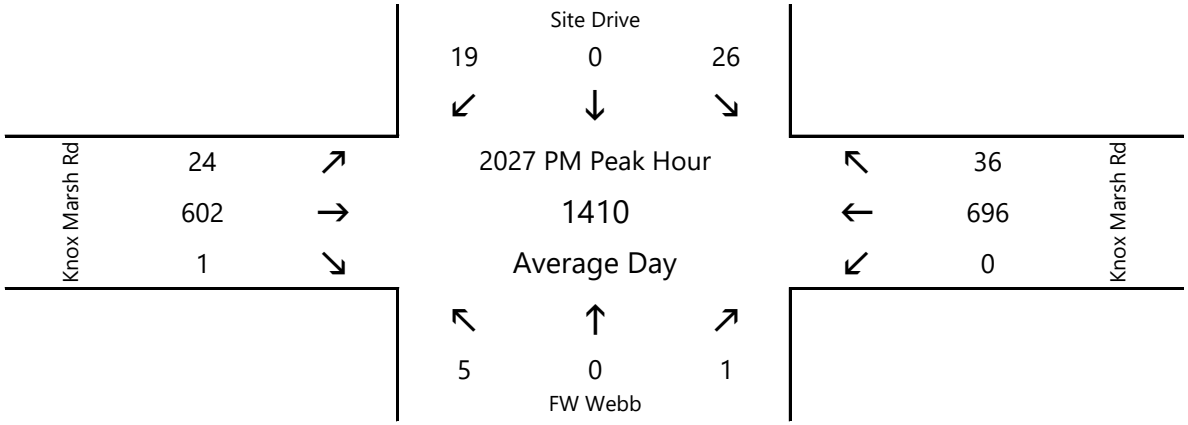


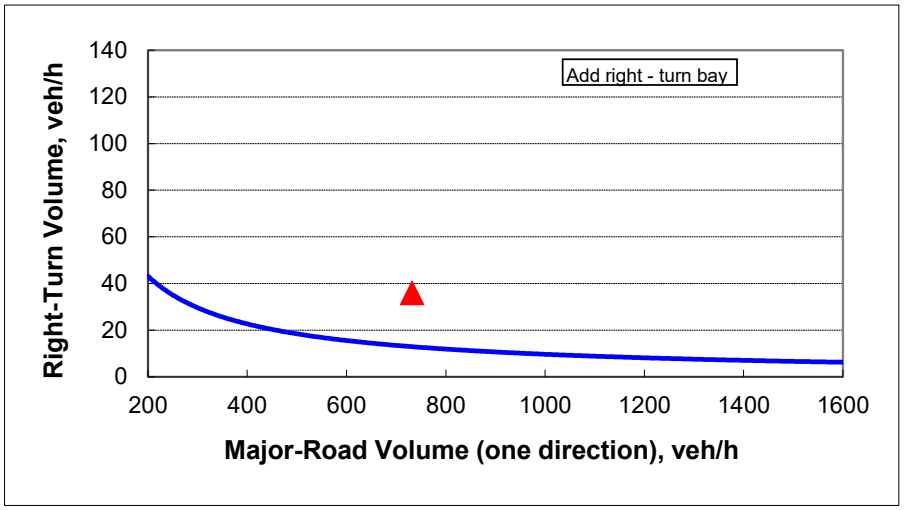
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	53
Major-road volume (one direction), veh/h:	732
Right-turn volume, veh/h:	36

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	13
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



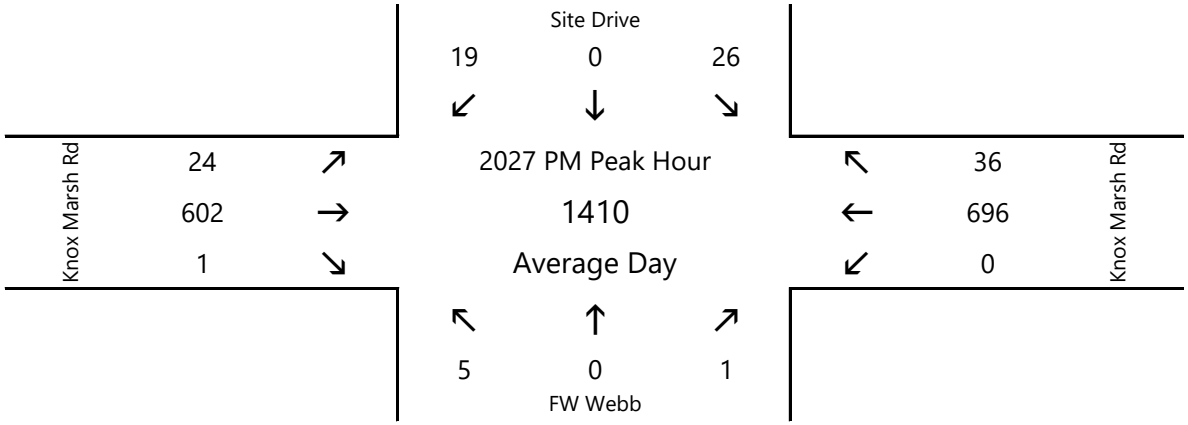


Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	914
Percentage of right-turns on minor road, %:	42.2%
Minor-road volume (one direction), veh/h:	64

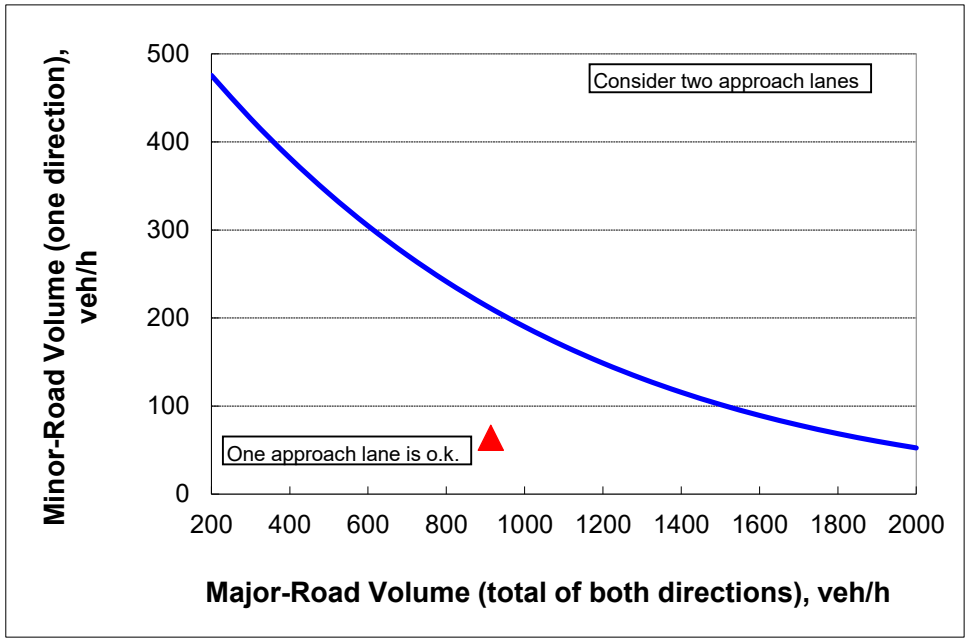
OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	211
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM



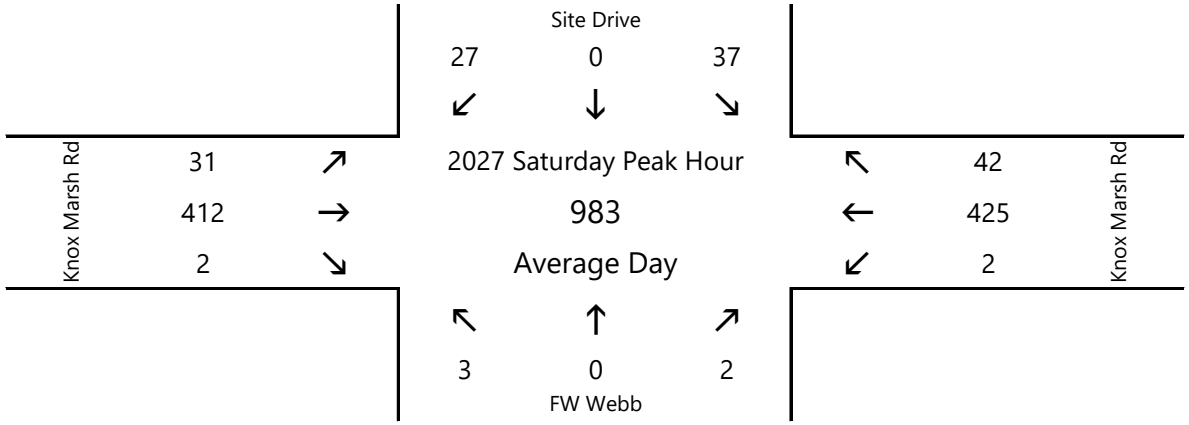


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

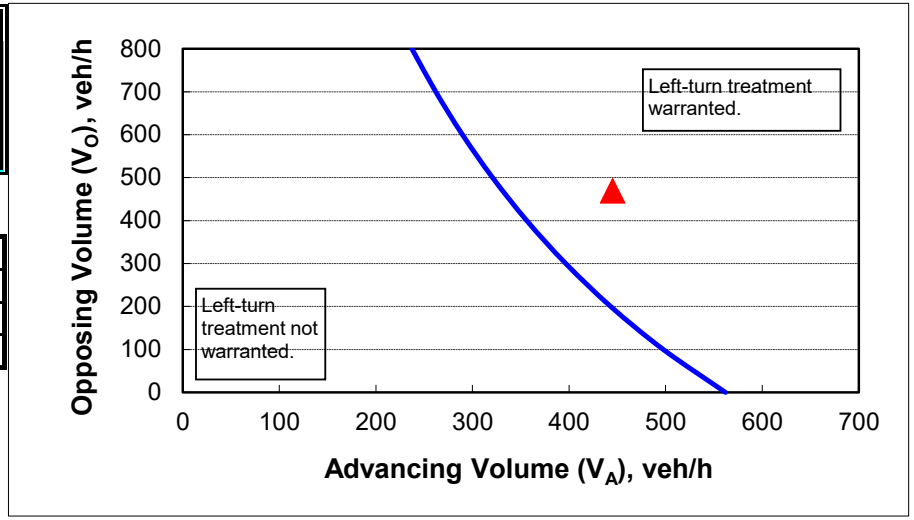
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	53
Percent of left-turns in advancing volume (V_A), %:	7.0%
Advancing volume (V_A), veh/h:	445
Opposing volume (V_O), veh/h:	469

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	331
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

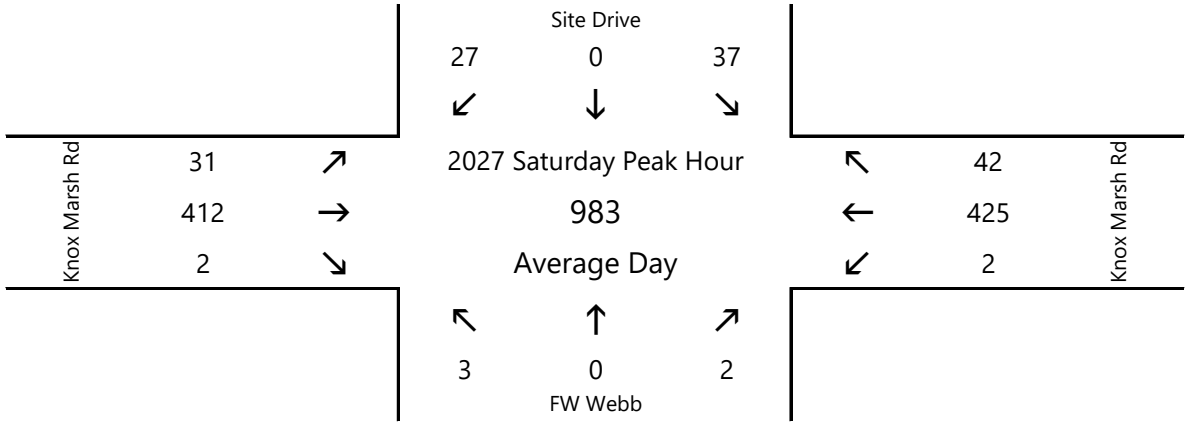


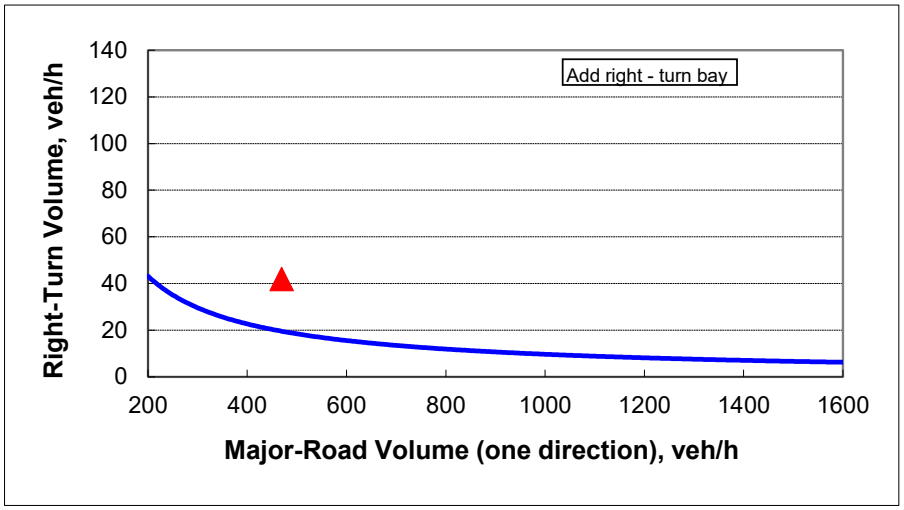
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	53
Major-road volume (one direction), veh/h:	469
Right-turn volume, veh/h:	42

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	20
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



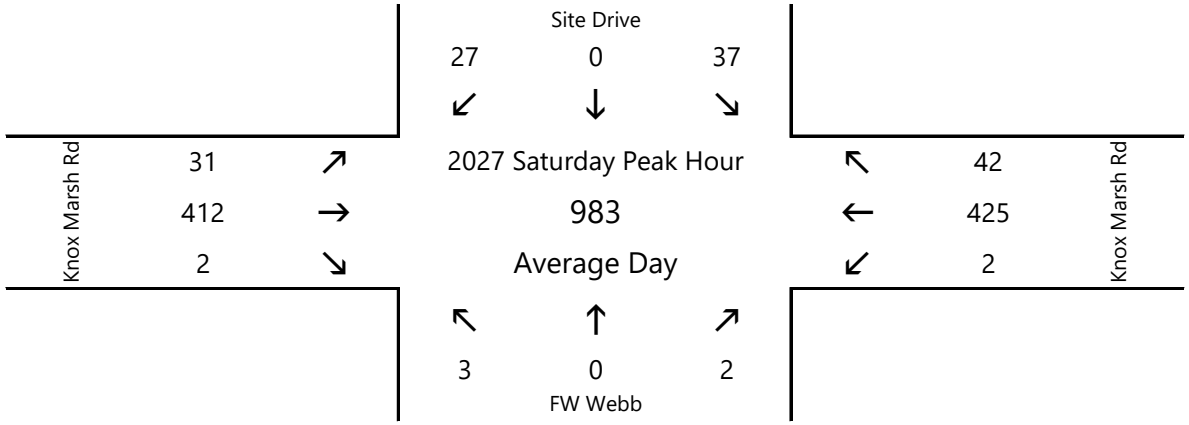


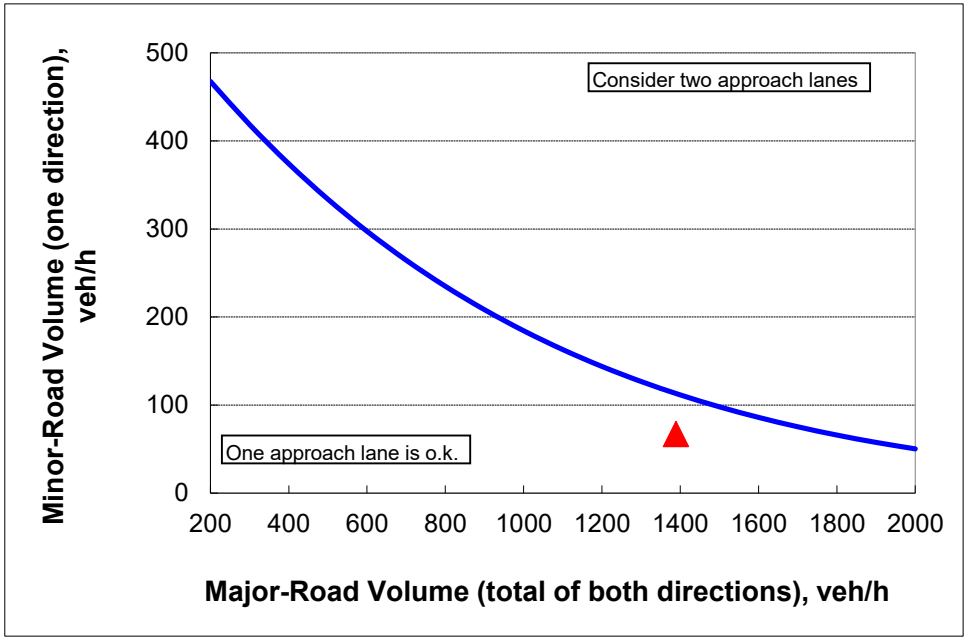
Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1389
Percentage of right-turns on minor road, %:	38.8%
Minor-road volume (one direction), veh/h:	67

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	113
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	



CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

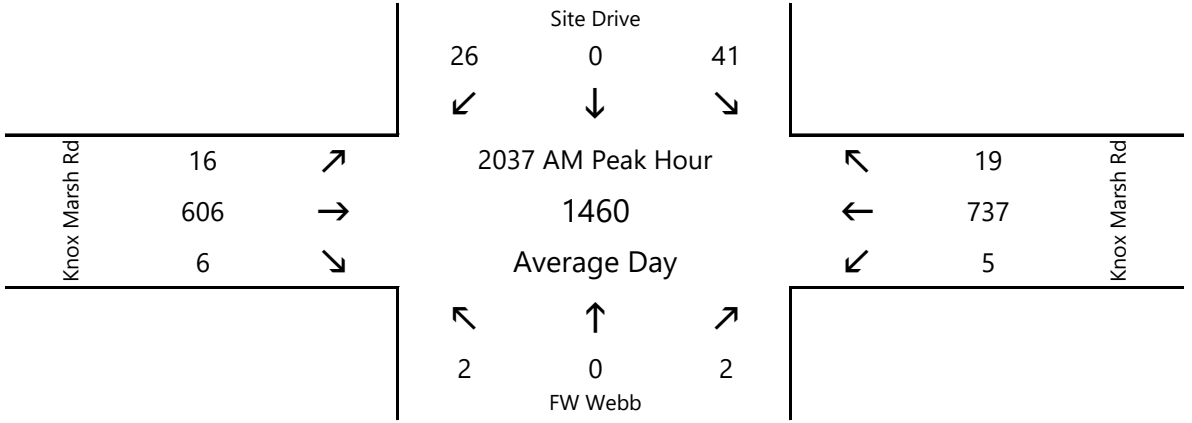


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

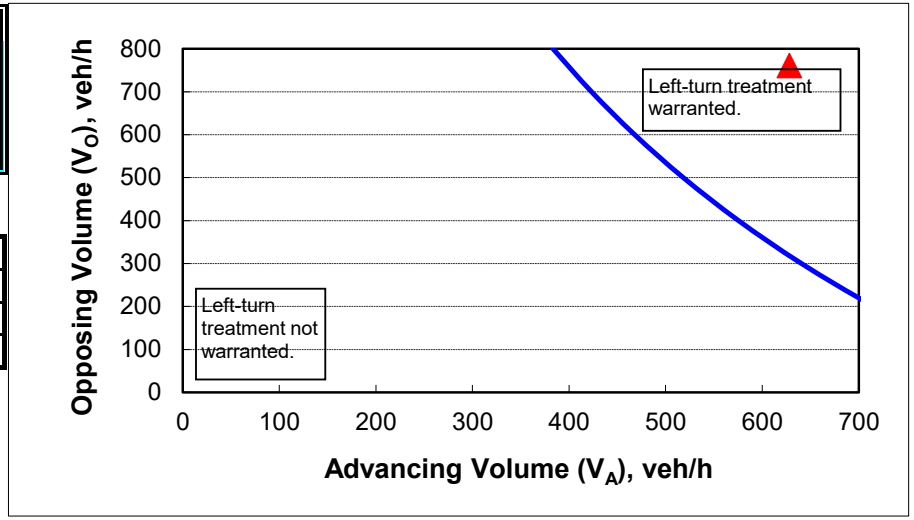
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	53
Percent of left-turns in advancing volume (V_A), %:	2.6%
Advancing volume (V_A), veh/h:	628
Opposing volume (V_O), veh/h:	761

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	398
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

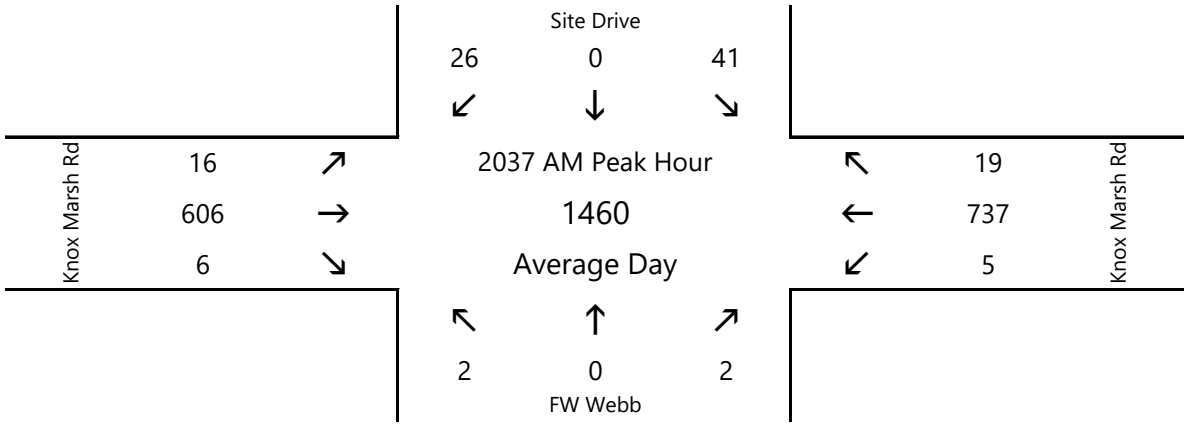


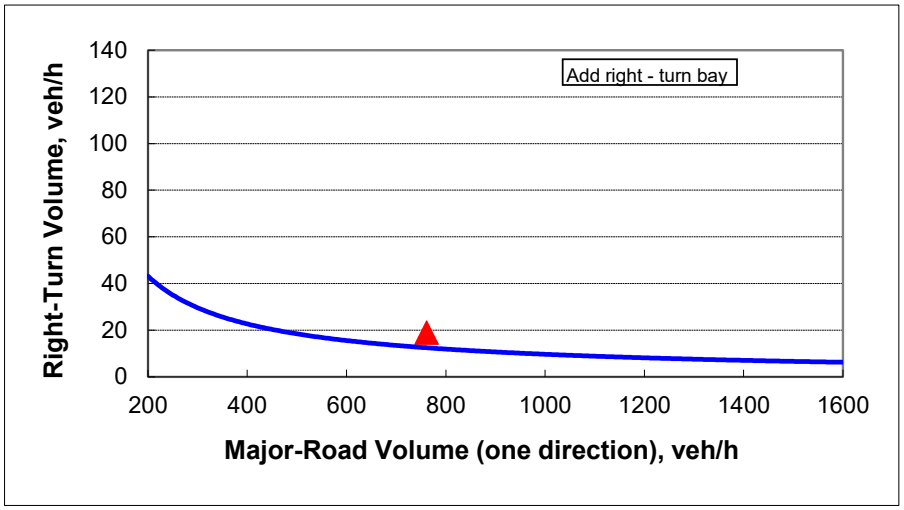
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	53
Major-road volume (one direction), veh/h:	761
Right-turn volume, veh/h:	19

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	12
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



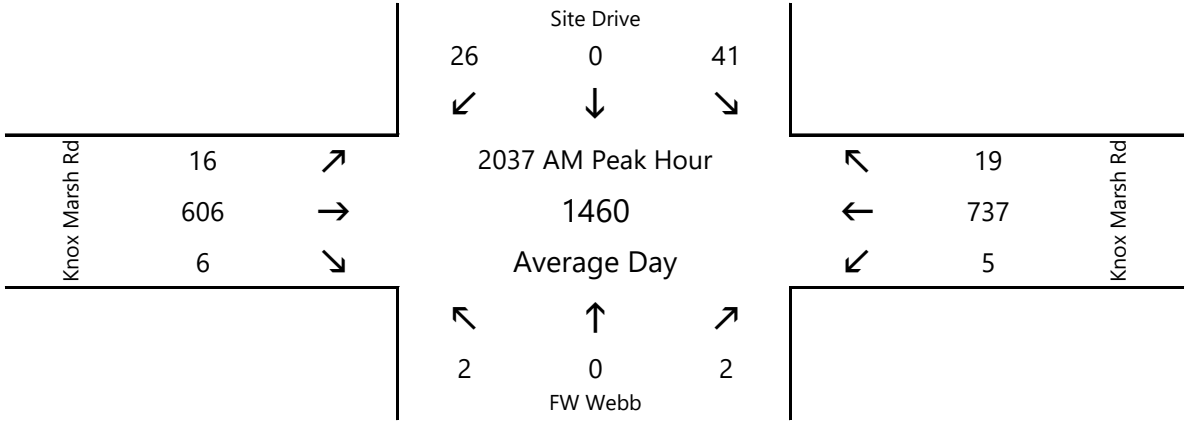


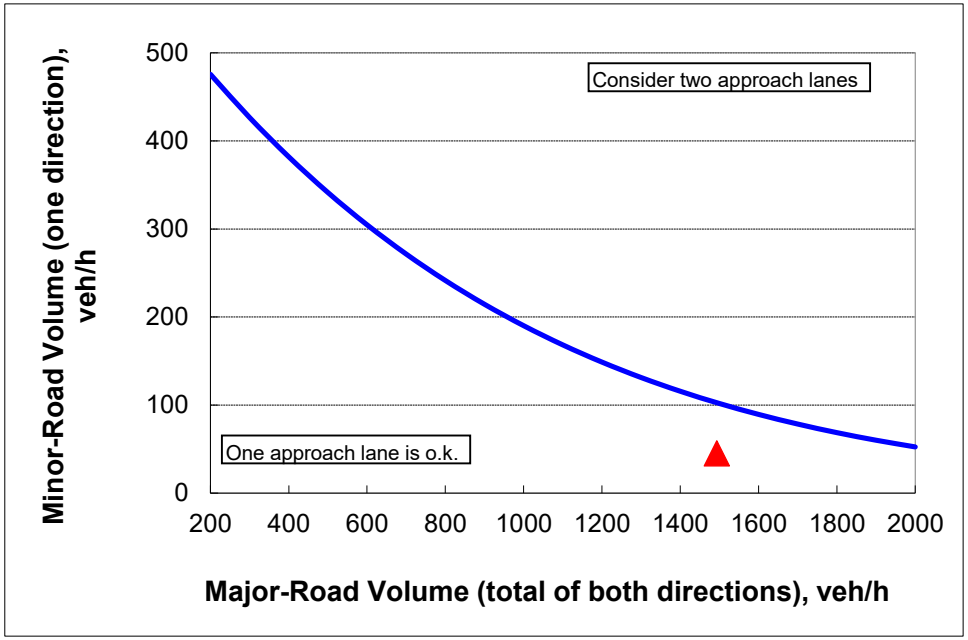
Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1494
Percentage of right-turns on minor road, %:	42.2%
Minor-road volume (one direction), veh/h:	45

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	103
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	



CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

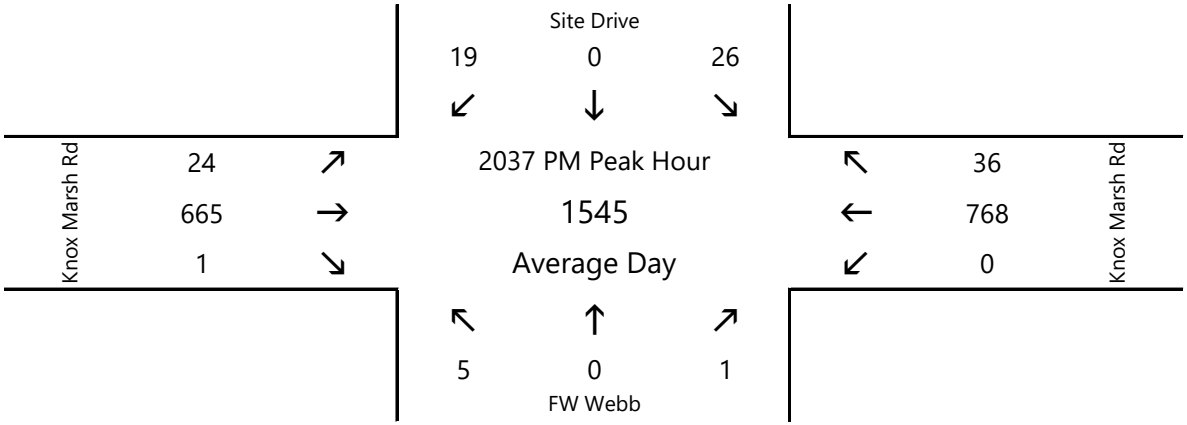


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

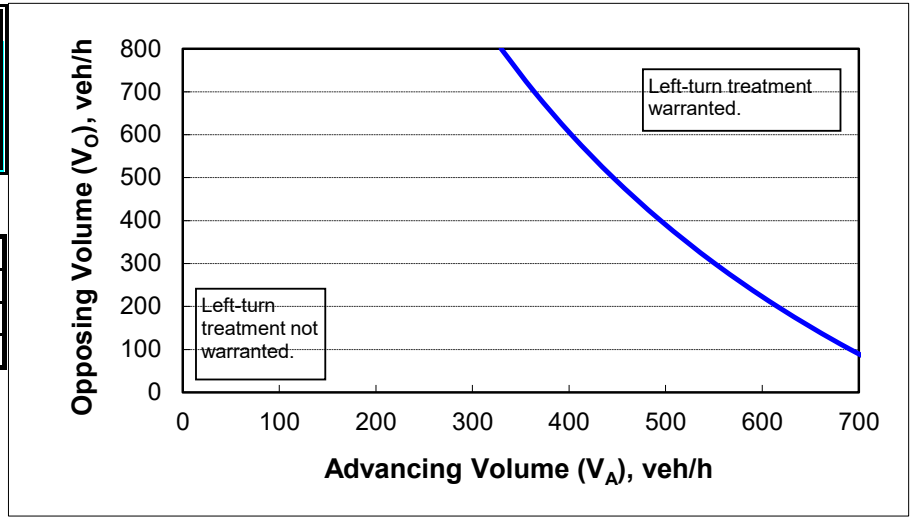
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	53
Percent of left-turns in advancing volume (V_A), %:	3.4%
Advancing volume (V_A), veh/h:	690
Opposing volume (V_O), veh/h:	804

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	328
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

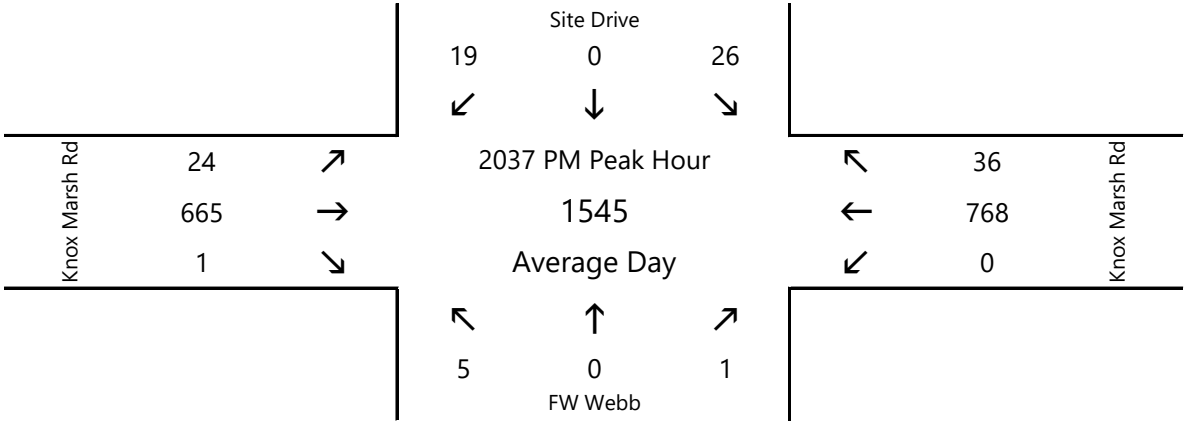


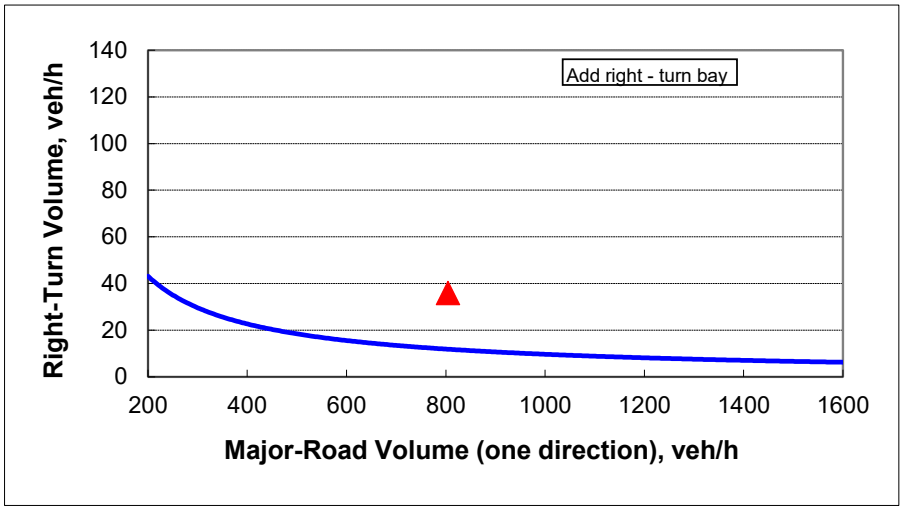
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	53
Major-road volume (one direction), veh/h:	804
Right-turn volume, veh/h:	36

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	12
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



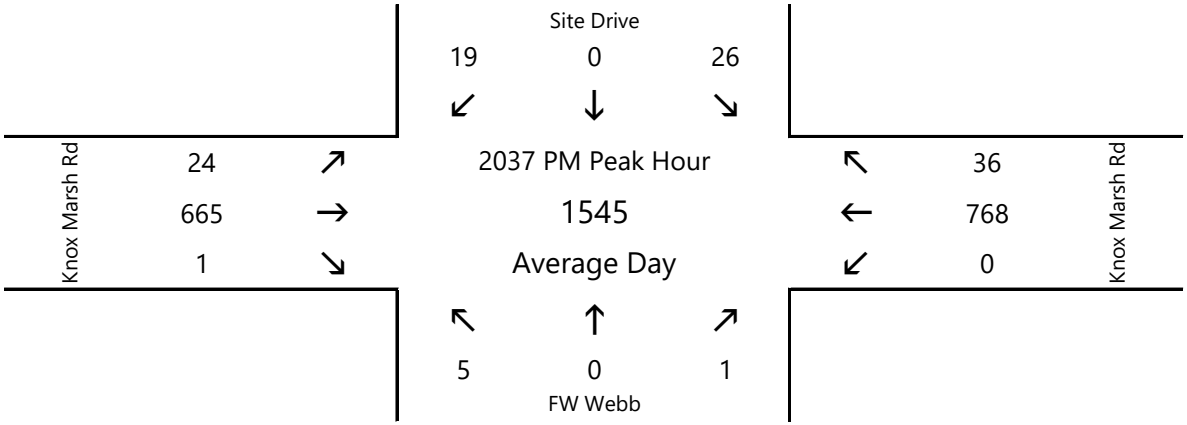


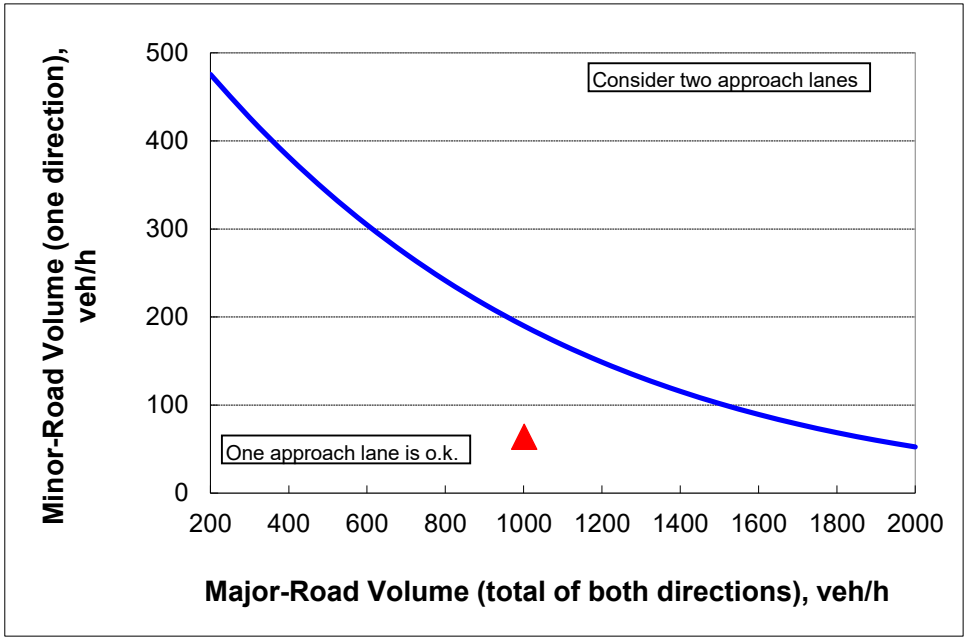
Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1002
Percentage of right-turns on minor road, %:	42.2%
Minor-road volume (one direction), veh/h:	64

OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	190
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	



CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM

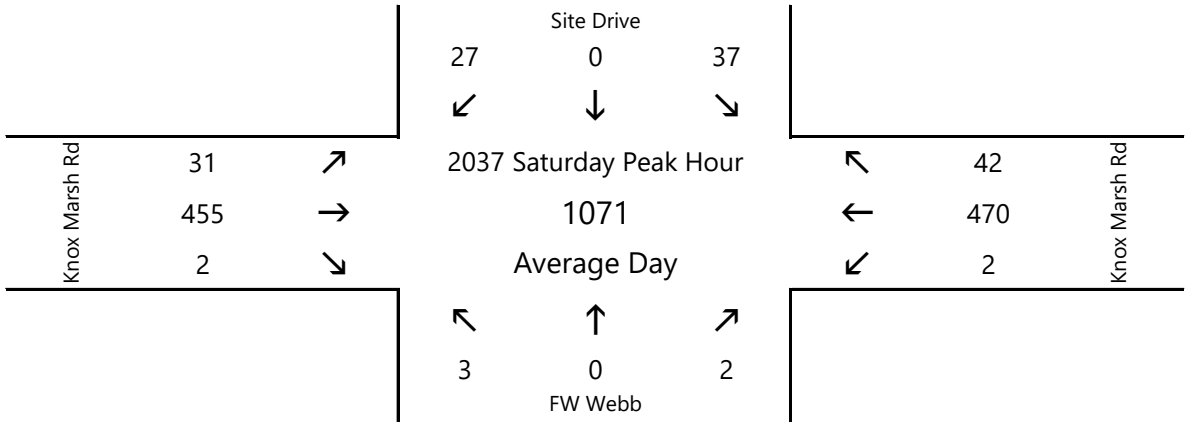


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

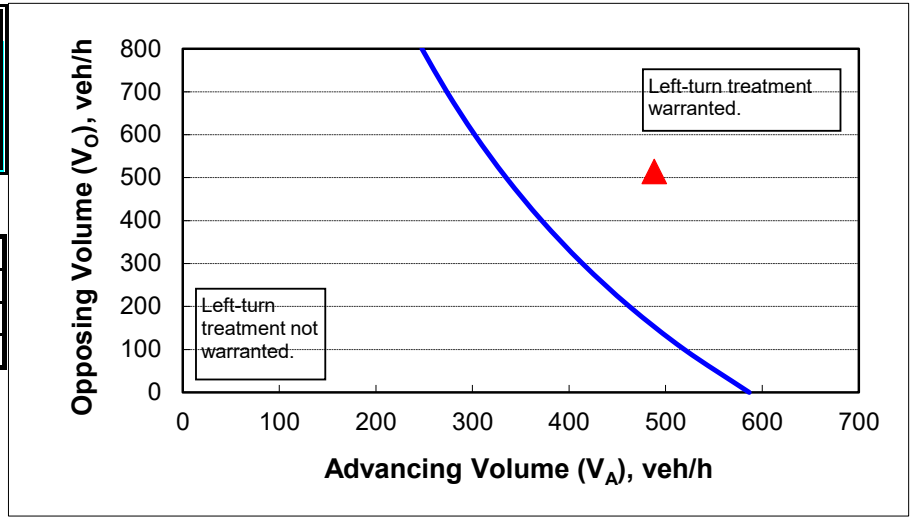
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	53
Percent of left-turns in advancing volume (V_A), %:	6.3%
Advancing volume (V_A), veh/h:	488
Opposing volume (V_O), veh/h:	514

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	330
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

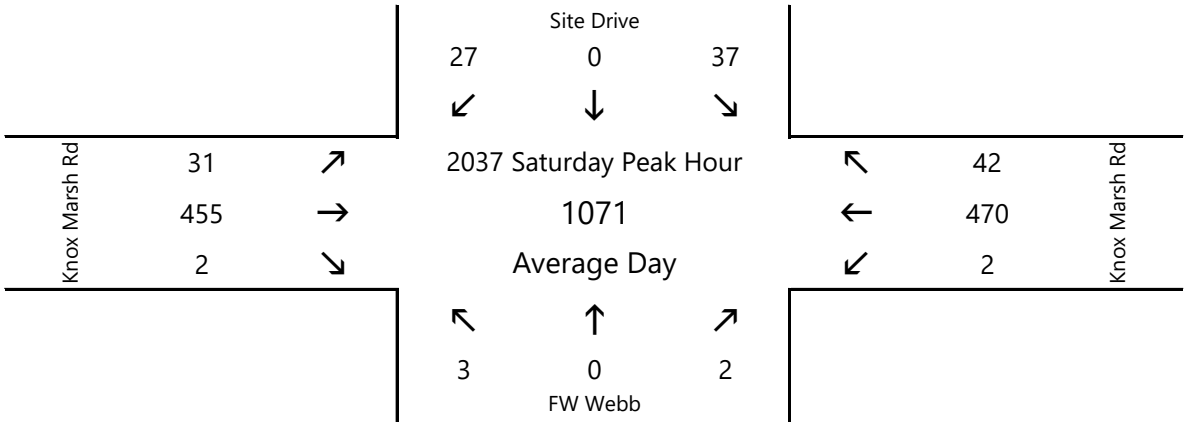


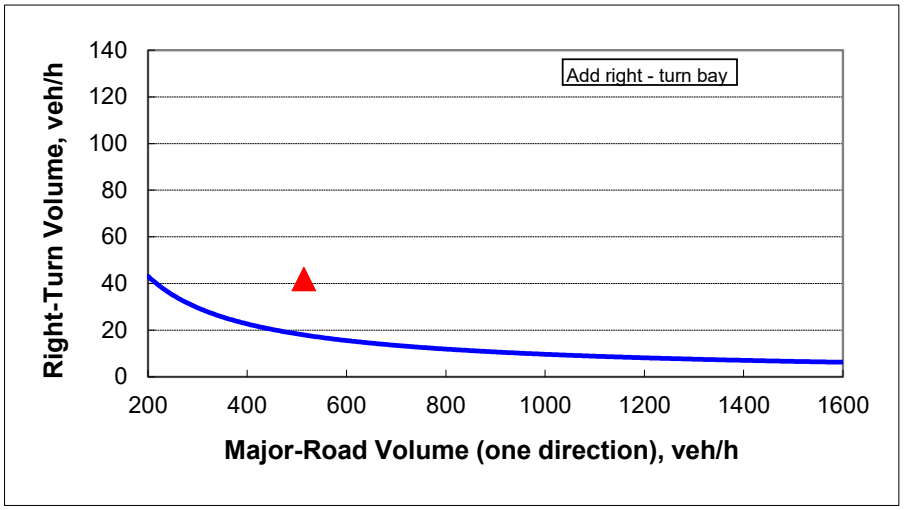
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

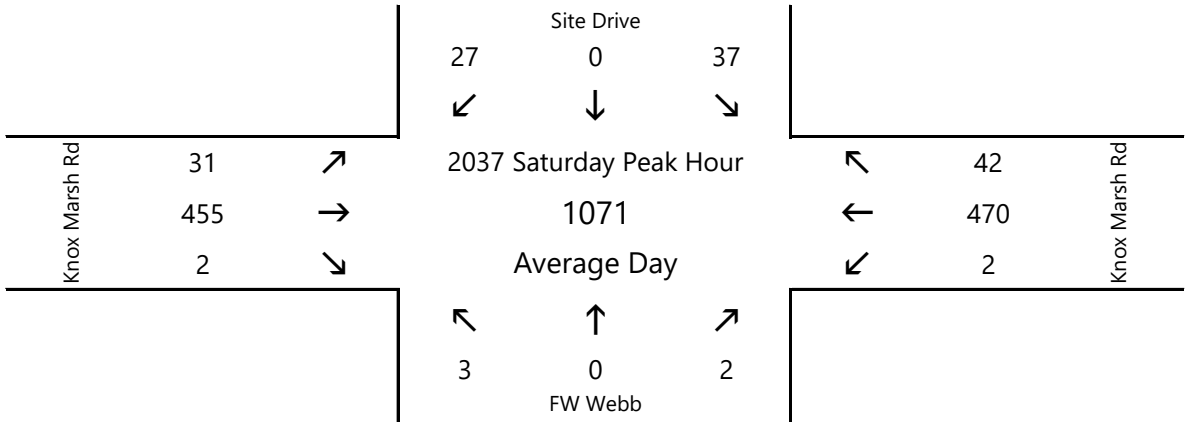
INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	53
Major-road volume (one direction), veh/h:	514
Right-turn volume, veh/h:	42

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	18
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	





Attachment D

Intersection Capacity Analysis

Intersection						
Int Delay, s/veh	0.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	593	6	5	722	2	2
Future Vol, veh/h	593	6	5	722	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	85	85	50	50
Heavy Vehicles, %	4	4	3	3	0	0
Mvmt Flow	645	7	6	849	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	652	0	1510	649
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	861	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	930	-	134	473
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	417	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	930	-	132	473
Mov Cap-2 Maneuver	-	-	-	-	132	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.1	23.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	206	-	-	930	-
HCM Lane V/C Ratio	0.039	-	-	0.006	-
HCM Ctrl Dly (s/v)	23.2	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	593	6	5	722	19	2	0	2	41	0	26
Future Vol, veh/h	16	593	6	5	722	19	2	0	2	41	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	85	85	85	50	50	50	90	90	90
Heavy Vehicles, %	4	4	4	3	3	3	0	0	0	2	2	2
Mvmt Flow	18	659	7	6	849	22	4	0	4	46	0	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	871	0	0	666	0	0	1586	1582	663	1573	1574	860
Stage 1	-	-	-	-	-	-	699	699	-	872	872	-
Stage 2	-	-	-	-	-	-	887	883	-	701	702	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	766	-	-	919	-	-	88	110	465	89	110	356
Stage 1	-	-	-	-	-	-	434	445	-	345	368	-
Stage 2	-	-	-	-	-	-	341	367	-	429	440	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	766	-	-	919	-	-	78	105	465	85	105	356
Mov Cap-2 Maneuver	-	-	-	-	-	-	78	105	-	85	105	-
Stage 1	-	-	-	-	-	-	418	429	-	332	363	-
Stage 2	-	-	-	-	-	-	309	362	-	410	424	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.3	0.1	33.6	73.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	134	766	-	-	919	-	-	121
HCM Lane V/C Ratio	0.06	0.023	-	-	0.006	-	-	0.615
HCM Ctrl Dly (s/v)	33.6	9.8	0	-	8.9	0	-	73.6
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q (veh)	0.2	0.1	-	-	0	-	-	3.1

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	593	6	5	722	19	2	0	2	41	0	26
Future Vol, veh/h	16	593	6	5	722	19	2	0	2	41	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	85	85	85	50	50	50	90	90	90
Heavy Vehicles, %	4	4	4	3	3	3	0	0	0	2	2	2
Mvmt Flow	18	659	7	6	849	22	4	0	4	46	0	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	871	0	0	666	0	0	1586	1582	663	1562	1563	849
Stage 1	-	-	-	-	-	-	699	699	-	861	861	-
Stage 2	-	-	-	-	-	-	887	883	-	701	702	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	766	-	-	919	-	-	88	110	465	91	112	361
Stage 1	-	-	-	-	-	-	434	445	-	350	372	-
Stage 2	-	-	-	-	-	-	341	367	-	429	440	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	766	-	-	919	-	-	79	107	465	88	109	361
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	107	-	88	109	-
Stage 1	-	-	-	-	-	-	424	435	-	342	369	-
Stage 2	-	-	-	-	-	-	312	364	-	415	430	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.3	0.1	33.3	69.3
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	135	766	-	-	919	-	-	125
HCM Lane V/C Ratio	0.059	0.023	-	-	0.006	-	-	0.596
HCM Ctrl Dly (s/v)	33.3	9.8	-	-	8.9	-	-	69.3
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q (veh)	0.2	0.1	-	-	0	-	-	3

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	651	1	0	753	5	1
Future Vol, veh/h	651	1	0	753	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	84	84	38	38
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	757	1	0	896	13	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	758	0	1654	758
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	896	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	858	-	109	410
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	402	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	858	-	109	410
Mov Cap-2 Maneuver	-	-	-	-	109	-
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	402	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	38.2
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	124	-	-	858	-
HCM Lane V/C Ratio	0.127	-	-	-	-
HCM Ctrl Dly (s/v)	38.2	-	-	0	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q (veh)	0.4	-	-	0	-

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	651	1	0	753	36	5	0	1	26	0	19
Future Vol, veh/h	24	651	1	0	753	36	5	0	1	26	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	38	38	38	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	2	2	2
Mvmt Flow	28	757	1	0	896	43	13	0	3	29	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	939	0	0	758	0	0	1742	1753	758	1733	1732	918
Stage 1	-	-	-	-	-	-	814	814	-	918	918	-
Stage 2	-	-	-	-	-	-	928	939	-	815	814	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	734	-	-	858	-	-	69	86	410	69	88	329
Stage 1	-	-	-	-	-	-	375	394	-	326	350	-
Stage 2	-	-	-	-	-	-	324	345	-	371	391	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	734	-	-	858	-	-	61	80	410	65	82	329
Mov Cap-2 Maneuver	-	-	-	-	-	-	61	80	-	65	82	-
Stage 1	-	-	-	-	-	-	350	368	-	304	350	-
Stage 2	-	-	-	-	-	-	303	345	-	344	365	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.4	0	69.6	75
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	71	734	-	-	858	-	-	98
HCM Lane V/C Ratio	0.222	0.038	-	-	-	-	-	0.51
HCM Ctrl Dly (s/v)	69.6	10.1	0	-	0	-	-	75
HCM Lane LOS	F	B	A	-	A	-	-	F
HCM 95th %tile Q (veh)	0.8	0.1	-	-	0	-	-	2.3

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	651	1	0	753	36	5	0	1	26	0	19
Future Vol, veh/h	24	651	1	0	753	36	5	0	1	26	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	38	38	38	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	2	2	2
Mvmt Flow	28	757	1	0	896	43	13	0	3	29	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	939	0	0	758	0	0	1742	1753	758	1711	1710	896
Stage 1	-	-	-	-	-	-	814	814	-	896	896	-
Stage 2	-	-	-	-	-	-	928	939	-	815	814	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	734	-	-	858	-	-	69	86	410	71	91	339
Stage 1	-	-	-	-	-	-	375	394	-	335	359	-
Stage 2	-	-	-	-	-	-	324	345	-	371	391	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	734	-	-	858	-	-	63	83	410	69	88	339
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	83	-	69	88	-
Stage 1	-	-	-	-	-	-	361	379	-	322	359	-
Stage 2	-	-	-	-	-	-	304	345	-	355	376	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.4	0	67.4	68.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	73	734	-	-	858	-	-	104
HCM Lane V/C Ratio	0.216	0.038	-	-	-	-	-	0.481
HCM Ctrl Dly (s/v)	67.4	10.1	-	-	0	-	-	68.2
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q (veh)	0.7	0.1	-	-	0	-	-	2.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	446	2	2	461	3	2
Future Vol, veh/h	446	2	2	461	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	31	31
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	501	2	2	518	10	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	503	0	1024	502
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1072	-	263	573
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1072	-	262	573
Mov Cap-2 Maneuver	-	-	-	-	262	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	597	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	335	-	-	1072	-
HCM Lane V/C Ratio	0.048	-	-	0.002	-
HCM Ctrl Dly (s/v)	16.3	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q (veh)	0.2	-	-	0	-

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	446	2	2	461	42	3	0	2	37	0	27
Future Vol, veh/h	31	446	2	2	461	42	3	0	2	37	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	31	31	31	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	35	501	2	2	518	47	10	0	6	41	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	565	0	0	503	0	0	1133	1141	502	1121	1119	542
Stage 1	-	-	-	-	-	-	572	572	-	546	546	-
Stage 2	-	-	-	-	-	-	561	569	-	575	573	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	1017	-	-	1072	-	-	182	202	573	183	207	540
Stage 1	-	-	-	-	-	-	509	508	-	522	518	-
Stage 2	-	-	-	-	-	-	516	509	-	503	504	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1017	-	-	1072	-	-	165	192	573	174	196	540
Mov Cap-2 Maneuver	-	-	-	-	-	-	165	192	-	174	196	-
Stage 1	-	-	-	-	-	-	485	484	-	497	516	-
Stage 2	-	-	-	-	-	-	486	507	-	473	480	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.6	0	21.8	25.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	231	1017	-	-	1072	-	-	244
HCM Lane V/C Ratio	0.07	0.034	-	-	0.002	-	-	0.291
HCM Ctrl Dly (s/v)	21.8	8.7	0	-	8.4	0	-	25.7
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q (veh)	0.2	0.1	-	-	0	-	-	1.2

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	446	2	2	461	42	3	0	2	37	0	27
Future Vol, veh/h	31	446	2	2	461	42	3	0	2	37	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	31	31	31	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	35	501	2	2	518	47	10	0	6	41	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	565	0	0	503	0	0	1133	1141	502	1097	1095	518
Stage 1	-	-	-	-	-	-	572	572	-	522	522	-
Stage 2	-	-	-	-	-	-	561	569	-	575	573	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	1017	-	-	1072	-	-	182	202	573	191	214	558
Stage 1	-	-	-	-	-	-	509	508	-	538	531	-
Stage 2	-	-	-	-	-	-	516	509	-	503	504	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1017	-	-	1072	-	-	167	195	573	184	206	558
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	195	-	184	206	-
Stage 1	-	-	-	-	-	-	492	491	-	520	530	-
Stage 2	-	-	-	-	-	-	487	508	-	480	487	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.6	0	21.6	24.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	233	1017	-	-	1072	-	-	257
HCM Lane V/C Ratio	0.069	0.034	-	-	0.002	-	-	0.277
HCM Ctrl Dly (s/v)	21.6	8.7	-	-	8.4	-	-	24.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q (veh)	0.2	0.1	-	-	0	-	-	1.1

Intersection						
Int Delay, s/veh	0.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	655	6	5	797	2	2
Future Vol, veh/h	655	6	5	797	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	4	3	3	0	0
Mvmt Flow	728	7	6	886	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	735	0	1630	732
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	898	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	866	-	113	424
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	401	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	866	-	111	424
Mov Cap-2 Maneuver	-	-	-	-	111	-
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	395	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.1	26
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	176	-	-	866	-
HCM Lane V/C Ratio	0.025	-	-	0.006	-
HCM Ctrl Dly (s/v)	26	-	-	9.2	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	655	6	5	797	19	2	0	2	41	0	26
Future Vol, veh/h	16	655	6	5	797	19	2	0	2	41	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	4	4	3	3	3	0	0	0	2	2	2
Mvmt Flow	18	728	7	6	886	21	2	0	2	46	0	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	907	0	0	735	0	0	1691	1687	732	1678	1680	897
Stage 1	-	-	-	-	-	-	768	768	-	909	909	-
Stage 2	-	-	-	-	-	-	923	919	-	769	771	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	742	-	-	866	-	-	75	95	424	75	95	339
Stage 1	-	-	-	-	-	-	397	414	-	329	354	-
Stage 2	-	-	-	-	-	-	326	353	-	394	410	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	742	-	-	866	-	-	66	90	424	71	90	339
Mov Cap-2 Maneuver	-	-	-	-	-	-	66	90	-	71	90	-
Stage 1	-	-	-	-	-	-	381	397	-	316	349	-
Stage 2	-	-	-	-	-	-	294	348	-	376	393	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.2	0.1	37.9	103.1
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	114	742	-	-	866	-	-	102
HCM Lane V/C Ratio	0.039	0.024	-	-	0.006	-	-	0.73
HCM Ctrl Dly (s/v)	37.9	10	0	-	9.2	0	-	103.1
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q (veh)	0.1	0.1	-	-	0	-	-	3.8

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	655	6	5	797	19	2	0	2	41	0	26
Future Vol, veh/h	16	655	6	5	797	19	2	0	2	41	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	4	4	3	3	3	0	0	0	2	2	2
Mvmt Flow	18	728	7	6	886	21	2	0	2	46	0	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	907	0	0	735	0	0	1691	1687	732	1667	1669	886
Stage 1	-	-	-	-	-	-	768	768	-	898	898	-
Stage 2	-	-	-	-	-	-	923	919	-	769	771	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	742	-	-	866	-	-	75	95	424	77	96	343
Stage 1	-	-	-	-	-	-	397	414	-	334	358	-
Stage 2	-	-	-	-	-	-	326	353	-	394	410	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	742	-	-	866	-	-	67	92	424	75	93	343
Mov Cap-2 Maneuver	-	-	-	-	-	-	67	92	-	75	93	-
Stage 1	-	-	-	-	-	-	387	404	-	326	355	-
Stage 2	-	-	-	-	-	-	296	351	-	382	400	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.2	0.1	37.3	91.8
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	116	742	-	-	866	-	-	108
HCM Lane V/C Ratio	0.038	0.024	-	-	0.006	-	-	0.689
HCM Ctrl Dly (s/v)	37.3	10	-	-	9.2	-	-	91.8
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q (veh)	0.1	0.1	-	-	0	-	-	3.6

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	719	1	0	832	5	1
Future Vol, veh/h	719	1	0	832	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	799	1	0	924	6	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	800	0	1724	800
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	924	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	827	-	99	388
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	827	-	99	388
Mov Cap-2 Maneuver	-	-	-	-	99	-
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	390	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	38.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	113	-	-	827	-
HCM Lane V/C Ratio	0.059	-	-	-	-
HCM Ctrl Dly (s/v)	38.8	-	-	0	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q (veh)	0.2	-	-	0	-

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	719	1	0	832	36	5	0	1	26	0	19
Future Vol, veh/h	24	719	1	0	832	36	5	0	1	26	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	2	2	2
Mvmt Flow	27	799	1	0	924	40	6	0	1	29	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	964	0	0	800	0	0	1809	1818	800	1798	1798	944
Stage 1	-	-	-	-	-	-	854	854	-	944	944	-
Stage 2	-	-	-	-	-	-	955	964	-	854	854	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	718	-	-	827	-	-	62	79	388	62	80	318
Stage 1	-	-	-	-	-	-	356	378	-	315	341	-
Stage 2	-	-	-	-	-	-	313	336	-	353	375	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	718	-	-	827	-	-	55	74	388	59	75	318
Mov Cap-2 Maneuver	-	-	-	-	-	-	55	74	-	59	75	-
Stage 1	-	-	-	-	-	-	332	352	-	294	341	-
Stage 2	-	-	-	-	-	-	292	336	-	328	350	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.3	0	67.7	86.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	64	718	-	-	827	-	-	90
HCM Lane V/C Ratio	0.104	0.037	-	-	-	-	-	0.556
HCM Ctrl Dly (s/v)	67.7	10.2	0	-	0	-	-	86.4
HCM Lane LOS	F	B	A	-	A	-	-	F
HCM 95th %tile Q (veh)	0.3	0.1	-	-	0	-	-	2.5

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	719	1	0	832	36	5	0	1	26	0	19
Future Vol, veh/h	24	719	1	0	832	36	5	0	1	26	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	2	2	2
Mvmt Flow	27	799	1	0	924	40	6	0	1	29	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	964	0	0	800	0	0	1809	1818	800	1778	1778	924
Stage 1	-	-	-	-	-	-	854	854	-	924	924	-
Stage 2	-	-	-	-	-	-	955	964	-	854	854	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	718	-	-	827	-	-	62	79	388	64	82	327
Stage 1	-	-	-	-	-	-	356	378	-	323	348	-
Stage 2	-	-	-	-	-	-	313	336	-	353	375	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	718	-	-	827	-	-	56	76	388	62	79	327
Mov Cap-2 Maneuver	-	-	-	-	-	-	56	76	-	62	79	-
Stage 1	-	-	-	-	-	-	342	364	-	311	348	-
Stage 2	-	-	-	-	-	-	293	336	-	339	361	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.3	0	66.6	80.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	65	718	-	-	827	-	-	94
HCM Lane V/C Ratio	0.103	0.037	-	-	-	-	-	0.532
HCM Ctrl Dly (s/v)	66.6	10.2	-	-	0	-	-	80.3
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q (veh)	0.3	0.1	-	-	0	-	-	2.4

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	492	2	2	509	3	2
Future Vol, veh/h	492	2	2	509	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	547	2	2	566	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	549	0	1118	548
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	570	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1031	-	231	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1031	-	230	540
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	299	-	-	1031	-
HCM Lane V/C Ratio	0.019	-	-	0.002	-
HCM Ctrl Dly (s/v)	17.3	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	492	2	2	509	42	3	0	2	37	0	27
Future Vol, veh/h	31	492	2	2	509	42	3	0	2	37	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	34	547	2	2	566	47	3	0	2	41	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	613	0	0	549	0	0	1225	1233	548	1211	1211	590
Stage 1	-	-	-	-	-	-	616	616	-	594	594	-
Stage 2	-	-	-	-	-	-	609	617	-	617	617	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	976	-	-	1031	-	-	157	178	540	159	182	508
Stage 1	-	-	-	-	-	-	481	485	-	491	493	-
Stage 2	-	-	-	-	-	-	486	484	-	477	481	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	976	-	-	1031	-	-	142	169	540	152	172	508
Mov Cap-2 Maneuver	-	-	-	-	-	-	142	169	-	152	172	-
Stage 1	-	-	-	-	-	-	457	461	-	466	492	-
Stage 2	-	-	-	-	-	-	456	483	-	451	457	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.5	0	23.4	29.6
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	201	976	-	-	1031	-	-	216
HCM Lane V/C Ratio	0.028	0.035	-	-	0.002	-	-	0.329
HCM Ctrl Dly (s/v)	23.4	8.8	0	-	8.5	0	-	29.6
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q (veh)	0.1	0.1	-	-	0	-	-	1.4

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	492	2	2	509	42	3	0	2	37	0	27
Future Vol, veh/h	31	492	2	2	509	42	3	0	2	37	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	34	547	2	2	566	47	3	0	2	41	0	30

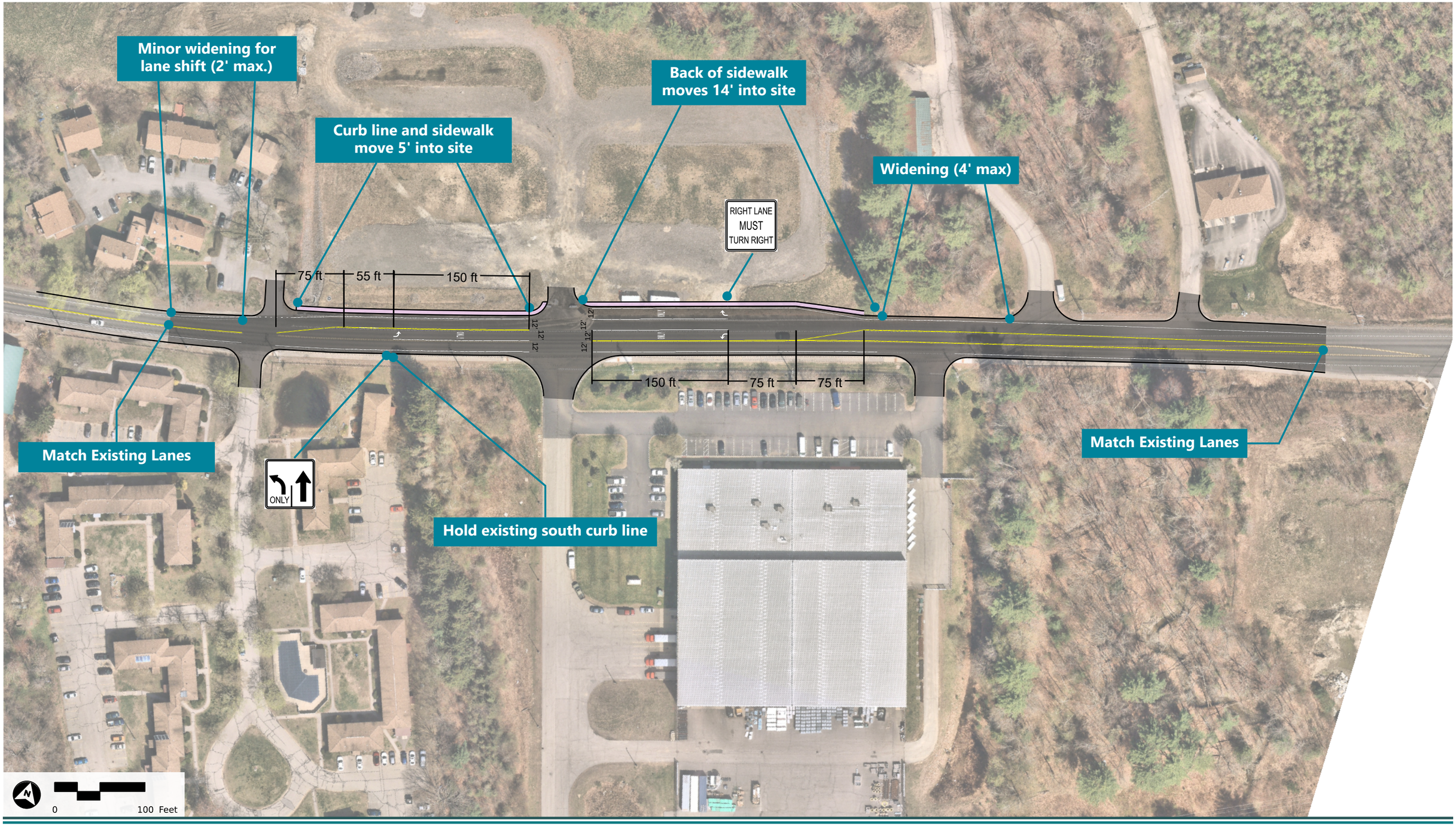
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	613	0	0	549	0	0	1225	1233	548	1187	1187	566
Stage 1	-	-	-	-	-	-	616	616	-	570	570	-
Stage 2	-	-	-	-	-	-	609	617	-	617	617	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	976	-	-	1031	-	-	157	178	540	165	188	524
Stage 1	-	-	-	-	-	-	481	485	-	506	505	-
Stage 2	-	-	-	-	-	-	486	484	-	477	481	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	976	-	-	1031	-	-	144	171	540	160	181	524
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	171	-	160	181	-
Stage 1	-	-	-	-	-	-	464	468	-	488	504	-
Stage 2	-	-	-	-	-	-	457	483	-	458	464	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.5	0	23.1	28.1
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	204	976	-	-	1031	-	-	226
HCM Lane V/C Ratio	0.027	0.035	-	-	0.002	-	-	0.315
HCM Ctrl Dly (s/v)	23.1	8.8	-	-	8.5	-	-	28.1
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q (veh)	0.1	0.1	-	-	0	-	-	1.3

Attachment E

Turn Lane Sketch



239 Knox Marsh Road

Turn Lane Concept Graphic

DRAFT | 2/20/2026

Attachment F

Traffic Count

Knox Marsh Road Count Report (All Vehicles)

Date	Time	Southbound						Westbound						Northbound						Eastbound					
							Approach Volume						Approach Volume						Approach Volume						Approach Volume
6/4/2025	22:00						25						23						23
6/4/2025	22:15						26						29						29
6/4/2025	22:30						13						18						18
6/4/2025	22:45						18						19						19
6/4/2025	23:00						16						24						24
6/4/2025	23:15						7						14						14
6/4/2025	23:30						13						14						14
6/4/2025	23:45						6						6						6
6/5/2025	0:00						6						7						7
6/5/2025	0:15						5						13						13
6/5/2025	0:30						11						9						9
6/5/2025	0:45						11						4						4
6/5/2025	1:00						4						6						6
6/5/2025	1:15						6						4						4
6/5/2025	1:30						9						3						3
6/5/2025	1:45						8						2						2
6/5/2025	2:00						1						3						3
6/5/2025	2:15						4						5						5
6/5/2025	2:30						1						2						2
6/5/2025	2:45						4						8						8
6/5/2025	3:00						4						5						5
6/5/2025	3:15						11						1						1
6/5/2025	3:30						3						3						3
6/5/2025	3:45						12						7						7
6/5/2025	4:00						12						11						11
6/5/2025	4:15						9						8						8
6/5/2025	4:30						5						2						2
6/5/2025	4:45						17						15						15
6/5/2025	5:00						20						21						21
6/5/2025	5:15						28						34						34
6/5/2025	5:30						52						50						50
6/5/2025	5:45						51						74						74
6/5/2025	6:00						54						83						83
6/5/2025	6:15						75						106						106
6/5/2025	6:30						85						119						119
6/5/2025	6:45						122						118						118

Date	Time	Southbound						Westbound						Northbound						Eastbound					
		U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossines	WB Crosswalk Crossines	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossines	SB Crosswalk Crossines	U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossines	WB Crosswalk Crossines	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossines	SB Crosswalk Crossines
6/5/2025	7:00	0	0	0	0	0	0	0	0	140	0	0	0	0	0	0	0	1	0	0	0	129	1	0	0
6/5/2025	7:15	0	0	0	0	0	0	0	1	160	0	0	0	0	0	0	0	0	1	0	0	132	1	0	0
6/5/2025	7:30	0	0	0	0	0	0	0	1	198	0	0	0	0	0	0	1	1	1	0	0	135	1	0	0
6/5/2025	7:45	0	0	0	0	0	0	0	3	179	0	0	0	0	0	0	1	0	0	0	0	137	1	0	0
6/5/2025	8:00	0	0	0	0	0	0	0	0	137	0	0	0	0	2	0	0	0	0	0	0	150	3	0	0
6/5/2025	8:15	0	0	0	0	1	0	0	0	126	0	0	0	0	1	0	1	0	0	0	0	120	4	0	0
6/5/2025	8:30	0	0	0	0	0	0	0	0	109	0	0	0	0	0	0	2	0	0	0	0	121	1	0	0
6/5/2025	8:45	0	0	0	0	0	0	0	0	100	0	0	0	0	3	0	1	0	0	0	0	128	1	0	0

Date	Time	Southbound						Westbound						Northbound						Eastbound					
							Approach Volume						Approach Volume						Approach Volume						Approach Volume
6/5/2025	9:00						93						98						98
6/5/2025	9:15						94						98						98
6/5/2025	9:30						80						101						101
6/5/2025	9:45						93						94						94
6/5/2025	10:00						89						90						90
6/5/2025	10:15						94						79						79
6/5/2025	10:30						108						119						119
6/5/2025	10:45						89						109						109
6/5/2025	11:00						64						87						87
6/5/2025	11:15						95						81						81
6/5/2025	11:30						87						86						86
6/5/2025	11:45						110						91						91
6/5/2025	12:00						75						79						79
6/5/2025	12:15						93						96						96
6/5/2025	12:30						100						90						90
6/5/2025	12:45						90						110						110
6/5/2025	13:00						85						83						83
6/5/2025	13:15						92						84						84
6/5/2025	13:30						101						92						92
6/5/2025	13:45						89						109						109
6/5/2025	14:00						109						93						93
6/5/2025	14:15						123						106						106
6/5/2025	14:30						130						124						124
6/5/2025	14:45						147						128						128
6/5/2025	15:00						130						122						122
6/5/2025	15:15						144						131						131
6/5/2025	15:30						127						166						166
6/5/2025	15:45						128						146						146
6/5/2025	16:00						128						160						160

Date	Time	Southbound						Westbound						Northbound						Eastbound					
		U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossings	WB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossings	SB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossings	WB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossings	SB Crosswalk Crossings
6/5/2025	16:15	0	0	0	0	0	3	0	1	166	0	0	0	0	0	0	1	0	0	0	0	162	0	0	1
6/5/2025	16:30	0	0	0	0	0	0	0	0	138	0	0	0	0	0	0	1	0	0	0	0	171	0	0	0
6/5/2025	16:45	0	0	0	0	0	0	0	0	170	0	0	0	0	1	0	0	0	1	0	0	176	1	0	0
6/5/2025	17:00	0	0	0	0	0	0	0	0	153	0	0	0	0	3	0	1	3	0	0	0	142	0	0	0
6/5/2025	17:15	0	0	0	0	0	0	0	0	170	0	0	0	0	1	0	0	0	2	0	0	154	0	0	0
6/5/2025	17:30	0	0	0	0	0	0	0	0	210	0	0	0	0	0	0	0	0	0	0	0	136	0	0	0
6/5/2025	17:45	0	0	0	0	0	0	0	0	163	0	0	0	0	0	0	0	0	0	0	0	118	0	0	0
6/5/2025	18:00	0	0	0	0	0	0	0	0	157	0	0	0	0	0	0	0	0	0	0	0	127	0	0	0

Date	Time	Southbound						Westbound						Northbound						Eastbound					
							Approach Volume						Approach Volume						Approach Volume						Approach Volume
6/5/2025	18:15						156						112						112
6/5/2025	18:30						116						93						93
6/5/2025	18:45						110						81						81
6/5/2025	19:00						66						79						79
6/5/2025	19:15						83						58						58
6/5/2025	19:30						69						71						71
6/5/2025	19:45						62						79						79
6/5/2025	20:00						54						78						78
6/5/2025	20:15						67						65						65
6/5/2025	20:30						63						53						53
6/5/2025	20:45						20						40						40
6/5/2025	21:00						44						149						149
6/5/2025	21:15						43						165						165
6/5/2025	21:30						60						128						128
6/5/2025	21:45						31						43						43
6/5/2025	22:00						58						30						30
6/5/2025	22:15						36						40						40
6/5/2025	22:30						46						17						17
6/5/2025	22:45						23						25						25
6/5/2025	23:00						22						20						20
6/5/2025	23:15						26						4						4
6/5/2025	23:30						26						13						13
6/5/2025	23:45						8						14						14
6/6/2025	0:00						5						12						12
6/6/2025	0:15						10						7						7
6/6/2025	0:30						8						7						7
6/6/2025	0:45						10						10						10
6/6/2025	1:00						6						6						6
6/6/2025	1:15						6						2						2
6/6/2025	1:30						5						0						0
6/6/2025	1:45						2						4						4
6/6/2025	2:00						3						3						3
6/6/2025	2:15						3						2						2
6/6/2025	2:30						2						4						4
6/6/2025	2:45						7						5						5
6/6/2025	3:00						2						10						10

6/6/2025	3:15									11										6							
6/6/2025	3:30									5										7							
6/6/2025	3:45									8										6							
6/6/2025	4:00									14										3							
6/6/2025	4:15									10										6							
6/6/2025	4:30									9										11							
6/6/2025	4:45									8										10							
6/6/2025	5:00									22										20							
6/6/2025	5:15									21										31							
6/6/2025	5:30									54										49							
6/6/2025	5:45									49										59							
6/6/2025	6:00									60										64							
6/6/2025	6:15									72										84							
6/6/2025	6:30									73										131							
6/6/2025	6:45									92										114							
6/6/2025	7:00									114										116							
6/6/2025	7:15									131										136							
6/6/2025	7:30									137										140							
6/6/2025	7:45									115										145							
6/6/2025	8:00									148										131							
6/6/2025	8:15									110										115							
6/6/2025	8:30									112										111							
6/6/2025	8:45									94										144							
6/6/2025	9:00									78										91							
6/6/2025	9:15									81										125							
6/6/2025	9:30									85										95							
6/6/2025	9:45									89										97							
6/6/2025	10:00									102										89							
6/6/2025	10:15									81										104							
6/6/2025	10:30									101										90							
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6/6/2025	11:00									87										89							
6/6/2025	11:15									93										97							
6/6/2025	11:30									88										110							
6/6/2025	11:45									113										95							
6/6/2025	12:00									117										88							
6/6/2025	12:15									82										118							
6/6/2025	12:30									118										89							
6/6/2025	12:45									95										95							
6/6/2025	13:00									108										89							
6/6/2025	13:15									105										103							
6/6/2025	13:30									115										109							
6/6/2025	13:45									106										117							
6/6/2025	14:00									99										106							
6/6/2025	14:15									129										117							
6/6/2025	14:30									126										143							
6/6/2025	14:45									136										131							
6/6/2025	15:00									128										115							
6/6/2025	15:15									161										126							
6/6/2025	15:30									123										167							
6/6/2025	15:45									124										143							
6/6/2025	16:00									177										143							
6/6/2025	16:15									181										162							
6/6/2025	16:30									153										143							
6/6/2025	16:45									167										169							
6/6/2025	17:00									191										117							
6/6/2025	17:15									189										151							
6/6/2025	17:30									129										103							
6/6/2025	17:45									128										114							
6/6/2025	18:00									114										109							
6/6/2025	18:15									94										107							
6/6/2025	18:30									83										86							
6/6/2025	18:45									65										68							
6/6/2025	19:00									79										70							
6/6/2025	19:15									55										55							
6/6/2025	19:30									60										62							
6/6/2025	19:45									76										99							
6/6/2025	20:00									59										129							
6/6/2025	20:15									39										58							
6/6/2025	20:30									40										14							
6/6/2025	20:45									29										30							
6/6/2025	21:00									43										40							
6/6/2025	21:15									45										25							
6/6/2025	21:30									43										34							
6/6/2025	21:45									35										23							
6/6/2025	22:00									34										30							
6/6/2025	22:15									23										23							
6/6/2025	22:30									26										34							
6/6/2025	22:45									27										34							
6/6/2025	23:00									28										32							
6/6/2025	23:15									16										16							
6/6/2025	23:30									14										11							
6/6/2025	23:45									13										18							
6/7/2025	0:00									10										10							
6/7/2025	0:15									3										12							
6/7/2025	0:30									13										15							
6/7/2025	0:45									5										3							
6/7/2025	1:00									9										10							
6/7/2025	1:15									5										7							
6/7/2025	1:30									5										9							
6/7/2025	1:45									4										2							
6/7/2025	2:00									3										4							
6/7/2025	2:15									6										3							
6/7/2025	2:30									9										1							
6/7/2025	2:45									1										8							
6/7/2025	3:00									3										2							
6/7/2025	3:15									3										2							
6/7/2025	3:30									4										5							
6/7/2025	3:45									4										2							
6/7/2025	4:00									10										3							
6/7/2025	4:15									7										2							
6/7/2025	4:30									5										3							
6/7/2025	4:45									1										1							
6/7/2025	5:00									10										6							
6/7/2025	5:15									6										13							
6/7/2025	5:30									18										5							
6/7/2025	5:45									19										19							
6/7/2025	6:00									24										16							
6/7/2025	6:15									22										23							
6/7/2025	6:30									26										54							
6/7/2025	6:45									29										34							
6/7/2025	7:00									53										41							
6/7/2025	7:15									53										44							
6/7/2025	7:30									58										57							
6/7/2025	7:45									58										51							
6/7/2025	8:00									51										49							
6/7/2025	8:15									53										66							
6/7/2025	8:30									55										68							
6/7/2025	8:45									57										88							
6/7/2025	9:00									71										74							
6/7/2025	9:15									93										85							
6/7/2025	9:30									89										87							
6/7/2025	9:45									72										96							
6/7/2025	10:00									81										94							
6/7/2025	10:15									85										84							
6/7/2025	10:30									93										99							
6/7/2025	10:45									107										101							
		Southbound						Westbound						Northbound						Eastbound							
Date	Time	U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossings	WB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossings	SB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossings	WB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossings	SB Crosswalk Crossings		
6/7/2025	11:00	0	0	0	0	0	0	0	0	105	0	0	0	0	0	0	0	0	0	0	0	84	0	0	0		
6/7/2025	11:15	0	0	0	0	0	0	0	2	105	0	0	0	0	0	0	0	1	0	0	0	91	0	0	0		
6/7/2025	11:30	0	0	0	0	0	0	0	0	96	0	0	0	0	3	0	1	0	0	0	0	93	1	0	0		
6/7/2025	11:45	0	0	0	0	0	0	0	1	99	0	0	0	0	0	0	1	0	0	0	0	102	0	0	0		
6/7/2025	12:00	0	0	0	0	0	0	0	0	115	0	0	0	0	0	0	0	0	0	0	0	105	0	0	0		

6/7/2025	12:15	0	0	0	0	0	0	0	1	120	0	0	0	0	0	0	0	0	0	0	0	116	1	0	0
6/7/2025	12:30	0	0	0	0	0	0	0	0	94	0	0	0	0	0	0	1	0	0	0	0	96	0	0	0
6/7/2025	12:45	0	0	0	0	0	0	0	0	85	0	0	0	0	0	0	1	0	0	0	0	99	0	0	0
		Southbound						**Westbound**						**Northbound**						**Eastbound**					

Date	Time	Approach Volume
6/7/2025	13:00	94
6/7/2025	13:15	112
6/7/2025	13:30	109
6/7/2025	13:45	106
6/7/2025	14:00	96
6/7/2025	14:15	88
6/7/2025	14:30	107
6/7/2025	14:45	101
6/7/2025	15:00	91
6/7/2025	15:15	82
6/7/2025	15:30	88
6/7/2025	15:45	93
6/7/2025	16:00	101

Approach Volume
103
98
82
105
103
95
87
98
90
101
106
103
90

Knox Marsh Road Count Report (Trucks)

		Southbound				Westbound				Northbound				Eastbound			
Date	Time	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns
6/5/2025	7:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0
6/5/2025	7:15	0	0	0	0	0	0	6	0	0	0	0	0	0	0	4	0
6/5/2025	7:30	0	0	0	0	0	0	4	0	0	0	0	0	0	0	7	0
6/5/2025	7:45	0	0	0	0	0	0	6	0	0	0	0	0	0	0	4	0
6/5/2025	8:00	0	0	0	0	0	0	4	0	0	0	0	0	0	0	9	0
6/5/2025	8:15	0	0	0	0	0	0	4	0	0	0	0	0	0	0	7	0
6/5/2025	8:30	0	0	0	0	0	0	3	0	0	0	0	0	0	0	6	0
6/5/2025	8:45	0	0	0	0	0	0	6	0	0	1	0	0	0	0	5	0

		Southbound				Westbound				Northbound				Eastbound			
Date	Time	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns
6/5/2025	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/5/2025	16:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0
6/5/2025	16:45	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0
6/5/2025	17:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0
6/5/2025	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/5/2025	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6/5/2025	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/5/2025	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0

		Southbound				Westbound				Northbound				Eastbound			
Date	Time	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns	U Turns	Left Turns	Straight Through	Right Turns
6/7/2025	11:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6/7/2025	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6/7/2025	11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6/7/2025	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/7/2025	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/7/2025	12:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6/7/2025	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/7/2025	12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Attachment G

Scoping Meeting Minutes

MEETING MINUTES

TRAFFIC STUDY SCOPING FOR NHDOT DRIVEWAY PERMIT APPLICATION

Driveway Permit ID	IA-2325	**NHDOT Project**	1832J (2021-02)
Meeting Date/Time:	May 8, 2025 / 10:30 AM - 12:00 PM	**Meeting Location**	Virtual / MS Teams
NHDOT District:	District 6	**Town/City**	Dover
Proponent/Owner:	236 Knox Marsh Road Realty Berry Surveying & Engineering	**Local Roadway Name**	Knox Marsh Road
Traffic Consultant:	VHB, Inc.	**State/US Highway ID**	NH Route 155

Attendees:

Stuart Thompson	NHDOT Traffic	**Jenn Conley**	VHB – Applicant's Traffic Engineer
Rowan Reddy	NHDOT Traffic	**Evan Haugh**	VHB – Applicant's Traffic Engineer
Roger Appleton	NHDOT District 6	**Christopher Berry**	Berry Surveying and Engineering – Applicant's Site / Civil Engineer
Lucas Miller	NHDOT District 6	**Gilbert Aleixo**	239 Knox Marsh Realty
Peter Crouch	NHDOT Traffic - Signals	**Evan Drew**	Stantec Consulting Services, Inc. (Stantec) – NHDOT Consultant
Desiree Caron	NHDOT Traffic - Design	**Trent Zanes**	NHDOT Highway Design

The proponent's traffic engineer, VHB, Inc. ("VHB"), provided a submission of a traffic scoping agenda memorandum in preparation for the scoping meeting. The memorandum was dated April 25, 2025. Included in the scoping meeting agenda submittals were City of Dover parcel maps and after the meeting, a copy of VHB's scoping meeting notes.

Size & Type of Development

The proposed 180 multifamily dwelling units and 84-room hotel will be located at 239 Knox Marsh Road (NH Route 155) in Dover. The proponent described the location as previously approved by NHDOT for 52

apartment units, twelve (12) detached housing units, and 23,000 square feet of commercial use from 2020 and 2021.

The proponent is anticipating a proposed Opening Year of 2027.

Site Access:

The proposed access driveway is located on Knox Marsh Road, opposite the existing western site access driveway for F.W. Webb. The parcel is currently vacant with some access improvements noted by NHDOT along its frontage of Knox Marsh Road, provided under the previous driveway permit application. These improvements were concurrent with a planned NHDOT paving project for Knox Marsh Road (NH Route 155).

NHDOT noted that the previous driveway permit application's TIAS reviewed auxiliary turn lane warrants, with findings just reaching thresholds in future scenarios for turn lanes from Knox Marsh Road. NHDOT noted that turn lanes were not required of the previous application due to this future and specific condition being met.

Analysis Periods:

- Analysis Peak Periods:
    - Morning Peak Hour Period
    - Afternoon Peak Hour Period
    - Saturday Peak Hour Period

Analysis Years:

- 2027 Opening Year
    - No Build
    - Build
    - Build with Mitigation (if required)
- 2037 Future Year
    - No Build
    - Build
    - Build with Mitigation (if required)

MEETING MINUTES

TRAFFIC STUDY SCOPING FOR NHDOT DRIVEWAY PERMIT APPLICATION

Background Growth and Seasonal Adjustment:

In VHB's scoping memorandum, they noted a review of NHDOT's Traffic Data Management System (TDMS) and identification of Station 02125001 – Dover Point Road, south of Middlebrook Road in Dover as a reference. From this review, VHB would use NHDOT's required one percent (1%) average annual background growth rate as a minimum.

In VHB's traffic memorandum, they noted a review of NHDOT's Seasonal Adjustment Data. For the scoping memo, they noted April counts would require a 1.13 seasonal adjustment factor to adjust to the peak month.

As the scoping meeting was conducted in May, Stantec will note that counts collected in May would require a peak-month adjustment of 1.03 for this counter.

Study Area Intersections:

Preliminary Locations – VHB identified the following intersections in its initial traffic memorandum in advance of the scoping meeting:

- Knox Marsh Road (NH Route 155) at Proposed Site Access Driveway and West Driveway of F.W. Webb.

In a review of nearby impactful intersections to be studied, the following intersections were noted, but due to the relatively low generation of traffic and distance from the proposed development, they were ultimately **not** included:

- Knox Marsh Road (NH Route 155) at Littleworth Road (NH Route 9) and Bellamy Road – Signalized Intersection – NHDOT ID S-125-03
- Piscataqua Road (US Route 4) at Madbury Road – Signalized Intersection – NHDOT ID S-133-01 – *Durham*

Stantec requested that automatic traffic recorder (ATR) data be collected in proximity to the proposed driveway intersection on Knox Marsh Road to provide speed and classification data. This would inform speeds to be used in the additional design and analysis considerations for the development's intersection with Knox Marsh Road. NHDOT noted the City of Dover is interested in evaluating and proposing a speed reduction in the vicinity of this development, where the speed enters Dover posted at 50 MPH and drops to 40 MPH near Progress Drive.

Other Projects / Developments Nearby:

NHDOT noted there was potential for a large project on Littleworth Road (NH Route 9), but that there have been no official submissions.

MEETING MINUTES

TRAFFIC STUDY SCOPING FOR NHDOT DRIVEWAY PERMIT APPLICATION

Stantec noted a previous scoping meeting had been conducted for a potential development located at 99 Knox Marsh Road (NH Route 155). NHDOT noted that no official TIAS submission has been made as of the time of this scoping meeting.

Stantec noted the Dover Fields development on Mast Road and Durham Road (NH Route 108), but that there is likely no overlap between the two developments' study areas.

Stantec noted NHDOT Project 41373 is slated to construct a multi-use path from Knox Marsh Road (NH Route 155) near Lilac Lane (approximately less than 1000 feet east of the proposed development) to connect to Bellamy Road and eventually Dover Middle and High Schools.

Trip Generation / Composition / Distribution:

Table 1 from VHB's scoping agenda memorandum presents the ITE estimates for the morning, evening, and Saturday midday.

Table 1 Peak Hour Trip-Generation Summary

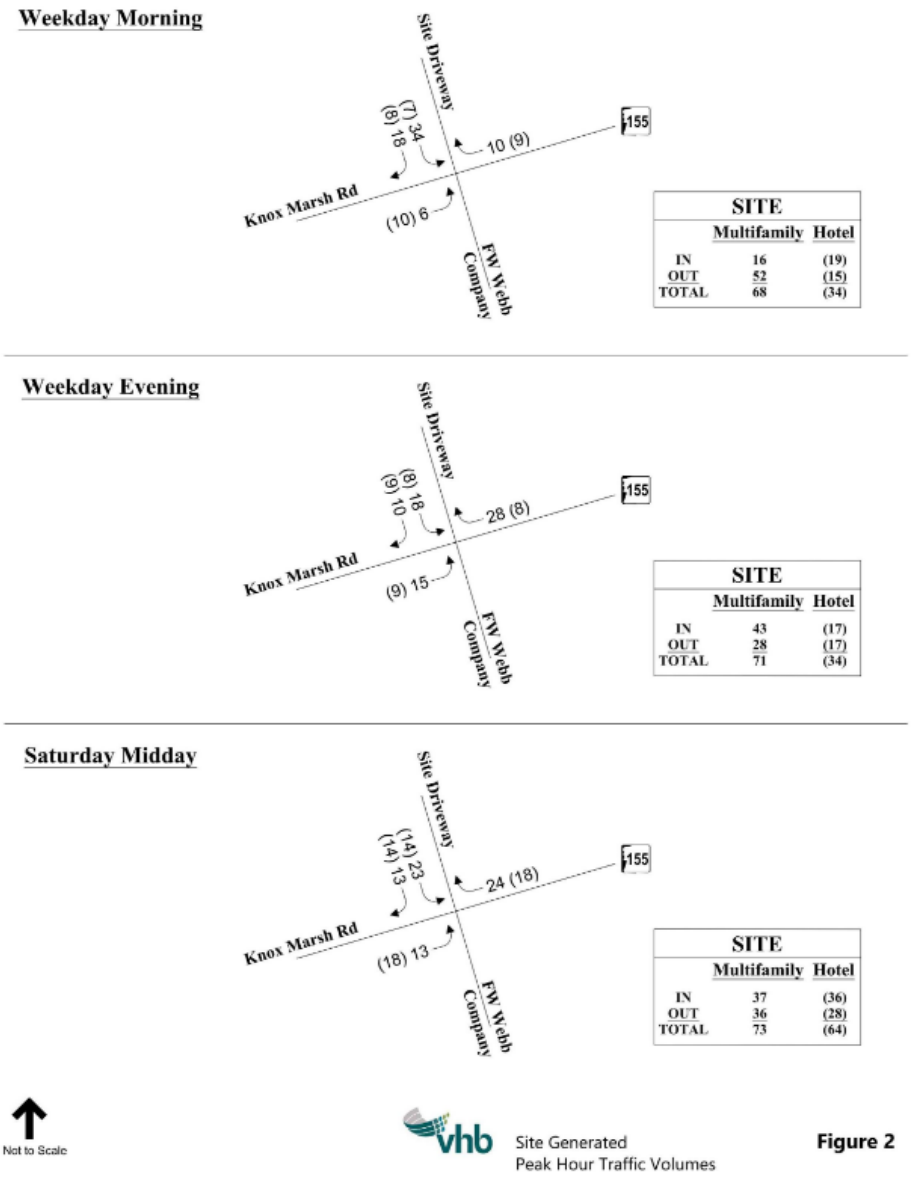
Peak Hour/Direction	Residential Trips [a]	Hotel Trips [b]	Total Trips	Previously Permitted Trips	Net Increase
Weekday AM					
Enter	16	19	35	27	8
Exit	52	15	67	28	39
Total	68	34	102	55	47
Weekday PM					
Enter	43	17	60	32	28
Exit	28	17	45	36	9
Total	71	34	105	68	37
Saturday Midday					
Enter	37	36	73	28	45
Exit	36	28	64	27	37
Total	73	64	137	55	82

a ITE Land Use Code 221 (Multifamily Housing [Mid-Rise]) for 180 dwelling units.
b ITE Land Use Code 310 (Hotel) for 84 rooms.

Figure 2 from VHB's scoping agenda memorandum presents the estimated distribution from and to the development's site access driveway using U.S. Census Journey to Work data and will be further supported by pro-rated turning movement count data to be collected. VHB noted differing distribution would be used between the lodging use (hotel) and the residential use.

MEETING MINUTES

TRAFFIC STUDY SCOPING FOR NHDOT DRIVEWAY PERMIT APPLICATION



Design Considerations:

Turn Lane Warrants

As was conducted for the initial TIAS submittal for this property, NHDOT requested review of left-turn and right-turn lane warrants from Knox Marsh Road (NH Route 155) at the site driveway.

MEETING MINUTES

TRAFFIC STUDY SCOPING FOR NHDOT DRIVEWAY PERMIT APPLICATION

Sight Distance

VAI noted they would do reviews of AASHTO and NHDOT All-Season Sight Distances, as appropriate. Stantec requested VHB review the speeds collected from the ATRs for sight distance inputs, and to review both NHDOT's All-Season intersection sight distance and AASHTO's recommended and required sight distances with this speed data.

Crash Data

Not expressly discussed in the meeting, but Stantec recommends VHB coordinate with NHDOT – Safety and/or City of Dover regarding recent crash history at the proposed site driveway and Knox Marsh Road.

Other Considerations:

Proponent's engineer to follow NHDOT Synchro Guidelines for capacity analysis.

Stantec and NHDOT recommended the applicant and their engineers review and coordinate with University of New Hampshire's (UNH's) Wildcat Transit regarding existing routing and stops along Knox Marsh Road.

NHDOT noted submittal of Synchro analysis files help expedite review.

NHDOT noted that the engineers should take care in internal driveway design and placement as to not interrupt operations between Knox Marsh Road and the proposed site driveway, such as avoiding queues that interrupt flows.

Note the Following Requirements:

The completed Traffic Impact Study shall bear the seal of a Professional Engineer licensed to practice in the State of New Hampshire. It is therefore expected that the Study has been checked by the Engineer and is free of errors and omissions before its submission to the District Office.

Submissions, including resubmissions, will be reviewed by the Bureau of Traffic in order they are received from the districts.

Based on Bureau workload, study reviews may be conducted by an on-call consultant under the oversight of the Bureau of Traffic, at the expense of the State.

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Attachment H

Crash History

2019-2023 Crash Summary



ACCIDENT NUMBER	INVESTIGATING AGENCY	CRASH DATE	MONTH OF THE CRASH	DAY OF THE WEEK	CRASH TIME	TOWN	COUNTY	ROUTE NO. STREET NAME	POSTED SPEED	FATAL INDICATOR	TOTAL INJURED
PDAR246916	DOVER PD	1/1/2020	January	Wednesday	3:53	DOVER	STRAFFORD COUNTY	KNOX MARSH ROAD	50	No	0
PDAR311062	DOVER PD	3/11/2022	March	Friday	18:17	DOVER	STRAFFORD COUNTY	218 KNOX MARSH RD		No	2

VEHICLES COUNT	CRASH TYPE	FIXED OBJECT STRUCK	FIRST HARMFUL EVENT	ROAD DESIGN	ROAD ALIGNMENT	ROAD SURFACE CONDITION	WEATHER CONDITION	POLICE DEPT CODE	LIGHT CONDITION	DIRECTION	DOT LOCATION CODE
1	Other Motor Vehicle	Telephone /Electric Pole		Not Physically Divided (2-Way Traffic)	Straight and Level	Ice	Clear	904	Dark-Lighted/ Dark-Street Light On		5
2			Motor Vehicle in Transport			Dry	Clear		Dark-Lighted		7

DOT LATITUDE	DOT LONGITUDE	MANUAL LOCATE CODE	LOCATED	SEVERITY
43.188678	-70.8844948			No Apparent Injury
43.17679	-70.90794	3		Suspected Serious Injury

Attachment I

Speed Study

Study Start: 6/4/2025 21:53
Study End: 6/7/2025 16:22
Duration: 66 hours
Total Vehicles: 36165

WB Average Speed: 48
EB Average Speed: 48
WB 85th %ile Speed: 53
EB 85th %ile Speed: 52
Overall Average Speed: 48
Overall 85th %ile Speed: 53

SPEEDS:	1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH
WB	54	55	89	199	476	1148	2673	6095	5312	1440	172	16	2	3
EB	43	27	59	142	386	871	2393	7106	6445	639	6	0	1	1

				WB Speed Detail														EB Speed Detail													
DATE	TIME	WB Volum	EB Volume	1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH	1-15 MPH	16-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-65 MPH	66-70 MPH	71-75 MPH	76+ MPH	UNKNOWN
6/4/2025	22:00	25	23	1	0	1	0	1	8	2	5	1	1	1	0	0	0	0	0	0	0	2	1	5	10	4	0	0	0	0	0	5
6/4/2025	22:15	26	29	0	0	1	0	0	2	5	7	4	2	0	0	0	0	0	0	0	1	3	6	8	7	2	0	0	0	0	0	7
6/4/2025	22:30	13	18	0	0	0	0	2	4	1	4	1	0	1	0	0	0	0	0	1	1	1	2	5	4	1	1	0	0	0	0	2
6/4/2025	22:45	18	19	0	0	0	0	0	6	2	2	3	2	0	0	0	0	0	0	0	0	1	2	3	8	3	1	0	0	0	0	4
6/4/2025	23:00	16	24	0	0	0	0	1	6	5	2	2	0	0	0	0	0	0	0	0	2	2	5	6	5	4	0	0	0	0	0	0
6/4/2025	23:15	7	14	0	0	0	0	2	1	3	0	1	0	0	0	0	0	0	0	0	2	0	1	3	3	3	1	0	0	0	0	1
6/4/2025	23:30	13	14	0	0	0	1	2	2	4	2	1	1	0	0	0	0	0	0	0	0	0	2	2	5	4	0	0	0	0	0	1
6/4/2025	23:45	6	6	0	0	0	0	1	0	1	4	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	0	0	0	0	0	0
6/5/2025	0:00	6	7	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	1	0	0	2	1	1	1	1	0	0	0	0	2
6/5/2025	0:15	5	13	0	0	0	1	0	1	0	2	0	1	0	0	0	0	0	0	0	1	2	3	2	2	2	0	0	0	0	0	1
6/5/2025	0:30	11	9	0	0	0	0	1	3	0	4	1	2	0	0	0	0	0	0	1	1	0	2	2	1	2	0	0	0	0	0	0
6/5/2025	0:45	11	4	0	0	0	2	0	1	3	1	2	1	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	1
6/5/2025	1:00	4	6	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	2	1	1	0	0	0	0	0
6/5/2025	1:15	6	4	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0
6/5/2025	1:30	9	3	0	0	0	1	3	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	1
6/5/2025	1:45	8	2	0	0	0	0	0	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
6/5/2025	2:00	1	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
6/5/2025	2:15	4	5	0	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2
6/5/2025	2:30	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
6/5/2025	2:45	4	8	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	2	0	2	2	1	1	0	0	0	0	0
6/5/2025	3:00	4	5	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	2	0	1	0	0	0	0	0
6/5/2025	3:15	11	1	0	0	0	1	1	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6/5/2025	3:30	3	3	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
6/5/2025	3:45	12	7	0	0	0	0	1	2	2	4	2	0	0	0	0	0	0	0	0	0	0	0	1	4	1	0	0	0	0	0	2
6/5/2025	4:00	12	11	0	0	0	0	0	3	2	1	4	0	0	0	0	0	0	0	1	1	0	2	3	2	1	1	0	0	0	0	2
6/5/2025	4:15	9	8	0	0	0	0	0	1	1	4	0	2	0	1	0	0	0	0	0	0	0	2	1	3	0	1	0	0	0	0	1
6/5/2025	4:30	5	2	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
6/5/2025	4:45	17	15	0	0	0	0	0	0	2	6	6	3	0	0	0	0	0	0	0	2	0	0	4	3	6	0	0	0	0	0	0
6/5/2025	5:00	20	21	0	0	0	0	0	1	1	5	10	3	0	0	0	0	0	1	0	0	0	3	1	6	10	0	0	0	0	0	0
6/5/2025	5:15	28	34	0	0	0	1	0	0	2	12	7	4	2	0	0	0	0	0	0	0	3	1	0	12	18	0	0	0	0	0	0
6/5/2025	5:30	52	50	0	0	0	0	1	1	1	11	25	11	1	0	0	0	0	0	0	0	3	0	2	14	30	1	0	0	0	0	1
6/5/2025	5:45	51	74	2	0	0	0	0	0	1	11	23	13	1	0	0	0	0	0	0	0	1	2	4	34	33	0	0	0	0	0	0
6/5/2025	6:00	54	83	0	0	0	0	0	4	7	15	20	8	0	0	0	0	0	0	1	2	5	3	9	34	29	0	0	0	0	0	0
6/5/2025	6:15	75	106	1	0	1	0	2	5	3	22	27	12	2	0	0	0	0	0	0	3	1	8	31	46	16	0	0	0	0	1	0
6/5/2025	6:30	85	119	0	0	0	1	1	1	9	23	36	10	4	0	0	0	0	1	2	1	3	3	27	60	22	0	0	0	0	0	0
6/5/2025	6:45	122	118	0	0	0	0	1	5	11	44	40	16	2	0	0	0	0	1	0	0	4	2	24	49	37	1	0	0	0	0	3
6/5/2025	7:00	135	129	0	1	0	0	1	2	13	33	64	21	0	0	0	0	1	0	0	0	7	15	29	56	21	0	0	0	0	0	0
6/5/2025	7:15	162	134	1	0	0	0	4	6	20	52	60	17	0	0	0	0	0	0	1	0	3	4	14	70	42	0	0	0	0	0	2
6/5/2025	7:30	194	138	2	5	4	2	3	14	39	55	48	17	0	0	0	0	1	0	0	0	4	6	22	67	38	0	0	0	0	0	5
6/5/2025	7:45	174	138	2	2	2	1	3	4	9	55	78	13	1	0	0	0	0	0	0	0	0	3	14	61	57	3	0	0	0	0	4
6/5/2025	8:00	138	153	1	0	1	2	0	3	13	56	46	13	3	0	0	0	0	0	0	2	1	6	8	73	58	5	0	0	0	0	0
6/5/2025	8:15	127	123	0	0	0	2	1	5	15	43	42	18	1	0	0	0	0	0	0	2	5	1	4	38	63	10	0	0	0	0	0
6/5/2025	8:30	110	122	0	0	0	0	3	7	12	42	32	11	1	0	0	0	0	0	0	0	1	6	17	52	45	1	0	0	0	0	2
6/5/2025	8:45	103	129	0	1	2	1	5	4	17	31	34	8	0	0	0	0	0	0	0	0	0	6	3	39	68	13	0	0	0	0	0
6/5/2025	9:00	93	98	0	0	0	1	2	8	18	29	25	10	0	0	0	0	0	1	0	2	3	4	5	30	48	5	0	0	0	0	0
6/5/2025	9:15	94	98	0	1	1	0	2	4	15	28	31	9	1	0	0	0	0	0	2	3	1	1	5	24	55	7	0	0	0	0	2
6/5/2025	9:30	80	101	0	1	0	1	0	2	10	32	28	4	1	0	0	0	0	0	0	0	4	2	8	31	43	13	0	0	0	0	1
6/5/2025	9:45	93	94	0	0	0	2	1	1	12	24	29	23	1	0	0	0	0	0	0	0	1	3	14	32	32	12	0	0	0	0	0
6/5/2025	10:00	89	90	0	0	0	1	1	1	14	17	42	9	3	0	0	0	0	0	1	5	1	2	6	29	38	8	0	0	0	0	1
6/5/2025	10:15	94	79	0	0	0	1	0	5	9	36	30	11	1	1	0	0	0	0	0	0	1	0	7	32	31	8	0	0	0	0	0
6/5/2025	10:30	108	119	0	5	3	3	5	3	11	35	36	5	1	0	0	0	0	0	1	0	0	4	26	49	34	5	0	0	0	0	1
6/5/2025	10:45	89	109	0	0	2	0	5	1	4	24	42	10	0	0	0	0	1	0	0	0	0	5	9	42	47	5	0	0	0	0	1
6/5/2025	11:00	64	87	0	0	1	1	0	1	3	14	27	11	1	2	0	0	0	0	1	1	0	4	8	25	43	5	0	0	0	0	3
6/5/2025	11:15	95	81	0	0	0	0	1	1	10	26	43	11	3	0	0	0	0	0	0	0	7	1	3	22	38	10	0	0	0	0	0
6/5/2025	11:30	87	86	0	0	1	1	4	6	9	34	20	9	2	0	0	0	0	0	0	0	0	1	3	26	45	11	0	0	0	0	1
6/5/2025	11:45	110	91	0	0	0	0	3	7	10	40	36	11	0	0	0	0	0	0	0	3	4	2	1	21	51	9	0	0	0	0	3
6/5/2025	12:00	75	79	0	0	0	3	1	7	6	20	21	15	2	0	0	0	1	0	0	1	0	7	8	13	40	9	0	0	0	0	0
6/5/2025	12:15	93	96	0	0	1	0	2	1	15	22	38	10	2	1	0	0	0	2	1	4	1	1	18	25	39	5	0	0	0	0	1
6/5/2025	12:30	100	90	1	0	0	1	1	4	11	41	27	11	1	0	0	0	2	0	0	0	1	4	11	35	35	2	0	0	0	0	2
6/5/2025	12:45	90	110	0	0	1	1	3	7	8	27	33	5	0	1	0	0	0	0	0	1	1	3	18	59	27	1	0	0	0	0	4
6/5/2025	13:00	85	83	0	0	0	2	0	3	11	39	23	4	0	0	0	0	0	0	0	2	1	4	8	34	31	3	0	0	0	0	3
6/5/2025	13:15	92	84	0	0	0	0	1	3	14	33	29	9	3	0	0	0	0	0	0	1	0	3	4	30	39	7	0	0	0	0	0
6/5/2025	13:30	101	92	0	0	0	2	0	10	16	27	35	9	0	1	0	0	0	0	0	0	1	2	7	33	41	8	0	0	0	0	1
6/5/2025	13:45	89	109	0	0	0	1	1	3	10	27	36	9	2	0	0	0	0	1	0	2	1	1	17	53	31	3	0	0	0	0	0
6/5/2025	14:00	109	93	0	0	0	0	3	4	17	37	34	12	1	0	0	0	2	1	0	0	5	4	10	34	33	4	0	0	0	0	1
6/5/2025	14:15	123	106	0	0	0	1	3	4	17	44	42	10	2	0	0	0	1	0	0	0	0	2	9	48	38	7	0	0	0	0	1
6/5/2025	14:30	130	124	1	2	1	3	2	10	24	52	27	7	1	0	0	0	0	0	0	0	2	5	20	56	36	5	0	0	0	0	0
6/5/2025	14:45	147	128	2	3	1	1	10	3	25	42	42	16	1	0	0	0	0	0	0	0	0	9	26	44	49	0	0	0	0	0	1
6/5/2025	15:00	130	122	0	0	0	1	4	8	16	41	45	11	2	0	0	0	0	0	1	2	1	3	10	50	52	3	0	0	0	0	2
6/5/2025	15:15	144	131	2	2	4	8	5	6	19	43	34	15	2	0	0	0	0	0	0	1	5	7	19	46	50	3	0	0	0	0	4
6/5/2025	15:30	127	166	1	0	2	3	4	8	13	43	40	13	0	0	0	0	0	0	0	0	1	3	12	67	81	2	0	0	0	0	0
6/5/2025	15:45	128	146	0	0	1	0	0	7	23	53	32	10	0	0	0	0	0	0	0	0	1	9	17	74	43	2	0	0	0	0	2
6/5/2025	16:00	128	160	0	0	1	0	7	10	20	47	36	4	0	0	0	0	0	0	0	0	0	3	25	68	63	1	0	0	0	0	3
6/5/2025	16:15	171	162	1	0	1	5	5	12	18	55	56	13	0	0	0	0	0	0	0	0	2	7	8	63	80	2	0	0	0	0	5
6/5/2025	16:30	141	172	0	1	0	3	8	8	21	40	38	17	1	0	0	0	0	0	0	1	0	5	17	73	75	1	0	0	0	0	4
6/5/2025	16:45	174	179	1	1	1	2	16	9	32	48	46	14	3	0	0	0	1	0	0	0	2	8	24	88	52	4	0	0	0	0	1
6/5/2025	17:00	162	144	1	1	0	2	2	5	19	72	49	6	2	0	0	0	3	0	0	0	2	5	3	56	74	1	0	0	0	0	3
6/5/2025	17:15	173	154	1	0	1	0	7	7	29	65	51	9	1	0	0	0	0	0	0	1	1	5	15	71	58	3	0	0	0	0	2
6/5/2025	17:30	209	136	0	0	0	1	2	15	33	80	67	8	2	0	0	0	0	0	0	0	0	5	7	52	71	1	0	0	0	0	1

| | | |

6/6/2025	17:00	191	117	0	1	0	1	6	14	21	61	68	16	0	0	0	0	0	0	0	0	1	0	7	31	69	9	0	0	0	0	3
6/6/2025	17:15	189	151	0	0	0	0	2	7	35	76	59	8	1	0	0	0	0	0	0	0	1	1	11	60	68	10	0	0	0	0	1
6/6/2025	17:30	129	103	0	0	0	0	1	7	23	46	45	6	1	0	0	0	0	0	0	1	0	1	8	38	40	15	0	0	0	0	0
6/6/2025	17:45	128	114	0	0	0	1	3	6	25	54	29	8	0	0	0	0	0	0	0	1	0	5	5	48	49	6	0	0	0	0	2
6/6/2025	18:00	114	109	0	0	0	3	4	21	10	37	33	2	1	0	0	0	0	0	0	0	0	3	12	39	50	5	0	0	0	0	3
6/6/2025	18:15	94	107	0	0	0	0	1	4	16	44	23	6	0	0	0	0	0	0	0	0	1	4	8	53	39	2	0	0	0	0	0
6/6/2025	18:30	83	86	0	0	0	0	4	10	14	31	20	2	0	0	0	0	0	0	0	0	2	3	19	41	20	1	0	0	0	0	2
6/6/2025	18:45	65	68	0	2	0	1	2	6	14	29	9	1	1	0	0	0	0	1	0	0	1	3	11	33	17	2	0	0	0	0	0
6/6/2025	19:00	79	70	0	1	0	0	3	5	30	36	3	0	0	0	0	0	0	0	2	0	0	1	26	36	5	0	0	0	0	0	1
6/6/2025	19:15	55	55	0	0	2	0	2	9	14	22	5	1	0	0	0	0	0	0	0	0	0	5	34	13	3	0	0	0	0	0	0
6/6/2025	19:30	60	62	7	0	3	1	4	7	23	15	0	0	0	0	0	0	0	8	3	0	1	0	8	33	7	2	0	0	0	0	0
6/6/2025	19:45	76	99	2	0	0	1	5	18	29	20	1	0	0	0	0	0	0	2	0	2	1	4	38	44	8	0	0	0	0	0	0
6/6/2025	20:00	59	129	0	1	1	0	4	11	24	15	2	0	0	0	0	0	0	0	0	1	0	4	28	73	22	1	0	0	0	0	1
6/6/2025	20:15	39	58	0	0	0	1	0	7	13	16	2	0	0	0	0	0	0	0	0	0	2	6	22	23	5	0	0	0	0	0	0
6/6/2025	20:30	40	14	0	0	0	1	5	5	10	16	1	0	0	1	0	0	0	0	0	0	0	0	5	7	2	0	0	0	0	0	1
6/6/2025	20:45	29	30	0	0	0	0	11	6	1	7	3	1	0	0	0	0	0	0	0	2	0	1	1	5	10	10	1	0	0	0	0
6/6/2025	21:00	43	40	0	0	1	8	6	6	11	8	2	1	0	0	0	0	0	0	0	2	2	1	7	8	7	9	2	0	0	0	2
6/6/2025	21:15	45	25	0	2	0	1	4	5	17	11	3	1	0	0	0	0	0	0	0	1	0	1	4	5	8	6	0	0	0	0	1
6/6/2025	21:30	43	34	0	0	0	0	1	7	17	14	4	0	0	0	0	0	0	0	0	1	2	0	4	9	12	5	1	0	0	0	0
6/6/2025	21:45	35	23	0	0	0	0	1	4	13	11	5	1	0	0	0	0	0	0	1	0	0	0	5	8	7	2	0	0	0	0	0
6/6/2025	22:00	34	30	0	0	0	0	1	5	10	15	3	0	0	0	0	0	0	0	0	0	1	0	7	8	9	3	2	0	0	0	0
6/6/2025	22:15	23	23	0	0	0	0	2	3	6	5	6	1	0	0	0	0	0	0	0	0	0	2	1	4	8	5	3	0	0	0	0
6/6/2025	22:30	26	34	0	0	0	0	3	5	7	9	1	0	1	0	0	0	0	0	0	0	1	3	6	13	7	4	0	0	0	0	0
6/6/2025	22:45	27	34	0	0	0	1	1	5	13	2	3	2	0	0	0	0	0	0	0	0	0	1	5	17	9	2	0	0	0	0	0
6/6/2025	23:00	28	32	0	0	0	1	4	4	6	8	3	1	0	0	0	0	0	0	0	0	0	4	5	13	9	1	0	0	0	0	1
6/6/2025	23:15	16	16	0	0	0	1	0	4	5	1	4	1	0	0	0	0	0	0	0	0	0	1	5	5	5	0	0	0	0	0	0
6/6/2025	23:30	14	11	0	0	0	0	1	1	10	0	1	1	0	0	0	0	0	0	0	0	0	0	0	7	3	1	0	0	0	0	0
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6/7/2025	0:00	10	10	0	0	0	1	1	0	3	2	1	2	0	0	0	0	0	0	0	0	0	0	3	3	3	1	0	0	0	0	0
6/7/2025	0:15	3	12	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	9	2	0	0	0	0	0	0
6/7/2025	0:30	13	15	0	0	0	1	0	3	1	7	1	0	0	0	0	0	0	0	0	0	1	0	4	4	4	1	0	0	0	0	1
6/7/2025	0:45	5	3	0	0	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
6/7/2025	1:00	9	10	0	0	0	1	1	4	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	6	1	1	0	0	0	0	0
6/7/2025	1:15	5	7	0	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	1	0	0	0	0	1
6/7/2025	1:30	5	9	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	3	2	0	0	0	0
6/7/2025	1:45	4	2	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
6/7/2025	2:00	3	4	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0
6/7/2025	2:15	6	3	0	0	0	0	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
6/7/2025	2:30	9	1	0	0	0	1	0	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6/7/2025	2:45	1	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	2	3	0	0	0	0	0	0
6/7/2025	3:00	3	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
6/7/2025	3:15	3	2	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
6/7/2025	3:30	4	5	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0
6/7/2025	3:45	4	2	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
6/7/2025	4:00	10	3	0	0	0	0	1	1	5	2	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
6/7/2025	4:15	7	2	0	0	0	0	1	1	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
6/7/2025	4:30	5	3	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	1
6/7/2025	4:45	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6/7/2025	5:00	10	6	0	0	0	0	0	0	0	4	5	0	1	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0
6/7/2025	5:15	6	13	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	1	1	0	0	0	4	7	0	0	0	0	0	0
6/7/2025	5:30	18	5	0	0	0	0	0	0	0	9	7	1	1	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0
6/7/2025	5:45	19	19	0	0	0	0	0	1	2	7	8	1	0	0	0	0	0	0	0	0	0	0	2	0	5	10	2	0	0	0	0	0
6/7/2025	6:00	24	16	0	1	0	1	0	3	0	3	13	3	0	0	0	0	0	0	0	0	1	1	1	6	5	2	0	0	0	0	0
6/7/2025	6:15	22	23	0	0	0	0	0	0	0	7	11	4	0	0	0	0	0	0	0	0	1	0	1	2	7	12	0	0	0	0	0
6/7/2025	6:30	26	54	0	0	0	0	0	0	3	7	11	3	2	0	0	0	0	0	0	0	0	2	0	3	22	26	1	0	0	0	0	0
6/7/2025	6:45	29	34	0	0	0	0	0	0	3	10	13	3	0	0	0	0	0	0	0	0	0	1	1	1	14	17	0	0	0	0	0	0
6/7/2025	7:00	53	41	0	0	1	0	0	2	6	17	18	7	0	0	0	0	0	0	0	0	2	0	0	5	15	17	2	0	0	0	0	2
6/7/2025	7:15	53	44	0	0	0	0	0	2	6	15	25	4	1	0	0	0	0	0	0	0	0	1	1	0	19	22	1	0	0	0	0	0
6/7/2025	7:30	58	57	0	0	0	0	0	2	6	17	27	5	1	0	0	0	0	0	1	0	1	0	0	1	18	33	3	0	0	0	0	0
6/7/2025	7:45	58	51	0	0	0	0	0	2	5	20	22	8	1	0	0	0	0	0	0	0	2	5	0	8	10	22	4	0	0	0	0	0
6/7/2025	8:00	51	49	0	0	0	0	1	0	0	24	20	4	2	0	0	0	0	0	0	0	0	2	0	1	16	23	7	0	0	0	0	0
6/7/2025	8:15	53	66	0	0	0	0	1	0	6	11	27	7	1	0	0	0	0	0	0	1	0	0	0	7	30	28	0	0	0	0	0	0
6/7/2025	8:30	55	68	0	0	0	0	1	4	4	13	25	6	0	0	0	0	0	0	0	0	0	1	1	3	24	37	2	0	0	0	0	2
6/7/2025	8:45	57	88	0	0	0	0	0	4	5	24	17	5	2	0	0	0	0	0	0	0	0	0	1	4	40	41	2	0	0	0	0	0
6/7/2025	9:00	71	74	1	0	0	0	1	1	11	20	28	9	0	0	0	0	0	0	1	1	2	0	3	9	25	32	1	0	0	0	0	0
6/7/2025	9:15	93	85	0	0	1	0	1	7	10	33	28	12	1	0	0	0	0	0	0	0	0	2	4	11	25	37	6	0	0	0	0	0
6/7/2025	9:30	89	87	0	1	2	0	4	1	15	36	24	5	1	0	0	0	0	0	1	0	0	3	0	4	28	47	4	0	0	0	0	0
6/7/2025	9:45	72	96	0	0	0	0	1	4	11	11	34	10	1	0	0	0	0	0	0	0	0	2	0	5	39	46	4	0	0	0	0	0
6/7/2025	10:00	81	94	0	0	0	0	1	2	12	30	28	8	0	0	0	0	0	0	0	0	0	0	1	6	43	38	6	0	0	0	0	0
6/7/2025	10:15	85	84	0	0	0	1	1	3	14	26	33	7	0	0	0	0	0	0	0	0	0	1	2	10	32	37	2	0	0	0	0	0
6/7/2025	10:30	93	99	0	0	0	2	4	7	6	26	34	12	2	0	0	0	0	0	0	0	0	0	5	12	39	38	5	0	0	0	0	0
6/7/2025	10:45	107	101	0	0	0	0	0	2	18	43	26	16	1	0	0	0	0	0	0	0	0	3	3	9	30	50	6	0	0	0	0	1
6/7/2025	11:00	107	83	0	0	0	6	2	5	10	51	28	4	0	0	0	0	0	0	0	0	0	1	3	4	27	45	3	0	0	0	0	1
6/7/2025	11:15	107	93	0	0	0	1	2	9	13	36	31	14	1	0	0	0	0	1	0	0	1	1	1	6	42	36	5	0	0	0	0	0
6/7/2025	11:30	99	95	0	1	1	1	2	6	11	39	33	5	0	0	0	0	0	0	0	0	0	2	4	10	24	46	9	0	0	0	0	0
6/7/2025	11:45	99	103	0	0	0	0	5	8	25	37	22	2	0	0	0	0	0	0	0	0	0	1	5	22	48	26	1	0	0	0	0	0
6/7/2025	12:00	114	104	0	0	0	0	1	5	4	53	39	10	1	0	0	0	0	0	0	0	1	1	1	24	41	30	6	0	0	0	0	1
6/7/2025	12:15	122	117	0	0	1	2	1	7	15	38	47	10	0	0	0	0	0	0	0	0	1	0	3	5	55	51	2	0	0	0	0	1
6/7/2025	12:30	94	96	0	0	0	1	3	1	11	27	37	13	0	0	0	0	0	0	0	1	0	2	3	11	33	41	5	0	0	0	0	1
6/7/2025	12:45	85	99	0	0	0	0	1	6	10	34	26	3	4	0	0	0	0	0	0	0	0	1	2	7	37	48	4	0	0	0	0	1
6/7/2025	13:00	94	103	0	1	0	1	0	5	11	33	38	3	1	0	0	0	0	0	0	0	0	0	2	4	53	43	1	0	0	0	0	1
6/7/2025	13:15	112	98	0	0	0	1	2	7	19	43	37	1	2	0	0	0	0	0	1	1	0	4	7	13	33	38	1	0	0	0	0	0
6/7/2025	13:30	109	82	0	0	1	0	1	3	13	34	52	3	1	0	0	0	0	0	0	0	0	3	1	10	34	33	1	0	0	0	0	1
6/7/2025	13:45	106	105	0	1	2	3	1	8	11	39	32	8	0	0	0	0	0	0	0	0	1	2	7	15	45	35	0	0	0	0	0	1
6/7/2025	14:00	96	103	0	0	0	0	1	7	21	43	18	4	2	0	0	0	0	0	0	0	0	0	0	15	42	44	2	0	0	0	0	0
6/7/2025	14:15	88	95	0	1	0	0	3	4	16	39	18	6	0	0	0	0	0	2	0	0	0	4	2	12	40	34	1	0	0	0	0	1
6/7/2025	14:30	107	87	0	0	1	1	1	9	22	49	21	2	1	0	0	0	0	0	0	0	0	0	4	16	41	25	1	0	0	0	0	0
6/7/2025	14:45	101	98	1	1	0	3	3	8	18	28	32	4	0	0	0	0	0	3	1	0	1	2	8	20	51	10	1	0	0	0	0	4
6/7/2025	15:00	91	90	0	0	0	0	0	4	27	32	21	6	1	0	0	0	0	0	0	0	0	1	2	14	46	27	0	0	0	0	0	0
6/7/2025	15:15	82	101	1	0	0	0	1	1	5	17	34	17	6	0	0	0	0	0	0	2	1	0	2	9	53	33	1	0	0	0	0	0
6/7/2025	15:30	88	106	0	0	0	0	0	1	9	16	38	22	2	0	0	0	0	0	0	0	0	3	5	16	48	33	1	0	0	0	0	0
6/7/2025	15:45	93	103	0	0	0	0	2	5	11	15	38	20	1	0	0	0	0	0	0	0	0	0	3	3	22	56	19	0	0	0	0	1
6/7/2025	16:00	101	90	0	1	0	1	2	8	23	46	13	2	3	1	0	1	2	1	0	4	6	4	24	40	9	0	0	0	0	0	0

