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, October 12, 2023**
Meeting Time: **10:30 AM**

1. 10:30 AM - 11:15 AM: 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 5 duplex structures (10 units total) with the single-family dwelling to remain on the property). (SITE-2023-0007). *[This item was previously heard by the Technical Review Committee on August 10, 2023.]*

2. 11:15 AM – 12:00 PM: Site Review Horizons Engineering, Inc. (Owners: Hellenic Realty Partners, LLC), Assessor's Map 2, Lot 19, zoned Central Business District-General, located at 333 Central Avenue. (Proposal is to convert 3,155 sf on 2nd floor space into 2 residential units and retain 1,875 sf for commercial space). (SITE-2023-0014)

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:**	09/24/2023
Status:	Review Expired	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: Construction of 5 duplex structures (10 units total) with single family home at front of site to remain. Proposed driveway called Nickel 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	0
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	Five 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

Note	Created By	Date and Time Created
1. Waiting for submittal for 2nd TRC - RLB	Rachel Blonigen	08/10/2023 14:15

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
	Grand Total for Plan	**$200.00**	**$0.00**

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	10/12/2023	Technical Review Committee Meeting

TRC Meeting Agenda Item	#1	TRC Meeting Motion	Resubmit for 2nf full TRC
TRC Meeting Next Steps	Revise and submit for 2nd full TRC		

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	In Review	10/04/2023	11/01/2023		No	No

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Meyers, Kathleen	In Review	10/04/2023	11/01/2023	
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	In Review	10/04/2023	11/01/2023	
IS Building Official	Fire / Inspection Services	Maxfield, Jim	In Review	10/04/2023	11/01/2023	
Planning	Planning	Kaspari, Jackson	In Review	10/04/2023	11/01/2023	
Zoning Administrator	Planning	Kypfer, Natasha	In Review	10/04/2023	11/01/2023	
Traffic Bureau	Police	Speidel, Marn	In Review	10/04/2023	11/01/2023	

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
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	
Land Use Plan Technical Review v.1	Receive Submittal		08/16/2023 14:01
Technical Review Committee Meeting v.1	Hold Meeting	10/04/2023 11:35	
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		

PLAN SNAPSHOT REPORT (SITE-2023-0007)

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, 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: Duplex 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 10 & Buildings Proposed 5

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

Number of Parking Spaces: Existing N/A Proposed 22 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: 5 duplexes, 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: 153-14-D(6) (Illumination Ratio (stat zone #3) & 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 335 Second Crown Point Rd, Barrington, NH 03825 Telephone #: 603-332-2863

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

ARCHITECT INFORMATION

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

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

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 Extension & Nickel 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_____

BERRY SURVEYING & ENGINEERING
335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com
crberry@metrocast.net
July 6, 2023/Rev: September 25, 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.

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 (see CUP application and request).

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 five (5) 2-family dwelling structures for ten (10) units behind the existing single-family home to remain at 34 New Rochester Road. This brings the total project yield post lot merger to nineteen (19) 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 133 linear feet (LF), including a seventeen (17) space parking lot that provides parking for the majority 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, 132 LF in length, consisting of twelve-foot travel lanes and 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. The proposal includes relocating the driveway cut for the garage of 36 New Rochester Road to be taken from Ember Drive and eliminating the driveway cut for 34 New Rochester Road.

With the exception of the five foot (5) raised concrete sidewalk 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 for infiltration. This is to account for the 20% maximum impervious requirement of the Secondary Groundwater Recharge Overlay district. Despite the use of porous products across the site, a Conditional Use Permit is required for greater than 20% impervious in this overlay district (22.1%). 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 applicant is applying for three non-environmental and one environmental Conditional Use Permits (CUPs); 1) Lot building coverage of 18.4% where 50% is required, 2) Frontage build-out of 39.1% where 60% (New Rochester Road) is required, 3) Not meeting front build-to line on New Rochester Road, 4) Greater than 20% impervious in the Secondary Groundwater Recharge District (22.1% proposed). Please find attached CUP application and narrative for justification and criteria. The applicant is applying for two waivers; 1) Drainage pipe cover of less than 3' (1.4' proposed), 2) Not meeting the required illumination ratio for statistical zone #3. Please find attached waiver request narrative for justification and criteria.

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, and percent impervious in secondary groundwater recharge overlay district.
- Waiver for drainage pipe cover and illumination ratio in statistical zone #3
- Site Plan Approval
- EPA Notice of Intent (NOI)
- NHDES Sewer Discharge Permit

Since the prior TRC, the following major revisions have been made and are discussed more in depth within the TRC response letter:

- Nickel Drive is now referred to as Ember Drive.
- Widened internal sidewalk to 10' wide, increased subbase depth for maintenance vehicles, added bollards where appropriate.
- Revised waterline to be located within the internal sidewalk and now loops out to New Rochester Road, location of fire hydrant has been revised.
- UGE is now looped back into Copper Drive from the Ember Drive side per provided Eversource Letter to serve.
- 2-family-dwelling units have been revised for accessible access on the first levels by adding 1:12 ramps and modifying the finished floor elevations. Accessible routes have been called out.
- Lighting has been revised.
- An estimate is provided for the construction cost of the proposed sidewalk on New Rochester Road.
- During the prior TRC, it was determined that the CUP for greater than maximum allowable parking spaces was not actually needed and has been removed.
- Waiver requests have been revised to reflect the updated Lighting Plan.
- A note has been added that parking spaces are to be assigned to units.

- The grading at the start of the Copper Drive parking lot has been revised to account for the cross-section transition.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry
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

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:	August 10, 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:
Natasha Kypfer, Zoning
Marn Speidel, Police
Jim Maxfield, Fire/Inspection Services
Ken Mavrogeorge, Engineering
James Burdin, Business Development
Others:
Chris Berry, Berry Surveying & Engineering
Kevin Poulin, Berry Surveying & Engineering

Approval of minutes from August 3, 2023:
K. Mavrogeorge moved to approve the August 3, 2023 minutes. Seconded by T. Clark. Vote: U/A.

PLAN REVIEW:
Planning:
- CUPs for lot coverage, frontage build out, front build to line, impervious area in secondary groundwater district
- CUP for maximum parking not needed for 1 space over max.
- Reminder: Impact fees, Water & Sewer investment fees
- Provide letters to serve
- Units for sale?
- Provide updated HOA documents
- Lot merger timing?
- Please revise "duplex" to "2-family dwelling" to mirror verbiage in Zoning Ordinance
- Revise plans:
  - Add Planning file number SITE-2023-0007
  - Owner's signatures on the final plans
  - Professional stamps on the final plans
  - Indicate snow storage
  - Where is laundry on first floor units?
  - Access easement? One HOA?
  - Minimum block length for Nikel?
  - Active and passive recreation
  - Remove note 36 if Building Official agrees
  - Provide lighting table or is that the waiver?
  - Where is the chain link fence proposed?

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
  - Provide a sign identifying porous asphalt is present and that there are restrictions on deicing materials on porous surfaces are noted in the inspection and maintenance plan that is provided.
  - Provide a commitment to maintain stormwater and specifically the porous pavement, that can be recorded at the registry of deeds.

DRAFT

- 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 requests a letter certifying the tie in locations or discharge points for all sump pumps and roof leaders for existing structures on the property.
- 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.
- Provide Standard Construction Sign Detail per Dover standards.
- Community Services has requested a proposal from a third party engineering firm to assess the capacity of the sewer main that this new development will tie into. Based on the amount of recent developments in the area, staff would like to have the model evaluated to determine if future upgrades are required. Costs associated with the assessment would be the responsibility of the applicant.

- Sheet 6 of 27:
  - Dover is moving away from the typical crosswalk hatching on this sheet. Dover is moving towards using the markings in the NHDOT Pedestrian Crossing Details (Sheet PM -15) located here on the web: https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/standardplans/documents/02222021-pm-15-std.pdf
  - Coordinate the transformer locations with Eversource prior to submission to PB. Will they need access to the transformers over the path?
  - Will tenants have access to all of the parking or will parking be close to their buildings?
  - Does the parking area along Nickel Dr need to have EV ready spaces?
  - Check configuration of the accessible ramp along Nickel Dr. One of the leaders looks to point to the wrong spot.
  - The pathway between the buildings:
    - It is recommended that this pathway should be made accessible to emergency vehicles and utility vehicles if utilities such as sewer are routed through this area.
    - IS should comment on the need for vehicular access through to the development next door/Copper Dr? Does it require a full loop?
  - Change sign to no parking this side of road instead of fire lane.
  - Identify the start/end of curbing.
  - Provide accessible charging station
  - Is the lot on Copper Dr capable of having a fire truck turn around?
- Sheet 7 of 27:
  - Why doesn't the perforated underdrain need to extend the entirety of the porous pavement?
  - Where do the catch basins in the porous pavement tie into for an overflow?
  - Xheck grading here. Unclear if part of Copper Dr will need to be reconstructed.
- Sheet 9 of 27: Are the porous pavers intended to be the sidewalk? Coordinate the call outs.
- Sheet 12 of 27:
  - Loop the water main back out to New Rochester Road
  - Recommend relocating water between the proposed duplexes to make it more accessible to operate curb stops and repair the main if needed? This could reduce the amount of water main required on the property.
- Sheet 14 of 27: Portions of the parking lots are unlit. Recommend additional fixtures be proposed.
- Sheet 20 of 27: Provide additional detail on how bike rack is secured to ground.

Police:

- Proposed mailbox cluster poses potential conflict with vehicles backing from driveway for Lot 104-3.
- Add "No Outlet" sign or placard to the proposed stop/street sign.
- Why an 8' internal sidewalk? Potential concern regarding at-grade access from Nickel Drive and confusion among visitors over whether it's intended to be a driveway.

DRAFT

- Parking supply for units in proximity to Nickel Drive appears inadequate. Drivers approaching on New Rochester Road may be rear-ended while slowing down to survey whether spaces are available.
- Would prefer full access between Nickel and Copper, if the lots are merged. This is both for emergency services access and for benefit of residents who need access to shared parking. Consider eliminating Units 10/11 to amend site plan for this purpose.
- Coordinate location of New Rochester Road sidewalk with proposed improvement plans of the Route 108 Complete Streets project.
- To the south, sidewalk is presumed to connect to Hotel Drive. Is sidewalk proposed to be extended north of Copper Drive?

Fire/Inspection Services:

- Provide an alternative to Nickel Drive
- Submitted documents makes reference to Copper ext. – Please remove from draft documents and use Copper Drive
- Clarify site access compliance with NFPA 1 Chapter 18 for Copper Drive – Provide turning template for the site.
- Clarify the number of units on the site
- Clarify design compliance with accessibility and indicate accessible routes
- Elevation plans do not appear to allow an accessible route.

Business Development:

- This site is located in a roughly quarter-mile stretch of New Rochester Road that is predominantly residential; the few businesses that are present appear to either be customary home occupations or have converted a residential structure. The proposed residential use appears to be an appropriate incremental increase in density that is consistent with this development pattern, with the intent of the Gateway District, and within the context of an arterial road with significant commercial traffic.
- The Zoning Ordinance recognizes and protects this largely residential section both by zoning this stretch of New Rochester Road in the Gateway District instead of the neighboring Commercial (C) District and through provisions within the Gateway District that limit the height or scale of some commercial uses in this area. We nevertheless encourage the applicants to make future owners or tenants aware of the mixed-use nature and potential of both the Gateway District and Commercial District and the potential for business location or expansion in those areas.

Planning Board:

- Waiver narratives?

Next Steps: Revise and submit for second full TRC.

Pause TRC at: 11:31 am.

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BERRY SURVEYING & ENGINEERING
335 Second Crown Point Road
Barrington, NH 03825
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September 25, 2023

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

RECEIVED
Planning Office
SEP 28 2023
Dover, New Hampshire

Re: Site Plan Review
TRC #1 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 August 10, 2023, we respectfully submit the following comments and revisions. Our comments are in **bold**. It is of note that Nickel Drive has been changed to Ember Drive. 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.

2. CUP for maximum parking not needed for 1 space over max.
   CUP request for maximum parking has been removed.

3. Reminder: Impact fees, Water & Sewer investment fees.
   Applicant will pay fees when due.

4. Provide letters to serve.
   Please find Eversource letter to serve. Other letters to serve will be provided when received.

5. Units for sale?
   The applicant will likely hold onto and rent the units for a period of time then likely place for sale at a later date.

6. Provide updated HOA documents.

The applicant requests that updated HOA documents are a condition of approval.

7. Lot Merger Timing?
   It is intended to pursue the same time line for the Lot Merger as the Site Plan approval.

8. Please revised "duplex" to 2-family dwelling" to mirror the verbiage in Zoning Ordinance.
   This verbiage has been revised to mirror the Zoning Ordinance. Please find documents and Site Plan, sheet #6.

9. Revise Plan to:
   a. Add Planning file number SITE-2023-0007.
      Please find Planning file number added to the title block.

   b. Owner's signatures on the final plans.
      Owner's signatures will be provided on the final plans.

   c. Professional stamps on the final plans.
      All required professional stamps will be provided on the final plans.

   d. Indicate snow storage.
      Please find shaded snow storage areas identified on the Site Plan, sheet #6.

   e. Where is laundry on the first-floor units?
      Laundry is shown under the stairs to the right of the refridgerator.

   f. Access Easement? One HOA?
      One HOA will be provided for the project.

   g. Minimum block length for Nickel?
      It is felt by BS&E that the waiver request is not need for minimum block length for Nickel Drive (now Ember Drive) since this is a parking lot.

   h. Active and Passive Recreation.

Please find the active and passive recreation calc on the Site Plan, sheet #6. Passive recreation area requirement is satisfied on site, active recreation space will require a fee to cover.

i. Remove note #36 if building official agrees.
Note #36 has been modified to remove "Not Applicable", as the 2-family dwellings will be sprinkled.

j. Provide lighting table or is that the waiver.
Please find revised Lighting Plan with waiver proposed for illumination ratio for statistical zone #3.

k. Where is chain link fence proposed?
The chain link fence is proposed around the trash toter location.

ENGINEERING COMMENTS

1. Applicant and Contractor shall review the Dover Construction Guidelines prior to scheduling a Preconstruction meeting with City staff.
Applicant acknowledges comment.

2. Provide a sign identifying porous asphalt is present and that there are restrictions on deicing materials on porous surfaces are noted in the inspection and maintenance plan that is provided.
This signage is now provided on the Site Plan, Sheet #6.

3. Provide a commitment to maintain stormwater and specifically the porous pavement, that can be recorded at the registry of deeds.
Please find the owner certification sheet at the rear of the document "Stormwater System Management: Inspection and Maintenance Manual.

4. 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 calculated.
The applicant requests that this is a condition of approval.

5. 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.

There are no sump pumps or roof leaders for the existing structure on the property. Please find requested letter.

6. Add a note that Design Engineer shall provide signed letter to City Engineering certifying that the stormwater management system has been installed in accordance with the approved plans.
   This note has been added to the Grading Plan, sheet #7.

7. Provide standard construction sign detail per Dover standards.
   The location of the sign is now provided on the Site Plan, sheet #6 and the detail is C22, sheet C-103, sheet #22.

8. Community Services has requested a proposal from a third party engineering firm to assess the capacity of the sewer main that this new development will tie into. Based on the amount of recent developments in the area, staff would like to have the model evaluated to determine if future upgrade costs are required. Costs associated with the assessment would be the responsibility of the applicant.
   Comment acknowledged, applicant has reached out to Dover Engineering on status on September 22, 2023. Applicant may hear from Dover Engineering between time of request/project resubmission and next TRC meeting.

9. Dover is moving away from the typical crosswalk hatching on this sheet. Dover is moving towards using the markings in the NHDOT pedestrian Crossing Details (PM-15).
   Please find revised crosswalk striping on Site Plan, sheet #6.

10. Coordinate the transformer locations with Eversource prior to submission to PB. Will they need to access the transformers over the path.
    Please find Eversource letter to serve for the project. The only requested change from Eversource was to loop the UGE into Copper Drive from Ember Drive.

11. Will tenants have access to all of the parking or will parking be close to their buildings.
    Parking spaces will be assigned to the units. This has been added as note #50 on the Site Plan, sheet #6.

12. Does the parking along Nickel Drive need to have EV ready spaces.

Per conversation at TRC, it was discussed that the two EV ready spaces at the rear of the site were adequate.

13. Check the configuration of the accessible ramp along Nickel Drive. One of the leaders looks to point to the wrong spot.
The leaders have been revised in this location. Please find sheet #6.

14. The pathway between the buildings:
-It is recommended that this pathway should be made accessible to emergency vehicles and utility vehicles if utilities such as sewer are routed through this area
This pathway has been widened to 10' with an increased subbase section. Find Site Plan, sheet #6 and porous paver plan, sheet #9.

-IS should comment on the need for vehicular access through to the development next door/Copper Dr. Does it require a full loop?
Per discussion at TRC, it was determined that a full loop is not required for the project design.

15. Change sign to no parking this side of road instead of fire lane.
This has been changed, see Site Plan sheet #6.

16. Identify the start/end of curbing.
Start/end of curbing is identified on the Site Plan, sheet #6.

17. Is the lot on Copper Dr. capable of having a fire truck turn around?
Please find fire truck turning movements, sheets #26 & 27.

18. Why doesn't the perforated underdrain need to extend the entirety of the porous pavement?

19. Where do the catch basins in the porous pavement tie into for an overflow.
#18 & #19 -> per conversation at TRC, the underdrain is proposed only as the discharge of the catch basins. The intent is to provide an area to disperse stormwater flow in the case of porous pavement failure or icing/snow situations.

20. Sheet 7: Check grading here. Unclear if part of Copper Drive will need to be reconstructed.

Please find clarifications on sheet #7. Approved Copper Drive will not need to be reconstructed. The approved portion of Copper Drive was crowned, with the proposed portion of Copper Drive to be superelevated to the right. The grading now shows a transition section between the crown and the superelevation from 0+62-1+00.

21. Sheet 9: Are porous pavers intended to be the sidewalk? Coordinate the call outs.
    The callouts for the sidewalk have been revised to include the word paver. Please find sheet #9.

22. Sheet 12: Loop the watermain back out to New Rochester Road.
    Please find revised water design, sheets 11 & #12.

23. Recommend relocating water between the proposed duplexes to make it more accessible to operate curb stops and repair the main if needed?
    Please find revised water design, sheets 11 & #12.

24. Sheet 17: Portions of the parking lot are unlit. Recommend additional fixtures be proposed.
    Please find revised Lighting Plan, sheet #17 and waiver request for illumination ratio for statistical zone #3.

25. Sheet 20: Provide additional detail on how bike rack is secured to ground.
    Please find revised detail on sheet #20.

POLICE DEPARTMENT COMMENTS

1. Proposed mailbox cluster poses potential conflict with vehicles backing from driveway for Lot 104-3.
   The mailbox cluster has been moved away from the driveway. Please find sheet #7.

2. Add "no outlet" sign or placard to the proposed stop/street sign.
   The "no outlet" placard has been added. Please find sheet #7.

3. Why 8' internal sidewalk? Potential concern regarding at-grade access from Nickel Drive and confusion among visitors over whether it's intended to be a driveway.

Per conversation at TRC, it was discussed with the engineering department to widen this walk to 10' for maintenance or emergency access. Three bollards have been added to the Site Plan to indicate that this sidewalk is not a driveway. Please find sheet #6.

4. Parking supplies for units in proximity to Nickel Drive appears inadequate. Drivers approaching on New Rochester Road may be rear-ended while slowing down to survey whether spaces are available.
   Per conversation at TRC, assigning parking spaces to units is a solution to this situation. Please note #50, sheet #6.

5. Would prefer full access between Nickel & Copper, if the lots are merged. This is both for emergency services access and for the benefit of residents who need access to shared parking. Consider eliminating Unit 10/11 to amend the Site Plan for this purpose.
   Per conversation at TRC, creating a full loop would detract from the project type that the applicant is trying to create. This would create a large volume of paved surfaces, when the applicant is trying to create as a walkable development. The internal sidewalk is being widened to 10' wide to assist with maintenance vehicle or emergency vehicle access.

6. Coordinate location of New Rochester Road sidewalk with proposed improvement plans of the Route 108 Complete Streets project.
   Per conversation at TRC, the applicant is providing a cost estimate to construct the sidewalk. This is done in order to justify not constructing the sidewalk with the potential for Rt 108 improvements, where this construction may be revised in the future for the Complete Streets project. Please find attached sidewalk construction cost estimate.

7. To the south, sidewalk is presumed to connect to Hotel Drive. Is sidewalk proposed to be extended north of Copper Drive.
   The sidewalk will not be extended to the north of Copper Drive as part of the applicant's project.

FIRE /INSPECTION SERVICES COMMENTS

1. Provide an alternative to Nickel Drive.
   Nickel Drive has been changed to Ember Drive.

2. Submitted documents make reference to Copper Ext – Please remove from draft documents and use Copper Drive.
   Copper Drive Ext. has been removed from the documents.

3. Clarify site access compliance with NFPA 1 Chapter 18 for Copper Drive – Provide turning template on the site.
   Turning templates are provided as sheets #26 & #27 in the plan set.

4. Locate No Parking fire lane signage on both sides of the road or increase road width for one side parking.
   The road width has been increased to 24'. See Site Plan, sheet #8.

5. Clarify the number of units on site.
   Please find the unit density calculation on the Site Plan, sheet #6.

6. Clarify design compliance with accessibility and indicate accessible routes.
   Please find the revised Site Plan indicating accessible route, sheet #6.

7. Elevation plans do not appear to allow an accessible route.
   Please find revised elevation plans and revised Grading Plans, sheets #7 & #8.

BUSINESS DEVELOPMENT COMMENTS

1. The site is located in a roughly quarter-mile stretch of New Rochester Road that is predominantly residential; the few businesses that are present appear to be either customary home occupations or have converted a residential structure. The proposed use appears to be an appropriate incremental increase in density that is consistent with this development pattern, with the intent of the gateway District, and within the context of an arterial road with significant commercial traffic.
   Comment acknowledged.

2. The Zoning Ordinance recognizes and protects this largely residential section both by zoning this stretch of New Rochester Road in the Gateway District instead of the neighboring Commercial (C) district and through provisions within the Gateway District that limit the height or scale of some commercial uses in the area. We nevertheless encourage the applicants to make future owners or tenants aware of the mixed-use nature and potential of both the Gateway District and Commercial District and the potential of both the Gateway District

and Commercial District and the potential for business location or expansion in those areas
Comment acknowledged; applicant is aware of this potential.

BUSINESS DEVELOPMENT COMMENTS

1. Waiver narratives?
   Please find the waiver request narratives within the application package.

Respectfully,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Design Engineer

Kenneth A. Berry, PE, LLS
VP – Technical Operations

Christopher R. Berry, SIT
Principal, President

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July 6, 2023/Rev: September 25, 2023

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

RECEIVED
Planning Office
SEP 28 2023
Dover, New Hampshire

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 1.4' 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).

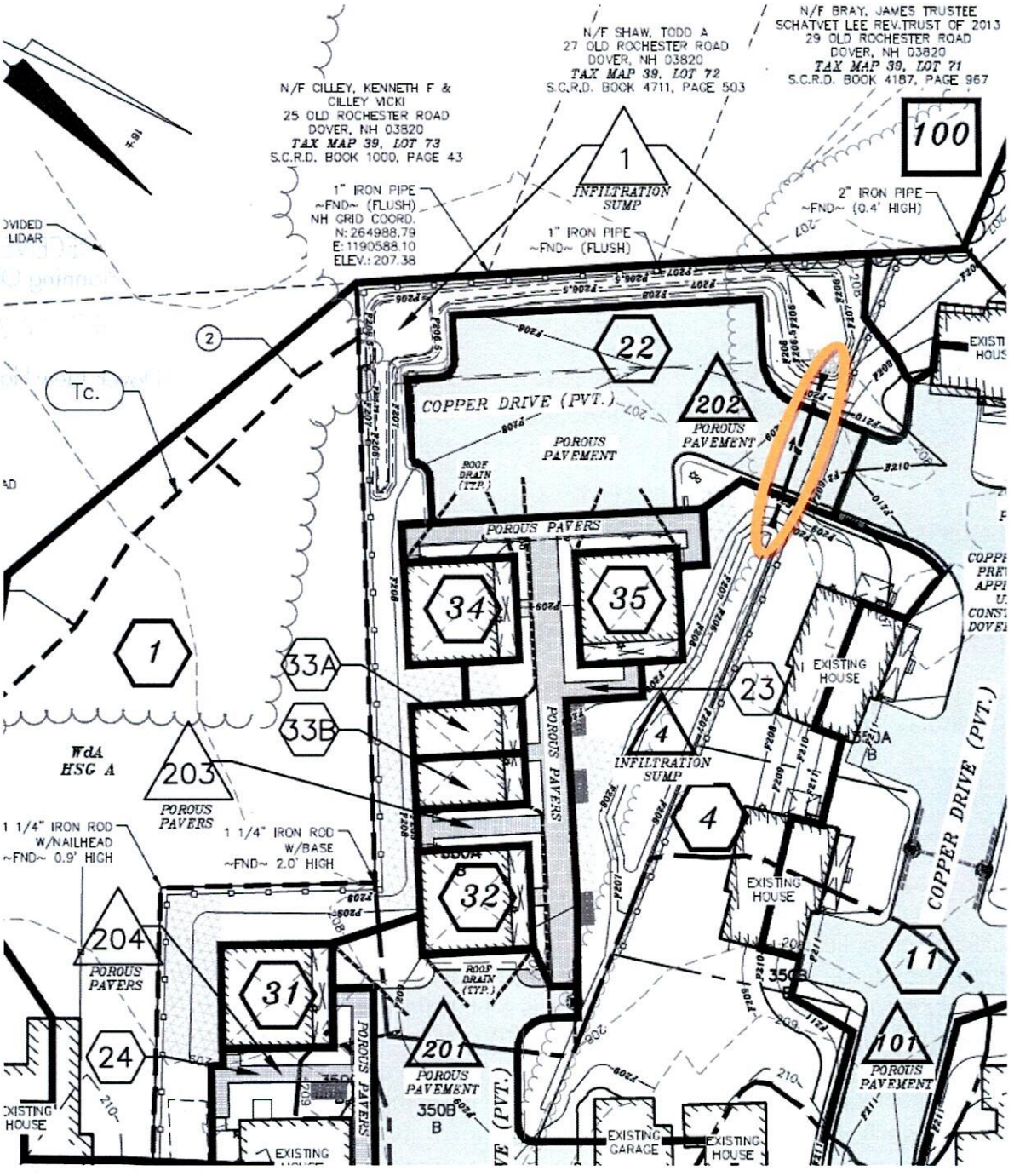

Image from W2-Proposed Watershed Plan showing the locations of Infiltration Sumps, Pond 4P and Pond 1P, in relation to the abutting property line.

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 1.6'+ 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.

In accordance with Site Plan Regulations Article 153-14-D(6), the following waiver is hereby requested:

1. Identification of Waiver Request: Illumination Ratio (Stat Zone #3) Site Plan Regulation 153-14-D(6)

- Proposed illumination ratio of 14:1 where 5:1 is required (Copper Drive parking spaces along property line).

2. Explanation:

The applicant is proposing to illuminate the site using a combination of stand-alone pole lights, residential wall packs on units, and bollard style lights at the rear of the Copper Drive parking lot. The applicant is not proposing stand-alone pole lights along the edge of the Copper Drive parking lot abutting single-family residences, instead is proposing the mentioned bollard style lights. This is due to proximity to abutting residential property lines, without lighting required to illuminate this parking spaces going over the property. These are mounted at a height so that the 6' vinyl fence shields the abutting residential property from lighting.

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 ensure safe access from parking lots to sidewalks/buildings. With a 6' perimeter white vinyl fence along the parking lot, outsider foot traffic is unlikely, especially given the proximity to the units. This parking lot is also low volume, as shown in the provided Traffic Impact Analysis, concerns with pedestrian and vehicle traffic are minimal. Sidewalk areas are illuminated.

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

Requiring the applicant to provide a minimum of 0.2 footcandles in the darkest parking space would pose an unnecessary hardship on the applicant. With sidewalks in the development being illuminated, residents and guests will be able to safely access units from their vehicles. The minimum required illumination of 0.2fc is provided, the ratio is not met due to the inability to place pole mounted lights without lighting the abutting residential property.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Christopher R. Berry
Principal, President

City of Dover, New Hampshire
CONDITIONAL USE PERMIT APPLICATION

[Revision Date: October 19, 2020]

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

APPLICANT AND OWNER INFORMATION

Name of Applicant: 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 39.1% where 60% is required.
2) Lot Building Coverage of 18.4% where 50% is required.
3) Not meeting front build-to line on New Rochester Road

Please see attached narrative, this application is for non-environmental CUP's only.

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

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: September 25, 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, followed by #4, 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 133 linear feet (LF). In addition to the eight single family homes on Copper Drive (two pre-existing, six under construction), the applicant is proposing to construct five duplex buildings (ten units) on Tax Map 39, Lot 103. This brings the total

yield for the subject parcel post lot merger to nineteen (19) units (ten duplex units and nine 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 18.4%. 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 39.1%. Without the ability to construct new homes along the frontage of New Rochester Road and the construction of Copper Drive and Ember Drive, the existing homes provide this 39.1% frontage buildout without further modifications.

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 > than 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 duplex 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 five duplex structures within 125 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 demolition and reconstruction of larger homes along New Rochester Road. With the applicant proposing to keeping these existing homes and the construction of approved Copper Drive and proposed Ember Drive, increasing the frontage build-out to 60% is not practical. Without modification of the existing single-family home on Lot 103, meeting the front build-to line on New Rochester Road is not practical.

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

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City of Dover, New Hampshire
CONDITIONAL USE PERMIT APPLICATION

[Revision Date: October 19, 2020]

RECEIVED
Planning Office
SEP 28 2023
Dover, New Hampshire

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:

Greater than 20% imp. in Secondary Groundwater Recharge Overlay (22.1%).

Please see attached narrative, this application is for environmental CUP only.

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.

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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:

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July 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
Conditional Use Permit Request (Environmental - one 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:

4) Greater than 20% Impervious in Secondary Groundwater Recharge Overlay

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 Permit Request #4 utilizes the standards of Chapter 170-28.E(4).

There is an existing single-family home at 34 New Rochester Road, proposed to remain. The proposal is to create a road (Nickel Drive) off of New Rochester Road and to extend Copper Drive 133 linear feet (LF). In addition to the eight single family homes on Copper Drive (two pre-existing, six under construction), the applicant is proposing to construct five duplex buildings (ten units) on Tax Map 39, Lot 103. This brings the total yield for the subject parcel post lot merger to nineteen (19) units (ten duplex units and nine single family units within the Gateway Zone).

1. Identification of Conditional Use Permits (CUP #4)
Chapter 170-28.E(4)

1.) Greater than 20% Impervious in Secondary Groundwater Recharge Overlay

The application is requesting a CUP to allow 22.1% impervious cover where no greater than 20% impervious coverage in the secondary groundwater district. Post lot merger, the subject parcel is to have 19,036 Sq. Ft of building coverage on the lot (18.4%), with remaining impervious surfaces consisting of pre-existing paved driveway, bituminous concrete and vertical granite curbing, and gravel shoulder for 3,923 Sq. Ft. (3.8%). All pavement and walkway surfaces within the development are proposed to be porous, removing pavement and walkway areas from impervious calculations. The roofs of the proposed duplex buildings will be equipped with gutters and downspouts, routed to porous pavement for infiltration.

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 (CUP #4)

(4) Conditional use permits. The PLANNING BOARD, after receiving a recommendation from the Conservation Commission, may vary the provisions herein by granting a conditional use permit in accordance with RSA 674:21. Along with the conditional use permit application, the APPLICANT shall submit expert technical information from a professional engineer, hydrologist or geologist that documents that the requested relief is consistent with the stated purpose and intent of this Chapter. Such technical information shall include an environmental protection plan consistent with the regulated substance management requirements of the NHDES's, "Best Management Practices for Groundwater Source Protection" (Part Env-Wq 401). Said plan shall also include provisions for routine monitoring and reporting of environmental protection activities to be reported to the City of Dover. Any cost incurred by the city in reviewing the groundwater protection information shall be paid by the APPLICANT for the conditional use application.

- **Env-Wq 401, Required Best Management Practices for Groundwater Protection, establishes best management practices for activities that are potential contamination sources, which are to be followed when using, storing, or**

otherwise handling regulated substances to minimize the risk for groundwater contamination (Env-Wq 401.01). The proposed residential use does not propose using, storing, or otherwise handling regulated substances upon completion. It is the opinion of the applicant that this submission is not applicable to the proposed project.

(i) Post-development infiltration volumes shall be no greater than predevelopment volumes as determined by use of the Development Review Model described in Section G, below.
The following is an excerpt from section 3.1 of the Drainage Narrative, demonstrating a reduction in post-development volumes from pre-development volumes at Final Reach #100 (project analysis point). This analysis compares the peak rate of runoff and volume of runoff generated by the area draining to the point of analysis in pre-duplex construction conditions to post duplex construction conditions, with stormwater mitigated by infiltration best management practices.

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	0.35	1.48	2.51	3.52	4.75

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	0.040	0.148	0.253	0.364	0.530

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

The following is an excerpt from section 5.0 of the Drainage Narrative, demonstrating pollutant removal efficiencies:

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%*

The porous pavement and porous paver systems accomplish the removal rate via filtration though the porous pavement filter media before infiltration into the earth.

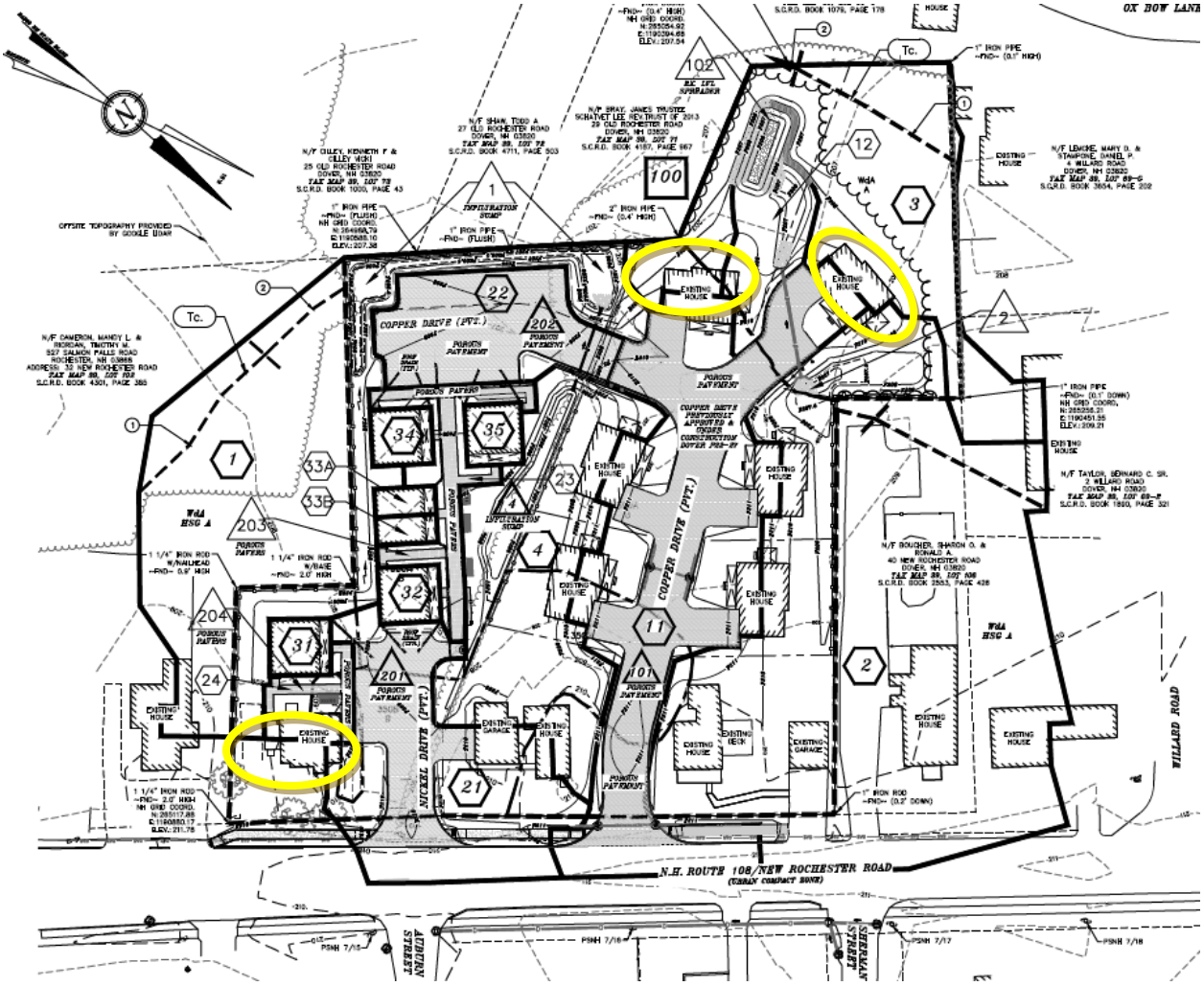
(iii) No stormwater infiltration system shall be located within the two hundred (200) day travel time of an existing or proposed municipal well as depicted on the map referenced in Section 170-28.3.B, above. In absence of a defined two hundred (200) day travel time radius, the APPLICANT shall submit a technical evaluation from a professional engineer, hydrologist or geologist that documents that the proposed discharge is consistent with the stated purpose and intent of this requirement.

