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, July 2, 2026**
Meeting Time: **10:30 AM**

1. Site Plan for 96 Broadway, LLC, Assessor's Map 27, Lot 169, Zoned G, located at 96 Broadway. (Proposal is to construct two (2) duplexes with associated parking area.) (SITE-2026-0007) [*This item was previously heard by the Planning Technical Review Committee on May 28, 2026*.]

PLAN SNAPSHOT REPORT SITE-2026-0007
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	04/30/2026
Work Class:	New Construction	**District:**	None	**Exp Date:**	07/04/2026
Status:	Fees Paid	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: Construction of two duplexes and associated parking area.

Parcel:	27169-000000 Main	**Address:**	96 Broadway Dover, NH Main	**Zone:**	G(Gateway District)

Owner	Engineer	Applicant
Ryan Eschbach	Hilary Badger	Hilary Badger
Home: (248) 225-6538	PO Box 249	PO Box 249
Business: (248) 225-6538	Rochester, NH 03867	Rochester, NH 03867
Mobile: (248) 225-6538	Business: (603) 335-3948	Business: (603) 335-3948

Plan Custom Fields

Total2	0	Total3	0	Total	0
Total5	0	Total4	0	Total6	4
Total7	0	Total9	2800	Total8	5600
Street Classification Type	Municipal	Recording Number		Net Change in # Parking Spaces (+/-)	7
Water Service	Municipal	Sewer Service	Municipal	Deed Book	5339
Total Acres (GIS)	0.35	Deed Page	197	Total SQFT	15246
Deed Date	03/13/2026	Proposed Property Use	Multi-family residential	Area of Parcel to be Developed (SQFT)	9500
Number of Parking Spaces Existing	5	Number of Parking Spaces Proposed	12	Distance to City Water	48
Distance to City Sewer	44	Type of Building to be Built	Duplex	Estimated Construction Value	1000000.00
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_Hilary_Badger_4/30/2026.jpg	04/30/2026 15:23	Badger, Hilary		Uploaded via CSS
2026.05.28_PlanningTechnicalReviewCommittee.Agenda.pdf	05/19/2026 17:18	Blonigen, Rachel		TRC Agenda
2026.05.28_PlanningTechnicalReviewCommittee.96 Broadway_SITE-2026-0007.pdf	05/29/2026 13:13	Blonigen, Rachel		Draft TRC Minutes

Invoice No.	Fee	Fee Amount	Amount Paid
INV-2026001386	Planning General Application Fee	$200.00	$200.00
	Total for Invoice INV-2026001386	$200.00	$200.00

INV-2026001780	Planning Legal Notice	$120.00	$120.00
	Planning Verified Mailing to Abutters	$377.00	$377.00
	Planning Residential Fee	$400.00	$400.00
	Planning Creation / Printing of Abutter Labels	$20.00	$20.00
	Total for Invoice INV-2026001780	**$917.00**	**$917.00**
	Grand Total for Plan	**$1,117.00**	**$1,117.00**

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	05/28/2026	Technical Review Committee Meeting

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	In Review	05/19/2026	05/27/2026		No	No

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Burdin, James	In Review	05/19/2026	06/16/2026	
City Engineer	Community Services - Engineering	Semprini, Jillian	In Review	05/19/2026	05/27/2026	
Planning	Planning	Bassegio, Erin	In Review	05/19/2026	06/16/2026	
Zoning Administrator	Planning	Crouser, Paul	In Review	05/19/2026	05/27/2026	
IS Building Official	Planning / Inspection Services	Maxfield, Jim	Requires Re-submit	05/19/2026	05/27/2026	05/27/2026

Comments: 1) Provide NH stamp on PE application.
2) Indicate distance between adjacent structures.

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Traffic	Police	Mitrushi, Alex	In Review	05/19/2026	05/27/2026	

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		05/01/2026 12:30	
Confirm application complete v.1	Generic Action		05/01/2026 12:30
Technical Review Committee Meeting Agenda v.1	Task	05/01/2026 12:30	05/19/2026 17:18
Land Use Plan Technical Review v.1	Receive Submittal	05/19/2026 0:00	
Technical Review Committee Meeting v.1	Hold Meeting	05/19/2026 17:21	
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: 96 Broadway LLC; Ryan Eschbach Telephone #(248)225-6538

Address of Applicant: US Route 1, Apt. 1C, York, ME 03909

E-Mail Address: Ryanesch@mac.com

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

Address of Property Owner:

PROPERTY INFORMATION

Address of Property: 96 Broadway, Dover NH

Assessor's Map # 27 Lot(s) # 169

Zoning District(s) Gateway District Overlay District(s) Central Business District

Size of Parcel: 15,429 sq. ft. 0.35 ac. Property Deed: Book 5339 Page: 197

Existing Use of Property: Multi Family Residentail

SITE PLAN INFORMATION

Describe Proposed Use: Multi Family Residentail

Area of Parcel to be Developed: 9,485 sq. ft.

If Multi-family Residential: Number of Units 4 additional units & Buildings Proposed 2 additional buildings

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

Number of Parking Spaces: Existing Approx. 5 Proposed 12

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

Number of Employees Total: _____ In Maximum Shift:

Dispostition of Parcel:

Building Footprint 884, 1400, 1400 sq. ft.

Total Building Area 2147, 2800, 2800 sq. ft.

Paved Area 4790 sq. ft.

Building Setbacks:

Front Yard 5 ft.

Rear Yard 44.7' ft.

Side Yard: Right 11.5 ft. Left 4.7' ft.

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

City Sewer? ✓ Yes ___ No How far is city sewer from the 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:

_____

_____

_____

BUILDING INFORMATION

Type of Building to be Built: 2 Duplexes

Height of Building: 28'-4" Finished Floor Elevation: 79.0'

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.) Glenn Griswold, Norway Plains Associates Inc.

Address 2 Continental Boulevard, Rochester NH 03866 Telephone #: (603)335-3948

Professional License #: _____ E-mail address: GGriswold@NorwayPlains.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Hilary Badger, Norway Plains Associates Inc.

Address 2 Continental Boulevard, Rochester NH 03866 Telephone #: (603)335-3948

Professional License #: 18290 E-mail address: HBadger@NorwayPlains.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Sarah Hourihane, Lassel Archtects

Address PO Box 370, South Berwick, ME 03908 Telephone #: 207-384-2049

Professional License #: 4574 E-mail address: sarah@lasselarchitects.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Victoria Martel, Sea Laurel

Address 150 Blackberry Hill Road, Berwick, ME 03901 Telephone #: 207-599-6517

Professional License #: _____ E-mail address: vicky@sealaurel.com

SOIL SCIENTIST INFORMATION

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

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

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: 4-7-26

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: 4-7-26

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: 4-7-26

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: 4-7-26

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
27	169	93 Broadway LLC	4 US Route 1 Unit 1C, York ME 03909

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Same as Owner		

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Hilary Badger, PE	Norway Plains Associates, Inc.	PO Box 249, Rochester NH 03866
Glenn Griswold, LLS	Norway Plains Associates, Inc.	PO Box 249, Rochester NH 03866
Sarah Hourihane, AIA	Lassel Architects	PO Box 370, South Berwick, ME 03908

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

Norway Plains Associates, Inc.
2 Continental Blvd., PO Box 249
Rochester, NH 03866

Abutters List

Applicant: **L & R Family Holdings**
Proposed Project: **Site Plan Review**
Site Address: **96 Broadway Street, Dover NH**
Town Tax Map & Lot: **Map 7, Lot 15**

Town Tax Map & Lot #:		**Abutter Name:**	**Mailing Address:**
Map	**Lot**		
27	169	Owner: 96 Broadway LLC	4 US Route 1, Unit 1C York, ME 03909
27	168	Danielle & Tyler Sherman	5 Hill Street Dover, NH 03820
27	171	Robert C Carrier, Trustee	4 Florence Street Dover, NH 03820
27	170	Changxing Lin & Ling Yang	4 Captain Parker Drive Lee, NH 03861
26	7A	121 Broadway LLC	340 Central Ave, Suite 202 Dover, NH 03820
26	8	Paula & Kristin Ford	PO Box 724 Greenland, NH 03840
26	9	99-101 Broadway, LLC	91 ½ Henry Law Ave Dover, NH 03820
27	205	Gary R. Boisse	PO Box 755 Somersworth, NH 03878-0755
27	206	Lauren S. & Christopher J. Neugebauer	4 Hill Street Dover, NH 03820
Civil Engineers / Surveyor / Agent		Hilary Badger Norway Plains Associates, Inc.	PO Box 249 Rochester, NH 03866-0249

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 # 4 per dwelling unit = $ 600.00
- ☐ 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 # 1 per Application = $200.00
- ☐ 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 # 2,860 sq. ft. = $200.20

SUBTOTAL PLAN REVIEW FEE = $ 800.20

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 # 3 of x $10.00= $ 30.00
- ☑ Certified letters fee: # of abutters 8 X $10.00= $ 80.00
- ☐ 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 # 1 applications = $ 120

SUBTOTAL = $ 230.00

TOTAL INVOICE AMOUNT = $ 1,230.20

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: 96 Broadway LLC File Number: _____

PROJECT TITLE: 96 Broadway

PROPERTY LOCATION: 96 Broadway Tax Map: 27 Lot: 169

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

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	N/A	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	Shown on plans	
Existing and proposed topographic information at two foot intervals	Included in all applicable plans	
Existing and proposed buildings and structure locations	Depicted on existing features and site plans	
Minimum building setbacks or build to lines on all lots	Shown on depicted lot	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	Sheet C-3	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	Sheet C-3	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	Sheet C-3	
Existing and proposed stormwater lines and facilities	Stormwater management depicted on Site Plan	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	Sheet L-2	
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	Shown on Existing Features Plan	
Existing natural features and/or significant vegetation on property	Shown on Existing Features Plan	
Depict existing contours up to 100 ft. beyond project limits	USGS Map included with drainage report	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	Sheet L-1	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	Shown and noted in Site Plan	
Location, material and size of existing and proposed pavement area	Included in all applicable plans	
Location of proposed fire lanes	NA	
Specify finished floor elevations of buildings	shown on plans	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	Sheet C-1	
Depict all service, storage, loading bays and utility areas	NA	
All applicable Dover Common Site Plan notes	Sheet C-1	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	Location depicted on Site Plan & details shown on Drainage Details Plan	
Stormwater Management System Operation and Maintenance Plan	Drainage report	
Letter to Serve from Public and Private Utilities		
Erosion and Sedimentation Control Plan	Shown on Temporary Erosion Plan & Permanent Erosion Plan	
Landscape Operation and Maintenance Plan		
Proposed restrictive covenants or homeowners association documents	NA	
Dates and permit numbers of all required state and federal permits	Cover Sheet	
If wetland buffer, indicate placards locations, as applicable	NA	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	Sheets E-1 and C-2	
Location of proposed drive-in facilities	NA	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Type text here	

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:

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2026-0007

Application Type:	Site Plan
Applicant(s):	Norway Plains Associates, Inc.
Owner(s):	96 Broadway, LLC
Location:	96 Broadway Street (Assessor's Map 27, Lot 169)
Date:	May 28, 2026

INTENT: Proposal is for the additional two (2) two-family structures and associated parking to the existing site which currently contains a 3-family dwelling.

LOTS/UNITS PROPOSED: Four (4) units proposed. Seven (7) total

AGENDA ITEM #: 2

ACREAGE: ±15,429 s.f. (0.35 ac)

ZONING DISTRICT: Gateway (G)

EXISTING/PROPOSED LAND USE: Residential (no change)

SURROUNDING LAND USE: Residential, Commercial

ZBA ACTION: None.

PERMITS REQUIRED: CUP needed for additional density (4 units additional)

WAIVERS REQUESTED: TBD

ATTENDANCE:
Erin Bassegio, Planning
Jill Semprini, Engineering
Jim Maxfield, Inspection Services
Craig Chabot, Fire Department
James Burdin, Business Development
Tom Clark, Planning Board

Others:
Hilary Badger, Norway Plains
Ryan Eschbach, Applicant/Owner
Sarah Hourihane, Lassel Architects
Brad Cruver, Lassel Architects

Meeting resumed at: 10:40 a.m.

PLAN REVIEW:
Planning:

- Reminder: water/sewer investment fees
- Owner/professional signatures on final plan set
- Paving is not permitted within 5' of the side/rear property lines per §153-17C
- Review required ground floor and building standards including pedestrian entrance required on street side
- Streetscape requirements triggered as project will meet 50% increase in property value per 170-20.E(3)
- Half of parking area closest to Hill St. seems dark-is there existing lighting not accounted for on the plan? Minimum 0.2 footcandle required in parking area per §153-14E(2)(b).
- CUP narrative should respond to all criteria per §170-19B
- Parking area perimeter landscaping required per §153-14G(3)(a)
- Would like to see attainable units. Seeking over double the permitted density
- Waivers needed as proposed:
  - Landscape O&M
- Revise plan set to include:
  - Lot coverage for the site
  - Solar readiness note
  - EV readiness
  - Correct ownership discrepancy on parcel label vs cover sheet
  - 2x2" approval box in lower right corner
  - Add wrought-iron fence and landscaping to screen parking area from Hill St. and abutter
  - Provide a front entrance from Broadway to fit in with rest of neighborhood.

Engineering:

- Paving not permitted within 5' of rear or side setbacks.
- Check retaining wall elevations on grading plan.
- Confirm s8" drain line to existing DMH; appears to be too small.
- Existing parking pavement to be regraded to prevent water runoff onto Hill St and to provide treatment.

DRAFT

Application Type:	Site Plan
Applicant(s):	Norway Plains Associates, Inc.
Owner(s):	96 Broadway, LLC
Location:	96 Broadway Street (Assessor's Map 27, Lot 169)
Date:	May 28, 2026

- Recommend adding catch basins to porous pavements areas.
- Add signs confirming porous pavement areas and winter sanding limitations.
- Existing condenser is close to proposed BMP. Consider relocating.
- Defer to IS for ADA compliance requirements.
- Recommend eliminating proposed sewer manholes and running 6" sewer services from each duplex directly to existing sewer main. Alternatively, consider connecting to sewer on Hill St. Otherwise:
    - Sewer services to be minimum 6" dia.
    - Sewer to be 8" minimum between manholes.
    - Connect services outside first sewer manhole
    - NHDES sewer connection permit required
- External cleanouts for sewer are not preferred
- Consider split water services outside of foundation at each building
- Defer to IS if building require fire protection sprinklers
- Drainage Pipe Trench detail on C-5 is not consistent with City details
- Typical sign detail should be 7', instead of 5' dwg C-4
- Steel bollard to be set in concrete dwg C-4
- No lighting in parking lot

Police:

- N/A

Inspection Services:

- Provide NH stamp on PE application.
- Indicate distance between adjacent structures.

Fire Department:

- No comments.

Business Development:

- Is there more opportunity for green space/usability of the site for potential future residents?

Planning Board:

- Narrative required that responds to CUP criteria.
- Gateway architectural standards required.

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

Adjournment: T. Clark moved to adjourn the meeting at 11:02 a.m. Seconded by J. Maxfield. Vote: U/A.

DRAFT

NORWAY PLAINS ASSOCIATES, INC.

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Rochester, NH 03236-0249
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www.norwayplains.com

P. O. Box 268
31 Mooney St.
Alton, NH 03809
Phone & Fax (603) 875-3948

June 4, 2026

Erin Bassegio, City Planner
Planning Department
City of Dover
288 Central Avenue
Dover, NH 03820

Re: Case Multi-Family Residential Site Plan Application; 96 Broadway LLC; 96 Broadway, Dover, NH, Map 27, Lot 169.

Dear Ms. Bassegio:

The following is a summary of action taken to address the comments from the May 28, 2026 TRC meeting for the proposed Multi-Family Residential Site Plan Application for 96 Broadway LLC located at 96 Broadway.

Planning Dept. Comments (Erin Bassegio):

- Reminder: Water / sewer investment fee
  - *Applicant is aware of fee*
- Owner/professional signatures on final plan set
  - *Signatures will be added to approved plan set*
- Paving is not permitted within 5' of the side / rear property lines per 153-17C
  - *Pavement has been removed from areas within 5' of rear and side property lines*
- Review required ground floor and building standards including pedestrian entrance required on street side
  - *The buildings have been revised, there is an entrance on the Broadway side of both buildings.*
- Street scape requirements triggered as project will meet 50% increase in property value per 170-20.E(3)
  - *Street scape requirements have been added to the landscape plan, a waiver will be requested to all reduced number of trees.*
- Half of parking area closest to Hill St. seems dark-is there existing lighting not accounted for on the plan? Minimum 0.2 footcandle required in parking area per 153-14E(2)(b)
  - *Lighting plan has been revised.*
- CUP narrative should respond to all criteria per 170-19B
  - *CUP narrative has been revised*
- Parking area perimeter landscaping required per 153-14G(3)(a)
  - *Landscaping plan has been updated.*
- Would like to see attainable units. Seeking over double the permitted density
  -

- Waivers needed as proposed:
  - Landscape O&M
  - Stormwater management plan
    - *Landscape O&M and stormwater management plan have been provided*
- Revise plan set to include:
  - Lot coverage for the site
  - Solar readiness note
  - EV readiness
  - Correct ownership discrepancy on parcel label vs cover sheet
  - 2x2" approval box in lower right corner
  - Add wrought-iron fence and landscaping to screen parking area from Hill Street and abutter
  - Provide front entrance from Broadway to fit in with rest of neighborhood
    - *All revisions have been made to the plan set*

Engineering (Jill Semprini):

- Paving not permitted within 5' of rear or side setbacks
  - *Pavement has been removed from areas within 5' of rear and side property lines*
- Check retaining wall elevations on grading plan
  - *Retaining wall has been removed*
- Confirm 8" drain line to existing DMH; appears to be too small
  - *8" drain line has been changed to 12"*
- Existing parking pavement to be regraded to prevent water runoff onto Hill St and to provide treatment
  - *Existing parking lot has been regraded to extent possible. A level spreader has been added to the edge of pavement along Hill St.*
- Recommend adding catch basins to porous pavement areas
  - *A catch basin has been added to the porous pavement area in case of porous pavement failure.*
- Add signs confirming porous pavement areas and winter limitations.
  - *Signs have been added to the edge of porous pavement*
- Defer to IS for ADA compliance requirements
  - *No action required*
- Recommend eliminating proposed sewer manholes and running 6" sewer services from each duplex directly to existing sewer main. Alternatively, consider connecting sewer on Hill St. Otherwise:
  - Sewer service to be minimum 6" dia
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  - Connect services outside first sewer manhole
  - NHDES sewer connection permit required
    - *The sewer has been revised to remove sewer manholes and y into the main.*
- External cleanouts for sewer are not preferred
  - *External cleanouts have been removed.*
- Consider split water services outside of foundation at each building
  - *Water service has been revised.*

- Defer to IS if required fire protection sprinklers
    - *The architectural design utilizes fire walls to negate the need for sprinklers in the structures*
- Drainage pipe trench detail on C-5 is not consistent with City details
    - *Detail has been revised*
- Typical sign detail should be 7', instead of 5' dwg C-4
    - *Detail has been revised*
- Steel bollard to be set in concrete dwg C-4
    - *Parking lot relocated making bollards unnecessary*
- No lighting in parking lot
    - *Lighting plan has been revised*

Police (Alex Mitrushi):
No comments

Inspection Services (Jim Maxfield):

- Provide NH stamp on PE application
    - *PE Stamp has been added to narratives*
- Indicate distances between adjacent buildings
    - *Distances between buildings has been added to sheet C-1*

Fire Department (Craig Chabot):
No comments

Business Development (James Burdin):
No comments

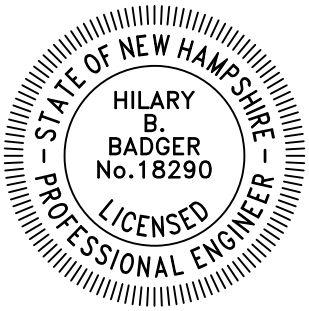
Planning Board (Tom Clark):
No comments

If you have any questions regarding the revisions made to this plan set, the design itself or any supplemental material submitted to satisfy the technical review, please feel free to call or email me.

Thank you for your consideration Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer



cc: 96 Broadway LLC

NORWAY PLAINS ASSOCIATES, INC.

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June 4, 2026

Erin Bassegio, City Planner
Planning Department
City of Dover
288 Central Avenue
Dover, NH 03820

Re: Case Multi-Family Residential Site Plan Application; 96 Broadway LLC; 96 Broadway, Dover, NH, Map 27, Lot 169.

Dear Ms. Bassegio:

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Planning Dept. Comments (Erin Bassegio):

- Reminder: Water / sewer investment fee
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Police (Alex Mitrushi):
No comments

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- Provide NH stamp on PE application
    - *PE Stamp has been added to narratives*
- Indicate distances between adjacent buildings
    - *Distances between buildings has been added to sheet C-1*

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No comments

Business Development (James Burdin):
No comments

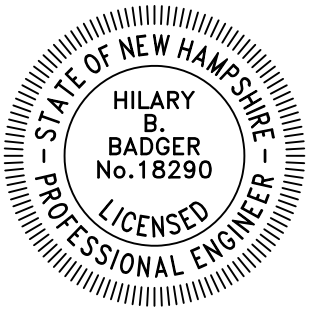
Planning Board (Tom Clark):
No comments

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Thank you for your consideration Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer



cc: 96 Broadway LLC

Landscape Operation & Maintenance Plan For 96 Broadway, Dover, NH

Weekly Tasks

1. Mow and edge lawns if needed. Lawns to be cut to 3.5" height.
2. Prune back any shrubs overhanging curbs or sidewalks.
3. Prune back any groundcover overhanging curbs or sidewalks.
4. Remove litter and leaves from plants, planting beds.
5. Remove any broken or fallen branches from trees. Remove sucker growth from tree trunks.
6. Remove any weeds larger than 2 inches (5 cm) high or wide from planters. Weeds 2 inches (5 cm) and larger must be removed, not just killed.
7. Replace bark mulch which has been knocked or washed out of planters. Smooth mulch layer if it has been disturbed.
8. Replace decorative rock which has been knocked or washed out of drip strips. Smooth decorative rock surface if it has been disturbed.
9. Check plants for signs of stress, pests or disease. Request authorization to replace other dead or missing plants. Note: Maintenance contractor must request authorization to make replacements within one week of the damage becoming evident.
10. Sweep or blow clean all walkways, curbs, and gutters.
11. Treat for any signs of disease or pest infestation.
12. Complete any items required on the Monthly Checklist.
13. Hand water any plants that are dry and stressed.
14. Check the irrigation system (if there is a system). Make emergency repairs as needed or request authorization to make major repairs. Note: Maintenance contractor must request authorization for repairs within one week of the damage becoming evident.
15. Adjust the irrigation controllers for current water needs of plants.
16. Gently prune shrubs at appropriate time of year based on species, for shape and form. **DO NOT shear.**

Yearly Tasks

Early Spring

1. Prune any tree branches that interfere with public safety. Prune all parking lot and street trees yearly to encourage strong growth.
2. Apply granular fertilizer to shrubs beds and lawns. Be sure to make application prior to a moderate rainfall in drip-irrigated planters so the rain will wash the fertilizer in.
3. Submit receipts to owner's authorized representative as proof of fertilizer purchase.
4. Trim any perennial foliage left in the fall for winter interest to within six inches of the ground.
5. Add new mulch to planters where the mulch depth has been reduced to less than 2 inches (5 cm) thick. Mulch depth shall not exceed 2". Additional mulch not required where shrubs or groundcover completely hide the soil surface from view.

6. Where there is irrigation and after threat of frost is gone, flush out irrigation systems as needed and check for proper operation of each valve zone.
7. Clean or replace plugged sprinkler nozzles. Replace plugged drip emitters.
8. Replace irrigation controller program back-up batteries.
9. Top dress woodland paths with matching materials, as needed.
10. Top dress pervious paths as needed.

June:

No additional items

July:

No additional items

August:

No additional items

September:

1. Inventory all plant materials. Inventory shall include an exact count of all shrubs and trees, itemized by planter. Replace any dead or missing plants.

October:

1. Prepare irrigation system for winter. Make sure backflow preventer is well insulated or drained prior to first freeze. Blow out pipes using compressed air in areas where freezing could result in breakage.
2. Mow field areas.

November:

1. "WILT-PRUF" broadleaf evergreens when temperature permits.

December:

1. Prune any tree branches that interfere with public safety. Prune all parking lot and street trees yearly to encourage strong growth.

Winter

Snow plowing of roads and shoulders to be performed by a Snow Pro certified contractor.

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April 28, 2026

Erin Bassegio, City Planner
Planning Department
City of Dover
288 Central Avenue
Dover, NH 03820

Re: Multi-Family Residential Site Plan Application; 96 Broadway LLC; 96 Broadway, Dover, NH, Map 27, Lot 169.

Dear Ms. Bassegio:

On behalf of 96 Broadway LLC, and Ryan Eschbach, we hereby submit a Multi-Family Residential Site Plan Application for a proposed expansion of multi-family housing located at 96 Broadway. The parcel, Tax Map 27, Lot 169, comprising 0.35 acres, is currently developed with a triplex and associated paved parking area.

The parcel is located within the Gateway (G) zoning district and Central Business Overlay District. Located northerly of the property are two residential lots, one of which is a duplex. West of the parcel is a single-family residence. South of the parcel is a multi-family lot, and two multi-family parcels to the east.

The parcel is developed with one triplex and parking lot suitable for five cars. To the north of the structure is a grassed lawn area with some trees. There is a narrow tree line along the western property line. Access to the site is via a paved driveway on Hill Street. The existing building is serviced by municipal water and sewer from Hill Street. The site generally slopes to the southwest, with no stormwater management on site currently. The entire parcel is comprised of Buxton soil series.

96 Broadway LLC is proposing the construction of two duplex buildings north of the existing building and installation of additional parking lot to accommodate parking associated with the new structures. The two new buildings will be serviced by municipal water and sewer. Utility connections will be made to the utilities along Broadway. Two new sewer manholes will be installed to accommodate the new sewer connections, one on the parcel and the other will be along the existing city sewer main. Wall mounted lights will be installed on the new structures to illuminate the walkways and entrances into the buildings.

Access to the site will continue to be from Hill Street, with no proposed modifications to the driveway. The existing parking area will be resurfaced, and dimensions will be adjusted to meet the City of Dover parking lot requirements. The proposed parking area will be constructed utilizing porous pavement. The parking area has been designed utilizing the City of Dover Site Plan Regulations, where 1.25 spaces are required per unit and 0.4 spaces per unit for visitors. There will be 12 spaces total. Additionally, one of

the required spaces will be reserved for accessible parking and has been designed as a van assessable space.

Two test pits were dug on site to assist with the stormwater management design. Due to the estimated seasonal high water table being shallow, infiltration of stormwater is not feasible on the parcel. The stormwater management design includes porous pavement and a bioretention basin, both will be lined with underdrains installed. All proposed impervious areas will drain into one of the treatment practices prior to being discharged into the City of Dover's closed drainage system. Waivers to the stormwater management requirements are included with this submission and an additional narrative is attached discussing the requests.

A conditional use permit is being sought for relief from the Gateway district density requirements. Where one unit is allowed for every 4,000 square feet of lot area, the applicant is requesting a reduction in this to allow for seven units on a 15,429 square foot lot. Additional information about this request is included in the conditional use application and narrative.

The proposed expansion will result in the need to apply for a wastewater permit with New Hampshire Department of Environmental Services. This is due to the installation of a new sewer manhole along the city's sewer main. The application will be filed prior to the start of construction after the site plan is approved.

We look forward to discussing this project with the Dover Technical Review Committee and Planning Board at the next available meetings.

Thank you for your consideration Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer

cc: 96 Broadway LLC

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: 96 Broadway LLC; Ryan Eschbach Telephone #(248)225-6538

Address of Applicant: US Route 1, Apt. 1C, York, ME 03909

E-Mail Address: Ryanesch@mac.com

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

Address of Property Owner:

PROPERTY INFORMATION

Address of Property: 96 Broadway, Dover NH

Assessor's Map # 27 Lot(s) # 169

Zoning District(s) Gateway District Overlay District(s) Central Business District

Size of Parcel: 15,429 sq. ft. 0.35 ac. Property Deed: Book 5339 Page: 197

Existing Use of Property: Multi Family Residentail

SITE PLAN INFORMATION

Describe Proposed Use: Multi Family Residentail

Area of Parcel to be Developed: 9,485 sq. ft.

If Multi-family Residential: Number of Units 4 additional units & Buildings Proposed 2 additional buildings

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

Number of Parking Spaces: Existing Approx. 5 Proposed 12

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

Number of Employees Total: _____ In Maximum Shift:

Dispostition of Parcel:

Building Footprint 884, 1400, 1400 sq. ft.

Total Building Area 2147, 2800, 2800 sq. ft.

Paved Area 4790 sq. ft.

Building Setbacks:

Front Yard 5 ft.

Rear Yard 44.7' ft.

Side Yard: Right 11.5 ft. Left 4.7' ft.

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

City Sewer? ✓ Yes ___ No How far is city sewer from the 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:

_____

_____

_____

BUILDING INFORMATION

Type of Building to be Built: 2 Duplexes

Height of Building: 28'-4" Finished Floor Elevation: 79.0'

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.) Glenn Griswold, Norway Plains Associates Inc.

Address 2 Continental Boulevard, Rochester NH 03866 Telephone #: (603)335-3948

Professional License #: _____ E-mail address: GGriswold@NorwayPlains.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Hilary Badger, Norway Plains Associates Inc.

Address 2 Continental Boulevard, Rochester NH 03866 Telephone #: (603)335-3948

Professional License #: 18290 E-mail address: HBadger@NorwayPlains.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Sarah Hourihane, Lassel Archtects

Address PO Box 370, South Berwick, ME 03908 Telephone #: 207-384-2049

Professional License #: 4574 E-mail address: sarah@lasselarchitects.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Victoria Martel, Sea Laurel

Address 150 Blackberry Hill Road, Berwick, ME 03901 Telephone #: 207-599-6517

Professional License #: _____ E-mail address: vicky@sealaurel.com

SOIL SCIENTIST INFORMATION

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

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

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: 4-7-26

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: 4-7-26

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: 4-7-26

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: 4-7-26

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
27	169	93 Broadway LLC	4 US Route 1 Unit 1C, York ME 03909

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Same as Owner		

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Hilary Badger, PE	Norway Plains Associates, Inc.	PO Box 249, Rochester NH 03866
Glenn Griswold, LLS	Norway Plains Associates, Inc.	PO Box 249, Rochester NH 03866
Sarah Hourihane, AIA	Lassel Architects	PO Box 370, South Berwick, ME 03908

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

Norway Plains Associates, Inc.
2 Continental Blvd., PO Box 249
Rochester, NH 03866

Abutters List

Applicant: **L & R Family Holdings**
Proposed Project: **Site Plan Review**
Site Address: **96 Broadway Street, Dover NH**
Town Tax Map & Lot: **Map 7, Lot 15**

Town Tax Map & Lot #:		**Abutter Name:**	**Mailing Address:**
Map	**Lot**		
27	169	Owner: 96 Broadway LLC	4 US Route 1, Unit 1C York, ME 03909
27	168	Danielle & Tyler Sherman	5 Hill Street Dover, NH 03820
27	171	Robert C Carrier, Trustee	4 Florence Street Dover, NH 03820
27	170	Changxing Lin & Ling Yang	4 Captain Parker Drive Lee, NH 03861
26	7A	121 Broadway LLC	340 Central Ave, Suite 202 Dover, NH 03820
26	8	Paula & Kristin Ford	PO Box 724 Greenland, NH 03840
26	9	99-101 Broadway, LLC	91 ½ Henry Law Ave Dover, NH 03820
27	205	Gary R. Boisse	PO Box 755 Somersworth, NH 03878-0755
27	206	Lauren S. & Christopher J. Neugebauer	4 Hill Street Dover, NH 03820
Civil Engineers / Surveyor / Agent		Hilary Badger Norway Plains Associates, Inc.	PO Box 249 Rochester, NH 03866-0249

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 # 4 per dwelling unit = $ 600.00
- ☐ 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 # 1 per Application = $200.00
- ☐ 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 # 2,860 sq. ft. = $200.20

SUBTOTAL PLAN REVIEW FEE = $ 800.20

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 # 3 of x $10.00= $ 30.00
- ☑ Certified letters fee: # of abutters 8 X $10.00= $ 80.00
- ☐ 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 # 1 applications = $ 120

SUBTOTAL = $ 230.00

TOTAL INVOICE AMOUNT = $ 1,230.20

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: 96 Broadway LLC File Number: _____

PROJECT TITLE: 96 Broadway

PROPERTY LOCATION: 96 Broadway Tax Map: 27 Lot: 169

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

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	N/A	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	Shown on plans	
Existing and proposed topographic information at two foot intervals	Included in all applicable plans	
Existing and proposed buildings and structure locations	Depicted on existing features and site plans	
Minimum building setbacks or build to lines on all lots	Shown on depicted lot	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	Sheet C-3	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	Sheet C-3	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	Sheet C-3	
Existing and proposed stormwater lines and facilities	Stormwater management depicted on Site Plan	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	Sheet L-2	
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	Shown on Existing Features Plan	
Existing natural features and/or significant vegetation on property	Shown on Existing Features Plan	
Depict existing contours up to 100 ft. beyond project limits	USGS Map included with drainage report	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	Sheet L-1	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	Shown and noted in Site Plan	
Location, material and size of existing and proposed pavement area	Included in all applicable plans	
Location of proposed fire lanes	NA	
Specify finished floor elevations of buildings	shown on plans	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	Sheet C-1	
Depict all service, storage, loading bays and utility areas	NA	
All applicable Dover Common Site Plan notes	Sheet C-1	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	Location depicted on Site Plan & details shown on Drainage Details Plan	
Stormwater Management System Operation and Maintenance Plan	Drainage report	
Letter to Serve from Public and Private Utilities		
Erosion and Sedimentation Control Plan	Shown on Temporary Erosion Plan & Permanent Erosion Plan	
Landscape Operation and Maintenance Plan		
Proposed restrictive covenants or homeowners association documents	NA	
Dates and permit numbers of all required state and federal permits	Cover Sheet	
If wetland buffer, indicate placards locations, as applicable	NA	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	Sheets E-1 and C-2	
Location of proposed drive-in facilities	NA	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Type text here	

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:

NORWAY PLAINS ASSOCIATES, INC.

LAND SURVEYORS • SEPTIC SYSTEM DESIGNERS • CIVIL ENGINEERS

P.O. Box 249
Continental Blvd. (03867)
Rochester, NH 03866-0249
Phone (603) 335-3948
www.norwayplains.com

P. O. Box 268
31 Mooney St.
Alton, NH 03809
Phone & Fax (603) 875-3948

June 8, 2026

Erin Bassegio, City Planner
Planning Department
City of Dover
288 Central Avenue
Dover, NH 03820

Re: Waiver Requests – 96 Broadway LLC; 96 Broadway, Dover, NH, Map 27, Lot 169.

Dear Ms. Bassegio:

On behalf of 96 Broadway LLC, and Ryan Eschbach, we hereby submit a Multi-Family Residential Site Plan Application for a proposed expansion of multi-family housing located at 96 Broadway. The parcel, Tax Map 27, Lot 169, comprising 0.35 acres, is currently developed with a triplex and associated paved parking area.

The following waivers are being requested from the City of Dover Site Plan Regulations:

153-14.A.(3)(b)[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.*

Justification: The existing stormwater on the parcel sheet-flows across the site and ultimately discharges toward the sidewalk along Hill Street. There is currently no stormwater treatment or water-quality infrastructure on the property. The existing parking lot is located very close to the property line, leaving no available space for stormwater management within the current layout.

The proposed stormwater design will significantly improve conditions by directing the majority of the impervious surface runoff to a dedicated treatment area before discharging to the City's closed drainage system. All stormwater generated by the proposed impervious cover will receive treatment that meets the applicable pollutant removal requirements. Because a larger portion of the site will be redirected to a different point of analysis (POA), and due to site constraints that prevent infiltration, it is not feasible to reduce the peak runoff rate at the POA.

As part of the analysis, the combined POAs were evaluated to understand the overall impact of the development on the closed drainage system. Both POAs ultimately drain to the same section of the municipal system. When considering the net effect, while also accounting for the reduction in untreated runoff entering the system, the development does not create a significant impact. The maximum peak rate

increase is 0.1 cfs, which is not expected to adversely affect the capacity or performance of the City's drainage infrastructure.

153-14.A.(3)(b)[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 impairment to streets, adjacent properties and downstream properties.*

Justification: The site is entirely underlain by the Buxton Soil Series, which has effectively zero infiltration capacity. Due to these soil conditions, combined with the high seasonal groundwater table observed on the parcel, infiltration of stormwater is not feasible. As a result, the proposed design focuses on water-quality treatment and controlled discharge rather than infiltration-based management.

Although the project results in an increase in stormwater volume leaving the site, all newly generated runoff will be treated to meet pollutant removal requirements. The increase in volume at the combined point of analysis (POA) is 0.02 acre-feet, representing a minimal change in overall system loading. Additionally, the proposed grading and drainage improvements significantly reduce the amount of untreated sheet flow currently discharging directly onto Hill Street.

No abutting properties will be adversely affected by the proposed drainage modifications. The majority of runoff will be directed into the City's closed drainage system, which has sufficient capacity to accommodate the modest increase in volume. The project therefore improves water-quality conditions on the site while maintaining acceptable peak flow and volume characteristics within the municipal drainage network.

153-14.G.3.A. *Along the perimeter of parking lots with 10 or more spaces, deciduous and/or evergreen shade trees shall be planted at 35 feet on center within the buffer area required by § 153-17C. Trees shall be species tolerant to the climatic conditions of Dover and shall be a minimum caliper of 3 inches (measured at four feet above grade level). Within the perimeter buffer, shrubs shall be planted between the trees at five feet on center. The shrubs shall be a mix of deciduous and evergreen species, tolerant to the climatic conditions of Dover and shall be a minimum height of two feet at the time of planting. All trees, shrubs and landscaping materials shall be maintained in good condition so as to present a healthy, neat, and orderly appearance.*

Justification: The proposed buffer consists of shade trees at the required spacing, along with a 6' tall privacy fence to provide buffering to the abutter. The privacy fence provides greater protection from the parking lot and associated vehicles to the abutter than shrubs would. Additionally, the combination of trees and a fence allows for snow storage on the development site, where shrubs in this area would be damaged by, or not allow for, proper snow removal operations.

170-20.E.3 *Minimum standards. In addition to any regulations set forth in the CBD sub-district tables and the Dover Streetscape Standards, development shall follow the regulations outlined below. Subsection E(3)(a), (b), and (c) shall only apply to new construction and/or renovations that will result in*

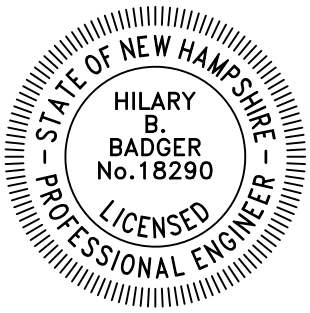
a 50% or more increase in the value of the property, as determined by a licensed New Hampshire appraiser. (a) Street trees/landscaping. [1] Each street shall have canopy shade trees (street trees). Street trees shall be planted at an average spacing not greater than 25 to 30 feet on center (measured per block face). The planting area's minimum dimension shall be not less than five feet. At planting, trees shall be 2.5 to three inches in diameter (four feet above grade) and shall meet the American Nursery Standards for height. The tree species used shall be selected from the City of Dover's approved list of street trees.

Justification: The plan proposes two ornamental trees, as opposed to canopy shade trees along Broadway. The site configuration does not allow adequate space for canopy shade trees at maturity. In addition to the two proposed ornamental trees, there are two existing trees within the City ROW along Broadway. Along Hill Street, the plan proposes one shade tree, along with one existing City tree within the ROW. This combination of existing and proposed trees provides the most street trees possible, given the site parameters.

Thank you for your consideration Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer



cc: 96 Broadway LLC

NORWAY PLAINS ASSOCIATES, INC.

LAND SURVEYORS • SEPTIC SYSTEM DESIGNERS • CIVIL ENGINEERS

P.O. Box 249
Continental Blvd. (03867)
Rochester, NH 03866-0249
Phone (603) 335-3948
www.norwayplains.com

P. O. Box 268
31 Mooney St.
Alton, NH 03809
Phone & Fax (603) 875-3948

June 4, 2026

Erin Bassegio, City Planner
Planning Department
City of Dover
288 Central Avenue
Dover, NH 03820

Re: Conditional Use Application; 96 Broadway LLC; 96 Broadway, Dover, NH, Map 27, Lot 169.

Dear Ms. Bassegio:

On behalf of 96 Broadway LLC, and Ryan Eschbach, we hereby submit a non-residential conditional use application for a proposed expansion of multi-family housing located at 96 Broadway. The parcel, Tax Map 27, Lot 169, comprising 0.35 acres, is currently developed with a triplex and associated paved parking area.

The parcel is located within the Gateway (G) zoning district and Central Business Overlay District. Located northerly of the property are two residential lots, one of which is a duplex. West of the parcel is a single-family residence. South of the parcel is a multi-family lot, and two multi-family parcels to the east.

The proposal is to construct two duplexes on the site and expand the existing parking area to support the additional residential units. A Conditional Use Permit is being requested to allow an increase in density.

New Hampshire continues to face a significant housing shortage, and the creation of additional residential units on an already developed parcel supports the community's broader housing goals. This project represents an efficient use of land and existing infrastructure while contributing needed housing to the local market.

The proposed higher-density residential development is designed to strengthen the surrounding urban fabric while meeting the City's goals for civic space, mobility, safety, architectural character, environmental responsiveness, and neighborhood compatibility. The project aligns with the City's planning principles in the following ways:

That both public and private buildings and landscaping shall contribute to the physical definition of rights-of-way as civic spaces.
The arrangement of buildings and landscaping is intentionally crafted to define the public realm and a coherent civic space. Building frontages frame the street edge with consistent setbacks, and pedestrian-oriented entries. Street trees, lighting, and a seating area reinforce the sense of place and create a comfortable environment for residents and visitors.

That development shall adequately accommodate automobiles, while respecting the pedestrian and the spatial form of public areas.
The development accommodates vehicles through structured or screened parking areas, minimizing visual and physical impacts on the streetscape. A sidewalk has been added to connect Broadway to the parking lot which promotes pedestrian access to the site.

That the design of streets and buildings shall reinforce safe environments, but not at the expense of accessibility.
Safety is reinforced through natural surveillance, lighting, and clear sightlines, but never at the expense of accessibility. The paved walkways have been designed with accessibility in mind and wherever possible all paths meet ADA standards. This reflects our commitment to universal accessibility as a core design principle.

That buildings shall provide their inhabitants with a clear sense of geography and climate through energy-efficient methods via a mixture of elements including windows, floor plan, and public and private space.
The architectural and landscape design draws from the region's climate and historical development patterns. Materials, roof forms, and planting selections reflect local building traditions and environmental conditions. This approach ensures the project feels authentic to its setting rather than imposed upon it.

That encourage civic buildings and other public gathering places be provided as locations that reinforce community identity and activity.
The proposed development is a private residential project. No civic buildings or public gathering spaces are planned on the property. A gathering space will be provided for tenants as an amenity exclusively for residents of the development.

That civic buildings shall be distinctive and appropriate to a role more important than the other buildings that constitute the fabric of the City.
No civic or public buildings are proposed on this parcel. The project is a private residential development and includes only residential uses and their permitted accessory components.

That the preservation and renewal of historic buildings shall be facilitated.
The proposal maintains the existing primary structure on the site without modification and introduces two new residential duplex buildings designed to complement the surrounding neighborhood and reinforce the city's planning goals.

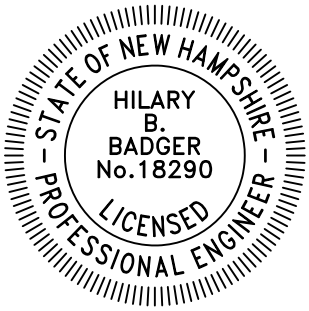
That the harmonious and orderly evolution of urban areas shall be advanced by the proposed building and/or use.
The proposed density aligns with long-term planning goals for compact, efficient land use. By concentrating housing near existing infrastructure and services, the project supports the orderly evolution of urban areas and reduces pressure for outward sprawl. The design integrates seamlessly with the surrounding street network and land-use pattern.

That if the relief is granted, the surrounding neighborhood is not negatively impacted.
Overall, the project promotes the harmonious and orderly evolution of the urban area by introducing well-designed, appropriately scaled housing that meets contemporary needs without disrupting neighborhood character. The increased density is thoughtfully integrated, ensuring that the surrounding community experiences no negative impacts. Traffic, noise, and service demands have been evaluated and mitigated, and the project's design enhances rather than burdens the neighborhood. Through careful planning, contextual architecture, and a commitment to public-realm quality, the development advances the city's long-term goals for sustainable, inclusive, and vibrant growth.

Thank you for your consideration Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer



cc: 96 Broadway LLC

City of Dover, New Hampshire
CONDITIONAL USE PERMIT APPLICATION

[Revision Date: October 19, 2020]

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

APPLICANT AND OWNER INFORMATION

Name of Applicant: 96 Broadway LLC; Ryan Eschbach Telephone # 248-225-6538

Address of Applicant: US Route 1, Apt 1C, York, ME 03909

E-Mail Address: Ryanesch@mac.com

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

Address of Property Owner: _____

PROPERTY INFORMATION

Assessor's Map # 27 Lot(s) # 169

Address of Property: 96 Broadway

Zoning District(s) Gateway District Overlay District(s) Central Business Overlay

Existing Use of Property: Multi family residential

CONDITIONAL USE PERMIT INFORMATION

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

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

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

The density of the parcel is intended to be 1 unit per 4,000 square feet, where the parcel is only 15,429 sf

7 units are proposed, including the existing 3 units on site. There will be no negative impact to the area

as the surronding lots are all sigle and multi family residential.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: NHDES Wastewater permit, not applied yet

Name of Professional That Prepared Plans: Hilary Badger, PE

Address PO Box 249, Rochester, NH 03867 Telephone #: 603-348-6656

Professional License #: 18290 E-mail address: hbadger@norwayplains.com

SIGNATURES

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

Signature of Property Owner: _____ Date: 4-7-26

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

Signature of Agent: Hilary Badger Date: 4/16/26

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: 4-7-26

NORWAY PLAINS ASSOCIATES, INC.

LAND SURVEYORS • SEPTIC SYSTEM DESIGNERS • CIVIL ENGINEERS

P.O. Box 249
Continental Blvd. (03867)
Rochester, NH 03866-0249
Phone (603) 335-3948
www.norwayplains.com

P. O. Box 268
31 Mooney St.
Alton, NH 03809
Phone & Fax (603) 875-3948

April 30, 2026

Erin Bassegio, City Planner
Planning Department
City of Dover
288 Central Avenue
Dover, NH 03820

Re: Traffic Impact Assessment; 96 Broadway LLC; 96 Broadway, Dover, NH, Map 27, Lot 169.

Dear Ms. Bassegio;

On behalf of 96 Broadway LLC and Ryan Eschbach, Norway Plains Associates, Inc. is pleased to submit a Traffic Impact Assessment for the parcel located on the corner of Broadway and Hill Street in the City of Dover.

The parcel, Tax Map 27, Lot 169, comprising 0.35 acres, is currently developed with a triplex and associated paved parking area. The existing entrance into the site is via a driveway on Hill Street that is 92-feet west of the intersection of Broadway.

The proposed development is the construction of two duplex buildings north of the existing building and installation of additional parking lot to accommodate parking associated with the new structures. Access to the site will continue to be from Hill Street, with no proposed modifications to the driveway. The existing parking area will be resurfaced, and dimensions will be adjusted to meet the City of Dover parking lot requirements.

All utilities for the proposed duplexes will be installed underground through Broadway. A 66.5-foot section of Broadway will be resurfaced after the utility installation. New stormwater management systems have been designed to treat the stormwater from the proposed impervious cover.

Pre-Existing Trip Generation:

The Institute of Traffic Engineers (ITE*)* publishes trip generation information for a wide variety of land uses (LU) based on extensive data and studies from throughout the country. The existing use of the property is multifamily residential, with three units on site at this time.

The peak hour trip generation for this Land Use can be determined by the number of units. The following is a breakdown of their respective ITE published peak hour trip generation rates.

Multifamily Housing Low Rise: Not Close to Rail Transit (#220)

	Trip Generation rates	
	Morning Peak Hour (7 – 9 am)	Afternoon Peak Hour (4 – 6 pm)
Per Unit	0.30 (10% entering, 90% exiting)	0.25 (90% entering, 10% exiting)

	Trip Generated	
	Morning Peak Hour (7 – 9 am)	Afternoon Peak Hour (4 – 6 pm)
3 Units	1 (0 entering, 1 exiting)	1 (1 entering, 0 exiting)

Based on the three units in the triplex, the number of trips during the morning peak is one exiting and afternoon peak is one entering.

Proposed Trip Generation:

The proposal is to construct two duplexes on the parcel, which will bring the total number of units to seven. The following peak hour trips generated for the sited would be:

Multifamily Housing Low Rise: Not Close to Rail Transit (#220)

	Trip Generation rates	
	Morning Peak Hour (7 – 9 am)	Afternoon Peak Hour (4 – 6 pm)
Per Unit	0.30 (10% entering, 90% exiting)	0.25 (90% entering, 10% exiting)

	Trip Generated	
	Morning Peak Hour (7 – 9 am)	Afternoon Peak Hour (4 – 6 pm)
7 Units	3 (0 entering, 3 exiting)	2 (2 entering, 0 exiting)

Based on the three units in the triplex and four units within the new duplexes, the number of trips during the morning peak is three exiting and afternoon peak is two entering. The overall impact of the development will be negligible.

Please don't hesitate to contact me if you have any questions, comments, or concerns. Thank you for your consideration.

Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer

cc: 96 Broadway, LLC

NORWAY PLAINS ASSOCIATES, INC.

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April 30, 2026

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Planning Department
City of Dover
288 Central Avenue
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	Morning Peak Hour (7 – 9 am)	Afternoon Peak Hour (4 – 6 pm)
Per Unit	0.30 (10% entering, 90% exiting)	0.25 (90% entering, 10% exiting)

	Trip Generated	
	Morning Peak Hour (7 – 9 am)	Afternoon Peak Hour (4 – 6 pm)
7 Units	3 (0 entering, 3 exiting)	2 (2 entering, 0 exiting)

Based on the three units in the triplex and four units within the new duplexes, the number of trips during the morning peak is three exiting and afternoon peak is two entering. The overall impact of the development will be negligible.

Please don't hesitate to contact me if you have any questions, comments, or concerns. Thank you for your consideration.

Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By: Hilary Badger
Hilary Badger, PE, Project Engineer

cc: 96 Broadway, LLC

DRAINAGE REPORT

96 BROADWAY
PREPARED FOR:
RYAN ESCHBACH
96 BRAODWAY
DOVER, NH
STRAFFORD COUNTY

April 2026

PREPARED BY:

NORWAY PLAINS ASSOCIATES, INC.

Hilary Badger , P.E. N.H. Reg. #18290

2 CONTINENTAL BOULEVARD, P.O. BOX 249, ROCHESTER, NEW HAMPSHIRE 03866-0249 (603) 335-3948

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1.0 INTRODUCTION:

This drainage report has been prepared as a supporting document to the proposed 96 Broadway residential expansion.

The purpose of any drainage analysis is to apply current mathematical stormwater modeling techniques used in the fields of Civil and Environmental Engineering, to predict the effect of a proposed construction project will have on the subject parcel. Those parcels include directly abutting the project, any downstream property, and/or drainage structures such as culverts, closed drainage systems, etc.

A design that provides adequate control of stormwater, minimizing and/or eliminating impacts to any downstream drainage structures (i.e. municipal culverts, bridges, etc.), is arrived at through an iterative process using the modeling discussed above. The pre-development drainage analysis reflects the modeling performed for the pre-development surface drainage, and for the land in its existing state. The post-development drainage analysis reflects the results of the final drainage design, and provides surface drainage values to compare to the pre-development values. In this way, the design engineer and any review agents are provided the necessary information to decide if the proposed design is adequate.

1.1 REVISIONS:

6/3/26 – Revise per TRC comments, update subcatchment areas and associated tables.

2.0 SITE AND PROJECT DESCRIPTION:

2.1 PROJECT LOCATION:

The site is located on the west side of Broadway. Please refer to Figure 1 (USGS Map previous page) for a pictorial placement of the project area. The property is designated by the Dover Assessing Maps as Map 27, Lot 169, refer to figure 2.

2.2 EXISTING SITE FEATURES:

The parcel is currently developed with a triplex and associated parking lot. There is some existing landscaping and trees within the lot. The lot does not have any existing stormwater management. Most of the site drains to the back, southwest, corner toward Hill Street.

According to the Natural Resources Conservation Service (NRCS); Custom Soil Resource Report for Strafford County, New Hampshire; (Appendix A-1).

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BzB	Buxton silt loam, 3 to 8 percent slopes	0.8	100.0%
	Totals for Area of Interest	**0.8**	**100.0%**

2.3 PROJECT DESCRIPTION:

The proposed site development is to expand the existing lot by constructing two additional duplexes. This will include the installation of a larger parking lot and new stormwater management systems. All stormwater from the development will be directed into a stormwater system and will be treated prior to entering the City's closed drainage system.

The new parking area will be constructed utilizing porous pavement to provide treatment for all new paved areas. The roof runoff will be directed into a small bioretention system to treat the stormwater. Both systems will be constructed with underdrains, as infiltration is not possible on the site.

3.0 METHODOLOGY:

The drainage analysis is based on "Urban Hydrology for Small Watersheds", as written by the U.S. Soil Conservation Service (S.C.S.) and released as Technical Release 55, in June of 1986. A modified TR-20 method was used to generate runoff. The weighted-Q method was used instead of using composite CN values due to widely differing curve numbers present (e.g. pavement and good condition woods on HSG A soils). This modification to the TR-20 method is recommended by the NRCS for model accuracy over the composite CN method used in WinTR-20, especially when there is a wide difference in curve numbers and lower rainfall amounts (210-VI-NEH Part 630, Ch. 10, pg 10-16, July 2004). The computer analysis is based on the S.C.S. TR-20 and the stormwater modeling software HYDROCAD™ release 10.0, written by Applied Microcomputer Systems of Chocorua, New Hampshire, was used. The drainage analysis is based on information compiled from the following resources:

- 96 Broadway Plans;
- USGS Topographic Map – Dover, NH Quadrangle;
- Aerial Photographs – Google Earth;
- NRCS Custom Soil Resource Report for Strafford County, New Hampshire;
- "Pre- and Post-Development Drainage Plans"

As stated in the introduction, the purpose of this report is to provide information supporting the design of the stormwater control measures employed by this project. A number of sources of information were consulted to prepare the calculations for this infrastructure to check its sufficiency. The USGS Map, Aerial Photos, and the Site-Specific Soils Maps and Report, and NRCS Soils Maps for Strafford County were all consulted. A number of site visits were performed to confirm site conditions.

The 2, 10, 25 and 50-year storm events have been used to model the stormwater runoff and to determine the adequacy of the chosen stormwater control methods. See Appendix A-6.1 for Extreme Precipitation Tables and other references used in the design and analysis.

If a subcatchment is returned with Times of Concentration (Tc) below the minimum allowed by TR-55 (TR-55 minimum Tc = 0.1 hour = 6 minutes); then Tc values are set in HydroCAD to automatically return a Tc of 6 minutes to insure proper modeling.

A codified system was used to number the subcatchments, reaches, and ponds, in the drainage analyses. The following Table lists prefixes and their meanings.

3.1 REACH STRUCTURE PREFIXES:

Prefix	Explanation
POA	Point of Analysis

3.2 POND STRUCTURE PREFIXES:

Prefix	Explanation
BR	Bioretention Basin
PP	Porous Pavement
CB	Catch Basin

4.0 PRE-DEVELOPMENT DRAINAGE ANALYSIS:

Complete HydroCAD model data for the pre-development can be found in Appendix A-4. For a graphical depiction of the Watershed analyzed, flow paths; subcatchments and POA's refer to the Pre-Development Drainage Plan, Figure D-2 in the pocket at the rear of the report.

The site topography breaks the watershed into two (2) subcatchments. These subcatchments drain to two (2) Points of Analysis (POAs).

TABLE 1: PRE-DEVELOPMENT DRAINAGE ANALYSIS RESULTS SUMMARY:

	Area	2-yr Rate	2-yr Volume	10-yr Rate	10-yr Volume	25-yr Rate	25-yr Volume	50-yr Rate	50-yr Volume
	(Ac.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)
Subcatchment 1	0.44	0.6	0.06	1.2	0.10	1.6	0.14	2.1	0.18
Subcatchment 2	0.10	0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
Total	0.54								
POA#1 (Hill Street)		0.6	0.06	1.2	0.10	1.6	0.14	2.1	0.18
POA#2 (Broadway)		0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
Combined POAs		0.9	0.08	1.6	0.14	2.1	0.19	2.7	0.24

5.0 POST-DEVELOPMENT DRAINAGE ANALYSIS:

Complete HydroCAD model data for the post-development can be found in Appendix A-4. For a graphical depiction of the Watershed analyzed, flow paths; subcatchments and POA's refer to the Post-Development Drainage Plan, Figure D-3 in the pocket at the rear of the report.

The proposed site topography breaks the watershed into nine (9) subcatchments. These subcatchments drain to the same two (2) Points of Analysis (POAs).

TABLE 2: POST-DEVELOPMENT DRAINAGE ANALYSIS RESULTS SUMMARY:

	Area	2-yr Rate	2-yr Volume	10-yr Rate	10-yr Volume	25-yr Rate	25-yr Volume	50-yr Rate	50-yr Volume
	(Ac.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)
Subcatchment 1	0.16	0.3	0.03	0.6	0.05	0.8	0.06	0.9	0.08
Subcatchment 2	0.10	0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
Subcatchment 3	0.03	0.1	0.01	0.1	0.01	0.2	0.02	0.2	0.02
Subcatchment 4	0.02	0.0	0.00	0.1	0.00	0.1	0.01	0.1	0.01
Subcatchment 5	0.03	0.1	0.01	0.1	0.01	0.2	0.02	0.2	0.02
Subcatchment 6	0.02	0.0	0.00	0.1	0.00	0.1	0.01	0.1	0.01
Subcatchment 7	0.02	0.0	0.00	0.1	0.00	0.1	0.01	0.1	0.01
Subcatchment 8	0.04	0.1	0.01	0.1	0.01	0.2	0.02	0.2	0.02
Subcatchment 9	0.11	0.3	0.02	0.4	0.04	0.6	0.05	0.7	0.06

	Area	2-yr Rate	2-yr Volume	10-yr Rate	10-yr Volume	25-yr Rate	25-yr Volume	50-yr Rate	50-yr Volume
	(Ac.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)
Total	**0.54**								
POA#1 (Hill Street)		0.4	0.03	0.6	0.05	0.7	0.06	0.9	0.08
POA#2 (Broadway)		0.7	0.06	1.1	0.11	1.4	0.15	1.7	0.18
Combined POAs		1.0	0.09	1.6	0.16	2.2	0.21	2.6	0.26

5.1 STORMWATER CONTROL AND TREATMENT PRACTICES:

5.1.1 POROUS ASPHALT PAVEMENT

The stormwater management design employs porous asphalt for the new parking area. The porous asphalt pavement allows for the stormwater from these surfaces to flow through the aggregate and through the different layers of sand and stone below. The stormwater will be treated by the 12" filter and then it will enter 4" perforated pipes along the bottom of the practice. No infiltration is possible due to poor groundwater depth and underlying soil types. All stormwater entering the practice will be treated following the MS4 guidelines.

5.1.2 BIORETENTION BASIN:

This stormwater management design employs an open Bioretention Basin for the treatment of the roof runoff from the two proposed duplexes. The basin will be vegetated and will not overtop during the 50-year storm event. The basin will not include infiltration as it is not possible on the site, alternatively the basin will be lined with 4" perforated pipes laid flat under the bioretention media. An 8" standpipe will be installed and connected to the underdrains. The outlet will be connected to the existing drainage manhole on Broadway.

The table below is a summary of the inflow and out flow and freeboard of the bioretention basin.

TABLE 3: BIORETENTION BASIN SUMMARY:

	2-yr Storm			10-yr Storm			50-yr Storm		
	Q_{in}	Q_{out}	Freeboard	Q_{in}	Q_{out}	Freeboard	Q_{in}	Q_{out}	Freeboard
	(cfs)	(cfs)	(ft)	(cfs)	(cfs)	(ft)	(cfs)	(cfs)	(ft)
Infiltration Basin	**0.3**	**0.2**	**0.15**	**0.5**	**0.4**	**0.09**	**0.8**	**0.7**	**0.03**

*Qout is the stormwater leaving the system
** Freeboard measured to the top of the earth berm.
BR Berm elevation = 78.0'
Details and specifications for the Bioretention Basin can be found on sheet C-5 of the plan set. A BMP Worksheet for the infiltration system practice can be found in Appendix A-3.

6.0 COMPARISON AND CONCLUSION

6.1 COMPARISON

The following table presents a comparison of the results of the pre-development drainage analysis and the post-development drainage analysis and the Points of Analysis.

6.1.1 SUMMARY RESULTS AT THE POA'S:

TABLE 4: COMPARISON; PRE- & POST-DEVELOPMENT POA'S:

	2-yr Rate (cfs)	2-yr Volume (Ac.-ft.)	10-yr Rate (cfs)	10-yr Volume (Ac.-ft.)	25-yr Rate (cfs)	25-yr Volume (Ac.-ft.)	50-yr Rate (cfs)	50-yr Volume (Ac.-ft.)
POA#1 Pre (Hill Street)	0.6	0.06	1.2	0.10	1.6	0.14	2.1	0.18
POA#1 Post (Hill Street)	0.4	0.03	0.6	0.05	0.7	0.06	0.9	0.08
Change	**-0.2**	**-0.03**	**-0.6**	**-0.05**	**-0.9**	**-0.08**	**-1.2**	**-0.10**
POA#2 Pre (Broadway)	0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
POA#2 Post (Broadway)	0.7	0.06	1.1	0.11	1.4	0.15	1.7	0.18
Change	**+0.4**	**+0.04**	**+0.7**	**+0.08**	**+0.9**	**+0.11**	**+1.0**	**+0.13**
Combined POAs Pre	0.9	0.08	1.6	0.14	2.1	0.19	2.7	0.24
Combined POAs Post	1.0	0.09	1.6	0.16	2.2	0.21	2.6	0.26
Change	**+0.1**	**+0.01**	**0.0**	**+0.02**	**+0.1**	**+0.02**	**-0.1**	**+0.02**

Due to no infiltration capacity within the underlying soils and high seasonal water tables throughout the property, infiltration is not possible. There will be increases in the volume of stormwater leaving the site. The proposed development redirects a large portion of the parcel directly into the City's closed drainage system, which will significantly decrease the stormwater sheet flowing onto Hill Street. The overall increases in the closed drainage system have been analyzed down grade of the site where the system connects to ensure minimal impact from the development.

6.2 CONCLUSION:

As seen in the preceding sections, through the implementation of effective stormwater controls, The stormwater generated from the development is appropriately treated prior to being discharged into the City of Dover's closed drainage system. Though there are increases in the volume and peak rate of runoff, the increases will not have a negative impact on abutting parcels and will not exceed the capacity of the closed drainage system.

This project does not propose any development within the 100-year floodplain (Env-Wq 1507.06(c)).

Temporary erosion control has been designed for the project during construction and this in concert with the permanent measures should maintain stormwater runoff quality down gradient, and maintain the sites contribution to offsite drainage systems at current levels. This design meets current Best Management Practices for stormwater control and provides a responsible stormwater management plan for the proposed work.

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DESIGN PLAN SET ..... (SEPARATE)

USGS QUADRANGLE

1" = 2000'

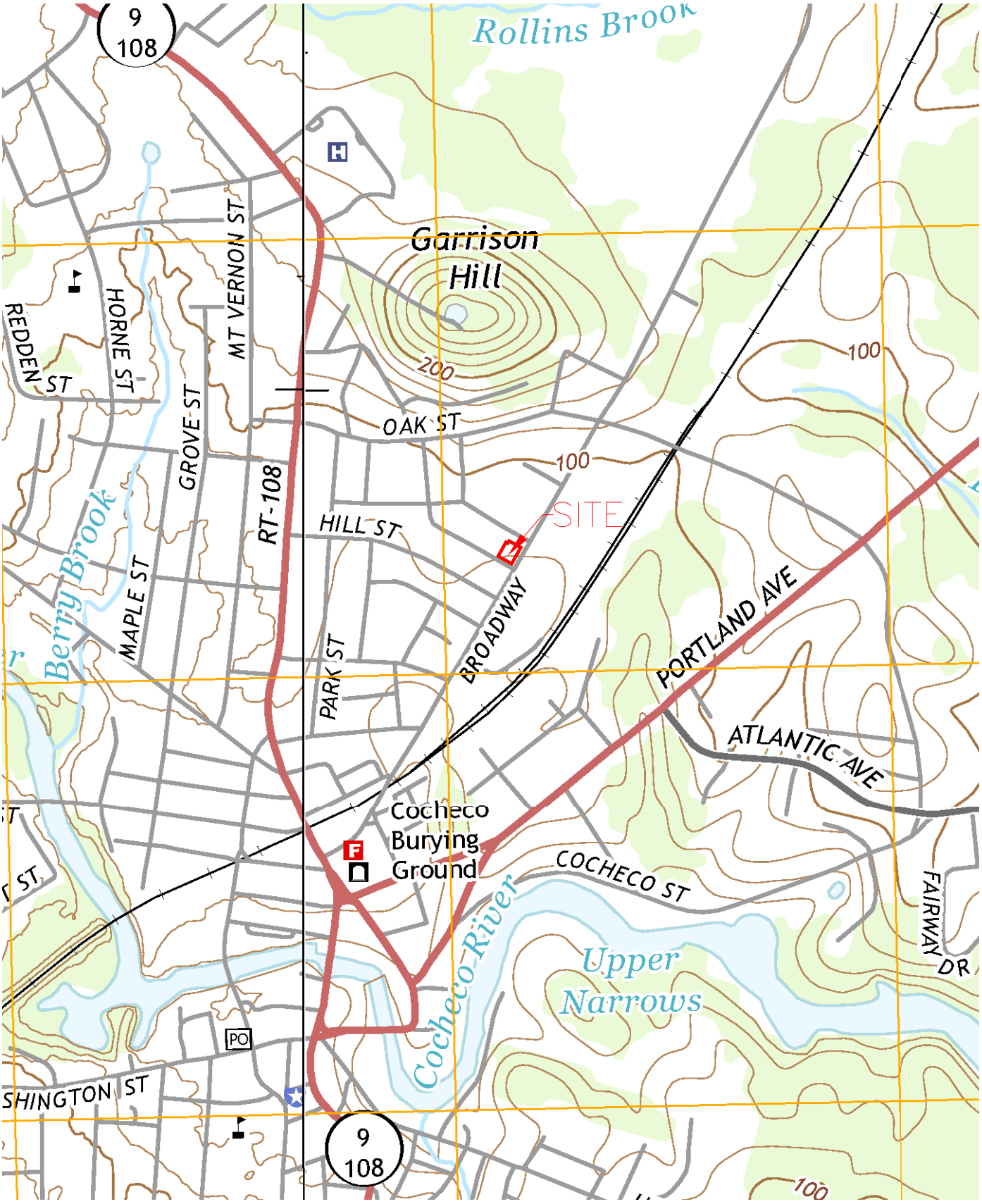
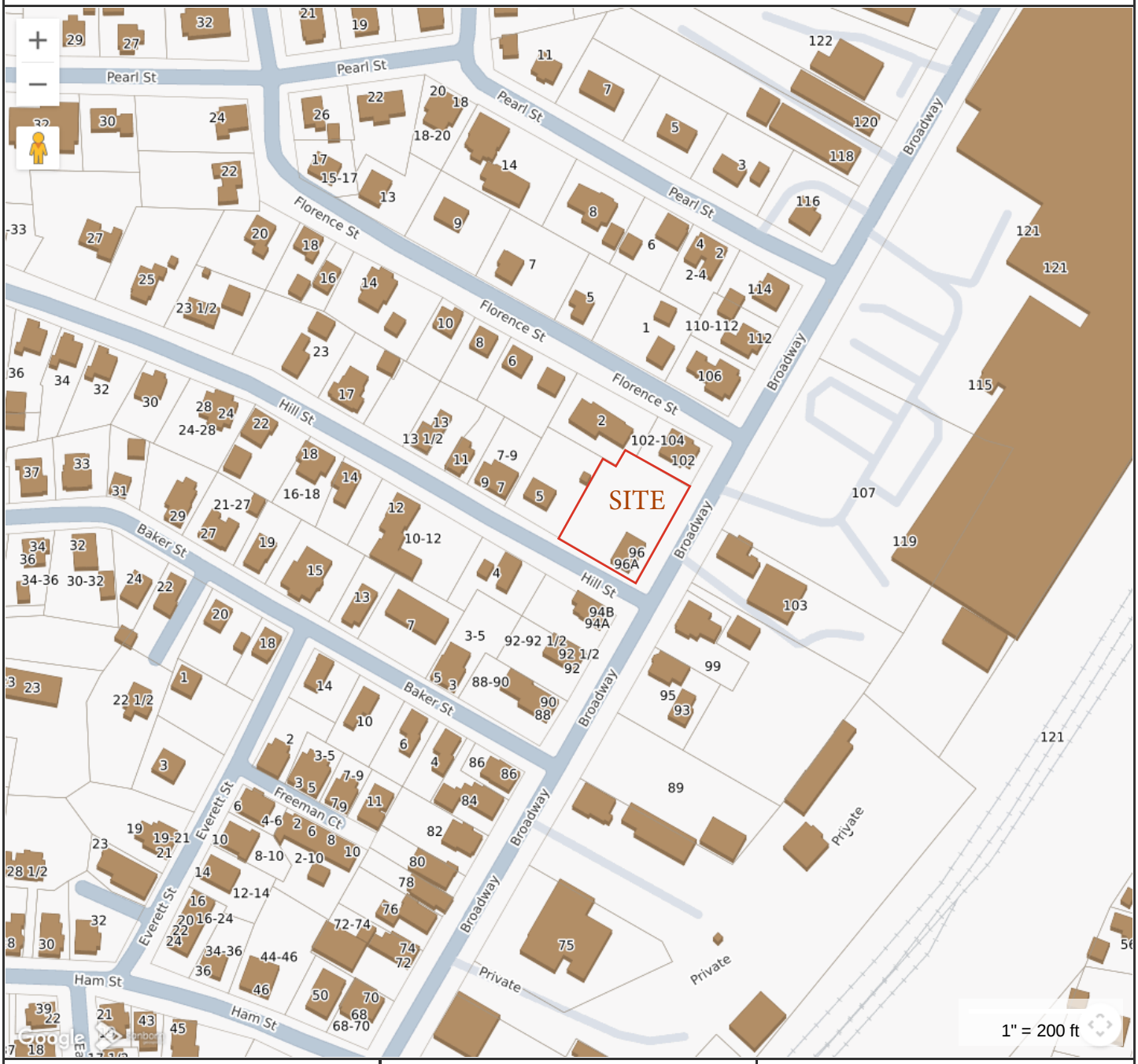


FIGURE 1

Tax Map 27, Lot 169



MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

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

Geometry updated 10/30/2023
Data updated Daily

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

NAIP AERIAL PHOTOGRAPGH

1" = 1000'

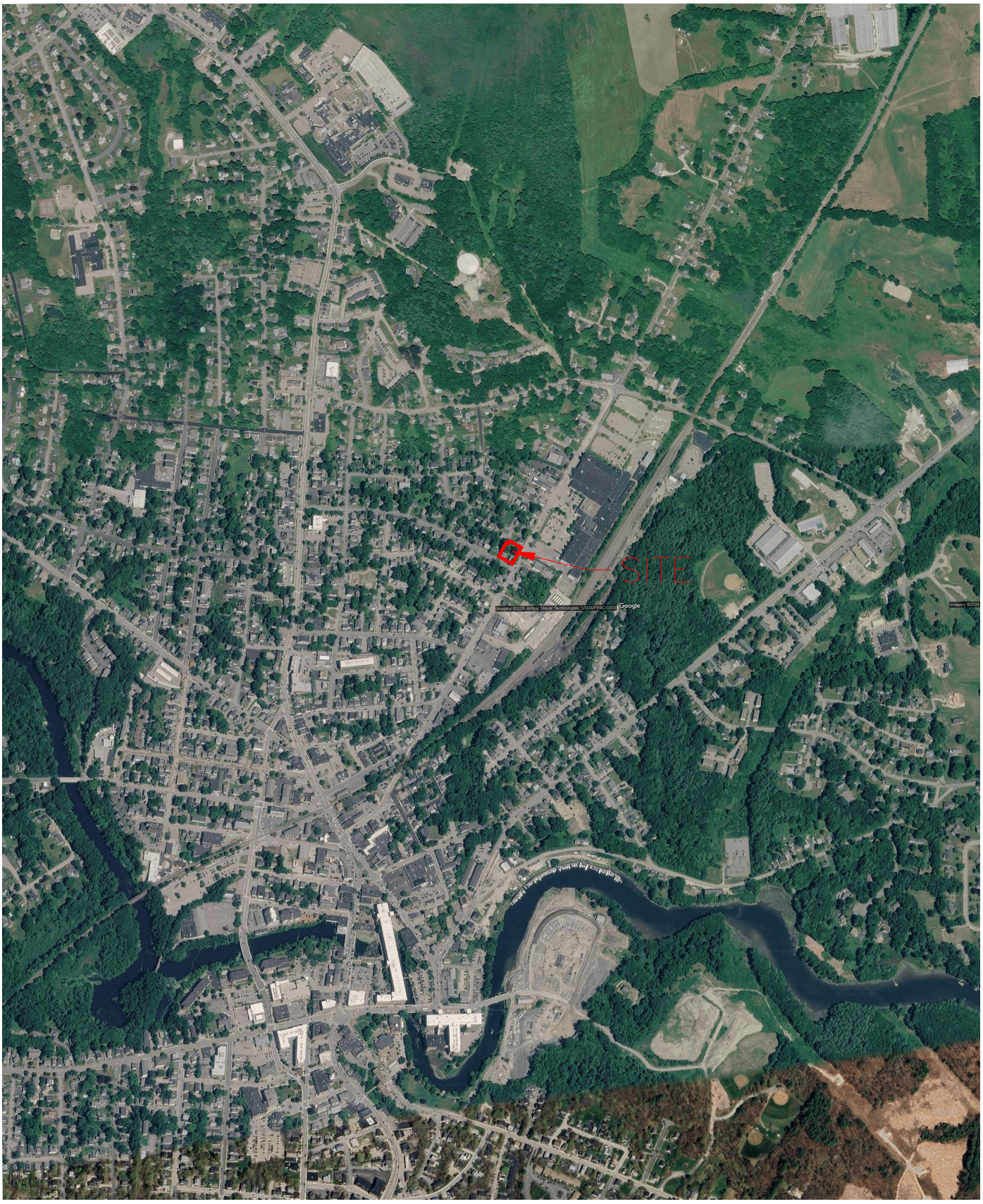


FIGURE 3

APPENDIX A 1

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



December 12, 2025

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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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: 1:574 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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 26, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BzB	Buxton silt loam, 3 to 8 percent slopes	0.8	100.0%
Totals for Area of Interest		**0.8**	**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

BzB—Buxton silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d6p
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: 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: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very 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 supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Minor Components

Elmwood

Percent of map unit: 10 percent
Hydric soil rating: No

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

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APPENDIX A 2

NORWAY PLAINS ASSOCIATES, INC.

