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, November 30, 2023**
Meeting Time: **10:30 AM**

1. 10:30 AM - 11:30 AM: Site Review for H.J. Stabile & Son, Inc, Assessor's Map 15, Lot 40-A, zoned G, located at Locust Street. (Proposal is to construct a Townhouse Condominium Complex of 22 units with associated parking & drainage. A Conditional Use Permit application would also appear before the Planning Board). (SITE-2023-0015)

2. 11:30 AM - 12:00 PM: Site Review for TF Moran (Owners 256-264 Central Avenue, LLC), Assessor's Map 9, Lots 111 & 112, zoned Central Business District, located at 256 & 264 Central Avenue. (Proposal is to replace gravel parking with 10,595 sf of paved parking related to their renovation of the buildings). (SITE-2023-0013) *[This item was previously heard on September 21, 2023]*

3. 12:00 PM - 12:30 PM: Site Review for Knox Marsh Development, LLC, (Owner: Robert Baldwin), Assessor's Map 39, Lot 103, zoned Gateway, located at 34 New Rochester Road. (Proposal is to construct 6 duplex structures (12 units total) with the single-family dwelling to remain on the property). (SITE-2023-0007). [*This item was previously heard on October 12, 2023]*

START TIMES FOR ITEMS 2 & 3 ARE APPROXIMATE

PLAN SNAPSHOT REPORT SITE-2023-0015
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	10/26/2023
Work Class:	New Construction	**District:**	None	**Exp Date:**	12/30/2023
Status:	Fees Due	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: Site Plan for 22 Unit Townhouse Condominium Complex with Associated Parking & Drainage.

Parcel: 15040-A00000 Main	**Address:** Locust St Dover, NH Main	**Zone:** G(Gateway District)

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

Applicant
Eric Jackson
20 Cotton Road Suite 200
Nashua, NH 03063
Home: (603) 889-0318
Business: (603) 889-0318
Mobile: (603) 661-3934

Plan Custom Fields

Total	0	Total2	0	Total3	0
Total4	0	Total5	0	Total6	0
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	45	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	3.91
Deed Book	SCRD 3166 & SCRD 4337	Total SQFT	170320	Deed Page	SCRD 780 & SCRD 566
Deed Date	4/4/20205 & 11/9/2015	Proposed Property Use	Residential - 22 Unit Townhouse Condominiums	Area of Parcel to be Developed (SQFT)	77000
Number of Parking Spaces Existing	0	Number of Parking Spaces Proposed	45	Number of Employees Total	0
Number of Employees in Max Shift	0	Distance to City Water	1	Distance to City Sewer	1
Type of Building to be Built	4 buildings with 22 townhouse units	Estimated Construction Value	550000.00	Refuse Removal	Private
Is there an existing Conservation Easement?	No	Existing Conservation Easement Details		TotalImpactFeeSDTOD	0.00
TotalImpactFeeTHTOD	0.00	TotalImpactFee23FTOD	0.00	TotalImpactFeeA4TOD	0.00
TotalImpactFeeMHTOD	0.00	TotalImpactFeeADUTOD	0.00	TotalImpactFeeAONRTOD	0.00
TotalImpactFeeAR55TOD	0.00	TotalImpactFeeAR62TOD	0.00	Sub Total Residential	0.00
TotalImpactFeeRIRCTOD	0.00	TotalImpactFeeOCSTOD	0.00	TotalImpactFeeITWCTOD	0.00
TotalImpactFeeNHALTOD	0.00	TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOTOD	0.00
Sub Total Non-Residential	0.00	Total of Impact Fees to be Assessed	0.00		

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Steve_Haight_10/26/2023.jpg	10/26/2023 13:53	Haight, Steve		Uploaded via CSS

PLAN SNAPSHOT REPORT (SITE-2023-0015)

Invoice No.	Fee		Fee Amount	Amount Paid
INV-00005589	Planning General Application Fee		$200.00	$0.00
		Total for Invoice INV-00005589	$200.00	$0.00
		Grand Total for Plan	**$200.00**	**$0.00**

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1			
Confirm application complete v.1	Generic Action		
Technical Review Committee Meeting Agenda v.1	Task		
Land Use Plan Technical Review v.1	Receive Submittal		
Technical Review Committee Meeting v.1	Hold Meeting		
Planning Board v.1			
Planning Board Agenda v.1	Task		
Invoice for Notices v.1	Task		
Send Notices v.1	Task		
Planner Creates Staff Recommendations v.1	Plan Activity		
Distribute Planning Board Materials v.1	Task		
Planning Board Hearing v.1	Hold Hearing		
Planning Board Decision v.1	Plan Activity		
NOD Sent to Applicant v.1	Create Report		
Final Plan v.1			
Land Use Plan Stamped and Signed v.1	Generic Action		
Plans uploaded to Treeno v.1	Generic Action		
Recording v.1	Task		
Property Info Group 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: H.J. Stabile & Son, Inc. Telephone # 603-889-0318 x-515

Address of Applicant: 20 Cotton Road, Suite 200 Nashua, NH 03063

E-Mail Address: eric@stabilecompanies.com

Name of Property Owner (*if different from applicant*): Double Diamond Holdings North, LLC Telephone # 603-749-2800

Address of Property Owner: 340 Central Avenue, Suite 202 Dover, NH 03820

Name & Address of 2nd Property Owner: Carmel A. Casey 36A Fisher Street Dover, NH 03820

PROPERTY INFORMATION

Address of Property: Fisher Street

Assessor's Map # 15 Lot(s) # 40A-1 (a portion of 15 / 40A & 51)

Zoning District(s) G Overlay District(s) Dover Conservation District

Size of Parcel: 170,468 sq. ft. 3.91 ac. Property Deed: (portion of) Book 3166 / 4337 Page: 780 / 566 Double Diamond Holdings North, LLC / Carmel A. Casey

Existing Use of Property: Vacant

SITE PLAN INFORMATION

Describe Proposed Use: Residential - Condominium Townhouses

Area of Parcel to be Developed: 77,000± sq. ft.

If Multi-family Residential: Number of Units 22 & Buildings Proposed 4

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

Number of Parking Spaces: Existing 0 Proposed Total 45: 22 single space drive-under garages, plus 23 additional surface spaces

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

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

Disposition of Parcel:

Building Footprint 15,400 sq. ft.

Total Building Area 46,320 sq. ft.

Paved Area 26,561 sq. ft.

Building Setbacks:

Front Yard 5-20 ft.

Rear Yard 15 ft.

Side Yard: Right 10 ft. Left 10 ft.

City Water? ✓ Yes ___ No How far is city water from the property? at Fisher Street

City Sewer? ✓ Yes ___ No How far is city sewer from the property? at Fisher Street

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION N/A

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

□ Residential □ Residential (reduced size) □ Industrial | □ Purchase □ Land Preservation

Relief sought (Check All That Apply):

□ Lot Size □ Frontage □ Setback □ 30' Buffer □ Increase by _____ units

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

BUILDING INFORMATION

Type of Building to be Built: 4 Condominium Townhouse Buildings (22 total units)

Height of Building: 37.5 feet (highest peak) Finished Floor Elevation: variable: 83.75' - 89.90'

Number of Seats (where applicable) N/A

Estimated value of construction: $550,000 Refuse removal: Public (Private) (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: None Requested

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

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kevin McEneaney, LLS - McEneaney Survey Associates

Address P.O. Box 681 Dover, NH 03821 Telephone #: 603-742-0911

Professional License #: NH LLS #661 E-mail address: kevin@surveynh.com

ENGINEER INFORMATION

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

Address P.O. Box 1166 Dover, NH 03821 Telephone #: 603-749-0443

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

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) JAD Design Group, Inc.

Address P.O. Box 728 Amherst, NH 03031 Telephone #: 603-554-1199

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Jeffrey R. Hyland, Landscape Architect Ironwood Design Group, LLC

Address 55 Main Street, Unit 129 Newmarket, NH 03857 Telephone #: 603-772-0590

Professional License #: Jeffrey R. Hyland, Landscape Architect #00026 E-mail address: jhyland@fewood.com

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) Bruce A. Gilday, CSS, CWS BAG Land Consultants

Address 43 Rockingham Street Concord, NH 03301 Telephone #: 603-228-5775

Professional License #: Bruce A. Gilday, CWS #88 E-mail address: bagilday@comcast.net

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: N/A Telephone #_____

Address Easement Holder: _____

SIGNATURES

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

Signature of Property Owner: _____ Date: _____
for Double Diamond Holdings North, LLC

Signature of Applicant (*if different from owner*): _____ Date: 10/25/23
for H.J. Stabile & Son, Inc.

Signature of Agent: _____ Date: _____

Signature of 2nd Property Owner: _____ Date: 10.25.23
Carmel A. Casey

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 2nd Property Owner: _____ Date: 10.25.23
Carmel A. Casey

Signature of Property Owner: _____ Date: _____
for Double Diamond Holdings North, LLC

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 2nd Property Owner: _____ Date: 10.25.23
Carmel A. Casey

Signature of Property Owner: _____ Date: _____
for Double Diamond Holdings North, LLC

Signature of Applicant (*if different from owner*): _____ Date: 10/25/23
for H.J. Stabile & Son, Inc.

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 2nd Property Owner: _____ Date: 10.25.23
Carmel A. Casey

Signature of Property Owner: _____ Date: _____
for Double Diamond Holdings North, LLC

Signature of Applicant (*if different from owner*): _____ Date: 10/25/23
for H.J. Stabile & Son, Inc.

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: 15 / 51 Carmel A. Casey 36A Fisher Street Dover, NH 03820

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS
15	40A-1	Double Diamond Holdings North, LLC	340 Central Avenue, Suite 202 Dover, NH 03820

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Eric Jackson	H.J. Stabile & Son, Inc. 20	Cotton Road, Ste. 200 Nashua, NH 03063

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Stephen J. Haight, PE	Civilworks New England	P.O. Box 1166 Dover, NH 03821
Kevin McEneaney, LLS	McEneaney Survey Associates	P.O. Box 681 Dover, NH 03821

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS
		N/A	

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, five (5) ~~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: H.J. Stabile & Son, Inc. File Number: P23-

PROJECT TITLE: Fisher Street Townhouses

PROPERTY LOCATION: Fisher Street Tax Map: 15 Lot: 40A-1

	Where/How Provided	Reviewed
1. Completed and signed Application form	5 copies delivered w/plan sets	
2. Plan Review Fees are provided	paid by client	
3. Electronic copy of the engineered/surveyed plan layout	pdf files of all application plan sets uploaded to City portal	
4. Electronic copy of supplementary materials and application	pdf files of all application materials uploaded to City portal	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	pending	
6. Waiver requests to the Site Plan Review Regulations, with written justification	none requested	
7. Conditional Use Permit applications x2	5 copies delivered w/application	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	included in application plan sets	
9. A colored architectural plan showing all sides of buildings	included in application plan sets	
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:	5 full size set delivered	
Location map at appropriate scale	x	
Proposed Project name and title and Planning File #	x	
Date, north arrow and scale	x	
Names of all abutting property owners	x	
Name and address of owners and/or applicants	x	
Signature & stamp of NH licensed land surveyor and/or engineer	x	
Zoning District boundaries, including any special or overlay districts	x	
Location of Conservation District areas	x	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	x	
Location and widths of existing & proposed easements & right of ways	x	
Location and width of existing and proposed access/egress ways	x	

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	X	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	X	
Existing and proposed topographic information at two foot intervals	X	
Existing and proposed buildings and structure locations	X	
Minimum building setbacks or build to lines on all lots	X	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	X	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	X	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	X	
Existing and proposed stormwater lines and facilities	X	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	X	
Location of Flood Hazard Zone	N/A	
Location of all bodies of water and watercourses	X	
Location of wetlands and buffers	X	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	X	
Existing natural features and/or significant vegetation on property	X	
Depict existing contours up to 100 ft. beyond project limits	X	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	pending	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	X	
Location, material and size of existing and proposed pavement area	X	
Location of proposed fire lanes	X	
Specify finished floor elevations of buildings	X	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	X	
Depict all service, storage, loading bays and utility areas	N/A	
All applicable Dover Common Site Plan notes	X	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	1 copy delivered & uploaded to City portal	
Stormwater Management System Operation and Maintenance Plan	1 copy delivered & uploaded to City portal	
Letter to Serve from Public and Private Utilities	5 copies delivered w/application	
Erosion and Sedimentation Control Plan	5 copies delivered w/application	
Landscape Operation and Maintenance Plan	5 copies delivered w/application	
Proposed restrictive covenants or homeowners association documents	tbd	
Dates and permit numbers of all required state and federal permits	none required	
If wetland buffer, indicate placards locations, as applicable	shown on plan set	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	5 copies delivered w/application	
Location of proposed drive-in facilities	N/A	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	tbd	

REVIEWED BY: _____ DATE_____ TRC DATE_____

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: H.J. Stabile & Son, Inc. Telephone # 603-889-0318 x-515

Address of Applicant: 20 Cotton Road, Suite 200 Nashua, NH 03063

E-Mail Address: eric@stabilecompanies.com

Name of Property Owner (if different from applicant): Double Diamond Holdings North, LLC Telephone # 603-749-0443

Address of Property Owner: 340 Central Avenue, Suite 202 Dover, NH 03821

Name & Address of Property Owner #2: Carmel A. Casey 36A Fisher Street Dover, NH 03820

PROPERTY INFORMATION

Assessor's Map # 15 Lot(s) # 40A-1 (a portion of 15 / 40A & 51)

Address of Property: Fisher Street

Zoning District(s) G Overlay District(s) Dover Conservation District

Existing Use of Property: Vacant

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:

Construction of a townhouse condominium complex with associated grading and parking will impact approximately 19,568 s.f. of the wetland buffer. Impact within the conservation district is 5,487 s.f. and falls completely within the wetland impact area. No wetlands will be impacted by this project.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: None Requested

Name of Professional That Prepared Plans: Stephen J. Haight, PE - Civilworks New England

Address P.O. Box 1166 Dover, NH 03821 Telephone #: 603-749-0443

Professional License #: NH PE # 7978 E-mail address: shaight@civilworksne.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: Double Diamond Holdings North, LLC Date:

Signature of Applicant (if different from owner): H.J. Stabile & Son, Inc. Date: 10/25/23

Signature of Agent: Date:

Signature of Property Owner #2: Carmel A. Casey Date: 10.25.23

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: for Double Diamond Holdings North, LLC Date:

Signature of 2nd Property Owner: Carmel A. Casey Date: 10.25.23

CITY OF DOVER CONDITIONAL USE
LIST OF ABUTTERS

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

Owner: 15 / 51 Carmel A. Casey 36A Fisher Street Dover, NH 03820

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS
15	40A-1	Double Diamond Holdings North, LLC	340 Central Ave, Ste 202 Dover, NH 03821

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Eric Jackson	H.J. Stabile & Son, Inc.	20 Cotton Road, Ste 200 Nashua, NH 03063

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Kevin McEneaney, LLS	McEneaney Survey Associates	P.O. Box 681 Dover, NH 03821
Stephen J. Haight, PE	Civilworks New England	P.O. Box 1166 Dover, NH 03821

Conservation Easement Holder: N/A

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

H. J. Stabile & Son, Inc.
20 Cotton Road, Suite 200
Nashua, NH 03063

October 25, 2023

City of Dover
288 Central Avenue
Dover, NH 03820

Attn: Planning Board

Re: LETTER OF APPLICANT AUTHORIZATION
Fisher Street Townhouse
Fisher Street, Tax Map 15, Lot 40A-1
(a portion of Tax Map 15, Lots 40A & 51)

I, Eric Jackson of H. J. Stabile & Son, Inc., authorize Civilworks New England to represent us as APPLICANT for all applications made to the City of Dover Planning Board and any other Dover Board or Committee, as well as any State of NH departments, as necessary, relative to the pursuit of permits for the development of the subject parcel.

Sincerely,

10/25/23

Eric Jackson – Director of Acquisitions & Development

Double Diamond Holdings North, LLC
340 Central Avenue, Suite 200
Dover, NH 03820

October 25, 2023

City of Dover
288 Central Avenue
Dover, NH 03820

Attn: Planning Board

Re: LETTER OF OWNER AUTHORIZATION
Fisher Street Townhouse
Fisher Street, Tax Map 15, Lot 40A-1
(a portion of 15 / 40A & 51)

I, Chad Kageleiry, Manager of Double Diamond Holdings North, LLC, authorize Civilworks New England to represent all applications made on behalf of H.J.Stabile & Son, Inc (APPLICANT).to the City of Dover Planning Board and any other Dover Board or Committee, as well as any State of NH departments, as necessary, relative to the pursuit of approvals and permits for the development of the subject parcel.

Sincerely,

Chad Kageleiry, Manager – Double Diamond Holdings North, LLC

Carmel A. Casey
36A Fisher Street
Dover, NH 03820

October 25, 2023

City of Dover
288 Central Avenue
Dover, NH 03820

Attn: Planning Board

Re: LETTER OF OWNER AUTHORIZATION
Fisher Street Townhouse
Fisher Street, Tax Map 15, Lot 40A-1
(a portion of Tax Map 15, Lots 40A & 51

I, Carmel A Casey, authorize Civilworks New England to represent all applications made on behalf of H.J.Stabile & Son, Inc (APPLICANT).to the City of Dover Planning Board and any other Dover Board or Committee, as well as any State of NH departments, as necessary, relative to the pursuit of approvals and permits for the development of the subject parcel.

Sincerely,

C Casey

Carmel A. Casey

PROJECT NARRATIVE

for

H.J. Stabile & Son, Inc.

Site Plan Review & Conditional Use Permit

Fisher Street Townhouses

Tax Map 15, Lot 40A-1

October 25, 2023

PROJECT OVERVIEW & SITE CHARACTERISTICS

The parcel, Tax Map 15, Lot 40A-1, being 3.54 acres per a recently approved subdivision of Tax Map 15, Lot 40A. However, the site design is based on a future Lot Line Adjustment with an abutting parcel, Tax Map 15, Lot 51, which will bring the subject parcel to 3.91 acres as depicted on the Site Plan.

The proposed project is for the construction of 4 buildings consisting of a total of 22 townhouse condominiums with associated parking on a 3.91-acre undeveloped parcel of land located on the southerly side of Fisher Street opposite the intersection with Elm Street. The parcel is in the Gateway (G) District. All other parcels on the same side of the street between Locust Street and the Community Trail (old railroad bed) are zoned Heritage Residential (HR). All parcels directly opposite this section of Fisher Street, and on both sides of Elm Street north of Fisher Street, as well as the closest section of the westerly side of Locust Street or westerly side, fall within the HR zone. All adjacent parcels to the west and south of the subject parcel are within the G zone.

The proposed site will include public water and sewer connections, underground electric and communication services, natural gas service, and associated drainage improvements. A portion of grading, drainage, pavement, and building is proposed within the 50' wetland buffer and the 50' conservation buffer from a stream, with total impacts of 19,568 sf. The impact within the conservation buffer is wholly within the wetland buffer. (See Conditional Use Permit applications). There are no proposed impacts to any wetlands.

The project site consists of the following general improvements:

- Clear the site, as necessary, for construction.
- Construction of 4 buildings containing 22 townhouse condominiums with associated parking and landscaping.
- Construction of on-site stormwater detention and treatment system, grading, and other drainage requirements.
- Site utility construction & installation.
- Reconstruction and upgrade of the existing entrance on Fisher Street.
- Stabilize remaining areas with loam and seed.

PROJECT NARRATIVE

for

H.J. Stabile & Son, Inc.

Site Plan Review & Conditional Use Permit

Fisher Street Townhouses

Tax Map 15, Lot 40A-1

October 25, 2023

DRIVEWAY AND PARKING LOT

Access to the parcel is from Fisher Street. The driveway will be 24' wide with a 5' sidewalk on the west side connecting to the sidewalk on Fisher Street. Parking will consist of a 23-space parking lot and a single car garage for each of the 22 units, for a total of 45 spaces on site. The lighting will consist of pole mounted LED fixtures that are dark sky compliant. Each unit will also have wall mounted lighting which will also be dark sky compliant.

WETLAND SETBACK IMPACT TYPE

The project work requires a conditional use permit from the City of Dover. Approximately +/- 19,568 s.f. of the wetland buffer will be impacted, and approximately +/-5,487 s.f. impact to the Conservation District buffer along the stream. Note: The impact to the Conservation District completely overlaps with the wetland buffer, making the net impact 19,568 s.f. The project does not impact bogs, marshes, sand dunes, tidal wetlands, cedar swamps, undisturbed tidal buffer zone, or involve any work within 50 feet of a salt marsh. The project is not located within 100 feet of prime wetlands.

DRAINAGE

This is a hydrologic analysis of the subject parcel located on Fisher Street in Dover, NH. The 3.91± acre lot is identified as Tax Map 15, Lot 40A-1. This site was a former laydown yard for the City of Dover, a 45,000± s.f. compacted gravel area was created. The site is partially compacted gravel, and the groundcover primarily consists of wooded vegetation with grassed areas along the edge of an unnamed drainageway. The parcel is bifurcated by the drainageway that runs east to west. It is bounded to the north by Fisher Street, to the west by the rail trail, to the east by residential development and to the south by undeveloped land. All drainage from the site discharges to a large stone railroad culvert beneath the rail trail, which is located on the south side of the site.

The project proposes 77,000± s.f. of disturbance including the construction of (4) multifamily residential townhomes and corresponding site improvements including site grading, paved parking, as well as stormwater quality and detention drainage improvements.

An 8.5± acre watershed was used to effectively analyze the pre-development conditions, that incorporates offsite areas that drain directly onsite and that will be incorporated into the proposed onsite drainage improvements. The post development analysis has been divided into twelve (12) sub-catchments that discharge to the same point of analysis developed for the pre-development model. Sub-catchments model the areas of the site that are directed through proposed drainage structures, conveyances, water quality practices, and Ferguson Waterworks Rain Guardian. Stormwater conveyance consists of overland flow, a swale, pipes, and a closed drainage system. The project proposes bioretention ponds, drip edges, and porous pavement to meet water quality criteria and stone outlet aprons for energy dissipation. The analysis shows that with the mitigation measures proposed will have negligible impact on the watersheds.

TRAFFIC

A traffic analysis report is pending.

UTILITIES

The proposed project will connect to City of Dover water and sewer as well as Unitil for natural gas, and Eversource for electricity. Water, sewer, electric lines, and natural gas lines are currently located within Fisher Street. Building connections will be made per the City's Community Services Utility Division and Fire Department requirements and standards.

Unitil

June 27, 2022

Stabile Companies
Attn: Anthony Tringali
20 Cotton Rd.
Nashua, NH 03063

RE: Locust St/Fisher St. Dover, NH

To Whom It May Concern:

Based on the provided scope and current operation of our distribution system, I am pleased to inform you that Unitil can supply your project with natural gas. The specific terms would be spelled out in a contract with the owner or the above referenced address.

Let me know if you have any questions. You can email me at dupliseas@unitil.com. My phone number is 603-294-5147.

Sincerely,

Susan L. Duplisea
Business Development Representative

CUSTOMER ENERGY SOLUTIONS
325 West Road
Portsmouth, NH 03801

T 888.486.4845 www.unitil.com

Steve Haight

From: Eric Jackson <ejackson@stabilecompanies.com>
Sent: Friday, June 2, 2023 3:04 PM
To: Steve Haight; Douglas LaRosa
Cc: Anthony Tringali
Subject: FW: [EXTERNAL] Work Request Submission Confirmation #13273510
Attachments: Unitil Will Serve Letter.pdf

Hi Steve and Doug,

Thanks again for your time yesterday. Per our discussion, I've attached the will-serve letter we received from Until when we initially inquired about it. And below, I've included the work order number from Eversource. We didn't get a work order number from Until – not sure if they actually provide one. We've inquired, but figured we'd send along what we had. Thanks!

Eric

Eric L. Jackson
Director of Acquisitions & Development
The Stabile Companies
20 Cotton Road, Suite 200
Nashua, NH 03063

P 603.889.0318 ext. 515
F 603.595.2571
www.stabilecompanies.com

From: Anthony Tringali <atringali@stabilecompanies.com>
Sent: Friday, June 2, 2023 2:35 PM
To: Eric Jackson <ejackson@stabilecompanies.com>
Subject: FW: [EXTERNAL] Work Request Submission Confirmation #13273510

EJ,

See below for the new work request number for Fisher street from Eversource

---

From: Eversource Do Not Reply <noreply@notifications.eversource.com>
Sent: Friday, June 2, 2023 2:33 PM
To: Anthony Tringali <atringali@stabilecompanies.com>
Subject: [EXTERNAL] Work Request Submission Confirmation #13273510



Work Request Submission Confirmation

Work Request Type:
Install Permanent Service - Underground

Work Request Number:
13273510

Job Location:
Lot 40 LOCUST STREET

Dear Valued Customer,

We received your work request with the following information:

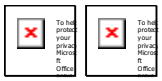
* Request Type: Install Permanent Service - Underground
* Request Number: 13273510
* Work Requested Date: 2023-06-02
* Job Location: Lot 40 LOCUST STREET
* Contractor Name: ANTHONY TRINGALI
* Contractor Phone Number: 6038890318

NOTE: This email confirms we received your request and does not imply that work will be performed.

Log into your Eversource.com account to track the status of your request. For questions or to cancel your request, call or email us and we'll be happy to assist you.

Sincerely,
Eversource Electric Service Support Center.
18003627764
NHNewService@eversource.com

Please save this confirmation email for your records.
This is an unmonitored mailbox - please do not reply.



Cheryl Andreason

From: Michael Menary
Sent: Monday, October 23, 2023 11:25 AM
To: Mavrogeorge, Kenneth
Cc: Joseph Griffin; Steve Haight; Cheryl Andreason
Subject: CNE#22017 - Fisher Street Townhouses - Fisher St, Dover NH - Utility Will Serve

Hello Ken,

H.J Stabile & Son, Inc. is proposing to construct 4 residential buildings, 22 units, with 2 beds each on Fisher Street; Tax Map 15, Lot 40A-1.

The project will consist of a total of 44 beds. This will result in approximate water & sewer usage of approximately **6,600 gpd**. [1]

[1] Volume is based on NHDES Env-Wq 1008.03 Table 1008-1 Design Flow figures: for Apartments – 2 or more (150 gpd/bedroom).

Please advise on the availability of sewer and water to the site.

Thank you for your time,

Michael Menary
Staff Engineer II
Civilworks New England, PLLC.
181 Watson Road
P.O. Box 1166
Dover, New Hampshire 03821
O: (603) 749-0443
C: (973) 907-0370

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No: 22.131.NH
Date Start: 08-18-22
Date End: 08-18-22

Sheet 1 **of** 2
Boring No: B-1
Location: See Plan
Approx. Surface Elev: 92

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-18-22	19'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0 92		-	0.0-0.2	2	3	6					-: 2" of 1-1/2" crushed stone	
		S-1	0.2-0.5	4	13		13	13	9		S-1: Brown, fine to coarse sand, some gravel, little silt (FILL)	
		S-1A	0.5-2.0	18							S-1A: Gray/Brown (mottled), desiccated silty clay	
		S-2	2.0-4.0	24	17	5	8	13	15		S-2: Gray/Brown (mottled), desiccated silty clay	
5 87		S-3	4.0-6.0	24	19	5	8	11	15		S-3: Gray/Brown (mottled), desiccated silty clay	
10 82		S-4	9.0-11.0	24	19	4	6	7	9		S-4: Gray, silty clay	
15 77		S-5	14.0-16.0	24	24	3	4	4	5		S-5: Gray, silty clay	
20 72		S-6	19.0-21.0	24	24	1	1	1	1		S-6: Gray, silty clay, wet	
25 67		S-7	24.0-25.5	18	16	WOH/ 18					S-7: Gray, clay, trace fine sand, wet	
		S-7A	25.5-26.0	6	4				WOH		S-7A: Gray, fine sand, little silt, trace clay	
30 62		S-8	29.0-31.0	24	18	3	4	4	11		S-8: Gray, fine to medium sand, some silt, little subangular gravel	

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No.: 22.131.NH
Date Start: 08-18-22
Date End: 08-18-22

Sheet 2 **of** 2
Boring No: B-1
Location: See Plan
Approx. Surface Elev: 92

			GROUNDWATER OBSERVATIONS			
	CASING	**SAMPLER**	**Date**	**Depth**	**Casing At**	**Stabilization Period**
Type	HSA	SS	08-18-22	19'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	SAMPLE Depth Range	SAMPLE Pen.	SAMPLE Rec.	BLOWS 0-6"	BLOWS 6-12"	BLOWS 12-18"	BLOWS 18-24"	Strata Change	Sample Description	Notes
35 — 57		S-9	34.0-36.0	24	15	3	14	18	24		S-9: Gray, fine to medium sand, some silt, little subangular gravel	
											BORING TERMINATED AT 36 ft	
40 — 52												
45 — 47												
50 — 42												
55 — 37												
60 — 32												

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No: 22.131.NH
Date Start: 08-18-22
Date End: 08-18-22

Sheet 1 **of** 1
Boring No: B-2
Location: See Plan
Approx. Surface Elev: 82

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-18-22	14.5'	17'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0 82		-	0.0-0.2	2	5	5					-: 2" of 1-1/2" crushed stone	
		S-1	0.2-0.6	5	13		16	10	10		S-1: Brown, fine to coarse sand, some gravel, little silt (FILL)	
		S-1A	0.6-2.0	17							S-1A: Gray, fine to coarse sand, little gravel, little silt (FILL)	
		S-2	2.0-4.0	24	11	8	6	8	13		S-2: Gray/Brown (mottled), desiccated clay, trace roots	
5 77		S-3	4.0-6.0	24	17	5	13	16	21		S-3: Gray/Brown (mottled), desiccated silty clay, trace roots	
10 72		S-4	9.0-11.0	24	23	5	4	6	6		S-4: Brown/Gray, silty clay, sand lenses, wet	
15 67		S-5	14.0-16.0	24	10	2	3	6	8		S-5: Gray, fine to medium sand, some silt, some subangular gravel, wet Auger Refusal at 17'	
20 62											BORING TERMINATED AT 17 ft	
25 57												
30 52												

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No: 22.131.NH
Date Start: 08-19-22
Date End: 08-19-22

Sheet 1 **of** 2
Boring No: B-3
Location: See Plan
Approx. Surface Elev: 93

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-19-22	16'	46'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0 — 93		S-1	0.0-1.0	12	8	1	4				S-1: Topsoil	
		S-1A	1.0-2.0	12	9			3	4		S-1A: Tan, fine sand and silt, trace fine roots	
		S-2	2.0-2.5	6	5	5					S-2: Tan, fine sand and silt, trace fine roots	
		S-2A	2.5-4.0	18	13		10	13	10		S-2A: Brown, fine sand, little silt	
5 — 88		S-3	4.0-6.0	24	17	3	5	6	10		S-3: Gray/Brown (mottled), silt, some fine sand	
10 — 83		S-4	9.0-11.0	24	17	1	4	5	8		S-4: Gray, silty clay	
15 — 78		S-5	14.0-16.0	24	24	2	3	5	3		S-5: Gray, silty clay (bottom 6" of sample was wet)	
20 — 73		S-6	19.0-21.0	24	24	WOH/ 12		1	3		S-6: Gray, silty clay, wet	
25 — 68		S-7	24.0-26.0	24	24	1	1	1	2		S-7: Gray, silty clay, wet	
30 — 63		S-8	29.0-31.0	24	24	WOR/ 24					S-8: Gray, silty clay, wet	

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No.: 22.131.NH
Date Start: 08-19-22
Date End: 08-19-22

Sheet 2 **of** 2
Boring No: B-3
Location: See Plan
Approx. Surface Elev: 93

			GROUNDWATER OBSERVATIONS			
	CASING	**SAMPLER**	**Date**	**Depth**	**Casing At**	**Stabilization Period**
Type	HSA	SS	08-19-22	16'	46'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
35 — 58		S-9	34.0-36.0	24	24	WOR/ 12		WOH	2		S-9: Gray, fine sand, some silt, trace clay, wet (6 - 1" layers of gray, clay)	
40 — 53												
45 — 48		S-10	45.0-46.0	12	10			6	10		S-10: Gray, fine to medium sand, some silt, little subangular gravel, wet	
											BORING TERMINATED AT 46 ft	
50 — 43												
55 — 38												
60 — 33												

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
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FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No: 22.131.NH
Date Start: 08-18-22
Date End: 08-18-22

Sheet 1 **of** 2
Boring No: B-4
Location: See Plan
Approx. Surface Elev: 80

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-18-22	19'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0 — 80		-	0.0-0.2	2	0	8	9	5	7		-: 2" of 1-1/2" crushed stone	
		S-1	0.2-2.0	22							S-1: No recovery (pushed stone)	
		S-2	2.0-4.0	24	0	16	16	19	18		S-2: No recovery (pushed stone)	
5 — 75		S-3	4.0-6.0	24	5	5	7	9	13		S-3: Gray/Brown (mottled), desiccated silty clay	
10 — 70		S-4	9.0-11.0	24	19	2	3	4	5		S-4: Gray/Brown, silty clay	
15 — 65		S-5	14.0-16.0	24	24	2	4	3	5		S-5: Gray/Brown, silty clay	
20 — 60		S-6	19.0-21.0	24	24	1/12"		1/12"			S-6: Gray, silty clay, wet	
25 — 55		S-7	24.0-26.0	24	22	WOH/ 12		1	2		S-7: Gray, fine sand, little silt, trace clay, wet	
30 — 50		S-8	29.0-31.0	24	15	4	4	6	17		S-8: Gray, fine to medium sand, some silt, little subangular gravel, wet	

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES: Trial #2; S-1; 0-1: 5-4: R=5; Brown, fine to coarse sand, some gravel, little silt (FILL)
S-1A; 1-5; 5-7; R=8; Gray/Brown, desiccated clay, trace fine roots
S-2; 2-4; 11-12-17-17; R=18; Gray/Brown, desiccated clay

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No.: 22.131.NH
Date Start: 08-18-22
Date End: 08-18-22

Sheet 2 **of** 2
Boring No: B-4
Location: See Plan
Approx. Surface Elev: 80

			GROUNDWATER OBSERVATIONS			
	CASING	**SAMPLER**	**Date**	**Depth**	**Casing At**	**Stabilization Period**
Type	HSA	SS	08-18-22	19'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	SAMPLE Depth Range	SAMPLE Pen.	SAMPLE Rec.	BLOWS 0-6"	BLOWS 6-12"	BLOWS 12-18"	BLOWS 18-24"	Strata Change	Sample Description	Notes
35 — 45		S-9	34.0-36.0	24	10	1	6	9	14		S-9: Gray, fine to medium sand, some silt, some subangular gravel, wet	
											BORING TERMINATED AT 36 ft	
40 — 40												
45 — 35												
50 — 30												
55 — 25												
60 — 20												

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES: Trial #2; S-1; 0-1: 5-4: R=5; Brown, fine to coarse sand, some gravel, little silt (FILL)
S-1A; 1-5; 5-7; R=8; Gray/Brown, desiccated clay, trace fine roots
S-2; 2-4; 11-12-17-17; R=18; Gray/Brown, desiccated clay

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Fisher St. Townhomes
Dover, NH
Project No: 22.131.NH
Date Start: 08-19-22
Date End: 08-19-22

Sheet 1 **of** 2
Boring No: B-5
Location: See Plan
Approx. Surface Elev: 80

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-19-22	14'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0 — 80		S-1	0.0-1.0	12	7	3	7				S-1: Topsoil	
		S-1A	1.0-2.0	12	12			12	21		S-1A: Tan, silt, little fine sand, trace fine roots	
		S-2	2.0-4.0	24	18	17	20	31	37		S-2: Gray/Brown (mottled), desiccated silty clay	
5 — 75		S-3	4.0-6.0	24	19	3	10	11	17		S-3: Gray/Brown (mottled), desiccated silty clay	
10 — 70		S-4	9.0-10.8	22	24	3	9	8	11		S-4: Gray/Brown (mottled), desiccated silty clay	
15 — 65		S-5	14.0-16.0	24	22	2	2	2	2		S-5: Gray, silty clay, wet	
20 — 60		S-6	19.0-21.0	24	24	WOR	1	1/12"			S-6: Gray, silty clay, wet	
25 — 55		S-7	24.0-26.0	24	12	WOr/12		2	1		S-7: Gray, fine sand, some silt, trace clay	
30 — 50		S-8	29.0-31.0	24	12	WOR	WOH	4	4		S-8: Gray, fine sand, trace silt, wet	

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

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Project: Fisher St. Townhomes
Dover, NH
Project No.: 22.131.NH
Date Start: 08-19-22
Date End: 08-19-22

Sheet 2 **of** 2
Boring No: B-5
Location: See Plan
Approx. Surface Elev: 80

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-19-22	14'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
35 — 45		S-9	34.0-36.0	24	15	WOR/ 12		2	5		S-9: Gray, fine sand, trace silt, wet	
40 — 40											BORING TERMINATED AT 36 ft	
45 — 35												
50 — 30												
55 — 25												
60 — 20												

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
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Project: Fisher St. Townhomes
Dover, NH
Project No: 22.131.NH
Date Start: 08-19-22
Date End: 08-19-22

Sheet 1 **of** 2
Boring No: B-6
Location: See Plan
Approx. Surface Elev: 72

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-19-22	14'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0 — 72		S-1	0.0-0.5	6	2	2					S-1: Topsoil	
		S-1A	0.5-2.0	18	15		8	15	18		S-1A: Gray/Brown, silt, little fine sand, trace fine roots	
		S-2	2.0-3.5	18	13	24	31	50			S-2: Gray/Brown (mottled), desiccated silty clay	
5 — 67		S-3	4.0-6.0	24	16	4	11	14	20		S-3: Gray/Brown (mottled), desiccated silty clay	
10 — 62		S-4	9.0-11.0	24	24	6	6	7	8		S-4: Gray, silty clay	
15 — 57		S-5	14.0-15.5	18	15	2	1	1			S-5: Gray, clay, trace fine sand, wet	
20 — 52		S-6	19.0-21.0	24	18	WOR/ 12		2	7		S-6: Gray, fine sand, trace silt, wet (2 - 1/2" clay varves)	
25 — 47		S-7	24.0-26.0	24	20	WOR	1	1	2		S-7: Bray, fine sand, little clay (3 - 1/2" clay varves)	
30 — 42		S-8	29.0-31.0	24	18	3	18	16	26		S-8: Gray, fine to medium sand, little silt, little subangular gravel	

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

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Project: Fisher St. Townhomes
Dover, NH
Project No.: 22.131.NH
Date Start: 08-19-22
Date End: 08-19-22

Sheet 2 **of** 2
Boring No: B-6
Location: See Plan
Approx. Surface Elev: 72

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	08-19-22	14'	36'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
35 — 37		S-9	34.0-36.0	24	12	12	26	26	33		S-9: Gray, fine to medium sand, little silt, little subangular gravel	
40 — 32											BORING TERMINATED AT 36 ft	
45 — 27												
50 — 22												
55 — 17												
60 — 12												

Driller: R. Marcoux
Helper: J. Donahue
Inspector: T. Young

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
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NOTES:

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NOTES

1. This plan is a reproduction of portions of "Conceptual Site Plan, Dover, NH", (dated May 22, 2022) by Civil Works New England of Dover, NH.
2. A geotechnical engineer from Miller Engineering & Testing, Inc. inspected the test borings.
3. Exploration locations were established by others and using the tape and pace method.

KEY

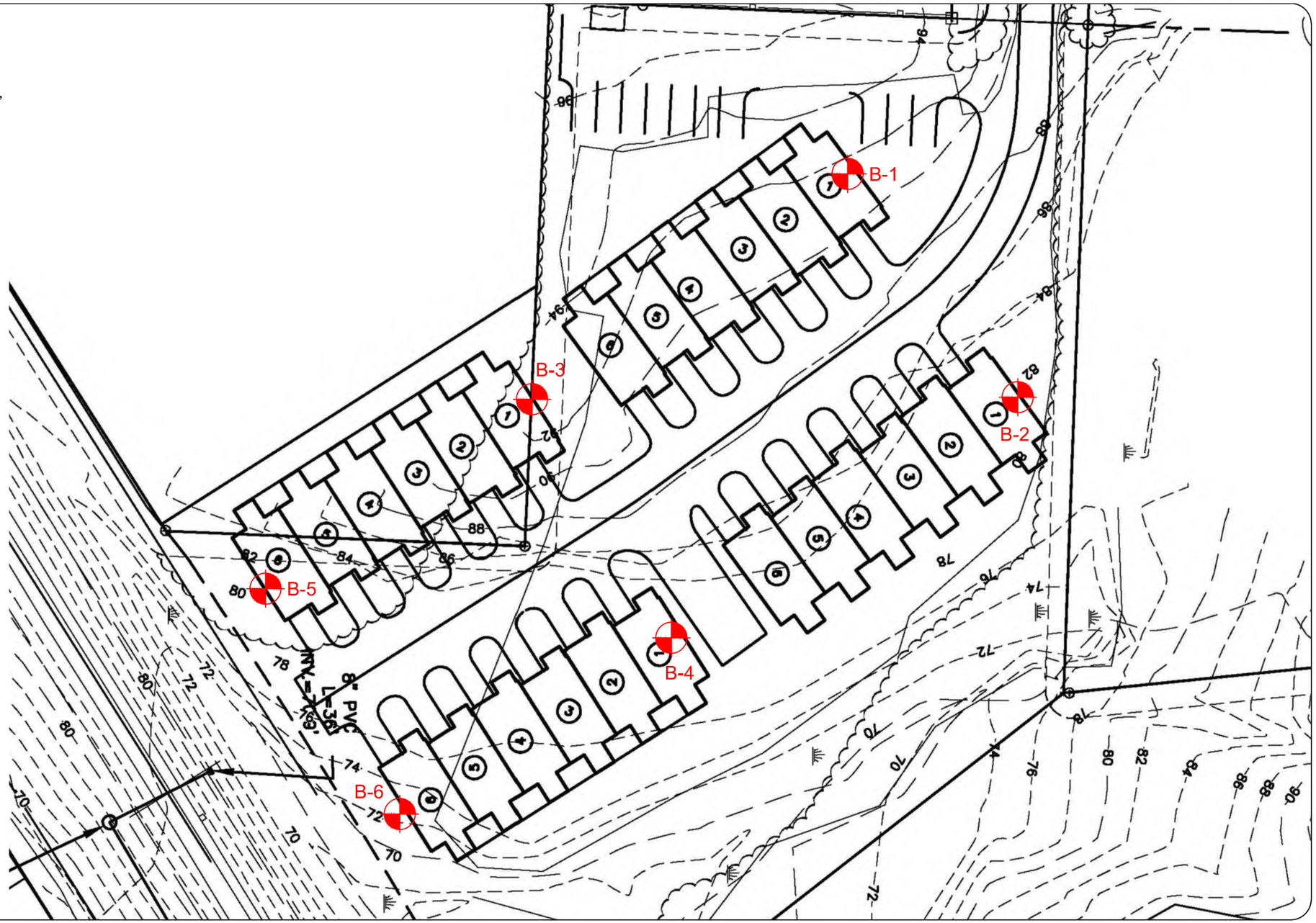
Approximate Boring Location



GRAPHIC SCALE

40 0 20 40 80

(IN FEET)



MILLER ENGINEERING & TESTING, INC.

100 SHEFFIELD ROAD - PO BOX 4776
MANCHESTER, NEW HAMPSHIRE 03108
TEL (603) 668-6016 // FAX (603) 668-8641

Fisher Street Townhomes
Dover, NH
August 2022
Project No. 22.131.NH

SUBSURFACE EXPLORATION LOCATION PLAN

FIGURE No. 1

Standard Traffic Impact Assessment & Analysis

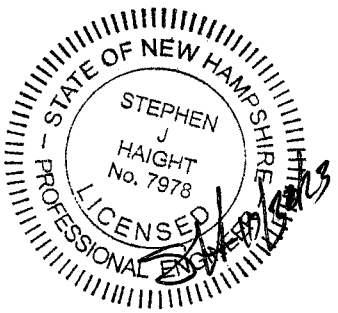
Fisher Street Townhouses
Fisher Street
Dover, New Hampshire

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prepared for:
H.J. Stabile & Son, Inc.
20 Cotton Road, Suite 200
Nashua, NH 03063
Contact Person: Eric Jackson
Tel. No. (603) 889-0318 x-515

prepared by:
Civilworks New England
P.O. Box 1166
Dover, NH 03821

October 2023
Reference No. 22017



Description of Site

The proposed project is for the construction of 4 buildings containing a total of 22 condominium townhouses on a 3.91-acre parcel of land located on the southerly side of Fisher Street opposite the intersection with Elm Street. The parcel is shown as Lot 40A-1 on Tax Map 15, which is in the Gateway (G) District. All other parcels on the same side of the street between Locust Street and the Community Trail (old railroad bed) are zoned Heritage Residential (HR). All parcels directly opposite this section of Fisher Street, and on both sides of Elm Street north of Fisher Street, as well as the closest section of the westerly side of Locust Street or westerly side, fall within the HR District. All adjacent parcels to the west and south of the subject parcel are within the Gateway District.

Description of Roadways

A. Fisher Street

Fisher Street is a two-way city street running in an east/west direction between Locust and Rutland Streets. There is an old railroad bed across Fisher Street running in a north/south direction which was converted to a community trail for pedestrians and cyclists by the City of Dover. This feature bifurcates the surrounding neighborhood.

There are no pavement markings on Fisher Street. The road edges are defined by vertical granite curbing and there is a paved sidewalk with a 3' grass strip on both sides of Fisher Street that extends from Locust Street to Rutland Street. There is no posted speed limit, so the presumed speed limit is 30 miles per hour.

B. Elm Street

Elm Street accesses Fisher Street directly opposite the entrance of the subject parcel access onto Fisher Street. Elm Street connects to Silver Street and crosses several streets that connect to either Belknap Street or Locust Street.

This interconnectivity provides for many different routes to and from the subject parcel, however, the primary routes assumed in this analysis are along Fisher Street to either Rutland Street to the west or Locust Street to the east.

Sight Distance Analysis

The available sight distance at the existing/proposed access driveway, looking both east and west, is more than 200 ft. for exiting vehicles. Methodology was based on the requirements of Section 157-60, Definitions, for All-Season Site Distance. The driver's "eye" was setback 14 ft. from the edge of pavement.

Fisher Street is not posted, therefore the speed limit defaults to 30 miles per hour and the straight and level geometry of the roadway segment, it is reasonable to assume a typical travel speed of 30 miles per hour. Per AASHTO-Geometric Design of Highways and Streets, required stopping sight distance, rounded for design, is 200 ft.

Stopping sight distance is the distance a vehicle travels from the time the driver sights an object (or vehicle) necessitating a stop (perception), plus the distance a vehicle travels during the physical reaction required to apply the brakes (reaction), plus the distance required to stop the vehicle from the instant the brakes are applied. As stated above, available sight distance exceeds 200 ft.

Trip Generation
The following is pertinent relative to calculation of trip generation estimates associated with the subject project:

- Data Source – ITE Trip Generation Handbook, 11th Edition
- Proposed Project
  - 22 Residential Condominium Townhouses
- Use Descriptions (per ITE Land Use Codes)
  - L.U.C. 220 – Multifamily Housing (Low-Rise) Not Close to Rail Transit
    - Ownership units
    - Peak hour of trip generation typically coincides with peak hours of adjacent streets.

Based on the above data and the project scope, the following trip generation during the A.M. and P.M. Peak Hours and distribution of trips has been calculated:

Townhouse Condominiums (L.U.C. 230)				
			Distribution	
Parameter	**Avg. Rate (1)**	**Total Trip Ends**	**Entering**	**Exiting**
A.M. Peak Hour	0.30	6.6	0.66	5.94
P.M. Peak Hour	0.25	5.5	4.95	0.55

(1) Per dwelling unit

Trip Distribution
Given the site's location relative to the Locus Street, Woodman School, Spaulding Turnpike, and Downtown Dover, it is assumed 50% of the trips will depart the site to the west (left-turn) to access the Spaulding Turnpike and 50% will depart to the east (right-turn) to access Locust Street. It is also assumed that 50% of the arriving trips will be from the west, and 50% from the east.

Based on the preceding assumptions, the following trip distribution is anticipated:

	Entering Trip Ends		**Exiting Trip Ends**	
Parameter	**via Fisher Street eastbound**	**via Fisher Street westbound**	**via Fisher Street eastbound**	**Via Fisher Street westbound**
A.M. Peak Hour	0.33	0.33	2.97	2.97
P.M. Peak Hour	2.48	2.48	0.28	0.28

6. Public Transit

The closest available public transit is provided by COAST. Route 34 is on Silver Street and Route 13 is on Central Avenue. Both routes have stops within 2 to 3 blocks of the subject Parcel, according to the schedule/map published on the COAST website.

Appendix 'A'
Trip Generation Rate Data

(Source: ITE Trip Generation Handbook, 11th Ed.)

Land Use: 220

Multifamily Housing (Low-Rise), Not Close to Rail Transit

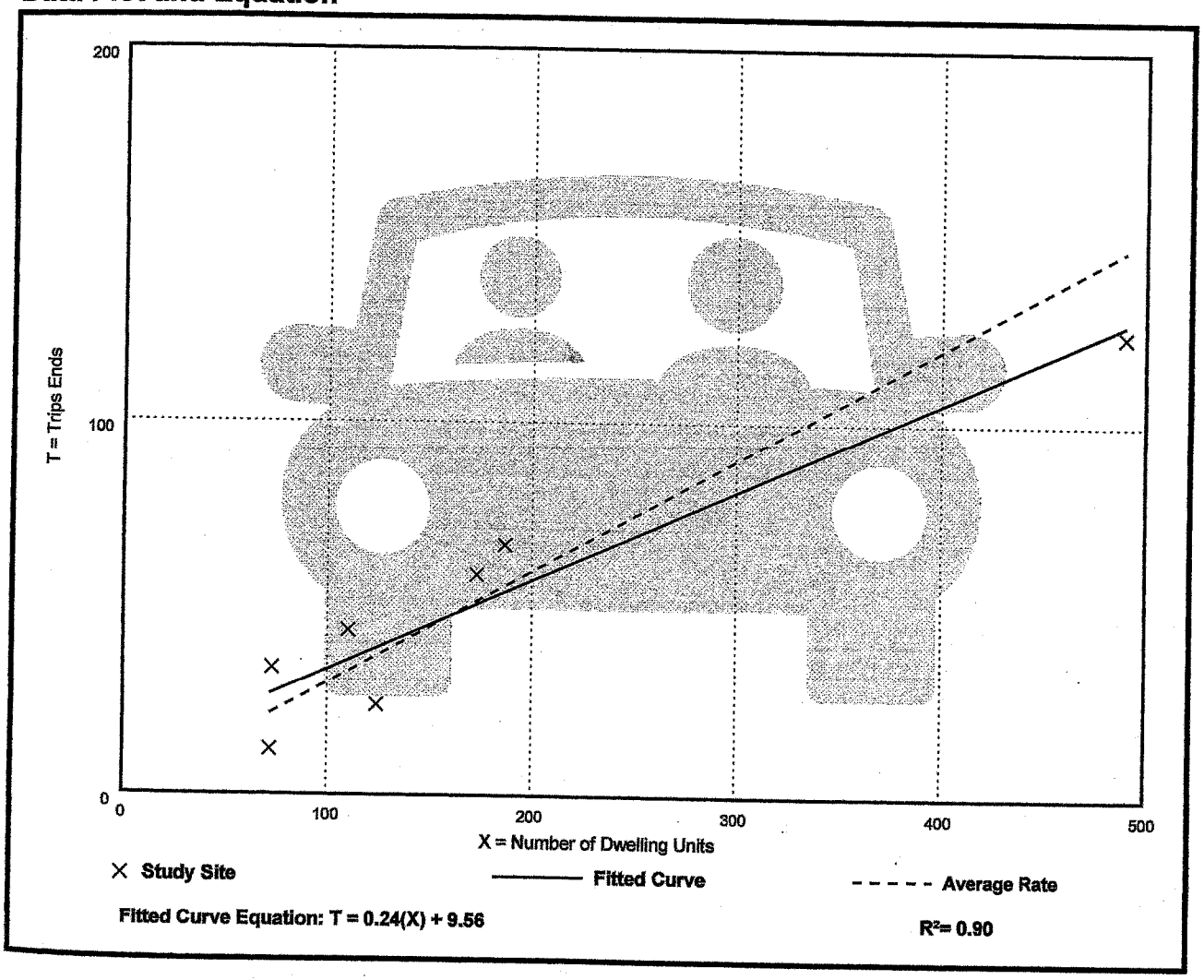
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: Dense Multi-Use Urban
Number of Studies: 7
Avg. Num. of Dwelling Units: 176
Directional Distribution: 10% entering, 90% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.17 - 0.47	0.09

Data Plot and Equation



Fitted Curve Equation: T = 0.24(X) + 9.56

R^2= 0.90

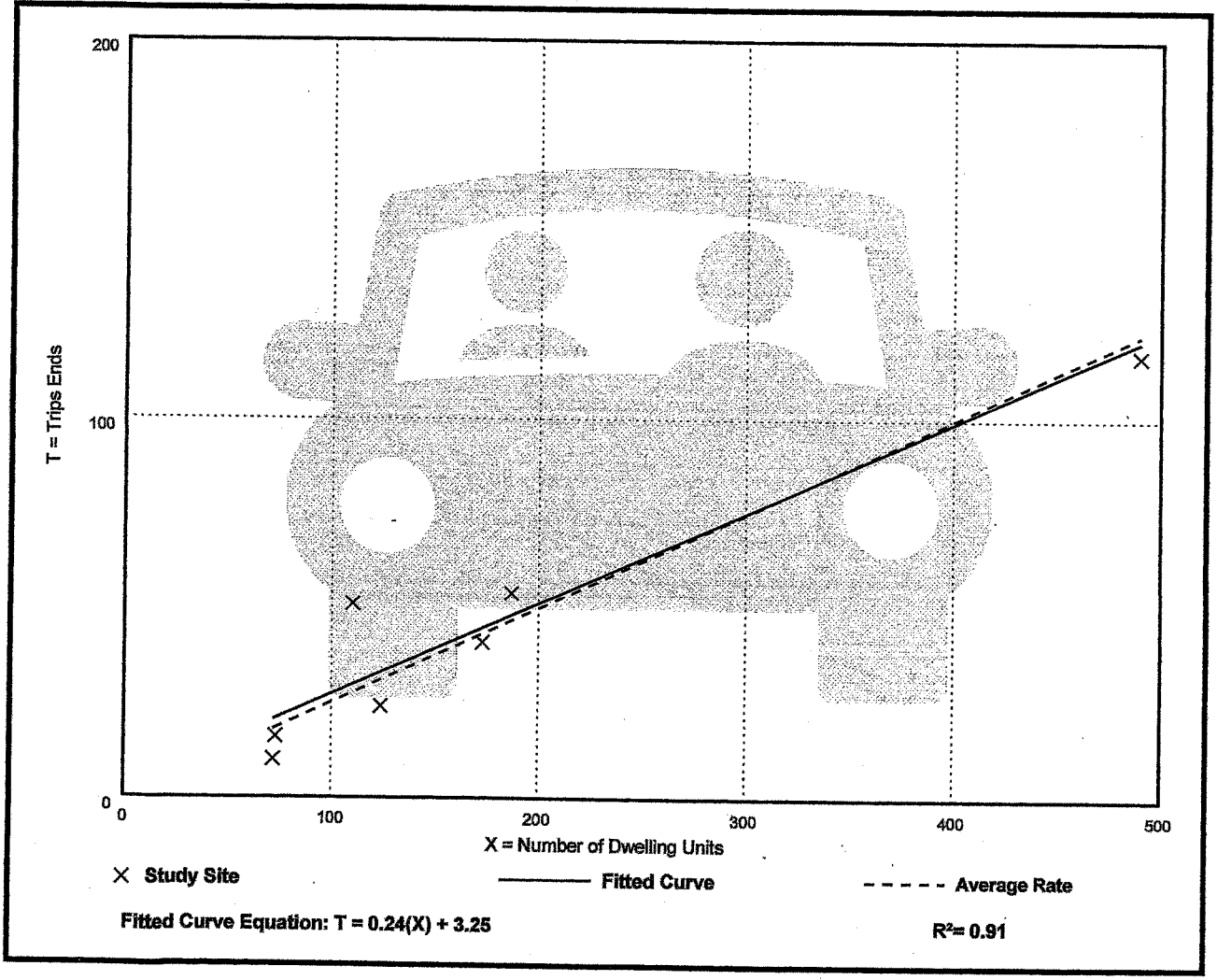
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: Dense Multi-Use Urban
Number of Studies: 7
Avg. Num. of Dwelling Units: 176
Directional Distribution: 90% entering, 10% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.25	0.14 - 0.46	0.08

Data Plot and Equation



Fitted Curve Equation: T = 0.24(X) + 3.25

R^2= 0.91

DRAINAGE ANALYSIS

FISHER STREET
TAX MAP 15, LOT 40-A-1

FISHER STREET
Dover, New Hampshire
Strafford County

October 2023

Prepared For:

H. J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

Prepared By:

Civilworks NE
PO Box 1166
181 Watson Road
Dover, NH 03820

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- 2.1.2 Soils
- 2.1.3 Rainfall Data
- 2.1.4 Runoff Curve Numbers

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- Node Listing – 50-yr

A-2 Developed Watersheds
- Drainage Diagram / Area and Soil Listings
- Node Listing – 2-yr
- Node Listing – 10-yr
- 10-yr Storm Summary
- Node Listing – 25-yr
- Node Listing – 50-yr

4.0 APPENDIX B – DESIGN
- B-1 Stormwater Best Management Practices
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1.0 INTRODUCTION

This is a hydrologic analysis of the subject parcel located on Fisher Street in Dover, NH. The 3.54± acre lot is identified as Tax Map 15, Lot 40-A-1. This site was a former laydown yard for the City of Dover, a 45,000± sf compacted gravel area was created. The site is partially compacted gravel, and the groundcover primarily consists of wooded vegetation with grassed areas along the edge of an unnamed drainageway. The parcel is bifurcated by the drainageway that runs east to west. It is bounded to the north by Fisher Street, to the west by the rail trail, to the east by residential development and to the south by undeveloped land. All drainage from the site discharges to a large stone railroad culvert beneath the rail trail, which is located on the south side of the site.

The project proposes 71,000± sf of disturbance including the construction of (4) multifamily residential townhomes and corresponding site improvements including site grading, paved parking, as well as stormwater quality and detention drainage improvements.

An 8.5± acre watershed was used to effectively analyze the pre-development conditions, that incorporates offsite areas that drain directly onsite and that will be incorporated into the proposed onsite drainage improvements. This watershed is identified as Watershed A.

The post development analysis has been divided into eleven (11) sub-catchments that discharge to the same point of analysis developed for the pre-development model. Sub-catchments model the areas of the site that are directed through proposed drainage structures, conveyances, water quality practices, and Ferguson Waterworks Rain Guardians. Stormwater conveyance consists of overland flow, a swale, pipes, and a closed drainage system. The project proposes bioretention ponds, drip edges, and porous pavement to meet water quality criteria and stone outlet aprons for energy dissipation. The analysis shows that with the mitigation measures proposed the project will have negligible impact on the watershed.

2.0 DRAINAGE ANALYSIS

A comprehensive hydrologic study of this site has been performed utilizing nationally recognized runoff estimating techniques developed by the USDA, Soil Conservation Services (SCS). The technique and runoff models are described in various SCS publications and references as follows:

- “Stormwater Management and Erosion Sediment Control Handbook for Urban and Developing Areas in New Hampshire”
- “New Hampshire Stormwater Manual Volume 2 - Post-Construction Best Management Practices Selection & Design”
- “Civil Engineering Reference Manual, Fifth Edition”
- “Open-Channel Hydraulics” Chow.
- “Stormwater Modeling System” HydroCAD Ver. 10.10

2.1 DRAINAGE DESIGN PARAMETERS

A brief review of the procedures and parameters used in the drainage study follows:

2.1.1 Watersheds

The watersheds and sub-catchment areas were delineated using wetland data provided by BAG Land Consultants, Bruce A. Gilday CWS #88 in November 2021, and field located by McEneaney Survey Associates of New England.

2.1.2 Soils

Soil types were determined utilizing the NRCS Web Soil Survey (WSS) mapping tool at http://websoilsurvey.nrcs.usda.gov which references the Strafford County, New Hampshire Soil Survey Area.

Hydrologic Drainage Class C:

HISS	Slopes	Map Name
SfC	8 to 15%	Suffield Silt Loam

2.1.3 Rainfall Data

Extreme precipitation estimate values from the Northeast Regional Climate Center were utilized in this analysis. The analysis has been performed for the 2-year, 10-year, 25-year, and 50-year storm events with 3.15”, 4.75”, 6.01”, and 7.18” rainfall depths respectively.

2.1.4 Runoff Curve Numbers

The SCS runoff curve numbers were used and are summarized within each sub-catchment drainage summary in Appendix A.

2.2 EXISTING CONDTIONS

For purposes of this analysis the subject parcel was analyzed with one point of discharge.

2.2.1 Table A – Existing Conditions (2, 10, 25, and 50-year storm events)

Watershed	**Pre-Development Volume (af)**	**Pre Development Peak Flows (cfs)**			
Point of Analysis	**2-yr**	**2-yr**	**10-yr**	**25-yr**	**50-yr**
A	0.83	6.2	11.9	16.2	20.4

2.3 DEVELOPED CONDITIONS

The post development watershed was analyzed utilizing the same summing point as the pre development analysis.

2.3.1 Table B – Developed Conditions (2, 10, 25, and 50-year storm events)

Watershed	**Post-Development Volume (af)**	**Post Development Peak Flows (cfs)**			
Point of Analysis	**2-yr**	**2-yr**	**10-yr**	**25-yr**	**50-yr**
A	0.85	4.9	10.4	14.4	18.2

2.4 HYDROLOGIC COMPARISON

The analysis indicates that the proposed project will have negligible impact on the watershed.

2.4.1 Table C – Pre/Post Development Comparison (2, 10, 25, and 50-year storm events)

Watershed	Pre/**Post-Development Volume (af)**	Pre/**Post Development Peak Flows (cfs)**			
Point of Analysis	**2-yr**	**2-yr**	**10-yr**	**25-yr**	**50-yr**
A	0.83/**0.85**	6.2/**4.9**	11.9/**10.4**	16.2/**14.4**	20.4/**18.2**

2.5 STORMWATER DESIGN

The project incorporates best management practices to treat stormwater and mitigate runoff.

2.5.1 Stormwater Best Management Practices

The project incorporates two bioretention systems, drip edges, and porous pavement to mitigate flow and water quality from the proposed development. Pre-treatment for the bioretention systems includes deep sump catch basins and/or Ferguson Waterworks Rain Guardian Fortress, this is an accepted proprietary pre-treatment water quality inlet by NHDES.

2.5.2 Groundwater Recharge

This lot was formerly owned by the City of Dover, they used this lot as a lay down yard. During this time, they compacted 45,259 sf of gravel. Much of this lot is udorthents and currently does not infiltrate water. Impervious area decreases by 186 sf. The Suffield Silt Loam soils identified by the NRCS Web Soil Survey have a minimum Ksat value of 0.0 in/hr. The site is not conducive to groundwater recharge.

2.5.3 Pollutant Removal

The site stormwater design captures 100% of the proposed onsite impervious area 62,300± sf and directs it to best management practices that provide pollutant removal. The project incorporates the following practices and associated pollutant removal efficacies as identified in the New Hampshire Stormwater Management Manual Volume 1, Appendix E:

	TSS	TN	TP
Bioretention System:	90%	65%	65%
Permeable Pavement with underdrain:	90%	10%	45%
Drip Edges:	90%	55%	60%

The pollutant removal meets or exceeds The City of Dover's, Site Review Regulations.

2.5.4 Outlet Protection

BMP's, conveyance structures, and outlet protection have been sized to convey the 50-year, 24 hour storm event. All proposed rip-rap applications shall consist of min. d50 = 6" stone with a stone layer thickness of 12" (min) on a filter fabric layer over a 6" thick (min) gravel base. See the plan set for rip-rap locations and the drainage details for additional information.

APPENDIX A

HYDROLOGIC CALCULATIONS

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.187 degrees North
Longitude	70.878 degrees West
Elevation	20 feet
Date/Time	Wed Aug 30 2023 09:34:43 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	2.31	2.76	3.15	3.88	4.45	1yr
2yr	0.32	0.49	0.61	0.81	1.01	1.29	2yr	0.88	1.17	1.50	1.91	2.45	3.15	3.50	2yr	2.79	3.37	3.86	4.60	5.23	2yr
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	4.49	5yr	3.52	4.32	4.94	5.81	6.57	5yr
10yr	0.40	0.63	0.80	1.09	1.42	1.85	10yr	1.22	1.69	2.18	2.83	3.66	4.75	5.42	10yr	4.20	5.21	5.95	6.93	7.80	10yr
25yr	0.46	0.74	0.94	1.30	1.72	2.27	25yr	1.49	2.09	2.70	3.53	4.61	6.01	6.95	25yr	5.32	6.68	7.61	8.77	9.80	25yr
50yr	0.52	0.83	1.06	1.48	2.00	2.67	50yr	1.73	2.46	3.18	4.19	5.49	7.18	8.39	50yr	6.35	8.07	9.17	10.48	11.65	50yr
100yr	0.58	0.94	1.21	1.71	2.32	3.12	100yr	2.00	2.89	3.75	4.96	6.53	8.58	10.14	100yr	7.60	9.75	11.06	12.53	13.86	100yr
200yr	0.64	1.05	1.36	1.95	2.70	3.67	200yr	2.33	3.40	4.43	5.89	7.79	10.26	12.26	200yr	9.08	11.79	13.34	14.98	16.49	200yr
500yr	0.76	1.24	1.62	2.36	3.30	4.54	500yr	2.85	4.22	5.50	7.37	9.82	13.01	15.75	500yr	11.51	15.15	17.10	18.99	20.77	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	1yr	0.64	0.88	0.92	1.26	1.57	2.12	2.46	1yr	1.88	2.36	2.88	3.35	4.03	1yr
2yr	0.31	0.49	0.60	0.81	1.00	1.18	2yr	0.86	1.16	1.36	1.83	2.36	3.04	3.40	2yr	2.69	3.27	3.75	4.47	5.05	2yr
5yr	0.35	0.54	0.67	0.91	1.16	1.40	5yr	1.00	1.37	1.61	2.15	2.78	3.71	4.12	5yr	3.28	3.97	4.61	5.41	6.11	5yr
10yr	0.38	0.59	0.73	1.02	1.31	1.60	10yr	1.13	1.56	1.81	2.44	3.13	4.27	4.78	10yr	3.78	4.60	5.32	6.24	7.01	10yr
25yr	0.44	0.66	0.82	1.18	1.55	1.91	25yr	1.34	1.87	2.11	2.84	3.65	4.94	5.79	25yr	4.37	5.57	6.48	7.55	8.42	25yr
50yr	0.48	0.73	0.91	1.31	1.76	2.19	50yr	1.52	2.14	2.35	3.19	4.09	5.64	6.68	50yr	4.99	6.42	7.53	8.71	9.66	50yr
100yr	0.54	0.81	1.01	1.46	2.01	2.51	100yr	1.73	2.45	2.63	3.57	4.57	6.42	7.69	100yr	5.68	7.40	8.74	10.06	11.07	100yr
200yr	0.59	0.89	1.13	1.64	2.29	2.87	200yr	1.97	2.80	2.93	4.00	5.10	7.31	8.87	200yr	6.47	8.53	10.14	11.61	12.70	200yr
500yr	0.69	1.03	1.33	1.93	2.74	3.45	500yr	2.36	3.37	3.40	4.63	5.92	8.64	10.68	500yr	7.65	10.27	12.33	14.06	15.18	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	1yr	0.75	1.05	1.23	1.74	2.21	2.87	3.08	1yr	2.54	2.97	3.43	4.22	4.81	1yr
2yr	0.33	0.51	0.62	0.85	1.04	1.25	2yr	0.90	1.22	1.48	1.95	2.51	3.29	3.62	2yr	2.91	3.49	4.00	4.75	5.45	2yr
5yr	0.39	0.61	0.75	1.03	1.31	1.58	5yr	1.13	1.55	1.86	2.50	3.20	4.24	4.85	5yr	3.75	4.67	5.28	6.23	7.00	5yr
10yr	0.46	0.70	0.87	1.22	1.57	1.92	10yr	1.36	1.88	2.23	3.05	3.86	5.21	6.06	10yr	4.62	5.83	6.65	7.65	8.53	10yr
25yr	0.56	0.84	1.05	1.50	1.97	2.48	25yr	1.70	2.42	2.88	3.97	4.96	7.07	8.14	25yr	6.26	7.82	8.90	10.07	11.12	25yr
50yr	0.64	0.98	1.22	1.75	2.35	2.99	50yr	2.03	2.93	3.49	4.83	6.03	8.74	10.20	50yr	7.74	9.80	11.12	12.38	13.59	50yr
100yr	0.75	1.13	1.42	2.04	2.80	3.62	100yr	2.42	3.54	4.24	5.92	7.33	10.81	12.78	100yr	9.56	12.28	13.88	15.25	16.63	100yr
200yr	0.87	1.30	1.65	2.39	3.34	4.39	200yr	2.88	4.29	5.16	7.24	8.90	13.39	16.03	200yr	11.85	15.41	17.35	18.78	20.38	200yr
500yr	1.06	1.58	2.03	2.95	4.19	5.64	500yr	3.62	5.51	6.66	9.47	11.54	17.81	21.63	500yr	15.76	20.80	23.31	24.76	26.67	500yr

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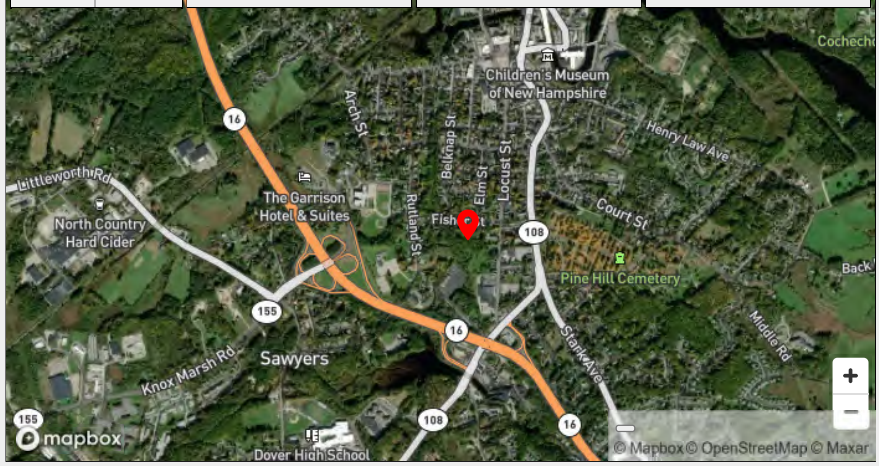
Select Product

- Extreme Precipitation Tables - HTML
- Extreme Precipitation Tables - Text/CSV
- Partial Duration Series - by Point
- Partial Duration Series - by Station
- Distribution Curves - Graphical
- Distribution Curves - Text/TBL
- Intensity Frequency Duration Graphs
- Precipitation Frequency Duration Graphs
- GIS Data Files
- Regional/State Maps

Select Location *Double-click map to place a marker, or enter address or latitude/longitude.*

Hybrid | Map | Satellite | Terrain

Locate by Address → | Locate by Lat/Lon 43.18° N -70.87° W → | Locate by State/County



Select Options

Smoothing: Yes | Delivery: Popup

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This project is a joint collaboration between:
Northeast Regional Climate Center (NRCC) Natural Resources Conservation Service (NRCS)
Cornell University
Contact: precip@cornell.edu

A-1

EXISTING WATERSHEDS



WS-A

Subcat Reach Pond Link

Routing Diagram for 22017 -PRE
Prepared by Civilworks New England, Printed 10/25/2023
HydroCAD® 10.10-5a s/n 03240 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
191,289	74	>75% Grass cover, Good, HSG C (WSA)
45,259	96	Gravel surface, HSG C (WSA)
16,853	98	Paved parking, HSG C (WSA)
1,765	98	Roofs, HSG C (WSA)
113,826	70	Woods, Good, HSG C (WSA)
368,992	**77**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
368,992	HSG C	WSA
0	HSG D	
0	Other	
368,992		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	0	191,289	0	0	191,289	>75% Grass cover, Good	
0	0	45,259	0	0	45,259	Gravel surface	
0	0	16,853	0	0	16,853	Paved parking	
0	0	1,765	0	0	1,765	Roofs	
0	0	113,826	0	0	113,826	Woods, Good	
0	**0**	**368,992**	**0**	**0**	**368,992**	**TOTAL AREA**	

A – 1

NODE LISTING – 2-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA: WS-A Runoff Area=368,992 sf 5.05% Impervious Runoff Depth=1.18"
Flow Length=769' Tc=21.4 min CN=77 Runoff=6.2 cfs 36,168 cf

Total Runoff Area = 368,992 sf Runoff Volume = 36,168 cf Average Runoff Depth = 1.18"
94.95% Pervious = 350,374 sf 5.05% Impervious = 18,618 sf

A – 1

NODE LISTING – 10-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA: WS-A Runoff Area=368,992 sf 5.05% Impervious Runoff Depth=2.42"
Flow Length=769' Tc=21.4 min CN=77 Runoff=11.9 cfs 74,268 cf

Total Runoff Area = 368,992 sf Runoff Volume = 74,268 cf Average Runoff Depth = 2.42"
94.95% Pervious = 350,374 sf 5.05% Impervious = 18,618 sf

A – 1

10-YR STORM SUMMARY

Summary for Subcatchment WSA: WS-A

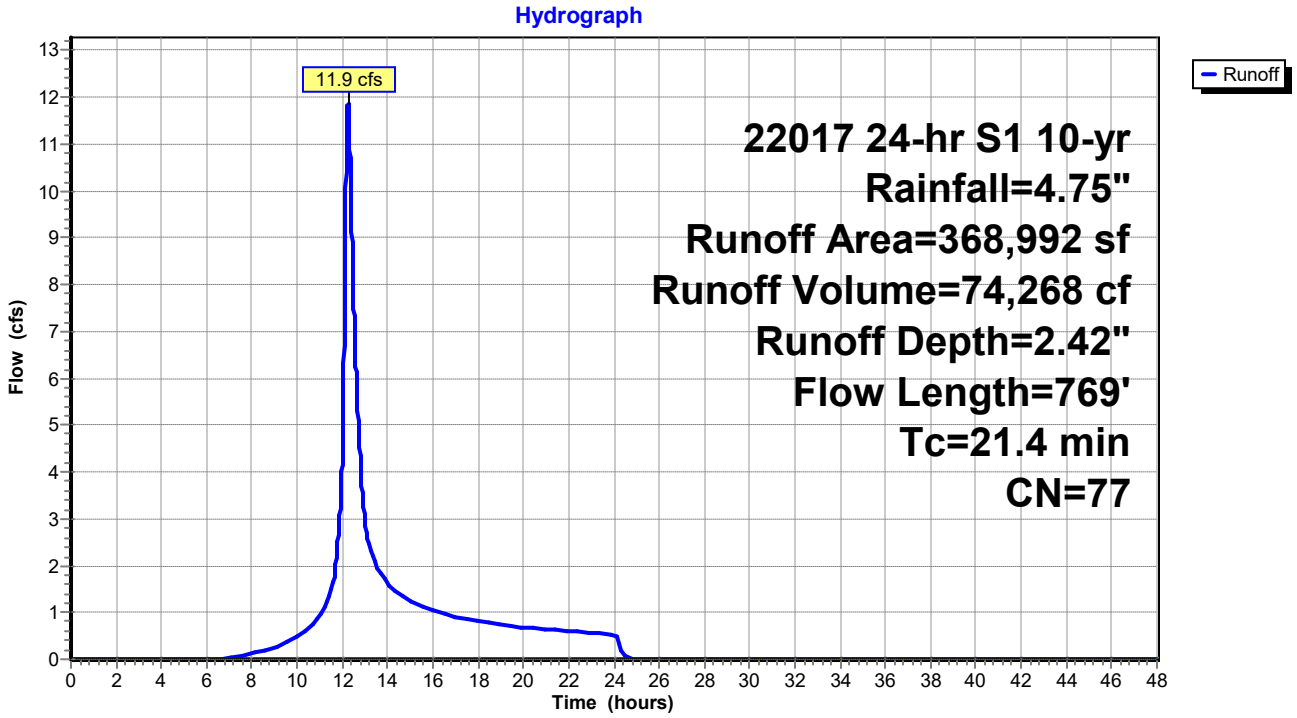
Runoff = 11.9 cfs @ 12.25 hrs, Volume= 74,268 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
113,826	70	Woods, Good, HSG C
191,289	74	>75% Grass cover, Good, HSG C
1,765	98	Roofs, HSG C
45,259	96	Gravel surface, HSG C
16,853	98	Paved parking, HSG C
368,992	77	Weighted Average
350,374		94.95% Pervious Area
18,618		5.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	94	0.0213	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
5.2	471	0.0467	1.51		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.9	204	0.0539	1.16		**Shallow Concentrated Flow, 3** Woodland Kv= 5.0 fps
21.4	769	Total			

Subcatchment WSA: WS-A



A – 1

NODE LISTING – 25-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA: WS-A Runoff Area=368,992 sf 5.05% Impervious Runoff Depth=3.49"
Flow Length=769' Tc=21.4 min CN=77 Runoff=16.2 cfs 107,248 cf

Total Runoff Area = 368,992 sf Runoff Volume = 107,248 cf Average Runoff Depth = 3.49"
94.95% Pervious = 350,374 sf 5.05% Impervious = 18,618 sf

A – 1

NODE LISTING – 50-YR

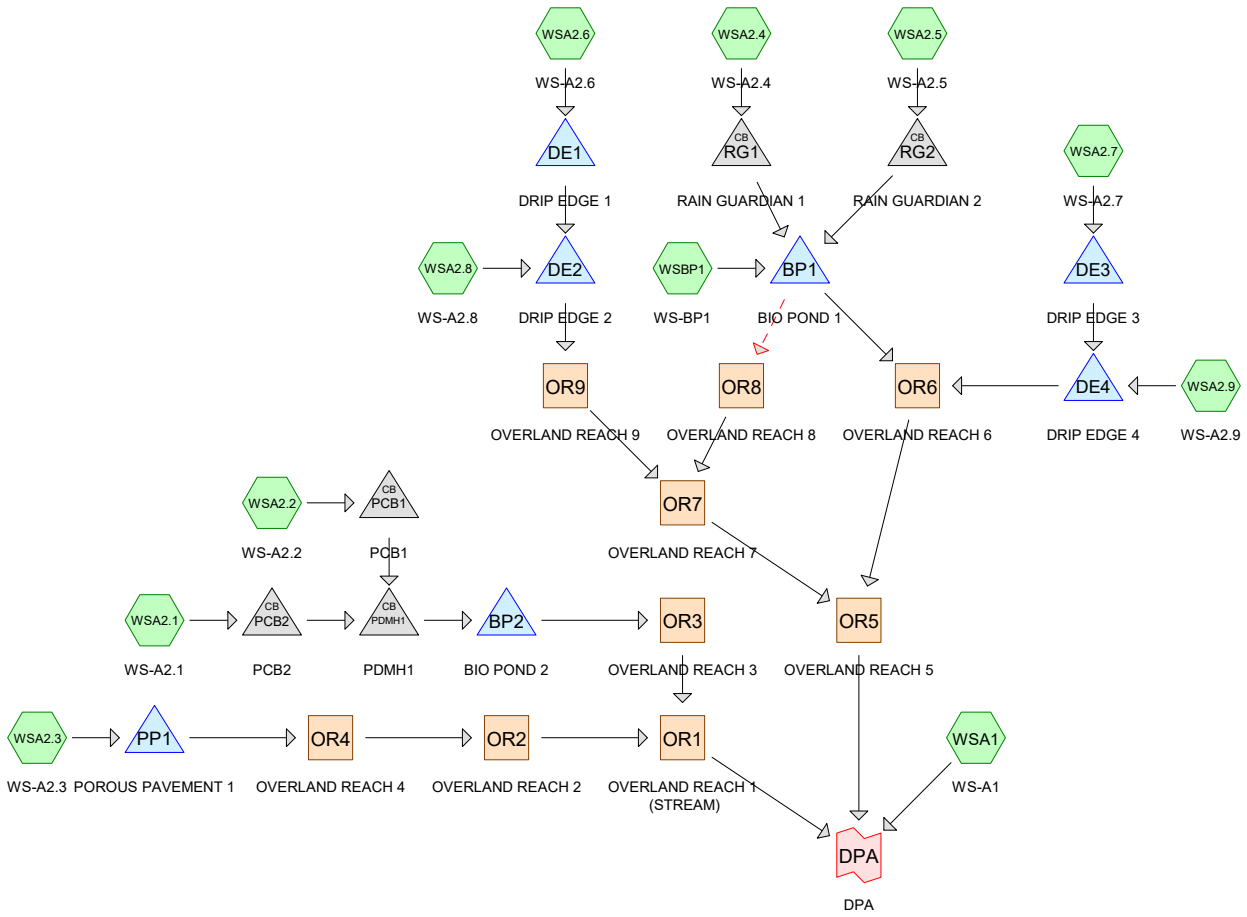
Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA: WS-A Runoff Area=368,992 sf 5.05% Impervious Runoff Depth=4.53"
Flow Length=769' Tc=21.4 min CN=77 Runoff=20.4 cfs 139,231 cf

Total Runoff Area = 368,992 sf Runoff Volume = 139,231 cf Average Runoff Depth = 4.53"
94.95% Pervious = 350,374 sf 5.05% Impervious = 18,618 sf

A-2

DEVELOPED WATERSHEDS



Subcat Reach Pond Link

Routing Diagram for 22017 -POST

Prepared by Civilworks New England, Printed 10/25/2023

HydroCAD® 10.10-5a s/n 03240 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
209,505	74	>75% Grass cover, Good, HSG C (WSA1, WSA2.1, WSA2.2, WSA2.3, WSA2.4, WSA2.5, WSA2.6, WSA2.7, WSA2.8, WSA2.9, WSBP1)
1,422	96	Gravel surface, HSG C (WSA1)
44,120	98	Paved parking, HSG C (WSA1, WSA2.1, WSA2.2, WSA2.3, WSA2.4, WSA2.5)
1,760	68	RIP RAP Drip Edge (WSA2.6, WSA2.7, WSA2.8, WSA2.9)
17,872	98	Roofs, HSG C (WSA1, WSA2.4, WSA2.5, WSA2.6, WSA2.7, WSA2.8, WSA2.9)
355	98	Unconnected pavement, HSG C (WSA1, WSA2.8)
93,958	70	Woods, Good, HSG C (WSA1, WSA2.2)
368,992	**77**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
367,232	HSG C	WSA1, WSA2.1, WSA2.2, WSA2.3, WSA2.4, WSA2.5, WSA2.6, WSA2.7, WSA2.8, WSA2.9, WSBP1
0	HSG D	
1,760	Other	WSA2.6, WSA2.7, WSA2.8, WSA2.9
368,992		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	0	209,505	0	0	209,505	>75% Grass cover, Good	
0	0	1,422	0	0	1,422	Gravel surface	
0	0	44,120	0	0	44,120	Paved parking	
0	0	0	0	1,760	1,760	RIP RAP Drip Edge	
0	0	17,872	0	0	17,872	Roofs	
0	0	355	0	0	355	Unconnected pavement	
0	0	93,958	0	0	93,958	Woods, Good	
0	**0**	**367,232**	**0**	**1,760**	**368,992**	**TOTAL AREA**	

A – 2

NODE LISTING – 2-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA1: WS-A1 Runoff Area=304,483 sf 5.89% Impervious Runoff Depth=1.00"
Flow Length=769' Tc=21.4 min CN=74 Runoff=4.2 cfs 25,495 cf

Subcatchment WSA2.1: WS-A2.1 Runoff Area=5,770 sf 58.80% Impervious Runoff Depth=1.95"
Flow Length=316' Tc=7.0 min CN=88 Runoff=0.3 cfs 939 cf

Subcatchment WSA2.2: WS-A2.2 Runoff Area=5,259 sf 78.40% Impervious Runoff Depth=2.30"
Flow Length=241' Slope=0.0400 '/' Tc=6.0 min CN=92 Runoff=0.3 cfs 1,009 cf

Subcatchment WSA2.3: WS-A2.3 Runoff Area=9,514 sf 91.53% Impervious Runoff Depth=2.70"
Flow Length=19' Slope=0.0530 '/' Tc=6.0 min CN=96 Runoff=0.6 cfs 2,141 cf

Subcatchment WSA2.4: WS-A2.4 Runoff Area=14,850 sf 66.47% Impervious Runoff Depth=2.12"
Flow Length=310' Tc=7.3 min CN=90 Runoff=0.8 cfs 2,626 cf

Subcatchment WSA2.5: WS-A2.5 Runoff Area=13,349 sf 79.72% Impervious Runoff Depth=2.40"
Flow Length=254' Tc=6.0 min CN=93 Runoff=0.8 cfs 2,667 cf

Subcatchment WSA2.6: WS-A2.6 Runoff Area=4,878 sf 41.59% Impervious Runoff Depth=1.57"
Flow Length=35' Slope=0.0570 '/' Tc=6.0 min CN=83 Runoff=0.2 cfs 637 cf

Subcatchment WSA2.7: WS-A2.7 Runoff Area=2,712 sf 75.22% Impervious Runoff Depth=2.21"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.2 cfs 500 cf

Subcatchment WSA2.8: WS-A2.8 Runoff Area=3,555 sf 51.08% Impervious Runoff Depth=1.79"
Flow Length=46' Slope=0.1250 '/' Tc=6.0 min CN=86 Runoff=0.2 cfs 531 cf

Subcatchment WSA2.9: WS-A2.9 Runoff Area=2,360 sf 76.27% Impervious Runoff Depth=2.21"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.1 cfs 435 cf

Subcatchment WSBP1: WS-BP1 Runoff Area=2,262 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=25' Slope=0.1250 '/' Tc=6.0 min CN=74 Runoff=0.1 cfs 189 cf

Reach OR1: OVERLAND REACH 1 Avg. Flow Depth=0.10' Max Vel=1.06 fps Inflow=0.2 cfs 3,732 cf
n=0.035 L=285.0' S=0.0228 '/' Capacity=32.1 cfs Outflow=0.2 cfs 3,731 cf

Reach OR2: OVERLAND REACH 2 Avg. Flow Depth=0.06' Max Vel=1.07 fps Inflow=0.1 cfs 1,784 cf
n=0.030 L=197.3' S=0.0324 '/' Capacity=44.6 cfs Outflow=0.1 cfs 1,784 cf

Reach OR3: OVERLAND REACH 3 Avg. Flow Depth=0.08' Max Vel=2.08 fps Inflow=0.1 cfs 1,948 cf
n=0.030 L=99.0' S=0.0939 '/' Capacity=28.2 cfs Outflow=0.1 cfs 1,948 cf

Reach OR4: OVERLAND REACH 4 Avg. Flow Depth=0.04' Max Vel=2.39 fps Inflow=0.1 cfs 1,784 cf
n=0.030 L=29.6' S=0.2672 '/' Capacity=101.5 cfs Outflow=0.1 cfs 1,784 cf

Reach OR5: OVERLAND REACH 5 Avg. Flow Depth=0.14' Max Vel=1.50 fps Inflow=0.5 cfs 7,585 cf
n=0.030 L=64.4' S=0.0214 '/' Capacity=36.3 cfs Outflow=0.5 cfs 7,585 cf

Reach OR6: OVERLAND REACH 6 Avg. Flow Depth=0.10' Max Vel=2.80 fps Inflow=0.4 cfs 6,417 cf
n=0.030 L=28.6' S=0.1266 '/' Capacity=69.9 cfs Outflow=0.4 cfs 6,417 cf

Reach OR7: OVERLAND REACH 7 Avg. Flow Depth=0.06' Max Vel=1.10 fps Inflow=0.1 cfs 1,168 cf
n=0.030 L=142.9' S=0.0341 '/' Capacity=36.3 cfs Outflow=0.1 cfs 1,168 cf

Reach OR8: OVERLAND REACH 8 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.0 cfs 0 cf
n=0.030 L=49.4' S=0.2126 '/' Capacity=42.4 cfs Outflow=0.0 cfs 0 cf

Reach OR9: OVERLAND REACH 9 Avg. Flow Depth=0.05' Max Vel=2.85 fps Inflow=0.1 cfs 1,168 cf
n=0.030 L=37.7' S=0.2851 '/' Capacity=49.1 cfs Outflow=0.1 cfs 1,168 cf

Pond BP1: BIO POND 1 Peak Elev=81.37' Storage=1,360 cf Inflow=1.6 cfs 5,483 cf
Primary=0.3 cfs 5,483 cf Secondary=0.0 cfs 0 cf Outflow=0.3 cfs 5,483 cf

Pond BP2: BIO POND 2 Peak Elev=85.49' Storage=468 cf Inflow=0.6 cfs 1,948 cf
Outflow=0.1 cfs 1,948 cf

Pond DE1: DRIP EDGE 1 Peak Elev=87.81' Storage=155 cf Inflow=0.2 cfs 637 cf
Outflow=0.1 cfs 637 cf

Pond DE2: DRIP EDGE 2 Peak Elev=84.60' Storage=255 cf Inflow=0.3 cfs 1,168 cf
Outflow=0.1 cfs 1,168 cf

Pond DE3: DRIP EDGE 3 Peak Elev=73.71' Storage=137 cf Inflow=0.2 cfs 500 cf
Outflow=0.1 cfs 500 cf

Pond DE4: DRIP EDGE 4 Peak Elev=72.23' Storage=196 cf Inflow=0.2 cfs 935 cf
Outflow=0.1 cfs 934 cf

Pond PCB1: PCB1 Peak Elev=85.59' Inflow=0.3 cfs 1,009 cf
12.0" Round Culvert n=0.012 L=22.0' S=0.0136 '/' Outflow=0.3 cfs 1,009 cf

Pond PCB2: PCB2 Peak Elev=85.56' Inflow=0.3 cfs 939 cf
12.0" Round Culvert n=0.012 L=11.0' S=0.0182 '/' Outflow=0.3 cfs 939 cf

Pond PDMH1: PDMH1 Peak Elev=85.49' Inflow=0.6 cfs 1,948 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0150 '/' Outflow=0.6 cfs 1,948 cf

Pond PP1: POROUS PAVEMENT 1 Peak Elev=89.11' Storage=2,041 cf Inflow=0.6 cfs 2,141 cf
Outflow=0.1 cfs 1,784 cf

Pond RG1: RAIN GUARDIAN 1 Peak Elev=81.37' Inflow=0.8 cfs 2,626 cf
Outflow=0.8 cfs 2,626 cf

Pond RG2: RAIN GUARDIAN 2 Peak Elev=81.37' Inflow=0.8 cfs 2,667 cf
Outflow=0.8 cfs 2,667 cf

Link DPA: DPA Inflow=4.9 cfs 36,811 cf
Primary=4.9 cfs 36,811 cf

Total Runoff Area = 368,992 sf Runoff Volume = 37,169 cf Average Runoff Depth = 1.21"
83.10% Pervious = 306,645 sf 16.90% Impervious = 62,347 sf

A – 2

NODE LISTING – 10-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA1: WS-A1 Runoff Area=304,483 sf 5.89% Impervious Runoff Depth=2.17"
Flow Length=769' Tc=21.4 min CN=74 Runoff=8.7 cfs 54,972 cf

Subcatchment WSA2.1: WS-A2.1 Runoff Area=5,770 sf 58.80% Impervious Runoff Depth=3.43"
Flow Length=316' Tc=7.0 min CN=88 Runoff=0.4 cfs 1,650 cf

Subcatchment WSA2.2: WS-A2.2 Runoff Area=5,259 sf 78.40% Impervious Runoff Depth=3.85"
Flow Length=241' Slope=0.0400 '/' Tc=6.0 min CN=92 Runoff=0.4 cfs 1,685 cf

Subcatchment WSA2.3: WS-A2.3 Runoff Area=9,514 sf 91.53% Impervious Runoff Depth=4.28"
Flow Length=19' Slope=0.0530 '/' Tc=6.0 min CN=96 Runoff=0.8 cfs 3,397 cf

Subcatchment WSA2.4: WS-A2.4 Runoff Area=14,850 sf 66.47% Impervious Runoff Depth=3.64"
Flow Length=310' Tc=7.3 min CN=90 Runoff=1.1 cfs 4,499 cf

Subcatchment WSA2.5: WS-A2.5 Runoff Area=13,349 sf 79.72% Impervious Runoff Depth=3.95"
Flow Length=254' Tc=6.0 min CN=93 Runoff=1.1 cfs 4,397 cf

Subcatchment WSA2.6: WS-A2.6 Runoff Area=4,878 sf 41.59% Impervious Runoff Depth=2.95"
Flow Length=35' Slope=0.0570 '/' Tc=6.0 min CN=83 Runoff=0.3 cfs 1,199 cf

Subcatchment WSA2.7: WS-A2.7 Runoff Area=2,712 sf 75.22% Impervious Runoff Depth=3.74"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.2 cfs 845 cf

Subcatchment WSA2.8: WS-A2.8 Runoff Area=3,555 sf 51.08% Impervious Runoff Depth=3.23"
Flow Length=46' Slope=0.1250 '/' Tc=6.0 min CN=86 Runoff=0.3 cfs 958 cf

Subcatchment WSA2.9: WS-A2.9 Runoff Area=2,360 sf 76.27% Impervious Runoff Depth=3.74"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.2 cfs 735 cf

Subcatchment WSBP1: WS-BP1 Runoff Area=2,262 sf 0.00% Impervious Runoff Depth=2.17"
Flow Length=25' Slope=0.1250 '/' Tc=6.0 min CN=74 Runoff=0.1 cfs 408 cf

Reach OR1: OVERLAND REACH 1 Avg. Flow Depth=0.16' Max Vel=1.43 fps Inflow=0.7 cfs 6,373 cf
n=0.035 L=285.0' S=0.0228 '/' Capacity=32.1 cfs Outflow=0.6 cfs 6,372 cf

Reach OR2: OVERLAND REACH 2 Avg. Flow Depth=0.09' Max Vel=1.32 fps Inflow=0.2 cfs 3,038 cf
n=0.030 L=197.3' S=0.0324 '/' Capacity=44.6 cfs Outflow=0.2 cfs 3,038 cf

Reach OR3: OVERLAND REACH 3 Avg. Flow Depth=0.15' Max Vel=3.18 fps Inflow=0.5 cfs 3,335 cf
n=0.030 L=99.0' S=0.0939 '/' Capacity=28.2 cfs Outflow=0.5 cfs 3,335 cf

Reach OR4: OVERLAND REACH 4 Avg. Flow Depth=0.06' Max Vel=2.95 fps Inflow=0.2 cfs 3,038 cf
n=0.030 L=29.6' S=0.2672 '/' Capacity=101.5 cfs Outflow=0.2 cfs 3,038 cf

Reach OR5: OVERLAND REACH 5 Avg. Flow Depth=0.23' Max Vel=2.05 fps Inflow=1.5 cfs 13,041 cf
n=0.030 L=64.4' S=0.0214 '/' Capacity=36.3 cfs Outflow=1.5 cfs 13,041 cf

Reach OR6: OVERLAND REACH 6 Avg. Flow Depth=0.16' Max Vel=3.98 fps Inflow=1.4 cfs 10,884 cf
n=0.030 L=28.6' S=0.1266 '/' Capacity=69.9 cfs Outflow=1.4 cfs 10,884 cf

Reach OR7: OVERLAND REACH 7 Avg. Flow Depth=0.06' Max Vel=1.12 fps Inflow=0.1 cfs 2,158 cf
n=0.030 L=142.9' S=0.0341 '/' Capacity=36.3 cfs Outflow=0.1 cfs 2,158 cf

Reach OR8: OVERLAND REACH 8 Avg. Flow Depth=0.02' Max Vel=1.21 fps Inflow=0.0 cfs 1 cf
n=0.030 L=49.4' S=0.2126 '/' Capacity=42.4 cfs Outflow=0.0 cfs 1 cf

Reach OR9: OVERLAND REACH 9 Avg. Flow Depth=0.05' Max Vel=2.85 fps Inflow=0.1 cfs 2,157 cf
n=0.030 L=37.7' S=0.2851 '/' Capacity=49.1 cfs Outflow=0.1 cfs 2,157 cf

Pond BP1: BIO POND 1 Peak Elev=81.77' Storage=1,913 cf Inflow=2.3 cfs 9,304 cf
Primary=1.3 cfs 9,303 cf Secondary=0.0 cfs 1 cf Outflow=1.3 cfs 9,304 cf

Pond BP2: BIO POND 2 Peak Elev=85.81' Storage=655 cf Inflow=0.9 cfs 3,335 cf
Outflow=0.5 cfs 3,335 cf

Pond DE1: DRIP EDGE 1 Peak Elev=88.24' Storage=237 cf Inflow=0.3 cfs 1,199 cf
Outflow=0.1 cfs 1,199 cf

Pond DE2: DRIP EDGE 2 Peak Elev=86.27' Storage=501 cf Inflow=0.4 cfs 2,157 cf
Outflow=0.1 cfs 2,157 cf

Pond DE3: DRIP EDGE 3 Peak Elev=73.88' Storage=169 cf Inflow=0.2 cfs 845 cf
Outflow=0.1 cfs 845 cf

Pond DE4: DRIP EDGE 4 Peak Elev=72.99' Storage=318 cf Inflow=0.3 cfs 1,581 cf
Outflow=0.1 cfs 1,580 cf

Pond PCB1: PCB1 Peak Elev=85.85' Inflow=0.4 cfs 1,685 cf
12.0" Round Culvert n=0.012 L=22.0' S=0.0136 '/' Outflow=0.4 cfs 1,685 cf

Pond PCB2: PCB2 Peak Elev=85.85' Inflow=0.4 cfs 1,650 cf
12.0" Round Culvert n=0.012 L=11.0' S=0.0182 '/' Outflow=0.4 cfs 1,650 cf

Pond PDMH1: PDMH1 Peak Elev=85.83' Inflow=0.9 cfs 3,335 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0150 '/' Outflow=0.9 cfs 3,335 cf

Pond PP1: POROUS PAVEMENT 1 Peak Elev=89.22' Storage=2,377 cf Inflow=0.8 cfs 3,397 cf
Outflow=0.2 cfs 3,038 cf

Pond RG1: RAIN GUARDIAN 1 Peak Elev=81.78' Inflow=1.1 cfs 4,499 cf
Outflow=1.1 cfs 4,499 cf

Pond RG2: RAIN GUARDIAN 2 Peak Elev=81.77' Inflow=1.1 cfs 4,397 cf
Outflow=1.1 cfs 4,397 cf

Link DPA: DPA Inflow=10.4 cfs 74,386 cf
Primary=10.4 cfs 74,386 cf

Total Runoff Area = 368,992 sf Runoff Volume = 74,746 cf Average Runoff Depth = 2.43"
83.10% Pervious = 306,645 sf 16.90% Impervious = 62,347 sf

A – 2

10-YR STORM SUMMARY

Summary for Subcatchment WSA1: WS-A1

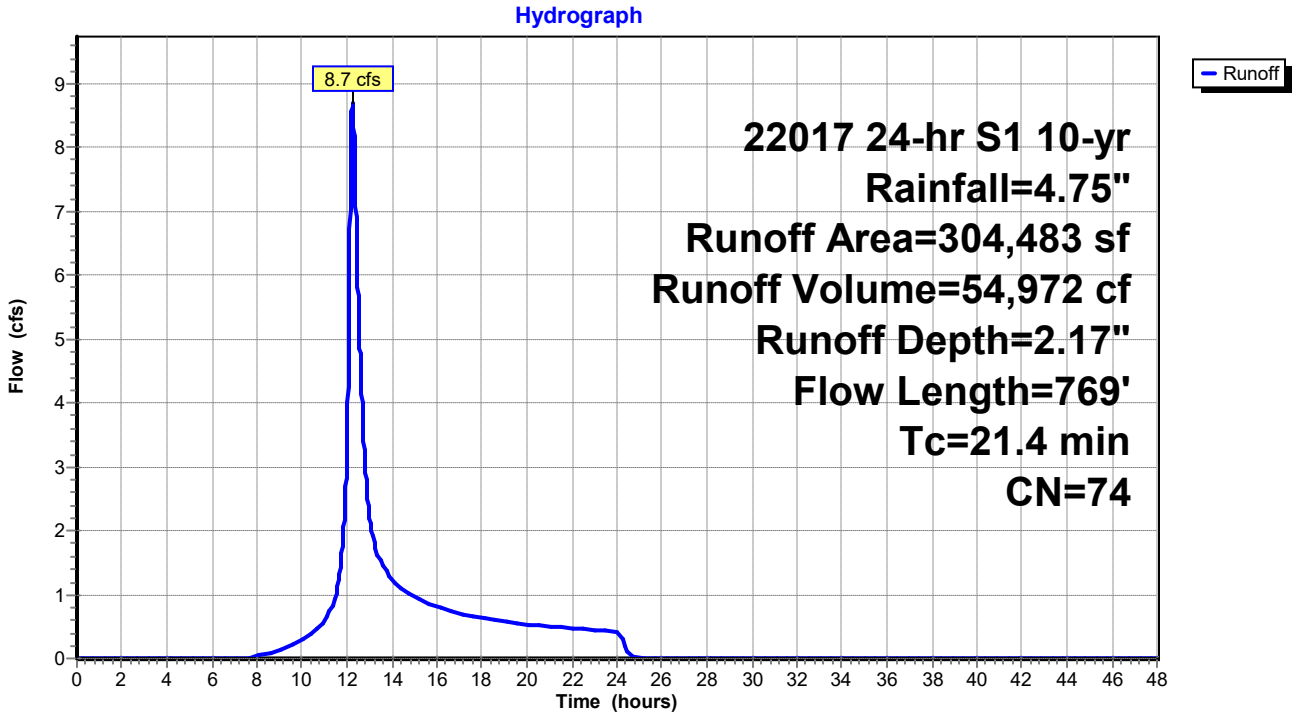
Runoff = 8.7 cfs @ 12.25 hrs, Volume= 54,972 cf, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
93,427	70	Woods, Good, HSG C
191,709	74	>75% Grass cover, Good, HSG C
1,422	96	Gravel surface, HSG C
1,662	98	Roofs, HSG C
339	98	Unconnected pavement, HSG C
15,924	98	Paved parking, HSG C
304,483	74	Weighted Average
286,558		94.11% Pervious Area
17,925		5.89% Impervious Area
339		1.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	94	0.0213	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
5.2	471	0.0467	1.51		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.9	204	0.0539	1.16		**Shallow Concentrated Flow, 3** Woodland Kv= 5.0 fps
21.4	769	Total			

Subcatchment WSA1: WS-A1



Summary for Subcatchment WSA2.1: WS-A2.1

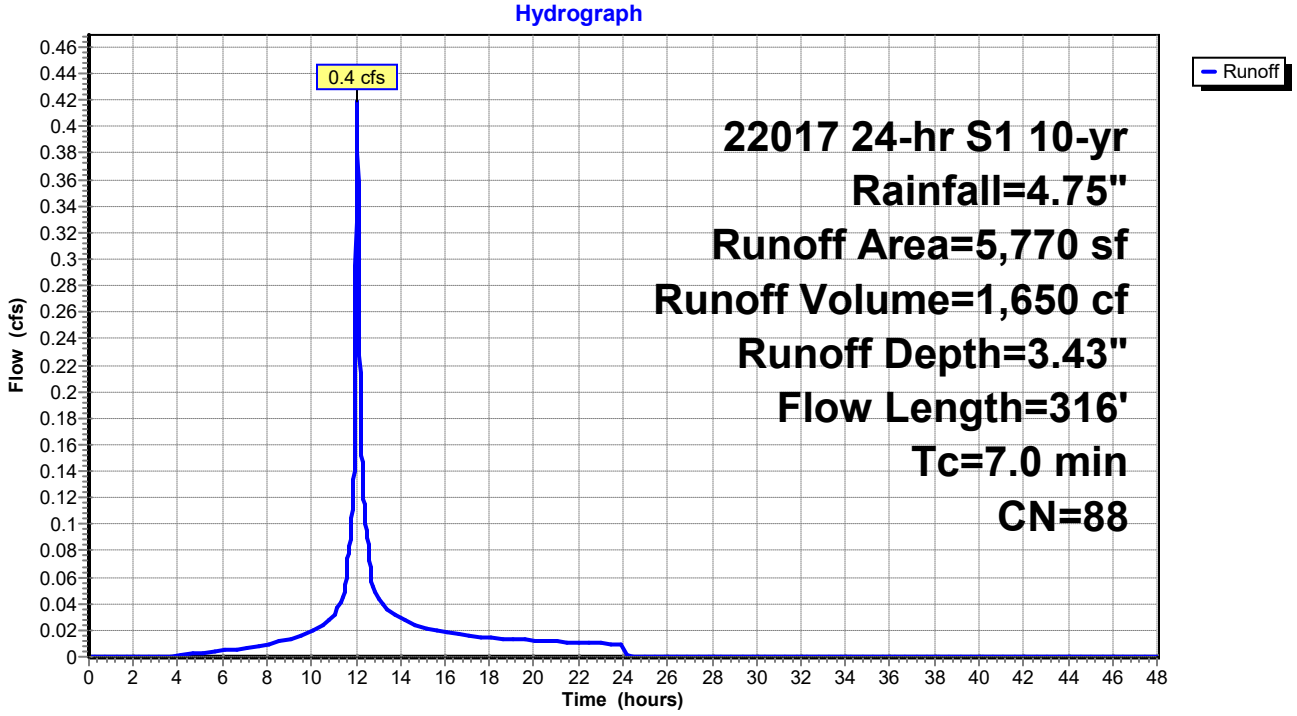
Runoff = 0.4 cfs @ 12.05 hrs, Volume= 1,650 cf, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,377	74	>75% Grass cover, Good, HSG C
3,393	98	Paved parking, HSG C
5,770	88	Weighted Average
2,377		41.20% Pervious Area
3,393		58.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	55	0.0727	0.17		**Sheet Flow, 1** Grass: Dense n= 0.240 P2= 3.15"
1.1	149	0.0134	2.35		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.5	85	0.0235	3.11		**Shallow Concentrated Flow, 3** Paved Kv= 20.3 fps
0.1	27	0.0544	4.73		**Shallow Concentrated Flow, 4** Paved Kv= 20.3 fps
7.0	316	Total			

Subcatchment WSA2.1: WS-A2.1



Summary for Subcatchment WSA2.2: WS-A2.2

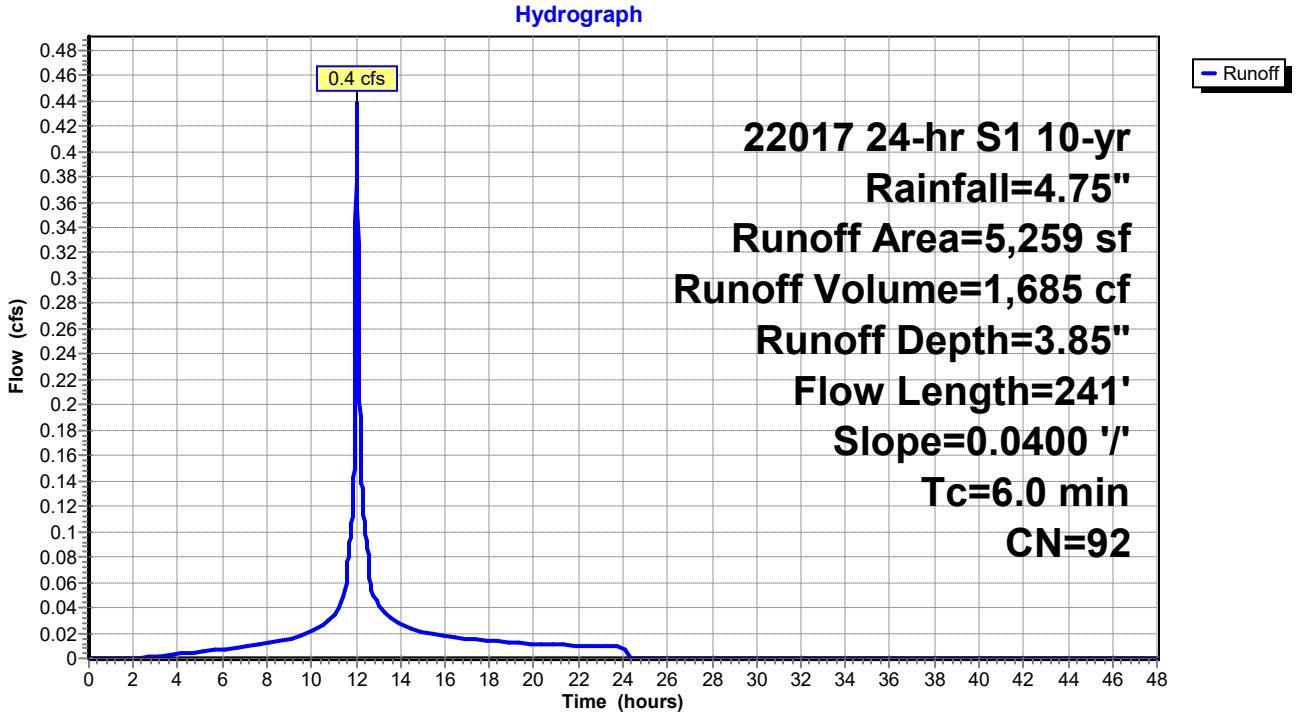
Runoff = 0.4 cfs @ 12.04 hrs, Volume= 1,685 cf, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
531	70	Woods, Good, HSG C
605	74	>75% Grass cover, Good, HSG C
4,123	98	Paved parking, HSG C
5,259	92	Weighted Average
1,136		21.60% Pervious Area
4,123		78.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	241	0.0400	4.06		**Shallow Concentrated Flow, 1** Paved Kv= 20.3 fps
1.0	241	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.2: WS-A2.2



Summary for Subcatchment WSA2.3: WS-A2.3

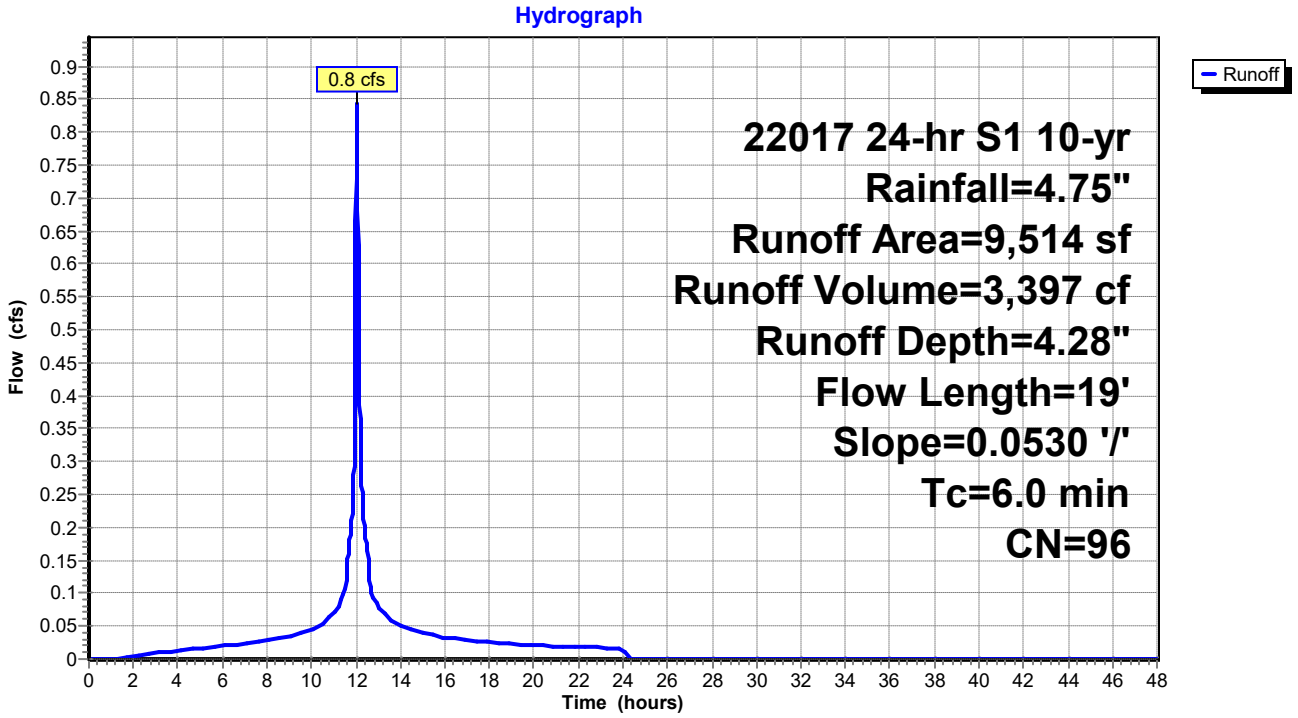
Runoff = 0.8 cfs @ 12.04 hrs, Volume= 3,397 cf, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
806	74	>75% Grass cover, Good, HSG C
8,708	98	Paved parking, HSG C
9,514	96	Weighted Average
806		8.47% Pervious Area
8,708		91.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	19	0.0530	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
2.6	19	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.3: WS-A2.3



Summary for Subcatchment WSA2.4: WS-A2.4

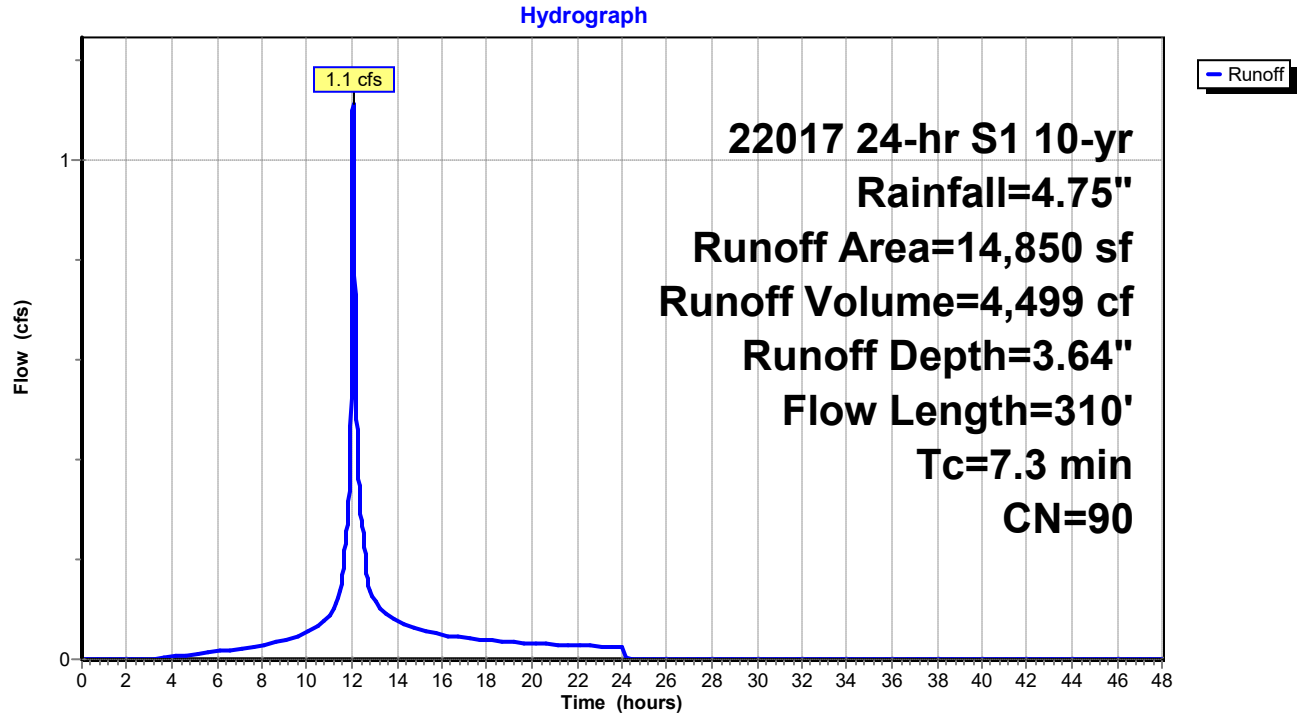
Runoff = 1.1 cfs @ 12.05 hrs, Volume= 4,499 cf, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
4,979	74	>75% Grass cover, Good, HSG C
4,287	98	Roofs, HSG C
5,584	98	Paved parking, HSG C
14,850	90	Weighted Average
4,979		33.53% Pervious Area
9,871		66.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	65	0.0754	0.18		**Sheet Flow, 1** Grass: Dense n= 0.240 P2= 3.15"
0.7	115	0.0174	2.68		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.1	38	0.0487	4.48		**Shallow Concentrated Flow, 3** Paved Kv= 20.3 fps
0.5	92	0.0250	3.21		**Shallow Concentrated Flow, 4** Paved Kv= 20.3 fps
7.3	310	Total			

Subcatchment WSA2.4: WS-A2.4



Summary for Subcatchment WSA2.5: WS-A2.5

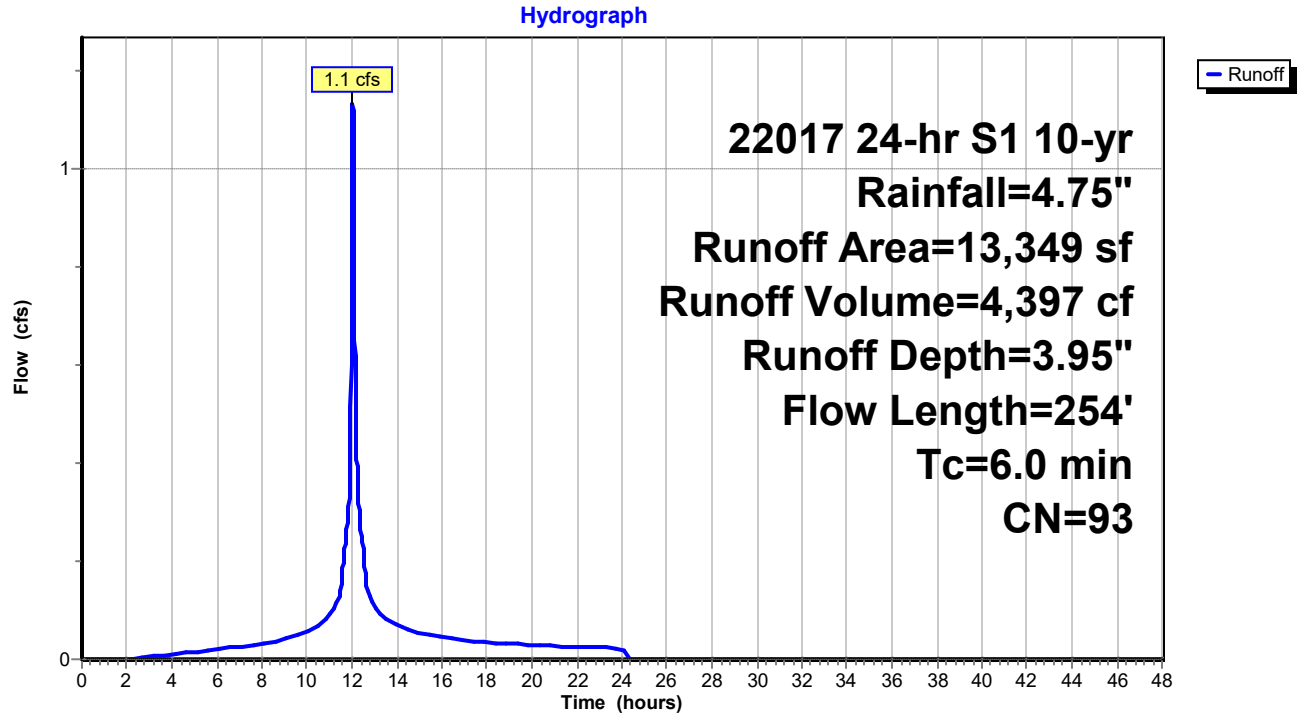
Runoff = 1.1 cfs @ 12.04 hrs, Volume= 4,397 cf, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,707	74	>75% Grass cover, Good, HSG C
4,254	98	Roofs, HSG C
6,388	98	Paved parking, HSG C
13,349	93	Weighted Average
2,707		20.28% Pervious Area
10,642		79.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0236	1.27		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.15"
0.4	73	0.0185	2.76		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.1	39	0.0474	4.42		**Shallow Concentrated Flow, 3** Paved Kv= 20.3 fps
0.5	92	0.0250	3.21		**Shallow Concentrated Flow, 4** Paved Kv= 20.3 fps
1.7	254	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.5: WS-A2.5



Summary for Subcatchment WSA2.6: WS-A2.6

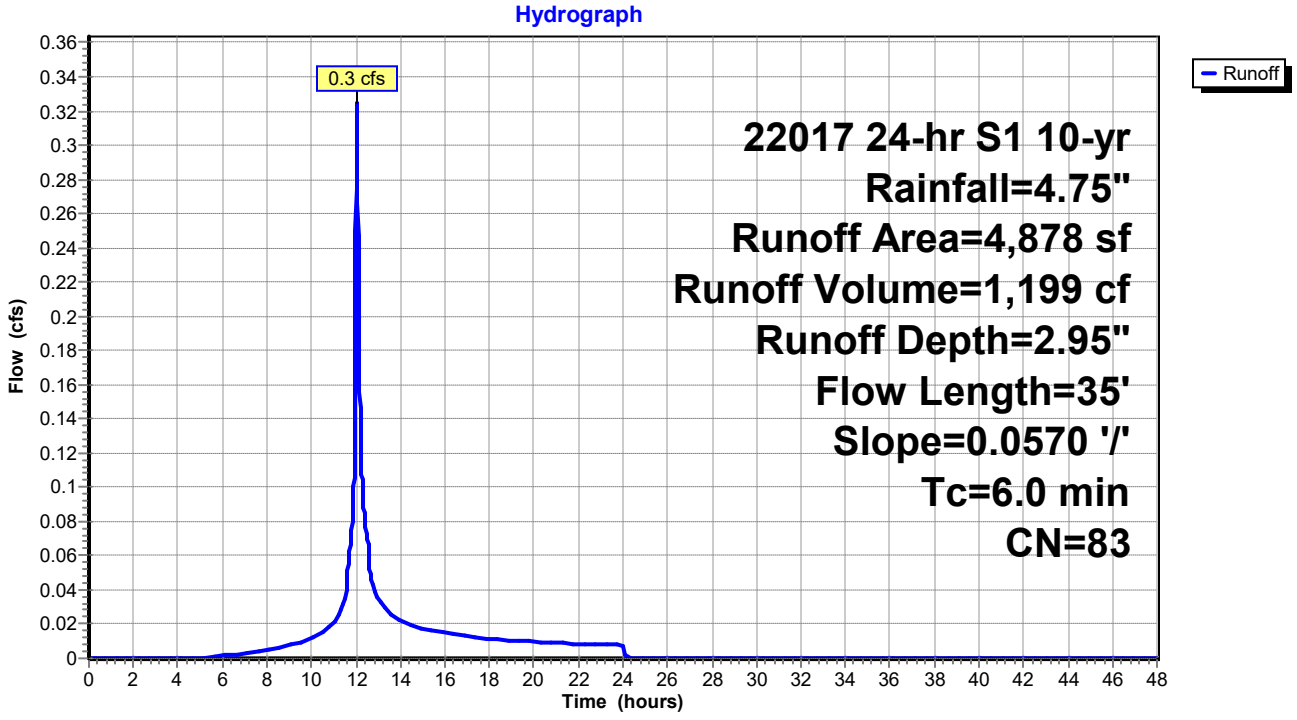
Runoff = 0.3 cfs @ 12.04 hrs, Volume= 1,199 cf, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

	Area (sf)	CN	Description
*	480	68	RIP RAP Drip Edge
	2,369	74	>75% Grass cover, Good, HSG C
	2,029	98	Roofs, HSG C
	4,878	83	Weighted Average
	2,849		58.41% Pervious Area
	2,029		41.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	35	0.0570	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
4.1	35	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.6: WS-A2.6



Summary for Subcatchment WSA2.7: WS-A2.7

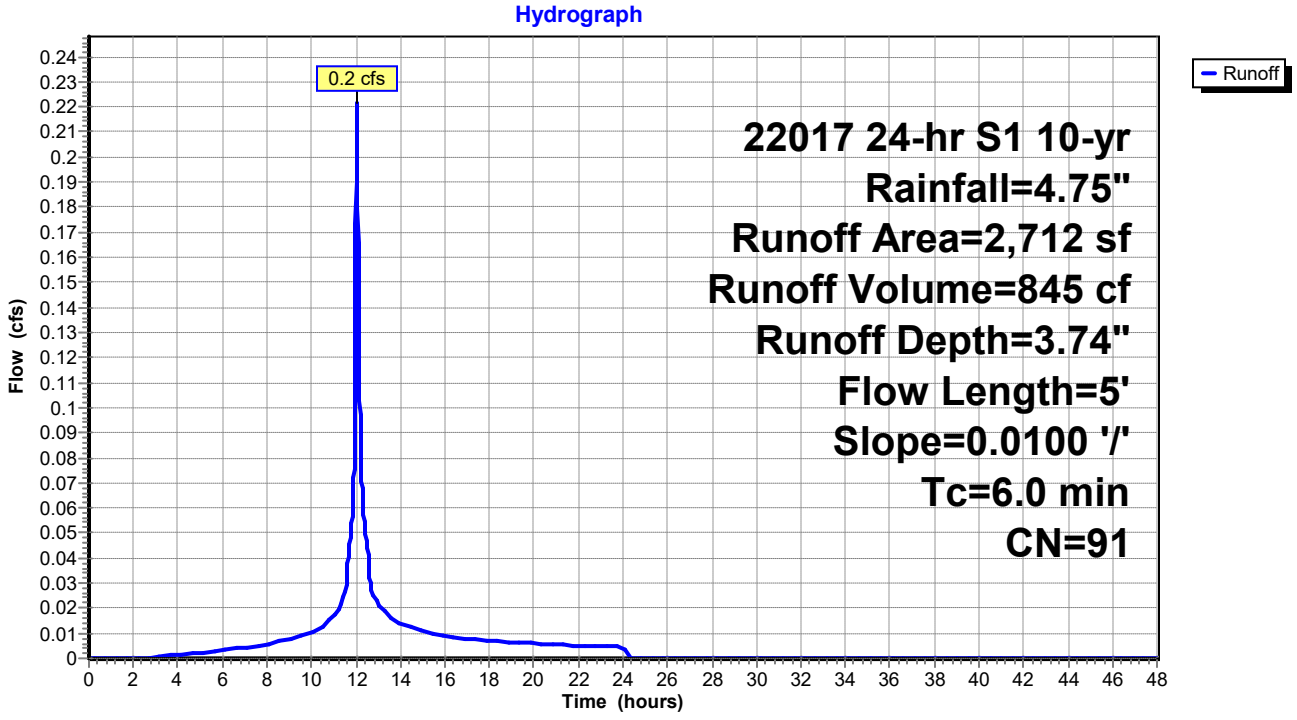
Runoff = 0.2 cfs @ 12.04 hrs, Volume= 845 cf, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

	Area (sf)	CN	Description
*	480	68	RIP RAP Drip Edge
	192	74	>75% Grass cover, Good, HSG C
	2,040	98	Roofs, HSG C
	2,712	91	Weighted Average
	672		24.78% Pervious Area
	2,040		75.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	5	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	5	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.7: WS-A2.7



Summary for Subcatchment WSA2.8: WS-A2.8

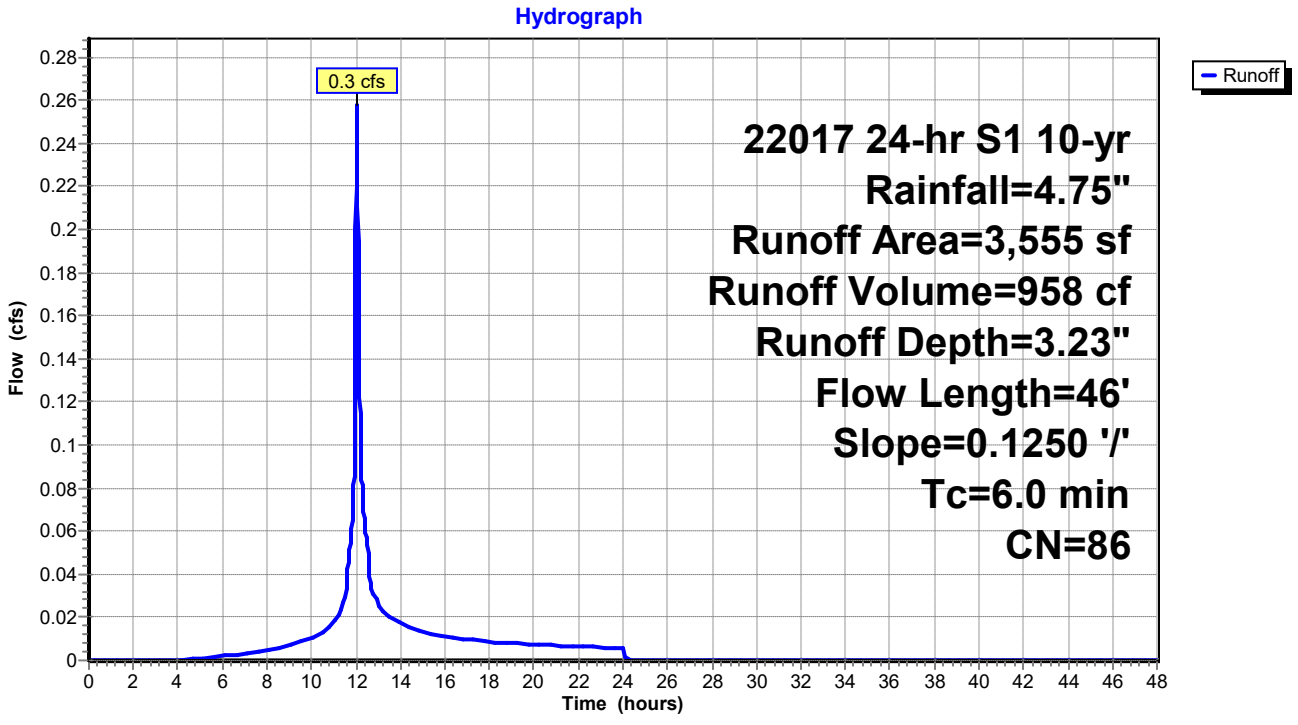
Runoff = 0.3 cfs @ 12.04 hrs, Volume= 958 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

	Area (sf)	CN	Description
*	400	68	RIP RAP Drip Edge
	1,339	74	>75% Grass cover, Good, HSG C
	16	98	Unconnected pavement, HSG C
	1,800	98	Roofs, HSG C
	3,555	86	Weighted Average
	1,739		48.92% Pervious Area
	1,816		51.08% Impervious Area
	16		0.88% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	46	0.1250	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
3.7	46	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.8: WS-A2.8



Summary for Subcatchment WSA2.9: WS-A2.9

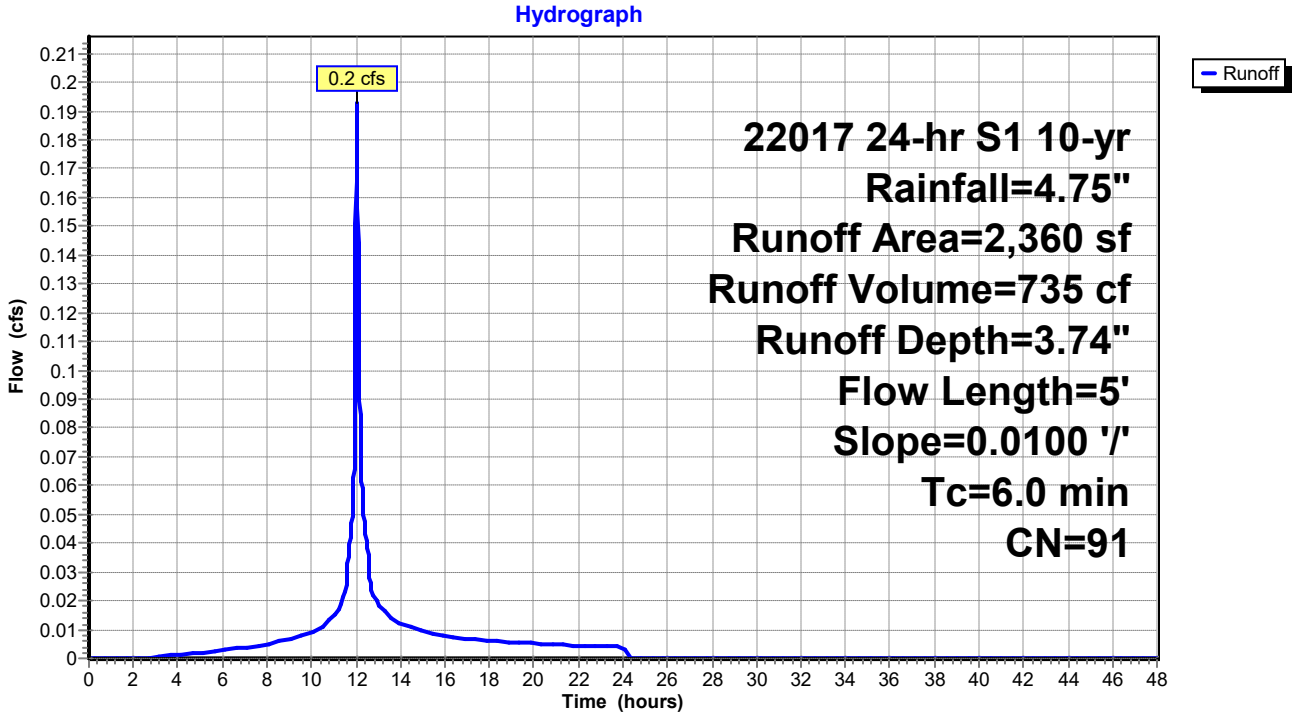
Runoff = 0.2 cfs @ 12.04 hrs, Volume= 735 cf, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

	Area (sf)	CN	Description
*	400	68	RIP RAP Drip Edge
	160	74	>75% Grass cover, Good, HSG C
	1,800	98	Roofs, HSG C
	2,360	91	Weighted Average
	560		23.73% Pervious Area
	1,800		76.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	5	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	5	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSA2.9: WS-A2.9



Summary for Subcatchment WSBP1: WS-BP1

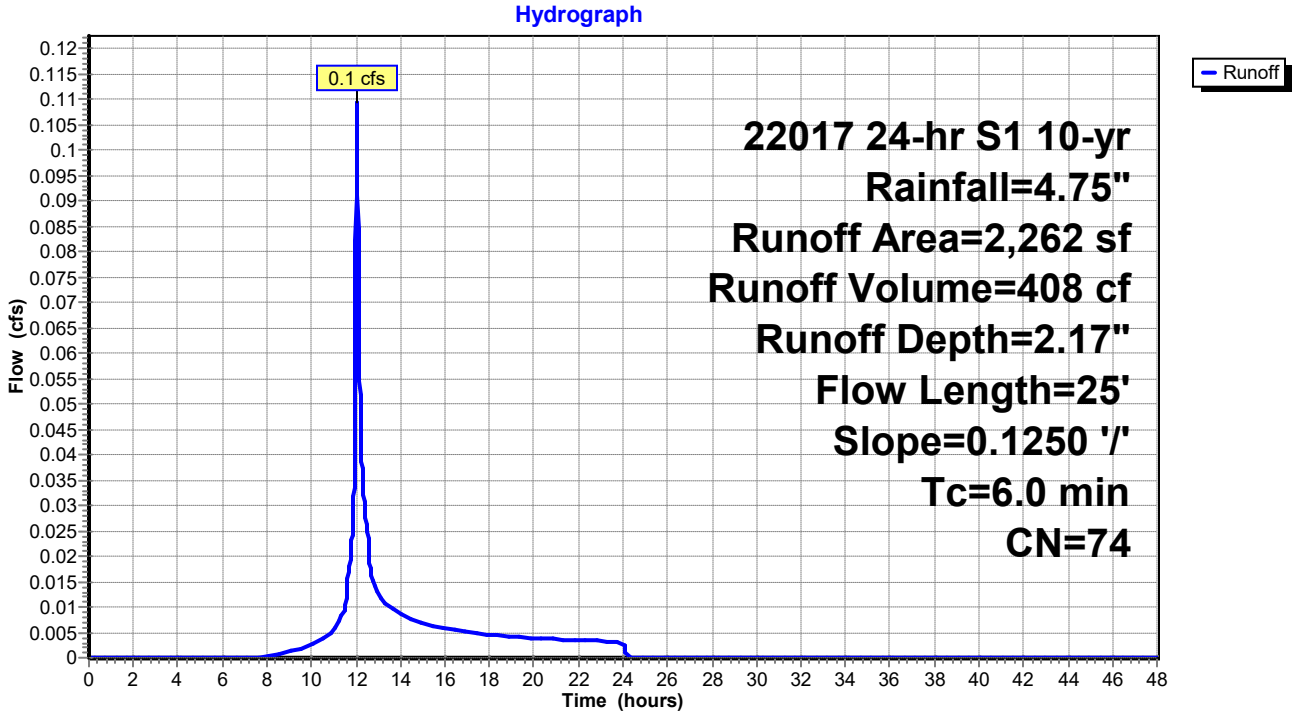
Runoff = 0.1 cfs @ 12.04 hrs, Volume= 408 cf, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
22017 24-hr S1 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,262	74	>75% Grass cover, Good, HSG C
2,262		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	25	0.1250	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
2.3	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment WSBP1: WS-BP1



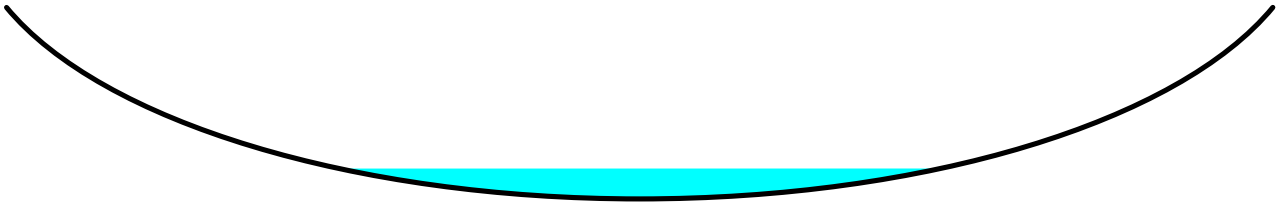
Summary for Reach OR1: OVERLAND REACH 1 (STREAM)

Inflow Area = 20,543 sf, 78.98% Impervious, Inflow Depth > 3.72" for 10-yr event
Inflow = 0.7 cfs @ 12.16 hrs, Volume= 6,373 cf
Outflow = 0.6 cfs @ 12.22 hrs, Volume= 6,372 cf, Atten= 10%, Lag= 3.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.43 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 10.2 min

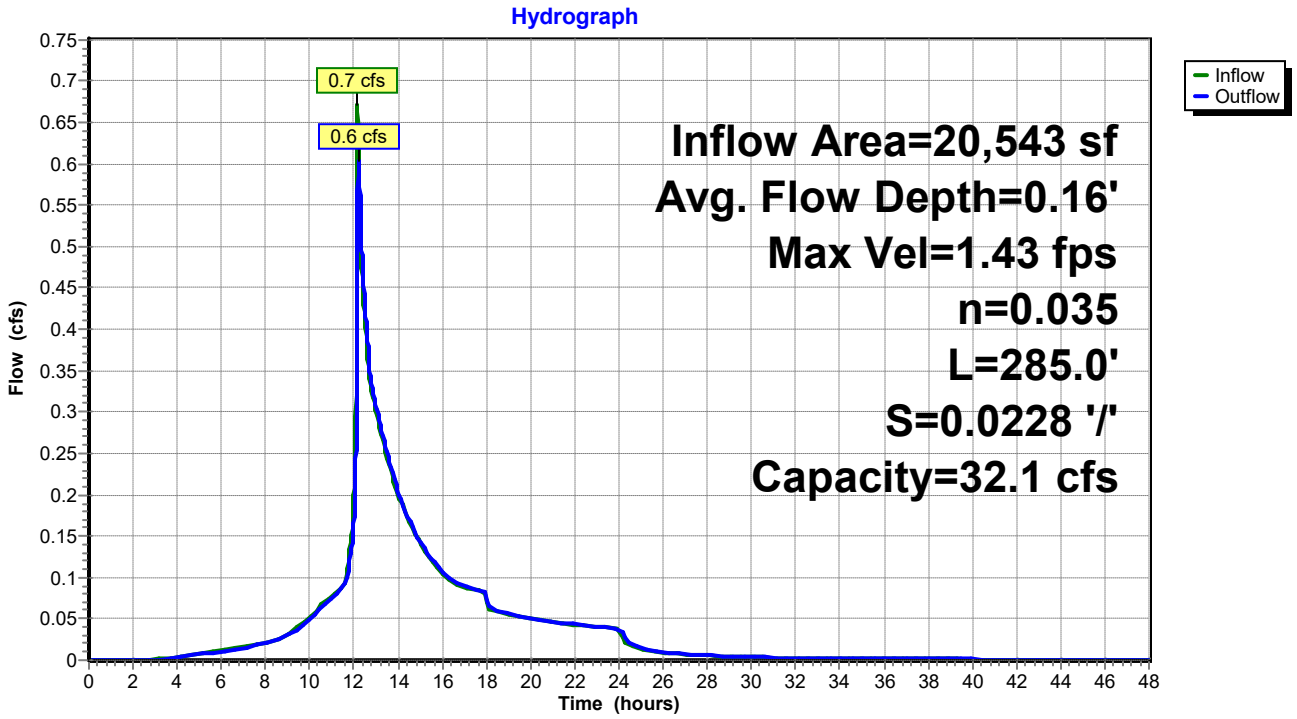
Peak Storage= 120 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 3.98'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 32.1 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 285.0' Slope= 0.0228 '/'
Inlet Invert= 71.50', Outlet Invert= 65.00'



‡

Reach OR1: OVERLAND REACH 1 (STREAM)



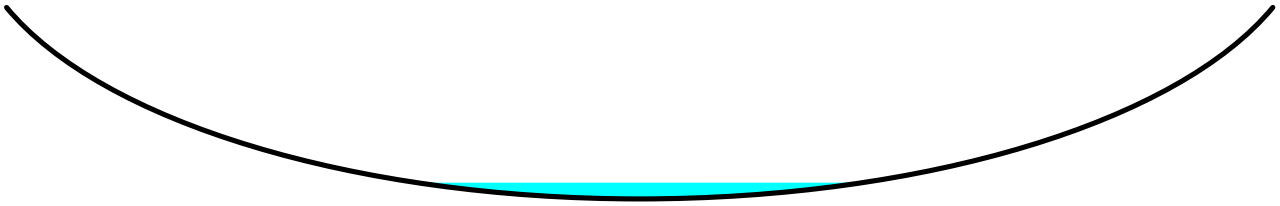
Summary for Reach OR2: OVERLAND REACH 2

Inflow Area = 9,514 sf, 91.53% Impervious, Inflow Depth > 3.83" for 10-yr event
Inflow = 0.2 cfs @ 12.32 hrs, Volume= 3,038 cf
Outflow = 0.2 cfs @ 12.36 hrs, Volume= 3,038 cf, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.32 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 6.3 min

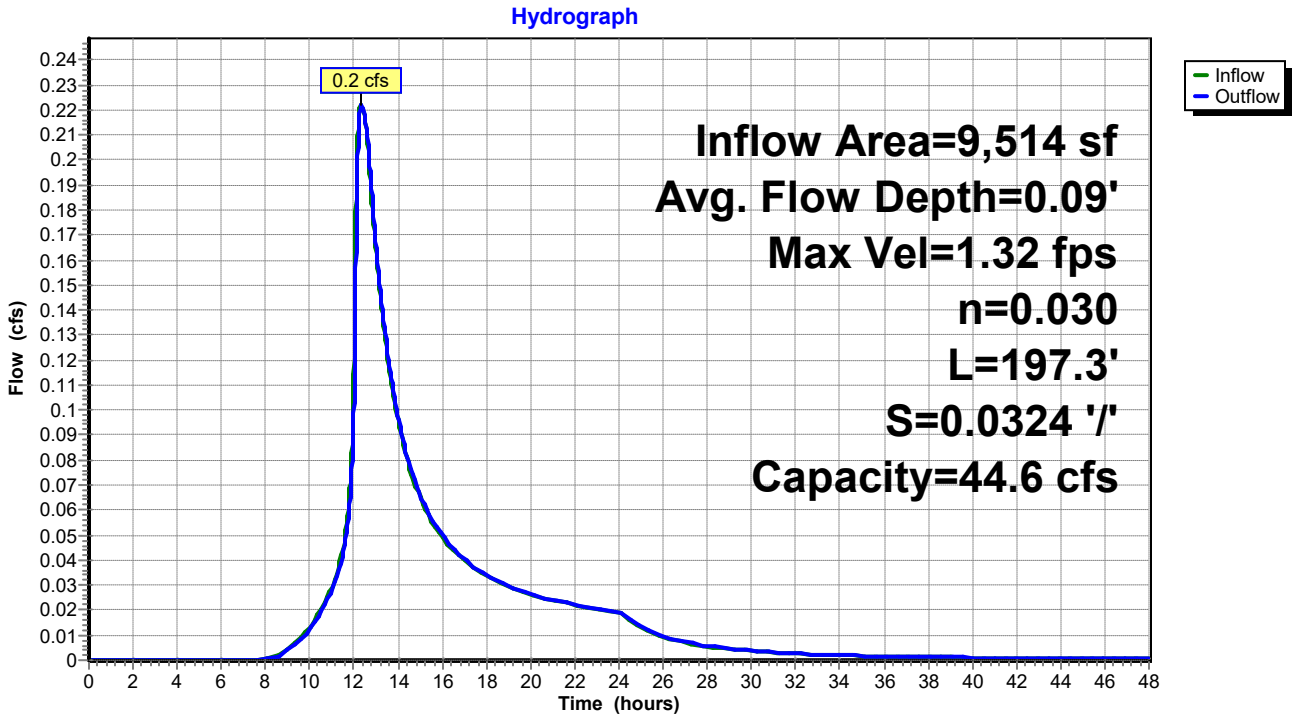
Peak Storage= 33 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 2.93'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 44.6 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 197.3' Slope= 0.0324 '/'
Inlet Invert= 78.09', Outlet Invert= 71.70'



‡

Reach OR2: OVERLAND REACH 2



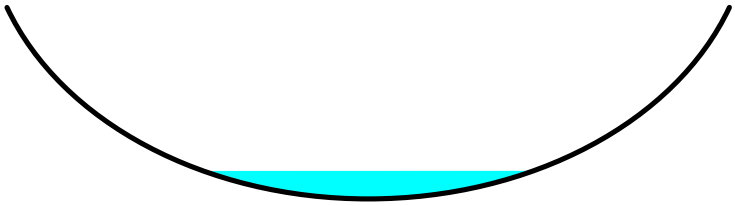
Summary for Reach OR3: OVERLAND REACH 3

Inflow Area = 11,029 sf, 68.15% Impervious, Inflow Depth = 3.63" for 10-yr event
Inflow = 0.5 cfs @ 12.15 hrs, Volume= 3,335 cf
Outflow = 0.5 cfs @ 12.16 hrs, Volume= 3,335 cf, Atten= 1%, Lag= 0.4 min

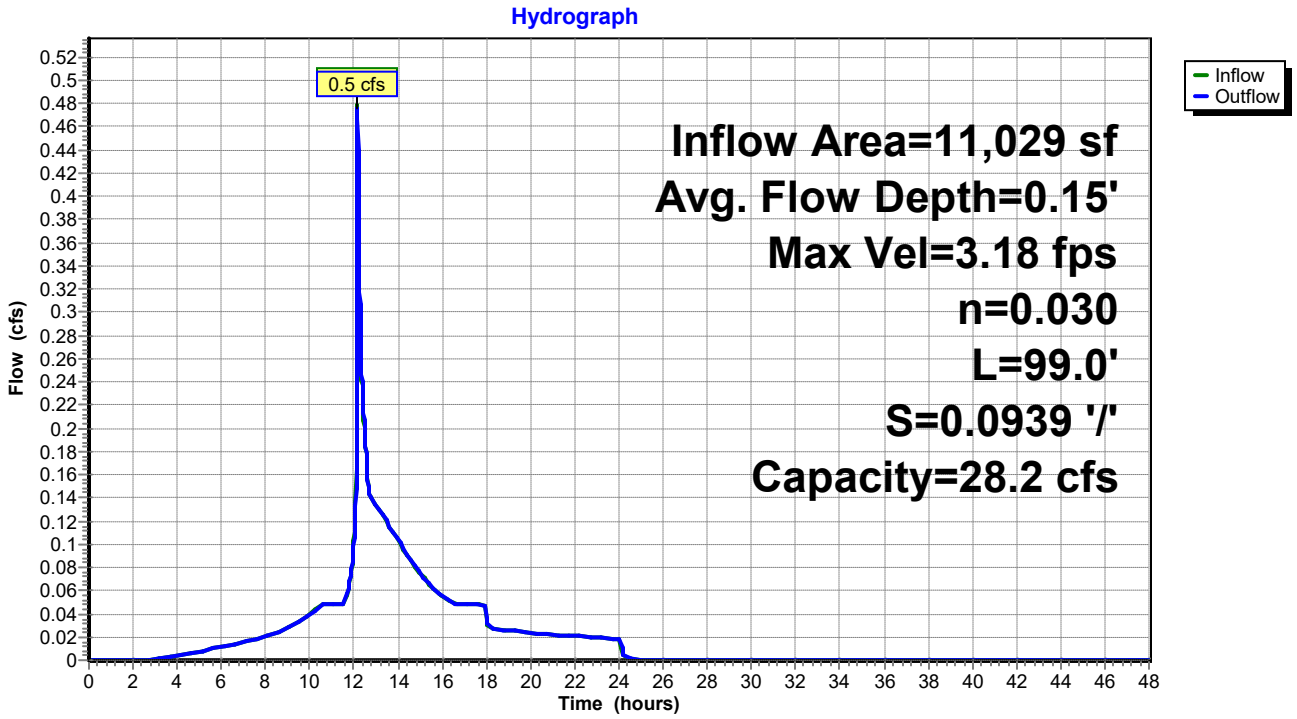
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.18 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 1.2 min

Peak Storage= 15 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 1.53'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 28.2 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 99.0' Slope= 0.0939 '/'
Inlet Invert= 81.00', Outlet Invert= 71.70'



Reach OR3: OVERLAND REACH 3



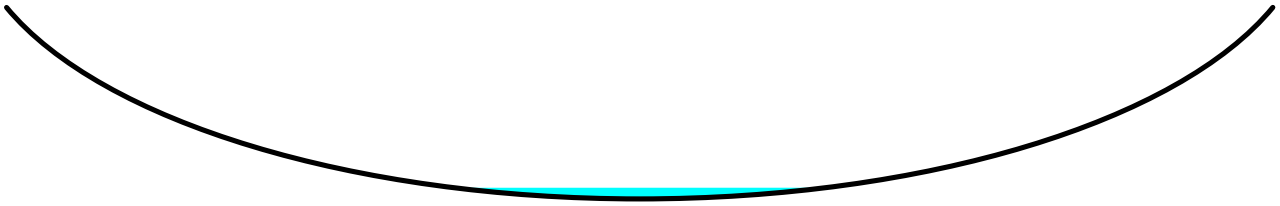
Summary for Reach OR4: OVERLAND REACH 4

Inflow Area = 9,514 sf, 91.53% Impervious, Inflow Depth > 3.83" for 10-yr event
Inflow = 0.2 cfs @ 12.32 hrs, Volume= 3,038 cf
Outflow = 0.2 cfs @ 12.32 hrs, Volume= 3,038 cf, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.95 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 0.4 min

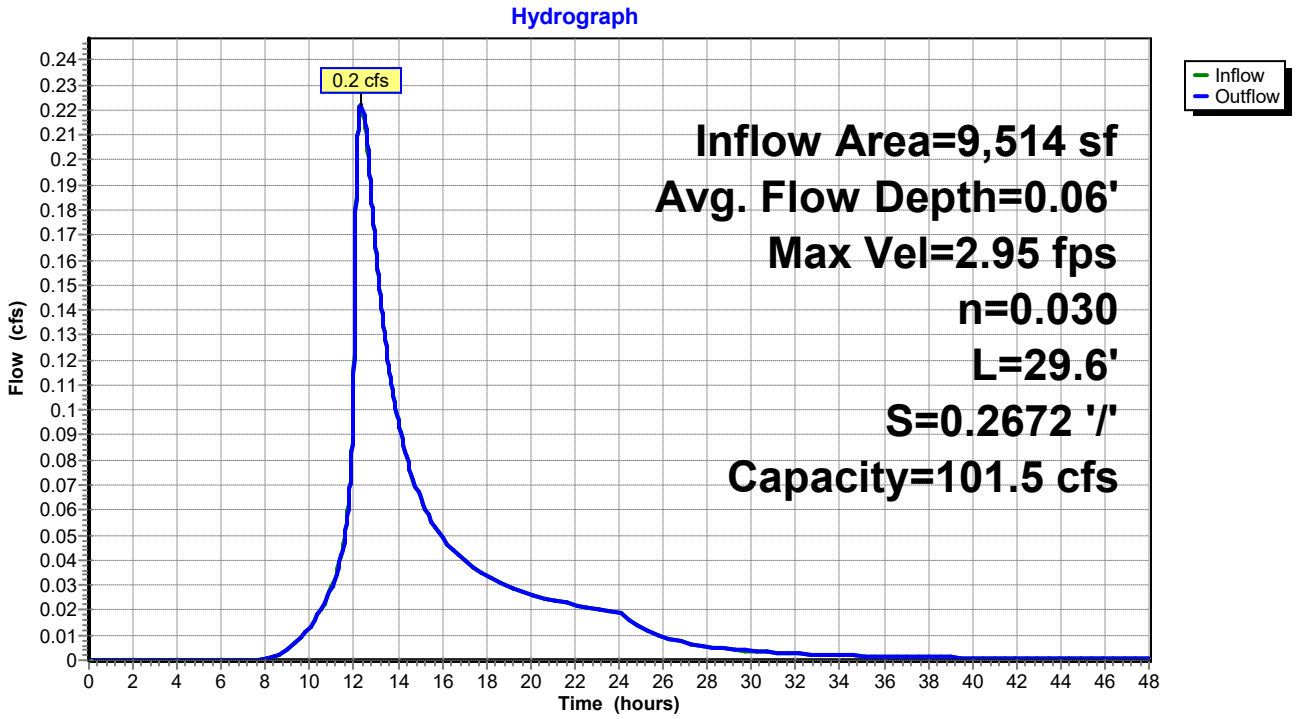
Peak Storage= 2 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 1.93'
Bank-Full Depth= 1.00' Flow Area= 5.3 sf, Capacity= 101.5 cfs

8.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 29.6' Slope= 0.2672 '/'
Inlet Invert= 86.00', Outlet Invert= 78.09'



‡

Reach OR4: OVERLAND REACH 4



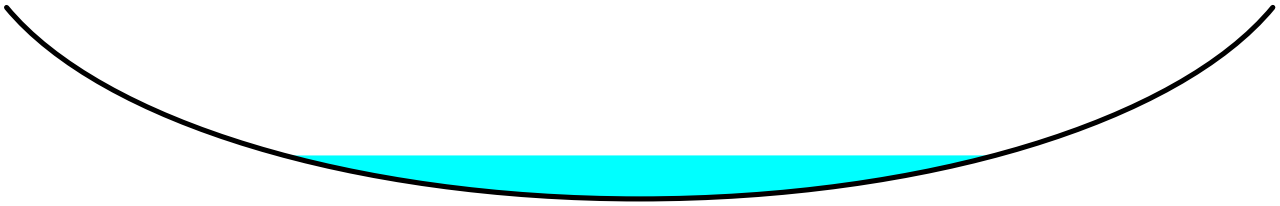
Summary for Reach OR5: OVERLAND REACH 5

Inflow Area = 43,966 sf, 64.14% Impervious, Inflow Depth = 3.56" for 10-yr event
Inflow = 1.5 cfs @ 12.16 hrs, Volume= 13,041 cf
Outflow = 1.5 cfs @ 12.17 hrs, Volume= 13,041 cf, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.05 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 1.5 min

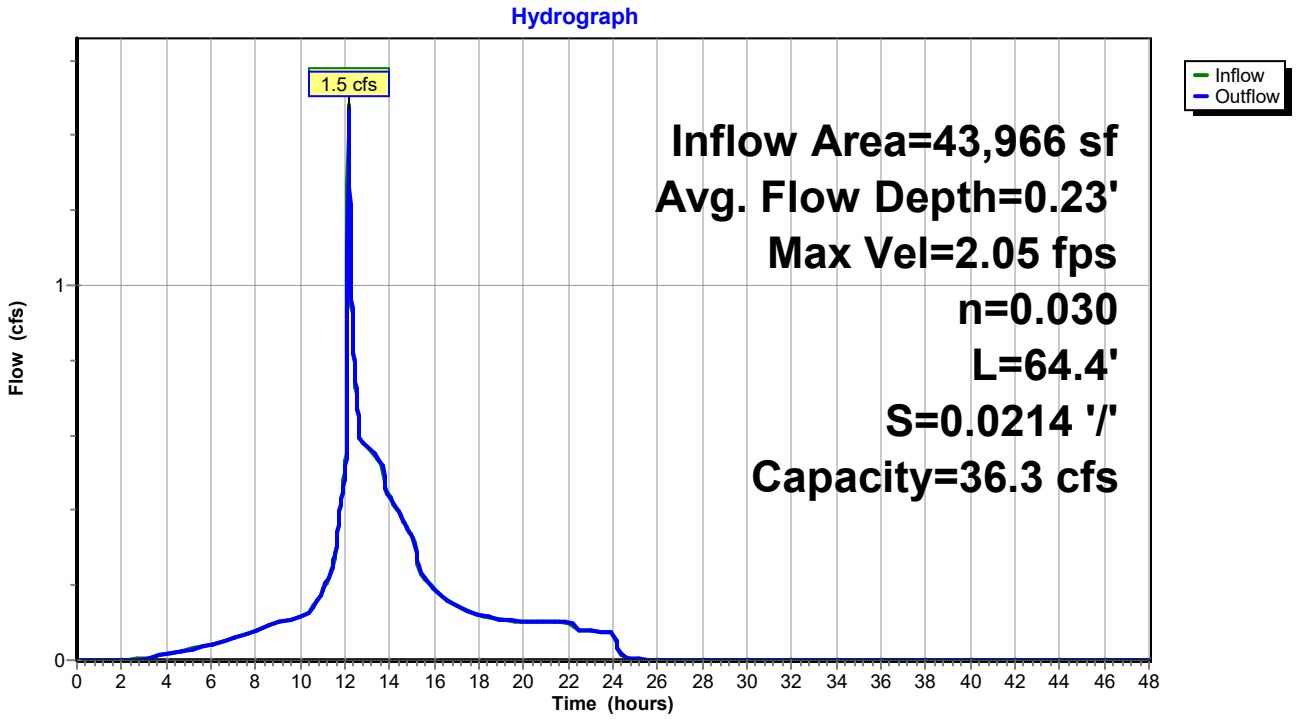
Peak Storage= 46 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 4.76'
Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 36.3 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 64.4' Slope= 0.0214 '/'
Inlet Invert= 66.38', Outlet Invert= 65.00'



‡

Reach OR5: OVERLAND REACH 5



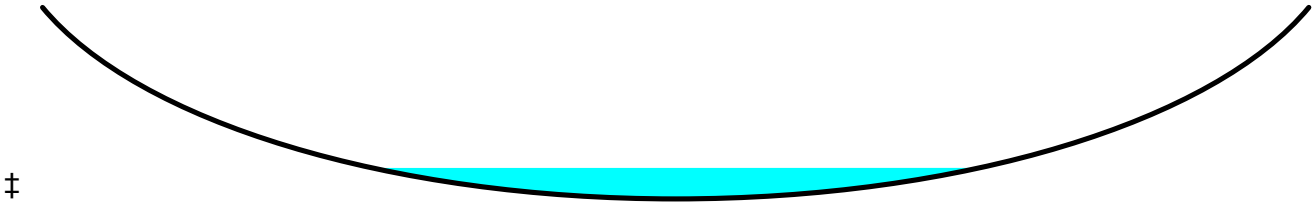
Summary for Reach OR6: OVERLAND REACH 6

Inflow Area = 35,533 sf, 68.54% Impervious, Inflow Depth = 3.68" for 10-yr event
Inflow = 1.4 cfs @ 12.16 hrs, Volume= 10,884 cf
Outflow = 1.4 cfs @ 12.16 hrs, Volume= 10,884 cf, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.98 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.3 min

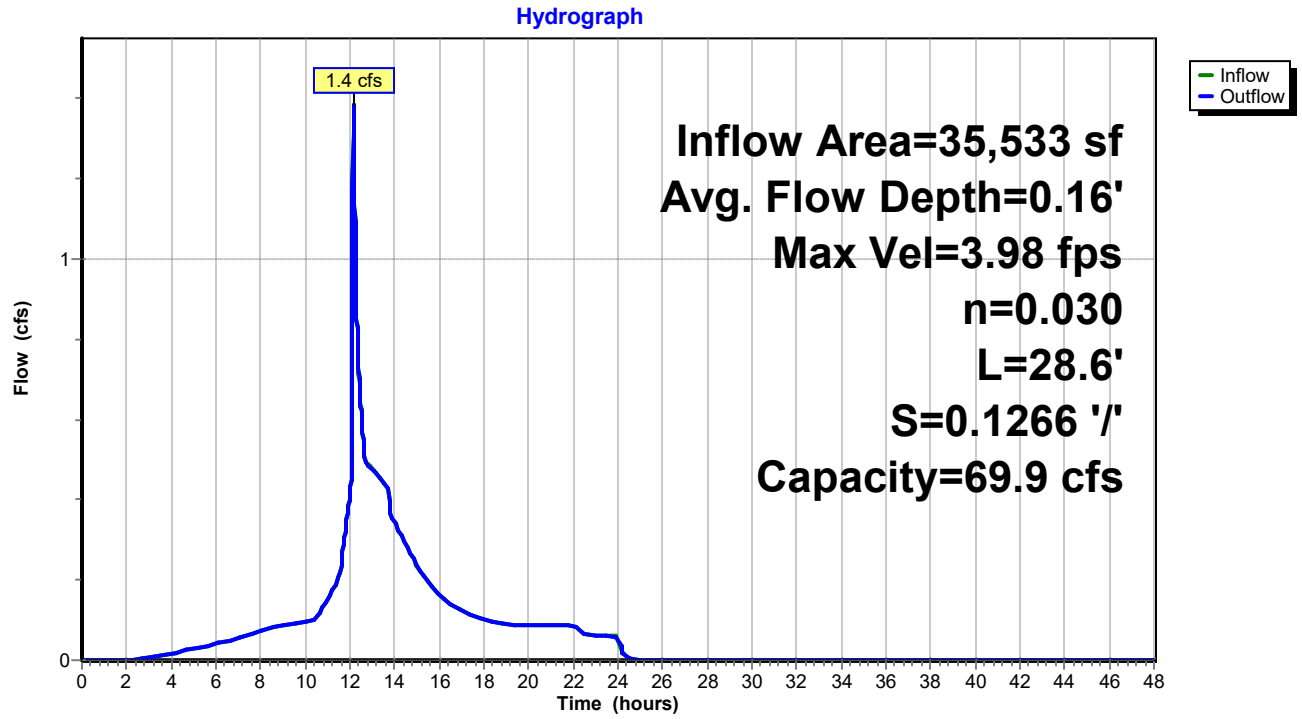
Peak Storage= 10 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 3.22'
Bank-Full Depth= 1.00' Flow Area= 5.3 sf, Capacity= 69.9 cfs

8.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 28.6' Slope= 0.1266 '/'
Inlet Invert= 70.00', Outlet Invert= 66.38'



‡

Reach OR6: OVERLAND REACH 6



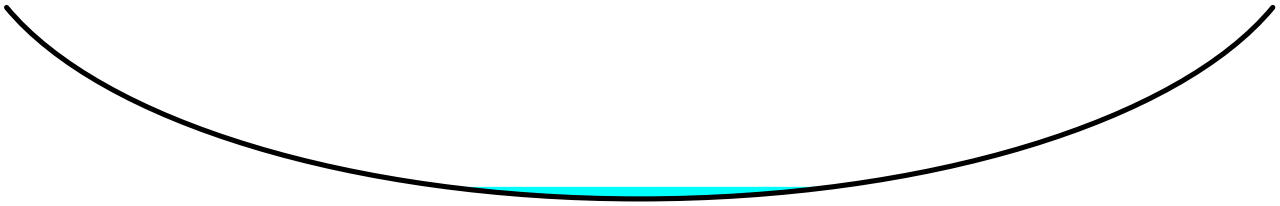
Summary for Reach OR7: OVERLAND REACH 7

Inflow Area = 8,433 sf, 45.59% Impervious, Inflow Depth = 3.07" for 10-yr event
Inflow = 0.1 cfs @ 12.18 hrs, Volume= 2,158 cf
Outflow = 0.1 cfs @ 12.18 hrs, Volume= 2,158 cf, Atten= 3%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.12 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 3.9 min

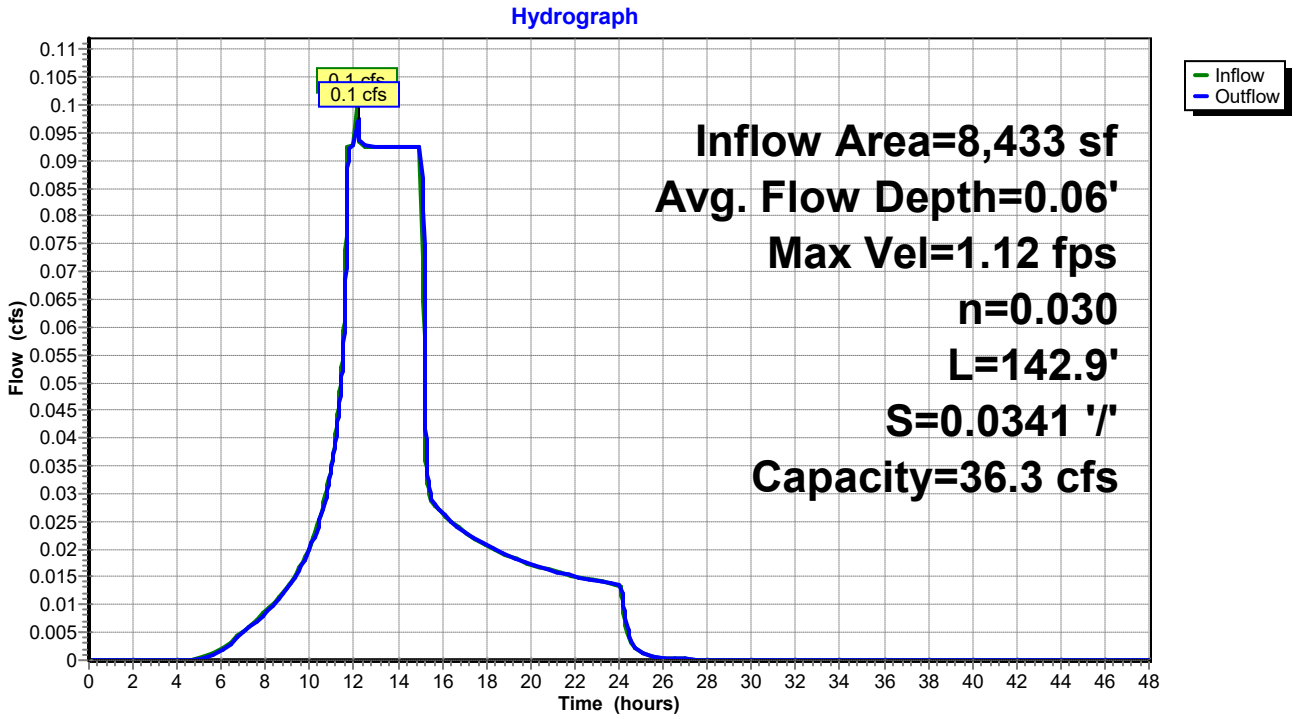
Peak Storage= 12 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 2.03'
Bank-Full Depth= 1.00' Flow Area= 5.3 sf, Capacity= 36.3 cfs

8.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 142.9' Slope= 0.0341 '/'
Inlet Invert= 71.25', Outlet Invert= 66.38'



‡

Reach OR7: OVERLAND REACH 7



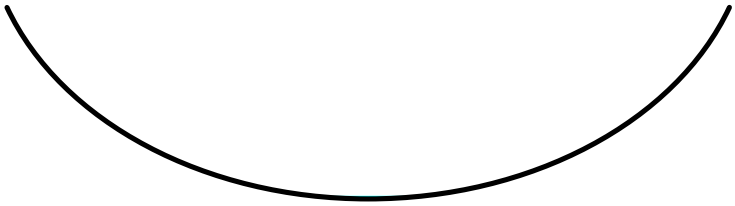
Summary for Reach OR8: OVERLAND REACH 8

Inflow = 0.0 cfs @ 12.17 hrs, Volume= 1 cf
Outflow = 0.0 cfs @ 12.18 hrs, Volume= 1 cf, Atten= 51%, Lag= 0.4 min

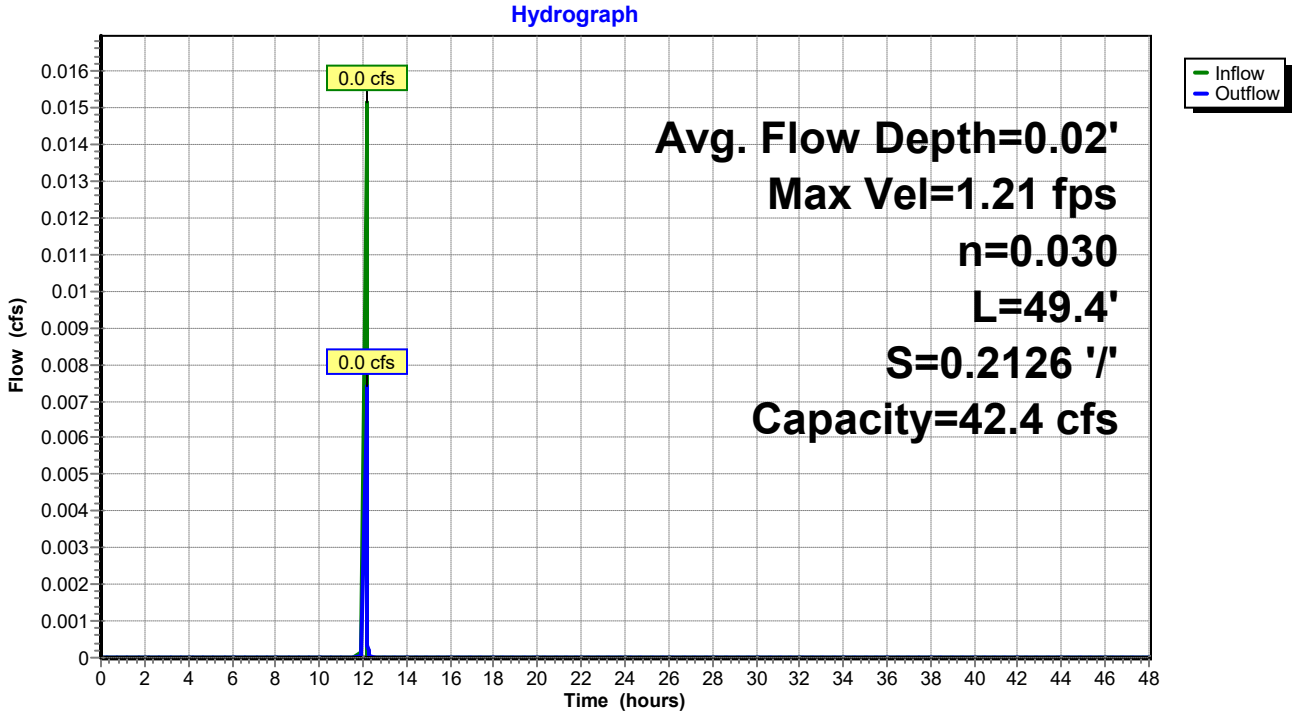
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.21 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 0.9 min

Peak Storage= 0 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 0.52'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 42.4 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 49.4' Slope= 0.2126 '/'
Inlet Invert= 81.75', Outlet Invert= 71.25'



Reach OR8: OVERLAND REACH 8



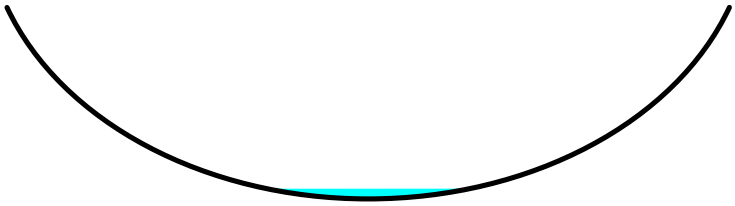
Summary for Reach OR9: OVERLAND REACH 9

Inflow Area = 8,433 sf, 45.59% Impervious, Inflow Depth = 3.07" for 10-yr event
Inflow = 0.1 cfs @ 11.83 hrs, Volume= 2,157 cf
Outflow = 0.1 cfs @ 11.72 hrs, Volume= 2,157 cf, Atten= 0%, Lag= 0.0 min

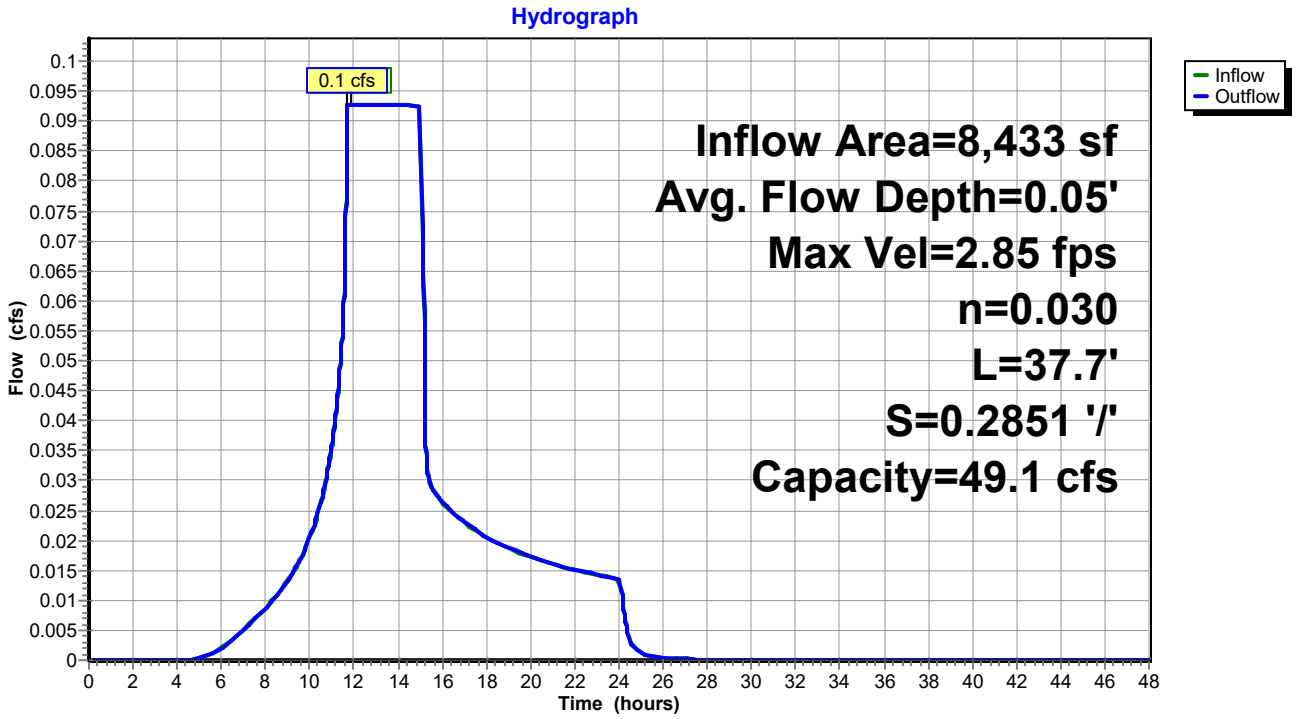
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.85 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 0.4 min

Peak Storage= 1 cf @ 11.72 hrs
Average Depth at Peak Storage= 0.05' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 2.7 sf, Capacity= 49.1 cfs

4.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 37.7' Slope= 0.2851 '/'
Inlet Invert= 82.00', Outlet Invert= 71.25'



Reach OR9: OVERLAND REACH 9



Summary for Pond BP1: BIO POND 1

Inflow Area = 30,461 sf, 67.34% Impervious, Inflow Depth = 3.67" for 10-yr event
Inflow = 2.3 cfs @ 12.04 hrs, Volume= 9,304 cf
Outflow = 1.3 cfs @ 12.16 hrs, Volume= 9,304 cf, Atten= 45%, Lag= 7.1 min
Primary = 1.3 cfs @ 12.16 hrs, Volume= 9,303 cf
Secondary = 0.0 cfs @ 12.17 hrs, Volume= 1 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 77.42' Surf.Area= 325 sf Storage= 39 cf
Peak Elev= 81.77' @ 12.16 hrs Surf.Area= 1,783 sf Storage= 1,913 cf (1,874 cf above start)
Flood Elev= 82.25' Surf.Area= 2,394 sf Storage= 2,797 cf (2,759 cf above start)

Plug-Flow detention time= 45.2 min calculated for 9,264 cf (100% of inflow)
Center-of-Mass det. time= 39.9 min (844.3 - 804.4)

Volume	Invert	Avail.Storage	Storage Description
#1	77.08'	198 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2	77.08'	2,599 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		2,797 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	84	38.1	0.0	0	0	84
78.25	84	38.1	35.0	34	34	129
78.50	84	38.1	20.0	4	39	138
80.00	84	38.1	10.0	13	51	195
80.99	224	56.8	100.0	147	198	344

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	241	87.5	0.0	0	0	241
78.25	241	87.5	35.0	99	99	343
78.50	241	87.5	20.0	12	111	365
80.00	241	87.5	10.0	36	147	497
81.00	1,027	233.4	100.0	589	735	4,226
81.70	1,500	238.1	100.0	879	1,615	4,467
82.00	1,781	286.9	100.0	492	2,106	6,508
82.25	2,170	258.9	100.0	493	2,599	7,726

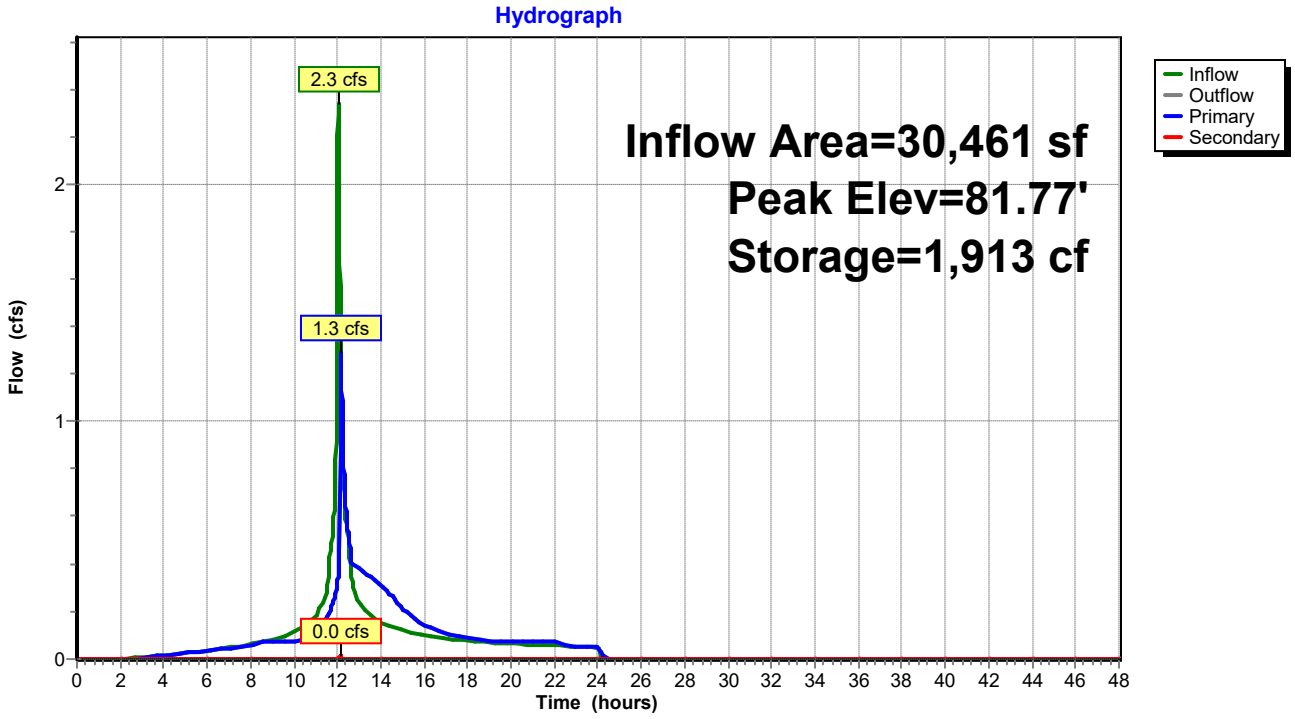
Device	Routing	Invert	Outlet Devices
#1	Primary	70.16'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.16' / 70.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	77.42'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	77.08'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	81.70'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	81.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.3 cfs @ 12.16 hrs HW=81.77' TW=70.16' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.3 cfs of 12.6 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.4 cfs of 1.9 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.4 cfs)
  - **4=Orifice/Grate** (Weir Controls 0.9 cfs @ 0.84 fps)

Secondary OutFlow Max=0.0 cfs @ 12.17 hrs HW=81.76' TW=81.77' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond BP1: BIO POND 1



Summary for Pond BP2: BIO POND 2

Inflow Area = 11,029 sf, 68.15% Impervious, Inflow Depth = 3.63" for 10-yr event
Inflow = 0.9 cfs @ 12.04 hrs, Volume= 3,335 cf
Outflow = 0.5 cfs @ 12.15 hrs, Volume= 3,335 cf, Atten= 44%, Lag= 6.6 min
Primary = 0.5 cfs @ 12.15 hrs, Volume= 3,335 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 81.92' Surf.Area= 208 sf Storage= 25 cf
Peak Elev= 85.81' @ 12.15 hrs Surf.Area= 638 sf Storage= 655 cf (630 cf above start)
Flood Elev= 86.10' Surf.Area= 920 sf Storage= 862 cf (837 cf above start)

Plug-Flow detention time= 42.1 min calculated for 3,310 cf (99% of inflow)
Center-of-Mass det. time= 33.0 min (841.9 - 808.9)

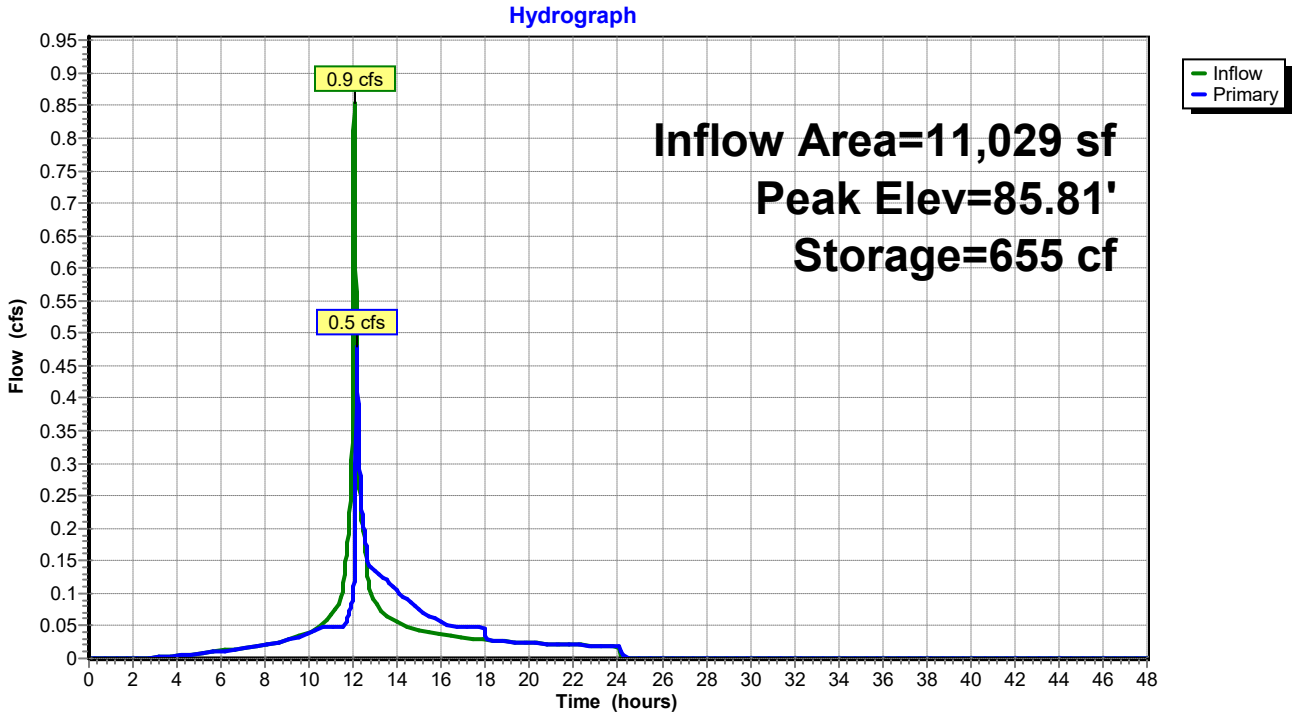
Volume	Invert	Avail.Storage	Storage Description
#1	81.58'	862 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
81.58	208	68.5	0.0	0	0	208
82.75	208	68.5	35.0	85	85	288
83.00	208	68.5	20.0	10	96	305
84.50	208	68.5	10.0	31	127	408
85.00	340	90.3	100.0	136	262	686
85.75	614	128.9	100.0	353	615	1,365
86.00	712	133.6	100.0	166	781	1,468
86.10	920	143.0	100.0	81	862	1,676

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.00' S= 0.0217 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	81.92'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	81.58'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	85.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.5 cfs @ 12.15 hrs HW=85.81' TW=81.15' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.5 cfs of 7.4 cfs potential flow)
  └─**2=Orifice/Grate** (Passes 0.1 cfs of 1.8 cfs potential flow)
    └─**3=Exfiltration** (Exfiltration Controls 0.1 cfs)
  └─**4=Orifice/Grate** (Weir Controls 0.3 cfs @ 0.83 fps)

Pond BP2: BIO POND 2



Summary for Pond DE1: DRIP EDGE 1

Inflow Area = 4,878 sf, 41.59% Impervious, Inflow Depth = 2.95" for 10-yr event
Inflow = 0.3 cfs @ 12.04 hrs, Volume= 1,199 cf
Outflow = 0.1 cfs @ 11.97 hrs, Volume= 1,199 cf, Atten= 66%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.97 hrs, Volume= 1,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 87.50' Surf.Area= 480 sf Storage= 96 cf
Peak Elev= 88.24' @ 12.25 hrs Surf.Area= 480 sf Storage= 237 cf (141 cf above start)
Flood Elev= 93.25' Surf.Area= 480 sf Storage= 1,080 cf (984 cf above start)

Plug-Flow detention time= 85.6 min calculated for 1,102 cf (92% of inflow)
Center-of-Mass det. time= 14.7 min (856.8 - 842.2)

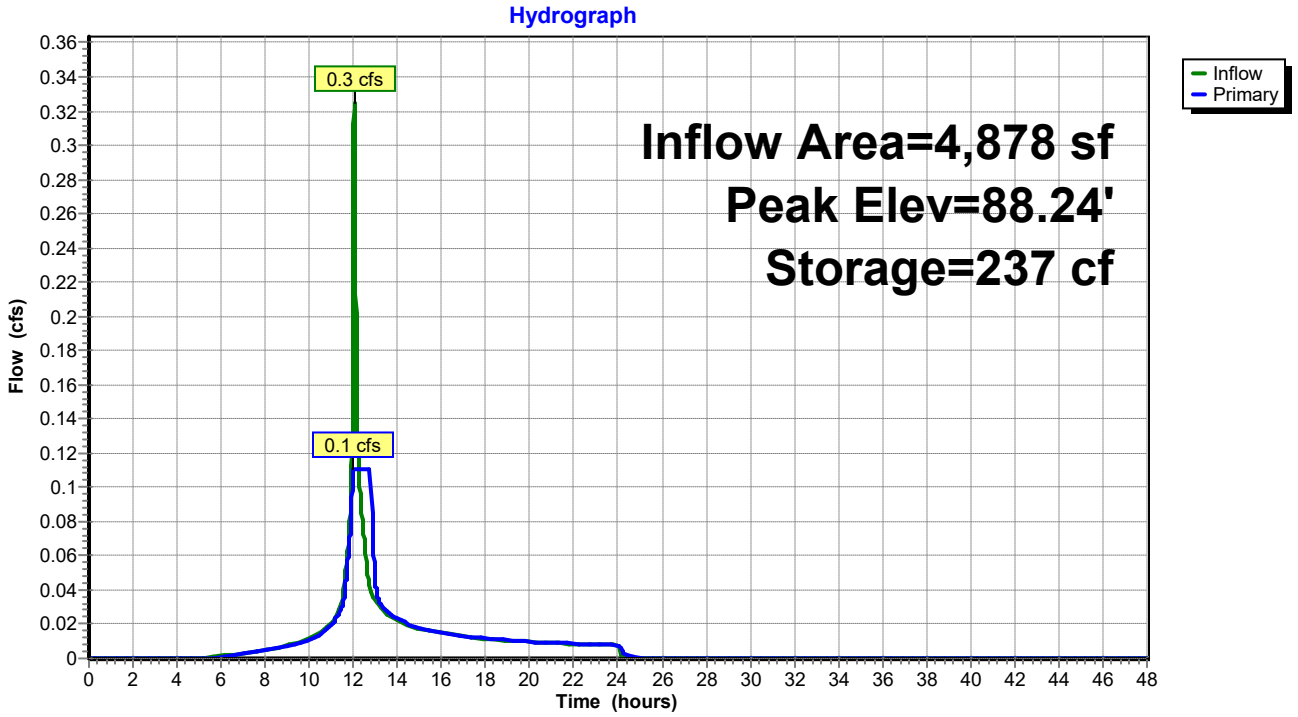
Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1,080 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	480	0.0	0	0
89.00	480	40.0	384	384
91.00	480	20.0	192	576
93.00	480	40.0	384	960
93.25	480	100.0	120	1,080

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0208 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	87.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.97 hrs HW=87.70' TW=83.99' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Pond DE1: DRIP EDGE 1



Summary for Pond DE2: DRIP EDGE 2

Inflow Area = 8,433 sf, 45.59% Impervious, Inflow Depth = 3.07" for 10-yr event
Inflow = 0.4 cfs @ 12.04 hrs, Volume= 2,157 cf
Outflow = 0.1 cfs @ 11.83 hrs, Volume= 2,157 cf, Atten= 75%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.83 hrs, Volume= 2,157 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 83.50' Surf.Area= 400 sf Storage= 80 cf
Peak Elev= 86.27' @ 12.92 hrs Surf.Area= 400 sf Storage= 501 cf (421 cf above start)
Flood Elev= 90.25' Surf.Area= 400 sf Storage= 1,060 cf (980 cf above start)

Plug-Flow detention time= 66.2 min calculated for 2,076 cf (96% of inflow)
Center-of-Mass det. time= 28.7 min (873.1 - 844.5)

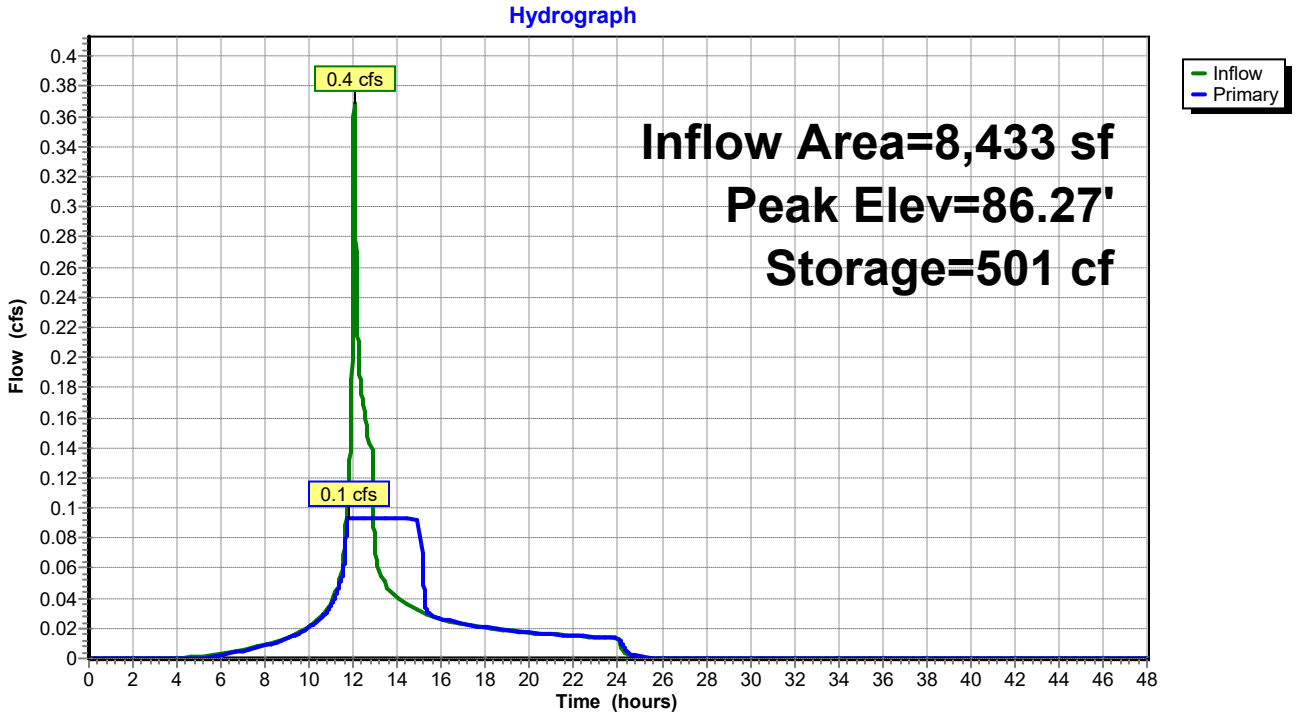
Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	1,060 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	400	0.0	0	0
86.00	400	40.0	480	480
88.00	400	20.0	160	640
90.00	400	40.0	320	960
90.25	400	100.0	100	1,060

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 83.50' / 82.00' S= 0.0625 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	83.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.83 hrs HW=83.73' TW=82.05' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.1 cfs of 0.2 cfs potential flow)
↑**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Pond DE2: DRIP EDGE 2



Summary for Pond DE3: DRIP EDGE 3

Inflow Area = 2,712 sf, 75.22% Impervious, Inflow Depth = 3.74" for 10-yr event
Inflow = 0.2 cfs @ 12.04 hrs, Volume= 845 cf
Outflow = 0.1 cfs @ 12.00 hrs, Volume= 845 cf, Atten= 50%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.00 hrs, Volume= 845 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 73.50' Surf.Area= 480 sf Storage= 96 cf
Peak Elev= 73.88' @ 12.16 hrs Surf.Area= 480 sf Storage= 169 cf (73 cf above start)
Flood Elev= 78.25' Surf.Area= 480 sf Storage= 984 cf (888 cf above start)

Plug-Flow detention time= 121.3 min calculated for 749 cf (89% of inflow)
Center-of-Mass det. time= 15.2 min (818.8 - 803.6)

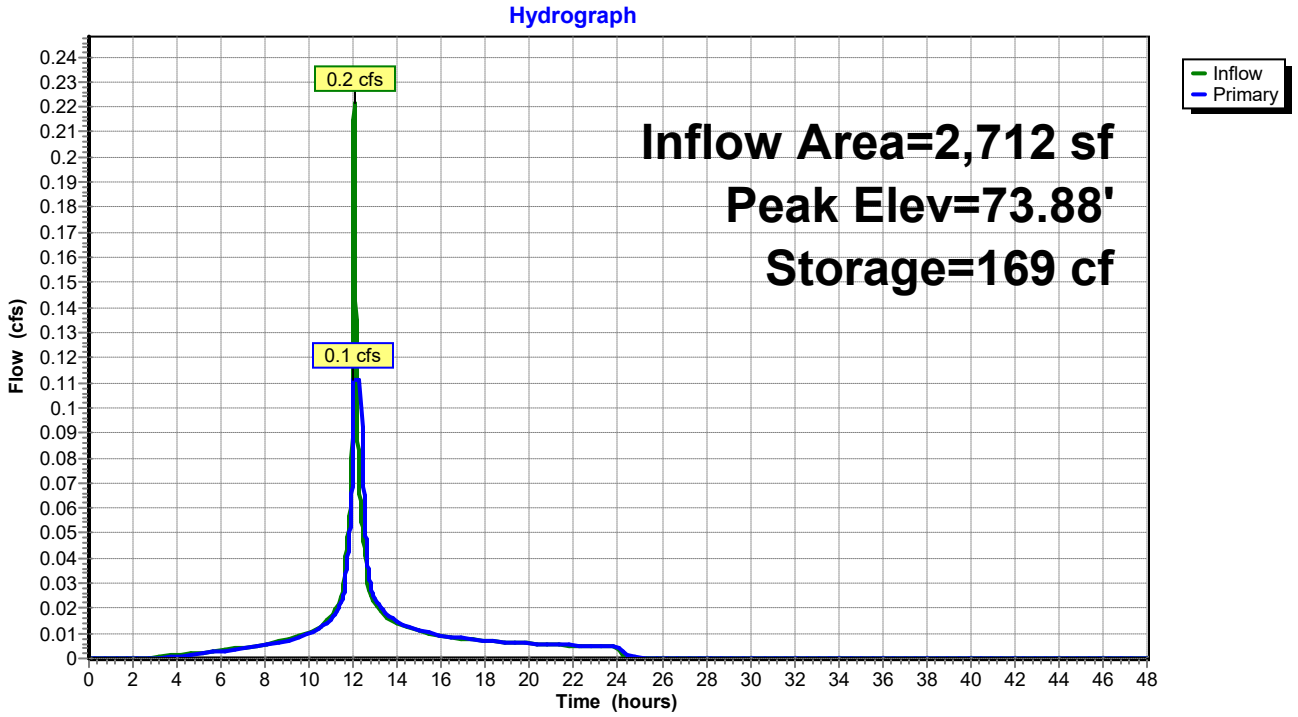
Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	984 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	480	0.0	0	0
75.00	480	40.0	384	384
76.00	480	20.0	96	480
78.00	480	40.0	384	864
78.25	480	100.0	120	984

Device	Routing	Invert	Outlet Devices
#1	Primary	73.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.50' / 73.00' S= 0.0208 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	73.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 12.00 hrs HW=73.69' TW=71.88' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Pond DE3: DRIP EDGE 3



Summary for Pond DE4: DRIP EDGE 4

Inflow Area = 5,072 sf, 75.71% Impervious, Inflow Depth = 3.74" for 10-yr event
Inflow = 0.3 cfs @ 12.04 hrs, Volume= 1,581 cf
Outflow = 0.1 cfs @ 11.89 hrs, Volume= 1,580 cf, Atten= 70%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.89 hrs, Volume= 1,580 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 71.50' Surf.Area= 400 sf Storage= 80 cf
Peak Elev= 72.99' @ 12.52 hrs Surf.Area= 400 sf Storage= 318 cf (238 cf above start)
Flood Elev= 76.25' Surf.Area= 400 sf Storage= 820 cf (740 cf above start)

Plug-Flow detention time= 71.9 min calculated for 1,500 cf (95% of inflow)
Center-of-Mass det. time= 17.7 min (829.4 - 811.7)

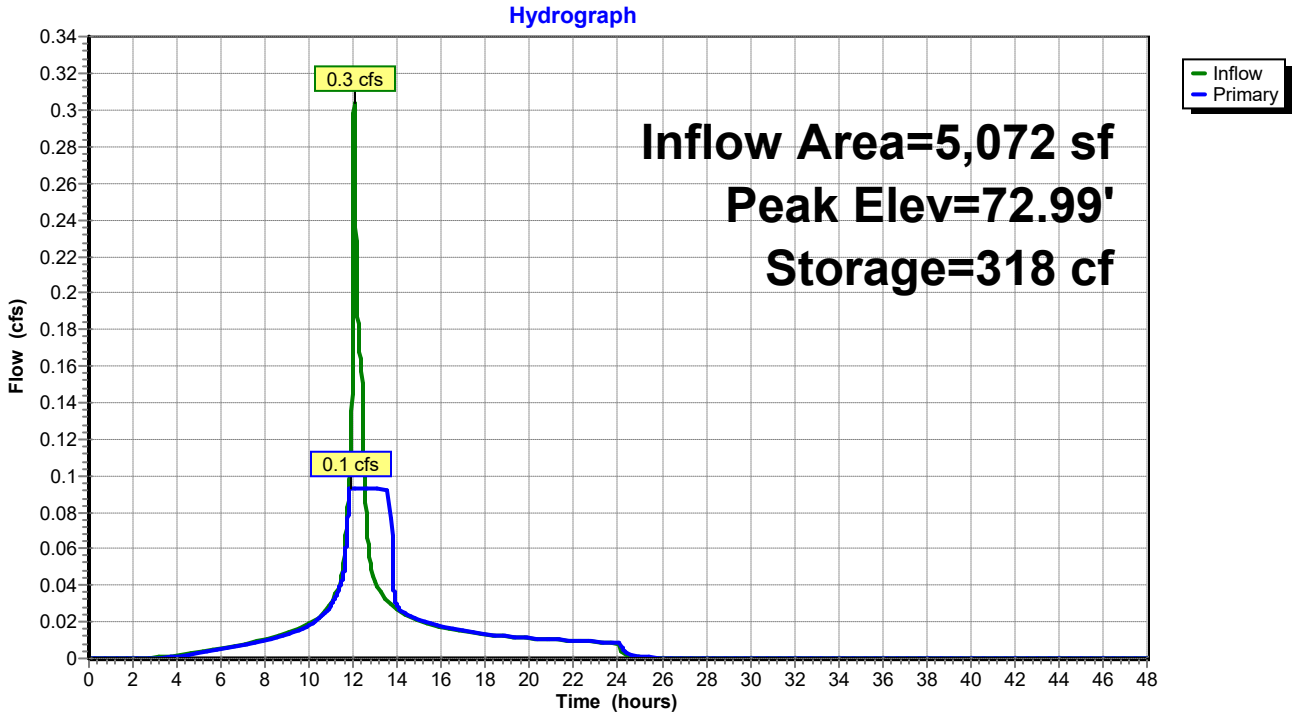
Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.00	400	0.0	0	0
73.00	400	40.0	320	320
74.00	400	20.0	80	400
76.00	400	40.0	320	720
76.25	400	100.0	100	820