The proposal does not rely on natural infiltration for treatment of impervious paved surfaces. Pollutants from the "first flush" (1" or rain or the water quality volume (WQV)) are treated through the filtration capabilities of porous pavement before being infiltrated into the ground. The applicant demonstrates compliance with the discharge consistent with the stated purpose and intent of this requirement by compliance with Chapter 170-28.3.(F).i and 170-28.3.(F).ii (prior two performance standards).

3. Justification for approval of Conditional Use Permits (CUP #4)

Given the underlying Gateway Zone requirement of 50% lot coverage, the applicant has attempted to maximize the building coverage of the lot, while minimizing impervious surfaces with the use of porous pavement and pavers. Proposed duplex units are equipped with gutters and downspouts, which route the roof stormwater runoff to porous pavement systems to be infiltrated. While the total project impervious coverage is 22.1%, the effective impervious area of the project is less than 20% due to the roof infiltration. With the exception of 1,341 Sq. Ft. of roof that does not infiltrate within the subject parcel, all remaining roof, curb, and gravel runoff volumes are infiltrated onsite. This results in an effective impervious area of 1,341 Sq. Ft (1.3%),

which is well under the 20% impervious threshold. Treatment of impervious surface is provided via filtration through porous surfaces before infiltration into the earth. The following image is from the W2-Proposed Conditions Watershed Plan with areas of roof that are not infiltrated within the subject parcel.



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(603) 332-2863 / (603) 335-4623 FAX
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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

Kenneth A. Berry, PE, LLS
Principal–VP Technical Operations

Christopher R. Berry, SIT
Principal, President

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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:

Greater than 20% imp. in Secondary Groundwater Recharge Overlay (22.1%).

Please see attached narrative, this application is for environmental CUP only.

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

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Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

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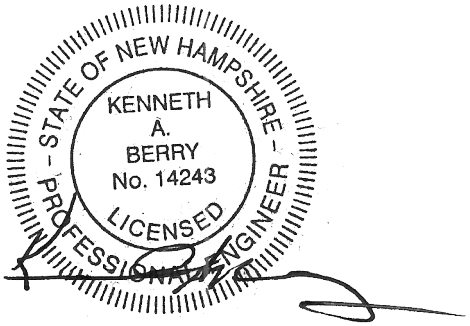
September 25, 2023

City of Dover
Community Services Department, Engineering Division
Attn: Mr. Kenneth Mavrogeorge, PE
271 Mast Road
Dover, NH 03820

Re: 34, 36, 38 Rochester Road Sidewalk Takeoff Calculation
Berry Surveying & Engineering
Knox Marsh Development, LLC (Copper & Ember Drive)
Tax Map 39, Lot 103
Planning File #SITE-2023-0007



Mr. Mavrogeorge,

This sheet is prepared to accompany the document titled "34, 36, 38 New Rochester Road Sidewalk Calculation Estimate" prepared on the City of Dover worksheet "Opinion of Probably Construction Cost". The intent of this document is to estimate the cost of concrete sidewalk construction along the frontage of 34, 36, & 38 New Rochester Road, in the event that this sidewalk is not constructed, and instead is constructed as part of the "Complete Streets" reconstruction of New Rochester Road. The idea of this calculation was discussed at the August 20, 2023 TRC meeting. Items such a mobilization, as built, SWPPP, site cleanup, or other typical construction monitoring items are not included in the cost. These items would be part of the general site construction if the sidewalk was to be constructed as shown on the plans at the time of the remaining construction.

Construction Expense Items

Item #1: Concrete Sidewalk

Concrete Sidewalk Calculations

- 1,150 Sq. Ft. of concrete sidewalk in subdivision = 127.8 SY
- Base Cost ($) 7,795.80 (Refer to "Opinion of Probably Construction Cost" Sheet)

Item #2: Common Excavation

Common Excavation Calculations

- 1,150 Sq. Ft. of concrete sidewalk in subdivision, cut 18" deep = 1,725 CF = 63.8CY
- Base Cost ($) 829.40 (Refer to "Opinion of Probably Construction Cost" Sheet)

Item #3: Crushed Gravel Backfill (NHDOT 304.3)

Crushed Gravel Backfill Calculations

- 1,150 Sq. Ft. of concrete sidewalk in subdivision, 12" deep = 1,150 CF = 42.6CY
- Base Cost ($) 1,363.20 (Refer to "Opinion of Probably Construction Cost" Sheet)

Item #4: Loam & Seed

Loam & Seed Calculations

- Assumed that 4' either side of sidewalk will require loam and seed, +/- 230 LF of sidewalk total. 230 LF * 4' * 4' = 3,680 SF loam and seed = 408.9 SY
- Base Cost ($) 4,906.80 (Refer to "Opinion of Probably Construction Cost" Sheet)
- BS&E has substituted $12 per SY as opposed to the $27 per SY provided in the table. This has been done based upon researching other municipalities bond templates and internet research.

Item #5: Reset Granite Curb

Curb Reset Calculations

- Assumed that 20 LF of curbing will need to be reset at each roadway tipdown (4)
- This results in 80 LF of granite curbing to be reset
- Base Cost ($) 1,920 (Refer to "Opinion of Probably Construction Cost" Sheet)

Item #5: Truncated Domes

Truncated Dome Calculations

- Five (5) truncated domes shown on the Site Plan
- Base Cost ($) 253.97 per Found from W.W. Grainger, Inc ($1,269.85 total)

Results within ADA warning pads. ADA Warning Pads - Grainger Industrial Supply. (n.d.). https://www.grainger.com/search/safety/traffic-safety/ada-warning-pads?tv_optin=false&searchQuery=truncated%2Bdome%2Bmats&tier=Not%2BApplicable&gucid=N%3AN%3APS%3APaid%3AGGL%3ACSM-2294%3AGN4Z6X%3A20500731&gclid=CjwKCAjw38SoBhB6EiwA8EQVLpuWotx0QhC2Y2V9czsPixTMszvXa6jXJ1sfuV9wyNyik6iBcZ0CTxoCO5YQAvD_BwE&gclsrc=aw.ds

This results in an estimated costs of sidewalk construction of $18,085.05, and with a 15% contingency resulting in a construction cost of $20,797.81.

Please feel free to reach out with questions regarding the sidewalk takeoff calculation.

Respectfully,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT
Principal, President

Kenneth A. Berry, PE, LLS
VP – Technical Operations

Kevin R. Poulin, PE
Design Engineer

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

Opinion of Probable Construction Cost

PROJECT NAME & ADDRESS: 34, 36, 38 New Rochester Road Sidewalk Calculation
DATE: September 25, 2023
MAP & LOT: 39, Lot 103
The intent of this sheet is to provide individual costing values associated with the sidewalk construction

Description	Quantity	Unit	2022 Unit Price	Total
Site Preparation				
Clearing & Grubbing		AC	$12,627.00	$ -
Removal of Pipe Lines ≤ 24"		LF	$17.00	$ -
Removal of Pipe Lines > 24"		LF	$93.00	$ -
Common Excavation	63.8	CY	$13.00	$ 829.40
Unsuitable Excavation		CY	$27.00	$ -
Ledge Excavation		CY	$110.00	$ -
Saw Cut Pavement		LF	$4.00	$ -
Roads				
Granular/Common Fill		CY	$32.00	$ -
Gravel Backfill (304.2)		CY	$23.00	$ -
Crushed Gravel (304.3)	42.6	CY	$32.00	$ 1,363.20
Crushed Stone - Fine Gradation (304.4)		CY	$40.00	$ -
Crushed Stone - Coarse Gradation (304.5)		CY	$44.00	$ -
Hot Bituminous Pavement - Hand Method		TON	$186.00	$ -
Hot Bituminous Pavement - Machine Method		TON	$121.00	$ -
Pavement Prep for Top Coat if placed over 1 yr after Base Coat		SY	$1.00	$ -
Cold Plane		SY	$3.00	$ -
Reclaim Pavement		SY	$4.00	$ -
Fine Grading		SY	$3.00	$ -
Concrete Sidewalk 4"	127.8	SY	$61.00	$ 7,795.80
Bituminous Sidewalk 3"		SY	$60.00	$ -
Straight Granite Curb		LF	$38.00	$ -
Curved Granite Curb		LF	$46.00	$ -
Reset Granite Curb	80	LF	$24.00	$ 1,920.00
Bituminous Curb, Type B 6" Reveal		LF	$9.00	$ -
Traffic Sign with Post		EA	$66.00	$ -
Lightpole Base and Fixture		EA	$7,425.00	$ -
Cobra Head Light onto Existing Pole		EA	$1,100.00	$ -
Conduit <6 "		LF	$196.00	$ -
Traffic Loop Detectors		EA	$825.00	$ -
Retroflective Paint Marking - 4" Line		LF	$1.00	$ -
Retroflective Paint Pavement Marking - Symbol or Word		SF	$4.00	$ -
Retroflective Thermoplastic Pavement Marking - ≤ 12" Line		LF	$3.00	$ -
Retroflective Thermoplastic Pavement Marking - Symbol		SF	$11.00	$ -
Obliterate Pavement Marking - ≤12" Line		LF	$1.00	$ -
Guardrail (Steel rail and posts)		LF	$31.00	$ -
Structural				
Mechanically Stabilized Earth Retaining Wall		SF	$62.00	$ -
Retaining Wall - Modular Block		SF	$50.00	$ -
Utilities				

Catch Basin with Frame, Grate & Hood		EA	$4,000.00	$ -
Special Catch Basins (i.e. Tree Box Filters)		EA	$2,915.00	$ -
Box Culvert ≤ 36' x 60'		LF	$1000.00	$ -
Box Culvert ≥ 36' x 60'		LF	$660.00	$ -
Drop Inlet		EA	$2,475.00	$ -
MH - 4'		EA	$3,229.00	$ -
MH - 5'		EA	$4,607.00	$ -
MH - 6'		EA	$4,859.00	$ -
MH - 8'		EA	$8,250.00	$ -
Remove and Reset CB, DI Grate and Frame		EA	$551.00	$ -
Reconstruct / Adjust Drainage Manholes		EA	$712.00	$ -
Outlet/Inlet Control Structure		EA	$770.00	$ -
Riprap		CY	$55.00	$ -
Perf Underdrain ≤ 6"		LF	$55.00	$ -
Perf Underdrain > 6"		LF	$85.00	$ -
12" RC Pipe - Class III		LF	$74.00	$ -
15" RC Pipe - Class IV		LF	$80.00	$ -
18" RC Pipe - Class IV		LF	$104.00	$ -
24" RC Pipe - Class IV		LF	$105.00	$ -
30" RC Pipe - Class IV		LF	$174.00	$ -
36" RC Pipe - Class IV		LF	$233.00	$ -
48" RC Pipe - Class V		LF	$402.00	$ -
12" RCP - End Sections		EA	$789.00	$ -
15" RCP - End Sections		EA	$901.00	$ -
18" RCP - End Sections		EA	$972.00	$ -
24" RCP - End Sections		EA	$1287.00	$ -
30" RCP - End Sections		EA	$1,348.00	$ -
36" RCP - End Sections		EA	$1,400.00	$ -
48" RCP - End Sections		EA	$1,700.00	$ -
12" Plastic Corrugated/Smooth Pipe		LF	$121.00	$ -
15" Plastic Corrugated/Smooth Pipe		LF	$64.00	$ -
18" Plastic Corrugated/Smooth Pipe		LF	$131.00	$ -
24" Plastic Corrugated/Smooth Pipe		LF	$117.00	$ -
30" Plastic Corrugated/Smooth Pipe		LF	$155.00	$ -
36" Plastic Corrugated/Smooth Pipe		LF	$100.00	$ -
12" Flared End Sections		EA	$432.00	$ -
15" Flared End Sections		EA	$250.00	$ -
18" Flared End Sections		EA	$550.00	$ -
24" Flared End Sections		EA	$645.00	$ -
30" Flared End Sections		EA	$750.00	$ -
36" Flared End Sections		EA	$610.00	$ -
PVC Gravity Main ≤ 8"		LF	$65.00	$ -
PVC Gravity Main > 8"		LF	$90.00	$ -
PVC Service Pipe and Fittings		LF	$74.00	$ -
PVC Forcemain Pipe ≤ 3"		LF	$30.00	$ -
PVC Forcemain Pipe > 3"		LF	$51.00	$ -
Reconstruct / Adjust Sewer Manholes		EA	$712.00	$ -
Manhole Covers and Frames (Drainage and Sewer)		EA	$688.00	$ -
6" Cement Lined Ductile Iron Water Pipe CL 52		LF	$146.00	$ -
8" Cement Lined Ductile Iron Water Pipe CL 52		LF	$192.00	$ -
12" Cement Lined Ductile Iron Water Pipe CL 52		LF	$246.00	$ -
20" Cement Lined Ductile Iron Water Pipe CL 52		LF	$140.00	$ -
3/4" Copper/HDPE Water Pipe		LF	$46.00	$ -

1" Copper/HDPE Water Pipe		LF	$95.00	$	-
2" Copper/HDPE Water Pipe		LF	$94.00	$	-
Curb Stop		EA	$465.00	$	-
Fittings		EA	$796.00	$	-
6" Gate Valve		EA	$1,442.00	$	-
8" Gate Valve		EA	$2,475.00	$	-
12" Gate Valve		EA	$3,776.00	$	-
Chlorine Injection Tap		EA	$1815.00	$	-
Hydrant		EA	$4,785.00	$	-
Drilled Wells		LF	$13.00	$	-
Electrical Tansformers/Cabinets with Pads		EA	$20,000.00	$	-
Subdivision Electrification		LF	$21.00	$	-
Site Stabilization/Landscaping					
Silt Fence (or equal)		LF	$4.00	$	-
Intet Protection		EA	$103.00	$	-
Storm Water Pollution Prevention Plan (SWPPP)		EA	$6,539.00	$	-
Monitor SWPPP		WK	$101.00	$	-
Temporary Safety Fence/Snow Fence/Construction Limits		LF	$6.00	$	-
Chain Link/Stockade Fence - 5'		LF	$57.00	$	-
New Trees - Deciduous - General		EA	$990.00	$	-
New Trees - Evergreen Cedar		EA	$750.00	$	-
Shrubs - Large		EA	$125.00	$	-
Shrubs - Small		EA	$100.00	$	-
Rain Garden or Gravel Wetland		SF	$11.00	$	-
Loam and Seed	408.9	SY	$12.00	$	4,906.80
Sod		SY	$9.00	$	-
Mulch		CY	$100.00	$	-
Hay Bales - Temporary Erosion Control		LF	$35.00	$	-
Quality Control					
Physical Testing Laboratory Services		AC	$15,000.00	$	-
Flagger		HR	$46.00	$	-
Project Documentation					
As-Built Drawing ($2,000 min total)		EA	$7,500.00	$	-
Staking/Monumentation/Record Drawings Prep ($1,000 min total)		EA	$2500.00	$	-
Site Maintenance					
Site Clean Up (Removal of Construction Materials/Debris)		AC	$6,100.00	$	-
Clean out Catch Basins (Vac-Truck)		HR	$126.00	$	-
Dumpster (20 CY - 4 Ton)		WK	$550.00	$	-
Demolition					
Specialized or Site Specific Demolition ($1,100 min)		LS	$1,100.00	$	-
Specialty Requirements per N.O.D.					
Mobilization/Demobilization		5% of total			
Cost from outside source					
Truncated Domes	5	EA	$253.97	$	1,269.85
			Total (not including Mob)	$	18,085.05
			15% Contingency	$	2,712.76
			Total	$	20,797.81

Notes:

1. This estimate may not be fully comprehensive and does not relieve the contractor or developer from obligations necessary to complete work
2. Unit cost of pipes inlcude cost of bedding materials
3. Prices related to ashphalt are volatile. Prices may need to be routinetly updated.

NOTICE OF MERGER

This notice of Merger is made this _____ day of _____, 202___. Be it known that Robert Baldwin of Knox Marsh Development LLC being the owner(s) of Tax Map 39, Lot 104, a parcel described in deed Book 5092, Page 613 recorded at the Strafford County Registry of Deeds and Tax Map 39, Lot 103, a parcel described in deed book 5116, page 655 recorded at the Strafford County Registry of Deeds has/have requested that said parcels be merged. The landowner(s) certify (ies) that the above described lots have at least one common boundary and are located in the City of Dover, NH, in the County of Strafford.

The above described lots shall not be conveyed as individual lots, but shall be conveyed as one. The intent is that any common boundaries between or among the lots shall be abandoned. The resulting merged lot may only be subdivided upon approval by the Planning Board based on the regulations existing at the time of application for the subdivision.

It is further understood that the above described lots shall be assessed as one lot for property tax evaluation purposes.

The owner(s) of the above described parcels has/have notified all mortgage holders for the above described parcels that said parcels are being merged and the owner(s) accepts full liability for this merger.

The Planning Board of the City of Dover, New Hampshire has signed this Notice of Merger as required by RSA 674:39-a and accepts no liability for this merger.

_____ _____
Owner Signature Witness

_____
(Print owner name)

_____ _____
Owner Signature Witness

_____
(Print owner name)

_____ _____
Owner Signature Witness

_____
(Print owner name)

_____ _____
Gina Cruikshank - Planning Board Chair Witness

EVERSOURCE ENERGY

September 20, 2023

1700 Lafayette Road
Portsmouth, NH 03801

Trevor S Emmons
603-332-7515
Trevor.emmons@eversource.com

Robert Baldwin
Knox Marsh Development LLC
242 Central Avenue
Dover, NH, 03820

Dear Robert Baldwin, Knox Marsh Development:

I am responding to your request to confirm the availability of electric service for the proposed 34 New Rochester Road, Ember Drive and extension to Copper Drive, a project being constructed for/by Knox Marsh Development LLC.

The proposed project consists of 5 residential duplex's and an existing single-family house, a total of 11 residential units. The proposed development will be constructed along New Rochester Road.

The developer will be responsible for the installation of all underground/overhead facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan Copper Drive & Nickel Drive. The proposed building service will be fed from a new riser pole to loop with new Copper Drive which will be determined by Eversource Engineering as depicted on utility plan Copper Drive & Nickel Drive. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground/overhead facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawing titled "Utility Plan Copper Drive & Nickel Drive" dated 7/6/2023, shows transformer locations to service your proposed project.

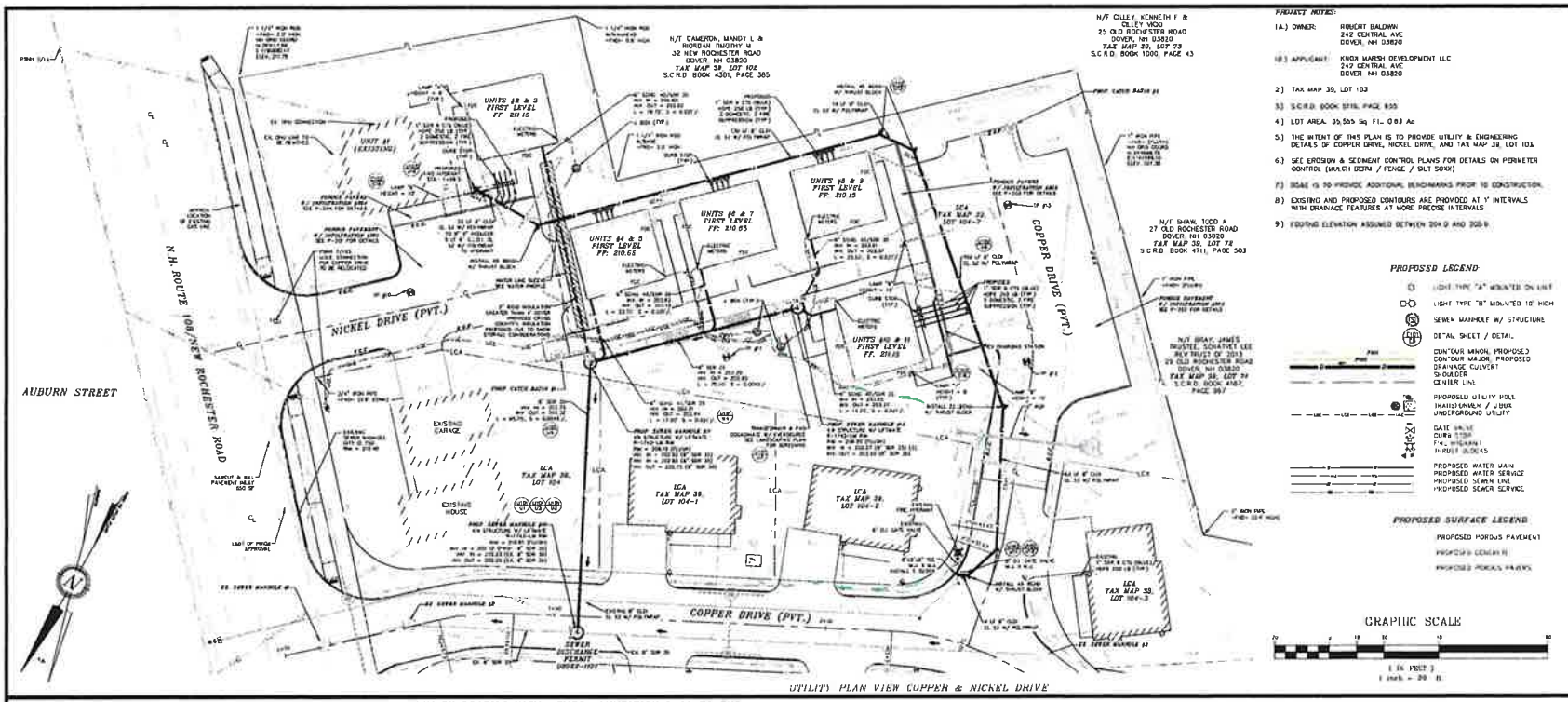
Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

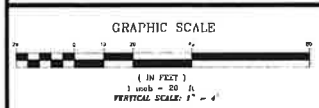
If you require additional information or I can be of further assistance please do not hesitate to contact me at our Rochester Office, 603-332-7515

Respectfully.

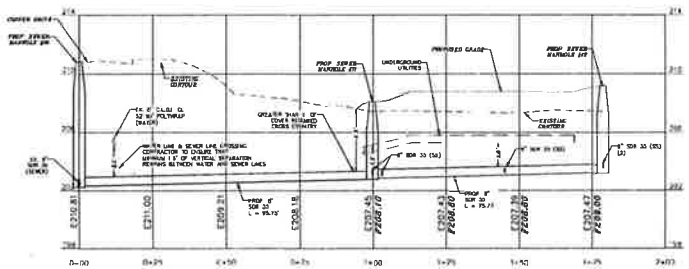
Trevor Emmons
Eastern Regional Engineer, Eversource

cc: Michael J. Busby, PE, Eastern Regional Engineering and Design Manager, Eversource
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource

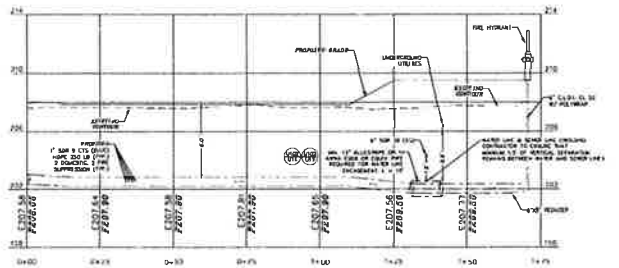




UTILITY PROFILE VIEW SEWER CONNECTION 0+00 TO END



UTILITY PROFILE VIEW WATER CONNECTION 0+00 TO END



DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

UTILITY PLAN COPPER DRIVE & NICKEL DRIVE
-AND 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

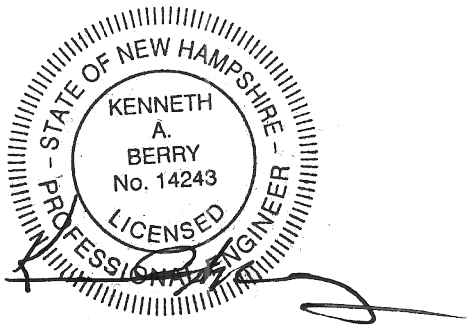
SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO : DB 2023 - 053

NOT FOR CONSTRUCTION

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

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 & Nickel 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 six previously approved single-family homes, two pre-existing homes on Lot 104 and one pre-existing on Lot 103, and five duplex structures (ten units) on Tax Map 39, Lots 103 & 104, for a total of nineteen (19) 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 Nickel Drive and New Rochester Road. The existing single-family driveway 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 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 2 vehicle trips (0 enter/2 exit) are predicted to occur at the weekday AM peak hour and 3 vehicle trips (2 enter/1 exit) at the PM peak hour for Nickel 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 72 weekday vehicle trips, 5 weekday AM peak hour vehicle trips, and 7 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 five new duplex units, in addition to a single-family home on site to remain, for a total of eleven 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). 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 nineteen (19), with trip generation divided between two access points based upon parking/access location. The five (5) duplex structures (ten units) are considered single family-attached housing and the nine (9) 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 447 LF in length (new extension) 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 Nickel Drive, with 25-foot pavement entrance radii for vehicle turning. Nickel Drive is proposed to be 132 LF in length. Nickel Drive is proposed to be aligned with Auburn Street to create a two-way stop-controlled intersection. In order to construct Nickel Drive, the applicant is proposing to remove two existing single family home driveway cuts (Lot 1003 & Lot 104) from New Rochester Road. The centerline of Nickel 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 & Nickel Drive that will be discussed later in the analysis.

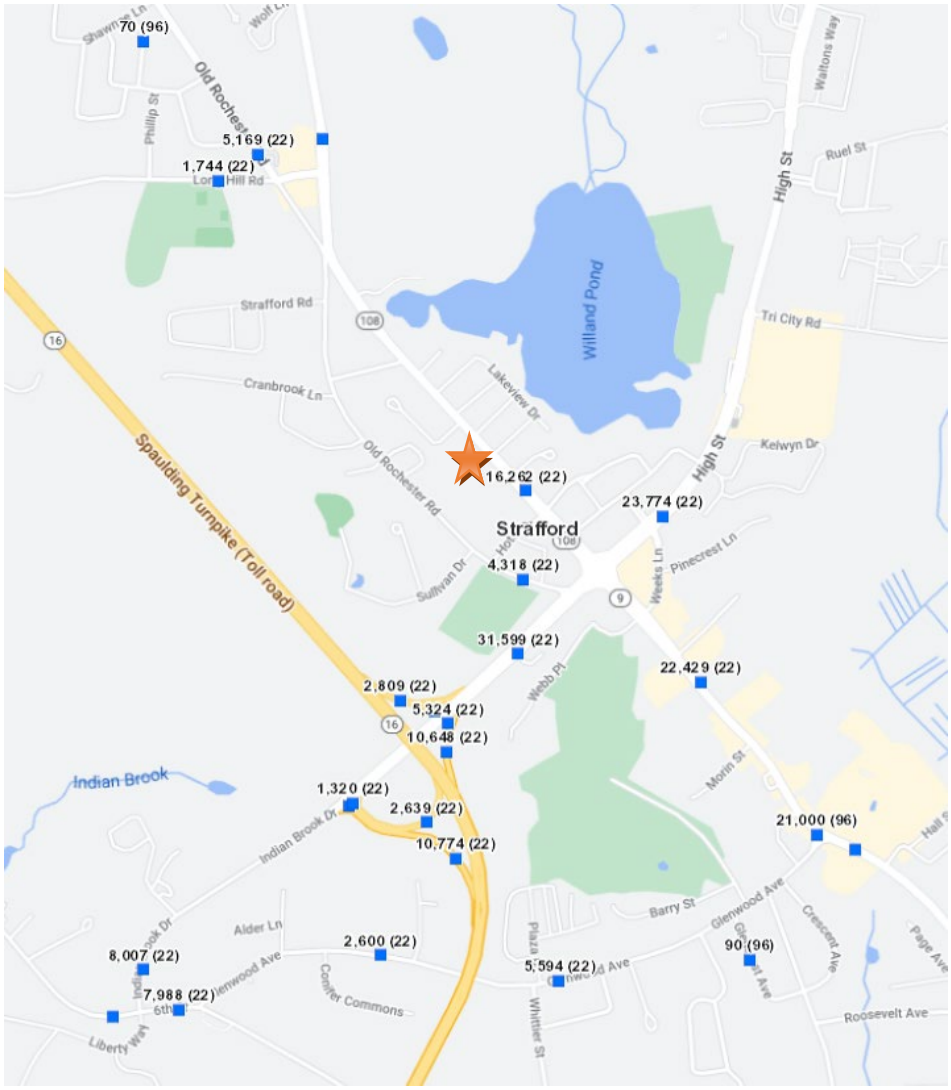

Figure 1: New Rochester Road with surrounding roadways (NHDOT)

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)

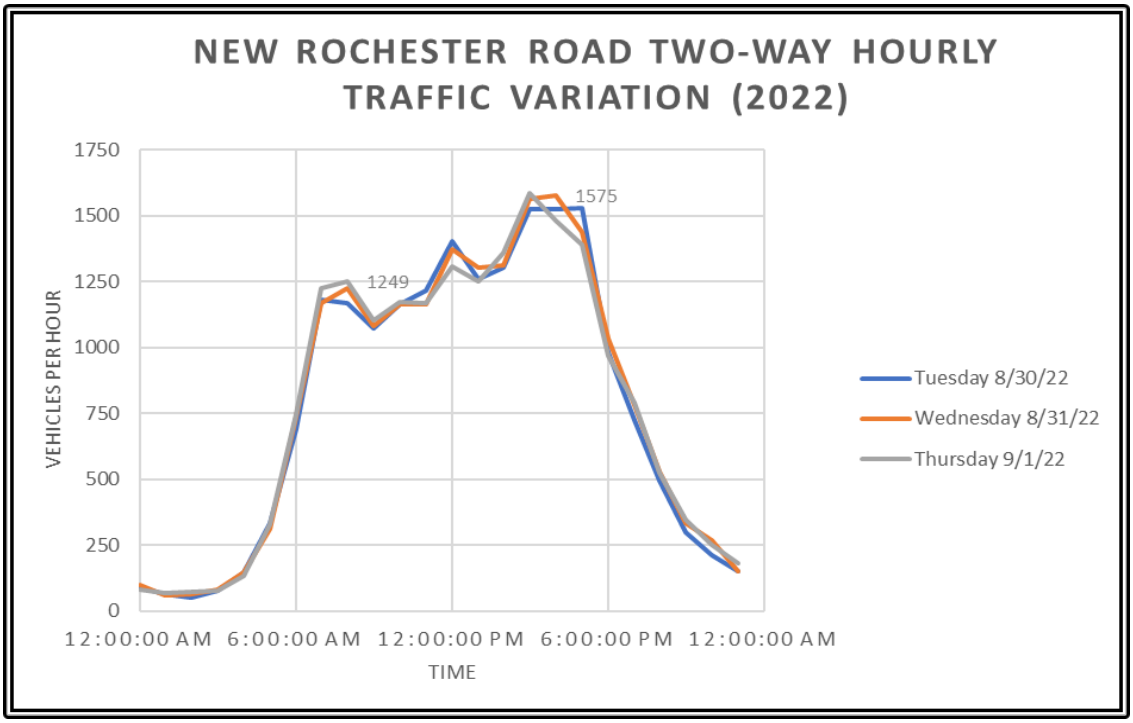

Figure 2: New Rochester Road 2022 two-way hourly variation

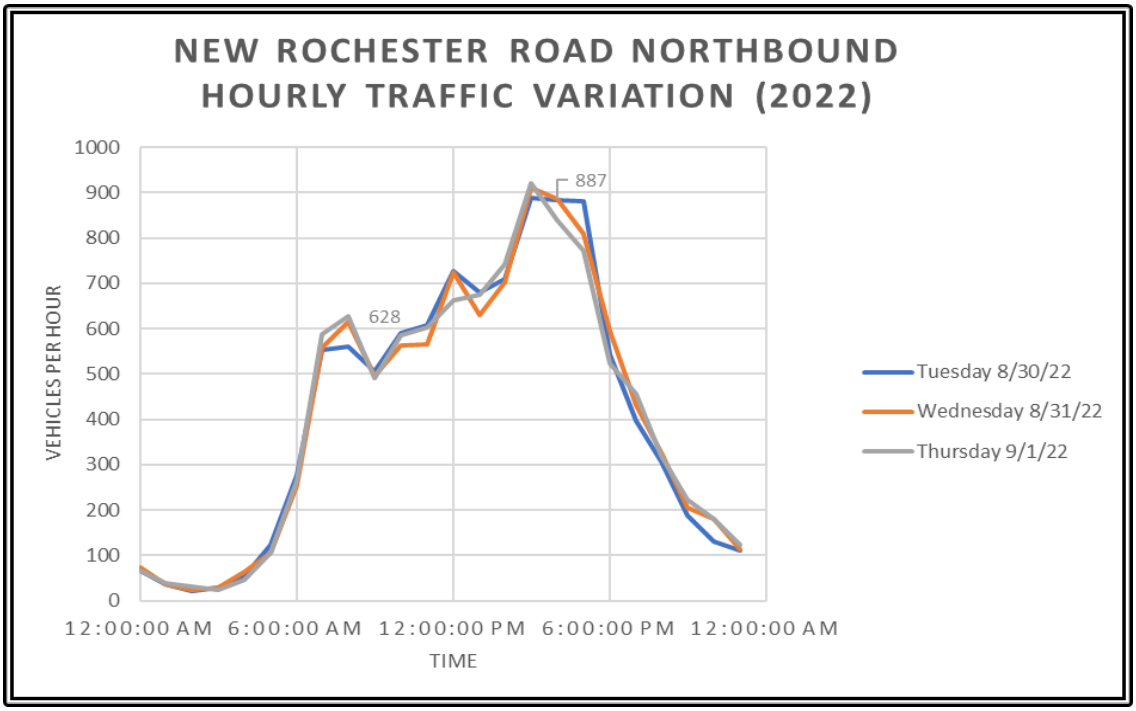

Figure 3: New Rochester Road 2022 northbound hourly variation

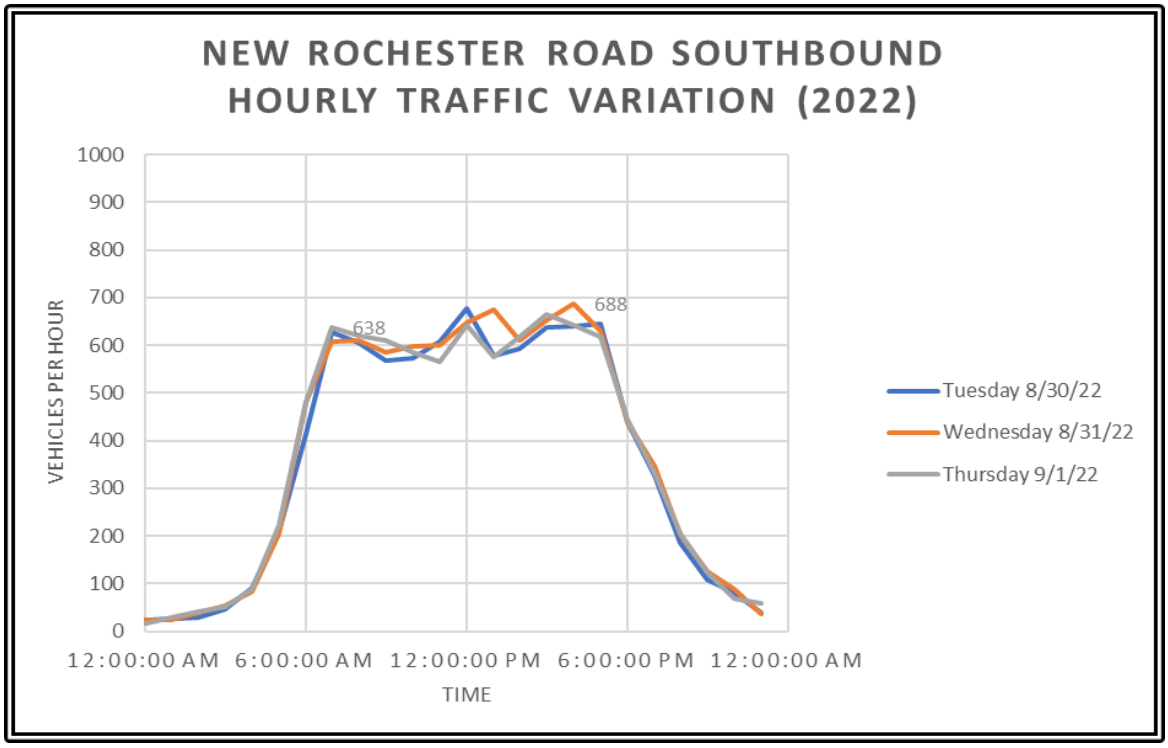

Figure 4: New Rochester Road 2022 southbound hourly variation with peak values

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 Nickel 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 Nickel 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 Nickel 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 Nickel 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	7			# Units	7			# Units	7		
Avg. Rate	9.43			Avg. Rate	0.70			Avg. Rate	0.94		
Total Trips	66			Total Trips	5			Total Trips	7		
% Enter	50	Total Enter	33	% Enter	25	Total Enter	1	% Enter	63	Total Enter	4
% Exit	50	Total Exit	33	% Exit	75	Total Exit	4	% Exit	37	Total Exit	3

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	8			# Units	8			# Units	8		
Avg. Rate	7.20			Avg. Rate	0.48			Avg. Rate	0.57		
Total Trips	58			Total Trips	4			Total Trips	5		
% Enter	50	Total Enter	29	% Enter	25	Total Enter	1	% Enter	59	Total Enter	3
% Exit	50	Total Exit	29	% Exit	75	Total Exit	3	% Exit	41	Total Exit	2

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	124			Total Trips	9			Total Trips	12		
% Enter	50	Total Enter	62	% Enter	25	Total Enter	2	% Enter	58	Total Enter	7
% Exit	50	Total Exit	62	% Exit	75	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 Nickel 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	2			# Units	2			# Units	2		
Avg. Rate	9.43			Avg. Rate	0.70			Avg. Rate	0.94		
Total Trips	19			Total Trips	1			Total Trips	2		
% Enter	50	Total Enter	9	% Enter	25	Total Enter	0	% Enter	63	Total Enter	1
% Exit	50	Total Exit	10	% Exit	75	Total Exit	1	% Exit	37	Total Exit	1

Table 7: (Nickel Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Single Family Attached Housing Nickel 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	2			# Units	2			# Units	2		
Avg. Rate	7.20			Avg. Rate	0.48			Avg. Rate	0.57		
Total Trips	14			Total Trips	1			Total Trips	1		
% Enter	50	Total Enter	7	% Enter	25	Total Enter	0	% Enter	59	Total Enter	1
% Exit	50	Total Exit	7	% Exit	75	Total Exit	1	% Exit	41	Total Exit	0

Table 8: (Nickel Drive) Peak hr of adjacent street traffic AM, PM, & weekday total

Total Trip Generation Nickel 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	33			Total Trips	2			Total Trips	3		
% Enter	50	Total Enter	16	% Enter	25	Total Enter	0	% Enter	67	Total Enter	2
% Exit	50	Total Exit	17	% Exit	75	Total Exit	2	% Exit	33	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	157			Total Trips	11			Total Trips	15		
% Enter	50	Total Enter	78	% Enter	25	Total Enter	2	% Enter	60	Total Enter	9
% Exit	50	Total Exit	79	% Exit	75	Total Exit	9	% Exit	40	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	72
Weekday AM Peak Hour	5
Weekday PM Peak Hour	7

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 22 in Appendix C. Figures 5 and 6 show the build turning movements to and from Copper & Nickel 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 14-16 and 23-25. A visual of these turning movements is shown in the following figures.