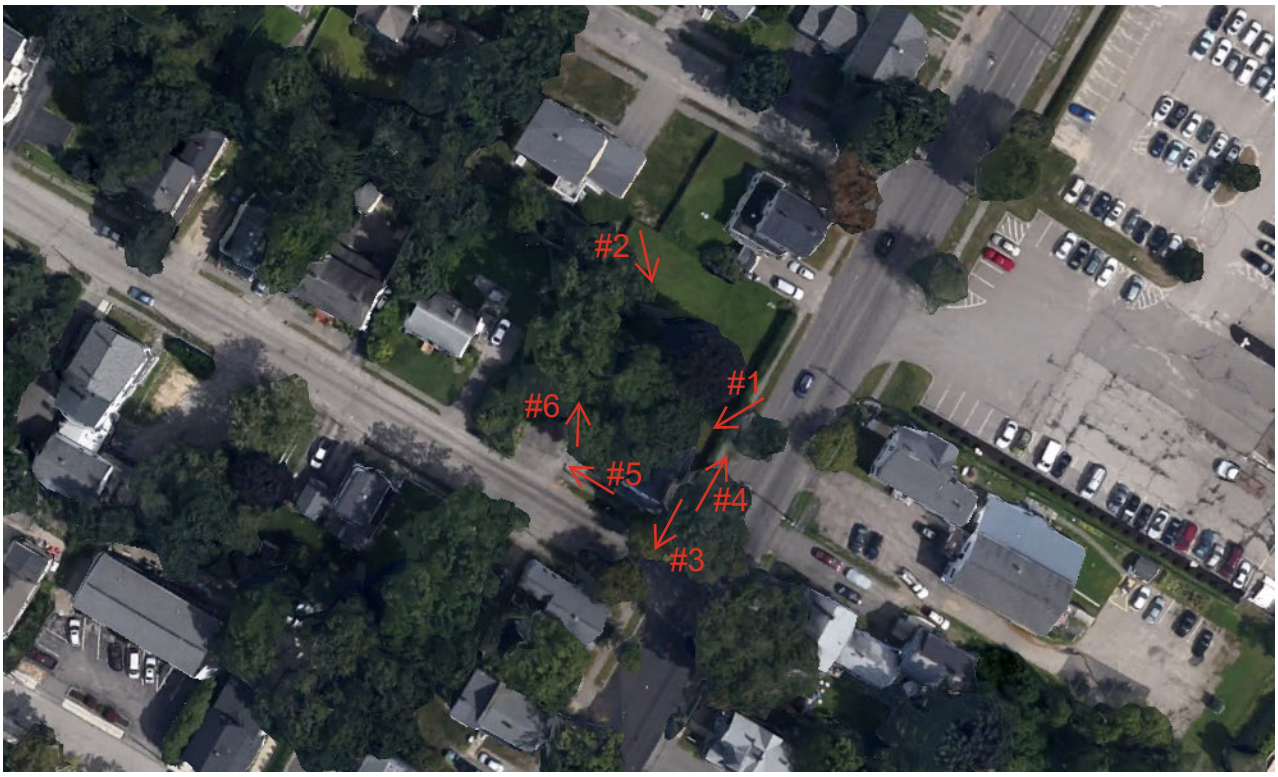
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www.norwayplains.com
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Alton, NH 03809

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rtetreault@norwayplains.com

PHOTO LOCATION KEY



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PHOTO EXHIBIT

RYAN ESCHBACH
96 BROADWAY STREET
DOVER, NH 03820
TAX MAP 27, LOT 169



Photo #1- Existing structure at the south corner of the subject parcel.
(January 07, 2026)



Photo #2 Looking at existing yard where two duplexes are proposed.
(January 07, 2026)



Photo #3 Facing south at the corner of Broadway Street and Hill Street from the Southerly corner of the lot.
(April 11, 2025)


Photo # 4 Facing North on Broadway Street from the Southerly corner of the subject parcel.
(July 31, 2023)



Photo #5 Showing entrance to parking at subject parcel. Access off of Hill Street.
(July 31, 2023)



Photo #6 Looking at existing parking area proposed to be extended into existing yard area
(April 11, 2025)

APPENDIX A 3

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Pourous Pavement / PP**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.16	ac	A = Area draining to the practice	
0.08	ac	A_I = Impervious area draining to the practice	
0.50	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.50	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.08	ac-in	WQV= 1" x Rv x A	
297	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
74	cf	25% x WQV (check calc for sediment forebay volume)	
222	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
2,910	sf	A_{SA} = Surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
YES	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
75.06	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.30	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.55	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
75.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
74.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
76.79	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
74.79	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
0.21	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
(1.79)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
75.27	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
76.60	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Asphalt		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.1	acres	A_{SA} = Surface area of the pervious pavement	
2.7	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	C-5	Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond PP: Proposed Porous Pavement

Elevation (feet)	Storage (cubic-feet)	
74.50	0	
74.55	3	
74.60	9	
74.65	16	
74.70	23	
74.75	29	
74.80	34	
74.85	59	
74.90	118	
74.95	176	
75.00	234	
75.05	292	
75.10	350	75.06= 297
75.15	409	
75.20	467	
75.25	525	
75.30	583	
75.35	641	
75.40	700	
75.45	758	
75.50	816	
75.55	874	
75.60	932	
75.65	991	
75.70	1,049	
75.75	1,107	
75.80	1,165	
75.85	1,223	
75.90	1,282	
75.95	1,340	
76.00	1,398	
76.05	1,427	
76.10	1,456	
76.15	1,485	
76.20	1,514	
76.25	1,543	
76.30	1,602	
76.35	1,660	
76.40	1,718	
76.45	1,776	
76.50	1,834	
76.55	**1,893**	
76.60	**1,928**	
76.65	1,928	
76.70	1,928	

Stage-Discharge for Pond PP: Proposed Porous Pavement

Elevation (feet)	Primary (cfs)
74.50	0.0
74.55	0.0
74.60	0.0
74.65	0.0
74.70	0.0
74.75	0.1
74.80	0.1
74.85	0.1
74.90	0.2
74.95	0.2
75.00	0.3
75.05	0.3
75.10	0.3
75.15	0.4
75.20	0.4
75.25	0.4
75.30	0.5
75.35	0.5
75.40	0.5
75.45	0.6
75.50	0.6
75.55	0.6
75.60	0.7
75.65	0.7
75.70	0.7
75.75	0.7
75.80	0.8
75.85	0.8
75.90	0.8
75.95	0.8
76.00	0.8
76.05	0.9
76.10	0.9
76.15	0.9
76.20	0.9
76.25	0.9
76.30	0.9
76.35	0.9
76.40	1.0
76.45	1.0
76.50	1.0
76.55	1.0
76.60	1.0
76.65	1.0
76.70	**1.0**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Bioretention Basin /BR**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.12	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
0.59	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.58	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.07	ac-in	WQV= 1" x Rv x A	
259	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
65	cf	25% x WQV (check calc for sediment forebay volume)	
194	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
170	sf	A_{SA} = Surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
YES	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
77.77	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
14.40	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
75.16	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
74.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
76.89	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
73.64	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.66	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.52	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
(1.73)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
77.97	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
78.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
378	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet 5		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet 5		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond BR: Bioretention Basin

Elevation (feet)	Storage (cubic-feet)
74.50	0
74.55	1
74.60	1
74.65	3
74.70	4
74.75	5
74.80	7
74.85	8
74.90	10
74.95	11
75.00	13
75.05	14
75.10	15
75.15	16
75.20	20
75.25	25
75.30	30
75.35	35
75.40	40
75.45	43
75.50	45
75.55	47
75.60	48
75.65	50
75.70	52
75.75	53
75.80	55
75.85	57
75.90	59
75.95	60
76.00	62
76.05	64
76.10	65
76.15	67
76.20	69
76.25	70
76.30	72
76.35	74
76.40	76
76.45	77
76.50	79
76.55	81
76.60	82
76.65	84
76.70	86
76.75	87
76.80	89
76.85	91
76.90	93
76.95	94
77.00	95
77.05	95
77.10	96
77.15	97
77.20	104
77.25	114
77.30	124
77.35	135
77.40	146
77.45	159
77.50	172
77.55	186
77.60	201
77.65	217
77.70	233
77.75	251
77.80	269
77.85	288
77.90	308
77.95	329
78.00	**351**

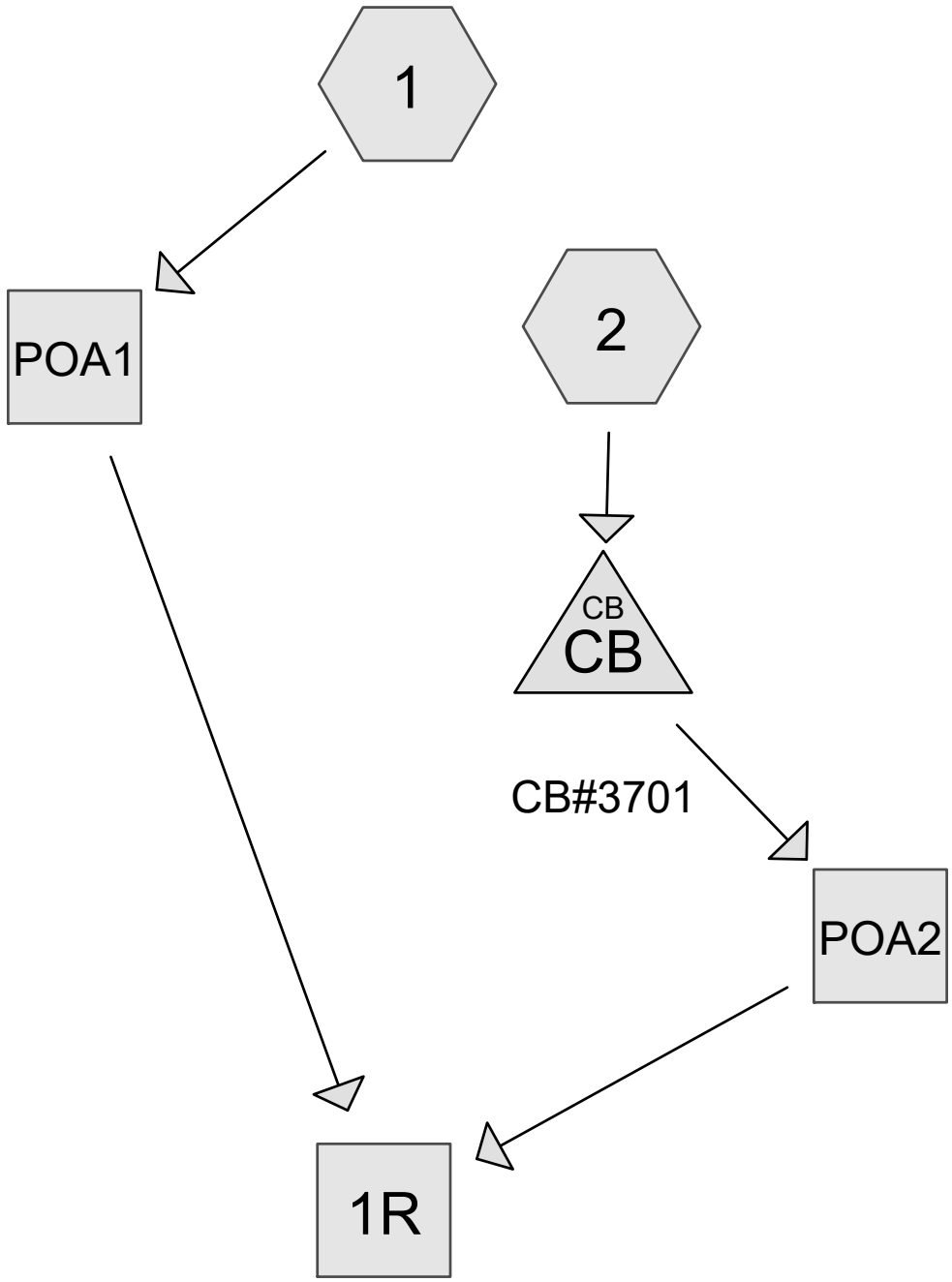
77.77 = 259

Stage-Discharge for Pond BR: Bioretention Basin

Elevation (feet)	Primary (cfs)
74.50	0.0
74.55	0.0
74.60	0.0
74.65	0.0
74.70	0.0
74.75	0.0
74.80	0.0
74.85	0.0
74.90	0.0
74.95	0.0
75.00	0.0
75.05	0.0
75.10	0.0
75.15	0.0
75.20	0.0
75.25	0.0
75.30	0.0
75.35	0.0
75.40	0.0
75.45	0.0
75.50	0.0
75.55	0.0
75.60	0.0
75.65	0.0
75.70	0.0
75.75	0.0
75.80	0.0
75.85	0.0
75.90	0.0
75.95	0.0
76.00	0.0
76.05	0.0
76.10	0.0
76.15	0.0
76.20	0.0
76.25	0.0
76.30	0.0
76.35	0.0
76.40	0.0
76.45	0.0
76.50	0.0
76.55	0.0
76.60	0.0
76.65	0.0
76.70	0.0
76.75	0.0
76.80	0.0
76.85	0.0
76.90	0.0
76.95	0.0
77.00	0.0
77.05	0.0
77.10	0.0
77.15	0.0
77.20	0.0
77.25	0.0
77.30	0.0
77.35	0.0
77.40	0.0
77.45	0.0
77.50	0.0
77.55	0.0
77.60	0.0
77.65	0.0
77.70	0.0
77.75	0.0
77.80	0.1
77.85	0.2
77.90	0.4
77.95	0.6
78.00	**0.8**

APPENDIX A 4

APPENDIX A 4.1



Subcat Reach Pond Link

Routing Diagram for 25321 Pre Development
Prepared by Norway Plains Associates, Inc., Printed 4/29/2026
HydroCAD® 10.10-5a s/n 01082 © 2020 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

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

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.280	74	>75% Grass cover, Good HSG C (1, 2)
0.008	65	Brush, Good, HSG C (1)
0.183	98	Paved parking HSG C (1, 2)
0.029	98	Roofs HSG C (1, 2)
0.039	72	Woods/grass comb., Good, HSG C (1)
0.539	**83**	**TOTAL AREA**

APPENDIX A 4.2

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=1.58"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=0.6 cfs 0.06 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=2.44"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.02 af

Reach 1R: Inflow=0.9 cfs 0.08 af
Outflow=0.9 cfs 0.08 af

Reach POA1: Inflow=0.6 cfs 0.06 af
Outflow=0.6 cfs 0.06 af

Reach POA2: Inflow=0.3 cfs 0.02 af
Outflow=0.3 cfs 0.02 af

Pond CB: CB#3701 Peak Elev=73.38' Inflow=0.3 cfs 0.02 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.3 cfs 0.02 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.08 af Average Runoff Depth = 1.74"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=2.86"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=1.2 cfs 0.10 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.03 af

Reach 1R: Inflow=1.5 cfs 0.14 af
Outflow=1.5 cfs 0.14 af

Reach POA1: Inflow=1.2 cfs 0.10 af
Outflow=1.2 cfs 0.10 af

Reach POA2: Inflow=0.4 cfs 0.03 af
Outflow=0.4 cfs 0.03 af

Pond CB: CB#3701 Peak Elev=73.47' Inflow=0.4 cfs 0.03 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.4 cfs 0.03 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.14 af Average Runoff Depth = 3.07"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=3.95"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=1.6 cfs 0.14 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.04 af

Reach 1R: Inflow=2.1 cfs 0.19 af
Outflow=2.1 cfs 0.19 af

Reach POA1: Inflow=1.6 cfs 0.14 af
Outflow=1.6 cfs 0.14 af

Reach POA2: Inflow=0.5 cfs 0.04 af
Outflow=0.5 cfs 0.04 af

Pond CB: CB#3701 Peak Elev=73.53' Inflow=0.5 cfs 0.04 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.5 cfs 0.04 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.19 af Average Runoff Depth = 4.17"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=5.00"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=2.1 cfs 0.18 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=6.25"
Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.05 af

Reach 1R: Inflow=2.7 cfs 0.24 af
Outflow=2.7 cfs 0.24 af

Reach POA1: Inflow=2.1 cfs 0.18 af
Outflow=2.1 cfs 0.18 af

Reach POA2: Inflow=0.7 cfs 0.05 af
Outflow=0.7 cfs 0.05 af

Pond CB: CB#3701 Peak Elev=73.58' Inflow=0.7 cfs 0.05 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.7 cfs 0.05 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.24 af Average Runoff Depth = 5.24"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

APPENDIX A 4.3

Summary for Subcatchment 1:

CarlsonPlanXYPos|1196762.4616|257760.7829|

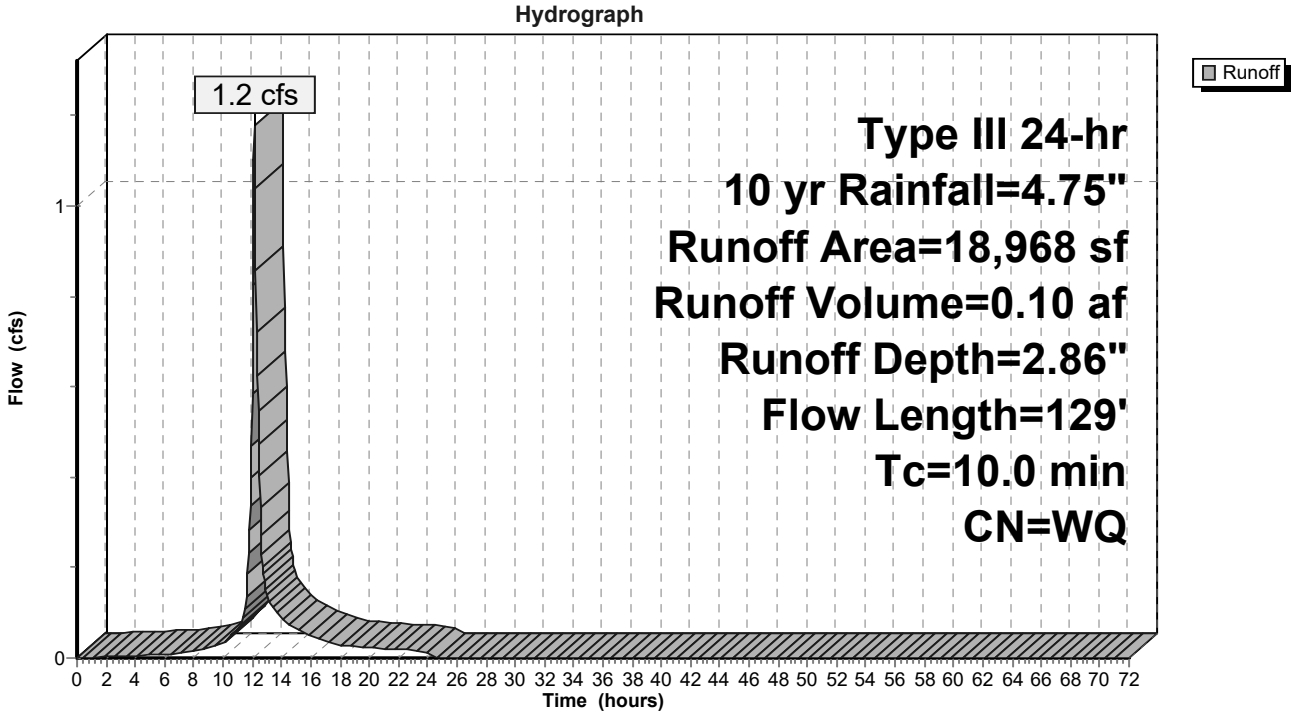
Runoff = 1.2 cfs @ 12.14 hrs, Volume= 0.10 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,084	98	Roofs HSG C
1,719	72	Woods/grass comb., Good, HSG C
4,758	98	Paved parking HSG C
11,079	74	>75% Grass cover, Good HSG C
328	65	Brush, Good, HSG C
18,968		Weighted Average
13,126		69.20% Pervious Area
5,842		30.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0500	0.1		**Sheet Flow, A-->B** Grass: Bermuda n= 0.410 P2= 3.15"
1.0	67	0.0500	1.1		**Shallow Concentrated Flow, B-->C** Woodland Kv= 5.0 fps
0.1	4	0.0200	1.0		**Shallow Concentrated Flow, C-->D** Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0100	2.0		**Shallow Concentrated Flow, D-->E** Paved Kv= 20.3 fps
0.1	3	0.0100	0.7		**Shallow Concentrated Flow, E-->F** Short Grass Pasture Kv= 7.0 fps
10.0	129	Total			

Subcatchment 1:



Summary for Subcatchment 2:

CarlsonPlanXYPos|1196823.1142|257707.8244|

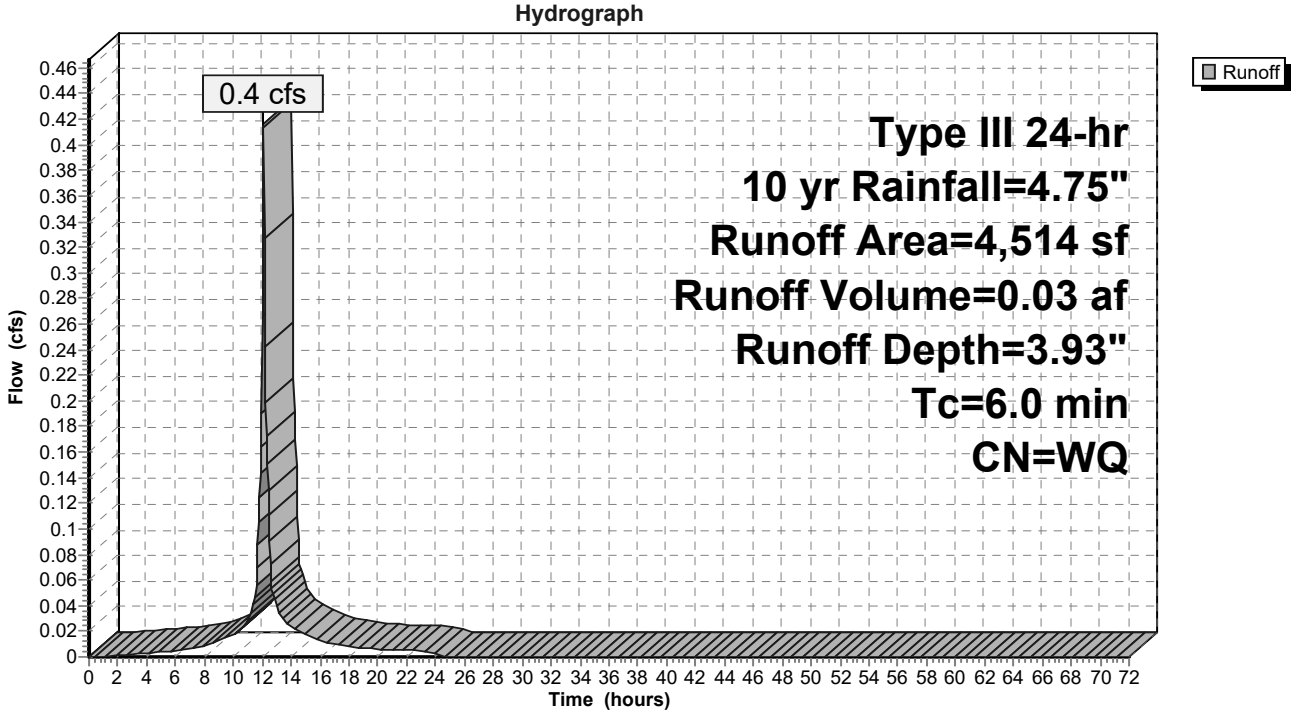
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
191	98	Roofs HSG C
3,201	98	Paved parking HSG C
1,122	74	>75% Grass cover, Good HSG C
4,514		Weighted Average
1,122		24.86% Pervious Area
3,392		75.14% Impervious Area

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

Subcatchment 2:

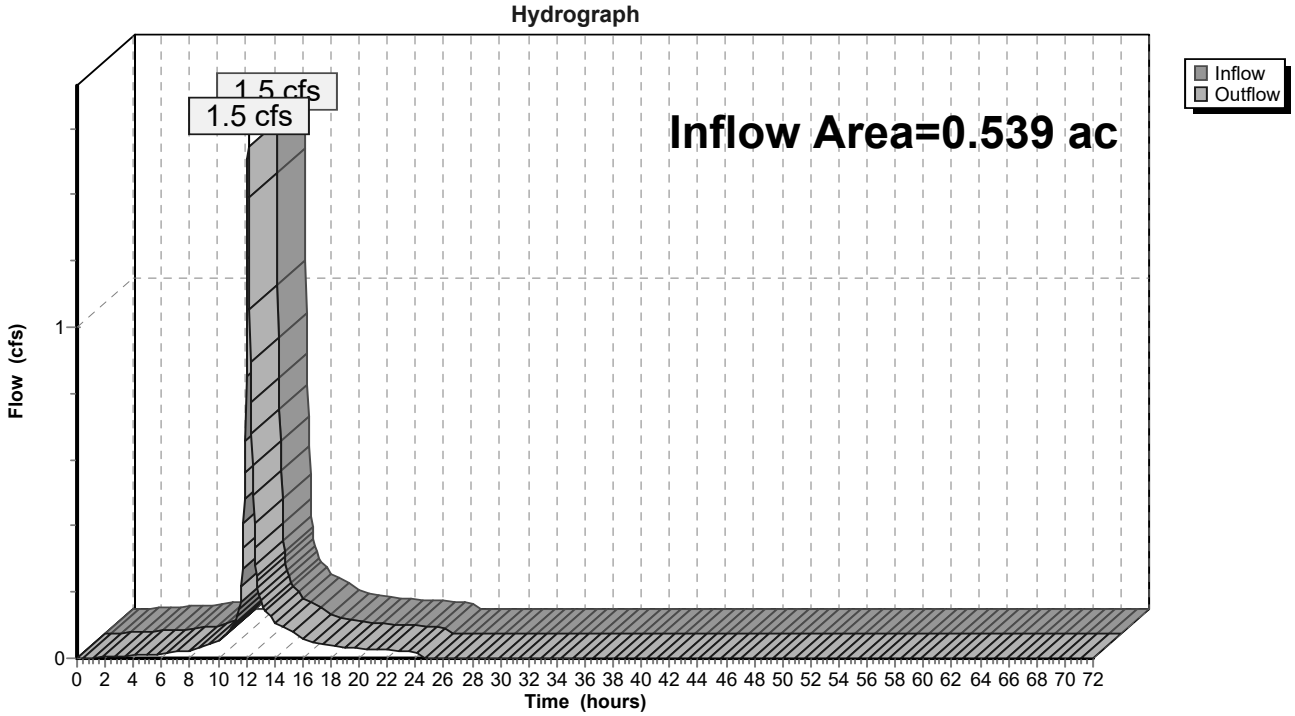


Summary for Reach 1R:

Inflow Area = 0.539 ac, 39.32% Impervious, Inflow Depth = 3.07" for 10 yr event
Inflow = 1.5 cfs @ 12.12 hrs, Volume= 0.14 af
Outflow = 1.5 cfs @ 12.12 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 1R:

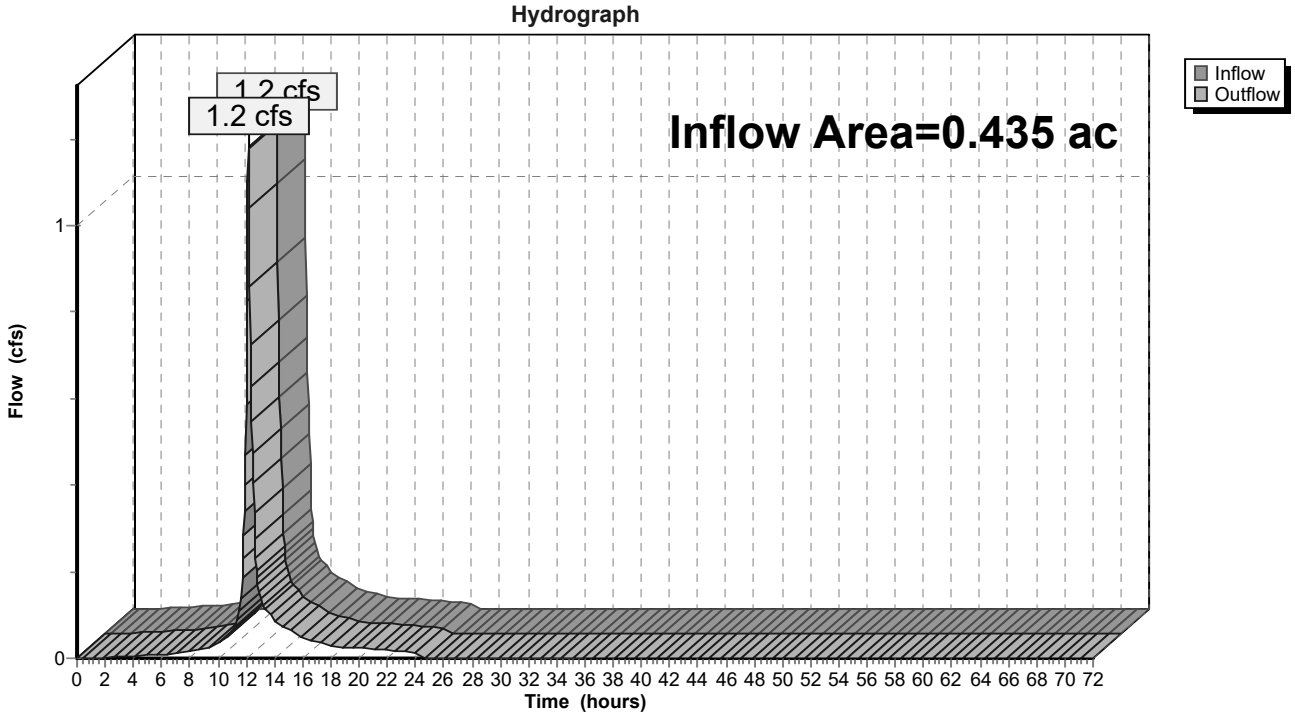


Summary for Reach POA1:

Inflow Area = 0.435 ac, 30.80% Impervious, Inflow Depth = 2.86" for 10 yr event
Inflow = 1.2 cfs @ 12.14 hrs, Volume= 0.10 af
Outflow = 1.2 cfs @ 12.14 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA1:

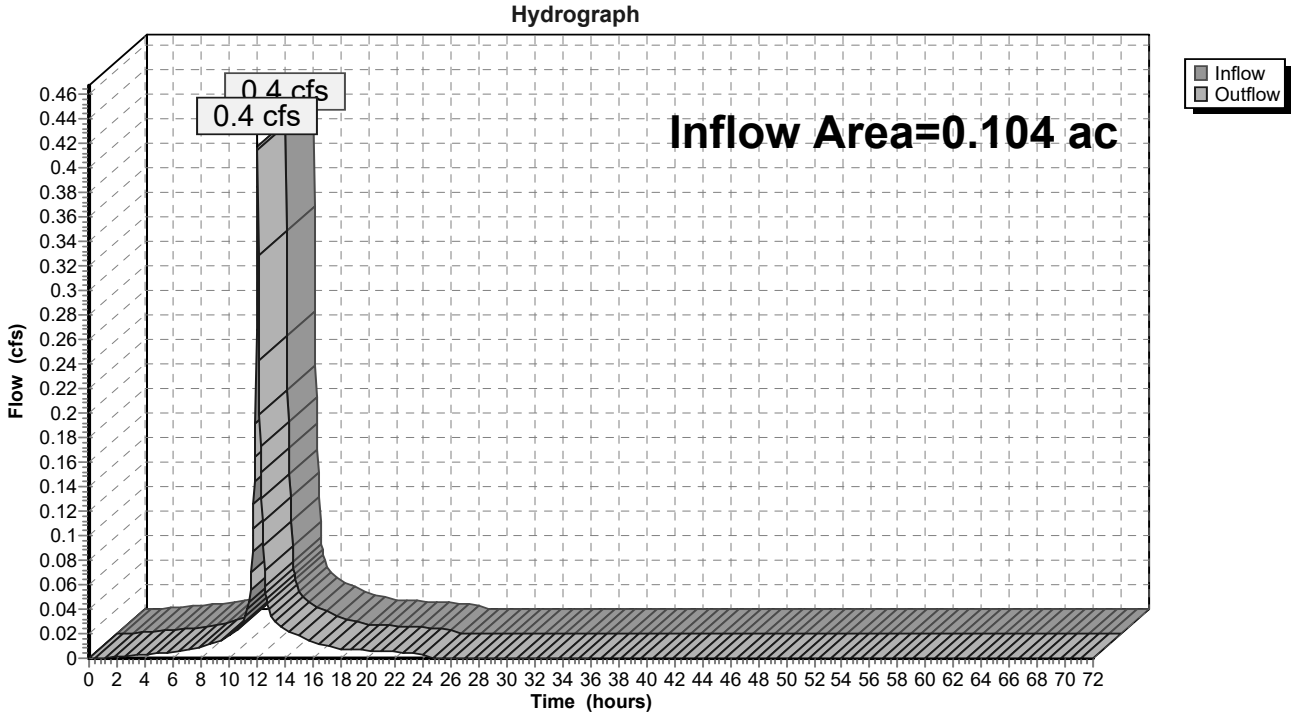


Summary for Reach POA2:

Inflow Area = 0.104 ac, 75.14% Impervious, Inflow Depth = 3.93" for 10 yr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA2:



Summary for Pond CB: CB#3701

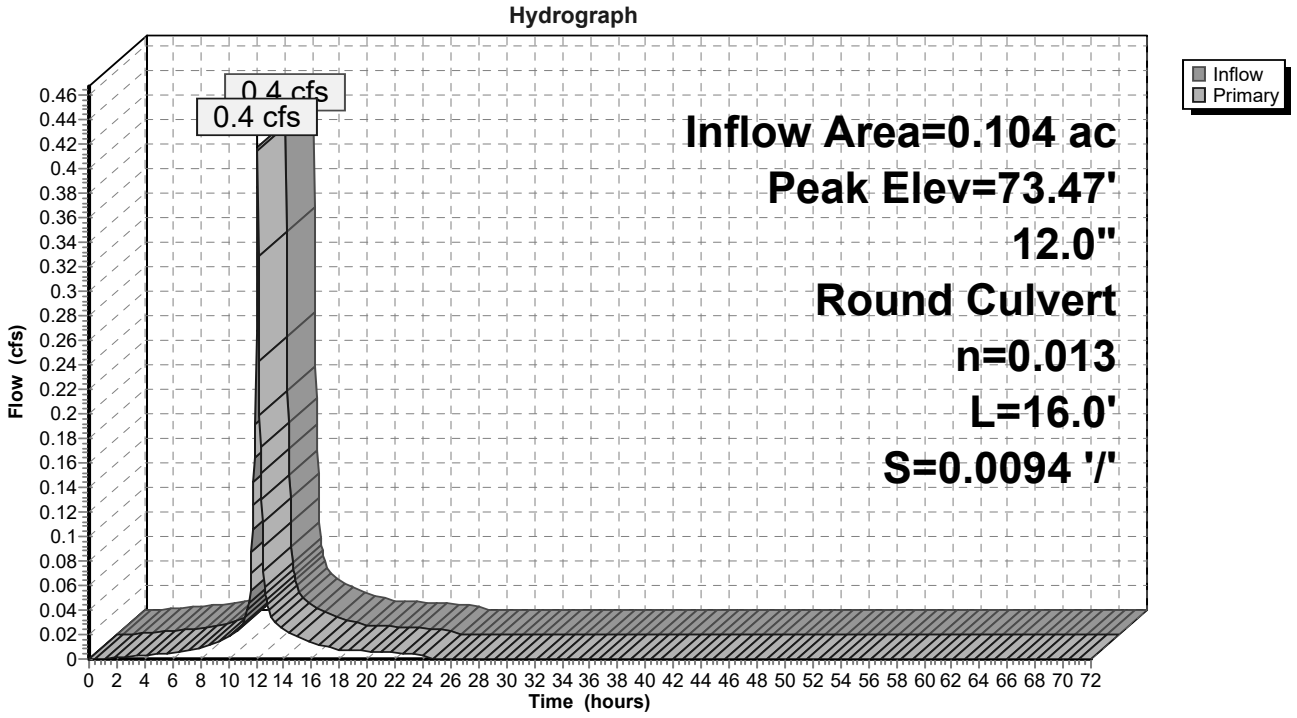
Inflow Area = 0.104 ac, 75.14% Impervious, Inflow Depth = 3.93" for 10 yr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 73.47' @ 12.09 hrs

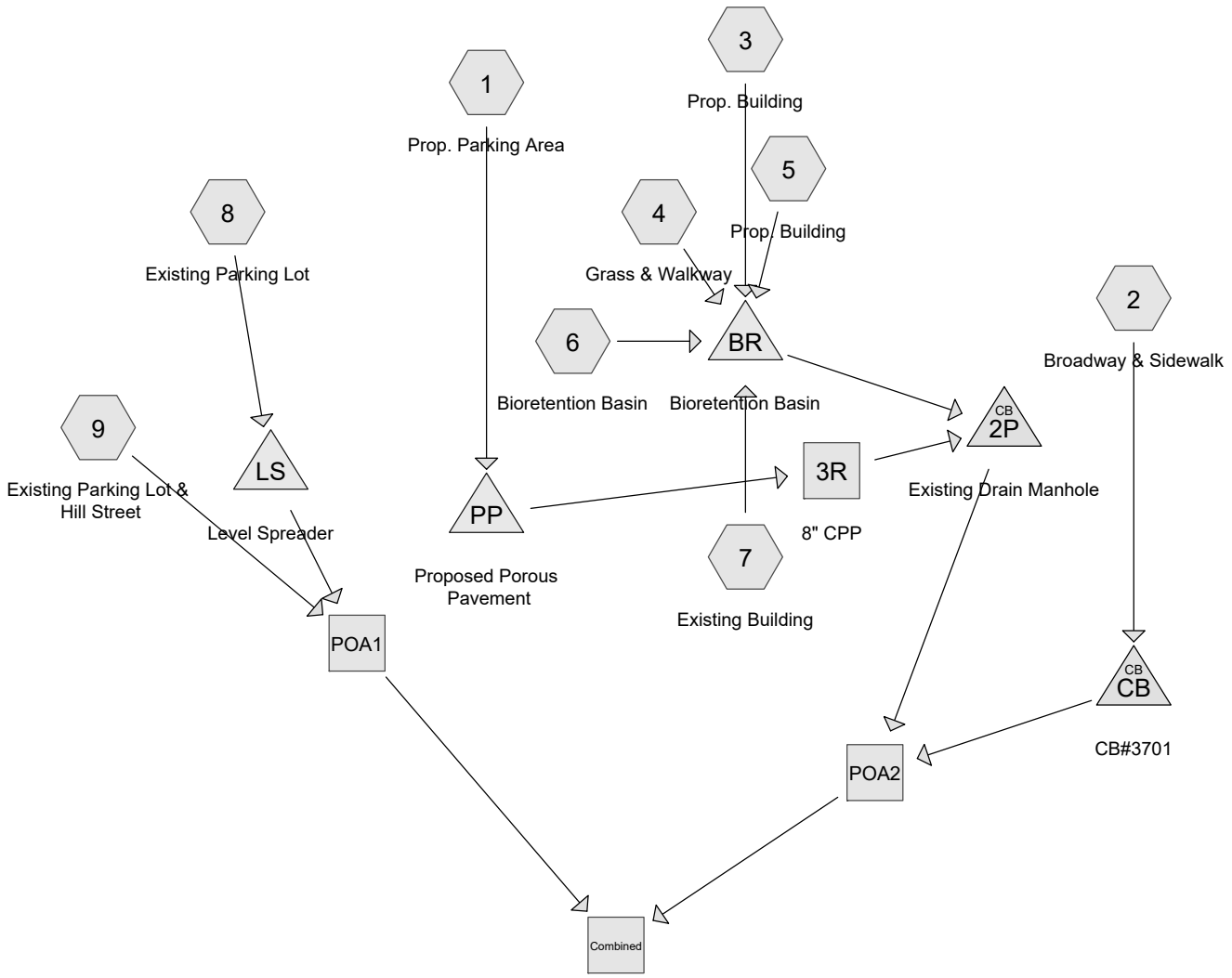
Device	Routing	Invert	Outlet Devices
#1	Primary	73.10'	**12.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.10' / 72.95' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.09 hrs HW=73.46' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.4 cfs @ 2.3 fps)

Pond CB: CB#3701



APPENDIX A 4.4



Subcat Reach Pond Link

Routing Diagram for 25321 Post Development rev-1
Prepared by Norway Plains Associates, Inc., Printed 6/4/2026
HydroCAD® 10.10-5a s/n 01082 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.206	74	>75% Grass cover, Good HSG C (1, 2, 4, 6, 7, 8, 9)
0.259	98	Paved parking HSG C (1, 2, 4, 8, 9)
0.073	98	Roofs HSG C (2, 3, 5, 9)
0.000	70	Woods, Good HSG C (8)
0.539	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.539	HSG C	1, 2, 3, 4, 5, 6, 7, 8, 9
0.000	HSG D	
0.000	Other	
0.539		**TOTAL AREA**

APPENDIX A 4.5

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=7,075 sf 50.50% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.03 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,513 sf 75.16% Impervious Runoff Depth=2.44"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.02 af

Subcatchment 3: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 4: Grass & Walkway Runoff Area=852 sf 33.92% Impervious Runoff Depth=1.65"
Tc=6.0 min CN=WQ Runoff=0.0 cfs 0.00 af

Subcatchment 5: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 6: Bioretention Basin Runoff Area=681 sf 0.00% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=74 Runoff=0.0 cfs 0.00 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=74 Runoff=0.0 cfs 0.00 af

Subcatchment 8: Existing Parking Lot Runoff Area=1,601 sf 68.96% Impervious Runoff Depth=2.32"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.01 af

Subcatchment 9: Existing Parking Lot & Hill Runoff Area=4,952 sf 66.03% Impervious Runoff Depth=2.27"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.02 af

Reach 3R: 8" CPP Avg. Flow Depth=0.21' Max Vel=1.92 fps Inflow=0.2 cfs 0.03 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.2 cfs 0.03 af

Reach Combined: Inflow=1.0 cfs 0.09 af
Outflow=1.0 cfs 0.09 af

Reach POA1: Inflow=0.4 cfs 0.03 af
Outflow=0.4 cfs 0.03 af

Reach POA2: Inflow=0.7 cfs 0.06 af
Outflow=0.7 cfs 0.06 af

Pond 2P: Existing Drain Manhole Peak Elev=73.97' Inflow=0.4 cfs 0.04 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=0.4 cfs 0.04 af

Pond BR: Bioretention Basin Peak Elev=77.86' Storage=292 cf Inflow=0.3 cfs 0.02 af
Outflow=0.3 cfs 0.02 af

Pond CB: CB#3701 Peak Elev=73.38' Inflow=0.3 cfs 0.02 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.3 cfs 0.02 af

Pond LS: Level Spreader Peak Elev=73.91' Storage=17 cf Inflow=0.1 cfs 0.01 af
Outflow=0.1 cfs 0.01 af

Pond PP: Proposed Porous Pavement Peak Elev=74.91' Storage=130 cf Inflow=0.3 cfs 0.03 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.2 cfs 0.03 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.10 af Average Runoff Depth = 2.18"
38.30% Pervious = 0.207 ac 61.70% Impervious = 0.333 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=7,075 sf 50.50% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=WQ Runoff=0.6 cfs 0.05 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,513 sf 75.16% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.03 af

Subcatchment 3: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=4.51"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 4: Grass & Walkway Runoff Area=852 sf 33.92% Impervious Runoff Depth=2.96"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.00 af

Subcatchment 5: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=4.51"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 6: Bioretention Basin Runoff Area=681 sf 0.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=74 Runoff=0.0 cfs 0.00 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.00 af

Subcatchment 8: Existing Parking Lot Runoff Area=1,601 sf 68.96% Impervious Runoff Depth=3.78"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.01 af

Subcatchment 9: Existing Parking Lot & Hill Runoff Area=4,952 sf 66.03% Impervious Runoff Depth=3.72"
Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.04 af

Reach 3R: 8" CPP Avg. Flow Depth=0.27' Max Vel=2.17 fps Inflow=0.3 cfs 0.05 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.3 cfs 0.05 af

Reach Combined: Inflow=1.6 cfs 0.16 af
Outflow=1.6 cfs 0.16 af

Reach POA1: Inflow=0.6 cfs 0.05 af
Outflow=0.6 cfs 0.05 af

Reach POA2: Inflow=1.1 cfs 0.11 af
Outflow=1.1 cfs 0.11 af

Pond 2P: Existing Drain Manhole Peak Elev=74.07' Inflow=0.7 cfs 0.08 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=0.7 cfs 0.08 af

Pond BR: Bioretention Basin Peak Elev=77.91' Storage=311 cf Inflow=0.5 cfs 0.04 af
Outflow=0.4 cfs 0.03 af

Pond CB: CB#3701 Peak Elev=73.47' Inflow=0.4 cfs 0.03 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.4 cfs 0.03 af

Pond LS: Level Spreader Peak Elev=73.92' Storage=18 cf Inflow=0.1 cfs 0.01 af
Outflow=0.1 cfs 0.01 af

Pond PP: Proposed Porous Pavement Peak Elev=75.04' Storage=278 cf Inflow=0.6 cfs 0.05 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.3 cfs 0.05 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.16 af Average Runoff Depth = 3.61"
38.30% Pervious = 0.207 ac 61.70% Impervious = 0.333 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=7,075 sf 50.50% Impervious Runoff Depth=4.49"
Tc=6.0 min CN=WQ Runoff=0.8 cfs 0.06 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,513 sf 75.16% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.04 af

Subcatchment 3: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=5.76"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 4: Grass & Walkway Runoff Area=852 sf 33.92% Impervious Runoff Depth=4.06"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.01 af

Subcatchment 5: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=5.76"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 6: Bioretention Basin Runoff Area=681 sf 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.00 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 8: Existing Parking Lot Runoff Area=1,601 sf 68.96% Impervious Runoff Depth=4.96"
Tc=6.0 min CN=WQ Runoff=0.2 cfs 0.02 af

Subcatchment 9: Existing Parking Lot & Hill Runoff Area=4,952 sf 66.03% Impervious Runoff Depth=4.89"
Tc=6.0 min CN=WQ Runoff=0.6 cfs 0.05 af

Reach 3R: 8" CPP Avg. Flow Depth=0.30' Max Vel=2.29 fps Inflow=0.4 cfs 0.06 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.4 cfs 0.06 af

Reach Combined: Inflow=2.2 cfs 0.21 af
Outflow=2.2 cfs 0.21 af

Reach POA1: Inflow=0.8 cfs 0.06 af
Outflow=0.8 cfs 0.06 af

Reach POA2: Inflow=1.4 cfs 0.15 af
Outflow=1.4 cfs 0.15 af

Pond 2P: Existing Drain Manhole Peak Elev=74.15' Inflow=0.9 cfs 0.10 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=0.9 cfs 0.10 af

Pond BR: Bioretention Basin Peak Elev=77.94' Storage=325 cf Inflow=0.6 cfs 0.05 af
Outflow=0.6 cfs 0.04 af

Pond CB: CB#3701 Peak Elev=73.53' Inflow=0.5 cfs 0.04 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.5 cfs 0.04 af

Pond LS: Level Spreader Peak Elev=73.92' Storage=18 cf Inflow=0.2 cfs 0.02 af
Outflow=0.2 cfs 0.01 af

Pond PP: Proposed Porous Pavement Peak Elev=75.16' Storage=415 cf Inflow=0.8 cfs 0.06 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.4 cfs 0.06 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.21 af Average Runoff Depth = 4.77"
38.30% Pervious = 0.207 ac 61.70% Impervious = 0.333 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=7,075 sf 50.50% Impervious Runoff Depth=5.57"
Tc=6.0 min CN=WQ Runoff=0.9 cfs 0.08 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,513 sf 75.16% Impervious Runoff Depth=6.25"
Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.05 af

Subcatchment 3: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 4: Grass & Walkway Runoff Area=852 sf 33.92% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.01 af

Subcatchment 5: Prop. Building Runoff Area=1,432 sf 100.00% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 6: Bioretention Basin Runoff Area=681 sf 0.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 8: Existing Parking Lot Runoff Area=1,601 sf 68.96% Impervious Runoff Depth=6.07"
Tc=6.0 min CN=WQ Runoff=0.2 cfs 0.02 af

Subcatchment 9: Existing Parking Lot & Hill Runoff Area=4,952 sf 66.03% Impervious Runoff Depth=6.00"
Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.06 af

Reach 3R: 8" CPP Avg. Flow Depth=0.35' Max Vel=2.43 fps Inflow=0.4 cfs 0.08 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.4 cfs 0.08 af

Reach Combined: Inflow=2.6 cfs 0.26 af
Outflow=2.6 cfs 0.26 af

Reach POA1: Inflow=0.9 cfs 0.08 af
Outflow=0.9 cfs 0.08 af

Reach POA2: Inflow=1.7 cfs 0.18 af
Outflow=1.7 cfs 0.18 af

Pond 2P: Existing Drain Manhole Peak Elev=74.22' Inflow=1.1 cfs 0.13 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=1.1 cfs 0.13 af

Pond BR: Bioretention Basin Peak Elev=77.97' Storage=338 cf Inflow=0.7 cfs 0.06 af
Outflow=0.7 cfs 0.05 af

Pond CB: CB#3701 Peak Elev=73.58' Inflow=0.7 cfs 0.05 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.7 cfs 0.05 af

Pond LS: Level Spreader Peak Elev=73.92' Storage=18 cf Inflow=0.2 cfs 0.02 af
Outflow=0.2 cfs 0.02 af

Pond PP: Proposed Porous Pavement Peak Elev=75.27' Storage=545 cf Inflow=0.9 cfs 0.08 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.4 cfs 0.08 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.26 af Average Runoff Depth = 5.88"
38.30% Pervious = 0.207 ac 61.70% Impervious = 0.333 ac

APPENDIX A 4.6

25321 Post Development rev-1

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10 yr	Type III 24-hr		Default	24.00	1	4.75	2

Summary for Subcatchment 1: Prop. Parking Area

CarlsonPlanXYPos|1196792.3840|257772.3434|

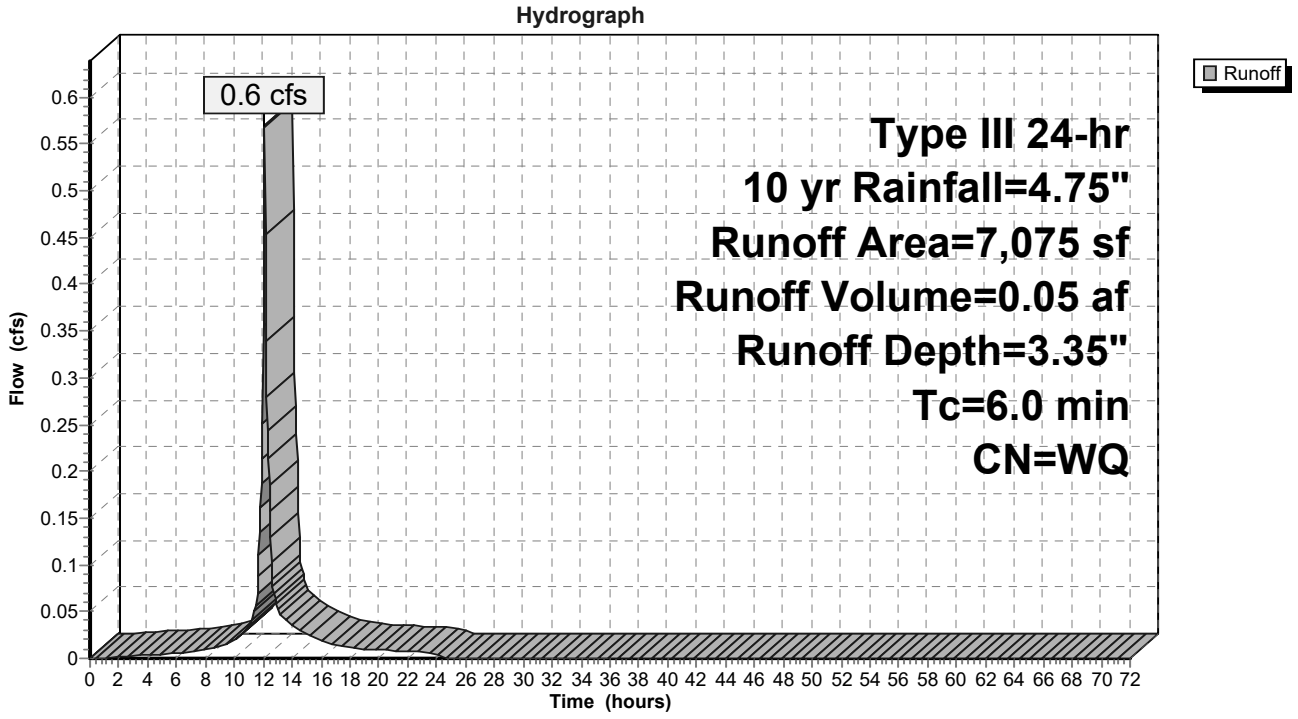
Runoff = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
3,573	98	Paved parking HSG C
3,502	74	>75% Grass cover, Good HSG C
7,075		Weighted Average
3,502		49.50% Pervious Area
3,573		50.50% Impervious Area

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

Subcatchment 1: Prop. Parking Area



Summary for Subcatchment 2: Broadway & Sidewalk

CarlsonPlanXYPos|1196833.5336|257736.4930|

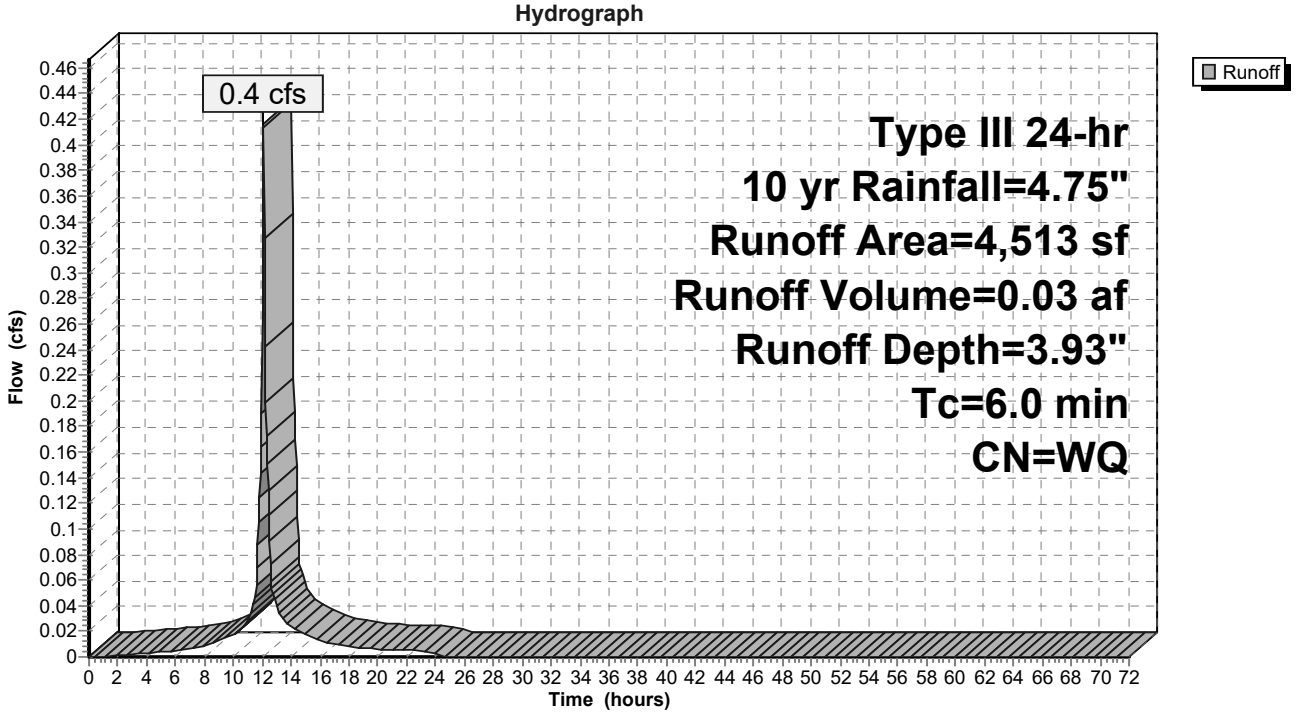
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

	Area (sf)	CN	Description
	3,201	98	Paved parking HSG C
	1,121	74	>75% Grass cover, Good HSG C
*	191	98	Roofs HSG C
	4,513		Weighted Average
	1,121		24.84% Pervious Area
	3,392		75.16% Impervious Area

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

Subcatchment 2: Broadway & Sidewalk



Summary for Subcatchment 3: Prop. Building

CarlsonPlanXYPos|1196793.6044|257744.7214|

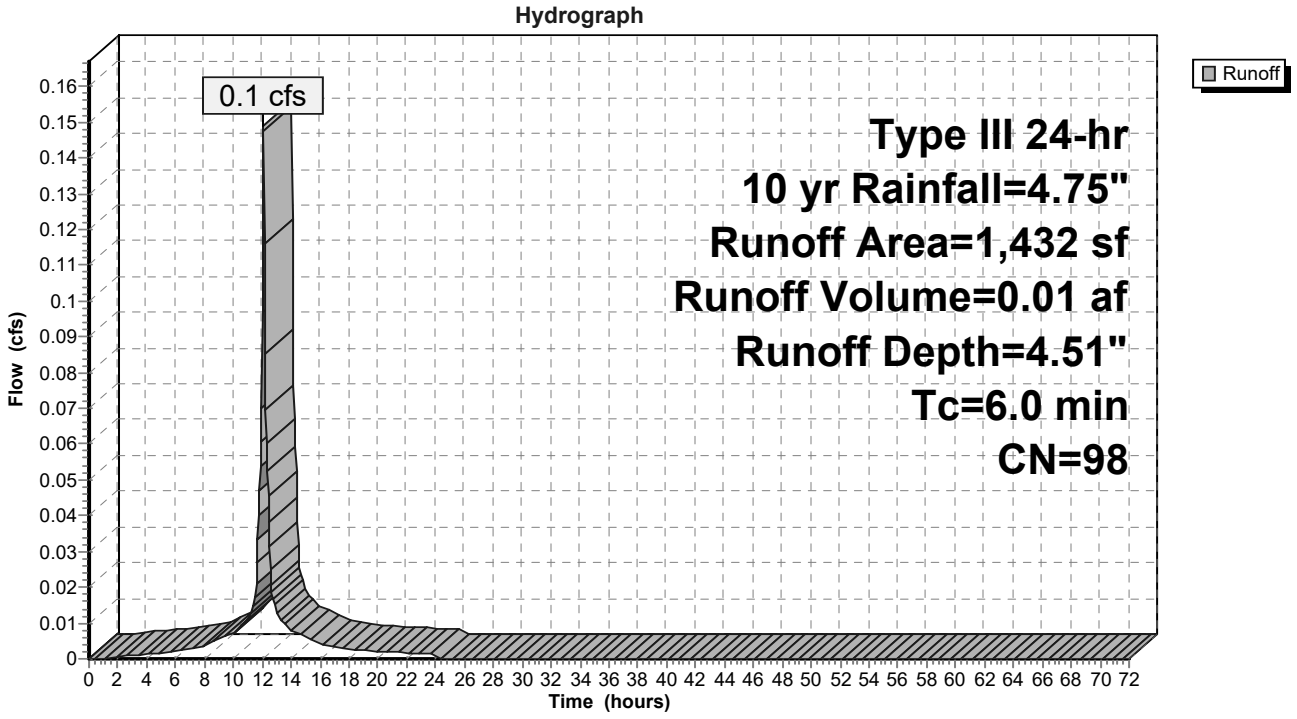
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,432	98	Roofs HSG C
1,432		100.00% Impervious Area

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

Subcatchment 3: Prop. Building



Summary for Subcatchment 4: Grass & Walkway

CarlsonPlanXYPos|1196811.3128|257737.4629|

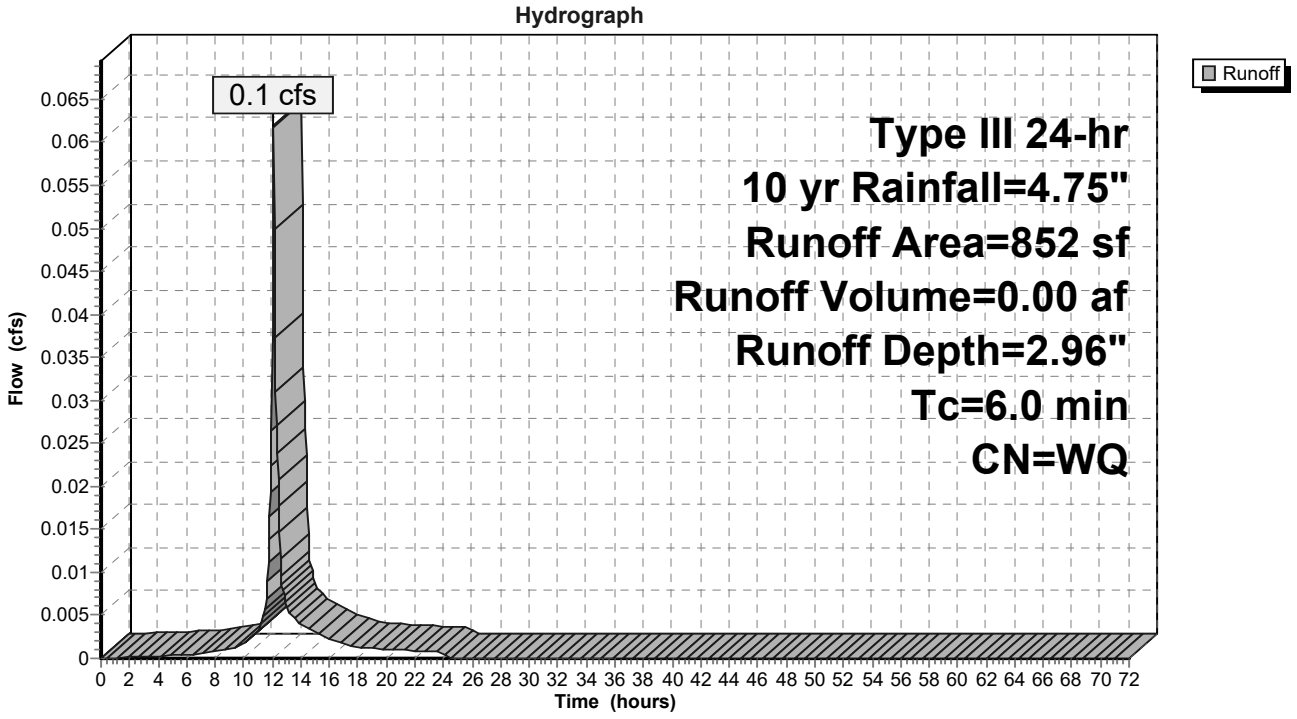
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.00 af, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
289	98	Paved parking HSG C
563	74	>75% Grass cover, Good HSG C
852		Weighted Average
563		66.08% Pervious Area
289		33.92% Impervious Area

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

Subcatchment 4: Grass & Walkway



Summary for Subcatchment 5: Prop. Building

CarlsonPlanXYPos|1196773.7486|257716.1405|

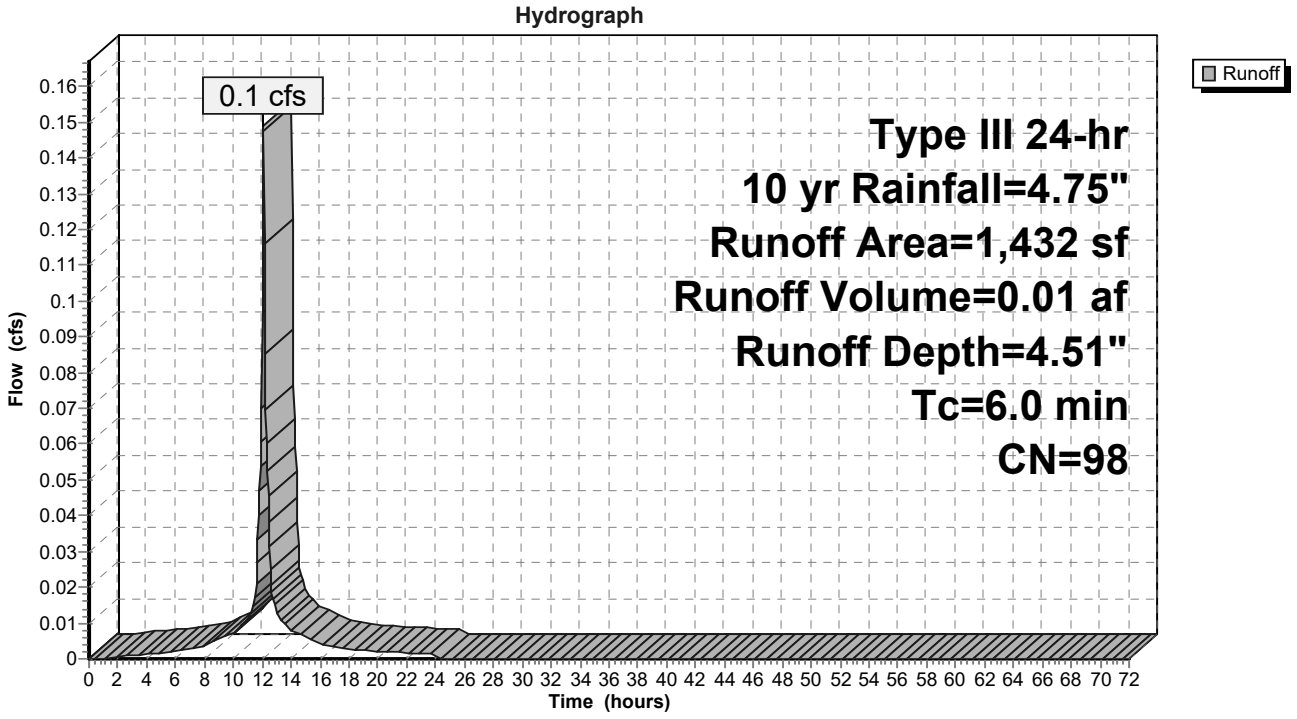
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,432	98	Roofs HSG C
1,432		100.00% Impervious Area