Device	Routing	Invert	Outlet Devices
#1	Primary	71.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.50' / 70.00' S= 0.0750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	71.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.89 hrs HW=71.68' TW=70.09' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Pond DE4: DRIP EDGE 4



Summary for Pond PCB1: PCB1

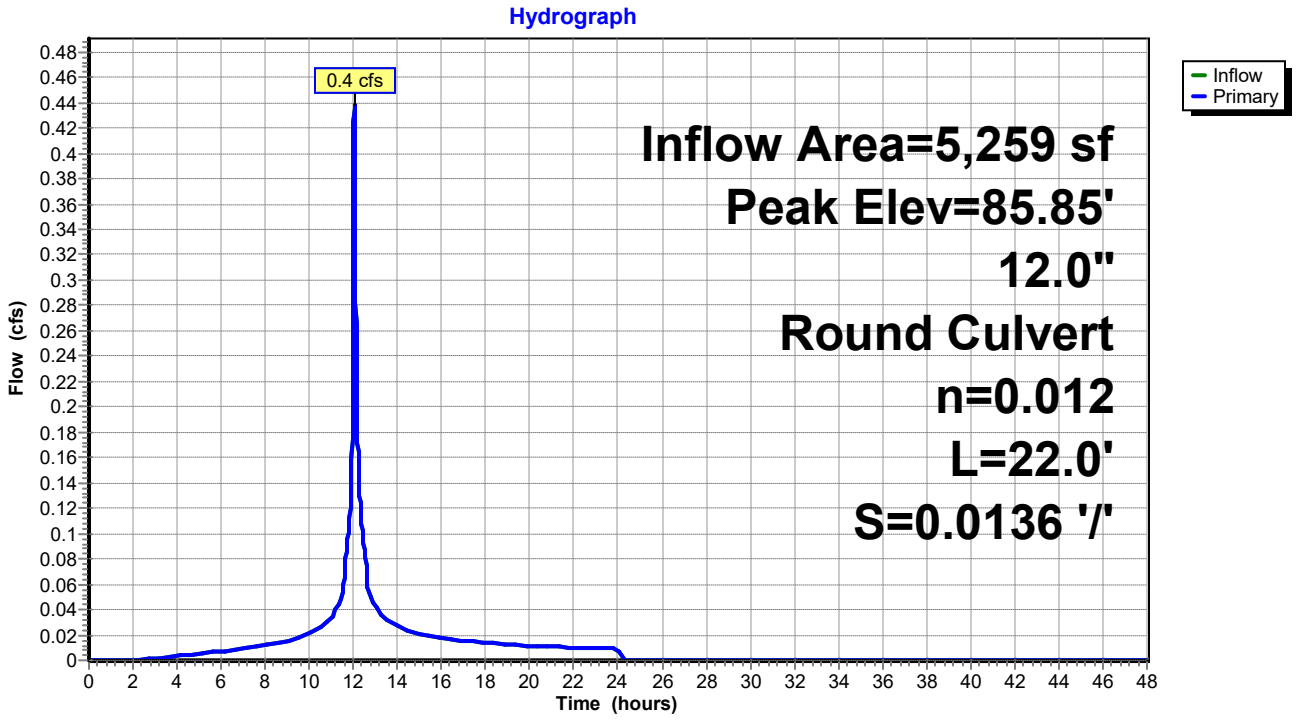
Inflow Area = 5,259 sf, 78.40% Impervious, Inflow Depth = 3.85" for 10-yr event
Inflow = 0.4 cfs @ 12.04 hrs, Volume= 1,685 cf
Outflow = 0.4 cfs @ 12.04 hrs, Volume= 1,685 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.04 hrs, Volume= 1,685 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 85.85' @ 12.15 hrs
Flood Elev= 88.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	85.30'	**12.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.30' / 85.00' S= 0.0136 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.04 hrs HW=85.71' TW=85.58' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.4 cfs @ 1.87 fps)

Pond PCB1: PCB1



Summary for Pond PCB2: PCB2

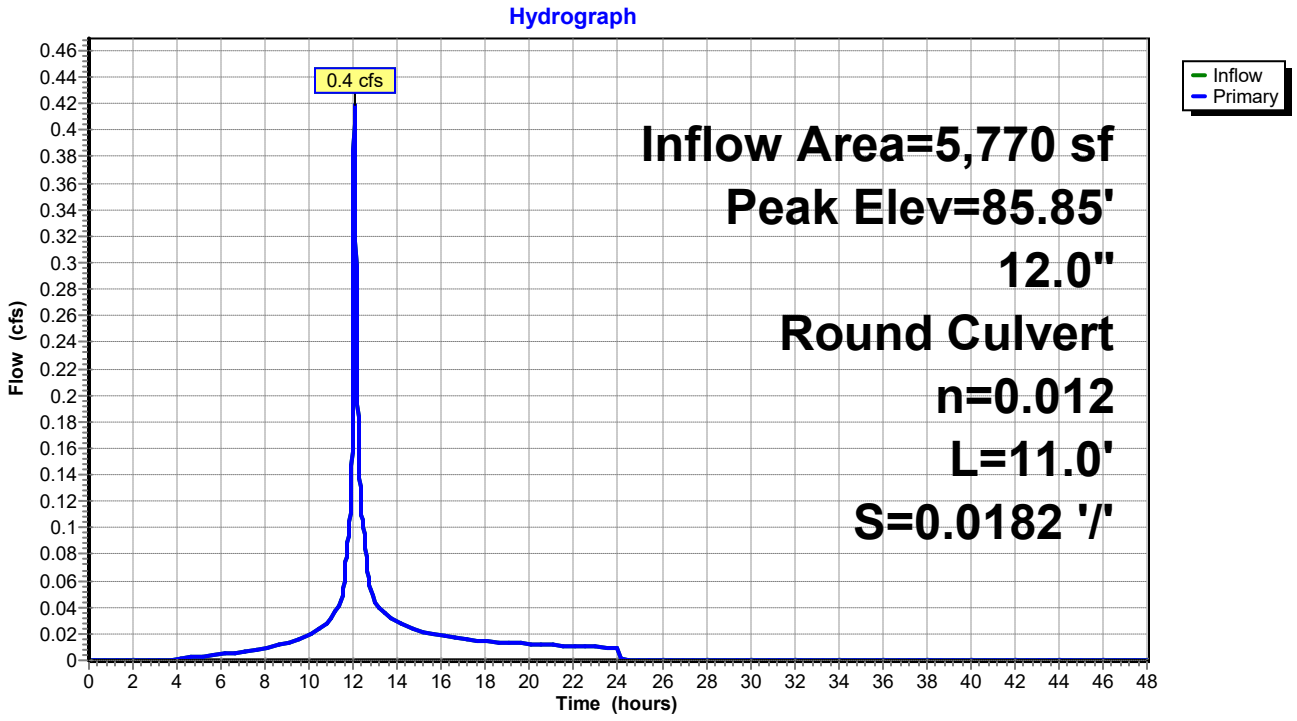
Inflow Area = 5,770 sf, 58.80% Impervious, Inflow Depth = 3.43" for 10-yr event
Inflow = 0.4 cfs @ 12.05 hrs, Volume= 1,650 cf
Outflow = 0.4 cfs @ 12.05 hrs, Volume= 1,650 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.05 hrs, Volume= 1,650 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 85.85' @ 12.15 hrs
Flood Elev= 88.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	85.30'	**12.0" Round Culvert** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.30' / 85.10' S= 0.0182 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.05 hrs HW=85.71' TW=85.62' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.4 cfs @ 1.72 fps)

Pond PCB2: PCB2



Summary for Pond PDMH1: PDMH1

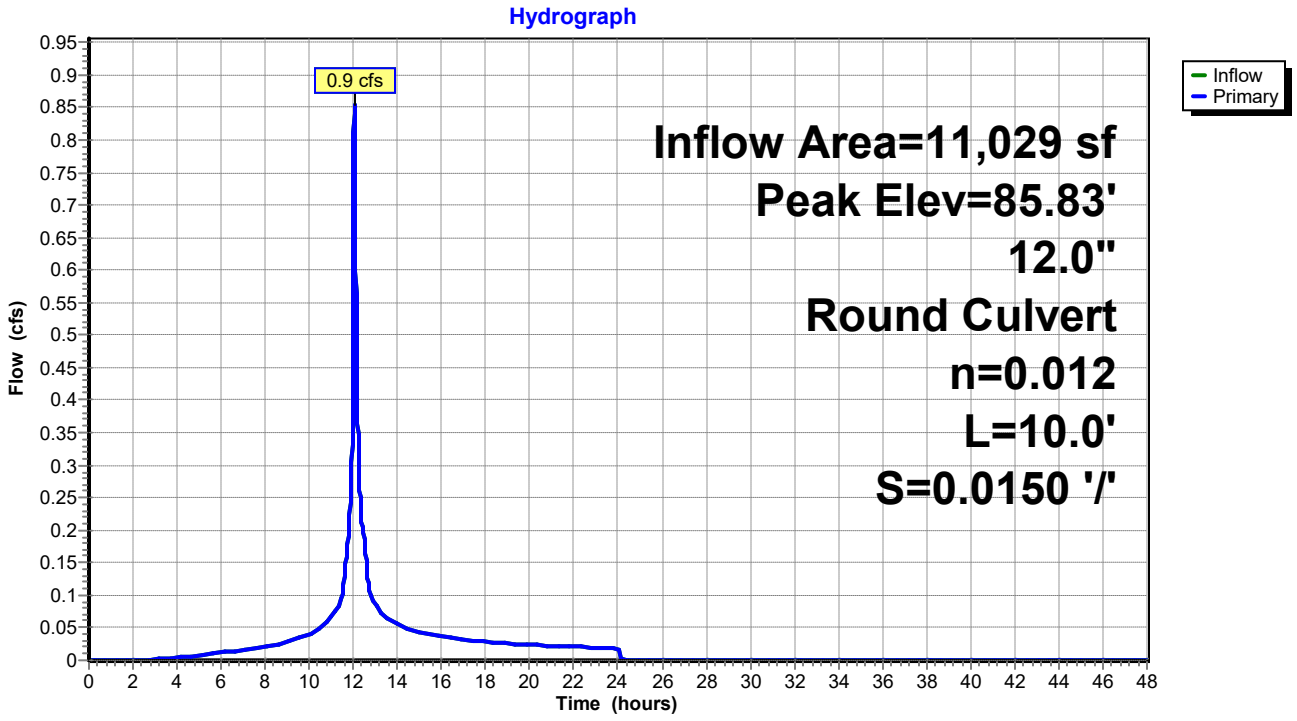
Inflow Area = 11,029 sf, 68.15% Impervious, Inflow Depth = 3.63" for 10-yr event
Inflow = 0.9 cfs @ 12.04 hrs, Volume= 3,335 cf
Outflow = 0.9 cfs @ 12.04 hrs, Volume= 3,335 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.04 hrs, Volume= 3,335 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 85.83' @ 12.15 hrs
Flood Elev= 89.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.90'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.90' / 84.75' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.6 cfs @ 12.04 hrs HW=85.60' TW=85.54' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.6 cfs @ 1.53 fps)

Pond PDMH1: PDMH1



Summary for Pond PP1: POROUS PAVEMENT 1

Inflow Area = 9,514 sf, 91.53% Impervious, Inflow Depth = 4.28" for 10-yr event
Inflow = 0.8 cfs @ 12.04 hrs, Volume= 3,397 cf
Outflow = 0.2 cfs @ 12.32 hrs, Volume= 3,038 cf, Atten= 74%, Lag= 16.9 min
Primary = 0.2 cfs @ 12.32 hrs, Volume= 3,038 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 88.75' Surf.Area= 8,451 sf Storage= 976 cf
Peak Elev= 89.22' @ 12.32 hrs Surf.Area= 8,451 sf Storage= 2,377 cf (1,401 cf above start)
Flood Elev= 91.50' Surf.Area= 8,451 sf Storage= 6,110 cf (5,134 cf above start)

Plug-Flow detention time= 475.7 min calculated for 2,062 cf (61% of inflow)
Center-of-Mass det. time= 206.8 min (976.6 - 769.8)

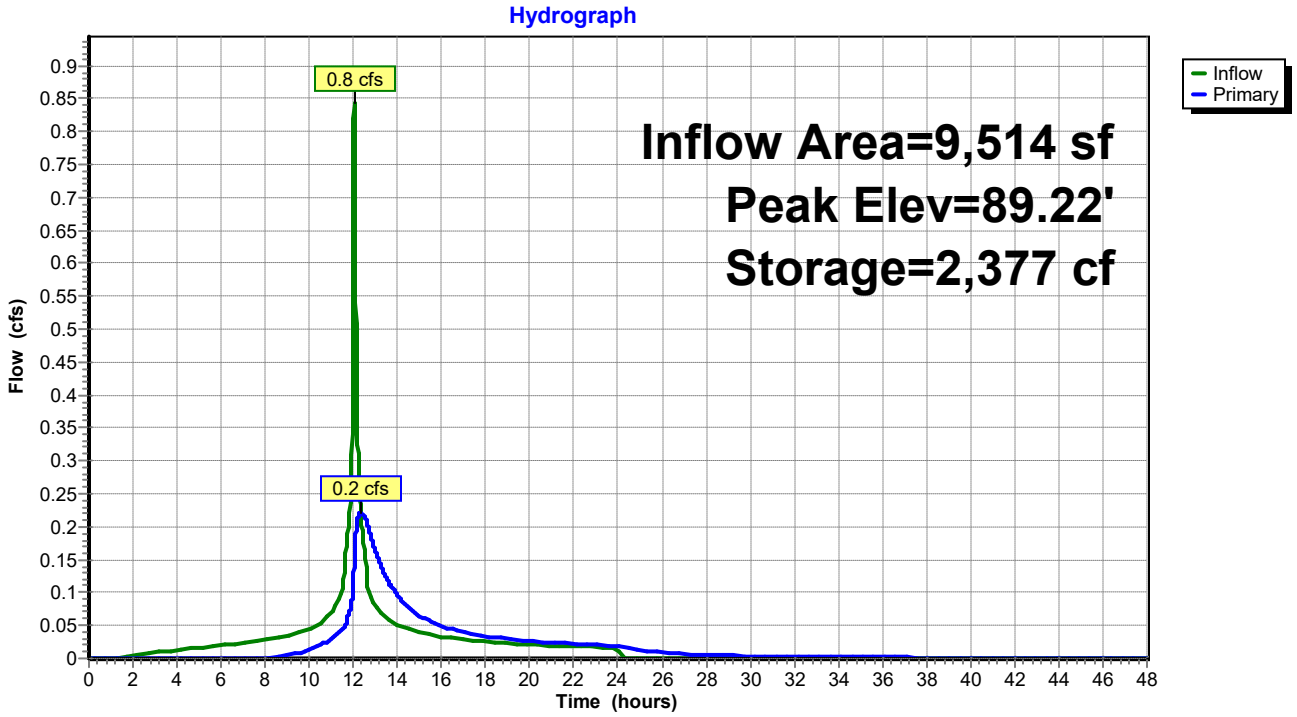
Volume	Invert	Avail.Storage	Storage Description
#1	88.42'	6,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.42	8,451	538.7	0.0	0	0	8,451
89.58	8,451	538.7	35.0	3,431	3,431	9,076
89.83	8,451	538.7	20.0	423	3,854	9,211
90.83	8,451	538.7	10.0	845	4,699	9,749
91.17	8,451	538.7	20.0	575	5,273	9,932
91.50	8,451	538.7	30.0	837	6,110	10,110

Device	Routing	Invert	Outlet Devices
#1	Primary	88.25'	**12.0" Round Culvert** L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.25' / 86.00' S= 0.0469 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	88.85'	**6.0" Round Culvert X 2.00** L= 180.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 88.85' / 88.75' S= 0.0006 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.2 cfs @ 12.32 hrs HW=89.22' TW=86.06' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.2 cfs of 2.6 cfs potential flow)
↑**2=Culvert** (Barrel Controls 0.2 cfs @ 0.98 fps)

Pond PP1: POROUS PAVEMENT 1



Summary for Pond RG1: RAIN GUARDIAN 1

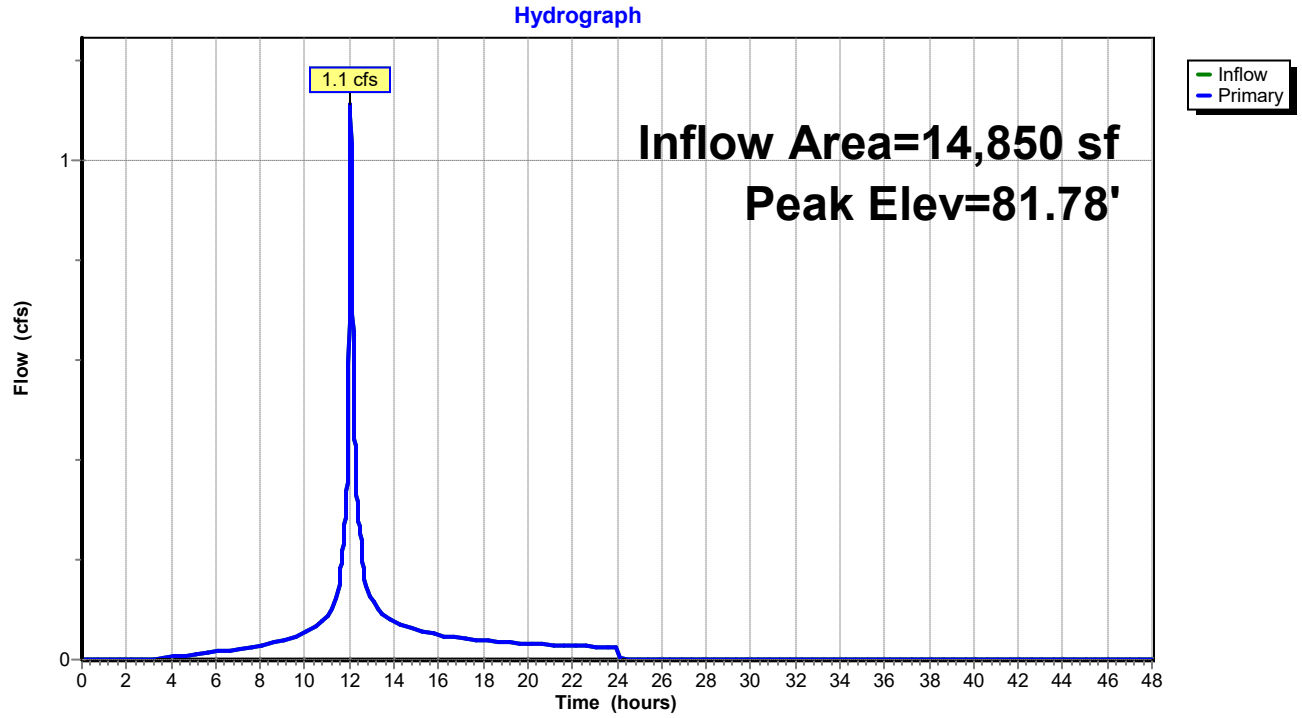
Inflow Area = 14,850 sf, 66.47% Impervious, Inflow Depth = 3.64" for 10-yr event
Inflow = 1.1 cfs @ 12.05 hrs, Volume= 4,499 cf
Outflow = 1.1 cfs @ 12.05 hrs, Volume= 4,499 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.1 cfs @ 12.05 hrs, Volume= 4,499 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 81.78' @ 12.16 hrs
Flood Elev= 82.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	81.09'	**38.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	81.94'	**41.0" W x 3.2" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.0 cfs @ 12.05 hrs HW=81.47' TW=81.48' (Dynamic Tailwater)
1=Orifice/Grate (Controls 0.0 cfs)
2=Orifice/Grate (Controls 0.0 cfs)

Pond RG1: RAIN GUARDIAN 1



Summary for Pond RG2: RAIN GUARDIAN 2

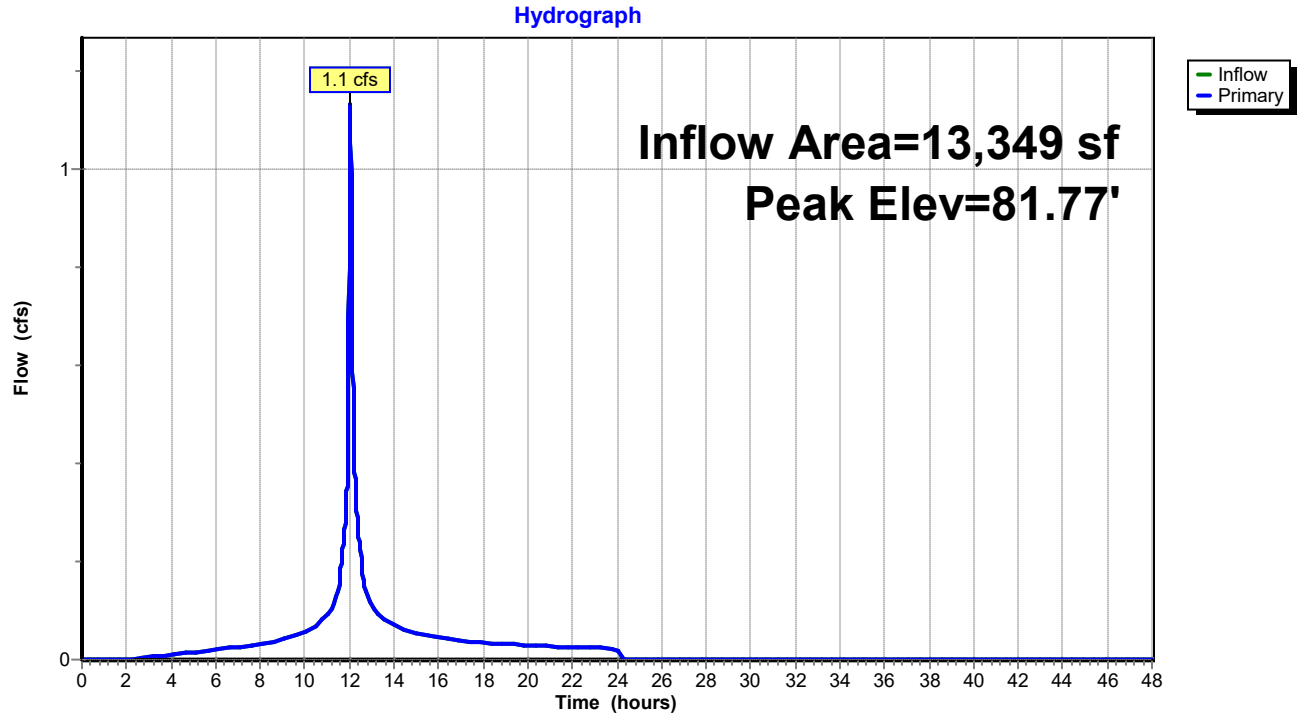
Inflow Area = 13,349 sf, 79.72% Impervious, Inflow Depth = 3.95" for 10-yr event
Inflow = 1.1 cfs @ 12.04 hrs, Volume= 4,397 cf
Outflow = 1.1 cfs @ 12.04 hrs, Volume= 4,397 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.1 cfs @ 12.04 hrs, Volume= 4,397 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 81.77' @ 12.16 hrs
Flood Elev= 82.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	81.09'	**38.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	81.94'	**41.0" W x 3.2" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.4 cfs @ 12.04 hrs HW=81.41' TW=81.40' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 0.4 cfs @ 0.41 fps)
└─**2=Orifice/Grate** (Controls 0.0 cfs)

Pond RG2: RAIN GUARDIAN 2

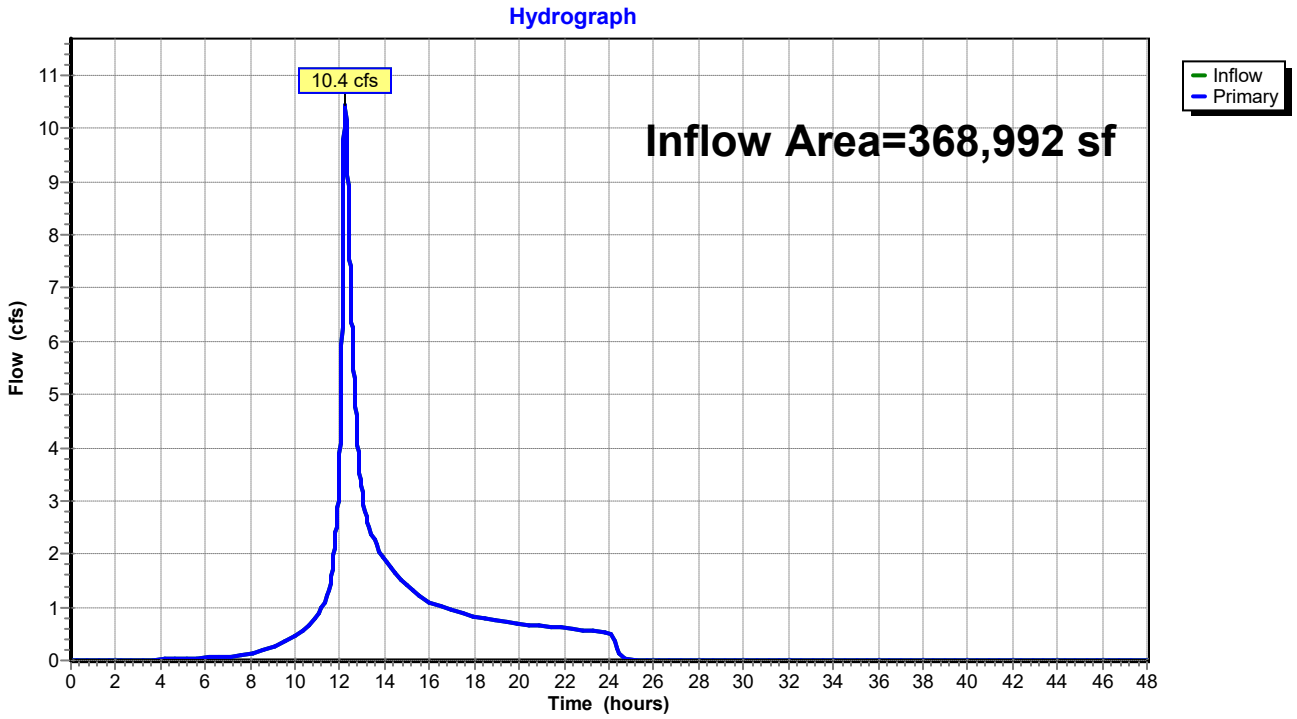


Summary for Link DPA: DPA

Inflow Area = 368,992 sf, 16.90% Impervious, Inflow Depth = 2.42" for 10-yr event
Inflow = 10.4 cfs @ 12.24 hrs, Volume= 74,386 cf
Primary = 10.4 cfs @ 12.24 hrs, Volume= 74,386 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DPA: DPA



A – 2

NODE LISTING – 25-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA1: WS-A1 Runoff Area=304,483 sf 5.89% Impervious Runoff Depth=3.19"
Flow Length=769' Tc=21.4 min CN=74 Runoff=12.2 cfs 81,025 cf

Subcatchment WSA2.1: WS-A2.1 Runoff Area=5,770 sf 58.80% Impervious Runoff Depth=4.64"
Flow Length=316' Tc=7.0 min CN=88 Runoff=0.5 cfs 2,229 cf

Subcatchment WSA2.2: WS-A2.2 Runoff Area=5,259 sf 78.40% Impervious Runoff Depth=5.08"
Flow Length=241' Slope=0.0400 '/' Tc=6.0 min CN=92 Runoff=0.5 cfs 2,226 cf

Subcatchment WSA2.3: WS-A2.3 Runoff Area=9,514 sf 91.53% Impervious Runoff Depth=5.54"
Flow Length=19' Slope=0.0530 '/' Tc=6.0 min CN=96 Runoff=1.0 cfs 4,390 cf

Subcatchment WSA2.4: WS-A2.4 Runoff Area=14,850 sf 66.47% Impervious Runoff Depth=4.86"
Flow Length=310' Tc=7.3 min CN=90 Runoff=1.4 cfs 6,009 cf

Subcatchment WSA2.5: WS-A2.5 Runoff Area=13,349 sf 79.72% Impervious Runoff Depth=5.19"
Flow Length=254' Tc=6.0 min CN=93 Runoff=1.4 cfs 5,776 cf

Subcatchment WSA2.6: WS-A2.6 Runoff Area=4,878 sf 41.59% Impervious Runoff Depth=4.10"
Flow Length=35' Slope=0.0570 '/' Tc=6.0 min CN=83 Runoff=0.4 cfs 1,667 cf

Subcatchment WSA2.7: WS-A2.7 Runoff Area=2,712 sf 75.22% Impervious Runoff Depth=4.97"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.3 cfs 1,123 cf

Subcatchment WSA2.8: WS-A2.8 Runoff Area=3,555 sf 51.08% Impervious Runoff Depth=4.42"
Flow Length=46' Slope=0.1250 '/' Tc=6.0 min CN=86 Runoff=0.3 cfs 1,309 cf

Subcatchment WSA2.9: WS-A2.9 Runoff Area=2,360 sf 76.27% Impervious Runoff Depth=4.97"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.2 cfs 977 cf

Subcatchment WSBP1: WS-BP1 Runoff Area=2,262 sf 0.00% Impervious Runoff Depth=3.19"
Flow Length=25' Slope=0.1250 '/' Tc=6.0 min CN=74 Runoff=0.2 cfs 602 cf

Reach OR1: OVERLAND REACH 1 Avg. Flow Depth=0.20' Max Vel=1.68 fps Inflow=1.2 cfs 8,485 cf
n=0.035 L=285.0' S=0.0228 '/' Capacity=32.1 cfs Outflow=1.0 cfs 8,484 cf

Reach OR2: OVERLAND REACH 2 Avg. Flow Depth=0.10' Max Vel=1.44 fps Inflow=0.3 cfs 4,031 cf
n=0.030 L=197.3' S=0.0324 '/' Capacity=44.6 cfs Outflow=0.3 cfs 4,030 cf

Reach OR3: OVERLAND REACH 3 Avg. Flow Depth=0.20' Max Vel=3.90 fps Inflow=0.9 cfs 4,455 cf
n=0.030 L=99.0' S=0.0939 '/' Capacity=28.2 cfs Outflow=0.9 cfs 4,455 cf

Reach OR4: OVERLAND REACH 4 Avg. Flow Depth=0.07' Max Vel=3.21 fps Inflow=0.3 cfs 4,031 cf
n=0.030 L=29.6' S=0.2672 '/' Capacity=101.5 cfs Outflow=0.3 cfs 4,031 cf

Reach OR5: OVERLAND REACH 5 Avg. Flow Depth=0.30' Max Vel=2.46 fps Inflow=2.7 cfs 17,462 cf
n=0.030 L=64.4' S=0.0214 '/' Capacity=36.3 cfs Outflow=2.7 cfs 17,462 cf

Reach OR6: OVERLAND REACH 6 Avg. Flow Depth=0.21' Max Vel=4.78 fps Inflow=2.5 cfs 14,456 cf
n=0.030 L=28.6' S=0.1266 '/' Capacity=69.9 cfs Outflow=2.5 cfs 14,456 cf

Reach OR7: OVERLAND REACH 7 Avg. Flow Depth=0.08' Max Vel=1.33 fps Inflow=0.2 cfs 3,006 cf
n=0.030 L=142.9' S=0.0341 '/' Capacity=36.3 cfs Outflow=0.2 cfs 3,006 cf

Reach OR8: OVERLAND REACH 8 Avg. Flow Depth=0.06' Max Vel=2.64 fps Inflow=0.1 cfs 30 cf
n=0.030 L=49.4' S=0.2126 '/' Capacity=42.4 cfs Outflow=0.1 cfs 30 cf

Reach OR9: OVERLAND REACH 9 Avg. Flow Depth=0.05' Max Vel=2.85 fps Inflow=0.1 cfs 2,976 cf
n=0.030 L=37.7' S=0.2851 '/' Capacity=49.1 cfs Outflow=0.1 cfs 2,976 cf

Pond BP1: BIO POND 1 Peak Elev=81.81' Storage=1,989 cf Inflow=2.9 cfs 12,387 cf
Primary=2.4 cfs 12,357 cf Secondary=0.1 cfs 30 cf Outflow=2.5 cfs 12,387 cf

Pond BP2: BIO POND 2 Peak Elev=85.86' Storage=688 cf Inflow=1.0 cfs 4,455 cf
Outflow=0.9 cfs 4,455 cf

Pond DE1: DRIP EDGE 1 Peak Elev=88.67' Storage=321 cf Inflow=0.4 cfs 1,667 cf
Outflow=0.1 cfs 1,667 cf

Pond DE2: DRIP EDGE 2 Peak Elev=88.16' Storage=665 cf Inflow=0.4 cfs 2,976 cf
Outflow=0.1 cfs 2,976 cf

Pond DE3: DRIP EDGE 3 Peak Elev=74.04' Storage=200 cf Inflow=0.3 cfs 1,123 cf
Outflow=0.1 cfs 1,122 cf

Pond DE4: DRIP EDGE 4 Peak Elev=73.89' Storage=392 cf Inflow=0.3 cfs 2,099 cf
Outflow=0.1 cfs 2,099 cf

Pond PCB1: PCB1 Peak Elev=85.97' Inflow=0.5 cfs 2,226 cf
12.0" Round Culvert n=0.012 L=22.0' S=0.0136 '/' Outflow=0.5 cfs 2,226 cf

Pond PCB2: PCB2 Peak Elev=85.97' Inflow=0.5 cfs 2,229 cf
12.0" Round Culvert n=0.012 L=11.0' S=0.0182 '/' Outflow=0.5 cfs 2,229 cf

Pond PDMH1: PDMH1 Peak Elev=85.92' Inflow=1.0 cfs 4,455 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0150 '/' Outflow=1.0 cfs 4,455 cf

Pond PP1: POROUS PAVEMENT 1 Peak Elev=89.29' Storage=2,574 cf Inflow=1.0 cfs 4,390 cf
Outflow=0.3 cfs 4,031 cf

Pond RG1: RAIN GUARDIAN 1 Peak Elev=81.85' Inflow=1.4 cfs 6,009 cf
Outflow=1.4 cfs 6,009 cf

Pond RG2: RAIN GUARDIAN 2 Peak Elev=81.84' Inflow=1.4 cfs 5,776 cf
Outflow=1.4 cfs 5,776 cf

Link DPA: DPA Inflow=14.4 cfs 106,971 cf
Primary=14.4 cfs 106,971 cf

Total Runoff Area = 368,992 sf Runoff Volume = 107,333 cf Average Runoff Depth = 3.49"
83.10% Pervious = 306,645 sf 16.90% Impervious = 62,347 sf

A – 2

NODE LISTING – 50-YR

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment WSA1: WS-A1 Runoff Area=304,483 sf 5.89% Impervious Runoff Depth=4.20"
Flow Length=769' Tc=21.4 min CN=74 Runoff=15.6 cfs 106,554 cf

Subcatchment WSA2.1: WS-A2.1 Runoff Area=5,770 sf 58.80% Impervious Runoff Depth=5.77"
Flow Length=316' Tc=7.0 min CN=88 Runoff=0.6 cfs 2,774 cf

Subcatchment WSA2.2: WS-A2.2 Runoff Area=5,259 sf 78.40% Impervious Runoff Depth=6.23"
Flow Length=241' Slope=0.0400 '/' Tc=6.0 min CN=92 Runoff=0.6 cfs 2,731 cf

Subcatchment WSA2.3: WS-A2.3 Runoff Area=9,514 sf 91.53% Impervious Runoff Depth=6.70"
Flow Length=19' Slope=0.0530 '/' Tc=6.0 min CN=96 Runoff=1.2 cfs 5,314 cf

Subcatchment WSA2.4: WS-A2.4 Runoff Area=14,850 sf 66.47% Impervious Runoff Depth=6.00"
Flow Length=310' Tc=7.3 min CN=90 Runoff=1.6 cfs 7,425 cf

Subcatchment WSA2.5: WS-A2.5 Runoff Area=13,349 sf 79.72% Impervious Runoff Depth=6.35"
Flow Length=254' Tc=6.0 min CN=93 Runoff=1.6 cfs 7,063 cf

Subcatchment WSA2.6: WS-A2.6 Runoff Area=4,878 sf 41.59% Impervious Runoff Depth=5.20"
Flow Length=35' Slope=0.0570 '/' Tc=6.0 min CN=83 Runoff=0.5 cfs 2,113 cf

Subcatchment WSA2.7: WS-A2.7 Runoff Area=2,712 sf 75.22% Impervious Runoff Depth=6.12"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.3 cfs 1,382 cf

Subcatchment WSA2.8: WS-A2.8 Runoff Area=3,555 sf 51.08% Impervious Runoff Depth=5.54"
Flow Length=46' Slope=0.1250 '/' Tc=6.0 min CN=86 Runoff=0.4 cfs 1,641 cf

Subcatchment WSA2.9: WS-A2.9 Runoff Area=2,360 sf 76.27% Impervious Runoff Depth=6.12"
Flow Length=5' Slope=0.0100 '/' Tc=6.0 min CN=91 Runoff=0.3 cfs 1,203 cf

Subcatchment WSBP1: WS-BP1 Runoff Area=2,262 sf 0.00% Impervious Runoff Depth=4.20"
Flow Length=25' Slope=0.1250 '/' Tc=6.0 min CN=74 Runoff=0.2 cfs 792 cf

Reach OR1: OVERLAND REACH 1 Avg. Flow Depth=0.23' Max Vel=1.83 fps Inflow=1.4 cfs 10,459 cf
n=0.035 L=285.0' S=0.0228 '/' Capacity=32.1 cfs Outflow=1.3 cfs 10,458 cf

Reach OR2: OVERLAND REACH 2 Avg. Flow Depth=0.11' Max Vel=1.53 fps Inflow=0.4 cfs 4,954 cf
n=0.030 L=197.3' S=0.0324 '/' Capacity=44.6 cfs Outflow=0.4 cfs 4,954 cf

Reach OR3: OVERLAND REACH 3 Avg. Flow Depth=0.23' Max Vel=4.19 fps Inflow=1.2 cfs 5,505 cf
n=0.030 L=99.0' S=0.0939 '/' Capacity=28.2 cfs Outflow=1.2 cfs 5,505 cf

Reach OR4: OVERLAND REACH 4 Avg. Flow Depth=0.07' Max Vel=3.40 fps Inflow=0.4 cfs 4,954 cf
n=0.030 L=29.6' S=0.2672 '/' Capacity=101.5 cfs Outflow=0.4 cfs 4,954 cf

Reach OR5: OVERLAND REACH 5 Avg. Flow Depth=0.33' Max Vel=2.65 fps Inflow=3.4 cfs 21,618 cf
n=0.030 L=64.4' S=0.0214 '/' Capacity=36.3 cfs Outflow=3.4 cfs 21,618 cf

Reach OR6: OVERLAND REACH 6 Avg. Flow Depth=0.24' Max Vel=5.14 fps Inflow=3.2 cfs 17,789 cf
n=0.030 L=28.6' S=0.1266 '/' Capacity=69.9 cfs Outflow=3.2 cfs 17,789 cf

Reach OR7: OVERLAND REACH 7 Avg. Flow Depth=0.10' Max Vel=1.49 fps Inflow=0.3 cfs 3,829 cf
n=0.030 L=142.9' S=0.0341 '/' Capacity=36.3 cfs Outflow=0.2 cfs 3,829 cf

Reach OR8: OVERLAND REACH 8 Avg. Flow Depth=0.07' Max Vel=3.08 fps Inflow=0.2 cfs 75 cf
n=0.030 L=49.4' S=0.2126 '/' Capacity=42.4 cfs Outflow=0.2 cfs 75 cf

Reach OR9: OVERLAND REACH 9 Avg. Flow Depth=0.05' Max Vel=2.85 fps Inflow=0.1 cfs 3,754 cf
n=0.030 L=37.7' S=0.2851 '/' Capacity=49.1 cfs Outflow=0.1 cfs 3,754 cf

Pond BP1: BIO POND 1 Peak Elev=81.84' Storage=2,028 cf Inflow=3.4 cfs 15,280 cf
Primary=3.1 cfs 15,204 cf Secondary=0.2 cfs 75 cf Outflow=3.3 cfs 15,280 cf

Pond BP2: BIO POND 2 Peak Elev=85.89' Storage=703 cf Inflow=1.2 cfs 5,505 cf
Outflow=1.2 cfs 5,505 cf

Pond DE1: DRIP EDGE 1 Peak Elev=89.37' Storage=419 cf Inflow=0.5 cfs 2,113 cf
Outflow=0.1 cfs 2,113 cf

Pond DE2: DRIP EDGE 2 Peak Elev=88.91' Storage=786 cf Inflow=0.5 cfs 3,754 cf
Outflow=0.1 cfs 3,754 cf

Pond DE3: DRIP EDGE 3 Peak Elev=74.27' Storage=244 cf Inflow=0.3 cfs 1,382 cf
Outflow=0.1 cfs 1,382 cf

Pond DE4: DRIP EDGE 4 Peak Elev=74.27' Storage=443 cf Inflow=0.4 cfs 2,585 cf
Outflow=0.1 cfs 2,585 cf

Pond PCB1: PCB1 Peak Elev=86.04' Inflow=0.6 cfs 2,731 cf
12.0" Round Culvert n=0.012 L=22.0' S=0.0136 '/' Outflow=0.6 cfs 2,731 cf

Pond PCB2: PCB2 Peak Elev=86.04' Inflow=0.6 cfs 2,774 cf
12.0" Round Culvert n=0.012 L=11.0' S=0.0182 '/' Outflow=0.6 cfs 2,774 cf

Pond PDMH1: PDMH1 Peak Elev=85.99' Inflow=1.2 cfs 5,505 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0150 '/' Outflow=1.2 cfs 5,505 cf

Pond PP1: POROUS PAVEMENT 1 Peak Elev=89.35' Storage=2,741 cf Inflow=1.2 cfs 5,314 cf
Outflow=0.4 cfs 4,954 cf

Pond RG1: RAIN GUARDIAN 1 Peak Elev=81.90' Inflow=1.6 cfs 7,425 cf
Outflow=1.6 cfs 7,425 cf

Pond RG2: RAIN GUARDIAN 2 Peak Elev=81.89' Inflow=1.6 cfs 7,063 cf
Outflow=1.6 cfs 7,063 cf

Link DPA: DPA Inflow=18.2 cfs 138,630 cf
Primary=18.2 cfs 138,630 cf

Total Runoff Area = 368,992 sf Runoff Volume = 138,992 cf Average Runoff Depth = 4.52"
83.10% Pervious = 306,645 sf 16.90% Impervious = 62,347 sf

APPENDIX B

DESIGN

B – 1

STORMWATER BEST MANAGEMENT PRACTICES

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bio-Retention Pond 1 (BP1)**

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 1508.07(a).	
0.70	ac	A = Area draining to the practice	
0.47	ac	A_I = Impervious area draining to the practice	
0.67	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.46	ac-in	WQV= 1" x Rv x A	
1,665	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
416	cf	25% x WQV (check calc for sediment forebay volume)	
1,249	cf	75% x WQV (check calc for surface sand filter volume)	
Rain Guardians		Method of Pretreatment? (not required for clean or roof runoff)	
na	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
na	sf	A_{SA} = Surface area of the practice	
na	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
na	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:			
81.70	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.50	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
1.85	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
78.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
77.42	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
70.00	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
36.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
42.50	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
8.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
81.84	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
82.25	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**
na	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
na	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**
1,665	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		Note what sheet in the plan set contains the filter course specification	
3.0	: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:			
NA		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
na	acres	A_{SA} = Surface area of the pervious pavement	
#VALUE!	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
na	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	na	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:

Summary for Pond BP1: BIO POND 1

Inflow Area = 30,461 sf, 67.34% Impervious, Inflow Depth = 6.02" for 50-yr event
Inflow = 3.4 cfs @ 12.04 hrs, Volume= 15,280 cf
Outflow = 3.3 cfs @ 12.06 hrs, Volume= 15,280 cf, Atten= 3%, Lag= 1.0 min
Primary = 3.1 cfs @ 12.06 hrs, Volume= 15,204 cf
Secondary = 0.2 cfs @ 12.06 hrs, Volume= 75 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 77.42' Surf.Area= 325 sf Storage= 39 cf
Peak Elev= 81.84' @ 12.06 hrs Surf.Area= 1,850 sf Storage= 2,028 cf (1,989 cf above start)
Flood Elev= 82.25' Surf.Area= 2,394 sf Storage= 2,797 cf (2,759 cf above start)

Plug-Flow detention time= 44.2 min calculated for 15,241 cf (100% of inflow)
Center-of-Mass det. time= 40.6 min (829.3 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	77.08'	198 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2	77.08'	2,599 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		2,797 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	84	38.1	0.0	0	0	84
78.25	84	38.1	35.0	34	34	129
78.50	84	38.1	20.0	4	39	138
80.00	84	38.1	10.0	13	51	195
80.99	224	56.8	100.0	147	198	344

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	241	87.5	0.0	0	0	241
78.25	241	87.5	35.0	99	99	343
78.50	241	87.5	20.0	12	111	365
80.00	241	87.5	10.0	36	147	497
81.00	1,027	233.4	100.0	589	735	4,226
81.70	1,500	238.1	100.0	879	1,615	4,467
82.00	1,781	286.9	100.0	492	2,106	6,508
82.25	2,170	258.9	100.0	493	2,599	7,726

Device	Routing	Invert	Outlet Devices
#1	Primary	70.16'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.16' / 70.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	77.42'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	77.08'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	81.70'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	81.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.1 cfs @ 12.06 hrs HW=81.84' TW=70.24' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.1 cfs of 12.6 cfs potential flow)
└─**2=Orifice/Grate** (Passes 0.4 cfs of 1.9 cfs potential flow)
└─**3=Exfiltration** (Exfiltration Controls 0.4 cfs)
└─**4=Orifice/Grate** (Weir Controls 2.7 cfs @ 1.21 fps)

Secondary OutFlow Max=0.2 cfs @ 12.06 hrs HW=81.84' TW=81.82' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.2 cfs @ 0.39 fps)

Stage-Area-Storage for Pond BP1: BIO POND 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
77.08	325	0
77.18	325	11
77.28	325	23
77.38	325	34
77.48	325	46
77.58	325	57
77.68	325	68
77.78	325	80
77.88	325	91
77.98	325	102
78.08	325	114
78.18	325	125
78.28	325	135
78.38	325	142
78.48	325	148
78.58	325	152
78.68	325	155
78.78	325	158
78.88	325	162
78.98	325	165
79.08	325	168
79.18	325	171
79.28	325	175
79.38	325	178
79.48	325	181
79.58	325	184
79.68	325	188
79.78	325	191
79.88	325	194
79.98	325	197
80.08	377	226
80.18	447	267
80.28	523	316
80.38	605	372
80.48	694	437
80.58	788	511
80.68	889	595
80.78	996	689
80.88	1,109	794
80.98	1,228	911
81.08	1,301	1,018
81.18	1,364	1,128
81.28	1,429	1,246
81.38	1,497	1,370
81.48	1,566	1,500
81.58	1,637	1,638
81.68	1,709	1,783
81.78	1,797	1,936
81.88	1,890	2,098
81.98	1,986	2,269
82.08	2,125	2,452
82.18	**2,281**	**2,649**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bio-Retention Pond 2 (BP2)**

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 1508.07(a).	
0.25	ac	A = Area draining to the practice	
0.17	ac	A_I = Impervious area draining to the practice	
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.17	ac-in	WQV= 1" x Rv x A	
610	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
152	cf	25% x WQV (check calc for sediment forebay volume)	
457	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump CB's		Method of Pretreatment? (not required for clean or roof runoff)	
114	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
N/A	sf	A_{SA} = Surface area of the practice	
N/A	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
N/A	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
85.75	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.15	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
2.26	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
83.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
81.92	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
81.92	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
81.92	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.08	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.08	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
85.89	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
86.10	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**
N/A	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
N/A	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	N/A	Note what sheet in the plan set contains the filter course specification.	
N/A	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
634	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		Note what sheet in the plan set contains the filter course specification	
3.0	: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:			
N/A		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
N/A	acres	A_{SA} = Surface area of the pervious pavement	
#VALUE!	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
N/A	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	N/A	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:

Summary for Pond BP2: BIO POND 2

Inflow Area = 11,029 sf, 68.15% Impervious, Inflow Depth = 5.99" for 50-yr event
Inflow = 1.2 cfs @ 12.04 hrs, Volume= 5,505 cf
Outflow = 1.2 cfs @ 12.06 hrs, Volume= 5,505 cf, Atten= 3%, Lag= 1.0 min
Primary = 1.2 cfs @ 12.06 hrs, Volume= 5,505 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 81.92' Surf.Area= 208 sf Storage= 25 cf
Peak Elev= 85.89' @ 12.06 hrs Surf.Area= 667 sf Storage= 703 cf (678 cf above start)
Flood Elev= 86.10' Surf.Area= 920 sf Storage= 862 cf (837 cf above start)

Plug-Flow detention time= 39.8 min calculated for 5,479 cf (100% of inflow)
Center-of-Mass det. time= 33.9 min (826.0 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	81.58'	862 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
81.58	208	68.5	0.0	0	0	208
82.75	208	68.5	35.0	85	85	288
83.00	208	68.5	20.0	10	96	305
84.50	208	68.5	10.0	31	127	408
85.00	340	90.3	100.0	136	262	686
85.75	614	128.9	100.0	353	615	1,365
86.00	712	133.6	100.0	166	781	1,468
86.10	920	143.0	100.0	81	862	1,676

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.00' S= 0.0217 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	81.92'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	81.58'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	85.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.2 cfs @ 12.06 hrs HW=85.89' TW=81.22' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.2 cfs of 7.5 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.2 cfs of 1.8 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.2 cfs)
  - **4=Orifice/Grate** (Weir Controls 1.0 cfs @ 1.21 fps)

Stage-Area-Storage for Pond BP2: BIO POND 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
81.58	208	0
81.68	208	7
81.78	208	15
81.88	208	22
81.98	208	29
82.08	208	36
82.18	208	44
82.28	208	51
82.38	208	58
82.48	208	66
82.58	208	73
82.68	208	80
82.78	208	86
82.88	208	91
82.98	208	95
83.08	208	97
83.18	208	99
83.28	208	101
83.38	208	103
83.48	208	106
83.58	208	108
83.68	208	110
83.78	208	112
83.88	208	114
83.98	208	116
84.08	208	118
84.18	208	120
84.28	208	122
84.38	208	124
84.48	208	126
84.58	227	144
84.68	252	168
84.78	278	195
84.88	305	224
84.98	334	256
85.08	365	291
85.18	398	329
85.28	433	370
85.38	469	415
85.48	506	464
85.58	545	517
85.68	585	573
85.78	625	634
85.88	664	698
85.98	704	767
86.08	**876**	**844**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Porous Pavement (PP1)**

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 1508.07(a).	
0.22	ac	A = Area draining to the practice	
0.20	ac	A_I = Impervious area draining to the practice	
0.92	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.87	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.19	ac-in	WQV= 1" x Rv x A	
693	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
173	cf	25% x WQV (check calc for sediment forebay volume)	
520	cf	75% x WQV (check calc for surface sand filter volume)	
na		Method of Pretreatment? (not required for clean or roof runoff)	
na	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
na	sf	A_{SA} = Surface area of the practice	
na	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
na	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:			
-	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
-	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
89.83	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
88.75	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
88.75	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
56.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.08	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
33.83	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.08	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
89.35	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
91.50	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
na	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
na	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**
na	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
na	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.)	
0.2	acres	A_{SA} = Surface area of the pervious pavement	
1.1	: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		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:

Summary for Pond PP1: POROUS PAVEMENT 1

Inflow Area = 9,514 sf, 91.53% Impervious, Inflow Depth = 6.70" for 50-yr event
Inflow = 1.2 cfs @ 12.04 hrs, Volume= 5,314 cf
Outflow = 0.4 cfs @ 12.28 hrs, Volume= 4,954 cf, Atten= 69%, Lag= 14.7 min
Primary = 0.4 cfs @ 12.28 hrs, Volume= 4,954 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 88.75' Surf.Area= 8,451 sf Storage= 976 cf
Peak Elev= 89.35' @ 12.28 hrs Surf.Area= 8,451 sf Storage= 2,741 cf (1,765 cf above start)
Flood Elev= 91.50' Surf.Area= 8,451 sf Storage= 6,110 cf (5,134 cf above start)

Plug-Flow detention time= 360.9 min calculated for 3,977 cf (75% of inflow)
Center-of-Mass det. time= 168.5 min (927.0 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1	88.42'	6,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.42	8,451	538.7	0.0	0	0	8,451
89.58	8,451	538.7	35.0	3,431	3,431	9,076
89.83	8,451	538.7	20.0	423	3,854	9,211
90.83	8,451	538.7	10.0	845	4,699	9,749
91.17	8,451	538.7	20.0	575	5,273	9,932
91.50	8,451	538.7	30.0	837	6,110	10,110

Device	Routing	Invert	Outlet Devices
#1	Primary	88.25'	**12.0" Round Culvert** L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.25' / 86.00' S= 0.0469 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	88.85'	**6.0" Round Culvert X 2.00** L= 180.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 88.85' / 88.75' S= 0.0006 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.4 cfs @ 12.28 hrs HW=89.35' TW=86.07' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.4 cfs of 2.9 cfs potential flow)
↑**2=Culvert** (Barrel Controls 0.4 cfs @ 1.13 fps)

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.11	ac	A = Area draining to the practice
0.05	ac	A_I = Impervious area draining to the practice
0.42	decimal	I = Percent impervious area draining to the practice, in decimal form
0.42	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.05	ac-in	WQV= 1" x Rv x A
172	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.42	inches	Q = Water quality depth. Q = WQV/A
92	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.8	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.163	inches	Ia = Initial abstraction. Ia = 0.2S
	minutes	T_c = Time of Concentration
	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
-	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: Drip Edge 1 (DE1): WQV Required = 172 CF, Provided = 696 CF

Summary for Pond DE1: DRIP EDGE 1

Inflow Area = 4,878 sf, 41.59% Impervious, Inflow Depth = 5.20" for 50-yr event
Inflow = 0.5 cfs @ 12.04 hrs, Volume= 2,113 cf
Outflow = 0.1 cfs @ 11.80 hrs, Volume= 2,113 cf, Atten= 78%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.80 hrs, Volume= 2,113 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 87.50' Surf.Area= 480 sf Storage= 96 cf
Peak Elev= 89.37' @ 12.51 hrs Surf.Area= 480 sf Storage= 419 cf (323 cf above start)
Flood Elev= 93.25' Surf.Area= 480 sf Storage= 1,080 cf (984 cf above start)

Plug-Flow detention time= 80.3 min calculated for 2,016 cf (95% of inflow)
Center-of-Mass det. time= 32.0 min (853.7 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1,080 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	480	0.0	0	0
89.00	480	40.0	384	384
91.00	480	20.0	192	576
93.00	480	40.0	384	960
93.25	480	100.0	120	1,080

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0208 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	87.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.80 hrs HW=87.69' TW=84.15' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.08	ac	A = Area draining to the practice
0.04	ac	A_I = Impervious area draining to the practice
0.51	decimal	I = Percent impervious area draining to the practice, in decimal form
0.51	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.04	ac-in	WQV= 1" x Rv x A
151	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.51	inches	Q = Water quality depth. Q = WQV/A
94	unitless	CN = Unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.6	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.125	inches	Ia = Initial abstraction. Ia = 0.2S
	minutes	T_c = Time of Concentration
	$cfs/mi^2/in$	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
-	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$.

Designer's Notes: Drip Edge 2 (DE2): WQV Required = 151 CF, Provided = 660 CF

Summary for Pond DE2: DRIP EDGE 2

Inflow Area = 8,433 sf, 45.59% Impervious, Inflow Depth = 5.34" for 50-yr event
Inflow = 0.5 cfs @ 12.04 hrs, Volume= 3,754 cf
Outflow = 0.1 cfs @ 11.56 hrs, Volume= 3,754 cf, Atten= 81%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.56 hrs, Volume= 3,754 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 83.50' Surf.Area= 400 sf Storage= 80 cf
Peak Elev= 88.91' @ 13.12 hrs Surf.Area= 400 sf Storage= 786 cf (706 cf above start)
Flood Elev= 90.25' Surf.Area= 400 sf Storage= 1,060 cf (980 cf above start)

Plug-Flow detention time= 84.0 min calculated for 3,674 cf (98% of inflow)
Center-of-Mass det. time= 58.6 min (893.1 - 834.5)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	1,060 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	400	0.0	0	0
86.00	400	40.0	480	480
88.00	400	20.0	160	640
90.00	400	40.0	320	960
90.25	400	100.0	100	1,060

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 83.50' / 82.00' S= 0.0625 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	83.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.56 hrs HW=83.73' TW=82.05' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.2 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.06	ac	A = Area draining to the practice
0.05	ac	A_I = Impervious area draining to the practice
0.75	decimal	I = Percent impervious area draining to the practice, in decimal form
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.05	ac-in	WQV= 1" x Rv x A
164	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.73	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.056	inches	Ia = Initial abstraction. Ia = 0.2S
	minutes	T_c = Time of Concentration
	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
-	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: Drip Edge 3 (DE3): WQV Required = 164 CF, Provided = 600 CF

Summary for Pond DE3: DRIP EDGE 3

Inflow Area = 2,712 sf, 75.22% Impervious, Inflow Depth = 6.12" for 50-yr event
Inflow = 0.3 cfs @ 12.04 hrs, Volume= 1,382 cf
Outflow = 0.1 cfs @ 11.95 hrs, Volume= 1,382 cf, Atten= 65%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.95 hrs, Volume= 1,382 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 73.50' Surf.Area= 480 sf Storage= 96 cf
Peak Elev= 74.27' @ 12.63 hrs Surf.Area= 480 sf Storage= 244 cf (148 cf above start)
Flood Elev= 78.25' Surf.Area= 480 sf Storage= 984 cf (888 cf above start)

Plug-Flow detention time= 95.9 min calculated for 1,286 cf (93% of inflow)
Center-of-Mass det. time= 19.7 min (806.8 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	73.00'	984 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
73.00	480	0.0	0	0
75.00	480	40.0	384	384
76.00	480	20.0	96	480
78.00	480	40.0	384	864
78.25	480	100.0	120	984

Device	Routing	Invert	Outlet Devices
#1	Primary	73.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 73.50' / 73.00' S= 0.0208 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	73.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.95 hrs HW=73.68' TW=72.09' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.05	ac	A = Area draining to the practice
0.04	ac	A_I = Impervious area draining to the practice
0.76	decimal	I = Percent impervious area draining to the practice, in decimal form
0.74	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.04	ac-in	WQV= 1" x Rv x A
145	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.74	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.054	inches	Ia = Initial abstraction. Ia = 0.2S
	minutes	T_c = Time of Concentration
	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
-	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: Drip Edge 4 (DE4): WQV Required = 145 CF, Provided = 500 CF

Summary for Pond DE4: DRIP EDGE 4

Inflow Area = 5,072 sf, 75.71% Impervious, Inflow Depth = 6.12" for 50-yr event
Inflow = 0.4 cfs @ 12.04 hrs, Volume= 2,585 cf
Outflow = 0.1 cfs @ 11.67 hrs, Volume= 2,585 cf, Atten= 76%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.67 hrs, Volume= 2,585 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 71.50' Surf.Area= 400 sf Storage= 80 cf
Peak Elev= 74.27' @ 12.59 hrs Surf.Area= 400 sf Storage= 443 cf (363 cf above start)
Flood Elev= 76.25' Surf.Area= 400 sf Storage= 820 cf (740 cf above start)

Plug-Flow detention time= 63.5 min calculated for 2,504 cf (97% of inflow)
Center-of-Mass det. time= 26.2 min (823.9 - 797.6)

Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.00	400	0.0	0	0
73.00	400	40.0	320	320
74.00	400	20.0	80	400
76.00	400	40.0	320	720
76.25	400	100.0	100	820

Device	Routing	Invert	Outlet Devices
#1	Primary	71.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.50' / 70.00' S= 0.0750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	71.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.67 hrs HW=71.68' TW=70.09' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

B – 2

OUTLET PROTECTION

OUTLET PROTECTION DESIGN CALCS

NON DEFINED CHANNEL

Job #: 22017
Date: 10/26/2023
Structure: DE 1 & 2
ED1

Variables:

Q= Discharge from the pipe (cfs)
$D_{0=}$ Diameter of the pipe (ft)
Tw= Tailwater depth above the invert of the pipe (ft)
La= Apron length
w_1= Apron width at pipe outlet
w_2= Apron width at downstream end of apron

Input:		
Outlet elev:	82	
Tailwater elev:	82.05	
Tw:	0.05	
Q:	0.1	
D_0:	1	

Apron Dimensions

w_1=	**3**	(ft)
w_2=	**11**	(ft)
La=	**8**	(ft)

Apron Length:

Tw > .5D_0	Tw < .5D_0
La: 7.300	La: 7.180

Apron Width:

Tw > .5D_0	Tw < .5D_0
w_2: 5.92	w_2: 10.18

w_1: 3

w_1=	3.00
w_2=	10.18
La=	7.18

RipRap Sizing

d_{50}=	0.02	(ft)
d_{50}=	0.22	(in)

RipRap Gradation

Stone Size			% of Weight Smaller Then the Given Size
0.03	TO	0.04	100
0.02	TO	0.03	85
0.02	TO	0.03	50
0.01	TO	0.01	15

Minimum Depth of Rock= 0.06 (ft)

Summary for Pond DE2: DRIP EDGE 2

Inflow Area = 8,433 sf, 45.59% Impervious, Inflow Depth = 5.34" for 50-yr event
Inflow = 0.5 cfs @ 12.04 hrs, Volume= 3,754 cf
Outflow = 0.1 cfs @ 11.56 hrs, Volume= 3,754 cf, Atten= 81%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.56 hrs, Volume= 3,754 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 83.50' Surf.Area= 400 sf Storage= 80 cf
Peak Elev= 88.91' @ 13.12 hrs Surf.Area= 400 sf Storage= 786 cf (706 cf above start)
Flood Elev= 90.25' Surf.Area= 400 sf Storage= 1,060 cf (980 cf above start)

Plug-Flow detention time= 84.0 min calculated for 3,674 cf (98% of inflow)
Center-of-Mass det. time= 58.6 min (893.1 - 834.5)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	1,060 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	400	0.0	0	0
86.00	400	40.0	480	480
88.00	400	20.0	160	640
90.00	400	40.0	320	960
90.25	400	100.0	100	1,060

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	**12.0" Round Culvert** L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 83.50' / 82.00' S= 0.0625 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	83.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.56 hrs HW=83.73' TW=82.05' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.2 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

OUTLET PROTECTION DESIGN CALCS

NON DEFINED CHANNEL

Job #: 22017
Date: 10/26/2023
Structure: DE 3 & 4
ED2

Variables:

Q= Discharge from the pipe (cfs)
$D_{0=}$ Diameter of the pipe (ft)
Tw= Tailwater depth above the invert of the pipe (ft)
La= Apron length
w_1= Apron width at pipe outlet
w_2= Apron width at downstream end of apron

Input:		
Outlet elev:	70
Tailwater elev:	70.09
Tw:	0.09
Q:	0.1
D_0:	1

Apron Dimensions

w_1=	**3**	(ft)
w_2=	**11**	(ft)
La=	**8**	(ft)

Apron Length:

Tw > .5D_0	Tw < .5D_0
La: 7.300	La: 7.180

Apron Width:

Tw > .5D_0	Tw < .5D_0
w_2: 5.92	w_2: 10.18

w_1: 3

w_1=	3.00
w_2=	10.18
La=	7.18

RipRap Sizing

d_{50}=	0.01	(ft)
d_{50}=	0.12	(in)

RipRap Gradation

Stone Size			% of Weight Smaller Then the Given Size
0.02	TO	0.02	100
0.01	TO	0.02	85
0.01	TO	0.02	50
0.00	TO	0.01	15

Minimum Depth of Rock= 0.03 (ft)

Summary for Pond DE4: DRIP EDGE 4

Inflow Area = 5,072 sf, 75.71% Impervious, Inflow Depth = 6.12" for 50-yr event
Inflow = 0.4 cfs @ 12.04 hrs, Volume= 2,585 cf
Outflow = 0.1 cfs @ 11.67 hrs, Volume= 2,585 cf, Atten= 76%, Lag= 0.0 min
Primary = 0.1 cfs @ 11.67 hrs, Volume= 2,585 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 71.50' Surf.Area= 400 sf Storage= 80 cf
Peak Elev= 74.27' @ 12.59 hrs Surf.Area= 400 sf Storage= 443 cf (363 cf above start)
Flood Elev= 76.25' Surf.Area= 400 sf Storage= 820 cf (740 cf above start)

Plug-Flow detention time= 63.5 min calculated for 2,504 cf (97% of inflow)
Center-of-Mass det. time= 26.2 min (823.9 - 797.6)

Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.00	400	0.0	0	0
73.00	400	40.0	320	320
74.00	400	20.0	80	400
76.00	400	40.0	320	720
76.25	400	100.0	100	820

Device	Routing	Invert	Outlet Devices
#1	Primary	71.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 71.50' / 70.00' S= 0.0750 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	71.00'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Primary OutFlow Max=0.1 cfs @ 11.67 hrs HW=71.68' TW=70.09' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.1 cfs of 0.1 cfs potential flow)
↑—**2=Exfiltration** (Exfiltration Controls 0.1 cfs)

OUTLET PROTECTION DESIGN CALCS

NON DEFINED CHANNEL

Job #: 22017
Date: 10/26/2023
Structure: BP1
ED3

Variables:

Q= Discharge from the pipe (cfs)
$D_{0=}$ Diameter of the pipe (ft)
Tw= Tailwater depth above the invert of the pipe (ft)
La= Apron length
w_1= Apron width at pipe outlet
w_2= Apron width at downstream end of apron

Input:		
Outlet elev:	70
Tailwater elev:	70.24
Tw:	0.24
Q:	3.1
D_0:	1

Apron Dimensions

w_1=	**3**	(ft)
w_2=	**16**	(ft)
La=	**13**	(ft)

Apron Length:

Tw > .5D_0	Tw < .5D_0
La: 16.300	La: 12.580

Apron Width:

Tw > .5D_0	Tw < .5D_0
w_2: 9.52	w_2: 15.58

w_1: 3

w_1=	3.00
w_2=	15.58
La=	12.58

RipRap Sizing

d_{50}=	0.38	(ft)
d_{50}=	4.52	(in)

RipRap Gradation

Stone Size			% of Weight Smaller Then the Given Size
0.57	TO	0.75	100
0.49	TO	0.68	85
0.38	TO	0.57	50
0.11	TO	0.19	15

Minimum Depth of Rock= 1.13 (ft)

Summary for Pond BP1: BIO POND 1

Inflow Area = 30,461 sf, 67.34% Impervious, Inflow Depth = 6.02" for 50-yr event
Inflow = 3.4 cfs @ 12.04 hrs, Volume= 15,280 cf
Outflow = 3.3 cfs @ 12.06 hrs, Volume= 15,280 cf, Atten= 3%, Lag= 1.0 min
Primary = 3.1 cfs @ 12.06 hrs, Volume= 15,204 cf
Secondary = 0.2 cfs @ 12.06 hrs, Volume= 75 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 77.42' Surf.Area= 325 sf Storage= 39 cf
Peak Elev= 81.84' @ 12.06 hrs Surf.Area= 1,850 sf Storage= 2,028 cf (1,989 cf above start)
Flood Elev= 82.25' Surf.Area= 2,394 sf Storage= 2,797 cf (2,759 cf above start)

Plug-Flow detention time= 44.2 min calculated for 15,241 cf (100% of inflow)
Center-of-Mass det. time= 40.6 min (829.3 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	77.08'	198 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2	77.08'	2,599 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		2,797 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	84	38.1	0.0	0	0	84
78.25	84	38.1	35.0	34	34	129
78.50	84	38.1	20.0	4	39	138
80.00	84	38.1	10.0	13	51	195
80.99	224	56.8	100.0	147	198	344

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.08	241	87.5	0.0	0	0	241
78.25	241	87.5	35.0	99	99	343
78.50	241	87.5	20.0	12	111	365
80.00	241	87.5	10.0	36	147	497
81.00	1,027	233.4	100.0	589	735	4,226
81.70	1,500	238.1	100.0	879	1,615	4,467
82.00	1,781	286.9	100.0	492	2,106	6,508
82.25	2,170	258.9	100.0	493	2,599	7,726

Device	Routing	Invert	Outlet Devices
#1	Primary	70.16'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.16' / 70.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	77.42'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	77.08'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	81.70'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	81.75'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.1 cfs @ 12.06 hrs HW=81.84' TW=70.24' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.1 cfs of 12.6 cfs potential flow)
└─**2=Orifice/Grate** (Passes 0.4 cfs of 1.9 cfs potential flow)
└─**3=Exfiltration** (Exfiltration Controls 0.4 cfs)
└─**4=Orifice/Grate** (Weir Controls 2.7 cfs @ 1.21 fps)

Secondary OutFlow Max=0.2 cfs @ 12.06 hrs HW=81.84' TW=81.82' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.2 cfs @ 0.39 fps)

OUTLET PROTECTION DESIGN CALCS

DEFINED CHANNEL

Job #: 22017
Date: 10/26/2023
Structure: BP2
ED4

Variables:

Q= Discharge from the pipe (cfs)
$D_{0=}$ Diameter of outlet pipe (ft)
D= Width of channel (ft)
z= Channel side slope (H:V ft/ft)
Tw= Tailwater depth above the invert of the pipe (ft)
La= Apron length
w_1= Apron width at pipe outlet
w_2= Apron width at downstream end of apron

Input:

Outlet elev:	81
Tailwater elev:	81.22
Tw:	0.22
Q:	1.2
D_0:	1.00
D:	2
z:	3

Apron Dimensions

w_1=	**8**	(ft)
w_2=	**2**	(ft)
La=	**10**	(ft)

Apron Length:

$Tw > .5D_0$	$Tw < .5D_0$
La: 10.600	La: 9.160

Apron Width:

w_2: 2

w_1: 8

w_1=	8.00
w_2=	2.00
La=	9.16

RipRap Sizing

d_{50}=	0.12	(ft)
d_{50}=	1.39	(in)

RipRap Gradation

Stone Size			% of Weight Smaller Then the Given Size
0.17	TO	0.23	100
0.15	TO	0.21	85
0.12	TO	0.17	50
0.03	TO	0.06	15

Minimum Depth of Rock= 0.35 (ft)

Summary for Pond BP2: BIO POND 2

Inflow Area = 11,029 sf, 68.15% Impervious, Inflow Depth = 5.99" for 50-yr event
Inflow = 1.2 cfs @ 12.04 hrs, Volume= 5,505 cf
Outflow = 1.2 cfs @ 12.06 hrs, Volume= 5,505 cf, Atten= 3%, Lag= 1.0 min
Primary = 1.2 cfs @ 12.06 hrs, Volume= 5,505 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 81.92' Surf.Area= 208 sf Storage= 25 cf
Peak Elev= 85.89' @ 12.06 hrs Surf.Area= 667 sf Storage= 703 cf (678 cf above start)
Flood Elev= 86.10' Surf.Area= 920 sf Storage= 862 cf (837 cf above start)

Plug-Flow detention time= 39.8 min calculated for 5,479 cf (100% of inflow)
Center-of-Mass det. time= 33.9 min (826.0 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	81.58'	862 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
81.58	208	68.5	0.0	0	0	208
82.75	208	68.5	35.0	85	85	288
83.00	208	68.5	20.0	10	96	305
84.50	208	68.5	10.0	31	127	408
85.00	340	90.3	100.0	136	262	686
85.75	614	128.9	100.0	353	615	1,365
86.00	712	133.6	100.0	166	781	1,468
86.10	920	143.0	100.0	81	862	1,676

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**12.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.00' S= 0.0217 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	81.92'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	81.58'	**10.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	85.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.2 cfs @ 12.06 hrs HW=85.89' TW=81.22' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.2 cfs of 7.5 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.2 cfs of 1.8 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.2 cfs)
  - **4=Orifice/Grate** (Weir Controls 1.0 cfs @ 1.21 fps)

APPENDIX C

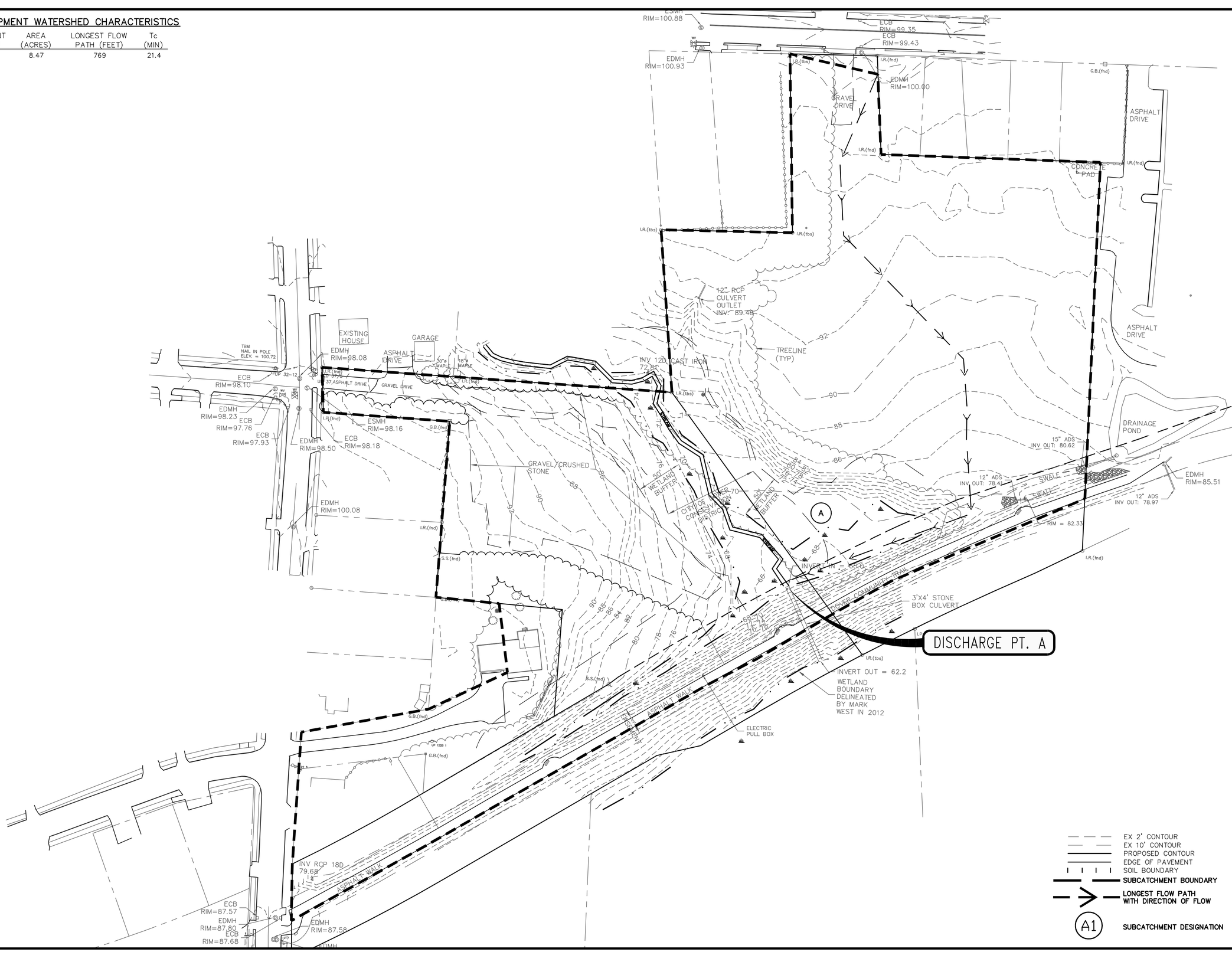
WATERSHED PLANS

C – 1

PRE-DEVELOPMENT CONDITIONS

PRE-DEVELOPMENT WATERSHED CHARACTERISTICS

SUBCATCHMENT DESIGNATION	AREA (ACRES)	LONGEST FLOW PATH (FEET)	Tc (MIN)
A	8.47	769	21.4



NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

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

NO.	REVISION	APP'D	DATE

DATE: 10-26-23
SCALE: 1"=10'
DRAWN BY: SRD
DESIGN BY: SRD
APPROVED BY:SJH
PROJECT NO: 22017
FILE DATED DWG

PRE-CONSTRUCTION WATERSHED PLAN

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

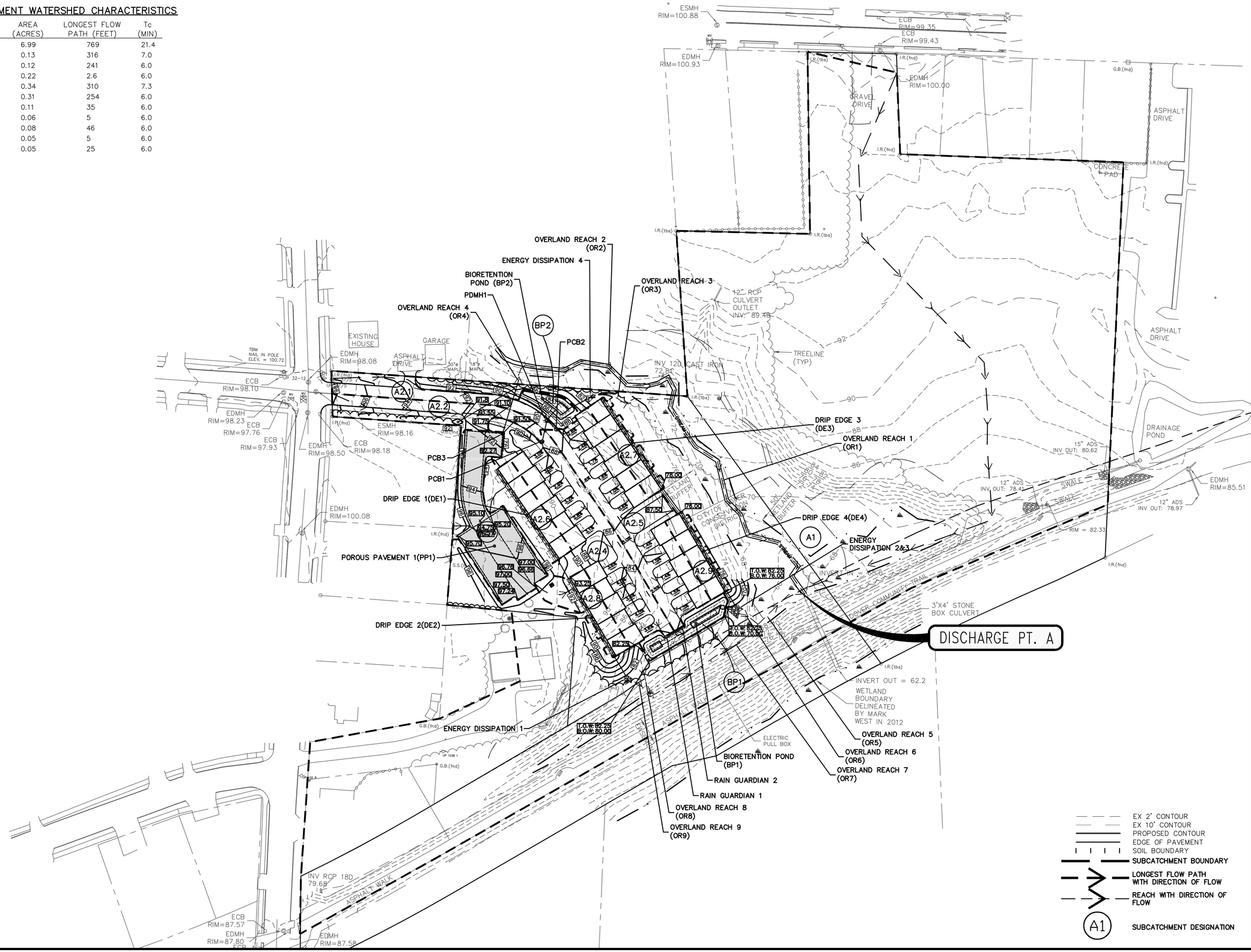
WS-1

C – 2

POST-DEVELOPMENT CONDITIONS

POST-DEVELOPMENT WATERSHED CHARACTERISTICS

SUBCATCHMENT DESIGNATION	AREA (ACRES)	LONGEST FLOW PATH (FEET)	Tc (MIN)
A1	6.99	769	21.4
A2.1	0.13	316	7.0
A2.2	0.12	241	6.0
A2.3	0.22	2.6	6.0
A2.4	0.34	310	7.3
A2.5	0.31	254	6.0
A2.6	0.11	35	6.0
A2.7	0.06	5	6.0
A2.8	0.08	46	6.0
A2.9	0.05	5	6.0
BP1	0.05	25	6.0



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CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1186
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NO.	REVISION	APP'D	DATE

DATE: 10-26-23
SCALE: 1"=50'
DRAWN BY: MJM
DESIGN BY: MJM
APPROVED BY:SJH
PROJECT NO: 22017
FILE NAME:DRNLDWG

POST-CONDITION WATERSHED PLAN

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

WS-2

Stormwater Management System Inspection & Maintenance Plan

FISHER STREET TOWNHOUSES
TAX MAP 15, LOT 40-A-1

Fisher Street
Dover, New Hampshire
Strafford County

October 2023

Prepared For:

H. J. STABILE & SON, INC.
20 Cotton Road, Suite 200
Nashua, New Hampshire 03063

Prepared By:

CIVILWORKS NEW ENGLAND
P.O. Box 1166
181 Watson Road
Dover, New Hampshire 03821

Introduction

Civilworks New England has prepared the following Stormwater Management System Inspection & Maintenance Plan for the **Fisher Street Townhouses, Dover, NH.** The intent of this plan is to provide a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this site.

The following inspection and maintenance program is necessary to keep the Stormwater Management System functioning properly. These measures will also help to minimize potential environmental impacts to the areas surrounding the developed site. By following the enclosed procedures, the property owners, and maintenance personnel will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff while at the same time ensuring the recharge of groundwater resources through continued infiltration.

This plan also requires the Owner/Operator to prepare and implement a salt minimization plan to reduce salt usage on-site and ultimately within the watershed. This plan will allow the owner/operator to monitor and modify how much salt is needed, when it should be applied, where it needs to be applied, with the ultimate goal of reducing salt-use without compromising safety. It is expected that salt-use reduction will lead to long-term cost-savings because of purchasing less salt and reduced impacts on vegetation (e.g., landscaping) and corrosion of infrastructure .

The salt minimization plan should include the retention of a contractor who has completed the Green SnowPro Training course and obtained NH DES Salt Application Certification.

It is anticipated that this be a living document that will be updated at regular intervals (recommend updating annually in advance of the winter season to facilitate adjustments).

Owner

H.J. Stabile & Son, Inc.
Eric Jackson, Director of Acquisitions & Development
20 Cotton Road, Suite 200
Nashua, New Hampshire 03063

In the event of a change in ownership, this Inspection and Maintenance Plan shall be transferred to the new party; transfer shall be documented to NH DES in writing.

Contact / Responsible Party

H.J. Stabile & Son, Inc.
Eric Jackson, Director of Acquisitions & Development
20 Cotton Road, Suite 200
Nashua, New Hampshire 03063

Phone: (603) 889-0318
Email: ericjackson@stabilecompanies.com

The contact information for the Contact / Responsible Party shall be kept current; transfer shall be documented to NH DES in writing.

Management Company

H.J. Stabile & Son, Inc.
Eric Jackson, Director of Acquisitions & Development
20 Cotton Road, Suite 200
Nashua, New Hampshire 03063

The contact information for the Management Party shall be kept current.

Inspection Schedule / Record Retention

Inspection frequency should, at a minimum, be in accordance with New Hampshire Stormwater Manual, Volume 2, latest edition, as updated by NH DES. See the Inspection and Maintenance Plan for frequency requirements. A copy of the completed Stormwater Management System's Inspection & Maintenance Log and Deicing Salt Quantity Use Log shall be maintained, kept on-site, and be made available to local, state, or federal regulators as applicable by law. All Inspection and Maintenance records must be provided to NH DES upon request.

Stormwater Management System Components

The Stormwater Management System associated with the project is designed to mitigate both the quantity and quality of site-generated stormwater runoff and to recharge the underlying groundwater resources. As a result, its design includes the following elements:

- Pipes/Culverts
- Outlet Structures
- Energy Dissipation Structures (Rip Rap)
- Catch Basins
- Bio-Retention Basin
- Ferguson Waterworks Rain Guardians Fortress
- Stone Drip Edges
- Porous Pavement
- Pavement
- Litter / Trash Removal

Structure callouts correlate to the design plans, a copy of which shall be maintained with this Inspection and Maintenance Plan.

Control of Invasive Species

During maintenance activities, check for the presence of invasive plants and remove them in a safe manner. Invasive plants shall be controlled to prevent them from reproducing, spreading, or re-growing. See the University of New Hampshire – Cooperative Extension's "Method for Disposing Non-Native Invasive Plants", included at the end of this manual, for guidance on the removal and disposal of invasive species.

Inspection and Maintenance Plan

By implementing the following procedures, the owners will be able to maintain the functional design of the Stormwater Management System and maximize the system's ability to remove sediment and other contaminants from site generated stormwater runoff and to effectively recharge the underlying groundwater resources.

PIPES/CULVERTS:

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

OUTLET STRUCTURE(S):

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

ENERGY DISSIPATION STRUCTURES (RIP RAP):

- Inspect the outlet protection annually for damage and deterioration. Repair damages immediately.
- If stones become displaced from the riprap areas, they should be replaced immediately and chinked in to assure stability. Add additional riprap as needed. Vegetation growing through the riprap should be eliminated at least yearly.

CATCH BASIN(S):

- Inspect once per year.
- Inspect for floatables, sediment accumulation, and hydrocarbons (oils and grease).
- Remove all floatables immediately and sediment accumulations ≥ 1 foot.
- Hydrocarbons shall be removed immediately by skimming, absorbent materials, or other methods and should be disposed of in accordance with applicable State and Federal regulations.

BIO-RETENTION BASINS:

- Inspection, by a **qualified professional**, of the Bio-Retention Basins at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24-hour period, with maintenance or rehabilitation conducted as warranted by such inspection. If the Bio-Retention Basin systems do not drain within 72-hours following a rainfall event, a qualified professional should assess the condition and determine measures required to restore filtration practice (as applicable).
- Embankments and spillways should be inspected by a **qualified professional** for settlement, erosion, seepage, animal burrows, woody vegetation, and other conditions that could degrade the embankment and reduce its stability for impounding water. Immediately take corrective action if any such conditions are found.
- Inlet and outlet pipes, inlet and outlet structures, energy dissipation structures or practices, and other structural appurtenances should be inspected by a **qualified professional**, and corrective action implemented (e.g., maintenance, repairs, or replacement) as indicated by such inspection.
- The bottoms, interior and exterior side slopes, and crest of earthen Bio-Retention Basins should be mowed, and the vegetation maintained in healthy condition, as appropriate to the function of the facility and type of vegetation.

- Vegetated embankments that serve as “berms” or “dams” that impound water should be mowed at least once annually to prevent the establishment of woody vegetation.
- Trash and debris should be removed from the basin and any inlet or outlet structures whenever observed.
- Accumulated sediment should be removed when it significantly affects pond capacity.
- Grass bio-retention basin shall be mowed weekly during growing season.

FERGUSON WATERWORKS RAIN GUARDIANS FORTRESS:

- Common maintenance needs include periodic removal of accumulated leaves (and other organic debris) and garbage from the internal grate and sediment and fine debris from the concrete and metal dry filter box. Contributing watersheds with high sediment concentrations may require up to monthly or twice monthly visits to satisfy maintenance needs.
- If sediment accumulates beyond an acceptable level in the system, it will be necessary to remove. This can be done by manual removal with a shovel or vacuum device. The filter screen can be cleaned manually through brushing or with pressurized water.

STONE DRIP EDGES:

- Inspect twice annually and following any rainfall event exceeding 2.5 inches in a 24-hour period.
- If the system does not drain within 72-hours following a rainfall event, a qualified engineer should inspect the system and determine measures required to restore the condition of the facility.
- Follow the University of New Hampshire’s “Methods for Disposing Non-Native Invasive Plants” for disposing of invasive species (Attached).
- There shall be no use of chemical herbicides or pesticides, except for wildlife habitat management and then only in coordination with the New Hampshire Fish and Game Nongame and Endangered Wildlife Program. Herbicides or pesticides are absolutely prohibited within wetlands or wetland buffer setbacks.

POROUS PAVEMENT:

- Prohibit sanding.
- Minimize application of salt for ice control.
- Monitor periodically, at least twice annually, within 30 minutes of a precipitation event, to ensure that the pavement surface drains effectively after storms.
- See attached checklist for inspection requirements.
- Inspect for salt accumulation, sediment, organic debris, etc. and periodically clean (1-2 times per year) using a sweeper or vacuum sweeper. Vacuum sweeping is the preferred method.
- Inspect adjacent non-permeable pavement sections (1-2 times per year) and ensure they are free of debris/sediment to prevent tracking.
- Inspect adjacent vegetated areas (1-2 times per year) to ensure there are no signs of erosion and sediment/organic debris run-on to the porous pavement areas.
- Inspect areas (as needed) to ensure stock piling of snow, sand/salt, mulch, soil, yard waste, etc. is not occurring.
- Inspect pavement for damaged areas (as needed) and repair as they are identified.

PAVEMENT:

- Minimize sanding.
- Minimize application of salt for ice control.
- Clean periodically (1-2 times per year) using a sweeper or vacuum sweeper. Vacuum sweeping is the preferred method.

LITTER / TRASH REMOVAL:

- Routinely patrol site for litter pick up.

DE-ICING AGENTS:

- To address the concerns associated with the application of chlorides and other deicing materials, NHDES recommends that the Owner/Operator develop a Road Salt and Deicing Minimization Plan for the parking lots and roadways. The plan should develop the policies that the development will keep in place to minimize salt and other deicer use after the project has been completed. The plan should include tracking the use of salt and other deicers for each storm event and compiling salt use data annually. (See Anti-Icing Data Form in the appendix).
- Use sand as primary agent for driveway and access way safety during ice and snow conditions.
- Minimize the use of salt during the winter.
- Use de-icing or anti-caking agents, added to enhance performance and application characteristics of sand mixtures, only as necessary and at minimum application rates.
- Recommend using a certified Winter Operator (Green SnowPro Trained) for applying de-icing agents.
- Monitor weather and apply de-icing agents based on weather conditions and temperatures.
- See attached "Winter Maintenance Guidelines for Porous Pavements" for de-icing agent recommendations.

ANTI-ICING AND SALT MINIMIZATION:

- Owner to develop a Road Salt and Deicing Minimization Plan
- Provide a written policy that the "Development" will keep in place to minimize salt and other deicer use after the project has been completed.
- Use the attached form to track the use of salt and other deicers for each storm event and compiling salt use data annually.
- See attached "Winter Maintenance Guidelines for Porous Pavements" for sanding and salting recommendations.

Inspection & Maintenance Table

System Component / BMP	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Pipes/Culverts	Annually	• Check for sediment accumulation • Check for erosion • Ensure swale is stabilized • Maintain healthy stand of veg., 4" minimum • Inspect for invasive species	≥ 1 in. sediment Repair immediately Restore veg. in-kind Mow twice per year Remove/Dispose of accordingly
Outlet Structure(s)	No sanding Limit 2-4 x's Year Periodically Periodically	• No sanding • Minimize salt use for ice • Vacuum to prevent tracking issues and clogging • Monitor to ensure surface drains effectively • Check for trash/debris • See attached for winter maintenance	No sanding Minimize as Req. 2-4 x's a year Remove when noticed
Energy Dissipation (ED) Structures (Rip Rap)	Annually	• Check for displaced stones • Check for woody vegetation	Replace immediately Remove annually
Catch Basins	Annually	• Check for sediment accumulation • Check for floatable contaminants	≥ 1 ft. sediment depth Remove all floatables
Bio-Retention Basins	Bi-Annually " " Periodically " " " "	• Check for erosion, settlement, seepage, etc. • Check for sediment accumulation in pond • Check for trash (in pond and structures) • Maintain 95% veg. (pond & slopes) • Maintain healthy stand of veg.	Repair immediately ≥ 2 in. sediment Remove all trash/debris Restore veg. in-kind Mow when ≥ 6 in Mow weekly in growing season
Ferguson Waterworks Rain Guardians Fortress	Periodically	• Check for trash, debris, and accumulated sediments in grate • Check sediment level	Remove debris and veg. periodically ≥ 3 in. sediment depth shovel sediment
Stone Drip Edges	Bi-Annually	• Check for sediment accumulation, debris, and invasive species. • Check for water draining	Remove any accumulated Sediment, debris, and invasive species and dispose of accordingly. 72 hours after a 2.5 inch storm event in a 24 hour period
Porous Pavement • Sanding • Salt Applications • Accumulated Salt • Sediment/Organic debris • Adj. Vegetated Areas • Underdrain Outlet • Trash/Debris • Pavement Condition • Stockpiles • Standing Water in Pavement • Winter Maintenance	Prohibit use As Req. Winter/Spring 1-2 x's / yr 1-2 x's / yr Annually Periodically Annually Regularly 1-2 x's / yr Rain Event	Prohibit use to prevent clogging issues RECORD APPLICATION RATES Inspect surface for salt accumulation Inspect surface for sediment/organics Inspect for erosion and prevent run-on to PP Inspect outlet for blockages Inspect for trash/debris Inspect for deteriorated pavement sections Inspect for stockpiled materials Inspect for standing water within 30 min of rain event See attached Winter Maintenance Fact Sheet	Vacuum to prevent issues Minimize as Req. Vacuum immediately Vacuum immediately Stabilize areas Remove blockage Remove when noticed Repair as identified Remove stockpiles Power wash or compressed air blower at 30 degrees or less
Pavement • Sanding • Salt Applications • Sweep/Vacuum • Trash/Debris	Limit use As Req. 1 - 2 x's Year Periodically	• Minimize use to prevent tracking issues • RECORD APPLICATION RATES • Sweep or vacuum to prevent tracking issues • Check for trash/debris	Sweep to prevent issues Minimize as Req. Sweep/Vac as needed Remove when noticed
Litter / Trash Removal	Periodically	• Check for litter and trash	Remove when noticed

Inspection & Maintenance Checklist/Log

The following page contains a blank copy of the Stormwater Management System's Inspection & Maintenance Log and a Deicing Salt Quantity Use Log. These forms are provided to assist the owners with the inspection and maintenance of the Stormwater Management System. The attached "Checklist for Inspection of Permeable Pavement" shall be used for logging the inspections of the porous pavement section.

Stormwater Management System's Inspection & Maintenance Log

Date of Inspection/Maintenance: _____ Inspector: _____

System Component / BMP	Cleaning / Repair Needed (List Items / Comments)	Date of Cleaning/Repair	Performed By

Deicing Salt Quantity Use Log

Date	Amount of Material Applied	Comments



The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

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1		
2		
3		

1.1

A



Unit - A6 | Unit - A5 | Unit - A4 | Unit - A3 | Unit - A2 | Unit - A1

Front Elevation

BUILDING - A

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

JAD DESIGN GROUP INC.
P.O. BOX 728 AMHERST, NH 03031
PHONE: (603) 554-1199
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Job : 2650_x
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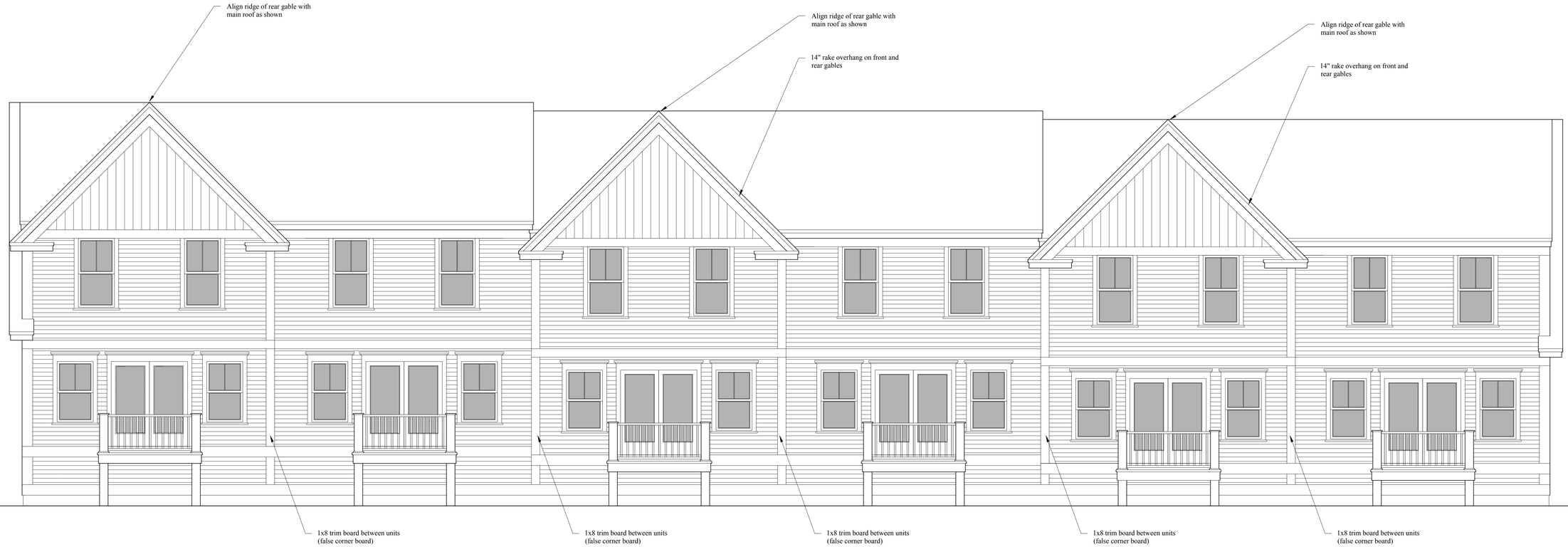
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-2.1.A

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Rear Elevation

BUILDING - A

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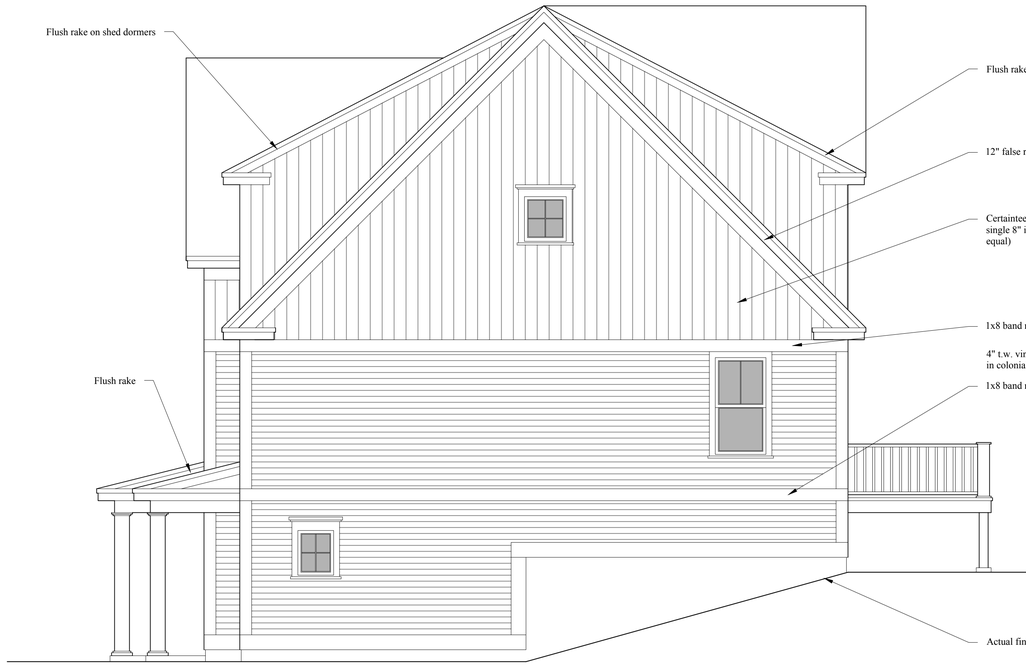
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Building - A

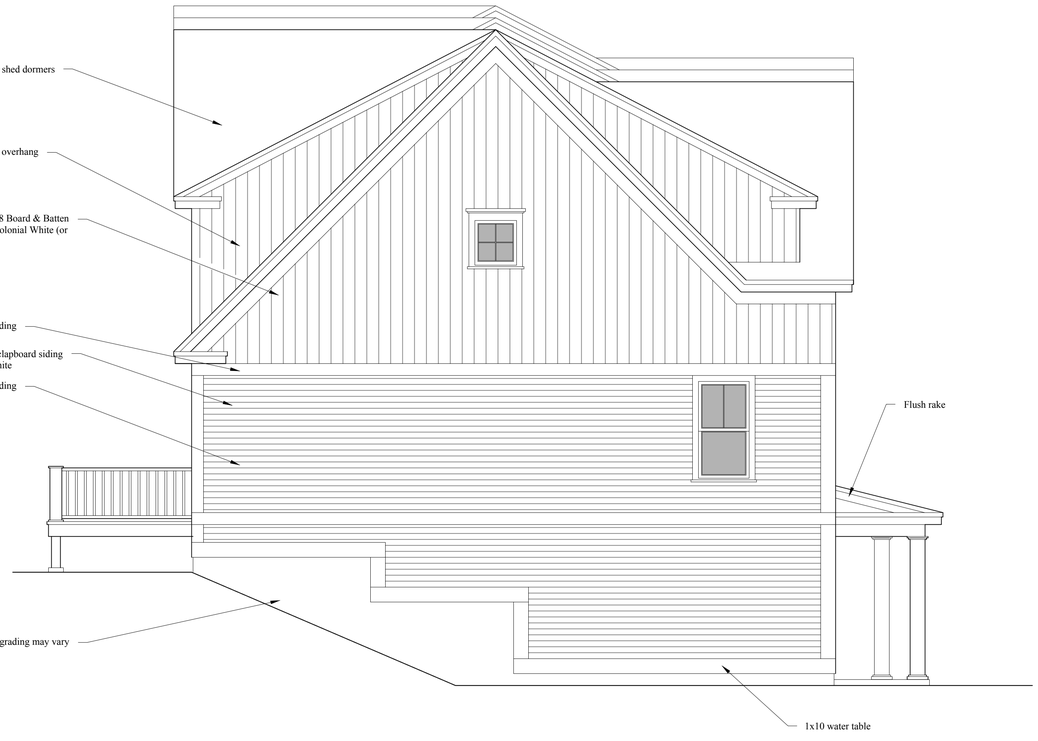
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Unit - A1

Right Side Elevation



Unit - A6

Left Side Elevation

BUILDING - A

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Exterior Elevations
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The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

BUILDING – B

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1.1

A



Unit - B5 | Unit - B4 | Unit - B3 | Unit - B2 | Unit - B1

Front Elevation

BUILDING - B

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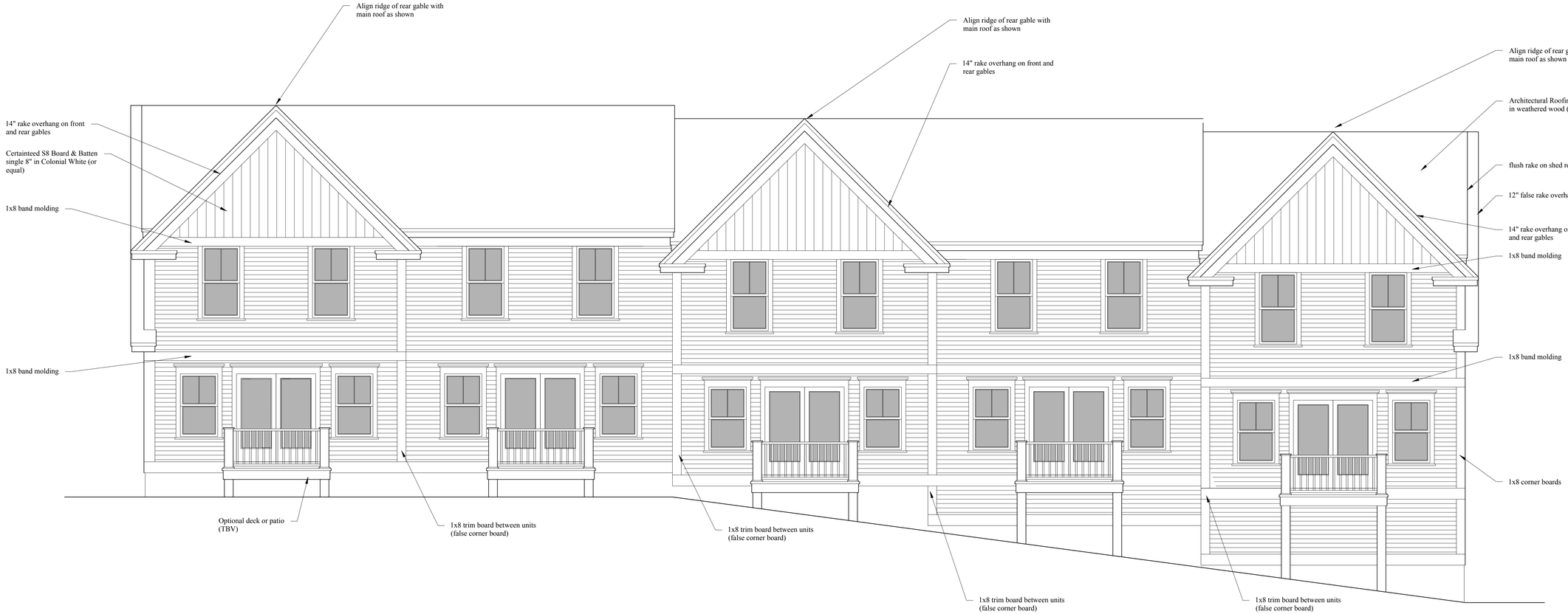
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Building - B

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Rear Elevation

BUILDING - B

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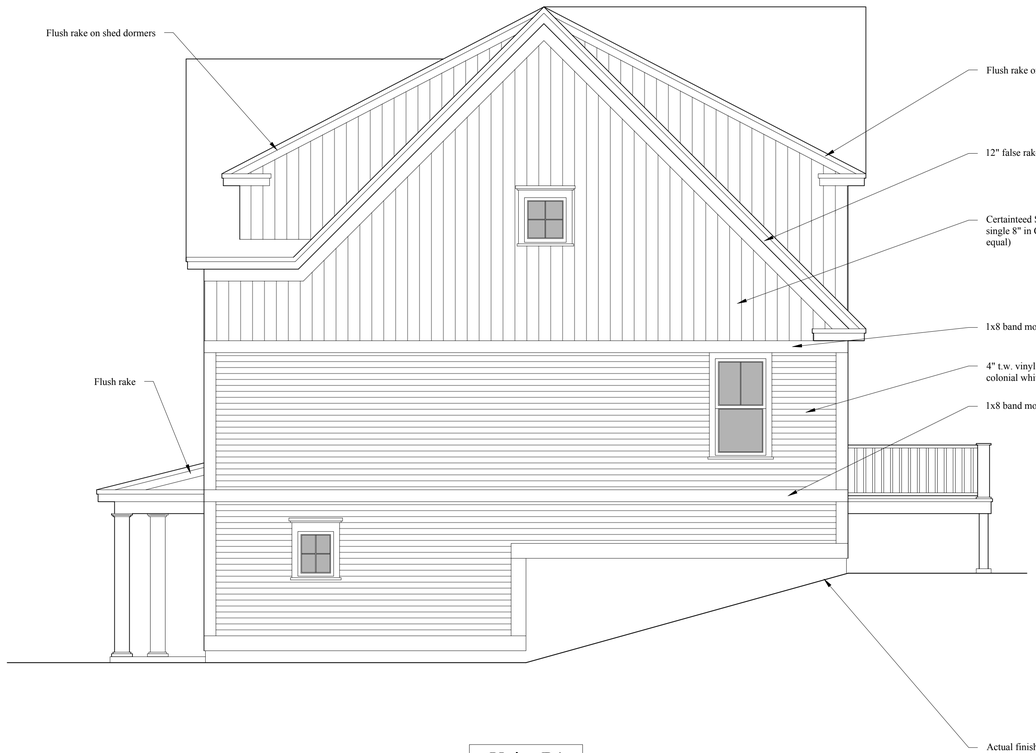
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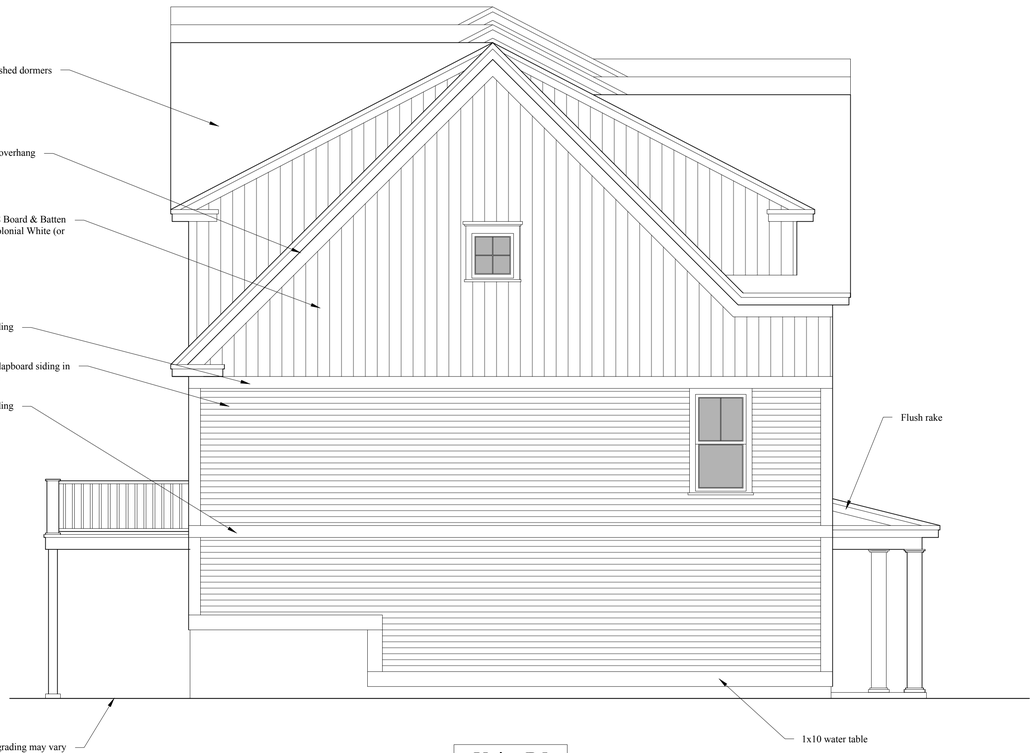
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Unit - B1

Right Side Elevation



Unit - B5

Left Side Elevation

BUILDING - B

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The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

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Front Elevation

BUILDING - C

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Rear Elevation

BUILDING - C

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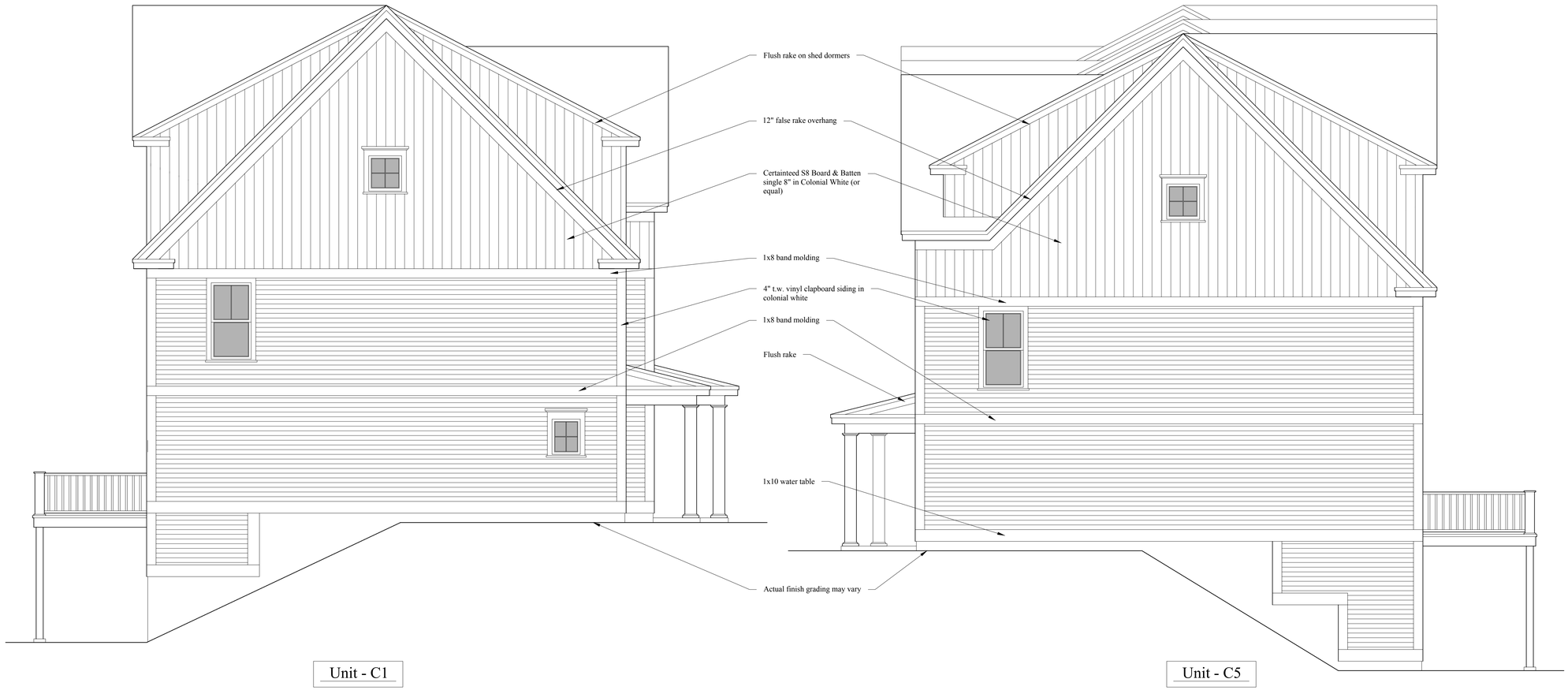
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Unit - C1

Left Side Elevation

Unit - C5

Right Side Elevation

BUILDING - C

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The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

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Unit - D1 | Unit - D2 | Unit - D3 | Unit - D4 | Unit - D5

Front Elevation

BUILDING - D

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Rear Elevation

BUILDING - D

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Date: 6/19/2023
Rev : .

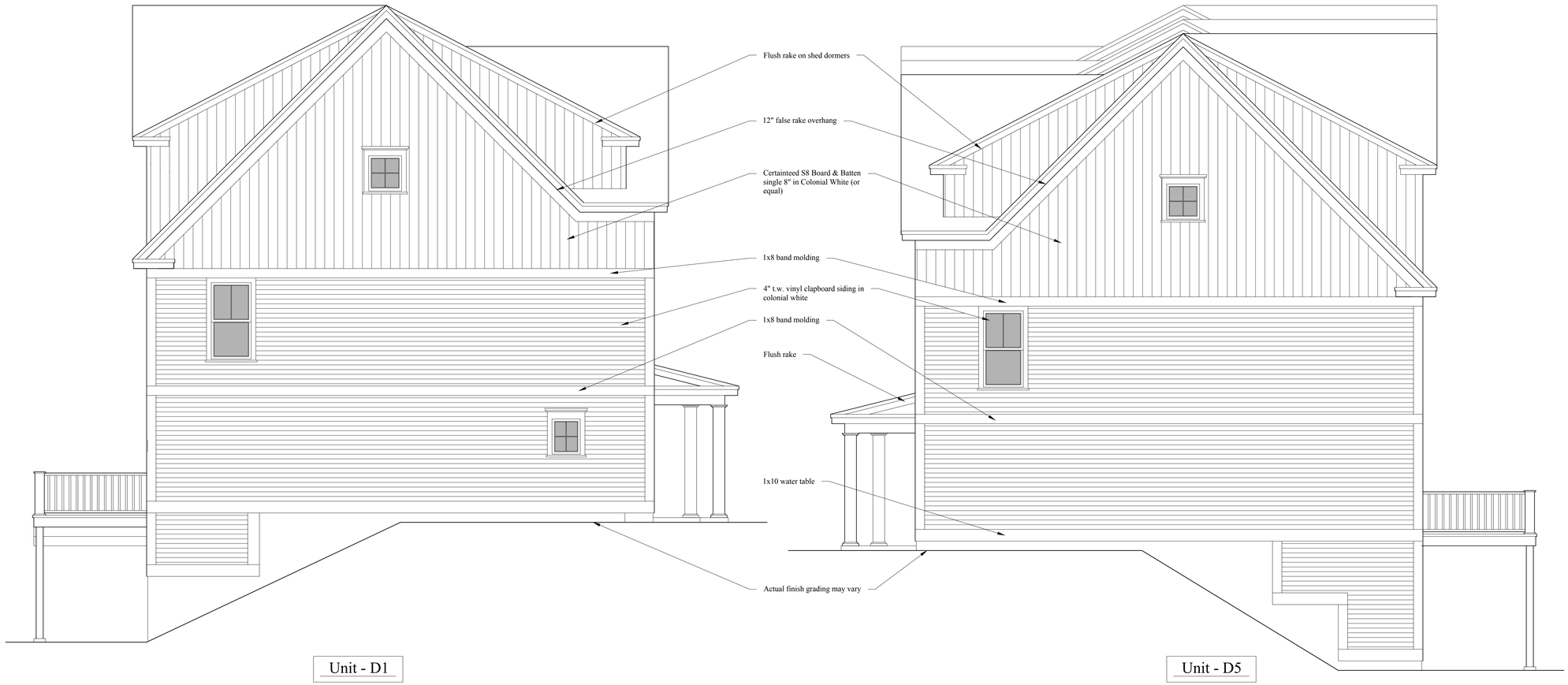
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - D

SHEET
A-2.2.D

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JAD DESIGN GROUP INC.



Unit - D1

Left Side Elevation

Unit - D5

Right Side Elevation

BUILDING - D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

JAD DESIGN GROUP INC.
P.O. BOX 728 AMHERST, NH 03031
PHONE: (603) 554-1199
www.jadhomes.com

Job : 2650_x
Ref : .
Date: 6/19/2023
Rev : .

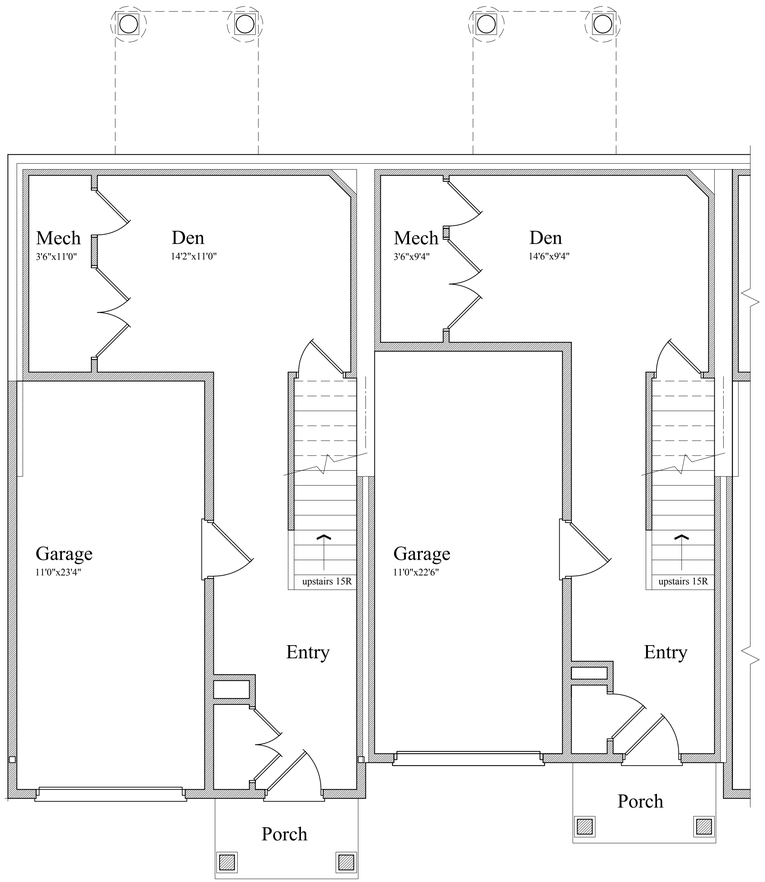
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - D

SHEET
A-2.3.D

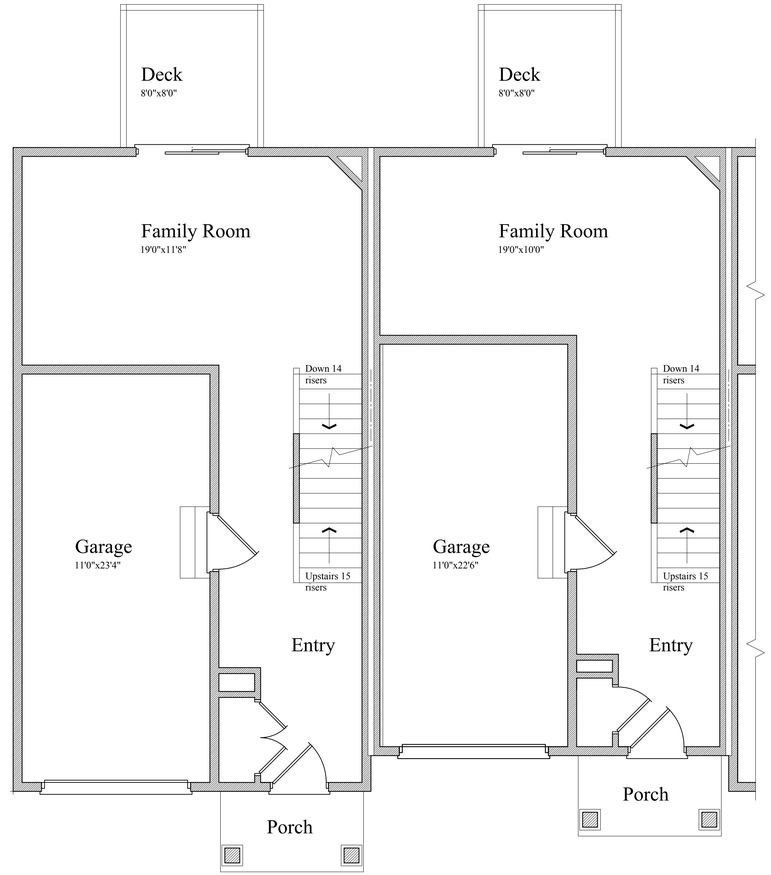
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JAD DESIGN GROUP INC.



Unit - A1
410 sf

Unit - A2
379 sf

Entry / Garage Level
Building A & B



Unit - C1
410 sf

Unit - C2
379 sf

Entry / Garage Level
Building C & D

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Job : 2650_x
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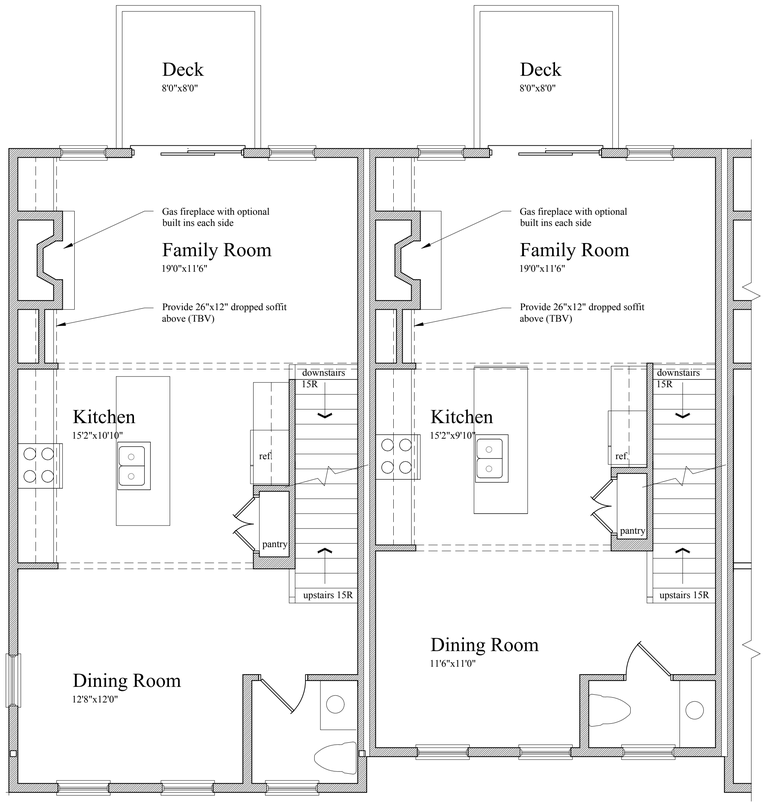
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Lower Floor Plan
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-3.1

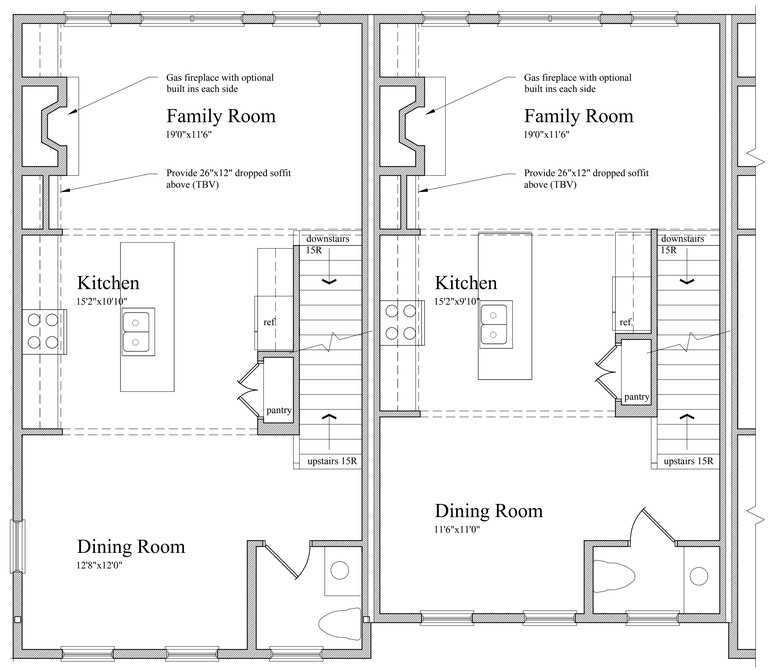
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Unit - A1
720 sf

Unit - A2
680 sf

Main Living Level
Building A & B



Unit - C1
720 sf

Unit - C2
680 sf

Main Living Level
Building C & D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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Job : 2650_x
Ref : .
Date: 6/19/2023
Rev : .

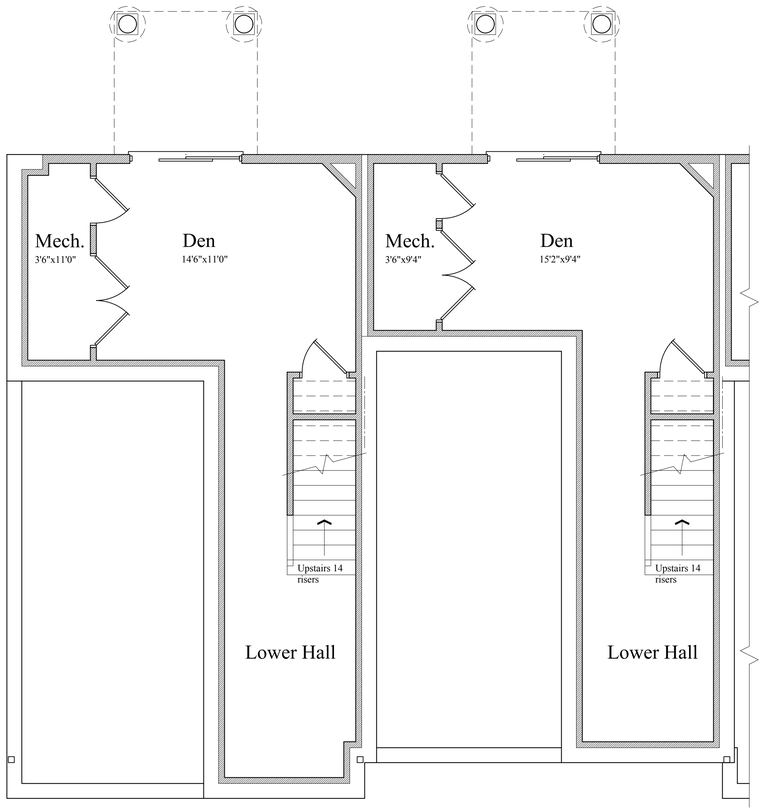
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Main Floor Plan
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-4.1

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Unit - C1
409 sf

Unit - C2
384 sf

Lower Level
Building C & D only



Unit - A1
720 sf

Unit - A2
680 sf

Bedroom Level
Building A, B, C & D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

JAD DESIGN GROUP INC.
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Job : 2650_x
Ref :
Date: 6/19/2023
Rev :

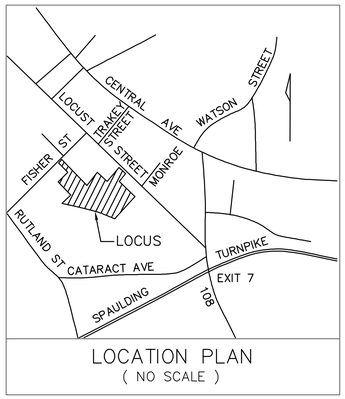
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Floor Plans
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-5.1

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LOCATION PLAN
(NO SCALE)

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN

H.J. STABILE AND SON, INC.

TAX MAP 15, LOT 40A-1

FISHER STREET

DOVER, NH

OCTOBER 26, 2023

OWNER

DOUBLE DIAMOND HOLDINGS NORTH, LLC.
340 CENTRAL AVENUE, #202
DOVER, NEW HAMPSHIRE 03820

_____ DATE

APPLICANT

H.J. STABILE AND SON, INC.
20 COTTON AVE, #200
NASHUA, NEW HAMPSHIRE 03863

_____ DATE

SITE CIVIL ENGINEER

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

LAND SURVEYOR

MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND
P.O. BOX 681
24 CHESTNUT STREET
DOVER, NH 03820
(603) 742–0911

ARCHITECT

JAD DESIGN GROUP INC.
P.O. BOX 728
AMHERST, NH 03031
(603) 554–1199

LANDSCAPE ARCHITECT

JEFFREY R. HYLAND, LANDSCAPE ARCHITECT #00026
IRONWOOD DESIGN GROUP, LLC
PO BOX 873
EXETER, NH 03822
(603) 772–0590

WETLAND SCIENTIST

DAMON E. BURT, CWS #00163
FRAGGLE ROCK ENVIRONMENTAL
38 GARLAND ROAD
STRAFFORD, NH 03884
(603) 969–5574

SHEET INDEX	SHEET
COVER SHEET	1
NEIGHBORHOOD PLAN	2
EXISTING CONDITIONS PLAN (BY MCENEANEY SURVEY)	3
NOTE SHEET	4
DEMOLITION PLAN	5
SITE PLAN	6
GRADING, DRAINAGE & EROSION CONTROL PLAN	7
UTILITY PLAN	8
EROSION CONTROL NOTES	9
DETAIL SHEETS	10-17
LIGHTING PLAN	18
LIGHTING DETAILS	19
DOVER LADDER TRUCK MOVEMENT PLAN	20
ARCHITECTURAL PLANS	
EXTERIOR ELEVATIONS (BUILDING A, B, C , AND D)	A2.1.A-A2.3.D
FLOOR PLANS	A3.1-A5.1
LANDSCAPE PLANS	
LANDSCAPE PLAN	L1.0
LANDSCAPE DETAILS	L2.0

PLANNING FILE NO.: P23–XX



ABUTTERS LIST (WITHIN 200 FT)

TAX MAP	LOT NO.	NAME & ADDRESS
15 21-22	15 21-22	DOUBLE DIAMOND HOLDINGS SOUTH, LLC. 340 CENTRAL AVE. #202 DOVER, NH 03820
15 66	15 66	RESTORATION CHURCH ASSEMBLY OF GOD PO BOX 1664 DOVER, NH 03821
15 62	15 62	SOUTH DOVER STORAGE SOLUTIONS LLC C/O ROBERT FOSTER 11 MOSES CARR ROAD ROLLINSFORD, NH 03869
15 54	15 54	MUNIZ LOUIS A & JOSEPHINE A CO-TRUSTEES MUNIZ REVOCABLE TRUST OF 2017 40 FISHER STREET DOVER, NH 03820
12 139	12 139	GRIFFIN ELISABETH 49 FISHER STREET DOVER, NH 03820
12 126	12 126	CITY OF DOVER 288 CENTRAL AVE DOVER, NH 03820
12 113	12 113	HAWKINS MATTHEW & ASHLEY TRUSTEES HAWKINS FAMILY REVOCABLE TRUST P.O. BOX 308 DOVER, NH 03821
15 52	15 52	SMART DONALD W & ACKLER SAUNDRA R 38 FISHER STREET DOVER, NH 03820
15 51	15 51	CASEY CARMEL A 36A FISHER STREET DOVER, NH 03820-2526
15 48	15 48	DEMOUPOULOS STAVROS REV TRUST 1/2 & DEMOUPOULOS ELEFTHERIA REV TRUST 1/2 7851 DUET COURT NEW PORT RICHEY, FL 34654
15 47	15 47	HENERBERRY JAMES CHARLES & HENERBERRY MELISSA FORD 26 FISHER STREET DOVER, NH 03820
12 104	12 104	COOPER DARYLE D & MARY ANN CO-TRUSTEES COOPER FAMILY REVOCABLE TRUST OF 2019 45 ELM STREET DOVER, NH 03820

ABUTTERS LIST (WITHIN 200 FT)

TAX MAP	LOT NO.	NAME & ADDRESS
12 56	12 56	MOYNIHAN THOMAS J & MOYNIHAN KAREN E 44 ELM STREET DOVER, NH 03820
15 46	15 46	MACMILLAN BRYAN & MACMILLAN ELIZABETH 18-20FISHER STREET DOVER, NH 03820
15 43	15 43	CHILDREN'S HOME 207 LOCUST STREET DOVER, NH 03820
15 42	15 42	BRUNSON DANA & COOLEY MOLLY 213 LOCUST STREET DOVER, NH 03820
15 41	15 41	HUGHES KEVIN R & HUGHES MAXINE M 223 LOCUST STREET DOVER, NH 03820
15 113	15 113	CENTRAL AVENUE MANAGEMENT LLC 601 CENTRAL AVE DOVER, NH 03820
15 113-A	15 113-A	PETERSON STEPHAN L 246 DOVER POINT ROAD DOVER, NH 03820
15 39	15 39	NOYES RYAN F P.O. BOX 1152 DOVER, NH 03821-1152
15 38	15 38	WHITE GARRETT B COAKLEY ROAD PORTSMOUTH, NH 03801-4134
15 37	15 37	DION JEREMY P & DION AIMEE L 3 EARLE STREET DOVER, NH 03820-2118
15 36	15 36	NOYES RYAN F P.O. BOX 1152 DOVER, NH 03821-1152
15 35	15 35	GARSTKA JEFFERY M & GARSTKA STACI P.O. BOX 154 PORTSMOUTH, NH 03802-0154

D / 11 TAX MAP LOT NUMBER

MAGNETIC

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P23-XX

NO.	REVISION	APP'D	DATE

DATE: 10-26-23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:SITE.DWG

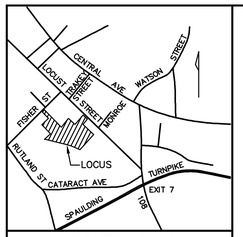
CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

NEIGHBORHOOD PLAN

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

2



LOCATION PLAN
(NO SCALE)

NH STATE PLANE
NAD 83 - GPS OBS.

REFERENCE PLANS:

1.) BOUNDARY LINE ADJUSTMENT PLAN, DOUBLE DIAMOND HOLDINGS SOUTH, LLC AND DOUBLE DIAMOND HOLDINGS NORTH, LLC, CENTRAL AVENUE, LOCUST STREET AND FISHER STREET, DOVER, NEW HAMPSHIRE; SCALE: 1" = 60'; DATED: FEBRUARY 12, 2008, REVISED THROUGH 4/9/08; BY: TRITECH EGINEERING CORPORATION; RECORDED SC.R.D. PLANS 94-16 & 94-17.

2.) PLAN OF LAND PREPARED FOR MOORE BUSINESS FORMS, INC. TAX MAP 15, LOT No. 21 & 22, 23, 40A & 68, LOCUST AND FISHER STREETS, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE; SCALE: 1" = 50'; DATED: DECEMBER 9, 1999, REVISED THROUGH 1/20/05; BY: McENEANEY SURVEY ASSOCIATES, INC.; RECORDED S.C.R.D. PLANS 78-96 & 78-97.

3.) COMMUNITY TRAIL PHASE III, TAX MAP 15, LOTS 21-22 & 40A; SCALE: 1" = 20'; DATED: NOV. 2017, REVISED THROUGH 9/9/2019; BY: FUSS & O'NEILL; RECORDED S.C.R.D. PLANS 11976 & 11977.

4.) SUBDIVISION PLAN PREPARED FOR DOUBLE DIAMOND HOLDINGS NORTH, LLC AND CARMEL A. CASEY, TAX MAP 15, LOT No. 40A, FISHER STREET, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE; SCALE: 1" = 40'; DATED: JULY 12, 2022; BY: THIS OFFICE.

5.) LOT LINE ADJUSTMENT PLAN PREPARED FOR DOUBLE DIAMOND HOLDINGS NORTH, LLC AND CARMEL A. CASEY, TAX MAP 15, LOT Nos. 40A-1 & 51, FISHER STREET, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE; SCALE: 1" = 40'; DATED: OCTOBER 25, 2023; BY: THIS OFFICE.

No.	Central Angle	Radius	Arc Length	Chord Length	Chord Bearing
C1	4°14'33"	1864.00'	138.02'	137.99'	S28°01'47"E
C2	5°35'27"	1957.00'	190.97'	190.89'	N27°20'49"W
C3	2°41'09"	2803.00'	131.40'	131.39'	N28°47'57"W

No.	Bearing	Distance
L1	S85°28'46"E	50.00'
L2	N88°23'57"E	50.25'
L3	N30°24'53"W	28.22'
L4	N12°41'05"W	50.00'
L5	S86°03'39"E	41.38'
L6	S86°14'18"E	44.05'

LEGEND

I.R.(fnd) – IRON ROD FOUND
I.P.(fnd) – IRON PIPE FOUND
S.S.(fnd) – STEEL STAKE FOUND
G.B.(fnd) – GRANITE BOUND FOUND
-o- UP – UTILITY POLE
ELEV. – ELEVATION
—— 56 —— – CONTOUR LINE – 2' INTERVAL
EOP – EDGE OF PAVEMENT
S.F. – SQUARE FEET
Ac. – ACRE
(TYP.) – TYPICAL
± – MORE OR LESS
S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS

NO.	DATE	DESCRIPTION	BY	CHK
CNE #22017		REVISIONS		

23-2511	EXIST.COND.	21-10	64-72
PROJECT NO	TYPE	FIELDBOOK & PAGES	

12 / 56
THOMAS J. MOYNIHAN
KAREN E. MOYNIHAN
44 ELM STREET
DOVER, NH 03820
4528 / 4

15 / 46
BRYAN MCMILLAN
ELIZABETH MCMILLAN
18-20 FISHER STREET
DOVER, NH 03820
4807 / 723
SEE NOTE #11

15 / 43
DOVER CHILDREN'S HOME
207 LOCUST STREET
DOVER, NH 03820
312 / 440

15 / 40A
DOUBLE DIAMOND HOLDINGS NORTH, LLC
340 CENTRAL AVENUE #202
DOVER, NH 03820
3166 / 780

12 / 104
COOPER FAMILY REVOCABLE TRUST OF 2019
45 ELM STREET
DOVER, NH 03820
4733 / 767

15 / 47
JAMES CHARLES HENERBERRY
MELISSA FORD HENERBERRY
26 FISHER STREET
DOVER, NH 03820
4752 / 593

15 / 48
STAVROS DEMOPOULOS REVOCABLE TRUST
ELEFTHERIA DEMOPOULOS REVOCABLE TRUST
7851 DUET COURT
PORT RICHEY, FL 34654
2668 / 620

15 / 49
JACOB COHEN-HOLMES
52 HAMPTON FALLS ROAD
EXETER, NH 03833
4630 / 864

15 / 50
LAURIE A. SMITH
GREGORY T. SMITH
36 FISHER STREET
DOVER, NH 03820
1073 / 386

15 / 51
15 / 52
DONALD W. SMART
SAUNDRA R. ACKLER
38 FISHER STREET
DOVER, NH 03820
1659 / 556

12 / 113
HAWKINS FAMILY REVOCABLE TRUST
P.O. BOX 308
DOVER, NH 03821
4307 / 762

12 / 126
CITY OF DOVER
288 CENTRAL AVE
DOVER, NH 03820
3311 / 694

12 / 139
ELISABETH GRIFFON
49 FISHER STREET
DOVER, NH 03820
44858 / 218

15 / 54
MUNIZ REVOCABLE TRUST OF 2017
40 FISHER STREET
DOVER, NH 03820
4463 / 193

15 / 62
SOUTH DOVER STORAGE SOLUTIONS, LLC
11 MOSES CARR ROAD
ROLLINSFORD, NH 03869
4055 / 77

ELM STREET
FISHER STREET {PUBLIC R.O.W.}
BELKNAP STREET

TBM
NAIL IN POLE
ELEV. = 100.72

HOUSE
GARAGE
ASPHALT DRIVE
GRAVEL DRIVE
EXISTING DECK
EXISTING HOUSE
EXISTING DRIVE
18"ø MAPLE
30"ø MAPLE
TREELINE (TYP)
STREAM
50' WETLAND BUFFER
CITY OF DOVER CONSERVATION DISTRICT
DRAINAGE EASEMENT (SEE NOTE 12)
GRAVEL/CRUSHED STONE
RETAINING WALL
ASPHALT WALK
DOVER COMMUNITY TRAIL (SEE NOTE 10)
50' DRAINAGE EASEMENT
3'X4' STONE BOX CULVERT
12"ø SLEEVE FOR PROPOSED SEWER
BUILDING ZONE HR
BUILDING ZONE G

S04°05'50"W 147.00'
S04°05'50"W 245.00'
S04°05'50"W 141.68'
S85°28'46"E 147.31'
S54°03'49"W 362.44'
S54°03'49"W 397.45'
S85°37'16"E 119.46'
S86°14'18"E 125.23'
S10°16'03"E 144.48'
N06°50'52"W 142.74'
S30°24'53"E 170.00'
N30°08'32"W 75.89'
S89°25'22"E 105.18'
N30°08'32"W 276.41'
N05°33'32"E 142.00'

PARCEL AREA
170,468 S.F.
3.91 Ac.

C1 C2 C3
L1 L2 L3 L4 L5 L6

NOTES:

1.) OWNER OF RECORD:
DOUBLE DIAMOND HOLDINGS NORTH, LLC
340 CENTRAL AVENUE #202
DOVER, NEW HAMPSHIRE 03820
S.C.R.D. VOLUME 3166, PAGE 780

2.) 15 / 40A – DENOTES TAX MAP AND PARCEL NUMBER.

3.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT PARCEL AS OF THE DATE OF THIS PLAN. THE BOUNDARY LINES SHOWN AS SHOWN ON REFERENCE PLAN #4.

4.) LOT AREA = 154, 408 S.F. / 3.54 Ac.

5.) ZONING DISTRICT:
GATEWAY (G)
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT SIZE	= N/A
MINIMUM LOT COVERAGE	= 50 PERCENT
MINIMUM FRONTAGE BUILD-OUT	= 60%
MAXIMUM BUILDING COVERAGE	= 50 PERCENT
BUILDING SETBACK REQUIREMENTS:	
FRONT SETBACK	= 5-20 FEET
SIDE SETBACK	= 10 FEET
REAR SETBACK	= 15 FEET
MAXIMUM BUILDING HEIGHT	= 4 STORY

6.) THE SUBJECT PARCEL IS NOT LOCATED WITHIN THE SPECIAL FLOOD HAZARD AREA (SFHA) AS SHOWN ON FLOOD INSURANCE RATE MAP 33017C0320E, EFFECTIVE DATE 9/30/2015.

7.) BASIS OF BEARING IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED 12/10/2021.
VERTICAL DATUM IS NH STATE PLANE (NAVD88) BASED ON GPS OBSERVATION DATED 12/10/2021.

8.) PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A SURVEY PERFORMED BY MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND DURING AUGUST 2022 WITH AN ERROR NOT GREATER THAN 1 IN 10,000.

9.) WETLAND FLAGGED LINES SHOWN WERE DELINEATED BY BAG LAND CONSULTANTS, BRUCE A. GILDAY CWS #88, DATED NOVEMBER 2021. IN ACCORDANCE WITH THE 1987 CORPS. OF ENGINEERS WETLANDS DELINEATION MANUAL AND LOCATED BY THIS OFFICE.

10.) THE PARCEL 15/40A-1 IS ENCUMBERED BY DRAINAGE AND COMMUNITY TRAIL EASEMENTS BENEFITING THE CITY OF DOVER, SEE REFERENCE PLAN 3.

11.) THE SUBJECT PARCEL IS ENCUMBERED BY A RIGHT OF WAY BENEFITING LOT 15/46, S.C.R.D. BOOK 4807, PAGE 723.

12.) A 50' WIDE DRAINAGE EASEMENT ON PARCEL 15/40A-1 TO BENEFIT PARCEL 15/40A.

"I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL GROUND SURVEY PERFORMED WITH A TOTAL STATION, BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, SAID SURVEY MEETS OR EXCEEDS THE MINIMUM PRECISION REQUIREMENTS FOR SURVEY CLASSIFICATION "U" AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS."

EXISTING CONDITIONS PLAN
FOR
FISHER STREET TOWNHOUSES
TAX MAP 15, LOT No. 40A-1
FISHER STREET
CITY of DOVER
COUNTY of STRAFFORD
STATE of NEW HAMPSHIRE

DOVER PLANNING FILE No.

DRAWN BY: KJF	FILE: MSA\2511\DWG\23-2511
SCALE: 1" = 40'	DATE: OCTOBER 25, 2023

40 20 0 20 40 80 120 160

STATE OF NEW HAMPSHIRE No. 661 KEVIN M. McENEANEY LICENSED LAND SURVEYOR
SIGNATURE

McEneaney Survey Associates of NEW ENGLAND
P.O. Box 681 – 24 CHESTNUT STREET
DOVER, NH 03820 (603) 742-0911

SURVEYING – PLANNING – CONSULTING

10/26/2023 13:27:50 File: \\cneserver1\MSA Projects\2511\Drawings\23-2511 EC.dwg Layout: STABILE EC

GENERAL NOTES:

1. OWNERS OF RECORD:

   DOUBLE DIAMOND HOLDINGS NORTH,LLC.
   340 CENTRAL AVENUE, SUITE 202
   DOVER, NEW HAMPSHIRE 03820

2. 15/40A – DENOTES TAX MAP AND PARCEL NUMBER.

3. PARCEL AREA = 145,408 S.F. / 3.54 Ac.

4. ZONING DISTRICT IS GATEWAY DISTRICT

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROVIDED
MINIMUM LOT SIZE	= NA	3.54 ACRES
MAXIMUM LOT COVERAGE	= 50 PERCENT	15.2 PERCENT
MINIMUM FRONTAGE	= 200 FEET	226.5 FEET
MINIMUM OPEN SPACE	= 33 PERCENT	55.3 PERCENT
BUILDING SETBACK REQUIREMENTS:		
FRONT SETBACK	= 50 FEET	±57 FEET
SIDE SETBACK	= 50 FEET	±76 FEET
REAR SETBACK	= 50 FEET	± 140 FEET
MAXIMUM BUILDING HEIGHT	= 55 FEET MAX.	< 55 FEET

5. THE SUBJECT PARCEL IS NOT LOCATED WITHIN THE SPECIAL FLOOD HAZARD AREA (SFHA) AS SHOWN ON FLOOD INSURANCE RATE MAP 33017C0320E
6. BASIS OF BEARING IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED 12/10/2021. VERTICAL DATUM IS NH STATE PLANE (NAVD88) BASED ON GPS OBSERVATION DATED 12/10/2021
7. PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A SURVEY PERFORMED BY MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND WITH AN ERROR NOT GREATER THAN 1 IN 10,000.
8. WETLANDS SHOWN WERE IDENTIFIED BY BAG LAND CONSULTANTS, BRUCE A. GILDAY, N.H.C.W.S. #88 ON NOVEMBER, 2021 IN ACCORDANCE WITH THE 1987 CORPS. OF ENGINEERS WETLANDS DELINEATION MANUAL AND LOCATED BY MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND.
9. THE PARCEL 15/40A–1 IS ENCUMBERED BY DRAINAGE AND COMMUNITY TRAIL EASEMENTS BENEFITING THE CITY OF DOVER, SEE REFERENCE PLAN 3.
10. THE SUBJECT PARCEL IS ENCUMBERED BY A RIGHT OF WAY BENEFITING LOT 15/46, S.C.R.D. BOOK 4807, PAGE 723.
11. A 50' WIDE DRAINAGE EASEMENT ON PARCEL 15/40A–1 TO BENEFIT PARCEL 15/40A .

DEMOLITION NOTES:

1. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
2. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY DEMOLITION/ CONSTRUCTION ACTIVITIES. (811).
4. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, UTILITIES AND PAVEMENT ON THE SITE TO THE LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO FAMILIARIZE HIMSELF WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS NOT ALREADY OBTAINED BY THE OWNER AND ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF–SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
8. THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATION IS NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
9. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF–SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES, AND CODES.
10. 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.

PERMIT SUMMARY:

1. 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.

   CONDITIONAL USE PERMIT: P23–XX: PENDING

   SITE PLAN: P23–XX: PENDING

SITE NOTES

1. PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A PLAN REFERENCED AND PREPARED BY MCENEANEY SURVEY ASSOCIATES OF NEW ENGLAND (SEE EXISTING CONDITIONS PLAN IN THIS PLAN SET).
2. THE PURPOSE OF THIS PLAN IS TO DEPICT IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF 4 MULTI–FAMILY RESIDENTIAL TOWNHOUSE BUILDINGS AND ASSOCIATED SITE IMPROVEMENTS.
3. EXTERIOR LIGHTING SHALL BE CUT–OFF TYPE FIXTURES PER CHAPTER 153–14–E AND SHALL PROVIDE LIGHTING DIRECTED ON–SITE ONLY.
4. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY AND STATE CODES.
5. ON–SITE SNOW STORAGE SHALL OCCUR ALONG THE EDGES OF PROPOSED PAVEMENT.
6. ALL CONSTRUCTION LAYOUT SHALL BE DONE BY A LICENSED SURVEYOR UNDER CONTRACT WITH THE CONTRACTOR.
7. SEE DETAILS FOR SIGN LEGENDS.
8. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICAN WITH DISABILITIES ACT, LATEST EDITIONS.
9. THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE CONSTRUCTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE FACILITIES AND THEIR COMPONENTS DURING DEMOLITION AND CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE OWNERS REPRESENTATIVE. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIE–DOWNS. SUCH MATERIALS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AT THE COMPLETION OF THE PROJECT.
10. METHODS OF DEMOLITION, CONSTRUCTION AND ERECTION ARE THE CONTRACTOR'S RESPONSIBILITY UNLESS OTHERWISE SPECIFIED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND MAINTAIN ENVIRONMENTAL CONTROLS AS REQUIRED BY FEDERAL, STATE AND MUNICIPAL REGULATIONS AND PERMITS. ENVIRONMENTAL CONTROLS SHALL INCLUDE BUT SHALL NOT BE LIMITED TO DUST CONTROL AND SILT BARRIERS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO STRUCTURES OR UTILITIES OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION PHASE CAUSED BY HIMSELF, HIS EMPLOYEES, HIS SUBCONTRACTORS OR EMPLOYEES OF SAME. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TEMPORARY FACILITIES FOR THE PROTECTION OF THE WORK, WORKERS AND PUBLIC SAFETY.
12. BUILDING ADDRESSES (INCLUDING APT/UNIT NUMBERS IF APPLICABLE) SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.
13. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS AND NH RSA 155–A: 5. THE PROPOSED STRUCTURE WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS.
14. THE SITE SHALL BE MAINTAINED TO PROVIDE ACCESSIBILITY IN ALL WEATHER CONDITIONS.
15. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM WITH DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.
16. THE SUBJECT PARCEL(S) IS (ARE) SERVED BY MUNICIPAL WATER AND SEWER.
17. 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 TO ANY EARTH DISTURBANCE ACTIVITY OCCURRING.
18. AS–BUILT PLANS OF THE SITE SHALL BE SUBMITTED ON PAPER AND IN A DIGITAL FORMAT IN PDF AND AUTOCAD DWG, AUTOCAD 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.
19. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY–FRIDAY 7 AM–6 PM, SATURDAY 9 AM–4 PM. NO CONSTRUCTION SHALL OCCUR ON SUNDAY OR DURING FEDERAL HOLIDAY HOURS. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR AND THE SIGN SHALL NOTE THAT THE ROADWAY IS PRIVATE. SAID SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR ASSISTANT CITY MANAGER.
20. 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.
21. 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.
22. ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
23. ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
24. APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL.
    HTTP://WWW.UNH.EDU/UNHSC/PTAPP.
25. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
26. 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.
27. FIRE DEPARTMENT ACCESS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.
28. REFUSE PICKUP WILL BE BY PRIVATE CONTRACTOR AND WILL BE VIA CURBSIDE PICK UP.
29. SNOW STORAGE WILL BE ACCORDING TO THE OPERATION AND MAINTENANCE PLAN AND WITHIN AREAS AS INDICATED.

UTILITY NOTES

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
3. THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE FOR WHICH DEVELOPMENT IS PROPOSED. SITE PLANS SHALL SHOW ANY EASEMENTS FOR THESE SERVICES.
4. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
5. THE SUBJECT PARCEL(S) IS (ARE) SERVED BY MUNICIPAL WATER AND SEWER.
6. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
7. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, DOUBLE CEMENT LINED DUCTILE IRON PIPE OR TYPE "K" COPPER, OR CITY APPROVED MATERIAL.
8. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF DOVER WATER DEPARTMENT.
9. ALL GRAVITY SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE NOTED AND CONFORM TO THE REQUIREMENTS OF THE CITY OF DOVER SEWER DEPARTMENT STANDARDS.
10. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE CITY OF DOVER COMMUNITY SERVICES DEPARTMENT STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
11. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
12. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE UTILITY COMPANIES.
13. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
14. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
15. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
16. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES. COORDINATE WITH GAS COMPANY.
17. A 10–FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18–INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
18. THE CONTRACTOR SHALL CONTACT "DIG–SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG–SAFE" NUMBER ON SITE AT ALL TIMES.
19. SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
20. GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF DOVER.
21. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF DOVER.
22. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
23. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
24. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING SHALL BE PREPARED BY THE PROJECT ELECTRICAL ENGINEER.
25. APPROVED BACKFLOW PREVENTORS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.
26. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE CITY AND STATE CODES.
27. A SECURITY ALARM SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 58, ARTICLE I, SECTION 58–2 OF THE CODE OF THE CITY OF DOVER.
28. THE PROPOSED STRUCTURE SHALL COMPLY WITH CHAPTER 81, ARTICLE IV, SECTION 81–27 AND THE STATE BUILDING CODES OF THE CODE OF THE CITY OF DOVER.
29. FIRE SUPPRESSION PLANS SHALL BE PROVIDED TO THE FIRE/INSPECTION DEPARTMENT PRIOR TO INSTALLATION.
30. THE STRUCTURE SHALL BE SERVED BY A SPRINKLER SYSTEM AS REQUIRED UNDER CHAPTER 81–30 OF THE CODE OF THE CITY OF DOVER AND THE ADOPTED STATE OF NEW HAMPSHIRE BUILDING & FIRE CODE.
31. 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.
32. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13.
33. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
34. SEWAGE LOADING (PER NHDES ENC–WQ 1008.03 TABLE 1008–1)
    APARTMENTS – 2 OR MORE: 150 GPD/BEDROOM = 22 UNITS X 2 BEDS X 150: 6,600 GPD

GRADING NOTES:

1. ALL ROAD DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR CONSTRUCTION OF THE CITY OF DOVER, N.H. AND "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION", LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. CONTRACTOR SHALL RETAIN A GEOTECHNICAL ENGINEERING CONSULTANT APPROVED BY THE OWNER, TO CONDUCT COMPACTION TESTING AND FILL GRADATION MONITORING PER THE ABOVE REFERENCED "STANDARD SPECIFICATIONS".
3. SEE EROSION CONTROL NOTES & DETAIL SHEET FOR TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.
4. ALL DRAINAGE PIPES SHALL BE HDPE OR APPROVED EQUAL UNLESS OTHERWISE NOTED.
5. ALL DISTURBED AREAS NOT OTHERWISE CALLED FOR SURFACE TREATMENT SHALL RECEIVE 6" OF HIGH QUALITY LOAM AND SHALL BE SEEDED WITH GRASS.
6. ALL SITEWORK CONSTRUCTION SHALL BE ADVANCED USING "BEST MANAGEMENT PRACTICES" SANCTIONED BY THE USDA SCS AND NHDES.
7. TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED, UTILIZED AND MAINTAINED UNTIL BASE MATERIALS ARE CONSTRUCTED.
8. CONTRACTOR SHALL PROVIDE A FINISH GRADED SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES AND UNDER RAISED STRUCTURES.
9. DENSITY REQUIREMENTS:

LOCATION	MINIMUM DENSITY
BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREA	90%

   *ALL PERCENTAGES SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH AASHTO STANDARD 180, METHOD C. FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH AASHTO STANDARD T–191, T–204, OR T–238 AND T–239.

10. SEE GENERAL EROSION CONTROL NOTES ON DETAIL SHEET.
11. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND AS SHOWN ON PLAN. MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED AND UPSTREAM AREAS HAVE BEEN STABILIZED.
12. INSPECT SILT BARRIERS AFTER EACH RAIN STORM OF 1/4 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
13. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED FOR THIS PROJECT. THE SWPPP MUST INCLUDE THE APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM THE SITE. PARTIES RESPONSIBLE FOR DEVELOPING THE SWPPP SHOULD REFER TO THE EPA NPDES CONSTRUCTION GENERAL PERMITS NOTICE OF INTENT FOR A COMPLETE OUTLINE OR REQUIRED ELEMENTS. THESE PLANS AND THE STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN PREPARED FOR THIS PROJECT MAY BE UTILIZED IN FULFILLING THE REQUIREMENTS.
14. ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS.
15. LIMIT TREE CLEARING TO ONLY THE EXTENT NECESSARY FOR CONSTRUCTION.
16. PLACARDS SHALL BE INSTALLED ALONG THE EDGE OF WETLAND PRIOR TO CONSTRUCTION.

UTILITY CONTACTS

NATURAL GAS: – CONTACT:
UNITIL CORPORATION
DAVID MACLEAN
325 WEST ROAD
PORTSMOUTH, NH 03801
TEL: (603)–294–5261
EMAIL: MACLEAND@UNITIL.COM

WATER & SEWER: – CONTACT:
CITY OF DOVER COMMUNITY SERVICES DEPARTMENT
PUBLIC WORKS & UTILITIES
KEN MAVROGEORGE, PE
271 MAST ROAD
DOVER, NH 03820
TEL: (603)–516–6450
EMAIL: K.MAVROGEORGE@DOVER.NH.GOV

ELECTRIC: – CONTACT:
EVERSOURCE
TREVER EMMONS
4 OLD DOVER ROAD
ROCHESTER, NH 03867
TEL: (603)–332–7515
EMAIL: TREVER.EMMONS@EVERSOURCE.COM

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P23–XX

DATE	REVISION	APP'D

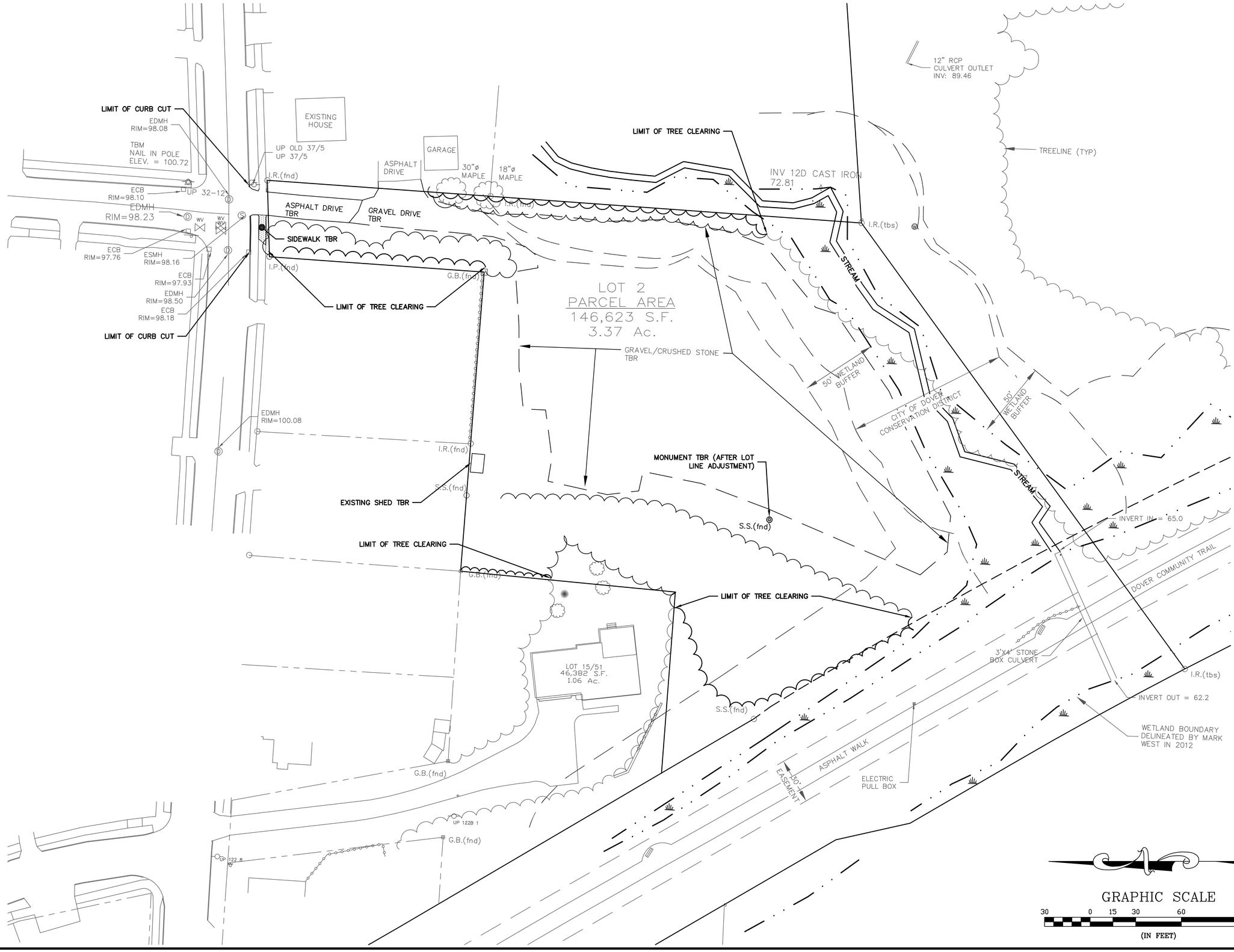
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DESIGN BY: SJH
APPROVED BY: SJH
PROJECT NO: 22017
FILE NAME: SITE.DWG

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

NOTE SHEET

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH



NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

DATE	REVISION	APP'D	DATE

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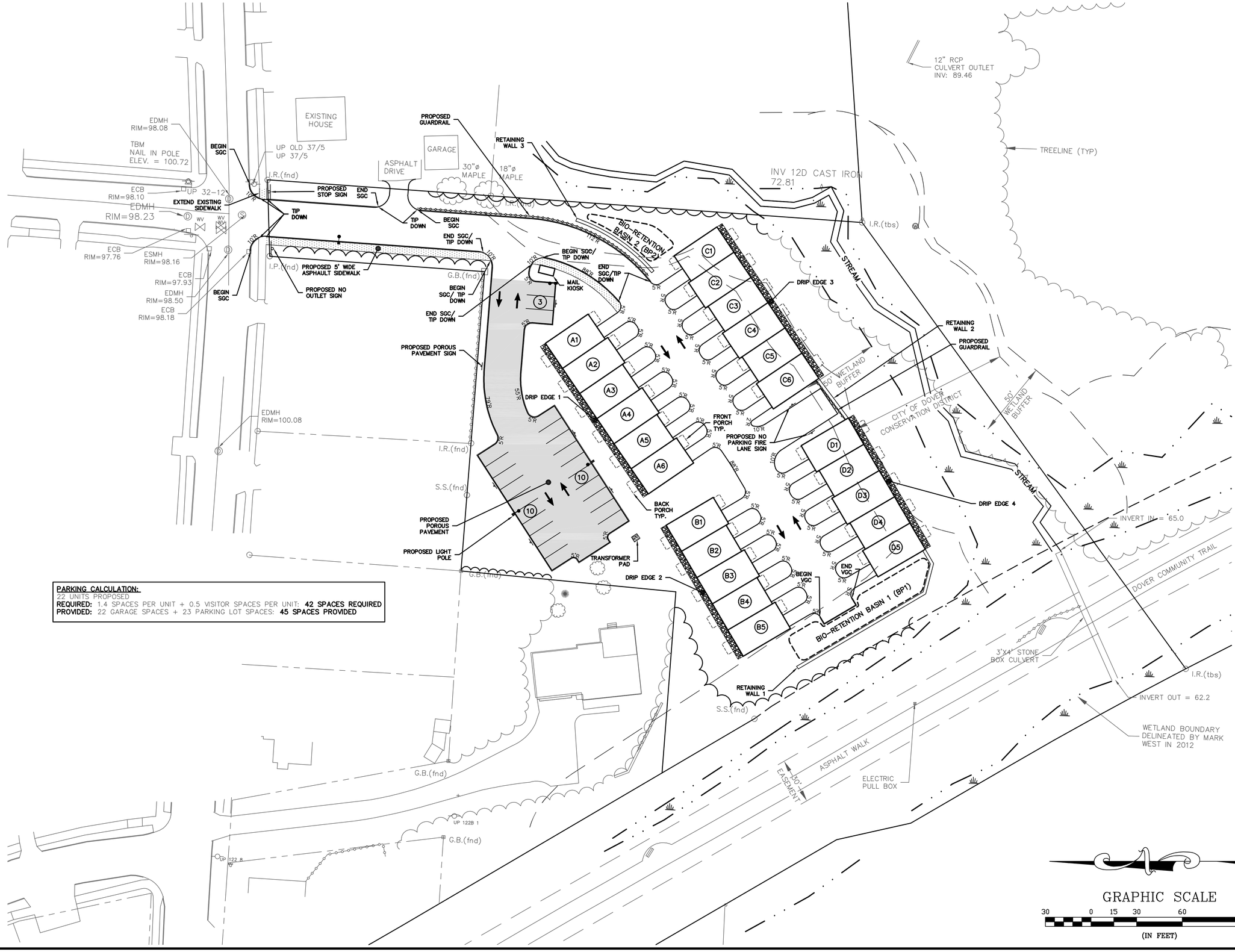
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DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:STE.DWG

DEMOLITION PLAN

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

5



PARKING CALCULATION:
22 UNITS PROPOSED
REQUIRED: 1.4 SPACES PER UNIT + 0.5 VISITOR SPACES PER UNIT: **42 SPACES REQUIRED**
PROVIDED: 22 GARAGE SPACES + 23 PARKING LOT SPACES: **45 SPACES PROVIDED**

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

NO.	REVISION	APP'D	DATE

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

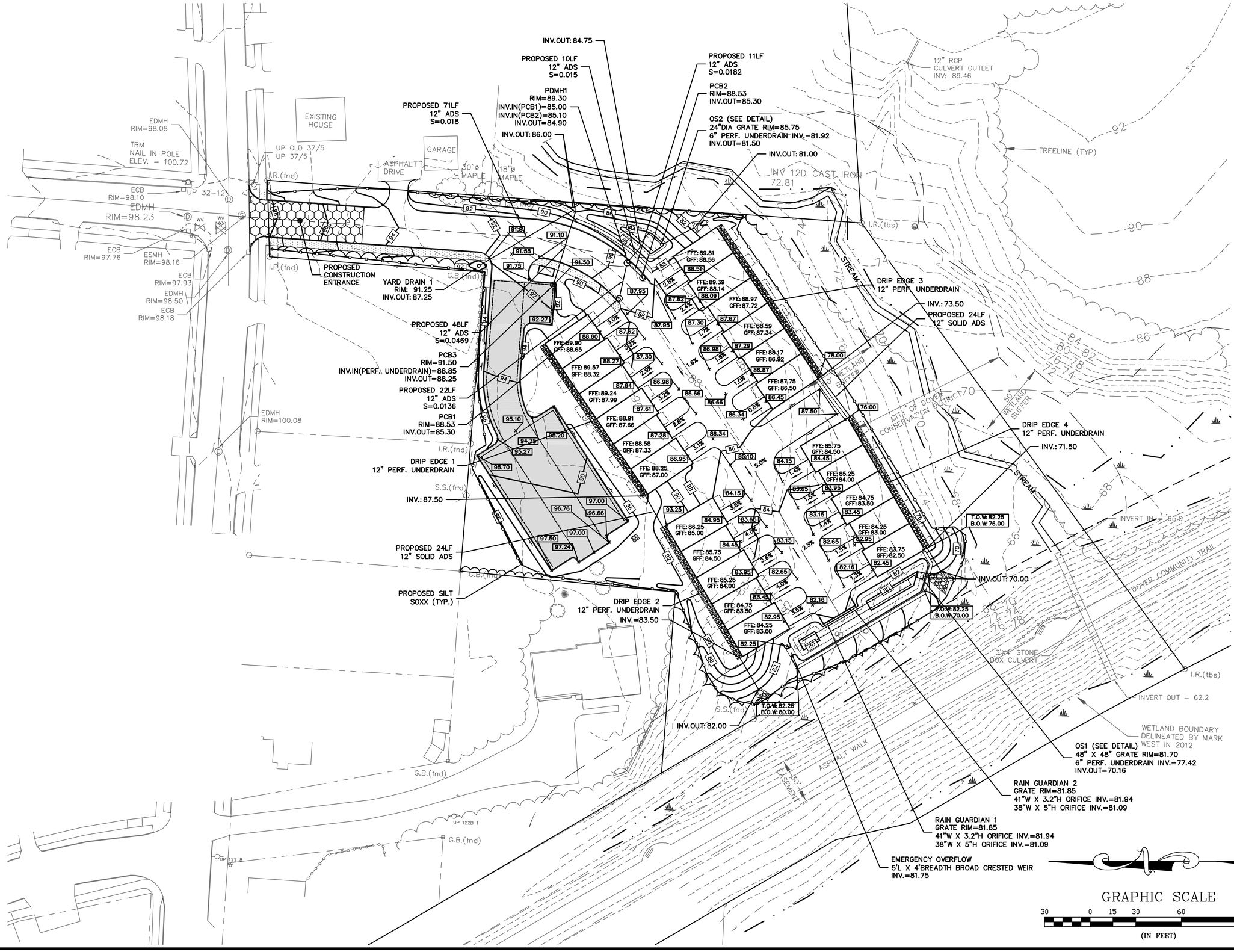
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SITE PLAN

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

6



NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

NO.	REVISION	APP'D	DATE

DATE: 10-26-23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:STE.DWG

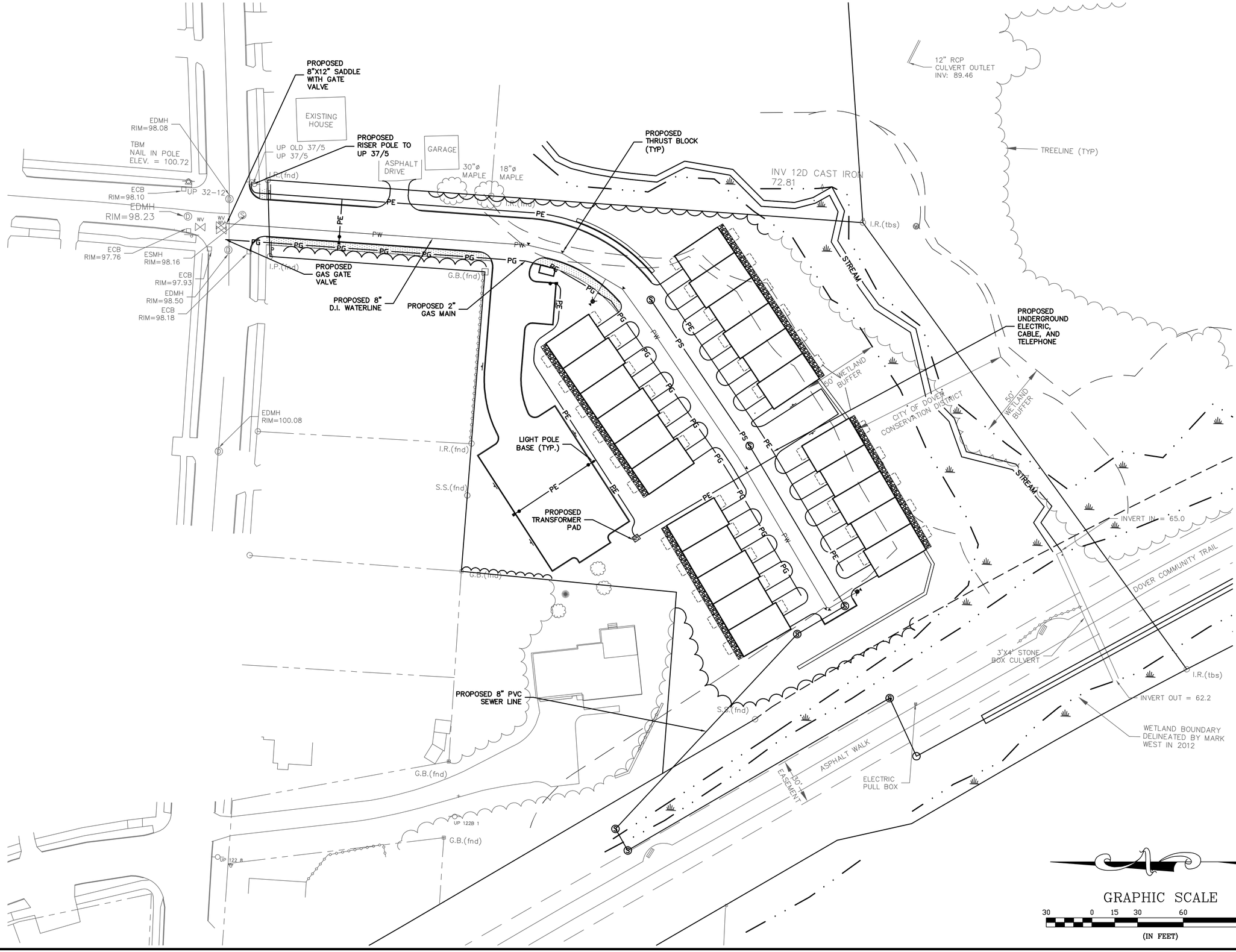
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181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
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GRADING, DRAINAGE & EROSION CONTROL PLAN

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

7



NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

REVISION	APP'D	DATE

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

DATE: 10-26-23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
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PROJECT NO:22017
FILE NAME:STE.DWG NO.

UTILITY PLAN

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

8

DESCRIPTION

1. THE PURPOSE OF THIS PLAN IS TO DEPICT IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF 4 MULTI-FAMILY RESIDENTIAL TOWNHOUSE BUILDINGS AND ASSOCIATED SITE IMPROVEMENTS.

PROJECT NAME AND LOCATION

FISHER STREET TOWNHOUSES
TAX MAP 15, LOT 40A-1 — *LATITUDE N43° 11' 13"*
FISHER STREET — *LONGITUDE W70° 52' 41"*
DOVER, NH

DISTURBED AREA

±77,000 S.F.

NOTES:
1. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION.
2. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.

SEQUENCE OF MAJOR ACTIVITIES

1. CONTRACTOR SHALL PREPARE THE SWPPP, FILE FOR AND OBTAIN THE NOI A MINIMUM OF 2 WEEKS PRIOR TO COMMENCEMENT OF SITE WORK.
2. PLACE TEMPORARY EROSION AND SEDIMENT CONTROL BMP'S PRIOR TO EARTH MOVING ACTIVITIES.
3. ALL EROSION CONTROL AND PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO COMMENCING EARTH MOVING OPERATIONS.
4. SELECTIVE DEMOLITION.
5. REGRADE SITE TO SUBGRADE.
6. TEMPORARY WATER DIVERSION (SWALES, BASINS) MUST BE USED AS NECCESSARY UNTIL AREAS ARE STABILIZED.
7. SWALES AND PONDS (AS APPLICABLE) SHALL BE CONSTRUCTED EARLY ON IN THE CONSTRUCTION SEQUENCE AND BEFORE ROUGH GRADING OF THE SITE AND ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
8. INSTALL DRAINAGE STRUCTURES AND CONTROLS.
9. INSTALL FOUNDATION FOOTINGS AND WALLS.
10. INSTALL UTILITIES.
11. PLACE GRAVELS AND FINE GRADE.
12. STABILIZE ROADWAYS AND PARKING AREAS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
13. ALL CUT AND FILL SLOPES SHALL BE LOAMED AND SEEDED (AS APPLICABLE) WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
14. ALL EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EVERY 1/2" OF RAINFALL.
15. IN ALL CASES THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION AND IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
16. WHEN ALL SITE WORK IS COMPLETE AND ALL DISTURBED AREAS ARE STABILIZED REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND FILE THE EPA – N.O.T.

DEFINITIONS

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWNG HAS OCCURRED.
1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED

INSTALLATION, MAINTENANCE, AND INSPECTION PROCEDURES OF EROSION AND SEDIMENT CONTROLS

A. SILT BARRIER

1. INSTALLATION
- *a. USE SILT BARRIER AS PERIMETER CONTROLS, PARTICULARLY AT THE LOWER OR DOWN SLOPE EDGE OF A DISTURBED AREA.*
- *b. LEAVE SPACE FOR MAINTENANCE BETWEEN TOE AND SLOPE OF SILT BARRIER.*
- *c. TRENCH IN THE SILT BARRIER ON THE UPHILL SIDE (6 INCHES DEEP BY 6 INCHES WIDE).*
- *d. INSTALL STAKES ON THE DOWNHILL SIDE OF THE SILT BARRIER.*
- *e. CURVE THE END OF THE SILT BARRIER UP-GRADIENT TO HELP IT CONTAIN RUNOFF.*

2. SEQUENCE OF INSTALLATION
- *a. SEDIMENT BARRIERS SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.*

3. MAINTENANCE
- *a. SILT BARRIERS SHOULD BE INSPECTED AND MAINTAINED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.*
- *b. SILT BARRIERS HAVE A USEFUL LIFE OF ONE SEASON. ON LONGER CONSTRUCTION PROJECTS, SILT BARRIERS SHOULD BE REPLACED PERIODICALLY TO MAINTAIN EFFECTIVENESS.*
- *c. REMOVE SEDIMENT WHEN IT REACHES ONE-THIRD (1/3) THE HEIGHT OF THE SILT BARRIER.*
- *d. REPLACE THE SILT BARRIERS WHERE THEY ARE TORN, WORN, OR OTHERWISED DAMAGED AND MONITOR PERFORMANCE TO ENSURE EFFECTIVE PERFORMANCE.*
- *e. RETRENCH OR REPLACE ANY SILT BARRIER THAT IS NOT PROPERLY ANCHORED TO THE GROUND.*
- *f. IF THERE IS EVIDENCE OF END FLOW ON PROPERLY INSTALLED BARRIERS, EXTEND BARRIERS UPHILL OR CONSIDER REPLACING THEM WITH OTHER MEASURES, SUCH AS TEMPORARY DIVERSIONS AND SEDIMENT TRAPS.*
- *g. SILT BARRIERS SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. IF THERE ARE SIGNS OF UNDERMINING AT THE CENTER OR THE EDGES OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SILT BARRIERS SHOULD BE REPLACED WITH A TEMPORARY CHECK DAM.*

B. MULCHING

1. TIMING
- *a. APPLY MULCH PRIOR TO ANY STORM EVENT. IT WILL BE NECESSARY TO CLOSELY MONITOR WEATHER PREDICTIONS TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.*
- *b. IN OTHER AREAS, THE TIME PERIOD CAN RANGE FROM 14 TO 30 DAYS OF INACTIVITY ON A AREA. THE LENGTH OF TIME VARYING WITH SITE CONDITIONS. PROFESSIONAL JUDGEMENT SHALL BE USED TO EVALUATE THE INTERACTION OF SITE CONDITIONS (SOIL ERODIBILITY, SEASON OF YEAR, EXTENT OF DISTURBANCE, PROXIMITY TO SENSITIVE RESOURCES, ETC.) AND THE POTENTIAL IMPACT OF EROSION ON ADJACENT AREAS TO CHOOSE AN APPROPRIATE TIME RESTRICTION.*
- *c. WITHIN 100 FEET OF RIVERS, STREAMS, WETLANDS, AND IN LAKE AND POND WATERSHEDS, THE TIME PERIOD OF WHICH MULCHING SHOULD TAKE OCCUR SHOULD BE NO GREATER THAN SEVEN (7) DAYS. THIS SEVEN DAY LIMIT SHOULD BE REDUCED FURTHER DURING WET WEATHER PERIODS.*

2. APPLICATION RATE
- *a. MULCH SHALL BE APPLIED AT A RATE OF BETWEEN 1.5 TO 2 TONS PER ACRE, OR 70 TO 90 POUNDS PER 1000 SQUARE FEET.*
- *b. GUIDELINES FOR WINTER MULCH APPLICATION. WHEN MULCH IS APPLIED TO PROVIDE PROTECTION OVER WINTER (PAST THE GROWING SEASON) IT SHALL BE AT A RATE OF 150-200 POUNDS OF HAY OR STRAW PER ACRE WITH ABOUT 4 INCHES IN DEPTH. A TACKIFIER MAY BE ADDED TO THE MULCH.*

3. MAINTENANCE
- *a. ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS. CHECK FOR SIGNS OF EROSION OR DISPLACEMENT OF THE MULCH. IF LESS THAN 90% OF THE SOIL SURFACE IS COVERED BY MULCH, ADDITIONAL MULCH SHALL BE IMMEDIATELY APPLIED.*
- *b. NETS MUST BE INSPECTED AFTER RAIN EVENTS FOR DISLOCATION OR FAILURE AND SHOULD BE REPAIRED AS NECCESSARY.*
- *c. INSPECTIONS SHOULD TAKE PLACE UNTIL THE SITE IS ESTABLISHED.*
- *d. EROSION CONTROL MULCH USED FOR TEMPORARY STABILIZATION SHOULD BE LEFT IN PLACE. VEGETATION ADDS STABILITY AND SHOULD BE PROMOTED.*

C. TEMPORARY SEEDING

1. SEEDBED PREPARATION
- *a. STONES AND TRASH SHOULD BE REMOVED SO AS NOT TO INTERFERE WITH THE SEEDING AREA.*
- *b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.*
- *c. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS.*
  - *i) APPLY FERTILIZER AT A RATE OF 600 POUNDS PER ACRE OR 13.8 POUNDS PER 1,000 SQUARE FEET OF LOW PHOSPHATE FERTILIZER OR EQUIVALENT.*
  - *ii) APPLY LIMESTONE AT A RATE OF 3 TONS PER ACRE OR 138 POUNDS PER 1,000 SQUARE FEET.*

2. SEEDING
- *a. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SUMMARY INCLUDING SEED AND FERTILIZER) WITH A SEEDING DEPTH FROM A QUARTER (1/4) TO A HALF (1/2) INCH.*
- *b. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.*
- *c. TEMPORARY SEEDING BETWEEN MAY 15TH AND AUGUST 15TH SHOULD BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE.*
- *d. VEGETATED GROWTH COVERING 85% OF THE DISTURBED AREA SHOULD BE ACHIEVED PRIOR TO OCTOBER 15TH.*

3. MAINTENANCE
- *a. TEMPORARY SEEDING SHALL BE INSPECTED PERIODICALLY. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER FABRICS, CHECK DAMS, ETC.).*

D. PERMANENT SEEDING

1. BEDDING – STONES LARGER THAN 2 INCHES, TRASH, ROOTS, AND OTHER DEBRIS INTERFERRING WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA SHOULD BE REMOVED. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF 4" TO PREPARE A SEEDBED AND MIX FERTILIZER INTO THE SOIL.
2. FERTILIZER
   - a. LIME AND FERTILIZER SHOULD BE WORKED INTO THE SOIL TO A DEPTH OF 4 INCHES USING A DISC, SPRING TOOTH HARROW, OR OTHER SUITABLE EQUIPMENT PRIOR TO OR AT THE SAME TIME OF SEEDING.
   - b. FERTILIZER SHOULD BE RESTRICTED TO A LOW PHOSPHATE, SLOW RELEASE NITORGEN FERTILIZER WHEN APPLIED TO AREAS BETWEEN 25 FEET AND 250 FEET FROM A SURFACE WATER BODY. NO FERTILIZER EXCEPT LIMESTONE SHOULD BE APPLIED WITHIN 25 FEET OF THE SURFACE WATER.
   - c. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
     AGRICULTURAL LIMESTONE @ 138 LBS. PER 1,000 S.F.
     LOW PHOSPHATE (N-P205-K20) FERTILIZER @ 13.8 LBS. PER 1,000 S.F.
3. SEED MIXTURE (RECOMMENDED)
   RATE:

TYPE	LBS. PER ACRE	LBS. PER 1,000 S.F.
TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDSFOOT TREFOIL	8	0.20
TOTAL	48	1.10

4. SEEDING
   - a. SPRING SEEDING USUALLY GIVES THE BEST RESULTS FOR ALL SEED MIXES OR WITH LEGUMES. PERMANENT SEEDING SHOULD BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST.
   - b. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER) WITH A SEEDING DEPTH FROM A QUARTER (1/4) TO A HALF (1/2) INCH.
   - c. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED SHOULD BE ACHIEVED PRIOR TO OCTOBER 15TH. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT TEMPORARY STABILIZATION MEASURES FOR OVERWINTER PROTECTION.
5. HYDROSEEDING
   - a. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF STRAW MULCH ON CRITICAL AREAS IS PREFERRED SINCE IT GRANTS BETTER SLOPE PROTECTION BY USING ADHESIVE MATERIALS.
   - b. SLOPES MUST BE NO STEEPER THAN 2 TO 1 (2 FEET HORIZONTALLY TO 1 FOOT VERTICALLY).
   - c. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
6. MAINTENANCE
   - a. PERMANENT SEEDED AREAS SHOULD BE INSPECTED AT LEAST MONTHLY DURING THE COURSE OF CONSTRUCTION. INSPECTIONS, MAINTENANCE, AND CORRECTIVE ACTIONS SHOULD CONTINUE UNTIL THE OWNER ASSUMES PERMANENT OPERATION OF THE SITE.
   - b. SEEDED AREAS SHOULD BE MOWED AS REQUIRED TO MAINTAIN A HEALTHY STAND OF VEGETATION, WITH MOWING HEIGHT AND FREQUENCY DEPENDENT ON TYPE OF GRASS COVER.
   - c. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABALIZATION OF EXPOSED SOILS
   - d. IF EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS RESEEDED. WITH OTHER TEMPORARY MEASURES USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.
   - e. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.

E. STORM DRAIN INLET PROTECTION

1. SPECIFICATIONS
- *a. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE BARRIER SHOULD BE LESS THAN ONE ACRE.*
- *b. ANY RESULTANT PONDING OF STORMWATER MUST NOT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES.*

2. INSTALLATION
- *a. INSTALL INLET PROTECTION AS SOON AS STORM DRAIN INLETS ARE INSTALLED AND BEFORE LAND-DISTURBANCE ACTIVITIES BEGIN IN AREAS WITH EXISTING STORM DRAIN SYSTEMS.*
- *b. PROTECT ALL INLETS THAT COULD RECEIVE STORMWATER FROM YOUR CONSTRUCTION PROJECT.*
- *c. USE IN CONJUNCTION WITH OTHER EROSION PREVENTION AND SEDIMENT CONTROL BMPS.*
- *d. DESIGN YOUR INLET PROTECTION TO HANDLE THE VOLUME OF WATER FROM THE AREA BEING DRAINED. ENSURE THAT THE DESIGN IS SIZED APPROPRIATELY.*

3. MAINTENANCE
- *a. INSPECT INLETS BARRIERS FREQUENTLY, BEFORE AND AFTER EACH RAINFALL EVENT AND REPAIR WHEN NECESSARY.*
- *b. SEDIMENT SHOULD BE REMOVED AND THE STORM DRAIN SEDIMENT BARRIER RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE BARRIER.*
- *c. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.*
- *d. SWEEP STREETS, SIDEWALKS, AND OTHER PAVED AREAS REGULARLY.*
- *e. ALL CATCH BASINS AND STORM DRAIN INLETS MUST BE CLEANED AT THE END OF CONSTRUCTION AND AFTER THE SITE HAS BEEN FULLY STABILIZED*

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES THE SILT BARRIERS SHALL BE INSTALLED PRIOR TO COMMENCING ANY CLEARING OR GRADING OF THE SITE. STRUCTURAL CONTROLS SHALL BE INSTALLED CONCURRENTLY WITH THE APPLICABLE ACTIVITY. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN TWENTY ONE (21) DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN FOURTEEN (14) DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, SILT FENCES AND ANY EARTH/DIKES WILL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED. ALL AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.

WASTE DISPOSAL
- *a. WASTE MATERIALS*
  ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN A DUMPSTER. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED ON SITE. ALL PERSONEL WILL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
- *b. HAZARDOUS WASTE*
  ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
- *c. SANITARY WASTE*
  ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

MAINTENACE OF STORMWATER MANAGEMENT FACILITIES
THE PROJECT PROPONENT IS RESPONSIBLE FOR THE MAINTENANCE OF ALL STORMWATER FACILITIES DURING CONSTRUCTION AND THE PROPERTY OWNER IS RESPONSIBLE AFTER CONSTRUCTION IS COMPLETE.

CATCH BASINS & STORMWATER TREATMENT STRUCTURES
1. CATCH BASINS & STORMWATER TREATMENT STRUCTURES SHOULD BE INSPECTED ON A MONTHLY BASIS AND/OR AFTER A MAJOR RAINFALL EVENT TO ASSURE THAT DEBRIS OR SEDIMENTS DO NOT REDUCE THE EFFECTIVENESS OF THE SYSTEM.

SPILL PREVENTION

A. MATERIAL MANAGEMENT PRACTICES
THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL SANITARY EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
GOOD HOUSEKEEPING:
THE FOLLOWING GOOD HOUSEKEEPING PRACTICES THAT WILL BE FOLLOWED ON SITE DURING
1. THE CONSTRUCTION PROJECT:
- *a. AN EFFORT WILL BE MADE TO STORE ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB.*
- *b. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.*
- *c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.*
- *d. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.*
- *e. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.*
- *f. WHENEVER POSSIBLE ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.*

2. HAZARDOUS PRODUCTS:
- *a. THE FOLLOWING PRACTICES WILL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:*
- *b. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.*
- *c. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION.*
- *d. SURPLUS PRODUCT THAT MUST BE DISPOSED OF WILL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.*

B. PRODUCT SPECIFICATION PRACTICES
THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON SITE:
1. PETROLEUM PRODUCTS:
   - a. ALL ON SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTATIVE MAINTENACE TO REDUCE LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
2. FERTILIZERS:
   - a. FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
3. PAINTS:
   - a. ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
4. CONCRETE TRUCKS:
   - a. CONCRETE TRUCKS WILL DISCHARGE AND WASH OUT SURPLUS CONCRETE OR DRUM WASH WATER IN A CONTAINED AREA ON SITE.

C. SPILL CONTROL PRACTICES
IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
- *a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.*
- *b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.*
- *c. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.*
- *d. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.*
- *e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OF LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.*
- *f. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM RECURRING AND HOW TO CLEANUP THE SPILL IF IT OCCURS. A DESCRIPTION OF THE SPILL, ITS CAUSE, AND THE CLEANUP MEASURES WILL BE INCLUDED.*
- *g. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.*

THE PROJECT PROPONENT IS REQUIRED TO MANAGE CONSTRUCTION TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO CONTROLLING INVASIVE SPECIES AND CONTROLLING FUGITIVE DUST IN ACCORDANCE WITH ENV-A 1002.

AGR 3800 PROHIBITED INVASIVE PLANT SPECIES RULES

THE RULE, AGR 3800, STATES: NO PERSON SHALL COLLECT, TRANSPORT, IMPORT, EXPORT, MOVE, BUY SELL, DISTRIBUTE, PROPAGATE OR TRANSPLANT ANY LIVING AND VIABLE PORTION OF ANY PLANT SPECIES, WHICH INCLUDED ALL OF THEIR CULTIVARS AND VARIETIES, LISTED IN TABLE 3800.1, NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES LIST'. A COMPLETE COPY OF THE RULES CAN BE ACCESSED ON THE INTERNET AT HTTP://AGRICULTURE.NH.GOV/TOPICS/PLANTS_INSECTS.HTM.

ENV-A 1002 FUGITIVE DUST: PRECAUTIONS TO PREVENT, ABATE, AND CONTROL FUGITIVE DUST.

a. ANY PERSON ENGAGED IN ANY ACTIVITY WITHIN THE STATE EMITS FUGITIVE DUST, OTHER THAT THOSE LISTED IN ENV-A 1002.02 (b), SHALL TAKE PRECAUTIONS THROUGHOUT THE DURATION OF THE ACTIVITY IN ORDER TO PREVENT, ABATE, AND CONTROL THE EMISSION OF FUGITIVE DUST.

b. PRECAUTIONS REQUIRED BY (a) ABOVE, SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
   - i) THE USE OF WATER OR HYDROPHILIC MATERIAL ON OPERATIONS OR SURFACES, OR BOTH;
   - ii) THE APPLICATION OF ASPHALT, WATER, OR HYDROPHILIC MATERIAL, OR TARPS OR OTHER SUCH COVERS TO MATERIAL STOCKPILES;
   - iii) THE USE OF HOODS, FANS, FABRIC FILTERS, OR OTHER DEVICES TO ENCLOSE AND VENT AREAS WHERE MATERIALS PRONE TO PRODUCING FUGITIVE DUST ARE HANDLED;
   - iv) THE USE OF CONTAINMENT METHODS FOR SANDBLASTING OR SIMILAR OPERATIONS; AND
   - v) THE USE OF VACUUMS OR OTHER SUCTION DEVICES TO COLLECT AIRBORNE PARTICULATE MATTER.

PER 153-10 F:
ALL SITE IMPROVEMENTS WHICH REQUIRE BLASTING OF LAND SHALL MEET THE FOLLOWING REQUIRMENTS PRIOR TO ANY BLASTING OCCURING.

1. *THE APPLICANT SHALL PREPARE A PRE-BLAST SURVEY OF ALL STRUCTURES WITHIN FIVE HUNDRED (500) FEET OF THE EXTERNAL BOUNDARIES OF THE PROPOSED LOT TO BE DEVELOPED. THIS SURVEY, ALONG WITH A MONITORING PLAN, SHALL BE ON FILE WITH THE DOVER FIRE AND RESCUE. UPON RECOMMENDATIONS OF THE CHIEF, THE PLANNING BOARD MAY REQUIRE A PRE-BLAST SURVEY OF ALL STRUCTURES WITHIN ONE THOUSAND (1000) FEET.*
2. *THE APPLICANT SHALL HOLD A NEIGHBORHOOD MEETING TO REVIEW THE BLASTING PLAN AND PRE-BLAST SURVEY WITH REPRESENTATIVES OF THE FIRE AND RESCUE AND THE BLASTING COMPANY IN ATTENDANCE, PRIOR TO ANY ON-SITE BLASTING. ABUTTERS WITHIN ONE THOUSAND (1000) FEET OF THE EXTERNAL BOUNDARY OF THE PROJECT PARCEL SHALL BE NOTIFIED BY THE CERTIFIED MAIL (PAID FOR BY THE APPLICANT) OF THE MEETING NO LESS THAN TEN (10) DAYS PRIOR TO THE MEETING AND NO MORE THAN FIFTEEN (15) DAYS PRIOR TO THE MEETING. THE NOTICE SHALL STATE THE TIME AND DATE OF THE BLASTING AND CONTAIN A MAP SHOWING THE BLASTING AREA, THE 1,000-FOOT-RADIUS AREA, AND THE 500-FOOT-RADIUS AREA.*
3. *PERMIT HOLDERS SHALL BE IN COMPLIANCE WITH NFPA 495, EXPLOSIVE MATERIALS CODE, IN ADDITION TO ALL OTHER ORDINANCES AND CODES SET FORTH IN THE CITY OF DOVER CODE, § 153-14A, STORMWATER MANAGEMENT, EROSION CONTROL AND FLOOD HAZARDS, OF THIS CHAPTER AND THE CITY OF DOVER FIRE PREVENTION CODE, WHICH SPECIFICALLY PROHIBITS THE OVERNIGHT STORAGE OF EXPLOSIVES OR BLASTING AGENTS. FURTHER, ALL STORAGE MAGAZINES SHALL BE LOCKED IN THE OPEN POSITION AT THE END OF THE DAY'S OPERATION FOR EASY INSPECTION BY CITY OFFICIALS.*
4. *BLASTING PERMITS MAY BE OBTAINED BY CALLING THE DOVER FIRE AND RESCUE DURING NORMAL BUSINESS HOURS. THE PERMITS ARE ONLY ACTIVE FOR THE DATES AND TIME SPECIFIED ON THE PERMIT.*
5. *PERMIT HOLDERS SHALL HOLD INSURANCE AGAINST CLAIMS FOR DAMAGES FOR PERSONAL INJURY AND PROPERTY WHICH MAY ARISE FROM THE PERFORMANCE OF THE WORK.*
6. *HOURS OF OPERATION FOR THE BLASTING SHALL BE NO EARLIER THAN 8:00AM AND NO LATER THAN 6:00PM, MONDAY THROUGH FRIDAY, EXCLUDING FEDERAL HOLIDAYS.*

WINTER CONSTRUCTION NOTES

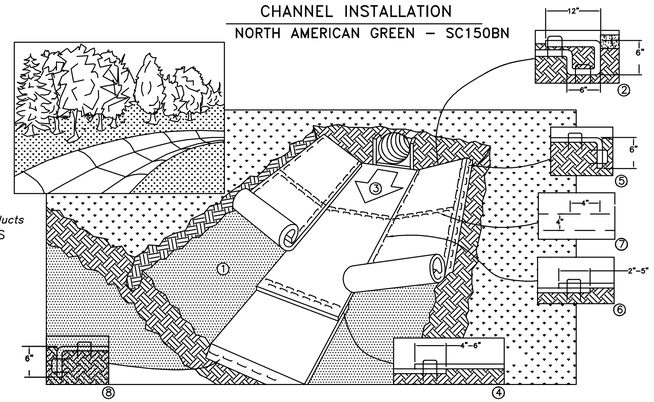
1. *ALL PROPOSED POST-DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT.*
2. *ALL DITCHES & SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS.*
3. *AFTER OCTOBER 15TH, INCOMPLETE ROAD AND PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3-INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT.*

ENV-WQ 1510: BEST MANAGEMENT PRACTICES FOR BLASTING

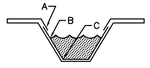
1) ALL ACTIVITIES ASSOCIATED WITH BLASTING NEED TO BE OPTIMIZED TO PREVENT THE RELEASE OF CHEMICALS ASSOCIATED WITH BLASTING ACTIVITIES TO THE ENVIRONMENT.
2) IF MORE THAN 5,000 CY OF ROCK REMOVAL IS REQUIRED DRINKING WATER WELLS MUST BE IDENTIFIED AND LOCATED WITHIN 2000 FEET OF THE PROPOSED BLASTING ACTIVITIES. DEVELOP A GROUNDWATER QUALITY SAMPLING PROGRAM TO MONITOR FOR NITRATE AND NITRITE EITHER IN THE DRINKING WATER SUPPLY WELLS OR IN OTHER WELLS THAT ARE REPRESENTATIVE OF THE DRINKING WATER SUPPLY WELLS IN THE AREA. THE PLAN MUST INCLUDE PRE AND POST BLAST WATER QUALITY MONITORING AND BE APPROVED BY NHDES PRIOR TO INITIATING BLASTING. THE GROUNDWATER SAMPLING PROGRAM MUST BE IMPLEMENTED ONCE APPROVED BY NHDES.
3) THE FOLLOWING BEST MANAGEMENT PROCEDURES FOR BLASTING SHALL BE COMPLIED WITH:
- *

CHANNEL INSTALLATION
NORTH AMERICAN GREEN – SC150BN

NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL–O–SEED DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" ACROSS THE WIDTH OF THE RECP's.
3. ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" – 6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECP's.
5. FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" – 5" (DEPENDING ON RECP's TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. NOTE: * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



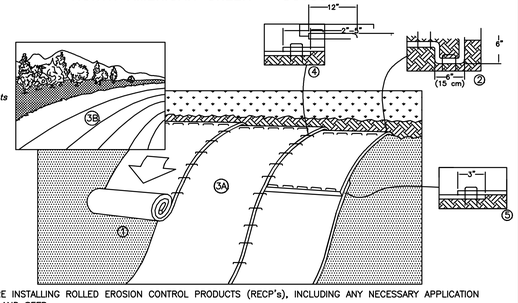
CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.

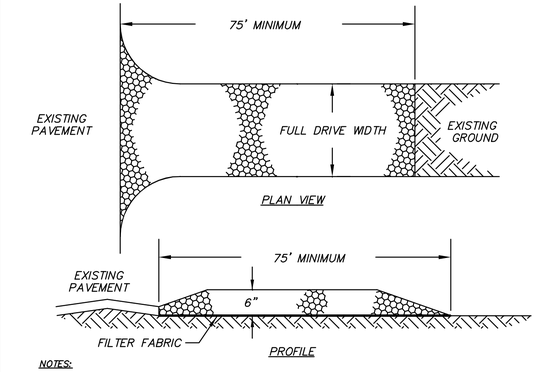
SLOPE INSTALLATION
NORTH AMERICAN GREEN – SC150BN

NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL–O–SEED DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™ , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

NOTE: THE USE OF WELDED PLASTIC OR BIODEGRADABLE PLASTIC NETTING OR THREAD IN EROSION CONTROL MATTING IS PROHIBITED. THE USE OF WILDLIFE FRIENDLY ORGANIC MATERIALS IS RECOMMENDED.