Attachment J

Trip Distribution (Journey to Work) Data

Trip Distribution Gravity Model - Place of Residency: Dover, NH

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United States and Puerto Rico Sorted by Residence Geography: 5-Year ACS, 2011-2015

Travel route assignment based on MapQuest direction from the site to the Municipality of the Workplace

Place of Work				Travel Route by Percent		Travel Route by Volume		
State	County	Municipality	Count	NH Route 155 West	NH Route 155 East	NH Route 155 West	NH Route 155 East	Total
Florida	Lee County		27			0	0	0
Georgia	Whitfield County		17			0	0	0
Illinois	Cook County		33			0	0	0
Maine	Cumberland County	Portland city	27		100%	0	27	27
Maine	Cumberland County	Raymond town	15		100%	0	15	15
Maine	Cumberland County	South Portland city	18		100%	0	18	18
Maine	Penobscot County	Bangor city	28		100%	0	28	28
Maine	York County	Berwick town	15		100%	0	15	15
Maine	York County	Biddeford city	24		100%	0	24	24
Maine	York County	Cornish town	38		100%	0	38	38
Maine	York County	Eliot town	15		100%	0	15	15
Maine	York County	Kennebunk town	33		100%	0	33	33
Maine	York County	Kittery town	366		100%	0	366	366
Maine	York County	North Berwick town	21		100%	0	21	21
Maine	York County	Saco city	34		100%	0	34	34
Maine	York County	Sanford city	16		100%	0	16	16
Maine	York County	South Berwick town	29		100%	0	29	29
Maine	York County	Wells town	5		100%	0	5	5
Maine	York County	York town	130		100%	0	130	130
Massachusetts	Bristol County	Fall River city	54		100%	0	54	54
Massachusetts	Bristol County	Mansfield town	15		100%	0	15	15
Massachusetts	Essex County	Amesbury Town city	28		100%	0	28	28
Massachusetts	Essex County	Andover town	44		100%	0	44	44
Massachusetts	Essex County	Danvers town	8		100%	0	8	8
Massachusetts	Essex County	Groveland town	10		100%	0	10	10
Massachusetts	Essex County	Haverhill city	3		100%	0	3	3
Massachusetts	Essex County	Lynn city	13		100%	0	13	13
Massachusetts	Essex County	Lynnfield town	8		100%	0	8	8
Massachusetts	Essex County	Middleton town	5		100%	0	5	5

Place of Work				Travel Route by Percent		Travel Route by Volume		
State	County	Municipality	Count	NH Route 155 West	NH Route 155 East	NH Route 155 West	NH Route 155 East	Total
Massachusetts	Essex County	Newbury town	19		100%	0	19	19
Massachusetts	Essex County	Newburyport city	97		100%	0	97	97
Massachusetts	Essex County	Peabody city	29		100%	0	29	29
Massachusetts	Essex County	Salem city	16		100%	0	16	16
Massachusetts	Essex County	Saugus town	37		100%	0	37	37
Massachusetts	Middlesex County	Burlington town	24		100%	0	24	24
Massachusetts	Middlesex County	Cambridge city	38		100%	0	38	38
Massachusetts	Middlesex County	Chelmsford town	9		100%	0	9	9
Massachusetts	Middlesex County	Everett city	11		100%	0	11	11
Massachusetts	Middlesex County	Framingham town	4		100%	0	4	4
Massachusetts	Middlesex County	Lexington town	25		100%	0	25	25
Massachusetts	Middlesex County	Lincoln town	25		100%	0	25	25
Massachusetts	Middlesex County	Lowell city	8		100%	0	8	8
Massachusetts	Middlesex County	Malden city	9		100%	0	9	9
Massachusetts	Middlesex County	North Reading town	10		100%	0	10	10
Massachusetts	Middlesex County	Reading town	3		100%	0	3	3
Massachusetts	Middlesex County	Stoneham town	18		100%	0	18	18
Massachusetts	Middlesex County	Wakefield town	11		100%	0	11	11
Massachusetts	Middlesex County	Waltham city	6		100%	0	6	6
Massachusetts	Middlesex County	Woburn city	79		100%	0	79	79
Massachusetts	Norfolk County	Braintree Town city	19		100%	0	19	19
Massachusetts	Norfolk County	Canton town	9		100%	0	9	9
Massachusetts	Norfolk County	Franklin Town city	15		100%	0	15	15
Massachusetts	Norfolk County	Quincy city	16		100%	0	16	16
Massachusetts	Plymouth County	Brockton city	17		100%	0	17	17
Massachusetts	Suffolk County	Boston city	125		100%	0	125	125
Massachusetts	Suffolk County	Chelsea city	17		100%	0	17	17
Massachusetts	Worcester County	Worcester city	8		100%	0	8	8
New Hampshire	Belknap County	Belmont town	18		100%	0	18	18
New Hampshire	Belknap County	Gilford town	33		100%	0	33	33
New Hampshire	Belknap County	Laconia city	12		100%	0	12	12
New Hampshire	Carroll County	Freedom town	22		100%	0	22	22
New Hampshire	Carroll County	Ossipee town	18		100%	0	18	18
New Hampshire	Cheshire County	Chesterfield town	57	100%		57	0	57
New Hampshire	Cheshire County	Keene city	26	100%		26	0	26

Place of Work				Travel Route by Percent		Travel Route by Volume		
State	County	Municipality	Count	NH Route 155 West	NH Route 155 East	NH Route 155 West	NH Route 155 East	Total
New Hampshire	Grafton County	Orford town	9	100%		9	0	9
New Hampshire	Hillsborough County	Amherst town	30	100%		30	0	30
New Hampshire	Hillsborough County	Bedford town	46	100%		46	0	46
New Hampshire	Hillsborough County	Manchester city	95	100%		95	0	95
New Hampshire	Hillsborough County	Merrimack town	21	100%		21	0	21
New Hampshire	Hillsborough County	Nashua city	59	100%		59	0	59
New Hampshire	Hillsborough County	Peterborough town	6	100%		6	0	6
New Hampshire	Merrimack County	Chichester town	13	100%		13	0	13
New Hampshire	Merrimack County	Concord city	100	100%		100	0	100
New Hampshire	Merrimack County	Epsom town	32	100%		32	0	32
New Hampshire	Rockingham County	Auburn town	8	100%		8	0	8
New Hampshire	Rockingham County	Brentwood town	2	100%		2	0	2
New Hampshire	Rockingham County	Candia town	5	100%		5	0	5
New Hampshire	Rockingham County	Danville town	21	100%		21	0	21
New Hampshire	Rockingham County	Deerfield town	56	100%		56	0	56
New Hampshire	Rockingham County	Derry town	47	100%		47	0	47
New Hampshire	Rockingham County	Epping town	27	100%		27	0	27
New Hampshire	Rockingham County	Exeter town	218	50%	50%	109	109	218
New Hampshire	Rockingham County	Greenland town	101		100%	0	101	101
New Hampshire	Rockingham County	Hampstead town	34	100%		34	0	34
New Hampshire	Rockingham County	Hampton town	153		100%	0	153	153
New Hampshire	Rockingham County	Kingston town	20	100%		20	0	20
New Hampshire	Rockingham County	Londonderry town	83	100%		83	0	83
New Hampshire	Rockingham County	New Castle town	45		100%	0	45	45
New Hampshire	Rockingham County	Newfields town	51	100%		51	0	51
New Hampshire	Rockingham County	Newington town	752		100%	0	752	752
New Hampshire	Rockingham County	Newmarket town	155	100%		155	0	155
New Hampshire	Rockingham County	North Hampton town	83		100%	0	83	83
New Hampshire	Rockingham County	Northwood town	16	100%		16	0	16
New Hampshire	Rockingham County	Nottingham town	7	100%		7	0	7
New Hampshire	Rockingham County	Plaistow town	14	100%		14	0	14
New Hampshire	Rockingham County	Portsmouth city	2,703		100%	0	2,703	2,703
New Hampshire	Rockingham County	Raymond town	50	100%		50	0	50
New Hampshire	Rockingham County	Rye town	95		100%	0	95	95
New Hampshire	Rockingham County	Salem town	55		100%	0	55	55

Place of Work				Travel Route by Percent		Travel Route by Volume		
State	County	Municipality	Count	NH Route 155 West	NH Route 155 East	NH Route 155 West	NH Route 155 East	Total
New Hampshire	Rockingham County	Seabrook town	97		100%	0	97	97
New Hampshire	Rockingham County	Stratham town	155	100%		155	0	155
New Hampshire	Rockingham County	Windham town	10	100%		10	0	10
New Hampshire	Strafford County	Barrington town	228		100%	0	228	228
New Hampshire	Strafford County	Dover city	5,928	50%	50%	2,964	2,964	5,928
New Hampshire	Strafford County	Durham town	1,236	100%		1,236	0	1,236
New Hampshire	Strafford County	Farmington town	19		100%	0	19	19
New Hampshire	Strafford County	Lee town	131	100%		131	0	131
New Hampshire	Strafford County	Madbury town	17	100%		17	0	17
New Hampshire	Strafford County	Middleton town	23		100%	0	23	23
New Hampshire	Strafford County	Milton town	25		100%	0	25	25
New Hampshire	Strafford County	New Durham town	21		100%	0	21	21
New Hampshire	Strafford County	Rochester city	772		100%	0	772	772
New Hampshire	Strafford County	Rollinsford town	99		100%	0	99	99
New Hampshire	Strafford County	Somersworth city	608		100%	0	608	608
New Hampshire	Strafford County	Strafford town	52		100%	0	52	52
Texas	Harris County		13					
West Virginia	Mercer County		14					
					Total	5,712	10,813	16,525
					Percentage	35%	65%	100%
					Route Name	NH Route 155 West	NH Route 155 East	Total
					USE FOR RESIDENTIAL	35%	65%	100%

Memorandum

To: Chris Berry
crberry@berrysurveying.com

Date: 03/19/2026

Project #: 53193.00

From: Jenn Conley, PE
Evan Haugh

Re: 239 Knox Marsh Road Program Changes

VHB completed a Traffic Impact Study for a land development project proposed at 239 Knox Marsh Road in Dover, New Hampshire. Since then, the development proposal has changed to reduce the number of housing units:

Development Program

Land Use	Previous Program	Current Program
Multifamily Housing	180 units	66 units
Hotel	84 rooms	84 rooms

The new development program generates 44-46 fewer trips in each peak hour period. A comparison is shown below:

Time Period/Direction	Previous Program Trip Generation	New Program Trip Generation	Net Reduction
Weekday AM Peak Hour:			
Enter	35	25	**-10**
Exit	67	33	**-34**
Total	102	58	**-44**
Weekday PM Peak Hour:			
Enter	60	33	**-27**
Exit	45	27	**-18**
Total	105	60	**-45**
Saturday Midday Peak Hour:			
Enter	73	50	**-23**
Exit	64	41	**-23**
Total	137	91	**-46**

Since the number of trips decreases in each peak period, the Traffic Study's conclusion that the development's trips have minimal impact on Route 155 traffic operations and that the intersection of Route 155, FW Webb, and the site driveway operates at an overall LOS A remain unchanged. Mitigation recommendations, which consisted of left and right turn lanes into the site, are still warranted under the revised program. Since these results are consistent with the study's original findings, the change in building program will not require re-evaluation of traffic impacts.

Engineers | Scientists | Planners | Designers
2 Bedford Farms Drive, Suite 200, Bedford, NH 03110-6525
P 603.391.3900 **F** 603.518.7495 www.vhb.com

#2 Bedroom Units	24	
#Bedrooms	48	Full Velocity (Manning Equation)
#Studio/1 Bedroom Units	9	V=(1.486/n)*(R^2/3)*(S^1/2)
Flow Received from Bedroom Units (gpm)		n 0.011
GPM=(150GPD * #BR * 6)/1440min/day		R 0.167
30.00		Pipe Dia (in) 8
Flow Received from Studio Units (gpm)		Area (ft^2) 0.349
GPM=(225GPD * #BR * 6)/1440min/day		8" SDR 35
8.44		Inv In (SMH #3) 89.06
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		Inv Out (SMH #4) 88.20
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day		Outlet Pipe Length (ft) 191.00
0.009		Slope 0.0045
Cumulative Infiltration (gpm)		Full Velocity (ft/s) 2.75
0.009		Discharge Rate (gpm) 429.89
Total Flow Received (BR Flow + INF) (gpm)		SMH #3 Inlet Pipe Length (ft) 27.00
38.45		
SMH #3		
Rim Elev	98.86	
Inv In (Residential Building C)	89.16	
Inv Out (Prop. SMH #4)	89.06	
Depth SMH	9.80	

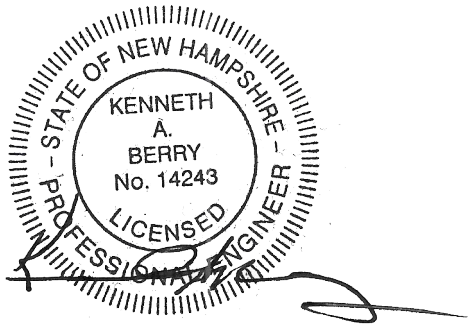
#2 Bedroom Units	24	
# Bedrooms	48	Full Velocity (Manning Equation)
#Studio/1 Bedroom Units	9	V=(1.486/n)*(R^2/3)*(S^1/2)
Flow Received from Bedroom Units (gpm)		n 0.011
GPM=(150GPD * #BR * 6)/1440min/day		R 0.167
30.00		Pipe Dia (in) 8
Flow Received from Studio Units (gpm)		Area (ft^2) 0.349
GPM=(225GPD * #BR * 6)/1440min/day		8" SDR 35
8.44		Inv In (SMH #5) 88.43
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		Inv Out (SMH #4) 88.20
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day		Outlet Pipe Length (ft) 56.90
0.013		Slope 0.004
Cumulative Infiltration (gpm)		Full Velocity (ft/s) 2.60
0.013		Discharge Rate (gpm) 407.32
Total Flow Received (BR Flow + INF) (gpm)		SMH #5 Inlet Pipe Length (ft) 40.00
38.45		
SMH #5		
Rim Elev	97.20	
Inv In (Residential Building B)	83.53	
Inv Out (Prop. SMH #4)	88.43	
Depth SMH	8.77	

#2 Bedroom Units	48	
# Bedrooms	96	Full Velocity (Manning Equation)
#Studio/1 Bedroom Units	18	V=(1.486/n)*(R^2/3)*(S^1/2)
Flow Received from Bedroom Units (gpm)		n 0.011
GPM=(150GPD * #BR * 6)/1440min/day		R 0.167
60.00		Pipe Dia (in) 8
Flow Received from Studio Units (gpm)		Area (ft^2) 0.349
GPM=(225GPD * #BR * 6)/1440min/day		8" SDR 35
16.88		Inv In (SMH #4) 88.10
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		Inv Out (SMH #6) 87.86
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day		Outlet Pipe Length (ft) 56.75
0.018		Slope 0.004
Cumulative Infiltration (gpm)		Full Velocity (ft/s) 2.66
0.039		Discharge Rate (gpm) 416.63
Total Flow Received (BR Flow + INF) (gpm)		
76.91		
SMH #4		
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	

#2 Bedroom Units	48	
#Bedrooms	96	Full Velocity (Manning Equation)
#Studio/1 Bedroom Units	18	V=(1.486/n)*(R^2/3)*(S^1/2)
# Lodging Units	84	n 0.011
# Lodging Employees	8	R 0.167
Flow Received from 2 Bedroom Units (gpm)		Pipe Dia (in) 8
GPM=(150GPD * #BR * 6)/1440min/day		Area (ft^2) 0.349
60.00		8" SDR 35
Flow Received from Studio Units (gpm)		Inv In (SMH #6) 87.76
GPM=(225GPD * #BR * 6)/1440min/day		Inv Out (SMH #7) 86.91
16.88		Outlet Pipe Length (ft) 212.50
Flow Received from Logding Units (gpm)		Slope 0.004
GPM=(106GPD * #Suites * 6)/1440min/day		Full Velocity (ft/s) 2.59
37.10		Discharge Rate (gpm) 405.19
Flow Received from Logding Employees (gpm)		SMH #6 Inlet Pipe Length (ft) 40.67
GPM=(10GPD * #Employees * 6)/1440min/day		
0.27		
Flow Received from Upstream Infiltration (gpm) (Inlet Pipe)		
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)		
114.30		
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	

#2 Bedroom Units	48	
#Bedrooms	96	Full Velocity (Manning Equation)
#Studio/1 Bedroom Units	18	V=(1.486/n)*(R^2/3)*(S^1/2)
# Lodging Units	84	n 0.011
# Lodging Employees	8	R 0.167
Flow Received from 2 Bedroom Units (gpm)		Pipe Dia (in) 8
GPM=(150GPD * #BR * 6)/1440min/day		Area (ft^2) 0.349
60.00		8" SDR 35
Flow Received from Studio Units (gpm)		Inv In (SMH #7) 86.81
GPM=(225GPD * #BR * 6)/1440min/day		Inv Out (SMH Dover GIS #2864) 86.54
16.88		Outlet Pipe Length (ft) 50.40
Flow Received from Logding Units (gpm)		Slope 0.005
GPM=(106GPD * #Suites * 6)/1440min/day		Full Velocity (ft/s) 2.99
37.10		Discharge Rate (gpm) 468.92
Flow Received from Logding Employees (gpm)		
GPM=(10GPD * #Employees * 6)/1440min/day		
0.27		
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)		
114.37		
SMH #7		
Rim Elev	94.00	
Inv In (SMH #6)	86.91	
Inv Out (SMH Dover GIS #2864)	86.81	
Depth SMH	7.19	

#2 Bedroom Units	48
#Bedrooms	96
#Studio/1 Bedroom Units	18
# Lodging Units	84
# Lodging Employees	8
Flow Received from 2 Bedroom Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
60.00	
Flow Received from Studio Units (gpm)	
GPM=(225GPD * #BR * 6)/1440min/day	
16.88	
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	
0.27	
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)	
114.38	
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	
2 Bedroom Unit, Flow/Bedroom (gpd)	150	
Flow/Studio or 1 Bedroom Unit (gpd)	225	
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: 8 Employees
Total 8" SDR 35/21 (Ft):	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
675.22	27,418	113.98
	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	202	0.14
	Total Flow Received (GPD):	Total Flow Received (GPM):
	27,620	114.38
It is not anticipated that this pipe will ever flow full		
Berry Surveying & Engineering: February 15, 2026		

PREVIOUS APPROVAL UNDER NHDES SEWER DISCHARGE PERMIT D2022-0705 WAS FOR 25,075 GPD. NEW APPROVAL REQUIRED.

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

Drainage Analysis
&
Erosion and Sediment Control Plan

Prepared for:

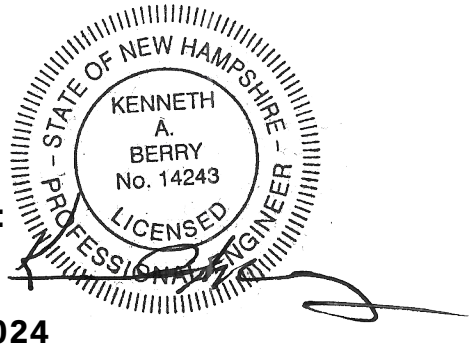
239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

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:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825



Project Number:
DB 2024-034

November 26, 2024
Revised: February 15, 2026

Table of Contents

USGS Quadrangle Location Map

Design Method Objectives Page 2

1.0	Existing Conditions Analysis	Page 2
2.0	Proposed Subdivision Analysis & Treatments	Page 3
3.0	Full Comparative Analysis	Page 6
4.0	Erosion and Sediment Control, BMP's	Page 7
5.0	Demonstration of Compliance with Dover Chapter 153-14	Page 15
6.0	Conclusion	Page 30

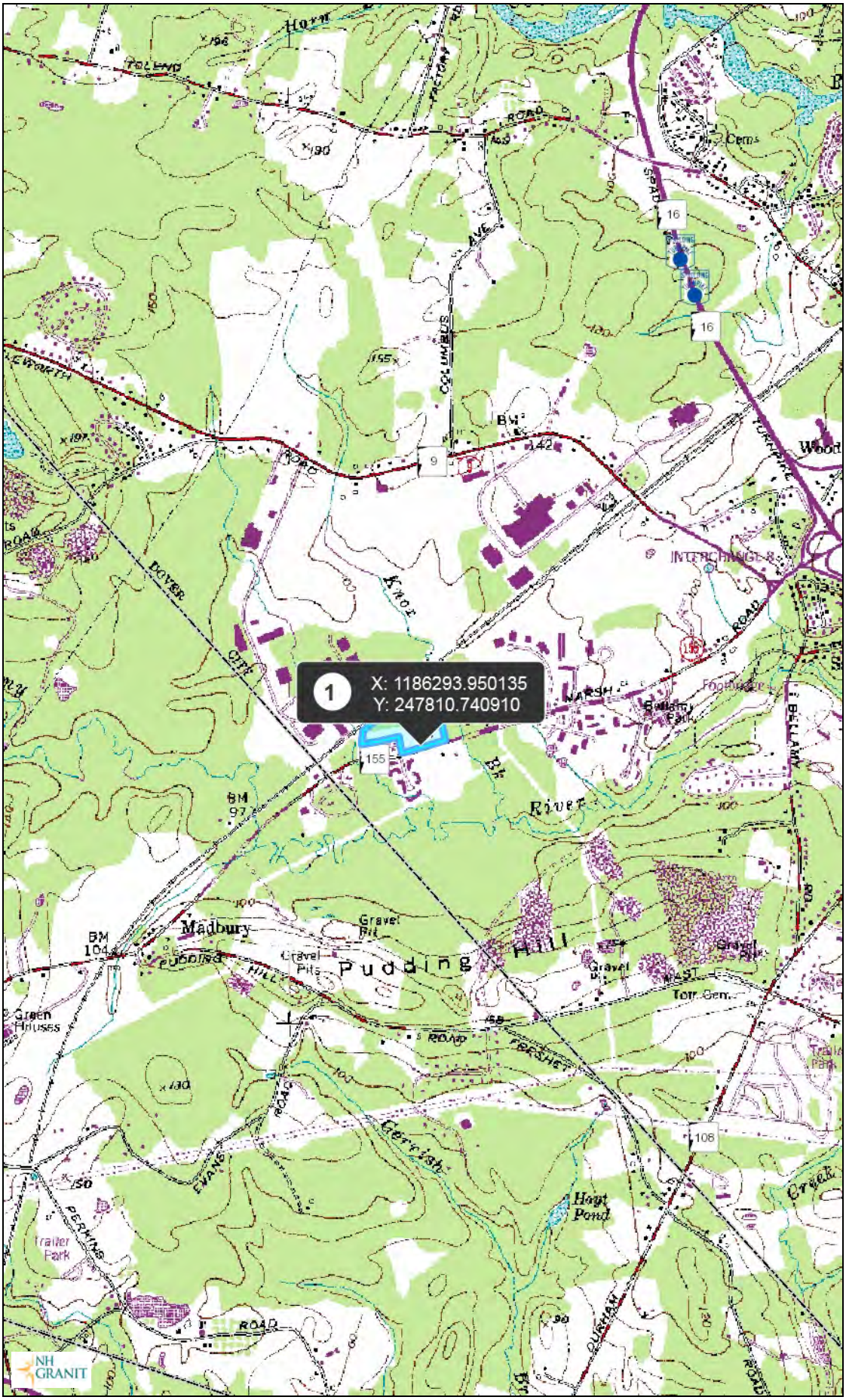
Appendix I - Existing Conditions Analysis
25 Yr - 24 Hr. Full Summary
2 Yr - 24 Hr. Node Listing
10 Yr - 24 Hr. Node Listing
25 Yr - 24 Hr. Node Listing
50 Yr - 24 Hr. Node Listing
100 Yr - 24 Hr. Node Listing

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

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

Enclosed:	W-1 Sheet	Existing Conditions Watershed Plan	Sheet 1
	W-2 Sheet	Post Construction Watershed Plan	Sheet 2
	Erosion & Sediment Control Plan		

Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

1: 24,000

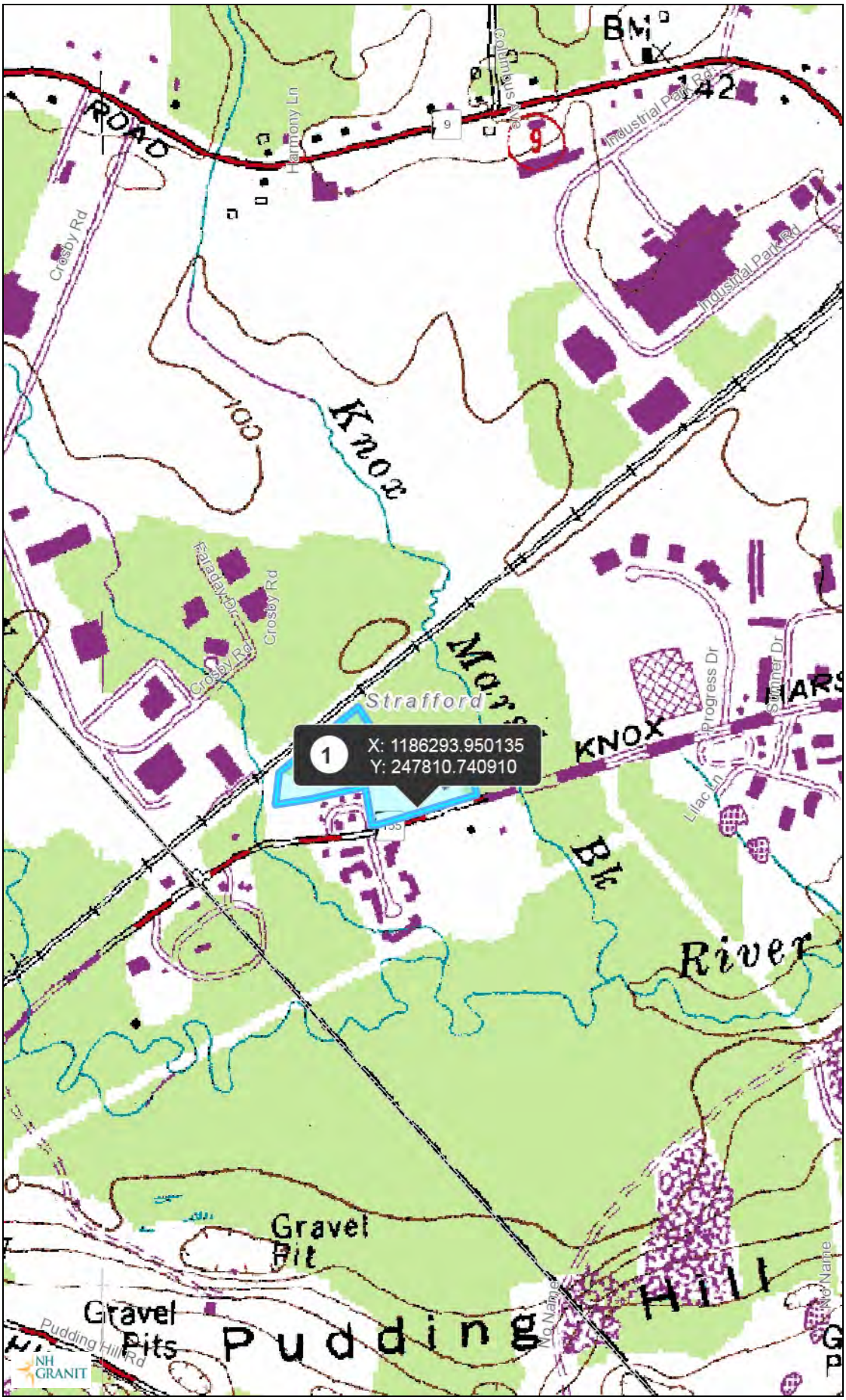
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Map Generated: 12/19/2019

Notes



Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

1: 10,000

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Notes



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 residential buildings, each containing 33 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 33 residential 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 **Catch Basin #7 (Pond C07P)**, 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 system. 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. For Channel Protection Volume (CPV) purposes, Env-Wq 1507.05(b)(1)b., requires the 2-year 24-hour post development peak rate of runoff to be less than or equal to the 2-year 24-hour predevelopment peak flow rate, and the 2-year 24-hour post development directed to a channel, downstream receiving water, or wetland is less than 2 CFS. The discharge from the developed area complies with the less than 2 CFS requirement for CPV purposes.

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	4.84	9.64
Final Reach #200	Existing	4.02	9.00	13.30	17.49	22.58
	Proposed	1.36	3.35	9.02	15.26	22.31
Final Reach #400	Existing	0.83	2.67	4.35	5.52	6.30
	Proposed	0.57	1.97	3.31	4.16	4.91

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	0.328	0.545	0.749	1.004
Final Reach #200	Existing	0.592	1.269	1.862	2.448	3.171
	Proposed	0.465	1.090	1.636	2.163	2.808

Final Reach #400	Existing	0.145	0.387	0.618	0.855	1.158
	Proposed	0.175	0.412	0.688	0.968	1.314

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-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

Christopher R. Berry, LLS
Principal, President

Kenneth A. Berry PE, LLS,
CPSWQ, CPESC, CESSWI
VP – Emeritus (Engineer of Record)

Kevin R. Poulin, PE
VP – Engineering Operations

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.

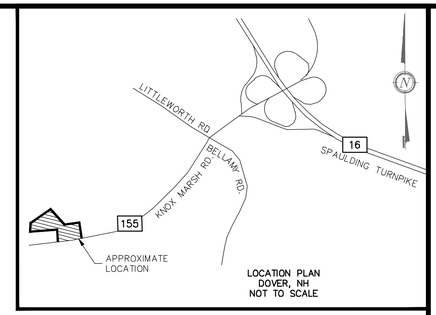
SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

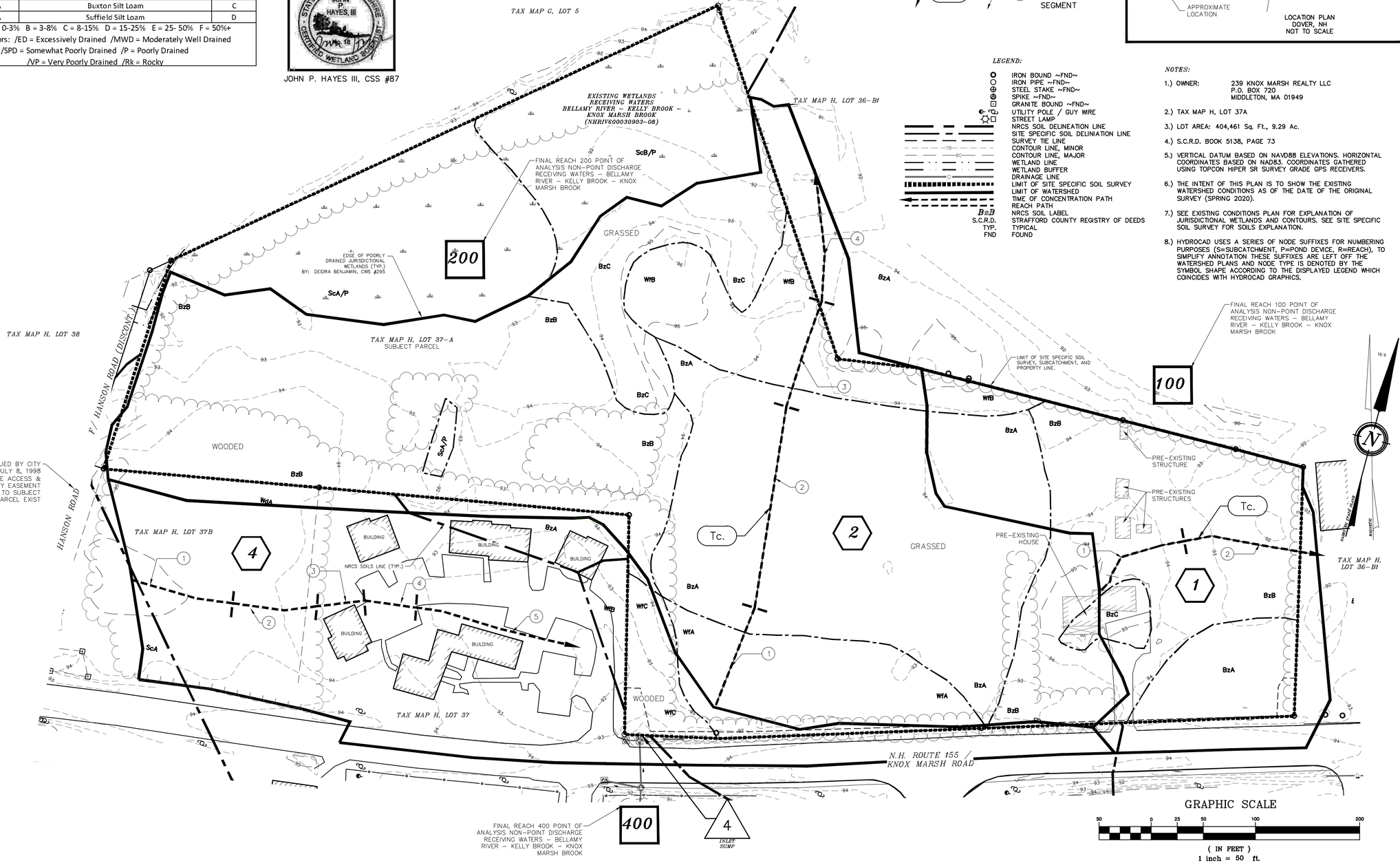
FLOW REACH SYMBOL

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.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PLANNING FILE #SITE–XXXX–XXXX

REVISION	DATE	DESCRIPTION

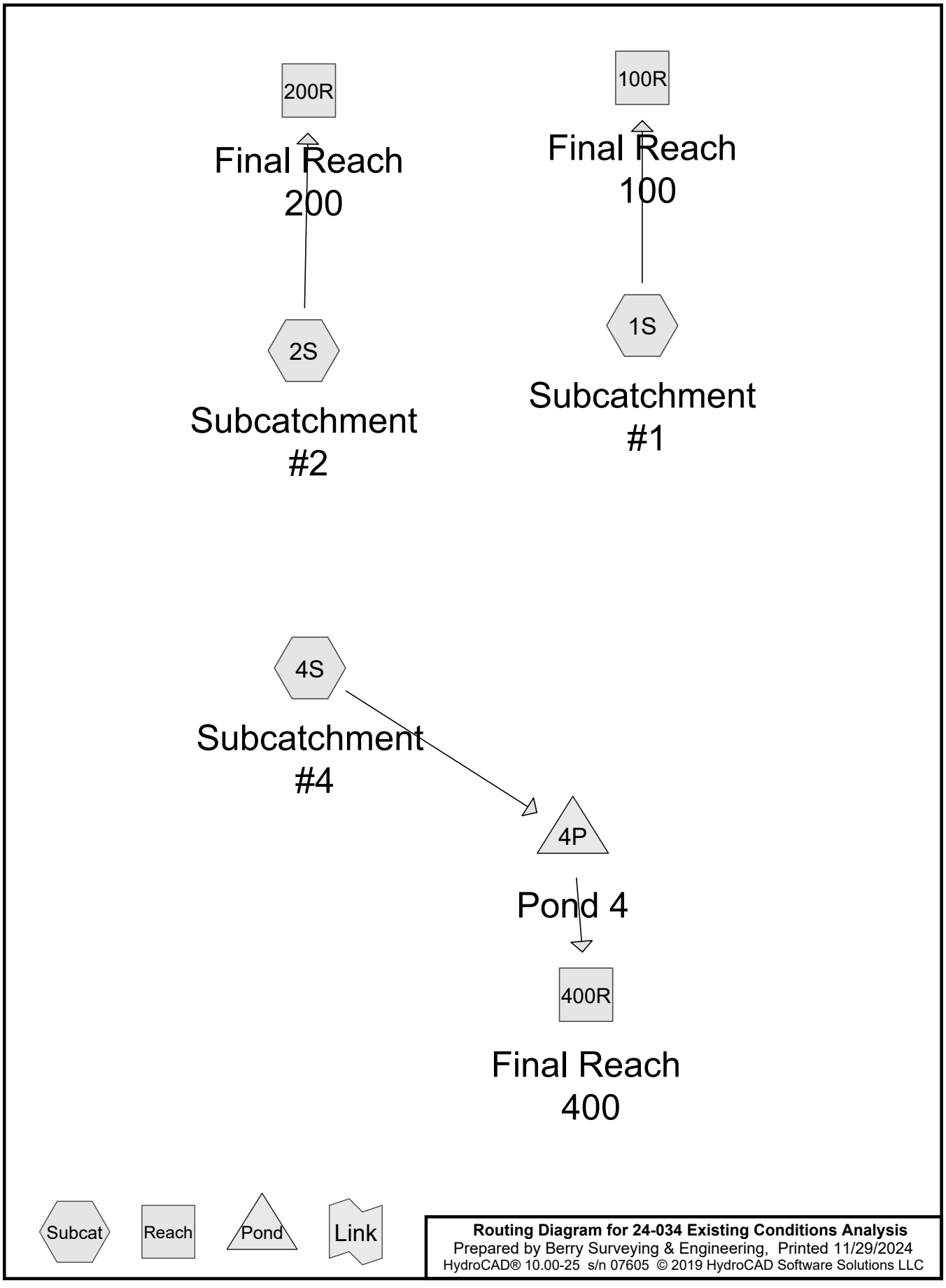
SWPPP EPA SITE MAP (PRE–EXISTING)
W–1 PRE–EXISTING WATERSHED PLAN

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

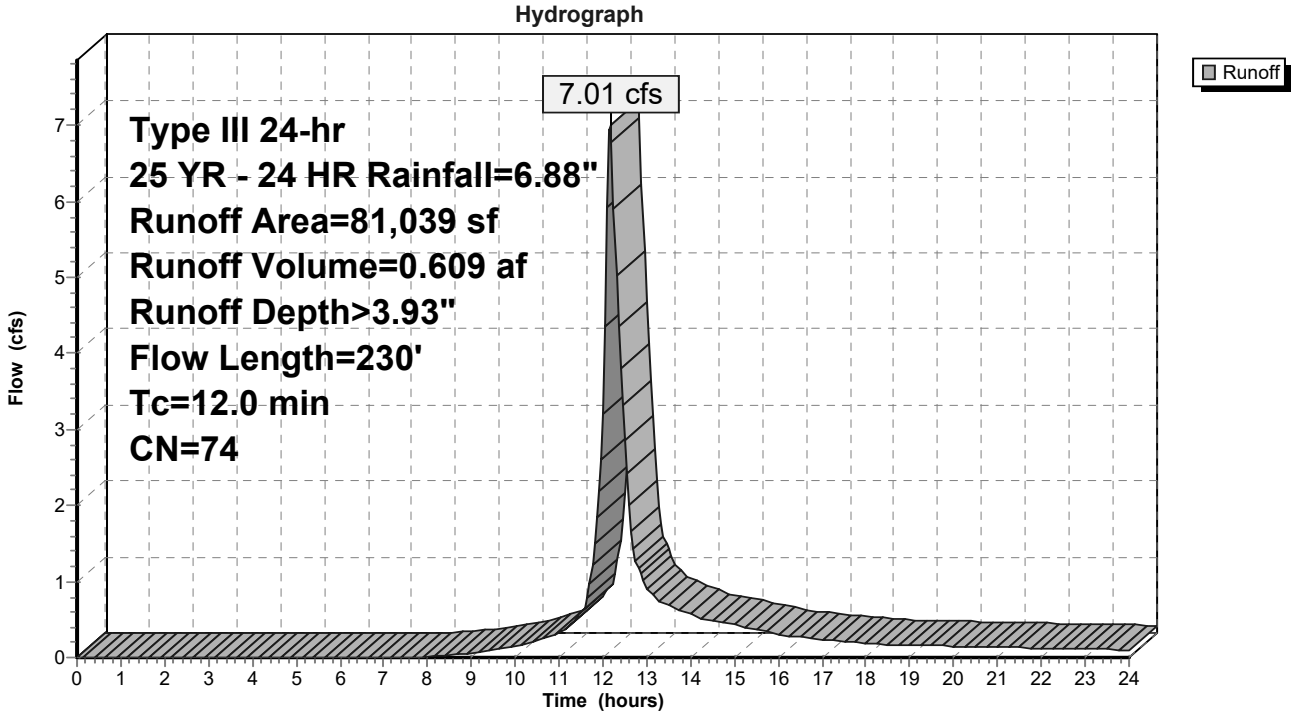
Runoff = 7.01 cfs @ 12.17 hrs, Volume= 0.609 af, Depth> 3.93"

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

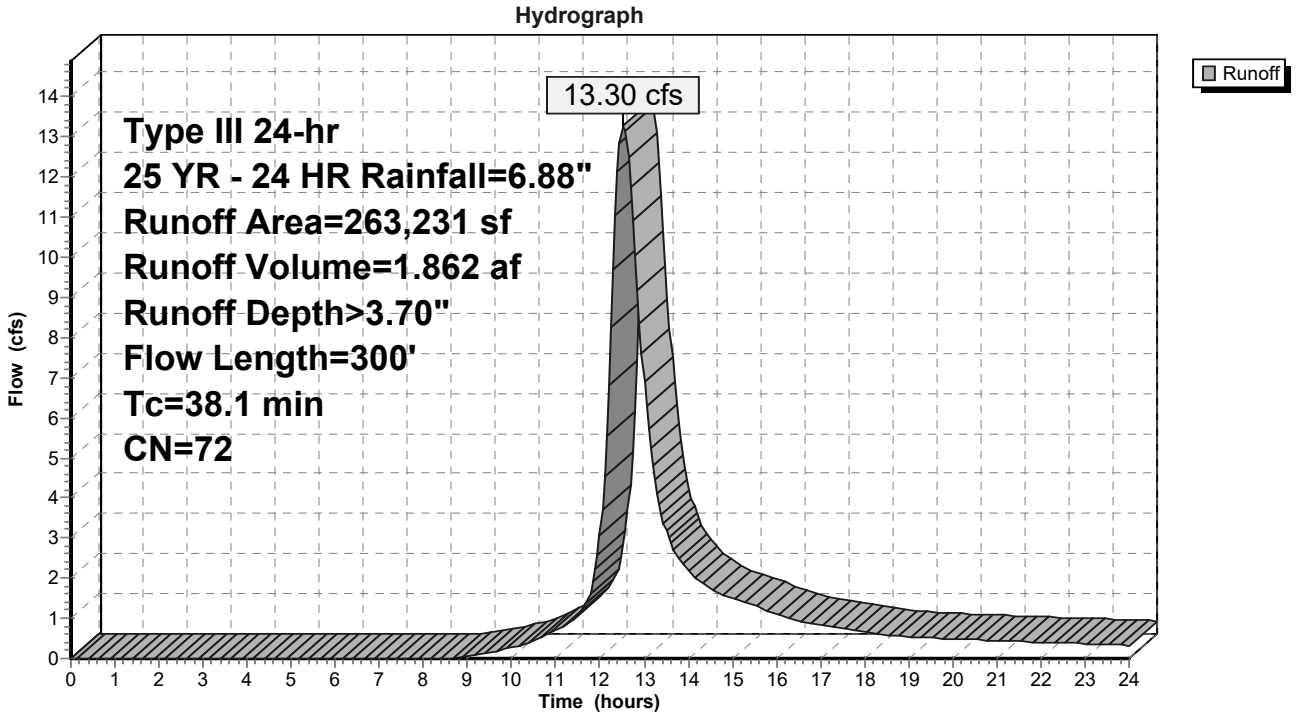
Runoff = 13.30 cfs @ 12.53 hrs, Volume= 1.862 af, Depth> 3.70"

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

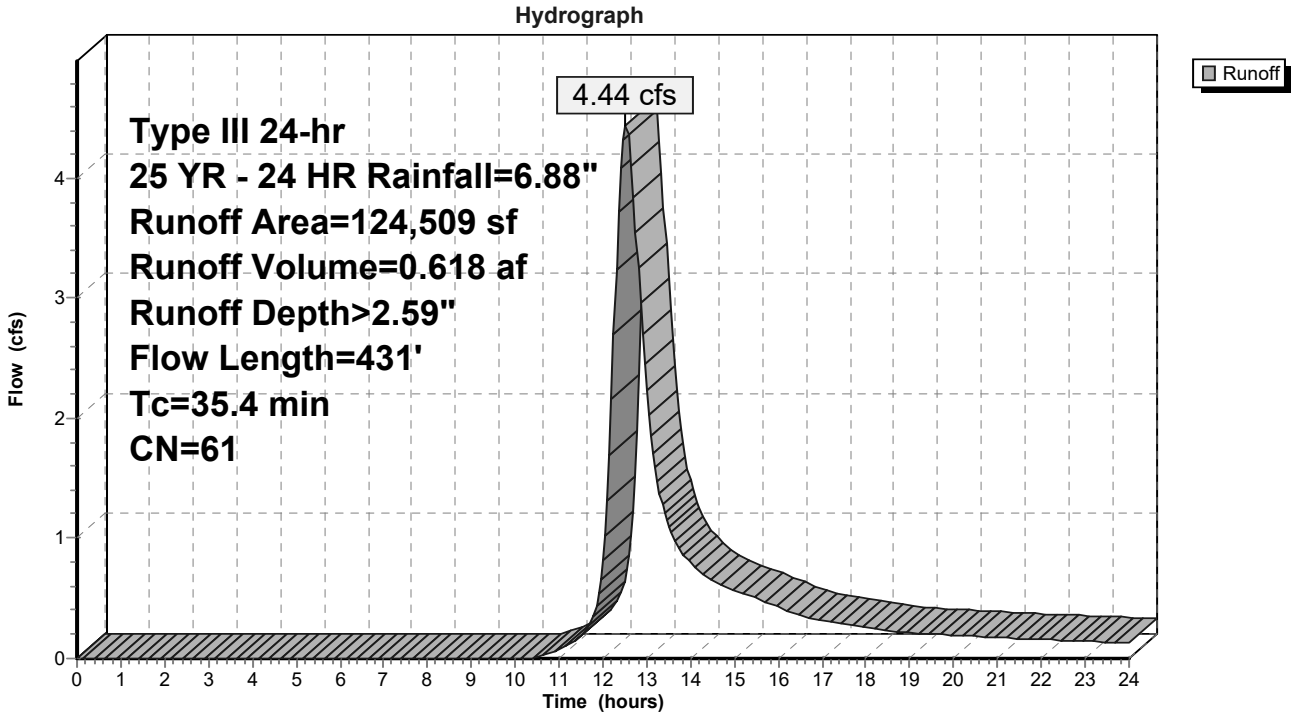
Runoff = 4.44 cfs @ 12.52 hrs, Volume= 0.618 af, Depth> 2.59"

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



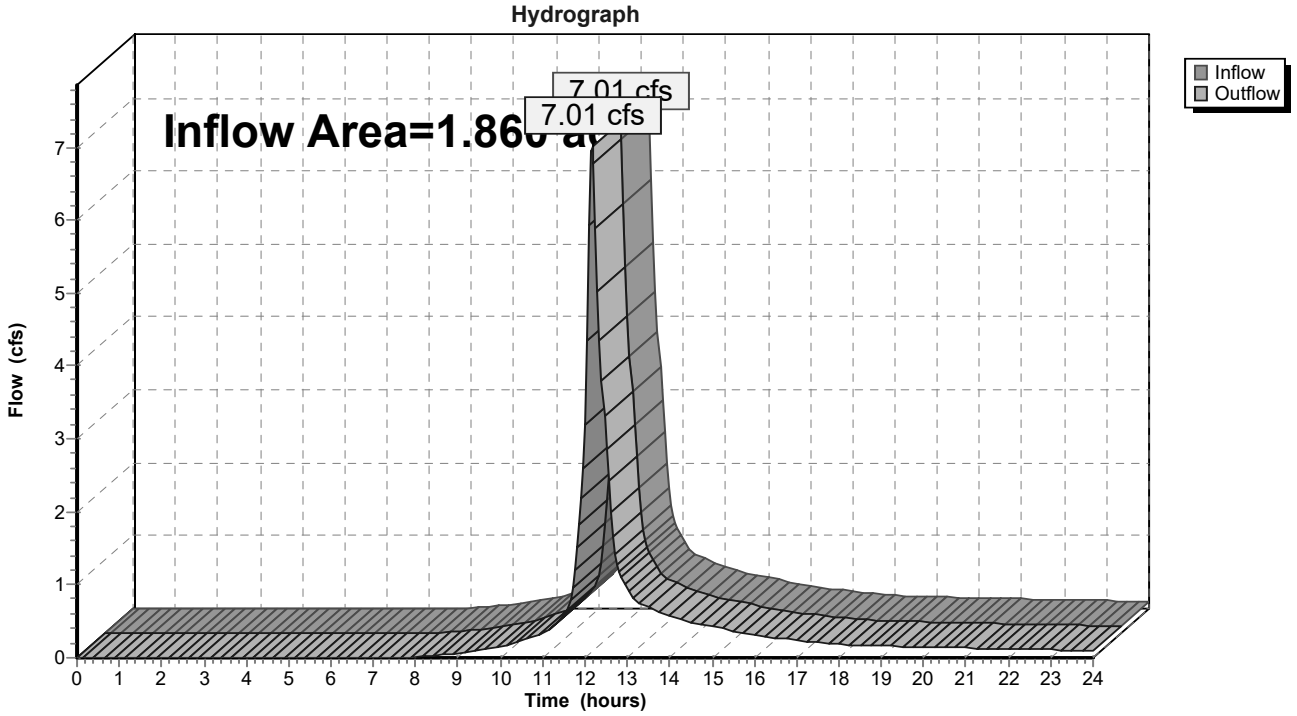
Summary for Reach 100R: Final Reach 100

[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



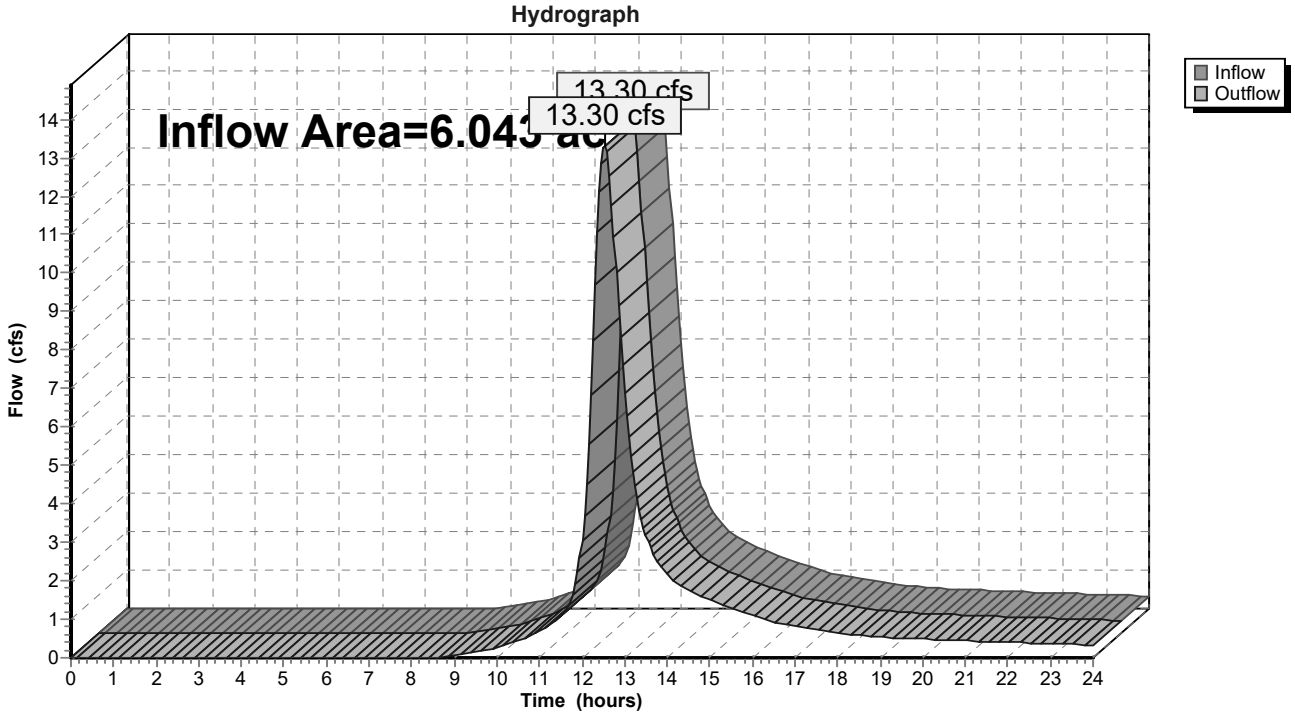
Summary for Reach 200R: Final Reach 200

[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



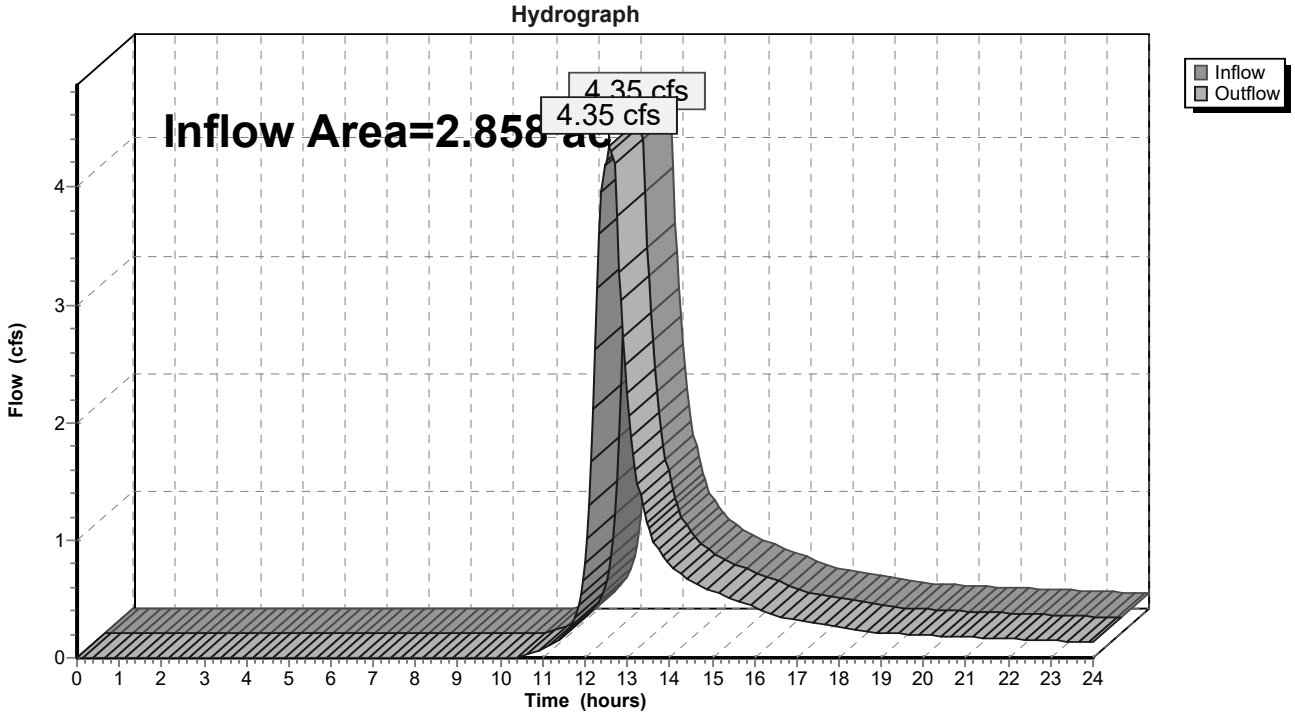
Summary for Reach 400R: Final Reach 400

[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)

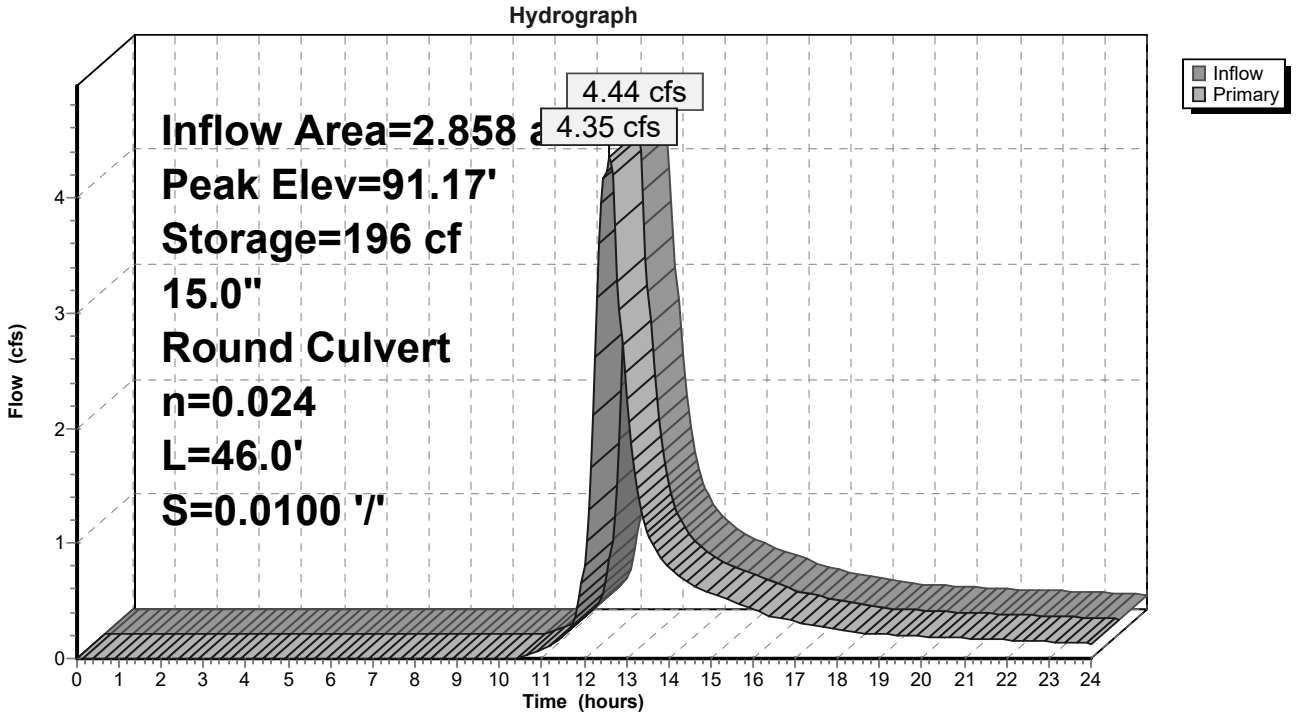
Volume	Invert	Avail.Storage	Storage Description
#1	89.38'	17,712 cf	**Open Water Storage (Irregular)**Listed below (Recalc)

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

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

DEIDRA BENJAMIN, CWS #295

STATE OF NEW HAMPSHIRE · JOHN P. HAYES, III · CERTIFIED WETLAND SCIENTIST · 1987

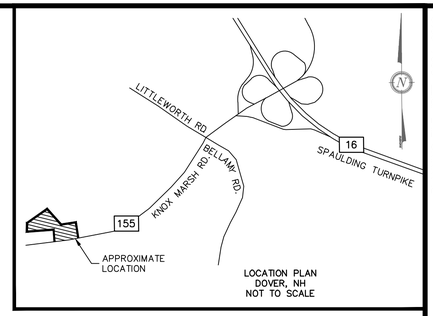
JOHN P. HAYES III, CSS #87

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
- HfB 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
- U.D 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.

TAX MAP C, LOT 5
TAX MAP H, LOT 36-B1
TAX MAP H, LOT 38
TAX MAP H, LOT 37-A
SUBJECT PARCEL
TAX MAP H, LOT 37B
TAX MAP H, LOT 37
TAX MAP H, LOT 36-B1
WOODED
GRASSED
BUILDING
PAVEMENT
EXISTING WETLANDS RECEIVING WATERS BELLAMY RIVER - KELLY BROOK - KNOX MARSH BROOK (NHRIV600030903-08)
103 G2 GRAVEL WETLAND (TYP.)
200
FINAL REACH 200 POINT OF ANALYSIS NON-POINT DISCHARGE SEE PLAN SET DB2024-034 C - RECEIVING WATERS - BELLAMY RIVER - KELLY BROOK - KNOX MARSH BROOK
EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: DEIDRA BENJAMIN, CWS #295
F. HANSON ROAD (DISCONT.)
HANSON ROAD
DISCONTINUED BY CITY OF DOVER JULY 8, 1998 33' WIDE ACCESS & UTILITY EASEMENT RIGHTS TO SUBJECT PARCEL EXIST
20 YARD DRAINS
NRCS SOILS LINE (TYP.)
16 INLET SUMP
4 INLET SUMP
C01 CATCH BASIN (TYP.)
FINAL REACH 400 POINT OF ANALYSIS NON-POINT DISCHARGE SEE PLAN SET DB2023-113 C-RECEIVING WATERS - BELLAMY RIVER - KELLY BROOK - KNOX MARSH BROOK
400
C02 CATCH BASIN
PROPOSED RESIDENTIAL BUILDING
D01 DRAIN MANHOLE
D04 DRAIN MANHOLE
C03 CATCH BASIN
C04 CATCH BASIN
C05 CATCH BASIN
C06 CATCH BASIN
PROPOSED LODGING BUILDING
UNMODELED DRAIN MANHOLE
D06 DRAIN MANHOLE
C07 CATCH BASIN
C08 CATCH BASIN
105 G2 DETENTION POND (TYP.)
106 G2 STORMTECH DETENTION POND (TYP.)
101 G2 GRAVEL WETLAND (TYP.)
104 G2 GRAVEL WETLAND (TYP.)
LIMIT OF SITE SPECIFIC SOIL SURVEY, SUBCATCHMENT, AND PROPERTY LINE.
FINAL REACH 100 POINT OF ANALYSIS NON-POINT DISCHARGE SEE PLAN SET DB2024-034 C - RECEIVING WATERS - BELLAMY RIVER - KELLY BROOK - KNOX MARSH BROOK
100
CONSTRUCTION EXIT - B5
N.H. ROUTE 155 / KNOX MARSH ROAD
MAINE NH STATE LINE MARKER

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-2024-0019

#	DATE	REVISION DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

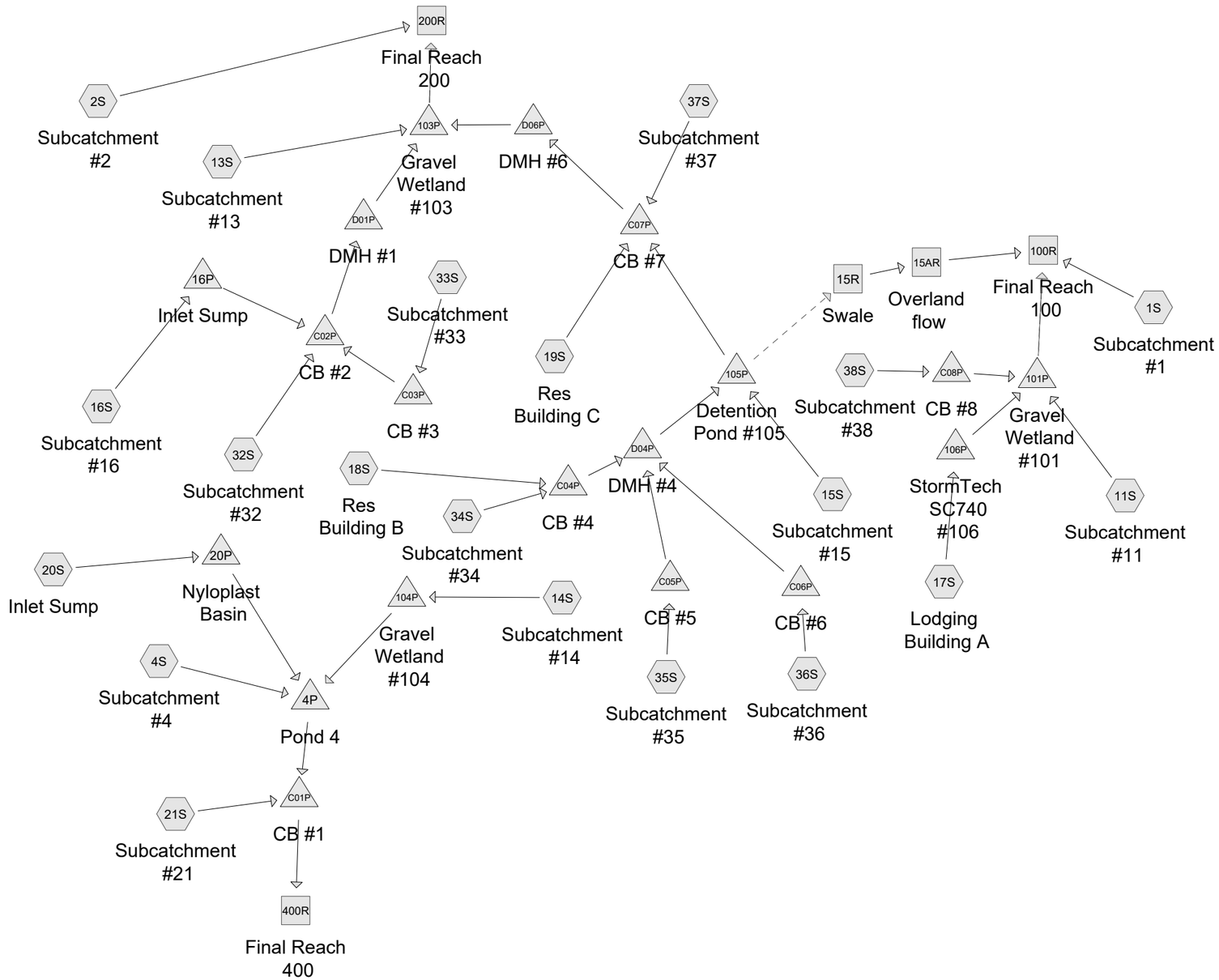
SWPPP EPA SITE MAP (PROPOSED)
W-2 PROPOSED WATERSHED PLAN

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

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



Routing Diagram for 24-034 Proposed Conditions Analysis, Revised 2/15/26

Prepared by Berry Surveying & Engineering

HydroCAD® 10.20-8a s/n 07605 © 2025 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.746	39	>75% Grass cover, Good, HSG A (4S, 20S)
4.586	74	>75% Grass cover, Good, HSG C (1S, 2S, 4S, 11S, 13S, 14S, 15S, 16S, 20S, 32S, 33S, 34S, 35S, 36S, 37S, 38S)
0.033	80	>75% Grass cover, Good, HSG D (4S, 13S, 20S)
0.110	96	Gravel surface, HSG C (2S, 11S, 13S, 14S, 15S, 16S)
0.002	96	Gravel surface, HSG D (13S)
0.807	98	Paved parking, HSG A (1S, 4S, 11S, 14S, 21S)
1.932	98	Paved parking, HSG C (1S, 11S, 13S, 14S, 15S, 16S, 32S, 33S, 34S, 35S, 36S, 37S, 38S)
0.186	98	Roofs, HSG A (4S)
1.144	98	Roofs, HSG C (4S, 11S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 32S, 33S, 34S, 35S, 36S, 37S, 38S)
0.805	30	Woods, Good, HSG A (2S, 4S, 20S)
0.366	70	Woods, Good, HSG C (1S, 2S)
0.043	77	Woods, Good, HSG D (4S)
10.762	**77**	**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
0.746	0.000	4.586	0.033	0.000	5.366	>75% Grass cover, Good	1S, 2S, 4S, 11S, 13S, 14S, 15S, 16S, 20S, 32S, 33S, 34S, 35S, 36S, 37S, 38S
0.000	0.000	0.110	0.002	0.000	0.112	Gravel surface	2S, 11S, 13S, 14S, 15S, 16S
0.807	0.000	1.932	0.000	0.000	2.740	Paved parking	1S, 4S, 11S, 13S, 14S, 15S, 16S, 21S, 32S, 33S, 34S, 35S, 36S, 37S, 38S
0.186	0.000	1.144	0.000	0.000	1.330	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
0.805	0.000	0.366	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	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	4P	89.51	88.92	59.0	0.0100	0.024	0.0	15.0	0.0	
2	16P	93.75	93.60	8.0	0.0188	0.012	0.0	18.0	0.0	
3	20P	89.75	89.50	350.0	0.0007	0.012	0.0	8.0	0.0	
4	101P	91.92	91.75	17.0	0.0100	0.010	0.0	6.0	0.0	
5	101P	91.92	91.75	16.0	0.0106	0.010	0.0	12.0	0.0	
6	103P	91.92	91.75	16.0	0.0106	0.012	0.0	6.0	0.0	
7	103P	91.92	91.75	12.0	0.0142	0.012	0.0	15.0	0.0	
8	104P	90.33	90.00	33.7	0.0098	0.012	0.0	6.0	0.0	
9	104P	90.33	90.00	13.5	0.0244	0.012	0.0	12.0	0.0	
10	105P	93.75	93.22	103.0	0.0051	0.012	0.0	18.0	0.0	
11	106P	92.75	92.50	15.0	0.0167	0.012	0.0	18.0	0.0	
12	C01P	89.34	88.92	42.0	0.0100	0.012	0.0	15.0	0.0	
13	C02P	93.50	93.20	55.0	0.0055	0.012	0.0	18.0	0.0	
14	C03P	93.90	93.60	53.5	0.0056	0.012	0.0	12.0	0.0	
15	C04P	94.61	94.45	32.0	0.0050	0.012	0.0	18.0	0.0	
16	C05P	94.51	94.45	10.7	0.0056	0.012	0.0	12.0	0.0	
17	C06P	94.60	94.45	28.5	0.0053	0.012	0.0	12.0	0.0	
18	C07P	93.12	92.92	40.0	0.0050	0.012	0.0	18.0	0.0	
19	C08P	93.25	93.15	9.0	0.0111	0.012	0.0	12.0	0.0	
20	D01P	93.10	92.50	112.0	0.0054	0.012	0.0	18.0	0.0	
21	D04P	94.35	93.95	78.0	0.0051	0.012	0.0	18.0	0.0	
22	D06P	92.82	92.50	50.0	0.0064	0.012	0.0	18.0	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=70,498 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=251' Tc=25.7 min CN=71 Runoff=4.15 cfs 0.486 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,939 sf 30.06% Impervious Runoff Depth>2.31"
Flow Length=431' Tc=35.4 min CN=58 Runoff=3.33 cfs 0.472 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,000 sf 44.24% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=85 Runoff=6.19 cfs 0.462 af

Subcatchment 13S: Subcatchment #13 Runoff Area=65,004 sf 14.35% Impervious Runoff Depth>4.36"
Tc=6.0 min CN=78 Runoff=7.44 cfs 0.543 af

Subcatchment 14S: Subcatchment #14 Runoff Area=25,492 sf 44.16% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=85 Runoff=3.35 cfs 0.250 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,854 sf 62.10% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=90 Runoff=4.09 cfs 0.315 af

Subcatchment 16S: Subcatchment #16 Runoff Area=15,096 sf 48.50% Impervious Runoff Depth>5.25"
Tc=6.0 min CN=86 Runoff=2.02 cfs 0.152 af

Subcatchment 17S: Lodging Building A Runoff Area=14,223 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.15 cfs 0.181 af

Subcatchment 18S: Res Building B Runoff Area=14,221 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.15 cfs 0.181 af

Subcatchment 19S: Res Building C Runoff Area=14,219 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.15 cfs 0.181 af

Subcatchment 20S: Inlet Sump Runoff Area=8,519 sf 0.00% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=65 Runoff=0.67 cfs 0.049 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=4,645 sf 87.10% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.69 cfs 0.056 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,551 sf 76.26% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=92 Runoff=0.80 cfs 0.063 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,741 sf 79.37% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.69 cfs 0.055 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,144 sf 79.78% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.61 cfs 0.048 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,398 sf 78.52% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.35 cfs 0.028 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,625 sf 77.68% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.53 cfs 0.042 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,423 sf 89.68% Impervious Runoff Depth>6.40"
Tc=6.0 min CN=96 Runoff=0.36 cfs 0.030 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 0.545 af
Outflow=2.98 cfs 0.545 af

Reach 200R: Final Reach 200 Inflow=9.02 cfs 1.636 af
Outflow=9.02 cfs 1.636 af

Reach 400R: Final Reach 400 Inflow=3.31 cfs 0.688 af
Outflow=3.31 cfs 0.688 af

Pond 4P: Pond 4 Peak Elev=90.95' Storage=1,950 cf Inflow=3.51 cfs 0.604 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=3.18 cfs 0.599 af

Pond 16P: Inlet Sump Peak Elev=94.56' Storage=730 cf Inflow=2.02 cfs 0.152 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.35 cfs 0.150 af

Pond 20P: Nyloplast Basin Peak Elev=91.19' Storage=5 cf Inflow=0.67 cfs 0.049 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.67 cfs 0.049 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.03' Storage=12,589 cf Inflow=6.62 cfs 0.600 af
Primary=0.08 cfs 0.109 af Secondary=1.09 cfs 0.220 af Tertiary=0.12 cfs 0.003 af Outflow=1.30 cfs 0.333 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.35' Storage=33,000 cf Inflow=15.74 cfs 1.652 af
Primary=0.19 cfs 0.248 af Secondary=3.32 cfs 0.792 af Tertiary=1.99 cfs 0.109 af Outflow=5.50 cfs 1.149 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.90' Storage=8,021 cf Inflow=3.35 cfs 0.250 af
Primary=0.10 cfs 0.083 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.083 af

Pond 105P: Detention Pond #105 Peak Elev=95.78' Storage=5,895 cf Inflow=7.85 cfs 0.626 af
Primary=3.19 cfs 0.619 af Secondary=0.00 cfs 0.000 af Outflow=3.19 cfs 0.619 af

Pond 106P: StormTech SC740 #106 Peak Elev=94.85' Storage=4,510 cf Inflow=2.15 cfs 0.181 af
Outflow=0.10 cfs 0.109 af

Pond C01P: CB #1 Peak Elev=90.32' Storage=12 cf Inflow=3.31 cfs 0.688 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=3.31 cfs 0.688 af

Pond C02P: CB #2 Peak Elev=94.46' Storage=0.000 af Inflow=2.75 cfs 0.269 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=2.75 cfs 0.269 af

Pond C03P: CB #3 Peak Elev=94.57' Storage=0.000 af Inflow=0.80 cfs 0.063 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.80 cfs 0.063 af

Pond C04P: CB #4 Peak Elev=95.84' Storage=0.000 af Inflow=2.85 cfs 0.235 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.84 cfs 0.235 af

Pond C05P: CB #5 Peak Elev=95.82' 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=95.82' Storage=0.000 af Inflow=0.35 cfs 0.028 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.34 cfs 0.028 af

Pond C07P: CB #7 Peak Elev=94.83' Storage=22 cf Inflow=5.58 cfs 0.842 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=5.56 cfs 0.841 af

Pond C08P: CB #8 Peak Elev=94.03' Storage=10 cf Inflow=0.36 cfs 0.030 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=94.36' Storage=0.000 af Inflow=2.75 cfs 0.269 af
18.0" Round Culvert n=0.012 L=112.0' S=0.0054 '/' Outflow=2.75 cfs 0.269 af

Pond D04P: DMH #4 Peak Elev=95.82' Storage=0.000 af Inflow=3.77 cfs 0.311 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=3.76 cfs 0.311 af

Pond D06P: DMH #6 Peak Elev=94.50' Storage=0.000 af Inflow=5.56 cfs 0.841 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0064 '/' Outflow=5.55 cfs 0.841 af

Total Runoff Area = 10.762 ac Runoff Volume = 3.891 af Average Runoff Depth = 4.34"
62.19% Pervious = 6.692 ac 37.81% Impervious = 4.070 ac

Summary for Subcatchment 1S: Subcatchment #1

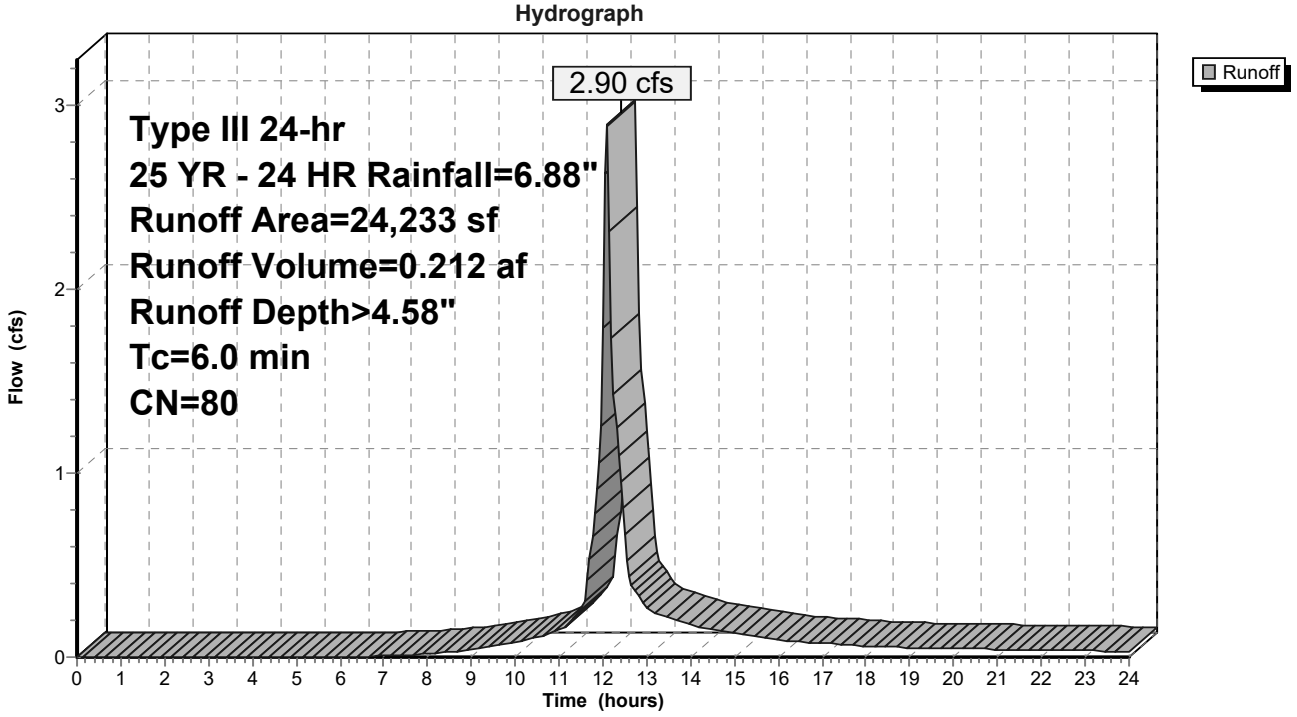
Runoff = 2.90 cfs @ 12.09 hrs, Volume= 0.212 af, Depth> 4.58"
Routed to Reach 100R : Final Reach 100

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

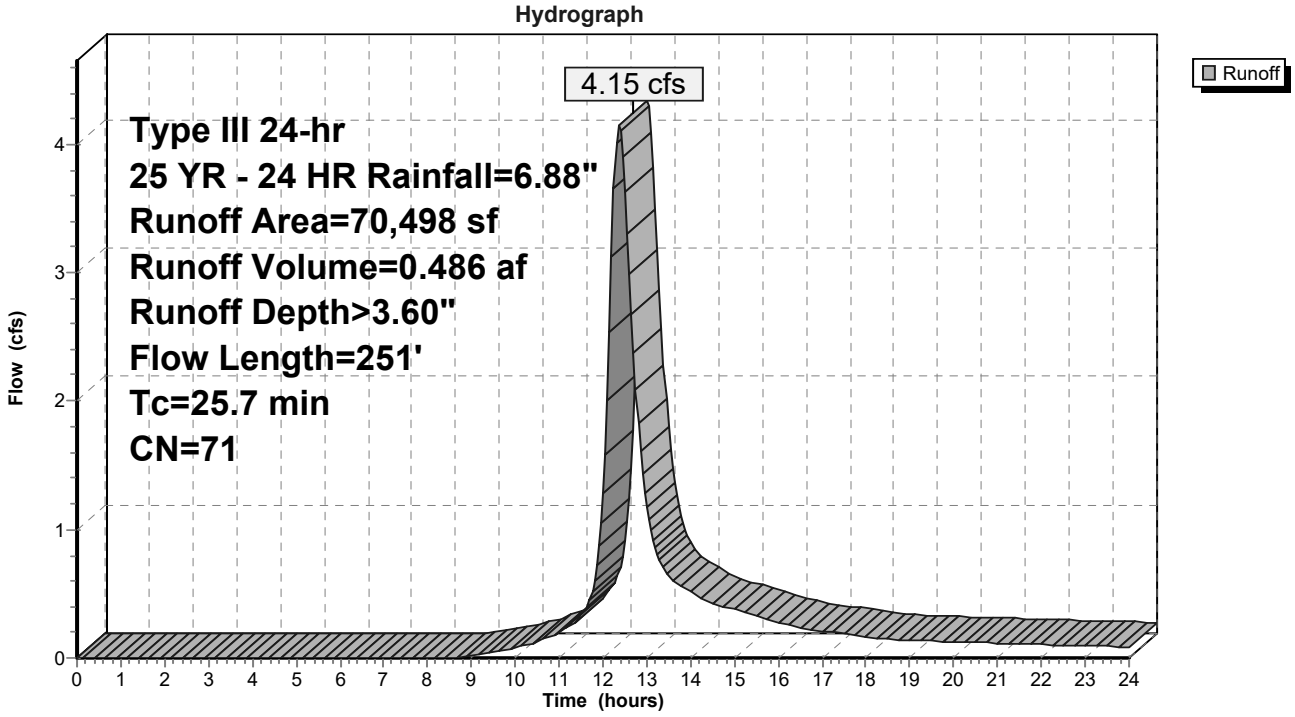
Runoff = 4.15 cfs @ 12.36 hrs, Volume= 0.486 af, Depth> 3.60"
Routed to Reach 200R : Final Reach 200

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
3,476	30	Woods, Good, HSG A
55,814	74	>75% Grass cover, Good, HSG C
10,893	70	Woods, Good, HSG C
315	96	Gravel surface, HSG C
70,498	71	Weighted Average
70,498		100.00% Pervious 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

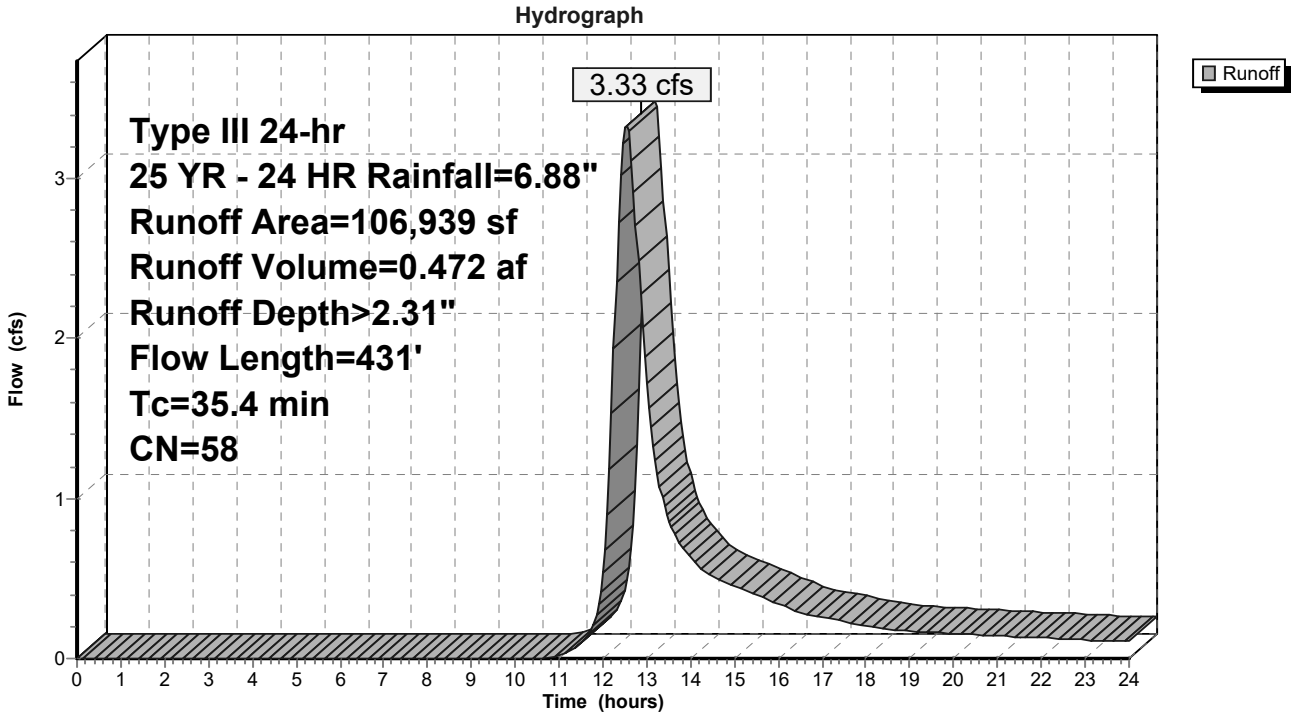
Runoff = 3.33 cfs @ 12.53 hrs, Volume= 0.472 af, Depth> 2.31"
Routed to Pond 4P : Pond 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 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
10,478	74	>75% Grass cover, Good, HSG C
247	80	>75% Grass cover, Good, HSG D
1,880	77	Woods, Good, HSG D
106,939	58	Weighted Average
74,791		69.94% Pervious Area
32,148		30.06% 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

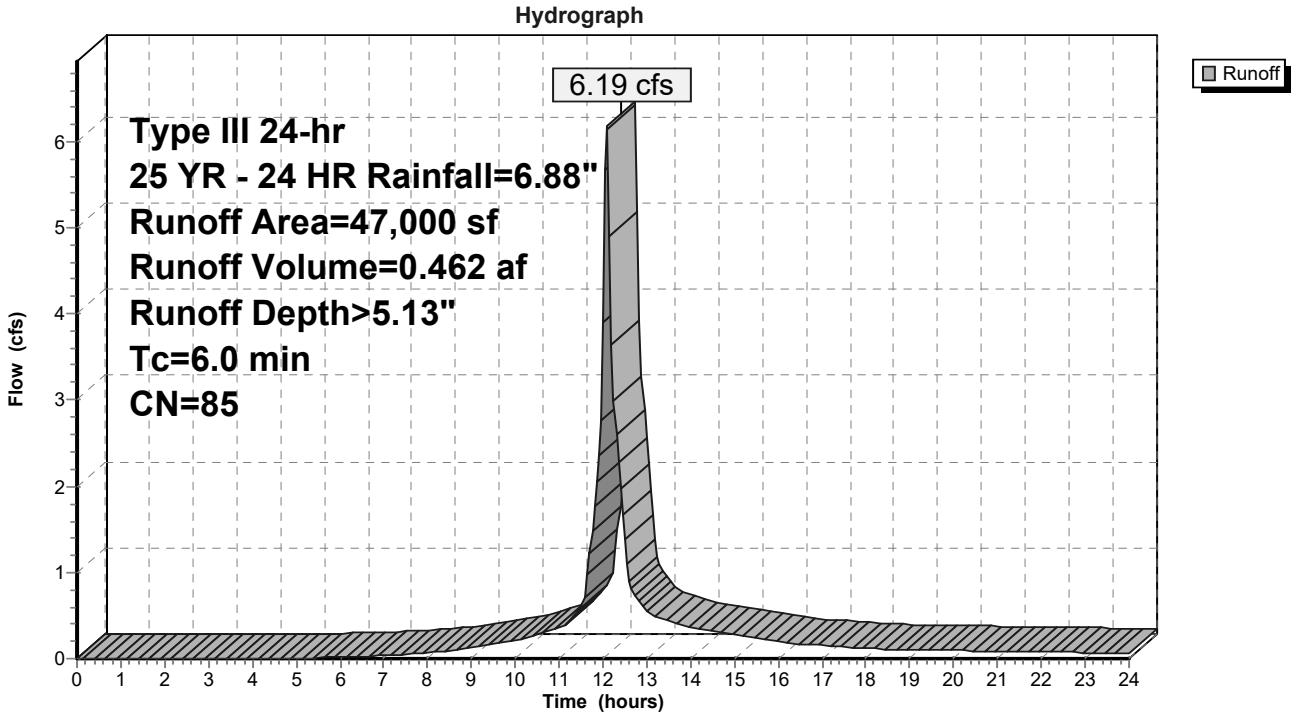
Runoff = 6.19 cfs @ 12.09 hrs, Volume= 0.462 af, Depth> 5.13"
Routed to Pond 101P : Gravel Wetland #101

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
18,784	98	Paved parking, HSG C
25,177	74	>75% Grass cover, Good, HSG C
1,031	96	Gravel surface, HSG C
1,224	98	Roofs, HSG C
47,000	85	Weighted Average
26,208		55.76% Pervious Area
20,792		44.24% 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

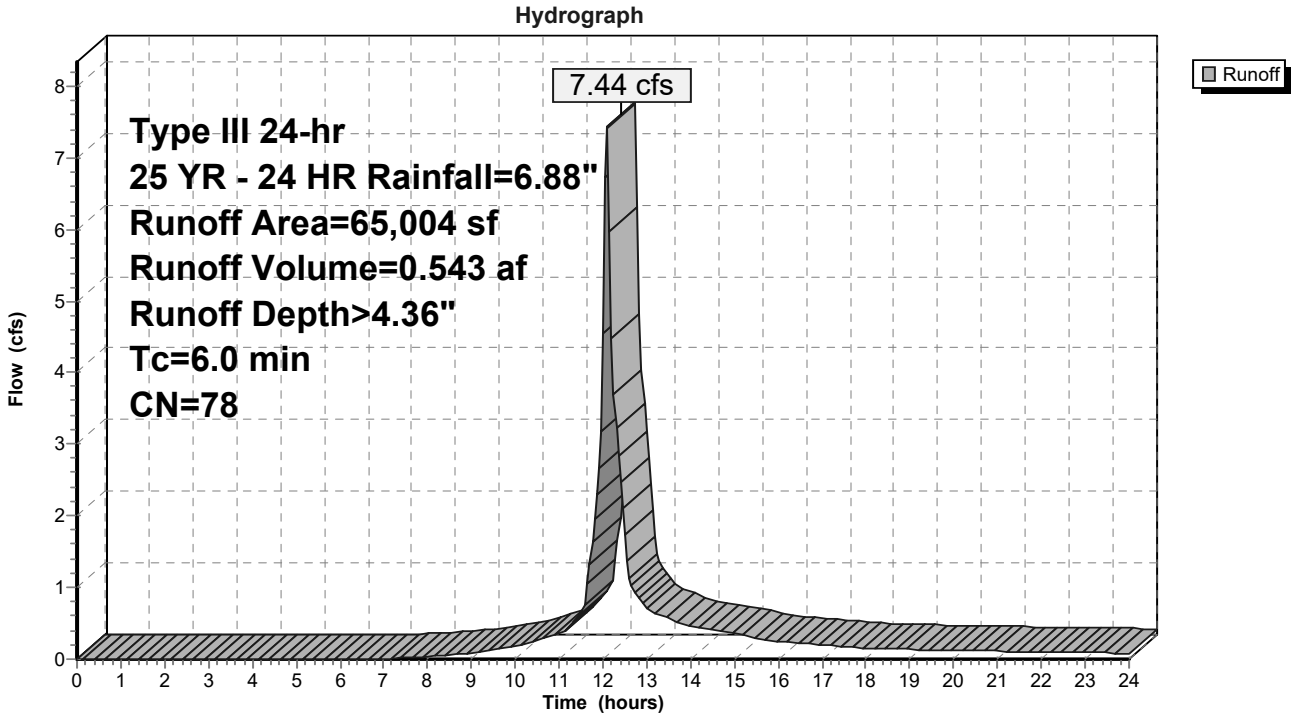
Runoff = 7.44 cfs @ 12.09 hrs, Volume= 0.543 af, Depth> 4.36"
Routed to Pond 103P : Gravel Wetland #103

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
52,508	74	>75% Grass cover, Good, HSG C
1,933	96	Gravel surface, HSG C
8,670	98	Paved parking, HSG C
660	98	Roofs, HSG C
1,132	80	>75% Grass cover, Good, HSG D
101	96	Gravel surface, HSG D
65,004	78	Weighted Average
55,674		85.65% Pervious Area
9,330		14.35% 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

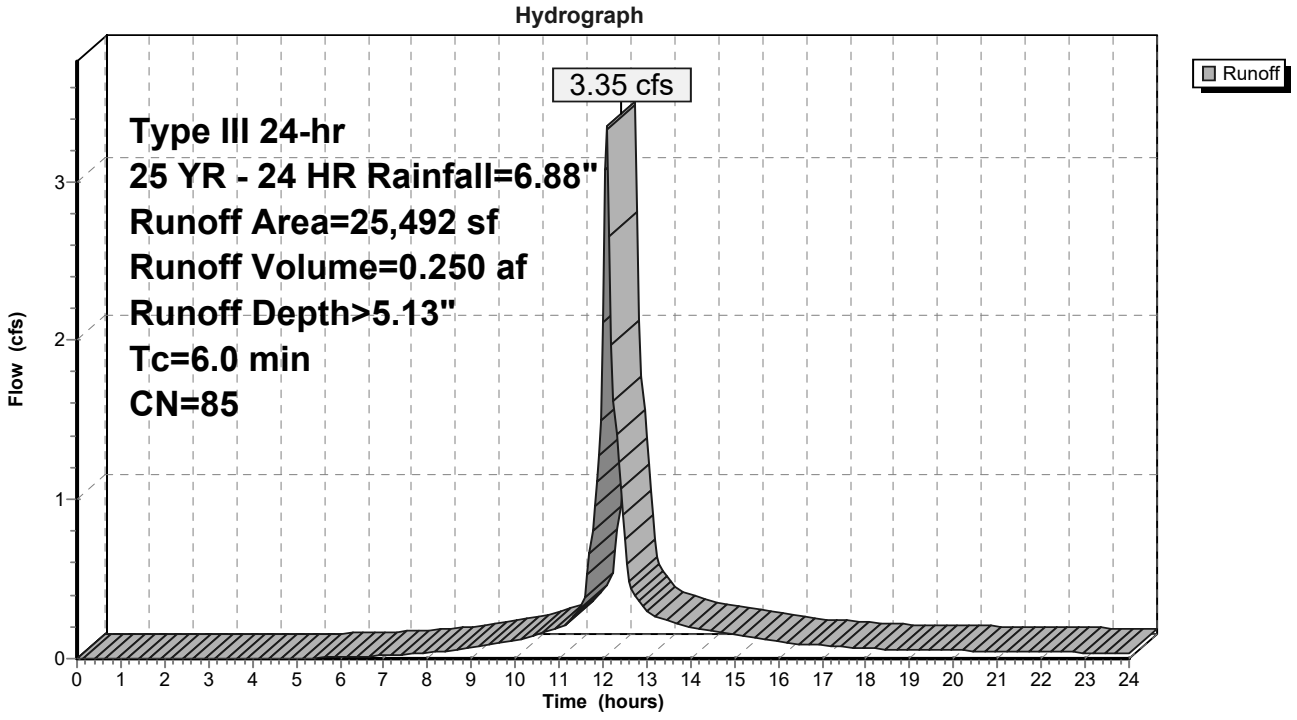
Runoff = 3.35 cfs @ 12.09 hrs, Volume= 0.250 af, Depth> 5.13"
Routed to Pond 104P : Gravel Wetland #104

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
13,796	74	>75% Grass cover, Good, HSG C
439	96	Gravel surface, HSG C
6,894	98	Paved parking, HSG C
310	98	Roofs, HSG C
25,492	85	Weighted Average
14,235		55.84% Pervious Area
11,257		44.16% 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

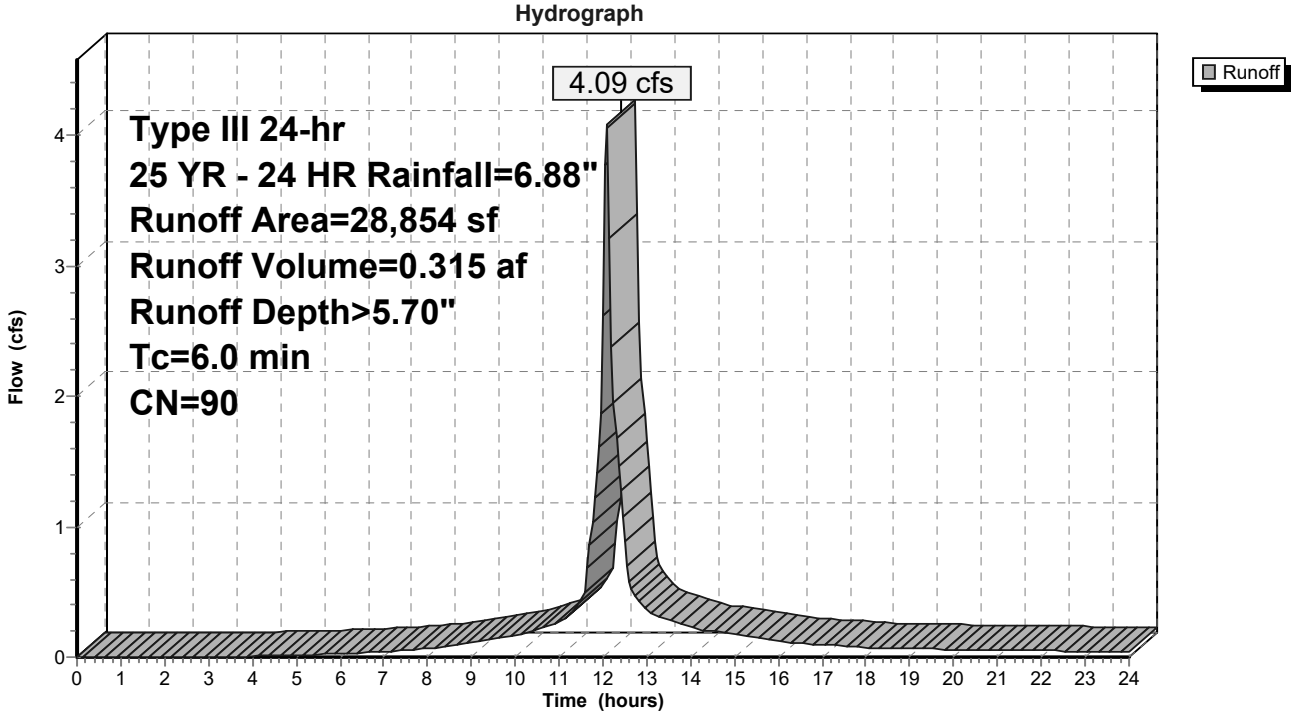
Runoff = 4.09 cfs @ 12.09 hrs, Volume= 0.315 af, Depth> 5.70"
Routed to Pond 105P : Detention Pond #105

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
17,488	98	Paved parking, HSG C
10,101	74	>75% Grass cover, Good, HSG C
834	96	Gravel surface, HSG C
431	98	Roofs, HSG C
28,854	90	Weighted Average
10,935		37.90% Pervious Area
17,919		62.10% 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

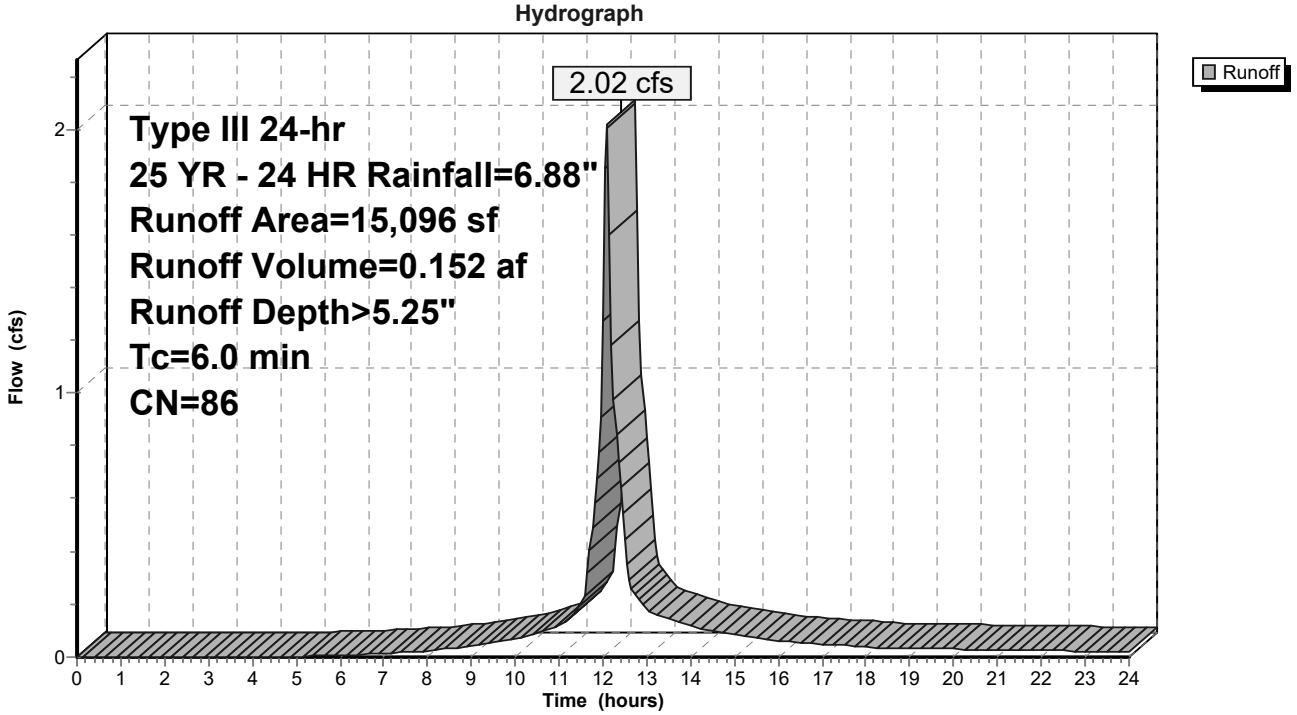
Runoff = 2.02 cfs @ 12.09 hrs, Volume= 0.152 af, Depth> 5.25"
Routed to Pond 16P : Inlet Sump

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
7,101	98	Paved parking, HSG C
7,543	74	>75% Grass cover, Good, HSG C
232	96	Gravel surface, HSG C
220	98	Roofs, HSG C
15,096	86	Weighted Average
7,775		51.50% Pervious Area
7,321		48.50% 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

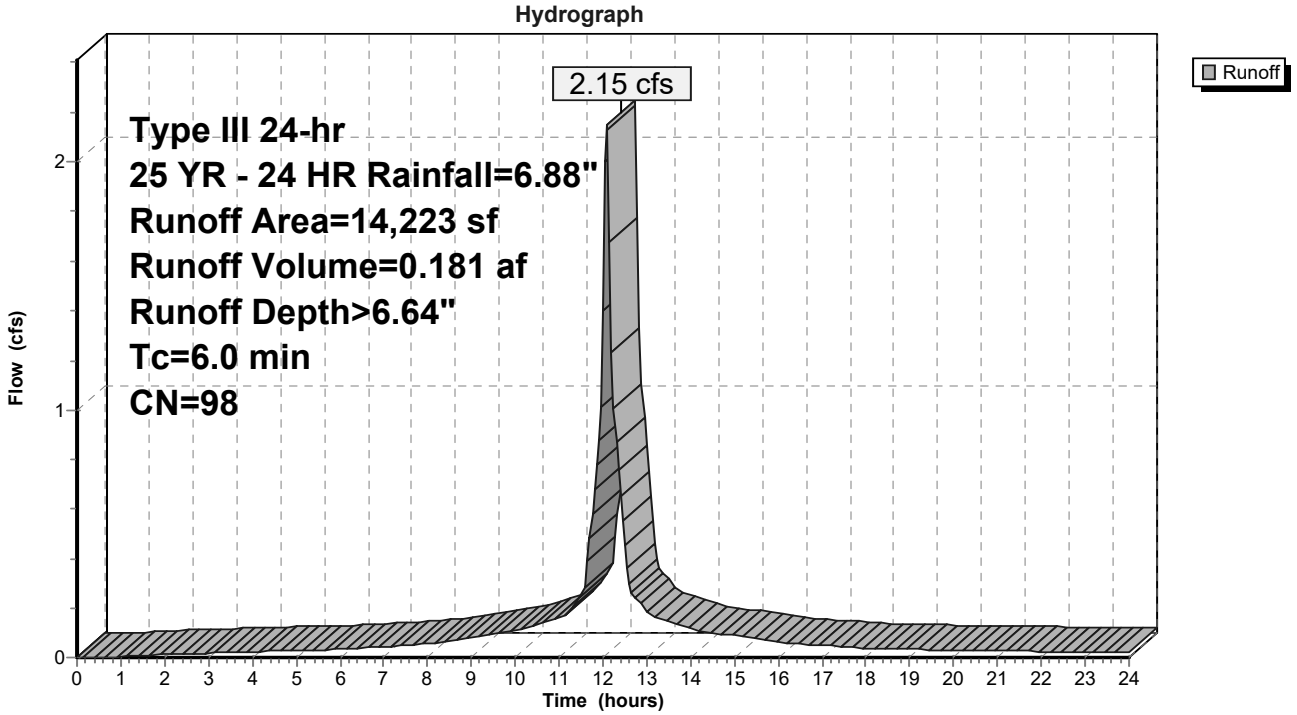
Runoff = 2.15 cfs @ 12.09 hrs, Volume= 0.181 af, Depth> 6.64"
Routed to Pond 106P : StormTech SC740 #106

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
14,223	98	Roofs, HSG C
14,223		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