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

Subcatchment 5: Prop. Building



Summary for Subcatchment 6: Bioretention Basin

CarlsonPlanXYPos|1196735.9916|257704.9174|

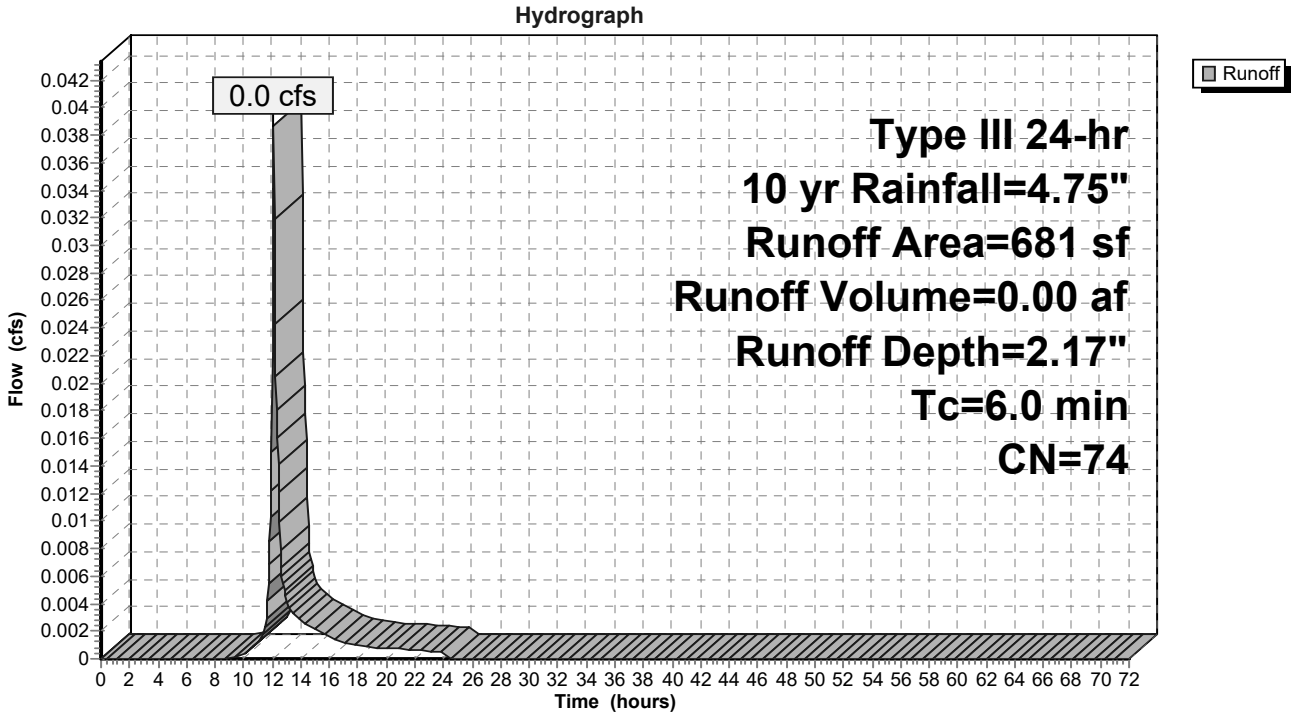
Runoff = 0.0 cfs @ 12.10 hrs, Volume= 0.00 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
681	74	>75% Grass cover, Good HSG C
681		100.00% Pervious Area

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

Subcatchment 6: Bioretention Basin



Summary for Subcatchment 7: Existing Building

CarlsonPlanXYPos|1196747.0301|257673.6021|

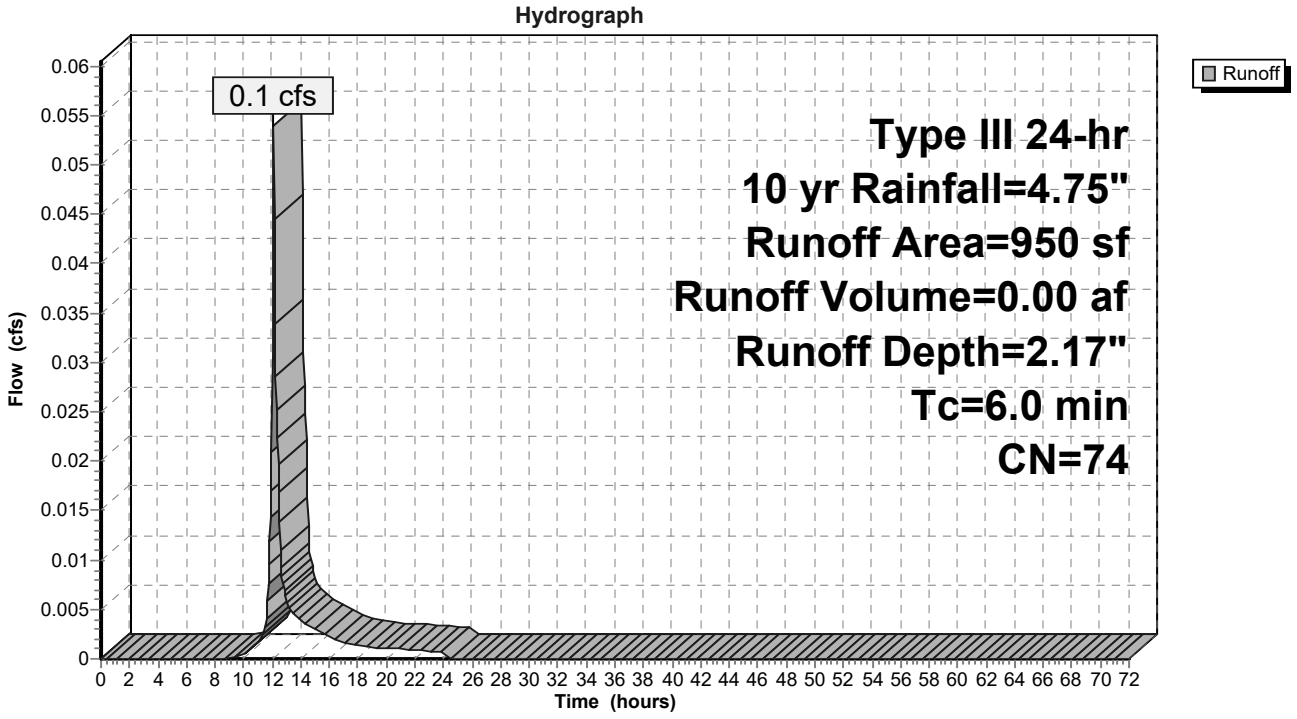
Runoff = 0.1 cfs @ 12.10 hrs, Volume= 0.00 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
950	74	>75% Grass cover, Good HSG C
950		100.00% Pervious Area

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

Subcatchment 7: Existing Building



Summary for Subcatchment 8: Existing Parking Lot

CarlsonPlanXYPos|1196694.8070|257704.6702|

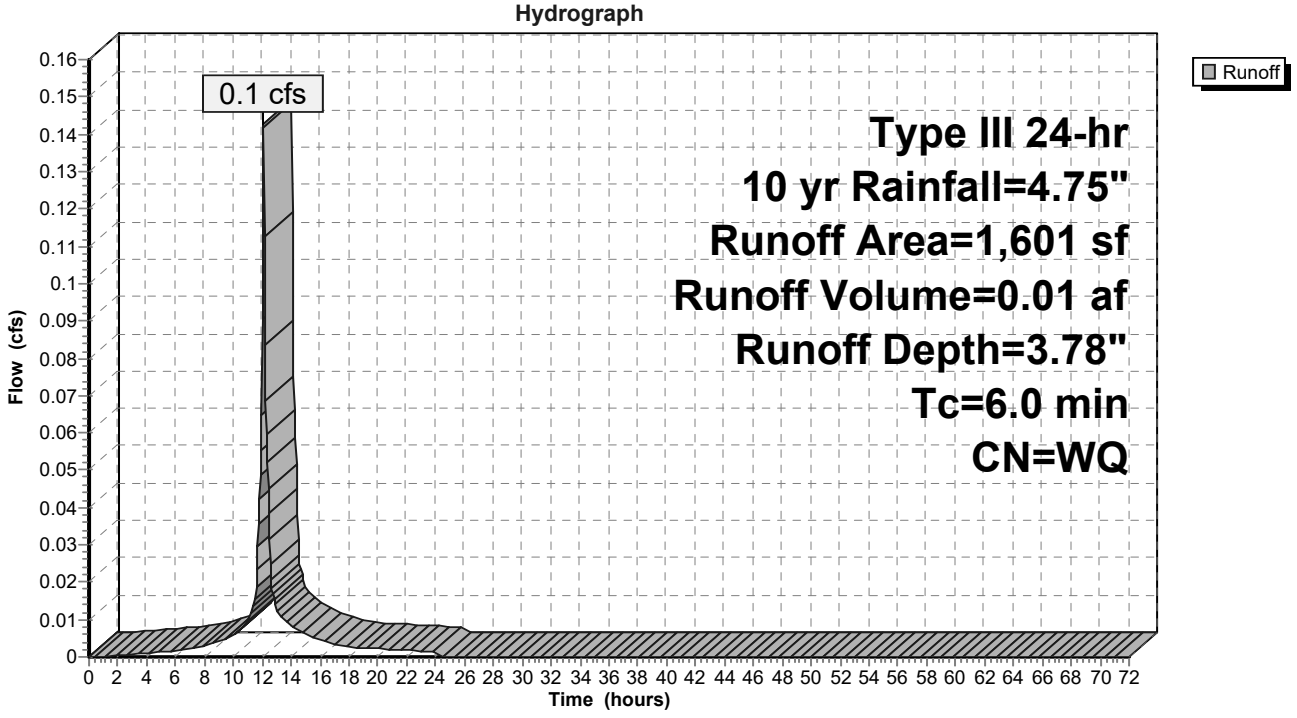
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,104	98	Paved parking HSG C
21	70	Woods, Good HSG C
476	74	>75% Grass cover, Good HSG C
1,601		Weighted Average
497		31.04% Pervious Area
1,104		68.96% Impervious Area

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

Subcatchment 8: Existing Parking Lot



Summary for Subcatchment 9: Existing Parking Lot & Hill Street

CarlsonPlanXYPos|1196689.1438|257672.9627|

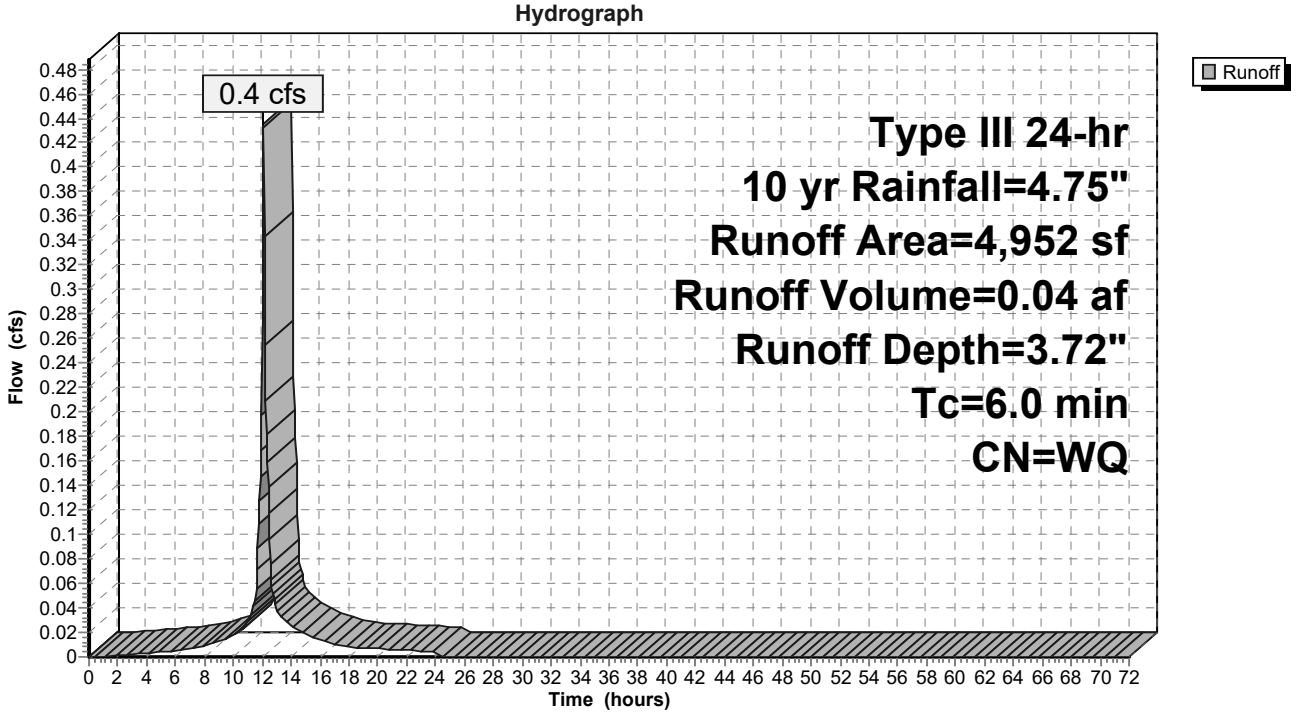
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.04 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
134	98	Roofs HSG C
3,136	98	Paved parking HSG C
1,682	74	>75% Grass cover, Good HSG C
4,952		Weighted Average
1,682		33.97% Pervious Area
3,270		66.03% Impervious Area

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

Subcatchment 9: Existing Parking Lot & Hill Street



Summary for Reach 3R: 8" CPP

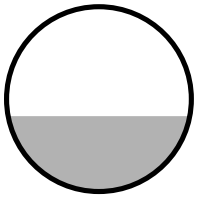
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.162 ac, 50.50% Impervious, Inflow Depth = 3.35" for 10 yr event
Inflow = 0.3 cfs @ 12.25 hrs, Volume= 0.05 af
Outflow = 0.3 cfs @ 12.25 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.2 min

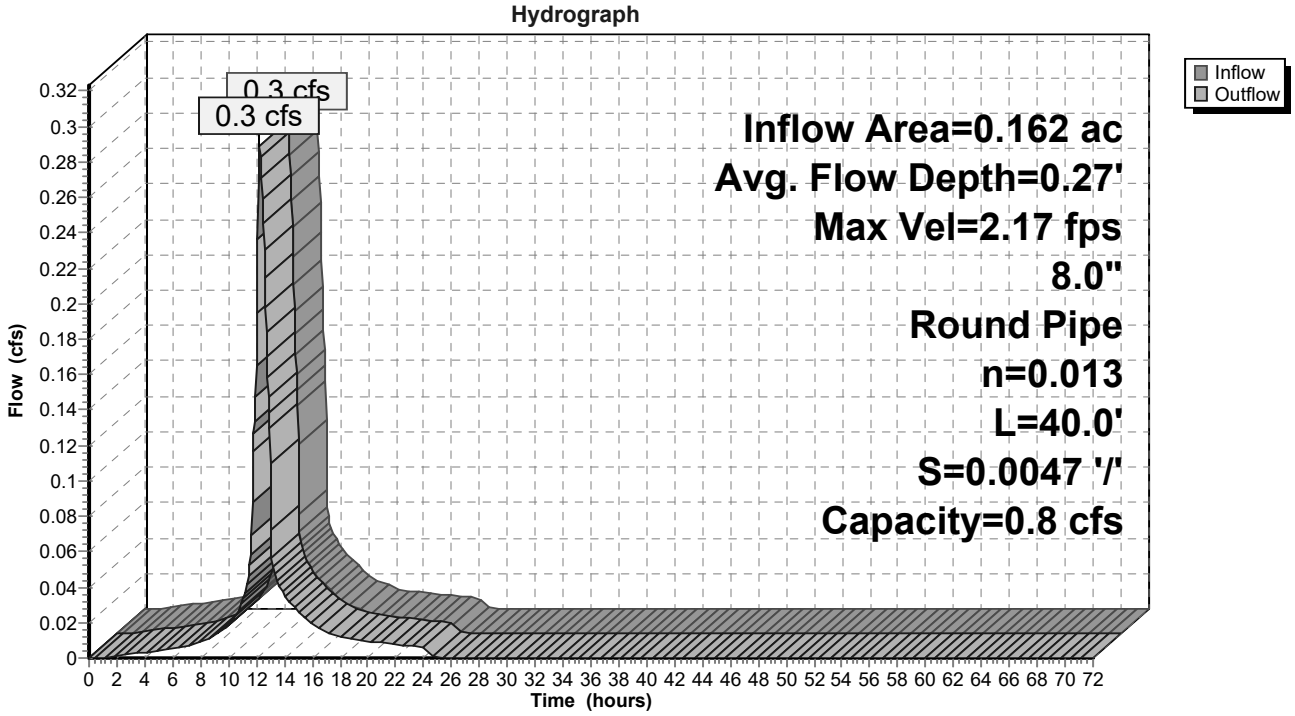
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.17 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 0.9 min

Peak Storage= 5 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.65'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 0.8 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 40.0' Slope= 0.0047 '/'
Inlet Invert= 74.49', Outlet Invert= 74.30'



Reach 3R: 8" CPP



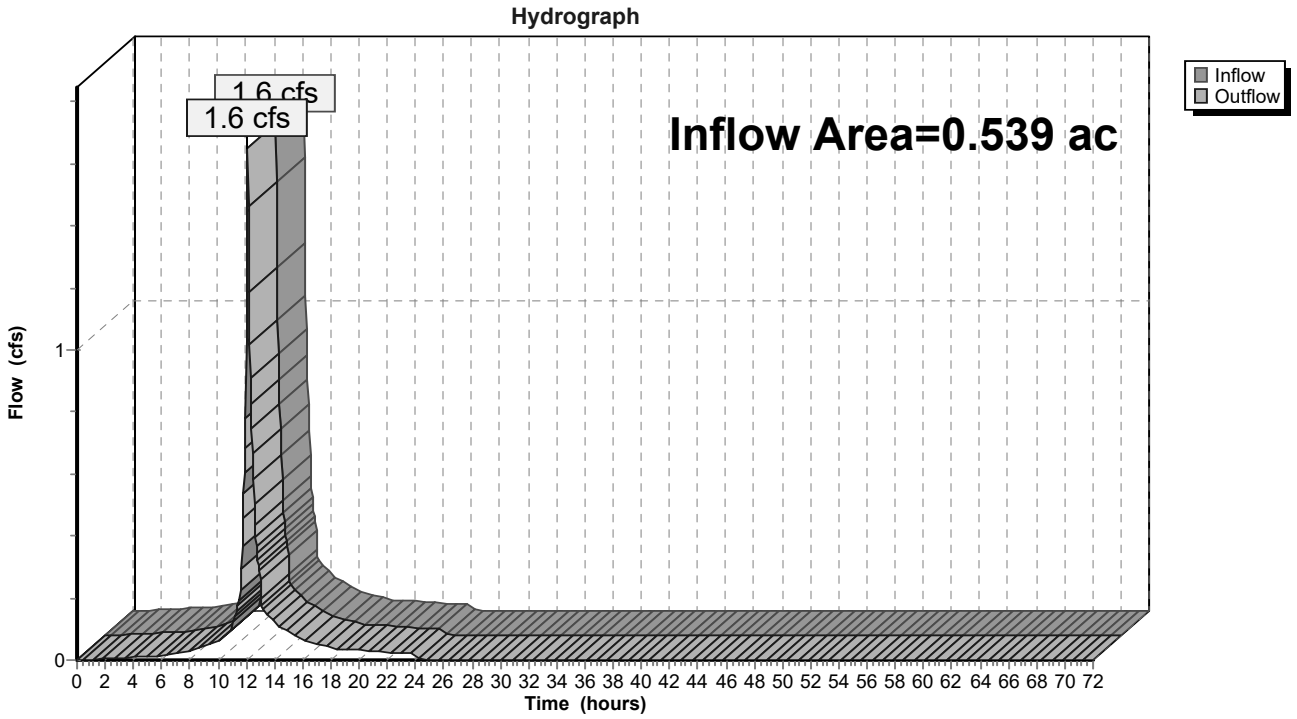
Summary for Reach Combined:

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

Inflow Area = 0.539 ac, 61.70% Impervious, Inflow Depth = 3.48" for 10 yr event
Inflow = 1.6 cfs @ 12.10 hrs, Volume= 0.16 af
Outflow = 1.6 cfs @ 12.10 hrs, Volume= 0.16 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach Combined:



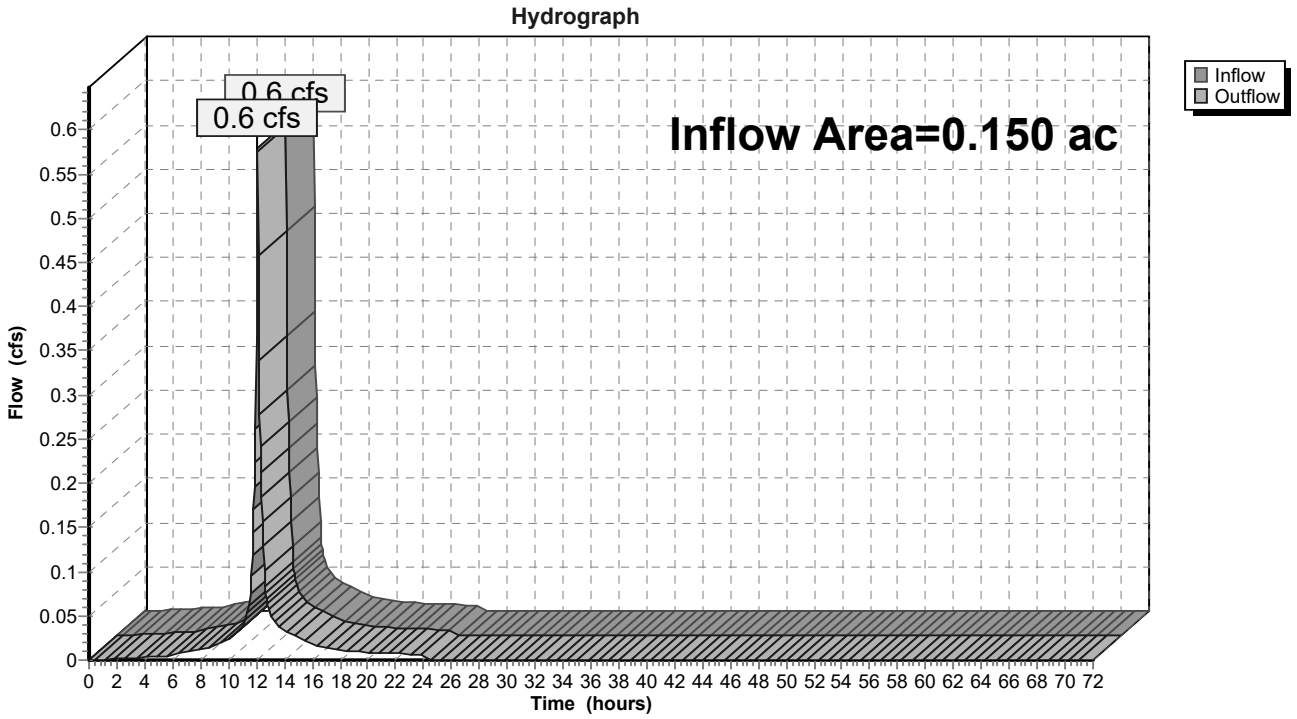
Summary for Reach POA1:

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

Inflow Area = 0.150 ac, 66.75% Impervious, Inflow Depth = 3.70" for 10 yr event
Inflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA1:



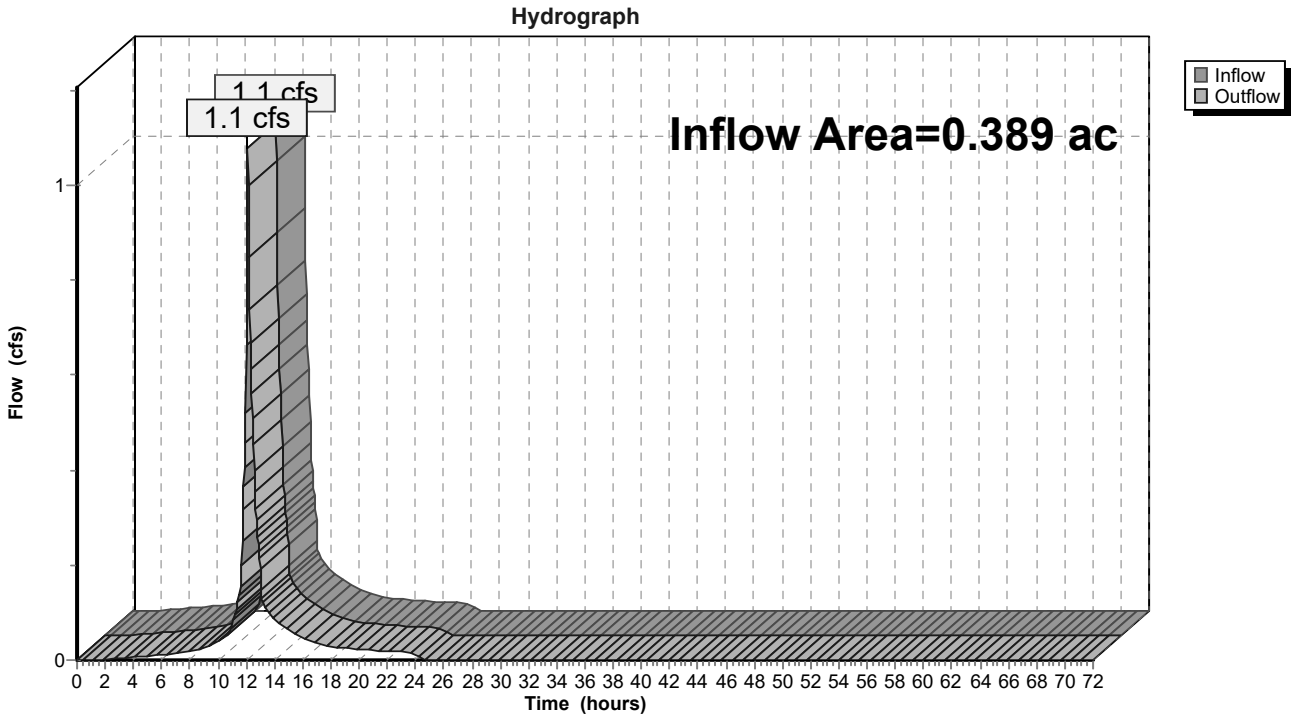
Summary for Reach POA2:

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

Inflow Area = 0.389 ac, 59.75% Impervious, Inflow Depth = 3.39" for 10 yr event
Inflow = 1.1 cfs @ 12.11 hrs, Volume= 0.11 af
Outflow = 1.1 cfs @ 12.11 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA2:



Summary for Pond 2P: Existing Drain Manhole

[57] Hint: Peaked at 74.07' (Flood elevation advised)

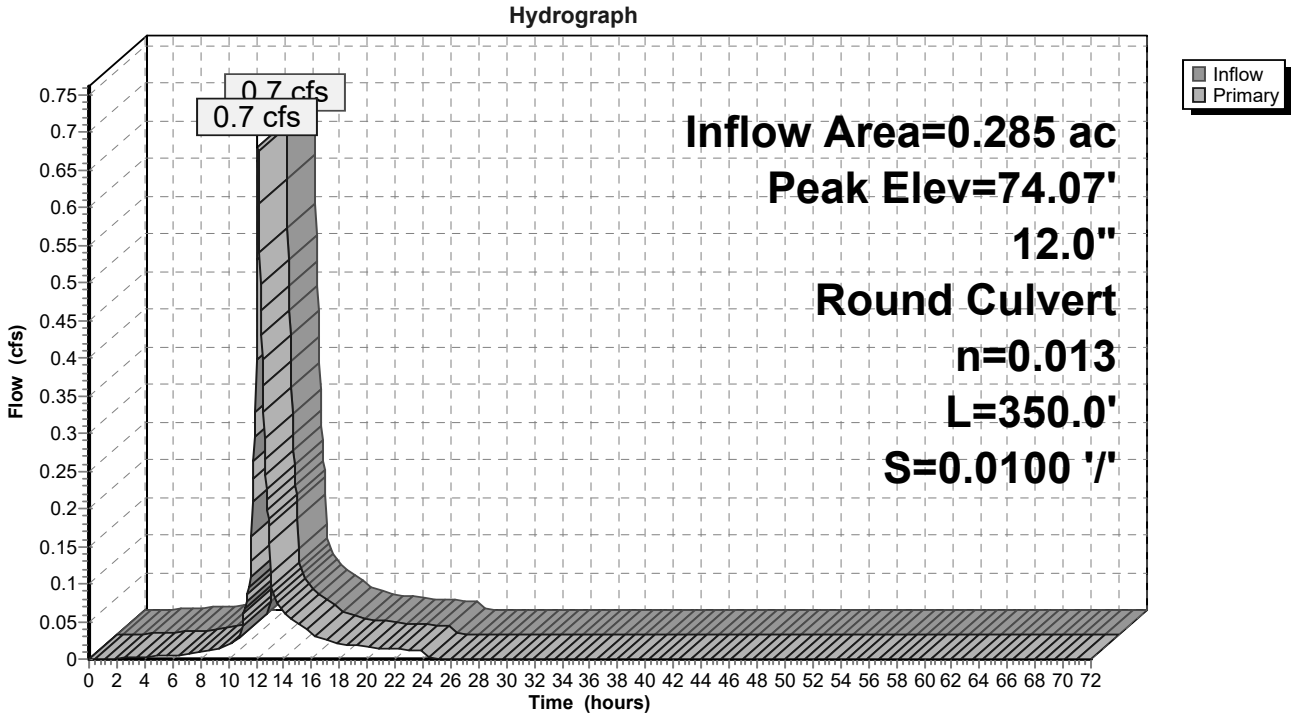
Inflow Area =	0.285 ac,	54.15% Impervious,	Inflow Depth =	3.20"	for 10 yr event
Inflow =	0.7 cfs @	12.13 hrs,	Volume=	0.08 af	
Outflow =	0.7 cfs @	12.13 hrs,	Volume=	0.08 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.7 cfs @	12.13 hrs,	Volume=	0.08 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 74.07' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.60'	**12.0" Round Culvert** L= 350.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.60' / 70.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.7 cfs @ 12.13 hrs HW=74.07' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.7 cfs @ 1.84 fps)

Pond 2P: Existing Drain Manhole



Summary for Pond BR: Bioretention Basin

Inflow Area = 0.123 ac, 58.97% Impervious, Inflow Depth = 3.55" for 10 yr event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af
Outflow = 0.4 cfs @ 12.12 hrs, Volume= 0.03 af, Atten= 5%, Lag= 1.6 min
Primary = 0.4 cfs @ 12.12 hrs, Volume= 0.03 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 77.91' @ 12.12 hrs Surf.Area= 924 sf Storage= 311 cf
Flood Elev= 78.00' Surf.Area= 959 sf Storage= 351 cf

Plug-Flow detention time= 125.2 min calculated for 0.03 af (84% of inflow)
Center-of-Mass det. time= 56.5 min (828.2 - 771.7)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	16 cf	**8.0" Round Pipe Storage** L= 45.0'
#2	75.16'	18 cf	**3/4" Crushed Stone (3" depth) (Irregular)** Listed below (Recalc) 44 cf Overall x 40.0% Voids
#3	75.16'	60 cf	**Filter Course 18" (Irregular)** Listed below (Recalc) 299 cf Overall x 20.0% Voids
#4	76.92'	4 cf	**Loam & Seed (3") (Irregular)** Listed below (Recalc) 41 cf Overall x 10.0% Voids
#5	77.16'	254 cf	**Basin Volume (Conic)** Listed below (Recalc)
		351 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.16	170	108.8	0	0	170
75.42	170	108.8	44	44	198

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.16	170	108.8	0	0	170
76.92	170	108.8	299	299	361

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
76.92	170	108.8	0	0	170
77.16	170	108.8	41	41	196

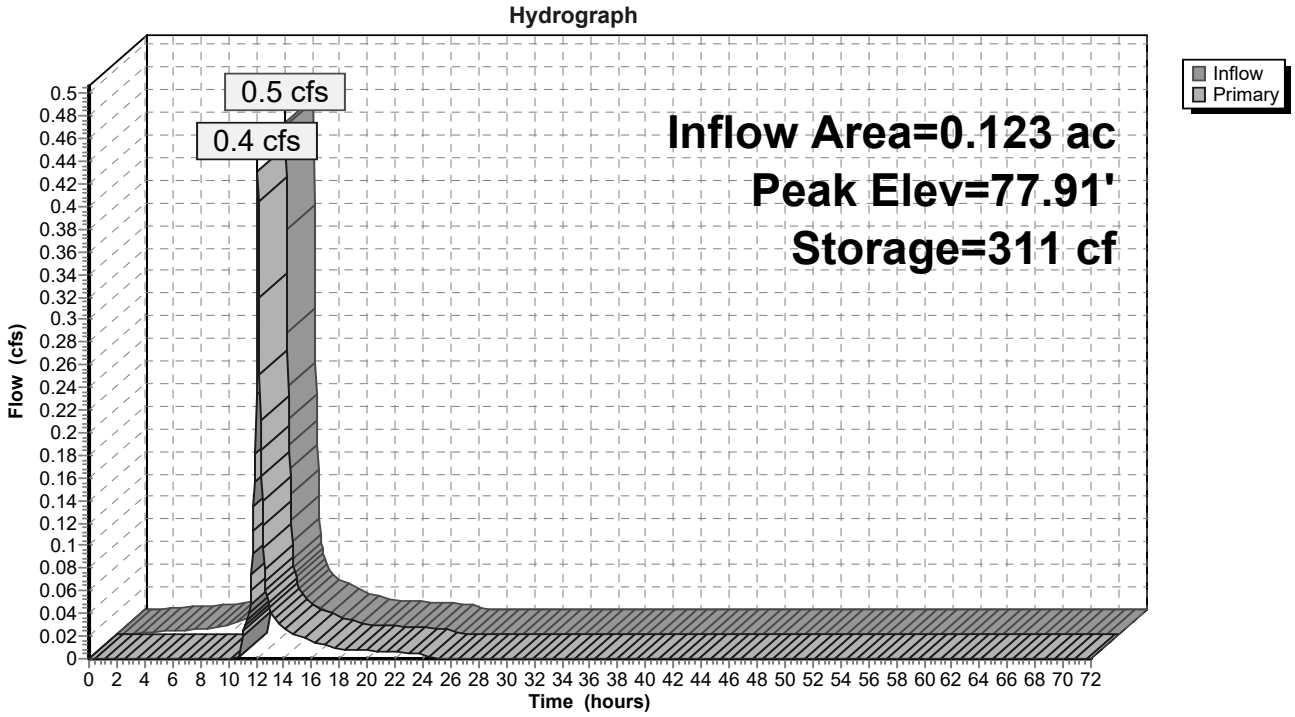
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.16	170	0	0	170
77.50	274	75	75	276
78.00	449	179	254	454

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 74.50' / 74.30' S= 0.0050 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2 Device 1 77.75' **8.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=77.91' TW=74.07' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.4 cfs of 5.1 cfs potential flow)
└─**2=Grate** (Weir Controls 0.4 cfs @ 1.29 fps)

Pond BR: Bioretention Basin



Summary for Pond CB: CB#3701

[57] Hint: Peaked at 73.47' (Flood elevation advised)

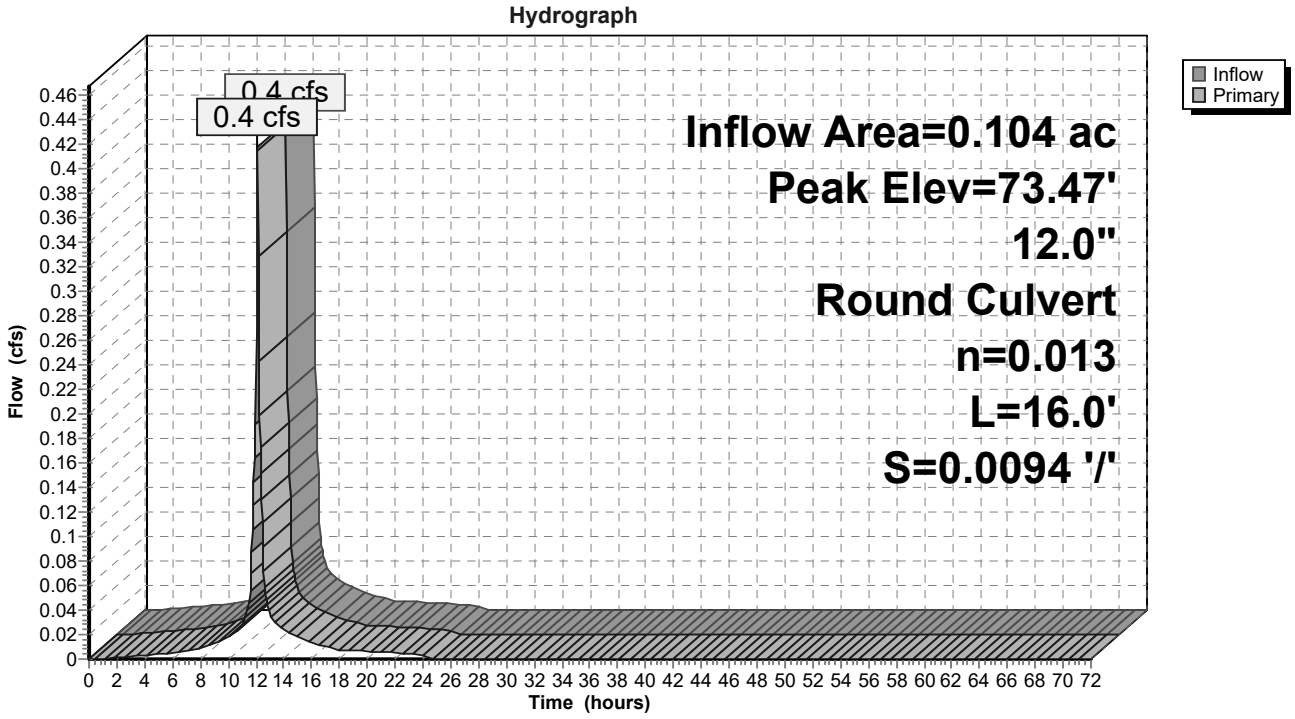
Inflow Area =	0.104 ac,	75.16% Impervious,	Inflow Depth =	3.93"	for 10 yr event
Inflow =	0.4 cfs @	12.09 hrs,	Volume=	0.03 af	
Outflow =	0.4 cfs @	12.09 hrs,	Volume=	0.03 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.4 cfs @	12.09 hrs,	Volume=	0.03 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 73.47' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.10'	**12.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.10' / 72.95' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.09 hrs HW=73.46' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.4 cfs @ 2.34 fps)

Pond CB: CB#3701



Summary for Pond LS: Level Spreader

Inflow Area = 0.037 ac, 68.96% Impervious, Inflow Depth = 3.78" for 10 yr event
Inflow = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af
Outflow = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af, Atten= 0%, Lag= 0.1 min
Primary = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 73.92' @ 12.09 hrs Surf.Area= 63 sf Storage= 18 cf

Plug-Flow detention time= 37.7 min calculated for 0.01 af (97% of inflow)
Center-of-Mass det. time= 17.6 min (782.6 - 765.1)

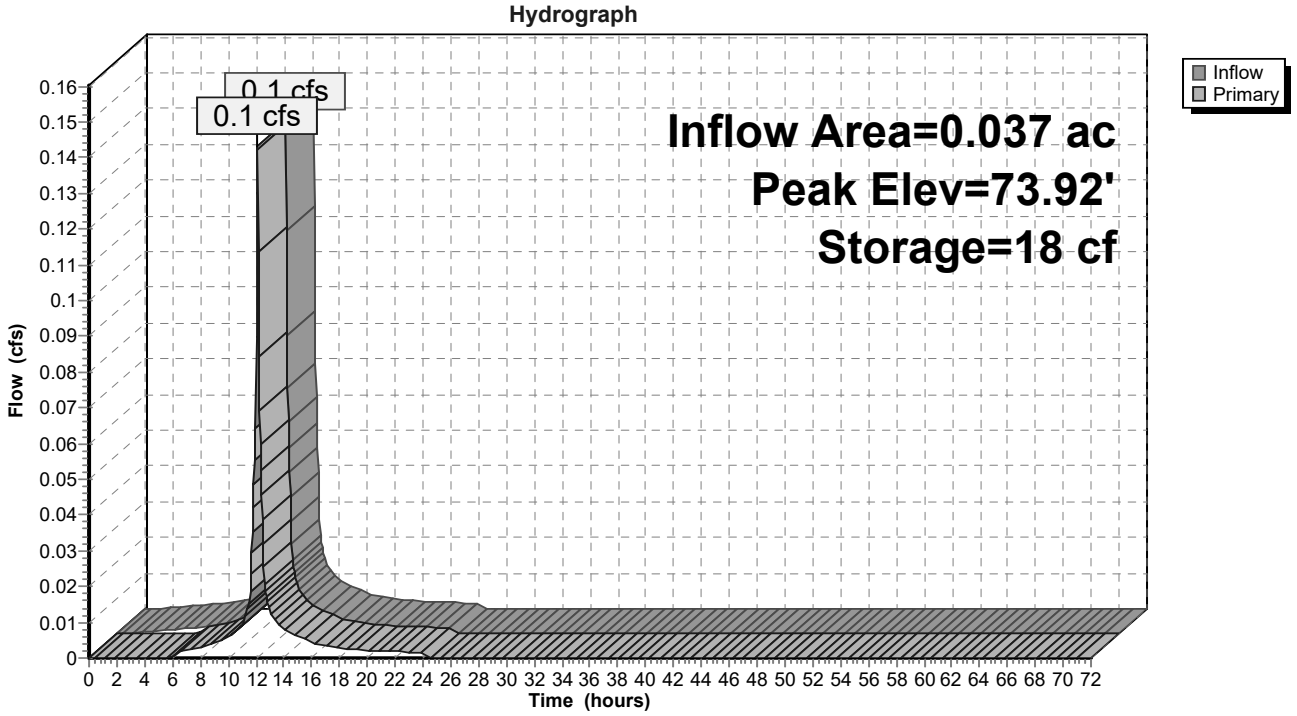
Volume	Invert	Avail.Storage	Storage Description
#1	73.50'	23 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.50	22	0	0
74.00	71	23	23

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**23.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.1 cfs @ 12.09 hrs HW=73.92' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.1 cfs @ 0.35 fps)

Pond LS: Level Spreader



Summary for Pond PP: Proposed Porous Pavement

Inflow Area = 0.162 ac, 50.50% Impervious, Inflow Depth = 3.35" for 10 yr event
Inflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.3 cfs @ 12.25 hrs, Volume= 0.05 af, Atten= 49%, Lag= 9.5 min
Primary = 0.3 cfs @ 12.25 hrs, Volume= 0.05 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 75.04' @ 12.25 hrs Surf.Area= 5,820 sf Storage= 278 cf
Flood Elev= 76.70' Surf.Area= 11,640 sf Storage= 1,928 cf

Plug-Flow detention time= 12.8 min calculated for 0.05 af (100% of inflow)
Center-of-Mass det. time= 12.9 min (791.0 - 778.0)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	36 cf	**4.0" Round Pipe Storage** L= 413.0'
#2	74.83'	198 cf	**3/4" Crushed Stone 2" (Irregular)** Listed below (Recalc) 495 cf Overall x 40.0% Voids
#3	75.00'	1,164 cf	**Filter Course 12" (Irregular)** Listed below (Recalc) 2,910 cf Overall x 40.0% Voids
#4	76.00'	146 cf	**Filter Blanket (3" of Pea Gravel) (Irregular)** Listed below (Recalc) 728 cf Overall x 20.0% Voids
#5	76.25'	384 cf	**Reservoir Course (4" crushed stone) (Irregular)** Listed below (Recalc) 960 cf Overall x 40.0% Voids
		1,928 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.83	2,910	230.6	0	0	2,910
75.00	2,910	230.6	495	495	2,949

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	2,910	230.6	0	0	2,910
76.00	2,910	230.6	2,910	2,910	3,141

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
76.00	2,910	230.6	0	0	2,910
76.25	2,910	230.6	728	728	2,968

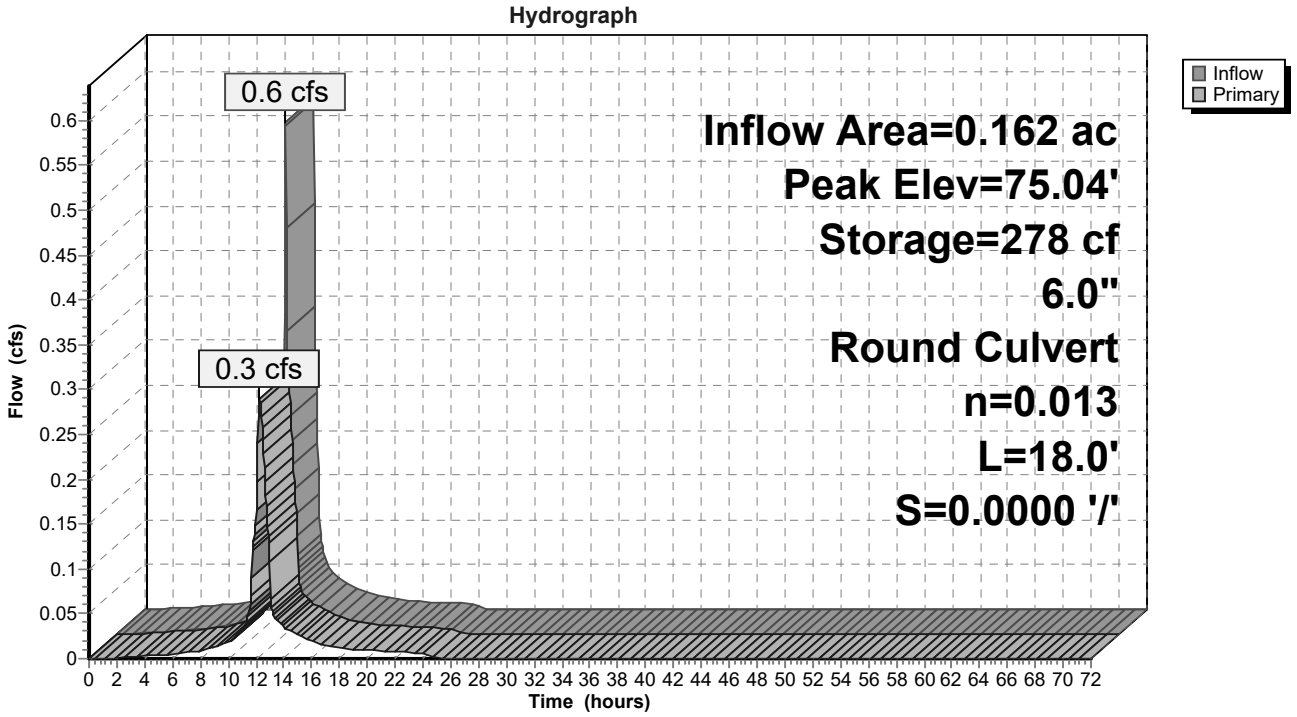
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
76.25	2,910	230.6	0	0	2,910
76.58	2,910	230.6	960	960	2,986

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	**6.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 74.50' / 74.50' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.3 cfs @ 12.25 hrs HW=75.04' TW=74.76' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.3 cfs @ 1.70 fps)

Pond PP: Proposed Porous Pavement



APPENDIX A 5

STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE MANUAL

96 BROADWAY
PREPARED FOR:
RYAN ESCHBACH
96 BRAODWAY
DOVER, NH
STRAFFORD COUNTY

April 2026

PREPARED BY:

NORWAY PLAINS ASSOCIATES, INC.

Hilary Badger, P.E.
N.H. Reg. #18290

2 CONTINENTAL BOULEVARD, P.O. BOX 249, ROCHESTER, NEW HAMPSHIRE 03866-0249 (603) 335-3948

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APPENDICES

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STORMWATER MANAGEMENT SYSTEM: INSPECTION & MAINTENACE LOG A-1
CONTROL OF INVASIVE SPECIES A-2
DE-ICING LOG A-3

1.0 INTRODUCTION:

The purpose of this Manual is to:

1) Make the Property Owner/Facility Operator explicitly aware of the maintenance responsibility that goes along with the design prepared for them at the site located at 96 Broadway, Dover NH.

2) Provide maintenance and inspection guidelines to be followed by this property owner, their successors and assigns and the agents thereof.

1.1 SUMMARY OF STORMWATER MANAGEMENT PRACTICES ON-SITE:

There are two (2) primary stormwater management practices employed on the site that will require routine inspection and maintenance to insure proper functioning of stormwater controls into the future.

1) Porous Pavement
2) Bioretention Basin

1.2 RESPONSIBLE PARTIES:

Property Owner:
Ryan Eschbach
US Route 1, Apt. 1C
York, ME 03909
(248) 225-6538
ryanesch@mac.com

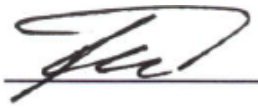
1.3 TRANSFER OF RESPONSIBILITY:

In the event that the property is sold or transferred to another party, the Town of Lee shall be notified of the transfer of ownership and responsibility for the stormwater management practices discussed in this manual. The mailing address for Town of Lee is:

City of Dover
Planning and Community Development
288 Central Avenue
Dover, NH 03820
(603) 516-6008

1.4 LONGTERM AGREEMENT

I the undersigned have read this inspection and maintenance manual. With the signature below I acknowledge that it my responsibility to maintain or have maintained by qualified professionals all of the stormwater management practices outlined in this manual for perpetuity and that all successors and assigns of myself will be responsible for inspection and maintenance of the stormwater management practices as well. I also acknowledge that it is my responsibility to document any transfer of ownership and responsibility with the City of Dover.



4-7-26

Ryan Eschbach

Date

2.0 INSPECTION & MAINTENANCE (CONSTRUCTION):

During Construction it is important to maintain the site where construction is ongoing in a manner that minimizes tracking of silt, sediment and construction materials both onto the base and sub-base for pavement areas and the completed pavement areas as well as the bottoms of all of the infiltration practices. Sediment should be monitored at all Silt Fence throughout construction and excessive build up should be removed and disposed of in accordance with state and local requirements.

2.1 INSPECTION (CONSTRUCTION):

1) The Site Construction Contractor Shall perform a daily inspection of the entire site to insure that construction activities as not impacting:

    a. Areas not currently under construction

    b. Areas under construction but sensitive to sediment and silt deposition
        - Gravel and crushed gravel base courses of the Pavement
        - Bioretention Basin

2) The Site Superintendent or his designee shall walk the perimeter of the site taking note of any sedimentation /siltation that may be occurring.

3) All silt fences shall be inspected weekly and after each rain event.

4) The Stabilized Construction Entrances shall be inspected daily to insure any mud, sediment and or silt is not tracked off site and is limited on site.

2.2 MAINTENANCE (CONSTRUCTION):

The Site Construction Contractor shall be responsible for all erosion and sediment control devices during construction. Refer to the Plan Set "96 BROADWAY, 96 BROADWAY, DOVER, NH, PREPARED FOR 96 BROADWAY LLC".

1) For all best management practices (BMP's) locations, details on proper installation and, construction sequencing.

2) In an effort to limit travel on the bioretention basin area, this area should be constructed early in the construction sequence and stabilized as soon as possible.

3) If silt, sand or sediment becomes noticeably deposited on areas of travel not within the work zone these areas shall be swept or cleaned as appropriate.

3.0 INSPECTION & MAINTENANCE (OPERATION):

To insure the prolonged operational life of all of the stormwater management practices employed on the site it is imperative that a logical and thorough inspection and maintenance plan be implemented. The following sections outline the Inspection & Maintenance Schedule and methods to be employed on site after the completion of construction during the operational life of individual stormwater management practices employed.

3.1 GENERAL SITE:

The site shall undergo general inspection as follows (see Appendix A-1 for Stormwater Management Practices, Inspection & Maintenance Checklist):

1) **Litter and Trash pick-up and removal:**
   a. **Inspection Frequency:**
      - Weekly

   b. **Minimum Inspection Requirements:**
      - Inspect the site within the limits of the lawn areas for blown or loose litter.

   c. **Maintenance/Cleanout Threshold:**
      - Clean as required;
      - Clean when visually apparent litter or trash spillage occurs.

3.2 STANDARD ASPHALT AND POROUS ASPHALT PAVEMENT AREAS:

The proposed driveways and parking areas shall undergo inspection as follows (see Appendix A-1 for Stormwater Management Practices, Inspection & Maintenance Checklist)

1) **Standard Asphalt Pavement:**
   a. **Inspection/Maintenance Frequency:**
      - At least 1 time per year, preferably 2 times a year (Early Spring prior to May 15 and Fall prior to October 15).

   b. **Minimum Inspection Requirements:**
      - Mandatory sweeping performed by a qualified professional
      - Typical street sweeping equipment is acceptable for sweeping paved driveway only.

2) **Porous Asphalt Pavement:**
   a. **Inspection/Maintenance Frequency:**
      - 2 times a year (Early Spring after April 15, Late Fall after October 15) mandatory sweeping
      - Periodic inspection (during rain event) to ensure the pavement drains effectively during and after storms.
   b. **Minimum Inspection Requirements:**
      - The pavement shall be inspected for areas of damage including spalling or deterioration;
      - Areas found to be damaged shall be noted for repair at the earliest convenience.
   c. **Maintenance/Cleanout Threshold:**
      - Quarterly Vacuum Sweeping by qualified professional
      - Power washing maybe required prior to vacuum sweeping to dislodge trapped particles
      - In areas irreparably damaged, standard HMA can be used to patch (not to exceed 10% of porous parking bay)
      - Never re-seal porous pavement with HMA or other impermeable material.
3) **De-icing Agents:**
   The use of sand as a de-icing agent is prohibited. **SAND CANNOT** be used in conjunction with porous pavement. It will clog the open pore structure of the pavement and cause premature failure of the surface leading to replacement.

a. Inspection/Maintenance Frequency:

- After every plowing, the site manager shall inspect the parking area to ensure that sand was not applied.

b. Minimum Inspection/Maintenance Requirements:

- No winter sanding is permitted.
- In the event that sand has been applied, the plowing contractor shall be contacted to ensure that sand is not employed on site again.
- Salt shall be applied only as necessary. This will vary depending on sun exposure. The use of salt shall be minimized.

c. Maintenance Threshold:

- After plowing of appreciable snow

3.3 BIORENTION BASIN

The Bioretention Basin shall undergo inspection as follows (see Appendix A-1 for Stormwater Management Practices, Inspection & Maintenance Checklist)

1) Bioretention Basins:

a. Inspection/Maintenance Frequency:

- Inspect pretreatment measures (i.e. stone outlet protection.) Bi-annually. Once in the spring prior to May 15 and once in the fall prior to October 15.
- Inspect infiltration surface bi-annually. Once in the spring prior to May 15 and once in the fall prior to October 15.
- Inspect garden bottom after any rainfall event of 2.5-inches in a 24-hour period or greater.
- Conduct annual inspections of the vegetation, and maintained in healthy conditions, including pruning, removal and replacement of dead or diseased vegetation, and removal of invasive species.

b. Minimum Inspection/Maintenance Requirements:

- Remove and dispose of accumulated sediment based on inspection. Repair area of removal as necessary to restore infiltration capacity.
- Perform maintenance and rehabilitation based on inspections.
- Remove debris (if any) from rain garden inlet or overflow outlet structure based on inspection.
- If the infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional (i.e. professional engineer, certified soils scientist, etc.) should assess the condition of the facility to determine measures required to restore infiltration function, including but not limited to removal of accumulated sediments or replacement of the bioretention basin soil mixture.

3.4 UNDERDRAIN SYSTEM:

The Underdrain System shall undergo inspection as follows (see Appendix A-1 for Stormwater Management Practices).

1) Manifold Manhole (outlet structure):

a. Inspection/Maintenance Frequency:

- At least 2 times per month
- Inspect manhole after any rainfall event of 2.5-inches in a 24-hour period or greater.

b. **Minimum Inspection/Maintenance Requirements:**
   - Check for sediment accumulation;
   - Filters to be cleaned out.

c. **Maintenance/Cleanout Threshold:**
   - Remove and dispose of all accumulated sediment based on inspection.

2) **Drainage pipes:**

a. **Inspection/Maintenance Frequency:**
   - 1 time every 2 years (Early Spring after April 15 or Fall after October 15) same time as the pavement sweeping

b. **Minimum Inspection/Maintenance Requirements:**
   - Check for sediment accumulation;
   - Check for clogging

c. **Maintenance/Cleanout Threshold:**
   - Sediment depth ≥ 1-inch
   - Clogged

3.5 SEDIMENT & WASTE MATERIAL DISPOSAL:

All material removed from the PAVEMENT and the STORMWATER MANAGEMENT PRACTICES on site shall be disposed of in accordance with local, state and federal regulations offsite.

3.6 QUALIFIED STORMWATER SYSTEM MAINTENANCE SERVICE:

It is strongly recommended that the maintenance of the Stormwater Management Practices outlined above, excepting the General Site Maintenance, be performed by a qualified company such as:

Stormwater Compliance, LLC
8 Blue Moon Drive
North Yarmouth, ME 04097
207-712-7181
info@stormwatercomp.com

Companies of this nature have all of the necessary equipment to maintain closed drainage systems.

3.7 CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in Appendix A-2. They should be controlled as described by Douglas Cygan with New Hampshire Department of Agriculture, Markets & Food, 603-271-3488, doug.cygan@agr.nh.gov

4.0 RECORD KEEPING; LONG TERM INSPECTION & MAINTENANCE:

Inspection and maintenance logs for stormwater practices employed by new development and re-development with substantial stormwater management infrastructure shall be kept and provided to representative of the City of Dover upon request.

APPENDIX A-1:

STORMWATER MANAGEMENT SYSTEM: INSPECTION & MAINTENANCE CHECKLIST

STORMWATER MANAGEMENT SYSTEM: INSPECTION AND MAINTENANCE LOG

Appendix A- 1
Stormwater Management System:
Inspection and Maintenance Checklist

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
General Site:			
Litter and Trash pick-up	Weekly	• Inspect the site within the limits of the lawn areas for blown or loose litter.	• Clean as required • Clean when visually apparent litter or trash spillage has occurred
Control of Invasive Species	Monthly	• Inspect the site where plantings have occurred for any species listed in appendix A-2.	• Disposed of the invasive species in accordance with A-2.
Driveway and Parking Areas:			
Standard Pavement Driveway	• At least 1 time per year, preferably 2 times/year (Early Spring prior to May 15 and Fall prior Oct. 15) •	• Mandatory sweeping performed by a qualified professional* • Typical street sweeping equipment is acceptable for sweeping the paved areas. •	• N/A
Porous Asphalt Paved Surface	• 2 times/year (Early Spring after April 15 and Late Fall after Oct. 15) • Periodically, (during rain events) to ensure proper drainage of porous pavement	• Inspect for areas of damage (including spalling and deterioration) • Damaged areas should be noted for repair at earliest convenience	• Quarterly Vacuum Sweeping by qualified professional • Power washing maybe required prior to vacuum sweeping to dislodge trapped particles • In areas irreparably damaged, standard HMA can be used to patch (not to exceed 10% of porous parking bay) • Never re-seal porous pavement with HMA or other impermeable material
De-icing Agent Application	• After every plowing, the site manager shall inspect the parking area to determine the need for sand application.	• NO winter sanding is permitted; application of sand shall be brought up with the plowing company and is not to happen again. • Salt shall be applied as necessary; amount will vary with sun exposure. • Use of salt shall be minimized	• After plowing of appreciable snowfall
Stormwater Management Practices:			
Drainage Pipes	• 1 time every 2 years (Early Spring after April 15 or Fall after October 15)	• Check for sediment accumulation; • Check for clogging	• Sediment depth $\geq$ 1-inch • Clog

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
Underdrain system:	• At least two times per month and after any rain events greater than 2.5 inches	• Check for sediment accumulation; • Check for floatable contaminants (i.e. oils etc.) Check for floatable trash (i.e. cigarette butts, paper etc.)	• If any ponding water is observed, inspection of cleanouts shall occur.
Bioretention Basin	• Water the grasses as needed following construction. • Conduct inspections after rainfall. • Conduct routine maintenance monthly. • Inspect all of the vegetation semi-annually during first year and annually after. •	• Water to promote plan growth and survival, mainly during the first two years and during dry periods. • Inspect site following rainfall events. Add/replace vegetation in any eroded areas. • Prune and weed swale to maintain appearance. Remove accumulated trash and debris. Replace mulch as needed. • Inspect inflow area for sediment accumulation. Remove any accumulated sediment or debris. • Inspect site for erosion as well as sediment and mulch which have been moved around in the garden. Add/replace vegetation in any eroded areas. • Inspect rain garden for dead or dying vegetation. Replace vegetation as needed. • Test planting bed for pH. If the pH is below 5.2, limestone should be applied. If the pH is about 8.0, iron sulfate and sulfur should be applied. • Remove and replace bioretention soil mixture if basin does not drain after 72-hours after a rain event.	• N/A

Regular Inspection and Maintenance Guidance for Permeable Pavements

Regular inspection and maintenance is critical to the effective operation of permeable pavement. It is the responsibility of the owner to maintain the pavement 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, seasonal changes, and traffic conditions.

ACTIVITIES

Visual inspections are an integral part of system maintenance. This includes monitoring pavement to ensure water drainage, debris accumulation, and surface deterioration.

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
Adjacent vegetated areas show no signs of erosion and run-on to permeable pavement. **Remedy:** Repair or replace any damaged structural parts.	Whenever vacuuming adjacent permeable pavements
Adjacent non-permeable sections of pavement are clean of debris to prevent debris tracking. **Remedy:** Vacuuming adjacent pavement non-permeable pavement can be effective at minimizing run-on.	
Check for standing water remaining on the surface of the pavement after a precipitation event within 30 minutes. **Remedy:** Use of a power washer or compressed air blower at an angle of 30 degrees or less can be effective, particularly in combination with a vacuum or vacuum sweeper.	1-2 times per year, more frequently for high-use sites or sites with higher potential for run-on
Check for debris accumulation, particularly in the winter. **Remedy:** Loose debris such as leaves or trash can be removed using a power/leaf blower or gutter broom. Fall and spring cleanup should be accompanied by pavement vacuuming.	
Accumulation of sediment and organic debris on the pavement surface. **Remedy:** Regular use of a vacuum sweeper can remove sediment and organic debris. The sweeper may be fitted with water jets.	
PAVEMENT CONDITION	
Check for accumulation of snow or other stockpiles of materials such as sand/salt, mulch, soil, yard waste, etc. Stockpiling of these materials on permeable pavements can lead to premature clogging. **Remedy:** Remove stockpile if possible and check for clogging in storage area.	As Needed
Damage to pavement **Remedy:** Repairs should be repaired as they are identified	

CHECKLIST FOR INSPECTION OF PERMEABLE PAVEMENT

Location:
Inspector:
Date:
Time:
Site Conditions:
Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1. Salt / Deicing (Winter/Spring)		
Use salt only for ice management	**S U**	
Accumulated salt removed in spring	**S U**	
2. Debris Cleanup (1-2 times per year minimum, Spring/Fall)		
Remove sediment and organic debris using vacuum street sweeper	**S U**	
Clean catch basins (if available)	**S U**	
3. Controlling Run-On		
Adjacent vegetated areas show no signs of erosion and run-on to permeable pavement	**S U**	
4. Outlet / Catch Basin Inspection (if available) (1-2 times per year, after large storm events)		
No evidence of blockage	**S U**	
Good condition, no need for cleaning/repair	**S U**	
5. Poorly Drained Pavement		
Recently cleaned and vacuumed	**S U**	
6. Pavement Condition		
No evidence of deterioration	**S U**	
7. Signage / Stockpiling (As Needed)		
No evidence of damage	**S U**	
Proper signage posted indicating usage for traffic load	**S U**	
No stockpiling of materials and other unauthorized uses	**S U**	

Corrective Action Needed	Due Date
1.	
2.	
3.	
Inspector's Signature	Date

Stormwater Management System Inspection & Maintenance Log

Date Inspected	Inspector	Cleaning/Repair Needed (List Items/Comments)	Date of Cleaning repair	Performed By

Stormwater Management System Inspection Photos:

APPENDIX A-2:

CONTROL OF INVASIVE PLANTS

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.

Background:

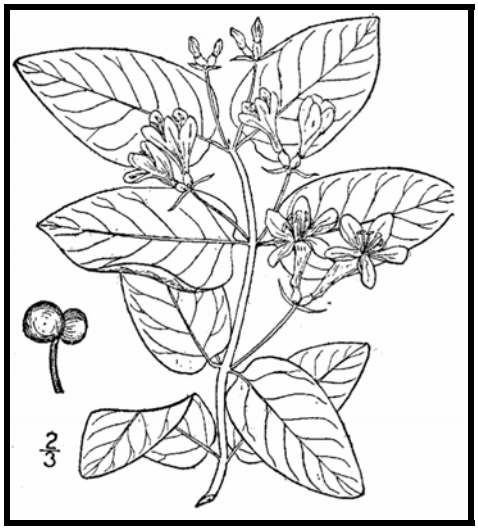
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, 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.