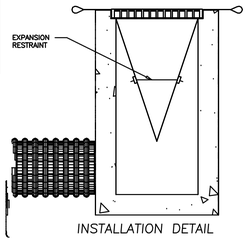
NOTES:
1. *SEE EROSION CONTROL NOTES BELOW FOR MATERIAL, INSTALLATION AND MAINTENANCE REQUIREMENTS.*
2. *TO BE INSTALLED AT EACH POINT OF EGRESS FROM THE WORK AREA.*

STABILIZED CONSTRUCTION ENTRANCE

1. SPECIFICATIONS
   A. AGGREGATE SIZE: USE THREE (3) INCHES STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
   B. AGGREGATE THICKNESS: NOT LESS THAN SIX (6) INCHES.
   C. WIDTH TEN (10) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH OF POINTS WHERE INGRESS OR EGRESS OCCURS.
   D. LENGTH: AS REQUIRED, BUT NOT LESS THAN SEVENTY–FIVE (75) FEET. PIPING OF SURFACE WATER UNDER ENTRANCE SHALL BE PROVIDED AS REQUIRED.
   E. GEOTEXTILE: TO BE PLACED OVER THE ENTIRE AREA TO BE COVERED WITH AGGREGATE.
   F. CRITERIA FOR GEOTEXTILE: THE FABRICS SHALL BE TREVIA SPUNBOND 1135, MIRAFI 600X OR EQUAL.

2. MAINTENANCE
   THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH AGGREGATE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



INSTALLATION DETAIL

SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS. AS SUPPLIED BY AH HARRIS OF PORTSMOUTH OR APPROVED EQUAL

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	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D–4491	0.55 SEC –1

HI–FLOW SILTSACK®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN–OFF)

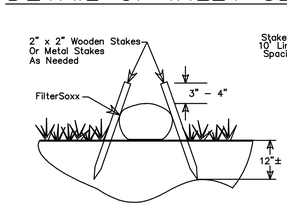
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D–4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D–4632	20 %
PUNCTURE	ASTM D–4833	135 LBS
MULLEN BURST	ASTM D–3786	420 PSI
TRAPEZOID TEAR	ASTM D–4533	45 LBS
UV RESISTANCE	ASTM D–4355	90 %
APPARENT OPENING SIZE	ASTM D–4751	20 US SIEVE
FLOW RATE	ASTM D–4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D–4491	1.5 SEC –1

OIL–ABSORBANT SILTSACK®

(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN–OFF OR SPILLS)

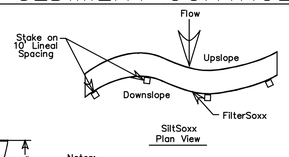
DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK® CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL–ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL–ABSORBANT SILTSACK®, WITH A WOVEN PILLOW INSERT.

DETAIL OF INLET SEDIMENT CONTROL DEVICE



FilterSoxx Section

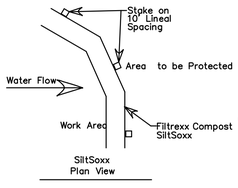
At Ends of Run Cross Stakes



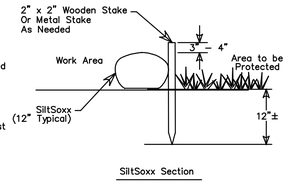
SiltSoxx Plan View

Notes:
1. All material to meet Filtrexx specifications
2. FilterSoxx compost/soil/rock/seed fill to meet application requirements.
3. Compost material to be dispersed on site, as determined by Engineer.

FilterSoxx Staking Details



SiltSoxx Plan View



SiltSoxx Section

Notes:
1. All material to meet Filtrexx specifications
2. SiltSoxx compost/soil/rock/seed fill to meet application requirements.
3. SiltSoxx depicted is for minimum slopes. Greater slopes may require larger socks per the Engineer.
4. Compost material to be dispersed on site, as determined by Engineer.

SILTSOXX DETAILS
NOT TO SCALE

SEEKING REPORTS OF RARE TURTLES

The NH Fish & Game Department is collecting observations of four turtle species:



Blanding's turtle (state endangered)
- Large, dark/black domed shell with lighter speckles
- Distinct yellow throat/chin
- Aquatic but often moves on land



Wood turtle (special concern)
- Sculpted, pyramidal brownish shell
- Orange around neck and limbs
- River/stream turtle spending many months on land



Eastern box turtle (state endangered)
- Small terrestrial turtle with highly domed shell
- Irregular yellow or orange markings over brown/black base



Spotted turtle (state threatened)
- Small, mostly aquatic with black or dark brown with yellow spots.
- Fairly flat shell compared to Blanding's turtle

Report sightings to RAARP@wildlife.nh.gov or 603-271-2461 *Please report promptly, noting specific location and date – Photographs strongly encouraged*

NOTES:
1. ALL OUTSIDE CONSTRUCTION PERSONNEL SHALL RECEIVE TRAINING IN THE IDENTIFICATION OF RARE TURTLE SPECIES AND MADE AWARE OF THEIR PROTECTED STATUS.
2. THE USE OF WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD IN EROSION CONTROL MATTING IS PROHIBITED
3. THE USE OF EROSION CONTROL BERM, WHITE FILTREXX DEGRADABLE WOVEN SILT SOCK, OR 'WILDLIFE FRIENDLY' WOVEN ORGANIC MATERIAL (E.G. COCO OR JUTE MATTING SUCH AS NORTH AMERICAN GREEN SC150BN OR EQUIVALENT) ARE ACCEPTABLE FOR USE.
4. IF WOOD, SPOTTED, OR BLANDING'S TURTLES ARE FOUND LAYING EGGS IN THE WORK AREA, PLEASE CONTACT MELISSA DOPERALSKI AT 271–1738 or JOSH MEGYESY AT 271–1125 FOR FURTHER INSTRUCTIONS.

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P22–47

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

NO.	REVISION	DATE	APP'D

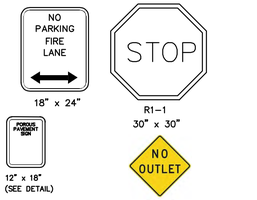
DATE: 10–26–23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY: SJH
PROJECT NO: 22017
FILE NAME: STE.DWG

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

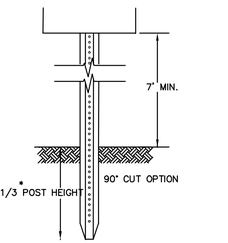
FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

DETAIL SHEET

10

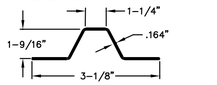


NOTE:
1. ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

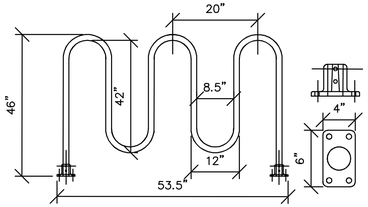


LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN

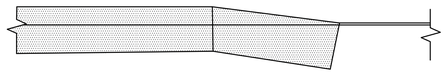
BAKED ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY.
ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.



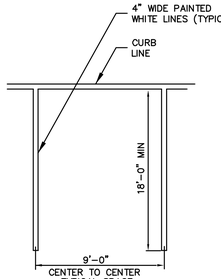
SIGN LEGEND & SIGN POST
NOT TO SCALE



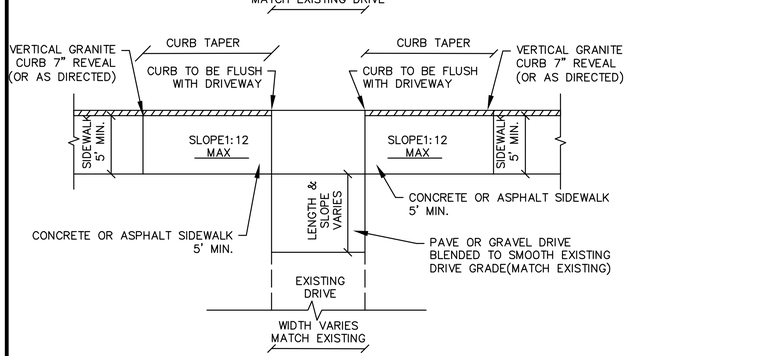
BIKE RACK DETAIL
NOT TO SCALE



GRANITE CURB TRANSITION AT TIP DOWN

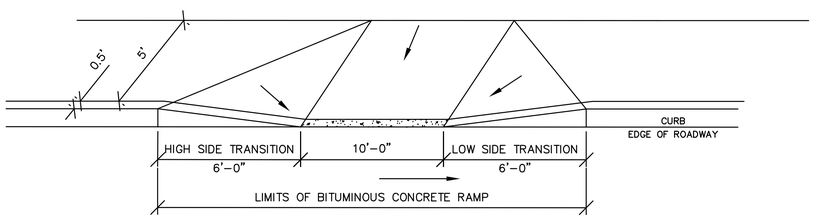


STANDARD PARKING STALL
NOT TO SCALE



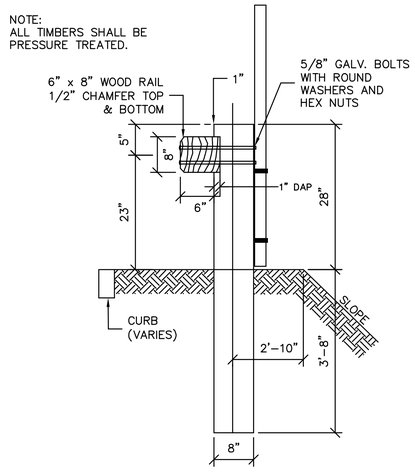
DRIVEWAY PLAN WITH SIDEWALK TIP DOWNS

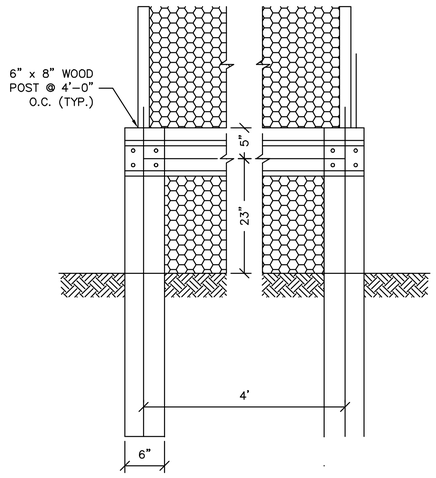
CITY OF DOVER D-9 SIDEWALK TIP DOWN AT DRIVEWAY DETAIL
NOT TO SCALE



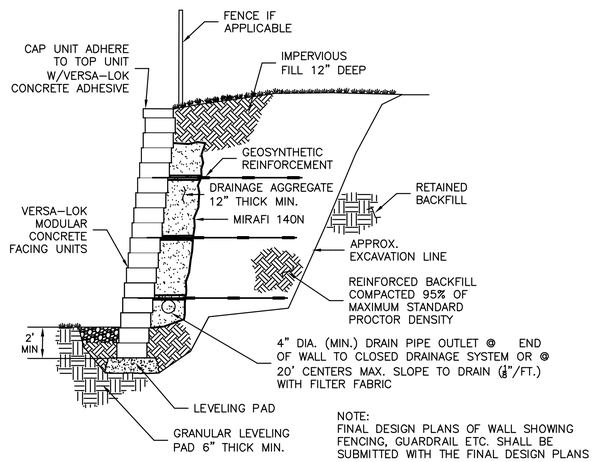
SIDEWALK APRON
NOT TO SCALE

NOTE:
ALL TIMBERS SHALL BE PRESSURE TREATED.





WOOD POST & WOOD BEAM GUARDRAIL DETAIL
NOT TO SCALE



NOTE:
FINAL DESIGN PLANS OF WALL SHOWING FENCING, GUARDRAIL ETC. SHALL BE SUBMITTED WITH THE FINAL DESIGN PLANS

TYPICAL SECTION REINFORCED RETAINING WALL WITH FENCE
NOT TO SCALE



MAIL KIOSK DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P22-47

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

NO.	REVISION	APP'D	DATE

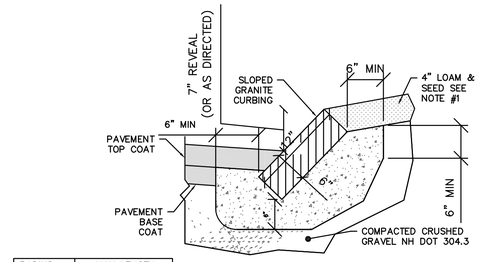
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DETAIL SHEET

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

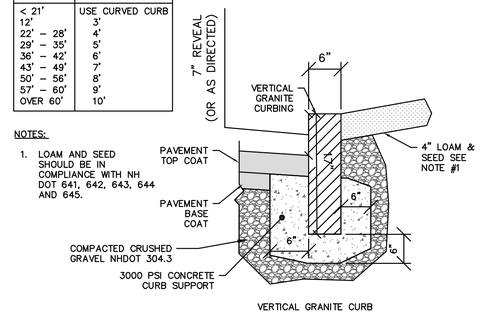
FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

11



SLOPED GRANITE CURB

RADIUS	MAX LENGTH
< 21'	USE CURVED CURB
12'	3'
22' – 28'	4'
29' – 35'	5'
36' – 42'	6'
43' – 49'	7'
50' – 56'	8'
57' – 60'	9'
OVER 60'	10'



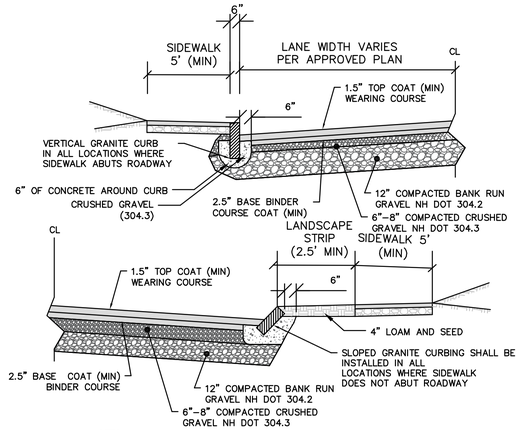
VERTICAL GRANITE CURB

NOTES:

1. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

CITY OF DOVER D–8 GRANITE CURB DETAIL

NOT TO SCALE

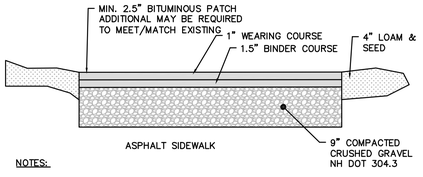


NOTES:

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.

CITY OF DOVER D–5 ROADWAY CROSS SECTION DETAIL

NOT TO SCALE

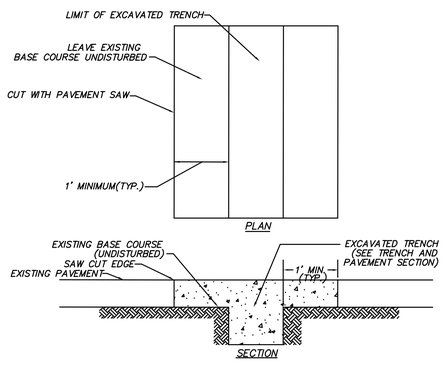


NOTES:

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.

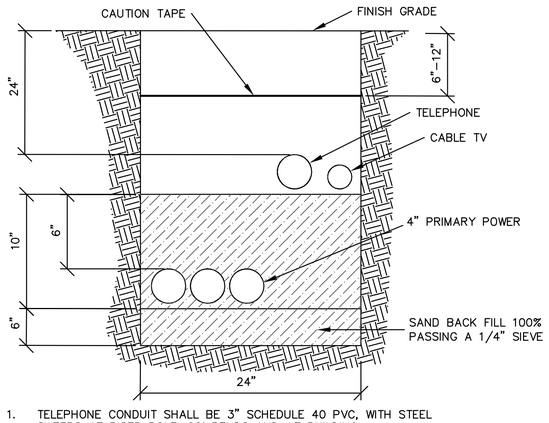
CITY OF DOVER D–6 ASPHALT SIDEWALK DETAIL

NOT TO SCALE



TRENCH PATCH

NOT TO SCALE



1. TELEPHONE CONDUIT SHALL BE 3" SCHEDULE 40 PVC, WITH STEEL SWEEPS AT RISER POLE, 90° BENDS AND AT BUILDING.
2. LEAVE PULL ROPE IN ALL CONDUITS FOR CABLE INSTALLATION.
3. FOR COMPLETE SPECIFICATIONS SEE "PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE CONSTRUCTION SPECIFICATIONS FOR UNDERGROUND CONDUIT SYSTEMS".
4. CONTRACTOR SHOULD VERIFY THE NUMBER & SIZE OF CONDUIT WITH THE APPROPRIATE UTILITIES.

UTILITY TRENCH

NOT TO SCALE

POROUS PAVEMENT

THIS AREA IS AN INTEGRAL COMPONENT OF THE DRAINAGE SYSTEM FOR THIS SITE. SEE SITE INSPECTION & MAINTENANCE PLAN FOR ALL APPLICABLE WINTER AND REGULAR MAINTENANCE GUIDELINES.

WINTER MAINTENANCE GUIDELINES

- SAND APPLICATION IS PROHIBITED
- APPLY ANTI ICING TREATMENTS PRIOR TO STORMS
- APPLY DEICING TREATMENTS DURING AND AFTER STORMS ONLY AS NECESSARY TO CONTROL COMPACT SNOW OR ICE NOT REMOVED BY PLOWING

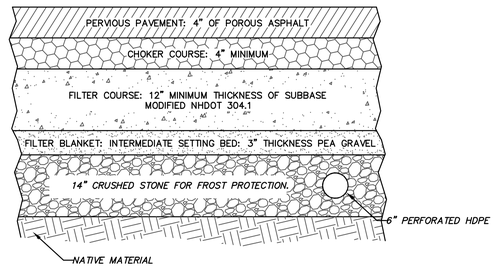
MAINTENANCE REQUIRED

- THIS POROUS PAVEMENT AREA SHALL BE CLEANED OF SAND, SALT & DEBRIS AT LEAST 2 TIMES A YEAR (SPRING & FALL) AND/OR AS NEEDED TO KEEP IT IN GOOD WORKING ORDER
- VACUUM SWEEPING IS THE PREFFERED METHOD OF ACCUMULATION REMOVAL
- AT LEAST 2 TIMES A YEAR, WITHIN 30 MINUTES OF A PRECIPITATION EVENT, ENSURE THE PAVEMENT SURFACE DRAINS EFFECTIVELY
- IF THE PAVEMENT SURFACE IS NOT DRAINING PROMPT VACUUM SWEEPING WILL BE REQUIRED

REF: UNH WEBSITE FOR STORMWATE MANAGEMENT "BMP'S" "http://WWW.UNH.EDU/UNHSC/

POROUS PAVEMENT SIGN DETAIL

NOT TO SCALE



(UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS)

NOTE:
1. SEE SITE PLAN FOR LOCATION OF POROUS PAVEMENT, PAVEMENT WIDTH AND LOCATION.
2. CONSTRUCTION MATERIALS SHALL NOT BE STORED ON THE POROUS PAVEMENT OR BASE MATERIALS.
3. A PROFESSIONAL ENGINEER SHALL PERFORM ON–SITE INSPECTIONS DURING THE CONSTRUCTION AND INSTALLATION OF POROUS PAVEMENT AND PROVIDE A STATEMENT UPON COMPLETION OF WORK IDENTIFYING THAT THE PAVEMENT WAS PRODUCED AND INSTALLED AS PER THE REFERENCED SPECIFICATION. NOTIFY THE CITY ENGINEER OF THE INSTALLATION SCHEDULE AND IN ADVANCED OF INSTALLATION.
4. CRUSHED STONE, BANK RUN GRAVEL & CRUSHED GRAVEL MATERIALS SHALL CONFORM WITH NHDOT STD. SPECIFICATIONS.
5. THE POROUS PAVEMENT AREAS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS IN "UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS, FEBRUARY 2014, REVISED SEPTEMBER 2016" (OR LATEST EDITION), PUBLISHED BY UNIVERSITY OF NEW HAMPSHIRE STORMWATER CENTER.
6. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS–SLOPE.
7. QUALITY CONTROL AND QUALITY ASSURANCE SHALL BE IN ACCORDANCE WITH THE REFERENCED SPECIFICATION.
8. POROUS ASPHALT SHALL BE INSTALLED AS THE LAST CONSTRUCTION ACTIVITY ONCE THE GRADING ACTIVITIES HAVE BEEN COMPLETED AND THE SITE HAS BEEN STABILIZED.

MAINTENANCE REQUIREMENTS:
1. MINIMIZING SANDING
2. MINIMIZE APPLICATION OF SALT FOR ICE CONTROL
3. MONITOR PERIODICALLY, AT LEAST TWICE ANNUALLY, WITHING 30 MINUTES OF A PRECIPITATION EVENT, TO ENSURE THAT THE PAVEMENT SURFACE DRAINS EFFECTIVELY AFTER STORMS.
4. SEE ATTACHED CHECKLIST FOR INSPECTION REQUIREMENTS (SEE STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN)
5. INSPECT FOR SALT ACCUMULATION, SEDIMENT, ORGANIC DEBRIS, ETC. AND PERIODICALLY CLEAN (1–2 TIMES PER YEAR) USING SWEEPER OR VACUUM SWEEPER. VACUUM SWEEPING IS THE PREFERRED METHOD.
6. INSPECT ADJACENT NON–PERMEABLE PAVEMENT SECTIONS (1–2 TIMES PER YEAR) AND ENSURE THEY ARE FREE OF DEBRIS/ SEDIMENT TO PREVENT TRACKING.
7. INSPECT ADJACENT VEGETATION AREAS (1–2 TIMES PER YEAR) TO ENSURE THERE ARE NO SIGNS OF EROSION AND SEDIMENT/ ORGANIC DEBRIS RUN–ON TO THE POROUS PAVEMENT AREAS.
8. INSPECT AREAS (AS NEEDED) TO ENSURE STOCK PILING OF SNOW, SAND/ SALT, MULCH, SOIL, YARD WASTE, ETC. IS NOT OCCURRING.
9. INSPECT PAVEMENT FOR DAMAGED AREAS (AS NEEDED) AND REPAIR AS THEY ARE IDENTIFIED.

(SEE SITE PLAN FOR LOCATION)

POROUS PAVEMENT SECTION

NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P22–47

NO.	REVISION	APP'D	DATE

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

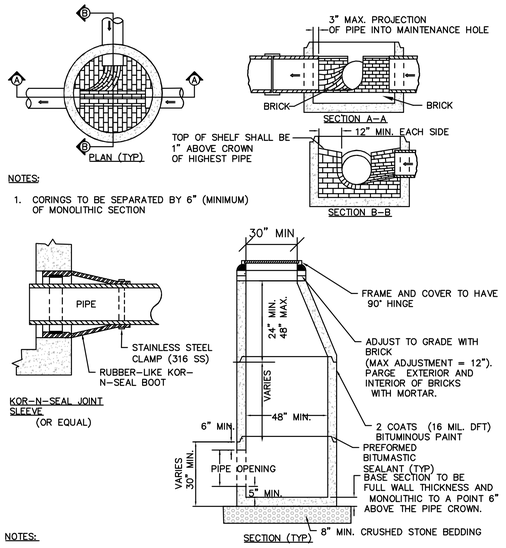
DATE: 10–26–23
SCALE: 1"=30'
DRAWN BY: M.M
DESIGN BY: S.H
APPROVED BY: S.H
PROJECT NO: 22017
FILE NAME: SITE.DWG

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

DETAIL SHEET

12



NOTES:

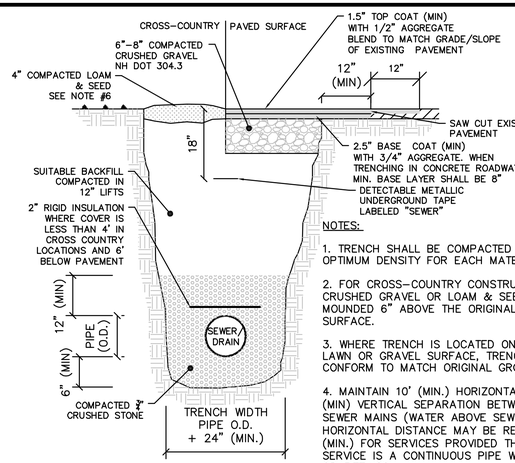
1. CORINGS TO BE SEPARATED BY 6" (MINIMUM) OF MONOLITHIC SECTION

NOTES:

1. ALL SEWER MAINTENANCE HOLES WITHIN CITY EASEMENTS OR RIGHT OF WAY SHALL HAVE LIFTMATE R-1743-LM COVERS OR APPROVED EQUAL.
2. SEWER MAINTENANCE HOLES NOT WITHIN CITY EASEMENTS OR RIGHT OF WAY SHALL BE SEALED TO PREVENT INFILTRATION.
3. MANHOLE CONSTRUCTION SHALL BE IN ACCORDANCE WITH NHDES ENV-Wq 704.13 MANHOLES: MATERIALS OF CONSTRUCTION
4. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH NHDES ENV-Wq 704.14 MANHOLES: STEPS.

CITY OF DOVER D-16
SEWER MANHOLE DETAIL

NOT TO SCALE

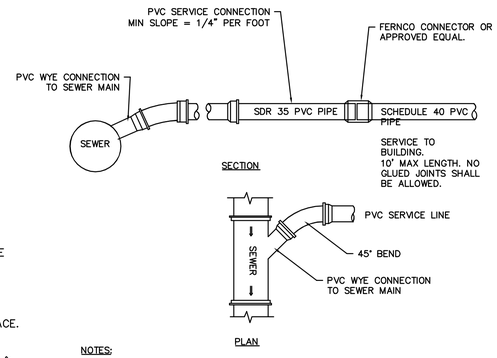


NOTES:

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.
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.

CITY OF DOVER D-3
SEWER TRENCH DETAIL

NOT TO SCALE

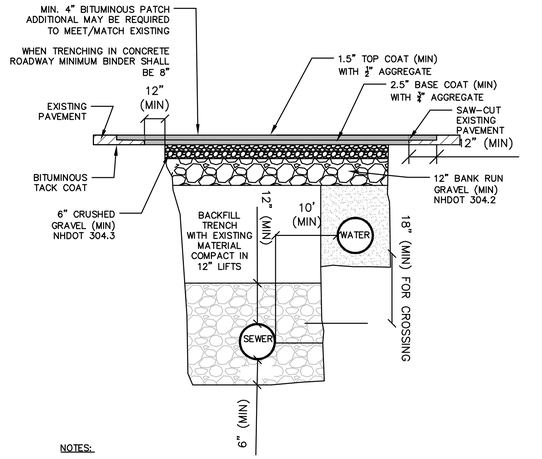


NOTES:

1. TRENCHING AND BEDDING REQUIREMENTS PER CITY SEWER TRENCH DETAIL (D-3).
2. SERVICE LATERAL DIAMETER VARIES PER APPLICATION. REVIEW SIZE WITH CITY ENGINEER PRIOR TO INSTALLATION.
3. SDR 35 SHALL NOT EXTEND INTO THE BUILDING

CITY OF DOVER D-17
SEWER SERVICE DETAIL

NOT TO SCALE

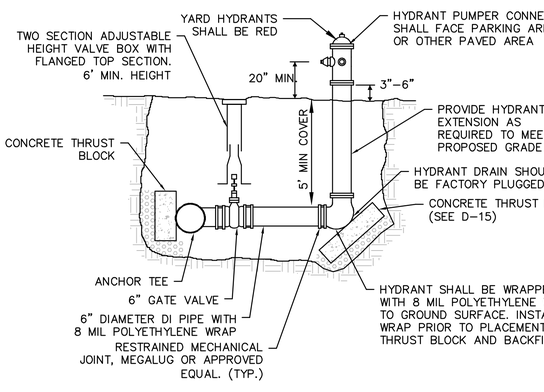


NOTES:

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.

CITY OF DOVER
TYPICAL TRENCH DETAIL

NOT TO SCALE

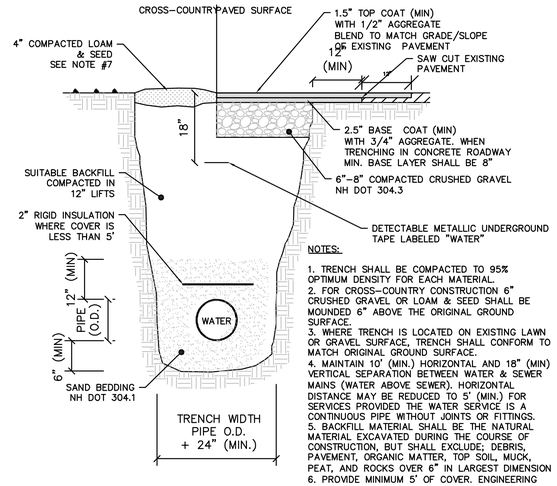


NOTES:

1. FIRE HYDRANTS SHALL BE FACTORY SEALED EDDY STYLE 2641.
2. HYDRANT SHALL BE PAINTED RED WITH EPOXY PAINT AS RECOMMENDED BY THE HYDRANT MANUFACTURER.
3. HYDRANT SHALL OPEN LEFT.

CITY OF DOVER D-14
FIRE HYDRANT DETAIL

NOT TO SCALE

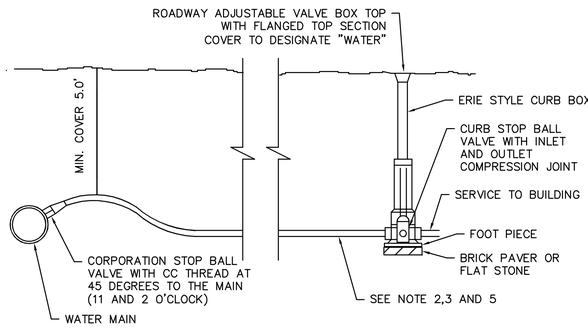


NOTES:

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.
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.

CITY OF DOVER D-4
WATER TRENCH DETAIL

NOT TO SCALE

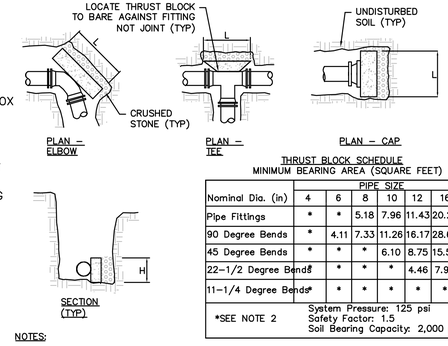


NOTES:

1. ALL WATER LINES 4" OR GREATER SHALL BE DUCTILE IRON WITH AN 8 MIL POLYETHYLENE WRAP, INCLUDING TEE AND OTHER CONNECTIONS.
2. WATER SERVICE LINES SHALL BE COPPER TUBING (TYPE K) BETWEEN MAIN AND CURB STOP.
3. SERVICE BETWEEN CURB STOP AND BUILDING MAY BE (BLUE OR BLACK) CTS SDR 9 PLASTIC POLYETHYLENE RATED FOR 250 psi.
4. CAM-LOCK REQUIRED FOR CTS OR IPS, MJ ADAPTER REQUIRED FOR HDPE
5. 3/4"- COPPER, CTS
   1"- COPPER, CTS
   2"- CTS, HDPE, IPS

CITY OF DOVER D-13
WATER SERVICE CONNECTION DETAIL

NOT TO SCALE



THRUST BLOCK SCHEDULE
MINIMUM BEARING AREA (SQUARE FEET)

	PIPE SIZE					
Nominal Dia. (in)	4	6	8	10	12	16
Pipe Fittings	*	*	5.18	7.96	11.43	20.29
90 Degree Bends	*	4.11	7.33	11.26	16.17	28.69
45 Degree Bends	*	*	*	6.10	8.75	15.53
22-1/2 Degree Bends*	*	*	*	*	4.46	7.92
11-1/4 Degree Bends*	*	*	*	*	*	*
*SEE NOTE 2	System Pressure: 125 psi Safety Factor: 1.5 Soil Bearing Capacity: 2,000 psf					

NOTES:

1. ALL THRUST BLOCKS SHALL BE PRE-CAST CONCRETE UNLESS APPROVED BY THE CITY ENGINEER.
2. 2'x2'x2' MINIMUM THRUST BLOCK REQUIRED, ANY BEARING AREA OVER 4SF REQUIRES THRUST BLOCKS, RESTRAINED JOINTS AND CALCULATIONS ASSOCIATED WITH THE JOINT.
3. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 125 PSI. IF THE SYSTEM PRESSURE IS ABOVE 125 PSI, INCREASE THE NOTED AREAS PROPORTIONALLY TO THE ACTUAL SYSTEM PRESSURE.
4. FOR MINIMUM BEARING AREAS OVER 4 SF, THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE HEIGHT (H).
5. PLACE CRUSHED STONE BEHIND THRUST BLOCK AGAINST UNDISTURBED SOIL.
6. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.
7. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.
8. USE OF THRUST BLOCKS DOES NOT ELIMINATE THE REQUIREMENT OF OTHER RESTRAINTS OR VICE VERSA.

CITY OF DOVER D-15
THRUST BLOCK DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P22-47

DATE	REVISION	APP'D

DATE: 10-26-23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:STE.DWG

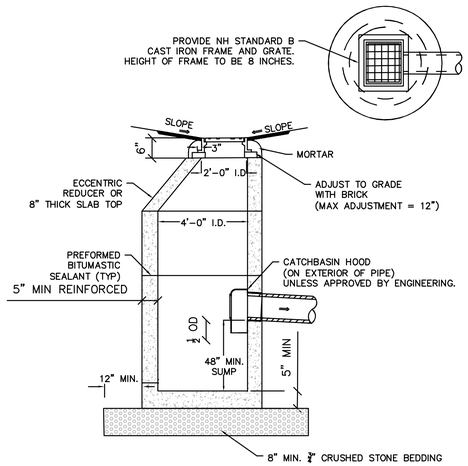
CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
181 Watson Road, PO Box 1166
Dover, New Hampshire 03821
603.749.0443

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

DETAIL SHEET

13

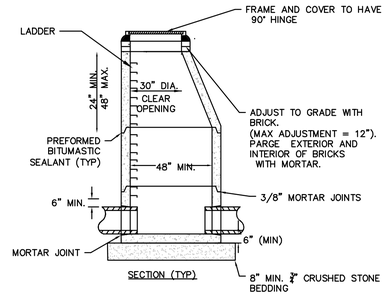


NOTES:

1. ENTIRE STRUCTURE SHALL BE H-20 LOAD RATED. PROVIDE MANUFACTURER REINFORCEMENT DETAILS TO THE CITY ENGINEER UPON REQUEST.

CITY OF DOVER D-19
CATCHBASIN DETAIL

NOT TO SCALE



NOTES:

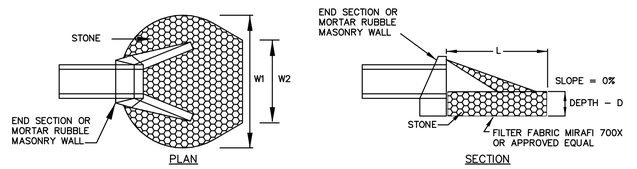
1. CORINGS TO BE SEPARATED BY 6" (MINIMUM) OF MONOLITHIC SECTION

CITY OF DOVER D-20
DRAIN MANHOLE DETAIL

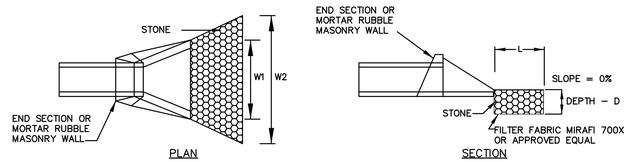
NOT TO SCALE

SPECIFICATIONS

1. All construction shall conform with the State of New Hampshire Department of Transportation (NHDOT), "Standard Specifications for Road and Bridge Construction"; hereinafter referred to as the "Standard Specifications".
2. Storm drains shall be ADS N12 or approved equal, and shall be jointed with neoprene "O" rings.
3. Catch basins and manholes shall be pre-cast reinforced concrete designed by an engineer registered in New Hampshire, and able to withstand loadings of 8 tons (H20 Loading).
4. Manholes shall have cast iron frames and covers with 30" inside diameter openings. A 3-inch (minimum) letter "D" for drain shall be plainly cast into the center of each cover.
5. Catch basins and manholes shall be adjusted to grade with courses of brick. Maximum adjustment to grade shall be 12 inches. Frames shall be set on a full bed of mortar, true to grade and concentric with the masonry. All voids between the top of the structure and the bottom flange of the frame shall be completely filled to make a watertight fit. A ring of mortar at least one inch thick and pitched to shed water away from the frame, shall be placed over and around the outside of the bottom flange. The mortar shall extend to the outer edge of the masonry all around its circumference and shall be finished smooth. No visible leakage will be permitted.
6. Invert channels of sewer manholes shall be formed smoothly to the largest pipe radius. Changes in grade shall be formed smoothly and evenly. The floor of the structure outside the channels shall be sloped towards the channels at approximately 1/2 inch per foot. The floor at the channel shall match the crown of the largest pipe.
7. Trench construction will conform with Section 603.3.1 of the Standard Specifications (1974).
8. Wood sheeting or a suitable trench box shall be used to support the trench as necessary. If wood sheeting is used, it shall be driven at a distance of 1 foot from the outside diameter of the pipe to a depth 6 inches below the invert of the pipe. Wood sheeting shall be cut off and left in place to an elevation not less than 1 foot above the top of the pipe, but not greater than 3 feet below the finished grade.
9. Bedding shall conform with Section 603.3.2 of the Standard Specifications (1974).
10. Backfill material will conform with Section 603.3.5 of the Standard Specifications (1974) and, in addition, shall exclude debris, pieces of pavement, organic matter, top soil, all wet or soft muck, peat or clay, all excavated ledge material, frozen material, all rocks over 6 inches in largest dimension, or any material which, as determined by the Engineer, will not provide sufficient support or maintain the completed construction in a stable condition. Backfill shall not be placed on frozen or previously frozen material.
11. All backfill and bedding compaction shall meet the requirements of AASHO T 99 Method C. Density shall be 95 percent. Compaction shall be 6 inch lifts for bedding and backfill to a plane 1 foot above the pipe and in 12 inch lifts thereafter by an approved mechanical compactor.
12. Should frozen material be encountered, it shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed as required before new backfill is placed.
13. The Contractor shall be responsible for any damage to frames and grates during and from the time of removal from the existing structure to and during the time of resetting, and shall replace in kind any damaged frames or grates at no additional compensation.
14. All trenches will be covered and debris, including any rejected materials, shall be removed daily. Strict safety precautions shall be maintained at all times.
15. Location of utilities shown on the plans are approximate.
    a) The Contractor shall, 48 hours prior to construction, notify the utility companies and have all utilities in the vicinity of the construction marked in the field.
    b) After the utilities have been located and prior to construction, the Contractor with the Engineer, shall layout the proposed drainage system in the field and rectify any utility conflicts which may be found.
    c) Any conflicts with utilities found during construction by the Contractor shall be immediately brought to the attention of the Engineer and the Utility Company and properly rectified.
    d) The Contractor is responsible for the cost of repair for any utilities damaged during construction. The Contractor shall contact the Utility Company to repair any damages, however, the Contractor may make appropriate repairs with the Utility Company's permission.
16. Complete shop drawings for pipe, manholes, catch basins, frames, grates and covers shall be submitted in triplicate for approval by the Engineer prior to the start of construction. Each shop drawing shall be checked and initialized by the Contractor to indicate approval before it is submitted to the Engineer.
17. Shop drawings for flat concrete covers shall be stamped prior to submission for approval by a New Hampshire Registered Professional Engineer.
18. Brick masonry for setting frames and brick and mortar plugs shall conform to the Standard Specification Section 604.2.4.



STONE APRON OUTLET PROTECTION DETAIL
OUTLET TO DEFINED CHANNEL



STONE APRON OUTLET PROTECTION DETAIL
OUTLET TO FLAT AREA, NON DEFINED CHANNEL

MAINTENANCE

THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIPRAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

STONE GRADATION

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE
100	1.5 TO 2.0 D50
85	1.3 TO 1.8 D50
50	1.0 TO 1.5 D50
15	0.3 TO 0.5 D50

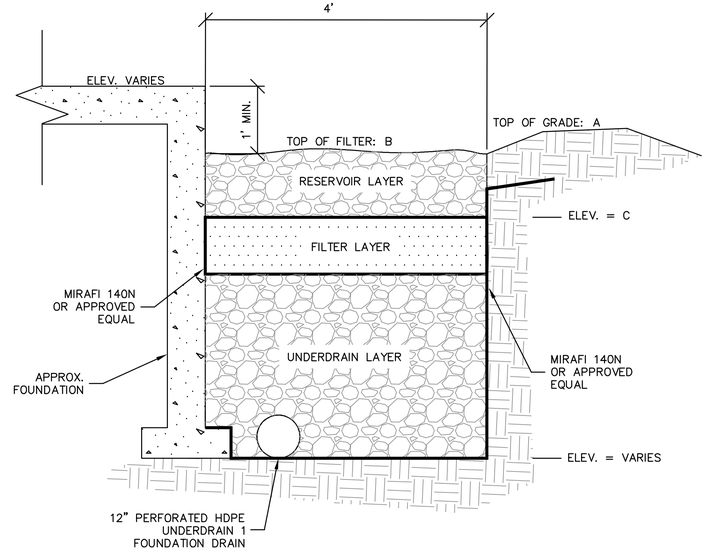
CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIPRAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

OUTLET FROM	W1(ft)	W2(ft)	L(ft)	D (ft)	D50(IN)	CHANNEL TYPE
ED1	3	11	8	1	6	UNDEFINED
ED2	3	11	8	1	6	UNDEFINED
BP1	3	16	13	1	6	UNDEFINED
BP2	8	2	10	1	6	DEFINED

RIP RAP OUTLET PROTECTION

NOT TO SCALE



NOTES:

1. RESERVOIR LAYER SHALL CONSIST OF WASHED 3/4" CRUSHED STONE.
2. FILTER LAYER SHALL BE ASTM C-33 SAND.
3. UNDERDRAIN LAYER SHALL CONSIST OF WASHED 3/4" CRUSHED STONE. MINIMUM DEPTH IS 2 FEET.

DRIP EDGE #	A	B	C	D
DE1	93.25	93.00	91.00	89.00
DE2	90.25	90.00	88.00	86.00
DE3	78.25	78.00	76.00	75.00
DE4	76.25	76.00	74.00	73.00

DRIP EDGE DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P22-47

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

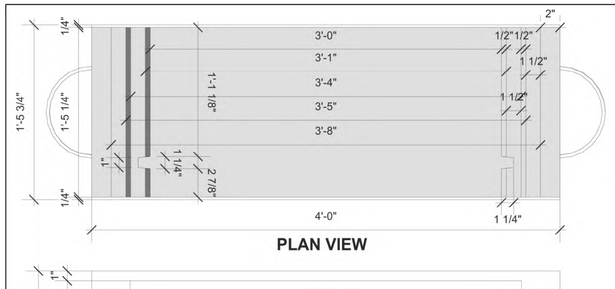
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DATE: 10-26-23			
SCALE: 1"=30'			
DRAWN BY: MJM			
DESIGN BY: SJH			
APPROVED BY:SJH			
PROJECT NO:22017			
FILE NAME:STE.DWG			

DETAIL SHEET

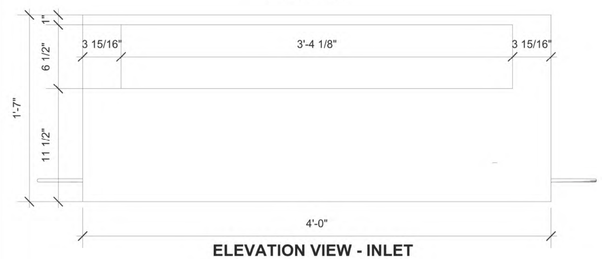
H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

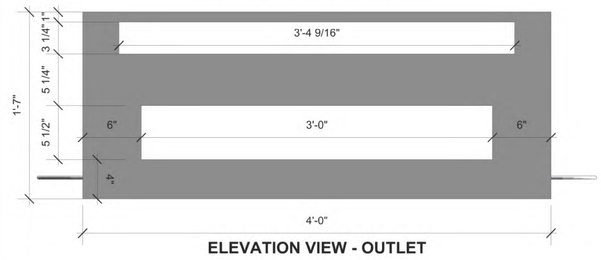
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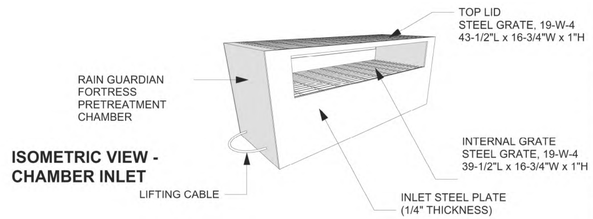
PLAN VIEW



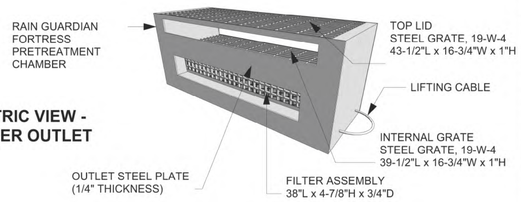
ELEVATION VIEW - INLET



ELEVATION VIEW - OUTLET



ISOMETRIC VIEW - CHAMBER INLET



ISOMETRIC VIEW - CHAMBER OUTLET

HANDLING INSTRUCTIONS



SPECIFICATIONS

1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURE (3.26 CF CONCRETE, 499 LBS, 1.36 CF STORAGE VOLUME), CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (5% TO 8.5% BY VOLUME). MANUFACTURED AND DESIGNED TO ASTM C858.
2. TWO-POINT PICK (EMBEDDED LIFTING CABLES)
3. INTERNAL GRATE - STEEL GRATE (25 LBS/PIECE, 1" THICK), 361 LB CONCENTRATED LOAD OR 206 LB/SQ-FT UNIFORM LOAD
4. TOP LID - STEEL GRATE (27 LBS/PIECE, 1" THICK), 361 LB CONCENTRATED LOAD OR 206 LB/SQ-FT UNIFORM LOAD
5. STEEL FACE PLATE (INLET AND OUTLET) - A36 1/4" THICKNESS
6. REMOVABLE FILTER ASSEMBLY (FIBERGLASS GRATE WITH FILTER AND ALUMINUM CHANNEL)

INSTALLATION NOTES

1. EXCAVATE AN AREA WITH DIMENSIONS OF AT LEAST 4'-6"L X 2'-0"W FOR THE RAIN GUARDIAN. THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS, BUT CONSIDERATIONS SHOULD INCLUDE SLOPE OF THE INLET AND BASIN SIDE SLOPES ADJACENT TO THE RAIN GUARDIAN. POSITION RAIN GUARDIAN SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL. THE EXCAVATION DEPTH SHOULD BE 1'-7" BELOW THE GUTTERLINE ELEVATION AT THE RAIN GARDEN INLET TO ACCOMMODATE THE 6" AGGREGATE BASE, 4" RAIN GUARDIAN BASE, AND 9" PONDING DEPTH.
2. INSTALL AN AGGREGATE BASE, COMPACTED TO 95% STANDARD PROCTOR, WITH DIMENSIONS OF AT LEAST 4'-6"L X 2'-0"W X 6"D. FINISHED TOP ELEVATION OF AGGREGATE TO BE PRECISELY 1'-1" BELOW THE GUTTER LINE ELEVATION AT THE RAIN GARDEN INLET.
3. SET RAIN GUARDIAN ON THE PREPARED AGGREGATE BASE. THE RAIN GUARDIAN INLET WILL BE 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN.
4. INSTALL FRAMING FOR INLET BETWEEN RAIN GUARDIAN AND BACK OF CURB. TOP ELEVATIONS OF THE FRAMING SHOULD MATCH THE TOP OF THE CURB ON THE STREET SIDE AND THE TOP OF THE RAIN GUARDIAN ON THE BIORETENTION SIDE.
5. INSTALL EXPANSION/CONTRACTION JOINT MATERIAL OR A SHEET OF POLY TO SERVE AS A BOND BREAK BETWEEN RAIN GUARDIAN AND CONCRETE INLET BEFORE POURING INLET.
6. SIDE CURBS OF THE POURED INLET MUST HAVE AN INSURMOUNTABLE PROFILE TO PREVENT WATER FLOW FROM OVERTOPPING THE DOWNSTREAM SIDE OF THE INLET.
7. INSTALL REMOVABLE FILTER. THE FILTER SHOULD BE INSTALLED IN THE CHANNEL AT THE RAIN GUARDIAN OUTLET WITH THE FILTER FABRIC FACING THE RAIN GUARDIAN INLET.
8. INSTALL INTERNAL GRATE AND THEN TOP LID.

RAIN GUARDIAN
U.S. PATENT NOS. 8,501,016 AND 8,858,804
PRETREATMENT FOR BIORETENTION
Rain Gardens • Swales • Filtration Basins • Infiltration Basins
www.RainGuardian.biz

RAIN GUARDIAN FORTRESS PRETREATMENT CHAMBER BIORETENTION PONDING DEPTH: 9" TYPICAL DETAIL

REVISION HISTORY

REV	BY	DATE	DESCRIPTION
A	MDH	11/16/22	FORTRESS
SCALE		VARIABLE	
U.S. PATENT NOS.		8,501,016 AND 8,858,804	

DEVELOPED BY: ANOKA CONSERVATION DISTRICT

MANUFACTURED BY: Stoneworks ARCHITECTURAL PRECAST / CAST STONE
NATIONAL PRECAST CONCRETE ASSOCIATION CERTIFIED PLANT

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PLANNING FILE NO.: P22-47

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

DATE:	10-26-23
SCALE:	1"=30'
DRAWN BY:	MJM
DESIGN BY:	SJH
APPROVED BY:	SJH
PROJECT NO:	22017
FILE NAME:	STE.DWG

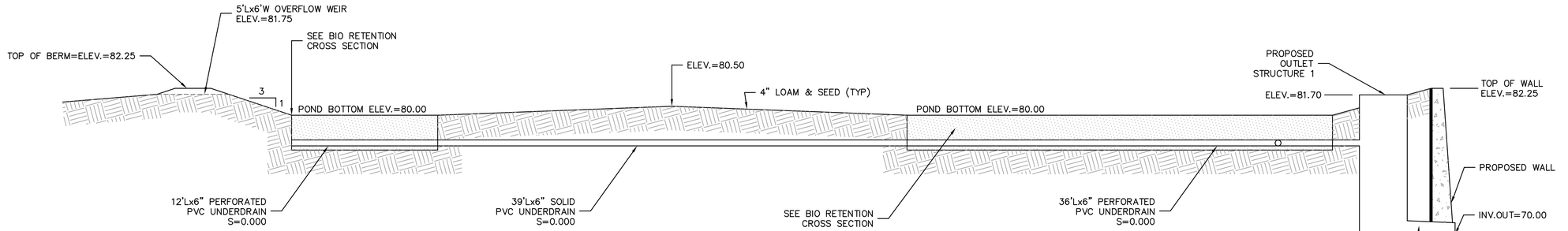
REVISION	APP'D	DATE

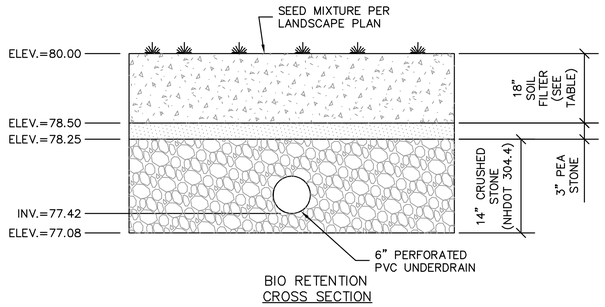
DETAIL SHEET

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

15





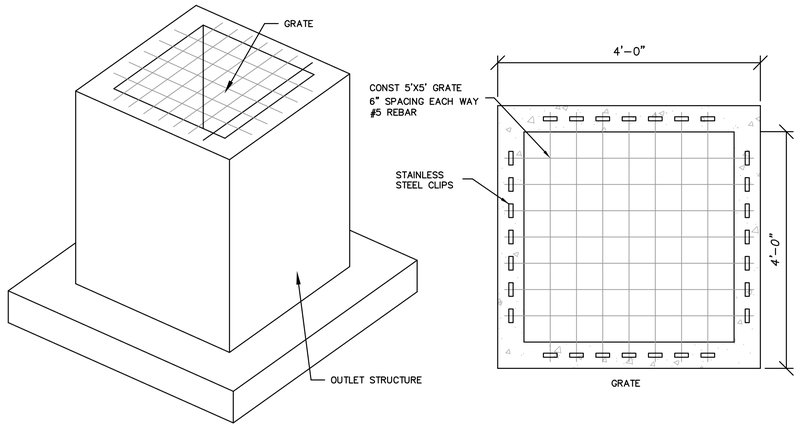
BIO RETENTION
CROSS SECTION

NOTES:
1. CONSTRUCT GRASSED OVERFLOW SPREADER EARLY DURING INITIAL CONSTRUCTION TO ESTABLISH TURF PRIOR TO CONSTRUCTION OF BIORETENTION SYSTEM.
2. DO NOT BEGIN CONSTRUCTION OF THE BIORETENTION AREA UNTIL LAWN AREA ON THE ENTIRE SITE AREA ESTABLISHED WITH AT LEAST 80 PERCENT TURF. FILTER ALL DRAIN INLETS IN THE SEDIMENT FOREBAYS TO PREVENT SILTATION INTO THE BIORETENTION AREA.
3. DO NOT DRIVE CONSTRUCTION EQUIPMENT THE FILTER MATERIAL. INSTALL FILTER MATERIAL BY MEANS OF AN EXCAVATOR LOCATED ADJACENT TO THE FILTER AREA.
4. MATERIALS: CRUSHED STONE LAYER SHALL MEET NHDOT 304.4. STONE SHALL CONTAIN NO MORE THAN 5% FINES PASSING THE #200 SIEVE. TOPSOIL SHALL CONTAIN 15 TO 25% FINES PASSING THE #200 SIEVE.
5. REFER TO LANDSCAPING DRAWINGS FOR GRASS SEED MIXES. FERTILIZATION OF THE FILTER AREA SHALL BE AVOIDED UNLESS ABSOLUTELY NECESSARY TO ESTABLISH VEGETATION.
6. INITIAL ESTABLISHMENT: DURING THE FIRST 2–3 MONTHS OF ESTABLISHMENT WATER THE GARDEN ON A WEEKLY BASIS (TO SUPPLEMENT RAINFALL FOR TOTAL OF 1 INCH PER WEEK).
7. ANNUAL MAINTENANCE: IN THE SPRING OF EACH YEAR, ANY DEAD VEGETATION SHALL BE REMOVED TO ALLOW FOR NEW GROWTH, AND ANY ACCUMULATED SEDIMENT (NORMALLY AT THE ENTRANCE TO THE GARDEN) SHALL ALSO BE REMOVED. TURF AT FILTER SHALL BE MOWED NO MORE THAN 3 TIMES PER GROWING SEASON. IF WATER PONDS ON THE SURFACE FOR MORE THAN 24 HOURS DURING THE FIRST YEAR OR 72 HOURS THEREAFTER, THE FILTER SURFACE SHALL BE AERATED WITH DEEP TINES OR THE SURFACE REPLACED.

BIO POND 1 (BP1) DETAIL

NOT TO SCALE

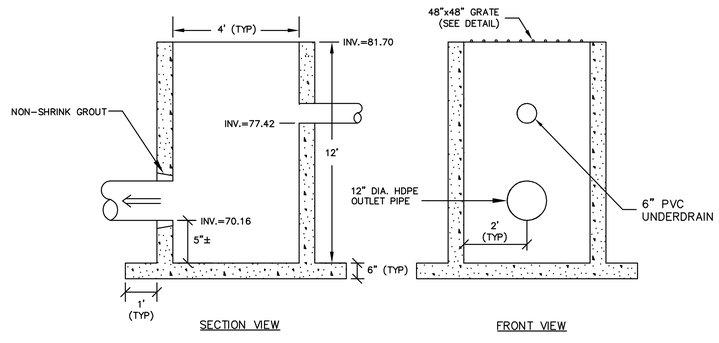
BIORETENTION FILTER MEDIA SPECIFICATIONS			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL	
		SIEVE NO.	PERCENT BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C-33 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
LOAMY COARSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		60	15 TO 40
		200	8 TO 15



NOTE:
1) OUTLET STRUCTURES SHALL BE PRE CAST WITH A MINIMUM CONCRETE STRENGTH OF 4,000 PSI @ 28 DAYS.
2) THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW BY THE TOWN.
3) TRASH RACKS SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL FRAMES AND/OR GRATES.
4) ALL TRASH RACK FASTENERS SHALL BE STAINLESS STEEL.

TYPICAL INLET TRASH RACK

NOT TO SCALE



NOTE:
1) ALL OUTLET STRUCTURES SHALL BE PRE CAST WITH A MINIMUM CONCRETE STRENGTH OF 4,000 PSI @ 28 DAYS.
2) THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EACH STRUCTURE FOR REVIEW BY THE TOWN.
3) SUMPS SHALL NOT BE GREATER THAN 8 INCHES.

OUTLET STRUCTURE 1 (OS-1) DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

PLANNING FILE NO.: P22-47

NO.	REVISION	APP'D	DATE

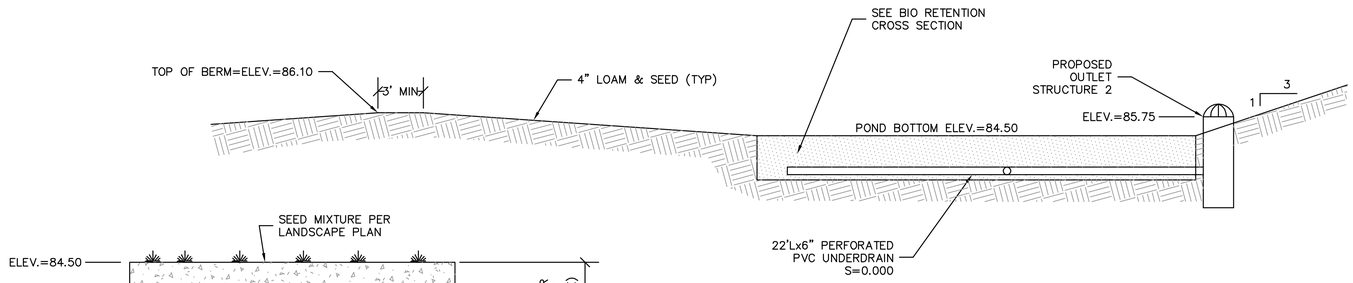
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DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:SITE.DWG

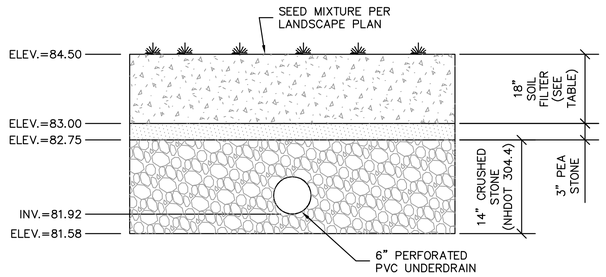
DETAIL SHEET

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

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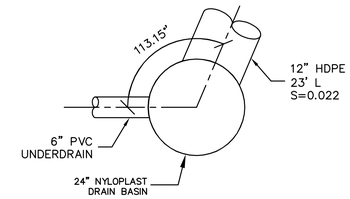
BIO RETENTION
CROSS SECTION

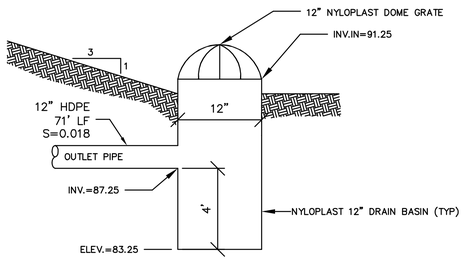
BIORETENTION FILTER MEDIA SPECIFICATIONS			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL	
		SIEVE NO.	PERCENT BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
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LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
LOAMY COARSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		60	15 TO 40
		200	8 TO 15

NOTES:
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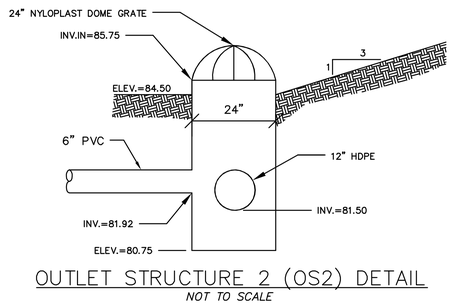
BIO POND 2 (BP2) DETAIL

NOT TO SCALE



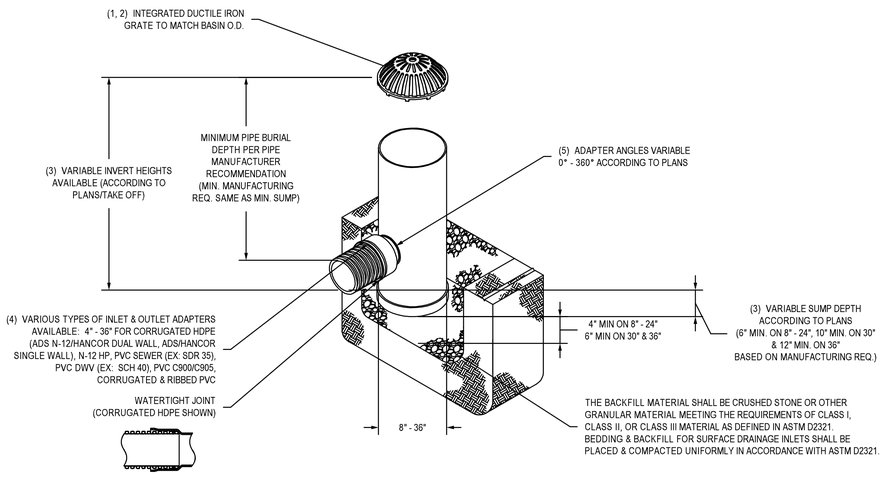


YARD DRAIN (YD1) DETAIL
NOT TO SCALE



OUTLET STRUCTURE 2 (OS2) DETAIL
NOT TO SCALE

NYLOPLAST DRAIN BASIN WITH DOME GRATE



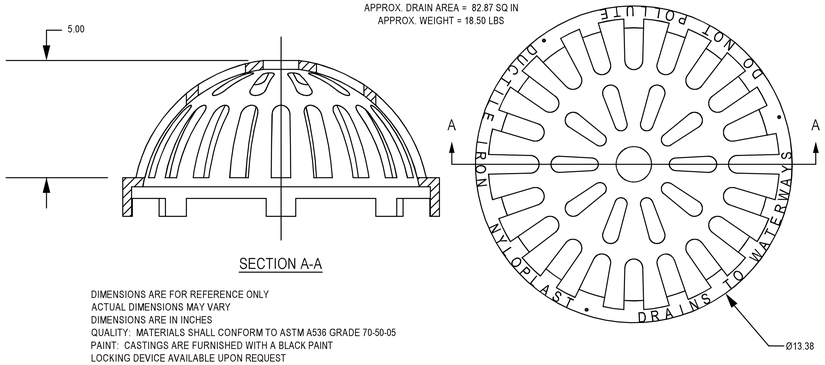
1 - 8" - 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 36").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 - 8" - 30" DOME GRATES HAVE NO LOAD RATING.

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DRAWN BY EBC	MATERIAL	ADS Nyloplast	3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com
DATE 03-25-10			
REVISED BY NMH	PROJECT NO./NAME	TITLE	DRAIN BASIN WITH DOME GRATE QUICK SPEC INSTALLATION DETAIL
DATE 06-12-18			
DWG SIZE A	SCALE 1:40 SHEET 1 OF 1	DWG NO. 7001-110-397	REV E

1299CGD

APPROX. DRAIN AREA = 82.87 SQ IN
APPROX. WEIGHT = 18.50 LBS



SECTION A-A

DIMENSIONS ARE FOR REFERENCE ONLY
ACTUAL DIMENSIONS MAY VARY
DIMENSIONS ARE IN INCHES
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST

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DRAWN BY EBC	MATERIAL	Nyloplast	3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com
DATE 3-8-06	DUCTILE IRON		
REVISED BY EBC	PROJECT NO./NAME	TITLE	12 IN DOME GRATE
DATE 3-10-11			
DWG SIZE A	SCALE NTS SHEET 1 OF 1	DWG NO. 7001-110-206	REV D

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY
PLANNING FILE NO.: P22-47

REVISION	APP'D	DATE

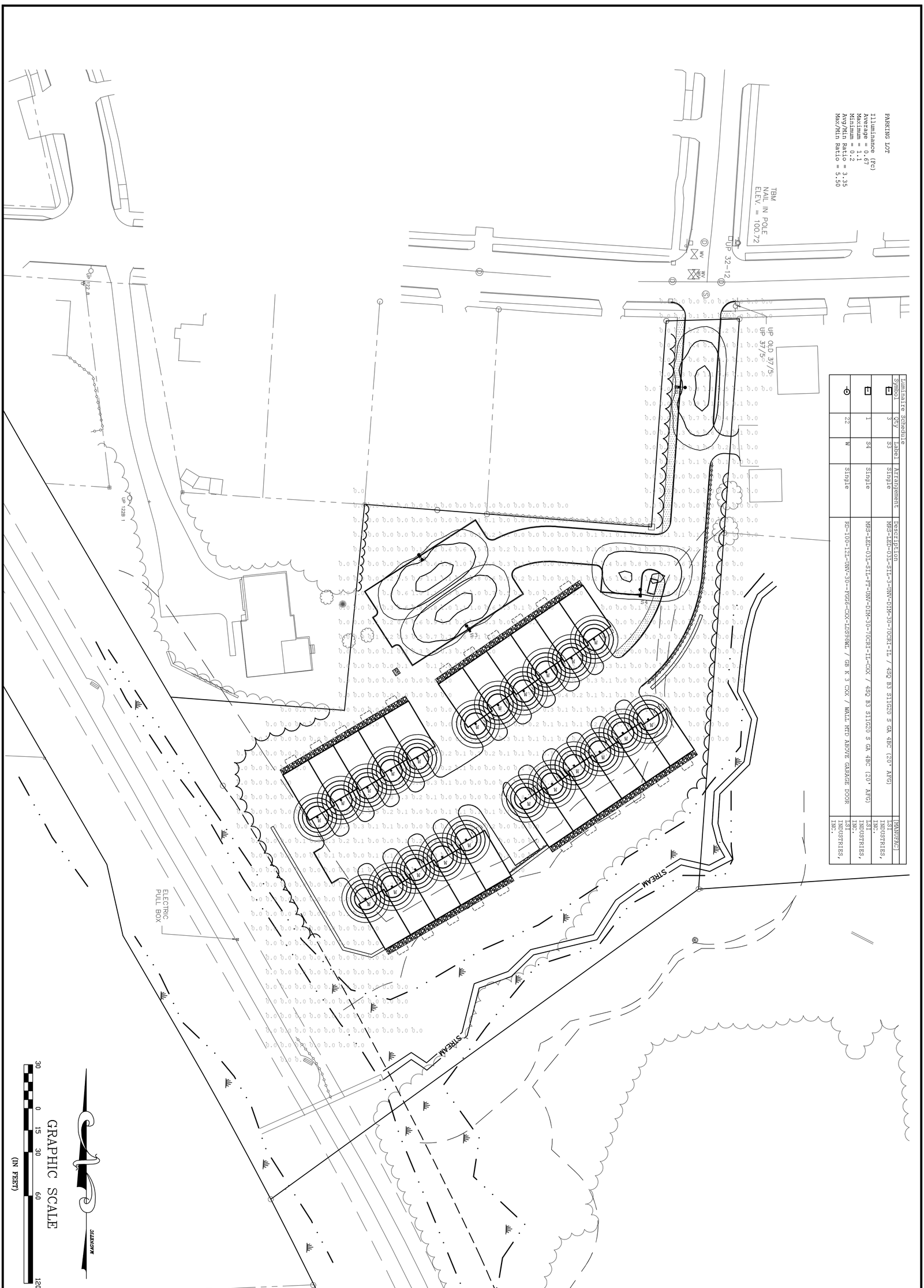
DATE: 10-26-23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY: SJH
PROJECT NO: 22017
FILE NAME: SITE.DWG

DETAIL SHEET

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

17



LIGHTING PLAN

18

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

DATE: 10-26-23				
SCALE: 1"=30'				
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PROJECT NO: 22017				
FILE NAME: SITE.DWG	NO.	REVISION	APP'D	DATE

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

Catalog # : _____ Project : _____

Prepared By : _____ Date : _____

Mirada Small Area (MRS)

Outdoor LED Area Light



IP66 IK08

OVERVIEW	
Lumen Package	6,000 - 30,000
Wattage Range	39 - 209
Efficacy Range (LPW)	112 - 163
Weight lbs(kg)	20 (9.1)
Control Options	IMSBT, ALB, ALS, 7-Pin, PC1

QUICK LINKS

Ordering Guide | Performance | Photometrics | Dimensions

FEATURES & SPECIFICATIONS

Construction
- Rugged die-cast aluminum housing contains factory prewired driver and optical unit. Cast aluminum wiring access door located underneath.
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Shipping weight: 27 lbs in carton.

Optical System
- State-of-the-Art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP66 rated seal.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in distribution types 2, 3, 4, 5W, FT, and LC/RC.
- Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 92-95%.
- Zero uplight.
- Available in 5000K, 4000K, and 3000K color temperatures per ANSI C78.377
- Minimum CRI of 70.
- Integral louver (IL) and integral half louver (IH) options available for enhanced backlight control.

Electrical
- High-performance driver features over-voltage, under-voltage, short-circuit and over temperature protection.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 VAC) Input 50/60 Hz or optional High Voltage (347-480 VAC).
- L70 Calculated Life: >60k Hours
- Total harmonic distortion: <20%
- Operating temperature: -40°C to +50°C (-40°F to +122°F). 30L lumen packages rated to +40°C.
- Power factor: > 90
- Input power stays constant over life.
- Field replaceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Driver is fully encased in potting material for moisture resistance and complies with FCC standards. Driver and key electronic components can easily be accessed.

Controls
- Optional integral passive infrared Bluetooth™ motion and photocell sensor. Fixtures operate independently and can be commissioned via IOS or Android configuration app.
- LSI's AirLink™ wireless control system options reduce energy and maintenance costs while optimizing light quality 24/7.

Installation
- Designed to mount to square or round poles.
- A single fastener secures the hinged door, underneath the housing and provides quick & easy access to the electrical compartment.
- Included terminal block accepts up to 12 ga. wire.
- Utilizes LSI's traditional B3 drill pattern.

Warranty
- LSI luminaires carry a 5-year limited warranty. Refer to https://www.lsicorp.com/resources/terms-conditions-warranty/ for more information.

Listings
- Listed to UL 1598 and UL 8750.
- Meets Buy American Act requirements.
- IDA compliant; with 3000K color temperature selection.
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable for wet locations.
- IP66 rated Luminaire per IEC 60598-1.
- 3G rated for ANSI C136.31 high vibration applications are qualified.
- IK08 rated luminaire per IEC 62262 mechanical impact code
- DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Catalog # : _____ Project : _____

Prepared By : _____ Date : _____

Steel Poles

Square Straight



QUICK LINKS

Ordering Guide | Configurations | Dimensions | EPA

FEATURES & SPECIFICATIONS

Pole Shaft
- Straight poles are 4", 5", or 6" square.
- Pole shaft is electro-welded ASTM-A500 Grade C steel tubing with a minimum yield strength of 50,000 psi.
- On Tenon Mount steel poles, tenon is 2-3/8" O.D. high-strength pipe. Tenon is 4-3/4" in length.

Hand-Hole
- Standard hand-hole location is 12" above pole base.
- Poles 22' and above have a 3" x 6" reinforced hand-hole. Shorter poles have a 2" x 4" non-reinforced hand-hole.

Base
- Pole base is ASTM-A36 hot-rolled steel plate with a minimum yield strength of 36,000 psi.
- Two-piece square base cover is optional.

Anchor Bolts
- Poles are furnished with anchor bolts featuring zinc-plated double nuts and washers. Galvanized anchor bolts are optional.
- Anchor Bolts conform to ASTM F 1554-07a Grade 55 with a minimum yield strength of 55,000 PSI.

Ground Lug
- Ground lug is standard.

Duplex Receptacle
- Weatherproof duplex receptacle is optional.

Ground Fault Circuit Interrupter
- Self-testing Ground fault circuit interrupter is optional.

Finishes
- Every pole is provided with the DuraGrip Protection System and a 5-year limited warranty.
- When the top-of-the line DuraGrip Plus Protection System is selected, in addition to the DuraGrip Protection System, a non-porous, automotive-grade corrosion coating is applied to the lower portion of the pole interior sealing and further protecting it from corrosion. This option extends the limited warranty to 7 years.

Determining The Luminaire/Pole Combination For Your Application:
- Select luminaire from luminaire ordering information.
- Select bracket configuration if required.
- Determine EPA value from luminaire/bracket EPA chart.
- Select Pole Height.
- Select MPH to match wind speed in the application area (See windspeed maps).
- Confirm pole EPA equal to or exceeding value of luminaire/bracket EPA.
- Consult factory for special wind load requirements and banner brackets.

Pole Vibration Damper
- A pole vibration damper is recommended in open terrain areas of the country where low steady state winds are common.
- Non-tapered poles and lightly loaded poles are more susceptible to destructive vibration if a damper is not installed.

Listings
- UL Listed
- BAA/TAA Compliant

Catalog #: _____ Project: _____

Prepared By: _____ Date: _____ Type: _____

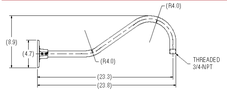
LSI Abolite Gooseneck and Wall Brackets

3/4" Single Reflector Gooseneck Wall Bracket. Features rigid conduit and cast wall plate which fits 4" octagonal box (by other), Brackets are finished in gloss white powder, additional colors are available.

NOTE: Brackets feature 3/4" stems which slip fit into wall plate (wall end is unthreaded). Conduit may be cut down (in the field by other) to shorten bracket length. CA5 wall plate included with all goosenecks.

All dimensions displayed in inches.

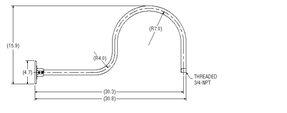
GB A 3 GWT



GB B 3 GWT

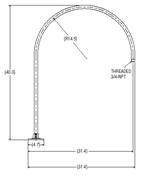


GB C 3 GWT

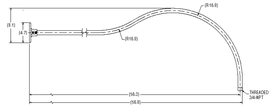


GB E 3 GWT

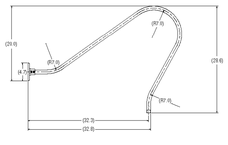
3/4" Single Reflector Gooseneck Wall Bracket. Features rigid conduit and cast wall plate which fits 4" octagonal box (by other). The bracket is designed to be mounted to a horizontal surface, but could also be mounted to a wall. The bracket features a gloss white powder finish, additional colors available.



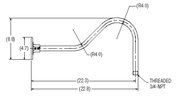
GB F 3 GWT



GB G 3 GWT

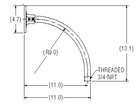


GB H 3 GWT



LSI Abolite | **Gooseneck and Wall Brackets**

GB K 3 GWT



GB P 3 GWT

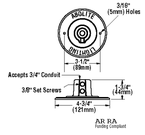


GB U 3 GWT



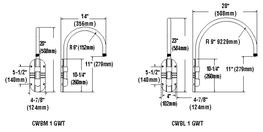
RECESSED CA-5

Gloss white powder finish (other colors available). Mounts to recessed 4" octagon box (by others).



CWBM 1 GWT and CWBL 1 GWT

Contemporary Wall Bracket with gloss white powder finish, additional colors available.



LIGHT POLE BASE

NOT TO SCALE

PLAN VIEW

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PLANNING FILE NO.: P22-47

NO.	REVISION	APP'D	DATE

DATE: 10-26-23
SCALE: 1"=30'
DRAWN BY: M.M
DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:SITE.DWG

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

LIGHTING DETAILS

19

EDMH
RIM=98.08

TBM
NAIL IN POLE
ELEV. = 100.72

ECB
RIM=98.10

UP 32-1

EDMH
RIM=98.23

WV

WV

ECB
RIM=97.76

ESMH
RIM=98.16

ECB
RIM=97.93

EDMH
RIM=98.50

ECB
RIM=98.18

EXISTING
HOUSE

UP OLD 37/5
UP 37/5

I.R.(fnd)

ASPHALT
DRIVE

GARAGE

30"ø
MAPLE

18"ø
MAPLE

I.R.(fnd)

I.P.(fnd)

G.B.(fnd)

45.50

8.50 20.00

Dover ladder feet

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.0

EDMH
RIM=100.08

I.R.(fnd)

S.S.(fnd)

G.B.(fnd)

G.B.(fnd)

UP 122B 1

G.B.(fnd)

UP 122 B

12" RCP
CULVERT OUTLET
INV: 89.46

TREELINE (TYP)

INV 12D CAST IRON
72.81

I.R.(tbs)

STREAM

50' WETLAND
BUFFER

CITY OF DOVER
CONSERVATION DISTRICT

50'
WETLAND
BUFFER

STREAM

INVERT IN = 65.0

DOVER COMMUNITY TRAIL

3'X4' STONE
BOX CULVERT

I.R.(tbs)

INVERT OUT = 62.2

S.S.(fnd)

WETLAND BOUNDARY
DELINEATED BY MARK
WEST IN 2012

ASPHALT WALK

50'
EASEMENT

ELECTRIC
PULL BOX

MAGNETIC

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

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PLANNING FILE
NO.: P22-47

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

	DATE
	APP'D
	REVISION
	NO.

DATE: 10-24-23
SCALE: 1"=30'
DRAWN BY: MJM
DESIGN BY: SJH
APPROVED BY:SJH
PROJECT NO:22017
FILE NAME:STE.DWG

DOVER LADDER TRUCK MOVEMENT PLAN

FISHER STREET TOWNHOUSES
RESIDENTIAL SITE PLAN
FISHER STREET
DOVER, NH

H.J. STABILE AND SON, INC.
20 COTTON ROAD, SUITE 200
NASHUA, NH 03063

20



The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

BUILDING – A

JAD DESIGN GROUP INC.
CUSTOM RESIDENTIAL DESIGN
www.jaddesigngroup.com 603.554.1199

Stabile Homes
Quality Homes for Today's Lifestyles

Corporate Office

20 Cotton Road, Nashua,
NH 03063
(603) 889-0318

MARKETING PLANS

REVISIONS RELEASE DATE:

	MM/DD/YY	REMARKS
1		
2		
3		

1.1

A



Unit - A6 | Unit - A5 | Unit - A4 | Unit - A3 | Unit - A2 | Unit - A1

Front Elevation

BUILDING - A

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

JAD DESIGN GROUP INC.
P.O. BOX 728 AMHERST, NH 03031
PHONE: (603) 554-1199
www.jadhomes.com

Job : 2650_x
Ref :
Date: 6/19/2023
Rev :

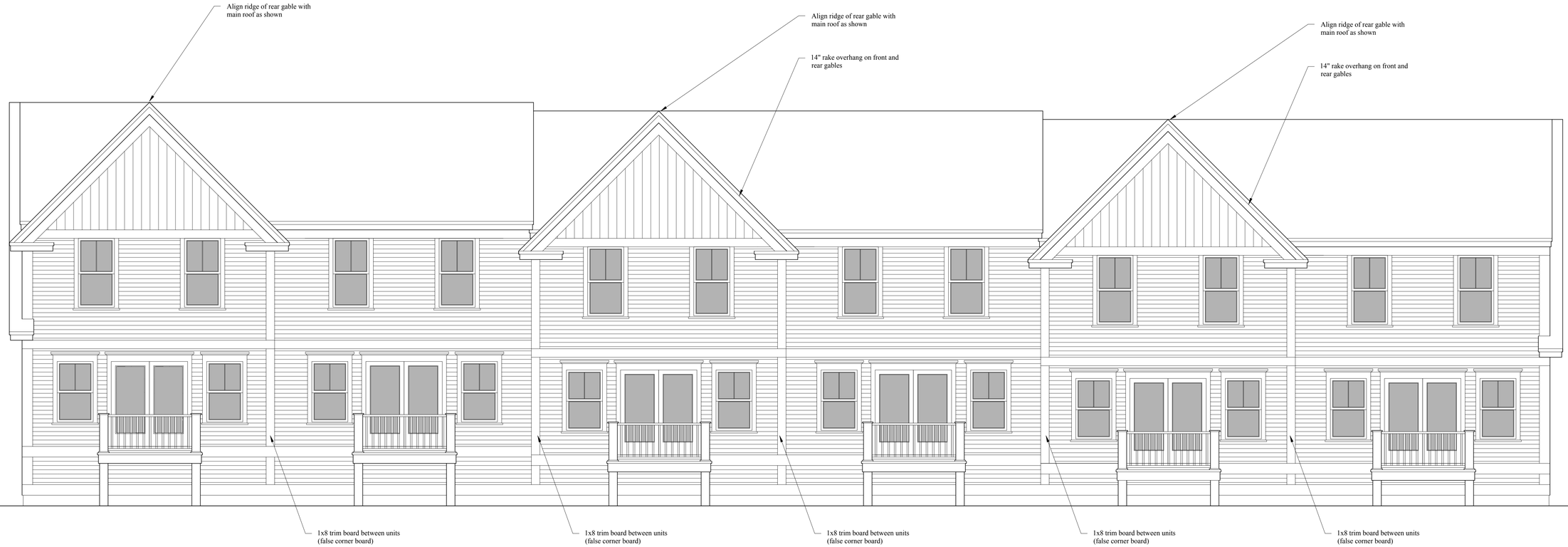
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-2.1.A

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Unit - A1 | Unit - A2 | Unit - A3 | Unit - A4 | Unit - A5 | Unit - A6

Rear Elevation

BUILDING - A

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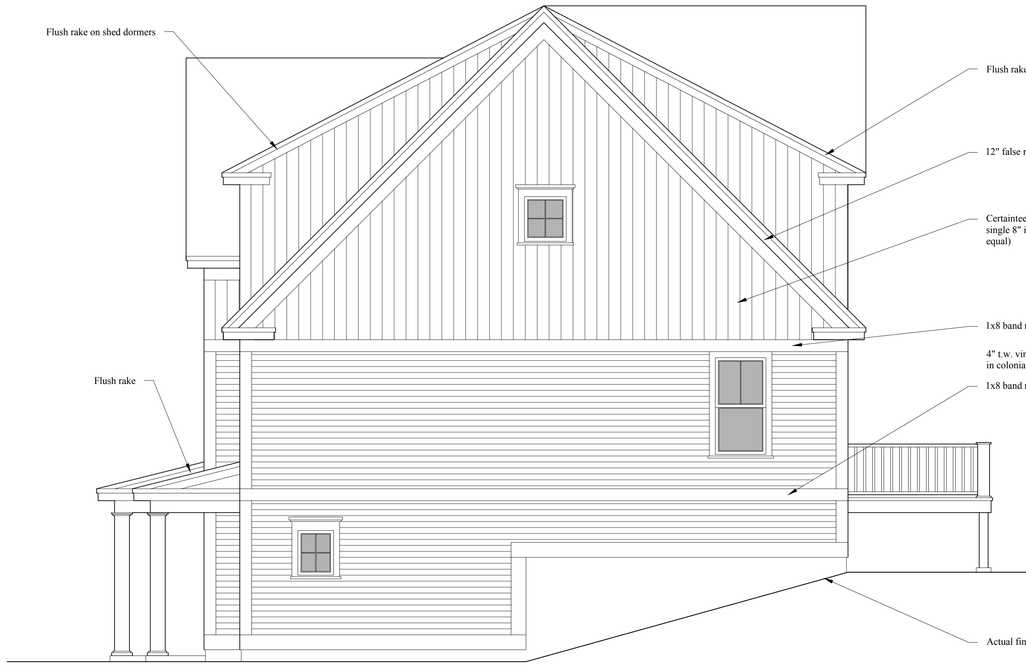
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - A

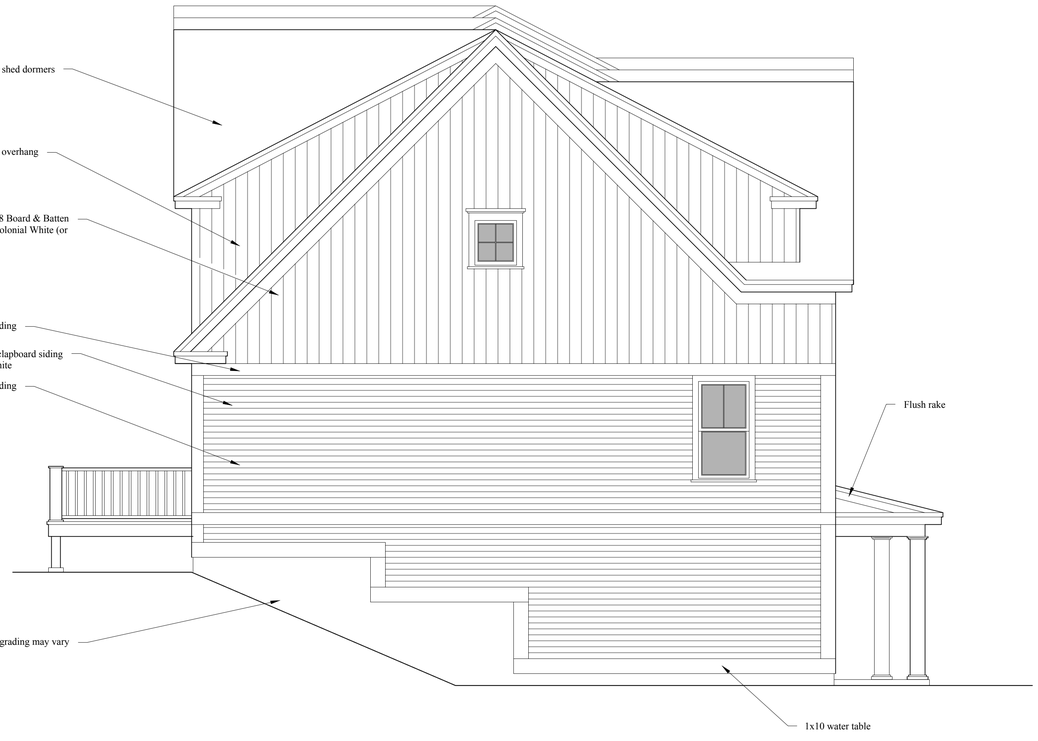
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Unit - A1

Right Side Elevation



Unit - A6

Left Side Elevation

BUILDING - A

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Job : 2650_x
Ref : .
Date: 6/19/2023
Rev : .

The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-2.3.A

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The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

BUILDING – B

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Corporate Office

20 Cotton Road, Nashua,
NH 03063
(603) 889-0318

MARKETING PLANS

REVISIONS RELEASE DATE:

	MM/DD/YY	REMARKS
1		
2		
3		

1.1

A



Unit - B5 | Unit - B4 | Unit - B3 | Unit - B2 | Unit - B1

Front Elevation

BUILDING - B

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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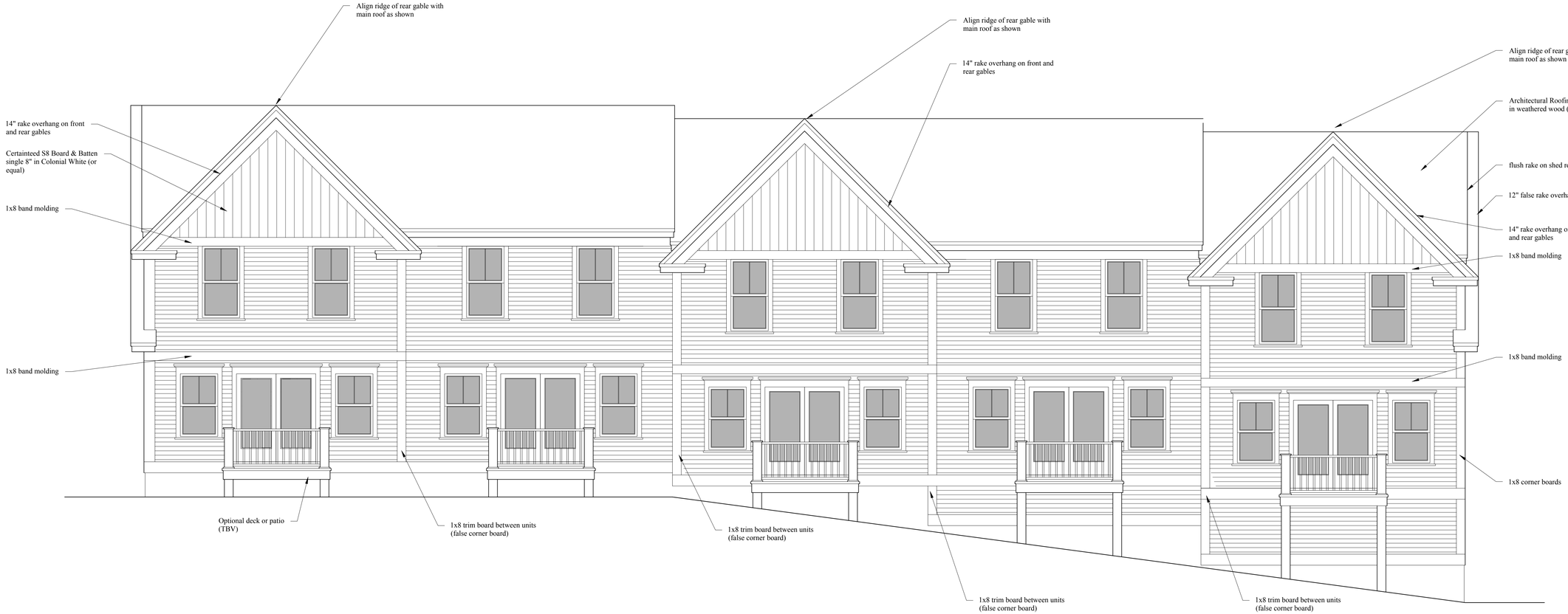
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - B

SHEET
A-2.1.B

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Unit - B1 | Unit - B2 | Unit - B3 | Unit - B4 | Unit - B5

Rear Elevation

BUILDING - B

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JAD DESIGN GROUP INC.
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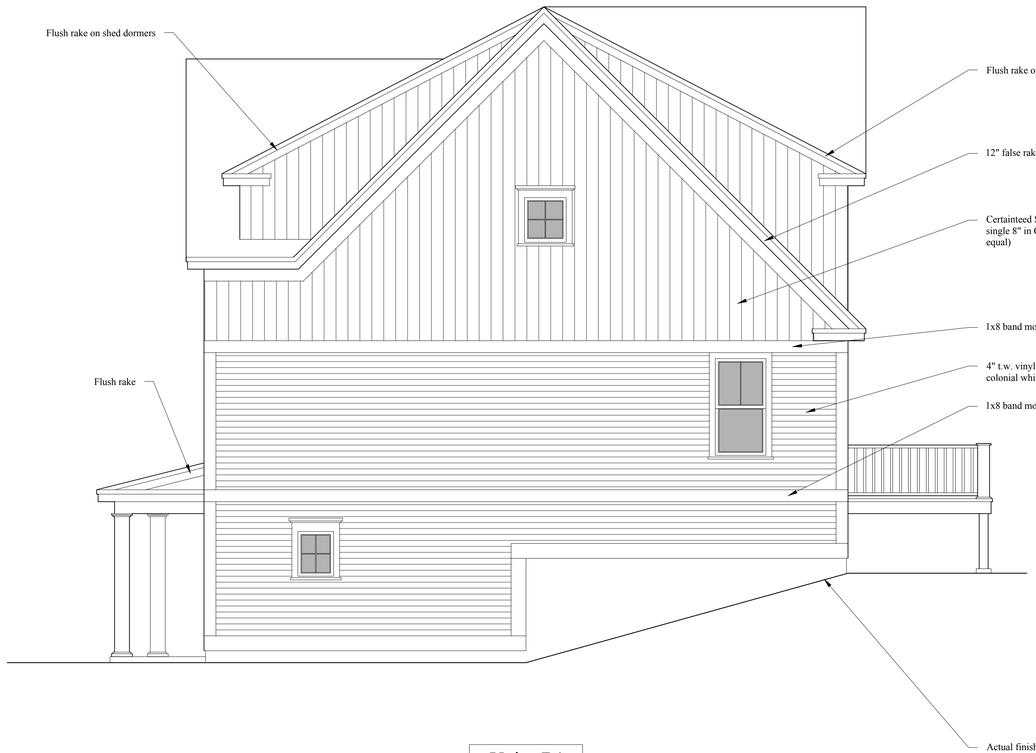
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - B

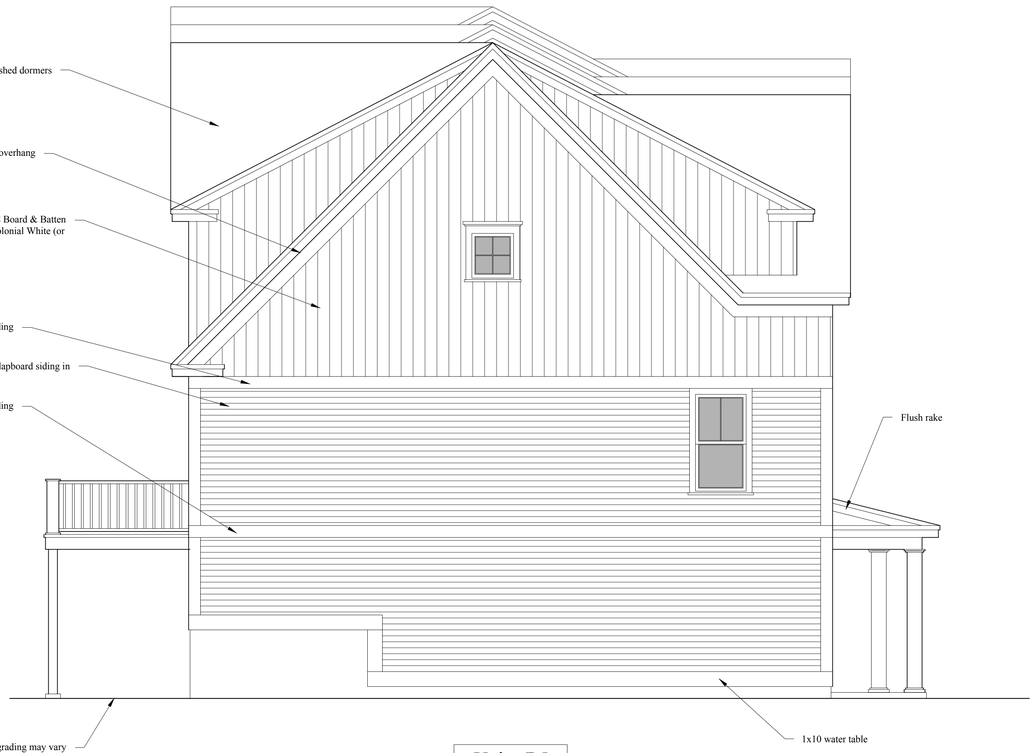
SHEET
A-2.2.B

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Unit - B1

Right Side Elevation



Unit - B5

Left Side Elevation

BUILDING - B

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JAD DESIGN GROUP INC.
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PHONE: (603) 554-1199
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Ref : .
Date: 6/19/2023
Rev : .

The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - B

SHEET
A-2.3.B

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The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

BUILDING – C

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(603) 889-0318

MARKETING PLANS

REVISIONS RELEASE DATE:

	MM/DD/YY	REMARKS
1		
2		
3		

1.1

A



Front Elevation

BUILDING - C

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Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - C

SHEET
A-2.1.C

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Unit - C6 | Unit - C5 | Unit - C4 | Unit - C3 | Unit - C2 | Unit - C1

Rear Elevation

BUILDING - C

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

JAD DESIGN GROUP INC.
P.O. BOX 728 AMHERST, NH 03031
PHONE: (603) 554-1199
www.jadhomes.com

Job : 2650_x
Ref :
Date: 6/19/2023
Rev :

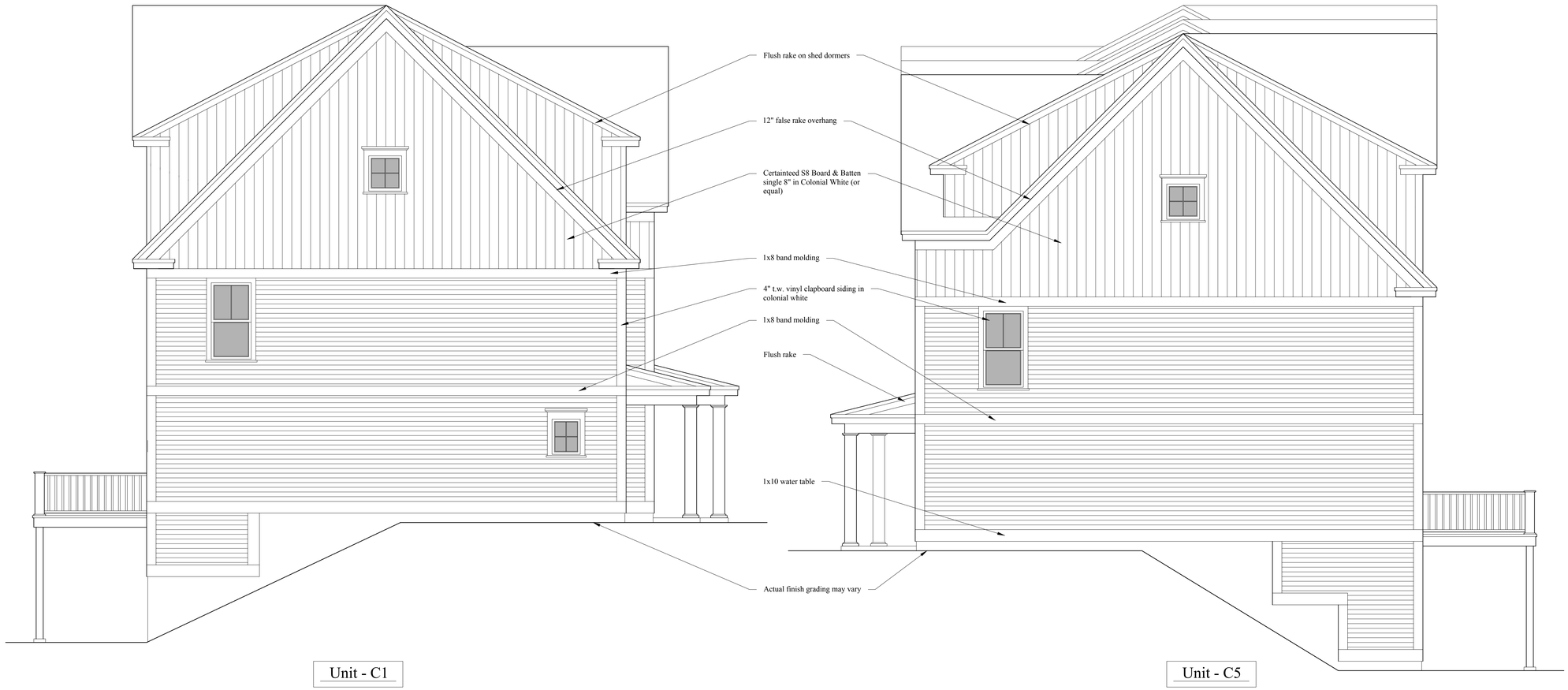
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - C

SHEET
A-2.2.C

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Unit - C1

Left Side Elevation

Unit - C5

Right Side Elevation

BUILDING - C

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Date: 6/19/2023
Rev : -

The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - C

SHEET
A-2.3.C

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The TOWNHOUSES
at Fisher Street

The Stabile Companies

engineer

Date: 6/28/23

BUILDING – D

JAD DESIGN GROUP INC.
CUSTOM RESIDENTIAL DESIGN
www.jaddesigngroup.com 603.554.1199

Stabile Homes
Quality Homes for Today's Lifestyles

Corporate Office
20 Cotton Road, Nashua,
NH 03063
(603) 889-0318

MARKETING PLANS

REVISIONS RELEASE DATE:

	MM/DD/YY	REMARKS
1		
2		
3		

1.1

A



Unit - D1 | Unit - D2 | Unit - D3 | Unit - D4 | Unit - D5

Front Elevation

BUILDING - D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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PHONE: (603) 554-1199
www.jadhomes.com

Job : 2650_x
Ref :
Date: 6/19/2023
Rev :

The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - D

SHEET
A-2.1.D

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Unit - A5 | Unit - A4 | Unit - A3 | Unit - A2 | Unit - A1

Rear Elevation

BUILDING - D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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Ref : .
Date: 6/19/2023
Rev : .

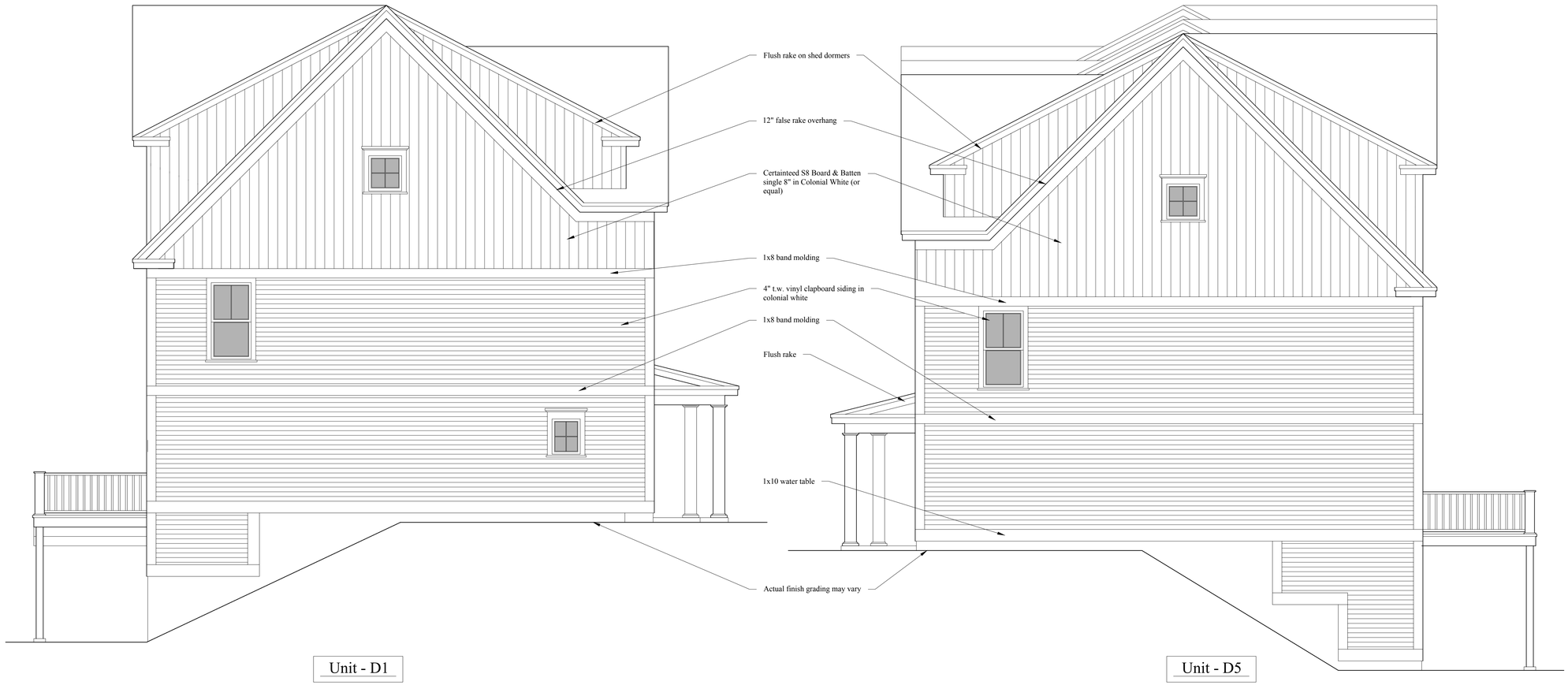
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - D

SHEET
A-2.2.D

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Unit - D1

Left Side Elevation

Unit - D5

Right Side Elevation

BUILDING - D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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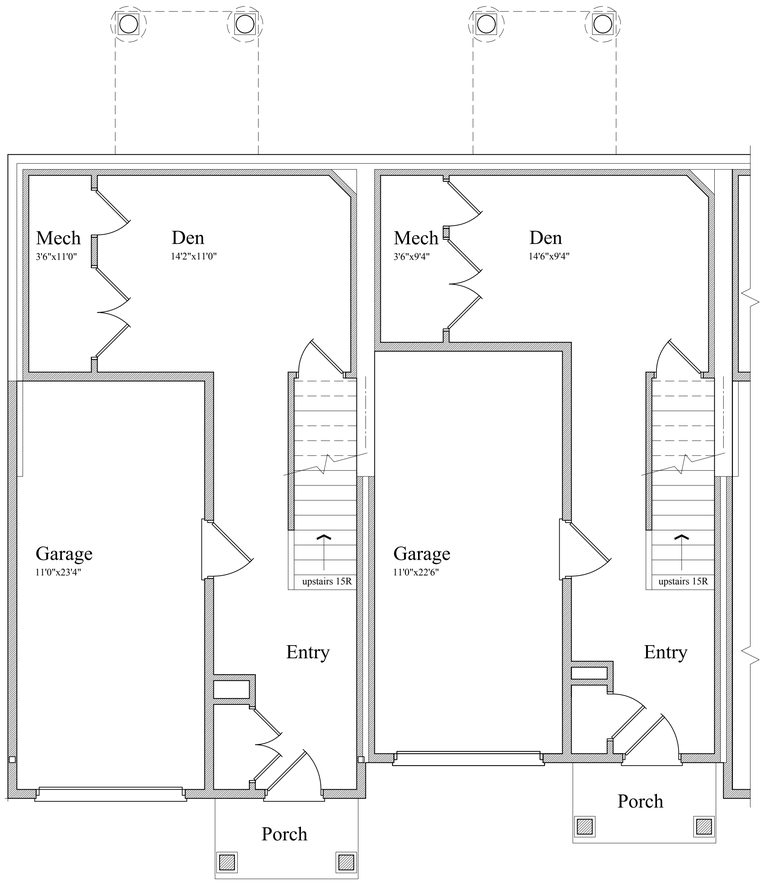
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Exterior Elevations
Scale : 1/4" = 1'-0"
Building - D

SHEET
A-2.3.D

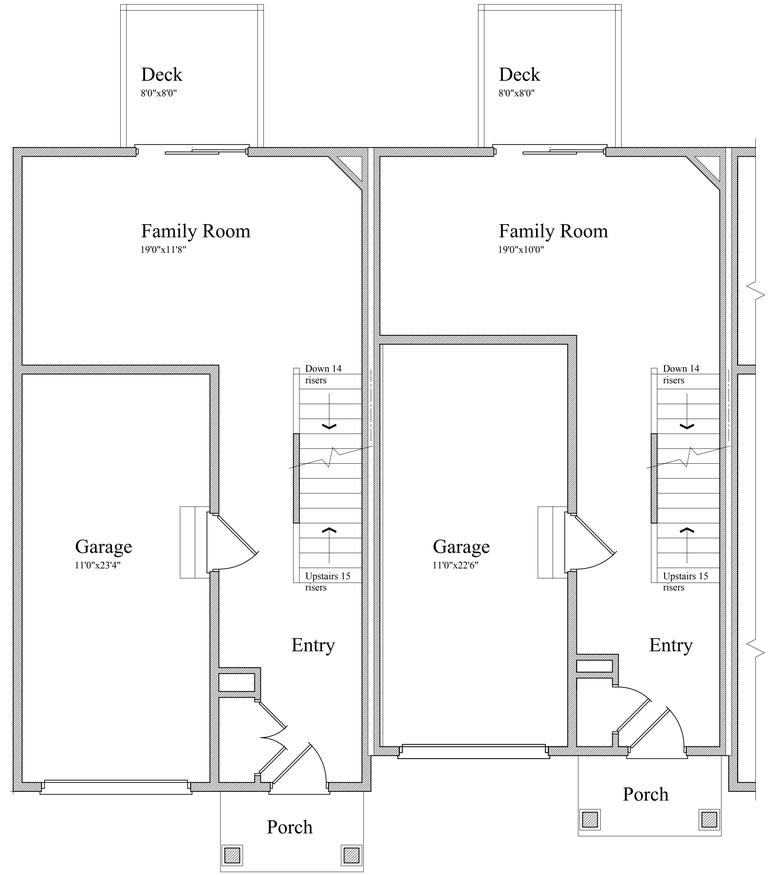
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Unit - A1
410 sf

Unit - A2
379 sf

Entry / Garage Level
Building A & B



Unit - C1
410 sf

Unit - C2
379 sf

Entry / Garage Level
Building C & D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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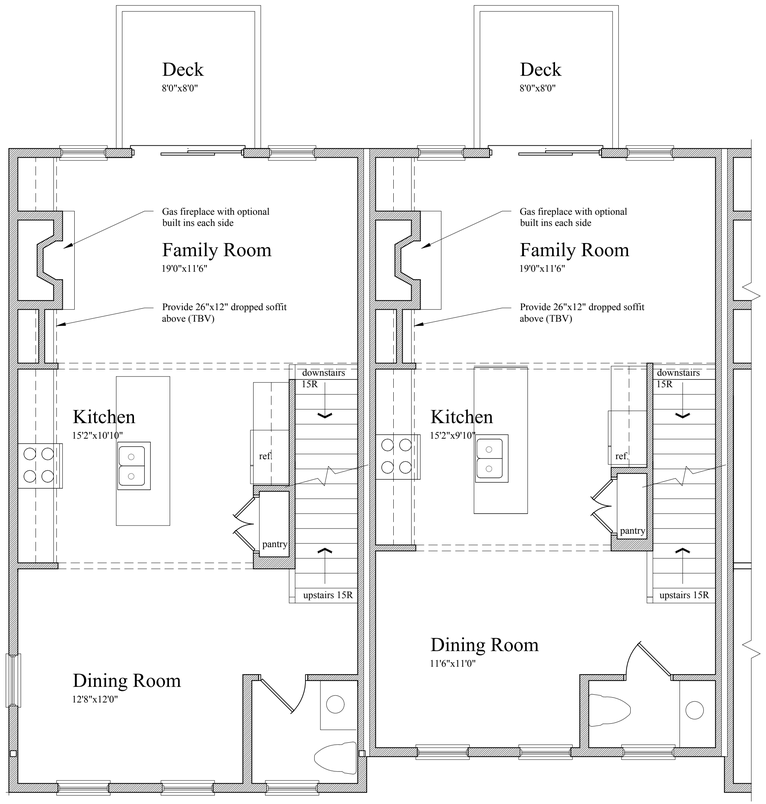
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Lower Floor Plan
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-3.1

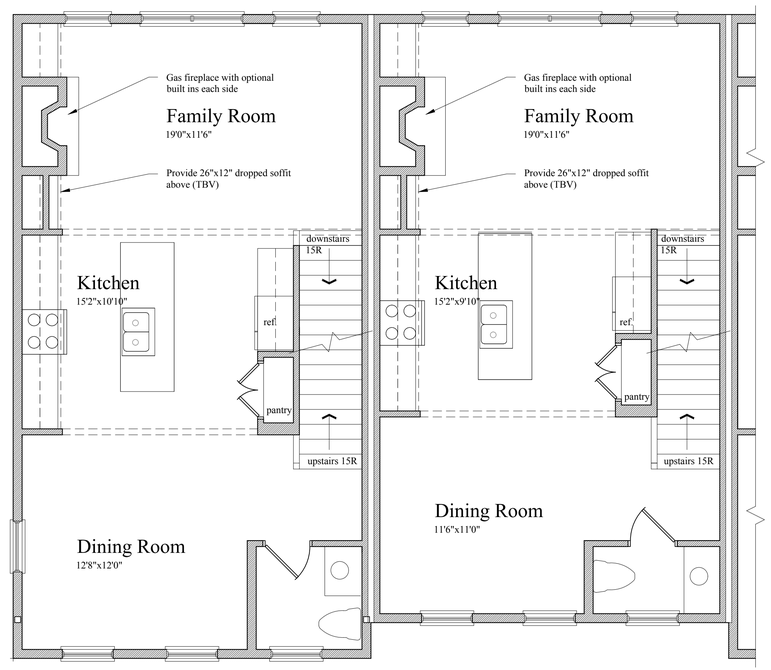
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Unit - A1
720 sf

Unit - A2
680 sf

Main Living Level
Building A & B



Unit - C1
720 sf

Unit - C2
680 sf

Main Living Level
Building C & D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

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Rev : .

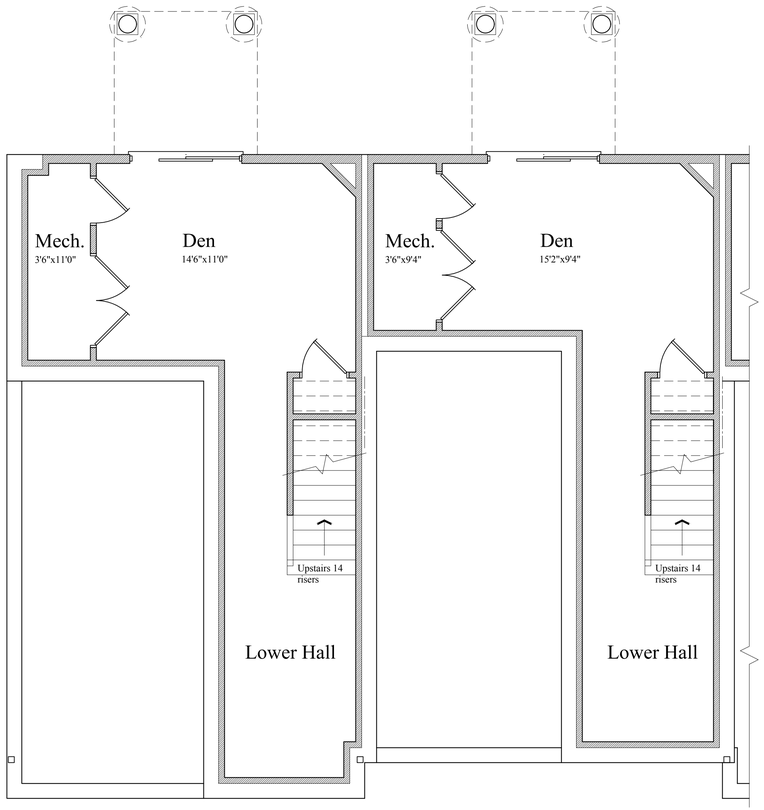
The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Main Floor Plan
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-4.1

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Unit - C1
409 sf

Unit - C2
384 sf

Lower Level
Building C & D only



Unit - A1
720 sf

Unit - A2
680 sf

Bedroom Level
Building A, B, C & D

CONTRACTOR TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBERS PRIOR TO STARTING CONSTRUCTION. BUILDING IS TO MEET OR EXCEED ALL STATE AND LOCAL BUILDING CODES.

JAD DESIGN GROUP INC.
P.O. BOX 728 AMHERST, NH 03031
PHONE: (603) 554-1199
www.jadhomes.com

Job : 2650_x
Ref :
Date: 6/19/2023
Rev :

The Stabile Companies
Fisher Street

Townhouses
Dover, NH

Floor Plans
Scale : 1/4" = 1'-0"
Building - A

SHEET
A-5.1

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NH STATE PLANE
NAD 83 - GPS OBS.

EDMH
RIM=98.08

EXISTING HOUSE

GARAGE

TBM
NAIL IN POLE
ELEV. = 100.72

ECB
RIM=98.10

EDMH
RIM=98.23

ECB
RIM=97.76

ECB
RIM=97.93

EDMH
RIM=98.50

ECB
RIM=98.18

EDMH
RIM=98.16

EDMH
RIM=100.08

UP OLD 37/5
UP 37/5
UP 32-12
45
98.09
STA MNS

ASPHALT DRIVE

GRAVEL DRIVE

30"ø MAPLE

18" MAPLE

I.R.(fnd)

G.B.(fnd)

S.S.(fnd)

1+00

2+00

3+00

4+00

5+00

TREE 12" MAP

TREE 16" MAP

TREE 18" OAK

55
94.33
STA MHS 120621
12" RCP
CULVERT
OUTLET
INV: 89.46

54
91.73
STA MHS 120621

TREELINE (TYP)

INV 12D CAST IRON
72.81

I.R.(tbs)

80.98
STA HTS 120621

STREAM

POTENTIAL
UNDERGROUND
INFILTRAION BASIN
LOCATION (TYP.)

50' WETLAND BUFFER

CITY OF DOVER
CONSERVATION DISTRICT

A

B

C

D

FFE: 89.90
GFF: 88.65

FFE: 89.57
GFF: 88.32

FFE: 89.24
GFF: 87.99

FFE: 88.91
GFF: 87.66

FFE: 88.58
GFF: 87.33

FFE: 88.25
GFF: 87.00

FFE: 89.81
GFF: 88.56

FFE: 89.39
GFF: 88.14

FFE: 88.97
GFF: 87.72

FFE: 88.59
GFF: 87.34

FFE: 88.17
GFF: 86.92

FFE: 87.75
GFF: 86.50

FFE: 86.25
GFF: 85.00

FFE: 85.75
GFF: 84.50

FFE: 85.25
GFF: 84.00

FFE: 84.75
GFF: 83.50

FFE: 84.25
GFF: 83.00

FFE: 85.75
GFF: 84.50

FFE: 85.25
GFF: 84.00

FFE: 84.75
GFF: 83.50

FFE: 84.25
GFF: 83.00

FFE: 83.75
GFF: 82.50

T.O.W: 72.75
B.O.W: 72.00

T.O.W: 73.43
B.O.W: 70.00

T.O.W: 75.23
B.O.W: 72.00

T.O.W: 76.16
B.O.W: 74.00

T.O.W: 77.28
B.O.W: 76.00

T.O.W: 80.08
B.O.W: 80.00

T.O.W: 78.63
B.O.W: 78.00

INVERT IN = 65.0

INVERT OUT = 62.2

3'X4' STONE BOX CULVERT

6062
65.96
STA MHS

ELECTRIC PULL BOX

ASPHALT WALK
58
84.66
STA MNS - WALK

50' EASEMENT

DOVER COMMUNITY TRAIL (SEE NOTE 10)

WETLAND BOUNDARY
DELINEATED BY MARK
WEST IN 2012

I.P.(fnd)

UP 122 8

UP 122B 1

SIDEWALK

PARKING CALCULATIONS

	REQUIRED	PROPOSED
1.9 PARKING SPACES PER UNIT	= 42	45

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

NO.	REVISION	APP'D	DATE

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

DATE: 3-16-23
SCALE: 1"=30'
DRAWN BY: DJL
DESIGN BY: DJL
APPROVED BY:SJH
PROJECT NO: 22017
FILE: 22017-SITE

GRADING EXHIBIT

STABILE COMPANIES
TRAILS EDGE
FISHER STREET

TAX MAP 15-40A LOT 2
TWENTY TWO TOWNHOUSES
FISHER STREET

EX-1

Landscape Best Management Practices
Operations and Maintenance Plan

Fisher Street Townhouses

TAX MAP 15, LOT 40-A-1
Dover, New Hampshire 03820

November 8, 2023

Prepared for
Civilworks New England/Haight Engineering, PLLC
181 Watson Road
PO Box 1166
Dover, New Hampshire 03821

Prepared by
Ironwood Design Group, LLC
PO Box 873
Exeter, New Hampshire 03833



Landscape Maintenance

Introduction

The landscape enhancements proposed for the Fisher St. Townhouse Project will require modest maintenance at various times throughout the year. For the site plantings, maintenance is most important during the first 1-2 years following installation when plants are becoming established. Anyone involved in the upkeep of the facility should become familiar with the landscape and its features. Identified below are basic, at minimum, maintenance tasks:

Weekly Tasks

1. Prune back any shrubs overhanging curbs or sidewalks.
2. Remove litter from plants bed.
3. Remove broken or fallen branches from trees.
4. Prune sucker growth from tree trunks.
5. Remove weeds larger than 2 inches high or wide from plant beds. Weeds 2 inches and larger must be removed, not just killed. **The application of herbicides such as Roundup is discouraged.**
6. Any invasive species seedlings observed should be removed and disposed of properly.
7. Replace bark mulch that may have been washed out of planting beds. Smooth mulch layer if it has been disturbed.
8. Check plants for signs of stress, pests or disease and notify Owner for authorization to replace.
9. If a significant decline in plant health is attributed to an insect pest, **apply an organic product and/or process** to control the pest.
10. Water plants that are dry and stressed.
11. Notify Owner for authorization to replace dead plants at the appropriate time (see annual tasks, September).
12. Identify other tasks listed on the Annual and Monthly checklist of tasks.

Annual Tasks

Early Spring

1. Prune winter damage such as broken tree branches that interfere with public safety.
2. Trim dead perennial foliage left in the fall for winter interest to within six inches of the ground.
3. Add new mulch to plant beds where the mulch depth has been reduced to less than 2 inches. Mulch depth shall not exceed two inches (top dressed). Mulch is not required where shrubs or groundcover completely hide the soil surface from view.
4. Gently prune shrubs at appropriate time of year based on species, for shape and form. **Do not shear.**
5. Energize the irrigation system, repair damaged components, test the system, adjust heads, and update programing.
6. Conduct a soil test to measure at a minimum, pH, phosphorus, potassium, calcium, and magnesium. Follow the recommendations provided with the soil test results.
7. Apply fertilizer only when required. A single application of fertilizer per year before Memorial Day is encouraged.

Monthly Tasks

June

No additional items

July

No additional items

August

Mow native meadow areas at 6”-9” height.

September

1. Inventory all plant materials, including an exact count of all shrubs and trees.
2. Replace any dead or missing plants.
3. Aerate lawn areas.
4. Apply pelletized lime at a rate of 80 lbs/1,000 square feet or as soil test dictates.

October

1. Winterize irrigation system.

November

1. Remove leaves from lawn areas and planting beds.
2. Remove perennial vegetation that has died back for the season.
3. Apply “WILT-PRUF” to broadleaf evergreens, according to label instructions, to protect shrubs from winter die back.

December

1. Prune any tree branches that interfere with public safety.
2. Prune desiduous trees yearly to encourage strong growth the following growing season. Trees adjacent to pedestrian sidewalks shall have branches pruned to 6-foot height.

Management Task or Activity	Time or Frequency						
	Weekly	Monthly	Spring	Summer	Fall	Winter	After Major Rain Events
Replace dead or dying plants			X				
Remove weeds	X		X	X	X		
Cut down grasses			X				
Remove accumulated leaves, litter, and plant debris		X					X

Stormwater Detention Facilities

Introduction

The stormwater facilities are used to attenuate flow and treat stormwater. The stormwater treatment areas consist of a large basin and linear swales seeded with a variety of native, adaptable, and rugged perennial grasses, and sometimes additional flowering plants. There are maintenance tasks associated with stormwater facilities.

Erosion

The soil in the facility and in areas draining to the facility shall be inspected for erosion. Eroded areas shall be filled with soil or mulch and seeded with the approved seed mix for the location.

Sediment Accumulation & Clogging

The accumulation of sediment within the facility may reduce its infiltration capacity and impair performance. The facility shall be inspected for accumulation of sediment and excessive sediment shall be removed with the area re-mulched and replanted as appropriate and necessary.

Outlet Structure Maintenance

The facility outlet structure requires monitoring. Periodically, the orifice on the outlet pipe may clog with debris. Any found debris should be removed and appropriately disposed of off-site.

Debris & Litter

Debris and litter should be removed monthly to maintain aesthetic appearance and public acceptance.

Plant Maintenance

Healthy vegetation contributes to the optimal operation of the stormwater facility. Planting area maintenance tasks include the removal of accumulated leaves, litter, and plant debris as needed. During the first 1-2 years after planting, the facility should be monitored for invasive species and weeded as needed and appropriate. Well-established facility vegetation should be mowed annually in the fall.

Snow Storage

Snow shall not be dumped directly onto the facility.

Chlorides

The stormwater facility is not suitable for treating chlorides. Chloride use on source surface areas tributary to the facility should be avoided if possible. In these locations, it would be prudent to eliminate or reduce application of chloride-containing deicing compounds, use alternative deicers, or apply clean sand as needed. Aggressive sweeping in these areas, along with pretreatment sumps and filter strips, will minimize the negative impact of the sand on the facility.

Management Task or Activity	Time or Frequency						
	Weekly	Monthly	Spring	Summer	Fall	Winter	After Major Rain Events
Inspect for erosion. Rake and redistribute/replenish any soil, rap, or mulch that has eroded		X					X
Inspect for standing water							X
Remove accumulated leaves, litter, and plant debris		X					X
Weed plant material		X					
Mow plant material					X		



Ironwood
Landscape Architecture • Planning

This image is an illustration created by Ironwood Design Group to convey design intent and provide a visual representation of the constructed project. The image is not an exact representation of an implemented design.



Ironwood
Landscape Architecture • Planning

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Ironwood
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Ironwood
Landscape Architecture • Planning

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PLAN SNAPSHOT REPORT SITE-2023-0013
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	09/05/2023
Work Class:	Alteration / Addition	**District:**	None	**Exp Date:**	11/09/2023
Status:	Fees Due	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**		**Approval Expire Date:**	

Description: The project includes the redevelopment of an existing parking lot associated with 256 Central Avenue which is accessed via Kirkland Street and the addition of a walkway and greenspace at 264 Central Avenue.

Parcel:		**Address:**		**Zone:**
09112-000000		264 Central Av Dover, NH		
09111-000000	Main	256 Central Av Dover, NH	Main	

Engineer
Chris Rice
Home: (603) 431-2222

Applicant
Jason Cook
170 Commerce Way Suite 102
Suite 102
Portsmouth, NH 03801
Business: (603) 431-2222

Plan Custom Fields

Total	0	Total2	0	Total3	10595
Total4	0	Total5	0	Total6	0
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	25	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	0.689
Deed Book	5117	Total SQFT	30012.8	Deed Page	240
Deed Date		Proposed Property Use	The proposed use includes the redevelopment of of gravel parking lot to a paved parking lot with walkway access to the lot from Central Avenue. The existing building on-site is planned to be renovated.	Area of Parcel to be Developed (SQFT)	17766
Number of Parking Spaces Existing	0	Number of Parking Spaces Proposed	25	Type of Building to be Built	Existing Building to remain
Estimated Construction Value	150000.00	Refuse Removal	Private	Is there an existing Conservation Easement?	No
Existing Conservation Easement Details		TotalImpactFeeSDTOD	0.00	TotalImpactFeeTHTOD	0.00
TotalImpactFee23FTOD	0.00	TotalImpactFeeA4TOD	0.00	TotalImpactFeeMHTOD	0.00
TotalImpactFeeADUTOD	0.00	TotalImpactFeeAONRTOD	0.00	TotalImpactFeeAR55TOD	0.00
TotalImpactFeeAR62TOD	0.00	Sub Total Residential	0.00	TotalImpactFeeRIRCTOD	0.00
TotalImpactFeeOCSTOD	0.00	TotalImpactFeeITWCTOD	0.00	TotalImpactFeeNHALTOD	0.00
TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOTOD	0.00	Sub Total Non-Residential	0.00
Total of Impact Fees to be Assessed	0.00				

PLAN SNAPSHOT REPORT (SITE-2023-0013)

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Jason_Cook_9/5/2023.jpg	09/05/2023 14:35	Cook, Jason		Uploaded via CSS
2023.09.21_PlanningTechnicalReviewCommittee.256_264_CentralAve_SITE-2023-0013.pdf	10/12/2023 15:33	Blonigen, Rachel		

Note	Created By	Date and Time Created
1. Requires 2nd TRC submittal- RLB	Rachel Blonigen	10/12/2023 15:37

Invoice No.	Fee		Fee Amount	Amount Paid
INV-00004936	Planning General Application Fee		$200.00	$200.00
		Total for Invoice INV-00004936	$200.00	$200.00
INV-00004967	Planning Creation / Printing of Abutter Labels		$30.00	$30.00
	Planning First Class Mailing		$16.00	$16.00
	Planning Public Notice in Newspaper		$120.00	$42.00
	Planning Certified Mailing to Abutters		$200.00	$200.00
	Planning Certified Mailing to Application Contacts		$20.00	$20.00
		Total for Invoice INV-00004967	$386.00	$308.00
INV-00004968	Planning Impervious Paved Area Fee		$741.65	$741.65
		Total for Invoice INV-00004968	$741.65	$741.65
		Grand Total for Plan	$1,327.65	$1,249.65

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	11/30/2023	Technical Review Committee Meeting

Meeting Custom Fields

TRC Meeting Next Steps	Resubmit for 2nd TRC

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	Requires Re-submit	09/07/2023	10/05/2023	10/12/2023	Yes	Yes

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Burdin, James	Requires Re-submit	09/07/2023	10/05/2023	10/12/2023

Comments: • The proposed landscape and hardscape design appears to be an improvement to this site and seem to make it a more attractive and manageable location for operating a business.
• The applicant is encouraged to communicate proactively with nearby businesses if site work or construction have the potential to temporarily impact business operations. The Office of Business Development is happy to assist with this outreach if necessary.

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	Requires Re-submit	09/07/2023	10/05/2023	10/12/2023

Comments: • General Comment:
o Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf
o Coordinate with Community Services (Engineering Department) for latest City Standard Details (drainage trench, etc.).
o Add note that Design Engineer shall provide signed letter to City Engineer certifying that the stormwater management system has been installed in accordance with approved plans.
o Recommend providing 1 sf of snow storage per 10 sf of pavement to be cleared. Verify snow storage meets or exceeds this recommendation or provide note to remove excess snow when storage areas are filled.
o Snow storage areas conflict with landscaping. Recommend storing snow in areas where landscaping won't get in the way.
o Manhole covers shall be Liftmate R-1743-LM or approved equal with 90 deg hinge
o The City recommends that the applicant source out ductile iron piping, which is the City preferred material, in advance commencing construction.
o Change "handicap" references to "accessible" where applicable throughout documents.
o Engineering requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing structures on the property.
o Provide construction sign detail per City standards.
o Are EV spaces being provided?
o Provide details for new Sewer Structure proposed in Kirkland.
o Since the proposed improvements cross property lines, are easements required or needed?
o A sewer connection permit from the NHDES will be required if a new SMH is proposed.
• Sheet S-1:
o 256 Central's existing 6 inch water service should be shown extending from Central Ave.
o 264 and 256 also have two water services
• Sheet C-02:
o Call out all curb radii
o Call out the start and end of curb and the types.
o Provide granite curbing in City right of way.
o Please review City curb ramp detail. Flush curb not provided across ramp.
o Please provide additional detail on the proposed sewer service including pipe material, size and slope.
• Sheet C-03:
o Catch basins have very little cover over pipes. Clarify if basins can be relocated to provide additional cover.
o Minimum 12" pipes are typical and called out in a note. It is assumed that the small diameter pipes are provided due to cover issues and not to control flow within the system. Recommend increasing the minimum pipe size if additional cover can be obtained.
o The internal weirs in DMH05 and DMH03 appear to direct flow to the ADS chambers prior to going to Isolator Row. Please clarify if this is intentional or revise configuration of weir.
o There is a dark line to the west of the underground infiltration system that appears to tie into the outlet structure but does not appear on the outlet structure detail. Please identify what this is and provide a detail for how it is installed.
o What is the method of pretreatment for the underground infiltration basin?
o If infiltration is the proposed method of treatment for the site, provide confirmation that the proper separation from ESHWT is provided per NHDES regs.
o Given that the Tree Box Filter and other stormwater components have limited cover, are there other methods of treatment that could be proposed to better work with the site?
• Sheet C-04:
o Lighting appears to spill over the Property Lines. Confirm that the standards of the Dover Code are met.
• Sheet C-06:
o Recommend providing a minimum of 12 inch slab for dumpster pad.
o Trench detail does not meet City standards for backfill and bedding.
o Will dumpster encloser include slats to obscure the dumpster?
• Sheet C-07:
o It is recommended that Catch Basins have oil separator hoods.
o Provide detail for weir structures that include elevation of weirs and
• Sheet C-08:
o Plan shows a Tree Box Filter but this sheet shows a filter media bow without a tree. Which is proposed?
o Recommend adding a note to coordinate with UNH Stormwater Center on installation if their detail is being proposed.
o This detail does not show the proposed pipes entering or exiting the structure.
• Drainage Analysis:
o Recommend providing a flood elevation for the proposed structures in the calculations.
o CB-04 is shown to have an 8 inch pipe in the calculations and 6 inch outlet on the plans. Please clarify which is correct.
o Are there tailwater concerns with the existing infrastructure being tied into? How would the system operate if the downstream existing infrastructure is flowing at capacity?
o Outlet structure for stormtech system shows a 12 inch outlet with a 8" orifice prior to outlet while the detail on Sheet C-07 shows an 18 inch outlet with 2 five inch orifices. Please confirm which is correct.
o Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets or exceeds the City's requirements.

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
IS Building Official	Fire / Inspection Services	Maxfield, Jim	Requires Re-submit	09/07/2023	10/05/2023	10/12/2023

Comments: • Clarify the two addresses on the application. Clarify 1 or 2 bldgs.
- Discuss the pad mount transformer and number of electrical services to the structure.
- Site accessibility- dumpster access for future apartments, notes and hardware detail should be provided on plan
- Provide the standard accessibility note indicating design compliance in accordance with applicable accessibility requirements.
- Provide note referencing compliance with NH RSA 155-A :5
- Indicate requirement for pre con meeting within plan set.
- Submitted plans appear to indicate two water lines- please clarify function, gate locations, size and type.
- Discuss the water suppression line, size and FDC location

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Planning	Planning	Benton, Donna	Requires Re-submit	09/07/2023	10/05/2023	10/12/2023

Comments: No comments

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Zoning Administrator	Planning	Kypfer, Natasha	In Review	09/07/2023	10/05/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Traffic Bureau	Police	Speidel, Marn	Requires Re-submit	09/07/2023	10/05/2023	10/12/2023

Comments: • Reduced travel aisle further and add walkway?
- Add controlling signage
- Paid parking option or permitted area?

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.2	In Review	11/07/2023	11/23/2023		No	No

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Dove, Annie	In Review	11/07/2023	12/05/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	In Review	11/07/2023	11/23/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
IS Building Official	Fire / Inspection Services	Maxfield, Jim	In Review	11/07/2023	11/23/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Zoning Administrator	Planning	Benton, Donna	In Review	11/07/2023	11/23/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Traffic Bureau	Police	Speidel, Marn	In Review	11/07/2023	11/23/2023	

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		09/05/2023 14:48	
Confirm application complete v.1	Generic Action		09/05/2023 14:48
Technical Review Committee Meeting Agenda v.1	Task	09/05/2023 14:48	09/07/2023 11:49
Land Use Plan Technical Review v.1	Receive Submittal	09/07/2023 0:00	10/12/2023 15:37
Land Use Plan Technical Review v.2	Receive Submittal	11/07/2023 0:00	
Technical Review Committee Meeting v.1	Hold Meeting	10/12/2023 15:36	10/12/2023 15:37
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 Final Review v.1	Receive Submittal
Land Use Plan Stamped and Signed v.1	Generic Action
Plans uploaded to Treeno v.1	Generic Action
Recording v.1	Task
Property Info Group 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 Complex v.1	Create Sub Permit
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2023-0013

Application Type:	Site Review
Applicant(s):	TF Moran
Owner(s):	256-264 Central Avenue, LLC
Location:	256 & 264 Central Avenue (Tax Map 9, Lot 111 & 112)
Date:	September 21, 2023

INTENT: Proposal is to replace gravel parking with 10,595 square feet of paved parking related to their renovation of the buildings. This is Phase I of a two phase project.

UNITS PROPOSED: n/a

AGENDA ITEM #: 1

ACREAGE:
Lot 111= 0.522± ac. / 22,747± sq. ft.
Lot 112= 0.167± ac. / 7,287± sq. ft.

ZONING DISTRICT: CBD-G

EXISTING LAND USE: Previously a Restaurant, Vacant building

PROPOSED LAND USE: Commercial with Paved Parking; Phase I: Paved parking (Planned for future is Phase II: Renovation of the existing structures)

SURROUNDING LAND USE: Commercial, Residential

ZBA ACTION: None

PERMITS REQUIRED:

WAIVERS REQUESTED: N/A

ATTENDANCE:
Members:
Donna Benton, Planning
Natasha Kypfer, Zoning
Tom Clark, Planning Board
Marn Speidel, Police
James Burdin, Business Development
Ken Mavrogeorge, Engineering
Others:
Chris Rice, TFMoran Inc.
Derek Fisher, 256-264 Central Avenue, LLC
Jason Cook, TFMoran Inc.

Approval of minutes from Septemeber 7, 2023:
T. Clark moved to approve the September 7, 2023 minutes. Seconded by J. Burdin. Vote: U/A.

PLAN REVIEW:
Planning:

- Legally okay to block ROW at dumpster? Provide copy of easement to Planning staff.
- 71% lot coverage existing?
- Snow storage adequate? Conflict with landscaping.
- Letter to Serve (including EV readiness)
- Lot merger documentation to be submitted
- Revise plans:
  - Owner's signatures on the final plans
  - Professional stamps on the final plans
  - Add file number to plan set, SITE-2023-0013
  - Confirm inclusion of all common notes
  - Add street trees and details of plants (not "by others")
  - Add benches (review streetscape standards)
  - Add bike rack
  - Provide 2% EVSE readiness
  - Where is 2nd accessible space? Fix note.
  - Add curb cut dimensions
  - Add aisle dimensions
  - Add plants to screen 3 sides of dumpster and revise to stockade fence not chain link
  - Light fixtures to meet standards in Downtown (CBD-G)
  - Keep light spill on property or ROW
  - Total parking not "required" but a "max". How many exist today?
  - Revise "handicap" to "accessible"
  - Change parking to 8 units

Engineering:

- General Comment:
  - Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf
  - Coordinate with Community Services (Engineering Department) for latest City Standard Details (drainage trench, etc.).
  - Add note that Design Engineer shall provide signed letter to City Engineer certifying that the stormwater

management system has been installed in accordance with approved plans.
  - Recommend providing 1 sf of snow storage per 10 sf of pavement to be cleared. Verify snow storage meets or exceeds this recommendation or provide note to remove excess snow when storage areas are filled.
  - Snow storage areas conflict with landscaping. Recommend storing snow in areas where landscaping won't get in the way.
  - Manhole covers shall be Liftmate R-1743-LM or approved equal with 90 deg hinge
  - The City recommends that the applicant source out ductile iron piping, which is the City preferred material, in advance commencing construction.
  - Change "handicap" references to "accessible" where applicable throughout documents.
  - ***Engineering requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing structures on the property.***
  - Provide construction sign detail per City standards.
  - Are EV spaces being provided?
  - Provide details for new Sewer Structure proposed in Kirkland.
  - Since the proposed improvements cross property lines, are easements required or needed?
  - A sewer connection permit from the NHDES will be required if a new SMH is proposed.
- Sheet S-1:
  - 256 Central's existing 6 inch water service should be shown extending from Central Ave.
  - 264 and 256 also have two water services
- Sheet C-02:
  - Call out all curb radii
  - Call out the start and end of curb and the types.
  - Provide granite curbing in City right of way.
  - Please review City curb ramp detail. Flush curb not provided across ramp.
  - Please provide additional detail on the proposed sewer service including pipe material, size and slope.
- Sheet C-03:
  - Catch basins have very little cover over pipes. Clarify if basins can be relocated to provide additional cover.
  - Minimum 12" pipes are typical and called out in a note. It is assumed that the small diameter pipes are provided due to cover issues and not to control flow within the system. Recommend increasing the minimum pipe size if additional cover can be obtained.
  - The internal weirs in DMH05 and DMH03 appear to direct flow to the ADS chambers prior to going to Isolator Row. Please clarify if this is intentional or revise configuration of weir.
  - There is a dark line to the west of the underground infiltration system that appears to tie into the outlet structure but does not appear on the outlet structure detail. Please identify what this is and provide a detail for how it is installed.
  - What is the method of pretreatment for the underground infiltration basin?
  - If infiltration is the proposed method of treatment for the site, provide confirmation that the proper separation from ESHWT is provided per NHDES regs.
  - Given that the Tree Box Filter and other stormwater components have limited cover, are there other methods of treatment that could be proposed to better work with the site?
- Sheet C-04:
  - Lighting appears to spill over the Property Lines. Confirm that the standards of the Dover Code are met.
- Sheet C-06:
  - Recommend providing a minimum of 12 inch slab for dumpster pad.
  - Trench detail does not meet City standards for backfill and bedding.
  - Will dumpster encloser include slats to obscure the dumpster?
- Sheet C-07:
  - It is recommended that Catch Basins have oil separator hoods.

  - Provide detail for weir structures that include elevation of weirs and
- Sheet C-08:
  - Plan shows a Tree Box Filter but this sheet shows a filter media bow without a tree. Which is proposed?
  - Recommend adding a note to coordinate with UNH Stormwater Center on installation if their detail is being proposed.
  - This detail does not show the proposed pipes entering or exiting the structure.
- Drainage Analysis:
  - Recommend providing a flood elevation for the proposed structures in the calculations.
  - CB-04 is shown to have an 8 inch pipe in the calculations and 6 inch outlet on the plans. Please clarify which is correct.
  - Are there tailwater concerns with the existing infrastructure being tied into? How would the system operate if the downstream existing infrastructure is flowing at capacity?
  - Outlet structure for stormtech system shows a 12 inch outlet with a 8" orifice prior to outlet while the detail on Sheet C-07 shows an 18 inch outlet with 2 five inch orifices. Please confirm which is correct.
  - Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets or exceeds the City's requirements.

Police:

- Reduced travel aisle further and add walkway?
- Add controlling signage
- Paid parking option or permitted area?

Fire/Inspection Services:

- Clarify the two addresses on the application. Clarify 1 or 2 bldgs.
- Discuss the pad mount transformer and number of electrical services to the structure.
- Site accessibility- dumpster access for future apartments, notes and hardware detail should be provided on plan
- Provide the standard accessibility note indicating design compliance in accordance with applicable accessibility requirements.
- Provide note referencing compliance with NH RSA 155-A :5
- Indicate requirement for pre con meeting within plan set.
- Submitted plans appear to indicate two water lines- please clarify function, gate locations, size and type.
- Discuss the water suppression line, size and FDC location

Business Development:

- The proposed landscape and hardscape design appears to be an improvement to this site and seem to make it a more attractive and manageable location for operating a business.
- The applicant is encouraged to communicate proactively with nearby businesses if site work or construction have the potential to temporarily impact business operations. The Office of Business Development is happy to assist with this outreach if necessary.

Planning Board: None.

Next Steps: Resubmit for a second full TRC including narrative outlining where and how these comments have been addressed.

Adjournment:
K. Mavrogeorge moved to adjourn the meeting at 11:48 am. Seconded by J. Burdin. Vote: U/A

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

NEW HAMPSHIRE 200

November 7, 2023

Gina Cruikshank, Chairperson
Dover Planning Board
288 Central Avenue
Dover, NH 03820

RE: Minor Site Plan Review Response to Comments & Rev 1 Submission
256 & 264 Central Avenue – 256-264 Central Avenue, LLC – Tax Map 9 Lots 111 & 112
TFM Project #47262.01
Dover File #2023-0013

Dear Chairperson Cruikshank,

On behalf of our client, 256-264 Central Avenue, LLC, TFMoran, Inc. (TFM) respectfully submits the following letter in response to the comments made by the City of Dover, in the letter titled "Technical Review Committee Minutes – Site-2023-0013". The following materials are included in this revised submission:

- **Technical Review Committee Minutes, dated September 21, 2023 (1 copy);**
- **Site Plan Application (8 copies);**
- **Easement for Abutting Shared Access (8 copies);**
- **Drainage Analysis (1 copy);**
- **Site Development Plans entitled "Site Development Plans, Tax Map 9 Lots 111 & 112, Site Improvement Plans, 256 & 264 Central Avenue, Dover, New Hampshire", prepared by TFMoran, Inc., dated August 31, 2023, revised November 7, 2023 (8 copies at 22"x34").**

To facilitate your review, we have provided your comments along with our responses, which are shown in ***bold italics***.

PLAN REVIEW:

Planning:

- Legally okay to block ROW at dumpster? Provide copy of easement to Planning staff.
  - ***The easement located to the north of the site was created to provide shared access between lots 114 & 116. A copy of the easement is included in this submittal.***
- 71% lot coverage existing?
  - ***The existing lot coverage for Map 9 Lot 112 has been added to the plan.***
- Snow storage adequate? Conflict with landscaping.
  - ***A snow storage calculation has been added to Sheet C-02.***
- Letter to Serve (including EV readiness)

- ***This response is currently in progress. We will supply to the Planning Department when available.***

- Lot merger documentation to be submitted.
  - ***This process is still in progress. The intent is for the lots to be merged.***
- Revise plans:
  - Owner's signature on the final plans
    - ***An owner's signature block has been added to the Cover Sheet (C-00) for final plan signature.***
  - Professional stamps on the plans
    - ***There is no professional stamp on this set of plans, however a stamp will be added prior to final submittal.***
  - Add file number to plan set, SITE-2023-0013
    - ***File number has been added to the Cover Sheet (C-00) within the Permits/Approvals.***
  - Confirm inclusion of all notes
    - ***Applicable notes from list of common site plan notes have been added to appropriate plan within sheet set.***
  - Add street trees and details of plants (not "by others")
    - ***Revisions have been made following the prior meeting including redesigning the site drainage. The originally proposed tree box filter is no longer required with the new design.***
  - Add benches (review streetscape standards)
    - ***Benches have been added along the streetscape. Two benches have been added near the walkway along Central Avenue, and one by the parking lot entrance along Kirkland Street.***
  - Add bike rack.
    - ***A bike rack (8 bike capacity) has been added to Site Layout Plan alongside the walkway behind the building.***
  - Provide 2% EVSE readiness.
    - ***One space has been prepared for the installation of a Level 2 (240V) EV Charging Station. See Sheet C-02.***
  - Where is 2nd accessible space?
    - ***One accessible space has been provided as required by ADA Accessibility Standards. The Parking Requirements on Sheet C-02 have been revised to reflect this change.***
  - Add curb dimensions.
    - ***Curb dimensions have been added to Sheet C-02***
  - Add aisle dimensions.
    - ***Additional aisle dimensions have been added to Sheet C-02.***
  - Add plants to screen 3 sides of dumpster and revise to stockade fence not chain link.
    - ***The dumpster detail on Sheet C-06 has been revised to reflect a stockade fence.***
  - Light fixtures to meet standards in Downtown.

- ***The proposed light fixtures have been designed to meet downtown standards. All fixtures are cut-off fixtures that carry the IDA (international dark sky) label as well as the DLC and Title 24 listings (related to energy efficiency). The light poles are also made of cast aluminum to help prevent corrosion from salt air.***

- Keep light spill on property or ROW.
  - ***The lighting design has been revised to prevent light spill onto adjacent properties. The mounting height for some of the lights was lowered to facilitate this improvement.***
- Total parking not required but a max. Can you lose 1 space? How many exist today?
  - ***Residential and office spaces are both being proposed. The parking calc is provided on Sheet C-02 with a maximum of 25 spaces allowed.***
- Revise "handicap" to "accessible"
  - ***The term "handicap" has been revised to "accessible" across all documents.***
- Change parking to 8 units.
  - ***The residential portion proposes 8 units, and this has been reflected on Sheet C-02.***

Engineering:

- General Comment
  - Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City Staff. The guidelines can be found on the City of Dover Website on the Engineering page.
    - ***Note 2 under "General Notes" has been revised to reflect the above comment.***
  - Coordinate with Community Services (Engineering Department) for latest City Standard Details (drainage trench, etc.)
    - ***We have coordinated with Community Services and applicable City Standard Details have been added to Sheets C-07 & C-08***
  - Add note that Design Engineer shall provide signed letter to City Engineer certifying that the stormwater management system has been installed in accordance with approved plans.
    - ***A note has been added to Sheet C-03 requiring a signed letter to eh City Engineer (Note 23).***
  - Recommend providing 1sf of snow storage per 10sf of pavement to be cleared. Verify snow storage meets or exceeds this recommendation or provide notes to remove excess snow when storage areas are filled.
    - ***A snow storage calculation has been added to Sheet C-02.***
  - Snow storage area conflicts with landscaping. Recommend storing snow in area where landscaping won't get in the way.
    - ***Snow storage that conflicts with proposed landscaping has been removed.***

- Manhole covers shall be Liftmate R-1743-LM or approved equal with 90-degree hinge.
  - ***The drain manhole detail on Sheet C-08 has been revised to call for the Liftmate R-1743-LM cover with 90° hinge.***
- The City recommends that the applicant source out ductile iron piping, which is the City preferred material, in advance commencing construction.
  - ***Noted.***
- Change "handicap" references to "accessible" where applicable throughout documents.
  - ***The term "handicap" has been revised to "accessible" across all documents.***
- Engineering requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing structures on the property.
  - ***A note has been added to Sheet C-03 requiring all drain lines to tie into the municipal stormwater system and connections into sewer system to be removed (Note 24).***
- Provide construction sign detail per City standards.
  - ***The construction sign detail has been added to Sheet C-07.***
- Are EV spaces being provided?
  - ***One space has been prepared for the installation of a Level 2 (240V) EV Charging Station. See Sheet C-02.***
- Provide details for new Sewer Structure proposed in Kirkland.
  - ***The proposed structure has been removed as the sewer line shown on Sheet C-02 currently exists and is connected to municipal sewer service in Kirkland Street without a structure.***
- Since the proposed improvements cross property lines, are easements required or needed?
  - ***The client is preparing paperwork to merge lots.***
- A sewer connection permit from the NHDES will be required if a new SMH is proposed.
  - ***The proposed structure has been removed as the sewer line shown on Sheet C-02 currently exists and is connected to municipal sewer service in Kirkland Street without a structure.***
  -

- Sheet S-1
  - 256 Central's existing 6-inch water service should be shown extending from Central Ave.
    - ***The Existing Conditions Plan has been updated based on information provided by Dover Community Services.***
  - 264 and 256 also have two water services.
    - ***See above.***
- Sheet C-02
  - Call out curb radii.
    - ***Curb dimensions have been added to Sheet C-02.***
  - Cal out the start and end of curb and the types.
    - ***Callout added to Sheet C-02 detailing concrete curb within property lines.***
  - Provide granite curbing in City right of way.
    - ***Callout added to Sheet C-02 detailing granite curb within right-of-way.***

- Please review City curb ramp detail. Flush not provided across ramp.
  - ***The Dover City Standards detail has been added to Sheet C-09.***
- Please provide additional details on the proposed sewer service including pipe material, size, and slope.
  - ***Sewer service detailed on Sheet C-02 exists. The callout has been revised to reflect this.***

- Sheet C-03
  - ***The following comments in this section are no longer applicable following the revisions to the site drainage design.***
    - Catch basins have very little cover over pipes. Clarify is basins can be relocated to provide additional cover.
    - Minimum 12" pipes are typical and called out in a note. It is assumed that the small diameter pipes are provided due to cover issues and not to control flow within the system. Recommend increasing the minimum pipe size if additional cover can be obtained.
    - The internal weirs in DMH05 and DMH03 appear to direct flow to the ADS chambers prior to going to Isolator Row. Please clarify if this is intentional or revise configuration or weir.
    - There is a dark line to the west of the underground infiltration system that appears to tie into the outlet structure but does not appear on the outlet structure detail. Please identify what this is and provide a detail for how it is installed.
    - What is the method or pretreatment for the underground infiltration basin?
    - If infiltration is proposed method of treatment for the site, provide confirmation that the proper separation from ESHWT id provided per NHDES regs. Given that the Tree Box Filter and other stormwater components have limited cover, are there other methods of treatment that could be proposed to better work with the site?
- Sheet C-04
  - Lighting appears to spill over the Property Lines. Confirm that the standards of the Dover Code are met.
    - ***See response to similar comments on Page 2 & 3.***
- Sheet C-06
  - Recommended providing a minimum of 12-inch slab for dumpster pad.
    - ***The concrete pad detail on Sheet C-06 has been revised to reflect a 12" slab.***
  - Trench detail does not meet City standards for backfill and bedding.
    - ***The sewer/drain trench detail from Dover's Construction Guidelines has been added to Sheet C-07.***
  - Will dumpster enclosure include slats to obscure the dumpster?
    - ***Notes have been revised to call for a stockade fence enclosing the dumpster.***
- Sheet C-07
  - It is recommended that Catch Basins have oil separator hoods.
  - Provide detail for weir structures that include elevation of weirs.
- Sheet C-08
  - ***The tree box filter has been removed following revisions to the site drainage design.***

        - Plan shows a Tree Box Filter, but this sheet shows a filter media box without a tree. Which is proposed?
        - Recommend adding a note to coordinate with UNH Stormwater Denter on installation if their detail is being proposed.
        - This detail does not show the proposed pipes entering or exiting the structure.
- Drainage Analysis
    - Recommend providing a flood elevation for the proposed structures in the calculations.
        - ***A flood elevation has been provided for all proposed structures.***
    - CB-04 is shown to have an 8-inch pipe in the calculations and 6-inch outlet on the plans. Please clarify which is correct.
        - ***CB-04 has been removed with the new drainage design.***
    - Are there tailwater concerns with the existing infrastructure being tied into? How would the system operate if the downstream existing infrastructure is flowing at capacity?
    - Outlet structure for stormtech system shows a 12" outlet with an orifice prior to outlet while the detail on sheet C-07 shows an 18-inch outlet with 2 five-inch orifices. Please confirm which is correct.
        - ***The stormtech system has been removed with the new drainage design.***
    - Applicant shall review section 153-14 of the Dover Code and clarify how the design meets or exceeds the City's requirements.
        - ***The site design includes a sediment forebay and bioretention to retain and treat all proposed impervious areas on site (except for roof runoff). The proposed BMP is designed to handle runoff from 100% (10,168 s.f.) of the new impervious area and 51.6% of the total site (15,521 s.f.).***

Police:

- Reduced travel aisle further and add walkway?
    - ***The travel width has been reduced from 30' to 26'. A walkway has been proposed connecting the lot to Central Avenue.***
- Signage shall be provided to control lot following construction.
    - ***Three "Private Parking" signs have been added to the site as noted on Sheet C-02***
- Paid parking option or permitted area?
    - ***This lot will be private parking.***

Fire/Inspection Services:

- Clarify the two addresses on the application. Clarify 1 or 2 bldgs.
    - ***There are two existing properties. The intent is to merge the properties. Further discussion is needed for deciding between one building versus two.***
- Discuss the pad mount transformer and number of electrical services to the structure.
    - ***We will follow up on this comment when coordination with Eversource is complete.***
- Site accessibility – dumpster access for future apartments, notes and hardware detail should be provided on plan.
    - ***Note has been added to the Trash Enclosure detail on Sheet C-08 (Note 5).***

- Provide the standard accessibility note indicating design compliance in accordance with applicable accessibility requirements.
  - ***Note has been added to Sheet C-02 (Note 7).***
- Provide note referencing compliance with NH RSA 155-A:5
  - ***Note has been added to Sheet C-02 (Note 7).***
- Indicate requirement for pre con meeting within plan set.
  - ***Note 2 on Sheet C-01 calls for a pre-construction meeting prior to any earth disturbing activity.***
- Submitted plans appear to indicate two water lines – please clarify function, gate locations, size, and type.
  - ***Water service has been revised to reflect existing service.***
- Discuss the water suppression line, size and FDC location.

Building Development:

- The proposed landscape and hardscape design appears to be an improvement to this site and seems to make it a more attractive and manageable location for opening a business.
- The applicant is encouraged to communicate proactively with nearby businesses if site work or construction has the potential to temporarily impact business operations. The office of Business Development is happy to assist with this outreach if necessary.

Respectfully,
TFMoran, Inc.

Christopher Rice
Principal/Senior Project Manager

CRR/jkc

cc: Derek Fisher, 256-264 Central Avenue, LLC (via e-mail)

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2023-0013

Application Type:	Site Review
Applicant(s):	TF Moran
Owner(s):	256-264 Central Avenue, LLC
Location:	256 & 264 Central Avenue (Tax Map 9, Lot 111 & 112)
Date:	September 21, 2023

INTENT: Proposal is to replace gravel parking with 10,595 square feet of paved parking related to their renovation of the buildings. This is Phase I of a two phase project.

UNITS PROPOSED: n/a

AGENDA ITEM #: 1

ACREAGE:
Lot 111= 0.522± ac. / 22,747± sq. ft.
Lot 112= 0.167± ac. / 7,287± sq. ft.

ZONING DISTRICT: CBD-G

EXISTING LAND USE: Previously a Restaurant, Vacant building

PROPOSED LAND USE: Commercial with Paved Parking; Phase I: Paved parking (Planned for future is Phase II: Renovation of the existing structures)

SURROUNDING LAND USE: Commercial, Residential

ZBA ACTION: None

PERMITS REQUIRED:

WAIVERS REQUESTED: N/A

ATTENDANCE:
Members:
Donna Benton, Planning
Natasha Kypfer, Zoning
Tom Clark, Planning Board
Marn Speidel, Police
James Burdin, Business Development
Ken Mavrogeorge, Engineering
Others:
Chris Rice, TFMoran Inc.
Derek Fisher, 256-264 Central Avenue, LLC
Jason Cook, TFMoran Inc.

Approval of minutes from Septemeber 7, 2023:
T. Clark moved to approve the September 7, 2023 minutes. Seconded by J. Burdin. Vote: U/A.

PLAN REVIEW:
Planning:

- Legally okay to block ROW at dumpster? Provide copy of easement to Planning staff.
- 71% lot coverage existing?
- Snow storage adequate? Conflict with landscaping.
- Letter to Serve (including EV readiness)
- Lot merger documentation to be submitted
- Revise plans:
  - Owner's signatures on the final plans
  - Professional stamps on the final plans
  - Add file number to plan set, SITE-2023-0013
  - Confirm inclusion of all common notes
  - Add street trees and details of plants (not "by others")
  - Add benches (review streetscape standards)
  - Add bike rack
  - Provide 2% EVSE readiness
  - Where is 2nd accessible space? Fix note.
  - Add curb cut dimensions
  - Add aisle dimensions
  - Add plants to screen 3 sides of dumpster and revise to stockade fence not chain link
  - Light fixtures to meet standards in Downtown (CBD-G)
  - Keep light spill on property or ROW
  - Total parking not "required" but a "max". How many exist today?
  - Revise "handicap" to "accessible"
  - Change parking to 8 units

Engineering:

- General Comment:
  - Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff. The guidelines can be found on the City of Dover Website on the Engineering page. https://www.dover.nh.gov/Assets/government/city-operations/1form/community-services/engineering/engineering-documents/Construction%20Guidelines.pdf
  - Coordinate with Community Services (Engineering Department) for latest City Standard Details (drainage trench, etc.).
  - Add note that Design Engineer shall provide signed letter to City Engineer certifying that the stormwater

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management system has been installed in accordance with approved plans.
  - Recommend providing 1 sf of snow storage per 10 sf of pavement to be cleared. Verify snow storage meets or exceeds this recommendation or provide note to remove excess snow when storage areas are filled.
  - Snow storage areas conflict with landscaping. Recommend storing snow in areas where landscaping won't get in the way.
  - Manhole covers shall be Liftmate R-1743-LM or approved equal with 90 deg hinge
  - The City recommends that the applicant source out ductile iron piping, which is the City preferred material, in advance commencing construction.
  - Change "handicap" references to "accessible" where applicable throughout documents.
  - ***Engineering requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing structures on the property.***
  - Provide construction sign detail per City standards.
  - Are EV spaces being provided?
  - Provide details for new Sewer Structure proposed in Kirkland.
  - Since the proposed improvements cross property lines, are easements required or needed?
  - A sewer connection permit from the NHDES will be required if a new SMH is proposed.
- Sheet S-1:
  - 256 Central's existing 6 inch water service should be shown extending from Central Ave.
  - 264 and 256 also have two water services
- Sheet C-02:
  - Call out all curb radii
  - Call out the start and end of curb and the types.
  - Provide granite curbing in City right of way.
  - Please review City curb ramp detail. Flush curb not provided across ramp.
  - Please provide additional detail on the proposed sewer service including pipe material, size and slope.
- Sheet C-03:
  - Catch basins have very little cover over pipes. Clarify if basins can be relocated to provide additional cover.
  - Minimum 12" pipes are typical and called out in a note. It is assumed that the small diameter pipes are provided due to cover issues and not to control flow within the system. Recommend increasing the minimum pipe size if additional cover can be obtained.
  - The internal weirs in DMH05 and DMH03 appear to direct flow to the ADS chambers prior to going to Isolator Row. Please clarify if this is intentional or revise configuration of weir.
  - There is a dark line to the west of the underground infiltration system that appears to tie into the outlet structure but does not appear on the outlet structure detail. Please identify what this is and provide a detail for how it is installed.
  - What is the method of pretreatment for the underground infiltration basin?
  - If infiltration is the proposed method of treatment for the site, provide confirmation that the proper separation from ESHWT is provided per NHDES regs.
  - Given that the Tree Box Filter and other stormwater components have limited cover, are there other methods of treatment that could be proposed to better work with the site?
- Sheet C-04:
  - Lighting appears to spill over the Property Lines. Confirm that the standards of the Dover Code are met.
- Sheet C-06:
  - Recommend providing a minimum of 12 inch slab for dumpster pad.
  - Trench detail does not meet City standards for backfill and bedding.
  - Will dumpster encloser include slats to obscure the dumpster?
- Sheet C-07:
  - It is recommended that Catch Basins have oil separator hoods.

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  - Provide detail for weir structures that include elevation of weirs and
- Sheet C-08:
  - Plan shows a Tree Box Filter but this sheet shows a filter media bow without a tree. Which is proposed?
  - Recommend adding a note to coordinate with UNH Stormwater Center on installation if their detail is being proposed.
  - This detail does not show the proposed pipes entering or exiting the structure.
- Drainage Analysis:
  - Recommend providing a flood elevation for the proposed structures in the calculations.
  - CB-04 is shown to have an 8 inch pipe in the calculations and 6 inch outlet on the plans. Please clarify which is correct.
  - Are there tailwater concerns with the existing infrastructure being tied into? How would the system operate if the downstream existing infrastructure is flowing at capacity?
  - Outlet structure for stormtech system shows a 12 inch outlet with a 8" orifice prior to outlet while the detail on Sheet C-07 shows an 18 inch outlet with 2 five inch orifices. Please confirm which is correct.
  - Applicant shall review the section 153-14 of the Dover Code and clarify how the design meets or exceeds the City's requirements.

Police:

- Reduced travel aisle further and add walkway?
- Add controlling signage
- Paid parking option or permitted area?

Fire/Inspection Services:

- Clarify the two addresses on the application. Clarify 1 or 2 bldgs.
- Discuss the pad mount transformer and number of electrical services to the structure.
- Site accessibility- dumpster access for future apartments, notes and hardware detail should be provided on plan
- Provide the standard accessibility note indicating design compliance in accordance with applicable accessibility requirements.
- Provide note referencing compliance with NH RSA 155-A :5
- Indicate requirement for pre con meeting within plan set.
- Submitted plans appear to indicate two water lines- please clarify function, gate locations, size and type.
- Discuss the water suppression line, size and FDC location

Business Development:

- The proposed landscape and hardscape design appears to be an improvement to this site and seem to make it a more attractive and manageable location for operating a business.
- The applicant is encouraged to communicate proactively with nearby businesses if site work or construction have the potential to temporarily impact business operations. The Office of Business Development is happy to assist with this outreach if necessary.

Planning Board: None.

Next Steps: Resubmit for a second full TRC including narrative outlining where and how these comments have been addressed.

Adjournment:

K. Mavrogeorge moved to adjourn the meeting at 11:48 am. Seconded by J. Burdin. Vote: U/A

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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: 256-264 Central Avenue, LLC Telephone #_____

Address of Applicant: 96 Main Street, Newmarket, NH 03857

E-Mail Address: _____

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

Address of Property Owner: _____

PROPERTY INFORMATION

Address of Property: 256 & 264 Central Avenue, Dover, NH 03839

Assessor's Map # 9 Lot(s) # 111 & 112

Zoning District(s) Central Business District Overlay District(s) General Sub-District

Size of Parcel: 111: 22,747 112: 7,287 sq. ft. 111: 0.522 112: 0.167 ac. Property Deed: Book 5117 Page: 240

Existing Use of Property: Commercial with Gravel Parking

SITE PLAN INFORMATION

Describe Proposed Use: Commercial with Paved Parking

Area of Parcel to be Developed: 17,766 sq. ft.

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

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

Number of Parking Spaces: Existing Not defined Proposed 25

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

Number of Employees Total: _____ In Maximum Shift: _____

Disposition of Parcel:

Building Footprint _____ sq. ft.

Total Building Area _____ sq. ft.

Paved Area _____ sq. ft.

Building Setbacks:

Front Yard _____ ft.

Rear Yard _____ ft.

Side Yard: Right____ ft. Left_____ ft.

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

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

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: N/A

Height of Building: _____ Finished Floor Elevation: _____

Number of Seats (where applicable) _____

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.) Brenda Kolbow, TFMoran Inc.

Address 170 Commerce Way, Suite 102, Portsmouth, NH 03801 Telephone #: (603) 431-2222

Professional License #: _____ E-mail address: bkolbow@tfmoran.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Jack McTigue, TFMoran Inc.

Address 170 Commerce Way, Suite 102, Portsmouth, NH 03801 Telephone #: (603) 431-2222

Professional License #: _____ E-mail address: jmctigue@tfmoran.com

ARCHITECT INFORMATION

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

Address _____Telephone #: _____

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

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

Address _____Telephone #: _____

Professional License #: _____ E-mail address: _____

SOIL SCIENTIST INFORMATION

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

Address _____Telephone #: _____

Professional License #: _____ E-mail address: _____

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: N/A Telephone #_____

Address Easement Holder: _____

SIGNATURES

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

Signature of Property Owner: _____ Date: 9/5/23

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: 9/5/23

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: 9/5/23

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: 9/5/23

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

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KNOW ALL MEN BY THESE PRESENTS,

THAT I, Sarah Low of Dover in the County of Strafford and State of New Hampshire

In consideration of Six Thousand ($6000.) Dollars

paid by Theodore M. Woodman of said Dover

the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Woodman, A certain tract of land situate in said Dover & bounded as follows. Beginning at the centre of a stone monument at the corner of Central Ave and Hale Street thence running westerly on the southerly side of said Hale Street eighty four and one half (84½) feet to other land of said Grantor thence turning and running southerly on other land of said Grantor about one hundred and ten and two thirds (110⅔) feet to land formerly of Richard Waldron thence turning and running easterly on said Waldrons land twenty one (21) feet to land of Ora Walker formerly known as the Young land, thence running and running northerly on said Walkers land twenty four and three quarters (24¾) feet — thence turning and running easterly on said Walkers land one hundred & one half (100½) feet to said Central Avenue thence turning and running northerly on said Central Avenue seventy four (74) feet to the bounds began at — together with a right of way in common with said Grantor over a passage way twelve feet wide in rear of the premises hereby conveyed from said Hale Street to said Waldrons land for the benefit of himself his Agents Servants tenants and heirs & assigns together with any rights, Claims and Easements which I now may have in said Walkers land by virtue of the Covenants Conditions and restrictions contained in a deed from William Hale to Nathaniel Young recorded with Strafford Deeds Book 202 Page 184. —

And also the right to enter the sewer which is on the southerly side of other land of said Grantor adjoining the premises hereby Conveyed — And the said Wood — for himself his heirs and assigns does Covenant and agree to and with the Sarah Low and her heirs and assigns that he will not erect or use any building to be erected on the irregular tract of land which lies south of the southerly line of said premises in a straight line from Central Avenue to the rear of said premises as a dwelling house, for the term of twenty five years from the date hereof.

TO HAVE AND TO HOLD the granted premises, with all the privileges and appurtenances thereto belonging, to the said Woodman and his heirs and assigns to their own use and behoof forever

And I do hereby, for myself and my executors and administrators, covenant, with the said grantee and his heirs and assigns, that I am lawfully seized in fee simple of the granted premises, that they are free from all incumbrances that I have good right to sell and convey the same as aforesaid; and that I will and my heirs, executors and administrators, shall warrant and defend the same to the said grantee and his heirs and assigns forever against the lawful claims and demands of all persons Except as aforesaid

~~And for the consideration aforesaid do hereby release unto the said grantee and his heirs and assigns all right of dower, courtesy and family homestead, in the granted premises.~~

IN WITNESS WHEREOF I have hereunto set my hands and seals, this First day of July — in the year ~~of our Lord 18~~ one thousand eight hundred and ninety three

Signed, sealed and delivered in the presence of us:

Mary A O'Connor

Geo. S. Frost

Sarah Low Seal

STATE OF NEW HAMPSHIRE, Strafford SS. July 1st 1893

Then personally appeared the above named Sarah Low and acknowledged the foregoing instrument to be her free act and deed. — Before me:

Geo. S. Frost Justice of the Peace.

~~Dated~~ ~~18~~

Received 10 am July 11, 1893 Examined by Frank E. Tompkins Register.

Project #47262.01

DRAINAGE ANALYSIS REPORT

F O R

256 & 264 Central Avenue

Dover, New Hampshire
Strafford County

Tax Map 9, Lots 111 & 112

Owned by and Prepared for
256-264 Central Avenue, LLC

August 31, 2023
Last Revised November 7, 2023

Prepared By:

TFM Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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1.0 - SUMMARY & PROJECT DESCRIPTION

The project includes the re-development of an existing gravel parking lot and alleyway into a paved parking lot with a brick walkway at 256 & 264 Central Avenue in Dover, NH. The existing Tax Map 9 Lots 111 & 112 is approximately 0.689 acres and currently contains a gravel parking lot. The site is within the Central Business District Zone and General Sub-District and is adjacent to the intersection of Central Avenue and Kirkland Street.

The proposed project is to construct a parking lot with 25 parking stalls. Associated improvements include and are not limited to access, grading, utilities, stormwater management system, lighting, and landscaping. The project proposes a total of 22,510 SF of impervious area within the property lines and approximately 17,766 SF of disturbance to facilitate the development.

This analysis has been completed to verify the project will not pose adverse stormwater effects on-site and off-site. Compared to the pre-development conditions, the post-development stormwater management system has been designed to reduce peak runoff rates, increases within regulatory limits the runoff volume, reduces the risk of erosion and sedimentation, and improves stormwater runoff quality. In addition, Best Management Practices are employed to formulate a plan that assures stormwater quality both during and after construction. The following summarizes the findings from the study.

2.0 - CALCULATION METHODS

The design storms analyzed in this study are the 2-year, 10-year, 25-year, and 50-year 24-hour storm events. The software program, HydroCAD version 10.00[1] was utilized to calculate the peak runoff rates from these storm events. The program estimates the peak rates using the TR-20 method. A Type III storm pattern was used in the model. Rainfall frequencies for the analyzed region were also incorporated into the model. Rainfall frequencies from the higher of the Extreme Precipitation Rates from Cornell University's Northeast Regional Climate Center (see Appendix A) were used to determine the storm-event intensities, see Table 1. Design standards were taken from the New Hampshire Stormwater Manual, December 2008[2].

	24-HOUR RAINFALL RATES
Storm-Event (year)	Northeast Regional Climate Center Extreme Precipitation (in)
2	3.15
10	4.75
25	6.01
50	7.18

Table 1 – 24-Hour Rainfall Rates

Time of Concentration is the time it takes for water to flow from the hydraulically most remote point in the watershed (with the longest travel time) to the watershed outlet. This time is determined by calculating the time it takes runoff to travel this route under one of three

[1] HydroCAD version 10.00, HydroCAD Software Solutions LLC, Chocorua, NH, 2013.
[2] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

hydrologic conditions: sheet flow, shallow concentrated flow, or channel flow. Because the Intensity-Duration-Frequency (IDF) curve is steep with short TC's, estimating the actual intensity is subject to error and overestimates actual runoff. Due to this, the TC's are adjusted to a minimum of 6 minutes.

3.0 – EXISTING SITE CONDITIONS

The soils within the proposed area of disturbance are identified in accordance with the NRCS Web Soil Survey (see Appendix B for details and soil locations). The Site-Specific Soil Survey identifies the soils within the disturbed project area as primarily Buxton silt loam. This soil is classified as moderately well drained.

Three test pits and infiltration tests were conducted. In nearly all test pit locations, fill material was discovered. Infiltration tests were determined per Ksat testing using a Compact Constant Head Permeameter (Amoozemeter) per Env-Wq 1504.14(d). The highest Estimated Seasonal High-Water Table (ESWT) observed were: unobserved at Test Pit #1 (dug to 52"), elevation 53.60' at Test Pit 2, and elevation 54.05 at Test Pit #3.

4.0 - PRE-DEVELOPMENT CONDITIONS

The pre-development condition is characterized by four subcatchments composing one watershed, which flows towards the municipal stormwater system, which ultimately discharges to the Piscataqua River. Pre-development subcatchment areas are depicted on the attached plan entitled "Pre-Development Drainage Map," Sheet D-01 in Appendix H.

Stormwater runoff from the site primarily flows over the compacted gravel, across abutting properties and to the existing municipal stormwater drainage system (POI-1, POI-2, & POI-3) and to the municipal sewer system (POI-4).

In the pre-development condition, the total impervious area is 26,056 SF over a total drainage analysis area of 30,031 SF.

5.0 - POST-DEVELOPMENT CONDITIONS

The post-development condition is characterized by one watershed divided into four subcatchment areas. Post-development subcatchment areas are depicted on the attached plan entitled "Post-Development Drainage Map," sheet D-02 in Appendix H.

In the post-development condition, the total impervious area is 22,510 SF over a total drainage analysis area of 30,031 SF. Impervious area from the project consists of a 10,072 SF footprint parking lot and walkway, a 12,270 SF footprint building and associated improvements. One BMP is proposed to treat and mitigate the stormwater runoff from the impact of the new impervious area from the proposed development.

Three test pits and infiltration tests were conducted. In nearly all test pit locations, fill material was discovered. Infiltration tests were determined per default published Ksat values for the design infiltration rates per Env-Wq 1504.14(c) and/or Ksat testing using a Compact Constant Head Permeameter (Amoozemeter) per Env-Wq 1504.14(d).

Table 2 summarizes the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year, and 50-year 24-hour Type III storm events for all discharge. Table 3 summarizes the

pre- and post-development peak runoff volumes for the 2-year 24-hour Type III storm events for all discharge.

TABLE 2 – SURFACE WATER PEAK RUNOFF RATE COMPARISON (CF)					
POINT OF INTEREST		DESIGN STORM			
		2-year	10-year	25-year	50-year
POI-1	Pre	0.3	0.4	0.6	0.7
	Post	0.1	0.1	0.1	0.2
POI-2	Pre	0.4	0.6	0.8	0.9
	Post	0.0	0.0	0.1	0.1
POI-3	Pre	0.4	0.7	0.9	1.0
	Post	0.7	1.2	1.6	1.9
POI-4	Pre	0.8	1.3	1.6	1.9
	Post	0.8	1.3	1.6	1.9

Table 2 - Pre and Post- Development Peak Runoff Rate Comparison

TABLE 3 – SURFACE WATER PEAK RUNOFF VOLUME COMPARISON (CF)		
POINT OF INTEREST		DESIGN STORM
		2-year
POI-1	Pre	818
	Post	115
POI-2	Pre	1,309
	Post	66
POI-3	Pre	1,477
	Post	1,987
POI-4	Pre	2,981
	Post	2,981

Table 3 - Pre and Post- Development Peak Runoff Volume Comparison

The proposed project reduces peak rates of runoff compared to existing conditions to all abutting properties for all storm events, in accordance Dover stormwater regulations. Additionally, per NHDES, the 2-year 24-hour storm does not result in an increased peak flow rate and reduces or increases volume within the limits of Env-Wq 1507.05(b)(1) from the pre-development to post-development condition. There will be no adverse effects on the abutting properties from the proposed stormwater management system.

Appendices D and F summarizes all 24-hour storm events for pre- and post-development drainage calculations using HydroCAD analysis. Appendices E and G provide a full summary of the 10-year, 24-hour storm for the pre- and post-development drainage calculations using HydroCAD analysis.

There is one warning messages for the 10-year storm event related to the proposed BMP's:

- *[90] Warning: Pond SF Qout>Qin may require smaller dt or Finer Routing*

6.0 – REGULATORY COMPLIANCE

The project meets the stricter of the stormwater standards identified in the New Hampshire Department of Environmental Services (DES) Env-Wq 1500 Alteration of Terrain Regulations and Dover stormwater management regulations.

7.0 – BEST MANAGEMENT PRACTICES

Best Management Practices will be developed in accordance with the New Hampshire Stormwater Manual, Volumes Two and Three, December 2008[3] to formulate a plan that assures stormwater quality both during and after construction. The intent of the outlined measures is to minimize erosion and sedimentation during construction, stabilize and protect the site from erosion after construction is complete and mitigate any adverse impacts to stormwater quality resulting from development. Best Management Practices for this project include:

- Temporary practices to be implemented during construction.

- Permanent practices to be implemented after construction.

7.1 – TEMPORARY PRACTICES

1. Erosion, sediment, and stormwater detention measures must be installed as directed by the engineer.
2. All disturbed areas, as well as loam stockpiles, shall be seeded and contained by a silt barrier.
3. Silt barriers must be installed prior to any construction commencing. All erosion control devices including silt barriers and storm drain inlet filters shall be inspected at least once per week and following any rainfall. All necessary maintenance shall be completed within twenty-four (24) hours.
4. Any silt barriers found to be failing must be replaced immediately. Sediment is to be removed from behind the silt fence if found to be one-third the height of the silt barrier or greater.
5. Any area of the site, which has been disturbed and where construction activity will not occur for more than twenty-one (21) days, shall be temporarily stabilized by mulching and seeding.
6. No construction materials shall be buried on-site.
7. After all areas have been stabilized, temporary practices are to be removed, and the area they are removed from must be smoothed and revegetated.
8. Areas must be temporarily stabilized within 14 days of disturbance or seeded and mulched within 3 days of final stabilization.
9. After November 15th, incomplete driveways or parking areas must be protected with a minimum of 3” of crushed gravel, meeting the standards of NHDOT item 304.3.
10. An area shall be considered stable if one of the following has occurred:

[3] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

a) Base course gravels are installed in areas to be paved.

b) A minimum of 85% vegetated growth has been established.

c) A minimum of 3" of non-erosive material such as stone or rip rap has been installed.

d) Erosion control blankets have been properly installed.

7.2 – PERMANENT PRACTICES

The objectives for developing permanent Best Management Practices for this site include the following:

1. Maintain existing runoff flow characteristics.
    a) Drainage is structured to minimize any offsite increase in runoff

2. Treatment BMP's are established to ensure the water quality.

3. Maintenance schedules are set to safeguard the long term working of the stormwater BMP's.

8.0 – CONCLUSION

The proposed stormwater management system will treat, infiltrate, and mitigate the runoff generated from the proposed development and provide protection of groundwater and surface waters as required through the Alteration of Terrain Bureau and Dover stormwater management regulations. The project has been designed in accordance with NHDES and Dover regulations. There is little change in the flow characteristics of the site. The proposed project has been designed to pose no adverse effects on surrounding properties.