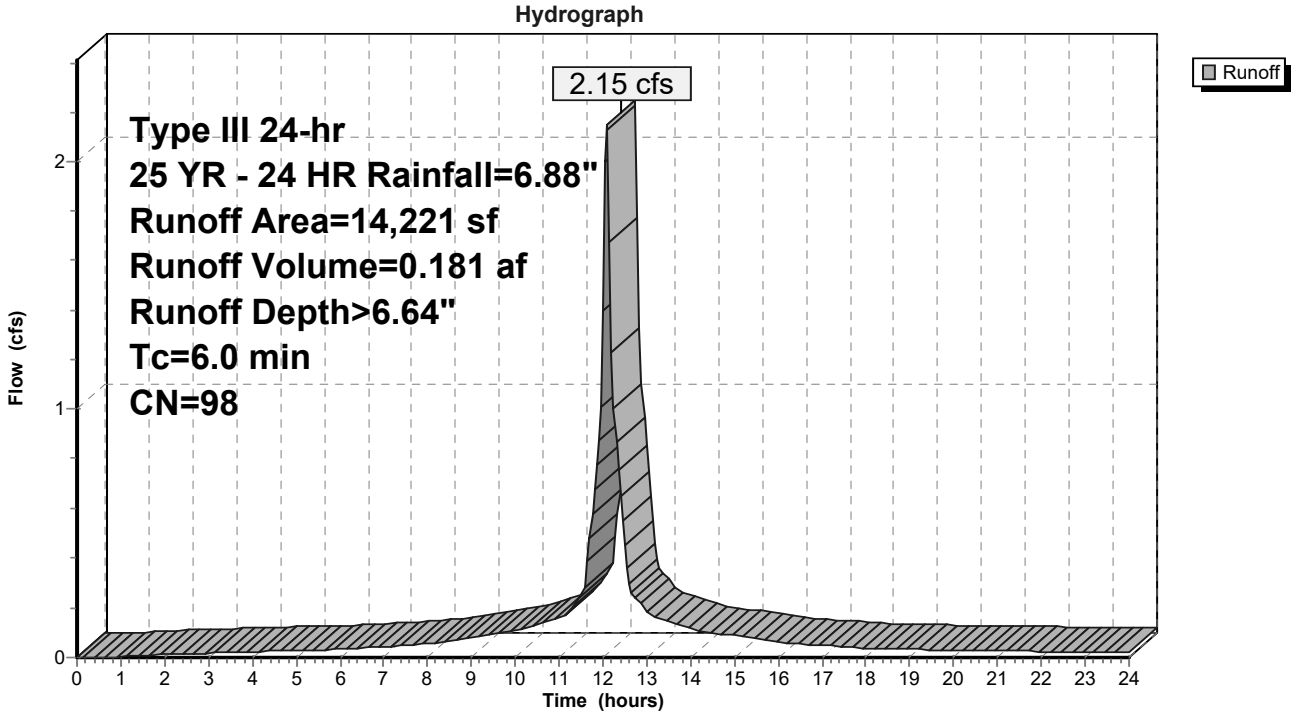
Runoff = 2.15 cfs @ 12.09 hrs, Volume= 0.181 af, Depth> 6.64"
Routed to Pond C04P : CB #4

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

Area (sf)	CN	Description
14,221	98	Roofs, HSG C
14,221		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

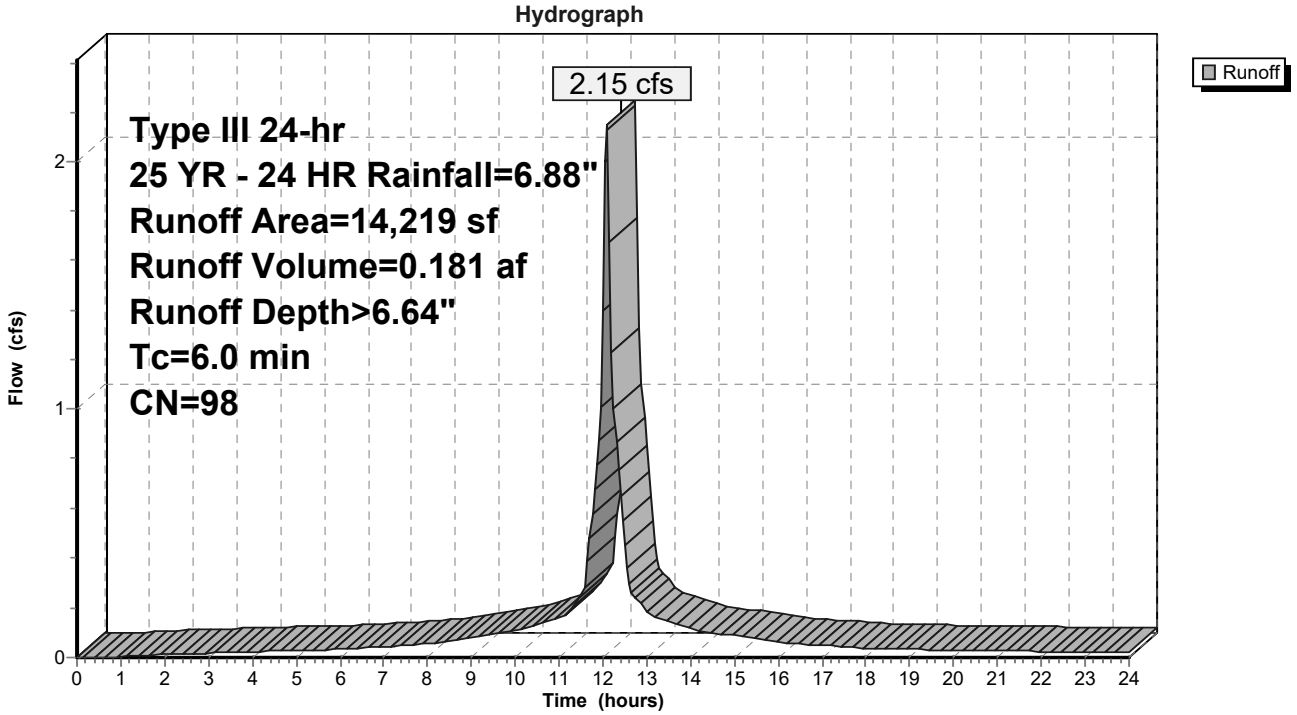
Runoff = 2.15 cfs @ 12.09 hrs, Volume= 0.181 af, Depth> 6.64"
Routed to Pond C07P : CB #7

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
14,219	98	Roofs, HSG C
14,219		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

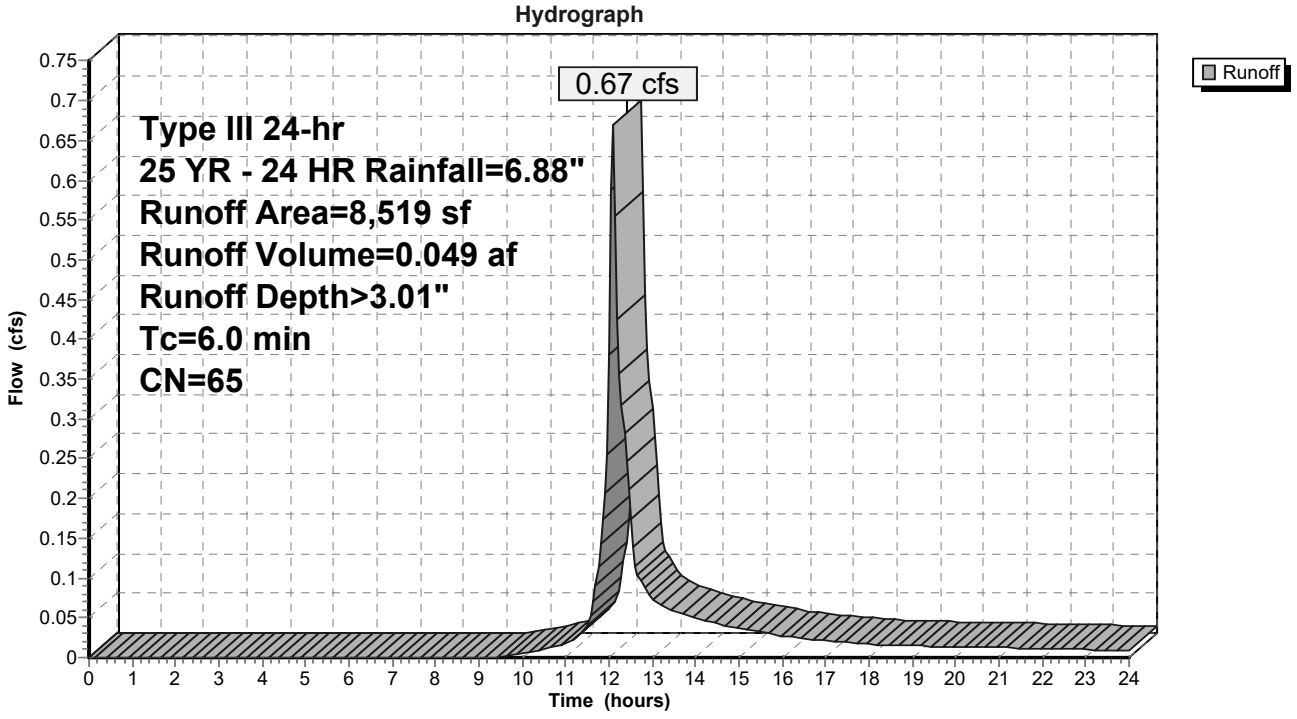
Runoff = 0.67 cfs @ 12.10 hrs, Volume= 0.049 af, Depth> 3.01"
Routed to Pond 20P : Nyloplast Basin

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
1,133	39	>75% Grass cover, Good, HSG A
784	30	Woods, Good, HSG A
6,522	74	>75% Grass cover, Good, HSG C
80	80	>75% Grass cover, Good, HSG D
8,519	65	Weighted Average
8,519		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

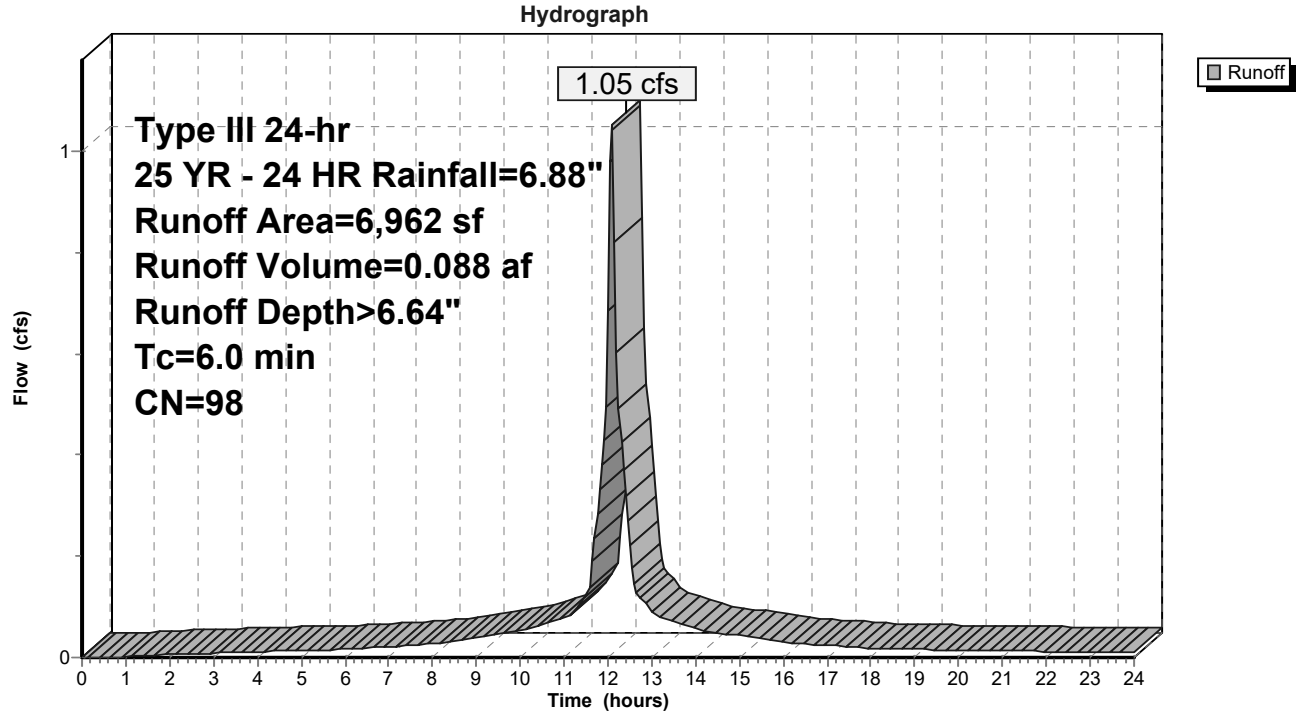
Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.088 af, Depth> 6.64"
Routed to Pond C01P : CB #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 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

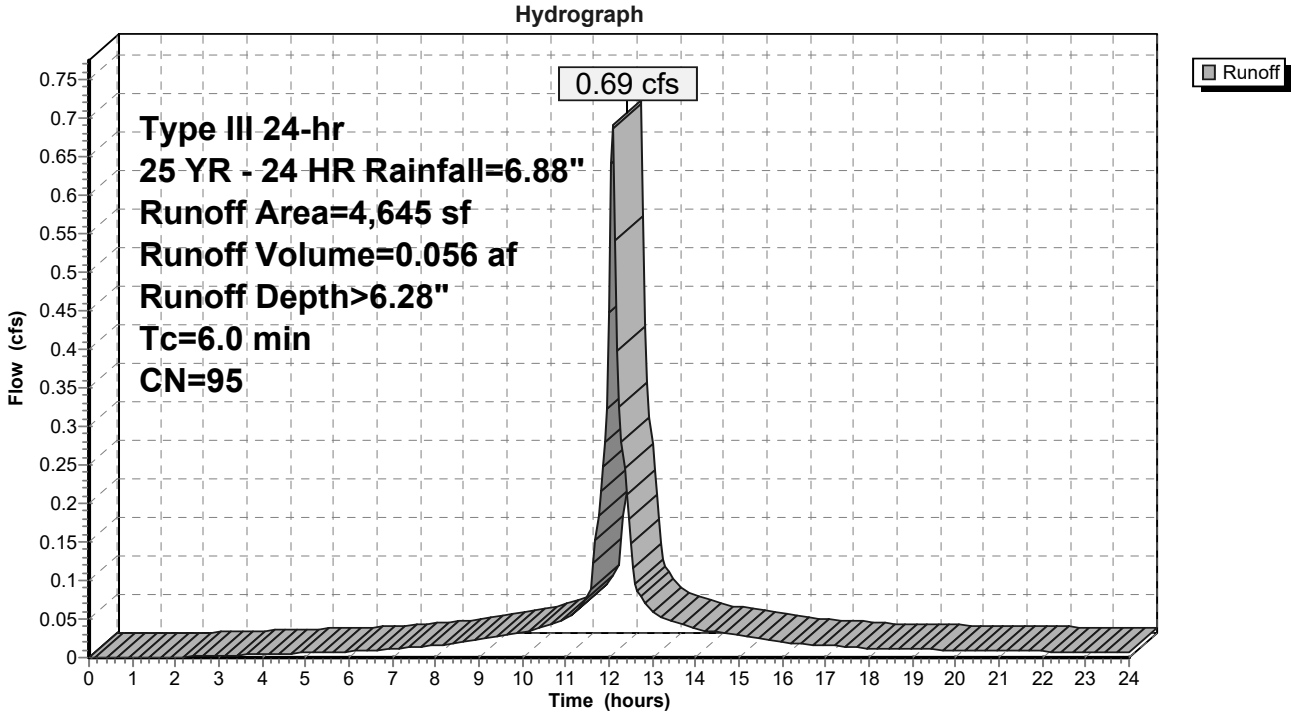
Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 6.28"
Routed to Pond C02P : CB #2

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

Area (sf)	CN	Description
3,837	98	Paved parking, HSG C
599	74	>75% Grass cover, Good, HSG C
209	98	Roofs, HSG C
4,645	95	Weighted Average
599		12.90% Pervious Area
4,046		87.10% 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

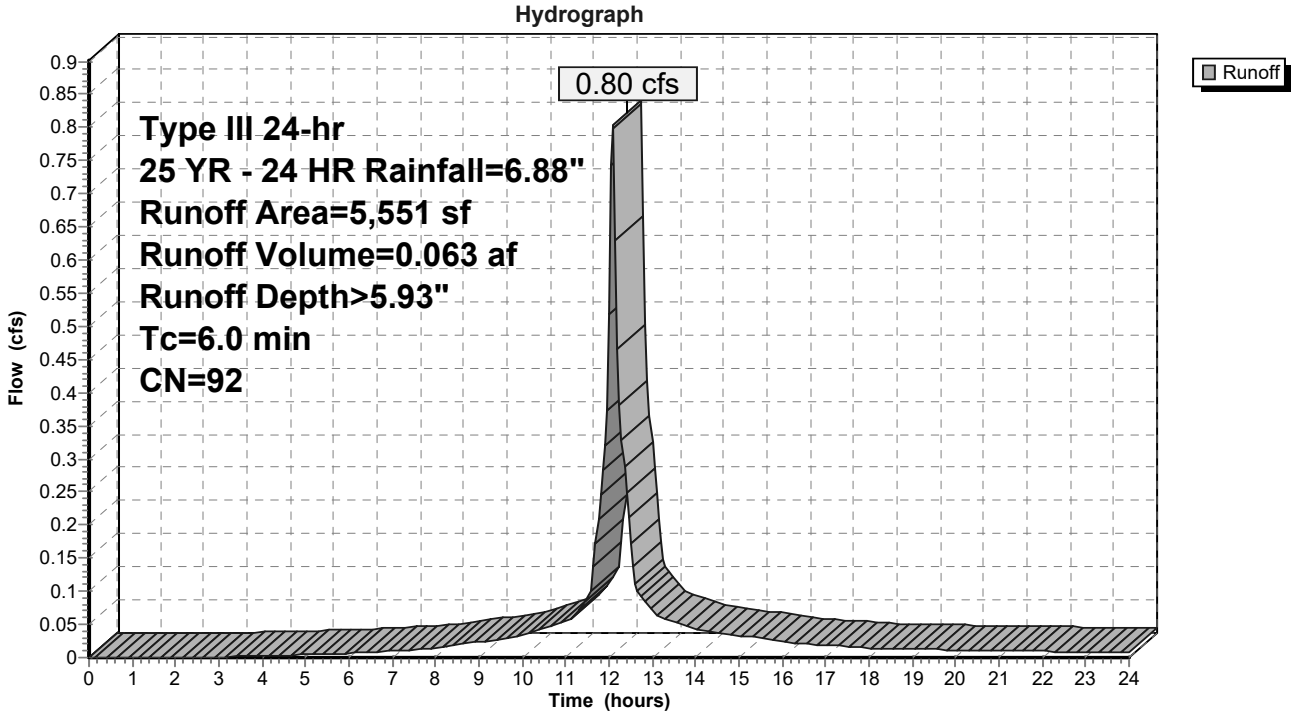
Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.063 af, Depth> 5.93"
Routed to Pond C03P : CB #3

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

Area (sf)	CN	Description
3,750	98	Paved parking, HSG C
1,318	74	>75% Grass cover, Good, HSG C
483	98	Roofs, HSG C
5,551	92	Weighted Average
1,318		23.74% Pervious Area
4,233		76.26% 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

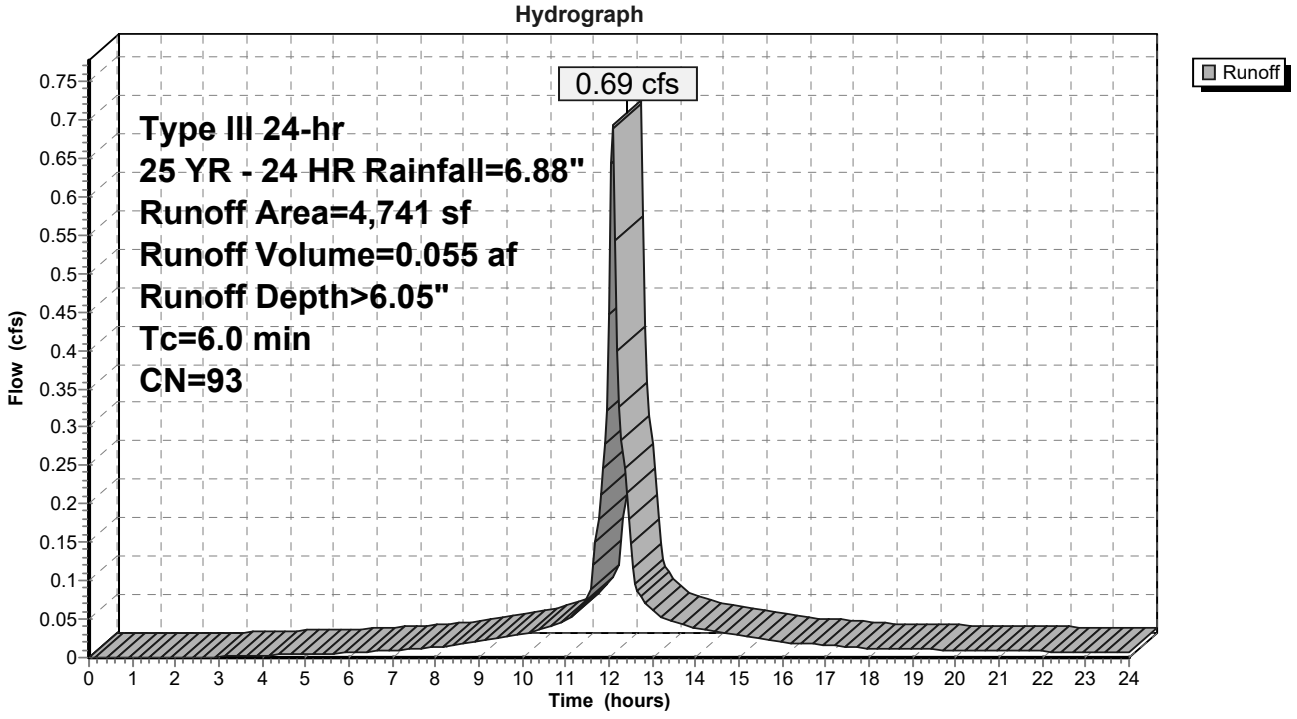
Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.055 af, Depth> 6.05"
Routed to Pond C04P : CB #4

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

Area (sf)	CN	Description
3,446	98	Paved parking, HSG C
978	74	>75% Grass cover, Good, HSG C
317	98	Roofs, HSG C
4,741	93	Weighted Average
978		20.63% Pervious Area
3,763		79.37% 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

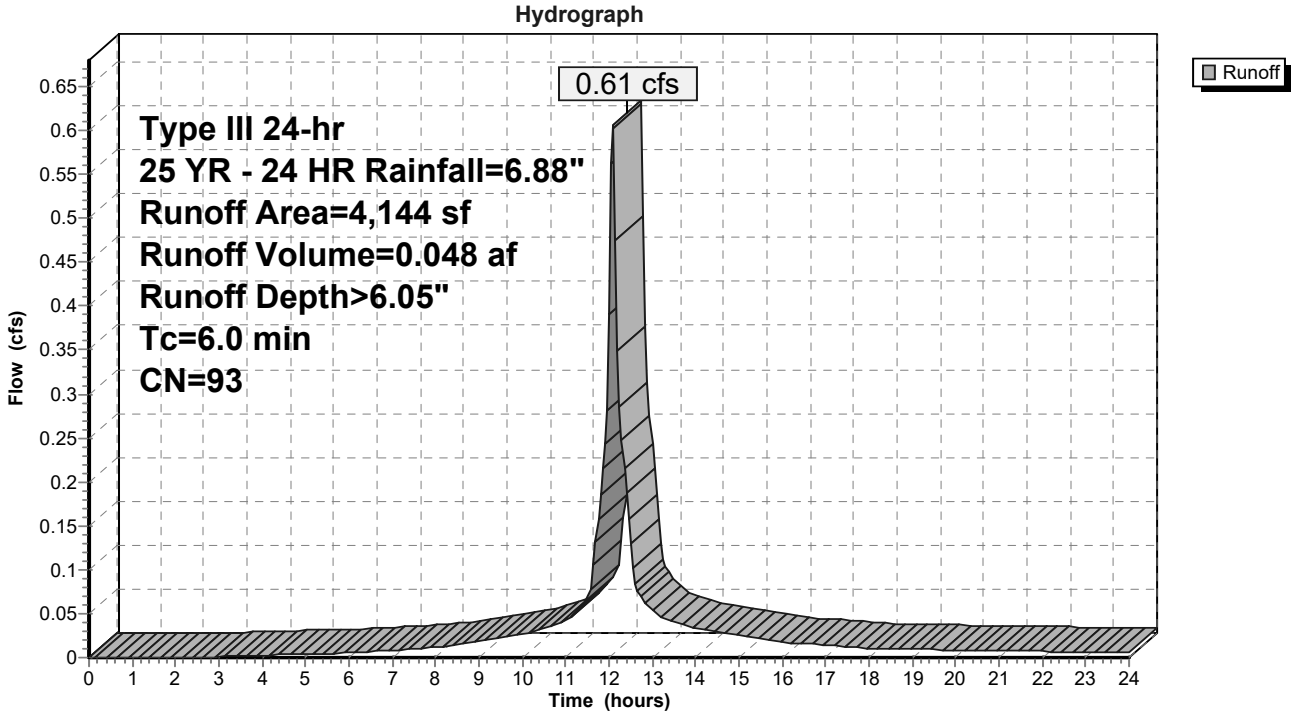
Runoff = 0.61 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 6.05"
Routed to Pond C05P : CB #5

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
3,071	98	Paved parking, HSG C
838	74	>75% Grass cover, Good, HSG C
235	98	Roofs, HSG C
4,144	93	Weighted Average
838		20.22% Pervious Area
3,306		79.78% 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

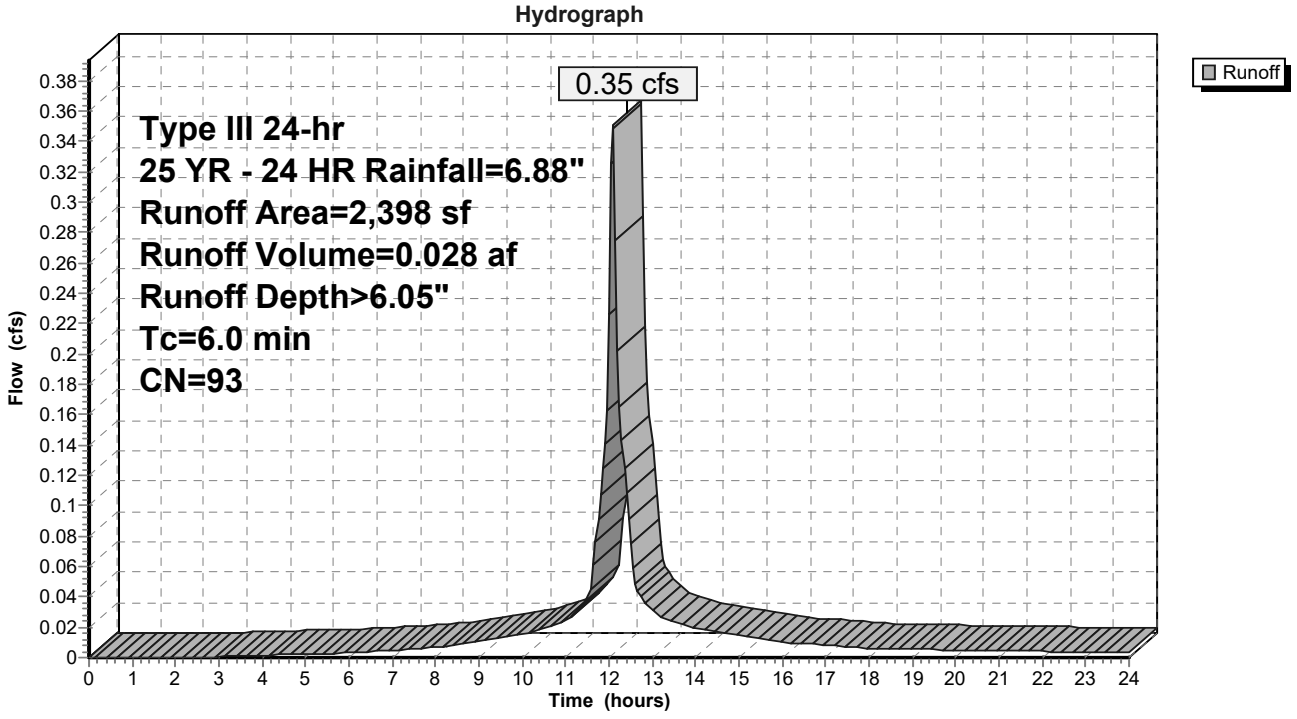
Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 6.05"
Routed to Pond C06P : CB #6

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
1,855	98	Paved parking, HSG C
515	74	>75% Grass cover, Good, HSG C
28	98	Roofs, HSG C
2,398	93	Weighted Average
515		21.48% Pervious Area
1,883		78.52% 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

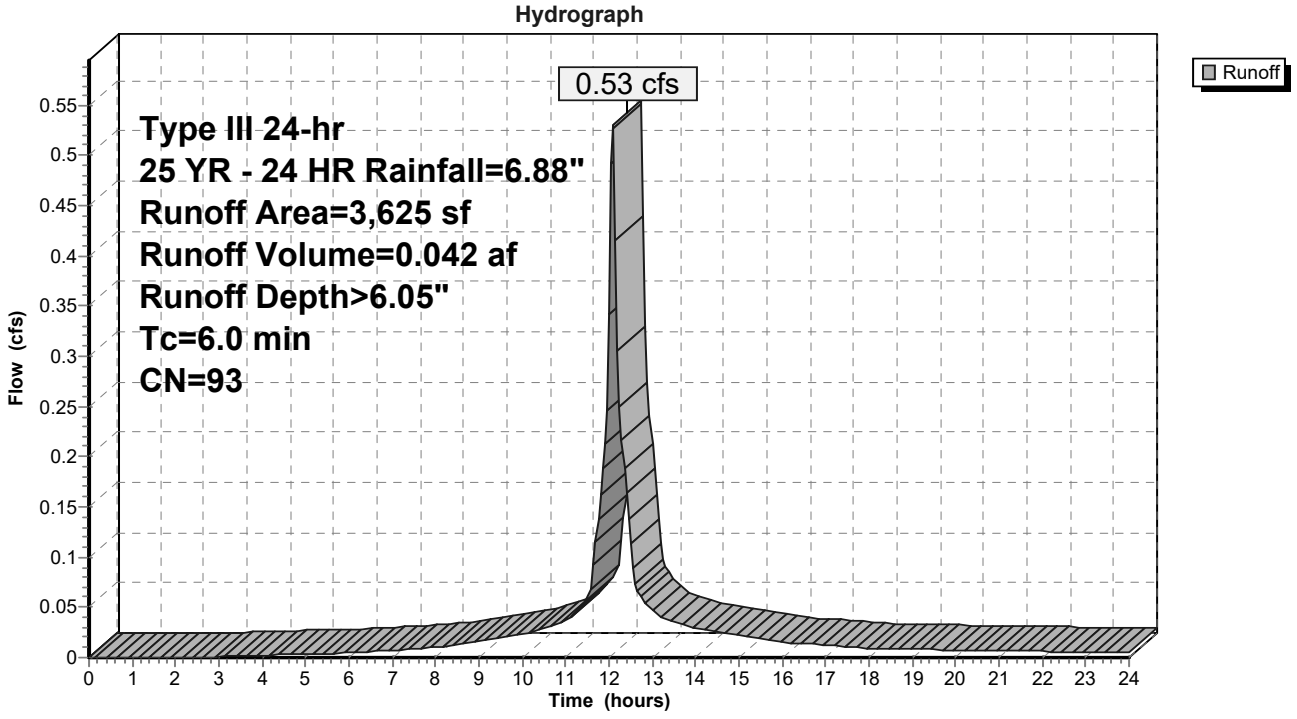
Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.042 af, Depth> 6.05"
Routed to Pond C07P : CB #7

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
2,449	98	Paved parking, HSG C
809	74	>75% Grass cover, Good, HSG C
367	98	Roofs, HSG C
3,625	93	Weighted Average
809		22.32% Pervious Area
2,816		77.68% 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

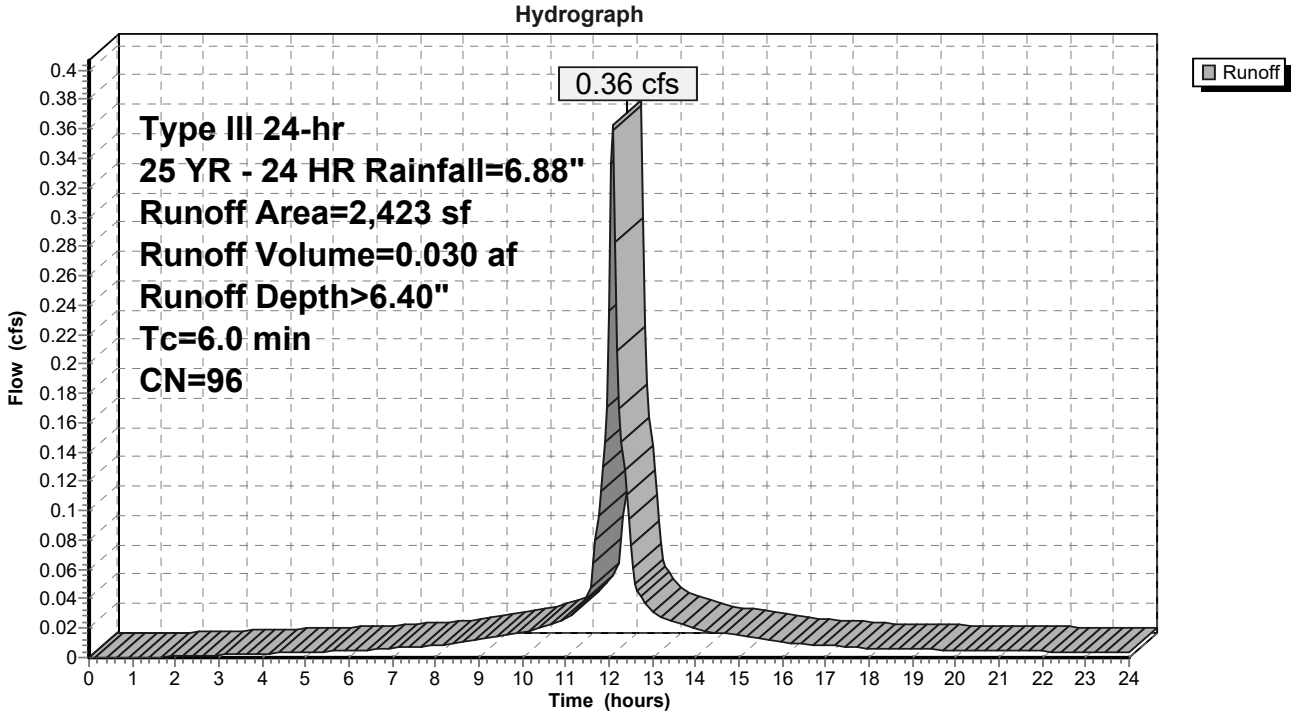
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 6.40"
Routed to Pond C08P : CB #8

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
1,996	98	Paved parking, HSG C
250	74	>75% Grass cover, Good, HSG C
177	98	Roofs, HSG C
2,423	96	Weighted Average
250		10.32% Pervious Area
2,173		89.68% 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



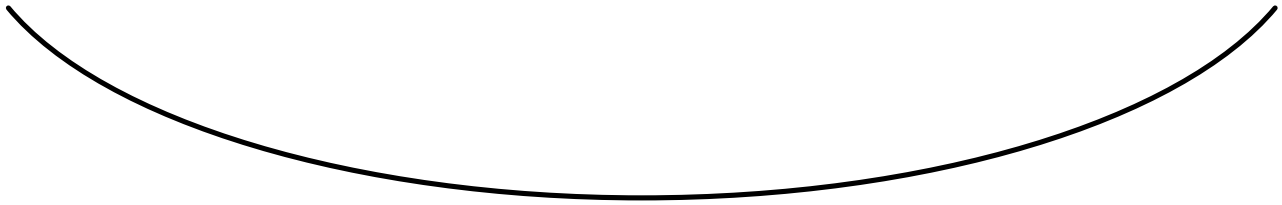
Summary for Reach 15AR: Overland flow

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
Routed to Reach 100R : Final Reach 100

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

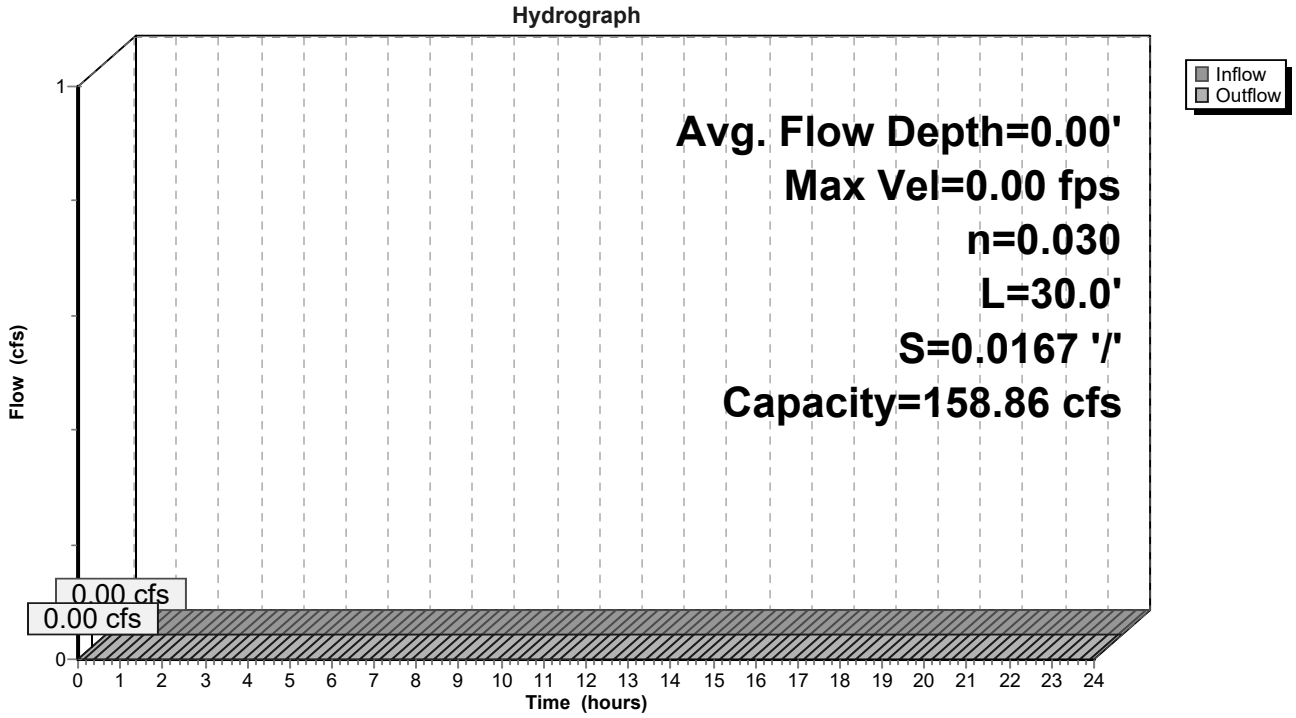
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.50' Flow Area= 25.0 sf, Capacity= 158.86 cfs

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
Routed to Reach 15AR : Overland flow

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

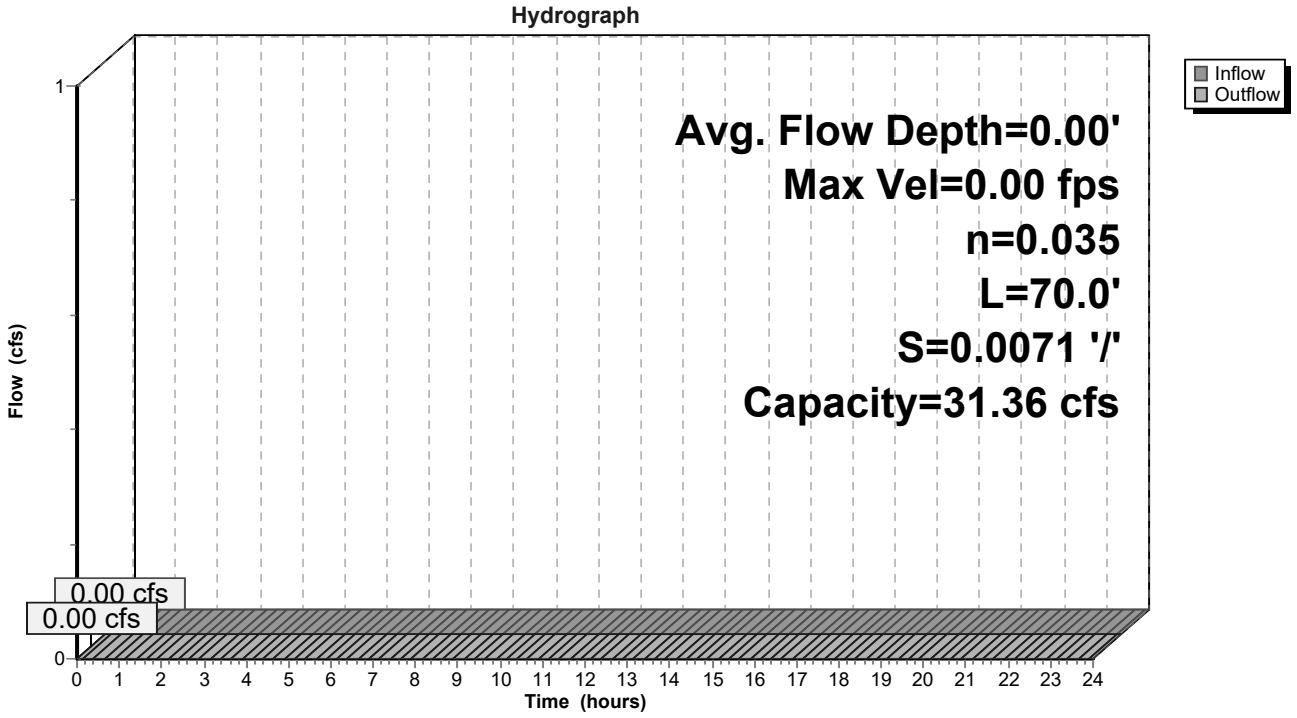
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 31.36 cfs

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



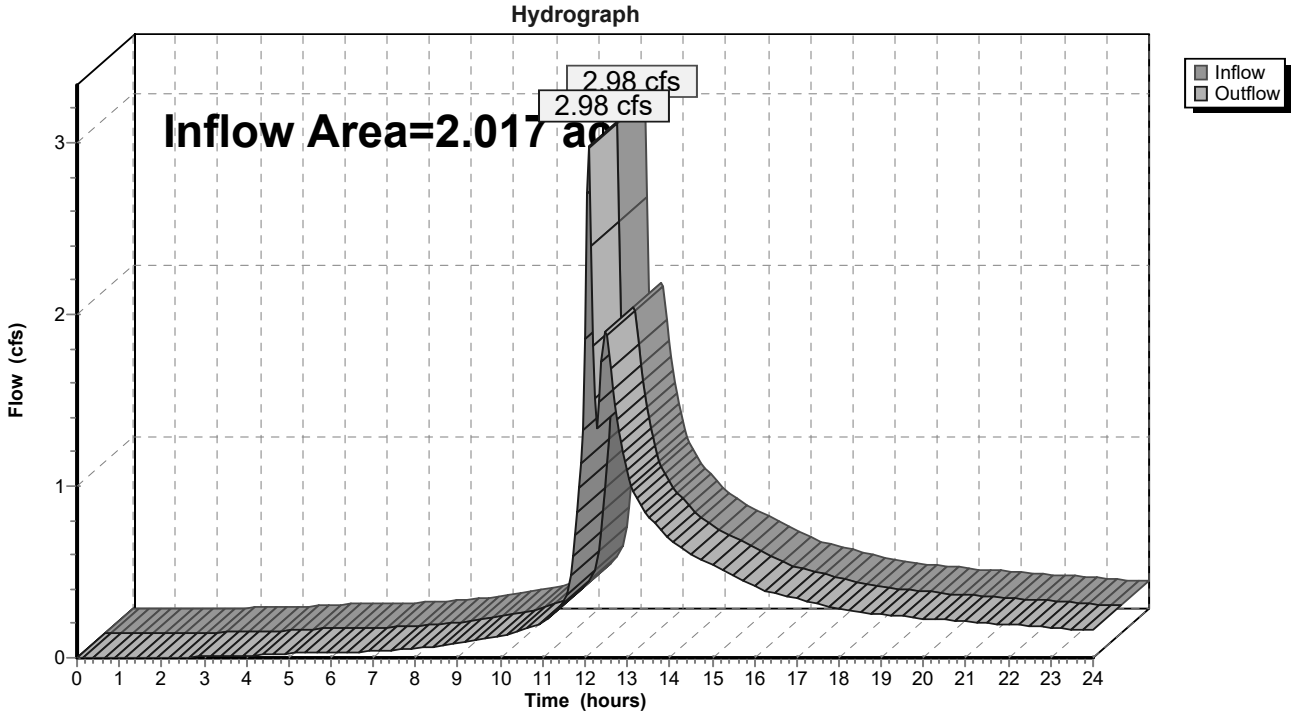
Summary for Reach 100R: Final Reach 100

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

Inflow Area = 2.017 ac, 49.89% Impervious, Inflow Depth > 3.24" for 25 YR - 24 HR event
Inflow = 2.98 cfs @ 12.09 hrs, Volume= 0.545 af
Outflow = 2.98 cfs @ 12.09 hrs, Volume= 0.545 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



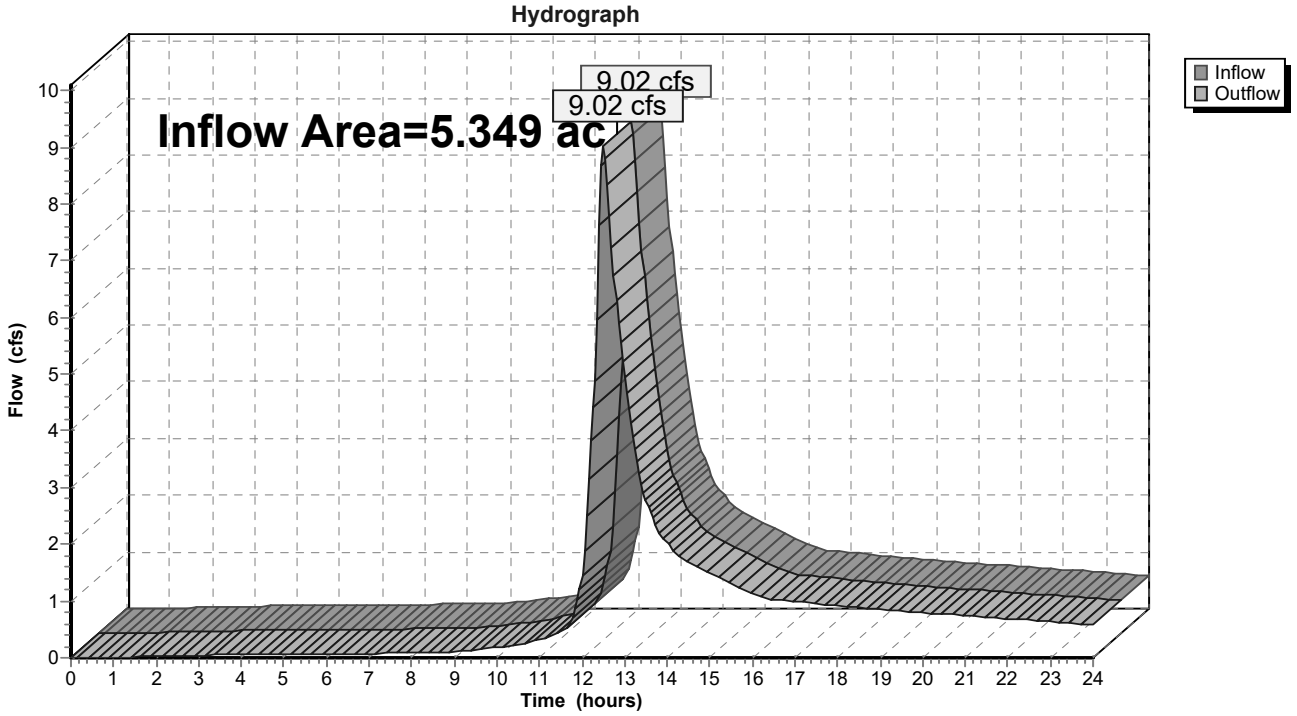
Summary for Reach 200R: Final Reach 200

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

Inflow Area = 5.349 ac, 35.65% Impervious, Inflow Depth > 3.67" for 25 YR - 24 HR event
Inflow = 9.02 cfs @ 12.51 hrs, Volume= 1.636 af
Outflow = 9.02 cfs @ 12.51 hrs, Volume= 1.636 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



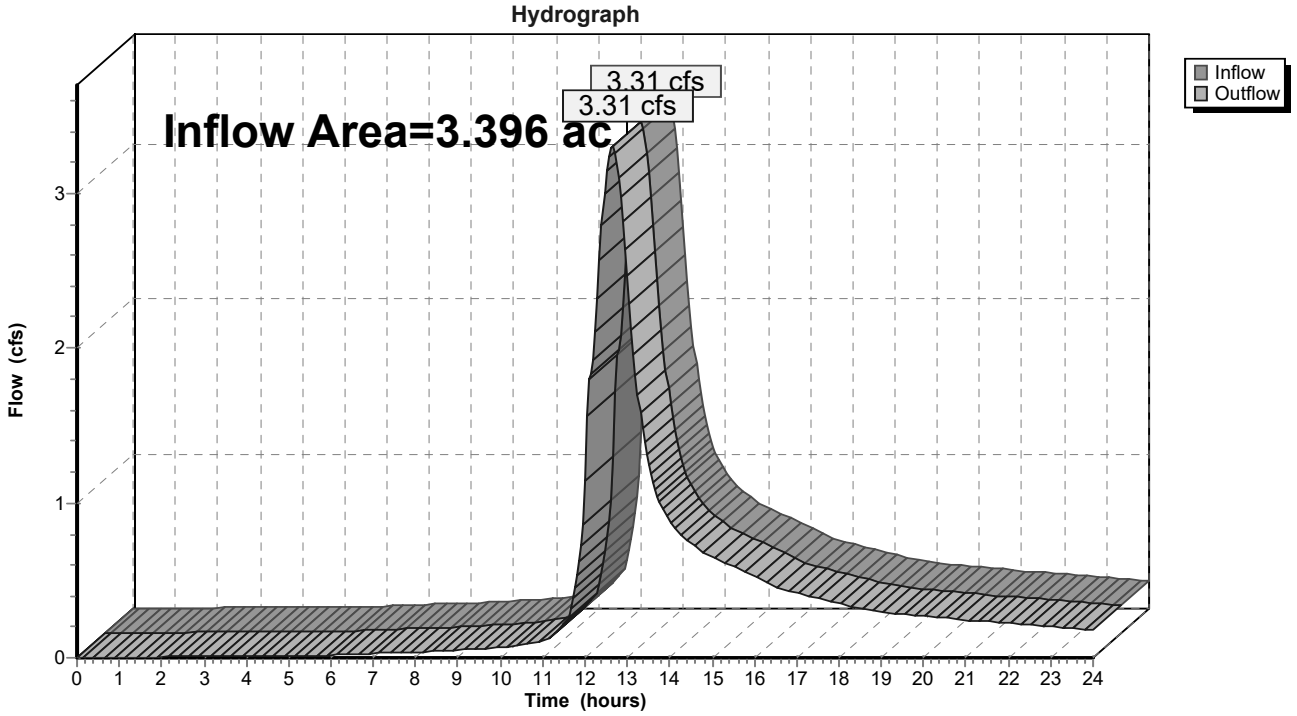
Summary for Reach 400R: Final Reach 400

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

Inflow Area = 3.396 ac, 34.05% Impervious, Inflow Depth > 2.43" for 25 YR - 24 HR event
Inflow = 3.31 cfs @ 12.64 hrs, Volume= 0.688 af
Outflow = 3.31 cfs @ 12.64 hrs, Volume= 0.688 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

[80] Warning: Exceeded Pond 20P by 0.01' @ 12.55 hrs (0.05 cfs 0.000 af)

Inflow Area = 3.236 ac, 30.79% Impervious, Inflow Depth > 2.24" for 25 YR - 24 HR event
Inflow = 3.51 cfs @ 12.51 hrs, Volume= 0.604 af
Outflow = 3.18 cfs @ 12.66 hrs, Volume= 0.599 af, Atten= 10%, Lag= 8.7 min
Primary = 3.18 cfs @ 12.66 hrs, Volume= 0.599 af
Routed to Pond C01P : CB #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.95' @ 12.67 hrs Surf.Area= 1,949 sf Storage= 1,950 cf
Flood Elev= 92.50' Surf.Area= 14,979 sf Storage= 10,779 cf

Plug-Flow detention time= 14.0 min calculated for 0.599 af (99% of inflow)
Center-of-Mass det. time= 9.8 min (910.3 - 900.6)

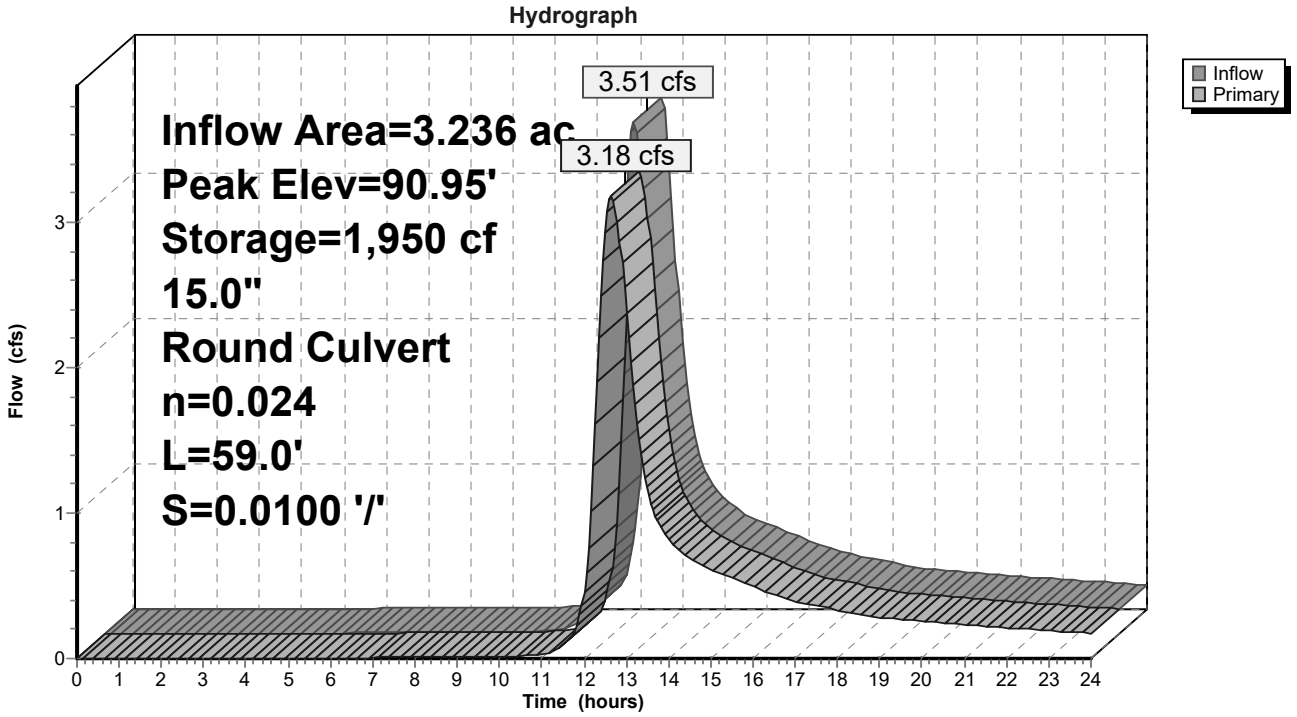
Volume	Invert	Avail.Storage	Storage Description
#1	89.50'	21,457 cf	**Open Water Storage (Irregular)**Listed below (Recalc)

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=3.17 cfs @ 12.66 hrs HW=90.95' TW=90.32' (Dynamic Tailwater)
↑—**1=15" CMP** (Outlet Controls 3.17 cfs @ 2.81 fps)

Pond 4P: Pond 4



Summary for Pond 16P: Inlet Sump

Inflow Area = 0.347 ac, 48.50% Impervious, Inflow Depth > 5.25" for 25 YR - 24 HR event
Inflow = 2.02 cfs @ 12.09 hrs, Volume= 0.152 af
Outflow = 1.35 cfs @ 12.19 hrs, Volume= 0.150 af, Atten= 33%, Lag= 6.0 min
Primary = 1.35 cfs @ 12.19 hrs, Volume= 0.150 af
Routed to Pond C02P : CB #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.56' @ 12.19 hrs Surf.Area= 1,308 sf Storage= 730 cf
Flood Elev= 95.50' Surf.Area= 2,445 sf Storage= 2,480 cf

Plug-Flow detention time= 32.0 min calculated for 0.150 af (99% of inflow)
Center-of-Mass det. time= 27.0 min (819.4 - 792.4)

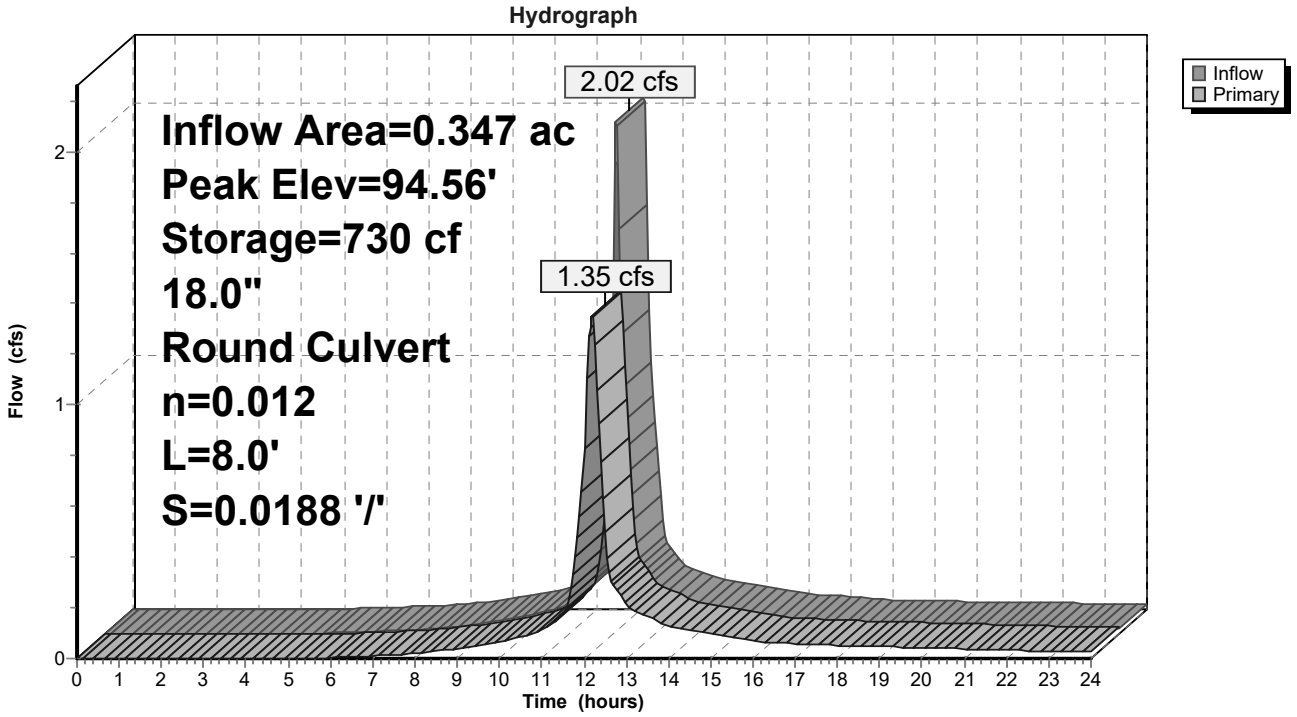
Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	2,480 cf	**Ponding Area (Irregular)**Listed below (Recalc)

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	770	168.3	154	154	1,619
95.00	1,829	427.0	1,262	1,416	13,877
95.50	2,445	469.0	1,065	2,480	16,880

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=1.44 cfs @ 12.19 hrs HW=94.56' TW=94.44' (Dynamic Tailwater)
1=18" RCP (Outlet Controls 1.44 cfs @ 2.15 fps)

Pond 16P: Inlet Sump



Summary for Pond 20P: Nyloplast Basin

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

Inflow Area = 0.196 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25 YR - 24 HR event
Inflow = 0.67 cfs @ 12.10 hrs, Volume= 0.049 af
Outflow = 0.67 cfs @ 12.10 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.2 min
Primary = 0.67 cfs @ 12.10 hrs, Volume= 0.049 af
Routed to Pond 4P : Pond 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 91.19' @ 12.10 hrs Surf.Area= 3 sf Storage= 5 cf
Flood Elev= 93.00' Surf.Area= 1,781 sf Storage= 1,447 cf

Plug-Flow detention time= 0.4 min calculated for 0.049 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (842.5 - 842.2)

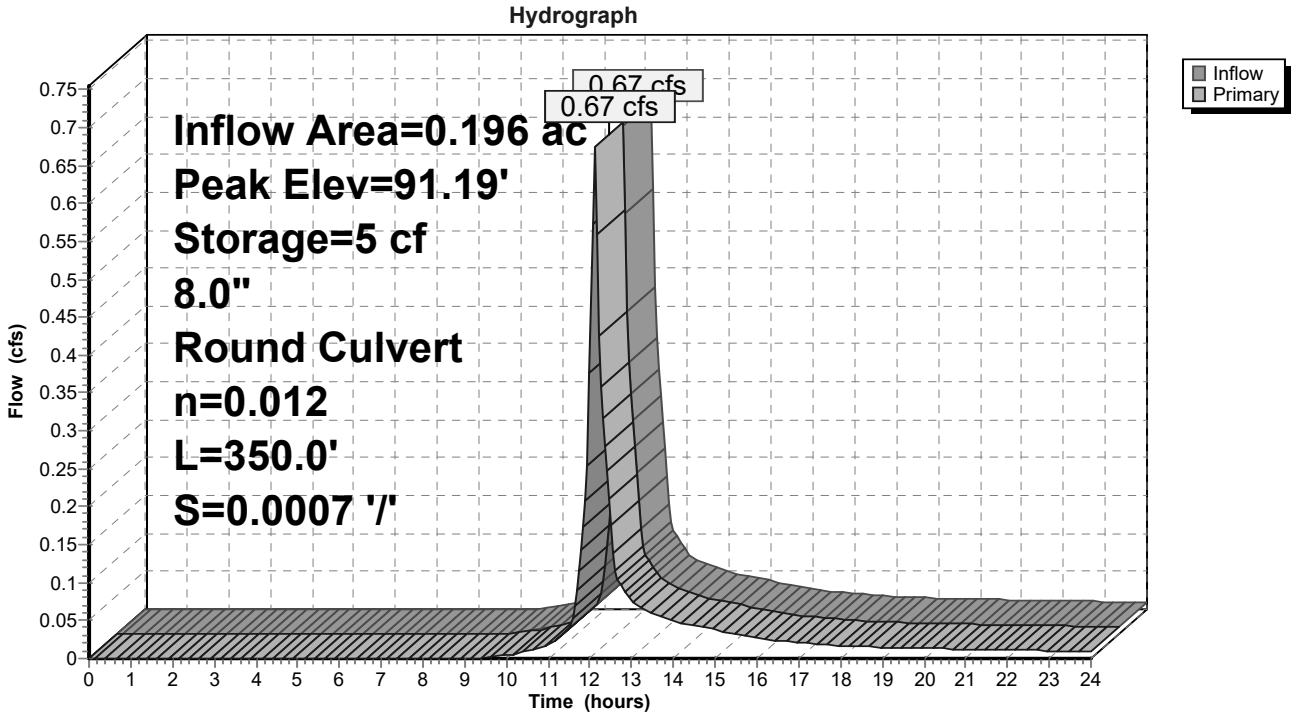
Volume	Invert	Avail.Storage	Storage Description
#1	91.75'	1,441 cf	**Ponding Area (Irregular)**Listed below (Recalc)
#2	89.75'	6 cf	**2.00'D x 2.00'H 2' Structure**
		1,447 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.75	570	209.4	0	0	570
92.00	814	151.8	172	172	2,226
92.50	1,257	225.6	514	686	4,445
93.00	1,778	303.1	755	1,441	7,708

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=0.66 cfs @ 12.10 hrs HW=91.18' TW=90.21' (Dynamic Tailwater)
↑—**1=8" HDPE N-12** (Outlet Controls 0.66 cfs @ 1.88 fps)

Pond 20P: Nyloplast Basin



Summary for Pond 101P: Gravel Wetland #101

[80] Warning: Exceeded Pond C08P by 0.06' @ 12.20 hrs (0.44 cfs 0.110 af)

Inflow Area = 1.461 ac, 58.43% Impervious, Inflow Depth > 4.93" for 25 YR - 24 HR event
Inflow = 6.62 cfs @ 12.09 hrs, Volume= 0.600 af
Outflow = 1.30 cfs @ 12.55 hrs, Volume= 0.333 af, Atten= 80%, Lag= 27.4 min
Primary = 0.08 cfs @ 12.55 hrs, Volume= 0.109 af
Routed to Reach 100R : Final Reach 100
Secondary = 1.09 cfs @ 12.55 hrs, Volume= 0.220 af
Routed to Reach 100R : Final Reach 100
Tertiary = 0.12 cfs @ 12.55 hrs, Volume= 0.003 af
Routed to Reach 100R : Final Reach 100

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.03' @ 12.55 hrs Surf.Area= 29,667 sf Storage= 12,589 cf
Flood Elev= 94.50' Surf.Area= 33,501 sf Storage= 19,418 cf

Plug-Flow detention time= 253.7 min calculated for 0.333 af (55% of inflow)
Center-of-Mass det. time= 115.7 min (932.5 - 816.8)

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

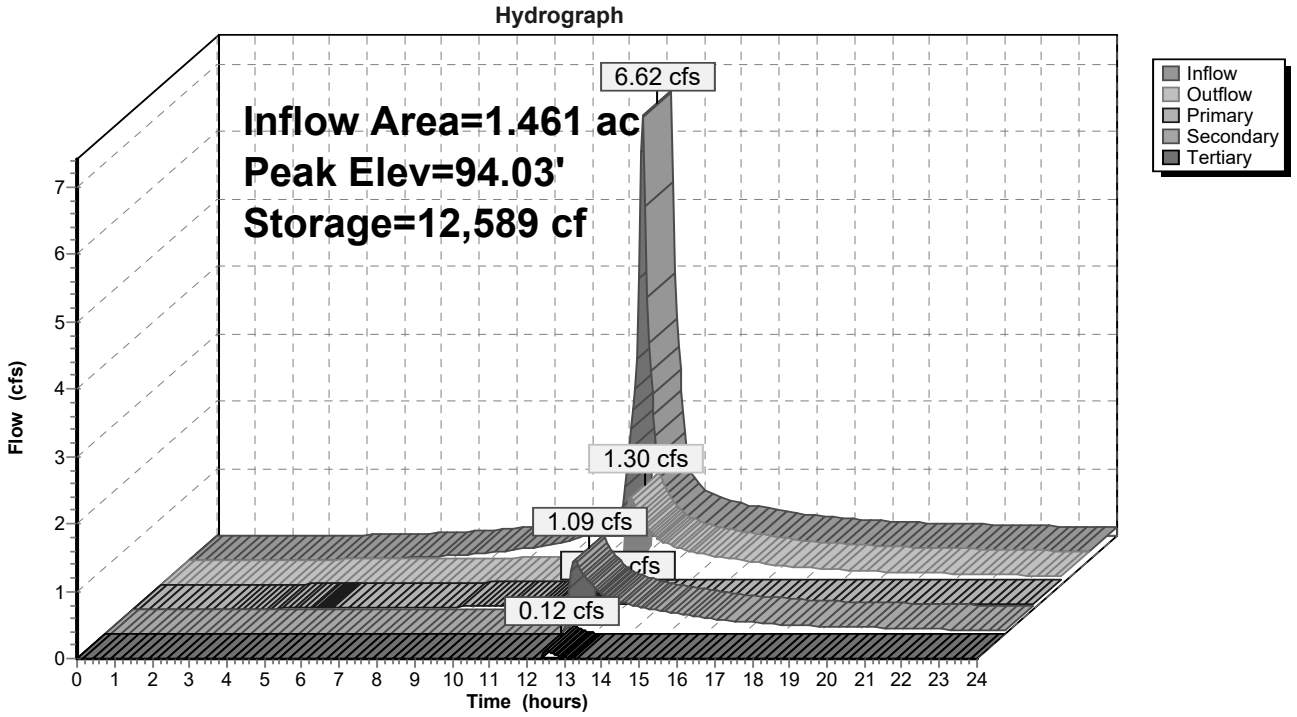
Device	Routing	Invert	Outlet Devices
#1	Primary	91.92'	**6.0" Round 6" HDPE N-12** L= 17.0' Ke= 0.500 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0100 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Secondary	91.92'	**12.0" Round 12" RCP** L= 16.0' Ke= 0.500 Inlet / Outlet 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 Limited to weir flow at low heads
#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 @ 12.55 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=1.09 cfs @ 12.55 hrs HW=94.03' TW=0.00' (Dynamic Tailwater)
↑└**2=12" RCP** (Passes 1.09 cfs of 4.80 cfs potential flow)
↑└**4=4' Structure** (Weir Controls 1.09 cfs @ 0.98 fps)

Tertiary OutFlow Max=0.12 cfs @ 12.55 hrs HW=94.03' TW=0.00' (Dynamic Tailwater)
↑└**5=10' Emergency Spillway** (Weir Controls 0.12 cfs @ 0.41 fps)

Pond 101P: Gravel Wetland #101



Summary for Pond 103P: Gravel Wetland #103

Inflow Area = 3.730 ac, 51.11% Impervious, Inflow Depth > 5.32" for 25 YR - 24 HR event
Inflow = 15.74 cfs @ 12.09 hrs, Volume= 1.652 af
Outflow = 5.50 cfs @ 12.55 hrs, Volume= 1.149 af, Atten= 65%, Lag= 27.1 min
Primary = 0.19 cfs @ 12.55 hrs, Volume= 0.248 af
Routed to Reach 200R : Final Reach 200
Secondary = 3.32 cfs @ 12.55 hrs, Volume= 0.792 af
Routed to Reach 200R : Final Reach 200
Tertiary = 1.99 cfs @ 12.55 hrs, Volume= 0.109 af
Routed to Reach 200R : Final Reach 200

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.35' @ 12.55 hrs Surf.Area= 38,974 sf Storage= 33,000 cf
Flood Elev= 95.00' Surf.Area= 41,377 sf Storage= 47,629 cf

Plug-Flow detention time= 235.1 min calculated for 1.149 af (70% of inflow)
Center-of-Mass det. time= 137.1 min (934.4 - 797.3)

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'	31,773 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	92.50'	7,442 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
		47,629 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	347.4	614	614	7,668
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	216.9	0	0	1,797
92.50	2,882	243.9	580	580	2,789
93.00	3,568	328.9	1,609	2,189	6,666
93.50	4,077	342.3	1,910	4,099	7,401

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.50	18,914	739.1	0	0	18,914
94.00	20,434	894.2	9,835	9,835	39,077
94.50	21,783	904.8	10,552	20,387	40,660
95.00	23,776	1,113.7	11,386	31,773	74,219

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	4,520	406.7	0	0	4,520
93.00	8,038	593.2	3,098	3,098	19,362
93.50	9,356	653.5	4,344	7,442	25,352

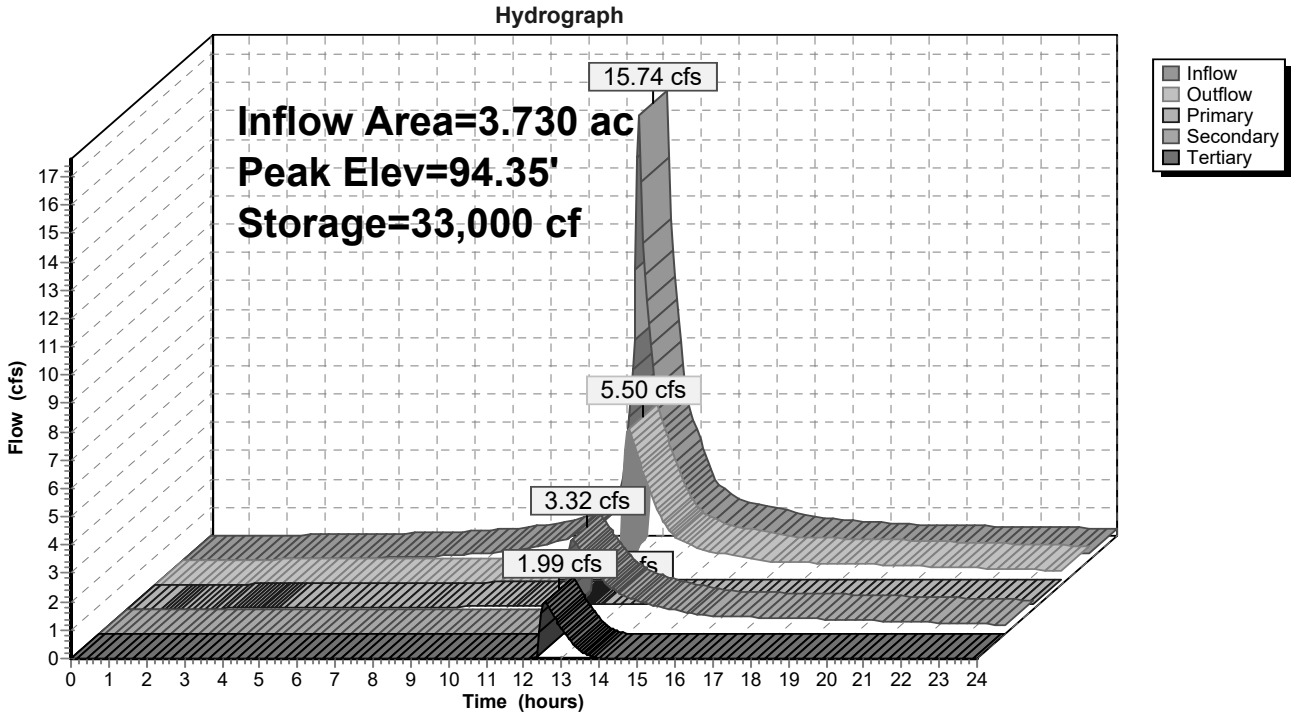
Device	Routing	Invert	Outlet Devices
#1	Primary	91.92'	**6.0" Round 6" HDPE N-12** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 91.92' / 91.75' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	91.92'	**15.0" Round 15" RCP** L= 12.0' CPP, projecting, no headwall, 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 Limited to weir flow at low heads
#4	Device 2	93.50'	**4.0" Vert. 4" Orifice (2) X 2.00** C= 0.600 Limited to weir flow at low heads
#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=0.19 cfs @ 12.55 hrs HW=94.35' TW=0.00' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.19 cfs of 1.10 cfs potential flow)
  └─**3=2.25" Orifice Goose Neck** (Orifice Controls 0.19 cfs @ 7.36 fps)

Secondary OutFlow Max=3.31 cfs @ 12.55 hrs HW=94.35' TW=0.00' (Dynamic Tailwater)
└─**2=15" RCP** (Passes 3.31 cfs of 6.27 cfs potential flow)
  ├─**4=4" Orifice (2)** (Orifice Controls 0.69 cfs @ 3.98 fps)
  └─**5=4' Structure** (Weir Controls 2.62 cfs @ 1.31 fps)

Tertiary OutFlow Max=1.98 cfs @ 12.55 hrs HW=94.35' TW=0.00' (Dynamic Tailwater)
└─**6=25' Emergency Spillway** (Weir Controls 1.98 cfs @ 0.80 fps)

Pond 103P: Gravel Wetland #103



Summary for Pond 104P: Gravel Wetland #104

Inflow Area = 0.585 ac, 44.16% Impervious, Inflow Depth > 5.13" for 25 YR - 24 HR event
Inflow = 3.35 cfs @ 12.09 hrs, Volume= 0.250 af
Outflow = 0.10 cfs @ 16.00 hrs, Volume= 0.083 af, Atten= 97%, Lag= 234.6 min
Primary = 0.10 cfs @ 16.00 hrs, Volume= 0.083 af
Routed to Pond 4P : Pond 4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 4P : Pond 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 92.90' @ 16.00 hrs Surf.Area= 9,773 sf Storage= 8,021 cf
Flood Elev= 94.00' Surf.Area= 6,280 sf Storage= 14,640 cf

Plug-Flow detention time= 382.4 min calculated for 0.083 af (33% of inflow)
Center-of-Mass det. time= 248.2 min (1,043.4 - 795.2)

Volume	Invert	Avail.Storage	Storage Description
#1	90.33'	43 cf	**4.00'D x 3.42'H Outlet Structure**
#2	91.00'	1,687 cf	**Sediment Forebay (Irregular)**Listed below (Recalc)
#3	91.00'	979 cf	**Cell 1 (Irregular)**Listed below (Recalc)
#4	91.00'	1,273 cf	**Cell 2 (Irregular)**Listed below (Recalc)
#5	92.00'	10,657 cf	**Open water storage (Irregular)**Listed below (Recalc)
		14,640 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	167	50.2	0	0	167
91.50	639	109.6	189	189	923
92.00	819	120.3	364	552	1,127
93.00	1,484	160.0	1,135	1,687	2,024

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	766	144.1	0	0	766
91.50	974	151.9	434	434	964
92.00	1,210	161.8	545	979	1,223

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	829	156.7	0	0	829
91.50	1,326	206.3	534	534	2,265
92.00	1,637	215.7	739	1,273	2,597

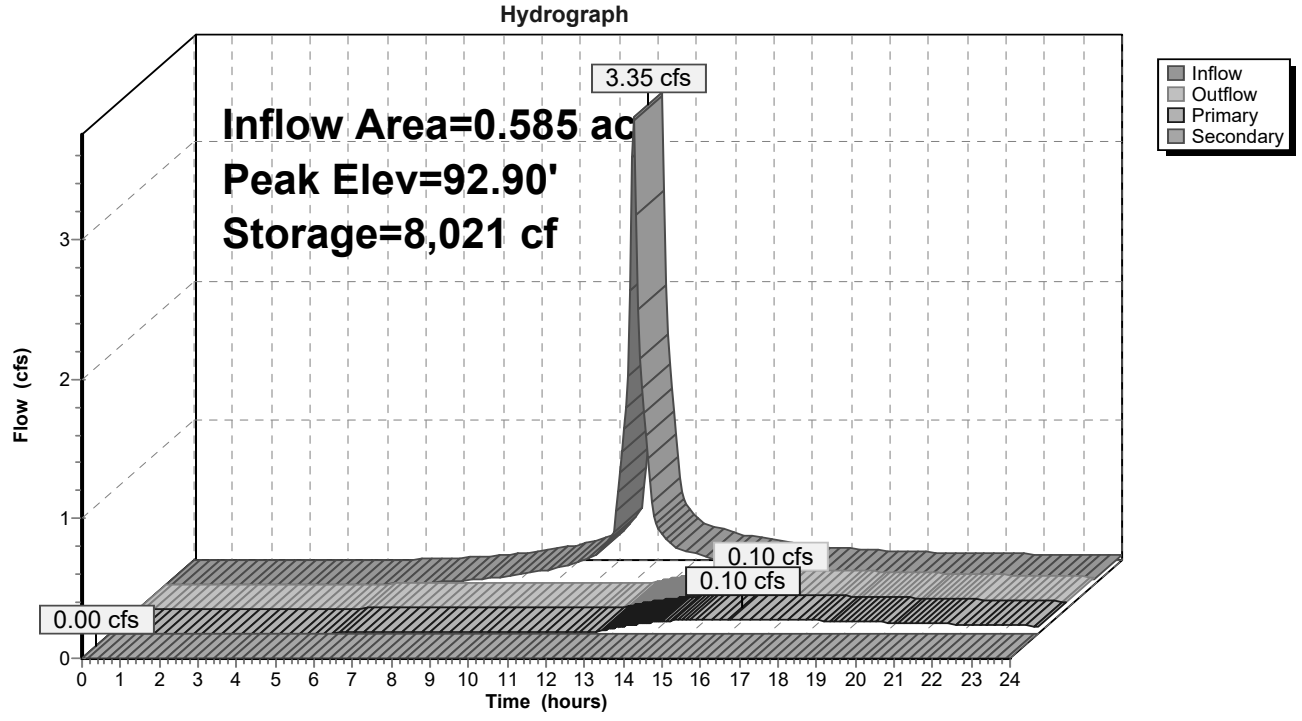
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.00	3,877	454.1	0	0	3,877
93.00	5,707	492.9	4,763	4,763	6,839
93.75	7,185	521.4	4,824	9,586	9,171
94.00	1,936	571.2	1,071	10,657	13,503

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 Limited to weir flow at low heads
#4	Device 1	92.65'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 2	93.50'	**15.0" W x 3.0" H Vert. 3"T X 15"W Box Orifice** C= 0.600 Limited to weir flow at low heads
#6	Device 2	93.79'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 16.00 hrs HW=92.90' TW=90.02' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.10 cfs of 1.14 cfs potential flow)
  └─**3=0.75" Orifice Goose Neck** (Orifice Controls 0.02 cfs @ 7.67 fps)
  └─**4=3" Orifice** (Orifice Controls 0.08 cfs @ 1.70 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 = 1.248 ac, 75.60% Impervious, Inflow Depth > 6.02" for 25 YR - 24 HR event
Inflow = 7.85 cfs @ 12.09 hrs, Volume= 0.626 af
Outflow = 3.19 cfs @ 12.27 hrs, Volume= 0.619 af, Atten= 59%, Lag= 11.0 min
Primary = 3.19 cfs @ 12.27 hrs, Volume= 0.619 af
Routed to Pond C07P : CB #7
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 15R : Swale

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.78' @ 12.31 hrs Surf.Area= 4,570 sf Storage= 5,895 cf
Flood Elev= 97.00' Surf.Area= 6,791 sf Storage= 12,731 cf

Plug-Flow detention time= 41.0 min calculated for 0.618 af (99% of inflow)
Center-of-Mass det. time= 34.0 min (801.2 - 767.2)

Volume	Invert	Avail.Storage	Storage Description
#1	93.75'	12,731 cf	**Open Water Storage (Irregular)** Listed below (Recalc)

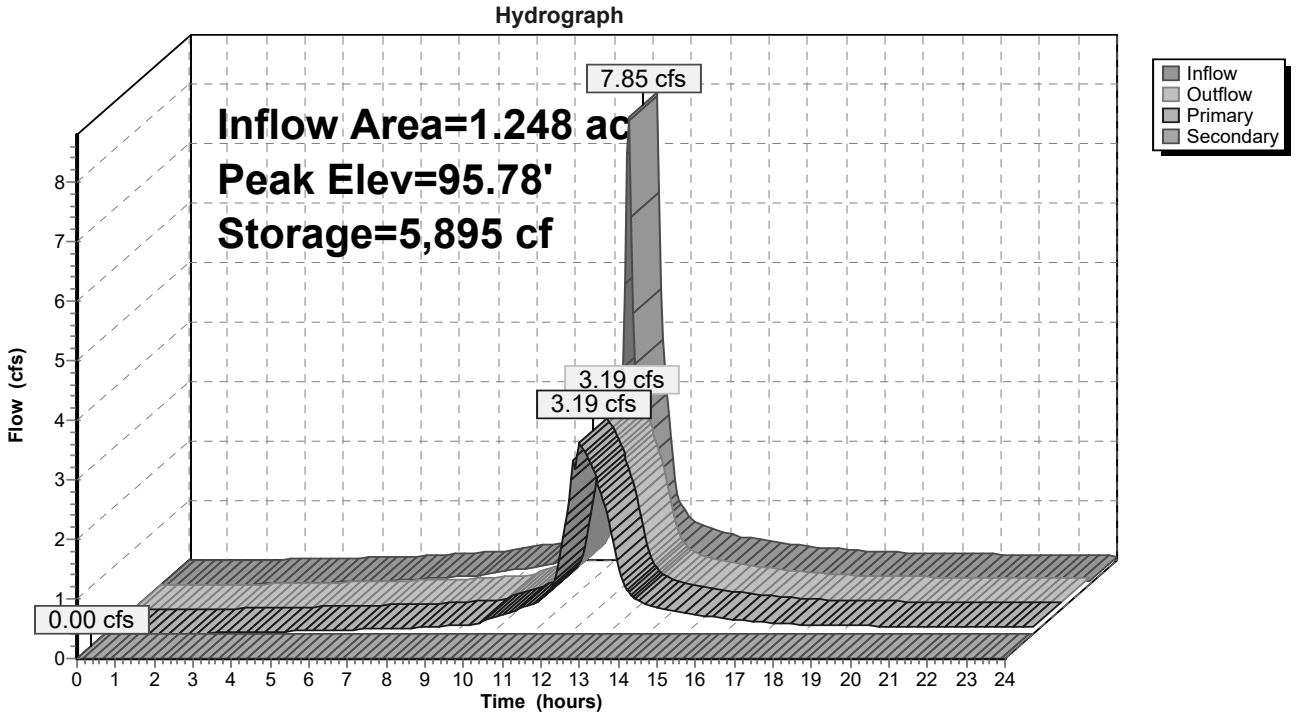
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.75	30	22.0	0	0	30
94.00	1,688	169.5	162	162	2,278
95.00	3,555	326.9	2,564	2,726	8,500
96.00	4,876	389.9	4,198	6,924	12,112
97.00	6,791	463.8	5,807	12,731	17,150

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 Limited to weir flow at low heads
#3	Device 1	94.30'	**6.0" Vert. 6" Orifice (3) X 3.00** C= 0.600 Limited to weir flow at low heads
#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=3.14 cfs @ 12.27 hrs HW=95.77' TW=94.73' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Passes 3.14 cfs of 8.22 cfs potential flow)
  ├**2=3" Orifice** (Orifice Controls 0.24 cfs @ 4.92 fps)
  ├**3=6" Orifice (3)** (Orifice Controls 2.90 cfs @ 4.92 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 = 0.327 ac,100.00% Impervious, Inflow Depth > 6.64" for 25 YR - 24 HR event
Inflow = 2.15 cfs @ 12.09 hrs, Volume= 0.181 af
Outflow = 0.10 cfs @ 14.76 hrs, Volume= 0.109 af, Atten= 95%, Lag= 160.3 min
Primary = 0.10 cfs @ 14.76 hrs, Volume= 0.109 af
Routed to Pond 101P : Gravel Wetland #101

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.85' @ 14.60 hrs Surf.Area= 3,623 sf Storage= 4,510 cf
Flood Elev= 96.25' Surf.Area= 3,623 sf Storage= 6,905 cf

Plug-Flow detention time= 294.4 min calculated for 0.109 af (60% of inflow)
Center-of-Mass det. time= 182.5 min (925.2 - 742.8)

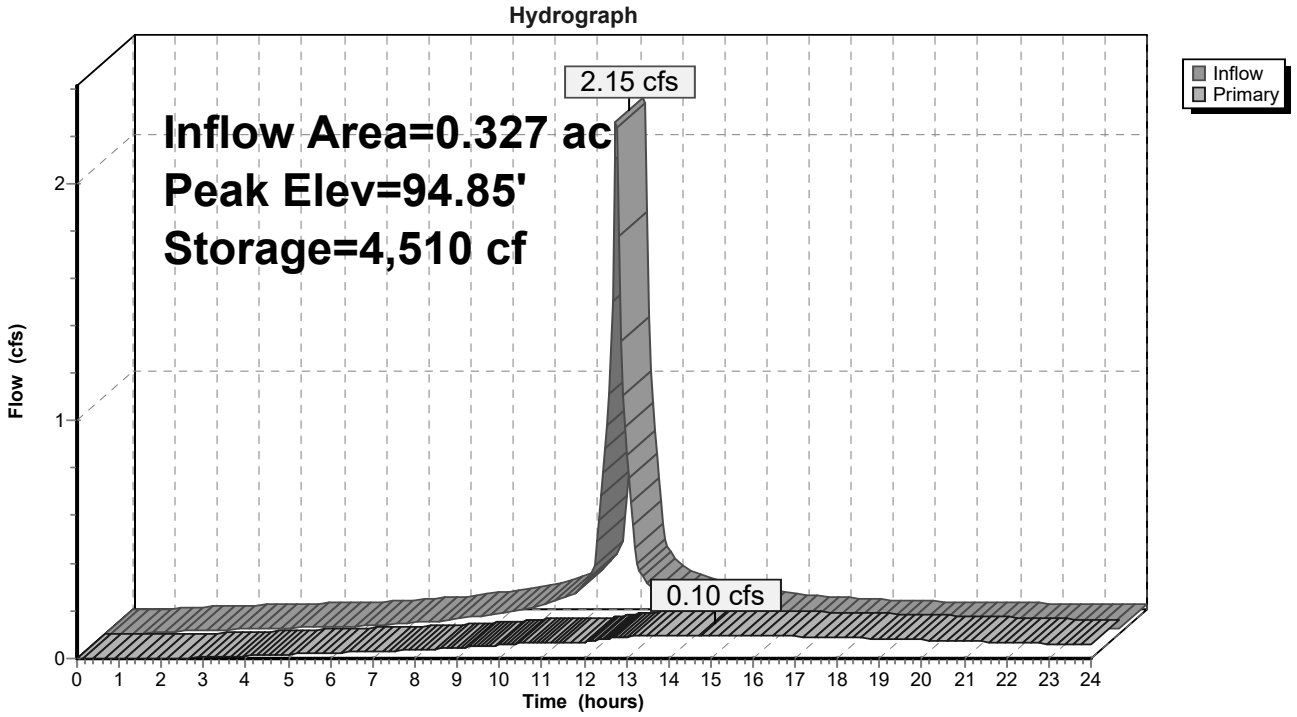
Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	3,850 cf	**Stone (Irregular)** Listed below (Recalc) 12,611 cf Overall - 2,986 cf Embedded = 9,624 cf x 40.0% Voids
#2	93.25'	2,986 cf	**ADS_StormTech SC-740 +Cap** x 65 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall 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 Limited to weir flow at low heads
#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 @ 14.76 hrs HW=94.85' TW=93.98' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Passes 0.10 cfs of 7.92 cfs potential flow)
  └**2=3" Orifice** (Orifice Controls 0.10 cfs @ 4.48 fps)
  └**3=18" Int. Stack** (Controls 0.00 cfs)

Pond 106P: StormTech SC740 #106



Summary for Pond C01P: CB #1

Inflow Area = 3.396 ac, 34.05% Impervious, Inflow Depth > 2.43" for 25 YR - 24 HR event
Inflow = 3.31 cfs @ 12.64 hrs, Volume= 0.688 af
Outflow = 3.31 cfs @ 12.64 hrs, Volume= 0.688 af, Atten= 0%, Lag= 0.0 min
Primary = 3.31 cfs @ 12.64 hrs, Volume= 0.688 af
Routed to Reach 400R : Final Reach 400

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.32' @ 12.64 hrs Surf.Area= 13 sf Storage= 12 cf
Flood Elev= 93.14' Surf.Area= 13 sf Storage= 48 cf

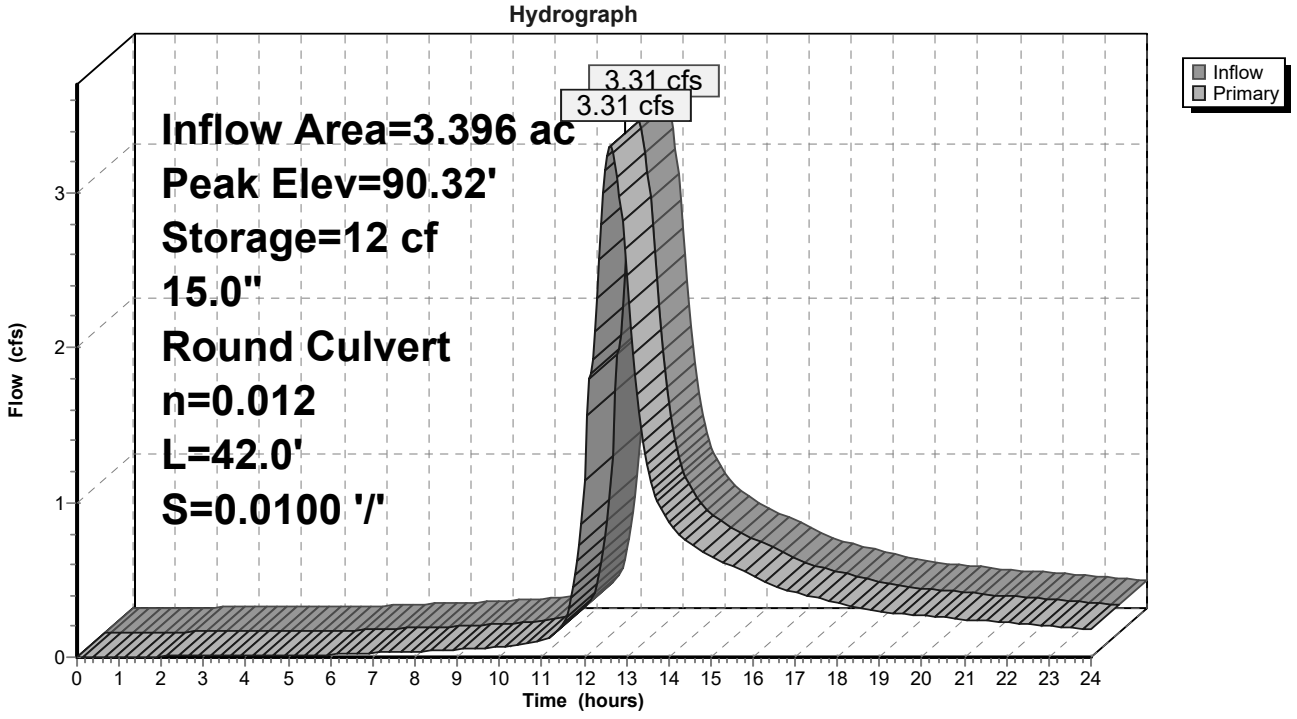
Plug-Flow detention time= 0.1 min calculated for 0.686 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (888.9 - 888.8)

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=3.30 cfs @ 12.64 hrs HW=90.32' TW=0.00' (Dynamic Tailwater)
1=15" RCP (Barrel Controls 3.30 cfs @ 4.38 fps)

Pond C01P: CB #1



Summary for Pond C02P: CB #2

Inflow Area = 0.581 ac, 61.68% Impervious, Inflow Depth > 5.56" for 25 YR - 24 HR event
Inflow = 2.75 cfs @ 12.10 hrs, Volume= 0.269 af
Outflow = 2.75 cfs @ 12.10 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min
Primary = 2.75 cfs @ 12.10 hrs, Volume= 0.269 af
Routed to Pond D01P : DMH #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.46' @ 12.14 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 97.85' Surf.Area= 0.000 ac Storage= 0.001 af

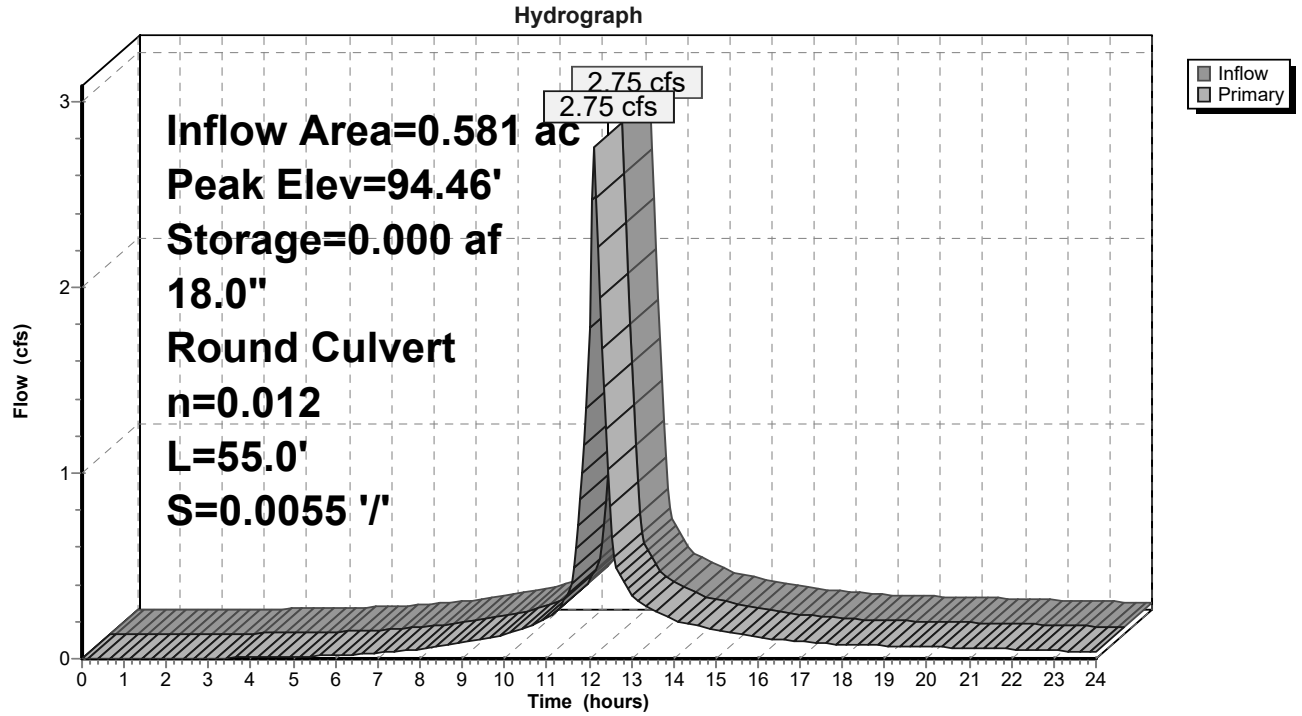
Plug-Flow detention time= 0.5 min calculated for 0.269 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (796.7 - 796.3)

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=2.44 cfs @ 12.10 hrs HW=94.45' TW=94.13' (Dynamic Tailwater)
1=18" RCP (Outlet Controls 2.44 cfs @ 2.94 fps)

Pond C02P: CB #2



Summary for Pond C03P: CB #3

Inflow Area = 0.127 ac, 76.26% Impervious, Inflow Depth > 5.93" for 25 YR - 24 HR event
Inflow = 0.80 cfs @ 12.09 hrs, Volume= 0.063 af
Outflow = 0.80 cfs @ 12.09 hrs, Volume= 0.063 af, Atten= 1%, Lag= 0.1 min
Primary = 0.80 cfs @ 12.09 hrs, Volume= 0.063 af
Routed to Pond C02P : CB #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.57' @ 12.14 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 97.80' Surf.Area= 0.000 ac Storage= 0.001 af

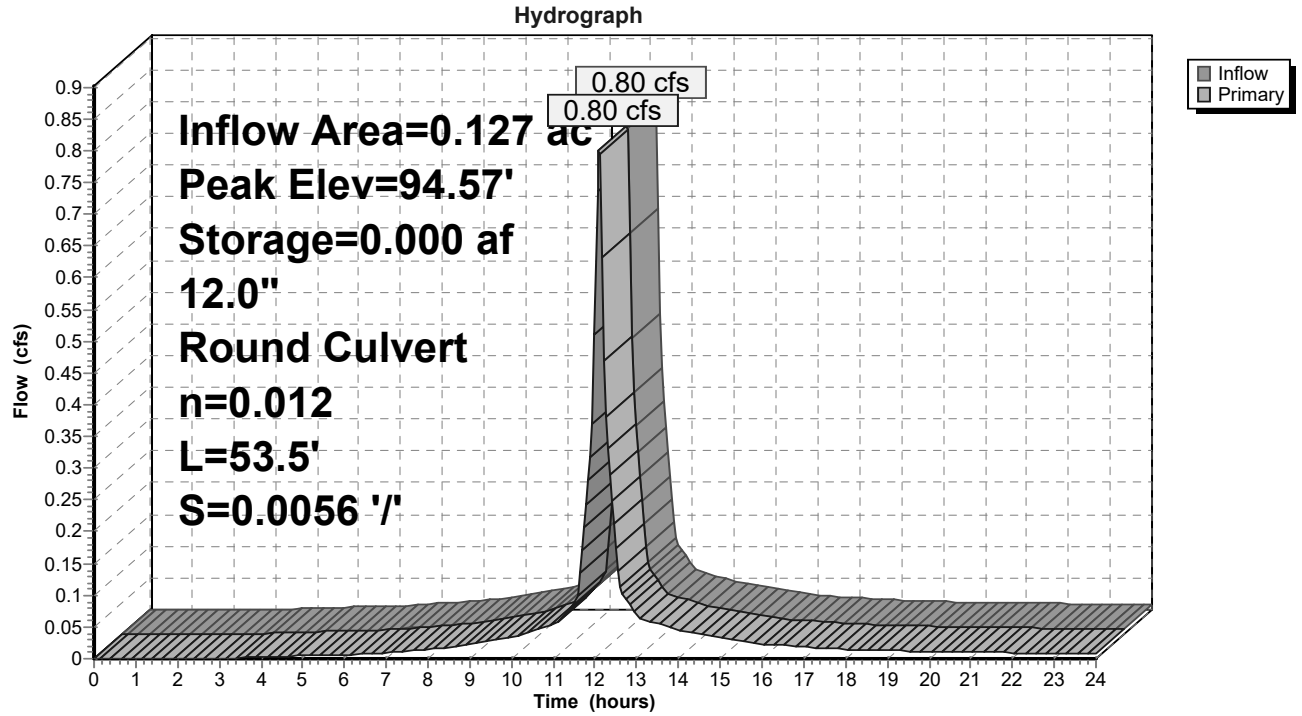
Plug-Flow detention time= 1.0 min calculated for 0.063 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (773.6 - 772.8)

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=0.55 cfs @ 12.09 hrs HW=94.53' TW=94.43' (Dynamic Tailwater)
1=12" RCP (Outlet Controls 0.55 cfs @ 1.50 fps)

Pond C03P: CB #3



Summary for Pond C04P: CB #4

Inflow Area = 0.435 ac, 94.84% Impervious, Inflow Depth > 6.49" for 25 YR - 24 HR event
Inflow = 2.85 cfs @ 12.09 hrs, Volume= 0.235 af
Outflow = 2.84 cfs @ 12.09 hrs, Volume= 0.235 af, Atten= 0%, Lag= 0.0 min
Primary = 2.84 cfs @ 12.09 hrs, Volume= 0.235 af
Routed to Pond D04P : DMH #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.84' @ 12.36 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.05' Surf.Area= 0.000 ac Storage= 0.001 af

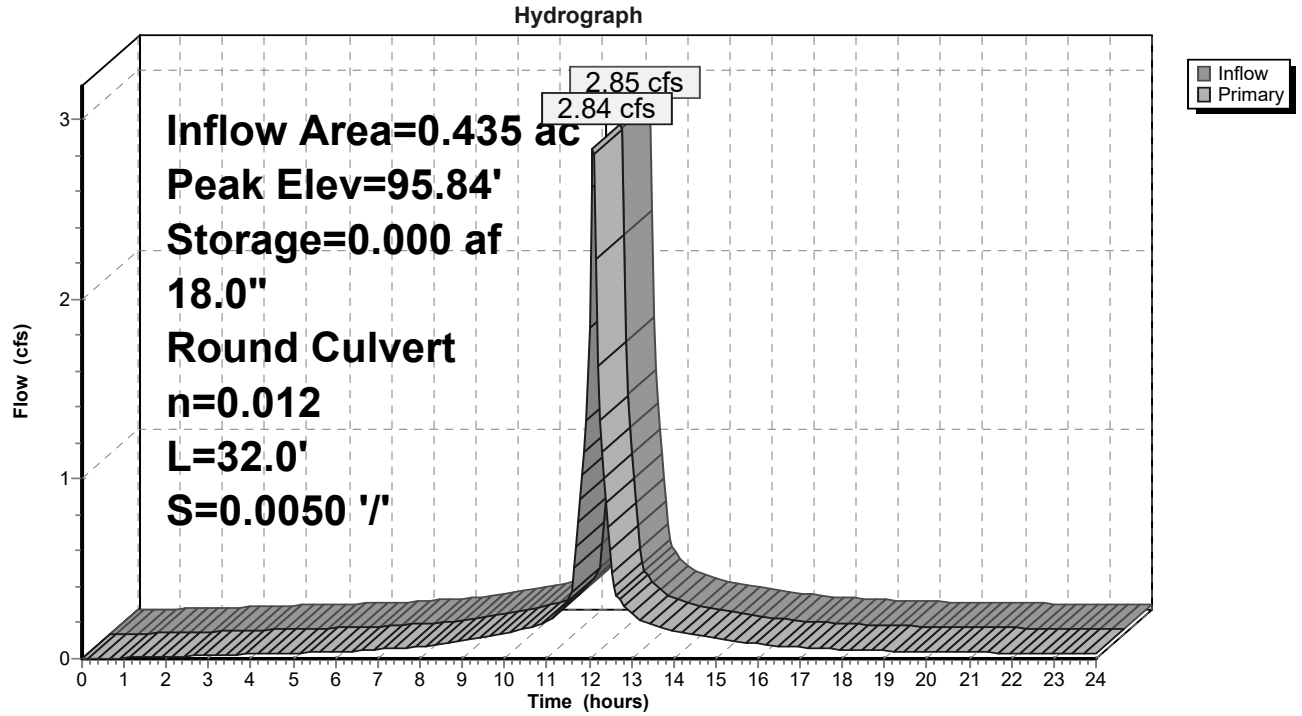
Plug-Flow detention time= 0.3 min calculated for 0.235 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (749.1 - 748.8)

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=1.80 cfs @ 12.09 hrs HW=95.69' TW=95.59' (Dynamic Tailwater)
1=18" RCP (Outlet Controls 1.80 cfs @ 1.84 fps)

Pond C04P: CB #4



Summary for Pond C05P: CB #5

Inflow Area = 0.095 ac, 79.78% 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
Routed to Pond D04P : DMH #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.82' @ 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

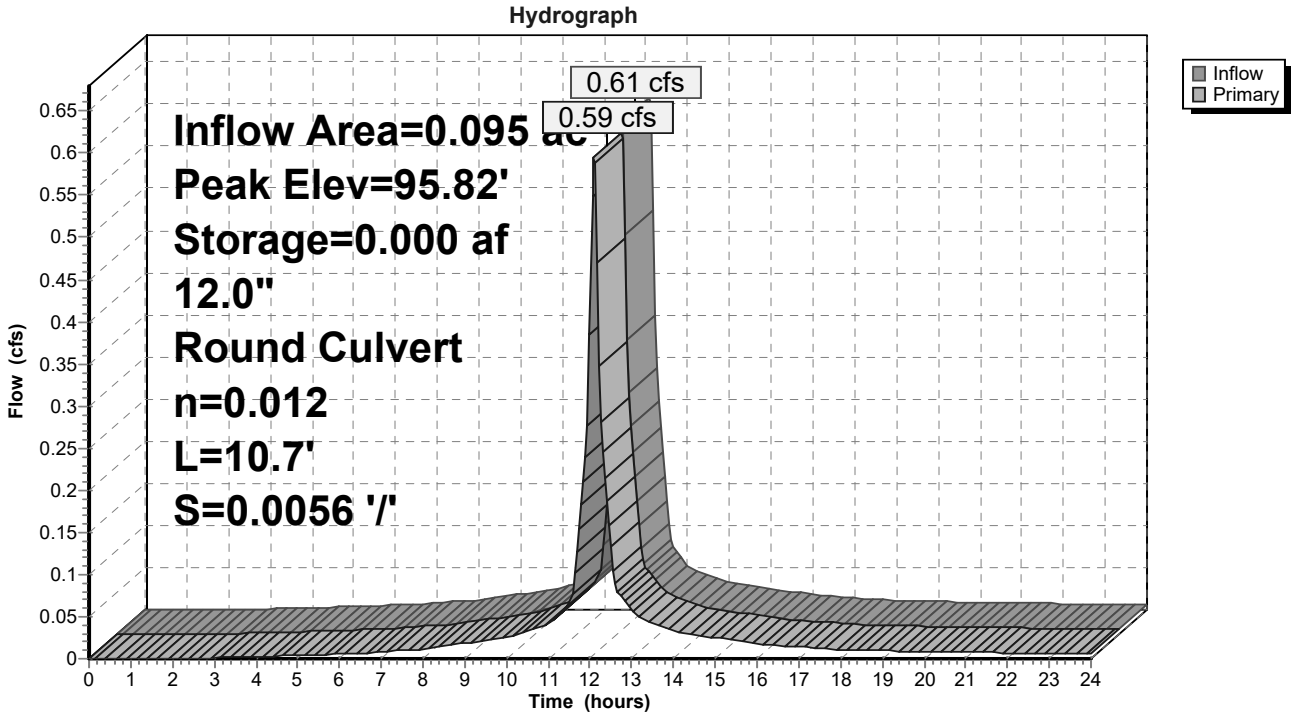
Plug-Flow detention time= 1.0 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (769.7 - 768.8)

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=95.48' TW=95.59' (Dynamic Tailwater)
1=12" RCP (Controls 0.00 cfs)

Pond C05P: CB #5



Summary for Pond C06P: CB #6

Inflow Area = 0.055 ac, 78.52% Impervious, Inflow Depth > 6.05" for 25 YR - 24 HR event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.028 af
Outflow = 0.34 cfs @ 12.09 hrs, Volume= 0.028 af, Atten= 4%, Lag= 0.1 min
Primary = 0.34 cfs @ 12.09 hrs, Volume= 0.028 af
Routed to Pond D04P : DMH #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.82' @ 12.38 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.25' Surf.Area= 0.000 ac Storage= 0.001 af

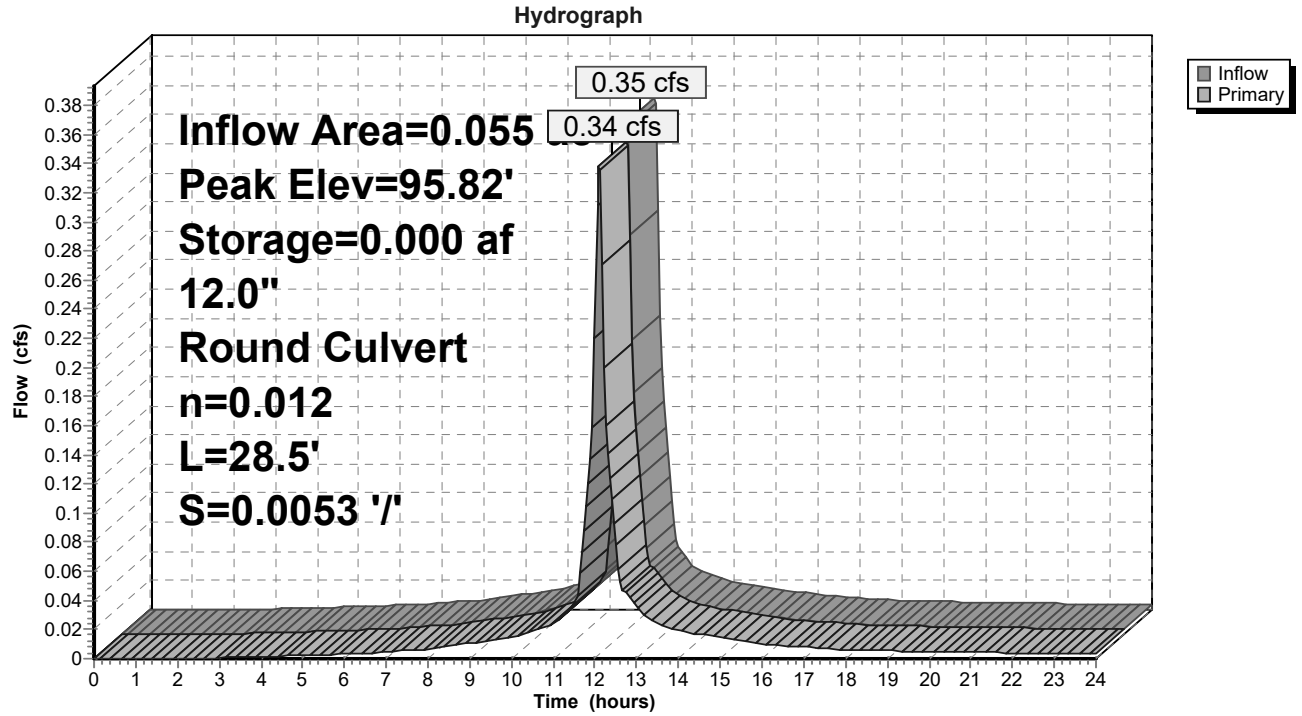
Plug-Flow detention time= 1.5 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (770.0 - 768.8)

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=95.47' TW=95.60' (Dynamic Tailwater)
1=12" RCP (Controls 0.00 cfs)

Pond C06P: CB #6



Summary for Pond C07P: CB #7

Inflow Area = 1.658 ac, 80.51% Impervious, Inflow Depth > 6.09" for 25 YR - 24 HR event
Inflow = 5.58 cfs @ 12.10 hrs, Volume= 0.842 af
Outflow = 5.56 cfs @ 12.10 hrs, Volume= 0.841 af, Atten= 0%, Lag= 0.0 min
Primary = 5.56 cfs @ 12.10 hrs, Volume= 0.841 af
Routed to Pond D06P : DMH #6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.83' @ 12.12 hrs Surf.Area= 13 sf Storage= 22 cf
Flood Elev= 98.05' Surf.Area= 13 sf Storage= 62 cf

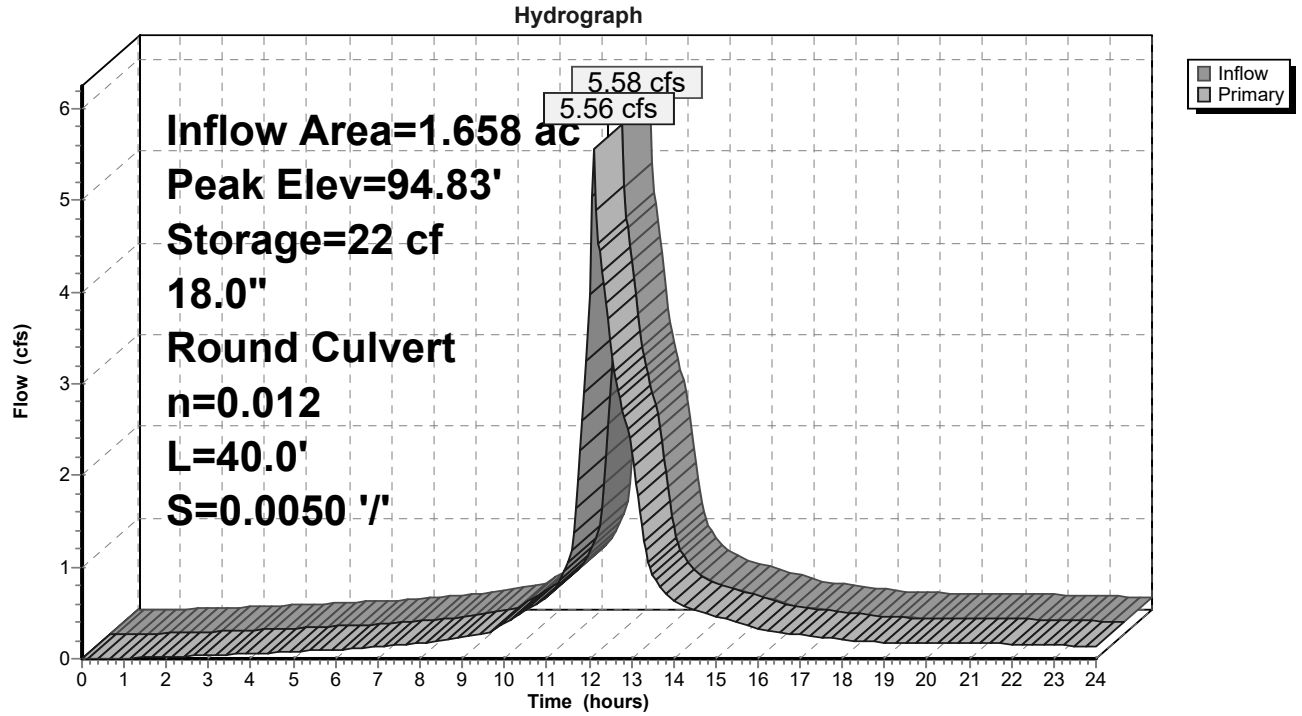
Plug-Flow detention time= 0.3 min calculated for 0.841 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (787.2 - 787.1)