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

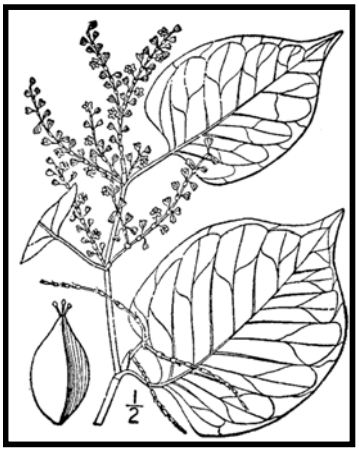
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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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APPENDIX A-3:

DE-ICING LOG

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied

APPENDIX A 6

APPENDIX A 6.1

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	43.204 degrees North
Longitude	70.87 degrees West
Elevation	20 feet
Date/Time	Fri Apr 03 2026 12:11:28 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	2.00	2.60	2.87	**1yr**	2.30	2.76	3.16	3.89	4.46
2yr	0.32	0.49	0.61	0.81	1.01	1.29	**2yr**	0.88	1.17	1.50	1.92	2.45	3.15	3.52	**2yr**	2.79	3.38	3.88	4.61	5.25
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.39	3.08	3.98	4.50	**5yr**	3.53	4.33	4.95	5.82	6.58
10yr	0.40	0.64	0.80	1.09	1.42	1.85	**10yr**	1.23	1.69	2.18	2.83	3.66	4.75	5.43	**10yr**	4.21	5.22	5.97	6.94	7.81
25yr	0.46	0.74	0.94	1.30	1.73	2.27	**25yr**	1.49	2.09	2.70	3.53	4.61	6.00	6.97	**25yr**	5.31	6.70	7.65	8.78	9.80
50yr	0.52	0.83	1.06	1.49	2.01	2.67	**50yr**	1.73	2.46	3.19	4.19	5.50	7.17	8.42	**50yr**	6.35	8.09	9.22	10.48	11.64
100yr	0.58	0.94	1.21	1.71	2.33	3.13	**100yr**	2.01	2.89	3.76	4.97	6.53	8.57	10.17	**100yr**	7.58	9.78	11.13	12.53	13.84
200yr	0.65	1.05	1.37	1.96	2.71	3.69	**200yr**	2.34	3.41	4.44	5.90	7.79	10.24	12.29	**200yr**	9.06	11.81	13.43	14.98	16.46
500yr	0.76	1.25	1.63	2.37	3.32	4.56	**500yr**	2.86	4.23	5.52	7.39	9.82	12.97	15.79	**500yr**	11.48	15.18	17.23	18.98	20.71

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	0.92	1.25	1.57	2.15	2.45	**1yr**	1.90	2.35	2.88	3.37	4.04
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.36	1.83	2.35	3.05	3.41	**2yr**	2.70	3.28	3.76	4.48	5.06
5yr	0.35	0.54	0.67	0.92	1.16	1.40	**5yr**	1.01	1.37	1.61	2.14	2.77	3.71	4.13	**5yr**	3.29	3.97	4.62	5.41	6.11
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.44	3.12	4.27	4.78	**10yr**	3.78	4.60	5.32	6.24	7.00
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.83	3.64	4.93	5.78	**25yr**	4.37	5.56	6.49	7.53	8.40
50yr	0.48	0.73	0.91	1.31	1.76	2.19	**50yr**	1.52	2.14	2.35	3.18	4.09	5.63	6.66	**50yr**	4.98	6.40	7.53	8.68	9.62
100yr	0.54	0.81	1.02	1.47	2.01	2.51	**100yr**	1.74	2.45	2.63	3.56	4.56	6.40	7.66	**100yr**	5.66	7.37	8.73	10.00	11.01
200yr	0.60	0.90	1.13	1.64	2.29	2.87	**200yr**	1.98	2.81	2.93	3.98	5.09	7.28	8.82	**200yr**	6.44	8.48	10.11	11.53	12.61
500yr	0.69	1.03	1.33	1.93	2.75	3.46	**500yr**	2.37	3.38	3.39	4.61	5.90	8.59	10.61	**500yr**	7.61	10.20	12.28	13.93	15.05

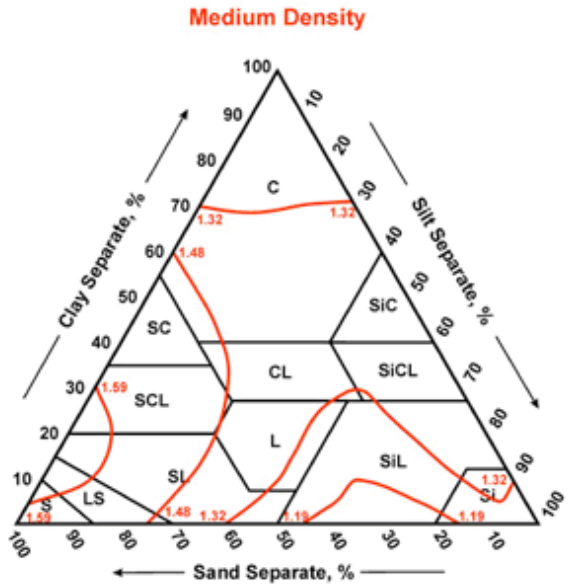
Upper Confidence Limits

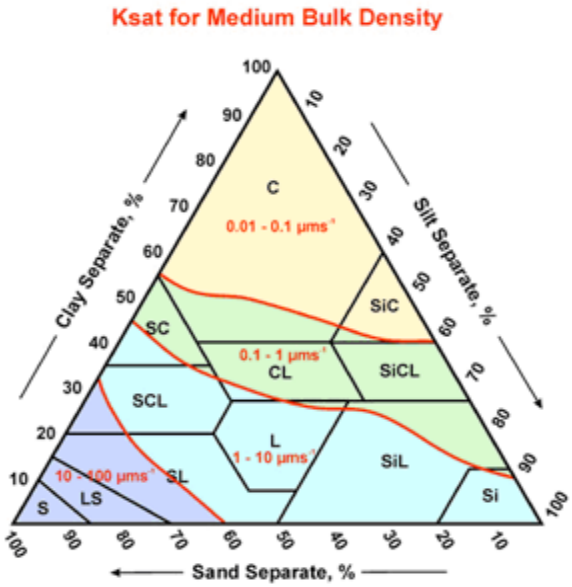
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.74	2.21	2.88	3.10	**1yr**	2.55	2.98	3.44	4.23	4.82
2yr	0.33	0.51	0.62	0.85	1.04	1.25	**2yr**	0.90	1.22	1.48	1.95	2.51	3.30	3.64	**2yr**	2.92	3.50	4.01	4.76	5.46
5yr	0.39	0.61	0.75	1.03	1.31	1.58	**5yr**	1.13	1.55	1.86	2.50	3.20	4.25	4.88	**5yr**	3.76	4.69	5.30	6.25	7.02
10yr	0.46	0.70	0.87	1.22	1.57	1.92	**10yr**	1.36	1.88	2.23	3.04	3.86	5.22	6.09	**10yr**	4.62	5.86	6.71	7.68	8.56
25yr	0.56	0.85	1.05	1.50	1.98	2.48	**25yr**	1.71	2.43	2.88	3.96	4.96	7.07	8.20	**25yr**	6.26	7.88	9.00	10.11	11.15
50yr	0.64	0.98	1.22	1.75	2.36	3.00	**50yr**	2.04	2.93	3.50	4.83	6.03	8.73	10.28	**50yr**	7.72	9.88	11.26	12.44	13.64
100yr	0.75	1.13	1.42	2.05	2.81	3.62	**100yr**	2.43	3.54	4.24	5.90	7.33	10.78	12.89	**100yr**	9.54	12.39	14.09	15.33	16.68
200yr	0.87	1.31	1.66	2.40	3.35	4.39	**200yr**	2.89	4.30	5.16	7.22	8.91	13.35	16.18	**200yr**	11.82	15.56	17.65	18.88	20.44
500yr	1.07	1.59	2.04	2.96	4.22	5.65	**500yr**	3.64	5.52	6.67	9.45	11.55	17.73	21.86	**500yr**	15.69	21.02	23.78	24.90	26.74

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APPENDIX A 6.2

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
Pootham	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

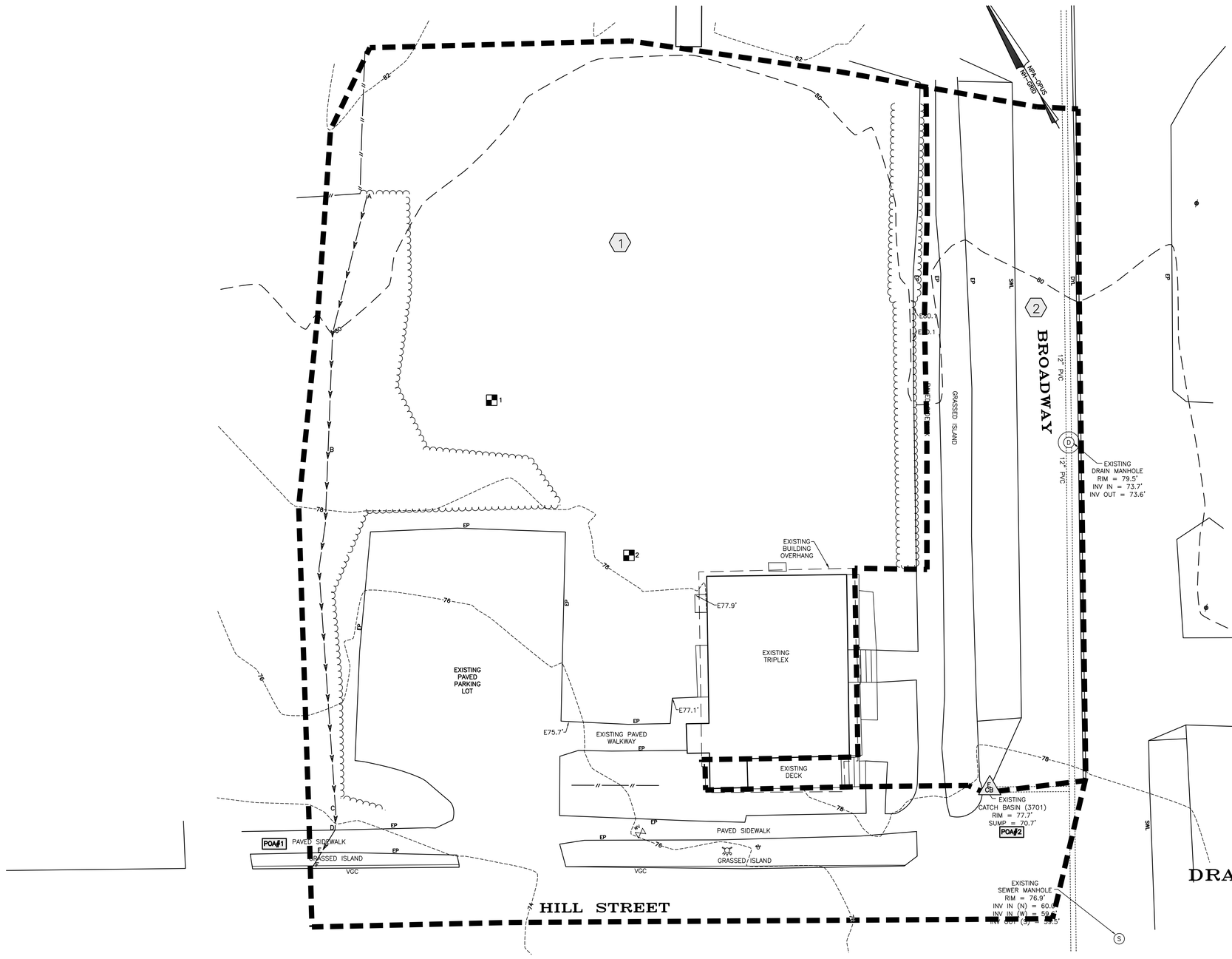
Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Cabot	589	0.6	2.0	0.06	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

PLANS:
APPENDIX D-1 & D-2

LEGEND

- EXISTING TREE LINE
- EXISTING DRAIN LINE
- 232 EXISTING CONTOUR LINE (DATUM)
- EXISTING UTILITY POLE
- TP #8 EXISTING TEST PIT
- SUBCATCHMENT BOUNDARIES
- SUBCATCHMENT DRAINAGE PATH
- 7 SUBCATCHMENT AREA
- CB DRAINAGE BASINS OR CATCH BASINS
- R1 DRAINAGE REACHES
- POA#1 POINTS OF ANALYSIS



PRE-DEVELOPMENT DRAINAGE ANALYSIS PLAN

TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026
GRAPHIC SCALE

10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

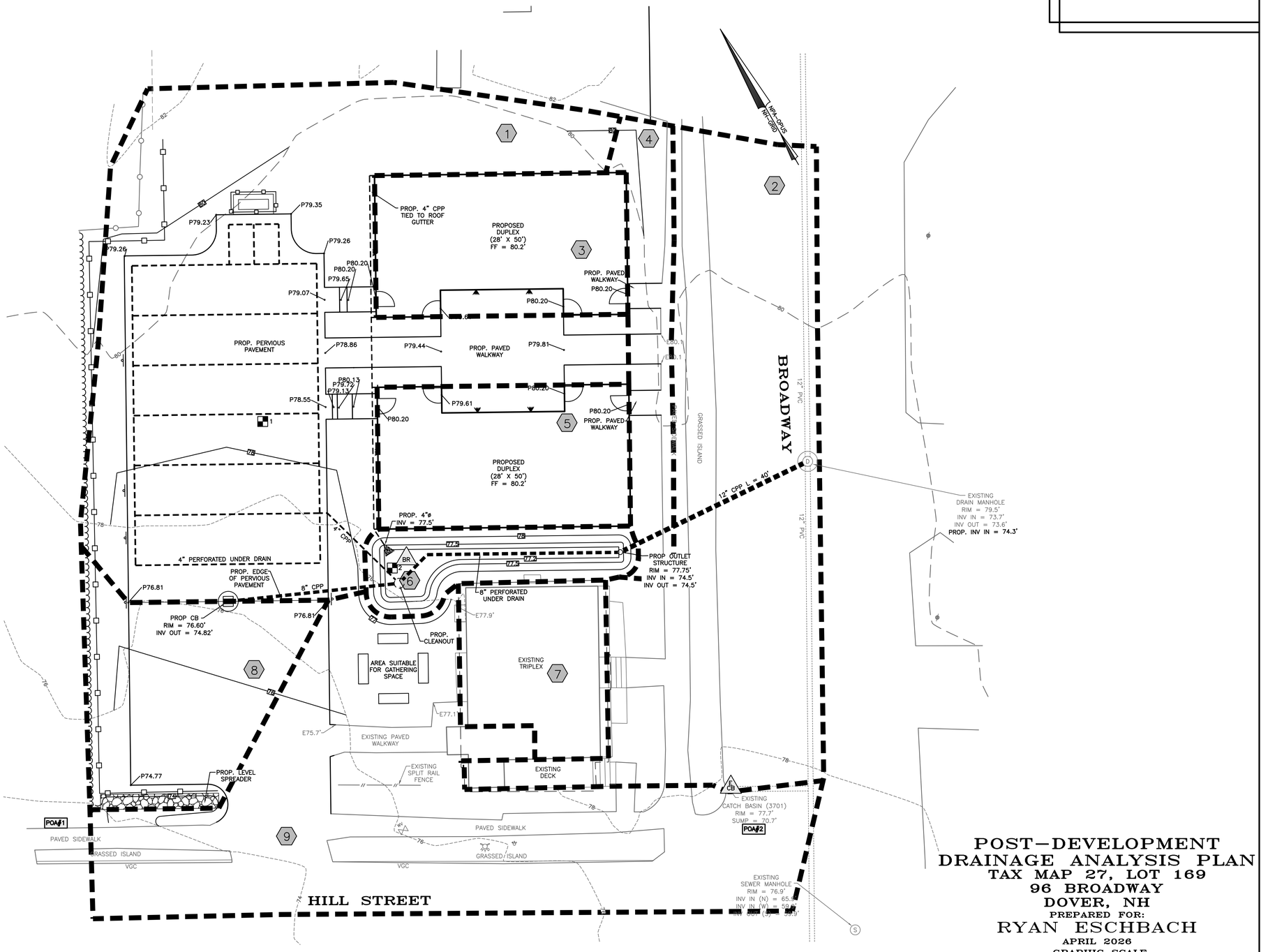
D-1

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948
NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603-335-3948

LEGEND

- EXISTING TREE LINE
- EXISTING DRAIN LINE
- 232 EXISTING CONTOUR LINE
- TP #8 EXISTING TEST PIT
- PROPOSED TREE LINE
- PROPOSED DRAIN LINE
- 232 PROPOSED CONTOUR LINE
- PROPOSED OUTLET STRUCTURE
- SUBCATCHMENT BOUNDARIES
- SUBCATCHMENT DRAINAGE PATH
- 7 SUBCATCHMENT AREA
- CB DRAINAGE BASINS OR CATCH BASINS
- R1 DRAINAGE REACHES
- POA#1 POINTS OF ANALYSIS



POST-DEVELOPMENT DRAINAGE ANALYSIS PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:

RYAN ESCHBACH

APRIL 2026

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 INCH = 10 FEET

D-2

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948

NORWAY PLAINS ASSOCIATES, INC.

2 Continental Blvd., Rochester, N.H. 603-335-3948

DRAINAGE REPORT

96 BROADWAY
PREPARED FOR:
RYAN ESCHBACH
96 BRAODWAY
DOVER, NH
STRAFFORD COUNTY

April 2026

PREPARED BY:

NORWAY PLAINS ASSOCIATES, INC.

Hilary Badger , P.E. N.H. Reg. #18290

2 CONTINENTAL BOULEVARD, P.O. BOX 249, ROCHESTER, NEW HAMPSHIRE 03866-0249 (603) 335-3948

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1.0 INTRODUCTION:

This drainage report has been prepared as a supporting document to the proposed 96 Broadway residential expansion.

The purpose of any drainage analysis is to apply current mathematical stormwater modeling techniques used in the fields of Civil and Environmental Engineering, to predict the effect of a proposed construction project will have on the subject parcel. Those parcels include directly abutting the project, any downstream property, and/or drainage structures such as culverts, closed drainage systems, etc.

A design that provides adequate control of stormwater, minimizing and/or eliminating impacts to any downstream drainage structures (i.e. municipal culverts, bridges, etc.), is arrived at through an iterative process using the modeling discussed above. The pre-development drainage analysis reflects the modeling performed for the pre-development surface drainage, and for the land in its existing state. The post-development drainage analysis reflects the results of the final drainage design, and provides surface drainage values to compare to the pre-development values. In this way, the design engineer and any review agents are provided the necessary information to decide if the proposed design is adequate.

1.1 REVISIONS:

2.0 SITE AND PROJECT DESCRIPTION:

2.1 PROJECT LOCATION:

The site is located on the west side of Broadway. Please refer to Figure 1 (USGS Map previous page) for a pictorial placement of the project area. The property is designated by the Dover Assessing Maps as Map 27, Lot 169, refer to figure 2.

2.2 EXISTING SITE FEATURES:

The parcel is currently developed with a triplex and associated parking lot. There is some existing landscaping and trees within the lot. The lot does not have any existing stormwater management. Most of the site drains to the back, southwest, corner toward Hill Street.

According to the Natural Resources Conservation Service (NRCS); Custom Soil Resource Report for Strafford County, New Hampshire; (Appendix A-1).

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BzB	Buxton silt loam, 3 to 8 percent slopes	0.8	100.0%
	Totals for Area of Interest	**0.8**	**100.0%**

2.3 PROJECT DESCRIPTION:

The proposed site development is to expand the existing lot by constructing two additional duplexes. This will include the installation of a larger parking lot and new stormwater management systems. All stormwater from the development will be directed into a stormwater system and will be treated prior to entering the City's closed drainage system.

The new parking area will be constructed utilizing porous pavement to provide treatment for all new paved areas. The roof runoff will be directed into a small bioretention system to treat the stormwater. Both systems will be constructed with underdrains, as infiltration is not possible on the site.

3.0 METHODOLOGY:

The drainage analysis is based on "Urban Hydrology for Small Watersheds", as written by the U.S. Soil Conservation Service (S.C.S.) and released as Technical Release 55, in June of 1986. A modified TR-20 method was used to generate runoff. The weighted-Q method was used instead of using composite CN values due to widely differing curve numbers present (e.g. pavement and good condition woods on HSG A soils). This modification to the TR-20 method is recommended by the NRCS for model accuracy over the composite CN method used in WinTR-20, especially when there is a wide difference in curve numbers and lower rainfall amounts (210-VI-NEH Part 630, Ch. 10, pg 10-16, July 2004). The computer analysis is based on the S.C.S. TR-20 and the stormwater modeling software HYDROCAD™ release 10.0, written by Applied Microcomputer Systems of Chocorua, New Hampshire, was used. The drainage analysis is based on information compiled from the following resources:

- 96 Broadway Plans;
- USGS Topographic Map – Dover, NH Quadrangle;
- Aerial Photographs – Google Earth;
- NRCS Custom Soil Resource Report for Strafford County, New Hampshire;
- "Pre- and Post-Development Drainage Plans"

As stated in the introduction, the purpose of this report is to provide information supporting the design of the stormwater control measures employed by this project. A number of sources of information were consulted to prepare the calculations for this infrastructure to check its sufficiency. The USGS Map, Aerial Photos, and the Site-Specific Soils Maps and Report, and NRCS Soils Maps for Strafford County were all consulted. A number of site visits were performed to confirm site conditions.

The 2, 10, 25 and 50-year storm events have been used to model the stormwater runoff and to determine the adequacy of the chosen stormwater control methods. See Appendix A-6.1 for Extreme Precipitation Tables and other references used in the design and analysis.

If a subcatchment is returned with Times of Concentration (Tc) below the minimum allowed by TR-55 (TR-55 minimum Tc = 0.1 hour = 6 minutes); then Tc values are set in HydroCAD to automatically return a Tc of 6 minutes to insure proper modeling.

A codified system was used to number the subcatchments, reaches, and ponds, in the drainage analyses. The following Table lists prefixes and their meanings.

3.1 REACH STRUCTURE PREFIXES:

Prefix	Explanation
POA	Point of Analysis

3.2 POND STRUCTURE PREFIXES:

Prefix	Explanation
BR	Bioretention Basin
PP	Porous Pavement
CB	Catch Basin

4.0 PRE-DEVELOPMENT DRAINAGE ANALYSIS:

Complete HydroCAD model data for the pre-development can be found in Appendix A-4. For a graphical depiction of the Watershed analyzed, flow paths; subcatchments and POA's refer to the Pre-Development Drainage Plan, Figure D-2 in the pocket at the rear of the report.

The site topography breaks the watershed into 10 subcatchments. These subcatchments drain to six Points of Analysis (POAs). There are three POAs that are onsite and three POAs offsite. The roof runoff (Subcatchment 3) is collected and reused in the production.

TABLE 1: PRE-DEVELOPMENT DRAINAGE ANALYSIS RESULTS SUMMARY:

	Area	2-yr Rate	2-yr Volume	10-yr Rate	10-yr Volume	25-yr Rate	25-yr Volume	50-yr Rate	50-yr Volume
	(Ac.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)
Subcatchment 1	0.44	0.6	0.06	1.2	0.10	1.6	0.14	2.1	0.18
Subcatchment 2	0.10	0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
Total	0.54								
POA#1 (Hill Street)		0.6	0.06	1.2	0.10	1.6	0.14	2.1	0.18
POA#2 (Broadway)		0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
Combined POAs		0.9	0.08	1.6	0.14	2.1	0.19	2.7	0.24

5.0 POST-DEVELOPMENT DRAINAGE ANALYSIS:

Complete HydroCAD model data for the post-development can be found in Appendix A-4. For a graphical depiction of the Watershed analyzed, flow paths; subcatchments and POA's refer to the Post-Development Drainage Plan, Figure D-3 in the pocket at the rear of the report.

TABLE 2: POST-DEVELOPMENT DRAINAGE ANALYSIS RESULTS SUMMARY:

	Area	2-yr Rate	2-yr Volume	10-yr Rate	10-yr Volume	25-yr Rate	25-yr Volume	50-yr Rate	50-yr Volume
	(Ac.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)
Subcatchment 1	0.15	0.3	0.02	0.5	0.04	0.7	0.05	0.9	0.07
Subcatchment 2	0.10	0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
Subcatchment 3	0.03	0.1	0.01	0.1	0.01	0.2	0.02	0.2	0.02
Subcatchment 4	0.02	0.0	0.00	0.1	0.00	0.1	0.01	0.1	0.01
Subcatchment 5	0.03	0.1	0.01	0.1	0.01	0.2	0.02	0.2	0.02
Subcatchment 6	0.02	0.0	0.00	0.1	0.00	0.1	0.01	0.1	0.01
Subcatchment 7	0.02	0.0	0.00	0.1	0.01	0.1	0.01	0.1	0.01
Subcatchment 8	0.16	0.4	0.03	0.6	0.05	0.8	0.07	1.0	0.08
Total	**0.54**								
POA#1 (Hill Street)		0.4	0.03	0.6	0.05	0.8	0.07	1.0	0.08
POA#2 (Broadway)		0.6	0.06	1.1	0.10	1.4	0.14	1.7	0.17

	Area	2-yr Rate	2-yr Volume	10-yr Rate	10-yr Volume	25-yr Rate	25-yr Volume	50-yr Rate	50-yr Volume
	(Ac.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)	(cfs)	(Ac.ft.)
Combined POAs		1.0	0.09	1.7	0.15	2.2	0.21	2.7	0.26

5.1 STORMWATER CONTROL AND TREATMENT PRACTICES:

5.1.1 POROUS ASPHALT PAVEMENT

The stormwater management design employs porous asphalt for the new parking area. The porous asphalt pavement allows for the stormwater from these surfaces to flow through the aggregate and through the different layers of sand and stone below. The stormwater will be treated by the 12" filter and then it will enter 4" perforated pipes along the bottom of the practice. No infiltration is possible due to poor groundwater depth and underlying soil types. All stormwater entering the practice will be treated following the MS4 guidelines.

5.1.2 BIORETENTION BASIN:

This stormwater management design employs an open Bioretention Basin for the treatment of the roof runoff from the two proposed duplexes. The basin will be vegetated and will not overtop during the 50-year storm event. The basin will not include infiltration as it is not possible on the site, alternatively the basin will be lined with 4" perforated pipes laid flat under the bioretention media. An 8" standpipe will be installed and connected to the underdrains. The outlet will be connected to the existing drainage manhole on Broadway.

The table below is a summary of the inflow and out flow and freeboard of the bioretention basin.

TABLE 3: BIORETENTION BASIN SUMMARY:

	2-yr Storm			10-yr Storm			50-yr Storm		
	Q_{in}	Q_{out}	Freeboard	Q_{in}	Q_{out}	Freeboard	Q_{in}	Q_{out}	Freeboard
	(cfs)	(cfs)	(ft)	(cfs)	(cfs)	(ft)	(cfs)	(cfs)	(ft)
Infiltration Basin	**0.3**	**0.2**	**0.15**	**0.5**	**0.4**	**0.09**	**0.8**	**0.7**	**0.03**

*Qout is the stormwater leaving the system
** Freeboard measured to the top of the earth berm.
BR Berm elevation = 78.0'
Details and specifications for the Bioretention Basin can be found on sheet C-5 of the plan set. A BMP Worksheet for the infiltration system practice can be found in Appendix A-3.

6.0 COMPARISON AND CONCLUSION

6.1 COMPARISON

The following table presents a comparison of the results of the pre-development drainage analysis and the post-development drainage analysis and the Points of Analysis.

6.1.1 SUMMARY RESULTS AT THE POA'S:

TABLE 4: COMPARISON; PRE- & POST-DEVELOPMENT POA'S:

	2-yr Rate (cfs)	2-yr Volume (Ac.-ft.)	10-yr Rate (cfs)	10-yr Volume (Ac.-ft.)	25-yr Rate (cfs)	25-yr Volume (Ac.-ft.)	50-yr Rate (cfs)	50-yr Volume (Ac.-ft.)
POA#1 Pre (Hill Street)	0.6	0.06	1.2	0.10	1.6	0.14	2.1	0.18
POA#1 Post (Hill Street)	0.4	0.03	0.6	0.05	0.8	0.07	1.0	0.08
Change	**-0.2**	**-0.03**	**-0.6**	**-0.05**	**-0.8**	**-0.07**	**-1.1**	**-0.10**
POA#2 Pre (Broadway)	0.3	0.02	0.4	0.03	0.5	0.04	0.7	0.05
POA#2 Post (Broadway)	0.6	0.06	1.1	0.10	1.4	0.14	1.7	0.17
Change	**+0.3**	**+0.04**	**+0.7**	**+0.07**	**+0.9**	**+0.10**	**+1.0**	**+0.12**
Combined POAs Pre	0.9	0.08	1.6	0.14	2.1	0.19	2.7	0.24
Combined POAs Post	1.0	0.09	1.7	0.15	2.2	0.21	2.7	0.26
Change	**+0.1**	**+0.01**	**+0.1**	**+0.01**	**+0.1**	**+0.02**	**0.0**	**+0.02**

Due to no infiltration capacity within the underlying soils and high seasonal water tables throughout the property, infiltration is not possible. There will be increases in the volume of stormwater leaving the site. The proposed development redirects a large portion of the parcel directly into the City's closed drainage system, which will significantly decrease the stormwater sheet flowing onto Hill Street. The overall increases in the closed drainage system have been analyzed down grade of the site where the system connects to ensure minimal impact from the development.

6.2 CONCLUSION:

As seen in the preceding sections, through the implementation of effective stormwater controls, The stormwater generated from the development is appropriately treated prior to being discharged into the City of Dover's closed drainage system. Though there are increases in the volume and peak rate of runoff, the increases will not have a negative impact on abutting parcels and will not exceed the capacity of the closed drainage system.

This project does not propose any development within the 100-year floodplain (Env-Wq 1507.06(c)).

Temporary erosion control has been designed for the project during construction and this in concert with the permanent measures should maintain stormwater runoff quality down gradient, and maintain the sites contribution to offsite drainage systems at current levels. This design meets current Best Management Practices for stormwater control and provides a responsible stormwater management plan for the proposed work.

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FIGURES & PLANS

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POST-DEVELOPMENT DRAINAGE AREA PLAN.....D-2 (POCKET)
DESIGN PLAN SET ..... (SEPARATE)

USGS QUADRANGLE

1" = 2000'

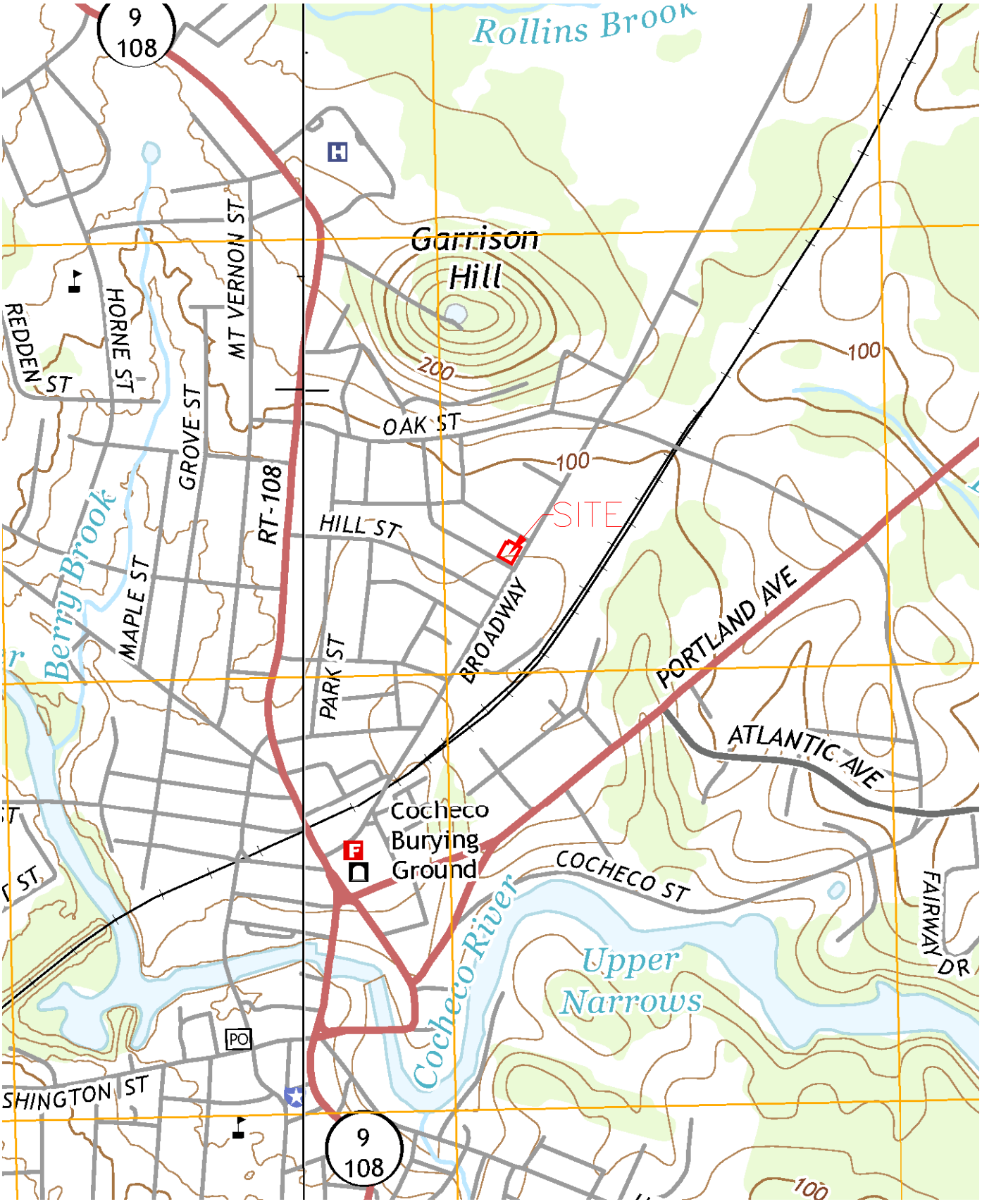
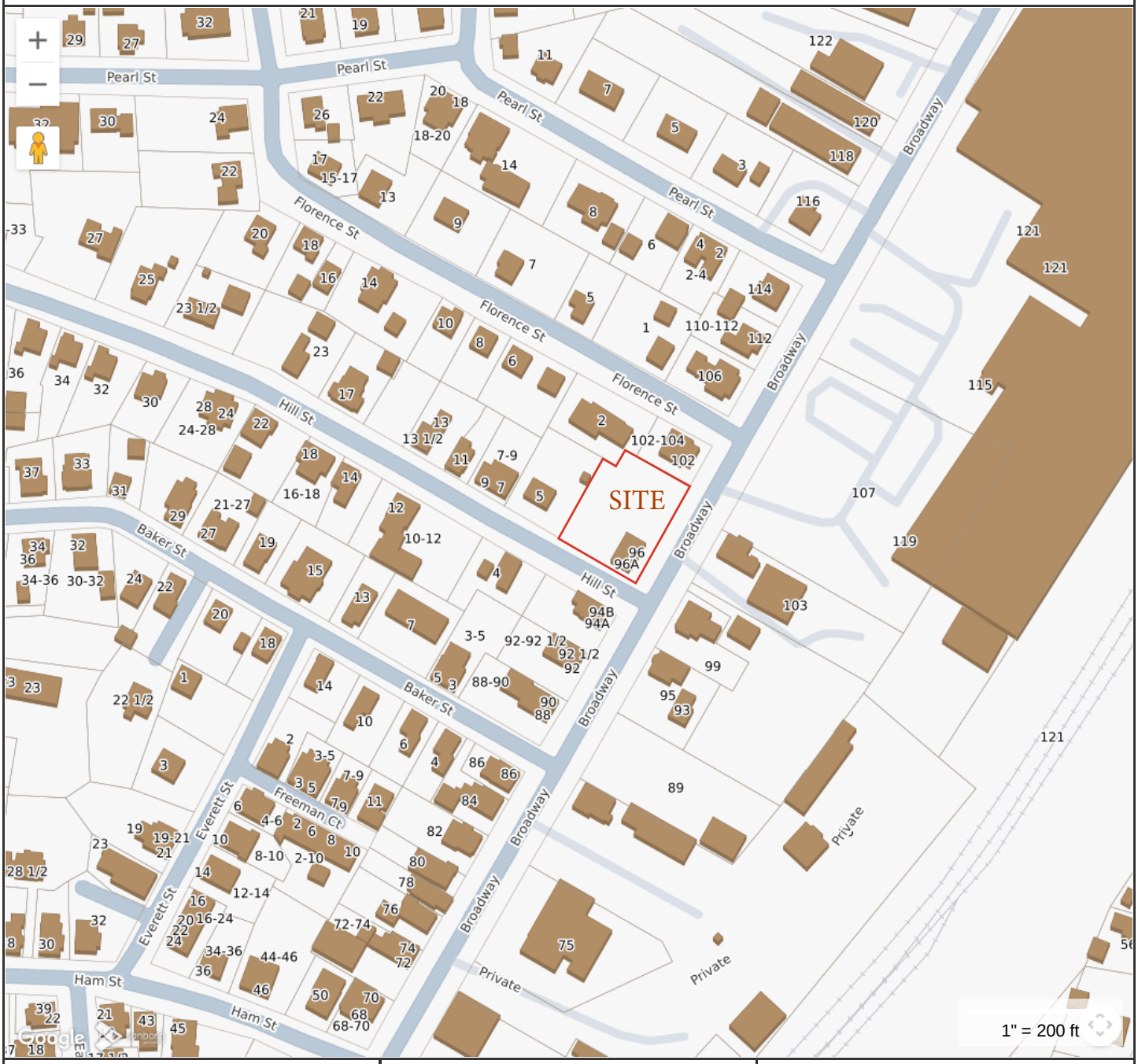


FIGURE 1

Tax Map 27, Lot 169



MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

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

Geometry updated 10/30/2023
Data updated Daily

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

NAIP AERIAL PHOTOGRAPGH

1" = 1000'

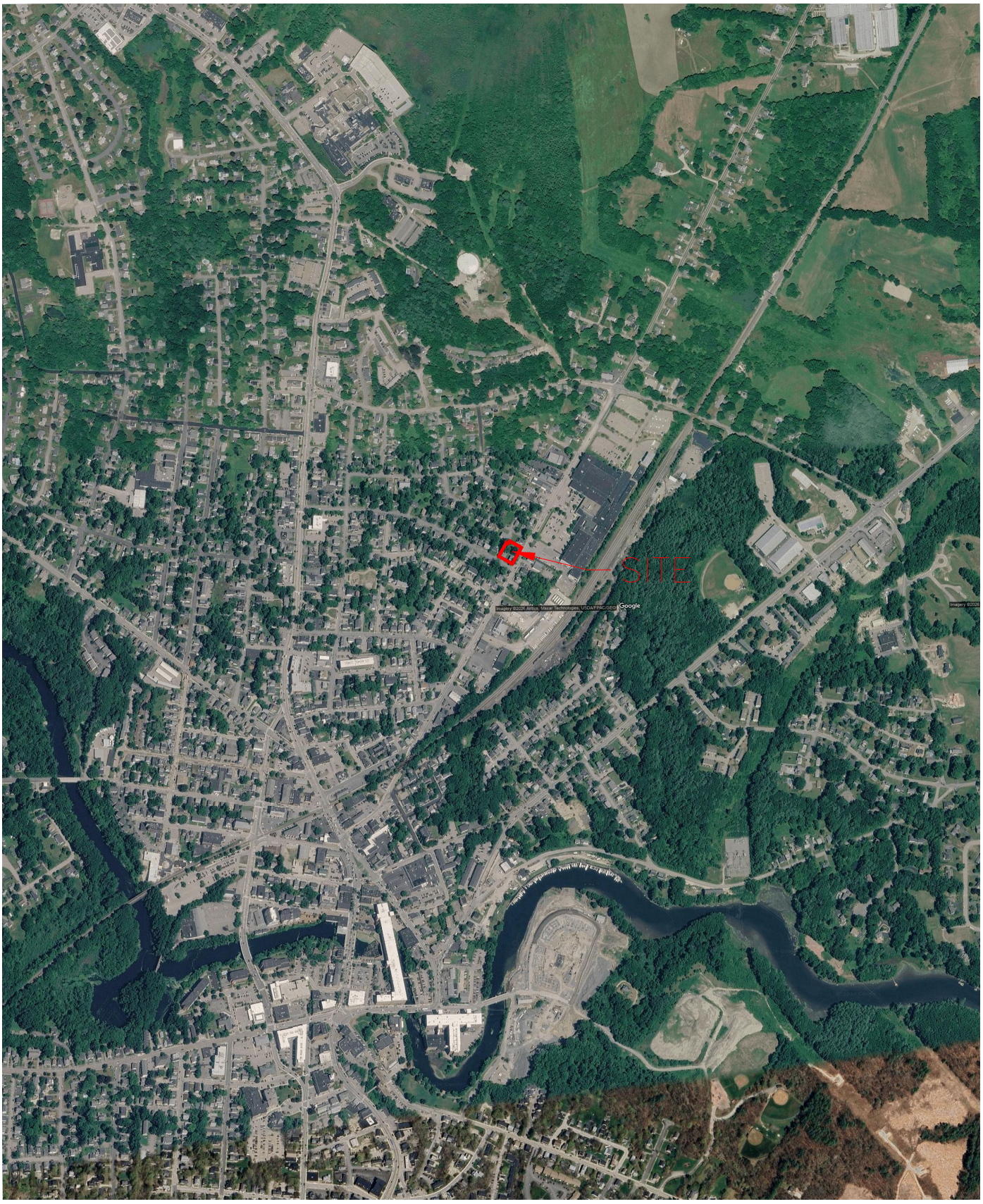


FIGURE 3

APPENDIX A 1

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



December 12, 2025

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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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: 1:574 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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 26, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BzB	Buxton silt loam, 3 to 8 percent slopes	0.8	100.0%
Totals for Area of Interest		**0.8**	**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

BzB—Buxton silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d6p
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: 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: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very 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 supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Minor Components

Elmwood

Percent of map unit: 10 percent
Hydric soil rating: No

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

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APPENDIX A 2

NORWAY PLAINS ASSOCIATES, INC.

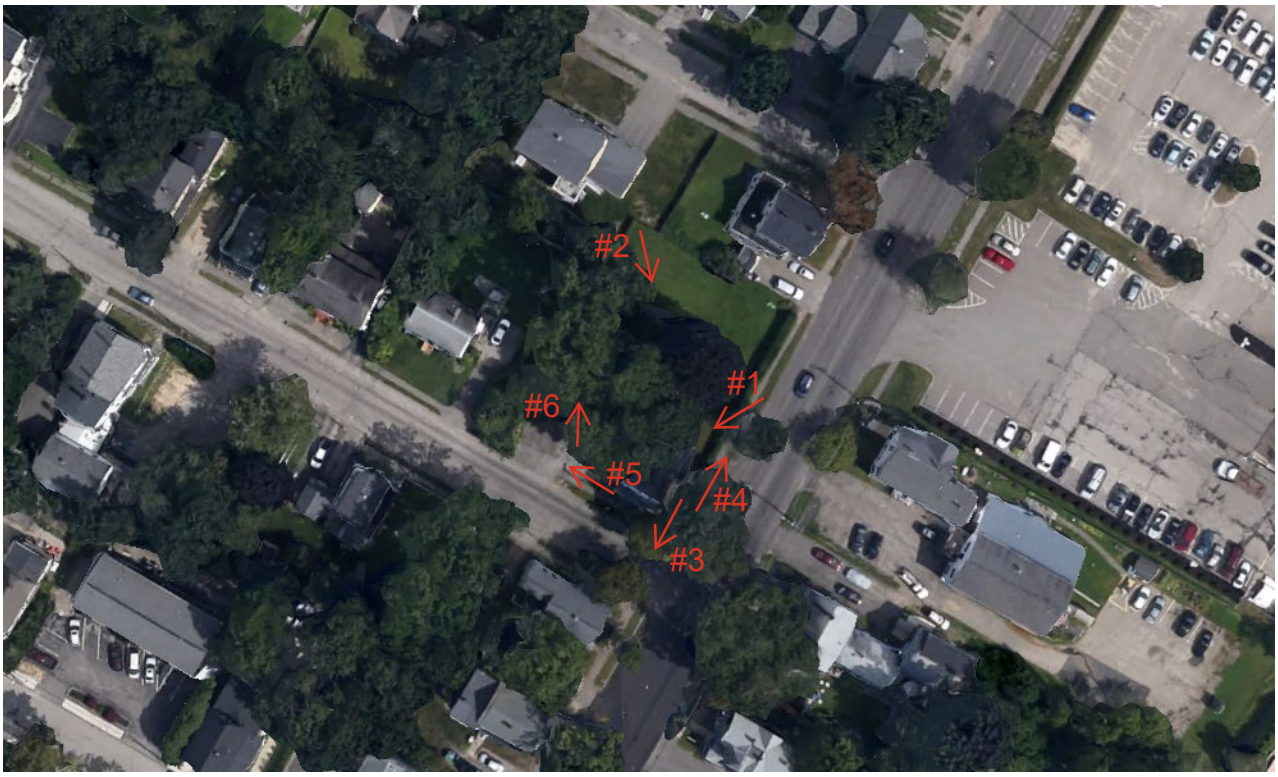
LAND SURVEYORS • SEPTIC SYSTEM DESIGNERS • CIVIL ENGINEERS

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PHOTO LOCATION KEY



NORWAY PLAINS ASSOCIATES, INC.

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PHOTO EXHIBIT

RYAN ESCHBACH
96 BROADWAY STREET
DOVER, NH 03820
TAX MAP 27, LOT 169



Photo #1- Existing structure at the south corner of the subject parcel.
(January 07, 2026)



Photo #2 Looking at existing yard where two duplexes are proposed.
(January 07, 2026)



Photo #3 Facing south at the corner of Broadway Street and Hill Street from the Southerly corner of the lot.
(April 11, 2025)


Photo # 4 Facing North on Broadway Street from the Southerly corner of the subject parcel.
(July 31, 2023)



Photo #5 Showing entrance to parking at subject parcel. Access off of Hill Street.
(July 31, 2023)



Photo #6 Looking at existing parking area proposed to be extended into existing yard area
(April 11, 2025)

APPENDIX A 3

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Pourous Pavement / PP**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.15	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
0.50	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.50	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.07	ac-in	WQV= 1" x Rv x A	
269	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
67	cf	25% x WQV (check calc for sediment forebay volume)	
201	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
2,392	sf	A_{SA} = Surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
YES	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
75.10	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.30	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.50	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
75.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
74.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
76.79	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
74.79	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
0.21	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
(1.79)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
75.25	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
76.68	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Asphalt		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.1	acres	A_{SA} = Surface area of the pervious pavement	
2.5	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	C-5	Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond PP: Proposed Porous Pavement

Elevation (feet)	Storage (cubic-feet)
74.50	0
74.55	3
74.60	8
74.65	13
74.70	19
74.75	24
74.80	28
74.85	49
74.90	97
74.95	145
75.00	193
75.05	241
75.10	288
75.15	336
75.20	384
75.25	432
75.30	480
75.35	528
75.40	575
75.45	623
75.50	671
75.55	719
75.60	767
75.65	815
75.70	862
75.75	910
75.80	958
75.85	1,006
75.90	1,054
75.95	1,102
76.00	1,149
76.05	1,173
76.10	1,197
76.15	1,221
76.20	1,245
76.25	1,269
76.30	1,317
76.35	1,365
76.40	1,413
76.45	1,460
76.50	1,508
76.55	**1,556**
76.60	**1,585**
76.65	1,585
76.70	1,585

Stage-Discharge for Pond PP: Proposed Porous Pavement

Elevation (feet)	Primary (cfs)
74.50	0.0
74.55	0.0
74.60	0.0
74.65	0.0
74.70	0.0
74.75	0.1
74.80	0.1
74.85	0.1
74.90	0.2
74.95	0.2
75.00	0.3
75.05	0.3
75.10	0.3
75.15	0.4
75.20	0.4
75.25	0.4
75.30	0.5
75.35	0.5
75.40	0.5
75.45	0.6
75.50	0.6
75.55	0.6
75.60	0.7
75.65	0.7
75.70	0.7
75.75	0.7
75.80	0.8
75.85	0.8
75.90	0.8
75.95	0.8
76.00	0.8
76.05	0.9
76.10	0.9
76.15	0.9
76.20	0.9
76.25	0.9
76.30	0.9
76.35	0.9
76.40	1.0
76.45	1.0
76.50	1.0
76.55	1.0
76.60	1.0
76.65	1.0
76.70	**1.0**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Bioretention Basin /BR**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.13	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
0.54	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.54	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.07	ac-in	WQV= 1" x Rv x A	
248	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
62	cf	25% x WQV (check calc for sediment forebay volume)	
186	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
299	sf	A_{SA} = Surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
YES	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
77.60	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
13.80	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
75.08	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
74.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
76.89	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
73.64	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.58	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.44	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
(1.81)	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
77.97	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
78.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
325	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
24.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet 5		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet 5		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond BR: Bioretention Basin

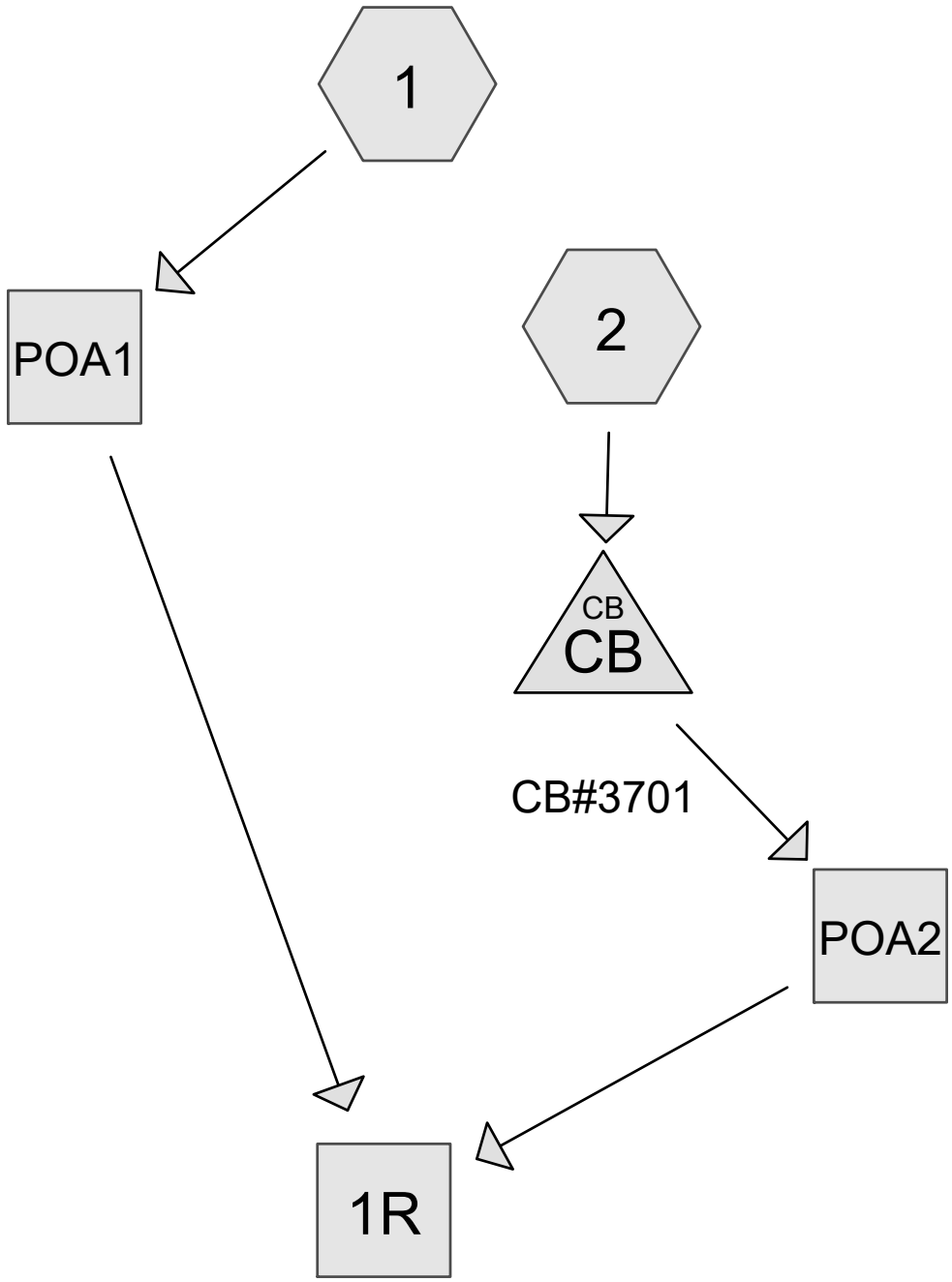
Elevation (feet)	Storage (cubic-feet)
74.50	0
74.55	1
74.60	2
74.65	3
74.70	5
74.75	6
74.80	7
74.85	10
74.90	16
74.95	22
75.00	28
75.05	34
75.10	39
75.15	42
75.20	44
75.25	47
75.30	50
75.35	53
75.40	56
75.45	59
75.50	62
75.55	65
75.60	68
75.65	71
75.70	74
75.75	77
75.80	80
75.85	83
75.90	86
75.95	89
76.00	92
76.05	95
76.10	98
76.15	101
76.20	104
76.25	107
76.30	110
76.35	113
76.40	116
76.45	119
76.50	122
76.55	125
76.60	128
76.65	131
76.70	134
76.75	137
76.80	140
76.85	143
76.90	146
76.95	149
77.00	152
77.05	155
77.10	158
77.15	159
77.20	161
77.25	162
77.30	163
77.35	170
77.40	186
77.45	203
77.50	221
77.55	240
77.60	260
77.65	281
77.70	302
77.75	325
77.80	349
77.85	374
77.90	401
77.95	428
78.00	**456**

Stage-Discharge for Pond BR: Bioretention Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
74.50	0.0	77.15	0.0
74.55	0.0	77.20	0.0
74.60	0.0	77.25	0.0
74.65	0.0	77.30	0.0
74.70	0.0	77.35	0.0
74.75	0.0	77.40	0.0
74.80	0.0	77.45	0.0
74.85	0.0	77.50	0.0
74.90	0.0	77.55	0.0
74.95	0.0	77.60	0.0
75.00	0.0	77.65	0.0
75.05	0.0	77.70	0.0
75.10	0.0	77.75	0.0
75.15	0.0	77.80	0.1
75.20	0.0	77.85	0.2
75.25	0.0	77.90	0.4
75.30	0.0	77.95	0.6
75.35	0.0	78.00	**0.8**
75.40	0.0		
75.45	0.0		
75.50	0.0		
75.55	0.0		
75.60	0.0		
75.65	0.0		
75.70	0.0		
75.75	0.0		
75.80	0.0		
75.85	0.0		
75.90	0.0		
75.95	0.0		
76.00	0.0		
76.05	0.0		
76.10	0.0		
76.15	0.0		
76.20	0.0		
76.25	0.0		
76.30	0.0		
76.35	0.0		
76.40	0.0		
76.45	0.0		
76.50	0.0		
76.55	0.0		
76.60	0.0		
76.65	0.0		
76.70	0.0		
76.75	0.0		
76.80	0.0		
76.85	0.0		
76.90	0.0		
76.95	0.0		
77.00	0.0		
77.05	0.0		
77.10	0.0		

APPENDIX A 4

APPENDIX A 4.1



Subcat Reach Pond Link

Routing Diagram for 25321 Pre Development
Prepared by Norway Plains Associates, Inc., Printed 4/29/2026
HydroCAD® 10.10-5a s/n 01082 © 2020 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

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

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.280	74	>75% Grass cover, Good HSG C (1, 2)
0.008	65	Brush, Good, HSG C (1)
0.183	98	Paved parking HSG C (1, 2)
0.029	98	Roofs HSG C (1, 2)
0.039	72	Woods/grass comb., Good, HSG C (1)
0.539	**83**	**TOTAL AREA**

APPENDIX A 4.2

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=1.58"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=0.6 cfs 0.06 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=2.44"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.02 af

Reach 1R: Inflow=0.9 cfs 0.08 af
Outflow=0.9 cfs 0.08 af

Reach POA1: Inflow=0.6 cfs 0.06 af
Outflow=0.6 cfs 0.06 af

Reach POA2: Inflow=0.3 cfs 0.02 af
Outflow=0.3 cfs 0.02 af

Pond CB: CB#3701 Peak Elev=73.38' Inflow=0.3 cfs 0.02 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.3 cfs 0.02 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.08 af Average Runoff Depth = 1.74"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=2.86"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=1.2 cfs 0.10 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.03 af

Reach 1R: Inflow=1.5 cfs 0.14 af
Outflow=1.5 cfs 0.14 af

Reach POA1: Inflow=1.2 cfs 0.10 af
Outflow=1.2 cfs 0.10 af

Reach POA2: Inflow=0.4 cfs 0.03 af
Outflow=0.4 cfs 0.03 af

Pond CB: CB#3701 Peak Elev=73.47' Inflow=0.4 cfs 0.03 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.4 cfs 0.03 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.14 af Average Runoff Depth = 3.07"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=3.95"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=1.6 cfs 0.14 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.04 af

Reach 1R: Inflow=2.1 cfs 0.19 af
Outflow=2.1 cfs 0.19 af

Reach POA1: Inflow=1.6 cfs 0.14 af
Outflow=1.6 cfs 0.14 af

Reach POA2: Inflow=0.5 cfs 0.04 af
Outflow=0.5 cfs 0.04 af

Pond CB: CB#3701 Peak Elev=73.53' Inflow=0.5 cfs 0.04 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.5 cfs 0.04 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.19 af Average Runoff Depth = 4.17"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Runoff Area=18,968 sf 30.80% Impervious Runoff Depth=5.00"
Flow Length=129' Tc=10.0 min CN=WQ Runoff=2.1 cfs 0.18 af

Subcatchment 2: Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=6.25"
Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.05 af

Reach 1R: Inflow=2.7 cfs 0.24 af
Outflow=2.7 cfs 0.24 af

Reach POA1: Inflow=2.1 cfs 0.18 af
Outflow=2.1 cfs 0.18 af

Reach POA2: Inflow=0.7 cfs 0.05 af
Outflow=0.7 cfs 0.05 af

Pond CB: CB#3701 Peak Elev=73.58' Inflow=0.7 cfs 0.05 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.7 cfs 0.05 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.24 af Average Runoff Depth = 5.24"
60.68% Pervious = 0.327 ac 39.32% Impervious = 0.212 ac

APPENDIX A 4.3

Summary for Subcatchment 1:

CarlsonPlanXYPos|1196762.4616|257760.7829|

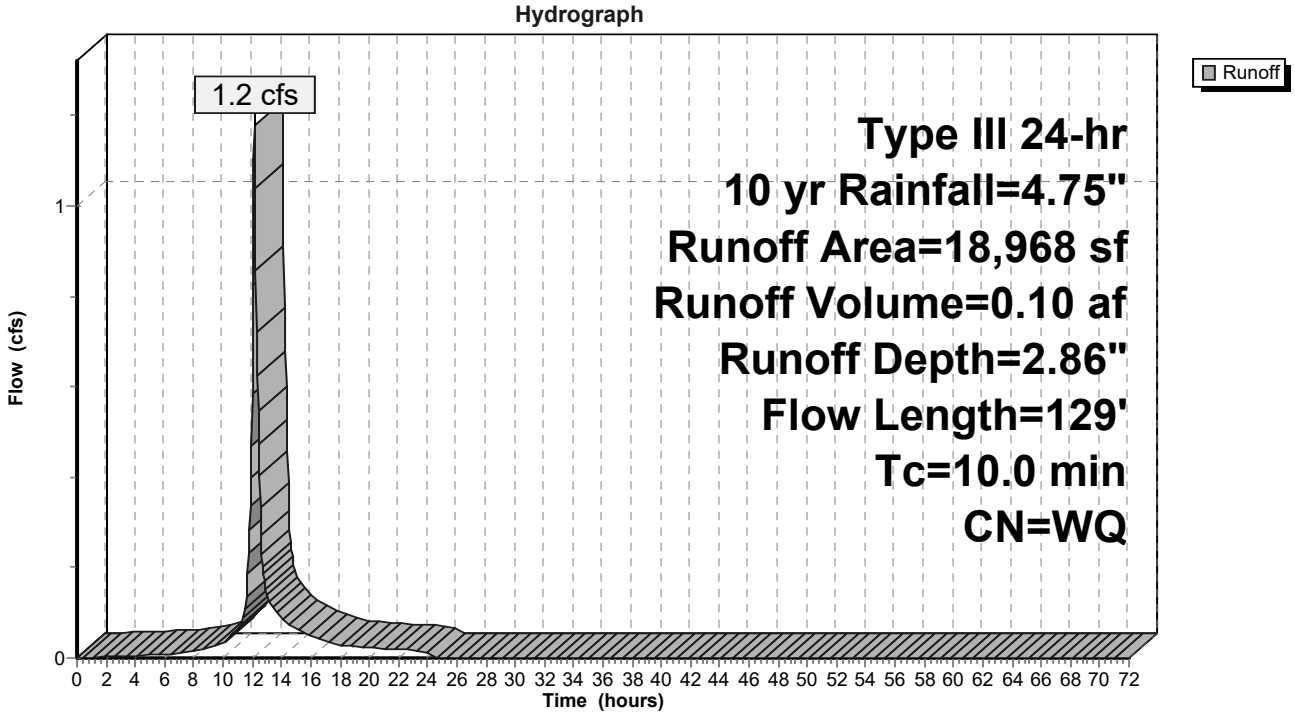
Runoff = 1.2 cfs @ 12.14 hrs, Volume= 0.10 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,084	98	Roofs HSG C
1,719	72	Woods/grass comb., Good, HSG C
4,758	98	Paved parking HSG C
11,079	74	>75% Grass cover, Good HSG C
328	65	Brush, Good, HSG C
18,968		Weighted Average
13,126		69.20% Pervious Area
5,842		30.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0500	0.1		**Sheet Flow, A-->B** Grass: Bermuda n= 0.410 P2= 3.15"
1.0	67	0.0500	1.1		**Shallow Concentrated Flow, B-->C** Woodland Kv= 5.0 fps
0.1	4	0.0200	1.0		**Shallow Concentrated Flow, C-->D** Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0100	2.0		**Shallow Concentrated Flow, D-->E** Paved Kv= 20.3 fps
0.1	3	0.0100	0.7		**Shallow Concentrated Flow, E-->F** Short Grass Pasture Kv= 7.0 fps
10.0	129	Total			

Subcatchment 1:



Summary for Subcatchment 2:

CarlsonPlanXYPos|1196823.1142|257707.8244|

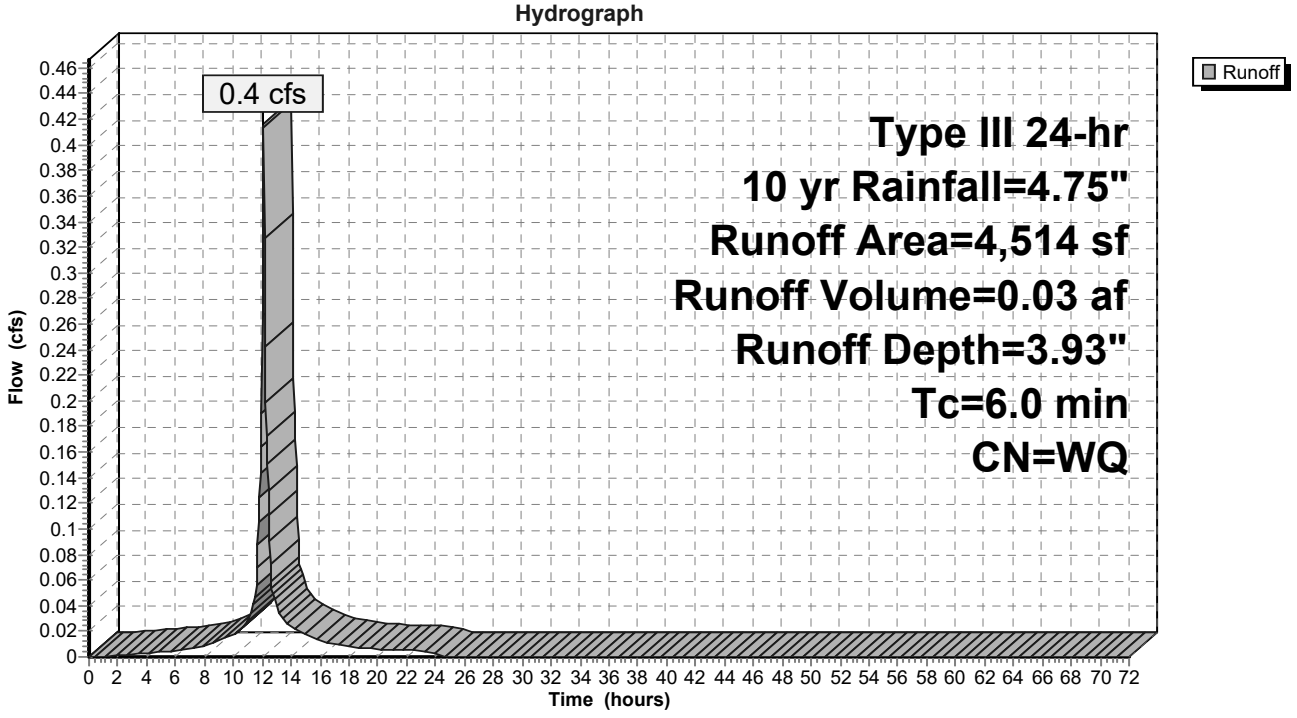
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
191	98	Roofs HSG C
3,201	98	Paved parking HSG C
1,122	74	>75% Grass cover, Good HSG C
4,514		Weighted Average
1,122		24.86% Pervious Area
3,392		75.14% Impervious Area

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

Subcatchment 2:

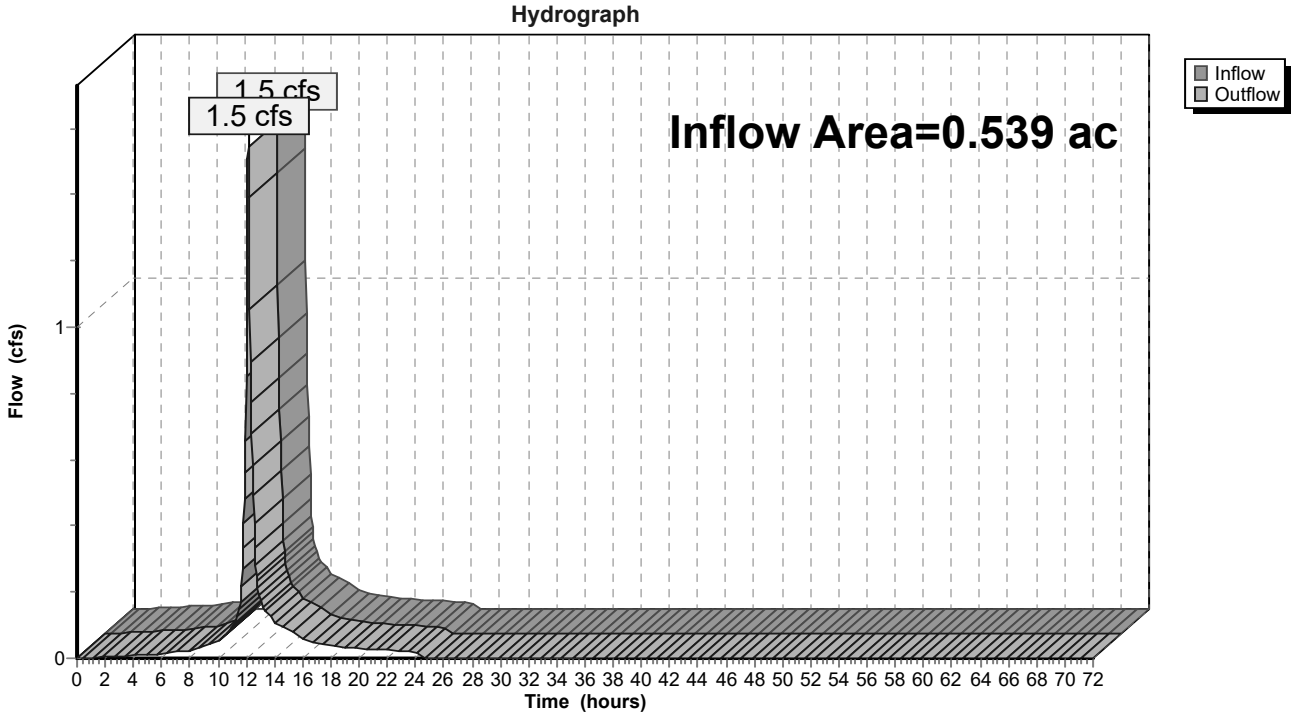


Summary for Reach 1R:

Inflow Area = 0.539 ac, 39.32% Impervious, Inflow Depth = 3.07" for 10 yr event
Inflow = 1.5 cfs @ 12.12 hrs, Volume= 0.14 af
Outflow = 1.5 cfs @ 12.12 hrs, Volume= 0.14 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 1R:

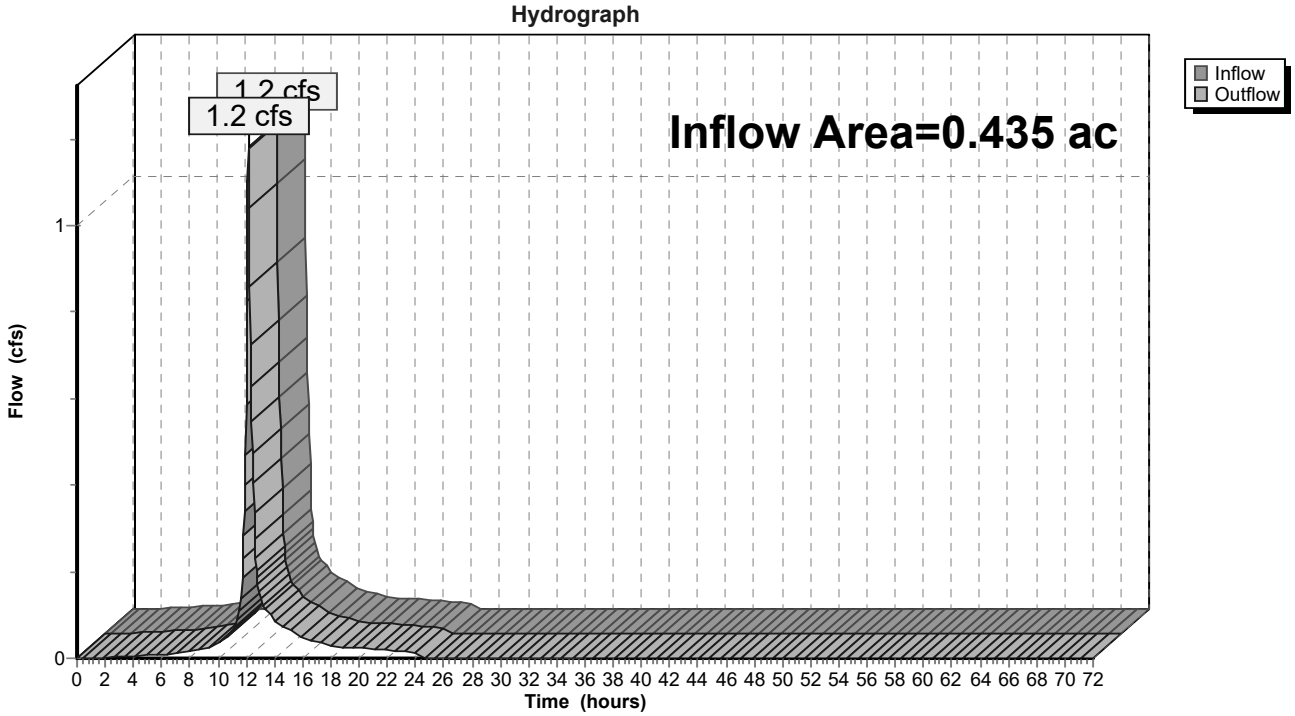


Summary for Reach POA1:

Inflow Area = 0.435 ac, 30.80% Impervious, Inflow Depth = 2.86" for 10 yr event
Inflow = 1.2 cfs @ 12.14 hrs, Volume= 0.10 af
Outflow = 1.2 cfs @ 12.14 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA1:

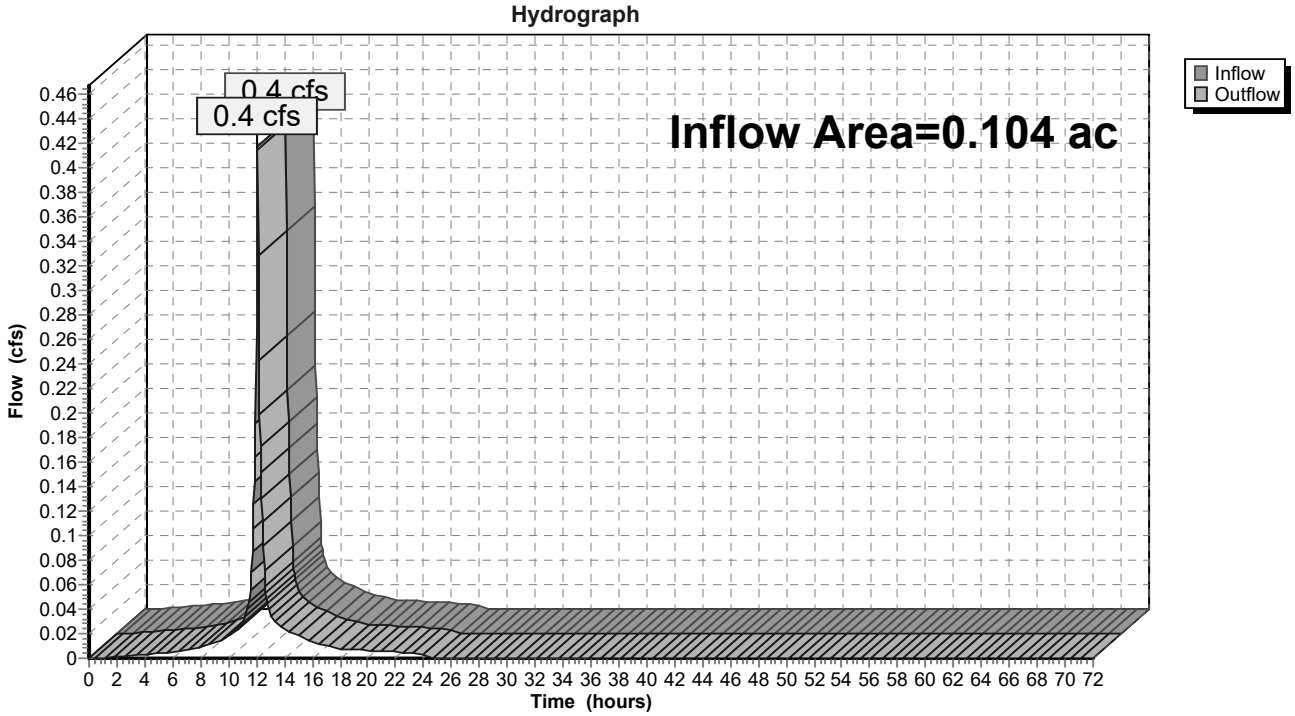


Summary for Reach POA2:

Inflow Area = 0.104 ac, 75.14% Impervious, Inflow Depth = 3.93" for 10 yr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA2:



Summary for Pond CB: CB#3701

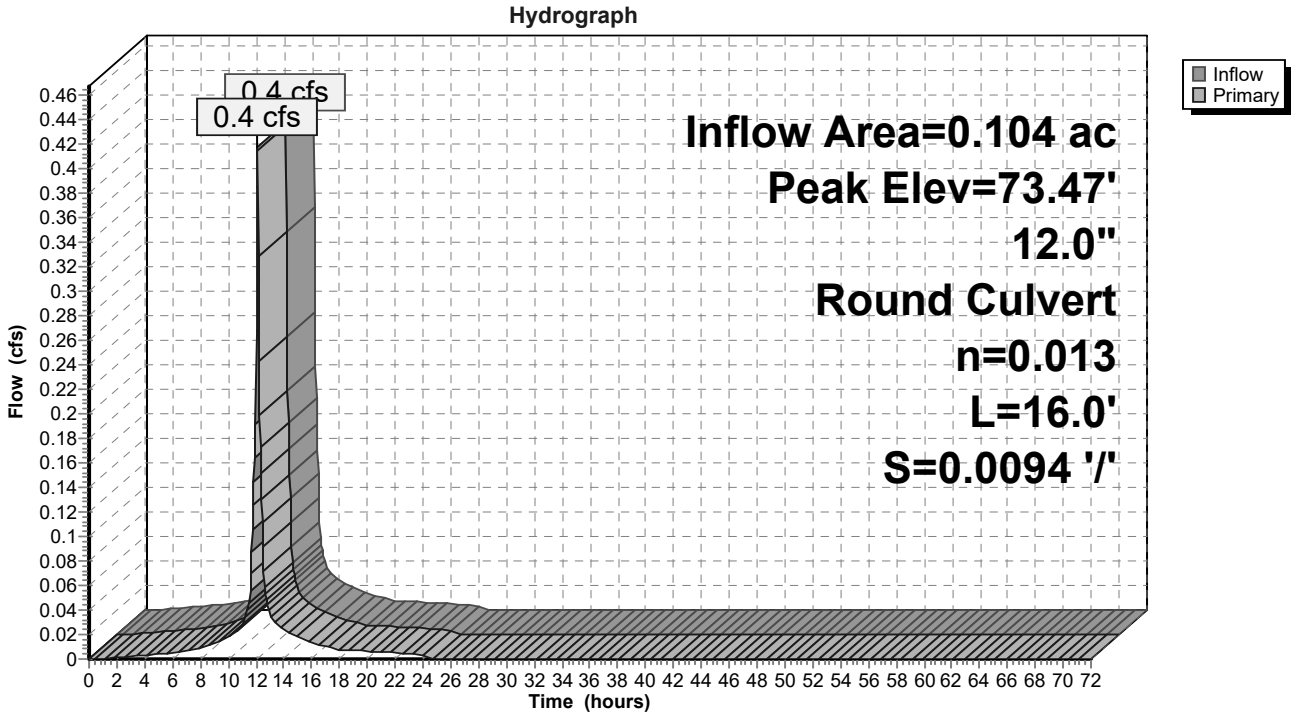
Inflow Area = 0.104 ac, 75.14% Impervious, Inflow Depth = 3.93" for 10 yr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 73.47' @ 12.09 hrs

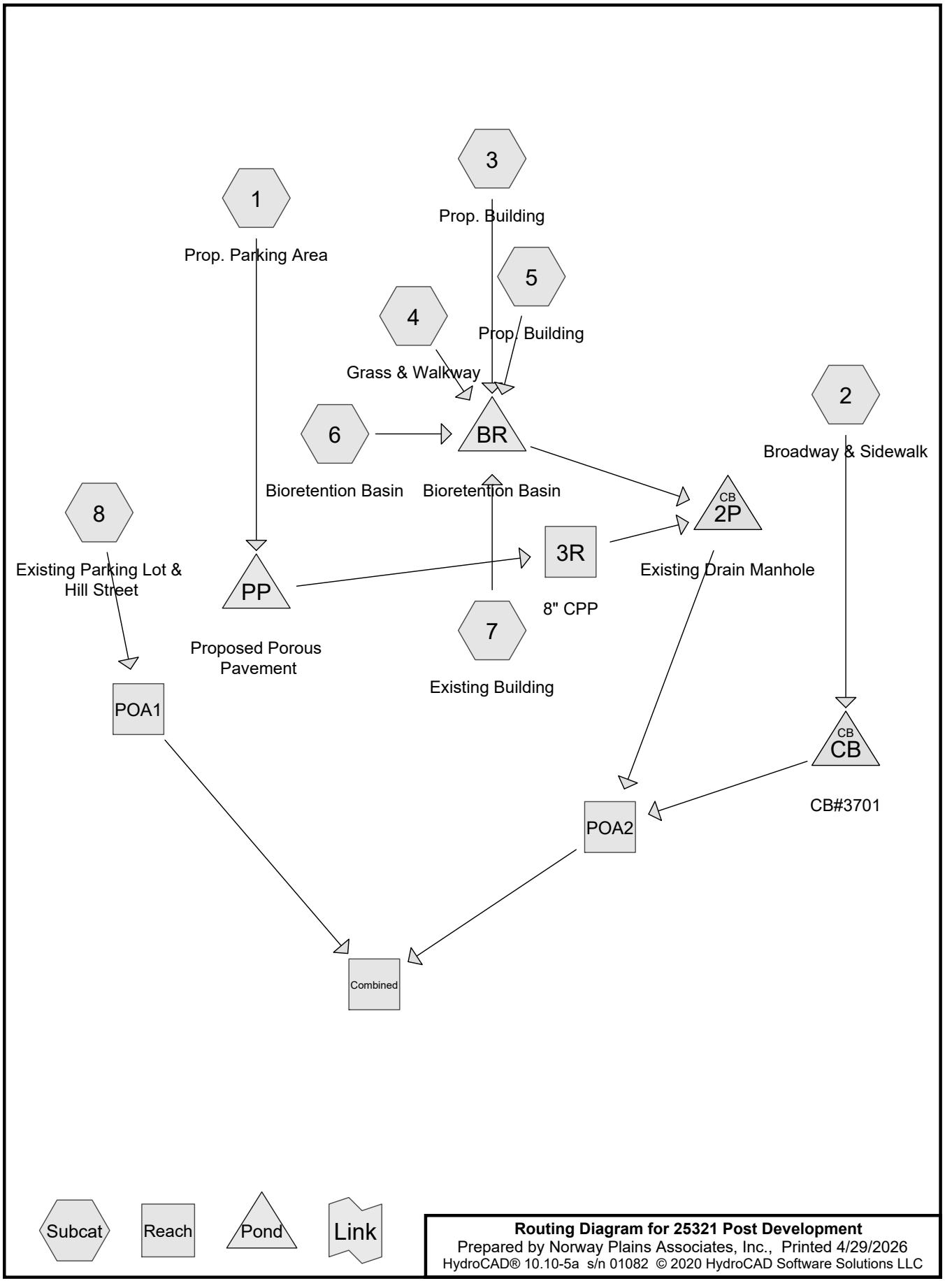
Device	Routing	Invert	Outlet Devices
#1	Primary	73.10'	**12.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.10' / 72.95' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.09 hrs HW=73.46' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.4 cfs @ 2.3 fps)

Pond CB: CB#3701



APPENDIX A 4.4



Routing Diagram for 25321 Post Development
Prepared by Norway Plains Associates, Inc., Printed 4/29/2026
HydroCAD® 10.10-5a s/n 01082 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.206	74	>75% Grass cover, Good HSG C (1, 2, 4, 6, 7, 8)
0.260	98	Paved parking HSG C (1, 2, 4, 8)
0.072	98	Roofs HSG C (2, 3, 5, 8)
0.001	70	Woods, Good HSG C (8)
0.539	**89**	**TOTAL AREA**

Soil Listing (all nodes)

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

APPENDIX A 4.5

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=6,316 sf 51.35% Impervious Runoff Depth=1.99"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.02 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=2.44"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.02 af

Subcatchment 3: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 4: Grass & Walkway Runoff Area=854 sf 26.23% Impervious Runoff Depth=1.51"
Tc=6.0 min CN=WQ Runoff=0.0 cfs 0.00 af

Subcatchment 5: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 6: Bioretention Basin Runoff Area=937 sf 0.00% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=74 Runoff=0.0 cfs 0.00 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=74 Runoff=0.0 cfs 0.00 af

Subcatchment 8: Existing Parking Lot & Hill Runoff Area=7,087 sf 67.91% Impervious Runoff Depth=2.30"
Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.03 af

Reach 3R: 8" CPP Avg. Flow Depth=0.21' Max Vel=1.90 fps Inflow=0.2 cfs 0.02 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.2 cfs 0.02 af

Reach Combined: Inflow=1.0 cfs 0.09 af
Outflow=1.0 cfs 0.09 af

Reach POA1: Inflow=0.4 cfs 0.03 af
Outflow=0.4 cfs 0.03 af

Reach POA2: Inflow=0.6 cfs 0.06 af
Outflow=0.6 cfs 0.06 af

Pond 2P: Existing Drain Manhole Peak Elev=73.95' Inflow=0.4 cfs 0.04 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=0.4 cfs 0.04 af

Pond BR: Bioretention Basin Peak Elev=77.85' Storage=375 cf Inflow=0.3 cfs 0.02 af
Outflow=0.2 cfs 0.01 af

Pond CB: CB#3701 Peak Elev=73.38' Inflow=0.3 cfs 0.02 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.3 cfs 0.02 af

Pond PP: Proposed Porous Pavement Peak Elev=74.90' Storage=101 cf Inflow=0.3 cfs 0.02 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.2 cfs 0.02 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.10 af Average Runoff Depth = 2.18"
38.31% Pervious = 0.206 ac 61.69% Impervious = 0.332 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=6,316 sf 51.35% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.04 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.03 af

Subcatchment 3: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=4.51"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 4: Grass & Walkway Runoff Area=854 sf 26.23% Impervious Runoff Depth=2.78"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.00 af

Subcatchment 5: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=4.51"
Tc=6.0 min CN=98 Runoff=0.1 cfs 0.01 af

Subcatchment 6: Bioretention Basin Runoff Area=937 sf 0.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.00 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.00 af

Subcatchment 8: Existing Parking Lot & Hill Runoff Area=7,087 sf 67.91% Impervious Runoff Depth=3.76"
Tc=6.0 min CN=WQ Runoff=0.6 cfs 0.05 af

Reach 3R: 8" CPP Avg. Flow Depth=0.27' Max Vel=2.15 fps Inflow=0.3 cfs 0.04 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.3 cfs 0.04 af

Reach Combined: Inflow=1.7 cfs 0.15 af
Outflow=1.7 cfs 0.15 af

Reach POA1: Inflow=0.6 cfs 0.05 af
Outflow=0.6 cfs 0.05 af

Reach POA2: Inflow=1.1 cfs 0.10 af
Outflow=1.1 cfs 0.10 af

Pond 2P: Existing Drain Manhole Peak Elev=74.07' Inflow=0.7 cfs 0.07 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=0.7 cfs 0.07 af

Pond BR: Bioretention Basin Peak Elev=77.91' Storage=404 cf Inflow=0.5 cfs 0.04 af
Outflow=0.4 cfs 0.03 af

Pond CB: CB#3701 Peak Elev=73.47' Inflow=0.4 cfs 0.03 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.4 cfs 0.03 af

Pond PP: Proposed Porous Pavement Peak Elev=75.03' Storage=221 cf Inflow=0.5 cfs 0.04 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.3 cfs 0.04 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.16 af Average Runoff Depth = 3.61"
38.31% Pervious = 0.206 ac 61.69% Impervious = 0.332 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=6,316 sf 51.35% Impervious Runoff Depth=4.51"
Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.05 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.04 af

Subcatchment 3: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=5.76"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 4: Grass & Walkway Runoff Area=854 sf 26.23% Impervious Runoff Depth=3.86"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.01 af

Subcatchment 5: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=5.76"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 6: Bioretention Basin Runoff Area=937 sf 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 8: Existing Parking Lot & Hill Runoff Area=7,087 sf 67.91% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=WQ Runoff=0.8 cfs 0.07 af

Reach 3R: 8" CPP Avg. Flow Depth=0.30' Max Vel=2.29 fps Inflow=0.4 cfs 0.05 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.4 cfs 0.05 af

Reach Combined: Inflow=2.2 cfs 0.21 af
Outflow=2.2 cfs 0.21 af

Reach POA1: Inflow=0.8 cfs 0.07 af
Outflow=0.8 cfs 0.07 af

Reach POA2: Inflow=1.4 cfs 0.14 af
Outflow=1.4 cfs 0.14 af

Pond 2P: Existing Drain Manhole Peak Elev=74.15' Inflow=0.9 cfs 0.10 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=0.9 cfs 0.10 af

Pond BR: Bioretention Basin Peak Elev=77.94' Storage=423 cf Inflow=0.6 cfs 0.05 af
Outflow=0.6 cfs 0.04 af

Pond CB: CB#3701 Peak Elev=73.53' Inflow=0.5 cfs 0.04 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.5 cfs 0.04 af

Pond PP: Proposed Porous Pavement Peak Elev=75.14' Storage=328 cf Inflow=0.7 cfs 0.05 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.4 cfs 0.05 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.21 af Average Runoff Depth = 4.77"
38.31% Pervious = 0.206 ac 61.69% Impervious = 0.332 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Prop. Parking Area Runoff Area=6,316 sf 51.35% Impervious Runoff Depth=5.60"
Tc=6.0 min CN=WQ Runoff=0.9 cfs 0.07 af

Subcatchment 2: Broadway & Sidewalk Runoff Area=4,514 sf 75.14% Impervious Runoff Depth=6.25"
Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.05 af

Subcatchment 3: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 4: Grass & Walkway Runoff Area=854 sf 26.23% Impervious Runoff Depth=4.91"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.01 af

Subcatchment 5: Prop. Building Runoff Area=1,400 sf 100.00% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=98 Runoff=0.2 cfs 0.02 af

Subcatchment 6: Bioretention Basin Runoff Area=937 sf 0.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 7: Existing Building Runoff Area=950 sf 0.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=74 Runoff=0.1 cfs 0.01 af

Subcatchment 8: Existing Parking Lot & Hill Runoff Area=7,087 sf 67.91% Impervious Runoff Depth=6.05"
Tc=6.0 min CN=WQ Runoff=1.0 cfs 0.08 af

Reach 3R: 8" CPP Avg. Flow Depth=0.34' Max Vel=2.41 fps Inflow=0.4 cfs 0.07 af
8.0" Round Pipe n=0.013 L=40.0' S=0.0047 '/' Capacity=0.8 cfs Outflow=0.4 cfs 0.07 af

Reach Combined: Inflow=2.7 cfs 0.26 af
Outflow=2.7 cfs 0.26 af

Reach POA1: Inflow=1.0 cfs 0.08 af
Outflow=1.0 cfs 0.08 af

Reach POA2: Inflow=1.7 cfs 0.17 af
Outflow=1.7 cfs 0.17 af

Pond 2P: Existing Drain Manhole Peak Elev=74.22' Inflow=1.1 cfs 0.12 af
12.0" Round Culvert n=0.013 L=350.0' S=0.0100 '/' Outflow=1.1 cfs 0.12 af

Pond BR: Bioretention Basin Peak Elev=77.97' Storage=439 cf Inflow=0.8 cfs 0.06 af
Outflow=0.7 cfs 0.05 af

Pond CB: CB#3701 Peak Elev=73.58' Inflow=0.7 cfs 0.05 af
12.0" Round Culvert n=0.013 L=16.0' S=0.0094 '/' Outflow=0.7 cfs 0.05 af

Pond PP: Proposed Porous Pavement Peak Elev=75.25' Storage=435 cf Inflow=0.9 cfs 0.07 af
6.0" Round Culvert n=0.013 L=18.0' S=0.0000 '/' Outflow=0.4 cfs 0.07 af

Total Runoff Area = 0.539 ac Runoff Volume = 0.26 af Average Runoff Depth = 5.88"
38.31% Pervious = 0.206 ac 61.69% Impervious = 0.332 ac

APPENDIX A 4.6

Summary for Subcatchment 1: Prop. Parking Area

CarlsonPlanXYPos|1196792.3840|257772.3434|

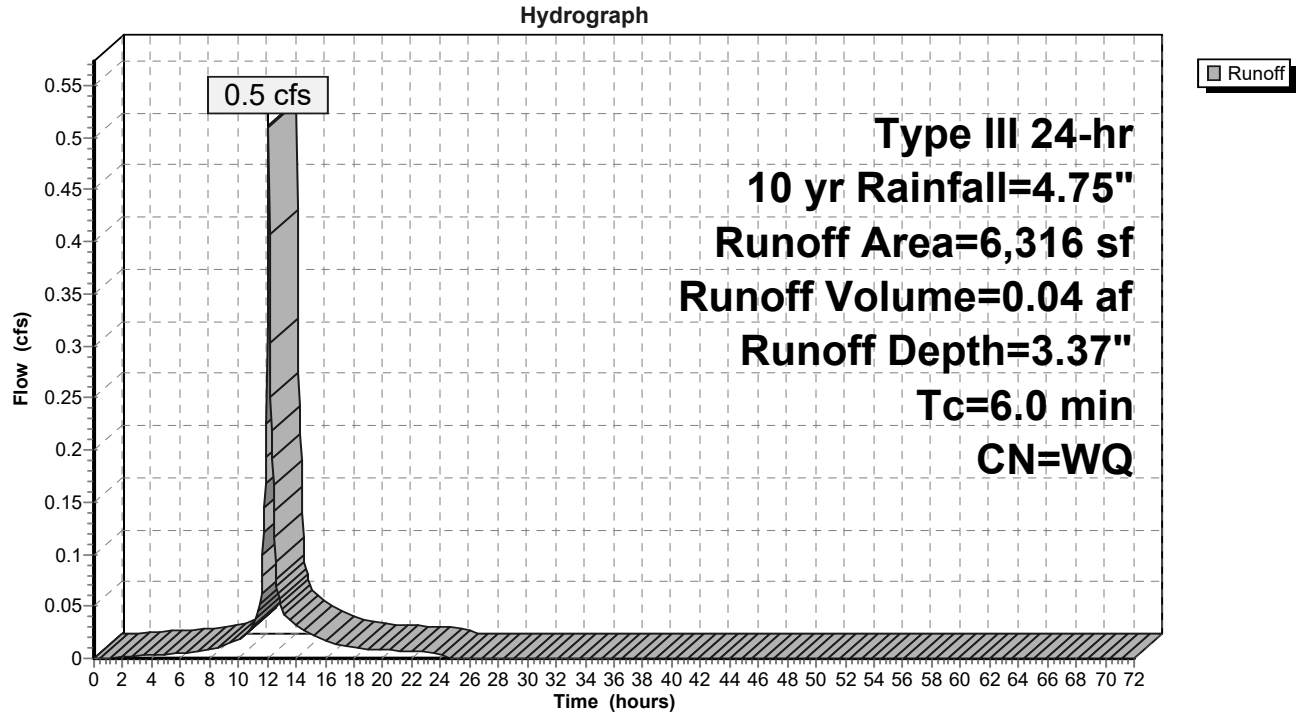
Runoff = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
3,243	98	Paved parking HSG C
3,073	74	>75% Grass cover, Good HSG C
6,316		Weighted Average
3,073		48.65% Pervious Area
3,243		51.35% Impervious Area

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

Subcatchment 1: Prop. Parking Area



Summary for Subcatchment 2: Broadway & Sidewalk

CarlsonPlanXYPos|1196833.5336|257736.4930|

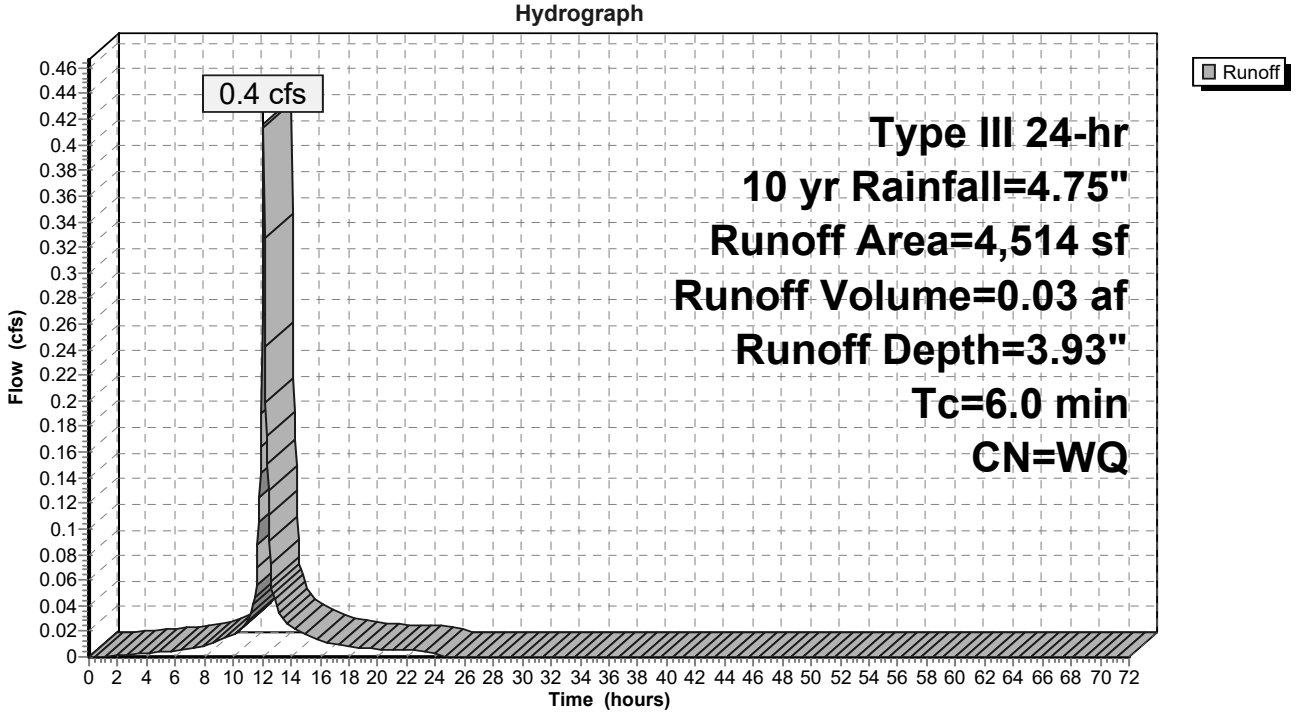
Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
3,201	98	Paved parking HSG C
191	98	Roofs HSG C
1,122	74	>75% Grass cover, Good HSG C
4,514		Weighted Average
1,122		24.86% Pervious Area
3,392		75.14% Impervious Area

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

Subcatchment 2: Broadway & Sidewalk



Summary for Subcatchment 3: Prop. Building

CarlsonPlanXYPos|1196793.6044|257744.7214|

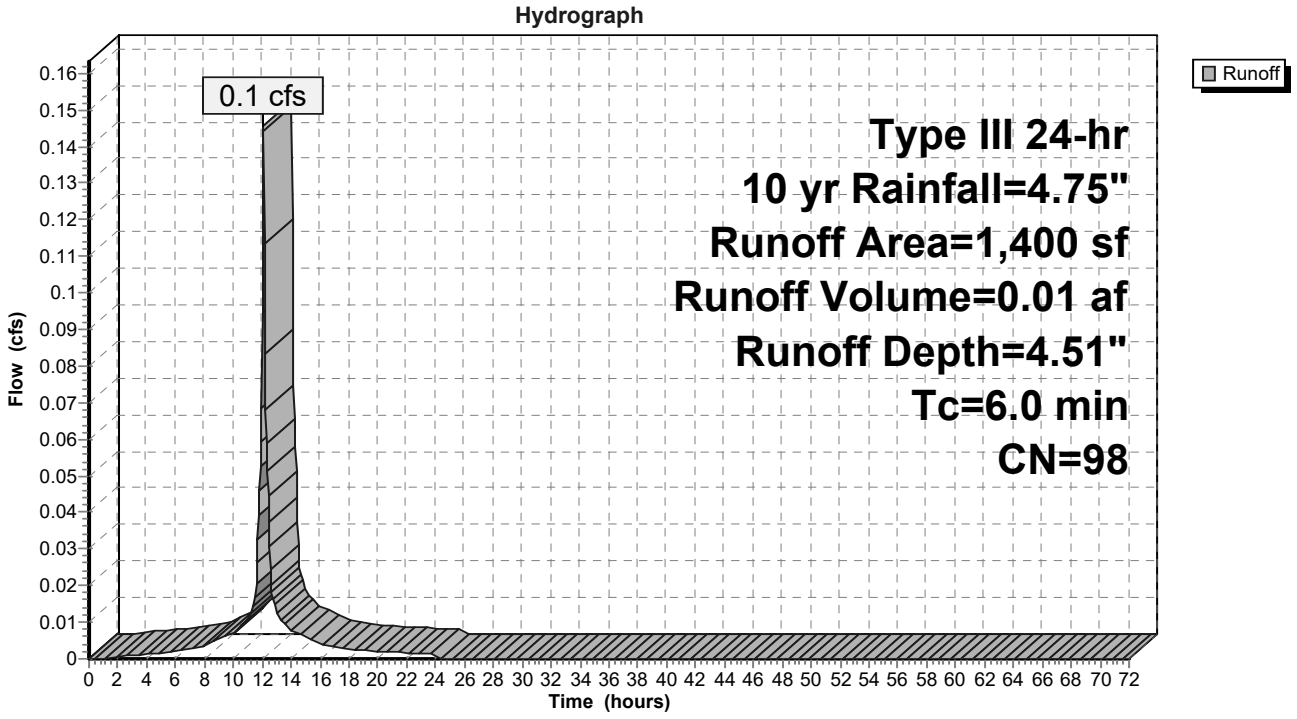
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,400	98	Roofs HSG C
1,400		100.00% Impervious Area

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

Subcatchment 3: Prop. Building



Summary for Subcatchment 4: Grass & Walkway

CarlsonPlanXYPos|1196811.3128|257737.4629|

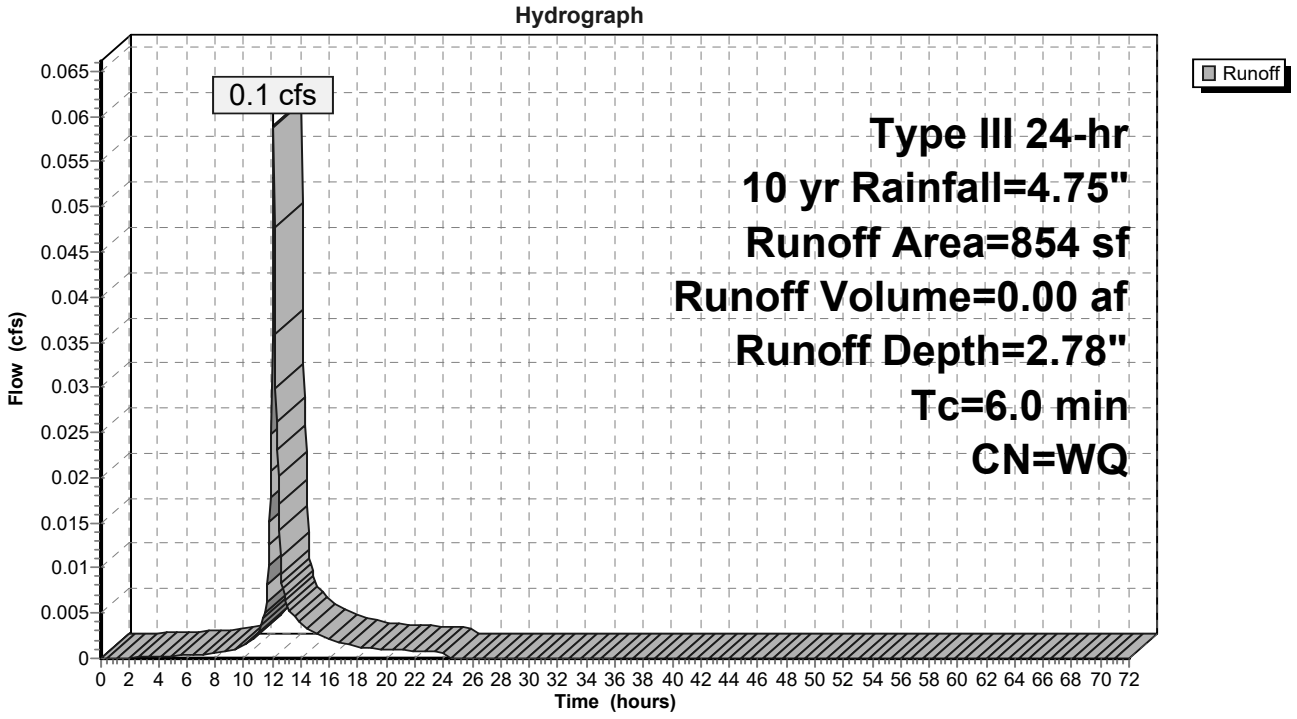
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.00 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
224	98	Paved parking HSG C
630	74	>75% Grass cover, Good HSG C
854		Weighted Average
630		73.77% Pervious Area
224		26.23% Impervious Area

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

Subcatchment 4: Grass & Walkway



Summary for Subcatchment 5: Prop. Building

CarlsonPlanXYPos|1196773.7486|257716.1405|

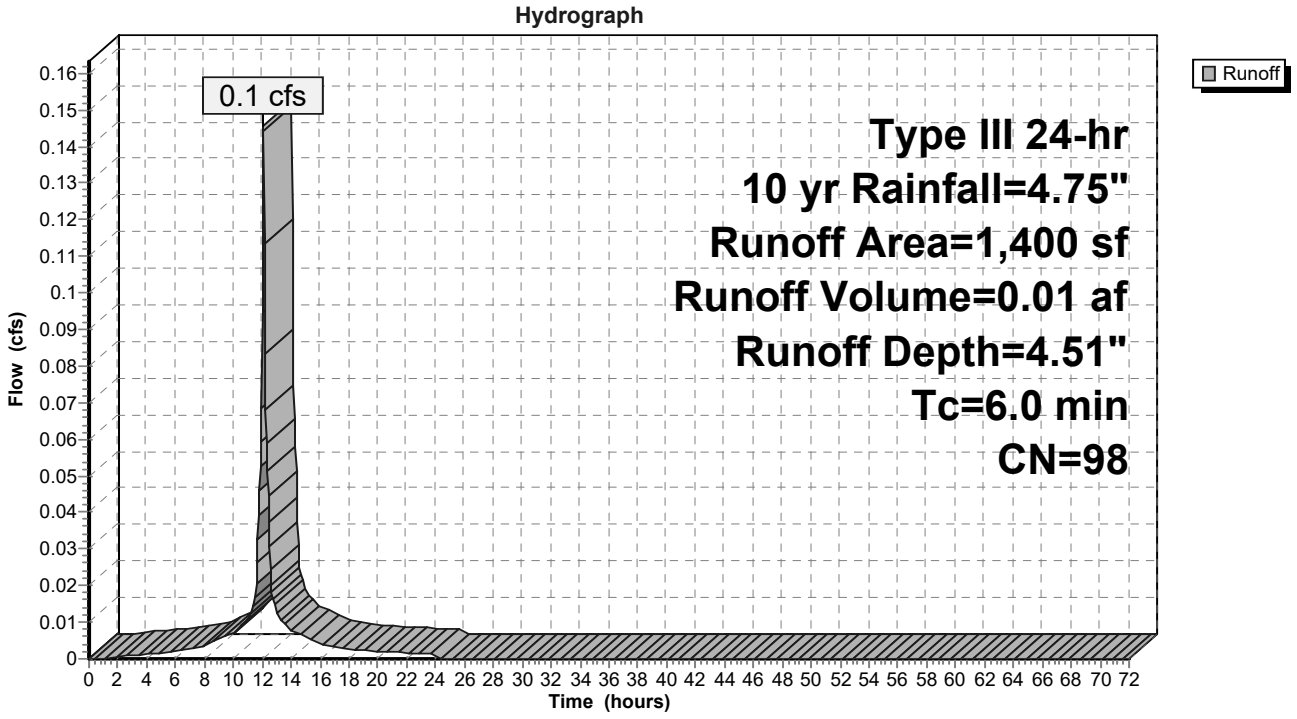
Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.01 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
1,400	98	Roofs HSG C
1,400		100.00% Impervious Area

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

Subcatchment 5: Prop. Building



Summary for Subcatchment 6: Bioretention Basin

CarlsonPlanXYPos|1196735.9916|257704.9174|

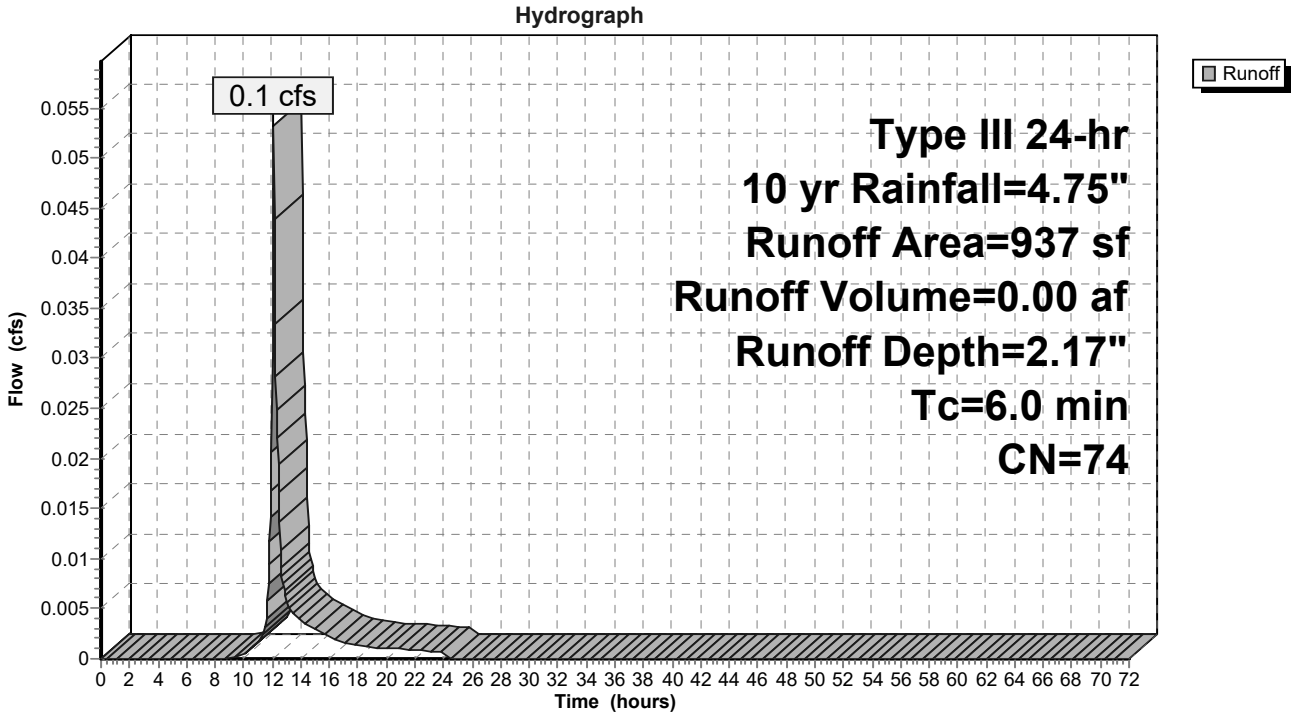
Runoff = 0.1 cfs @ 12.10 hrs, Volume= 0.00 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
937	74	>75% Grass cover, Good HSG C
937		100.00% Pervious Area

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

Subcatchment 6: Bioretention Basin



Summary for Subcatchment 7: Existing Building

CarlsonPlanXYPos|1196747.0301|257673.6021|

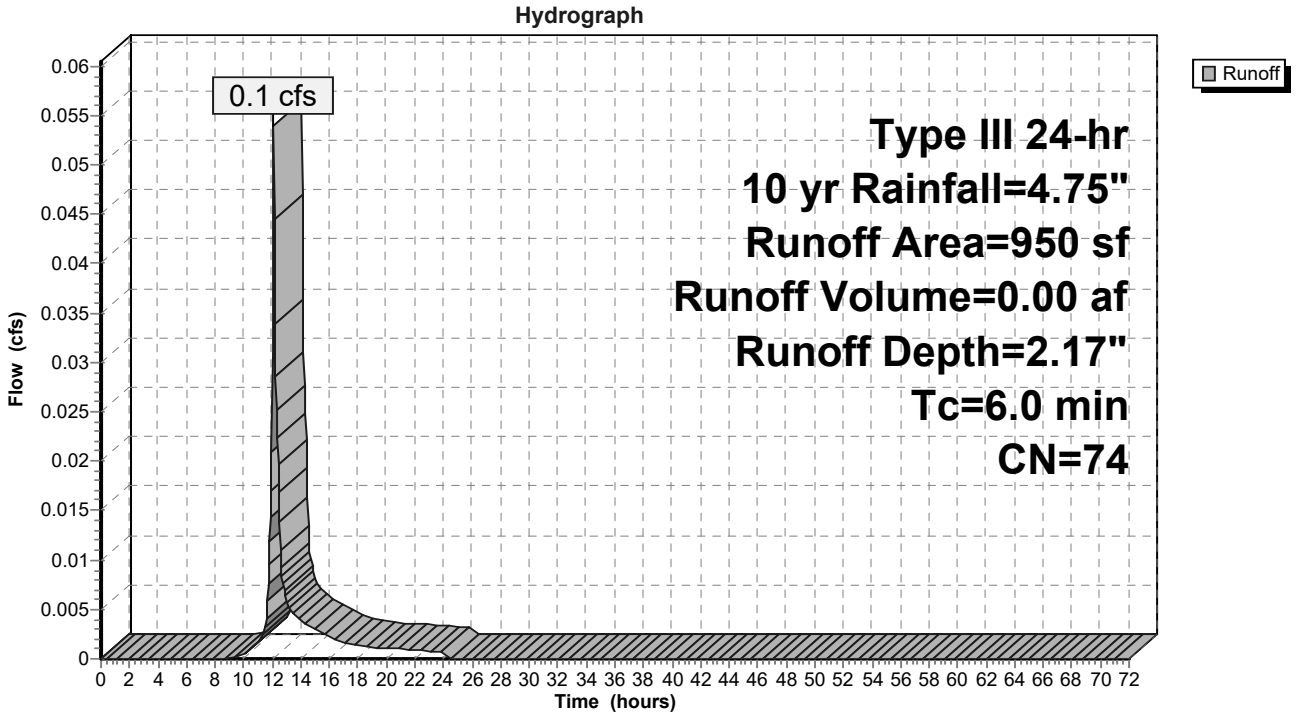
Runoff = 0.1 cfs @ 12.10 hrs, Volume= 0.00 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
950	74	>75% Grass cover, Good HSG C
950		100.00% Pervious Area

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

Subcatchment 7: Existing Building



Summary for Subcatchment 8: Existing Parking Lot & Hill Street

CarlsonPlanXYPos|1196694.8070|257704.6702|

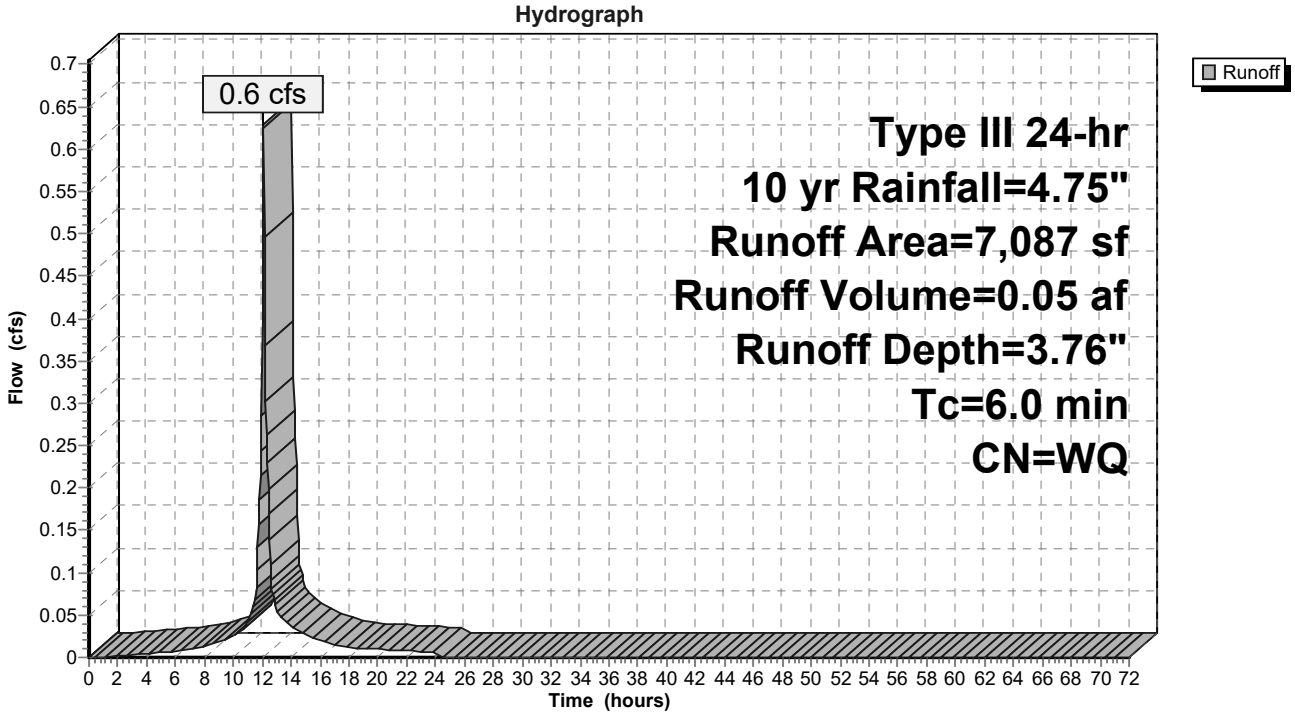
Runoff = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.75"

Area (sf)	CN	Description
134	98	Roofs HSG C
4,679	98	Paved parking HSG C
29	70	Woods, Good HSG C
2,245	74	>75% Grass cover, Good HSG C
7,087		Weighted Average
2,274		32.09% Pervious Area
4,813		67.91% Impervious Area

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

Subcatchment 8: Existing Parking Lot & Hill Street



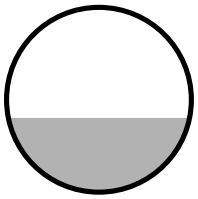
Summary for Reach 3R: 8" CPP

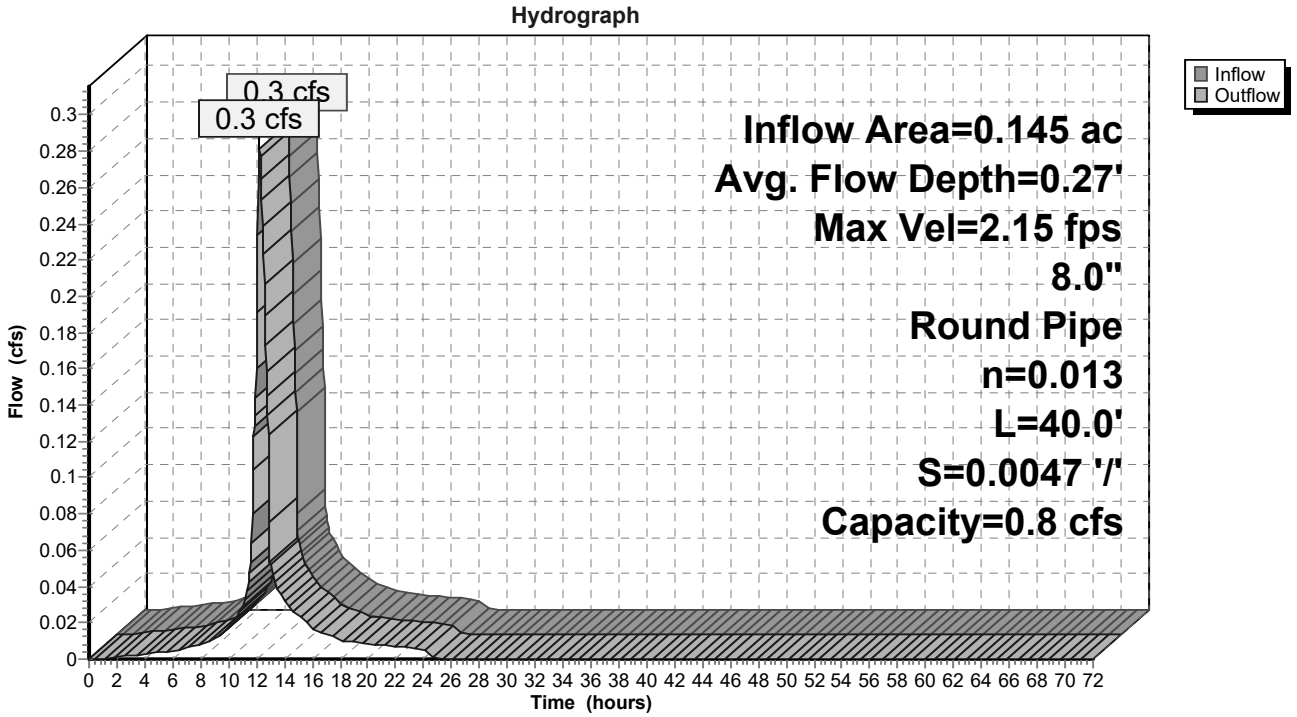
Inflow Area = 0.145 ac, 51.35% Impervious, Inflow Depth = 3.37" for 10 yr event
Inflow = 0.3 cfs @ 12.22 hrs, Volume= 0.04 af
Outflow = 0.3 cfs @ 12.23 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 0.9 min

Peak Storage= 5 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.65'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 0.8 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 40.0' Slope= 0.0047 '/'
Inlet Invert= 74.49', Outlet Invert= 74.30'



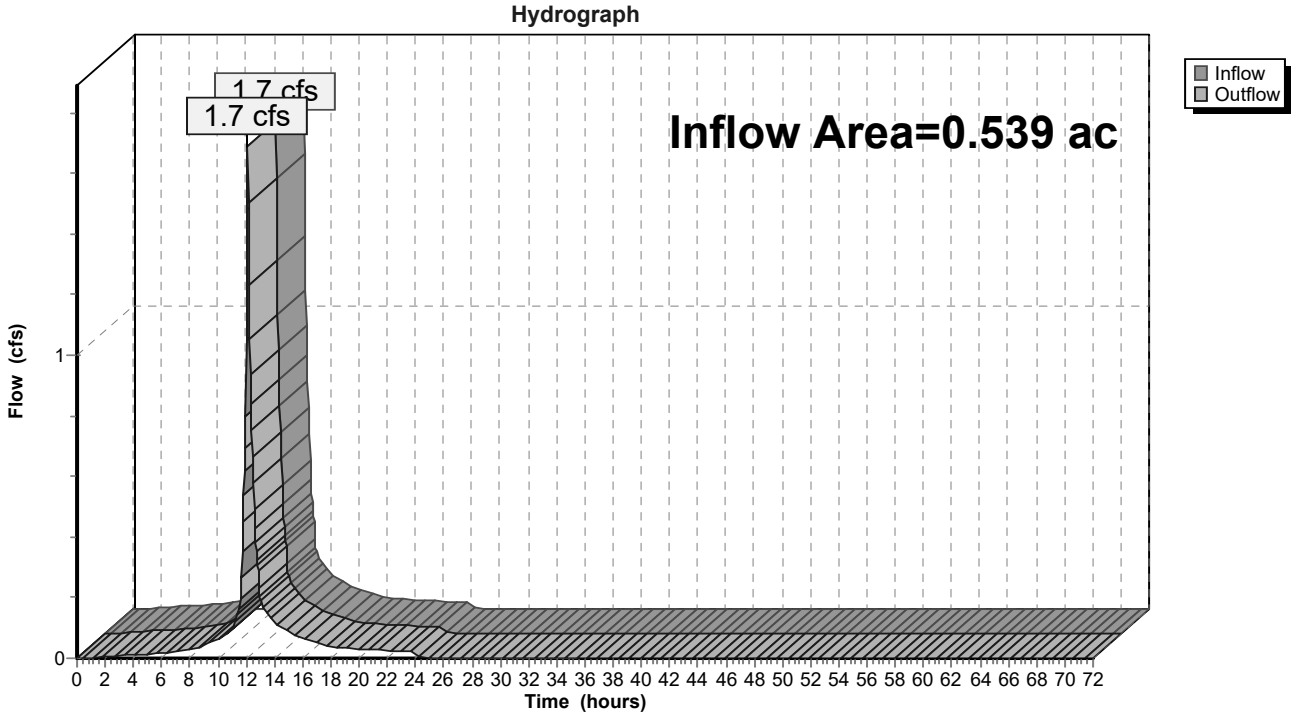


Summary for Reach Combined:

Inflow Area = 0.539 ac, 61.69% Impervious, Inflow Depth = 3.45" for 10 yr event
Inflow = 1.7 cfs @ 12.10 hrs, Volume= 0.15 af
Outflow = 1.7 cfs @ 12.10 hrs, Volume= 0.15 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach Combined:

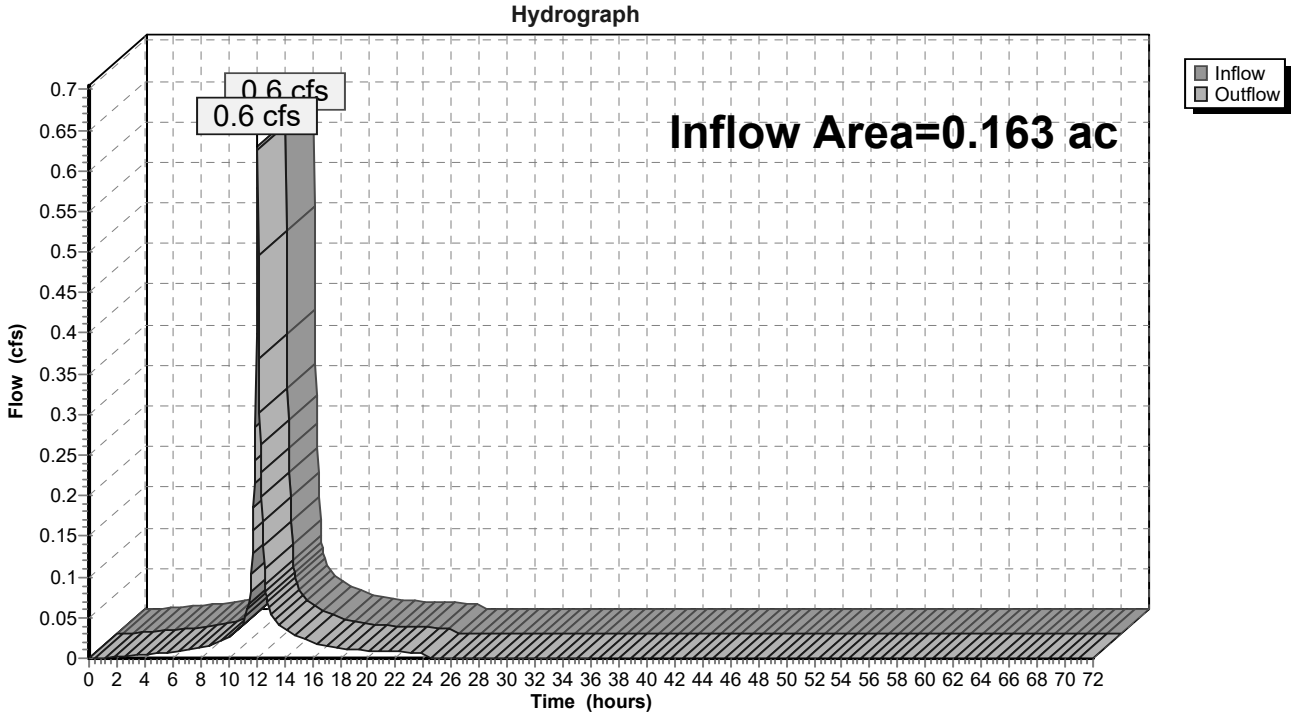


Summary for Reach POA1:

Inflow Area = 0.163 ac, 67.91% Impervious, Inflow Depth = 3.76" for 10 yr event
Inflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA1:

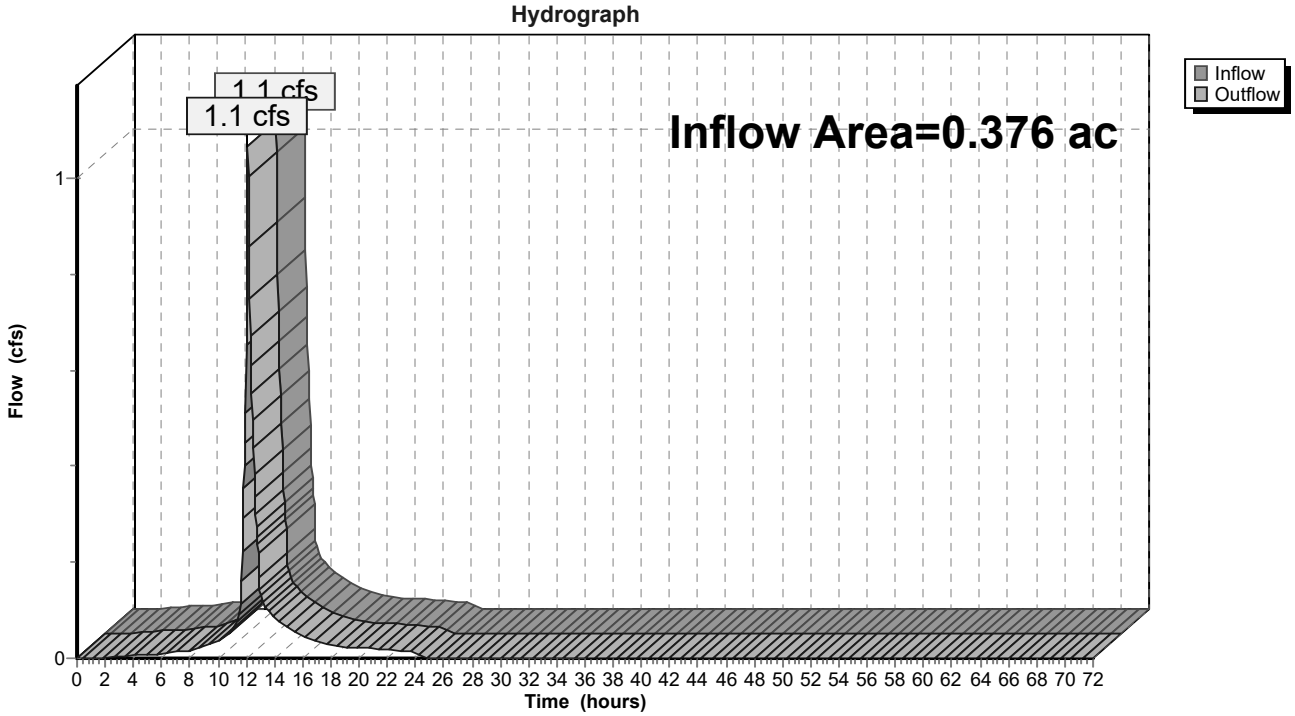


Summary for Reach POA2:

Inflow Area = 0.376 ac, 59.00% Impervious, Inflow Depth = 3.31" for 10 yr event
Inflow = 1.1 cfs @ 12.11 hrs, Volume= 0.10 af
Outflow = 1.1 cfs @ 12.11 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach POA2:



Summary for Pond 2P: Existing Drain Manhole

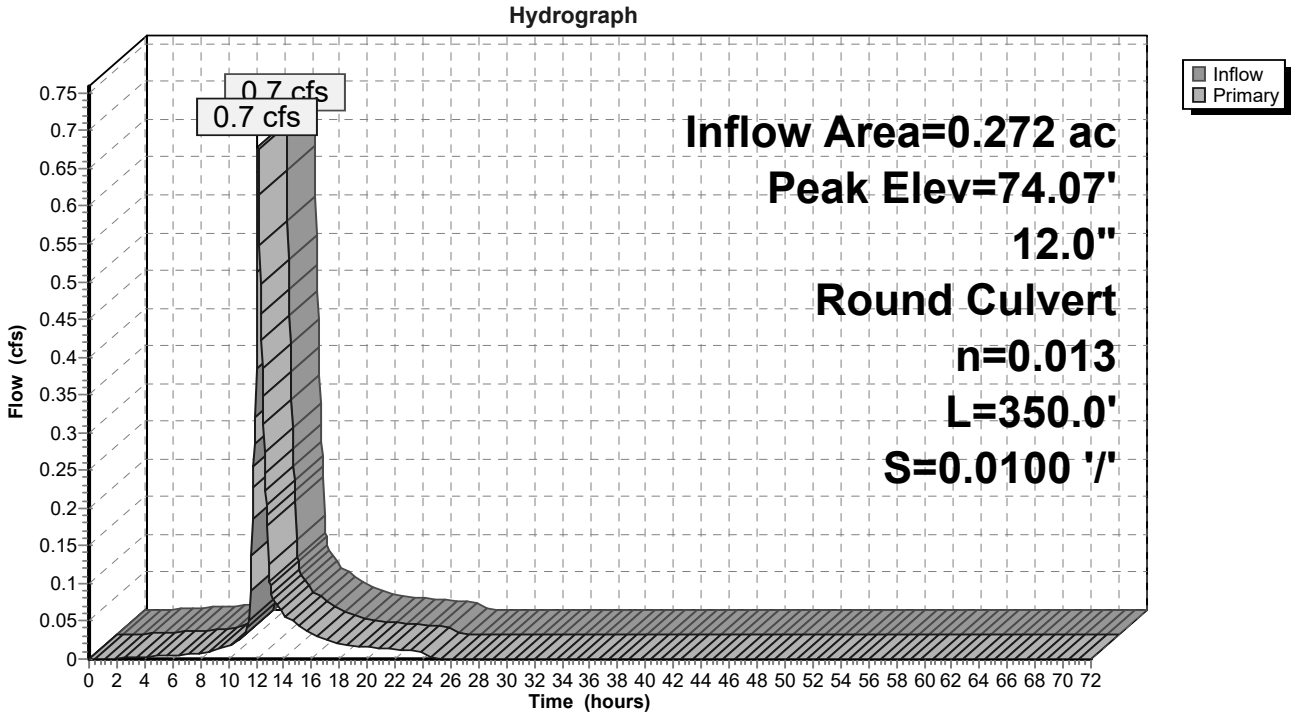
Inflow Area = 0.272 ac, 52.85% Impervious, Inflow Depth = 3.08" for 10 yr event
Inflow = 0.7 cfs @ 12.14 hrs, Volume= 0.07 af
Outflow = 0.7 cfs @ 12.14 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min
Primary = 0.7 cfs @ 12.14 hrs, Volume= 0.07 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 74.07' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.60'	**12.0" Round Culvert** L= 350.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.60' / 70.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.7 cfs @ 12.14 hrs HW=74.07' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.7 cfs @ 1.85 fps)

Pond 2P: Existing Drain Manhole



Summary for Pond BR: Bioretention Basin

Inflow Area = 0.127 ac, 54.57% Impervious, Inflow Depth = 3.45" for 10 yr event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af
Outflow = 0.4 cfs @ 12.12 hrs, Volume= 0.03 af, Atten= 8%, Lag= 2.1 min
Primary = 0.4 cfs @ 12.12 hrs, Volume= 0.03 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 77.91' @ 12.12 hrs Surf.Area= 1,435 sf Storage= 404 cf
Flood Elev= 78.00' Surf.Area= 1,479 sf Storage= 456 cf

Plug-Flow detention time= 145.1 min calculated for 0.03 af (80% of inflow)
Center-of-Mass det. time= 65.6 min (840.5 - 774.9)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	7 cf	**4.0" Round Pipe Storage** L= 85.0'
#2	74.83'	30 cf	**3/4" Crushed Stone (3" depth) (Irregular)** Listed below (Recalc) 75 cf Overall x 40.0% Voids
#3	75.08'	120 cf	**Filter Course 24" (Irregular)** Listed below (Recalc) 598 cf Overall x 20.0% Voids
#4	77.08'	7 cf	**Loam & Seed (3") (Irregular)** Listed below (Recalc) 75 cf Overall x 10.0% Voids
#5	77.33'	292 cf	**Basin Volume (Conic)** Listed below (Recalc)
		456 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.83	299	134.6	0	0	299
75.08	299	134.6	75	75	333

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.08	299	134.6	0	0	299
77.08	299	134.6	598	598	568

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	299	134.6	0	0	299
77.33	299	134.6	75	75	333

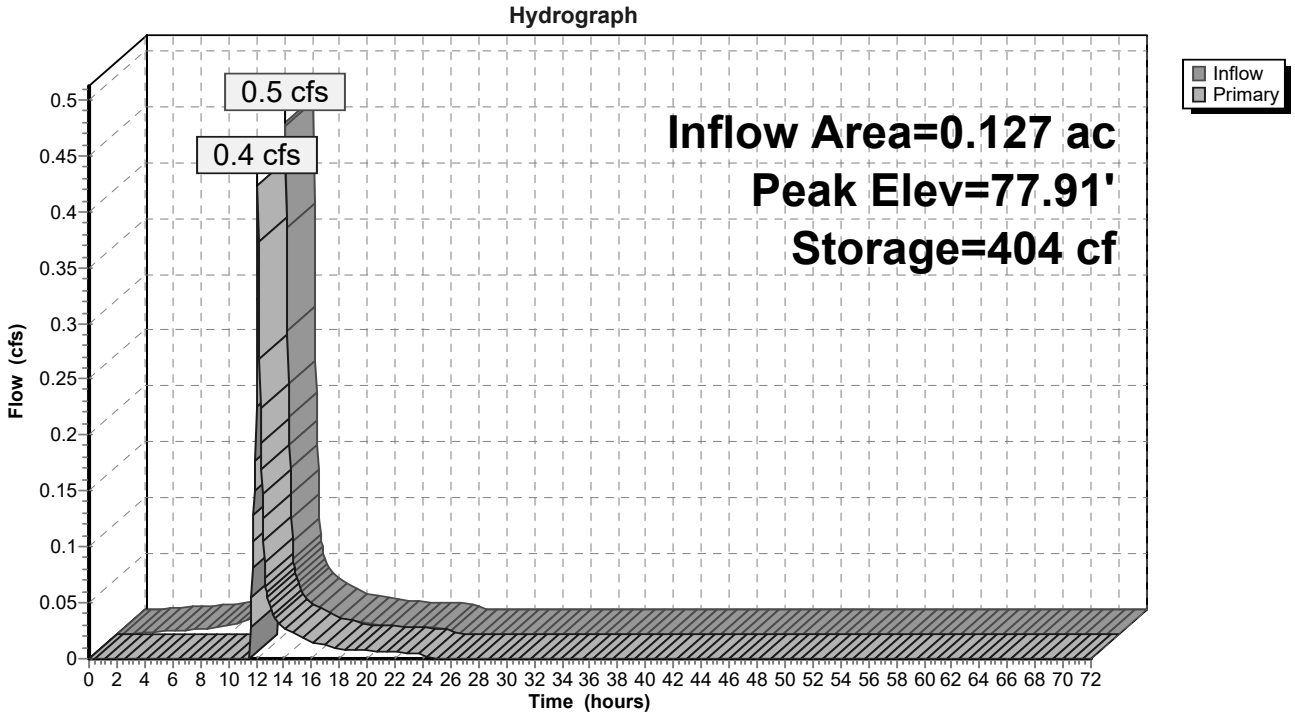
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.33	299	0	0	299
77.50	368	57	57	369
78.00	582	235	292	586

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 74.50' / 74.30' S= 0.0050 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2 Device 1 77.75' **8.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=77.90' TW=74.07' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.4 cfs of 2.3 cfs potential flow)
↑**2=Grate** (Weir Controls 0.4 cfs @ 1.28 fps)

Pond BR: Bioretention Basin



Summary for Pond CB: CB#3701

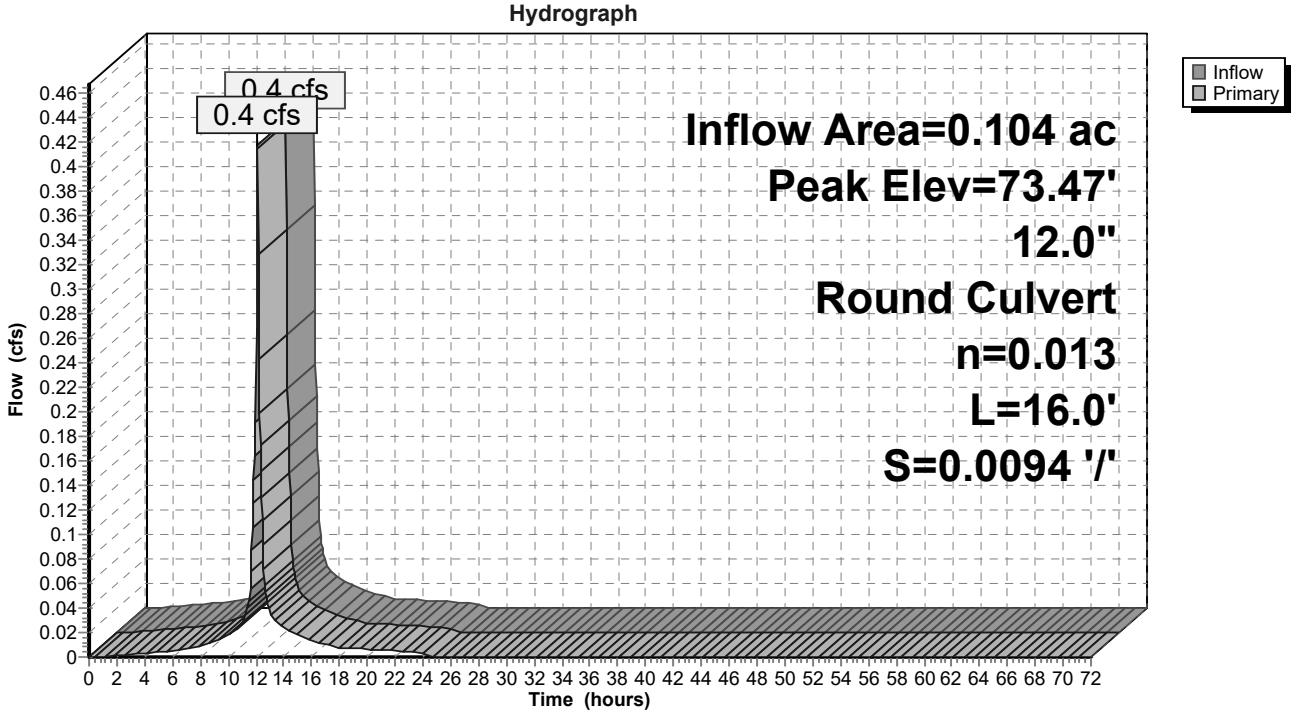
Inflow Area = 0.104 ac, 75.14% Impervious, Inflow Depth = 3.93" for 10 yr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 73.47' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	73.10'	**12.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.10' / 72.95' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.09 hrs HW=73.46' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.4 cfs @ 2.34 fps)

Pond CB: CB#3701



Summary for Pond PP: Proposed Porous Pavement

Inflow Area = 0.145 ac, 51.35% Impervious, Inflow Depth = 3.37" for 10 yr event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 0.04 af
Outflow = 0.3 cfs @ 12.22 hrs, Volume= 0.04 af, Atten= 45%, Lag= 8.0 min
Primary = 0.3 cfs @ 12.22 hrs, Volume= 0.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 75.03' @ 12.22 hrs Surf.Area= 4,784 sf Storage= 221 cf
Flood Elev= 76.70' Surf.Area= 9,568 sf Storage= 1,585 cf

Plug-Flow detention time= 11.7 min calculated for 0.04 af (100% of inflow)
Center-of-Mass det. time= 10.9 min (788.2 - 777.4)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	30 cf	**4.0" Round Pipe Storage** L= 344.0'
#2	74.83'	163 cf	**3/4" Crushed Stone 2" (Irregular)** Listed below (Recalc) 407 cf Overall x 40.0% Voids
#3	75.00'	957 cf	**Filter Course 12" (Irregular)** Listed below (Recalc) 2,392 cf Overall x 40.0% Voids
#4	76.00'	120 cf	**Filter Blanket (3" of Pea Gravel) (Irregular)** Listed below (Recalc) 598 cf Overall x 20.0% Voids
#5	76.25'	316 cf	**Reservoir Course (4" crushed stone) (Irregular)** Listed below (Recalc) 789 cf Overall x 40.0% Voids
		1,585 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
74.83	2,392	204.7	0	0	2,392
75.00	2,392	204.7	407	407	2,427

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	2,392	204.7	0	0	2,392
76.00	2,392	204.7	2,392	2,392	2,597

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
76.00	2,392	204.7	0	0	2,392
76.25	2,392	204.7	598	598	2,443

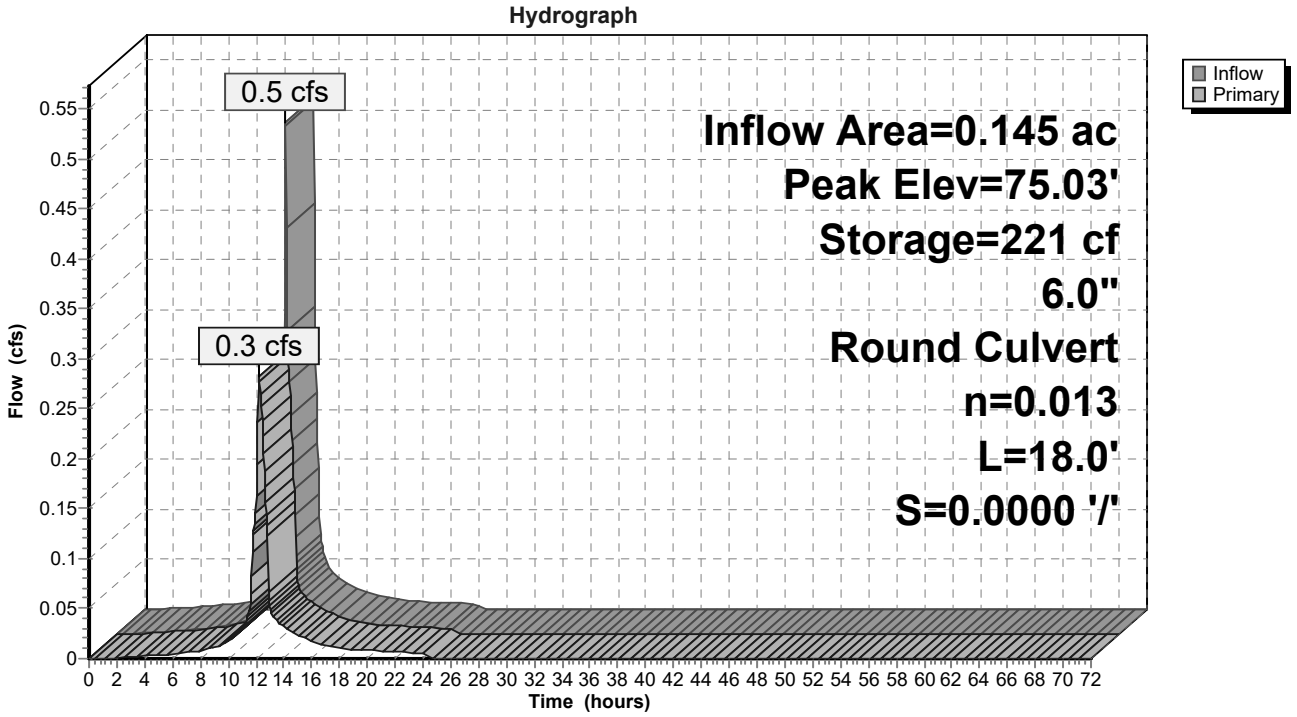
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
76.25	2,392	204.7	0	0	2,392
76.58	2,392	204.7	789	789	2,460

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	**6.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 74.50' / 74.50' S= 0.0000 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.3 cfs @ 12.22 hrs HW=75.03' TW=74.76' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.3 cfs @ 1.68 fps)

Pond PP: Proposed Porous Pavement



APPENDIX A 5

STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE MANUAL

96 BROADWAY
PREPARED FOR:
RYAN ESCHBACH
96 BRAODWAY
DOVER, NH
STRAFFORD COUNTY

April 2026

PREPARED BY:

NORWAY PLAINS ASSOCIATES, INC.