Respectfully,
TFMoran, Inc. Seacoast Division

Christopher Rice
Senior Project Manager

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APPENDIX A – EXTREME PRECIPITATION RATES

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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	43.193 degrees North
Longitude	70.874 degrees West
Elevation	10 feet
Date/Time	Mon Jun 26 2023 16:44:43 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**	2.31	2.76	3.16	3.89	4.45	**1yr**
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	3.51	**2yr**	2.79	3.38	3.87	4.61	5.24	**2yr**
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	6.57	**5yr**
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	5.96	6.94	7.81	**10yr**
25yr	0.46	0.74	0.94	1.30	1.72	2.27	**25yr**	1.49	2.09	2.70	3.53	4.61	6.01	6.96	**25yr**	5.32	6.70	7.63	8.78	9.80	**25yr**
50yr	0.52	0.83	1.06	1.49	2.00	2.67	**50yr**	1.73	2.46	3.18	4.19	5.49	7.18	8.41	**50yr**	6.35	8.09	9.21	10.49	11.65	**50yr**
100yr	0.58	0.94	1.21	1.71	2.33	3.13	**100yr**	2.01	2.89	3.75	4.96	6.53	8.58	10.16	**100yr**	7.59	9.77	11.11	12.54	13.86	**100yr**
200yr	0.64	1.05	1.36	1.96	2.71	3.68	**200yr**	2.34	3.40	4.44	5.90	7.80	10.26	12.28	**200yr**	9.08	11.81	13.40	14.99	16.48	**200yr**
500yr	0.76	1.25	1.63	2.36	3.31	4.55	**500yr**	2.86	4.22	5.51	7.38	9.82	12.99	15.78	**500yr**	11.50	15.18	17.19	19.00	20.75	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.92	1.26	1.58	2.14	2.45	**1yr**	1.90	2.36	2.88	3.36	4.03	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.36	1.83	2.35	3.04	3.40	**2yr**	2.69	3.27	3.75	4.47	5.05	**2yr**
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.15	2.77	3.71	4.13	**5yr**	3.29	3.97	4.62	5.41	6.11	**5yr**
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	7.01	**10yr**
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.83	3.64	4.92	5.78	**25yr**	4.36	5.56	6.49	7.54	8.41	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.19	**50yr**	1.52	2.14	2.35	3.19	4.09	5.61	6.67	**50yr**	4.97	6.41	7.53	8.69	9.64	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.51	**100yr**	1.73	2.45	2.63	3.56	4.56	6.38	7.68	**100yr**	5.65	7.38	8.73	10.03	11.04	**100yr**
200yr	0.59	0.89	1.13	1.64	2.29	2.87	**200yr**	1.97	2.80	2.93	3.99	5.09	7.26	8.84	**200yr**	6.42	8.50	10.12	11.57	12.66	**200yr**
500yr	0.69	1.03	1.33	1.93	2.74	3.45	**500yr**	2.36	3.37	3.40	4.61	5.89	8.57	10.64	**500yr**	7.58	10.23	12.29	13.99	15.12	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.24	1.74	2.21	2.88	3.10	**1yr**	2.55	2.98	3.44	4.23	4.82	**1yr**
2yr	0.33	0.51	0.62	0.85	1.04	1.25	**2yr**	0.90	1.22	1.47	1.95	2.51	3.30	3.64	**2yr**	2.92	3.50	4.01	4.76	5.46	**2yr**
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	4.87	**5yr**	3.76	4.68	5.29	6.25	7.01	**5yr**
10yr	0.46	0.70	0.87	1.22	1.57	1.92	**10yr**	1.36	1.88	2.24	3.05	3.86	5.22	6.08	**10yr**	4.62	5.85	6.69	7.67	8.55	**10yr**
25yr	0.56	0.85	1.05	1.50	1.98	2.48	**25yr**	1.71	2.43	2.88	3.97	4.97	7.09	8.18	**25yr**	6.28	7.86	8.97	10.10	11.15	**25yr**
50yr	0.64	0.98	1.22	1.75	2.36	3.00	**50yr**	2.04	2.93	3.50	4.83	6.03	8.76	10.25	**50yr**	7.75	9.86	11.22	12.42	13.63	**50yr**
100yr	0.75	1.13	1.42	2.05	2.81	3.63	**100yr**	2.43	3.54	4.24	5.92	7.34	10.83	12.86	**100yr**	9.58	12.36	14.02	15.31	16.68	**100yr**
200yr	0.87	1.31	1.66	2.40	3.35	4.40	**200yr**	2.89	4.30	5.16	7.24	8.92	13.42	16.14	**200yr**	11.88	15.52	17.55	18.85	20.43	**200yr**
500yr	1.07	1.58	2.04	2.96	4.21	5.65	**500yr**	3.64	5.52	6.67	9.47	11.57	17.84	21.80	**500yr**	15.79	20.96	23.63	24.86	26.74	**500yr**

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Northeast Regional Climate Center

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APPENDIX B – SITE-SPECIFIC SOIL SURVEY & NRCS WEB SOIL REPORT

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United States Department of Agriculture

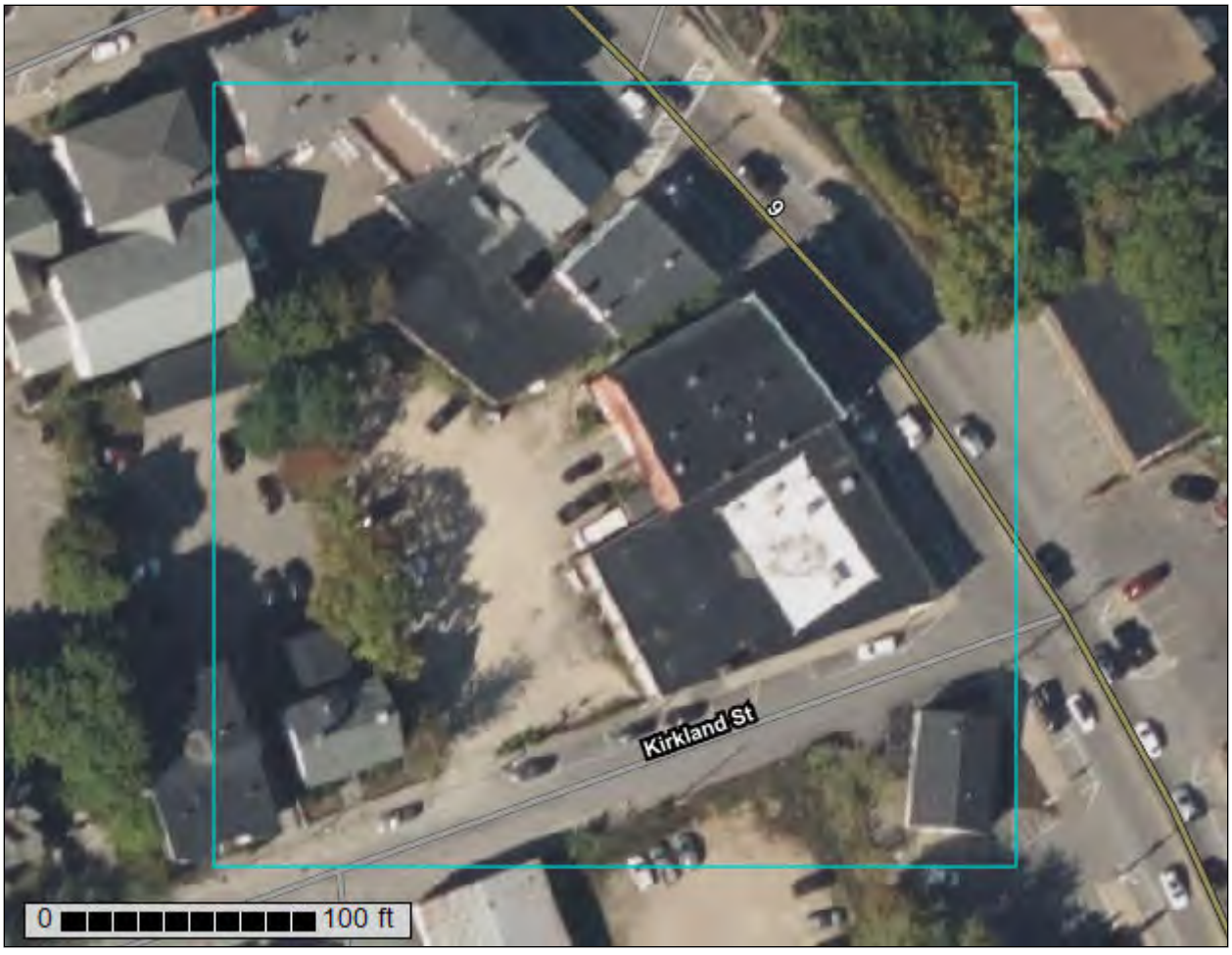
NRCS

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

256 & 264 Central Avenue Dover, NH



August 14, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:790 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

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 23, Sep 9, 2022

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BzB	Buxton silt loam, 3 to 8 percent slopes	2.2	99.5%
SfC	Suffield silt loam, 8 to 15 percent slopes	0.0	0.5%
Totals for Area of Interest		**2.2**	**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

SfC—Suffield silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d8v
Elevation: 0 to 250 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Suffield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffield

Typical profile

H1 - 0 to 19 inches: silt loam
H2 - 19 to 28 inches: silt loam
H3 - 28 to 41 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY017NH - Well Drained Lake Plain
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 9 percent
Hydric soil rating: No

Buxton

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

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

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APPENDIX C – TEST PIT LOGS & INFILTRATION TEST DATA

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Civil Engineers
Structural Engineers
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Test Pit Logs

PROJECT NAME:	256 & 264 Central Avenue, Dover NH	ENGINEER:	Corey Colwell
PROJECT NUMBER:	47262.01	DATE OF TESTING:	6/14/2023
PROJECT LOCATION:	264 Central Avenue, Dover NH	EXCAVATOR:	Sea Glass Property Maintenance

TEST PIT 1

DEPTH	SOIL CONDITIONS	Data
0-8"	Silty Gravel - Blocky	ESHWT
8-10"	Asphalt	Not observed
10-52"	Fill, Dark Silty Sand	Bottom of Pit
		52"
		Redox
		Not observed

TEST PIT 2

DEPTH	SOIL CONDITIONS	Data
0-3"	Silty Gravel - Blocky	ESHWT
3-6"	Sandy Gravel - compacted/firm	42"
6-10"	Crushed Asphalt	Bottom of Pit
10-42"	Fill - Sandy gravel	56"
42-56"	Dark Sandy Silt/Clay	Redox
		42"

TEST PIT 3

DEPTH	SOIL CONDITIONS	Data
0-3"	Silty Gravel - Blocky	ESHWT
3-13"	Sandy Gravel - Compacted - Firm	42"
13-33"	Dark Sand Fill with Ash	Bottom of Pit
33-63"	Dark Sandy Silty Fill with Coal and Ash	63"
		Redox
		Not Observed

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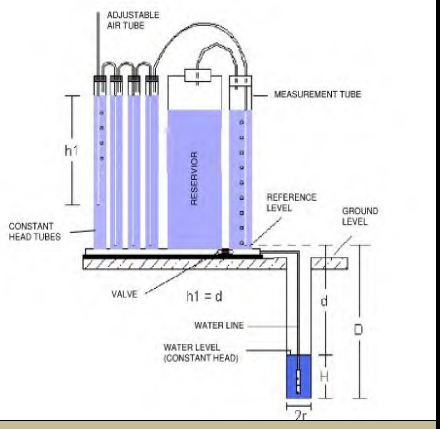
PROJECT NAME:	256 & 264 Central Avenue, Dover NH	ENGINEER:	Jason Cook
PROJECT NUMBER:	47262.01	DATE OF TESTING:	6/14/2023
PROJECT LOCATION:	264 Central Avenue, Dover NH		

Amoozemeter Field Data Sheet

Test Pit 1

Ksat (Average) = 0.402

SETUP CALCULATIONS			Test 1	Test 2	Test 3
D- REF LINE OF A-METER TO HOLE BOTTOM (cm)			94.0	92.7	95.3
H - DEPTH OF H20 IN HOLE (cm)			20.3	19.1	21.6
d - TOP OF WATER TO OUTFLOW LENGTH (cm)			73.7	73.7	73.7
AUGER DIAMETER (cm)			5.0	5.0	5.0
AREA OF AUGER HOLE (cm^2)			19.6	19.6	19.6
DEPTH TO IMPERVIOUS LAYER/SHWT, "s" (cm)			132.08	132.08	132.08
GLOVER SOLUTION A OR B			A	A	A
SOIL DESCRIPTION AT TEST 1 DEPTH:	Fill, Dark Silty Sand				
SOIL HORIZON AT TEST 1 DEPTH:					
SOIL DESCRIPTION AT TEST 2 DEPTH:	Fill, Dark Silty Sand				
SOIL HORIZON AT TEST 2 DEPTH:					
SOIL DESCRIPTION AT TEST 3 DEPTH:	Fill, Dark Silty Sand				
SOIL HORIZON AT TEST 3 DEPTH:					
ONE OR BOTH CHAMBERS USED:			1	1	1



TEST #1

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
0.1	40	A	0.000754	20.0	0.05	3.77E-05	0.05340596	
0.1	40	A	0.000754	20.0	0.05	3.77E-05	0.05340596	
0.1	40	A	0.000754	20.0	0.05	3.77E-05	0.05340596	
0.1	40	A	0.000754	20.0	0.05	3.77E-05	0.05340596	
0.2	40	A	0.000754	20.0	0.1	7.54E-05	0.10681193	

Average Ksat (3 consecutive readings w/same outflow per time): 0.053406

TEST #2

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
0.2	40	A	0.000815	20.0	0.1	8.15E-05	0.11553036	
0.6	40	A	0.000815	20.0	0.3	0.000245	0.34659108	
0.5	40	A	0.000815	20.0	0.25	0.000204	0.2888259	
0.5	40	A	0.000815	20.0	0.25	0.000204	0.2888259	
0.7	40	A	0.000815	20.0	0.35	0.000285	0.40435626	
0.7	40	A	0.000815	20.0	0.35	0.000285	0.40435626	
0.7	40	A	0.000815	20.0	0.35	0.000285	0.40435626	

Average Ksat (3 consecutive readings w/same outflow per time): 0.404356

TEST #3

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
1.5	40	A	0.000674	20.0	0.75	0.000506	0.71668219	
2.2	40	A	0.000674	20.0	1.1	0.000742	1.05113388	
0.7	40	A	0.000674	20.0	0.35	0.000236	0.33445169	
1.5	40	A	0.000674	20.0	0.75	0.000506	0.71668219	
1.5	40	A	0.000674	20.0	0.75	0.000506	0.71668219	
1.7	40	A	0.000674	20.0	0.85	0.000573	0.81223981	

Average Ksat (3 consecutive readings w/same outflow per time): 0.748535

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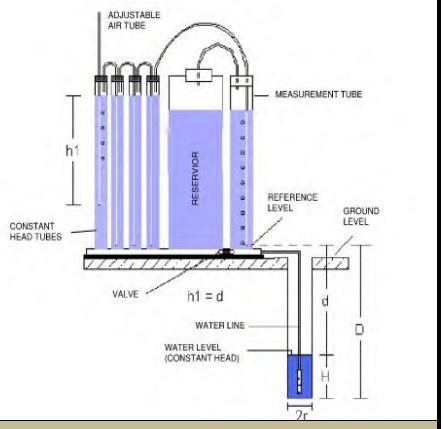
PROJECT NAME:	256 & 264 Central Avenue, Dover NH	ENGINEER:	Jason Cook
PROJECT NUMBER:	47262.01	DATE OF TESTING:	6/14/2023
PROJECT LOCATION:	264 Central Avenue, Dover NH		

Amoozemeter Field Data Sheet

Test Pit 2

Ksat (Average) = 3.50

SETUP CALCULATIONS			Test 1	Test 2	Test 3
D- REF LINE OF A-METER TO HOLE BOTTOM (cm)			94.0	95.3	95.3
H - DEPTH OF H20 IN HOLE (cm)			20.3	21.6	21.6
d - TOP OF WATER TO OUTFLOW LENGTH (cm)			73.7	73.7	73.7
AUGER DIAMETER (cm)			5.0	5.0	5.0
AREA OF AUGER HOLE (cm^2)			19.6	19.6	19.6
DEPTH TO IMPERVIOUS LAYER/SHWT, "s" (cm)			106.68	106.68	106.68
GLOVER SOLUTION A OR B			A	A	A
SOIL DESCRIPTION AT TEST 1 DEPTH:	Fill, Sandy gravel				
SOIL HORIZON AT TEST 1 DEPTH:					
SOIL DESCRIPTION AT TEST 2 DEPTH:	Fill, Sandy gravel				
SOIL HORIZON AT TEST 2 DEPTH:					
SOIL DESCRIPTION AT TEST 3 DEPTH:	Fill, Sandy gravel				
SOIL HORIZON AT TEST 3 DEPTH:					
ONE OR BOTH CHAMBERS USED:			1	1	1



TEST #1

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
5.4	40	A	0.000754	20.0	2.7	0.002035	2.8839221	
0.7	40	A	0.000754	20.0	0.35	0.000264	0.37384175	
1.4	40	A	0.000754	20.0	0.7	0.000528	0.74768351	
0.4	40	A	0.000754	20.0	0.2	0.000151	0.21362386	
0.4	40	A	0.000754	20.0	0.2	0.000151	0.21362386	
0.4	40	A	0.000754	20.0	0.2	0.000151	0.21362386	

Average Ksat (3 consecutive readings w/same outflow per time: 0.213624

TEST #2

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
7	20	A	0.000674	20.0	7	0.004719	6.68903376	
4.7	20	A	0.000674	20.0	4.7	0.003169	4.49120838	
4.9	20	A	0.000674	20.0	4.9	0.003304	4.68232363	
4.8	20	A	0.000674	20.0	4.8	0.003236	4.586766	

Average Ksat (3 consecutive readings w/same outflow per time: 4.586766

TEST #3

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
6.5	20	A	0.000674	20.0	6.5	0.004382	6.21124563	
2.5	10	A	0.000674	20.0	5	0.003371	4.77788126	
3.2	10	A	0.000674	20.0	6.4	0.004315	6.11568801	
1.8	10	A	0.000674	20.0	3.6	0.002427	3.4400745	

Average Ksat (3 consecutive readings w/same outflow per time: 5.701605

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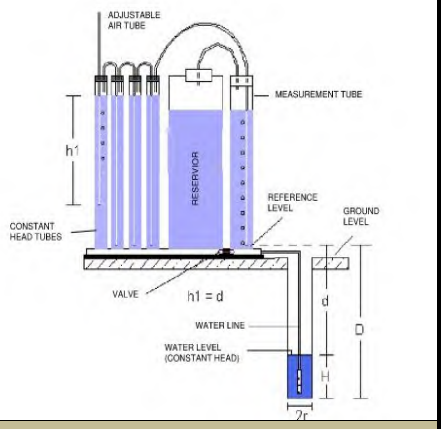
PROJECT NAME:	256 & 264 Central Avenue, Dover NH	ENGINEER:	Jason Cook
PROJECT NUMBER:	47262.01	DATE OF TESTING:	6/14/2023
PROJECT LOCATION:	264 Central Avenue, Dover NH		

Amoozemeter Field Data Sheet

Test Pit 3

Ksat (Average) = 1.91

SETUP CALCULATIONS			Test 1	Test 2	Test 3
D- REF LINE OF A-METER TO HOLE BOTTOM (cm)			67.3	66.0	66.0
H - DEPTH OF H20 IN HOLE (cm)			19.1	17.8	17.8
d - TOP OF WATER TO OUTFLOW LENGTH (cm)			48.3	48.3	48.3
AUGER DIAMETER (cm)			5.0	5.0	5.0
AREA OF AUGER HOLE (cm^2)			19.6	19.6	19.6
DEPTH TO IMPERVIOUS LAYER/SHWT, "s" (cm)			106.68	106.68	106.68
GLOVER SOLUTION A OR B			A	A	A
SOIL DESCRIPTION AT TEST 1 DEPTH:	Dark Sand Fill w/ Ash				
SOIL HORIZON AT TEST 1 DEPTH:					
SOIL DESCRIPTION AT TEST 2 DEPTH:	Dark Sand Fill w/ Ash				
SOIL HORIZON AT TEST 2 DEPTH:					
SOIL DESCRIPTION AT TEST 3 DEPTH:	Dark Sand Fill w/ Ash				
SOIL HORIZON AT TEST 3 DEPTH:					
ONE OR BOTH CHAMBERS USED:			1	1	1



TEST #1

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
1.1	20	A	0.000815	20.0	1.1	0.000897	1.27083397	
1.1	20	A	0.000815	20.0	1.1	0.000897	1.27083397	
1.3	20	A	0.000815	20.0	1.3	0.00106	1.50189469	
1.3	20	A	0.000815	20.0	1.3	0.00106	1.50189469	
1.3	20	A	0.000815	20.0	1.3	0.00106	1.50189469	
1.4	20	A	0.000815	20.0	1.4	0.001141	1.61742505	
1.2	20	A	0.000815	20.0	1.2	0.000978	1.38636433	

Average Ksat (3 consecutive readings w/same outflow per time: 1.501895

TEST #2

READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
1.9	20	A	0.000924	20.0	1.9	0.001755	2.48709915	
1.1	20	A	0.000924	20.0	1.1	0.001016	1.43989951	
1.4	20	A	0.000924	20.0	1.4	0.001293	1.83259938	
1.4	20	A	0.000924	20.0	1.4	0.001293	1.83259938	
1.5	20	A	0.000924	20.0	1.5	0.001385	1.96349933	
1.5	20	A	0.000924	20.0	1.5	0.001385	1.96349933	
1.5	20	A	0.000924	20.0	1.5	0.001385	1.96349933	

Average Ksat (3 consecutive readings w/same outflow per time: 1.963499

TEST #3

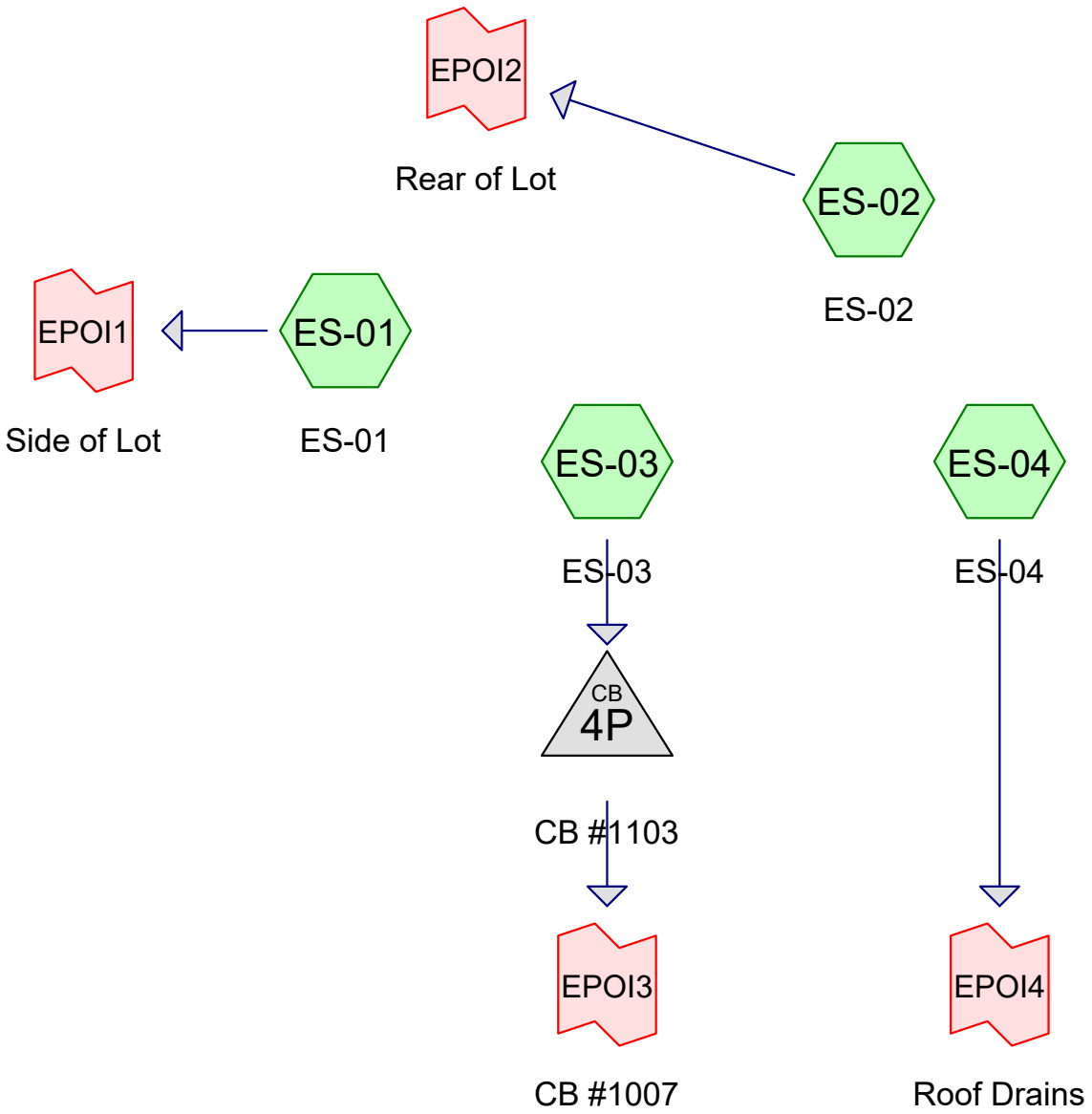
READING (Δ)	TIME INTERVAL (sec)	COEFFICIENT A or B	COEFFICIENT A or B 1/cm	CONVERSION FACTOR cm^3	OUTFLOW cm^3/s	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) cm/sec	SATURATED HYDRAULIC CONDUCTIVITY (Ksat) in/hr	COMMENTS
1.4	20	A	0.000924	20.0	1.4	0.001293	1.83259938	
1.5	20	A	0.000924	20.0	1.5	0.001385	1.96349933	
1.7	20	A	0.000924	20.0	1.7	0.00157	2.22529924	
1.8	20	A	0.000924	20.0	1.8	0.001662	2.3561992	
1.7	20	A	0.000924	20.0	1.7	0.00157	2.22529924	
1	20	A	0.000924	20.0	1	0.000924	1.30899955	
1.5	20	A	0.000924	20.0	1.5	0.001385	1.96349933	

Average Ksat (3 consecutive readings w/same outflow per time: 2.268933

APPENDIX D – PRE-DEVELOPMENT CALCULATIONS

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Pre-development



Subcat Reach Pond Link

Routing Diagram for 47262-00 Site Drainage
Prepared by {enter your company name here}, Printed 11/3/2023
HydroCAD® 10.10-7a s/n 00866 © 2021 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.15	2
2	25-yr	Type III 24-hr		Default	24.00	1	6.01	2
3	50-yr	Type III 24-hr		Default	24.00	1	7.18	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
3,367	86	<50% Grass cover, Poor, HSG C (ES-01, ES-02, ES-03)
11,812	96	Gravel surface, HSG C (ES-01, ES-02, ES-03)
1,452	98	Paved parking, HSG C (ES-03)
12,270	98	Roofs, HSG C (ES-04)
528	98	Unconnected pavement, HSG B (ES-02)
602	70	Woods, Good, HSG C (ES-01, ES-03)
30,031	**95**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
528	HSG B	ES-02
29,503	HSG C	ES-01, ES-02, ES-03, ES-04
0	HSG D	
0	Other	
30,031		**TOTAL AREA**

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

Subcatchment ES-01: ES-01 Runoff Area=4,630 sf 0.00% Impervious Runoff Depth>2.12"
Flow Length=143' Tc=6.2 min CN=90 Runoff=0.26 cfs 818 cf

Subcatchment ES-02: ES-02 Runoff Area=6,560 sf 8.05% Impervious Runoff Depth>2.40"
Flow Length=202' Tc=8.3 min UI Adjusted CN=93 Runoff=0.37 cfs 1,309 cf

Subcatchment ES-03: ES-03 Runoff Area=6,571 sf 22.10% Impervious Runoff Depth>2.70"
Flow Length=81' Slope=0.0430 '/' Tc=6.0 min CN=96 Runoff=0.43 cfs 1,477 cf

Subcatchment ES-04: ES-04 Runoff Area=12,270 sf 100.00% Impervious Runoff Depth>2.92"
Tc=6.0 min CN=98 Runoff=0.84 cfs 2,981 cf

Pond 4P: CB #1103 Peak Elev=55.99' Inflow=0.43 cfs 1,477 cf
6.0" Round Culvert n=0.013 L=54.0' S=0.0150 '/' Outflow=0.43 cfs 1,477 cf

Link EPOI1: Side of Lot Inflow=0.26 cfs 818 cf
Primary=0.26 cfs 818 cf

Link EPOI2: Rear of Lot Inflow=0.37 cfs 1,309 cf
Primary=0.37 cfs 1,309 cf

Link EPOI3: CB #1007 Inflow=0.43 cfs 1,477 cf
Primary=0.43 cfs 1,477 cf

Link EPOI4: Roof Drains Inflow=0.84 cfs 2,981 cf
Primary=0.84 cfs 2,981 cf

Total Runoff Area = 30,031 sf Runoff Volume = 6,586 cf Average Runoff Depth = 2.63"
52.55% Pervious = 15,781 sf 47.45% Impervious = 14,250 sf

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

Subcatchment ES-01: ES-01 Runoff Area=4,630 sf 0.00% Impervious Runoff Depth>4.85"
Flow Length=143' Tc=6.2 min CN=90 Runoff=0.56 cfs 1,872 cf

Subcatchment ES-02: ES-02 Runoff Area=6,560 sf 8.05% Impervious Runoff Depth>5.19"
Flow Length=202' Tc=8.3 min UI Adjusted CN=93 Runoff=0.78 cfs 2,836 cf

Subcatchment ES-03: ES-03 Runoff Area=6,571 sf 22.10% Impervious Runoff Depth>5.53"
Flow Length=81' Slope=0.0430 '/' Tc=6.0 min CN=96 Runoff=0.86 cfs 3,030 cf

Subcatchment ES-04: ES-04 Runoff Area=12,270 sf 100.00% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=98 Runoff=1.62 cfs 5,898 cf

Pond 4P: CB #1103 Peak Elev=56.92' Inflow=0.86 cfs 3,030 cf
6.0" Round Culvert n=0.013 L=54.0' S=0.0150 '/' Outflow=0.86 cfs 3,030 cf

Link EPOI1: Side of Lot Inflow=0.56 cfs 1,872 cf
Primary=0.56 cfs 1,872 cf

Link EPOI2: Rear of Lot Inflow=0.78 cfs 2,836 cf
Primary=0.78 cfs 2,836 cf

Link EPOI3: CB #1007 Inflow=0.86 cfs 3,030 cf
Primary=0.86 cfs 3,030 cf

Link EPOI4: Roof Drains Inflow=1.62 cfs 5,898 cf
Primary=1.62 cfs 5,898 cf

Total Runoff Area = 30,031 sf Runoff Volume = 13,636 cf Average Runoff Depth = 5.45"
52.55% Pervious = 15,781 sf 47.45% Impervious = 14,250 sf

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

Subcatchment ES-01: ES-01 Runoff Area=4,630 sf 0.00% Impervious Runoff Depth>6.00"
Flow Length=143' Tc=6.2 min CN=90 Runoff=0.68 cfs 2,313 cf

Subcatchment ES-02: ES-02 Runoff Area=6,560 sf 8.05% Impervious Runoff Depth>6.34"
Flow Length=202' Tc=8.3 min UI Adjusted CN=93 Runoff=0.94 cfs 3,468 cf

Subcatchment ES-03: ES-03 Runoff Area=6,571 sf 22.10% Impervious Runoff Depth>6.70"
Flow Length=81' Slope=0.0430 '/' Tc=6.0 min CN=96 Runoff=1.03 cfs 3,668 cf

Subcatchment ES-04: ES-04 Runoff Area=12,270 sf 100.00% Impervious Runoff Depth>6.94"
Tc=6.0 min CN=98 Runoff=1.94 cfs 7,093 cf

Pond 4P: CB #1103 Peak Elev=57.67' Inflow=1.03 cfs 3,668 cf
6.0" Round Culvert n=0.013 L=54.0' S=0.0150 '/' Outflow=1.03 cfs 3,668 cf

Link EPOI1: Side of Lot Inflow=0.68 cfs 2,313 cf
Primary=0.68 cfs 2,313 cf

Link EPOI2: Rear of Lot Inflow=0.94 cfs 3,468 cf
Primary=0.94 cfs 3,468 cf

Link EPOI3: CB #1007 Inflow=1.03 cfs 3,668 cf
Primary=1.03 cfs 3,668 cf

Link EPOI4: Roof Drains Inflow=1.94 cfs 7,093 cf
Primary=1.94 cfs 7,093 cf

Total Runoff Area = 30,031 sf Runoff Volume = 16,542 cf Average Runoff Depth = 6.61"
52.55% Pervious = 15,781 sf 47.45% Impervious = 14,250 sf

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APPENDIX E – PRE-DEVELOPMENT CALCULATIONS (10-YEAR STORM EVENT)

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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 ES-01: ES-01

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 1,402 cf, Depth> 3.63"
Routed to Link EPOI1 : Side of Lot

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
0	98	Paved parking, HSG C
459	70	Woods, Good, HSG C
2,649	96	Gravel surface, HSG C
1,522	86	<50% Grass cover, Poor, HSG C
4,630	90	Weighted Average
4,630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	6	0.0100	0.03		**Sheet Flow, Sheet Flow 1** Woods: Light underbrush n= 0.400 P2= 3.15"
1.4	6	0.0100	0.07		**Sheet Flow, Sheet Flow 2** Grass: Short n= 0.150 P2= 3.15"
1.3	88	0.0140	1.15		**Sheet Flow, Sheet Flow 3** Smooth surfaces n= 0.011 P2= 3.15"
0.4	33	0.0060	1.25		**Shallow Concentrated Flow, Shallow Concentrated Flow 1** Unpaved Kv= 16.1 fps
0.1	10	0.0150	1.22		**Shallow Concentrated Flow, Shallow Concentrated Flow 2** Nearly Bare & Untilled Kv= 10.0 fps
6.2	143	Total			

Summary for Subcatchment ES-02: ES-02

Runoff = 0.60 cfs @ 12.11 hrs, Volume= 2,159 cf, Depth> 3.95"
Routed to Link EPOI2 : Rear of Lot

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Adj	Description
4,308	96		Gravel surface, HSG C
1,724	86		<50% Grass cover, Poor, HSG C
528	98		Unconnected pavement, HSG B
6,560	94	93	Weighted Average, UI Adjusted
6,032			91.95% Pervious Area
528			8.05% Impervious Area
528			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	0.99		**Sheet Flow, Sheet Flow 1** Smooth surfaces n= 0.011 P2= 3.15"
6.9	80	0.0312	0.19		**Sheet Flow, Sheet Flow 2** Grass: Short n= 0.150 P2= 3.15"
0.8	75	0.0106	1.66		**Shallow Concentrated Flow, Shallow Concentrated Flow 1** Unpaved Kv= 16.1 fps
0.3	27	0.0278	1.67		**Shallow Concentrated Flow, Shallow Concentrated Flow 2** Nearly Bare & Untilled Kv= 10.0 fps
8.3	202	Total			

Summary for Subcatchment ES-03: ES-03

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 2,344 cf, Depth> 4.28"
Routed to Pond 4P : CB #1103

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,452	98	Paved parking, HSG C
143	70	Woods, Good, HSG C
4,855	96	Gravel surface, HSG C
121	86	<50% Grass cover, Poor, HSG C
6,571	96	Weighted Average
5,119		77.90% Pervious Area
1,452		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	81	0.0430	1.78		**Sheet Flow, Sheet Flow 1** Smooth surfaces n= 0.011 P2= 3.15"
5.2					**Direct Entry, Direct Entry**
6.0	81	Total			

Summary for Subcatchment ES-04: ES-04

Runoff = 1.28 cfs @ 12.09 hrs, Volume= 4,612 cf, Depth> 4.51"
Routed to Link EPOI4 : Roof Drains

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
12,270	98	Roofs, HSG C
0	98	Paved parking, HSG C
12,270	98	Weighted Average
12,270		100.00% Impervious Area

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

Summary for Pond 4P: CB #1103

Inflow Area = 6,571 sf, 22.10% Impervious, Inflow Depth > 4.28" for 10-yr event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,344 cf
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,344 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,344 cf
Routed to Link EPOI3 : CB #1007

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.28' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	55.53'	**6.0" Round Culvert** L= 54.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.53' / 54.72' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.65 cfs @ 12.09 hrs HW=56.26' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.65 cfs @ 3.33 fps)

Summary for Link EPOI1: Side of Lot

Inflow Area = 4,630 sf, 0.00% Impervious, Inflow Depth > 3.63" for 10-yr event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 1,402 cf
Primary = 0.43 cfs @ 12.09 hrs, Volume= 1,402 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link EPOI2: Rear of Lot

Inflow Area = 6,560 sf, 8.05% Impervious, Inflow Depth > 3.95" for 10-yr event
Inflow = 0.60 cfs @ 12.11 hrs, Volume= 2,159 cf
Primary = 0.60 cfs @ 12.11 hrs, Volume= 2,159 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link EPOI3: CB #1007

Inflow Area = 6,571 sf, 22.10% Impervious, Inflow Depth > 4.28" for 10-yr event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,344 cf
Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,344 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link EPOI4: Roof Drains

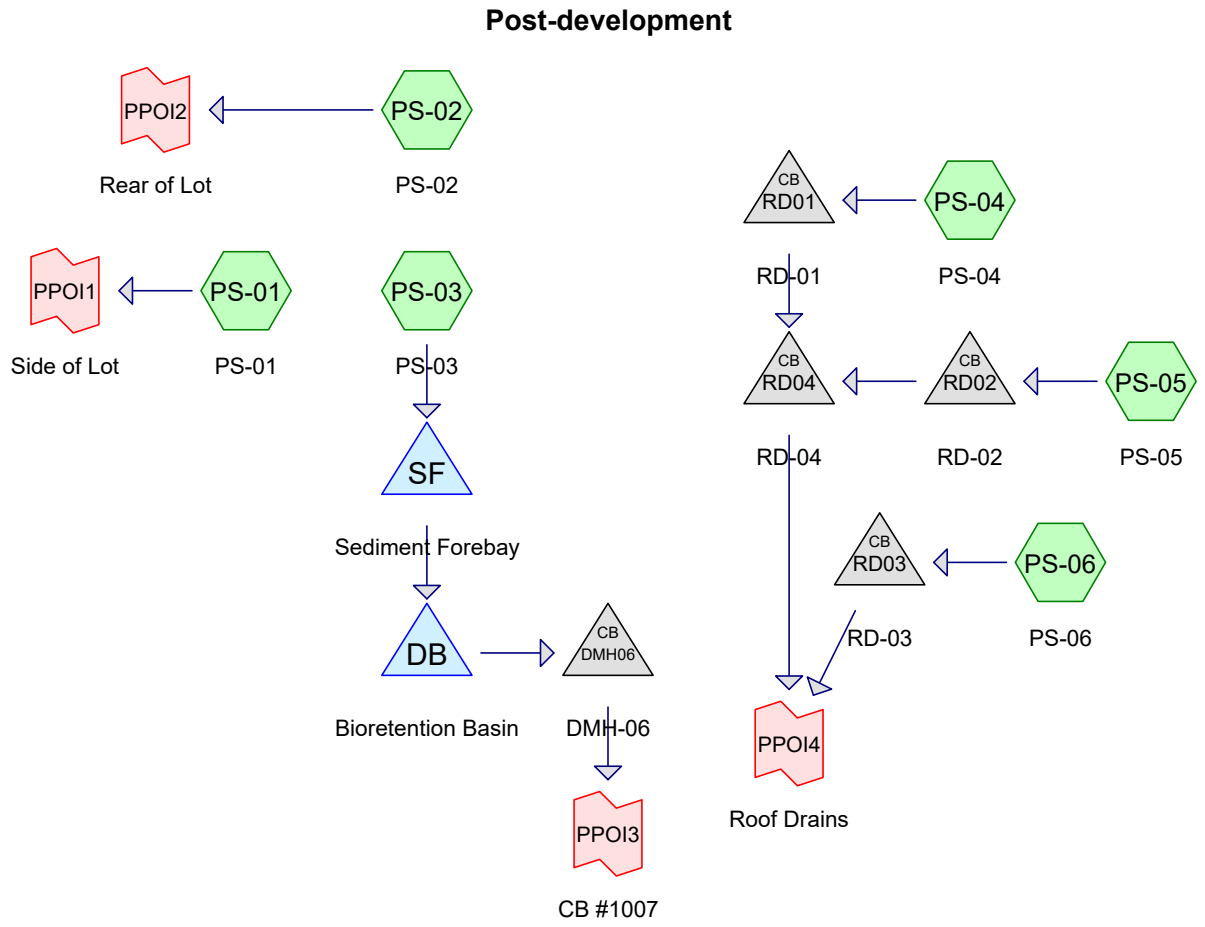
Inflow Area = 12,270 sf,100.00% Impervious, Inflow Depth > 4.51" for 10-yr event
Inflow = 1.28 cfs @ 12.09 hrs, Volume= 4,612 cf
Primary = 1.28 cfs @ 12.09 hrs, Volume= 4,612 cf, Atten= 0%, Lag= 0.0 min

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

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APPENDIX F – POST-DEVELOPMENT CALCULATIONS

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Subcat Reach Pond Link

Routing Diagram for 47262-00 Site Drainage
Prepared by {enter your company name here}, Printed 11/3/2023
HydroCAD® 10.10-7a s/n 00866 © 2021 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.15	2
2	25-yr	Type III 24-hr		Default	24.00	1	6.01	2
3	50-yr	Type III 24-hr		Default	24.00	1	7.18	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
6,993	74	>75% Grass cover, Good, HSG C (PS-01, PS-02, PS-03)
10,168	98	Paved parking, HSG C (PS-03)
12,270	98	Roofs, HSG C (PS-04, PS-05, PS-06)
397	73	Woods, Fair, HSG C (PS-03)
203	70	Woods, Good, HSG C (PS-01)
30,031	**92**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
30,031	HSG C	PS-01, PS-02, PS-03, PS-04, PS-05, PS-06
0	HSG D	
0	Other	
30,031		**TOTAL AREA**

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

Subcatchment PS-01: PS-01 Runoff Area=1,455 sf 0.00% Impervious Runoff Depth>0.95"
Flow Length=28' Slope=0.0500 '/' Tc=6.0 min CN=73 Runoff=0.03 cfs 115 cf

Subcatchment PS-02: PS-02 Runoff Area=785 sf 0.00% Impervious Runoff Depth>1.00"
Flow Length=30' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.02 cfs 66 cf

Subcatchment PS-03: PS-03 Runoff Area=15,521 sf 65.51% Impervious Runoff Depth>2.12"
Flow Length=174' Tc=6.0 min CN=90 Runoff=0.86 cfs 2,743 cf

Subcatchment PS-04: PS-04 Runoff Area=1,505 sf 100.00% Impervious Runoff Depth>2.92"
Tc=6.0 min CN=98 Runoff=0.10 cfs 366 cf

Subcatchment PS-05: PS-05 Runoff Area=2,575 sf 100.00% Impervious Runoff Depth>2.92"
Flow Length=26' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.18 cfs 626 cf

Subcatchment PS-06: PS-06 Runoff Area=8,190 sf 100.00% Impervious Runoff Depth>2.92"
Tc=6.0 min CN=98 Runoff=0.56 cfs 1,990 cf

Pond DB: Bioretention Basin Peak Elev=56.11' Storage=467 cf Inflow=0.86 cfs 2,554 cf
Discarded=0.01 cfs 263 cf Primary=0.74 cfs 1,987 cf Outflow=0.74 cfs 2,250 cf

Pond DMH06: DMH-06 Peak Elev=55.29' Inflow=0.74 cfs 1,987 cf
18.0" Round Culvert n=0.013 L=25.0' S=0.0048 '/' Outflow=0.74 cfs 1,987 cf

Pond RD01: RD-01 Peak Elev=55.90' Inflow=0.10 cfs 366 cf
6.0" Round Culvert n=0.013 L=79.0' S=0.0051 '/' Outflow=0.10 cfs 366 cf

Pond RD02: RD-02 Peak Elev=55.70' Inflow=0.18 cfs 626 cf
6.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.18 cfs 626 cf

Pond RD03: RD-03 Peak Elev=55.57' Inflow=0.56 cfs 1,990 cf
8.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.56 cfs 1,990 cf

Pond RD04: RD-04 Peak Elev=55.60' Inflow=0.28 cfs 991 cf
8.0" Round Culvert n=0.013 L=54.0' S=0.0050 '/' Outflow=0.28 cfs 991 cf

Pond SF: Sediment Forebay Peak Elev=56.48' Storage=146 cf Inflow=0.86 cfs 2,743 cf
Discarded=0.00 cfs 72 cf Primary=0.86 cfs 2,554 cf Outflow=0.86 cfs 2,626 cf

Link PPOI1: Side of Lot Inflow=0.03 cfs 115 cf
Primary=0.03 cfs 115 cf

Link PPOI2: Rear of Lot Inflow=0.02 cfs 66 cf
Primary=0.02 cfs 66 cf

Link PPOI3: CB #1007 Inflow=0.74 cfs 1,987 cf
Primary=0.74 cfs 1,987 cf

Link PPOI4: Roof Drains

Inflow=0.84 cfs 2,981 cf
Primary=0.84 cfs 2,981 cf

Total Runoff Area = 30,031 sf Runoff Volume = 5,905 cf Average Runoff Depth = 2.36"
25.28% Pervious = 7,593 sf 74.72% Impervious = 22,438 sf

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

Subcatchment PS-01: PS-01 Runoff Area=1,455 sf 0.00% Impervious Runoff Depth>3.09"
Flow Length=28' Slope=0.0500 '/' Tc=6.0 min CN=73 Runoff=0.12 cfs 375 cf

Subcatchment PS-02: PS-02 Runoff Area=785 sf 0.00% Impervious Runoff Depth>3.19"
Flow Length=30' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.07 cfs 209 cf

Subcatchment PS-03: PS-03 Runoff Area=15,521 sf 65.51% Impervious Runoff Depth>4.85"
Flow Length=174' Tc=6.0 min CN=90 Runoff=1.89 cfs 6,276 cf

Subcatchment PS-04: PS-04 Runoff Area=1,505 sf 100.00% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=98 Runoff=0.20 cfs 723 cf

Subcatchment PS-05: PS-05 Runoff Area=2,575 sf 100.00% Impervious Runoff Depth>5.77"
Flow Length=26' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.34 cfs 1,238 cf

Subcatchment PS-06: PS-06 Runoff Area=8,190 sf 100.00% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=98 Runoff=1.08 cfs 3,937 cf

Pond DB: Bioretention Basin Peak Elev=56.45' Storage=670 cf Inflow=1.88 cfs 6,074 cf
Discarded=0.01 cfs 313 cf Primary=1.59 cfs 5,449 cf Outflow=1.60 cfs 5,762 cf

Pond DMH06: DMH-06 Peak Elev=55.53' Inflow=1.59 cfs 5,449 cf
18.0" Round Culvert n=0.013 L=25.0' S=0.0048 '/' Outflow=1.59 cfs 5,449 cf

Pond RD01: RD-01 Peak Elev=56.04' Inflow=0.20 cfs 723 cf
6.0" Round Culvert n=0.013 L=79.0' S=0.0051 '/' Outflow=0.20 cfs 723 cf

Pond RD02: RD-02 Peak Elev=55.90' Inflow=0.34 cfs 1,238 cf
6.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.34 cfs 1,238 cf

Pond RD03: RD-03 Peak Elev=55.99' Inflow=1.08 cfs 3,937 cf
8.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=1.08 cfs 3,937 cf

Pond RD04: RD-04 Peak Elev=55.76' Inflow=0.54 cfs 1,961 cf
8.0" Round Culvert n=0.013 L=54.0' S=0.0050 '/' Outflow=0.54 cfs 1,961 cf

Pond SF: Sediment Forebay Peak Elev=56.56' Storage=171 cf Inflow=1.89 cfs 6,276 cf
Discarded=0.00 cfs 84 cf Primary=1.88 cfs 6,074 cf Outflow=1.88 cfs 6,158 cf

Link PPOI1: Side of Lot Inflow=0.12 cfs 375 cf
Primary=0.12 cfs 375 cf

Link PPOI2: Rear of Lot Inflow=0.07 cfs 209 cf
Primary=0.07 cfs 209 cf

Link PPOI3: CB #1007 Inflow=1.59 cfs 5,449 cf
Primary=1.59 cfs 5,449 cf

Link PPOI4: Roof Drains

Inflow=1.62 cfs 5,898 cf
Primary=1.62 cfs 5,898 cf

Total Runoff Area = 30,031 sf Runoff Volume = 12,758 cf Average Runoff Depth = 5.10"
25.28% Pervious = 7,593 sf 74.72% Impervious = 22,438 sf

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

Subcatchment PS-01: PS-01 Runoff Area=1,455 sf 0.00% Impervious Runoff Depth>4.09"
Flow Length=28' Slope=0.0500 '/' Tc=6.0 min CN=73 Runoff=0.16 cfs 496 cf

Subcatchment PS-02: PS-02 Runoff Area=785 sf 0.00% Impervious Runoff Depth>4.20"
Flow Length=30' Slope=0.0500 '/' Tc=6.0 min CN=74 Runoff=0.09 cfs 274 cf

Subcatchment PS-03: PS-03 Runoff Area=15,521 sf 65.51% Impervious Runoff Depth>6.00"
Flow Length=174' Tc=6.0 min CN=90 Runoff=2.31 cfs 7,755 cf

Subcatchment PS-04: PS-04 Runoff Area=1,505 sf 100.00% Impervious Runoff Depth>6.94"
Tc=6.0 min CN=98 Runoff=0.24 cfs 870 cf

Subcatchment PS-05: PS-05 Runoff Area=2,575 sf 100.00% Impervious Runoff Depth>6.94"
Flow Length=26' Slope=0.0100 '/' Tc=6.0 min CN=98 Runoff=0.41 cfs 1,488 cf

Subcatchment PS-06: PS-06 Runoff Area=8,190 sf 100.00% Impervious Runoff Depth>6.94"
Tc=6.0 min CN=98 Runoff=1.29 cfs 4,734 cf

Pond DB: Bioretention Basin Peak Elev=56.59' Storage=759 cf Inflow=2.20 cfs 7,549 cf
Discarded=0.01 cfs 329 cf Primary=1.85 cfs 6,906 cf Outflow=1.86 cfs 7,235 cf

Pond DMH06: DMH-06 Peak Elev=55.59' Inflow=1.85 cfs 6,906 cf
18.0" Round Culvert n=0.013 L=25.0' S=0.0048 '/' Outflow=1.85 cfs 6,906 cf

Pond RD01: RD-01 Peak Elev=56.10' Inflow=0.24 cfs 870 cf
6.0" Round Culvert n=0.013 L=79.0' S=0.0051 '/' Outflow=0.24 cfs 870 cf

Pond RD02: RD-02 Peak Elev=56.01' Inflow=0.41 cfs 1,488 cf
6.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.41 cfs 1,488 cf

Pond RD03: RD-03 Peak Elev=56.14' Inflow=1.29 cfs 4,734 cf
8.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=1.29 cfs 4,734 cf

Pond RD04: RD-04 Peak Elev=55.83' Inflow=0.64 cfs 2,358 cf
8.0" Round Culvert n=0.013 L=54.0' S=0.0050 '/' Outflow=0.64 cfs 2,358 cf

Pond SF: Sediment Forebay Peak Elev=56.63' Storage=194 cf Inflow=2.31 cfs 7,755 cf
Discarded=0.00 cfs 88 cf Primary=2.20 cfs 7,549 cf Outflow=2.20 cfs 7,637 cf

Link PPOI1: Side of Lot Inflow=0.16 cfs 496 cf
Primary=0.16 cfs 496 cf

Link PPOI2: Rear of Lot Inflow=0.09 cfs 274 cf
Primary=0.09 cfs 274 cf

Link PPOI3: CB #1007 Inflow=1.85 cfs 6,906 cf
Primary=1.85 cfs 6,906 cf

Link PPOI4: Roof Drains

Inflow=1.94 cfs 7,093 cf
Primary=1.94 cfs 7,093 cf

Total Runoff Area = 30,031 sf Runoff Volume = 15,618 cf Average Runoff Depth = 6.24"
25.28% Pervious = 7,593 sf 74.72% Impervious = 22,438 sf

APPENDIX G – POST-DEVELOPMENT CALCULATIONS (10-YEAR STORM EVENT)

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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 PS-01: PS-01

Runoff = 0.08 cfs @ 12.10 hrs, Volume= 253 cf, Depth> 2.08"
Routed to Link PPOI1 : Side of Lot

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
203	70	Woods, Good, HSG C
1,252	74	>75% Grass cover, Good, HSG C
1,455	73	Weighted Average
1,455		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	28	0.0500	0.19		**Sheet Flow, Sheet Flow 1** Grass: Short n= 0.150 P2= 3.15"
3.5					**Direct Entry, Direct Entry**
6.0	28	Total			

Summary for Subcatchment PS-02: PS-02

Runoff = 0.04 cfs @ 12.10 hrs, Volume= 142 cf, Depth> 2.16"
Routed to Link PPOI2 : Rear of Lot

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
785	74	>75% Grass cover, Good, HSG C
785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.0500	0.19		**Sheet Flow, Sheet Flow 1** Grass: Short n= 0.150 P2= 3.15"
3.4					**Direct Entry, Direct Entry**
6.0	30	Total			

Summary for Subcatchment PS-03: PS-03

Runoff = 1.44 cfs @ 12.09 hrs, Volume= 4,699 cf, Depth> 3.63"
Routed to Pond SF : Sediment Forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
10,168	98	Paved parking, HSG C
4,956	74	>75% Grass cover, Good, HSG C
397	73	Woods, Fair, HSG C
15,521	90	Weighted Average
5,353		34.49% Pervious Area
10,168		65.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0350	1.71		**Sheet Flow, Sheet Flow 1** Smooth surfaces n= 0.011 P2= 3.15"
0.5	70	0.0150	2.49		**Shallow Concentrated Flow, Shallow Concentrated Flow 1** Paved Kv= 20.3 fps
0.1	4	0.0150	0.86		**Shallow Concentrated Flow, Shallow Concentrated 2** Short Grass Pasture Kv= 7.0 fps
4.4					**Direct Entry, Direct Entry**
6.0	174	Total			

Summary for Subcatchment PS-04: PS-04

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 566 cf, Depth> 4.51"
Routed to Pond RD01 : RD-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,505	98	Roofs, HSG C
1,505		100.00% Impervious Area

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

Summary for Subcatchment PS-05: PS-05

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 968 cf, Depth> 4.51"
Routed to Pond RD02 : RD-02

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,575	98	Roofs, HSG C
2,575		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	26	0.0100	0.10		**Sheet Flow, Sheet Flow 1**
					Grass: Short n= 0.150 P2= 3.15"
1.6					**Direct Entry, Direct Entry**
6.0	26	Total			

Summary for Subcatchment PS-06: PS-06

Runoff = 0.85 cfs @ 12.09 hrs, Volume= 3,079 cf, Depth> 4.51"
Routed to Pond RD03 : RD-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
8,190	98	Roofs, HSG C
8,190		100.00% Impervious Area

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

Summary for Pond DB: Bioretention Basin

Inflow Area = 15,521 sf, 65.51% Impervious, Inflow Depth > 3.48" for 10-yr event
Inflow = 1.44 cfs @ 12.10 hrs, Volume= 4,502 cf
Outflow = 1.24 cfs @ 12.15 hrs, Volume= 4,193 cf, Atten= 14%, Lag= 3.1 min
Discarded = 0.01 cfs @ 12.15 hrs, Volume= 293 cf
Primary = 1.24 cfs @ 12.15 hrs, Volume= 3,899 cf
Routed to Pond DMH06 : DMH-06

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.31' @ 12.15 hrs Surf.Area= 1,392 sf Storage= 581 cf
Flood Elev= 57.00' Surf.Area= 1,522 sf Storage= 840 cf

Plug-Flow detention time= 55.0 min calculated for 4,193 cf (93% of inflow)
Center-of-Mass det. time= 19.6 min (819.4 - 799.8)

Volume	Invert	Avail.Storage	Storage Description
#1	55.70'	563 cf	**Pond Storage (Prismatic)**Listed below (Recalc)
#2	54.20'	119 cf	**Filter Media (Prismatic)**Listed below (Recalc)
			594 cf Overall x 20.0% Voids
#3	53.20'	158 cf	**Stone Storage (Prismatic)**Listed below (Recalc)
			396 cf Overall x 40.0% Voids
		840 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.70	396	0	0
56.70	730	563	563

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.20	396	0	0
55.70	396	594	594

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	396	0	0
54.20	396	396	396

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.20'	**0.200 in/hr Exfiltration over Surface area**
#2	Primary	55.06'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.06' / 54.84' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	55.75'	**4.0" Vert. Orifice X 4.00** C= 0.600 Limited to weir flow at low heads
#4	Device 2	56.69'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	56.10'	**4.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.15 hrs HW=56.31' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.23 cfs @ 12.15 hrs HW=56.31' TW=55.44' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.23 cfs of 2.75 cfs potential flow)
  ├**3=Orifice** (Orifice Controls 1.05 cfs @ 3.01 fps)
  ├**4=Grate** (Controls 0.00 cfs)
  └**5=Orifice** (Orifice Controls 0.18 cfs @ 1.55 fps)

Summary for Pond DMH06: DMH-06

Inflow Area = 15,521 sf, 65.51% Impervious, Inflow Depth > 3.01" for 10-yr event
Inflow = 1.24 cfs @ 12.15 hrs, Volume= 3,899 cf
Outflow = 1.24 cfs @ 12.15 hrs, Volume= 3,899 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.24 cfs @ 12.15 hrs, Volume= 3,899 cf
Routed to Link PPOI3 : CB #1007

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.44' @ 12.15 hrs
Flood Elev= 58.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.84'	**18.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.84' / 54.72' S= 0.0048 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.23 cfs @ 12.15 hrs HW=55.44' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.23 cfs @ 2.77 fps)

Summary for Pond RD01: RD-01

Inflow Area = 1,505 sf,100.00% Impervious, Inflow Depth > 4.51" for 10-yr event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 566 cf
Outflow = 0.16 cfs @ 12.09 hrs, Volume= 566 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.16 cfs @ 12.09 hrs, Volume= 566 cf
Routed to Pond RD04 : RD-04

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.98' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	55.64'	**6.0" Round Culvert** L= 79.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.64' / 55.24' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=55.97' TW=55.69' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.15 cfs @ 1.55 fps)

Summary for Pond RD02: RD-02

Inflow Area = 2,575 sf,100.00% Impervious, Inflow Depth > 4.51" for 10-yr event
Inflow = 0.27 cfs @ 12.09 hrs, Volume= 968 cf
Outflow = 0.27 cfs @ 12.09 hrs, Volume= 968 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.09 hrs, Volume= 968 cf
Routed to Pond RD04 : RD-04

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.81' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	55.33'	**6.0" Round Culvert** L= 17.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.33' / 55.24' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.26 cfs @ 12.09 hrs HW=55.81' TW=55.69' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.26 cfs @ 1.74 fps)

Summary for Pond RD03: RD-03

Inflow Area = 8,190 sf,100.00% Impervious, Inflow Depth > 4.51" for 10-yr event
Inflow = 0.85 cfs @ 12.09 hrs, Volume= 3,079 cf
Outflow = 0.85 cfs @ 12.09 hrs, Volume= 3,079 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.09 hrs, Volume= 3,079 cf
Routed to Link PPOI4 : Roof Drains

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.76' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	55.03'	**8.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.03' / 54.93' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.83 cfs @ 12.09 hrs HW=55.74' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.83 cfs @ 2.77 fps)

Summary for Pond RD04: RD-04

Inflow Area = 4,080 sf,100.00% Impervious, Inflow Depth > 4.51" for 10-yr event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 1,534 cf
Outflow = 0.42 cfs @ 12.09 hrs, Volume= 1,534 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.09 hrs, Volume= 1,534 cf
Routed to Link PPOI4 : Roof Drains

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.69' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	55.24'	**8.0" Round Culvert** L= 54.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.24' / 54.97' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.41 cfs @ 12.09 hrs HW=55.69' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.41 cfs @ 2.36 fps)

Summary for Pond SF: Sediment Forebay

Inflow Area = 15,521 sf, 65.51% Impervious, Inflow Depth > 3.63" for 10-yr event
Inflow = 1.44 cfs @ 12.09 hrs, Volume= 4,699 cf
Outflow = 1.44 cfs @ 12.10 hrs, Volume= 4,581 cf, Atten= 0%, Lag= 0.4 min
Discarded = 0.00 cfs @ 12.10 hrs, Volume= 80 cf
Primary = 1.44 cfs @ 12.10 hrs, Volume= 4,502 cf
Routed to Pond DB : Bioretention Basin

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

Peak Elev= 56.52' @ 12.10 hrs Surf.Area= 308 sf Storage= 160 cf
Flood Elev= 56.70' Surf.Area= 357 sf Storage= 219 cf

Plug-Flow detention time= 24.6 min calculated for 4,581 cf (97% of inflow)
Center-of-Mass det. time= 9.6 min (801.6 - 792.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.70'	219 cf	**Pond Storage (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.70	80	0	0
56.70	357	219	219

Device	Routing	Invert	Outlet Devices
#1	Primary	56.37'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	55.70'	**0.200 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=56.52' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.42 cfs @ 12.10 hrs HW=56.52' TW=56.27' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.42 cfs @ 0.93 fps)

Summary for Link PPOI1: Side of Lot

Inflow Area = 1,455 sf, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 0.08 cfs @ 12.10 hrs, Volume= 253 cf
Primary = 0.08 cfs @ 12.10 hrs, Volume= 253 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PPOI2: Rear of Lot

Inflow Area = 785 sf, 0.00% Impervious, Inflow Depth > 2.16" for 10-yr event
Inflow = 0.04 cfs @ 12.10 hrs, Volume= 142 cf
Primary = 0.04 cfs @ 12.10 hrs, Volume= 142 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PPOI3: CB #1007

Inflow Area = 15,521 sf, 65.51% Impervious, Inflow Depth > 3.01" for 10-yr event
Inflow = 1.24 cfs @ 12.15 hrs, Volume= 3,899 cf
Primary = 1.24 cfs @ 12.15 hrs, Volume= 3,899 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PPOI4: Roof Drains

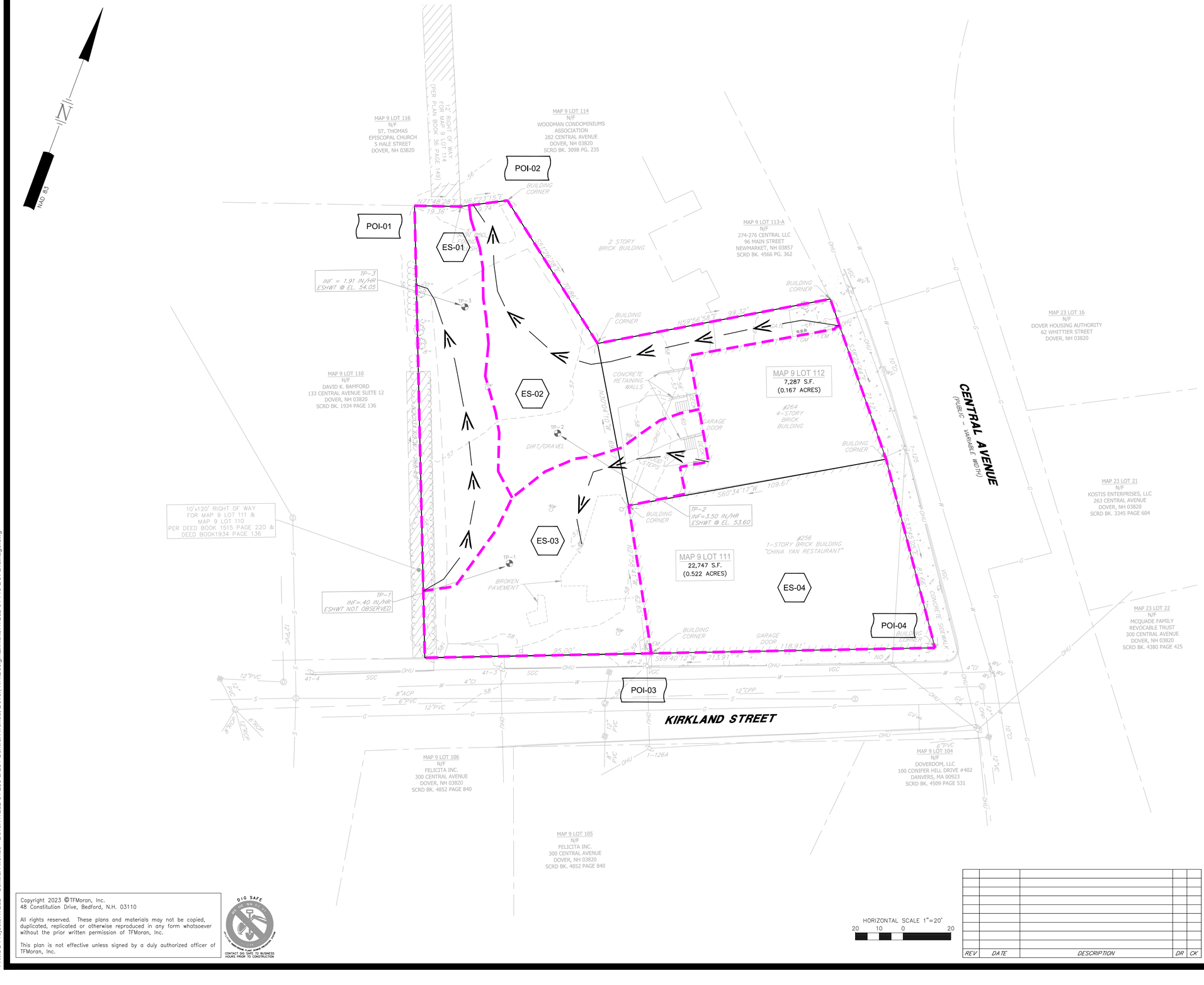
Inflow Area = 12,270 sf,100.00% Impervious, Inflow Depth > 4.51" for 10-yr event
Inflow = 1.28 cfs @ 12.09 hrs, Volume= 4,612 cf
Primary = 1.28 cfs @ 12.09 hrs, Volume= 4,612 cf, Atten= 0%, Lag= 0.0 min

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

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APPENDIX H – DRAINAGE MAPS

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LEGEND

- PROPERTY LINE
- LIMITS OF DRAINAGE SUBCATCHMENT
- SOIL GROUP BREAKLINE
- FLOW PATH (Tc LINE)
- REACH
- POI-1 — POINT OF INTEREST
- ES-1 — SUBCATCHMENT AREA
- EP-1 — POND, CULVERT, OR CATCH BASIN
- ER-1 — REACH

SOIL PHASE LEGEND (PERCENT)

A	B	C	D	E	F
0–3	3–8	8–15	15–25	25–50	50+

SOIL LEGEND (PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP	DRAINAGE CLASS
BzB	BUXTON SILT LOAM, 3% – 8% SLOPES	NONE	MODERATELY WELL DRAINED

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

PRE-DEVELOPMENT DRAINAGE MAP

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

1"=20' (11"X17")

SCALE: 1"=20' (22"X34") **AUGUST 18, 2023**

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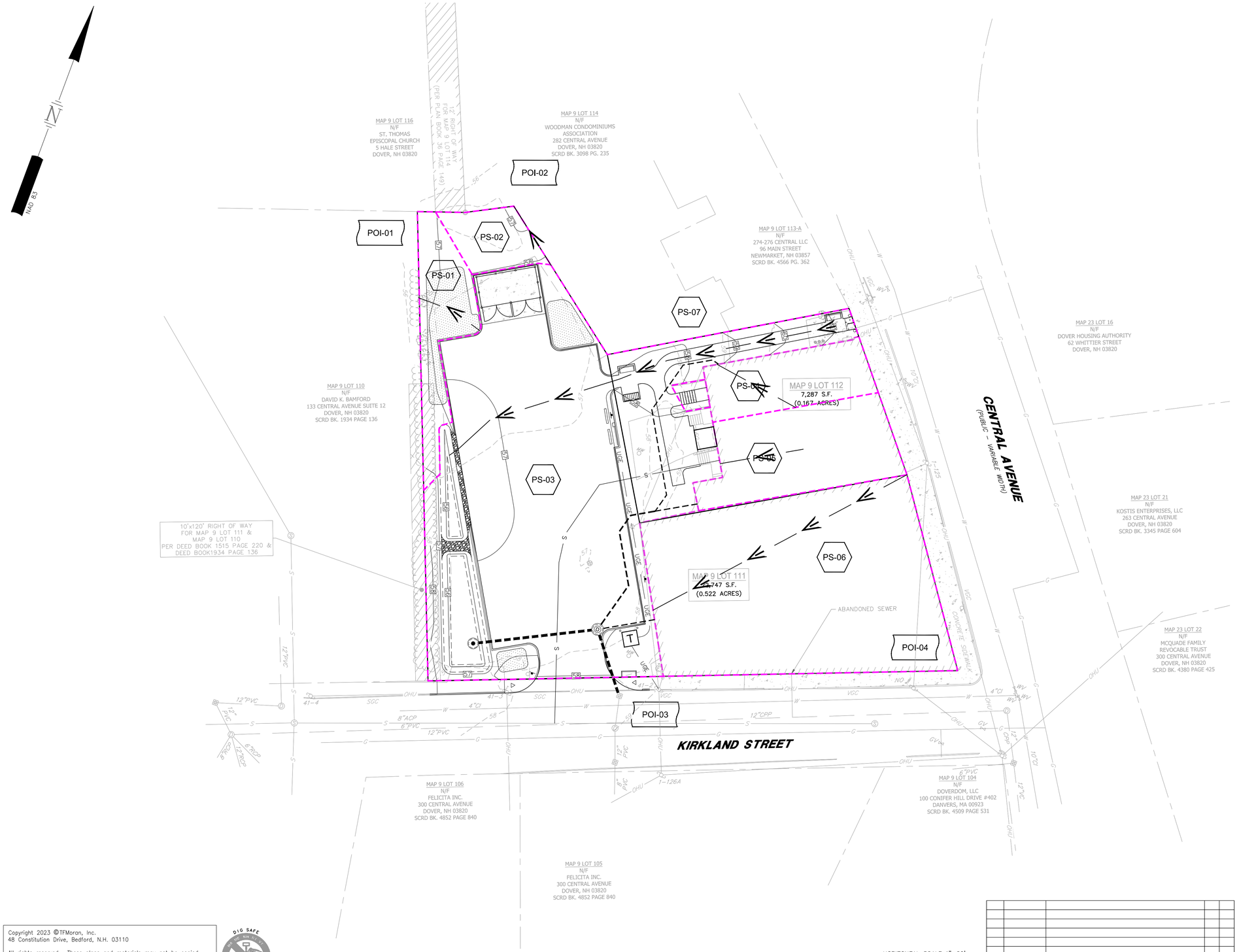
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Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
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Phone (603) 431-2222
Fax (603) 431-0910
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FILE					
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	CK	RR	CADFILE	47262-01 PRE-DEV DRAINAGE	

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LEGEND

- PROPERTY LINE
- LIMITS OF DRAINAGE SUBCATCHMENT
- SOIL GROUP BREAKLINE
- FLOW PATH (Tc LINE)
- REACH
- POI-1 — POINT OF INTEREST
- PS-1 — SUBCATCHMENT AREA
- PP-1 — POND, CULVERT, OR CATCH BASIN
- PR-1 — REACH

SOIL PHASE LEGEND (PERCENT)

A	B	C	D	E	F
0–3	3–8	8–15	15–25	25–50	50+

SOIL LEGEND (PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP	DRAINAGE CLASS
BzB	BUXTON SILT LOAM, 3% – 8% SLOPES	NONE	MODERATELY WELL DRAINED

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

POST-DEVELOPMENT DRAINAGE MAP

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

1"=40' (11"X17")

SCALE: 1"=20' (22"X34") **AUGUST 31, 2023**

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FILE	DR	JKC	FB	–	
47262.01	CK	CRR	CADFILE	47262-01 POST-DEV DRAINAGE	D-02

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PROPOSED SITE IMPROVEMENTS

256 & 264 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE

AUGUST 31, 2023
(LAST REVISED OCTOBER 24, 2023)

GENERAL INFORMATION

OWNER
MAP 9 LOT 111
256-264 CENTRAL AVENUE, LLC
96 MAIN STREET
NEWMARKET, NH 03857

MAP 9 LOT 112
256-264 CENTRAL AVENUE, LLC
96 MAIN STREET
NEWMARKET, NH 03857

APPLICANT/PREPARED FOR
256-264 CENTRAL AVENUE, LLC
96 MAIN STREET
NEWMARKET, NH 03857

RESOURCE LIST

PLANNING/ZONING DEPARTMENT
288 CENTRAL AVENUE
DOVER, NH 03820
(603) 516-6008
DONNA BENTON, AICP, DIRECTOR OF PLANNING AND COMMUNITY DEVELOPMENT

PUBLIC WORKS
271 MAST ROAD
DOVER, NH 03820
(603) 516-6450

ASSOCIATED PROFESSIONALS

LIGHTING DESIGN
EXPOSURE LIGHTING
501 ISLINGTON STREET, UNIT 1A
PORTSMOUTH, NH 03801
(603) 601-8080
KEN SWEENEY, APPLICATIONS ENGINEER

VICINITY PLAN



INDEX OF SHEETS

SHEET	SHEET TITLE
C-00	COVER
C-01	NOTES & LEGEND
S-01	EXISTING CONDITIONS PLAN
C-02	SITE LAYOUT PLAN
C-03	GRADING AND DRAINAGE PLAN
C-04	LIGHTING PLAN
C-05	LANDSCAPE PLAN
C-06	VEHICLE MOVEMENT PLAN
C-07 TO C-09	DETAILS

PERMITS/APPROVALS

	NUMBER	APPROVED	EXPIRES
DOVER PLANNING BOARD MINOR SITE PLAN REVIEW APPROVAL	SITE-2023-0013	-	-

OWNER'S SIGNATURE

THE PROPERTY WILL BE DEVELOPED IN ACCORDANCE WITH THIS PLAN AND THE ORDINANCES OF THE CITY OF DOVER, NEW HAMPSHIRE.

OWNER OR AUTHORIZED AGENT *DATE*

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

COVER

256 & 264 CENTRAL AVE
DOVER, NH

OWNED BY & PREPARED FOR
256-264 CENTRAL AVENUE, LLC

SCALE: NTS **AUGUST 31, 2023**

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REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
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Landscape Architects
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LEGEND

PROPOSED	
	PROPERTY LINE
	ZONING LINE
	EASEMENT
	BASELINE
	FLOODPLAIN
	EDGE OF WATERBODY
	EDGE OF WETLAND
	SETBACK (WETLAND)
	SETBACK (STRUCTURE)
	SETBACK (PARKING)
	SETBACK (LANDSCAPE)
	GRAVEL ROAD
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
CC	CONCRETE CURB
ICC	INTEGRATED CONCRETE CURB
BIT	BITUMINOUS ASPHALT CURB
CCB	CAPE COD BERM
	SAWCUT
	BUILDING
	BUILDING ROOF OVERHANG
	BUILDING FOUNDATION
	BUILDING ENTRANCE
	OVERHEAD DOOR
	TREE LINE
X X	FENCE (CHAIN LINK)
X X	FENCE (WIRE)
	FENCE (STOCKADE)
	GUARDRAIL
	STONE WALL
	RETAINING WALL
X X X	SILT FENCE
SS SS SS	SILT SOCK
XXXX	SOIL BOUNDARY
	LIMIT OF GRADING
100	CONTOUR
TC100.50 BC100.00 OR 100.00	SPOT GRADE
##	PARKING COUNT
DSLY	YELLOW DOUBLE SOLID LINE
SSLY	YELLOW SINGLE SOLID LINE
SSLW	WHITE SINGLE SOLID LINE
SBLW	WHITE SINGLE BROKEN LINE
STOP	STOP BAR
	CROSSWALK
	ACCESSIBLE PARKING SYMBOL
	PAVEMENT ARROW
	TRAFFIC FLOW ARROW (NOT PAINTED)
	SIGN (SINGLE POST)
	SIGN (DOUBLE POST)
	SIGN (PYLON)
	SIGN (MONUMENT)
	BOLLARD
D	DUMPSTER PAD

PROPOSED	
	CONCRETE
	GRAVEL
	HEAVY DUTY PAVEMENT
	CONSTRUCTION ENTRANCE
	SNOW STORAGE
	RIPRAP
	INLET PROTECTION
	FLOW ARROW
RIDGE	GRADE BREAK RIDGE
	DRAIN LINE
	DRAINAGE SWALE
	STORMWATER BMP
S	SEWER LINE
FM	SEWER FORCE MAIN LINE
W	WATER LINE
G	GAS LINE
OHE	OVERHEAD UTILITY LINE
UGE	UNDERGROUND UTILITY LINE
	CATCH BASIN
	DRAIN INLET
	OUTLET CONTROL STRUCTURE
	ROOF DRAIN
	DRAIN CLEANOUT
	DRAIN MANHOLE
	FARED END SECTION
	SEWER CLEAN OUT
S	SEWER MANHOLE
	SEWER VENT
	DRAIN/SEWER/WATER PLUG OR CAP
	HYDRANT
	FIRE DEPARTMENT CONNECTION
	WATER GATE VALVE
	WATER SHUTOFF
	THRUST BLOCK
W	WATER METER
W	WATER MANHOLE
W	WELL
	GAS GATE VALVE
	GAS SHUT OFF
G	GAS METER
T	TELEPHONE MANHOLE
E	ELECTRIC MANHOLE
	TRAFFIC CONTROL CABINET
	ELECTRIC HANDHOLE
	ELECTRIC PULL BOX
E	ELECTRIC METER
	FLOOD LIGHT
	LIGHT POLE
	UTILITY POLE
	GUY POLE
T	TRANSFORMER PAD
B-#	BORING LOCATION
TP-#	TEST PIT LOCATION
IT-#	INFILTRATION TEST LOCATION
MW-#	MONITORING WELL

ABBREVIATIONS

GENERAL

ABAN	ABANDON
AC	ACRES
ADJ	ADJUST
APPROX	APPROXIMATE
BC	BOTTOM OF CURB
BIT	BITUMINOUS
BK/PG	BOOK & PAGE
BLDG	BUILDING
BMP	BEST MANAGEMENT PRACTICE
BS	BOTTOM OF SLOPE
BW	BOTTOM OF WALL
CONC	CONCRETE
COORD	COORDINATE
DIA	DIAMETER
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
ESHWT	ESTIMATED SEASONAL HIGH WATER TABLE
EXIST	EXISTING
FFE	FINISHED FLOOR ELEVATION
FND	FOUNDATION
HP	HIGH POINT
INV	INVERT ELEVATION
INF	INFILTRATION TEST
L	LENGTH
LF	LINEAR FEET
LSA	LANDSCAPE AREA
MAX	MAXIMUM
MIN	MINIMUM
N/F	NOW OR FORMERLY
NHFG	NEW HAMPSHIRE FISH & GAME
NTS	NOT TO SCALE
OC	ON CENTER
PAVE	PAVEMENT
PERF	PERFORATED
PROP	PROPOSED
R	RADIUS
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
REM	REMOVE
RET	RETAIN
RIM	RIM ELEVATION
ROW	RIGHT OF WAY
S	SLOPE
SF	SQUARE FEET
SW	SIDEWALK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TP	TEST PIT
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
WCR	ACCESSIBLE WHEELCHAIR RAMP
W/	WITH

UTILITIES

CB	CATCH BASIN
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
COND	CONDUIT
DCB	DOUBLE CATCH BASIN
DIP	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FES	FLARED END SECTION
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
LP	LIGHT POLE
OCS	OUTLET CONTROL STRUCTURE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
SOS	SEDIMENT OIL SEPARATOR
TSV	TAPPING SLEEVE, VALVE, AND BOX
UP	UTILITY POLE

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DIG SAFE
811 OR 888-DIG-SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

GENERAL NOTES

1. THESE PLANS ARE PERMIT DRAWINGS ONLY AND HAVE NOT BEEN DETAILED FOR CONSTRUCTION OR BIDDING.
2. A PRE-CONSTRUCTION MEETING WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE CITY ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY. THE APPLICANT AND CONTRACTOR SHALL REVIEW THE DOVER CONSTRUCTION GUIDELINES PRIOR TO SCHEDULING THIS MEETING.
3. THESE PLANS WERE PREPARED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. TFMORAN, INC. ASSUMES NO LIABILITY AS A RESULT OF ANY CHANGES OR NON-CONFORMANCE WITH THESE PLANS EXCEPT UPON THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
4. ALL IMPROVEMENTS SHOWN ON THE SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE DOVER PLANNING BOARD.
5. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE CITY OF DOVER, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK TO CONFORM TO CITY OF DOVER DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS. ALL WORK WITHIN THE RIGHT-OF-WAY OF THE CITY AND/OR STATE SHALL COMPLY WITH APPLICABLE STANDARDS. COORDINATE ALL WORK WITHIN THE RIGHT-OF-WAY WITH APPROPRIATE CITY, COUNTY, AND/OR STATE AGENCY.
6. THE SITE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH APPLICABLE SECTIONS OF ENV-WQ 1500. THE SITE CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF CONSTRUCTION OF EACH STORMWATER FACILITY TO COORDINATE REQUIRED INSPECTIONS. THE CONTRACTOR SHALL TAKE PROGRESS PHOTOS DURING CONSTRUCTION OF ALL STORMWATER DRAINAGE COMPONENTS AND SEND TO THE ENGINEER.
7. THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS/ENTITIES THAT MAY ACQUIRE AND 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 RSE 477 AND 478. THE NOTICE NEED NOT SET FORTH REQUIREMENTS AT LENGTH, SO LONG AS IT IS SUFFICIENT TO PROVIDE NOTICE TO PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.
8. SEE EXISTING CONDITIONS PLAN FOR THE HORIZONTAL AND VERTICAL DATUM.
9. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION. VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.
10. CONTACT EASEMENT OWNERS PRIOR TO COMMENCING ANY WORK WITHIN THE EASEMENTS.
11. PRIOR TO COMMENCING ANY SITE WORK, ALL LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD.
12. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.
13. TFMORAN, INC. ASSUMES NO LIABILITY FOR WORK PERFORMED WITHOUT AN ACCEPTABLE PROGRAM OF TESTING AND INSPECTION AS APPROVED BY THE ENGINEER OF RECORD.
14. TEMPORARY FENCING SHALL BE PROVIDED AND COVERED WITH A FABRIC MATERIAL TO CONTROL DUST MITIGATION.
15. ALL DEMOLITION SHALL INSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKWAYS, AND ANY OTHER ADJACENT OPERATING FACILITIES. PRIOR WRITTEN PERMISSION FROM THE OWNER/DEVELOPER AND LOCAL PERMITTING AUTHORITY IS REQUIRED IF CLOSURE/OBSTRUCTIONS TO ROADS, STREET, WALKWAYS, AND OTHERS IS DEEMED NECESSARY. CONTRACTOR TO PROVIDE ALTERNATE ROUTES AROUND CLOSURES/OBSTRUCTIONS PER LOCAL/STATE/FEDERAL REGULATIONS.
16. REFER TO ARCHITECTURAL PLANS FOR LAYOUT OF BUILDING FOUNDATIONS AND CONCRETE ELEMENTS WHICH ABUT THE BUILDING SUCH AS STAIRS, SIDEWALKS, LOADING DOCK RAMPS, PADS, AND COMPACTOR PADS. DO NOT USE SITE PLANS FOR LAYOUT OF FOUNDATIONS.
17. IN THE EVENT OF A CONFLICT BETWEEN PLANS, SPECIFICATIONS, AND DETAILS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATION.
18. IF CONDITIONS AT THE SITE ARE DIFFERENT THAN SHOWN ON THE PLANS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED WORK.
19. CONTRACTOR'S GENERAL RESPONSIBILITIES:
    - A. BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE, AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS AND CONDITIONS OF ALL PROJECT-SPECIFIC PERMITS AND APPROVALS AS LISTED ON THE COVER SHEET TO THESE PLANS OR OTHERWISE REQUIRED.
    - B. NOTIFY ENGINEER IN WRITING OF ANY DISCREPANCIES OF PROPOSED LAYOUT AND/OR EXISTING FEATURES.
    - C. EMPLOY A LICENSED SURVEYOR TO DETERMINE ALL LINES AND GRADES AND LAYOUT OF SITE ELEMENTS AND BUILDINGS.
    - D. THE CONTRACTOR SHALL BE RESPONSIBLE TO BECOME FAMILIAR WITH THE SITE AND ALL SURROUNDING CONDITIONS. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
    - E. TAKE APPROPRIATE MEASURES TO REDUCE, TO THE FULLEST EXTENT POSSIBLE, NOISE, DUST, AND UNSIGHTLY DEBRIS. CONSTRUCTION ACTIVITIES SHALL BE CARRIED OUT ON MONDAY-FRIDAY FROM 7AM TO 6PM AND SATURDAY-SUNDAY FROM 9AM TO 4PM IN ACCORDANCE WITH THE APPLICABLE MUNICIPAL ORDINANCES AND REGULATIONS OF THE CITY OF DOVER, NEW HAMPSHIRE. HOURS OF CONSTRUCTION MUST BE LOCATED ON SITE AND APPROVED BY THE CITY ENGINEER OR PLANNING DIRECTOR.
    - F. MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
    - G. IN ACCORDANCE WITH RSA 430:53 AND AGR 3800, THE CONTRACTOR SHALL NOT TRANSPORT INVASIVE SPECIES OFF THE PROPERTY, AND SHALL DISPOSE OF INVASIVE SPECIES ON-SITE IN A LEGAL MANNER.
    - H. COORDINATE WITH ALL UTILITY COMPANIES AND CONTACT DIGSAFE (811 OR 888-344-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
    - I. PROTECT NEW AND EXISTING BURIED UTILITIES DURING INSTALLATION OF ALL SITE ELEMENTS. DAMAGED UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
    - J. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY TFMORAN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
    - K. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
    - L. IF ANY DEVIATIONS FROM THE APPROVED PLANS AND SPECIFICATIONS HAVE BEEN MADE, THE SITE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS STAMPED BY A LICENSED SURVEYOR OR QUALIFIED ENGINEER ALONG WITH A LETTER STAMPED BY A QUALIFIED ENGINEER DESCRIBING ALL SUCH DEVIATIONS, AND BEAR ALL COSTS FOR PREPARING AND FILING ANY NEW PERMITS OR PERMIT AMENDMENTS THAT MAY BE REQUIRED.
    - M. AT COMPLETION OF CONSTRUCTION, THE SITE CONTRACTOR SHALL PROVIDE A LETTER CERTIFYING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND A LETTER STAMPED BY A QUALIFIED ENGINEER THAT THEY HAVE OBSERVED ALL UNDERGROUND DETENTION SYSTEMS, INFILTRATION SYSTEMS, OR FILTERING SYSTEMS PRIOR TO BACKFILL, AND THAT SUCH SYSTEMS CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS.
    - N. COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

GRADING & DRAINAGE NOTES

1. THE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF NHDES ENV-WQ 1500 AS APPLICABLE.
2. APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK THE ACCURACY OF THE TOPOGRAPHY AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ANY EARTHWORK BEING PERFORMED ON THE SITE. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED FOR PAYMENT AFTER EARTHWORK HAS COMMENCED.
4. COORDINATE WITH ARCHITECTURAL PLANS FOR DETAILED GRADING AT BUILDING, AND SIZE AND LOCATION OF ALL BUILDING SERVICES.
5. COORDINATE WITH MECHANICAL AND PLUMBING PLANS FOR ROOF DRAIN INFORMATION.
6. LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, SIDEWALKS, AND ALIGNMENTS.
7. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE, RAMPS, AND LOADING AREAS.
8. THE SITE SHALL BE GRADED SO ALL FINISHED PAVEMENT HAS POSITIVE DRAINAGE AND SHALL NOT POND WATER DEEPER THAN 1/4" FOR A PERIOD OF MORE THAN 15 MINUTES AFTER FLOODING.
9. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
10. ALL SIDEWALK AND OTHER CURB REVEALS SHALL BE 6" WITH A TOLERANCE OF PLUS OR MINUS 3/8". WHERE SIDEWALK IS TO BE FLUSH, THE PAVEMENT REVEAL SHALL BE 1/4" WITH A TOLERANCE OF 1/8".
11. THE FINISHED GRADE AT BOTTOM OF ALL ACCESSIBLE RAMPS SHALL BE FLUSH WITH PAVEMENT WITH A TOLERANCE OF PLUS OR MINUS 1/4".
12. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE PRIOR TO INSTALLATION OF FINISHED PAVEMENT.
13. ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS AND SHALL MEET LOCAL STANDARDS AND THE REQUIREMENTS OF THE LATEST NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION AND THE NHDOT STANDARD STRUCTURE DRAWINGS UNLESS OTHERWISE NOTED.
14. STORMWATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED TO LINE AND GRADE AS SHOWN ON THE PLANS. CONSTRUCTION METHODS SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS, SECTION 603. CATCH BASINS AND DRAIN MANHOLES SHALL CONFORM TO SECTION 604. ALL CATCH BASIN GRATES SHALL BE TYPE B AND CONFORM TO NHDOT STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
15. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
16. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER, AND MULCH.
17. DENSITY REQUIREMENTS:

MINIMUM DENSITY*	LOCATION
95%	BELOW PAVED OR CONCRETE AREAS
95%	TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL
90%	BELOW LOAM AND SEED AREAS

*ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C. FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM D-6938.

UTILITY NOTES

1. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
2. ALL PROPOSED UTILITY WORK, INCLUDING MATERIAL, INSTALLATION, TERMINATION, EXCAVATION, BEDDING, BACKFILL, COMPACTION, TESTING, CONNECTIONS, AND CONSTRUCTION SHALL BE COORDINATED WITH AND COMPLETED IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS, CODES, AND STANDARDS OF ALL CORRESPONDING UTILITY ENTITIES AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.
4. COORDINATE ALL WORK ADJACENT TO PROPOSED BUILDINGS WITH ARCHITECTURAL BUILDING DRAWINGS. CONFIRM UTILITY PENETRATIONS AND INVERT ELEVATIONS ARE COORDINATED PRIOR TO INSTALLATION.
5. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
6. THE EXACT LOCATION OF NEW UTILITY CONNECTIONS SHALL BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH UTILITY COMPANY, COUNTY AGENCY, AND/OR PRIVATE UTILITY COMPANY.
7. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE UTILITY INSTALLATION COMPLETE AND OPERATIONAL.
8. ALL UTILITY COMPANIES REQUIRE INDIVIDUAL CONDUITS. CONTRACTOR TO COORDINATE WITH TELEPHONE, CABLE, AND ELECTRIC COMPANIES REGARDING NUMBER, SIZE, AND TYPE OF CONDUITS REQUIRED PRIOR TO INSTALLATION OF ANY CONDUIT.
9. SANITARY SEWER SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATIONS AS SHOWN ON THESE PLANS. ALL SEWER MAINS AND FITTINGS SHALL BE PVC AND SHALL CONFORM TO ASTM F 679 (SDR 35 MINIMUM). FORCE MAINS AND FITTINGS SHALL CONFORM TO NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. SANITARY MANHOLES SHALL CONFORM TO NHDES WATER DIVISION WASTEWATER ENGINEERING BUREAU STANDARDS AND SPECIFICATIONS SHOWN HEREON.
10. ON-SITE WATER DISTRIBUTION SHALL BE TO CITY OF DOVER STANDARDS AND SPECIFICATIONS. WATER MAINS SHALL HAVE A MINIMUM OF 5.5' COVER. WHERE WATER PIPES CROSS SEWER LINES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. HORIZONTAL SEPARATION BETWEEN WATER AND SEWER SHALL BE 10' MINIMUM. WHERE A SANITARY LINE CROSSES A WATER LINE, SEWER LINE MUST BE CONSTRUCTED OF FORCE MAIN MATERIALS (PER ENV-WQ 704.08) FROM BUILDING OR MANHOLE TO MANHOLE, OR SUBSTITUTE RUBBER-GASKETED PRESSURE PIPE FOR THE SAME DISTANCE. WHEN SANITARY LINES PASS BELOW WATER LINES, LAY PIPE SO THAT NO JOINT IN THE SANITARY LINE WILL BE CLOSER THAN 6' HORIZONTALLY TO THE WATER LINE.
11. THRUST BLOCKS SHALL BE PROVIDED AT ALL LOCATIONS WHERE WATER LINE CHANGES DIRECTIONS OR CONNECTS TO ANOTHER WATER LINE.
12. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONDUIT AND WIRING TO ALL SIGNS AND LIGHTS. CONDUIT TO BE A MINIMUM OF 24" BELOW FINISH GRADE.
13. ALL PROPOSED UTILITIES SHALL BE UNDERGROUND. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES.
14. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL INSPECTIONS, TESTING, AND RELATED SERVICES AND SUBMIT COPIES OF ACCEPTANCE TO THE OWNER, UNLESS OTHERWISE INDICATED.
15. PROVIDE PERMANENT PAVEMENT REPAIR FOR ALL UTILITY TRENCHES IN EXISTING ROAD OR PAVEMENT TO REMAIN. SAW CUT TRENCH, PAVEMENT, AND GRANULAR BASE THICKNESS TO MATCH EXISTING PAVEMENT. OBTAIN ALL PERMITS REQUIRED FOR TRENCHING.
16. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND STRUCTURES, PIPES, CHAMBERS, ETC. SHALL BE COVERED WITH A MINIMUM OF 18" OF COMPACTED SOIL BEFORE EXPOSURE TO VEHICLE LOADS.
17. APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR BOTH FIRE AND DOMESTIC WATER LINES.
18. THE 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.
19. 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.
20. 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.
21. THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:

DRAINAGE	MUNICIPAL
SEWER	MUNICIPAL
WATER	MUNICIPAL
GAS	NOT AVAILABLE
ELECTRIC	EVERSOURCE
TELEPHONE	CONSOLIDATED COMMUNICATIONS
CABLE	COMCAST XFINITY

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

NOTES & LEGEND

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

AUGUST 31, 2023

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

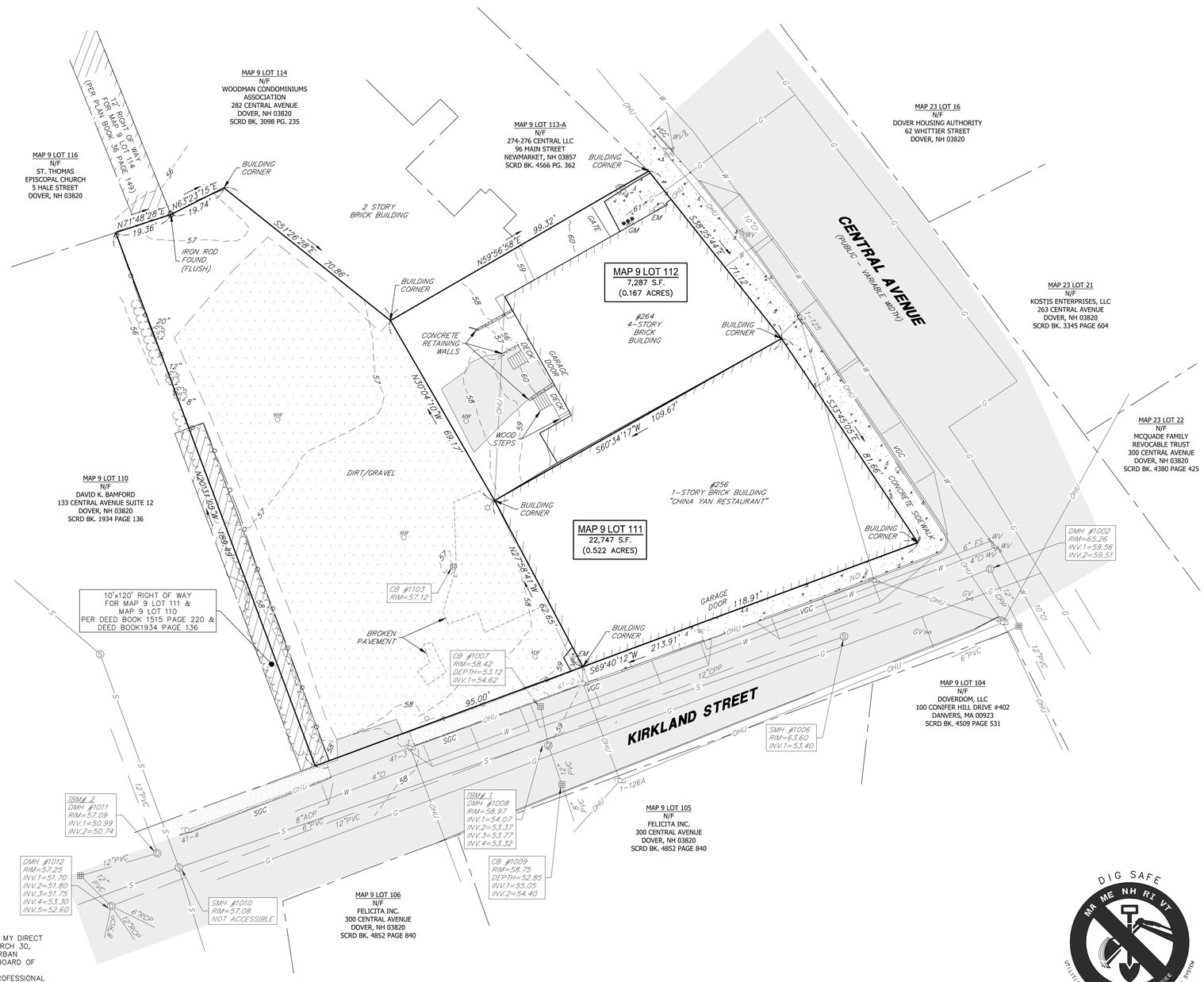
Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
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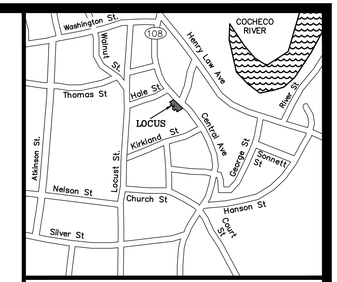
FILE	DR	JKC	FB	–	
47262.01	CK	CRR	CADFILE	47262-01 LEGEND	C-01

Nov 06, 2023 - 12:40pm
F:\MSC Projects\47262 - Central Avenue - Dover\47262-01 256 & 264 Central Avenue, Dover, NH\Design\PRODUCTION DRAWINGS\47262-01 Legend.dwg

LEGEND:

MAP 9 LOT 111 & 112	ASSESSORS MAP/ LOT NUMBER
ACP	ASBESTOS CONCRETE PIPE
A.G.	ABOVE GRADE
BK. PG.	BOOK/PAGE
CPP	CORRUGATED PLASTIC PIPE
DMH	DRAIN MANHOLE
EP	EDGE OF PAVEMENT
FF	FINISHED FLOOR
FS	FIRE SERVICE
GREG	GAS REGULATOR
INVERT	
N/F	NOW OR FORMERLY
PVC	POLYVINYL CHLORIDE
SCRD	STRAFFORD COUNTY REGISTRY OF DEEDS
RCP	REINFORCED CONCRETE PIPE
S.F.	SQUARE FEET
SMH	SEWER MANHOLE
TBM	TEMPORARY BENCHMARK
UP	UTILITY POLE
VGC	VERTICAL GRANITE CURB
	GM (GAS METER)
	IRON PIPE/ROD FOUND
	BOLLARD
	EM (ELECTRIC METER)
	LIGHT POLE
	UTILITY POLE
	ELECTRIC MANHOLE
	CATCH BASIN
	CB (CATCH BASIN ROUND)
	DECIDUOUS TREE
	SEWER MANHOLE
	HYDRANT
MW	MONITORING WELL
WV	WATER GATE VALVE
	SIGN
	CHAIN LINK FENCE
OHU	OVERHEAD UTILITIES
	APPROXIMATE ABUTTER LINE
	BOUNDARY LINE
	SETBACK LINE
	TREE LINE
D	DRAIN LINE
S	SEWER LINE
G	GAS LINE
W	WATER LINE
60	EXISTING CONTOUR
	ASPHALT
	CONCRETE
	GRAVEL
	EASEMENT
	PAVEMENT





LOCATION PLAN

NOTES:

1. THE PARCELS ARE LOCATED IN THE GENERAL CENTRAL BUSINESS (CBD) ZONING DISTRICT.
2. THE PARCELS ARE SHOWN ON THE CITY OF DOVER ASSESSOR'S MAP 9 AS LOTS 111 & 112.
3. THE PARCELS ARE LOCATED IN ZONE X, AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) STRAFFORD COUNTY, NEW HAMPSHIRE, PANEL 330 OF 405, MAP NUMBER 33017C0330E, MAP REVISED SEPTEMBER 30, 2015.
4. DIMENSIONAL REQUIREMENTS:

	REQUIRED:
LOT SIZE:	N/A
FRONTAGE BUILD-OUT:	70% MIN.
MINIMUM YARD DIMENSIONS:	
FRONT:	XXX'
SIDE:	0' MIN.-24' MAX.
REAR:	10' MIN.
MAXIMUM STRUCTURE DIMENSIONS:	
PRINCIPAL BUILDING HEIGHT:	5 STORY MAX., 2 STORY MIN.
LOT COVERAGE:	75%

5. OWNER OF RECORD:
   MAP 9 LOTS 111 & 112:
   256-264 CENTRAL, LLC
   96 MAIN STREET
   NEWMARKET, NH 03857
   SCRD BK#5117 PG#240
6. PARCEL AREA:

MAP 9 LOT 111:	MAP 9 LOT 112:
22,747 S.F.	7,287 S.F.
(0.522 ACRES)	(0.167 ACRES)

7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE BOUNDARY LINES, LIMITED TOPOGRAPHY AND CURRENT SITE FEATURES OF MAP 9 LOTS 111 & 112.
9. FIELD SURVEY COMPLETED BY TCE IN MARCH, 2023 USING A LIECA TS-16 AND CARLSON SURVPC DATA COLLECTION SOFTWARE.
10. HORIZONTAL DATUM IS NAD83 (2011) PER STATIC GPS OBSERVATIONS. THE VERTICAL DATUM IS NAVD88 PER STATIC GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 1 FOOT.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE STRAFFORD COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

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I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY THOSE UNDER MY DIRECT SUPERVISION AND ARE THE RESULT OF A FIELD SURVEY CONDUCTED ON MARCH 30, 2023. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, AND THE FIELD TRAVERSE SURVEY EXCEEDS A PRECISION OF 1:15,000.

STATE OF NEW HAMPSHIRE — No. 01037 — BRENDA M. KOLBOW — LICENSED LAND SURVEYOR
Brenda M. Kolbow
SIGNATURE

LICENSED LAND SURVEYOR

2023-10-24
DATE

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CALL 811 TOLL FREE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

20 10 0 20
Graphic Scale in Feet

REV.	DATE	DESCRIPTION	DR	CK
1	10/24/2023	ADDED WATER LINES	RJB	BMK

TAX MAP 9 LOTS 111 & 112

EXISTING CONDITIONS PLAN

256-264 CENTRAL, LLC

256 & 264 CENTRAL AVENUE

DOVER, NEW HAMPSHIRE

COUNTY OF STRAFFORD

OWNED BY

256-264 CENTRAL, LLC

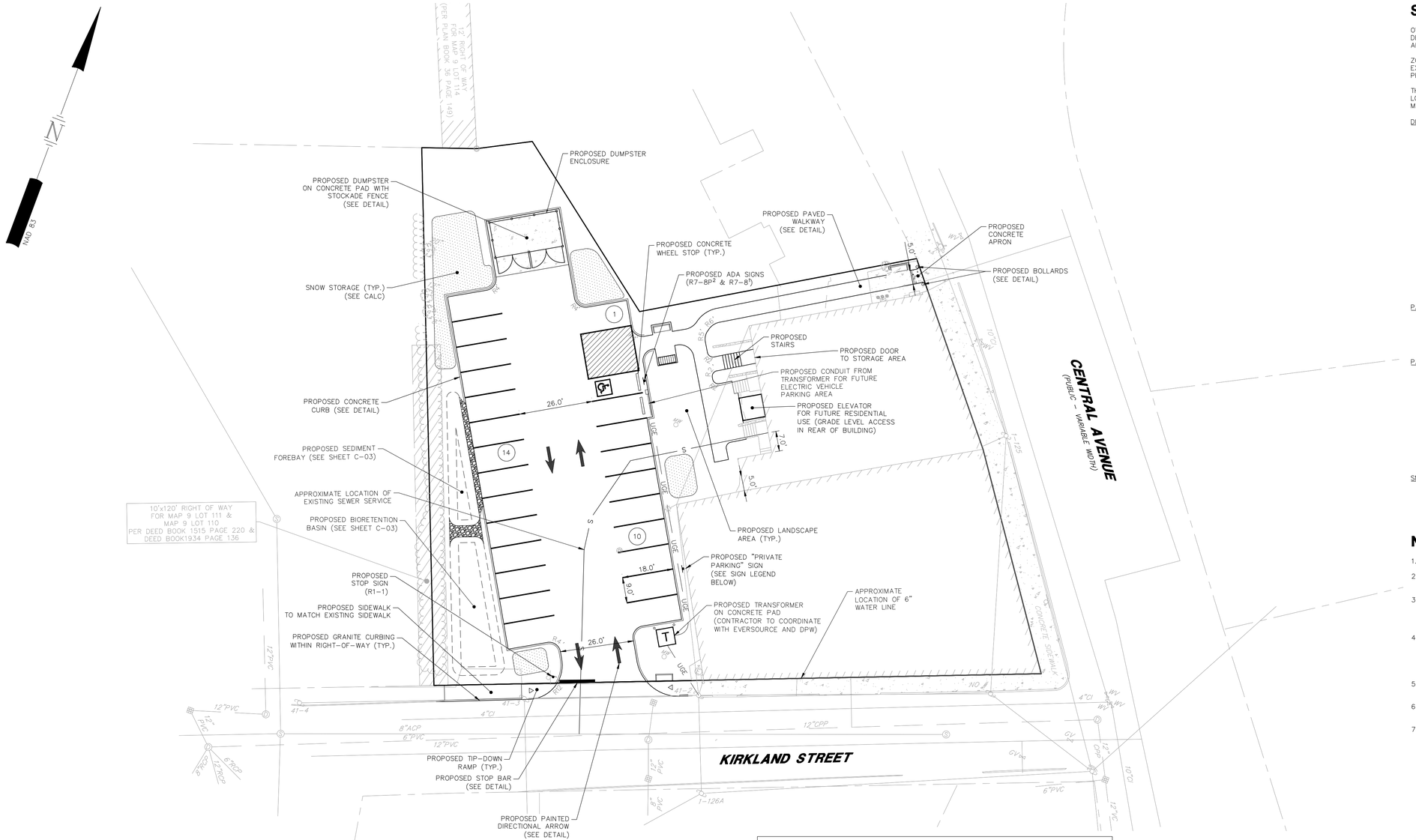
SCALE: 1" = 20' (22x34)
1" = 40' (11x17)

SEPTEMBER 1, 2023

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
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FILE	DR	BMK	FB	558	
47262-01	CK	JCC	CADFILE		S-1

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SITE DATA

OWNER OF RECORD OF MAP 09 LOTS 111 & 112: 256-264 CENTRAL AVENUE, LLC
DEED REFERENCE TO PARCEL IS BK 5117 PG 240
AREA OF PARCELS = 30,034± SF OR 0.689± ACRES

ZONED: CBD-G
EXISTING USE: COMMERCIAL
PROPOSED USE: COMMERCIAL

THE PURPOSE OF THIS PLAN IS TO DEPICT PROPOSED WORK TO PAVE AND STRIPE THE EXISTING PARKING LOT. ASSOCIATED IMPROVEMENTS INCLUDE AND ARE NOT LIMITED TO ACCESS, GRADING, STORMWATER MANAGEMENT, LIGHTING, LANDSCAPING, AND UTILITIES.

DIMENSIONAL REQUIREMENTS (CURRENT ZONING)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
LOT AREA	N/A SF	30,034 SF (0.689± AC)
LOT FRONTAGE	N/A FT	213.9 FT (MAP 9 LOT 111) 71 FT (MAP 9 LOT 112)
DEPTH	N/A FT	214 FT (MAP 9 LOT 111) 99 FT (MAP 9 LOT 112)
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT	2-5 STORIES	2-5 STORIES
LOT COVERAGE	75%	79% (MAP 9 LOT 111) 87% (EXISTING LOT 111) 71% (MAP 9 LOT 112) 70% (EXISTING LOT 112)
SETBACKS/BUFFER:		
BUILDING FRONT	BUILD TO LINE	0 FT
BUILDING SIDE (MAX)	24 FT	0 FT
BUILDING REAR (MIN)	10 FT	95 FT (MAP 9 LOT 111) 24 FT (MAP 9 LOT 112)

PARKING REQUIREMENTS

PARKING SPACES (SEE CALCULATION)	25 SPACES	25 SPACES
ACCESSIBLE SPACES (REQ'D BY ADA)	1 SPACE	1 SPACE
PARKING SPACE SIZE	9 FT X 18 FT	9 FT X 18 FT
AISLE WIDTH	22 FT	30 FT

PARKING CALCULATIONS

REQUIRED PARKING RATIO:
RETAIL/SERVICE*: 1 SPACE PER 275 S.F. OF GROSS LEASABLE AREA
OFFICE: 1 SPACE PER 300 S.F. OF GROSS LEASABLE AREA
RESIDENTIAL: 1.25 SPACES PER UNIT AND 0.4 VISITOR SPACES PER UNIT
*WHERE COMMERCIAL AND RESIDENTIAL USES ARE CO-LOCATED, ONLY THE RESIDENTIAL PARKING SHALL BE REQUIRED.

TOTAL REQUIRED =		
3,112 S.F. * 1 SPACE/300 S.F.	= 10	SPACES +
9 UNITS * 1.25 SPACES/UNIT+0.4 VISITOR SPACED PER UNIT	= 15	SPACES
TOTAL	= 25	SPACES

SNOW STORAGE

TOTAL SNOW STORAGE REQUIRED:
1 SF OF STORAGE AREA / 10 SF OF PAVED CLEARING AREA
10,072 SF OF CLEARING AREA X 1SF / 10 SF = 1,007 SF REQUIRED

TOTAL SNOW STORAGE PROVIDED: 1,166 SF

NOTES

1. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
2. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE DOVER ZONING ORDINANCE AND SITE PLAN REGULATIONS.
3. SNOW SHALL NOT BE STOCKPILED IN STORMWATER BMP'S. SEE SNOW STORAGE LOCATIONS. IN THE EVENT THAT THE SNOW STORAGE AREAS PROVIDED ON THE SITE ARE COMPLETELY UTILIZED, EXCESS SNOW SHALL BE TRANSPORTED OFF SITE FOR DISPOSAL IN ACCORDANCE WITH NHDES REGULATION. IF SNOW IS STORED WITHIN PARKING AREA, KEEP CATCH BASINS CLEAR.
4. THE PARKING LOT AND ASSOCIATED IMPROVEMENTS CONSIST OF PHASE ONE OF THE PROJECT. PHASE TWO INVOLVES RENOVATION OF THE EXISTING BUILDINGS LOCATED AT BOTH 256 & 264 CENTRAL AVENUE. THE FUTURE BUILDING WILL CONSIST OF COMMERCIAL ON THE FIRST FLOOR, OFFICE SPACE ON THE SECOND FLOOR, AND RESIDENTIAL UNITS ON THE THIRD AND FOURTH FLOORS.
5. ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.
6. A SECURITY SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 45, ARTICLE I, SECTION 45-2 OF THE CODE OF THE CITY OF DOVER.
7. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE RENOVATIONS WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. (I.E. IBC, ANSI-117.1) AND NH RSA 155-A:5.

SIGN LEGEND

ID	SIGN	SIZE (INCHES) WIDTH	SIZE (INCHES) HEIGHT	DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
R1-1	STOP	30	30	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	1
R7-81	RESERVED PARKING	12	18		1
R7-8P2	VAN ACCESSIBLE	18	9		1
	PRIVATE PARKING VIOLATORS WILL BE TOWED AT OWNERS EXPENSE	12	18		3

NOTE:
1. ACCESSIBLE PARKING SIGNS SHALL BE IN ACCORDANCE WITH CITY OF DOVER STANDARDS AND ADA REGULATIONS.
2. PER ADA STANDARDS, A "VAN ACCESSIBLE" PLAQUE DOES NOT RESTRICT USE OF ACCESSIBLE SPACES TO VAN USERS ONLY.

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

SITE LAYOUT PLAN

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

AUGUST 31, 2023

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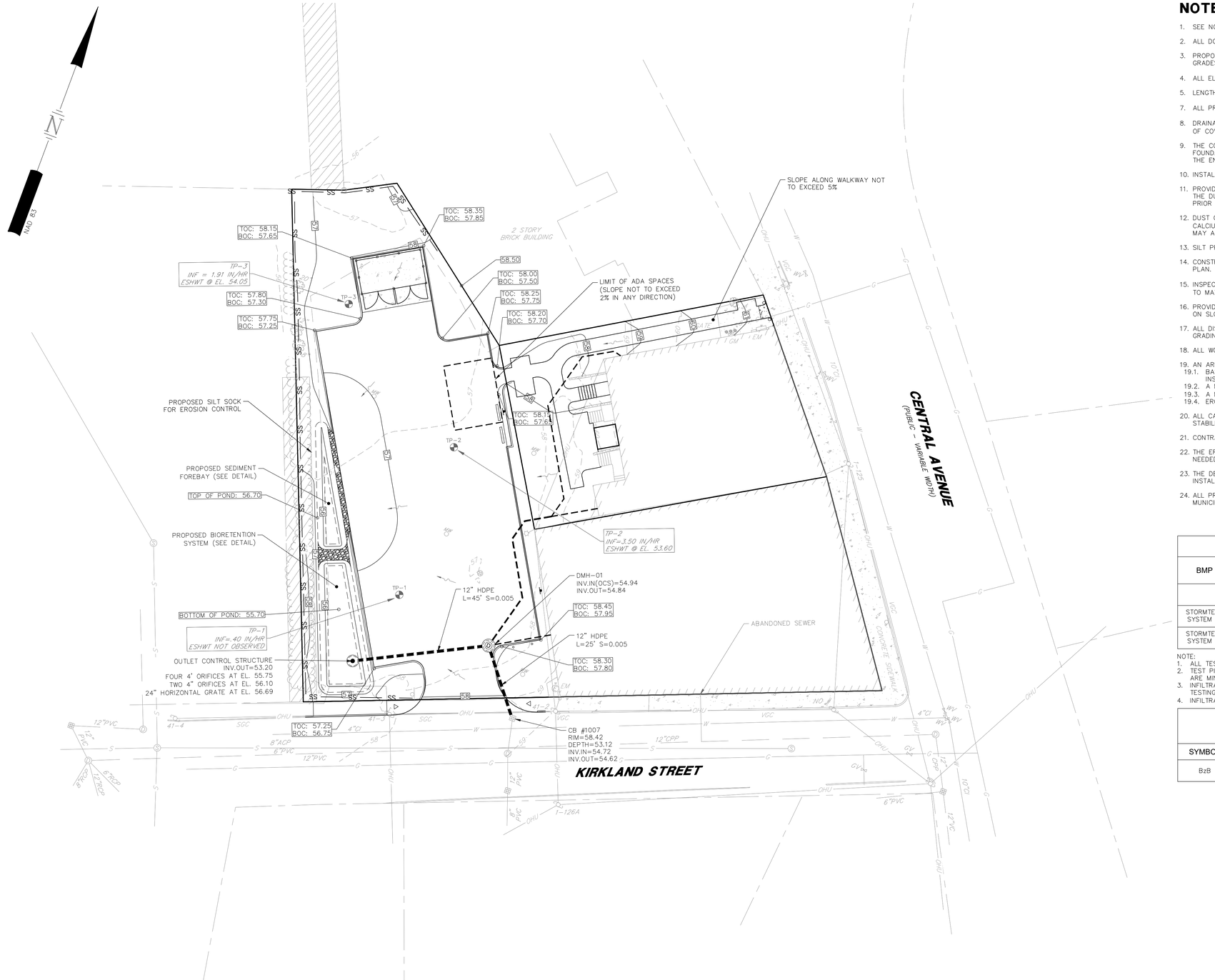
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FILE	DR	CK	FB	CADFILE	
47262.01	JKC	CRR	–	47262-01 SITE LAYOUT (DESIGN 2)	C-02

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NOTES

1. SEE NOTES ON SHEET C-01.
2. ALL DOORS AND GARAGE ENTRANCES SHALL BE AT FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED.
3. PROPOSED SPOT GRADES ARE PROVIDED TO THE NEAREST 0.05. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE FINISHED GRADES MEET ADA STANDARDS FOR WHEEL CHAIR RAMPS, HANDICAP SPACES AND ACCESS AISLES, CROSSWALKS, SIDEWALKS, ETC.
4. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
5. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
7. ALL PROPOSED DRAINAGE PIPES SHALL BE 12" AND HDPE, UNLESS OTHERWISE NOTED ON THE PLAN.
8. DRAINAGE PIPES WITH LESS THAN 3' COVER SHALL BE INSULATED (SEE UTILITY TRENCH DETAIL) AND DRAINAGE CATCH BASINS WITH LESS THAN 3.5' OF COVER OVER INVERTS SHALL USE SLAB TOP CATCH BASIN (SEE DETAILS).
9. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT AND ARCHITECTURAL PLANS FOR SUBDRAINAGE SYSTEMS FOR THE BUILDING FOUNDATION. SUBDRAINAGE MUST DAYLIGHT OR TIE INTO THE STORMWATER MANAGEMENT SYSTEM. COORDINATE SUBDRAINAGE SYSMTEM DESIGN WITH THE ENGINEER OF RECORD.
10. INSTALL SILT BARRIER ALONG THE PERIMETER OF THE AREA TO BE DISTURBED AS FIRST ORDER OF WORK.
11. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED. INLET PROTECTION BARRIERS SHALL BE IN PLACE AT ALL CATCH BASINS PRIOR TO THE DISTURBANCE OF SOIL.
12. DUST CONTROL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. IT SHALL BE ACCOMPLISHED BY THE UNIFORM APPLICATION OF CALCIUM CHLORIDE AT THE RATE OF 1-1/2 POUNDS PER SQUARE YARD BY MEANS OF A LIME SPREADER OR OTHER APPROVED METHOD. WATER MAY ALSO BE USED FOR DUST CONTROL, AND APPLIED BY SPRINKLING WITH WATER TRUCK DISTRIBUTORS, AS REQUIRED.
13. SILT PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS CONTAINED IN THIS PLAN SET.
14. CONSTRUCT JUTE MATTING ON ALL SLOPES STEEPER THAN 3:1, DISTURBED AREAS SLOPING TOWARDS WETLANDS AND ALL LOCATIONS SHOWN ON PLAN.
15. INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EACH RAIN STORM OF 0.10" OR GREATER. REPAIR/MODIFY SILT BARRIER AS NECESSARY TO MAXIMIZE FILTER EFFICIENCY. REMOVE SEDIMENT WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
16. PROVIDE SILT BARRIERS AT THE BASE OF CUT AND FILL SLOPES UNTIL COMPLETION OF THE PROJECT OR UNTIL VEGETATION BECOMES ESTABLISHED ON SLOPES. EROSION PROTECTION BELOW FILL SLOPES SHALL BE PLACED IMMEDIATELY AFTER CLEARING, PRIOR TO EMBANKMENT CONSTRUCTION.
17. ALL DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
18. ALL WORK AREAS TO BE STABILIZED AT THE END OF EACH WORK DAY AND PRIOR TO ANY PREDICTED SIGNIFICANT RAIN EVENT.
19. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    - 19.1. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, ARE INSTALLED IN AREAS TO BE PAVED
    - 19.2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
    - 19.3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED
    - 19.4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
20. ALL CATCH BASINS, MANHOLES, AND DRAIN LINES SHALL BE THOROUGHLY CLEANED OF ALL SEDIMENT AND DEBRIS AFTER ALL AREAS HAVE BEEN STABILIZED.
21. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY DURING CONSTRUCTION.
22. THE EROSION CONTROL PRACTICES SHOWN ON THESE PLANS ARE ILLUSTRATIVE ONLY AND SHALL BE SUPPLEMENTED BY THE SITE CONTRACTOR AS NEEDED.
23. THE DESIGN ENGINEER SHALL PROVIDE A SIGNED LETTER TO THE CITY ENGINEER CERTIFYING THAT THE STORMWATER MANAGEMENT SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS.
24. ALL PROPOSED ROOF DRAINS AND SUMP PUMPS SHALL TIE INTO THE MUNICIPAL DRAINAGE SYSTEM. ALL EXISTING STORMWATER CONNECTIONS TO MUNICIPAL SEWER MUST BE REMOVED.

TEST PIT & INFILTRATION TEST

BMP	TEST PIT #	APPROX GROUND	BOTTOM OF POND	INFILTRATION TEST		TEST PIT	
		ELEV	ELEV	ELEV	DEPTH	ELEV	DEPTH (MIN)
STORMTECH SYSTEM #1	1	57.25	54.60	54.25	3.0'	52.91	4.33'
STORMTECH SYSTEM #1	2	57.10	54.60	54.00	3.1'	52.43	4.67'

NOTE:
1. ALL TEST PITS ARE TO BE TESTED FOR INFILTRATION RATES AT THE GIVEN INFILTRATION ELEVATIONS.
2. TEST PITS ARE TO BE EXCAVATED UNTIL SEASONAL HIGH WATER TABLE OR THE LOCATION OF LEDGE IS ENCOUNTERED. TEST PIT DEPTHS LISTED ARE MINIMUM DEPTHS. IF SEASONAL HIGH WATER OR LEDGE ARE ENCOUNTERED, THE TEST PIT CAN BE STOPPED.
3. INFILTRATION TESTS ARE FOR INFILTRATION ONLY. THEY CAN BE DISCONTINUED IF SEASONAL HIGH WATER OR LEDGE IS ENCOUNTERED WITHIN THE TESTING RANGE FOR THE INFILTRATION.
4. INFILTRATION TESTS SHALL BE PERFORMED ACCORDING TO ENV-WQ 1504.14 (e) [AoT STANDARDS].

SOIL LEGEND (PER NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
BzB	BUXTON SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

GRADING & DRAINAGE PLAN

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

HORIZONTAL SCALE 1"=20'
20 10 0 20

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

AUGUST 31, 2023

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

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TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
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Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
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47262.01	CK	CRR	CADFILE	47262-01 GRADING	C-03

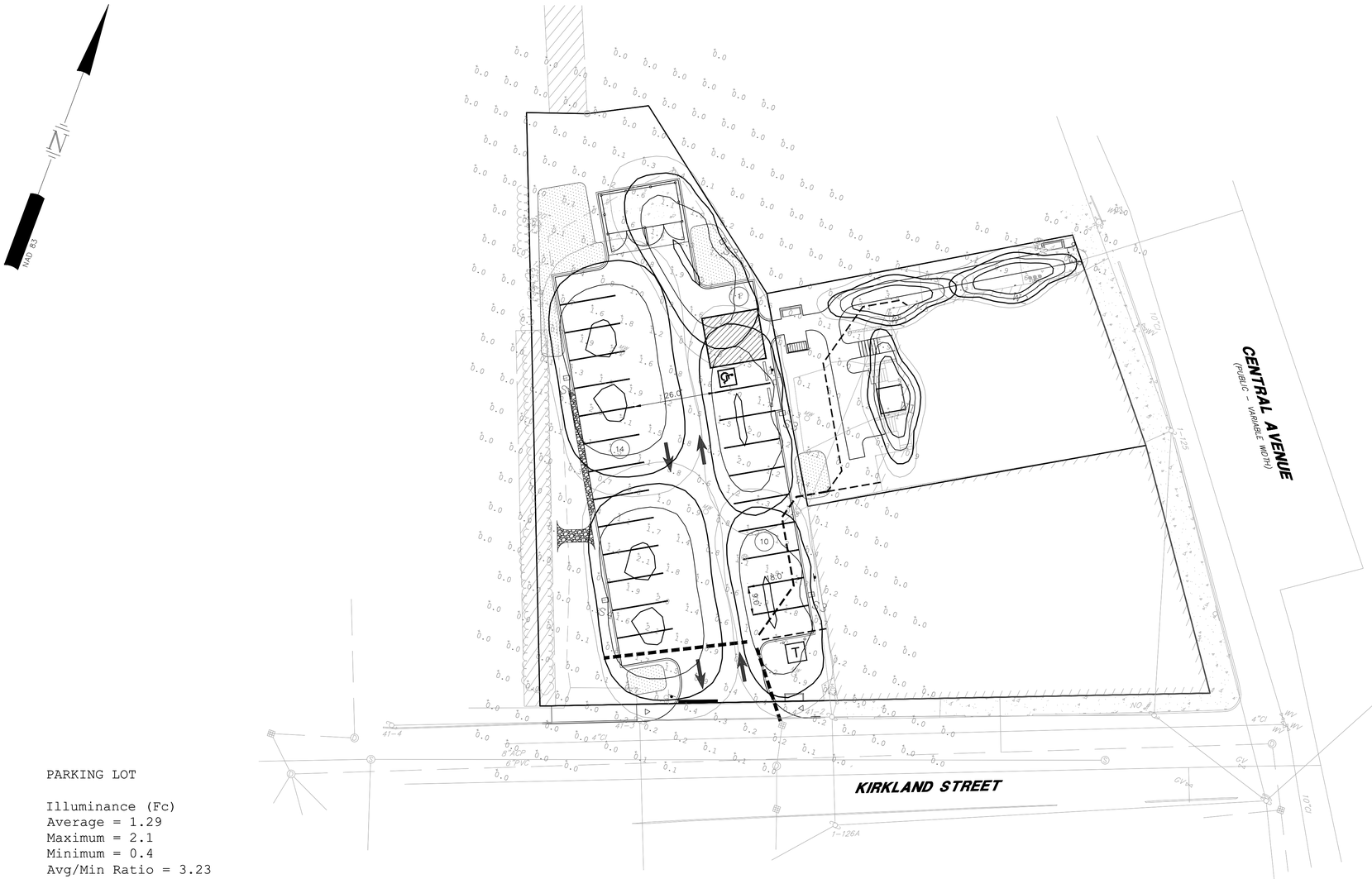
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Mirada Small Area (MRS)
Outdoor LED Area Light



Steel Poles
Square Straight



AWL
All-Weather Wallpack - Low Profile



PARKING LOT

Illuminance (Fc)
Average = 1.29
Maximum = 2.1
Minimum = 0.4
Avg/Min Ratio = 3.23
Max/Min Ratio = 5.25

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	[MANUFAC]
	3	S3	Single	MRS-LED-03L-SIL-3-UNV-DIM-30-70CRI-IL-CXX / 4SQ B3 S11G15 S GA 4BC (15' AFG)	LSI INDUSTRIES, INC.
	2	S4	Single	MRS-LED-06L-SIL-FT-UNV-DIM-30-70CRI-IL-CXX / 4SQ B3 S11G 20 S GA 4BC (20' AFG)	LSI INDUSTRIES, INC.
	1	W1	Single	AWL CXX - 3000K / WALL MTD 9' AFG	LSI INDUSTRIES, INC.
	2	W2	Single	AWL CXX - 3000K / WALL MTD 8' AFG	LSI INDUSTRIES, INC.

HORIZONTAL SCALE 1"=20'
20 10 0 20

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

LIGHTING PLAN

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

AUGUST 31, 2023

REV	DATE	DESCRIPTION	DR	CK
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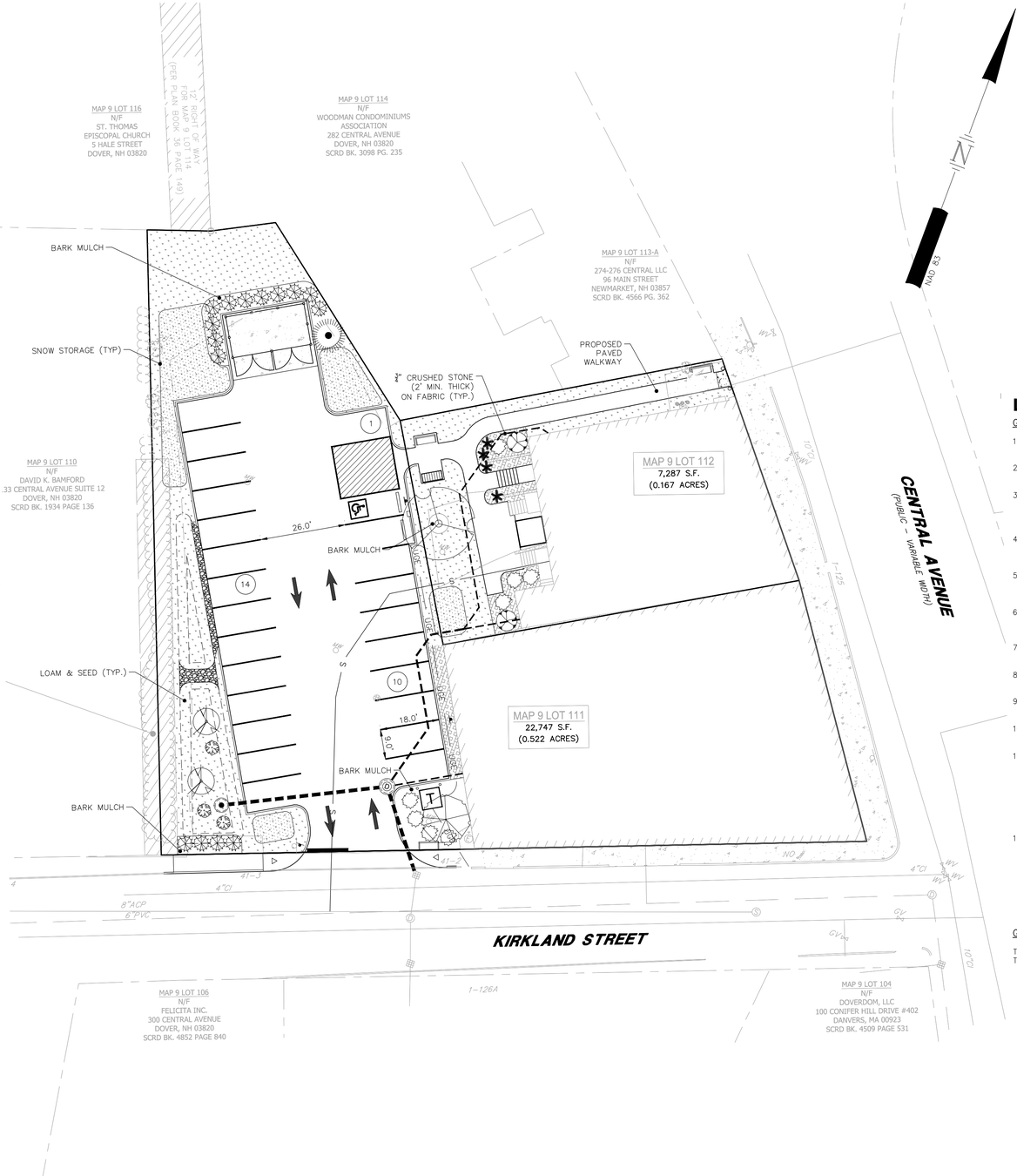
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47262.01	CK	CRR	CADFILE	47262-01 LIGHTING	C-04

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HORIZONTAL SCALE 1"=20'
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LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS
	1	PLATANUS X ACREIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANETREE	2 1/2" TO 3" CAL.	B&B
	1	MALUS 'SNOWDRIFT' SNOWDRIFT FLOWERING CRABAPPLE	2" TO 2 1/2" CAL.	B&B
	1	PICEA PUNGENS BLUE SPRUCE	6' TO 7'	B&B
	3	CORNUS SERICEA 'ARCTIC FIRE' ARCTIC FIRE RED-OSIER DOGWOOD	3 GAL.	CONT.
	2	HAMAMELIS VIRGINIANA 'HARVEST MOON' HARVEST MOON WITCHHAZEL	4' TO 5'	B&B
	8	JUNIPERUS C. 'SEAGREEN' SEAGREEN JUNIPER	3 GAL.	CONT.
	4	SPIRAEA X B. 'ANTHONY WATERER' ANTHONY WATERER SPIREA	3 GAL.	CONT.
	15	THUJA O. 'TECHNY' MISSION ARBORVITAE	4' TO 5'	B&B
	2	VIBURNUM DENTATUM ARROWWOOD VIBURNUM	3' TO 4'	B&B

LANDSCAPE NOTES

GENERAL

1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE RULES, REGULATIONS, LAWS, AND ORDINANCES HAVING JURISDICTION OVER THIS PROJECT SITE.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND NOTIFY OWNER'S REPRESENTATIVE OF CONFLICTS.
3. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON PLANS BEFORE PRICING THE WORK. ANY DIFFERENCE IN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION. LANDSCAPE QUANTITIES SHOWN ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN LANDSCAPE LEGEND.
4. THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK AND VERIFY THAT THE PLANS IN THE CONTRACTOR'S POSSESSION ARE THE MOST CURRENT PLANS AVAILABLE AND ARE THE APPROVED PLAN SET FOR USE IN CONSTRUCTION.
5. ALL PLANT MATERIALS INSTALLED SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA) [FORMERLY THE AMERICAN ASSOCIATION OF NURSERYMEN] IN THE AMERICAN STANDARD FOR NURSERY STOCK (AS AMENDED) [ANSI Z60.1-1996].
6. ALL PLANTS SHALL BE FIRST CLASS AND SHALL BE REPRESENTATIVE OF THEIR NORMAL SPECIES AND/OR VARIETIES. ALL PLANTS MUST HAVE GOOD, HEALTHY, WELL-FORMED UPPER GROWTH AND A LARGE, FIBEROUS, COMPACT ROOT SYSTEM.
7. ALL PLANTS SHALL BE FREE FROM DISEASE AND INSECT PESTS AND SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL LAWS PERTAINING TO PLANT DISEASES AND INFESTATIONS.
8. ALL TREES SHALL BE BALLED AND BURLAPPED (B&B) UNLESS OTHERWISE NOTED OR APPROVED BY LANDSCAPE ARCHITECT.
9. IF APPLICABLE, THE CONTRACTOR SHALL HAVE ALL FALL TRANSPLANTING HAZARD PLANTS DUG IN THE SPRING AND STORED FOR FALL PLANTING.
10. ALL INVASIVE PLANT SPECIES FROM THE "NEW HAMPSHIRE PROHIBITED INVASIVE PLANT SPECIES LIST", TO BE REMOVED SHALL BE DONE SO IN ACCORDANCE WITH THE "INVASIVE SPECIES ACT, HB 1258-FN."
11. LOAM SHALL CONSIST OF LOOSE FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE FREE FROM STONES, LUMPS, STUMPS, OR SIMILAR OBJECTS LARGER THAN 2" IN GREATEST DIAMETER, SUBSOIL, ROOTS, AND WEEDS. THE MINIMUM AND MAXIMUM PH VALUE SHALL BE FROM 5.5 TO 7.0. LOAM SHALL CONTAIN A MINIMUM OF 2% AND A MAXIMUM OF 5% ORGANIC MATTER AS DETERMINED BY LOSS BY IGNITION. SOIL TEXTURE SHALL BE SANDY CLAY LOAM OR SANDY LOAM WITH CLAY CONTENT BETWEEN 15 AND 25%, AND A COMBINED CLAY/SILT CONTENT OF NO MORE THAN 55%. NOT MORE THAN 65% SHALL PASS A NO. 200 SIEVE AS DETERMINED BY THE WASH TEST IN ACCORDANCE WITH ASTM D1140. IN NO INSTANCE SHALL MORE THAN 20% OF THAT MATERIAL PASSING THE #4 SIEVE CONSIST OF CLAY SIZE PARTICLES.
12. ACCEPTABLE SEED MIXES ARE AS FOLLOWS:

PARK SEED MIX (NHDOT TYPE 15) MIN. 120 LBS/ACRE:

33% CREEPING RED FESCUE	(MIN. 40 LBS/ACRE)
42% PERENNIAL RYEGRASS	(MIN. 50 LBS/ACRE)
21% KENTUCKY BLUEGRASS	(MIN. 25 LBS/ACRE)
4% REDTOP	(MIN. 5 LBS/ACRE)

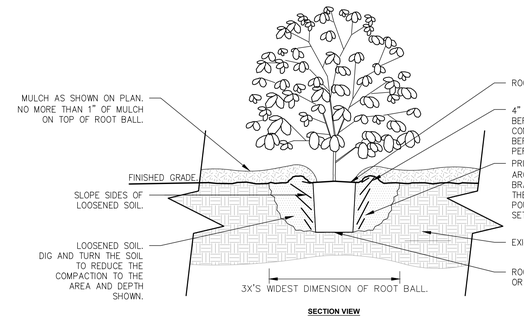
TEMPORARY LAWN MIX: (MIN. 47 LBS/ACRE)
100% ANNUAL RYE

GUARANTEE

THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE WORK FOR A PERIOD OF ONE YEAR, BEGINNING AT THE START OF THE MAINTENANCE PERIOD.

SHRUB PLANTING

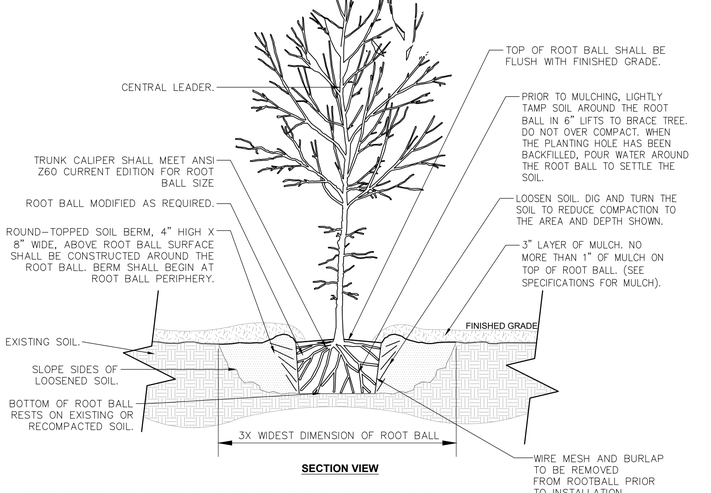
NOT TO SCALE



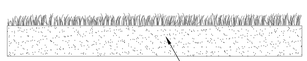
SECTION VIEW

TREE WITH MULCH BERM

NOT TO SCALE



SECTION VIEW



LOAM & SEED

NOT TO SCALE

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DIG SAFE
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CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

LANDSCAPE PLAN

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

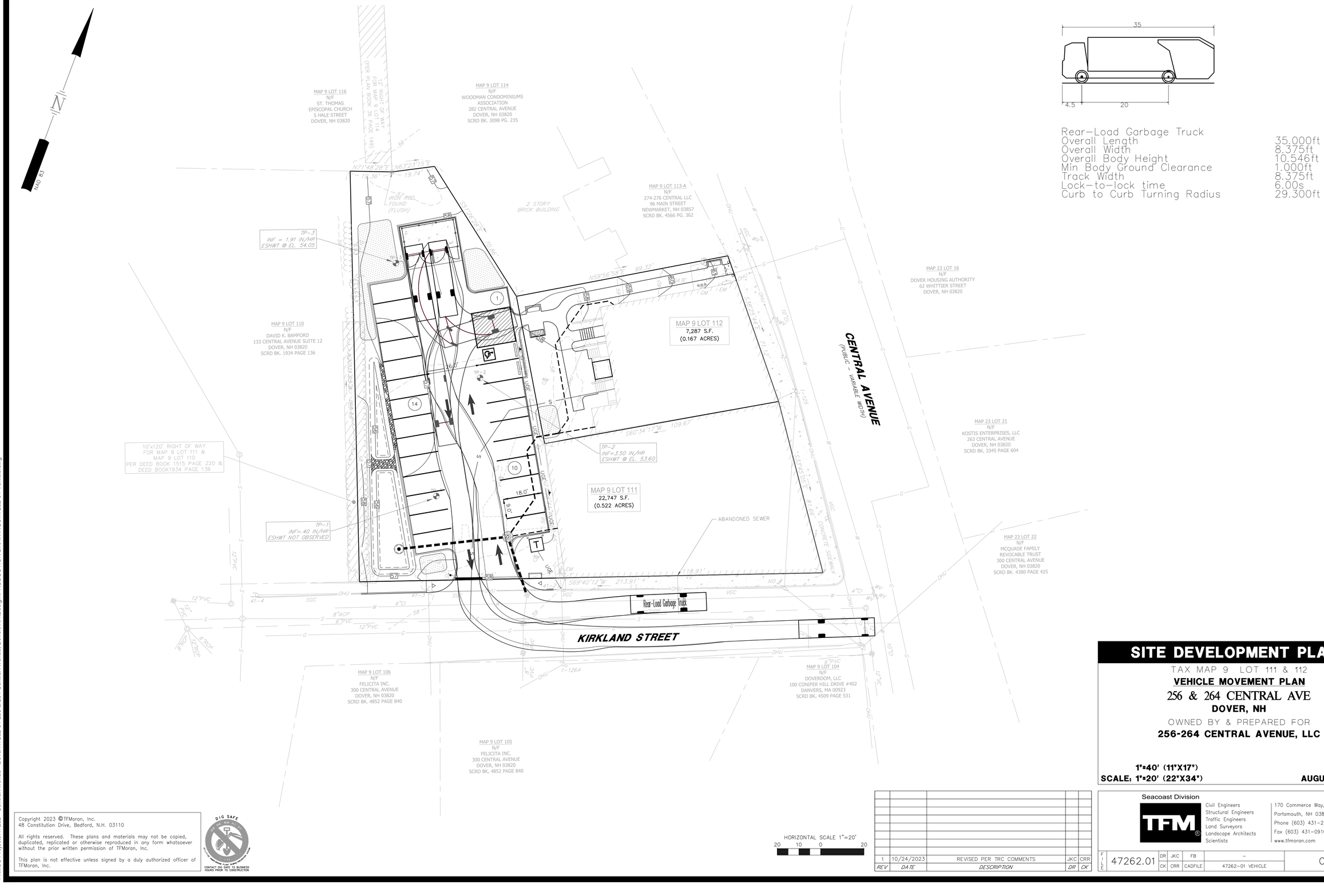
1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

AUGUST 31, 2023

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47262.01	DR	JKC	FB	–	C-05
		CK	CRR	CADFILE	47262-01 LANDSCAPE	

Nov 06, 2023 - 12:41pm
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SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

VEHICLE MOVEMENT PLAN

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

1"=40' (11"X17")

SCALE: 1"=20' (22"X34")

AUGUST 31, 2023

HORIZONTAL SCALE 1"=20'

20 10 0 20

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

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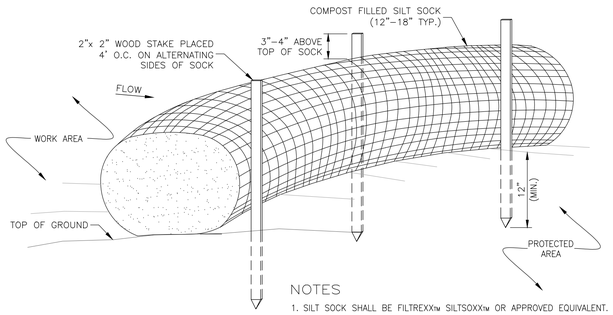
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FILE	DR	JKC	FB	–	C-06
47262.01	CK	CRR	CADFILE	47262-01 VEHICLE	

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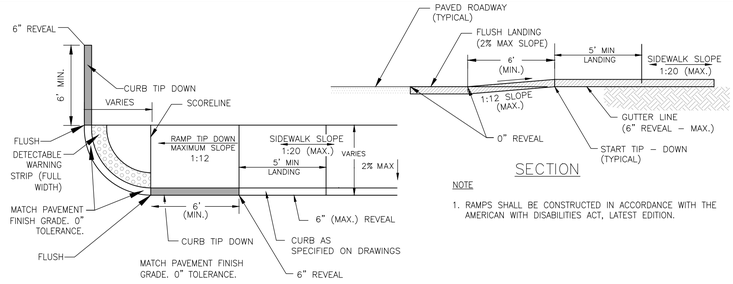


NOTES

1. SILT SOCK SHALL BE FILTREXX™ SILTSOXX™ OR APPROVED EQUIVALENT.
2. SEE SPECIFICATIONS FOR SOCK SIZE AND COMPOST FILL REQUIREMENTS.
3. SILT SOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED AS NEEDED.
4. COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.

SILT SOCK

NOT TO SCALE



PLAN

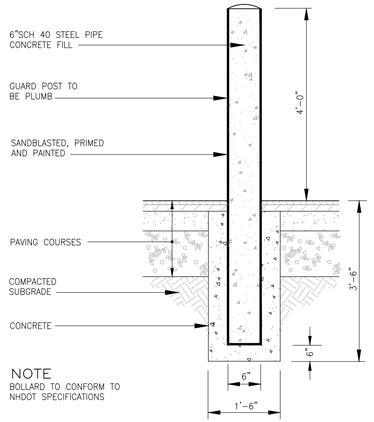
SECTION

NOTE

1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICAN WITH DISABILITIES ACT, LATEST EDITION.

SIDEWALK TIP DOWN RAMP

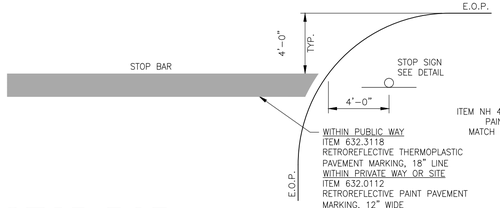
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NOTE
BOLLARD TO CONFORM TO NHDOT SPECIFICATIONS

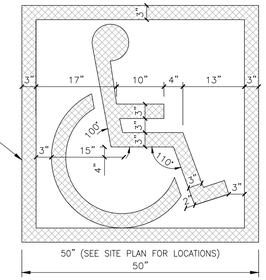
BOLLARD

NOT TO SCALE



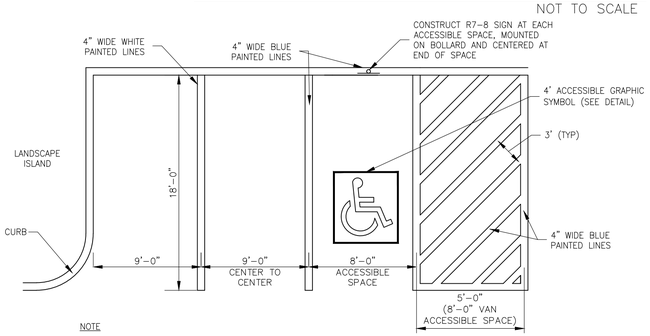
STOP BAR

NOT TO SCALE



PAINTED ACCESSIBLE SYMBOL

NOT TO SCALE

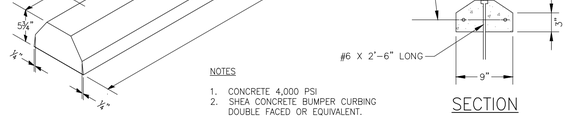


NOTE

1. TRAFFIC PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER AND SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". APPLY TWO COATS.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT, LATEST EDITION.
3. ALL PAINTED ISLANDS SHALL BE 4" WIDE DIAGONAL LINES AT 3'–0" OC BORDERED BY 4" WIDE LINES.
4. 2% MAXIMUM CROSS SLOPE ALLOWED IN ACCESSIBLE PARKING SPACES AND ACCESS AISLES.

TYPICAL PARKING LAYOUT

NOT TO SCALE



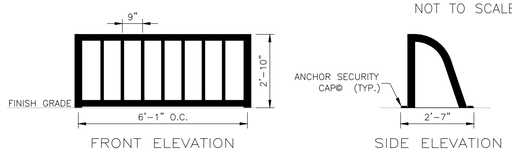
NOTES

1. CONCRETE 4,000 PSI
2. SHEA CONCRETE BUMPER CURBING DOUBLE FACED OR EQUIVALENT.

SECTION

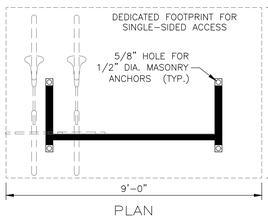
PRECAST CONCRETE WHEEL STOP

NOT TO SCALE



FRONT ELEVATION

SIDE ELEVATION



PLAN

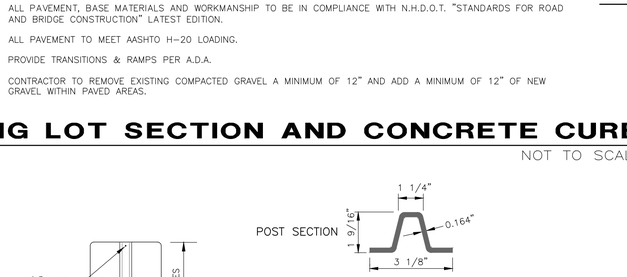
BIKE–RAIL® : VERSION 9 MODERATE SECURITY BIKE RACKS			
MODEL #	LENGTH (O.C.)	BIKE CAPACITY 1 SIDE	2 SIDES
BR– 4.9	3'–1"	3	6
BR– 4.9	6'–1"	5	10
BR– 4.9	9'–1"	7	14
BR– 4.9	12'–1"	9	18
BR– 4.9	15'–1"	11	22
BR– 4.9	18'–1"	13	26

MANUFACTURER

BIKE SECURITY RACKS CO., INC.
12 SAWYER LOOP
WENTWORTH, NH 03282
(800) 545–2757

BICYCLE RACK

BIKE RAIL™ OR APPROVED EQUAL NOT TO SCALE



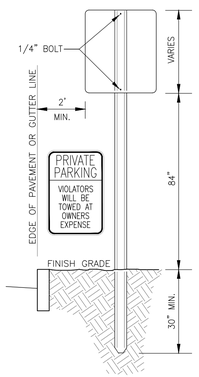
LAYER	
TOP	1–1/2"
BINDER	1–1/2"
CRUSHED GRAVEL	6"
BANK RUN GRAVEL	12"

CONSTRUCTION NOTES

1. REMOVE ALL LOAM, CLAY, MUCK, STUMPS, AND OTHER IMPROPER PAVEMENT FOUNDATION MATERIAL WITHIN 2' OF SUBGRADE. REPLACE WITH COMPACTED GRANULAR FILL MATERIAL ACCEPTABLE TO APPROVING AGENCY. COMPACTION TO BE AT LEAST 95% OF STANDARD PROCTOR.
2. ALL PAVEMENT, BASE MATERIALS AND WORKMANSHIP TO BE IN COMPLIANCE WITH N.H.D.O.T. "STANDARDS FOR ROAD AND BRIDGE CONSTRUCTION" LATEST EDITION.
3. ALL PAVEMENT TO MEET AASHTO H–20 LOADING.
4. PROVIDE TRANSITIONS & RAMPS PER A.D.A.
5. CONTRACTOR TO REMOVE EXISTING COMPACTED GRAVEL A MINIMUM OF 12" AND ADD A MINIMUM OF 12" OF NEW GRAVEL WITHIN PAVED AREAS.

PARKING LOT SECTION AND CONCRETE CURB

NOT TO SCALE



POST SECTION

LENGTH: P–12, 12'–0"; P–14, 14'–0"; P–16, 16'–0".

WEIGHT PER LINEAR FOOT: 2.50 LBS. (MIN.)

HOLES: 3/8" DIA. 1' C–C FULL LENGTH

STEEL: SHALL CONFORM TO ASTM A–499 (GRADE 60) OR ASTM A–576 (GRADE 1070–1080).

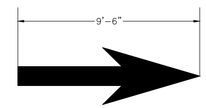
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN, BAKED ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTES

1. POSTS SHALL BE PLUMB; ANY POST BENT OR OTHERWISE DAMAGED SHALL BE REMOVED AND PROPERLY REPLACED. POSTS MAY BE SET OR DRIVEN.
2. WHEN POSTS ARE SET, HOLES SHALL BE DUG TO THE PROPER DEPTH, AFTER INSERTING POSTS, THE HOLES SHALL BE BACKFILLED WITH SUITABLE MATERIAL IN LAYERS NO TO EXCEED 6" DEEP THOROUGHLY COMPACTED, CARE BEING TAKEN TO PRESERVE THE ALIGNMENT OF THE POST.
3. WHEN POSTS ARE DRIVEN, A SUITABLE DRIVING CAP SHALL BE USED AND AFTER DRIVING THE TOP OF THE POST SHALL HAVE SUBSTANTIALLY THE SAME CROSS–SECTIONAL DIMENSION AS THE BODY OF THE POST; BATTERED HEADS WILL NOT BE ACCEPTED.
4. POSTS SHALL NOT BE DRIVEN WITH THE SIGN ATTACHED TO THE POST.
5. SIGNS SHALL BE ERECTED IN CONFORMANCE WITH THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
6. WHEN SIGN IS IN PLACE NO PART OF POST SHALL EXTEND ABOVE THE SIGN.
7. DIMENSIONS SHOWN ARE NOMINAL.
8. ALTERNATE SECTIONS MUST BE APPROVED PRIOR TO USE.

TRAFFIC SIGN POST IN GRADE

NOT TO SCALE



NOTES

1. TRAFFIC PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER AND SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". APPLY TWO COATS.
2. SYMBOLS AND PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT, LATEST EDITION.

PAINTED ARROW

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

DETAILS

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

SCALE: NTS **AUGUST 31, 2023**

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

Seacoast Division
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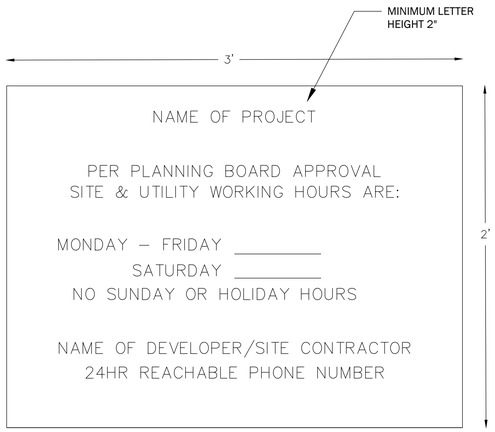
FILE		DR	JKC	FB	–	
	47262.01	CK	CRR	CADFILE	47262–01 DETAILS	C–07

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P:\MSC Projects\47262 - Central Avenue - Dover\47262-01 256 & 264 Central Avenue, Dover, NH\Design\PRODUCTION DRAWINGS\47262-01 Details.dwg

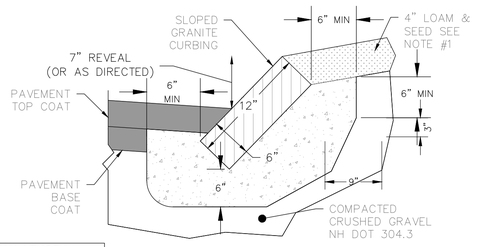


NOTES:

1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND

CONSTRUCTION SIGN

DOVER CITY STANDARD DETAIL — NOT TO SCALE

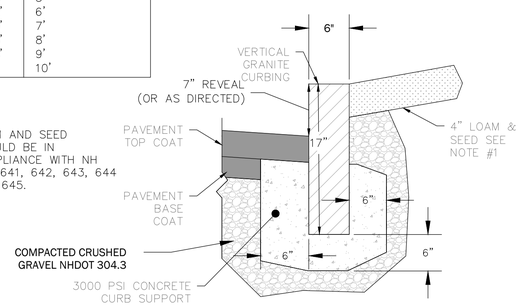


RADIUS	MAX LENGTH
< 21'	USE CURVED CURB
12'	3'
22' – 28'	4'
29' – 35'	5'
36' – 42'	6'
43' – 49'	7'
50' – 56'	8'
57' – 60'	9'
OVER 60'	10'

SLOPED GRANITE CURB

NOTES:

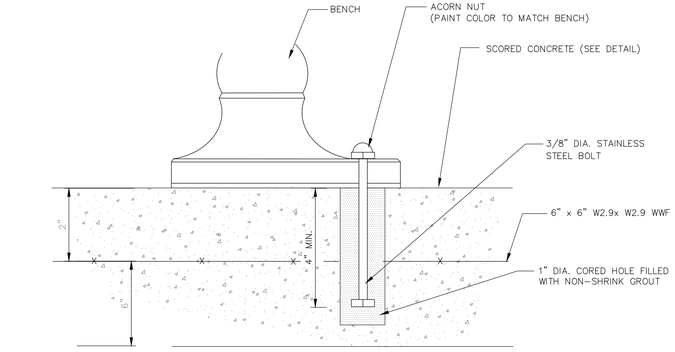
1. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.



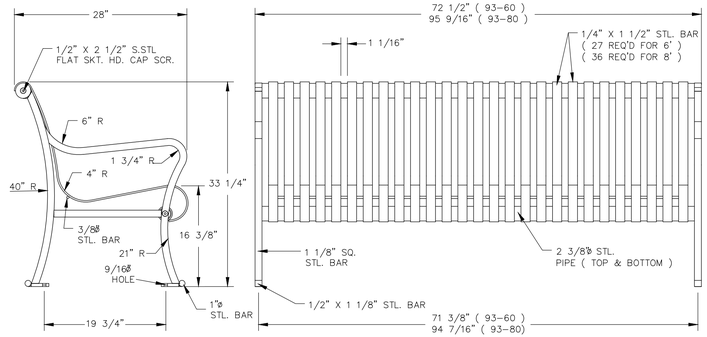
VERTICAL GRANITE CURB

GRANITE CURB

DOVER CITY STANDARD DETAIL — NOT TO SCALE



BENCH ANCHOR

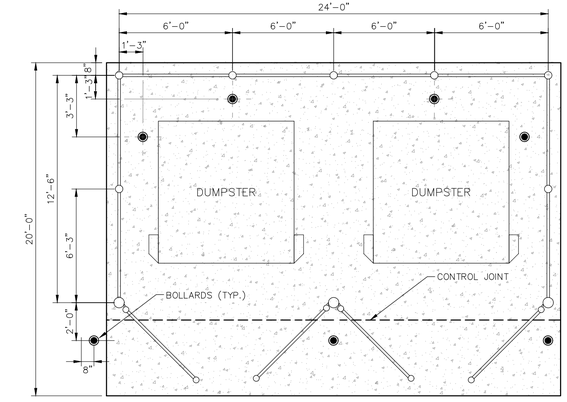


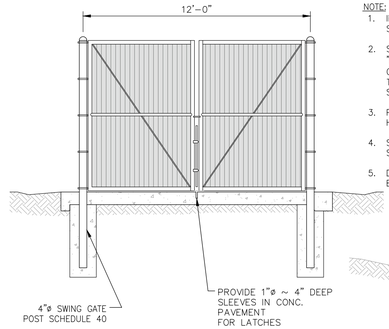
NOTES

1. ALL STEEL MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING (SEE COLOR OPTIONS).
2. 1/2" X 3 3/4" PLTD. EXPANSION ANCHOR BOLTS PROVIDED
3. BENCH IS SHIPPED UNASSEMBLED.

BENCH

NOT TO SCALE

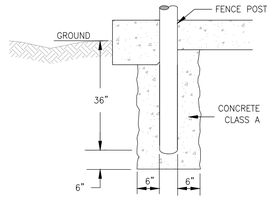




GATE DETAIL

NOTE:

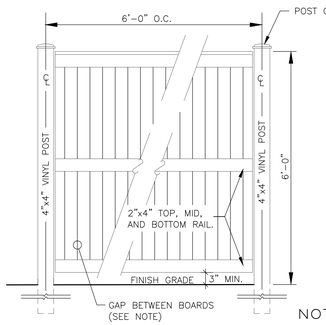
1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. STOCKADE FENCE TO BE COMMERCIAL "BEST" GRADE. 2" MESH MADE OF 8 GAUGE OR 6 GAUGE WIRE. 1-5/8" O.D. TOP AND BOTTOM RAILS, SCHEDULE 40. SEE DETAIL FOR POST SIZES.
3. POSTS, GATES, WIRE MESH AND HARDWARE TO BE VINYL COATED.
4. SEE CONCRETE PAD DETAIL FOR SPECIFICATION ON THE PAD.
5. DUMPSTER PAD AND HANDLES SHALL BE CONSTRUCTED TO BE ACCESSIBLE.

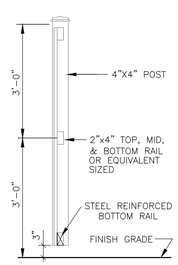


FENCE POST FOOTING DETAIL

TRASH ENCLOSURE

NOT TO SCALE





SECTION

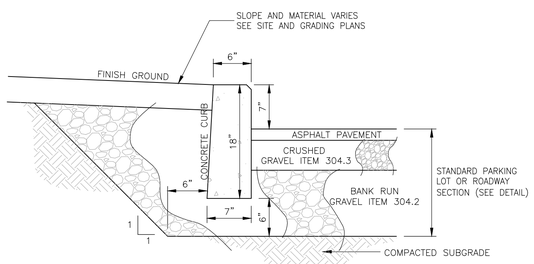
NOTES

1. STAGGERED GAP SHALL BE 7/8".
2. TOP, MIDDLE & BOTTOM RAILS SHALL FACE THE OUTSIDE OF STRUCTURE.
3. COLOR TO BE WHITE.

STAGGERED PICKET VINYL FENCE SECTION

NOT TO SCALE

FOOTING



NOTE: PROVIDE TRANSITIONS & RAMPS PER A.D.A.

CONCRETE CURB

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

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DOVER, NH

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SCALE: NTS — **AUGUST 31, 2023**

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

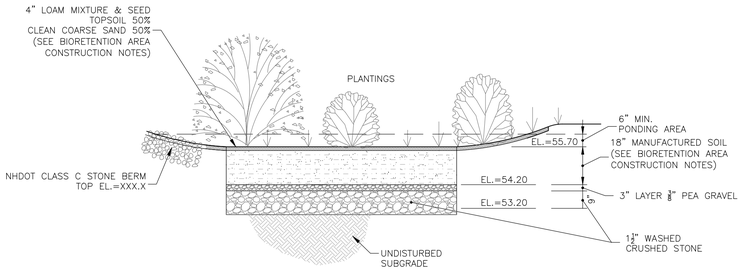
FILE		DR	JKC	FB	–	
	47262.01	CK	CRR	CADFILE	47262-01 DETAILS	C-08

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This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

Nov 06, 2023 - 12:41pm
F:\MSC Projects\47262 - Central Avenue - Dover\47262-01 256 & 264 Central Avenue, Dover, NH\Design\PRODUCTION DRAWINGS\47262-01 Details.dwg



BIORETENTION NOTES

– DO NOT PLACE THE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

–DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.

– DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

– DO NOT STORE CONSTRUCTION MATERIALS OR EQUIPMENT IN AREA OF PROPOSED BIORETENTION BASIN

BIORETENTION AREA SECTION

NOT TO SCALE

BIORETENTION AREA CONSTRUCTION

1. CLEAR AND GRUB THE AREA WHERE THE BIORETENTION AREAS ARE TO BE LOCATED. STOCKPILE LOAM FOR REUSE ON SLOPES.
2. GRADE BIORETENTION AREAS ACCORDING TO PLAN AND DETAILS. SIDE SLOPES SHALL HAVE 4" LOAM AND SEED. BOTTOM OF BIORETENTION AREAS TO BE CONSTRUCTED WITH MULCH, MANUFACTURED SOIL, PEA STONE AND CRUSHED STONE (SEE BIORETENTION AREA DETAIL). SPECIFIC PLANTINGS SHALL BE FIELD LOCATED BY LANDSCAPE ARCHITECT AT TIME OF INSTALLATION.
3. BIORETENTION MANUFACTURED SOIL MIXTURE SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES EXCLUDING MULCH. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATION. THE MANUFACTURED SOIL MIX SHALL CONSIST OF THE FOLLOWING BY VOLUME:
   - ASTM C–33 CONCRETE SAND (50–55% BY VOLUME)
   - LOAMY SAND TOPSOIL (20–30% BY VOLUME) WITH 15–25% FINES PASSING THE NO. 200 SIEVE
   - MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH (20–30% BY VOLUME) WITH LESS THAN 5% PASSING THE NO. 200 SIEVE
4. TOPSOIL/LOAM SHALL CONSIST OF LOOSE FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE FREE FROM STONES, LUMPS, STUMPS, OR SIMILAR OBJECTS LARGER THAN ONE INCH (1") IN GREATEST DIAMETER, SUBSOIL, ROOTS, AND WEEDS. THE MINIMUM AND MAXIMUM PH VALUE SHALL BE FROM 5.5 TO 7.2. LOAM SHALL CONTAIN A MINIMUM OF FOUR PERCENT (4%) AND A MAXIMUM OF FIVE AND A HALF PERCENT (5.5%) ORGANIC MATTER AS DETERMINED BY WEIGHT. NOT MORE THAN TWENTY–FIVE PERCENT (25%) SHALL PASS A NO. 200 SIEVE. IN NO INSTANCE SHALL MORE THAN 20% OF THAT MATERIAL PASSING THE #4 SIEVE CONSIST OF CLAY SIZE PARTICLES. THE RATIO OF THE PARTICLE SIZE FOR 80% PASSING (D80) TO THE PARTICLE SIZE FOR 30% PASSING (D30) SHALL BE 6.0 OR LESS (D80/D30 ≤ 6.0). SATURATED HYDRAULIC CONDUCTIVITY OF TOPSOIL/LOAM SHALL BE BETWEEN 3 INCHES/HOUR AND 10 INCHES/HOUR ACCORDING TO ASTM D5856–95 WHEN COMPACTED TO A MINIMUM OF 88% STANDARD PROCTOR, ASTM 698.
5. CLEAN COARSE SAND SHALL MEET THE FOLLOWING SPECIFICATION:

US STANDARD SIEVE SIZE	PERCENT FINER
3/8 INCH	100
#4	65–90
#10	40–75
#40	5–40
#100	0
#200	0

6. SEEDING FOR BIORETENTION AREA SIDE SLOPES SHALL HAVE A MINIMUM OF 4" LOAM MIXTURE INSTALLED WITH TYPICAL LAWN MIX (MIN. 200 LBS/ACRE):
   33% CREEPING RED FESCUE (MIN. 66 LBS/ACRE)
   42% PERENNIAL RYEGRASS (MIN. 84 LBS/ACRE)
   21% KENTUCKY BLUEGRASS (MIN. 42 LBS/ACRE)
   4% REDTOP (MIN. 8 LBS/ACRE)
7. SEEDING FOR BIORETENTION AREA BASIN SHALL BE NEW ENGLAND WETLAND PLANTS, INC. NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES (MIN. 35 LBS/ACRE).
8. THE DRAINAGE LAYER MATERIAL SHALL BE PLACED WITH ONLY NOMINAL COMPACTION APPLIED BY A DOZER OR GRADER. FORMAL COMPACTION USING A VIBRATORY STEEL DRUM ROLLER SHALL NOT BE USED AS DENSIFICATION WILL REDUCE THE PERMEABILITY AND ABILITY FOR THE MANUFACTURED SOIL TO PROPERLY DRAIN. THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT EQUIPMENT & VEHICLE TRAFFIC FROM DRIVING IN THE AREA OF THE PROPOSED BIORETENTION AREA DURING CONSTRUCTION. THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT SMEARING OF THE SUBGRADE DURING CONSTRUCTION.

BIORETENTION AREA INSPECTION & MAINTENANCE

INSPECTION & MAINTENANCE SCHEDULE TO BEGIN AFTER CONSTRUCTION SITE IS STABILIZED AND FLOW DIRECTED TO BASIN.

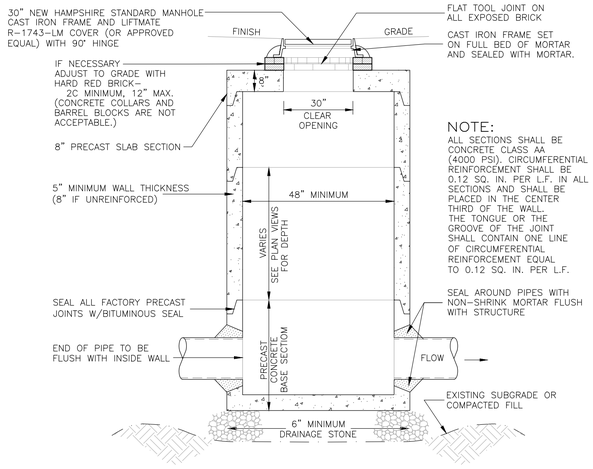
1. BIORETENTION AREA SHALL BE INSPECTED TWICE A YEAR AND MAINTENANCE PERFORMED AS REQUIRED PER INSPECTION. AT LEASE ONCE ANNUALLY THE BASIN SHALL BE INSPECTED FOR DRAWDOWN TIME. IF THE BASIN DOES NOT DRAIN WITHIN 72 HOURS, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION AND DETERMINE MEASURES REQURIED TO RESTORE FUNCTION.
2. VEGETATION – SHALL BE INSPECTED AND MAINTAINED IN A HEALTHY CONDITION BY REMOVING/REPLACING DEAD OR DESEASED VEGETATION AND REMOVING INVASIVE SPECIES. THE VEGETATED AREAS SHALL BE PROTECTED FROM DAMAGE BY TRAFFIC AND DENSE WEED GROWTH. VEGETATION MAINTENANCE A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS. PER ACRE OF 10–20–20 FERTILIZER SHALL BE APPLIED.
3. BOTTOM OF BASIN – BOTTOM OF BASIN SHALL BE INSPECTED FOR EROSION, SEDIMENT ACCUMULATION, TRASH & DEBRIS. REPAIR ANY ERODED AREA OF THE BIORETENTION AREA WITH APPROPRIATE GRASS COVER AFTER REPLACING ANY LOST FILL MATERIAL AND LOAM. REMOVED SEDIMENT, TRASH & DEBRIS SHALL BE REMOVED AND DISPOSED OF PROPERLY.
4. INLET/OUTLET – CONDITIONS OF PIPES/RIPRAP SHALL BE NOTED AND REPAIRS MADE IF NEEDED. ACCUMULATED SEDIMENT & DEBRIS SHALL BE REMOVED AND DISPOSED OF PROPERLY. IF EROSION HAS OCCURED, THEN MEASURES SHALL BE TAKEN TO STABILZE AND PROTECT THE AREAS.

DIG SAFE
CALL BEFORE YOU DIG
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

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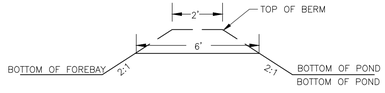
This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.



NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C–478

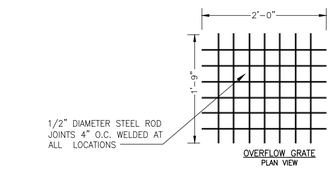
DRAIN MANHOLE

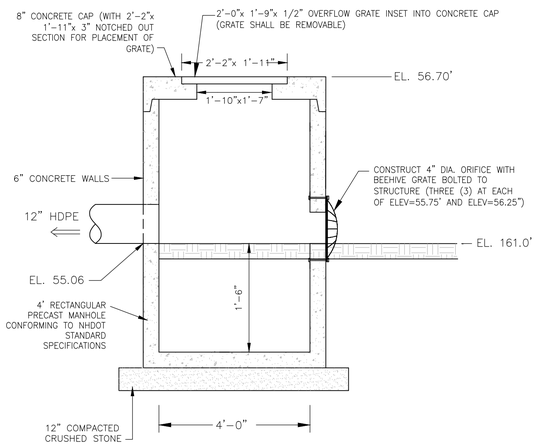
SLAB TOP NOT TO SCALE



RIPRAP SEDIMENT FOREBAY SPILLWAY PROFILE

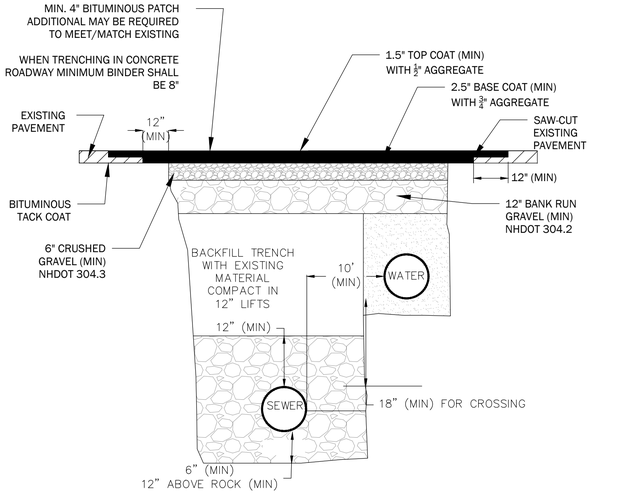
NOT TO SCALE





OUTLET STRUCTURE

SLAB TOP (FOR USE IN DETENTION BASINS) NOT TO SCALE



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

DOVER CITY STANDARD DETAIL NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 9 LOT 111 & 112

DETAILS

256 & 264 CENTRAL AVE

DOVER, NH

OWNED BY & PREPARED FOR

256-264 CENTRAL AVENUE, LLC

SCALE: NTS **AUGUST 31, 2023**

REV	DATE	DESCRIPTION	DR	CK
1	10/24/2023	REVISED PER TRC COMMENTS	JKC	CRR

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431–2222
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PLAN SNAPSHOT REPORT SITE-2023-0007
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	07/21/2023
Work Class:	New Construction	**District:**	None	**Exp Date:**	NOT AVAILABLE
Status:	In Review	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: Construction of 6 duplex structures (12 units total) with single family home at front of site to remain. Proposed driveway called Ember Drive and extension of Copper Drive

Parcel:	39103-000000 Main	**Address:**	34 New Rochester Rd Dover, NH Main	**Zone:**	G(Gateway District)

Developer
Baldwin Robert
Home: (603) 742-2121
Mobile: (603) 986-2373

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

Owner
Baldwin Robert
Home: (603) 742-2121
Mobile: (603) 986-2373

Plan Custom Fields

Total	0	Total2	0	Total3	0
Total4	0	Total5	0	Total6	12
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	22	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	0.82
Deed Book	5116	Total SQFT	35719.2	Deed Page	655
Deed Date	June 12, 2023	Proposed Property Use	Duplex residential with single family home	Area of Parcel to be Developed (SQFT)	35555
Number of Parking Spaces Existing	0	Number of Parking Spaces Proposed	22	Number of Employees Total	0
Number of Employees in Max Shift	0	Distance to City Water	0	Distance to City Sewer	0
Type of Building to be Built	Six duplex structures	Estimated Construction Value	3000000.00	Refuse Removal	Private
Is there an existing Conservation Easement?	No	Existing Conservation Easement Details		TotalImpactFeeSDTOD	0.00
TotalImpactFeeTHTOD	0.00	TotalImpactFee23FTOD	0.00	TotalImpactFeeA4TOD	0.00
TotalImpactFeeMHTOD	0.00	TotalImpactFeeADUTOD	0.00	TotalImpactFeeAONRTOD	0.00
TotalImpactFeeAR55TOD	0.00	TotalImpactFeeAR62TOD	0.00	Sub Total Residential	0.00
TotalImpactFeeRIRCTOD	0.00	TotalImpactFeeOCSTOD	0.00	TotalImpactFeeITWCTOD	0.00
TotalImpactFeeNHALTOD	0.00	TotalImpactFeeOIUTOD	0.00	TotalImpactFeeAFAOTOD	0.00
Sub Total Non-Residential	0.00	Total of Impact Fees to be Assessed	0.00		

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Chris_Berry_7/21/2023.jpg	07/21/2023 9:20	Berry, Chris		Uploaded via CSS
SITE-2023-0007 Snapshot Report.pdf	07/25/2023 9:35	Blonigen, Rachel		
2023.08.10_PlanningTechnicalReviewCommittee.Agenda.pdf	07/26/2023 12:30	Blonigen, Rachel		TRC Agenda
2023.08.10_PlanningTechnicalReviewCommittee.34NewRochRd_SITE-2023-00	08/16/2023 14:00	Blonigen, Rachel		Draft TRC Minutes

PLAN SNAPSHOT REPORT (SITE-2023-0007)

07.pdf

2023.10.12_PlanningTechnicalReviewCommittee.34NewRochRd_SITE-2023-0007.pdf	10/12/2023 13:54	Blonigen, Rachel	DRAFT TRC Minutes

Note	Created By	Date and Time Created
1. Waiting for submittal for 2nd TRC - RLB	Rachel Blonigen	08/10/2023 14:15
2. Waiting on submittal for informal 3rd TRC meeting. RLB	Rachel Blonigen	10/12/2023 13:55

Invoice No.	Fee		Fee Amount	Amount Paid
INV-00004362	Planning General Application Fee		$200.00	$0.00
		Total for Invoice INV-00004362	$200.00	$0.00
INV-00005750	Planning Residential Fee		$1,200.00	$0.00
		Total for Invoice INV-00005750	$1,200.00	$0.00
		Grand Total for Plan	$1,400.00	$0.00

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	08/10/2023	Technical Review Committee Meeting

Meeting Custom Fields

TRC Meeting Agenda Item	#1	TRC Meeting Motion	Resubmit for 2nf full TRC
TRC Meeting Next Steps	Revise and submit for 2nd full TRC	TRC Meeting Next Steps	Resubmit for 3 informal TRC.

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	Requires Re-submit	10/04/2023	11/01/2023	10/12/2023	Yes	Yes

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Burdin, James	Requires Re-submit	10/04/2023	11/01/2023	10/12/2023

Comments: No comments

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	Requires Re-submit	10/04/2023	11/01/2023	10/12/2023

Comments: Project: 34 New Rochester Road (Meeting #2)
TRC Meeting: October 12, 2023
Reviewer: Kenneth A. Mavrogeorge, PE

- General Comment:
o Provide a commitment to maintain stormwater and specifically the porous pavement, that can be recorded at the registry of deeds. Confirm that the language in the Owner Certification is sufficient for recording with the City Attorney's Office.
o It is strongly recommended that the Applicant submit a detailed breakdown of proposed HOA costs for annual maintenance and replacement of private infrastructure including backup as to how the fees are estimated. Engineering supports this as a condition of approval.
- Sheet 6 of 27:
o Check leader calling out the porous sign. It looks like it's pointing to the wrong spot.
o Provide accessible charging station
- Sheet 21 of 27:
o Detail C15 has a note referencing detail C15. Please revise reference to C14 (?).
o Provide detail showing the porous pavement sign.
- Sheet 24 of 27: Detail U18 should read "less than 6' cover sewer (pavement)"
- General Comment:
o Community Services received a proposal from a City prequalified consultant to expand the City's sewer model into this area of the City. The City requests that the Applicant either provide a fee of $500 per proposed unit to offset a small portion of the fees for the sewer assessment. If the assessment shows that there is a capacity issue, the Applicant would need to contribute to the recommended capacity upgrades.

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
IS Building Official	Fire / Inspection Services	Maxfield, Jim	Requires Re-submit	10/04/2023	11/01/2023	10/12/2023

Comments: • Clarify site access compliance with NFPA 1 Chapter 18 for Copper Drive.
- Sheet 6 - Elevation plans do not appear to provide accessibility to EV charging stations
- Discuss additional snow storage areas
- Clarify site access compliance with NFPA 1 Chapter 18 for Copper Drive.
- Sheet 6 - Elevation plans do not appear to provide accessibility to EV charging stations
- Discuss additional snow storage areas

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Planning	Planning	Benton, Donna	Requires Re-submit	10/04/2023	11/01/2023	10/12/2023

Comments: • CUPs for lot coverage, frontage build out, front build to line, impervious area in secondary groundwater district. Thanks for narratives/applications
- Reminder: Impact fees, Water & Sewer investment fees
- Provide updated HOA documents as a COA
- Lot merger as a COA
- Revise road name on all sheets (See sheet 9 possibly others)
- Active and passive rec fee as a COA
- Contribute towards sewer modeling
- Sidewalk contribution
- Revise plans:
  - Owner's signatures on the final plans
  - Professional stamps on the final plans
  - Lighting seems very bright?
  - No chain link fence or vinyl fence in Gateway
  - Porous pavement maintenance plan?
  - Add street trees
  - Add egress/curbcut dimensions
  - Confirm and label toter locations

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Zoning Administrator	Planning	Kypfer, Natasha	In Review	10/04/2023	11/01/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Traffic Bureau	Police	Speidel, Marn	Requires Re-submit	10/04/2023	11/01/2023	10/12/2023

Comments: • Sheet 6, note 48: amend this note to ensure the HOA isn't limited by this language to replace the fence with a different suitable type in the future if it so chooses.
- Lamps at rear of Copper Drive parking area appear to impede snow removal and may be apt for damage depending on size of pole and base. No detail was provided for these fixtures.
- White vinyl perimeter fence detail shows 17.5" open slats extending down from the top of the 6' fence. This may be inconsistent with Sheet 14, lighting plan, which shows an adjacent 5'5" lamp not shedding any light beyond the fence.

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.2	In Review	11/08/2023	11/21/2023		No	No

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Meyers, Kathleen	In Review	11/08/2023	12/06/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	In Review	11/08/2023	11/21/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
IS Building Official	Fire / Inspection Services	Maxfield, Jim	In Review	11/08/2023	11/21/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Planning	Planning	Kaspari, Jackson	In Review	11/08/2023	12/06/2023	

PLAN SNAPSHOT REPORT (SITE-2023-0007)

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Zoning Administrator	Planning	Benton, Donna	In Review	11/08/2023	11/21/2023	

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Traffic Bureau	Police	Speidel, Marn	In Review	11/08/2023	11/21/2023	

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		08/16/2023 14:00	08/16/2023 14:08
Confirm application complete v.1	Generic Action		08/16/2023 14:01
Confirm application complete v.1	Generic Action		08/16/2023 14:10
Confirm application complete v.1	Generic Action		11/08/2023 12:14
Technical Review Committee Meeting Agenda v.1	Task	11/08/2023 12:14	
Technical Review Committee Meeting Agenda v.1	Task	08/16/2023 14:10	10/04/2023 11:36
Technical Review Committee Meeting Agenda v.1	Task	08/16/2023 14:00	08/16/2023 14:01
Land Use Plan Technical Review v.1	Receive Submittal	10/04/2023 0:00	10/12/2023 14:08
Land Use Plan Technical Review v.1	Receive Submittal		08/16/2023 14:01
Land Use Plan Technical Review v.1	Receive Submittal		
Land Use Plan Technical Review v.2	Receive Submittal	11/08/2023 0:00	
Technical Review Committee Meeting v.1	Hold Meeting	10/04/2023 11:35	10/12/2023 14:09
Technical Review Committee Meeting v.1	Hold Meeting		
Technical Review Committee Meeting v.1	Hold Meeting	08/16/2023 14:01	08/16/2023 14:08
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 Final Review v.1	Receive Submittal		
Land Use Plan Stamped and Signed v.1	Generic Action		
Plans uploaded to Treeno v.1	Generic Action		
Recording v.1	Task		
Property Info Group 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 Complex v.1	Create Sub Permit		
Create / Link to Permit - Site Work, Construction v.1	Create Sub Permit		

CITY OF DOVER

TECHNICAL REVIEW COMMITTEE MINUTES – SITE-2023-0007

Application Type:	Site Review
Applicant(s):	Knox Marsh Development, LLC
Owner(s):	Robert Baldwin
Location:	34 New Rochester Road (Tax Map 39, Lot 103)
Date:	October 12, 2023

INTENT: To construct 5 two-family structures (10 units in total) with the single-family dwelling to remain on the property.

UNITS PROPOSED: 10, plus existing (11 in total)

AGENDA ITEM #: 1

ACREAGE:
Existing = 0.47± ac.
Post Lot Merger = 93,953± sq. ft.

ZONING DISTRICT: G

EXISTING LAND USE: Single-family residence

PROPOSED LAND USE: Add 10 residential units

SURROUNDING LAND USE: Residential, Willand Pond

ZBA ACTION: None

PERMITS REQUIRED:
- EPA NOI
- NHDES Sewer Discharge Permit

WAIVERS REQUESTED:
- Drainage pipe
- Minimum illumination levels

ATTENDANCE:
Donna Benton, Zoning
Erin Bassegio, Planning
Marn Speidel, Police
Jim Maxfield, Fire/Inspection Services
Ken Mavrogeorge, Engineering
James Burdin, Business Development
Others:
Kevin Poulin, Berry Surveying & Engineering
Robert Baldwin, Knox Marsh Development

Approval of minutes from September 21, 2023:
J.Burdin moved to approve the September 21, 2023 minutes. Seconded by: M.Speidel.
Vote: U/A.

PLAN REVIEW:
Planning:
- *CUPs for lot coverage, frontage build out, front build to line, impervious area in secondary groundwater district.* Thanks for narratives/applications
- *Reminder: Impact fees, Water & Sewer investment fees*
- *Provide updated HOA documents as a COA*
- *Lot merger as a COA*
- *Revise road name on all sheets* (See sheet 9 possibly others)
- Active and passive rec fee as a COA
- Contribute towards sewer modeling
- Sidewalk contribution
- *Revise plans:*
  - *Owner's signatures on the final plans*
  - *Professional stamps on the final plans*
  - Lighting seems very bright?
  - No chain link fence or vinyl fence in Gateway
  - Porous pavement maintenance plan?
  - Add street trees
  - Add egress/curbcut dimensions
  - Confirm and label toter locations

Engineering:
- General Comment:
  - Provide a commitment to maintain stormwater and specifically the porous pavement, that can be recorded at the registry of deeds. Confirm that the language in the Owner Certification is sufficient for recording with the City Attorney's Office.
  - It is strongly recommended that the Applicant submit a detailed breakdown of proposed HOA costs for annual maintenance and replacement of private infrastructure including backup as to how the fees are estimated. Engineering supports this as a condition of approval.
- Sheet 6 of 27:
  - Check leader calling out the porous sign. It looks like it's pointing to the wrong spot.
  - Provide accessible charging station
- Sheet 21 of 27:
  - Detail C15 has a note referencing detail C15. Please revise reference to C14 (?).
  - Provide detail showing the porous pavement sign.

DRAFT

- Sheet 24 of 27: Detail U18 should read "less than 6' cover sewer (pavement)"
- General Comment:
    - Community Services received a proposal from a City prequalified consultant to expand the City's sewer model into this area of the City. The City requests that the Applicant either provide a fee of $500 per proposed unit to offset a small portion of the fees for the sewer assessment. If the assessment shows that there is a capacity issue, the Applicant would need to contribute to the recommended capacity upgrades.

Police:

- Sheet 6, note 48: amend this note to ensure the HOA isn't limited by this language to replace the fence with a different suitable type in the future if it so chooses.
- Lamps at rear of Copper Drive parking area appear to impede snow removal and may be apt for damage depending on size of pole and base. No detail was provided for these fixtures.
- White vinyl perimeter fence detail shows 17.5" open slats extending down from the top of the 6' fence. This may be inconsistent with Sheet 14, lighting plan, which shows an adjacent 5'5" lamp not shedding any light beyond the fence.

Fire/Inspection Services:

- *Clarify site access compliance with NFPA 1 Chapter 18 for Copper Drive.*
- *Sheet 6 - Elevation plans do not appear to provide accessibility to EV charging stations*
- Discuss additional snow storage areas

Business Development:

- None

Planning Board:

- N/A

Next Steps: Revise plans and update TRC response letter. Schedule informal TRC.

Pause TRC at: 11:08am

DRAFT

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

November 6, 2023

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

Re: Site Plan Review
TRC #2 Response Letter
Berry Surveying & Engineering
Knox Marsh Development, LLC
34 New Rochester Rd
Tax Map 39, Lot 103
Dover File #SITE-2023-0007

Based on comments from the Technical Review Committee Minutes from October 12, 2023, we respectfully submit the following comments and revisions. Our comments are in **bold**. Items highlighted in **magenta** are requested to be a condition of approval.

PLANNING COMMENTS

1. CUPs for lot coverage, frontage-build out, front build to line, impervious are in secondary groundwater district.
   Comment acknowledged. Due to a scribers error, the environmental CUP for greater than 20% impervious coverage was not needed from the beginning of this application, and the threshold of 20% impervious coverage has not been triggered with the new submission. Only three, non-environmental CUPs, are required for the project.

2. Reminder: Impact fees, Water & Sewer investment fees.
   Applicant will pay fees when due.

3. Provide updated HOA documents as a COA.
   Updated HOA documents are provided within this submission.

4. Lot merger as a COA.
   Comment acknowledged.

5. Revise road name on all sheets (See Sheet 9 possibly others).
   Nickel Drive is removed from the plans and documents and has been corrected to Ember Drive.

6. Active and passive rec fee as a COA.
   Comment acknowledged.

7. Contribute towards sewer modeling.
   Applicant acknowledges sewer modeling contribution is required and will pay this fee when due.

8. Sidewalk contribution.
   Applicant acknowledges comment, sidewalk costing takeoff provided in previous submission.

9. Revise Plans:

   a. Owner's signatures on the final plans.
      Owner's signatures will be provided on the final plans.

   b. Professional stamps on the final plans.
      All required professional stamps will be provided on the final plans.

   c. Lighting seems very bright?
      Lighting has been revised to have no locations greater than 4.9 f/c. With the revised parking lot array along Copper Drive, a waiver for illumination ratio is no longer required for the project.

   d. No chain link fence or vinyl fence in Gateway
      Chain link fence and vinyl fence has been removed in place of stockade fence across the plan set and construction detail.

   e. Porous pavement maintenance plan?
      Porous pavement maintenance is provided within the provided document titled "Stormwater System Management: Inspection and Maintenance Manual", located within the drainage binder.

   f. Add street trees
      Additional street trees have been added. Please find the Landscaping Plan, sheet #16.

   g. Add egress/curbcut dimensions

A dimension of the curb cut has been added to the sight distance plans, sheets #17 & #18.

h. Confirm and label toter locations
New toter locations have provided adjacent to each unit. Please find the site plan, sheet #6.

ENGINEERING COMMENTS

General Comment:

1. Provide a commitment to maintain stormwater and specifically the porous pavement that can be recorded at the registry of deeds. Confirm that the language in the Owner Certification is sufficient for recording with the City Attorney's Office.
This language has been submitted to the City Attorney's office for review.

2. It is strongly recommended that the Applicant submit a detailed breakdown of proposed HOA costs for annual maintenance and replacement of private infrastructure including backup as to how the fees are estimated. Engineering supports this as a condition of approval.
Comment Acknowledged.

Sheet 6 of 27:

1. Check leader calling out the porous sign. It looks like it's pointing to the wrong spot.
The original intent was to place the sign on the light pole, based upon subsequent conversation at TRC, the location of the sign has moved to the front of the site.

2. Provide accessible charging station
Please find revised Copper Drive parking array. The applicant has met with IS regarding this topic. It was discussed that the combination of modifying the location of the accessible parking space, in addition to "use last" signage, that this location was acceptable.

Sheet 21 of 27:

1. Detail C15 has a note referencing detail C15. Please revise reference to C14?
   This detail has been revised. Please find C15.

2. Provide detail showing the porous pavement sign.
   Please find detail as detail C20, sheet C103.

Sheet 24 of 27:

1. Detail U18 should read "less than 6' cover sewer (pavement)".
   Detail U18 has been revised.

General Comment:

2. Community Services received a proposal from a City prequalified consultant to expand the City's sewer model into this area of the City. The City requests that the Applicant either provide a fee of $500 per proposed unit to offset a small portion of the fees for the sewer assessment. If the assessment shows that there is a capacity issue, the Applicant would need to contribute to the recommended capacity upgrades.
   Applicant acknowledges comment.

POLICE DEPARTMENT COMMENTS

1. Sheet 6, note 48: amend this note to ensure the HOA isn't limited by this language to replace the fence with a different suitable type in the future if it so chooses.
   This language has been modified, please find note #48, sheet #6.

2. Lamps at rear of Copper Drive parking area appear to impede snow removal and may be apt for damage depending on size of pole and base. No detail was provided for these fixtures.
   The lighting of the Copper Drive parking lot has been revised to include one pole lamp and only two bollard lamps. Details of these fixtures are included as detail C18, sheet C103.

3. White vinyl perimeter fence detail shows 17.5" open slats extending down from the top of the 6' fence. This may be inconsistent with Sheet 14, lighting plan, which shows an adjacent 5'5" lamp not shedding any light beyond the fence.

White vinyl fence is no longer proposed based upon Planning comment. Stockade fencing has been provided in place. Please find the Site Plan, sheet #6 and the stockade fence detail C19, sheet C103.

FIRE /INSPECTION SERVICES COMMENTS

1. Clarify site access compliance with NFPA 1 Chapter 18 for Copper Drive
   The applicant has met with IS and has revised the site design to be compliant with NFPA 1 Chapter 18, with the end of Copper Drive being less than 150' from the edge of traveled way for the hammerhead turnaround.

2. Sheet 6 – Elevation plans do not appear to provide accessibility to EV charging stations.
   The applicant has met with IS and discussed an acceptable solution to provide an accessible charging station. Please find Site Plan, sheet #6.

3. Discuss additional snow storage areas
   Snow storage area have been added to the site and reconfigured based upon the new layout. This includes notes about excess snow removal. Please find Site Plan, sheet #6.

Respectfully,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Design Engineer

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

Christopher R. Berry, SIT
Principal, President

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Fax: (603) 335-4623
www.BerrySurveying.Com
crberry@metrocast.net
July 6, 2023/Rev: November 6, 2023

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

Re: Residential Site Plan & Lot Merger
Project Narrative
Knox Marsh Development, LLC
34 New Rochester Rd, Tax Map 39, Lot 103 (Site Plan & Lot Merger)
36 New Rochester Rd/Copper Dr, Tax Map 39, Lot 104 (Lot Merger) (P22-027)

Dear Mrs. Benton,

On behalf of our client, Knox Marsh Development, LLC, Berry Surveying & Engineering (BS&E) is submitting a proposed Residential Site Plan at 34 New Rochester Road (NH Route 108) (Tax Map 39, Lot 103) and a lot merger between Tax Map 39, Lot 103 & 104. Tax Map 39, Lot 103 is being merged into Lot 104, consisting of Copper Drive, known as Limited Common Area Tax Map 39, Lot 104-7 (P22-027). Site Plan and Conditional Use Permit applications are listed as Tax Map 39, Lot 103 as the subject parcel. During TRC #1, it was requested that Nickel Drive be modified. The applicant has selected Ember Drive to replace this name. During TRC #2, Copper Drive's compliance with NFPA 1 Chapter 18 was brought into question. As a result of meeting with Inspection Services, Copper Drive was shortened to comply as a result, and is the genesis of the project changes presented. A full list of revision items since TRC #2 is included at the end of the project narrative.

Background and General Narrative:

Knox Marsh Development, LLC, owns the parcels known as 34 and 36 New Rochester Road in Dover, NH (Tax Map 39, Lots 103 & 104). These parcels contain 35,555 Sq. Ft. (0.82 Ac.) and 68,111 Sq. Ft. (1.56 Ac.), respectively. Tax Map 39, Lot 104 is included in this narrative for reference to a proposed lot merger (included in plan set & application) and extension of Copper Drive to Tax Map 39, Lot 103. Site Plan activity in this narrative is referring to construction on parcel Tax Map 39, Lot 103. Percentages provided in documents and plans are based upon the combined lot merger area of 103,666 Sq. Ft. (2.38 Ac.).

Berry Surveying & Engineering has conducted an on-site survey of the parcels which includes a topographic analysis and wetlands analysis. No wetlands were found on site as determined by John P. Hayes III, CWS, CSS. Tax Map 39, Lot 103 contains a single-family home built in 1943 located at the front of the property along New Rochester Road. The site is located across the street from the intersections of New Rochester Road and Sherman Street, and New Rochester Road and Auburn Street, approximately 0.3 miles from the intersection of New Rochester Road, Central Avenue, and Indian Brook Drive. Tax Map 39, Lot 103 is open and grassed at the front and partially wooded at the rear.

Topographic conditions on site are relatively flat, gradually sloping from New Rochester Road to the rear of the site. The site consists of sandy, well drained soils as shown on the Site Specific Soils Map by John P Hayes, III, CSS. The site is located in the Gateway District, within 300' of the center of New Rochester Road, and the R-12 zone at the rear. The Gateway District zone line has been adjusted by 50' to include the entire area of development within this district. This site is also located with the Secondary Groundwater Recharge Overlay. The maximum 20% impervious threshold is not triggered by this application post lot merger.

The Proposal:

The Gateway District, within 300' of the center of New Rochester Road, allows for single family and two-family dwelling unit residential development restricted to two stories in height. Utilizing the 50' Zone Line Adjustment, the subject parcel post lot merger, has 93,953 Sq. Ft. located within the Gateway District and 9,713 Sq. Ft. within the R-12 Zone. Gateway District residential density is 4,000 Sq. Ft. per unit, resulting in a yield of twenty-three (23) units within the subject parcels by right. Previously approved Copper Drive (P22-027) consisted of eight total single-family homes, with two pre-existing and six under construction. The proposal is to construct six (6) 2-family dwelling structures for twelve (12) units behind the existing single-family home to remain at 34 New Rochester Road. The applicant is also proposing to convert the existing single-family homes at 36 & 38 New Rochester Road into 2-family dwelling units. This brings the total project yield post lot merger to twenty-three (23) total units. As previously mentioned, Tax Map 39, Lot 103 will be merged into Lot 104 and become Limited Common Area Tax Map 39, Lot 104-7. This Limited Common Area, not including Copper Drive, is subject to the 5-20' build-to front setback line to pavement, 10' side setback, and a rear/external boundary line 15' building setback.

The proposed 2-family dwelling structures will be accessed from two locations; Copper Drive or Ember Drive. Copper Drive is proposed to be extended by 94 linear feet

(LF), including a fourteen (14) space parking lot that provides parking for a portion of the units. The parking is proposed as twelve-foot travel lanes and 9'x18' parking spaces constructed from porous pavement. This parking is located at the rear of the subject parcel.

Ember Drive is a new accessway/parking proposed off of New Rochester Road, 141 LF in length, consisting of twelve-foot travel lanes and fourteen (14) 9'x18' parking spaces constructed from porous pavement. Ember Drive is located between the single-family homes located at 34 and 36 New Rochester Road. This parking lot provides the remaining parking for the remaining 2-family dwelling units.

With the exception of the five foot (5) raised concrete sidewalk along New Rochester Road to improve the walkability and the civic nature of the urban core, all pavement and sidewalk surfaces are porous pavement or porous pavers. This is done to infiltrate stormwater runoff generated by the site. Proposed 2-family dwelling roofs are routed via gutter and downspout to the porous pavement or pavers for infiltration. This is to account for the 20% maximum impervious requirement of the Secondary Groundwater Recharge Overlay district. The use of porous products across the site allows the project to not require a Conditional Use Permit is required for greater than 20% impervious in this overlay district (19.3% provided). The design includes two infiltration sumps in addition to the porous pavement and porous pavers. The design intent of these infiltration sumps is to infiltrate "clean" water including grassed area from off site and roofs areas to protect abutting properties from stormwater runoff.

The proposed 2-family dwellings are similar in footprint to surrounding single family homes (975 Sq. Ft. footprint) and is restricted to two stories, as the surrounding single family homes. This footprint is an attempt to create a streetscape that is harmonious with the surrounding architecture. Streetscape is enhanced through the use of landscaping, hardscaping and typical urban amenities such as benches. Street trees, shrubs, and ornamental grasses are used throughout Copper Drive and Ember Drive create an inviting entrance and streetscape. Ornamental grasses and shrubs are proposed around 2-family dwellings and a mix of shrubs hardwoods/evergreens are proposed throughout the interior and perimeter of the site. Infiltration sumps are planted with shrubs and plants.

Water and sewer mains are proposed to be connected from Copper Drive, with water looping back out to New Rochester Road. Electric/cable utilities will be taken from a relocated utility pole (PSNH 7/15s) located at the entrance of Ember Drive and underground to a transformer and boxes on site. Water is proposed to be an 8" C.L.D.I. line which runs to a fire hydrant on Ember Drive. Each proposed 2-family dwelling will

have two 1" SDR 9 domestic water services and two 1" SDR fire suppression line with individual curb stops. Sewer is proposed to be an 8" SDR 35 gravity line with a 6" SDR 35 service to each building. Heating and cooling will be done via mini-splits. The existing single-family home will retain existing utility services. The single-family homes at 36 & 38 New Rochester Road to be converted to 2-family dwellings will utilize existing services, with new internal utilities to be plumbed to support.

The applicant is applying for three non-environmental Conditional Use Permits (CUPs); 1) Lot building coverage of 18.4% where 50% is required, 2) Frontage build-out of 47.4% where 60% (New Rochester Road) is required, 3) Not meeting front build-to line on New Rochester Road. Please find attached CUP application and narrative for justification and criteria. The applicant is applying for one waiver; 1) Drainage pipe cover of less than 3' (1.6' proposed). Please find attached waiver request narrative for justification and criteria.

It is of note, a scribers error occurred in previous TRC submissions. A environmental CUP for greater than 20% impervious coverage was not needed from the beginning of this application, and the threshold of 20% impervious coverage has not been triggered with the new submission. Only three, non-environmental CUPs, are required for the project.

The project requires the following approvals:

- Planning Board acceptance of the Voluntary Lot Merger
- CUP for lot coverage, frontage build-out, & front build-to line
- Waiver for drainage pipe cover
- Site Plan Approval
- EPA Notice of Intent (NOI)
- NHDES Sewer Discharge Permit

Since TRC #2, the following major revisions have been made and are discussed more in depth within the TRC response letter:

- Copper Drive has been shortened to comply with NFPA 1 Chapter 18. As a result of this, an additional 2-family dwelling unit has been added to the end of Copper Drive.
- The grading and footprint of the Copper Drive parking lot has been modified for additional parking spaces and compliance with lighting requirements.
- Ember Drive has increased in length and parking spaces added to both sides of the road.

- Water, sewer, & electric utilities have been revised as a result of these modifications. Revised sewer calculations and state application are included in the submission.
- The accessible parking space/EV charging space arrangement has been revised based upon meeting with Inspection Services, applicable EV signage has been added to the Site Plan.
- The applicant is now proposing to convert the existing single-family homes at 36 & 38 New Rochester Road to meet the allowed unit density for the subject parcel.
- The Traffic Impact Analysis has been revised to reflect the additional units and vehicle distribution difference from the prior site plans.
- Lighting has been revised to no longer require a waiver for illumination ratio in the Copper Drive parking lot.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry, SIT
Principal, President

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

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: Knox Marsh Development LLC Telephone # 603-742-2121

Address of Applicant: 242 Central Ave, Dover, NH 03820

E-Mail Address: robert@centralfallsrealty.com

Name of Property Owner (*if different from applicant*): Robert Baldwin Telephone # 603-986-2373

Address of Property Owner: 242 Central Ave, Dover, NH 03820

PROPERTY INFORMATION

Address of Property: 34 New Rochester Road

Assessor's Map # 39 Lot(s) # 103

Zoning District(s) Gateway, R-12 Overlay District(s) Secondary Groundwater Recharge

Size of Parcel: 35,555 sq. ft. 0.82 ac. Property Deed: Book 5116 Page: 655

Existing Use of Property: Existing single family home

SITE PLAN INFORMATION

Describe Proposed Use: 2-family dwelling Site Plan w/ one ex single family to remain, lot merger w/ Copper Drive LCA (P22-27)

Area of Parcel to be Developed: 35,555 SF sq. ft.

If Multi-family Residential: Number of Units 12 & Buildings Proposed 6

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

Number of Parking Spaces: Existing N/A Proposed 28 spaces

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

Number of Employees Total: 0 In Maximum Shift: 0

Disposition of Parcel:

Building Footprint _____ sq. ft.

Total Building Area _____ sq. ft.

Paved Area _____ sq. ft.

Building Setbacks:

Front Yard 5-20 ft.

Rear Yard 15 ft.

Side Yard: Right 10 ft. Left 10 ft.

City Water? X Yes ___ No How far is city water from the property? New Rochester Road

City Sewer? X Yes ___ No How far is city sewer from the property? New Rochester Road

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: 6 2-family dwellings, existing single family home to remain

Height of Building: 30' +/- Finished Floor Elevation: See plans

Number of Seats (where applicable) N/A

Estimated value of construction: 3,000,000 Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: 157-40-B(5) (Min. pipe cover)

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

Please find attached narrative.

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kenneth A Berry, PE, LLS
Christopher R. Berry
Berry Surveying & Engineering

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

Professional License #: _____ E-mail address: K.Berry@BerrySurveying.com
crberry@metrocast.net

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Kenneth A Berry, PE, LLS
Christopher R. Berry
Berry Surveying & Engineering

Address _____ Telephone #: 603-332-2863

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

ARCHITECT INFORMATION

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

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

LANDSCAPE ARCHITECT INFORMATION

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

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

Professional License #: 78 E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) John P. Hayes III

Address 7 Limestone Way, North Hampton NH 03862 Telephone #: 603-205-4396

Professional License #: 87 E-mail address: johnphayes@comcast.net

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: 7-21-23

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

Signature of Agent: _____ Date: 7-21-23

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: 7-21-23

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: 7-21-23

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: 7-21-23

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

CITY OF DOVER SITE REVIEW
LIST OF ABUTTERS

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

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 1, 2021)

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 # 2 of lots involved = $400
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee $200.00 = $_____
- ☐ SITE REVIEW – RESIDENTIAL Application fee $200.00+ $100.00 x # 12 per dwelling unit = $1,400.00
- ☐ 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 # 3 per Application = $600.00
- ☐ 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 = $_____

2. TOTAL IMPERVIOUS PAVED AREA (for new development, roadways or additions to existing parking lots, (not to exceed $10,000)) Application fee of $200.00 is N/A if it is part of a Site Review or Subdivision Plan. $200.00 + $.07 per sq. ft. x # _____ sq. ft. = $_____
0(All porous pavement)

SUBTOTAL PLAN REVIEW FEE (A) = $ 2,400

AND

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

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
  - Certified letters fee # _____ of x $8.00= $_____
- ☐ Certified letters fee: # of abutters _____ X $8.00= $_____
- ☐ 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 $100.00 x # _____ applications = $_____

SUBTOTAL NOTICE FEE (B & C) = $_____

TOTAL INVOICE AMOUNT (A, B & C) = $_____

PLAN REVIEW FEE COLLECTED/PAID = $ _____

BALANCE DUE = $ _____

The balance 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: Knox Marsh Development, LLC File Number: _____

PROJECT TITLE: Copper Drive & Ember Drive

PROPERTY LOCATION: 34 New Rochester RD Tax Map: 39 Lot: 103

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

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	x	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	x	
Existing and proposed topographic information at two foot intervals	x	
Existing and proposed buildings and structure locations	x	
Minimum building setbacks or build to lines on all lots	x	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	x	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	x	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	x	
Existing and proposed stormwater lines and facilities	x	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	x	
Location of Flood Hazard Zone	N/A Noted on plan	
Location of all bodies of water and watercourses	N/A None	
Location of wetlands and buffers	N/A None	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	x	
Existing natural features and/or significant vegetation on property	x	
Depict existing contours up to 100 ft. beyond project limits	x	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	x	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	x	
Location, material and size of existing and proposed pavement area	x	
Location of proposed fire lanes	x	
Specify finished floor elevations of buildings	x	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	x	
Depict all service, storage, loading bays and utility areas	x	
All applicable Dover Common Site Plan notes	x	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	x	
Stormwater Management System Operation and Maintenance Plan	x	
Letter to Serve from Public and Private Utilities	x	
Erosion and Sedimentation Control Plan	x	
Landscape Operation and Maintenance Plan	x	
Proposed restrictive covenants or homeowners association documents	Will provide	
Dates and permit numbers of all required state and federal permits	Will provide	
If wetland buffer, indicate placards locations, as applicable	N/A	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	x	
Location of proposed drive-in facilities	N/A	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required	Will provide as needed	

REVIEWED BY: _____ DATE_____ TRC DATE_____

City of Dover, New Hampshire
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: Knox Marsh Development LLC Telephone # 603-742-2121

Address of Applicant: 242 Central Ave. Dover, NH 03820

E-Mail Address: Robert@centralfallsrealty.com

Name of Property Owner (if different from applicant): Robert Baldwin Telephone # 603-986-2373

Address of Property Owner: 242 Central Ave. Dover, NH 03820

PROPERTY INFORMATION

Assessor's Map # 39 Lot(s) # 103

Address of Property: 34 New Rochester Road

Zoning District(s) Gateway & R-12 Overlay District(s) Secondary Groundwater Recharge

Existing Use of Property: Single family home

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:

1) Frontage Build-Out of 47.1% where 60% is required.
2) Lot Building Coverage of 17.1% where 50% is required.
3) Not meeting front build-to line on New Rochester Road

Please see attached narrative.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: EPA NOI/SWPPP, NHDES Sewer Discharge Permit

Name of Professional That Prepared Plans: Kenneth A. Berry PE, LLS
Berry Surveying & Engineering
Christopher R. Berry Project Manager

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

Professional License #: 805 & 14243 E-mail address: Crberry@metrocast.net

SIGNATURES

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

Signature of Property Owner: _____ Date: 7-21-23

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

Signature of Agent: _____ Date: 7-21-23

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: 7-21-23

CITY OF DOVER CONDITIONAL USE
LIST OF ABUTTERS

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

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 1, 2021)

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

A. Plan Review Fees

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

- ☐ SUBDIVISION Application fee $200.00 + $150.00 x # _____ new lots created = $_____
- ☐ LOT LINE ADJUSTMENT Application fee $200.00 + $100.00 X # ___ of lots involved = $_____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee $200.00 = $_____
- ☐ SITE REVIEW – RESIDENTIAL Application fee $200.00+ $100.00 x # __ per dwelling unit =$_____
- ☐ SITE REVIEW – NON-RESIDENTIAL Application fee $200.00 + (not to exceed $10,000)
  - New construction $.15 sq. ft. x # _____ sq. ft.= $_____
  - Additions (new floor space) $.10 per sq. ft. x # _____sq. ft.= $_____
- ☐ MOTEL/HOTEL $35.00 x # ___ per lodging unit= $_____
- ☐ CHANGE OF USE Application fee $200.00 + (not to exceed $5,000)
  - Existing floor spaces $.10 per sq. ft. x # _____ sq. ft. = $_____
- ☐ CONDITIONAL USE PERMIT Application fee $200.00 x # _____ per Application = $_____
- ☐ GRAVEL PIT/ EXCAVATIONS
  - Application fee $50.00= $_____
  - Permit fee $75.00= $_____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee $200.00 = $_____
- ☐ REQUEST FOR REZONING Application fee $200.00 = $_____
- ☐ DRIVEWAY WAIVER Application fee $200.00 = $_____

2. TOTAL IMPERVIOUS PAVED AREA (for new development, roadways or additions to existing parking lots, (not to exceed $10,000)) Application fee of $200.00 is N/A if it is part of a Site Review or Subdivision Plan. $200.00 + $.07 per sq. ft. x # _____ sq. ft. = $_____

SUBTOTAL PLAN REVIEW FEE (A) = $_____

AND

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

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
  - Certified letters fee # _____ of x $8.00= $_____
- ☐ Certified letters fee: # of abutters _____ X $8.00= $_____
- ☐ 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 $100.00 x # _____ applications = $_____

SUBTOTAL NOTICE FEE (B & C) = $_____

TOTAL INVOICE AMOUNT (A, B & C) = $_____

PLAN REVIEW FEE COLLECTED/PAID = $ _____

Included on Site Plan APP **BALANCE DUE = $ _____**

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

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

July 6, 2023/Rev: November 8, 2023

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

Re: Residential Site Plan & Lot Merger
Conditional Use Permit Request (Non- Environmental - four of five total)
Knox Marsh Development, LLC
34 New Rochester Rd, Tax Map 39, Lot 103 (Site Plan & Lot Merger)
36 New Rochester Rd/Copper Dr, Tax Map 39, Lot 104 (Lot Merger) (P22-027)

Chairperson & Members of the Dover Planning Board:

Pursuant to Zoning Regulations (Chapter 170) and Site Plan Regulations (Chapter 153) Berry Surveying & Engineering (BS&E), on behalf of Knox Marsh Development, LLC, respectfully requests the City of Dover Planning Board approve the following Conditional Use Permits:

1) Minimum Lot Coverage less than 50%
2) Minimum Frontage Build-Out of less than 60%
3) Not Meeting front build-to line on 5-20' on New Rochester Road

Background:

Knox Marsh Development is looking to re-develop the site at 34 New Rochester Road and is proposing a lot merger with Tax Map 39, Lot 104. All percentages provided are a function of the lot merger, for a total lot area of 103,666 Sq. Ft. (2.38 Ac.). Conditional Use Permits (CUP) Request #1-3 utilize the Central Business District Regulations (Chapter 170-20-B) for Conditional Use Permit Request, as there are no specific standards listed for request #1-3. Conditional Use Permit Request #4 utilizes the standards of Chapter 154-14(D)(5). This narrative will provide justifications for CUPs #1-3 based upon the applicable standards.

There is an existing single-family home at 34 New Rochester Road, proposed to remain. The proposal is to create a road (Ember Drive) off of New Rochester Road and to extend Copper Drive 156 linear feet (LF). In addition to the single-family home at 34 New Rochester Road to remain, six previously approved home single family homes on Copper Drive, and the conversion of two single family homes (36 & 38 New Rochester Road) to 2-family dwellings, the applicant is proposing to construct six additional 2-family dwelling buildings (twelve units) on Tax Map 39, Lot 103. This brings the total

yield for the subject parcel post lot merger to twenty-three (23) units (sixteen 2-family dwelling units and seven single family units within the Gateway Zone).

1. **Identification of Conditional Use Permits (CUPs #1-3) (Chapter 170-20-B)**
   1.) Minimum Lot Coverage less than 50%
   2.) Minimum Frontage Build-Out of less than 60%
   3.) Not Meeting front build-to line on 5-20' on New Rochester Road

CUP #1): Dimensional regulations in the Gateway District state that lot coverage must be 50%. We ask that Conditional Use Permits be granted to allow the site to have a building coverage of 17.1%. Due to the layout of the site, congruency with surrounding land uses, construction of Copper Drive and Ember Drive, zoning boundary lines and restrictions, and deed restrictions, the site is designed with the maximum building footprints possible. The subject parcel is located within the Secondary Groundwater Recharge Zone, where a maximum of 20% impervious coverage is allowed. The single-family home proposed on LCA Tax Map 39, Lot 104-4 is located in a portion of the subject parcel tract (Tax Map 39, Lot 105 original) that is restricted by deed to only one principal residential structure. Additionally, the zone line for the Gateway District (300' from center of New Rochester Road), has been adjusted by 50' to include all proposed development within the Gateway District. Use of the rear of the subject parcels would be located in the R-12 Zone (Lot 104), a zone with more conservative zoning dimensional requirements. Within 300' of the center line of New Rochester Road, building height is limited to two stories and residential is limited to single family and two-family dwelling units. Given this restriction, multi-family drive under town houses or other more intensive uses that would increase the building lot coverage are not allowed within this portion of the Gateway District.

CUP #2): A CUP requesting the reduction of the frontage build-out on New Rochester Road from 60% to 47.4%. While the applicant is proposing additional construction along New Rochester Road to approach the required number of 60%, reaching this number is not practical given the curb cuts for Copper Drive/Ember Drive along with the applicable side building setbacks.

CUP #3): A CUP requesting the existing single-family home on Tax Map 39, Lot 103 to not meet the front build-to line of New Rochester Road (5-20'). Without modification of the existing single-family structure, the front of the house is 5.1' from the 20' build-to line. As the structure is proposed to remain and be remodeled, the distance off of New Rochester Road is consistent with surrounding single family homes.

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

2. Compliance with the following standards (CUPs #1-3)

a) That both public and private buildings and landscaping shall contribute to the physical definition of rights of way as civic spaces.

- **A landscaping plan including street trees, shrubs, and grasses is proposed along Copper Drive and Ember Drive. The project balances the pedestrian and livability needs of the site with the infrastructure required through the use of landscaping, hardscaping, and small amenities. The right of way is clearly defined by these features for Copper Drive.**

b) That development shall adequately accommodate automobiles, while respecting the pedestrian and the spatial form of public areas.

- **The site is designed with a hammerhead turnaround and the required road cross section (24' wide) for the proposed volume of trips of Copper Drive. Ember Drive is less than 150 feet long and has the required cross section (24' wide). A 5' raised sidewalk along New Rochester Road has been added to improve walkability and the civic nature of the urban core.**

c) That the design of streets and buildings shall reinforce safe environments.

- **The design of buildings and street reinforce safe environments by pedestrian access and a low (15 MPH) posted speed limit. Copper Drive and Ember Drive is proposed to be a private roadway, reducing the potential for outside traffic to enter the neighborhood, keeping volume low (>150 vehicles per day Copper Drive and approximatly 50 Vehicles per day for Ember Drive). Curb tip downs are proposed at sidewalk and driveway crossings. A sidewalk is proposed at the parking lots of Copper Drive and Ember Drive with sidewalk connectivity to the 2-family dwelling units.**

d) That architecture and landscape design shall grow from local climate, topography, history, and building practice.

- **The architecture of the new duplex structures are similar in size to surrounding single family homes (975 Sq. Ft. foot**

print). The relatively flat topography of the site allows for a harmonious streetscape with finished floors of homes and driveways to be within a vertical foot +/- of each other. The preservation of the existing single-family home at the front of the site allows the New Rochester Road corridor to consist of structures of similar age, while new construction is set back from the corridor. Larger building footprints would cause non-compliance with building setbacks and internal building separation requirements.

e) That buildings shall provide their inhabitants with a clear sense of geography and climate through energy efficient methods.
   - **The new structures will be built to the current building codes keeping energy efficiency in mind through the use of heat pumps and other fossil fuel reducing devices.**

f) That civic buildings and public gathering places shall be provided as locations that reinforce community identity and activity.
   - **While the homes are not Civic in nature or use, the potential for gatherings by residents is encouraged by proposed benches, sidewalk, and landscaping. By having six 2-family dwelling structures within 175 feet +/- of each other, the proposed landscaping provides a visually appealing element, encouraging pedestrian activity within the development via sidewalks and passive recreation amenities.**

g) That civic buildings shall be distinctive and appropriate to a role more important than the other buildings that constitute the fabric of the city.
   - **Though the homes are not Civic in nature or use, the proposed street scape, unit density, and pedestrian amenities help to provide a community feeling, an essential element in the fabric of the city.**

h) That the preservation and renewal of historic buildings shall be facilitated.
   - **The existing single-family homes on Lot 103 was built in 1943. The existing structures have undergone substantial renovation within the last ten years in an attempt to preserve and enhance this structure.**

i) That the harmonious and orderly evolution of urban areas shall be secured through the adoption of these regulations.
- **The harmonious and orderly evolution of the urban area is secured in the redevelopment of the project site in the manner in which it is presented. Proposed duplex units shown are limited in footprint by lot dimensions and limited in height by zoning restrictions. This results in similar home styles and a harmonious streetscape.**

3. Justification for approval of Conditional Use Permits (CUPs #1-3)

Given the limited residential development options due to restrictions within 300' of the center of New Rochester Road, it is incumbent on the applicant to maximize the development density allowed in the Gateway District within these parameters. Approved homes on Copper Drive meet the 5-20' front build-to line to the pavement, are close to the rear 15' setbacks, and provide a minimum of 25' between units, maximizing the building footprint within each LCA. The proposed duplex units are subject to the same front build-to, side, and rear setbacks. The proposed separation of twelve feet between duplex structures at the closest point maximizes the building footprints, while providing space on site for passive recreation uses and parking.

With the rear of Lot 104 located within R-12 zone, the development area within the Gateway District has been maximized utilizing the 50' zone line adjustment. In terms of frontage build-out, the applicant is unable to increase the existing frontage build-out to 60% without the complete demolition and reconstruction of larger homes along New Rochester Road. While the applicant is proposing additional construction along New Rochester Road to approach the required number of 60%, reaching this number is not practical given the curb cuts for Copper Drive/Ember Drive along with the applicable side building setbacks.

Thank you for your time and attention to this matter, and we hope you look favorably upon the request.
Respectfully Submitted,

BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry, SIT
Principal, President

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
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July 6, 2023/Rev: November 6, 2023

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

Re: Waiver Requests
Residential Site Plan
Knox Marsh Development, LLC
34 New Rochester Road
Tax Map 39, Lot 103

Chairperson & Members of the Dover Planning Board:

In accordance with Subdivision Regulations Article 157-40-B(5), the following waiver is hereby requested:

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

- Proposed 12" Reinforced Concrete (RCP) drainage pipe with 1.6' minimum cover where 3' is required.

2. Explanation:

The applicant proposes to utilize infiltration sumps in two areas of the project to protect abutting properties from stormwater runoff leaving the subject parcel. As part of the Copper Drive, a 12" RCP is proposed as a high-flow by-pass (100YR 24-HR storm event only) for the infiltration sump (Pond 4P) that receives roof runoff from Copper Drive homes and grassed area. The intention of this pipe invert at the proposed elevation is for this infiltration sump (Pond 4P) to infiltrate the 50YR-24HR storm event without overflow. In the case of overflow, this infiltration sump (Pond 4P) flows to a second, smaller infiltration sump (Pond 1P) adjacent to the parking lot that receives off-site stormwater from Tax Map 39, Lot 102 and grassed area of Tax Map 39, Lot 103. If the invert of the 12" RCP was lower, a reduced volume of stormwater would be infiltrated in Pond 4P, increasing the volume of water that would leave Pond 1P and cross the property line of Tax Map 39, Lots 71, 72, & 73 on the larger storm events (25, 50, 100YR-24HR storm events).

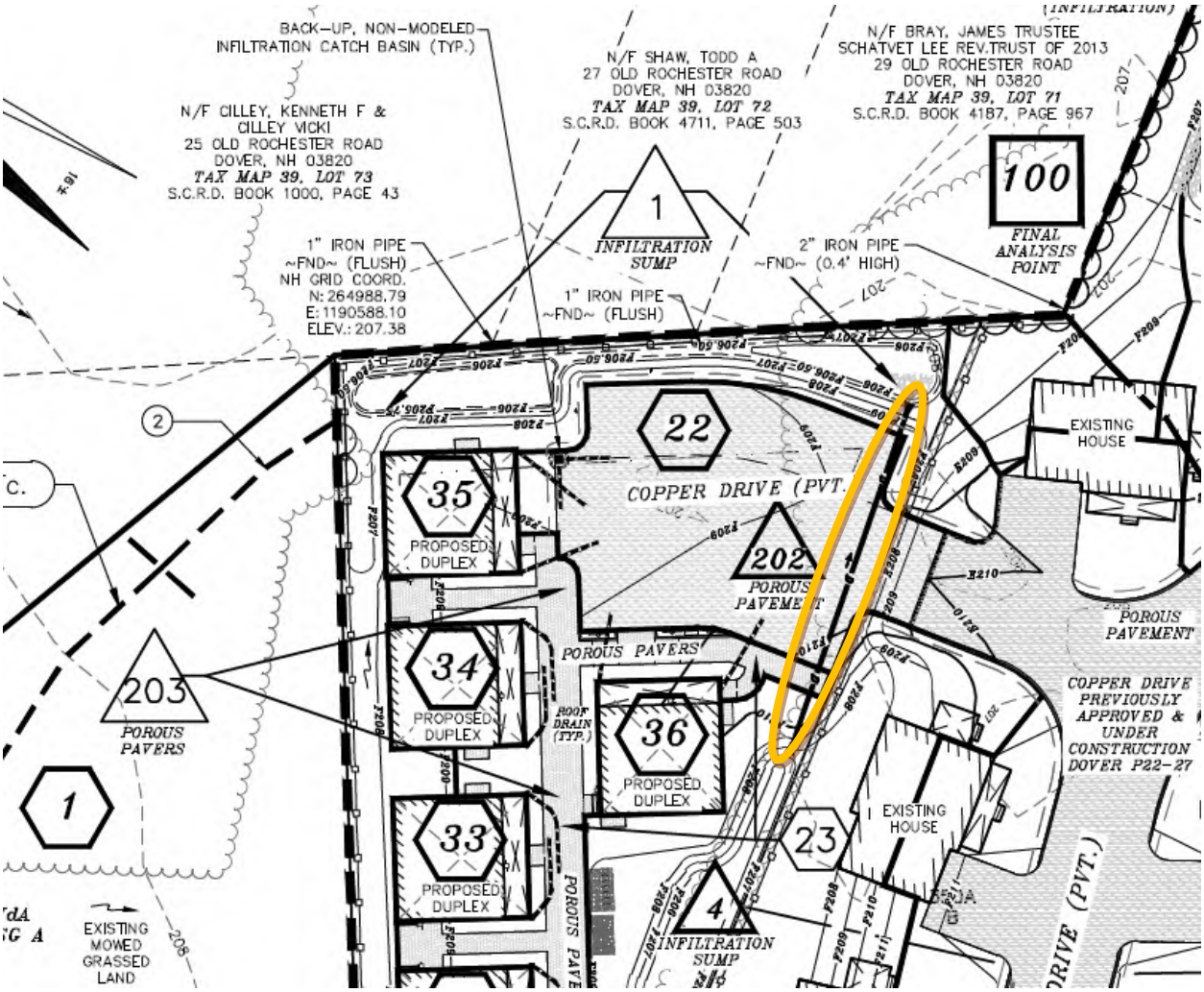


Image from W2-Proposed Watershed Plan showing the locations of Infiltration Sumps, Pond 4P and Pond 1P, in relation to the abutting property line.

3. Waiver Justification:

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

The purpose and intent of this regulation is to provide long term pavement and pipe durability. The proposed design is to provide a level of safety of protection for abutting properties from stormwater runoff of an urbanized area such as this. With porous pavement proposed, a thicker cross-section (32" total) is proposed as opposed to a conventional pavement section (22" total). The proposed pipe type is Reinforced Concrete (RCP), which is designed to withstand lower cover applications. With sandy soils, there are fewer concerns for floating or heaving of the pipe.

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

Requiring the applicant to provide 3' of cover would pose an unnecessary hardship on the applicant. To provide the required cover, the applicant could take two separate routes, with the design intent for Pond 1P, adjacent to the parking area, not to overflow until the 100YR 24-HR storm event. The first option would be to keep the proposed grade of Copper Drive the same, while lowering the 12" RCP invert 1.6'+ to meet the three feet of cover requirement. As previously mentioned, this would reduce the volume of stormwater infiltrated on site in Pond 4P and increase the amount of overflow onto abutting properties from the proposed design. The bottom of the infiltration sumps (Pond 4P & Pond 1P) cannot be lowered, as they are greater than one foot above seasonal high-water table. This would require the removal or parking spaces to provide additional ponding volume in Pond 1P to infiltrate the 50YR-24HR storm event.