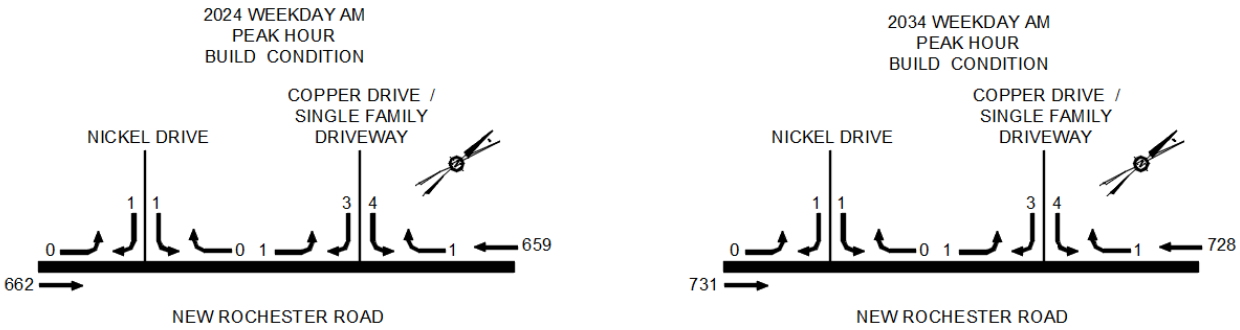

Figure 5: 2024 & 2034 build projected traffic volumes & turn movement weekday AM peak

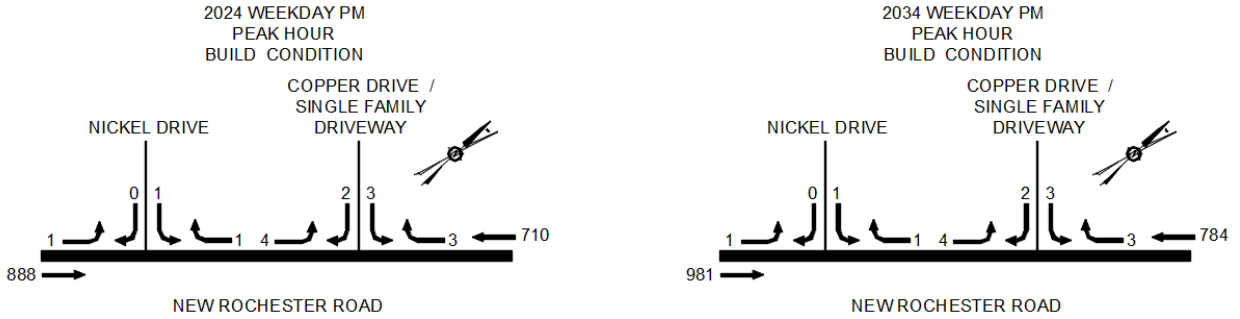

Figure 6: 2024 & 2034 build projected traffic volumes & turn movement weekday PM peak

Tables 12-15 show in a tabular format the total trips that are calculated to occur to and from Copper Drive & Nickel 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	2			
Trips Enter from NH Rt 108 Northbound		0.0	Left	0.0
Trips Enter from NH Rt 108 Southbound		0.0	Right	0.0
Trips Exit to NH Rt 108 Northbound		1.0	Left	50.1
Trips Exit to NH Rt 108 Southbound		1.0	Right	49.9

Table 14: Weekday AM peak hour build turning movements to and from Nickel Drive

Time	PM Peak Hour	# Trips	Turn Type	% Distribution
Total Trips	3			
Trips Enter from NH Rt 108 Northbound		1.1	Left	37.1
Trips Enter from NH Rt 108 Southbound		0.9	Right	29.6
Trips Exit to NH Rt 108 Northbound		0.6	Left	18.5
Trips Exit to NH Rt 108 Southbound		0.4	Right	14.8

Table 15: Weekday PM peak hour build turning movements to and from Nickel 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 trips are to occur turning left into the site during the weekday AM peak hour and 1 trip during the PM peak hour for Nickel Drive. Nickel Drive AM peak hour calculations are not provided as the calculated number was 0 left hand turns. The projection of the traffic volumes and data used to conduct the left-turn bay warrant analyses are included in Appendix B as Figures 14-16. The full warrant analyses can be found in Appendix B as Figures 17-22. Tables 16-18 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 Nickel 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)

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)	1	1
Advancing Volume (NB) (L+TR+R)	890	983
Opposing Volume (SB) (TR+R)	711	785
Percent Lefts	0.12%	0.11%
85th Percentile Speed (MPH)	45	45
Limiting Adv. Volume (veh/hr)	2,127	2,077
Left-Turn Bay Warranted	NO	NO

Table 18: Weekday PM peak hour NCHRP 457 left-turn bay analysis (Nickel)

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 0 trips are to occur turning right into the site during the weekday AM peak hour and 1 trip during the PM peak hour for Nickel Drive. Nickel Drive AM peak hour calculations are not provided as the calculated number was 0 right hand turns. The projection of the traffic volumes and data used to conduct the right-turn bay warrant analyses are included in Appendix B as Figures 23-25. The full warrant analyses can be found in Appendix B as Figures 26-31. Tables 19-21 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 Nickel 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)	678	749
85th Percentile Speed (MPH)	45	45
Limiting Right-Turn Volume (veh/hr)	25	21
Right-Turn Bay Warranted	NO	NO

Table 19: 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)	877	968
85th Percentile Speed (MPH)	45	45
Limiting Right-Turn Volume (veh/hr)	15	13
Right-Turn Bay Warranted	NO	NO

Table 20: Weekday PM 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)	1	1
Advancing Volume (SB) (L+TR+R)	877	968
85th Percentile Speed (MPH)	45	45
Limiting Right-Turn Volume (veh/hr)	23	19
Right-Turn Bay Warranted	NO	NO

Table 21: Weekday PM peak hour NCHRP 457 right-turn bay analysis (Nickel)

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 Nickel 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 2 vehicle trips (0 enter/2 exit) are predicted to occur at the weekday AM peak hour and 3 vehicle trips (2 enter/1 exit) at the PM peak hour for Nickel 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 72 weekday vehicle trips, 5 weekday AM peak hour vehicle trips, and 7 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

Christopher R. Berry, SIT
Principal, President

Kenneth A. Berry, PE, LLS,
CPSWQ, CPESC, CESSWI
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Appendix A

Traffic Counts

New Hampshire DOT Department of Transportation

TCDS Help MS2

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

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	1.1	0.9	872.7	0.13
2023	879	879.4	1.1	0.9	881.4	0.13
2024	888	888.2	1.1	0.9	890.2	0.12
2025	897	897.0	1.1	0.9	899.0	0.12
2026	906	906.0	1.1	0.9	908.0	0.12
2027	915	915.1	1.1	0.9	917.1	0.12
2028	924	924.2	1.1	0.9	926.2	0.12
2029	933	933.5	1.1	0.9	935.5	0.12
2030	943	942.8	1.1	0.9	944.8	0.12
2031	952	952.2	1.1	0.9	954.2	0.12
2032	962	961.8	1.1	0.9	963.8	0.12
2033	971	971.4	1.1	0.9	973.4	0.11
2034	981	981.1	1.1	0.9	983.1	0.11
Year	Opposing Volume	Opposing Volume Peaked (TR)	Right Turns (R)		Total Opposing Volume (TR+R)	
2022	696	695.7	0.9		696.6	
2023	703	702.6	0.9		703.5	
2024	710	709.6	0.9		710.5	
2025	717	716.7	0.9		717.6	
2026	724	723.9	0.9		724.8	
2027	731	731.2	0.9		732.0	
2028	738	738.5	0.9		739.4	
2029	746	745.8	0.9		746.7	
2030	753	753.3	0.9		754.2	
2031	761	760.8	0.9		761.7	
2032	768	768.4	0.9		769.3	
2033	776	776.1	0.9		777.0	
2034	784	783.9	0.9		784.8	
Seasonal Peaking Factor (August)		1.00				

Figure 16: Data used for Weekday PM peak hour left-turn warrant analyses Nickel 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.

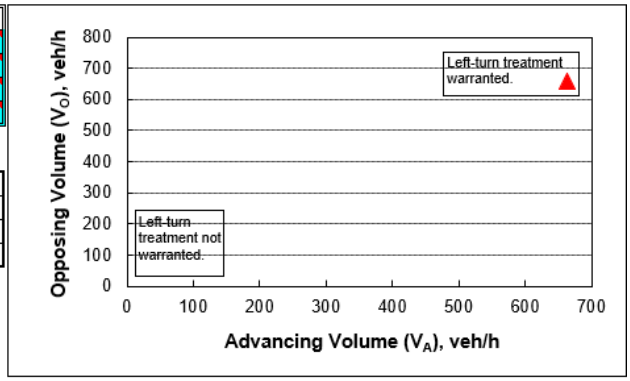
2-lane roadway (English)

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 17: 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.

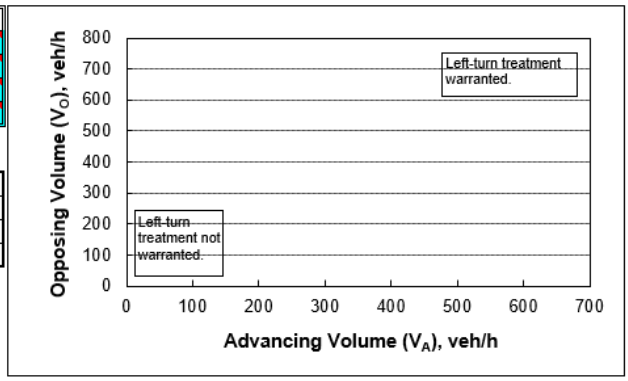
2-lane roadway (English)

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 18: 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.

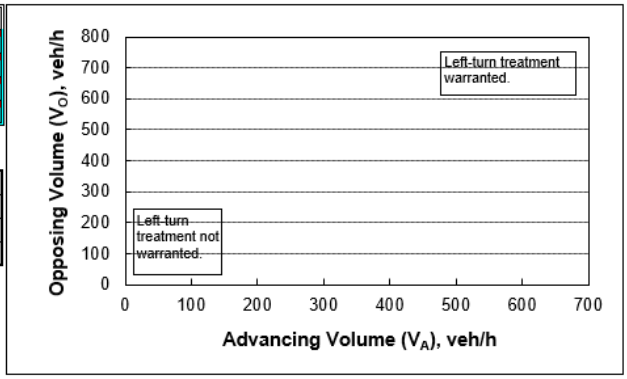
2-lane roadway (English)

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 19: 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.

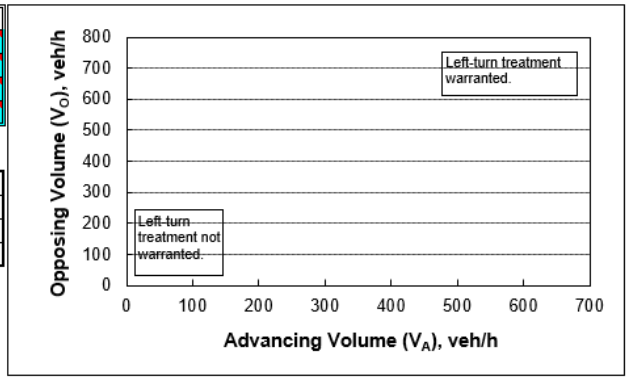
2-lane roadway (English)

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 20: 2034 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.

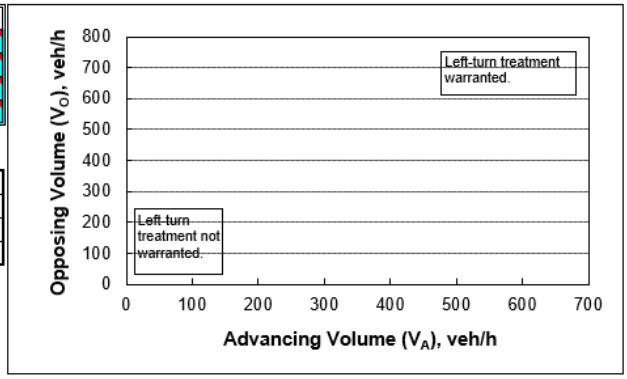
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	890
Opposing volume (V_O), veh/h:	711

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2127
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 21: 2024 Weekday PM peak hour NCHRP 457 left-turn bay warrant analysis Nickel Dr

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

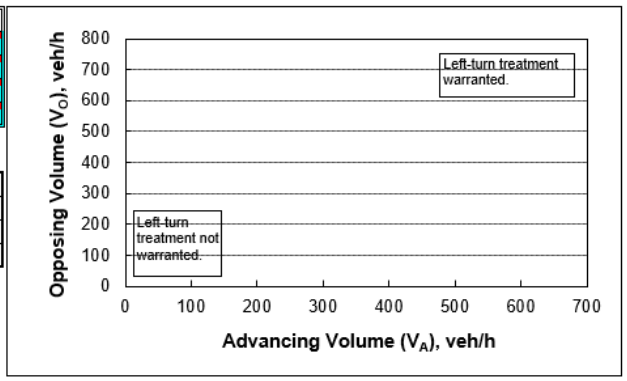
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	983
Opposing volume (V_O), veh/h:	785

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2077
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 22: 2034 Weekday PM peak hour NCHRP 457 left-turn bay warrant analysis Nickel 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 23: 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 24: Data used for Weekday PM 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	1.1	0.9	697.7
2023	703	702.6	1.1	0.9	704.6
2024	710	709.6	1.1	0.9	711.6
2025	717	716.7	1.1	0.9	718.7
2026	724	723.9	1.1	0.9	725.9
2027	731	731.2	1.1	0.9	733.2
2028	738	738.5	1.1	0.9	740.5
2029	746	745.8	1.1	0.9	747.8
2030	753	753.3	1.1	0.9	755.3
2031	761	760.8	1.1	0.9	762.8
2032	768	768.4	1.1	0.9	770.4
2033	776	776.1	1.1	0.9	778.1
2034	784	783.9	1.1	0.9	785.9
Seasonal Peaking Factor (August)		1.00			

Figure 25: Data used for Weekday PM peak hour right-turn warrant analyses Nickel 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:	654
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.	

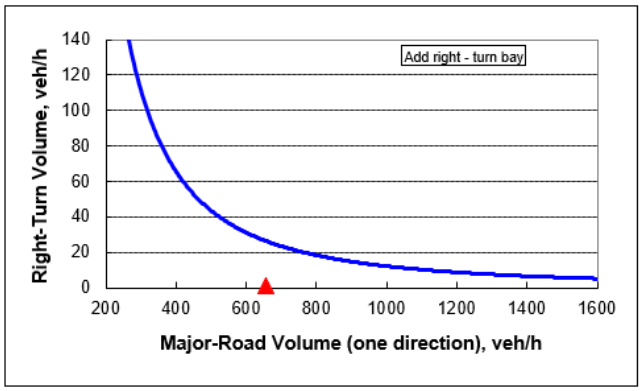


Figure 26: 2024 Weekday AM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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.	

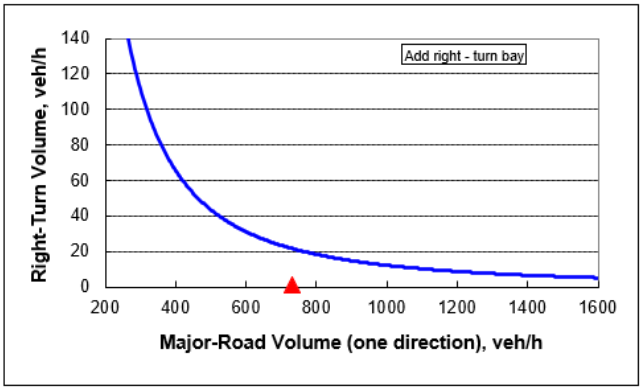


Figure 27: 2034 Weekday AM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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:	710
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	23
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

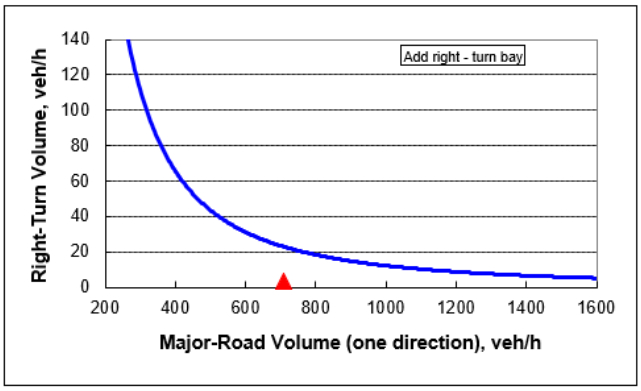


Figure 28: 2024 Weekday PM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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.	

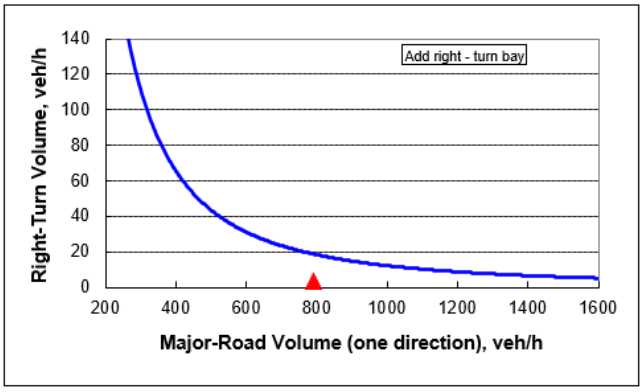


Figure 29: 2034 Weekday PM peak hour NCHRP 457 right-turn bay warrant analysis Copper Dr

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:	705
Right-turn volume, veh/h:	1

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	23
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

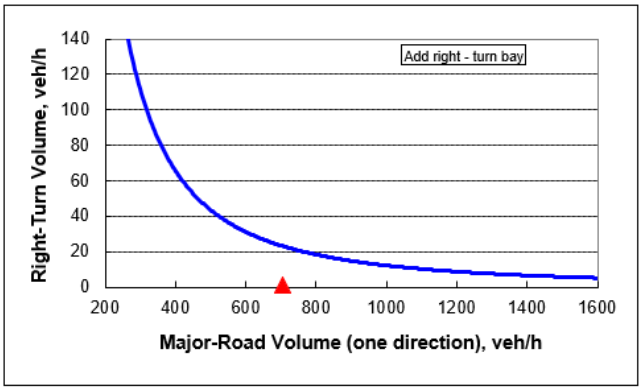


Figure 30: 2024 Weekday PM peak hour NCHRP 457 right-turn bay warrant analysis Nickel Dr

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:	786
Right-turn volume, veh/h:	1

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.	

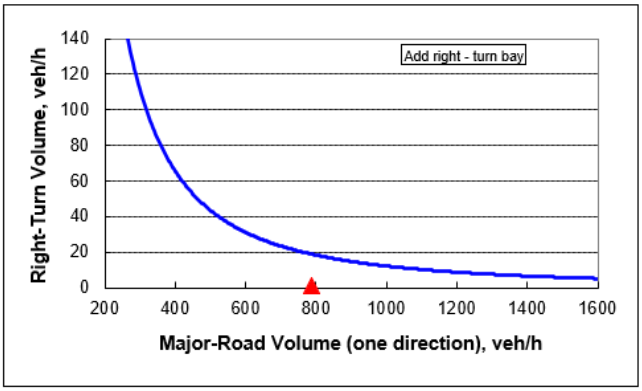


Figure 31: 2034 Weekday PM peak hour NCHRP 457 right-turn bay warrant analysis Nickel Dr

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 22: 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 32: 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 33: ITE Trip Generation, 11th Edition

Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation

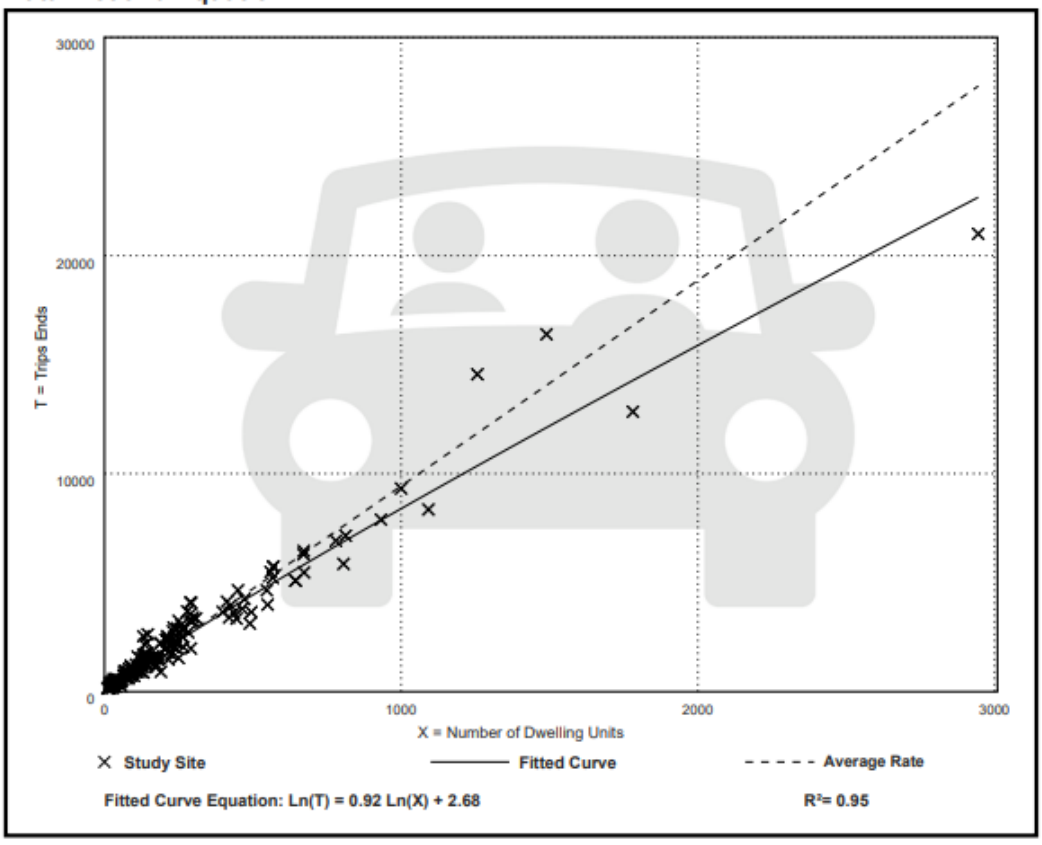


Figure 34: ITE Trip Generation, 11th Edition

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

Single-Family Detached Housing
(210)

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: General Urban/Suburban
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation

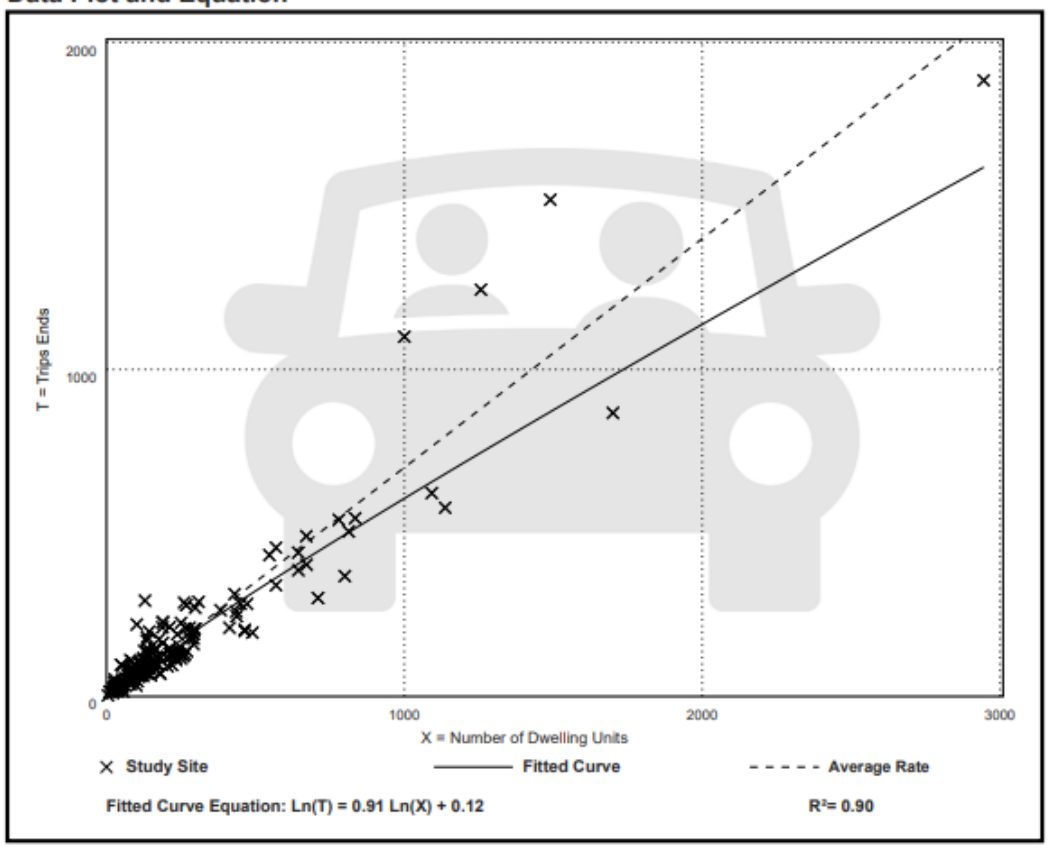


Figure 35: ITE Trip Generation, 11th Edition

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

Single-Family Detached Housing
(210)

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: General Urban/Suburban
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation

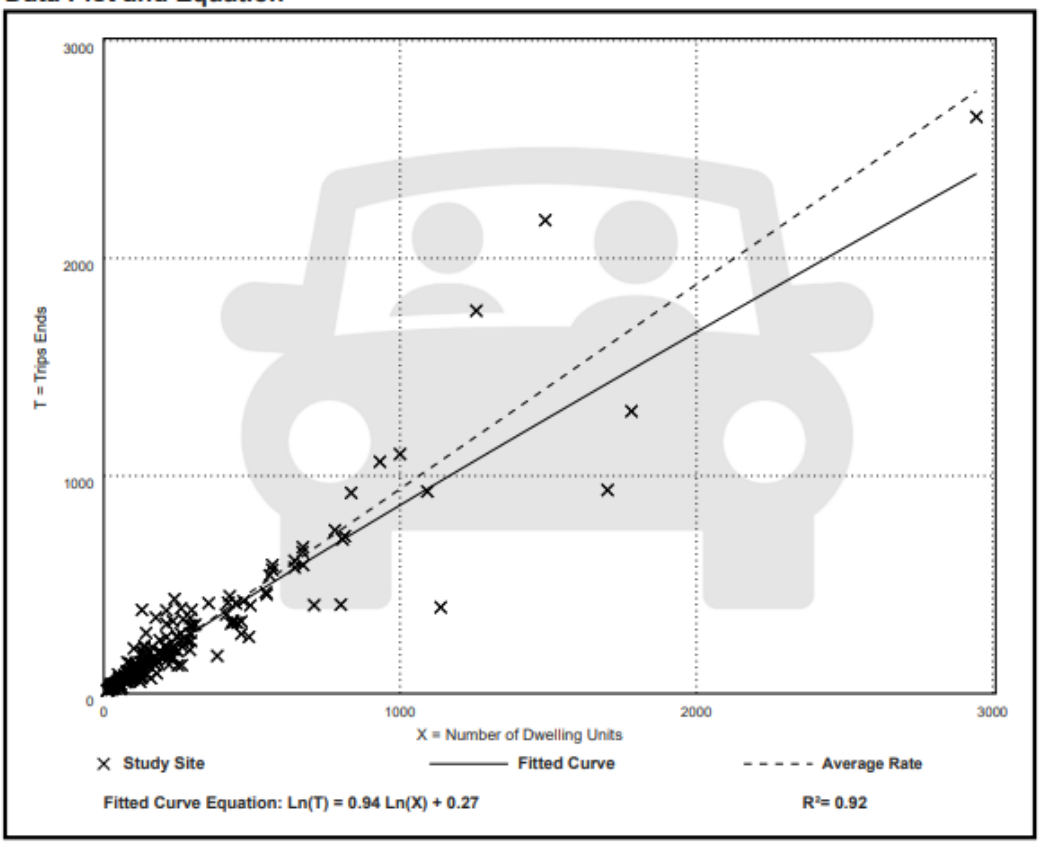


Figure 36: ITE Trip Generation, 11th Edition

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

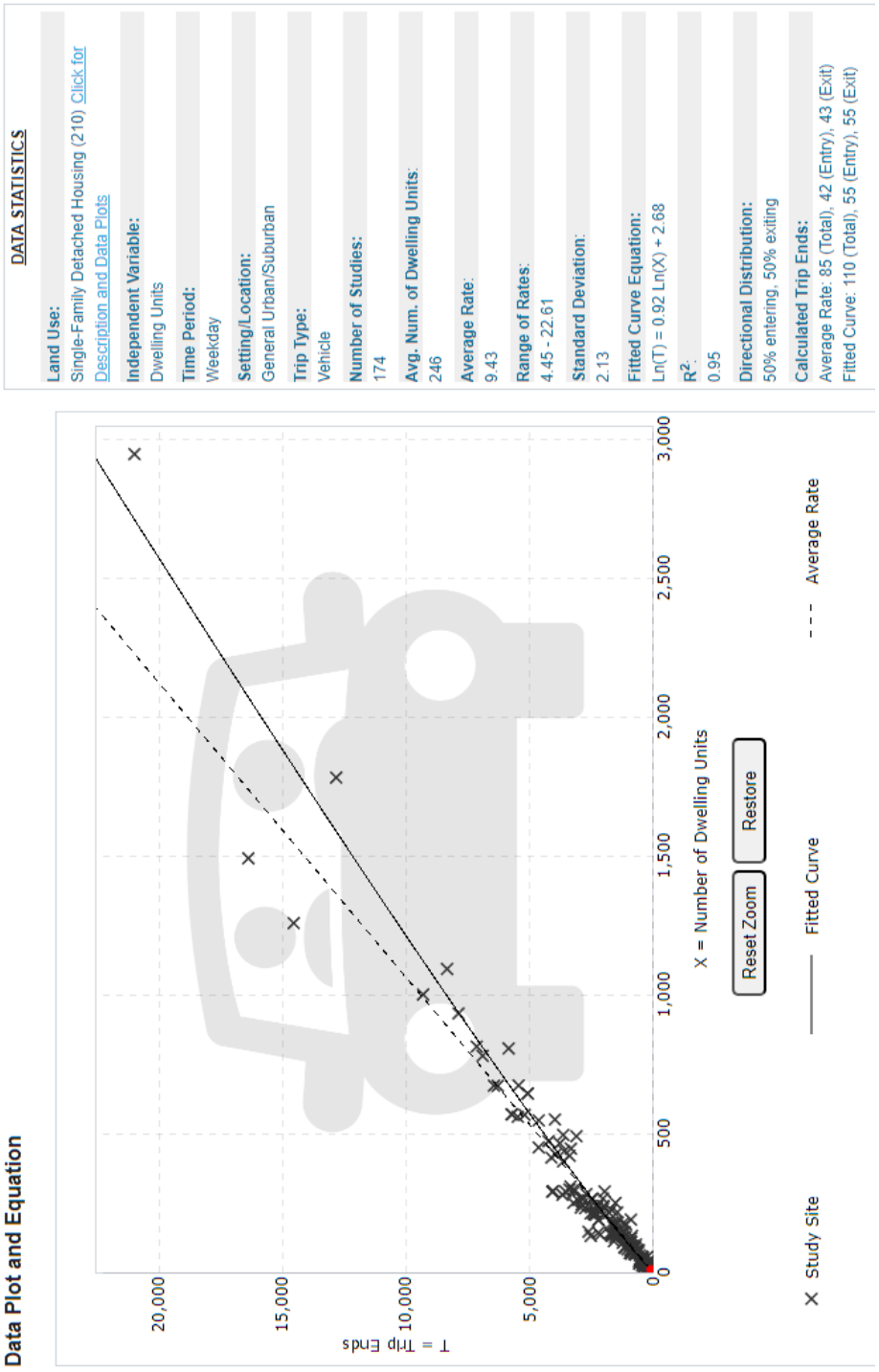


Figure 37: ITE Trip Generation, 11th Edition

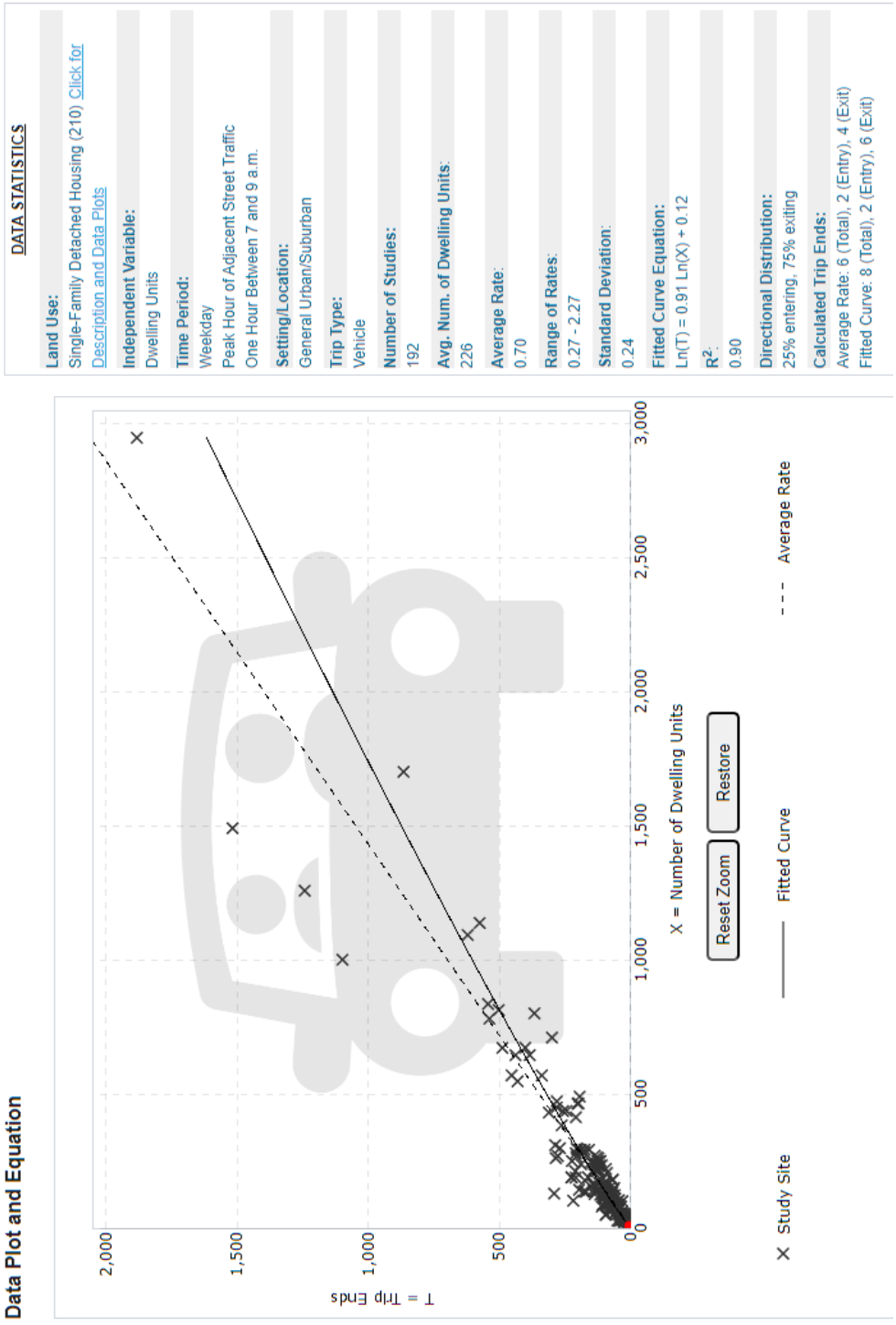


Figure 38: ITE Trip Generation, 11th Edition

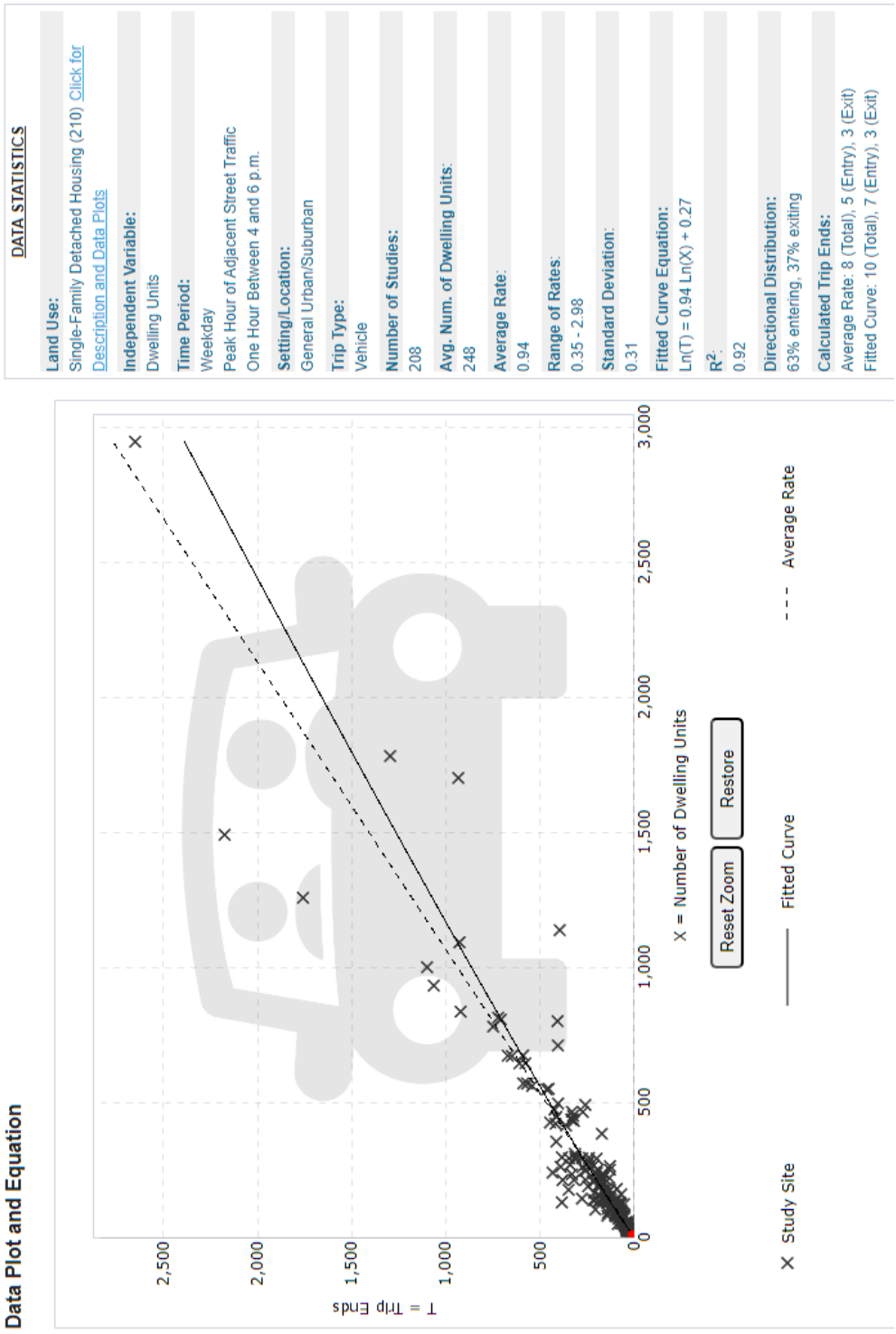


Figure 39: ITE Trip Generation, 11th Edition

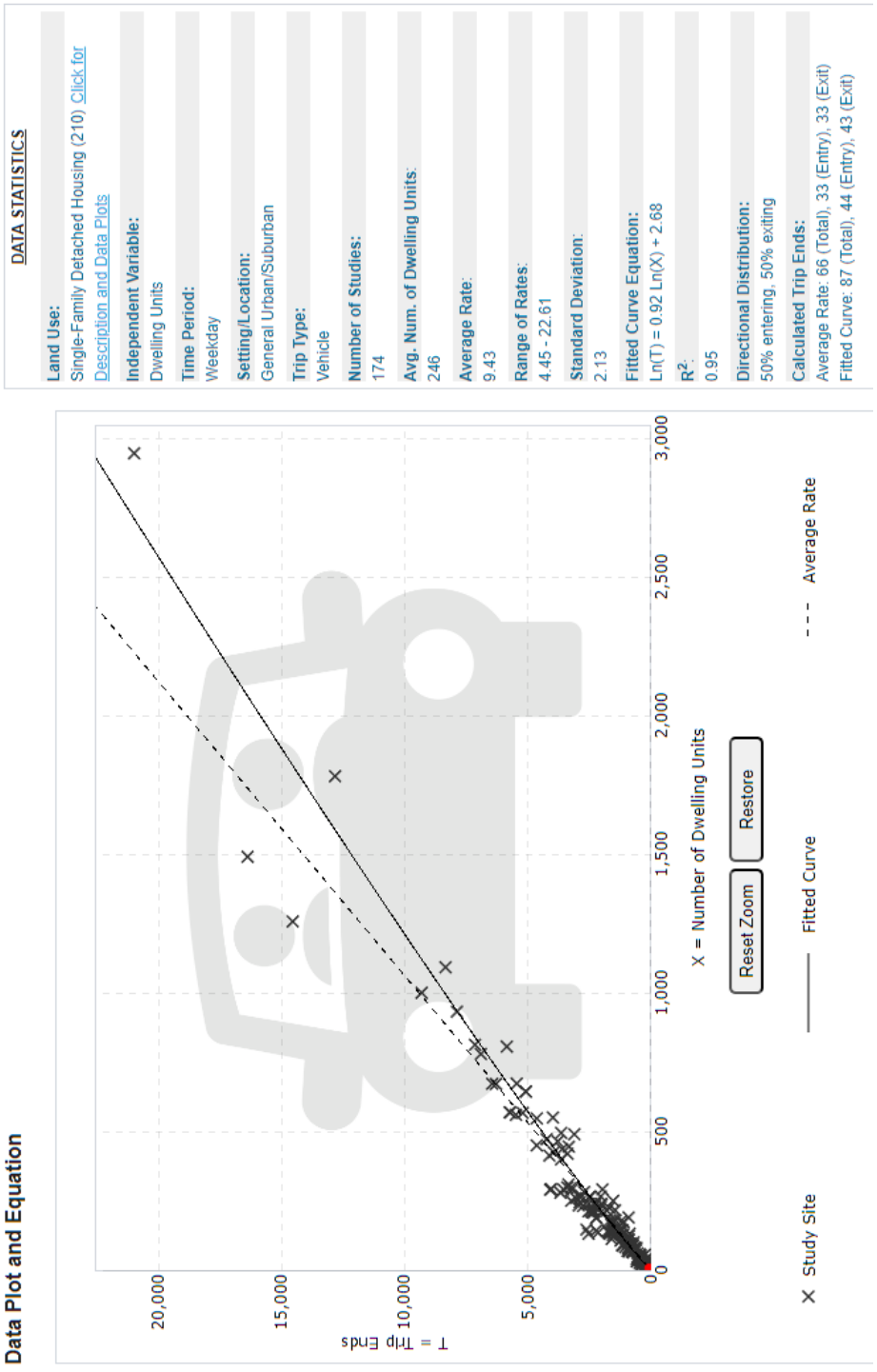


Figure 40: ITE Trip Generation, 11th Edition

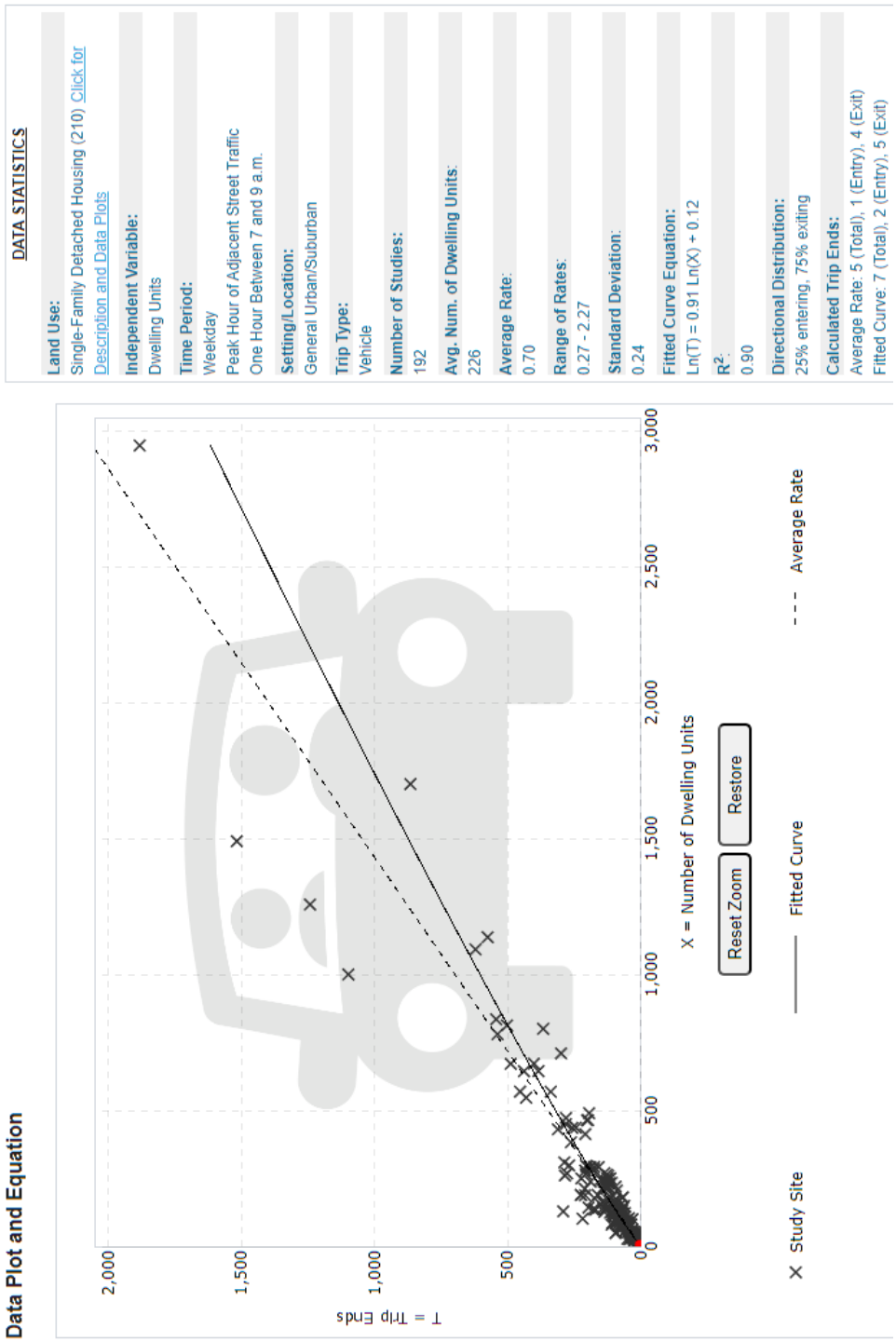


Figure 41: ITE Trip Generation, 11th Edition

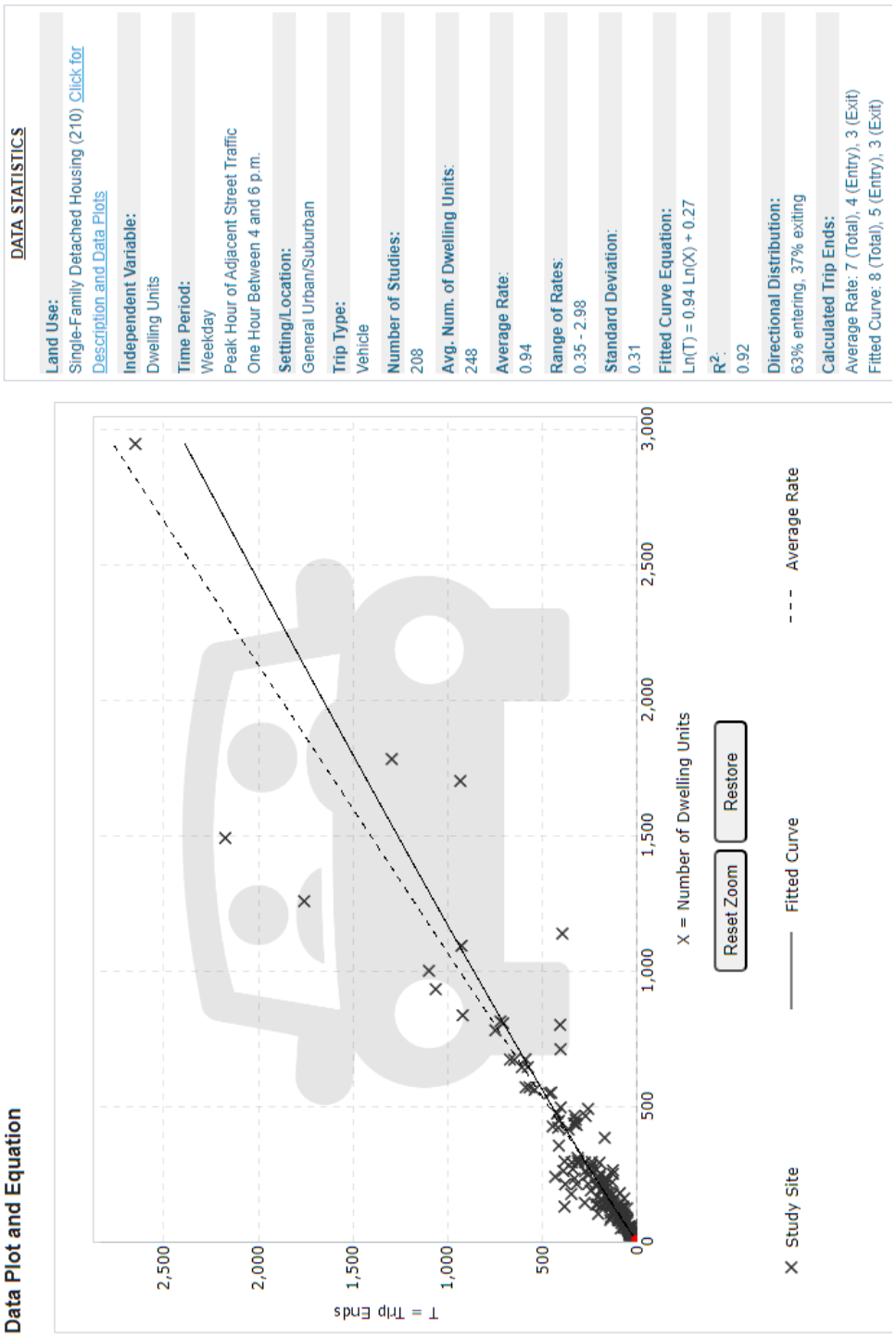


Figure 42: ITE Trip Generation, 11th Edition

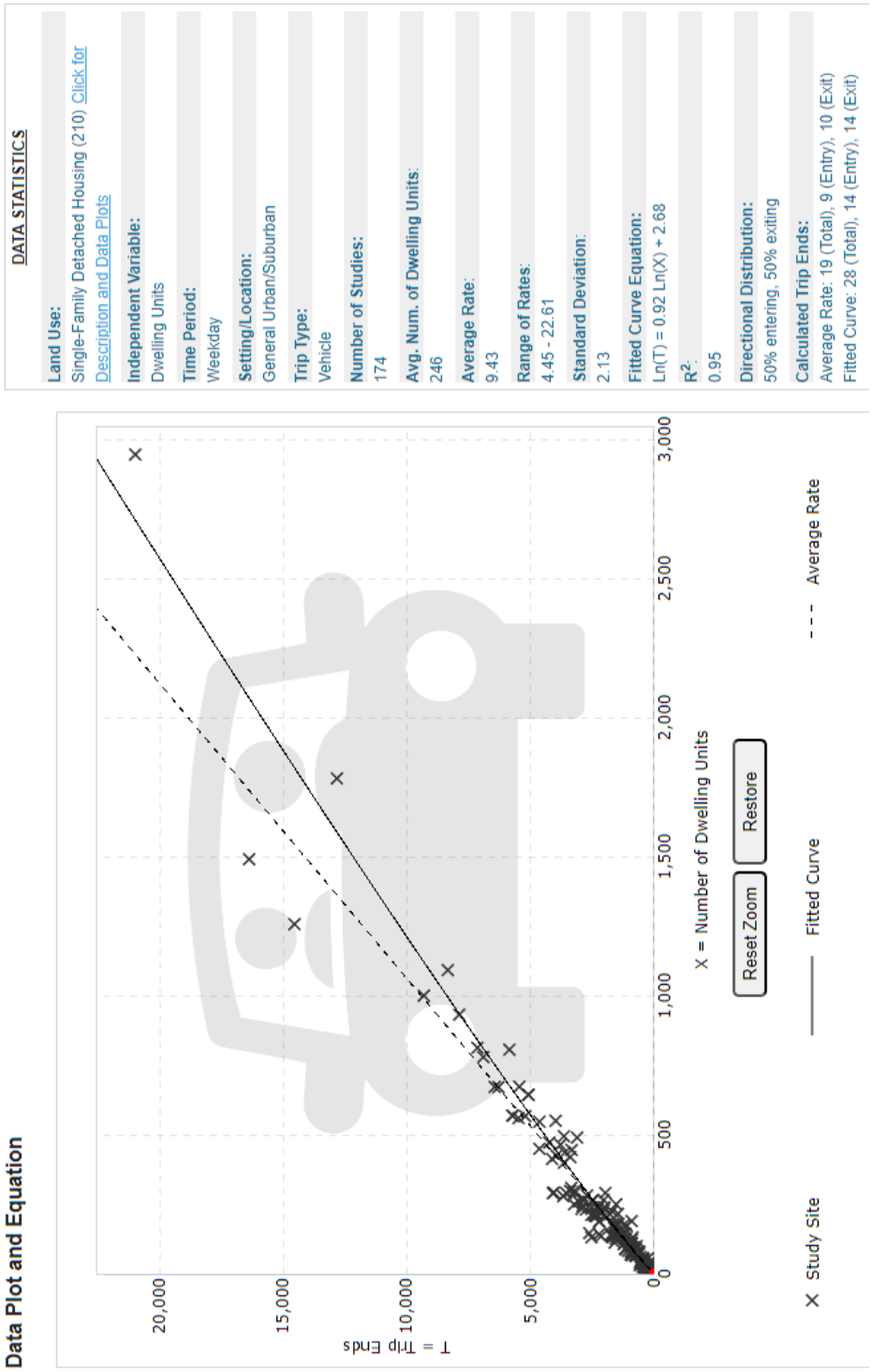


Figure 43: ITE Trip Generation, 11th Edition

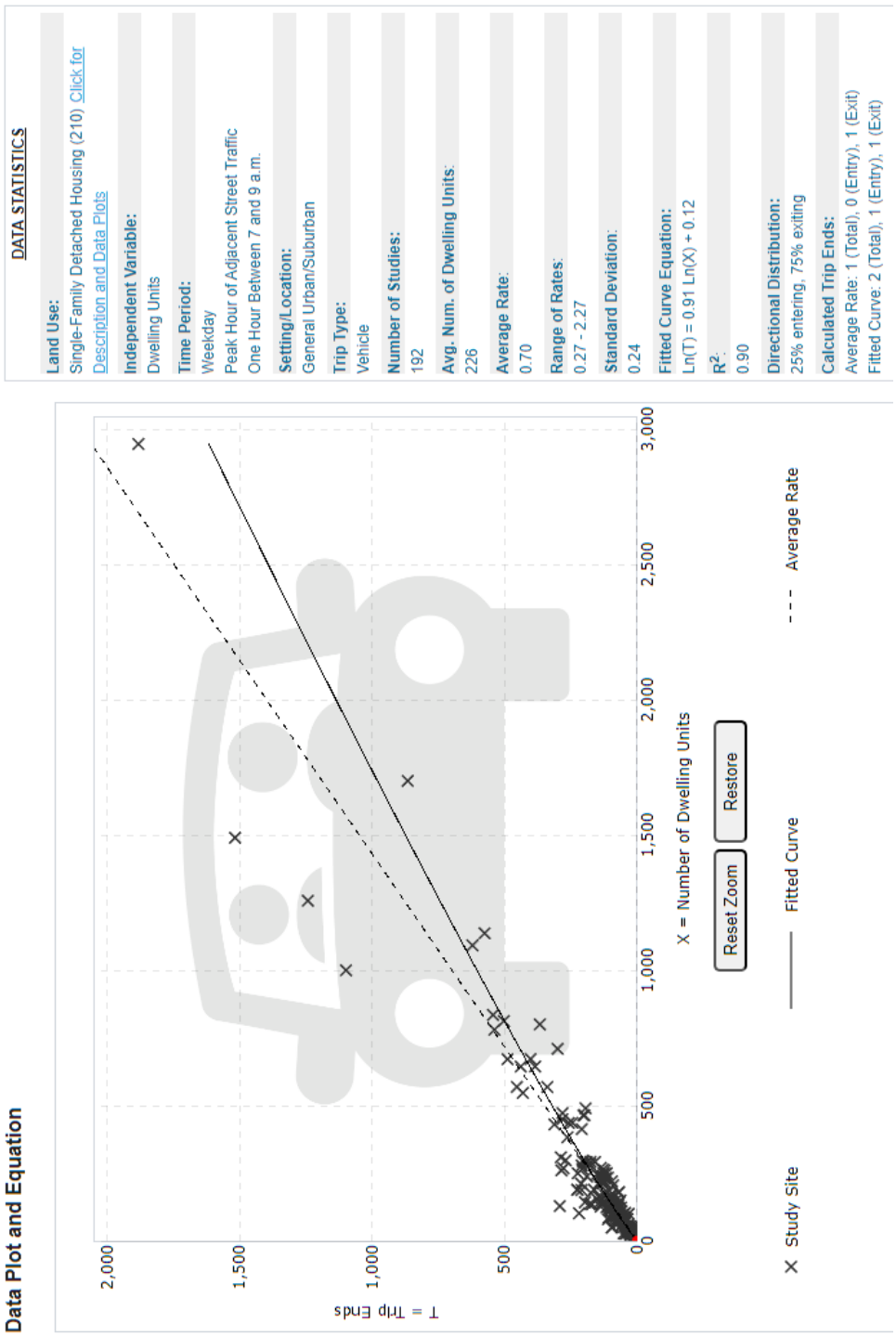


Figure 44: ITE Trip Generation, 11th Edition

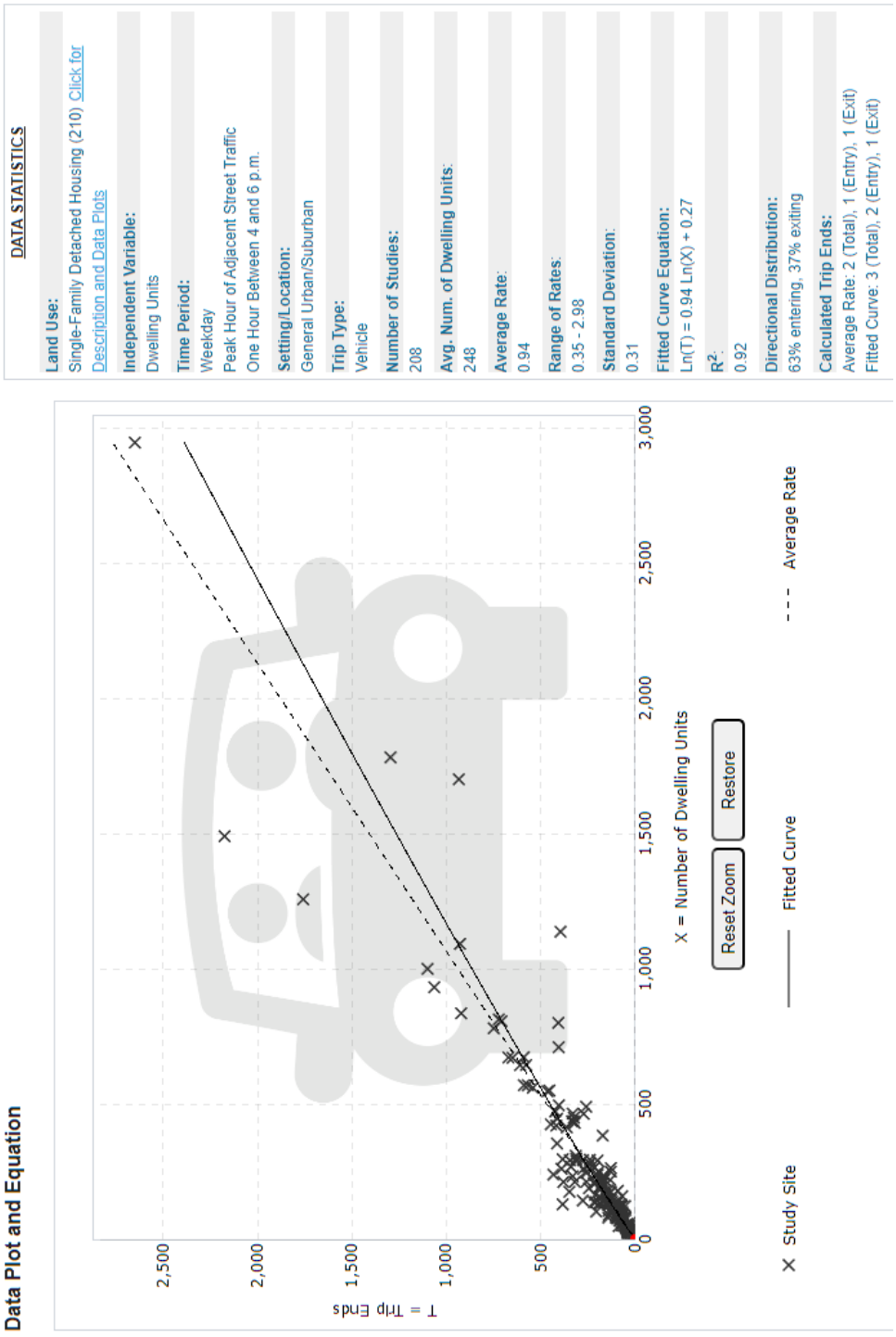


Figure 45: ITE Trip Generation, 11th Edition

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 46: ITE Trip Generation, 11th Edition

Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation

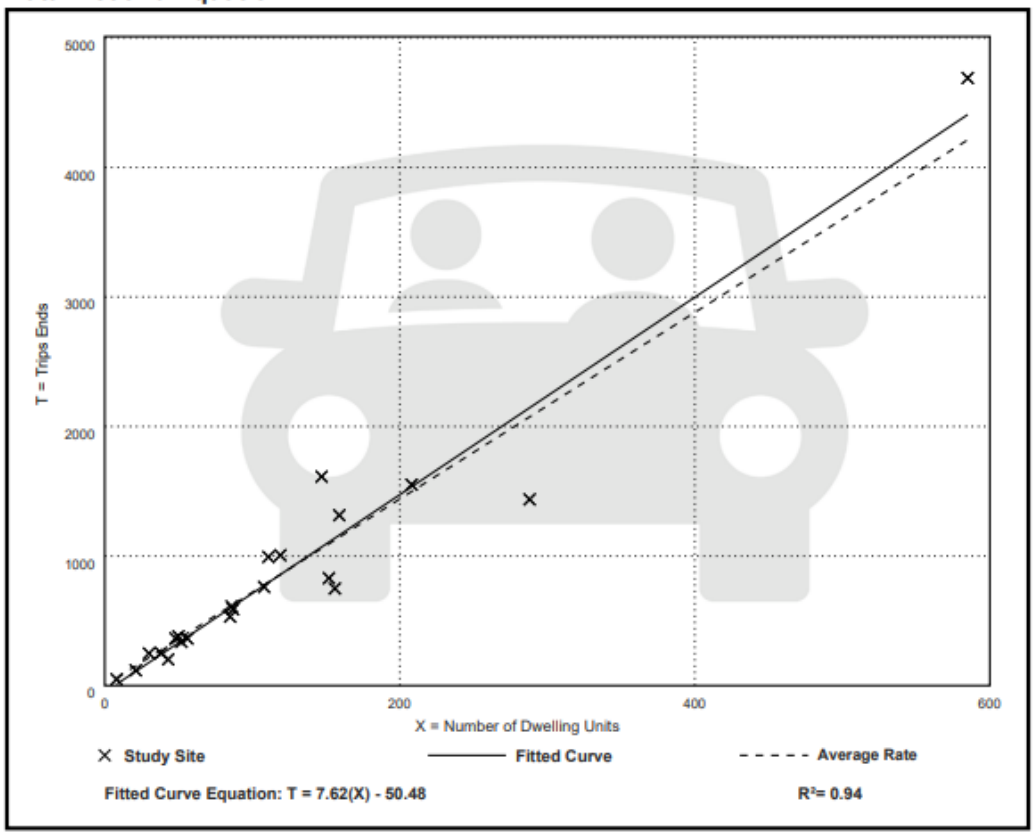


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Figure 47: ITE Trip Generation, 11th Edition

Single-Family Attached Housing
(215)

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: General Urban/Suburban
Number of Studies: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation

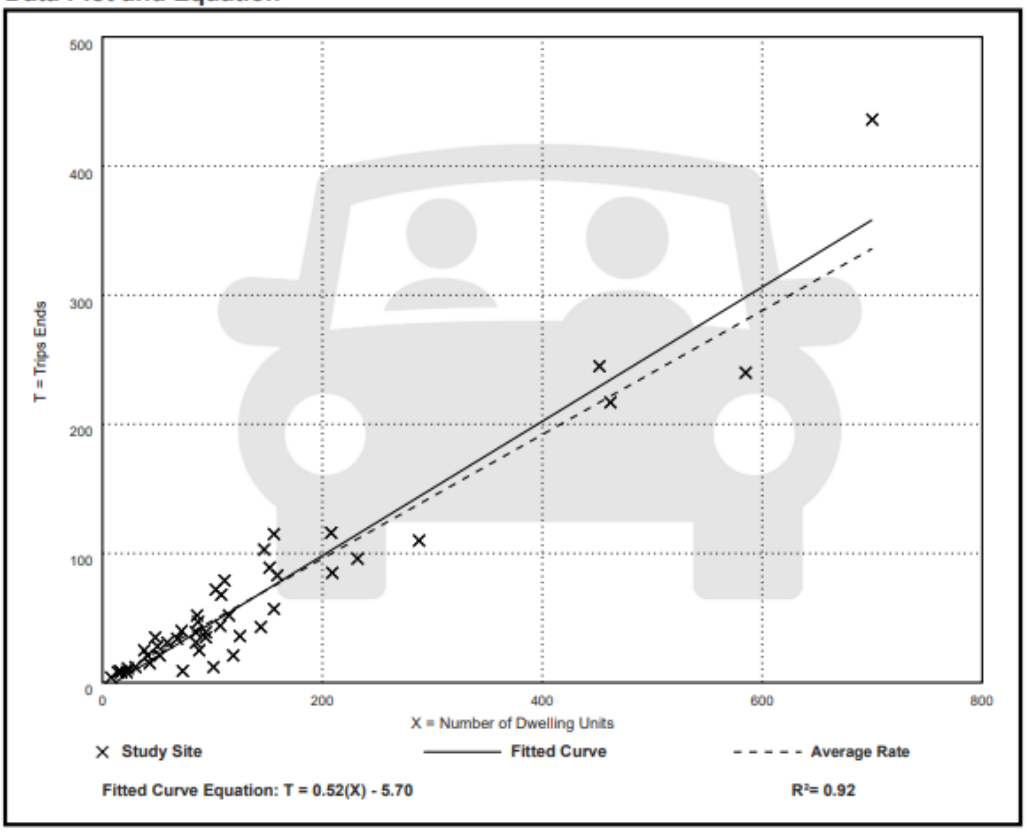

Figure 48: ITE Trip Generation, 11th Edition

BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

Single-Family Attached Housing
(215)

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: General Urban/Suburban
Number of Studies: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation

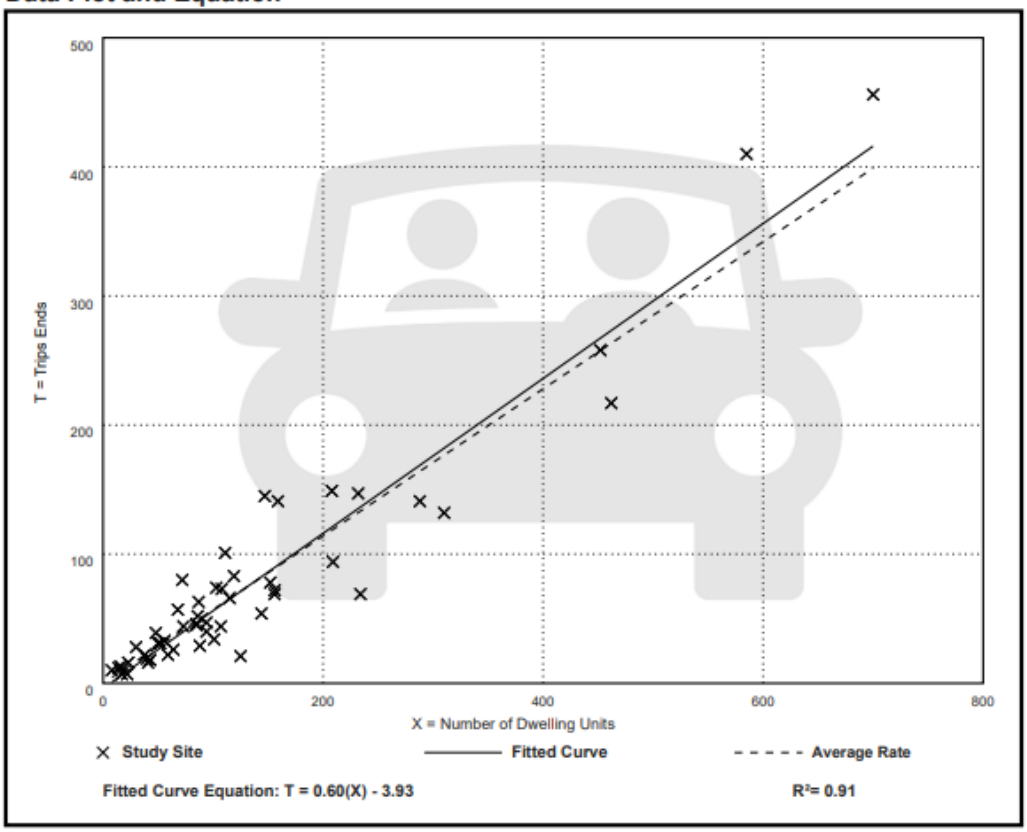

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Figure 49: ITE Trip Generation, 11th Edition