Hilary Badger, P.E.
N.H. Reg. #18290

2 CONTINENTAL BOULEVARD, P.O. BOX 249, ROCHESTER, NEW HAMPSHIRE 03866-0249 (603) 335-3948

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1.0 INTRODUCTION:

The purpose of this Manual is to:

1) Make the Property Owner/Facility Operator explicitly aware of the maintenance responsibility that goes along with the design prepared for them at the site located at 96 Broadway, Dover NH.

2) Provide maintenance and inspection guidelines to be followed by this property owner, their successors and assigns and the agents thereof.

1.1 SUMMARY OF STORMWATER MANAGEMENT PRACTICES ON-SITE:

There are two (2) primary stormwater management practices employed on the site that will require routine inspection and maintenance to insure proper functioning of stormwater controls into the future.

1) Porous Pavement
2) Bioretention Basin

1.2 RESPONSIBLE PARTIES:

Property Owner:
Ryan Eschbach
US Route 1, Apt. 1C
York, ME 03909
(248) 225-6538
ryanesch@mac.com

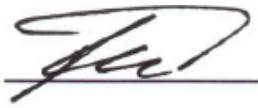
1.3 TRANSFER OF RESPONSIBILITY:

In the event that the property is sold or transferred to another party, the Town of Lee shall be notified of the transfer of ownership and responsibility for the stormwater management practices discussed in this manual. The mailing address for Town of Lee is:

City of Dover
Planning and Community Development
288 Central Avenue
Dover, NH 03820
(603) 516-6008

1.4 LONGTERM AGREEMENT

I the undersigned have read this inspection and maintenance manual. With the signature below I acknowledge that it my responsibility to maintain or have maintained by qualified professionals all of the stormwater management practices outlined in this manual for perpetuity and that all successors and assigns of myself will be responsible for inspection and maintenance of the stormwater management practices as well. I also acknowledge that it is my responsibility to document any transfer of ownership and responsibility with the City of Dover.



4-7-26

Ryan Eschbach

Date

2.0 INSPECTION & MAINTENANCE (CONSTRUCTION):

During Construction it is important to maintain the site where construction is ongoing in a manner that minimizes tracking of silt, sediment and construction materials both onto the base and sub-base for pavement areas and the completed pavement areas as well as the bottoms of all of the infiltration practices. Sediment should be monitored at all Silt Fence throughout construction and excessive build up should be removed and disposed of in accordance with state and local requirements.

2.1 INSPECTION (CONSTRUCTION):

1) The Site Construction Contractor Shall perform a daily inspection of the entire site to insure that construction activities as not impacting:

    a. Areas not currently under construction

    b. Areas under construction but sensitive to sediment and silt deposition
        - Gravel and crushed gravel base courses of the Pavement
        - Bioretention Basin

2) The Site Superintendent or his designee shall walk the perimeter of the site taking note of any sedimentation /siltation that may be occurring.

3) All silt fences shall be inspected weekly and after each rain event.

4) The Stabilized Construction Entrances shall be inspected daily to insure any mud, sediment and or silt is not tracked off site and is limited on site.

2.2 MAINTENANCE (CONSTRUCTION):

The Site Construction Contractor shall be responsible for all erosion and sediment control devices during construction. Refer to the Plan Set "96 BROADWAY, 96 BROADWAY, DOVER, NH, PREPARED FOR 96 BROADWAY LLC".

1) For all best management practices (BMP's) locations, details on proper installation and, construction sequencing.

2) In an effort to limit travel on the bioretention basin area, this area should be constructed early in the construction sequence and stabilized as soon as possible.

3) If silt, sand or sediment becomes noticeably deposited on areas of travel not within the work zone these areas shall be swept or cleaned as appropriate.

3.0 INSPECTION & MAINTENANCE (OPERATION):

To insure the prolonged operational life of all of the stormwater management practices employed on the site it is imperative that a logical and thorough inspection and maintenance plan be implemented. The following sections outline the Inspection & Maintenance Schedule and methods to be employed on site after the completion of construction during the operational life of individual stormwater management practices employed.

3.1 GENERAL SITE:

The site shall undergo general inspection as follows (see Appendix A-1 for Stormwater Management Practices, Inspection & Maintenance Checklist):

1) **Litter and Trash pick-up and removal:**
   a. **Inspection Frequency:**
      - Weekly

   b. **Minimum Inspection Requirements:**
      - Inspect the site within the limits of the lawn areas for blown or loose litter.

   c. **Maintenance/Cleanout Threshold:**
      - Clean as required;
      - Clean when visually apparent litter or trash spillage occurs.

3.2 STANDARD ASPHALT AND POROUS ASPHALT PAVEMENT AREAS:

The proposed driveways and parking areas shall undergo inspection as follows (see Appendix A-1 for Stormwater Management Practices, Inspection & Maintenance Checklist)

1) **Standard Asphalt Pavement:**
   a. **Inspection/Maintenance Frequency:**
      - At least 1 time per year, preferably 2 times a year (Early Spring prior to May 15 and Fall prior to October 15).

   b. **Minimum Inspection Requirements:**
      - Mandatory sweeping performed by a qualified professional
      - Typical street sweeping equipment is acceptable for sweeping paved driveway only.

2) **Porous Asphalt Pavement:**
   a. **Inspection/Maintenance Frequency:**
      - 2 times a year (Early Spring after April 15, Late Fall after October 15) mandatory sweeping
      - Periodic inspection (during rain event) to ensure the pavement drains effectively during and after storms.
   b. **Minimum Inspection Requirements:**
      - The pavement shall be inspected for areas of damage including spalling or deterioration;
      - Areas found to be damaged shall be noted for repair at the earliest convenience.
   c. **Maintenance/Cleanout Threshold:**
      - Quarterly Vacuum Sweeping by qualified professional
      - Power washing maybe required prior to vacuum sweeping to dislodge trapped particles
      - In areas irreparably damaged, standard HMA can be used to patch (not to exceed 10% of porous parking bay)
      - Never re-seal porous pavement with HMA or other impermeable material.
3) **De-icing Agents:**
   The use of sand as a de-icing agent is prohibited. **SAND CANNOT** be used in conjunction with porous pavement. It will clog the open pore structure of the pavement and cause premature failure of the surface leading to replacement.

a. Inspection/Maintenance Frequency:

- After every plowing, the site manager shall inspect the parking area to ensure that sand was not applied.

b. Minimum Inspection/Maintenance Requirements:

- No winter sanding is permitted.
- In the event that sand has been applied, the plowing contractor shall be contacted to ensure that sand is not employed on site again.
- Salt shall be applied only as necessary. This will vary depending on sun exposure. The use of salt shall be minimized.

c. Maintenance Threshold:

- After plowing of appreciable snow

3.3 BIORENTION BASIN

The Bioretention Basin shall undergo inspection as follows (see Appendix A-1 for Stormwater Management Practices, Inspection & Maintenance Checklist)

1) Bioretention Basins:

a. Inspection/Maintenance Frequency:

- Inspect pretreatment measures (i.e. stone outlet protection.) Bi-annually. Once in the spring prior to May 15 and once in the fall prior to October 15.
- Inspect infiltration surface bi-annually. Once in the spring prior to May 15 and once in the fall prior to October 15.
- Inspect garden bottom after any rainfall event of 2.5-inches in a 24-hour period or greater.
- Conduct annual inspections of the vegetation, and maintained in healthy conditions, including pruning, removal and replacement of dead or diseased vegetation, and removal of invasive species.

b. Minimum Inspection/Maintenance Requirements:

- Remove and dispose of accumulated sediment based on inspection. Repair area of removal as necessary to restore infiltration capacity.
- Perform maintenance and rehabilitation based on inspections.
- Remove debris (if any) from rain garden inlet or overflow outlet structure based on inspection.
- If the infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional (i.e. professional engineer, certified soils scientist, etc.) should assess the condition of the facility to determine measures required to restore infiltration function, including but not limited to removal of accumulated sediments or replacement of the bioretention basin soil mixture.

3.4 UNDERDRAIN SYSTEM:

The Underdrain System shall undergo inspection as follows (see Appendix A-1 for Stormwater Management Practices).

1) Manifold Manhole (outlet structure):

a. Inspection/Maintenance Frequency:

- At least 2 times per month
- Inspect manhole after any rainfall event of 2.5-inches in a 24-hour period or greater.

b. **Minimum Inspection/Maintenance Requirements:**
   - Check for sediment accumulation;
   - Filters to be cleaned out.

c. **Maintenance/Cleanout Threshold:**
   - Remove and dispose of all accumulated sediment based on inspection.

2) **Drainage pipes:**

a. **Inspection/Maintenance Frequency:**
   - 1 time every 2 years (Early Spring after April 15 or Fall after October 15) same time as the pavement sweeping

b. **Minimum Inspection/Maintenance Requirements:**
   - Check for sediment accumulation;
   - Check for clogging

c. **Maintenance/Cleanout Threshold:**
   - Sediment depth ≥ 1-inch
   - Clogged

3.5 SEDIMENT & WASTE MATERIAL DISPOSAL:

All material removed from the PAVEMENT and the STORMWATER MANAGEMENT PRACTICES on site shall be disposed of in accordance with local, state and federal regulations offsite.

3.6 QUALIFIED STORMWATER SYSTEM MAINTENANCE SERVICE:

It is strongly recommended that the maintenance of the Stormwater Management Practices outlined above, excepting the General Site Maintenance, be performed by a qualified company such as:

Stormwater Compliance, LLC
8 Blue Moon Drive
North Yarmouth, ME 04097
207-712-7181
info@stormwatercomp.com

Companies of this nature have all of the necessary equipment to maintain closed drainage systems.

3.7 CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in Appendix A-2. They should be controlled as described by Douglas Cygan with New Hampshire Department of Agriculture, Markets & Food, 603-271-3488, doug.cygan@agr.nh.gov

4.0 RECORD KEEPING; LONG TERM INSPECTION & MAINTENANCE:

Inspection and maintenance logs for stormwater practices employed by new development and re-development with substantial stormwater management infrastructure shall be kept and provided to representative of the City of Dover upon request.

APPENDIX A-1:

STORMWATER MANAGEMENT SYSTEM: INSPECTION & MAINTENANCE CHECKLIST

STORMWATER MANAGEMENT SYSTEM: INSPECTION AND MAINTENANCE LOG

Appendix A- 1
Stormwater Management System:
Inspection and Maintenance Checklist

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
General Site:			
Litter and Trash pick-up	Weekly	• Inspect the site within the limits of the lawn areas for blown or loose litter.	• Clean as required • Clean when visually apparent litter or trash spillage has occurred
Control of Invasive Species	Monthly	• Inspect the site where plantings have occurred for any species listed in appendix A-2.	• Disposed of the invasive species in accordance with A-2.
Driveway and Parking Areas:			
Standard Pavement Driveway	• At least 1 time per year, preferably 2 times/year (Early Spring prior to May 15 and Fall prior Oct. 15) •	• Mandatory sweeping performed by a qualified professional* • Typical street sweeping equipment is acceptable for sweeping the paved areas. •	• N/A
Porous Asphalt Paved Surface	• 2 times/year (Early Spring after April 15 and Late Fall after Oct. 15) • Periodically, (during rain events) to ensure proper drainage of porous pavement	• Inspect for areas of damage (including spalling and deterioration) • Damaged areas should be noted for repair at earliest convenience	• Quarterly Vacuum Sweeping by qualified professional • Power washing maybe required prior to vacuum sweeping to dislodge trapped particles • In areas irreparably damaged, standard HMA can be used to patch (not to exceed 10% of porous parking bay) • Never re-seal porous pavement with HMA or other impermeable material
De-icing Agent Application	• After every plowing, the site manager shall inspect the parking area to determine the need for sand application.	• NO winter sanding is permitted; application of sand shall be brought up with the plowing company and is not to happen again. • Salt shall be applied as necessary; amount will vary with sun exposure. • Use of salt shall be minimized	• After plowing of appreciable snowfall
Stormwater Management Practices:			
Drainage Pipes	• 1 time every 2 years (Early Spring after April 15 or Fall after October 15)	• Check for sediment accumulation; • Check for clogging	• Sediment depth $\geq$ 1-inch • Clog

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
Underdrain system:	• At least two times per month and after any rain events greater than 2.5 inches	• Check for sediment accumulation; • Check for floatable contaminants (i.e. oils etc.) Check for floatable trash (i.e. cigarette butts, paper etc.)	• If any ponding water is observed, inspection of cleanouts shall occur.
Bioretention Basin	• Water the grasses as needed following construction. • Conduct inspections after rainfall. • Conduct routine maintenance monthly. • Inspect all of the vegetation semi-annually during first year and annually after. •	• Water to promote plan growth and survival, mainly during the first two years and during dry periods. • Inspect site following rainfall events. Add/replace vegetation in any eroded areas. • Prune and weed swale to maintain appearance. Remove accumulated trash and debris. Replace mulch as needed. • Inspect inflow area for sediment accumulation. Remove any accumulated sediment or debris. • Inspect site for erosion as well as sediment and mulch which have been moved around in the garden. Add/replace vegetation in any eroded areas. • Inspect rain garden for dead or dying vegetation. Replace vegetation as needed. • Test planting bed for pH. If the pH is below 5.2, limestone should be applied. If the pH is about 8.0, iron sulfate and sulfur should be applied. • Remove and replace bioretention soil mixture if basin does not drain after 72-hours after a rain event.	• N/A

Regular Inspection and Maintenance Guidance for Permeable Pavements

Regular inspection and maintenance is critical to the effective operation of permeable pavement. It is the responsibility of the owner to maintain the pavement 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, seasonal changes, and traffic conditions.

ACTIVITIES

Visual inspections are an integral part of system maintenance. This includes monitoring pavement to ensure water drainage, debris accumulation, and surface deterioration.

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
Adjacent vegetated areas show no signs of erosion and run-on to permeable pavement. **Remedy:** Repair or replace any damaged structural parts.	Whenever vacuuming adjacent permeable pavements
Adjacent non-permeable sections of pavement are clean of debris to prevent debris tracking. **Remedy:** Vacuuming adjacent pavement non-permeable pavement can be effective at minimizing run-on.	
Check for standing water remaining on the surface of the pavement after a precipitation event within 30 minutes. **Remedy:** Use of a power washer or compressed air blower at an angle of 30 degrees or less can be effective, particularly in combination with a vacuum or vacuum sweeper.	1-2 times per year, more frequently for high-use sites or sites with higher potential for run-on
Check for debris accumulation, particularly in the winter. **Remedy:** Loose debris such as leaves or trash can be removed using a power/leaf blower or gutter broom. Fall and spring cleanup should be accompanied by pavement vacuuming.	
Accumulation of sediment and organic debris on the pavement surface. **Remedy:** Regular use of a vacuum sweeper can remove sediment and organic debris. The sweeper may be fitted with water jets.	
PAVEMENT CONDITION	
Check for accumulation of snow or other stockpiles of materials such as sand/salt, mulch, soil, yard waste, etc. Stockpiling of these materials on permeable pavements can lead to premature clogging. **Remedy:** Remove stockpile if possible and check for clogging in storage area.	As Needed
Damage to pavement **Remedy:** Repairs should be repaired as they are identified	

CHECKLIST FOR INSPECTION OF PERMEABLE PAVEMENT

Location:
Inspector:
Date:
Time:
Site Conditions:
Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1. Salt / Deicing (Winter/Spring)		
Use salt only for ice management	**S U**	
Accumulated salt removed in spring	**S U**	
2. Debris Cleanup (1-2 times per year minimum, Spring/Fall)		
Remove sediment and organic debris using vacuum street sweeper	**S U**	
Clean catch basins (if available)	**S U**	
3. Controlling Run-On		
Adjacent vegetated areas show no signs of erosion and run-on to permeable pavement	**S U**	
4. Outlet / Catch Basin Inspection (if available) (1-2 times per year, after large storm events)		
No evidence of blockage	**S U**	
Good condition, no need for cleaning/repair	**S U**	
5. Poorly Drained Pavement		
Recently cleaned and vacuumed	**S U**	
6. Pavement Condition		
No evidence of deterioration	**S U**	
7. Signage / Stockpiling (As Needed)		
No evidence of damage	**S U**	
Proper signage posted indicating usage for traffic load	**S U**	
No stockpiling of materials and other unauthorized uses	**S U**	

Corrective Action Needed	Due Date
1.	
2.	
3.	
Inspector's Signature	Date

Stormwater Management System Inspection & Maintenance Log

Date Inspected	Inspector	Cleaning/Repair Needed (List Items/Comments)	Date of Cleaning repair	Performed By

Stormwater Management System Inspection Photos:

APPENDIX A-2:

CONTROL OF INVASIVE PLANTS

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.

Background:

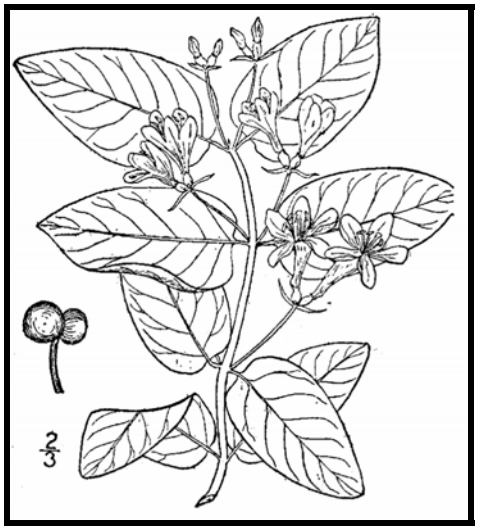
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, 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.

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

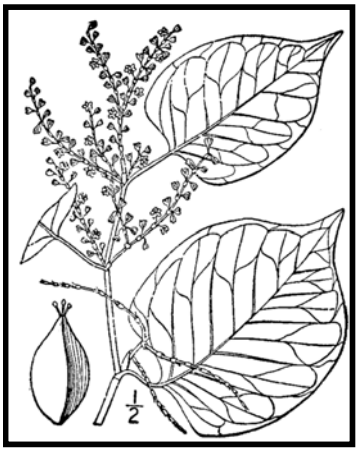
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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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APPENDIX A-3:

DE-ICING LOG

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied

APPENDIX A 6

APPENDIX A 6.1

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	43.204 degrees North
Longitude	70.87 degrees West
Elevation	20 feet
Date/Time	Fri Apr 03 2026 12:11:28 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	2.00	2.60	2.87	**1yr**	2.30	2.76	3.16	3.89	4.46
2yr	0.32	0.49	0.61	0.81	1.01	1.29	**2yr**	0.88	1.17	1.50	1.92	2.45	3.15	3.52	**2yr**	2.79	3.38	3.88	4.61	5.25
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.39	3.08	3.98	4.50	**5yr**	3.53	4.33	4.95	5.82	6.58
10yr	0.40	0.64	0.80	1.09	1.42	1.85	**10yr**	1.23	1.69	2.18	2.83	3.66	4.75	5.43	**10yr**	4.21	5.22	5.97	6.94	7.81
25yr	0.46	0.74	0.94	1.30	1.73	2.27	**25yr**	1.49	2.09	2.70	3.53	4.61	6.00	6.97	**25yr**	5.31	6.70	7.65	8.78	9.80
50yr	0.52	0.83	1.06	1.49	2.01	2.67	**50yr**	1.73	2.46	3.19	4.19	5.50	7.17	8.42	**50yr**	6.35	8.09	9.22	10.48	11.64
100yr	0.58	0.94	1.21	1.71	2.33	3.13	**100yr**	2.01	2.89	3.76	4.97	6.53	8.57	10.17	**100yr**	7.58	9.78	11.13	12.53	13.84
200yr	0.65	1.05	1.37	1.96	2.71	3.69	**200yr**	2.34	3.41	4.44	5.90	7.79	10.24	12.29	**200yr**	9.06	11.81	13.43	14.98	16.46
500yr	0.76	1.25	1.63	2.37	3.32	4.56	**500yr**	2.86	4.23	5.52	7.39	9.82	12.97	15.79	**500yr**	11.48	15.18	17.23	18.98	20.71

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	0.92	1.25	1.57	2.15	2.45	**1yr**	1.90	2.35	2.88	3.37	4.04
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.36	1.83	2.35	3.05	3.41	**2yr**	2.70	3.28	3.76	4.48	5.06
5yr	0.35	0.54	0.67	0.92	1.16	1.40	**5yr**	1.01	1.37	1.61	2.14	2.77	3.71	4.13	**5yr**	3.29	3.97	4.62	5.41	6.11
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.44	3.12	4.27	4.78	**10yr**	3.78	4.60	5.32	6.24	7.00
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.83	3.64	4.93	5.78	**25yr**	4.37	5.56	6.49	7.53	8.40
50yr	0.48	0.73	0.91	1.31	1.76	2.19	**50yr**	1.52	2.14	2.35	3.18	4.09	5.63	6.66	**50yr**	4.98	6.40	7.53	8.68	9.62
100yr	0.54	0.81	1.02	1.47	2.01	2.51	**100yr**	1.74	2.45	2.63	3.56	4.56	6.40	7.66	**100yr**	5.66	7.37	8.73	10.00	11.01
200yr	0.60	0.90	1.13	1.64	2.29	2.87	**200yr**	1.98	2.81	2.93	3.98	5.09	7.28	8.82	**200yr**	6.44	8.48	10.11	11.53	12.61
500yr	0.69	1.03	1.33	1.93	2.75	3.46	**500yr**	2.37	3.38	3.39	4.61	5.90	8.59	10.61	**500yr**	7.61	10.20	12.28	13.93	15.05

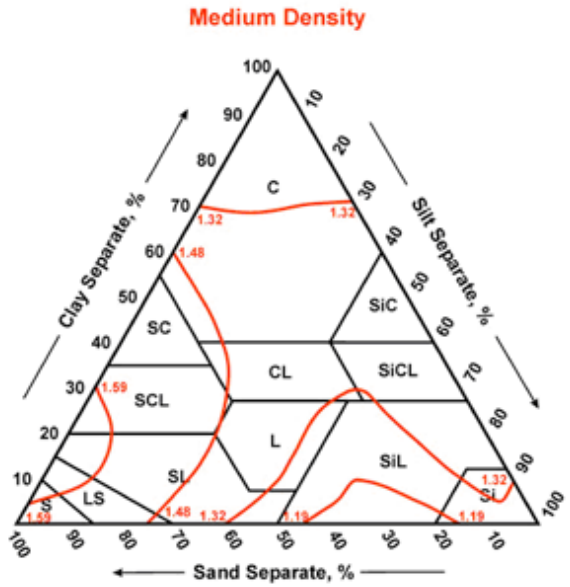
Upper Confidence Limits

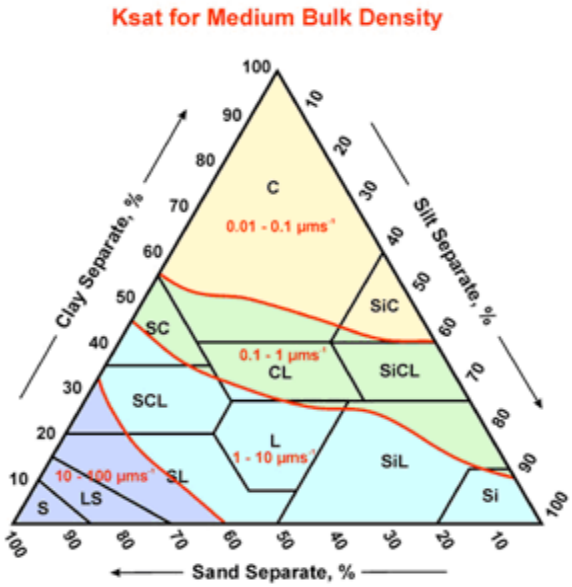
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.74	2.21	2.88	3.10	**1yr**	2.55	2.98	3.44	4.23	4.82
2yr	0.33	0.51	0.62	0.85	1.04	1.25	**2yr**	0.90	1.22	1.48	1.95	2.51	3.30	3.64	**2yr**	2.92	3.50	4.01	4.76	5.46
5yr	0.39	0.61	0.75	1.03	1.31	1.58	**5yr**	1.13	1.55	1.86	2.50	3.20	4.25	4.88	**5yr**	3.76	4.69	5.30	6.25	7.02
10yr	0.46	0.70	0.87	1.22	1.57	1.92	**10yr**	1.36	1.88	2.23	3.04	3.86	5.22	6.09	**10yr**	4.62	5.86	6.71	7.68	8.56
25yr	0.56	0.85	1.05	1.50	1.98	2.48	**25yr**	1.71	2.43	2.88	3.96	4.96	7.07	8.20	**25yr**	6.26	7.88	9.00	10.11	11.15
50yr	0.64	0.98	1.22	1.75	2.36	3.00	**50yr**	2.04	2.93	3.50	4.83	6.03	8.73	10.28	**50yr**	7.72	9.88	11.26	12.44	13.64
100yr	0.75	1.13	1.42	2.05	2.81	3.62	**100yr**	2.43	3.54	4.24	5.90	7.33	10.78	12.89	**100yr**	9.54	12.39	14.09	15.33	16.68
200yr	0.87	1.31	1.66	2.40	3.35	4.39	**200yr**	2.89	4.30	5.16	7.22	8.91	13.35	16.18	**200yr**	11.82	15.56	17.65	18.88	20.44
500yr	1.07	1.59	2.04	2.96	4.22	5.65	**500yr**	3.64	5.52	6.67	9.45	11.55	17.73	21.86	**500yr**	15.69	21.02	23.78	24.90	26.74

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APPENDIX A 6.2

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
Pootham	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

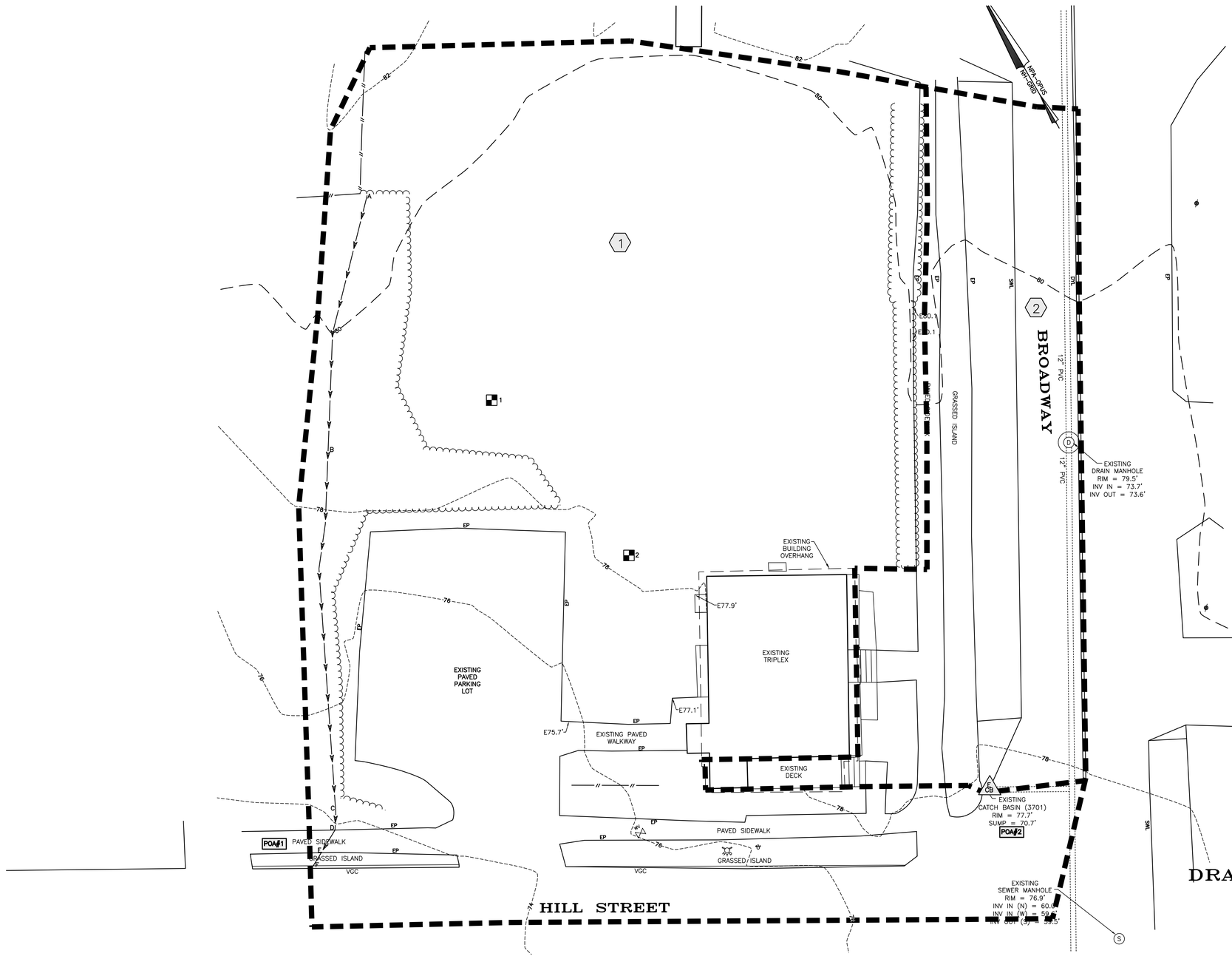
Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Cabot	589	0.6	2.0	0.06	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

PLANS:
APPENDIX D-1 & D-2

LEGEND

- EXISTING TREE LINE
- EXISTING DRAIN LINE
- 232 EXISTING CONTOUR LINE (DATUM)
- EXISTING UTILITY POLE
- TP #8 EXISTING TEST PIT
- SUBCATCHMENT BOUNDARIES
- SUBCATCHMENT DRAINAGE PATH
- 7 SUBCATCHMENT AREA
- CB DRAINAGE BASINS OR CATCH BASINS
- R1 DRAINAGE REACHES
- POA#1 POINTS OF ANALYSIS



PRE-DEVELOPMENT DRAINAGE ANALYSIS PLAN

TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026
GRAPHIC SCALE

10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

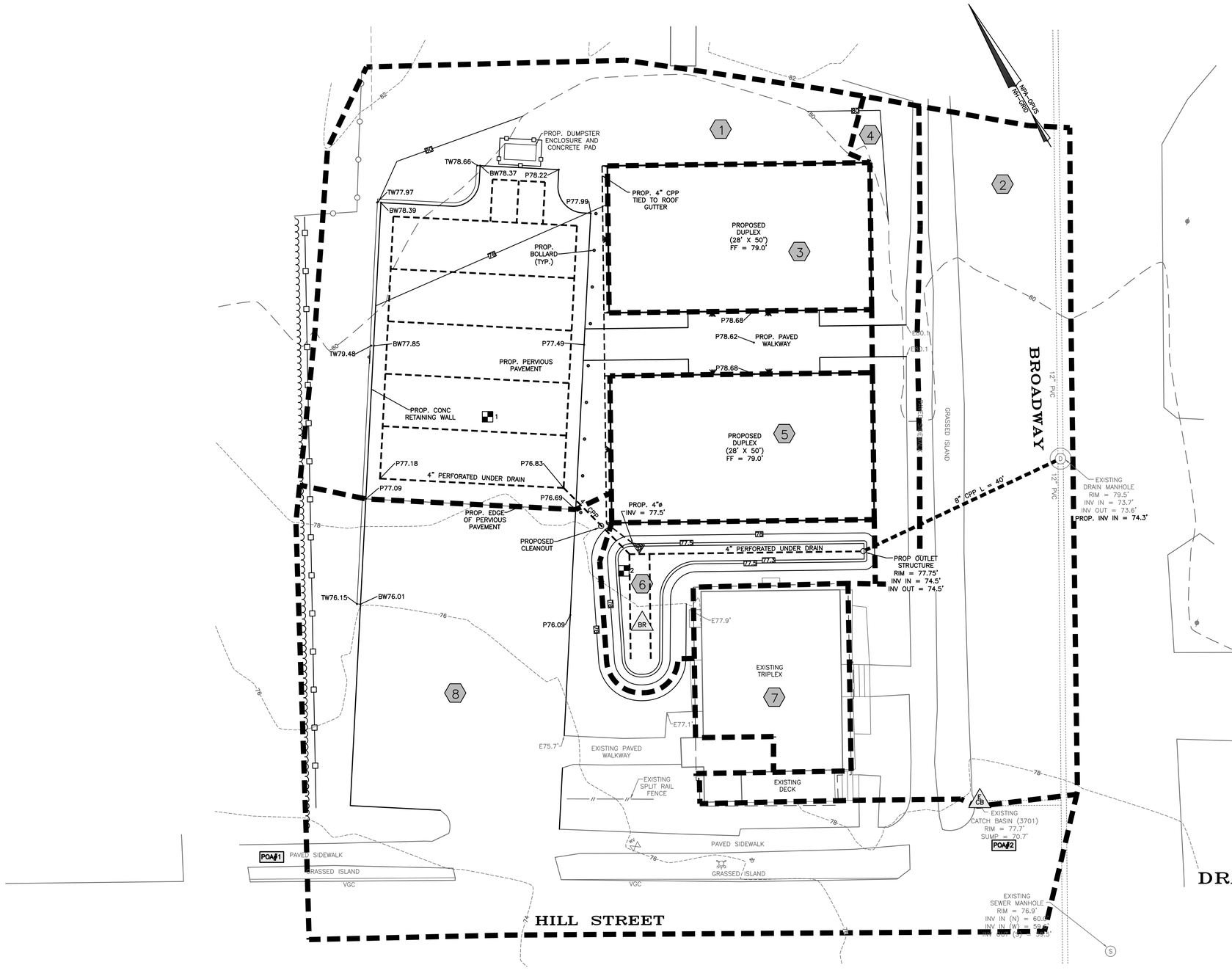
D-1

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948
NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603-335-3948

LEGEND

- EXISTING TREE LINE
- EXISTING DRAIN LINE
- 232 EXISTING CONTOUR LINE
- TP #8 EXISTING TEST PIT
- PROPOSED TREE LINE
- PROPOSED DRAIN LINE
- 232 PROPOSED CONTOUR LINE
- PROPOSED OUTLET STRUCTURE
- SUBCATCHMENT BOUNDARIES
- SUBCATCHMENT DRAINAGE PATH
- 7 SUBCATCHMENT AREA
- CB DRAINAGE BASINS OR CATCH BASINS
- R1 DRAINAGE REACHES
- POA#1 POINTS OF ANALYSIS



POST-DEVELOPMENT DRAINAGE ANALYSIS PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:

RYAN ESCHBACH

APRIL 2026

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 INCH = 10 FEET

D-2

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948

NORWAY PLAINS ASSOCIATES, INC.

2 Continental Blvd., Rochester, N.H. 603-335-3948

Landscape Operation & Maintenance Plan For 96 Broadway, Dover, NH

Weekly Tasks

1. Mow and edge lawns if needed. Lawns to be cut to 3.5" height.
2. Prune back any shrubs overhanging curbs or sidewalks.
3. Prune back any groundcover overhanging curbs or sidewalks.
4. Remove litter and leaves from plants, planting beds.
5. Remove any broken or fallen branches from trees. Remove sucker growth from tree trunks.
6. Remove any weeds larger than 2 inches (5 cm) high or wide from planters. Weeds 2 inches (5 cm) and larger must be removed, not just killed.
7. Replace bark mulch which has been knocked or washed out of planters. Smooth mulch layer if it has been disturbed.
8. Replace decorative rock which has been knocked or washed out of drip strips. Smooth decorative rock surface if it has been disturbed.
9. Check plants for signs of stress, pests or disease. Request authorization to replace other dead or missing plants. Note: Maintenance contractor must request authorization to make replacements within one week of the damage becoming evident.
10. Sweep or blow clean all walkways, curbs, and gutters.
11. Treat for any signs of disease or pest infestation.
12. Complete any items required on the Monthly Checklist.
13. Hand water any plants that are dry and stressed.
14. Check the irrigation system (if there is a system). Make emergency repairs as needed or request authorization to make major repairs. Note: Maintenance contractor must request authorization for repairs within one week of the damage becoming evident.
15. Adjust the irrigation controllers for current water needs of plants.
16. Gently prune shrubs at appropriate time of year based on species, for shape and form. **DO NOT shear.**

Yearly Tasks

Early Spring

1. Prune any tree branches that interfere with public safety. Prune all parking lot and street trees yearly to encourage strong growth.
2. Apply granular fertilizer to shrubs beds and lawns. Be sure to make application prior to a moderate rainfall in drip-irrigated planters so the rain will wash the fertilizer in.
3. Submit receipts to owner's authorized representative as proof of fertilizer purchase.
4. Trim any perennial foliage left in the fall for winter interest to within six inches of the ground.
5. Add new mulch to planters where the mulch depth has been reduced to less than 2 inches (5 cm) thick. Mulch depth shall not exceed 2". Additional mulch not required where shrubs or groundcover completely hide the soil surface from view.

6. Where there is irrigation and after threat of frost is gone, flush out irrigation systems as needed and check for proper operation of each valve zone.
7. Clean or replace plugged sprinkler nozzles. Replace plugged drip emitters.
8. Replace irrigation controller program back-up batteries.
9. Top dress woodland paths with matching materials, as needed.
10. Top dress pervious paths as needed.

June:

No additional items

July:

No additional items

August:

No additional items

September:

1. Inventory all plant materials. Inventory shall include an exact count of all shrubs and trees, itemized by planter. Replace any dead or missing plants.

October:

1. Prepare irrigation system for winter. Make sure backflow preventer is well insulated or drained prior to first freeze. Blow out pipes using compressed air in areas where freezing could result in breakage.
2. Mow field areas.

November:

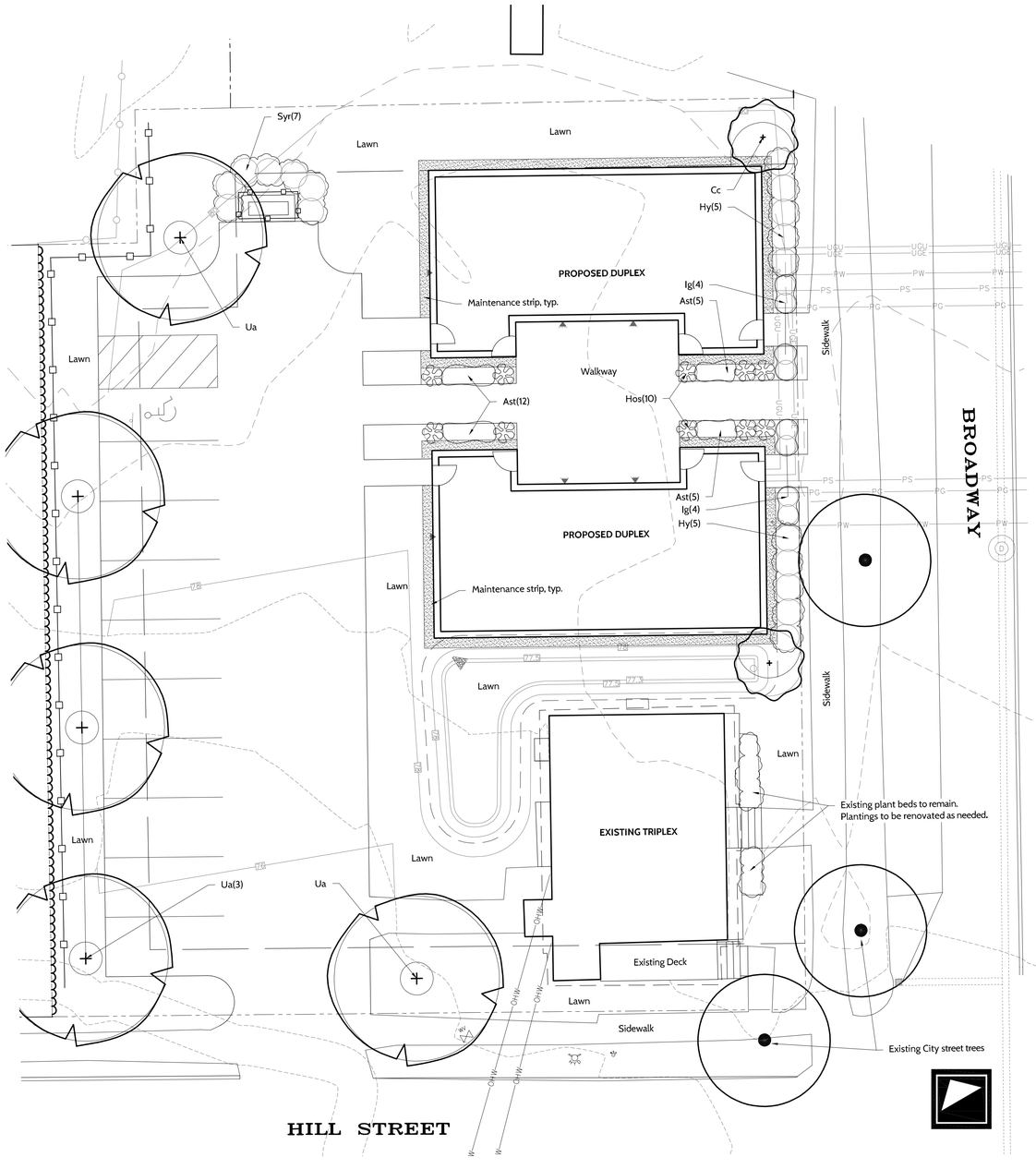
1. "WILT-PRUF" broadleaf evergreens when temperature permits.

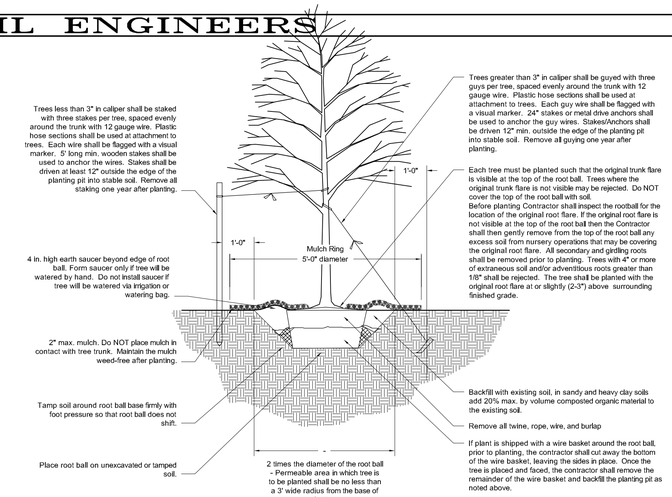
December:

1. Prune any tree branches that interfere with public safety. Prune all parking lot and street trees yearly to encourage strong growth.

Winter

Snow plowing of roads and shoulders to be performed by a Snow Pro certified contractor.





TREE PLANTING DETAIL

Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Cc	*Crataegus crusgalli 'Inermis'*	Thornless Cockspur	2	2.5-3" Cal	B&B
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	5	3-3.5" Cal	B&B

SHRUBS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Hyl	*Hydrangea arborescens 'Incrediball'*	Smooth Hydrangea	10	5 gal	
Ig	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	8	5 gal	Full to ground
Syr	*Syringa x 'Bloomerang Purple'*	Reblooming Lilac	7	5 gal	

PERENNIALS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Ast	*Astilbe 'Peach Blossom'*	Peach Astilbe	22	1 gal	
Hos	*Hosta 'Frances Williams'*	Frances Williams Hosta	10	2 gal	

LANDSCAPE NOTES

1. Design is based on drawings by Norway Plains dated June 2026 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
5. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
6. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
7. This plan is for review purposes only, NOT for Construction. Construction Documents will be provided upon request.
8. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
9. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 811.
10. The Contractor shall procure any required permits prior to construction.
11. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
12. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
13. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
14. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
15. All plants shall be legibly tagged with proper botanical name.
16. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
17. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
18. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
19. All landscaping shall be provided with the following:
    a. An underground sprinkling system
    b. An outside hose attachment within 150 feet
20. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide water from off site, should it not be available on site.
21. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
22. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
23. Drip strip shall extend to 6" beyond roof overhang and shall be edged with 3/16" thick metal edger.
24. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
25. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy.
26. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
27. Landscape Architect is not responsible for the means and methods of the contractor.

SEA LAUREL
Landscape Architecture

LANDSCAPE PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:
RYAN ESCHBACH
JUNE 2026

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

L-1

Drawing Name: M:\2025\25321\DWGS\25321 SP-1.dwg
Thu, 04 Jun 2026 - 2:16pm

96 BROADWAY

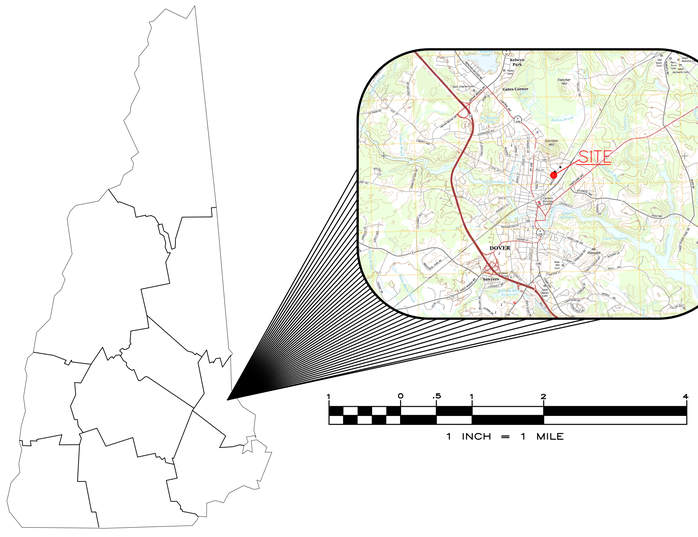
96 BROADWAY, DOVER, NH

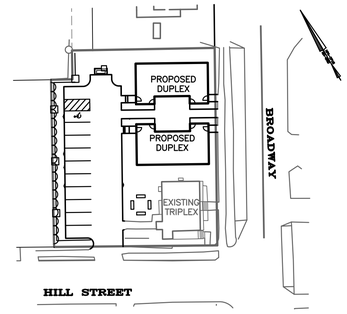
TAX MAP 27, LOT 169

PREPARED FOR

96 BROADWAY LLC: RYAN ESCHBACH

APRIL 2026





OVERALL SITE
1" = 50'

STATE OF NEW HAMPSHIRE
HILARY B. BADGER
No.18290
LICENSED
PROFESSIONAL ENGINEER

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO ENSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

CIVIL ENGINEERS

NORWAY PLAINS ASSOCIATES, INC.
2 CONTINENTAL BOULEVARD
ROCHESTER, NEW HAMPSHIRE 03867
(603) 335-3948

LANDSCAPING ARCHITECTS

SEA LAUREL LANDSCAPE ARCHITECTURE
VICTORIA MARTEL
150 BLACKBERRY HILL ROAD
BERWICK, ME 03901
VICKY@SEALAUREL.COM
(207) 599-6517

ARCHITECTS

LASSEL ARCHITECTS
SARAH HOURIHANE, AIA LEED AP
370 MAIN STREET
SOUTH BERWICK, ME 03908
(207) 384-2049

OWNER OF RECORD

TAX MAP 27, LOT 169
96 BROADWAY LLC
US ROUTE 1, APT 1C
YORK, ME 03909
SCRD BOOK 5339, PAGE 197

APPLICANT

RYAN ESCHBACH
96 BROADWAY LLC
US ROUTE 1, APT 1C
YORK, ME 03909
(248) 225-6538

PROPERTY OWNER: _____ DATE: _____

STATE AND FEDERAL PERMITS:

STATE OF NEW HAMPSHIRE PERMIT NUMBERS:

NHDES ALTERATION OF TERRAIN:	NOT REQUIRED
NHDES WETLANDS PERMIT:	NOT REQUIRED
NHDES DAM PERMIT:	NOT REQUIRED
NHDES SUBDIVISION PERMIT:	NOT REQUIRED
NHDES SUBSURFACE SYSTEMS PERMIT:	NOT REQUIRED
NHDES WASTEWATER PERMIT:	NOT REQUIRED
NHDOT DRIVEWAY/ENTRANCE PERMIT:	NOT REQUIRED

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES):

NPDES PERMITS ARE ONLY REQUIRED FOR PROJECTS MEETING THE DISTURBED AREA CRITERIA BELOW AND HAVING A POINT SOURCE STORMWATER DISCHARGE FROM THE SITE TO AN ADJACENT WETLAND OR WATER BODY (I.E. CULVERT, SWALE, ETC. OUTLETING TO A WETLAND, CREEK, STREAM OR RIVER).

NPDES PERMIT: NOT REQUIRED

NPDES PERMITS CONSIST OF A NOTICE OF INTENT (NOI) FILED WITH THE ENVIRONMENTAL PROTECTION AGENCY AT LEAST 14 DAYS PRIOR TO CONSTRUCTION COMMENCING AND A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) BEING PREPARED, KEPT ON SITE AND FOLLOWED BY THE CONTRACTOR.

FOR STATUS OF THIS PERMIT, CONTACT THE PROJECT GENERAL CONTRACTOR.

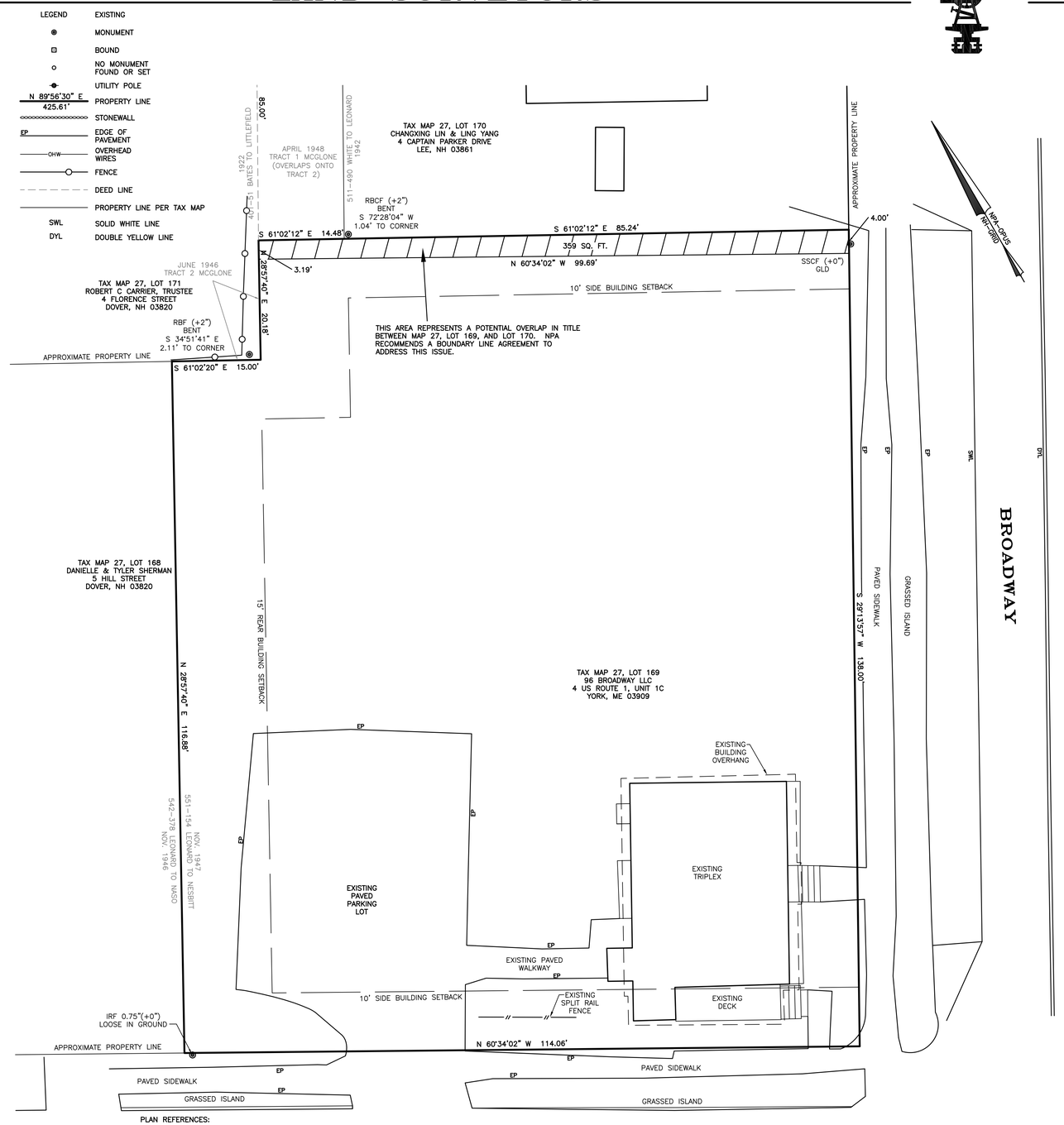
FINAL APPROVAL BY
DOVER PLANNING BOARD

CERTIFIED BY: _____ DATE: _____

SHEET INDEX

		COVER	
SHEET	S-1	PLAN OF LAND	1" = 10'
SHEET	E-1	EXISTING FEATURES	1" = 10'
SHEET	C-1	OVERALL SITE PLAN	1" = 10'
SHEET	C-2	GRADING AND DRAINAGE PLAN	1" = 10'
SHEET	C-3	UTILITY PLAN	1" = 10'
SHEET	C-4	CONSTRUCTION DETAILS	AS SHOWN
SHEET	C-5	DRAINAGE DETAILS	AS SHOWN
SHEET	C-6	UTILITY DETAILS	AS SHOWN
SHEET	C-7	SEWER DETAILS	AS SHOWN
SHEET	C-8	TEMPORARY EROSION AND SEDIMENTATION CONTROL DETAILS	AS SHOWN
SHEET	C-9	PERMANENT EROSION AND SEDIMENTATION CONTROL DETAILS	AS SHOWN
SHEET	L-1	SITE LANDSCAPING PLAN	1" = 10'
SHEET	L-2	LIGHTING PLAN AND DETAILS	1" = 10'

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1



PLAN REFERENCES:

1. "MAP OF PROPERTY IN DOVER NH OWNED BY ALPHONSO A CHENEY" DATED OCTOBER 1897 BY WILLIAM G. OGDEN, CE RECORDED: SCRD POCKET 4, FOLDER 5, PLAN 44
2. "PLAN OF LOTS, ROBERT E. PRYOR, DOVER NH" DATED NOVEMBER 1960 BY G.L. DAVIS & ASSOCIATES RECORDED: SCRD BOOK 726, PAGE 77
3. "SITE PLAN OF 13-13 ½ HILL STREET, PREPARED FOR 13 HILL ST, LLC" DATED MARCH 2002 BY MACENEANEY SURVEY ASSOCIATES, INC. RECORDED: SCRD PLAN BOOK 85, PAGE 50
4. "LOT LINE ADJUSTMENT PLAN PREPARED FOR SANDRA G. NEVINS, 17-19 HILL STREET, DOVER, NH" DATED JANUARY 2020 BY MACENEANEY SURVEY ASSOCIATES, INC. RECORDED: SCRD PLAN NO. 12073
5. "MINOR SUBDIVISION OF LAND PREPARED FOR THOMAS & EVELYN K. BACKOWIES" DATED MAY 2020 BY MACENEANEY SURVEY ASSOCIATES, INC. RECORDED: SCRD PLAN 12207

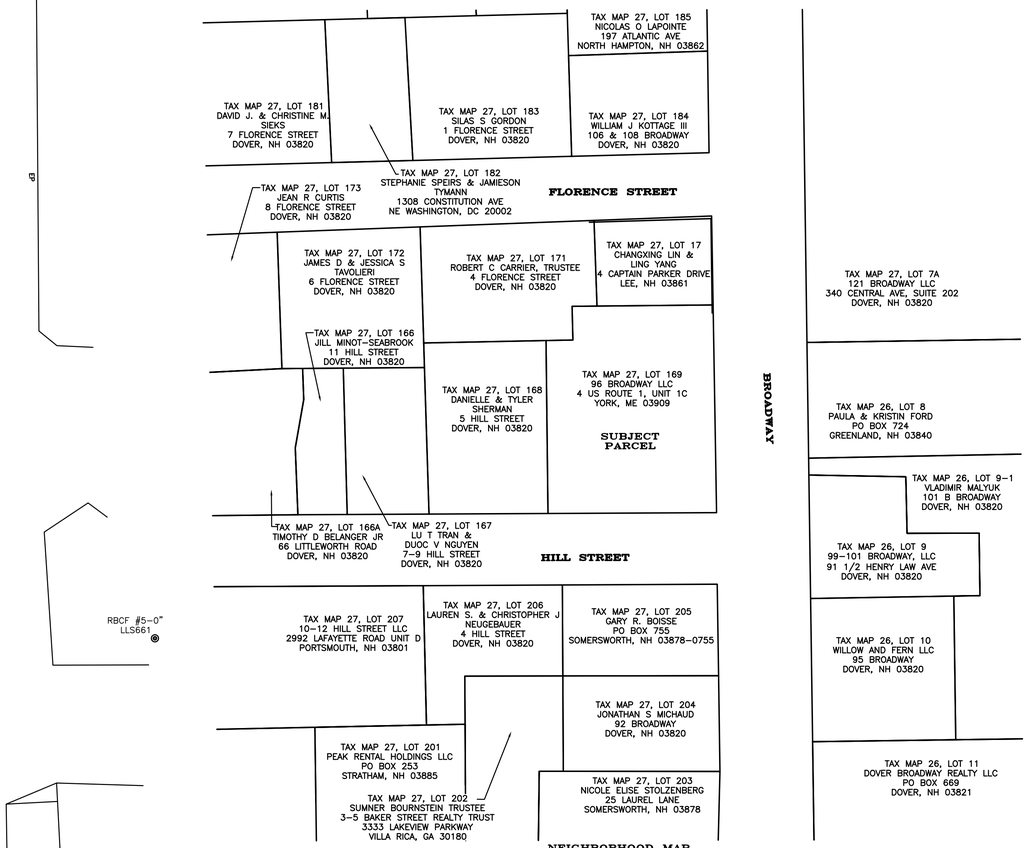
FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE BOUNDARY OF TAX MAP 27, LOT 169.
2. TOTAL PARCEL AREA: MAP 27, LOT 169 0.35 ACRES.
3. PARCEL IS ZONED: GATEWAY DISTRICT.
4. DIMENSIONAL REGULATIONS PER ZONING ORDINANCE:
   MINIMUM LOT AREA/DWELLING UNIT = 4,000 SF
   MINIMUM LOT AREA = N/A
   FRONT PRIMARY BUILD TO LINE = 5 FEET MIN. – 20 FEET MAX
   FRONT SECONDARY BUILD TO LINE = 5 FEET MIN. – 20 FEET MAX
   FRONTAGE BUILD-OUT = 60%
   MINIMUM YARD SETBACKS:
   SIDE = 10 FEET
   REAR = 15 FEET
   MAXIMUM LOT COVERAGE = 50%
   MAXIMUM BUILDING HEIGHT = 4 STORY
   (ULTIMATE CERTIFICATION AND VERIFICATION OF THE ZONE DESIGNATION AND APPLICABLE LOCATION OF BUILDING SETBACK REQUIREMENTS ARE THE SOLE RESPONSIBILITY OF THE ZONING OFFICER IN THE SUBJECT MUNICIPALITY.)
5. THE SURVEYED PARCEL IS SERVICED BY THE MUNICIPAL WATER AND SEWER SYSTEM.
6. THE SURVEYED PARCEL IS NOT LOCATED WITHIN THE 100 YEAR FLOOD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP DATED 9/30/2015 COMMUNITY PANEL # 33017C0330E.
7. HORIZONTAL DATUM: NH STATE PLANE, NAD83(2011), VERTICAL DATUM: NAVD88 (GEOID18A).
8. FIELD SURVEY COMPLETED ON THE FOLLOWING DATES: JANUARY–APRIL 2026.
9. ABUTTING PROPERTY INFORMATION WAS TAKEN FROM DOVER TAX RECORDS. ABUTTING PROPERTY LINES WERE TAKEN FROM DOVER TAX MAPS AND ARE FOR INFORMATIONAL PURPOSES ONLY.
10. BROADWAY IS A VARIABLE WIDTH CLASS IV ROAD.

RESERVED REGISTRY OF DEEDS

REVISIONS:
6/1/26 – REVISE OWNER INFORMATION



NEIGHBORHOOD MAP
1 INCH = 50 FEET

THIS PLAN REPRESENTS A SURVEY OF REAL PROPERTY AND IS BASED ON A FIELD SURVEY THAT HAS A POSITIONAL ACCURACY OF GREATER THAN 1:15,000. THE SURVEY WAS CONDUCTED BY ME AND BY THOSE DIRECTLY UNDER MY SUPERVISION. EVERY REASONABLE EFFORT HAS BEEN MADE TO EXAMINE THE RECORD DOCUMENTS AND TO PROPERLY ESTABLISH THE BOUNDARIES OF THE SUBJECT PROPERTY. THIS PLAN CERTIFICATION DOES NOT CONSTITUTE OR GUARANTEE TITLE.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I FURTHER CERTIFY THAT I HAVE FILED A COPY OF THIS PLAN WITH THE PLANNING BOARD OF THE CITY OF DOVER IN ACCORDANCE WITH RSA 676:18.

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 1129 GLENN D. GRISWOLD SIGNATURE

GLENN GRISWOLD, LLS #1129 DATE

TAX MAP 27, LOT 169
96 BROADWAY LLC
US ROUTE 1, APT 1C
YORK, ME 03909
SCRD BOOK 5339, PAGE 197
PLAN OF LAND
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

S-1

LAND SURVEYORS

CIVIL ENGINEERS

LEGEND

- N 90°00'00" E 1.38 — PROPERTY LINE
- EXISTING TREE LINE
- EXISTING CHAIN LINK FENCE
- 258 — EXISTING CONTOUR LINE (NAVD88)
- EXISTING DRAIN LINE
- OHW — EXISTING OVERHEAD WIRES
- W — EXISTING WATER LINE
- S — EXISTING SEWER LINE
- G — EXISTING GAS LINE
- EXISTING UTILITY POLE
- EXISTING CATCH BASIN
- EXISTING SEWER MANHOLE
- EXISTING MONUMENT
- EXISTING HYDRANT
- EXISTING WATER GATE OR SHUT-OFF VALVE
- 1 — EXISTING TEST PIT LOCATION & NUMBER

TAX MAP 27, LOT 170
CHANGXING LIN & LING YANG
4 CAPTAIN PARKER DRIVE
LEE, NH 03861

RBCF (+2")
BENT
S 72°28'04" W
1.04' TO CORNER

S 61°02'12" E 14.48'

S 61°02'12" E 85.24'

APPROXIMATE PROPERTY LINE

SSCF (+0')
GLD

10' SIDE BUILDING SETBACK

TAX MAP 27, LOT 171
ROBERT C CARRIER, TRUSTEE
4 FLORENCE STREET
DOVER, NH 03820

RBF (+2")
BENT
S 34°51'41" E
2.11' TO CORNER

N 28°57'40" E 201.18'

S 61°02'20" E 15.00'

14" HEMLOCK TREE
10" HEMLOCK TREE

12" HEMLOCK TREE
16" HEMLOCK TREE

20" HEMLOCK TREE

18" HEMLOCK TREE
12" HEMLOCK TREE

TAX MAP 27, LOT 168
DANIELLE & TYLER SHERMAN
5 HILL STREET
DOVER, NH 03820

15' REAR BUILDING SETBACK

N 28°57'40" E 118.88'

EXISTING BUSH

50" BEECH

2 – 14" MAPLE TREES

TAX MAP 27, LOT 169
96 BROADWAY LLC
4 US ROUTE 1, UNIT 1C
YORK, ME 03909

9" MAPLE TREE
12" MAPLE TREE

2 – 3" MAPLE TREES

8" MAPLE TREE
4" MAPLE TREE

6" MAPLE TREE

8" ASH TREE

IRF 0.75"(+0")
LOOSE IN GROUND

EXISTING PAVED PARKING LOT

EXISTING TRIPLEX

EXISTING MINI SPLIT CONDENSER

EXISTING BUILDING OVERHANG

EXISTING LANDSCAPE AREA

E77.9'

E77.1'

E75.7'

EXISTING PAVED WALKWAY 5.0'

EXISTING SPLIT RAIL FENCE

EXISTING DECK

5.0'

5.5'

10' SIDE BUILDING SETBACK

N 60°34'02" W 114.06'

APPROXIMATE PROPERTY LINE

PAVED SIDEWALK

PROP. TEMPORARY CATCH BASIN FILTER

EXISTING CATCH BASIN (3701)
RIM = 77.7'
SUMP = 70.7'

44" OAK

26" ASH

GRASSED ISLAND

20.0'

VGC

HILL STREET

28.8'

EXISTING SEWER MANHOLE
RIM = 76.9'
INV IN (N) = 65.9'
INV IN (W) = 59.9'
INV OUT (S) = 59.9'

"STOP SIGN"
"HILL ST"

"NO TRUCKS–TRUCK ROUTE
RIGHT ARROW"
SIGN

APPROXIMATE PROPERTY LINE

S 29°13'57" W 138.00'

PAVED SIDEWALK

GRASSED ISLAND

9" OAK CLUSTER X6

E80.1

E80.1

EP

SWL

BROADWAY

12" PVC

LOCATION OF 8" ACP SEWERMAIN

APPROXIMATE LOCATION OF 12" WATERMAIN

MBA GRIDS NORTH

PSNH 114_26
26BELLA

APPROXIMATE LOCATION OF NATURAL GAS LINE

EXISTING DRAIN MANHOLE
RIM = 79.5'
INV IN = 73.7'
INV OUT = 73.6'

30.2'

114_25_63_25
NETCO
"NO PARKING"
RBCF #5–0"
LLS661

PLAN REFERENCES:

1. "MAP OF PROPERTY IN DOVER NH OWNED BY ALPHONSO A CHENEY"
   DATED OCTOBER 1897 BY WILLIAM G. OGDEN, CE
   RECORDED: SCRD POCKET 4, FOLDER 5, PLAN 44
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   DATED JANUARY 2020 BY MACENEANEY SURVEY ASSOCIATES, INC.
   RECORDED: SCRD PLAN NO. 12073
5. "MINOR SUBDIVISION OF LAND PREPARED FOR THOMAS & EVELYN K. BACKOWIES"
   DATED MAY 2020 BY MACENEANEY SURVEY ASSOCIATES, INC.
   RECORDED: SCRD PLAN 12207

TEST PIT INFORMATION
TEST PITS CONDUCTED ON JANUARY 23, 2026 BY:
ASHLEY F. ROWE, DESIGNER OF SUBSURFACE DISPOSAL SYSTEMS 1857

TEST PIT 1
0" – 2" LOAM TOPSOIL.
2" – 27" VERY FINE SANDY LOAM, GRANULAR, FRIABLE. REDOXIMORPHIC CONCENTRATIONS COMMON BELOW 23".
27" – 47" VERY FINE SILTY LOAM, GRANULAR, FRIABLE. RESTRICTIVE FEATURE/LEDGE OR LARGE BOULDER AT 47".
SHWT AT 23", RESTRICTIVE FEATURE AT 47", NO OBSERVED WATER.