The second option would be to keep the invert of the 12" RCP in Pond 4P the same, but raise the profile of Copper Drive 1.4'+ to meet cover requirements. This would result in the fill slope of the parking lot of Copper Drive to be closer to the boundary line, removing the infiltration capacity of Pond 1P, adjacent to the parking lot. This would also result in the removal of parking spaces to provide additional ponding volume in Pond 1P, to meet the design intent of this pond infiltrating the 50YR, 24HR storm event.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

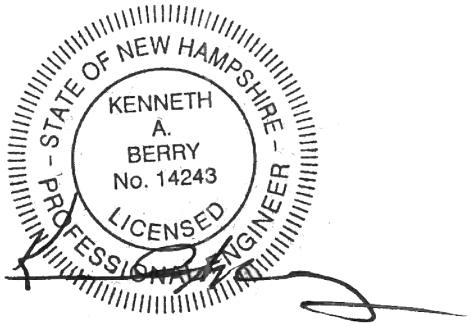
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July 6, 2023/Rev: November 6, 2023

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



RE: Traffic Impact Analysis & Distribution
Copper Drive & Ember Drive
Knox Marsh Development, LLC
Tax Map 39, Lot 103 & 104
34-36 New Rochester Road (NH Route 108)
Dover, NH 03820

Mrs. Benton,

Pursuant to the City of Dover Site Review Regulations, Berry Surveying & Engineering (BS&E), on behalf of Knox Marsh Development, LLC, has prepared a Standard Traffic Impact Analysis for the following: six previously approved single-family homes, two pre-existing homes on Lot 104 to be converted to 2-family dwellings, one pre-existing home on Lot 103, and six 2-family dwellings (twelve units) on Tax Map 39, Lots 103 & 104, for a total of twenty-three (23) units. Tax Map 39, Lot 104 & 105 have been previously merged, with a Limited Common Area (LCA) Subdivision approved. This subdivision is known as Copper Drive (Dover Approved Project #P22-027). A Lot Merger is proposed as part of the application for Tax Map 39, Lot 103 and 104, combining the lots as Limited Common Areas under Tax Map 39, Lot 104. There are two points of analysis; the existing intersection of Copper Drive and New Rochester Road (NH Route 108) and the proposed intersection of Ember Drive and New Rochester Road. The existing single-family driveway (converted to 2-family dwelling) on LCA Tax Map 39, Lot 105 is included with Copper Drive as a single analysis point in the proposed condition.

The following conclusions were reached as a result of the Traffic Impact Analysis:

- A total of 9 vehicle trips (2 enter/7 exit) are predicted to occur at the weekday AM peak hour and 12 vehicle trips (7 enter/5 exit) at the PM peak hour for Copper Drive.

- A total of 4 vehicle trips (1 enter/3 exit) are predicted to occur at the weekday AM peak hour and 4 vehicle trips (3 enter/1 exit) at the PM peak hour for Ember Drive.

- The 2024 and 2034 build traffic volumes DO NOT satisfy the NCHRP 457 guidelines for the implementation of a left-turn lane for all peak hours for Copper Drive.

- The 2024 and 2034 build traffic volumes DO NOT satisfy the NCHRP 457 guidelines for the implementation of a left-turn lane for all peak hours for Copper Drive.

- This is an increase from the existing/approved condition of 96 weekday vehicle trips, 7 weekday AM peak hour vehicle trips, and 8 weekday PM peak hour vehicle trips for the entire project.

- It is recommended that the surrounding infrastructure will be sufficient to handle the projected increase in vehicle trips and peak hour and all other hours.

- The number of driveway cuts along New Rochester Road is being reduced in this proposal.

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Proposed Development & Introduction

The proposal is to develop Tax Map 39, Lot 103 to contain six new 2-family dwelling units, in addition to a single-family home on site to remain, for a total of thirteen units within the original subject parcel limits. Tax Map 39, Lot 103 is proposed to be merged with Tax Map 39, Lot 104/Copper Drive (Dover project #P22-027) (6 single-family approved homes and two pre-existing single-family homes). The two pre-existing single-family homes are being converted to two-family dwellings. A lot merger has been previously completed between Tax Map 39, Lot 104 & 105 for Copper Drive. This project will be referred to as being located on Tax Map 39, Lot 104 for the duration of this analysis. The total unit count on the parcel will become twenty-three (23), with trip generation divided between two access points based upon parking/access location. The eight (8) 2-family dwelling structures (sixteen units) are considered single family-attached housing and the seven (7) single family units are considered single family-detached housing.

The existing access to the site (located on existing Tax Map 39, Lot 104) is a 24-foot-wide roadway, known as Copper Drive, with 25-foot pavement entrance radii for vehicle turning. Copper Drive is 409 LF in length (new parking) with a hammerhead turn around provided. The proposed access to the site (located on existing Tax Map 39, Lot 103) is a 24-foot-wide roadway, known as Ember Drive, with 25-foot pavement entrance radii for vehicle turning. Ember Drive is proposed to be 141 LF in length. Ember Drive is proposed to be aligned with Auburn Street to create a two-way stop-controlled intersection. In order to construct Ember Drive, the applicant is proposing to remove two existing single family home driveway cuts (Lot 103 & Lot 104) from New Rochester Road. The centerline of Ember Drive will be located 115 feet from the centerline of Copper Drive. This is due to the characteristics of the properties/existing single family home locations along New Rochester Road.

The purpose of this analysis is to determine the maximum number of trips coming to and leaving the proposed project site during certain peak periods of the day. This information is then used in determining the impact on safety as it relates to the existing roadway infrastructure. The following components of the analysis are typical for a project of this size pursuant to the Institute of Traffic Engineers (ITE) manual.

Existing Conditions

Existing Site Description

The subject parcels are known as Tax Map 39, Lots 103 & 104 containing 35,555 Sq. Ft. (0.82 Ac.) and 68,111 Sq. Ft. (1.56 Ac.) of land, respectively. Tax Map 39, Lot 103 currently contains a single-family home (proposed to remain), with grass yard and wooded area in the rear. Tax Map 39, Lot 104 contains Copper Lane (under construction at time of application), with two pre-existing single-family homes and six single-family homes under construction. The subject parcels are located in the Gateway District and contains lot frontage on New Rochester Road (NH Route 108). There are several driveways and local roads surrounding the subject parcels, which are discussed later in the analysis.

New Rochester Road Roadway Description

New Rochester Road (NH Route 108) is a two lane minor arterial road at the subject parcel, according to the NHDOT MS2 Transportation Management System (NHDOT). This portion of New Rochester Road is in the Urban Compact Zone, and therefore not under NHDOT jurisdiction. New Rochester Road runs north to south parallel with N.H. Route 16 and provides access to Somersworth and Rochester to the north and N.H. Routes 9 & 16 to the south (Indian Brook Drive, Central Avenue, Dover, Somersworth, Portsmouth). It has an Average Annual Daily Traffic (AADT) of approximately 16,262 (2022) divided between north and south in the data provided by the NHDOT.

New Rochester Road in the area of the project is composed of a thirty-two foot wide paved surface (edge of pavement to edge of pavement) with a twelve foot southbound lane and a fourteen foot northbound lane. There is a variable width paved and gravel shoulder on the west side of the road and vertical granite curbing with a sidewalk on the east side. There is centerline delineation and fog / edge lines provided. The posted speed limit of the roadway is 35 miles per hour (MPH). The geometry of New Rochester Road is relatively flat and straight in the project location. There are public transit opportunities within a ¼ mile of Copper Drive & Ember Drive that will be discussed later in the analysis.

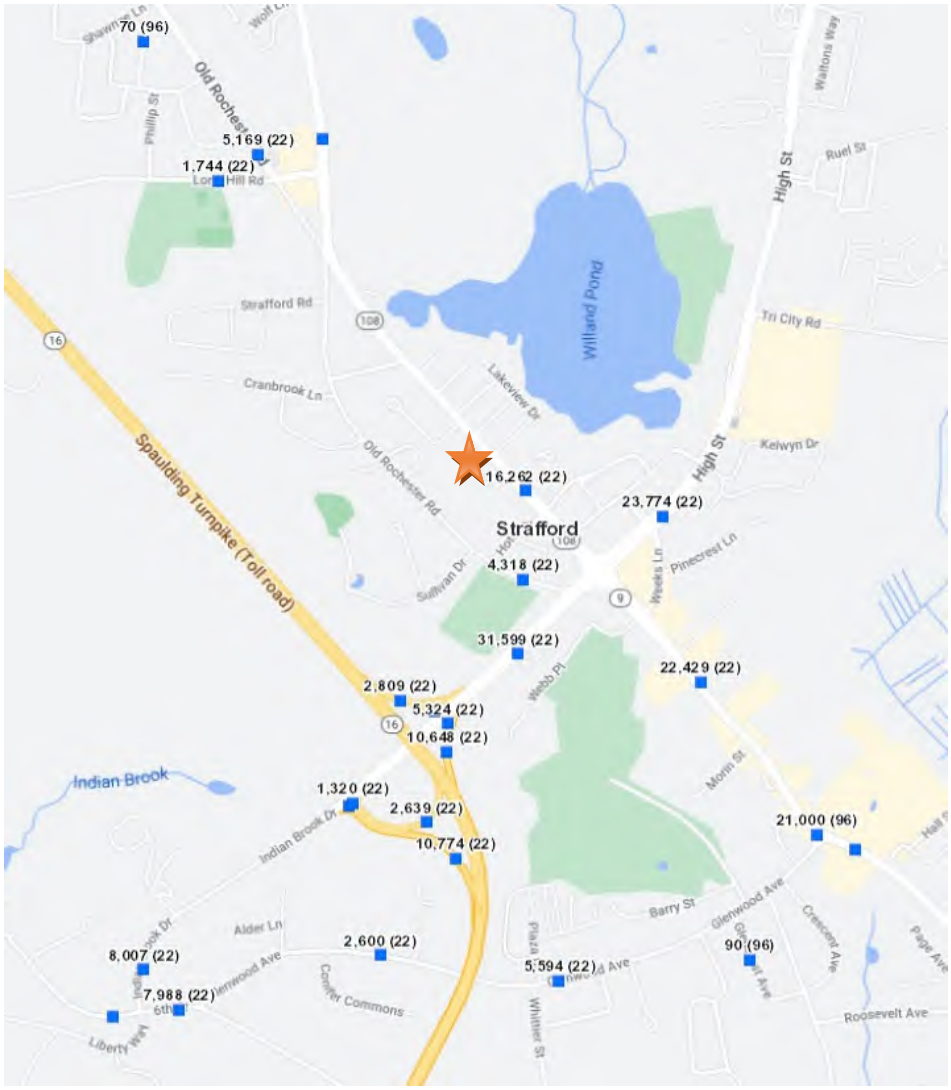


Figure 1: New Rochester Road with surrounding roadways (NHDOT)

Existing Traffic Volumes

According to traffic counts recorded by the NHDOT for August 30th - September 1st 2022, the New Rochester Road AM and PM weekday two-way peaks were 1,318 trips and 1,583 trips, respectively. It is shown by the NHDOT that this portion of New Rochester Road has an AADT 16,262 (2022) divided between north and south in the data provided by the NHDOT.

The highest weekday peak hour traffic volume on this section of New Rochester Road northbound occurred from 7:30-8:30 AM with 683 vehicles and from 4-5 PM with 887

vehicles. Southbound highest weekday peak hour traffic volume occurred from 7:15-8:15 AM with 656 vehicles and from 4:15-5:15 PM with 714 vehicles. Table #1 shows the traffic direction breakdown of New Rochester Road and Figures #1-3 are graphical representations of the traffic variations occurring throughout the day. It can be seen from the directional percent distribution that the primary direction of travel during the Weekday AM peak hour is split evenly between northbound and southbound. The primary direction of travel during the PM peak hour is northbound towards Somersworth and Rochester. Traffic counts of New Rochester Road provided by the NHDOT are included in Appendix A as Figures 7-13.

Traffic Distribution New Rochester Road						
Date	Northbound		Southbound		Two-Way	
Tuesday 8/30/22	AM Peak	612	AM Peak	651	AM Peak	1260
	PM Peak	886	PM Peak	685	PM Peak	1571
Wednesday 8/31/22	AM Peak	652	AM Peak	631	AM Peak	1283
	PM Peak	887	PM Peak	714	PM Peak	1583
Thursday 9/1/22	AM Peak	683	AM Peak	656	AM Peak	1318
	PM Peak	839	PM Peak	688	PM Peak	1527
Average Peak Hour Traffic	AM Peak	649	AM Peak	646	AM Peak	1287
	PM Peak	871	PM Peak	696	PM Peak	1560
% Distribution	AM Peak	50.1	AM Peak	49.9		
	PM Peak	55.6	PM Peak	44.4		

Table 1: Directional breakdown of trips occurring on New Rochester Road (NH Route 108)

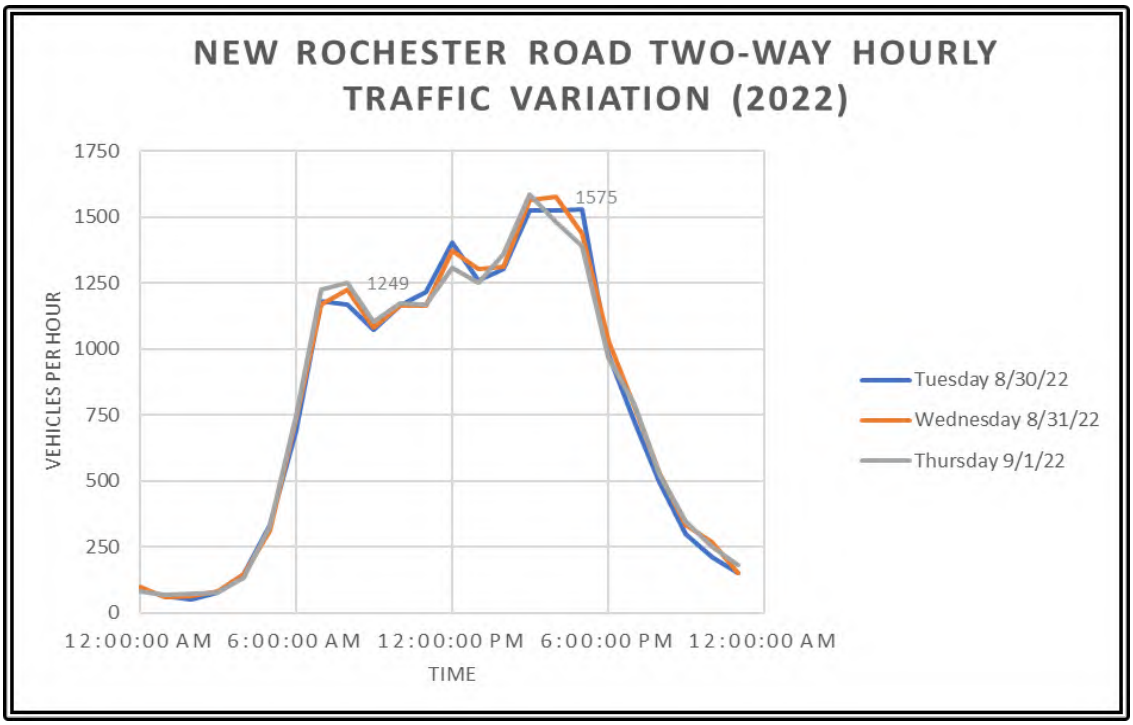


Figure 2: New Rochester Road 2022 two-way hourly variation

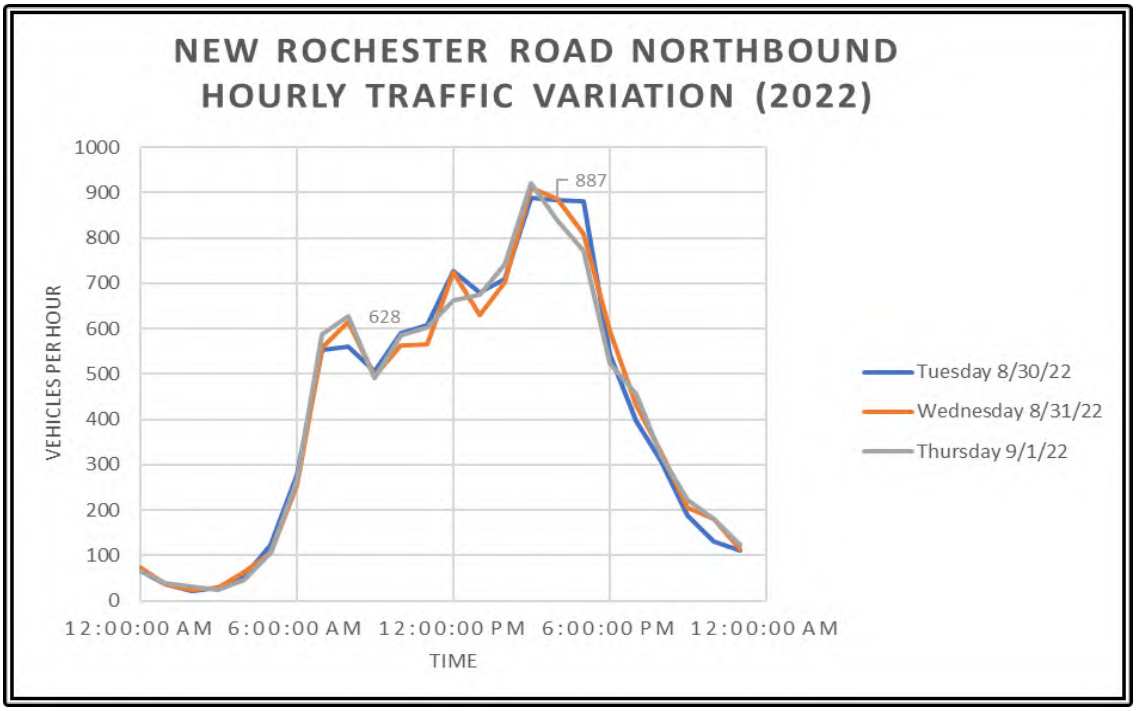


Figure 3: New Rochester Road 2022 northbound hourly variation

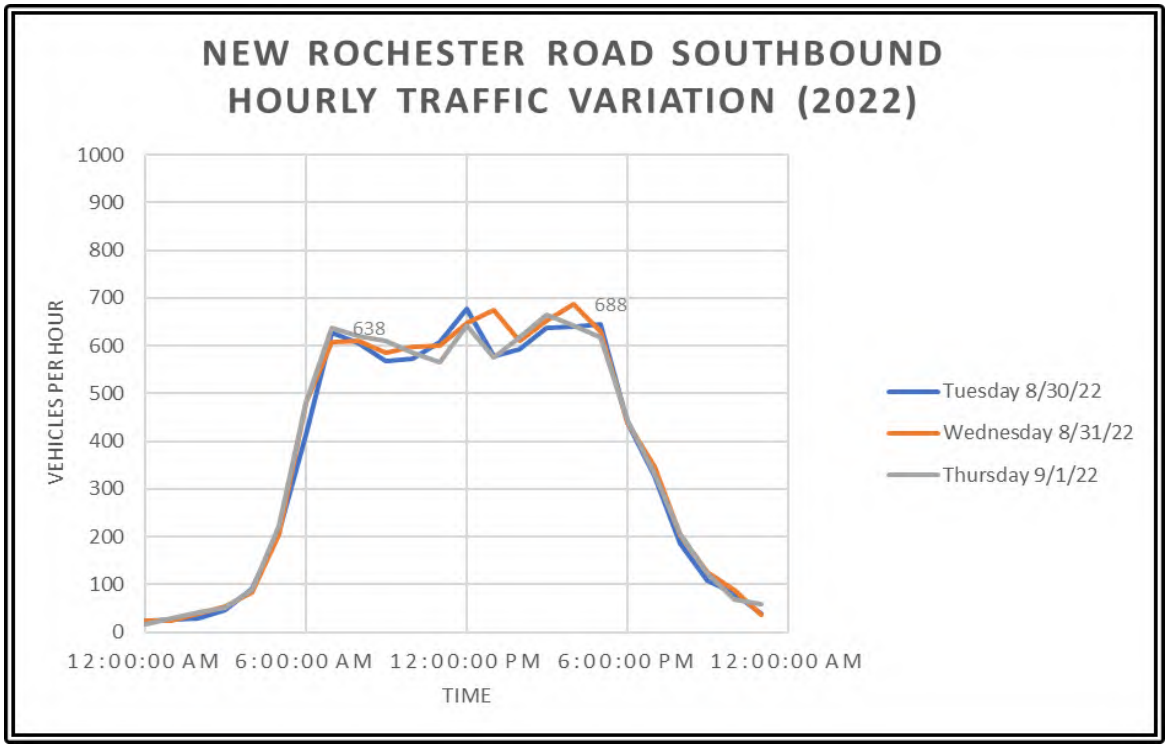


Figure 4: New Rochester Road 2022 southbound hourly variation with peak values

Existing Vehicle Speeds

As previously mentioned, the posted speed limit of New Rochester Road is 35 MPH. For the purposes of the safety analysis below, the 85th percentile of speed is required. This particular section of New Rochester Road was observed by Berry Surveying & Engineering to analyze the pass by traffic, reviewing speed. Excessive speeds were rare, and most operators obeyed the posted speed limits within a deviation of 10 MPH. This is consistent with speeds found on urban roads. The 85th percentile derived by observation and consistency with general practice is 45 MPH. Proposed Ember Drive will be located approximately 400 feet from the beginning of the southbound deceleration/turn lanes of the intersection of New Rochester Road/Willand Pond Road/Hotel Drive. The proximity to this intersection reduces corridor speed from the 85th percentile when a stop is required.

Surrounding Roadways & Signalized Intersections

There are several local roadways within a quarter mile of proposed Ember Drive and existing Copper Drive. On the eastern side of New Rochester Road local roads include: Earle St, Gage St, Lake St, Sherman St, Auburn St, and Newton St. The western side

includes Willard St and Willand Ave. These local roads serve fifteen or less single-family homes.

Further to the south, approximately 0.2 miles is the signalized intersection of Willand Pond Road, Hotel Drive, and New Rochester Road. Willand Pond Road is the commercial driveway for Dover Marine and other commercial businesses in the park. Hotel Drive provides access to Hampton Inn and Comfort Inn & Suites. Approximately 0.3 miles to the south of Copper Drive is the signalized intersection of Indian Brook Drive (NH Route 9), Central Avenue (NH Route 9 & 108), and New Rochester Road. Indian Brook Drive to the east and west of the signalized intersections is considered Other Principal Arterial by the NHDOT with an AADT east of the intersection of 23,774 (2022) and west of the intersection (towards NH Route 16) AADT of 31,599 (2022). Central Avenue is considered a Minor Arterial Road by the NHDOT with an AADT of 22,429.

Proximity to Public Transportation/Pedestrian Access

The proposed build out presents an excellent opportunity for the utilization of public transportation for residents and guests alike. Approximately 100 feet to the north is a Coast bus stop, Route 12N, New Rochester Road & Sherman Street). Additionally, approximately 0.1 miles to the south is a Coast bus stop, Route 12S (New Rochester Road & Hotel Drive). There is an existing sidewalk on the subject parcel side of New Rochester Road (ends at 32 New Rochester Road) that will be connected to Copper and Ember Drive across the subject parcel frontage, along with a sidewalk across the road. This connectivity to sidewalks and bus stop proximity has a potential for a reduction in vehicle trip generation.

Existing Trip Generation

The 11th Edition ITE Trip Generation Manual was used to determine the existing volume of trips from Copper Drive and the three single family driveways of the subject parcel. Included is the percentage of entrance-to-exit traffic experienced during the weekday AM & PM peak hours between 7 and 9 AM and 4 and 6 PM, and total weekday volume. Land Use Code Single Family Detached Housing (210) was used in deriving the existing trip generation from the project site. Tables 2 & 3 provides average trip rate, total trips generated, enter to exit ratio, and the enter to exit distribution. This calculation includes the eight single-family homes on Copper Drive and the existing single-family home on Tax Map 39, Lot 103.

Single Family Detached Housing:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
# Units	9			# Units	9			# Units	9		
Avg. Rate	9.43			Avg. Rate	0.70			Avg. Rate	0.94		
Total Trips	85			Total Trips	6			Total Trips	8		
% Enter	50	Total Enter	42	% Enter	25	Total Enter	2	% Enter	63	Total Enter	5
% Exit	50	Total Exit	43	% Exit	75	Total Exit	4	% Exit	37	Total Exit	3

Table 2: (Single Family Detached Housing) Peak hr of adjacent street traffic AM, PM, & weekday total

Total Existing Trip Generation:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
Total Trips	85			Total Trips	6			Total Trips	8		
% Enter	50	Total Enter	42	% Enter	25	Total Enter	2	% Enter	63	Total Enter	5
% Exit	50	Total Exit	43	% Exit	75	Total Exit	4	% Exit	37	Total Exit	3

Table 3: Existing trip generation from the project site during AM, PM, & weekday total

Proposed Trip Generation

The 11th Edition ITE Trip Generation Manual was used to determine the proposed volume of trips. Included is the percentage of entrance-to-exit traffic experienced during the weekday AM & PM peak hours between 7 and 9 AM and 4 and 6 PM, and total weekday volume. Land Use Code Single Family Detached Housing (210) and Single Family Attached Housing (215) was used in deriving the proposed trip generation from the project site. Tables 4-9 provides average trip rate, total trips generated, enter to exit ratio, and the enter to exit distribution for the proposed trips at Copper Drive and Ember Drive. Table 10 includes the total trip generation between the two roadways for the entire project. The single-family driveway on LCA Tax Map 39, Lot 105 is included in the Copper Drive analysis.

Single Family Detached Housing Copper Drive:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
# Units	6			# Units	6			# Units	6		
Avg. Rate	9.43			Avg. Rate	0.70			Avg. Rate	0.94		
Total Trips	57			Total Trips	4			Total Trips	6		
% Enter	50	Total Enter	28	% Enter	25	Total Enter	1	% Enter	63	Total Enter	4
% Exit	50	Total Exit	29	% Exit	75	Total Exit	3	% Exit	37	Total Exit	2

Table 4: (Copper Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Single Family Attached Housing Copper Drive:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
# Units	10			# Units	10			# Units	10		
Avg. Rate	7.20			Avg. Rate	0.48			Avg. Rate	0.57		
Total Trips	72			Total Trips	5			Total Trips	6		
% Enter	50	Total Enter	36	% Enter	25	Total Enter	1	% Enter	59	Total Enter	3
% Exit	50	Total Exit	36	% Exit	75	Total Exit	4	% Exit	41	Total Exit	3

Table 5: (Copper Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Total Trip Generation Copper Drive:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
Total Trips	129			Total Trips	9			Total Trips	12		
% Enter	50	Total Enter	64	% Enter	22	Total Enter	2	% Enter	58	Total Enter	7
% Exit	50	Total Exit	65	% Exit	78	Total Exit	7	% Exit	42	Total Exit	5

Table 6: (Copper Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Single Family Detached Housing Ember Drive:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
# Units	1			# Units	1			# Units	1		
Avg. Rate	9.43			Avg. Rate	0.70			Avg. Rate	0.94		
Total Trips	9			Total Trips	1			Total Trips	1		
% Enter	50	Total Enter	5	% Enter	25	Total Enter	0	% Enter	63	Total Enter	1
% Exit	50	Total Exit	4	% Exit	75	Total Exit	1	% Exit	37	Total Exit	0

Table 7: (Ember Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Single Family Attached Housing Ember Drive:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
# Units	6			# Units	6			# Units	6		
Avg. Rate	7.20			Avg. Rate	0.48			Avg. Rate	0.57		
Total Trips	43			Total Trips	3			Total Trips	3		
% Enter	50	Total Enter	22	% Enter	25	Total Enter	1	% Enter	59	Total Enter	2
% Exit	50	Total Exit	21	% Exit	75	Total Exit	2	% Exit	41	Total Exit	1

Table 8: (Ember Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Total Trip Generation Ember Drive:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
Total Trips	52			Total Trips	4			Total Trips	4		
% Enter	50	Total Enter	27	% Enter	25	Total Enter	1	% Enter	75	Total Enter	3
% Exit	50	Total Exit	25	% Exit	75	Total Exit	3	% Exit	25	Total Exit	1

Table 9: (Copper Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Total Project Trip Generation:

Time Method	Weekday Total Dwelling Units			Time Method	AM Peak Adj. Street Traffic Dwelling Units			Time Method	PM Peak Adj. Street Traffic Dwelling Units		
Total Trips	181			Total Trips	13			Total Trips	16		
% Enter	50	Total Enter	91	% Enter	23	Total Enter	3	% Enter	63	Total Enter	10
% Exit	50	Total Exit	90	% Exit	77	Total Exit	10	% Exit	38	Total Exit	6

Table 10: Proposed trip generation from the project site during AM, PM, & weekday total

Increase from Existing Trip Generation

Changes in Trip Generation	
Time	Change in Trips Generated
Weekday Total	96
Weekday AM Peak Hour	7
Weekday PM Peak Hour	8

Table 11: Increase from existing trip generation

Build Traffic Projections and Turning Analysis

Traffic data obtained from the NHDOT in 2022 has been projected to 2024 and ten years further to 2034. This has been done using an August peak seasonal adjustment factor of 1.00 (Urban Highways Group 4, AM & PM) and using an annual growth rate of 1%, compounded annually. The derivation of the peak seasonal adjustment factor comes from an average series of values from other urban highways from across New Hampshire, which can be found as Table 20 in Appendix C. Figures 5 and 6 show the build turning movements to and from Copper & Ember Drive during weekday AM and PM peak hours. These figures also show the projected volume of traffic northbound and southbound on New Rochester Road for 2024 and 2034. This data is then used to preform NCHRP 457 left-turn and right-turn bay warrant analyses. Appendix B contains the data that was used to conduct the analyses as Figures 14 & 15 and 20 & 21. A visual of these turning movements is shown in the following figures.

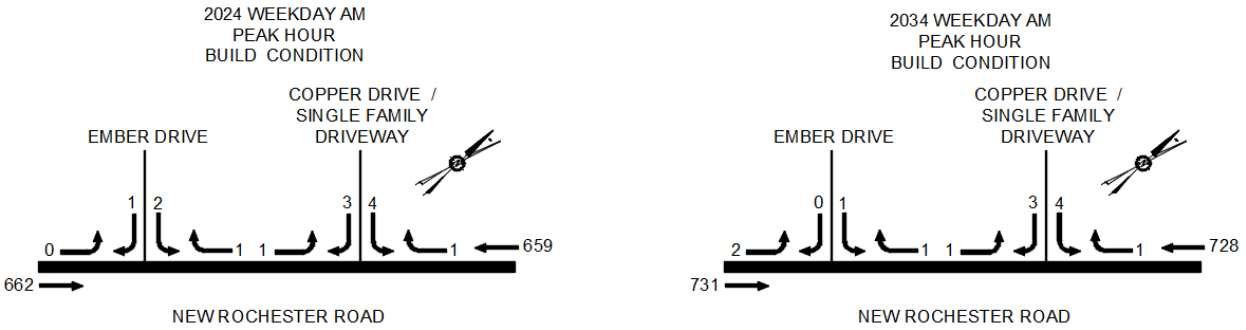


Figure 5: 2024 & 2034 build projected traffic volumes & turn movement weekday AM peak

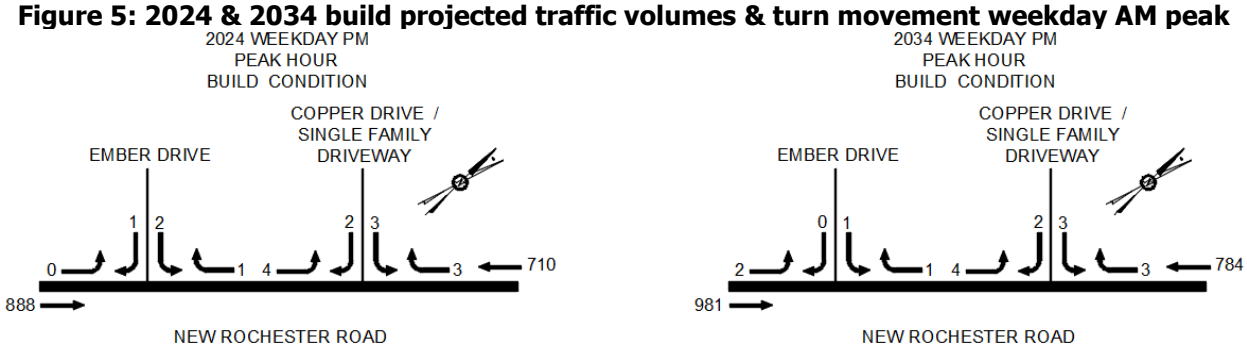


Figure 6: 2024 & 2034 build projected traffic volumes & turn movement weekday PM peak

Tables 12-15 show in a tabular format the total trips that are calculated to occur to and from Copper Drive & Ember Drive are shown at the weekday peak hours analyzed in a build situation. These trips are further broken down into enter and exit to and from the site as well as percentage of left and right turns.

Time	AM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	9			
Trips Enter from NH Rt 108 Northbound		1.0	Left	11.1
Trips Enter from NH Rt 108 Southbound		1.0	Right	11.1
Trips Exit to NH Rt 108 Northbound		3.5	Left	39.0
Trips Exit to NH Rt 108 Southbound		3.5	Right	38.8

Table 12: Weekday AM peak hour build turning movements to and from Copper Drive

Time	PM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	12			
Trips Enter from NH Rt 108 Northbound		3.9	Left	32.4
Trips Enter from NH Rt 108 Southbound		3.1	Right	25.9
Trips Exit to NH Rt 108 Northbound		2.8	Left	23.2
Trips Exit to NH Rt 108 Southbound		2.2	Right	18.5

Table 13: Weekday PM peak hour build turning movements to and from Copper Drive

Time	AM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	4			
Trips Enter from NH Rt 108 Northbound		0.5	Left	12.5
Trips Enter from NH Rt 108 Southbound		0.5	Right	12.5
Trips Exit to NH Rt 108 Northbound		1.5	Left	37.6
Trips Exit to NH Rt 108 Southbound		1.5	Right	37.4

Table 14: Weekday AM peak hour build turning movements to and from Ember Drive

Time	PM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	4			
Trips Enter from NH Rt 108 Northbound		1.7	Left	41.7
Trips Enter from NH Rt 108 Southbound		1.3	Right	33.3
Trips Exit to NH Rt 108 Northbound		0.6	Left	13.9
Trips Exit to NH Rt 108 Southbound		0.4	Right	11.1

Table 15: Weekday PM peak hour build turning movements to and from Ember Drive

Left-Turn Warrants Analysis

Depending on vehicle speed, advancing vehicular volumes, opposing vehicular volumes, and the percent of left turns that vehicles are predicted to make, certain roadways may require special treatment for vehicles making left turning maneuvers. The determination of this special treatment is determined by the NCHRP 457 left-turn bay guidelines. Calibration constants of 3.0 seconds are used for average left turn time, 5.0 seconds for critical headway, and 1.9 seconds for vehicles to clear the advancing lane. If warranted, the left turn bay would allow for deceleration of vehicles and storage in the queue to wait safely for advancing traffic to pass.

The traffic volumes obtained from the NHDOT from 2022 projected to 2024 and 2034 were used to determine if a left-turn bay is warranted to safely enter the site. It has been calculated that approximately 1 trip is to occur turning left into the site during the weekday AM peak hour and 4 trips during the PM peak hour for Copper Drive. It has been calculated that approximately 0-1 trips are to occur turning left into the site during the weekday AM peak hour and 2 trips during the PM peak hour for Ember Drive. Ember Drive AM & PM peak hour calculations are not provided as the generated traffic is less than the Copper Drive generation, which does not trigger a turn warrant. The projection of the traffic volumes and data used to conduct the left-turn bay warrant analyses are included in Appendix B as Figures 14 & 15. The full warrant analyses can be found in Appendix B as Figures 16-19. Tables 16 & 17 are summaries of the left-turn bay warrant analyses for the proposed site entrance. Using the 85th percentile speed of 45 MPH, it was determined that a left-turn bay IS NOT warranted to safely enter Copper Drive or Ember Drive.

Left-Turn Lane Warrants Analysis New Rochester Road (NH Route 108)		
Factors	2024 Weekday AM Build Volume	2034 Weekday AM Build Volume
Left-Turn Volume (NB)	1	1
Advancing Volume (NB) (L+TR+R)	664	733
Opposing Volume (SB) (TR+R)	660	729
Percent Lefts	0.15%	0.14%
85th Percentile Speed (MPH)	45	45
Limiting Adv. Volume (veh/hr)	2,035	1,997
Left-Turn Bay Warranted	NO	NO

Table 16: Weekday AM peak hour NCHRP 457 left-turn bay analysis (Copper)

Left-Turn Lane Warrants Analysis New Rochester Road (NH Route 108)		
Factors	2024 Weekday PM Build Volume	2034 Weekday PM Build Volume
Left-Turn Volume (NB)	4	4
Advancing Volume (NB) (L+TR+R)	895	988
Opposing Volume (SB) (TR+R)	713	787
Percent Lefts	0.43%	0.39%
85th Percentile Speed (MPH)	45	45
Limiting Adv. Volume (veh/hr)	1,139	1,112
Left-Turn Bay Warranted	NO	NO

Table 17: Weekday PM peak hour NCHRP 457 left-turn bay analysis (Copper)

Right-Turn Warrants Analysis

Depending on vehicle speed, advancing vehicular volumes, and the percent of right turns that vehicles are predicted to make, certain roadways may require special treatment for vehicles making right turning maneuvers. The determination of this special treatment is determined by the NCHRP 457 right turn bay guidelines. If warranted, the right-turn bay would allow for deceleration of vehicles and storage in the queue to wait safely for right turning traffic to clear.

The traffic volumes obtained from the NHDOT from 2022 projected to 2024 and 2034 were used to determine if a right-turn bay is warranted to safely enter the site. It has been calculated that approximately 1 trip is to occur turning right into the site during the weekday AM peak hour and 3 trips during the PM peak hour for Copper Drive. It has been calculated that approximately 1 trip is to occur turning right into the site during the weekday AM peak hour and 1 trip during the PM peak hour for Ember Drive. Ember Drive AM & PM peak hour calculations are not provided as the generated traffic is less than the Copper Drive generation, which does not trigger a turn warrant. The projection of the traffic volumes and data used to conduct the right-turn bay warrant analyses are included in Appendix B as Figures 20 & 21. The full warrant analyses can be found in Appendix B as Figures 22-25. Tables 18 & 19 are summaries of the right-turn bay warrant analyses for the proposed site entrance. Using the 85th percentile speed of 45 MPH, it was determined that a right-turn bay IS NOT warranted to safely enter Copper Drive or Ember Drive.

Right-Turn Lane Warrants Analysis New Rochester Road (NH Route 108)		
Factors	2024 Weekday AM Build Volume	2034 Weekday AM Build Volume
Right-Turn Volume (SB)	1	1
Advancing Volume (SB) (L+TR+R)	661	730
85th Percentile Speed (MPH)	45	45
Limiting Right-Turn Volume (veh/hr)	26	22
Right-Turn Bay Warranted	NO	NO

Table 18: Weekday AM peak hour NCHRP 457 right-turn bay analysis (Copper)

Right-Turn Lane Warrants Analysis New Rochester Road (NH Route 108)		
Factors	2024 Weekday PM Build Volume	2034 Weekday PM Build Volume
Right-Turn Volume (SB)	3	3
Advancing Volume (SB) (L+TR+R)	717	791
85th Percentile Speed (MPH)	45	45
Limiting Right-Turn Volume (veh/hr)	22	19
Right-Turn Bay Warranted	NO	NO

Table 19: Weekday PM peak hour NCHRP 457 right-turn bay analysis (Copper)

Sight Distance and Safety Analysis

Sight distance on New Rochester Road to the north and south, as well as roadway alignment are the two determining factors of safety. Copper Drive and Ember Drive, sight distance to the north un-obstructed for well over 400 feet (measured), while sight distance to the south is un-obstructed for well over 400 feet (measured). The standard sight distance that would be required by NHDOT in this situation is 400 feet. In this instance both the northerly and southerly sight distances exceed the standard AASHTO 45 MPH standard practice of 360 feet. There are no improvements required to obtain this sight distance.

With respect to general safety of New Rochester Road in relation to the peak hour trip generation and AADT, it is our assessment that the cross section of pavement and shoulder widths are appropriate.

*AASHTO Geometric Design of Highways and Streets (2011)

Conclusions and Recommendations

1) A total of 9 vehicle trips (2 enter/7 exit) are predicted to occur at the weekday AM peak hour and 12 vehicle trips (7 enter/5 exit) at the PM peak hour for Copper Drive.

2) A total of 4 vehicle trips (1 enter/3 exit) are predicted to occur at the weekday AM peak hour and 4 vehicle trips (3 enter/1 exit) at the PM peak hour for Ember Drive.

3) The 2024 and 2034 build traffic volumes DO NOT satisfy the NCHRP 457 guidelines for the implementation of a left-turn lane for all peak hours for Copper Drive.

4) The 2024 and 2034 build traffic volumes DO NOT satisfy the NCHRP 457 guidelines for the implementation of a left-turn lane for all peak hours for Copper Drive.

5) This is an increase from the existing/approved condition of 96 weekday vehicle trips, 7 weekday AM peak hour vehicle trips, and 8 weekday PM peak hour vehicle trips.

6) It is recommended that the surrounding infrastructure will be sufficient to handle the projected increase in vehicle trips and peak hour and all other hours.

7) The number of driveway cuts along New Rochester Road is being reduced in this proposal.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

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Principal, President

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Project Engineer

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Principal, VP-Technical Operations
Engineer of Record

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Appendix A

Traffic Counts

New Hampshire DOT Department of Transportation

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Transportation Data Management System

Home | Login | Locate | Locate All | Email This

Auto-Locate OFF

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82125103	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	S0000108__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	NH 108
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	New Rochester Rd		
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD		

More Detail

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2022	16,262	1,552	10	58	15,236 (94%)	1,026 (6%)	
2021	13,844[3]		10	56	12,584 (91%)	1,260 (9%)	Grown from 2020
2020	12,483[3]		10	56	11,359 (91%)	1,124 (9%)	Grown from 2019
2019	14,790	1,469	10	56	13,546 (92%)	1,244 (8%)	
2018	18,159[3]		9	58	16,743 (92%)	1,416 (8%)	Grown from 2017

Figure 7: History of AADT values and classification for New Rochester Road

New Hampshire DOT Department of Transportation

TCDS Help MS2

Transportation Data Management System

Home Back Login Locate Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	82125103_NB
Type	SPOT
Fnct'l Class	4
Located On	New Rochester Rd
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD
Direction	NB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Tue 8/30/2022
End Date	Wed 8/31/2022
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821251035010
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	15	25	14	13	67
1:00-2:00	7	8	13	8	36
2:00-3:00	6	3	3	9	21
3:00-4:00	10	9	4	6	29
4:00-5:00	3	9	22	21	55
5:00-6:00	15	22	45	42	124
6:00-7:00	25	66	90	96	277
7:00-8:00	94	126	158	175	553
8:00-9:00	150	129	133	148	560
9:00-10:00	121	114	152	120	507
10:00-11:00	144	160	122	165	591
11:00-12:00	157	161	136	154	608
12:00-13:00	150	178	182	217	727
13:00-14:00	176	172	172	160	680
14:00-15:00	170	182	160	197	709
15:00-16:00	246	214	210	219	889
16:00-17:00	219	212	217	236	884
17:00-18:00	198	235	201	177	811
18:00-19:00	145	143	126	129	543
19:00-20:00	97	119	101	79	396
20:00-21:00	89	91	70	56	306
21:00-22:00	77	30	39	42	188
22:00-23:00	30	36	40	24	130
23:00-24:00	33	39	20	20	112
Total					9,803
AM Peak					11:45-12:45 664
PM Peak					15:00-16:00 889

Count Navigation: |<< < > >> Count Type: VOLUME

Directions: 2-WAY NB SB

Figure 8: Tuesday August 30, 2022 NH Rt 108 northbound traffic count

New Hampshire DOT Department of Transportation

TCDS Help MS2

Transportation Data Management System

Home Back Login Locate Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	82125103_SB
Type	SPOT
Fnct'l Class	4
Located On	New Rochester Rd
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD
Direction	SB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Tue 8/30/2022
End Date	Wed 8/31/2022
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821251035010
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	7	6	7	3	23
1:00-2:00	9	8	3	7	27
2:00-3:00	5	12	6	7	30
3:00-4:00	9	9	15	14	47
4:00-5:00	14	11	23	42	90
5:00-6:00	28	46	59	78	211
6:00-7:00	87	98	110	118	413
7:00-8:00	150	152	179	146	627
8:00-9:00	174	137	151	144	606
9:00-10:00	138	120	145	164	567
10:00-11:00	134	157	146	135	572
11:00-12:00	151	148	151	157	607
12:00-13:00	158	175	163	181	677
13:00-14:00	138	151	143	147	579
14:00-15:00	144	155	140	154	593
15:00-16:00	172	148	133	184	637
16:00-17:00	162	152	161	166	641
17:00-18:00	189	169	155	133	646
18:00-19:00	131	90	130	89	440
19:00-20:00	91	80	77	80	328
20:00-21:00	61	47	46	32	186
21:00-22:00	43	25	20	21	109
22:00-23:00	22	25	16	18	81
23:00-24:00	17	11	7	4	39
Total					8,776
AM Peak					11:45-12:45 653
PM Peak					16:30-17:30 685

Count Navigation: |<< < > >> Count Type: VOLUME

Directions: 2-WAY NB SB

Figure 9: Tuesday August 30, 2022 NH Rt 108 southbound traffic count

New Hampshire DOT Department of Transportation

TCDS Help MS2

Transportation Data Management System

Home Back Login Locate Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	82125103_NB
Type	SPOT
Fnct'l Class	4
Located On	New Rochester Rd
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD
Direction	NB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Wed 8/31/2022
End Date	Thu 9/1/2022
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821251035010
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	29	17	17	11	74
1:00-2:00	10	9	11	7	37
2:00-3:00	9	4	5	5	23
3:00-4:00	6	10	5	7	28
4:00-5:00	6	11	13	34	64
5:00-6:00	13	30	29	34	106
6:00-7:00	41	58	64	93	256
7:00-8:00	77	129	172	180	558
8:00-9:00	151	149	158	156	614
9:00-10:00	102	131	119	143	495
10:00-11:00	157	135	129	143	564
11:00-12:00	142	131	138	155	566
12:00-13:00	158	184	186	196	724
13:00-14:00	133	173	157	166	629
14:00-15:00	184	170	190	157	701
15:00-16:00	223	204	246	237	910
16:00-17:00	243	229	203	212	887
17:00-18:00	225	213	187	183	808
18:00-19:00	157	169	140	129	595
19:00-20:00	116	121	108	87	432
20:00-21:00	96	84	84	62	326
21:00-22:00	63	47	54	41	205
22:00-23:00	47	50	46	37	180
23:00-24:00	25	43	27	18	113
Total					9,895
AM Peak					11:45-12:45 683
PM Peak					15:30-16:30 955

Count Navigation: |<< < > >> Count Type: VOLUME

Directions: 2-WAY NB SB

Figure 10: Wednesday August 31, 2022 NH Rt 108 northbound traffic count

New Hampshire DOT Department of Transportation

TCDS Help MS2

Transportation Data Management System

Home Back Login Locate Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	82125103_SB
Type	SPOT
Fnct'l Class	4
Located On	New Rochester Rd
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD
Direction	SB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Wed 8/31/2022
End Date	Thu 9/1/2022
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821251035010
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	14	4	5	2	25
1:00-2:00	13	4	3	4	24
2:00-3:00	9	9	15	6	39
3:00-4:00	9	11	20	15	55
4:00-5:00	15	10	26	32	83
5:00-6:00	30	47	59	69	205
6:00-7:00	82	122	149	128	481
7:00-8:00	145	148	169	146	608
8:00-9:00	185	131	142	153	611
9:00-10:00	140	137	154	155	586
10:00-11:00	153	150	148	147	598
11:00-12:00	118	166	145	170	599
12:00-13:00	187	157	163	140	647
13:00-14:00	159	174	177	165	675
14:00-15:00	158	154	155	144	611
15:00-16:00	154	183	138	178	653
16:00-17:00	158	180	183	167	688
17:00-18:00	184	171	141	134	630
18:00-19:00	141	112	90	97	440
19:00-20:00	112	76	87	72	347
20:00-21:00	72	55	44	31	202
21:00-22:00	54	29	20	24	127
22:00-23:00	30	27	17	14	88
23:00-24:00	14	11	7	4	36
Total					9,058
AM Peak					11:45-12:45 677
PM Peak					16:15-17:15 714

Count Navigation: |<< < > >> Count Type: VOLUME

Directions: 2-WAY NB SB

Figure 11: Wednesday August 21, 2022 NH Rt 108 southbound traffic count

New Hampshire DOT Department of Transportation

TCDS Help MS2

Transportation Data Management System

Home Back Login Locate Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	82125103_NB
Type	SPOT
Fnct'l Class	4
Located On	New Rochester Rd
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD
Direction	NB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Thu 9/1/2022
End Date	Fri 9/2/2022
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821251035010
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	14	26	13	14	67
1:00-2:00	11	14	6	7	38
2:00-3:00	7	8	8	8	31
3:00-4:00	5	6	8	5	24
4:00-5:00	3	6	9	28	46
5:00-6:00	12	24	32	37	105
6:00-7:00	39	48	74	105	266
7:00-8:00	105	137	160	186	588
8:00-9:00	175	162	138	153	628
9:00-10:00	117	117	129	128	491
10:00-11:00	138	127	166	154	585
11:00-12:00	130	148	139	186	603
12:00-13:00	161	162	182	157	662
13:00-14:00	157	178	150	190	675
14:00-15:00	168	183	199	193	743
15:00-16:00	227	211	248	235	921
16:00-17:00	193	236	213	197	839
17:00-18:00	193	231	188	159	771
18:00-19:00	152	158	132	81	523
19:00-20:00	105	134	107	111	457
20:00-21:00	84	82	82	71	319
21:00-22:00	77	55	44	47	223
22:00-23:00	39	53	55	33	180
23:00-24:00	33	45	25	20	123
Total					9,908
AM Peak					11:45-12:45 691
PM Peak					15:00-16:00 921

Count Navigation: |<< < > >> Count Type: VOLUME

Directions: 2-WAY NB SB

Figure 12: Thursday September 1, 2022 NH Rt 108 northbound traffic count

New Hampshire DOT Department of Transportation

TCDS Help MS2

Transportation Data Management System

Home Back Login Locate Locate All

Auto-Locate OFF

Volume Count Report

LOCATION INFO	
Location ID	82125103_SB
Type	SPOT
Fnct'l Class	4
Located On	New Rochester Rd
Loc On Alias	NH 108 (NEW ROCHESTER RD) NORTH OF WILLARD POND RD
Direction	SB
County	STRAFFORD
Community	DOVER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Thu 9/1/2022
End Date	Fri 9/2/2022
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	821251035010
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	7	6	3	0	16
1:00-2:00	12	8	6	4	30
2:00-3:00	8	17	3	14	42
3:00-4:00	6	10	16	19	51
4:00-5:00	10	21	22	35	88
5:00-6:00	42	44	57	79	222
6:00-7:00	71	127	153	131	482
7:00-8:00	152	148	182	156	638
8:00-9:00	170	127	161	163	621
9:00-10:00	148	136	177	150	611
10:00-11:00	135	158	157	135	585
11:00-12:00	126	141	148	150	565
12:00-13:00	166	172	136	169	643
13:00-14:00	150	134	151	141	576
14:00-15:00	171	127	174	145	617
15:00-16:00	173	165	153	174	665
16:00-17:00	144	173	159	166	642
17:00-18:00	190	154	150	124	618
18:00-19:00	124	124	108	88	444
19:00-20:00	94	74	83	81	332
20:00-21:00	71	52	47	35	205
21:00-22:00	46	33	29	16	124
22:00-23:00	13	20	21	15	69
23:00-24:00	22	18	11	7	58
Total					8,944
AM Peak					07:15-08:15 656
PM Peak					16:15-17:15 688

Count Navigation: |<< < > >> Count Type: VOLUME

Directions: 2-WAY NB SB

Figure 13: Thursday September 1, 2022 NH Rt 108 southbound traffic count

Appendix B

Data Used in Left-Turn Bay Warrants Analysis

Year	Advancing Volume	Advancing Volume Peaked (TR)	Left Turns (L)	Right Turns (R)	Total Advancing Volume (L+TR+R)	% of Left Turn
2022	649	649.0	1.0	1.0	651.0	0.15
2023	655	655.5	1.0	1.0	657.5	0.15
2024	662	662.0	1.0	1.0	664.0	0.15
2025	669	668.7	1.0	1.0	670.7	0.15
2026	675	675.4	1.0	1.0	677.4	0.15
2027	682	682.1	1.0	1.0	684.1	0.15
2028	689	688.9	1.0	1.0	690.9	0.15
2029	696	695.8	1.0	1.0	697.8	0.14
2030	703	702.8	1.0	1.0	704.8	0.14
2031	710	709.8	1.0	1.0	711.8	0.14
2032	717	716.9	1.0	1.0	718.9	0.14
2033	724	724.1	1.0	1.0	726.1	0.14
2034	731	731.3	1.0	1.0	733.3	0.14
Year	Opposing Volume	Opposing Volume Peaked (TR)	Right Turns (R)		Total Opposing Volume (TR+R)	
2022	646	646.0	1.0		647.0	
2023	652	652.5	1.0		653.5	
2024	659	659.0	1.0		660.0	
2025	666	665.6	1.0		666.6	
2026	672	672.2	1.0		673.2	
2027	679	679.0	1.0		680.0	
2028	686	685.7	1.0		686.7	
2029	693	692.6	1.0		693.6	
2030	700	699.5	1.0		700.5	
2031	707	706.5	1.0		707.5	
2032	714	713.6	1.0		714.6	
2033	721	720.7	1.0		721.7	
2034	728	727.9	1.0		728.9	
Seasonal Peaking Factor (August)		1.00				

Figure 14: Data used for Weekday AM peak hour left-turn warrant analyses Copper Drive

Year	Advancing Volume	Advancing Volume Peaked (TR)	Left Turns (L)	Right Turns (R)	Total Advancing Volume (L+TR+R)	% of Left Turn
2022	871	870.7	3.9	3.1	877.7	0.44
2023	879	879.4	3.9	3.1	886.4	0.44
2024	888	888.2	3.9	3.1	895.2	0.43
2025	897	897.0	3.9	3.1	904.0	0.43
2026	906	906.0	3.9	3.1	913.0	0.43
2027	915	915.1	3.9	3.1	922.1	0.42
2028	924	924.2	3.9	3.1	931.2	0.42
2029	933	933.5	3.9	3.1	940.5	0.41
2030	943	942.8	3.9	3.1	949.8	0.41
2031	952	952.2	3.9	3.1	959.2	0.41
2032	962	961.8	3.9	3.1	968.8	0.40
2033	971	971.4	3.9	3.1	978.4	0.40
2034	981	981.1	3.9	3.1	988.1	0.39
Year	Opposing Volume	Opposing Volume Peaked (TR)	Right Turns (R)		Total Opposing Volume (TR+R)	
2022	696	695.7	3.1		698.8	
2023	703	702.6	3.1		705.7	
2024	710	709.6	3.1		712.8	
2025	717	716.7	3.1		719.9	
2026	724	723.9	3.1		727.0	
2027	731	731.2	3.1		734.3	
2028	738	738.5	3.1		741.6	
2029	746	745.8	3.1		749.0	
2030	753	753.3	3.1		756.4	
2031	761	760.8	3.1		763.9	
2032	768	768.4	3.1		771.6	
2033	776	776.1	3.1		779.2	
2034	784	783.9	3.1		787.0	
Seasonal Peaking Factor (August)		1.00				

Figure 15: Data used for Weekday PM peak hour left-turn warrant analyses Copper Drive

Left-Turn Bay Warrants Analysis

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

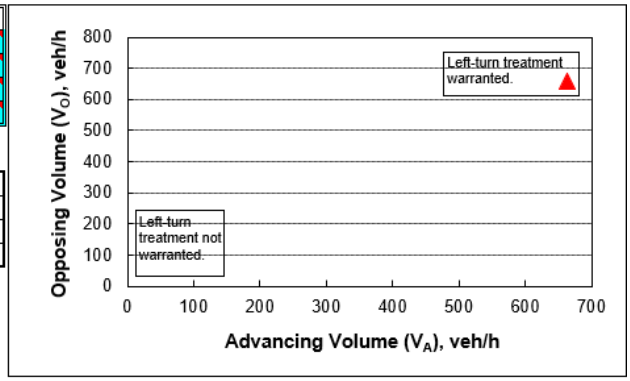
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	664
Opposing volume (V_O), veh/h:	660

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2035
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Figure 16: 2024 Weekday AM peak hour NCHRP 457 left-turn bay warrant analysis Copper Dr

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

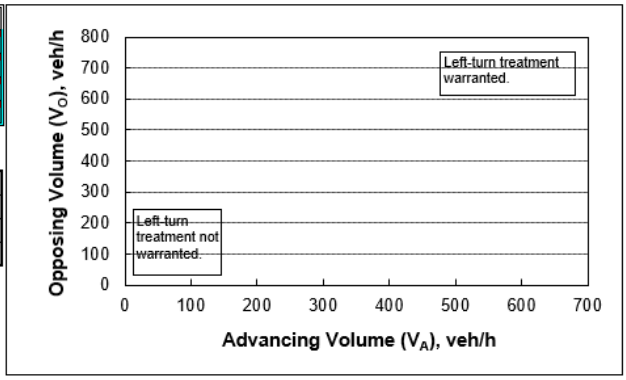
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	733
Opposing volume (V_O), veh/h:	729

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1997
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Figure 17: 2034 Weekday AM peak hour NCHRP 457 left-turn bay warrant analysis Copper Dr

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

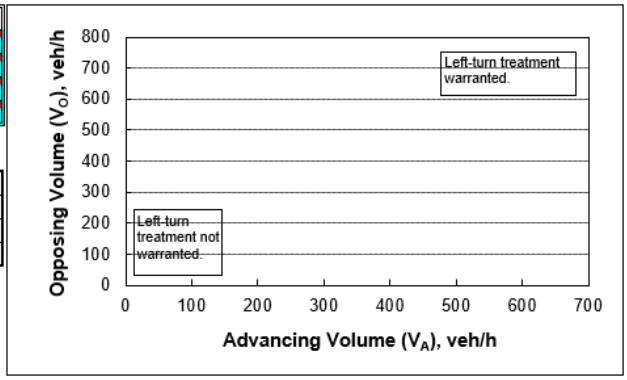
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	895
Opposing volume (V_O), veh/h:	713

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1139
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Figure 18: 2024 Weekday PM peak hour NCHRP 457 left-turn bay warrant analysis Copper Dr

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

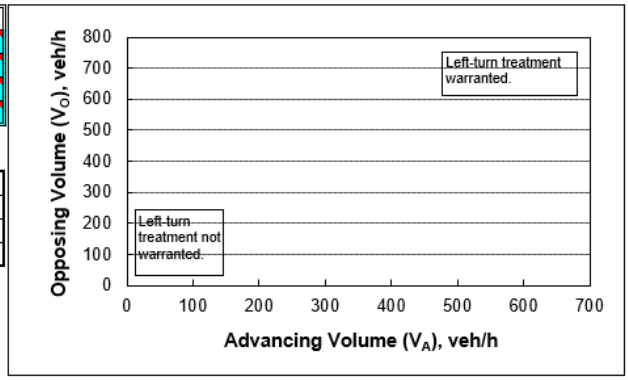
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	988
Opposing volume (V_O), veh/h:	787

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1112
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

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

Figure 19: 2034 Weekday PM peak hour NCHRP 457 left-turn bay warrant analysis Copper Dr

Data Used in Right-Turn Bay Warrants Analysis

Year	Advancing Volume	Advancing Volume Peaked (TR)	Left Turns (L)	Right Turns (R)	Total Advancing Volume (L+TR+R)
2022	646	646.0	1.0	1.0	648.0
2023	652	652.5	1.0	1.0	654.5
2024	659	659.0	1.0	1.0	661.0
2025	666	665.6	1.0	1.0	667.6
2026	672	672.2	1.0	1.0	674.2
2027	679	679.0	1.0	1.0	681.0
2028	686	685.7	1.0	1.0	687.7
2029	693	692.6	1.0	1.0	694.6
2030	700	699.5	1.0	1.0	701.5
2031	707	706.5	1.0	1.0	708.5
2032	714	713.6	1.0	1.0	715.6
2033	721	720.7	1.0	1.0	722.7
2034	728	727.9	1.0	1.0	729.9
Seasonal Peaking Factor (August)		1.00			

Figure 20: Data used for Weekday AM peak hour right-turn warrant analyses Copper Drive

Year	Advancing Volume	Advancing Volume Peaked (TR)	Left Turns (L)	Right Turns (R)	Total Advancing Volume (L+TR+R)
2022	696	695.7	3.9	3.1	702.7
2023	703	702.6	3.9	3.1	709.6
2024	710	709.6	3.9	3.1	716.6
2025	717	716.7	3.9	3.1	723.7
2026	724	723.9	3.9	3.1	730.9
2027	731	731.2	3.9	3.1	738.2
2028	738	738.5	3.9	3.1	745.5
2029	746	745.8	3.9	3.1	752.8
2030	753	753.3	3.9	3.1	760.3
2031	761	760.8	3.9	3.1	767.8
2032	768	768.4	3.9	3.1	775.4
2033	776	776.1	3.9	3.1	783.1
2034	784	783.9	3.9	3.1	790.9
Seasonal Peaking Factor (August)		1.00			

Figure 21: Data used for Weekday PM peak hour right-turn warrant analyses Copper Drive

Right-Turn Bay Warrants Analysis

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

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	661
Right-turn volume, veh/h:	1

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	26
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

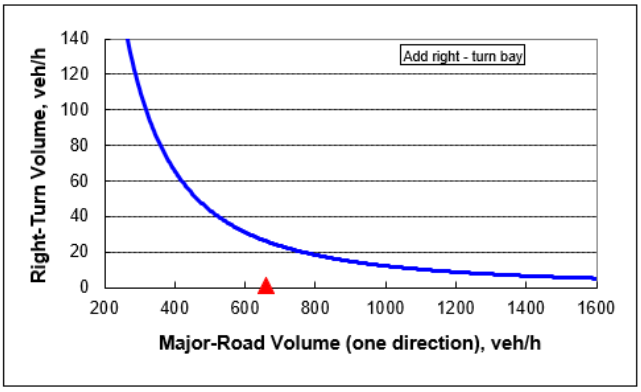


Figure 22: 2024 Weekday AM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	730
Right-turn volume, veh/h:	1

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	22
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

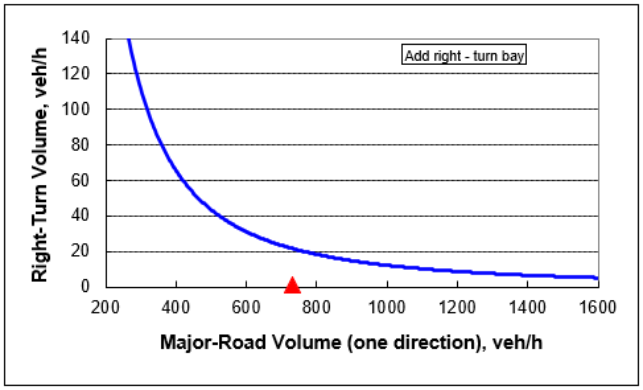


Figure 23: 2034 Weekday AM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	717
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	22
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

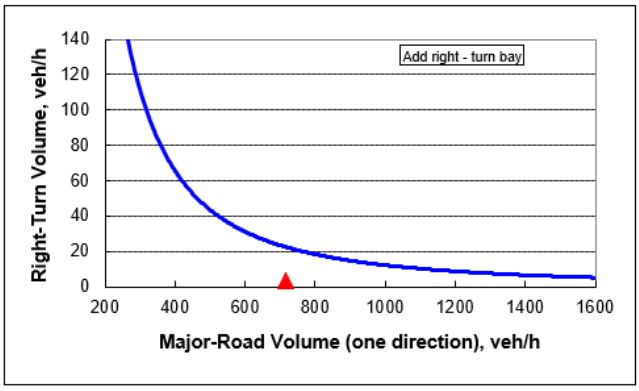


Figure 24: 2024 Weekday PM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	791
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	19
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

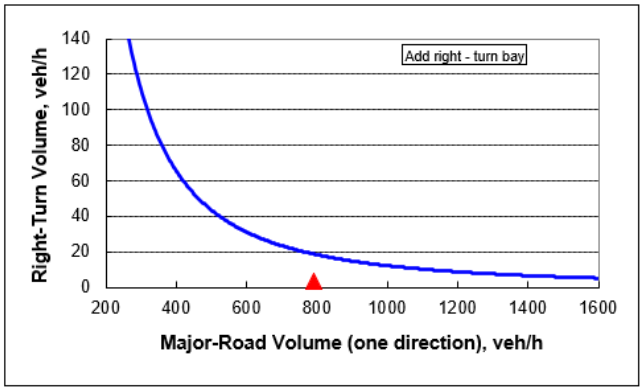


Figure 25: 2034 Weekday PM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

Appendix C

Miscellaneous

Group 4 Averages:		Year 2019 Monthly Data Urban Highways	
		Adjustment to	
Month	ADT	Average	Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22
Average ADT:	12,838		
Peak ADT:	14,016		

Table 20: Derivation of the seasonal peaking factor

Table 3-1. Stopping Sight Distance on Level Roadways

U.S. Customary					Metric				
Design Speed (mph)	Brake Reaction Distance (ft)	Braking Distance on Level (ft)	Stopping Sight Distance		Design Speed (km/h)	Brake Reaction Distance (m)	Braking Distance on Level (m)	Stopping Sight Distance	
			Calculated (ft)	Design (ft)				Calculated (m)	Design (m)
15	55.1	21.6	76.7	80	20	13.9	4.6	18.5	20
20	73.5	38.4	111.9	115	30	20.9	10.3	31.2	35
25	91.9	60.0	151.9	155	40	27.8	18.4	46.2	50
30	110.3	86.4	196.7	200	50	34.8	28.7	63.5	65
35	128.6	117.6	246.2	250	60	41.7	41.3	83.0	85
40	147.0	153.6	300.6	305	70	48.7	56.2	104.9	105
45	165.4	194.4	359.8	360	80	55.6	73.4	129.0	130
50	183.8	240.0	423.8	425	90	62.6	92.9	155.5	160
55	202.1	290.3	492.4	495	100	69.5	114.7	184.2	185
60	220.5	345.5	566.0	570	110	76.5	138.8	215.3	220
65	238.9	405.5	644.4	645	120	83.4	165.2	248.6	250
70	257.3	470.3	727.6	730	130	90.4	193.8	284.2	285
75	275.6	539.9	815.5	820	140	97.3	224.8	322.1	325
80	294.0	614.3	908.3	910					
85	313.5	693.5	1007.0	1010					

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 11.2 ft/s² [3.4 m/s²] used to determine calculated sight distance.

Figure 26: Derivation of stopping sight distance requirements

Appendix D

Trip Generation Derivation

Land Use: 210
Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077,1078, 1079

Figure 27: ITE Trip Generation, 11th Edition

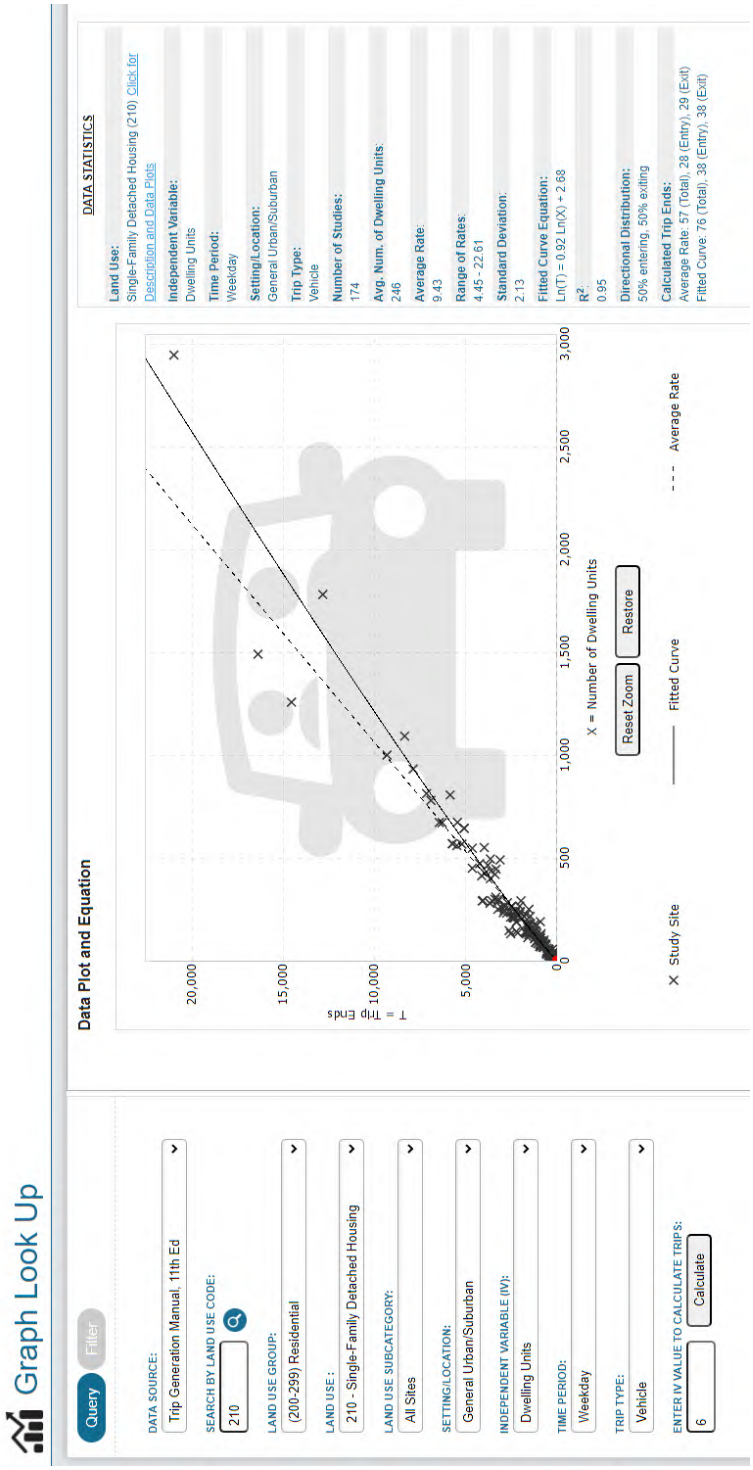


Figure 28: ITE Trip Generation, 11th Edition Copper Drive Detached

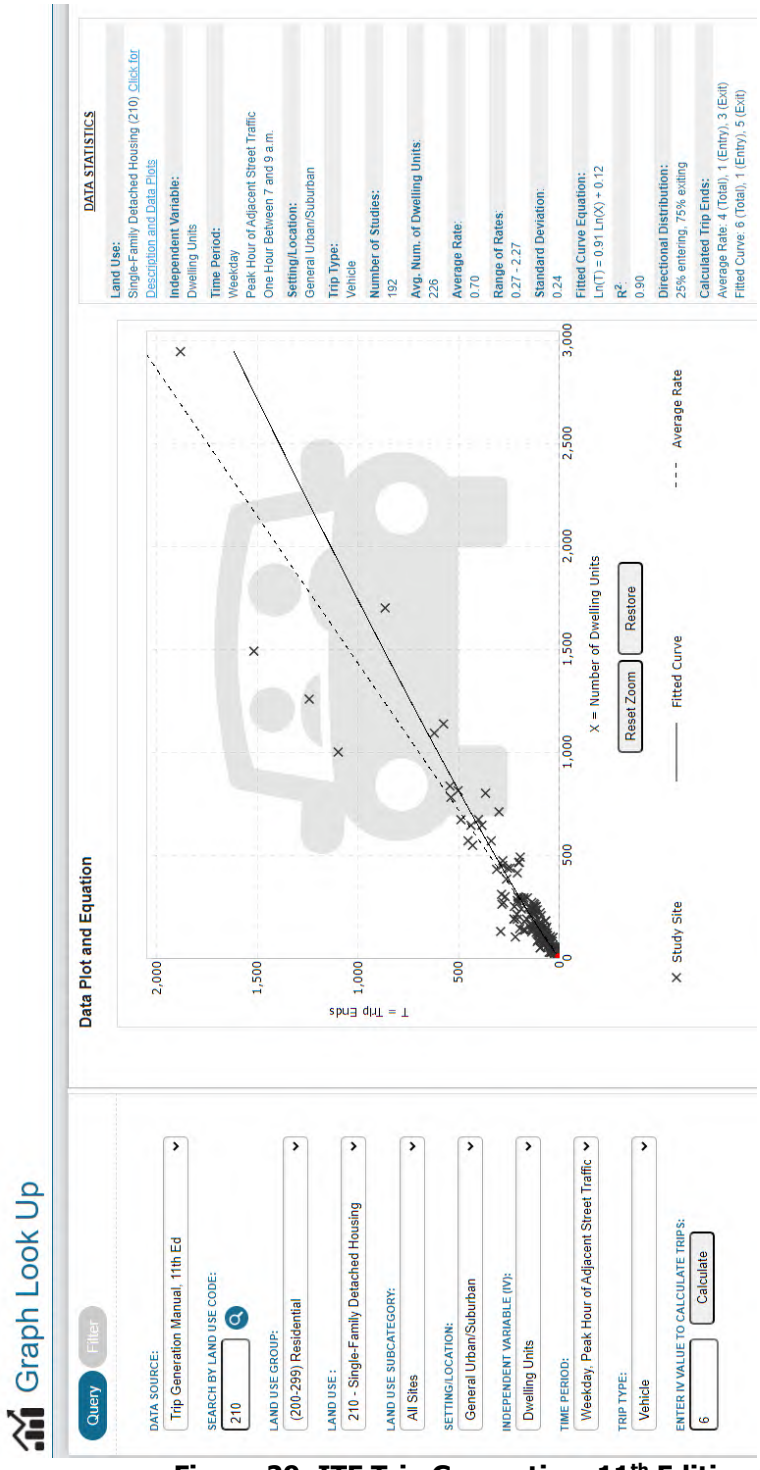


Figure 29: ITE Trip Generation, 11th Edition Copper Drive Detached

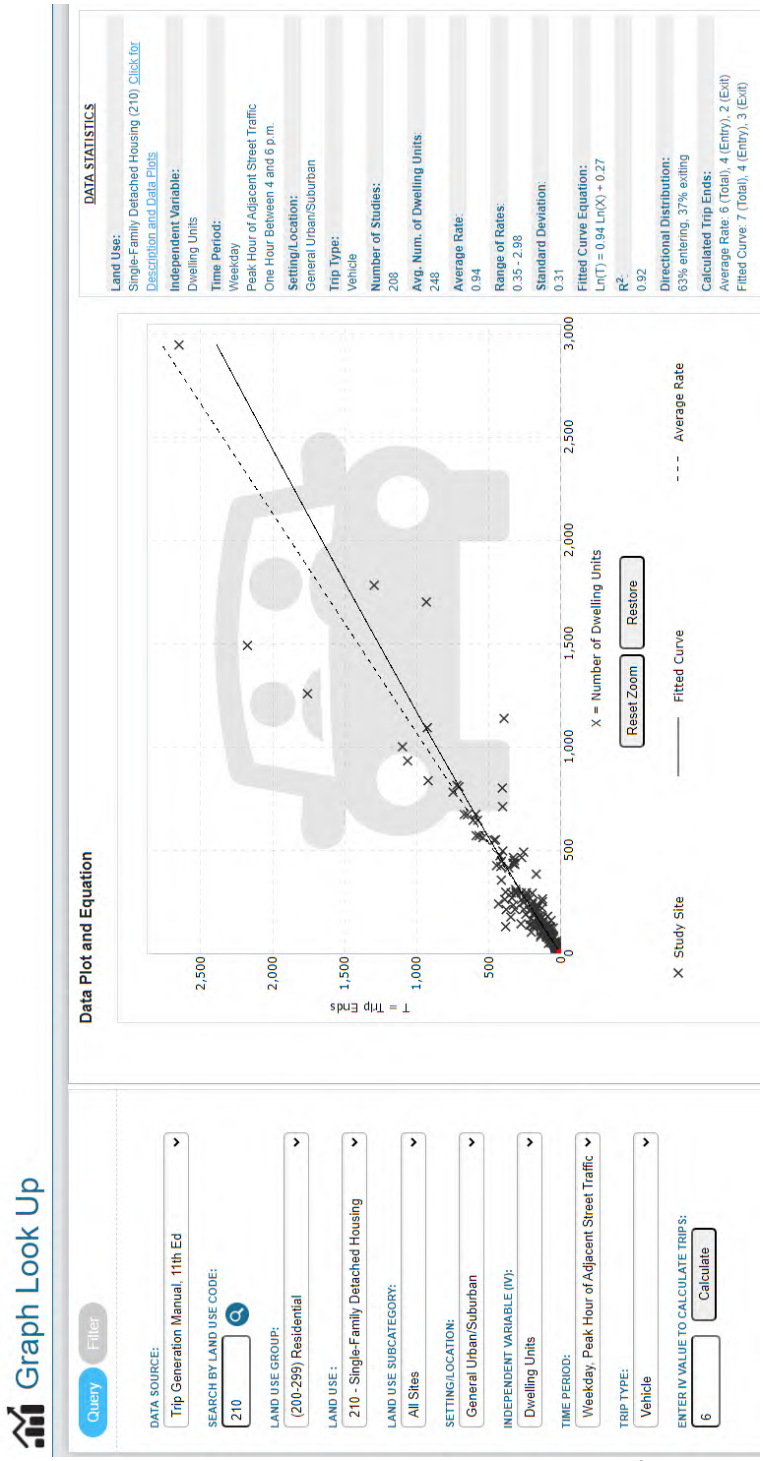


Figure 30: ITE Trip Generation, 11th Edition Copper Drive Detached

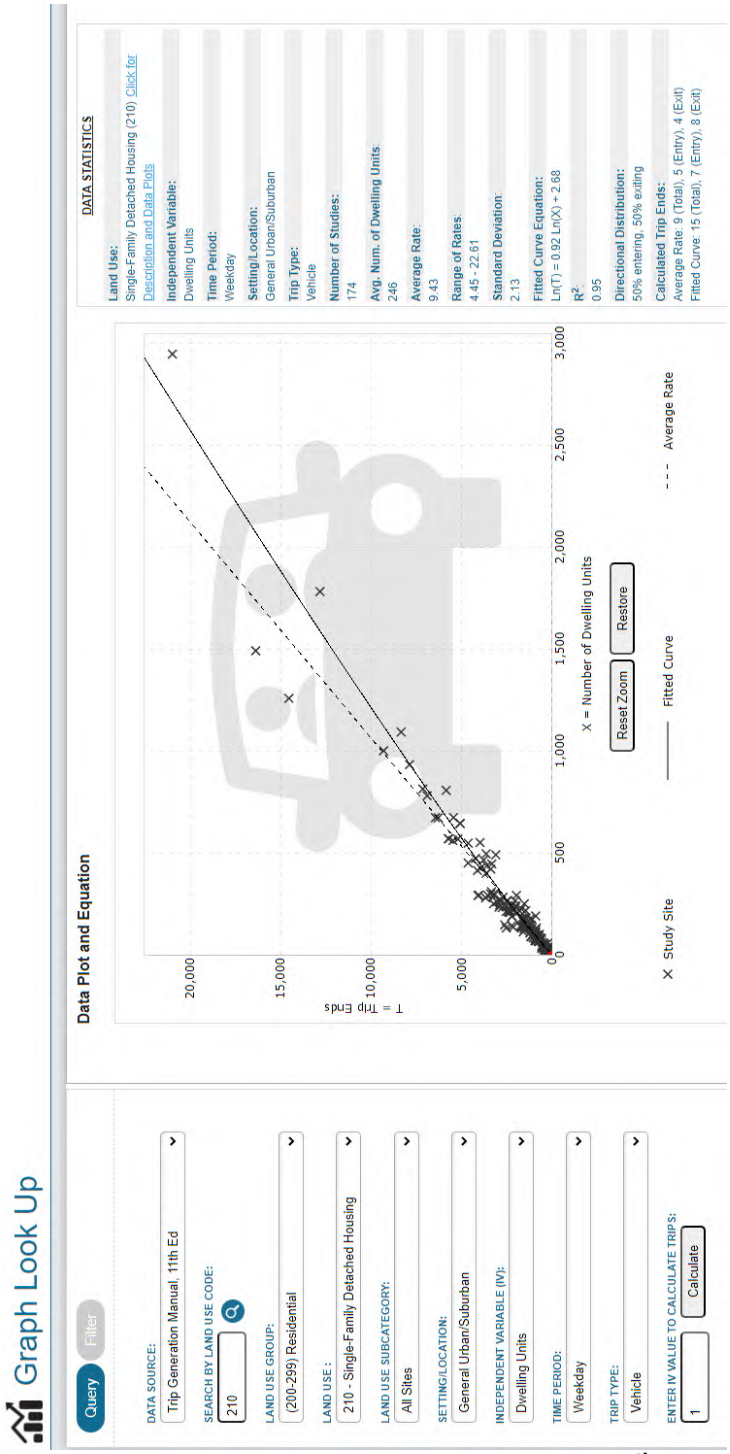


Figure 31: ITE Trip Generation, 11th Edition Ember Drive Detached

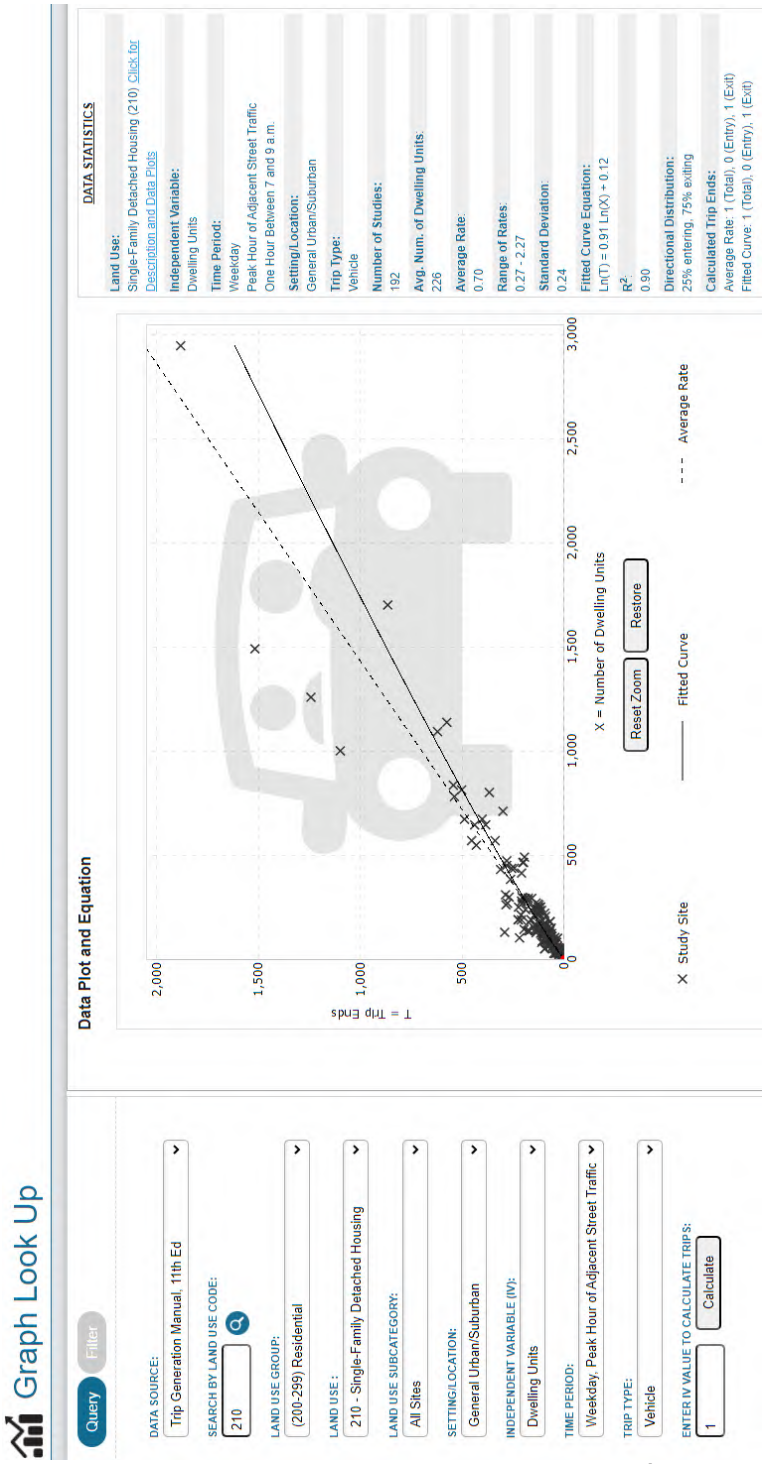


Figure 32: ITE Trip Generation, 11th Edition Ember Drive Detached

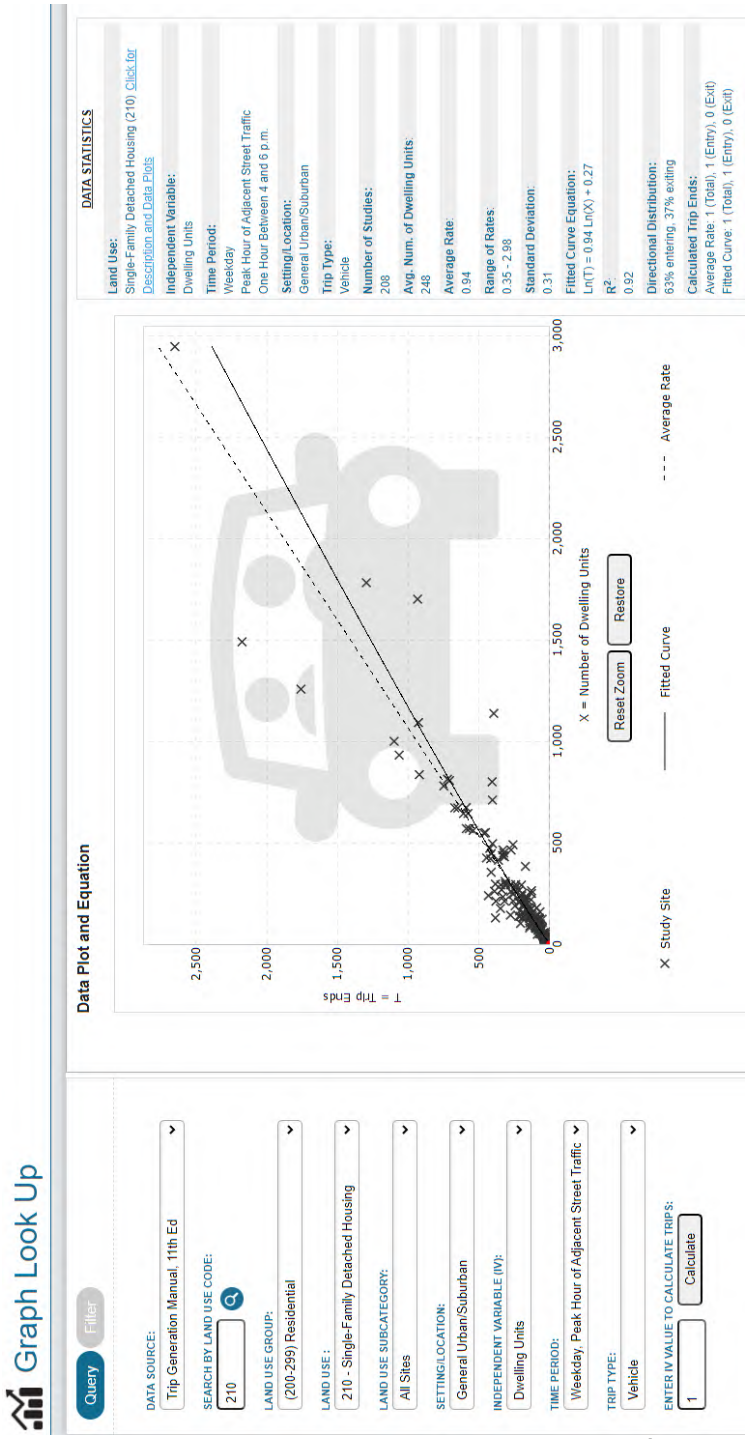


Figure 33: ITE Trip Generation, 11th Edition Ember Drive Detached

Land Use: 215
Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

Figure 34: ITE Trip Generation, 11th Edition

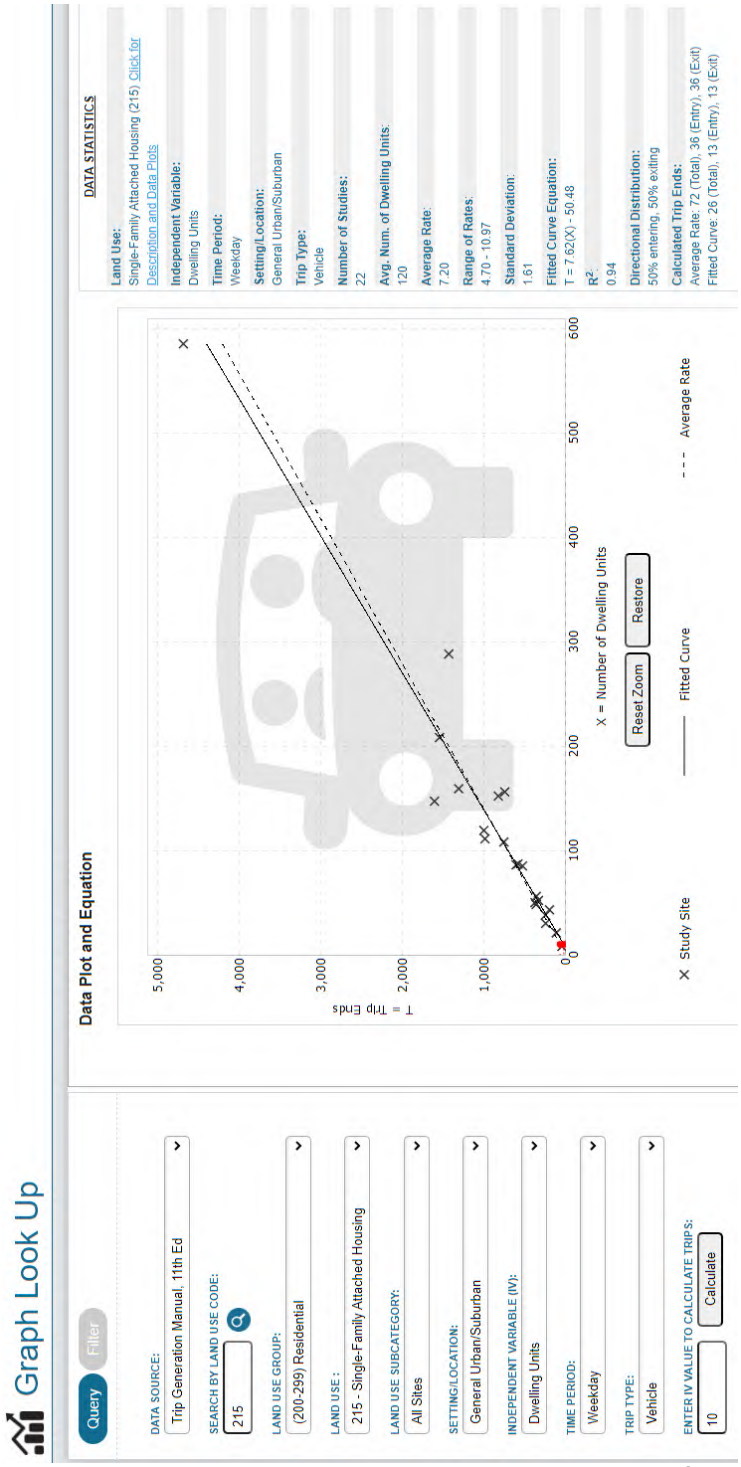


Figure 35: ITE Trip Generation, 11th Edition Copper Attached

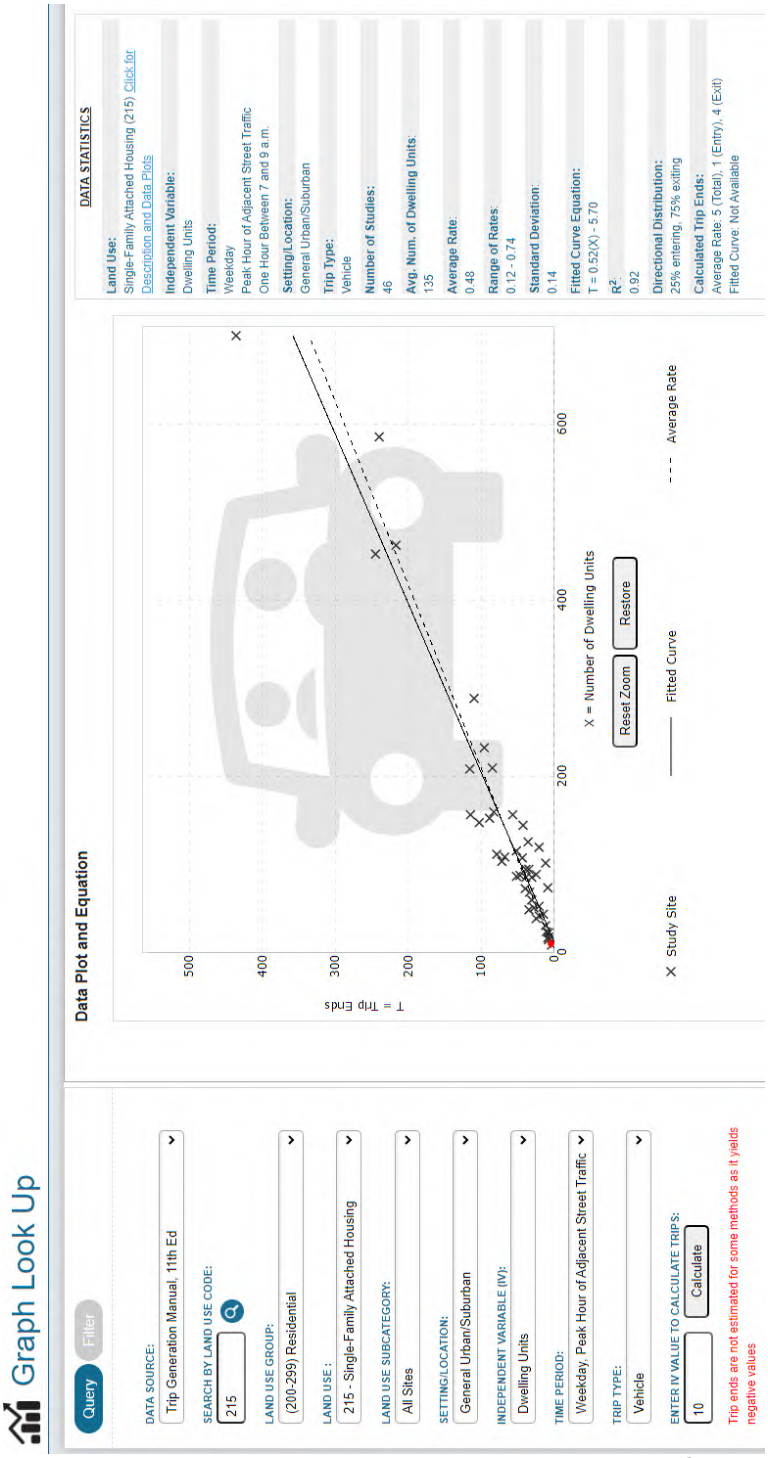


Figure 36: ITE Trip Generation, 11th Edition Copper Attached

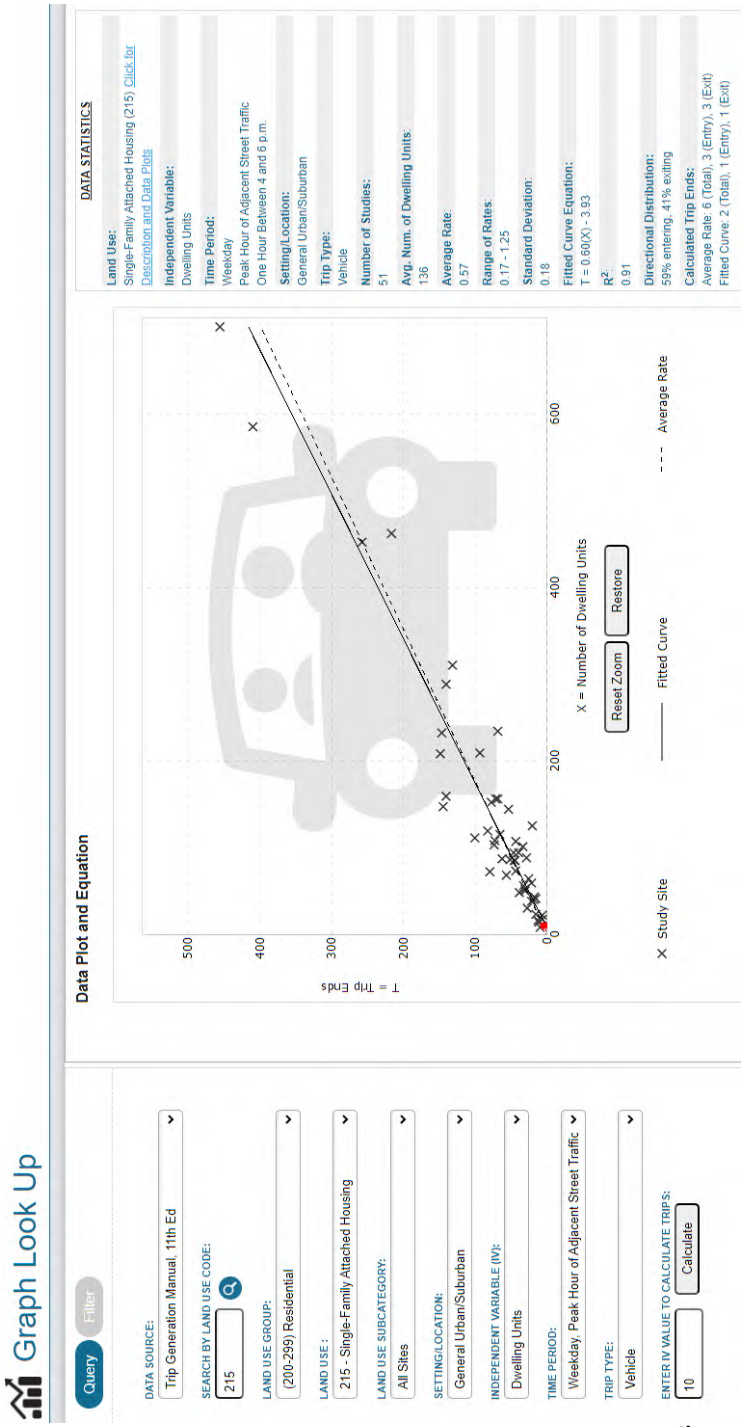


Figure 37: ITE Trip Generation, 11th Edition Copper Attached

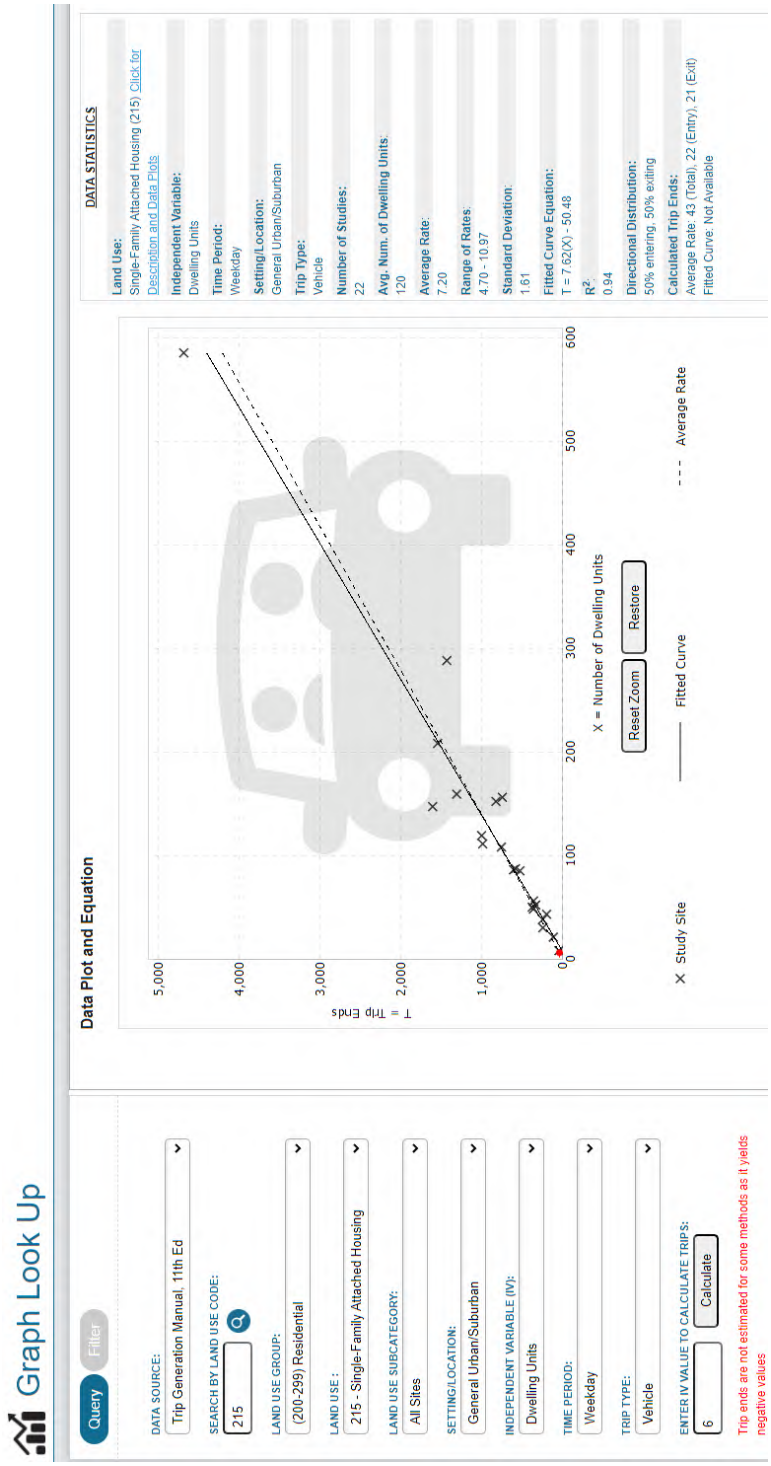


Figure 38: ITE Trip Generation, 11th Edition Ember Attached

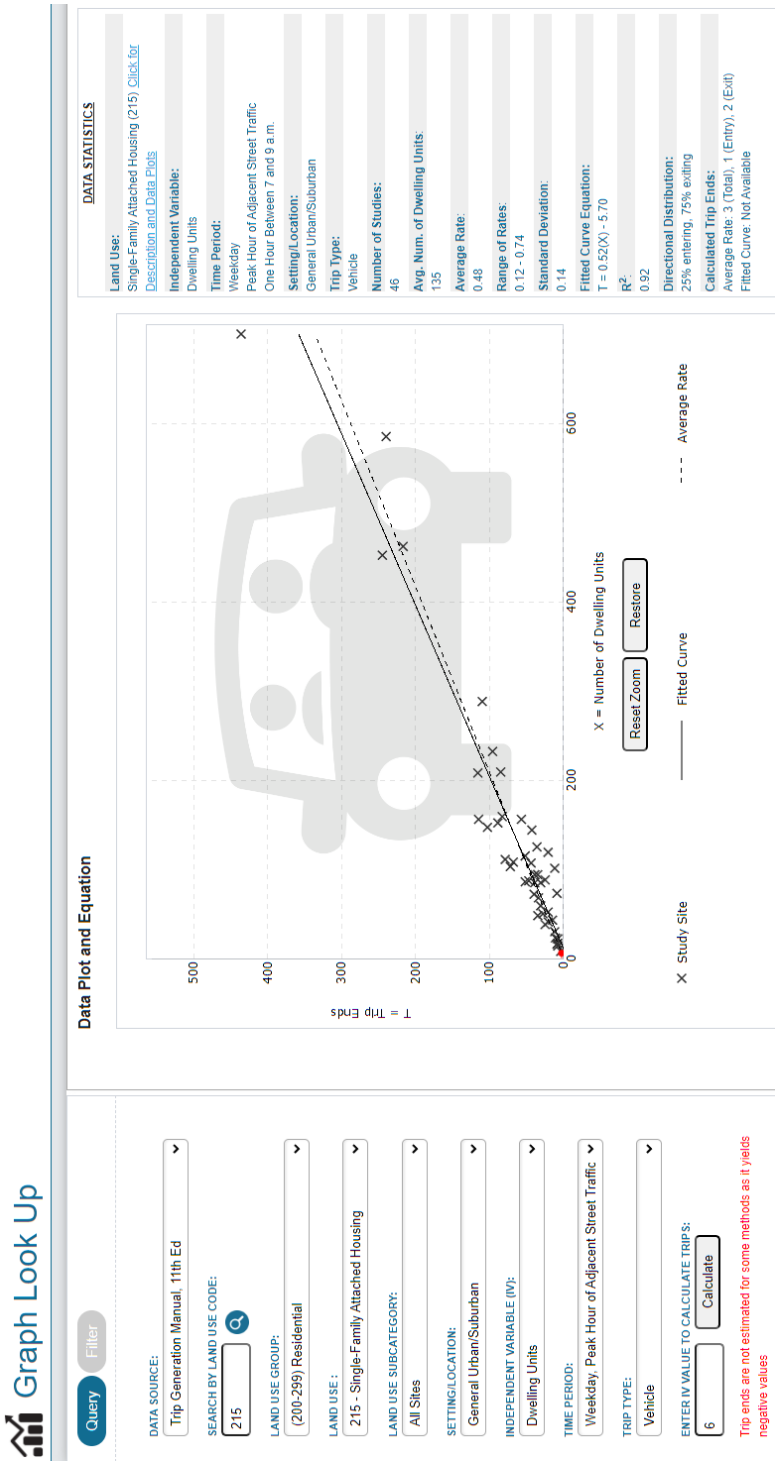


Figure 39: ITE Trip Generation, 11th Edition Ember Attached

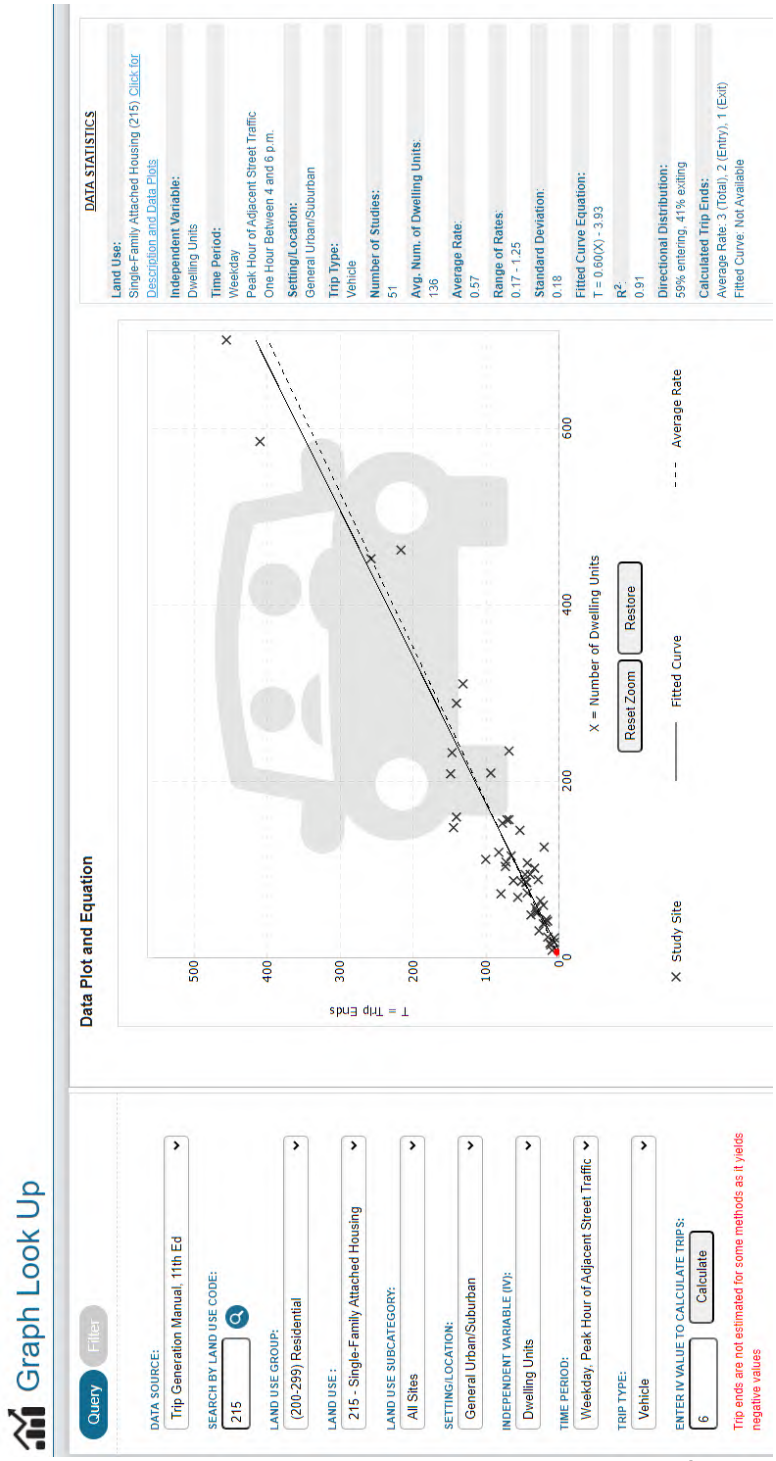


Figure 40: ITE Trip Generation, 11th Edition Ember Attached

DRAINAGE ANALYSIS
&
EROSION AND SEDIMENT CONTROL PLAN

Prepared for:

Knox Marsh Development LLC
242 Central Avenue
DOVER, NH 03820

Land of

Robert Baldwin
242 Central Avenue
DOVER, NH 03820

COPPER DRIVE & EMBER DRIVE
34 NEW ROCHESTER ROAD, DOVER, NH
TAX MAP 39, LOT 103

Prepared by:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825

Project Number:
DB 2023-053

July 6, 2023
Rev: November 6, 2023

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4.0 Erosion & Sediment Control, BMP's Page 6

5.0 Demonstration of Compliance with Dover Chapter 153-14 Page 15

6.0 Conclusion Page 29

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Extreme Precipitation Tables
NCRS USDA Web-soil Map
Site Specific Soils Survey Report & Plan
Pond #201-204 Treatment Sheets
Stormwater System Management: Inspection & Maintenance Manual & Plan
Infiltration Feasibility Study & Report
Watershed Report Card, 303(d) List, & ORW List
Filtrexx Construction Specifications

Enclosed: W-1 Sheet Existing Conditions Watershed Plan Sheet 1
W-2 Sheet Post Construction Watershed Plan Sheet 2
Erosion and Sediment Control Plan

Map by NH GRANIT



Legend

- Parcels
- State
- County
- City/Town

Map Scale

1: 24,000

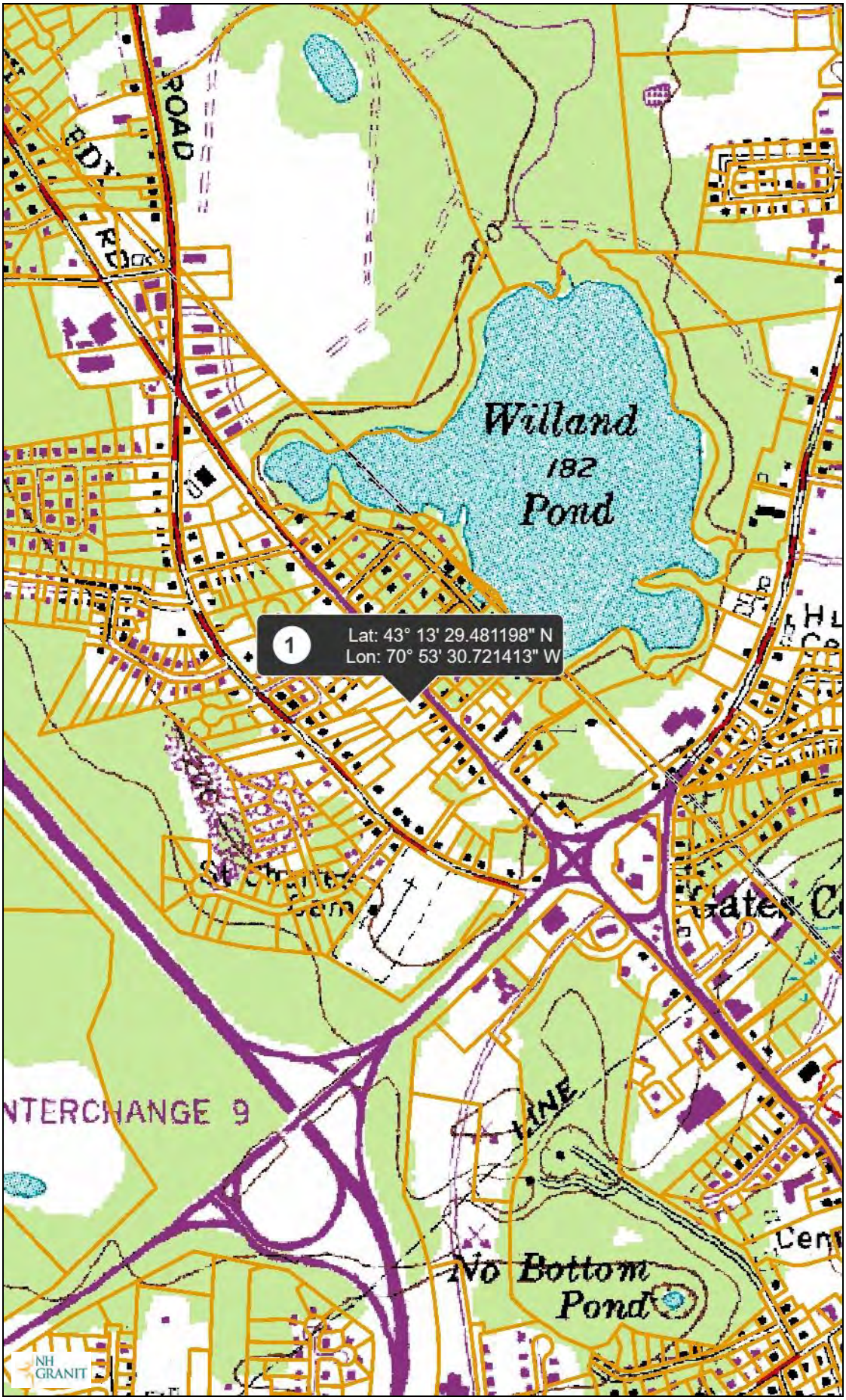
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Notes



Map by NH GRANIT



Legend

- Parcels
- State
- County
- City/Town

Map Scale

1: 10,000

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Notes



DESIGN METHOD OBJECTIVES

Knox Marsh Development, LLC is proposing to develop six new duplex structures in addition to the existing single-family home on Tax Map 39, Lot 103 and the conversion of two single family homes to duplex structures on Tax Map 39, Lot 104 (lot merger proposed). The majority of the lot is grassed in the existing condition. This Drainage Analysis includes the original approved and constructed Copper Drive project (Dover #P22-27). The developed roadway at the southwest side of the subject parcel will be referred to as Copper Drive, as it is an extension of the existing Copper Drive and the roadway to the northeast side of the subject parcel located off of New Rochester Road will be referred to as Ember Drive.

An Existing and Proposed Conditions analysis was conducted for the purpose of estimating the peak rate of stormwater run-off from the property and subsequently designing adequate mitigation of drainage. There is a single existing drainage discharge point which is identified in the existing analysis and duplicated in the proposed conditions analysis. Designing two watershed models we have compared the differences in these rates of peak run-off and surface water volume. Sheet W1, Existing Conditions Watershed Plan, outlines the characteristics of the site in its existing or pre-construction conditions for Tax Map 39, Lot 103. While Sheet W1, Existing Conditions and outlines the characteristics of post-construction conditions for Tax Map 39, Lot 104 (Copper Drive and house construction). The post-construction conditions of Tax Map 39, Lot 104 was chosen as opposed to the pre-construction conditions, due to the reduction in peak rate of runoff and surface water volume from the constructed condition (See approved Drainage Analysis for Dover #P22-27 & Sheet W1). The second analysis displays the proposed (post-construction) conditions for Tax Map 39, Lot 103 (See Sheet W2.) The analysis was conducted using data for; 2 Yr-24 Hr (3.61”), 10 Yr-24 Hr (5.44”), 25 Yr-24 Hr (6.87”), 50 Yr-24 Hr (8.20”), and 100 Yr-24 Hr (9.79”) storm events. Storm event analysis was accomplished using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment and rainfall quantities are based on the Extreme Precipitation Table for this location from the Northeast Regional Climate Center / Cornell University (http://precip.eas.cornell.edu). As Dover is considered a Seacoast Community by NHDES, the Extreme Precipitation quantities have been adjusted to be 115% of the documented rainfalls for the 24-hour events.

1.0 Existing Conditions Analysis:

Reference: Sheet W1 - Existing Conditions Watershed Plan (Enclosed)
Existing Conditions Plan
Site Specific Soils Map Plan

The existing property consists of several residential parcels or limited common areas, each with an existing house and attached or detached garage. There are three subcatchments flowing to off-site nonpoint final reaches. The combined area of the property is 2.38 acres and the area of the analysis is 3.59 acres. There were no wetlands identified on the site. The current use is supported by municipal water and sewer. On-

site soils were mapped by John P. Hayes III, CSS #87 and shown on the Site Specific Soils Map and included report.

The soils are made up of WdA - Windsor, which is classified as Hydrologic Soil Group (HSG) A and 350 - Udipsaments which is classified as HSG B. Off-site soils consist of WdA – Windsor loamy sand, which is classified as Hydrologic Soil Group A, based on the USDA, NRCS Websoil. Land covers include pavement, grass, roofs, gravel, woods, water (pool).

Water drains overland flow into the City of Dover MS4 System and into Willand Pond (NHLAK600030405-03). The impairment of the watershed are as follows:

Willand Pond (NHLAK600030405-03),
Mercury, NE Regional Mercury TMDL, December 20, 2008, TMDL #33883
Escherichia coli, 58 NH Bacteria Impaired Waters, August 29, 2011, TMDL #40665
Non-Native Aquatic Plans
Other flow regime alterations
Oxygen, Dissolved
Dissolved oxygen saturation
pH, Low Priority

Final Reach #100:

*The existing conditions analysis is based upon Copper Drive being completed and designed as approved. It is still under construction at the time of application. *

Subcatchment #1 consists of land not interrupted/disturbed by the development of Copper Drive. This includes off-site land from Tax Map 39, Lot 69-E and Tax Map 39, Lot 102. The remainder of the area includes the subject parcel of Tax Map 39, Lot 103 and the Limited Common Area land remaining from the Copper Drive development. Runoff flows south over the property line to a nonpoint discharge reach analyzed as **Final Reach #100**. Land is made up of roofs, paved roadway and driveway, residential lawn, and woods.

Subcatchment #2 is remaining area of the Existing Conditions that is disrupted by the proposed development and routed through an inlet sump to a Rain Garden w/ Infiltration. As the stormwater routed through this inlet sump is generated primarily from offsite (Tax Map 39, Lot 69-E), a sediment forebay provides adequate pre-treatment, but the system does not treat the entire offsite water quality volume. This Rain Garden functions as a level spreader once the infiltration cell is full and is only proposed to provide compliance with the 2-Yr peak rate of runoff at **Final Reach #100** as part of the original Copper Drive design. Land is made up of roofs, paved roadway and driveway, residential lawn, and a pool.

Subcatchments #11 and #12 are the direct contributing areas to **Porous Pavement w/ Infiltration #101 (Pond 101P)** and **Rain Garden w/ Infiltration #102 (Pond 102P)** respectively. Porous Pavement w/ Infiltration (Pond 101P) is not routed to the final reach because the pond is able to infiltrate the 100-Yr storm event. The body of porous pavement is modeled in a conservative manner, only the primary roadway (301 LF, 24' wide) storage volume is modeled. In the constructed condition the driveways will provide additional infiltration and storage capabilities beyond what is modeled. Rain Garden w/ Infiltration #102 is routed as a point discharge to the analysis point at **Final Reach 100.**

2.0 Proposed Conditions Analysis:

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

The proposed conditions analysis consists of sixteen (16) subcatchments. The final analysis point from the existing analysis is preserved. Stormwater BMPs with pond numbers in the 100's have been previously approved and constructed, while stormwater BMPs in the 200's are proposed as part of this project. Land covers include pavement, grass, roofs, gravel, woods, water (pool).

Final Reach #100:

Subcatchment #1 is the remaining, mostly off-site (Tax Map 39, Lot 102) area that drains to an Infiltration Sump (**Pond #1)** and flows to the northwest to **Final Reach #100** for the 100YR-24 HR storm event only. Land is made up of roofs, paved roadway and driveway, residential lawn, and woods. **Pond #1** exists for the purpose of being a sediment pond during construction, protection of abutting properties during extreme precipitations times, and snow storage purposes.

Subcatchment #3 is the remaining area (mostly wooded) of the Existing Conditions subcatchment from the north that is not diverted by the proposed development (not draining to **Pond #1**) and is a non-point discharge. **Subcatchment #2** is remaining area of the Existing Conditions that is disrupted by the proposed development and routed through an inlet sump to a Rain Garden w/ Infiltration. As the stormwater routed through this inlet sump is generated primarily from offsite, a sediment forebay provides adequate pre-treatment, but the system does not treat the entire offsite water quality volume. This Rain Garden functions as a level spreader once the infiltration cell is full and is only proposed to provide compliance with the 2-Yr peak rate of runoff at **Final Reach #100** as part of the original Copper Drive design. Land is made up of roofs, paved roadway and driveway, residential lawn, and a pool.

Subcatchment #4 is the area that drains to an infiltration sump **(Pond #4).** This area includes the grassed area and rear roof line of the houses along the southern

edge of Copper Drive and adjacent to the porous walkway between the proposed duplex units. **Pond #4's** primary outlet (12" RCP) does not function until the 100YR-24HR storm event, which then overflows to **Pond #1** and to **Final Reach #100**. Land is made up of roofs and residential lawn. **Pond #4** exists for the purpose of being a sediment pond during construction, protection of abutting properties during extreme precipitations times, and snow storage purposes.

Subcatchments #11 and #12 are the contributing areas to **Porous Pavement w/ Infiltration #101 (Pond 101P)** and **Rain Garden w/ Infiltration #102 (Pond 102P)**. Porous Pavement w/ Infiltration (Pond 101P) is not routed to the final reach because the pond is able to infiltrate the 100-Yr storm event. The body of porous pavement is modeled in a conservative manner, only the primary parking area (301 LF, 24' wide) storage volume is modeled. In the constructed condition the driveways will provide additional infiltration and storage capabilities beyond what is modeled. Rain Garden w/ Infiltration #102 is routed as a point discharge to the analysis point at **Final Reach 100.** Land is made up of roofs, paved roadway, and residential lawn.

Subcatchments #21 and #22 are the contributing areas to **Porous Pavement w/ Infiltration #201 (Pond 201P)** and **Porous Pavement w/ Infiltration #202 (Pond 202)**. Both porous pavement ponds are not routed to the final reach because the ponds are able to infiltrate the 100-Yr storm event. Land is made up of roofs, paved roadway, and residential lawn

Subcatchments #31, #32, #33, #34, #35, #36 are the proposed roofs of the duplex structures that are captured via gutter and downspout and routed to a porous pavement or pavers system for infiltration. **Subcatchment #31,** is routed to **Porous Pavement w/ Infiltration #201 (Pond 201P). Subcatchments #32, #33, #34** are routed to **Porous Pavers w/ Infiltration #203 (Pond 203P). Subcatchments #35 & #36** are routed to **Porous Pavement w/ Infiltration #202 (Pond 202P).**

Summary

Porous Pavement w/ Infiltration #201, Porous Pavement w/ Infiltration #202, Porous Pavers w/ Infiltration #203, & Porous Pavers w/ Infiltration #204 captures all of the runoff from the proposed roadways and roofs, in addition to some proposed roof area for Lot 103. This runoff is infiltrated after treatment through the filter course of the pavement. The peak rate of runoff from the proposal is reduced in the five storm events, at both final reaches, analyzed comparing pre-conditions to post-conditions. The design provides overflow areas in case of porous pavement failure (Infiltration Sumps #1P & 4P). The two catch basins provided on the project are not intended to infiltrate stormwater during regular use. These are provided as back up incase of porous pavement failure, or in snow conditions where the infiltration sumps are filled with snow to assist with infiltration.

3.0a Stormwater Treatment:

Surface water runoff from the development area is being treated by porous pavers w/ infiltration. Time of Concentration for porous pavement practices is a standard 800

minutes direct entry when using a 41 inch base course according to UNH Stormwater Center. In our practice we are using a 24 inch base course, resulting in a scaling of the Tc. in proportion to the course thickness of 468 minutes, then apply a factor of safety of two (2). We have determined a 234 minute time of concentration is proportionately appropriate. Using this same process, porous pavers with a 9" stone base results in a Tc. of 176 minutes. Applying a factor of safety of two (2), results in a Tc. of 88 minutes. Water Quality Volume calculations based on the Alteration of Terrain model along with Pond Storage Tables are included in Appendix 3 for the modeled practice.

3.0b Stormwater Infiltration:

Groundwater recharge volume requirements are satisfied by Porous Pavement w/ Infiltration #201, Porous Pavement w/ Infiltration #202, Porous Pavers w/ Infiltration #203, & Porous Pavers w/ Infiltration #204 (Ponds #201, #202, #203, & #204). (Sheets P-201, P-202, P-203, & P-204). See Infiltration Feasibility Study also prepared by Berry Surveying & Engineering and published on the same day.

3.1 FULL COMPARATIVE ANALYSIS

ANALYSIS COMPONENT: PEAK RATE DISCHARGE (Cubic Feet / Second)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	0.62	2.54	4.46	6.43	8.91
	Proposed	0.34	1.46	2.47	3.47	4.69

ANALYSIS COMPONENT: VOLUME (Acre Feet)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	0.101	0.330	0.556	0.790	1.093
	Proposed	0.039	0.145	0.249	0.357	0.526

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

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

The proposed site development is protected from erosion and the abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA); and City of Dover Chapter 153-14 A, Stormwater Management, Erosion Control, and Flood Hazards. **Temporary stabilization measures should be in place within seven calendar**

days for exposed soils areas that are within one hundred feet of a surface water body or a wetland and no more than 14 calendar days for all other areas. Permanent stabilization should be in place within three calendar days following completion of final grading of exposed soil areas. Erosion and sediment control measures shall be installed prior to any soil land disturbance and must be reviewed and approved by the City of Dover Community Services Department. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them. Abutting properties will not be adversely affected by this development. Reference is also made to the Inspection, Operation & Maintenance Manual which has been written specifically for this project and available to the owner.

As this proposed site redevelopment disturbs greater than one acre of land, for the project on Tax Map 39, Lot 103 & 104 combined, a Notice of Intent is required to be submitted to the US EPA. This project will be covered by the Construction General Permit. As this project proposes less than 100,000 square feet of impact it does not require an issued permit by NHDES AoT, however construction is governed by a General Permit by Rule under NH RSA 485-A:17. Either a Stormwater Pollution Prevention Plan (SWPPP) or a Stormwater Management Plan (SWMP) as required by the City of Dover will be required. In either case, the requirements of Chapter 153-14 A will be included in the plan.

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

The plan set demonstrates the location of perimeter sediment control. The Erosion and Sediment Control Details, Sheet E-101, has the specifications for installation and maintenance of the silt fence, Filtrexx mulch filled Silt Soxx (or approved equal), and Erosion Control Mix Berm. It is noted that the City of Dover prefers the mulch berms as well as the Filtrexx product.

Porous Asphalt Pavement/Pavers & Infiltration Bed

Description: The Permeable Pavement system consists of a porous pavement surface and permeable sub-base materials that is going to allow infiltration of surface water runoff into the native subsoil. The layers of the sub-base materials serve as a filter for the runoff prior to infiltration. Care must be taken during the preparation of the sub-base materials to ensure operation of the infiltration bed and the sub-soil under the system must be scarified to a depth of two-feet below the system to ensure that the soil has not become compacted and does not contain topsoil remnants or boulders.

Maintenance Considerations: No winter sand will be used on permeable pavement and will minimize application of salt for ice control. **Pavement Vacuuming** - Due to the nature of porous pavement, sand must be removed by vacuuming on a regular basis when the pores become clogged two to four times per year. This process varies due to the amount of sand and sweeping efforts but should be investigated two to four times every year. The life expectancy of the porous asphalt pavement system is about 20 years following the prescribed regular maintenance schedule.

In-Ground Infiltration Basin (Sumps)

Description: Infiltration basins are impoundments designed to temporarily store runoff, allowing all or a portion of the water to infiltrate into the ground. An infiltration basin is designed to completely drain between storm events. An infiltration basin is specifically designed to retain and infiltrate the entire Water Quality Volume. Some infiltration basins may infiltrate additional volumes during larger storm events, but many will be designed to release stormwater exceeding the water quality volume from the larger storms. In a properly sited and designed infiltration basin, water quality treatment is provided by runoff pollutants binding to soil particles beneath the basin as water percolates into the subsurface. Biological and chemical processes occurring in the soil also contribute to the breakdown of pollutants. Infiltrated water is used by plants to support growth or it is recharged to the underlying groundwater. As with all impoundment BMPs, surface infiltration basins should be designed with an outlet structure to pass peak flows during a range of storm events, as well as with an emergency spillway to pass peak flows around the embankment during extreme storm events that exceed the combined infiltration capacity and outlet structure capacity of the facility. See SWM Volume 2, 4-3.3b, Treatment Practices, In-Ground Infiltration Basin, page 88.

Maintenance Considerations: Removal of debris from inlet and outlet structures. Removal of accumulated sediment. Inspection and repair of outlet structures and appurtenances. Inspection of infiltration components at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection. Inspection and removal of accumulated sediment as warranted by inspection, but no less than once annually. Periodic mowing of embankments. Removal of woody vegetation from embankments. Inspection and repair of embankments and spillways. If an infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional 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 reconstruction of the infiltration trench.

Culvert Inlet Sumps & Cross Culvert w/ Flared End Sections

Description: In one location, to capture the surface water runoff that is trapped within the inside of the residential roadway and residential runoff from back yards, there is a Residential Inlet Sump. This culvert pipe, flared end sections, and constructed sump will collect the runoff that is directed to that location during and after the residential development. The culvert will allow the runoff to discharge and not allow water to pond to the house elevations in the back yards. The location of the Residential Inlet Sump will be marked and identified with headwall and bollards.

Maintenance Considerations: Vegetation and debris will need to be removed from the culvert inlet several times a year, especially late fall after the majority of the leaves have fallen and in the spring. In addition to the sump and culverts themselves, the

drainage channel will need to be inspected to ensure that the runoff intended to get to the inlets is making it to the sump. The identification fence post will be inspected for structural condition and painted condition.

Deep Sump Catch Basin

Description: A deep sump catch basin consists of a manhole-type structure with an inlet grate, an outlet pipe connected to the piped drainage system, and a sump with a depth several times the diameter of the outlet pipe. The inlet grate is located at the surface, and is sometimes combined with a vertical inlet integrated with a street or parking area curb. The sump's purpose is to capture coarse sediments and debris from the runoff intercepted by the structure. The outlet pipe can be fitted with a "hood" consisting of a cast metal or formed plastic fitting, designed to prevent floating materials from exiting the structure. Deep sump catch basins used as pretreatment are most effective if sited "off-line" since flow-through basins are more susceptible to sediment re-suspension. All pretreatment deep sump catch basins will have an outlet pipe hood which extends one-foot below the outlet invert and will include a hood vent. During construction the catch basins will be protected by inlet protection per the approved construction plans. Hoods are to be installed during initial construction. See SWM Volume 2, 4-4.5 Pre-treatment Practices, 5. Pre-treatment Swales, page 144.

Maintenance Considerations:
Catch basins may require frequent maintenance. Depending on location, this may require several cleanings of the sumps each year. At a minimum, it is recommended that catch basins be inspected at least twice annually, once following snow-melt and once following leaf drop, and cleaned as indicated by inspection. Sediment should be removed when it approaches half the sump depth. If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other method and disposed in conformance with applicable state and federal regulations. Cleaning may require Vacuum-truck instead of "clam-shell" to avoid damage to hood. Damaged hoods should be replaced when noted by inspection.

Conveyance Swales

Description: "Swales are stabilized channels designed to convey runoff at non-erosive velocities." (NHDES SWM) They will be trapezoidal or parabolic in section view. A conveyance swale is intended to move surface water runoff from one point to another where as a treatment swale will slow the velocity to a point where sediment will settle out of the stormwater flow. A treatment swale will be constructed to a width of between four and eight feet and have a minimum length of 100 feet. The flow characteristics will also meet design criteria. See SWM Volume 2, 4.3 Treatment Practices, 5. Treatment Swales, page 123.
Project Intent: The swales are individually designed in the drainage analysis and specified on the design plans. The designed swales must have greater than 85%

vegetated growth prior to receiving runoff. The bottom of a treatment swale must be above the seasonal high water table.

Maintenance Considerations: Grassed swales will be inspected twice annually, removing accumulated sediment and gross solids. Grass will be mowed periodically but to a depth of not less than 4 inches. Any damage to the vegetation will be repaired and woody vegetation and invasive vegetation will be removed.

Rip Rap Outlet Protection

Description: Outlet Protection consists of a riprap apron or preformed scour hole that is designed to provide velocity reduction of the surface water run-off that is leaving a culvert. The design is dependent on the culvert size, soil conditions, velocity, and quantity of the run-off. There are to be no bend or curves at the intersection of the conduit and apron. Ref.: NHDES SWM Volume 2, Section 4-6 Conveyance Practices, 6. Outlet Protection and 1. Detention Ponds, Note 3, Page 158.

Maintenance Considerations: The riprap outlet protection will be inspected annually for damage, which must be corrected immediately. Any sediment buildup will be removed and disposed of correctly. This material will be cleaned out along with any gross solids and disposed of properly. (See invasive species below) Any rip rap that has been displaced from the original construction will be repaired, especially recreating the level lip.

Stabilization for Long Term Cover

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

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

Conservation Mix

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	15	0.35
Creeping Red Fescue	15	0.35

Annual Ryegrass	5	0.12
Perennial Ryegrass	5	0.12
Kentucky Bluegrass	15	0.35
White Clover	7	0.16
Total	**62**	**1.45**

Conservation Mix will used to stabilize all 2:1 slopes and all land area disturbed within the wetland buffer. As the site is to be stabilized with erosion control mix as a mulch, the vegetation should be established with a high percentage of white clover for growth to be established. Conservation Mix will also be used to plant and stabilize the erosion control mix mulch. Seed will originally be applied by hydroseeding which includes a tackifier. Due to the shade factor of the solar panels, special care must be taken to establish growth.

Environmental Dust Control

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

Inlet Protection / Storm Drain Inlets

Storm drain inlet protection will be installed per the Erosion & Sediment Control Details as a sediment barrier installed around a storm drain inlet, catch basin, or curb inlet to reduce sediment intrusion into a system after it has been constructed and existing catch basins. These are to be constructed in accordance with the Erosion & Sediment Control Details, Sheet E-101 and maintained after every rain event.

At a minimum, you must comply with following (EPA CGP Part 2.1.2.9.b) “Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.”

It is vital in the construction of this site that the existing MS4 drainage system not be impacted by sediment. See also sediment track out below.

Sediment Track-Out / Stabilized Construction Entrance / Exit

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be between 1 and 2-inch coarse aggregate, and the pad itself

constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Construction Details Plan. The Construction Exit will be maintained in a condition that will prevent tracking of sediment onto the public highway. When the control pad becomes ineffective, the stone should be removed along with the collected soil material, regraded on site, and stabilized. A plan view and profile are shown on the Construction Details Plan in E-101 Erosion & Sediment Control Details.

Off-site Vehicle Tracking: A stabilized construction entrance has been provided to help reduce vehicle tracking of sediments. The paved street adjacent to the site entrance will be swept every other week or as necessary to remove any excess mud, dirt or rock tracked from the site. After the binder pavement has been placed, any construction activity that causes the tracking of sediments will also result in street sweeping. Pavement should be swept prior to surface pavement and periodically to remove materials. Dump trucks hauling material from the construction site will be covered with a tarpaulin.

At a minimum, you must provide for maintenance that meets the following (EPA CGP Part 2.1.2.3.d) "Where sediment has been tracked-out from your site onto the surface of off-site streets, other paved areas, and sidewalks, you must remove the deposited sediment by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. You must remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance (unless it is connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water."

Stockpiled Sediment or Soil

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

At a minimum, you must comply with following (EPA CGP Part 2.1.2.4d) "Do no hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similar effective control,) storm drain inlet, or surface water."

Dewatering Practices

Dewatering practices are not known to be required on this site. If during construction this becomes required, an addendum will be published specific for the

requirements. As a general rule, ground water that needs to be removed from an excavation will be pumped to a sediment basin or a storm drain inlet prior to discharge from the site.

At a minimum, you must comply with following (EPA CGP Part 2.1.3.4) "With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications."

Regarding dewatering practices in the State of New Hampshire, specifically see Construction General Permit Section 9.1.2 NHR12000 State of New Hampshire and "Clarification of Section 9.1.2 … and other New Hampshire specific information for the U.S. EPA 2012 NPDES Construction General Permit (CGP), May 3, 2012"

Please be advised that should dewatering become required, the EPA CGP 2022 requires daily inspections, monitoring, and reporting quarterly to the agency.

Construction Sequence

1. Cut and remove trees in construction area only as required.

2. Construct and/or install temporary and permanent sediment erosion and detention control facilities as required.

3. Erosion, sediment and detention control facility shall be installed & stabilized prior to any earth moving operation & or directing runoff to them.

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

5. Construct temporary culverts as required, or directed.

6. Construct roadways for access to desired construction areas. All roads shall be stabilized immediately.

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

8. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded or mulched as required, or directed. No area is allowed to be disturbed for a length of time that exceeds 60 days before being stabilized. Daily, or as required. All roadways and parking areas shall be stabilized within 72 hours of achieving finished grades. All cut and fill slopes shall be stabilized within 72 hours of achieving finished grades.

9. Construct temporary berms, drains ditches, silt fences, sediment traps, etc. mulch and seed as required.

10. Inspect and maintain all erosion and sediment control measures during construction.

11. Complete permanent seeding and landscaping.

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

13. Smooth and revegetate all disturbed areas.

14. Finish paving all roadways.

Temporary Erosion Control Measures

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

2. Erosion, sediment control measures shall be installed as shown on the plans and at locations as required, or directed by the engineer.

3. All disturbed areas shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4" of loam and seeded with not less than 1.10 pound of seed per 1,000 square feet (48 pounds per acre) of area.

4. Silt fences and other barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired, sediment deposits shall periodically be removed and properly disposed of.

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

6. Areas must be seeded and mulched within 5 days of final grading, permanently stabilized within 3 days of final grading, or temporarily stabilized within 14 days of initial disturbance of soil.

Inspection and Maintenance Schedule

Sediment control measures will be inspected during and after storm events to ensure that the practice still has integrity and is not allowing sediment to pass. Depending on SWPPP criteria, all controls will be inspected either once every 7 days and after storm

events. Inspection reports must be submitted to City of Dover Engineering Department. Sediment build-up in swales and level spreaders will be removed if it is deeper than six inches. See also Stormwater System Operation: Inspection & Maintenance Manual published separately also by Berry Surveying & Engineering. See also Storm Water Pollution Prevention Plan (SWPPP) and / or Stormwater Management Plan (SWMP) developed in accordance with EPA NPDES or City of Dover requirements.

Corrective Action measures will be made in accordance with Stormwater Management Plan (SWMP) / SWPPP requirements and records maintained on site by the Contractor.

5.0 Demonstration of Compliance with Dover Chapter 153-14

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

(3) Design standards.

(a) Minimum protections and management standards.

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

Acknowledgement of project compliance with the EPA Phase II stormwater rules is shown on the Grading Plan, sheet #7, note #11.

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

There are no wetlands/wetland buffers located on the subject parcel.

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

Please find Porous Pavement w/ Infiltration & Porous Pavers w/ Infiltration design, sheet #8. These LIDs are proposed across the project due to infiltration capacity of the existing soil. A reduction in stormwater runoff volume will occur from the implementation of the LIDs. See comparative analysis in section 3.1.

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

Please find Inspection & Maintenance Manual included in the drainage binder. See E-101 & E-102 with references to the New Hampshire Stormwater Manual (NH SWM).

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

Please find note #13 on the Erosion & Sediment Control Plans. Prior to construction, a stormwater pollution prevention plan will be developed in accordance with US EPA CGP 2022.

[6] Salt and other deicing materials shall be stored under cover or located such that no direct discharges to receiving waters are possible. Snow storage areas shall be located such that no direct discharges to receiving waters are possible. See the NHDES guidance fact sheet on road salt and snow disposal.

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

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

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

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

Parking surfaces and roads are provided porous pavement and walkways within the project are provided as porous pavers. The extent of these surfaces has been minimized to the extent practical.

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

Stormwater runoff is conveyed to a series of porous pavement or porous pavers and infiltrated. Two additional infiltration areas are proposed that receive offsite flow or grassed/roof area to control stormwater existing the subject parcel.

(b) Stormwater management for new development.

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

Utilizing this standard and guidance from the Pollutant Removal Efficiencies for the NH Stormwater Manual, Volume 2, the design can expect to see the following annual performance standards for a ***Permeable Pavement that infiltrates WQV >75' from water***

- *Total Suspended Solids (TSS) reduction of 90%*
- *Total Nitrogen (TN) reduction of 60%*
- *Total Phosphorous (TP) reduction of 65%*

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

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

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

Please find comparative analysis in Section 3.1 for the demonstration of a reduction in peak rate at the final reach.

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

Please find comparative analysis in Section 3. 1 for the demonstration of a reduction in volume at the final reach

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

Infiltration rates for designing groundwater recharge practices have been determined in accordance with Section Env-Wq 1501.14. Soil type 350A & B (Deerfield derivation) is able to infiltration at a rate of 3in/hr after a factor of safety of two applied.

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

All Practices have been sized within these parameters. Infiltration Sump #1P provides 0.92' of freeboard and Infiltration Sump #4P provides 0.69' of freeboard at the 10YR-24HR event.

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

This standard is not applicable for this project.

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

Off-site stormwater flow has been accounted for in the project design. Please find watershed sheets within the drainage binder.

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

The seasonal high-water table elevations are shown in the Porous Pavement/Porous Paver Plan, sheet #8.

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

All practices have been designed to be maintained and located within the open site.

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

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

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

These standards are not applicable for this project.

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

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

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

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

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

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

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

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

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

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

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

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

See Inspection & Maintenance Manual and Erosion & Sediment Control Plans, sheet #10.

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

Copies will be provided when developed and published prior to NOI submittal and construction included with the Stormwater Pollution Prevention Plan (SWPPP)

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

There is to be no disturbance outside of the limit of construction. Erosion & sediment control measures are to be in place prior to the start of land grubbing. See Erosion & Sediment Control Plans, sheet #10.

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

The limit of disturbance is to be staked prior to the beginning of construction. The project is proposed as one phase due to the less than one acre of disturbance for this portion of the project.

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

Please find Erosion & Sediment Control Plan, sheet #10.

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

Please find Erosion & Sediment Control Plan, sheet #10.

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

There are no wetland areas, stream channels, or wetland buffers within 50' of the subject parcel.

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

Please find Erosion & Sediment Control Plan (sheet #10), Inspection & Maintenance Manual, and Construction Detail Sheets E-101 & E-102.

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

Please find Erosion & Sediment Control Plan (sheet #10), Inspection & Maintenance Manual.

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

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

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

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

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

Please find Inspection & Maintenance Manual containing this statement.

[13] For projects proposing to disturb and expose soils in areas of 10 acres or more at one time, a temporary (or permanent) sediment basin must be provided with storage for a calculated volume of runoff from a drainage area from a two-year, twenty-four-hour storm, or equivalent control measures, where attainable, until final stabilization of the site. Alternatively, the sediment basin can be sized to provide 3,600 cubic feet of storage per acre of drainage area until final stabilization of the site. In determining appropriate locations and number of sediment basins needed, the operators may consider such factors as erodibility of site soils, slope lengths, available area on site, construction period and other unique site considerations.

This standard is not applicable for this project.

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

The limit of construction is not to be expanded beyond the staked limit of construction.

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

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

The applicant acknowledges this standard. This is shown as note #14 on the Erosion & Sediment Control Plan.

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

The applicant acknowledges this standard. This is shown as note #15 on the Erosion & Sediment Control Plan.

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

The applicant acknowledges this standard. This is shown as note #15 on the Erosion & Sediment Control Plan.

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

The applicant acknowledges this standard.

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

The applicant acknowledges this standard.

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

The applicant acknowledges this standard.

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

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

Please find Erosion & Sediment Control Plans, sheet #10.

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

Please find W1 Existing watershed and W2 Proposed watershed plans within the drainage binder.

[c] Description of LID proposed measures.

Please see section 4.0 of this drainage narrative. Low impact development measures include the implementation of two porous pavement bed w/infiltration and two porous paver beds w/infiltration.

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

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

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

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

Please find Existing Conditions Plans, sheet #2. There are no steep slopes, wetlands, or flood zones within the subject parcel.

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

Please find Site Specific Soils Survey (sheet #3) and W-1 Existing Watershed Plan.

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

Please find W-1 Existing Watershed Plan, Site Specific Soils Survey (sheet #3).

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

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

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

Please find sections 1.0 and 2.0 of this narrative as well as W-1 Existing Watershed Plan, Existing Drainage Analysis, W-2 Proposed Watershed Plan & Proposed Drainage Analysis.

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

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

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

Utilizing this standard and guidance from the Pollutant Removal Efficiencies for the NH Stormwater Manual, Volume 2, the design can expect to see the following annual performance standards for a ***Permeable Pavement that infiltrates WQV >75' from water***

- *Total Suspended Solids (TSS) reduction of 90%*
- *Total Nitrogen (TN) reduction of 60%*
- *Total Phosphorous (TP) reduction of 65%*

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

Please see section 4.0 of this drainage narrative. Low impact development measures include the implementation of two porous

pavement bed w/infiltration and two porous paver beds w/infiltration.

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

Porous Pavement & Porous Pavers are proposed on site and qualify as low impact development.

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

Please find comparative analysis demonstrating compliance with the 2-100YR 24Hr storm events.

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

Please find Infiltration Feasibility Study in Drainage Binder.

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

There is no increase in post-development runoff volume due to the infiltration proposed to occur due to the implementation of LID devices including porous pavement w/ infiltration & porous pavers w/infiltration.

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

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

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

There is no disturbance proposed within any flood zones.

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

Please find Inspection & Maintenance Manual. EPA and NHDES will require an inspection every 7 days and after a storm event greater than 0.25".

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

Please find Inspection & Maintenance Manual.

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

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

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

Please find Inspection & Maintenance Manual.

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

Please find Inspection & Maintenance Manual and plans.

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

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

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

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

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

Please find Inspection & Maintenance Manual.

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

Please find Inspection & Maintenance Manual.

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

Please find Inspection & Maintenance Manual.

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

Please find Inspection & Maintenance Manual.

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

Please find Inspection & Maintenance Plans within the drainage binder.

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

Please find Inspection & Maintenance Manual.

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

Please find note #29 of the Site Plan, sheet #6.

6.0 CONCLUSION

Peak rates of runoff flow are reduced in the post-construction analysis / condition, as compared to the pre-construction peak rates of runoff flow at **Final Reach #100.** This reduction occurs during the 2 Yr, 10 Yr, 25 Yr, 50 Yr, and 100 Yr/24 Hour extreme storm events due to the infiltration of the porous pavement treatment, as well as lot specific storm water mitigation as shown on the development plans and details. Per Env-Wq 1507.05(b)(1)(a) the channel protection volume is satisfied by the 2-year, 24-hour post-development peak flow rate generated from the proposed disturbance being less than the 2-year, 24-hour pre-development peak flow rate and the 2-100 year, 24-hour post-development storm volumes has not increased over the pre-development volume at the final reach.

A Site Specific, Terrain Alteration Permit (RSA 485: A-17) is not required for this site plan due to the area of disturbance being less than 100,000 SF and the site will operate as a General Permit by Rule under this rule. Because the site impact is greater than one acre between the two projects, a Notice of Intent with the EPA is required and the site will operation in accordance with the City of Dover Chapter 153-14 A Stormwater Management, Erosion Control, and Flood Hazards and the approved Stormwater Management Plan.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT
Principal, President

Kenneth A. Berry PE, LLS,
CPSWQ, CPESC, CESSWI
Principal, VP - Technical Operations

Kevin R. Poulin, PE
Project Engineer

Appendix I - Existing Conditions Analysis

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

JOHN P. HAYES III, CSS #87

JOHN P. HAYES III, CWS #18

WETLAND NOTES:

WETLANDS WERE DELINEATED BY JOHN P. HAYES IN NOVEMBER OF 2021

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

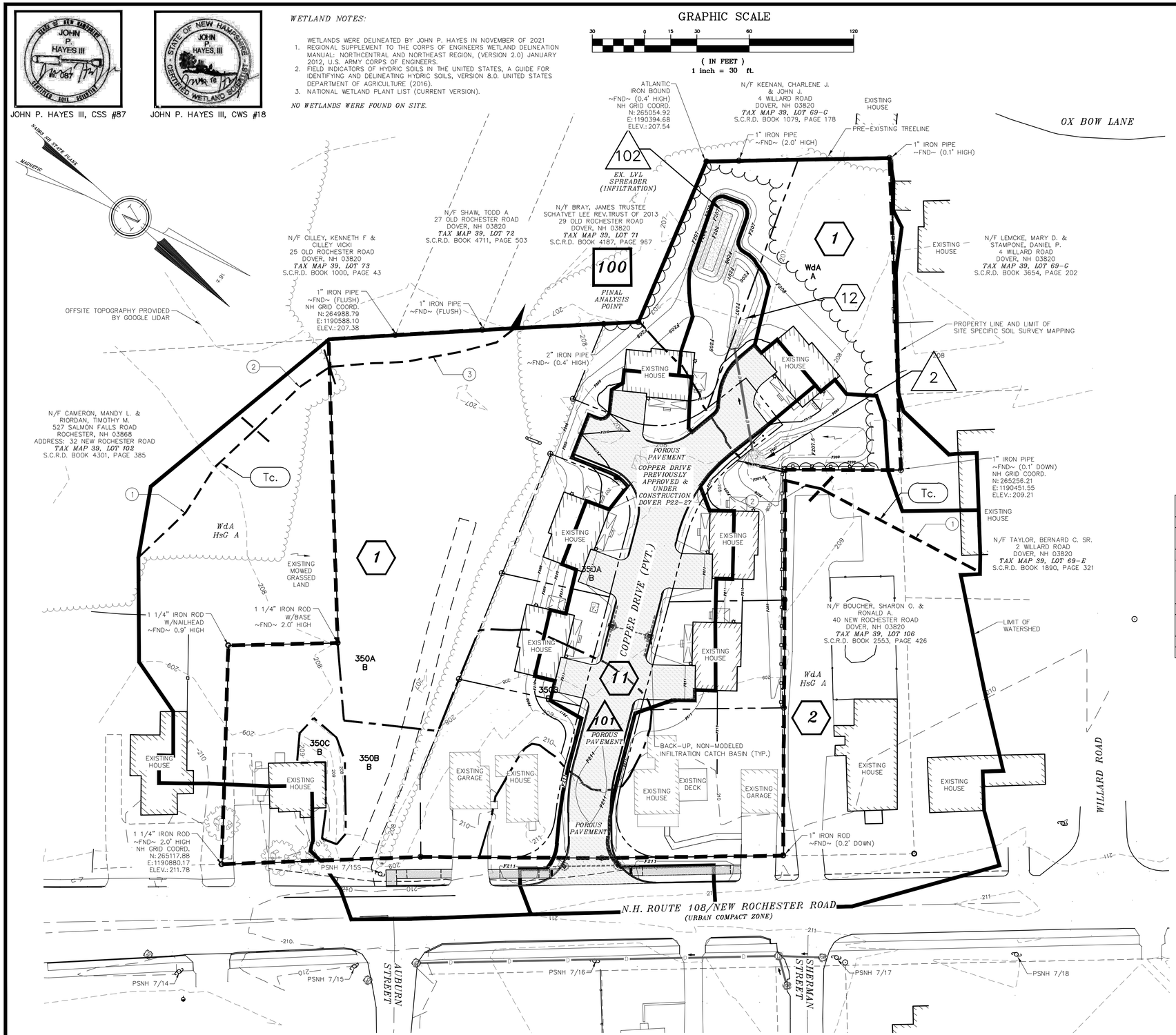
NO WETLANDS WERE FOUND ON SITE.

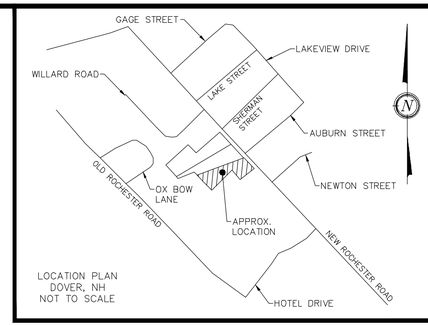
GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

1 inch = 30 ft.





NOTES:

1.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING WATERSHED CONDITIONS OF TAX MAP 39, LOTS 103 LOCATED IN DOVER, N.H., AS OF THE FIELD SURVEY IN NOVEMBER 2021.

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

7.) TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN NOVEMBER 2021.

8.) WETLANDS WERE DELINEATED BY JOHN P. HAYES, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, IN MAY OF 2023. NO WETLANDS WERE FOUND ON SITE.

9.) ANY SURFACE WATER RUNOFF THAT LEAVES THIS SITE WILL ENTER THE DOVER MS4 AND ENTER WILLAND POND (SEE DRAINAGE ANALYSIS).

SOILS LEGEND

Site Specific Soils

Symbol	K	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd		A	Windsor	A
350		A,B	Udipsaments (Wet Substratum)	B

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

Denominators: /P = Poorly Drained /VP = Very Poorly Drained /Rk = Rocky

NRCS Soils

Symbol	K	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd		A	Windsor Loamy Sand	A

NRCS SOIL DATA:

WdA ~ WINDSOR LOAMY SAND 0 TO 3% SLOPES

SEE NRCS WEBSOIL

LEGEND:

299 — EXISTING CONTOUR MINOR
300 — EXISTING CONTOUR MAJOR
LIMIT OF SITE SPECIFIC SOILS MAP
448A — SOIL LINE
SOIL SERIES
NRCS SOIL LINE
HYB — NRCS SOIL LABEL
LIMIT OF WATERSHED
TIME OF CONCENTRATION PATH
FLOW REACH
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
TBR TO BE REMOVED

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

FLOW REACH SYMBOL

POND DEVICE SYMBOL

TIME OF CONCENTRATION SEGMENT

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

EPA GCP SWPPP SITE MAP (EXISTING)

W-1 EXISTING WATERSHED

LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

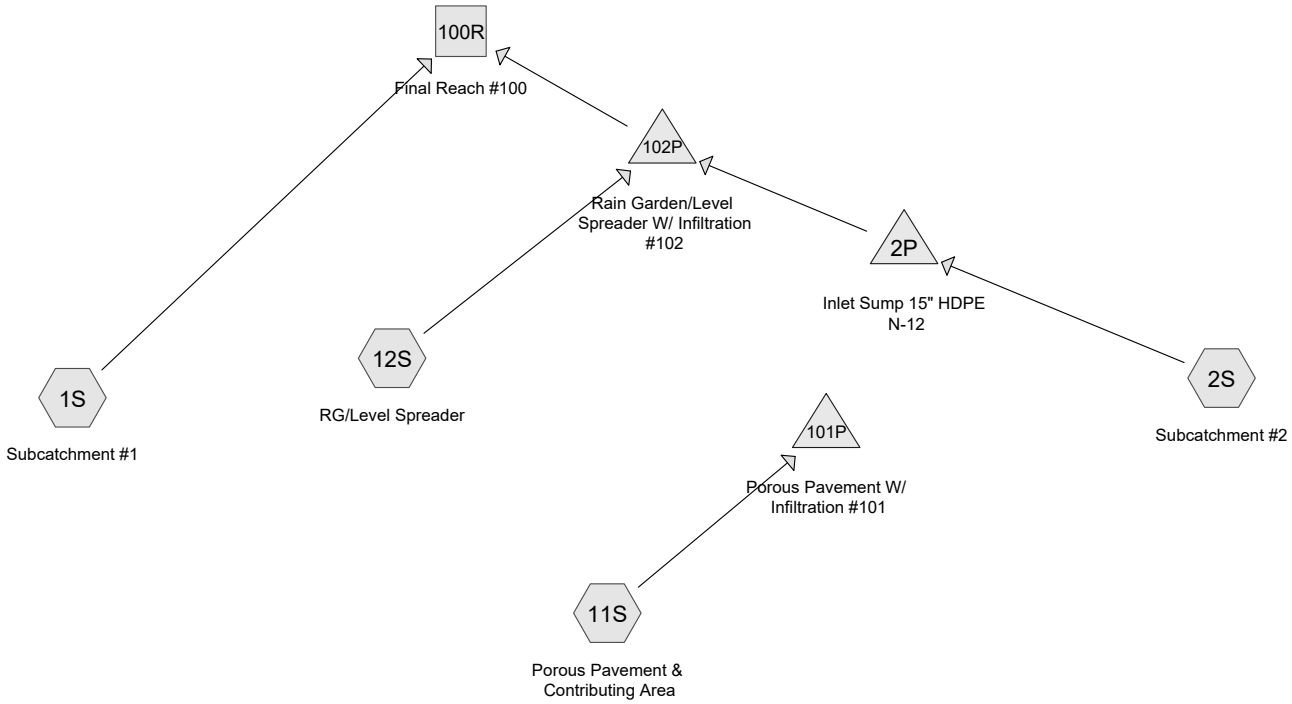
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

SHEET 1 OF 2

NOT FOR CONSTRUCTION



Subcat Reach Pond Link

Routing Diagram for 23-053 Existing Analysis
Prepared by Berry Surveying & Engineering, Printed 7/19/2023
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.965	39	>75% Grass cover, Good, HSG A (1S, 2S, 11S, 12S)
1.181	61	>75% Grass cover, Good, HSG B (1S, 2S, 11S, 12S)
0.011	96	Gravel surface, HSG A (1S, 2S, 12S)
0.055	96	Gravel surface, HSG B (1S, 2S, 12S)
0.324	98	Paved parking, HSG A (1S, 2S, 11S)
0.268	98	Paved parking, HSG B (1S, 2S, 11S)
0.124	98	Roofs, HSG A (1S, 2S, 11S, 12S)
0.215	98	Roofs, HSG B (1S, 2S, 11S, 12S)
0.013	98	Water Surface, HSG A (2S)
0.323	30	Woods, Good, HSG A (1S, 2S)
0.114	55	Woods, Good, HSG B (1S)
3.593	**62**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.760	HSG A	1S, 2S, 11S, 12S
1.833	HSG B	1S, 2S, 11S, 12S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
3.593		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.965	1.181	0.000	0.000	0.000	2.146	>75% Grass cover, Good	1S, 2S, 11S, 12S
0.011	0.055	0.000	0.000	0.000	0.065	Gravel surface	1S, 2S, 12S
0.324	0.268	0.000	0.000	0.000	0.592	Paved parking	1S, 2S, 11S
0.124	0.215	0.000	0.000	0.000	0.340	Roofs	1S, 2S, 11S, 12S
0.013	0.000	0.000	0.000	0.000	0.013	Water Surface	2S
0.323	0.114	0.000	0.000	0.000	0.437	Woods, Good	1S, 2S
1.760	**1.833**	**0.000**	**0.000**	**0.000**	**3.593**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	206.70	206.40	60.0	0.0050	0.012	15.0	0.0	0.0

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

Subcatchment 1S: Subcatchment #1 Runoff Area=85,152 sf 9.48% Impervious Runoff Depth>2.02"
Flow Length=266' Tc=31.0 min CN=55 Runoff=2.42 cfs 0.330 af

Subcatchment 2S: Subcatchment #2 Runoff Area=44,731 sf 33.54% Impervious Runoff Depth>2.89"
Flow Length=122' Tc=14.0 min CN=64 Runoff=2.65 cfs 0.248 af

Subcatchment 11S: Porous Pavement & Runoff Area=22,746 sf 78.97% Impervious Runoff Depth>5.42"
Tc=234.0 min CN=90 Runoff=0.53 cfs 0.236 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.94"
Tc=6.0 min CN=42 Runoff=0.06 cfs 0.007 af

Reach 100R: Final Reach #100 Inflow=4.46 cfs 0.556 af
Outflow=4.46 cfs 0.556 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.69' Storage=298 cf Inflow=2.65 cfs 0.248 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=2.45 cfs 0.247 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=207.39' Storage=91 cf Inflow=0.53 cfs 0.236 af
Outflow=0.50 cfs 0.236 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.33' Storage=1,014 cf Inflow=2.49 cfs 0.254 af
Discarded=0.01 cfs 0.017 af Primary=2.38 cfs 0.226 af Outflow=2.40 cfs 0.243 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.820 af Average Runoff Depth = 2.74"
73.71% Pervious = 2.648 ac 26.29% Impervious = 0.945 ac

Summary for Subcatchment 1S: Subcatchment #1

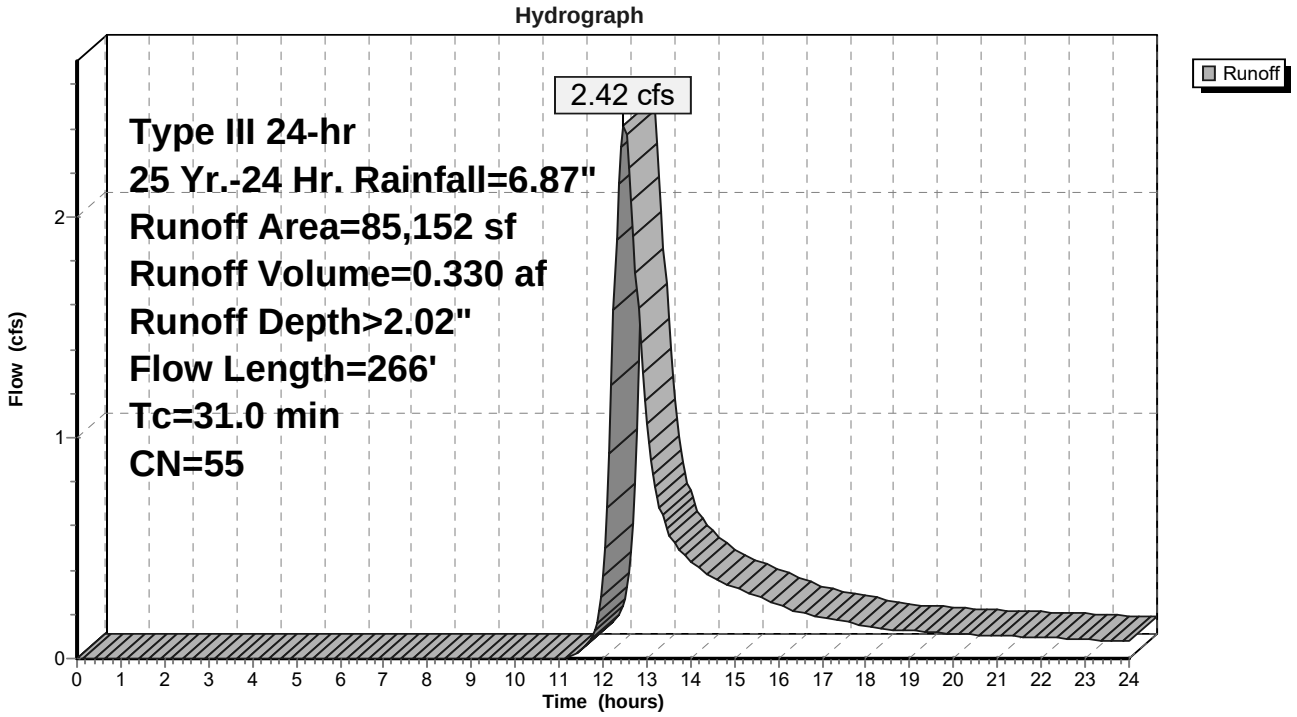
Runoff = 2.42 cfs @ 12.48 hrs, Volume= 0.330 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,390	98	Roofs, HSG A
18,707	39	>75% Grass cover, Good, HSG A
2,533	98	Paved parking, HSG A
13,788	30	Woods, Good, HSG A
358	96	Gravel surface, HSG A
3,561	98	Roofs, HSG B
36,988	61	>75% Grass cover, Good, HSG B
590	98	Paved parking, HSG B
4,977	55	Woods, Good, HSG B
2,260	96	Gravel surface, HSG B
85,152	55	Weighted Average
77,078		90.52% Pervious Area
8,074		9.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0150	0.07		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
2.8	56	0.0045	0.34		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
5.5	110	0.0023	0.34		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
31.0	266	Total			

Subcatchment 1S: Subcatchment #1



Summary for Subcatchment 2S: Subcatchment #2

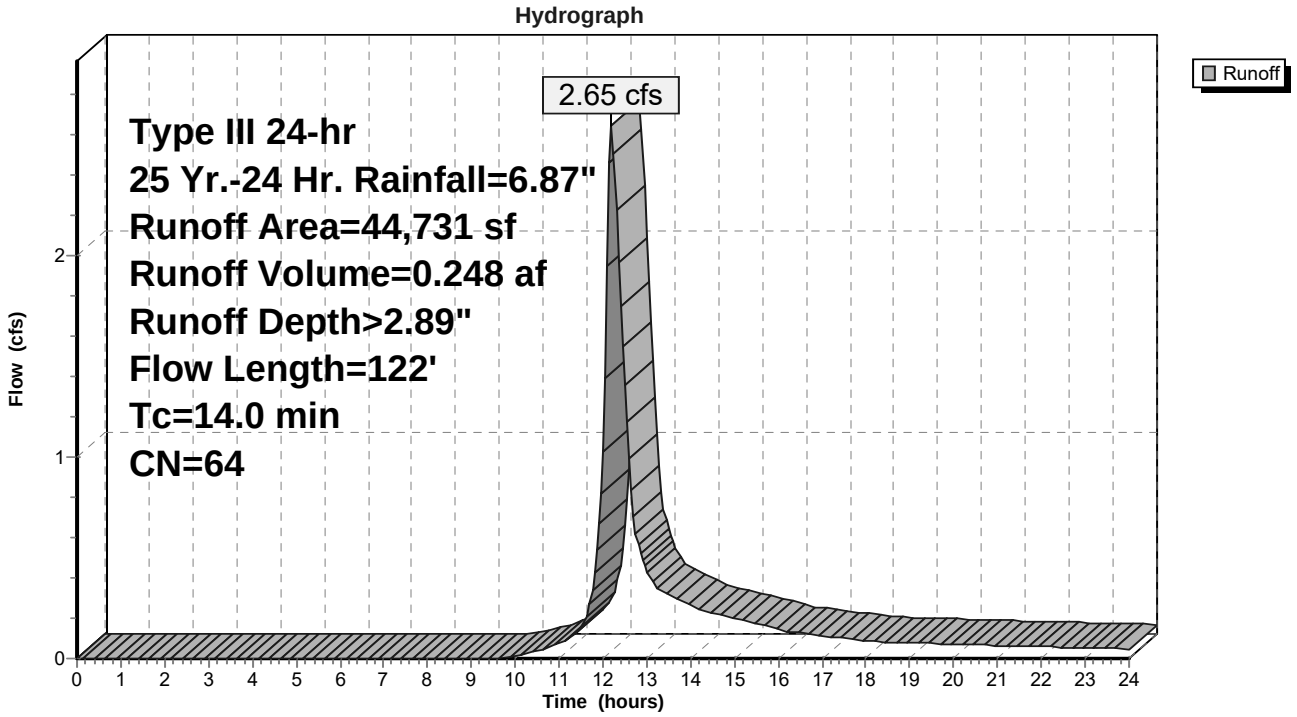
Runoff = 2.65 cfs @ 12.20 hrs, Volume= 0.248 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
19,403	39	>75% Grass cover, Good, HSG A
9,879	61	>75% Grass cover, Good, HSG B
7,656	98	Paved parking, HSG A
675	98	Paved parking, HSG B
3,401	98	Roofs, HSG A
2,695	98	Roofs, HSG B
84	96	Gravel surface, HSG A
84	96	Gravel surface, HSG B
574	98	Water Surface, HSG A
280	30	Woods, Good, HSG A
44,731	64	Weighted Average
29,730		66.46% Pervious Area
15,001		33.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0075	0.12		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.3	22	0.0340	1.29		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
14.0	122	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 11S: Porous Pavement & Contributing Area

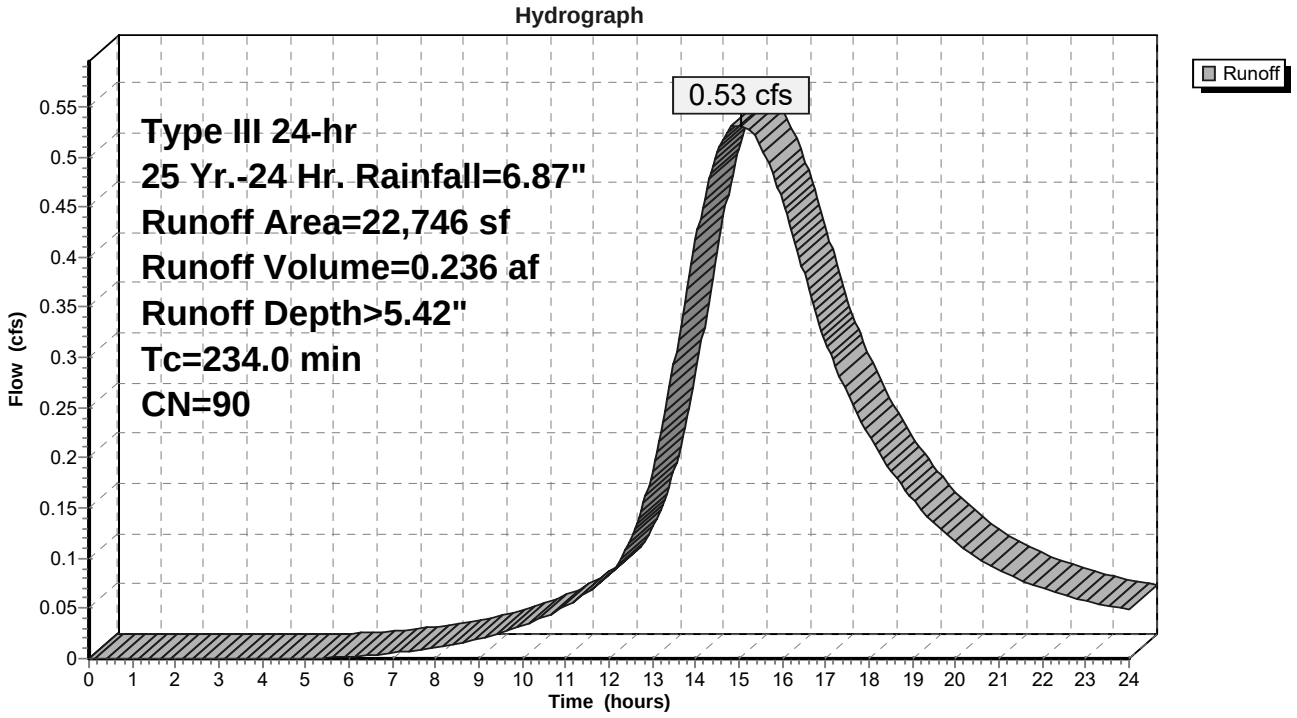
Runoff = 0.53 cfs @ 15.03 hrs, Volume= 0.236 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
542	98	Roofs, HSG A
3,106	98	Roofs, HSG B
358	39	>75% Grass cover, Good, HSG A
4,426	61	>75% Grass cover, Good, HSG B
3,921	98	Paved parking, HSG A
10,393	98	Paved parking, HSG B
22,746	90	Weighted Average
4,784		21.03% Pervious Area
17,962		78.97% Impervious Area

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

Subcatchment 11S: Porous Pavement & Contributing Area



Summary for Subcatchment 12S: RG/Level Spreader

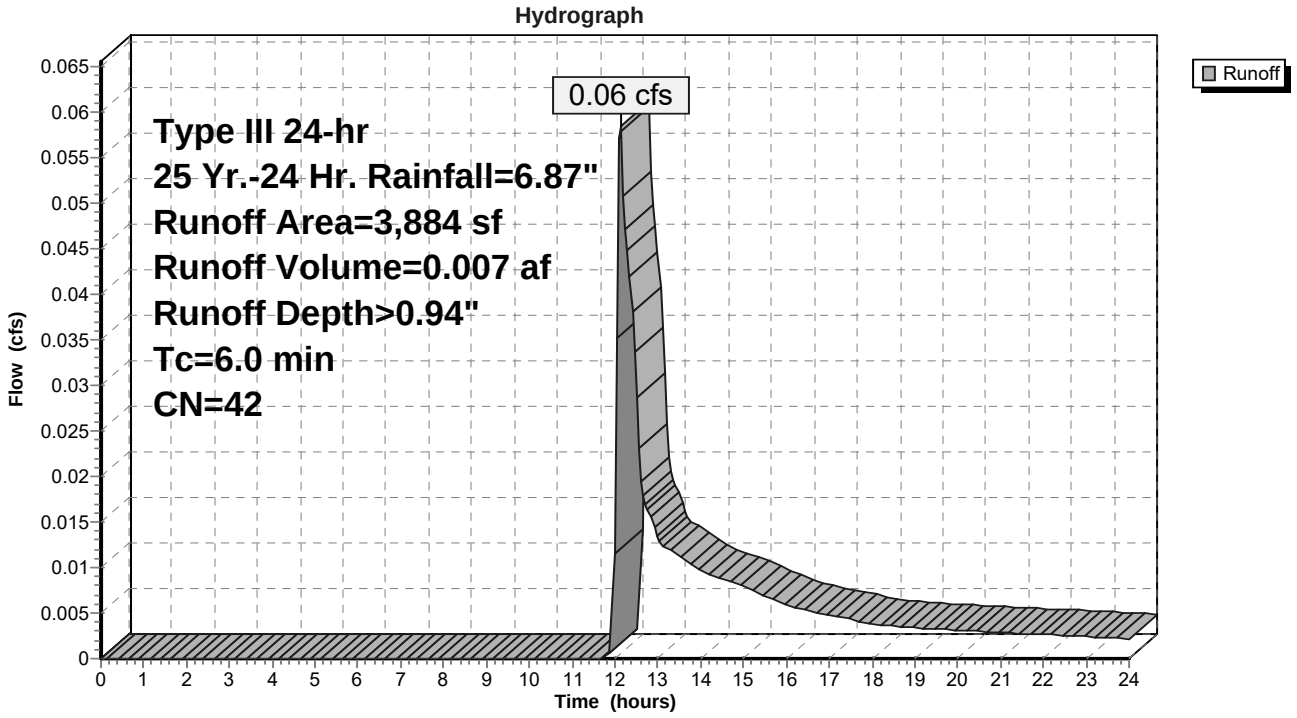
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.007 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
87	98	Roofs, HSG A
23	98	Roofs, HSG B
3,567	39	>75% Grass cover, Good, HSG A
147	61	>75% Grass cover, Good, HSG B
18	96	Gravel surface, HSG A
42	96	Gravel surface, HSG B
3,884	42	Weighted Average
3,774		97.17% Pervious Area
110		2.83% Impervious Area

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

Subcatchment 12S: RG/Level Spreader



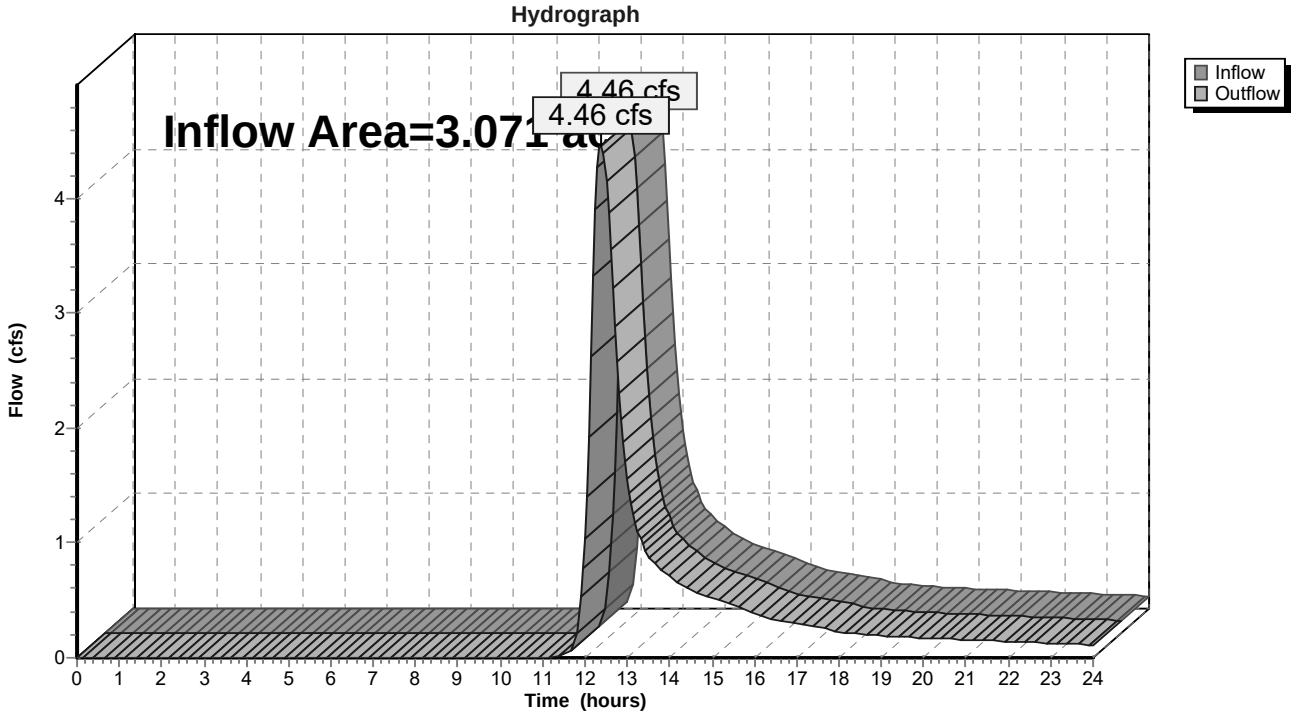
Summary for Reach 100R: Final Reach #100

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

Inflow Area = 3.071 ac, 17.33% Impervious, Inflow Depth > 2.17" for 25 Yr.-24 Hr. event
Inflow = 4.46 cfs @ 12.38 hrs, Volume= 0.556 af
Outflow = 4.46 cfs @ 12.38 hrs, Volume= 0.556 af, Atten= 0%, Lag= 0.0 min

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

Reach 100R: Final Reach #100



Summary for Pond 2P: Inlet Sump 15" HDPE N-12

Inflow Area = 1.027 ac, 33.54% Impervious, Inflow Depth > 2.89" for 25 Yr.-24 Hr. event
Inflow = 2.65 cfs @ 12.20 hrs, Volume= 0.248 af
Outflow = 2.45 cfs @ 12.24 hrs, Volume= 0.247 af, Atten= 8%, Lag= 1.9 min
Primary = 2.45 cfs @ 12.24 hrs, Volume= 0.247 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.69' @ 12.27 hrs Surf.Area= 793 sf Storage= 298 cf
Flood Elev= 208.15' Surf.Area= 1,621 sf Storage= 870 cf

Plug-Flow detention time= 2.1 min calculated for 0.247 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (852.5 - 850.9)

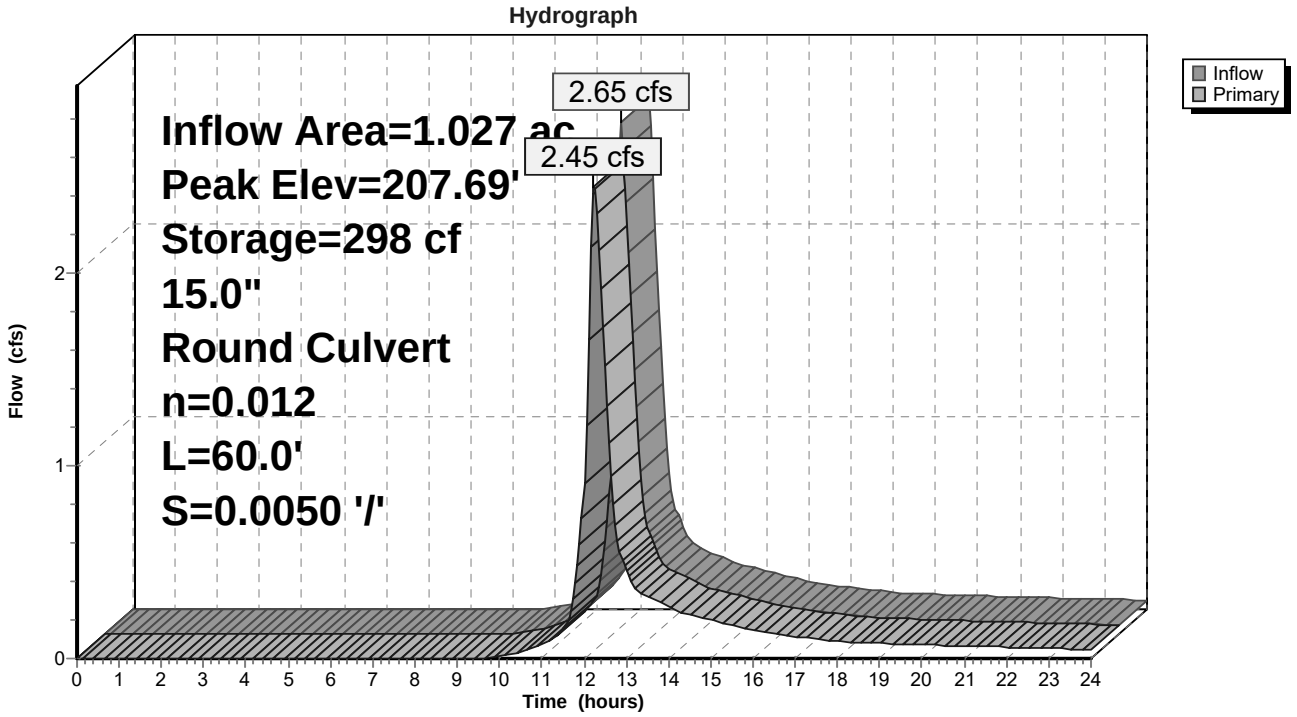
Volume	Invert	Avail.Storage	Storage Description
#1	206.69'	870 cf	**Ponding Area (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.69	25	19.0	0	0	25
207.00	159	59.4	26	26	277
207.50	472	101.9	151	176	824
208.00	1,468	197.8	462	638	3,113
208.15	1,621	243.7	232	870	4,726

Device	Routing	Invert	Outlet Devices
#1	Primary	206.70'	**15.0" Round 15" HDPE N-12** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 206.70' / 206.40' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.28 cfs @ 12.24 hrs HW=207.68' TW=207.31' (Dynamic Tailwater)
↑**1=15" HDPE N-12** (Outlet Controls 2.28 cfs @ 3.05 fps)

Pond 2P: Inlet Sump 15" HDPE N-12



Summary for Pond 101P: Porous Pavement W/ Infiltration #101

Inflow Area = 0.522 ac, 78.97% Impervious, Inflow Depth > 5.42" for 25 Yr.-24 Hr. event
Inflow = 0.53 cfs @ 15.03 hrs, Volume= 0.236 af
Outflow = 0.50 cfs @ 15.25 hrs, Volume= 0.236 af, Atten= 6%, Lag= 13.2 min
Discarded = 0.50 cfs @ 15.25 hrs, Volume= 0.236 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.39' @ 15.62 hrs Surf.Area= 7,208 sf Storage= 91 cf
Flood Elev= 209.69' Surf.Area= 7,208 sf Storage= 5,276 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.6 min (963.9 - 963.3)

Volume	Invert	Avail.Storage	Storage Description
#1	207.36'	2,883 cf	**Stone (Irregular)** Listed below (Recalc) 7,208 cf Overall x 40.0% Voids
#2	208.36'	1,442 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 7,208 cf Overall x 20.0% Voids
#3	209.36'	951 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 2,379 cf Overall x 40.0% Voids
		5,276 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.36	7,208	648.0	0	0	7,208
208.36	7,208	648.0	7,208	7,208	7,856

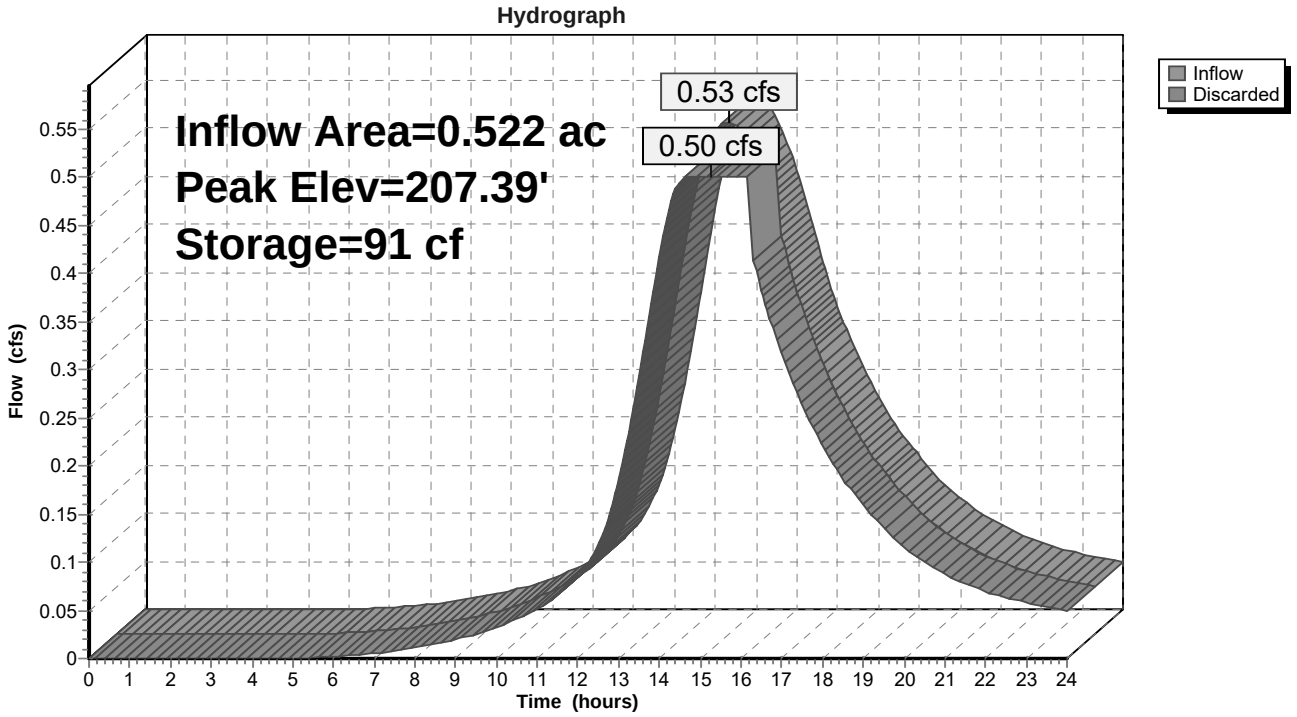
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.36	7,208	648.0	0	0	7,208
209.36	7,208	648.0	7,208	7,208	7,856

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
209.36	7,208	648.0	0	0	7,208
209.69	7,208	648.0	2,379	2,379	7,422

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.36'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.50 cfs @ 15.25 hrs HW=207.38' (Free Discharge)
↑**1=Infiltration 3in/hr** (Exfiltration Controls 0.50 cfs)

Pond 101P: Porous Pavement W/ Infiltration #101



Summary for Pond 102P: Rain Garden/Level Spreader W/ Infiltration #102

Inflow Area = 1.116 ac, 31.08% Impervious, Inflow Depth > 2.74" for 25 Yr.-24 Hr. event
Inflow = 2.49 cfs @ 12.23 hrs, Volume= 0.254 af
Outflow = 2.40 cfs @ 12.29 hrs, Volume= 0.243 af, Atten= 4%, Lag= 3.4 min
Discarded = 0.01 cfs @ 11.05 hrs, Volume= 0.017 af
Primary = 2.38 cfs @ 12.29 hrs, Volume= 0.226 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.33' @ 12.29 hrs Surf.Area= 209 sf Storage= 1,014 cf
Flood Elev= 208.00' Surf.Area= 209 sf Storage= 1,898 cf

Plug-Flow detention time= 36.4 min calculated for 0.243 af (95% of inflow)
Center-of-Mass det. time= 11.9 min (866.0 - 854.2)

Volume	Invert	Avail.Storage	Storage Description
#1	203.50'	84 cf	**Stone (Irregular)** Listed below (Recalc) 209 cf Overall x 40.0% Voids
#2	204.50'	63 cf	**Bio-Media (Irregular)** Listed below (Recalc) -Impervious 314 cf Overall x 20.0% Voids
#3	206.00'	976 cf	**Infiltration Cell (Irregular)** Listed below (Recalc) -Impervious
#4	206.00'	776 cf	**Sediment Forebay (Irregular)** Listed below (Recalc) -Impervious
		1,898 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
203.50	209	81.6	0	0	209
204.50	209	81.6	209	209	291

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
204.50	209	81.6	0	0	209
206.00	209	84.6	314	314	340

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	209	81.6	0	0	209
207.00	482	100.5	336	336	498
208.00	811	119.4	639	976	846

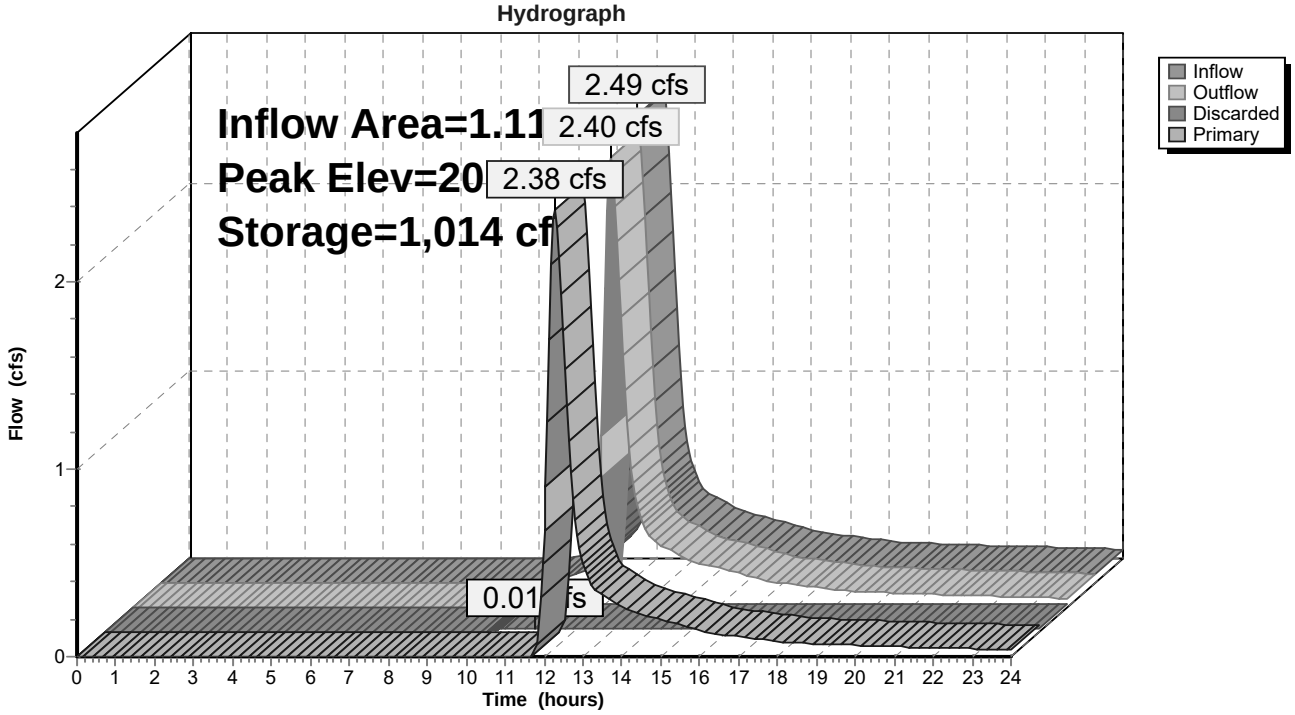
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	43	25.0	0	0	43
207.00	424	118.2	201	201	1,107
208.00	742	130.6	576	776	1,383

Device	Routing	Invert	Outlet Devices
#1	Discarded	203.50'	**3.000 in/hr 3IN/HR Infiltration over Surface area**
#2	Primary	206.75'	**2.0' long x 45.0' breadth 45' Level Spreader** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.01 cfs @ 11.05 hrs HW=204.74' (Free Discharge)
└**1=3IN/HR Infiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.38 cfs @ 12.29 hrs HW=207.33' TW=0.00' (Dynamic Tailwater)
└**2=45' Level Spreader** (Weir Controls 2.38 cfs @ 2.05 fps)

Pond 102P: Rain Garden/Level Spreader W/ Infiltration #102



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

Subcatchment 1S: Subcatchment #1 Runoff Area=85,152 sf 9.48% Impervious Runoff Depth>0.38"
Flow Length=266' Tc=31.0 min CN=55 Runoff=0.28 cfs 0.062 af

Subcatchment 2S: Subcatchment #2 Runoff Area=44,731 sf 33.54% Impervious Runoff Depth>0.76"
Flow Length=122' Tc=14.0 min CN=64 Runoff=0.58 cfs 0.065 af

Subcatchment 11S: Porous Pavement & Runoff Area=22,746 sf 78.97% Impervious Runoff Depth>2.41"
Tc=234.0 min CN=90 Runoff=0.24 cfs 0.105 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.05"
Tc=6.0 min CN=42 Runoff=0.00 cfs 0.000 af

Reach 100R: Final Reach #100 Inflow=0.62 cfs 0.101 af
Outflow=0.62 cfs 0.101 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.10' Storage=44 cf Inflow=0.58 cfs 0.065 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.57 cfs 0.065 af

Pond 101P: Porous Pavement W/ Infiltration #101 Peak Elev=207.36' Storage=0 cf Inflow=0.24 cfs 0.105 af
Outflow=0.24 cfs 0.105 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=206.91' Storage=607 cf Inflow=0.57 cfs 0.065 af
Discarded=0.01 cfs 0.015 af Primary=0.35 cfs 0.039 af Outflow=0.36 cfs 0.054 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.232 af Average Runoff Depth = 0.77"
73.71% Pervious = 2.648 ac 26.29% Impervious = 0.945 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=85,152 sf 9.48% Impervious Runoff Depth>1.20"
Flow Length=266' Tc=31.0 min CN=55 Runoff=1.31 cfs 0.195 af

Subcatchment 2S: Subcatchment #2 Runoff Area=44,731 sf 33.54% Impervious Runoff Depth>1.87"
Flow Length=122' Tc=14.0 min CN=64 Runoff=1.66 cfs 0.160 af

Subcatchment 11S: Porous Pavement & Runoff Area=22,746 sf 78.97% Impervious Runoff Depth>4.09"
Tc=234.0 min CN=90 Runoff=0.40 cfs 0.178 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.43"
Tc=6.0 min CN=42 Runoff=0.02 cfs 0.003 af

Reach 100R: Final Reach #100 Inflow=2.54 cfs 0.330 af
Outflow=2.54 cfs 0.330 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.46' Storage=160 cf Inflow=1.66 cfs 0.160 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=1.55 cfs 0.160 af

Pond 101P: Porous Pavement W/ Infiltration #101 Peak Elev=207.36' Storage=0 cf Inflow=0.40 cfs 0.178 af
Outflow=0.40 cfs 0.178 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.17' Storage=845 cf Inflow=1.57 cfs 0.163 af
Discarded=0.01 cfs 0.016 af Primary=1.47 cfs 0.135 af Outflow=1.48 cfs 0.151 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.536 af Average Runoff Depth = 1.79"
73.71% Pervious = 2.648 ac 26.29% Impervious = 0.945 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=85,152 sf 9.48% Impervious Runoff Depth>2.02"
Flow Length=266' Tc=31.0 min CN=55 Runoff=2.42 cfs 0.330 af

Subcatchment 2S: Subcatchment #2 Runoff Area=44,731 sf 33.54% Impervious Runoff Depth>2.89"
Flow Length=122' Tc=14.0 min CN=64 Runoff=2.65 cfs 0.248 af

Subcatchment 11S: Porous Pavement & Runoff Area=22,746 sf 78.97% Impervious Runoff Depth>5.42"
Tc=234.0 min CN=90 Runoff=0.53 cfs 0.236 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.94"
Tc=6.0 min CN=42 Runoff=0.06 cfs 0.007 af

Reach 100R: Final Reach #100 Inflow=4.46 cfs 0.556 af
Outflow=4.46 cfs 0.556 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.69' Storage=298 cf Inflow=2.65 cfs 0.248 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=2.45 cfs 0.247 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=207.39' Storage=91 cf Inflow=0.53 cfs 0.236 af
Outflow=0.50 cfs 0.236 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.33' Storage=1,014 cf Inflow=2.49 cfs 0.254 af
Discarded=0.01 cfs 0.017 af Primary=2.38 cfs 0.226 af Outflow=2.40 cfs 0.243 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.820 af Average Runoff Depth = 2.74"
73.71% Pervious = 2.648 ac 26.29% Impervious = 0.945 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=85,152 sf 9.48% Impervious Runoff Depth>2.90"
Flow Length=266' Tc=31.0 min CN=55 Runoff=3.58 cfs 0.472 af

Subcatchment 2S: Subcatchment #2 Runoff Area=44,731 sf 33.54% Impervious Runoff Depth>3.93"
Flow Length=122' Tc=14.0 min CN=64 Runoff=3.64 cfs 0.336 af

Subcatchment 11S: Porous Pavement & Runoff Area=22,746 sf 78.97% Impervious Runoff Depth>6.67"
Tc=234.0 min CN=90 Runoff=0.65 cfs 0.290 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>1.53"
Tc=6.0 min CN=42 Runoff=0.12 cfs 0.011 af

Reach 100R: Final Reach #100 Inflow=6.43 cfs 0.790 af
Outflow=6.43 cfs 0.790 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.88' Storage=485 cf Inflow=3.64 cfs 0.336 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=3.26 cfs 0.336 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=207.65' Storage=828 cf Inflow=0.65 cfs 0.290 af
Outflow=0.50 cfs 0.290 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.46' Storage=1,167 cf Inflow=3.35 cfs 0.348 af
Discarded=0.01 cfs 0.018 af Primary=3.22 cfs 0.318 af Outflow=3.24 cfs 0.336 af

Total Runoff Area = 3.593 ac Runoff Volume = 1.110 af Average Runoff Depth = 3.71"
73.71% Pervious = 2.648 ac 26.29% Impervious = 0.945 ac

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

Subcatchment 1S: Subcatchment #1 Runoff Area=85,152 sf 9.48% Impervious Runoff Depth>4.04"
Flow Length=266' Tc=31.0 min CN=55 Runoff=5.10 cfs 0.658 af

Subcatchment 2S: Subcatchment #2 Runoff Area=44,731 sf 33.54% Impervious Runoff Depth>5.24"
Flow Length=122' Tc=14.0 min CN=64 Runoff=4.88 cfs 0.448 af

Subcatchment 11S: Porous Pavement & Runoff Area=22,746 sf 78.97% Impervious Runoff Depth>8.18"
Tc=234.0 min CN=90 Runoff=0.79 cfs 0.356 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>2.37"
Tc=6.0 min CN=42 Runoff=0.21 cfs 0.018 af

Reach 100R: Final Reach #100 Inflow=8.91 cfs 1.093 af
Outflow=8.91 cfs 1.093 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=208.11' Storage=803 cf Inflow=4.88 cfs 0.448 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=4.20 cfs 0.448 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=208.08' Storage=2,073 cf Inflow=0.79 cfs 0.356 af
Outflow=0.50 cfs 0.356 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.61' Storage=1,346 cf Inflow=4.33 cfs 0.466 af
Discarded=0.01 cfs 0.019 af Primary=4.20 cfs 0.435 af Outflow=4.21 cfs 0.454 af

Total Runoff Area = 3.593 ac Runoff Volume = 1.480 af Average Runoff Depth = 4.94"
73.71% Pervious = 2.648 ac 26.29% Impervious = 0.945 ac

Appendix II - Proposed Conditions Analysis

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

JOHN P. HAYES III, CSS #87

JOHN P. HAYES III, CWS #18

WETLAND NOTES:

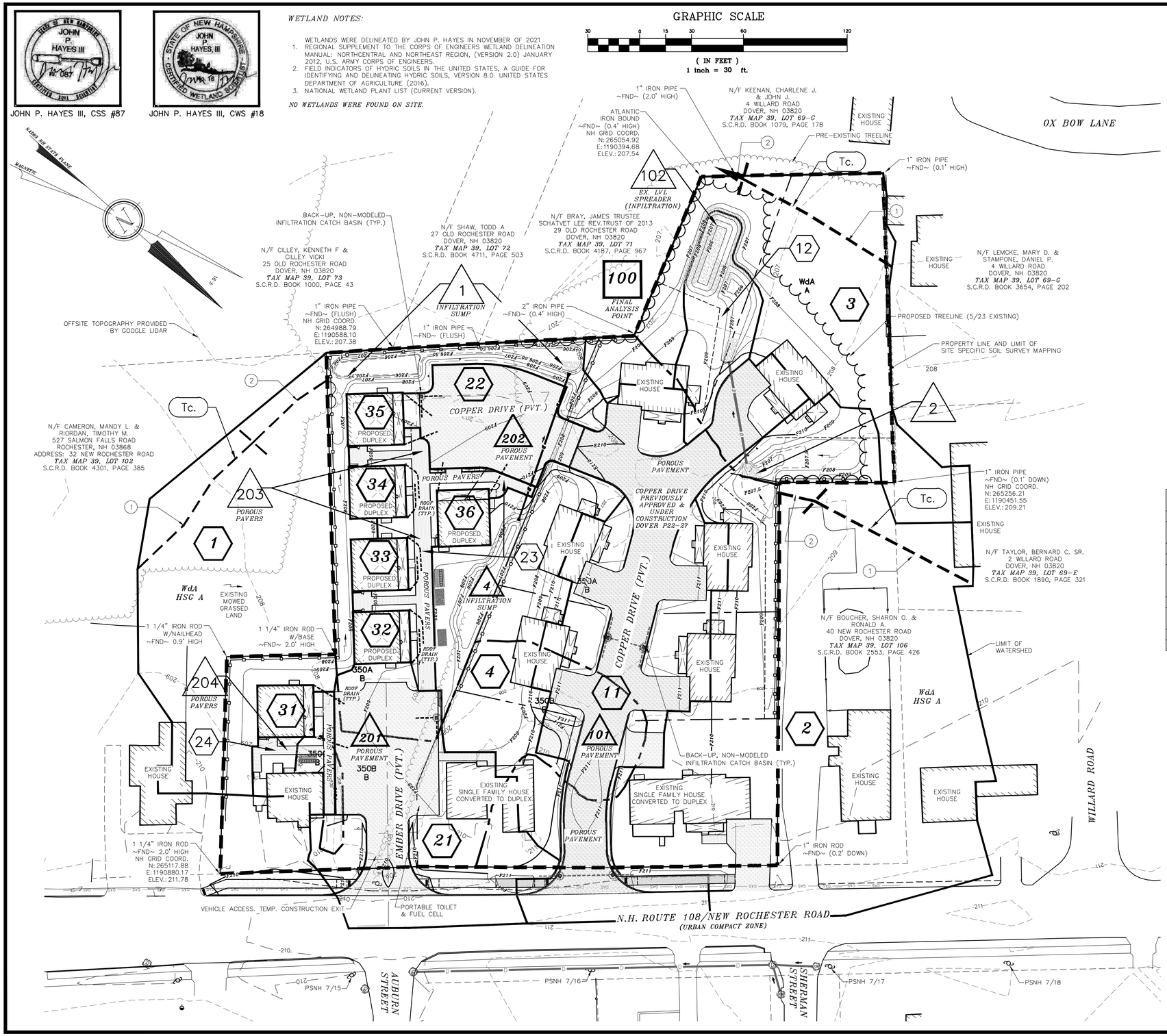
WETLANDS WERE DELINEATED BY JOHN P. HAYES IN NOVEMBER OF 2021
1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

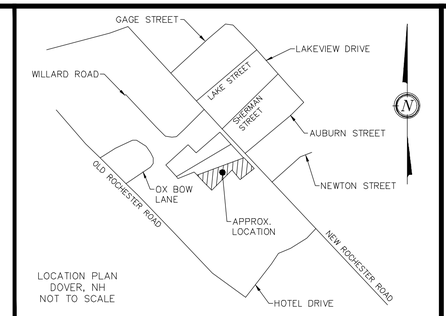
NO WETLANDS WERE FOUND ON SITE.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED WATERSHED CONDITIONS OF TAX MAP 39, LOTS 103 LOCATED IN DOVER, N.H..