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=5.04 cfs @ 12.10 hrs HW=94.80' TW=94.23' (Dynamic Tailwater)
↑**1=18" HDPE N-12** (Inlet Controls 5.04 cfs @ 2.85 fps)

Pond C07P: CB #7



Summary for Pond C08P: CB #8

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.056 ac, 89.68% Impervious, Inflow Depth > 6.40" for 25 YR - 24 HR event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.030 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
Routed to Pond 101P : Gravel Wetland #101

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

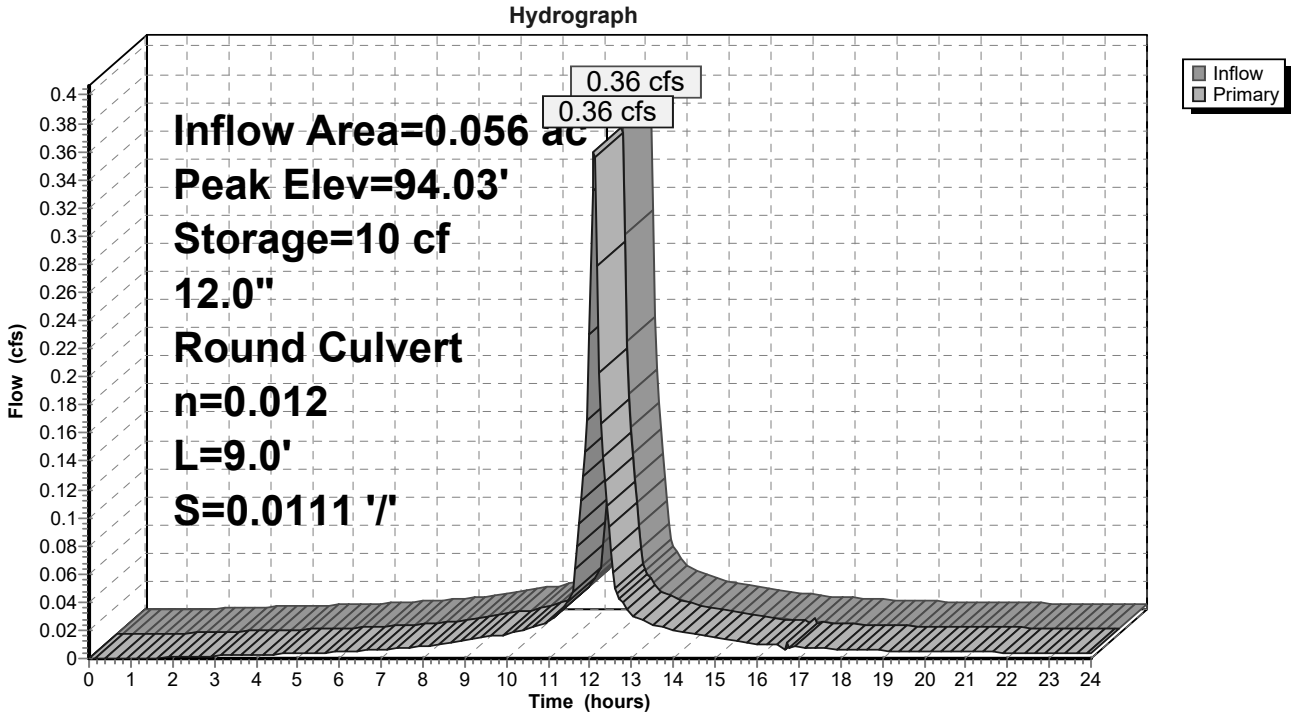
Plug-Flow detention time= 5.0 min calculated for 0.029 af (99% of inflow)
Center-of-Mass det. time= 0.9 min (755.8 - 754.9)

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=0.10 cfs @ 12.09 hrs HW=93.64' TW=93.63' (Dynamic Tailwater)
1=12" HDPE N-12 (Outlet Controls 0.10 cfs @ 0.51 fps)

Pond C08P: CB #8



Summary for Pond D01P: DMH #1

Inflow Area = 0.581 ac, 61.68% Impervious, Inflow Depth > 5.56" for 25 YR - 24 HR event
Inflow = 2.75 cfs @ 12.10 hrs, Volume= 0.269 af
Outflow = 2.75 cfs @ 12.10 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min
Primary = 2.75 cfs @ 12.10 hrs, Volume= 0.269 af
Routed to Pond 103P : Gravel Wetland #103

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.36' @ 12.55 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 99.25' Surf.Area= 0.000 ac Storage= 0.002 af

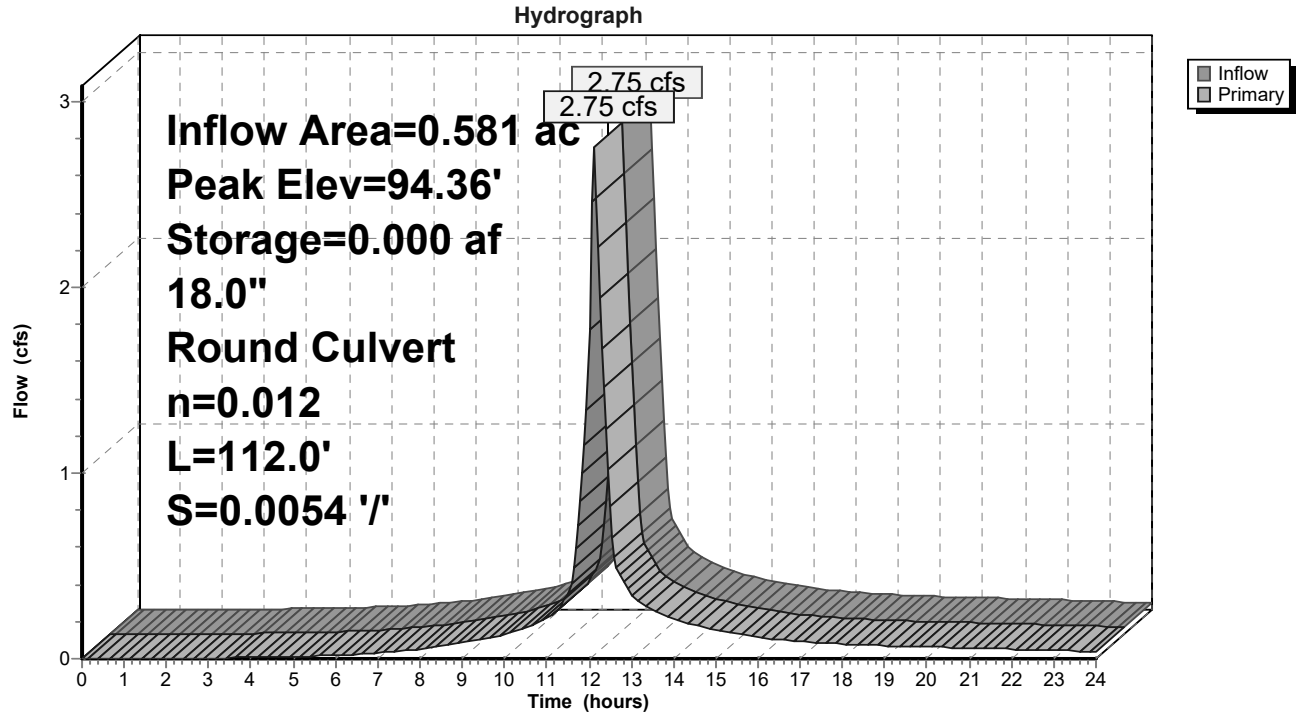
Plug-Flow detention time= 0.8 min calculated for 0.268 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (797.0 - 796.7)

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= 112.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 93.10' / 92.50' S= 0.0054 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.30 cfs @ 12.10 hrs HW=94.13' TW=93.81' (Dynamic Tailwater)
1=18" HDPE N-12 (Outlet Controls 2.30 cfs @ 2.51 fps)

Pond D01P: DMH #1



Summary for Pond D04P: DMH #4

[80] Warning: Exceeded Pond C04P by 0.01' @ 12.25 hrs (0.68 cfs 0.003 af)
[80] Warning: Exceeded Pond C05P by 0.16' @ 12.05 hrs (1.51 cfs 0.036 af)
[80] Warning: Exceeded Pond C06P by 0.17' @ 12.05 hrs (1.29 cfs 0.032 af)

Inflow Area = 0.585 ac, 90.86% Impervious, Inflow Depth > 6.38" for 25 YR - 24 HR event
Inflow = 3.77 cfs @ 12.09 hrs, Volume= 0.311 af
Outflow = 3.76 cfs @ 12.09 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min
Primary = 3.76 cfs @ 12.09 hrs, Volume= 0.311 af
Routed to Pond 105P : Detention Pond #105

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 95.82' @ 12.33 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.30' Surf.Area= 0.000 ac Storage= 0.001 af

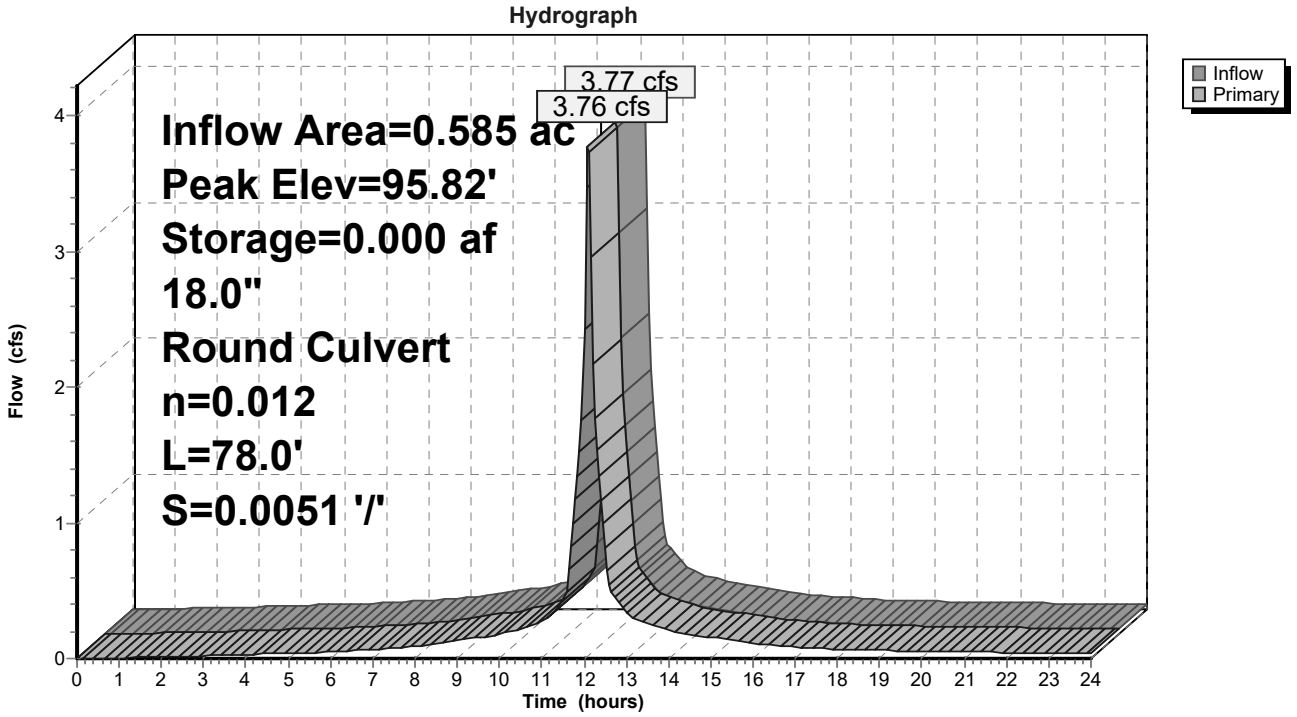
Plug-Flow detention time= 0.3 min calculated for 0.311 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (754.3 - 754.1)

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=2.56 cfs @ 12.09 hrs HW=95.59' TW=95.40' (Dynamic Tailwater)
↑—**1=18" RCP** (Outlet Controls 2.56 cfs @ 2.21 fps)

Pond D04P: DMH #4



Summary for Pond D06P: DMH #6

Inflow Area = 1.658 ac, 80.51% Impervious, Inflow Depth > 6.09" for 25 YR - 24 HR event
Inflow = 5.56 cfs @ 12.10 hrs, Volume= 0.841 af
Outflow = 5.55 cfs @ 12.10 hrs, Volume= 0.841 af, Atten= 0%, Lag= 0.0 min
Primary = 5.55 cfs @ 12.10 hrs, Volume= 0.841 af
Routed to Pond 103P : Gravel Wetland #103

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.50' @ 12.49 hrs Surf.Area= 0.000 ac Storage= 0.000 af
Flood Elev= 98.05' Surf.Area= 0.000 ac Storage= 0.002 af

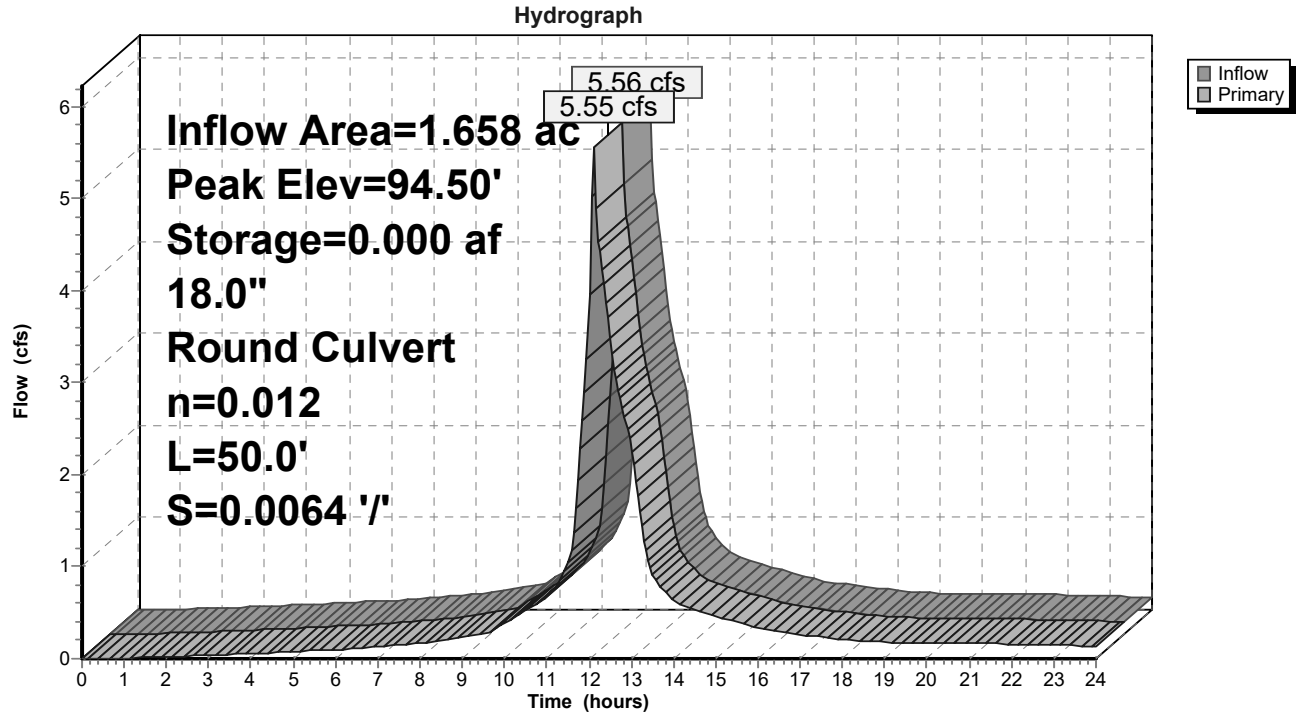
Plug-Flow detention time= 0.4 min calculated for 0.839 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (787.4 - 787.2)

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= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 92.82' / 92.50' S= 0.0064 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.83 cfs @ 12.10 hrs HW=94.23' TW=93.80' (Dynamic Tailwater)
1=18" HDPE N-12 (Outlet Controls 4.83 cfs @ 3.62 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=70,498 sf 0.00% Impervious Runoff Depth>1.12"
Flow Length=251' Tc=25.7 min CN=71 Runoff=1.21 cfs 0.151 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,939 sf 30.06% 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=47,000 sf 44.24% Impervious Runoff Depth>2.10"
Tc=6.0 min CN=85 Runoff=2.61 cfs 0.189 af

Subcatchment 13S: Subcatchment #13 Runoff Area=65,004 sf 14.35% Impervious Runoff Depth>1.57"
Tc=6.0 min CN=78 Runoff=2.68 cfs 0.196 af

Subcatchment 14S: Subcatchment #14 Runoff Area=25,492 sf 44.16% Impervious Runoff Depth>2.10"
Tc=6.0 min CN=85 Runoff=1.41 cfs 0.103 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,854 sf 62.10% Impervious Runoff Depth>2.54"
Tc=6.0 min CN=90 Runoff=1.90 cfs 0.140 af

Subcatchment 16S: Subcatchment #16 Runoff Area=15,096 sf 48.50% Impervious Runoff Depth>2.19"
Tc=6.0 min CN=86 Runoff=0.87 cfs 0.063 af

Subcatchment 17S: Lodging Building A Runoff Area=14,223 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=1.12 cfs 0.092 af

Subcatchment 18S: Res Building B Runoff Area=14,221 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=1.12 cfs 0.092 af

Subcatchment 19S: Res Building C Runoff Area=14,219 sf 100.00% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=98 Runoff=1.12 cfs 0.092 af

Subcatchment 20S: Inlet Sump Runoff Area=8,519 sf 0.00% Impervious Runoff Depth>0.80"
Tc=6.0 min CN=65 Runoff=0.15 cfs 0.013 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=4,645 sf 87.10% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=95 Runoff=0.35 cfs 0.027 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,551 sf 76.26% Impervious Runoff Depth>2.73"
Tc=6.0 min CN=92 Runoff=0.39 cfs 0.029 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,741 sf 79.37% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=93 Runoff=0.34 cfs 0.026 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,144 sf 79.78% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=93 Runoff=0.30 cfs 0.022 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,398 sf 78.52% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=93 Runoff=0.17 cfs 0.013 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,625 sf 77.68% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=93 Runoff=0.26 cfs 0.020 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,423 sf 89.68% Impervious Runoff Depth>3.14"
Tc=6.0 min CN=96 Runoff=0.19 cfs 0.015 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=1.36 cfs 0.465 af
Outflow=1.36 cfs 0.465 af

Reach 400R: Final Reach 400 Inflow=0.57 cfs 0.175 af
Outflow=0.57 cfs 0.175 af

Pond 4P: Pond 4 Peak Elev=90.02' Storage=441 cf Inflow=0.55 cfs 0.133 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=0.49 cfs 0.130 af

Pond 16P: Inlet Sump Peak Elev=94.20' Storage=323 cf Inflow=0.87 cfs 0.063 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=0.63 cfs 0.063 af

Pond 20P: Nyloplast Basin Peak Elev=90.14' Storage=1 cf Inflow=0.15 cfs 0.013 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.15 cfs 0.013 af

Pond 101P: Gravel Wetland #101 Peak Elev=93.57' Storage=7,654 cf Inflow=2.87 cfs 0.259 af
Primary=0.07 cfs 0.087 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.087 af

Pond 103P: Gravel Wetland #103 Peak Elev=93.72' Storage=20,011 cf Inflow=7.17 cfs 0.716 af
Primary=0.17 cfs 0.202 af Secondary=0.19 cfs 0.111 af Tertiary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.314 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.16' Storage=3,596 cf Inflow=1.41 cfs 0.103 af
Primary=0.02 cfs 0.020 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.020 af

Pond 105P: Detention Pond #105 Peak Elev=94.99' Storage=2,706 cf Inflow=3.80 cfs 0.293 af
Primary=2.11 cfs 0.292 af Secondary=0.00 cfs 0.000 af Outflow=2.11 cfs 0.292 af

Pond 106P: StormTech SC740 #106 Peak Elev=93.78' Storage=2,042 cf Inflow=1.12 cfs 0.092 af
Outflow=0.08 cfs 0.056 af

Pond C01P: CB #1 Peak Elev=89.69' Storage=4 cf Inflow=0.57 cfs 0.175 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=0.57 cfs 0.175 af

Pond C02P: CB #2 Peak Elev=94.07' Storage=0.000 af Inflow=1.28 cfs 0.119 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=1.28 cfs 0.119 af

Pond C03P: CB #3 Peak Elev=94.29' Storage=0.000 af Inflow=0.39 cfs 0.029 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.39 cfs 0.029 af

Pond C04P: CB #4 Peak Elev=95.32' Storage=0.000 af Inflow=1.46 cfs 0.117 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=1.45 cfs 0.117 af

Pond C05P: CB #5 Peak Elev=95.17' 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=95.16' 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=94.18' Storage=13 cf Inflow=3.23 cfs 0.403 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=3.23 cfs 0.403 af

Pond C08P: CB #8 Peak Elev=93.57' Storage=4 cf Inflow=0.19 cfs 0.015 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.19 cfs 0.014 af

Pond D01P: DMH #1 Peak Elev=93.72' Storage=0.000 af Inflow=1.28 cfs 0.119 af
18.0" Round Culvert n=0.012 L=112.0' S=0.0054 '/' Outflow=1.28 cfs 0.118 af

Pond D04P: DMH #4 Peak Elev=95.16' Storage=0.000 af Inflow=1.91 cfs 0.153 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=1.90 cfs 0.153 af

Pond D06P: DMH #6 Peak Elev=93.77' Storage=0.000 af Inflow=3.23 cfs 0.403 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0064 '/' Outflow=3.23 cfs 0.403 af

Total Runoff Area = 10.762 ac Runoff Volume = 1.504 af Average Runoff Depth = 1.68"
62.19% Pervious = 6.692 ac 37.81% Impervious = 4.070 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=70,498 sf 0.00% Impervious Runoff Depth>2.44"
Flow Length=251' Tc=25.7 min CN=71 Runoff=2.79 cfs 0.329 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,939 sf 30.06% Impervious Runoff Depth>1.40"
Flow Length=431' Tc=35.4 min CN=58 Runoff=1.92 cfs 0.287 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,000 sf 44.24% Impervious Runoff Depth>3.77"
Tc=6.0 min CN=85 Runoff=4.61 cfs 0.339 af

Subcatchment 13S: Subcatchment #13 Runoff Area=65,004 sf 14.35% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=78 Runoff=5.30 cfs 0.384 af

Subcatchment 14S: Subcatchment #14 Runoff Area=25,492 sf 44.16% Impervious Runoff Depth>3.77"
Tc=6.0 min CN=85 Runoff=2.50 cfs 0.184 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,854 sf 62.10% Impervious Runoff Depth>4.30"
Tc=6.0 min CN=90 Runoff=3.13 cfs 0.237 af

Subcatchment 16S: Subcatchment #16 Runoff Area=15,096 sf 48.50% Impervious Runoff Depth>3.88"
Tc=6.0 min CN=86 Runoff=1.51 cfs 0.112 af

Subcatchment 17S: Lodging Building A Runoff Area=14,223 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=1.70 cfs 0.141 af

Subcatchment 18S: Res Building B Runoff Area=14,221 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=1.70 cfs 0.141 af

Subcatchment 19S: Res Building C Runoff Area=14,219 sf 100.00% Impervious Runoff Depth>5.20"
Tc=6.0 min CN=98 Runoff=1.70 cfs 0.141 af

Subcatchment 20S: Inlet Sump Runoff Area=8,519 sf 0.00% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=65 Runoff=0.43 cfs 0.032 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=4,645 sf 87.10% Impervious Runoff Depth>4.85"
Tc=6.0 min CN=95 Runoff=0.54 cfs 0.043 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,551 sf 76.26% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=92 Runoff=0.62 cfs 0.048 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,741 sf 79.37% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.54 cfs 0.042 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,144 sf 79.78% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.47 cfs 0.037 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,398 sf 78.52% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.27 cfs 0.021 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,625 sf 77.68% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=93 Runoff=0.41 cfs 0.032 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,423 sf 89.68% Impervious Runoff Depth>4.97"
Tc=6.0 min CN=96 Runoff=0.29 cfs 0.023 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 0.328 af
Outflow=2.16 cfs 0.328 af

Reach 200R: Final Reach 200 Inflow=3.35 cfs 1.090 af
Outflow=3.35 cfs 1.090 af

Reach 400R: Final Reach 400 Inflow=1.97 cfs 0.412 af
Outflow=1.97 cfs 0.412 af

Pond 4P: Pond 4 Peak Elev=90.53' Storage=1,190 cf Inflow=2.03 cfs 0.347 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=1.87 cfs 0.343 af

Pond 16P: Inlet Sump Peak Elev=94.40' Storage=535 cf Inflow=1.51 cfs 0.112 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.05 cfs 0.111 af

Pond 20P: Nyloplast Basin Peak Elev=90.54' Storage=2 cf Inflow=0.43 cfs 0.032 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.43 cfs 0.032 af

Pond 101P: Gravel Wetland #101 Peak Elev=93.97' Storage=11,874 cf Inflow=4.97 cfs 0.442 af
Primary=0.08 cfs 0.104 af Secondary=0.22 cfs 0.073 af Tertiary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.176 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.24' Storage=30,633 cf Inflow=12.01 cfs 1.235 af
Primary=0.19 cfs 0.235 af Secondary=1.07 cfs 0.525 af Tertiary=0.00 cfs 0.000 af Outflow=1.26 cfs 0.761 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.72' Storage=6,804 cf Inflow=2.50 cfs 0.184 af
Primary=0.03 cfs 0.028 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.028 af

Pond 105P: Detention Pond #105 Peak Elev=95.41' Storage=4,302 cf Inflow=6.08 cfs 0.479 af
Primary=2.87 cfs 0.476 af Secondary=0.00 cfs 0.000 af Outflow=2.87 cfs 0.476 af

Pond 106P: StormTech SC740 #106 Peak Elev=94.39' Storage=3,487 cf Inflow=1.70 cfs 0.141 af
Outflow=0.07 cfs 0.080 af

Pond C01P: CB #1 Peak Elev=90.05' Storage=9 cf Inflow=1.97 cfs 0.413 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=1.97 cfs 0.412 af

Pond C02P: CB #2 Peak Elev=94.28' Storage=0.000 af Inflow=2.13 cfs 0.202 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=2.13 cfs 0.202 af

Pond C03P: CB #3 Peak Elev=94.44' Storage=0.000 af Inflow=0.62 cfs 0.048 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.62 cfs 0.048 af

Pond C04P: CB #4 Peak Elev=95.56' Storage=0.000 af Inflow=2.24 cfs 0.183 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.23 cfs 0.183 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=94.47' Storage=17 cf Inflow=4.61 cfs 0.649 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=4.61 cfs 0.649 af

Pond C08P: CB #8 Peak Elev=93.97' Storage=9 cf Inflow=0.29 cfs 0.023 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.29 cfs 0.023 af

Pond D01P: DMH #1 Peak Elev=94.24' Storage=0.000 af Inflow=2.13 cfs 0.202 af
18.0" Round Culvert n=0.012 L=112.0' S=0.0054 '/' Outflow=2.13 cfs 0.202 af

Pond D04P: DMH #4 Peak Elev=95.47' Storage=0.000 af Inflow=2.95 cfs 0.241 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=2.95 cfs 0.241 af

Pond D06P: DMH #6 Peak Elev=94.25' Storage=0.000 af Inflow=4.61 cfs 0.649 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0064 '/' Outflow=4.61 cfs 0.649 af

Total Runoff Area = 10.762 ac Runoff Volume = 2.796 af Average Runoff Depth = 3.12"
62.19% Pervious = 6.692 ac 37.81% Impervious = 4.070 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=70,498 sf 0.00% Impervious Runoff Depth>3.60"
Flow Length=251' Tc=25.7 min CN=71 Runoff=4.15 cfs 0.486 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,939 sf 30.06% Impervious Runoff Depth>2.31"
Flow Length=431' Tc=35.4 min CN=58 Runoff=3.33 cfs 0.472 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,000 sf 44.24% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=85 Runoff=6.19 cfs 0.462 af

Subcatchment 13S: Subcatchment #13 Runoff Area=65,004 sf 14.35% Impervious Runoff Depth>4.36"
Tc=6.0 min CN=78 Runoff=7.44 cfs 0.543 af

Subcatchment 14S: Subcatchment #14 Runoff Area=25,492 sf 44.16% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=85 Runoff=3.35 cfs 0.250 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,854 sf 62.10% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=90 Runoff=4.09 cfs 0.315 af

Subcatchment 16S: Subcatchment #16 Runoff Area=15,096 sf 48.50% Impervious Runoff Depth>5.25"
Tc=6.0 min CN=86 Runoff=2.02 cfs 0.152 af

Subcatchment 17S: Lodging Building A Runoff Area=14,223 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.15 cfs 0.181 af

Subcatchment 18S: Res Building B Runoff Area=14,221 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.15 cfs 0.181 af

Subcatchment 19S: Res Building C Runoff Area=14,219 sf 100.00% Impervious Runoff Depth>6.64"
Tc=6.0 min CN=98 Runoff=2.15 cfs 0.181 af

Subcatchment 20S: Inlet Sump Runoff Area=8,519 sf 0.00% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=65 Runoff=0.67 cfs 0.049 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=4,645 sf 87.10% Impervious Runoff Depth>6.28"
Tc=6.0 min CN=95 Runoff=0.69 cfs 0.056 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,551 sf 76.26% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=92 Runoff=0.80 cfs 0.063 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,741 sf 79.37% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.69 cfs 0.055 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,144 sf 79.78% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.61 cfs 0.048 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,398 sf 78.52% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.35 cfs 0.028 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,625 sf 77.68% Impervious Runoff Depth>6.05"
Tc=6.0 min CN=93 Runoff=0.53 cfs 0.042 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,423 sf 89.68% Impervious Runoff Depth>6.40"
Tc=6.0 min CN=96 Runoff=0.36 cfs 0.030 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 0.545 af
Outflow=2.98 cfs 0.545 af

Reach 200R: Final Reach 200 Inflow=9.02 cfs 1.636 af
Outflow=9.02 cfs 1.636 af

Reach 400R: Final Reach 400 Inflow=3.31 cfs 0.688 af
Outflow=3.31 cfs 0.688 af

Pond 4P: Pond 4 Peak Elev=90.95' Storage=1,950 cf Inflow=3.51 cfs 0.604 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=3.18 cfs 0.599 af

Pond 16P: Inlet Sump Peak Elev=94.56' Storage=730 cf Inflow=2.02 cfs 0.152 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.35 cfs 0.150 af

Pond 20P: Nyloplast Basin Peak Elev=91.19' Storage=5 cf Inflow=0.67 cfs 0.049 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.67 cfs 0.049 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.03' Storage=12,589 cf Inflow=6.62 cfs 0.600 af
Primary=0.08 cfs 0.109 af Secondary=1.09 cfs 0.220 af Tertiary=0.12 cfs 0.003 af Outflow=1.30 cfs 0.333 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.35' Storage=33,000 cf Inflow=15.74 cfs 1.652 af
Primary=0.19 cfs 0.248 af Secondary=3.32 cfs 0.792 af Tertiary=1.99 cfs 0.109 af Outflow=5.50 cfs 1.149 af

Pond 104P: Gravel Wetland #104 Peak Elev=92.90' Storage=8,021 cf Inflow=3.35 cfs 0.250 af
Primary=0.10 cfs 0.083 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.083 af

Pond 105P: Detention Pond #105 Peak Elev=95.78' Storage=5,895 cf Inflow=7.85 cfs 0.626 af
Primary=3.19 cfs 0.619 af Secondary=0.00 cfs 0.000 af Outflow=3.19 cfs 0.619 af

Pond 106P: StormTech SC740 #106 Peak Elev=94.85' Storage=4,510 cf Inflow=2.15 cfs 0.181 af
Outflow=0.10 cfs 0.109 af

Pond C01P: CB #1 Peak Elev=90.32' Storage=12 cf Inflow=3.31 cfs 0.688 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=3.31 cfs 0.688 af

Pond C02P: CB #2 Peak Elev=94.46' Storage=0.000 af Inflow=2.75 cfs 0.269 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=2.75 cfs 0.269 af

Pond C03P: CB #3 Peak Elev=94.57' Storage=0.000 af Inflow=0.80 cfs 0.063 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.80 cfs 0.063 af

Pond C04P: CB #4 Peak Elev=95.84' Storage=0.000 af Inflow=2.85 cfs 0.235 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.84 cfs 0.235 af

Pond C05P: CB #5 Peak Elev=95.82' 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=95.82' Storage=0.000 af Inflow=0.35 cfs 0.028 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.34 cfs 0.028 af

Pond C07P: CB #7 Peak Elev=94.83' Storage=22 cf Inflow=5.58 cfs 0.842 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=5.56 cfs 0.841 af

Pond C08P: CB #8 Peak Elev=94.03' Storage=10 cf Inflow=0.36 cfs 0.030 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=94.36' Storage=0.000 af Inflow=2.75 cfs 0.269 af
18.0" Round Culvert n=0.012 L=112.0' S=0.0054 '/' Outflow=2.75 cfs 0.269 af

Pond D04P: DMH #4 Peak Elev=95.82' Storage=0.000 af Inflow=3.77 cfs 0.311 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=3.76 cfs 0.311 af

Pond D06P: DMH #6 Peak Elev=94.50' Storage=0.000 af Inflow=5.56 cfs 0.841 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0064 '/' Outflow=5.55 cfs 0.841 af

Total Runoff Area = 10.762 ac Runoff Volume = 3.891 af Average Runoff Depth = 4.34"
62.19% Pervious = 6.692 ac 37.81% Impervious = 4.070 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=70,498 sf 0.00% Impervious Runoff Depth>4.76"
Flow Length=251' Tc=25.7 min CN=71 Runoff=5.49 cfs 0.641 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,939 sf 30.06% Impervious Runoff Depth>3.25"
Flow Length=431' Tc=35.4 min CN=58 Runoff=4.82 cfs 0.665 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,000 sf 44.24% Impervious Runoff Depth>6.43"
Tc=6.0 min CN=85 Runoff=7.66 cfs 0.578 af

Subcatchment 13S: Subcatchment #13 Runoff Area=65,004 sf 14.35% Impervious Runoff Depth>5.60"
Tc=6.0 min CN=78 Runoff=9.48 cfs 0.696 af

Subcatchment 14S: Subcatchment #14 Runoff Area=25,492 sf 44.16% Impervious Runoff Depth>6.43"
Tc=6.0 min CN=85 Runoff=4.15 cfs 0.314 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,854 sf 62.10% Impervious Runoff Depth>7.03"
Tc=6.0 min CN=90 Runoff=4.98 cfs 0.388 af

Subcatchment 16S: Subcatchment #16 Runoff Area=15,096 sf 48.50% Impervious Runoff Depth>6.55"
Tc=6.0 min CN=86 Runoff=2.49 cfs 0.189 af

Subcatchment 17S: Lodging Building A Runoff Area=14,223 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=2.58 cfs 0.217 af

Subcatchment 18S: Res Building B Runoff Area=14,221 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=2.58 cfs 0.217 af

Subcatchment 19S: Res Building C Runoff Area=14,219 sf 100.00% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=98 Runoff=2.58 cfs 0.217 af

Subcatchment 20S: Inlet Sump Runoff Area=8,519 sf 0.00% Impervious Runoff Depth>4.08"
Tc=6.0 min CN=65 Runoff=0.92 cfs 0.066 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=4,645 sf 87.10% Impervious Runoff Depth>7.63"
Tc=6.0 min CN=95 Runoff=0.83 cfs 0.068 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,551 sf 76.26% Impervious Runoff Depth>7.27"
Tc=6.0 min CN=92 Runoff=0.97 cfs 0.077 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,741 sf 79.37% Impervious Runoff Depth>7.39"
Tc=6.0 min CN=93 Runoff=0.84 cfs 0.067 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,144 sf 79.78% Impervious Runoff Depth>7.39"
Tc=6.0 min CN=93 Runoff=0.73 cfs 0.059 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,398 sf 78.52% Impervious Runoff Depth>7.39"
Tc=6.0 min CN=93 Runoff=0.42 cfs 0.034 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,625 sf 77.68% Impervious Runoff Depth>7.39"
Tc=6.0 min CN=93 Runoff=0.64 cfs 0.051 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,423 sf 89.68% Impervious Runoff Depth>7.75"
Tc=6.0 min CN=96 Runoff=0.44 cfs 0.036 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=4.84 cfs 0.749 af
Outflow=4.84 cfs 0.749 af

Reach 200R: Final Reach 200 Inflow=15.26 cfs 2.163 af
Outflow=15.26 cfs 2.163 af

Reach 400R: Final Reach 400 Inflow=4.16 cfs 0.968 af
Outflow=4.16 cfs 0.968 af

Pond 4P: Pond 4 Peak Elev=91.52' Storage=3,498 cf Inflow=5.22 cfs 0.868 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=4.02 cfs 0.862 af

Pond 16P: Inlet Sump Peak Elev=94.72' Storage=951 cf Inflow=2.49 cfs 0.189 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.58 cfs 0.187 af

Pond 20P: Nyloplast Basin Peak Elev=91.78' Storage=25 cf Inflow=0.92 cfs 0.066 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.81 cfs 0.066 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.10' Storage=13,440 cf Inflow=8.17 cfs 0.747 af
Primary=0.09 cfs 0.113 af Secondary=2.51 cfs 0.342 af Tertiary=0.71 cfs 0.024 af Outflow=3.31 cfs 0.479 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.42' Storage=34,474 cf Inflow=18.68 cfs 2.050 af
Primary=0.20 cfs 0.258 af Secondary=5.21 cfs 1.004 af Tertiary=4.37 cfs 0.259 af Outflow=9.78 cfs 1.522 af

Pond 104P: Gravel Wetland #104 Peak Elev=93.13' Storage=9,476 cf Inflow=4.15 cfs 0.314 af
Primary=0.16 cfs 0.136 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.136 af

Pond 105P: Detention Pond #105 Peak Elev=96.17' Storage=7,776 cf Inflow=9.50 cfs 0.765 af
Primary=3.22 cfs 0.753 af Secondary=0.00 cfs 0.000 af Outflow=3.22 cfs 0.753 af

Pond 106P: StormTech SC740 #106 Peak Elev=95.34' Storage=5,494 cf Inflow=2.58 cfs 0.217 af
Outflow=0.12 cfs 0.133 af

Pond C01P: CB #1 Peak Elev=90.49' Storage=15 cf Inflow=4.16 cfs 0.968 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=4.16 cfs 0.968 af

Pond C02P: CB #2 Peak Elev=94.63' Storage=0.000 af Inflow=3.29 cfs 0.332 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=3.28 cfs 0.332 af

Pond C03P: CB #3 Peak Elev=94.71' Storage=0.000 af Inflow=0.97 cfs 0.077 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=0.97 cfs 0.077 af

Pond C04P: CB #4 Peak Elev=96.21' Storage=0.000 af Inflow=3.41 cfs 0.284 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=3.41 cfs 0.284 af

Pond C05P: CB #5 Peak Elev=96.20' 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=96.20' Storage=0.000 af Inflow=0.42 cfs 0.034 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.41 cfs 0.034 af

Pond C07P: CB #7 Peak Elev=95.14' Storage=25 cf Inflow=5.95 cfs 1.022 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=5.94 cfs 1.022 af

Pond C08P: CB #8 Peak Elev=94.10' Storage=11 cf Inflow=0.44 cfs 0.036 af
12.0" Round Culvert n=0.012 L=9.0' S=0.0111 '/' Outflow=0.43 cfs 0.036 af

Pond D01P: DMH #1 Peak Elev=94.49' Storage=0.000 af Inflow=3.28 cfs 0.332 af
18.0" Round Culvert n=0.012 L=112.0' S=0.0054 '/' Outflow=3.28 cfs 0.332 af

Pond D04P: DMH #4 Peak Elev=96.19' Storage=0.001 af Inflow=4.53 cfs 0.377 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=4.52 cfs 0.377 af

Pond D06P: DMH #6 Peak Elev=94.68' Storage=0.001 af Inflow=5.94 cfs 1.022 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0064 '/' Outflow=5.94 cfs 1.021 af

Total Runoff Area = 10.762 ac Runoff Volume = 4.959 af Average Runoff Depth = 5.53"
62.19% Pervious = 6.692 ac 37.81% Impervious = 4.070 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=70,498 sf 0.00% Impervious Runoff Depth>6.18"
Flow Length=251' Tc=25.7 min CN=71 Runoff=7.11 cfs 0.834 af

Subcatchment 4S: Subcatchment #4 Runoff Area=106,939 sf 30.06% Impervious Runoff Depth>4.47"
Flow Length=431' Tc=35.4 min CN=58 Runoff=6.71 cfs 0.914 af

Subcatchment 11S: Subcatchment #11 Runoff Area=47,000 sf 44.24% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=85 Runoff=9.40 cfs 0.719 af

Subcatchment 13S: Subcatchment #13 Runoff Area=65,004 sf 14.35% Impervious Runoff Depth>7.11"
Tc=6.0 min CN=78 Runoff=11.92 cfs 0.884 af

Subcatchment 14S: Subcatchment #14 Runoff Area=25,492 sf 44.16% Impervious Runoff Depth>7.99"
Tc=6.0 min CN=85 Runoff=5.10 cfs 0.390 af

Subcatchment 15S: Subcatchment #15 Runoff Area=28,854 sf 62.10% Impervious Runoff Depth>8.62"
Tc=6.0 min CN=90 Runoff=6.03 cfs 0.476 af

Subcatchment 16S: Subcatchment #16 Runoff Area=15,096 sf 48.50% Impervious Runoff Depth>8.12"
Tc=6.0 min CN=86 Runoff=3.05 cfs 0.234 af

Subcatchment 17S: Lodging Building A Runoff Area=14,223 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=3.08 cfs 0.261 af

Subcatchment 18S: Res Building B Runoff Area=14,221 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=3.08 cfs 0.261 af

Subcatchment 19S: Res Building C Runoff Area=14,219 sf 100.00% Impervious Runoff Depth>9.59"
Tc=6.0 min CN=98 Runoff=3.08 cfs 0.261 af

Subcatchment 20S: Inlet Sump Runoff Area=8,519 sf 0.00% Impervious Runoff Depth>5.42"
Tc=6.0 min CN=65 Runoff=1.22 cfs 0.088 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=4,645 sf 87.10% Impervious Runoff Depth>9.23"
Tc=6.0 min CN=95 Runoff=1.00 cfs 0.082 af

Subcatchment 33S: Subcatchment #33 Runoff Area=5,551 sf 76.26% Impervious Runoff Depth>8.86"
Tc=6.0 min CN=92 Runoff=1.18 cfs 0.094 af

Subcatchment 34S: Subcatchment #34 Runoff Area=4,741 sf 79.37% Impervious Runoff Depth>8.99"
Tc=6.0 min CN=93 Runoff=1.01 cfs 0.081 af

Subcatchment 35S: Subcatchment #35 Runoff Area=4,144 sf 79.78% Impervious Runoff Depth>8.99"
Tc=6.0 min CN=93 Runoff=0.88 cfs 0.071 af

Subcatchment 36S: Subcatchment #36 Runoff Area=2,398 sf 78.52% Impervious Runoff Depth>8.99"
Tc=6.0 min CN=93 Runoff=0.51 cfs 0.041 af

Subcatchment 37S: Subcatchment #37 Runoff Area=3,625 sf 77.68% Impervious Runoff Depth>8.99"
Tc=6.0 min CN=93 Runoff=0.77 cfs 0.062 af

Subcatchment 38S: Subcatchment #38 Runoff Area=2,423 sf 89.68% Impervious Runoff Depth>9.35"
Tc=6.0 min CN=96 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=9.64 cfs 1.004 af
Outflow=9.64 cfs 1.004 af

Reach 200R: Final Reach 200 Inflow=22.31 cfs 2.808 af
Outflow=22.31 cfs 2.808 af

Reach 400R: Final Reach 400 Inflow=4.91 cfs 1.314 af
Outflow=4.91 cfs 1.314 af

Pond 4P: Pond 4 Peak Elev=92.09' Storage=6,331 cf Inflow=7.22 cfs 1.193 af
15.0" Round Culvert n=0.024 L=59.0' S=0.0100 '/' Outflow=4.75 cfs 1.186 af

Pond 16P: Inlet Sump Peak Elev=94.93' Storage=1,286 cf Inflow=3.05 cfs 0.234 af
18.0" Round Culvert n=0.012 L=8.0' S=0.0188 '/' Outflow=1.80 cfs 0.232 af

Pond 20P: Nyloplast Basin Peak Elev=92.11' Storage=270 cf Inflow=1.22 cfs 0.088 af
8.0" Round Culvert n=0.012 L=350.0' S=0.0007 '/' Outflow=0.79 cfs 0.088 af

Pond 101P: Gravel Wetland #101 Peak Elev=94.17' Storage=14,470 cf Inflow=10.00 cfs 0.932 af
Primary=0.09 cfs 0.117 af Secondary=4.59 cfs 0.483 af Tertiary=1.71 cfs 0.062 af Outflow=6.39 cfs 0.662 af

Pond 103P: Gravel Wetland #103 Peak Elev=94.52' Storage=36,727 cf Inflow=22.16 cfs 2.529 af
Primary=0.20 cfs 0.268 af Secondary=6.56 cfs 1.225 af Tertiary=9.06 cfs 0.481 af Outflow=15.82 cfs 1.974 af

Pond 104P: Gravel Wetland #104 Peak Elev=93.46' Storage=11,555 cf Inflow=5.10 cfs 0.390 af
Primary=0.22 cfs 0.191 af Secondary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.191 af

Pond 105P: Detention Pond #105 Peak Elev=96.44' Storage=9,269 cf Inflow=11.45 cfs 0.930 af
Primary=5.68 cfs 0.915 af Secondary=0.00 cfs 0.000 af Outflow=5.68 cfs 0.915 af

Pond 106P: StormTech SC740 #106 Peak Elev=95.60' Storage=5,952 cf Inflow=3.08 cfs 0.261 af
Outflow=0.63 cfs 0.170 af

Pond C01P: CB #1 Peak Elev=90.65' Storage=17 cf Inflow=4.90 cfs 1.314 af
15.0" Round Culvert n=0.012 L=42.0' S=0.0100 '/' Outflow=4.91 cfs 1.314 af

Pond C02P: CB #2 Peak Elev=94.86' Storage=0.000 af Inflow=3.85 cfs 0.408 af
18.0" Round Culvert n=0.012 L=55.0' S=0.0055 '/' Outflow=3.84 cfs 0.408 af

Pond C03P: CB #3 Peak Elev=94.91' Storage=0.000 af Inflow=1.18 cfs 0.094 af
12.0" Round Culvert n=0.012 L=53.5' S=0.0056 '/' Outflow=1.17 cfs 0.094 af

Pond C04P: CB #4 Peak Elev=96.52' Storage=0.001 af Inflow=4.09 cfs 0.342 af
18.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=4.08 cfs 0.342 af

Pond C05P: CB #5 Peak Elev=96.50' 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=96.50' Storage=0.001 af Inflow=0.51 cfs 0.041 af
12.0" Round Culvert n=0.012 L=28.5' S=0.0053 '/' Outflow=0.49 cfs 0.041 af

Pond C07P: CB #7 Peak Elev=96.23' Storage=39 cf Inflow=7.32 cfs 1.238 af
18.0" Round Culvert n=0.012 L=40.0' S=0.0050 '/' Outflow=7.25 cfs 1.238 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=0.52 cfs 0.043 af

Pond D01P: DMH #1 Peak Elev=94.68' Storage=0.000 af Inflow=3.84 cfs 0.408 af
18.0" Round Culvert n=0.012 L=112.0' S=0.0054 '/' Outflow=3.84 cfs 0.408 af

Pond D04P: DMH #4 Peak Elev=96.50' Storage=0.001 af Inflow=5.43 cfs 0.455 af
18.0" Round Culvert n=0.012 L=78.0' S=0.0051 '/' Outflow=5.42 cfs 0.455 af

Pond D06P: DMH #6 Peak Elev=95.23' Storage=0.001 af Inflow=7.25 cfs 1.238 af
18.0" Round Culvert n=0.012 L=50.0' S=0.0064 '/' Outflow=7.23 cfs 1.238 af

Total Runoff Area = 10.762 ac Runoff Volume = 6.267 af Average Runoff Depth = 6.99"
62.19% Pervious = 6.692 ac 37.81% Impervious = 4.070 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**

Powered by ACIS Northeast Regional Climate Center

RIP RAP CALCULATIONS

24-034 239 Knox Marsh Realty LLC

Barrington, NH

Berry Surveying & Engineering

335 Second Crown Point Road

Barrington, NH

11/26/2024/Rev: 2/15/26

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	1.30	1.00	8.6	11.6	0.14	0.50	1.20
15" RCP (Pond #103P)	0.25	5.50	1.25	14.0	17.8	0.59	0.67	1.70

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

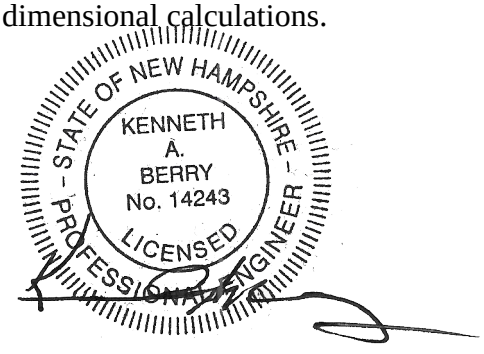
d50 = (0.02 x Q4/3) / (Tw x Do) Tw = Tailwater Depth

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 #D06P)	1.85	5.55	1.50	17.9	11.7	0.07	0.50	1.20
18" HDPE (Pond #D01P)	1.85	2.75	1.50	14.2	10.2	0.03	0.50	1.20
18" RCP (Pond #D04P)	1.83	3.77	1.50	15.5	10.7	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)	0.95	0.10	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

Table 7-24 -- Recommended Rip Rap Gradation Ranges

d50 Size =	0.67	Feet	8	Inches

% of Weight Smaller	Size of Stone (Inches)	
Than the Given d50 Size	From	To
100%	12	16
85%	10	14
50%	8	12
15%	2	4

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.

1.46	ac	A = Area draining to the practice	
0.85	ac	A_I = Impervious area draining to the practice	
0.58	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.58	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.84	ac-in	WQV= 1" x Rv x A	
3,054	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
305	cf	10% x WQV (check calc for sediment forebay)	
1,374	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
3,619	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]	
92.95	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.06	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
28.28	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 0.094 af)

Inflow Area = 1.461 ac, 58.43% Impervious, Inflow Depth > 6.14" for 50 YR - 24 HR event
Inflow = 8.17 cfs @ 12.09 hrs, Volume= 0.747 af
Outflow = 3.31 cfs @ 12.32 hrs, Volume= 0.479 af, Atten= 60%, Lag= 14.0 min
Primary = 0.09 cfs @ 12.32 hrs, Volume= 0.113 af
Routed to Reach 100R : Final Reach 100
Secondary = 2.51 cfs @ 12.32 hrs, Volume= 0.342 af
Routed to Reach 100R : Final Reach 100
Tertiary = 0.71 cfs @ 12.32 hrs, Volume= 0.024 af
Routed to Reach 100R : Final Reach 100

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= 30,175 sf Storage= 13,440 cf
Flood Elev= 94.50' Surf.Area= 33,501 sf Storage= 19,418 cf

Plug-Flow detention time= 218.2 min calculated for 0.479 af (64% of inflow)
Center-of-Mass det. time= 91.6 min (904.8 - 813.2)

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 Limited to weir flow at low heads
#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=94.09' 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=2.49 cfs @ 12.32 hrs HW=94.09' TW=0.00' (Dynamic Tailwater)
↑└**2=12" RCP** (Passes 2.49 cfs of 4.89 cfs potential flow)
↑└**4=4' Structure** (Weir Controls 2.49 cfs @ 1.28 fps)

Tertiary OutFlow Max=0.69 cfs @ 12.32 hrs HW=94.09' TW=0.00' (Dynamic Tailwater)
↑└**5=10' Emergency Spillway** (Weir Controls 0.69 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	WQV = 3,054 CF	
92.46	694	93.52	7,179	WQV Elev: = 92.95'	
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		

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: = 92.95'
WQV 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.

3.73	ac	A = Area draining to the practice	
1.90	ac	A_I = Impervious area draining to the practice	
0.51	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.51	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.90	ac-in	WQV= 1" x Rv x A	
6,887	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
689	cf	10% x WQV (check calc for sediment forebay)	
3,099	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
7,442	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**
0.16	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
92.95	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.12	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
31.88	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")?	
94.42	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

Inflow Area = 3.730 ac, 51.11% Impervious, Inflow Depth > 6.59" for 50 YR - 24 HR event
Inflow = 18.68 cfs @ 12.09 hrs, Volume= 2.050 af
Outflow = 9.78 cfs @ 12.34 hrs, Volume= 1.522 af, Atten= 48%, Lag= 15.3 min
Primary = 0.20 cfs @ 12.34 hrs, Volume= 0.258 af
Routed to Reach 200R : Final Reach 200
Secondary = 5.21 cfs @ 12.34 hrs, Volume= 1.004 af
Routed to Reach 200R : Final Reach 200
Tertiary = 4.37 cfs @ 12.34 hrs, Volume= 0.259 af
Routed to Reach 200R : Final Reach 200

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 94.42' @ 12.34 hrs Surf.Area= 39,160 sf Storage= 34,474 cf
Flood Elev= 95.00' Surf.Area= 41,377 sf Storage= 47,629 cf

Plug-Flow detention time= 197.8 min calculated for 1.522 af (74% of inflow)
Center-of-Mass det. time= 109.3 min (900.7 - 791.4)

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'	31,773 cf	**Open Water Storage (Irregular)** Listed below (Recalc)
#5	92.50'	7,442 cf	**Sediment Forebay (Irregular)** Listed below (Recalc)
		47,629 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	347.4	614	614	7,668
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	216.9	0	0	1,797
92.50	2,882	243.9	580	580	2,789
93.00	3,568	328.9	1,609	2,189	6,666
93.50	4,077	342.3	1,910	4,099	7,401

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.50	18,914	739.1	0	0	18,914
94.00	20,434	894.2	9,835	9,835	39,077
94.50	21,783	904.8	10,552	20,387	40,660
95.00	23,776	1,113.7	11,386	31,773	74,219

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.50	4,520	406.7	0	0	4,520
93.00	8,038	593.2	3,098	3,098	19,362
93.50	9,356	653.5	4,344	7,442	25,352

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 Limited to weir flow at low heads
#4	Device 2	93.50'	**4.0" Vert. 4" Orifice (2) X 2.00** C= 0.600 Limited to weir flow at low heads
#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 @ 12.34 hrs HW=94.42' TW=0.00' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.20 cfs of 1.12 cfs potential flow)
  └─**3=2.25" Orifice Goose Neck** (Orifice Controls 0.20 cfs @ 7.47 fps)

Secondary OutFlow Max=5.20 cfs @ 12.34 hrs HW=94.42' TW=0.00' (Dynamic Tailwater)
└─**2=15" RCP** (Passes 5.20 cfs of 6.38 cfs potential flow)
  ├─**4=4" Orifice (2)** (Orifice Controls 0.73 cfs @ 4.17 fps)
  └─**5=4' Structure** (Weir Controls 4.48 cfs @ 1.56 fps)

Tertiary OutFlow Max=4.36 cfs @ 12.34 hrs HW=94.42' TW=0.00' (Dynamic Tailwater)
└─**6=25' Emergency Spillway** (Weir Controls 4.36 cfs @ 1.04 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	7,325	94.04	26,508
91.94	0	93.00	7,629	94.06	26,920
91.96	1	93.02	7,936	94.08	27,333
91.98	1	93.04	8,245	94.10	27,746
92.00	1	93.06	8,555	94.12	28,161
92.02	1	93.08	8,868	94.14	28,577
92.04	2	93.10	9,182	94.16	28,994
92.06	2	93.12	9,497	94.18	29,412
92.08	2	93.14	9,815	94.20	29,830
92.10	2	93.16	10,135	94.22	30,250
92.12	3	93.18	10,456	94.24	30,671
92.14	3	93.20	10,779	94.26	31,093
92.16	3	93.22	11,104	94.28	31,517
92.18	3	93.24	11,431	94.30	31,941
92.20	4	93.26	11,759	94.32	32,366
92.22	4	93.28	12,090	94.34	32,792
92.24	4	93.30	12,422	94.36	33,220
92.26	41	93.32	12,756	94.38	33,649
92.28	116	93.34	13,092	94.40	34,078
92.30	195	93.36	13,430	94.42	34,509
92.32	278	93.38	13,770	94.44	34,941
92.34	365	93.40	14,111	94.46	35,374
92.36	455	93.42	14,455	94.48	35,808
92.38	549	93.44	14,800	94.50	36,243
92.40	648	93.46	15,147	94.52	36,679
92.42	750	93.48	15,497	94.54	37,117
92.44	856	93.50	15,848	94.56	37,557
92.46	967	93.52	16,227	94.58	37,998
92.48	1,082	93.54	16,607	94.60	38,441
92.50	1,201	93.56	16,989	94.62	38,885
92.52	1,415	93.58	17,371	94.64	39,331
92.54	1,632	93.60	17,755	94.66	39,778
92.56	1,852	93.62	18,140	94.68	40,227
92.58	2,076	93.64	18,527	94.70	40,678
92.60	2,303	93.66	18,914	94.72	41,130
92.62	2,534	93.68	19,303	94.74	41,584
92.64	2,768	93.70	19,693	94.76	42,039
92.66	3,006	93.72	20,084	94.78	42,496
92.68	3,248	93.74	20,476	94.80	42,955
92.70	3,493	93.76	20,870	94.82	43,415
92.72	3,741	93.78	21,265	94.84	43,877
92.74	3,994	93.80	21,661	94.86	44,340
92.76	4,250	93.82	22,058	94.88	44,805
92.78	4,510	93.84	22,456	94.90	45,272
92.80	4,774	93.86	22,856	94.92	45,740
92.82	5,041	93.88	23,257	94.94	46,210
92.84	5,313	93.90	23,659	94.96	46,681
92.86	5,588	93.92	24,063	94.98	47,154
92.88	5,868	93.94	24,467	95.00	**47,629**
92.90	6,151	93.96	24,873		
92.92	6,439	93.98	25,280		
92.94	6,730	94.00	25,688		
92.96	7,026	94.02	26,098		

WQV = 6,887 CF
WQV Elev: = 92.95'

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: = 92.95'
WV Discharge = 0.12 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.

0.59	ac	A = Area draining to the practice	
0.26	ac	A_I = Impervious area draining to the practice	
0.44	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.45	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.26	ac-in	WQV= 1" x Rv x A	
950	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
95	cf	10% x WQV (check calc for sediment forebay)	
428	cf	45% x WQV (check calc for gravel wetland treatment bay volume)	
1,687	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
979	cf	V_{TB1} = Volume of treatment bay 1 [1]	**≥ 45%WQV**
1,273	cf	V_{TB2} = Volume of treatment bay 2 [1]	**≥ 45%WQV**
0.02	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec) [2]	
91.42	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{avg}$**
52.79	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")?	
93.13	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 = 0.585 ac, 44.16% Impervious, Inflow Depth > 6.43" for 50 YR - 24 HR event
Inflow = 4.15 cfs @ 12.09 hrs, Volume= 0.314 af
Outflow = 0.16 cfs @ 15.33 hrs, Volume= 0.136 af, Atten= 96%, Lag= 194.5 min
Primary = 0.16 cfs @ 15.33 hrs, Volume= 0.136 af
Routed to Pond 4P : Pond 4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 4P : Pond 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 93.13' @ 15.33 hrs Surf.Area= 10,288 sf Storage= 9,476 cf
Flood Elev= 94.00' Surf.Area= 6,280 sf Storage= 14,640 cf

Plug-Flow detention time= 368.2 min calculated for 0.136 af (43% of inflow)
Center-of-Mass det. time= 247.5 min (1,036.6 - 789.0)

Volume	Invert	Avail.Storage	Storage Description
#1	90.33'	43 cf	**4.00'D x 3.42'H Outlet Structure**
#2	91.00'	1,687 cf	**Sediment Forebay (Irregular)**Listed below (Recalc)
#3	91.00'	979 cf	**Cell 1 (Irregular)**Listed below (Recalc)
#4	91.00'	1,273 cf	**Cell 2 (Irregular)**Listed below (Recalc)
#5	92.00'	10,657 cf	**Open water storage (Irregular)**Listed below (Recalc)
		14,640 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	167	50.2	0	0	167
91.50	639	109.6	189	189	923
92.00	819	120.3	364	552	1,127
93.00	1,484	160.0	1,135	1,687	2,024

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	766	144.1	0	0	766
91.50	974	151.9	434	434	964
92.00	1,210	161.8	545	979	1,223

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.00	829	156.7	0	0	829
91.50	1,326	206.3	534	534	2,265
92.00	1,637	215.7	739	1,273	2,597

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
92.00	3,877	454.1	0	0	3,877
93.00	5,707	492.9	4,763	4,763	6,839
93.75	7,185	521.4	4,824	9,586	9,171
94.00	1,936	571.2	1,071	10,657	13,503

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 Limited to weir flow at low heads
#4	Device 1	92.65'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 2	93.50'	**15.0" W x 3.0" H Vert. 3"T X 15"W Box Orifice** C= 0.600 Limited to weir flow at low heads
#6	Device 2	93.79'	**48.0" Horiz. 4' Structure** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 15.33 hrs HW=93.13' TW=90.15' (Dynamic Tailwater)
└─**1=6" HDPE N-12** (Passes 0.16 cfs of 1.19 cfs potential flow)
  ├─**3=0.75" Orifice Goose Neck** (Orifice Controls 0.02 cfs @ 8.01 fps)
  └─**4=3" Orifice** (Orifice Controls 0.14 cfs @ 2.86 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	360
91.23	471
91.28	587
91.33	709
91.38	837
91.43	971
91.48	1,113
91.53	1,261
91.58	1,412
91.63	1,567
91.68	1,725
91.73	1,887
91.78	2,053
91.83	2,222
91.88	2,395
91.93	2,572
91.98	2,752
92.03	2,968
92.08	3,209
92.13	3,457
92.18	3,710
92.23	3,968
92.28	4,233
92.33	4,504
92.38	4,780
92.43	5,063
92.48	5,352
92.53	5,647
92.58	5,948
92.63	6,255
92.68	6,570
92.73	6,890
92.78	7,217
92.83	7,551
92.88	7,891
92.93	8,238
92.98	8,592
93.03	8,908
93.08	9,199
93.13	9,495
93.18	9,796
93.23	10,101
93.28	10,411
93.33	10,726
93.38	11,046
93.43	11,371
93.48	11,701
93.53	12,036
93.58	12,375
93.63	12,720
93.68	13,070
93.73	13,426
93.78	13,773
93.83	14,060
93.88	14,289
93.93	14,466
93.98	**14,598**

WQV = 950 CF
WQV Elev: = 91.42'

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: = 91.42'
WV Discharge = 0.01 CFS

Summary for Pond 106P: StormTech SC740 #106

Inflow Area = 0.327 ac,100.00% Impervious, Inflow Depth > 3.36" for 2 YR - 24 HR event
Inflow = 1.12 cfs @ 12.09 hrs, Volume= 0.092 af
Outflow = 0.08 cfs @ 12.11 hrs, Volume= 0.056 af, Atten= 93%, Lag= 1.5 min
Primary = 0.08 cfs @ 12.11 hrs, Volume= 0.056 af
Routed to Pond 101P : Gravel Wetland #101

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 93.78' @ 13.91 hrs Surf.Area= 3,623 sf Storage= 2,042 cf
Flood Elev= 96.25' Surf.Area= 3,623 sf Storage= 6,905 cf

Plug-Flow detention time= 241.7 min calculated for 0.055 af (61% of inflow)
Center-of-Mass det. time= 135.3 min (888.9 - 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 Limited to weir flow at low heads
#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=93.48' TW=92.95' (Dynamic Tailwater)
└**1=18" HDPE N-12** (Passes 0.08 cfs of 2.26 cfs potential flow)
  ├**2=3" Orifice** (Orifice Controls 0.08 cfs @ 3.50 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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Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....11
Map Unit Descriptions.....11
Strafford County, New Hampshire.....13
Be—Biddeford silty clay loam.....13
BzA—Buxton silt loam, 0 to 3 percent slopes.....14
DeB—Deerfield loamy fine sand, 3 to 8 percent slopes.....15
Ml—Mixed alluvial land, wet.....16
ScA—Scantic silt loam, 0 to 3 percent slopes.....17
SfC—Suffield silt loam, 8 to 15 percent slopes.....18
WdA—Windsor loamy sand, 0 to 3 percent slopes.....19
WfB—Windsor loamy fine sand, clay subsoil variant, 0 to 8 percent slopes.....21
References.....23

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
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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%.

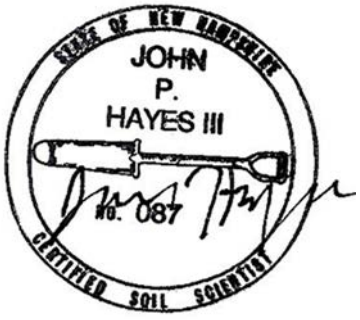
MAP UNIT #	SOIL TAXANOMIC NAME	DESCRIPTION
WfB (State No. 327)	**Windsor Variant (clay Subsoil)**	The Windsor Variant series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits, that have a clay subsoil. They are nearly level through very steep soils on glaciofluvial 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

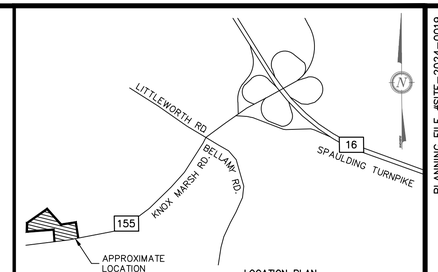
SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

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 — 087 — CERTIFIED SOIL SCIENTIST

JOHN P. HAYES III, CSS #87

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

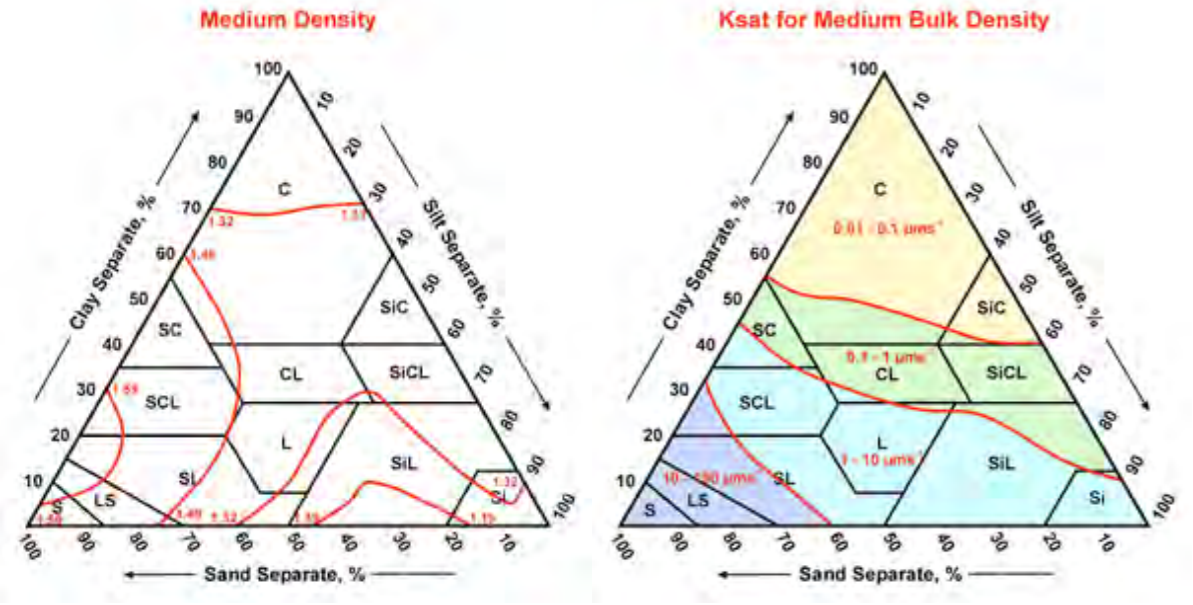
PRE-EXISTING SITE SPECIFIC SOILS MAP
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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

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:

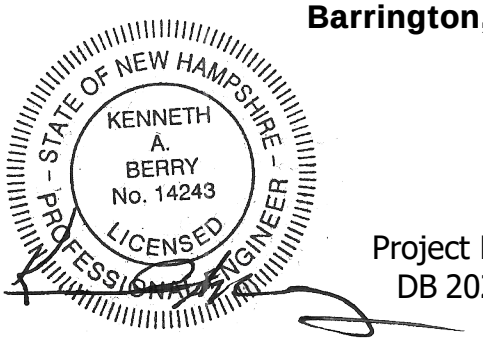
239 Knox Marsh Realty, LLC
P.O. Box 720
Middleton, MA 01949

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
Revised: February 15, 2026

Inspection and Maintenance Manual

Stormwater System Management

Table of Contents

Introduction w/ Practice Inventory .....Page 2
Conveyance Swales & Treatment Swales.....Page 4
Culvert Pipes, Flared End Section / Headwalls.....Page 4
Catch Basins (Without Sumps), Yard Drains & Drain Manholes.....Page 4
Internal Parking Trench Drains & Retaining Wall Underdrains w/ Cleanouts.....Page 5
Detention Ponds .....Page 5
ADS StormTech Chamber Systems (SC-740).....Page 6
Sediment Forebays.....Page 7
Subsurface Gravel Wetlands.....Page 8
Rip-Rap Outlet Protection & Emergency Spill Way.....Page 9
Stabilization for Long Term Cover.....Page 9
Street Sweeping.....Page 10
Snow Removal & Winter Maintenance.....Page 11
Control of Invasive Species.....Page 11
Annual Report.....Page 13
Inspection & Maintenance Manual Checklist.....Page 14
Inspection & Maintenance Log Sheet ..... Page 18
Deicing Log Sheet.....Page 19
Owner Certification .....Page 20
Operation & Maintenance Plans Attached – 1 Page
Control of Invasive Plants, NH Department of Agriculture Attached – 4 Pages
NHDES Green SnoPro Utilization Chart Attached – 1 Page
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 33 unit buildings. This includes nearly 2,000 linear feet of roadway/parking/circulation lanes, parking areas, three subsurface gravel wetlands, Stormtech Chamber Detention Pond, and open water detention area.

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 #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-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
VP – Engineering Operations

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
VP – Emeritus (Engineer of Record)

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 #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

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.)
BY: DEIDRA BENJAMIN, CWS

50' WETLAND BUFFER (TYP.)

DRAIN MANHOLE

OUTLET STRUCTURE #105
DETENTION POND #105
SEE P-105 FOR DETAILS

RIP RAP SPILLWAY

RIP RAP LEVEL SPREADER

INSPECTION PORTS

ISOLATOR ROW

STORMTECH DETENTION POND #106
SEE P-106 FOR DETAILS

OUTLET STRUCTURE #106

DRAIN MANHOLE
CATCH BASIN

RETAINING WALL UD OUTLET

RIP RAP LEVEL SPREADER

DRAIN MANHOLE

NYLOPLAST CLEANOUT

INTERNAL TRENCH DRAIN

PROPOSED 33 UNITS
BUILDING "C"
GARAGE FF = 99.35

UNDER DRAIN CLEANOUTS

DRAIN MANHOLE W/ WEIR PLATE

CATCH BASINS

INLET SUMP

YARD DRAIN CLEANOUT

CONVEYANCE SWALES

PROPOSED 33 UNITS
BUILDING "B"
PARKING FF = 99.00

TIBETAN DRIVE

CATCH BASIN

PROPOSED 84 SUITE LODGING UNITS
BUILDING "A"
PARKING FF = 98.60

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

UNDERDRAIN CLEANOUT

INLET SUMP

PIPES IN HEADWALL (3)

OUTLET STRUCTURE #104 A&B
SEE P-104 FOR DETAILS

N.H. ROUTE 155 / KNOX MARSH ROAD

SEDIMENT FOREBAY

GRAVEL WETLAND #104
SEE P-104 FOR DETAILS

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

16°±

MAGNETIC

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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 14245
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"	90 – 100
#4	20 – 55
#8	5 – 30
#16	0 – 10
#50	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#89)

1-1/2" WASHED CRUSHED STONE*	
SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	95 – 100
3/4"	35 – 70
3/8"	10 – 30
#4	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#467)

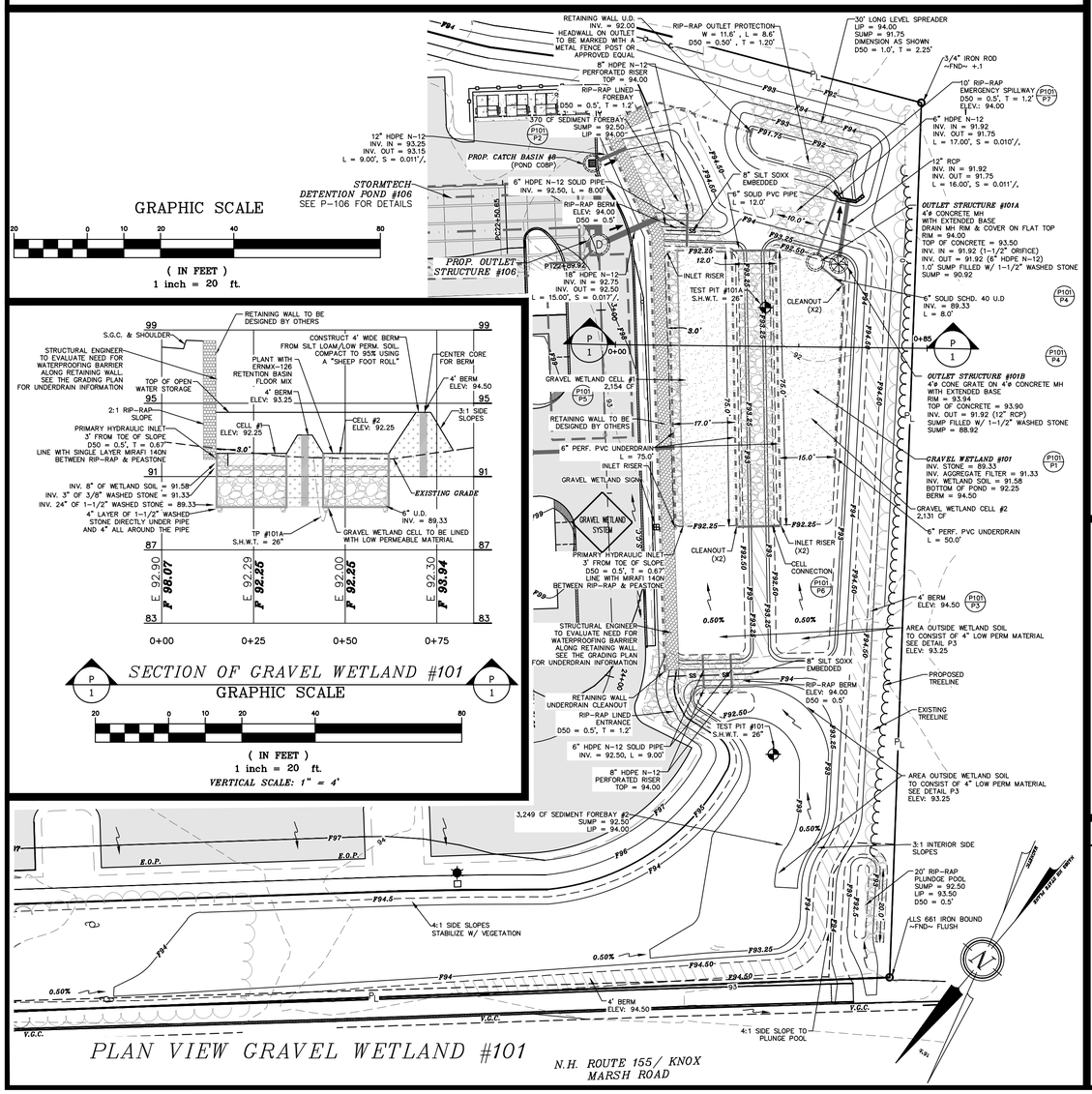
WETLAND SOIL	
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10"	90 – 75
#100	40 – 50
#200	25 –50
SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

DESIGN REFERENCES

1 UNH STORMWATER CENTER

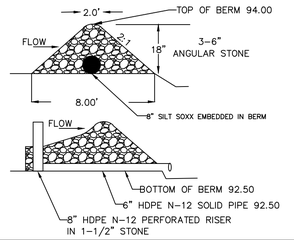
CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

P1



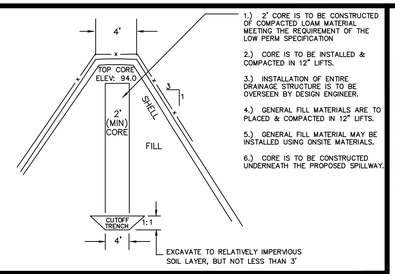
P2

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.

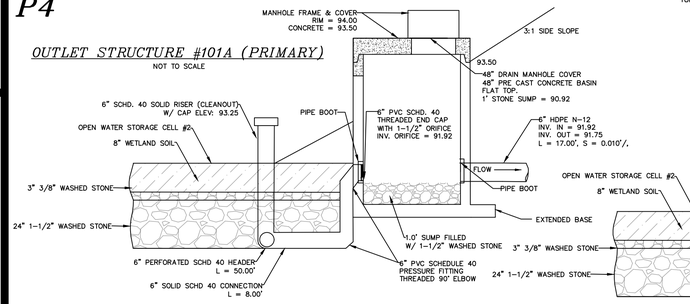
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

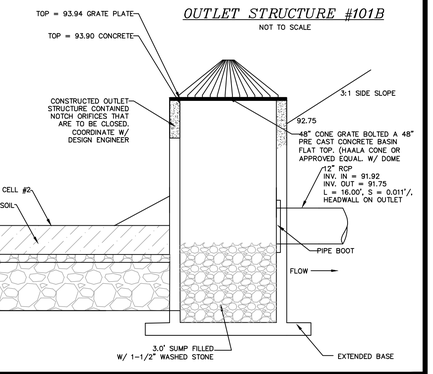
OUTLET STRUCTURE #101A (PRIMARY)

NOT TO SCALE



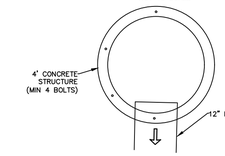
OUTLET STRUCTURE #101B

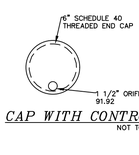
NOT TO SCALE



TOP VIEW (101B)

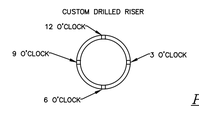
NOT TO SCALE

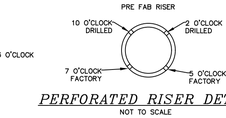




CAP WITH CONTROL ORIFICE (101A)

NOT TO SCALE

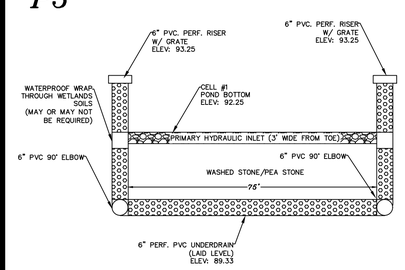




PERFORATED RISER DETAIL

NOT TO SCALE

P5

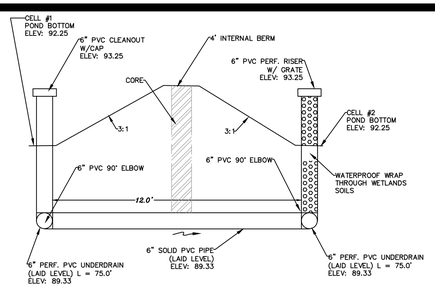


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6

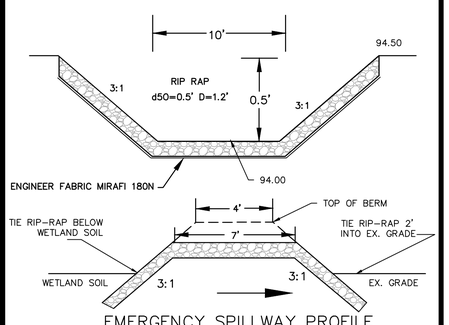


GRAVEL WETLAND CONNECTION SYSTEM

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	22.08
20.00 %	*Puccinellia distans, Fults*	Alkaligrass, Fults	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 %	*Poa palustris*	Fowl Bluegrass	16.80
10.00 %	*Carex wolfiniolfera, 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.

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

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. 14243
LICENSED PROFESSIONAL ENGINEER

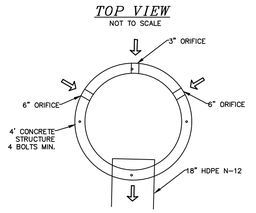
P–101

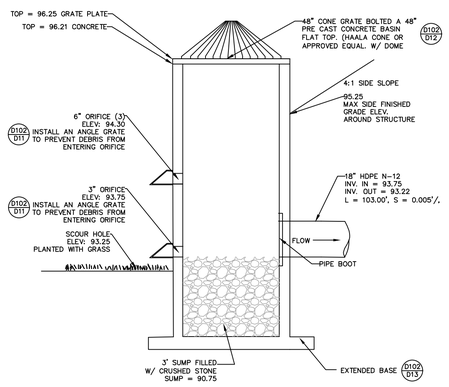
NOT FOR CONSTRUCTION

P1

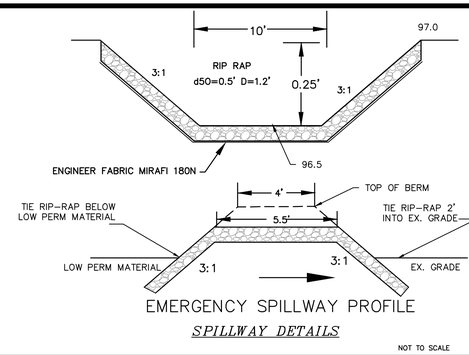
OUTLET STRUCTURE #105

NOT TO SCALE





P2

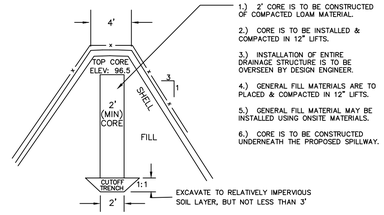


EMERGENCY SPILLWAY PROFILE

SPILLWAY DETAILS

NOT TO SCALE

P3



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 %	*Puccinellia distans, 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	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

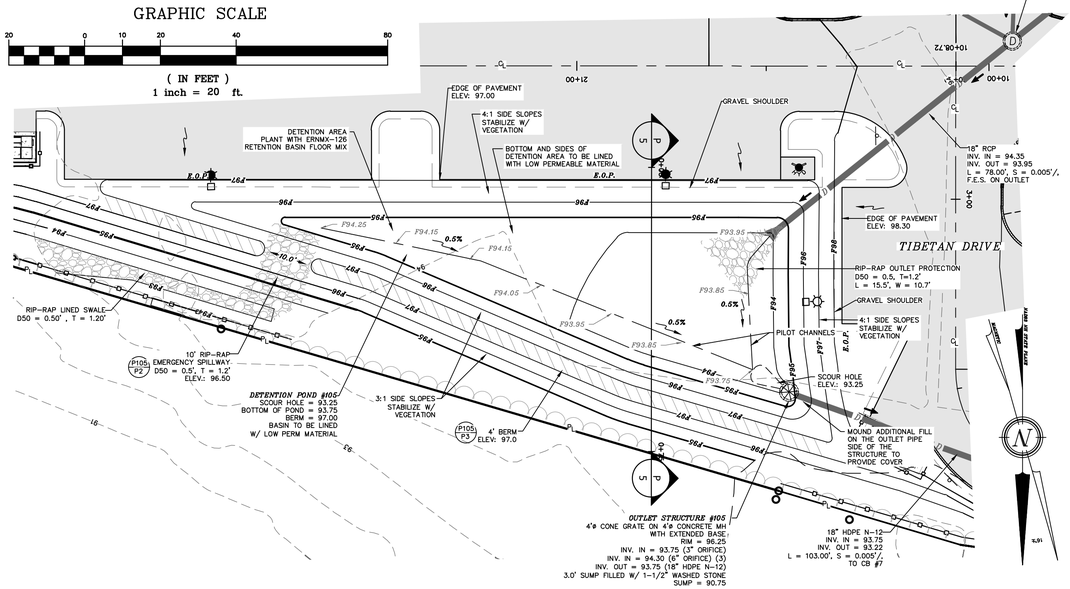
The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

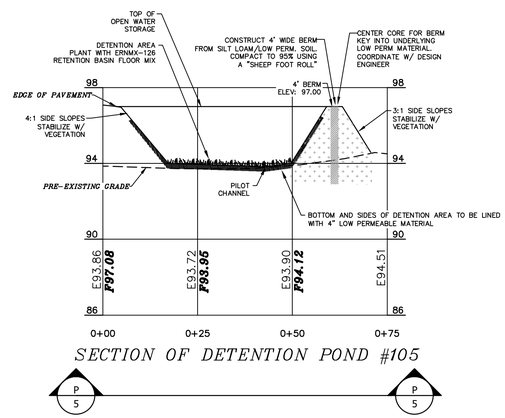
PLAN VIEW DETENTION POND #105

GRAPHIC SCALE

20 0 10 20 40 80

(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-105

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

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"	90 – 100
#4	20 – 55
#8	5 – 30
#16	0 – 10
#50	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#89)

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	95 – 100
3/4"	35 – 70
3/8"	10 – 30
#4	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#467)

WETLAND SOIL

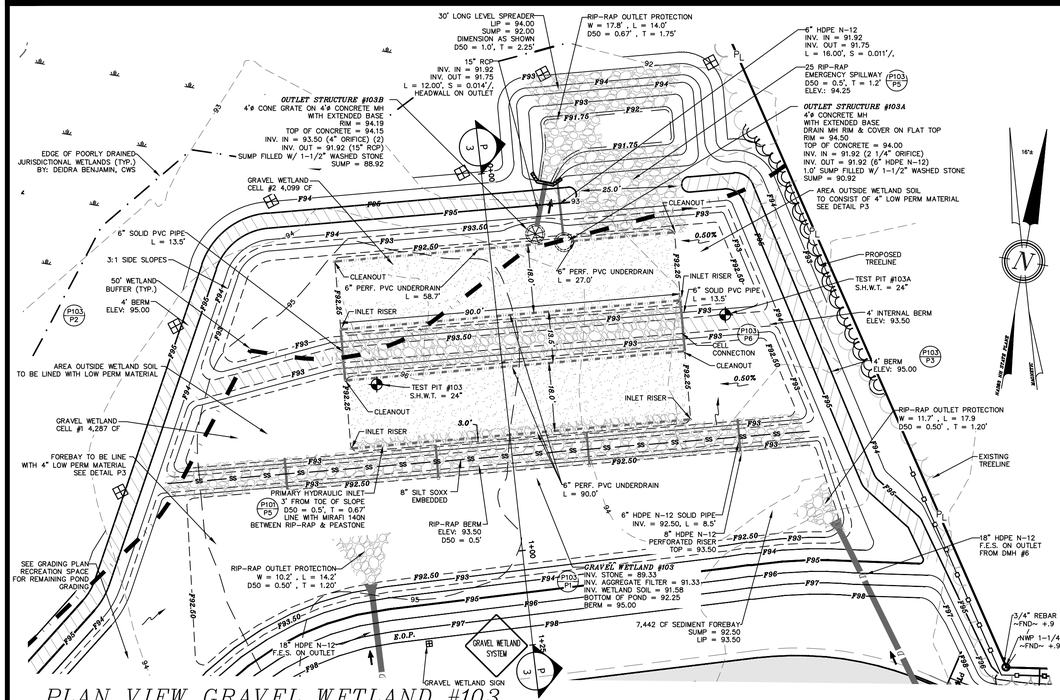
SIEVE SIZE	% PASSING BY WEIGHT
0.5	100
#10"	90 – 75
#100	40 – 50
#200	25 –50

SIEVE SIZE	% PASSING TOLERANCES
0.5	±10.0
#10	±5.0
#100	±5.0
#200	±5.0

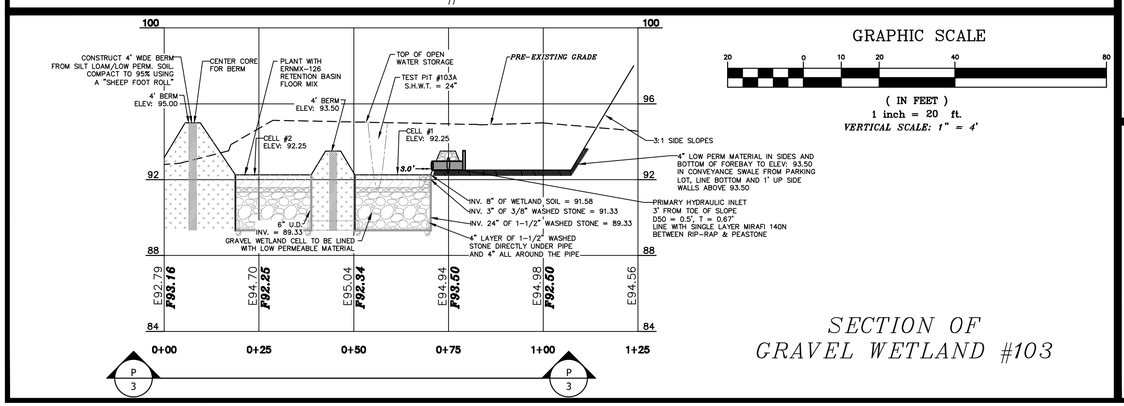
DESIGN REFERENCES

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

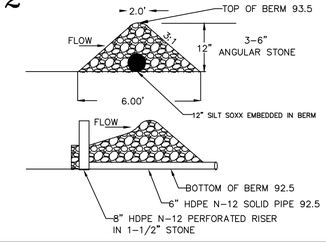
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

P2

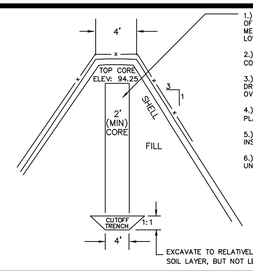
STONE BERM FOR FOREBAY



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.

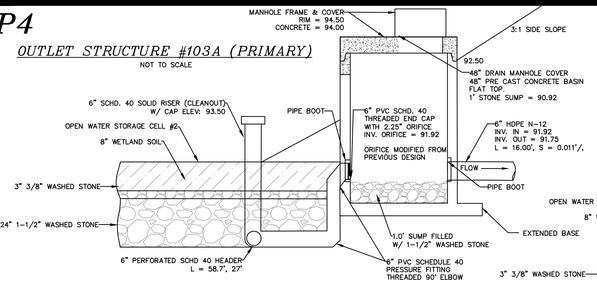
4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

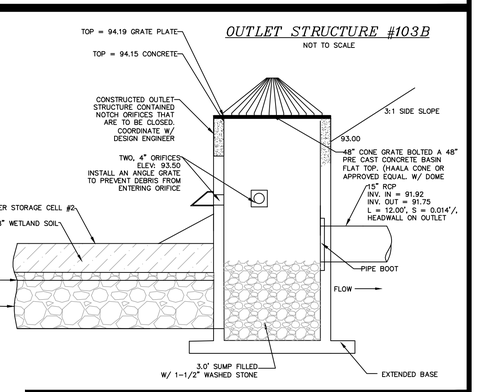
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

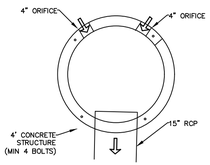
OUTLET STRUCTURE #103A (PRIMARY)
NOT TO SCALE

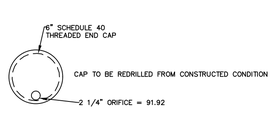


OUTLET STRUCTURE #103B
NOT TO SCALE

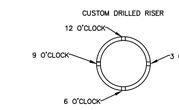


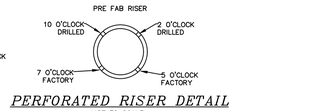
TOP VIEW (103B)
NOT TO SCALE





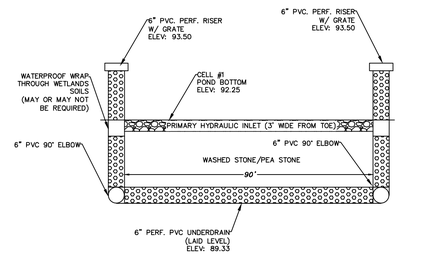
CAP WITH CONTROL ORIFICE
NOT TO SCALE





PERFORATED RISER DETAIL
NOT TO SCALE

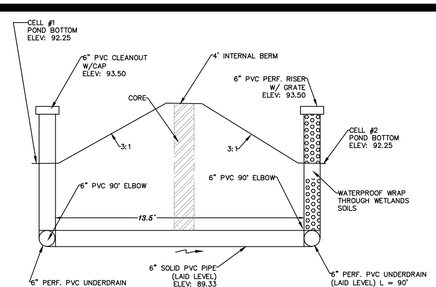
P5



GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

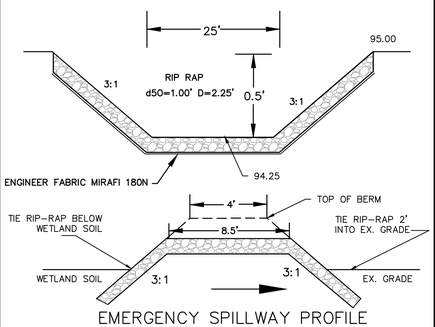
P6



GRAVEL WETLAND CONNECTION SYSTEM
NOT TO SCALE

P7

SPILLWAY DETAILS
NOT TO SCALE



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 %	*Puccinellia distans, 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	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-103

PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
#1	REVISED UNIT COUNT & PROJECT LAYOUT	02-15-26	

GRAVEL WETLAND #103
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
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 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"	90 – 100
#4	20 – 55
#8	5 – 30
#16	0 – 10
#50	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#89)

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	95 – 100
3/4"	35 – 70
3/8"	10 – 30
#4	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#467)

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

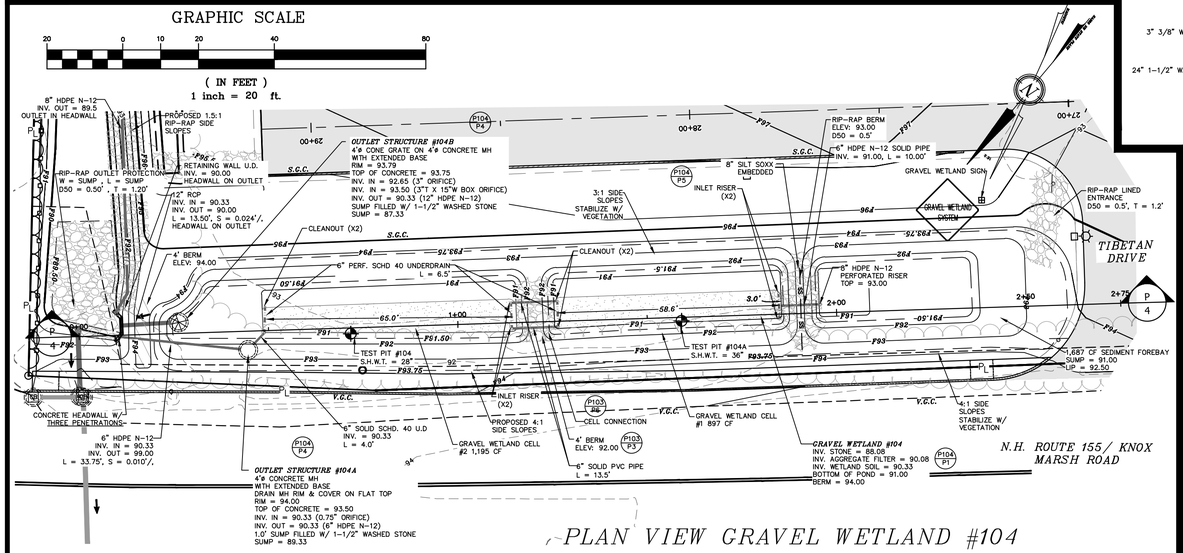
CONSTRUCTION NOTE: THE DESIGN ENGINEER IS TO BE ON SITE PRIOR TO AND DURING THE PLACEMENT OF THE RESERVOIR STONE, AND TO WITNESS THE INSTALLATION OF THE UNDER-DRAIN AND INTER-CHAMBER PIPES. PLEASE PROVIDE 24 HOURS NOTICE PRIOR TO REQUESTED INSPECTION. A LETTER CERTIFYING AS TO THE CONSTRUCTION BY THE OWNER AND DESIGN ENGINEER IS REQUIRED AS A CONDITION OF THE ALTERATION OF TERRAIN PERMIT AND THE CITY OF DOVER

GRAPHIC SCALE

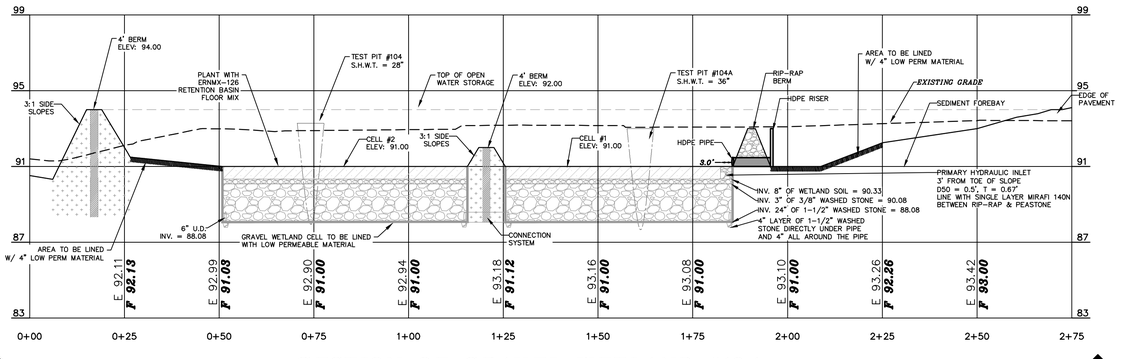
20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.



PLAN VIEW GRAVEL WETLAND #104



SECTION OF GRAVEL WETLAND #104

GRAPHIC SCALE

20 0 10 20 40 80

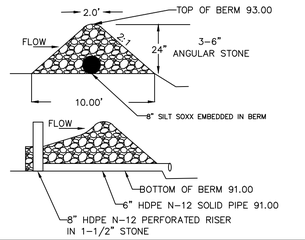
(IN FEET)

1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

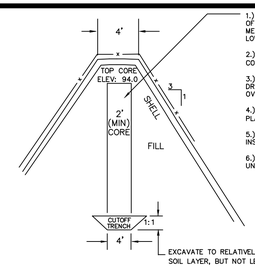
P2

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.

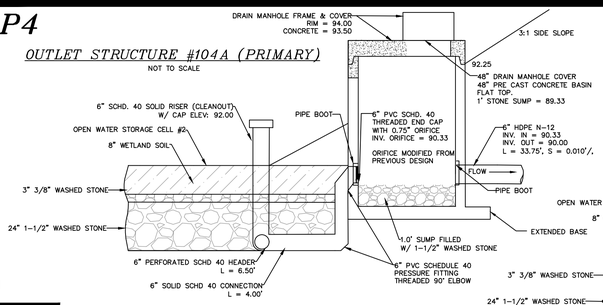
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

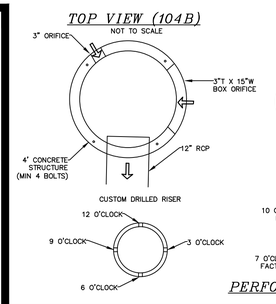
OUTLET STRUCTURE #104A (PRIMARY)

NOT TO SCALE



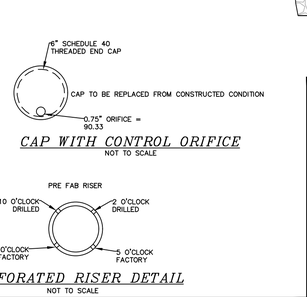
TOP VIEW (104B)

NOT TO SCALE



CAP WITH CONTROL ORIFICE

NOT TO SCALE

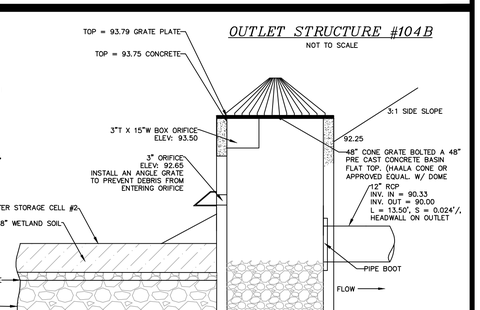


PERFORATED RISER DETAIL

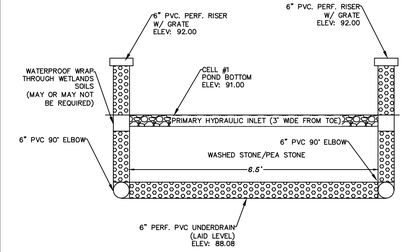
NOT TO SCALE

OUTLET STRUCTURE #104B

NOT TO SCALE



P5

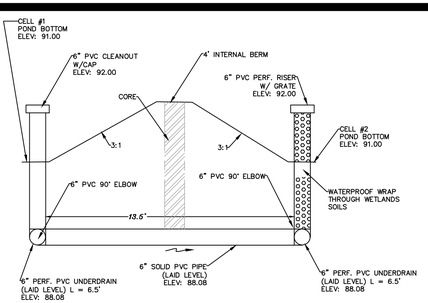


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6



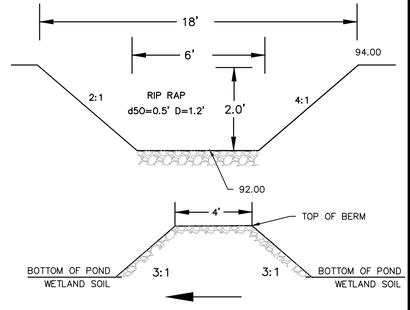
GRAVEL WETLAND CONNECTION SYSTEM

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	22.08
20.00 %	*Fuccinellia distans, 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	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-2024-0019

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

GRAVEL WETLAND #104
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

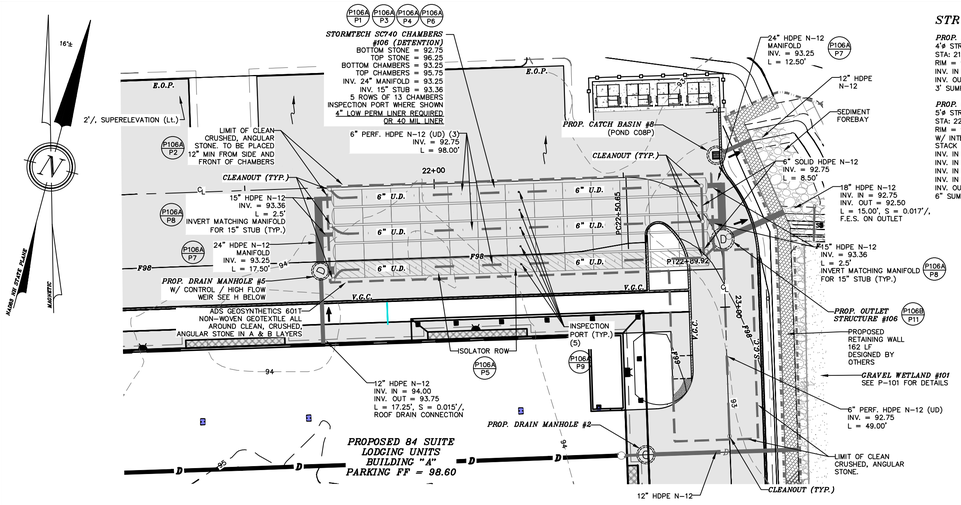
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

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–104

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

A REPRESENTATIVE FROM BSE 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) (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 ULD.)
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

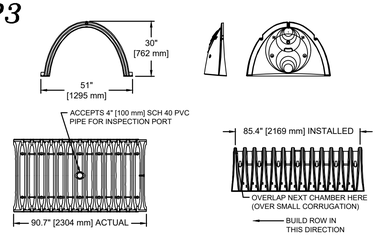
MATERIAL LOCATION		DESCRIPTION	AASHTO M43 DESIGNATION[1]	COMPACTION/DENSITY REQUIREMENT
D	FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE 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 TOP OF THE EMBEDMENT STONE (B) LAYER) TO 12" (300 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOILS/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" (300 mm) OF MATERIAL OVER STONE (B) HAS BEEN PLACED. 6" (200 mm) OF ADDITIONAL LAYERS MAY BE INSTALLED TO A MIN. OF 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 (A) LAYER 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]

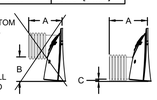
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740EPE06T	6" [150 mm]	10.90" [277 mm]	16.50" [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

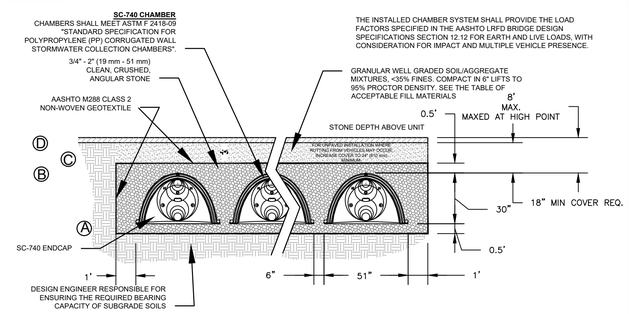
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*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.



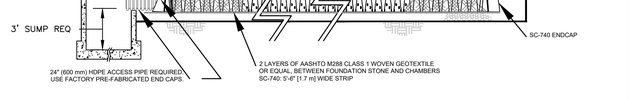
SC-740 TECHNICAL SPEC.

P4



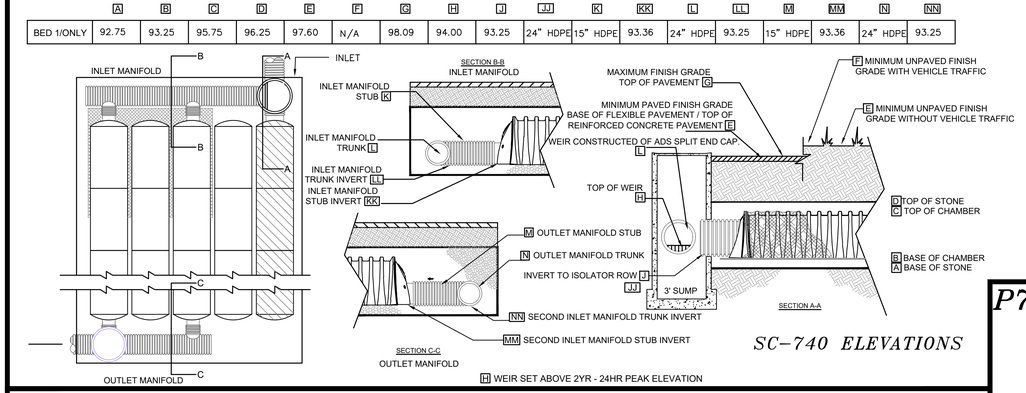
SC-740 STANDARD CROSS SECTION

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	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

SC-740 ELEVATIONS

H WEIR SET ABOVE 2YR - 24HR PEAK ELEVATION

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
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- 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:

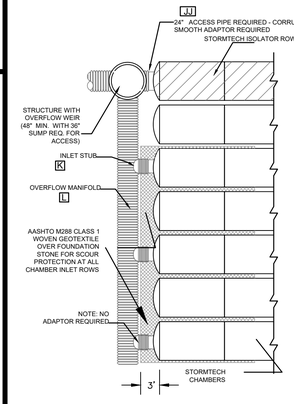
- TEMPORARY BENCHMARK (T.B.M.)
- F101 / E6 DETAIL SHEET / DETAIL
- P176 / P175 CONTOUR MINOR, PROPOSED / CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- U.D. UNDERDRAIN
- GUARD RAIL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- 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

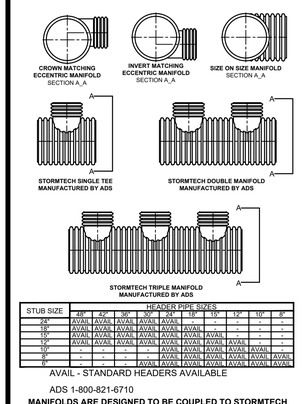
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

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

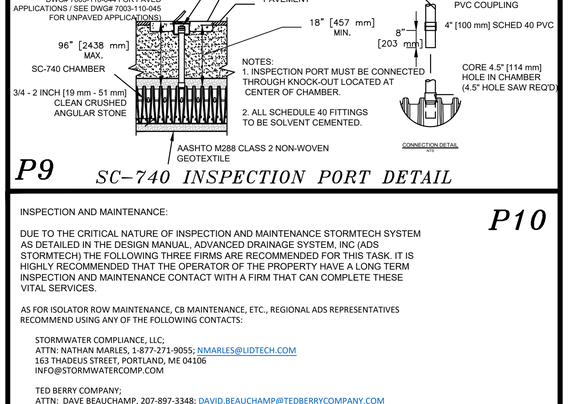
AVAIL - STANDARD HEADERS AVAILABLE

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-2024-0019

#	REVISION	DATE	DESCRIPTION
			REVISED UNIT COUNT & PROJECT LAYOUT
#1		02-15-26	

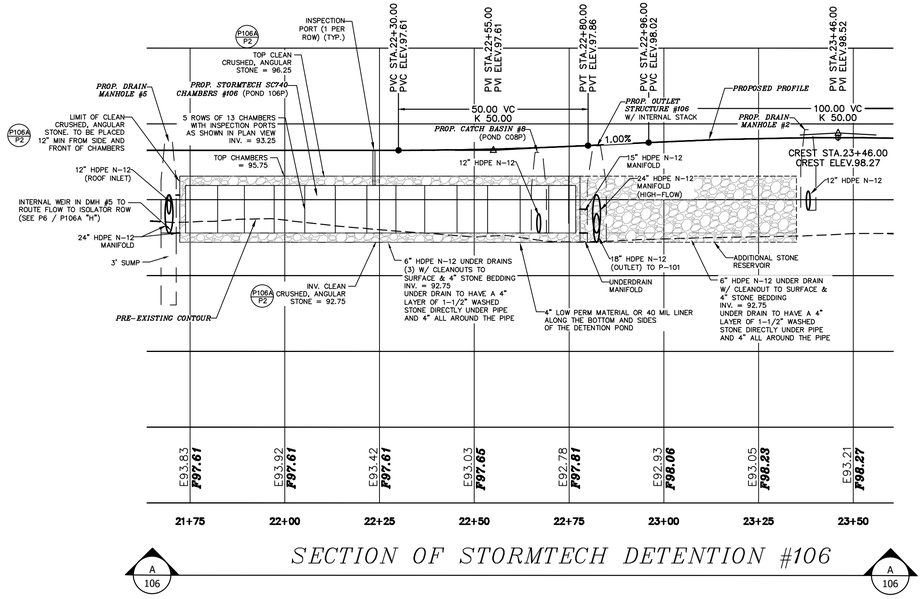
STORMTECH SC740 CHAMBER DETENTION POND #106A
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



SECTION OF STORMTECH DETENTION #106

GRAPHIC SCALE

20 0 10 20 40 80

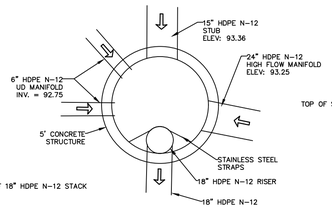
(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.