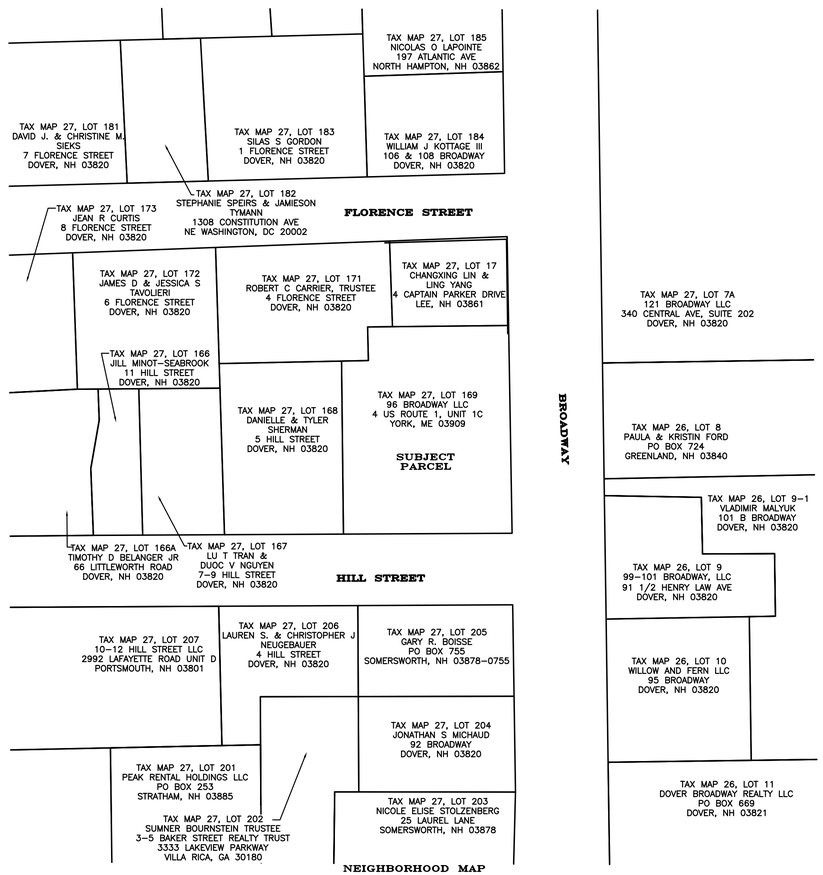
TEST PIT 2
0" – 8" LOAM TOPSOIL.
8" – 40" VERY FINE SANDY LOAM, GRANULAR, FRIABLE. REDOXIMORPHIC CONCENTRATIONS COMMON BELOW 23".
40" – 62" VERY FINE SILTY LOAM, GRANULAR, FRIABLE. REFUSAL AT 62" DUE TO LEDGE OR LARGE BOULDER.
SHWT AT 23", REFUSAL AT 62", NO OBSERVED WATER.

GENERAL SITE PLAN NOTES

1. THE PARCEL IS SHOWN AS LOT NO. 169, MAP 27 ON THE CITY OF DOVER TAX ASSESSOR'S MAPS.
2. THIS PARCEL IS LOCATED IN THE GATEWAY DISTRICT.
3. TOTAL PARCEL AREA: 15,429 SQUARE FEET OR 0.35 ACRES.
4. THE PURPOSE OF THIS PLAN IS TO DEPICT THE EXISTING FEATURES ON THE LOT.
5. ALL EXISTING UTILITIES LOCATIONS ARE APPROXIMATE AS SHOWN. THE CONTRACTOR SHALL VERIFY THEIR EXACT LOCATION PRIOR TO ANY WORK BEING PERFORMED.
6. TITLE REFERENCE FOR THE PROJECT PARCEL IS THE STRAFFORD COUNTY REGISTRY OF DEEDS, BOOK 5339, PAGE 197.
7. THESE PLANS SHOW THE EXISTING CONDITIONS AS APPARENT AT THE TIME OF SURVEY. FIELDWORK WAS PERFORMED JANUARY–MARCH, 2026.
8. DIMENSIONAL REGULATIONS PER ZONING ORDINANCE:
   GATEWAY DISTRICT:
   MINIMUM LOT AREA/DWELLING UNIT = 4,000 SF
   MINIMUM LOT AREA = N/A
   FRONT PRIMARY BUILD TO LINE = 5 FEET MIN. – 20 FEET MAX
   FRONT SECONDARY BUILD TO LINE = 5 FEET MIN. – 20 FEET MAX
   FRONTAGE BUILD–OUT = 60%
   MINIMUM YARD SETBACKS:
   SIDE = 10 FEET
   REAR = 15 FEET
   MAXIMUM LOT COVERAGE = 50%
   MAXIMUM BUILDING HEIGHT = 4 STORY
   (ULTIMATE CERTIFICATION AND VERIFICATION OF THE ZONE DESIGNATION AND APPLICABLE LOCATION OF BUILDING SETBACK REQUIREMENTS ARE THE SOLE RESPONSIBILITY OF THE ZONING OFFICER IN THE SUBJECT MUNICIPALITY.)
9. ORIENTATION: HORIZONTAL: NH STATE PLANE NAD83(2011)
   VERTICAL DATUMS NAVD88(GEOID18A)
10. PARCEL IS NOT LOCATED WITHIN ZONE A (100YR FLOOD) AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY MAP, COMMUNITY #33017C0330E DATED SEPTEMBER 30, 2015.

STATE OF NEW HAMPSHIRE — No. 1129 — GLENN D. GRISWOLD — LAND SURVEYOR
SIGNATURE

REVISIONS:
6/1/26 – REVISE OWNER INFORMATION



NEIGHBORHOOD MAP
1 INCH = 50 FEET

FINAL APPROVAL BY
DOVER PLANNING BOARD

CERTIFIED BY: _____ DATE: _____

EXISTING FEATURES PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

E-1

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

TAX MAP 27, LOT 169
96 BROADWAY LLC
US ROUTE 1, APT 1C
YORK, ME 03909
SCRD BOOK 5339, PAGE 197

31 Mooney Street, Alton, N.H. 603-875-3948

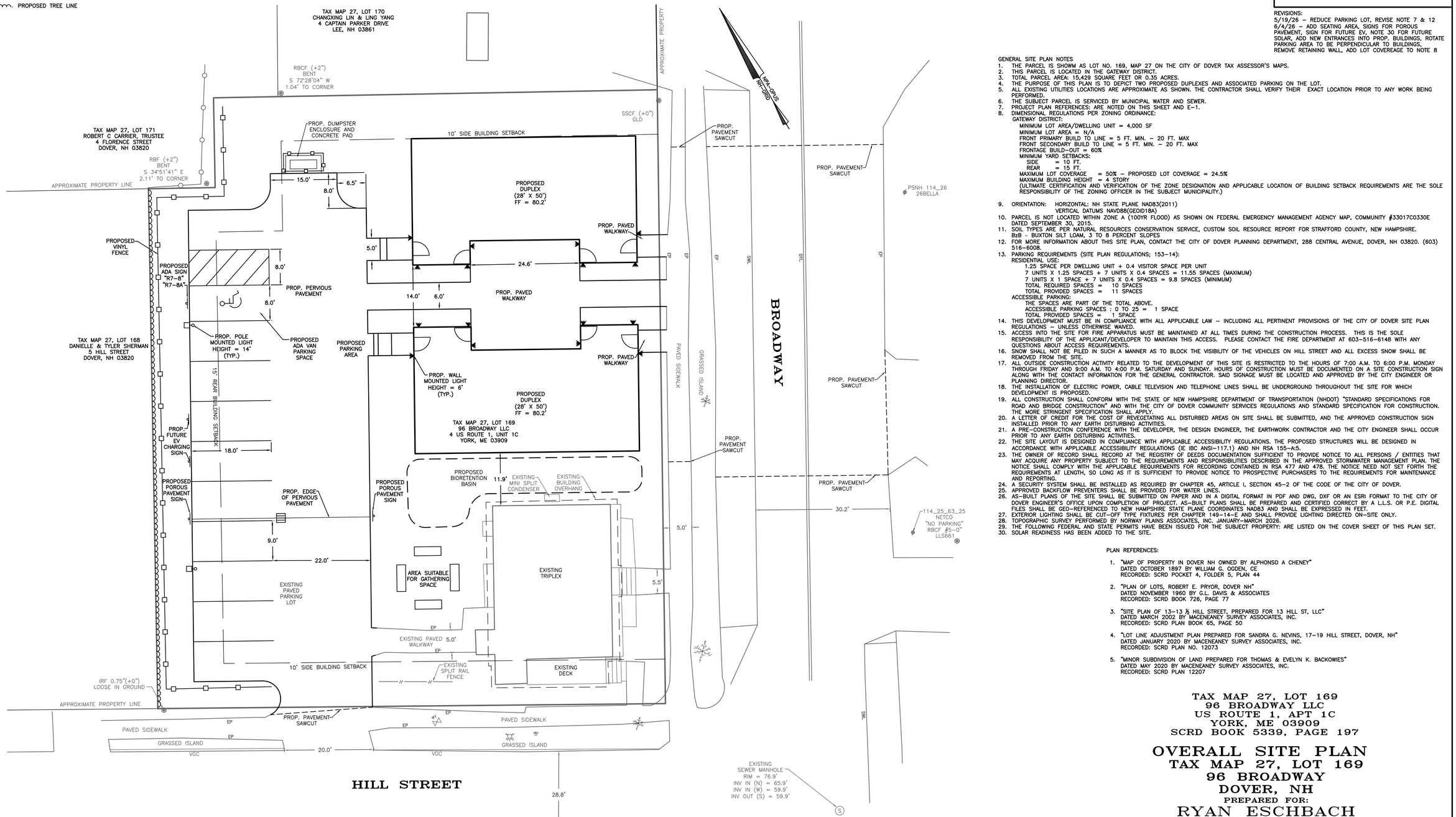
NORWAY PLAINS ASSOCIATES, INC.

2 Continental Blvd., Rochester, N.H. 603-335-3948

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)–335–3948.

LEGEND

- N 90°00'00" E 1.38 — PROPERTY LINE
- EXISTING TREE LINE
- OHW — EXISTING OVERHEAD WIRES
- EXISTING UTILITY POLE
- PROPOSED BUILDING
- PROPOSED PAVEMENT
- PROPOSED TREE LINE



REVISIONS:
5/19/26 – REDUCE PARKING LOT, REVISE NOTE 7 & 12
6/4/26 – ADD SEATING AREA, SIGNS FOR POROUS PAVEMENT, SIGN FOR FUTURE EV, NOTE 30 FOR FUTURE SOLAR, ADD NEW ENTRANCES INTO PROP. BUILDINGS, ROTATE PARKING AREA TO BE PERPENDICULAR TO BUILDINGS, REMOVE RETAINING WALL, ADD LOT COVEREAGE TO NOTE 8

GENERAL SITE PLAN NOTES

1. THE PARCEL IS SHOWM AS LOT NO. 169, MAP 27 ON THE CITY OF DOVER TAX ASSESSOR'S MAPS.
2. THIS PARCEL IS LOCATED IN THE GATEWAY DISTRICT.
3. TOTAL PARCEL AREA: 15,429 SQUARE FEET OR 0.35 ACRES.
4. THE PURPOSE OF THIS PLAN IS TO DEPICT TWO PROPOSED DUPLEXES AND ASSOCIATED PARKING ON THE LOT.
5. ALL EXISTING UTILITIES LOCATIONS ARE APPROXIMATE AS SHOWN. THE CONTRACTOR SHALL VERIFY THEIR EXACT LOCATION PRIOR TO ANY WORK BEING PERFORMED.
6. THE SUBJECT PARCEL IS SERVICED BY MUNICIPAL WATER AND SEWER.
7. PROJECT PLAN REFERENCES: ARE NOTED ON THIS SHEET AND E–1.
8. DIMENSIONAL REGULATIONS PER ZONING ORDINANCE:
   GATEWAY DISTRICT:
   MINIMUM LOT AREA/DWELLING UNIT = 4,000 SF
   MINIMUM LOT AREA = N/A
   FRONT PRIMARY BUILD TO LINE = 5 FT. MIN. – 20 FT. MAX
   FRONT SECONDARY BUILD TO LINE = 5 FT. MIN. – 20 FT. MAX
   FRONTAGE BUILD–OUT = 60%
   MINIMUM YARD SETBACKS:
   SIDE = 10 FT.
   REAR = 15 FT.
   MAXIMUM LOT COVERAGE = 50% – PROPOSED LOT COVERAGE = 24.5%
   MAXIMUM BUILDING HEIGHT = 4 STORY
   (ULTIMATE CERTIFICATION AND VERIFICATION OF THE ZONE DESIGNATION AND APPLICABLE LOCATION OF BUILDING SETBACK REQUIREMENTS ARE THE SOLE RESPONSIBILITY OF THE ZONING OFFICER IN THE SUBJECT MUNICIPALITY.)
9. ORIENTATION: HORIZONTAL: NH STATE PLANE NAD83(2011)
   VERTICAL DATUMS NAVD88(GEOID18A)
10. PARCEL IS NOT LOCATED WITHIN ZONE A (100YR FLOOD) AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY MAP, COMMUNITY #33017C0330E DATED SEPTEMBER 30, 2015.
11. SOIL TYPES ARE PER NATURAL RESOURCES CONSERVATION SERVICE, CUSTOM SOIL RESOURCE REPORT FOR STRAFFORD COUNTY, NEW HAMPSHIRE.
    BzB – BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES
12. FOR MORE INFORMATION ABOUT THIS SITE PLAN, CONTACT THE CITY OF DOVER PLANNING DEPARTMENT, 288 CENTRAL AVENUE, DOVER, NH 03820. (603) 516–6008.
13. PARKING REQUIREMENTS (SITE PLAN REGULATIONS; 153–14):
    RESIDENTIAL USE:
    1.25 SPACE PER DWELLING UNIT + 0.4 VISITOR SPACE PER UNIT
    7 UNITS X 1.25 SPACES + 7 UNITS X 0.4 SPACES = 11.55 SPACES (MAXIMUM)
    7 UNITS X 1 SPACE + 7 UNITS X 0.4 SPACES = 9.8 SPACES (MINIMUM)
    TOTAL REQUIRED SPACES = 10 SPACES
    TOTAL PROVIDED SPACES = 11 SPACES
    ACCESSIBLE PARKING:
    THE SPACES ARE PART OF THE TOTAL ABOVE.
    ACCESSIBLE PARKING SPACES : 0 TO 25 = 1 SPACE
    TOTAL PROVIDED SPACES = 1 SPACE
14. THIS DEVELOPMENT MUST BE IN COMPLIANCE WITH ALL APPLICABLE LAW – INCLUDING ALL PERTINENT PROVISIONS OF THE CITY OF DOVER SITE PLAN REGULATIONS – UNLESS OTHERWISE WAIVED.
15. ACCESS INTO THE SITE FOR FIRE APPARATUS MUST BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PROCESS. THIS IS THE SOLE RESPONSIBILITY OF THE APPLICANT/DEVELOPER TO MAINTAIN THIS ACCESS. PLEASE CONTACT THE FIRE DEPARTMENT AT 603–516–6148 WITH ANY QUESTIONS ABOUT ACCESS REQUIREMENTS.
16. SNOW SHALL NOT BE PILED IN SUCH A MANNER AS TO BLOCK THE VISIBILITY OF THE VEHICLES ON HILL STREET AND ALL EXCESS SNOW SHALL BE REMOVED FROM THE SITE.
17. ALL OUTSIDE CONSTRUCTION ACTIVITY RELATED TO THE DEVELOPMENT OF THIS SITE IS RESTRICTED TO THE HOURS OF 7:00 A.M. TO 6:00 P.M. MONDAY THROUGH FRIDAY AND 9:00 A.M. TO 4:00 P.M. SATURDAY AND SUNDAY. 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.
18. THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED.
19. 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.
20. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON SITE SHALL BE SUBMITTED, AND THE APPROVED CONSTRUCTION SIGN INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITIES.
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 ACTIVITIES.
22. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURES WILL BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS (IE IBC ANSI–117.1) AND NH RSA 155–A:5.
23. 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.
24. A SECURITY SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 45, ARTICLE I, SECTION 45–2 OF THE CODE OF THE CITY OF DOVER.
25. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR WATER LINES.
26. AS–BUILT PLANS OF THE SITE SHALL BE SUBMITTED ON PAPER AND IN A DIGITAL FORMAT IN PDF AND DWG, DXF OR AN 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.
27. EXTERIOR LIGHTING SHALL BE CUT–OFF TYPE FIXTURES PER CHAPTER 149–14–E AND SHALL PROVIDE LIGHTING DIRECTED ON–SITE ONLY.
28. TOPOGRAPHIC SURVEY PERFORMED BY NORWAY PLAINS ASSOCIATES, INC. JANUARY–MARCH 2026.
29. THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY: ARE LISTED ON THE COVER SHEET OF THIS PLAN SET.
30. SOLAR READINESS HAS BEEN ADDED TO THE SITE.

PLAN REFERENCES:

1. "MAP OF PROPERTY IN DOVER NH OWNED BY ALPHONSO A CHENEY"
   DATED OCTOBER 1897 BY WILLIAM G. OGDEN, CE
   RECORDED: SCRD POCKET 4, FOLDER 5, PLAN 44
2. "PLAN OF LOTS, ROBERT E. PRYOR, DOVER NH"
   DATED NOVEMBER 1960 BY G.L. DAVIS & ASSOCIATES
   RECORDED: SCRD BOOK 726, PAGE 77
3. "SITE PLAN OF 13–13 ½ HILL STREET, PREPARED FOR 13 HILL ST, LLC"
   DATED MARCH 2002 BY MACENEANEY SURVEY ASSOCIATES, INC.
   RECORDED: SCRD PLAN BOOK 65, PAGE 50
4. "LOT LINE ADJUSTMENT PLAN PREPARED FOR SANDRA G. NEVINS, 17–19 HILL STREET, DOVER, NH"
   DATED JANUARY 2020 BY MACENEANEY SURVEY ASSOCIATES, INC.
   RECORDED: SCRD PLAN NO. 12073
5. "MINOR SUBDIVISION OF LAND PREPARED FOR THOMAS & EVELYN K. BACKOWIES"
   DATED MAY 2020 BY MACENEANEY SURVEY ASSOCIATES, INC.
   RECORDED: SCRD PLAN 12207

TAX MAP 27, LOT 169
96 BROADWAY LLC
US ROUTE 1, APT 1C
YORK, ME 03909
SCRD BOOK 5339, PAGE 197

OVERALL SITE PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

FINAL APPROVAL BY DOVER PLANNING BOARD

CERTIFIED BY: _____ DATE: _____

FILE NO. 537
PLAN NO. C–3792
DWG. NO. 25321/SP–1

C–1



REVISIONS:
5/29/26 – REDUCE PARKING LOT

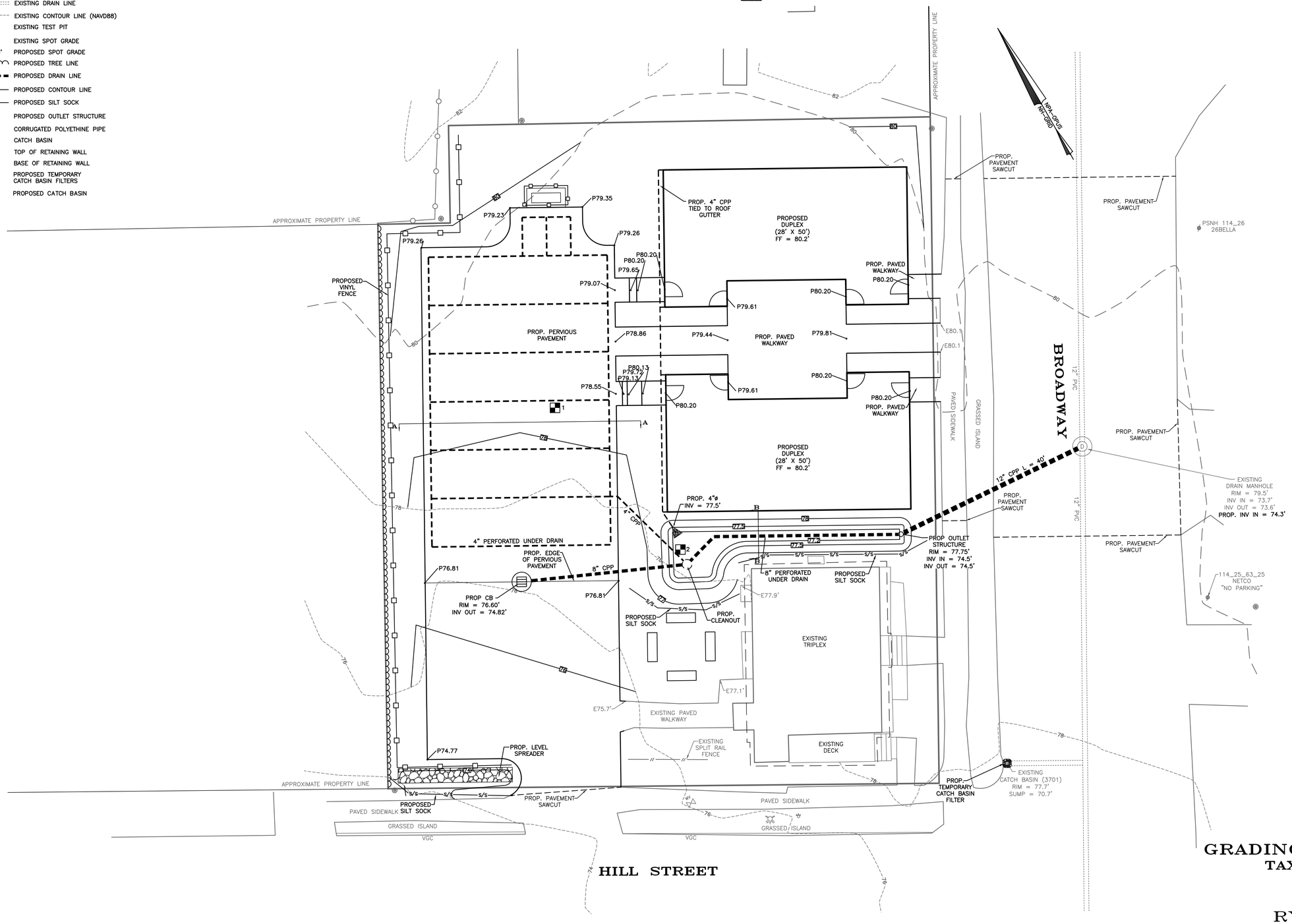
LEGEND

N 90°00'00" E 1.38'	PROPERTY LINE
	EXISTING TREE LINE
	EXISTING DRAIN LINE
232	EXISTING CONTOUR LINE (NAVD88)
1	EXISTING TEST PIT
E78.1'	EXISTING SPOT GRADE
P77.25'	PROPOSED SPOT GRADE
	PROPOSED TREE LINE
	PROPOSED DRAIN LINE
232	PROPOSED CONTOUR LINE
s/s	PROPOSED SILT SOCK
	PROPOSED OUTLET STRUCTURE
CPP	CORRUGATED POLYETHINE PIPE
CB	CATCH BASIN
TW	TOP OF RETAINING WALL
BW	BASE OF RETAINING WALL
	PROPOSED TEMPORARY CATCH BASIN FILTERS
	PROPOSED CATCH BASIN

TEST PIT INFORMATION
TEST PITS CONDUCTED ON JANUARY 23, 2026 BY:
ASHLEY F. ROWE, DESIGNER OF SUBSURFACE DISPOSAL SYSTEMS 1857

TEST PIT 1
0" – 2" LOAM TOPSOIL.
2" – 27" VERY FINE SANDY LOAM, GRANULAR, FRIABLE. REDOXIMORPHIC CONCENTRATIONS COMMON BELOW 23", SHWT AT 23".
27" – 47" VERY FINE SILTY LOAM, GRANULAR, FRIABLE. RESTRICTIVE FEATURE/ LEDGE OR LARGE BOULDER AT 47".
SHWT AT 23", RESTRICTIVE FEATURE AT 47", NO OBSERVED WATER.

TEST PIT 2
0" – 8" LOAM TOPSOIL.
8" – 40" VERY FINE SANDY LOAM, GRANULAR, FRIABLE. REDOXIMORPHIC CONCENTRATIONS COMMON BELOW 23", SHWT AT 23".
40" – 62" VERY FINE SILTY LOAM, GRANULAR, FRIABLE. REFUSAL AT 62" DUE TO LEDGE OR LARGE BOULDER.
SHWT AT 23", REFUSAL AT 62", NO OBSERVED WATER.



GRADING & DRAINAGE PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:
RYAN ESCHBACH

APRIL 2026

GRAPHIC SCALE

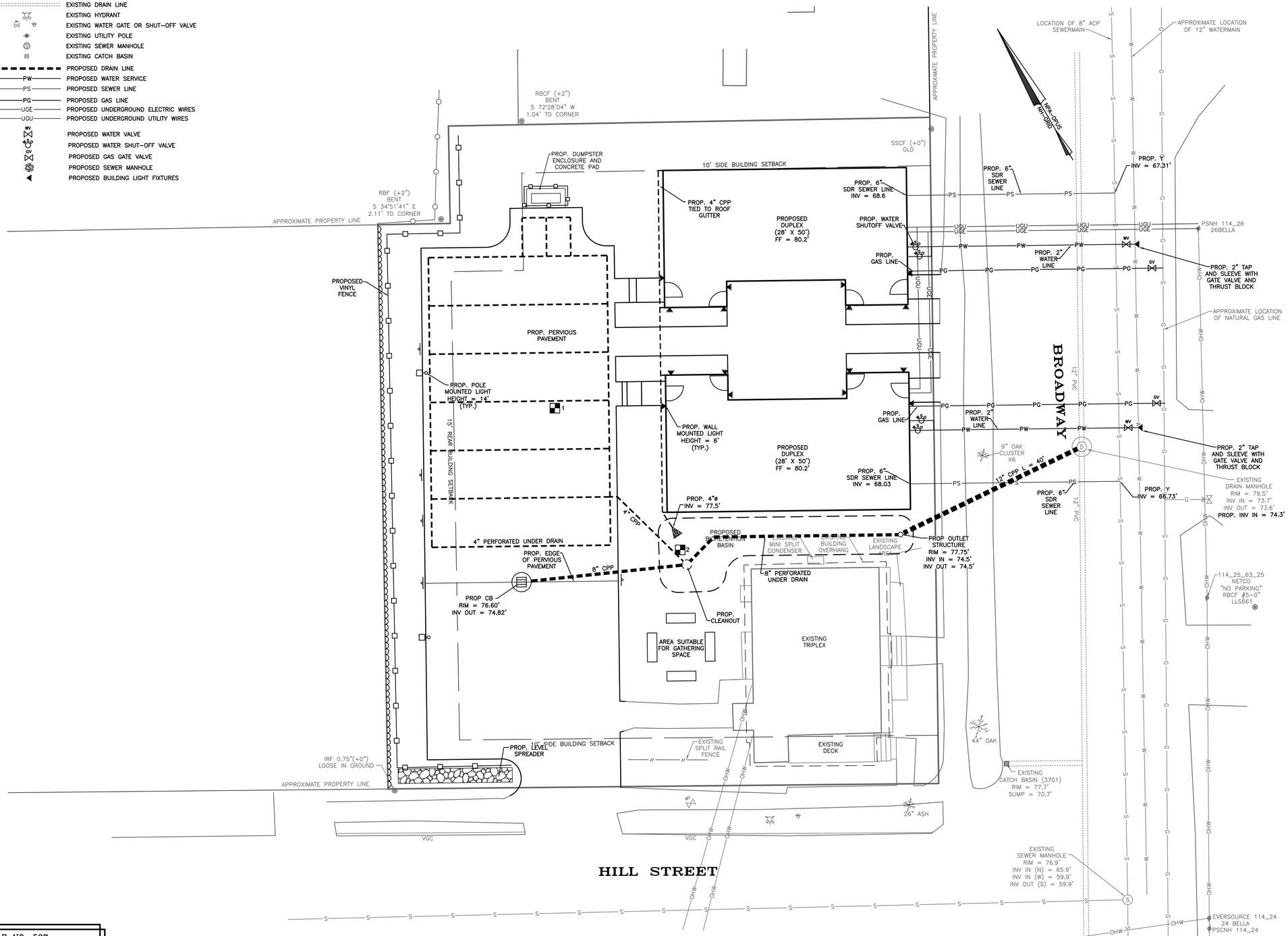
10 0 5 10 20 40
(IN FEET)
1 INCH = 10 FEET

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

C-2

LEGEND

- PROPERTY LINE
- EXISTING OVERHEAD WIRES
- EXISTING WATER MAIN
- EXISTING GRAVITY SEWER MAIN
- EXISTING GAS PIPE
- EXISTING DRAIN LINE
- EXISTING HYDRANT
- EXISTING WATER GATE OR SHUT-OFF VALVE
- EXISTING UTILITY POLE
- EXISTING SEWER MANHOLE
- EXISTING CATCH BASIN
- PROPOSED DRAIN LINE
- PROPOSED WATER SERVICE
- PROPOSED SEWER LINE
- PROPOSED GAS LINE
- PROPOSED UNDERGROUND ELECTRIC WIRES
- PROPOSED UNDERGROUND UTILITY WIRES
- PROPOSED WATER VALVE
- PROPOSED WATER SHUT-OFF VALVE
- PROPOSED GAS GATE VALVE
- PROPOSED SEWER MANHOLE
- PROPOSED BUILDING LIGHT FIXTURES



UTILITY PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:

RYAN ESCHBACH

APRIL 2026

GRAPHIC SCALE

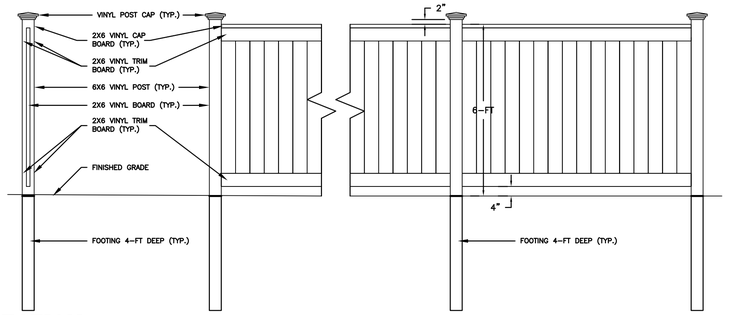
10 0 5 10 20 40

(IN FEET)

1 INCH = 10 FEET

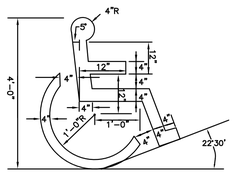
FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

C-3

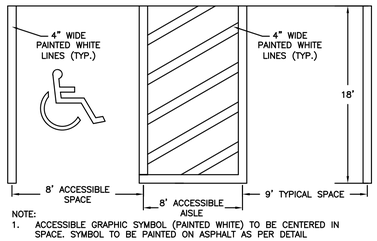


TYPICAL SOLID VINYL FENCE DUMPSTER ENCLOSURE

SCALE: 1/2"=1'



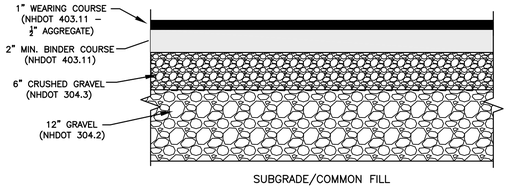
ACCESSIBLE SYMBOL



NOTE:
1. ACCESSIBLE GRAPHIC SYMBOL (PAINTED WHITE) TO BE CENTERED IN SPACE. SYMBOL TO BE PAINTED ON ASPHALT AS PER DETAIL

STALL STRIPING DETAIL

NOT TO SCALE

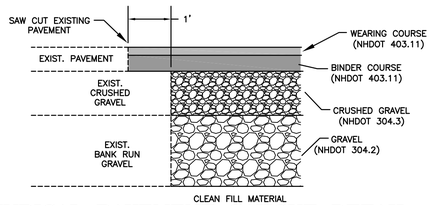


PARKING LOT CROSS-SECTIONS

NOT TO SCALE

PAVEMENT NOTES:
1. PLACE COMMON FILL IN 12 INCH LIFTS. COMPACT COMMON FILL TO 95% MAXIMUM PROCTOR DENSITY.
2. PLACE GRAVEL IN MAXIMUM 8 INCH LIFTS. COMPACT TO 95% MAXIMUM PROCTOR DENSITY.
3. PLACE CRUSHED GRAVEL IN MAXIMUM 8 INCH LIFTS. COMPACT TO 95% MAXIMUM PROCTOR DENSITY.
4. PAVEMENT MUST BE INSTALLED IN TWO COURSES, A BINDER COURSE AND A WEARING COURSE.

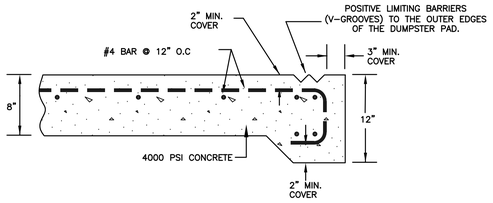
CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.



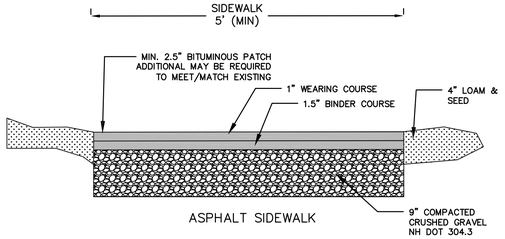
TYPICAL PAVEMENT SAWCUT DETAIL

NOT TO SCALE

1. SAWCUT THROUGH DEPTH OF PAVEMENT AT LEAST 1 FT. FROM EDGE OR GREATER IF REQUIRED.
2. INSTALL AND COMPACT CRUSHED GRAVEL TO GRADE.
3. PLACE BINDER COURSE.
4. GRIND OR SAWCUT EXISTING PAVEMENT 1 FT. WIDE TO A DEPTH NECESSARY TO PROPERLY MATCH NEW WEARING COURSE PAVEMENT.
5. TACK COAT ALL EXISTING PAVEMENT SURFACES WITH EMULSIFIED ASPHALT (MS-1) PRIOR TO PLACING NEW PAVEMENT.



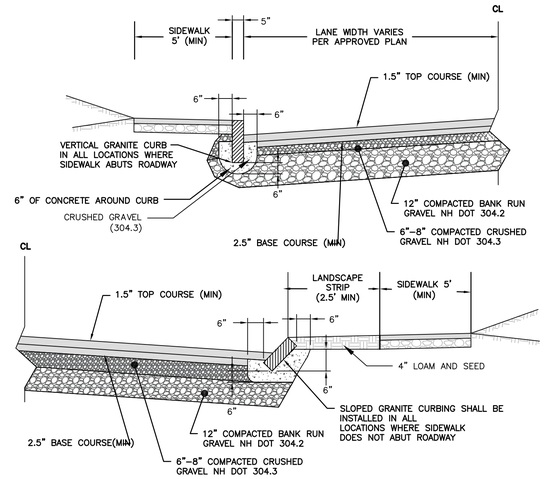
DUMPSTER PAD DETAIL



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.

ASPHALT & CONCRETE SIDEWALK DETAIL

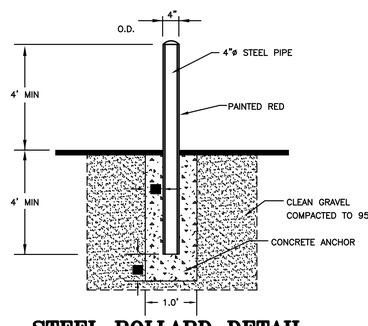
NOT TO SCALE
CITY OF DOVER DETAIL D-6



NOTES:
1. THIS DETAIL IS FOR GENERAL REVIEW PURPOSES ONLY, FINAL DESIGN SHALL BE BASED ON SPECIFIC SITE CONDITIONS AND APPROVED PLANS.
2. SIDEWALK LOCATION AND MATERIAL SHALL BE AS APPROVED BY THE CITY OF DOVER.

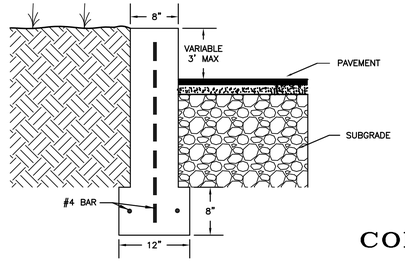
PUBLIC ROAD CROSS SECTION DETAIL

NOT TO SCALE
CITY OF DOVER DETAIL D-5



STEEL BOLLARD DETAIL

NOT TO SCALE



CONCRETE RETAINING WALL

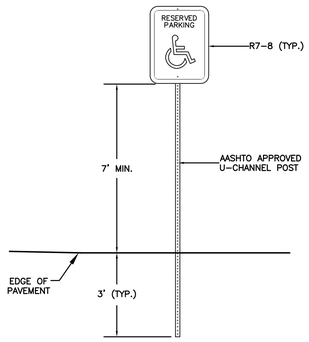
NOT TO SCALE

REVISIONS:
5/29/26 - REVISE PER TRC COMMENTS

ITEM NO.	SIGN SIZE HEIGHT	SIGN SIZE WIDTH	TEXT	NO. SIGNS REQ'D
R7-8	18"	12"	RESERVED PARKING	1
R7-8A	6"	12"	VAN ACCESSIBLE	1

NOTES:
1. ALL SIGNS SHALL BE PER "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.

SIGN SCHEDULE



NOTES:
1. SIGN POST SHALL BE AASHTO APPROVED U-CHANNEL OR OTHER PER ASSHTO "SPECIFICATIONS FOR STRUCTURAL SUPPORT OF HIGHWAY SIGNS, LUMINARIES AND SIGNALS", LATEST EDITION.
2. SIGNS SHALL BE MOUNTED 5 FT FROM GROUND TO BOTTOM EDGE WHERE PARKING AND PARKING LOT MOVEMENTS TAKE PLACE.

TYPICAL SIGN DETAIL

NOT TO SCALE

CONSTRUCTION DETAILS
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948
NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603-335-3948

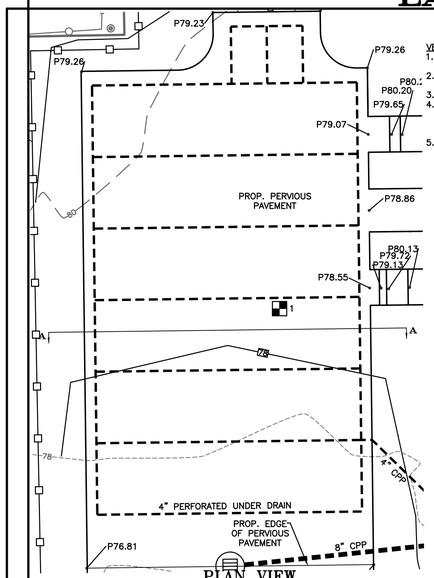
BIORETENTION BASIN NOTES

VEGETATED RESIDENTIAL BIORETENTION BSAIN CONSTRUCTION AND MAINTENANCE NOTES:

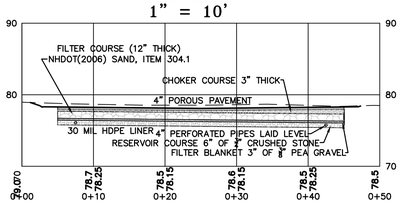
1. DO NOT PLACE BIORETENTION SYSTEM INTO SERVICE UNTIL THE PLANTS HAS BEEN PLANTED AND THE ADJACENT AREAS ARE FULLY ESTABLISHED.
2. SYSTEM SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENTS EXCEEDING 2.5 INCHES IN A 24–HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION AS WARRANTED BY SUCH INSPECTION.
3. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
4. AT LEAST ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF THE BIORETENTION BASIN DOES NOT DRAIN WITHIN 72 HOUSE FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITIONS OF THE GARDEN TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
5. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

BIORETENTION FILTER MEDIA			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL	
		SIEVE NO.	PERCENT BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C–33 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDY BARK OR WOOD FIBERS MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDY BARK OR WOOD FIBERS MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
LOAMY COURSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		60	15 TO 40
		200	8 TO 15

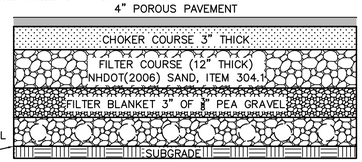
SUGGESTED PLANTINGS (SHADY RAIN GARDEN)
PLANTS WITHIN THE WETTER CENTER OF THE GARDEN:
WOODY SHRUBS:
VERNAL WITCH HAZEL; 6–10'H x 6–10'W
NATIVE RHODODENDRON; 1–3'H x 1–3'W
LABRADOR TEA; 1–3'H x 1–3'W
WINTERBERRY; 6–8'H x 6–8'W
PERENNIALS:
ROYAL FERN; 2–5'H x 2–5'W
NATIVE COLOMBINE; 1–2'H x 1–2'W
SENSITIVE FERN; 2'H x 18'W
CARDINAL FLOWERS; 2–4'H x 1'W
PLANTS WITHIN THE DRYER OUTER EDGE OF THE GARDEN:
WOODY SHRUBS:
SWEETFERN; 2–4H x 2–4'W
BEARBERRY; 6–12" x 1–2'W
PERENNIALS:
WILD GERANIUM; 1–2'H x 2'W



PLAN VIEW
1" = 10'



CROSS SECTION A–A
VERTICAL SCALE 1" = 10'
HORIZONTAL SCALE 1" = 10'



POROUS ASPHALT MIX DESIGN CRITERIA***	
US STANDARD SIEVE SIZE INCHES / MM	PERCENT PASSING (%)
0.75 / 19	100
0.50 / 12.5	85–100
0.375 / 9.5	55–75
No.4 / 4.75	10–25
No.8 / 2.36	5–12
No.200 / 0.075 (#200)	2–4
BINDER CONTENT (AASHTO T164)	5.8–6.5
AIR VOID CONTENT (ASTM D6752)	16.0–22%
BRAINDOWN (ASTM D6390)*	<0.3%
RETAINED TENSILE STRENGTH (AASHTO 283)**	≥80%
CANTABRO ABRASION TEST ON UNAGED SAMPLE	≤20%
CANTABRO ABRASION TEST ON 7 DAY AGE SAMPLES	≤30%

GRADATION & COMPACTION OF CHOKER, FILTER & RESERVOIR COURSE MATERIAL			
US STANDARD SIEVE SIZE INCHES / MM	PERCENT PASSING (%)		
	CHOKER COURSE (AASHTO No. 57)	FILTER COURSE (MODIFIED NHDOT 304.1)	RESERVOIR COURSE (AASHTO No. 3)
6 / 150	–	100	
2.5 / 63	–	–	
2 / 50	–	–	90–100
1.5 / 37.5	100	–	35–70
1 / 25	95–100	–	0–15
¾ / 19	–	–	
½ / 12.5	25–60	–	0–5
⅜ / 9.5		–	
#4 / 4.75	0–10	70–100	70–100
#8 / 2.36	0–5	–	
#200 / 0.075	0–5	0–6**	
%COMPACTION ASTM D698 AASHTO T99	95	95	

*PREFERABLY LESS THAN 4%

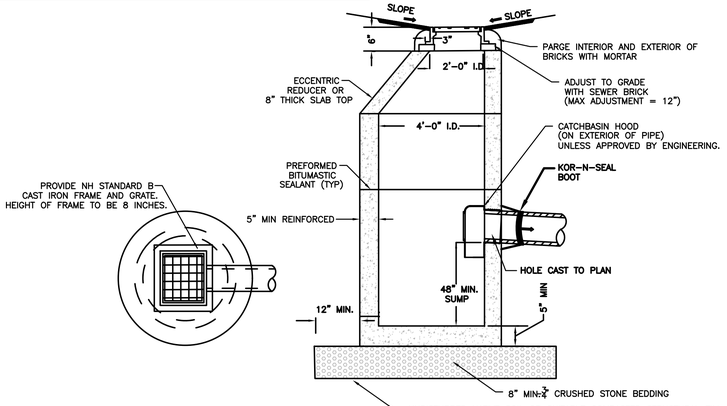
**CELLULOSE, MINERAL, OR POLYESTER FIBER MAY BE USED TO REDUCE DRAINDOWN.
IF THE TSR (RETAINED TENSILE STRENGHT) VALUE FALL BELOW 80% WHEN TESTED PER NAPA IS 131 (with a single freeze thaw cycle rather than 5). THEN IN STEP 4, THE CONTRACTOR SHALL EMPLOY AN ANTISTRIP ADDITIVE, SUCH AS HYDRATED LIME (ASTMC977) OR A FATTY AMINE, TO RAISE THE TSR VALUE.
SEE UNHSC DESIGN SPECIFICATION FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS FEBRUARY 2014 REVISION SEPTEMBER 2016
***TIABLE 5 SEE UNHSC DESIGN SPECIFICATION FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS FEBRUARY 2014 REVISION SEPTEMBER 2016

CONSTRUCTION AND QA/QC REQUIREMENTS FOR THE POROUS PAVEMENT SHALL BE IN ACCORDANCE WITH THE UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS, FEBRUARY 2014, REVISION SEPTEMBER 2016

TO PREVENT DEGRADATION OF POROUS PAVEMENT DURING CONSTRUCTION, IT'S CRUCIAL TO PROTECT THE PERMEABLE SURFACE FROM SOIL CONTAMINATION BY KEEPING CONSTRUCTION TRAFFIC OFF THE AREA, USING TRACKED VEHICLES WHEN NECESSARY, AND IMPLEMENTING PROPER EROSION CONTROL MEASURES LIKE SILT FENCING TO PREVENT SEDIMENT FROM ENTERING THE POROUS PAVEMENT; ESSENTIALLY, TREATING THE AREA AS A SENSITIVE ZONE THAT SHOULD NOT BE EXPOSED TO EXCESSIVE SOIL DISTURBANCE OR DEBRIS DURING CONSTRUCTION.
KEY POINTS TO REMEMBER:
CLEARLY MARK PERMEABLE PAVEMENT AREAS:
USE SIGNAGE OR FENCING TO CLEARLY DELINEATE THE POROUS PAVEMENT ZONES AND PREVENT ACCIDENTAL CONSTRUCTION ACTIVITY WITHIN THEM.
MINIMIZE SOIL COMPACTION:
AVOID DRIVING HEAVY EQUIPMENT DIRECTLY ON THE PERMEABLE PAVEMENT AREA AND USE TRACKED VEHICLES WITH WIDER CONTACT POINTS TO DISTRIBUTE WEIGHT MORE EVENLY.
PROTECT FROM SEDIMENT:
INSTALL SILT FENCES OR OTHER EROSION CONTROL MEASURES AROUND THE CONSTRUCTION SITE TO PREVENT SEDIMENT FROM WASHING ONTO THE POROUS PAVEMENT SURFACE.
PROPER SURFACE MANAGEMENT:
REMOVE ANY DEBRIS OR SEDIMENT THAT MAY ACCUMULATE ON THE POROUS PAVEMENT SURFACE DURING CONSTRUCTION, ENSURING THE VOIDS REMAIN OPEN FOR WATER INFILTRATION.
CONSIDER TEMPORARY PROTECTION:
IN CERTAIN SITUATIONS, COVER THE POROUS PAVEMENT AREA WITH A PROTECTIVE LAYER LIKE A GEOTEXTILE FABRIC DURING CONSTRUCTION PHASES WHERE CONTAMINATION RISK IS HIGH

CROSS–SECTION FOR POROUS ASHALT PAVEMENT

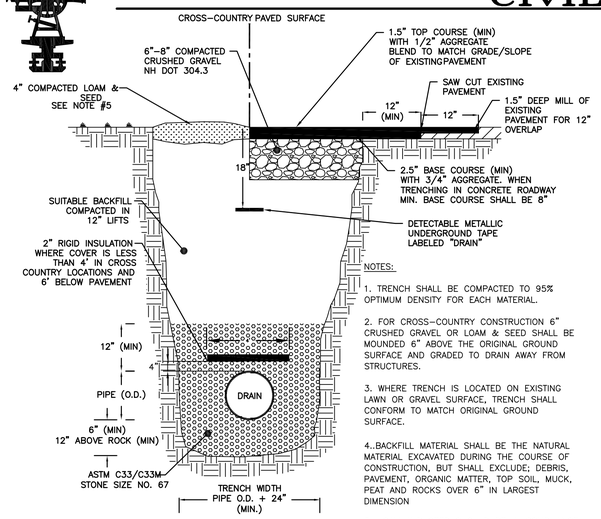
NOT TO SCALE



NOTES:
1. ENTIRE STRUCTURE SHALL BE H–20 LOAD RATED. PROVIDE MANUFACTURER REINFORCEMENT DETAILS TO THE CITY ENGINEER UPON REQUEST.
2. CONTRACTOR SHALL HAVE OPTION TO USE 6" OR 8" PRECAST GRADE RINGS TO ADJUST GRADE.

CATCH BASIN DETAIL

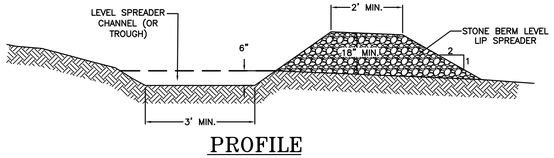
NOT TO SCALE



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 AND GRADED TO DRAIN AWAY FROM STRUCTURES.
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.

DRAINAGE PIPE TRENCH INSTALLATION DETAIL

NOT TO SCALE



PROFILE

STONE BERM LEVEL SPREADER

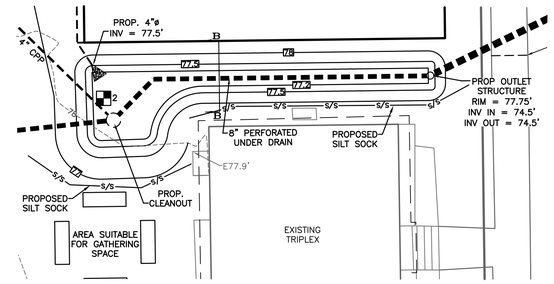
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS
1. SLOPE OF RECEIVING AREA SHALL BE LESS THAN 15 PERCENT (ALONG FLOW PATH).
2. BOTTOM OF SPREADER CHANNEL, AND BASE AND TOP OF BERM SHOULD BE 0 PERCENT GRADE.
3. SPREADER CHANNEL CROSS SECTION SHALL BE A 6–INCH DEEP TRAPEZOIDAL TROUGH.
4. SPREADER CHANNEL BOTTOM SHALL BE A MINIMUM OF 3 FEET IN WIDTH.
5. SIDE SLOPES OF THE LEVEL SPREADER CHNNEL AND BERM SHALL BE 2h:1v OR FLATTER.
6. THE BERM TOP SHALL BE A MINIMUM OF 2 FEET IN WIDTH.
7. THE BERM SHALL BE A MINIMUM OF 18–INCHES IN HEIGHT.
8. THE STONE GRADATION OF THE BERM SHALL BE AS FOLLOWS:

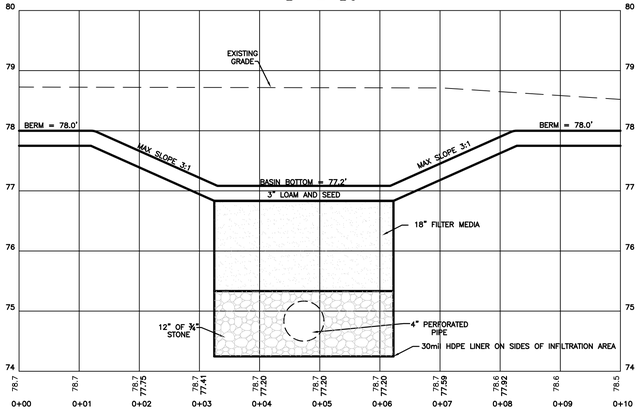
SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING SQUARE MESH SIEVE
12–INCH	100
6–INCH	84 – 100
3–INCH	68 – 83
1–INCH	42 – 52
NO. 4	8 – 12

MAINTENANCE NOTES:
1. MAINTENANCE ACTIVITIES NEED TO COMPLY WITH LAWS THAT PROTECT WILDLIFE, INCLUDING BUT NOT LIMITED TO RSA 209:8, RSA 209:9, RSA 209:10, AND RSA 212–A:7.
2. 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.
3. REMOVE DEBRIS WHENEVER OBSERVED DURING INSPECTION.
4. REMOVE SEDIMENT WHEN ACCUMULATION EXCEEDS 25 PERCENT OF SPREADER CHANNEL DEPTH.
5. REMOVE WOODY VEGETATION.
6. SNOW SHOULD NOT BE STORED WITHIN OR DOWN–SLOPE OF THE LEVEL SPREADER OR ITS APPROACH CHANNEL.
7. REPAIR ANY EROSION AND RE–GRADE OR REPLACE STONE BERM MATERIAL, AS WARRANTED BY INSPECTION.
8. 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 REGRADING.

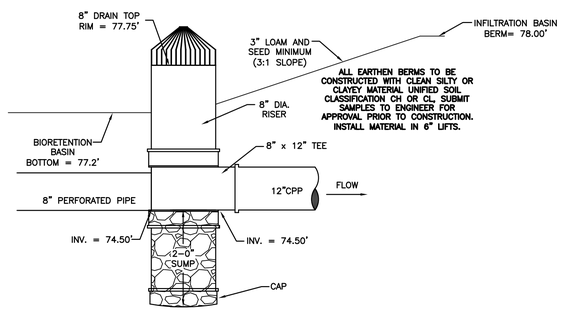
REVISIONS:
5/29/26 – REVISE PER TRC COMMENTS
6/4/26 – ADD LEVEL SPREADER



BIORETENTION BASIN PLAN VIEW
1" = 10'



CROSS SECTION B–B
VERTICAL SCALE 1" = 1'
HORIZONTAL SCALE 1" = 1'



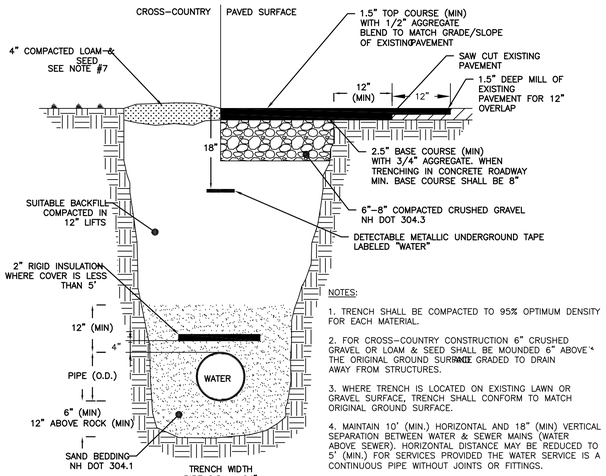
BIORETENTION BASIN OUTLET STANDPIPE DETAIL

NOT TO SCALE

DRAINAGE DETAILS
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

C–5

FILE NO. 537
PLAN NO. C–3792
DWG. NO. 25321/SP–1



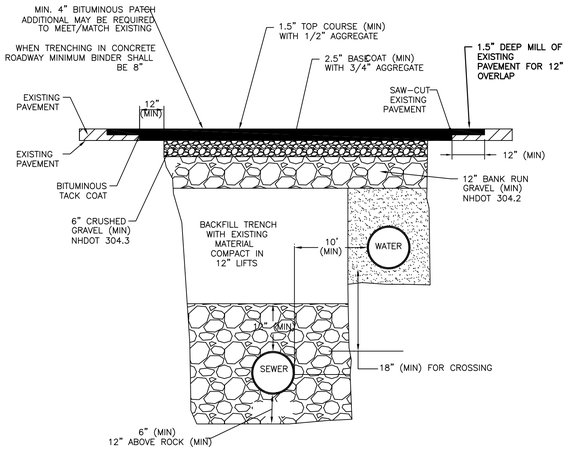
NOTES:

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 GRADED TO DRAIN AWAY FROM STRUCTURES.
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 TRENCH DETAIL

NOT TO SCALE

CITY OF DOVER DETAIL D-4



NOTES:

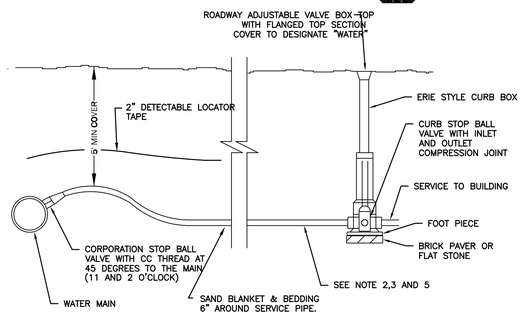
1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY.
2. ALL WORK SHALL COMPLY WITH THE CITY OF DOVER CONSTRUCTION GUIDELINES AND PROCEDURES
3. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.

TYPICAL TRENCH DETAIL

NOT TO SCALE

CITY OF DOVER DETAIL D-10

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.



NOTES:

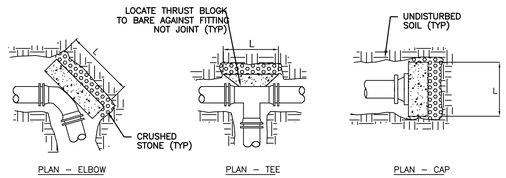
1. ALL WATER LINES 4" OR GREATER SHALL BE DUCTILE IRON WITH A ZINC COATED 8 MIL POLYETHYLENE WRAP, INCLUDING TEE AND OTHER CONNECTIONS.
2. WATER SERVICE LINES SHALL BE COPPER TUBING (TYPE K) BETWEEN MAIN AND CURB STOP.
3. SERVICE BETWEEN CURB STOP AND BUILDING MAY BE (BLUE OR BLACK) CTS SDR 9 PLASTIC POLYETHYLENE RATED FOR 250 psi.
4. CAM-LOCK REQUIRED FOR CTS OR IPS, MJ ADAPTER REQUIRED FOR HDPE
5. ALL SERVICES SHALL BE 1". PROVIDE 1" TO 3/4" REDUCER COUPLING WHERE EXISTING SERVICES ARE 3/4", SUBSIDIARY.
6. APPROVED WATER SERVICE MATERIALS INCLUDE:
   1"- COPPER, CTS
   2"- CTS, HDPE, IPS
7. ALL SADDLES USED AS SPECIFIED SHALL HAVE DOUBLE STAINLESS STEEL STRAPS.

   TAPS TO BE MADE AT APPROX. 2:00 AND 10:00.

WATER SERVICE DETAIL

NOT TO SCALE

CITY OF DOVER DETAIL D-13



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					

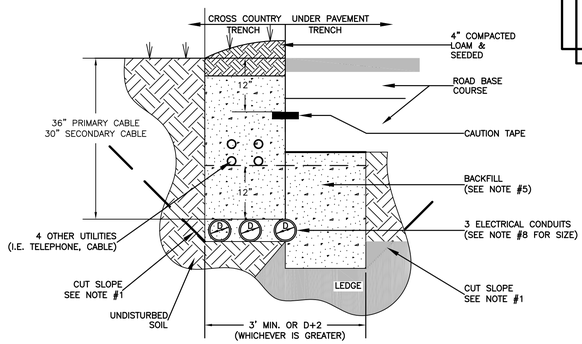
NOTES:

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 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.

CONCRETE THRUST BLOCK DETAIL

NOT TO SCALE

CITY OF DOVER DETAIL D-15



NOTES:

1. ALL NON-METALLIC CONDUIT AND FITTINGS SHALL BE ELECTRICAL GRADE, SCHEDULE 40 PVC, AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEMA TC2-1990 AND BE UL LISTED. ONLY GRAY-COLORED CONDUIT WILL BE ACCEPTED. ANY PVC CONDUIT NOT HAVING THE PROPER NEMA AND UL MARKINGS WILL NOT BE ACCEPTED. ALL STEEL CONDUITS SHALL CONFORM TO ASTM A120 AND BE RIGID GALVANIZED STEEL. ALL PVC JOINTS MUST BE CEMENTED. STEEL FITTINGS SHALL BE SEALED WITH COMPOUND.
2. ALL 90 DEGREE SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES. ALL STEEL SWEEPS WITHIN 18" OF THE SURFACE SHALL BE PROPERLY GROUNDED.
3. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE PSNH DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING CABLE PULLING.
4. THE CONDUIT SHALL CROSS PAVED AREAS AT APPROXIMATELY 90 DEGREES.
5. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY PSNH. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6-INCH LAYERS.
6. A SUITABLE PULL STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE PSNH 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.
7. ROUTING OF THE CONDUIT AND INSPECTION PRIOR TO BACKFILL WILL BE PROVIDED BY PSNH. INSTALLATION OF THE CONDUIT WILL BE DONE BY THE CONTRACTOR. THE PSNH SUPERVISOR MUST BE NOTIFIED 2 BUSINESS DAYS PRIOR TO BACKFILLING THE TRENCH. IN THE EVENT THAT A CABLE CANNOT BE SUCCESSFULLY PULLED THROUGH THE COMPLETED CONDUIT SYSTEM DUE TO A CONSTRUCTION ERROR, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND REPAIR THE INVOLVED CONDUIT. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL RESULTING EXPENSES.
8. NORMAL CONDUIT SIZES FOR PSNH ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY.
9. 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.
10. CONDUIT MAY BE INSTALLED BY EXCAVATING AN OPEN TRENCH WITH SIDE SLOPES OF 1:1 MAXIMUM TO A DEPTH OF 4-FT. INSTALLATIONS DEEPER THAN 4-FT REQUIRE THE USE OF A TRENCH BOX.

ELECTRICAL & UNDERGROUND UTILITY TRENCH INSTALLATION DETAIL

NOT TO SCALE

1.) CONTRACTOR SHALL NOTIFY DIG-SAFE (811) 72 HOURS PRIOR TO THE START OF CONSTRUCTION.
2.) ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AS SHOWN. THE CONTRACTOR SHALL VERIFY THEIR LOCATIONS AND ELEVATIONS.
3.) THESE PLAN SHOWS ONLY THOSE FEATURES THAT WERE VISUALLY APPARENT ON THE DATE OF THE SURVEY. THE ABSENCE OF SUBSURFACE STRUCTURES, UTILITIES, ETC. FROM THIS PLAN, BUT IN EXISTENCE IS NOT INTENDED OR IMPLIED.
4.) ANY UTILITY POLES THAT NEED TO BE RELOCATED SHALL BE COORDINATED WITH **EVERSOURCE** OR **VERIZON**, WHOM EVER HAS CONTROL OVER THEM.
5.) PROPOSED UTILITIES ARE TO BE UNDERGROUND. COORDINATE LOCATION OF UNDERGROUND UTILITIES AND TRANSFORMER PADS WITH PSNH AND OTHER PERTINENT UTILITY COMPANIES.
6.) WATER AND SEWER LINES SHALL BE INSTALLED A MINIMUM OF 10-FT APART HORIZONTALLY.
7.) WHERE SEWER AND WATER LINES MUST CROSS, SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM 9-FT HORIZONTALLY FROM THE WATER LINE AND A VERTICAL SEPARATION OF 18-INCHES SHALL BE MAINTAINED.
8.) SEWER PIPE JOINTS SHALL BE TESTED WITH ZERO LEAKAGE AT 25 POUNDS PER SQUARE INCH FOR GRAVITY SEWER AND AT 1-1/2 TIMES WORKING PRESSURE FOR ALL FORCE MAINS.
9.) WATERLINE CONSTRUCTION:
   A.) ALL PROPOSED WATER LINE MATERIAL USED SHALL MEET **DOVER** WATER DEPARTMENT AND **DOVER** ENGINEERING DEPARTMENT SPECIFICATIONS. WATER LINES SHALL BE A.W.W.A C 151, CLASS 52, CEMENT LINED, DUCTILE IRON PIPE.
   B.) PROPOSED WATER GATE VALVES SHALL BE MANUFACTURED BY KENNEDY OF AMERICAN FLOW CONTROL, RESILIENT SEAT TYPE.
   C.) ALL WATER LINES SHALL BE BURIED A MINIMUM OF 5'.
   D.) IF 5' OF COVER IS NOT AVAILABLE WATER LINE SHALL BE INSULATED AS SHOWN IN THE "SHALLOW COVER TRENCH DETAIL FOR INSULATED WATER PIPE".
   E.) ALL WATER FITTINGS SHALL BE CLASS 52.
   F.) PROPOSED WATER GATE VALVE SHALL OPEN CLOCKWISE (RIGHT).
10.) WORK TO CONNECT INTO THE WATER OR SEWER MAINS REQUIRES A PERMIT FROM THE **DOVER** PUBLIC WORKS DEPARTMENT. CONTRACTORS ARE TO BE PRE-QUALIFIED.

UTILITY DETAILS
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:

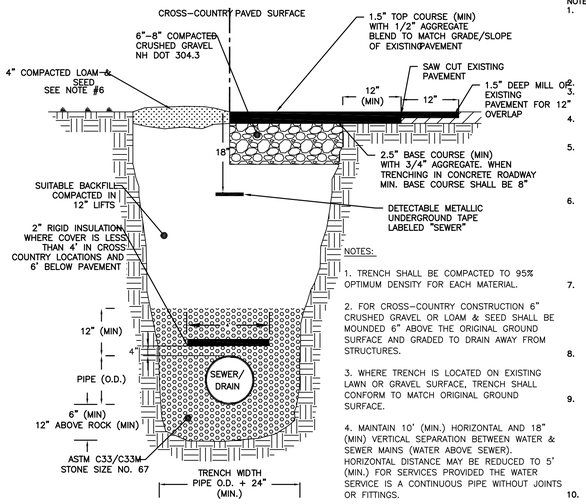
RYAN ESCHBACH

APRIL 2026

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948
NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603-335-3948

REVISIONS:
6/4/26 – REVISE PER TRC COMMENTS



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 AND GRADED TO DRAIN AWAY FROM STRUCTURES.

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.

SEWER TRENCH DETAIL

NOT TO SCALE

CITY OF DOVER DETAIL D–3

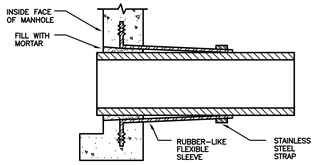
MORTAR USED IN MANHOLE CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING:
MORTAR SHALL BE COMPOSED OF TYPE II PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION.
PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE AS SHOWN BELOW;

HYDRATED LIME	SAND	TYPE II PORTLAND CEMENT
NONE	4.5 PARTS	1.5 PARTS
0.5 PARTS	4.5 PARTS	1 PART

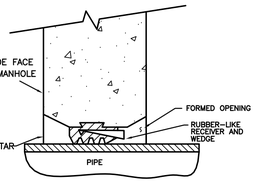
CEMENT SHALL BE TYPE II PORTLAND CEMENT THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C150/C150M STANDARD IN EFFECT AT THE TIME THE CEMENT WAS MANUFACTURED.
HYDRATED LIME SHALL BE TYPE S THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C207 STANDARD IN EFFECT AT THE TIME THE HYDRATED LIME WAS PROCESSED.
SAND SHALL CONSIST OF INERT NATURAL SAND THAT IS CERTIFIED BY ITS SUPPLIER AS CONFORMING TO THE ASTM C33 STANDARD IN EFFECT AT THE TIME THE SAND IS PROCESSED BY "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES"

NOTES:

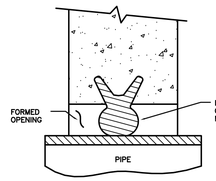
1. IT IS INTENTION OF THE CITY OF DOVER PUBLIC WORKS DEPARTMENT THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAK PROOF QUALITIES CONSIDERED NECESSARY BY THE PUBLIC WORKS DEPARTMENT FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H–20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED CONCRETE. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
3. VACUUM LEAKAGE TESTING (ASTM C1244) SHALL BE PERFORMED FOR ALL MANHOLES, LOW–PRESSURE AIR TESTING (ASTM F1417) AND DEFLECTION TRETING USING A 'GO/NO GO' MANDREL FOR ALL SANITARY SEWERS, IN ACCORDANCE WITH THE NHDES SEWER REGULATIONS AND THE CITY OF ROCHESTER DEPARTMENT OF PUBLIC WORKS REQUIREMENTS.
4. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. BRICK MASONRY CONFORM WITH ASTM C32. INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETED
5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30–INCH CLEAR OPENING. A 3–INCH (MINIMUM HEIGHT) LETTER "SEWER" FOR SEWERS OR "DRAIN" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
6. SEWER MANHOLE FRAME AND COVER;
FRAME – EJ 2006Z PRODUCT#00200611
COVER – EJ 2006A1 PRODUCT#00200628
IMMEDIATELY FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN, OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE.
7. BEDDING: MIN. 6" OF 3/4" CRUSHED STONE (12" IN LEDGE) FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33:
100% PASSING 1 INCH SCREEN
90–100% PASSING 3/4 INCH SCREEN
20–55% PASSING 3/8 INCH SCREEN
0–10% PASSING #4 SIEVE
0–5% PASSING #8 SIEVE
WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, CRUSHED STONE MIN. 3/4" SHALL BE USED.
8. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3000#) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
CEMENT: 6.0 BAGS PER CUBIC YARD
WATER: 5.75 GALLONS PER BAG CEMENT
MAXIMUM SIZE OF AGGREGATE: 1 INCH.
9. FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
RCP & CI PIPE – ALL SIZES – 48"
AC & VC PIPE – UP THROUGH 12" DIA. – 18" SEE NOTE 9.A.
AC & VC PIPE – LARGER THAN 12" DIA. – 36"
DI PIPE– NONE REQUIRED
PVC (ASTM 3034) – UP THROUGH 15" DIA. – NONE REQUIRED
PVC (ASTM F 679) –LARGER THAN 15" DIA. – 48" TO 60"
PVC (ASTM F 789) – ALL SIZES – 48" TO 60"
9.A. UNDER SEVERE CONDITIONS WHEN DIFFERENTIAL SETTING CANNOT BE CONTROLLED WITHIN NORMAL LIMITS, VARIATIONS IN THE STUB LENGTH MAY BE NECESSARY. OTHER PLASTIC PIPES SHALL BE REVIEWED ON A CASE BY CASE BASIS.
10. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H–20 LOADS.
11. MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE 4 INCHES.
12. PIPE AND JOINT MATERIALS P.V.C. (POLY VINYL CHLORIDE) PIPE: ALL P.V.C. PIPE AND FITTINGS SHALL CONFORM TO THE MOST RECENT REQUIREMENTS OF ASTM SPECIFICATIONS FOR TYPE PSM POLY VINYL CHLORIDE (P.V.C.) SEWER PIPE AND FITTINGS, DESIGNATION D–3034 AND ASTM SPECIFICATIONS FOR SEWER PIPE, JOINTS USING ELASTOMERIC SEALS, DESIGNATION D–3212. MANUFACTURER'S CERTIFICATE OF COMPLIANCE SHALL BE FURNISHED TO THE ENGINEER, PRIOR TO INSTALLATION METHODS OF SHIPPING AND STORAGE ON SITE SHALL BE SUCH AS TO AVOID INJURY TO THE PIPE. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB. MINIMUM "PIPE STIFFNESS" (f/y) AT 7 1/2" DEFLECTION SHALL BE 45 PSI FOR SIZE WHEN TESTED IN ACCORDANCE WITH ASTM METHODS OF TEST D–2412, "EXTERNAL LOADING PROPERTIES OF PLASTIC PIPE BY PARALLEL – PLATE LOADING." ALL P.V.C. PIPE SHALL BE TYPE SDR–35 (A MEASURE OF THICKNESS AND RIGIDITY) AND SHALL HAVE ELASTOMERIC GASKET JOINTS. SOLVENT CEMENT JOINTS SHALL NOT BE ALLOWED. P.V.C. USED FOR FORCE MAINS SHALL CONFORM TO ASTM D–2241 AND D–1784 (CLASS 1254–B). A SAFETY FACTOR OF 2.5 SHALL BE USED FOR PRESSURE RATING DETERMINATION WITH A STANDARD DIMENSION RATIO (SDR) NO HIGHER THAN 26.
13. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE
14. JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIAL USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.
15. TEES OR WYES: WHERE A TEE OR WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING MANUFACTURERS INSTRUCTIONS USING A BOLTED, CLAMPED, OR EPOXY–CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION, AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL UP TO AND INCLUDING 15" DIAMETER. DOES (NOT APPLY TO INSTALLATIONS WHERE TEES & WYES ARE USED.)
16. PIPE INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED, AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AS SPECIFIED IN NOTE 10. BEDDING AND RE–FILL FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH THE APPROPRIATE MECHANICAL DEVICES. THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE HOUSE FOUNDATION AT A GRADE OF NOT LESS THAN 1/8 INCH PER FOOT PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
17. TESTING. THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS (PRIOR TO BACKFILLING)
A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND, WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.
B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER, TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF THE TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.
C. DRY FLUORESCENCE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER, OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWNSTREAM MANHOLE. LEAKAGE OBSERVED IN ANY OF THE ABOVE ALTERNATE TESTS SHALL BE CAUSE FOR NON–ACCEPTANCE AND THE PIPE SHALL BE DUG–UP IF NECESSARY AND RE–LAID SO AS TO ASSURE WATER–TIGHTNESS.
18. ILLEGAL CONNECTION: NOTHING BUT SANITARY WASTE FLOW FROM THE HOUSE TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS OR SUMP PUMPS OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE, OR GROUND WATER, SHALL NOT BE PERMITTED.
19. HOUSE AND WATER SERVICE SHOULD NOT BE LAID IN THE SAME TRENCH AS SEWER SERVICE, BUT WHEN NECESSARY, SHALL BE PLACED ABOVE AND TO THE SIDE OF THE HOUSE SEWER AS SHOWN.
20. BEDDING: MIN. 3/4" CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33.6
100% PASSING 1 INCH SCREEN
90–100% PASSING 3/4 INCH SCREEN
20–55% PASSING 3/8 INCH SCREEN
0–10% PASSING #4 SIEVE
0–5% PASSING #8 SIEVE
WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, MIN. 3/4" CRUSHED STONE SHALL BE USED.
21. LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY": DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.
22. CONCRETE: CONCRETE SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 PSI.) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WATER WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
CEMENT: 6.0 BAGS/C.Y.
WATER: 5.75 GALLONS/BAG OF CEMENT
AGGREGATE: 1 1/2" MAX.
23. CHIMNEYS: IF VERTICAL DROP INTO SEWER IS GREATER THAN 4', A CHIMNEY SHALL BE CONSTRUCTED FOR THE HOUSE CONNECTION.
24. ALL DRAINAGE AND SEWER STRUCTURES INCLUDING FRAMES AND GRATES SHALL BE H–20 LOADING.
25. ALL SEWER CONSTRUCTION SHALL BE CONSTRUCTED TO NHDES AND THE CITY OF ROCHESTER STANDARDS & SPECIFICATIONS
26. HORIZONTAL JOINTS: BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE COMMISSION, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATER TIGHTNESS UPON AN ELASTOMERIC OR MASTIC–LIKE GASKET.
27. PIPE TO MANHOLE JOINTS: SHALL BE ONLY AS APPROVED BY THE COMMISSION AND IN GENERAL, WILL DEPEND FOR WATER TIGHTNESS UPON EITHER AN APPROVED NON–SHRINKING MORTAR OR ELASTOMERIC SEALANT.
28. FOR BITUMASTIC TYPE JOINTS: THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY APPROVED BITUMASTIC SEALANTS: RAM–NEK KENT SEAL NO.2 EZ
29. THE CONTRACTOR SHALL NOTIFY DIG–SAFE 1–888–344–7233 PRIOR TO CONSTRUCTION.