6.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

7.) TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN NOVEMBER 2021.

8.) WETLANDS WERE DELINEATED BY JOHN P. HAYES, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, IN MAY OF 2023. NO WETLANDS WERE FOUND ON SITE.

9.) ANY SURFACE WATER RUNOFF THAT LEAVES THIS SITE WILL ENTER THE DOVER MS4 AND ENTER WILLAND POND (SEE DRAINAGE ANALYSIS).

SEE PLAN SET FOR ADDITIONAL DETAILS:
GRADING PLANS
POROUS PAVEMENT PLANS
EROSION & SEDIMENT CONTROL PLANS

SOILS LEGEND

Site Specific Soils

Symbol	K	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd		A	Windsor	A
350		A,B	Udipsaments (Wet Substratum)	B

Slopes: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25- 50% F = 50%+
Denominators: /P = Poorly Drained /VP = Very Poorly Drained /Rk = Rocky

NRCS Soils

Symbol	K	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd		A	Windsor Loamy Sand	A

NRCS SOIL DATA:

WdA ~ WINDSOR LOAMY SAND 0 TO 3% SLOPES

SEE NRCS WEBSOIL

LEGEND:

299	EXISTING CONTOUR, MINOR
300	EXISTING CONTOUR, MAJOR
F211	PROPOSED CONTOUR, MINOR
F210	PROPOSED CONTOUR, MAJOR
	LIMIT OF SITE SPECIFIC SOIL SURVEY
448A	SOIL LINE
	SOIL SERIES
	NRCS SOIL LINE
	NRCS SOIL LABEL
HJB	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED
EPA C.G.P.	ENVIRONMENTAL PROTECTION AGENCY CONSTRUCTION GENERAL PERMIT
S.W.P.P.P.	STORMWATER POLLUTION PREVENTION PLAN

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

FLOW REACH SYMBOL

POND DEVICE SYMBOL

TIME OF CONCENTRATION SEGMENT

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

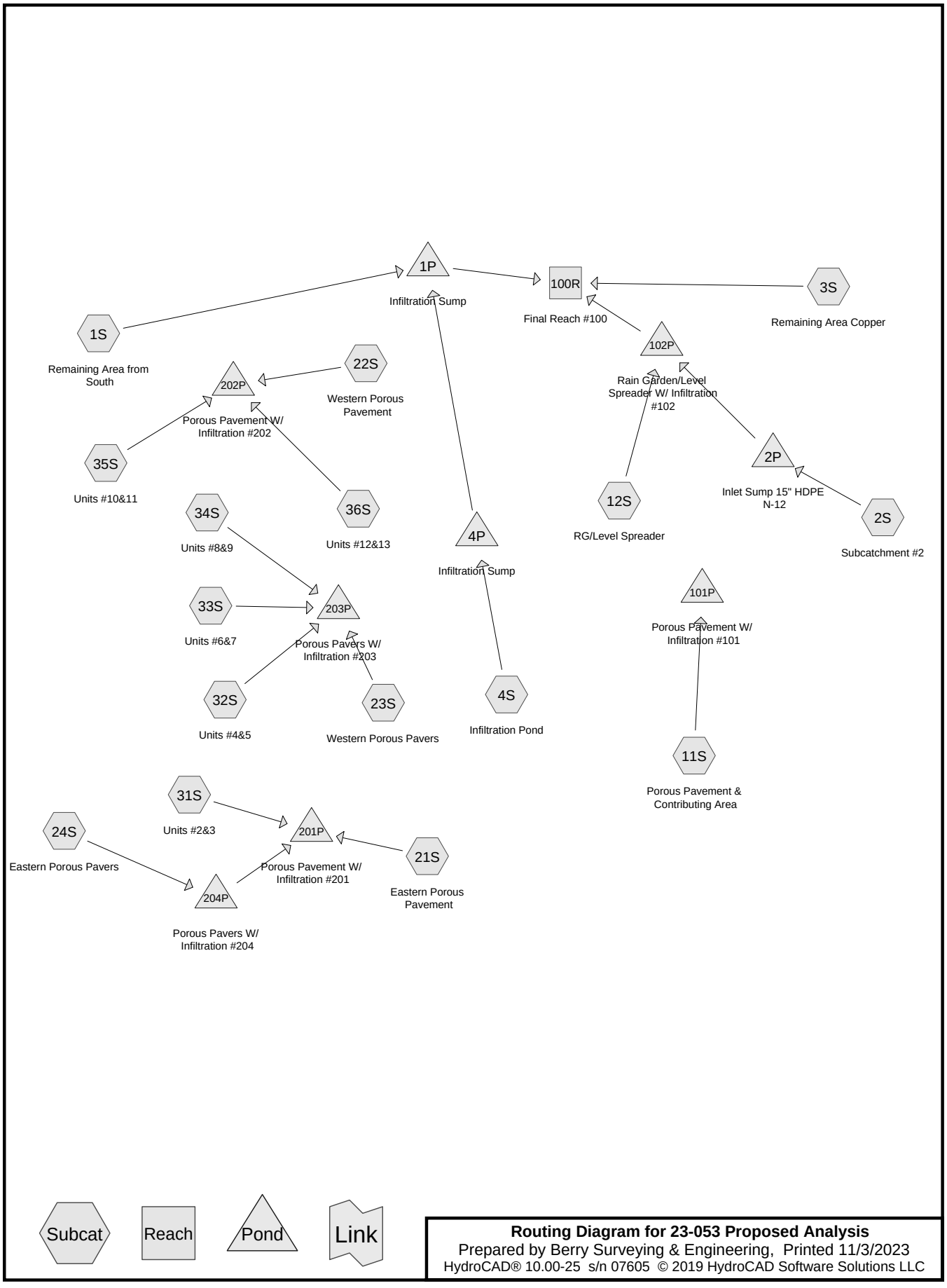
EPA GCP SWPPP SITE MAP (PROPOSED)
W-2 PROPOSED WATERSHED
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

KENNETH A. BERRY No. 14243 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



Routing Diagram for 23-053 Proposed Analysis
Prepared by Berry Surveying & Engineering, Printed 11/3/2023
HydroCAD® 10.00-25 s/n 07605 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.967	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 11S, 12S, 21S)
0.830	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 11S, 12S, 21S, 22S, 23S, 24S)
0.005	96	Gravel surface, HSG A (2S, 11S, 12S, 21S)
0.039	96	Gravel surface, HSG B (1S, 2S, 4S, 11S, 12S, 21S, 22S)
0.334	98	Paved parking, HSG A (2S, 11S, 21S)
0.593	98	Paved parking, HSG B (1S, 2S, 4S, 11S, 21S, 22S, 23S, 24S)
0.124	98	Roofs, HSG A (1S, 2S, 3S, 11S, 12S)
0.353	98	Roofs, HSG B (2S, 3S, 4S, 11S, 12S, 21S, 23S, 24S, 31S, 32S, 33S, 34S, 35S, 36S)
0.013	98	Water Surface, HSG A (2S)
0.316	30	Woods, Good, HSG A (1S, 2S, 3S)
3.575	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.760	HSG A	1S, 2S, 3S, 11S, 12S, 21S
1.815	HSG B	1S, 2S, 3S, 4S, 11S, 12S, 21S, 22S, 23S, 24S, 31S, 32S, 33S, 34S, 35S, 36S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
3.575		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.967	0.830	0.000	0.000	0.000	1.797	>75% Grass cover, Good	1S, 2S, 3S, 4S, 11S, 12S, 21S, 22S, 23S, 24S
0.005	0.039	0.000	0.000	0.000	0.044	Gravel surface	1S, 2S, 4S, 11S, 12S, 21S, 22S
0.334	0.593	0.000	0.000	0.000	0.927	Paved parking	1S, 2S, 4S, 11S, 21S, 22S, 23S, 24S
0.124	0.353	0.000	0.000	0.000	0.478	Roofs	1S, 2S, 3S, 4S, 11S, 12S, 21S, 23S, 24S, 31S, 32S, 33S, 34S, 35S, 36S
0.013	0.000	0.000	0.000	0.000	0.013	Water Surface	2S
0.316	0.000	0.000	0.000	0.000	0.316	Woods, Good	1S, 2S, 3S
1.760	**1.815**	**0.000**	**0.000**	**0.000**	**3.575**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	206.70	206.40	60.0	0.0050	0.012	15.0	0.0	0.0
2	4P	207.50	206.50	86.0	0.0116	0.012	12.0	0.0	0.0

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

Subcatchment 1S: Remaining Area from Runoff Area=25,413 sf 2.07% Impervious Runoff Depth>1.17"
Flow Length=156' Tc=25.5 min CN=45 Runoff=0.37 cfs 0.057 af

Subcatchment 2S: Subcatchment #2 Runoff Area=43,912 sf 35.53% Impervious Runoff Depth>2.89"
Flow Length=122' Tc=14.0 min CN=64 Runoff=2.60 cfs 0.243 af

Subcatchment 3S: Remaining Area Copper Runoff Area=16,731 sf 7.61% Impervious Runoff Depth>0.86"
Flow Length=106' Tc=21.5 min CN=41 Runoff=0.16 cfs 0.028 af

Subcatchment 4S: Infiltration Pond Runoff Area=11,757 sf 14.48% Impervious Runoff Depth>3.20"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=67 Runoff=0.99 cfs 0.072 af

Subcatchment 11S: Porous Pavement & Runoff Area=23,638 sf 80.49% Impervious Runoff Depth>5.53"
Tc=234.0 min CN=91 Runoff=0.56 cfs 0.250 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.94"
Tc=6.0 min CN=42 Runoff=0.06 cfs 0.007 af

Subcatchment 21S: Eastern Porous Runoff Area=13,526 sf 64.01% Impervious Runoff Depth>4.86"
Tc=234.0 min CN=85 Runoff=0.29 cfs 0.126 af

Subcatchment 22S: Western Porous Runoff Area=5,079 sf 96.26% Impervious Runoff Depth>6.23"
Tc=234.0 min CN=97 Runoff=0.13 cfs 0.061 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,868 sf 68.25% Impervious Runoff Depth>5.16"
Tc=88.0 min CN=86 Runoff=0.17 cfs 0.038 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=2,071 sf 70.88% Impervious Runoff Depth>5.27"
Tc=88.0 min CN=87 Runoff=0.09 cfs 0.021 af

Subcatchment 31S: Units #2&3 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Subcatchment 32S: Units #4&5 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=98 Runoff=0.05 cfs 0.012 af

Subcatchment 33S: Units #6&7 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=98 Runoff=0.05 cfs 0.012 af

Subcatchment 34S: Units #8&9 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=98 Runoff=0.05 cfs 0.012 af

Subcatchment 35S: Units #10&11 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Subcatchment 36S: Units #12&13 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Reach 100R: Final Reach #100 Inflow=2.47 cfs 0.249 af
Outflow=2.47 cfs 0.249 af

Pond 1P: Infiltration Sump Peak Elev=206.51' Storage=616 cf Inflow=0.37 cfs 0.057 af
Discarded=0.16 cfs 0.057 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.057 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.68' Storage=290 cf Inflow=2.60 cfs 0.243 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=2.40 cfs 0.243 af

Pond 4P: Infiltration Sump Peak Elev=207.32' Storage=1,231 cf Inflow=0.99 cfs 0.072 af
Discarded=0.12 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.072 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=207.44' Storage=233 cf Inflow=0.56 cfs 0.250 af
Outflow=0.50 cfs 0.250 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.32' Storage=1,006 cf Inflow=2.45 cfs 0.250 af
Discarded=0.01 cfs 0.017 af Primary=2.34 cfs 0.221 af Outflow=2.36 cfs 0.238 af

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.51' Storage=0 cf Inflow=0.31 cfs 0.138 af
Outflow=0.31 cfs 0.138 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=205.56' Storage=0 cf Inflow=0.18 cfs 0.084 af
Outflow=0.18 cfs 0.084 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=207.00' Storage=452 cf Inflow=0.31 cfs 0.075 af
Outflow=0.17 cfs 0.075 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.30' Storage=101 cf Inflow=0.09 cfs 0.021 af
Discarded=0.06 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.021 af

Total Runoff Area = 3.575 ac Runoff Volume = 0.974 af Average Runoff Depth = 3.27"
60.35% Pervious = 2.158 ac 39.65% Impervious = 1.417 ac

Summary for Subcatchment 1S: Remaining Area from South

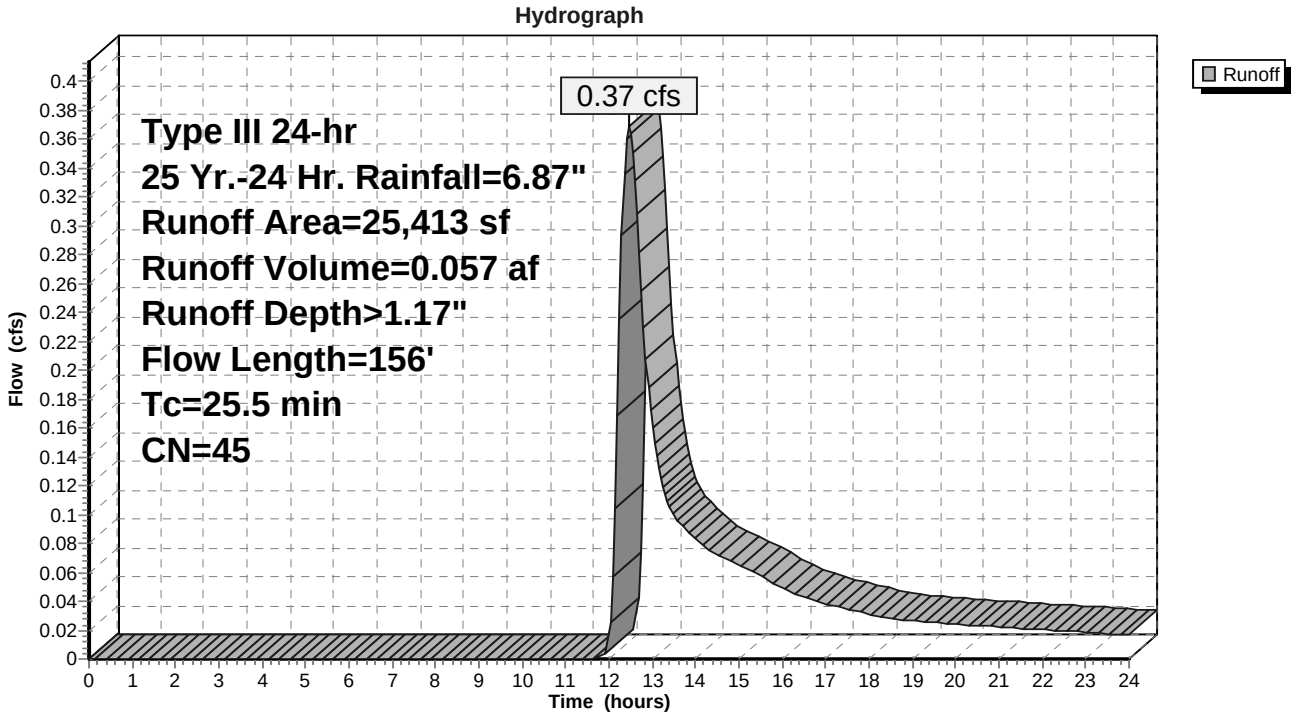
Runoff = 0.37 cfs @ 12.46 hrs, Volume= 0.057 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
10,176	39	>75% Grass cover, Good, HSG A
490	98	Roofs, HSG A
6,885	30	Woods, Good, HSG A
7,532	61	>75% Grass cover, Good, HSG B
294	96	Gravel surface, HSG B
36	98	Paved parking, HSG B
25,413	45	Weighted Average
24,887		97.93% Pervious Area
526		2.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0150	0.07		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
2.8	56	0.0045	0.34		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
25.5	156	Total			

Subcatchment 1S: Remaining Area from South



Summary for Subcatchment 2S: Subcatchment #2

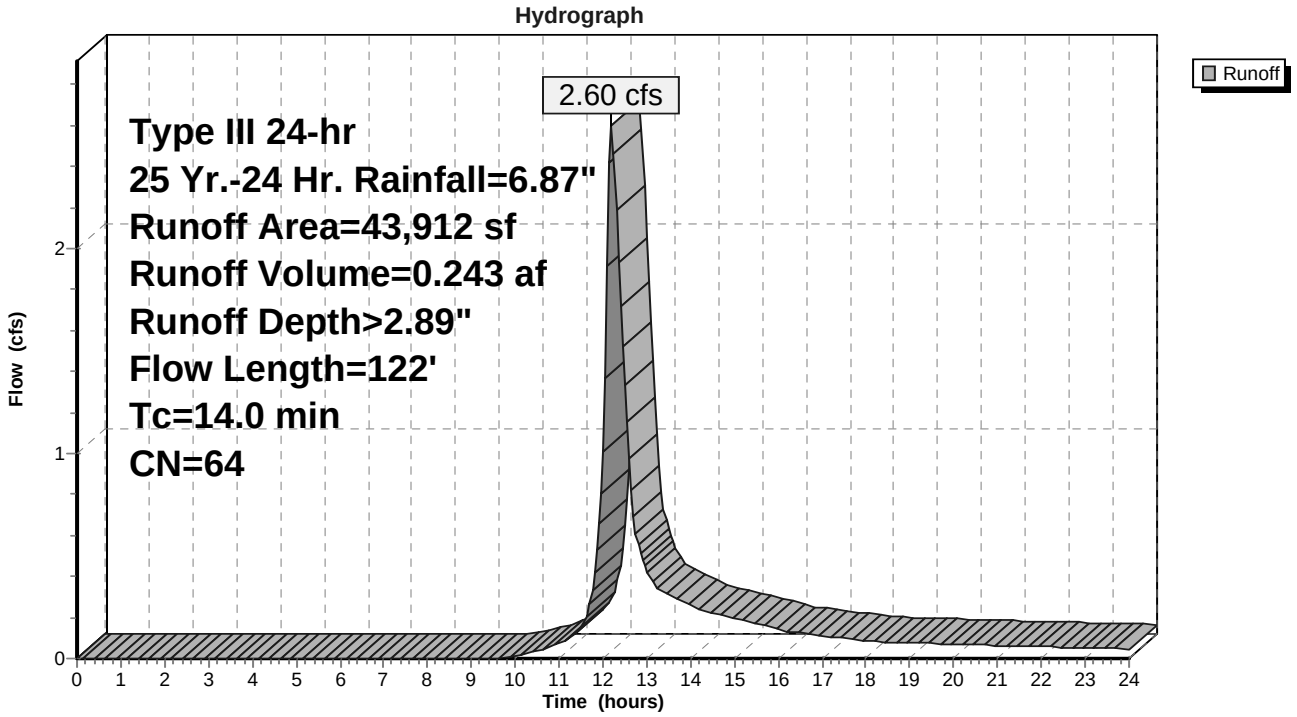
Runoff = 2.60 cfs @ 12.20 hrs, Volume= 0.243 af, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
19,126	39	>75% Grass cover, Good, HSG A
8,738	61	>75% Grass cover, Good, HSG B
7,656	98	Paved parking, HSG A
676	98	Paved parking, HSG B
3,401	98	Roofs, HSG A
3,293	98	Roofs, HSG B
84	96	Gravel surface, HSG A
84	96	Gravel surface, HSG B
574	98	Water Surface, HSG A
280	30	Woods, Good, HSG A
43,912	64	Weighted Average
28,312		64.47% Pervious Area
15,600		35.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0075	0.12		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
0.3	22	0.0340	1.29		**Shallow Concentrated Flow, Segment #2** Short Grass Pasture Kv= 7.0 fps
14.0	122	Total			

Subcatchment 2S: Subcatchment #2



Summary for Subcatchment 3S: Remaining Area Copper

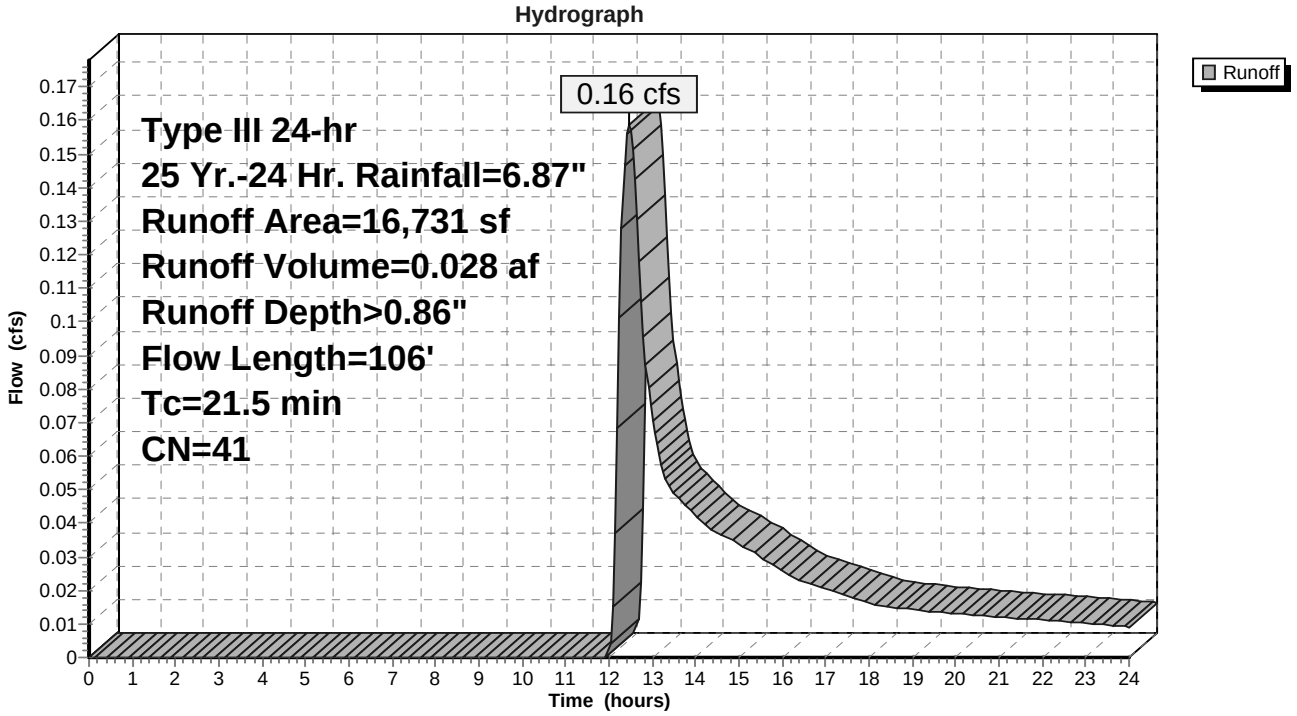
Runoff = 0.16 cfs @ 12.45 hrs, Volume= 0.028 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
7,962	39	>75% Grass cover, Good, HSG A
884	61	>75% Grass cover, Good, HSG B
900	98	Roofs, HSG A
374	98	Roofs, HSG B
6,611	30	Woods, Good, HSG A
16,731	41	Weighted Average
15,457		92.39% Pervious Area
1,274		7.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	100	0.0175	0.08		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.61"
0.2	6	0.0080	0.45		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
21.5	106	Total			

Subcatchment 3S: Remaining Area Copper



Summary for Subcatchment 4S: Infiltration Pond

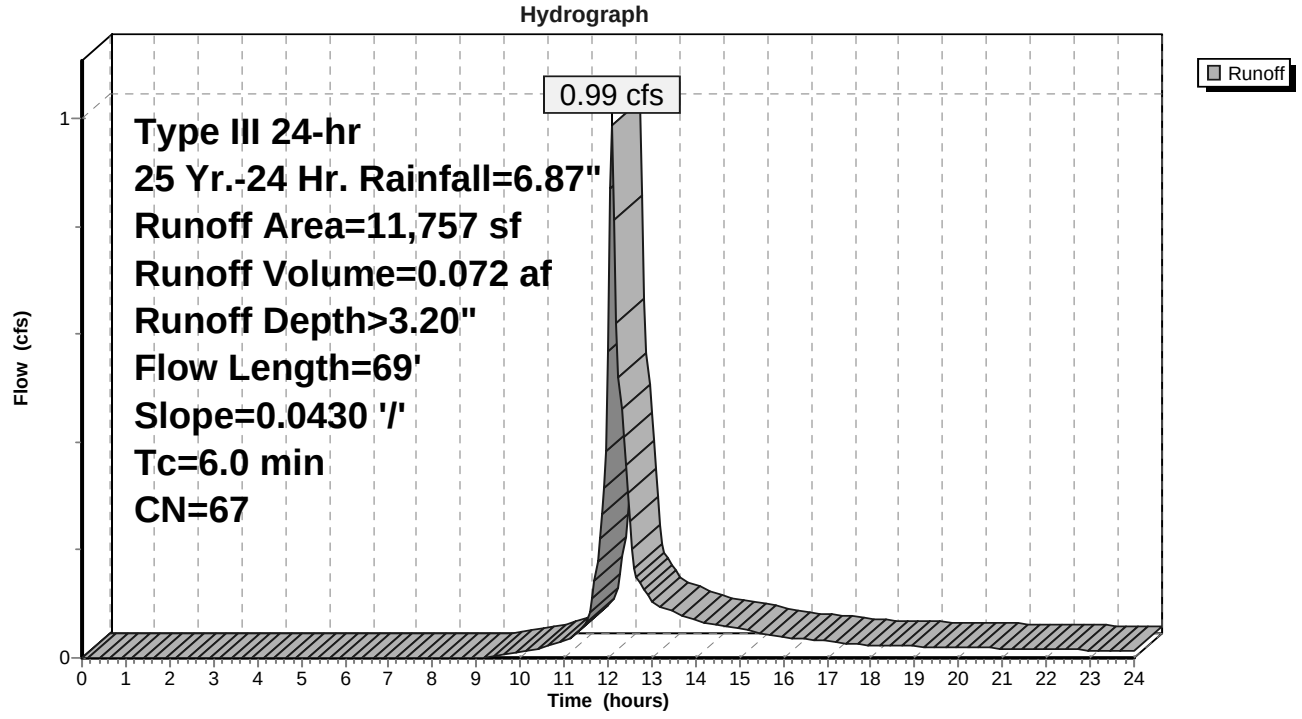
Runoff = 0.99 cfs @ 12.10 hrs, Volume= 0.072 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
9,920	61	>75% Grass cover, Good, HSG B
1,649	98	Roofs, HSG B
134	96	Gravel surface, HSG B
54	98	Paved parking, HSG B
11,757	67	Weighted Average
10,054		85.52% Pervious Area
1,703		14.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	69	0.0430	0.23		**Sheet Flow, Segment #1** Grass: Short n= 0.150 P2= 3.61"
5.0	69	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4S: Infiltration Pond



Summary for Subcatchment 11S: Porous Pavement & Contributing Area

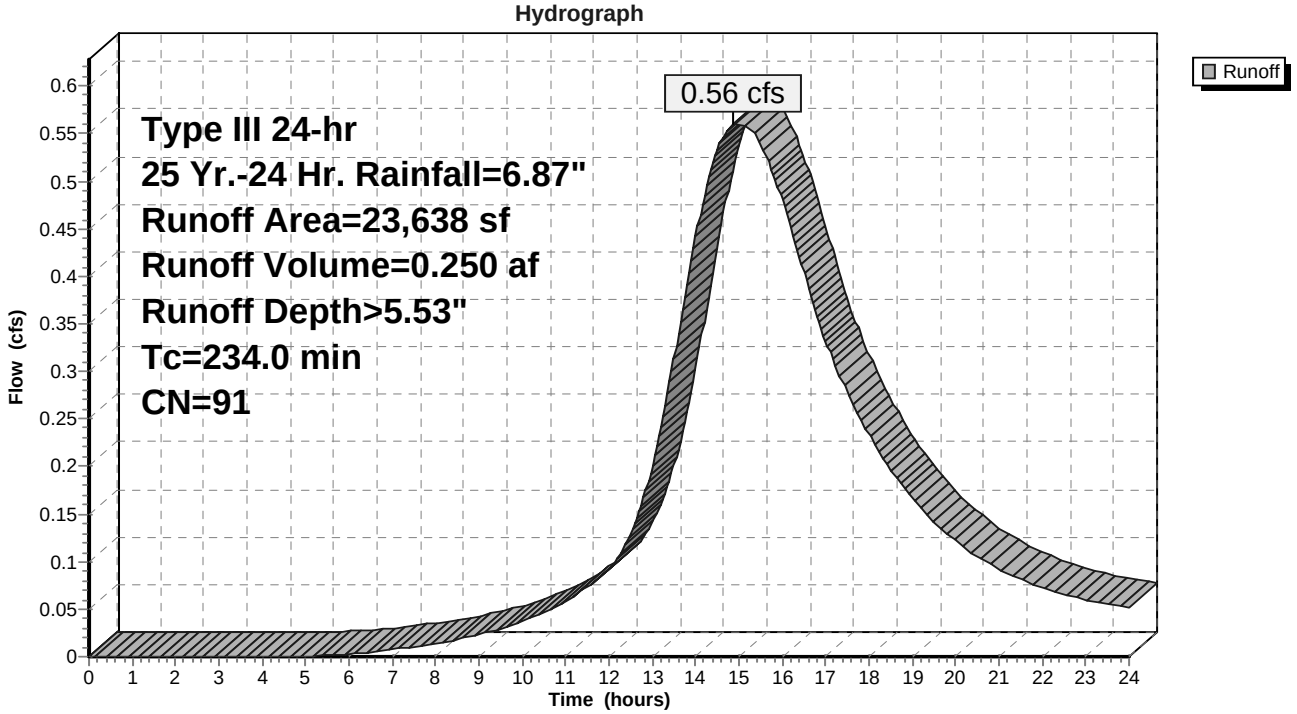
Runoff = 0.56 cfs @ 14.85 hrs, Volume= 0.250 af, Depth> 5.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
542	98	Roofs, HSG A
3,167	98	Roofs, HSG B
460	39	>75% Grass cover, Good, HSG A
3,404	61	>75% Grass cover, Good, HSG B
3,973	98	Paved parking, HSG A
11,345	98	Paved parking, HSG B
92	96	Gravel surface, HSG A
655	96	Gravel surface, HSG B
23,638	91	Weighted Average
4,611		19.51% Pervious Area
19,027		80.49% Impervious Area

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

Subcatchment 11S: Porous Pavement & Contributing Area



Summary for Subcatchment 12S: RG/Level Spreader

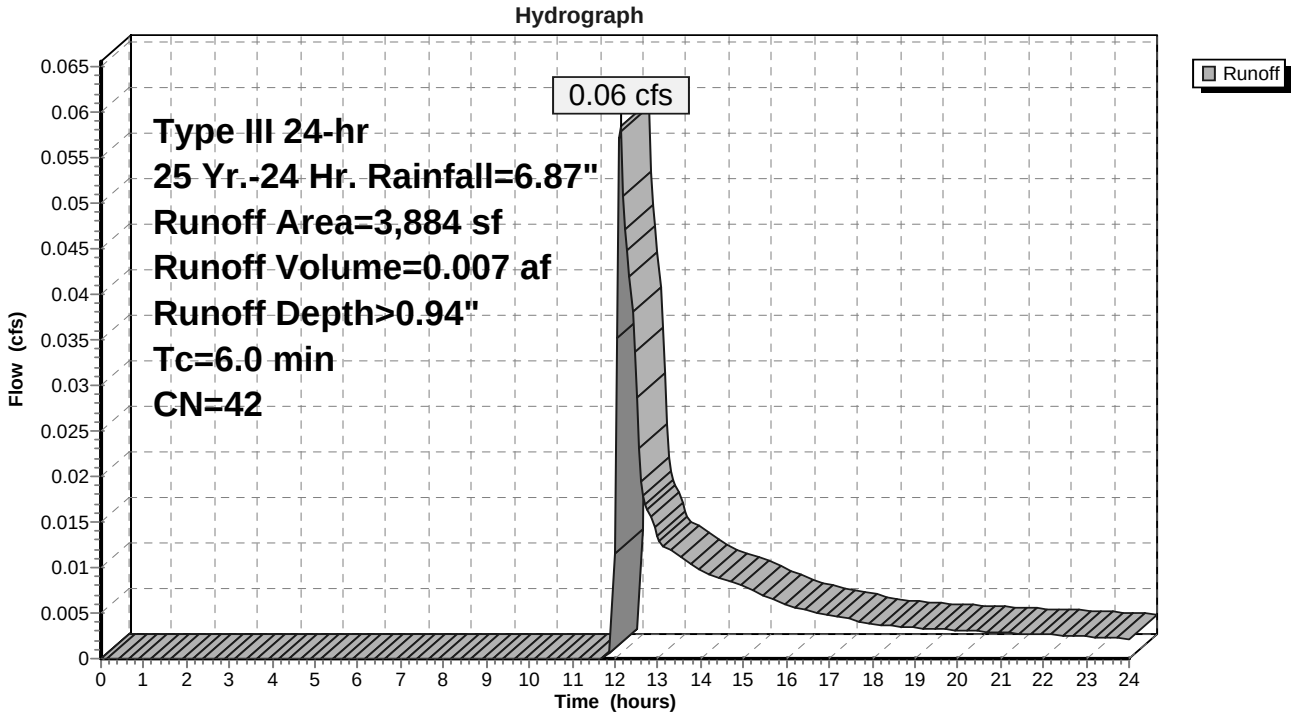
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.007 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
87	98	Roofs, HSG A
23	98	Roofs, HSG B
3,567	39	>75% Grass cover, Good, HSG A
147	61	>75% Grass cover, Good, HSG B
18	96	Gravel surface, HSG A
42	96	Gravel surface, HSG B
3,884	42	Weighted Average
3,774		97.17% Pervious Area
110		2.83% Impervious Area

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

Subcatchment 12S: RG/Level Spreader



Summary for Subcatchment 21S: Eastern Porous Pavement

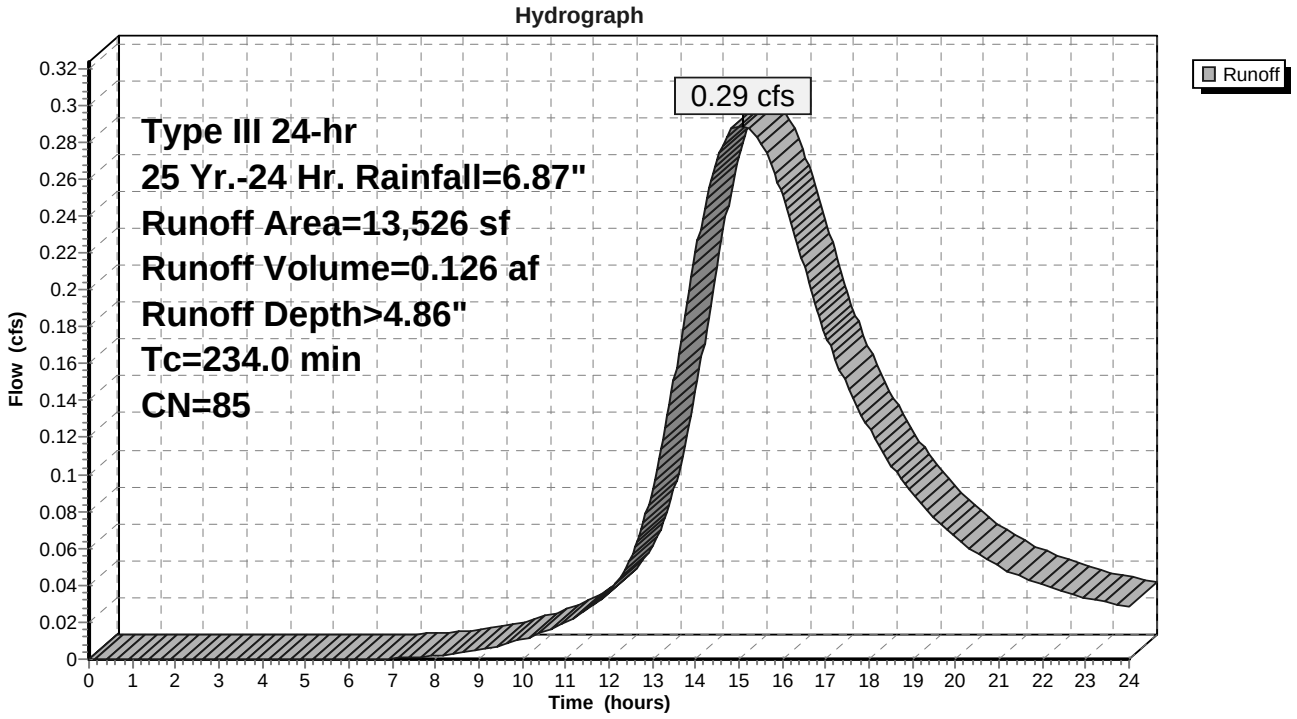
Runoff = 0.29 cfs @ 15.07 hrs, Volume= 0.126 af, Depth> 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
3,544	61	>75% Grass cover, Good, HSG B
5,406	98	Paved parking, HSG B
351	98	Roofs, HSG B
853	39	>75% Grass cover, Good, HSG A
2,901	98	Paved parking, HSG A
31	96	Gravel surface, HSG A
440	96	Gravel surface, HSG B
13,526	85	Weighted Average
4,868		35.99% Pervious Area
8,658		64.01% Impervious Area

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

Subcatchment 21S: Eastern Porous Pavement



Summary for Subcatchment 22S: Western Porous Pavement

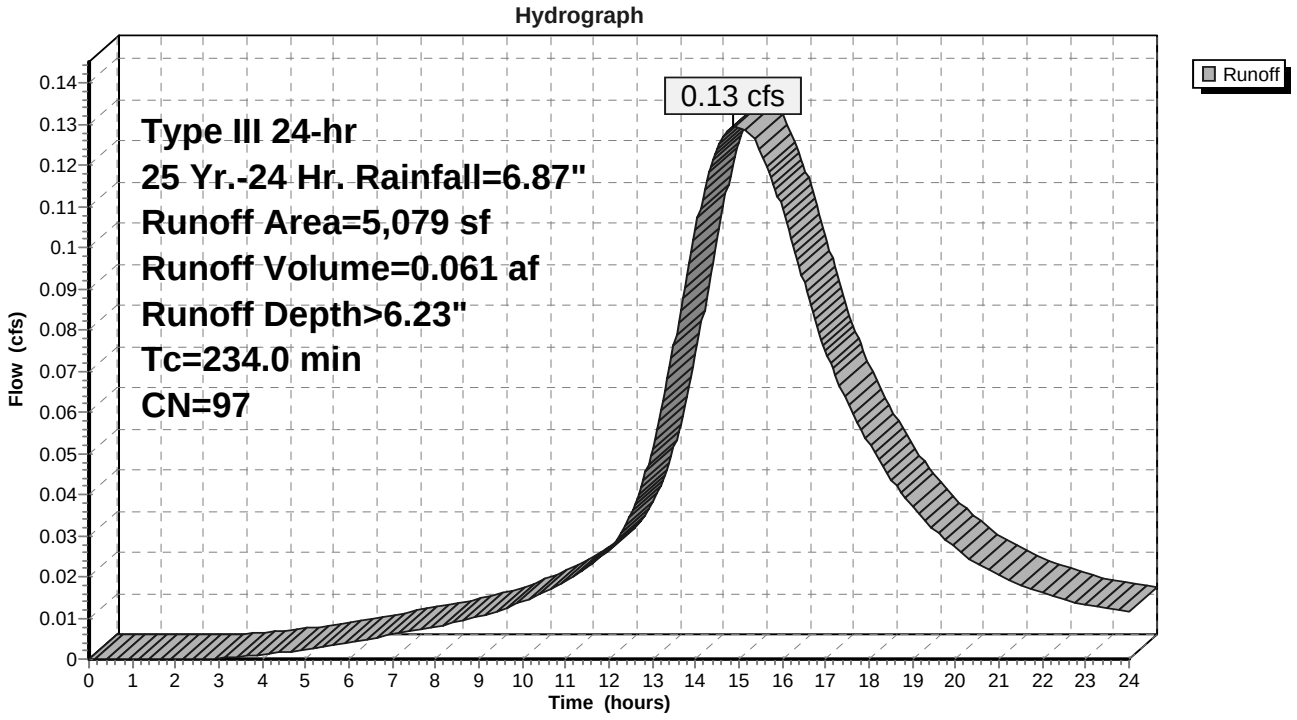
Runoff = 0.13 cfs @ 14.86 hrs, Volume= 0.061 af, Depth> 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
150	61	>75% Grass cover, Good, HSG B
4,889	98	Paved parking, HSG B
40	96	Gravel surface, HSG B
5,079	97	Weighted Average
190		3.74% Pervious Area
4,889		96.26% Impervious Area

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

Subcatchment 22S: Western Porous Pavement



Summary for Subcatchment 23S: Western Porous Pavers

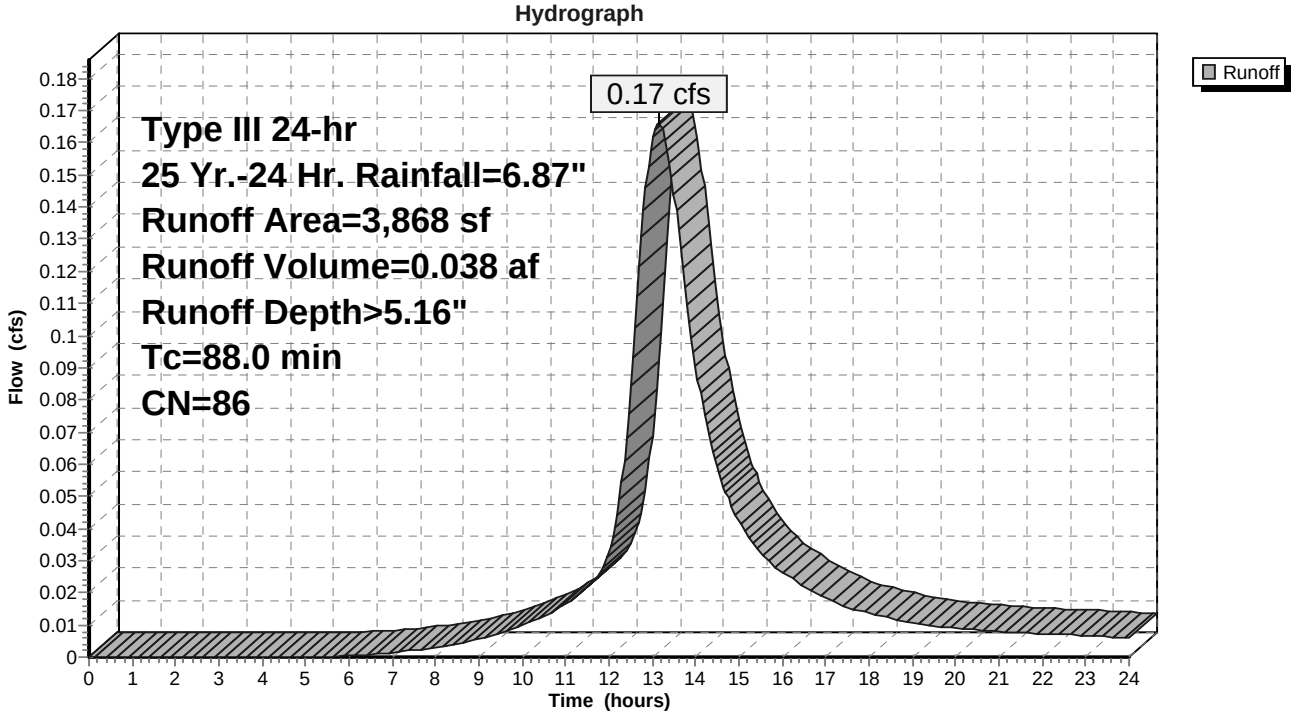
Runoff = 0.17 cfs @ 13.16 hrs, Volume= 0.038 af, Depth> 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,228	61	>75% Grass cover, Good, HSG B
2,618	98	Paved parking, HSG B
22	98	Roofs, HSG B
3,868	86	Weighted Average
1,228		31.75% Pervious Area
2,640		68.25% Impervious Area

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

Subcatchment 23S: Western Porous Pavers



Summary for Subcatchment 24S: Eastern Porous Pavers

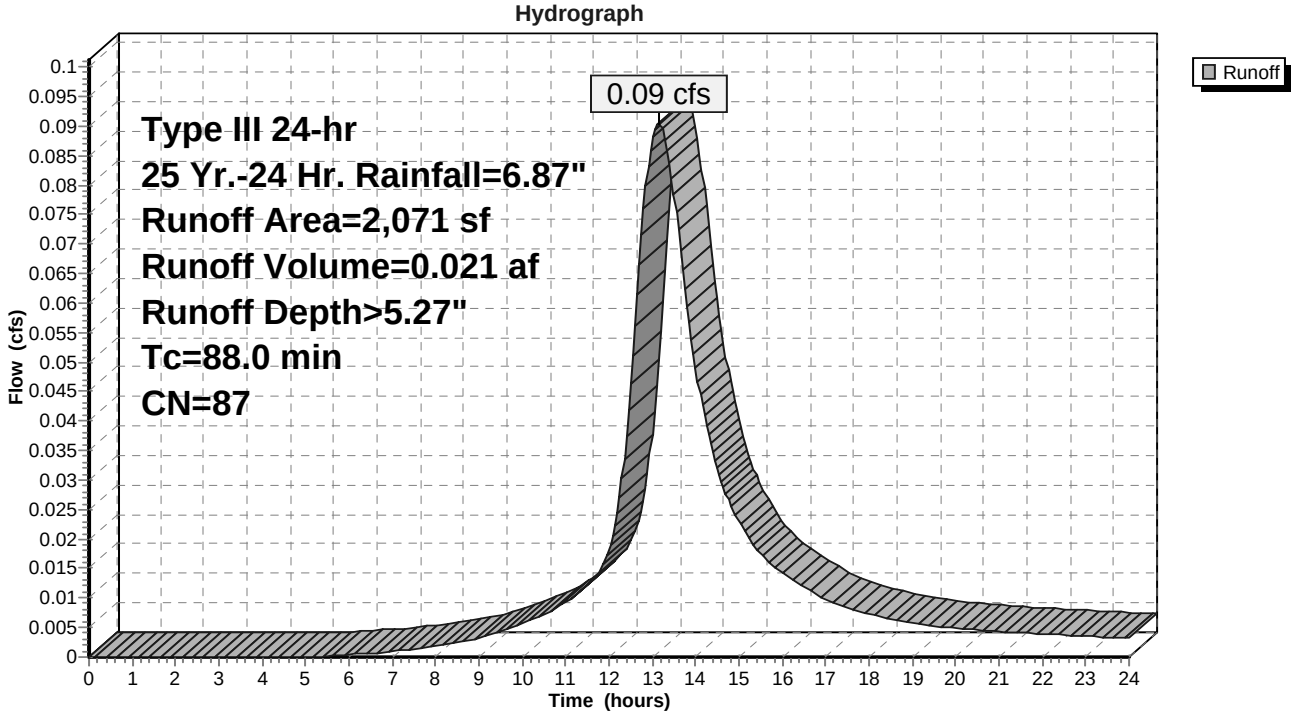
Runoff = 0.09 cfs @ 13.16 hrs, Volume= 0.021 af, Depth> 5.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
603	61	>75% Grass cover, Good, HSG B
815	98	Paved parking, HSG B
653	98	Roofs, HSG B
2,071	87	Weighted Average
603		29.12% Pervious Area
1,468		70.88% Impervious Area

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

Subcatchment 24S: Eastern Porous Pavers



Summary for Subcatchment 31S: Units #2&3

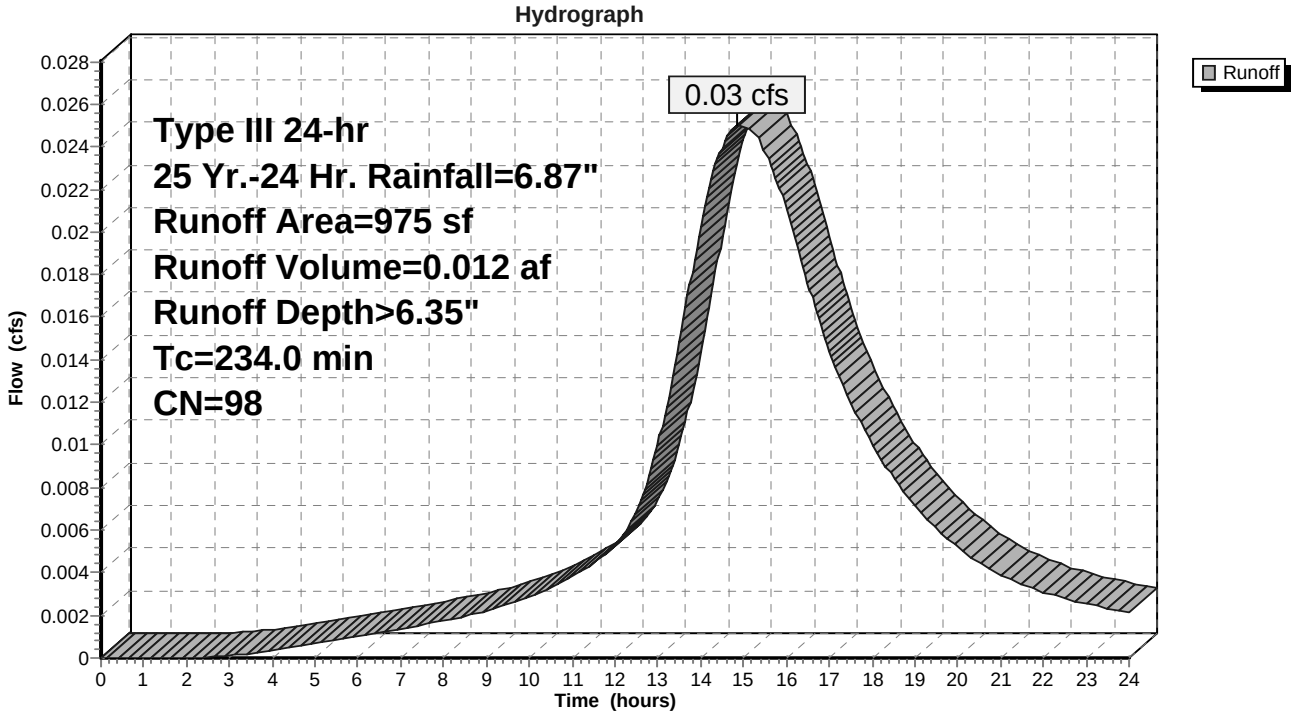
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
975	98	Roofs, HSG B
975		100.00% Impervious Area

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

Subcatchment 31S: Units #2&3



Summary for Subcatchment 32S: Units #4&5

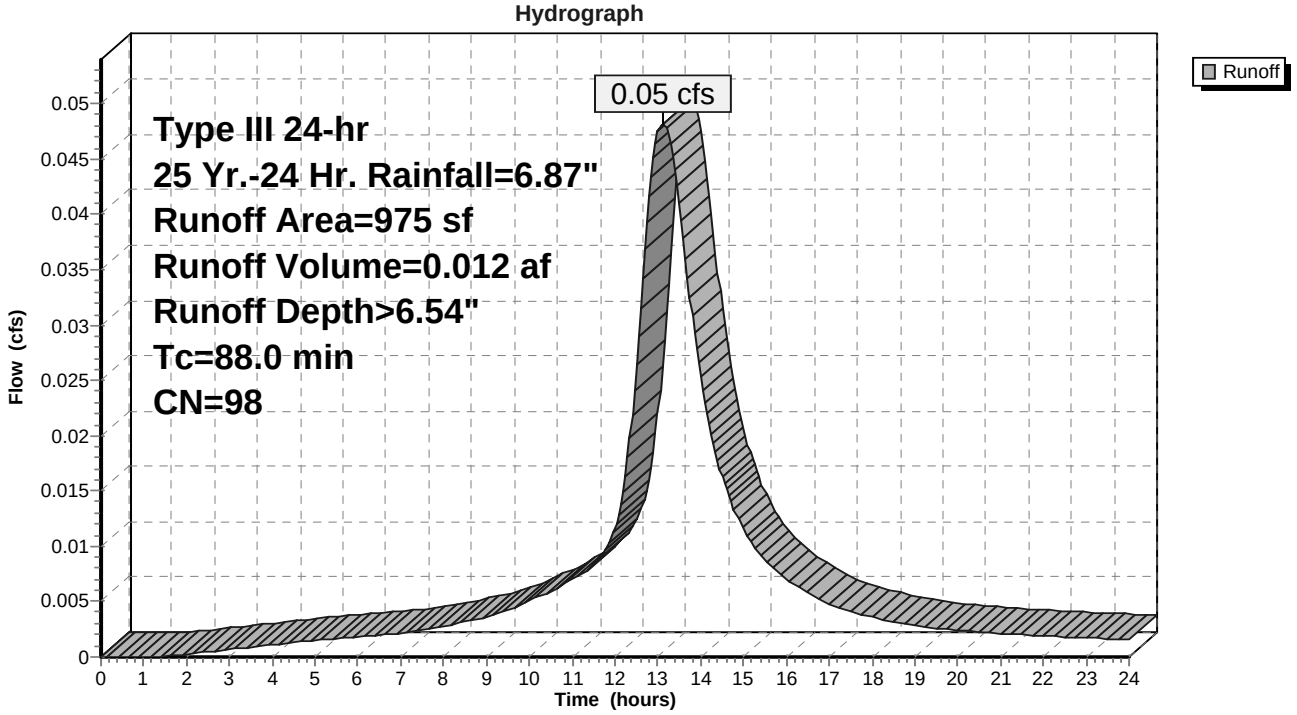
Runoff = 0.05 cfs @ 13.12 hrs, Volume= 0.012 af, Depth> 6.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
975	98	Roofs, HSG B
975		100.00% Impervious Area

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

Subcatchment 32S: Units #4&5



Summary for Subcatchment 33S: Units #6&7

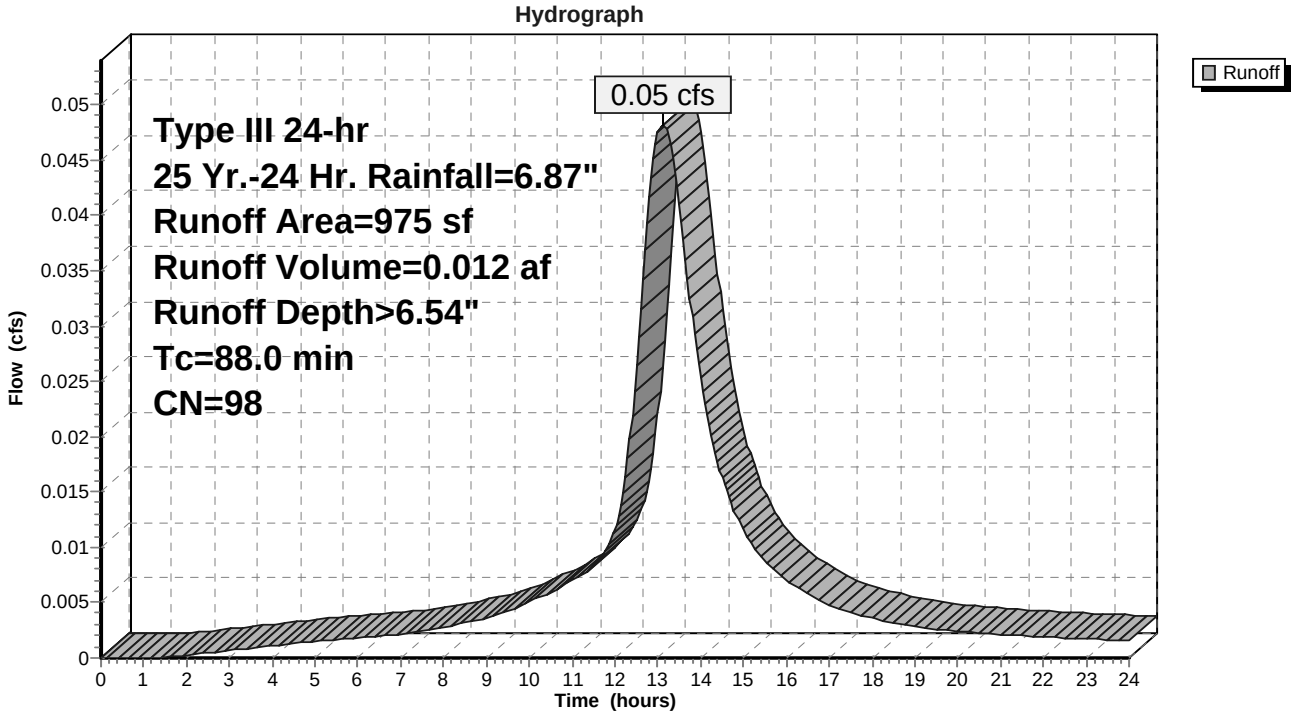
Runoff = 0.05 cfs @ 13.12 hrs, Volume= 0.012 af, Depth> 6.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
975	98	Roofs, HSG B
975		100.00% Impervious Area

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

Subcatchment 33S: Units #6&7



Summary for Subcatchment 34S: Units #8&9

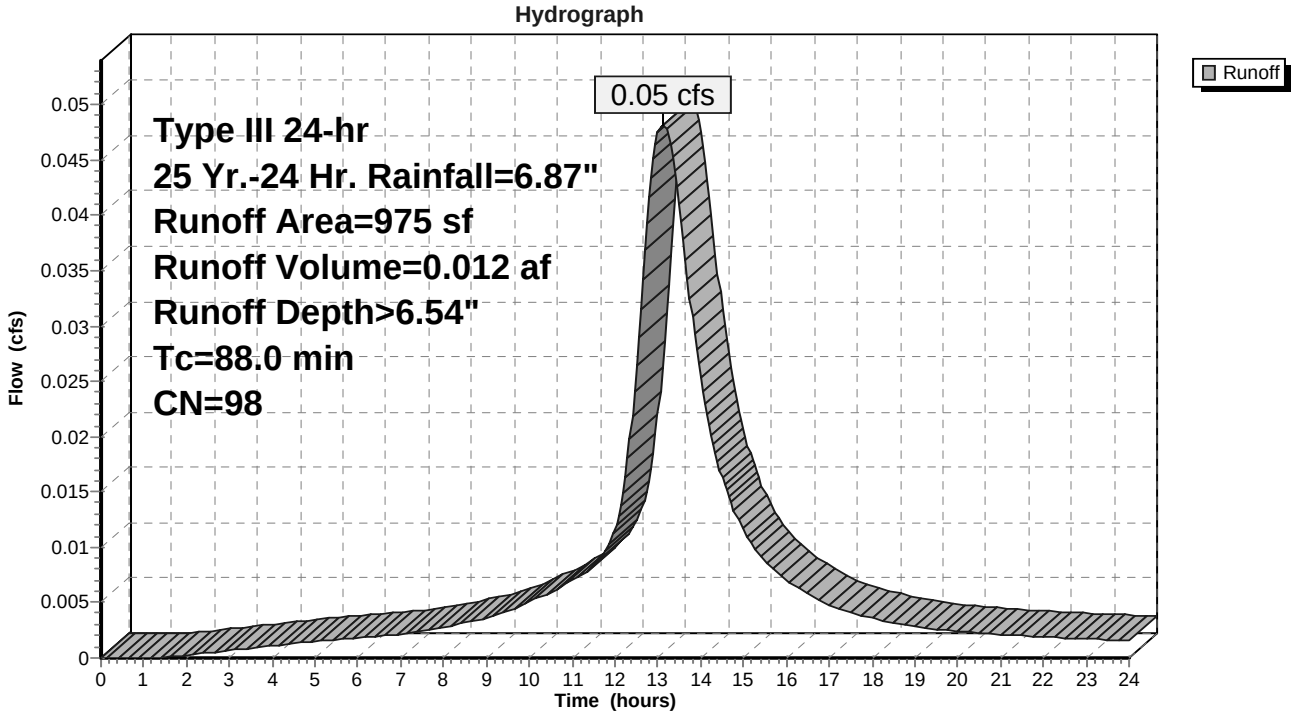
Runoff = 0.05 cfs @ 13.12 hrs, Volume= 0.012 af, Depth> 6.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
975	98	Roofs, HSG B
975		100.00% Impervious Area

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

Subcatchment 34S: Units #8&9



Summary for Subcatchment 35S: Units #10&11

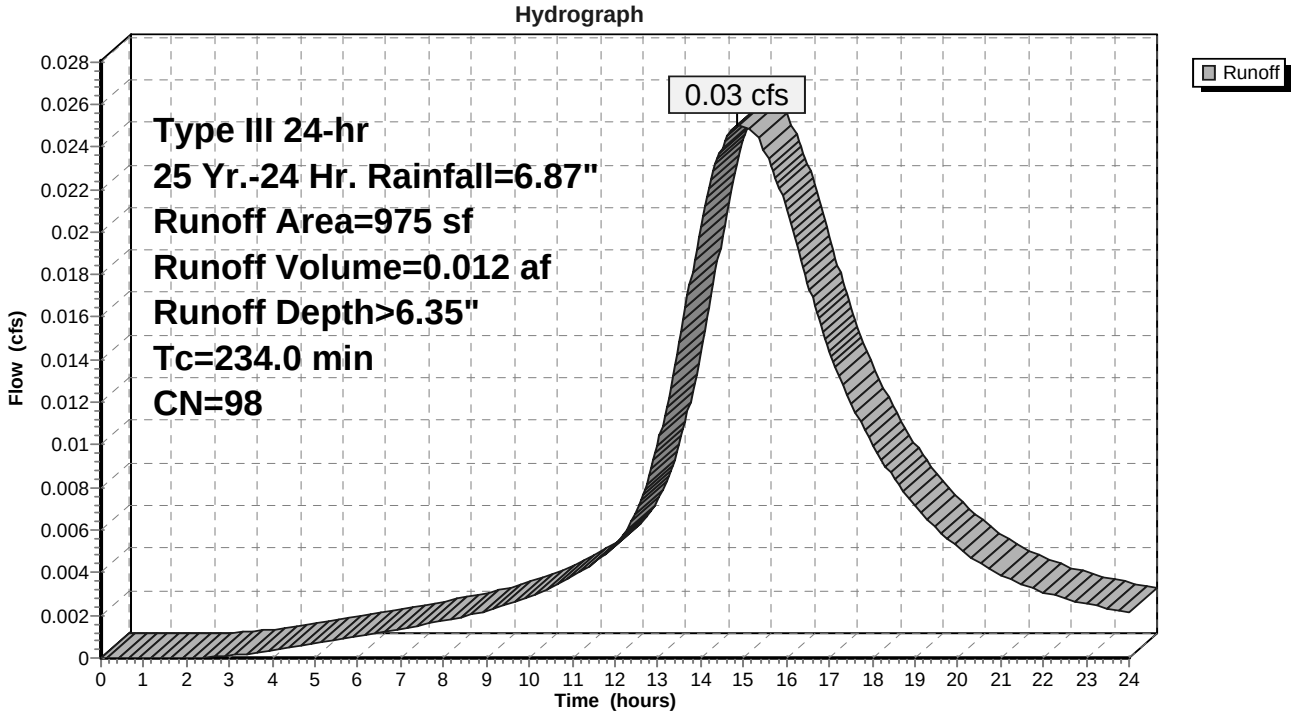
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
975	98	Roofs, HSG B
975		100.00% Impervious Area

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

Subcatchment 35S: Units #10&11



Summary for Subcatchment 36S: Units #12&13

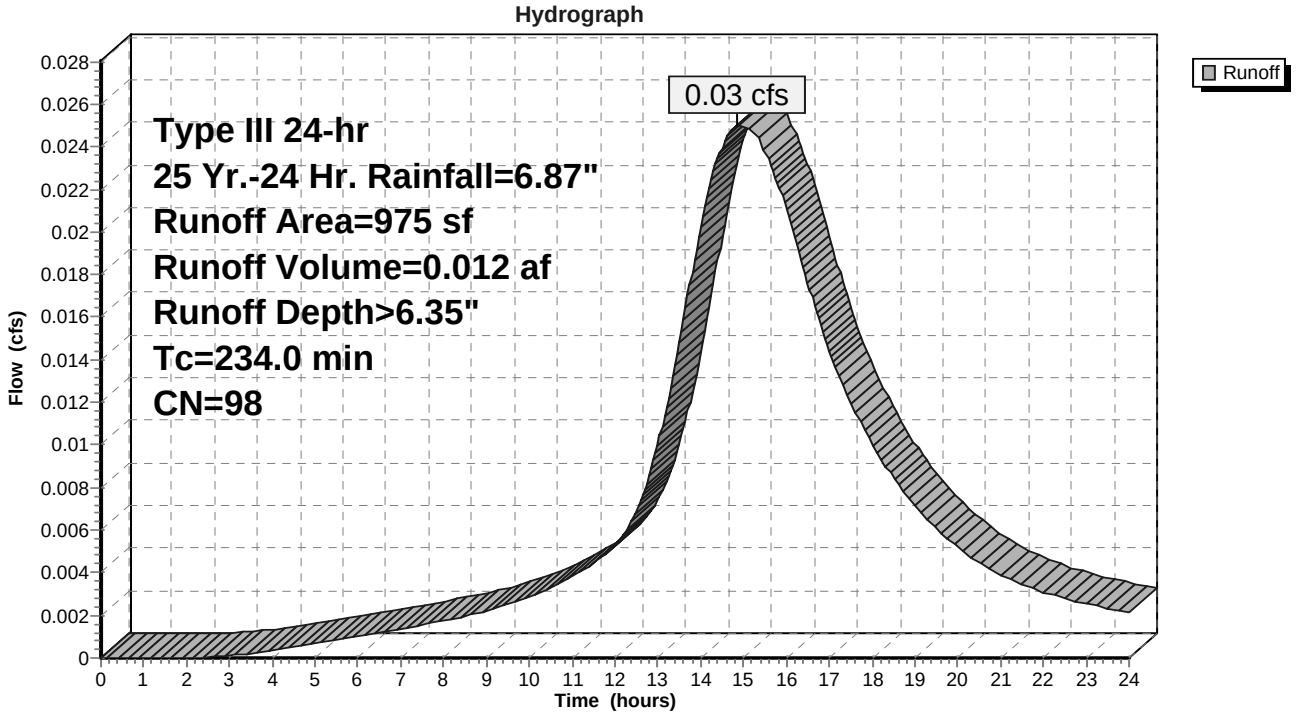
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
975	98	Roofs, HSG B
975		100.00% Impervious Area

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

Subcatchment 36S: Units #12&13



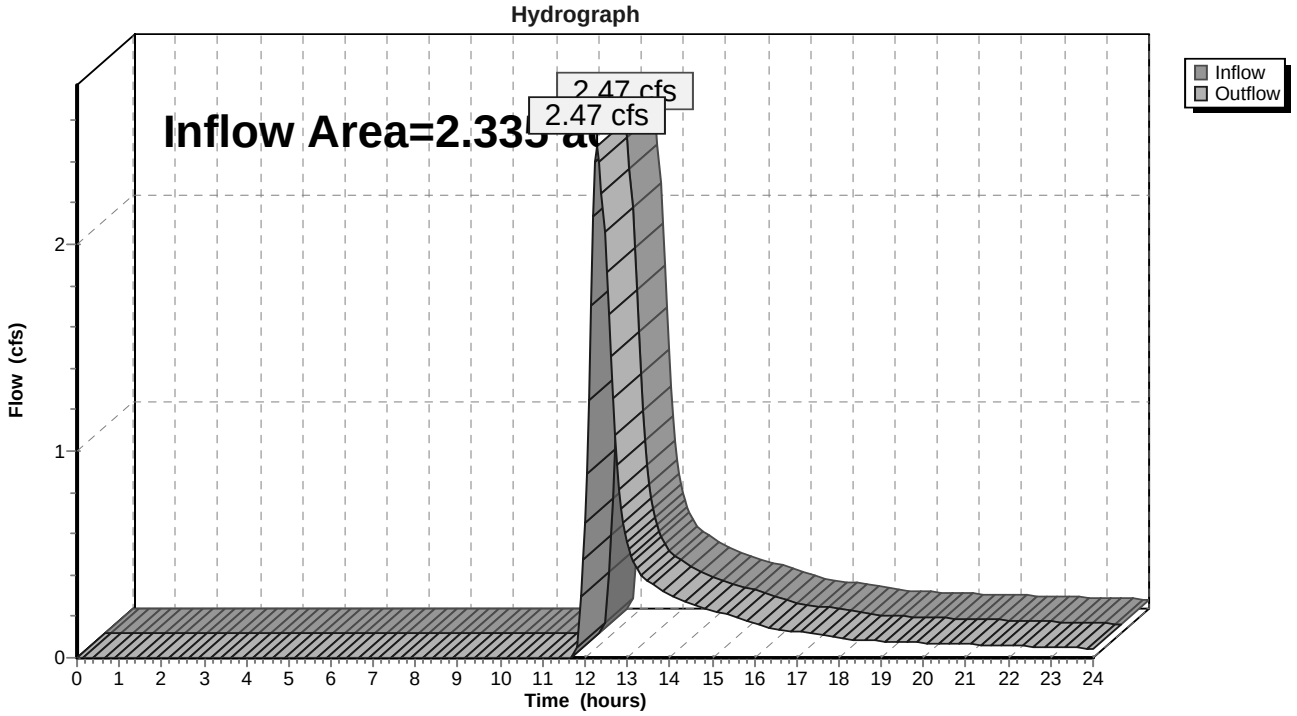
Summary for Reach 100R: Final Reach #100

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

Inflow Area = 2.335 ac, 18.89% Impervious, Inflow Depth > 1.28" for 25 Yr.-24 Hr. event
Inflow = 2.47 cfs @ 12.30 hrs, Volume= 0.249 af
Outflow = 2.47 cfs @ 12.30 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.0 min

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

Reach 100R: Final Reach #100



Summary for Pond 1P: Infiltration Sump

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=20)

Inflow Area = 0.853 ac, 6.00% Impervious, Inflow Depth > 0.80" for 25 Yr.-24 Hr. event
Inflow = 0.37 cfs @ 12.46 hrs, Volume= 0.057 af
Outflow = 0.16 cfs @ 13.00 hrs, Volume= 0.057 af, Atten= 57%, Lag= 32.6 min
Discarded = 0.16 cfs @ 13.00 hrs, Volume= 0.057 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 206.51' @ 13.01 hrs Surf.Area= 2,288 sf Storage= 616 cf
Flood Elev= 207.00' Surf.Area= 2,914 sf Storage= 1,332 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 81.3 min (995.8 - 914.5)

Volume	Invert	Avail.Storage	Storage Description
#1	205.75'	406 cf	**Ponding Area South (Irregular)**Listed below (Recalc)
#2	206.00'	199 cf	**Ponding Area North (Irregular)**Listed below (Recalc)
#3	206.50'	1,172 cf	**Open Water (Irregular)**Listed below (Recalc)
		1,778 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.75	443	111.7	0	0	443
206.00	499	114.8	118	118	506
206.50	660	162.3	289	406	1,555

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	330	102.4	0	0	330
206.50	472	138.1	199	199	1,016

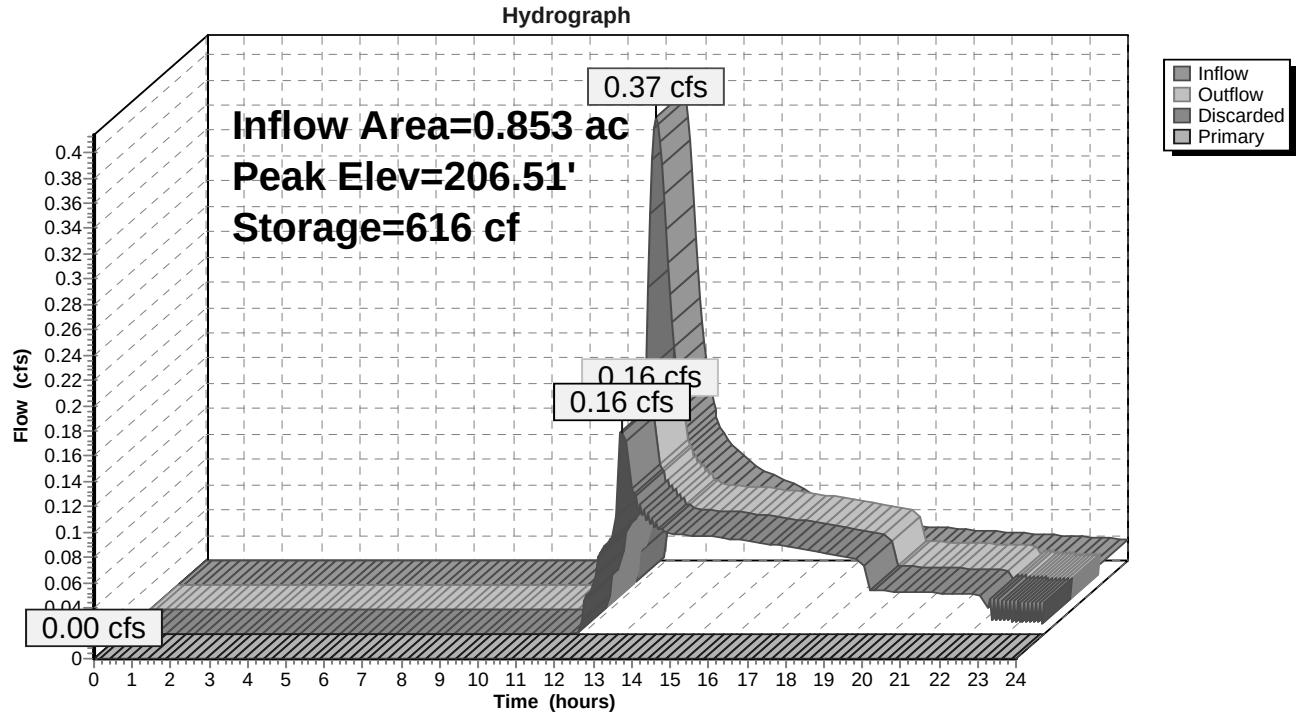
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.50	1,146	316.5	0	0	1,146
207.00	1,782	412.8	726	726	6,738
207.25	1,782	412.8	446	1,172	6,841

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.75'	**3.000 in/hr Infiltration over Surface area**
#2	Primary	207.00'	**135.0' long x 2.0' breadth Overflow**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.16 cfs @ 13.00 hrs HW=206.51' (Free Discharge)
└**1=Infiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=205.75' TW=0.00' (Dynamic Tailwater)
└**2=Overflow** (Controls 0.00 cfs)

Pond 1P: Infiltration Sump



Summary for Pond 2P: Inlet Sump 15" HDPE N-12

Inflow Area = 1.008 ac, 35.53% Impervious, Inflow Depth > 2.89" for 25 Yr.-24 Hr. event
Inflow = 2.60 cfs @ 12.20 hrs, Volume= 0.243 af
Outflow = 2.40 cfs @ 12.24 hrs, Volume= 0.243 af, Atten= 8%, Lag= 1.9 min
Primary = 2.40 cfs @ 12.24 hrs, Volume= 0.243 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.68' @ 12.27 hrs Surf.Area= 775 sf Storage= 290 cf
Flood Elev= 208.15' Surf.Area= 1,621 sf Storage= 870 cf

Plug-Flow detention time= 2.1 min calculated for 0.243 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (852.5 - 850.9)

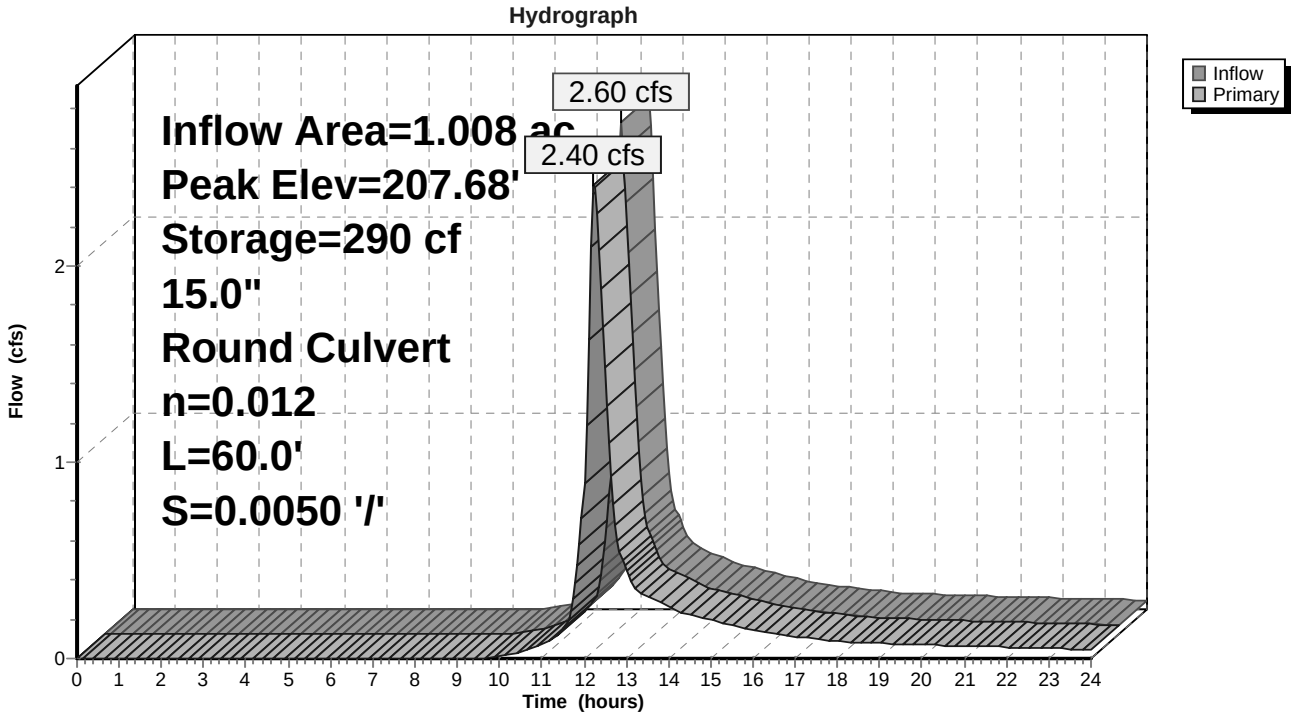
Volume	Invert	Avail.Storage	Storage Description
#1	206.69'	870 cf	**Ponding Area (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.69	25	19.0	0	0	25
207.00	159	59.4	26	26	277
207.50	472	101.9	151	176	824
208.00	1,468	197.8	462	638	3,113
208.15	1,621	243.7	232	870	4,726

Device	Routing	Invert	Outlet Devices
#1	Primary	206.70'	**15.0" Round 15" HDPE N-12** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 206.70' / 206.40' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.24 cfs @ 12.24 hrs HW=207.67' TW=207.30' (Dynamic Tailwater)
↑**1=15" HDPE N-12** (Outlet Controls 2.24 cfs @ 3.03 fps)

Pond 2P: Inlet Sump 15" HDPE N-12



Summary for Pond 4P: Infiltration Sump

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=10)

Inflow Area = 0.270 ac, 14.48% Impervious, Inflow Depth > 3.20" for 25 Yr.-24 Hr. event
Inflow = 0.99 cfs @ 12.10 hrs, Volume= 0.072 af
Outflow = 0.12 cfs @ 12.87 hrs, Volume= 0.072 af, Atten= 88%, Lag= 46.2 min
Discarded = 0.12 cfs @ 12.87 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.32' @ 12.87 hrs Surf.Area= 1,765 sf Storage= 1,231 cf
Flood Elev= 207.75' Surf.Area= 3,142 sf Storage= 2,276 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 132.3 min (970.1 - 837.8)

Volume	Invert	Avail.Storage	Storage Description
#1	206.00'	3,181 cf	**Ponding Area (Irregular)**Listed below (Recalc)

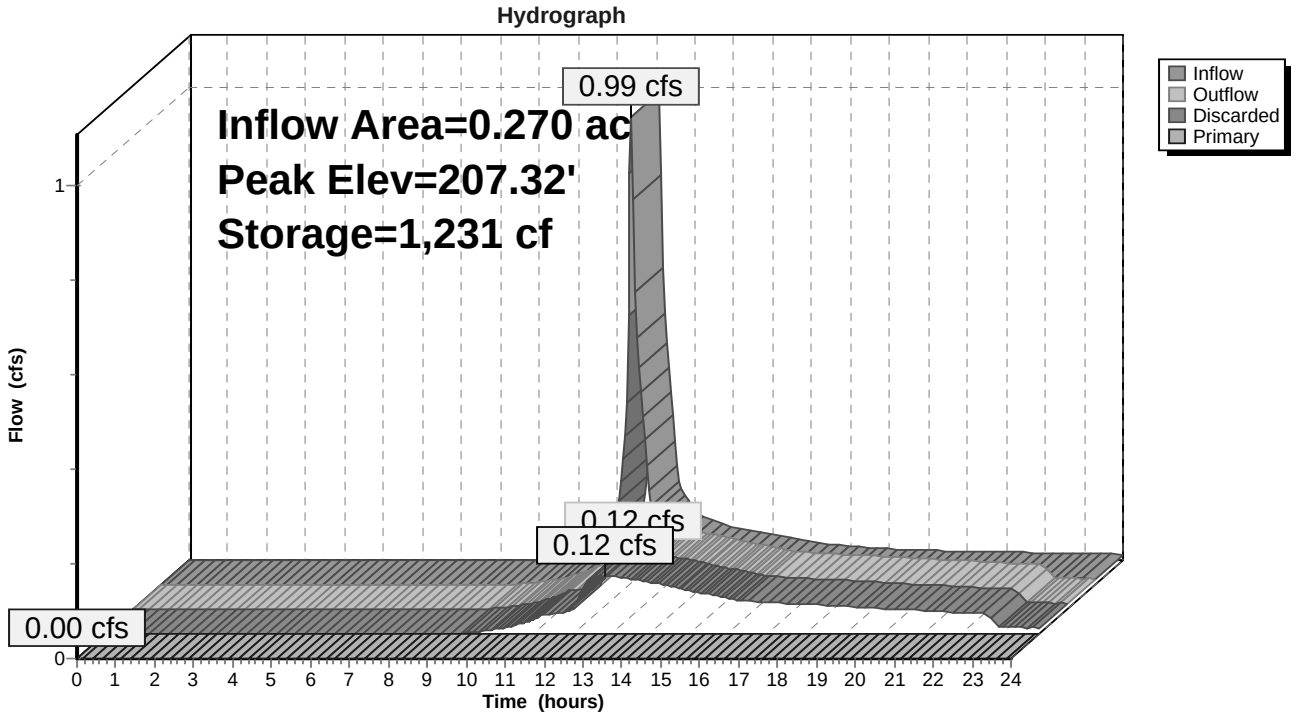
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	608	163.3	0	0	608
207.00	1,002	195.9	797	797	1,557
208.00	4,120	359.3	2,385	3,181	8,782

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.00'	**3.000 in/hr Infiltration over Surface area**
#2	Primary	207.50'	**12.0" Round 12" RCP** L= 86.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 207.50' / 206.50' S= 0.0116 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.12 cfs @ 12.87 hrs HW=207.32' (Free Discharge)
↑**1=Infiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=206.00' TW=205.75' (Dynamic Tailwater)
↑**2=12" RCP** (Controls 0.00 cfs)

Pond 4P: Infiltration Sump



Summary for Pond 101P: Porous Pavement W/ Infiltration #101

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=69)

Inflow Area = 0.543 ac, 80.49% Impervious, Inflow Depth > 5.53" for 25 Yr.-24 Hr. event
Inflow = 0.56 cfs @ 14.85 hrs, Volume= 0.250 af
Outflow = 0.50 cfs @ 14.80 hrs, Volume= 0.250 af, Atten= 11%, Lag= 0.0 min
Discarded = 0.50 cfs @ 14.80 hrs, Volume= 0.250 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.44' @ 15.85 hrs Surf.Area= 7,208 sf Storage= 233 cf
Flood Elev= 209.69' Surf.Area= 7,208 sf Storage= 5,276 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.1 min (962.2 - 960.1)

Volume	Invert	Avail.Storage	Storage Description
#1	207.36'	2,883 cf	**Stone (Irregular)** Listed below (Recalc) 7,208 cf Overall x 40.0% Voids
#2	208.36'	1,442 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 7,208 cf Overall x 20.0% Voids
#3	209.36'	951 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 2,379 cf Overall x 40.0% Voids
		5,276 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.36	7,208	648.0	0	0	7,208
208.36	7,208	648.0	7,208	7,208	7,856

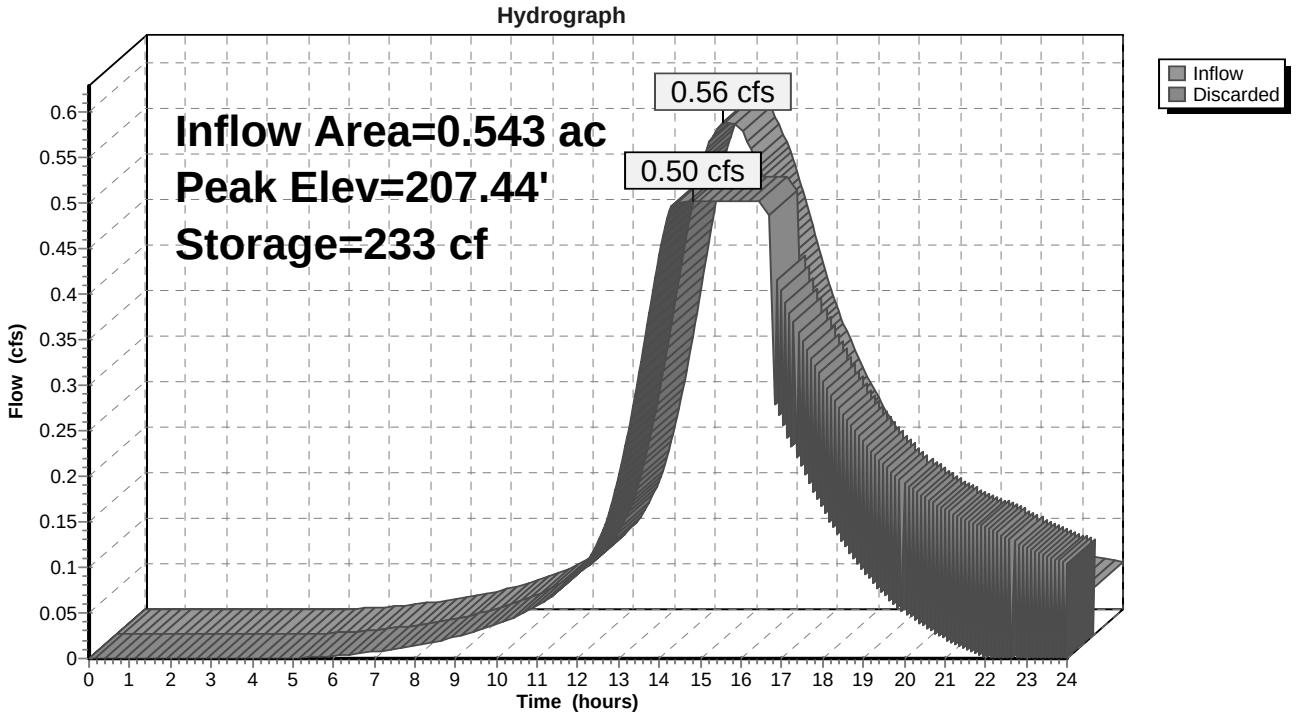
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.36	7,208	648.0	0	0	7,208
209.36	7,208	648.0	7,208	7,208	7,856

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
209.36	7,208	648.0	0	0	7,208
209.69	7,208	648.0	2,379	2,379	7,422

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.36'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.50 cfs @ 14.80 hrs HW=207.38' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.50 cfs)

Pond 101P: Porous Pavement W/ Infiltration #101



Summary for Pond 102P: Rain Garden/Level Spreader W/ Infiltration #102

Inflow Area = 1.097 ac, 32.87% Impervious, Inflow Depth > 2.73" for 25 Yr.-24 Hr. event
Inflow = 2.45 cfs @ 12.23 hrs, Volume= 0.250 af
Outflow = 2.36 cfs @ 12.29 hrs, Volume= 0.238 af, Atten= 4%, Lag= 3.4 min
Discarded = 0.01 cfs @ 11.05 hrs, Volume= 0.017 af
Primary = 2.34 cfs @ 12.29 hrs, Volume= 0.221 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.32' @ 12.29 hrs Surf.Area= 209 sf Storage= 1,006 cf
Flood Elev= 208.00' Surf.Area= 209 sf Storage= 1,898 cf

Plug-Flow detention time= 36.9 min calculated for 0.238 af (95% of inflow)
Center-of-Mass det. time= 12.0 min (866.2 - 854.2)

Volume	Invert	Avail.Storage	Storage Description
#1	203.50'	84 cf	**Stone (Irregular)** Listed below (Recalc) 209 cf Overall x 40.0% Voids
#2	204.50'	63 cf	**Bio-Media (Irregular)** Listed below (Recalc) -Impervious 314 cf Overall x 20.0% Voids
#3	206.00'	976 cf	**Infiltration Cell (Irregular)** Listed below (Recalc) -Impervious
#4	206.00'	776 cf	**Sediment Forebay (Irregular)** Listed below (Recalc) -Impervious
		1,898 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
203.50	209	81.6	0	0	209
204.50	209	81.6	209	209	291

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
204.50	209	81.6	0	0	209
206.00	209	84.6	314	314	340

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	209	81.6	0	0	209
207.00	482	100.5	336	336	498
208.00	811	119.4	639	976	846

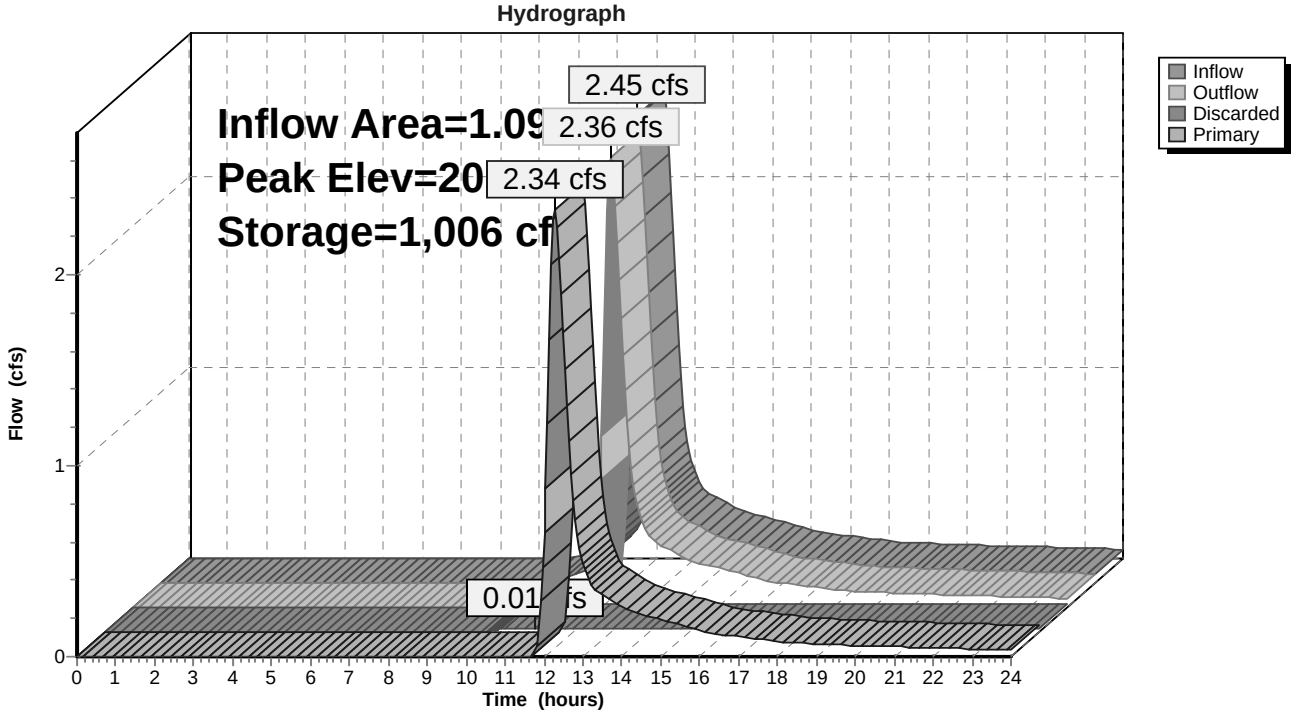
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	43	25.0	0	0	43
207.00	424	118.2	201	201	1,107
208.00	742	130.6	576	776	1,383

Device	Routing	Invert	Outlet Devices
#1	Discarded	203.50'	**3.000 in/hr 3IN/HR Infiltration over Surface area**
#2	Primary	206.75'	**2.0' long x 45.0' breadth 45' Level Spreader** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.01 cfs @ 11.05 hrs HW=204.68' (Free Discharge)
└**1=3IN/HR Infiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.33 cfs @ 12.29 hrs HW=207.32' TW=0.00' (Dynamic Tailwater)
└**2=45' Level Spreader** (Weir Controls 2.33 cfs @ 2.04 fps)

Pond 102P: Rain Garden/Level Spreader W/ Infiltration #102



Summary for Pond 201P: Porous Pavement W/ Infiltration #201

Inflow Area = 0.380 ac, 66.99% Impervious, Inflow Depth > 4.34" for 25 Yr.-24 Hr. event
Inflow = 0.31 cfs @ 15.06 hrs, Volume= 0.138 af
Outflow = 0.31 cfs @ 15.06 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.31 cfs @ 15.06 hrs, Volume= 0.138 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 205.51' @ 15.06 hrs Surf.Area= 5,821 sf Storage= 0 cf
Flood Elev= 207.84' Surf.Area= 5,821 sf Storage= 4,261 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (972.8 - 972.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.51'	2,328 cf	**Stone (Irregular)** Listed below (Recalc) 5,821 cf Overall x 40.0% Voids
#2	206.51'	1,164 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 5,821 cf Overall x 20.0% Voids
#3	207.51'	768 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 1,921 cf Overall x 40.0% Voids
		4,261 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.51	5,821	436.4	0	0	5,821
206.51	5,821	436.4	5,821	5,821	6,257

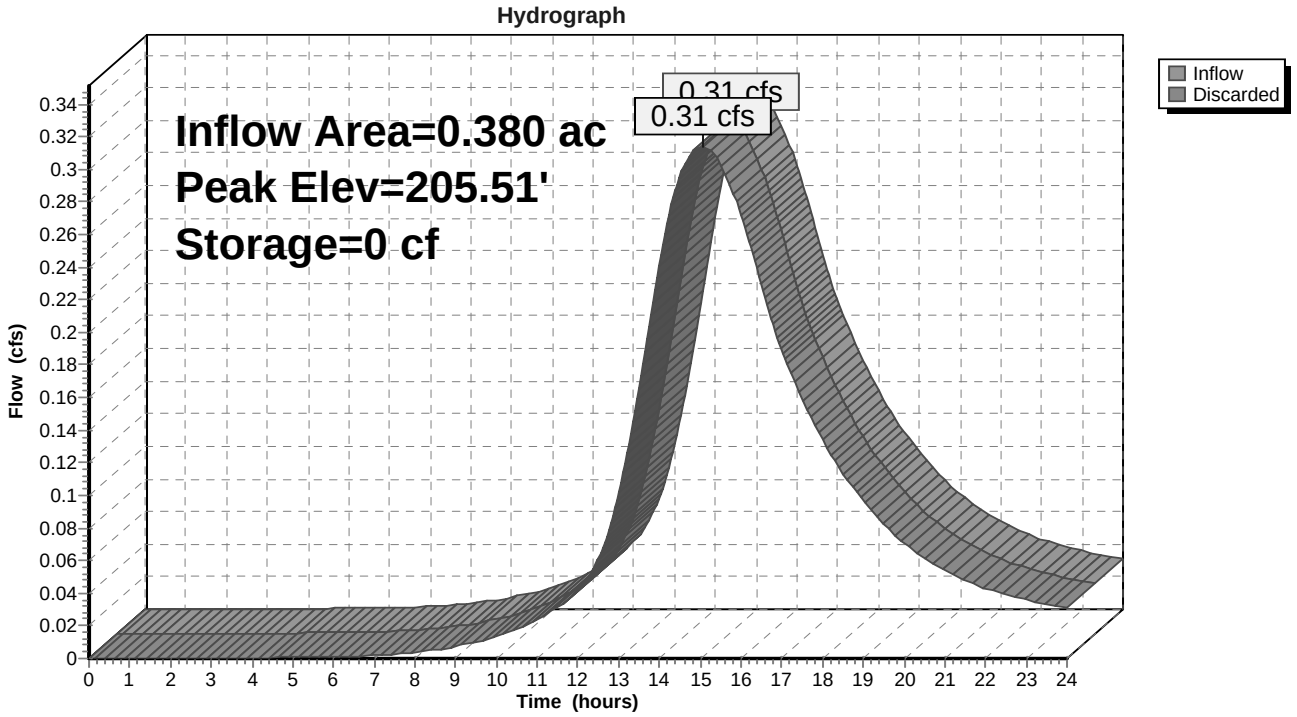
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.51	5,821	436.4	0	0	5,821
207.51	5,821	436.4	5,821	5,821	6,257

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.51	5,821	436.5	0	0	5,821
207.84	5,821	436.4	1,921	1,921	5,965

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.51'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.40 cfs @ 15.06 hrs HW=205.51' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.40 cfs)

Pond 201P: Porous Pavement W/ Infiltration #201



Summary for Pond 202P: Porous Pavement W/ Infiltration #202

Inflow Area = 0.161 ac, 97.30% Impervious, Inflow Depth > 6.26" for 25 Yr.-24 Hr. event
Inflow = 0.18 cfs @ 14.86 hrs, Volume= 0.084 af
Outflow = 0.18 cfs @ 14.86 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.18 cfs @ 14.86 hrs, Volume= 0.084 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 205.56' @ 14.86 hrs Surf.Area= 4,889 sf Storage= 0 cf
Flood Elev= 207.89' Surf.Area= 4,889 sf Storage= 3,579 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (932.6 - 932.6)

Volume	Invert	Avail.Storage	Storage Description
#1	205.56'	1,956 cf	**Stone (Irregular)** Listed below (Recalc) 4,889 cf Overall x 40.0% Voids
#2	206.56'	978 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 4,889 cf Overall x 20.0% Voids
#3	207.56'	645 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 1,613 cf Overall x 40.0% Voids
		3,579 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.56	4,889	300.0	0	0	4,889
206.56	4,889	300.0	4,889	4,889	5,189

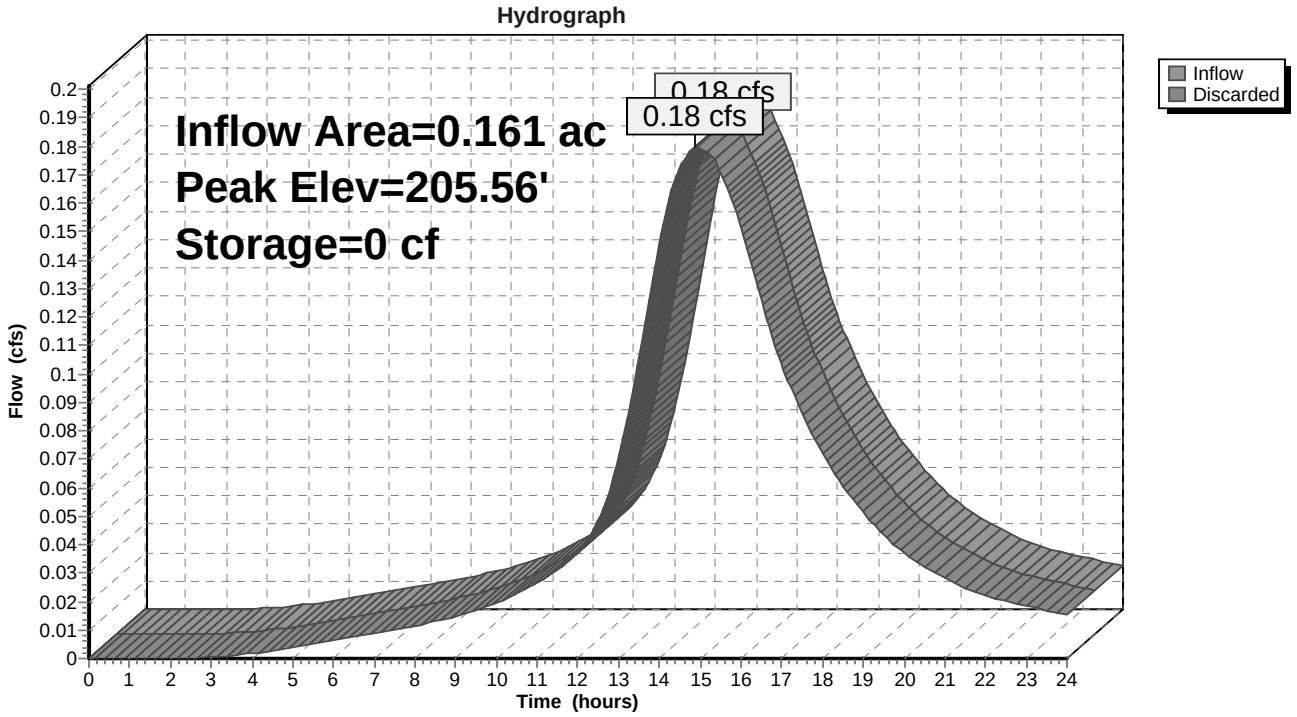
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.56	4,889	300.0	0	0	4,889
207.56	4,889	300.0	4,889	4,889	5,189

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.56	4,889	300.0	0	0	4,889
207.89	4,889	300.0	1,613	1,613	4,988

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.56'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.34 cfs @ 14.86 hrs HW=205.56' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.34 cfs)

Pond 202P: Porous Pavement W/ Infiltration #202



Summary for Pond 203P: Porous Pavers W/ Infiltration #203

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=81)

Inflow Area = 0.156 ac, 81.92% Impervious, Inflow Depth > 5.75" for 25 Yr.-24 Hr. event
Inflow = 0.31 cfs @ 13.14 hrs, Volume= 0.075 af
Outflow = 0.17 cfs @ 12.70 hrs, Volume= 0.075 af, Atten= 46%, Lag= 0.0 min
Discarded = 0.17 cfs @ 12.70 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.00' @ 13.99 hrs Surf.Area= 2,427 sf Storage= 452 cf
Flood Elev= 208.28' Surf.Area= 2,427 sf Storage= 1,563 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.3 min (850.5 - 835.3)

Volume	Invert	Avail.Storage	Storage Description
#1	206.53'	1,456 cf	**Stone (Irregular)** Listed below (Recalc) 3,641 cf Overall x 40.0% Voids
#2	208.03'	107 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 534 cf Overall x 20.0% Voids
		1,563 cf	Total Available Storage

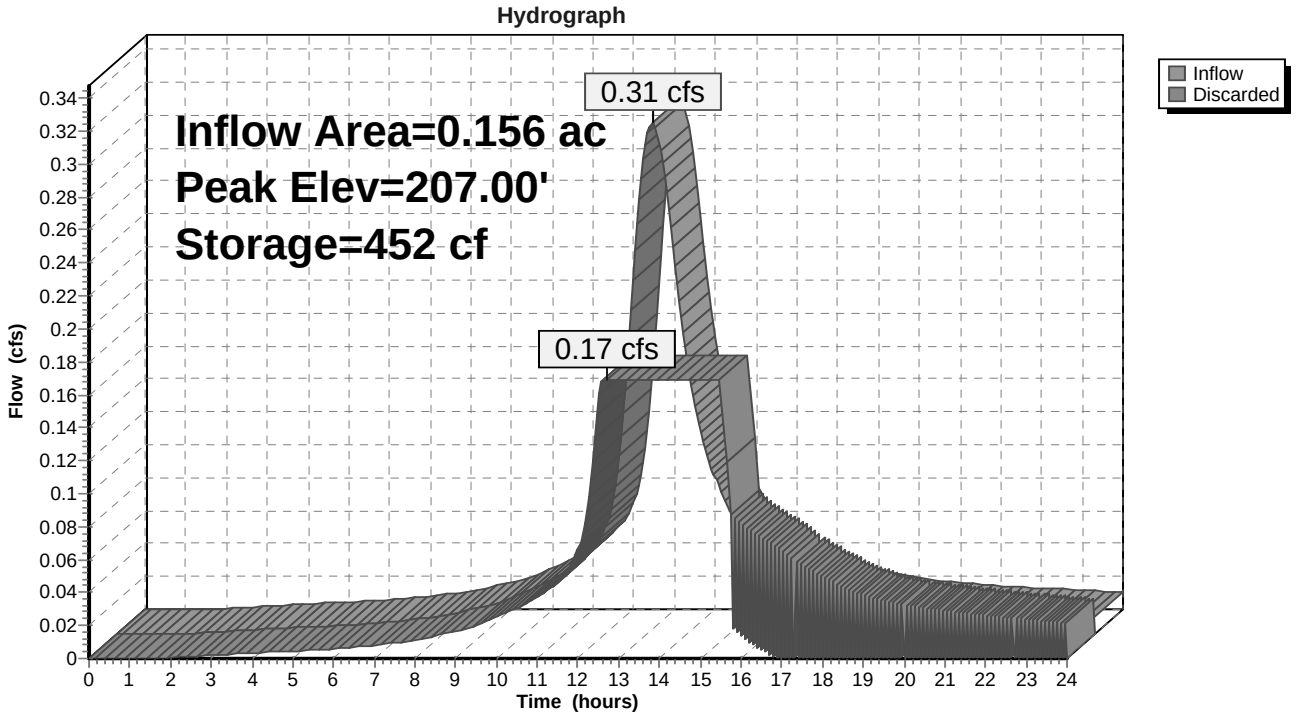
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.53	2,427	645.5	0	0	2,427
208.03	2,427	645.5	3,641	3,641	3,395

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.03	2,427	645.5	0	0	2,427
208.25	2,427	645.5	534	534	2,569

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.53'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.17 cfs @ 12.70 hrs HW=206.55' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.17 cfs)

Pond 203P: Porous Pavers W/ Infiltration #203



Summary for Pond 204P: Porous Pavers W/ Infiltration #204

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

Inflow Area = 0.048 ac, 70.88% Impervious, Inflow Depth > 5.27" for 25 Yr.-24 Hr. event
Inflow = 0.09 cfs @ 13.16 hrs, Volume= 0.021 af
Outflow = 0.06 cfs @ 12.75 hrs, Volume= 0.021 af, Atten= 39%, Lag= 0.0 min
Discarded = 0.06 cfs @ 12.75 hrs, Volume= 0.021 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 208.30' @ 13.88 hrs Surf.Area= 794 sf Storage= 101 cf
Flood Elev= 209.23' Surf.Area= 794 sf Storage= 357 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 10.3 min (866.5 - 856.2)

Volume	Invert	Avail.Storage	Storage Description
#1	207.98'	318 cf	**Stone (Irregular)** Listed below (Recalc) 794 cf Overall x 40.0% Voids
#2	208.98'	79 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 397 cf Overall x 20.0% Voids
		397 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.98	794	278.8	0	0	794
208.98	794	278.8	794	794	1,073

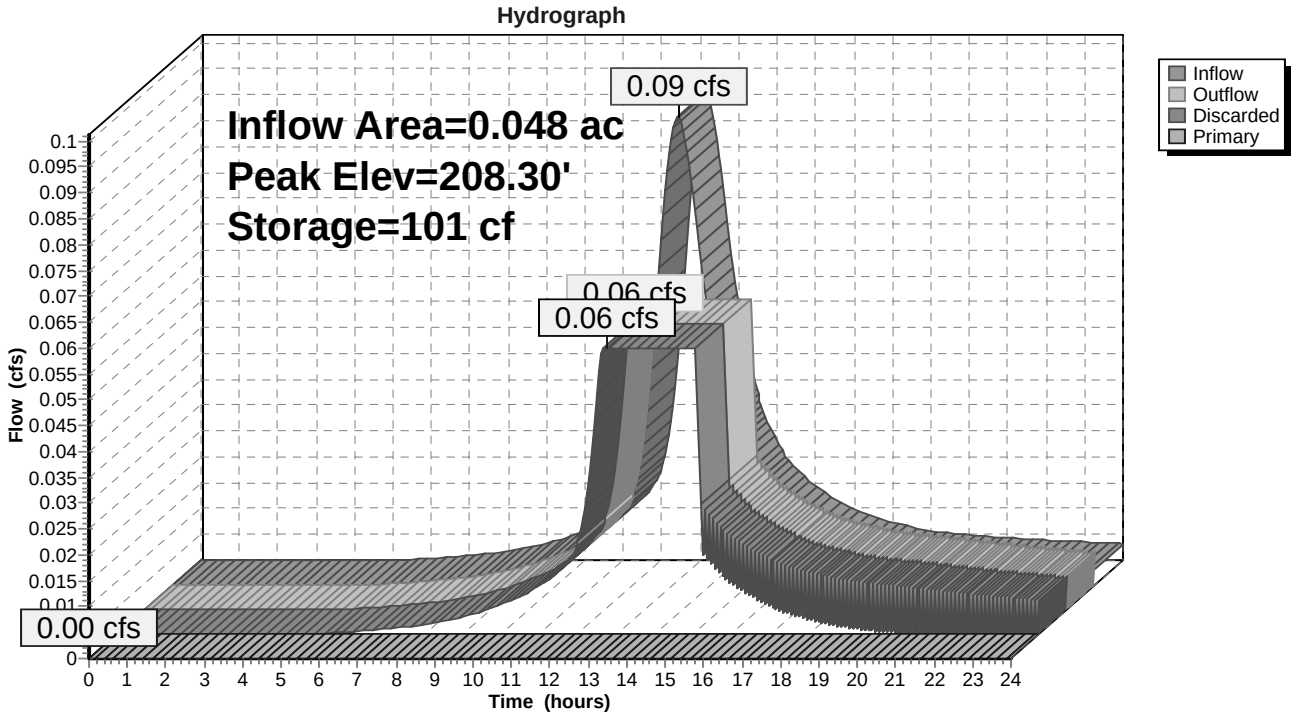
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.98	794	278.8	0	0	794
209.23	794	278.8	199	199	864
209.48	794	278.8	199	397	933

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.98'	**3.000 in/hr Infiltration 3in/hr over Surface area**
#2	Primary	209.23'	**52.0' long x 2.0' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.06 cfs @ 12.75 hrs HW=208.00' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.98' TW=205.51' (Dynamic Tailwater)
2=Overflow (Controls 0.00 cfs)

Pond 204P: Porous Pavers W/ Infiltration #204



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

Subcatchment 1S: Remaining Area from Runoff Area=25,413 sf 2.07% Impervious Runoff Depth>0.10"
Flow Length=156' Tc=25.5 min CN=45 Runoff=0.01 cfs 0.005 af

Subcatchment 2S: Subcatchment #2 Runoff Area=43,912 sf 35.53% Impervious Runoff Depth>0.76"
Flow Length=122' Tc=14.0 min CN=64 Runoff=0.57 cfs 0.064 af

Subcatchment 3S: Remaining Area Copper Runoff Area=16,731 sf 7.61% Impervious Runoff Depth>0.03"
Flow Length=106' Tc=21.5 min CN=41 Runoff=0.00 cfs 0.001 af

Subcatchment 4S: Infiltration Pond Runoff Area=11,757 sf 14.48% Impervious Runoff Depth>0.91"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=67 Runoff=0.25 cfs 0.020 af

Subcatchment 11S: Porous Pavement & Runoff Area=23,638 sf 80.49% Impervious Runoff Depth>2.51"
Tc=234.0 min CN=91 Runoff=0.26 cfs 0.113 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.05"
Tc=6.0 min CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment 21S: Eastern Porous Runoff Area=13,526 sf 64.01% Impervious Runoff Depth>1.98"
Tc=234.0 min CN=85 Runoff=0.12 cfs 0.051 af

Subcatchment 22S: Western Porous Runoff Area=5,079 sf 96.26% Impervious Runoff Depth>3.12"
Tc=234.0 min CN=97 Runoff=0.07 cfs 0.030 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,868 sf 68.25% Impervious Runoff Depth>2.16"
Tc=88.0 min CN=86 Runoff=0.07 cfs 0.016 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=2,071 sf 70.88% Impervious Runoff Depth>2.24"
Tc=88.0 min CN=87 Runoff=0.04 cfs 0.009 af

Subcatchment 31S: Units #2&3 Runoff Area=975 sf 100.00% Impervious Runoff Depth>3.23"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 32S: Units #4&5 Runoff Area=975 sf 100.00% Impervious Runoff Depth>3.33"
Tc=88.0 min CN=98 Runoff=0.03 cfs 0.006 af

Subcatchment 33S: Units #6&7 Runoff Area=975 sf 100.00% Impervious Runoff Depth>3.33"
Tc=88.0 min CN=98 Runoff=0.03 cfs 0.006 af

Subcatchment 34S: Units #8&9 Runoff Area=975 sf 100.00% Impervious Runoff Depth>3.33"
Tc=88.0 min CN=98 Runoff=0.03 cfs 0.006 af

Subcatchment 35S: Units #10&11 Runoff Area=975 sf 100.00% Impervious Runoff Depth>3.23"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 36S: Units #12&13 Runoff Area=975 sf 100.00% Impervious Runoff Depth>3.23"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Reach 100R: Final Reach #100 Inflow=0.34 cfs 0.039 af
Outflow=0.34 cfs 0.039 af

Pond 1P: Infiltration Sump Peak Elev=205.75' Storage=0 cf Inflow=0.01 cfs 0.005 af
Discarded=0.01 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.10' Storage=43 cf Inflow=0.57 cfs 0.064 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=0.56 cfs 0.064 af

Pond 4P: Infiltration Sump Peak Elev=206.33' Storage=219 cf Inflow=0.25 cfs 0.020 af
Discarded=0.05 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.021 af

Pond 101P: Porous Pavement W/ Infiltration #101 Peak Elev=207.36' Storage=0 cf Inflow=0.26 cfs 0.113 af
Outflow=0.26 cfs 0.113 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=206.91' Storage=604 cf Inflow=0.56 cfs 0.064 af
Discarded=0.01 cfs 0.015 af Primary=0.34 cfs 0.038 af Outflow=0.35 cfs 0.053 af

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.51' Storage=0 cf Inflow=0.13 cfs 0.057 af
Outflow=0.13 cfs 0.057 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=205.56' Storage=0 cf Inflow=0.09 cfs 0.042 af
Outflow=0.09 cfs 0.042 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.53' Storage=0 cf Inflow=0.15 cfs 0.035 af
Outflow=0.15 cfs 0.035 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=207.98' Storage=0 cf Inflow=0.04 cfs 0.009 af
Discarded=0.04 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.009 af

Total Runoff Area = 3.575 ac Runoff Volume = 0.347 af Average Runoff Depth = 1.16"
60.35% Pervious = 2.158 ac 39.65% Impervious = 1.417 ac

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

Subcatchment 1S: Remaining Area from Runoff Area=25,413 sf 2.07% Impervious Runoff Depth>0.58"
Flow Length=156' Tc=25.5 min CN=45 Runoff=0.14 cfs 0.028 af

Subcatchment 2S: Subcatchment #2 Runoff Area=43,912 sf 35.53% Impervious Runoff Depth>1.87"
Flow Length=122' Tc=14.0 min CN=64 Runoff=1.63 cfs 0.157 af

Subcatchment 3S: Remaining Area Copper Runoff Area=16,731 sf 7.61% Impervious Runoff Depth>0.38"
Flow Length=106' Tc=21.5 min CN=41 Runoff=0.05 cfs 0.012 af

Subcatchment 4S: Infiltration Pond Runoff Area=11,757 sf 14.48% Impervious Runoff Depth>2.11"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=67 Runoff=0.64 cfs 0.048 af

Subcatchment 11S: Porous Pavement & Runoff Area=23,638 sf 80.49% Impervious Runoff Depth>4.19"
Tc=234.0 min CN=91 Runoff=0.43 cfs 0.190 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.43"
Tc=6.0 min CN=42 Runoff=0.02 cfs 0.003 af

Subcatchment 21S: Eastern Porous Runoff Area=13,526 sf 64.01% Impervious Runoff Depth>3.57"
Tc=234.0 min CN=85 Runoff=0.21 cfs 0.092 af

Subcatchment 22S: Western Porous Runoff Area=5,079 sf 96.26% Impervious Runoff Depth>4.86"
Tc=234.0 min CN=97 Runoff=0.10 cfs 0.047 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,868 sf 68.25% Impervious Runoff Depth>3.82"
Tc=88.0 min CN=86 Runoff=0.12 cfs 0.028 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=2,071 sf 70.88% Impervious Runoff Depth>3.92"
Tc=88.0 min CN=87 Runoff=0.07 cfs 0.016 af

Subcatchment 31S: Units #2&3 Runoff Area=975 sf 100.00% Impervious Runoff Depth>4.98"
Tc=234.0 min CN=98 Runoff=0.02 cfs 0.009 af

Subcatchment 32S: Units #4&5 Runoff Area=975 sf 100.00% Impervious Runoff Depth>5.13"
Tc=88.0 min CN=98 Runoff=0.04 cfs 0.010 af

Subcatchment 33S: Units #6&7 Runoff Area=975 sf 100.00% Impervious Runoff Depth>5.13"
Tc=88.0 min CN=98 Runoff=0.04 cfs 0.010 af

Subcatchment 34S: Units #8&9 Runoff Area=975 sf 100.00% Impervious Runoff Depth>5.13"
Tc=88.0 min CN=98 Runoff=0.04 cfs 0.010 af

Subcatchment 35S: Units #10&11 Runoff Area=975 sf 100.00% Impervious Runoff Depth>4.98"
Tc=234.0 min CN=98 Runoff=0.02 cfs 0.009 af

Subcatchment 36S: Units #12&13 Runoff Area=975 sf 100.00% Impervious Runoff Depth>4.98"
Tc=234.0 min CN=98 Runoff=0.02 cfs 0.009 af

Reach 100R: Final Reach #100 Inflow=1.46 cfs 0.145 af
Outflow=1.46 cfs 0.145 af

Pond 1P: Infiltration Sump Peak Elev=206.08' Storage=186 cf Inflow=0.14 cfs 0.028 af
Discarded=0.06 cfs 0.028 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.028 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.46' Storage=157 cf Inflow=1.63 cfs 0.157 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=1.52 cfs 0.157 af

Pond 4P: Infiltration Sump Peak Elev=206.98' Storage=780 cf Inflow=0.64 cfs 0.048 af
Discarded=0.07 cfs 0.048 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.048 af

Pond 101P: Porous Pavement W/ Infiltration #101 Peak Elev=207.36' Storage=0 cf Inflow=0.43 cfs 0.190 af
Outflow=0.43 cfs 0.190 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.16' Storage=839 cf Inflow=1.54 cfs 0.160 af
Discarded=0.01 cfs 0.016 af Primary=1.44 cfs 0.133 af Outflow=1.45 cfs 0.148 af

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.51' Storage=0 cf Inflow=0.23 cfs 0.102 af
Outflow=0.23 cfs 0.102 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=205.56' Storage=0 cf Inflow=0.14 cfs 0.066 af
Outflow=0.14 cfs 0.066 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.70' Storage=169 cf Inflow=0.24 cfs 0.057 af
Outflow=0.17 cfs 0.057 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.06' Storage=25 cf Inflow=0.07 cfs 0.016 af
Discarded=0.06 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.016 af

Total Runoff Area = 3.575 ac Runoff Volume = 0.678 af Average Runoff Depth = 2.28"
60.35% Pervious = 2.158 ac 39.65% Impervious = 1.417 ac

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

Subcatchment 1S: Remaining Area from Runoff Area=25,413 sf 2.07% Impervious Runoff Depth>1.17"
Flow Length=156' Tc=25.5 min CN=45 Runoff=0.37 cfs 0.057 af

Subcatchment 2S: Subcatchment #2 Runoff Area=43,912 sf 35.53% Impervious Runoff Depth>2.89"
Flow Length=122' Tc=14.0 min CN=64 Runoff=2.60 cfs 0.243 af

Subcatchment 3S: Remaining Area Copper Runoff Area=16,731 sf 7.61% Impervious Runoff Depth>0.86"
Flow Length=106' Tc=21.5 min CN=41 Runoff=0.16 cfs 0.028 af

Subcatchment 4S: Infiltration Pond Runoff Area=11,757 sf 14.48% Impervious Runoff Depth>3.20"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=67 Runoff=0.99 cfs 0.072 af

Subcatchment 11S: Porous Pavement & Runoff Area=23,638 sf 80.49% Impervious Runoff Depth>5.53"
Tc=234.0 min CN=91 Runoff=0.56 cfs 0.250 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>0.94"
Tc=6.0 min CN=42 Runoff=0.06 cfs 0.007 af

Subcatchment 21S: Eastern Porous Runoff Area=13,526 sf 64.01% Impervious Runoff Depth>4.86"
Tc=234.0 min CN=85 Runoff=0.29 cfs 0.126 af

Subcatchment 22S: Western Porous Runoff Area=5,079 sf 96.26% Impervious Runoff Depth>6.23"
Tc=234.0 min CN=97 Runoff=0.13 cfs 0.061 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,868 sf 68.25% Impervious Runoff Depth>5.16"
Tc=88.0 min CN=86 Runoff=0.17 cfs 0.038 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=2,071 sf 70.88% Impervious Runoff Depth>5.27"
Tc=88.0 min CN=87 Runoff=0.09 cfs 0.021 af

Subcatchment 31S: Units #2&3 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Subcatchment 32S: Units #4&5 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=98 Runoff=0.05 cfs 0.012 af

Subcatchment 33S: Units #6&7 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=98 Runoff=0.05 cfs 0.012 af

Subcatchment 34S: Units #8&9 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=98 Runoff=0.05 cfs 0.012 af

Subcatchment 35S: Units #10&11 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Subcatchment 36S: Units #12&13 Runoff Area=975 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Reach 100R: Final Reach #100 Inflow=2.47 cfs 0.249 af
Outflow=2.47 cfs 0.249 af

Pond 1P: Infiltration Sump Peak Elev=206.51' Storage=616 cf Inflow=0.37 cfs 0.057 af
Discarded=0.16 cfs 0.057 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.057 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.68' Storage=290 cf Inflow=2.60 cfs 0.243 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=2.40 cfs 0.243 af

Pond 4P: Infiltration Sump Peak Elev=207.32' Storage=1,231 cf Inflow=0.99 cfs 0.072 af
Discarded=0.12 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.072 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=207.44' Storage=233 cf Inflow=0.56 cfs 0.250 af
Outflow=0.50 cfs 0.250 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.32' Storage=1,006 cf Inflow=2.45 cfs 0.250 af
Discarded=0.01 cfs 0.017 af Primary=2.34 cfs 0.221 af Outflow=2.36 cfs 0.238 af

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.51' Storage=0 cf Inflow=0.31 cfs 0.138 af
Outflow=0.31 cfs 0.138 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=205.56' Storage=0 cf Inflow=0.18 cfs 0.084 af
Outflow=0.18 cfs 0.084 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=207.00' Storage=452 cf Inflow=0.31 cfs 0.075 af
Outflow=0.17 cfs 0.075 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.30' Storage=101 cf Inflow=0.09 cfs 0.021 af
Discarded=0.06 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.021 af

Total Runoff Area = 3.575 ac Runoff Volume = 0.974 af Average Runoff Depth = 3.27"
60.35% Pervious = 2.158 ac 39.65% Impervious = 1.417 ac

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

Subcatchment 1S: Remaining Area from Runoff Area=25,413 sf 2.07% Impervious Runoff Depth>1.83"
Flow Length=156' Tc=25.5 min CN=45 Runoff=0.65 cfs 0.089 af

Subcatchment 2S: Subcatchment #2 Runoff Area=43,912 sf 35.53% Impervious Runoff Depth>3.93"
Flow Length=122' Tc=14.0 min CN=64 Runoff=3.58 cfs 0.330 af

Subcatchment 3S: Remaining Area Copper Runoff Area=16,731 sf 7.61% Impervious Runoff Depth>1.43"
Flow Length=106' Tc=21.5 min CN=41 Runoff=0.32 cfs 0.046 af

Subcatchment 4S: Infiltration Pond Runoff Area=11,757 sf 14.48% Impervious Runoff Depth>4.28"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=67 Runoff=1.33 cfs 0.096 af

Subcatchment 11S: Porous Pavement & Runoff Area=23,638 sf 80.49% Impervious Runoff Depth>6.79"
Tc=234.0 min CN=91 Runoff=0.68 cfs 0.307 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>1.53"
Tc=6.0 min CN=42 Runoff=0.12 cfs 0.011 af

Subcatchment 21S: Eastern Porous Runoff Area=13,526 sf 64.01% Impervious Runoff Depth>6.08"
Tc=234.0 min CN=85 Runoff=0.36 cfs 0.157 af

Subcatchment 22S: Western Porous Runoff Area=5,079 sf 96.26% Impervious Runoff Depth>7.50"
Tc=234.0 min CN=97 Runoff=0.16 cfs 0.073 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,868 sf 68.25% Impervious Runoff Depth>6.43"
Tc=88.0 min CN=86 Runoff=0.20 cfs 0.048 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=2,071 sf 70.88% Impervious Runoff Depth>6.54"
Tc=88.0 min CN=87 Runoff=0.11 cfs 0.026 af

Subcatchment 31S: Units #2&3 Runoff Area=975 sf 100.00% Impervious Runoff Depth>7.62"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.014 af

Subcatchment 32S: Units #4&5 Runoff Area=975 sf 100.00% Impervious Runoff Depth>7.86"
Tc=88.0 min CN=98 Runoff=0.06 cfs 0.015 af

Subcatchment 33S: Units #6&7 Runoff Area=975 sf 100.00% Impervious Runoff Depth>7.86"
Tc=88.0 min CN=98 Runoff=0.06 cfs 0.015 af

Subcatchment 34S: Units #8&9 Runoff Area=975 sf 100.00% Impervious Runoff Depth>7.86"
Tc=88.0 min CN=98 Runoff=0.06 cfs 0.015 af

Subcatchment 35S: Units #10&11 Runoff Area=975 sf 100.00% Impervious Runoff Depth>7.62"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.014 af

Subcatchment 36S: Units #12&13 Runoff Area=975 sf 100.00% Impervious Runoff Depth>7.62"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.014 af

Reach 100R: Final Reach #100 Inflow=3.47 cfs 0.357 af
Outflow=3.47 cfs 0.357 af

Pond 1P: Infiltration Sump Peak Elev=206.88' Storage=1,122 cf Inflow=0.65 cfs 0.089 af
Discarded=0.19 cfs 0.088 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.088 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=207.87' Storage=470 cf Inflow=3.58 cfs 0.330 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=3.21 cfs 0.330 af

Pond 4P: Infiltration Sump Peak Elev=207.54' Storage=1,696 cf Inflow=1.33 cfs 0.096 af
Discarded=0.17 cfs 0.095 af Primary=0.01 cfs 0.000 af Outflow=0.17 cfs 0.096 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=207.74' Storage=1,102 cf Inflow=0.68 cfs 0.307 af
Outflow=0.50 cfs 0.307 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.46' Storage=1,158 cf Inflow=3.30 cfs 0.341 af
Discarded=0.01 cfs 0.018 af Primary=3.17 cfs 0.312 af Outflow=3.18 cfs 0.330 af

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.51' Storage=1 cf Inflow=0.39 cfs 0.172 af
Outflow=0.39 cfs 0.172 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=205.56' Storage=0 cf Inflow=0.22 cfs 0.101 af
Outflow=0.22 cfs 0.101 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=207.31' Storage=762 cf Inflow=0.38 cfs 0.092 af
Outflow=0.17 cfs 0.092 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.58' Storage=191 cf Inflow=0.11 cfs 0.026 af
Discarded=0.06 cfs 0.026 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.026 af

Total Runoff Area = 3.575 ac Runoff Volume = 1.270 af Average Runoff Depth = 4.26"
60.35% Pervious = 2.158 ac 39.65% Impervious = 1.417 ac

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

Subcatchment 1S: Remaining Area from Runoff Area=25,413 sf 2.07% Impervious Runoff Depth>2.74"
Flow Length=156' Tc=25.5 min CN=45 Runoff=1.05 cfs 0.133 af

Subcatchment 2S: Subcatchment #2 Runoff Area=43,912 sf 35.53% Impervious Runoff Depth>5.24"
Flow Length=122' Tc=14.0 min CN=64 Runoff=4.79 cfs 0.440 af

Subcatchment 3S: Remaining Area Copper Runoff Area=16,731 sf 7.61% Impervious Runoff Depth>2.23"
Flow Length=106' Tc=21.5 min CN=41 Runoff=0.56 cfs 0.071 af

Subcatchment 4S: Infiltration Pond Runoff Area=11,757 sf 14.48% Impervious Runoff Depth>5.64"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=67 Runoff=1.75 cfs 0.127 af

Subcatchment 11S: Porous Pavement & Runoff Area=23,638 sf 80.49% Impervious Runoff Depth>8.30"
Tc=234.0 min CN=91 Runoff=0.83 cfs 0.375 af

Subcatchment 12S: RG/Level Spreader Runoff Area=3,884 sf 2.83% Impervious Runoff Depth>2.37"
Tc=6.0 min CN=42 Runoff=0.21 cfs 0.018 af

Subcatchment 21S: Eastern Porous Runoff Area=13,526 sf 64.01% Impervious Runoff Depth>7.56"
Tc=234.0 min CN=85 Runoff=0.44 cfs 0.196 af

Subcatchment 22S: Western Porous Runoff Area=5,079 sf 96.26% Impervious Runoff Depth>9.03"
Tc=234.0 min CN=97 Runoff=0.19 cfs 0.088 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,868 sf 68.25% Impervious Runoff Depth>7.95"
Tc=88.0 min CN=86 Runoff=0.25 cfs 0.059 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=2,071 sf 70.88% Impervious Runoff Depth>8.08"
Tc=88.0 min CN=87 Runoff=0.14 cfs 0.032 af

Subcatchment 31S: Units #2&3 Runoff Area=975 sf 100.00% Impervious Runoff Depth>9.15"
Tc=234.0 min CN=98 Runoff=0.04 cfs 0.017 af

Subcatchment 32S: Units #4&5 Runoff Area=975 sf 100.00% Impervious Runoff Depth>9.43"
Tc=88.0 min CN=98 Runoff=0.07 cfs 0.018 af

Subcatchment 33S: Units #6&7 Runoff Area=975 sf 100.00% Impervious Runoff Depth>9.43"
Tc=88.0 min CN=98 Runoff=0.07 cfs 0.018 af

Subcatchment 34S: Units #8&9 Runoff Area=975 sf 100.00% Impervious Runoff Depth>9.43"
Tc=88.0 min CN=98 Runoff=0.07 cfs 0.018 af

Subcatchment 35S: Units #10&11 Runoff Area=975 sf 100.00% Impervious Runoff Depth>9.15"
Tc=234.0 min CN=98 Runoff=0.04 cfs 0.017 af

Subcatchment 36S: Units #12&13 Runoff Area=975 sf 100.00% Impervious Runoff Depth>9.15"
Tc=234.0 min CN=98 Runoff=0.04 cfs 0.017 af

Reach 100R: Final Reach #100 Inflow=4.69 cfs 0.526 af
Outflow=4.69 cfs 0.526 af

Pond 1P: Infiltration Sump Peak Elev=207.02' Storage=1,372 cf Inflow=1.21 cfs 0.144 af
Discarded=0.20 cfs 0.114 af Primary=1.20 cfs 0.028 af Outflow=1.40 cfs 0.142 af

Pond 2P: Inlet Sump 15" HDPE N-12 Peak Elev=208.09' Storage=778 cf Inflow=4.79 cfs 0.440 af
15.0" Round Culvert n=0.012 L=60.0' S=0.0050 '/' Outflow=4.13 cfs 0.440 af

Pond 4P: Infiltration Sump Peak Elev=207.71' Storage=2,148 cf Inflow=1.75 cfs 0.127 af
Discarded=0.21 cfs 0.112 af Primary=0.18 cfs 0.011 af Outflow=0.39 cfs 0.123 af

Pond 101P: Porous Pavement W/ Infiltration Peak Elev=208.21' Storage=2,463 cf Inflow=0.83 cfs 0.375 af
Outflow=0.50 cfs 0.376 af

Pond 102P: Rain Garden/Level Spreader W/ Peak Elev=207.60' Storage=1,334 cf Inflow=4.26 cfs 0.458 af
Discarded=0.01 cfs 0.019 af Primary=4.13 cfs 0.427 af Outflow=4.15 cfs 0.446 af

Pond 201P: Porous Pavement W/ Infiltration Peak Elev=205.66' Storage=341 cf Inflow=0.48 cfs 0.213 af
Outflow=0.40 cfs 0.213 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=205.56' Storage=0 cf Inflow=0.26 cfs 0.122 af
Outflow=0.26 cfs 0.122 af

Pond 203P: Porous Pavers W/ Infiltration Peak Elev=207.74' Storage=1,172 cf Inflow=0.46 cfs 0.112 af
Outflow=0.17 cfs 0.112 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.96' Storage=311 cf Inflow=0.14 cfs 0.032 af
Discarded=0.06 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.032 af

Total Runoff Area = 3.575 ac Runoff Volume = 1.643 af Average Runoff Depth = 5.51"
60.35% Pervious = 2.158 ac 39.65% Impervious = 1.417 ac

Appendix III - Calculations, Charts, & Graphs

Extreme Precipitation Tables
Rip Rap Calculations
NHDES AoT Spreadsheets
USDA / NRCS Websoil
NRCS Soil Survey Report
Stormwater System Operation & Maintenance Plan
& Inspection and Maintenance Manual
Infiltration Feasibility Report
Watershed Report Card, 303 (d) List, ORW List

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.892 degrees West
Latitude	43.225 degrees North
Elevation	0 feet
Date/Time	Tue, 23 Nov 2021 13:01:50 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.03	**1yr**	0.70	0.98	1.20	1.54	1.99	2.59	2.87	**1yr**	2.30	2.76	3.16	3.89	4.45	**1yr**
2yr	0.32	0.49	0.61	0.81	1.01	1.28	**2yr**	0.87	1.17	1.50	1.91	2.44	3.14	3.51	**2yr**	2.78	3.37	3.87	4.60	5.24	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.38	3.07	3.97	4.49	**5yr**	3.51	4.32	4.94	5.80	6.56	**5yr**
10yr	0.40	0.63	0.80	1.09	1.42	1.85	**10yr**	1.23	1.69	2.18	2.82	3.65	4.73	5.42	**10yr**	4.18	5.21	5.96	6.92	7.78	**10yr**
25yr	0.47	0.74	0.94	1.30	1.73	2.27	**25yr**	1.49	2.09	2.70	3.52	4.59	5.97	6.94	**25yr**	5.28	6.67	7.63	8.74	9.75	**25yr**
50yr	0.52	0.83	1.07	1.49	2.01	2.67	**50yr**	1.73	2.46	3.19	4.18	5.47	7.13	8.38	**50yr**	6.31	8.06	9.20	10.43	11.57	**50yr**
100yr	0.58	0.94	1.21	1.72	2.33	3.13	**100yr**	2.01	2.89	3.75	4.95	6.50	8.51	10.12	**100yr**	7.53	9.73	11.10	12.45	13.74	**100yr**
200yr	0.65	1.06	1.37	1.96	2.72	3.69	**200yr**	2.34	3.40	4.44	5.89	7.75	10.16	12.22	**200yr**	8.99	11.75	13.39	14.87	16.32	**200yr**
500yr	0.76	1.25	1.63	2.37	3.33	4.56	**500yr**	2.87	4.22	5.52	7.37	9.76	12.86	15.70	**500yr**	11.38	15.09	17.18	18.82	20.51	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.92	1.25	1.54	2.10	2.45	**1yr**	1.85	2.35	2.92	3.43	4.10	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.15	1.36	1.82	2.35	3.05	3.40	**2yr**	2.70	3.27	3.75	4.47	5.08	**2yr**
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.14	2.77	3.70	4.12	**5yr**	3.27	3.96	4.61	5.40	6.10	**5yr**
10yr	0.38	0.59	0.73	1.02	1.31	1.60	**10yr**	1.13	1.56	1.81	2.43	3.12	4.25	4.77	**10yr**	3.76	4.59	5.31	6.21	6.97	**10yr**
25yr	0.44	0.67	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.83	3.63	5.05	5.76	**25yr**	4.47	5.54	6.48	7.49	8.34	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.19	**50yr**	1.52	2.14	2.36	3.19	4.07	5.78	6.64	**50yr**	5.11	6.38	7.52	8.62	9.54	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.51	**100yr**	1.74	2.45	2.64	3.57	4.53	6.61	7.63	**100yr**	5.85	7.34	8.72	9.92	10.89	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.88	**200yr**	1.98	2.81	2.95	4.00	5.05	7.55	8.78	**200yr**	6.68	8.44	10.11	11.41	12.44	**200yr**
500yr	0.70	1.04	1.33	1.94	2.75	3.47	**500yr**	2.38	3.39	3.43	4.64	5.84	8.98	10.55	**500yr**	7.95	10.14	12.28	13.76	14.79	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.23	1.73	2.20	2.84	3.09	**1yr**	2.51	2.97	3.40	4.19	4.76	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.47	1.95	2.51	3.26	3.63	**2yr**	2.88	3.49	4.00	4.75	5.42	**2yr**
5yr	0.39	0.60	0.75	1.03	1.31	1.58	**5yr**	1.13	1.54	1.85	2.49	3.19	4.23	4.86	**5yr**	3.74	4.67	5.30	6.23	7.00	**5yr**
10yr	0.46	0.70	0.87	1.22	1.57	1.91	**10yr**	1.36	1.87	2.23	3.03	3.85	5.19	6.07	**10yr**	4.60	5.84	6.69	7.65	8.52	**10yr**
25yr	0.56	0.85	1.05	1.50	1.98	2.47	**25yr**	1.71	2.41	2.87	3.95	4.95	6.87	8.16	**25yr**	6.08	7.84	8.97	10.07	11.09	**25yr**
50yr	0.64	0.98	1.22	1.75	2.36	2.98	**50yr**	2.04	2.91	3.48	4.81	6.01	8.45	10.22	**50yr**	7.48	9.83	11.23	12.38	13.55	**50yr**
100yr	0.75	1.13	1.42	2.05	2.81	3.59	**100yr**	2.43	3.51	4.23	5.88	7.31	10.41	12.82	**100yr**	9.21	12.33	14.04	15.25	16.57	**100yr**
200yr	0.87	1.31	1.66	2.40	3.35	4.35	**200yr**	2.89	4.26	5.14	7.19	8.88	12.84	16.09	**200yr**	11.36	15.47	17.58	18.77	20.30	**200yr**
500yr	1.07	1.59	2.04	2.97	4.22	5.59	**500yr**	3.64	5.46	6.64	9.40	11.51	16.98	21.73	**500yr**	15.03	20.90	23.68	24.75	26.55	**500yr**

Powered by ACIS

RIP RAP CALCULATIONS

23-053 34 New Rochester Road
Copper Drive & Ember Drive
Dover, NH

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH
7/6/2023/ Rev 11/6/23

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.* Rip Rap was sized for the 25 year storm event. (Some d50 sizes and T values have been modified)

TAILWATER < HALF THE Do

La = (1.8 x Q) / Do 3/2 + (7 x Do) Q = Peak Flow & Do is Pipe Diameter
W = La + 3*Do or defined channel width
d50 = (0.02 x Q4/3) / (Tw x Do) Tw = Tailwater Depth
T = Largest Stone Size x 1.5

Culvert or Catch Basin	Tailwater (Feet) Tw	Discharge (C.F.S.) Q	Diameter of Pipe Do	Length of Rip Rap La (feet)	Width of Rip Rap W (feet)	d50-Stone Rip Rap d50(ft.)	Actual Size	Thickness
12" RCP (Pond #4P)	0.20	0.25	1.00	7.5	10.5	0.02	0.50	1.20

Please note that the designer chose to use the 100 Year Event for the dimensional calculations.

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d50 Size =	0.5	Feet	6	Inches
% of Weight Smaller Than the Given d50 Size	Size of Stone (Inches) From		To	
100%	9		12	
85%	8		11	
50%	6		9	
15%	2		3	

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

0.01	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.48	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = Weighted groundwater recharge depth	
0.1225	ac-in	GRV = AI * Rd	
444	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

GRV Satisified with Porous Pavement #201 (P201), Porous Pavement #202 (P202),
Porous Pavers #203 (P203), & Porous Pavers #204 (P204)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Porous Pavement W/ Infiltration #201**

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 1508.07(a).	
0.38	ac	A = Area draining to the practice	
0.25	ac	A_I = Impervious area draining to the practice	
0.67	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.65	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.25	ac-in	WQV= 1" x Rv x A	
901	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
225	cf	25% x WQV (check calc for sediment forebay volume)	
675	cf	75% x WQV (check calc for surface sand filter volume)	
N/A		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:			
5,821	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
No	Yes/No	(Use the calculations below)	
0.6	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
206.51	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
-	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
204.58	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
204.58	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
206.51	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.93	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.93	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
205.51	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
207.84	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	
2.8	: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		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:

Summary for Pond 201P: Porous Pavement W/ Infiltration #201

Inflow Area = 0.380 ac, 66.99% Impervious, Inflow Depth > 5.41" for 50 Yr.-24 Hr. event
Inflow = 0.39 cfs @ 15.05 hrs, Volume= 0.172 af
Outflow = 0.39 cfs @ 15.06 hrs, Volume= 0.172 af, Atten= 0%, Lag= 1.0 min
Discarded = 0.39 cfs @ 15.06 hrs, Volume= 0.172 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 205.51' @ 15.06 hrs Surf.Area= 5,821 sf Storage= 1 cf
Flood Elev= 207.84' Surf.Area= 5,821 sf Storage= 4,261 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (967.8 - 967.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.51'	2,328 cf	**Stone (Irregular)** Listed below (Recalc) 5,821 cf Overall x 40.0% Voids
#2	206.51'	1,164 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 5,821 cf Overall x 20.0% Voids
#3	207.51'	768 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 1,921 cf Overall x 40.0% Voids
		4,261 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.51	5,821	436.4	0	0	5,821
206.51	5,821	436.4	5,821	5,821	6,257

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.51	5,821	436.4	0	0	5,821
207.51	5,821	436.4	5,821	5,821	6,257

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.51	5,821	436.5	0	0	5,821
207.84	5,821	436.4	1,921	1,921	5,965

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.51'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.40 cfs @ 15.06 hrs HW=205.51' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.40 cfs)

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Porous Pavement W/ Infiltration #202**

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 1508.07(a).	
0.16	ac	A = Area draining to the practice	
0.16	ac	A_I = Impervious area draining to the practice	
0.97	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.93	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.15	ac-in	WQV= 1" x Rv x A	
541	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
135	cf	25% x WQV (check calc for sediment forebay volume)	
406	cf	75% x WQV (check calc for surface sand filter volume)	
N/A		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:			
4,889	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
No	Yes/No	(Use the calculations below)	
0.4	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
206.56	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
-	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
204.68	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
204.68	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
206.56	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.88	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.88	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
205.56	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
207.89	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	
1.4	: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		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:

Summary for Pond 202P: Porous Pavement W/ Infiltration #202

Inflow Area = 0.161 ac, 97.30% Impervious, Inflow Depth > 7.54" for 50 Yr.-24 Hr. event
Inflow = 0.22 cfs @ 14.86 hrs, Volume= 0.101 af
Outflow = 0.22 cfs @ 14.86 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.22 cfs @ 14.86 hrs, Volume= 0.101 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 205.56' @ 14.86 hrs Surf.Area= 4,889 sf Storage= 0 cf
Flood Elev= 207.89' Surf.Area= 4,889 sf Storage= 3,579 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (929.9 - 929.9)

Volume	Invert	Avail.Storage	Storage Description
#1	205.56'	1,956 cf	**Stone (Irregular)** Listed below (Recalc) 4,889 cf Overall x 40.0% Voids
#2	206.56'	978 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 4,889 cf Overall x 20.0% Voids
#3	207.56'	645 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 1,613 cf Overall x 40.0% Voids
		3,579 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.56	4,889	300.0	0	0	4,889
206.56	4,889	300.0	4,889	4,889	5,189

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.56	4,889	300.0	0	0	4,889
207.56	4,889	300.0	4,889	4,889	5,189

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.56	4,889	300.0	0	0	4,889
207.89	4,889	300.0	1,613	1,613	4,988

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.56'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.34 cfs @ 14.86 hrs HW=205.56' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.34 cfs)

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: **Porous Pavers W/ Infiltration #203**

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 1508.07(a).	
0.16	ac	A = Area draining to the practice	
0.13	ac	A_I = Impervious area draining to the practice	
0.82	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.79	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1" x Rv x A	
446	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
111	cf	25% x WQV (check calc for sediment forebay volume)	
334	cf	75% x WQV (check calc for surface sand filter volume)	
N/A		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:			
2,427	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
No	Yes/No	(Use the calculations below)	
0.7	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
206.53	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
-	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
204.73	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
204.73	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
206.53	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.80	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.80	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
207.31	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
208.28	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:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.1	acres	A_{SA} = Surface area of the pervious pavement	
2.8	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
15.0	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:

15" Stone Base for the Pavers, grassed area, & porous paver area

Summary for Pond 203P: Porous Pavers W/ Infiltration #203

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=70)

Inflow Area = 0.156 ac, 81.92% Impervious, Inflow Depth > 7.04" for 50 Yr.-24 Hr. event
Inflow = 0.38 cfs @ 13.13 hrs, Volume= 0.092 af
Outflow = 0.17 cfs @ 12.60 hrs, Volume= 0.092 af, Atten= 55%, Lag= 0.0 min
Discarded = 0.17 cfs @ 12.60 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 207.31' @ 14.19 hrs Surf.Area= 2,427 sf Storage= 762 cf
Flood Elev= 208.28' Surf.Area= 2,427 sf Storage= 1,563 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 28.7 min (860.3 - 831.6)

Volume	Invert	Avail.Storage	Storage Description
#1	206.53'	1,456 cf	**Stone (Irregular)** Listed below (Recalc) 3,641 cf Overall x 40.0% Voids
#2	208.03'	107 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 534 cf Overall x 20.0% Voids
		1,563 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.53	2,427	645.5	0	0	2,427
208.03	2,427	645.5	3,641	3,641	3,395

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.03	2,427	645.5	0	0	2,427
208.25	2,427	645.5	534	534	2,569

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.53'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.17 cfs @ 12.60 hrs HW=206.56' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.17 cfs)

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: **Porous Pavers W/ Infiltration #204**

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 1508.07(a).	
0.05	ac	A = Area draining to the practice	
0.34	ac	A_I = Impervious area draining to the practice	
7.09	decimal	I = Percent impervious area draining to the practice, in decimal form	
6.43	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.31	ac-in	WQV= 1" x Rv x A	
1,120	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
280	cf	25% x WQV (check calc for sediment forebay volume)	
840	cf	75% x WQV (check calc for surface sand filter volume)	
N/A		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:			
794	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
No	Yes/No	(Use the calculations below)	
5.6	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
207.98	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
204.58	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
204.58	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
207.98	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
3.40	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
3.40	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
208.58	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
209.23	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:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
2.6	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
9.0	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:

9" Stone Base for the Pavers, only receiving roof runoff, grassed area, & porous paver area

Summary for Pond 204P: Porous Pavers W/ Infiltration #204

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=75)

Inflow Area = 0.048 ac, 70.88% Impervious, Inflow Depth > 6.54" for 50 Yr.-24 Hr. event
Inflow = 0.11 cfs @ 13.15 hrs, Volume= 0.026 af
Outflow = 0.06 cfs @ 12.65 hrs, Volume= 0.026 af, Atten= 50%, Lag= 0.0 min
Discarded = 0.06 cfs @ 12.65 hrs, Volume= 0.026 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 208.58' @ 14.09 hrs Surf.Area= 794 sf Storage= 191 cf
Flood Elev= 209.23' Surf.Area= 794 sf Storage= 357 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 21.5 min (872.2 - 850.6)

Volume	Invert	Avail.Storage	Storage Description
#1	207.98'	318 cf	**Stone (Irregular)** Listed below (Recalc) 794 cf Overall x 40.0% Voids
#2	208.98'	79 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 397 cf Overall x 20.0% Voids
		397 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.98	794	278.8	0	0	794
208.98	794	278.8	794	794	1,073

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.98	794	278.8	0	0	794
209.23	794	278.8	199	199	864
209.48	794	278.8	199	397	933

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.98'	**3.000 in/hr Infiltration 3in/hr over Surface area**
#2	Primary	209.23'	**52.0' long x 2.0' breadth Overflow** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.06 cfs @ 12.65 hrs HW=208.00' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.98' TW=205.51' (Dynamic Tailwater)
2=Overflow (Controls 0.00 cfs)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Strafford County, New Hampshire



November 23, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,130 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

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 22, Aug 31, 2021

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HbE	Hinckley loamy sand, 15 to 60 percent slopes	0.0	0.2%
WdA	Windsor loamy sand, 0 to 3 percent slopes	19.1	99.8%
Totals for Area of Interest		**19.2**	**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

HbE—Hinckley loamy sand, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: 2svmh
Elevation: 0 to 890 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, nose slope, side slope, head slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Outwash terraces, moraines, eskers, kames, kame terraces, outwash deltas, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, nose slope, side slope, head slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, side slope, head slope, nose slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

WdA—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash plains, outwash terraces, deltas, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

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TEST PIT DATA:

TEST PIT #1
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #2
0–10" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–24" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
24–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–74" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 74"
REFUSAL @ N/A

TEST PIT #3
0–10" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–22" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
22–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–76" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 76"
REFUSAL @ N/A

TEST PIT #4
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, LOAM FINE SAND, GRANULAR, FRIABLE
8–12" 7.5YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
12–22" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
22–38" 10YR 5/4 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
38–78" 10YR 6/2 LIGHT BROWNISH GRAY, SAND WITH REDOX. FEAT. PRESENT, LOOSE, SINGLE GRAIN
E.S.H.W.T. @ 38"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ 54"
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #5
0–10" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–30" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
30–36" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
36–76" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 36"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 76"
REFUSAL @ N/A

TEST PIT #6
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20" 7.5 YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
20–30" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
30–42" 10YR 4/6 YELLOWISH BROWN, GRAVELLY SAND, GRANULAR, FRIABLE
42–78" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 42"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #7
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18" 7.5 YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
18–30" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
30–42" 10YR 4/6 YELLOWISH BROWN, GRAVELLY SAND, GRANULAR, FRIABLE
42–78" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 42"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #8
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20" 7.5 YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
20–34" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
34–44" 10YR 4/6 YELLOWISH BROWN, GRAVELLY SAND, GRANULAR, FRIABLE
44–78" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 44"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #9
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–28" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
28–41" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
41–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 41"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #10
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 32"
REFUSAL @ N/A

TEST PIT #11
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 32"
REFUSAL @ N/A

TEST PIT #12
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 32"
REFUSAL @ N/A

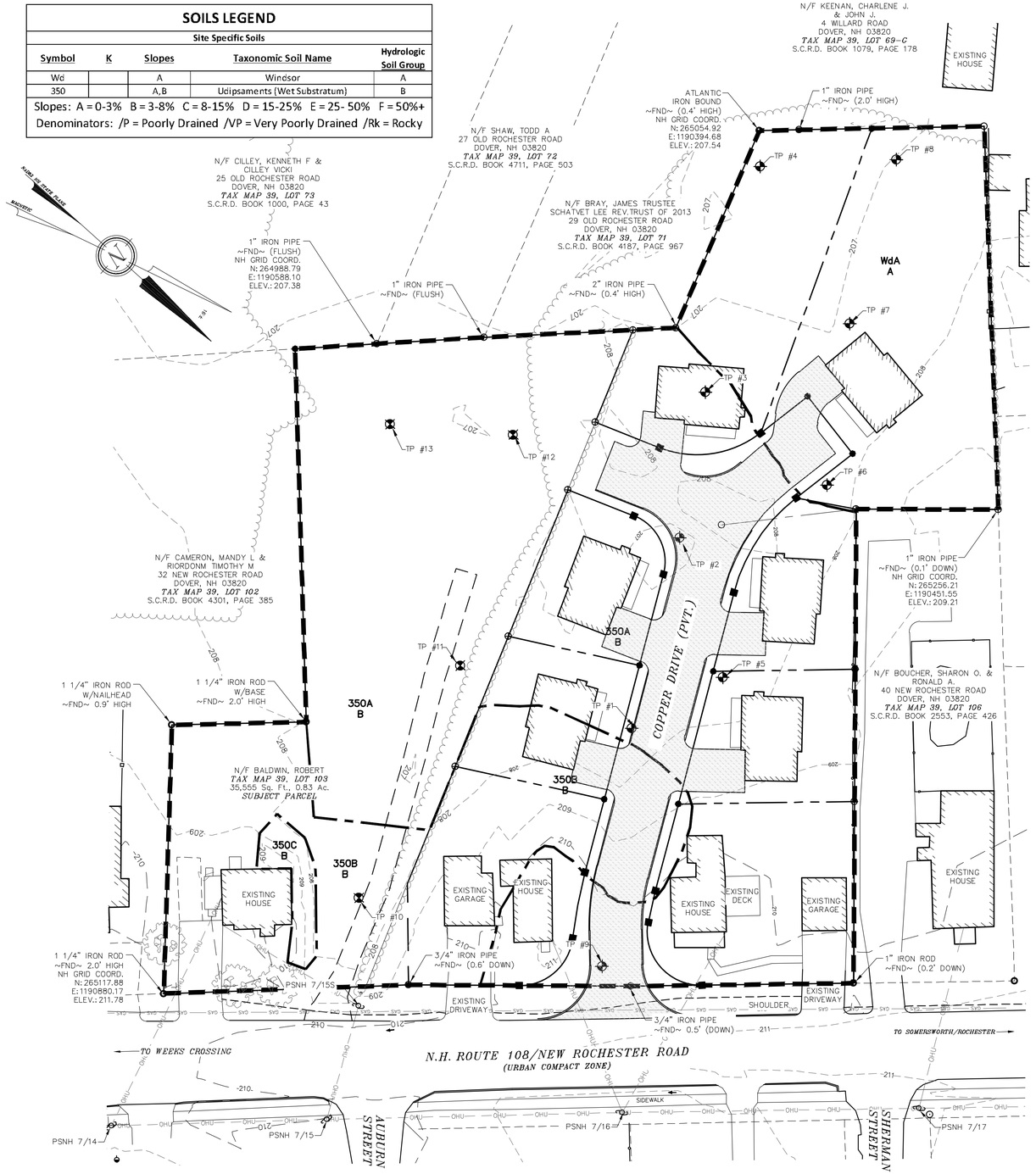
TEST PIT #13
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 32"
REFUSAL @ N/A

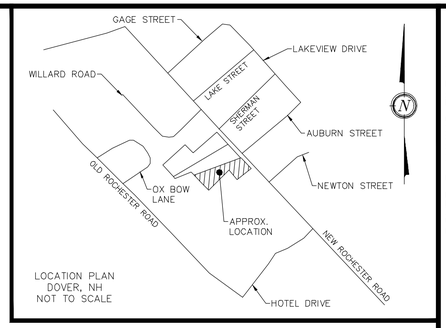
SOILS LEGEND

Site Specific Soils

Symbol	K	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd		A	Windsor	A
350		A,B	Ucipsamments (Wet Substratum)	B

Slopes: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25- 50% F = 50%+
Denominators: /P = Poorly Drained /VP = Very Poorly Drained /Rk = Rocky





NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING SOIL CONDITIONS OF TAX MAP 39, LOTS 103 & 104 LOCATED IN DOVER, N.H.

WETLAND NOTES:

1. WETLANDS WERE DELINEATED BY JOHN P. HAYES IN MAY OF 2023. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

NO WETLANDS WERE FOUND ON SITE.

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

CHRISTOPHER R. BERRY
NH PERMITTED DESIGNER #1886

LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- UTILITY POLE
- TEST PIT
- OHU — OHU — OHU — OVERHEAD UTILITIES LINE
- 276 — EXISTING CONTOUR MINOR
- 275 — EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- WdA — SOIL SERIES
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

SITE SPECIFIC SOILS MAP
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE No. 805 KENNETH A. BERRY LICENSED LAND SURVEYOR
SIGNATURE

NOT FOR CONSTRUCTION

John P. Hayes III CSS, CWS,
7 Limestone Way
North Hampton, NH 03862
603-205-4396
johnphayes@comcast.net

2/22/22

Christopher Berry **Job # 22-003**
Berry Surveying and Engineering
335 Second Crown Point Road
Barrington NH 03825

2/15/22
Site Specific Soil Survey
Map 39 Lots 104 & 105
36 & 38 New Rochester Road Dover , NH

Dear Chris,

This letter report presents the findings of a Site Specific Soil Survey conducted on the referenced properties by John P. Hayes III on February 15, 2022. The soil survey was conducted in accordance with the New Hampshire Supplement of the Site-Specific Soil Mapping Standard For New Hampshire and Vermont, Version 5.0, December 2017, Special Publication # 3, published by the Society of Soil Scientist of Northern New England.

The properties that are subject of the soil survey is located on the southwest side of of New Rochester road, and southeast of Willard Drive in Dover, NH. The mapped area of the two pacels is 1.6 acres in size. The plans used for these soil maps are a 30 scale plan, where 1 inch equals 30 feet, with one foot contours.

The purpose of the soil survey is to provide the client with soils information for urban and suburban or rural land planning. Soil characteristics on the property were evaluated through observation of numerous test pits, and hand auger probes conducted throughout the property. Slope phases were determined with the use of the topography provided on the plan. The Site-specific Soil Map Units identified are taken from the New Hampshire State-Wide Numerical Soils Legend, Issue #10 January 2011, and are briefly described below. Official Series Descriptions (OSD) for each of these soil series are enclosed with this report. The soil map units comply with the Range In Characteristics described in the OSD. Any limiting enclusions on the site, do not exceed 15 percent of any of the soil map units. Dissimilar inclusions, if any, will be noted in the report. Limits of the Site Specific mapping units are highlighted on the plan. The Hydrological Soil Groups for each of the soil series was determined using SSSNNE Publication No. 5 Ksat Values for New Hampshire Soils September 2009. Limits of the Site Specific mapping units are highlighted on the plan.

Portions of the soil map with the map unit 350, contain disturbed soils that have been excavated and/or regraded, that are moderately well drained, and sandy in texture, A Disturbed Soil Mapping Unit Supplement for New Hampshire DES AoT Site Specific Soil Maps, is also included. This supplement explains the additional information given about each of the disturbed soil map units that are present on the site.

MAP UNIT #	SOIL TAXANOMIC NAME	SLOPES	HYDROLOGIC SOIL GROUP	DESCRIPTION
Wd (State No. 26)	**Windsor**	**A**	**A**	The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. These soils are found in the southwest portion of the property. These soils are deep to bedrock. Saturated hydraulic conductivity is high or very high. Some inclusions of Deerfield soils may be present, but are less than 10 percent of the mapped areas.Estimated seasonal high water tables in these soils range from 38 to 44 inches.
350 (dbadb)	**Udipsamments Wet Substratum**	**A B**	**B**	Udipsamments are disturbed soils that have been excavated and/or regraded and are sandy in texture. These disturbed soils are located on the northeast portion of the mapped area, near the road and around the present structures. These disturbed soils are mostly derrived from the Deerfield soil series. They have a sandy substratum overlain with a layer of gravelly loamy sand fill material and topsoil. These soils are moderately well drained, and are deep to bedrock. Saturated hydraulic conductivity is high or very high. Estimated seasonal high water tables in these soils range from 30 to 36 inches.

Slope Phases

Alpha Slope Symbol	Range
A	**0 – 3%**
B	**3 – 8%**
C	**8 – 15%**
D	**15 – 25%**
E	**25 – 50%**
F	**> 50%**

I trust that this Soil Survey and report meet your current planning needs. Please do not hesitate to contact me if you have any questions.

Sincerely:

John P. Hayes III CSS, CWS



NOTES:

1.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

2.) 2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) EXISTING CONDITIONS INFORMATION IS BASED ON A SURVEY PERFORMED BY BERRY SURVEYING & ENGINEERING, FOR DETAILS SEE EXISTING CONDITIONS PLAN AND PLAN SET COMPLETED.

6.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE DRAINAGE INFRASTRUCTURE THAT REQUIRES PERIODIC INSPECTION AND MAINTENANCE. IT IS TO ACCOMPANY A DOCUMENT ENTITLES "INSPECTION AND MAINTENANCE MANUAL, STORMWATER SYSTEM MANAGEMENT PUBLISHED BY BERRY SURVEYING & ENGINEERING ON THE SAME DATE.

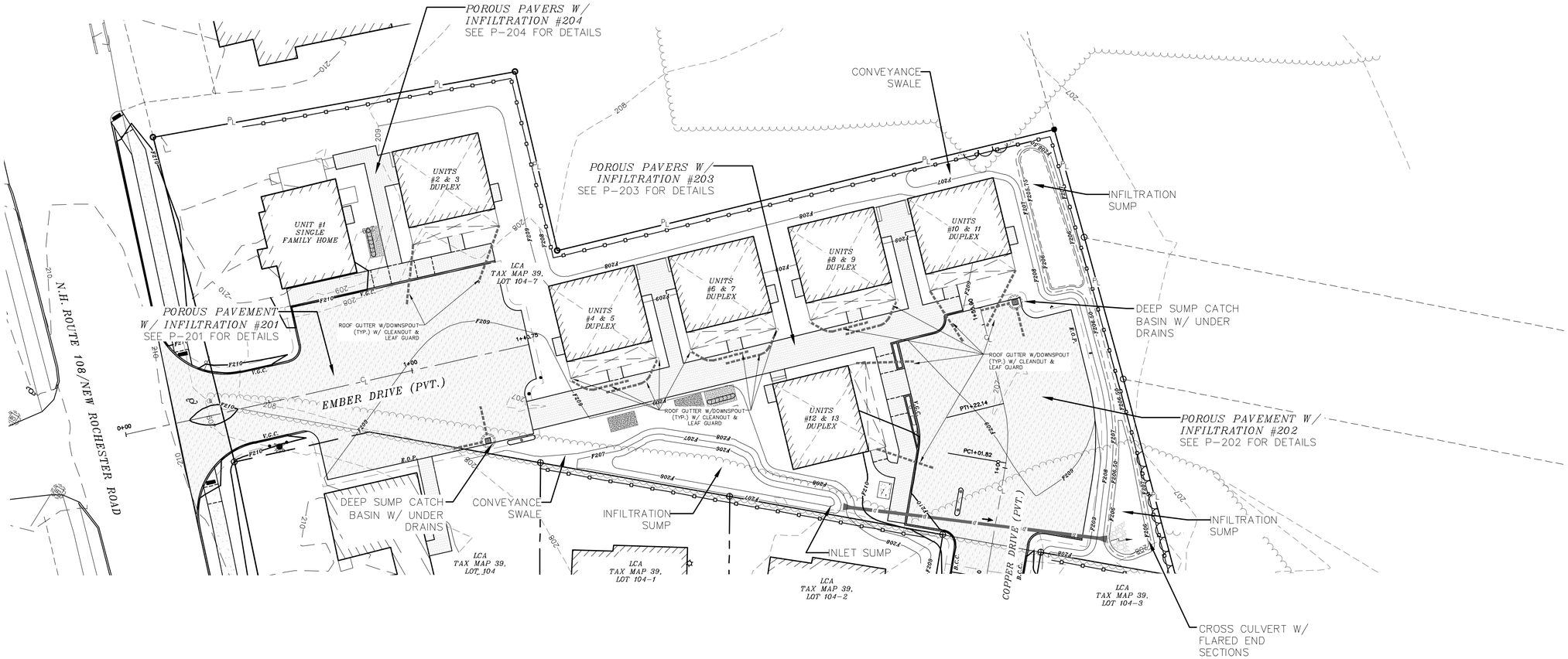
7.) THIS PLAN IS TO ACCOMPANY THE INSPECTION, OPERATIONS, & MAINTENANCE PLAN FOR EXISTING COPPER DRIVE FOR COMPLETE SITE OPERATIONS.

NOTE: HALF SCALE PLANS, (11-INCHES X 17-INCHES) WILL HAVE A SCALE THAT IS TWICE THE PUBLISHED SCALE.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



NOT FOR CONSTRUCTION

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

INSPECTION, OPERATIONS, AND MAINTENANCE PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

BERRY SURVEYING & ENGINEERING
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Barrington, NH 03825
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Stormwater System Management:

Inspection and Maintenance Manual

Copper Drive & Ember Drive
Dover, NH 03820

Prepared for:

Knox Marsh Development LLC
242 Central Avenue
Dover, NH 03820

Land of

Robert Baldwin
242 Central Avenue
Dover, NH 03820

34 New Rochester Road, Dover, NH
Tax Map 39, Lot 103

Prepared By

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825
603-332-2863

Project Number:
DB2023-053

July 6, 2023
Rev: November 6, 2023

Stormwater System Management:

Inspection and Maintenance Manual

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Control of Invasive Plants, NH Department of Agriculture Attached – 4 Pages

Introduction

The Best Management Practices (BMP) described in this manual are specified in more detail within the plan set giving design details and specifications. The New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA) is included by reference to this manual. Additional details, construction specifications, and example drawings are provided within this reference. (http://des.nh.gov/organization/divisions/water/stormwater/)

The BMP's are covered below in the general order in which the storm water flows. Each BMP has a description and maintenance consideration listed. A Check List table is proved after the narrative to summarize the maintenance responsibilities and schedule. A Log Form is also provided for the owners use.

For details regarding the design of the Storm Water System see also Drainage Analysis & Sediment and Erosion Control Plan also published by Berry Surveying & Engineering dated July 6, 2023. See also plan set completed for Knox Marsh Development, LLC dated July 6, 2023, as revised.

Robert Baldwin, owner, and managing member of Knox Marsh Development, is responsible for the Stormwater System Operation and Maintenance that will be constructed on this property. A significant step in this responsibility is the Inspection and Maintenance of each component of the system. Ongoing, semi-annual, and annual inspection and maintenance requirement are documented below and must be taken seriously. Failure of any component of the system can result in surface water run-off ponding and/or freezing in the driveway and parking lots, leaving the developed site untreated, and/or causing violations to issued permits. The owner must maintain, and have available, plans of the Stormwater System in order properly inspect and maintain the system. (Reduced copies attached.) Robert Baldwin is responsible to ensure that any subsequent owner, owners association, or subcontractor has copies of the Log Form and Annual Report records and fully understands the responsibilities of this plan. The grantor owner will ensure this document is provided to the grantee owner by duplicating the Ownership Responsibility Sheet which is found toward the back of this document, which will be maintained with the Inspection & Maintenance Logs, provided to the City of Dover Engineering Department, DPW, Dover Community Services with the Annual Report.

Knox Marsh Development, LLC is proposing to develop six new duplex structures in addition to the existing single-family home on Tax Map 39, Lot 103 and the conversion of two single family homes to duplex structures on Tax Map 39, Lot 104 (lot merger proposed).

The following drainage features will all require periodic inspections and maintenance based on this manual:

Porous Pavement w/ Infiltration #201

Porous Pavement w/ Infiltration #202

Porous Pavers w/ Infiltration #203

Porous Pavers w/ Infiltration #204

Infiltration Sump

Inlet Sump & Cross Culvert W/ Flared End Sections

Deep Sump Catch Basins

Conveyance Swale

Outlet Protection

Stabilization for Long Term Cover

Porous Asphalt Pavement/Pavers & Infiltration Bed

Description: The Permeable Pavement system consists of a porous pavement surface and permeable sub-base materials that is going to allow infiltration of surface water runoff into the native subsoil. The layers of the sub-base materials serve as a filter for the runoff prior to infiltration. Care must be taken during the preparation of the sub-base materials to ensure operation of the infiltration bed and the sub-soil under the system must be scarified to a depth of two-feet below the system to ensure that the soil has not become compacted and does not contain topsoil remnants or boulders.

Maintenance Considerations: No winter sand will be used on permeable pavement and will minimize application of salt for ice control. **Pavement Vacuuming** - Due to the nature of porous pavement, sand must be removed by vacuuming on a regular basis when the pores become clogged two to four times per year. This process varies due to the amount of sand and sweeping efforts but should be investigated two to four times every year. The life expectancy of the porous asphalt pavement system is about 20 years following the prescribed regular maintenance schedule.

In-Ground Infiltration Basin

Description: Infiltration basins are impoundments designed to temporarily store runoff, allowing all or a portion of the water to infiltrate into the ground. An infiltration basin is designed to completely drain between storm events. An infiltration basin is specifically designed to retain and infiltrate the entire Water Quality Volume. Some infiltration basins may infiltrate additional volumes during larger storm events, but many will be designed to release stormwater exceeding the water quality volume from the larger storms. In a properly sited and designed infiltration basin, water quality treatment is provided by runoff pollutants binding to soil particles beneath the basin as water percolates into the subsurface. Biological and chemical processes occurring in the soil also contribute to the breakdown of pollutants. Infiltrated water is used by plants to support growth or it is recharged to the underlying groundwater. As with all impoundment BMPs, surface infiltration basins should be designed with an outlet structure to pass peak flows during a range of storm events, as well as with an emergency spillway to pass peak flows around the embankment during extreme storm events that exceed the combined infiltration capacity and outlet structure capacity of the facility. See SWM Volume 2, 4-3.3b, Treatment Practices, In-Ground Infiltration Basin, page 88.

Maintenance Considerations: Removal of debris from inlet and outlet structures. Removal of accumulated sediment. Inspection and repair of outlet structures and appurtenances. Inspection of infiltration components at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection. Inspection and removal of

accumulated sediment as warranted by inspection, but no less than once annually. Periodic mowing of embankments. Removal of woody vegetation from embankments. Inspection and repair of embankments and spillways. If an infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional 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 reconstruction of the infiltration trench.

Culvert Inlet Sumps & Cross Culvert w/ Flared End Sections

Description: In one location, to capture the surface water runoff that is trapped within the inside of the residential roadway and residential runoff from back yards, there is a Residential Inlet Sump. This culvert pipe, flared end sections, and constructed sump will collect the runoff that is directed to that location during and after the residential development. The culvert will allow the runoff to discharge and not allow water to pond to the house elevations in the back yards. The location of the Residential Inlet Sump will be marked and identified with headwall and bollards.

Maintenance Considerations: Vegetation and debris will need to be removed from the culvert inlet several times a year, especially late fall after the majority of the leaves have fallen and in the spring. In addition to the sump and culverts themselves, the drainage channel will need to be inspected to ensure that the runoff intended to get to the inlets is making it to the sump. The identification fence post will be inspected for structural condition and painted condition.

Deep Sump Catch Basin

Description: A deep sump catch basin consists of a manhole-type structure with an inlet grate, an outlet pipe connected to the piped drainage system, and a sump with a depth several times the diameter of the outlet pipe. The inlet grate is located at the surface, and is sometimes combined with a vertical inlet integrated with a street or parking area curb. The sump's purpose is to capture coarse sediments and debris from the runoff intercepted by the structure. The outlet pipe can be fitted with a "hood" consisting of a cast metal or formed plastic fitting, designed to prevent floating materials from exiting the structure. Deep sump catch basins used as pretreatment are most effective if sited "off-line" since flow-through basins are more susceptible to sediment re-suspension. All pretreatment deep sump catch basins will have an outlet pipe hood which extends one-foot below the outlet invert and will include a hood vent. During construction the catch basins will be protected by inlet protection per the approved construction plans. Hoods are to be installed during initial construction. See SWM Volume 2, 4-4.5 Pre-treatment Practices, 5. Pre-treatment Swales, page 144.

Maintenance Considerations:

Catch basins may require frequent maintenance. Depending on location, this may require several cleanings of the sumps each year. At a minimum, it is recommended that catch basins be inspected at least twice annually, once following snow-melt and once following leaf drop, and cleaned as indicated by inspection. Sediment should be removed when it approaches half the sump depth. If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other method and disposed in conformance with applicable state and federal regulations. Cleaning may require Vacuum-truck instead of "clam-shell" to avoid damage to hood. Damaged hoods should be replaced when noted by inspection.

Conveyance Swales

Description: "Swales are stabilized channels designed to convey runoff at non-erosive velocities." (NHDES SWM) They will be trapezoidal or parabolic in section view. A conveyance swale is intended to move surface water runoff from one point to another where as a treatment swale will slow the velocity to a point where sediment will settle out of the stormwater flow. A treatment swale will be constructed to a width of between four and eight feet and have a minimum length of 100 feet. The flow characteristics will also meet design criteria. See SWM Volume 2, 4.3 Treatment Practices, 5. Treatment Swales, page 123.

Project Intent: The swales are individually designed in the drainage analysis and specified on the design plans. The designed swales must have greater than 85% vegetated growth prior to receiving runoff. The bottom of a treatment swale must be above the seasonal high water table.

Maintenance Considerations: Grassed swales will be inspected twice annually, removing accumulated sediment and gross solids. Grass will be mowed periodically but to a depth of not less than 4 inches. Any damage to the vegetation will be repaired and woody vegetation and invasive vegetation will be removed.

Rip Rap Outlet Protection

Description: Outlet Protection consists of a riprap apron or preformed scour hole that is designed to provide velocity reduction of the surface water run-off that is leaving a culvert. The design is dependent on the culvert size, soil conditions, velocity, and quantity of the run-off. There are to be no bend or curves at the intersection of the

conduit and apron. Ref.: NHDES SWM Volume 2, Section 4-6 Conveyance Practices, 6. Outlet Protection and 1. Detention Ponds, Note 3, Page 158.

Maintenance Considerations: The riprap outlet protection will be inspected annually for damage, which must be corrected immediately. Any sediment buildup will be removed and disposed of correctly. This material will be cleaned out along with any gross solids and disposed of properly. (See invasive species below) Any rip rap that has been displaced from the original construction will be repaired, especially recreating the level lip.

Stabilization for Long Term Cover

Vegetated Stabilization – Original Planting

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

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

Conservation Mix

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	15	0.35
Creeping Red Fescue	15	0.35
Annual Ryegrass	5	0.12
Perennial Ryegrass	5	0.12
Kentucky Bluegrass	15	0.35
White Clover	7	0.16
Total	**62**	**1.45**

Conservation Mix will used to stabilize all 2:1 slopes and all land area disturbed within the wetland buffer. As the site is to be stabilized with erosion control mix as a mulch, the vegetation should be established with a high percentage of white clover for growth to be established. Conservation Mix will also be used to plant and stabilize the erosion control mix mulch. Seed will originally be applied by hydroseeding which includes a tackifier. Due to the shade factor of the solar panels, special care must be taken to establish growth.

Snow Storage Areas & Winter Maintenance

Description: The effective use of salt and sand for winter maintenance is both a cost and an environmental consideration. In accordance with City of Dover Chapter 153-14 A, Snow and ice removal shall be performed by a contractor certified by the "Green SnoPro" program, or approved equivalent, following the Best Management Practices for the application of deicing materials. The use of salt for deicing will be minimized. De-icing logs will be maintained for the development.

Maintenance Considerations: Snow will be stockpiled in designated area during the course of the winter and any excess snow will be taken off-site and disposed of in an appropriate area. As the snow is melting in the spring, sand will be swept and removed from the site. The catch basin sumps will be scheduled for one of the two annual cleanings in the early spring.

Reference is made to the NHDES Green SnoPro program and Minnesota Pollution Control Agency document "Winter Parking Lot and Sidewalk Maintenance Manual".

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

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

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;

- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

See the attached pages prepared by the New Hampshire Department of Agriculture.

Annual Report

Description: The owner is responsible to keep an **I & M Activity Log** that documents inspection, maintenance and repairs to the storm water management system, and a **Deicing Log** to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner (s) have copies of the Stormwater System Management: Inspection and Maintenance Manual, copies of past logs and check lists. This includes any owner association for potential condominium conversion of the property. The Annual Report will be prepared and submitted to the City of Dover Engineering Department with copies of both logs and check lists no later than December 15th of each year. Upon an ownership change, the Annual Report will include the Transfer of Ownership Responsibility Forms duplicated from the form found below.

The plan set that accompanies this project includes a grading and drainage plan, construction details, and a sediment & erosion control plan. The Inspection and Maintenance Plan is attached.

Respectfully
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Design Engineer &
Project Manager

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
Principal, VP – Technical Operations

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Checklist

Residential Development

Knox Marsh Development
Copper Drive & Ember Drive
(34 New Rochester Road)
Dover, NH

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Pavement Sweeping	Three Times Per Year	N/A	N/A
		Litter/Trash Removal	Routinely	Inspect dumpsters, outdoor waste receptacles area, and yard areas.	Parcel will be free of litter/trash.
		Deicing Agents	N/A	N/A	Use salt as the primary agent for roadway safety during winter.
		Closed Drainage System:			
		Porous Pavement	2-4 times per year	Check for sediment and debris accumulation buildup.	Vaccuum pavement to remove debris

☑	Date	BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
		Winter Maintenance	Ongoing	Remove snow as directed.	Ongoing
		Infiltration Sumps	Annually	72-Hour drawdown time evaluation and vegetation evaluation.	Remove dead & diseased vegetation along with all debris, take corrective measures of filtration surface if required.
		Post Winter Maintenance	Annually	Remove excess sand, gross solids, and repair vegetation and plantings	Parcel will be free of excess sand, litter/trash. Vegetation per approved plans.
		Annual Report	1 time per year	Submit Annual Report to Dover Engineering Department and kept on file by the owner.	Report to be submitted on or before December 15th each year.

Inspection Checklist: Page 3

Porous Pavement w/ Infiltration #201

Porous Pavement w/ Infiltration #202

Porous Pavers w/ Infiltration #203

Porous Pavers w/ Infiltration #204

Infiltration Sump

Inlet Sump & Cross Culvert W/ Flared End Sections

Deep Sump Catch Basins

Conveyance Swale

Outlet Protection

Stabilization for Long Term Cover

Inspection Notes:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Residential Development
Knox Marsh Development
Copper Drive & Ember Drive
(34 New Rochester Road)
Dover, NH

BMP / System	Date Inspected	Inspector	Cleaning/Repair (List Items & Comments)	Repair Date	Performed By:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Deicing Log Form

Residential Development
Knox Marsh Development
Copper Drive & Ember Drive
(34 New Rochester Road)
Dover, NH

Date	Amount Applied	Performed By:	Date	Amount Applied	Performed By:

STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN CERTIFICATION

Owner	Responsibility
Name: ROBERT BALDWIN, MANAGING MEMBER Address: 242 Central Avenue DOVER, NH 03820 Telephone: 603-986-2373 E-Mail Address: Robert@centralfallsrealty.com	The owner is responsible for the conduct of all construction activities, and ultimate compliance with all the provisions of the Stormwater System Operation & Maintenance Plan and the implementation of the Inspection and Maintenance Manual.

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Printed Name:

Representing:

Control of Invasive Plants

New Hampshire
Department of Agriculture,
Markets & Food
Douglas Cygan
603-271-3488
doug.cygan@agr.nh.gov

This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. **Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article.** Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.
Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.
Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.
Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.
MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.
Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may *applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.*

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.
Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum* obtusifolium). *Control:* (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.
Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.
Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.
Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.
Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.
Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)
Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.

Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.
Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.
Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

(1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.
(2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.
(3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.
(4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.
(5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
(6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.
(7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.
(8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.
(9) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.
(10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.
(11) FOLIAR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some

plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

Pavement Temp. (°F) and Trend (↑ ↓)	Weather Condition	Maintenance Actions	Application Rate (lbs/per 1000 sq.ft.)			
			Salt Prewetted/Pretreated with salt brine	Salt Prewetted/Pretreated with other blends	Dry salt	Winter sand
>30 ↑	Snow	Plow, treat intersections only				Not recommended
	Frz. Rain	Apply chemical				Not recommended
30 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				Not recommended
25 - 30 ↑	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				Not recommended
25 - 30 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
20 - 25 ↑	Snow or frz. Rain	Plow and Apply chemical				3.25 for frz. Rain
20 - 25 ↓	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
15 - 20 ↑	Snow	Plow and apply chemical				Not recommended
	Frz. Rain	Apply chemical				3.25
15 - 20 ↓	Snow or Frz. Rain	Plow and apply chemical				3.25 for frz. Rain
0 to 15 ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended		Not recommended	5.0 and spot-treat as needed
< 0	Snow	Plow, treat with blends, sand hazardous areas	Not recommended		Not recommended	5.0 and spot-treat as needed

Table 19. Application Rates for Deicing

These rates & table format are based on road application guidelines (Mn Snow & Ice Control Field Handbook, Manual 2005-1). Develop your own application rates by adjusting your current rates incrementally downward toward these guidelines. Where temperature categories overlap, select the rate most applicable to your situation.

Infiltration Feasibility Report

Copper Drive & Ember Drive
Dover, NH 03820

Prepared for:

Knox Marsh Development LLC
242 Central Avenue
DOVER, NH 03820

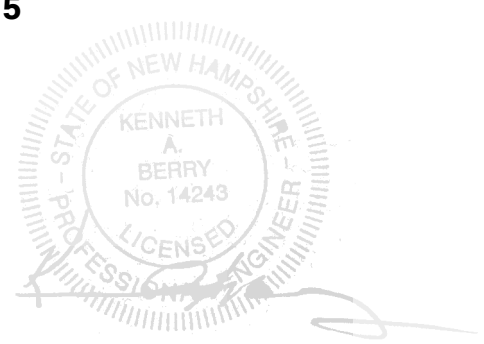
Land of

Robert Baldwin
242 Central Avenue
DOVER, NH 03820

34 NEW ROCHESTER ROAD, DOVER, NH
TAX MAP 39, LOT 103

Prepared by:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825



Project Number:
DB 2023-053

July 6, 2023
Revised: November 6, 2023

Table of Contents

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2.0	Existing Topography at Location of Practice	Page 2
3.0	Test Pit Location	Page 3
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5.0	Profile Descriptions	Page 13
6.0	Soil Plan	Page 14
7.0	Summary of Infiltration Rates	Page 18

1.0 Location of Practices:

The project proposes four locations of infiltration for ground water recharge as well as channel flow protection purposes. The following is a list by Pond number designation in the HydroCAD report (Pond #X). This Infiltration Feasibility Report is supplemental to the original Copper Drive Infiltration Feasibility Report that has been approved (Dover Project #P22-27).

Porous Pavement w/ Infiltration #201 (201P) is considered as Ember Drive. Flow is received from the porous pavement area itself, several roofs via gutters and downspouts, grassed area and pavement from New Rochester Road. The contributing area to the porous pavement is less than 5:1.

Porous Pavement w/ Infiltration #202 (202P) is considered the extension of Copper Drive paved roadway and parking area. Flow is received from the porous pavement area itself, several roofs via gutters and downspouts, and a small grassed area. The contributing area to the porous pavement is less than 5:1.

Porous Pavers w/ Infiltration #203 (203P) is considered as the porous paver walkway adjacent to duplex units #4-13. Flow is received from the porous paver area itself and adjacent grassed area. The contributing area to the porous pavers is less than 5:1.

Porous Pavers w/ Infiltration #204 (204P) is considered as the porous paver walkway adjacent to duplex units #2-3. Flow is received from the porous paver area itself, roof runoff from the existing single family home, and adjacent grassed area. The contributing area to the porous pavers is less than 5:1.

2.0 Existing topography at the location of the practices

Porous Pavement #201 (201P) is proposed across an area of roughly 5% or less slope that is currently residential lawn.

Porous Pavement #202 (202P) is proposed across an area of roughly 3% or less slope that is currently residential lawn and a portion of wooded area.

Porous Pavers #203 (203P) is proposed across an area of roughly 3% or less slope that is currently residential lawn.

Porous Pavers #204 (204P) is proposed across an area of roughly 5-8% or less slope that is currently residential lawn.

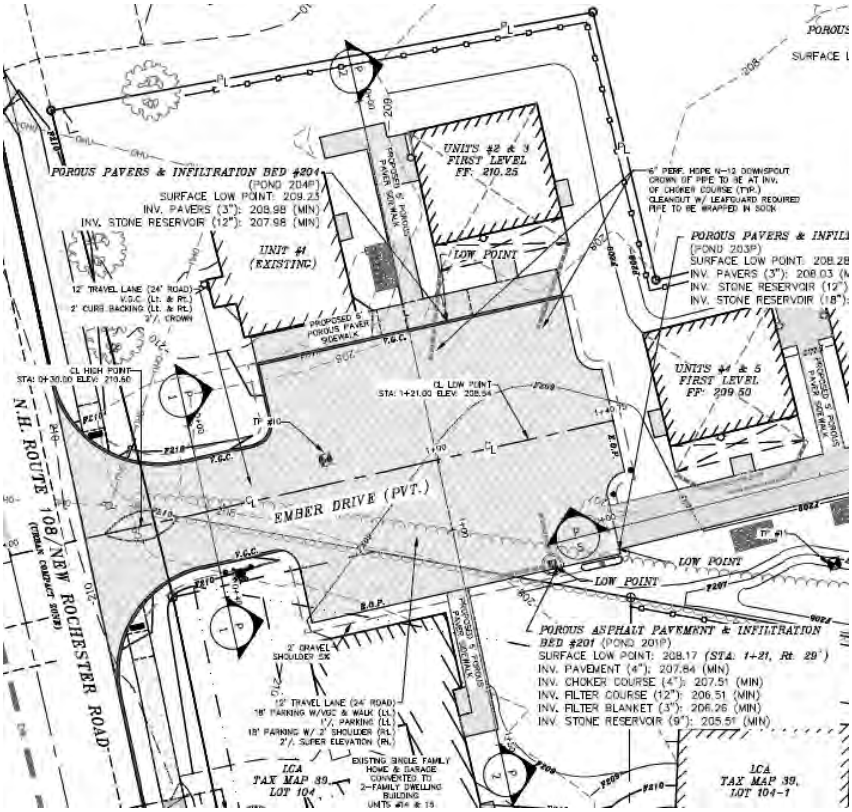
3.0 Test Pit Locations

Porous Pavement #201 (Pond 201) – This practice has a modeled surface area of 5,821 square feet (SF) and is proposed to be constructed over approximately test pit #10. See test pit profiles below. See test pit locations on Porous Pavement w/ Infiltration#201, sheet #9. These test pits were completed in July of 2023 by Christopher R. Berry, NH Licensed Septic Designer. There is one soil type in the vicinity of the practice. Udipsamments, derived from the Deerfield Series, considered to be a HSG B soil where the most restrictive published Ksat is 6.0 inches per hour. The rate of 3.0 inches per hour is used for the design.

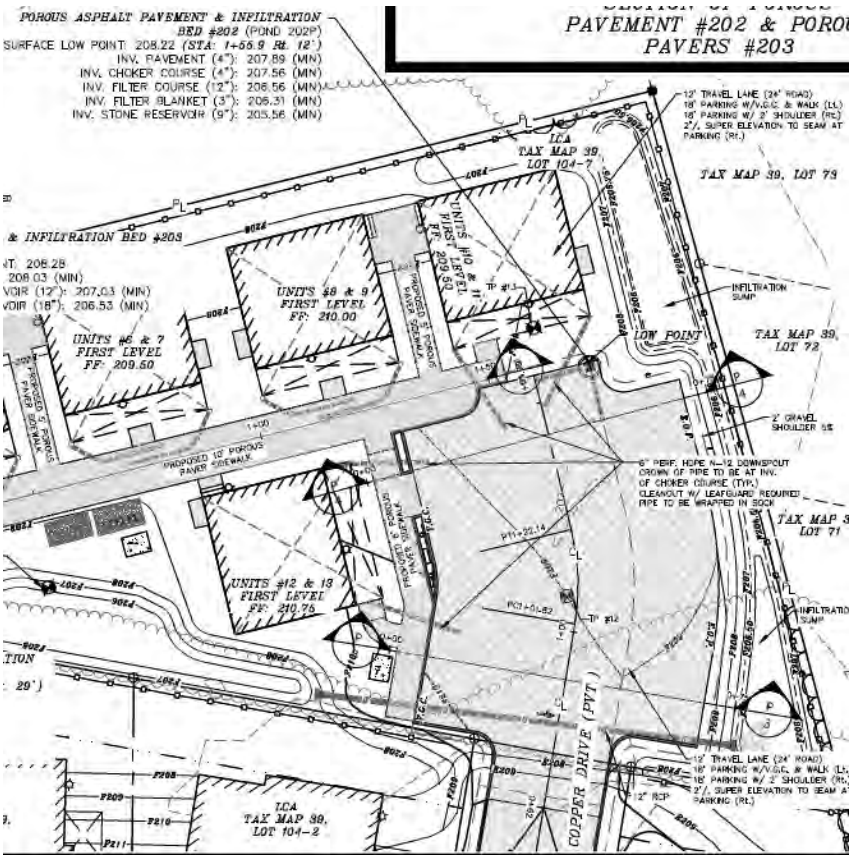
Porous Pavement #202 (Pond 202) – This practice has a modeled surface area of 4,889 square feet (SF) and is proposed to be constructed over approximately test pits #12 & 13. See test pit profiles below. See test pit locations on Porous Pavement w/ Infiltration#202, sheet #9. These test pits were completed in July of 2023 by Christopher R. Berry, NH Licensed Septic Designer. There is one soil type in the vicinity of the practice. Udipsamments, derived from the Deerfield Series, considered to be a HSG B soil where the most restrictive published Ksat is 6.0 inches per hour. The rate of 3.0 inches per hour is used for the design.

Porous Pavers #203 (Pond 203) – This practice has a modeled surface area of 2,427 square feet (SF) and is proposed to be constructed over approximately test pit #11. See test pit profiles below. See test pit locations on Porous Pavers w/ Infiltration#203, sheet #9. These test pits were completed in July of 2023 by Christopher R. Berry, NH Licensed Septic Designer. There is one soil type in the vicinity of the practice. Udipsamments, derived from the Deerfield Series, considered to be a HSG B soil where the most restrictive published Ksat is 6.0 inches per hour. The rate of 3.0 inches per hour is used for the design.

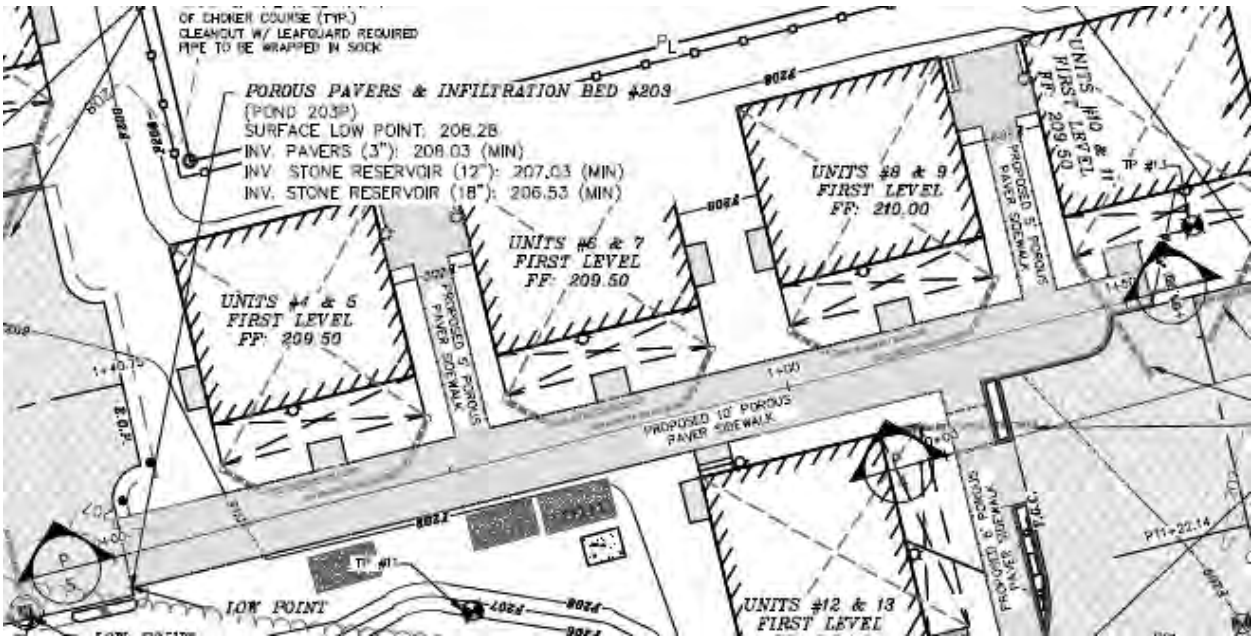
Porous Pavers #204 (Pond 204) – This practice has a modeled surface area of 794 square feet (SF) and is proposed to be constructed over approximately test pit #10. See test pit profiles below. See test pit locations on Porous Pavers w/ Infiltration #204, sheet #9. These test pits were completed in July of 2023 by Christopher R. Berry, NH Licensed Septic Designer. There is one soil type in the vicinity of the practice. Udipsamments, derived from the Deerfield Series, considered to be a HSG B soil where the most restrictive published Ksat is 6.0 inches per hour. The rate of 3.0 inches per hour is used for the design.