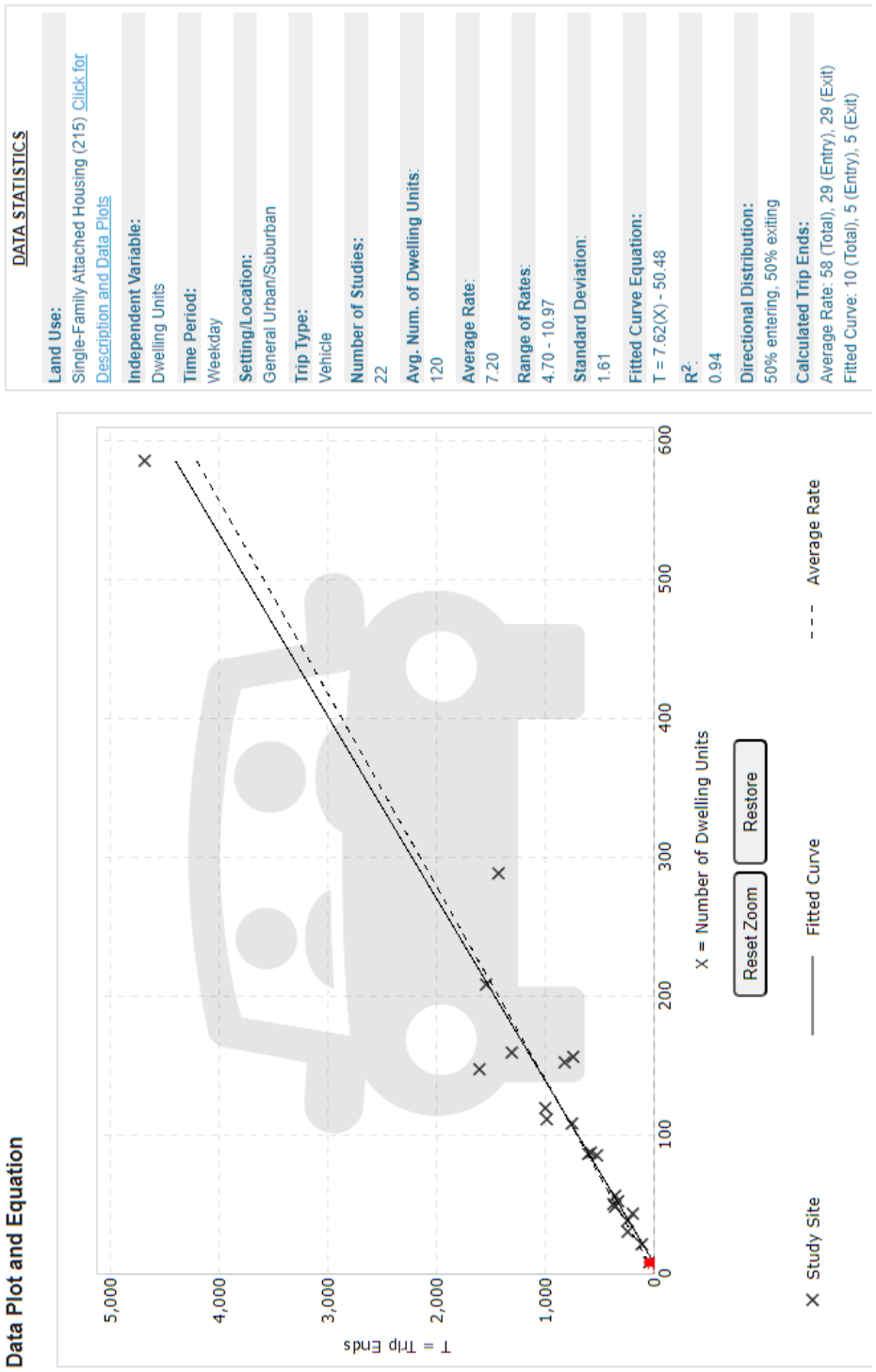


Figure 50: ITE Trip Generation, 11th Edition

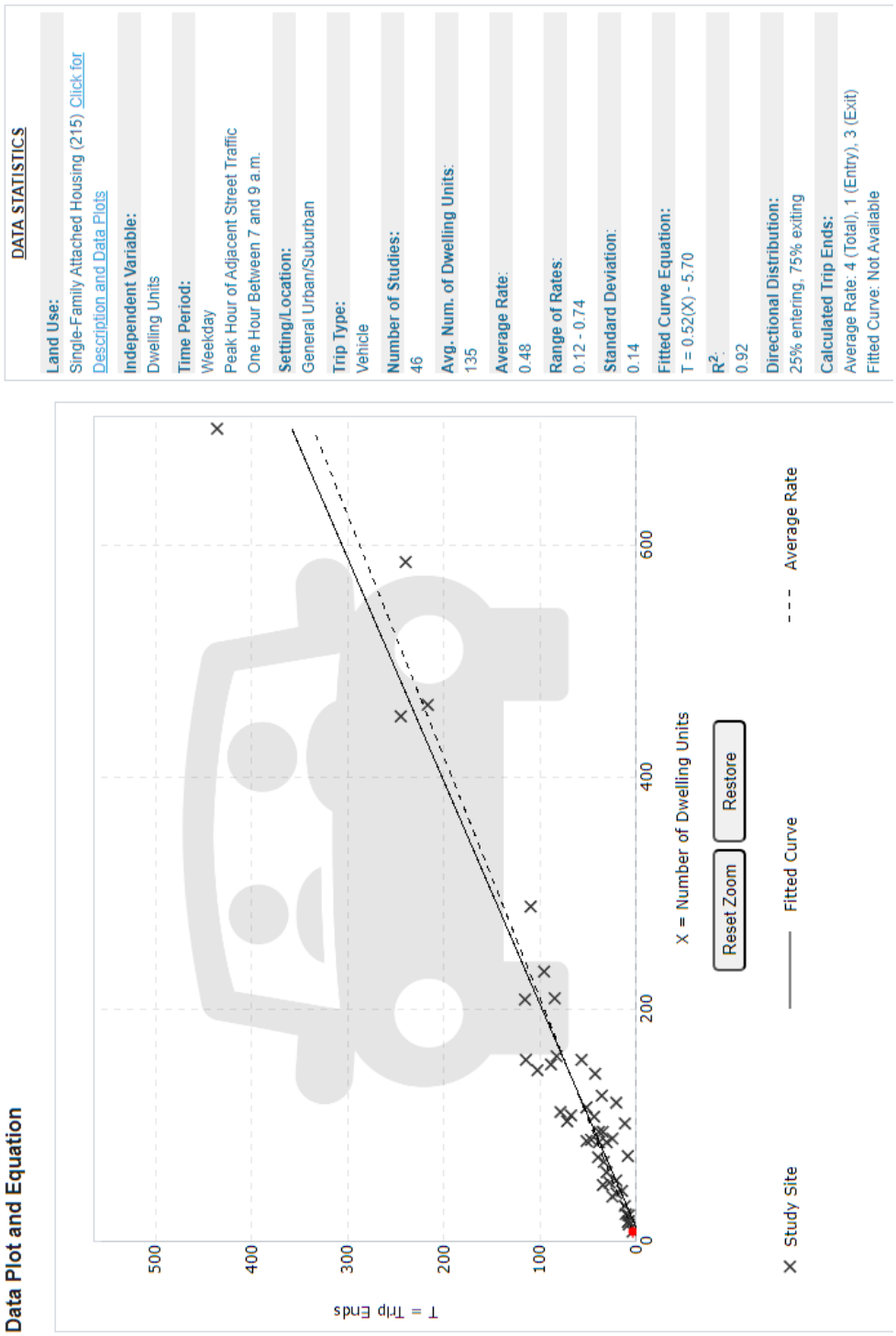


Figure 51: ITE Trip Generation, 11th Edition

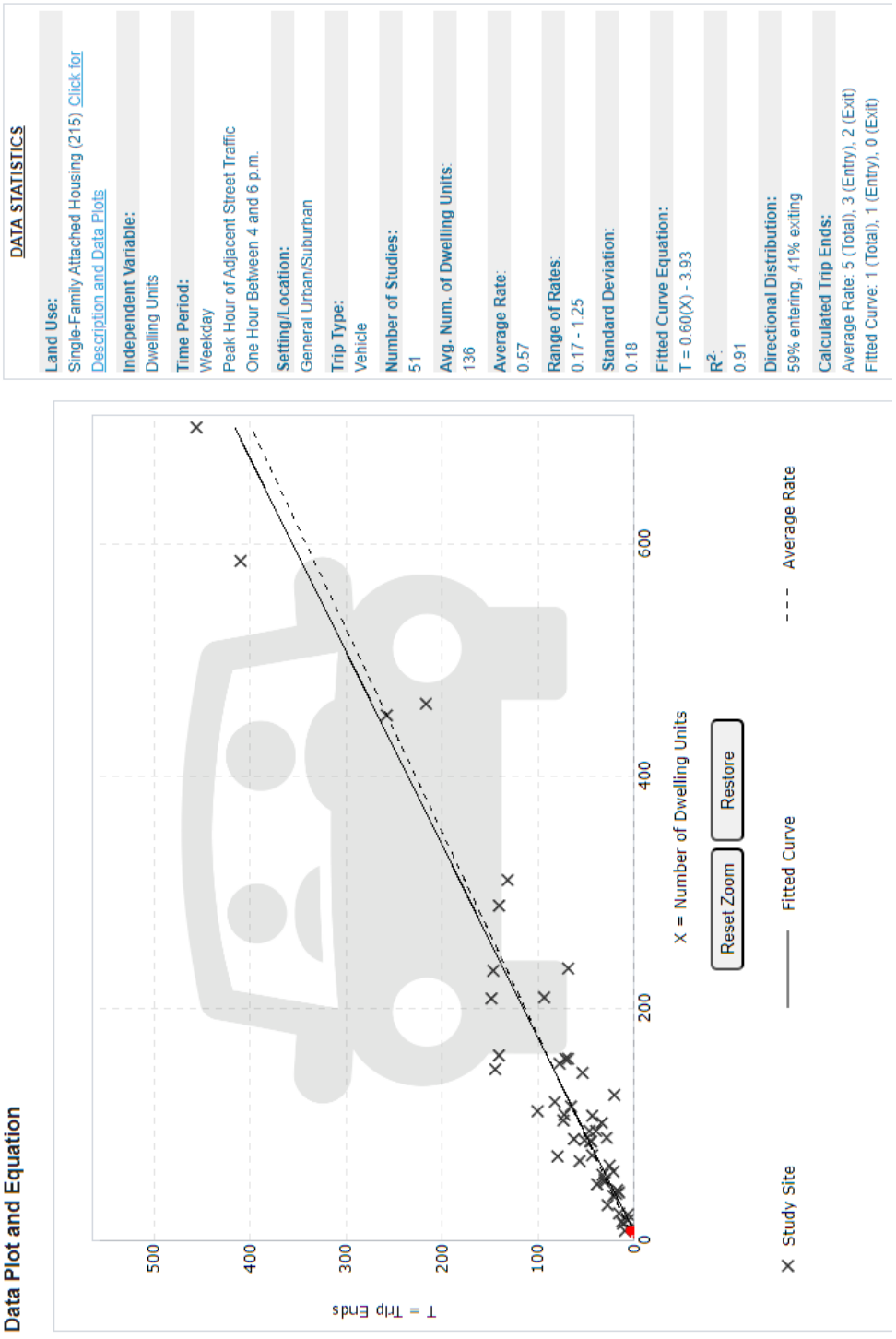


Figure 52: ITE Trip Generation, 11th Edition

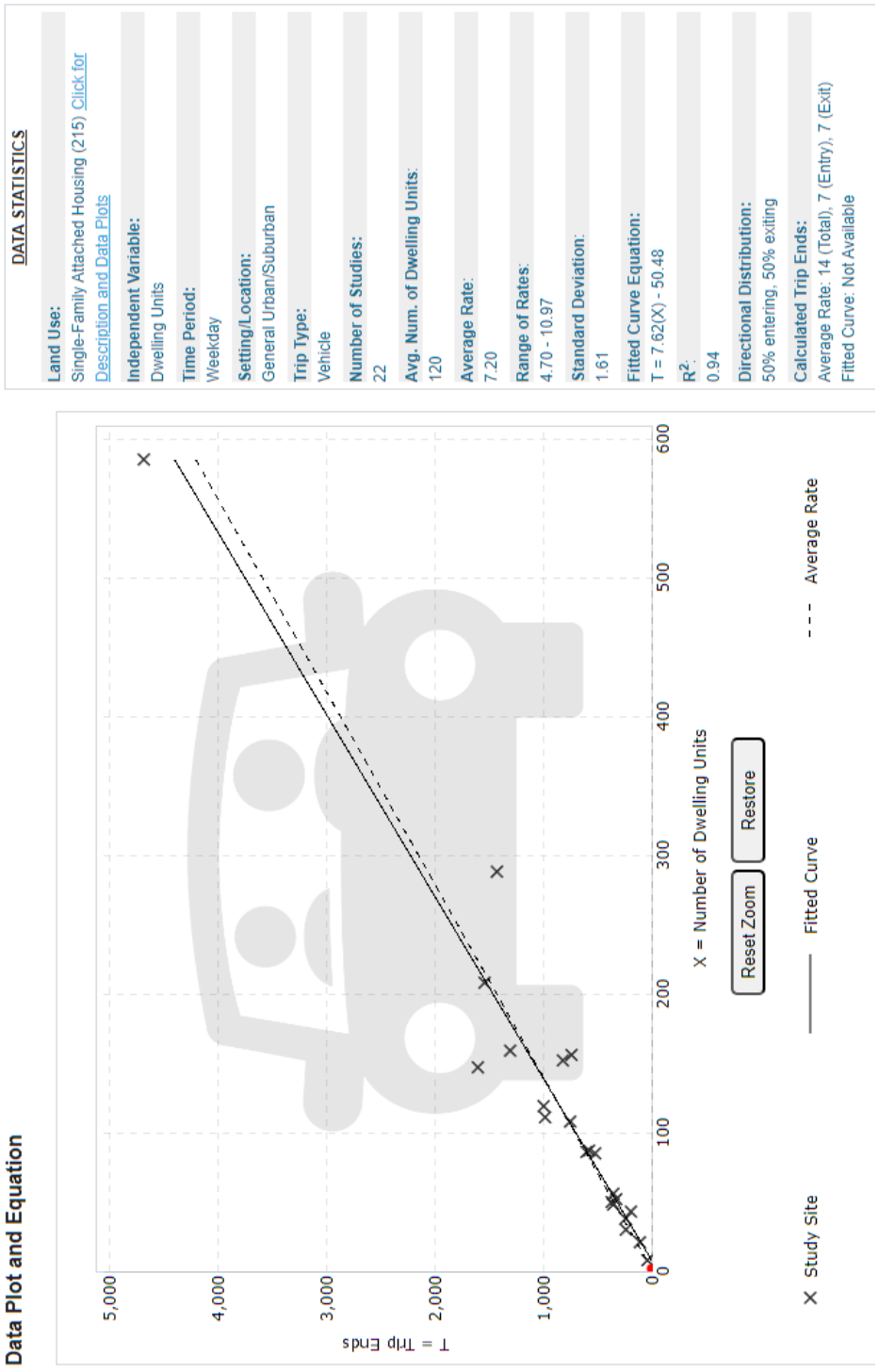


Figure 53: ITE Trip Generation, 11th Edition

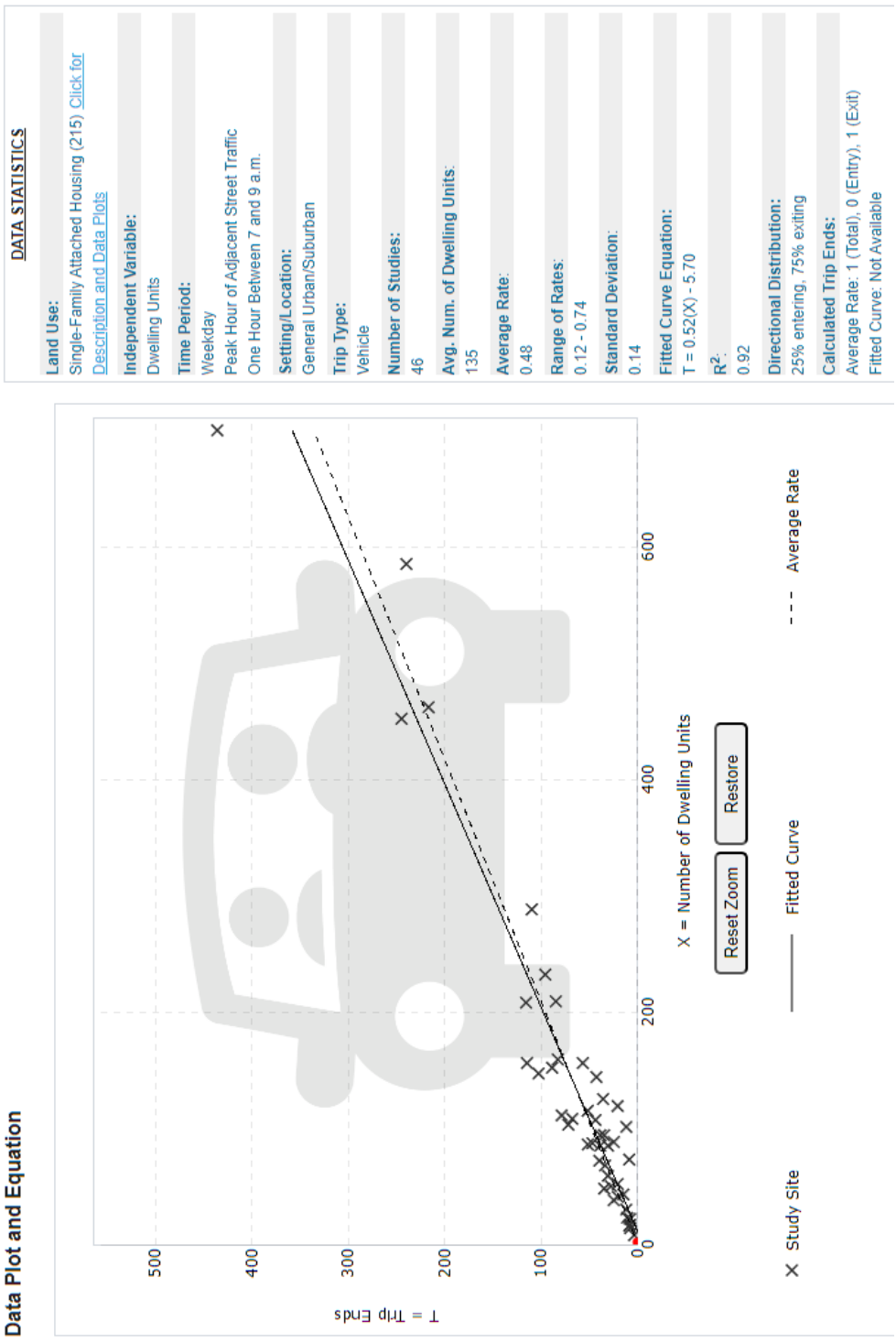


Figure 54: ITE Trip Generation, 11th Edition

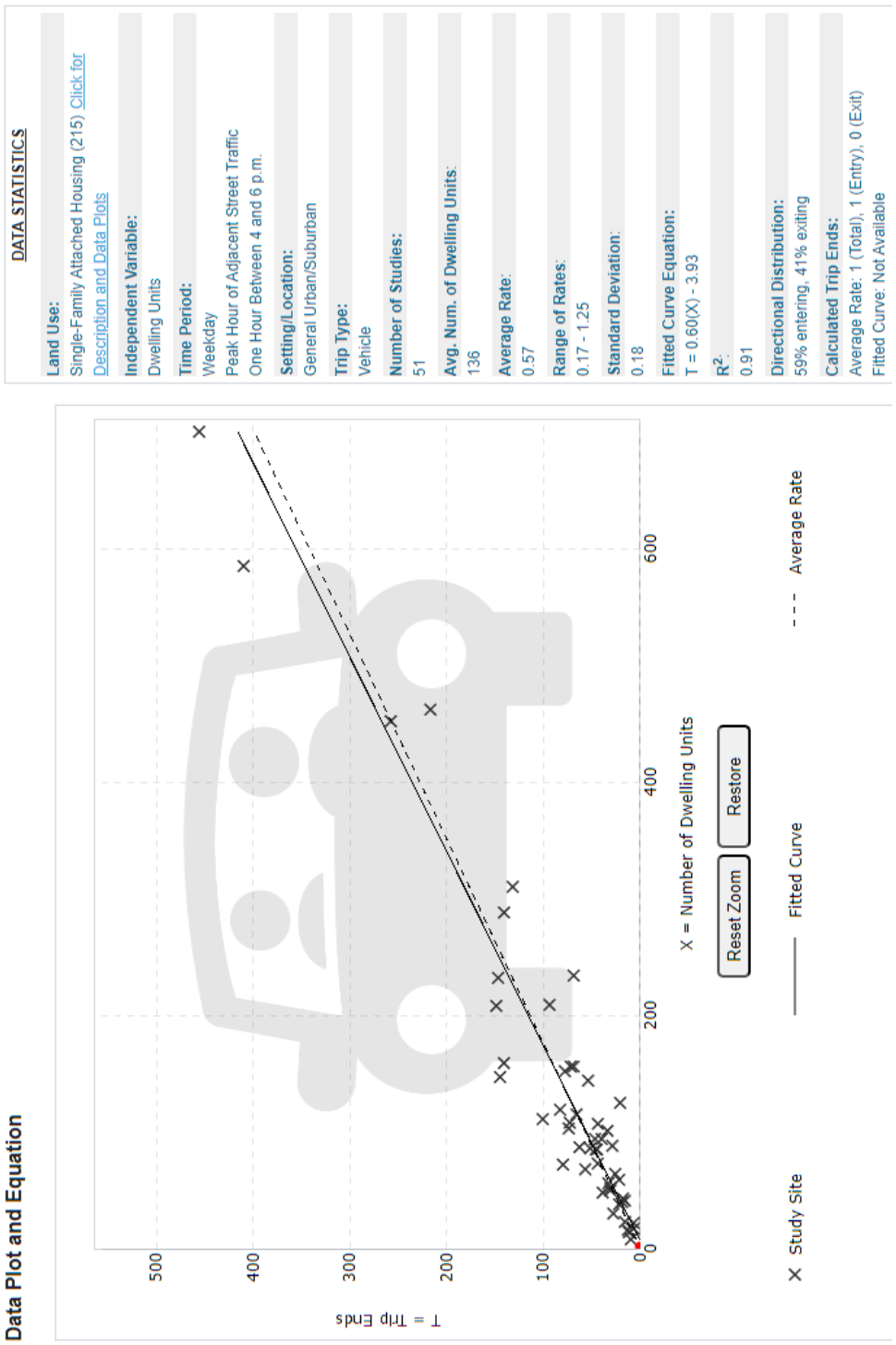


Figure 55: ITE Trip Generation, 11th Edition

DRAINAGE ANALYSIS
&
EROSION AND SEDIMENT CONTROL PLAN

Prepared for:

Knox Marsh Development LLC
242 Central Avenue
DOVER, NH 03820

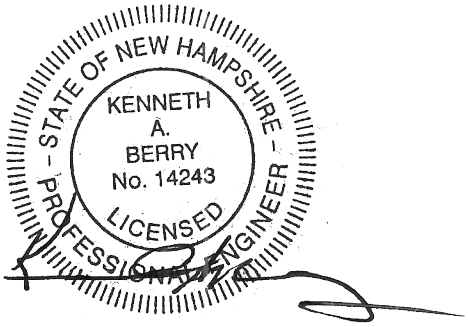
Land of

Robert Baldwin
242 Central Avenue
DOVER, NH 03820

COPPER DRIVE & NICKEL 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: September 25, 2023

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2 Yr- 24 Hr Node Listing
10 Yr -24 Hr. Node Listing
50 Yr-24 Hr. Node Listing
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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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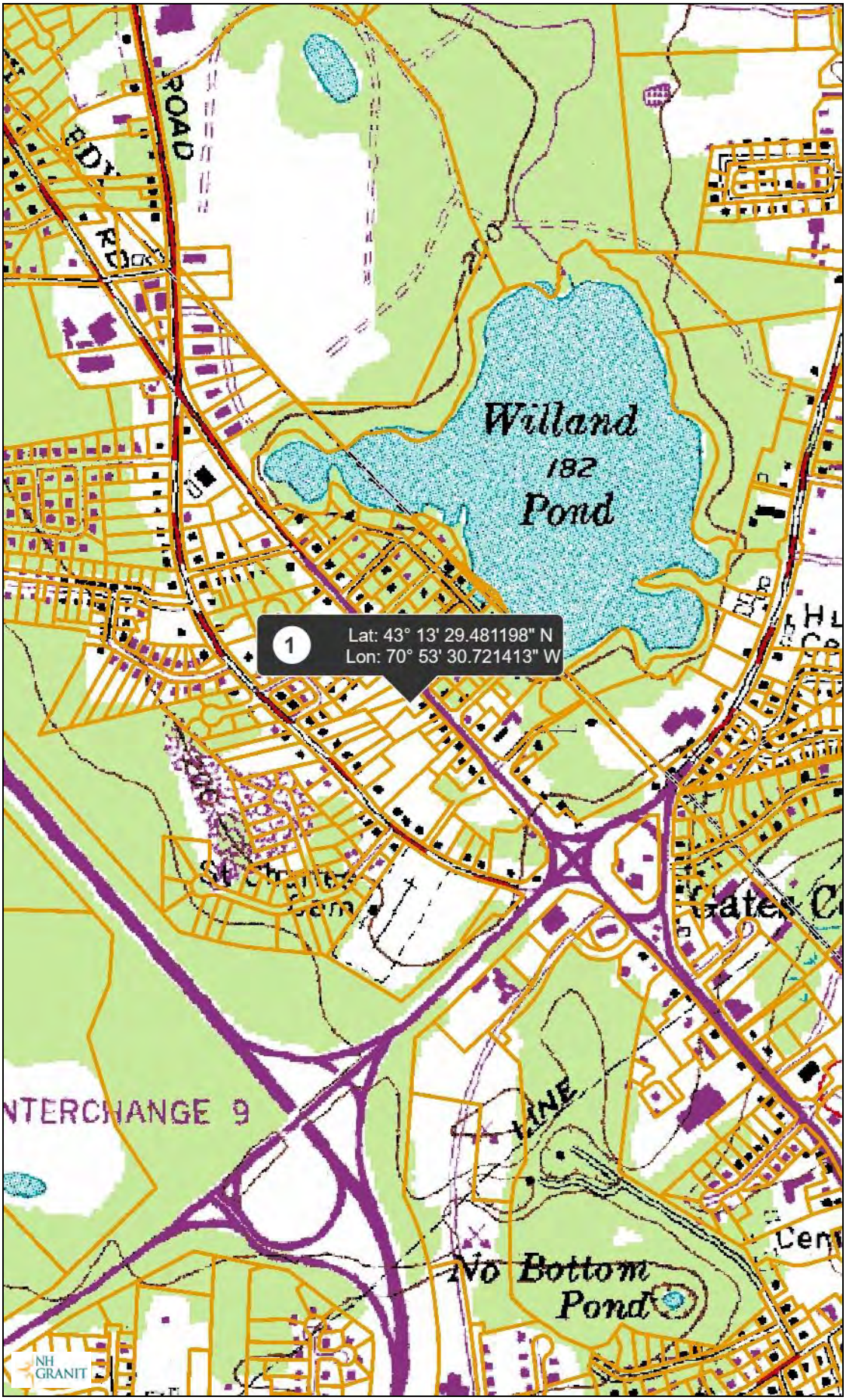
Map Generated: 7/13/2023

Notes

Map by NH GRANIT



Legend

- Parcels
- State
- County
- City/Town

Map Scale

1: 10,000

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Map Generated: 7/13/2023

Notes

DESIGN METHOD OBJECTIVES

Knox Marsh Development, LLC is proposing to develop five duplex structures in addition to the existing single-family home on Tax Map 39, Lot 103. The property is currently occupied by a single-family structure that will remain. The majority of the lot is open 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 Nickel 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, #33A&B, #34, #35 are the proposed roofs of the duplex structures that are captured via gutter and downspout and routed to a porous pavement system for infiltration. **Subcatchments #31, #32, #33A** are routed to **Porous Pavement w/ Infiltration #201 (Pond 201P). Subcatchments #33B, #34, #35** are routed to **Porous Pavement w/ Infiltration #202 (Pond 202P),** where the entirety of the subcatchment area is infiltrated.

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	0.35	1.48	2.51	3.52	4.75

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	0.040	0.148	0.253	0.364	0.530

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. **Any area disturbed by construction will be re-stabilized within 14**

calendar days and abutting properties will not be adversely affected by this development. 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. 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 149-14 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 (Deerefield 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 0.9' of freeboard and Infiltration Sump #4P provides 1.0' 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, sheets #9.

[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 Plans, 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 Plans, 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 Plans (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 Plans (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.

(q) 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:

1. WETLANDS WERE DELINEATED BY JOHN P. HAYES IN NOVEMBER OF 2021
2. 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.
3. 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).
4. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

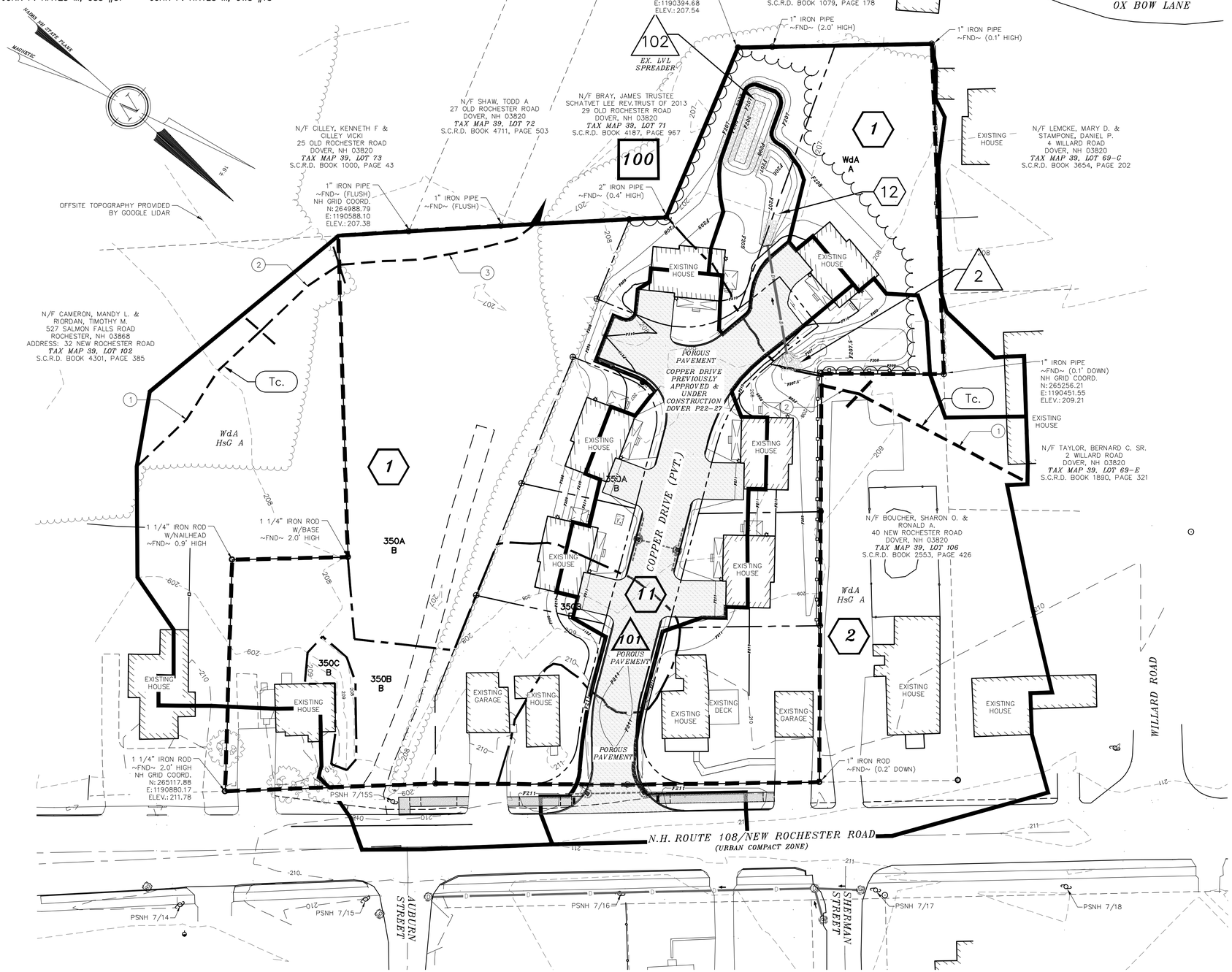
NO WETLANDS WERE FOUND ON SITE.

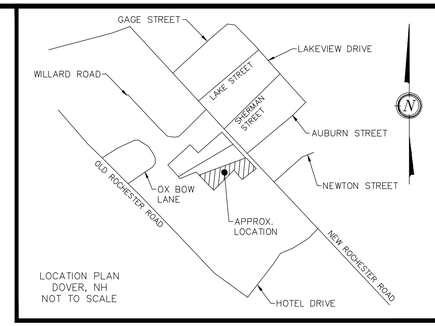
GRAPHIC SCALE

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 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 NOVEMBER OF 2021. NO WETLANDS WERE FOUND ON SITE.