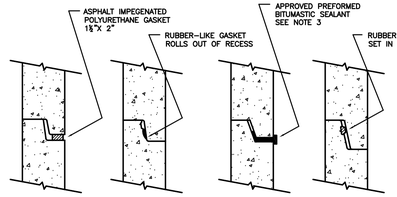
LOCK–JOINT FLEXIBLE MANHOLE SLEEVE
(OR EQUAL)



PRESS–WEDGE II
(OR EQUAL)

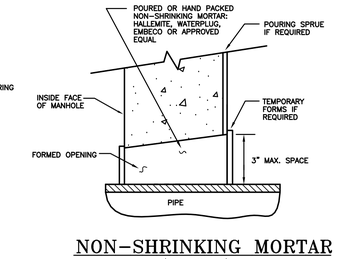


A–LOK
(OR EQUAL)

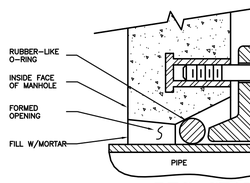


NOTE: ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

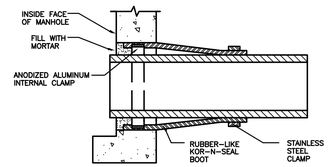
DETAIL–B



NON–SHRINKING MORTAR
(OR EQUAL)



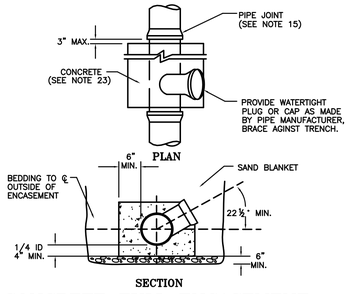
RES–SEAL
(OR EQUAL)



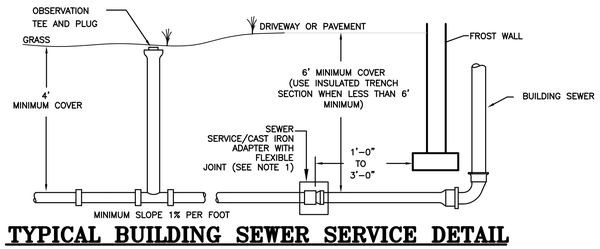
KOR–N–SEAL JOINT SLEEVE
(OR EQUAL)

DETAIL–A

NOTE: ALL GASKETS, SEALANTS, MORTAR ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.



CONCRETE FULL ENCASEMENT



TYPICAL BUILDING SEWER SERVICE DETAIL

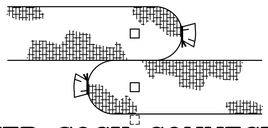
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NOTES:
1. MEXADAPTOR TYPE COUPLING SHALL BE USED FOR FLEXIBLE TRANSITION TO BUILDING.

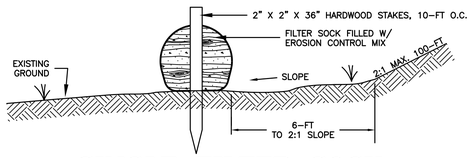
SANITARY SEWER DETAILS
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603–335–3948

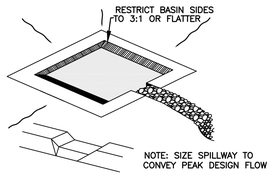
CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.



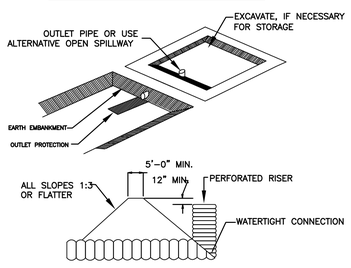
FILTER SOCK CONNECTION
PLAN VIEW



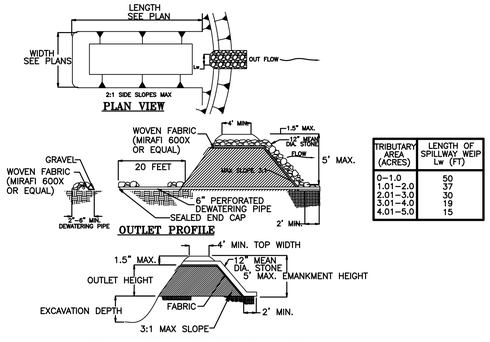
SINGLE FILTER SOCK
CROSS-SECTION



TYPICAL OPEN SPILLWAY



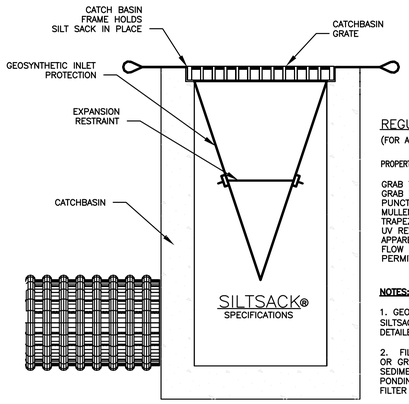
EMBANKMENT SECTION THRU RISER



TRIBUTARY AREA (ACRES)	LENGTH OF SPILLWAY WEIP Lw (FT)
0-1.0	50
1.01-2.0	37
2.01-3.0	30
3.01-4.0	19
4.01-5.0	15

ALTERNATE OUTLET PROFILE

SEDIMENT TRAP



REGULAR FLOW SILTSACK®

(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

NOTES:

1. GEOSYNTHETIC SEDIMENT FILTER TRAP SHALL BE "REGULAR FLOW SILTSACK®" OR APPROVED EQUAL. SPECIFICATIONS FOR SILTSACK® ARE DETAILED.
2. FILTER TRAPS SHALL BE INSPECTED AFTER EVERY RAIN EVENT OF 0.25" OR GREATER AND SEDIMENTS SHALL BE REMOVED FROM TRAP WHEN SEDIMENT HAS REACHED TWO THIRDS OF THE DEPTH OF THE TRAP, OR IF PONDING OF WATER AT SURFACE BEGINS TO OCCUR. DO NOT PUNCTURE FILTER TRAP TO MITIGATE PONDING.
3. INSTALL SILT SACKS IN CATCH BASIN UPON INSTALLATION OF STRUCTURE.

CATCH BASIN GEOSYNTHETIC SEDIMENT TRAP

NOT TO SCALE

STOCKPILE PRACTICES:

1. LOCATE STOCKPILES A MINIMUM OF 50-FT. AWAY FROM CONCENTRATED FLOWS OF STORMWATER, DRAINAGE COURSES OR INLETS.
2. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY PERIMETER MEASURES SUCH AS DIVERSIONS, BERMS, SANDBAGS OR OTHER APPROVED PRACTICES.
3. STOCKPILES SHALL BE SURROUNDED BY SEDIMENT BARRIERS AS DESCRIBED ON THE PLANS AND IN NHSMM VOL. 3, TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILE.
4. IMPLEMENT WIND EROSION CONTROL PRACTICES AS APPROPRIATE ON ALL STOCKPILED MATERIAL.
5. PLACE BAGGED MATERIALS ON PALLETS OR UNDERCOVER.

PROTECTION OF INACTIVE STOCKPILES:

6. INACTIVE SOIL STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS OR PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY SEED AND MULCH OR OTHER TEMPORARY STABILIZATION PRACTICE) AND TEMPORARY PERIMETER SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES.
7. INACTIVE STOCKPILES OF CONCRETE RUBBLE, ASPHALT CONCRETE RUBBLE, AGGREGATE MATERIALS, AND SIMILAR MATERIALS SHALL BE PROTECTED WITH TEMPORARY SEDIMENT PERIMETER BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES. IF THE MATERIALS ARE A SOURCE OF DUST, THEY SHALL ALSO BE COVERED.

PROTECTION OF ACTIVE STOCKPILES:

8. ALL STOCKPILES SHALL BE SURROUNDED WITH TEMPORARY LINEAR SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) PRIOR TO THE ONSET OF PRECIPITATION. PERIMETER BARRIERS SHALL BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIAL FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHALL BE INSPECTED AT THE END OF EACH WORKING DAY.
9. WHEN A STORM IS PREDICTED, STOCKPILES SHALL BE PROTECTED WITH AN ANCHORED PROTECTIVE COVERING.

TEMPORARY VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:

1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHALL BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHALL INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR O THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:

1. STONES AND TRASH SHALL BE REMOVED SO AS NOT TO INTERFERE WITH THE SEEDING AREA.
2. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
3. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHALL BE APPLIED DURING THE GROWING SEASON.
4. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. FERTILIZER SHALL BE RESTRICTED TO LIME, WOOD ASH OR LOW PHOSPHATE AND SLOW RELEASE NITROGEN VARIETIES, UNLESS A SOIL TEST WARRANTS OTHERWISE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000-SF)*
   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 870 LB./ACRE (20 LB./1,000-SF)*
   *LOW PHOSPHATE FERTILIZER (6-0-4) OR EQUIVALENT

SEEDING:

1. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDRO SEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
2. TEMPORARY SEED SHALL TYPICALLY OCCUR PRIOR TO SEPTEMBER 15.
3. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHALL BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
4. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHALL BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVER WINTER PROTECTION.

MAINTENANCE REQUIREMENTS:

1. TEMPORARY SEEDING SHALL BE INSPECTED WEEKLY AFTER ANY RAINFALL EXCEEDING 1/2 INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHALL BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
2. BASED ON INSPECTION, AREAS SHALL BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHALL BE IMPLEMENTED.
3. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND AREAS SHALL BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

DUST CONTROL PRACTICES:

1. APPLY DUST CONTROL MEASURES AS NECESSARY TO MAINTAIN CONTROL OF DUST ON SITE.
2. WATER APPLICATION:
   A) MOISTEN EXPOSED SOIL SURFACES PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST.
   B) AVOID EXCESSIVE APPLICATION OF WATER THAT WOULD RESULT IN MOBILIZING SEDIMENT AND SUBSEQUENT DEPOSITION IN NATURAL WATERBODIES.
3. STONE APPLICATION:
   A) COVER SURFACE WITH CRUSHED OR COARSE GRAVEL.
   B) IN AREAS NEAR WATERWAYS USE ONLY CHEMICALLY STABILIZED OR WASHED AGGREGATE.
4. REFER TO "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" FOR OTHER ALLOWABLE DUST CONTROL PRACTICES (I.E. COMMERCIAL TACKIFIERS OR CHEMICAL TREATMENTS SUCH AS CALCIUM CHLORIDE, ETC.)

TEMPORARY VEGETATION SEEDING RECOMMENDATIONS

SPECIES	PER ACRE BUSHELS (BU) OR POUNDS (LBS.)	PER 1,000-SF	REMARKS
WINTER RYE	2.5 BU OR 112 LBS.	2.5 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	2.5 BU OR 80 LBS.	2.0 LBS.	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15 FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYE GRASS	40 LBS.	1.0 LB.	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15 AND SEPTEMBER 15. COVER THE SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYE GRASS	30 LBS.	0.7 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLE 4-1
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

TEMPORARY EROSION AND SEDIMENTATION CONTROL
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:

RYAN ESCHBACH

APRIL 2026

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948

NORWAY PLAINS ASSOCIATES, INC.

2 Continental Blvd., Rochester, N.H. 603-335-3948

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PERMANENT VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHALL BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHALL INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR TO THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:
1. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHALL BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY AND SILT SOILS SHALL BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
2. REMOVE FROM THE SURFACE ALL STONES 2-INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
3. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
4. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
5. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHALL BE APPLIED DURING THE GROWING SEASON.
6. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. FERTILIZER SHALL BE RESTRICTED TO LIME, WOOD ASH OR LOW PHOSPHATE AND SLOW RELEASE NITROGEN VARIETIES, UNLESS A SOIL TEST WARRANTS OTHERWISE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000-SF)*
   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 870 LB./ACRE (20 LB./1,000-SF)*
   *LOW PHOSPHATE FERTILIZER (6-0-4) OR EQUIVALENT

SEEDING:
1. INOCULATE ALL LEGUME SEED WITH THE CORRECT TYPE OF INOCULANT.
2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE.
3. WHERE FEASIBLE EXCEPT WHERE EITHER CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHALL BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
4. SPRING SEEDING USUALLY GIVES THE BEST RESULTS FOR ALL SEED MIXES OR WITH LEGUMES. PERMANENT SEEDING SHALL BE COMPLETED 45 DAYS PRIOR TO FIRST KILLING FROST. WHEN CROWN VETCH IS SEEDED IN LATE SUMMER AT LEAST 35% OF THE SEED SHALL BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SPECIFIED SEEDING DATES, MULCH ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3. AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
5. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHALL BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
6. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHALL BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVER WINTER PROTECTION.

HYDROSEEDING:
1. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
2. SLOPES BUST BE NO STEEPER THAN 2:1 (2 FEET HORIZONTALLY BY 1 FOOT VERTICALLY.
3. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
4. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

MAINTENANCE REQUIREMENTS:
1. PERMANENT SEEDED AREAS SHALL BE INSPECTED AT LEAST MONTHLY DURING THE COURSE OF CONSTRUCTION. INSPECTION, MAINTENANCE AND CORRECTIVE ACTIONS SHALL CONTINUE UNTIL THE OWNER ASSUMES PERMANENT OPERATION OF THE SITE.
2. SEEDED AREAS SHALL BE MOWED AS REQUIRED TO MAINTAIN A HEALTHY STAND OF VEGETATION. MOWING HEIGHT AND FREQUENCY DEPEND OF TYPE OF GRASS COVER.
3. BASED ON INSPECTION, AREAS SHALL BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS.
4. AT A MINIMUM 85% OF THE SOIL SURFACE SHALL BE COVERED BY VEGETATION.
5. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND AREAS SHALL BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION SEEDING RECOMMENDATIONS

USE	MIXTURE	SPECIES	LBS./ACRE	LBS./ 1,000-SF
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY RECREATION SITES	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
PLAY AREAS AND ATHLETIC FIELDS (TOPSOIL ESSENTIAL FOR GOOD TURF)	F	CREEPING RED FESCUE KENTUCKY BLUEGRASS TOTAL	50 50 100	1.15 1.15 2.30

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLES 4-2 AND 4-3
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

GENERAL CONSTRUCTION PHASING:

1. STABILIZATION:
   A SITE IS DEEMED STABILIZED WHEN IT IS IN A CONDITION IN WHICH THE SOIL ON SITE WILL NOT EXPERIENCE ACCELERATED OR UNNATURAL EROSION UNDER THE CONDITIONS OF A 10-YEAR STORM EVENT, SUCH AS BUT NOT LIMITED TO:
   A)IN AREAS THAT WILL NOT BE PAVED:
      a) A MINIMUM OF 85% VEGETATIVE COVER HAS BEEN ESTABLISHED;
      b) A MINIMUM OF 3-INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAPHAS BEEN INSTALLED; OR A CERTIFIED COMPOST BLANKET HAS BEEN INSTALLED, OR;
      c) EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
   B)IN AREAS TO BE PAVED:
      a) BASE COURSE GRAVELS HAVE BEEN INSTALLED.
2. TEMPORARY STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHALL BE TEMPORARILY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 14 DAYS FROM THE TIME OF INITIAL DISTURBANCE. UNLESS A SHORTER TIME IS SPECIFIED BY LOCAL AUTHORITIES, THE CONSTRUCTION SEQUENCE APPROVED AS PART OF THE ISSUED PERMIT OR AN INDEPENDENT MONITOR.
3. PERMANENT STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHALL BE PERMANENTLY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 3 DAYS FOLLOWING FINAL GRADING.
4. MAXIMUM AREA OF DISTURBANCE:
   THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, NO MORE THAN 5 ACRES SHALL BE DISTURBED (NOT STABILIZED) AT ANY TIME.
5. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR CONSTRUCTION.
   A) FLAG OR OTHERWISE DELINEATE AREAS NOT TO BE DISTURBED.
   B) EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM THESE AREAS TO PRESERVE NATURAL VEGETATION.
6. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED GRADING AND DRAINAGE PLAN DEPICTED ON SHEET C-2.
7. ALL EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN DEPICTED ON SHEET C-2
8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN THE AMOUNT NECESSARY TO COMPLETE FINISHED GRADING AND BE PROTECTED FROM EROSION.
9. STOCKPILES, BORROW AREAS AND SPOILS SHALL BE STABILIZED AS DESCRIBED UNDER "SOIL STOCKPILE PRACTICES".
10. SLOPES SHALL NOT BE CREATED SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTIES WITHOUT ADEQUATE PROTECTION AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED DAMAGE.
11. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND/OR OTHER OBJECTIONABLE MATERIALS.
12. AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3-INCHES PRIOR TO PLACEMENT OF TOPSOIL. TOPSOIL SHALL BE PLACED WITHOUT SIGNIFICANT COMPACTION TO PROVIDE A LOOSE BEDDING FOR PLACEMENT OF SEED.
13. ALL FILLS SHALL BE COMPACTED IN ACCORDANCE WITH PROJECT SPECIFICATIONS TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES, SITE UTILITIES, CONDUITS AND OTHER FACILITIES, SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
14. IN GENERAL, FILLS SHALL BE COMPACTED IN LAYERS RANGING FROM 6 TO 24 INCHES IN THICKNESS. THE CONTRACTOR SHALL REVIEW THE PROJECT GEOTECHNICAL REPORT AND/OR THE "PROJECT SPECIFIC PHASING NOTES" FOR SPECIFIC GUIDANCE.
15. ANY AND ALL FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS (LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING INSTALLED), LOGS, STUMPS, BUILDING DEBRIS, FROZEN MATERIAL AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY LIFTS.
16. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE (I.E. CLAY, SILT) MATERIALS ARE SUSCEPTIBLE TO ACCELERATED SETTLEMENT AND POTENTIAL ACCELERATED EROSION. WORK IN AREAS OF THESE MATERIALS SHALL BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER.
17. THE OUTER FACE OF THE FILL SLOPE SHALL BE ALLOWED TO STAY LOOSE, NOT ROLLED OR COMPACTED, OR BLADE SMOOTHED. A BULLDOZER MAY RUN UP AND DOWN THE FILL SLOPE SO THE DOZER TREADS (CLEAT TRACKS) CREATE GROOVES PERPENDICULAR TO THE SLOPE. IF THE SOIL IS NOT TOO MOIST, EXCESSIVE COMPACTION WILL NOT OCCUR. SEE "SURFACE ROUGHENING" IN THE NHSMM, VOL.3.
18. ROUGHEN THE SURFACE OF ALL SLOPES DURING THE CONSTRUCTION OPERATION TO RETAIN WATER, INCREASE INFILTRATION AND FACILITATE VEGETATION ESTABLISHMENT.
19. USE SLOPE BREAKS, SUCH AS DIVERSIONS, BENCHES, OR CONTOUR FURROWS AS APPROPRIATE TO REDUCE THE LENGTH OF CUT-FILL SLOPES TO LIMIT SHEET AND RILL EROSION AND PREVENT GULLY EROSION. ALL BENCHES SHALL BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF CONSTRUCTION.
20. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE EVALUATED BY A PROFESSIONAL ENGINEER (PREFERABLY THE DESIGN ENGINEER) TO DETERMINE IF THE PROPOSED DESIGN SHALL BE REVISED TO PROPERLY MANAGE THE CONDITION.
21. STABILIZE ALL GRADED AREAS (AS ABOVE) WITH VEGETATION, CRUSHED STONE, COMPOST BLANKET, OR OTHER GROUND COVER AS SOON AS GRADING IS COMPLETE OR IF WORK IS INTERRUPTED FOR 21 WORKING DAYS OR MORE. USE MULCH OR OTHER APPROVED METHODS TO STABILIZE AREAS TEMPORARILY WHERE FINAL GRADING MUST BE DELAYED.
22. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.
23. THE PROJECT SHALL BE CONSTRUCTED TO MEET ALL REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER ARG 3800 RELATIVE TO INVASIVE SPECIES.

ABOVE NOTES EXCERPTED, ADAPTED AND REFERENCED FROM "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" (NHSMM, VOL. 3)

PROJECT SPECIFIC CONSTRUCTION PHASING:

1. REFER TO THE "GENERAL CONSTRUCTION PHASING" NOTES PRIOR TO COMMENCING CONSTRUCTION IN ACCORDANCE WITH THE FOLLOWING PHASING. THE "GENERAL CONSTRUCTION PHASING" NOTES APPLY TO THE OVERALL CONSTRUCTION AND SHALL BE ADHERED TO.
2. INSTALL ALL TEMPORARY SEDIMENT CONTROL BARRIERS (I.E. SILT SOCK, EROSION CONTROL MIX BERM, STONE CHECK DAMS, ETC.) AROUND THE OUTER PERIMETER OF THE CONSTRUCTION SITE AS DEPICTED ON SHEET C-2 PRIOR TO EARTH MOVING OPERATIONS.
3. INSTALL ORANGE SNOW FENCE AROUND THE PERIMETER OF THE INFILTRATION BASINS AND THE FENCE SHALL REMAIN IN PLACE UNTIL CONSTRUCTION OF THE BASINS HAS STARTED.
4. CLEAR, GRUB AND STRIP THE SITE. STUMPS, BRUSH AND OTHER ORGANIC WASTE SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS.
5. STOCKPILE STRIPPED TOPSOIL AND CUT MATERIAL TO BE REUSED ON SITE IN AN APPROPRIATE LOCATION IN ACCORDANCE WITH THE "SOIL STOCKPILES PRACTICES". MAINTAIN THE STOCKPILES AS DIRECTED IN THE "SOIL STOCKPILE PRACTICES".
6. PERFORM THE NECESSARY CUTS AND FILLS TO CONSTRUCT THE BIORETENTION BASIN AS DEPICTED ON SHEET C-2 AND IN ACCORDANCE WITH THE BIORETENTION BASIN DETAILS SHOWN ON SHEET C-5.
7. CONSTRUCT THE BIORETENTION BASIN. LOAM SEED AND MULCH THE SIDE SLOPES OF THE BASIN AS DIRECTED IN THE BIORETENTION BASIN DETAILS.
8. ALL DITCHES/SWALES/AND BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. PERFORM THE NECESSARY CUTS AND FILLS TO SUBGRADE IN THE BUILDING AND PARKING LOT AREAS.
   A) INSTALL REQUIRED FILLS IN MAXIMUM 8-INCH LIFTS AND COMPACT EACH LIFT TO 95% MAXIMUM PROCTOR DENSITY.
10. AS SUBGRADE IS ACHIEVED INSTALL REMAINING SEDIMENT CONTROL BARRIERS WITHIN THE SITE (I.E. ADDITIONAL SILT FENCE, CHECK DAMS AND SEDIMENT CONTROLS AND CATCH BASINS, ETC.)
11. INSTALL ALL UTILITIES AND CLOSED DRAINAGE SYSTEM COMPONENTS (I.E. PIPE CULVERTS, CATCH BASINS AND REMAINING WATER MAIN) PER THE CORRESPONDING DETAILS AND AS SHOWN ON SHEET C-2 AND C-3, AS EACH STRUCTURE IS COMPLETED INSTALL THE CORRESPONDING
12. ALL CUT AND FILL SLOPES AND LAWN AREAS NOT TO BE PAVED SHALL BE LOAMED AND SEEDED FOR PERMANENT VEGETATION AND STABILIZATION AS DESCRIBED UNDER THE "PERMANENT VEGETATION PRACTICES" WITHIN 3 DAYS OF ACHIEVING FINAL GRADE.
13. INSTALL ALL GRAVEL BASE AND CRUSHED GRAVEL MATERIALS FOR THE PARKING AREA AS SPECIFIED IN THE CORRESPONDING DETAILS.
14. THE PARKING AREAS SHALL BE STABILIZED (CONSTRUCTED TO GRAVEL BASE COURSE) WITHIN 3 DAYS OF ACHIEVING FINISHED SUBGRADE ELEVATIONS.
15. INSTALL PAVEMENT SURFACES AS SOON AS POSSIBLE AFTER THE INSTALLATION OF THE GRAVEL BASE AND CRUSHED GRAVEL, IN ORDER TO LIMIT THE SOIL EROSION AND POLLUTION OF THE GRAVEL MATERIALS WITH ORGANIC MATERIALS. IN NO CASE SHALL AREAS TO BE PAVED BE LEFT UNPROTECTED THROUGH OUT THE WINTER MONTHS.
16. ALL DISTURBED AREAS SHALL BE STABILIZED AS SOON AS POSSIBLE. IN NO CASE SHALL ANY DISTURBED AREA BE LEFT UN-STABILIZED FOR LONGER THAN 21 DAYS. IF NECESSARY TEMPORARY STABILIZATION MEASURES AS DISCUSSED IN THE "GENERAL CONSTRUCTION PHASING NOTES" AND NHSMM, VOL. 3 SHOULD BE EMPLOYED.

MAINTENANCE AND INSPECTION:
20. DURING CONSTRUCTION ALL TEMPORARY AND PERMANENT SEDIMENT, EROSION CONTROL AND STORMWATER MANAGEMENT PRACTICES SHOULD BE INSPECTED WEEKLY, AFTER EVERY 1/2 INCH OF RAINFALL, AND ANNUALLY.
17. EXCESS SEDIMENT SHOULD BE REMOVED FROM TEMPORARY SEDIMENT, EROSION CONTROL AND STORMWATER MANAGEMENT PRACTICES WHEN IT REACHES PRESCRIBED THRESHOLDS DISCUSSED IN THE DETAILS FOR EACH PRACTICE.
18. ALL DAMAGED TEMPORARY AND PERMANENT SEDIMENT, EROSION CONTROL AND STORMWATER MANAGEMENT PRACTICES SHOULD BE REPAIRED OR REPLACED IMMEDIATELY UPON NOTICE.
19. SEDIMENT SHALL BE DISPOSED OF PROPERLY EITHER ON SITE OR OFF SITE.

PROJECT COMPLETION AND STABILIZATION:
20. UPON PROJECT COMPLETION, ONCE THE SITE IS DEEMED STABILIZED (VEGETATION IS GERMINATED), THE TEMPORARY SEDIMENT CONTROL BARRIERS AND EROSION CONTROL PRACTICES SHALL BE REMOVED. ANY DISTURBANCE CREATED DURING REMOVAL SHALL BE REPAIRED IN AN APPROPRIATE MANNER.
21. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM ALL ON SITE CATCH BASINS AND BIORETENTION BASIN.

WINTER STABILIZATION & CONSTRUCTION PRACTICES:

MAINTENANCE REQUIREMENTS:
1. MAINTENANCE MEASURES SHALL BE PERFORMED THROUGHOUT CONSTRUCTION, INCLUDING OVER THE WINTER PERIOD. AFTER EACH RAINFALL, SNOWSTORM, OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL CONDUCT INSPECTION OF ALL INSTALLED EROSION CONTROL PRACTICES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUED FUNCTION.
2. FOR ANY AREA STABILIZED BY TEMPORARY OR PERMANENT SEEDING PRIOR TO THE ONSET OF THE WINTER SEASON, THE CONTRACTOR SHALL CONDUCT AN INSPECTION IN THE SPRING TO ASCERTAIN THE CONDITION OF THE VEGETATION AND REPAIR ANY DAMAGED AREAS OR BARE SPOTS AND RESEED AS REQUIRED TO ACHIEVE AN ESTABLISHED VEGETATIVE COVER (AT LEAST 85% OF AREA VEGETATED WITH HEALTHY, VIGOROUS GROWTH.)

SPECIFICATIONS:
THE FOLLOWING STABILIZATION TECHNIQUES SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 15.
1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE LIMITED TO 1-ACRE AND SHALL BE PROTECTED AGAINST EROSION BY THE METHODS DISCUSSED IN NHSMM, VOL. 3 AND ELSEWHERE IN THIS PLAN SET, PRIOR TO ANY THAW OR SPRING MELT EVENT.
2. STABILIZATION AS FOLLOWS SHALL BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
   A. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING, OR 2 INCHES OF EROSION CONTROL MIX (REFER TO NHSMM, VOL. 3 FOR SPECIFICATION).
   B. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15 SHALL BE SEEDED AND COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET OR WITH A MINIMUM OF 4 INCHES OF EROSION CONTROL MIX, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. NOTE THAT COMPOST BLANKETS SHALL NOT EXCEED 2 INCHES IN THICKNESS OR THEY MAY OVERHEAT.
3. ALL STONE COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.
4. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.
5. ALL MULCH APPLIED DURING WINTER SHALL BE ANCHORED (I.E. BY NETTING, TRACKING, WOOD CELLULOSE FIBER).
6. WITHIN 24 HOURS OF STOCKPILING SOIL MATERIALS SHALL BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR WITH A 4 INCH LAYER OF EROSION CONTROL MIX. MULCH SHALL BE REESTABLISHED PRIOR TO ANY RAIN OR SNOWFALL. NO SOIL STOCKPILE SHALL BE PLACED (EVEN COVERED WITH MULCH) WITHIN 100-FT OF ANY WETLAND OR OTHER WATER RESOURCE AREA.
7. FROZEN MATERIAL (I.E. FROST LAYER REMOVED DURING WINTER CONSTRUCTION) SHALL BE STOCKPILED SEPARATELY AND IN A LOCATION AWAY FROM ANY AREA NEEDING PROTECTION. FROZEN MATERIAL STOCKPILES CAN MELT IN SPRING AND BECOME UNWORKABLE AND DIFFICULT TO TRANSPORT DUE TO HIGH SOIL MOISTURE CONTENT.
8. INSTALLATION OF EROSION CONTROL BLANKETS SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH OR ON FROZEN GROUND.
9. ALL GRASS-LINED DITCHES AND CHANNELS SHALL BE CONSTRUCTED BY SEPTEMBER 1. ALL DITCHES AND SWALES WHICH DO NOT EXHIBIT 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS AS DETERMINED BY A PROFESSIONAL ENGINEER. IF STONE LINING IS NECESSARY, THE CONTRACTOR MAY NEED TO RE-GRADE THE DITCH AS REQUIRED TO PROVIDE ADEQUATE CROSS-SECTION AFTER ALLOWING FOR PLACEMENT OF THE STONE.
10. ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.
11. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER SHALL BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF SAND AND GRAVEL WITH A GRADATION THAT IS LESS THAN 12% OF THE SAND PORTION, OR MATERIAL PASSING THE NUMBER 4 SIEVE, BY WEIGHT, PASSES THE NUMBER 200 SIEVE.
12. SEDIMENT BARRIERS THAT ARE INSTALLED DURING FROZEN CONDITIONS SHALL CONSIST OF EROSION CONTROL MIX BERMS, OR CONTINUOUS CONTAINED BERMS. SILT FENCES AND HAY BALES SHALL NOT BE INSTALLED WHEN FROZEN CONDITIONS PREVENT PROPER EMBEDMENT OF THESE BARRIERS.

PERMANENT EROSION AND SEDIMENTATION CONTROL
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH
PREPARED FOR:
RYAN ESCHBACH
APRIL 2026

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

31 Mooney Street, Alton, N.H. 603-875-3948

NORWAY PLAINS ASSOCIATES, INC.

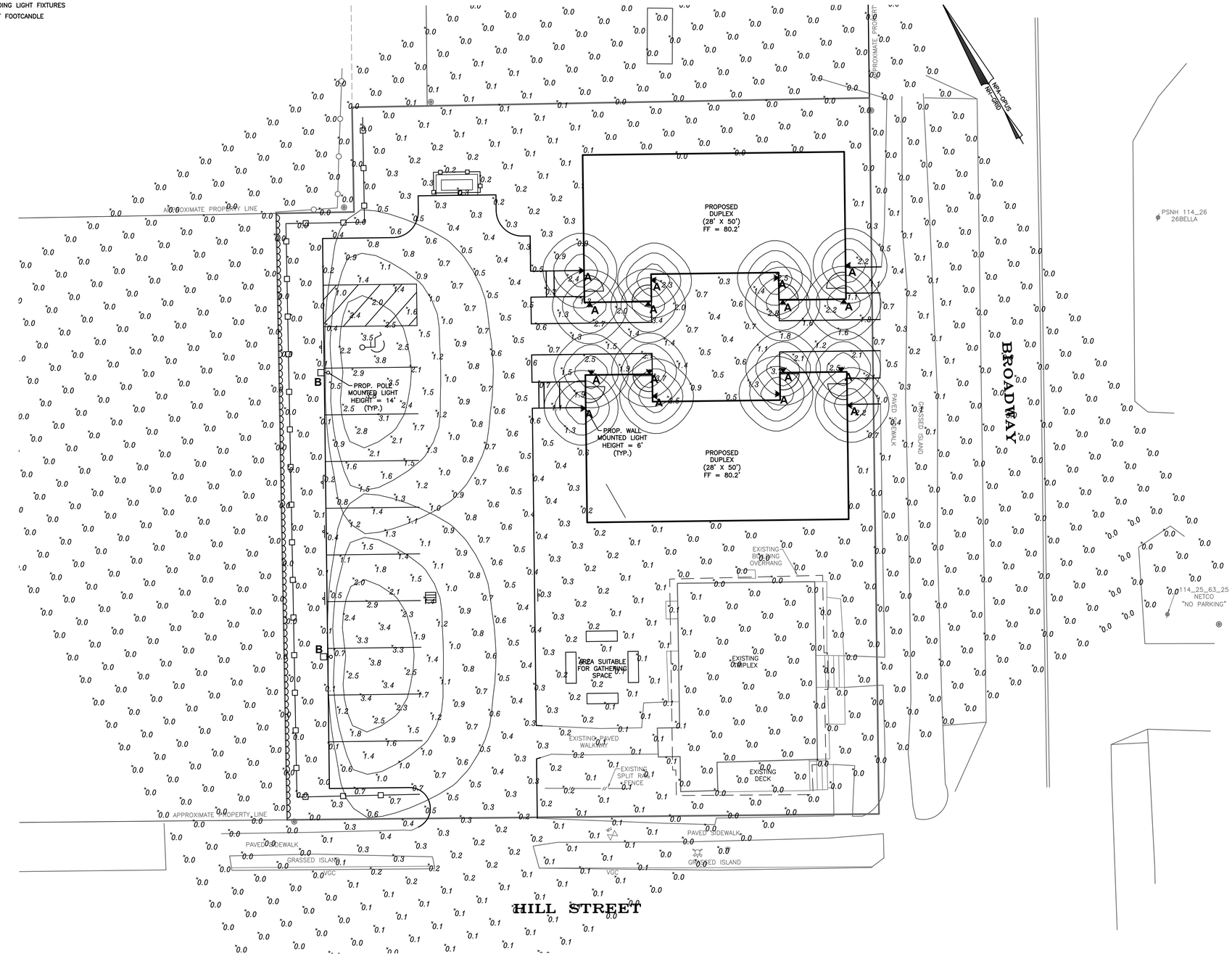
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CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

LEGEND

- PROPERTY LINE
- JURISDICTIONAL WETLANDS
- EXISTING OVERHEAD WIRES
- EXISTING LIGHT POLES
- PROPOSED BUILDING
- PROPOSED PAVEMENT
- PROPOSED PAVEMENT WITH CURBING
- PROPOSED LIGHT POLES
- PROPOSED BUILDING LIGHT FIXTURES
- 4.2 PROPOSED LIGHT FOOTCANDLE

Luminaire Schedule			
Symbol	Label	Qty	Description
◀	A	16	WAC LIGHTING: WSW115616-3000K-BK, MOUNTED AT 6'
◀	B	2	MCGRAW-EDISON; GALN GALLEON II, POLE MOUNTED AT 14'





WAC LIGHTING
LEVEE



MCGRAW-EDISON
GALN GALLEON II

REFLEX

LIGHTING PLAN
TAX MAP 27, LOT 169
96 BROADWAY
DOVER, NH

PREPARED FOR:
RYAN ESCHBACH

APRIL 2026

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 INCH = 10 FEET

FILE NO. 537
PLAN NO. C-3792
DWG. NO. 25321/SP-1

L-2

PROJECT:

96 BROADWAY HOUSING



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207 384 2049
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ADDRESS:

96 BROADWAY
DOVER, NH 03820

CLIENT:

RYAN ESCHBACH

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DRAWING No.	DRAWING NAME.
Schematic Design	
SD - 01	SITE PLAN
SD - 02	FIRST FLOOR PLAN
SD - 03	SECOND FLOOR PLAN
SD - 04	ROOF PLAN
SD - 05	EXTERIOR ELEVATIONS
SD - 06	3D VIEWS

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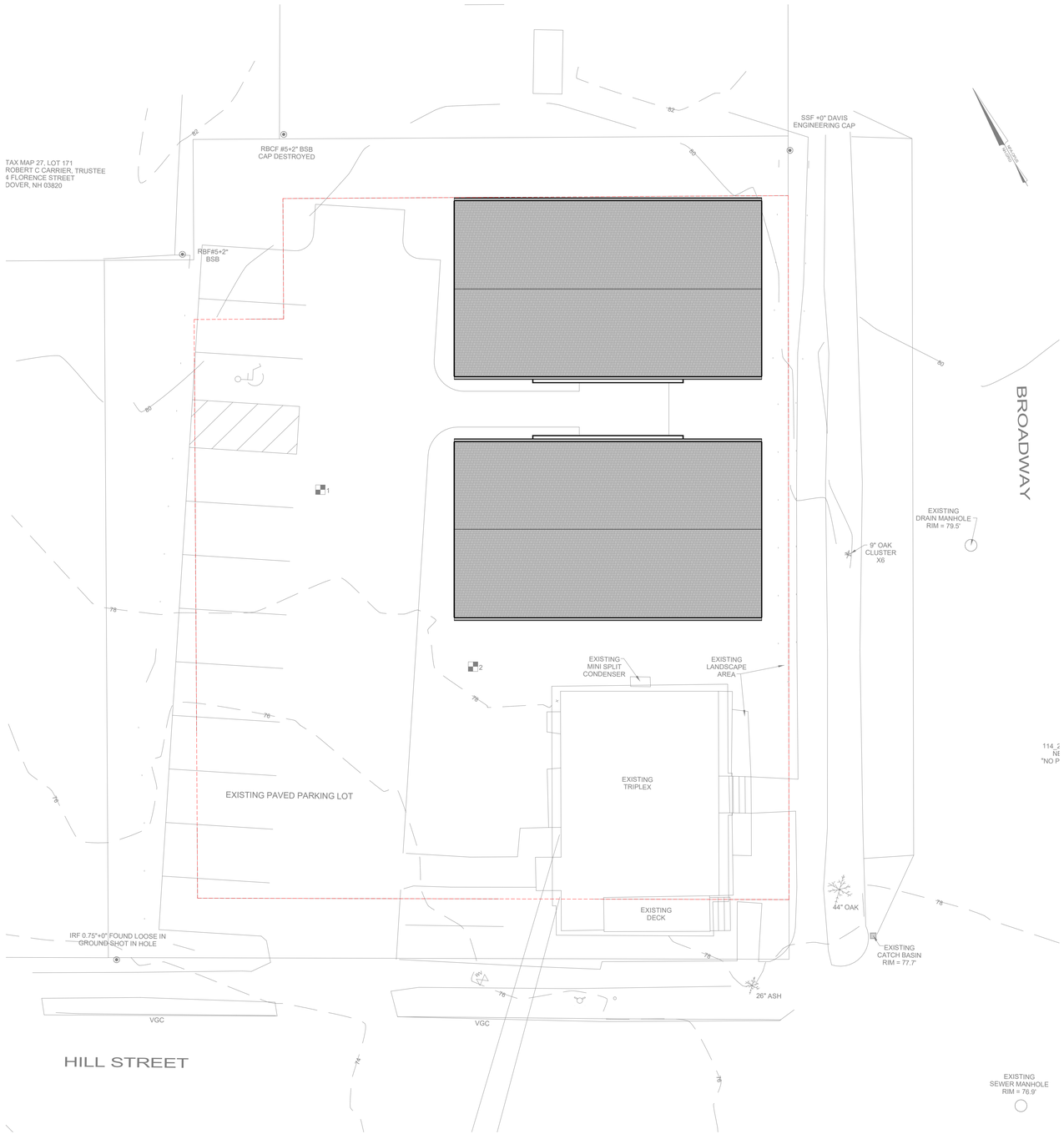
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1 SITE PLAN
1" = 10'-0"

CLIENT:
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PROJECT:
96 BROADWAY HOUSING

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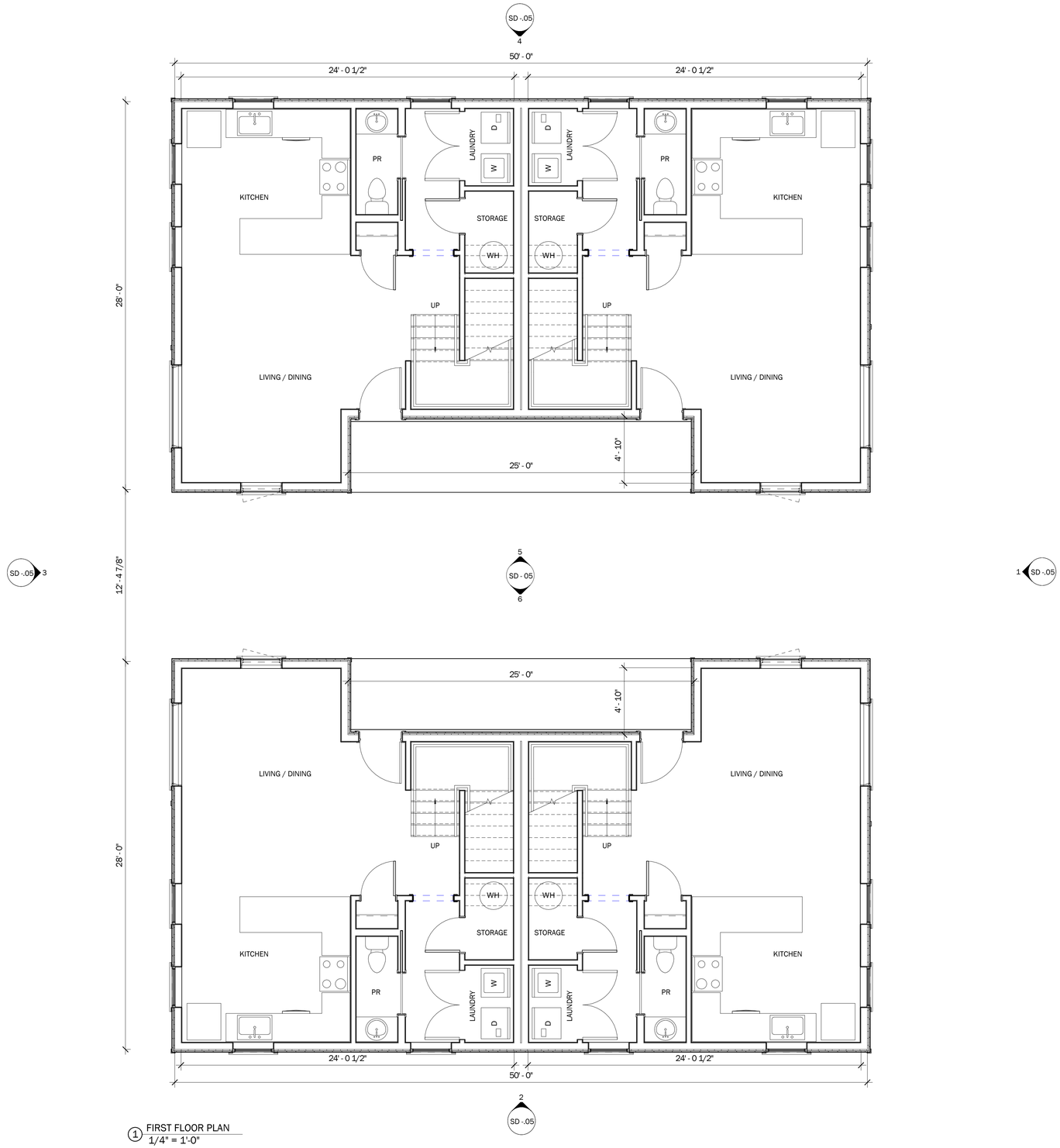
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1 FIRST FLOOR PLAN
1/4" = 1'-0"

CLIENT:
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PROJECT:
96 BROADWAY HOUSING

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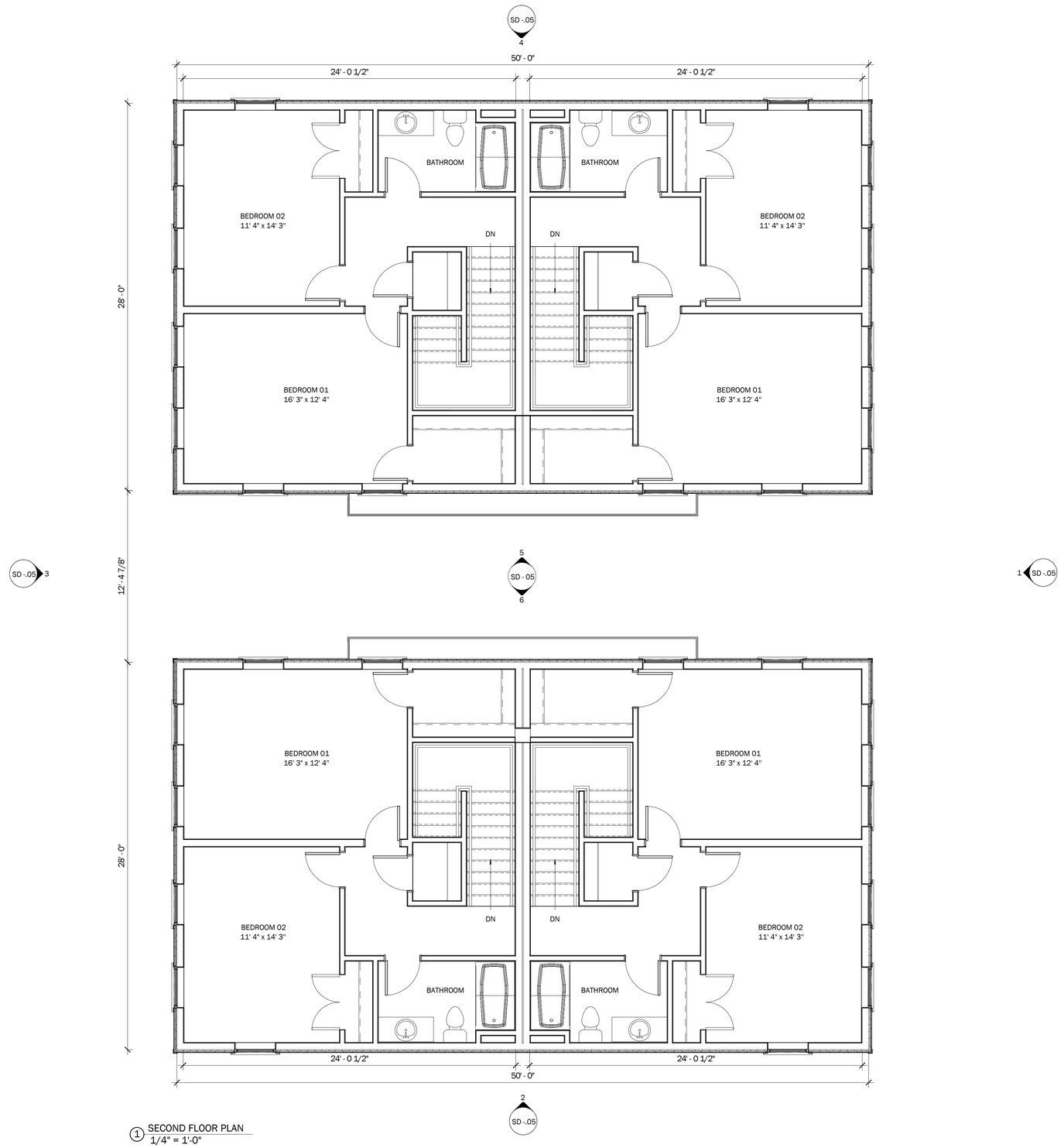
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1 SECOND FLOOR PLAN
1/4" = 1'-0"

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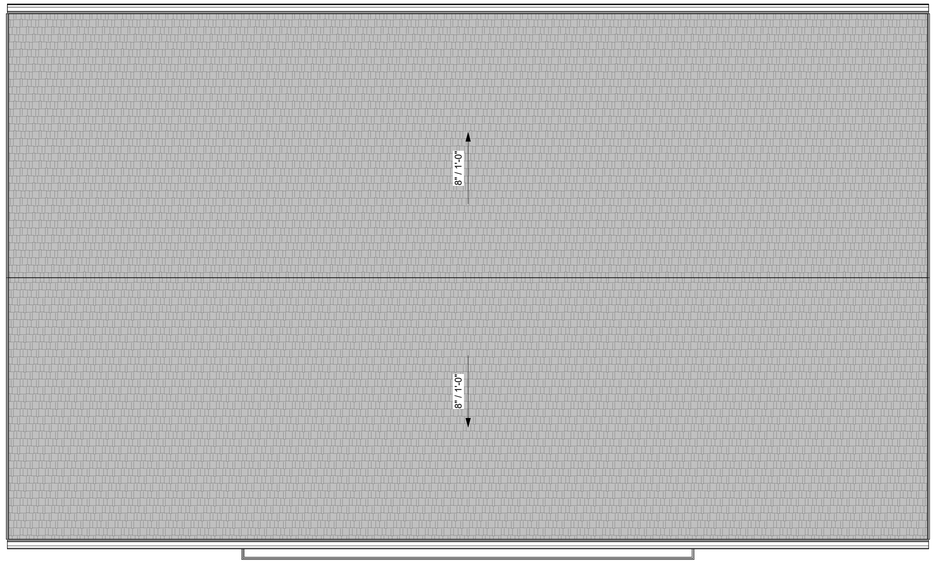
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DRAWING NAME: SECOND FLOOR PLAN
DRAWING NUMBER: SD - 03

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SD -.05
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SD -.05 3
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SD - 05
6
1 SD -.05
2
SD -.05

1 ROOF PLAN
1/4" = 1'-0"

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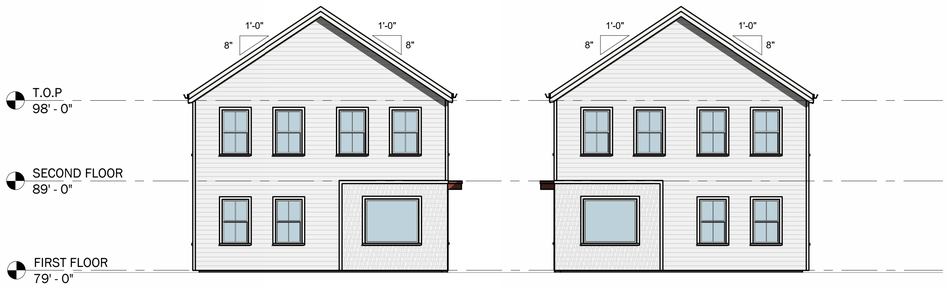
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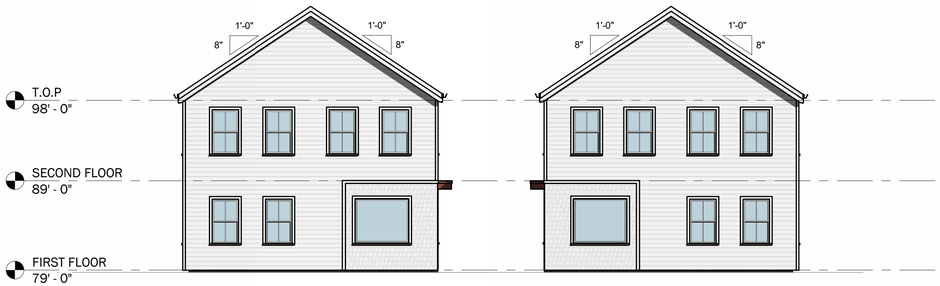
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① EAST ELEVATION
1/8" = 1'-0"



② SOUTH ELEVATION
1/8" = 1'-0"



③ WEST ELEVATION
1/8" = 1'-0"



④ NORTH ELEVATION
1/8" = 1'-0"



⑤ INTERIOR SOUTH ELEVATION
1/8" = 1'-0"



⑥ INTERIOR NORTH ELEVATION
1/8" = 1'-0"

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VIEW FROM BROADWAY 01



VIEW FROM BROADWAY 02

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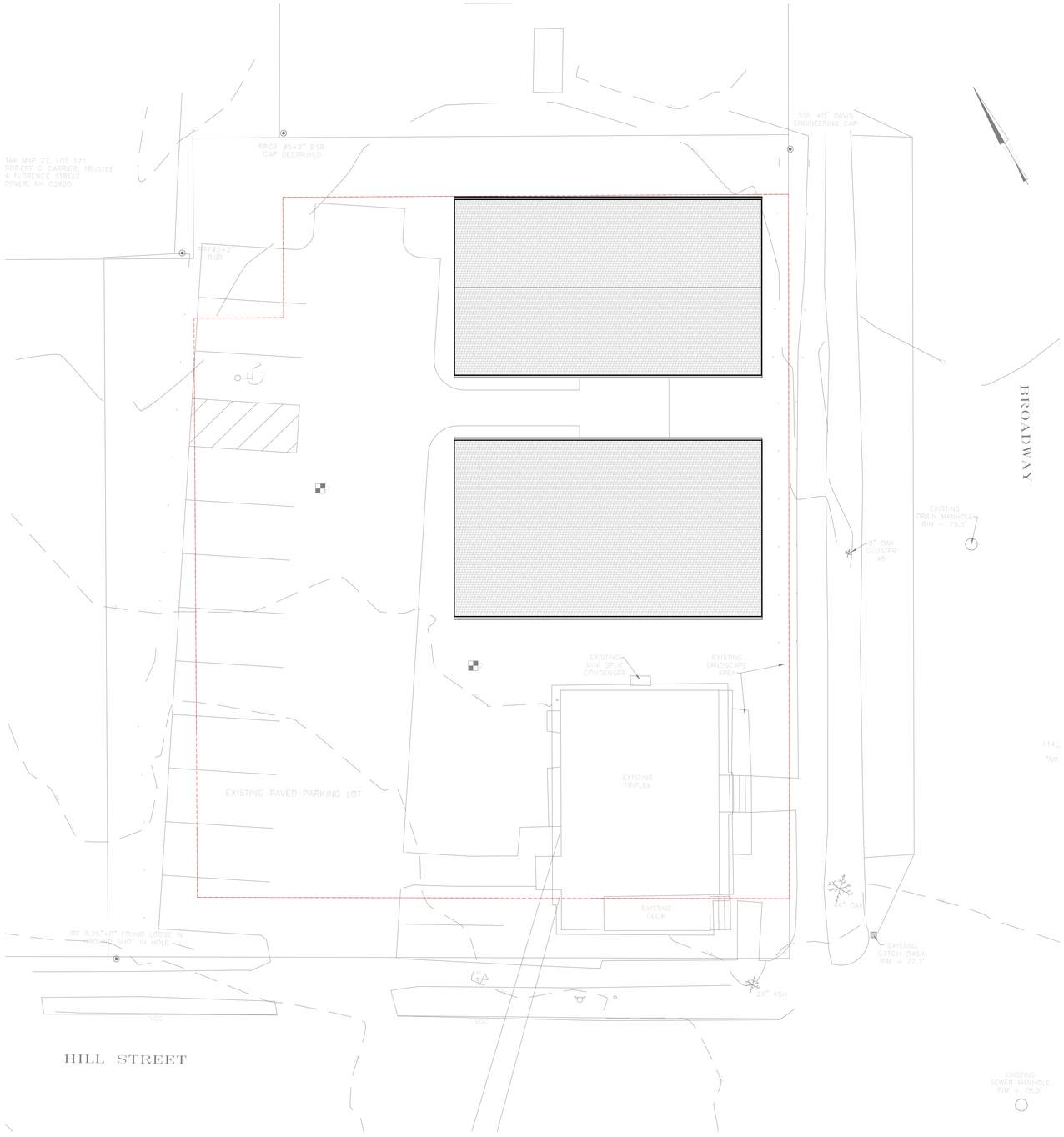
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1 SITE PLAN
1" = 10'-0"

CLIENT:
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PROJECT:
96 BROADWAY HOUSING

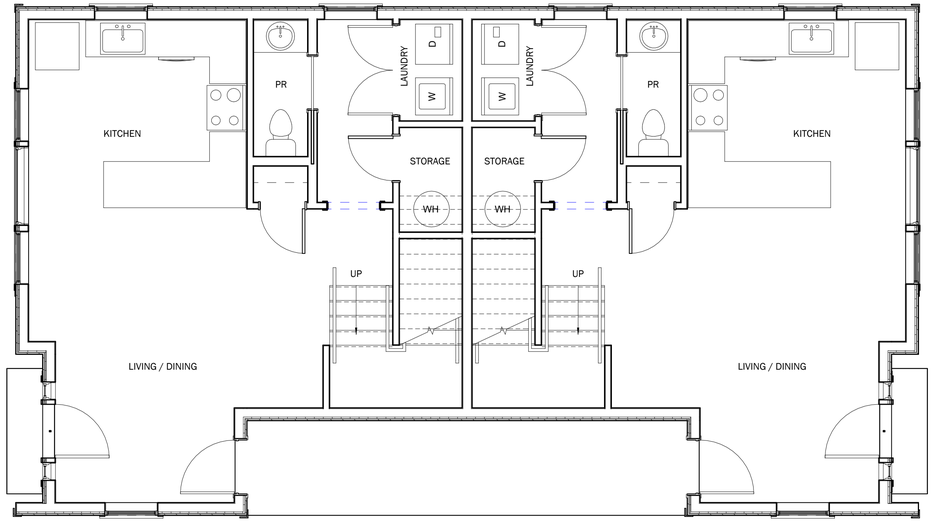
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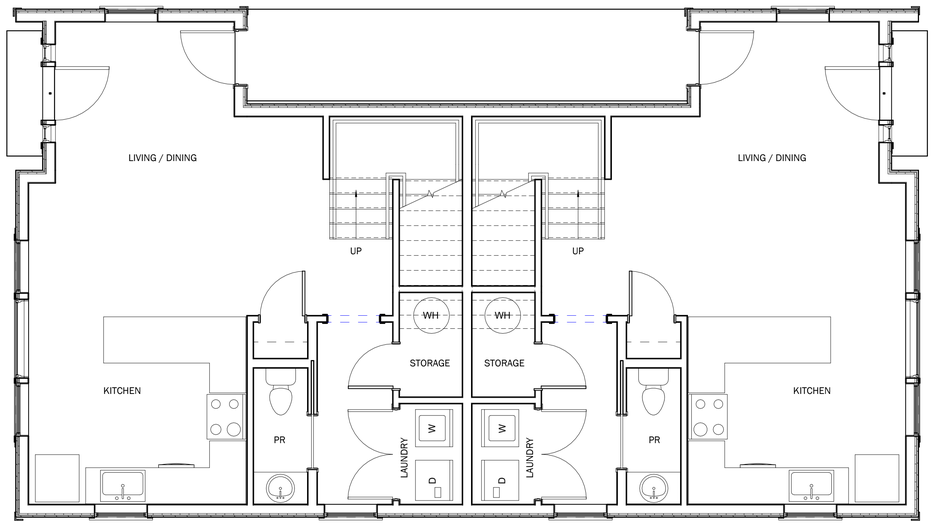
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SD - 05
4



SD - 05 3
5
SD - 05
6
1 SD - 05



2
SD - 05

1 FIRST FLOOR PLAN
1/4" = 1'-0"

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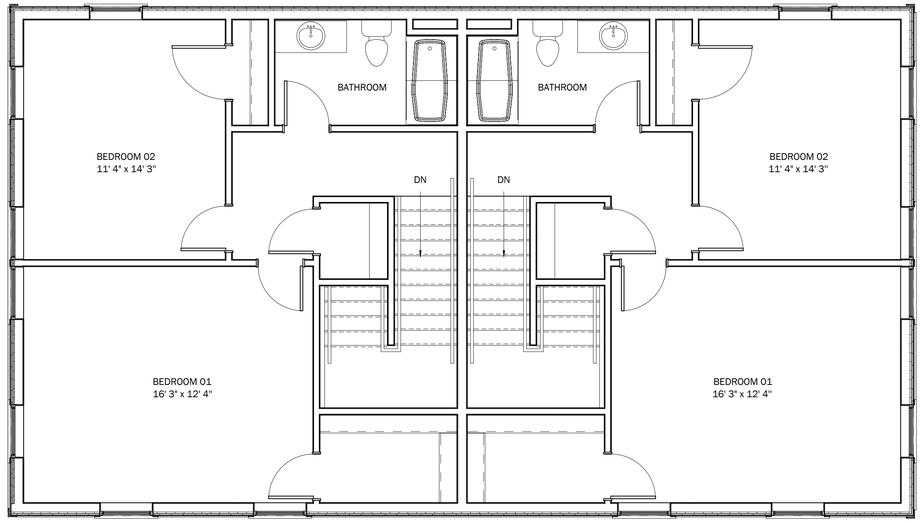
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SD - 05
4



SD - 05 3
5
SD - 05
6
1 SD - 05
2
SD - 05

1 SECOND FLOOR PLAN
1/4" = 1'-0"

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CLIENT:
RYAN ESCHBACH

PROJECT:
96 BROADWAY HOUSING

DRAFT

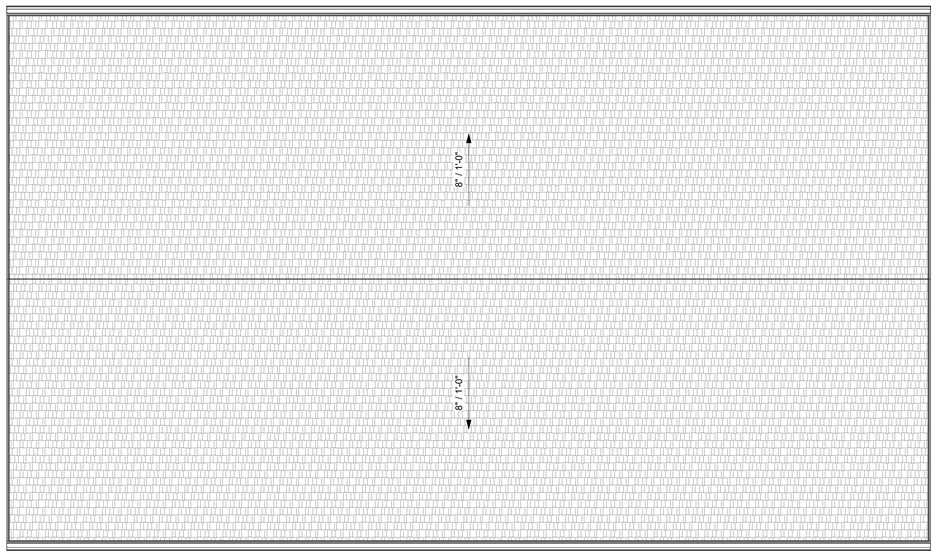
PROJECT NUMBER: 26.07
DATE: JUNE 04, 2026
SCALE: AS NOTED
REVISION:
NORTH:

DRAWING NAME: SECOND FLOOR PLAN
DRAWING NUMBER: SD - 03

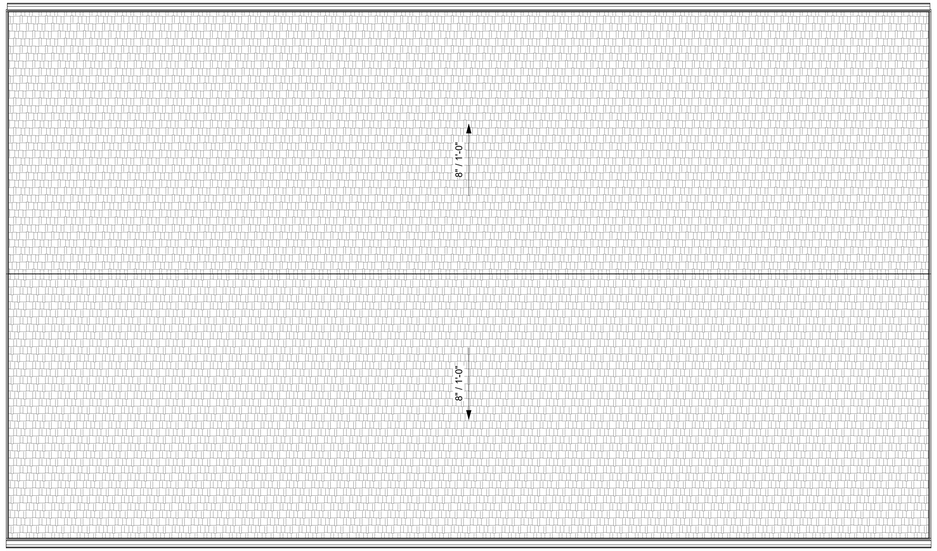
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SD - 05
4



SD - 05 3
5
SD - 05
6
1 SD - 05



2
SD - 05

1 ROOF PLAN
1/4" = 1'-0"

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CLIENT:
RYAN ESCHBACH

PROJECT:
96 BROADWAY HOUSING

DRAFT

PROJECT NUMBER: 26.07
DATE: JUNE 04, 2026
SCALE: AS NOTED
REVISION:

NORTH:

DRAWING NAME: ROOF PLAN
DRAWING NUMBER: SD - 04

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CONFORMANCE WITH DESIGN STANDARDS:

- GROUND FLOOR FACING BROADWAY WINDOW OPENINGS ARE AT 32% OF FACADE

- PEDESTRIAN ENTRANCES AT FRONT FACADES

- FRONT FACADES TO BE PAINTED WOOD CLAPBOARDS

- RECESSED ENTRANCES

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1 EAST ELEVATION
1/8" = 1'-0"



2 SOUTH ELEVATION
1/8" = 1'-0"



3 WEST ELEVATION
1/8" = 1'-0"



4 NORTH ELEVATION
1/8" = 1'-0"



5 INTERIOR SOUTH ELEVATION
1/8" = 1'-0"



6 INTERIOR NORTH ELEVATION
1/8" = 1'-0"

CLIENT:
RYAN ESCHBACH

PROJECT:
96 BROADWAY HOUSING

DRAFT

PROJECT NUMBER: 26.07
DATE: JUNE 04, 2026
SCALE: AS NOTED
REVISION:
NORTH:
DRAWING NAME: EXTERIOR ELEVATIONS
DRAWING NUMBER: SD - 05

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BUILDING FACTS:

BUILDING HEIGHT: 29'-6"

SQUARE FOOTAGE PER UNIT: 1,239 SF
TOTAL SQUARE FOOTAGE: 4,956 SF

SQUARE FOOTAGE OF FOOTPRINTS: 2,800 SF

ZONING DISTRICT: GATEWAY



VIEW FROM BROADWAY 01



VIEW FROM BROADWAY 02

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CLIENT:
RYAN ESCHBACH

PROJECT:
96 BROADWAY HOUSING

DRAFT

PROJECT NUMBER: 26.07
DATE: JUNE 04, 2026
SCALE: AS NOTED
REVISION:
NORTH:
DRAWING NAME: 3D VIEWS
DRAWING NUMBER: SD - 06

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