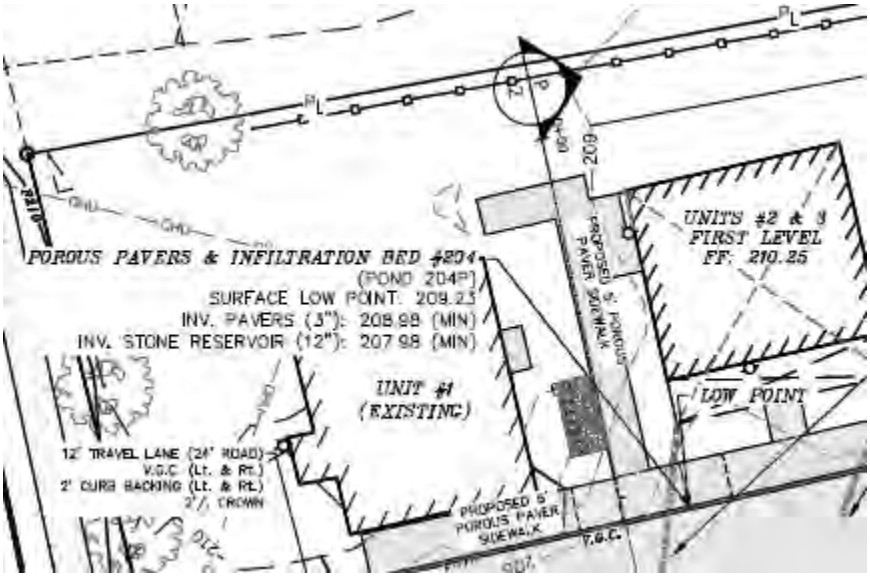
Porous Pavement w/ Infiltration #201 (Pond 201)



Porous Pavement w/ Infiltration #202 (Pond 202)



Porous Pavers w/ Infiltration #203 (Pond 203)



Porous Pavers w/ Infiltration #204 (Pond 204)

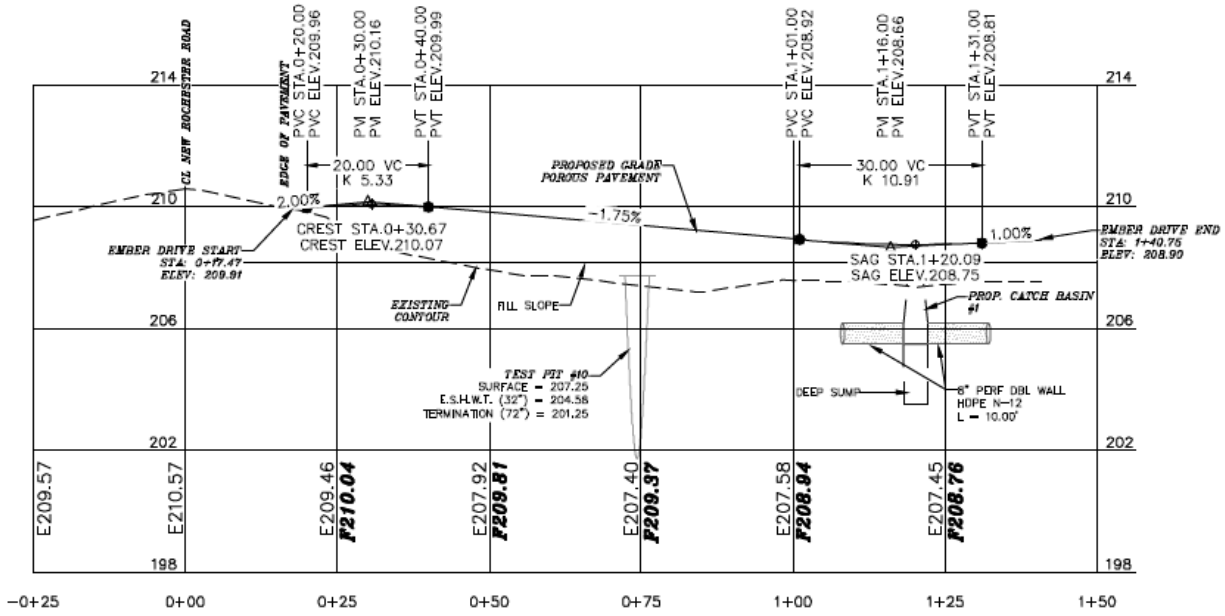
4.0 Seasonal High Water Table (SHWT) and bedrock elevations

Porous Pavement w/ Infiltration #201 (Pond 201)

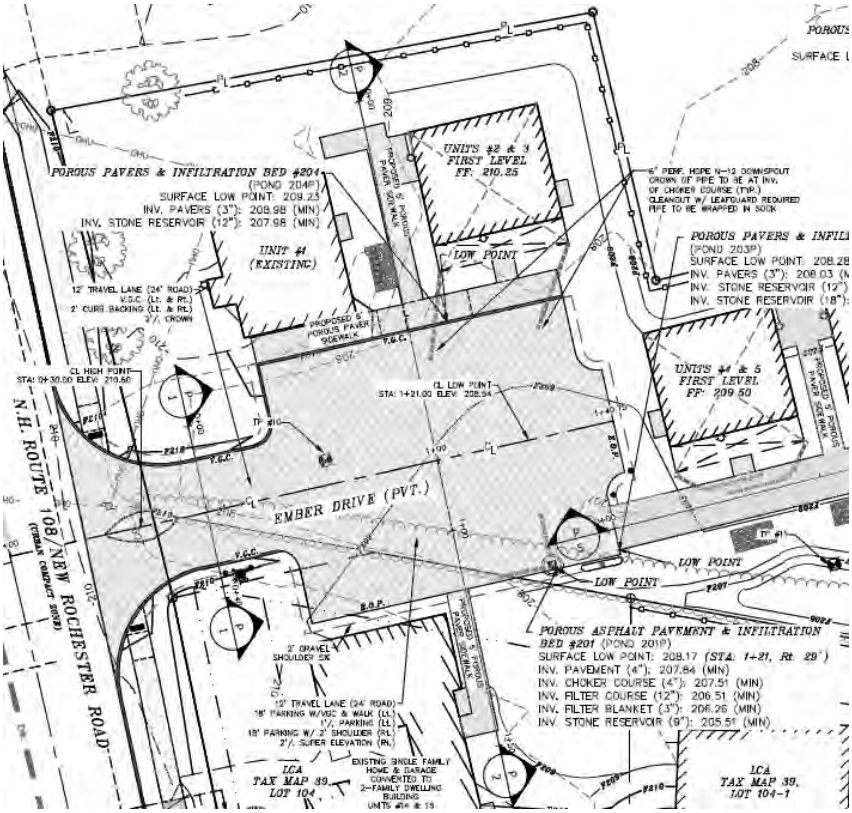
TP#10:	Existing Surface Elevation of TP =	207.25’
	SHWT = 32 – Inches	>204.58’
	Bedrock = > 72 – Inches	>201.25’
	Ground Water = N/A	
	Deepest Elevation of TP =	201.25’

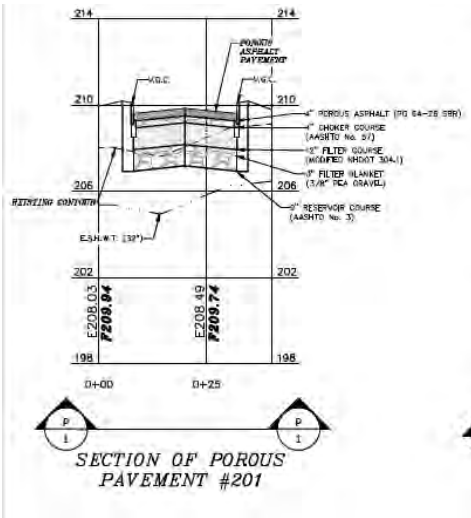
Porous Pavement #101 (Pond 101) Lowest Point: 208.17’

Profile Porous Pavement w/ Infiltration #201

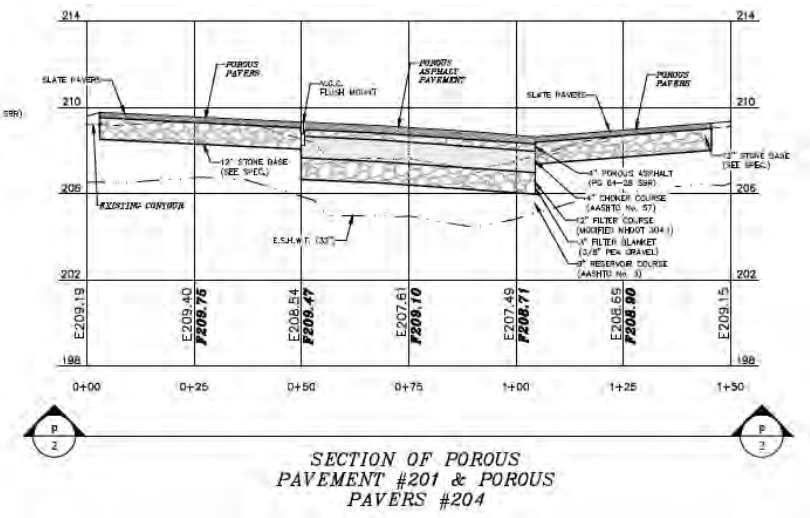


Cross Sections Porous Pavement w/ Infiltration #201





SECTION OF POROUS PAVEMENT #201



SECTION OF POROUS PAVEMENT #201 & POROUS PAVERS #204

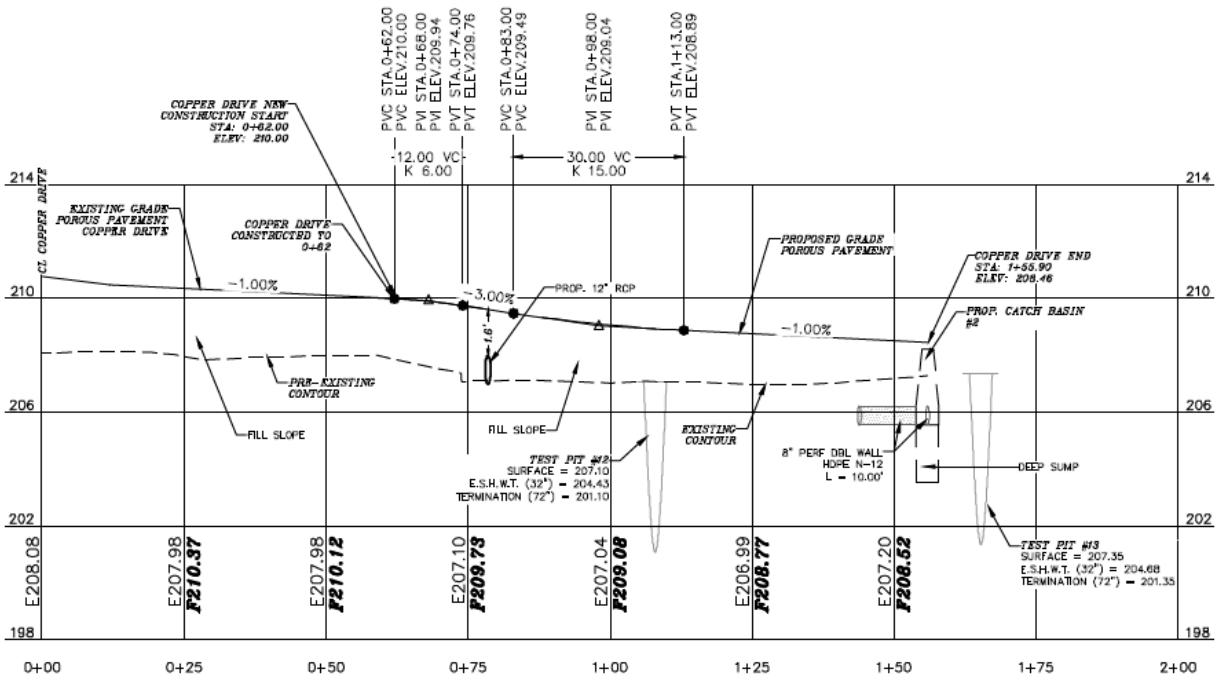
Porous Pavement w/ Infiltration #202 (Pond 202)

TP#12:	Existing Surface Elevation of TP =	207.10’
	SHWT = 32 – Inches	>204.43’
	Bedrock = > 72 – Inches	>201.10’
	Ground Water = N/A	
	Deepest Elevation of TP =	201.10’

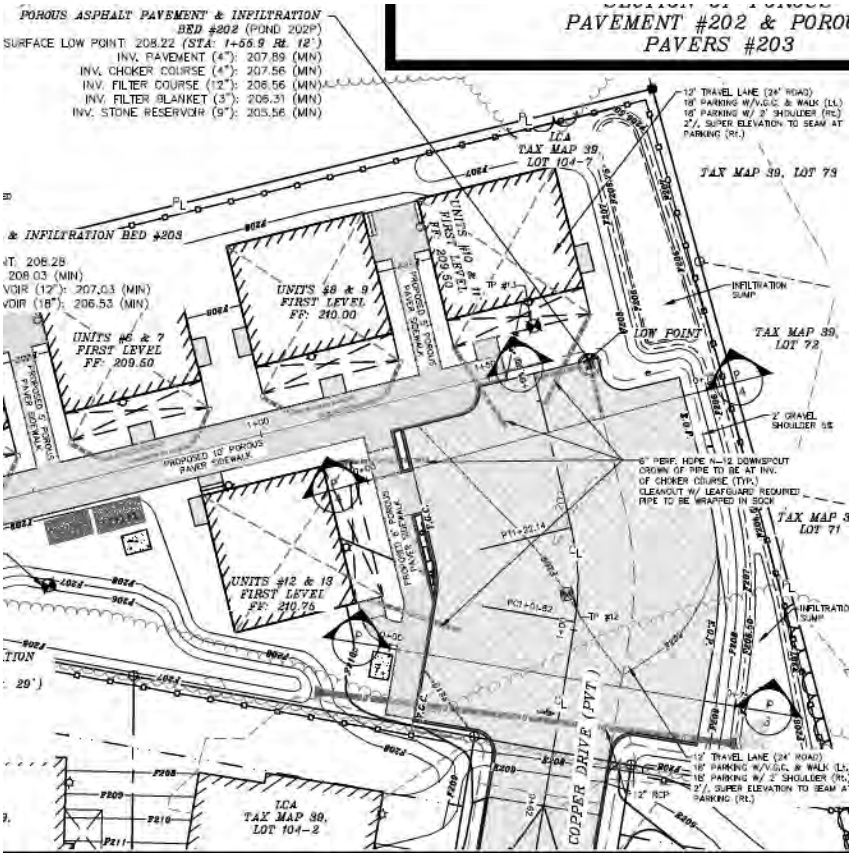
TP#13:	Existing Surface Elevation of TP =	207.35’
	SHWT = 32 – Inches	>204.68’
	Bedrock = > 72 – Inches	>201.35’
	Ground Water = N/A	
	Deepest Elevation of TP =	201.35’

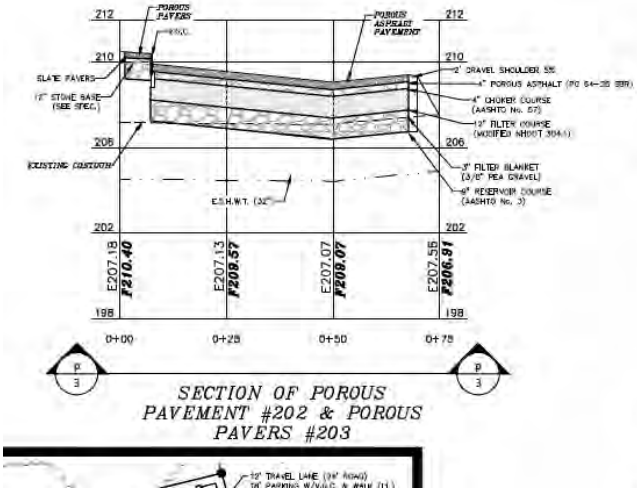
Porous Pavement #202 (Pond 202) Lowest Point: 208.22’

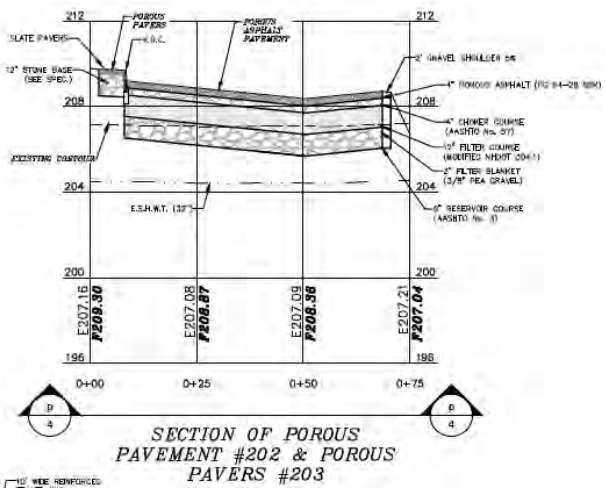
Profile Porous Pavement w/ Infiltration #202



Cross Sections Porous Pavement w/ Infiltration #202





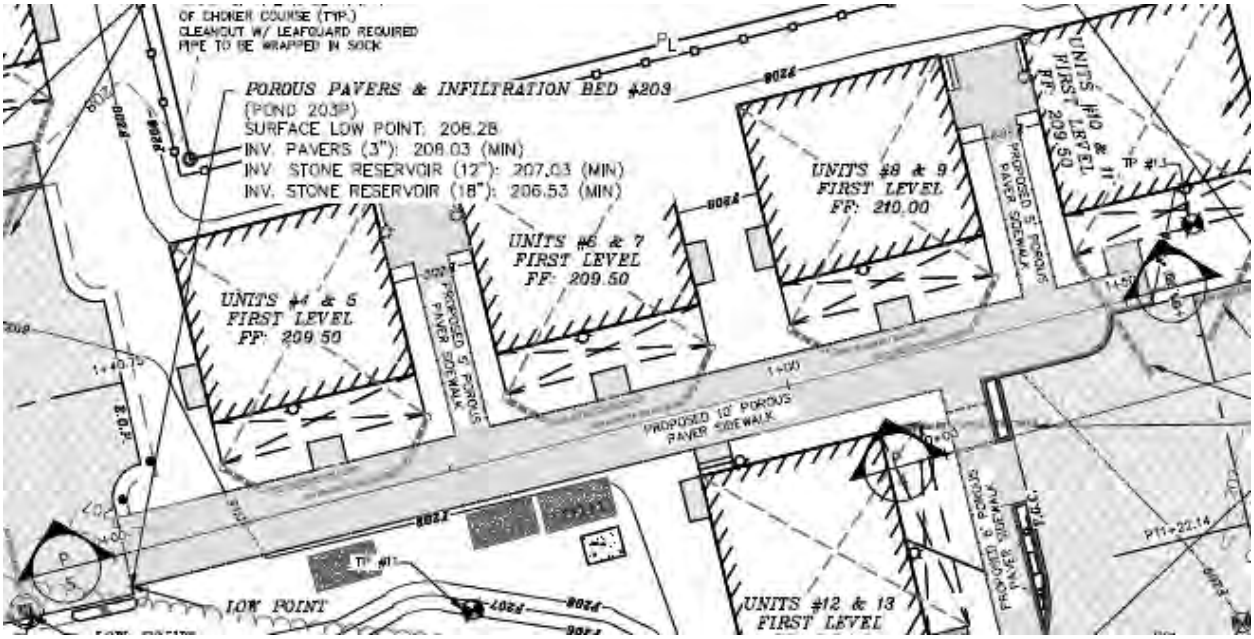


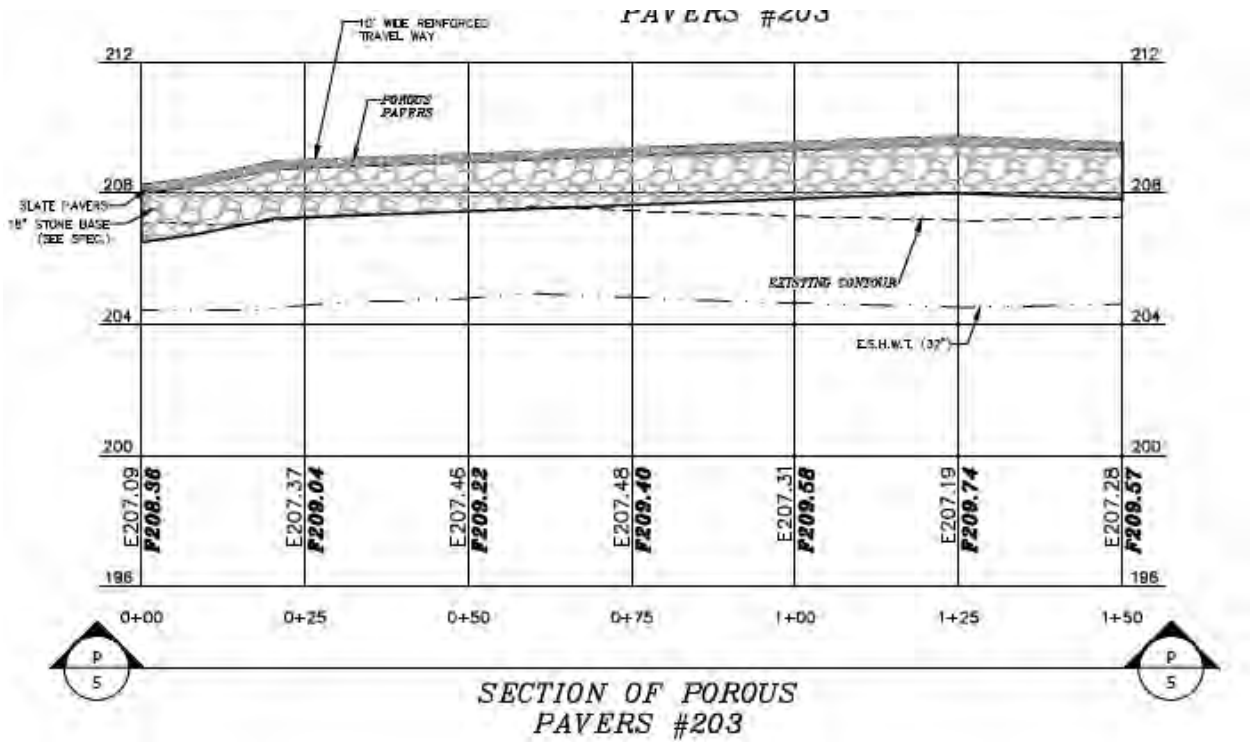
Porous Pavers w/ Infiltration #203 (Pond 203)

TP#11:	Existing Surface Elevation of TP =	207.40’
	SHWT = 32 – Inches	>204.73’
	Bedrock = > 72 – Inches	>201.40’
	Ground Water = N/A	
	Deepest Elevation of TP =	201.40’

Porous Pavers #203 (Pond 203) Lowest Point: 208.28’

Cross Sections Porous Pavers w/ Infiltration #203



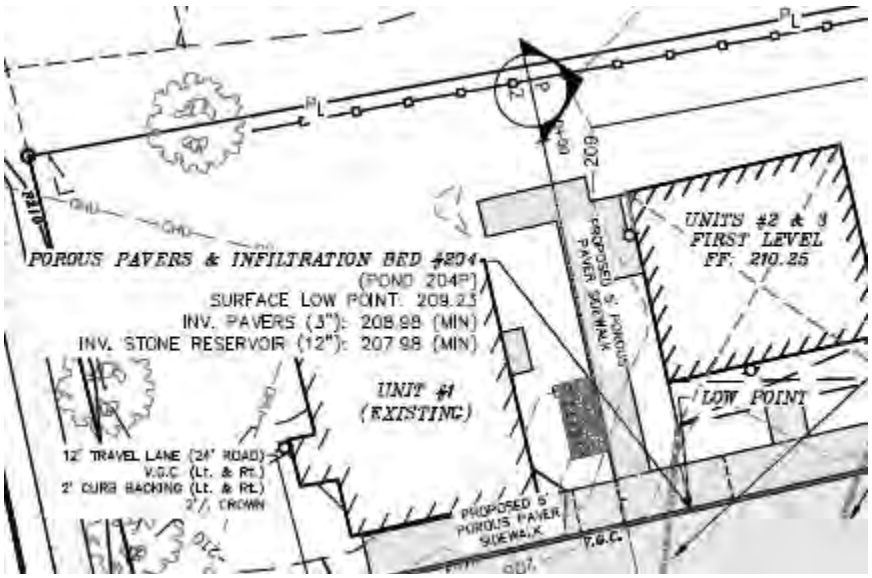


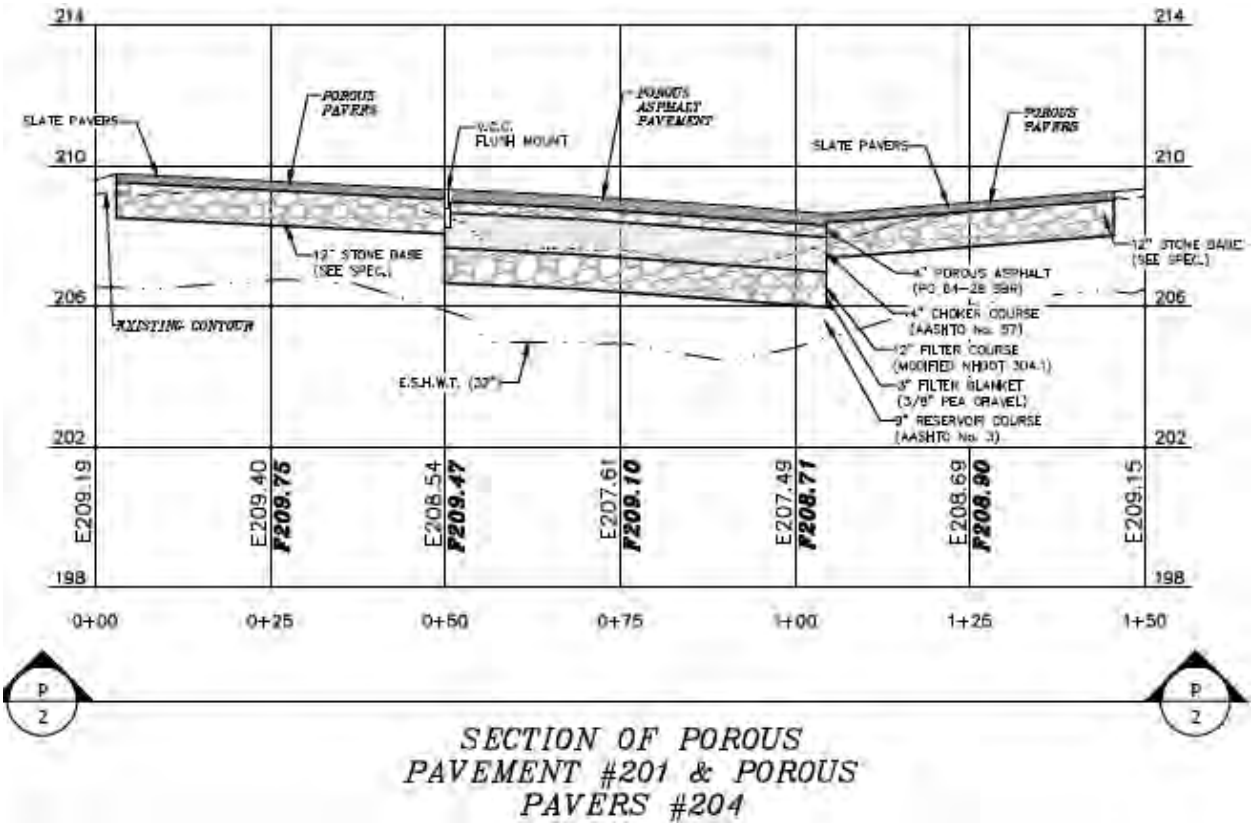
Porous Pavers w/ Infiltration #204 (Pond 204)

TP#10:	Existing Surface Elevation of TP =	207.25’
	SHWT = 32 – Inches	>204.58’
	Bedrock = > 72 – Inches	>201.25’
	Ground Water = N/A	
	Deepest Elevation of TP =	201.25’

Porous Pavers #204 (Pond 204) Lowest Point: 209.23’

Cross Sections Porous Pavers w/ Infiltration #204





SECTION OF POROUS PAVEMENT #201 & POROUS PAVERS #204

5.0 Profile descriptions

The following test pit data was collected in July, 2023 see profile below.

TEST PIT #10
0-12” 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12-25” 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25-32” 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32-72” 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #11
0-12” 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12-25” 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25-32” 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32-72” 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #12
0-12” 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12-25” 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25-32” 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32-72” 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #13

0-12” 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE

12-25” 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE

25-32” 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE

32-72” 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE

E.S.H.W.T. @ 32"

RESTRICTIVE LAYER @ N/A

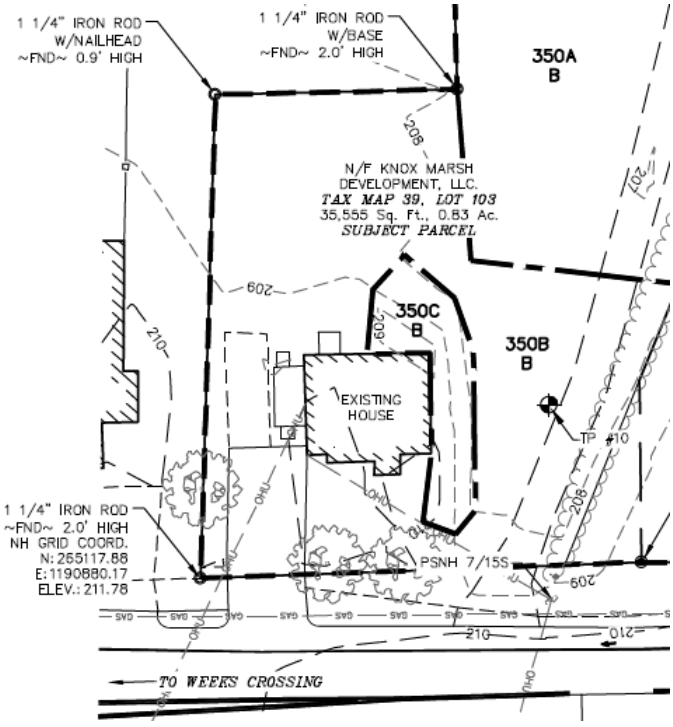
GROUND WATER @ N/A

TERMINATED @ 72"

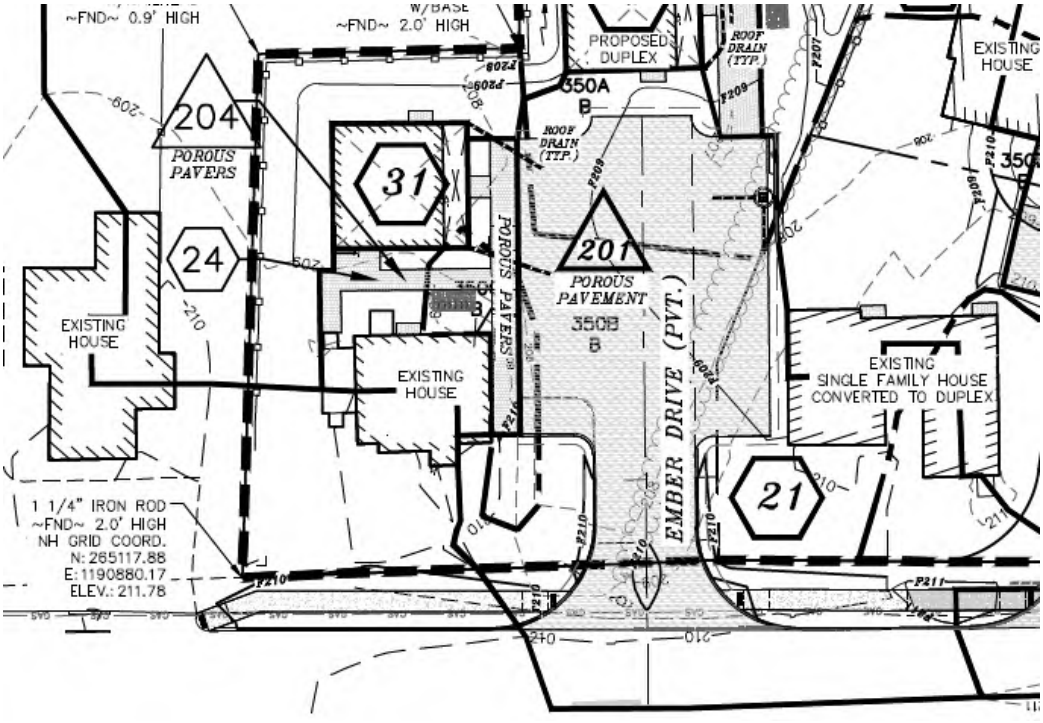
REFUSAL @ N/A

6.0 Soil plan in the area of the proposed practices

Porous Pavement w/ Infiltration #201 is located over Udipsamments (derived from Deerfield Series). (Pond #201) See Test Pits #10.

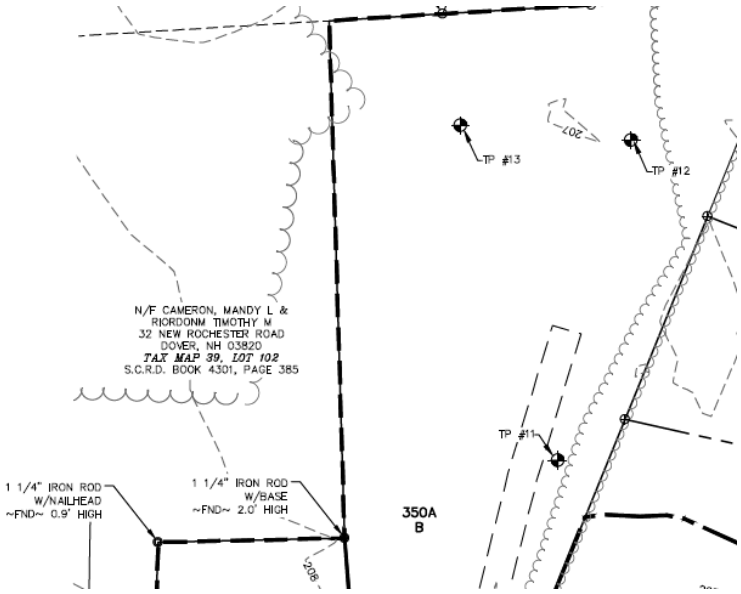


Existing

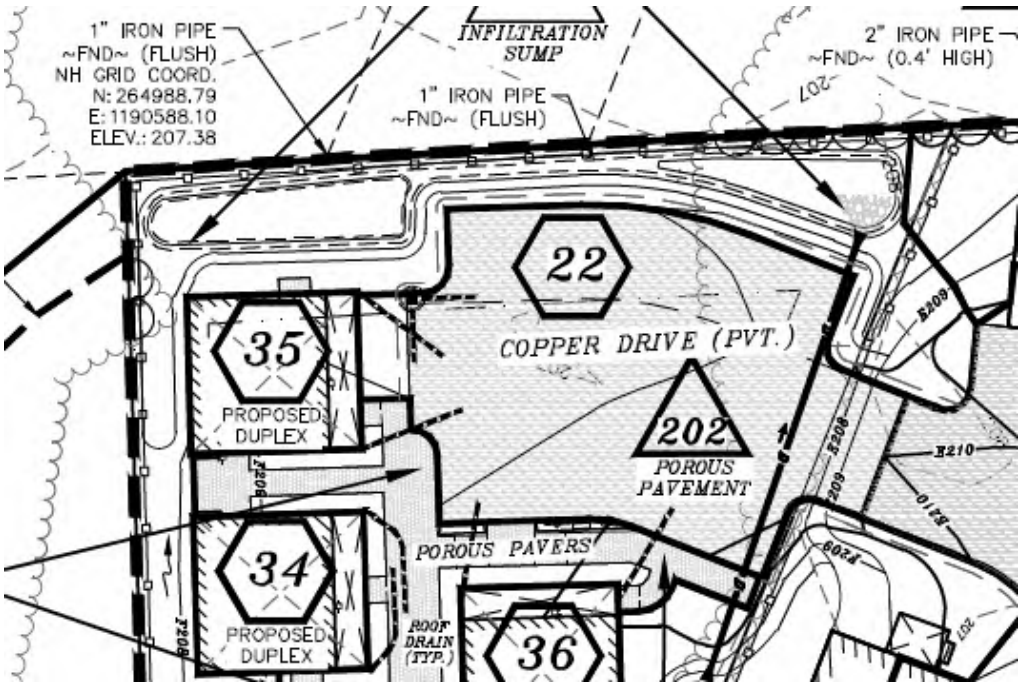


Proposed

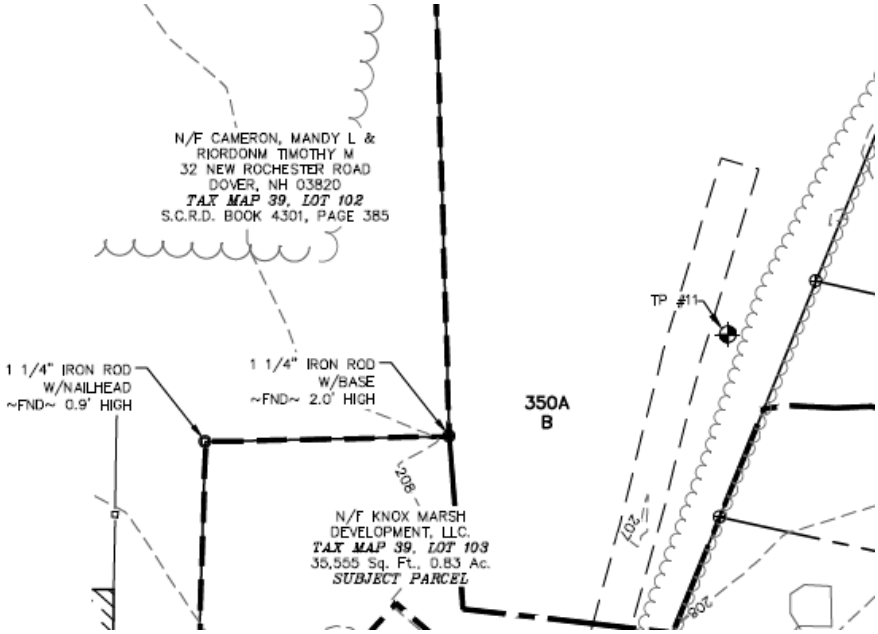
Porous Pavement w/ Infiltration #202 is located over Udipsamments (derived from Deerfield Series). (Pond #202) See Test Pits #12 & 13.



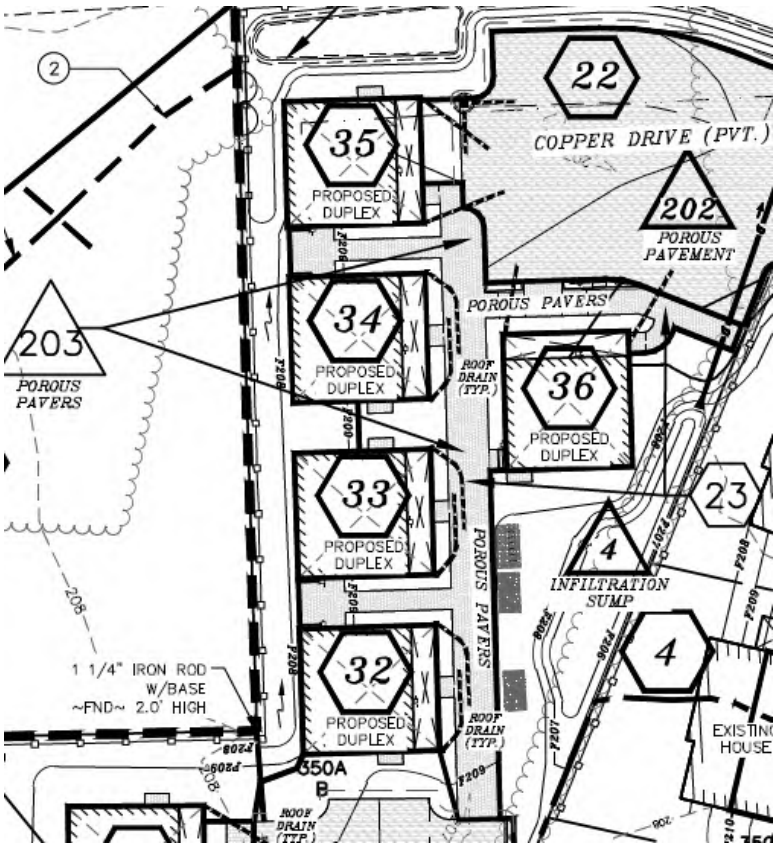
Existing



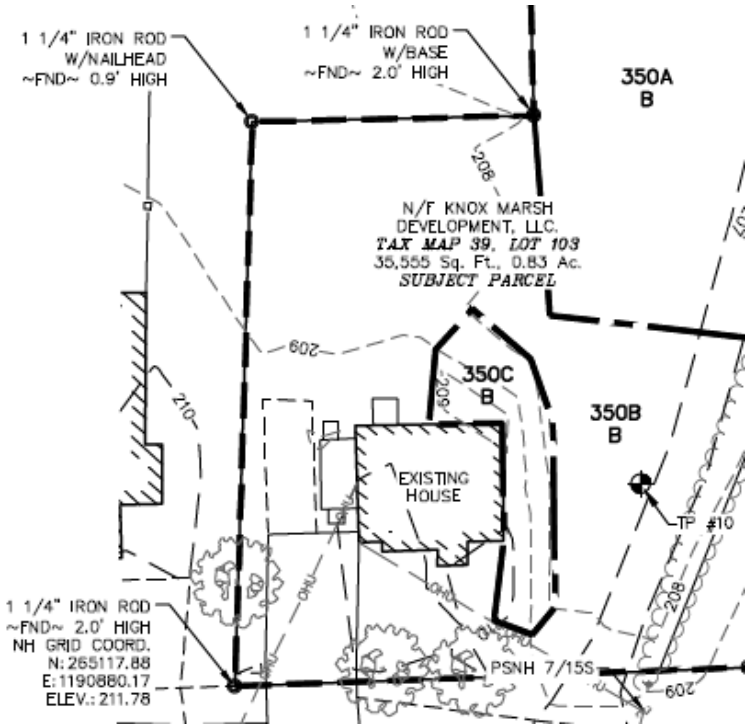
Proposed Porous Pavers w/ Infiltration #203 is located over Udipsamments (derived from Deerfield Series). (Pond #203) See Test Pit #11.



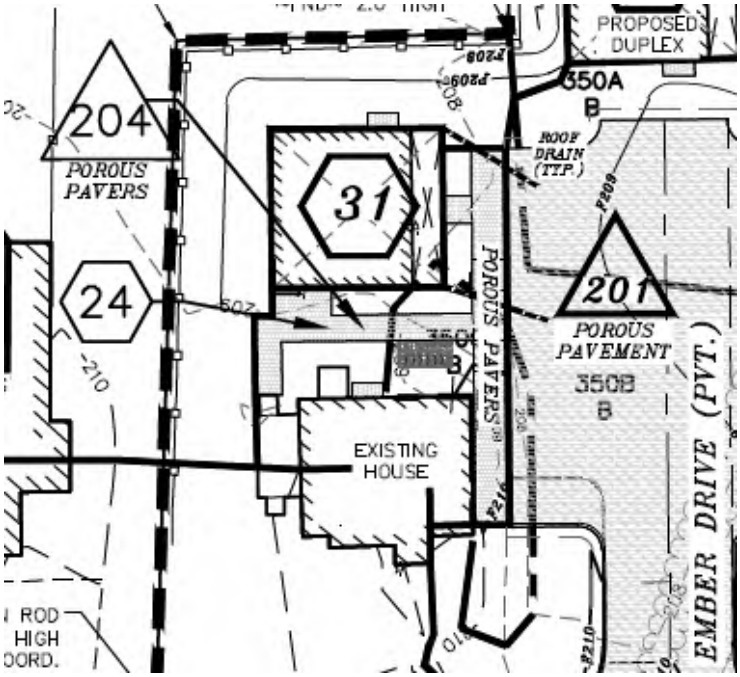
Existing



Proposed Porous Pavers w/ Infiltration #204 is located over Udipsamments (derived from Deerfield Series). (Pond #204) See Test Pit #10.



Existing



Proposed

7.0 Summary of Infiltration Rate

Porous Pavement w/ Infiltration #201, Porous Pavement w/ Infiltration #202, Porous Pavers w/ Infiltration #203, and Porous Pavers w/ Infiltration #204 are located within Udipsaments, derived from the Deerfield Series, considered to be a HSG B soil where the most restrictive published Ksat is also 6.0 inches per hour. The rate of 3.0 inches per hour is used for the design.

Amoozemeter testing was not conducted on site and the alternate method of using the USDA / NRCS published values was employed. Reference is made to KSat Values for New Hampshire Soils (Including Hydrologic and DES Soil Lot Sizing Groups, sponsored by the Society of Soil Scientists of Norther New England, Publication #5 dated September 2009.

Respectfully submitted:

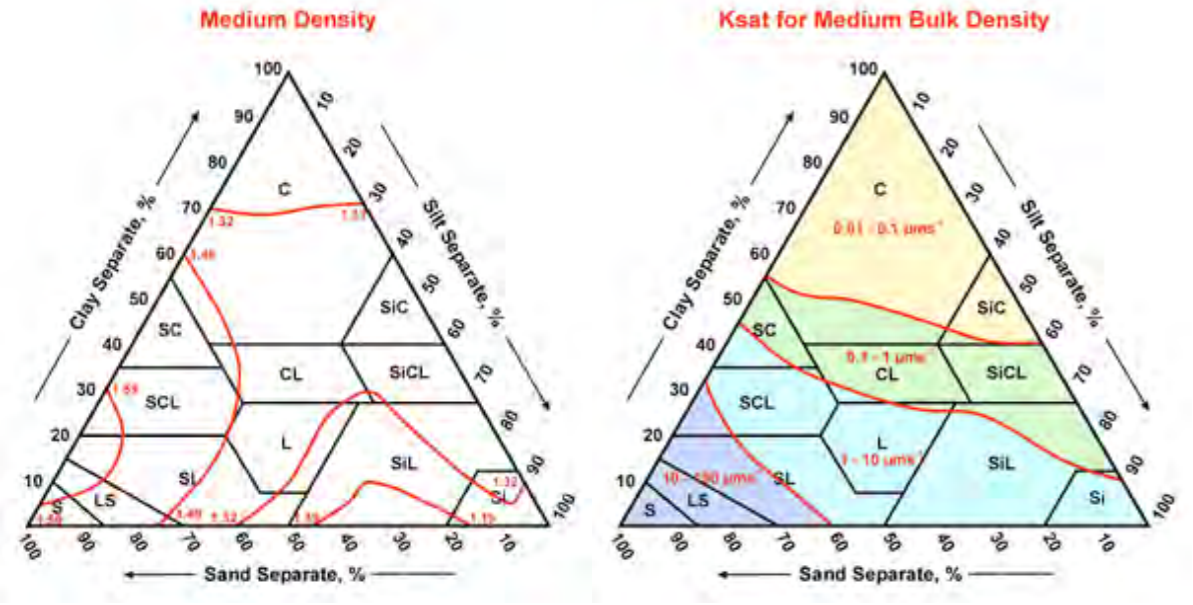
BERRY SURVEYING & ENGINEERING

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Project Engineer

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CPSWQ, CPESC, CESSWI
Principal, VP – Technical Operations
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Attached: KSat NH Document

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)

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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:

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SATURATED HYDRAULIC CONDUCTIVITY (K_{SAT})

K_{sat} refers to the ease with which pores in a saturated soil transmit water. The estimates presented here are expressed in terms of inches per hour (NRCS official data presents K_{sat} in both micrometers per second and inches per hour). K_{sat} values are based on soil characteristics observed in the field, particularly structure, consistence, porosity, and texture. (USDA NRCS, Web Soil Survey)

Saturated flow occurs when the soil water pressure is positive; that is, when the soil matric potential is zero (satiated wet condition). In most soils this situation takes place when about 95 percent of the total pore space is filled with water. The remaining 5 percent is filled with entrapped air. Saturated hydraulic conductivity cannot be used to describe water movement under unsaturated conditions. (Soil Survey Manual, 1993)

It is commonly known that soil features (and thus data) for a certain soil series name may be slightly different from one county soil survey to the next and the range in characteristics (via the Typical Pedon) may be slightly different. For example – a Marlow soil (series) in Carroll County may have a higher sand content in its B horizon as opposed to a Marlow soil (series) in Coos County; resulting in a slightly different Ksat range for the B horizon.

The K_{sat} data for this publication was obtained from the USDA-NRCS Soil Data Mart using the Typical Pedon from the county that best reflected the soil and/or had the most acres of that soil. This data is presented in B and C horizons only as it is assumed that the topsoil (A or A_p horizon) will be removed in typical construction practices.

References:

Web Soil Survey. *Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/.*

Soil Data Mart. *http://soildatamart.nrcs.usda.gov/.*

Soil Survey Manual. *Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.*

HYDROLOGIC SOIL GROUPS

Hydrologic group is a group of soils having the same runoff potential under similar storm and cover conditions.

Hydrologic groups are used in equations that estimate runoff from rainfall. These estimates are needed for solving hydrologic problems that arise in planning stormwater management, watershed protection, and flood-prevention projects and for planning or designing structures for the use, control, and disposal of water.

Classifications assigned to soils were based on the use of rainfall-runoff data from small watersheds and infiltrometer plots. From these data, relationships between soil properties and hydrologic groups were established. Assignment of soils to hydrologic groups is based on the relationship between soil properties and hydrologic groups. Wetness characteristics, permeability after prolonged wetting, and depth to very slowly permeable layers are properties that assist in estimating hydrologic groups. Minimum annual steady ponded infiltration rate for a bare ground surface determines the hydrologic soil groups.

Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonally high water table, intake rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. (The influence of ground cover is treated independently, not in hydrologic soil groups.).

The soils in the United States are placed into four groups, A, B, C, and D, and three dual classes, *A/D, B/D,* and *C/D.* In the definitions of the classes, infiltration rate is the rate at which water enters the soil at the surface and is controlled by the surface conditions. Transmission rate is the rate at which water moves in the soil and is controlled by soil properties. Definitions of the classes are as follows:

Group A- Saturated hydraulic conductivity is very high or in the upper half of high and internal free water occurrence is very deep. Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group A are as follows. The saturated hydraulic conductivity of all soil layers exceeds 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 10 micrometers per second (1.42 inches per hour).

Group B- Saturated hydraulic conductivity is in the lower half of high or in the upper half of moderately high and free water occurrence is deep or very deep. Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group B are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] ranges from 10.0 micrometers per second (1.42 inches per hour) to 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 4.0 micrometers per second (0.57 inches per hour) but is less than 10.0 micrometers per second (1.42 inches per hour).

Group C- Saturated hydraulic conductivity is in the lower half of moderately high or in the upper half of moderately low and internal free water occurrence is deeper than shallow. Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group C are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] is between 1.0 micrometers per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 0.40 micrometers per second (0.06 inches per hour) but is less than 4.0 micrometers per second (0.57 inches per hour). .

Group D- Saturated hydraulic conductivity is below the upper half of moderately low, and/or internal free water occurrence is shallow or very shallow and transitory through permanent. Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 50 centimeters [20 inches] and all soils with a water table within 60 centimeters [24 inches] of the surface are in this group, although some may have a dual classification, as described in the next section, if they can be adequately drained. The limits on the physical diagnostic characteristics of group D are as follows. For soils with a water impermeable layer at a depth between 50 centimeters and 100 centimeters [20 and 40 inches], the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 1.0 micrometers per second (0.14 inches per hour). For soils that are deeper than 100 centimeters [40 inches] to a restriction or water table, the saturated hydraulic

conductivity of all soil layers within 100 centimeters [40 inches] of the surface is less than or equal to 0.40 micrometers per second (0.06 inches per hour).

Dual hydrologic soil groups-Certain wet soils are placed in group D based solely on the presence of a water table within 60 centimeters [24 inches] of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups *(A/D, B/D,* and *C/D)* based on their saturated hydraulic conductivity and the water table depth when drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters [24 inches] below the surface in a soil where it would be higher in a natural state.

References:

National Engineering Handbook, Natural Resource Conservation Service, U.S. Department of Agriculture.

Soil Data Mart. *http://soildatamart.nrcs.usda.gov/*.

Soil Survey Manual. *Soil Survey Division Staff. 1993. Soil survey manual. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 18.*

TABLE A

NUMERICAL LEGEND

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Madawaska, aquentic	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	loamy over sandy, sandy-skeletal	yes	gravelly loamy sand in C
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Ricker	674	2.0	6.0	2.00	6.0	A	4	Organic over bedrock (up to 4" of mineral)	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep

no longer recognized

organic materials

TABLE B

SOIL SERIES

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Ricker	674	2.0	6.0	2.00	6.0	A	4	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep

no longer recognized
organic materials

TABLE C

NHDES SOIL GROUPINGS

SSSNNE
Special Publilcation No. 5
September, 2009

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Adams	36	1	6.0	20.0	20.00	99.0	A	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Caesar	526	1	20.0	100.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	coarse sand	no	
Champlain	35	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	gravelly sand	no	
Colton	22	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Gloucester	11	1	6.0	20.0	6.00	20.0	A	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hermon	55	1	2.0	20.0	6.00	20.0	A	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hoosic	510	1	2.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Masardis	23	1	6.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Merrimac	10	1	2.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Quonset	310	1	2.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Redstone	665	1	2.0	6.0	6.00	20.0	A	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Success	154	1	2.0	6.0	6.00	20.0	A	Sandy Till	frigid	sandy-skeletal	yes	cemented
Suncook	2	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Suncook	402	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Sunday	102	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Sunday	202	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Warwick	210	1	2.0	6.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Windsor	26	1	6.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	mesic	sandy	no	
Abenaki	501	2	0.6	2.0	6.00	99.0	B	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Agawam	24	2	6.0	20.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	2	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Bangor	572	2	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Berkshire	72	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bice	226	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	no	sandy loam
Canton	42	2	2.0	6.0	6.00	20.0	B	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Charlton	62	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Dutchess	366	2	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Fryeburg	208	2	0.6	2.0	2.00	6.0	B	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Groveton	27	2	0.6	2.0	0.60	6.0	B	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	2	0.6	2.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	2	0.6	2.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	2	0.6	2.0	0.20	2.0	B	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	2	0.6	2.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Houghtonville	795	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Lombard	259	2	0.6	6.0	2.00	20.0	C/D	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Monadnock	142	2	0.6	2.0	2.00	6.0	B	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Occum	1	2	0.6	2.0	6.00	20.0	B	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	2	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	2	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Salmon	630	2	0.6	2.0	0.60	2.0	B	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Stetson	523	2	0.6	6.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Unadilla	30	2	0.6	2.0	2.00	20.0	B	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Chichester	442	2	0.6	2.0	2.00	6.0	B	Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Acton	146	3	2.0	20.0	2.00	20.0	B	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Becket	56	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	3	0.6	2.0	0.06	2.0	B	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bernardston	330	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Boxford	32	3	0.1	0.2	0.00	0.2	C	Silt and Clay Deposits	mesic	fine	no	silty clay loam

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Buckland	237	3	0.6	2.0	0.06	0.2	C	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Buxton	232	3	0.1	0.6	0.00	0.2	C	Silt and Clay Deposits	frigid	fine	no	silty clay
Canterbury	166	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Chatfield Var.	289	3	0.6	6.0	0.60	6.0	B	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	3	0.6	2.0	0.02	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Colonel	927	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Croghan	613	3	20.0	100.0	20.00	100.0	B	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	3	0.6	2.0	0.06	0.6	B	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	3	6.0	20.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	3	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	3	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Eldridge	38	3	6.0	20.0	0.06	0.6	C	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elmridge	238	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116	3					C	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Gilmanton	478	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Henniker	46	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hitchcock	130	3	0.6	2.0	0.06	0.6	B	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Howland	566	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Lanesboro	228	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Lovewell	307	3	0.6	2.0	0.60	2.0	B	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Machias	520	3	2.0	6.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Madawaska	28	3	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	3	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Melrose	37	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Metacomet	458	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	3	6.0	100.0	6.00	100.0	B	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39	3					C	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Montauk	44	3	0.6	6.0	0.06	0.6	C	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Mundal	610	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Newfields	444	3	0.6	2.0	0.60	2.0	B	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	3	0.6	2.0	0.60	2.0	C	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	3	0.6	6.0	6.00	20.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Paxton	66	3	0.6	2.0	0.00	0.2	C	Firm, platy, loamy till	mesic	loamy	no	
Peru	78	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	
Pittstown	334	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	3	0.6	2.0	0.06	0.6	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	3	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Poocham	230	3	0.6	2.0	0.20	2.0	B	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	3	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Scio	531	3	0.6	2.0	0.60	2.0	B	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scituate	448	3	0.6	2.0	0.06	0.2	C	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Sheepscot	14	3	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Sudbury	118	3	2.0	6.0	2.00	20.0	B	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Suffield	536	3	0.6	2.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Sunapee	168	3	0.6	2.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	
Sunapee var	269	3	0.6	2.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Surplus	669	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Sutton	68	3	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	mesic	loamy	no	
Telos	123	3	0.6	2.0	0.02	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Waumbeck	58	3	2.0	20.0	6.00	20.0	B	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Winooski	103	3	0.6	6.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Woodbridge	29	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Winooski	9	3	0.6	6.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Canaan	663	4	2.0	20.0	2.00	20.0	C	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Cardigan	357	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Chatfield	89	4	0.6	6.0	0.60	6.0	B	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Elliottsville	128	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Glebe	671	4	2.0	6.0	2.00	6.0	C	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Glover	NA	4	0.6	2.0	0.60	2	D	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Hogback	91	4	2.0	6.0	2.00	6.0	C	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	4	0.6	6.0	0.60	6.0	C/D	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Kearsarge	359	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Lyman	92	4	2.0	6.0	2.00	6.0	A/D	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Macomber	252	4	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Millsite	251	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monson	133	4	0.6	2.0	0.60	2.0	D	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Pennichuck	460	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Rawsonville	98	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Ricker	674	4	2.0	6.0	2.00	6.0	A	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Saddleback	673	4	0.6	2.0	0.60	2.0	C/D	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Shapleigh	136	4					C/D	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Thorndike	84	4	0.6	2.0	0.60	2.0	C/D	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Tunbridge	99	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Winnecook	88	4	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Woodstock	93	4	2.0	6.0	2.00	6.0	C/D	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Au Gres	516	5					B	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bemis	224	5	0.6	0.2	0.00	0.2	C	Firm, platy, loamy till	cryic	loamy	no	
Binghamville	534	5	0.2	2.0	0.06	0.2	D	Terraces and glacial lake plains	mesic	silty	no	
Brayton	240	5	0.6	2.0	0.06	0.6	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Cabot	589	5	0.6	2.0	0.06	0.2	D	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Charles	209	5	0.6	100.0	0.60	100.0	C	Flood Plain (Bottom Land)	frigid	silty	no	
Cohas	505	5	0.6	2.0	0.60	100.0	C	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Grange	433	5	0.6	2.0	0.60	2.0	C	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Kinsman	614	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	frigid	sandy	yes	
Leicester	514	5	0.6	6.0	0.60	20.0	C	Loose till, loamy textures	mesic	loamy	no	
Lim	3	5	0.6	2.0	6.00	20.0	C	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	5	0.6	2.0	0.60	2.0	C	Flood Plain (Bottom Land)	mesic	silty	no	
Lyme	246	5	0.6	6.0	0.60	6.0	C	Loose till, sandy textures	frigid	loamy	no	
Mashpee	315	5	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	mesic	sandy	yes	
Monarda	569	5	0.2	2.0	0.02	0.2	D	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Moosilauke	414	5	6.0	20.0	6.00	20.0	C	Loose till, sandy textures	frigid	sandy	no	
Naumburg	214	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	frigid	sandy	yes	
Pemi	633	5	0.6	2.0	0.06	0.6	C	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	5	0.6	2.0	0.06	0.2	C	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314	5					B	Outwash and Stream Terraces	mesic	sandy	yes	
Raynham	533	5	0.2	2.0	0.06	0.2	C	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	5	0.6	2.0	6.00	100.0	D	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Ridgebury	656	5	0.6	6.0	0.00	0.2	C	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	5	0.6	6.0	6.00	20.0	C	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	5	0.2	2.0	0.06	0.6	C	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	5	0.6	6.0	6.00	20.0	C	Flood Plain (Bottom Land)	frigid	loamy	no	

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Saugatuck	16	5	0.06	0.2	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	5	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	frigid	fine	no	
Scitico	33	5	0.0	0.2	0.00	0.2	C	Silt and Clay Deposits	mesic	fine	no	
Shaker	439	5	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Squamscott	538	5	6.0	20.0	0.06	0.6	C	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stissing	340	5	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Swanton	438	5	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Walpole	546	5	2.0	6.0	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	no	
Wareham	34	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	no	
Biddeford	234	6	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	frigid	fine	no	organic over clay
Bucksport	895	6					D	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	6	0.2	6.0	0.02	0.2	D	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Catden	296	6					A/D	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Chocorua	395	6			6.00	20.0	D	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Greenwood	295	6					A/D	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Ipswich	397	6					D	Tidal Flat	mesic	hemic/sapric	no	deep organic
Matunuck	797	6			20.00	100.0	D	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	6	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	6	0.6	2.0	0.60	2.0	D	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Natchaug	496	6			0.20	2.0	D	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Ossipee	495	6			0.20	2.0	D	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497	6			20.00	100.0	D	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Peacham	549	6	0.6	2.0	0.00	0.2	D	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pondicherry	992	6			6.00	20.0	D	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Saco	6	6	0.6	2.0	6.00	20.0	D	Flood Plain (Bottom Land)	mesic	silty	no	strata
Scarboro	115	6	6.0	20.0	6.00	20.0	D	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Searsport	15	6	6.0	20.0	6.00	20.0	D	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Timakwa	393	6			6.00	100.0	D	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Vassalboro	150	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Waskish	195	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Westbrook	597	6			0.00	2.0	D	Tidal Flat	mesic	loamy	no	organic over loam
Whitman	49	6	0.0	0.2	0.00	0.2	D	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Wonsqueak	995	6			0.20	2.0	D	Organic Materials - Freshwater	frigid	loamy	no	organic over loam

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Welcome to New Hampshire's Watershed Report Cards built from the 2020/2022, 305(b)/303(d)

Each Watershed Report Card covers a single 12-digit Hydrologic Unit Code (HUC12), on average a 34 square mile area. Each Watershed Report Card has three components;

1. REPORT CARD - A one page card that summarizes the overall use support for Aquatic Life Integrity, Primary Contact (i.e. Swimming), and Secondary Contact (i.e. Boating) Designated Uses on every Assessment Unit ID (AUID) within the HUC12.
2. HUC 12 MAP - A map of the watershed with abbreviated labels for each AUID within the HUC12.
3. ASSESSMENT DETAILS - Anywhere from one to forty pages with the detailed assessment information for each and every AUID in the Report Card and Map.

How are the Surface Water Quality Assessment determinations made?

All readily available data with reliable Quality Assurance/Quality Control is used in the biennial surface water quality assessments. For a full understanding of how the Surface Water Quality Standards (Env-Wq 1700) are translated into surface water quality assessments we urge the reader to review the 2020/2022 Consolidated Assessment and Listing Methodology (CALM).

Where can I find more advanced mapping resources?

GIS files are available by assessment cycle at the NHDES FTP site.

I'd like to see the more raw water quality data?

The web mapping tool allows you to download the data used in the assessment of the primary contact and aquatic life designated uses by clicking on the "Data Access Waterbody Data (Aquatic Life and Swimming Uses)" link for any assessment unit.

How are assessments coded in the report card?

Assessment outcomes are displayed on a color scale as well as an alpha numeric scale that provides additional distinctions for the designated use and parameter level assessments as outlined in the table below.

		Severe Not Supporting, Severe	**Poor** Not Supporting, Marginal	**Likely Bad** Insufficient Information – Potentially Not Supporting	**No Data** No Data	**Likely Good** Insufficient Information – Potentially Full Supporting	**Marginal** Full Support, Marginal	**Good** Full Support, Good
CATEGORY	**Description**							
Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL* Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL* Needed	5-P	5-M or 5-T					

* TMDL stands for Total Maximum Daily Load studies

Watershed 305(b) Assessment Summary Report:

Assessment Cycle: 2020/2022

HUC 12: 010600030405

HUC 12 Name: Middle Salmon Falls River

(Locator map on next page only applies to this HUC12)

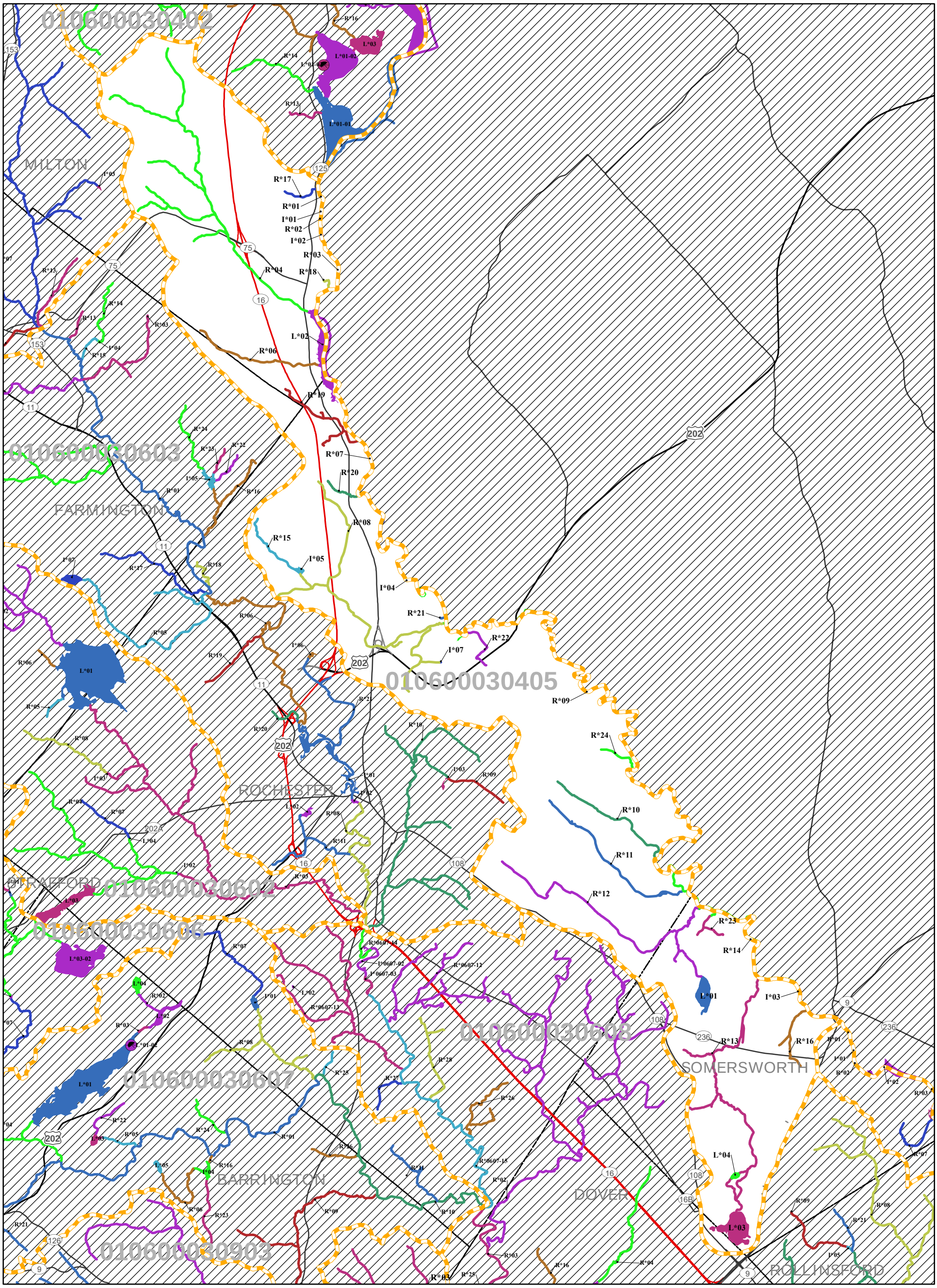
Good	Meets water quality standards/thresholds by a relatively large margin.
Marginal	Meets water quality standards/thresholds but only marginally.
Likely Good	Limited data available, however, the data that is available suggests that the parameter is Potentially Attaining Standards (PAS).
No Current Data	Insufficient information to make an assessment decision.
Likely Bad	Limited data available, however, the data that is available suggests that the parameter is Potentially Not Supporting (PNS) water quality standards.
Poor	Not meeting water quality standards/thresholds. The impairment is marginal.
Severe	Not meeting water quality standards/thresholds. The impairment is more severe and causes poor water quality.



Assessment Unit ID	Map Label	Assessment Unit Name	Aquatic Life	Fish Consump.	Swimming	Boating
NHIMP600030405-01	I*01	Salmon Falls River - Milton Leather Board Dam		4A-M	3-ND	3-ND
NHIMP600030405-02	I*02	Salmon Falls River - Salmon Falls River Ii	3-PAS	4A-M	3-PAS	3-ND
NHIMP600030405-03	I*03	Salmon Falls River - Great Falls Upper Dam	5-M	4A-M	3-ND	3-ND
NHIMP600030405-04	I*04	Salmon Falls River - Baxter Mill Dam Pond	5-M	4A-M	4A-M	4A-M
NHIMP600030405-05	I*05	Unnamed Brook - Pulitzer Dam	3-ND	4A-M	3-ND	3-ND
NHIMP600030405-07	I*07	Unnamed Brook - Woodland Green Detention Pond	3-ND	4A-M	3-ND	3-ND
NHLAK600030405-01	L*01	Lily Pond	3-ND	4A-M	3-ND	3-ND
NHLAK600030405-02	L*02	Spaulding Pond	4C-P	4A-M	3-ND	3-ND
NHLAK600030405-03	L*03	Willand Pond	5-P	4A-M	4A-P	3-ND
NHLAK600030405-04	L*04	Unnamed Pond	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-01	R*01	Salmon Falls River	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-02	R*02	Salmon Falls River	3-ND	4A-M	3-ND	3-ND

NHRIV600030405-03	R*03	Salmon Falls River	3-PAS	4A-M	3-PAS	3-ND
NHRIV600030405-04	R*04	Lyman Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-06	R*06	Unnamed Brook - To Salmon Falls River	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-07	R*07	Salmon Falls River	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-08	R*08	Heath Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-09	R*09	Salmon Falls River	5-P	4A-M	3-PAS	3-ND
NHRIV600030405-10	R*10	Unnamed Brook - To Salmon Falls River	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-11	R*11	Unnamed Brook - To Salmon Falls River	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-12	R*12	Unnamed Brook - From Lily Pond To Salmon Falls River	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-13	R*13	Tates Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-14	R*14	Salmon Falls River - Unnamed Brook	5-M	4A-M	4A-M	3-ND
NHRIV600030405-15	R*15	Heath Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-16	R*16	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-17	R*17	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-18	R*18	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-19	R*19	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-20	R*20	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-21	R*21	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-22	R*22	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-23	R*23	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHRIV600030405-24	R*24	Unnamed Brook	3-ND	4A-M	3-ND	3-ND

AUIDs For HUC12: 010600030405 - Middle Salmon Falls River



HUC12 Boundaries
Town Boundaries

Major Roads
Interstate Highway
US Highway
State Highway

Assessment Unit Coloring
AUs Ending with:

0 =
1 =
2 =
3 =
4 =
5 =
6 =
7 =
8 =
9 =

N
W E
S

Abbrv. Label	HUC 12
L*03	010700060201

AUID = NHLAK700060201-03

Assessment Unit IDs are derived from the HUC12 they reside within. The labels have been shortened on this map for presentation purposes.
Example: the Label "L*03" in HUC12 = 010700060201 represents AUID = "NHLAK700060201-03"
In rare cases where an AUID extends beyond the boundary of a single HUC12, additional portions of the end of the HUC 12 number have also been replaced.

0 0.7 1.4 2.1 2.8 Miles

Scale:1:71,650

S:\WD-Watershed\WQ_Planning\305b_303d\2020\Report_Cards\HUC12_maps

Assessment Unit ID: NHLAK600030405-03
Assessment Unit Name: Willand Pond
Town(s) Primary Town is Listed First: Dover, Somersworth

Size: 65.6710 ACRES
Assessment Unit Category: 5-P
Beach: N

2020/2022, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category	TMDL Priority
Aquatic Life Integrity	5-P	CHLORIDE	N	2017	N/A	3-PAS	
		CHLOROPHYLL-A		2017	NLV	2-M	LOW
		DISSOLVED OXYGEN SATURATION		2017	2017	5-M	LOW
		Non-Native Aquatic Plants	N			4C-M	
		OXYGEN, DISSOLVED		2017	2017	5-P	LOW
		Other flow regime alterations	N			4C-P	
		PH		2017	2017	5-M	LOW
		PHOSPHORUS (TOTAL)	N	2017	NLV	2-M	LOW
		TURBIDITY	N	2017	2015	3-PAS	
Fish Consumption	4A-M	MERCURY - FISH CONSUMPTION ADVISORY	N			4A-M	
Potential Drinking Water Supply	2-G	ESCHERICHIA COLI	N	2010	2010	3-PNS	
Primary Contact Recreation	4A-P	CHLOROPHYLL-A	N	2017	2011	2-M	
		Cyanobacteria hepatotoxic microcystins	N	2019	2019	3-PNS	
		ESCHERICHIA COLI	N	2010	2009	4A-P	
Secondary Contact Recreation	3-ND	ESCHERICHIA COLI	N	2010	2009	3-ND	
Wildlife	3-ND						

Good	Marginal	Likely Good	No Current Data	Likely Bad	Poor	Severe
Meets water quality standards/thresholds by a relatively large margin.	Meets water quality standards/thresholds but only marginally.	Limited data available. The data that is available suggests that the parameter is Potentially Attaining Standards (PAS)	Insufficient information to make an assessment decision.	Limited data available The data that is available suggests that the parameter is Potentially Not Supporting (PNS) water quality standards.	Not meeting water quality standards/thresholds. The impairment is marginal.	Not meeting water quality standards/thresholds The impairment is more severe and causes poor water quality.

2020/2022	NHLAK600020803-06	PURITY LAKE	EATON, MADISON	95.510	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600020803-08	SHAW POND	FREEDOM	12.577	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600020803-08-02	SHAW POND - CAMP WAKUTA BEACH	FREEDOM	1.380	ACRES	Aquatic Life Integrity	pH	3-ND	11/21/2007	114 ACID PONDS	33879	Non-ORW
2020/2022	NHLAK600020803-09	TROUT POND	FREEDOM	20.691	ACRES	Aquatic Life Integrity	pH	5-P				Non-ORW
2020/2022	NHLAK600020804-01-01	BERRY BAY	FREEDOM, EFFINGHAM	152.240	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600020804-01-02	LEAVITT BAY	OSSIPEE, EFFINGHAM, FREEDOM	190.095	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-M				Non-ORW
2020/2022	NHLAK600020804-01-02	LEAVITT BAY	OSSIPEE, EFFINGHAM, FREEDOM	190.095	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600020804-01-03	BROAD BAY	FREEDOM, OSSIPEE	430.048	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-M				Non-ORW
2020/2022	NHLAK600020804-01-03	BROAD BAY	FREEDOM, OSSIPEE	430.048	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600020804-01-04	LEAVITT BAY - CAMP MARIST BEACH	EFFINGHAM	1.380	ACRES	Aquatic Life Integrity	pH	3-ND	11/21/2007	114 ACID PONDS	33879	Non-ORW
2020/2022	NHLAK600020804-01-05	BROAD BAY - CAMP HUCKINS BEACH	FREEDOM	1.380	ACRES	Aquatic Life Integrity	pH	3-ND	11/21/2007	114 ACID PONDS	33879	Non-ORW
2020/2022	NHLAK600020804-01-06	BROAD BAY - CAMP ROBIN HOOD BEACH	FREEDOM	1.380	ACRES	Aquatic Life Integrity	pH	3-ND	11/21/2007	114 ACID PONDS	33879	Non-ORW
2020/2022	NHLAK600020804-03	DUCK POND	FREEDOM	34.032	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600020902-01	PROVINCE LAKE	EFFINGHAM, WAKEFIELD	965.649	ACRES	Aquatic Life Integrity	Chlorophyll-a	5-M				Non-ORW
2020/2022	NHLAK600020902-01	PROVINCE LAKE	EFFINGHAM, WAKEFIELD	965.649	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600020902-01	PROVINCE LAKE	EFFINGHAM, WAKEFIELD	965.649	ACRES	Aquatic Life Integrity	Phosphorus (Total)	5-M				Non-ORW
2020/2022	NHLAK600020902-01	PROVINCE LAKE	EFFINGHAM, WAKEFIELD	965.649	ACRES	Primary Contact Recreation	Cyanobacteria hepatotoxic microcystins	5-M				Non-ORW
2020/2022	NHLAK600021001-01	BALCH POND	WAKEFIELD	295.040	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-M				Non-ORW
2020/2022	NHLAK600021001-01	BALCH POND	WAKEFIELD	295.040	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600021001-03	BELLEAU LAKE	WAKEFIELD	187.174	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-M				Non-ORW
2020/2022	NHLAK600030401-01-01	LOVELL LAKE	WAKEFIELD	552.403	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030401-01-02	LOVELL POND - TOWN BEACH	WAKEFIELD	0.436	ACRES	Primary Contact Recreation	Escherichia coli	2-M	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39276	Non-ORW
2020/2022	NHLAK600030401-02	MOUNTAIN LAKE	BROOKFIELD	11.867	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-P				Non-ORW
2020/2022	NHLAK600030401-03	COOKS POND	BROOKFIELD	245.934	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030403-02	HORN POND	WAKEFIELD	118.234	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600030403-03	LAKE IVANHOE	WAKEFIELD	68.239	ACRES	Aquatic Life Integrity	pH	4A-M	9/24/2004	IVANHOE LAKE	11492	Non-ORW
2020/2022	NHLAK600030404-01-01	MILTON POND	MILTON	163.895	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030404-01-02	TOWNHOUSE POND	MILTON	125.646	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030404-01-03	MILTON THREE PONDS - MILTON POND REC AREA BEACH	MILTON	1.382	ACRES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39275	Non-ORW
2020/2022	NHLAK600030404-02	NORTHEAST POND	MILTON	285.041	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030405-02	SPAULDING POND	MILTON, ROCHESTER	49.724	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-P				Non-ORW
2020/2022	NHLAK600030405-03	WILLAND POND	SOMERSWORTH, DOVER	65.671	ACRES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M				Non-ORW
2020/2022	NHLAK600030405-03	WILLAND POND	SOMERSWORTH, DOVER	65.671	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-M				Non-ORW
2020/2022	NHLAK600030405-03	WILLAND POND	SOMERSWORTH, DOVER	65.671	ACRES	Aquatic Life Integrity	Other flow regime alterations	4C-P				Non-ORW
2020/2022	NHLAK600030405-03	WILLAND POND	SOMERSWORTH, DOVER	65.671	ACRES	Aquatic Life Integrity	Oxygen, Dissolved	5-P				Non-ORW
2020/2022	NHLAK600030405-03	WILLAND POND	SOMERSWORTH, DOVER	65.671	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030405-03	WILLAND POND	SOMERSWORTH, DOVER	65.671	ACRES	Primary Contact Recreation	Escherichia coli	4A-P	8/29/2011	58 NH BACTERIA IMPAIRED WATERS	40665	Non-ORW
2020/2022	NHLAK600030601-01	CHALK POND	NEW DURHAM	52.787	ACRES							ORW
2020/2022	NHLAK600030601-04	MARCHS POND	NEW DURHAM	73.998	ACRES							ORW
2020/2022	NHLAK600030601-04-02	MARCHS POND - BIRCH HILL SUMMER CAMP BEACH	NEW DURHAM	1.380	ACRES							ORW
2020/2022	NHLAK600030601-05-01	SUNRISE LAKE	MIDDLETON	246.308	ACRES	Aquatic Life Integrity	Chlorophyll-a	5-M				Non-ORW
2020/2022	NHLAK600030601-05-01	SUNRISE LAKE	MIDDLETON	246.308	ACRES	Aquatic Life Integrity	Non-Native Aquatic Plants	4C-M				Non-ORW
2020/2022	NHLAK600030601-05-01	SUNRISE LAKE	MIDDLETON	246.308	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600030601-05-01	SUNRISE LAKE	MIDDLETON	246.308	ACRES	Aquatic Life Integrity	Phosphorus (Total)	5-M				Non-ORW
2020/2022	NHLAK600030601-05-01	SUNRISE LAKE	MIDDLETON	246.308	ACRES	Primary Contact Recreation	Cyanobacteria hepatotoxic microcystins	5-M				Non-ORW
2020/2022	NHLAK600030601-05-02	SUNRISE LAKE - TOWN BEACH	MIDDLETON	0.533	ACRES	Aquatic Life Integrity	pH	4A-M	11/21/2007	114 ACID PONDS	33879	Non-ORW
2020/2022	NHLAK600030601-05-02	SUNRISE LAKE - TOWN BEACH	MIDDLETON	0.533	ACRES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39276	Non-ORW
2020/2022	NHLAK600030601-08	TAUSSIG WILDLIFE POND DAM	NEW DURHAM	2.600	ACRES							ORW
2020/2022	NHLAK600030602-01	BAXTER LAKE	FARMINGTON, ROCHESTER	301.390	ACRES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M				Non-ORW
2020/2022	NHLAK600030602-01	BAXTER LAKE	FARMINGTON, ROCHESTER	301.390	ACRES	Aquatic Life Integrity	Oxygen, Dissolved	5-M				Non-ORW
2020/2022	NHLAK600030602-01	BAXTER LAKE	FARMINGTON, ROCHESTER	301.390	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030602-03	ROCHESTER RESERVOIR	ROCHESTER, BARRINGTON	53.032	ACRES	Aquatic Life Integrity	pH	4A-M	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600030604-01-01	BOW LAKE	STRAFFORD, NORTHWOOD	1145.795	ACRES	Aquatic Life Integrity	pH	4A-M	9/24/2004	BOW LAKE	11466	ORW
2020/2022	NHLAK600030604-01-02	BOW LAKE - TOWN BEACH	STRAFFORD	0.970	ACRES	Aquatic Life Integrity	pH	3-ND	9/14/2006	BOW LAKE	32408	ORW
2020/2022	NHLAK600030604-01-02	BOW LAKE - TOWN BEACH	STRAFFORD	0.970	ACRES	Primary Contact Recreation	Escherichia coli	2-G	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39276	ORW
2020/2022	NHLAK600030604-01-03	BOW LAKE - MARY WALDRON BEACH	NORTHWOOD	0.315	ACRES	Aquatic Life Integrity	pH	3-ND	9/14/2006	BOW LAKE	32409	ORW
2020/2022	NHLAK600030604-01-04	BOW LAKE - BENNETT BRIDGE BEACH	NORTHWOOD	0.436	ACRES	Aquatic Life Integrity	pH	3-ND	9/14/2006	BOW LAKE	32410	ORW
2020/2022	NHLAK600030604-02	UNNAMED POND	STRAFFORD	6.343	ACRES							ORW
2020/2022	NHLAK600030604-03	UNNAMED POND	STRAFFORD	10.547	ACRES							ORW
2020/2022	NHLAK600030605-01	NIPPO POND	BARRINGTON	85.116	ACRES	Aquatic Life Integrity	pH	4A-P	9/20/2007	158 ACID PONDS	33878	ORW
2020/2022	NHLAK600030605-02	STONEHOUSE POND	BARRINGTON	13.337	ACRES							ORW
2020/2022	NHLAK600030605-03	HUCKINS MILL POND	STRAFFORD	17.268	ACRES							ORW
2020/2022	NHLAK600030605-04	UNNAMED POND	STRAFFORD	13.726	ACRES							ORW
2020/2022	NHLAK600030606-01	LONG POND	BARRINGTON	54.885	ACRES	Aquatic Life Integrity	Chlorophyll-a	4A-M	5/12/2011	LONG POND	40291	Non-ORW
2020/2022	NHLAK600030606-01	LONG POND	BARRINGTON	54.885	ACRES	Aquatic Life Integrity	Phosphorus (Total)	4A-M	5/12/2011	LONG POND	40291	Non-ORW
2020/2022	NHLAK600030606-01	LONG POND	BARRINGTON	54.885	ACRES	Primary Contact Recreation	Chlorophyll-a	4A-M	5/12/2011	LONG POND	40291	Non-ORW
2020/2022	NHLAK600030607-01	AYERS POND	BARRINGTON	235.137	ACRES	Aquatic Life Integrity	pH	4A-M	9/24/2004	AYERS POND	11462	Non-ORW
2020/2022	NHLAK600030608-01	FRESH CREEK POND	DOVER, ROLLINSFORD	19.795	ACRES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M				Non-ORW
2020/2022	NHLAK600030608-01	FRESH CREEK POND	DOVER, ROLLINSFORD	19.795	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030608-01	FRESH CREEK POND	DOVER, ROLLINSFORD	19.795	ACRES	Primary Contact Recreation	Escherichia coli	4A-P	9/21/2010	NEW HAMPSHIRE STATEWIDE BACTERIA	39272	Non-ORW
2020/2022	NHLAK600030701-02	LOWER FREESES POND	DEERFIELD	25.093	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030701-03	UPPER FREESES POND	DEERFIELD	30.154	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030702-01	UNNAMED POND	CANDIA	5.249	ACRES							ORW
2020/2022	NHLAK600030702-02-01	SPRUCE POND	DEERFIELD	21.692	ACRES							ORW
2020/2022	NHLAK600030702-02-02	SPRUCE POND - SPRUCE POND BEACH	DEERING	1.380	ACRES							ORW
2020/2022	NHLAK600030702-03	UNNAMED POND	DEERFIELD	8.959	ACRES							ORW
2020/2022	NHLAK600030703-01	GOVERNORS LAKE	RAYMOND	60.331	ACRES	Aquatic Life Integrity	Chlorophyll-a	4A-M	5/12/2011	GOVERNORS LAKE	40284	Non-ORW
2020/2022	NHLAK600030703-01	GOVERNORS LAKE	RAYMOND	60.331	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030703-01	GOVERNORS LAKE	RAYMOND	60.331	ACRES	Aquatic Life Integrity	Phosphorus (Total)	4A-M	5/12/2011	GOVERNORS LAKE	40284	Non-ORW
2020/2022	NHLAK600030703-01	GOVERNORS LAKE	RAYMOND	60.331	ACRES	Primary Contact Recreation	Chlorophyll-a	2-G	5/12/2011	GOVERNORS LAKE	40284	Non-ORW
2020/2022	NHLAK600030703-03-01	ONWAY LAKE	RAYMOND	178.248	ACRES	Aquatic Life Integrity	Dissolved oxygen saturation	5-M				Non-ORW
2020/2022	NHLAK600030703-03-01	ONWAY LAKE	RAYMOND	178.248	ACRES	Aquatic Life Integrity	pH	5-M				Non-ORW
2020/2022	NHLAK600030704-02-01	PAWTUCKAWAY LAKE	NOTTINGHAM	781.628	ACRES	Aquatic Life Integrity	Chlorophyll-a	4A-M	5/12/2011	PAWTUCKAWAY LAKE	40293	Non-ORW
2020/2022	NHLAK600030704-02-01	PAWTUCKAWAY LAKE	NOTTINGHAM	781.628	ACRES	Aquatic Life Integrity	Dissolved oxygen saturation	4A-M	5/12/2011	PAWTUCKAWAY LAKE	40293	Non-ORW
2020/2022	NHLAK600030704-02-01	PAWTUCKAWAY LAKE	NOTTINGHAM	781.628	ACRES	Aquatic Life Integrity	pH	4A-P	9/20/2007	158 ACID PONDS	33878	Non-ORW
2020/2022	NHLAK600030704-02-01	PAWTUCKAWAY LAKE	NOTTINGHAM	781.628	ACRES	Aquatic Life Integrity	Phosphorus (Total)	4A-M	5/12/2011	PAWTUCKAWAY LAKE	40293	Non-ORW
2020/2022	NHLAK600030704-02-01	PAWTUCKAWAY LAKE	NOTTINGHAM	781.628	ACRES	Primary Contact Recreation	Chlorophyll-a	2-M	5/12/2011	PAWTUCKAWAY LAKE	40293	Non-ORW

SWPPP Cut Sheet:

Filtrexx® Inlet Protection

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Inlet protection is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for storm drain **inlet protection** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons) on and around construction activities.

APPLICATION

Drain inlets are located in areas that receive runoff from surrounding lands, often exposed and disturbed soils, and are located at a low point, or in a sump. Inlet protection used around drain inlets (or *Drain* Inlet protection) should completely enclose the circumference of the drain and where possible should not be placed on a grade or slope. Inlet protection used around drain inlets should never be the only form of site sediment control and should be accompanied by erosion control/slope stabilization practices, such as Slope protection or rolled erosion control blankets (RECB). Inlet protection should never be placed where they divert runoff flow from the drain inlet, or on top of the inlet, which can cause flooding. Under high runoff and sediment loading conditions placement of 1-2 in (25-50 mm) diameter rock (AASHTO #2) may be placed around the outer circumference of the Inlet protection up to ½ the height of the Inlet protection. This will slow runoff velocity as it contacts the Inlet protection and will reduce sediment build-up and clogging of the Inlet protection.

Curb inlets are generally located on paved surfaces and are designed to rapidly drain storm runoff from roadways to prevent flooding that poses a hazard to vehicular traffic. Inlet protection devices should be placed in a manner which intercepts runoff prior to entering the inlet, but does not block or divert runoff from the inlet. To prevent diversion of runoff, Inlet protection used around curbs (or *Curb* Inlet protection) should be used in low points, or sumps, and minor slopes or grades. Inlet protection should never be placed in or on the curb inlet drain, or placed in a manner than obstructs vehicular traffic. Inlet protection height should be at least 1 in (25 mm) lower than top of curb inlet to allow for overflow into the drain and not over the curb. Maximum sediment removal efficiency occurs when minor ponding exists behind Inlet protection but should never lead to flooding.

Curb sediment containment systems are used to reduce the sediment and pollutant load flowing to a curb inlet. They are generally placed on paved surfaces perpendicular to runoff flow and should be lower than the height of the curb. Curb sediment containment systems should never cause flooding or placed where they are a hazard to vehicular traffic. Inlet protection used for curb sediment containment (or *Curb Sediment Containment* Inlet protection) can be placed on a grade but should never be placed directly upslope from curb inlet where it may inadvertently divert runoff from entering curb inlet.

INSTALLATION

1. Inlet protection used for inlet protection to reduce sediment and soluble pollutants entering storm drains shall meet Filtrexx® FilterSoxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be a Filtrexx® Certified™ Installer as determined by Filtrexx® International, LLC (440-926-2607 or visit web site at Filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (current list of installers can be found at www.filtrexx.com). Look for the Filtrexx® Certified™ Installer Seal.

3. Filtrexx® Inlet protection shall be placed at locations indicated on plans as directed by the Engineer. Inlet protection should be installed in a pattern that allows complete protection of the inlet area.
4. Installation of curb Inlet protection will ensure a minimal overlap of at least 1 ft (300mm) on either side of the opening being protected. The Inlet protection will be anchored to the soil behind the curb using staples, stakes or other devices capable of holding the Inlet protection in place.
5. Standard Inlet protection for curb inlet protection and curb sediment containment will use 8 in (200mm) diameter Inlet protection, and drain inlets on soil will use 12 in (300mm) or 18 in (450mm) diameter Inlet protection. In severe flow situations, larger Inlet protection may be specified by the Engineer. During curb installation, Inlet protection shall be compacted to be slightly shorter than curb height.
6. If Inlet protection becomes clogged with debris and sediment, they shall be maintained so as to assure proper drainage and water flow into the storm drain. In severe storm events, overflow of the Inlet protection may be acceptable in order to keep the area from flooding.
7. Curb and drain Inlet protection shall be positioned so as to provide a permeable physical barrier to the drain itself, allowing sediment to collect on the outside of the Inlet protection.
8. For drains and inlets that have only curb cuts, without street grates, a spacer is required in order to keep the Inlet protection away from the drain opening. This spacer should be a hog wire screen bent to overlap the grate opening and keep the sock from falling into the opening. Use at least one spacer for every 4 ft (1.2m) of curb drain opening. The wire grid also prevents other floatable waste from passing over the Inlet protection.
9. Stakes shall be installed through the middle of the drain Inlet protection on 5 ft (1.5m) centers, using 2 in (50mm) x 2 in (50mm) x 3 ft (1m) wood stakes.
10. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Inlet protection should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Inlet protection may be required or sediment removal may be necessary. Inlet protection shall be inspected until contributing drainage area has been permanently stabilized and construction activity has ceased

1. The Contractor shall maintain the Inlet protection in a functional condition at all times and it shall be routinely inspected.
2. If the Inlet protection has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Inlet protection when accumulation has reached 1/2 of the effective height of the Inlet protection, or as directed by the Engineer. Alternatively, for drain Inlet protection a new Soxx™ may be placed on top of the original increasing the sediment storage capacity without soil disturbance.
4. Inlet protection shall be maintained until disturbed area above or around the device has been permanently stabilized and construction activity has ceased.
5. Regular maintenance includes lifting the Inlet protection and cleaning around and under them as sediment collects.
6. The FilterMedia™ will be removed from paved areas or dispersed on site soil or behind curb once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.

Table 2.4 Spacing for Curb Sediment Containment Systems.

Grade (%)	Spacing (ft)	Spacing (mm)
0.5	100	30
1.0	50	15
2.0	25	8
3.0	16	5
4.0	13	4
5.0	10	3

Source: Fifield, 2001.

Figure 2.1. Engineering Design Drawing for Curb and Drain Inlet Protection

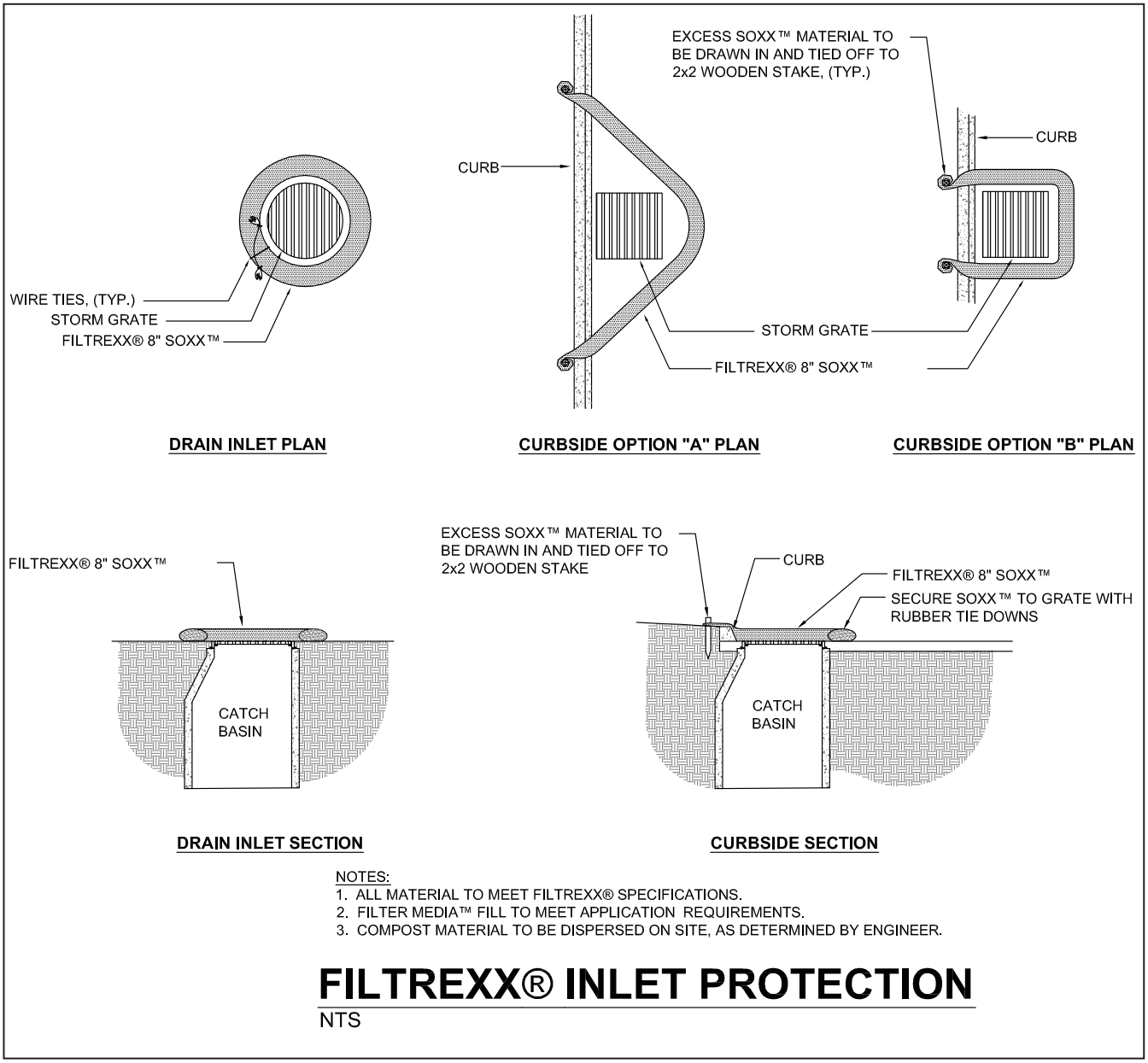
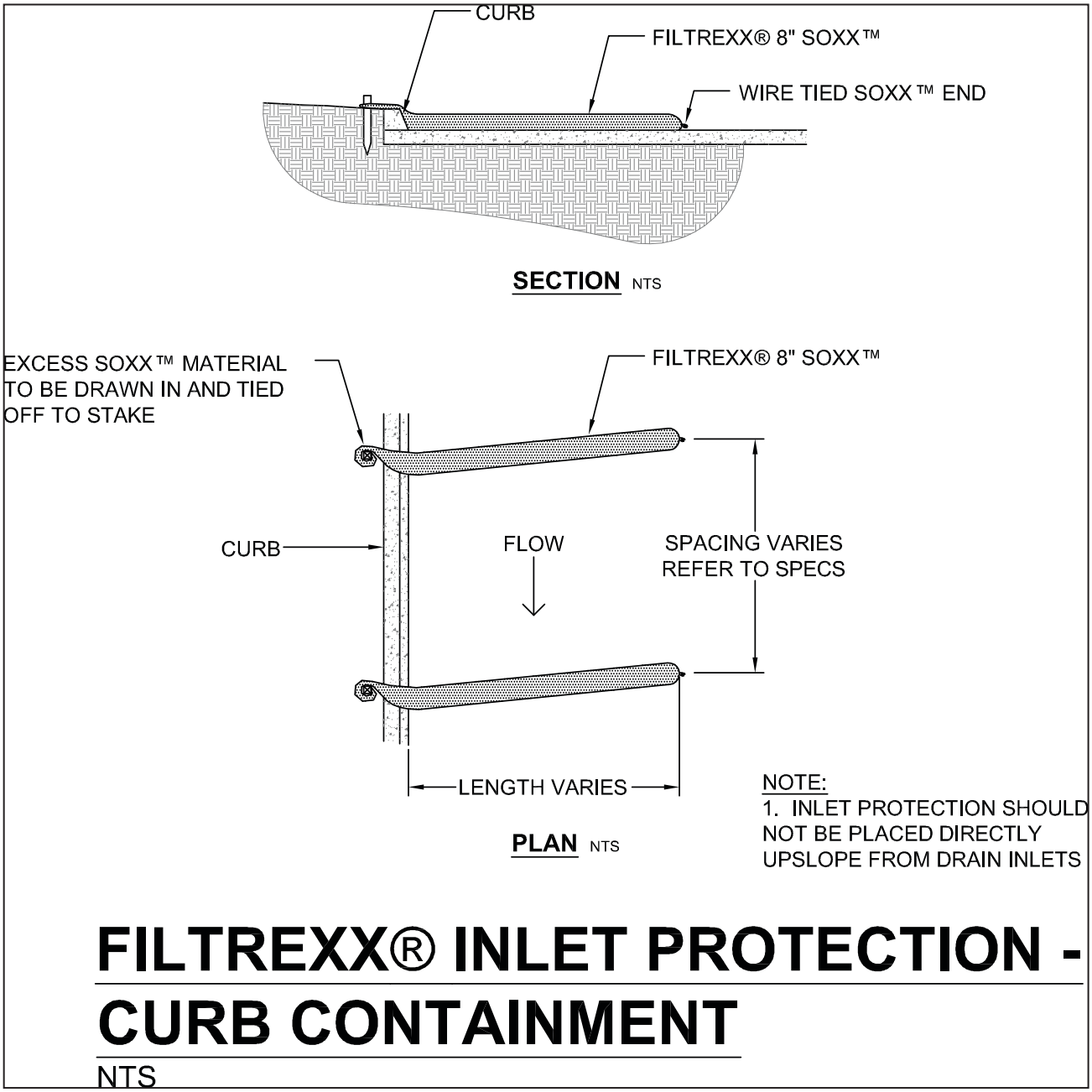


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



SWPPP Cut Sheet:

Filtrexx® Sediment Control

Sediment & Perimeter Control Technology

PURPOSE & DESCRIPTION

Filtrexx® Sediment control is a three-dimensional tubular sediment control and storm water runoff filtration device typically used for **perimeter control** of sediment and other soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities.

APPLICATION

Filtrexx® Sediment control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Sediment control is effective when installed perpendicular to sheet or low concentrated flow. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation.
- On frozen ground where trenching of silt fence is impossible.
- On paved surfaces where trenching of silt fence is impossible.

INSTALLATION

1. Sediment control used for perimeter control of sediment and soluble pollutants in storm runoff shall meet Filtrexx® Soxx™ Material Specifications and use Certified Filtrexx® FilterMedia™.
2. Contractor is required to be Filtrexx® Certified™, or use pre-filled Filtrexx® Sediment control products manufactured by a Filtrexx® Certified Manufacturer™ as determined by Filtrexx® International, LLC (440-926-2607 or visit www.filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application. Look for the Filtrexx® Certified™ Seal.
3. Sediment control will be placed at locations indicated on plans as directed by the Engineer.
4. Sediment control should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second Sediment control shall be constructed at the top of the slope.
5. Effective Soxx™ height in the field should be as follows: 8" Diameter Sediment control = 6.5" high, 12" Diameter Sediment control = 9.5" high, 18" Diameter SiltSoxx™ = 14.5" high, 24" Diameter Sediment control = 19" high.
6. Stakes shall be installed through the middle of the Sediment control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) hard wood stakes. In the event staking is not possible, i.e., when Sediment control is used on pavement, heavy concrete blocks shall be used behind the Sediment control to help stabilize during rainfall/runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the Sediment control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for

establishment of permanent vegetation. The Engineer will specify seed requirements.

10. Filtrexx® Sediment control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct Filtrexx® Sediment control installation (Figure 1.1).

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased

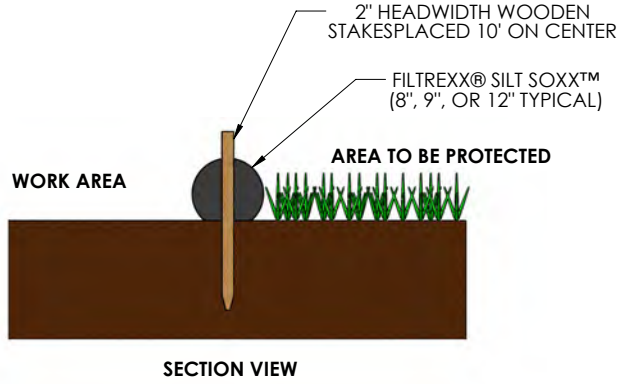
1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (meters)*				
	8 in (200 mm) Sediment control	12 in (300 mm) Sediment control	18 in (450 mm) Sediment control	24 in (600mm) Sediment control	32 in (800mm) Sediment control
	6.5 in (160 mm)**	9.5 in (240 mm) **	14.5 in (360 mm) **	19 in (480 mm) **	26 in (650 mm) **
2 (or less)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

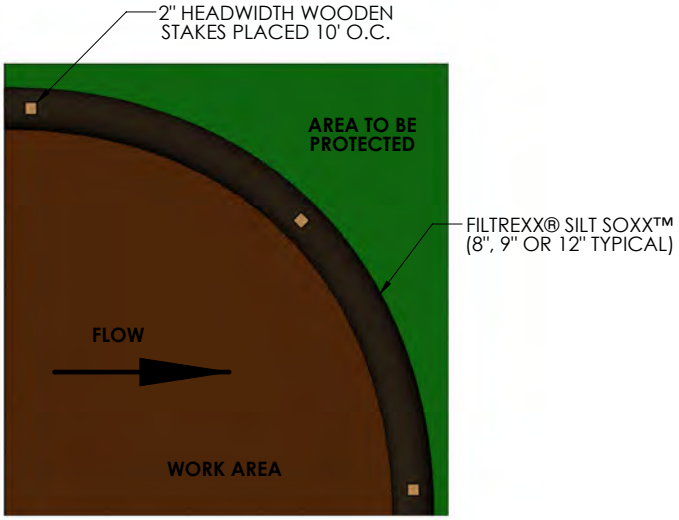
* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

FILTREXX® SILT SOXX™

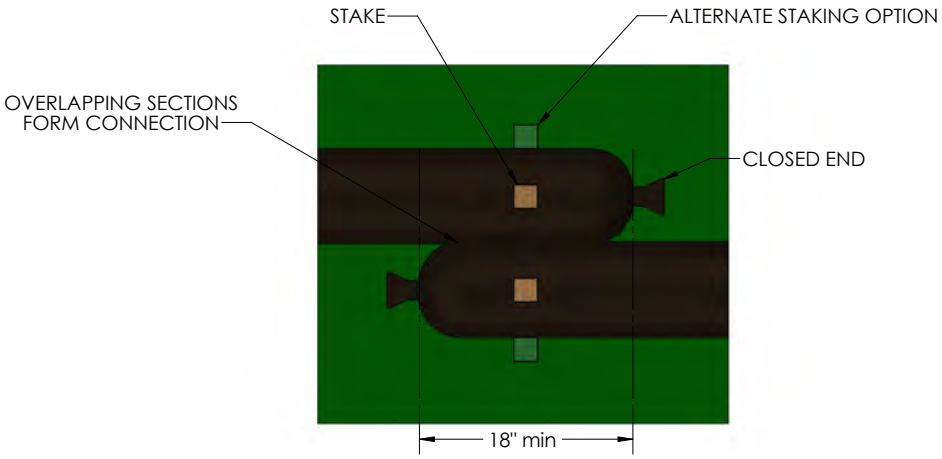


SECTION VIEW

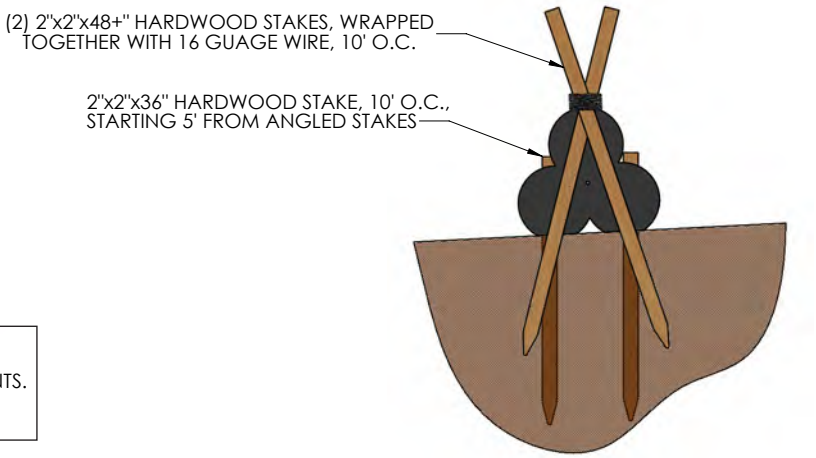


TOP VIEW

COMPOST SOCK CONNECTION/ATTACHMENT DETAIL



FILTREXX® PYRAMID STAKING DETAIL



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

SOILS & DEWATERING:

WdA	*WINDSOR*	*LOAMY SAND*	*K= 0.17*
DeA	*DEEREFIELD*	*LOAMY SAND*	*K= 0.17*
(350A&B)			

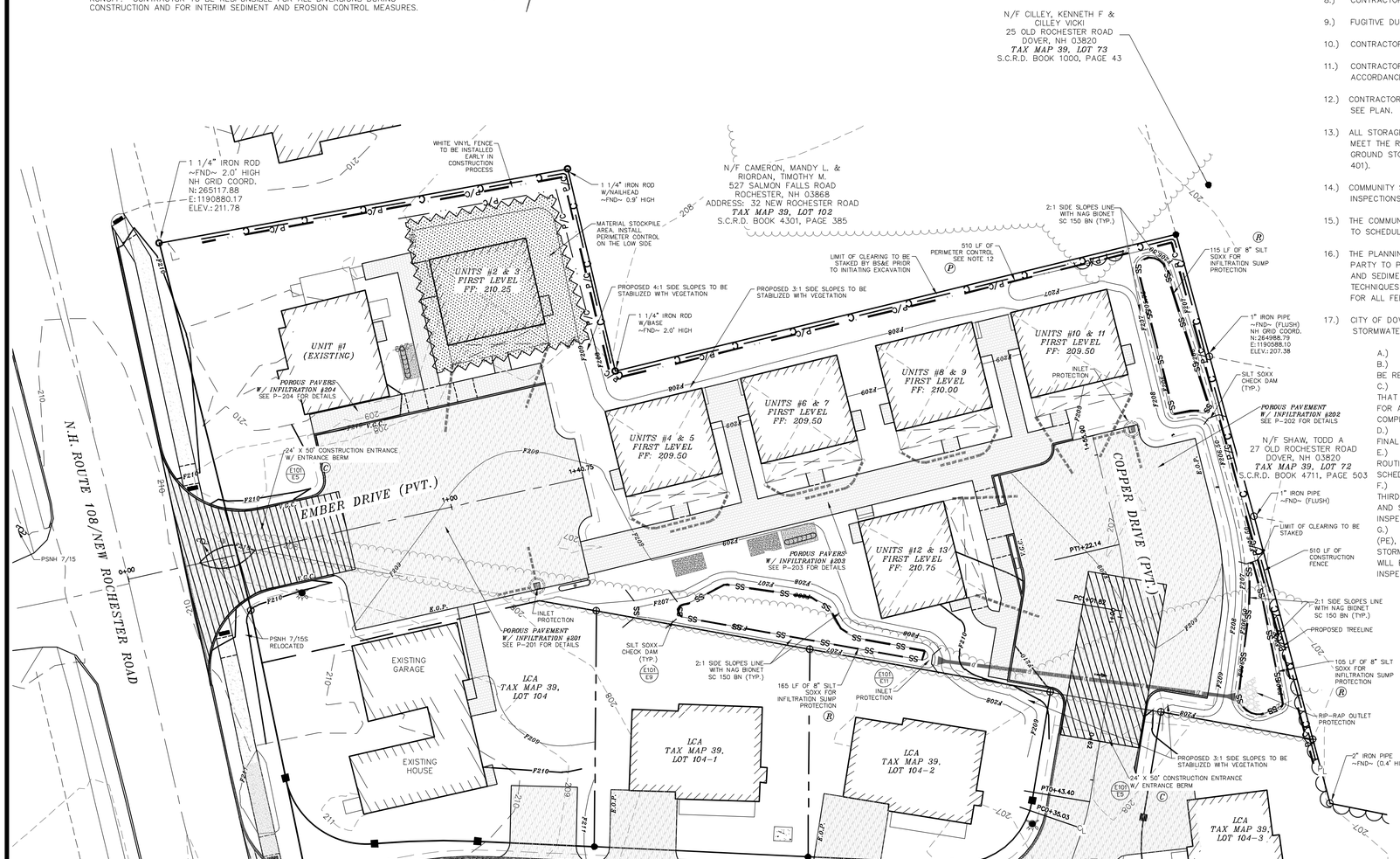
SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. & ROCKINGHAM COUNTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2012 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED MAY 3, 2012 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIES OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E-101 AND E-102.

THE CONSTRUCTION SCHEDULE WILL BE MANAGED SO THAT ALL STORMWATER STRUCTURES WILL BE BUILT AND STABILIZED PRIOR TO RECEIVING SURFACE WATER RUNOFF. CONTRACTOR TO BE RESPONSIBLE FOR ALL DIVERSIONS DURING CONSTRUCTION AND FOR INTERIM SEDIMENT AND EROSION CONTROL MEASURES.





NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.83 Ac.

5.) THE INTENT OF THIS PLAN IS SHOW THE PROPOSED EROSION AND SEDIMENT CONTROL MEASURES.

6.) CONTRACTOR IS TO INSTALL A CONSTRUCTION ENTRANCE PRIOR TO EARTH DISTURBING ACTIVITIES.

7.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ANYTHING DISTURBED, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO NEW ROCHESTER ROAD OR THE EXISTING DRIVEWAYS.

8.) CONTRACTOR IS RESPONSIBLE FOR CLEANING AND MAINTAINING THE INLET PROTECTION ONCE INSTALLED.

9.) FUGITIVE DUST IS TO BE CONTROLLED THROUGHOUT THE CONSTRUCTION PROCESS IN ACCORDANCE WITH ENV–A 1000.

10.) CONTRACTOR IS TO MEET THE REQUIREMENTS SPECIFIED IN RSA 430:51–57 AND AGR 3800, RELATING TO INVASIVE SPECIES.

11.) CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE WATER QUALITY FROM ANY RUN OFF DURING THE CONSTRUCTION PROCESS, IN ACCORDANCE WITH ENV–WQ 1507, IN ORDER TO PREVENT VIOLATIONS OF THE STORM WATER QUALITY STANDARDS.

12.) CONTRACTOR AY USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN.

13.) ALL STORAGE FACILITIES FOR FUEL, CHEMICALS, CHEMICAL OR INDUSTRIAL WASTES, AND BIODEGRADABLE RAW MATERIALS SHALL MEET THE REGULATIONS OF THE NHDES, INCLUDING BUT NOT LIMITED TO THOSE INVOLVING UNDERGROUND STORAGE TANKS, ABOVE GROUND STORAGE TANKS, HAZARDOUS WASTE AND BEST MANAGEMENT PRACTICES FOR GROUND WATER PROTECTION (PART ENV–WQ 401).

14.) COMMUNITY SERVICES DEPARTMENT OR ITS DESIGNATED AGENT SHALL HAVE ACCESS TO THE SITE TO COMPLETE ROUTINE INSPECTIONS.

15.) THE COMMUNITY SERVICES DEPARTMENT SHALL BE NOTIFIED 24 HOURS PRIOR TO INSTALLATION OF A STORMWATER BMP IN ORDER TO SCHEDULE AN INSPECTION. THESE INSPECTIONS SHALL BE COMPLETED DURING NORMAL WORK HOURS.

16.) THE PLANNING BOARD OR COMMUNITY SERVICES DEPARTMENT MAY REQUIRE THE DESIGN ENGINEER AND/OR AN INDEPENDENT THIRD PARTY TO PROVIDE INSPECTION AND OVERSIGHT OF THE CONSTRUCTION OF THE STORMWATER MANAGEMENT FACILITIES AND EROSION AND SEDIMENT CONTROL MEASURES AT ITS DISCRETION. SUCH OVERSIGH MAY BE ESPECIALLY IMPORTANT FOR IMPLEMENTING TECHNIQUES SUCH AS POROUS PAVEMENT OR SUSURFACE INFILTRATION SYSTEMS. THE OWNER/APPLICANT SHALL BE RESPONSIBLE FOR ALL FEES ASSOCIATED WITH THIRD–PARTY INSPECTIONS.

17.) CITY OF DOVER: IN ACCORDANCE WITH SITE PLAN REVIEW REGULATIONS (153–14) THE FOLLOWING STORMWATER MEASURES ARE REQUIRED.

A.) ALL PROPOSED BMPs WILL CONFORM TO THE NH STORMWATER MANUAL VOLUME 3.
B.) EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY COMMUNITY SERVICE.
C.) TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN CALENDAR DAYS FOR EXPOSED SOILS AREAS THAT ARE WITHIN ONE HUNDRED FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.
D.) ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL STABILIZATION IS ACCOMPLISHED.
E.) COMMUNITY SERVICES DEPARTMENT OR THEIR DESIGNATED AGENT SHALL HAVE ACCESS TO THE SITE TO COMPLETE ROUTINE INSPECTIONS AND SHALL BE NOTIFIED 24–HOURS PRIOR TO INSTALLATION OF A STORMWATER BMP IN ORDER TO SCHEDULE AN INSPECTION, DURING NORMAL WORKING HOURS.
F.) THE PLANNING BOARD OR COMMUNITY SERVICES MAY REQUIRE THE DESIGN ENGINEER AND/OR AN INDEPENDENT, THIRD–PARTY INSPECTION AND OVERSIGHT OF THE CONSTRUCTION OF STORMWATER MANAGEMENT FACILITIES AND EROSION AND SEDIMENT CONTROL AT THEIR DISCRETION. THE OWNER / APPLICANT IS RESPONSIBLE FOR ALL FEES ASSOCIATED WITH INSPECTIONS.
G.) ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORMWATER INSPECTOR (CESSWI), OR A CERTIFIED PROFESSIONAL IN STORMWATER QUALITY (CPSWQ). INSPECTION REPORTS WILL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT. U.S. EPA, CGP 2022 REQUIRES A QUALIFIED AND CERTIFIED INSPECTOR (SEE SWPPP).

LEGEND:

- (R) POND PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- REBAR (FND)
- IRON BOUND (FND)
- IRON PIPE (FND)
- UTILITY POLE
- BENCHMARK
- SS SS SS — PERIMETER CONTROL FILTREXX SILTSOXX
- C C — CONSTRUCTION FENCE
- P/C — TREE LINE

STABILIZATION NOTE:
SEE NOTE #6, SHEET E–102, DETAIL E–18
SIDE SLOPES ARE TO BE STABILIZED WITHIN THREE WORKING DAY UPON COMPLETION OF FINAL GRADE.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

DOVER PLANNING FILE #SITE–2023–0007

#	REVISION	DATE	DESCRIPTION
#2		11–06–23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1		9–25–23	REVISED PER DOVER TRC COMMENT

EROSION AND SEDIMENT CONTROL PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

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

NOT FOR CONSTRUCTION

NHDES-W-09-008

APPLICATION FOR SEWER CONNECTION PERMIT
Water Division/Wastewater
Engineering Bureau Design Review Section

RSA/Rule: RSA 485-A:37 / Env-Wq 703.07

TYPE OR PRINT CLEARLY

Use this application for Sewer Connection Permit to request NHDES review/approval for any proposed sewerage design. Under RSAs 485 and 485-A, design plans for new sewerage facilities – whether publicly or privately owned, and regardless of design flow – must be submitted to NHDES for review/approval action at least 30 days prior to construction. Pursuant to Env-Wq 703, design submittals must include 1 set of engineering plans/specifications, pertinent design calculations, the required fee, and a Municipal Certification (signed by an authorized municipal official, see page 2).

1. Engineer of Record - Contact Information		
Engineer / Contact: Kenneth A. Berry	*Company: Berry Surveying & Engineering*	
Mailing Address: 335 Second Crown Point Road		
Town/City: Barrington	*State:* NH	*ZIP:* 03825
Phone Number: 603-332-2863	*Email: k.berry@berrysurveying.com*	

2. Description of Proposed Work (check all that apply)	
☒	An extension of a collector or interceptor; Extension of SDP D2022-1107
☐	A sewage pumping station greater than 50 gpm or serving more than one building;
☒	A proposed sewer that serves more than one building or that requires a manhole at the connection.

Project Name or Description: Copper Drive & Ember Drive		
Project Location - Street Address: 34 New Rochester Road		
Project Location - Town / City: Dover		
Name Of Receiving WWTF: Dover		
Average Design Flow (ADF, gal/day): 3,600		
Proposed Sewer Length (Linear ft)	Pipe Diameter (inches)	Pipe Material
220.50	8"	SDR 35

3. Required Fee	
☒	Sewer connection design submittals must be accompanied by a review fee payment based on the project's average design flow - $0.10 per gal/day ("a dime a gallon") for design flows up to 10,000 gal/day, plus $0.05 per gal/day for any flows in excess thereof.
☐	A fee of $200 per plan sheet shall be paid for review of modifications to privately owned pump stations, force mains, interceptors, and wastewater treatment facilities which are not associated with an increase in wastewater flow.
☐	Fees are not required of municipalities for municipal projects.
Fee Enclosed: $360	Please make checks payable to "Treasurer State of NH".

Italics indicate items are optional.

RSA/Rule: RSA 485-A:37 / Env-Wq 703.07

4. Municipal Certification	
On behalf of Copper Drive & Ember Drive,the City of Dover hereby provides the following municipal certification.	
The municipal sewage collection system and wastewater treatment facilities have been demonstrated, pursuant to Env-Wq 703.07(d), to have adequate processing capability for the proposed added hydraulic flow and organic flow at the time of connection. The proposed sewer connection and/or sewerage design meet with the approval of the local jurisdictional authority.	
Name Of Municipal Official (Project Location):	Title:
Signature:	Date:
Email Address:	
When the Receiving WWTF is in a different Municipality from that of the Project Location, the following additional certification is required.	
Name Of WWTF Official (Host Community):	Title:
Signature:	Date:
Email Address:	

Submit completed application package to:

NHDES Wastewater Engineering Bureau
Design Review Section
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095

NOTE: A Separate INDUSTRIAL WASTEWATER INDIRECT DISCHARGE REQUEST (IDR) May be Required For Industrial Waste Contributions, Depending On Quantity And Quality. For Further Information, Contact The Industrial Pretreatment Supervisor Of The Wastewater Engineering Bureau At (603)-271-2052.

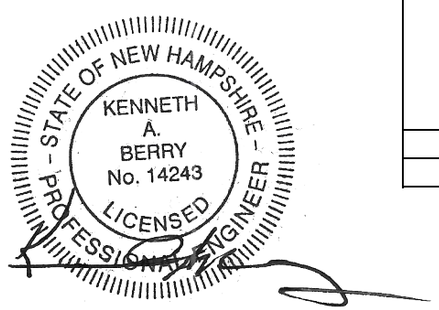
# 2br Units	12
# Bedrooms	24
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
15.00	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.038	
Cumulative Infiltration (gpm)	
0.038	
Total Flow Received (BR Flow + INF) (gpm)	
15.04	
Prop. SMH #12	
Rim Elev	209.75
Inv In (Units #8 & 9)	204.17
Inv In (Units #10 & 11)	204.17
Inv Out (Prop. SMH #2)	204.00
Depth SMH	5.75

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (Prop. SMH #12)	204.00
Inv Out (Prop. SMH #11)	202.87
Length (ft)	119.50
Slope	0.009
Full Velocity (ft/s)	3.98
Discharge Rate (gpm)	622.99

# 2br Units	12
# Bedrooms	24
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
15.00	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.032	
Cumulative Infiltration (gpm)	
0.070	
Total Flow Received (BR Flow + INF) (gpm)	
15.07	
Prop. SMH #11	
Rim Elev	208.27
Inv In (Prop. SMH #12)	202.87
Inv Out (Prop. SMH #10)	202.77
Depth SMH	5.50

Full Velocity (Manning Equation)	
V=(1.486/n)*(R^2/3)*(S^1/2)	
n	0.011
R	0.167
Pipe Dia (in)	8
Area (ft^2)	0.349
8" SDR 35	
Inv In (Prop. SMH #11)	202.77
Inv Out (Prop. SMH #10)	202.32
Length (ft)	101.00
Slope	0.004
Full Velocity (ft/s)	2.73
Discharge Rate (gpm)	427.63

# 2br Units	12
# Bedrooms	24
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
15.00	
Cumulative Infiltration (gpm)	
0.070	
Total Flow Received (BR Flow + INF) (gpm)	
15.07	
Prop. SMH #10 (Only flow from 34 New Rochester Rd)	
Rim Elev	210.81
Inv In (Prop. SMH #11)	202.32
Inv In (Ex. SMH #3)	202.23
Inv Out (Ex. SMH #2)	202.22
Depth SMH	8.59



23-053 Sewer Calculations		
Peaking Factor		6
Flow/Bedroom (gpd)		150
Units are two (2) bedrooms		
Total 8" SDR 35 Length (Ft):	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
220.50	3,600	15.00
	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	100	0.07
	Total Flow Received (GPD):	Total Flow Received (GPM):
	3,700	15.07
It is not anticipated that the pipes will ever flow full		
Project is connecting to gravity sewer in Copper Drive, Sewer Discharge Permit D2022-1107		

MAJOR RESIDENTIAL SITE PLAN & LOT MERGER PLAN FOR KNOX MARSH DEVELOPMENT, LLC 34 NEW ROCHESTER ROAD DOVER, N.H. TAX MAP 39, LOT 103

TABLE OF CONTENTS:

SHEET 1 ~ NEIGHBORHOOD PLAN
SHEET 2 ~ EXISTING CONDITIONS PLAN & DEMOLITION PLAN
SHEET 3 ~ SITE SPECIFIC SOILS MAP
SHEET 4 ~ LOT MERGER PLAN*
SHEET 5 ~ LIMITED COMMON AREA REVISION PLAN*
SHEET 6 ~ SITE PLAN
SHEET 7 ~ GRADING PLAN & PROFILE COPPER DRIVE
SHEET 8 ~ GRADING PLAN & PROFILE EMBER DRIVE
SHEET 9 ~ COPPER DRIVE POROUS PAVEMENT DRIVEWAY ADDITIONS
SHEET 10 ~ P201-204-POROUS PAVEMENT/PAVERS PLANS
SHEET 11 ~ EROSION & SEDIMENT CONTROL PLAN
SHEET 12 ~ UTILITY PLAN & PROFILE COPPER DRIVE
SHEET 13 ~ UTILITY PLAN & PROFILE SEWER/WATER LINES
SHEET 14 ~ CROSS SECTIONS COPPER DRIVE & EMBER DRIVE
SHEET 15 ~ LIGHTING PLAN
SHEET 16 ~ LANDSCAPING PLAN
SHEET 17 ~ SIGHT DISTANCE SOUTHBOUND
SHEET 18 ~ SIGHT DISTANCE NORTHBOUND
SHEET 19 ~ E101-EROSION & SEDIMENT CONTROL DETAILS
SHEET 20 ~ E102-EROSION & SEDIMENT CONTROL DETAILS
SHEET 21 ~ C101-CONSTRUCTION DETAILS
SHEET 22 ~ C102-CONSTRUCTION DETAILS
SHEET 23 ~ C103-CONSTRUCTION DETAILS
SHEET 24 ~ U101-UTILITY DETAILS
SHEET 25 ~ U102-UTILITY DETAILS
SHEET 26 ~ L101-LANDSCAPING DETAILS
SHEET 27 ~ DOVER FIRE TRUCK TURN TEMPLATE
SHEET 28 ~ DOVER FIRE TRUCK TURN TEMPLATE

* INDICATES PLAN IS TO BE RECORDED AT S.C.R.D.

OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

APPLICANT: KNOX MARSH DEVELOPMENT, LLC
242 CENTRAL AVE
DOVER, NH 03820

_____
ROBERT BALDWIN

SURVEYOR OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

ENGINEER OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

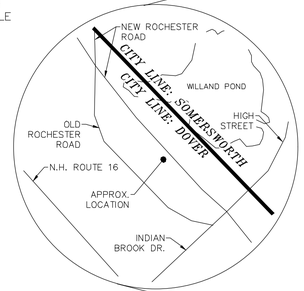
WETLAND SCIENTIST: JOHN P. HAYES III, CSS, CWS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 205-4396

SOILS SCIENTIST: JOHN P. HAYES III, CSS, CWS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 205-4396

NOTE:

BERRY SURVEYING & ENGINEERING HAS PREPARED AN INSPECTION & MAINTENANCE MANUAL AS PART OF THIS PROJECTS DOCUMENTATION. ALL USERS ARE BOUND TO THIS DOCUMENT AS PART OF THE APPROVAL OF THE PLANNING BOARD. COPIES OF THE YEARLY INSPECTIONS ARE TO BE DELIVERED TO THE CITY OF DOVER COMMUNITY SERVICES DEPARTMENT. THIS IS AN ADDENDUM TO THE ORIGINAL COPPER DRIVE MANUAL.

LOCATION PLAN
DOVER, NH
NOT TO SCALE



VICINITY SKETCH
DOVER, NH
SCALE: 1" = 250' ±



WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SITE PLAN, THE SITE PLAN APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS AND SPECIFICATIONS OF THE CITY OF DOVER LAND SITE PLAN REGULATIONS AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL, UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED, IN ANY PARTICULAR, BELOW. NON – ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FOR SITE PLAN APPROVAL.

GENERAL PLAN SET NOTES:

1.) 11x17" PLANS ARE TWICE THE PUBLISHED SCALE.

2.) ALL PLANS ARE CONSIDERED TO BE NOT FOR CONSTRUCTION UNLESS THEY CONTAIN THE APPROVAL STAMP OF THE CITY OF DOVER.

REQUIRED PERMITS:

1.) NHDES SEWER DISCHARGE PERMIT: D2022-1107 (NEEDS AMENDMENT)
2.) EPA NOTICE OF INTENT/SWPPP (NOI): NHR10010C (SWPPP/SWMP NEEDS AMENDMENT)
3.) DIVISION OF HISTORICAL RESOURCES: 15390
4.) EVERSOURCE WORK ORDER NUMBER: PENDING

APPROVED DOVER

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 805
KENNETH A. BERRY
SIGNATURE

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

MAJOR RESIDENTIAL SITE PLAN & LOT MERGER PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14246
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

ABBREVIATION LEGEND:

E.O.P.	EDGE OF PAVEMENT
V.G.C.	VERTICAL GRANITE CURB
B.C.C.	BITUMINOUS CONCRETE CURB
BITUM.	BITUMINOUS
E.S.H.W.T	ESTIMATE SEASONAL HIGH WATER TABLE
TYP.	TYPICAL
O.H.U.	OVERHEAD ELECTRIC / UTILITY
U.G.E.	UNDER GROUND ELECTRIC / UTILITY
C.L.D.I.	CONCRETE LINED DUCTILE IRON
INV.	INVERT
ELEV.	ELEVATION
F.E.S.	FLARED END SECTION
HDPE	HIGH DENSITY POLYETHYLENE
RECB	ROLLED EROSION CONTROL BLANKET
F.G.	FINISHED GRADE
E.G.	EXISTING GRADE
E.T.W.	EDGE OF TRAVELED WAY
T.B.C.	TO BE REMOVED
PL	PROPERTY LINE
EL	EASEMENT LINE
CL	CENTER LINE
CF	CUBIC FEET
P.C.	POINT OF CURVATURE
P.T.	POINT OF TANGENCY
P.V.C.	POINT OF VERTICAL CURVE
P.V.I.	POINT OF VERTICAL INTERSECTION
P.V.T.	POINT OF VERTICAL TANGENCY
EX.	EXISTING
PROP.	PROPOSED
STA.	STATION
BMP	BEST MANAGEMENT PRACTICE
'/,	FEET / FEET
TP	TEST PIT
RCP	REINFORCED CONCRETE PIPE
FDC	FIRE DEPARTMENT CONNECTION
TBS	TO BE SET

{ } SSL ( ) ~ {SIZE} SINGLE SOLID LINE (COLOR W=WHITE, Y=YELLOW)
{ } DSL ( ) ~ {SIZE} DOUBLE SOLID LINE (COLOR W=WHITE, Y=YELLOW)
{ } SSB ( ) ~ {SIZE} SINGLE SOLID W/ BROKEN LINE (COLOR W=WHITE, Y=YELLOW)
{ } SBL ( ) ~ {SIZE} SINGLE BROKEN LINE (COLOR W=WHITE, Y=YELLOW)
{ } DBL ( ) ~ {SIZE} DOUBLE BROKEN LINE (COLOR W=WHITE, Y=YELLOW)

EXISTING LEGEND:

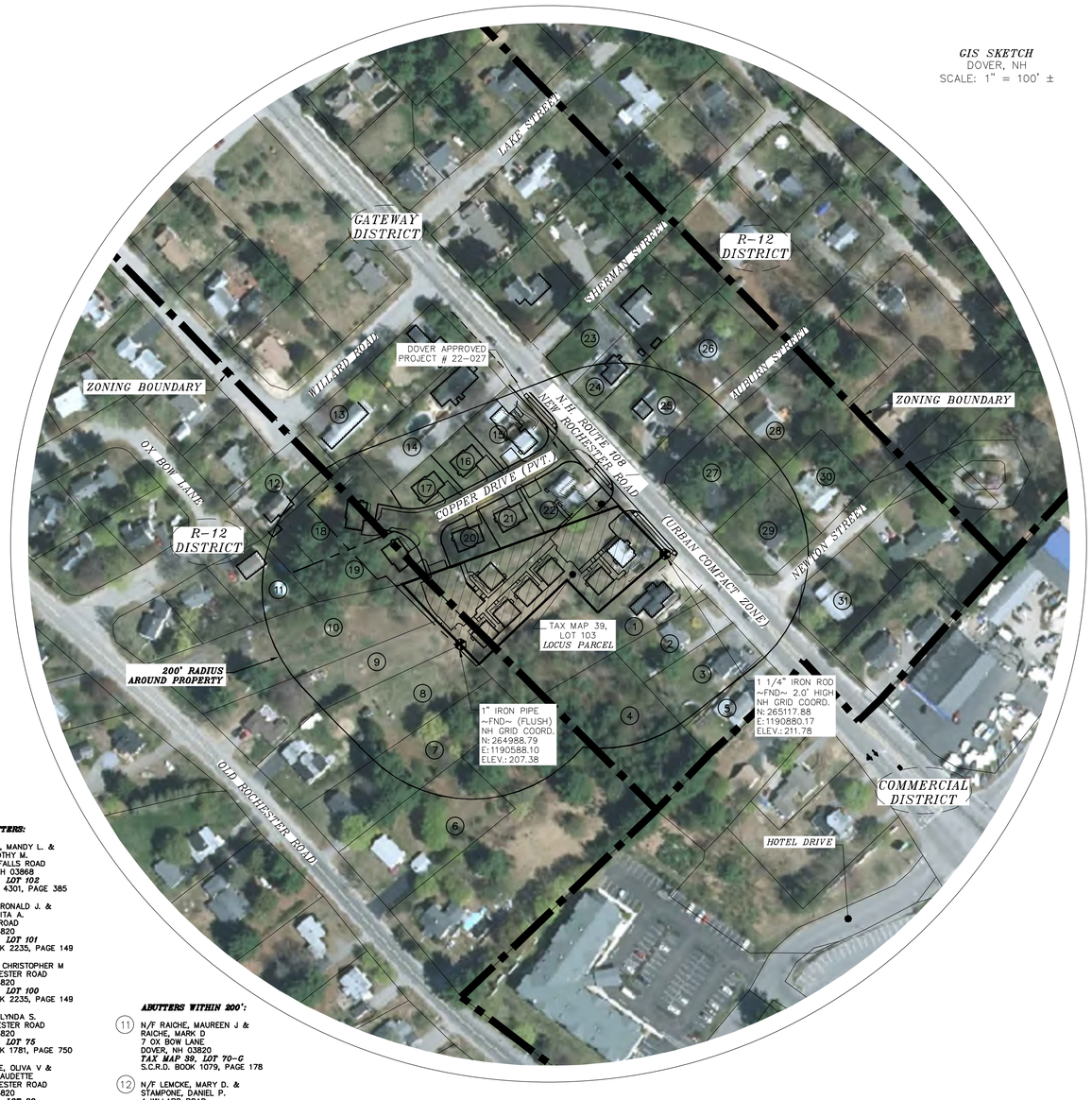
- IRON PIPE ~FND~
- IRON BOUND ~FND~
- 3/4" REBAR W/ID CAP ~SET~
- UTILITY POLE
- SIGNAGE
- DRAINAGE CULVERT
- DRAIN MANHOLE W/ STRUCTURE
- SEWER MANHOLE W/ STRUCTURE
- CATCH BASIN W/ STRUCTURE
- WATER GATE VALVE
- WATER SHUT OFF
- FIRE HYDRANT
- GAS VALVE
- SEWER LINE
- WATER LINE
- OVERHEAD UTILITIES
- UNDERGROUND UTILITIES
- BUILDING SETBACK LINE
- TREELINE
- CONTOUR LINE, MINOR
- CONTOUR LINE, MAJOR
- ZONING DISTRICT LINE
- GAS LINE
- 200x00 EXISTING SPOT ELEVATION

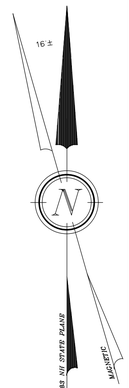
PROPOSED LEGEND:

- 3/4" REBAR W/ ID CAP ~TBS~
- GRANITE BOUND ~TBS~
- UTILITY POLE
- LIGHT TYPE "A" MOUNTED ON BUILDING
- LIGHT TYPE "B" MOUNTED ON POLE
- LIGHT TYPE "C" MOUNTED ON POST
- SEWER MANHOLE W/ STRUCTURE
- CATCH BASIN W/ STRUCTURE
- SIGNAGE
- CHECK DAM-MATERIAL AS SPECIFIED
- FLOW ARROW
- DETAIL SHEET / DETAIL
- MATCH POINT
- MATCH LINE
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- DRAIN CULVERT W/ FLARED END SECTION (F.E.S.)
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- TRANSFORMER / J.BOX
- UNDERGROUND UTILITY
- SILT FENCE / EROSION MIX BERM
- FILTREXX 8" - 12" SILT SOXX AS SPECIFIED
- ORANGE CONSTRUCTION PERIMETER FENCE
- PERIMETER CONTROL
- NRCS SOIL DELINEATION
- WdA SOIL TYPE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- SNOW STORAGE
- PASSIVE RECREATION SPACE
- POROUS PAVEMENT
- POROUS PAVERS
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- F230.31 PROPOSED SPOT ELEVATION
- PROPOSED WATER LINE
- PROPOSED WATER SERVICE
- PROPOSED SEWER LINE
- PROPOSED SEWER SERVICE
- PROPOSED TREE LINE
- PROPOSED GRAVEL SHOULDER PAVEMENT INLAY

SIGN ID NUMBER	SIGN SIZE (WIDTH x HEIGHT)	SIGN	TEXT DIMENSIONS	NO. OF SIGNS	BACKGROUND	LEGEND	BORDER	POST SIZE & QUANTITY
R1-1	30"x30"	STOP	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	RED	WHITE	WHITE	SQUARE (1)
R7-8	12"x18"	RESERVED PARKING	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	2	WHITE	GREEN W/ WHITE SYMBOL ON BLUE	RED	SQUARE (2)
R7-8a	12"x6"	VAN ACCESSIBLE	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	2	WHITE	GREEN	GREEN	SQUARE (0)
D9-11b	24"x24"		SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	BLUE	WHITE	WHITE	U-CHANNEL (1)
D9-11b	12"x18"	ACCESSIBLE TV CHARGE USE LADY	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	BLUE	WHITE	WHITE	U-CHANNEL (1)
W14-2	12"X6"	NO OUTLET	SEE STANDARD HIGHWAY SIGNS 2004 EDITION PUBLISHED BY USDOT - FHWA	1	YELLOW	BLACK	BLACK	U-CHANNEL (0)

GIS SKETCH
DOVER, NH
SCALE: 1" = 100' ±





DIRECT ABUTTERS:

1. N/F CAMERON, MANDY L. & RIORDAN, TIMOTHY M. 527 SALMON FALLS ROAD ROCHESTER, NH 03868 ***TAX MAP 39, LOT 102*** S.C.R.D. BOOK 4301, PAGE 385
2. N/F WEEDEN, RONALD J. & WEEDEN, JUANITA A. 145 DURHAM ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 101*** S.C.R.D. BOOK 2235, PAGE 149
3. N/F MERCIER, CHRISTOPHER M 28 NEW ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 100*** S.C.R.D. BOOK 2235, PAGE 149
4. N/F DEMERS, LYNDA S. 21 OLD ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 75*** S.C.R.D. BOOK 1781, PAGE 750
5. N/F LACHANCE, OLIVA V & LACHANCE, CLAUDETTE 28 NEW ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 99*** S.C.R.D. BOOK 1017, PAGE 117
6. N/F POMERLEAU, JEAN. 21-1/2 OLD ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 75-A*** S.C.R.D. BOOK 2704, PAGE 286
7. N/F BODOH, JACOB & MARCOUX, ELIZABETH 23 OLD ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 74*** S.C.R.D. BOOK 4387, PAGE 503
8. N/F CILLEY, KENNETH F. & CILLEY, VICKI 25 OLD ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 73*** S.C.R.D. BOOK 1000, PAGE 43
9. N/F SHAW, TODD A. 27 OLD ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 72*** S.C.R.D. BOOK 4711, PAGE 503
10. N/F BRAY, JAMES TRUSTEE SCHATVET LEE REV. TRUST OF 2013 29 OLD ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 71*** S.C.R.D. BOOK 4187, PAGE 967

ABUTTERS WITHIN 200':

11. N/F RAICHE, MAUREEN J & RAICHE, MARK D 7 OX BOW LANE DOVER, NH 03820 ***TAX MAP 39, LOT 70-G*** S.C.R.D. BOOK 1079, PAGE 178
12. N/F LEMCKE, MARY D. & STAMPONE, DANIEL P. 4 WILLARD ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 69-G*** S.C.R.D. BOOK 3654, PAGE 202
13. N/F TAYLOR, BERNARD C. SR. 2 WILLARD ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 69-E*** S.C.R.D. BOOK 1890, PAGE 321
14. N/F BOUCHER, SHARON O. & BOUCHER, RONALD A. 40 NEW ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 106*** S.C.R.D. BOOK 2553, PAGE 426
15. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 105*** S.C.R.D. BOOK 4920, PAGE 284
16. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104-6*** S.C.R.D. BOOK 4920, PAGE 284
17. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104-5*** S.C.R.D. BOOK 4920, PAGE 284

ABUTTERS WITHIN 200' CONT.:

18. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104-4*** S.C.R.D. BOOK 4920, PAGE 284
19. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104-3*** S.C.R.D. BOOK 4920, PAGE 284
20. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104-2*** S.C.R.D. BOOK 4920, PAGE 284
21. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104-1*** S.C.R.D. BOOK 4920, PAGE 284
22. N/F KNOX MARSH DEVELOPMENT, LLC 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 104*** BOOK 4920, PAGE 284

ABUTTERS WITHIN 200' CONT.:

23. N/F KNOX MARSH DEVELOPMENT, LLC. 242 CENTRAL AVE. DOVER, NH 03820 ***TAX MAP 39, LOT 37-1*** S.C.R.D. BOOK 4894, PAGE 781
24. N/F KNOX MARSH DEVELOPMENT, LLC. 242 CENTRAL AVE DOVER, NH 03820 ***TAX MAP 39, LOT 37*** S.C.R.D. BOOK 4894, PAGE 781
25. N/F HARKINS, SEAN 23 1/2 NEW ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 38*** S.C.R.D. BOOK 4427, PAGE 545
26. N/F ROSS, BENJAMIN C. & JOHNSON, SARAH K. 4 AUBURN STREET DOVER, NH 03820 ***TAX MAP 39, LOT 39*** S.C.R.D. BOOK 4717, PAGE 566
27. N/F MCKEAGNEY, ROBERT B & MCKEAGNEY, WENDI E. 23 NEW ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 27*** S.C.R.D. BOOK 2886, PAGE 330

ABUTTERS WITHIN 200' CONT.:

28. N/F MELVILLE, WILLIAM & MELVILLE, AKIKO 3 AUBURN STREET DOVER, NH 03820 ***TAX MAP 39, LOT 26*** S.C.R.D. BOOK 2560, PAGE 131
29. N/F FRATUS, GARY A. & FRATUS, TERESA G. 2A NEWTON STREET DOVER, NH 03820 ***TAX MAP 39, LOT 28*** S.C.R.D. BOOK 2120, PAGE 312
30. N/F GOULD, LAURENCE J. 2 NEWTON STREET DOVER, NH 03820 ***TAX MAP 39, LOT 29***
31. N/F LIN, JINGYING 21 NEW ROCHESTER ROAD DOVER, NH 03820 ***TAX MAP 39, LOT 18*** S.C.R.D. BOOK 4598, PAGE 885

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

NEIGHBORHOOD PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — NO. 805 — KENNETH A. BERRY — SIGNATURE

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14248 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

JOHN P. HAYES III, CWS #18

WETLAND NOTES:

1.) WETLANDS WERE DELINEATED BY JOHN P. HAYES IN MAY OF 2023. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.

2.) FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).

3.) NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

NO WETLANDS WERE FOUND ON SITE.

PLAN REFERENCES:

1.) "PARTIAL PLAN OF LOTS LAND OF MRS. F.C. WHIPP"
BY: GERARD A. CRAWFORD
DATED: MAY 1955
S.C.R.D. PLAN #28B, POCKET #1, FOLDER #2

2.) "FISCHER HOMES INC. DAME DEVELOPMENT DOVER N.H."
BY: GRANT L. DAVIS
DATED: FEBRUARY 8, 1956
S.C.R.D. PLAN #65, POCKET #2, FOLDER #15

3.) "PLAN OF LOTS AT LAKEVIEW PARK, DOVER N.H.
OWNED BY M.C. MEAGHER, TRUSTEE"
BY: WM. A. GROVER CIVIL ENGINEER
DATED: JUNE 1904
S.C.R.D. PLAN #8, POCKET #7, FOLDER #2

4.) "WHIPP DEVELOPMENT REVISED SUBDIVISION, LAND OF MRS. FRED C. WHIPP DOVER, NH"
BY: GERARD A. CRAWFORD
DATED: MAY, 1955
S.C.R.D. PLAN #16, POCKET #7, FOLDER #2

5.) "PLAN OF SUBDIVISION BERNARD J. JR. & SALLY B. MALLON"
BY: K.E. MOORE & B.G. STAPLES, LAND SURVEYORS
DATED: JULY, 1976
S.C.R.D. PLAN #17A-61

6.) "PLAN OF SUBDIVISION FOR DONALD & MORNA MESSIER OLD ROCHESTER ROAD DOVER, NEW HAMPSHIRE"
BY: K.E. MOORE & B.G. STAPLES LAND SURVEYORS
DATED: MAY 1980
S.C.R.D. PLAN #22A-40

7.) "FEDERAL PROJECT NO. STP-M-5125(005)
STP-F-027-1(34)" SHEET 28
BY: CARON ENGINEERING
S.C.R.D. PLAN #56-85

8.) "FEDERAL PROJECT NO. STP-M-5125(005)
STP-F-027-1(34)" SHEET 30
BY: CARON ENGINEERING
S.C.R.D. PLAN #56-89

9.) "CARRIER TO ZERBINOPOULOS DEED SKETCH"
DATED: APRIL 10, 1964
S.C.R.D. BOOK 781, PAGE 424

10.) "PLAN OF LAND PREPARED FOR CHARLENE ZERBINOPOULOS"
BY: ATLANTIC SURVEY CO. INC.
DATED: NOVEMBER 2005
PLAN #05156

11.) "SUBDIVISION PLAN LAND OF ROBERT S. BALDWIN,
25 NEW ROCHESTER ROAD, DOVER, NH"
BY: BERRY SURVEYING & ENGINEERING
DATED: NOVEMBER 23, 2020
S.C.R.D. PLAN #12386

12.) "CONDOMINIUM SUBDIVISION PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12837, DB 2021-135

13.) "EASEMENT PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12838, DB 2021-135

14.) "LOT MERGER PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12839, DB 2021-135

ABUTTERS ACROSS NEW ROCHESTER ROAD:

(A) N/F HARKINS, SEAN.
23 ½ NEW ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 38
S.C.R.D. BOOK 4427, PAGE 545

(B) N/F MCKEAGNEY, ROBERT B. & WENDI E.
23 NEW ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 27
S.C.R.D. BOOK 2686, PAGE 330

(C) N/F FRATUS, GARY A. & TERESA G.
2A NEWTON STREET
DOVER, NH 03820
TAX MAP 39, LOT 28
S.C.R.D. BOOK 2120, PAGE 312

(D) N/F LIN, JINGYING
21 NEW ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 18
BOOK 4598, PAGE 885

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

KENNETH A. BERRY L.L.S. 805 DATE

SOIL DATA:

WdA ~ WINDSOR LOAMY SAND 0 TO 3% SLOPES

SEE: USDA/NRCS WEBSOIL

MAGNETIC — MAINE NH STATE PLANE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

N/F CILLEY, KENNETH F & CILLEY VICKI
25 OLD ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 73
S.C.R.D. BOOK 1000, PAGE 43

1" IRON PIPE ~FND~ (FLUSH)
NH GRID COORD.
N:264988.79
E:1190588.10
ELEV.: 207.38

N/F SHAW, TODD A
27 OLD ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 72
S.C.R.D. BOOK 4711, PAGE 503

N/F BRAY, JAMES TRUSTEE
SCHATVET LEE REV.TRUST OF 2013
29 OLD ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 71
S.C.R.D. BOOK 4187, PAGE 967

2" IRON PIPE ~FND~ (0.4' HIGH)

N 45°28'44" W 38.25'
N 45°28'44" W 50.12'
N 44°50'26" W 69.63'

1" IRON PIPE ~FND~ (FLUSH)

50' ZONE LINE ADJUSTMENT PER CHAPTER 170-10.E

R-12 ZONE
GATEWAY ZONE

GATEWAY ZONE 15.0'
R-12 ZONE 30.0'

207x22
207x12
207x19
207x38
207x30
207x52
207x62
208x27

TP #13
TP #12
TP #11
TP #10

WOODED
OPEN
POROUS PAVEMENT
EXISTING TREELINE

3/4" REBAR W/ ID CAP ~SET~ (UP 0.6')
NH GRID COORD.
N:265089.13
E:1190547.11
ELEV.:206.95

3/4" REBAR W/ ID CAP ~SET~ (UP 0.9')
NH GRID COORD.
N: 265147.98
E:1190710.19
ELEV.: 209.01

LCA TAX MAP 39, LOT 104-3 EXISTING HOUSE #14
LCA TAX MAP 39, LOT 104-4 EXISTING HOUSE #15
LCA TAX MAP 39, LOT 104-2 EXISTING HOUSE #10
TAX MAP 39, LOT 104-5 EXISTING HOUSE #9
LCA TAX MAP 39, LOT 104-1 EXISTING HOUSE #6
TAX MAP 39, LOT 104-6 EXISTING HOUSE #5
COMMON AREA TAX MAP 39, LOT 104-7 12,405 Sq. Ft. 0.28 Ac.

N/F CAMERON, MANDY L. & RIORDAN, TIMOTHY M.
527 SALMON FALLS ROAD
ROCHESTER, NH 03868
ADDRESS: 32 NEW ROCHESTER ROAD
TAX MAP 39, LOT 102
S.C.R.D. BOOK 4301, PAGE 385

1 1/4" IRON ROD W/NAILHEAD ~FND~ 0.9' HIGH
1 1/4" IRON ROD W/BASE ~FND~ 2.0' HIGH
N 43°17'12" W 62.73'

34 NEW ROCHESTER ROAD
TAX MAP 39, LOT 103
S.C.R.D. BOOK 5116, PAGE 655
LOT AREA:
35,555 Sq.Ft., 0.82 Ac.
SUBJECT PARCEL

S 49°44'19" W 125.51'
S 45°17'21" W 174.32'
S 44°03'08" E 94.31'

EXISTING GRAVEL DRIVEWAY T.B.R.
EXISTING HOUSE #32
EXISTING HOUSE #34
EXISTING TREES
EXISTING DRIVEWAY T.B.R.
EXISTING DRIVEWAY
1 1/4" IRON ROD ~FND~ 2.0' HIGH
NH GRID COORD.
N:265117.88
E:1190880.17
ELEV.: 211.78

BUILDING SETBACK LINE (TYP.)
BUILD-TO LINES
EXISTING GRASS & GRAVEL TRAVEL WAY
EXISTING GARAGE
EXISTING HOUSE #36
EXISTING DECK
EXISTING GARAGE TO BE REMOVED
EXISTING DRIVEWAY TO BE REPLACED W/ POROUS PAVEMENT
PATH TO BE REPLACED W/ POROUS PAVERS
UNDER CONSTRUCTION FROM PRIOR APPROVAL P22-027
3/4" IRON PIPE ~FND~ (0.6' DOWN)
PSNH 7/15S T.B.R. COORDINATE W/EVERSOURCE

TAX MAP 39, LOT 105
N/F KNOX MARSH DEVELOPMENT, LLC.
242 CENTRAL AVENUE
DOVER, NH 03820
TAX MAP 39, LOT 104
S.C.R.D. BOOK 4920, PAGE 284

N/F BOUCHER, SHARON O. & RONALD
40 NEW ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 105
S.C.R.D. BOOK 2353, PAGE 426

N.H. ROUTE 108/NEW ROCHESTER ROAD
(URBAN COMPACT ZONE)
TO WEEKS CROSSING
TO SOMERSWORTH/ROCHESTER
PAVED SIDEWALK
SHOULDER
5' CONCRETE SIDEWALK
4" SSL (W)
4" DSL (Y)
EXISTING SEWER MANHOLE CITY ID #746 RIM = 209.97 INV. IN = 204.41 (8" ACP) INV. IN = 204.31 (8" ACP) INV. OUT = 204.31 (8" ACP)
EXISTING SEWER MANHOLE CITY ID #750 RIM = 210.46 INV. IN = 201.36 (12" VCP) INV. OUT = 201.26 (12" VCP)
EXISTING CATCH BASIN CITY ID #7492 RIM = 210.25
EXISTING 12" AC WATER MAIN
EXISTING 10" DI CL52 RAW WATER MAIN
EXISTING DRAIN LINE
AUBURN STREET
PSNH 7/14
PSNH 7/15
PSNH 7/16

LOCATION PLAN
DOVER, NH
NOT TO SCALE
GAGE STREET
LAKEVIEW DRIVE
WILLARD ROAD
LAKE STREET
SHERMAN STREET
AUBURN STREET
NEWTON STREET
OX BOW LANE
OLD ROCHESTER ROAD
APPROX. LOCATION
NEW ROCHESTER ROAD
HOTEL DRIVE

NOTES:

1.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) ZONING: G - GATEWAY DISTRICT (30,355 Sq.Ft.)
SECONDARY GROUNDWATER RECHARGE OVERLAY
DENSITY: 4,000 Sq. Ft. / UNIT
SETBACKS
FRONT BUILD TO~ 5-20'
SIDE ~ 10'
REAR ~ 15'
MIN. LOT SIZE: N/A
MAX. LOT COVERAGE: 50%
MAX. BUILDING HEIGHT: 2 STORIES (300' OF CL NEW ROCHESTER RD)
RESIDENTIAL: SINGLE FAMILY AND TWO FAMILY
MAX. IMPERVIOUS COVERAGE: 20%

ZONING: R-12 - MEDIUM DENSITY RESIDENTIAL (5,200 Sq.Ft.)
SECONDARY GROUNDWATER RECHARGE OVERLAY
SETBACKS
FRONT BUILD TO~ 15-25'
SIDE ~ 15'
REAR ~ 30'
MIN. LOT SIZE: 12,000 Sq. Ft.
MIN. FRONTAGE: 100'
MAX. LOT COVERAGE: 30%
MAX. BUILDING HEIGHT: 35'
MAX. IMPERVIOUS COVERAGE: 20%

6.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING BOUNDARIES AND CONDITIONS OF TAX MAP 39, LOTS 103 LOCATED IN DOVER, N.H., AS OF THE FIELD SURVEY IN NOVEMBER 2021.

7.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PROPERTY DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF.: FEMA COMMUNITY #330145, MAP 33017C0320E, DATED: SEPTEMBER 30, 2015.

8.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

9.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN NOVEMBER OF 2021 WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

10.) TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN NOVEMBER 2021.

11.) THIS SITE IS SERVICED BY MUNICIPAL SEWER AND WATER.

12.) NO OBSERVED CEMETERY.

13.) LOT COVERAGE: BUILDING COVERAGE: 3.06%, TOTAL LOT COVERAGE: 5.88%, FRONTAGE BUILD-OUT: 40.6'

LEGEND:

- 3/4" REBAR W/ID CAP ~TBS~
- 3/4" REBAR W/ID CAP ~SET~
- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEST PIT
- CURB STOP
- GATE VALVE
- FIRE HYDRANT
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- ABUTTING PROPERTY LINE
- BUILDING SETBACK LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING DRAIN LINE
- OVERHEAD UTILITIES
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- EXISTING TREELINE
- ZONING DISTRICT LINE
- EXISTING LCA LINES
- *WdA/HSG A* USDA/NRCS SOIL SYMBOL
- (A) ABUTTER LOCATION SYMBOL
- 207x62 SPOT GRADE
- FND FOUND
- TYP TYPICAL
- S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
- T.B.R. TO BE REMOVED
- TBS TO BE SET

DOVER PLANNING FILE #SITE-2023-0007

#	REVISION	DATE	DESCRIPTION
#2			REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1		11-06-23 9-25-23	REVISED PER DOVER TRC COMMENT

EXISTING CONDITIONS PLAN & DEMOLITION PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE — NO. 805 — LICENSED LAND SURVEYOR — KENNETH A. BERRY — SIGNATURE

NOT FOR CONSTRUCTION

TEST PIT DATA:

TEST PIT #1
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #2
0–10" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–24" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
24–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–74" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 74"
REFUSAL @ N/A

TEST PIT #3
0–10" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–22" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
22–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–76" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 76"
REFUSAL @ N/A

TEST PIT #4
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, LOAM FINE SAND, GRANULAR, FRIABLE
8–12" 7.5YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
12–22" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
22–38" 10YR 5/4 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
38–78" 10YR 6/2 LIGHT BROWNISH GRAY, SAND WITH REDOX. FEAT. PRESENT, LOOSE. SINGLE GRAIN
E.S.H.W.T. @ 38"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ 54"
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #5
0–10" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
10–30" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
30–36" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
36–76" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 36"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 76"
REFUSAL @ N/A

TEST PIT #6
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20" 7.5 YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
20–30" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
30–42" 10YR 4/6 YELLOWISH BROWN, GRAVELLY SAND, GRANULAR, FRIABLE
42–78" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 42"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #7
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–18" 7.5 YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
18–30" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
30–42" 10YR 4/6 YELLOWISH BROWN, GRAVELLY SAND, GRANULAR, FRIABLE
42–78" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 42"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #8
0–8" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
8–20" 7.5 YR 5/6 STRONG BROWN, LOAMY SAND, GRANULAR, FRIABLE
20–34" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, FRIABLE
34–44" 10YR 4/6 YELLOWISH BROWN, GRAVELLY SAND, GRANULAR, FRIABLE
44–78" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 44"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 78"
REFUSAL @ N/A

TEST PIT #9
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–28" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
28–41" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
41–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 41"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #10
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #11
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

TEST PIT #12
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

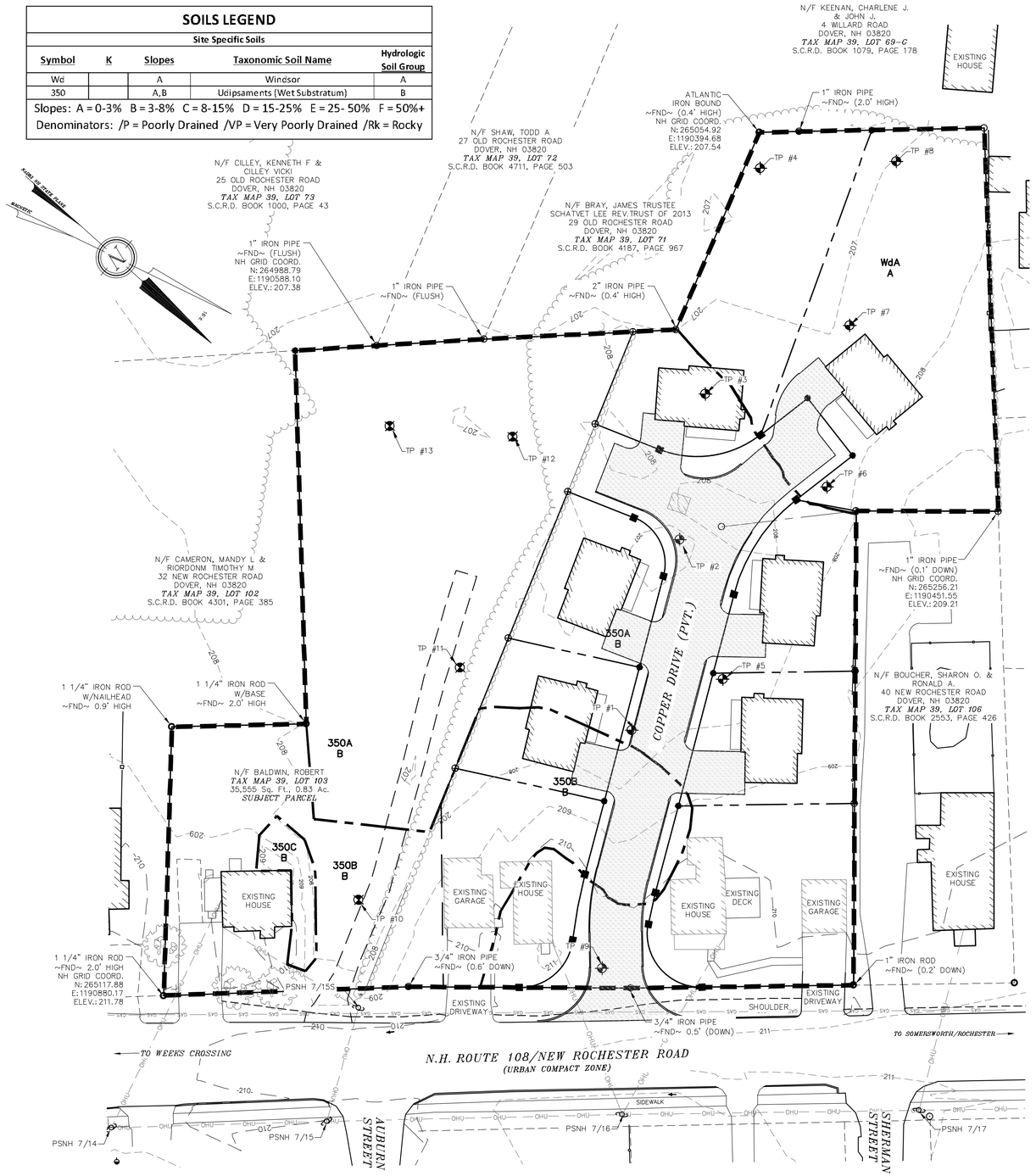
TEST PIT #13
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–29" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

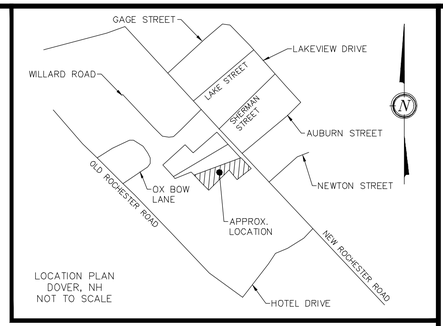
SOILS LEGEND

Site Specific Soils

Symbol	K	Slopes	Taxonomic Soil Name	Hydrologic Soil Group
Wd		A	Windsor	A
350		A,B	Ucipsaments (Wet Substratum)	B

Slopes: A = 0-3% B = 3-8% C = 8-15% D = 15-25% E = 25- 50% F = 50%+
Denominators: /P = Poorly Drained /VP = Very Poorly Drained /Rk = Rocky





LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

6.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING SOIL CONDITIONS OF TAX MAP 39, LOTS 103 & 104 LOCATED IN DOVER, N.H.

WETLAND NOTES:

1. WETLANDS WERE DELINEATED BY JOHN P. HAYES IN MAY OF 2023. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 8.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2016).
3. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

NO WETLANDS WERE FOUND ON SITE.

JOHN P. HAYES III, CWS #18

JOHN P. HAYES III, CSS #87

CHRISTOPHER R. BERRY
NH PERMITTED DESIGNER #1886

LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- UTILITY POLE
- TEST PIT
- OHU — OHU — OHU — OVERHEAD UTILITIES LINE
- 276 — EXISTING CONTOUR MINOR
- 275 — EXISTING CONTOUR MAJOR
- SOIL LINE
- LIMIT OF SOIL SURVEY
- WdA — SOIL SERIES
- S.C.R.D. — STRAFFORD COUNTY REGISTRY OF DEEDS
- TYP. — TYPICAL
- FND — FOUND

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DOVER PLANNING FILE #SITE–2023–0007

#	DATE	DESCRIPTION
#2	11–06–23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9–25–23	REVISED PER DOVER TRC COMMENT

SITE SPECIFIC SOILS MAP
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE — No. 805 — LICENSED LAND SURVEYOR — KENNETH A. BERRY — SIGNATURE

NOT FOR CONSTRUCTION

PLAN REFERENCES:

1.) "PARTIAL PLAN OF LOTS LAND OF MRS. F.C. WHIPP"
BY: GERARD A. CRAWFORD
DATED: MAY 1955
S.C.R.D. PLAN #28B, POCKET #1, FOLDER #2

2.) "FISCHER HOMES INC. DAME DEVELOPMENT DOVER N.H."
BY: GRANT L. DAVIS
DATED: FEBRUARY 8, 1956
S.C.R.D. PLAN #65, POCKET #2, FOLDER #15

3.) "PLAN OF LOTS AT LAKEVIEW PARK, DOVER N.H.
OWNED BY M.C. MEAGHER, TRUSTEE"
BY: WM. A. GROVER CIVIL ENGINEER
DATED: JUNE 1904
S.C.R.D. PLAN #8, POCKET #7, FOLDER #2

4.) "WHIPP DEVELOPMENT REVISED SUBDIVISION, LAND OF MRS. FRED C. WHIPP DOVER, NH"
BY: GERARD A. CRAWFORD
DATED: MAY, 1955
S.C.R.D. PLAN #16, POCKET #7, FOLDER #2

5.) "PLAN OF SUBDIVISION FOR BERNARD J. JR. & SALLY B. MALLON"
BY: K.E. MOORE & B.G. STAPLES, LAND SURVEYORS
DATED: JULY, 1976
S.C.R.D. PLAN #17A-61

6.) "PLAN OF SUBDIVISION FOR DONALD & MORNA MESSIER OLD ROCHESTER ROAD DOVER, NEW HAMPSHIRE"
BY: K.E. MOORE & B.G. STAPLES LAND SURVEYORS
DATED: MAY 1980
S.C.R.D. PLAN #22A-40

7.) "FEDERAL PROJECT NO. STP-M-5125(005)
STP-F-027-1(34)" SHEET 28
BY: CARON ENGINEERING
S.C.R.D. PLAN #56-85

8.) "FEDERAL PROJECT NO. STP-M-5125(005)
STP-F-027-1(34)" SHEET 30
BY: CARON ENGINEERING
S.C.R.D. PLAN #56-89

9.) "CARRIER TO ZERBINOPOULOS DEED SKETCH"
DATED: APRIL 10, 1964
S.C.R.D. BOOK 781, PAGE 424

10.) "PLAN OF LAND PREPARED FOR CHARLENE ZERBINOPOULOS"
BY: ATLANTIC SURVEY CO. INC.
DATED: NOVEMBER 2005
PLAN #05156

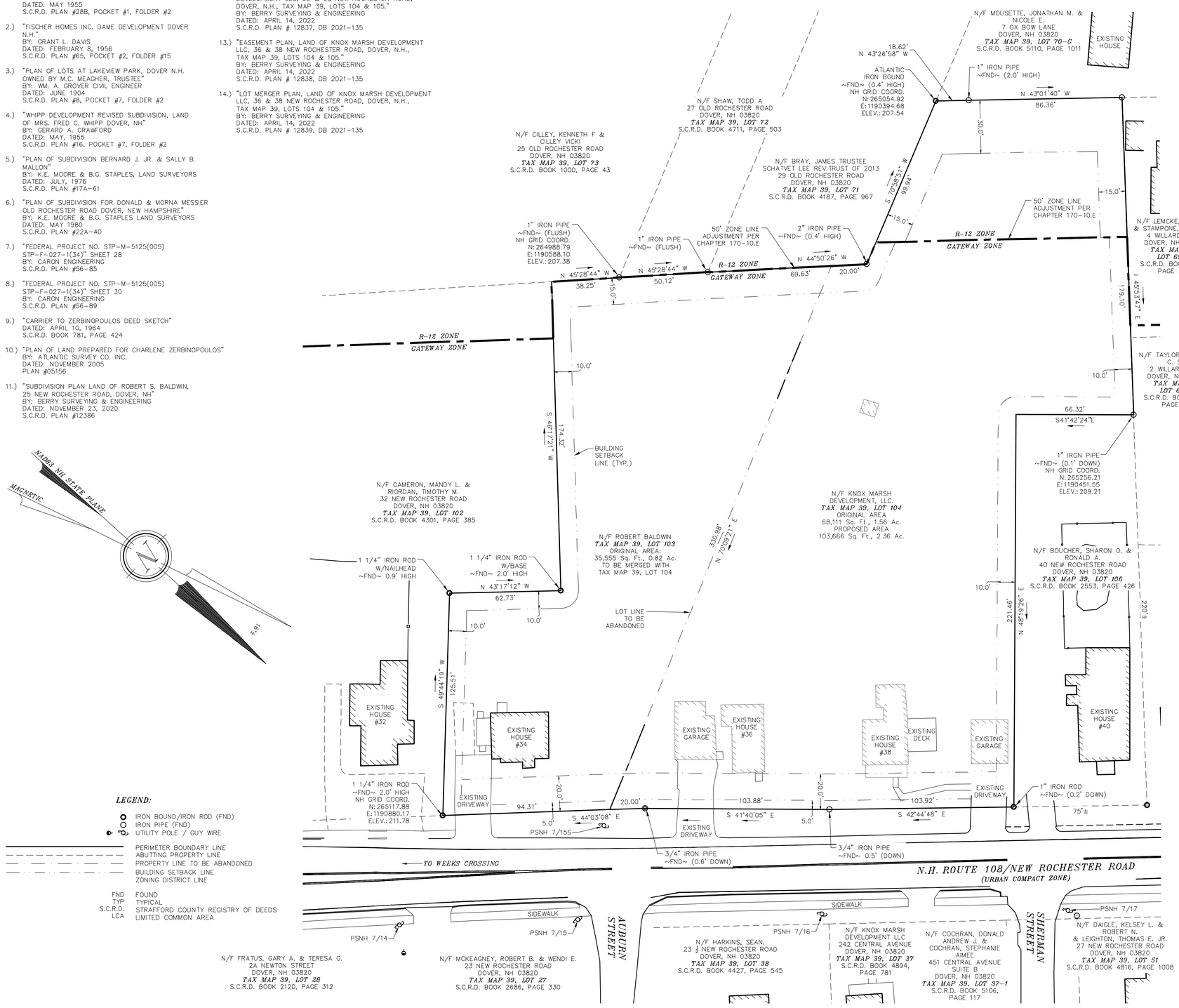
11.) "SUBDIVISION PLAN LAND OF ROBERT S. BALDWIN, 25 NEW ROCHESTER ROAD, DOVER, NH"
BY: BERRY SURVEYING & ENGINEERING
DATED: NOVEMBER 23, 2020
S.C.R.D. PLAN #12386

PLAN REFERENCES (CONT'D):

12.) "CONDOMINIUM SUBDIVISION PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12837, DB 2021-135

13.) "EASEMENT PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12838, DB 2021-135

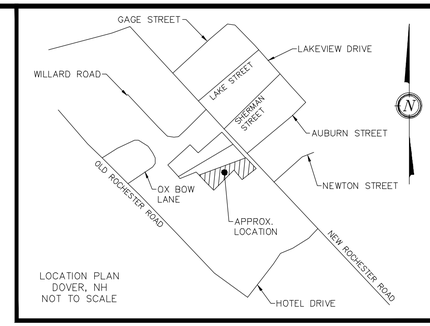
14.) "LOT MERGER PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12839, DB 2021-135



LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- UTILITY POLE / GUY WIRE
- PERIMETER BOUNDARY LINE
- ABUTTING PROPERTY LINE
- PROPERTY LINE TO BE ABANDONED
- BUILDING SETBACK LINE
- ZONING DISTRICT LINE

FND FOUND
TYP TYPICAL
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
LCA LIMITED COMMON AREA



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES:

1.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820
_____ OWNER SIGNATURE

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq.Ft., 0.82 Ac.

5.) OWNER: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820
_____ OWNER SIGNATURE

6.) TAX MAP 39, LOT 104

7.) S.C.R.D. BOOK 4920, PAGE 284
S.C.R.D. BOOK 4920, PAGE 308

8.) LOT AREA: 68,111 Sq. Ft., 1.56 Ac.

9.) LOT 104 WAS PART OF A MERGER WITH LOT 105, DATED DECEMBER 21, 2022 AND RECORDED AT S.C.R.D. BOOK 5092, PAGE 613. SEE PLAN REFERENCE #14 FOR FURTHER DETAILS.

10.) ZONING: G – GATEWAY DISTRICT (93,953 Sq.Ft.)
SECONDARY GROUNDWATER RECHARGE OVERLAY
DENSITY: 4,000 Sq. Ft. / UNIT
SETBACKS
FRONT BUILD TO~ 5-20'
SIDE ~ 10'
REAR ~ 15'
MIN. LOT SIZE: N/A
MAX. LOT COVERAGE: 50%
MAX. BUILDING HEIGHT: 2 STORIES (300' OF CL NEW ROCHESTER RD)
RESIDENTIAL: SINGLE FAMILY AND TWO FAMILY
MAX. IMPERVIOUS COVERAGE: 20%

ZONING: R-12 – MEDIUM DENSITY RESIDENTIAL (9,713 Sq.Ft.)
SECONDARY GROUNDWATER RECHARGE OVERLAY
SETBACKS
FRONT BUILD TO~ 15-25'
SIDE ~ 15'
REAR ~ 30'
MIN. LOT SIZE: 12,000 Sq. Ft.
MIN. FRONTAGE: 100'
MAX. LOT COVERAGE: 30%
MAX. BUILDING HEIGHT: 35'
MAX IMPERVIOUS COVERAGE: 20%

11.) THE INTENT OF THIS PLAN IS TO SHOW THE LOT MERGER PLAN OF TAX MAP 39, LOTS 103 & 104 LOCATED IN DOVER, N.H.

12.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PROPERTY DOES NOT FALL WITHIN THE FLOOD PLAIN. FLOOD HAZARD REF: FEMA, COMMUNITY #330145, MAP 33017C0320E, DATED: SEPTEMBER 30, 2015.

13.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

14.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN NOVEMBER OF 2021 WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

15.) TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN NOVEMBER 2021.

16.) THIS SITE IS SERVICED BY MUNICIPAL SEWER AND WATER.

17.) WETLANDS WERE DELINEATED BY JOHN P. HAYES, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, IN MAY OF 2023. NO WETLANDS WERE FOUND ON SITE.

18.) THIS LOT MERGER WAS ADDRESSED BY THE DOVER PLANNING BOARD ON XXXXX XX, 2023. SEE LOT MERGER FORM TO BE RECORDED AT STRAFFORD COUNTY REGISTRY OF DEEDS.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

KENNETH A. BERRY L.L.S. 805 DATE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DOVER PLANNING FILE #SITE-2023-0007

#	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

LOT MERGER PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 805
KENNETH A. BERRY
SIGNATURE

NOT FOR CONSTRUCTION

PLAN REFERENCES:

1.) "PARTIAL PLAN OF LOTS LAND OF MRS. F.C. WHIPP"
BY: GERARD A. CRAWFORD
DATED: MAY 1955
S.C.R.D. PLAN #28B, POCKET #1, FOLDER #2

2.) "FISCHER HOMES INC. DAME DEVELOPMENT DOVER N.H."
BY: GRANT L. DAVIS
DATED: FEBRUARY 8, 1956
S.C.R.D. PLAN #65, POCKET #2, FOLDER #15

3.) "PLAN OF LOTS AT LAKEVIEW PARK, DOVER N.H.
OWNED BY M.C. MEAGHER, TRUSTEE"
BY: WM. A. GROVER CIVIL ENGINEER
DATED: JUNE 1904
S.C.R.D. PLAN #8, POCKET #7, FOLDER #2

4.) "WHIPP DEVELOPMENT REVISED SUBDIVISION, LAND OF MRS. FRED C. WHIPP DOVER, NH"
BY: GERARD A. CRAWFORD
DATED: MAY, 1955
S.C.R.D. PLAN #16, POCKET #7, FOLDER #2

5.) "PLAN OF SUBDIVISION BERNARD J. JR. & SALLY B. MALLON"
BY: K.E. MOORE & B.G. STAPLES, LAND SURVEYORS
DATED: JULY, 1976
S.C.R.D. PLAN #17A-61

6.) "PLAN OF SUBDIVISION FOR DONALD & MORNA MESSIER OLD ROCHESTER ROAD DOVER, NEW HAMPSHIRE"
BY: K.E. MOORE & B.G. STAPLES LAND SURVEYORS
DATED: MAY 1980
S.C.R.D. PLAN #22A-40

7.) "FEDERAL PROJECT NO. STP-M-5125(005)
STP-F-027-1(34)" SHEET 28
BY: CARON ENGINEERING
S.C.R.D. PLAN #56-85

8.) "FEDERAL PROJECT NO. STP-M-5125(005)
STP-F-027-1(34)" SHEET 30
BY: CARON ENGINEERING
S.C.R.D. PLAN #56-89

9.) "CARRIER TO ZERBINOPOULOS DEED SKETCH"
DATED: APRIL 10, 1964
S.C.R.D. BOOK 781, PAGE 424

10.) "PLAN OF LAND PREPARED FOR CHARLENE ZERBINOPOULOS"
BY: ATLANTIC SURVEY CO. INC.
DATED: NOVEMBER 2005
PLAN #05156

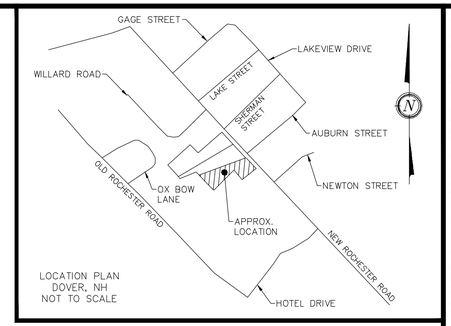
11.) "SUBDIVISION PLAN LAND OF ROBERT S. BALDWIN, 25 NEW ROCHESTER ROAD, DOVER, NH"
BY: BERRY SURVEYING & ENGINEERING
DATED: NOVEMBER 23, 2020
S.C.R.D. PLAN #12386

PLAN REFERENCES (CONT'D):

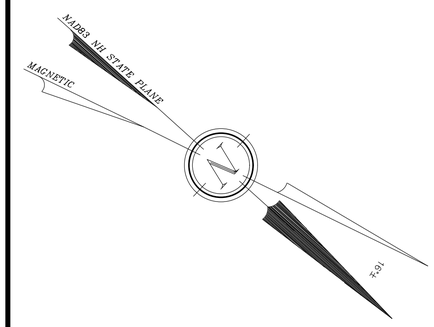
12.) "CONDOMINIUM SUBDIVISION PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12837, DB 2021-135

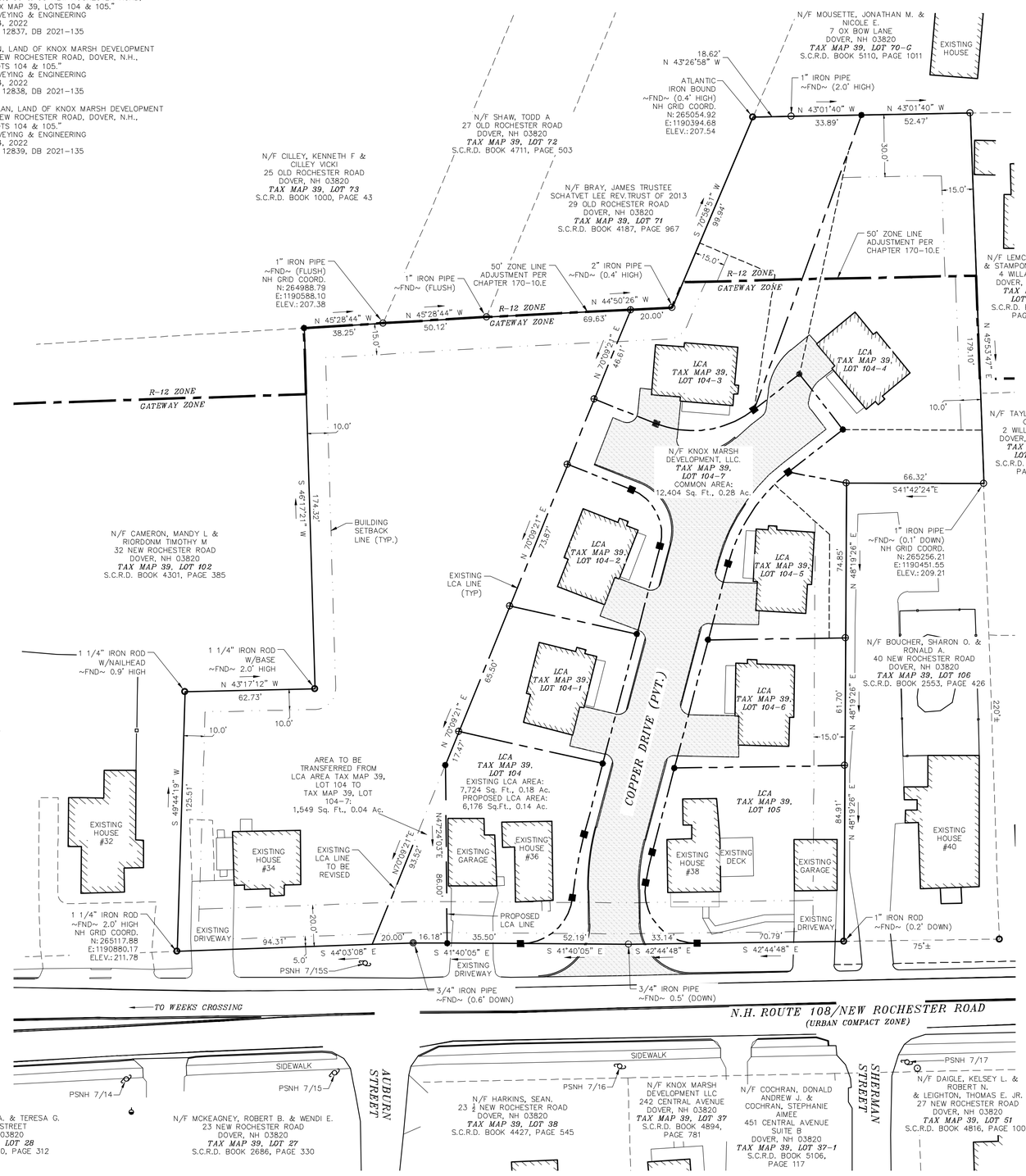
13.) "EASEMENT PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12838, DB 2021-135

14.) "LOT MERGER PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12839, DB 2021-135



LOCATION PLAN
DOVER, NH
NOT TO SCALE





LEGEND:

- ● 3/4" REBAR W/ID CAP ~TBS~
- ■ GRANITE BOUND ~TBS~
- ⊕ 3/4" REBAR W/ID CAP ~SET~
- ○ IRON BOUND/IRON ROD (FND)
- ○ IRON PIPE (FND)
- UTILITY POLE / GUY WIRE

	PERIMETER BOUNDARY LINE
	ABUTTING PROPERTY LINE
	BUILDING SETBACK LINE
	ZONING DISTRICT LINE
	EXISTING LCA LINE
	LCA LINE TO BE REVISED
	PROPOSED LCA LINE
	EXISTING EASEMENT
FND	FOUND
TYP	TYPICAL
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
LCA	LIMITED COMMON AREA
TBS	TO BE SET

NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

OWNER SIGNATURE

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 104-7

3.) S.C.R.D. BOOK 4920, PAGE 284
S.C.R.D. BOOK 4920, PAGE 308
S.C.R.D. BOOK 5116, PAGE 655

4.) EXISTING COMMON AREA: 47,959 Sq. Ft., 1.10 Ac.
PROPOSED COMMON AREA: 49,508 Sq.Ft., 1.14 Ac.

9.) ZONING: G – GATEWAY DISTRICT (93,953 Sq.Ft.)
SECONDARY GROUNDWATER RECHARGE OVERLAY
DENSITY: 4,000 Sq. Ft. / UNIT
SETBACKS
FRONT BUILD TO~ 5-20'
SIDE ~ 10'
REAR ~ 15'
MIN. LOT SIZE: N/A
MAX. LOT COVERAGE: 50%
MAX. BUILDING HEIGHT: 2 STORIES (300' OF CL NEW ROCHESTER RD)
RESIDENTIAL: SINGLE FAMILY AND TWO FAMILY
MAX. IMPERVIOUS COVERAGE: 20%

ZONING: R-12 – MEDIUM DENSITY RESIDENTIAL (9,713 Sq.Ft.)
SECONDARY GROUNDWATER RECHARGE OVERLAY
SETBACKS
FRONT BUILD TO~ 15-25'
SIDE ~ 15'
REAR ~ 30'
MIN. LOT SIZE: 12,000 Sq. Ft.
MIN. FRONTAGE: 100'
MAX. LOT COVERAGE: 30%
MAX. BUILDING HEIGHT: 35'
MAX IMPERVIOUS COVERAGE: 20%

10.) THE INTENT OF THIS PLAN IS TO SHOW THE REVISION OF THE LCA LINE BETWEEN LCA LOT TAX MAP 39, LOTS 104 & 104-7 LOCATED IN DOVER, N.H.

11.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PROPERTY DOES NOT FALL WITHIN THE FLOOD PLAIN. FLOOD HAZARD REF: FEMA, COMMUNITY #330145, MAP 33017C0320E, DATED: SEPTEMBER 30, 2015.

12.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

13.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN NOVEMBER OF 2021 WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

14.) TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN NOVEMBER 2021.

15.) THIS SITE IS SERVICED BY MUNICIPAL SEWER AND WATER.

16.) WETLANDS WERE DELINEATED BY JOHN P. HAYES, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170-27.1 OF THE ZONING ORDINANCE, IN MAY OF 2023. NO WETLANDS WERE FOUND ON SITE.

17.) A BLANKET UTILITY EASEMENT IS PROVIDED TO THE CITY OF DOVER IN COPPER DRIVE AND EMBER DRIVE TO MAINTAIN THE POTABLE DRINKING WATER QUALITY THROUGH THE HYDRANT FLUSHING PROGRAM AND ACCESS TO INDIVIDUAL UNIT CURB BOXES.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

KENNETH A. BERRY L.L.S. 805 DATE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

DOVER PLANNING FILE #SITE-2023-0007

#	DATE	REVISION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

LIMITED COMMON AREA REVISION PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR NO. 805 KENNETH A. BERRY SIGNATURE

NOT FOR CONSTRUCTION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

N/F CILLEY, KENNETH F & CILLEY VICKI
25 OLD ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 73
S.C.R.D. BOOK 1000, PAGE 43

N/F SHAW, TODD A
27 OLD ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 72
S.C.R.D. BOOK 4711, PAGE 503

N/F BRAY, JAMES TRUSTEE
SCHATVET LEE REV.TRUST OF 2013
29 OLD ROCHESTER ROAD
DOVER, NH 03820
TAX MAP 39, LOT 71
S.C.R.D. BOOK 4187, PAGE 967

N/F CAMERON, MANDY L. & JORDAN, TIMOTHY M.
527 SALMON FALLS ROAD
ROCHESTER, NH 03868
ADDRESS: 32 NEW ROCHESTER ROAD
TAX MAP 39, LOT 102
S.C.R.D. BOOK 4301, PAGE 385

N/F KNOX MARSH DEVELOPMENT, LLC.
242 CENTRAL AVENUE
DOVER, NH 03820
TAX MAP 39, LOT 104
S.C.R.D. BOOK 4920, PAGE 284

R-12 ZONE
GATEWAY ZONE

PROPOSED LEGEND:

- 3/4" REBAR W/ ID CAP ~TBS~
- LCA — LIMITED COMMON AREA (LCA) LINE
- E101 / E6 — DETAIL SHEET / DETAIL
- TRANSFORMER & PAD
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- SNOW STORAGE
- RECREATION SPACE

PROPOSED SURFACE LEGEND:

- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS BRICK

NOTES:

1A.) OWNER: ROBERT BALDWIN, 242 CENTRAL AVE, DOVER, NH 03820 — ROBERT BALDWIN

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC, 242 CENTRAL AVE, DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) ZONING: G – GATEWAY DISTRICT
SECONDARY GROUNDWATER RECHARGE OVERLAY
DENSITY: 4,000 Sq. Ft. / UNIT
SETBACKS — PROVIDED SETBACKS:
FRONT BUILD TO ~ 5–20' — 5–20' PROVIDED
SIDE ~ 10' — 10' MIN PROVIDED
REAR ~ 15' — 15' PROVIDED
SECONDARY BUILD TO ~ 5–20' — 5–20' PROVIDED
MIN. LOT SIZE: N/A
LOT COVERAGE: 50% (FUNCTION OF LOT MERGER) 17.1% PROVIDED (SEE CUP)
FRONTAGE BUILD–OUT: 50% (FUNCTION OF LOT MERGER) 47.4% PROVIDED (SEE CUP)
MAX. BUILDING HEIGHT: 2 STORIES (300' OF CL NEW ROCHESTER RD)
RESIDENTIAL: SINGLE FAMILY AND TWO FAMILY
MAX. IMPERVIOUS COVERAGE: 20% (FUNCTION OF LOT MERGER) 19.3% PROVIDED

6.) THE INTENT OF THIS PLAN IS TO SHOW THE SITE DEVELOPMENT PLAN OF TAX MAP 39, LOT 103 & REFERENCES APPROVED SITE PLAN DOVER #P22–27 (ORIGINAL COPPER DRIVE).

7.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PROPERTY DOES NOT FALL WITHIN THE FLOOD PLAIN FLOOD HAZARD REF: FEMA COMMUNITY #330145, MAP: 33017C0310E, DATED: SEPTEMBER 30, 2015.

8.) VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE. COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

9.) THE BOUNDARY LINES SHOWN ON THIS PLAN ARE THE RESULT OF A CLOSED TRAVERSE PERFORMED BY THIS OFFICE IN NOVEMBER OF 2021 WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

10.) TOPOGRAPHY PROVIDED IS DEMARCATED AT 1' INTERVALS, AND IS THE RESULT OF A FIELD SURVEY PERFORMED IN NOVEMBER 2021.

11.) THIS SITE IS SERVICED BY MUNICIPAL SEWER AND WATER.

12.) WETLANDS WERE DELINEATED BY JOHN P. HAYES, CERTIFIED WETLANDS SCIENTIST, IN ACCORDANCE WITH CHAPTER 170–27.1 OF THE ZONING ORDINANCE, IN MAY OF 2023. NO WETLANDS WERE FOUND ON SITE.

13.) LIST ANY VARIANCES OR SPECIAL EXCEPTIONS GRANTED BY THE ZONING BOARD OF ADJUSTMENT OR CONDITIONAL USE PERMITS GRANTED BY THE PLANNING BOARD FOR THE PROPOSED USE OR STRUCTURE, INCLUDING THE CASE NUMBER AND DATE OF DECISION AND ANY CONDITIONS: NONE

14.) 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. 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.

15.) THE INSTALLATION OF ELECTRIC POWER, CABLE TELEVISION AND TELEPHONE LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE PROPOSED.

16.) ALL CONSTRUCTION SHALL CONFORM WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2016" AND WITH THE CITY OF DOVER COMMUNITY SERVICES REGULATIONS AND STANDARD SPECIFICATION FOR CONSTRUCTION. THE MORE STRINGENT SPECIFICATION SHALL APPLY.

17.) ALL EROSION CONTROL NOTES SHALL INCLUDE PROVISIONS FOR CONSTRUCTION SEQUENCING, TEMPORARY EROSION CONTROL MEASURES, AND PERMANENT STANDARDS SUCH AS LOAM SPREAD RATE FOR DISTURBED AREAS, RATES OF LIME, TYPE AND RATES FOR FERTILIZER, AND SEED AND MULCH MIXTURE WITH RATES OF APPLICATION.

18.) THE LIMITS OF CONSTRUCTION DISTURBANCE THAT ARE LOCATED IN OR WITHIN THE 50 FT. OF CONSERVATION AND WETLAND DISTRICTS SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS. NO 50' BUFFERS ON SITE SO NOT APPLICABLE FOR THIS PROJECT.

19.) ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS. (NOT APPLICABLE)

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. THE PROPOSED PROJECT WILL CONSIST OF ONE PHASE AND WILL DISTURB 36,000 Sq.Ft. 0.83 Ac. (SEE NOTE #45)

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.) THE SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY–FRIDAY 7AM–6PM, NO SATURDAY & NO SUNDAY, OR FEDERAL HOLIDAY HOURS. HOURS OF CONSTRUCTION SHALL BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR THE GENERAL CONTRACTOR. THE PROJECT SIGN SHALL INDICATE THE ROAD IS PROPOSED TO BE PRIVATE AND SHALL RECEIVE NO CITY SERVICES.

23.) BUILDING ADDRESSES SHALL BE ASSIGNED BY THE BUILDING OFFICIAL AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.

24.) THE PROPOSED USE FOR THE SITE IS SIX NEW 2–FAMILY DWELLINGS IN ADDITION TO ONE EXISTING SINGLE FAMILY HOME FOR A TOTAL OF ELEVEN UNITS. COPPER DRIVE HAS 8 UNITS APPROVED, WITH TWO PRE–EXISTING SINGLE FAMILY HOMES TO BE CONVERTED TO 2–FAMILY DWELLINGS, BRINGING THE TOTAL UNIT COUNT POST LOT MERGER TO 23 UNITS.

25.) THE FOLLOWING FEDERAL AND STATE PERMITS HAVE BEEN ISSUED FOR THE SUBJECT PROPERTY:
NHDES SEWER DISCHARGE PERMIT: D2022–1107 (NEEDS AMENDMENT)
EPA NOTICE OF INTENT/SWPPP (NOI): NHR10010C (SWPPP/SWMP NEEDS AMENDMENT)
DIVISION OF HISTORICAL RESOURCES: 15390

26.) COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM TO DOVER CITY CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

27.) ANY RETAINING WALL TALLER THAN FOUR FEET (4') REQUIRES ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

28.) ANY FENCE TALLER THAN SEVEN FEET (7') REQUIRES THE ISSUANCE OF A BUILDING PERMIT FROM INSPECTION SERVICES.

29.) THE OWNER OF RECORD SHALL RECORD AT THE REGISTRY OF DEEDS DOCUMENTATION SUFFICIENT TO PROVIDE NOTICE TO ALL PERSONS/ENTITIES THAT MAY ACQUIRE ANY PROPERTY SUBJECT TO THE REQUIREMENTS AND RESPONSIBILITIES DESCRIBED IN THE APPROVED STORMWATER MANAGEMENT PLAN. THE NOTICE SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR RECORDING CONTAINED IN RSA 477 AND 478. THE NOTICE NEED NOT SET FORTH THE REQUIREMENTS AT LENGTH, SO LONG AS IT IS SUFFICIENT TO PROVIDE NOTICE TO PROSPECTIVE PURCHASERS TO THE REQUIREMENTS FOR MAINTENANCE AND REPORTING.

30.) FIRE DEPARTMENT ACCESS ROADS SHALL BE INSTALLED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS IN ALL WEATHER CONDITIONS AT ALL TIMES.

31.) EXTERIOR LIGHTING SHALL BE CUT–OFF TYPE FIXTURES PER CHAPTER 153–14–E AND SHALL PROVIDE LIGHTING DIRECTED ON–SITE ONLY.

32.) APPROVED BACKFLOW PREVENTERS SHALL BE PROVIDED FOR DOMESTIC WATER LINES.

33.) SITE IS TO COMPLY WITH NFPA 1 CHAPTER 18.

34.) COPPER DRIVE & EMBER DRIVE ARE PROPOSED TO BE PRIVATE. REFER TO THE HOA DOCUMENTS FOR ROAD & DRAINAGE RESPONSIBILITIES. COPPER DRIVE AND EMBER DRIVE ARE PROPOSED TO BE POROUS ASPHALT PAVEMENT. COPPER DRIVE AND EMBER DRIVE WILL ALWAYS BE PRIVATE AND WILL NEVER BE ACCEPTED BY THE CITY OF DOVER.

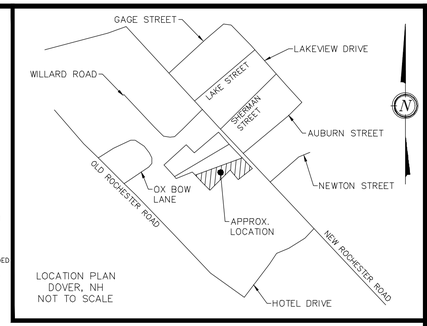
35.) APPLICANT SHALL COMPLETE LAND USE DEVELOPMENT TRACKING FORM, MOST RECENTLY REVISED VERSION, UTILIZING THE ONLINE POLLUTION TRACKING AND ACCOUNTING PILOT PROJECT (PTAPP) PORTAL. **HTTPS://WWW.UNH.EDU/UNHSC/PTAPP**

36.) THE PROPOSED 2–FAMILY DWELLING STRUCTURES SHALL BE SERVED BY A SPRINKLER SYSTEM AS REQUIRED BY CHAPTER 81–30 OF THE NH BUILDING AND FIRE CODES.

37.) SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED AND APPROVED BY INSPECTION SERVICES PRIOR TO CONNECTION OF THE BACKFLOW DEVICE.

38.) FIRE DEPARTMENT CONNECTION(S), IF REQUIRED BY THE SPECIFIC SYSTEM, SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13. ACCESS TO THE FDC SHALL MAINTAIN A CLEAR AND UNOBSTRUCTED PATH AT ALL TIMES.

39.) THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED STRUCTURE WILL ALSO BE DESIGNED IN ACCORDANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS (I.E. IBC, ANSI–117.1) AND NH RSA 155–A:5.



LOCATION PLAN
DOVER, NH
NOT TO SCALE

NOTES CONTINUED:

40.) THE EXISTING SINGLE FAMILY HOME ON TAX MAP 39, LOT 103 WILL CONTINUE TO USE EXISTING UTILITY SERVICES.

41.) PRIVATE TRASH PICKUP WILL BE DONE THROUGH THE USE OF TOTERS PADS PLACED ADJACENT TO EACH UNIT AND WILL BE COLLECTED INDIVIDUALLY THROUGH THE PRIVATE WASTE PICK UP COMPANY.

42.) HEATING & COOLING FOR PROPOSED UNITS IS TO BE DONE VIA MINI–SPLITS.

43.) DUE TO PROXIMITY TO SEASONAL HIGH WATER TABLES IN SANDY SOILS, FULL FOUNDATIONS ARE NOT ADVISABLE.

44.) THE FRONT OF THE STOP BAR IS TO BE 4' FROM THE EXTENSION OF THE V.G.C. TIPDOWN, WHERE THE CROSS WALK WOULD BE LOCATED.

45.) PROJECT DISTURBANCE: TOTAL 81,000 Sq. Ft. (1.86 Ac.) (45,000 Sq. Ft. (1.03 Ac.) ORIGINAL COPPER DRIVE (P22–027), 36,000 Sq. Ft. (0.83 Ac.) COPPER DRIVE EXTENSION & EMBER DRIVE) NOTE THAT THE PROJECT IS SUBJECT TO THE EPA NPDES PHASE II. THE NOTICE OF INTENT (NOI) MUST BE FILED ALONG WITH A STORMWATER POLLUTION PREVENTION PLAN (SWPPP). EROSION AND SEDIMENT CONTROL INSPECTIONS TO BE CONDUCTED ONCE PER EVERY SEVEN DAYS AND AT AN INCREASED FREQUENCY INCLUDING WITHIN 24–HOURS OF A 0.25 INCH RAIN EVENT. INSPECTIONS TO BE CONDUCTED BY A "QUALIFIED PERSON" AS DEFINED BY EPA CGP 4.1.1 AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN 24 HOURS IN ACCORDANCE WITH CGP 4.1.7 AND MAINTAINED BY THE OWNER FOR A PERIOD OF THREE YEARS AFTER THE PROJECT IS COMPLETED. SEE ALSO CITY OF DOVER ADDITIONAL INSPECTION REQUIREMENTS BELOW.

46.) EXISTING IMPERVIOUS AREA/LOT COVERAGE IS A FUNCTION OF LOT MERGER (103,666 Sq. Ft.)
PROPOSED IMPERVIOUS AREA/LOT COVERAGE IS A FUNCTION OF TOTAL PROJECT
POROUS PAVEMENT & PAVERS NOT INCLUDED IN CALCULATION OF IMPERVIOUS AREA
PRE–EXISTING BUILDING COVERAGE AREA: 4,552 Sq. Ft. (4.4%)
PRE–EXISTING PAVED IMPERVIOUS AREA: 1,917 Sq. Ft. (1.8%)
TOTAL EXISTING IMPERVIOUS COVER IS 6,469 Sq. Ft. (6.2%)
PROPOSED EX. & PROP. BUILDING IMPERVIOUS AREA: 17,830 Sq. Ft. (17.1%)
PROPOSED IMPERVIOUS AREA (CURB & GRAVEL) & EX PAVED: 2,214 Sq. Ft. (2.1%)
TOTAL PROPOSED IMPERVIOUS COVER IS 20,044 Sq. Ft. (19.3%)

47.) TWO (2) EV PARKING SPACES ARE PROVIDED AT THE COPPER DRIVE PARKING LOT.

48.) THE HOA IS RESPONSIBLE FOR THE LIFETIME MAINTENANCE OF THE 6' PERIMETER FENCE AND ALL OTHER COMMON AREA ITEMS.

49.) THE PERIMETER BOUNDARY WILL BE STAKED OUT BY BERRY SURVEYING & ENGINEERING PRIOR TO THE START OF CONSTRUCTION.

50.) PARKING SPACES WILL BE ASSIGNED TO UNITS.

51.) UNITS #14 & #15 ALONG WITH UNITS #16 & #17 ARE THE CONVERSION OF SINGLE FAMILY HOMES TO 2–FAMILY DWELLINGS. WATER & SEWER UTILITIES FOR THE PROPOSED UNITS ARE TO BE PLUMBED THROUGH THE EXISTING UNITS AND UTILIZE EXISTING SERVICES FROM NEW ROCHESTER ROAD. OVERHEAD ELECTRIC TO BE CONFIGURED/UPGRADED TO SUPPORT BOTH DWELLINGS.

52.) SITE PLAN AMMENDMENT NEEDED FOR THE MODIFICATIONS TO THE SINGLE FAMILY HOMES ON COPPER DRIVE.

WAIVER REQUESTS:

SUBDIVISION REGULATION ARTICLE 157–40–B(5): MINIMUM PIPE COVER

CONDITIONAL USE PERMITS: (% ARE FUNCTIONS OF LOT MERGER)

FRONTAGE BUILD–OUT OF 47.4% WHERE 60% IS REQ. (NEW ROCHESTER ROAD)
LOT COVERAGE OF 17.1% WHERE 50% IS REQ.
NOT MEETING FRONT BUILT–TO LINE ON NEW ROCHESTER ROAD

RECREATION SPACE REQUIREMENTS (DOVER CODE ARTICLE V , 170–15.)

PROPOSED NUMBER OF BEDROOMS: 26 (13 2BR)
RECREATION SPACE REQUIREMENT (100 SF PER BEDROOM): 2,600 SF
½ RECREATION SPACE FOR PASSIVE USE: 1,300 SF
3,215 SF PROVIDED (SATISFIED ON SITE)
½ RECREATION SPACE FOR ACTIVE USE: 1,300 SF
(SATISFIED OFF SITE) (RECREATION FEE REQUIRED)

UNIT DENSITY CALCULATION:

- TOTAL AREA GATEWAY ZONE (FUNCTION OF LOT MERGER W/ TAX MAP 39, LOT 104): 93,953 Sq. Ft.
  - DENSITY OF 4,000 Sq. Ft. / UNIT
  - 93,953 Sq. Ft. / 4,000 Sq. Ft. / UNIT = 23.5 UNITS
  - 23 UNITS ALLOWED BY RIGHT, 23 UNITS ON PROJECT
  - 1 EXISTING SINGLE FAMILY HOME ON SITE (ORIGINAL TAX MAP 39, LOTS 103)
  - 6 ADDITIONAL SINGLE FAMILY HOMES CONSTRUCTED (PRIOR APPROVAL)
  - 6 ADDITIONAL 2–FAMILY DWELLING (12 UNITS) PROPOSED
  - 2 SINGLE FAMILY HOMES/GARAGE CONVERTED TO 2–FAMILY–DWELLINGS

PARKING REQUIREMENTS:

CHAPTER 153–14D PARKING TABLE

- RESIDENTIAL (UNITS USING THE PARKING LOTS)
  - RESIDENTIAL (GATEWAY) 1.9 SPACES PER UNIT:
    - 14 UNITS UTILIZING PARKING LOT x 1.9 SPACES/UNIT = 26.6 SPACES

TOTAL MAXIMUM = 27 SPACES
TOTAL PROPOSED = 28 SPACES, DETERMINED BY PLANNING DIRECTOR TO NOT NEEDED CUP FOR ONE PARKING SPACE OVER THE MAXIMUM.

5% EV REQUIREMENT = 1.40 SPACES, 2 PROPOSED ON COPPER DRIVE PARKING LOT
5% BIKE PARKING = 1.40 SPACES, 14 PROVIDED

SNOW STORAGE CALCULATION:

- STORAGE CALCULATION (6:1 RATIO USED) (POROUS PAVEMENT)
  - PAVED AREA = 10,676 Sq.Ft. / 6 = 1,780 Sq.Ft.
  - >3,825 Sq.Ft. PROVIDED
  - SNOW SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS ONCE IDENTIFIED AREAS ARE FULL. WHEN SNOW BANKS ALONG THE ROAD ARE GREATER THAN 2' TALL, A WING PLOW IS TO COME THROUGH AND KNOCK THE SNOW BANK HEIGHTS DOWN TO ENSURE ALL SEASON SIGHT DISTANCE.

APPROVED DOVER

DOVER PLANNING FILE #SITE–2023–0007

REVISION	DATE	DESCRIPTION
#2	11–06–23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9–25–23	REVISED PER DOVER TRC COMMENT

SITE PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14047 — LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

PROJECT NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1A.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF COPPER DRIVE AND TAX MAP 39, LOT 103.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

PROPOSED LEGEND:

- FLOW ARROW
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- F211 / F210 / D — CONTOUR MINOR, PROPOSED; CONTOUR MAJOR, PROPOSED; DRAINAGE CULVERT
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- F109.31 — PROPOSED SPOT ELEVATION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROPOSED SURFACE LEGEND:

- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS PAVERS

GRADING NOTES:

1.) THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS DATED 2016. CURRENT STANDARD PLANS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE PROPOSAL.

2.) CONTRACTOR SHALL TAKE SPECIAL CARE IN NOT DISTURBING EXISTING MONUMENTS BOUNDS, AND OR BENCHMARKS WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION

3.) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION

4.) WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

5.) THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

6.) AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. LIMIT OF GRADING SHOULD NOT BE EXPANDED WITHOUT CONSULTING THE DESIGN ENGINEER. SEE ALSO E&SC PLAN.

7.) THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R & R).

8.) ALL SYMBOLS, WORDS, TRANSVERSE MARKINGS (STOP BARS, CROSSWALK LINES, AND RAILROAD SYMBOLS), LANE LINES, AND ALL OTHER MARKINGS NOTED WITH {T} SHALL BE THERMOPLASTIC.

9.) ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM PLACED AND SEEDED. THE LOAM SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.

10.) ALL ELEVATIONS TO BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE DESIGN ENGINEER IS TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY. TEMPORARY BENCHMARKS (T.B.M.) ARE TO BE PROVIDED BY THE DESIGN ENGINEER.

11.) PROJECT DISTURBANCE: TOTAL 81,000 Sq. Ft. (1.86 Ac.) (45,000 Sq. Ft. (1.03 Ac.) ORIGINAL COPPER DRIVE (P22-027), 36,000 Sq. Ft. (0.83 Ac.) COPPER DRIVE PHASE 2 & EMBER DRIVE). NOTE THAT THE PROJECT IS SUBJECT TO THE EPA NPDES PHASE II. THE NOTICE OF INTENT (NOI) MUST BE FILED ALONG WITH A STORMWATER POLLUTION PREVENTION PLAN (SWPPP). EROSION AND SEDIMENT CONTROL INSPECTIONS TO BE CONDUCTED ONCE PER EVERY SEVEN DAYS AND AT AN INCREASED FREQUENCY INCLUDING WITHIN 24-HOURS OF A 0.25 INCH RAIN EVENT. INSPECTIONS TO BE CONDUCTED BY A "QUALIFIED PERSON" AS DEFINED BY EPA CSP 4.1.1 AND INSPECTION REPORTS SUBMITTED TO THE CITY OF DOVER, NH, ENGINEERING DEPARTMENT WITHIN 24 HOURS IN ACCORDANCE WITH CGP 4.1.7 AND MAINTAINED BY THE OWNER FOR A PERIOD OF THREE YEARS AFTER THE PROJECT IS COMPLETED. SEE ALSO CITY OF DOVER ADDITIONAL INSPECTION REQUIREMENTS BELOW.

12.) ALL TREATMENT SWALES TO BE CONSTRUCTED SHALL HAVE SOD BOTTOMS UNLESS OTHERWISE INSTRUCTED BY THE DESIGN ENGINEER DURING CONSTRUCTION.

13.) A LETTER OF CREDIT FOR THE COST OF RE-VEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS, AS MAY BE APPLICABLE.

14.) A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND DOVER CITY STAFF SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.

15.) BUILDING ADDRESSES SHALL BE DETERMINED BY THE BUILDING OFFICIAL.