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
Tc. — TIME OF CONCENTRATION SEGMENT

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

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

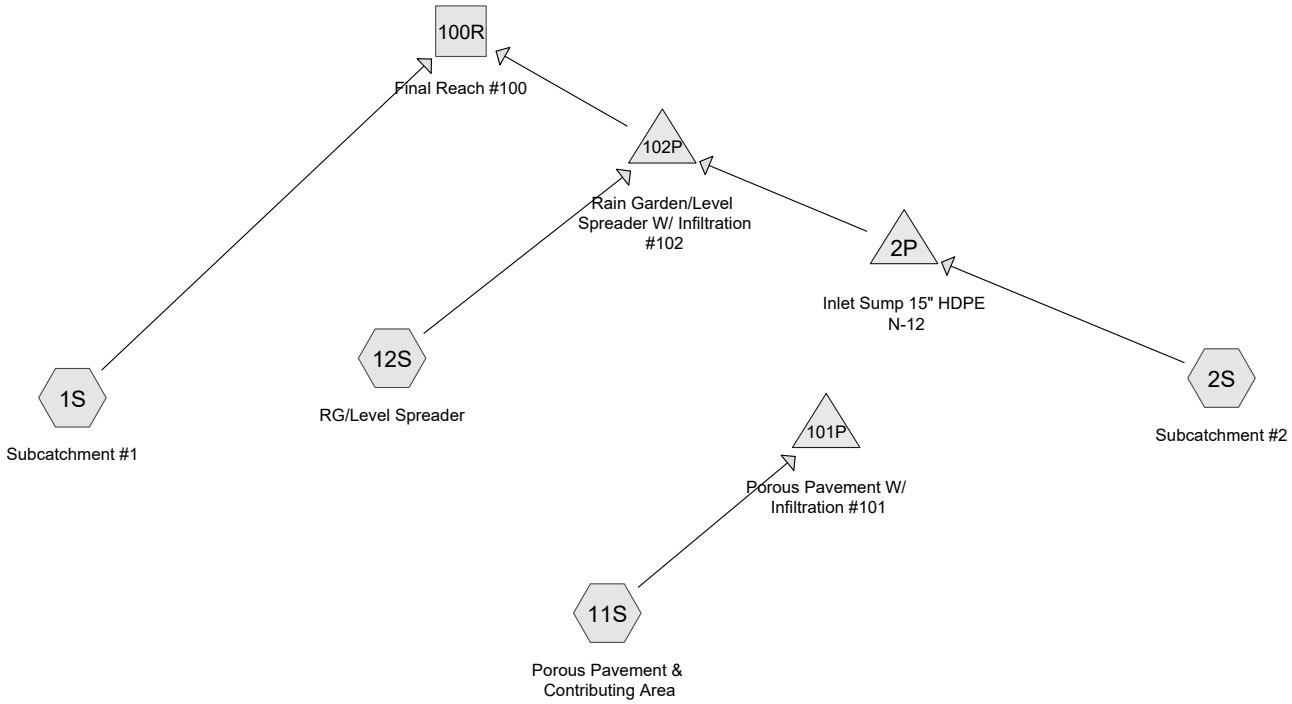
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

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

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

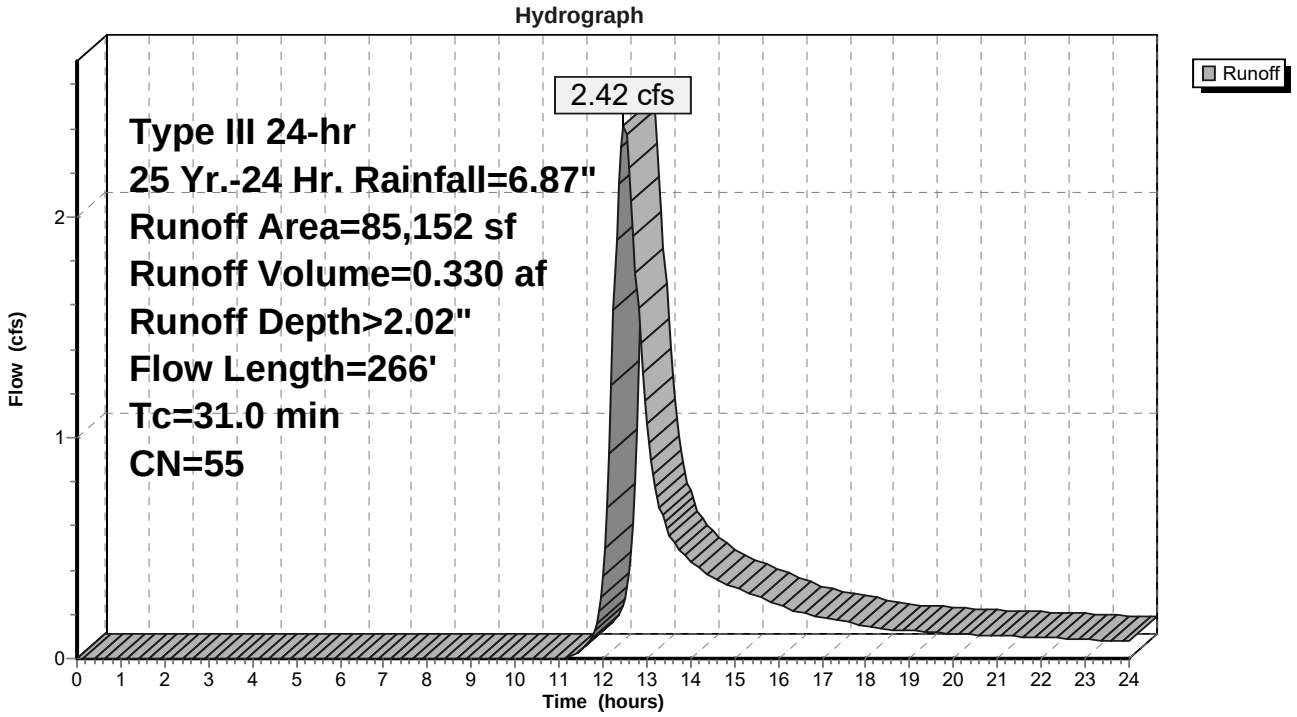
Runoff = 2.42 cfs @ 12.48 hrs, Volume= 0.330 af, Depth> 2.02"

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

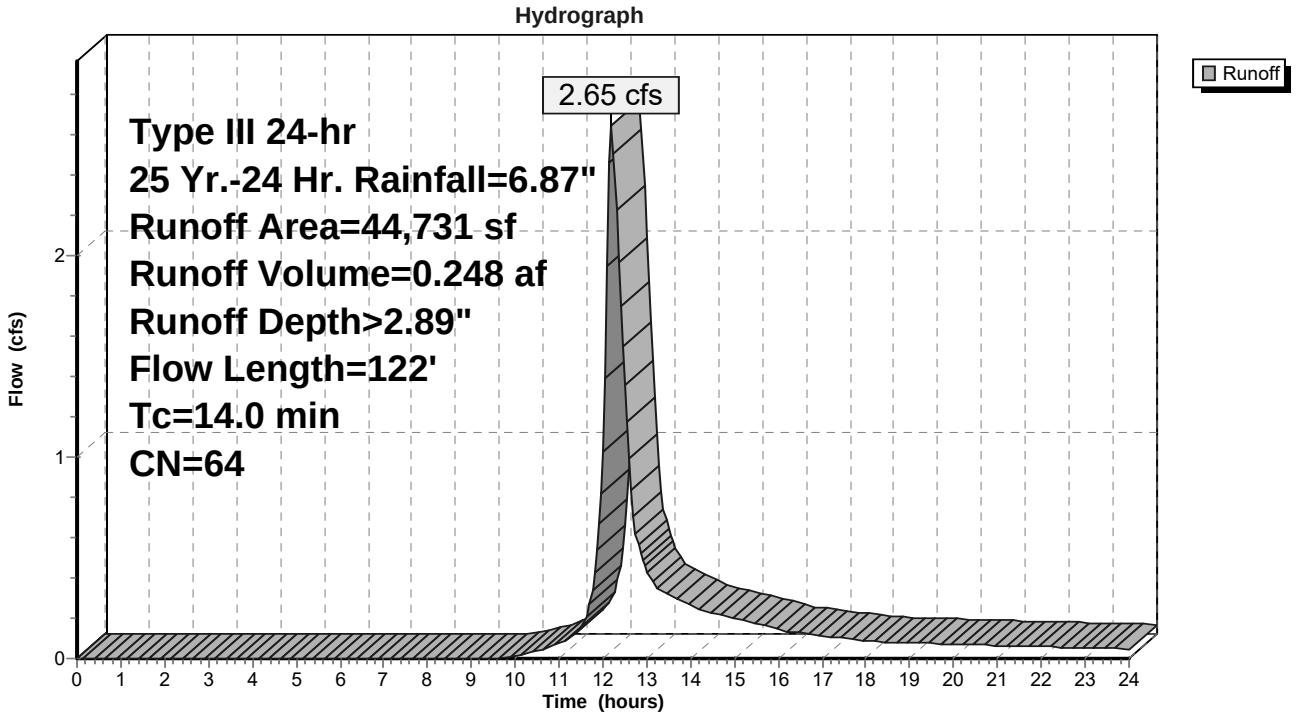
Runoff = 2.65 cfs @ 12.20 hrs, Volume= 0.248 af, Depth> 2.89"

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

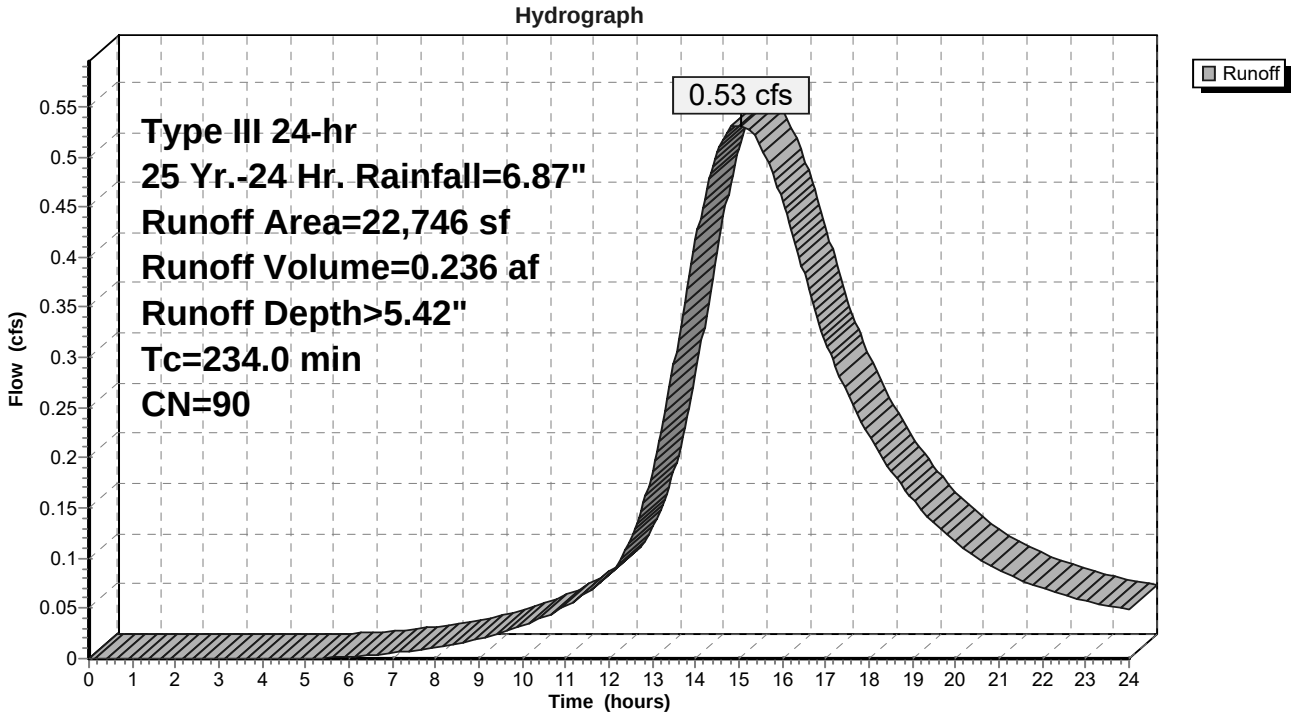
Runoff = 0.53 cfs @ 15.03 hrs, Volume= 0.236 af, Depth> 5.42"

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

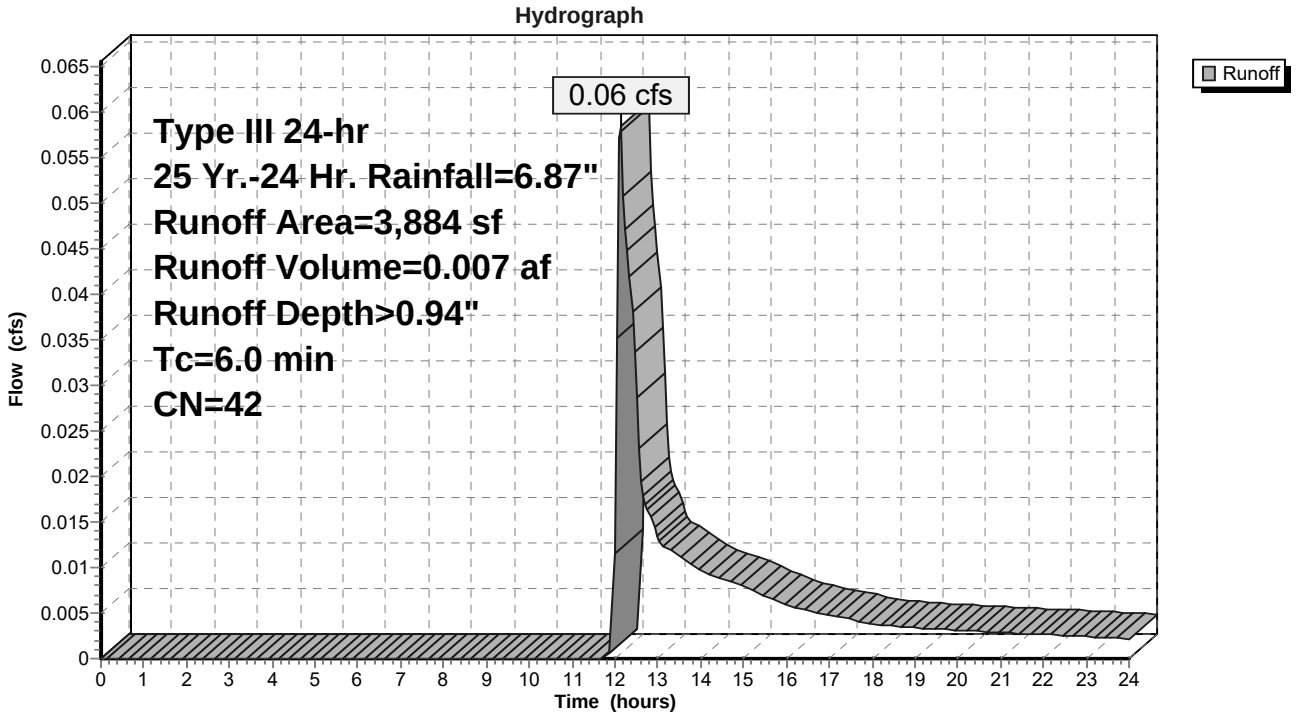
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.007 af, Depth> 0.94"

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



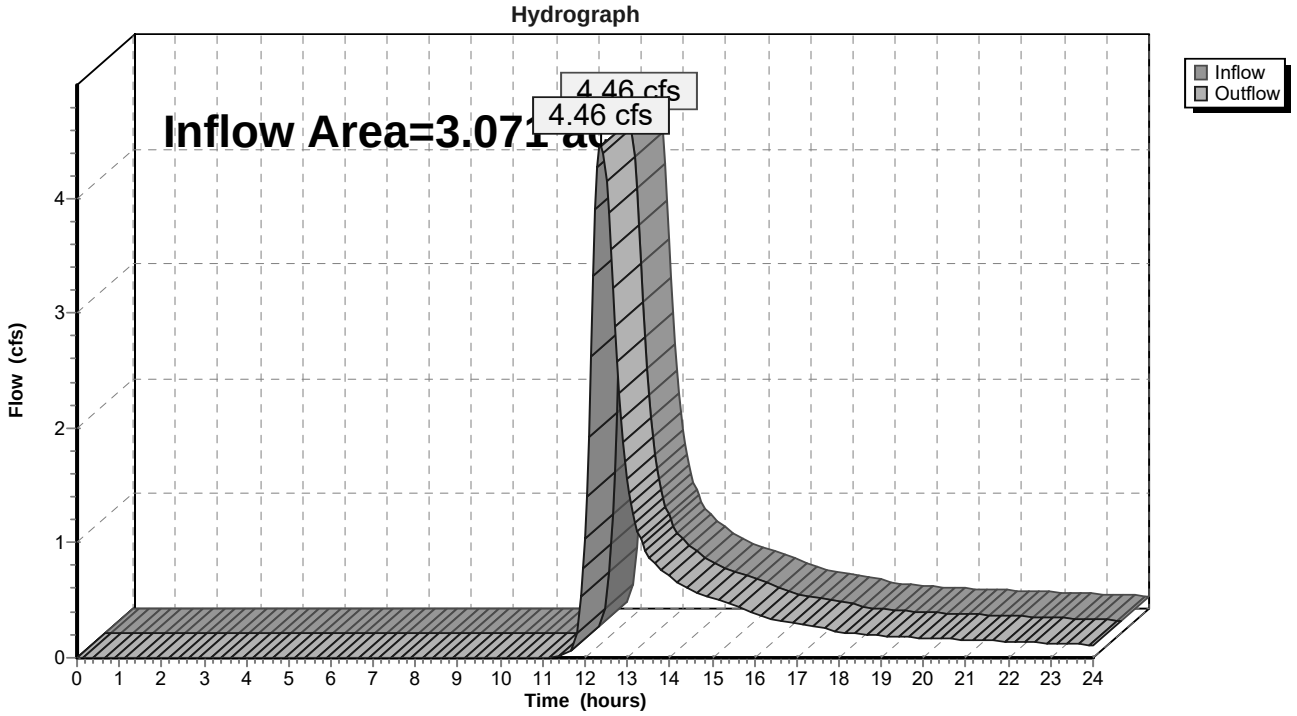
Summary for Reach 100R: Final Reach #100

[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)

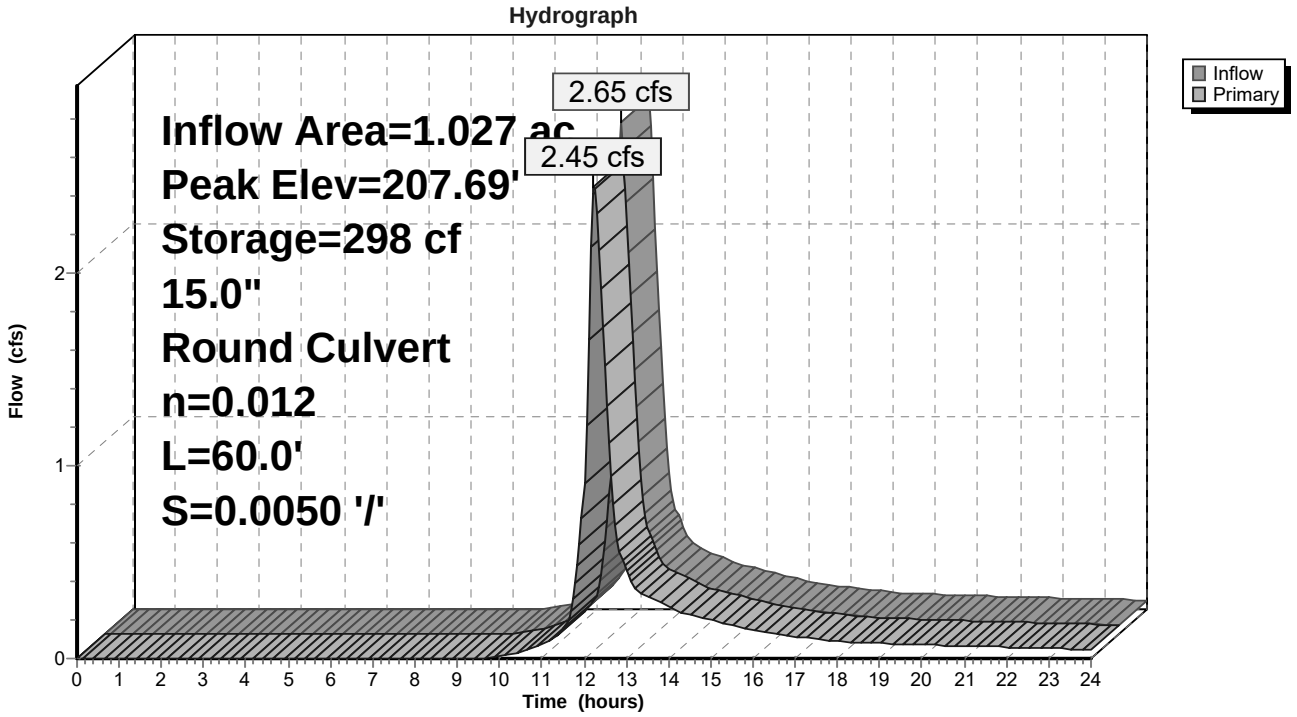
Volume	Invert	Avail.Storage	Storage Description
#1	206.69'	870 cf	**Ponding Area (Irregular)**Listed below (Recalc)

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

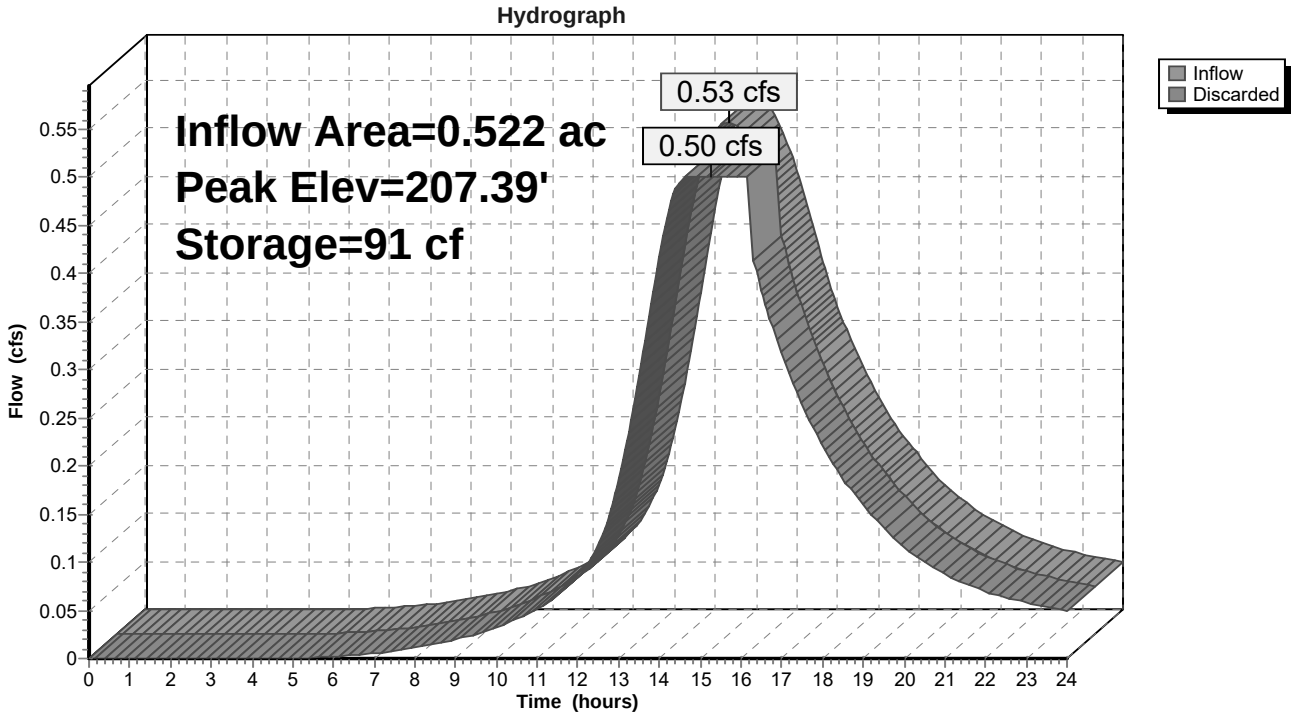
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.36	7,208	648.0	0	0	7,208
209.36	7,208	648.0	7,208	7,208	7,856

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

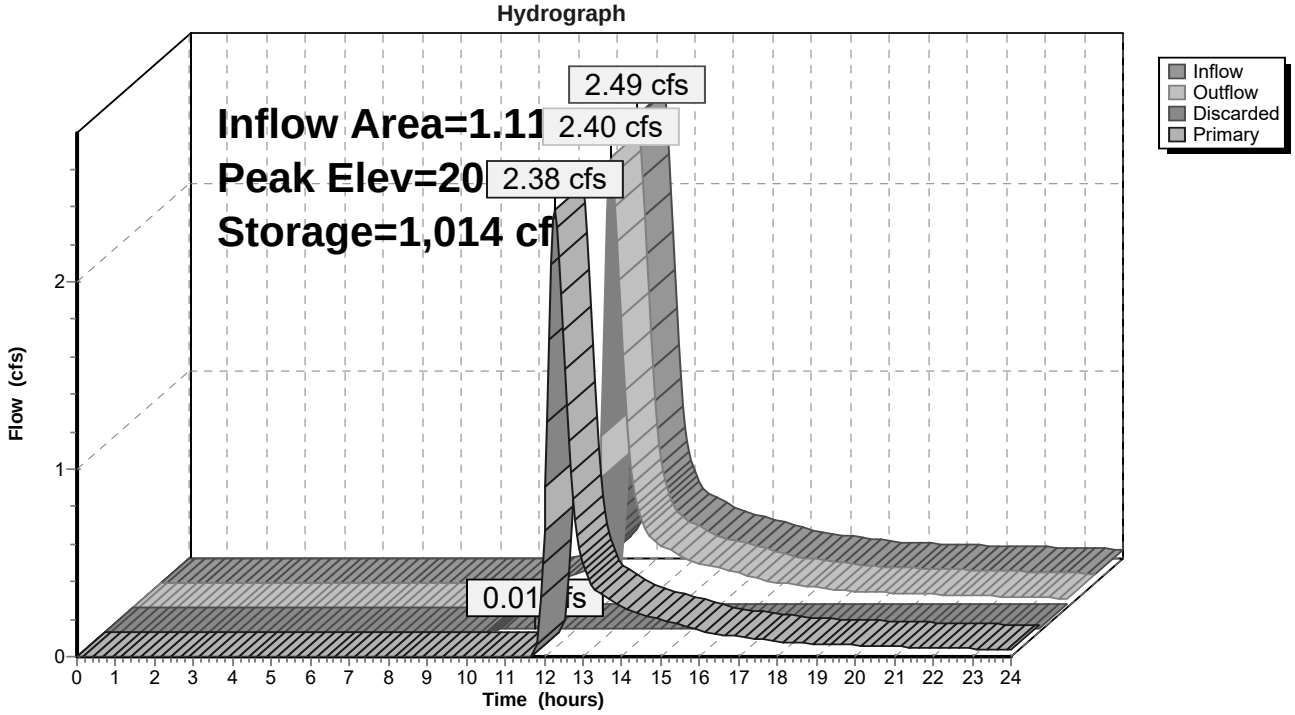
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	43	25.0	0	0	43
207.00	424	118.2	201	201	1,107
208.00	742	130.6	576	776	1,383

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:

1. WETLANDS WERE DELINEATED BY JOHN P. HAYES IN NOVEMBER OF 2021
2. 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.
3. 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).
4. NATIONAL WETLAND PLANT LIST (CURRENT VERSION).

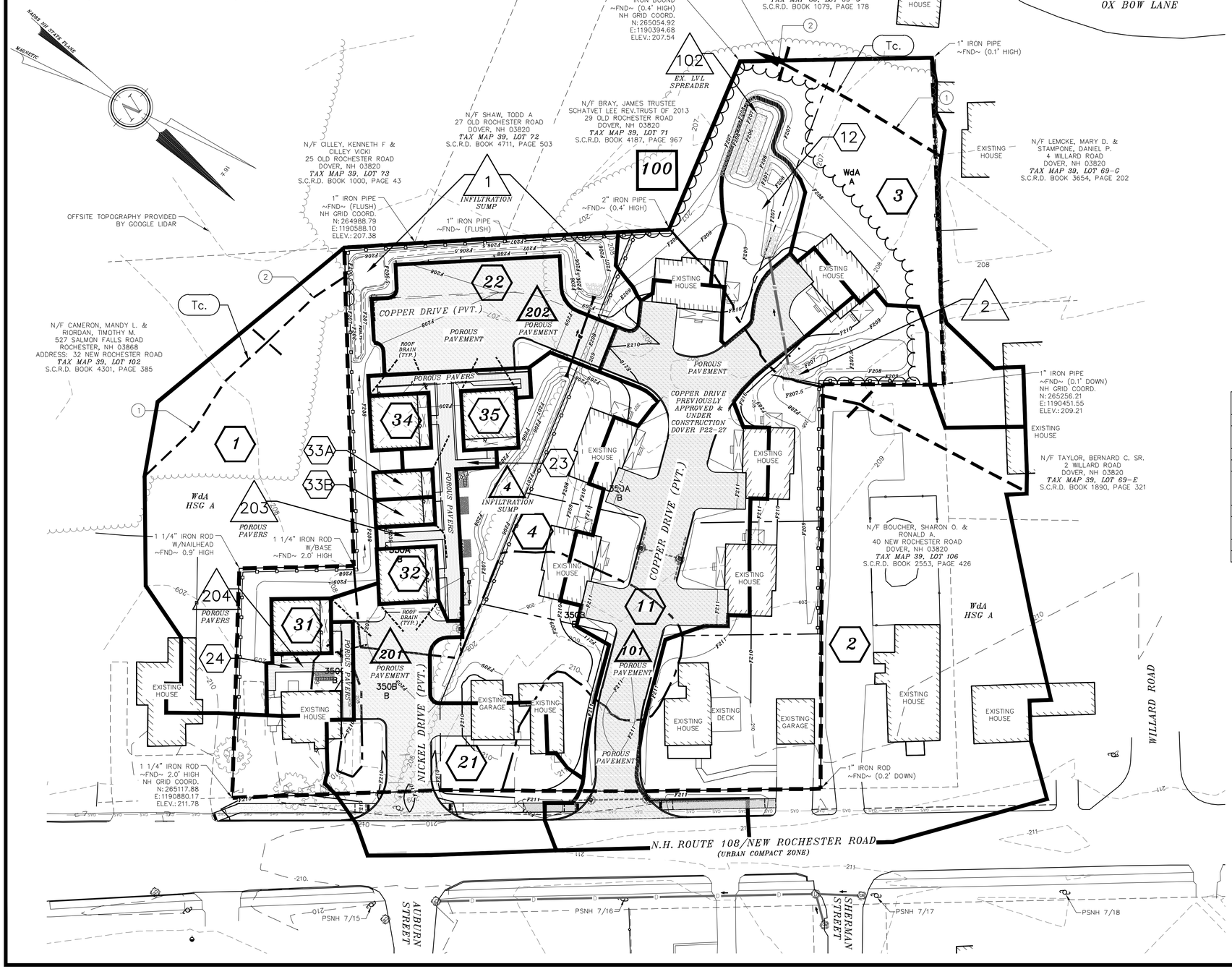
NO WETLANDS WERE FOUND ON SITE.

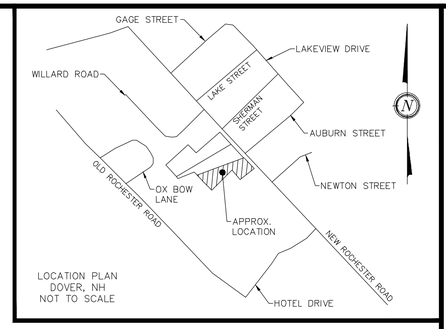
GRAPHIC SCALE

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.

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:

EXISTING CONTOUR, MINOR
EXISTING CONTOUR, MAJOR
PROPOSED CONTOUR, MINOR
PROPOSED CONTOUR, MAJOR
LIMIT OF SITE SPECIFIC SOIL SURVEY
SOIL LINE
SOIL SERIES
NRCS SOIL LINE
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

#	DATE	REVISION
1	9-25-23	REVISED PER DOVER TRC COMMENT

DESCRIPTION

DOVER PLANNING FILE #SITE-2023-0007

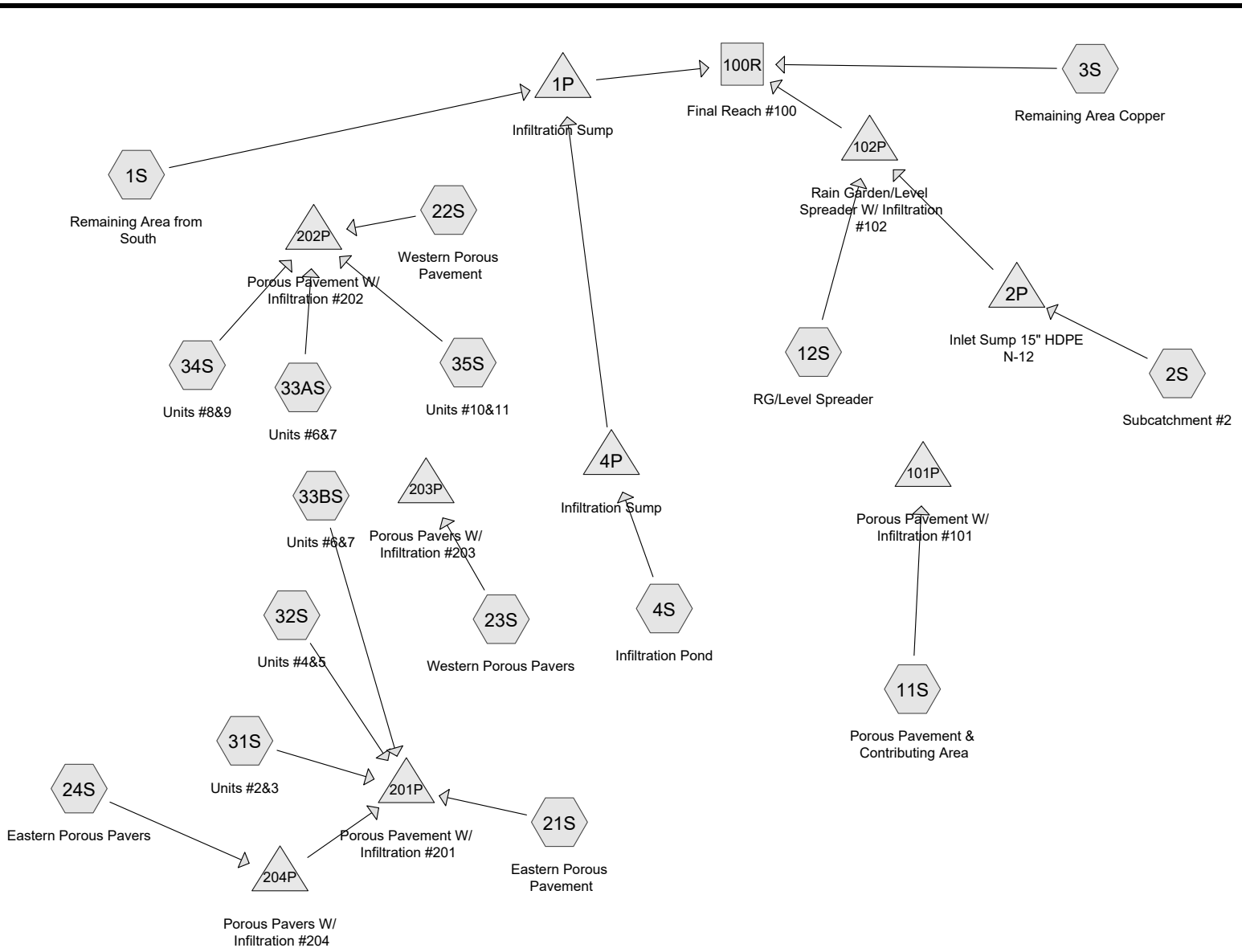
W-2 PROPOSED WATERSHED
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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. 14241 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

NOT FOR CONSTRUCTION



Routing Diagram for 23-053 Proposed Analysis

Prepared by Berry Surveying & Engineering, Printed 9/28/2023

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.971	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 11S, 12S, 21S)
0.925	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 11S, 12S, 21S, 22S, 23S, 24S)
0.003	96	Gravel surface, HSG A (2S, 12S, 21S)
0.025	96	Gravel surface, HSG B (1S, 2S, 4S, 12S, 21S, 22S)
0.332	98	Paved parking, HSG A (2S, 11S, 21S)
0.556	98	Paved parking, HSG B (2S, 11S, 21S, 22S, 23S, 24S)
0.124	98	Roofs, HSG A (1S, 2S, 3S, 11S, 12S)
0.327	98	Roofs, HSG B (2S, 3S, 4S, 11S, 12S, 21S, 24S, 31S, 32S, 33AS, 33BS, 34S, 35S)
0.013	98	Water Surface, HSG A (2S)
0.316	30	Woods, Good, HSG A (1S, 2S, 3S)
3.593	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.760	HSG A	1S, 2S, 3S, 11S, 12S, 21S
1.833	HSG B	1S, 2S, 3S, 4S, 11S, 12S, 21S, 22S, 23S, 24S, 31S, 32S, 33AS, 33BS, 34S, 35S
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
0.971	0.925	0.000	0.000	0.000	1.895	>75% Grass cover, Good	1S, 2S, 3S, 4S, 11S, 12S, 21S, 22S, 23S, 24S
0.003	0.025	0.000	0.000	0.000	0.028	Gravel surface	1S, 2S, 4S, 12S, 21S, 22S
0.332	0.556	0.000	0.000	0.000	0.889	Paved parking	2S, 11S, 21S, 22S, 23S, 24S
0.124	0.327	0.000	0.000	0.000	0.451	Roofs	1S, 2S, 3S, 4S, 11S, 12S, 21S, 24S, 31S, 32S, 33AS, 33BS, 34S, 35S
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	**1.833**	**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
2	4P	207.50	206.50	46.0	0.0217	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=25,537 sf 1.92% 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=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 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=13,424 sf 13.31% Impervious Runoff Depth>3.10"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=66 Runoff=1.09 cfs 0.080 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

Subcatchment 21S: Eastern Porous Runoff Area=12,627 sf 61.07% Impervious Runoff Depth>4.64"
Tc=234.0 min CN=83 Runoff=0.26 cfs 0.112 af

Subcatchment 22S: Western Porous Runoff Area=6,592 sf 95.75% Impervious Runoff Depth>6.23"
Tc=234.0 min CN=97 Runoff=0.17 cfs 0.079 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,546 sf 62.75% Impervious Runoff Depth>4.93"
Tc=88.0 min CN=84 Runoff=0.15 cfs 0.033 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=1,812 sf 66.72% Impervious Runoff Depth>5.16"
Tc=88.0 min CN=86 Runoff=0.08 cfs 0.018 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>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Subcatchment 33AS: Units #6&7 Runoff Area=488 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 33BS: Units #6&7 Runoff Area=487 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 34S: Units #8&9 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 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