LOW PERMEABILITY MATERIAL GRADATION

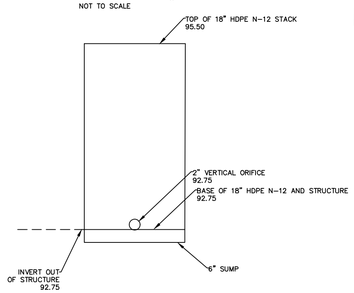
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

P11

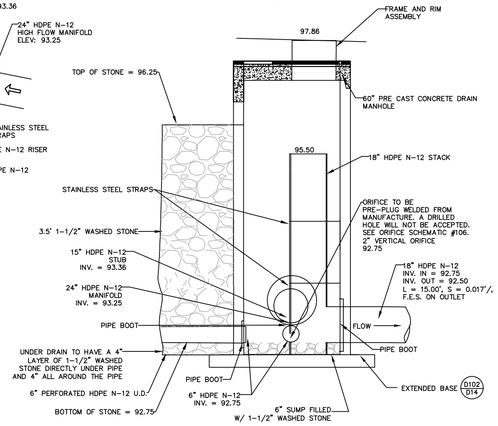
TOP VIEW
NOT TO SCALE (NO FRAME AND RIM IN THIS VIEW)



ORIFICE SCHEMATIC #106
NOT TO SCALE



OUTLET STRUCTURE #106
NOT TO SCALE



PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 14243 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)

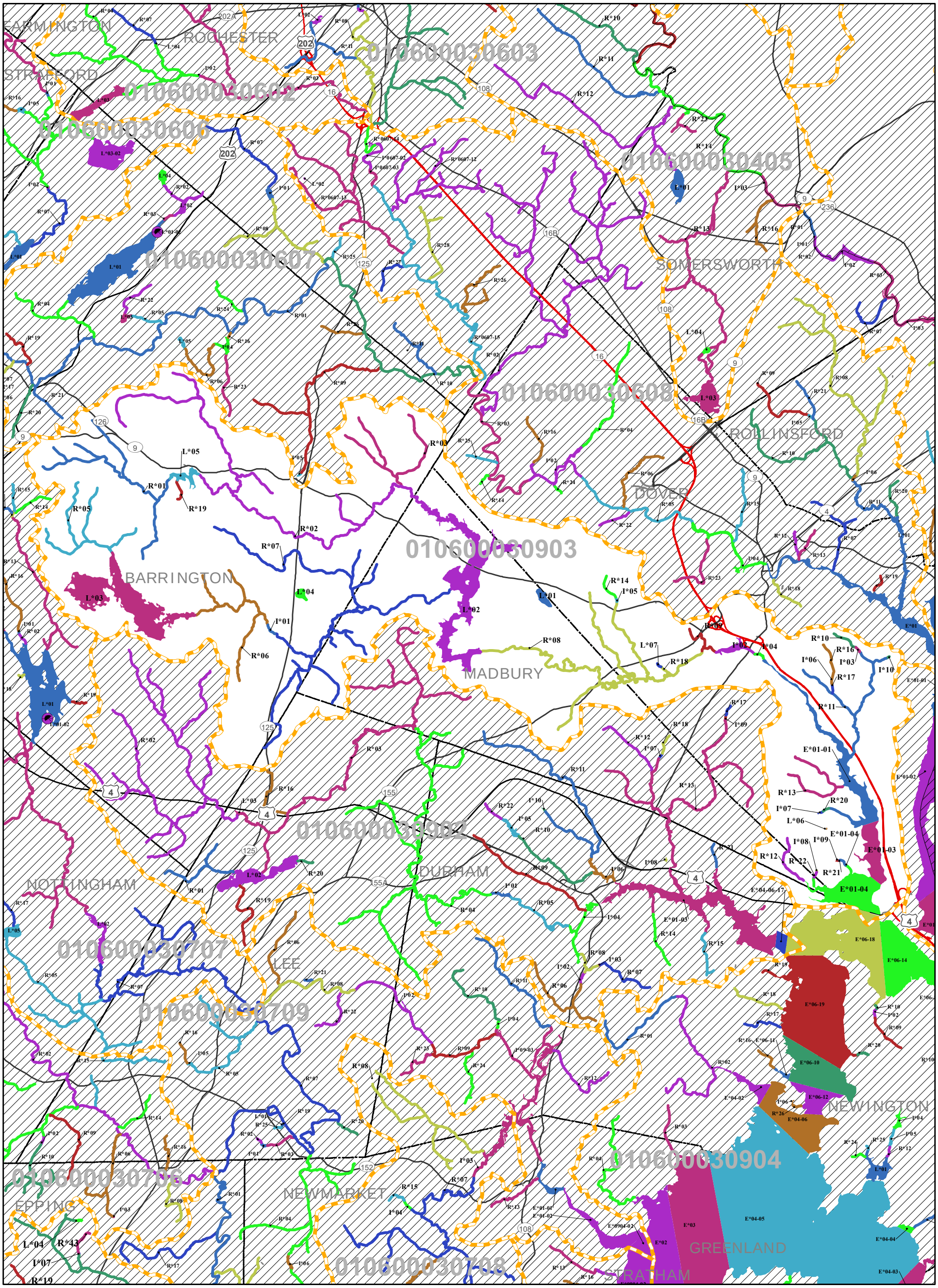
Assessment Cycle 2018

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



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

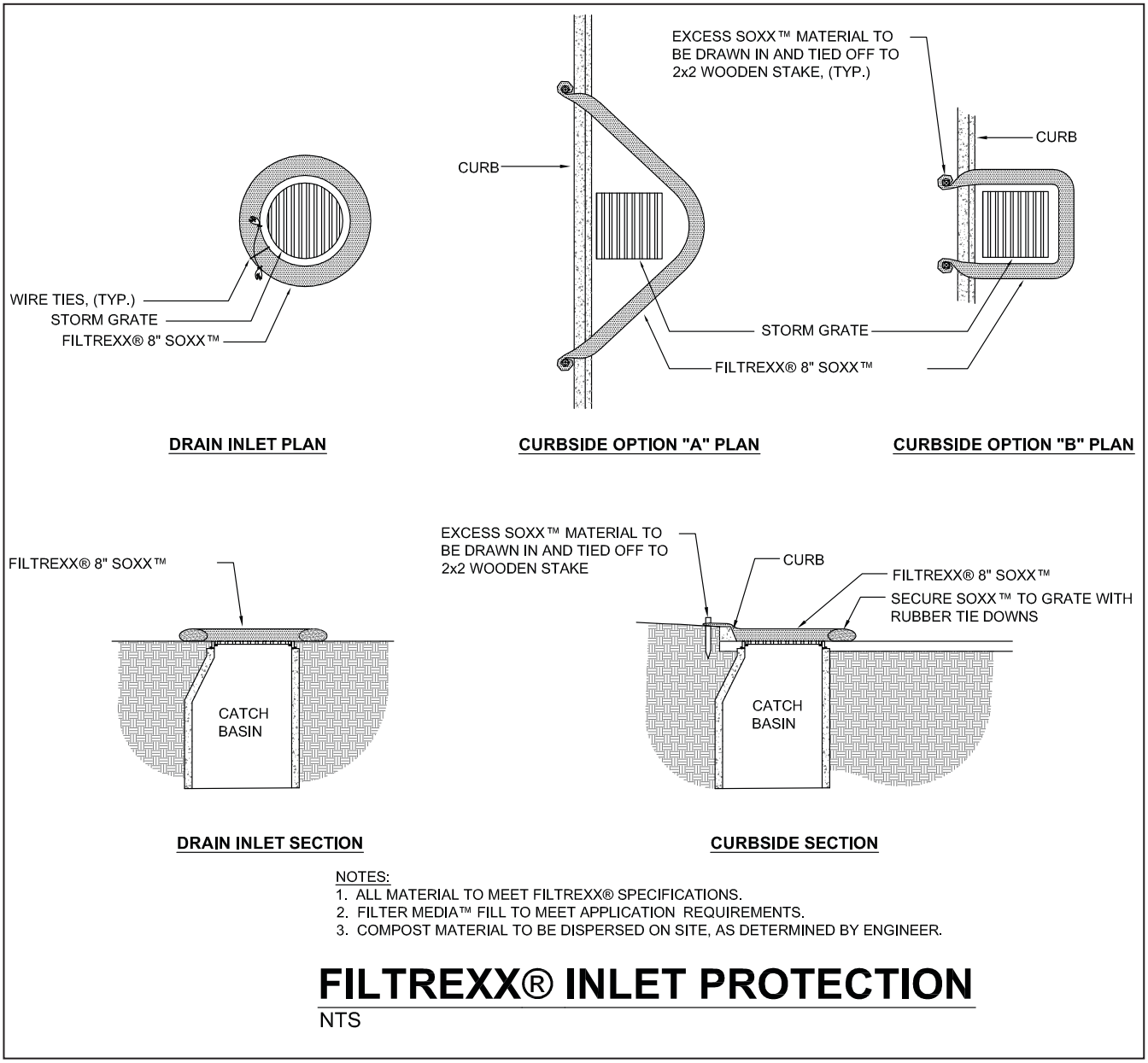
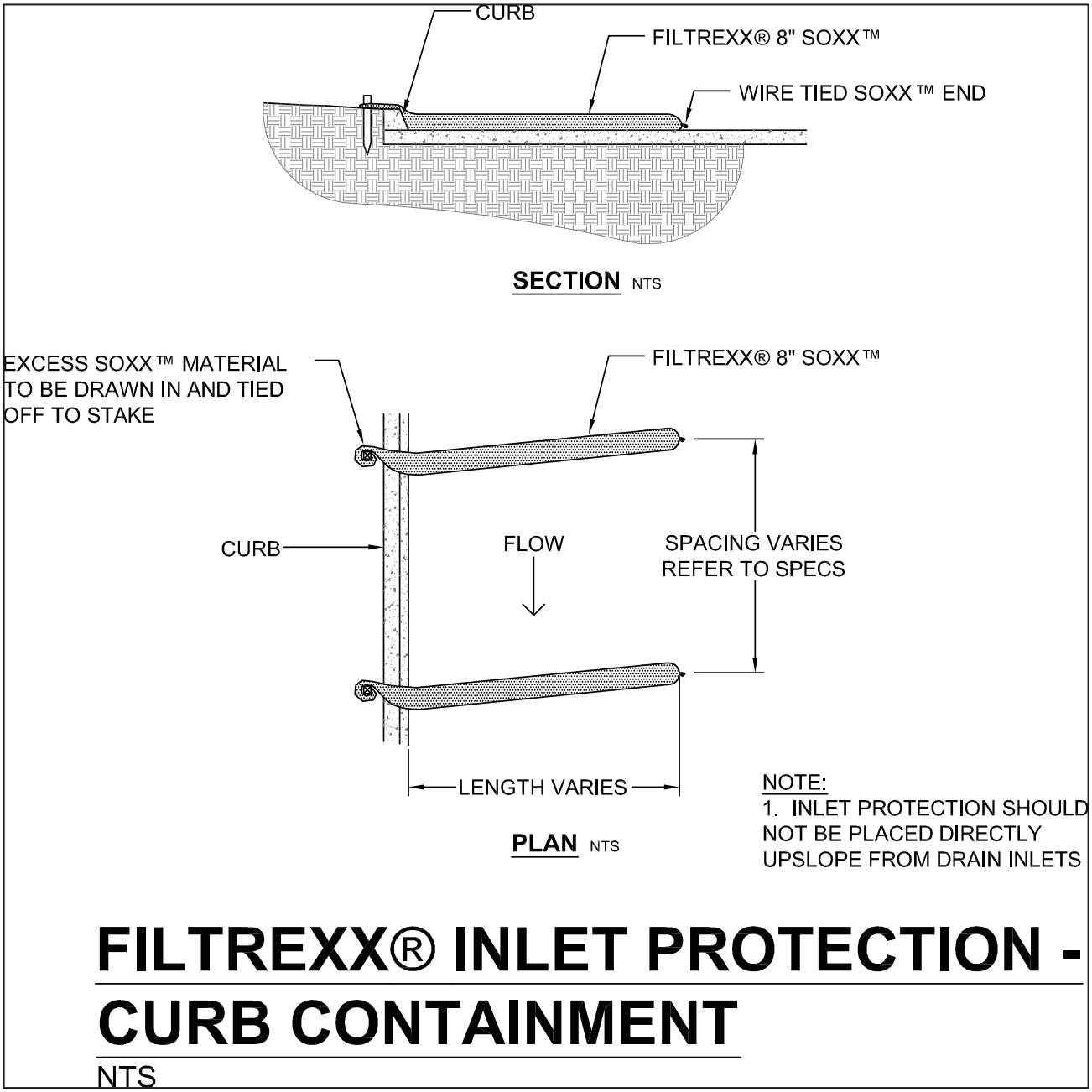


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



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

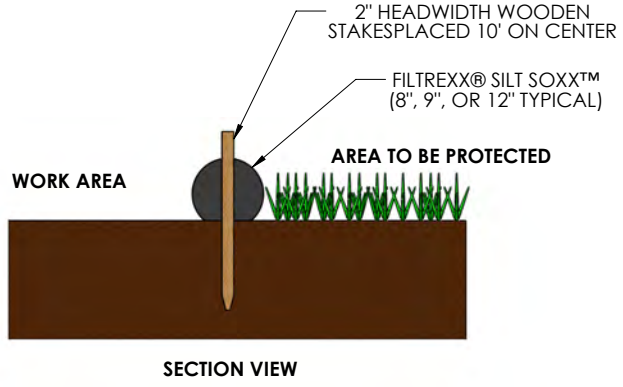
1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of 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)

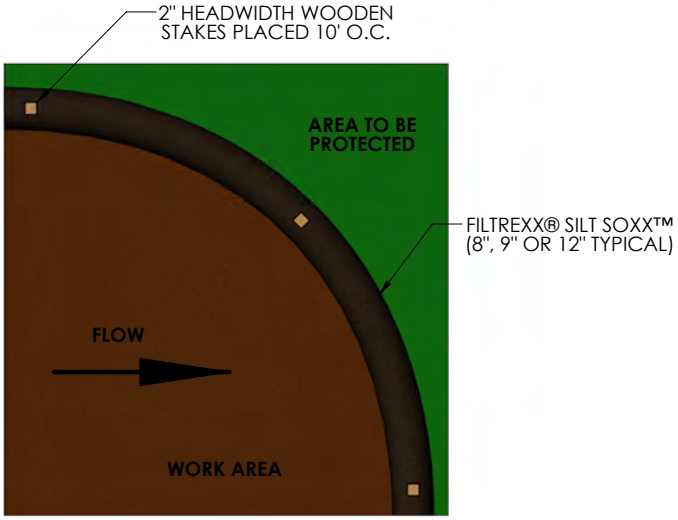
* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

FILTREXX® SILT SOXX™

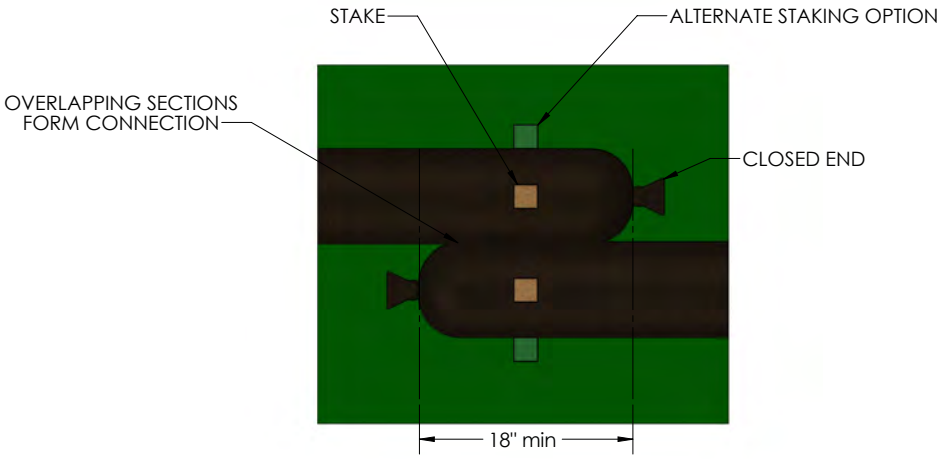


SECTION VIEW

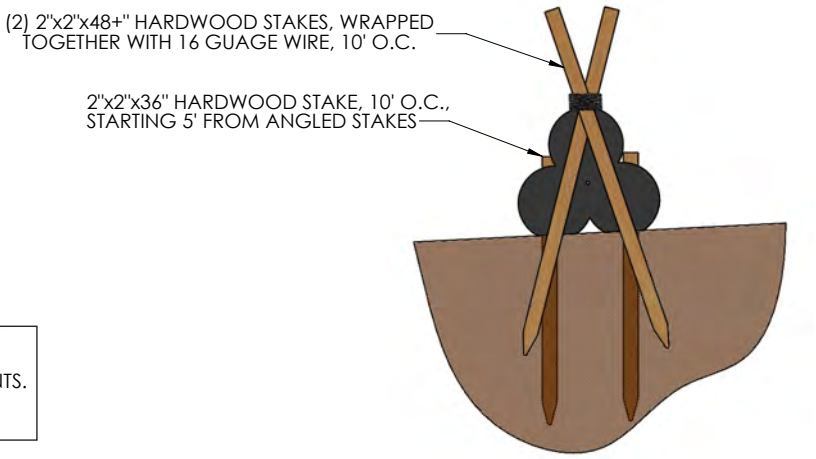


TOP VIEW

COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



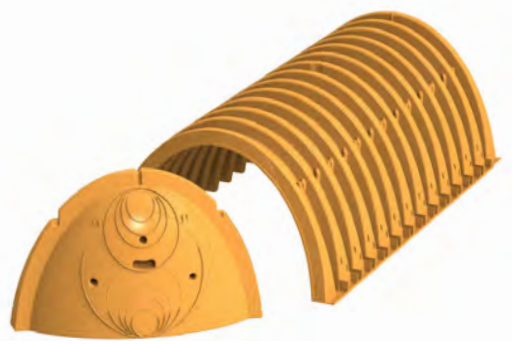
FILTREXX® PYRAMID STAKING DETAIL



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

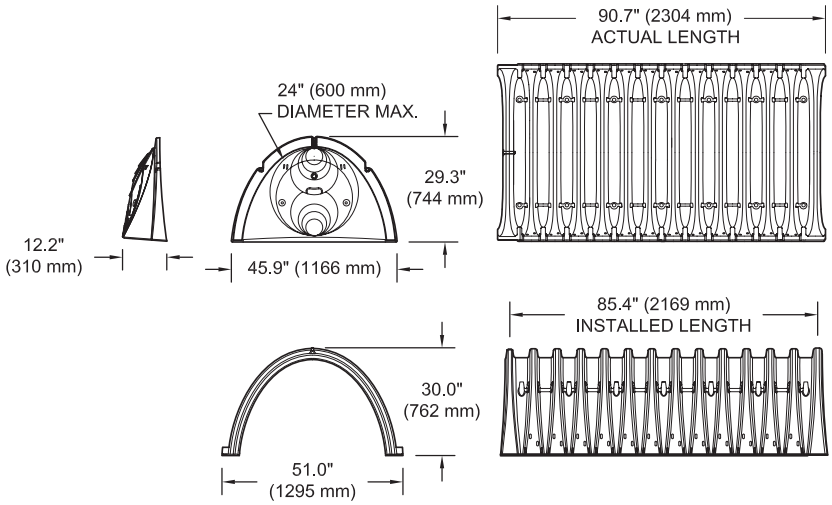
Chamber Storage
45.9 ft³ (1.30 m³)

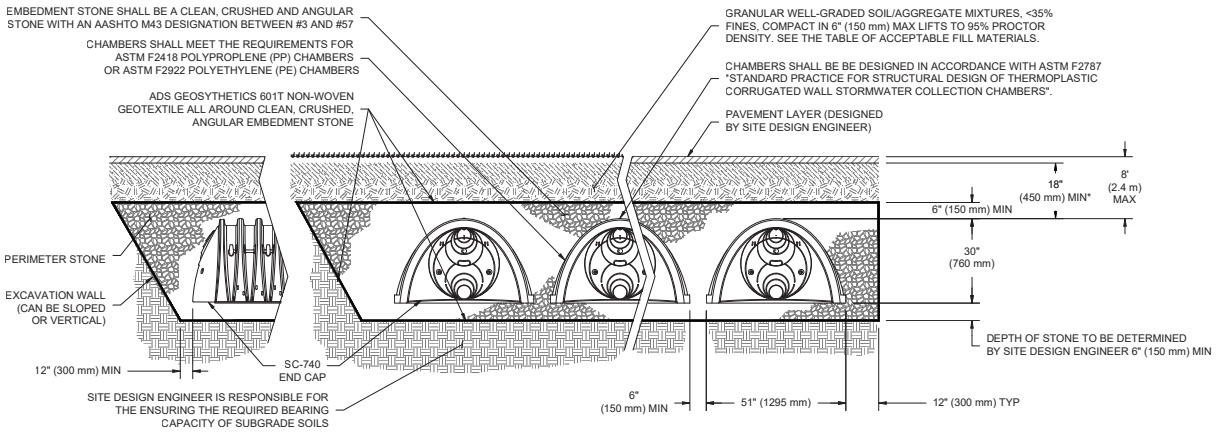
Min. Installed Storage*
74.9 ft³ (2.12 m³)

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)	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)	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)

Stone Cover

Stone Foundation

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.

Working on a project?
Visit us at adspipe.com/stormtech and utilize the Design Tool

ADS StormTech™

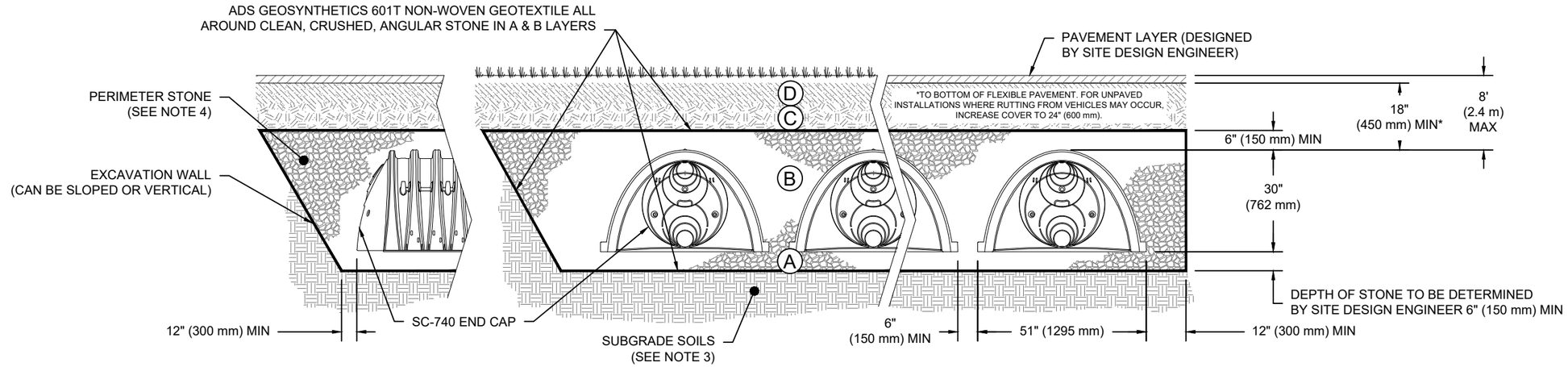
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ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

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

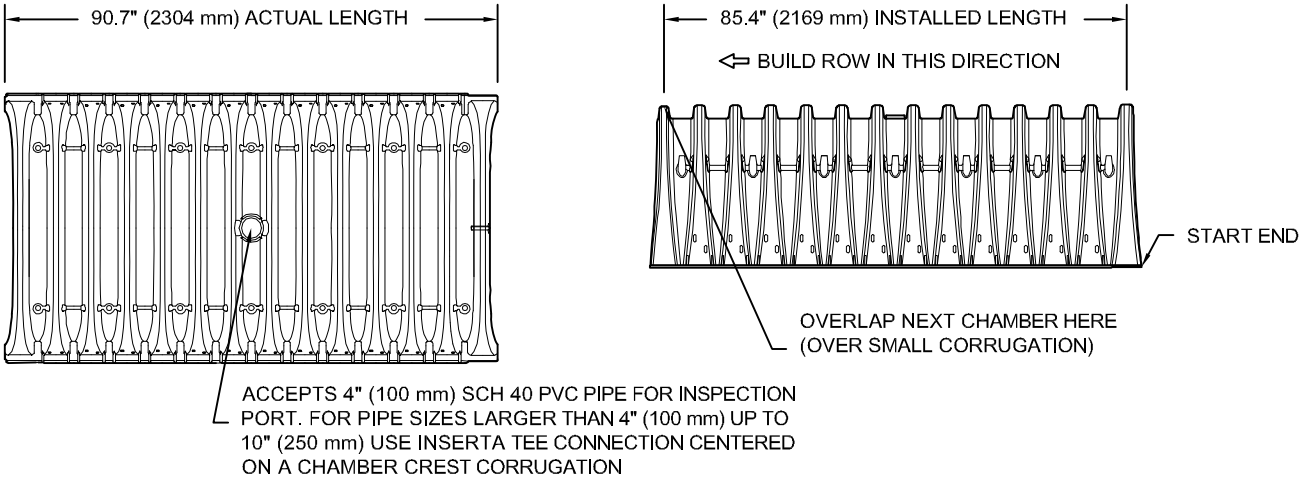
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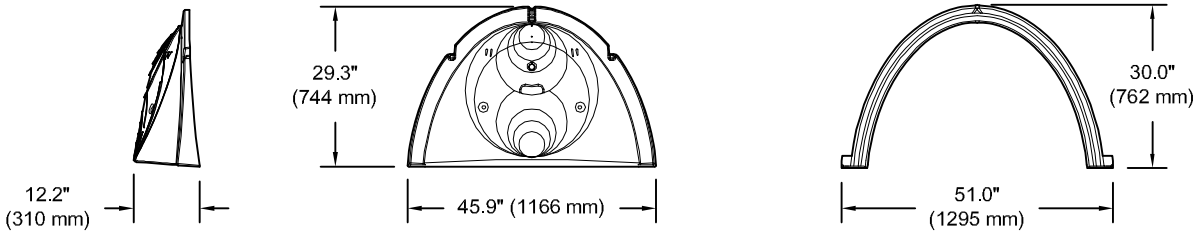
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SC-740 TECHNICAL SPECIFICATION

NTS

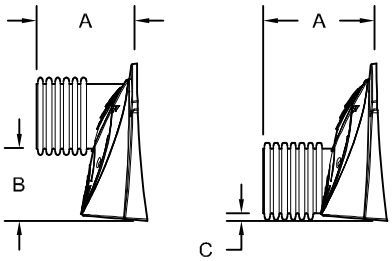




NOMINAL CHAMBER SPECIFICATIONS

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



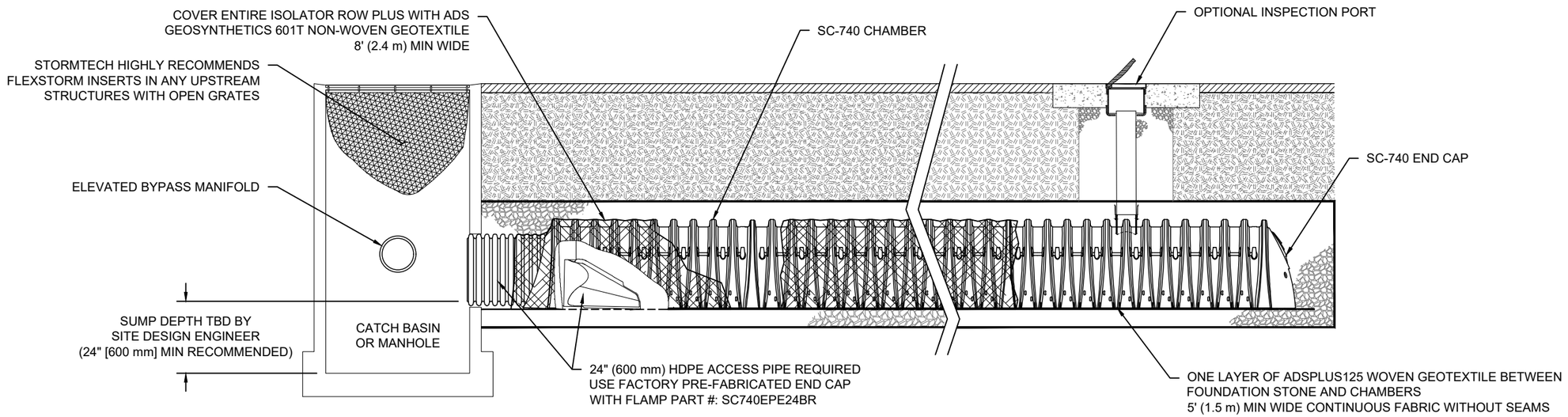
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

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

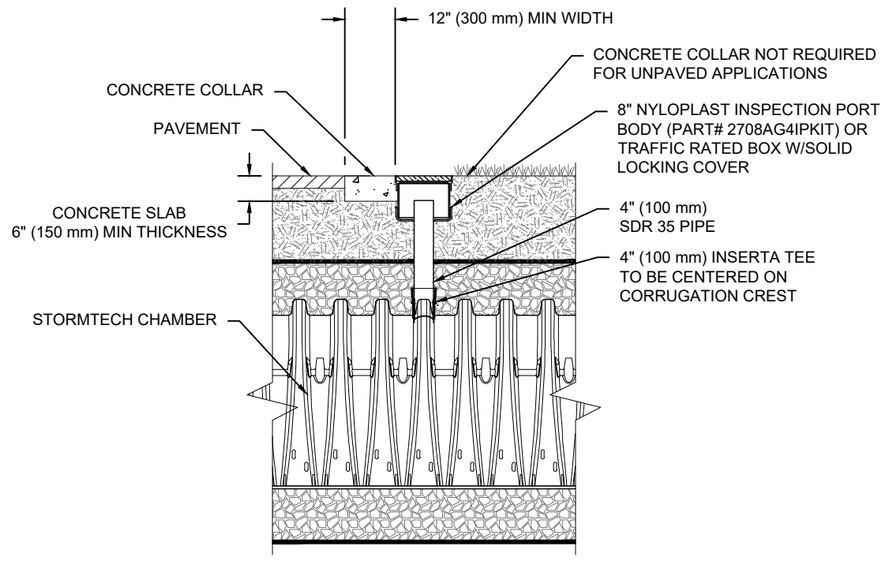
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

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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4640 TRUEMAN BLVD
HILLIARD, OH 43026

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.

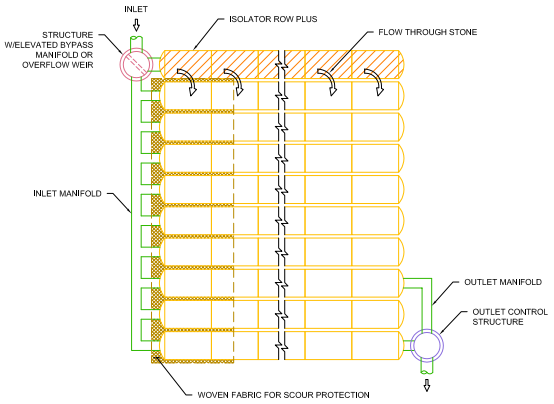
Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*



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.

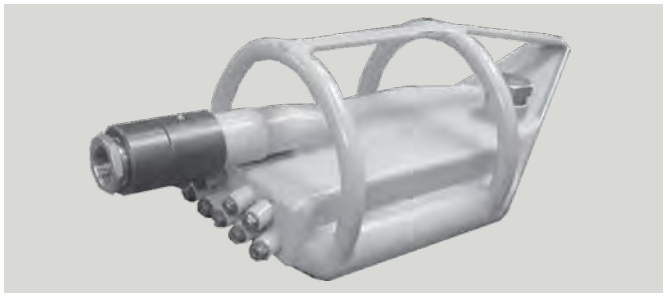
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

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.**

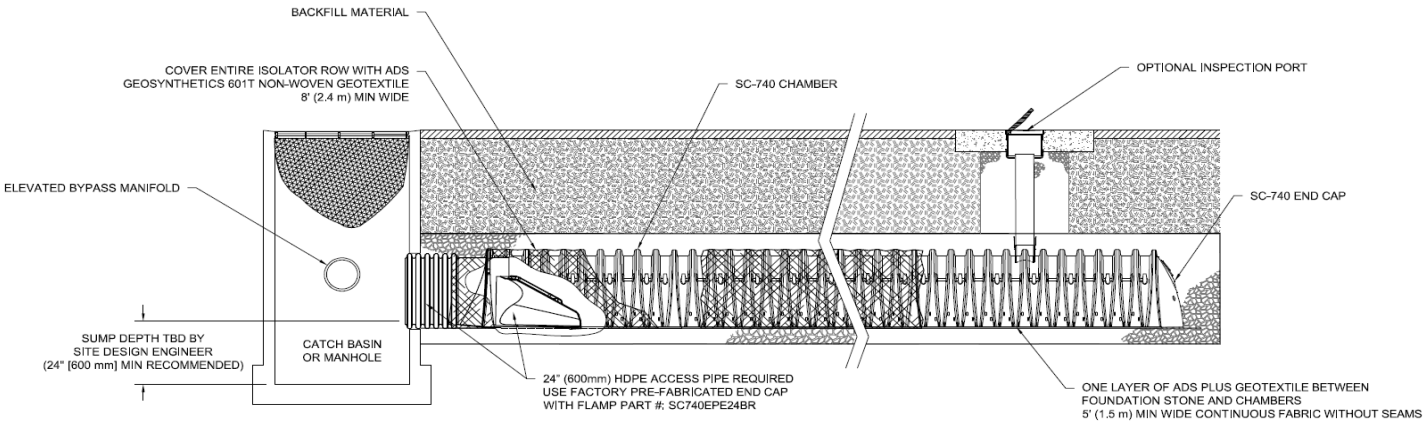






StormTech Isolator Row PLUS (*not to scale*)

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.

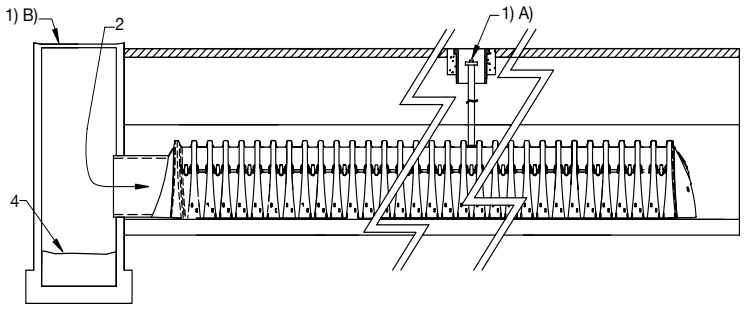
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

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.

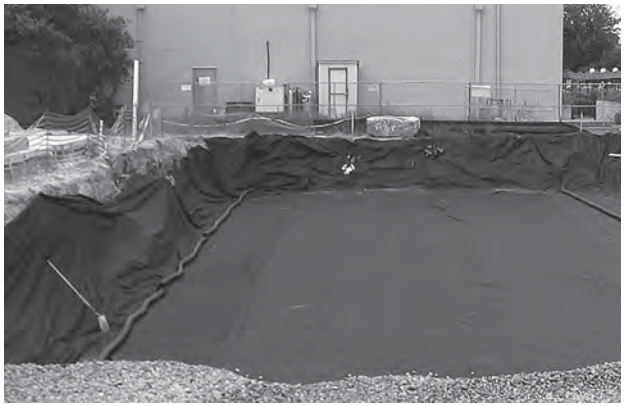
B. Use of a dozer to push embedment stone between the rows of chambers may cause damage to chambers and is not an acceptable backfill method. Any chambers damaged by using the "dump and push" method are not covered under the StormTech standard warranty.

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.

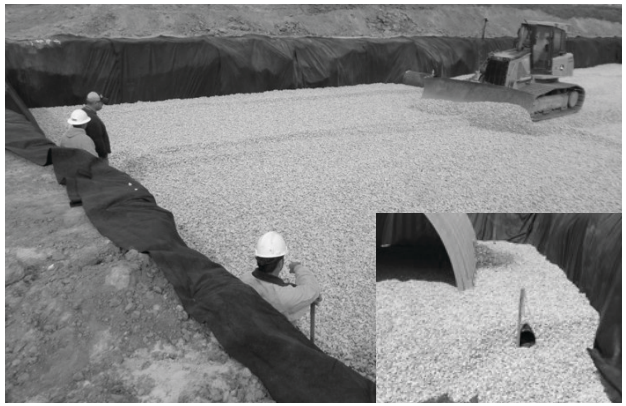
Requirements for System Installation



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)

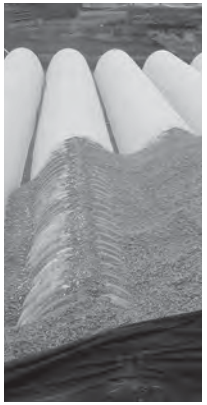
Isolator Row Plus



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





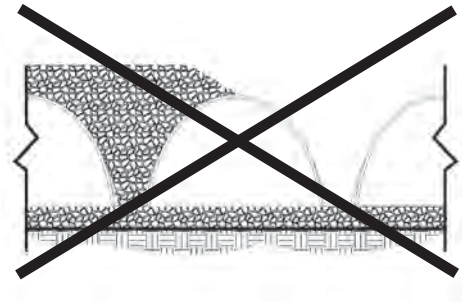
Initial embedment shall be spotted along the centerline of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.



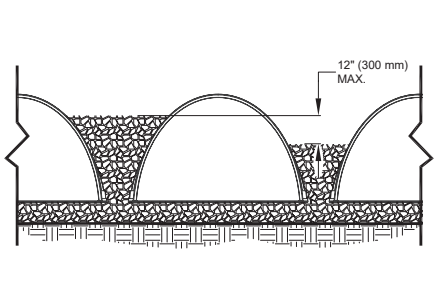


No equipment shall be operated on the bed at this stage of the installation. Excavators must be located off the bed. Dump trucks shall not dump stone directly on to the bed. Dozers or loaders are not allowed on the bed at this time.

Backfill of Chambers – Embedment Stone

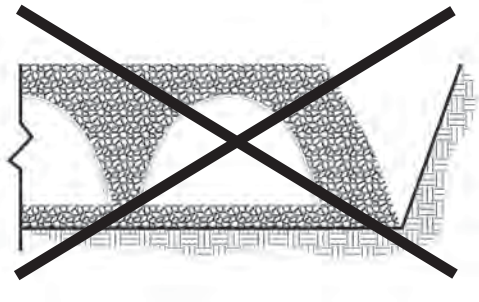


Uneven Backfill

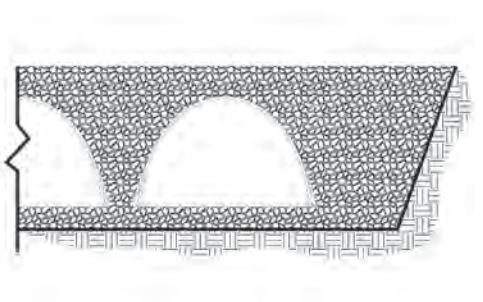


Even Backfill

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.

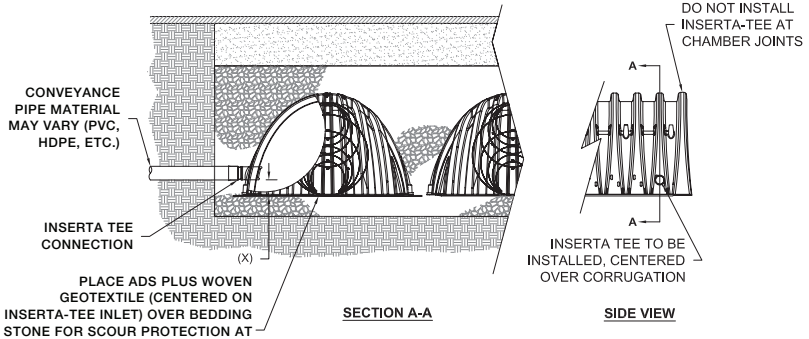
Final Backfill of Chambers – Fill Material





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

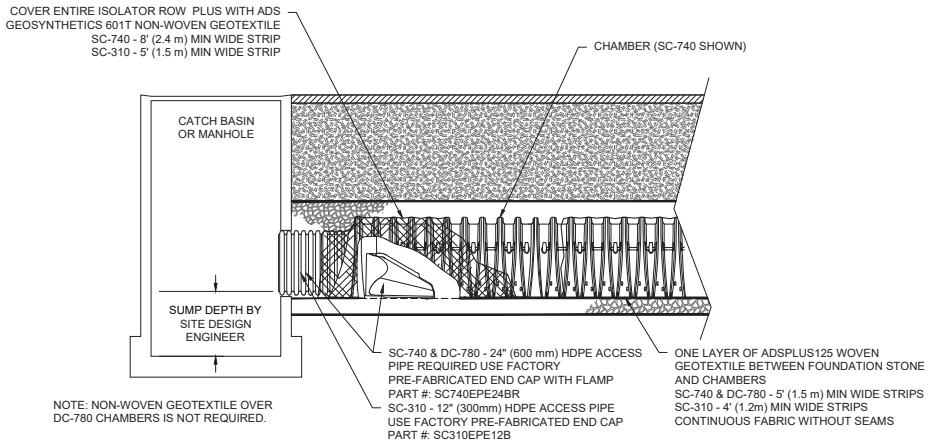


Table 1- Acceptable Fill Materials

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

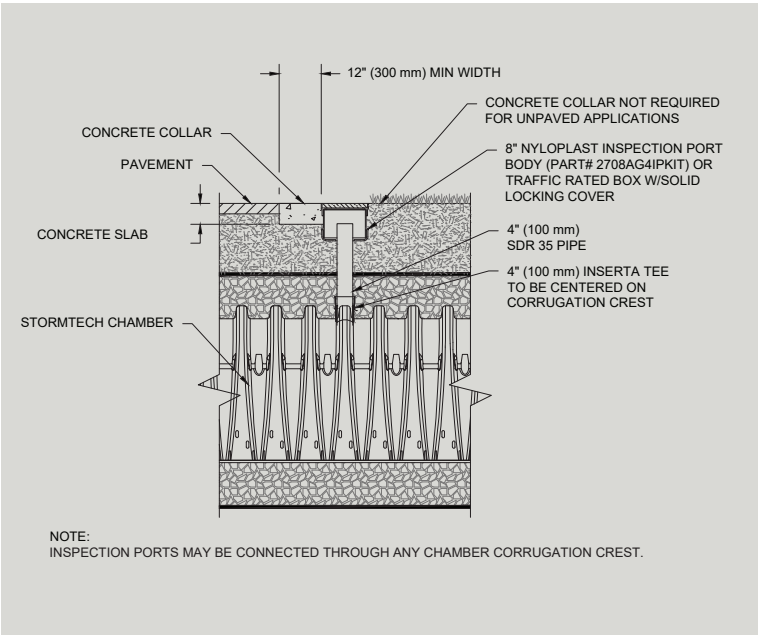
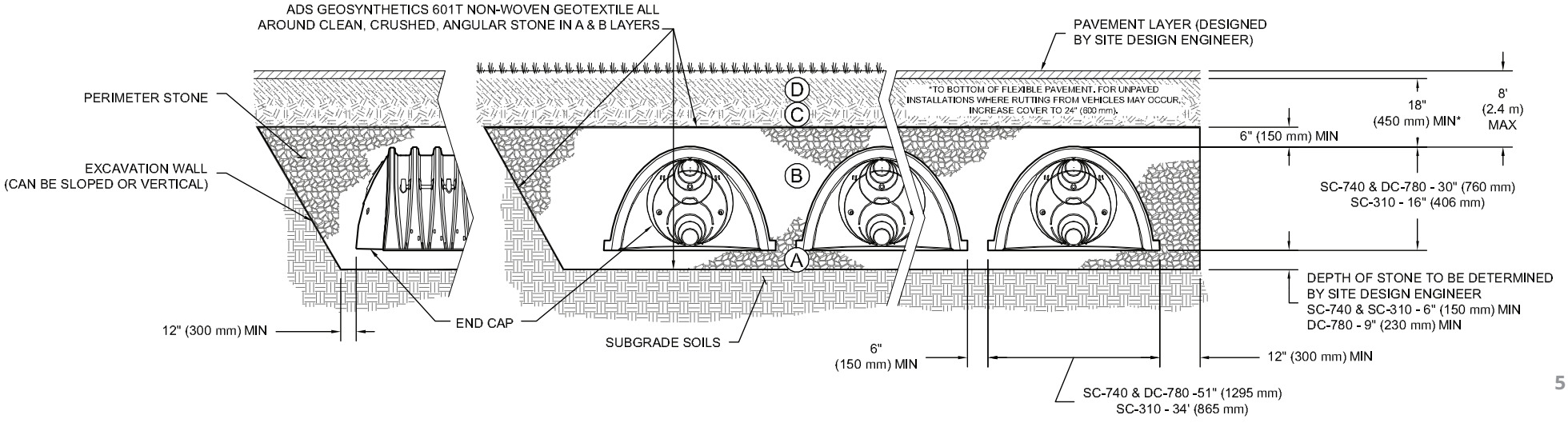


Figure 2 - Fill Material Locations



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.

Table of Contents

1.0 Introduction 2
2.0 Background 2
3.0 Implementation 2
4.0 Costs 5
5.0 Maintenance 8
Attachment A: Raw Item Costs 9
Attachment B: Subsurface Gravel Wetland Inspection and Maintenance Guidance 23
Attachment C: Results of Subsurface Gravel Wetland Inspections 26

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.

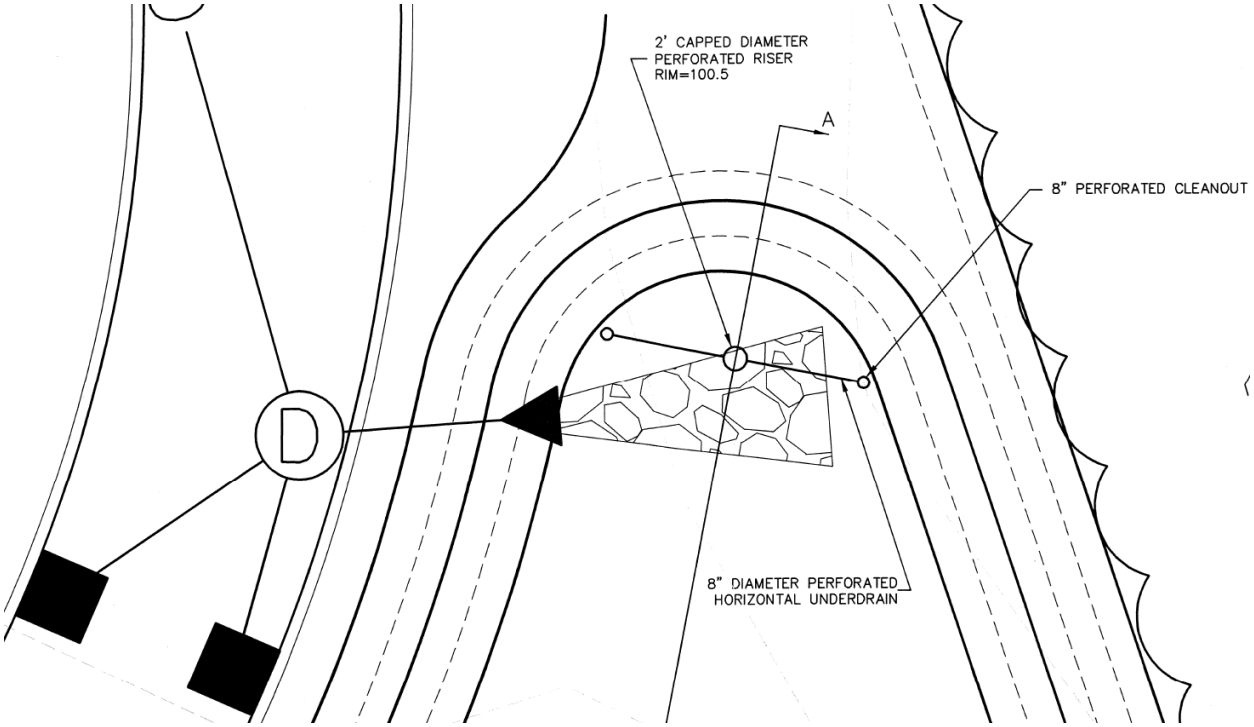


Figure 1: Typical plan view of multi-inlet configuration of a SGW system

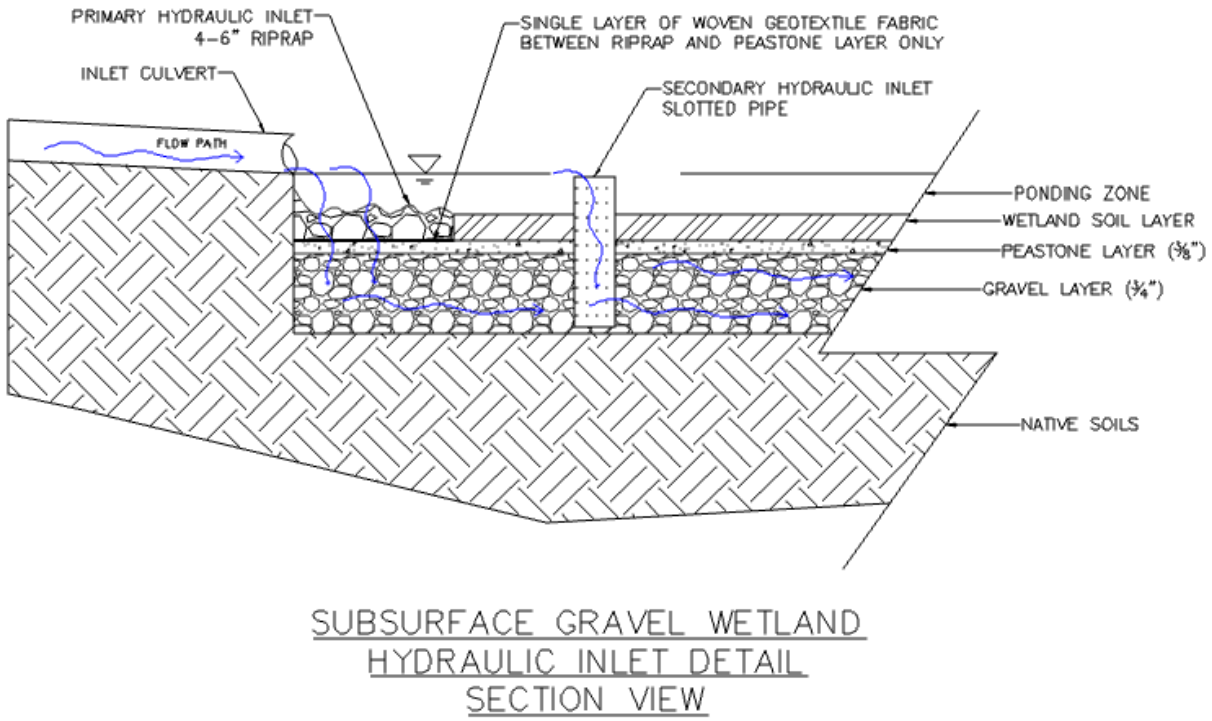


Figure 2: Typical profile view of multi-inlet configuration of a SGW system.

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

P. Salo 12/3/2013

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**

P. Salo 12/2/2013

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**

P. Salo 12/2/2013

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.

P. Salo 12/2/2013

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**

P. Salo 12/3/2013

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**

P. Salo 12/3/2013

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**

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**

P. Salo 12/2/2013

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**

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** (circled)	Fore bay has pooled water. Full of cattails.
2. Short Circuiting & Erosion			
No evidence of animal burrows or other holes	**S** (circled)	**U**	
No evidence of erosion	**S** (circled)	**U**	
3. Drought Conditions (As needed)			
Water plants as needed	**S** (circled)	**U**	
Dead or dying plants	**S** (circled)	**U**	
4. Sedimentation Chamber or Forebay Inlet Inspection			
No evidence of sediment accumulation, trash, and debris.	**S** (circled)	**U**	
Good condition, no need for repair	**S** (circled)	**U**	
5. Vegetation Coverage			
50 % coverage established throughout system by first year	**S** (circled)	**U**	
Robust coverage by year 2 or later	**S** (circled)	**U**	
6. Inlet and Outlet Controls:			
Flow is unobstructed in openings (grates, orifices, etc)	**S** (circled)	**U**	
Structures are operational with no evidence of deterioration	**S** (circled)	**U**	
7. Vegetation removal (once every 3 years)			No maintenance has been done to date.
Prune dead, diseased, or decaying plants	**S**	**U** (circled)	

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

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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: 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

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

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*
BzA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BzB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BzC	*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.

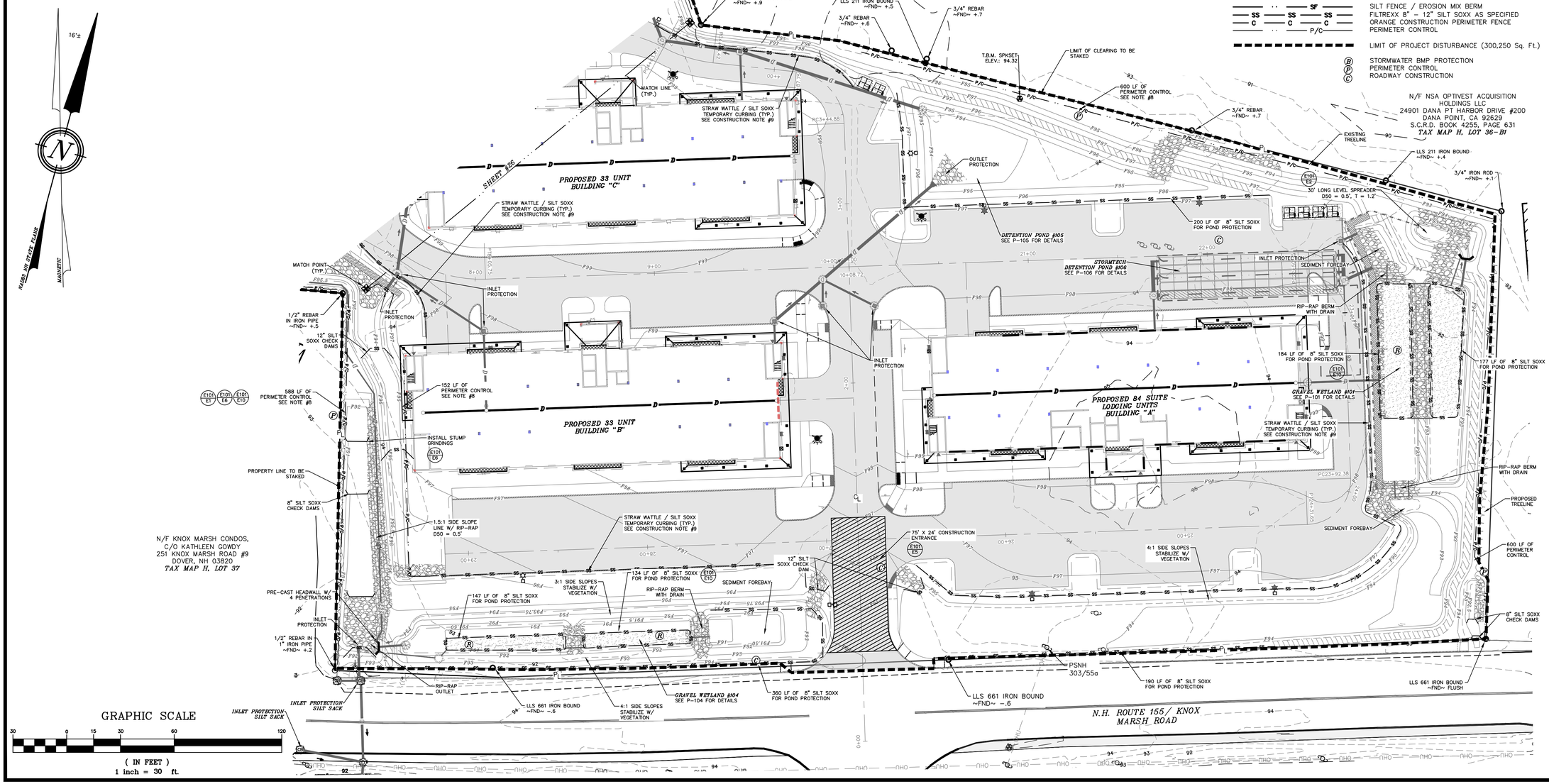
8.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL GRADE IS GREATER THAN 5%. MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL GRADE IS 5% OR LESS.

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.

NOT FOR CONSTRUCTION

PLANNING FILE #SITE–2024–0019

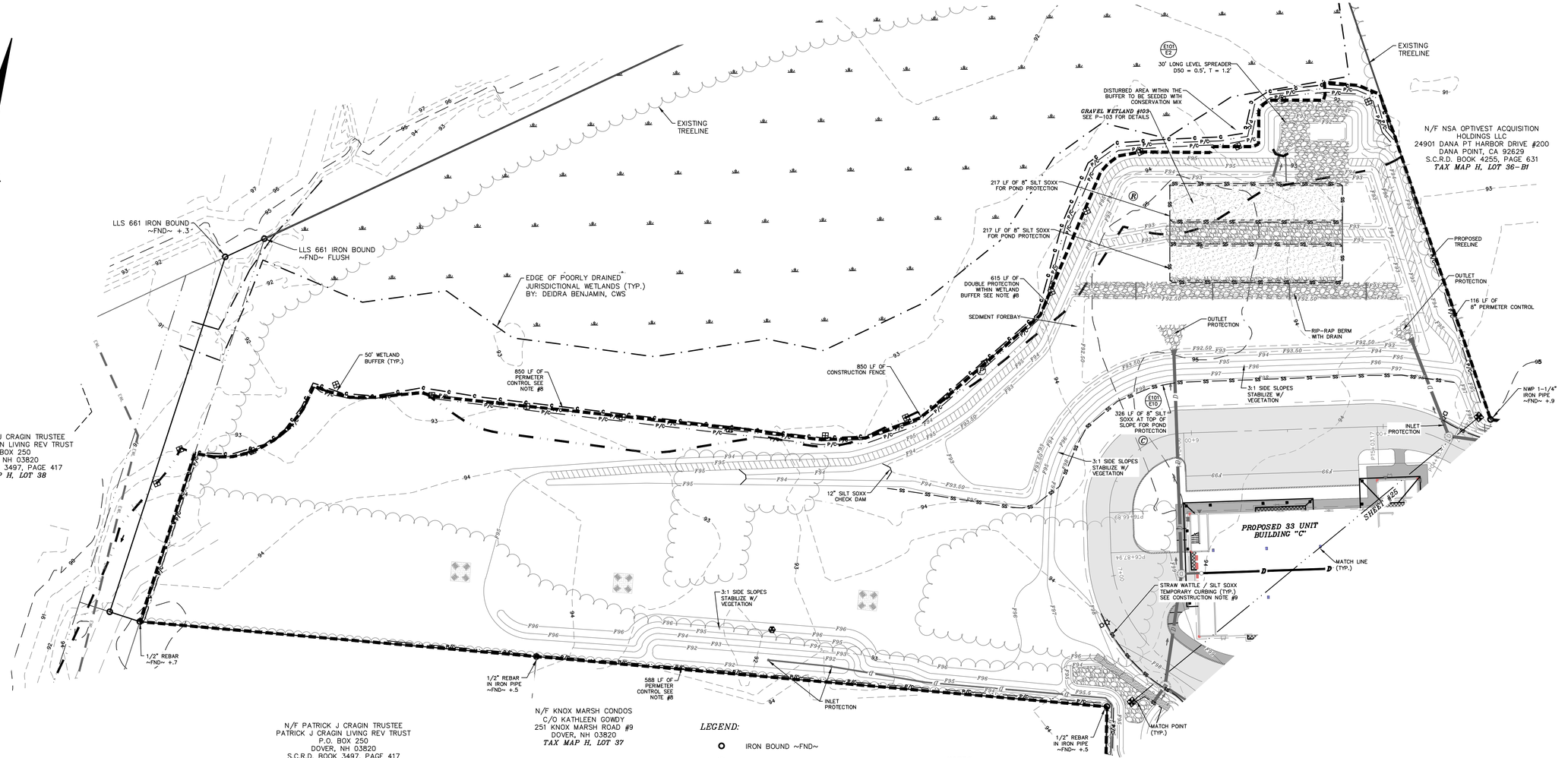
#	DATE	REVISION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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



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
BxA	BUXTON	SILT LOAM	K= 0.28
BxB	BUXTON	SILT LOAM	K= 0.49
BxC	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.

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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.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

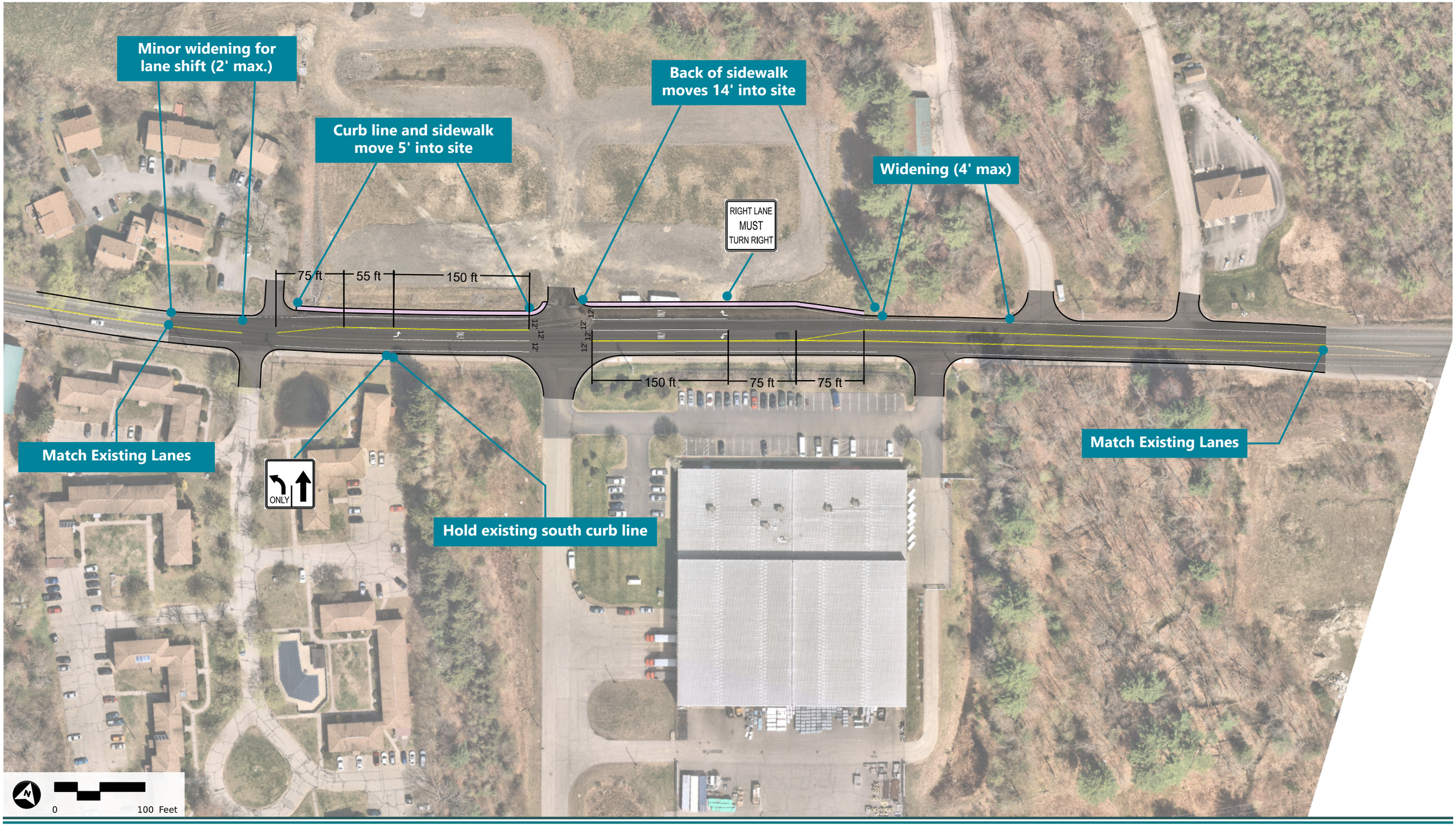
EROSION AND SEDIMENT CONTROL PLAN WEST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14243 – LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



239 Knox Marsh Road

Turn Lane Concept Graphic

DRAFT | 2/20/2026

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/February 15, 2026

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 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 (5) 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	4.84	9.64
Final Reach #200	Existing	4.02	9.00	13.30	17.49	22.58
	Proposed	1.36	3.35	9.02	15.26	22.31
Final Reach #400	Existing	0.83	2.67	4.35	5.52	6.30
	Proposed	0.57	1.97	3.31	4.16	4.91

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	0.328	0.545	0.749	1.004
Final Reach #200	Existing	0.592	1.269	1.862	2.448	3.171
	Proposed	0.465	1.090	1.636	2.163	2.808
Final Reach #400	Existing	0.145	0.387	0.618	0.855	1.158
	Proposed	0.175	0.412	0.688	0.968	1.314

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 31.3% decrease in the peak rate of runoff for the 2YR-24HR storm event, 26.2% decrease in the peak rate of stormwater runoff for the 10YR-24HR storm event, 23.9% decrease in the peak rate of runoff for the 25YR-24HR storm event, 24.6% decrease in the peak rate of runoff for the 50YR-24HR storm event, 22.1% 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.

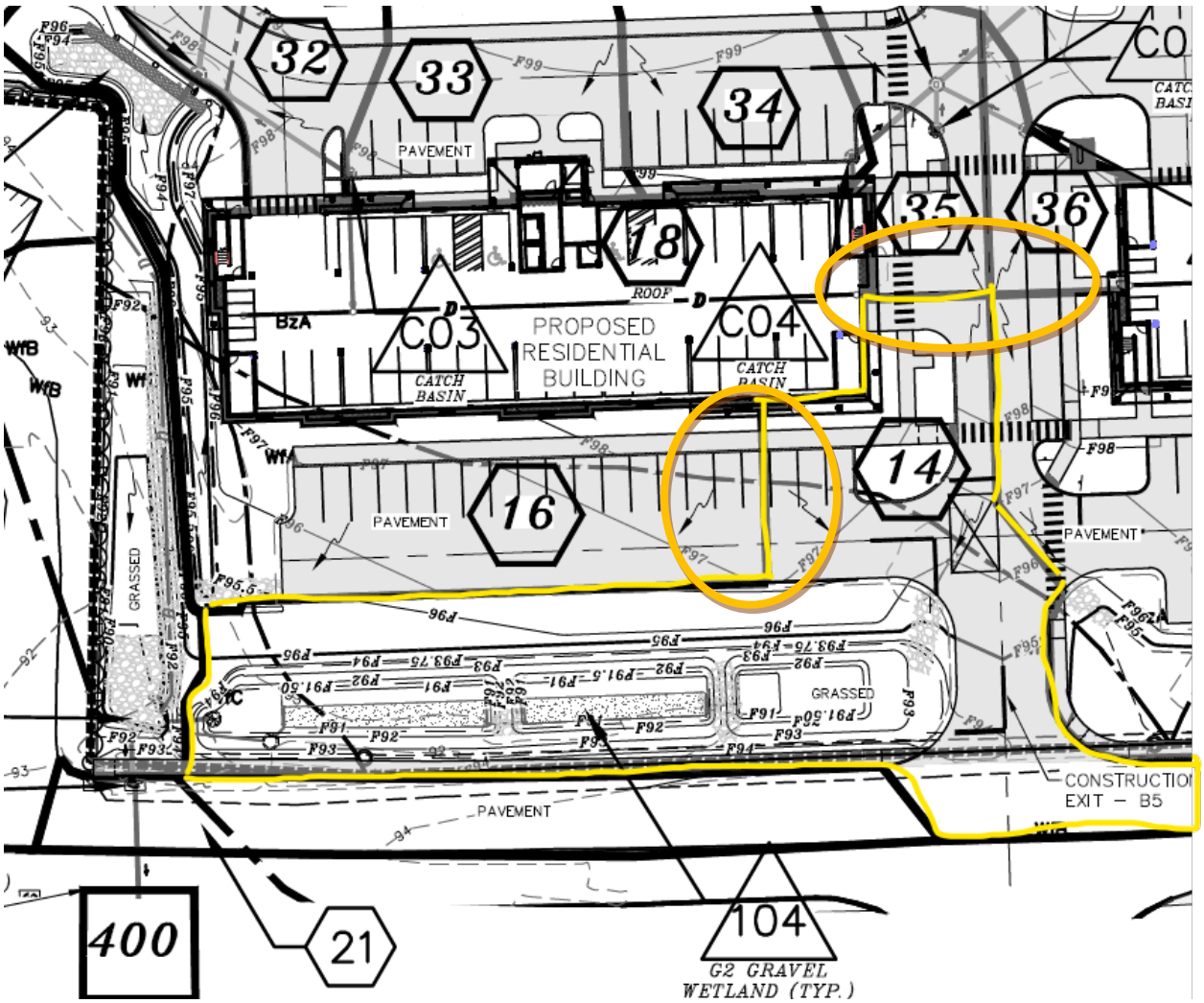


Figure 2: W2 Proposed Watershed Plan

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 11 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 Revised 2/15/26
HydroCAD® 10.20-8a s/n 07605 © 2025 HydroCAD Software Solutions LLC

Summary for Pond 104P: Gravel Wetland #104

Inflow Area = 0.585 ac, 44.16% Impervious, Inflow Depth > 2.10" for 2 YR - 24 HR event
Inflow = 1.41 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 0.02 cfs @ 23.39 hrs, Volume= 0.020 af, Atten= 99%, Lag= 678.2 min
Primary = 0.02 cfs @ 23.39 hrs, Volume= 0.020 af
Routed to Pond 4P : Pond 4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 4P : Pond 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 92.16' @ 23.39 hrs Surf.Area= 7,912 sf Storage= 3,596 cf
Flood Elev= 94.00' Surf.Area= 6,280 sf Storage= 14,640 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 (0.57CFS), 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.

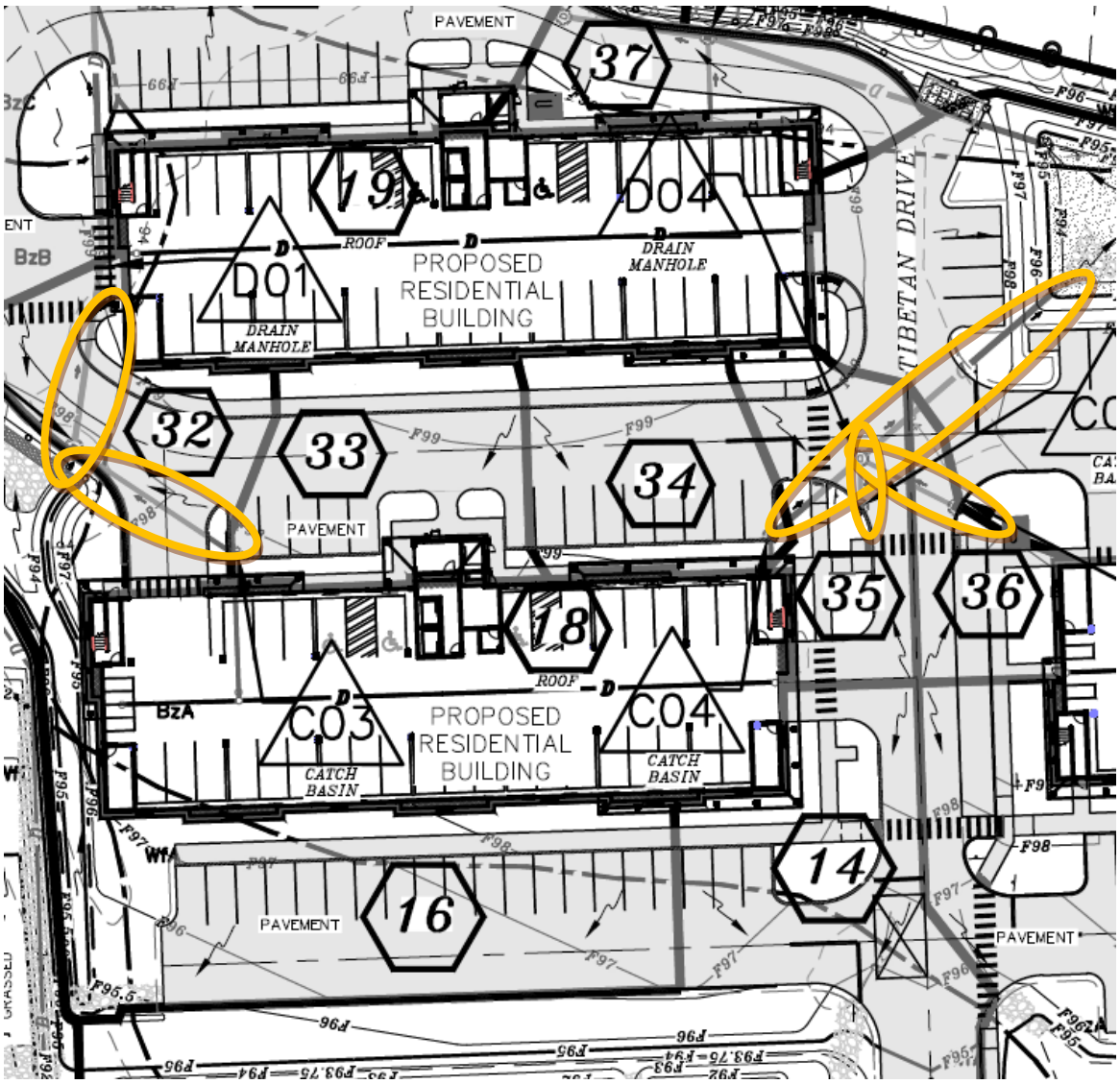


Figure 4: W2 Proposed Watershed Plan

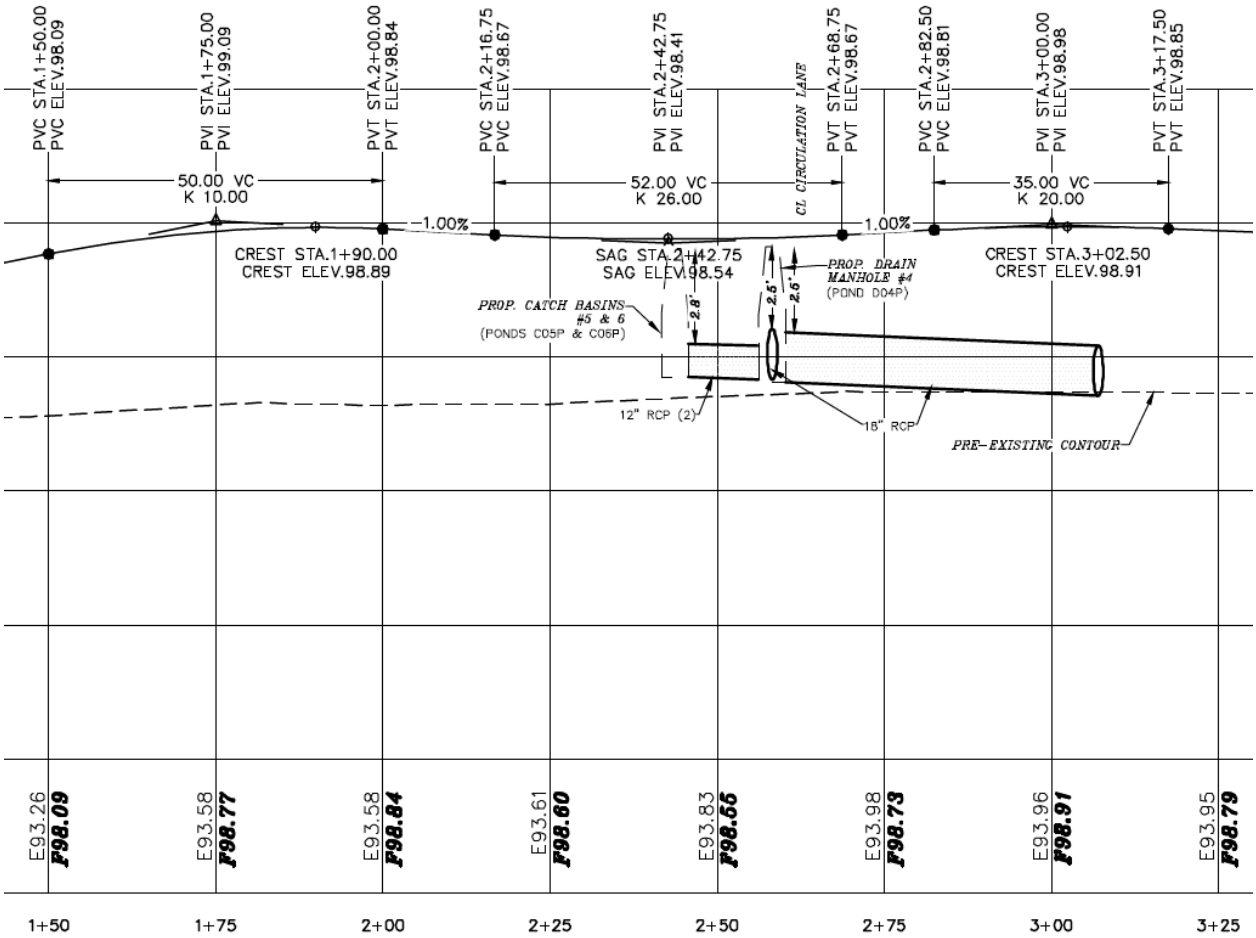


Figure 5: Tibetan Drive profile from Grading Plan sheet #13

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.

5. Identification of Waiver Request: Internal Roadway Width Site Plan Regulation 153-14-C(2)

- Proposed travel lane of Tibetan Drive of 18 feet with shoulders & curbing adjacent to and behind a portion of Building "C", where no parking spaces are proposed.
- Proposed travel lane along the eastern side of Building "A" of 18 feet with shoulders & curbing where no parking spaces are proposed.

1. Explanation:

The applicant is proposing a Portion of Tibetan Drive (3+45-5+09) and Building "A" drive lane (22+65-24+05) of less than 24' due to distance from the property line at the rear of the site and proposed elevation of the traveled way to achieve compliance with Dover Stormwater Management Regulations.

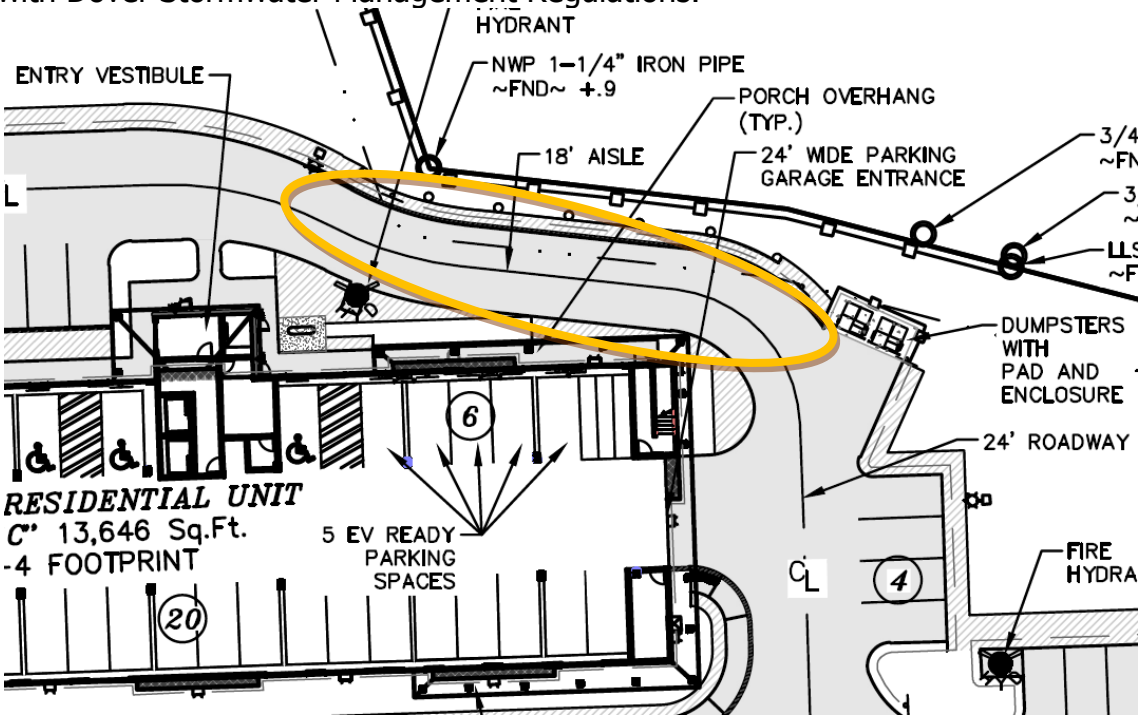


Figure 6: Tibetan Drive Overview Site Plan

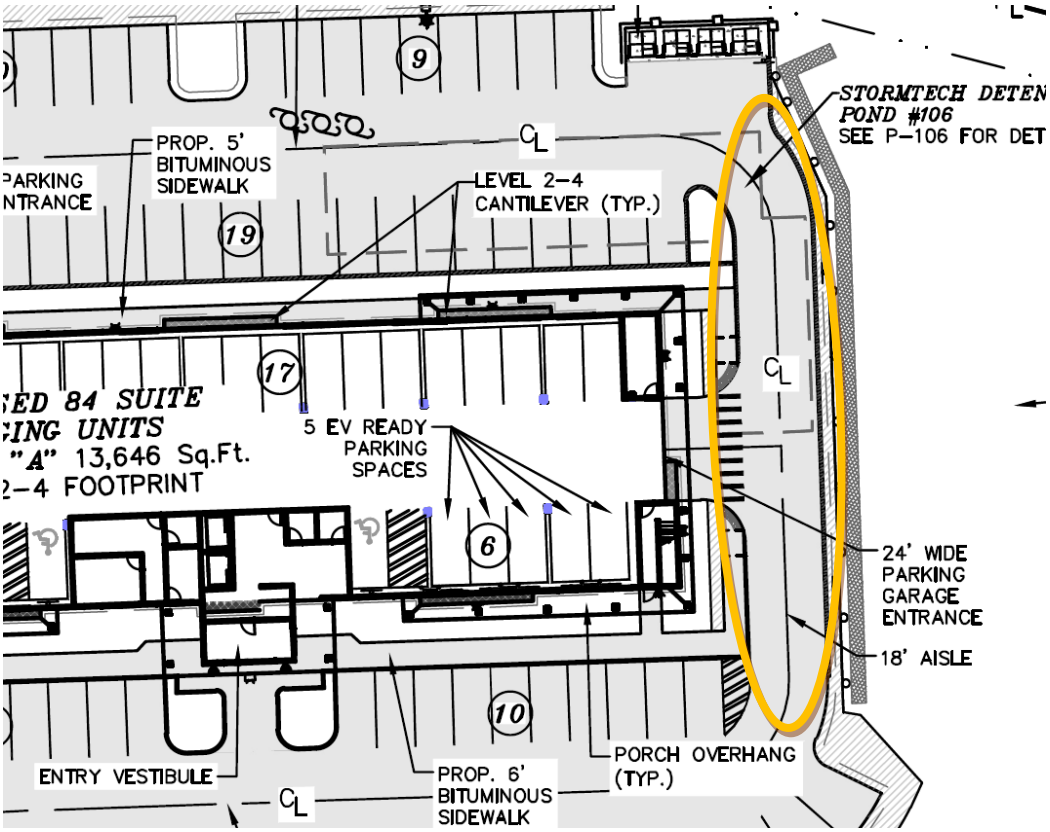


Figure 7: Tibetan Drive Overview Site Plan

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 to ensure proper vehicular access and emergency vehicle access/circulation. As demonstrated on the fire truck turning template (sheet #57), a fire truck is able to circulate around these buildings with the geometry as proposed. There are no parking spots in these areas, so vehicular movement in and out of parking spaces is not a concern at this location. The roadway is 24' wide to the south at the mouth of the parking garage entrance and is rewidened to

24’ by the time the traveled way reaching parking spaces in both situations.

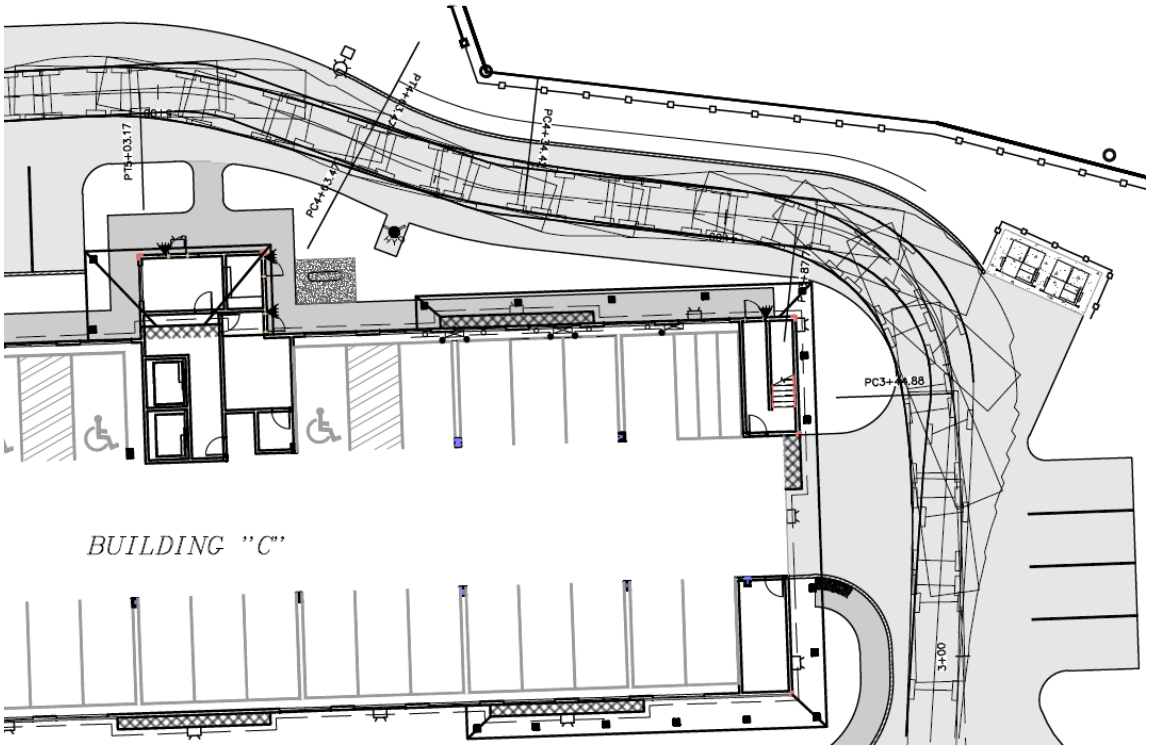


Figure 8: Tibetan Drive Fire Truck Turning Movement (sheet #57)

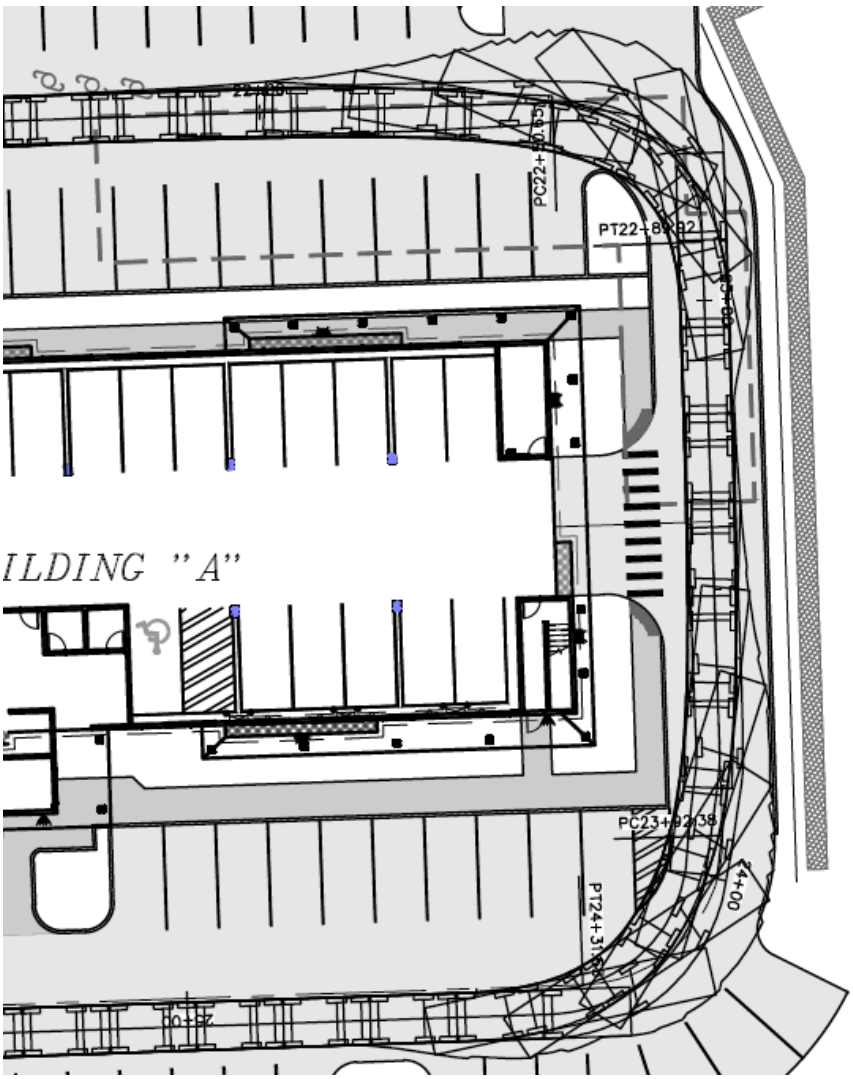


Figure 9: Tibetan Drive Fire Truck Turning Movement (sheet #57)

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 the need for a different building configuration at the rear of the site, or the site in general.

Tibetan Drive (3+45-5+09): An alternative would be to move the Site forward the necessary length to achieve the 24' traveled lane, however would decrease the available queue length at the front of the site for vehicles exiting to NH Route 155. As traffic is a noted concern for the project, the applicant feels that providing additional

queue capacity to exit the Site from the originally approved design would be a higher priority for the development. The traveled way is 18' wide to allow space for a 1.5:1 fill slope with guard rail to be graded in before the abutting property line. The site grade is filled by 4+ feet in this location to provide cover for drainage pipe, to create the storage volume for the subsurface gravel wetland at the rear of the site, and continuity with the grade of the surrounding site/buildings. This additional fill/elevation required also presents a challenge in terms of width of the roadway in this location.

Building "A" circulation (22+65-24+05): This aisle width is controlled by the requirements of Gravel Wetland #101. The constructed gravel wetland requires a 15' flow path in each of the gravel wetland cells. This gravel wetland as designed and constructed provides the minimum flow path required with no room for adjustments to the pond flow path. This includes the construction of a retaining wall and guard rail to meet the pad site elevation required to create the storage volume of the subsurface gravel wetland. An alternative would be to shift the entire site west. This would result in the entrance of Tibetan Drive not being aligned with the FW Webb driveway across the street and pose a challenge with the circulation alignment around building "C", being pinched closer to the abutting residential property (Tax Map H, Lot 37). The circulation width of 18' had been approved on previous rendition of the project.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
VP, Engineering Operations

Christopher R. Berry, LLS
Principal, President

TABLE OF CONTENTS:

SHEET 1 ~ NEIGHBORHOOD PLAN
SHEET 2 ~ PROJECT NOTES
SHEET 3 ~ BOUNDARY PLAN*
SHEET 4 ~ EXISTING CONDITIONS PLAN
SHEET 5 ~ EASEMENT PLAN*
SHEET 6 ~ SITE SPECIFIC SOILS MAP
SHEET 7 ~ CONSTRUCTION PHASING PLAN
SHEET 8 ~ DEMOLITION PLAN
SHEETS 9–11 ~ SITE PLANS
SHEETS 12–18 ~ GRADING PLANS
SHEETS 19–24 ~ STORMWATER BMP PLANS (P–101–P–106)
SHEETS 25–26 ~ EROSION & SEDIMENT CONTROL PLANS
SHEETS 27–34 ~ UTILITY PLANS
SHEET 35 ~ LIGHTING PLAN
SHEETS 36–37 ~ LANDSCAPING PLANS
SHEETS 38–40 ~ NHDOT/SIGHT DISTANCE PLANS (NHDOT–1–NHDOT–3)
SHEETS 41–42 ~ CROSS SECTIONS
SHEETS 43–44 ~ EROSION & SEDIMENT CONTROL DETAILS (E101–E102)
SHEETS 45–48 ~ CONSTRUCTION DETAILS (C101–C104)
SHEETS 49–51 ~ DRAINAGE CONSTRUCTION DETAILS (D101–D103)
SHEETS 52–53 ~ UTILITY CONSTRUCTION DETAILS (U101–U102)
SHEET 54 ~ LANDSCAPING CONSTRUCTION DETAILS (L101)
SHEET 55 ~ WILDLIFE IDENTIFICATION PLAN (W101)
SHEETS 56–57 ~ TRUCK TURNING PLANS

*DENOTES THAT A PLAN IS TO BE RECORDED AT THE S.C.R.D.

"RESIDENCES & LODGES AT KELLY BROOK"
MIXED–USE 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
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WETLAND SCIENTIST: DEIDRA BENJAMIN, CWS #295
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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

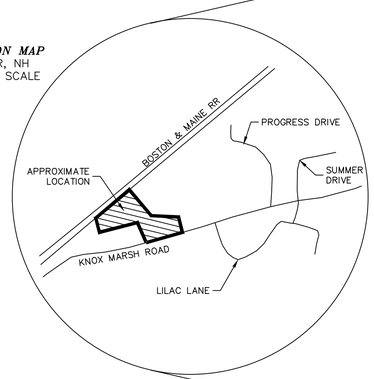
ARCHITECT: NICK ISAAK, AIA
ISAAK DESIGN, PLLC
35 OYSTER RIVER ROAD
DURHAM, NH 03824

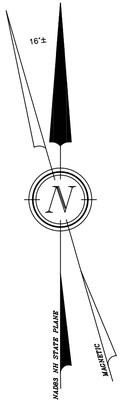
OWNER & APPLICANT:

239 KNOX MARSH REALTY, LLC
P.O. BOX 720
MIDDLETON, MA 01949

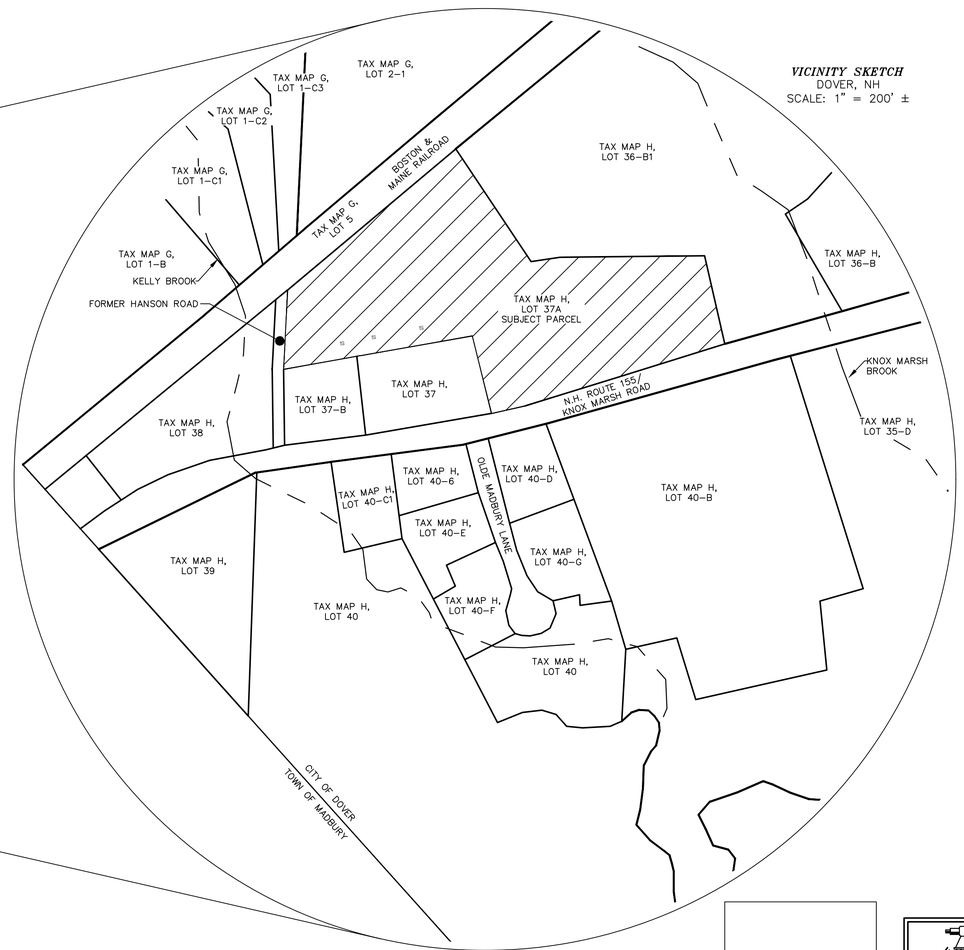
OWNER'S SIGNATURE DATE

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–2024–0019

REVISION	DATE	DESCRIPTION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

MIXED–USE 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. 14233 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
- E175.31 — EXISTING SPOT GRADE
- F175.31 — 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", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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:

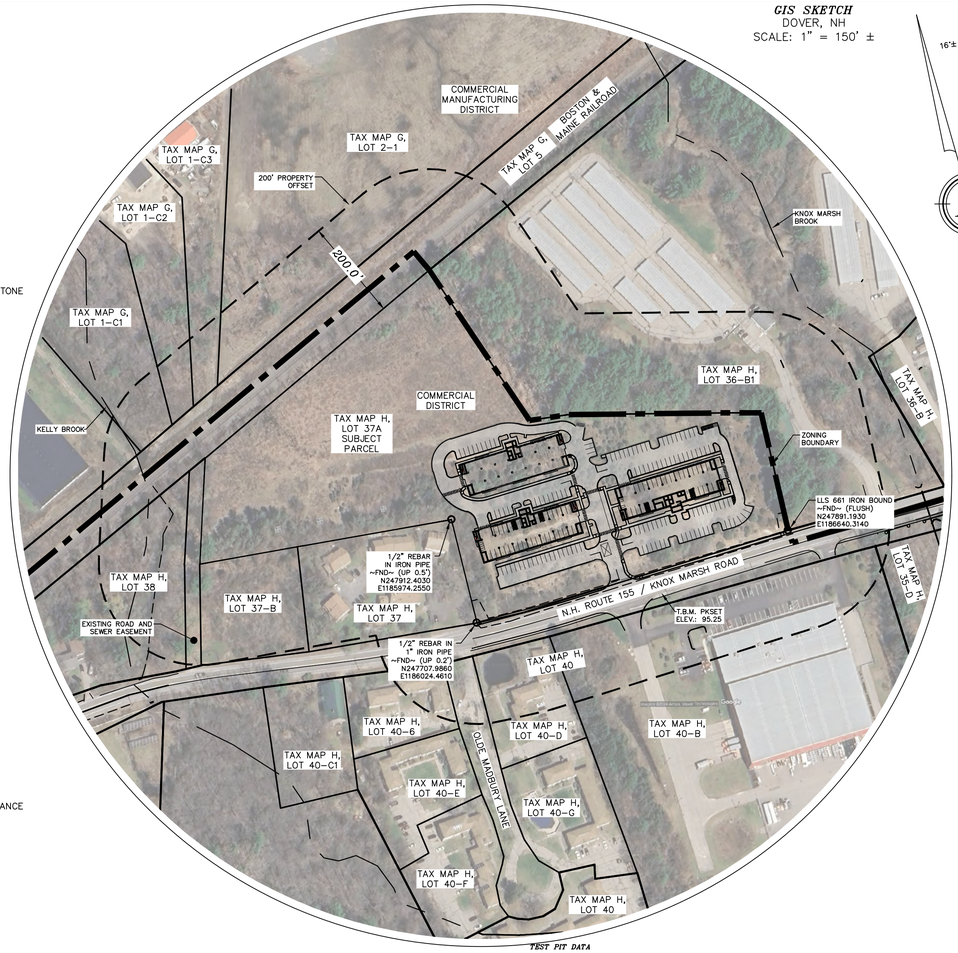
- KF – FEATHER REED GRASS

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 BROW, NTNE 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 BROW, 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–2024–0019

#	REVISION	DATE	DESCRIPTION
1		02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 14243 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

SITE PLAN NOTES:

1.) OWNER / APPLICANT: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 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, 5.) PROVIDED:
SECONDARY GROUNDWATER RECHARGE

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 PREVIOUS APPROVAL
MAX. BUILDING HEIGHT: 40'	44'6"-CASE ZONE-2024-0033 WAS APPROVED ON JULY 18, 2024
MAX. LOT COVERAGE: 50%	11.4%
MAX. IMPERVIOUS COVERAGE: 20%	31.6%-PREVIOUS CUP APPROVED FOR 33.8% (P22-46) NEW APPROVAL NOT REQUIRED.

6.) THE INTENT OF THIS PLAN IS TO SHOW A MIXED-USE SITE PLAN PROJECT IN THE COMMERCIAL 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.) UST 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:

14.) ALL THREE (3) BUILDINGS, IN COMBINATION, MUST MAINTAIN THE SAME, OR GREATER, PERCENTAGE OF COMMERCIAL USE (sf/3RD IN PERPETUITY). OTHERWISE, AN ADDITIONAL VARIANCE(S) WOULD BE REQUIRED;

15.) THE COMMERCIAL BUILDINGS (NN) TO BE UNDER CONSTRUCTION (MEANING BUILDING PERMITS ISSUED, FOUNDATION POURED, WALLS BEING FRAMED, ECT.) PRIOR TO THE BUILDING PERMITS BEING ISSUED FOR THE RESIDENTIAL BUILDINGS. ANY CHANGE OF USE TO BUILDING A MAY BE SUBJECT TO PLANNING DEPARTMENT AND PLANNING BOARD REVIEW.

16.) CONDITIONAL USE PERMIT-P21-05 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 10,699 Sq. Ft. OF WETLAND BUFFER DISTURBANCE. THE PROJECT AS PROPOSED COMPLIES WITH THIS CUP NO ADDITIONAL WETLAND BUFFER IMPACTS ARE PROPOSED.

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. THE PROJECT AS PROPOSED COMPLIES WITH THIS CUP, AS A REDUCTION IN IMPERVIOUS SURFACE FROM THE ORIGINAL APPROVAL IS PROPOSED.

17.) 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 L.L.S. OR P.E. DIGITAL FILES SHALL BE GEO-REFERENCED TO NEW HAMPSHIRE STATE PLANE COORDINATES NAD83 AND SHALL BE EXPRESSED IN FEET.

18.) 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.

19.) 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.

20.) 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.

21.) 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.

22.) ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.

23.) 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 #46)

24.) 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.

25.) 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 DIRECTOR OF PLANNING AND COMMUNITY DEVELOPMENT.

26.) BUILDING ADDRESSES SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

27.) THE PROPOSED USE FOR THE SITE IS 84 SUITE LODGING UNITS IN ONE BUILDING AND 66 UNITS BETWEEN TWO BUILDINGS (33 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.

28.) 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	AoT-2183-A (TO BE AMENDED)
~	US EPA NOI & SWPPP	NHR10010U (SWPPP ADDENDUM REQUIRED)
~	NATURAL HERITAGE BUREAU	NHB22-0387
~	NH DIVISION OF HISTORICAL RESOURCES	DHR #10630
~	NHDOT DRIVEWAY PERMIT	06-125-415 (TO BE AMENDED)

29.) COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

30.) ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

31.) ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

32.) 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.

33.) FIRE DEPARTMENT ACCESS ROADS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.

34.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

35.) APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR DOMESTIC WATER LINES.

36.) SITE IS TO COMPLY WITH NFPA 1 CHAPTER 18.

37.) 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.

38.) 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

SITE PLAN NOTES CONTINUED:

39.) 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.

40.) 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.

41.) 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.

42.) 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.

43.) 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.

44.) HEATING & COOLING FOR PROPOSED UNITS IS TO BE DONE VIA UNITS LOCATED ON THE ROOFS, SCREENED BY PARAPET.

45.) THE BUILDINGS ARE DESIGNED AS SLAB ON GRADE CONSTRUCTION WITH STANDARD 4' FROST WALLS.

46.) 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"

47.) SIXTEEN (16) EV PARKING SPACES ARE PROVIDED.

48.) THE OWNERS AND THEIR SUCCESSORS ARE RESPONSIBLE FOR THE LIFETIME MAINTENANCE OF ALL BUFFERING AND INTERNAL LANDSCAPING.

49.) THE PERIMETER BOUNDARY WILL BE STAKED OUT BY BERRY SURVEYING & ENGINEERING PRIOR TO THE START OF CONSTRUCTION.

50.) THE APPLICANT IS TO PROVIDE SURETY WITHIN THE CONFINES OF NH RSA 674:36.

51.) 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 LIFTMATE 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.) 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 REVEW 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 REVEWED 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 (PESC), A CERTIFIED EROSION SEDIMENT AND STORMWATER INSPECTOR (CESSW), 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 EFFECTIVE 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 BUILDING CONSTRUCTION.

15.) CURB BOXES SHOULD BE PLACED IN THE LAWN AREA, OR IF PLACED IN PAVEMENT, A ROAD BOX IS REQUIRED.

16.) SEE PRE-EXISTING CONDITIONS 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.

17.) MINIMUM SLOPE FOR ALL SEWER PIPE IS TO BE NO LESS THAN 0.004'/_.

18.) 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.

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

20.) CONTRACTOR TO TRANSFER TEMPORARY BENCHMARK TO A SUITABLE BENCHMARK TO CONTROL CONSTRUCTION. ANY ELEVATION DISCREPANCIES ARE TO BE REPORTED

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

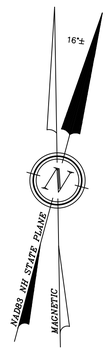
6.) "LOT LINE ADJUSTMENT PLAN, ROUTE 155 – KNOX MARSH ROAD, DOVER, N.H., FOR SOUTHWEST PARTNERS REALTY L.L.C."
BY: NORWAY PLAINS ASSOCIATES, INC.
DATED: APRIL 2000
FILE NUMBER 303
S.C.R.D.: PLAN # 59–47

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.

N/F BOSTON & MAINE RAILROAD,
IRON HORSE PARK
500 WATER STREET, J–910
JACKSONVILLE, FL 32202
TAX MAP G, 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

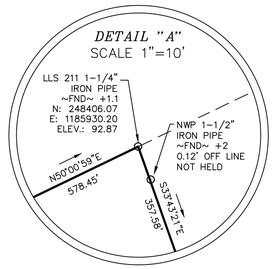
N/F NSA OPTIVEST ACQUISITION HOLDINGS LLC
24901 DANA PT HARBOR DRIVE #200
DANA POINT, CA 92629
S.C.R.D. BOOK 4255, PAGE 631
TAX MAP H, LOT 36–B1

N50°00'59"E
578.45'

S33°43'01"E
357.58'

EXISTING PERIMETER BOUNDARY

DETAIL "A"
SCALE 1"=10'



NWP 1–1/4" IRON PIPE
~FND~ +.9

N89°30'59"E
49.94'

N81°26'28"E
77.37'

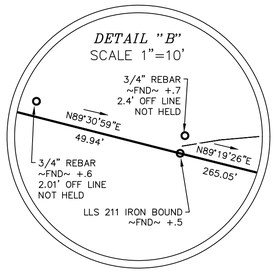
3/4" REBAR
~T.B.S.~

LLS 211 IRON BOUND
~FND~ +.5
HELD
SEE DETAIL "B"

3/4" REBAR
~FND~ +.7
2.4' OFF LINE
NOT HELD
SEE DETAIL "B"

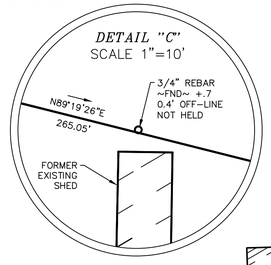
3/4" REBAR
~FND~ +.6
2.01' OFF LINE
NOT HELD
SEE DETAIL "B"

DETAIL "B"
SCALE 1"=10'



3/4" REBAR
~FND~ +.7
0.4' OFF–LINE
NOT HELD
SEE DETAIL "C"

DETAIL "C"
SCALE 1"=10'



FORMER EXISTING SHED

N89°19'26"E
265.05'

OLD UTILITY POLE

LLS 211 IRON BOUND
~FND~ +.4

N89°49'54"E
66.73'

3/4" IRON ROD
~FND~ +.1

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

238.77'
S1°25'13"E

FORMER EXISTING HOUSE

FORMER DRIVEWAY LOCATION

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

FORMER E.O.P.

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

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

N50°00'30"E
22.57'

LLS 661 IRON BOUND
~FND~ FLUSH

LLS 661 IRON BOUND
~FND~ +.3

N01°01'12"E
194.48'

N87°01'49"W
16.54'

1/2" REBAR
~FND~ +.7

207.44'
S80°01'53"W

1/2" REBAR
IN IRON PIPE
~FND~ +.5

298.49'
S80°01'48"W

1/2" REBAR
IN IRON PIPE
~FND~ +.5

HANSON ROAD

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

N/F KNOX MARSH CONDOS,
C/O KATHLEEN GOWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

EXISTING BUILDING

EXISTING MONUMENT

EVERSOURCE
303/62A

PSNH
303/62

PSC NH
303/62

PSNH 303/61

NET
146/48

VZ 48

PSNH
303/59

N13°47'57"W
210.49'

EASEMENT TO BE GRANTED TO NHDOT PER EXISTING PERMIT

1/2" REBAR IN 1" IRON PIPE
~FND~ +.2
DESTROYED 2024
TO BE RESET

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

PSNH
303/55a

91.59'
251.12'
300.08'
S77°25'30"W
S72°45'55"W
S72°46'28"W

N.H. ROUTE 155/ KNOX MARSH ROAD

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

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

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

PSNH
303/53

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.

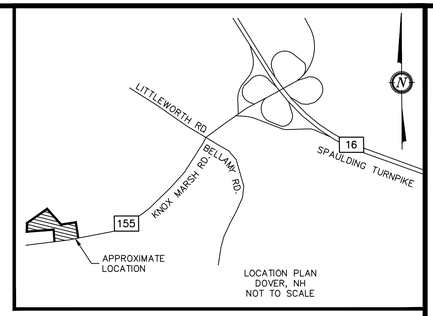
7.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN SPRING 2020 WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

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–2024–0019

#	DATE	DESCRIPTION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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.

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

DEIDRA BENJAMIN, CWS #295

SOILS:

BxA – 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

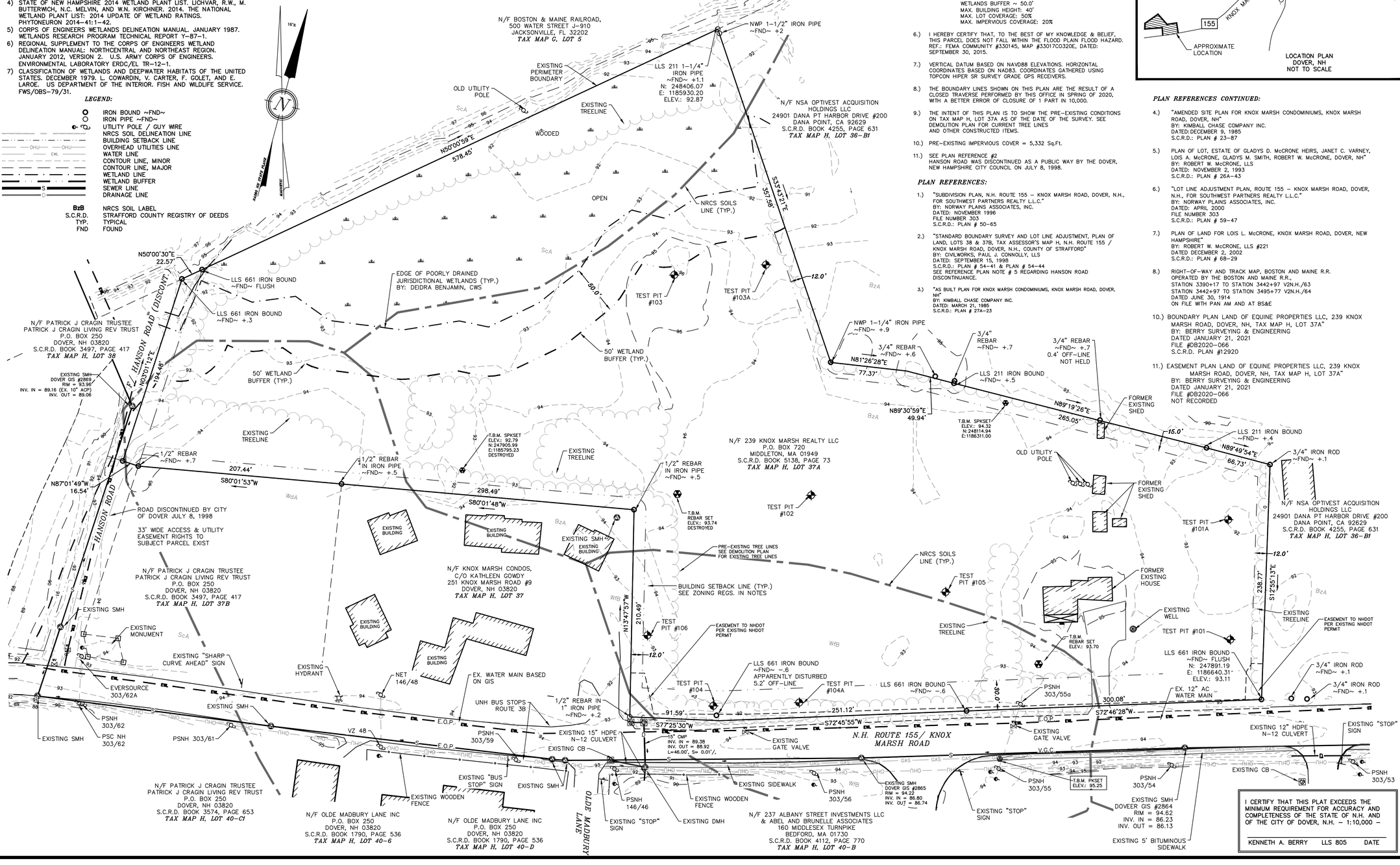
SEE WEBSOIL USDA–NRCS

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

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- UTILITY POLE / GUY WIRE
- NRCS SOIL DELINEATION LINE
- BUILDING SETBACK LINE
- OHU — OVERHEAD UTILITIES LINE
- DRL — WATER LINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- WETLAND LINE
- WETLAND BUFFER
- S — SEWER LINE
- D — DRAINAGE LINE

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: 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

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.

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

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

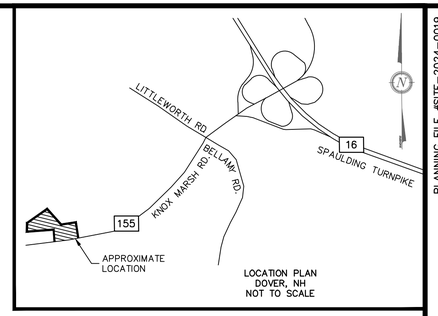
6.) "LOT LINE ADJUSTMENT PLAN, ROUTE 155 – KNOX MARSH ROAD, DOVER, N.H., FOR SOUTHWEST PARTNERS REALTY L.L.C."
BY: NORWAY PLAINS ASSOCIATES, INC.
DATED: APRIL 2000
FILE NUMBER 303
S.C.R.D.: PLAN # 59–47

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



LOCATION PLAN
DOVER, NH
NOT TO SCALE

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–2024–0019

#	DATE	REVISION / DESCRIPTION
1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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 57

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°±

NAD83 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

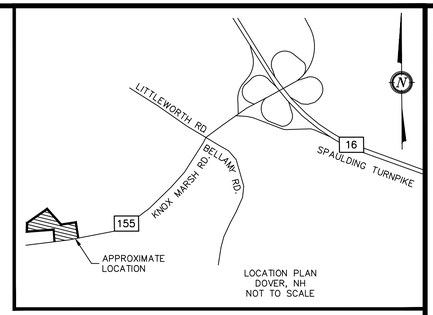
2.) TAX MAP H, LOT 37A

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°18'14"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

LLS 661 IRON BOUND ~FND~ -.6 DESTROYED TO BE RESET

S73°17'34"W 515.69'

PSNH 303/55a

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

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

F.W. WEBB DRIVEWAY

PSNH 303/56

PSNH 303/55

PSNH 303/54

F.W. WEBB DRIVEWAY

PSNH 303/53

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

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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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 No. 805 LICENSED LAND SURVEYOR 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

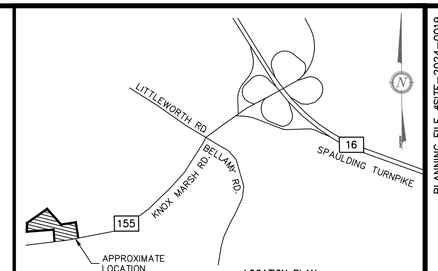
SLOPE: A = 0–3% B = 3–8% C = 8–15% D = 15–25% E = 25–50% F = 50%+

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.

N/F BOSTON & MAINE RAILROAD,
500 WATER STREET J-910
JACKSONVILLE, FL 32202
TAX MAP G, LOT 5

OLD UTILITY POLE

USDA/NRCS WEBSOIL SOIL DELINEATION

EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: DEIDRA BENJAMIN, CWS

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

TEST PIT #103A

TEST PIT #103

LLS 661 IRON BOUND ~FND~ FLUSH

LLS 661 IRON BOUND ~FND~ +.3

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

50' WETLAND BUFFER (TYP.)