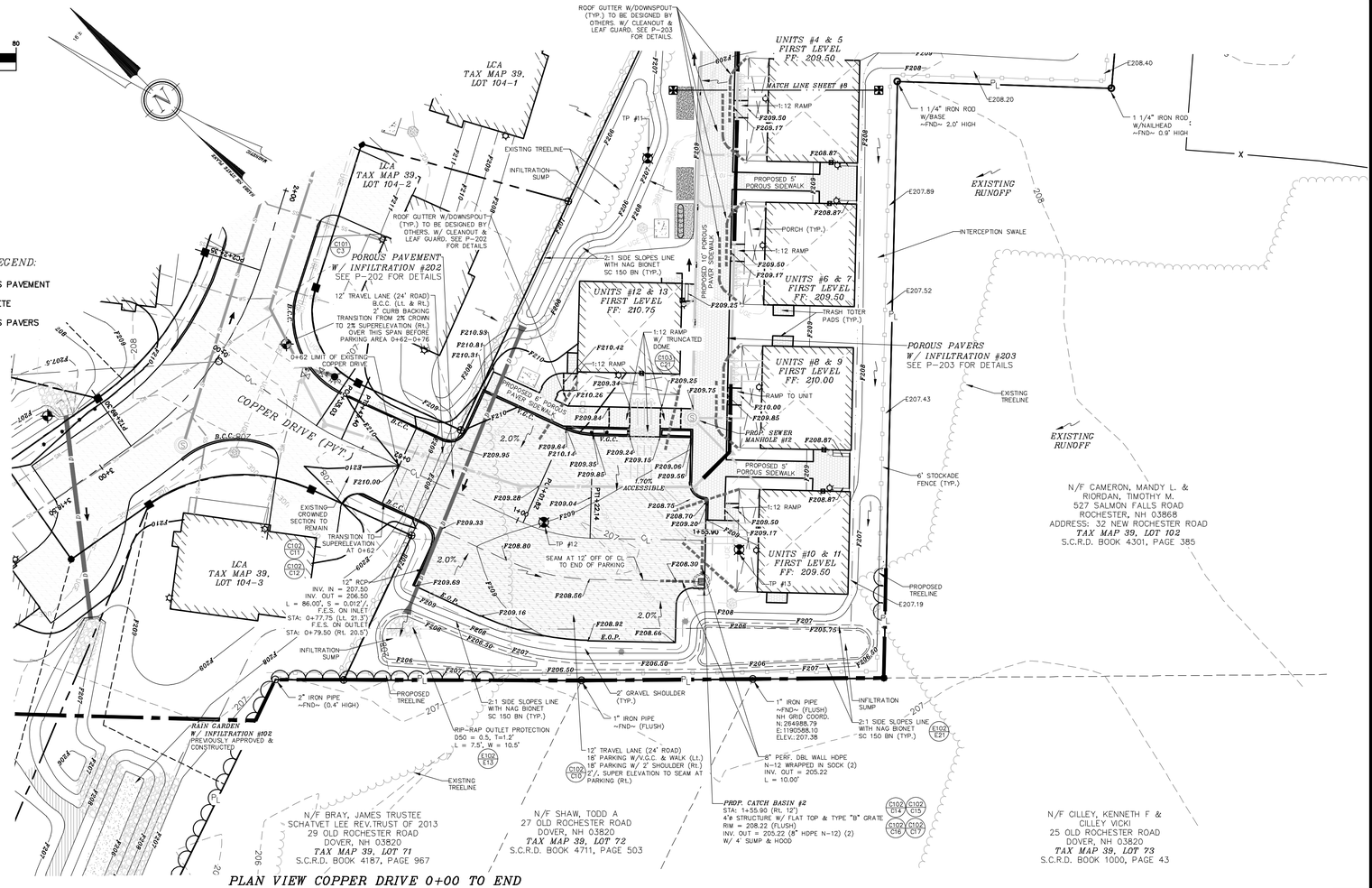
16.) WRITTEN DIMENSION ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR IS TO CONFIRM ALL ELEVATIONS. CONFLICTS WILL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO CONSTRUCTION.

17.) COMMERCIAL VEHICLE ROUTE DURING CONSTRUCTION SHALL CONFORM WITH CITY OF DOVER CODE OR BE COORDINATED WITH THE COMMUNITY SERVICES DIRECTOR.

18.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

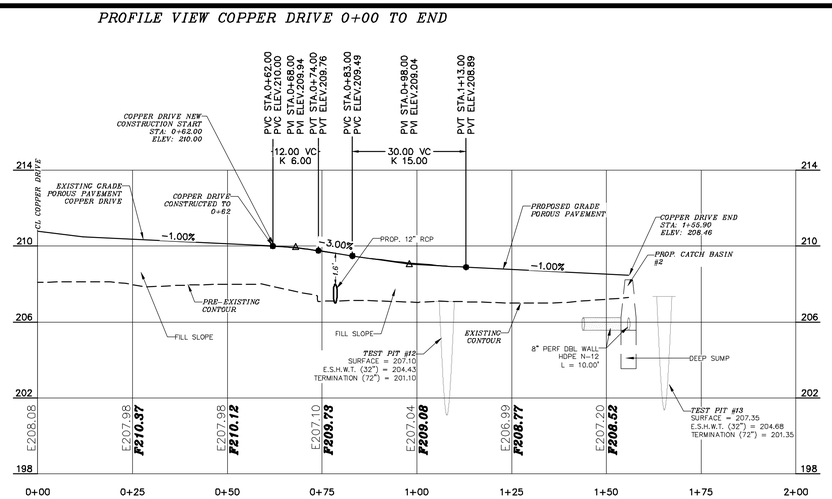
19.) SEE DETAILS CONCERNING SITE LAYOUT, DRAINAGE, UTILITY, AND SEDIMENT AND EROSION CONTROLS.

20.) DESIGN ENGINEER OF RECORD SHALL PROVIDE SIGNED LETTER TO CITY ENGINEER CERTIFYING THAT THE STORMWATER MANAGEMENT SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS. DESIGN ENGINEER OR DESIGN ENGINEERS REPRESENTATIVE IS TO BE PERIODICALLY ON SITE AND INSPECT DURING CONSTRUCTION PROCESS. CONTRACTOR IS TO PROVIDE 24-48 HOURS NOTICES PRIOR TO INSPECTION REQUESTS.



PLAN VIEW COPPER DRIVE 0+00 TO END

PROFILE VIEW COPPER DRIVE 0+00 TO END



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #SITE-2023-0007

#	REVISION	DATE	DESCRIPTION
#2			REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1		11-06-23 9-25-23	REVISED PER DOVER TRC COMMENT

PLAN & PROFILE COPPER DRIVE 0+00 TO END
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

NOT FOR CONSTRUCTION

PROJECT NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1A.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF EMBER DRIVE AND TAX MAP 39, LOT 103.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

GRAPHIC SCALE

20 0 10 20 40 80

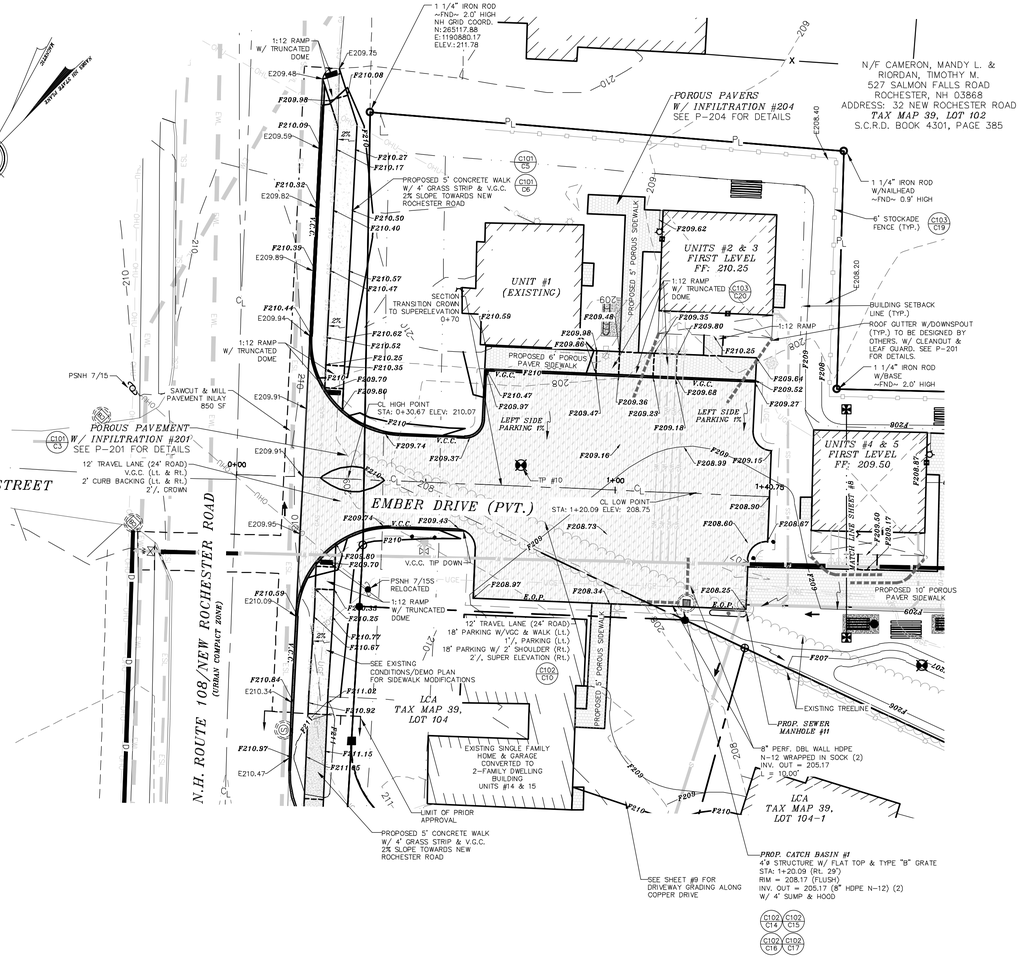
(IN FEET)
1 inch = 20 ft.

PROPOSED LEGEND:

- FLOW ARROW
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- F211 / F210 / D — CONTOUR MINOR, PROPOSED; CONTOUR MAJOR, PROPOSED; DRAINAGE CULVERT
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- F109.31 — PROPOSED SPOT ELEVATION

PROPOSED SURFACE LEGEND:

- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS PAVERS



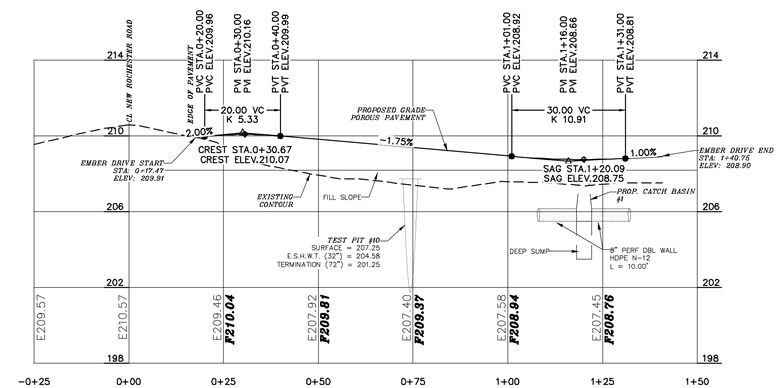
PLAN VIEW EMBER DRIVE 0+00 TO END

PROFILE VIEW EMBER DRIVE 0+00 TO END

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



DOVER PLANNING FILE #SITE-2023-0007

#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED	
#1	9-25-23	REVISED PER DOVER TRC COMMENT	
REVISION	DATE	DESCRIPTION	

PLAN & PROFILE EMBER DRIVE 0+00 TO END
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14249
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

PROJECT NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1A.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) THE INTENT OF THIS PLAN IS TO PROVIDE GRADING & ENGINEERING DETAILS OF DRIVEWAYS LOCATED OFF OF COPPER DRIVE AND TAX MAP 39, LOT 103.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

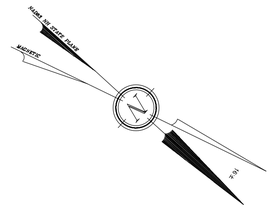
7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

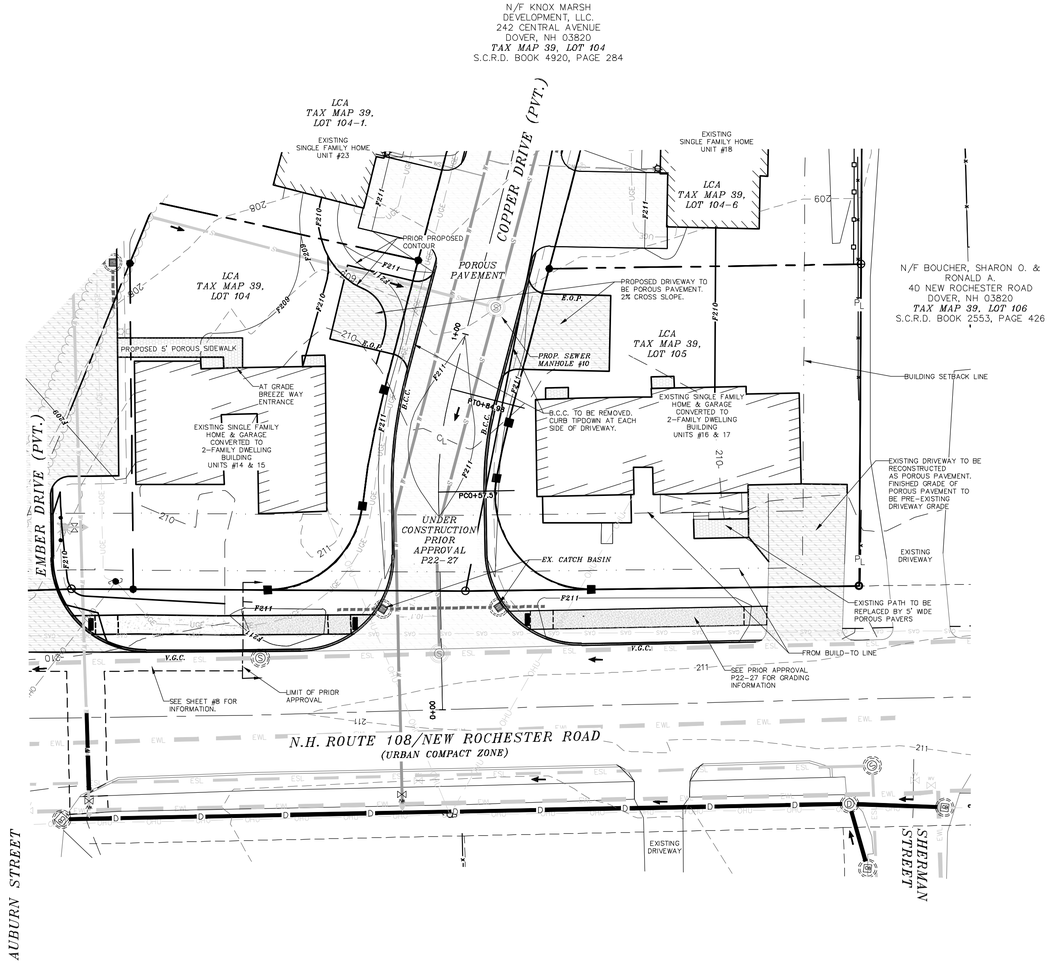


PROPOSED LEGEND:

- FLOW ARROW
- TEMPORARY BENCHMARK (T.B.M.)
- E101 / E6 — DETAIL SHEET / DETAIL
- F211 — CONTOUR MINOR, PROPOSED
- F210 — CONTOUR MAJOR, PROPOSED
- D — DRAINAGE CULVERT
- SHOULDER
- CENTER LINE
- BUILDING SETBACK LINE
- RIP RAP
- STORMWATER BEST MANAGEMENT PRACTICE (BMP)
- BERM
- F109.31 — PROPOSED SPOT ELEVATION

PROPOSED SURFACE LEGEND:

- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS PAVERS



DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

COPPER DRIVE POROUS PAVEMENT DRIVEWAY ADDITIONS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

NOT FOR CONSTRUCTION

DESIGN NOTES:

1.) POROUS ASPHALT PAVEMENT WILL CONFORM TO UNHSC (2007b) SPECIFICATIONS AS UPDATED BY UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS (DATED: SEPTEMBER 2016).

2.) THE FILTER COURSE WILL BE INSTALLED AT A MINIMUM DEPTH OF 12 INCHES AND CONSIST OF NHDOT (2016) SAND, ITEM 304.1 PER THE NH STORMWATER MANUAL.

3.) SEE CROSS SECTIONS FOR DETAILS.

4.) SEE STORMWATER SYSTEM MANAGEMENT: INSPECTION AND MAINTENANCE MANUAL AND PLAN, DATED JULY 7, 2023 FOR MAINTENANCE REQUIREMENTS.

REFERENCE:

1.) NH STORMWATER MANUAL: VOLUME 2, SECTION 4E PERMEABLE PAVEMENT.

2.) UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS, FEBRUARY 2014, REVISED SEPTEMBER 2016, UNIVERSITY OF NEW HAMPSHIRE STORWATER CENTER, DURHAM, NH 03824-3534.

3.) POROUS ASPHALT PAVEMENT FOR STORMWATER MANAGEMENT, THE UNH STORMWATER CENTER.

CHOKER COURSE *

SIEVE SIZE	% PASSING BY WEIGHT
1 1/2"	100
1"	95 – 100
1/2"	25 – 60
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #57 – AASHTO

FILTER COURSE *

SIEVE SIZE	% PASSING BY WEIGHT
6"	100
# 4	70 – 100
# 200	0 – 6**

* EQUIVALENT TO MODIFIED NHDOT 304.1 – SECTION 304 OF NHDOT NHDOT STANDARD SPECIFICATIONS

** LESS THAN 4% FINES

POROUS ASPHALT MIX DESIGN CRITERIA

SIEVE SIZE	% PASSING BY WEIGHT
3/4"	100
1/2"	85 – 100
3/8"	55 – 75
# 4	10 – 25
# 8	5 – 12
# 200	2 – 4

BINDER CONTENT (AASHTO T164)	5.8 – 6.5%
AIR VOID CONTENT (AASHTO D6752)	16 – 22%
DRAINDOWN (AASHTO D6390)	≤ 0.3%
RETAINED TENSILE STRENGTH (AASHTO D6390)	≥ 80%
CANTABRO ABRASION TEST (UNAGED)	≤ 20%
CANTABRO ABRASION TEST (7 DAYS)	≤ 30%

FILTER BLANKET COURSE *

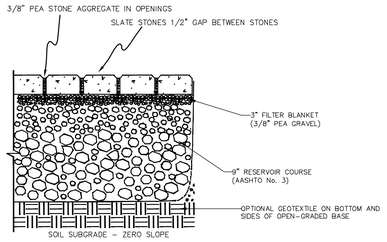
SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

RESERVOIR COURSE *

SIEVE SIZE	% PASSING BY WEIGHT
2 1/2"	100
2"	90 – 100
1 1/2"	35 – 70
1"	0 – 15
1/2"	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #3 – AASHTO

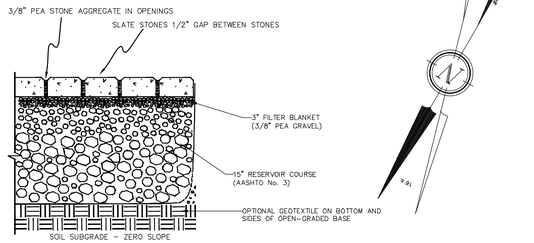


5-6' WIDE POROUS PAVERS DETAIL

NOT TO SCALE

POROUS ASPHALT PAVEMENT

NOT TO SCALE



10' WIDE POROUS PAVERS DETAIL

NOT TO SCALE

PROPOSED SURFACE LEGEND:

PROPOSED POROUS PAVEMENT

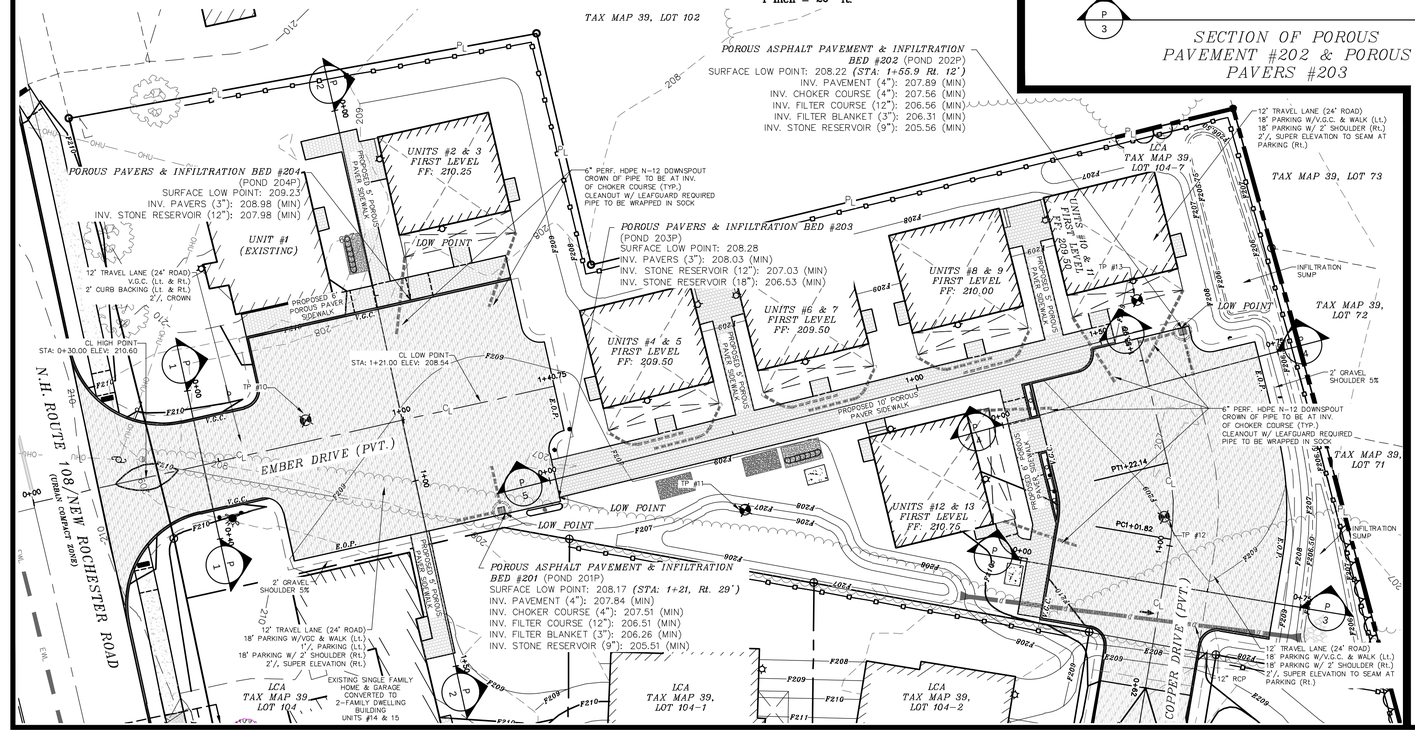
PROPOSED CONCRETE

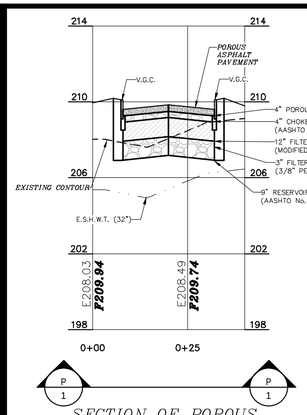
PROPOSED POROUS PAVERS

GRAPHIC SCALE

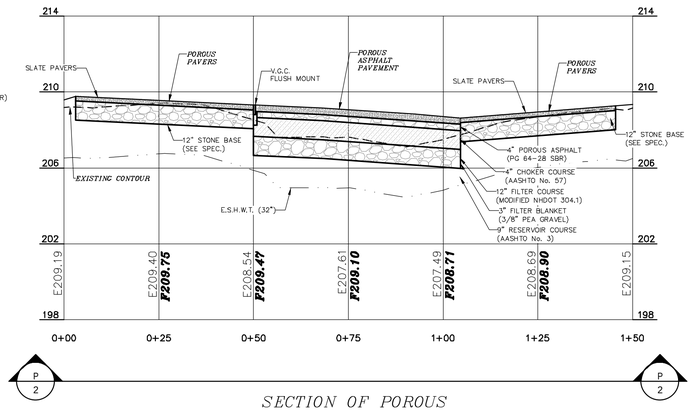
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

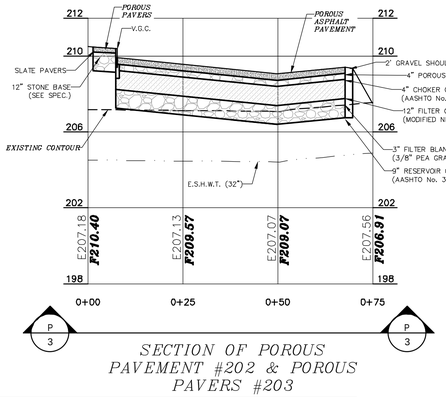




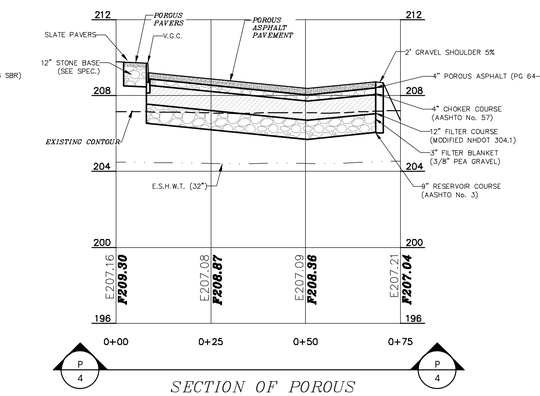
SECTION OF POROUS PAVEMENT #201



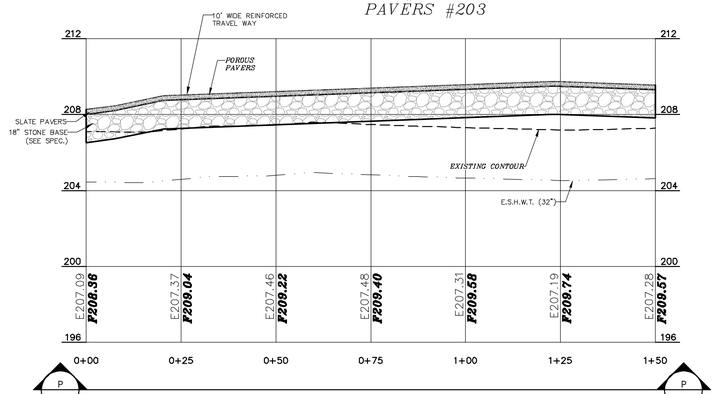
SECTION OF POROUS PAVEMENT #201 & POROUS PAVERS #204



SECTION OF POROUS PAVEMENT #202 & POROUS PAVERS #203



SECTION OF POROUS PAVEMENT #202 & POROUS PAVERS #203



SECTION OF POROUS PAVERS #203

POROUS PAVEMENT TOTAL SECTION DEPTH = 32"
TOTAL SECTION REQUIRED = 31.2" (65% OF FROST DEPTH)
FROST DEPTH = 48" (UNHSC)

POROUS PAVEMENT E.S.H.W.T. = 2.67' (32") GREATER THAN 1' FROM FILTER COURSE TO E.S.H.W.T. PROVIDED FOR ENTIRE INFILTRATION BED

SEE GRADING PLANS & PROFILES FOR SPOT ELEVATIONS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

P-201-P204

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

POROUS ASPHALT PAVEMENT W/ INFILTRATION #201 & #202
& POROUS PAVERS W/ INFILTRATION #203 & #204
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE KENNETH A. BERRY No. 14283 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

SOILS & DEWATERING:

WdA	*WINDSOR*	*LOAMY SAND*	*K= 0.17*
DeA	*DEEREFIELD*	*LOAMY SAND*	*K= 0.17*
(350A&B)			

SEE WEBSOIL USDA–NRCS
ERODIBILITY FACTOR – K, CPESC MANUAL, ENVIROCERT INTERNATIONAL INC. & ROCKINGHAM COUNTY SOIL SURVEY, ROCKWEB SOIL ATTRIBUTES.

CONTRACTOR TO BE AWARE OF THE SOIL PROFILES AND ENSURE THAT PROPER EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE TAKEN AT ALL TIMES. ANY DEWATERING REQUIREMENTS IN NEW HAMPSHIRE REQUIRE SPECIAL PROVISIONS IN ACCORDANCE WITH THE "CLARIFICATION OF SECTION 9.1.2 (STATE OF NEW HAMPSHIRE CONDITIONS) AND OTHER NH SPECIFIC INFORMATION FOR THE U.S. EPA 2012 NPDES CONSTRUCTION GENERAL PERMIT (CGP)" DATED MAY 3, 2012 INCLUDED IN THE SWPPP.

COVER MANAGEMENT DURING CONSTRUCTION FOR EXPOSED SOIL WILL INCLUDE HAY / STRAW APPLIED AT A RATE OF 2.0 TONS PER ACRE, TEMPORARY SEEDING OF ANNUAL RYE GRASS, AND PERMANENT SEEDING AT THE EARLIES OPPORTUNITY. SEE ADDITIONAL REQUIREMENT FOR STABILIZATION ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEETS, E-101 AND E-102.

THE CONSTRUCTION SCHEDULE WILL BE MANAGED SO THAT ALL STORMWATER STRUCTURES WILL BE BUILT AND STABILIZED PRIOR TO RECEIVING SURFACE WATER RUNOFF. CONTRACTOR TO BE RESPONSIBLE FOR ALL DIVERSIONS DURING CONSTRUCTION AND FOR INTERIM SEDIMENT AND EROSION CONTROL MEASURES.





NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.83 Ac.

5.) THE INTENT OF THIS PLAN IS SHOW THE PROPOSED EROSION AND SEDIMENT CONTROL MEASURES.

6.) CONTRACTOR IS TO INSTALL A CONSTRUCTION ENTRANCE PRIOR TO EARTH DISTURBING ACTIVITIES.

7.) CONTRACTOR IS RESPONSIBLE FOR SWEEPING THE PARKING LOT, SIDEWALKS AND ANYTHING DISTURBED, TO ENSURE THAT NO SEDIMENT IS BEING TRACKED ONTO NEW ROCHESTER ROAD OR THE EXISTING DRIVEWAYS.

8.) CONTRACTOR IS RESPONSIBLE FOR CLEANING AND MAINTAINING THE INLET PROTECTION ONCE INSTALLED.

9.) FUGITIVE DUST IS TO BE CONTROLLED THROUGHOUT THE CONSTRUCTION PROCESS IN ACCORDANCE WITH ENV–A 1000.

10.) CONTRACTOR IS TO MEET THE REQUIREMENTS SPECIFIED IN RSA 430:51–57 AND AGR 3800, RELATING TO INVASIVE SPECIES.

11.) CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE WATER QUALITY FROM ANY RUN OFF DURING THE CONSTRUCTION PROCESS, IN ACCORDANCE WITH ENV–WQ 1507, IN ORDER TO PREVENT VIOLATIONS OF THE STORM WATER QUALITY STANDARDS.

12.) CONTRACTOR AY USE SILT FENCE, SILT SOXX OR MULCH BERM FOR PERIMETER CONTROL. SPECIFIC PRACTICES MAY BE SPECIFIED, SEE PLAN.

13.) ALL STORAGE FACILITIES FOR FUEL, CHEMICALS, CHEMICAL OR INDUSTRIAL WASTES, AND BIODEGRADABLE RAW MATERIALS SHALL MEET THE REGULATIONS OF THE NHDES, INCLUDING BUT NOT LIMITED TO THOSE INVOLVING UNDERGROUND STORAGE TANKS, ABOVE GROUND STORAGE TANKS, HAZARDOUS WASTE AND BEST MANAGEMENT PRACTICES FOR GROUND WATER PROTECTION (PART ENV–WQ 401).

14.) COMMUNITY SERVICES DEPARTMENT OR ITS DESIGNATED AGENT SHALL HAVE ACCESS TO THE SITE TO COMPLETE ROUTINE INSPECTIONS.

15.) THE COMMUNITY SERVICES DEPARTMENT SHALL BE NOTIFIED 24 HOURS PRIOR TO INSTALLATION OF A STORMWATER BMP IN ORDER TO SCHEDULE AN INSPECTION. THESE INSPECTIONS SHALL BE COMPLETED DURING NORMAL WORK HOURS.

16.) THE PLANNING BOARD OR COMMUNITY SERVICES DEPARTMENT MAY REQUIRE THE DESIGN ENGINEER AND/OR AN INDEPENDENT THIRD PARTY TO PROVIDE INSPECTION AND OVERSIGHT OF THE CONSTRUCTION OF THE STORMWATER MANAGEMENT FACILITIES AND EROSION AND SEDIMENT CONTROL MEASURES AT ITS DISCRETION. SUCH OVERSIGH MAY BE ESPECIALLY IMPORTANT FOR IMPLEMENTING TECHNIQUES SUCH AS POROUS PAVEMENT OR SUSURFACE INFILTRATION SYSTEMS. THE OWNER/APPLICANT SHALL BE RESPONSIBLE FOR ALL FEES ASSOCIATED WITH THIRD–PARTY INSPECTIONS.

17.) CITY OF DOVER: IN ACCORDANCE WITH SITE PLAN REVIEW REGULATIONS (153–14) THE FOLLOWING STORMWATER MEASURES ARE REQUIRED.

A.) ALL PROPOSED BMPs WILL CONFORM TO THE NH STORMWATER MANUAL VOLUME 3.
B.) EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY COMMUNITY SERVICE.
C.) TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN CALENDAR DAYS FOR EXPOSED SOILS AREAS THAT ARE WITHIN ONE HUNDRED FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.
D.) ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL STABILIZATION IS ACCOMPLISHED.
E.) COMMUNITY SERVICES DEPARTMENT OR THEIR DESIGNATED AGENT SHALL HAVE ACCESS TO THE SITE TO COMPLETE ROUTINE INSPECTIONS AND SHALL BE NOTIFIED 24–HOURS PRIOR TO INSTALLATION OF A STORMWATER BMP IN ORDER TO SCHEDULE AN INSPECTION, DURING NORMAL WORKING HOURS.
F.) THE PLANNING BOARD OR COMMUNITY SERVICES MAY REQUIRE THE DESIGN ENGINEER AND/OR AN INDEPENDENT, THIRD–PARTY INSPECTION AND OVERSIGHT OF THE CONSTRUCTION OF STORMWATER MANAGEMENT FACILITIES AND EROSION AND SEDIMENT CONTROL AT THEIR DISCRETION. THE OWNER / APPLICANT IS RESPONSIBLE FOR ALL FEES ASSOCIATED WITH INSPECTIONS.
G.) ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORMWATER INSPECTOR (CESSWI), OR A CERTIFIED PROFESSIONAL IN STORMWATER QUALITY (CPSWQ). INSPECTION REPORTS WILL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT. U.S. EPA, CGP 2022 REQUIRES A QUALIFIED AND CERTIFIED INSPECTOR (SEE SWPPP).

LEGEND:

- (R) POND PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- REBAR (FND)
- IRON BOUND (FND)
- IRON PIPE (FND)
- UTILITY POLE
- BENCHMARK
- PERIMETER CONTROL
- FILTREXX SILTSOXX
- CONSTRUCTION FENCE
- TREE LINE

STABILIZATION NOTE:
SEE NOTE #6, SHEET E–102, DETAIL E–18
SIDE SLOPES ARE TO BE STABILIZED WITHIN THREE WORKING DAY UPON COMPLETION OF FINAL GRADE.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

DOVER PLANNING FILE #SITE–2023–0007

#	REVISION	DATE	DESCRIPTION
#2		11–06–23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1		9–25–23	REVISED PER DOVER TRC COMMENT

EROSION AND SEDIMENT CONTROL PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

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

NOT FOR CONSTRUCTION

PROJECT NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.83 Ac.

5.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY & ENGINEERING DETAILS OF COPPER DRIVE AND TAX MAP 39, LOT 103.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

PROPOSED LEGEND:

- LIGHT TYPE "A" MOUNTED ON UNIT
- LIGHT TYPE "B" MOUNTED 14' HIGH
- LIGHT TYPE "C" MOUNTED 5.5' HIGH
- SEWER MANHOLE W/ STRUCTURE
- E101 / E6 — DETAIL SHEET / DETAIL
- F101 — CONTOUR MINOR, PROPOSED
- F100 — CONTOUR MAJOR, PROPOSED
- D — DRAINAGE CULVERT
- SHOULDER
- CENTER LINE
- PROPOSED UTILITY POLE
- TRANSFORMER / JBOX
- UGE — UNDERGROUND UTILITY
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- S — PROPOSED SEWER LINE
- SS — PROPOSED SEWER SERVICE

PROPOSED SURFACE LEGEND:

- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS PAVERS

NOTES:

1.) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVE AND BELOW GROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITY CONFLICTS SHOULD BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.

2.) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3.) PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES, TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAGFIC IN SENSITIVE AREAS, AND MAINTAINING AN EGFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL MEETING THE ENGINEERS SPECIFIC RECOMMENDED CRITERIA.

4.) IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER (NOT ALLOWED IN CITY R.O.W.), EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATION. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.

5.) PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION. VOIDS BETWEEN STONES AND CLUMPS OF MATERIAL SHALL BE FILLED WITH FINE MATERIALS.

6.) FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES AND THE DOVER DPW.

7.) CONTRACTOR TO CONTACT DOVER DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY CONSTRUCTION TO COORDINATE ALL WORK CONCERNING INSTALLATION OF ANY PROPOSED WATER LINE IMPROVEMENTS.

8.) ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL CONFORM TO CITY OF DOVER STANDARDS. ALL HIGHWAY CONSTRUCTION WILL MEET THE CITY OF DOVER STANDARDS.

9.) CONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSTALLATIONS WITH EVERSOURCE AT (800) 662-7764. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL. A 48-HOUR MINIMUM NOTICE IS REQUIRED.

10.) CONTRACTOR SHALL COORDINATE ALL TELECOMMUNICATIONS INSTALLATIONS WITH FAIRPOINT COMMUNICATIONS AT (603) 427-5525.

11.) CONTRACTOR SHALL COORDINATE ALL CABLE INSTALLATIONS WITH COMCAST.

12.) ALL SEWER MANHOLE RIMS & COVERS ARE TO BE LIFTMATE R-1743-LM.

13.) ALL WATER SERVICES ARE TO BE WITNESSED WITH A 2"X4" PAINTED BLUE. ALL SEWER SERVICES ARE TO BE WITNESSED WITH A 2"X4" PAINTED YELLOW, IS STUBBED PRIOR TO BUILDING CONSTRUCTION. DETECTABLE METALLIC UNDERGROUND TAPE SHALL BE LABELED APPROPRIATELY.

14.) CURB BOXES SHOULD BE PLACED IN THE LAWN AREA, OR IF PLACED IN PAVEMENT, A ROAD BOX IS REQUIRED.

15.) SEE EXISTING CONDTIONS PLAN FOR DATUM. VERTICAL DATUM BASED ON NAVD88 ELEVATIONS. HORIZONTAL DATUM BASED ON NAD83 STATE PLANE COORDINATES GATHERED USING TOPCON HIPER SR SURVEY GRADE GPS.

16.) MINIMUM SLOPE FOR ALL SEWER SERVICE CONNECTIONS IS TO BE NO LESS THAN 0.02 FT/FT.

17.) ALL SEWER INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF NHDES & DOVER DPW SEWER DIVISION STANDARDS. ALL PVC SEWER PIPE IS TO CONFORM WITH ENV-WQ 704.05 (c)-(e) FOR SDR 35 GRAVITY SEWER PIPE,

18.) CONTRACTOR TO TRANSFER TEMPORARY BENCHMARK TO A SUITABLE BENCHMARK TO CONTROL CONSTRUCTION. ANY ELEVATION DISCREPANCIES ARE TO BE REPORTED TO THE THE DESIGN ENGINEER IMMEDIATELY.

19.) ALL SEWER AND WATER CROSSINGS ARE TO MAINTAIN A 1.5' OF SEPARATION.

20.) THE SINGLE FAMILY HOME WILL CONTINUE TO UTILIZE THEIR EXISTING SERVICES

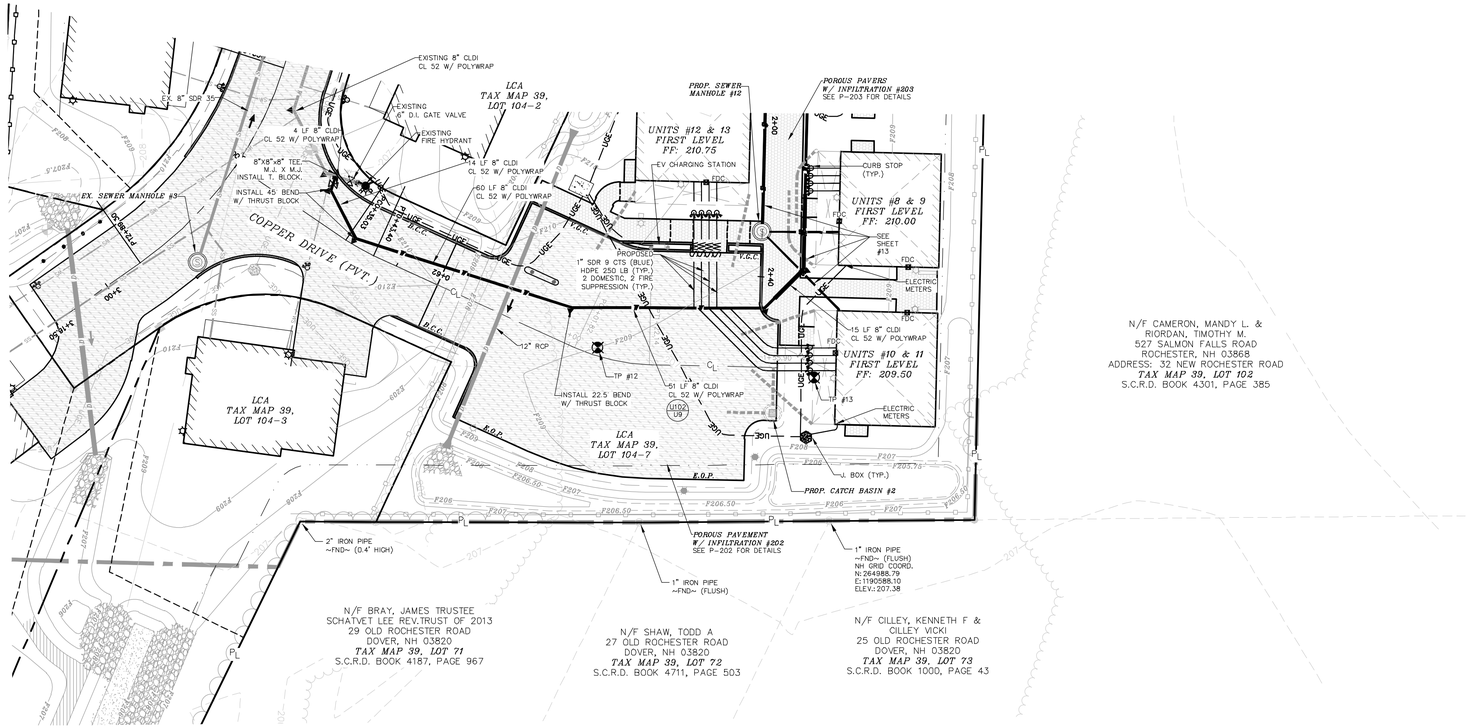
21.) HEATING AND COOLING FOR PROPOSED UNITS WILL BE DONE VIA MINI-SPLIT.

GRAPHIC SCALE

20 0 10 20 40 80

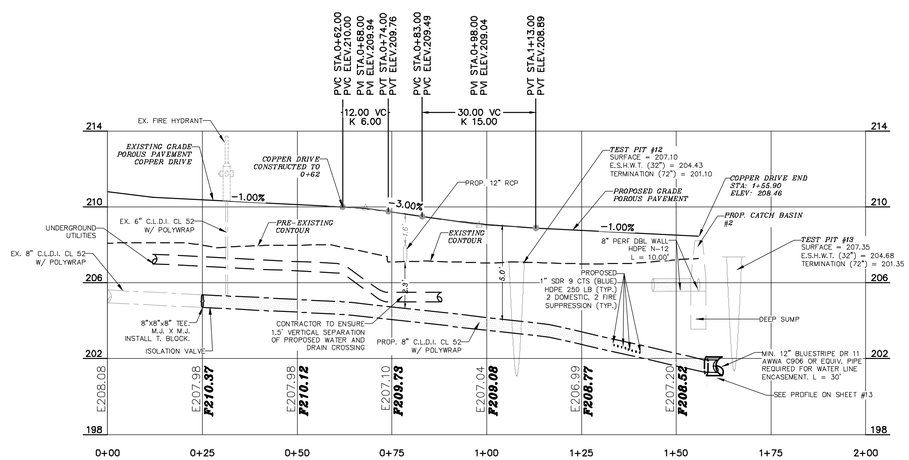
(IN FEET)
1 inch = 20 ft.





UTILITY PLAN VIEW COPPER DRIVE 0+00 TO END

UTILITY PROFILE VIEW COPPER DRIVE 0+00 TO END



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
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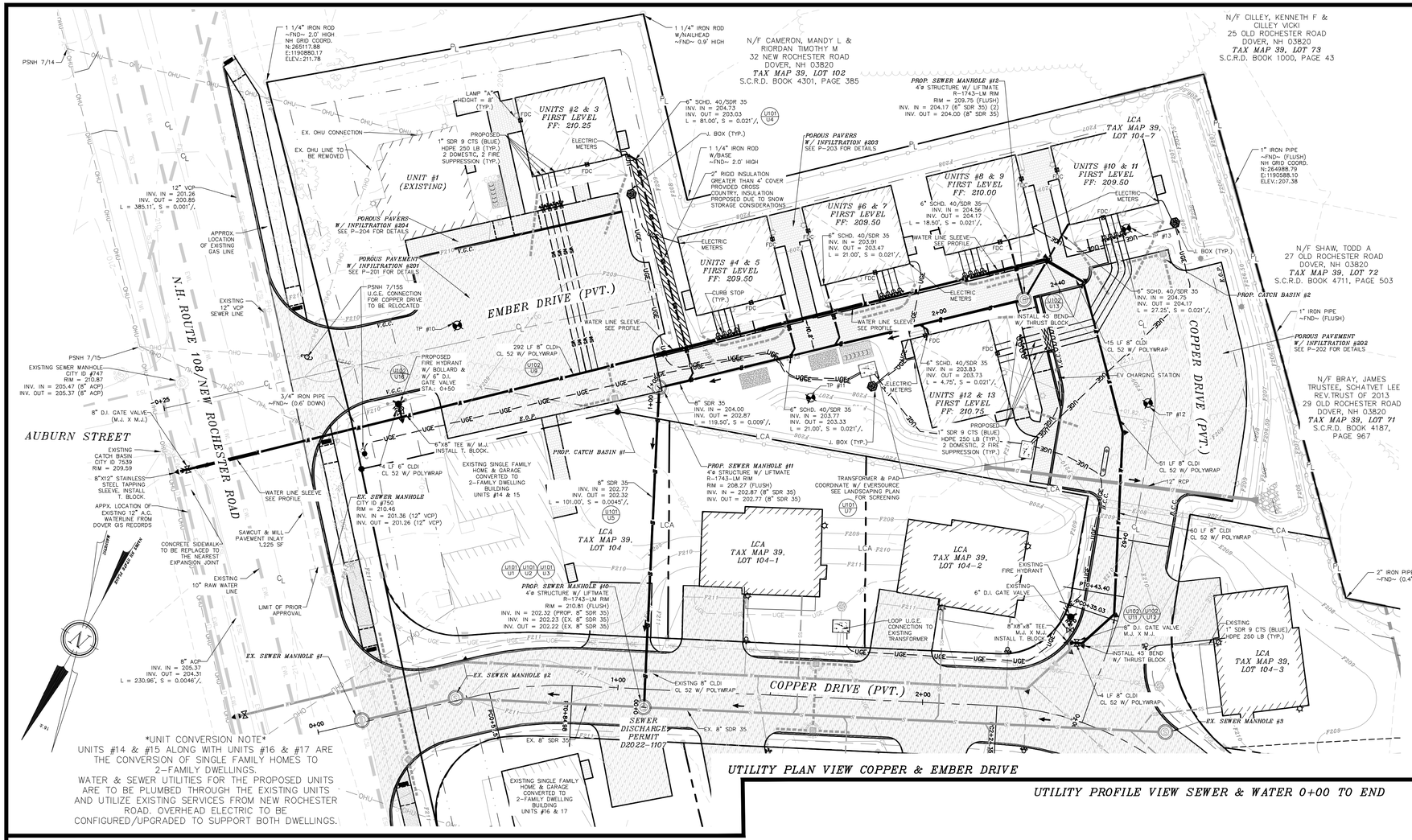
UTILITY PLAN & PROFILE COPPER DRIVE 0+00 TO END
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

NOT FOR CONSTRUCTION



PROJECT NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.83 Ac.

5.) THE INTENT OF THIS PLAN IS TO PROVIDE UTILITY & ENGINEERING DETAILS OF COPPER DRIVE, EMBER DRIVE, AND TAX MAP 39, LOT 103.

6.) SEE EROSION & SEDIMENT CONTROL PLANS FOR DETAILS ON PERIMETER CONTROL (MULCH BERM / FENCE / SILT SOXX).

7.) BS&E IS TO PROVIDE ADDITIONAL BENCHMARKS PRIOR TO CONSTRUCTION.

8.) EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

9.) FOOTING ELEVATION ASSUMED BETWEEN 204.0 AND 205.0.

PROPOSED LEGEND:

- LIGHT TYPE "A" MOUNTED ON UNIT
- LIGHT TYPE "B" MOUNTED 14' HIGH
- LIGHT TYPE "C" MOUNTED 5.5' HIGH
- SEWER MANHOLE W/ STRUCTURE
- DETAIL SHEET / DETAIL
- CONTOUR MINOR, PROPOSED
- CONTOUR MAJOR, PROPOSED
- DRAINAGE CULVERT
- SHOULDER
- CENTER LINE
- PROPOSED UTILITY POLE
- TRANSFORMER / J.BOX
- UNDERGROUND UTILITY
- GATE VALVE
- CURB STOP
- FIRE HYDRANT
- THRUST BLOCKS
- PROPOSED WATER MAIN
- PROPOSED WATER SERVICE
- PROPOSED SEWER LINE
- PROPOSED SEWER SERVICE

PROPOSED SURFACE LEGEND:

- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS PAVERS

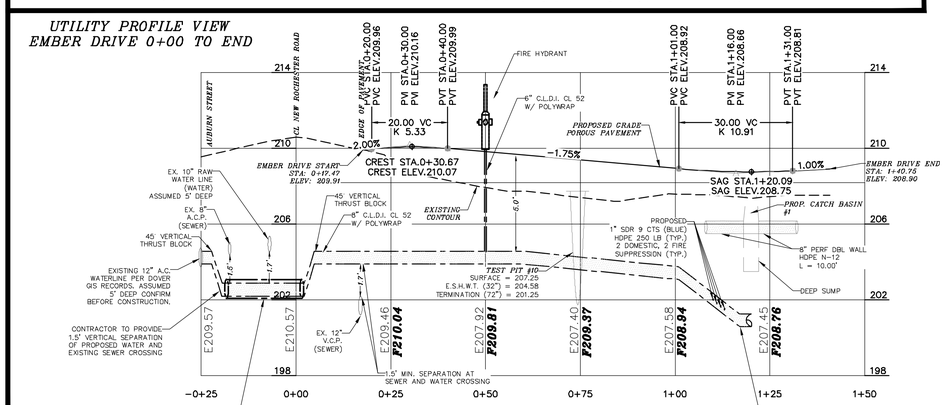
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

UTILITY PLAN VIEW COPPER & EMBER DRIVE

UTILITY PROFILE VIEW EMBER DRIVE 0+00 TO END

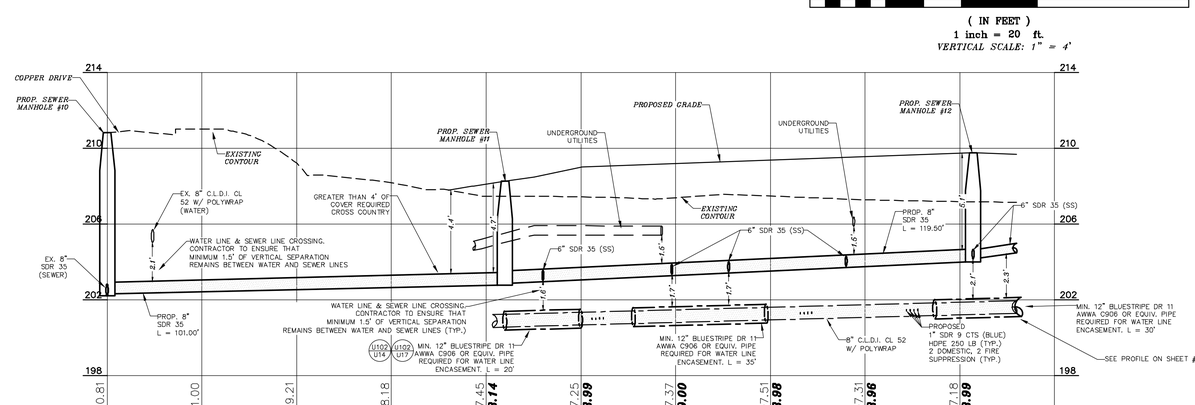


UTILITY PROFILE VIEW SEWER & WATER 0+00 TO END

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



NOT FOR CONSTRUCTION

UNIT CONVERSION NOTE
UNITS #14 & #15 ALONG WITH UNITS #16 & #17 ARE THE CONVERSION OF SINGLE FAMILY HOMES TO 2-FAMILY DWELLINGS.
WATER & SEWER UTILITIES FOR THE PROPOSED UNITS ARE TO BE PLUMBED THROUGH THE EXISTING UNITS AND UTILIZE EXISTING SERVICES FROM NEW ROCHESTER ROAD. OVERHEAD ELECTRIC TO BE CONFIGURED/UPGRADED TO SUPPORT BOTH DWELLINGS.

DOVER PLANNING FILE #SITE-2023-0007

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UTILITY PLAN COPPER DRIVE & EMBER DRIVE
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

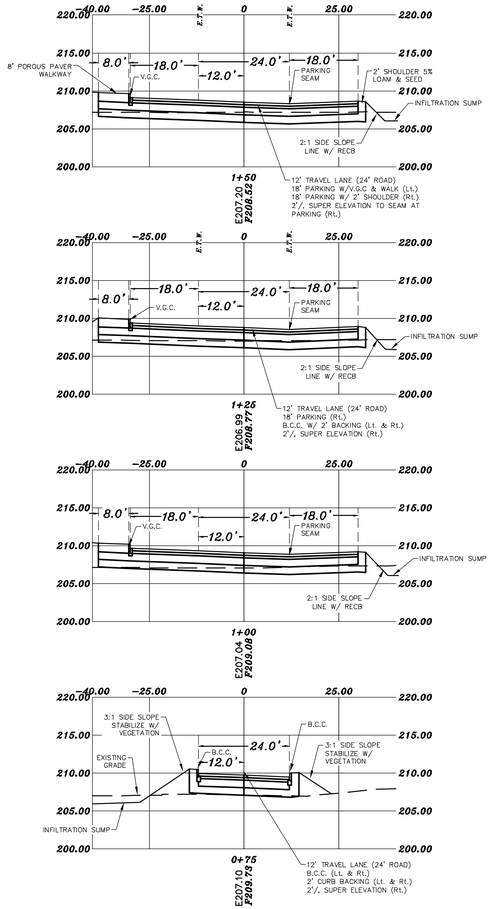
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
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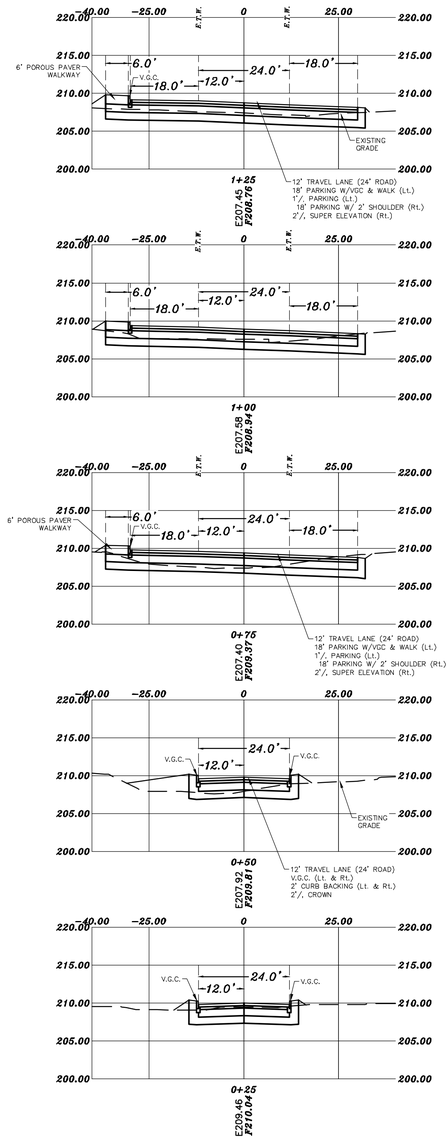
STATE OF NEW HAMPSHIRE
KENNETH A BERRY
No. 14243
LICENSED PROFESSIONAL ENGINEER

NOTE
SEE C-101
FOR TYPICAL
POROUS
PAVEMENT
SECTION

COPPER DRIVE



EMBER DRIVE



GRAPHIC SCALE

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(IN FEET)
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Vertical Scale 1 Inch = 10 ft.

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
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CROSS SECTIONS COPPER DRIVE & EMBER DRIVE
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14248
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION



NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.82 Ac.

5.) THE INTENT OF THIS PLAN IS TO SHOW THE PROPOSED LIGHTING DESIGN FOR THE RESIDENTIAL SITE PLAN FOR A SINGLE FAMILY HOME AND 6 TWO FAMILY RESIDENCES.

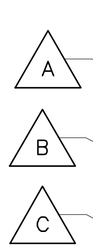
6.) SEE CONSTRUCTION DETAILS FOR LIGHT PRODUCT CUT SHEETS.

7.) LAMP "A" IS A TYPICAL RESIDENTIAL LAMP MOUNTED ON THE BUILDINGS THAT IS MOUNTED APPROXIMATELY 6-8' OFF THE GROUND.

8.) LAMP "B" IS A TYPICAL POLE MOUNTED RESIDENTIAL LAMP THAT IS MOUNTED APPROXIMATELY 14' OFF THE GROUND.

9.) LAMP "C" IS A BOLLARD TOP TYPE LIGHT THAT IS MOUNTED APPROXIMATELY 5.5' OFF THE GROUND.

10.) EXTERIOR LIGHTING SHALL BE CUT-OFF TYPE FIXTURES PER CHAPTER 153-14-E AND SHALL PROVIDE LIGHTING DIRECTED ON-SITE ONLY.

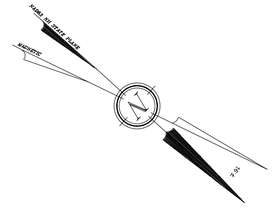


Schedule

Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Lumens Per Lamp	Light Loss Factor	Wattage
	A		15	Lithonia Lighting	ODSL10 SRC	CRAFTSTON WALL MOUNTED SMALL DECORATIVE LANTERN, ONE LAMP 13W SPIRAL COMPACT FLUORESCENT, WHITE GLASS DIFFUSER 4.25" DIA. X 6.65" HIGH. ELECTRONIC BALLAST	1	900	1	12.6
	B		4	Lithonia Lighting	DSX1 LED P1 30K T3M MVOLT	DSX1 LED P1 30K T3M MVOLT	1	8279	1	54
	C		2	Lithonia Lighting	KBR8 LED 12C 350 30K ASY MVOLT	KBR8 WITH 3 LIGHT BOARDS (12 LEDs) 350mA DRIVER, 3000K COLOR TEMP AND ASYMMETRIC OPTIC	1	641	1	16

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Stat Zone # 1	X	2.0 fc	4.5 fc	0.4 fc	11.3:1	5.0:1
Stat Zone # 2	X	2.0 fc	4.6 fc	0.4 fc	11.5:1	5.0:1
Stat Zone # 3	X	2.0 fc	4.9 fc	0.4 fc	12.3:1	5.0:1
Stat Zone # 4	X	2.0 fc	4.7 fc	0.4 fc	11.8:1	5.0:1



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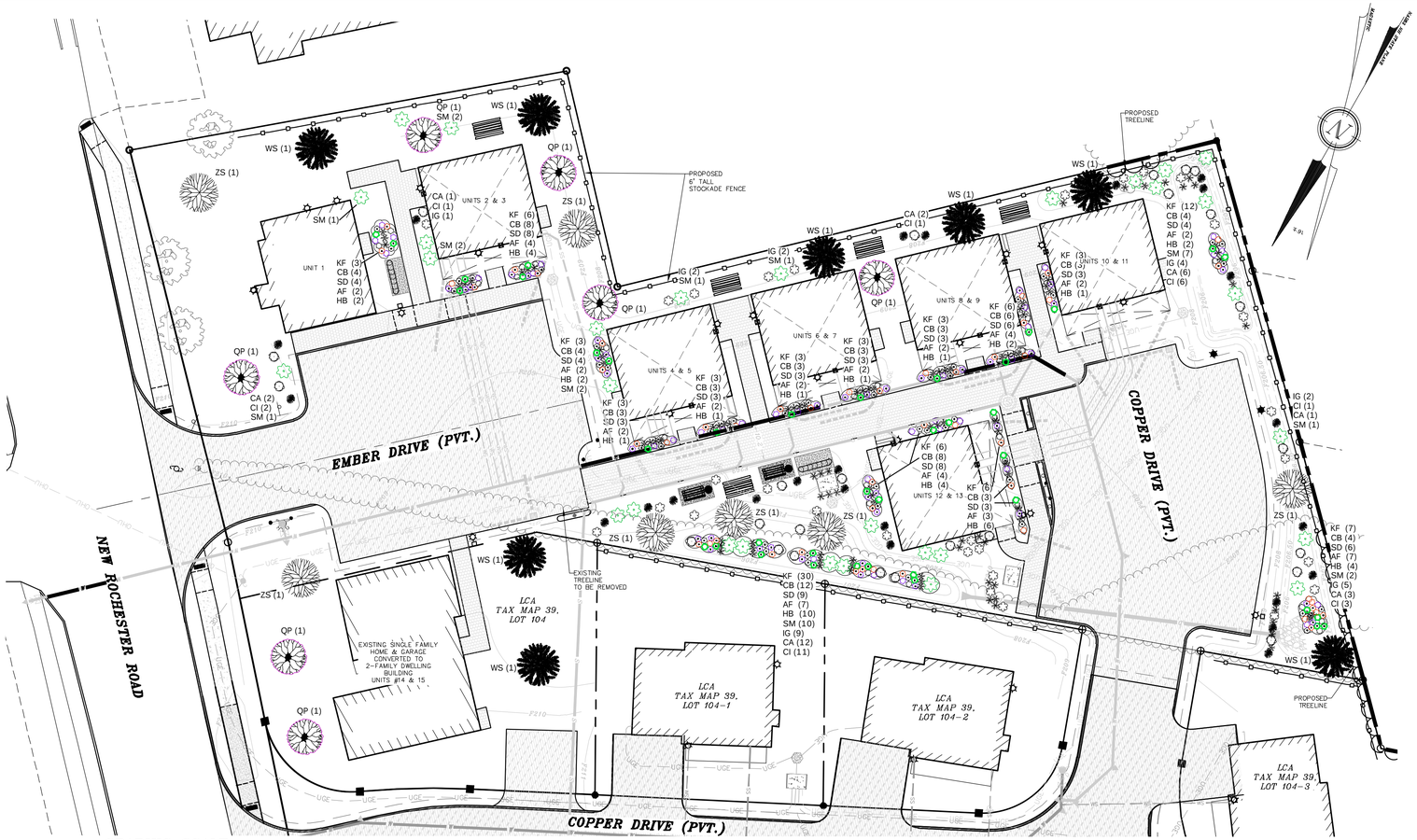
LIGHTING PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

NOT FOR CONSTRUCTION



NOTES:

1. CALL DIG SAFE PRIOR TO BEGINNING WORK. (1-888-344-7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.
2. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING.
3. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS. VARIATIONS IN QUANTITIES ARE TO BE APPROVED BY THE DESIGN ENGINEER.
4. PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.
5. ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN
6. ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.
7. ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.
8. ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.
9. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.
10. NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.
11. ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH
12. WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL-ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.
13. MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWING AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.
14. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.
15. THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWING SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.
16. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.
17. ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.
18. SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.
19. ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.
20. TREES ARE TO BE 6' TALL AT PLANTING.
21. ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)
22. 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.
23. PLANT-PIT BACK-FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON-SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.
24. ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.
25. TOPSOIL WILL BE TESTED FOR FERTILIZATION REQUIREMENTS, AND SLOW RELEASE ENVIRONMENTALLY FRIENDLY FERTILIZER WILL BE APPLIED AT THE RECOMMENDED RATES.
26. ALL DISTURBED WETLAND BUFFER AREAS, EXCEPT FOR AREAS THAT ARE PART OF THE DRAINAGE SYSTEM, ARE TO BE RESEEDED WITH A CONSERVATION SEED MIX AND ONLY MOWED TWICE PER YEAR.
27. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
28. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ONGOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
29. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
30. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NO LESS THAN ONE FULL YEAR FROM THE TIME OF INSTALLATION. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE OWNER IN WRITING OR OTHERWISE FORFEIT HIS CLAIM.
31. BY THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAS DIED, THAT HAS LOST NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESS PRUNING OR INADEQUATE OR IMPROPER CARE, OR IS, IN THE OPINION OF THE OWNER, IN UNHEALTHY OR UNSIGHTLY CONDITION.
32. THE CONTRACTOR IS TO USE TEMPORARY MEASURES FOR WATERING PLANTS DURING THE ESTABLISHMENT PERIOD. INCLUDING CONNECTING TEMPORARY HOSES TO THE STRUCTURE WATER SUPPLY LINE AND UTILIZING SPRINKLERS UNTIL 85% GROWTH OCCURS.

PLANTING NOTES

1. CONTRACTOR SHALL OBTAIN APPROVAL FROM L.A. PRIOR TO PURCHASING &/OR INSTALLING SUBSTITUTE PLANT MATERIAL PRIOR TO PURCHASE OF ANY SUBSTITUTE MATERIALS.
2. CONSTRUCTION ACCESS WILL BE AS DIRECTED BY L.A. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ACCESS ROUTE AND ALL AREAS DISTURBED BY PLANTING OPERATIONS UPON COMPLETION OF CONSTRUCTION OPERATIONS, AT NO ADDITIONAL COST TO THE OWNER.
3. LAYOUT OF ALL PLANTING BEDS AND LOCATION OF PLANTS TO BE APPROVED BY L.A. ON SITE PRIOR TO CONSTRUCTION AND INSTALLATION.
4. CONTRACTOR TO REMOVE ALL DEBRIS GENERATED BY PLANT INSTALLATION. DEBRIS TO BE DISPOSED OF IN A LEGAL MANNER.
5. ALL PLANT MATERIAL SHALL BE GUARANTEED TO BE IN GOOD, HEALTHY & FLOURISHING CONDITION FOR ONE YEAR FROM THE DATE OF FINAL INSTALLATION APPROVAL BY L.A. CONTRACTOR SHALL REPLACE, WITHOUT COST TO OWNER, AND AS SOON AS WEATHER CONDITIONS PERMIT, ALL DEAD AND NON-FLOURISHING PLANTS AS DETERMINED BY THE L.A. REPLACEMENT PLANTS SHALL BE BE GUARANTEED IDENTICALLY TO ORIGINAL PLANTS, TIME PERIOD COMMENCING FROM DATE OF REPLACEMENT PLANTING APPROVAL BY L.A.
6. ALL BEDS TO BE MULCHED WITH 3" DEPTH SHREDDED BARK MULCH UNLESS NOTED OTHERWISE.
7. CONTRACTOR TO PROVIDE NECESSARY TEMPORARY IRRIGATION IF NEEDED BASED ON TIME OF YEAR THE PROJECT IS IMPLEMENTED.
8. ALL PLANT MATERIAL TO COMPLY WITH THE CITY OF DOVER'S SITE REVIEW REGULATIONS, 149-14(G), SUCH THAT THERE SHALL BE DECIDUOUS SHADE TREES PLANTED 40 FEET O.C. ALONG THE PERIMTERE OF THE PARKING LOTS AND SHRUBS PLANTED 5 FEET O.C. WITHIN THE PERIMETER BUFFER. SEE PLANT LIST FOR SPECIES AND SIZE OF PLANTS.

TEMPORARY WATERING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR MAKING SURE ALL PLANT MATERIAL HAS ADEQUATE WATER DURING THE ESTABLISHMENT PERIOD.
2. THE USE OF GATOR BAGS, SOAKER HOSE, HAND WATERING AND OTHER TECHNIQUES SHOULD BE USED TO ASSURE PROPER HYDRATION OF THE PLANTINGS IS MAINTAINED.
3. TEMPORARY IRRIGATION SYSTEMS CAN BE SET UP TO ASSIST IN WATERING ACTIVITIES.

PLANTING SCHEDULE
Copper Drive/Nickel Drive
Botanical Name/ Common Name

	Size	Qty	Label
Trees			
Quercus plaustric 'Green Pillar' / Green Pillar Pin Oak	4" Cal.	7	QP
Zelkova serrata 'Green Vase' / Green Vase Zelkova	4" Cal.	7	ZS
Picea glauca / White Spruce	4" Cal.	8	WS
Shrubs			
Clethra alnifolia 'Sixteen Candles' / Sixteen Candles Summersweet	3 Gal.	27	CA
Cornus alba 'Ivory Halo' / Ivory Halo Dogwood	3 Gal.	25	CI
Ilex glabra 'Shamrock' / Shamrock Inkberry	3 Gal.	25	IG
Syringa meyeri 'Palibin' / Dwarf Korean Lilac	3 Gal.	30	SM
Grasses			
Calamagrostis acutifolia 'Karl Foerster' / Feather Reed Grass	#2	97	KF
Perennialls			
Geranium sanguineum 'New Hampshire Purple' / Cransebill	#1	71	CB
Hemerocallis 'Happy Returns' / Happy Returns Daylily	#1	70	SD
Astilbe x arendsii 'Bridal Veil' / Bridal Veil Astilbe	#1	47	AF
Hosta 'Big Daddy' / Big daddy Plantain Lily	#1	42	HB

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General Plant Maintenance Guide

General Plant Bed Maintenance:

- All plant maintenance should be performed by a qualified horticulturalist or licensed arborist. Cleaning the dead material out of the planting bed in the fall helps keep litter from building up around the plants and in some cases killing the plants. Watering the first year during dry periods will help get the plants established. Mulching every year is not necessary. Raking the old mulch and turning it over is all that is needed. When necessary only install one inch of mulch and do not place the mulch closer than 3" to the trunks or stems of woody plants.

Trees

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the trunk.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after trees have dropped their leaves for the year.
- Prune dead wood once a year.
- Depending on the amount of compaction the bed area receives, deep root aeration may be needed over time

Woody Shrubs

- The first year watering during dry periods will be necessary.
- 3" inches of mulch maybe used. The mulch should be kept 3 inches from the stems.
- Fertilizing is not necessary for the first year. Fertilizing in subsequent years only when and if the foliage is looking weak.
- Fertilization should occur prior to Mat 31st or after shrubs have dropped their leaves or gone dormant for the year.
- Prune dead wood once a year.

Grasses

- Grasses only need to be clipped back at the end of the growing season and all the clippings removed from the area.
- Do not over mulch. Too much mulch will prohibit the grass from developing into a strong clump.

Perennials

- All perennials need to be pruned back after the first or second hard frost. A two-step method; first dead head all the flower heads and let drop to the ground for re-seeding. Second cut the stems back to 3" above the ground and remove the stem and leaf litter and place in compost. Do not over mulch. Too much mulch will prohibit the growth and development
- Fertilizing perennials once in the spring with a low phosphate fertilizer will help the plants to get started in the spring.

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311 kast hill road
hopkinton, nh 03229
603. 491. 2322
terrainplanning.com

EMBER Drive & Copper Drive

Site Location:
34 New Rochester Road
Dover, NH
Tax Map: 39
Lots: 103

Prepared For:
Berry Surveying & Engineering
335 Second Crown Point Rd
Barrington, NH 03825

LANDSCAPE PLAN

DATE:

SCALE: 1" = 20'

PROJECT #:

Drawn By: ID

Checked By: ERB

REVISIONS: DATE:
Issued for Client Review

This plan is the property of Terrain Planning & Design LLC. Use or reproduction of this plan by any means without permission or purchase from Terrain Planning & Design LLC is prohibited.

L - 01

NOT FOR CONSTRUCTION

NOTES:

1A.) OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

1B.) APPLICANT: KNOX MARSH DEVELOPMENT LLC
242 CENTRAL AVE
DOVER, NH 03820

2.) TAX MAP 39, LOT 103

3.) S.C.R.D. BOOK 5116, PAGE 655

4.) LOT AREA: 35,555 Sq. Ft., 0.83 Ac.

5.) THIS IS A RESIDENTIAL SITE PLAN.

6.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE AVAILABLE SIGHT DISTANCE FROM THE PROPOSED ROADWAY KNOWN AS EMBER DRIVE.

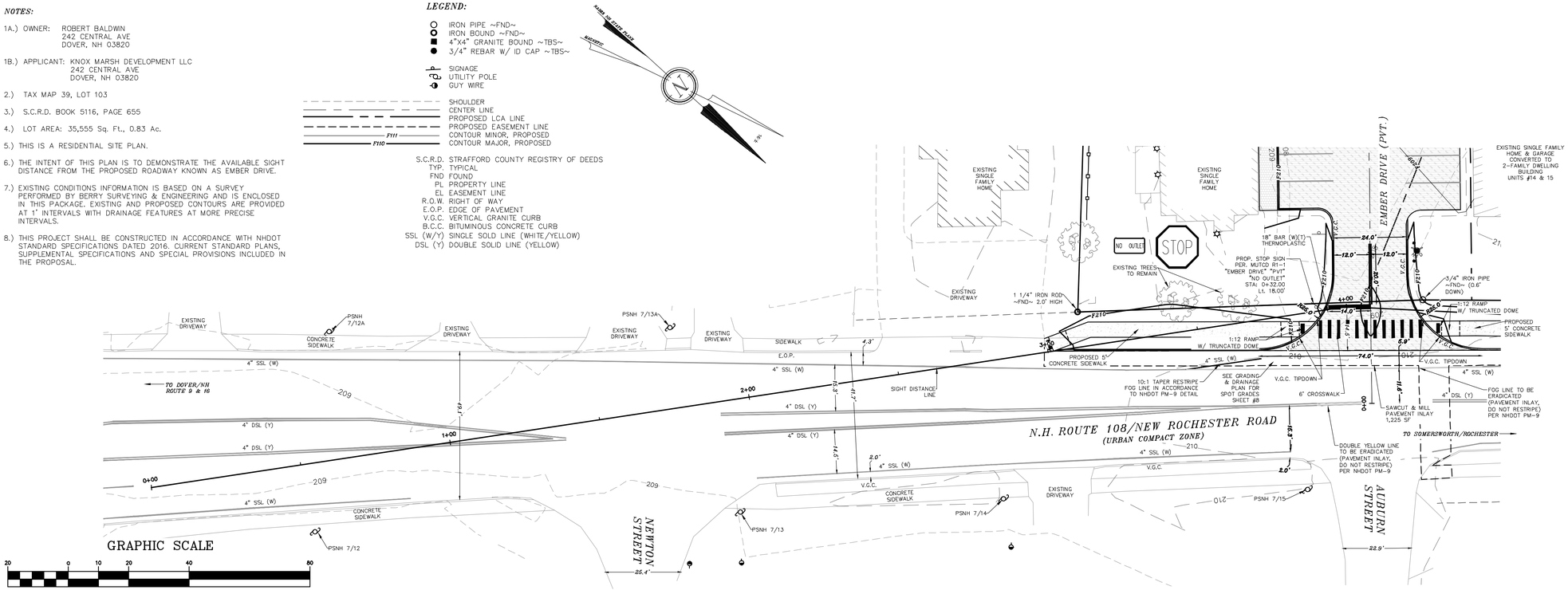
7.) EXISTING CONDITIONS INFORMATION IS BASED ON A SURVEY PERFORMED BY BERRY SURVEYING & ENGINEERING AND IS ENCLOSED IN THIS PACKAGE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

8.) THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS DATED 2016. CURRENT STANDARD PLANS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE PROPOSAL.

LEGEND:

- IRON PIPE ~FND~
- IRON BOUND ~FND~
- 4"x4" GRANITE BOUND ~TBS~
- 3/4" REBAR W/ ID CAP ~TBS~
- SIGNAGE
- UTILITY POLE
- GUY WIRE
- SHOULDER
- CENTER LINE
- PROPOSED LCA LINE
- PROPOSED EASEMENT LINE
- F111 CONTOUR MINOR, PROPOSED
- F110 CONTOUR MAJOR, PROPOSED

S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
FND FOUND
PL PROPERTY LINE
EL EASEMENT LINE
R.O.W. RIGHT OF WAY
E.O.P. EDGE OF PAVEMENT
V.G.C. VERTICAL GRANITE CURB
B.C.C. BITUMINOUS CONCRETE CURB
SSL (W/Y) SINGLE SOLD LINE (WHITE/YELLOW)
DSL (Y) DOUBLE SOLID LINE (YELLOW)



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

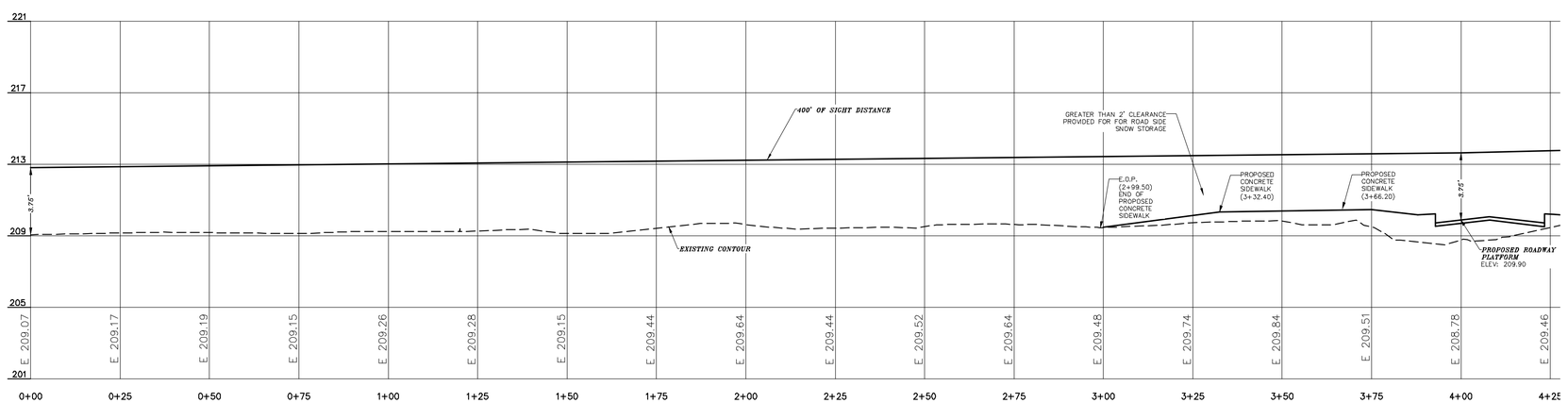
PLAN VIEW N.H. ROUTE 108/NEW ROCHESTER ROAD & EMBER DRIVE

PROFILE VIEW SIGHT LINE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'



SIGHT DISTANCE REQUIREMENT:

DESIGN SPEED: 35 MPH / 85TH ASSUMED 45 MPH

NORTHBOUND: DOWNGRADE <3%, 360 FEET REQUIRED (400 FEET PROVIDED)
SOUTHBOUND: UPGRADE <3%, 360 FEET REQUIRED (400 FEET PROVIDED)

FROM AASHTO GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (2011) EXHIBIT 3.1

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
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SIGHT DISTANCE NEW ROCHESTER ROAD NORTHBOUND
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

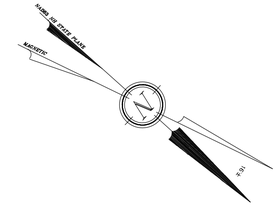
SD-1

NOT FOR CONSTRUCTION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



LEGEND:

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- IRON BOUND ~FND~
- 4"X4" GRANITE BOUND ~TBS~
- 3/4" REBAR W/ ID CAP ~TBS~
- SIGNAGE
- UTILITY POLE
- GUY WIRE
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- P111 CONTOUR MINOR, PROPOSED
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S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
TYP. TYPICAL
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R.O.W. RIGHT OF WAY
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V.G.C. VERTICAL GRANITE CURB
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SSL (W/Y) SINGLE SOLID LINE (WHITE/YELLOW)
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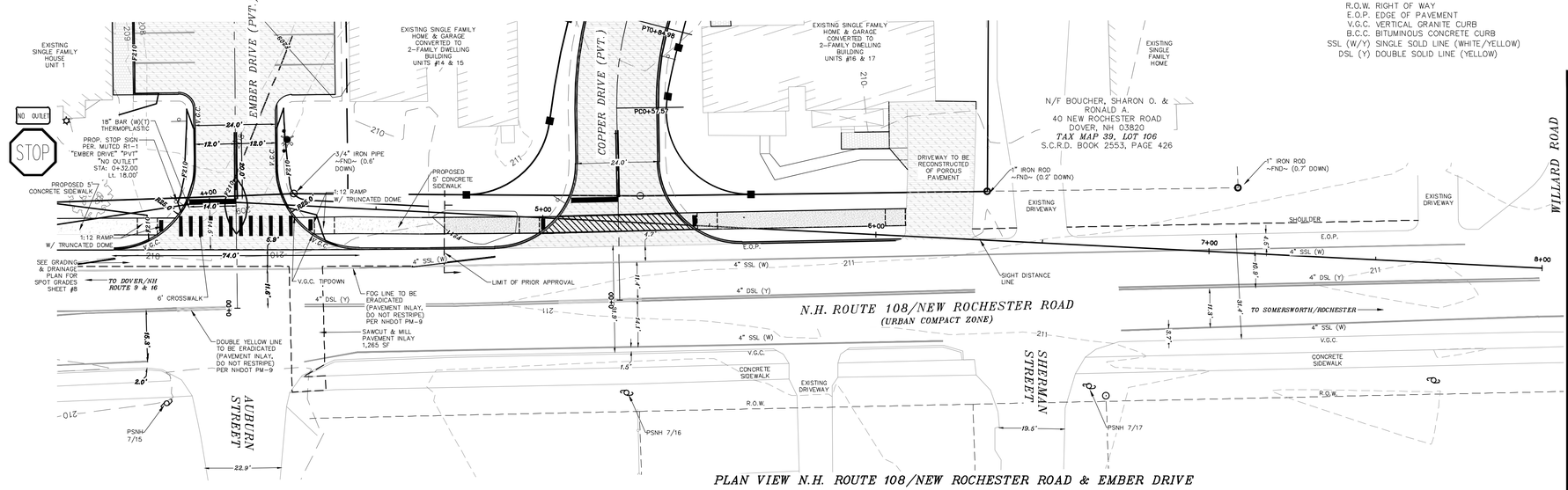
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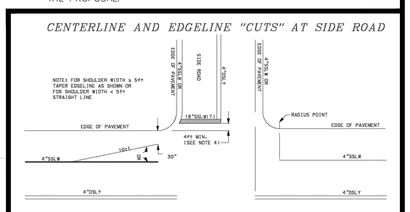
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PLAN VIEW N.H. ROUTE 108/NEW ROCHESTER ROAD & EMBER DRIVE

CENTERLINE AND EDGELINE "CUTS" AT SIDE ROAD



PM-9 GENERAL NOTES

1.) EDGELINE DETAILS ARE SHOWN FOR MAINLINE ROADWAYS WITHOUT TURN LANE. THE PRESENCE OF TURN LANES MAY REQUIRE DIFFERENT EDGELINE TREATMENTS,

2.) EDGELINES ON THE SIDE ROADS, WHEN CALLED FOR, SHALL FOLLOW THE ABOVE MAINLINE TYPICALS. EDGELINES SHALL NOT BE CONTINUOUS AROUND THE MAINLINE/SIDE ROAD RADIUS. EDGELINES SHALL END AT STOP BARS.

3.) CENTERLINE AND EDGELINE SHALL BE CONTINUOUS PAST RESIDENTIAL DRIVEWAYS. CENTERLINE AND EDGELINE SHALL BREAK FOR COMMERCIAL DRIVES W/TRAFFIC CONTROLS, MINOR SIDE ROADS, OR PRIVATE INTERSECTIONS.

4.) LOCATION OF THE STOP LINE MAY VARY DUE TO INTERSECTION SIGHT DISTANCE AND VEHICLE TURNING RADIUS AND MAY NOT ALWAYS COINCIDE WITH THE LOCATION OF THE STOP SIGN.

5.) IF THERE IS NO EDGELINE, END STOP BAR 12" FROM EDGE OF PAVEMENT.

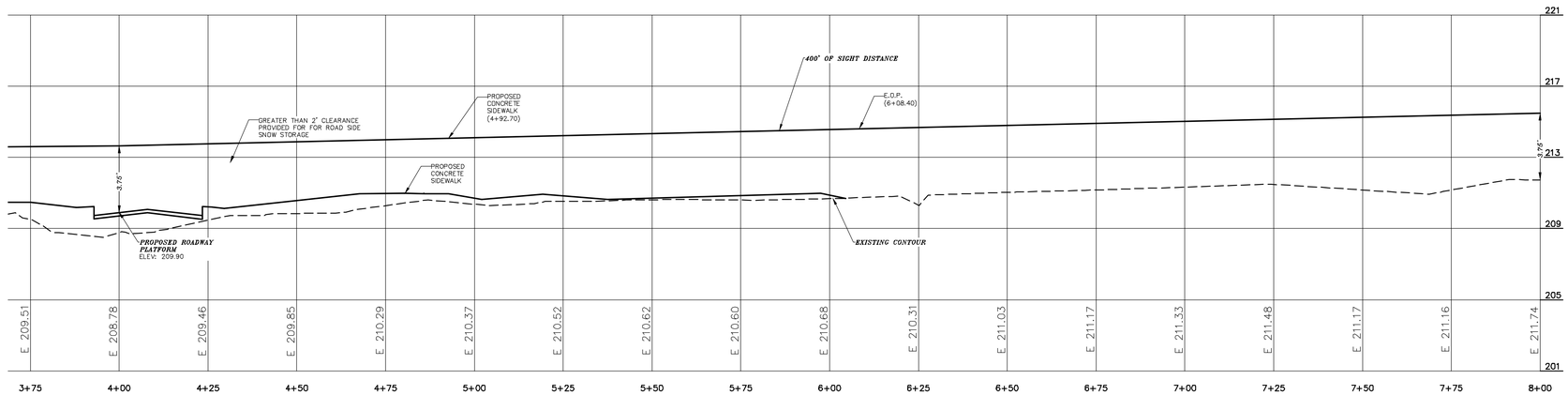
6.) STOP BARS, WORDS, LANE LINES, SYMBOLS AND ARROWS SHALL BE THERMOPLASTIC (T).

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

PROFILE VIEW SIGHT LINE



SD-2

DOVER PLANNING FILE #SITE-2023-0007

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SIGHT DISTANCE NEW ROCHESTER ROAD NORTHBOUND
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

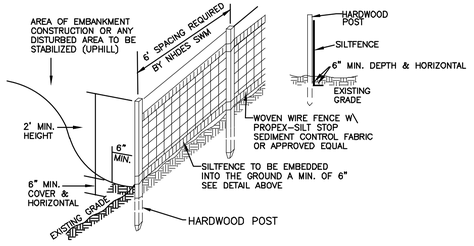
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

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

NOT FOR CONSTRUCTION

E1



SILT FENCE CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES AND FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP MID AND BOTTOM SECTIONS AND BE EMBEDDED INTO GROUND A MINIMUM OF 8" THE FENCE POSTS SHALL BE A MINIMUM 48" LONG, SPACED A MAXIMUM 6' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF. SEE MAINTENANCE NOTE BELOW. REMOVAL OF SEDIMENT REQUIRED AT A DEPTH OF 6-INCHES.
4. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
5. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER.
6. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE-VEGETATED.
7. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, SILT FENCE, PAGE 90.

SILT FENCE MAINTENANCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH SIX-INCHES IN DEPTH.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE DETAIL
NOT TO SCALE

E2

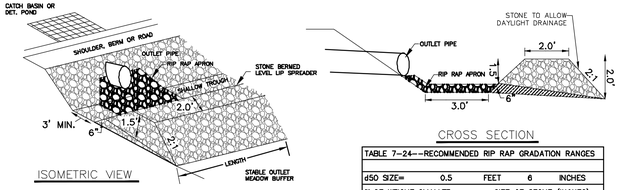
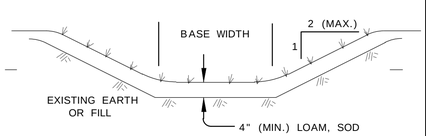


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE=	0.5	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

1. CONSTRUCT THE LEVEL SPREADER LIP ON A 0% GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING EXCELSIOR ENFORCER MATTING BENEATH THE STONE. EACH STRIP SHALL OVERLAP BY AT LEAST SIX INCHES.
4. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
5. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE LIP HAS BEEN DAMAGED AND THE DESIGN CONDITIONS HAVE NOT CHANGED. ANY DETRIMENTAL SEDIMENT ACCUMULATION SHOULD BE REMOVED. IF STONE REMOVAL HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED.
6. REFERENCE IS MADE TO NHDES SWM VOL. 2, 4-6, STONE BERM LEVEL SPREADERS, PAGE 162

STONE BERM LEVEL SPREADER
NOT TO SCALE

E3



GRASS TREATMENT SWALE
NOT TO SCALE

INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATIONS, VEGETATION LOSS, & INVASIVE SPECIES. REPAIR AS NECESSARY.

MOW GRASS ANNUALLY TO A DEPTH OF 4".

INSTALL STABILIZATION MATTING DURING CONSTRUCATION

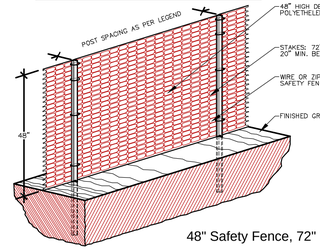
TO BE CONSTRUCTED IAW NH SWM #2 CHAPTER 4, #5 TREATMENT SWALES, PAGE 123.

E4

CONSTRUCTION SAFETY FENCE
NOT TO SCALE

LEGEND

SAF12	48" ORANGE FENCE, 12 FEET O.C.
SAF11	48" ORANGE FENCE, 11 FEET O.C..
SAF10	48" ORANGE FENCE, 10 FEET O.C.
SAF9	48" ORANGE FENCE, 9 FEET O.C.
SAF8	48" ORANGE FENCE, 8 FEET O.C..
SAF7	48" ORANGE FENCE, 7 FEET O.C.
SAF6	48" ORANGE FENCE, 6 FEET O.C.



48" Safety Fence, 72" T-Posts

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
3. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
4. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS.
5. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

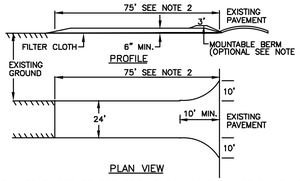
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EROSION & SEDIMENT CONTROL DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

E5

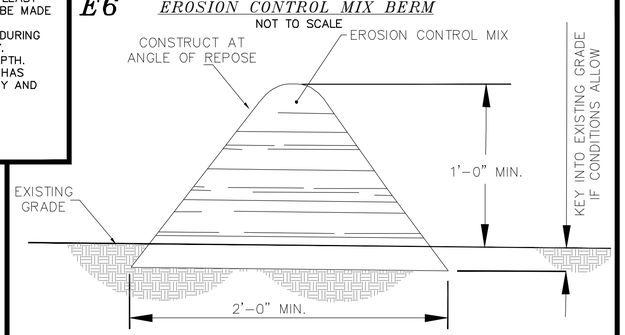
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH ANGULAR STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CONSTRUCTION EXIT, PAGE 124.

E6

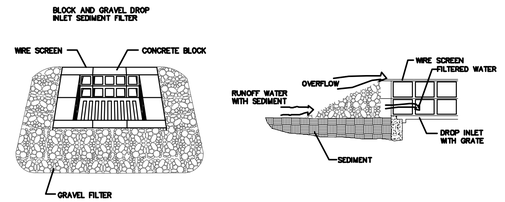
EROSION CONTROL MIX BERM
NOT TO SCALE



EROSION CONTROL MIX BERMS SHALL BE USED ONLY AS FOLLOWS:

1. BERMS SHALL BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE BERM.
2. THE BERMS SHALL BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSLY AS POSSIBLE.
3. THE BERMS SHALL BE INSTALLED ON SLOPES LESS THAN 5%.
4. SUBJECT TO (E), BELOW, THE MIX SHALL HAVE AN ORGANIC PORTION BETWEEN 80 AND 100%, DRY WEIGHT BASIS, AND BE FIBROUS AND ELONGATED SUCH AS FROM SHREDDED BARK, STUMP GRINDINGS, COMPOSED BARK, OR EQUIVALENT MANUFACTURED PRODUCTS.
5. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS, OR REPROCESSED WOOD PRODUCTS SHALL NOT BE USED AS ORGANIC MATERIAL.
6. THE MIX SHALL NOT CONTAIN SILTS, CLAY, OR FINE SANDS.
7. THE MIX SHALL HAVE A PARTICLE SIZE BY WEIGHT OF 70 TO 85% PASSING A 6-INCH SCREEN AND A MAXIMUM OF 85% PASSING THE 0.75-INCH SCREEN.
8. THE MIX PH SHALL BE BETWEEN 5.0 AND 8.0.
9. THE BERM SHALL BE AT LEAST 12 INCHES HIGH AND AT LEAST 2 FEET WIDE.
10. TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, EROSION CONTROL MIX BERMS, PAGE 106.

E7



MAINTENANCE

ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER
NOT TO SCALE

TO BE USED IN ALL AREAS WHERE THERE WILL BE NO TRAFFIC.

TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

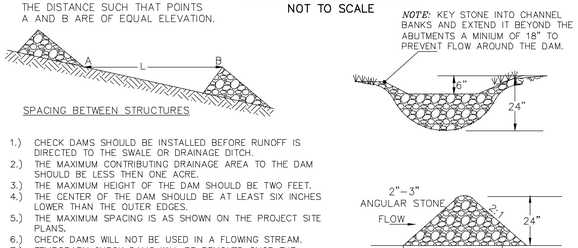
E8

TEMPORARY EROSION CONTROL MEASURES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS SHALL BE RETURNED TO ORIGINAL GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. (SEE SEED SPECIFICATIONS THIS SHEET)
4. ALL DISTURBED AREAS WILL BE RESTABILIZED WITHIN 45 DAYS. AT ANY ONE TIME, NO MORE THAN 5 ACRES, (217,800 Sq. Ft.) WILL BE DISTURBED.
5. SILT FENCES AND PERIMETER BARRIERS SHALL BE INSPECTED PERIODICALLY AND AFTER EVERY RAIN DURING THE LIFE OF THE PROJECT. ALL DAMAGED AREAS SHALL BE REPAIRED, SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
6. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
7. PER THE EPA CGP REQUIREMENTS THERE WILL BE REPORTS OF THE EROSION CONTROL INSPECTIONS IAW SWPPP PREPARED BY BS&E. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OR GREATER RAIN EVENT.
8. DITCHES, SWALES, AND BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
10. DRIVEWAYS AND CUT AND FILL SPLOPES MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINAL GRADE.
11. STABILIZATION MEANS:
    - 11.1. A MINIMUM OF 85% OF VEGETATIVE COVER HAS BEEN ESTABLISHED.
    - 11.2. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED, OR
    - 11.3. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
12. THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
13. THE NHDES STORMWATER MANUAL, IN THREE VOLUMES, DATED DECEMBER 2008, IS A PART OF THIS PLAN SET AND THE MORE RESTRICTIVE WILL GOVERN. (NH SWM)

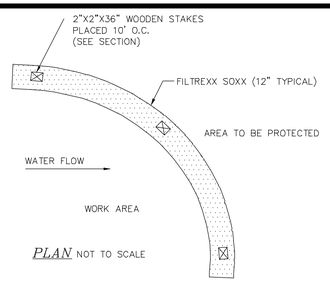
E9

STONE CHECK DAM
NOT TO SCALE



1.) CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2.) THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THEN ONE ACRE.
3.) THE MAXIMUM HEIGHT OF THE DAM SHOULD BE TWO FEET.
4.) THE CENTER OF THE DAM SHOULD BE AT LEAST SIX INCHES LOWER THAN THE OUTER EDGES.
5.) THE MAXIMUM SPACING IS AS SHOWN ON THE PROJECT SITE PLANS.
6.) CHECK DAMS WILL NOT BE USED IN A FLOWING STREAM.
7.) TEMPORARY CHECK DAMS WILL BE REMOVED ONCE THE SWALE OR DITCH IS DETERMINED STABLE.
8.) TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY CHECK DAMS, PAGE 114.

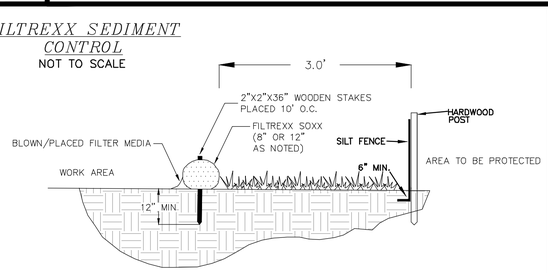
E10



NOTES

1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIRMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. SILTSOXX MAY BE USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
5. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIRMENTS OF THE SPECIFIC APPLICATION.
6. FILTREXX SOXX IS A REGISTERED TRADEMARK OF FILTREXXIN TERNATIONAL, LLC.
7. SILT FENCE IS NOT A SUBSTITUTION FOR SILT SOXX AND ANY EQUAL SUBSTITUTION TO BE APPROVED.
8. TO BE CONSTRUCTED IAW FILTREXX, SECTION 1:EROSION & SEDIMENT CONTROL (PAGE 323) - CONSTRUCTION ACTIVITIES, SWPPP CUT SHEET: FILTREXX SEDIMENT CONTROL

FILTREXX SEDIMENT CONTROL
NOT TO SCALE

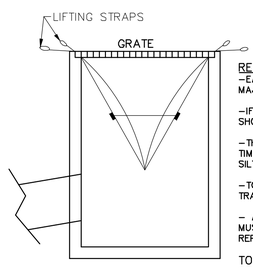


Filtrexx International, LLC
35481 Grafton Eastern Rd | Grafton, Oh 44044
440-926-2607 | fax: 440-926-4021
WWW.FILTREXX.COM
OR APPROVED EQUAL

NOTE: FOR AREAS REQUIRING DOUBLE PERIMETER CONTROL WITHIN 50' OF JURISDICTIONAL WETLANDS AND NOT FOR ALL SILT SOXX APPLICATIONS. THIS DUPLICATION MAY BE SPECIFIED AS 12" SILT SOXX OR ORANGE CONSTRUCTION FENCE AS NOTED.

SECTION NOT TO SCALE

E11



RECOMMENDED MAINTENANCE SCHEDULE

-EACH SILTSACK SHOULD BE INSPECTED AFTER EVERY MAJOR RAIN EVENT, AND MUST BE MAINTAINED.

-IF THERE HAVE BEEN NO MAJOR EVENTS, SILTSACK SHOULD BE INSPECTED EVERY 2-3 WEEKS.

-THE RESTRAINT CORD SHOULD BE VISIBLE AT ALL TIMES. IF CORD IS COVERED WITH SEDIMENT, THE SILTSACK SHOULD BE EMPTIED.

-TO BE USED IN ALL AREAS WHERE THERE WILL BE TRAFFIC.

- ARE SUBJECT TO DAMAGE BY SNOW PLOWS, AND MUST BE INSPECTED AFTER ANY SNOW EVENT AND REPLACED AS REQUIRED.

TO BE CONSTRUCTED IAW NH SWM #3 4-2 SEDIMENT CONTROL PRACTICES, TEMPORARY STORM DRAIN INLET PROTECTION, PAGE 118.

SILTSACK DETAIL
NOT TO SCALE

E-101

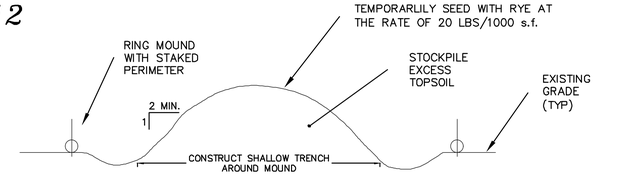
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14248
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

E12



TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, SOIL STOCKPILE PRACTICES, PAGE 46.

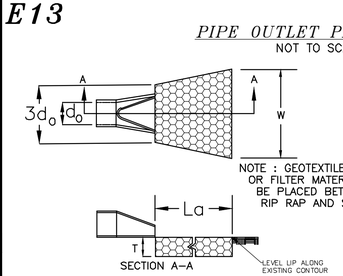
TOPSOIL STOCKPILE MOUND

NOT TO SCALE

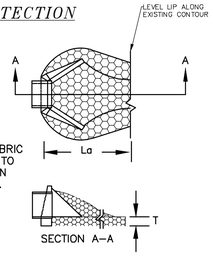
E13

PIPE OUTLET PROTECTION

NOT TO SCALE



PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL



PIPE OUTLET TO WELL–DEFINED CHANNEL

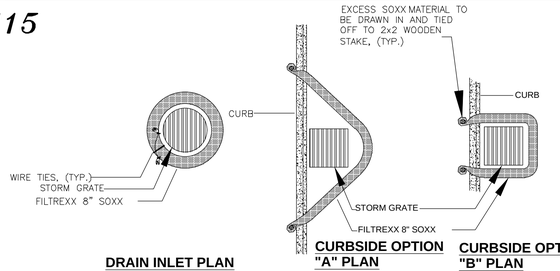
PIPE OUTLET PROTECTION CONSTRUCTION SPECIFICATIONS

1. THE SUB GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS. SPECIFIED GRADATION.
2. THE ROCK OR GRAVEL USED FOR FILTER OF RIP RAP SHALL CONFORM TO NHDOT SECTION 583.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. TO BE CONSTRUCTED IAW NH SWM #2 4–6 CONVEYANCE PRACTICES, 6. OUTLET PROTECTION, PAGE 172.

E14

TABLE 7–24––RECOMMENDED RIP RAP GRADATION RANGES			
d50 SIZE= 0.5	FEET	6	INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO
100%	9		12
85%	8		11
50%	6		9
15%	2		3

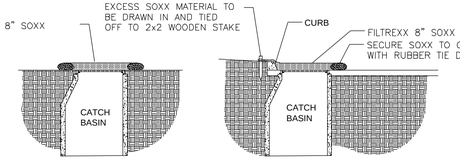
E15



DRAIN INLET PLAN

CURBSIDE OPTION "A" PLAN

CURBSIDE OPTION "B" PLAN



DRAIN INLET SECTION

CURBSIDE SECTION

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILTER MEDIA FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

FILTREXX INLET PROTECTION

NOT TO SCALE

E16

NOTE: THIS PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

NOTE: Temporary seed mix for stabilization of turf shall be winter rye or oats at a rate of 2.5 lbs. per 1000 s.f. and shall be placed prior to OCT. 15, if permanent seeding not yet complete.

SEEDING GUIDE

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	FAIR	GOOD	EXCELLENT
	E	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	FAIR	GOOD	GOOD	EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	F	FAIR	EXCELLENT	EXCELLENT	2/
	G	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH–PM–24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE 7–36.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

* RECOMMENDED

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1;3:1 SLOPES OR FLATTER ARE PREFERRED.
   WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEED BED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING
   AND INCORPORATED INTO THE SOIL KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE,
   THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
   AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100LBS. PER 1,000 SQ.FT.
   NITROGEN(N), 50LBS. PER ACRE OR 1.1LBS. PER 1,000 SQ.FT.
   PHOSPHATE(P2O5), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   POTASH(K2O), 100LBS. PER ACRE OR 2.2LBS. PER 1,000 SQ.FT.
   (NOTE: THIS IS THE EQUIVALENT OF 500LBS. PER ACRE OF 10–20–20 FERTILIZER OR 1,000LBS. PER ACRE OF 5–10–10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO TABLE(G–E1 THIS SHEET) FOR APPROPRIATE SEED MIXTURES AND TABLE(H–E1 THIS SHEET) FOR RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT TREFOIL, AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREA SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIAL STAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.
6. TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, PERMANENT VEGETATION, PAGE 60.

SEEDING RATES

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
C. TALL FESCUE	24	0.55
CREEPING RED FESCUE	24	0.55
BIRDS FOOT TREFOIL	REMOVED	REMOVED
TOTAL	48	1.10
D. TALL FESCUE	30	0.45
FLAT PEA	20	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

CONSERVATION MIX	POUNDS PER ACRE	POUNDS PER 1,000 S.F.
TALL FESCUE (35%)	15	0.35
CREEPING RED FESCUE (25%)	15	0.35
ANNUAL RYEGRASS (12%)	5	0.12
PERENNIAL RYEGRASS (10%)	5	0.12
KENTUCKY BLUEGRASS (10%)	15	0.35
WHITE CLOVER (3%)	7	0.16

E17

CONSTRUCTION SEQUENCE:

1.) CUT AND REMOVE TREES IN CONSTRUCTION AREA ONLY AS REQUIRED, RELOCATE ANY PROJECT T.B.M.

2.) CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITIES AS SPECIFIED. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SOIL LAND DISTURBANCE AND MUST BE REVIEWED AND APPROVED BY THE COMMUNITY SERVICES DEPARTMENT.

3.) EROSION, SEDIMENT AND DETENTION CONTROL FACILITY SHALL BE INSTALLED & STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.TEMPORARY DIVERSIONS MAY BE REQUIRED. POST CONSTRUCTION STORM WATER MANAGEMENT PRACTICES MUST BE INITIATED AND STABILIZED EARLY IN THE PROCESS.

4.) CLEAR, CUT AND DISPOSE OF DEBRIS IN APPROVED FACILITY

5.) CONSTRUCT TEMPORARY CULVERTS AS REQUIRED, OR DIRECTED

6.) CONSTRUCT ROADWAYS FOR ACCESS TO DESIRED CONSTRUCTION AREAS. ALL ROADS SHALL BE STABILIZED IMMEDIATELY

7.) START BUILDING CONSTRUCTION AND INSTALL VINYL FENCE AROUND PERIMETER OF PROJECT.

8.) INSTALL PIPE AND CONSTRUCTION ASSOCIATED APPURTENANCES AS REQUIRED OR DIRECTED. INSTALL RAIN GARDENS. ALL DISTURBED AREAS SHALL STABILIZED IMMEDIATELY AFTER GRADING.

9.) BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED OR MULCHED AS REQUIRED, OR DIRECTED. NO AREA IS ALLOWED TO BE DISTURBED FOR A LENGTH OF TIME THAT EXCEEDS 60 DAYS BEFORE BEING STABILIZED, DAILY, OR AS REQUIRED. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADES.

10.) CONSTRUCT TEMPORARY BERMS, DRAINS DITCHES, SILT FENCES, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED.

11.) INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION. ALL SWPPP INSPECTIONS MUST BE CONDUCTED BY A QUALIFIED PROFESSIONAL SUCH AS A PROFESSIONAL ENGINEER (PE), A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), A CERTIFIED EROSION SEDIMENT AND STORM WATER INSPECTOR (CESSW), OR A CERTIFIED PROFESSIONAL IN STORM WATER QUALITY (CPSWQ). INSPECTION REPORTS SHALL BE SUBMITTED TO THE COMMUNITY SERVICES DEPARTMENT.

12.) COMPLETE PERMANENT SEEDING AND LANDSCAPING.

13.) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE.

14.) SMOOTH AND REVEGETATE ALL DISTURBED AREAS.

15.) FINISH PAVING ALL ROADWAYS.

E18

DEFINITION OF STABLE:

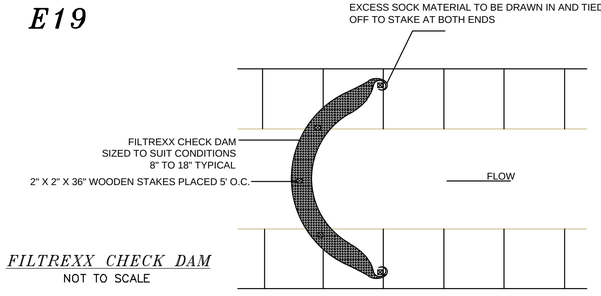
PER ENV–WQ 1500 ALTERATION OF TERRAIN

1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
2. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED..
3. A MINIMUM OF 3 INCHES OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIP–RAP HAS BEEN INSTALLED.
4. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

ADDITION STABILIZATION NOTES:

5. HAY MULCH OR OTHER APPROVED METHODS SHALL BE USED TO CONTROL EROSION OF NEWLY GRADED AREAS. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS AFTER THEIR CONSTRUCTION.
6. DISTURBED SOIL AREAS SHALL BE EITHER TEMPORARILY OR PERMANENTLY STABILIZED. IN AREAS WHERE FINAL GRADING HAS NOT OCCURRED, TEMPORARY STABILIZATION MEASURES SHOULD BE IN PLACE WITHIN SEVEN (7) CALENDAR DAYS FOR EXPOSED SOIL AREAS THAT ARE WITHIN ONE HUNDRED (100) FEET OF A SURFACE WATER BODY OR A WETLAND AND NO MORE THAN 14 CALENDAR DAYS FOR ALL OTHER AREAS. PERMANENT STABILIZATION SHOULD BE IN PLACE WITHIN THREE (3) CALENDAR DAYS FOLLOWING COMPLETION OF FINAL GRADING OF EXPOSED SOIL AREAS.

E19

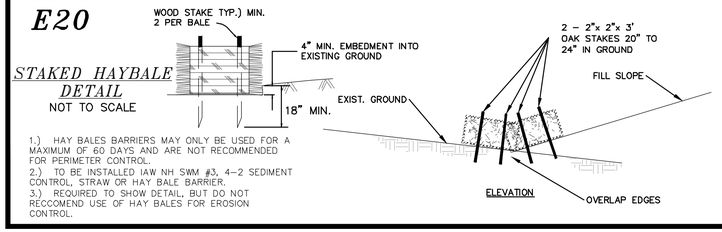


FILTREXX CHECK DAM

NOT TO SCALE

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. CHECK DAM SHOULD BE USED IN AREAS THAT DRAIN 1 ACRE OR LESS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
4. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.
5. CONTRACTOR IS REQUIRED TO BE A FILTREXX CERTIFIED INSTALLER.

E20

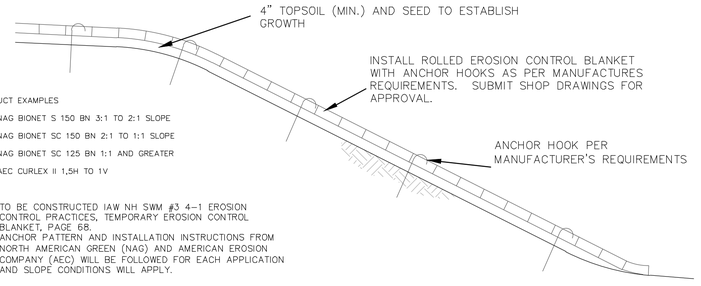


STAKED HAYBALE DETAIL

NOT TO SCALE

1.) HAY BALES BARRIERS MAY ONLY BE USED FOR A MAXIMUM OF 60 DAYS AND ARE NOT RECOMMENDED FOR PERIMETER CONTROL.
2.) TO BE INSTALLED IAW NH SWM #3, 4–2 SEDIMENT CONTROL, STRAW OR HAY BALE BARRIER.
3.) REQUIRED TO SHOW DETAIL, BUT DO NOT RECCOMEND USE OF HAY BALES FOR EROSION CONTROL.

E21



PRODUCT EXAMPLES

1.) NAG BIONET S 150 BN 3:1 TO 2:1 SLOPE
2.) NAG BIONET SC 150 BN 2:1 TO 1:1 SLOPE
3.) NAG BIONET SC 125 BN 1:1 AND GREATER
4.) AEC CURLEX II 1.5H TO 1V

1. TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, TEMPORARY EROSION CONTROL BLANKET, PAGE 68.
2. ANCHOR PATTERN AND INSTALLATION INSTRUCTIONS FROM NORTH AMERICAN GREEN (NAG) AND AMERICAN EROSION COMPANY (AEC) WILL BE FOLLOWED FOR EACH APPLICATION AND SLOPE CONDITIONS WILL APPLY.

ROLLED EROSION CONTROL BLANKET (RECB) SLOPE STABILIZATION DETAIL

NOT TO SCALE

E22

WINTER STABILIZATION NOTES

1. ALL DISTURBED AREAS THAT DO NOT HAVE AT LEAST 85% VEGETATIVE COVERAGE PRIOR TO OCTOBER 15TH SHALL BE STABILIZED BY APPLYING MULCH AT A RATE OF 3–4 TONS PER ACRE. ALL SIDE SLOPES, STEEPER THAN 4:1, THAT ARE NOT DIRECTED TO SWALES OR DETENTION BASINS, SHALL BE LINED WITH BIODEGRADABLE/PHOTODEGRADABLE "JUTE MATTING" (EXCELSIOR'S CURLEX II OR EQUAL). ALL OTHER SLOPES SHALL BE MULCHED AND TACKED AT A RATE OF 3–4 TONS PER ACRE. THE APPLICATION OF MULCH AND/OR JUTE MATTING SHALL NOT OCCUR OVER EXISTING SNOW COVER. IF THE SITE IS ACTIVE AFTER OCTOBER 15TH, ANY SNOW THAT ACCUMULATES ON DISTURBED AREAS SHALL BE REMOVED. PRIOR TO SPRING THAW ALL AREAS WILL BE STABILIZED, AS DIRECTED ABOVE.

2. ALL SWALES THAT DO NOT HAVE FULLY ESTABLISHED VEGETATION SHALL BE EITHER LINED WITH TEMPORARY JUTE MATTING OR TEMPORARY STONE CHECK DAMS (APPROPRIATELY SPACED). STONE CHECK DAMS WILL BE MAINTAINED THROUGHOUT THE WINTER MONTHS. IF THE SWALES ARE TO BE MATTED WITH PERMANENT LINERS OR RIPRAP WITH ENGINEERING FABRIC, THIS SHALL BE COMPLETED PRIOR TO WINTER SHUTDOWN OR AS SOON AS THEY ARE PROPERLY GRADED AND SHAPED.

3. PRIOR TO OCT. 15TH ALL ROADWAY AND PARKING AREAS SHALL BE BROUGHT UP TO AND THROUGH THE BANK RUN GRAVEL APPLICATION. IF THESE AREAS' ELEVATIONS ARE PROPOSED TO REMAIN BELOW THE PROPOSED SUBGRADE ELEVATION, THE SUBGRADE MATERIAL SHALL BE ROUGHLY CROWNED AND A 3" LAYER OF CRUSHED GRAVEL SHALL BE PLACED AND COMPACTED. THIS WILL ALLOW THE SUBGRADE TO SHED RUNOFF AND WILL REDUCE ROADWAY EROSION. THIS CRUSHED GRAVEL DOES NOT HAVE TO CONFORM TO NH DOT 304.3, BUT SHALL HAVE BETWEEN 15–25% PASSING THE #200 SIEVE AND THE LARGEST STONE SIZE SHALL BE 2". IF THE SITE IS ACTIVE AFTER OCTOBER 15TH, ANY ACCUMULATED SNOW SHALL BE REMOVED FROM ALL ROADWAY AND PARKING AREAS.

4. AFTER OCTOBER 15TH, THE END OF NEW HAMPSHIRE'S AVERAGE GROWING SEASON, NO ADDITIONAL LOAM SHALL BE SPREAD ON SIDE SLOPES AND SWALES. THE STOCKPILES THAT WILL BE LEFT UNDISTURBED UNTIL SPRING SHALL BE SEEDED BY THIS DATE. AFTER OCTOBER 15TH, ANY NEW OR DISTURBED PILES SHALL BE MULCHED AT A RATE OF 3–4 TONS PER ACRE. ALL STOCKPILES THAT WILL REMAIN THROUGHOUT THE WINTER SHALL BE SURROUNDED WITH SILT FENCING.

E–102

DOVER PLANNING FILE #SITE–2023–0007

#	DATE	DESCRIPTION
#2	11–06–23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9–25–23	REVISED PER DOVER TRC COMMENT

EROSION & SEDIMENT CONTROL DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

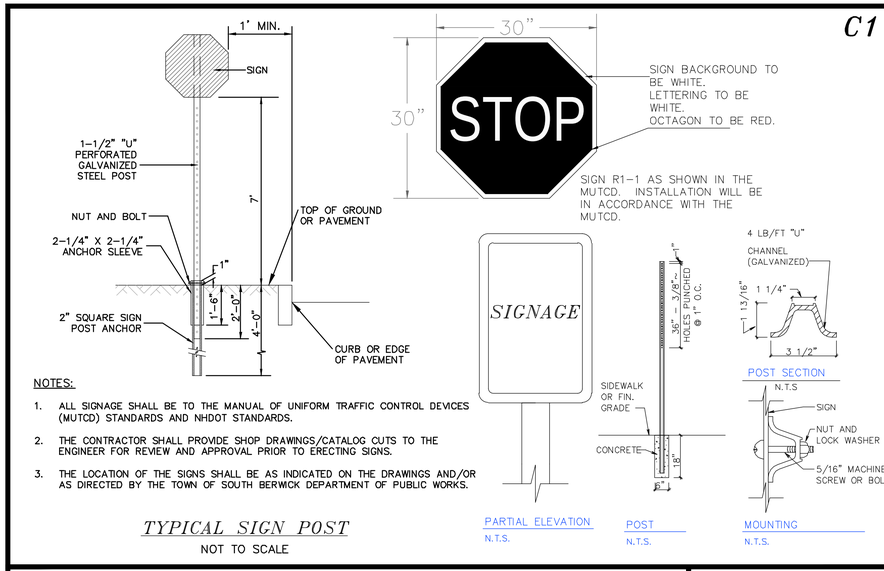
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE — KENNETH A. BERRY No. 14248 LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

C1



NOTES:

1. ALL SIGNAGE SHALL BE TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND NHDOT STANDARDS.
2. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS/CATALOG CUTS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ERECTING SIGNS.
3. THE LOCATION OF THE SIGNS SHALL BE AS INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE TOWN OF SOUTH BERWICK DEPARTMENT OF PUBLIC WORKS.

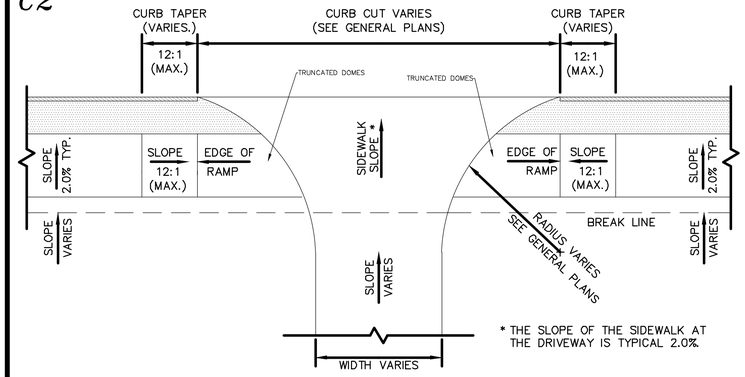
TYPICAL SIGN POST
NOT TO SCALE

PARTIAL ELEVATION
N.T.S.

POST
N.T.S.

MOUNTING
N.T.S.

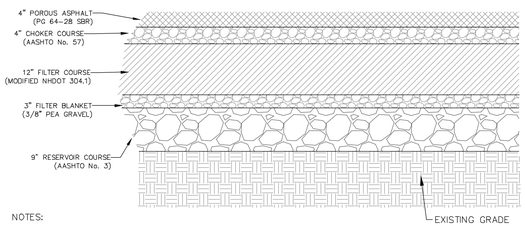
C2



* THE SLOPE OF THE SIDEWALK AT THE DRIVEWAY IS TYPICAL 2.0%

PLAN VIEW (SIDEWALK WITH GRASS PANEL)
NOT TO SCALE

C3

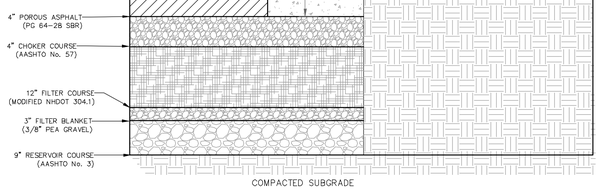


NOTES:

1.) SEE SPECIFICATIONS, GRADATIONS, AND DESIGN REFERENCES ON SHEET P-201&202.

POROUS ASPHALT PAVEMENT SECTION
NOT TO SCALE

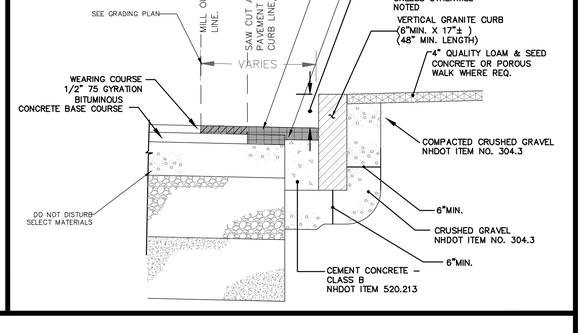
C4



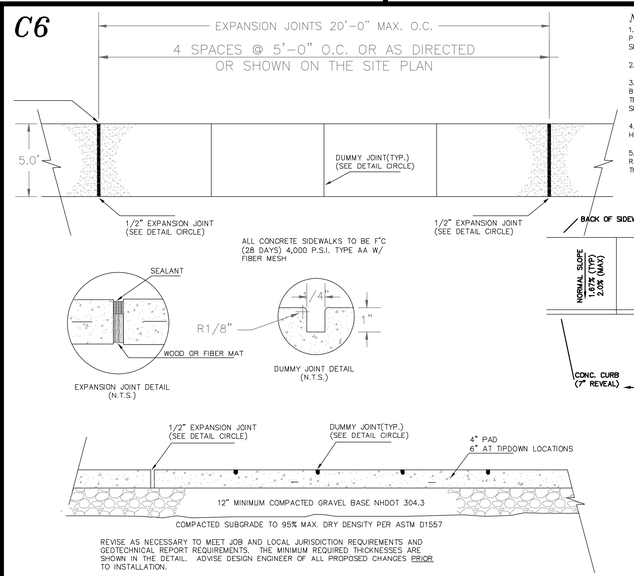
BITUMINOUS CONCRETE CURB
NOT TO SCALE

C5

VERTICAL GRANITE CURB DETAIL
NOT TO SCALE



C6



REVISE AS NECESSARY TO MEET JOB AND LOCAL JURISDICTION REQUIREMENTS AND GEOTECHNICAL REPORT REQUIREMENTS. THE MINIMUM REQUIRED THICKNESSES ARE SHOWN IN THE DETAIL. ADVISE DESIGN ENGINEER OF ALL PROPOSED CHANGES PRIOR TO INSTALLATION.

CONCRETE SIDEWALK
NOT TO SCALE

NOTES:

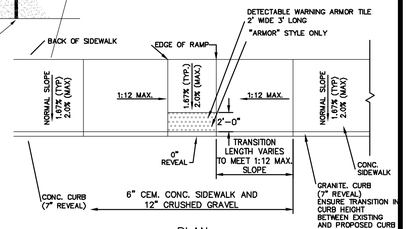
1.) PROVIDE EXPANSION JOINT MATERIAL WHERE CURB RAMP ADJOINS ANY RIGID PAVEMENT, SIDEWALK OR STRUCTURE WITH THE TOP OF JOINT FILLER PLUS SEALANT FLUSH WITH ADJACENT CONCRETE SURFACE.

2.) SEAL JOINTS WITH AN APPROVED SEALING MATERIAL.

3.) PROVIDE SLIP RESISTANT TEXTURE ON CURB RAMP BY COARSE BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP. EXTEND TEXTURE THE FULL WIDTH AND LENGTH OF THE CURB RAMP INCLUDING FLARED SIDE RAMPS.

4.) CURB RAMP AND SIDE FLARE LENGTHS ARE VARIABLE AND BASED ON CURB HEIGHT AND THE SIDEWALK PITCH.

5.) WHENEVER POSSIBLE, CONSTRUCT THE TRANSITION SLOPE FROM THE CURB RAMP AND FLARE SIDES TO ADJOINING SURFACES WITH A GRADUAL CURVE RATHER THAN AN ABRUPT ANGLE.

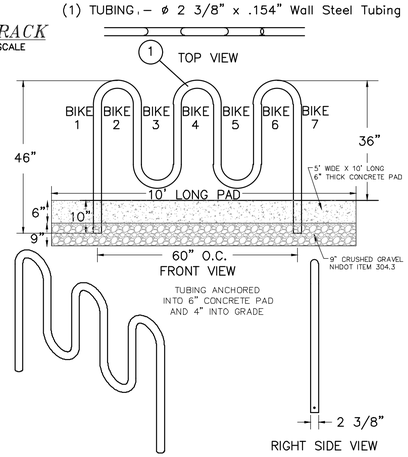


PLAN

C7

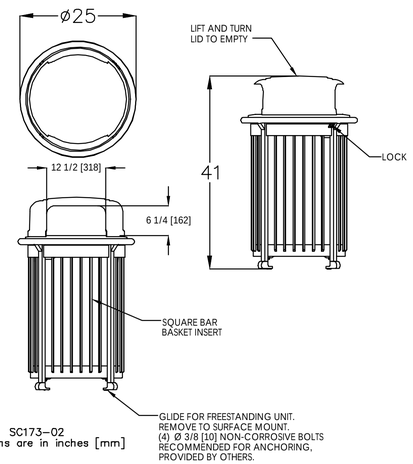
MATERIALS LIST
(1) TUBING - ø 2 3/8" x .154" Wall Steel Tubing

BIKE RACK
NOT TO SCALE



C8

BIN DETAIL
(NOT TO SCALE)



landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

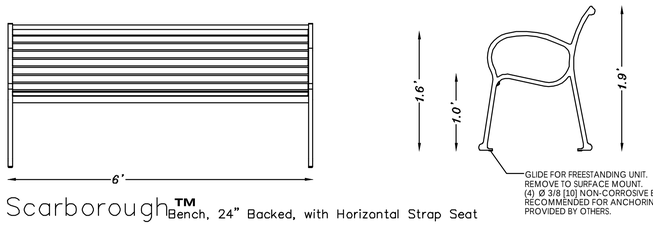
C9

BENCH DETAIL
(NOT TO SCALE)

Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat
Product Drawing

Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat

www.landscapeforms.com Date: 5/19/2010 Ph: 800.521.2546



Scarborough™ Bench, 24" Backed, with Horizontal Strap Seat

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
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CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

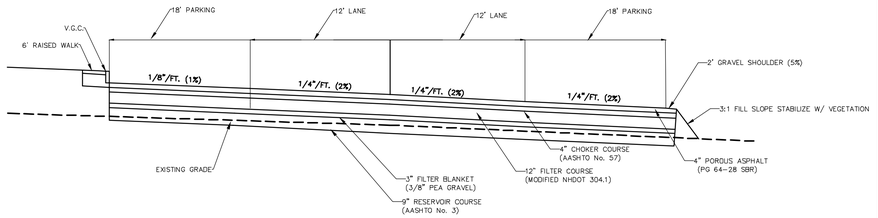
SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY No. 14248
LICENSED PROFESSIONAL ENGINEER

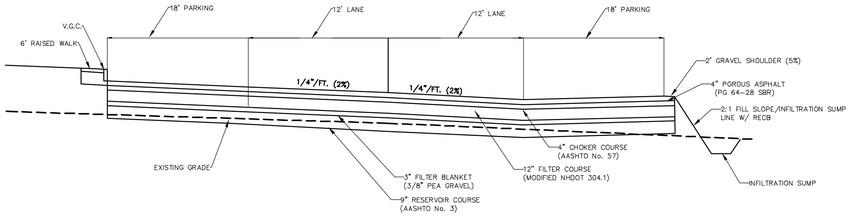
C-101

NOT FOR CONSTRUCTION

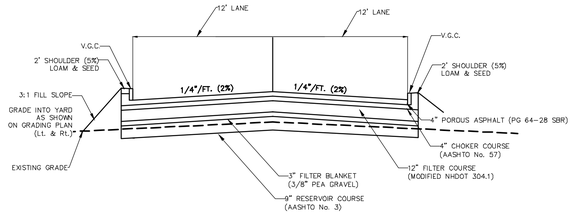
C10



TYPICAL ROADWAY SECTION EMBER DRIVE
0+63–END (POROUS PAVEMENT)
NOT TO SCALE

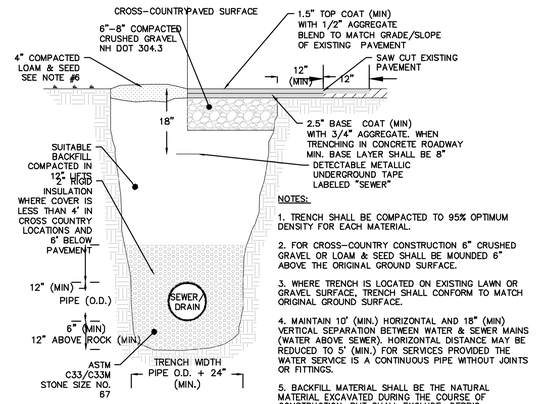


TYPICAL ROADWAY SECTION COPPER DRIVE
0+76–END (POROUS PAVEMENT)
NOT TO SCALE



TYPICAL ROADWAY SECTION EMBER DRIVE
0+00–0+63 (POROUS PAVEMENT)
NOT TO SCALE

C11



NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.
5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE: DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
6. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

TYPICAL DRAIN PIPE TRENCH
NOT TO SCALE

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
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CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

TYPICAL ROADWAY SECTION COPPER DRIVE
0+62–0+76 (POROUS PAVEMENT)
NOT TO SCALE

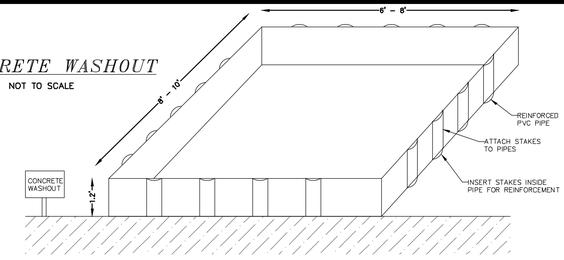
C12

CONCRETE FLARED END SECTION
NOT TO SCALE

DIA.	A	B	C	D	E	G	R	T
12"	4"	24"	48 7/8"	72 7/8"	24"	2"	1 1/2"	2"
15"	6"	27"	46"	73"	30"	2 1/4"	1 1/2"	2 1/4"
18"	9"	27"	46"	73"	36"	2 1/2"	1 1/2"	2 1/2"
24"	9 1/2"	43 1/2"	30"	73 1/2"	48"	3"	1 1/2"	3"
30"	12"	54"	19 3/4"	73 3/4"	60"	3 1/2"	1 1/2"	3 1/2"
36"	15"	63"	34 3/4"	97 3/4"	72"	4"	2"	4"
42"	21"	63"	35"	98"	78"	4 1/2"	2"	4 1/2"
48"	24"	72"	26"	98"	84"	5"	2"	5"

C13

CONCRETE WASHOUT
NOT TO SCALE



NOTES:

1.) CONCRETE WASHOUT SHALL BE INSTALLED PRIOR TO ANY CONCRETE POURS.

2.) SIGNS SHALL BE INSTILLED TO CLEARLY INDICATE WHERE THE LOCATION OF THE WASHOUT AREA IS.

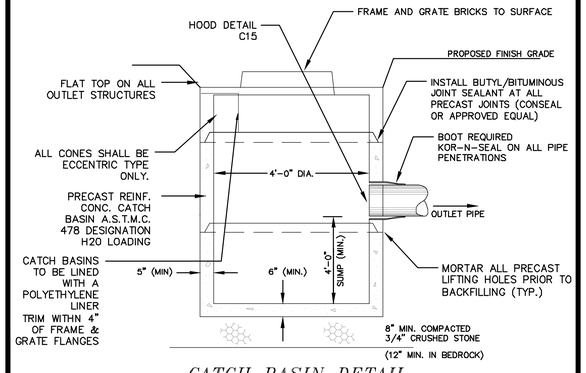
3.) CONTRACTOR IS RESPONSIBLE TO MAINTAIN AND REPLACE WASHOUT AREA AS NEEDED.

4.) RESIDUE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

5.) DO NOT WASH CONCRETE TRUCKS OUT INTO DRAINAGE AREAS, SWALES, STREETS OR UNDISTURBED AREAS.

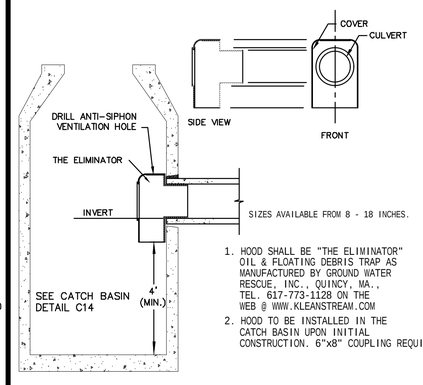
6.) WASHOUT AREA SHALL BE PLACED AWAY FROM DRAINAGE FEATURES AND OUTSIDE AND WETLAND BUFFERS.

C14



CATCH BASIN DETAIL
NOT TO SCALE

C15

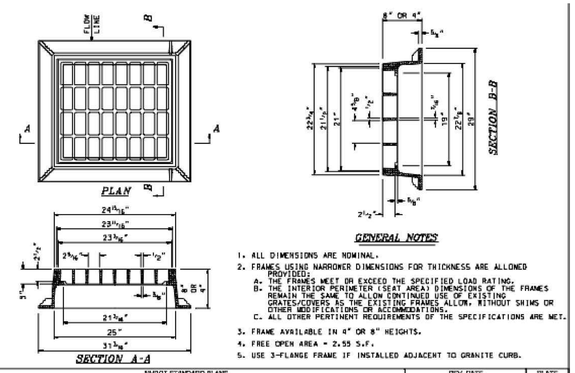


1. HOOD SHALL BE "THE ELIMINATOR" OIL & FLOATING DEBRIS TRAP AS MANUFACTURED BY GROUND WATER RESCUE, INC., QUINCY, MA., TEL. 617-773-1128 ON THE WEB @ WWW.KLEANSTREAM.COM
2. HOOD TO BE INSTALLED IN THE CATCH BASIN UPON INITIAL CONSTRUCTION. 6"x8" COUPLING REQUIRED.

CATCH BASIN HOOD DETAIL
NOT TO SCALE

C16

CATCH BASIN GRATE (TYPE "B")
NOT TO SCALE



GENERAL NOTES:

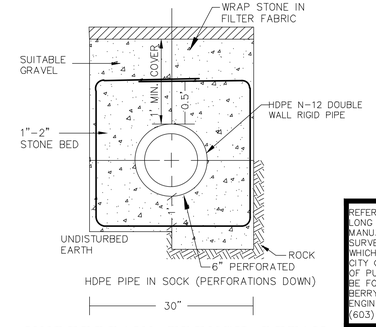
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. FRAME AVAILABLE IN 4" OR 8" HEIGHTS.
4. FREE OPEN AREA = 2.55 S.F.
5. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

NHDOT STANDARD PLANS

REV.	DATE	PLATE
	06-16-2010	2
	08-14-2015	STANDARD
		DR-1

TYPE "B" GRATE & FRAME

C17



UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

REFERENCE IS MADE TO A LONG TERM MAINTENANCE MANUAL PREPARED BY BERRY SURVEYING & ENGINEERING, WHICH IS ON FILE AT THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS, AND CAN BE FOUND AT THE OFFICE OF BERRY SURVEYING & ENGINEERING. (603) 332-2863

C-102

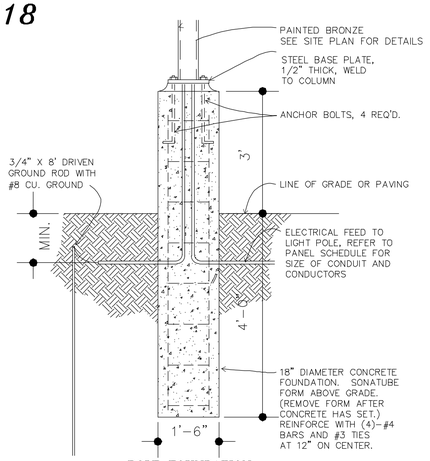
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 7971
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

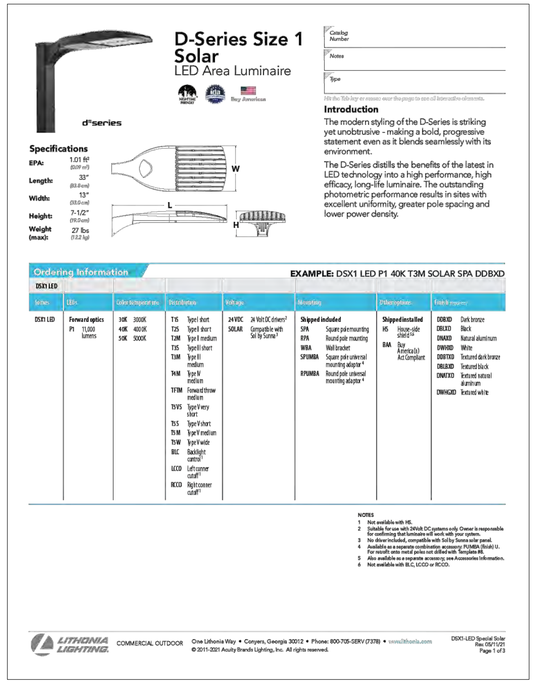
C18



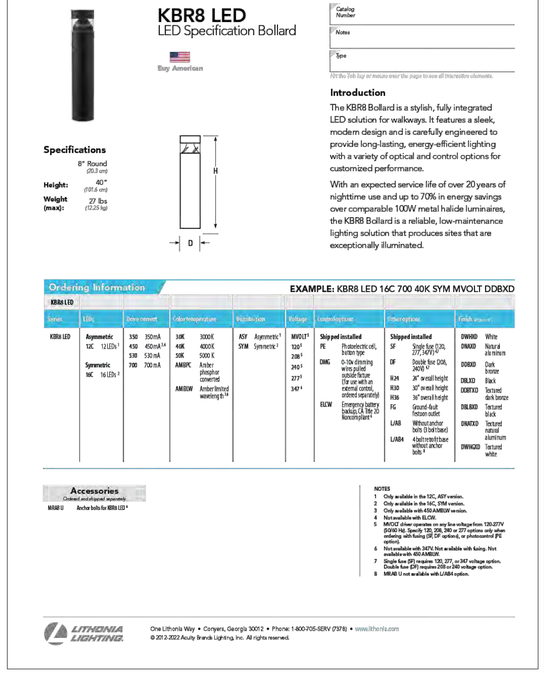
LIGHT BASE DETAIL
NOT TO SCALE



TYPICAL RESIDENTIAL LAMP MOUNTED AT 6-8' +/- AS SHOWN
NOT TO SCALE



TYPICAL POLE LAMP MOUNTED AT 14' +/- AS SHOWN
NOT TO SCALE

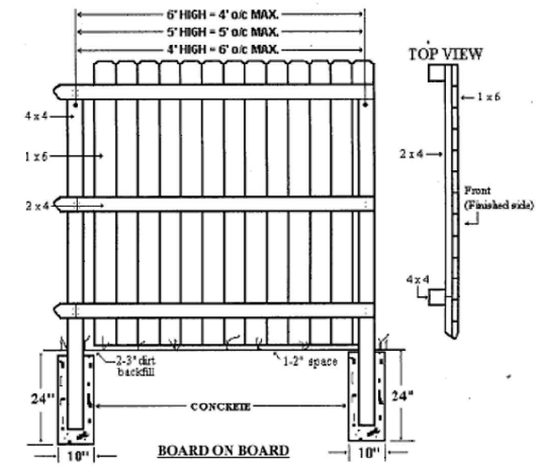


LAMP "C" MOUNTED 5.5'
NOT TO SCALE

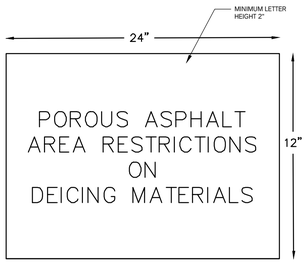
STANDARD 3.5' HEIGHT, 2' PEDISTAL REQUIRED FOR MOUNTING HEIGHT

C19

STOCKADE FENCE DETAIL
NOT TO SCALE



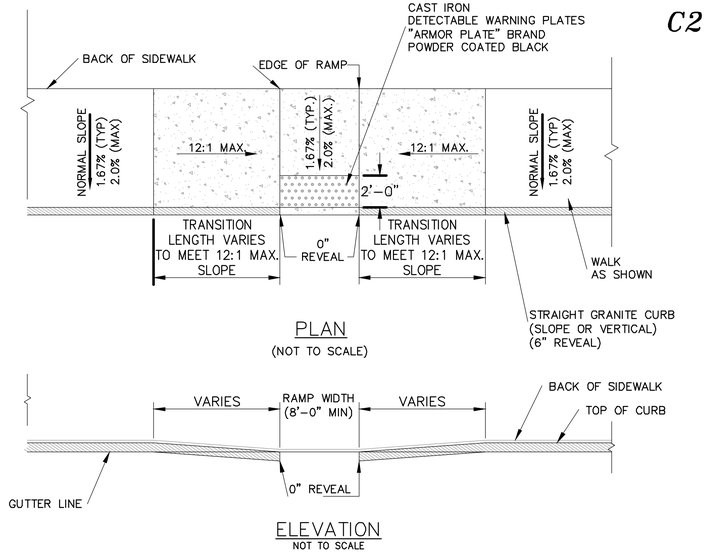
C20



POROUS PAVEMENT SIGN
NOT TO SCALE

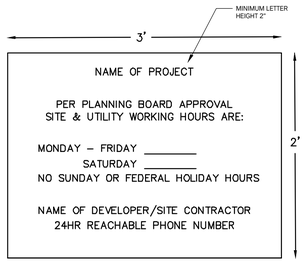
NOTES:
1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND
3. TO BE MOUNTED AT A HEIGHT OF 3'

C21



TYPICAL DETAIL FOR ACCESSIBLE RAMP
NOT TO SCALE

C22



REQUIRED PROJECT INFORMATION SIGN
NOT TO SCALE

NOTES:
1. SIGN SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND
2. SIGN SHALL BE WEATHER RESISTANT AND SECURED TO THE GROUND
3. TO BE PLACED AT THE INTERSECTION OF TOLEND RD/THEODORE DR & SUN HAWK LANE/ATINA WAY

C-103

DOVER PLANNING FILE #SITE-2023-0007

#	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

NOT FOR CONSTRUCTION

U1

NOTES ON MANHOLE AND SEWER CONSTRUCTION:

1) IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT AND ADEQUATE JOINTING. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND HS-20-44 LOADING, INCLUDING THE COVER. ALL SMH CONSTRUCTION AND MATERIALS WILL BE IAW ENV.-WQ 704.13 ADOPTED OCTOBER 15, 2014

2) BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE. (IAW ENV.-WQ 704.12 (d))

3) SEWER MANHOLE DIAMETER SHALL BE AS INDICATED ON THE PLANS.

4) PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.

5) GRAVITY SEWER PIPE TESTING WILL BE IN ACCORDANCE WITH ENV.-WQ 704.06 AND MAN HOLE TESTING IAW ENV.-WQ 704.17 DATED OCTOBER 15, 2014.

6) INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. INVERT BRICKS SHALL BE LAID ON EDGE AND THE BASE SECTION SHALL BE FULL. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. (IAW ENV.-WQ 704.13 (a) (9)), MORTAR SHALL CONFORM WITH REQUIREMENTS OF IAW ENV.-WQ 704.13 (c).

   FRAMES AND COVERS: MANHOLES FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. 3-INCH (MINIMUM HEIGHT) LETTERS WITH THE WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH MANHOLE COVER. (IAW ENV.-WQ 704.13 (a) (4-6)) SEWER MAN HOLE COVERS ARE TO BE LIFTMATE R-1743-LM.

7) SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 8 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H-20 LOADS.

8) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE DOVER DPW, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON A DOUBLE ROW OF AN OVERLAPPING TYPE ELASTOMERIC OR MASTIC-LIKE GASKET. APPROVED ELASTOMERIC SEALANTS ARE: RAM-NEK, KENT SEAL NO. 2, EZ, OR EQUAL.

9) IN CROSS COUNTRY AREAS OUTSIDE OF THE PAVED ROADWAY SURFACE, THE MANHOLE FRAME ELEVATION SHALL BE A MINIMUM OF 6" ABOVE FINISHED GRADE. GRADE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE MANHOLE. SEE TYPICAL TRENCH DETAIL ON SHEET D-102.

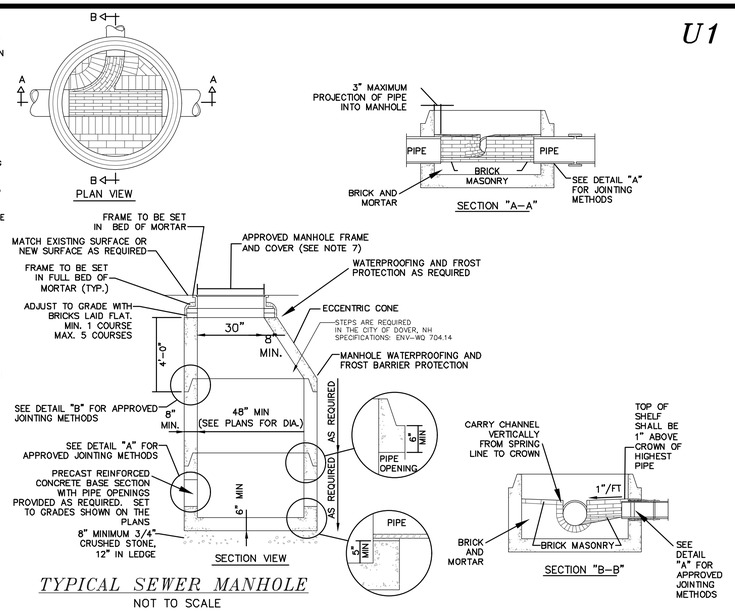
11.) ALL FRAMES AND GRATES ARE TO BE U.S.A. MADE. MANHOLE STEPS ARE REQUIRED IN THIS MUNICIPALITY AND MUST CONFORM TO THE REQUIREMENTS OF ENV-WQ 704.14.

12.) THE CONTRACTOR TO WORK WITH CITY OF DOVER REVIEW ENGINEER AND SEWER DEPARTMENT ON THE MEANS AND METHODS USED TO INSTALL ALL SEWER STRUCTURES.

13.) ANY WORK INVOLVING THE CUTTING INTO THE EXISTING A.C. PIPE SHALL MEET THE REQUIREMENTS OF ENV-A 1800.

14.) THE "CITY OF DOVER, NEW HAMPSHIRE, DEPARTMENT OF COMMUNITY SERVICES, CONSTRUCTION GUIDELINES, PERMITS, RULES, AND REGULATIONS" (DATED MARCH 13, 2018) ARE A PART OF THE CONSTRUCTION DETAILS AND TO BE FOLLOWED.

15.) MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STANDARD AND ENV-WQ 704.17.



TYPICAL SEWER MANHOLE
NOT TO SCALE

U2

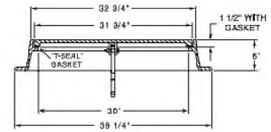
R-1743-LM
LiftMate Frame, Solid Gasketed Lid

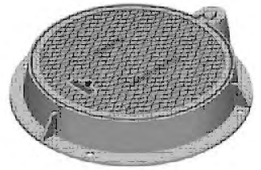
Heavy Duty

Furnished with four 1" anchor holes on 36-7/8" diameter bolt circle.

Hinge plug available for self-seal application.

See p. 13 for LiftMate information.

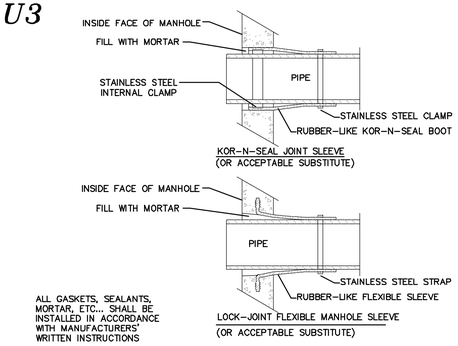




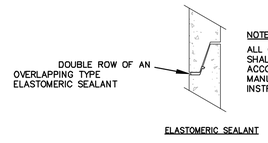
SEWER MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

SEWER MANHOLE COVER DETAIL
NOT TO SCALE

U3



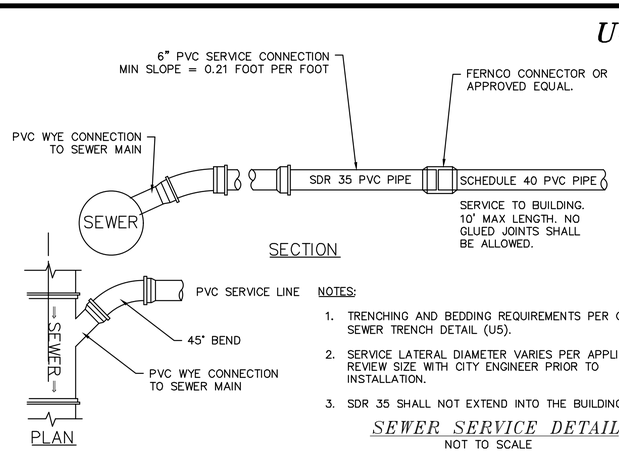
DETAIL "A" - PIPE TO MANHOLE JOINTS
NOT TO SCALE



NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

DETAIL "B" HORIZONTAL JOINTS
NOT TO SCALE

U4

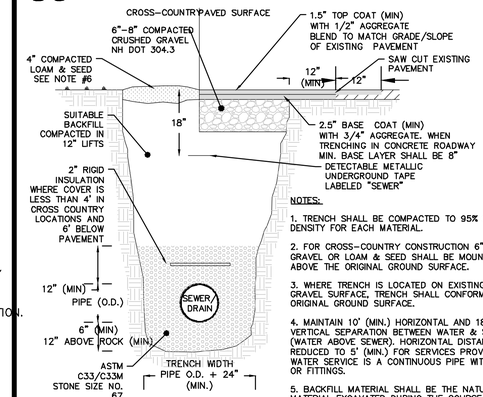


NOTES:

1. TRENCHING AND BEDDING REQUIREMENTS PER CITY SEWER TRENCH DETAIL (U5).
2. SERVICE LATERAL DIAMETER VARIES PER APPLICATION. REVIEW SIZE WITH CITY ENGINEER PRIOR TO INSTALLATION.
3. SDR 35 SHALL NOT EXTEND INTO THE BUILDING

SEWER SERVICE DETAIL
NOT TO SCALE

U5

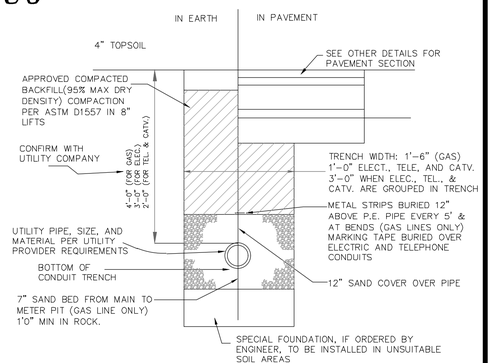


NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.
5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
6. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

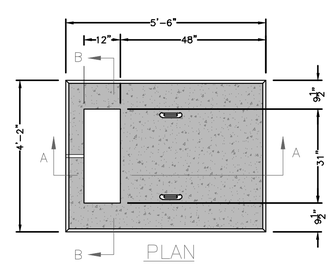
TYPICAL SEWER PIPE TRENCH
NOT TO SCALE

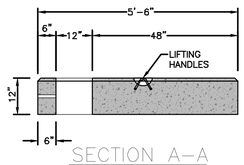
U6

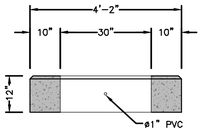


ELECTRICAL, TELEPHONE, AND GAS TRENCH
NOT TO SCALE

U7



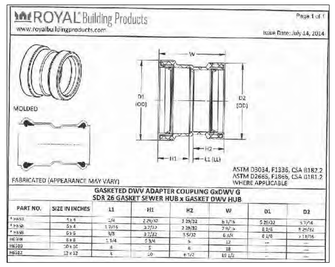




NOTES:
1. CONCRETE MINIMUM STRENGTH 4,000 PSI AFTER 28 DAYS
2. REINFORCEMENT STEEL CONFORMS TO ASTM A615 GRADE 60 #6 REBAR.
3. MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS.
4. MUST BE A SHEA CONCRETE PRODUCT OR EQUAL.

TRANSFORMER AND PAD DETAIL
NOT TO SCALE

U8



PART NO.	SIZE IN INCHES	L1	H1	H2	W	D1	D2
* 0300	3 x 4	4	2.75/32	3 19/32	5 13/32	3 13/32	3 7/16
* 0400	4 x 4	1 13/16	3.27/32	3 19/32	7 19/32	4 3/16	4 29/32
* 0406	6 x 6	3/8	3.27/32	3 19/32	8 3/4	6 3/16	6 13/16
HC308	8 x 8	1 1/4	6 3/8	¾	12	—	—
HC310	10 x 10	4	8	¾	14	—	—
HC312	12 x 12	¾	10	4 1/2	17 1/2	—	—

COUPLING DETAIL
NOT TO SCALE

U-101

DOVER PLANNING FILE #SITE-2023-0007

#	REVISION	DATE	DESCRIPTION
#2			REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1		11-06-23 9-25-23	REVISED PER DOVER TRC COMMENT

UTILITY CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

NOT FOR CONSTRUCTION

U9

NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.

2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.

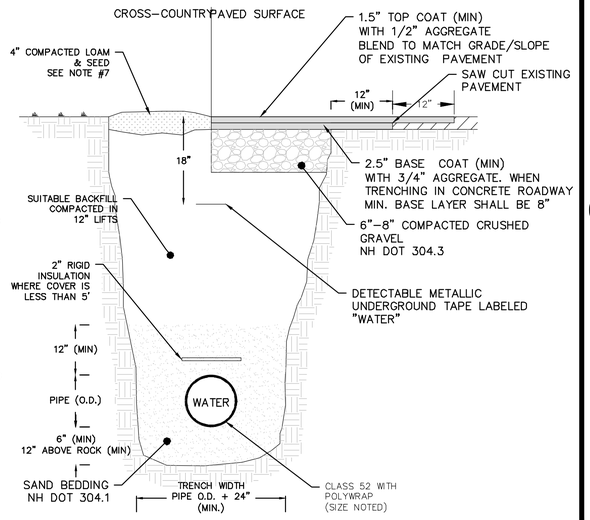
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.

4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.

5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT, AND ROCKS OVER 6" IN LARGEST DIMENSION

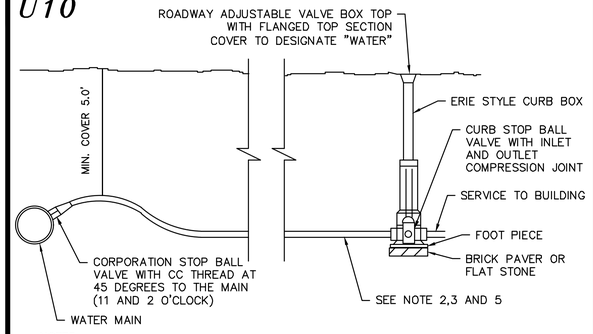
6. PROVIDE MINIMUM 5' OF COVER. ENGINEERING APPROVAL REQUIRED FOR LESS THAN 5' OF COVER.

7. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.



WATER PIPE TRENCH
NOT TO SCALE

U10



NOTES:

1. ALL WATER LINES 4" OR GREATER SHALL BE DUCTILE IRON WITH AN 8 MIL POLYETHYLENE WRAP, INCLUDING TEE AND OTHER CONNECTIONS.

2. WATER SERVICE LINES SHALL BE COPPER TUBING (TYPE K) BETWEEN MAIN AND CURB STOP.

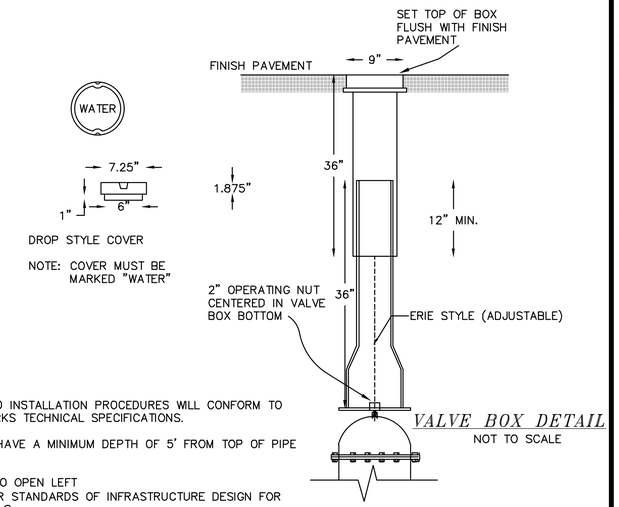
3. SERVICE BETWEEN CURB STOP AND BUILDING MAY BE (BLUE OR BLACK) CTS SDR 9 PLASTIC POLYETHYLENE RATED FOR 250 psi.

4. CAM-LOCK REQUIRED FOR CTS OR IPS, MJ ADAPTER REQUIRED FOR HDPE

5. ¾"- COPPER, CTS
   1"- COPPER, CTS
   2"- CTS, HDPE, IPS

WATER SERVICE CONNECTION
NOT TO SCALE

U11



NOTES:

1.) ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO LOCAL WATER WORKS TECHNICAL SPECIFICATIONS.

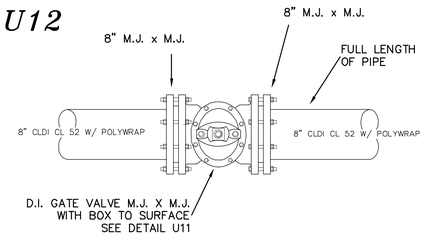
2.) ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

3.) ALL VALVES ARE TO OPEN LEFT

4.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

VALVE BOX DETAIL
NOT TO SCALE

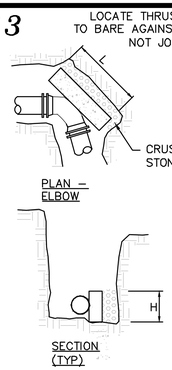
U12

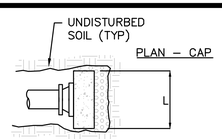


SHUTOFF VALVE DETAIL
NOT TO SCALE

1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

U13





THRUST BLOCK SCHEDULE
MINIMUM BEARING AREA (SQUARE FEET)

	PIPE SIZE					
Nominal Dia. (in)	4	6	8	10	12	16
Pipe Fittings	*	*	5.18	7.96	11.43	20.29
90 Degree Bends	*	4.11	7.33	11.26	16.17	28.69
45 Degree Bends	*	*	*	6.10	8.75	15.53
22-1/2 Degree Bends	*	*	*	*	4.46	7.92
11-1/4 Degree Bends	*	*	*	*	*	*

*SEE NOTE 2

System Pressure: 125 psi
Safety Factor: 1.5
Soil Bearing Capacity: 2,000 psf

NOTES:

1. ALL THRUST BLOCKS SHALL BE PRE-CAST CONCRETE UNLESS APPROVED BY THE CITY ENGINEER.

2. 2'X2'X2' MINIMUM THRUST BLOCK REQUIRED, ANY BEARING AREA OVER 4SF REQUIRES THRUST BLOCKS, RESTRAINED JOINTS AND CALCULATIONS ASSOCIATED WITH THE JOINT.

3. THE MINIMUM BEARING AREAS SHOWN IN THE THRUST BLOCK SCHEDULE ARE BASED ON A SYSTEM PRESSURE OF 125 PSI. IF THE SYSTEM PRESSURE IS ABOVE 125 PSI, INCREASE THE NOTED AREAS PROPORTIONALLY TO THE ACTUAL SYSTEM PRESSURE.

4. FOR MINIMUM BEARING AREAS OVER 4 SF, THE LENGTH (L) OF THE BLOCK IS APPROXIMATELY TWICE AS LONG AS THE HEIGHT (H).

5. PLACE CRUSHED STONE BEHIND THRUST BLOCK AGAINST UNDISTURBED SOIL.

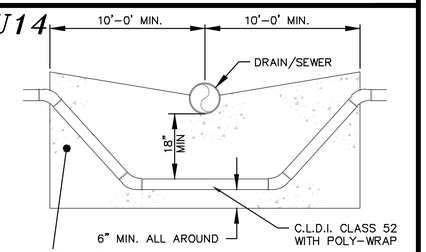
6. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.

7. CONCRETE COMPRESSIVE STRENGTH: 2,000 PSI MINIMUM.

8. USE OF THRUST BLOCKS DOES NOT ELIMINATE THE REQUIREMENT OF OTHER RESTRAINTS OR VICE VERSA.

THRUST BLOCKS
NOT TO SCALE

U14

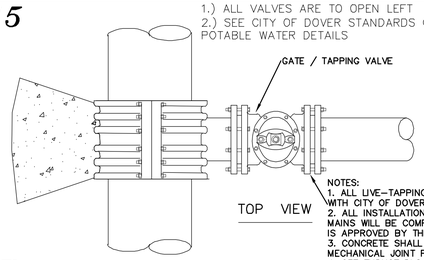


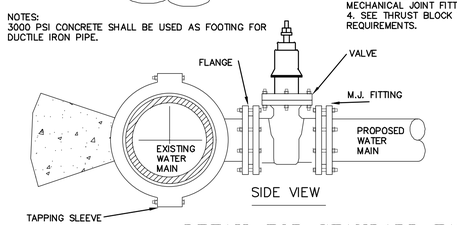
1.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

WATER MAIN INSTALLATION - BELOW DRAIN & SEWER
NOT TO SCALE

U15

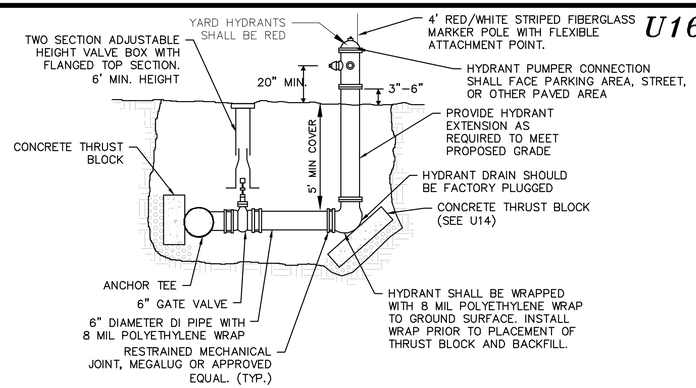
1.) ALL VALVES ARE TO OPEN LEFT
2.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS





DETAIL FOR STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
NOT TO SCALE

U16



NOTES:

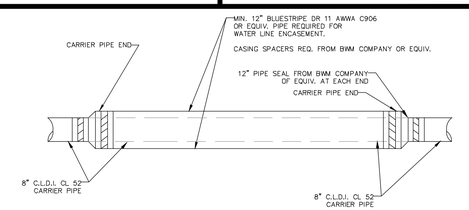
1. FIRE HYDRANTS SHALL BE FACTORY SEALED EDDY STYLE 2641.

2. HYDRANT SHALL BE PAINTED RED WITH EPOXY PAINT AS RECOMMENDED BY THE HYDRANT MANUFACTURER.

3. HYDRANT SHALL OPEN LEFT.

FIRE HYDRANT
NOT TO SCALE

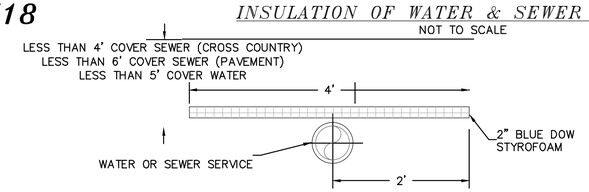
U17



WATERLINE SLEEVE DETAIL
NOT TO SCALE

U18

INSULATION OF WATER & SEWER SERVICES
NOT TO SCALE



U-102

DOVER PLANNING FILE #SITE-2023-0007

#	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

UTILITY CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

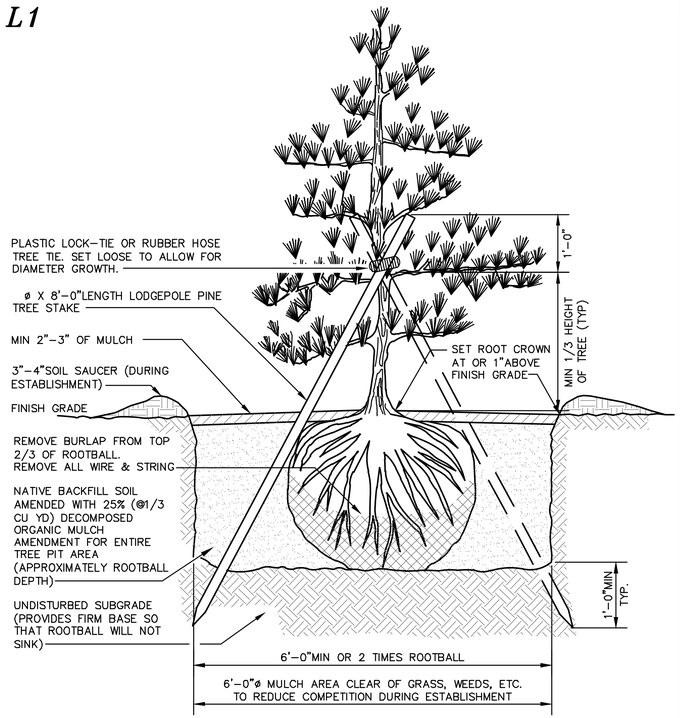
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

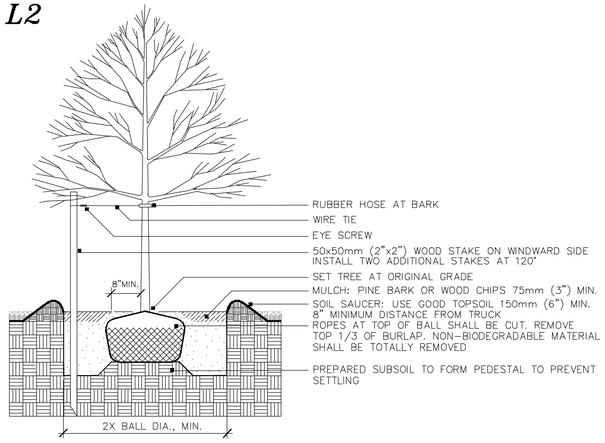
NOT FOR CONSTRUCTION

L1



CONIFEROUS TREE PLANTING

L2



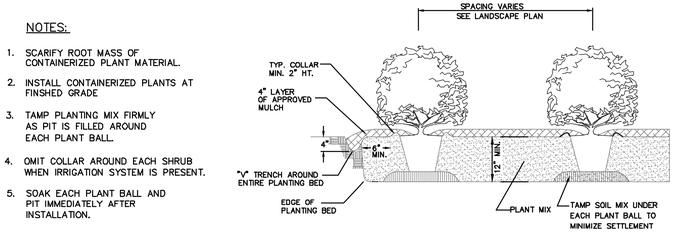
DECIDUOUS TREE PLANTING

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

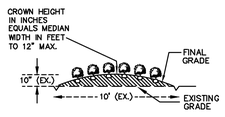
L3

NOTES:

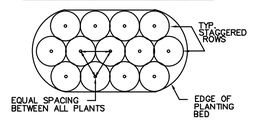
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL



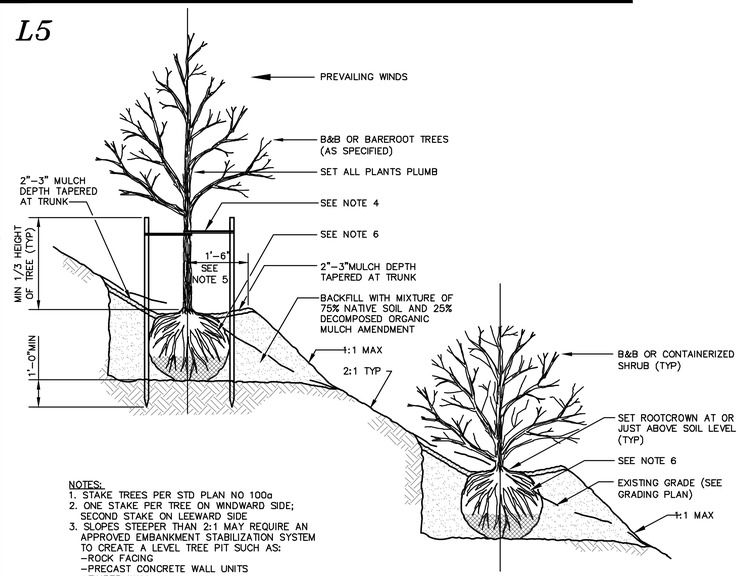
TYPICAL BED CROWNING



TYPICAL PLANTING BED PLAN

SHRUB & HEDGE PLANTING

L5



NOTES:
1. STAKE TREES PER STD PLAN NO 100a
2. ONE STAKE PER TREE ON WINDWARD SIDE; SECOND STAKE ON LEEWARD SIDE
3. SLOPES STEEPER THAN 2:1 MAY REQUIRE AN APPROVED EMBANKMENT STABILIZATION SYSTEM TO CREATE A LEVEL TREE PIT SUCH AS:
   - ROCK FACING
   - PRECAST CONCRETE WALL UNITS
   - TIMBER WALL
   - MANUFACTURED SLOPE RETENTION UNITS
4. CHAINLOCK TREE TIE. LOOP EACH TIE AROUND TREE LOOSELY TO PROVIDE 1" SLACK FOR DIAMETER GROWTH.
5. SHAPE SOIL TO PROVIDE 3' DIAMETER OR ROOTBALL DIAMETER, WHICHEVER IS GREATER, WATERING RING.
6. REMOVE ALL WIRE AND STRING. REMOVE TOP 2/3 OF BURLAP.

TREE PLANTING ON SLOPES

L6

NOTES:

1.) CALL DIG SAFE PRIOR TO BEGINNING WORK. (1-888-344-7233). THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF THE SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER OR GENERAL CONTRACTOR.

2.) CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL SITE CONDITIONS PRIOR TO CONSTRUCTION BIDDING. SEE NOTE XXX ON OVERALL SITE PLAN.

3.) PROVIDED SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING CONDITIONS.

4.) ALL PLANT MATERIAL INSTALLED SHALL MEET THE SPECIFICATIONS OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

5.) ALL PLANT MATERIALS SHALL BE FREE FROM INSECTS AND DISEASE.

6.) ALL PLANTINGS SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE FROM OWNER.

7.) ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.

8.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY PLANTED TREES AND SHRUBS DURING THE CONSTRUCTION PROCESS. WHERE REQUIRED, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING (SNOW OR EQUAL) AROUND EXISTING TREES AND SHRUBS THAT COULD BE IMPACTED BY THE CONSTRUCTION PROCESS. STORAGE OF CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, SNOW STORAGE AND OR VEHICLE PARKING SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF TREES OR TWENTY FEET WHICH EVER IS GREATER.

9.) NEW PLANTINGS SHALL BE INSTALLED PER PROJECT DRAWINGS AND SPECIFICATION THAT INCLUDE FERTILIZATION AND MULCHING AS REQUIRED.

10.) ALL SHRUB BEDS AND TREE PITS SHALL BE MULCHED WITH 3" CLEAN SHREDDED BLACK MULCH.

11.) WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR GROUND COVER AND PERENNIAL BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL-ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.

12.) MAINTENANCE OF NEW PLANTINGS AND LAWNS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND OR LANDSCAPE SUBCONTRACTOR UNTIL ACCEPTANCE BY THE OWNER. RESPONSIBILITIES SHALL INCLUDE WATERING WEEDING AND MOWING AS NECESSARY. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, REPLACEMENT MATERIAL SHALL BE GUARANTEED FOR AND ADDITIONAL YEAR FROM TIME OF INSTALLATION.

13.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY EROSION CONTROL MEASURES DURING THE CONSTRUCTION PHASE AND UNTIL ALL AREAS HAVE BEEN STABILIZED AND ACCEPTED BY THE OWNER. THE GENERAL CONTRACTOR SHALL PROVIDE WEEKLY INSPECTIONS OF EROSION MEASURE AND IMMEDIATELY AFTER STORM EVENTS AND REPAIR AS NECESSARY.

14.) THE GENERAL CONTRACTOR AND OR THE LANDSCAPE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL THREE GUYING MATERIAL ONCE PLANT MATERIAL HAS BEEN ESTABLISHED. (MINIMUM OF ONE GROWNG SEASON). ALL TEMPORARY EROSION CONTROL MEASURE SHALL BE REMOVED ONCE STABILIZATION OF DISTURBANCE HAS BEEN ACCEPTED BY OWNER.

15.) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR A MINIMUM OF TWO MOWINGS FOR ALL TURF AREAS OR UNTIL ACCEPTANCE BY THE OWNER. A MINIMUM UNIFORM 75% CATCH OF TURF IS REQUIRED FOR ACCEPTANCE.

16.) ALL PLANTINGS SHALL BE WATERED REGULARLY DURING THEIR FIRST YEAR AND MAINTAINED PERMANENTLY IN GOOD GROWING CONDITION AS AN EFFECTIVE VISUAL SCREEN.

17.) SHRUBS OR TREES WHICH DIE SHALL BE REPLACED WITHIN ONE GROWING SEASON WITH NEW SHRUBS OR TREES TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE LANDSCAPING REQUIREMENTS.

18.) ALL REQUIRED LANDSCAPING SHALL BE INSTALLED BEFORE OCCUPANCY, OR WITHIN SIX MONTHS IF OCCUPANCY OCCURS DURING WINTER CONDITIONS.

19.) TREES ARE TO BE 3" CALIPER 6" OFF THE ROOT BALL.

20.) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITIONS (AMERICAN ASSOCIATION OF NURSERYMEN, INC.)

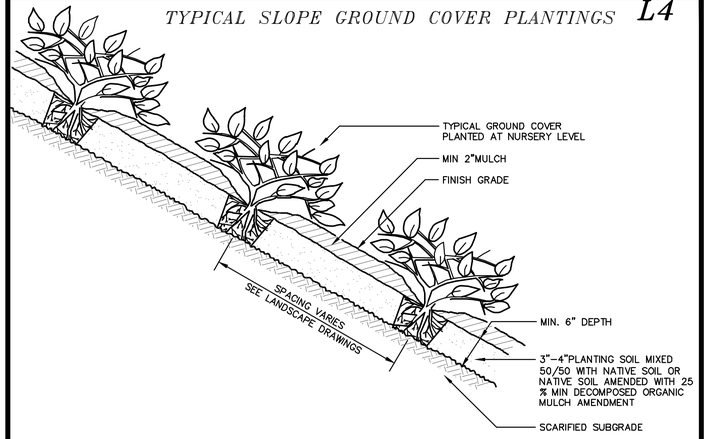
21.) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.

22.) PLANT-PIT BACK-FILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PARTS OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON-SITE TOPSOIL AS PART OF BACK FILL WHEN AVAILABLE.

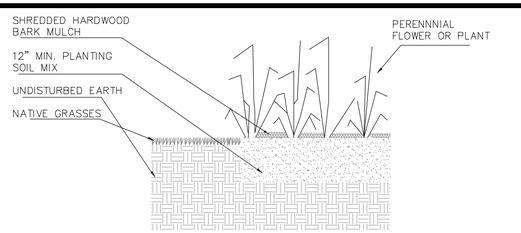
23.) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.

L4

TYPICAL SLOPE GROUND COVER PLANTINGS

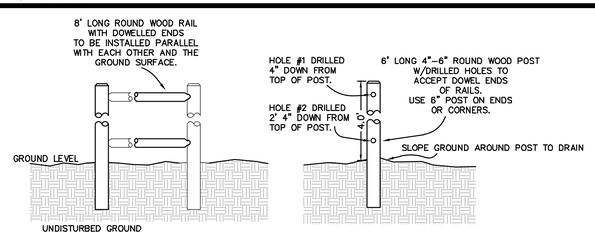


L8



PERENNIAL PLANTING DETAIL

L7



TYPICAL POST & RAIL FENCE DETAIL

N.T.S.

L-101

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
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#1	9-25-23	REVISED PER DOVER TRC COMMENT

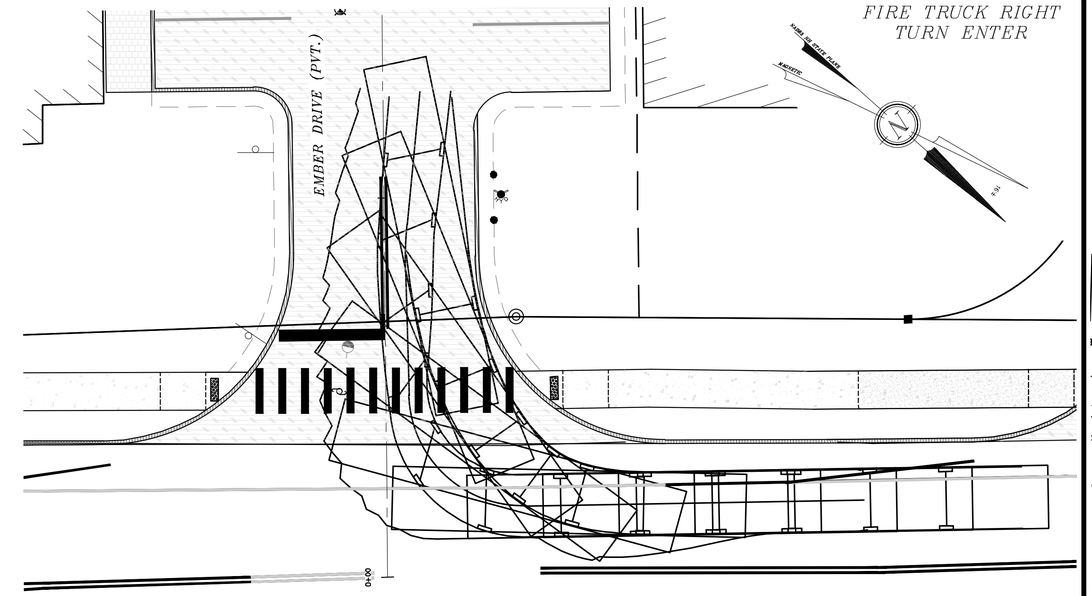
LANDSCAPING CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

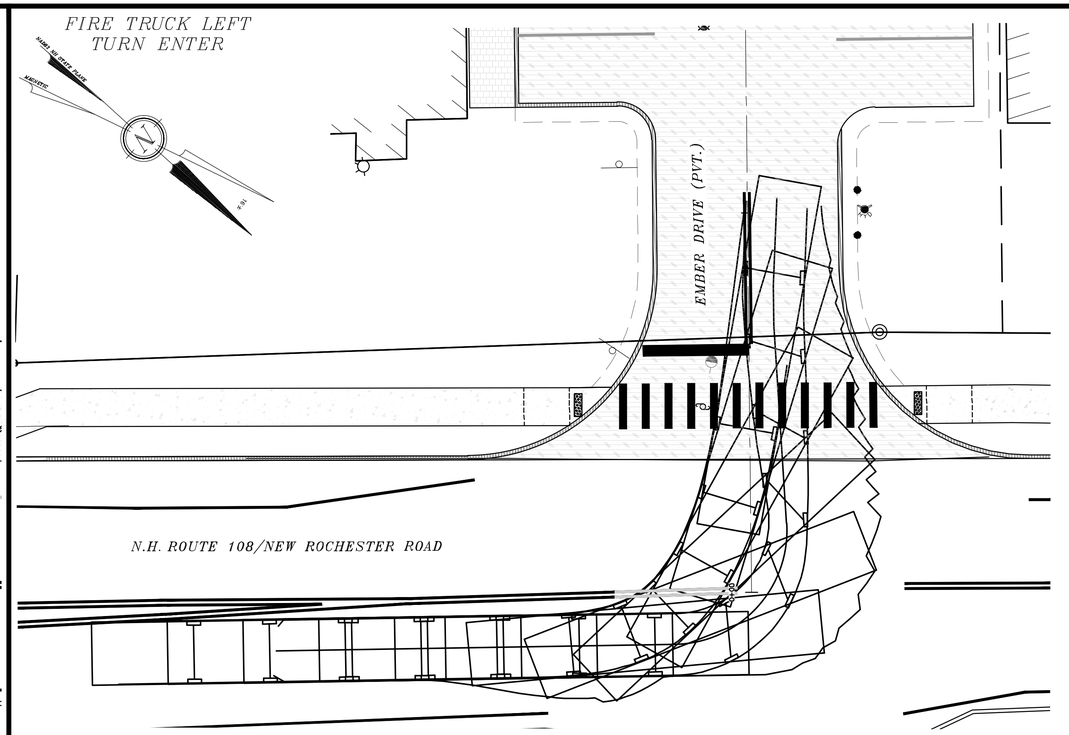
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

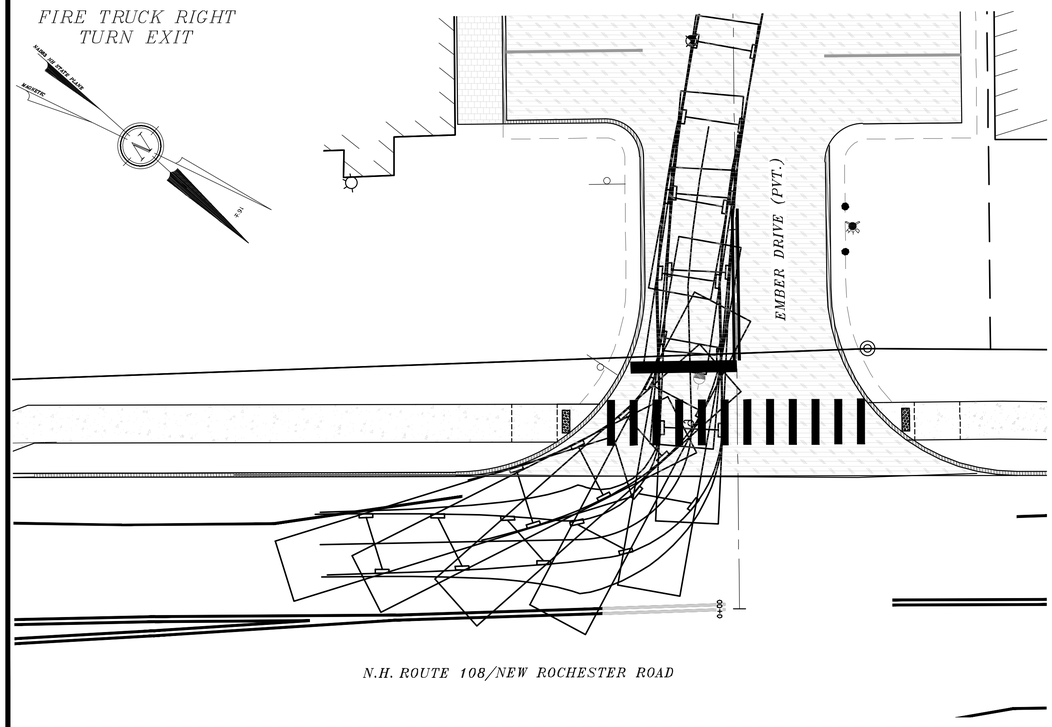
SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

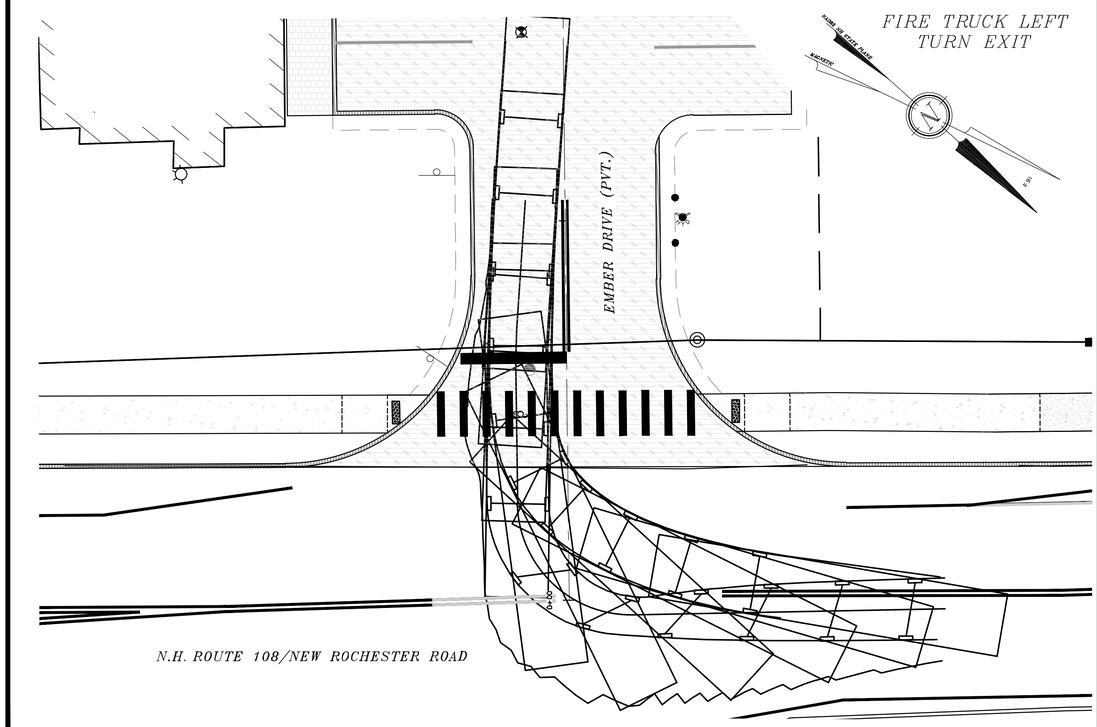
STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14248
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION









DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

DOVER FIRE TRUCK TURN MOVEMENTS INTERSECTION
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

SCALE : 1 IN. EQUALS 10 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

SHEET 27 OF 28

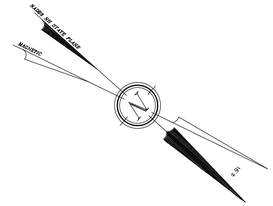
NOT FOR CONSTRUCTION



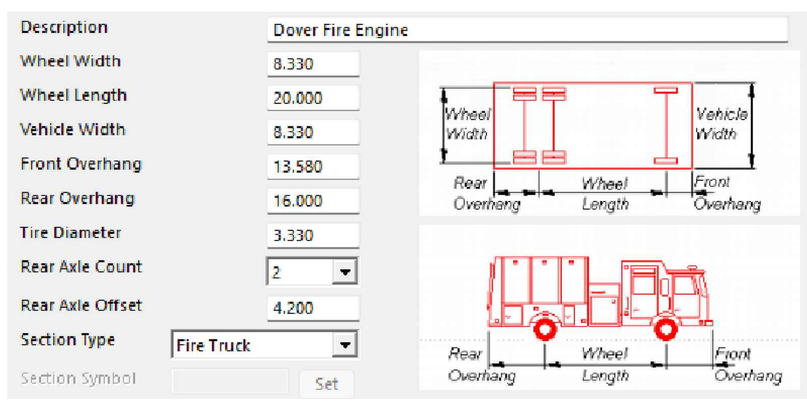
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



FIRE TRUCK HAMMERHEAD



DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#2	11-06-23	REVISED PER TRC #2 & ADDITIONAL UNITS ADDED
#1	9-25-23	REVISED PER DOVER TRC COMMENT

DOVER FIRE TRUCK TURN TEMPLATE
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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

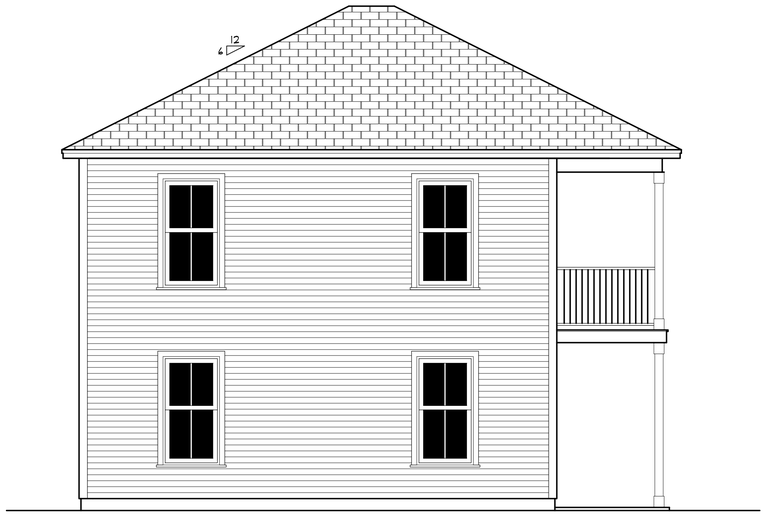
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DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14247
LICENSED
PROFESSIONAL ENGINEER

SHEET 28 OF 28

NOT FOR CONSTRUCTION

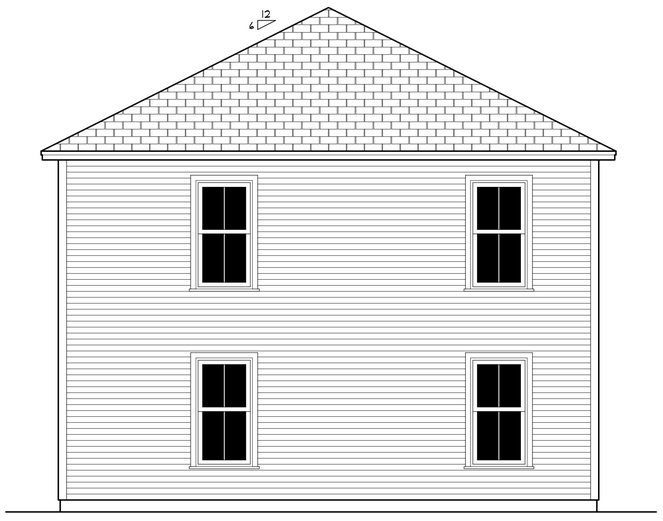
THESE PLANS WERE NOT DRAWN BY A LICENSED ARCHITECT OR ENGINEER
M. MORELAND CONSTRUCTION TAKES NO RESPONSIBILITY IN THE STRUCTURAL OR LIFE SAFETY DETAILING IN THESE PLANS.
ALL WORK SHALL COMPLY TO ALL LOCAL, STATE, & NATIONAL BUILDING CODES



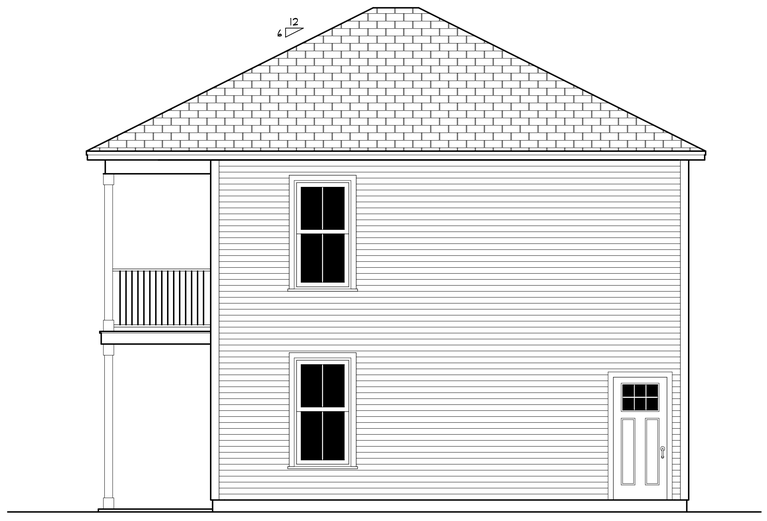
2 SIDE ELEVATION
SCALE 1/4"=1'0"



1 FRONT ELEVATION
SCALE 1/4"=1'0"



3 REAR ELEVATION
SCALE 1/4"=1'0"



4 SIDE ELEVATION
SCALE 1/4"=1'0"

M. MORELAND CONSTRUCTION
ARCHITECTURAL DESIGNER

S. BERWICK ME
03908 PH.207-752-2498

NOTES:
V.I.F. ALL DIMENSIONS

CONTRACTOR IS RESPONSIBLE FOR ALL FINISHED DIMENSIONS

CONTRACTOR IS RESPONSIBLE FOR MEETING ALL STATE & NATIONAL BUILDING CODES

LOCATION

DRAWN BY

SIGNATURE | DATE

DRAWING LIST

A-1	FLOOR PLANS
A-2	FOUNDATION PLAN
A-3	ELEVATIONS
A-4	FIRST FLOOR FRAMING
A-5	ROOF FRAMING
A-6	SECTION & DETAILS

OWNER

PROJECT:
NEW ROCHESTER RD
DOVER NH

PROJECT NUMBER:

ISSUE	DATE
DESIGN	6-30-23

SCALE
1/4"=1'-0"
0 5 10

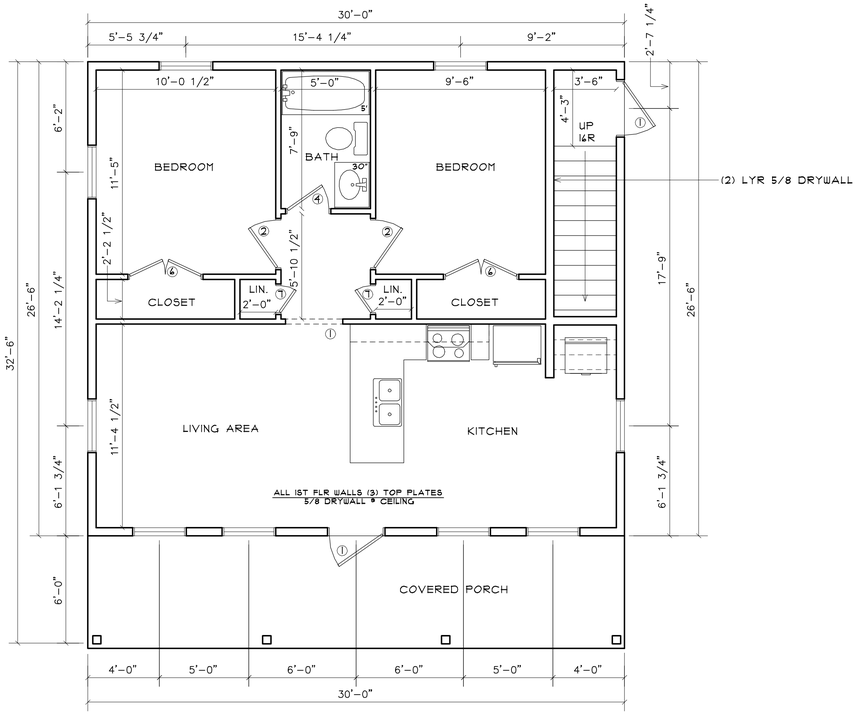
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ELEVATIONS

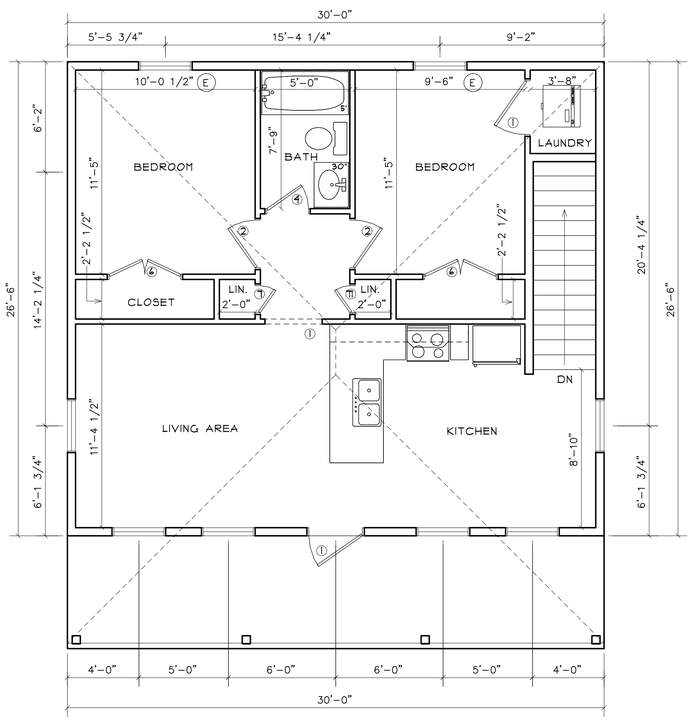
A-2

THESE PLANS WERE NOT DRAWN BY A LICENSED ARCHITECT OR ENGINEER
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(E) WINDOWS WILL MEET OR EXCEED A CLEAR OPENABLE AREA OF 5.7 SQ. FT. & A CLEAR OPENABLE WIDTH OF 20" & A CLEAR OPENABLE HEIGHT OF 24"

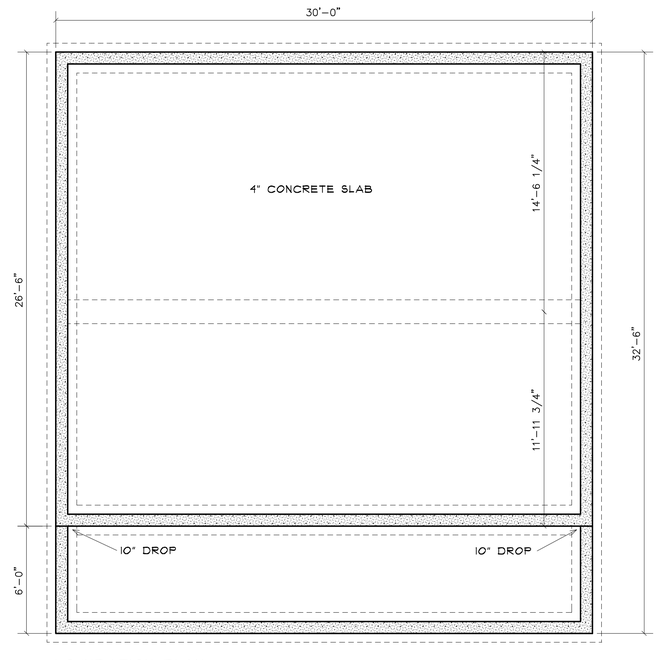


1 FIRST FLOOR PLAN
SCALE 1/4"=1'0"

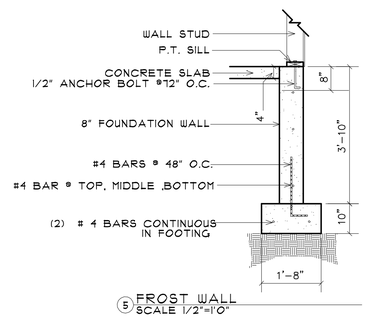


2 SECOND FLOOR PLAN
SCALE 1/4"=1'0"

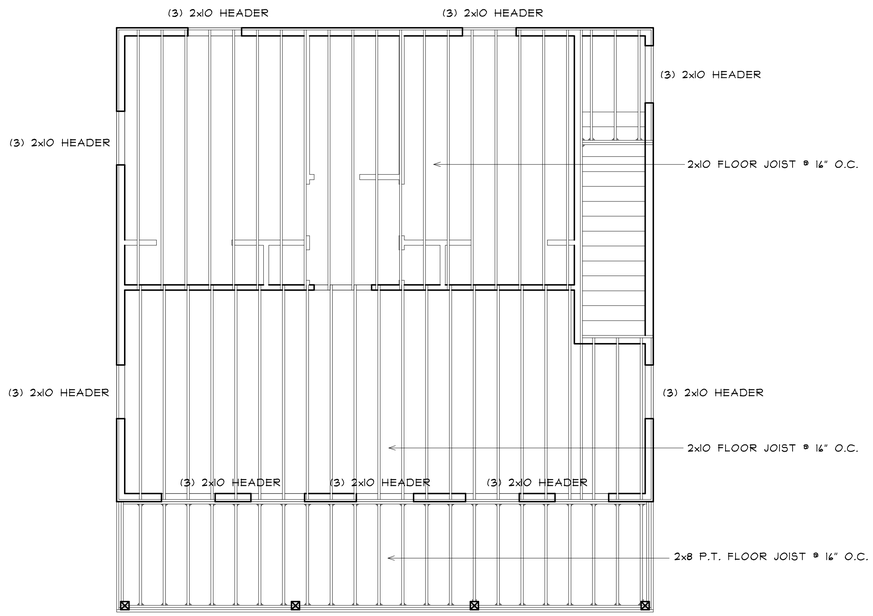
DOOR SCHEDULE			
1	3'-0" x 6'-8"	7	1'-6" x 6'-8"
2	2'-8" x 6'-8"		
3	2'-6" x 6'-8"		
4	2'-4" x 6'-8"		
5	5'-0" x 6'-8"		
6	4'-0" x 6'-8"		



3 FOUNDATION PLAN
SCALE 1/4"=1'0"



5 FROST WALL
SCALE 1/2"=1'0"



4 SECOND FLOOR FRAME
SCALE 1/4"=1'0"

M. MORELAND CONSTRUCTION
ARCHITECTURAL DESIGNER
S. BERWICK ME
03908 PH.207-752-2498

NOTES:
V.I.F. ALL DIMENSIONS

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CONTRACTOR IS RESPONSIBLE FOR MEETING ALL STATE & NATIONAL BUILDING CODES

LOCATION

DRAWN BY

SIGNATURE | DATE

DRAWING LIST

A-1	FLOOR PLANS
A-2	FOUNDATION PLAN
A-3	ELEVATIONS
A-4	FIRST FLOOR FRAMING
A-5	ROOF FRAMING
A-6	SECTION & DETAILS

OWNER

PROJECT:
NEW ROCHESTER RD
DOVER NH

PROJECT NUMBER:

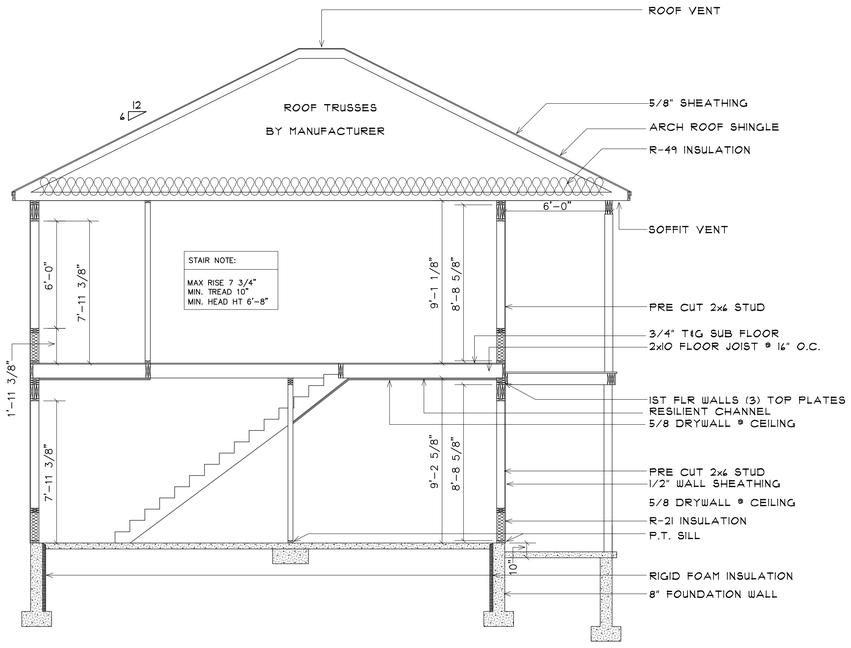
ISSUE	DATE
DESIGN	6-30-23

SCALE
1/4"=1'-0"
0 5 10

STAMP

FLOOR PLANS

THESE PLANS WERE NOT DRAWN BY A LICENSED ARCHITECT OR ENGINEER
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M. MORELAND CONSTRUCTION
ARCHITECTURAL DESIGNER

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OWNER

PROJECT:

NEW ROCHESTER RD
DOVER NH

PROJECT NUMBER:

ISSUE	DATE
DESIGN	6-30-23

SCALE
1/4"=1'-0"
0 5 10

STAMP

FLOOR PLAN

A-1



