Reach 100R: Final Reach #100 Inflow=2.51 cfs 0.253 af
Outflow=2.51 cfs 0.253 af

Pond 1P: Infiltration Sump Peak Elev=206.52' Storage=599 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=207.69' 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 4P: Infiltration Sump Peak Elev=207.16' Storage=1,355 cf Inflow=1.09 cfs 0.080 af
Discarded=0.12 cfs 0.080 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.080 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

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.39' Storage=7 cf Inflow=0.32 cfs 0.142 af
Outflow=0.32 cfs 0.142 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=204.94' Storage=0 cf Inflow=0.23 cfs 0.108 af
Outflow=0.23 cfs 0.108 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.35' Storage=0 cf Inflow=0.15 cfs 0.033 af
Outflow=0.15 cfs 0.033 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.38' Storage=104 cf Inflow=0.08 cfs 0.018 af
Discarded=0.04 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.018 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.956 af Average Runoff Depth = 3.19"
62.33% Pervious = 2.239 ac 37.67% Impervious = 1.353 ac

Summary for Subcatchment 1S: Remaining Area from South

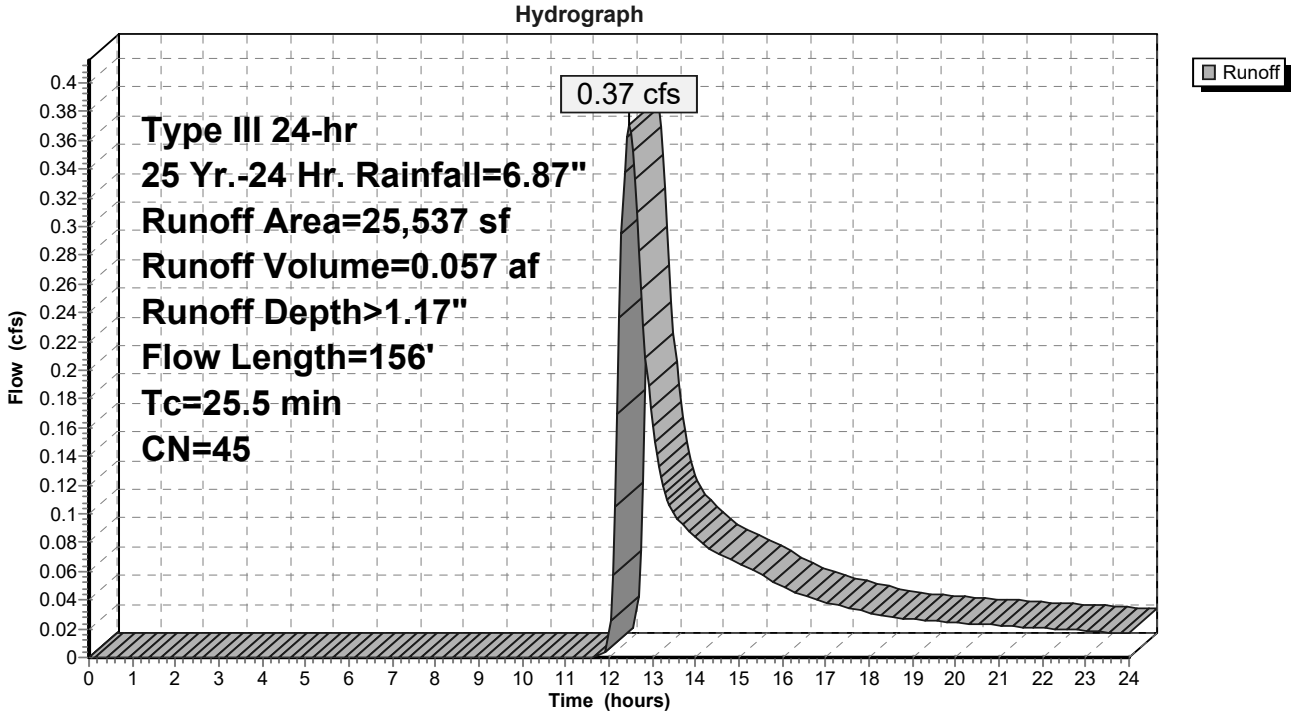
Runoff = 0.37 cfs @ 12.46 hrs, Volume= 0.057 af, Depth> 1.17"

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
7,489	61	>75% Grass cover, Good, HSG B
497	96	Gravel surface, HSG B
25,537	45	Weighted Average
25,047		98.08% Pervious Area
490		1.92% 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

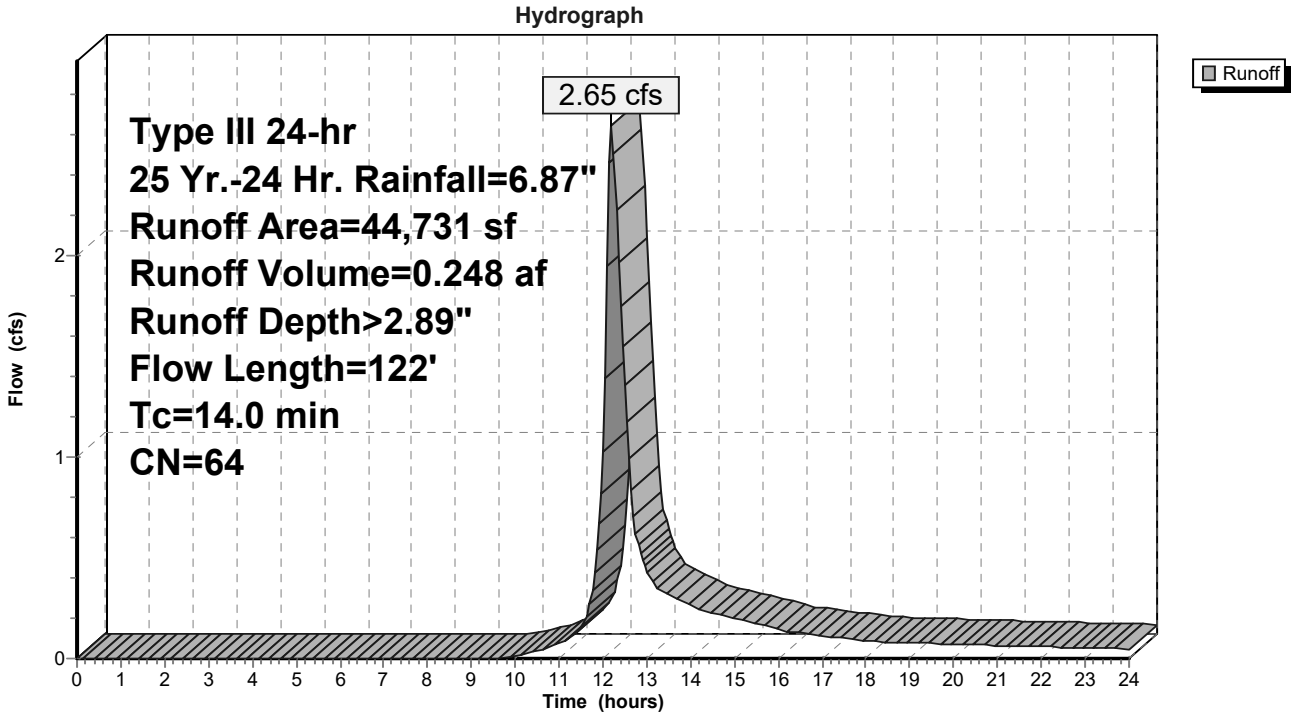
Runoff = 2.65 cfs @ 12.20 hrs, Volume= 0.248 af, Depth> 2.89"

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 3S: Remaining Area Copper

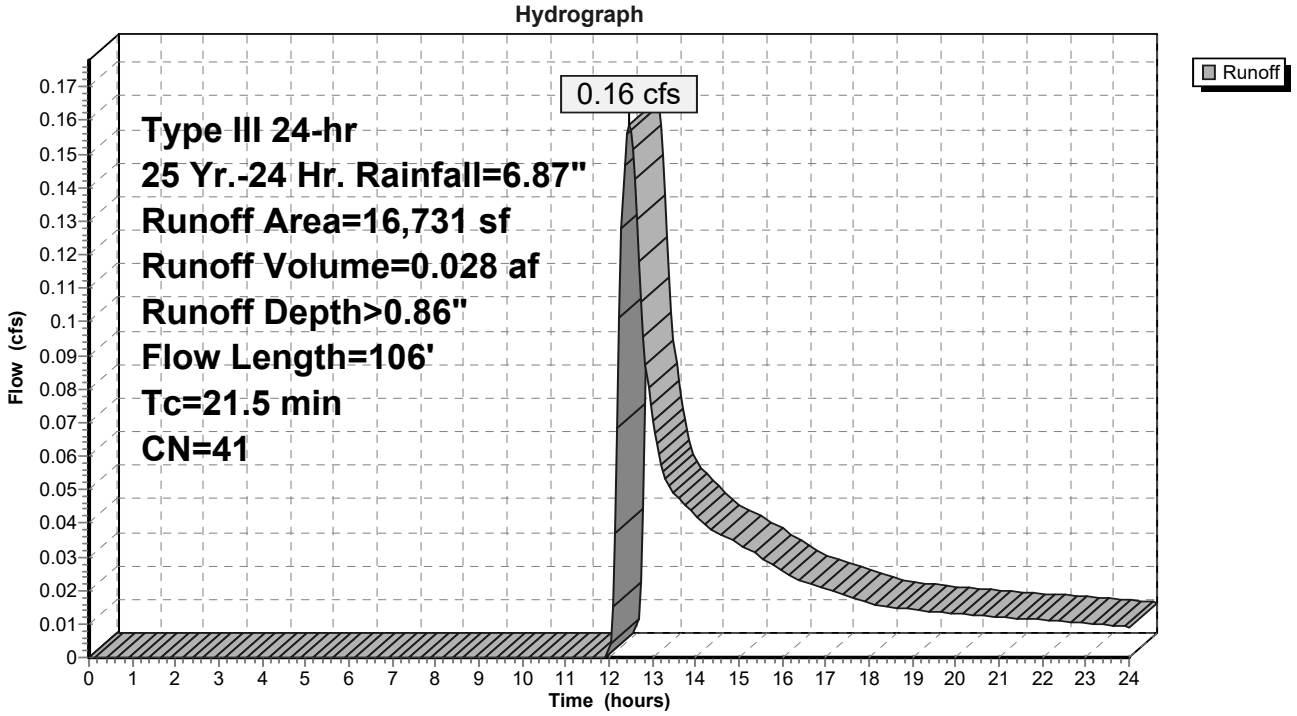
Runoff = 0.16 cfs @ 12.45 hrs, Volume= 0.028 af, Depth> 0.86"

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

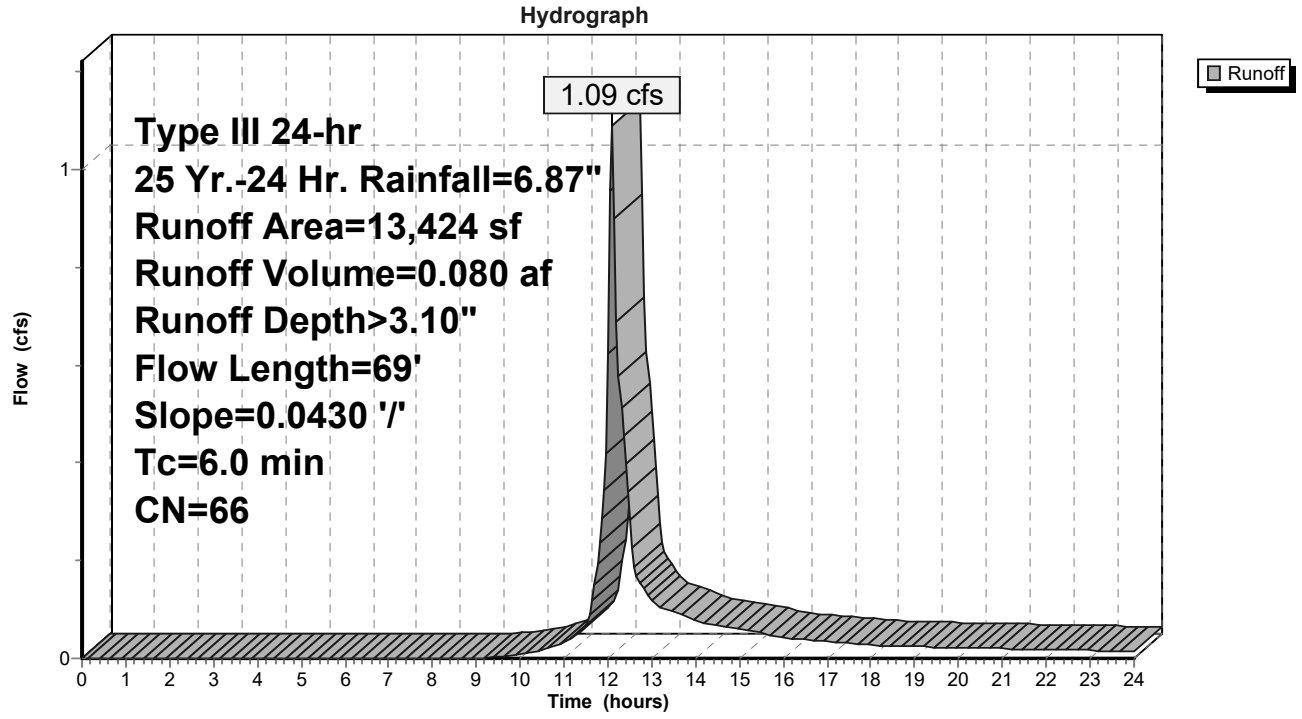
Runoff = 1.09 cfs @ 12.10 hrs, Volume= 0.080 af, Depth> 3.10"

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
11,581	61	>75% Grass cover, Good, HSG B
1,787	98	Roofs, HSG B
56	96	Gravel surface, HSG B
13,424	66	Weighted Average
11,637		86.69% Pervious Area
1,787		13.31% 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

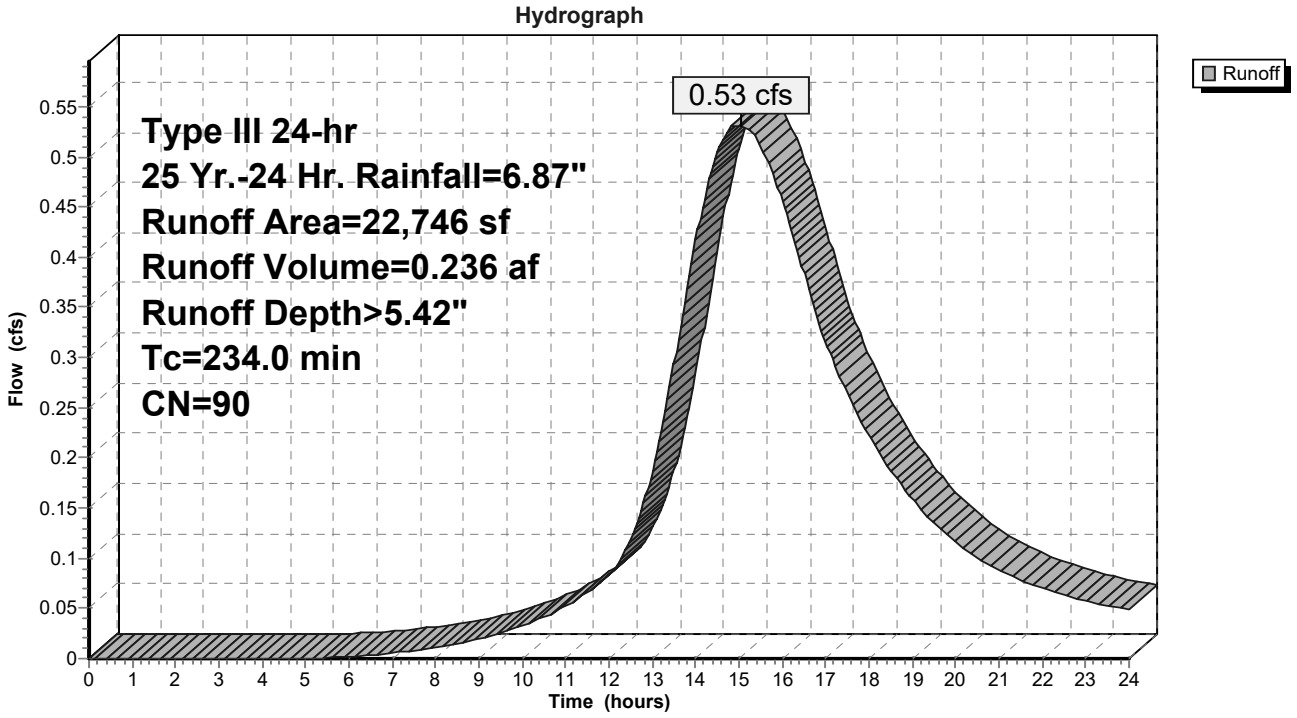
Runoff = 0.53 cfs @ 15.03 hrs, Volume= 0.236 af, Depth> 5.42"

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

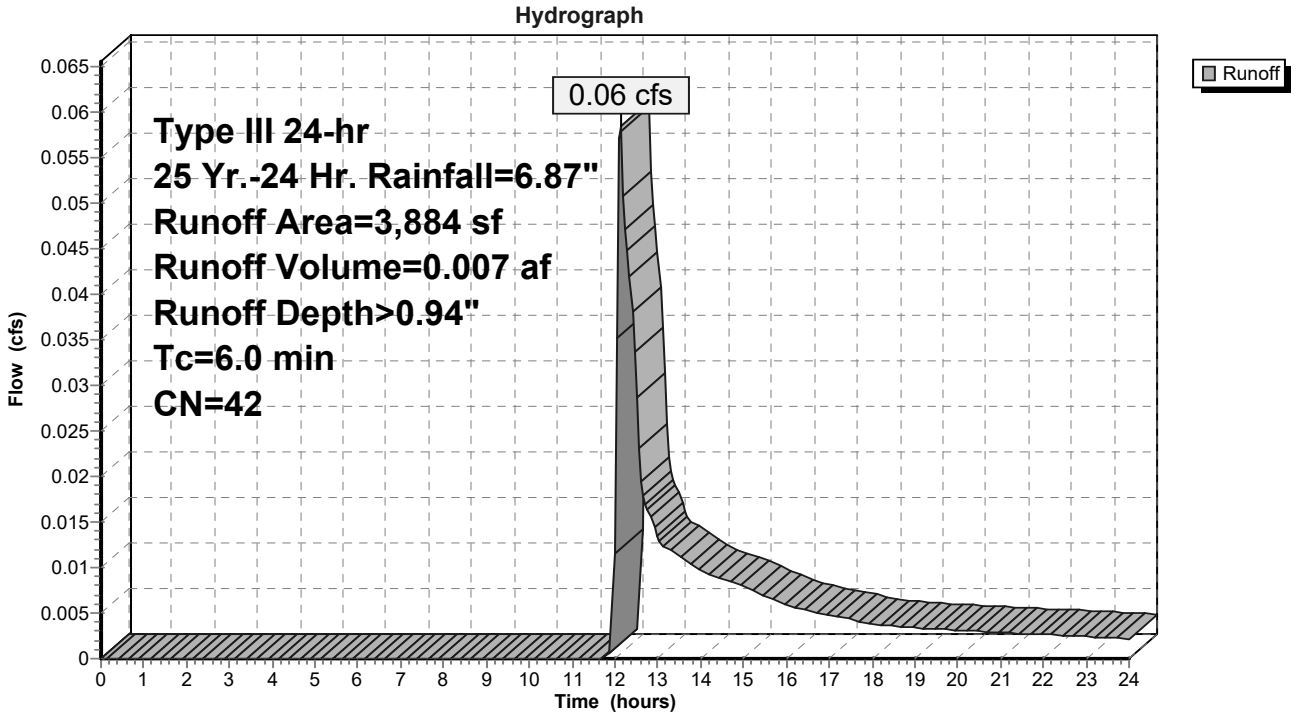
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.007 af, Depth> 0.94"

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 Subcatchment 21S: Eastern Porous Pavement

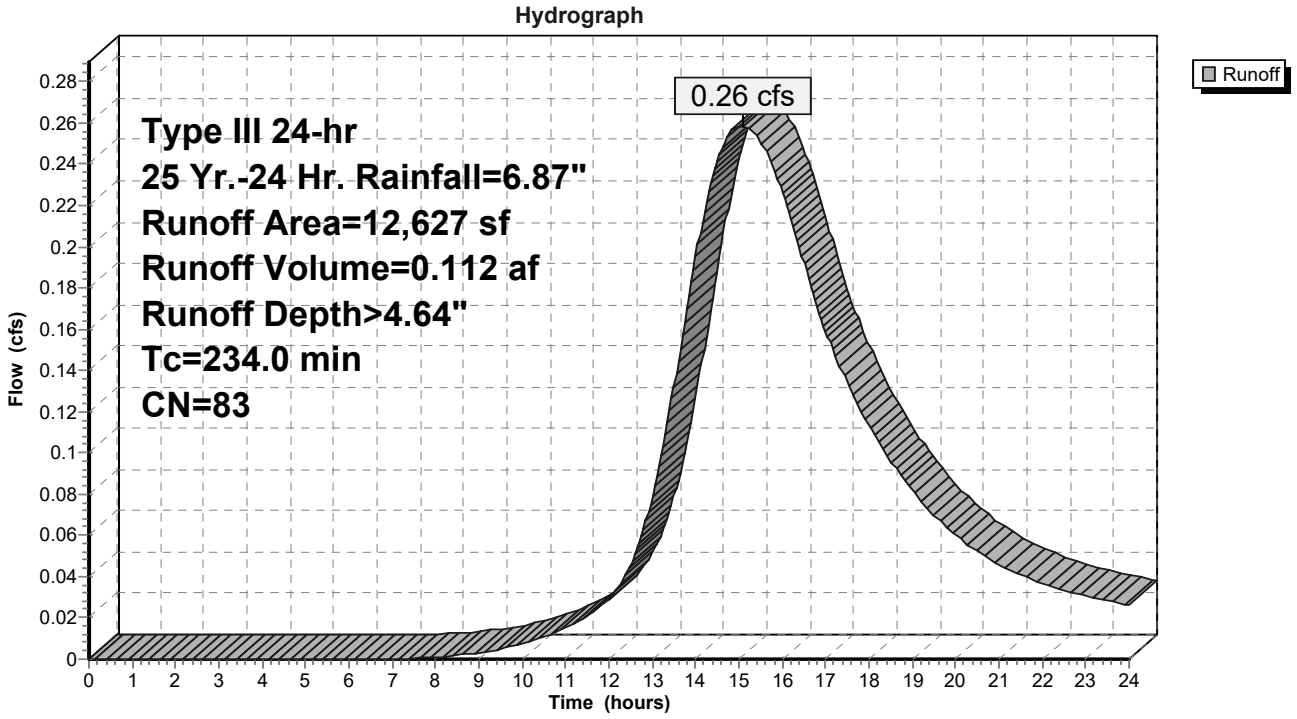
Runoff = 0.26 cfs @ 15.08 hrs, Volume= 0.112 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
3,795	61	>75% Grass cover, Good, HSG B
4,000	98	Paved parking, HSG B
807	98	Roofs, HSG B
822	39	>75% Grass cover, Good, HSG A
2,904	98	Paved parking, HSG A
31	96	Gravel surface, HSG A
268	96	Gravel surface, HSG B
12,627	83	Weighted Average
4,916		38.93% Pervious Area
7,711		61.07% 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

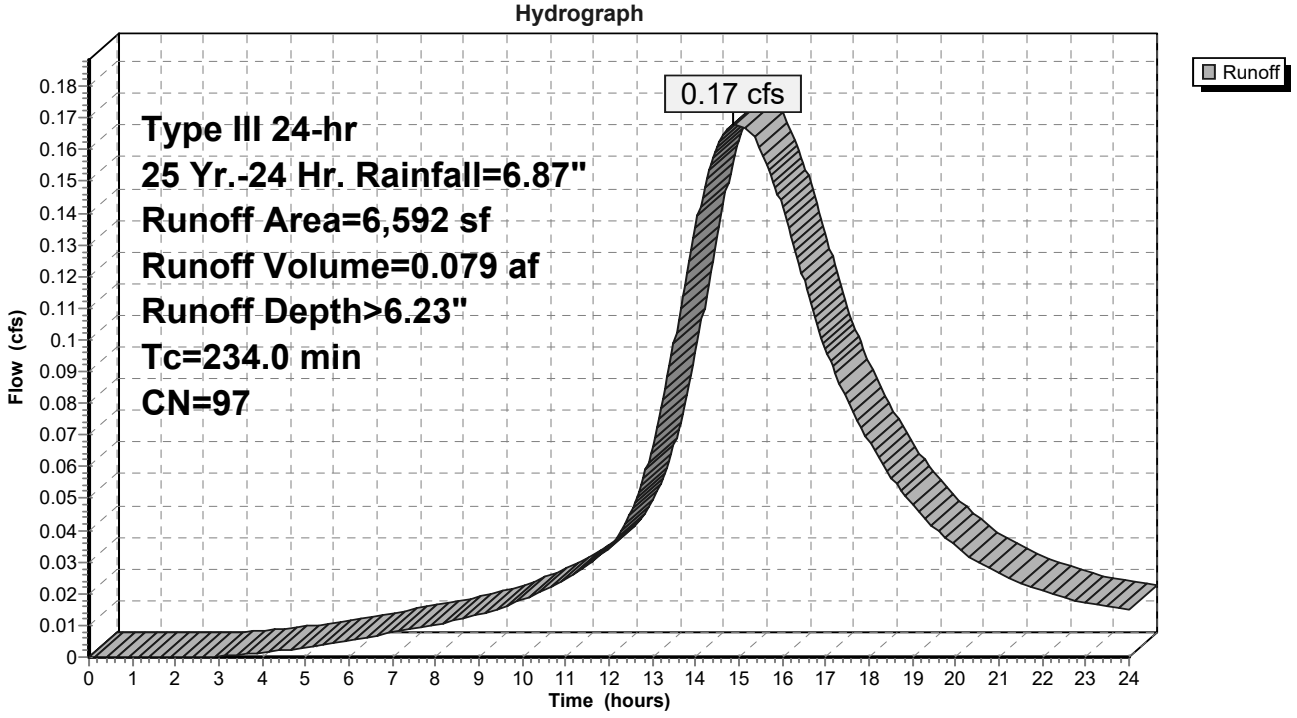
Runoff = 0.17 cfs @ 14.86 hrs, Volume= 0.079 af, Depth> 6.23"

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
154	61	>75% Grass cover, Good, HSG B
6,312	98	Paved parking, HSG B
126	96	Gravel surface, HSG B
6,592	97	Weighted Average
280		4.25% Pervious Area
6,312		95.75% 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

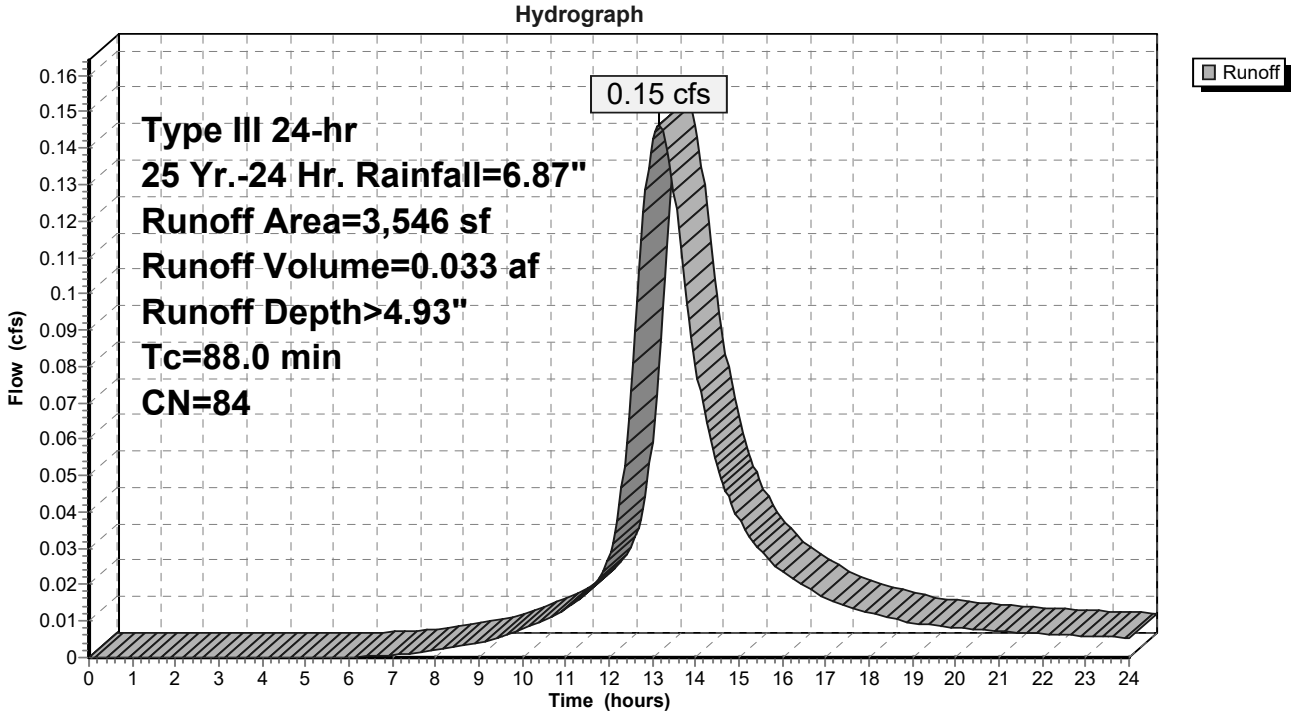
Runoff = 0.15 cfs @ 13.17 hrs, Volume= 0.033 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Yr.-24 Hr. Rainfall=6.87"

Area (sf)	CN	Description
1,321	61	>75% Grass cover, Good, HSG B
2,225	98	Paved parking, HSG B
3,546	84	Weighted Average
1,321		37.25% Pervious Area
2,225		62.75% 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

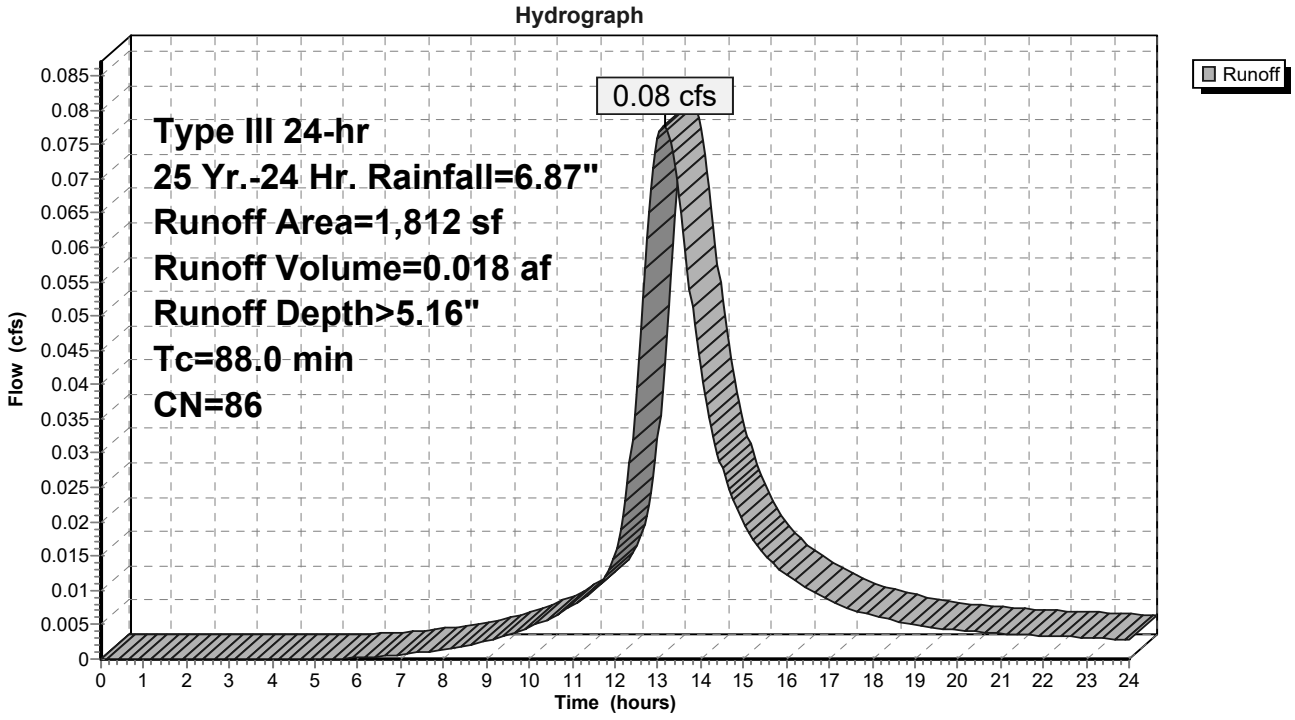
Runoff = 0.08 cfs @ 13.16 hrs, Volume= 0.018 af, Depth> 5.16"

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
603	61	>75% Grass cover, Good, HSG B
633	98	Paved parking, HSG B
576	98	Roofs, HSG B
1,812	86	Weighted Average
603		33.28% Pervious Area
1,209		66.72% 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

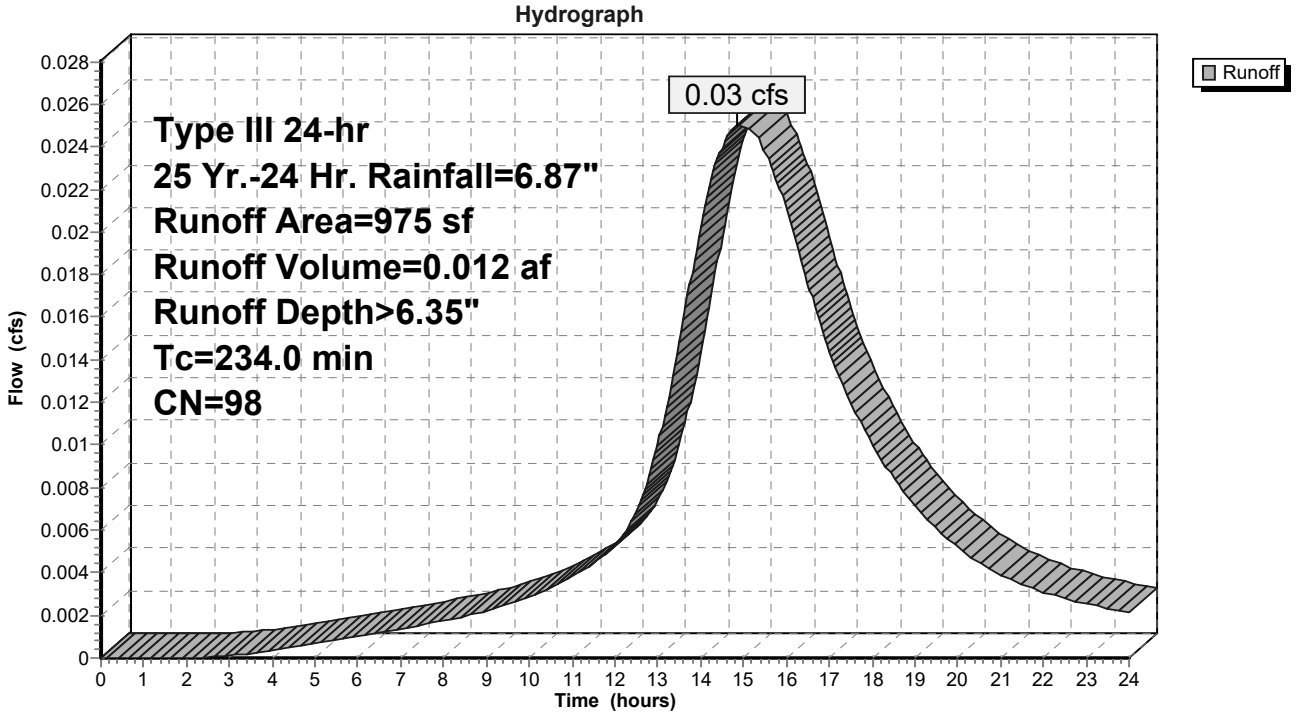
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