NON JURISDICTIONAL POORLY DRAINED

T.B.M. SPKSET ELEV.: 92.79 N:247905.99 E:1185795.23 DESTROYED

1/2" REBAR ~FND~ +.7

1/2" REBAR IN IRON PIPE ~FND~ +.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

OFFSITE SOIL USDA/NRCS WEBSOIL

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

1/2" REBAR IN IRON PIPE ~FND~ +.5

TEST PIT #102

N/F KNOX MARSH CONDOS,
C/O KATHLEEN GOWDY
251 KNOX MARSH ROAD #9
DOVER, NH 03820
TAX MAP H, LOT 37

TEST PIT #106

TEST PIT #104

TEST PIT #104A

1/2" REBAR IN 1" IRON PIPE ~FND~ +.2 DESTROYED TO BE RESET

LLS 661 IRON BOUND ~FND~ -.6 DESTROYED TO BE RESET

PSNH 303/55a

PSNH 146/46

PSNH 303/56

PSNH 303/55

T.B.M. PKSET ELEV.: 95.25

N.H. ROUTE 155/ KNOX MARSH ROAD

PSNH 303/54

PSNH 303/53

NWP 1-1/4" IRON PIPE ~FND~ +.9

3/4" REBAR ~FND~ +.6

3/4" REBAR ~FND~ +.7

3/4" REBAR ~FND~ +.7 0.4' OFF-LINE NOT HELD

LLS 211 IRON BOUND ~FND~ +.5

T.B.M. SPKSET ELEV.: 94.32 N:248114.94 E:1186311.00

FORMER EXISTING SHED

LLS 211 IRON BOUND ~FND~ +.4

3/4" IRON ROD ~FND~ +.1

OLD UTILITY POLE

FORMER EXISTING SHED

TEST PIT #101A

LIMIT OF SOIL SURVEY

TEST PIT #105

FORMER EXISTING HOUSE

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

TEST PIT #101

LLS 661 IRON BOUND ~FND~ FLUSH N: 247891.19 E: 1186640.31 ELEV.: 93.11

FORMER DRIVEWAY LOCATION

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. 087
CERTIFIED SOIL SCIENTIST

JOHN P. HAYES III, CSS #87

PLANNING FILE #SITE--2024--0019

REVISION	DATE	DESCRIPTION
#1	02--15--26	REVISED UNIT COUNT & PROJECT LAYOUT

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 57

NOT FOR CONSTRUCTION

NOTES:

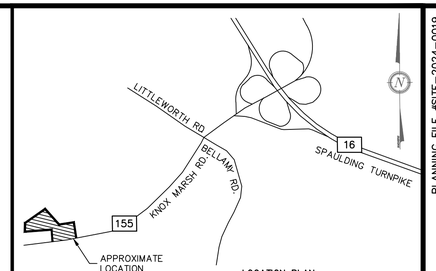
1.) OWNER: 239 KNOX MARSH REALTY LLC
P.O. BOX 720
MIDDLETON, MA 01949

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,

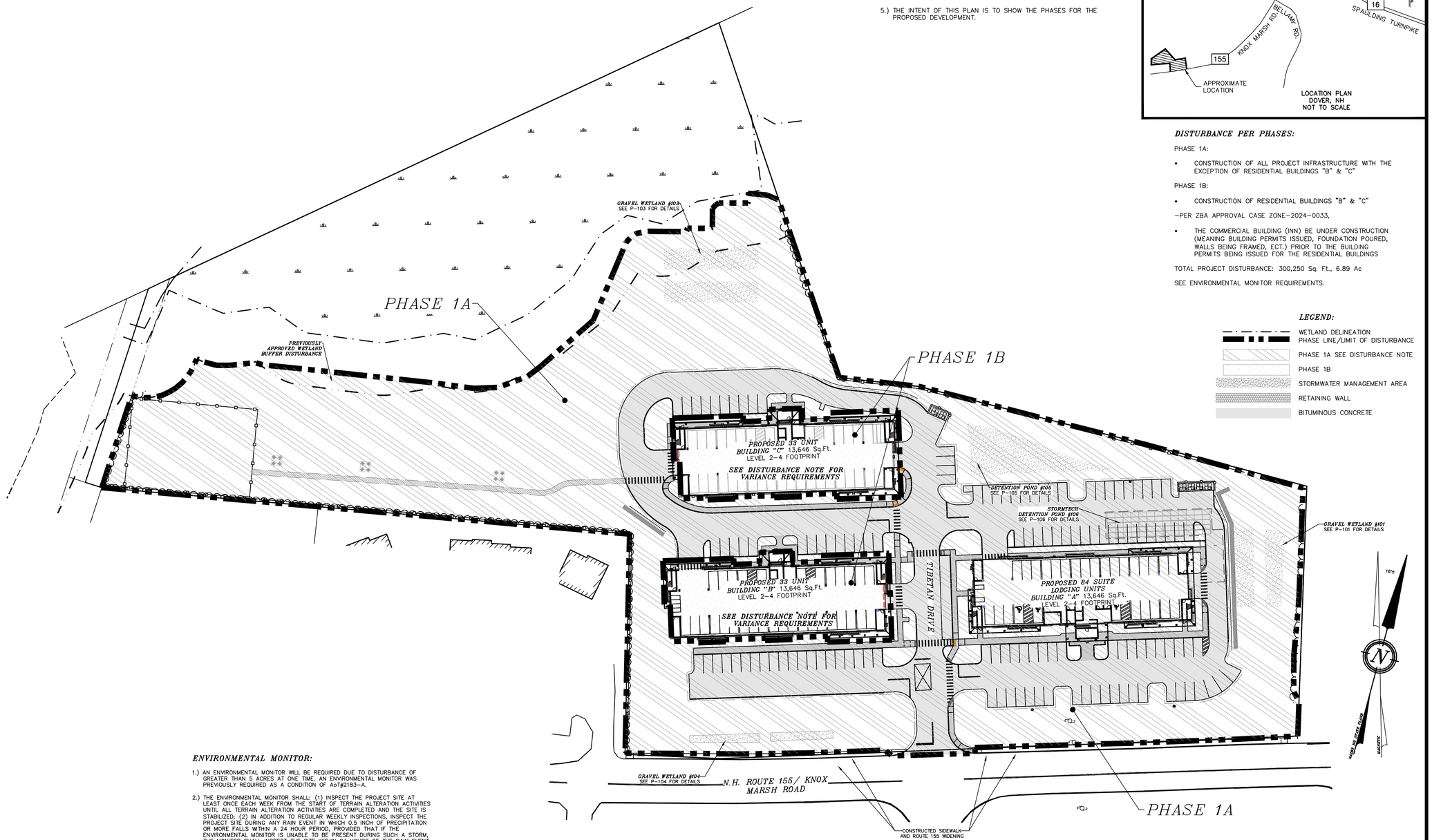
- THE COMMERCIAL BUILDING (INN) BE UNDER CONSTRUCTION (MEANING BUILDING PERMITS ISSUED, FOUNDATION POURED, WALLS BEING FRAMED, ECT.) PRIOR TO THE BUILDING PERMITS BEING ISSUED FOR THE RESIDENTIAL BUILDINGS

TOTAL PROJECT DISTURBANCE: 300,250 Sq. Ft., 6.89 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 Act#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–2024–0019

REVISION	DATE	DESCRIPTION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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 WRE
- 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

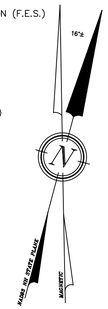
5.) THE INTENT OF THIS PLAN IS SHOW THE DEMOLITION OF DRAINAGE, CURBING, AND UTILITIES FOR THE PROPOSED SITE PLAN.

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 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

N.H. ROUTE 155/ KNOX MARSH ROAD

TIBETAN DRIVE

GRAVEL WETLAND #103

GRAVEL WETLAND #104

GRAVEL WETLAND #101

DETENTION POND #105

LLS 211 1-1/4" IRON PIPE ~FND~ +1.1
OLD UTILITY POLE
LLS 661 IRON BOUND ~FND~ FLUSH
LLS 661 IRON BOUND ~FND~ +.3
EDGE OF POORLY DRAINED JURISDICTIONAL WETLANDS (TYP.) BY: DEIDRA BENJAMIN, CWS
EXISTING FOREBAY TO BE RECONSTRUCTED
OUTLET STRUCTURES #103A & B TO REMAIN WITH MODIFICATIONS. SEE P-103.
EXISTING BERM TO BE RECONSTRUCTED
EXISTING 15" HDPE N-12 TO BE REMOVED
EXISTING HYDRANT TO BE RELOCATED
NMP 1-1/4" IRON PIPE ~FND~ +.9
EXISTING DRAIN MANHOLE TO BE REMOVED
EXISTING 18" HDPE N-12 (2) T.B.R.
3/4" REBAR ~FND~ +.6
3/4" REBAR ~FND~ +.7
EXISTING GATE VALVE TO BE RELOCATED
LLS 211 IRON BOUND ~FND~ +.5
EX. 12" AC WATER MAIN GIS LOCATED
EXISTING 8" CLDI CL 52 W/ POLYWRAP
50' WETLAND BUFFER (TYP.)
EXISTING 8" SDR 35 T.B.R.
EXISTING SMH T.B.R.
EXISTING 15" HDPE N-12 TO BE REMOVED.
T.B.M. SPKSET ELEV.: 94.32
PRE-EX. SEWER MANHOLE
EXISTING GATE VALVE
EXISTING TREE LINE (TYP)
PRE-EXISTING TREE LINE (TYP)
PRE-EXISTING CONTOUR LINE (TYP)
EXISTING MATERIAL STOCKPILE
EXISTING 8" CLDI CL 52 W/ POLYWRAP, 152 L.F. TO BE RELOCATED
EXISTING SMH T.B.R.
EXISTING BERM TO BE RECONSTRUCTED
3/4" IRON ROD ~FND~ +.1
OUTLET STRUCTURES #101A & B TO REMAIN WITH MODIFICATIONS. SEE P-101.
1/2" REBAR ~FND~ +.7
1/2" REBAR IN IRON PIPE ~FND~ +.5
T.B.M. SPKSET ELEV.: 92.79
EXISTING 15" RCP TO BE REMOVED
INLET SUMP TO BE RECONSTRUCTED
EXISTING 8" CLDI CL 52 W/ POLYWRAP
EXISTING EDGE OF CRUSHED GRAVEL (TYP)
EXISTING CONTOUR LINE (TYP)
EXISTING 8" SDR 35 TO BE RESET
EXISTING 4" C.L.D.I TO BE RELOCATED
EXISTING 8" SDR 35 (SEE NOTE 8)
EXISTING GATE VALVES
EXISTING HYDRANT
RIP RAP T.B.R.
EVERSOURCE 303/62A
CRUSHED GRAVEL TO BE REMOVED IN AREAS OF PROPOSED LANDSCAPING (TYP.)
EXISTING SMH (SEE NOTE 8)
EXISTING HYDRANT
NET 146/48
OUTLET STRUCTURES #104A & B TO REMAIN WITH MODIFICATIONS. SEE P-104.
1/2" REBAR IN 1" IRON PIPE ~FND~ +.2 DESTROYED, TO BE RESET BY BSE
T.B.M. REBAR SET ELEV.: 93.70
LLS 661 IRON BOUND ~FND~ FLUSH
PRE-EX. SEWER MANHOLE
PSNH 303/62
PSC NH 303/62
PSNH 303/61
VZ 48
PSNH 303/59
PSNH 146/46
LLS 661 IRON BOUND ~FND~ -.6 DESTROYED
PSNH 303/56
PRE-EXISTING SMH- DOVER GIS #2865
T.B.M. PKSET ELEV.: 95.25
PSNH 303/55a PULL POLE
EX. 12" AC WATER MAIN LOCATION FROM GIS
PSNH 303/55
EX. 12" ACP
PSNH 303/54
PRE-EXISTING SMH- DOVER GIS #2864

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

SHEET 8 OF 57

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
BUILDING "B": 3 STUDIO UNITS, 6 1 BR UNITS, 24 2 BR UNITS
BUILDING "C": 3 STUDIO UNITS, 6 1 BR UNITS, 24 2 BR UNITS

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
31.6% IMPERVIOUS COVERAGE IN THE SECONDARY GROUNDWATER RECHARGE ZONE: PREVIOUSLY APPROVED FOR 33.8%

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-(J)(6)(4)): PENDING
UTILITY DROP POLES ABOVE GROUND (157-44): PENDING
INTERNAL ROADWAY WIDTH (153-14-C(2)): PENDING

RECREATION SPACE REQUIREMENTS (DOVER CODE ARTICLE V , 170-15.)
PROPOSED NUMBER OF BEDROOMS: 114
OPEN SPACE REQUIREMENT (100 SF PER BEDROOM): 11,400 SF
½ RECREATION SPACE FOR PASSIVE USE: 5,700 SF REQ., 10,200 SF (ON SITE)
½ RECREATION SPACE FOR ACTIVE USE: 5,700 SF REQ., 22,550 SF (ON SITE)

PARKING REQUIREMENTS:

RESIDENTIAL
- RESIDENTIAL (NON-CBD-G) = 1.40 SPACES PER UNIT
- VISITOR = 0.5 SPACE PER UNIT
- 66 UNITS x 1.90 SPACES = 125.4 SPACES REQUIRED

LODGING
- 1 SPACE PER UNIT = 84 UNITS = 84 SPACES
- EMPLOYEES = 1 SPACE PER EMP. PER SHIFT = 8 EMP. ASSUMED = 8 SPACES
- 1 SPACE REQUIRED PER 500SF OF COMMON AREA = 2,000 Sq. Ft = 4 SPACES
- SPACES REQUIRED = 95 SPACES

TOTAL SPACES REQUIRED: 221 SPACES
TOTAL SPACES PROVIDED: 221 SPACES

ACCESSIBLE SPACES REQUIRED = 7
ACCESSIBLE SPACES PROVIDED = 9 (3 IN EACH BUILDING)
EVSE SPACE REQUIREMENT (5%) = 11.05, (12) SPACES
EVSE SPACES PROVIDED = 16 SPACES (5 BUILDING "A" LODGING, 6 BUILDING "B", 5 BUILDING "C")
BICYCLE SPACES (5%) = 11.05, (12) SPACES
BICYCLE SPACES PROVIDED = 21 SPACES
MOTORCYCLE SPACES = 9 SPACES (NOT INCLUDED IN SPACE CALCULATIONS)
61 SPACES AT FRONT OF SITE
160 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, 160 SPACES ARE TO THE REAR OR SIDE = 72.4%

SNOW STORAGE CALCULATION:

- STORAGE CALCULATION (6:1 RATIO USED)
  - PLOWABLE AREA = 76,163 Sq.Ft. / 6 = 12,694 Sq.Ft.
  - >14,437 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: 46,643 Sq. Ft. (11.4%)
ROAD & PARKING LOTS: 69,209 Sq. Ft. (16.98%)
IMPERVIOUS AREA (CURB, SHOULDER, WALKS, CONCRETE PADS & GRAVEL WALKWAY): 12,760 Sq. Ft. (3.13%)
TOTAL PROPOSED IMPERVIOUS COVER IS 128,612 Sq. Ft. (31.6%)
(REVISED ENVIRONMENTAL CUP NOT 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", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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%	11.4%
MAX. IMPERVIOUS: 20%	-31.6%-PREVIOUS CUP APPROVED FOR 33.8% (P22-46) NEW APPROVAL NOT 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 (NN) 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

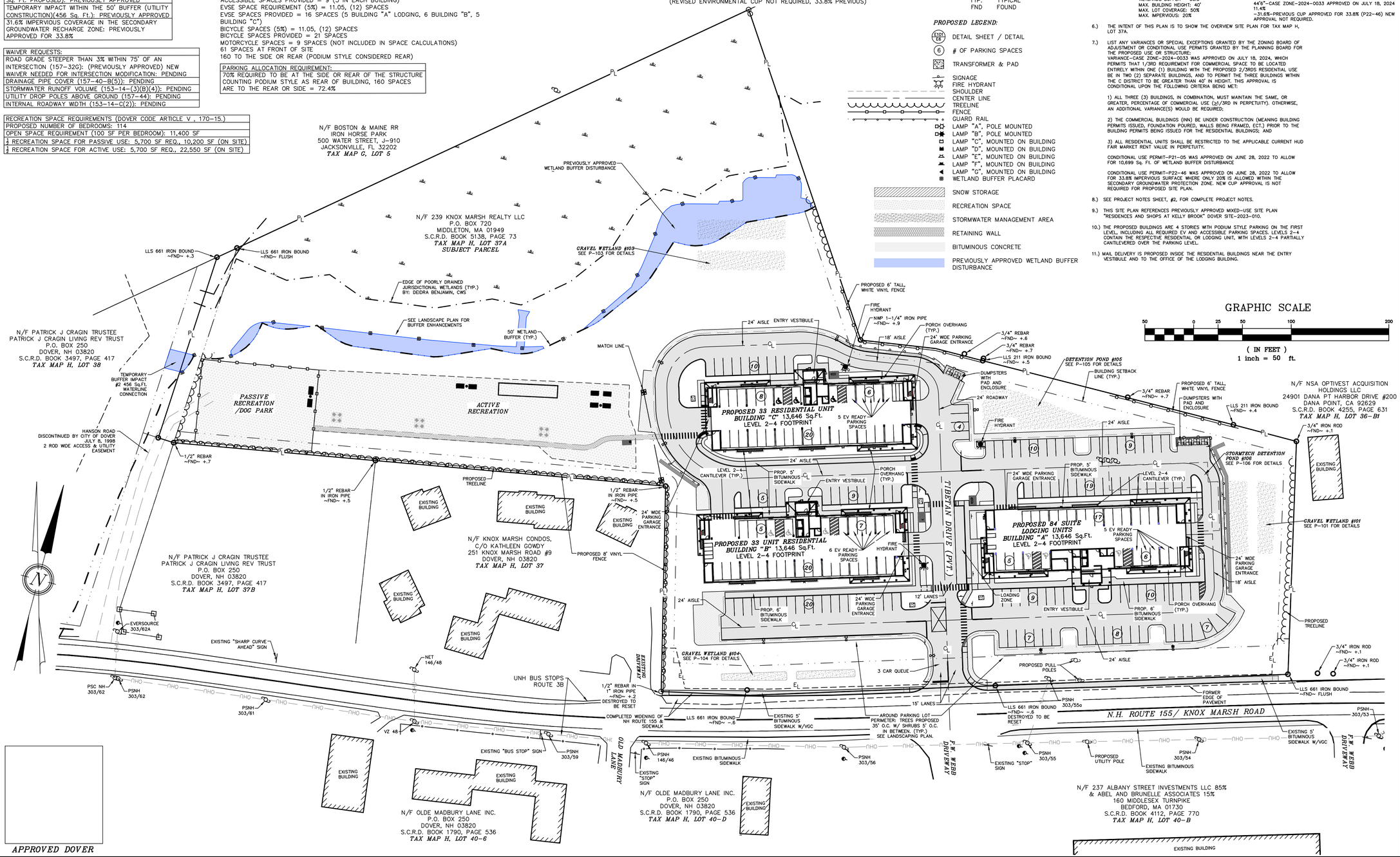
CONDITIONAL USE PERMIT-P22-46 WAS APPROVED ON JUNE 28, 2022 TO ALLOW FOR 33.8% IMPERVIOUS SURFACE WHERE ONLY 20% IS ALLOWED WITHIN THE SECONDARY GROUNDWATER PROTECTION ZONE. NEW CUP APPROVAL IS NOT REQUIRED FOR PROPOSED SITE PLAN.

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 PARTIALLY 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.



APPROVED DOVER

NOT FOR CONSTRUCTION

PLANNING FILE #SITE-2024-0019

#	DATE	REVISION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 14249 — LICENSED PROFESSIONAL ENGINEER

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

GRAVEL WETLAND #103
SEE P-103 FOR DETAILS

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OHU — 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", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF THE SITE PLAN.

6.) SEE OVERVIEW SITE PLAN AND PROJECT NOTES FOR ZONING AND NOTES.

PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

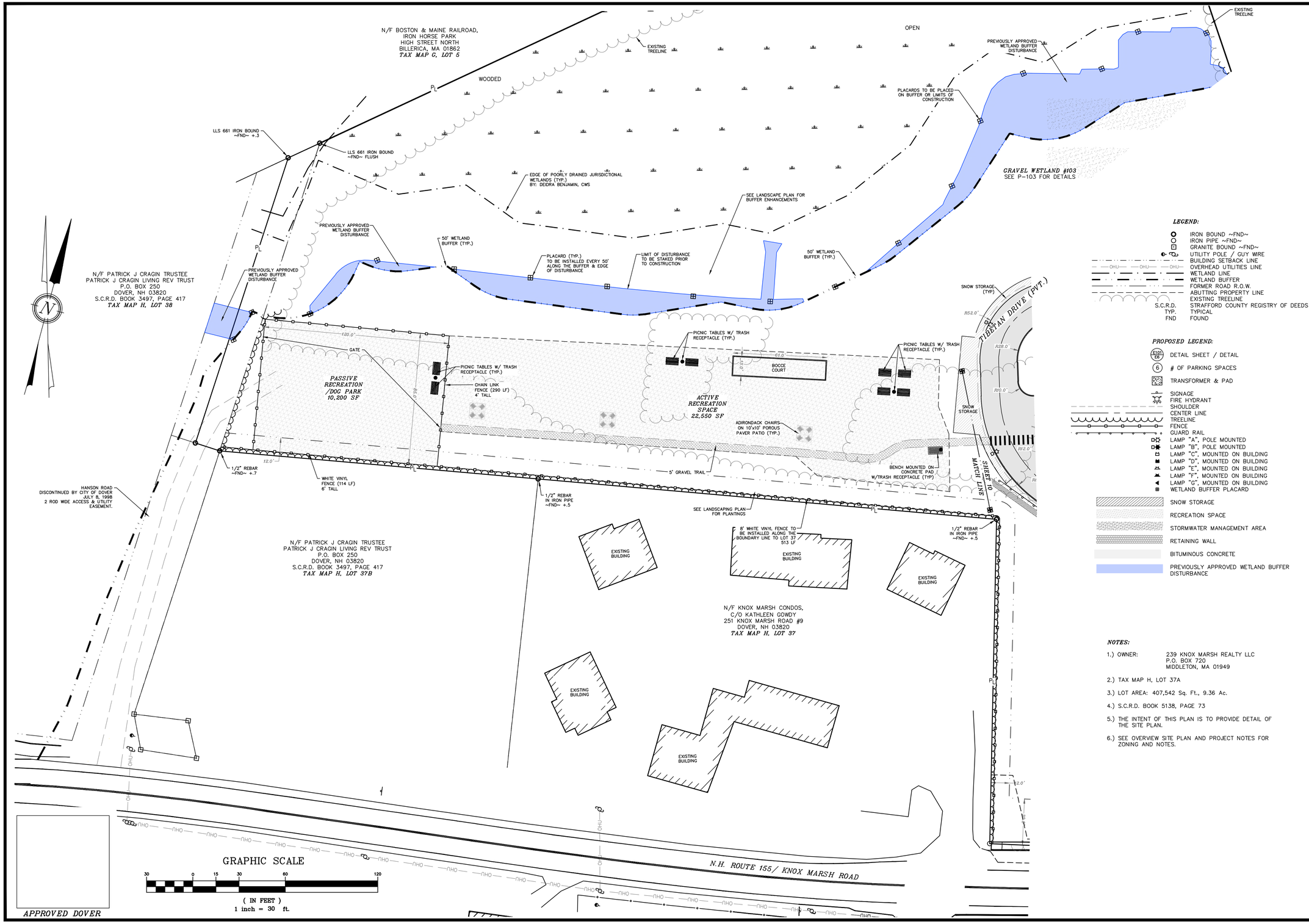
SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

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

APPROVED DOVER

SHEET 10 OF 57

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", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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.) THE INTENT OF THIS PLAN IS TO PROVIDE DETAIL OF THE SITE PLAN.

6.) SEE OVERVIEW SITE PLAN AND PROJECT NOTES FOR ZONING AND NOTES.

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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 — PROFESSIONAL ENGINEER — LICENSED PROFESSIONAL SURVEYOR

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: GRADING PLAN RECREATION AREA
SHEETS #19–#24: STORMWATER BMPs #101–#106
SHEETS #25–#26: EROSION & SEDIMENT CONTROL PLAN
SHEETS #43–#44: EROSION & SEDIMENT CONTROL DETAILS E–101–E102
SHEETS #45–#48: CONSTRUCTION DETAILS C–101–C104
SHEETS #49–#51: 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.

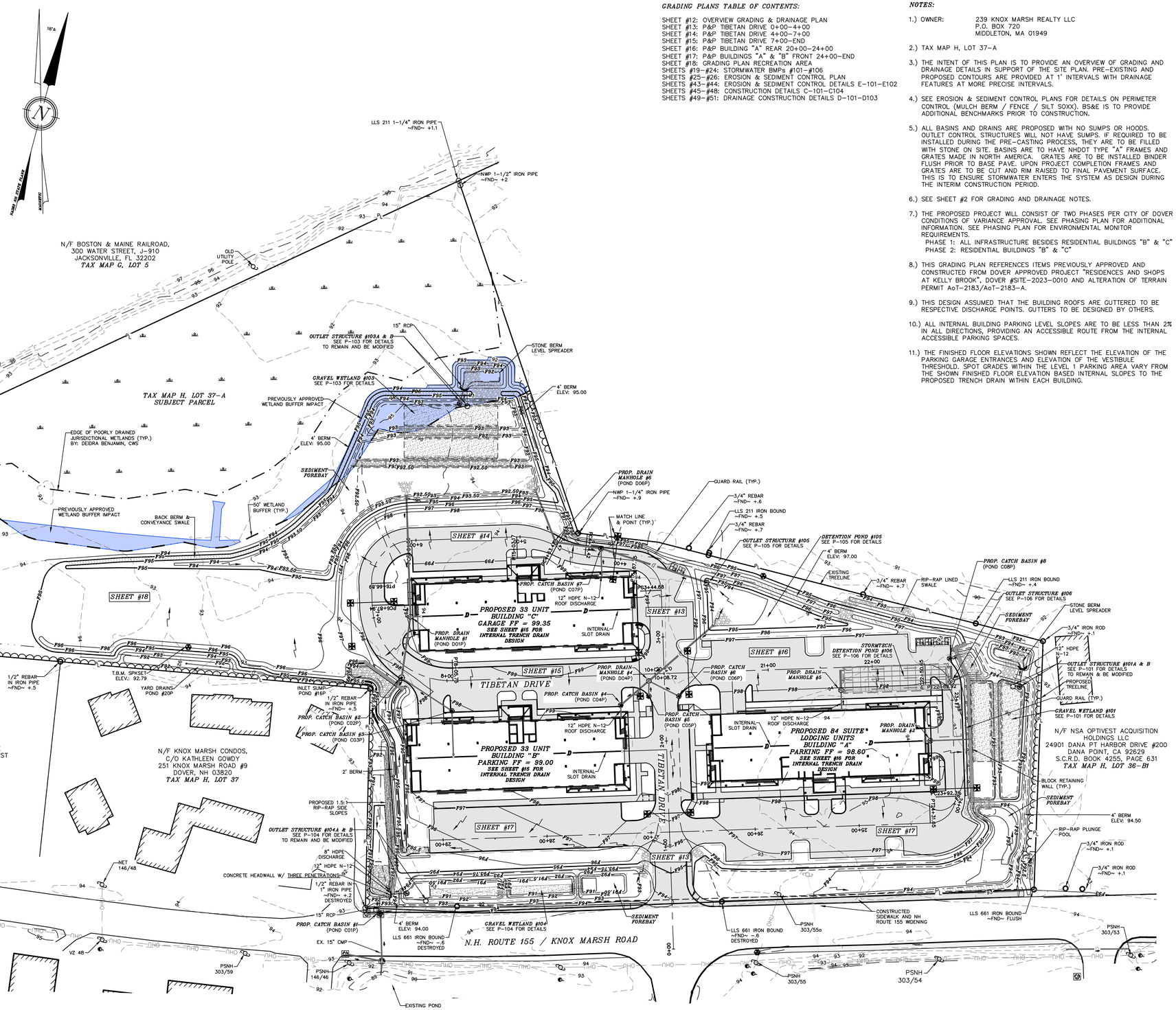
7.) THE PROPOSED PROJECT WILL CONSIST OF TWO PHASES PER CITY OF DOVER CONDITIONS OF VARIANCE APPROVAL. SEE PHASING PLAN FOR ADDITIONAL INFORMATION. SEE PHASING PLAN FOR ENVIRONMENTAL MONITOR REQUIREMENTS.
PHASE 1: ALL INFRASTRUCTURE BESIDES RESIDENTIAL BUILDINGS "B" & "C"
PHASE 2: RESIDENTIAL BUILDINGS "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.



REVISION	DATE	DESCRIPTION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE–2024–0019

OVERVIEW GRADING 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

NADB3 NH STATE PLANE

MAGNETIC

7.9±

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)

COORDINATE W/ MEP PLANS FOR ROOF DRAIN DESIGN BUILDING TO HAVE GUTTERS DESIGNED BY OTHERS

PROPOSED 33 UNIT BUILDING "B" PARKING FF = 99.00 *SEE SHEET #6 FOR INTERNAL TRENCH DRAIN DESIGN*

COORDINATE W/ MEP PLANS FOR ROOF DRAIN DESIGN BUILDING TO HAVE GUTTERS DESIGNED BY OTHERS

PROPOSED 33 UNIT BUILDING "C" GARAGE FF = 99.35 *SEE SHEET #6 FOR INTERNAL TRENCH DRAIN DESIGN*

PROPOSED 84 SUITE LODGING UNITS BUILDING "A" PARKING FF = 98.60 *SEE SHEET #6 FOR INTERNAL TRENCH DRAIN DESIGN*

COORDINATE W/ MEP PLANS FOR ROOF DRAIN DESIGN BUILDING TO HAVE GUTTERS DESIGNED BY OTHERS

GRAVEL WETLAND #104 SEE P-104 FOR DETAILS

GRAVEL WETLAND #101 SEE P-101 FOR DETAILS

N.H. ROUTE 155 / KNOX MARSH ROAD

TIBETAN DRIVE

PROP. CATCH BASIN #4 (POND C04P)

PROP. DRAIN MANHOLE #4 (POND D04P)

PROP. CATCH BASIN #5 (POND C05P)

PROP. CATCH BASIN #6 (POND C06P)

PROP. SEWER MANHOLE #5

PROP. SEWER MANHOLE #4

PROP. SEWER MANHOLE #3

PROP. SEWER MANHOLE #6

PROP. OUTLET STRUCTURE #105

DETENTION POND #105 SEE P-105 FOR DETAILS

SEE P-105 FOR OUTLET PROTECTION

SHEET #14 · SHEET #15 · SHEET #16 · SHEET #17

SEDIMENT FOREBAY

RIP-RAP LINED ENTRANCE D50 = 0.5' T = 1.2'

4:1 SIDE SLOPES STABILIZE W/ VEGETATION

1:12 RAMP (TYP.)

5' AT GRADE BITUMINOUS SIDEWALK

5' RAISED BITUMINOUS SIDEWALK

EGRESS DOOR

PARKING GARAGE ENTRANCE

LIMIT OF LEVEL 1

V.C.C. TIP DOWN

V.G.C. TIP DOWN AT SIDEWALK

E.O.P.

PAVEMENT SEAM

TEST PIT #105

CL LOW POINT STA: 0+45.00 ELEV: 93.97

CL HIGH POINT STA: 1+90.00 ELEV: 98.89

CL LOW POINT STA: 2+42.75 ELEV: 98.54

CL HIGH POINT STA: 3+02.50 ELEV: 98.91

THE CENTERLINE STARTS AT THE EXISTING SEWER LINE

GRADE ENTRANCE TO ENSURE RUNOFF FLOWS TO RESPECTIVE RIP-RAP ENTRANCE

12" RCP INV. IN = 94.61 INV. OUT = 94.45 L = 32.00', S = 0.005'/,

12" RCP INV. IN = 94.51 INV. OUT = 94.45 L = 10.75', S = 0.006'/,

12" RCP INV. IN = 94.60 INV. OUT = 94.45 L = 28.50', S = 0.005'/,

18" RCP INV. IN = 94.35 INV. OUT = 93.95 L = 78.00', S = 0.005'/, F.E.S. ON OUTLET

18" HDPE N-12 INV. IN = 93.75 INV. OUT = 93.22 L = 103.00', S = 0.005'/,

1.5:1 FILL SLOPE LINE W/ RECB NAG BIONET SC150 BN (E102 E21)

GUARD RAIL (TYP.) (C103 C22)

MATCH LINE & POINT (TYP.)

BOUNDARY LINE TO BE STAKED OUT

3/4" REBAR ~FND~ +.6

SCOUR HOLE

LLS 211 IRON BOUND ~FND~ +.5

3/4" REBAR ~FND~ +.7

4' BERM ELEV: 97.00

LLS 661 IRON BOUND ~FND~ -.6 DESTROYED

5' RAISED BITUMINOUS SIDEWALK

0+00 1+00 2+00 3+00 4+00

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PLAN VIEW TIBETAN DRIVE 0+00 TO 4+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.

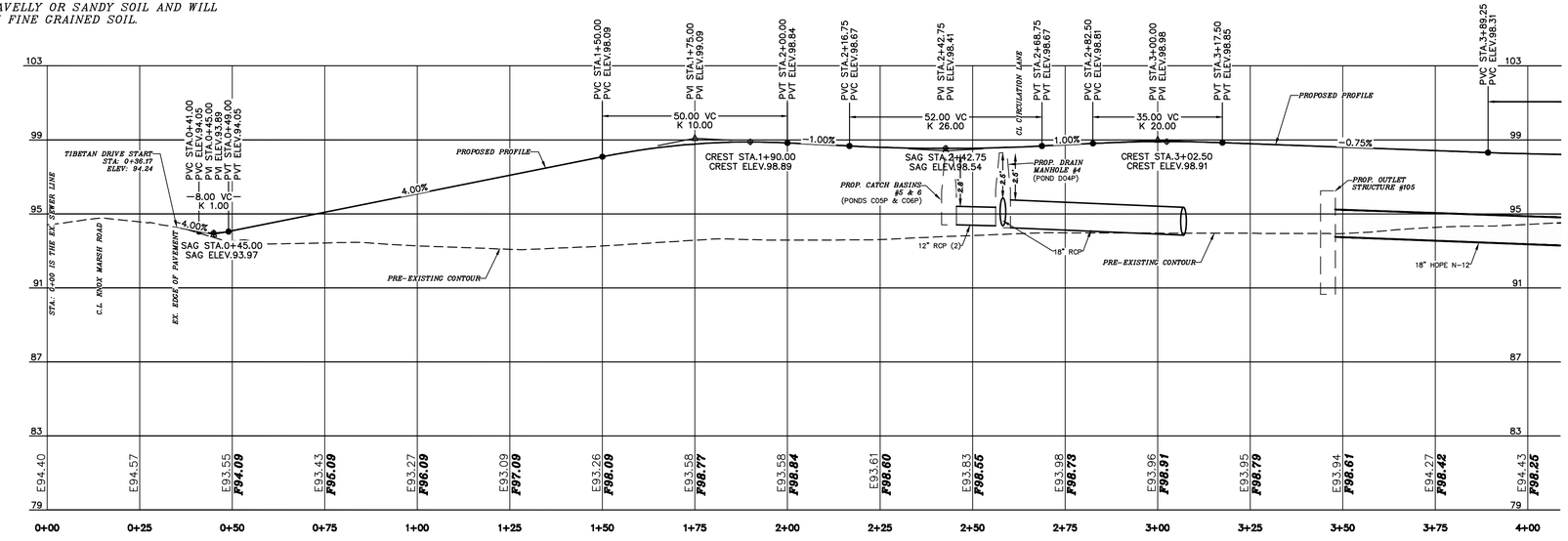
LEGEND:

- 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
- P176 — CONTOUR MINOR, PROPOSED
- P175 — CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
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- 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

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-2024-0019

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

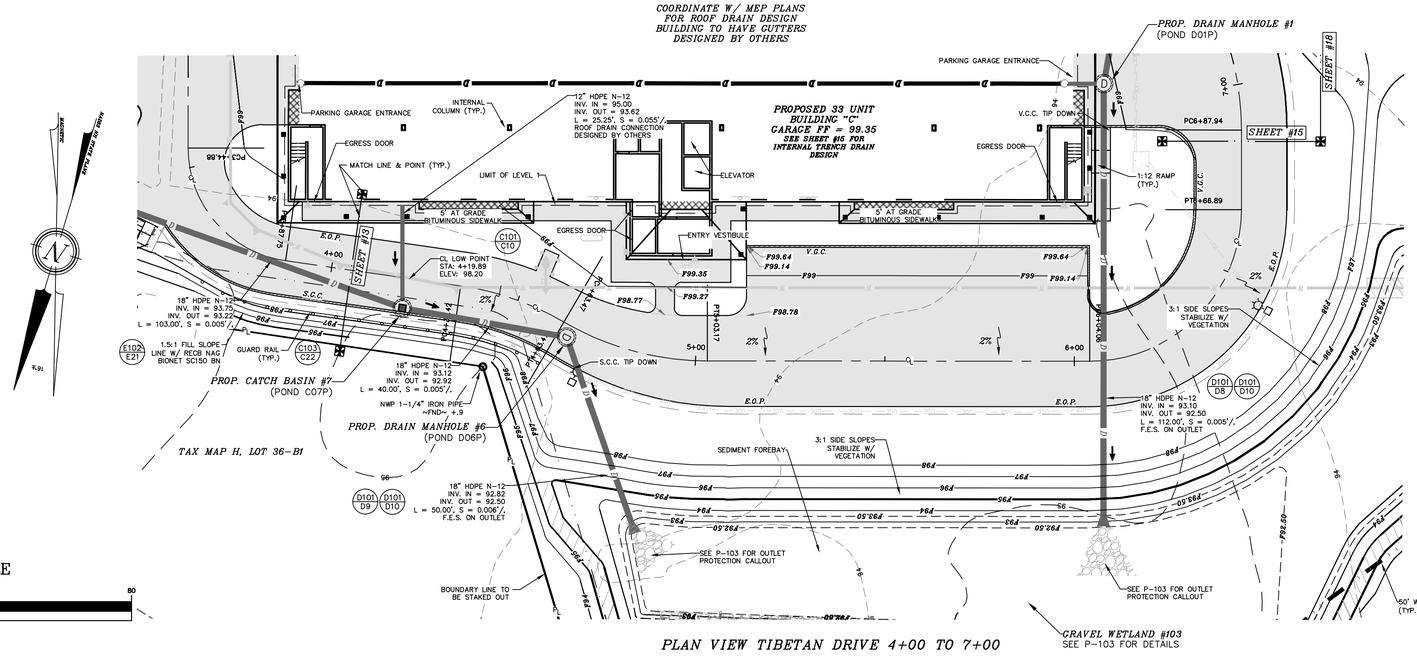
NOT FOR CONSTRUCTION

STRUCTURES TABLE:

PROP. CATCH BASIN #7 (POND C07P)
4'ø STRUCTURE W/ TYPE "A" GRATE (D101 D1)
STA: 4+20.00 (Rt. 8.35')
RIM = 98.05 (FLUSH)
INV. IN = 93.62 (12" HDPE N-12) (BLD C ROOF)
INV. IN = 93.22 (18" HDPE N-12) (OS #DS) (D101 D2)
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 (D101 D3)
STA: 4+66.00 (Rt. 3.10')
RIM = 98.68 (FLUSH)
INV. IN = 92.92 (18" HDPE N-12) (CB #7) (D101 D5)
INV. OUT = 92.82 (18" HDPE N-12) (P-103)

NOTE: THERE IS NO DRAIN MANHOLE #3 ON THIS PROJECT.



PLAN VIEW TIBETAN DRIVE 4+00 TO 7+00

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

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"

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LEGEND:

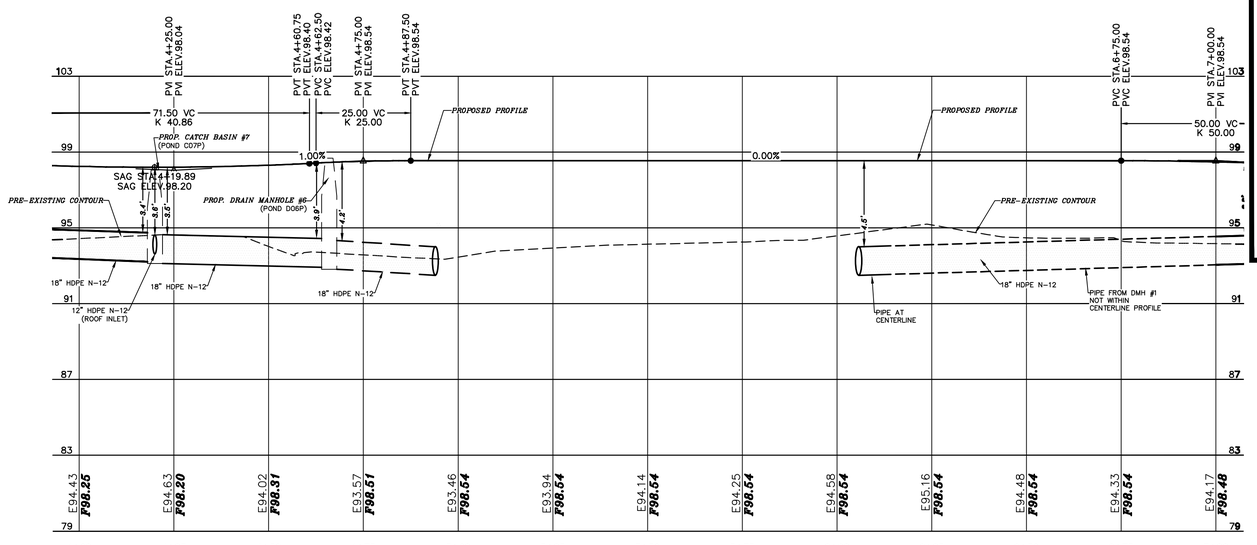
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- LIMIT OF STORMTECH CHAMBER STONE/GENERAL STONE
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- STORMWATER BMP OUTLET STRUCTURE

GRAPHIC SCALE
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(IN FEET)
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VERTICAL SCALE: 1" = 4'

ROAD NOTE:

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PROFILE VIEW TIBETAN DRIVE 4+00 TO 7+00



PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

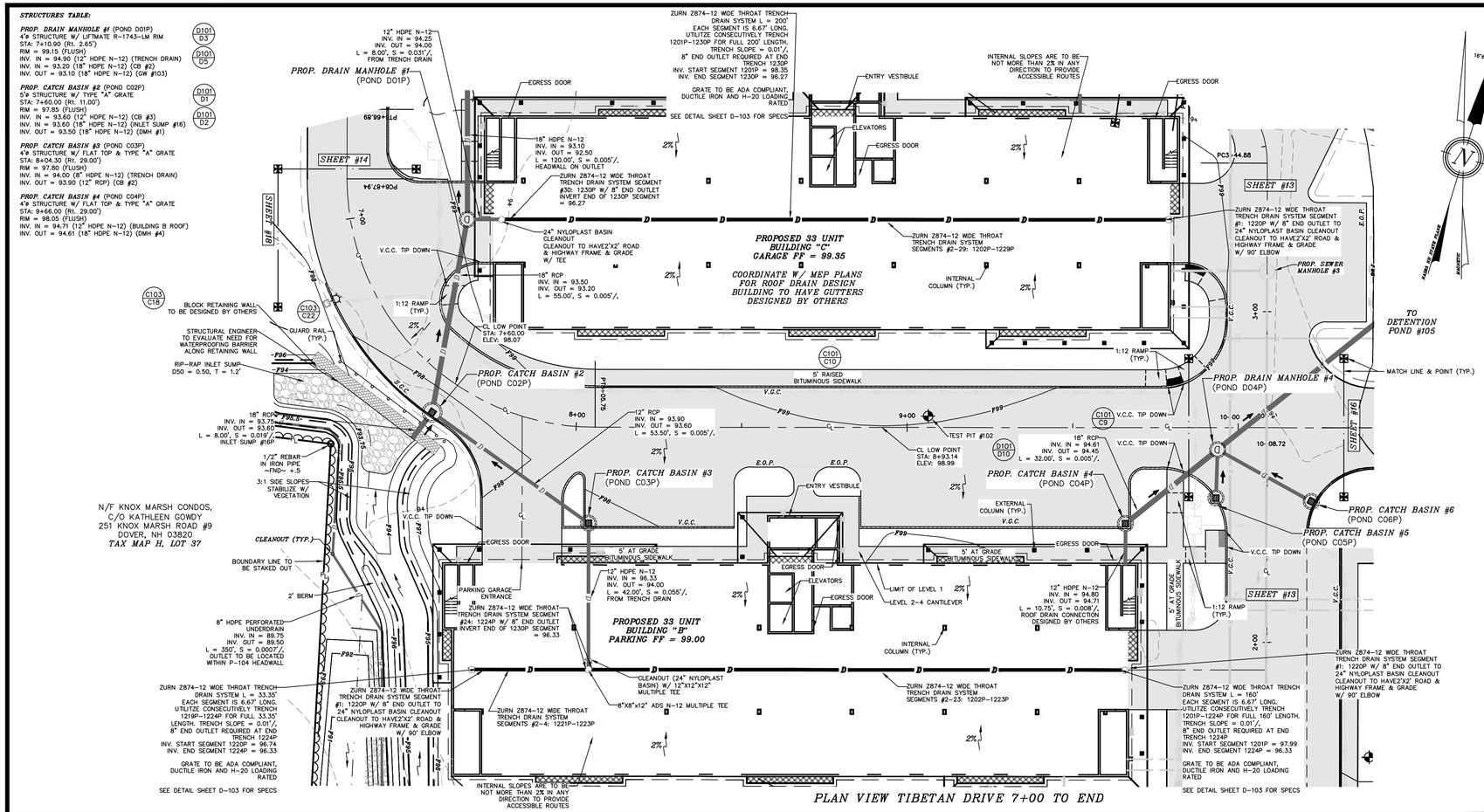
STRUCTURES TABLE:

PROP. DRAIN MANHOLE #1 (POND D01P)
4'ø STRUCTURE W/ LIFTMATE 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)
INV. OUT = 93.10 (18" HDPE N-12) (GW #103)

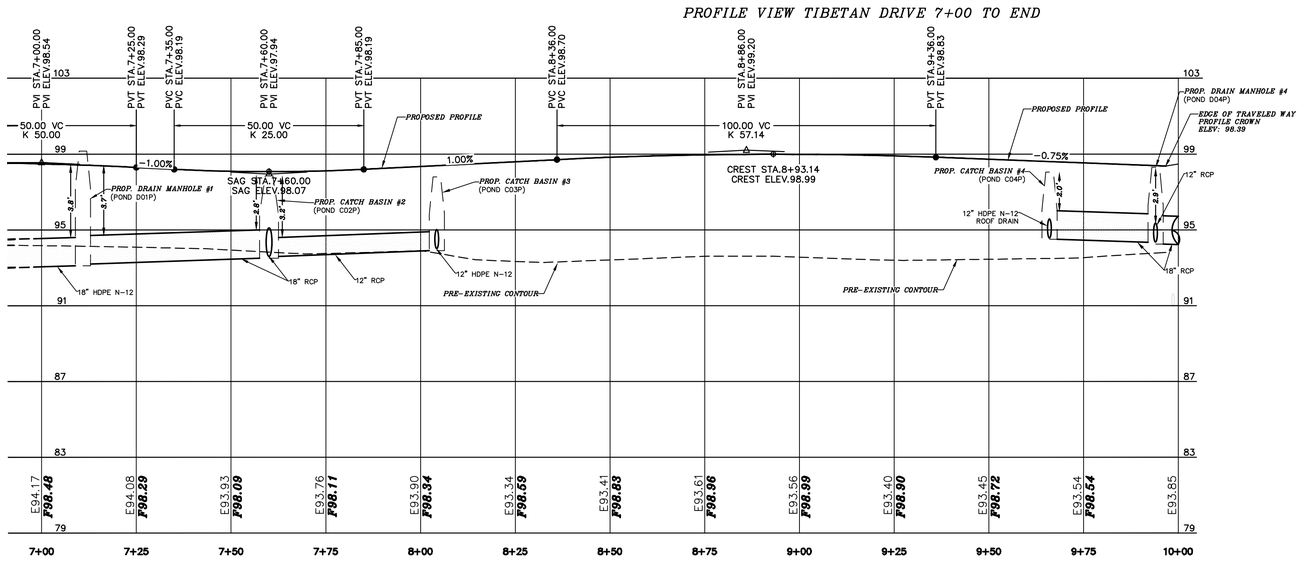
PROP. CATCH BASIN #2 (POND C02P)
5'ø STRUCTURE W/ TYPE "A" GRATE
STA: 7+60.00 (RT. 11.00')
RIM = 97.85 (FLUSH)
INV. IN = 93.60 (12" HDPE N-12) (CB #3)
INV. IN = 93.60 (18" HDPE N-12) (INLET SUMP #16)
INV. OUT = 93.50 (18" HDPE N-12) (DMH #1)

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" RCP) (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.

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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
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- F176 — CONTOUR MINOR, PROPOSED
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- BUILDING SETBACK LINE
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- STORMWATER BMP OUTLET STRUCTURE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

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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-2024-0019

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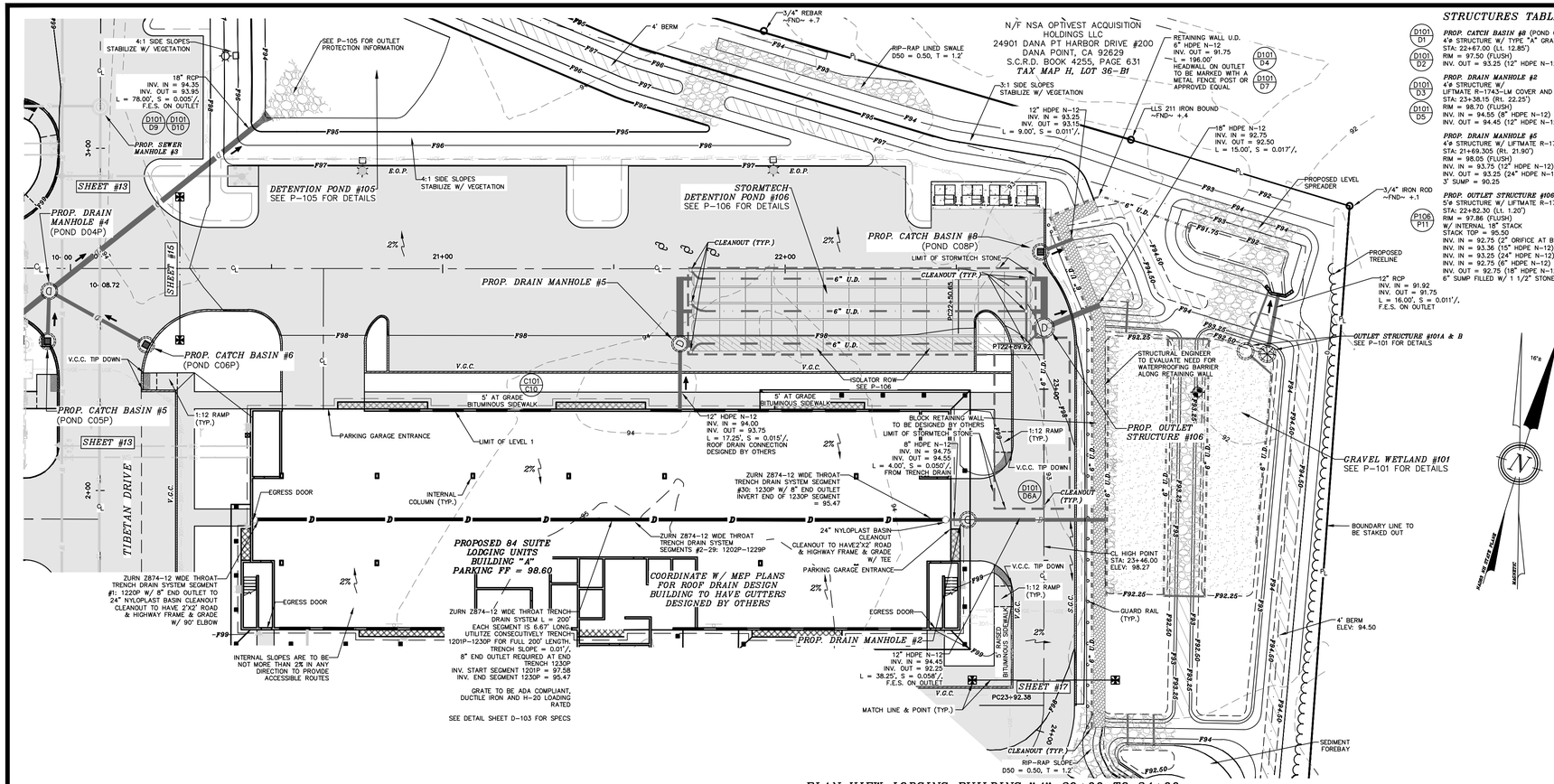
PLAN AND PROFILE TIBETAN DRIVE 7+00 TO END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37-A

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:

PROP. CATCH BASIN #8 (POND C08P) (D101 D1, D101 D2)
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)

PROP. DRAIN MANHOLE #2 (D101 D3, D101 D5)
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 (D101 D4, D101 D7)
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

PROP. OUTLET STRUCTURE #106 (P106 P11)
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 = 93.25 (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

NOTES:

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

2.) TAX MAP H, LOT 37-A

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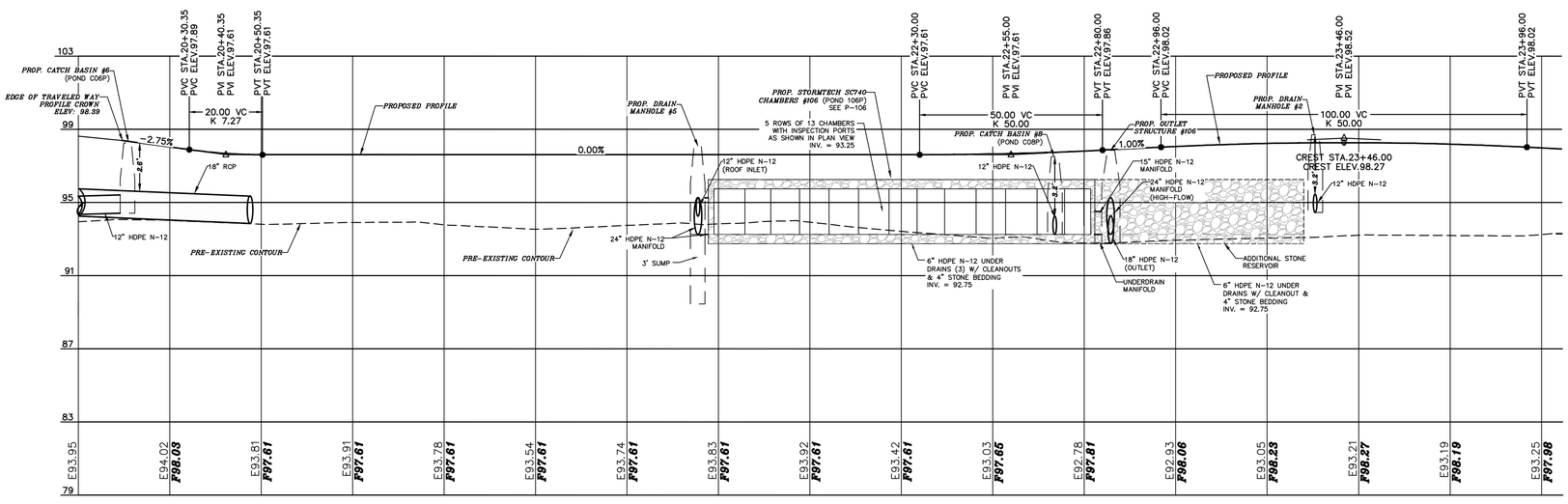
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PLAN VIEW LODGING BUILDING "A" 20+00 TO 24+00

PROFILE VIEW LODGING BUILDING "A" 20+00 TO 24+00



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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 — 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.

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"

N.H. ROUTE 155/ KNOX MARSH ROAD

GRAVEL WETLAND #101
SEE P-101 FOR DETAILS

GRAVEL WETLAND #104
SEE P-104 FOR DETAILS

PROPOSED 84 SUITE LODGING UNITS BUILDING "A"
PARKING FF = 98.60
SEE SHEET #16 FOR INTERNAL TRENCH DRAIN DESIGN

PROPOSED 33 UNIT BUILDING "B"
PARKING FF = 99.00
SEE SHEET #15 FOR INTERNAL TRENCH DRAIN DESIGN

COORDINATE W/ MEP PLANS FOR ROOF DRAIN DESIGN BUILDING TO HAVE GUTTERS DESIGNED BY OTHERS

COORDINATE W/ MEP PLANS FOR ROOF DRAIN DESIGN BUILDING TO HAVE GUTTERS DESIGNED BY OTHERS

PLAN VIEW LODGING BUILDING "A" 24+00 TO END & FRONT RESIDENTIAL BUILDING "B"

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PROFILE VIEW LODGING BUILDING "A" 24+00 TO END & FRONT RESIDENTIAL BUILDING "B"

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.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

#	REVISION	DATE	DESCRIPTION
1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

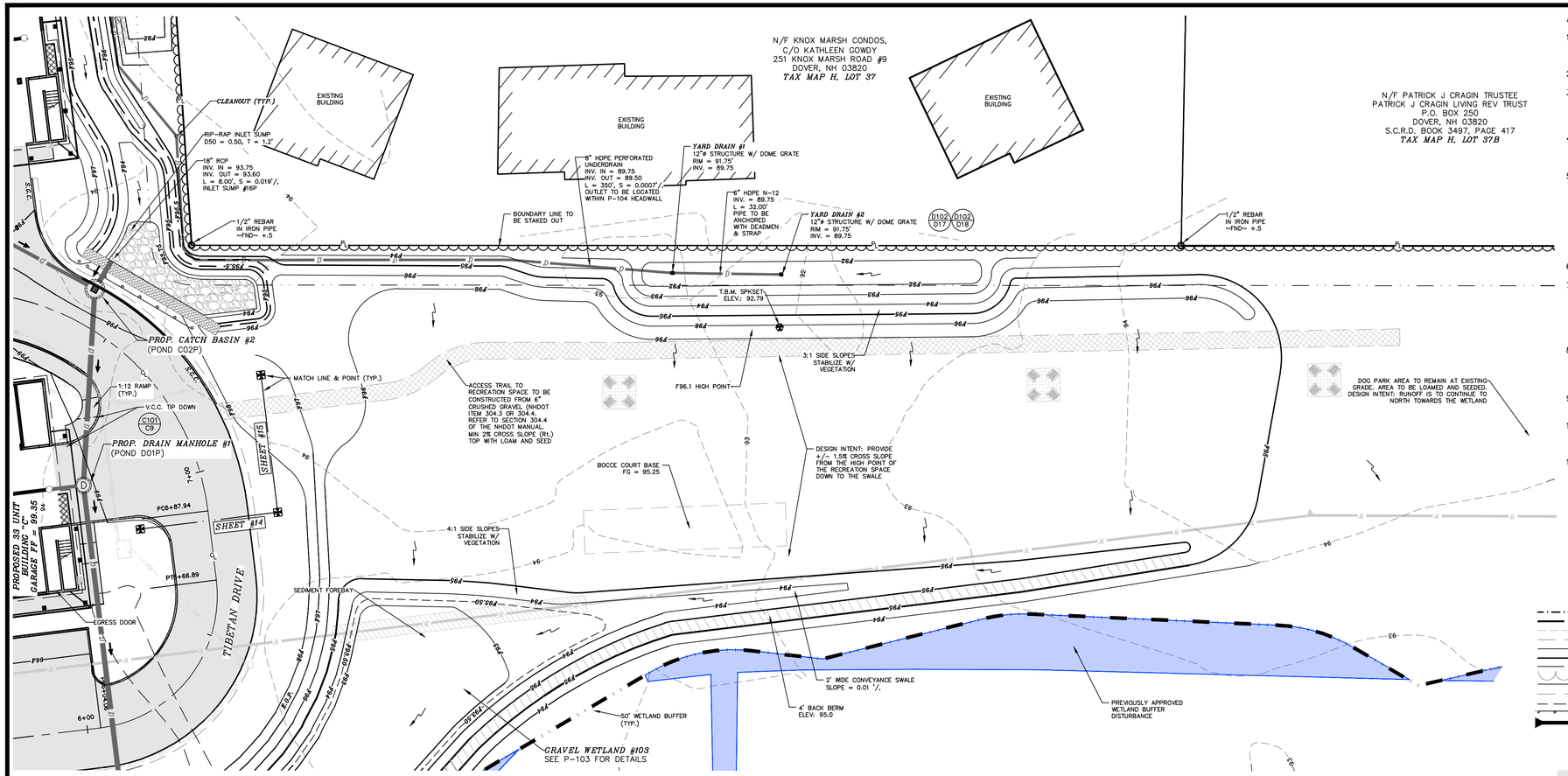
PLAN AND PROFILE BUILDINGS "A" & "B" FRONT 24+00-END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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



GRADING PLAN RECREATION AREA



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
- 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
- P175.31 — 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

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

GRADING PLAN RECREATION AREA
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
OCTOBER

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 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"	90 – 100
#4	20 – 55
#8	5 – 30
#16	0 – 10
#50	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#89)

1-1/2" WASHED CRUSHED STONE*	
SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	95 – 100
3/4"	35 – 70
3/8"	10 – 30
#4	0 – 5

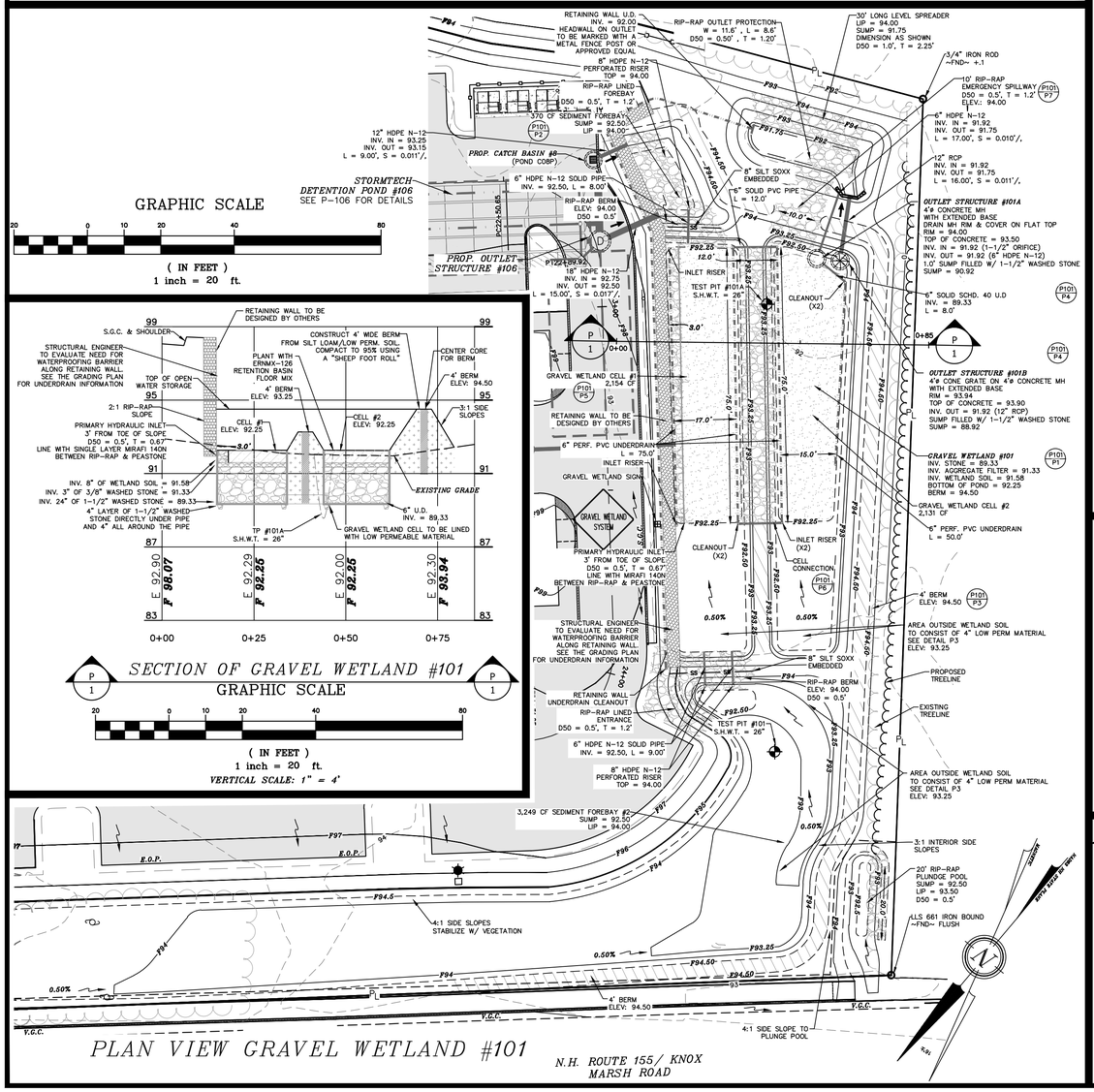
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#467)

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



SECTION OF GRAVEL WETLAND #101

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

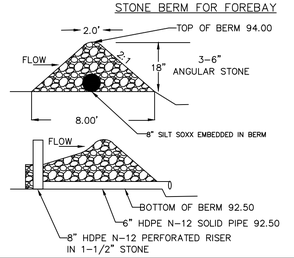
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'

PLAN VIEW GRAVEL WETLAND #101

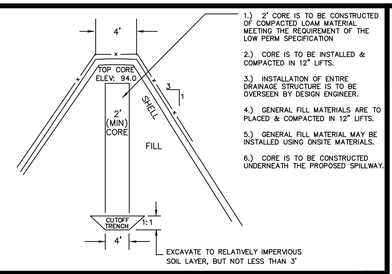
P2

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.

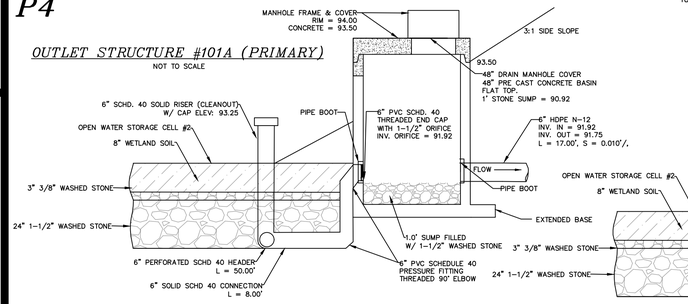
5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

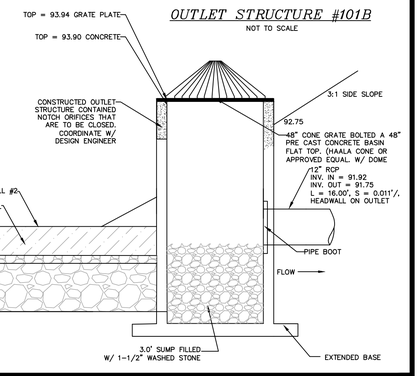
OUTLET STRUCTURE #101A (PRIMARY)

NOT TO SCALE



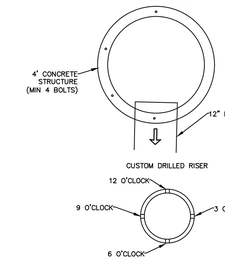
OUTLET STRUCTURE #101B

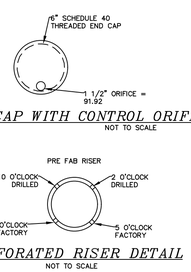
NOT TO SCALE



TOP VIEW (101B)

NOT TO SCALE





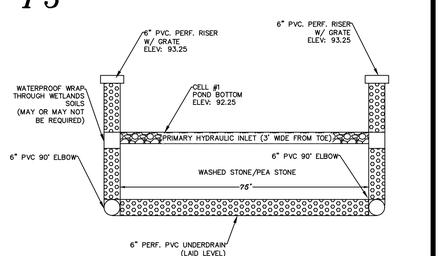
CAP WITH CONTROL ORIFICE (101A)

NOT TO SCALE

PERFORATED RISER DETAIL

NOT TO SCALE

P5

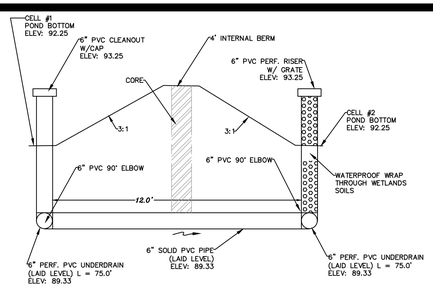


GRAVEL WETLAND INLET SYSTEM

NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

P6

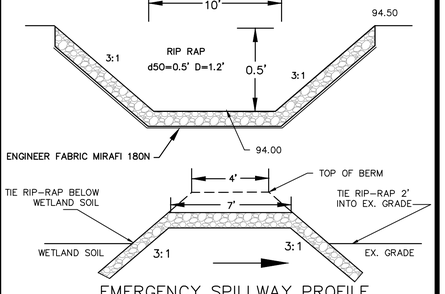


GRAVEL WETLAND CONNECTION SYSTEM

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	22.08
20.00 %	*Puccinellia distans, 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	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.

#	REVISION	DATE	DESCRIPTION
1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

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

KENNETH A. BERRY No. 14293 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

P–101

SHEET 19 OF 57

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"	90 – 100
#4	20 – 55
#8	5 – 30
#16	0 – 10
#50	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#89)

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	95 – 100
3/4"	35 – 70
3/8"	10 – 30
#4	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#467)

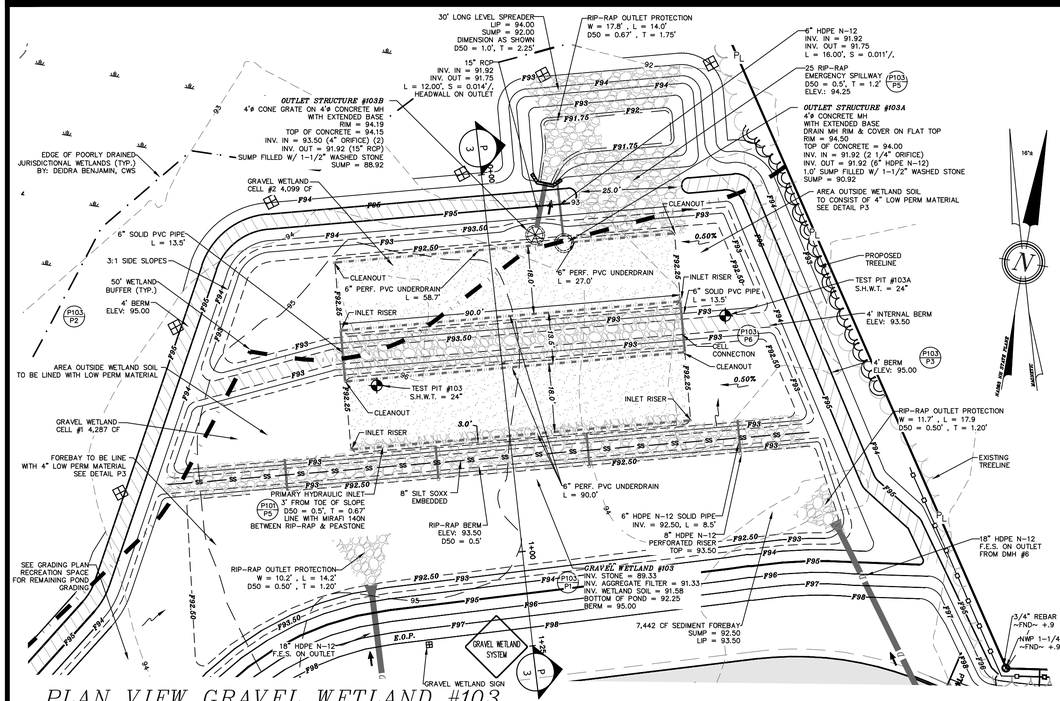
WETLAND SOIL

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

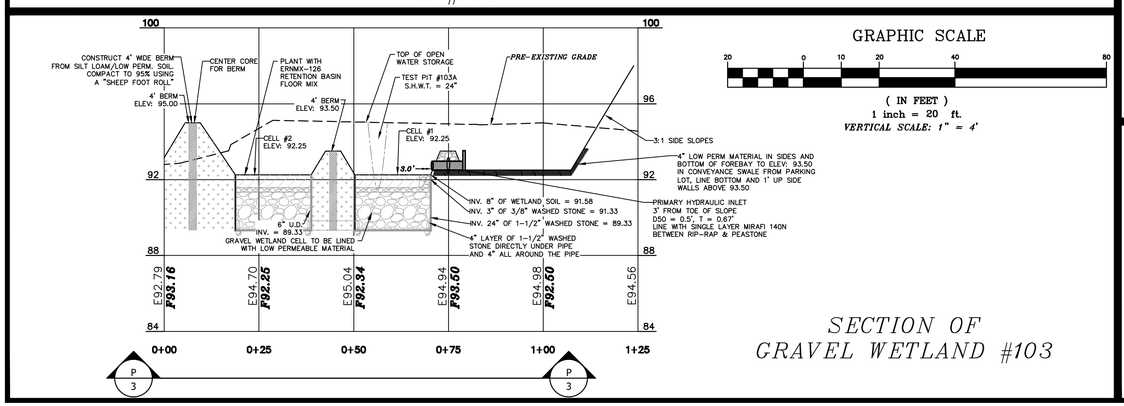
DESIGN REFERENCES

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



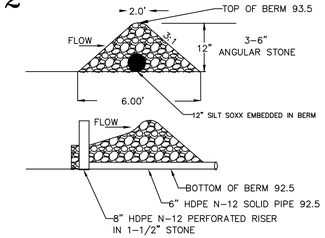
PLAN VIEW GRAVEL WETLAND #103



SECTION OF GRAVEL WETLAND #103

P2

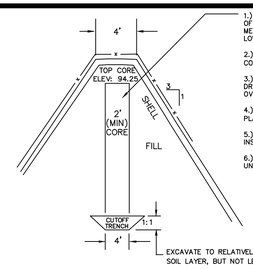
STONE BERM FOR FOREBAY



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.

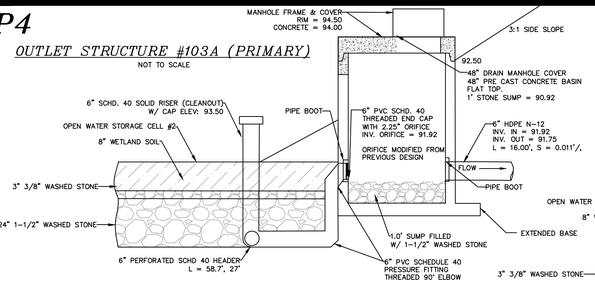
4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

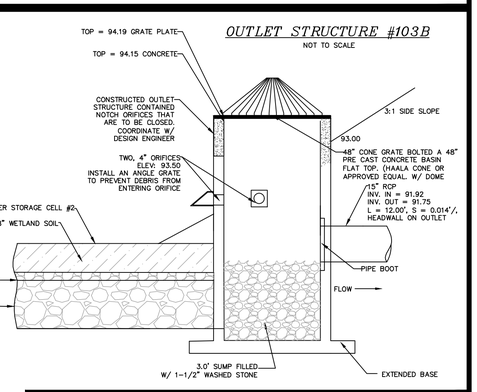
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

P4

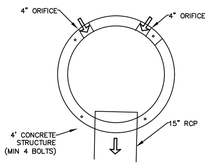
OUTLET STRUCTURE #103A (PRIMARY)
NOT TO SCALE

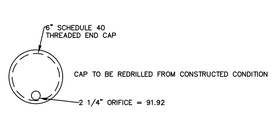


OUTLET STRUCTURE #103B
NOT TO SCALE

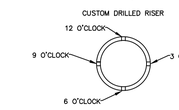


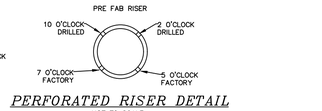
TOP VIEW (103B)
NOT TO SCALE





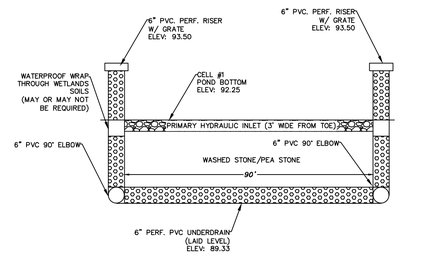
CAP WITH CONTROL ORIFICE
NOT TO SCALE





PERFORATED RISER DETAIL
NOT TO SCALE

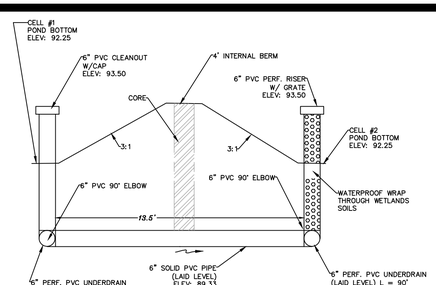
P5



GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

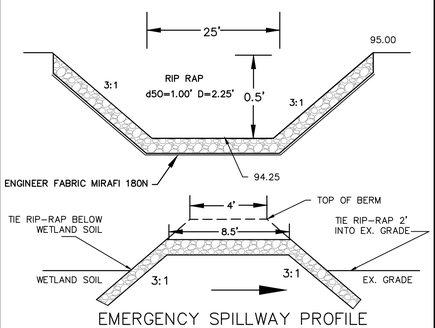
P6



GRAVEL WETLAND CONNECTION SYSTEM
NOT TO SCALE

P7

SPILLWAY DETAILS
NOT TO SCALE



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 %	*Puccinellia distans, 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	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-103

PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
#1	REVISED UNIT COUNT & PROJECT LAYOUT	02-15-26	

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. 14293
LICENSED PROFESSIONAL ENGINEER

SHEET 20 OF 57

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 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"	90 – 100
#4	20 – 55
#8	5 – 30
#16	0 – 10
#50	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#89)

1-1/2" WASHED CRUSHED STONE*

SIEVE SIZE	% PASSING BY WEIGHT
2"	100
1-1/2"	95 – 100
3/4"	35 – 70
3/8"	10 – 30
#4	0 – 5

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS (#467)

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

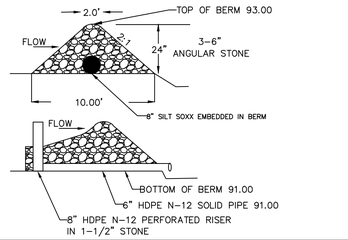
DESIGN REFERENCES

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

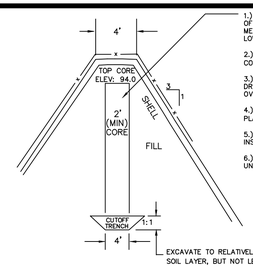
P2

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.

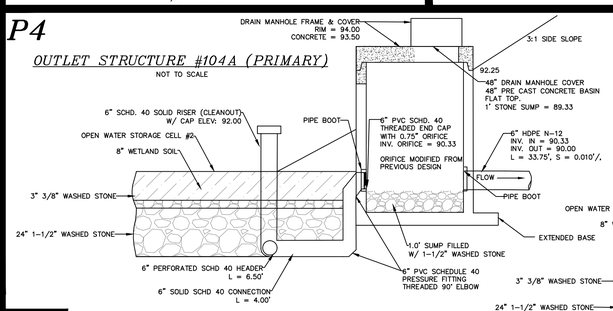
3.) INSTALLATION OF ENTIRE DRAINAGE STRUCTURE IS TO BE OVERSEEN BY DESIGN ENGINEER.

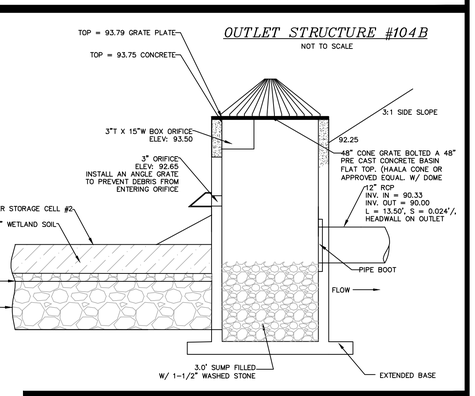
4.) GENERAL FILL MATERIALS ARE TO PLACED & COMPACTED IN 12" LIFTS.

5.) GENERAL FILL MATERIAL MAY BE INSTALLED USING ONSITE MATERIALS.

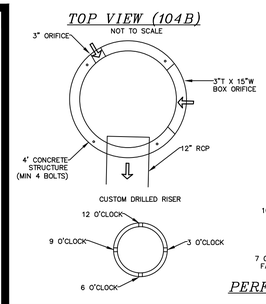
6.) CORE IS TO BE CONSTRUCTED UNDERNEATH THE PROPOSED SPILLWAY.

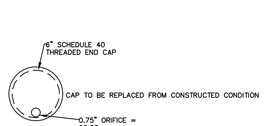
P4





TOP VIEW (104B)
NOT TO SCALE

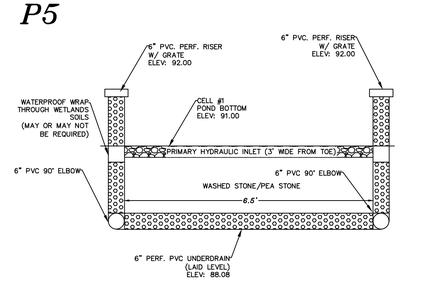




CAP WITH CONTROL ORIFICE
NOT TO SCALE

PERFORATED RISER DETAIL
NOT TO SCALE

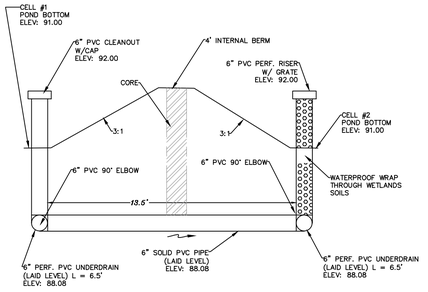
P5



GRAVEL WETLAND INLET SYSTEM
NOT TO SCALE

NOTE: THERE IS NO WETLAND SOIL IN THE GRAVEL WETLAND INLET SYSTEM

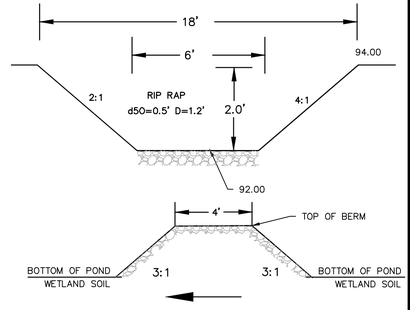
P6



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	22.08
20.00 %	*Fuccinellia distans, 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	81.60
1.00 %	*Juncus effusus*	Soft Rush	48.00

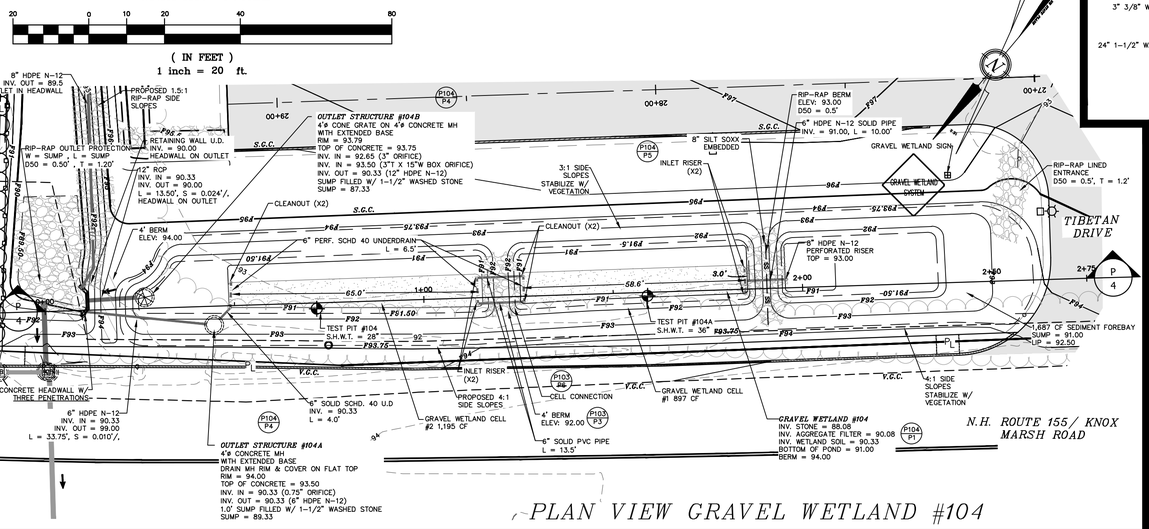
100.00 % **Mix Price/Lb Bulk: $15.98**

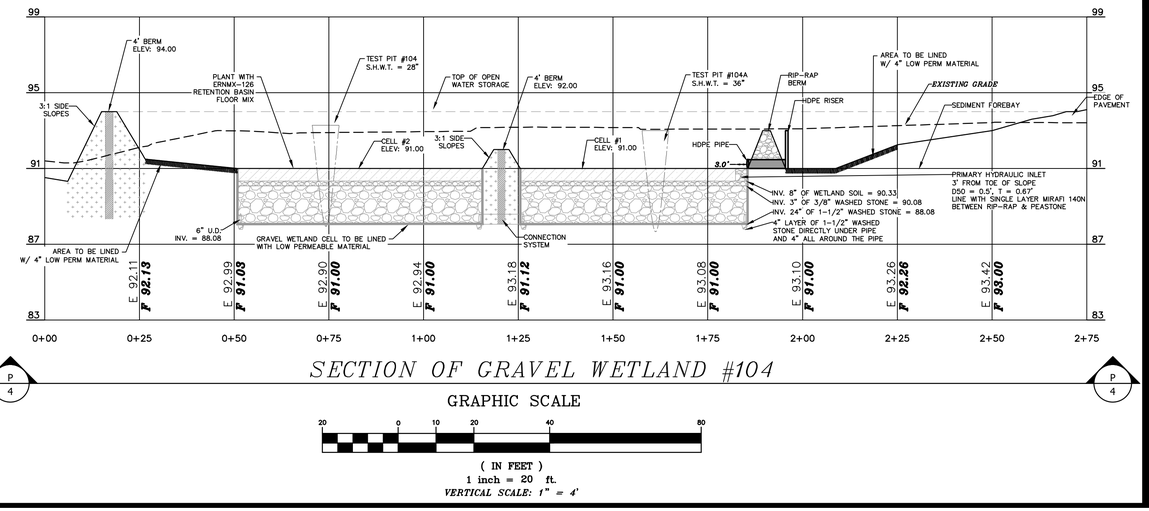
Seeding Rate: 20-40 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

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.





GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

#	REVISION	DATE	DESCRIPTION
1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

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. 14293
LICENSED PROFESSIONAL ENGINEER

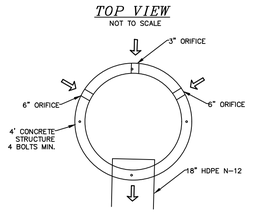
P–104

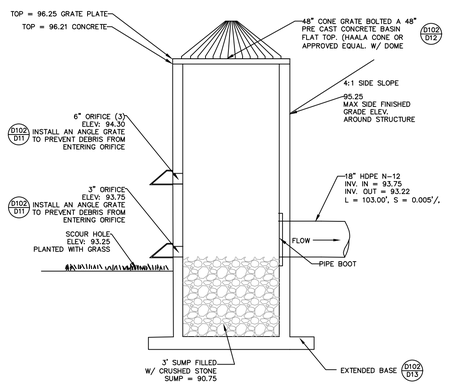
NOT FOR CONSTRUCTION

P1

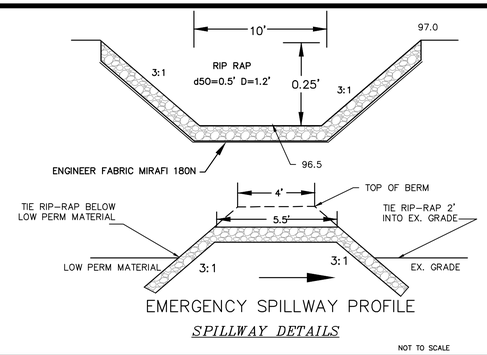
OUTLET STRUCTURE #105

NOT TO SCALE





P2

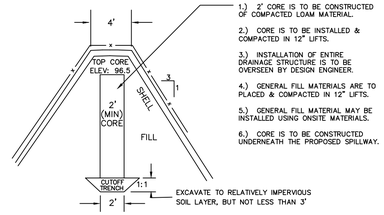


EMERGENCY SPILLWAY PROFILE

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 %	*Puccinellia distans, 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	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

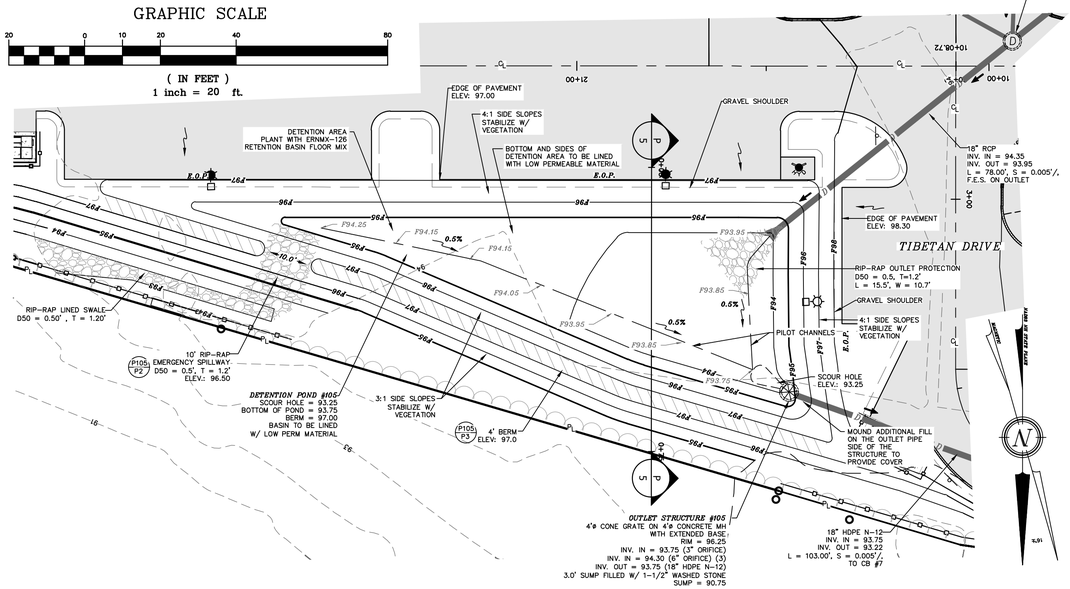
The hardy inexpensive grass and grass-like species are ideal for retention basins that may have high salt inflows and where mowing may be required. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

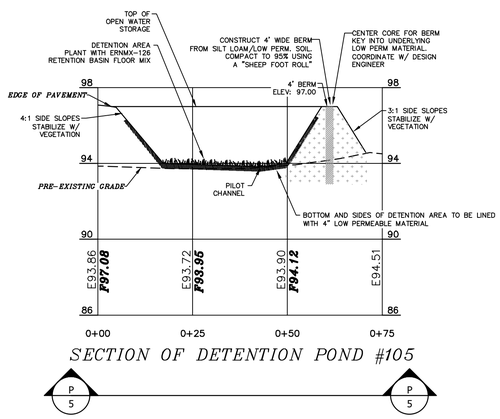
PLAN VIEW DETENTION POND #105

GRAPHIC SCALE

20 0 10 20 40 80

(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-105

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

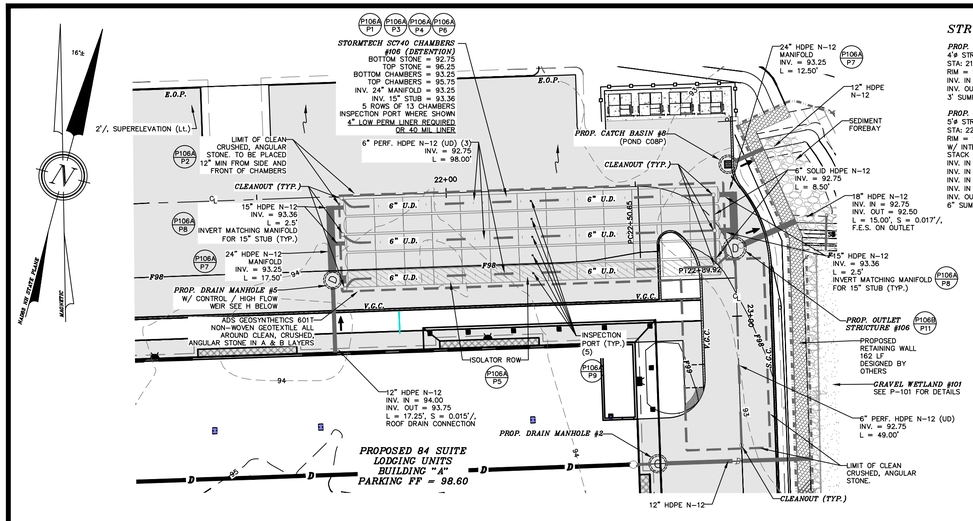
DETENTION POND #105
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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
PROFESSIONAL ENGINEER
OCTOBER

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

A REPRESENTATIVE FROM BSⅇE 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) (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 ULD.)
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

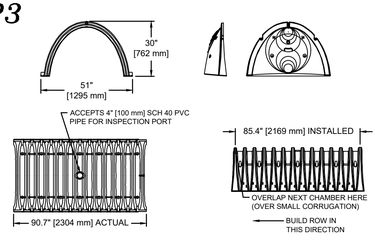
MATERIAL LOCATION		DESCRIPTION	AASHTO M43 DESIGNATION[1]	COMPACTION/DENSITY REQUIREMENT
D	FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE 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 TOP OF THE EMBEDMENT STONE (B) LAYER) TO 12" (300 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOILS/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" (300 mm) OF MATERIAL OVER STONE (B) HAS BEEN PLACED. 2 (300 mm) OF ADDITIONAL LAYERS MAY BE INSTALLED TO A MIN. OF 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 (A) LAYER 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]

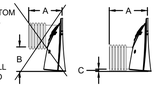
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740EPE06T	6" [150 mm]	10.90" [277 mm]	16.50" [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

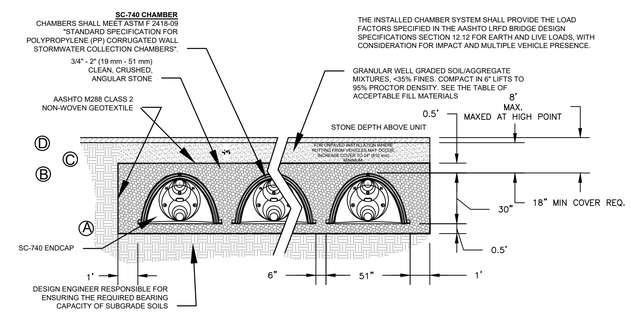
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*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.



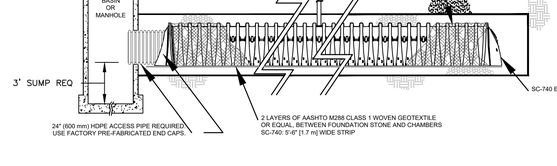
SC-740 TECHNICAL SPEC.

P4



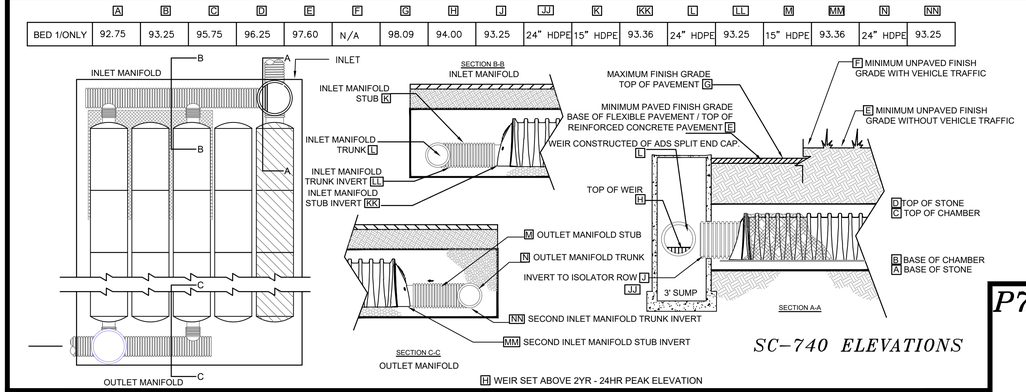
SC-740 STANDARD CROSS SECTION

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	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

SC-740 ELEVATIONS

H WEIR SET ABOVE 2YR - 24HR PEAK ELEVATION

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:

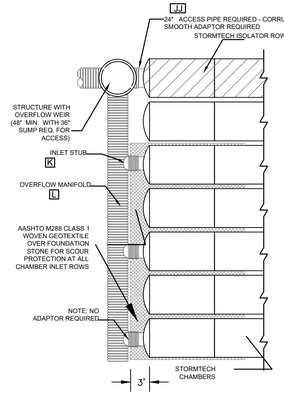
- TEMPORARY BENCHMARK (T.B.M.)
- F101 / E6 DETAIL SHEET / DETAIL
- P176 / P175 CONTOUR MINOR, PROPOSED / CONTOUR MAJOR, PROPOSED
- ROAD CENTERLINE
- SHOULDER
- PAVEMENT SEAM
- D DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- U.D UNDERDRAIN
- GUARD RAIL
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (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

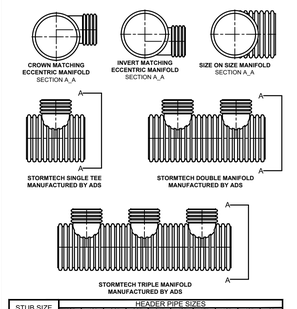
* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

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

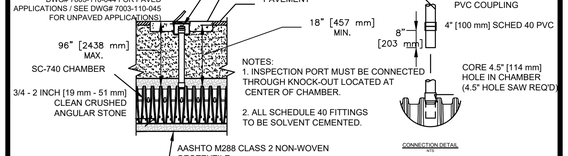
AVAIL - STANDARD HEADERS AVAILABLE

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-2024-0019

#	REVISION	DATE	DESCRIPTION
1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

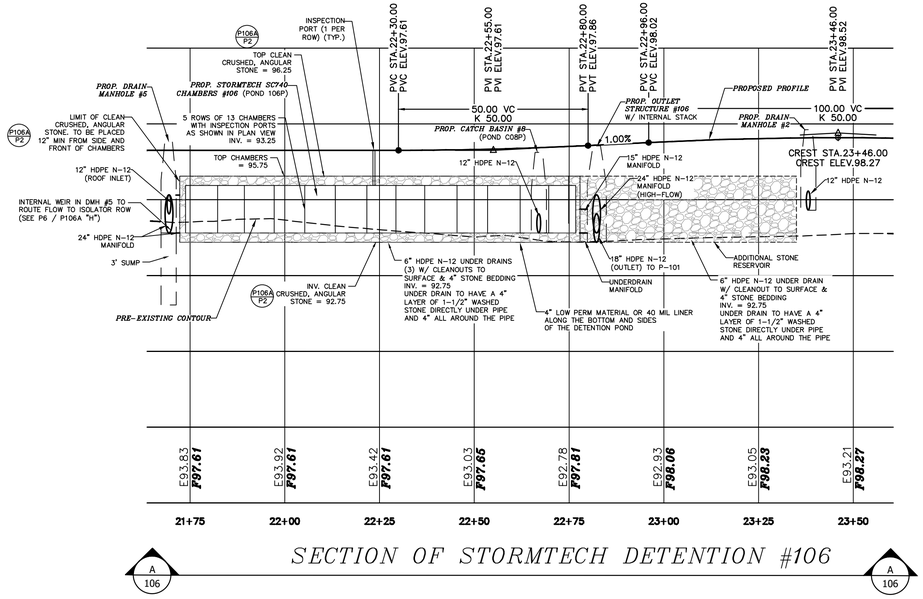
STORMTECH SC740 CHAMBER DETENTION POND #106A
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14233 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

NOT FOR CONSTRUCTION



SECTION OF STORMTECH DETENTION #106

A 106 A 106

GRAPHIC SCALE

20 0 10 20 40 80

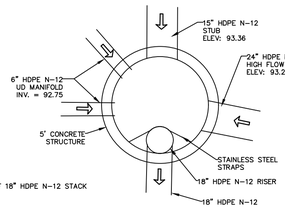
(IN FEET) VERTICAL SCALE: 1" = 4'
1 inch = 20 ft.

LOW PERMEABILITY MATERIAL GRADATION

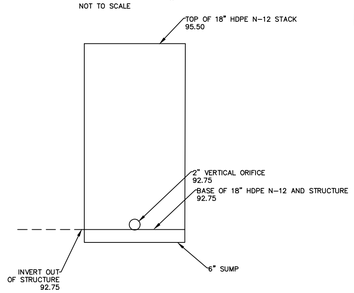
SIEVE SIZE	% PASSING BY WEIGHT
#4	95 – 100
#40	60 – 95
#100	40 – 60
#200	25 – 45

P11

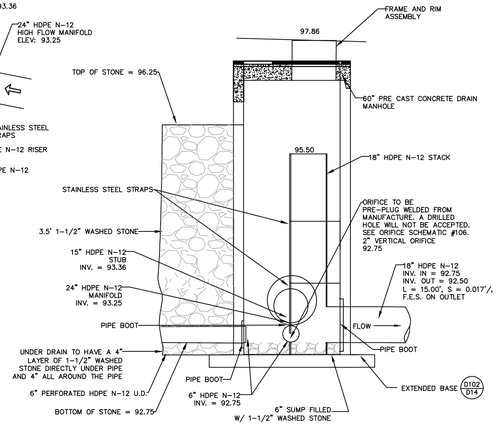
TOP VIEW
NOT TO SCALE (NO FRAME AND RIM IN THIS VIEW)



ORIFICE SCHEMATIC #106
NOT TO SCALE



OUTLET STRUCTURE #106
NOT TO SCALE



PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 14243 LICENSED PROFESSIONAL ENGINEER

P–106B

NOT FOR CONSTRUCTION

SOILS & DEWATERING:

WfA	*WINDSOR*	*VARIANT*	*K= 0.17*
WfB	*WINDSOR*	*VARIANT*	*K= 0.17*
WfC	*WINDSOR*	*VARIANT*	*K= 0.17*
BzA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BzB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BzC	*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.

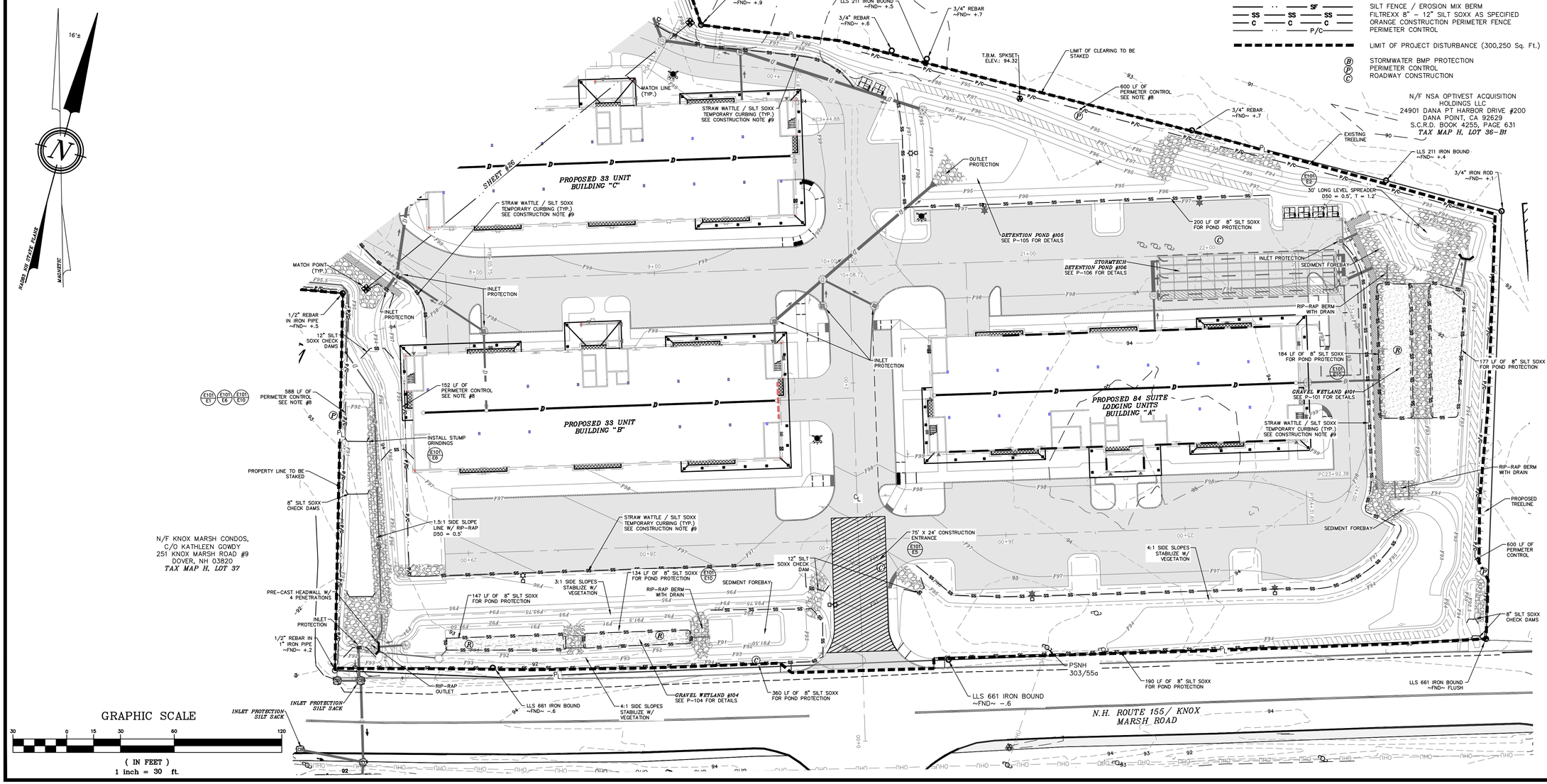
8.) CONTRACTOR CAN USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN. SILT FENCE OR SILT SOXX REQUIRED WHEN UPGRADIENT DISTURBED SOIL GRADE IS GREATER THAN 5%. MULCH BERM CAN BE USED WHEN THE UPGRADIENT DISTURBED SOIL GRADE IS 5% OR LESS.

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



PLANNING FILE #SITE–2024–0019

#	DATE	REVISION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

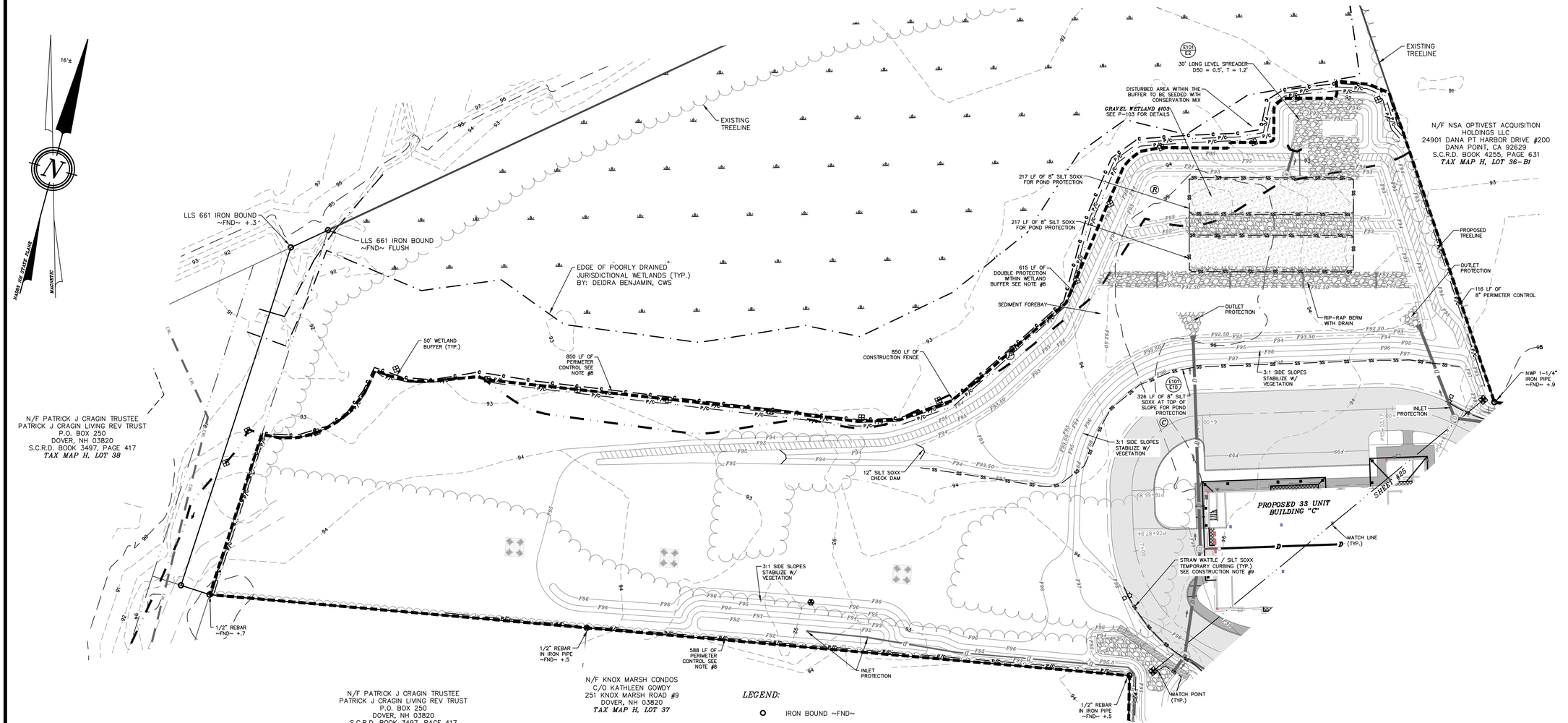
EROSION AND SEDIMENT CONTROL PLAN EAST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14249
LICENSED PROFESSIONAL ENGINEER

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*
BxA	*BUXTON*	*SILT LOAM*	*K= 0.28*
BxB	*BUXTON*	*SILT LOAM*	*K= 0.49*
BxC	*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.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-2024-0019

#	DATE	REVISION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 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
- 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", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", MOUNTED ON BUILDING
- S — 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 = 60 ft.

UTILITY PLANS TABLE OF CONTENTS:

SHEET #27: OVERVIEW UTILITY PLAN
SHEET #28: UTILITY P&P TIBETAN DRIVE 0+00–4+00
SHEET #29: UTILITY P&P TIBETAN DRIVE 4+00–7+00
SHEET #30: UTILITY P&P TIBETAN DRIVE 7+00–END
SHEET #31: UTILITY P&P BUILDING "A" 20+00–24+00
SHEET #32: SEWER CONNECTION PROFILE
SHEET #33: UTILITY PLAN VIEW WATERLINE
SHEET #34: WATERLINE EXTENSION P&P HANSON ROAD
SHEETS #52–#53: 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 RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE 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 DIFFERENTIAL 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 PIPE IS TO BE NO LESS THAN 0.004'/.

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:

48, 2–BEDROOM UNITS (150 GPD/BEDROOM) = 14,400 GPD
+
12, 1BR UNITS (225 GPD/UNIT) = 2,700 GPD
+
6, STUDIO UNITS (225 GPD/UNIT) = 1,350 GPD
+
84, LODGING UNITS (53 GPD PER GUEST METCALF & EDDY/AECOM TABLE 3–3) ASSUMED AVERAGE OF 2 GUESTS/SUITE = 8,904 GPD
+
8 ASSUMED EMPLOYEES (8 GPD PER EMPLOYEE METCALF & EDDY/AECOM TABLE 3–3) = 64 GPD

TOTAL DESIGN FLOW = 27,418 GPD
PREVIOUS APPROVAL UNDER NHDES SEWER DISCHARGE PERMIT D2022–0705 WAS FOR 25,075 GPD. NEW APPROVAL REQUIRED.

TAX MAP G, LOT 5

TAX MAP H, LOT 37B

TAX MAP H, LOT 37

TAX MAP H, LOT 36–B1

N.H. ROUTE 155 / KNOX MARSH ROAD

LLS 211 1–1/4" IRON PIPE ~FND~ +1.1

OLD UTILITY POLE

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: DEIDRA BENJAMIN, CWS

8" CLDI CL 52 W/ POLYWRAP

MATCH LINE & POINT (TYP.)

50' WETLAND BUFFER (TYP.)

EX. 12" AC WATER MAIN GIS LOCATED

1/2" REBAR ~FND~ +.7

1/2" REBAR IN IRON PIPE ~FND~ +.5

T.B.M. SPKSET ELEV.: 92.79

1/2" REBAR IN IRON PIPE ~FND~ +.5

EX. SEWER MANHOLE

EVERSOURCE 303/62A

EXISTING HYDRANT

NET 146/48

GRAVEL WETLAND #104 SEE P–104 FOR DETAILS

1/2" REBAR IN 1" IRON PIPE ~FND~ +.2 DESTROYED TO BE RESET

EX. SEWER MANHOLE

PSNH 303/62

PSC NH 303/62

PSNH 303/61

EX. SEWER MANHOLE

VZ 48

PSNH 303/59

EX. 12" AC WATER MAIN GIS LOCATED

EX. SEWER MANHOLE

PSNH 146/46

PSNH 303/56

EXISTING SMH DOVER GIS #2865

AC WATERLINE TAP, SEE NOTES FOR SAFETY SPECIFICATIONS. INSTALLED 2023

T.B.M. PKSET ELEV.: 95.25

PSNH 303/55

PROPOSED UTILITY POLE

EX. 12" ACP

PSNH 303/54

EXISTING SMH DOVER GIS #2864

PROPOSED HYDRANT

NMP 1–1/4" IRON PIPE ~FND~ +.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

3/4" IRON ROD ~FND~ +.1

GRAVEL WETLAND #101 SEE P–101 FOR DETAILS

MATCH LINE & POINT (TYP.)

LLS 661 IRON BOUND ~FND~ FLUSH

PROPOSED PULL POLE

EX. 12" AC WATER MAIN LOCATION FROM GIS

8" SDR 21

PROPOSED 33 UNIT BUILDING "C" GARAGE FF = 99.35

PROPOSED 33 UNIT BUILDING "B" PARKING FF = 99.00

PROPOSED 84 SUITE LODGING UNITS BUILDING "A" PARKING FF = 98.60

TRANSFORMER & PAD

ELECTRIC METERS

F.D.C.

4" CLDI CL 52 W/ POLYWRAP

8" SDR 35

PROP. SMH #3

PROP. SMH #4

PROP. SMH #5

PROP. SMH #6

PROP. SMH #7

ELECTRIC MANHOLE

UNDERGROUND ELECTRIC TO CREATE LOOP

LAMP "A" (TYP.)

LAMP "B" (TYP.)

SHEET #27

SHEET #28

SHEET #29

SHEET #30

SHEET #31

SHEET #32

SHEET #33

SHEET #34

PLANNING FILE #SITE–2024–0019

#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT
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. 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 37A

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

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

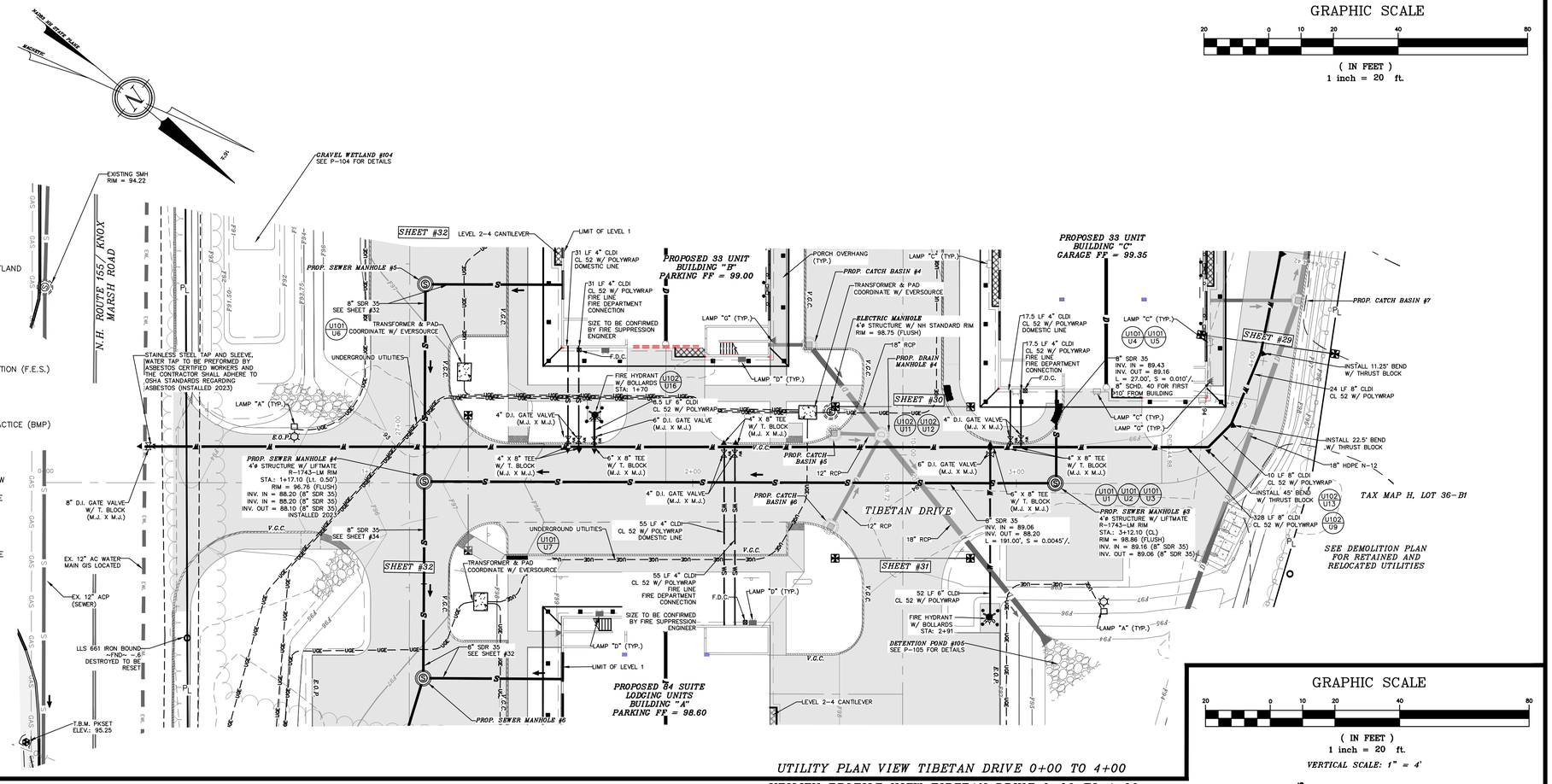
5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

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
- FP76 — CONTOUR MINOR, PROPOSED
- FP75 — 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
- DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UGE — UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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

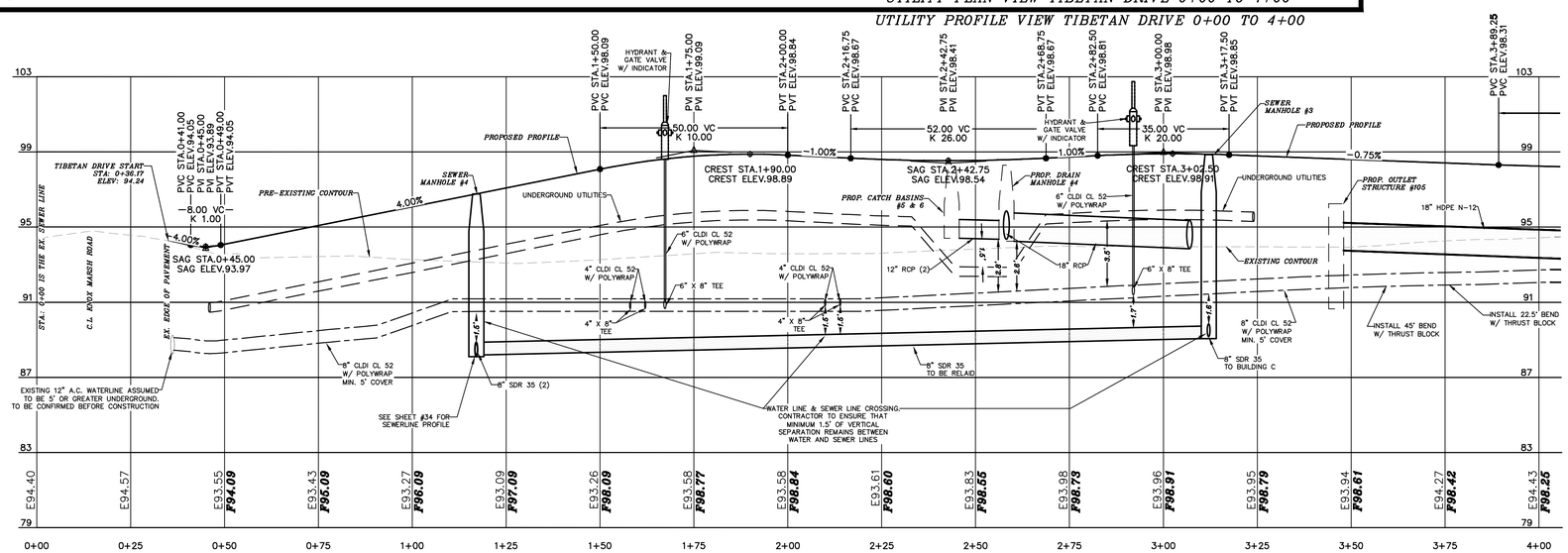


GRAPHIC SCALE

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'

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

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
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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 37A

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

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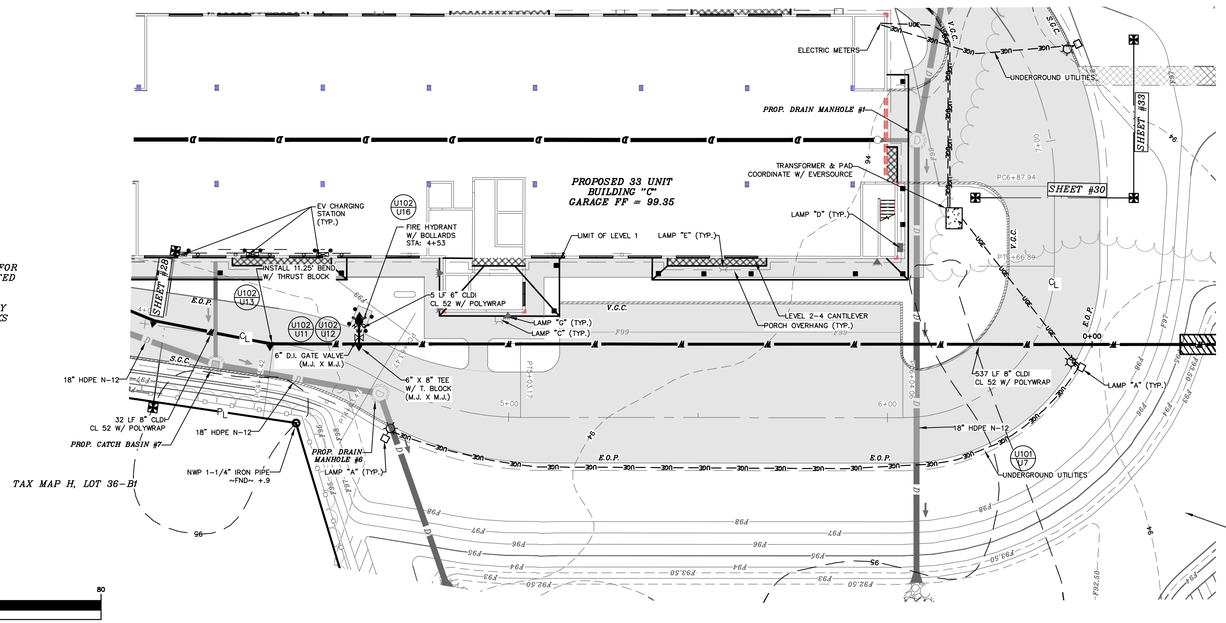
5.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

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.

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

LEGEND:

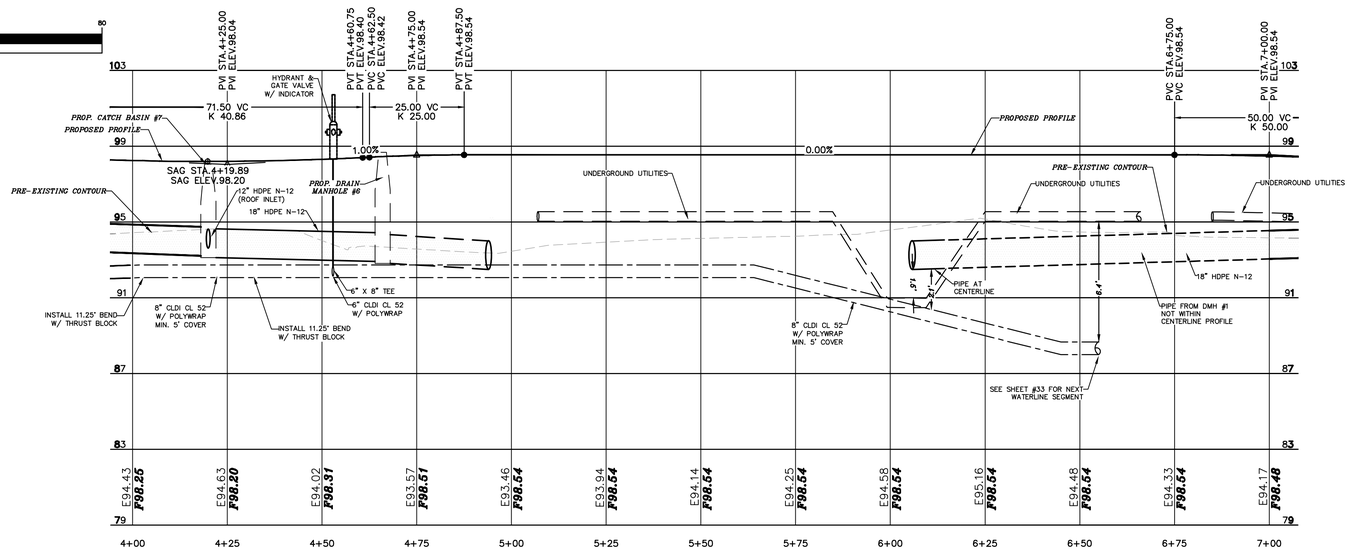
- UTILITY POLE/GUY WIRE
- TEST PIT
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- POORLY DRAINED JURISDICTIONAL WETLAND
- WETLAND BUFFER
- CONTOUR MINOR, EXISTING
- CONTOUR MAJOR, EXISTING
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- BUILDING SETBACK LINE
- TREELINE
- ROAD 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
- UGE — UGE — UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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 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'



PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER 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.) THE INTENT OF THIS PLAN IS TO SHOW THE UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

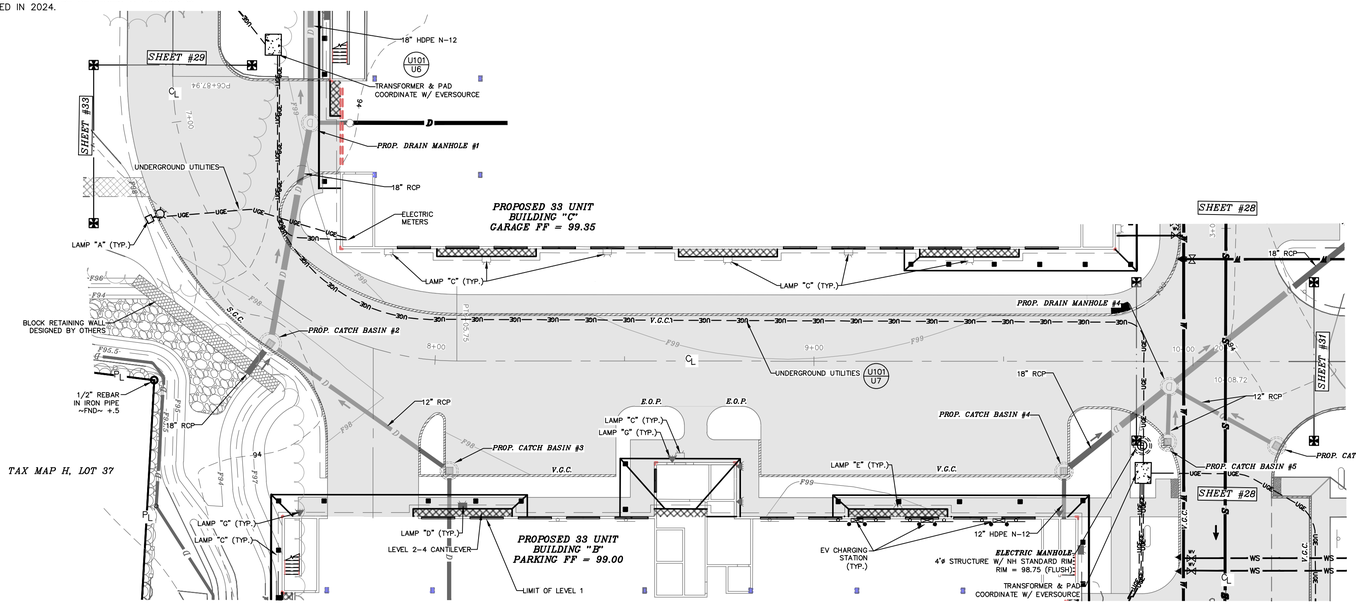
6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

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.



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 — UGE — UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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

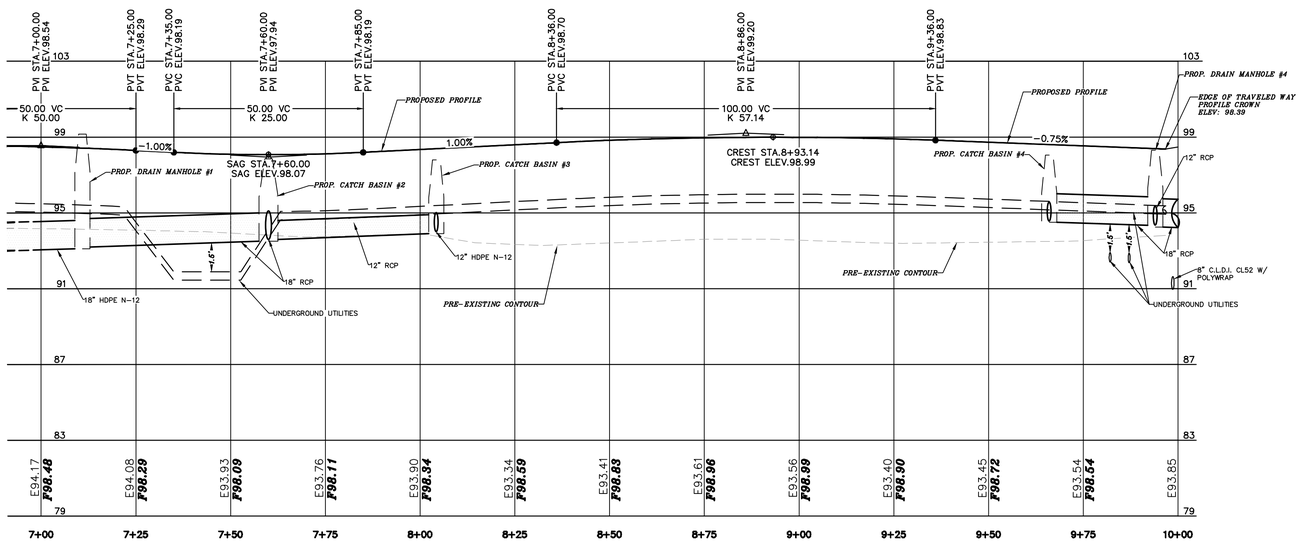
UTILITY PLAN VIEW TIBETAN DRIVE 7+00 TO END

UTILITY PROFILE VIEW TIBETAN DRIVE 7+00 TO END

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

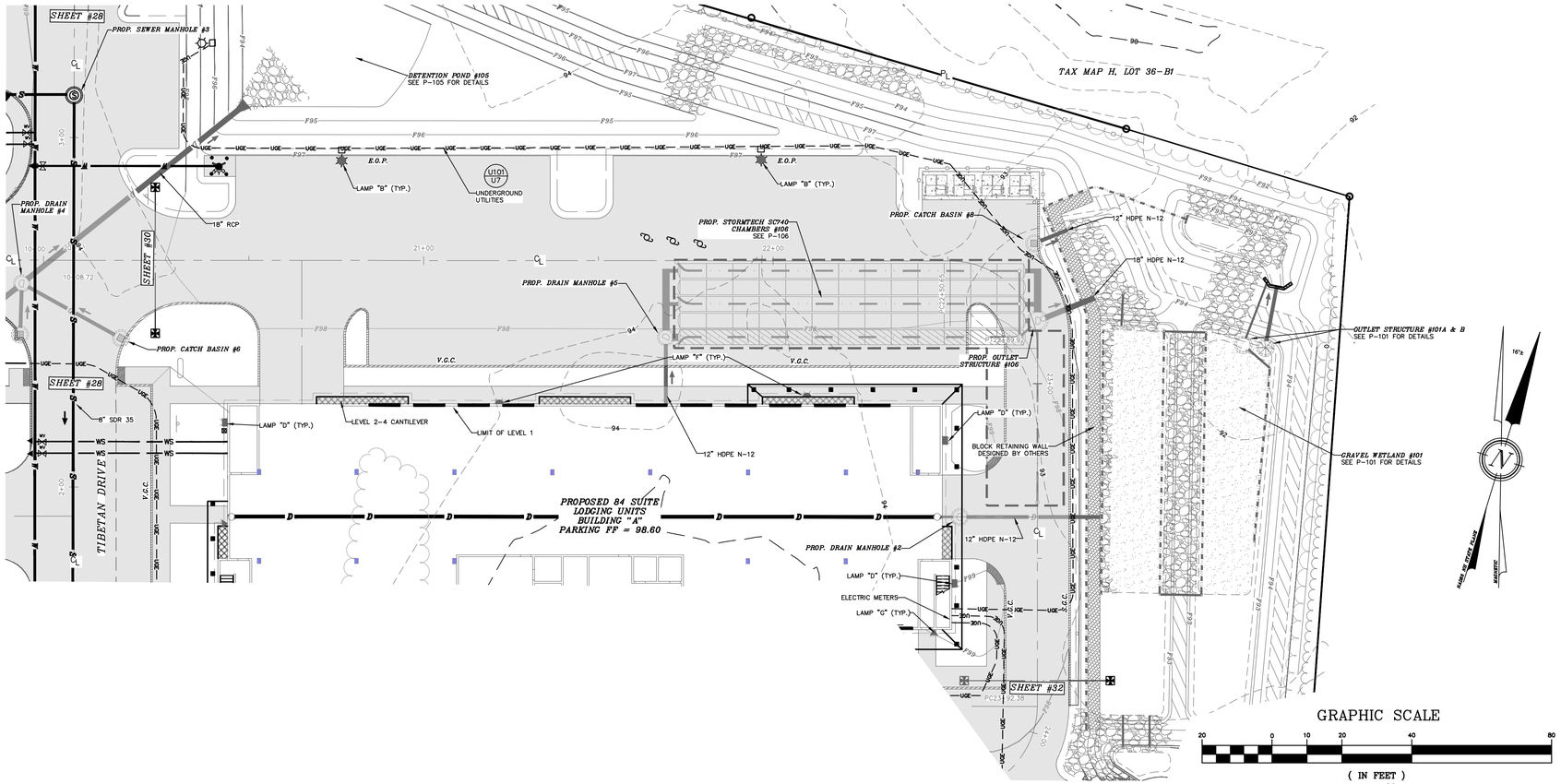
UTILITY PLAN AND PROFILE TIBETAN DRIVE 7+00 TO END
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14241
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 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 UTILITY DETAIL FOR THE PROPOSED DEVELOPMENT.

6.) SEE OVERVIEW UTILITY PLAN FOR ALL OTHER STANDARD UTILITY NOTES.

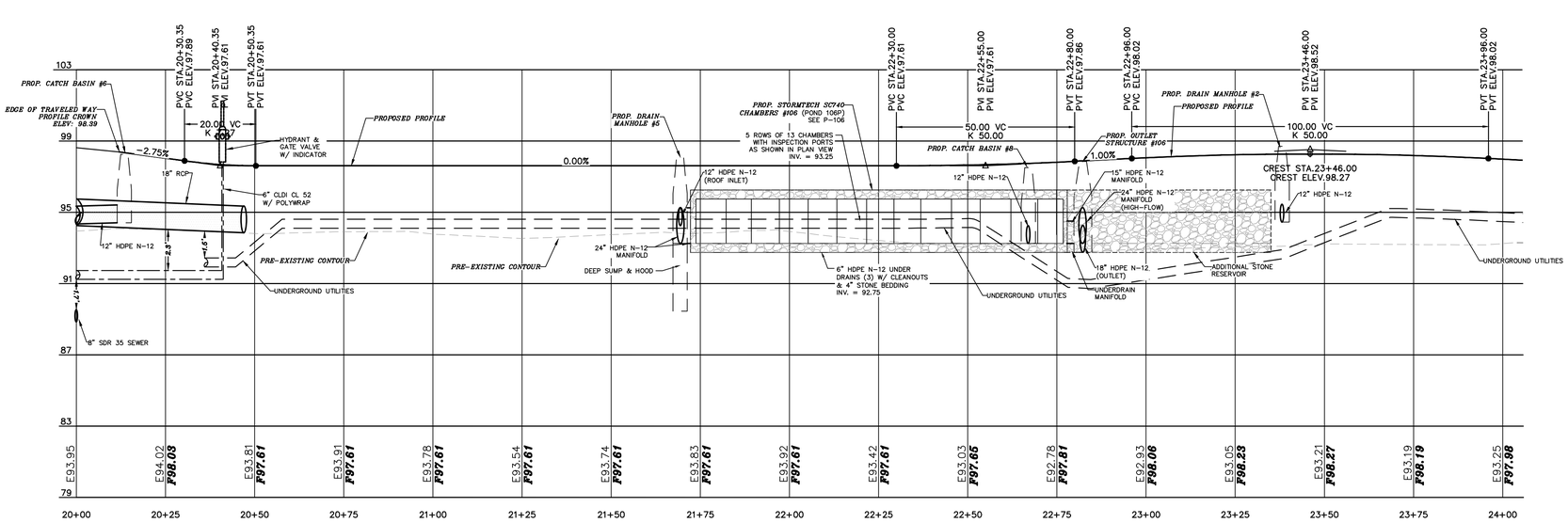
7.) SEE DEMOLITION PLAN FOR UTILITIES TO BE RETAINED. A PORTION OF THE UTILITIES WERE INSTALLED IN 2024.

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
- UGE — UGE — UGE — TRANSFORMER / J.BOX UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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 PLAN VIEW REAR LODGING BUILDING "A" 20+00 TO 24+00

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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

UTILITY

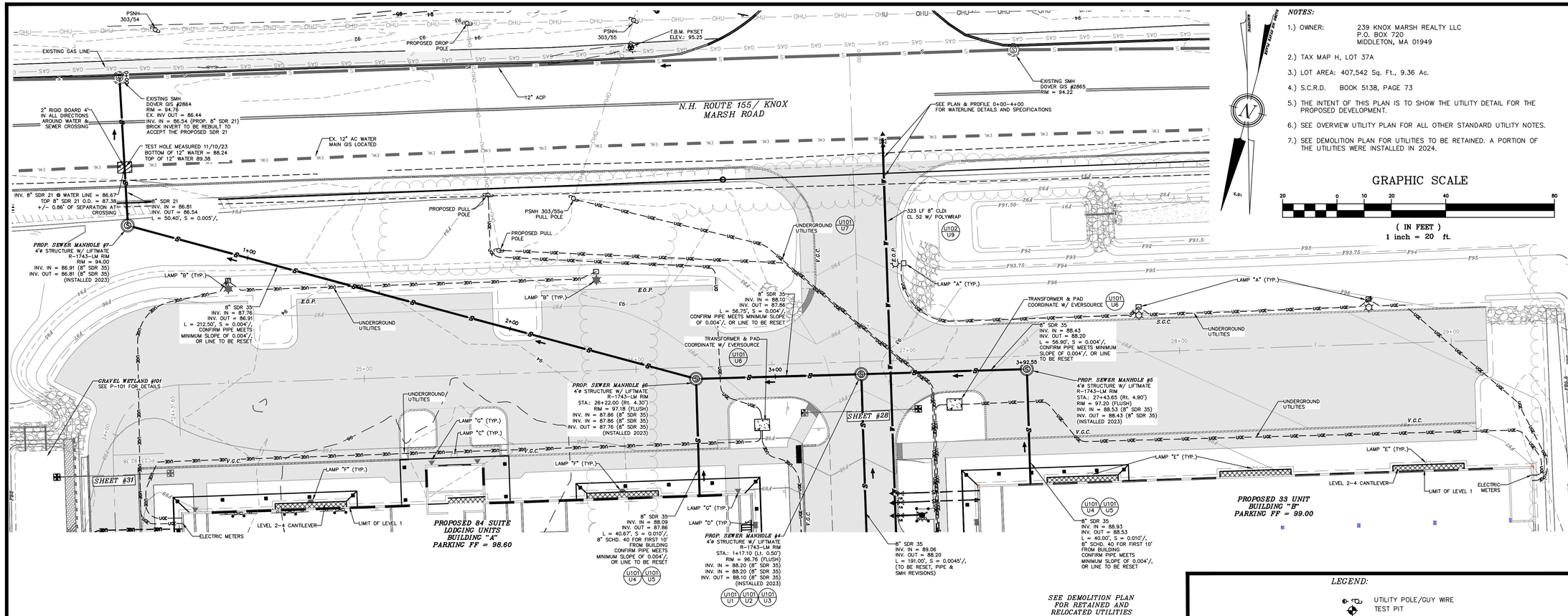
PLAN AND PROFILE LODGING BUILDING "A" 20+00 TO 24+00
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14241
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.

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GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND:

- UTILITY POLE/GUY WIRE
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- 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
- UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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

PLAN VIEW EX. SMH #2864 TO PROP. SMH #5

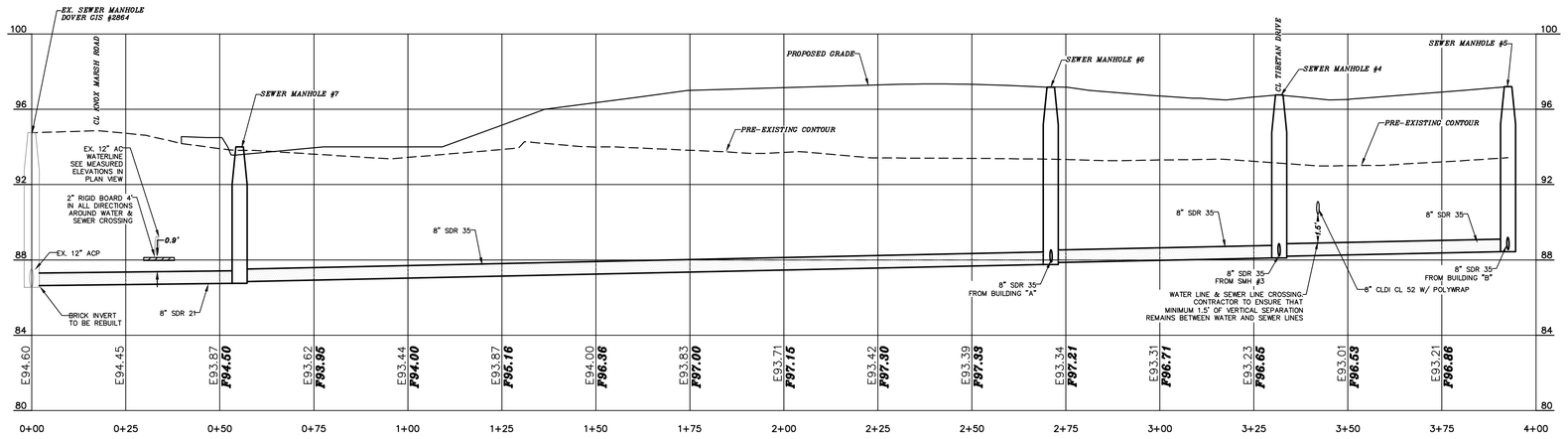
PROFILE VIEW EX. SMH #2864 TO PROP. SMH #5

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

VERTICAL SCALE: 1" = 4'



PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

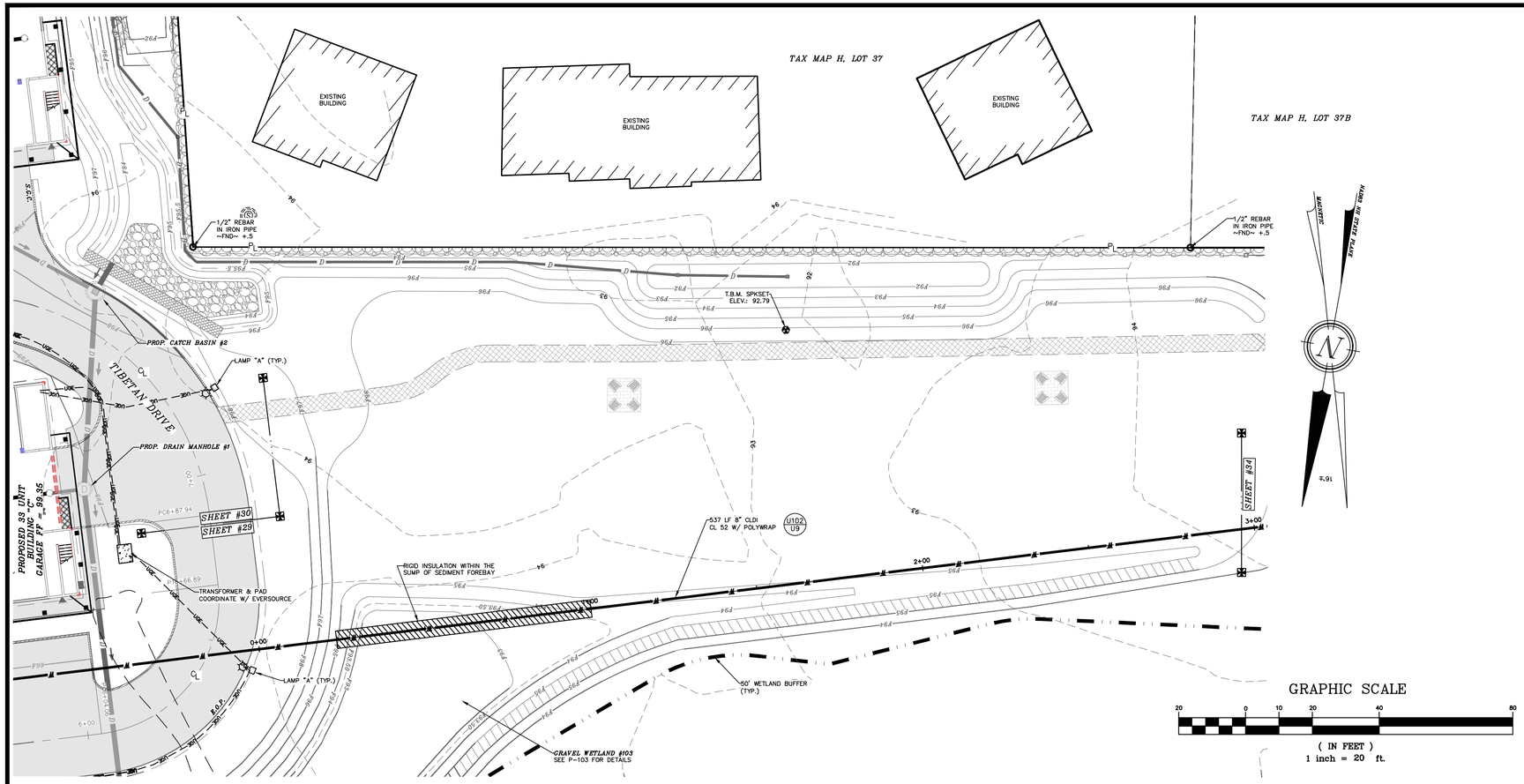
MIXED USE BUILDING UTILITY & SEWER PROFILE
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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

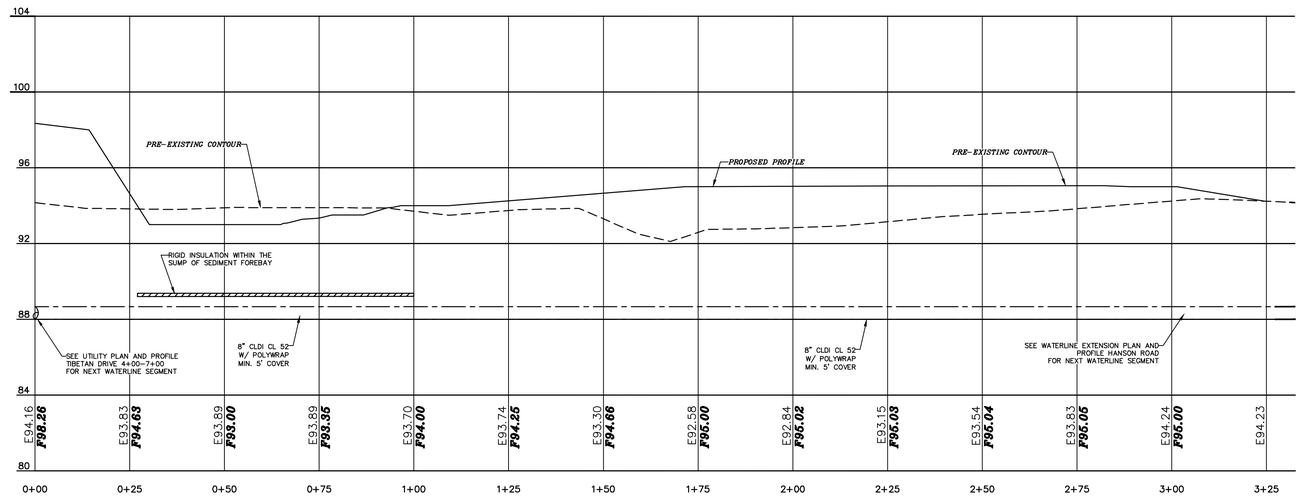
STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14293 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



UTILITY PLAN VIEW WATERLINE

UTILITY PROFILE VIEW WATERLINE



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
- 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 UGE UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", 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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

UTILITY PLAN AND PROFILE WATERLINE
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 — PROFESSIONAL SURVEYOR

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
- FY76 — CONTOUR MINOR, PROPOSED
- FY75 — 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
- D — DRAIN MANHOLE W/STRUCTURE
- CATCH BASIN W/ STRUCTURE
- STORMWATER BMP OUTLET STRUCTURE
- TRANSFORMER / J.BOX
- UGE — UGE — UGE — UNDERGROUND UTILITY
- LAMP "A", POLE MOUNTED
- LAMP "B", POLE MOUNTED
- LAMP "C", MOUNTED ON BUILDING
- LAMP "D", MOUNTED ON BUILDING
- LAMP "E", MOUNTED ON BUILDING
- LAMP "F", MOUNTED ON BUILDING
- LAMP "G", MOUNTED ON BUILDING
- S — 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

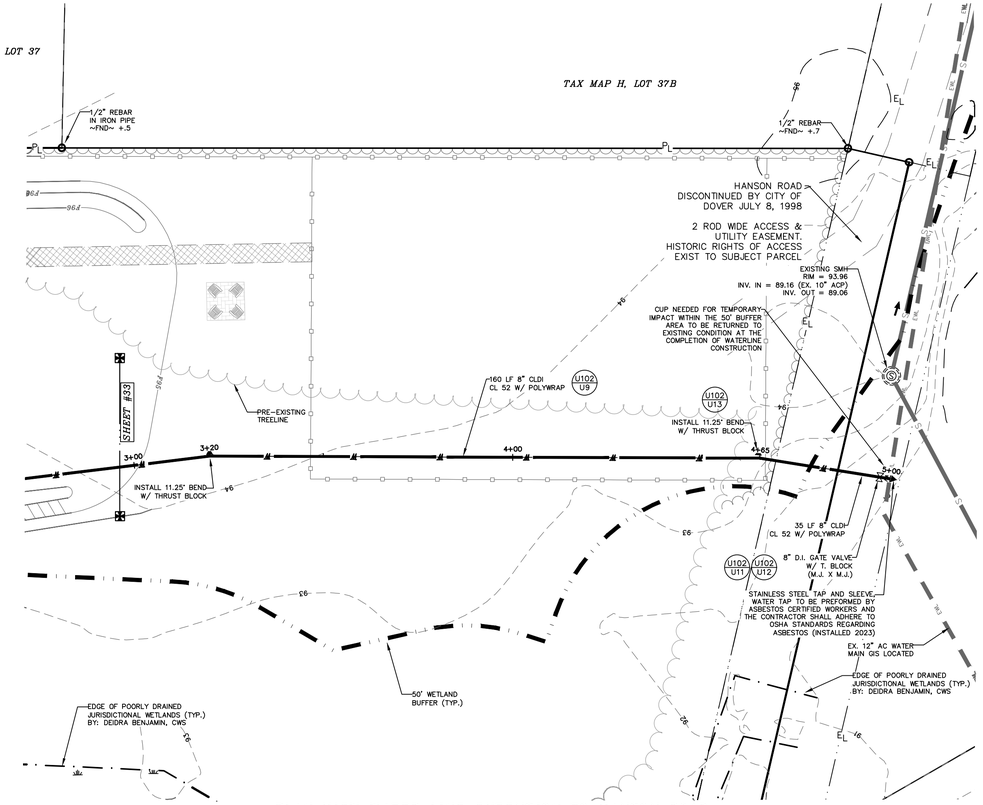
(IN FEET)

1 inch = 20 ft.



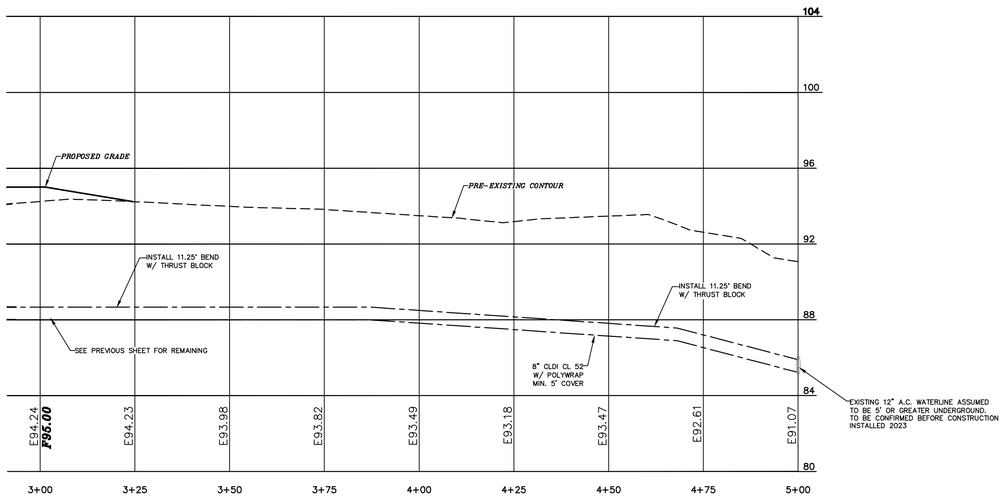
TAX MAP H, LOT 37

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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

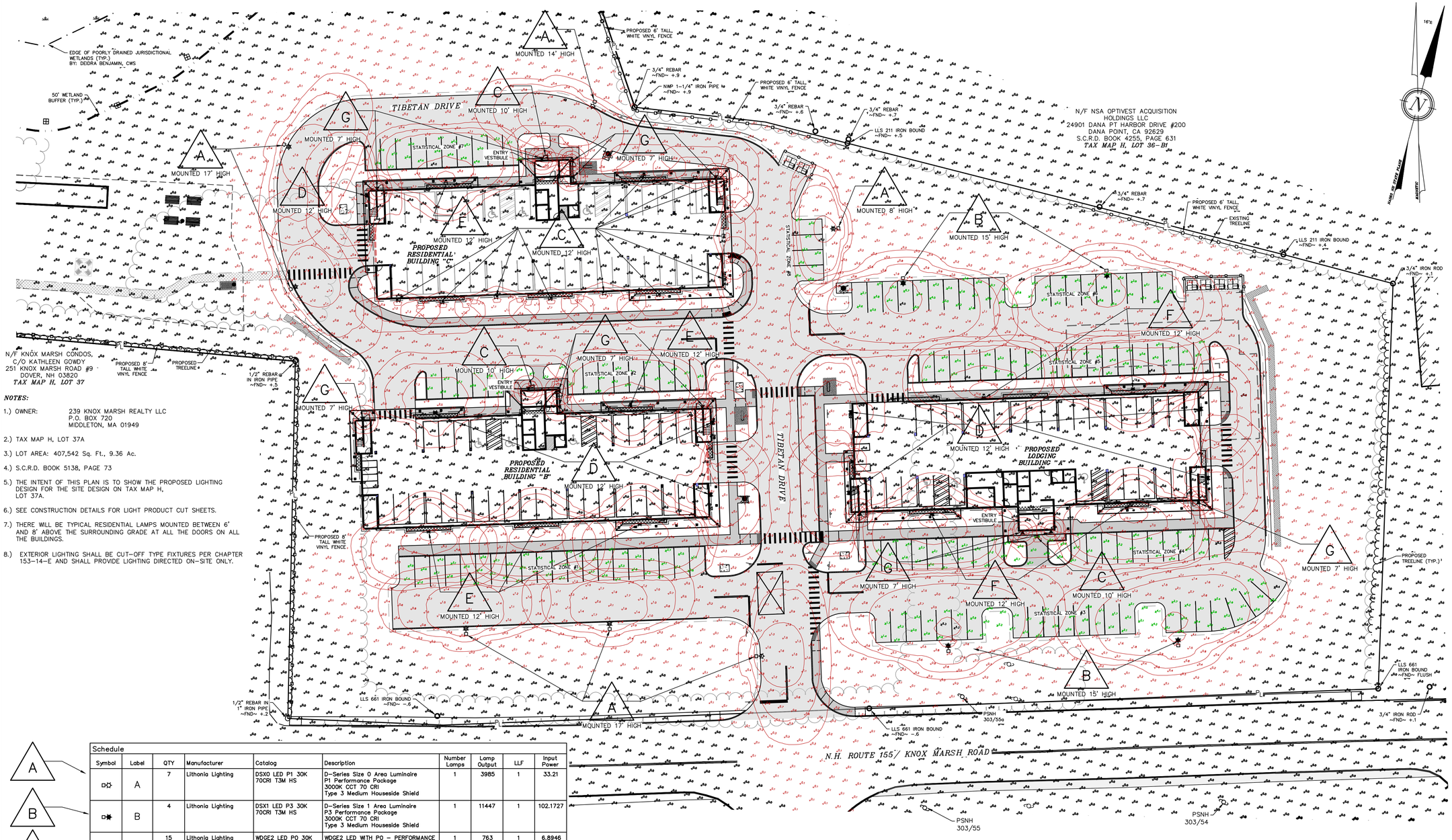
WATERLINE EXTENSION PLAN & PROFILE HANSON ROAD
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14241
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.) 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	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power
A	A	7	Lithonia Lighting	DSXO LED P1 30K 70CRI T3M HS	D-Series Size 0 Area Luminaire P1 Performance Package 3000K CCT 70 CRI Type 3 Medium Houseside Shield	1	3985	1	33.21
B	B	4	Lithonia Lighting	DSX1 LED P3 30K 70CRI T3M HS	D-Series Size 1 Area Luminaire P3 Performance Package 3000K CCT 70 CRI Type 3 Medium Houseside Shield	1	11447	1	102.1727
C	C	15	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
D	D	8	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
E	E	5	Lithonia Lighting	WDGE3 LED P3 70CRI R3 30K	WDGE3 LED WITH P3 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 OPTIC	1	9265	1	71.6952
F	F	4	Lithonia Lighting	WDGE3 LED P4 30K 70CRI R3	WDGE3 LED WITH P4 - PERFORMANCE PACKAGE, 3000K, 70CRI, TYPE 3 OPTIC	1	11212	1	87.8914
G	G	15	Lithonia Lighting	ODSL10 SRC	CRAFTSTON WALL MOUNTED SMALL DECORATIVE LANTERN, ONE LAMP 13W SPIRAL COMPACT FLUORESCENT, WHITE GLASS DIFFUSER 4.25" DIA. X 6.65" HIGH, ELECTRONIC BALLAST	1	900	1	12.6

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Stat Zone #1	X	2.4 fc	5.0 fc	0.4 fc	12.5:1	6.0:1
Stat Zone #2	X	1.8 fc	5.8 fc	0.3 fc	19.3:1	6.0:1
Stat Zone #3	X	2.4 fc	5.3 fc	0.4 fc	13.3:1	6.0:1
Stat Zone #4	X	1.8 fc	6.2 fc	0.3 fc	20.7:1	6.0:1
Stat Zone #5	X	3.0 fc	6.8 fc	0.5 fc	13.6:1	6.0:1
Stat Zone #6	X	3.0 fc	6.0 fc	0.5 fc	12.0:1	6.0:1
Stat Zone #7	X	2.4 fc	6.0 fc	0.4 fc	15.0:1	6.0:1
Stat Zone #8	X	1.8 fc	5.3 fc	0.3 fc	17.7:1	6.0:1

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

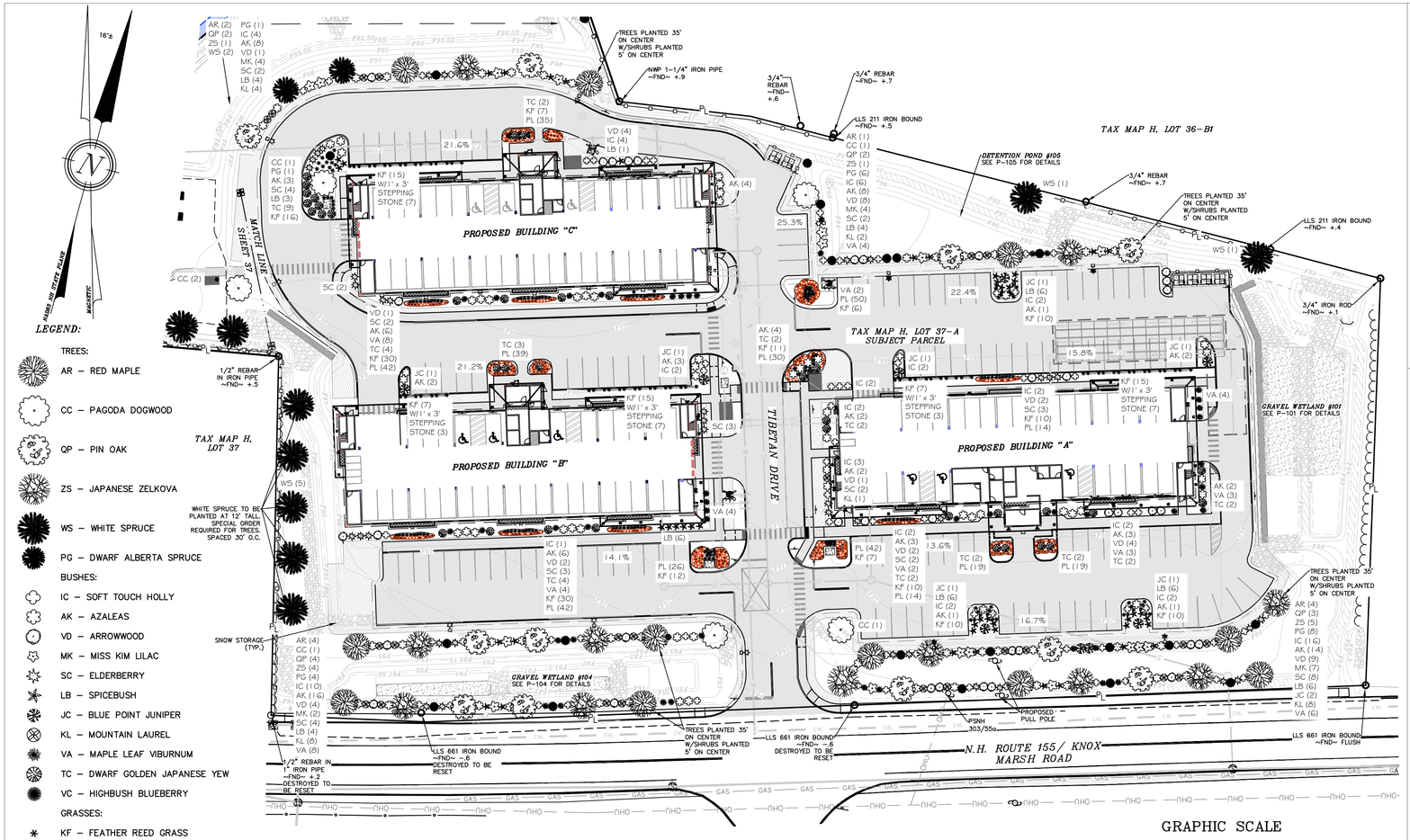
LIGHTING PLAN EAST
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14243 LICENSED PROFESSIONAL ENGINEER -

NOT FOR CONSTRUCTION



NOTES:

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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.	12	AR
Cornus Controversa / Pagoda Dogwood	4" cal.	6	CC
Zelkova serrata / Japanese Zelkova	4" cal.	11	ZS
Quercus palustris / Pin Oak	4" cal.	17	QP
Picea Glauca / White Spruce	4" cal.	16	WS
Picea Glauca 'Conica' /Dwarf Alberta Spruce	3 gal.	31	PG
Shrubs			
Ilex crenata 'Soft Touch'/ Soft Touch Holly	24"	65	IC
Azalea 'Karen'/ Karen Azalea	24"	131	AK
Viburnum Dentatum / Arrowwood Viburnum	24"	38	VD
Syringa Pubescens Subsp. Patula 'Miss Kim'/ Miss Kim Lilac	24"	17	MK
Sambucus Canadensis/ American Elderberry	24"	37	SC
Lindera Benzoin/ Northern Spicebush	24"	46	LB
Juniperus chinensis 'Blue Point'/ Blue Point Juniper	24"	9	JC
Kalmia latifolia/ Mountain Laurel	24"	23	KL
Viburnum acerifolium / Maple Leaf Viburnum	24"	48	VA
Taxus cuspidata 'Nana Aurescents"/ Dwarf Golden Japanese Yew	24"	36	TC
Vaccinium Corymbosum / Highbush Blueberry	24"	40	VC
Plants			
Black-Eyed Susan, New England Aster, Anise Hyssop & Cranesbill	3" pot	364	PL
Grasses			
Calamagrostis acutifolia 'Karl Foerster' / Feather Reed Grass	#2	228	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
2/15/2026: REVISE UNIT COUNT AND PROJECT LAYOUT

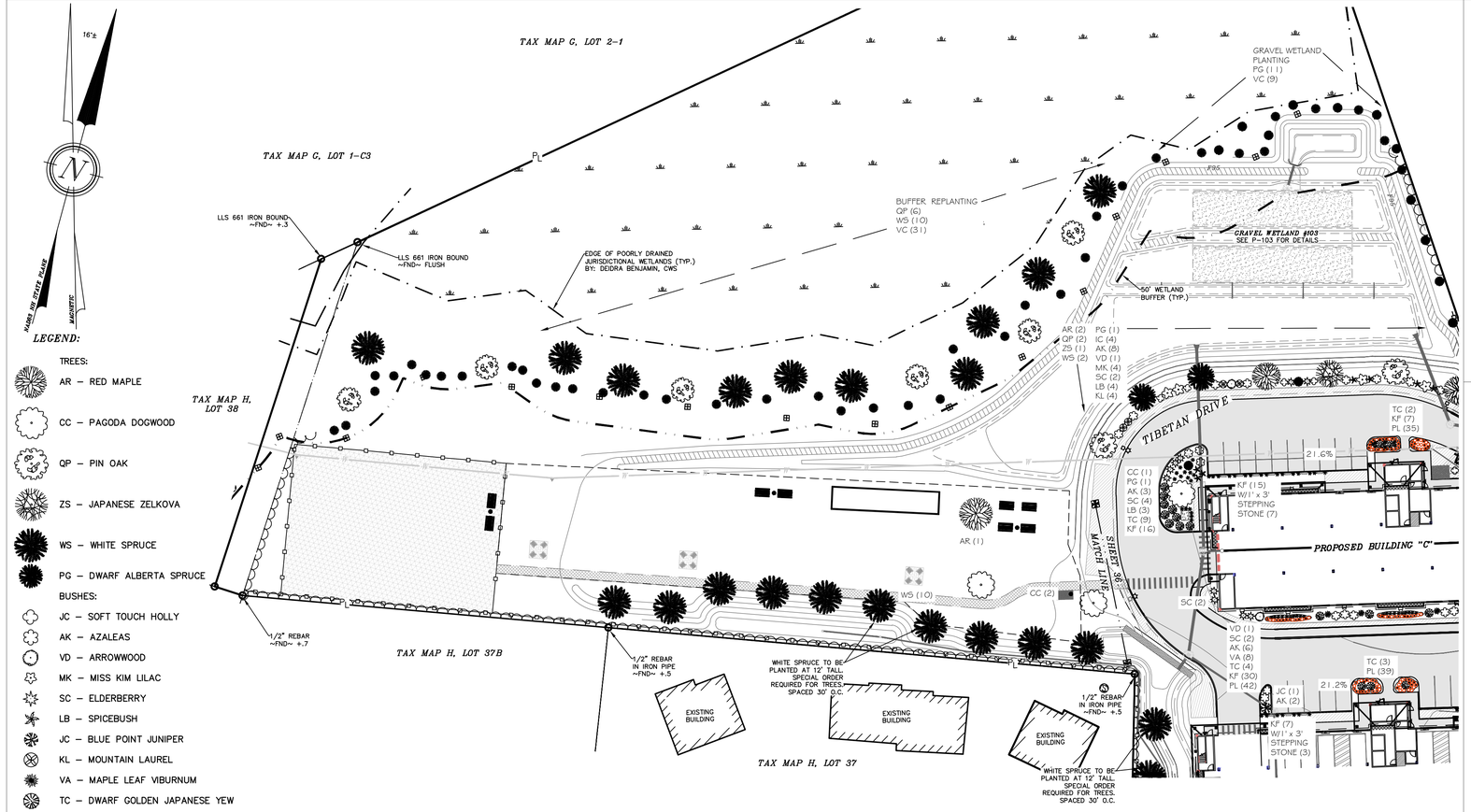
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L - 01

SHEET 36 OF 57

LICENSED LANDSCAPE ARCHITECT ERIC R BUCK 078 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.

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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 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.	12	AR
Cornus Controversa / Pagoda Dogwood	4" cal.	6	CC
Zelkova serrata / Japanese Zelkova	4" cal.	11	ZS
Quercus palustris / Pin Oak	4" cal.	17	QP
Picea Glauca / White Spruce	4" cal.	16	WS
Picea Glauca 'Conica' /Dwarf Alberta Spruce	3 gal.	31	PG
Shrubs			
Ilex crenata 'Soft Touch'/ Soft Touch Holly	24"	65	IC
Azalea 'Karen'/ Karen Azalea	24"	131	AK
Viburnum Dentatum / Arrowwood Viburnum	24"	38	VD
Syringa Pubescens Subsp. Patula 'Miss Kim'/ Miss Kim Lilac	24"	17	MK
Sambucus Canadensis/ American Elderberry	24"	37	SC
Lindera Benzoin/ Northern Spicebush	24"	46	LB
Juniperus chinensis 'Blue Point'/ Blue Point Juniper	24"	9	JC
Kalmia latifolia/ Mountain Laurel	24"	23	KL
Viburnum acerifolium / Maple Leaf Viburnum	24"	48	VA
Taxus cuspidata 'Nana Aurescents"/ Dwarf Golden Japanese Yew	24"	36	TC
Vaccinium Corymbosum / Highbush Blueberry	24"	40	VC
Plants			
Black-Eyed Susan, New England Aster, Anise Hyssop & Cranesbill	3" pot	364	PL
Grasses			
Calamagrostis acutifolia 'Karl Foerster' / Feather Reed Grass	#2	228	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

2/15/2026: REVISE UNIT COUNT AND PROJECT LAYOUT

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L - 02

SHEET 37 OF 57

CERTIFIED 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

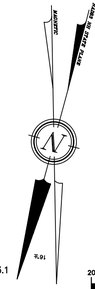
SIGHT DISTANCE REQUIREMENT:

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

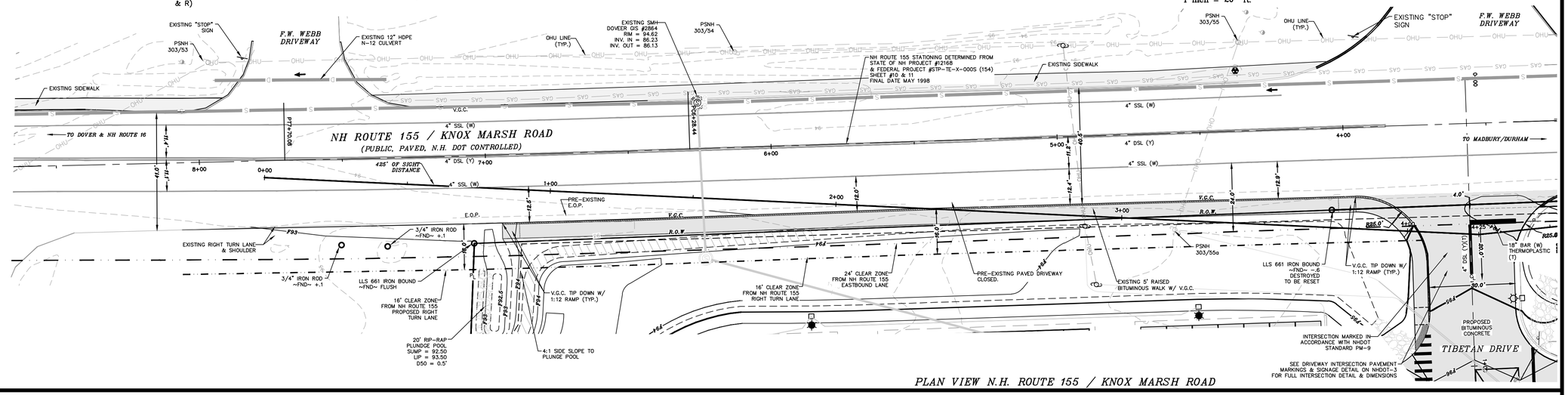


GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

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

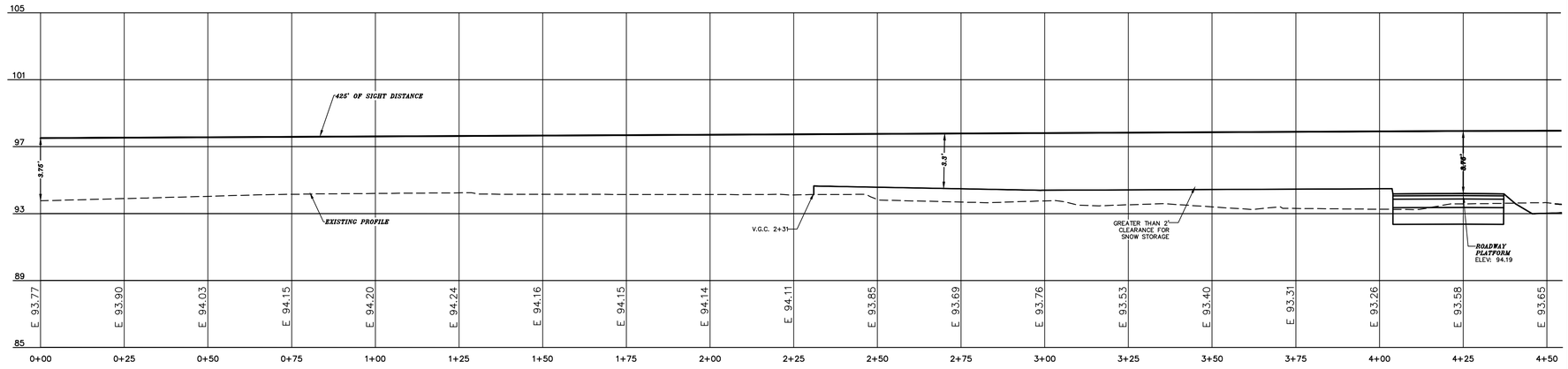
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
PL PROPERTY LINE
R.O.W. RIGHT OF WAY
E.O.P. EDGE OF PAVEMENT
SSL (W) SINGLE SOLID LINE (WHITE)
DSL (Y) DOUBLE SOLID LINE (YELLOW)



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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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. 14241
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.) THIS IS PROPOSED TO BE A RESIDENTIAL AND COMMERCIAL DRIVEWAY.

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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.

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

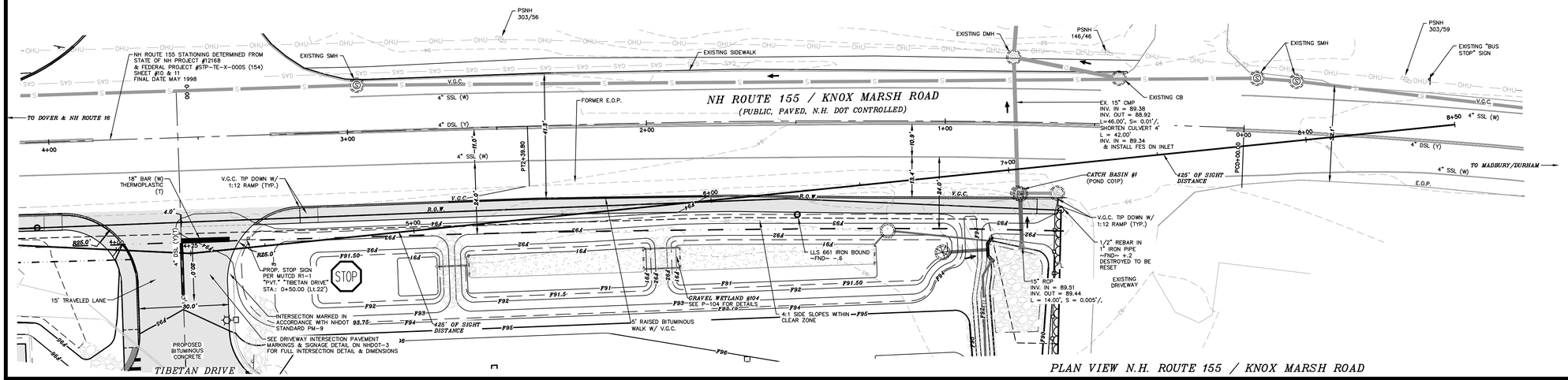
400' REQUIRED BY NHDOT

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)

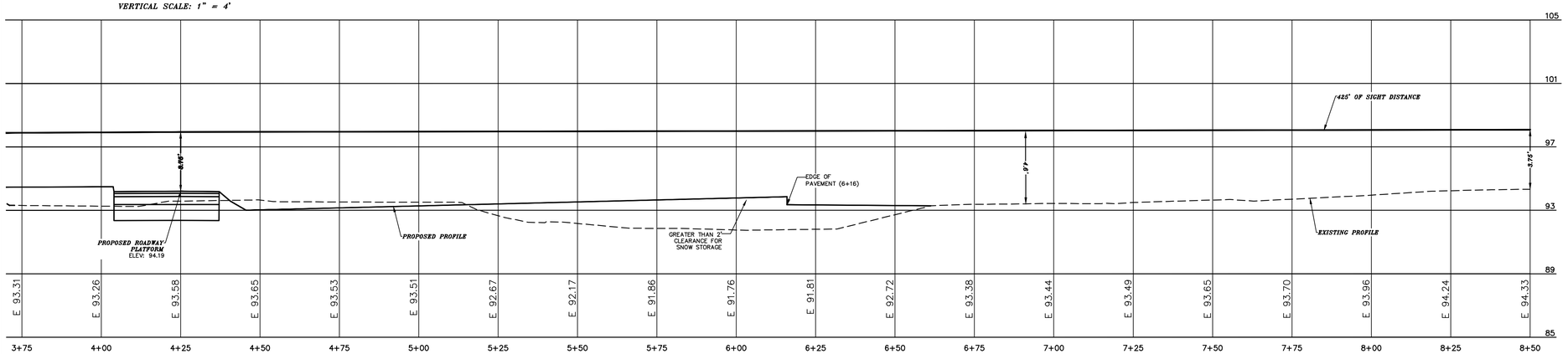
GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



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-2024-0019

#	DATE	REVISION
1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

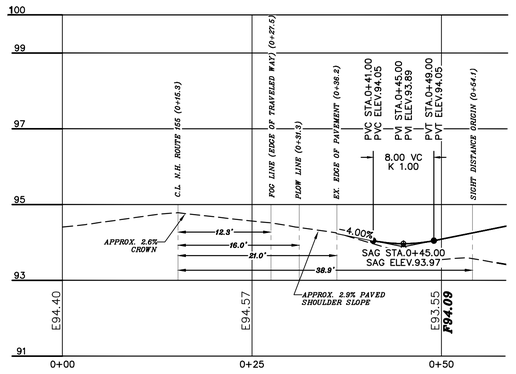
DETAIL–1

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

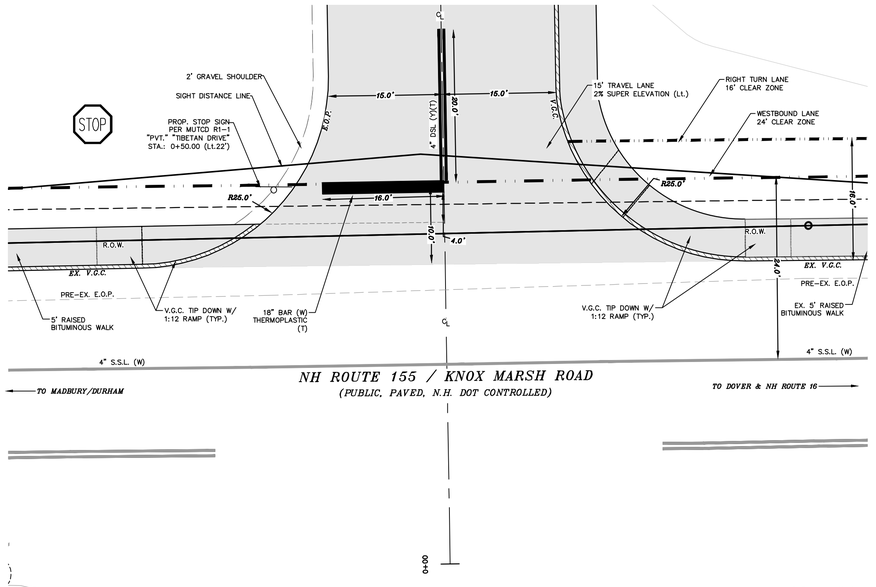
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

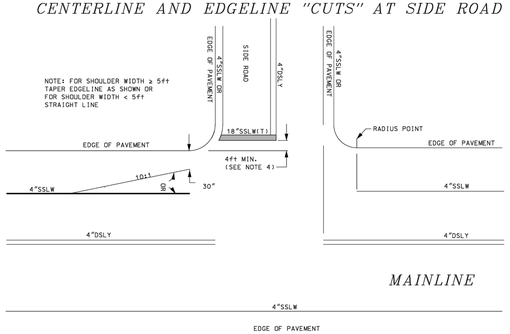
TIBETAN DRIVE (30') INTERSECTION PAVEMENT MARKINGS & SIGNAGE DETAILS

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–2024–0019

REVISION	DATE	DESCRIPTION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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

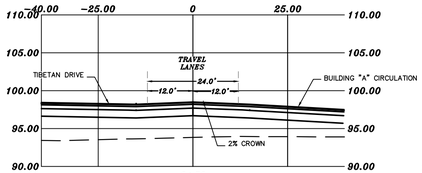
SCALE : 1 IN. EQUALS 10 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

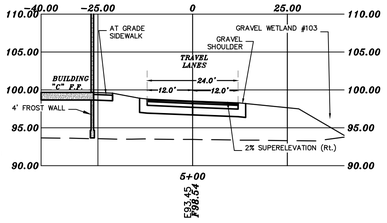
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14233
LICENSED PROFESSIONAL ENGINEER

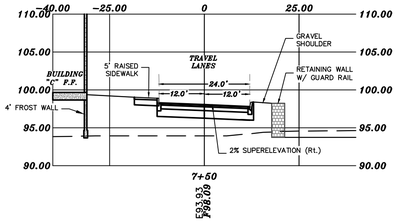
NOT FOR CONSTRUCTION

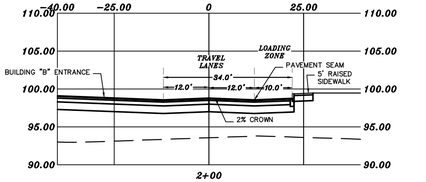
NOTE: *CURBING IS V.C.C. ALONG SIDEWALKS AND S.G.C. IN NON-SIDEWALK AREAS*

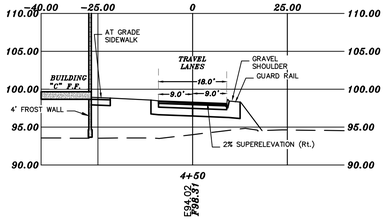
TIBETAN DRIVE 0+00-END

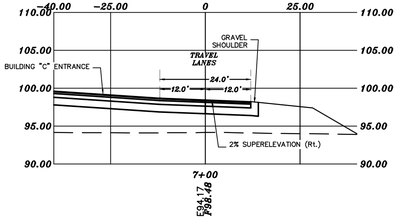


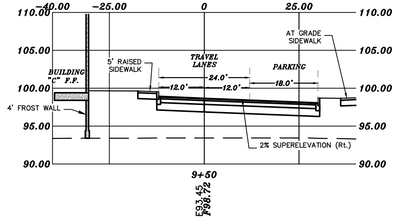


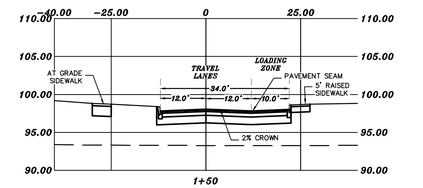


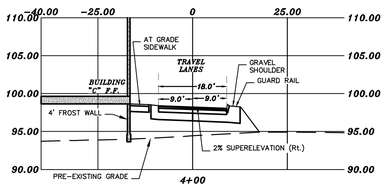


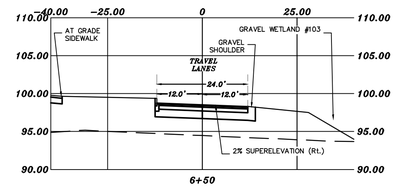


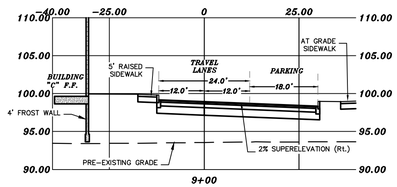


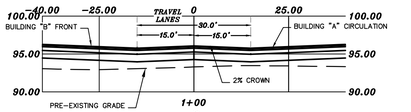


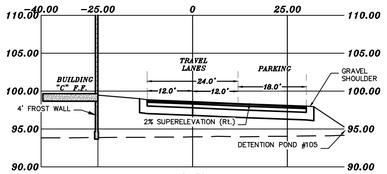


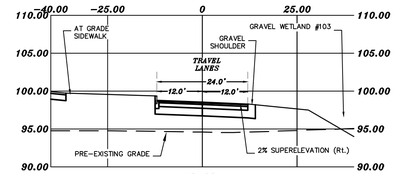


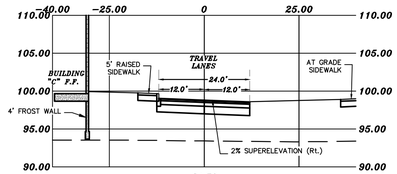


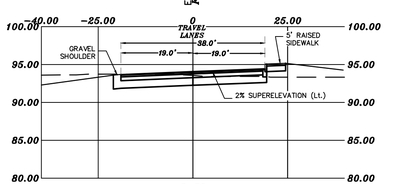


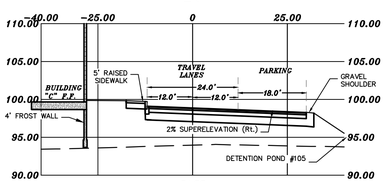


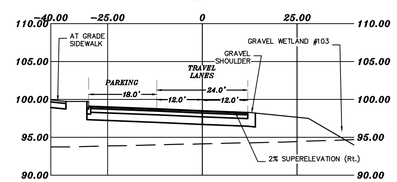


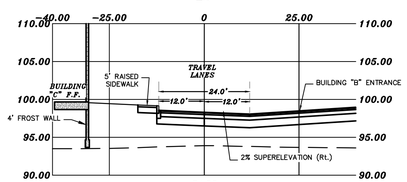












GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale 10

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

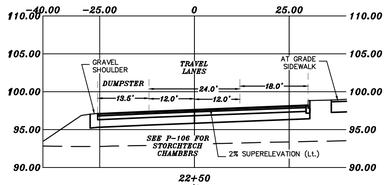
SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

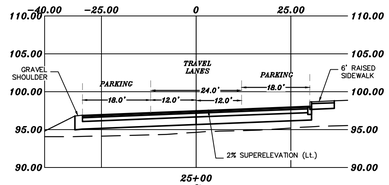
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

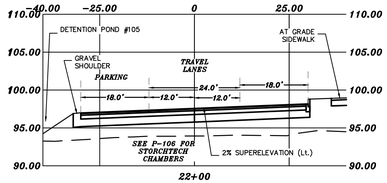
NOT FOR CONSTRUCTION

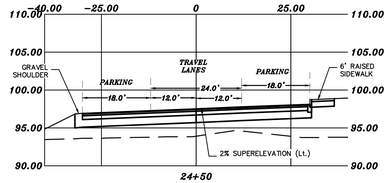
NOTE: *CURBING IS V.G.C. ALONG SIDEWALKS AND S.G.C. IN NON-SIDEWALK AREAS*

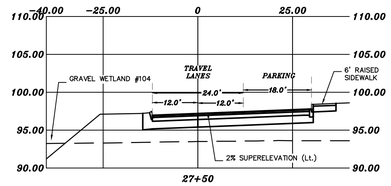
BUILDING "A" CIRCULATION AND BUILDING "B" FRONT 20+00-END

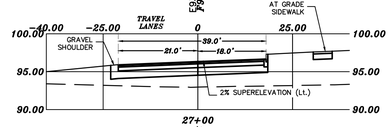


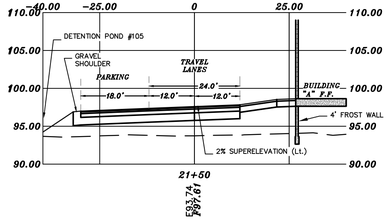


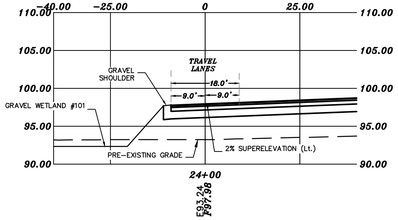


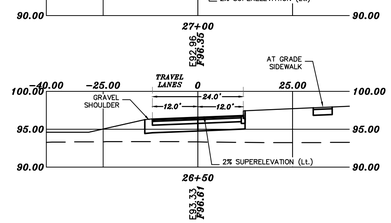


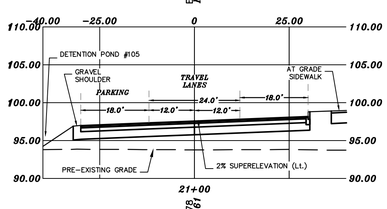


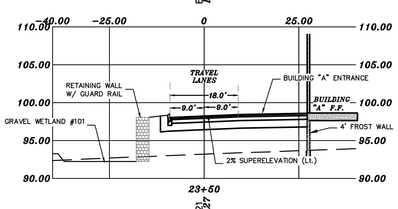


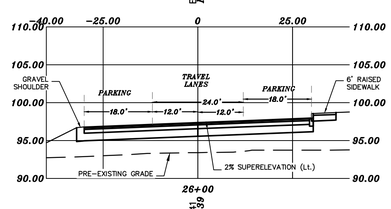


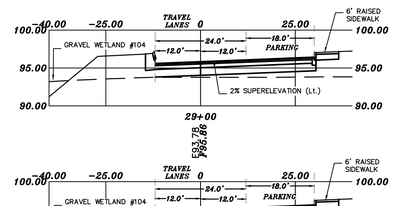


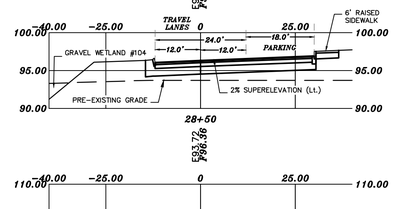


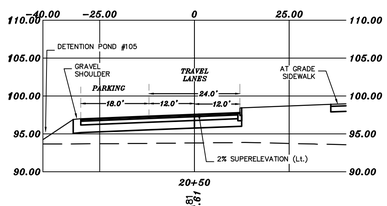


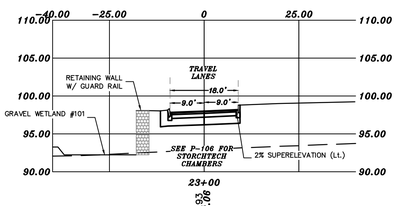


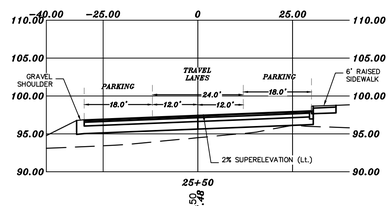


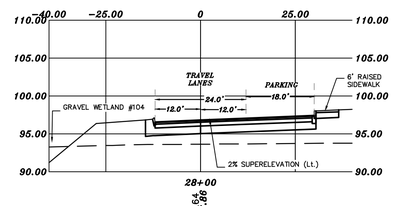












GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale 10

PLANNING FILE #SITE-2024-0019

#	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

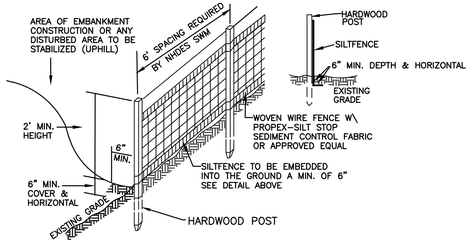
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14233
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, 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

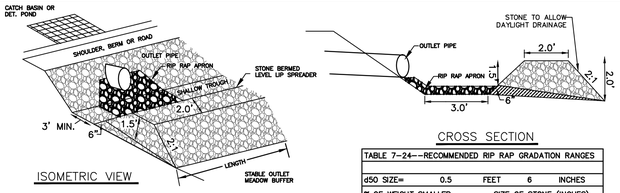
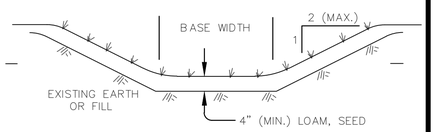


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

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

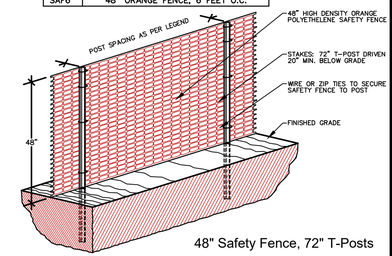
TO BE CONSTRUCTED IAW NH SWM #2 CHAPTER 4, #5 TREATMENT SWALES, PAGE 123.

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.

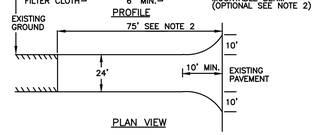
PLANNING FILE #SITE-2024-0019

#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT
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

E5

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

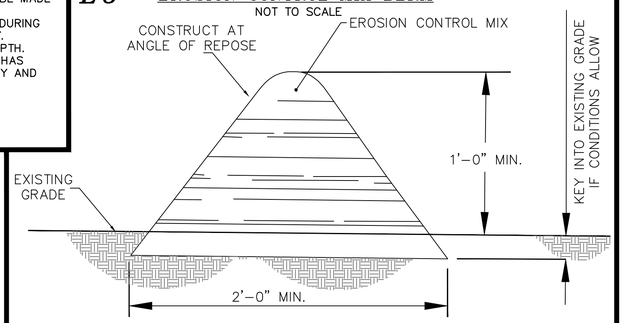


PLAN VIEW

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

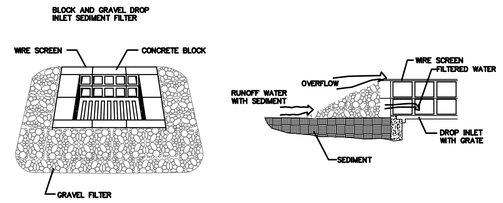
EROSION CONTROL MIX BERM
NOT TO SCALE



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.

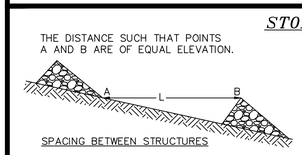
E8

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

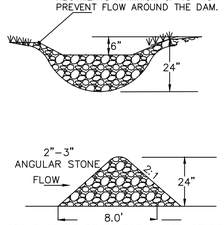
STONE CHECK DAM
NOT TO SCALE



SPACING BETWEEN STRUCTURES

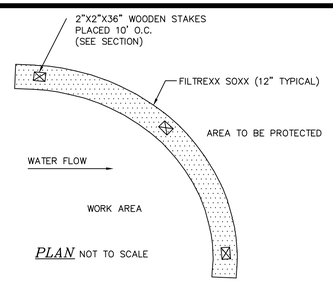
1.) CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2.) THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THEN ONE ACRE.
3.) THE MAXIMUM HEIGHT OF THE DAM SHOULD BE TWO FEET.
4.) THE CENTER OF THE DAM SHOULD BE AT LEAST SIX INCHES LOWER THAN THE 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.

NOTE: KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIUM OF 18" TO PREVENT FLOW AROUND THE DAM.



STONE GRADE STABILIZATION STRUCTURE

E10

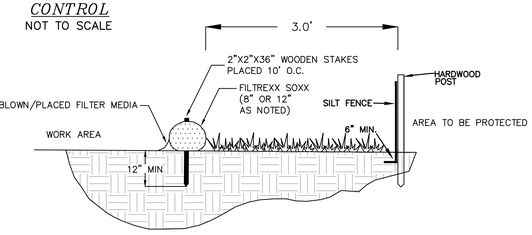


PLAN NOT TO SCALE

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 SEDIMENT CONTROL
NOT TO SCALE

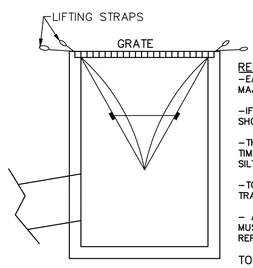


Filtrexx International, LLC
35481 Grafton Eastern Rd | Grafton, Oh 44044
440-926-2607 | fax: 440-926-4021
WWW.FILTREXX.COM
OR APPROVED EQUAL

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

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

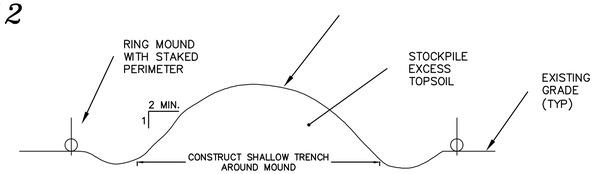
SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14293
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

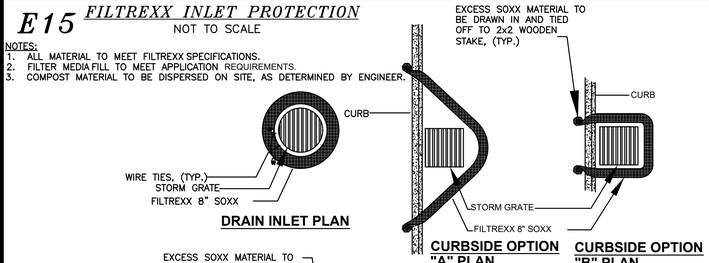
NOT TO SCALE

E15

FILTREXX INLET PROTECTION

NOT TO SCALE

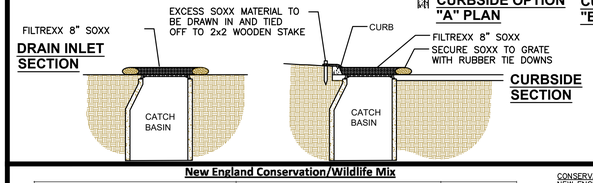
NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.



DRAIN INLET PLAN

CURBSIDE OPTION "A" PLAN

CURBSIDE OPTION "B" PLAN



DRAIN INLET SECTION

CURBSIDE SECTION

New England Conservation/Wildlife Mix

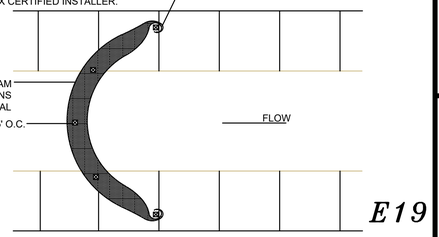
Botanical Name	Common Name	Indicator
Elymus virginicus	Virginia Wild Rye	FACW-
Schizachyrium scoparium	Little Bluestem	FACU
Andropogon gerardii	Big Bluestem	FAC
Festuca rubra	Red Fescue	FACU
Sorghastrum nutans	Indian Grass	UPL
Panicum virgatum	Switch Grass	FAC
Chamaecrista fasciculata	Partridge Pea	FACU
Desmodium 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.

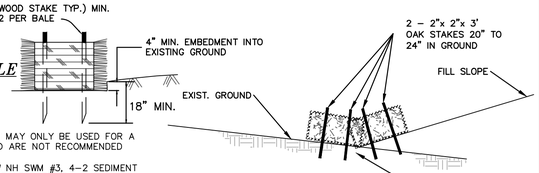


FILTREXX CHECK DAM

NOT TO SCALE

E19

E20



STAKED HAYBALE DETAIL

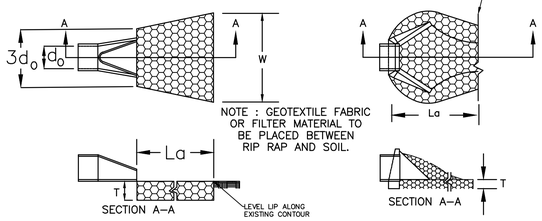
NOT TO SCALE

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.

E13

PIPE OUTLET PROTECTION

NOT TO SCALE



PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

PIPE OUTLET TO WELL–DEFINED CHANNEL

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

NOTE: Temporary seed mix for stabilization of turf shall be winter rye or oats at a rate of 2.5 lbs. per 1000 s.f. and shall be placed prior to 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
	C	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	GOOD	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		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 %	*Ranicum clandestinum, Tioga*	Deertongue, Tioga	22.68
20.00 %	*Puccinellia distans, 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 wiegmannii, 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.

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:*

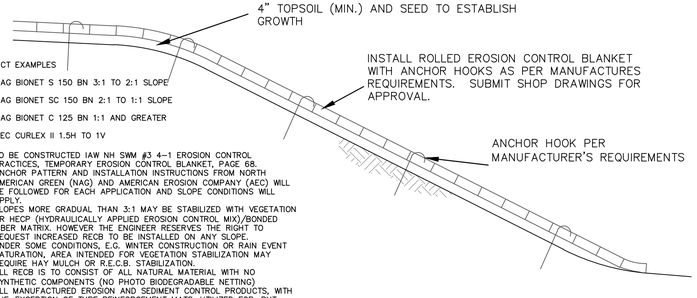
PER ENV–WQ 1500 ALTERATION OF TERRAIN

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

PLANNING FILE #SITE–2024–0019

#	REVISION	DATE	DESCRIPTION
1		02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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

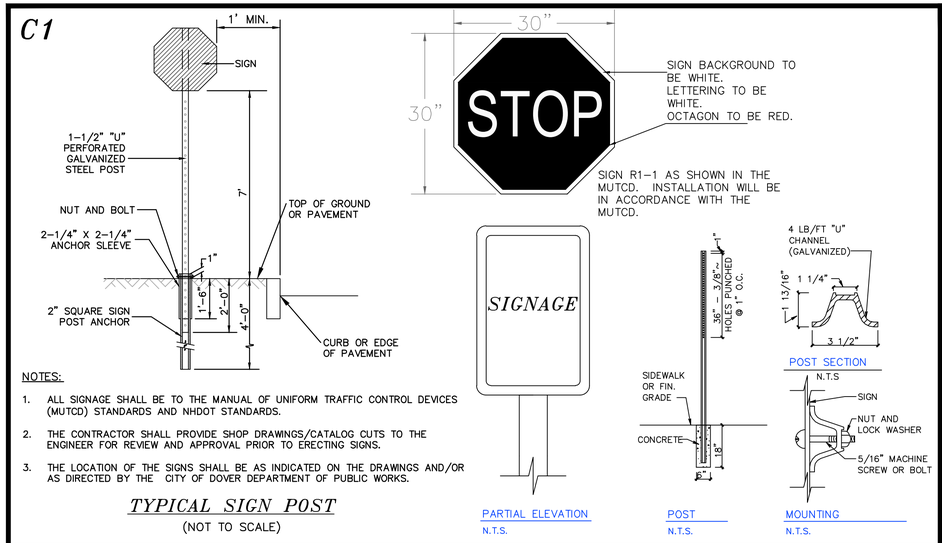
SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

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

E–102

NOT FOR CONSTRUCTION

C1



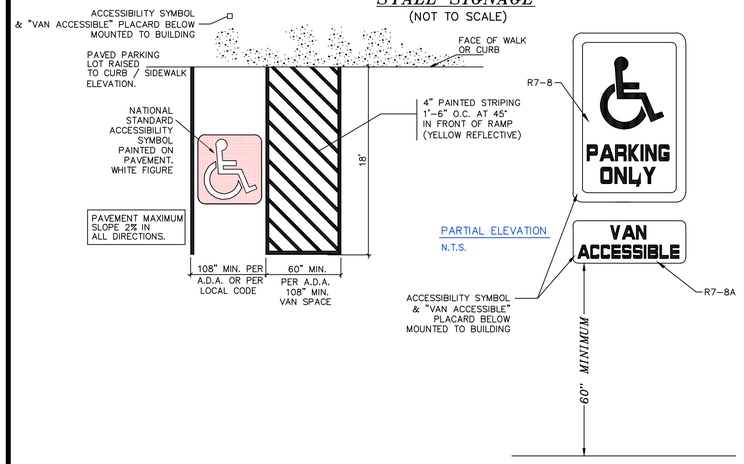
NOTES:

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)

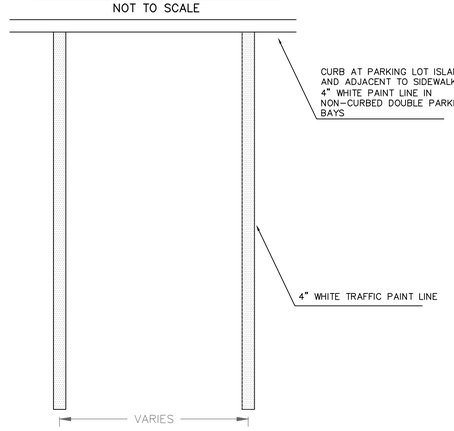
C2

ACCESSIBLE PARKING STALL SIGNAGE
(NOT TO SCALE)



C3

PARKING SPACE DETAIL
NOT TO SCALE



NOTES:

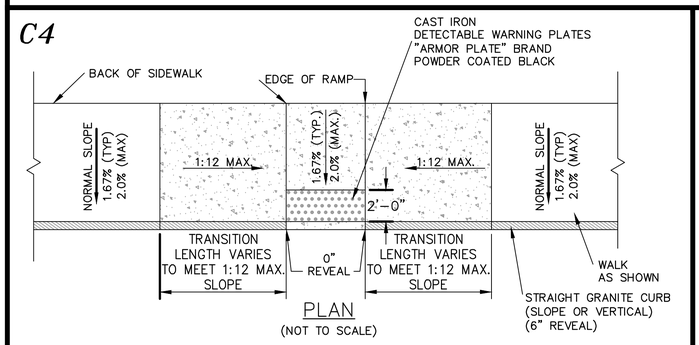
1.) PROVIDE TWO COATS OF PAINT ON ALL PARKING LINES.
2.) SEE PROPOSED SITE PLANS FOR LOCATION OF PARKING SPACES.
3.) PAINTED SPACES ONLY WHERE MARKED ON SITE PLAN

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

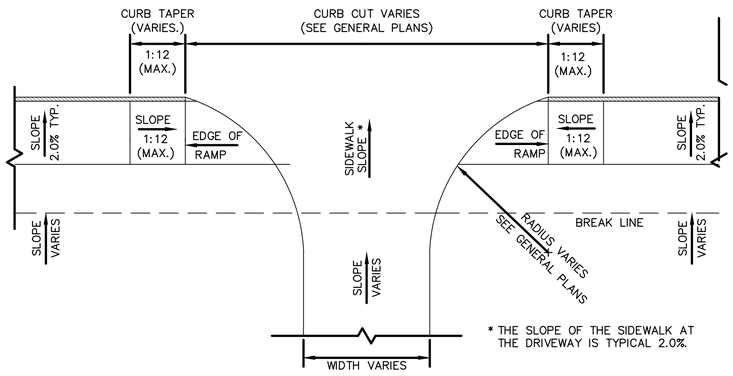
CONSTRUCTION DETAILS
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

C4



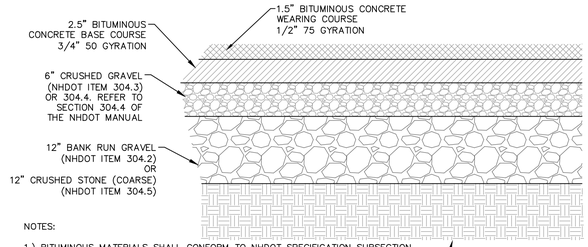
TYPICAL DETAIL FOR WHEELCHAIR RAMP

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

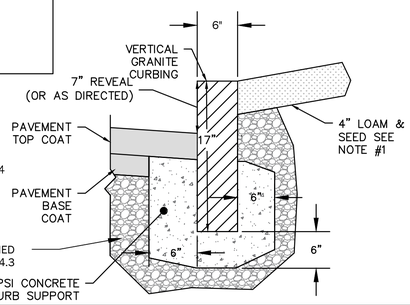
C7

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'

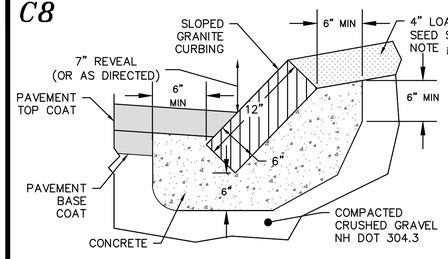
NOTES:

1. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

VERTICAL GRANITE CURB DETAIL
NOT TO SCALE

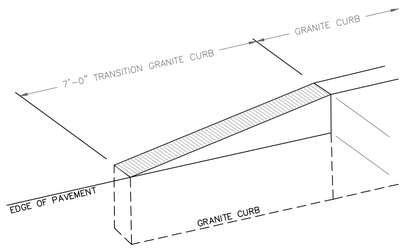


C8



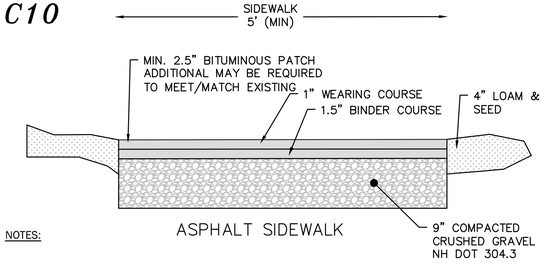
SLOPE GRANITE CURB DETAIL
NOT TO SCALE

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

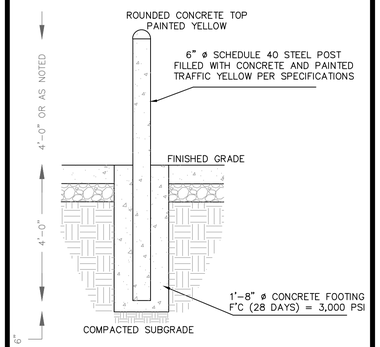
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

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

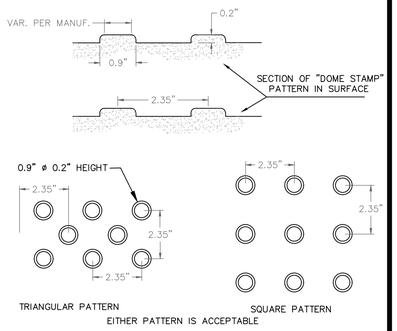
C10



BOLLARD DETAIL

NOT TO SCALE

C11

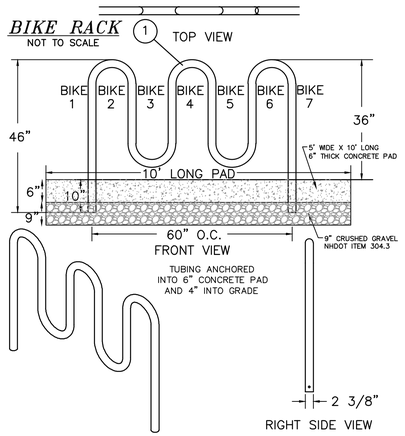


DETECTABLE WARNING SURFACE

NOT TO SCALE

C12

MATERIALS LIST
(1) TUBING - ø 2 3/8" x .154" Wall Steel Tubing



C13

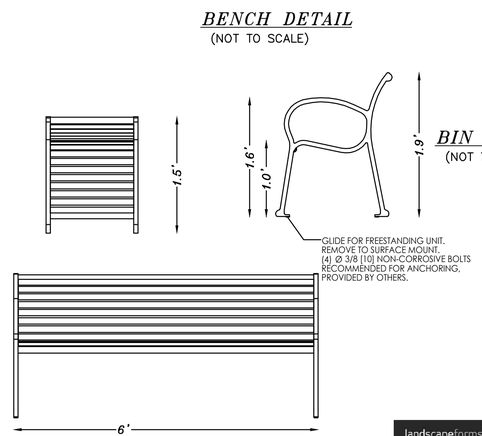
Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat

Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat
Product Drawing

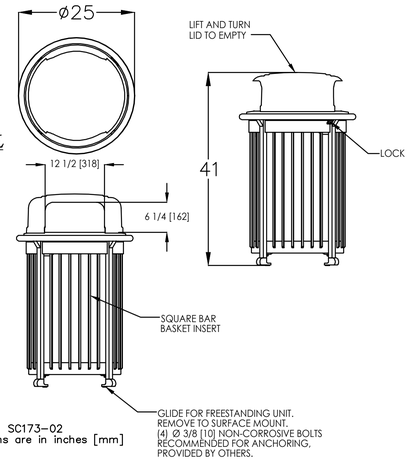
www.landscapeforms.com

Date: 5/19/2010
Ph: 800.521.2546

BENCH DETAIL
(NOT TO SCALE)



BIN DETAIL
(NOT TO SCALE)

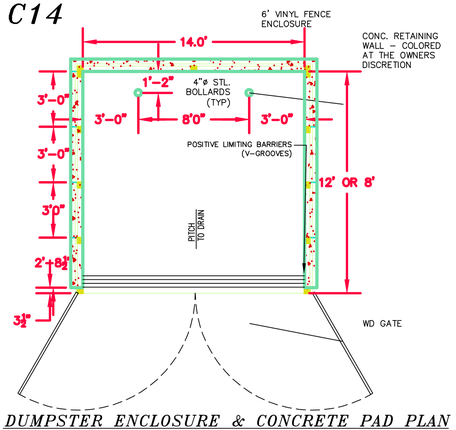


landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

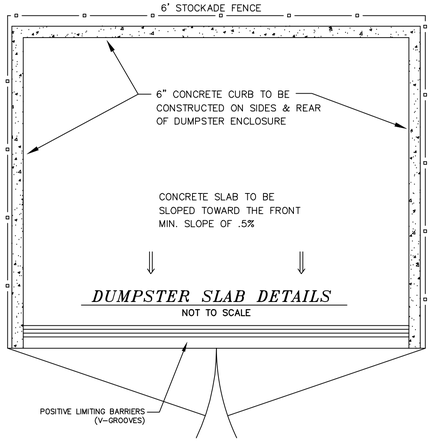
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C14



DUMPSTER ENCLOSURE & CONCRETE PAD PLAN

NOT TO SCALE



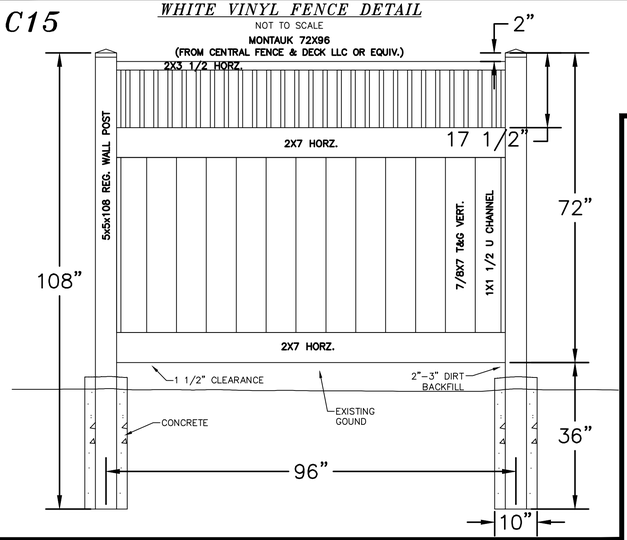
DUMPSTER SLAB DETAILS

NOT TO SCALE

C15

WHITE VINYL FENCE DETAIL

NOT TO SCALE



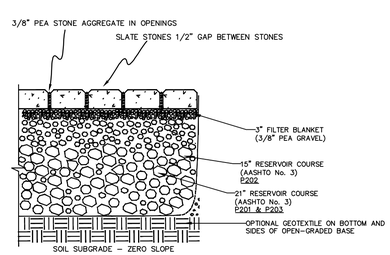
C16

Polywood® Adirondack Chair - Brown



MODEL NO.	DESCRIPTION	SIZE L x W x H	CAPACITY (LBS.)	WT. (LBS.)	PRICE EACH 1	PRICE EACH 2+	COLOR	IN STOCK SHIPS TODAY
H-10778BR	Chair	33 x 30 x 36"	325	34	OVERSTOCK SALE! $266 Regular Price $295		Brown	1 ADD

C17



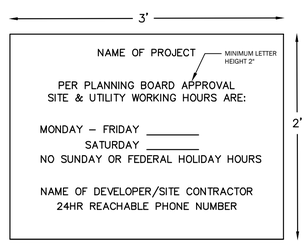
5-8' WIDE POROUS PAVERS DETAIL

NOT TO SCALE

C18

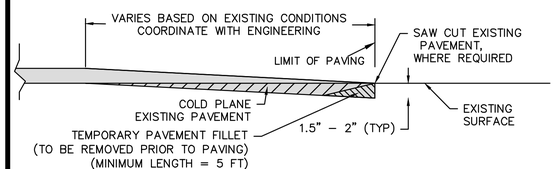
REQUIRED PROJECT INFORMATION SIGN

NOT TO SCALE

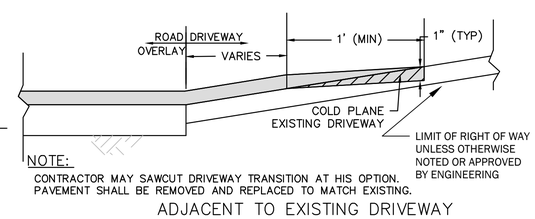


NOTES:
1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND
3. TO BE PLACED AT THE INTERSECTION OF KNOX MARSH ROAD/TIBETAN DRIVE.

C19



ADJACENT TO EXISTING PAVEMENT



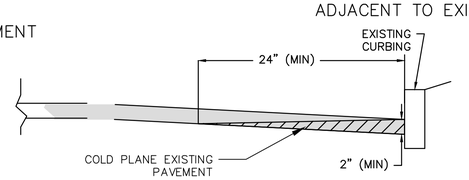
NOTE:
CONTRACTOR MAY SAWCUT DRIVEWAY TRANSITION AT HIS OPTION. PAVEMENT SHALL BE REMOVED AND REPLACED TO MATCH EXISTING.

ADJACENT TO EXISTING DRIVEWAY

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



ADJACENT TO EXISTING CURB

C-102

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

C20

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'

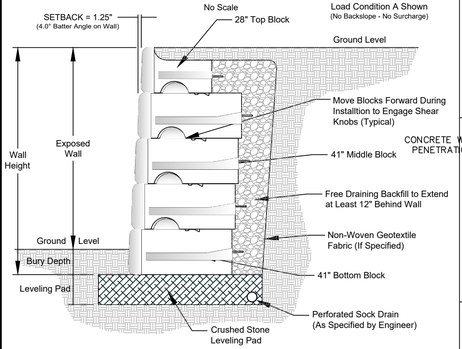
3.) USE 41" MIDDLE BLOCK FOR MIDDLE ROWS, APPROXIMATELY 7 COURSES DEPENDING ON WALL HEIGHT.

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.

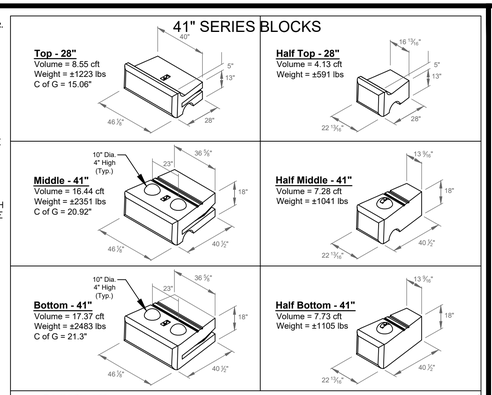
6.) THE WALL MANUFACTURER TYPICALLY PROVIDES WALL PROFILE AND BLOCK COUNT TO THE CONTRACTOR AS REQUIRED FOR CONSTRUCTION. THIS IS TO BE REVIEWED BY BOTH DPW AND DESIGN ENGINEER FOR CORRELATION WITH PROJECT SITE PLANS AND IS TO BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER (OTHERS).

Typical Gravity Wall with 41" Blocks



Note:
Load Condition A Shown
(No Backslope - No Surcharge)

41" SERIES BLOCKS



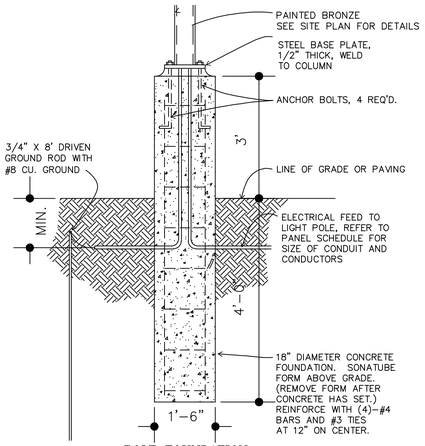
NOTES:
Volume and Center of Gravity (C of G) calculations are based on the blocks as shown.
Center of Gravity is measured from the back of the block.
Half blocks may include a fork lift slot on one side.
Actual weights and volumes may vary.
Weight shown is based on 143 pcf concrete.

Redi-Rock© International, LLC

RETAINING WALL DETAIL

NOT TO SCALE

C21

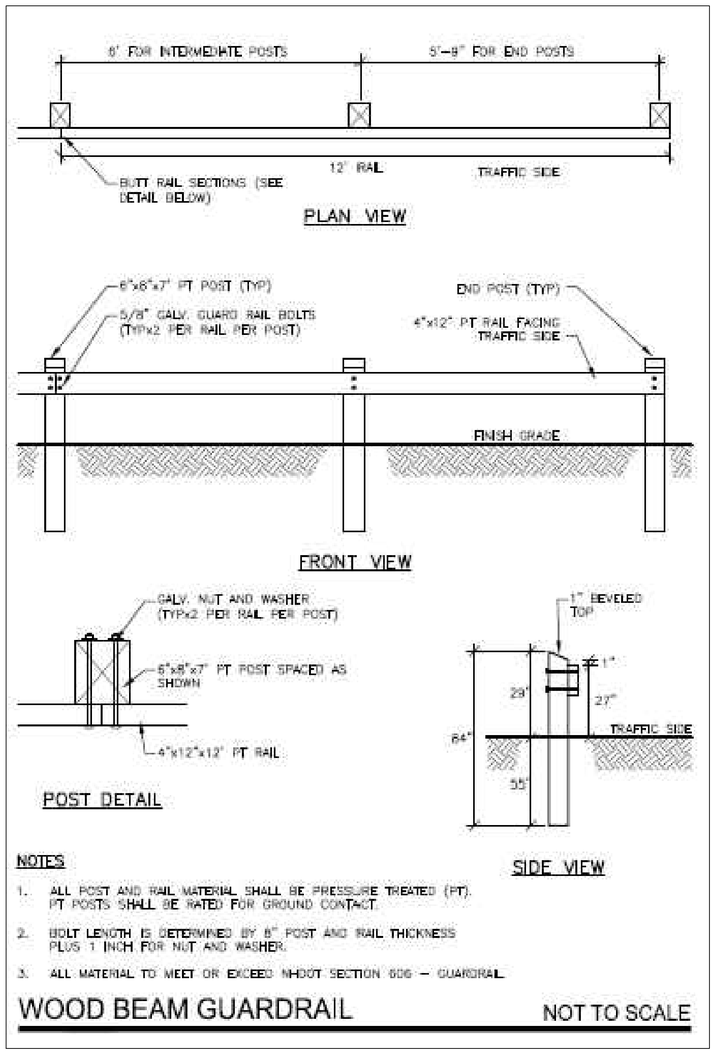


POLE FOUNDATION

LIGHT BASE DETAIL

NOT TO SCALE

C22



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 8" 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)

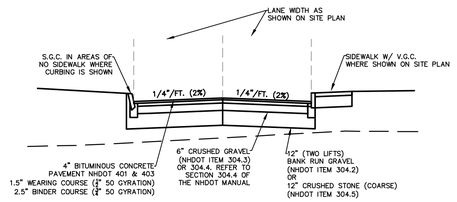
C23

CROSS SECTION NOTES

1. ALL ROADWAY FILL TO BRING ROAD TO SUBGRADE SHALL BE INSTALLED IN LIFTS NO GREATER THAN 12".

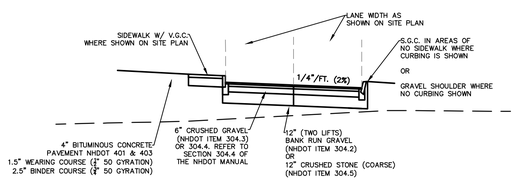
2. ALL FILL SHALL BE COMPACTED TO 95% MINIMUM. COMPACTION TESTS TO BE CONDUCTED AT THE START OF THE PROJECT AND NO FURTHER THAN 100 FEET APART.

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.



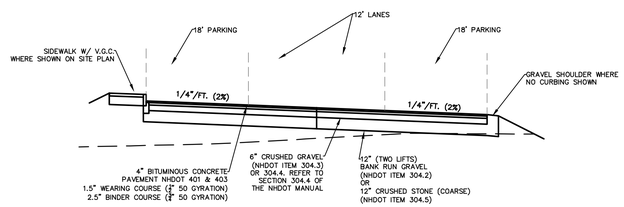
TYPICAL CROWNED ROADWAY SECTION

NOT TO SCALE



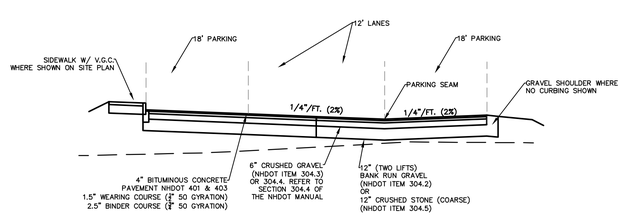
TYPICAL SUPERELEVATED ROADWAY SECTION

NOT TO SCALE



TYPICAL SUPERELEVATED PARKING LOT SECTION

NOT TO SCALE



TYPICAL SUPERELEVATED PARKING LOT SECTION W/ SEAM

NOT TO SCALE

PLANNING FILE #SITE–2024–0019

#	REVISION	DATE	DESCRIPTION
#1		02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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

C24

D-Series Size 0
LED Area Luminaire

d-series

Specifications

EPA:	0.44 ft² (0.04 m²)
Length:	26.18" (665 mm)
Width:	14.06" (357 mm)
Height H1:	2.26" (57 mm)
Height H2:	7.65" (194 mm)
Weight:	23 lbs (10.4 kg)

Catalog Number
Notes
Type
Hit the Tab key or mouse over the page to see all interactive elements.

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.

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*See ordering tree for details

Design Select options indicated by this color background.

Ordering Information **EXAMPLE:** DSX0 LED P6 40K 70CRI T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED

Series	Optics	Color temperature	Color Rendering Index	Distribution	Voltage	Mounting
DSX0 LED	Forward optics: P1, P2, P3, P4, P5, P6, P7, P8, P9	30K 3000K; 40K 4000K; 50K 5000K	70CRI; 80CRI	AFR Automotive front row; T1S Type I short; T2M Type II medium; T3S Type III short; T3M Type III medium; T4M Type IV medium; T4FT Type IV Forward Throw medium; T4W Type IV low glare; TFTM Forward Throw medium; TSG Type V low glare; TSW Type V wide; BLC3 Type III backlight control; BLC4 Type IV backlight control; LCCO Left corner cutoff; RCCO Right corner cutoff	MVOLT (120V-277V); VOLT (347V-480V); 120 [1,2]; 208 [1,2]; 240 [1,2]; 277 [1,2]; 347 [1,2,3]; 480 [1,2,3]	Shipped included: SPA Square pole mounting (fits ø3 to ø4 in. tenons); RPA Round pole mounting; SPA5 Square pole mounting (fits ø5 to ø6 in. tenons); RPA5 Round pole mounting (fits ø5 to ø6 in. tenons); SPA8N Square narrow pole mounting (fits ø8 in. tenons); WBA Wall bracket; MA Mast arm adapter (mounts on 2 3/8" OD horizontal tenon)

Optics: P6 and P7 not available with 30K or 40K. P6 not available with 50K. P8 and P9 not available with 70CRI. P8 and P9 not available with 40K or 50K. P8 and P9 not available with T1S, T2S, T2M, T3S, T3M, T4M, T4FT, TFTM, TSG, TSW, BLC3, BLC4, LCCO, RCCO. P8 and P9 not available with SPA5, RPA5, SPA8N. P8 and P9 not available with 347 or 480. P9 not available with SPA, RPA, WBA, MA.

Control options: Shipped installed: NLTAIR2 PIRHN nLight AIR gen 2 enabled with bi-level motion / ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc [1,4,5]; PIR High/low, motion/ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc [1,4,5]; PER NEMA twist-lock receptacle only (control ordered separately) [6]; PERS Five-pin receptacle only (controls ordered separately) [6,7]; PE Photocell, Button Type [4]; DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately) [8]; BCE Bottom conduit entry for back box (PBBW). Total of 4 entry points.; SPD10KV 10kV Surge pack [9]; CCE Coastal Construction [1]

Mounting options: PER7 Seven-pin receptacle only (control ordered separately) [7,8]; FAO Field adjustable output [10,11]; BL30 Bi-level switched dimming, 30% [4,11]; BL50 Bi-level switched dimming, 50% [4,11]; DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately) [11]

Shipped separately: KMA Mast arm mounting bracket adapter (specify finish) [12]; WBP Wall box (specify finish) [13]; BSW Bird spikes (field installed); EGSR External Glare Shield (reversible, field install required, matches housing finish); BSDB Bird Spikes (field install required)

Finish: 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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DSXO-LED Rev. 11/15/24 Page 1 of 9

LAMP "A" MOUNTED 8', 14' & 17'

C25

D-Series Size 1
LED Area Luminaire

d-series

Specifications

EPA:	0.69 ft² (0.06 m²)
Length:	32.71" (831 mm)
Width:	14.26" (362 mm)
Height H1:	7.88" (200 mm)
Height H2:	2.73" (69 mm)
Weight:	34 lbs (15.4 kg)

Catalog Number
Notes
Type
Hit the Tab key or mouse over the page to see all interactive elements.

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 65% and expected service life of over 100,000 hours.

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*See ordering tree for details

Design Select options indicated by this color background.

Ordering Information **EXAMPLE:** DSX1 LED P7 40K 70CRI T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX1 LED

Series	Optics	Color temperature	Color Rendering Index	Distribution	Voltage	Mounting
DSX1 LED	Forward optics: P1, P2, P3, P4, P5, P6, P7, P8, P9	30K 3000K; 40K 4000K; 50K 5000K	70CRI; 80CRI	AFR Automotive front row; T1S Type I short; T2M Type II medium; T3M Type III medium; T4M Type IV medium; T4FT Type IV Forward Throw medium; TSG Type V low glare; TSW Type V wide; BLC3 Type III backlight control; BLC4 Type IV backlight control; LCCO Left corner cutoff; RCCO Right corner cutoff	MVOLT (120V-277V); VOLT (347V-480V); 120 [1,2]; 208 [1,2]; 240 [1,2]; 277 [1,2]; 347 [1,2,3]; 480 [1,2,3]	Shipped included: SPA Square pole mounting (fits ø3 to ø4 in. tenons); RPA Round pole mounting; SPA5 Square pole mounting (fits ø5 to ø6 in. tenons); RPA5 Round pole mounting; SPA8N Square narrow pole mounting; WBA Wall bracket; MA Mast arm adapter (mounts on 2 3/8" OD horizontal tenon)

Optics: P6 and P7 not available with 30K or 40K. P6 not available with 50K. P8 and P9 not available with 70CRI. P8 and P9 not available with 40K or 50K. P8 and P9 not available with T1S, T2S, T2M, T3S, T3M, T4M, T4FT, TFTM, TSG, TSW, BLC3, BLC4, LCCO, RCCO. P8 and P9 not available with SPA5, RPA5, SPA8N. P8 and P9 not available with 347 or 480. P9 not available with SPA, RPA, WBA, MA.

Control options: Shipped installed: NLTAIR2 PIRHN nLight AIR gen 2 enabled with bi-level motion / ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc [1,4,5]; PIR High/low, motion/ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc [1,4,5]; PER NEMA twist-lock receptacle only (control ordered separately) [6]; PERS Five-pin receptacle only (controls ordered separately) [6,7]

Other options: Shipped installed: SPD20KV 20kV surge protection [9]; HS Houseside shield (black finish standard) [8]; L90 Left rotated optics [1]; R90 Right rotated optics [1]; CCE Coastal Construction [1]; HA 50°C ambient operation [4]; BAA Buy American Act and Build America Buy America Qualified; SF Single fuse (120, 277, 347V) [4]; DF Double fuse (208, 240, 480V) [4]

Shipped separately: EGSR External Glare Shield (reversible, field install required, matches housing finish); BSDB Bird Spikes (field install required)

Finish: DDBTXD Dark Bronze; DBLXD Black; DNATXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white; DSSTXD Textured sandstone

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DSX1-LED Rev. 09/29/25 Page 1 of 10

LAMP "B" MOUNTED 15'

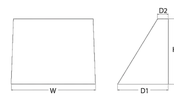
C26



WDGE2 LED
Architectural Wall Sconce
Precision Refractive Optic

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight (without options):	13.5 lbs



Catalog Number
Notes
Type
Hit the Tab key or mouse over the page to see all interactive elements.

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	Standard EM, 0°C	Cold EM, -20°C	Sensor	Approximate Lumens (4000K, 80CRI) P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--
WDGE2 LED	Visual Comfort	10W	18W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000
WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	--	7,500	8,500	10,000	12,000	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000

Ordering Information **EXAMPLE:** WDGE2 LED P3 40K 80CRI T3M MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
WDGE2 LED	P0 [1]; P1 [1]; P2 [1]; P3 [1]; P4 [1]	27K 2700K; 30K 3000K; 40K 4000K; 50K 5000K; AMBP Amber	90CRI; LW* Limited Wavelength	T1S Type I Short; T2M Type II Medium; T3M Type III Medium; T4FT Forward Throw Medium	MVOLT; 347 [2]; 480 [2]	Shipped included: XBW Surface mounting bracket; XCW Indirect Canopy Ceiling Washer bracket (dry/damp locations only) [3]; Shipped separately: AWS 3/8 inch Architectural wall spacer [4]; PBBW Surface-mounted back box (top, left, right conduit entry). Use when there is no junction box available. [5]

Options: 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 [6]; DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately) [7]; BCE Bottom conduit entry for back box (PBBW). Total of 4 entry points.; CCE Coastal Construction [8]

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.; PIRH1FC3V 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.; NLTAIR2 PIR Embedded wireless controls by nLight with ULI924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 8-15' mounting heights.; NLTAIR2 PIRH Embedded wireless controls by nLight with ULI924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 15-30' mounting heights.

See page 4 for out of box functionality

Finish: DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DSSXD Sandstone; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white

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WDGE2 LED Rev. 07/08/24

LAMP "C" MOUNTED 10' & 12'

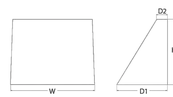
C27



WDGE2 LED
Architectural Wall Sconce
Precision Refractive Optic

Specifications

Depth (D1):	7"
Depth (D2):	1.5"
Height:	9"
Width:	11.5"
Weight (without options):	13.5 lbs



Catalog Number
Notes
Type
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Introduction

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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.

design select
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*See ordering tree for details

WDGE LED Family Overview

Luminaire	Optics	Standard EM, 0°C	Cold EM, -20°C	Sensor	Approximate Lumens (4000K, 80CRI) P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--
WDGE2 LED	Visual Comfort	10W	18W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000
WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	--	7,500	8,500	10,000	12,000	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000

Ordering Information **EXAMPLE:** WDGE2 LED P3 40K 80CRI T3M MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
WDGE2 LED	P0 [1]; P1 [1]; P2 [1]; P3 [1]; P4 [1]	27K 2700K; 30K 3000K; 40K 4000K; 50K 5000K; AMBP Amber	90CRI; LW* Limited Wavelength	T1S Type I Short; T2M Type II Medium; T3M Type III Medium; T4FT Forward Throw Medium	MVOLT; 347 [2]; 480 [2]	Shipped included: XBW Surface mounting bracket; XCW Indirect Canopy Ceiling Washer bracket (dry/damp locations only) [3]; Shipped separately: AWS 3/8 inch Architectural wall spacer [4]; PBBW Surface-mounted back box (top, left, right conduit entry). Use when there is no junction box available. [5]

Options: 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 [6]; DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately) [7]; BCE Bottom conduit entry for back box (PBBW). Total of 4 entry points.; CCE Coastal Construction [8]

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.; PIRH1FC3V 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.; NLTAIR2 PIR Embedded wireless controls by nLight with ULI924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 8-15' mounting heights.; NLTAIR2 PIRH Embedded wireless controls by nLight with ULI924 listed emergency operation, Passive Infrared Occ sensor and on/off photocell for 15-30' mounting heights.

See page 4 for out of box functionality

Finish: DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DSSXD Sandstone; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white; DSSTXD Textured sandstone

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WDGE2 LED Rev. 07/08/24

LAMP "D" MOUNTED 12'

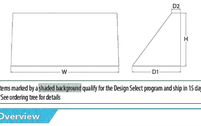
C28



WDGE3 LED
Architectural Wall Sconce

Specifications

Depth (D1):	8"
Depth (D2):	1.5"
Height:	9"
Width:	18"
Weight (without options):	19.5 lbs



Catalog Number
Notes
Type
Hit the Tab key or mouse over the page to see all interactive elements.

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.
WDGE3 has been designed to deliver up to 12,000 lumens through a precision refractive lens with wide distribution, perfect for augmenting the lighting from pole mounted luminaires.

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

WDGE LED Family Overview

Luminaire	Optics	Standard EM, 0°C	Cold EM, -20°C	Sensor	Approximate Lumens (4000K, 80CRI) P1	P2	P3	P4	P5	P6
WDGE1 LED	Visual Comfort	4W		--	750	1,200	2,000	--	--	--
WDGE2 LED	Visual Comfort	10W	18W	Standalone / nLight	--	1,200	2,000	3,000	4,500	6,000
WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	6,000	7,500	8,500	10,000	12,000	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000

Ordering Information **EXAMPLE:** WDGE3 LED P3 40K 70CRI R3 MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
WDGE3 LED	P0; P1; P2; P3; P4	30K 3000K; 40K 4000K; 50K 5000K	70CRI; 80CRI	R2 Type 2; R3 Type 3; T4W Type 4 Wide; RFT Forward Throw	MVOLT; 347 [1]; 480 [1]	Shipped included: SRM Surface mounting bracket; XCW Indirect Canopy Ceiling Washer bracket (dry/damp locations only) [2]; Shipped separately: AWS 3/8 inch Architectural wall spacer [3]; PBBW Surface-mounted back box (top, left, right conduit entry). Use when there is no junction box available. [4]

Options: E15WH Emergency battery backup, Certified in CA Title 20 MAEDBS (15W, 0°C min); E20WC Emergency battery backup, Certified in CA Title 20 MAEDBS (15W, -20°C min); PE Photocell, Button Type [5]; DMG 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately) [6]; BCE Bottom conduit entry for back box (PBBW). Total of 4 entry points.; SPD10KV 10kV Surge pack [7]; CCE Coastal Construction [8]

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.; PIRH1FC3V Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation.

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See page 4 for out of box functionality

Finish: DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DSSXD Sandstone; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white; DSSTXD Textured sandstone

Accessories Ordered and shipped separately
WDGAWS DDBXD WDGE 3/8inch Architectural Wall Spacer (specify finish)
WDGEPBBW DDBXD-U WDGE3 surface-mounted back box (specify finish)

NOTES
1. 347V and 480V not available with E15WH or E20WC.
2. Not qualified for DLC. Not available with emergency battery backup or sensors/controls.
3. For PBBW and AWS with CCE option, requires an XBA.
4. PBT not available in 480V and with sensors/controls.
5. DMG option not available with sensors/controls.
6. Not available with E20WC option.
7. Available with MVOLT only and only rated to 25C ambient.

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WDGE3 LED Rev. 10/24/25

LAMP "E" MOUNTED 12'

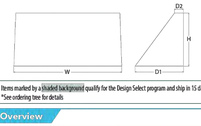
C29



WDGE3 LED
Architectural Wall Sconce

Specifications

Depth (D1):	8"
Depth (D2):	1.5"
Height:	9"
Width:	18"
Weight (without options):	19.5 lbs



Catalog Number
Notes
Type
Hit the Tab key or mouse over the page to see all interactive elements.

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.
WDGE3 has been designed to deliver up to 12,000 lumens through a precision refractive lens with wide distribution, perfect for augmenting the lighting from pole mounted luminaires.

design select
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WDGE2 LED	Precision Refractive	10W	18W	Standalone / nLight	700	1,200	2,000	3,200	4,200	--
WDGE3 LED	Precision Refractive	15W	18W	Standalone / nLight	6,000	7,500	8,500	10,000	12,000	--
WDGE4 LED	Precision Refractive			Standalone / nLight	--	12,000	16,000	18,000	20,000	22,000

Ordering Information **EXAMPLE:** WDGE3 LED P3 40K 70CRI R3 MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
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See page 4 for out of box functionality

Finish: DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DSSXD Sandstone; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white; DSSTXD Textured sandstone

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WDGEPBBW DDBXD-U WDGE3 surface-mounted back box (specify finish)

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WDGE3 LED Rev. 10/24/25

LAMP "F MOUNTED 12'

C30



TYPICAL RESIDENTIAL LAMP "G" MOUNTED AT 7' +/- AS SHOWN

NOT TO SCALE

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

CONSTRUCTION DETAILS
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 : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

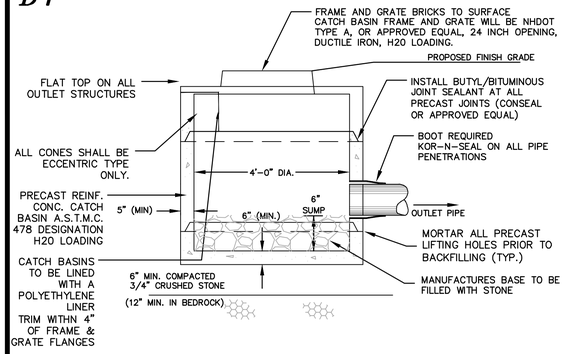
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14241
LICENSED PROFESSIONAL ENGINEER

C-104

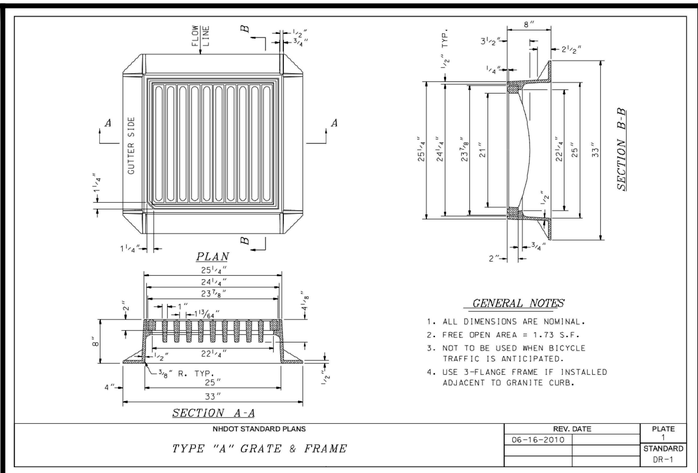
SHEET 48 OF 57

NOT FOR CONSTRUCTION

D1

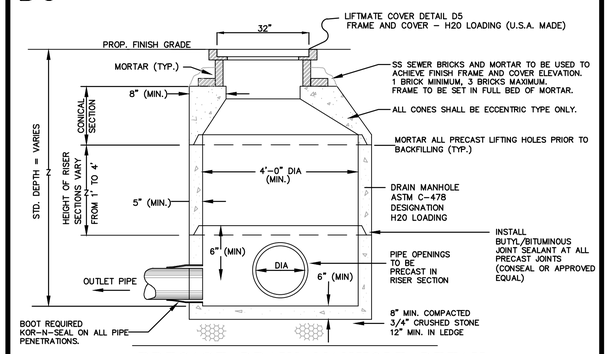


CATCH BASIN DETAIL
NOT TO SCALE



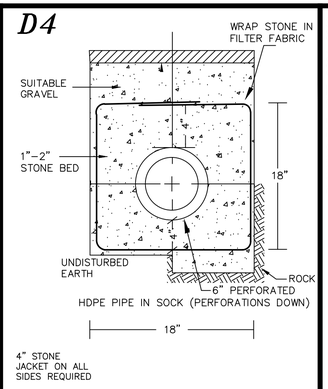
D2 *CATCH BASIN GRATE*
NOT TO SCALE

D3



PRECAST DRAIN MANHOLE DETAIL
NOT TO SCALE

D4



UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

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

D5

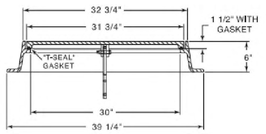
R-1743-LM
LiftMate Frame, Solid Gasketed Lid

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.

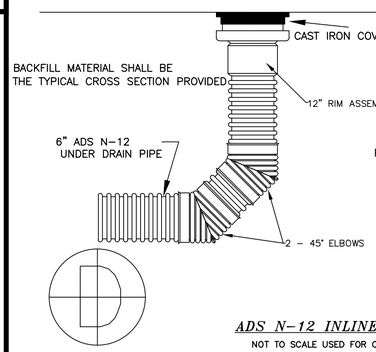




DRAIN MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

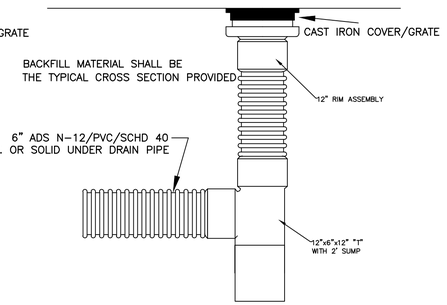
DRAIN MANHOLE COVER DETAIL
NOT TO SCALE

D6A

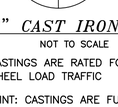


ADS N-12 INLINE DRAIN
NOT TO SCALE USED FOR CLEANOUTS

D6B



ADS N-12, PVC, SCHD. 40 INLINE DRAIN
NOT TO SCALE USED FOR GRAVEL WETLAND CLEANOUTS

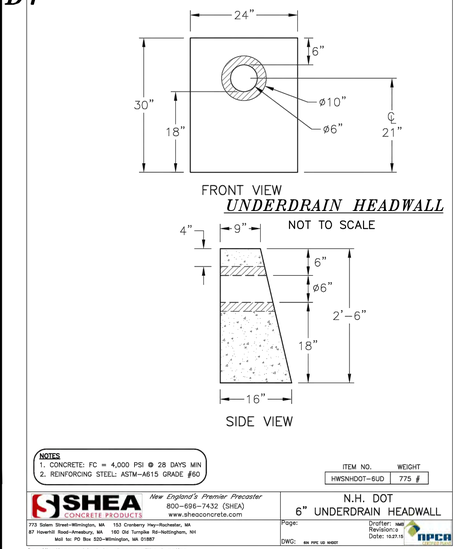


12" CAST IRON COVER
NOT TO SCALE

CASTINGS ARE RATED FOR H20 WHEEL LOAD TRAFFIC

PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT

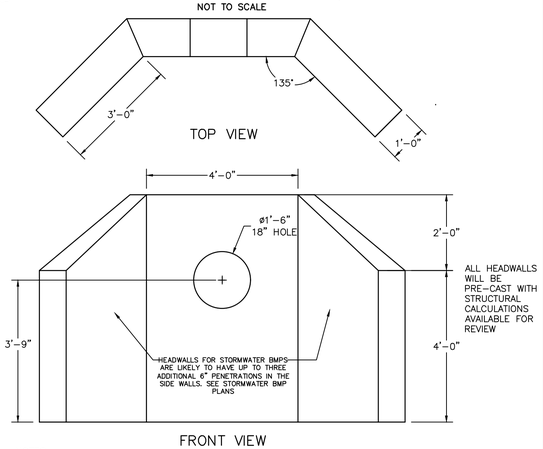
D7



UNDERDRAIN HEADWALL
NOT TO SCALE

D8

HEADWALL (CONCRETE)
NOT TO SCALE

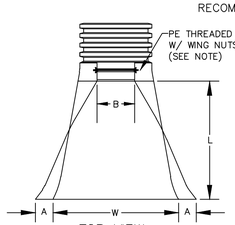


NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.

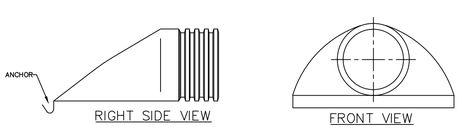
D9

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.

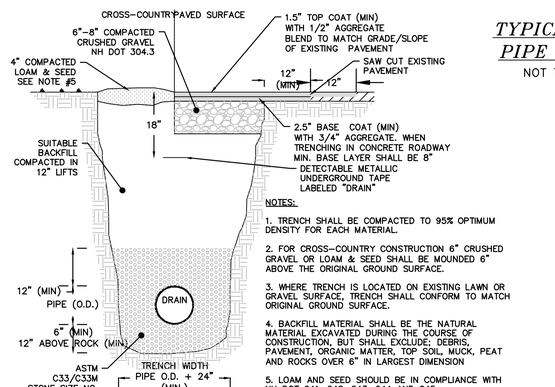


ADS N-12 FLARED END SECTIONS
NOT TO SCALE (ALL DIMENSIONS ARE NOMINAL)



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

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. 14241 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

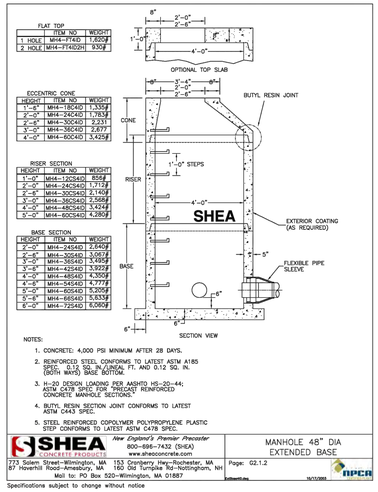
Save Trees

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.

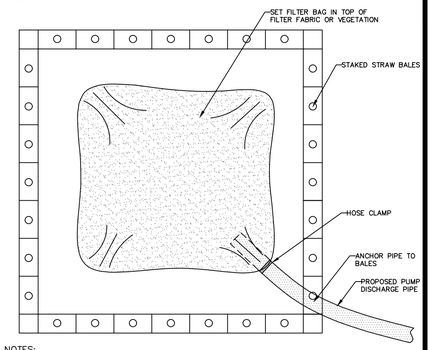
- Plate design for a clean appearance
- Standard 2" openings (other sizes can be made)
- Angled top/front plate to maximize debris deflection
- Mounting flanges on 3 sides allows grate to be mounted at floor level inverts
- Galvanized steel construction. Can be made from aluminum or stainless steel.

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.

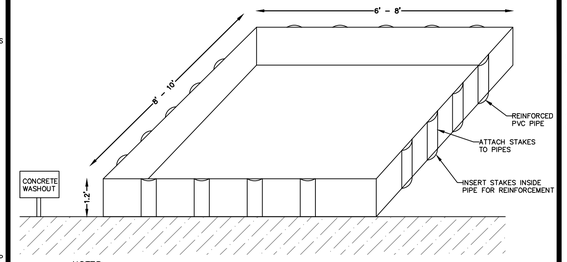
4.) SIZE OF DE-WATERING AREA TO BE 10' X 10', ADJUST SIZE DEPENDING ON VOLUME AND USE.

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

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

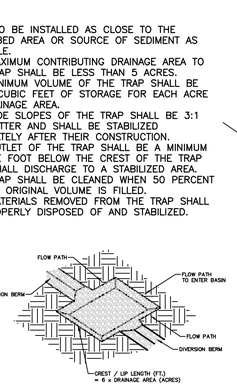
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

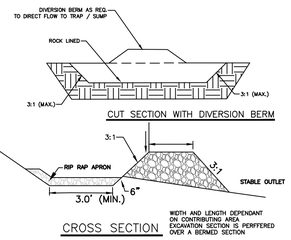
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14243
LICENSED PROFESSIONAL ENGINEER

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.



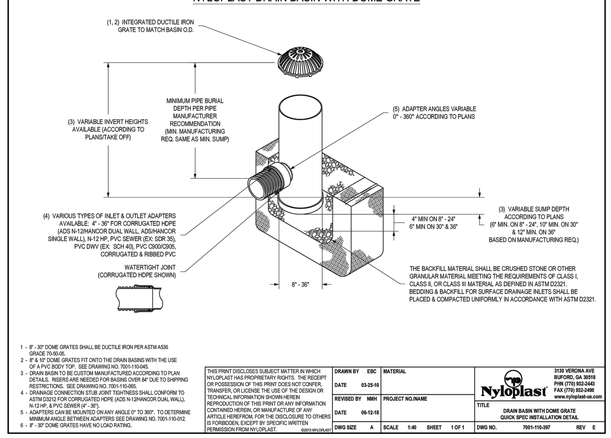
ISOMETRIC VIEW



SIEVE DESIGNATION	SIZE OF STONE (INCHES)
100%	12
84-100%	6
68-83%	3
42-55%	1
8-12%	NO. 4

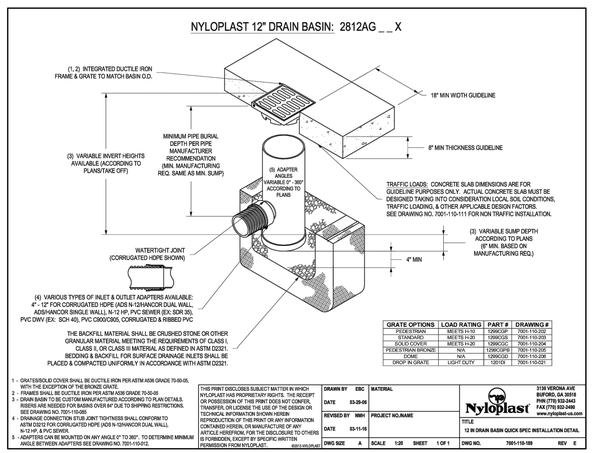
STONE LINED SEDIMENT TRAP
NOT TO SCALE

D17



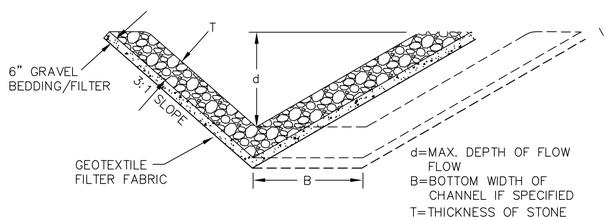
NYLOPLAST DOME GRATE
NOT TO SCALE

D18



12" NYLOPLAST DRAIN BASIN
NOT TO SCALE

D19



TYPICAL SECTION FOR A RIPRAP LINED CHANNEL
NOT TO SCALE

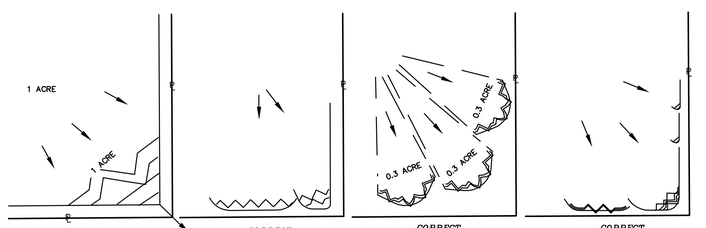
D20

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

SHEET 50 OF 57

NOT FOR CONSTRUCTION

D21

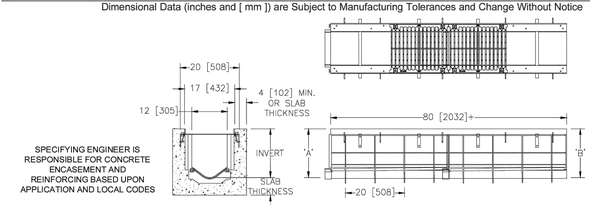
ZURN Z874-12

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: ZurnZ874-12
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.

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

Grate 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

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

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]	2048	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
1225NP	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)

REV. Q DATE: 05/05/11 C.N. NO. 121231

DWG. NO. 64183 PRODUCT NO. Z874-12

ZURN INDUSTRIES, LLC ♦ SPECIFICATION DRAINAGE OPERATION ♦ 1801 Pittsburgh Ave. ♦ Erie, PA 16514
Phone: 814\455-0921 ♦ Fax: 814454-7929 ♦ 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

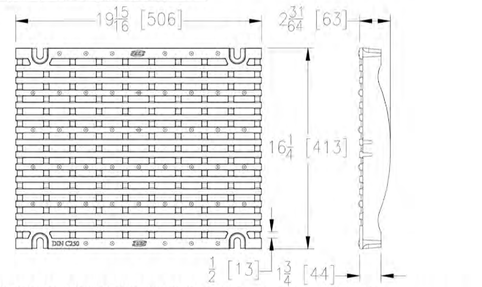
ZURN P874-12-ADA-USA

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 cm^2/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. in^2/ft.[1398cm^2/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

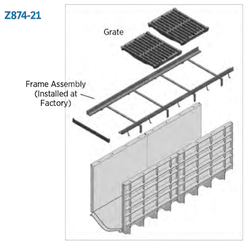
Z874 Perma-Trench®

HDPE Drain Systems (12", 18", 21.25" Throat)

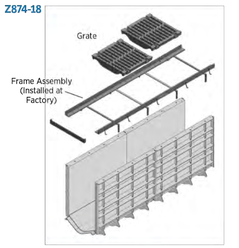
Z874-12



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

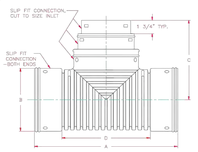
Features and Benefits

- 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

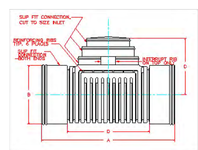
D24

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 (146 mm)
0844AA	8 in (200 mm)	18.8 in (478 mm)	9.9 in (251 mm)	10.5 in (6 mm)	13.0 in (330 mm)
1044AA	10 in (250 mm)	21.0 in (533 mm)	12.3 in (311 mm)	11.8 in (298 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)



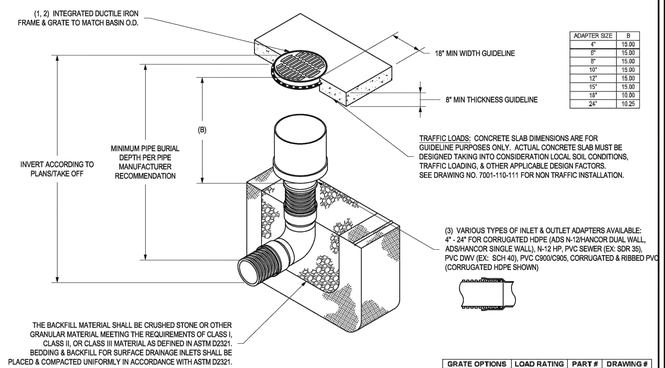
NOTE: ALL DIMENSIONS ARE NOMINAL

© 2021 Advanced Drainage Systems, Inc.

DRAWING #	1035
DRAWN BY	CRM 09.11.06
APPROVED BY	JCB 06.25.07
REVISIONS	TJR 09/20/11

D25

NYLOPLAST 24 " INLINE DRAIN: 2724AG _ _ X



ADAPTER SIZE	B
4"	15.00
6"	15.00
8"	15.00
10"	15.00
12"	15.00
15"	15.00
18"	10.00
24"	10.25

GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	2499CGP	7001-110-216
STANDARD	MEETS H-20	2499CGS	7001-110-217
SOLID COVER	MEETS H-20	2499CGC	7001-110-218
DOME	N/A	2499CGD	7001-110-219
DROP IN GRATE	LIGHT DUTY	2401CI	7001-110-075

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 70-50-05.
3 - 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 - 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. 7001-110-364 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

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BUFORD, GA 30518
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FAX (770) 932-2490
www.nyloplast-us.com

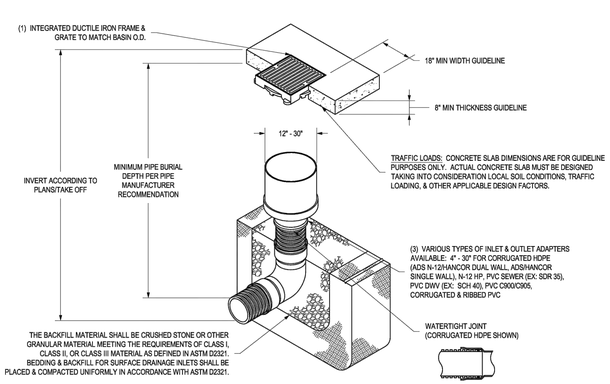
TITLE
24 IN INLINE DRAIN QUICK SPEC INSTALLATION DETAIL

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-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
3 - ROAD & HIGHWAY GRATE SHALL MEET H-20 LOAD RATING.

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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

3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
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-02-2024-0019

#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT
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. 14241 - LICENSED PROFESSIONAL ENGINEER

SHEET 51 OF 57

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 THROUGH 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). SEE ALSO DETAIL U6 SPECIFICATIONS AND TESTING.

   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 ON 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.

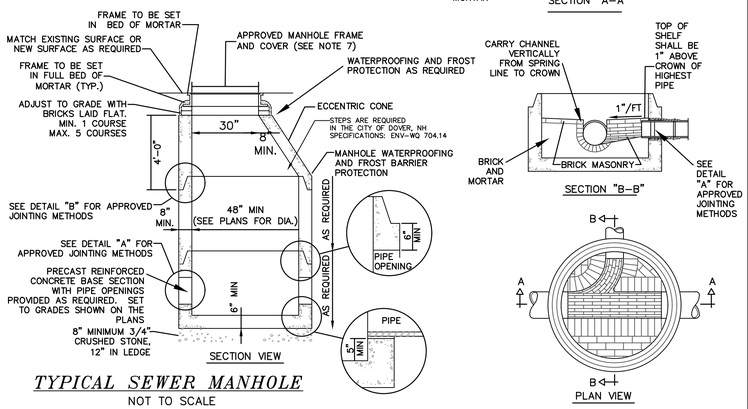
12.) THE CONTRACTOR TO WORK WITH CITY OF DOVER REVIEW ENGINEER AND SEWER DEPARTMENT ON THE MEANS AND METHODS USED TO INSTALL ALL SEWER STRUCTURES.

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. SEE ALSO DETAIL U6 SPECIFICATIONS AND TESTING.

U1a

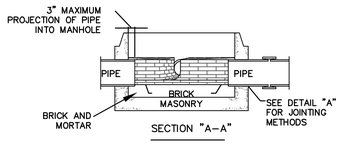


TYPICAL SEWER MANHOLE

NOT TO SCALE

BRICK MAXONRY SHELF DETAIL U1b

NOT TO SCALE



SECTION "A-A"

SECTION "B-B"

PLAN VIEW

U2

R-1743-LM

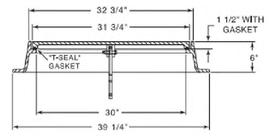
LiftMate Frame, Solid Gasketed Lid

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.



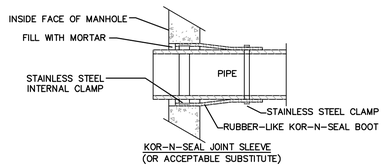


SEWER MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

SEWER MANHOLE COVER DETAIL

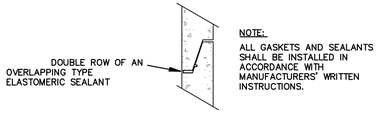
NOT TO SCALE

U3



DETAIL "A" - PIPE TO MANHOLE JOINTS

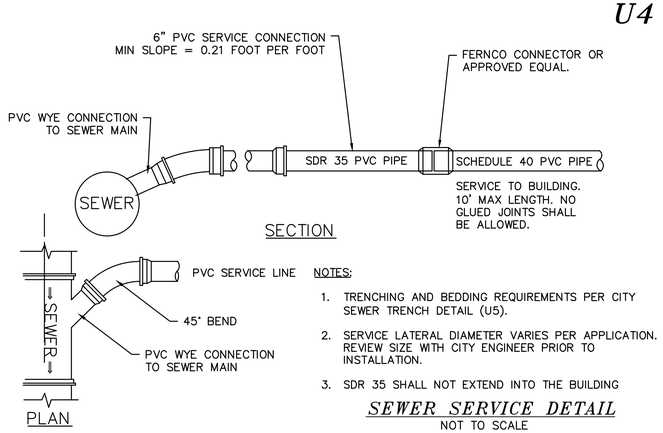
NOT TO SCALE



DETAIL "B" HORIZONTAL JOINTS

NOT TO SCALE

U4



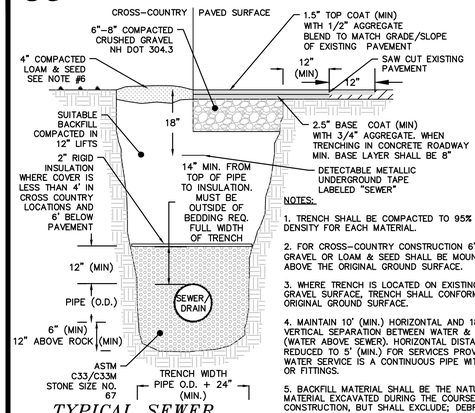
NOTES:

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



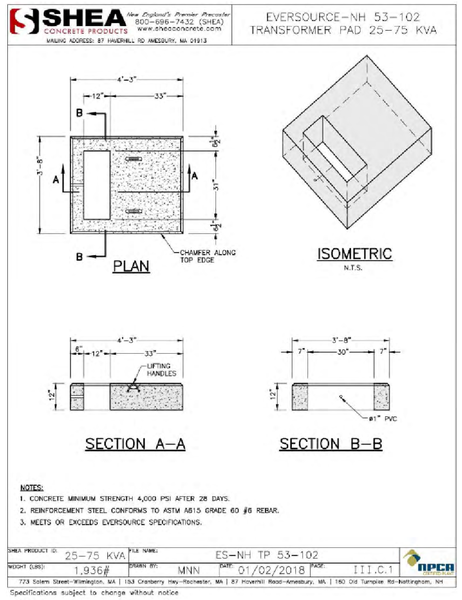
NOTES:

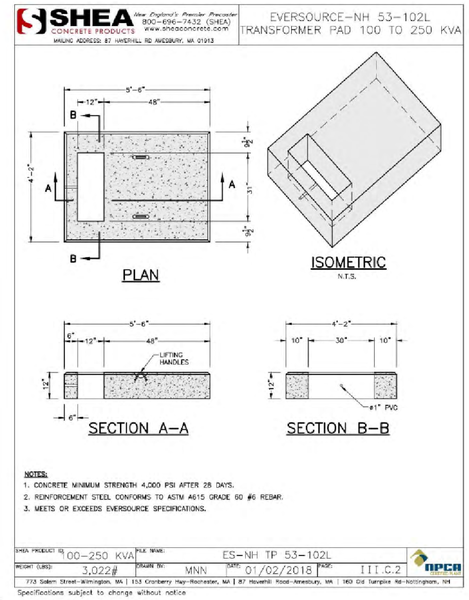
1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND 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

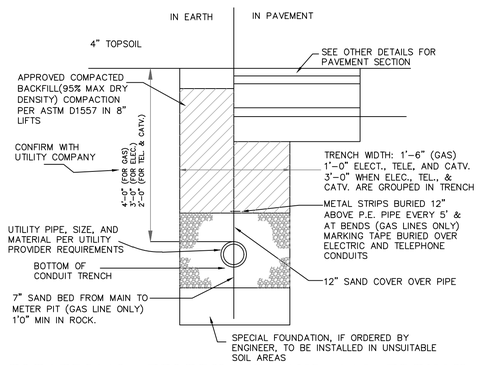




TRANSFORMER AND PAD DETAIL

NOT TO SCALE

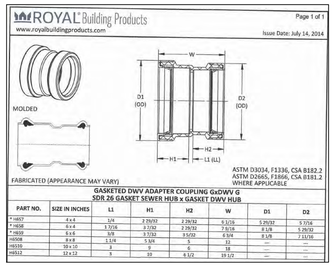
U7



ELECTRICAL, TELEPHONE, AND GAS TRENCH

NOT TO SCALE

U8



PART NO.	SIZE IN INCHES	L1	H1	H2	W	D1	D2
* HDGT	4 x 4	1/4	2 29/32	2 29/32	5 1/16	3 29/32	5 7/16
* HDGB	6 x 4	3 7/16	3 7/32	2 29/32	7 9/16	5 1/8	5 29/32
* HDGD	8 x 6	3/8	3 7/32	3 9/32	6 3/4	8 1/8	7 11/16
HDGR	8 x 8	1 1/8	5 3/8	5	10	—	—
HDGS	10 x 10	1	6	6	12	—	—
HDG12	12 x 12	1	10	8 1/2	15 1/2	—	—

COUPLING DETAIL

NOT TO SCALE

U-101

#	REVISION	DATE	DESCRIPTION
#1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PLANNING FILE #SITE-2024-0019

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. 14241
LICENSED PROFESSIONAL ENGINEER

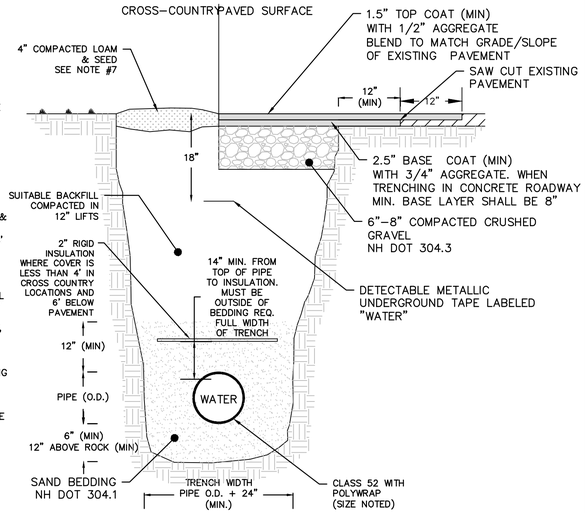
SHEET 52 OF 57

NOT FOR CONSTRUCTION

U9

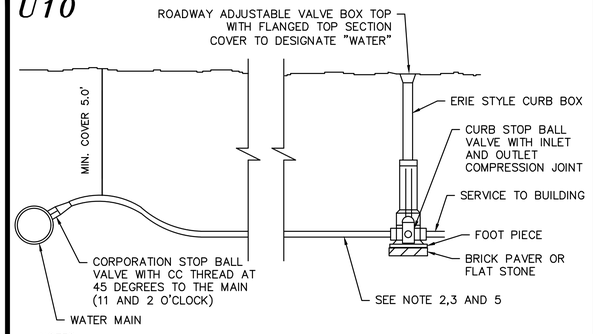
NOTES:

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

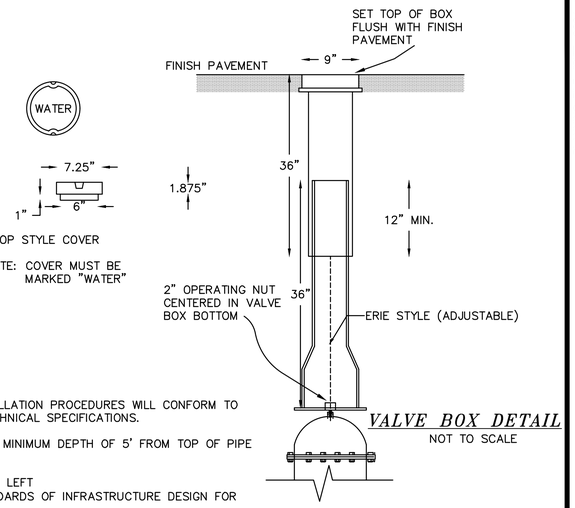


NOTES:

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

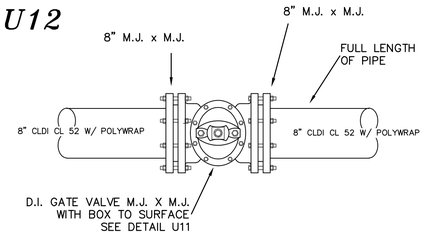


VALVE BOX DETAIL
NOT TO SCALE

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

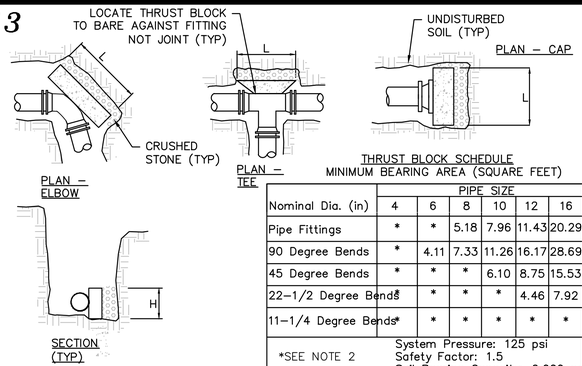
U12



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	*	*	*	*	*	*

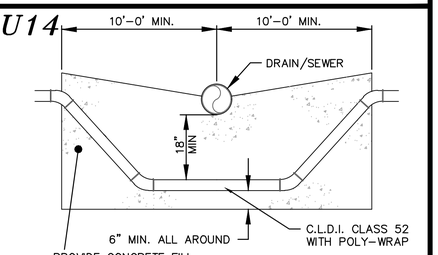
*SEE NOTE 2
System Pressure: 125 psi
Safety Factor: 1.5
Soil Bearing Capacity: 2,000 psf

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

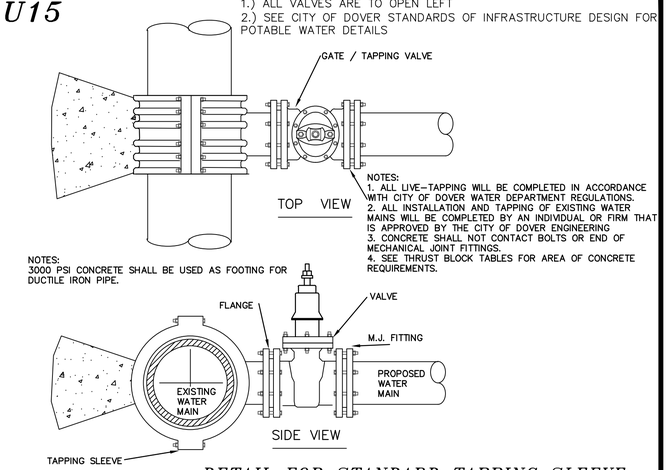


1.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

WATER MAIN INSTALLATION - BELOW DRAIN & SEWER
NOT TO SCALE

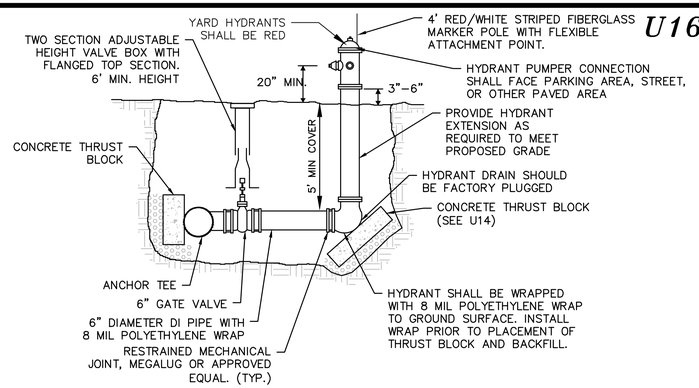
U15

1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS



DETAIL FOR STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
NOT TO SCALE

U16

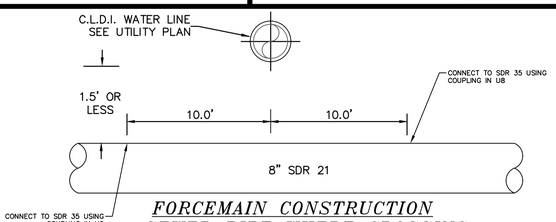


NOTES:

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

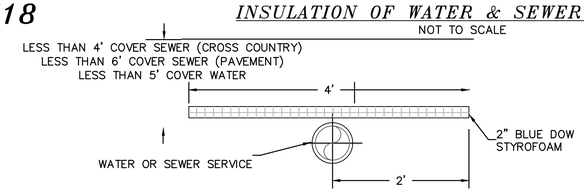
U17



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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

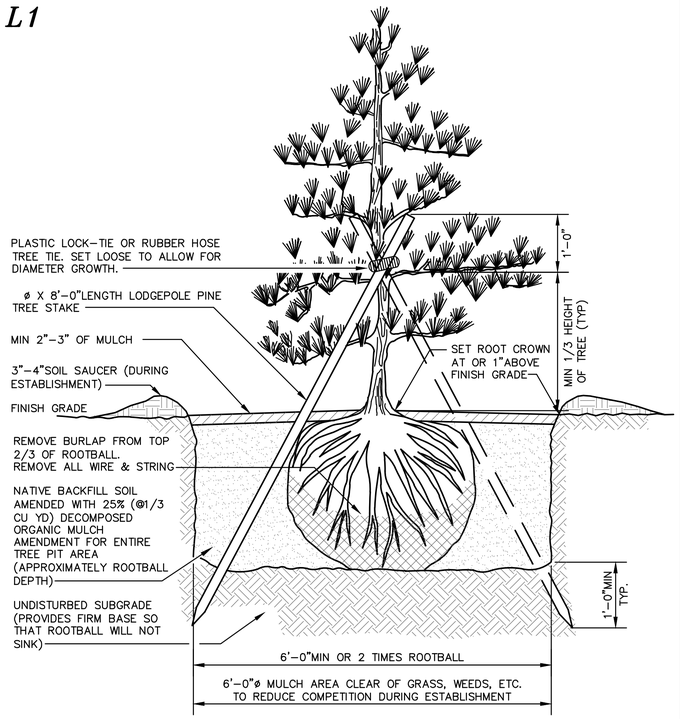
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14274 LICENSED PROFESSIONAL ENGINEER

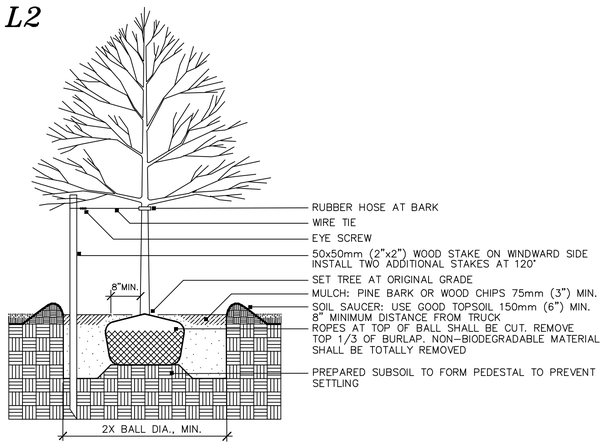
NOT FOR CONSTRUCTION

L1



CONIFEROUS TREE PLANTING

L2



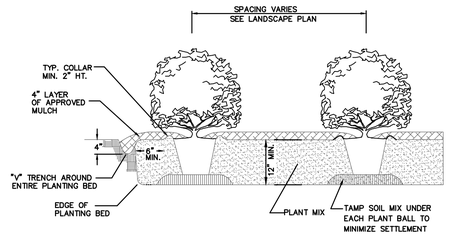
DECIDUOUS TREE PLANTING

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

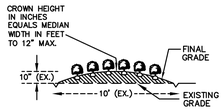
L3

NOTES:

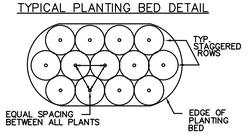
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL



TYPICAL BED CROWNING

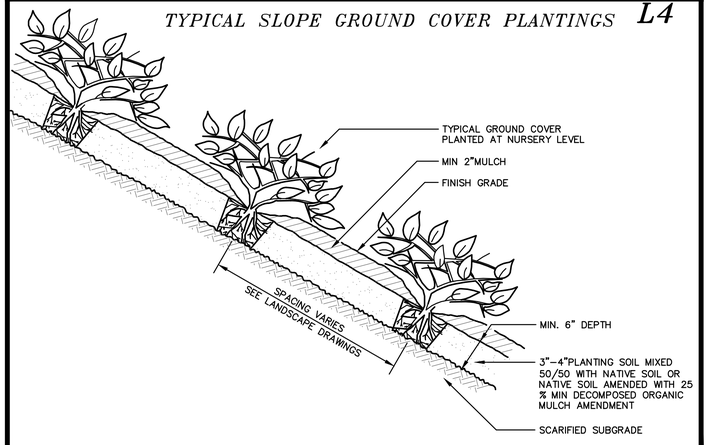


TYPICAL PLANTING BED PLAN

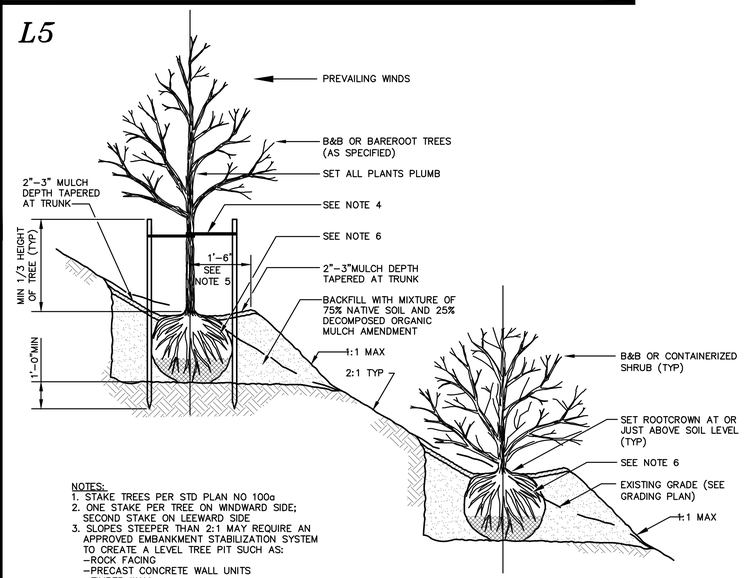
SHRUB & HEDGE PLANTING

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 GROWNG 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.

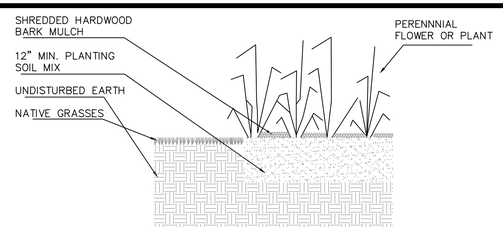
20.) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)

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.

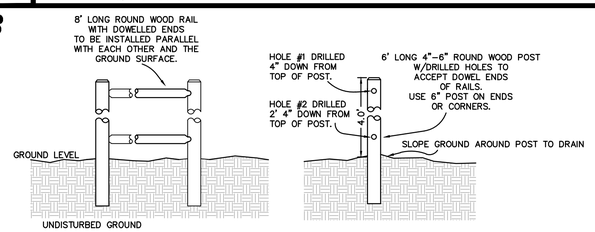
23.) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.

L7



PERENNIAL PLANTING DETAIL

L8



TYPICAL POST & RAIL FENCE DETAIL

NOT TO SCALE

PLANNING FILE #SITE–2024–0019

REVISION	DATE	DESCRIPTION
#1	02–15–26	REVISED UNIT COUNT & PROJECT LAYOUT

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

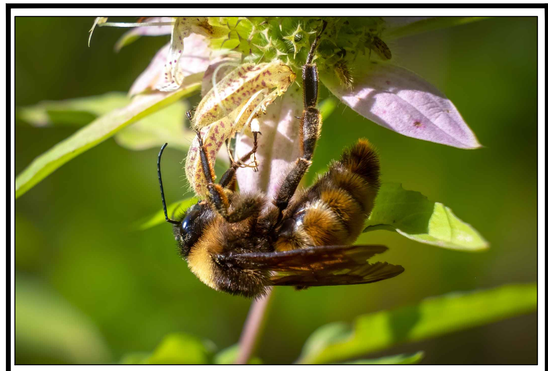
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

STATE OF NEW HAMPSHIRE – KENNETH A. BERRY No. 14243 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 8¾ 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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

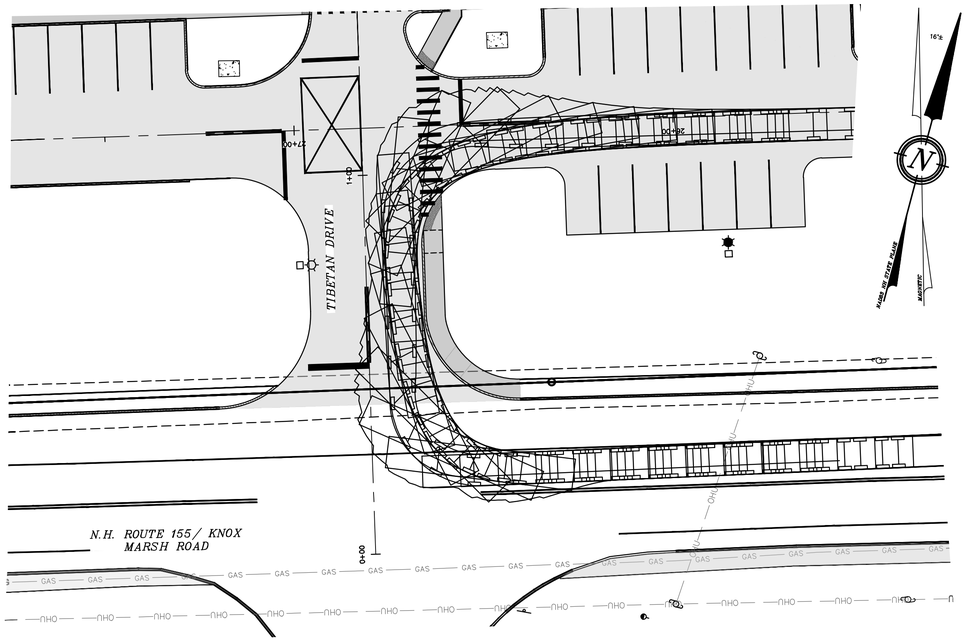
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS NOTED
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 – 034

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

SHEET 55 OF 57

NOT FOR CONSTRUCTION

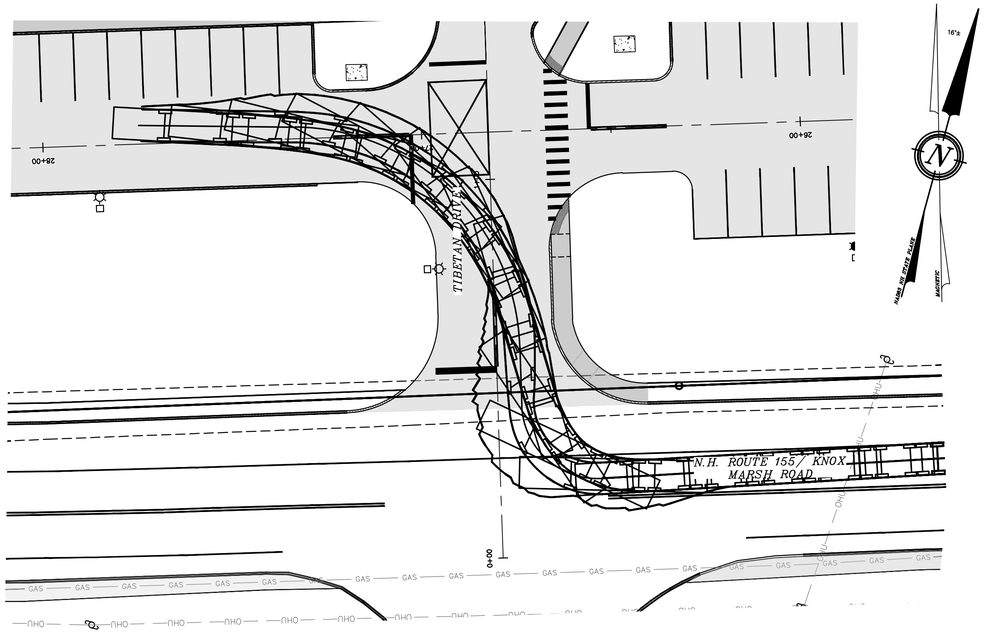


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TRUCK TURNING ENTRANCE RIGHT FROM EAST

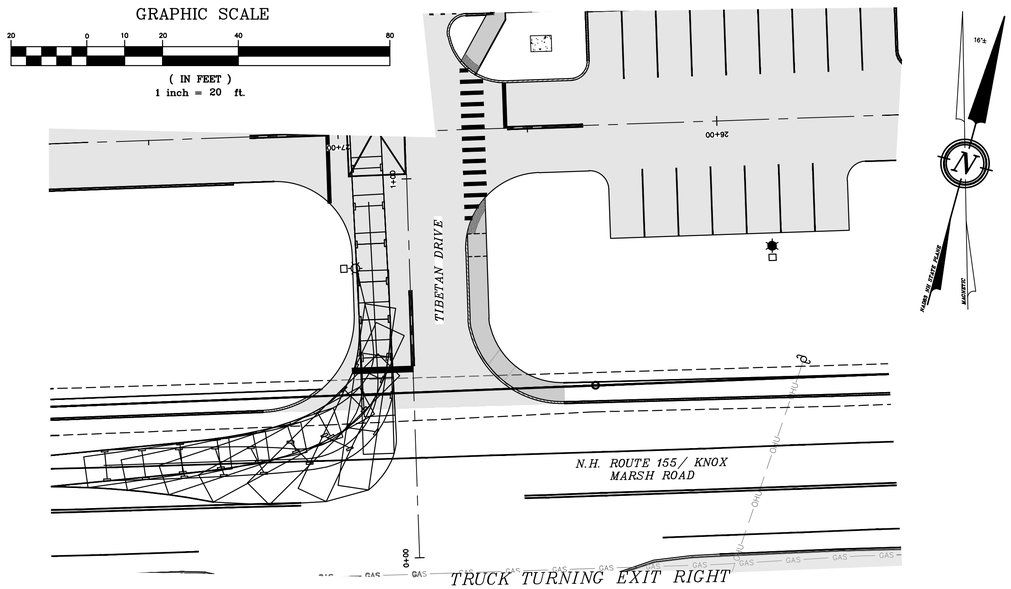


GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

TRUCK TURNING ENTRANCE LEFT FROM EAST

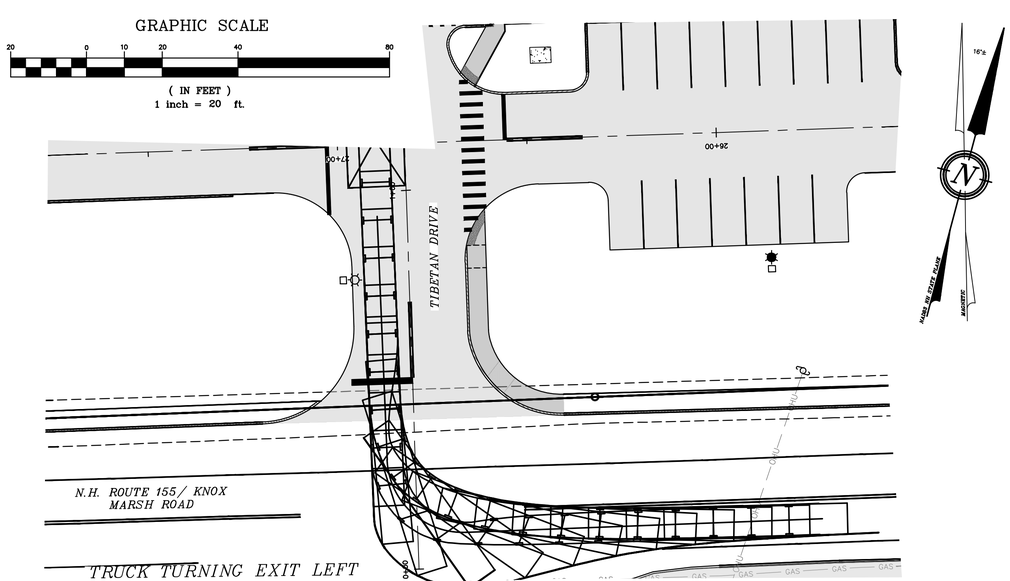


GRAPHIC SCALE

20 0 10 20 40 80

(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-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

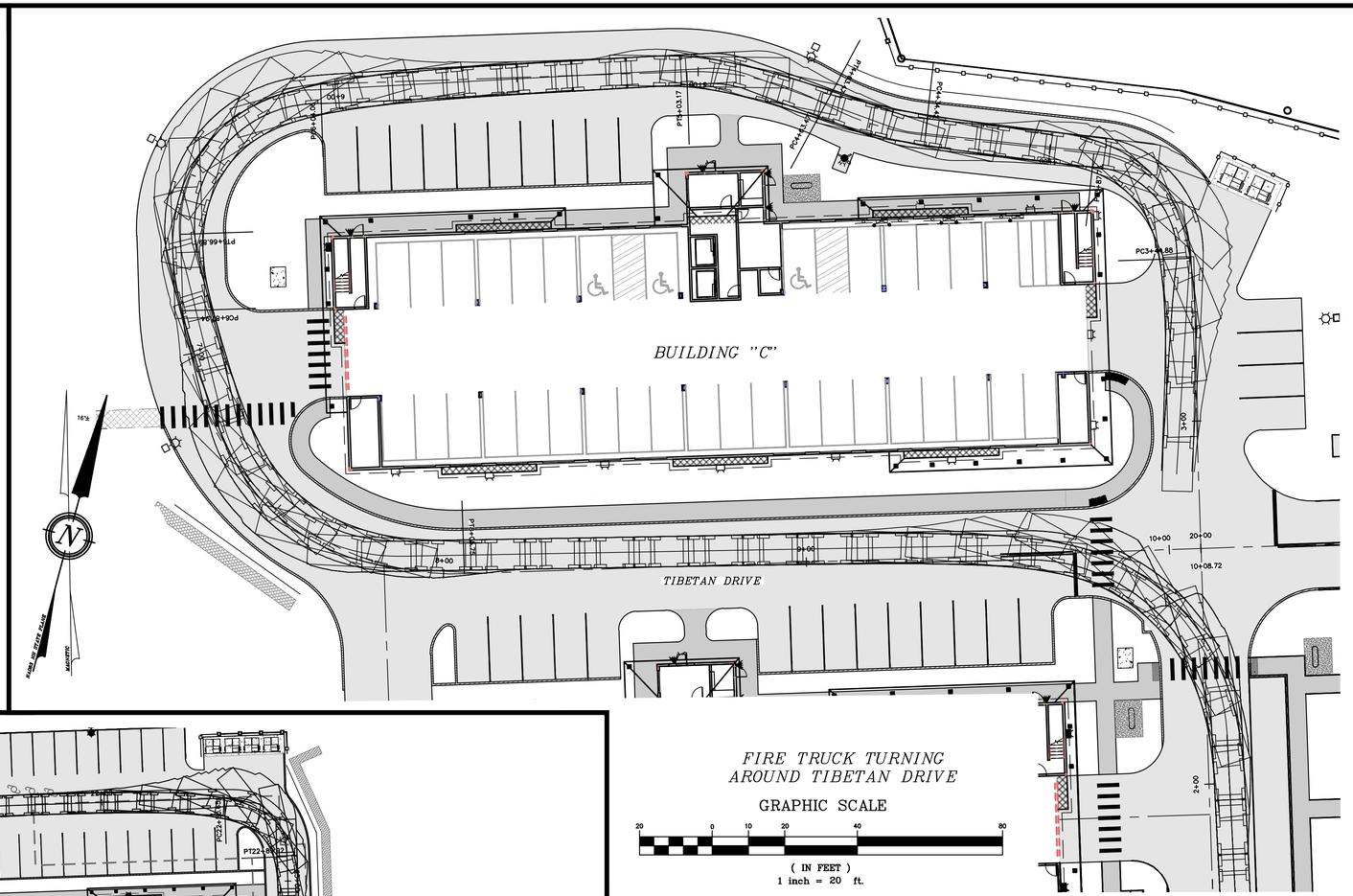
TRUCK TURNING ENTRANCE DOVER, NH FIRE T1 TEMPLATE
LAND OF
239 KNOX MARSH REALTY, LLC
239 KNOX MARSH ROAD
DOVER, N.H.
TAX MAP H, LOT 37A

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. 14251
LICENSED PROFESSIONAL ENGINEER

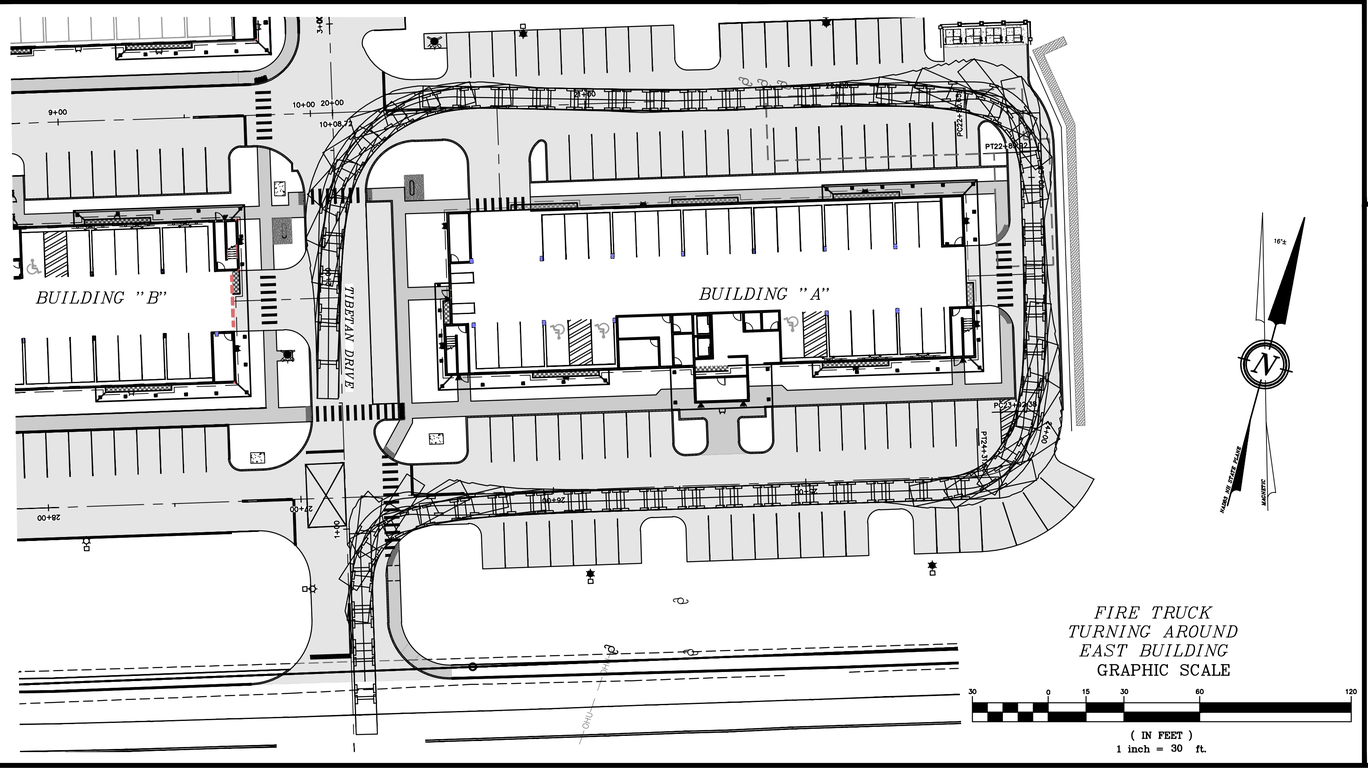
NOT FOR CONSTRUCTION



FIRE TRUCK TURNING
AROUND TIBETAN DRIVE
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



FIRE TRUCK
TURNING AROUND
EAST BUILDING
GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

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

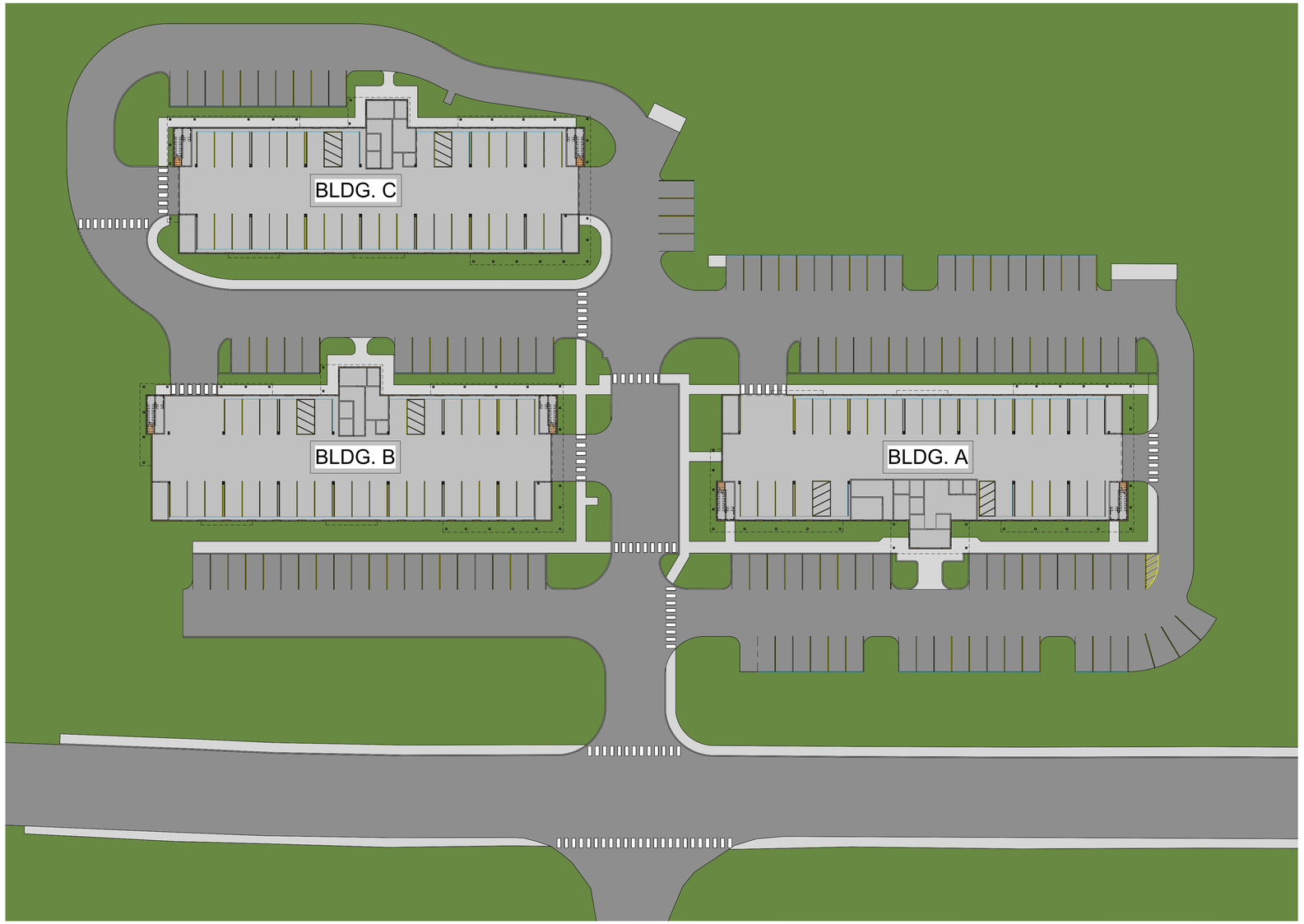
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : NOVEMBER 26, 2024
FILE NO. : DB 2024 - 034

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

SHEET 57 OF 57

NOT FOR CONSTRUCTION



1 Site Plan
1" = 30'-0"

NOT FOR CONSTRUCTION

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ARCHITECTURE &
URBAN DESIGN
(603) 969-6711
NICK@ISAAKDESIGN.COM

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Consultant
Address
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e-mail

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Consultant
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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

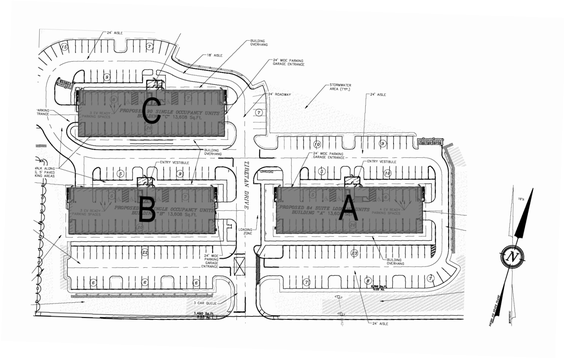
SITE PLAN

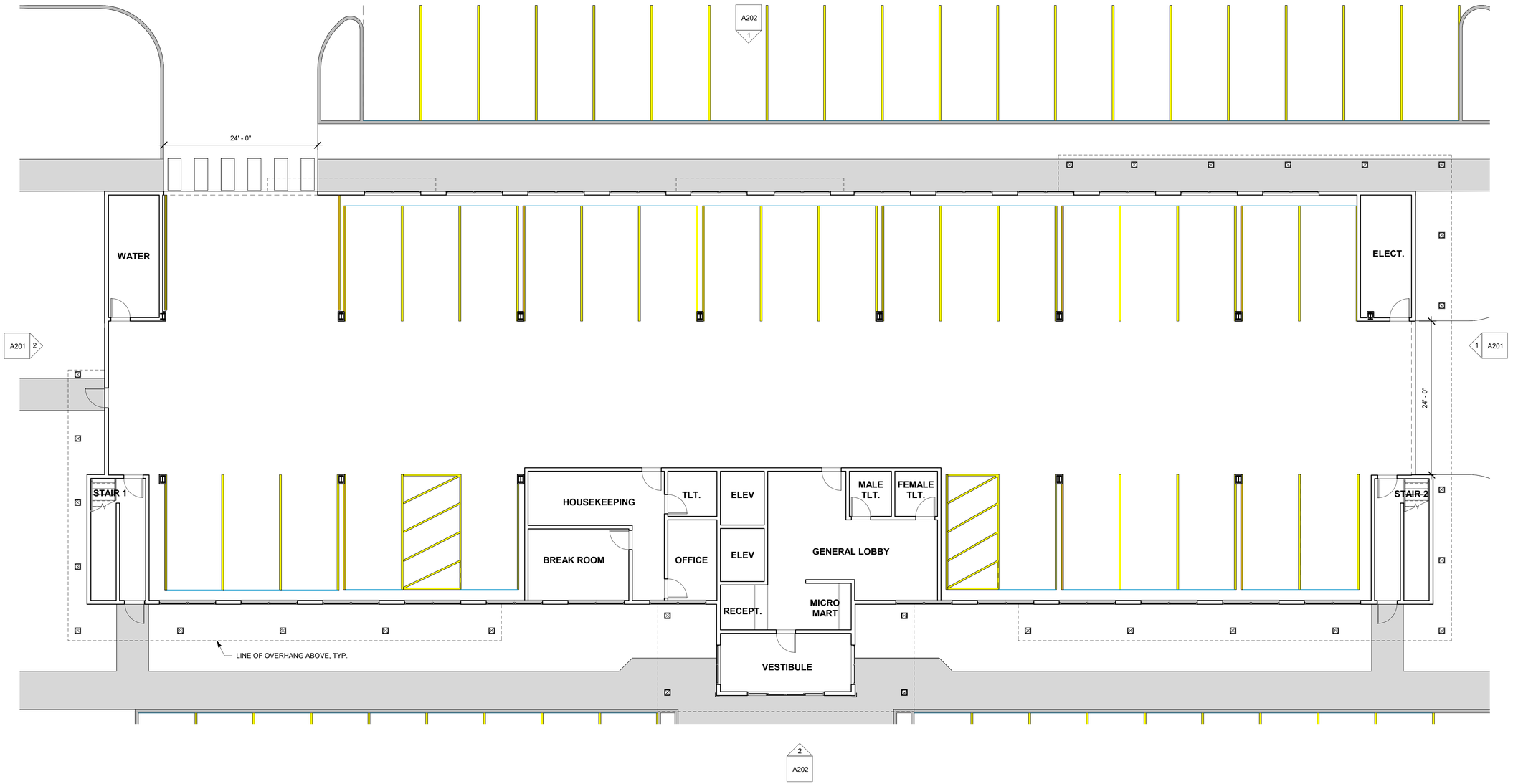
Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A100

Scale 1" = 30'-0"

3/11/2026 6:17:56 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

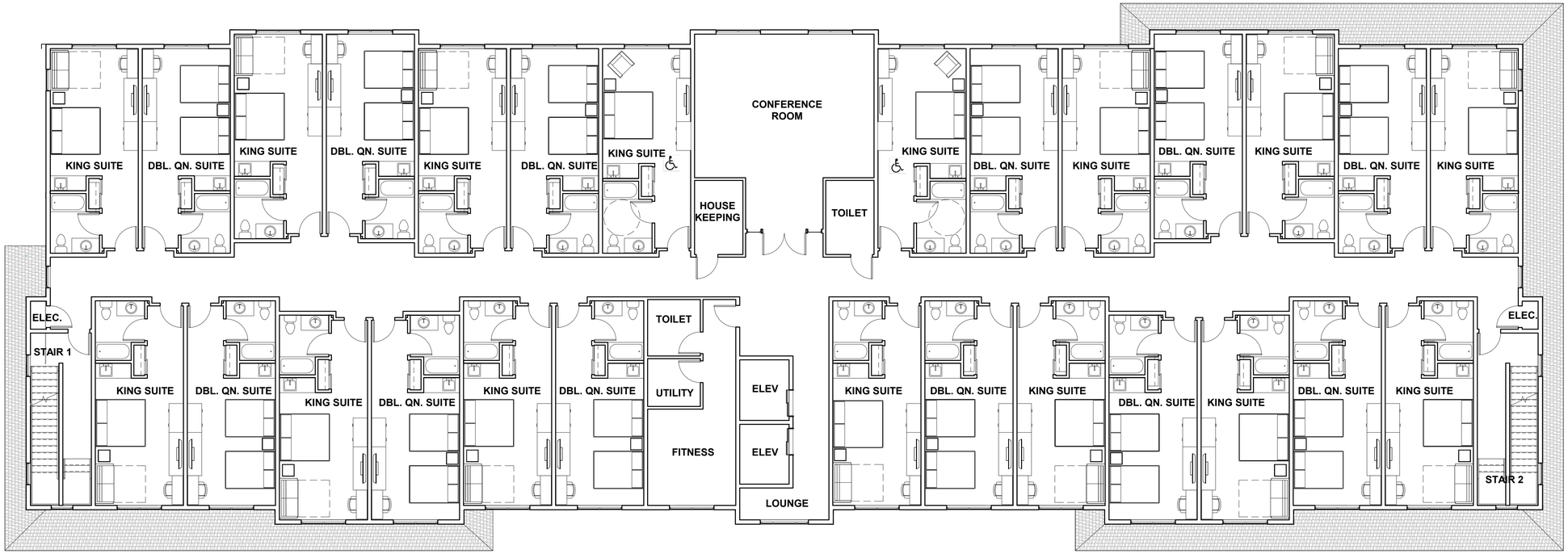
Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A101

Scale	As indicated

3/11/2026 6:17:57 PM

A202
1



A201 2
1 A201
2
A202

1 BUILDING A - LEVEL 2
1/8" = 1'-0"

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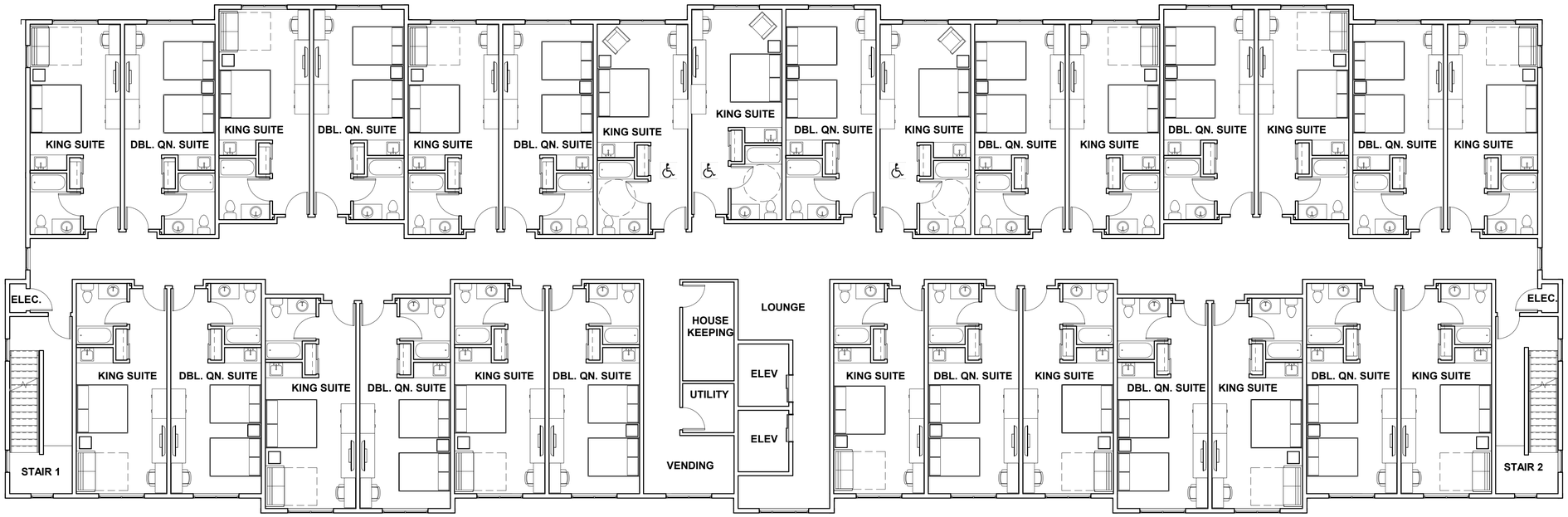
239 KNOX MARSH RD.
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BUILDING A - LEVEL 2

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker
	A102
Scale	1/8" = 1'-0"

3/11/2026 6:17:57 PM

A202
1



A201 2
1 A201
2
A202

1 BUILDING A - LEVEL 3
1/8" = 1'-0"

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BUILDING A - LEVEL 3

Project number	2430
Date	03/06/26
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A103

Scale	1/8" = 1'-0"

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1 BUILDING A - LEVEL 4
1/8" = 1'-0"

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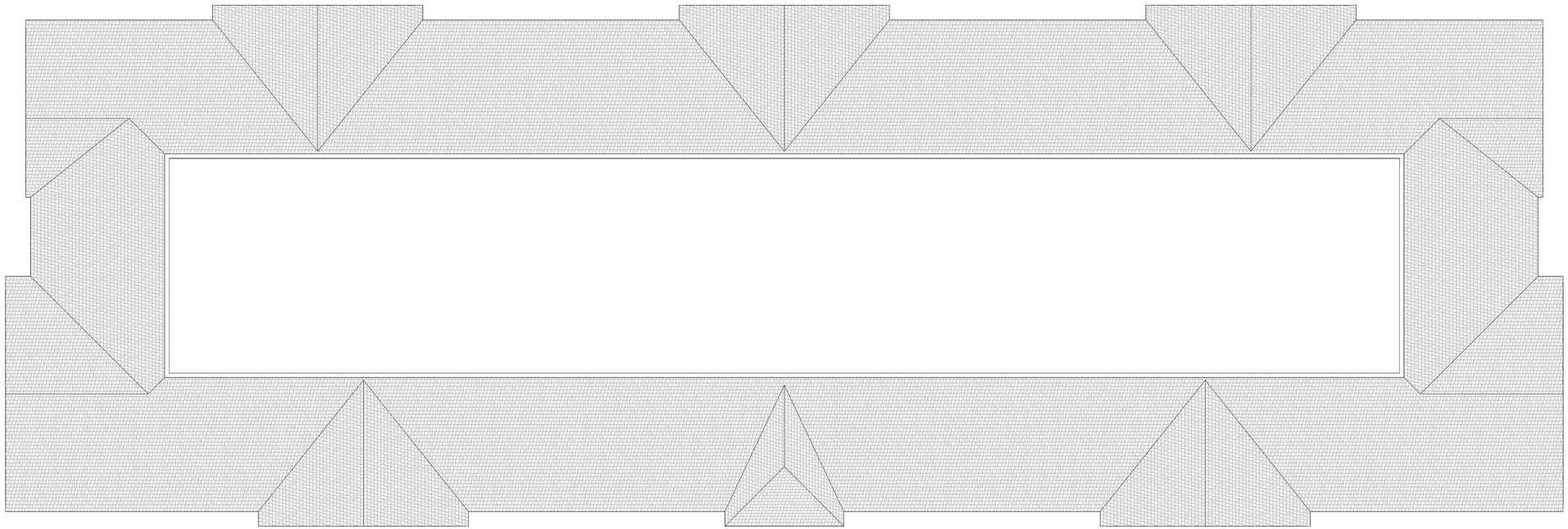
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BUILDING A - LEVEL 4

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker
	A104
Scale	1/8" = 1'-0"

3/11/2026 6:17:59 PM

A202
1



A201 2

1 A201

2
A202

1 Roof Plan
1/8" = 1'-0"

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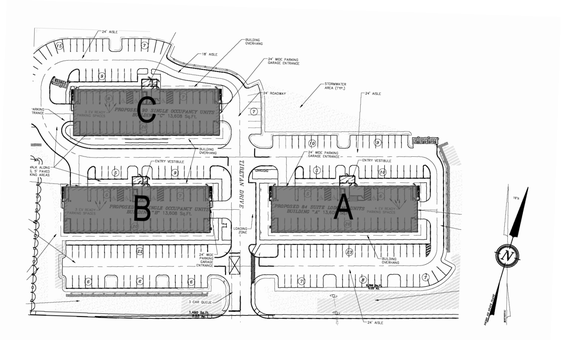
ROOF PLAN

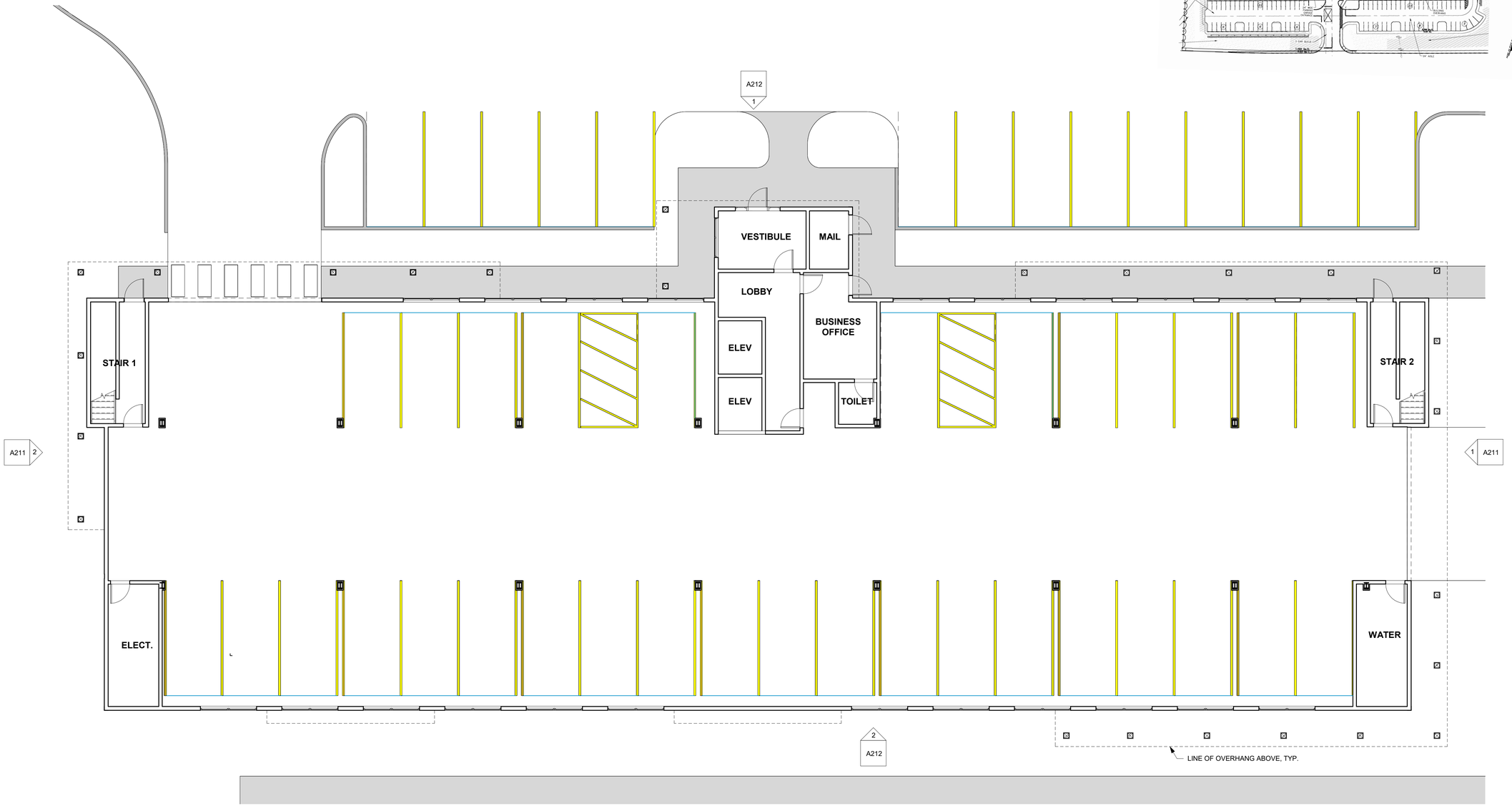
Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A105

Scale 1/8" = 1'-0"

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1 BUILDING B - LEVEL 1
1/8" = 1'-0"

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BUILDING B - LEVEL 1

Project number	2430
Date	03/06/26
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Checked by	Checker

A111

Scale: As indicated

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1 BUILDING B - LEVEL 2
1/8" = 1'-0"

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BUILDING B - LEVEL 2

Project number	2430
Date	03/06/26
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Checked by	Checker
	A112
Scale	1/8" = 1'-0"

3/11/2026 6:18:00 PM



1 BUILDING B - LEVEL 3
1/8" = 1'-0"

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BUILDING B - LEVEL 3

Project number	2430
Date	03/06/26
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Checked by	Checker

A113

Scale 1/8" = 1'-0"

3/11/2026 6:18:01 PM



1 BUILDING B - LEVEL 4
1/8" = 1'-0"

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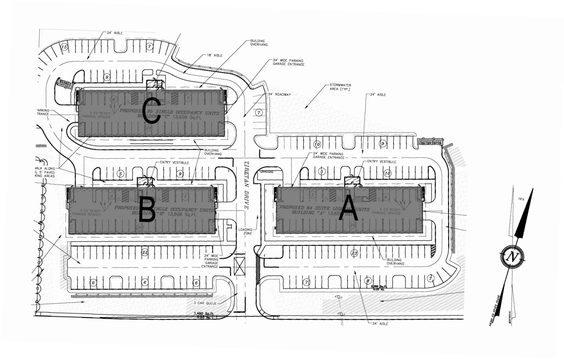
BUILDING B - LEVEL 4

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A114

Scale 1/8" = 1'-0"

3/11/2026 6:18:01 PM





1 BUILDING C - LEVEL 1
1/8" = 1'-0"

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BUILDING C - LEVEL 1

Project number	2430
Date	03/06/26
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Checked by	Checker

A121

Scale: As indicated

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1 BUILDING C - LEVEL 2
1/8" = 1'-0"

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BUILDING C - LEVEL 2

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A122

Scale 1/8" = 1'-0"

3/11/2026 6:18:02 PM



1 BUILDING C - LEVEL 3
1/8" = 1'-0"

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BUILDING C - LEVEL 3

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A123

Scale 1/8" = 1'-0"

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1 BUILDING C - LEVEL 4
1/8" = 1'-0"

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No.	Description	Date

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BUILDING C - LEVEL 4

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A124

Scale 1/8" = 1'-0"

3/11/2026 6:18:03 PM

EXTERIOR FINISH LEGEND

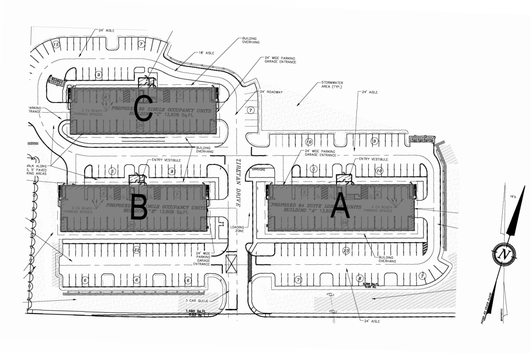
6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE



2 BUILDING A - WEST
1/8" = 1'-0"



1 BUILDING A - EAST
1/8" = 1'-0"



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No.	Description	Date

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BUILDING A - ELEVATIONS

Project number	2430
Date	03/06/26
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Checked by	Checker

A201

Scale As indicated

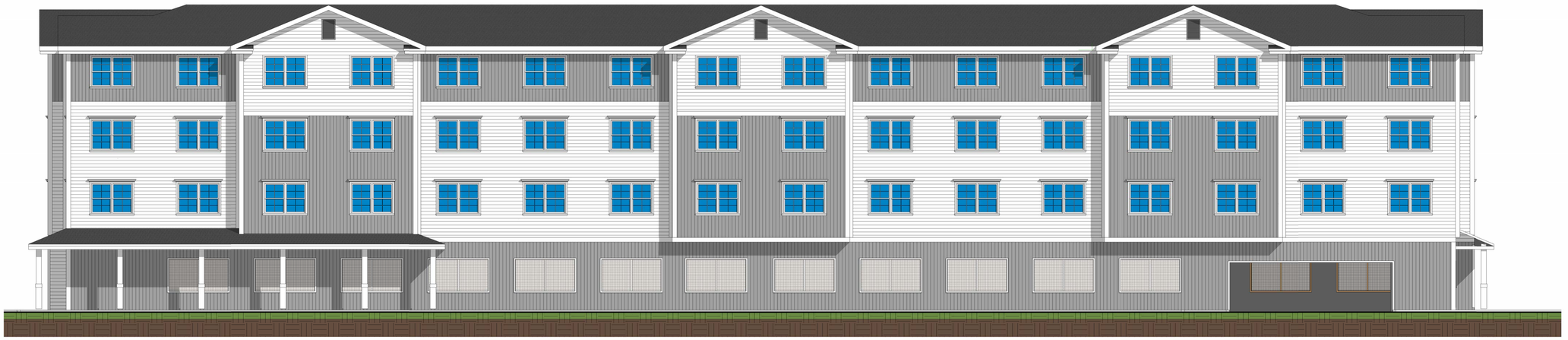
3/17/2026 6:16:06 PM

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"

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BUILDING A - ELEVATIONS

Project number	2430
Date	03/06/26
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Checked by	Checker

A202

Scale	1/8" = 1'-0"

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EXTERIOR FINISH LEGEND

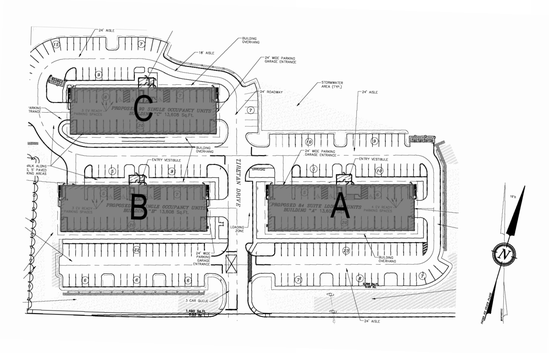
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6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE



2 BUILDING B - WEST
1/8" = 1'-0"



1 BUILDING B - EAST
1/8" = 1'-0"



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BUILDING B - ELEVATIONS

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A211

Scale As indicated

3/17/2026 6:16:18 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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BUILDING B - ELEVATIONS

Project number	2430
Date	03/06/26
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Checked by	Checker

A212

Scale 1/8" = 1'-0"

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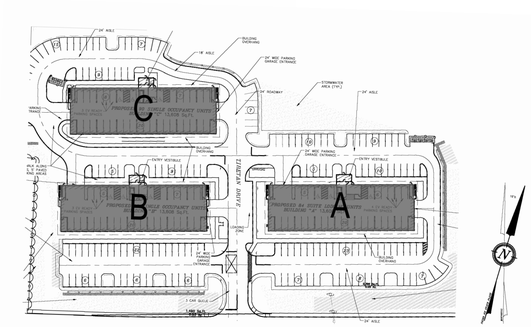
6" VINYL SIDING - GRAY	6" VINYL SIDING - LIGHT BLUE	6" VINYL SIDING - BROWN	6" VINYL SIDING - BROWN
6" VINYL SIDING - LIGHT GRAY	6" VINYL SIDING - TAN	6" VINYL SIDING - CREAM	TRIM - WHITE



2 BUILDING C - WEST
1/8" = 1'-0"



1 BUILDING C - EAST
1/8" = 1'-0"



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239 KNOX MARSH RD.
DOVER, NH

BUILDING C - ELEVATIONS

Project number	2430
Date	03/06/26
Drawn by	CS
Checked by	NI

A221

Scale As indicated

3/17/2026 6:18:27 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"

NOT FOR CONSTRUCTION

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ARCHITECTURE &
URBAN DESIGN
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NICK@ISAAKDESIGN.COM

www.isaakdesign.com

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No.	Description	Date

239 KNOX MARSH RD.
DOVER, NH

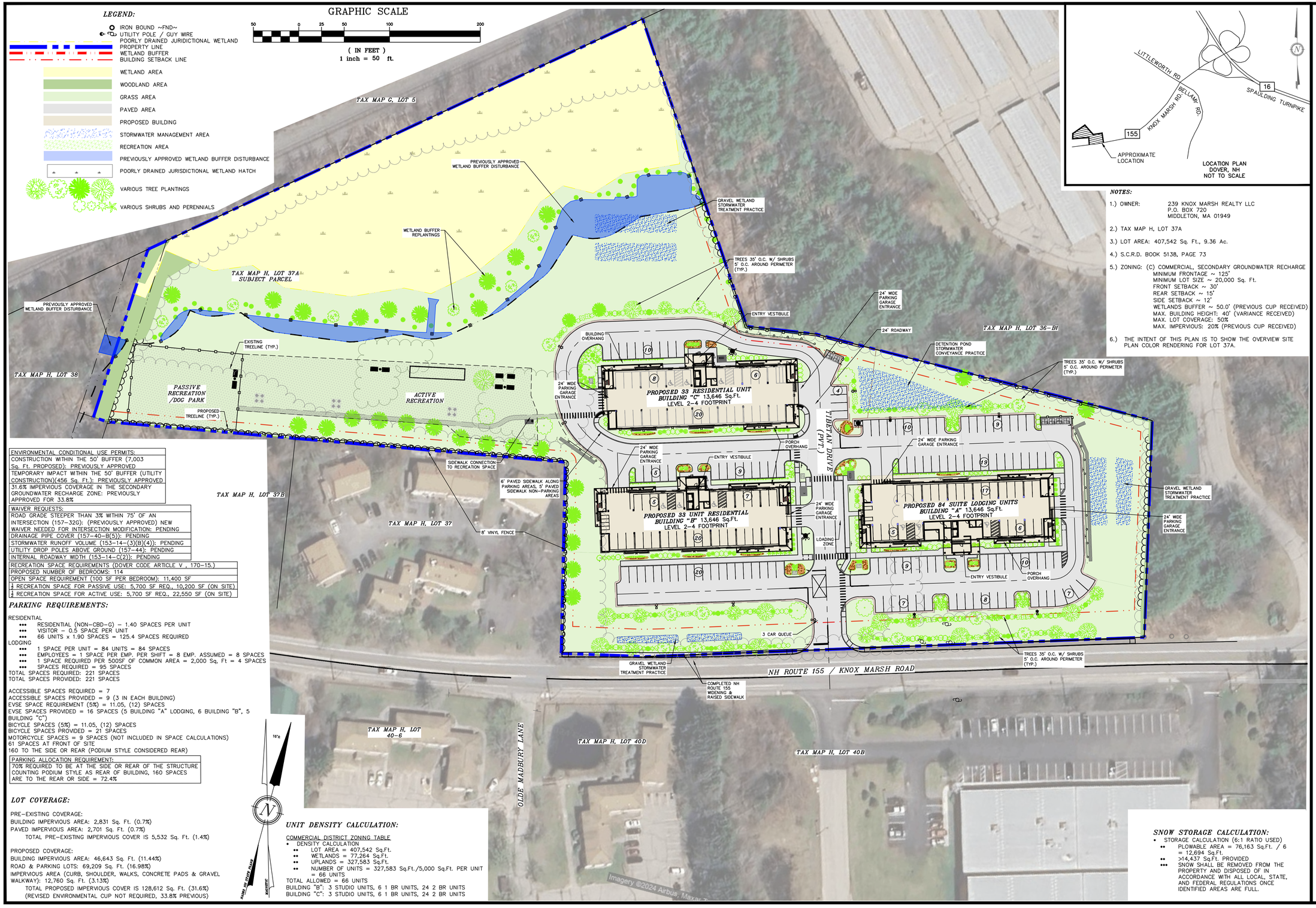
BUILDING C - ELEVATIONS

Project number	2430
Date	03/06/26
Drawn by	Author
Checked by	Checker

A222

Scale 1/8" = 1'-0"

3/11/2026 6:18:32 PM



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)

6.) THE INTENT OF THIS PLAN IS TO SHOW THE OVERVIEW SITE PLAN COLOR RENDERING FOR LOT 37A.

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
31.6% IMPERVIOUS COVERAGE IN THE SECONDARY GROUNDWATER RECHARGE ZONE: PREVIOUSLY APPROVED FOR 33.8%

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
INTERNAL ROADWAY WIDTH (153-14-C(2)): PENDING

RECREATION SPACE REQUIREMENTS (DOVER CODE ARTICLE V , 170-15.)
PROPOSED NUMBER OF BEDROOMS: 114
OPEN SPACE REQUIREMENT (100 SF PER BEDROOM): 11,400 SF
½ RECREATION SPACE FOR PASSIVE USE: 5,700 SF REQ., 10,200 SF (ON SITE)
½ RECREATION SPACE FOR ACTIVE USE: 5,700 SF REQ., 22,550 SF (ON SITE)

PARKING REQUIREMENTS:

RESIDENTIAL
- RESIDENTIAL (NON-CBD-G) - 1.40 SPACES PER UNIT
- VISITOR - 0.5 SPACE PER UNIT
- 66 UNITS x 1.90 SPACES = 125.4 SPACES REQUIRED

LODGING
- 1 SPACE PER UNIT = 84 UNITS = 84 SPACES
- EMPLOYEES = 1 SPACE PER EMP. PER SHIFT = 8 EMP. ASSUMED = 8 SPACES
- 1 SPACE REQUIRED PER 500SF OF COMMON AREA = 2,000 Sq. Ft = 4 SPACES
- SPACES REQUIRED = 95 SPACES

TOTAL SPACES REQUIRED: 221 SPACES
TOTAL SPACES PROVIDED: 221 SPACES

ACCESSIBLE SPACES REQUIRED = 7
ACCESSIBLE SPACES PROVIDED = 9 (3 IN EACH BUILDING)
EVSE SPACE REQUIREMENT (5%) = 11.05, (12) SPACES
EVSE SPACES PROVIDED = 16 SPACES (5 BUILDING "A" LODGING, 6 BUILDING "B", 5 BUILDING "C")
BICYCLE SPACES (5%) = 11.05, (12) SPACES
BICYCLE SPACES PROVIDED = 21 SPACES
MOTORCYCLE SPACES = 9 SPACES (NOT INCLUDED IN SPACE CALCULATIONS)
61 SPACES AT FRONT OF SITE
160 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, 160 SPACES ARE TO THE REAR OR SIDE = 72.4%

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: 46,643 Sq. Ft. (11.44%)
ROAD & PARKING LOTS: 69,209 Sq. Ft. (16.98%)
IMPERVIOUS AREA (CURB, SHOULDER, WALKS, CONCRETE PADS & GRAVEL WALKWAY): 12,760 Sq. Ft. (3.13%)
TOTAL PROPOSED IMPERVIOUS COVER IS 128,612 Sq. Ft. (31.6%)
(REVISED ENVIRONMENTAL CUP NOT REQUIRED, 33.8% PREVIOUS)

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
BUILDING "B": 3 STUDIO UNITS, 6 1 BR UNITS, 24 2 BR UNITS
BUILDING "C": 3 STUDIO UNITS, 6 1 BR UNITS, 24 2 BR UNITS

SNOW STORAGE CALCULATION:
- STORAGE CALCULATION (6:1 RATIO USED)
  - PLOWABLE AREA = 76,163 Sq.Ft. / 6 = 12,694 Sq.Ft.
  - >14,437 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.

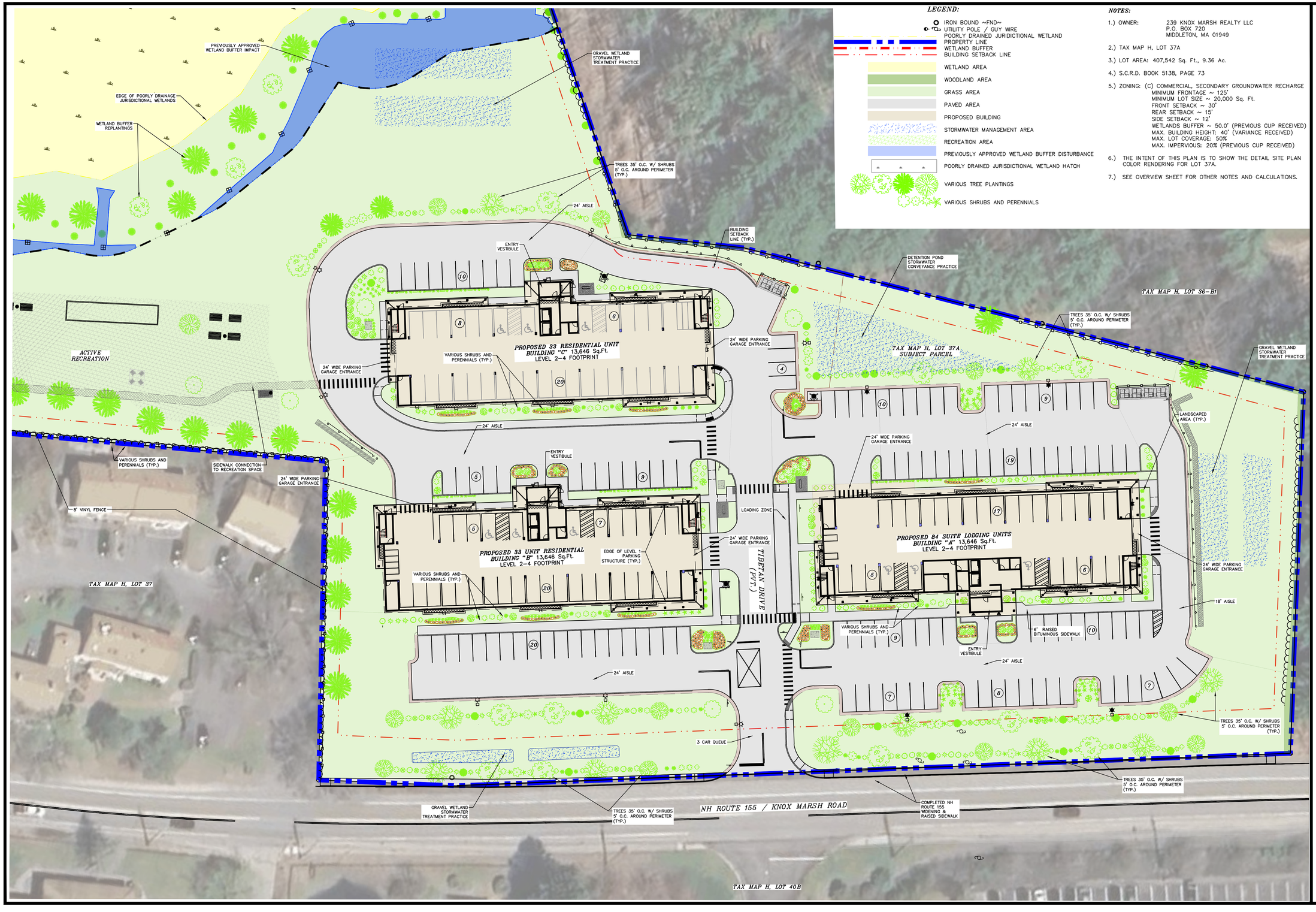
PLANNING FILE #SITE-2024-0019

#	REVISION	DATE	DESCRIPTION
1		02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

OVERVIEW MIXED-USE 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



PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

MIXED-USE 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

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 AN OVERLAY OF THE ORIGINAL APPROVED SITE PLAN (SITE-2023-0010) WITH THE REVISED SITE PLAN PROPOSAL.

LEGEND:

- IRON BOUND ~FND~
- IRON PIPE ~FND~
- GRANITE BOUND ~FND~
- UTILITY POLE / GUY WIRE
- BUILDING SETBACK LINE
- OHU OVERHEAD UTILITIES LINE
- WETLAND LINE
- WETLAND BUFFER
- FORMER ROAD R.O.W.
- ABUTTING PROPERTY LINE
- SITE-2023-0010 APPROVAL
- REVISED SITE PLAN PROPOSAL

TAX MAP C, LOT 5

TAX MAP H, LOT 37A
SUBJECT PARCEL

TAX MAP H, LOT 38

STORMWATER MANAGEMENT AREA

DEAD END ROADWAY WITH SINGLE FAMILY HOMES REMOVED.

AREA PROPOSED TO BE UTILIZED FOR RECREATION SPACE.

PROPOSED RESIDENTIAL BUILDING "B" LOCATION

TAX MAP H, LOT 36-B1

HANSON ROAD
DISCONTINUED BY CITY OF DOVER
JULY 8, 1998
2 ROD WIDE ACCESS & UTILITY EASEMENT

TAX MAP H, LOT 37

TAX MAP H, LOT 37B

PROPOSED RESIDENTIAL BUILDING "B" LOCATION

PROPOSED LODGING BUILDING "A" LOCATION

ORIGINALLY APPROVED MIXED USE BUILDING LOCATION

ORIGINALLY APPROVED MIXED USE BUILDING LOCATION

PARKING LOTS AND BUILDINGS PUSHED BACK TO PROVIDE INCREASED QUEUE CAPACITY AT THE INTERSECTION

EXISTING DRIVEWAY

OLD MADBURY LANE

N.H. ROUTE 155/ KNOX MARSH ROAD

F.W. WEBB DRIVEWAY

F.W. WEBB DRIVEWAY

TAX MAP H, LOT 40-D

TAX MAP H, LOT 40-B

TAX MAP H, LOT 40-6

MAGNETIC NORTH

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PROPOSED SITE PLAN OVERLAY W/ ORIGINAL APPROVAL
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

NOTES:

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

2.) TAX MAP H, LOT 37A

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- 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
- SITE-2023-0010 APPROVAL
- REVISED SITE PLAN PROPOSAL
- SITE-2023-0010 UTILITIES
- REVISED SITE PLAN UTILITIES

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

TAX MAP C, LOT 5

TAX MAP H, LOT 37A
SUBJECT PARCEL

TAX MAP H, LOT 38

TAX MAP H, LOT 36-B1

TAX MAP H, LOT 37

TAX MAP H, LOT 37B

TAX MAP H, LOT 40-6

TAX MAP H, LOT 40-D

TAX MAP H, LOT 40-B

STORMWATER MANAGEMENT AREA

DEAD END ROADWAY WITH SINGLE FAMILY HOMES REMOVED.

AREA PROPOSED TO BE UTILIZED FOR RECREATION SPACE.

PROPOSED RESIDENTIAL BUILDING "B" LOCATION

HANSON ROAD DISCONTINUED BY CITY OF DOVER JULY 8, 1998

2 ROD WIDE ACCESS & UTILITY EASEMENT

PROPOSED RESIDENTIAL BUILDING "B" LOCATION

ORIGINALLY APPROVED MIXED USE BUILDING LOCATION

PROPOSED LODGING BUILDING "A" LOCATION

ORIGINALLY APPROVED MIXED USE BUILDING LOCATION

PARKING LOTS AND BUILDINGS PUSHED BACK TO PROVIDE INCREASED QUEUE CAPACITY AT THE INTERSECTION

EXISTING DRIVEWAY

OLD MADBURY LANE

F.W. WEBB DRIVEWAY

N.H. ROUTE 155/ KNOX MARSH ROAD

16°±

MAGNETIC NORTH

GRID NORTH

PLANNING FILE #SITE-2024-0019

REVISION	DATE	DESCRIPTION
#1	02-15-26	REVISED UNIT COUNT & PROJECT LAYOUT

PROPOSED SITE PLAN OVERLAY W/ ORIGINAL UTILITIES
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
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SCALE : 1 IN. EQUALS 50 FT.
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