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

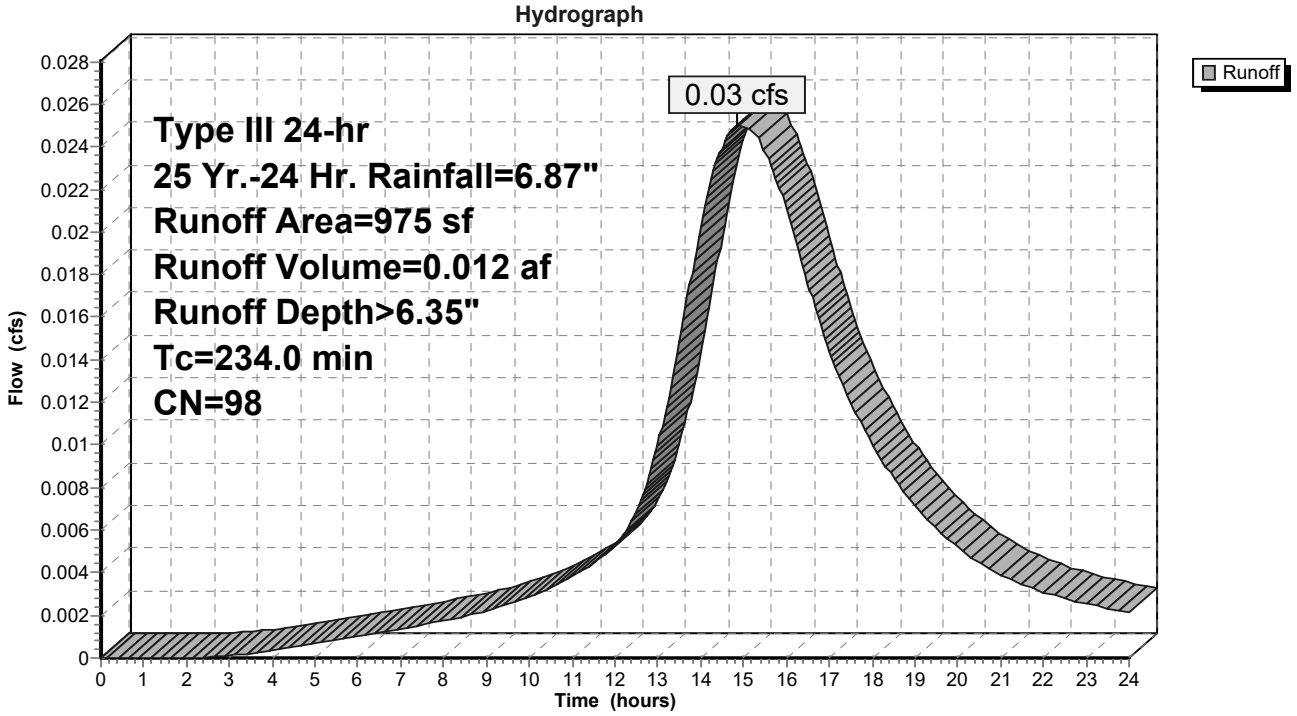
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

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 32S: Units #4&5



Summary for Subcatchment 33AS: Units #6&7

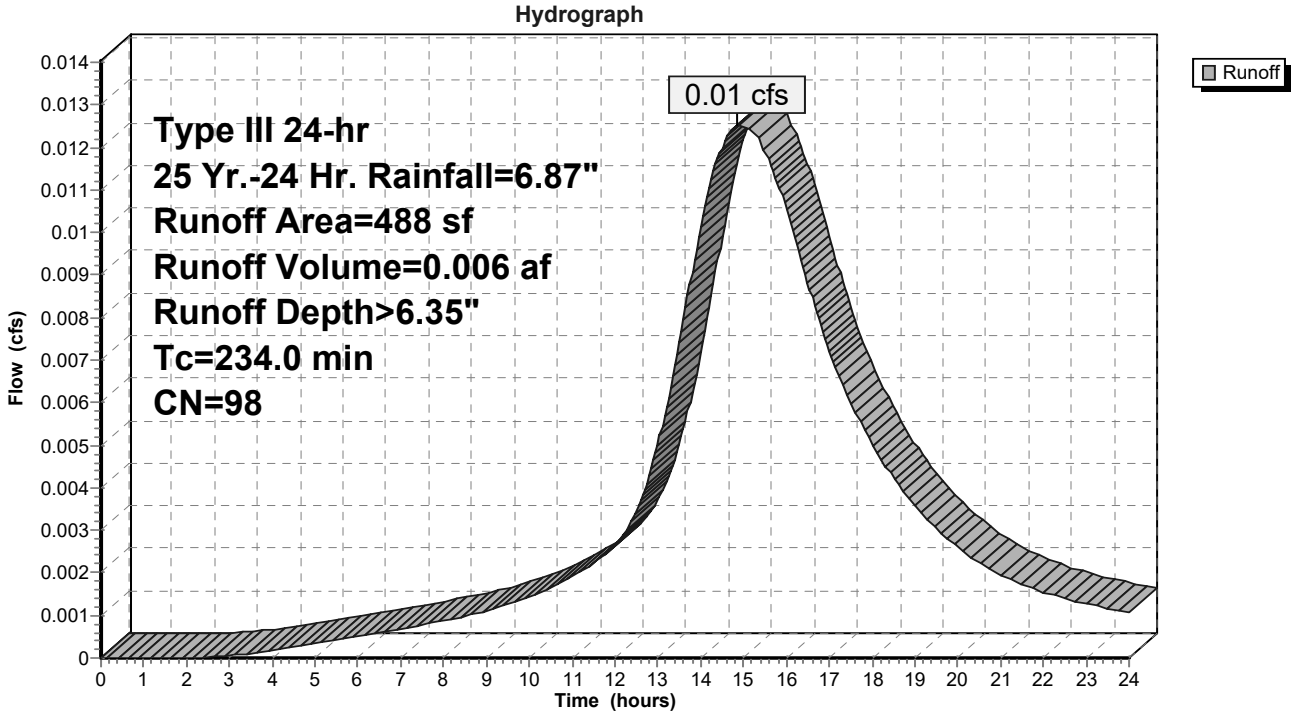
Runoff = 0.01 cfs @ 14.86 hrs, Volume= 0.006 af, Depth> 6.35"

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
488	98	Roofs, HSG B
488		100.00% Impervious Area

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

Subcatchment 33AS: Units #6&7



Summary for Subcatchment 33BS: Units #6&7

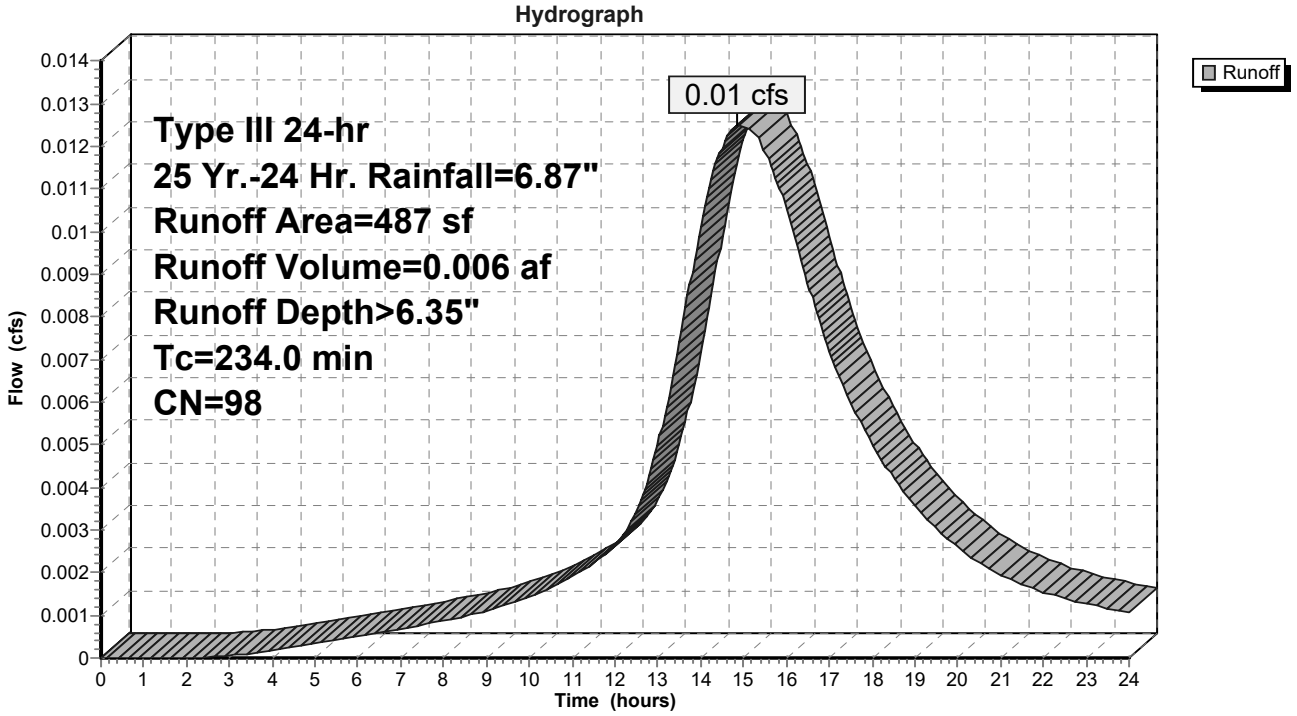
Runoff = 0.01 cfs @ 14.86 hrs, Volume= 0.006 af, Depth> 6.35"

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
487	98	Roofs, HSG B
487		100.00% Impervious Area

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

Subcatchment 33BS: Units #6&7



Summary for Subcatchment 34S: Units #8&9

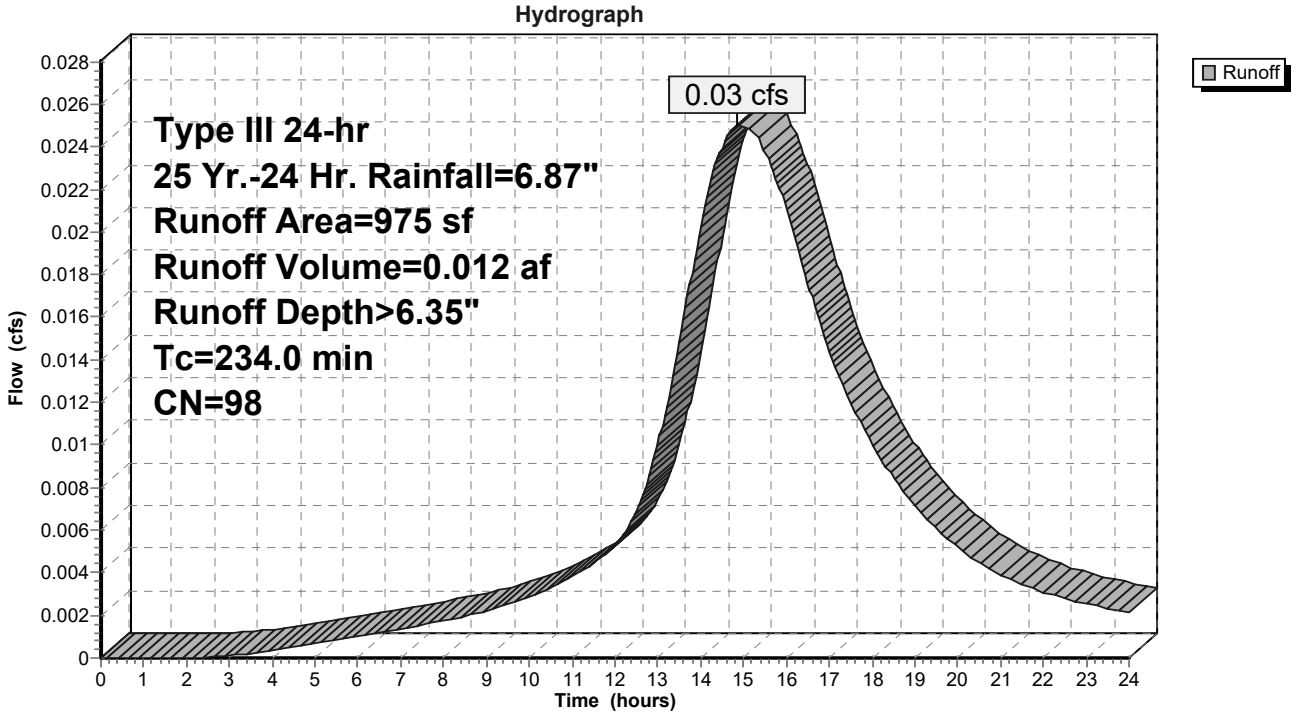
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

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 34S: Units #8&9



Summary for Subcatchment 35S: Units #10&11

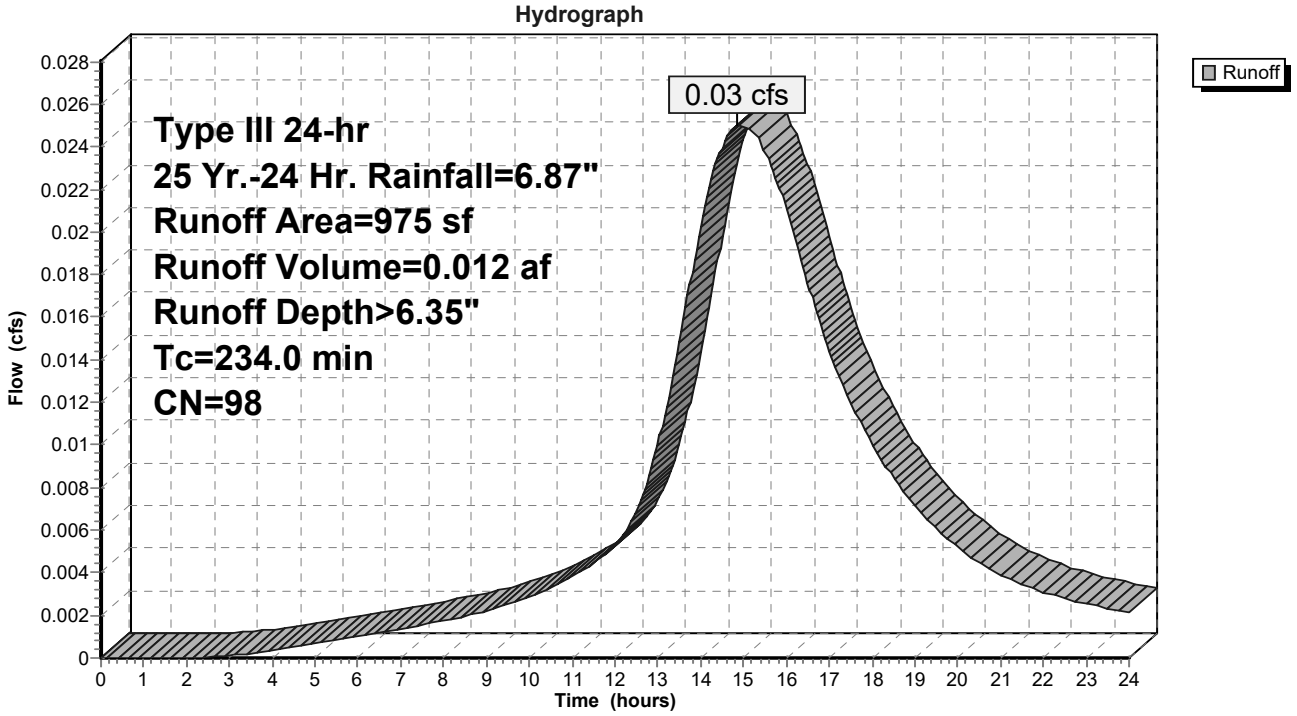
Runoff = 0.03 cfs @ 14.86 hrs, Volume= 0.012 af, Depth> 6.35"

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



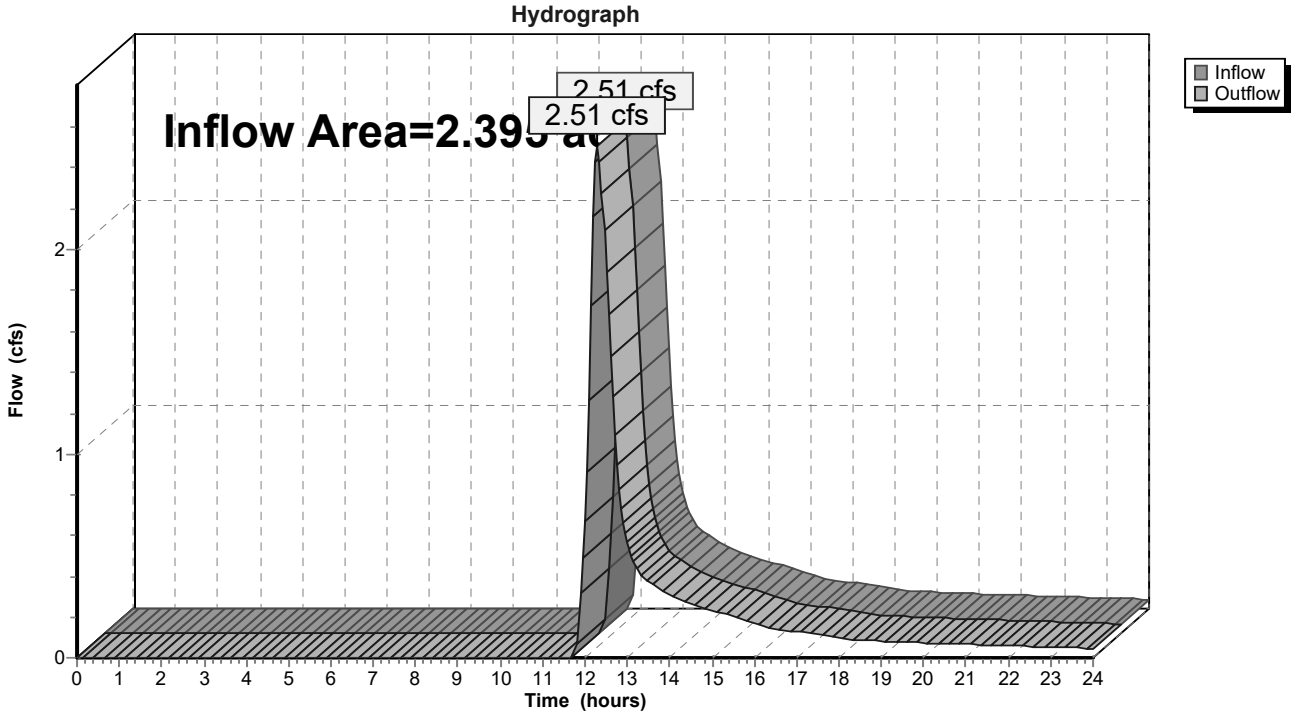
Summary for Reach 100R: Final Reach #100

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

Inflow Area = 2.395 ac, 17.89% Impervious, Inflow Depth > 1.27" for 25 Yr.-24 Hr. event
Inflow = 2.51 cfs @ 12.30 hrs, Volume= 0.253 af
Outflow = 2.51 cfs @ 12.30 hrs, Volume= 0.253 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=14)

Inflow Area = 0.894 ac, 5.84% Impervious, Inflow Depth > 0.76" for 25 Yr.-24 Hr. event
Inflow = 0.37 cfs @ 12.46 hrs, Volume= 0.057 af
Outflow = 0.16 cfs @ 12.99 hrs, Volume= 0.057 af, Atten= 56%, Lag= 32.0 min
Discarded = 0.16 cfs @ 12.99 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= 206.52' @ 12.99 hrs Surf.Area= 2,360 sf Storage= 599 cf
Flood Elev= 207.00' Surf.Area= 2,778 sf Storage= 1,328 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 81.4 min (995.9 - 914.5)

Volume	Invert	Avail.Storage	Storage Description
#1	205.75'	371 cf	**Ponding Area South (Irregular)**Listed below (Recalc)
#2	206.00'	208 cf	**Ponding Area North (Irregular)**Listed below (Recalc)
#3	206.50'	1,179 cf	**Open Water (Irregular)**Listed below (Recalc)
		1,758 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	391	134.6	0	0	391
206.00	460	138.5	106	106	482
206.50	602	144.8	265	371	641

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	376	78.5	0	0	376
206.50	457	84.7	208	208	466

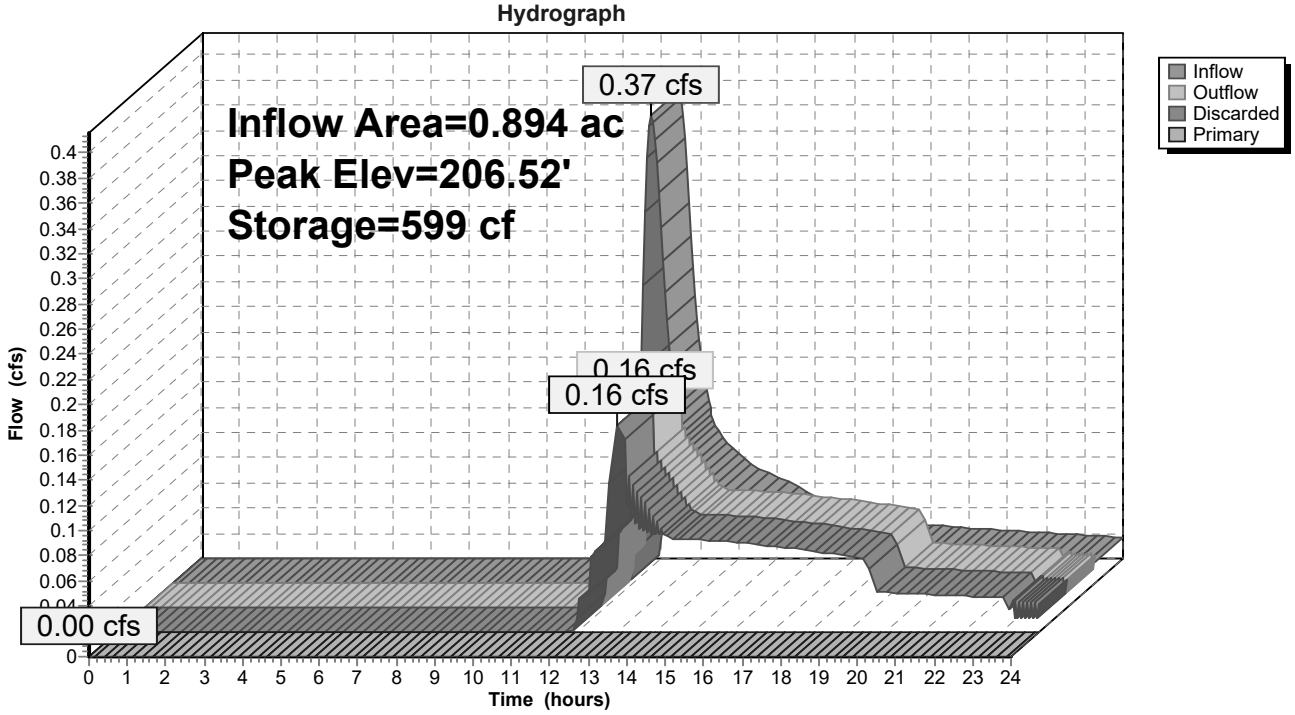
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.50	1,288	427.1	0	0	1,288
207.00	1,719	434.6	749	749	1,846
207.25	1,719	434.6	430	1,179	1,954

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 @ 12.99 hrs HW=206.52' (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 = 1.027 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)

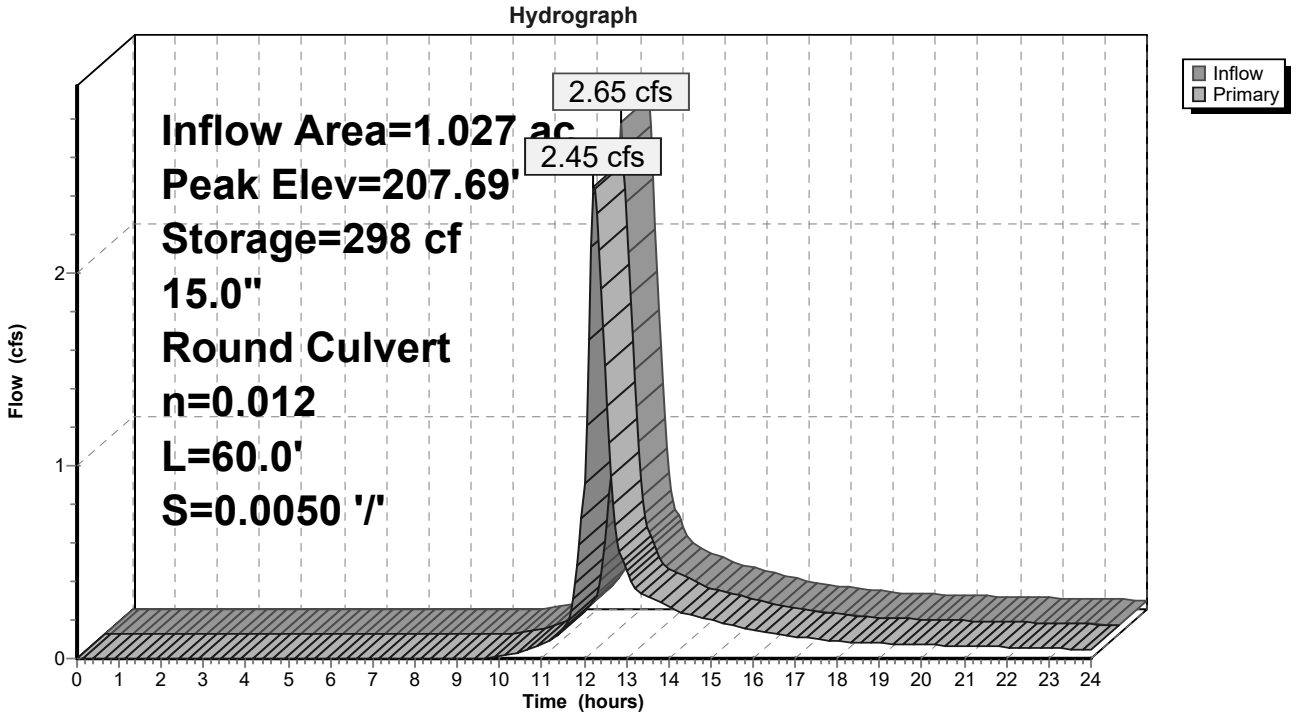
Volume	Invert	Avail.Storage	Storage Description
#1	206.69'	870 cf	**Ponding Area (Irregular)**Listed below (Recalc)

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 4P: Infiltration Sump

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=22)

Inflow Area = 0.308 ac, 13.31% Impervious, Inflow Depth > 3.10" for 25 Yr.-24 Hr. event
Inflow = 1.09 cfs @ 12.10 hrs, Volume= 0.080 af
Outflow = 0.12 cfs @ 12.99 hrs, Volume= 0.080 af, Atten= 89%, Lag= 53.4 min
Discarded = 0.12 cfs @ 12.99 hrs, Volume= 0.080 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= 207.16' @ 12.99 hrs Surf.Area= 1,751 sf Storage= 1,355 cf
Flood Elev= 207.75' Surf.Area= 3,566 sf Storage= 2,894 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 127.9 min (968.0 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	206.00'	3,904 cf	**Ponding Area (Irregular)**Listed below (Recalc)

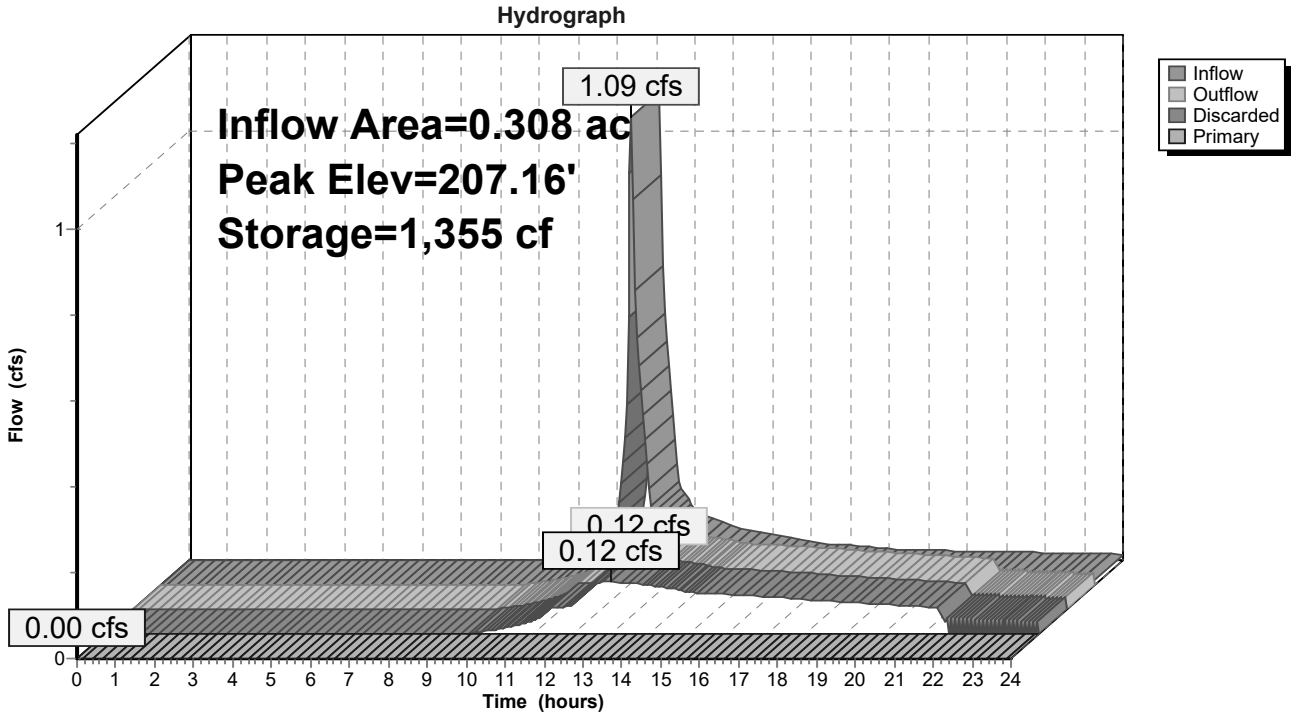
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	863	221.8	0	0	863
207.00	1,371	253.1	1,107	1,107	2,069
208.00	4,527	401.9	2,796	3,904	9,832

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= 46.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 207.50' / 206.50' S= 0.0217 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.12 cfs @ 12.99 hrs HW=207.16' (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

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

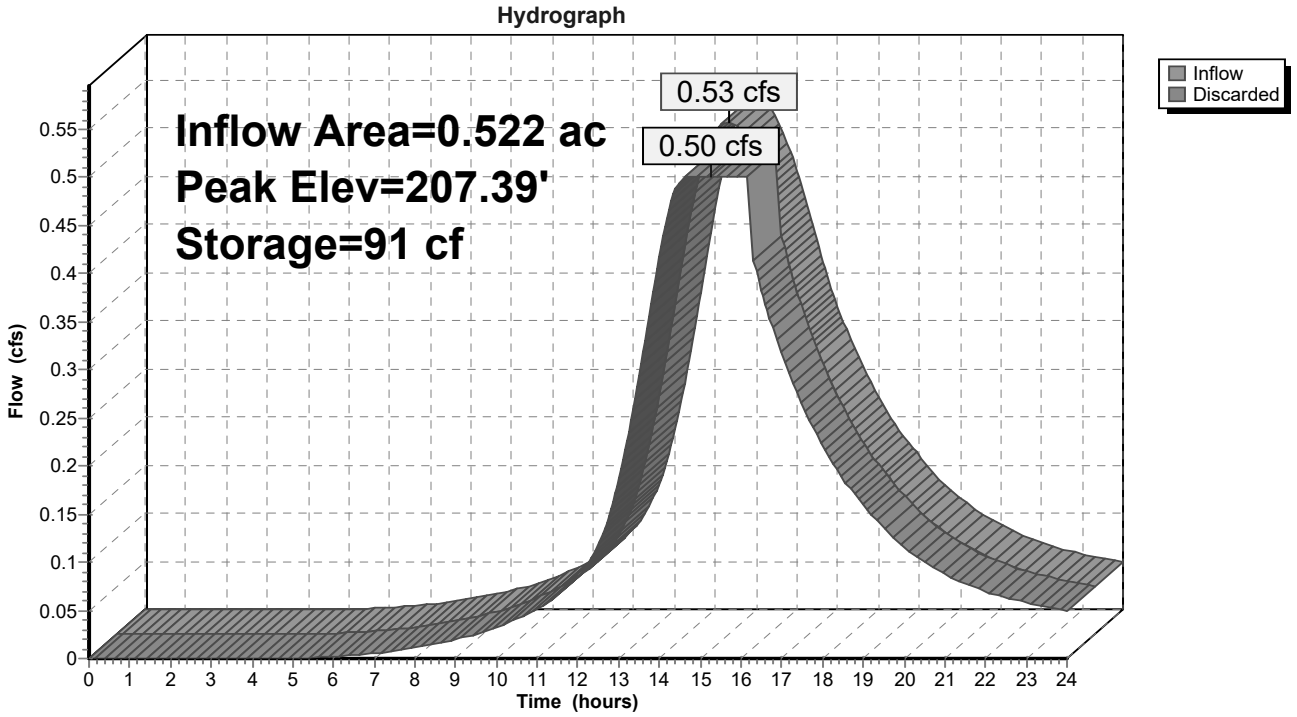
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.36	7,208	648.0	0	0	7,208
209.36	7,208	648.0	7,208	7,208	7,856

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

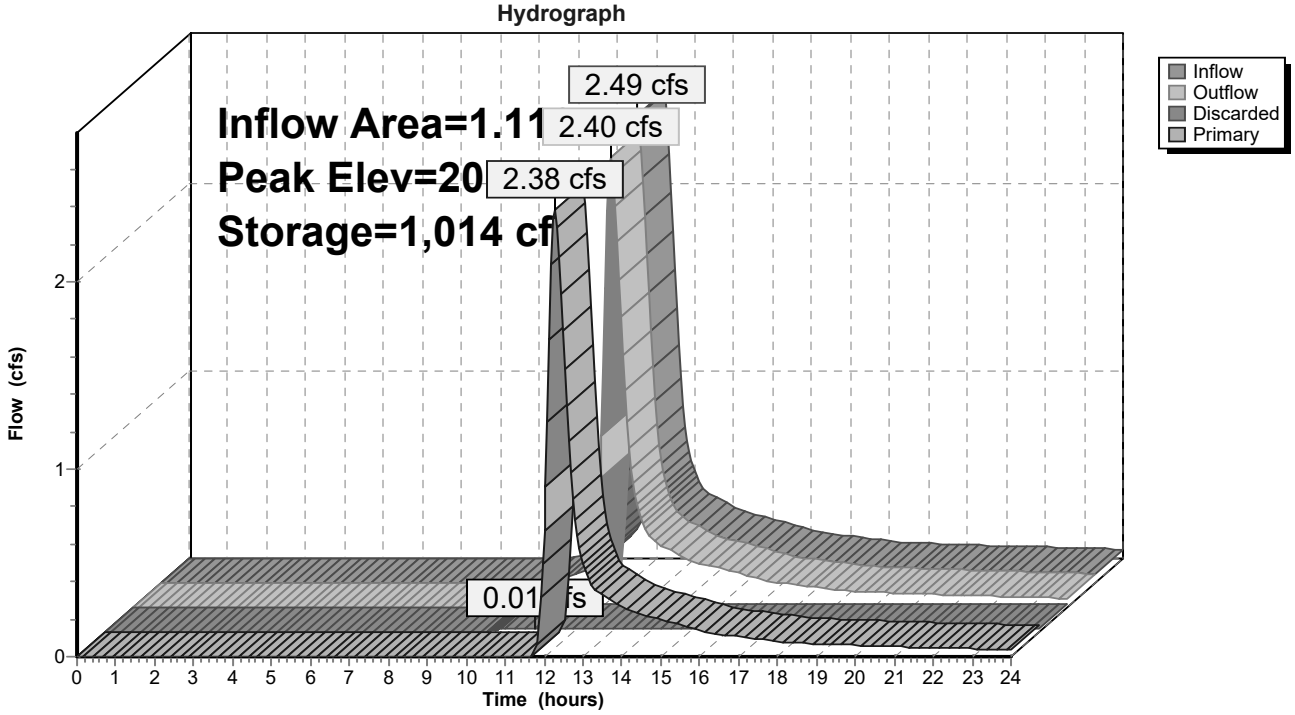
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.00	43	25.0	0	0	43
207.00	424	118.2	201	201	1,107
208.00	742	130.6	576	776	1,383

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



Summary for Pond 201P: Porous Pavement W/ Infiltration #201

Inflow Area = 0.387 ac, 67.30% Impervious, Inflow Depth > 4.39" for 25 Yr.-24 Hr. event
Inflow = 0.32 cfs @ 15.07 hrs, Volume= 0.142 af
Outflow = 0.32 cfs @ 15.33 hrs, Volume= 0.142 af, Atten= 1%, Lag= 15.8 min
Discarded = 0.32 cfs @ 15.33 hrs, Volume= 0.142 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 205.39' @ 15.33 hrs Surf.Area= 4,577 sf Storage= 7 cf
Flood Elev= 207.72' Surf.Area= 4,577 sf Storage= 3,350 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (970.5 - 970.5)

Volume	Invert	Avail.Storage	Storage Description
#1	205.39'	1,831 cf	**Stone (Irregular)** Listed below (Recalc) 4,577 cf Overall x 40.0% Voids
#2	206.39'	915 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 4,577 cf Overall x 20.0% Voids
#3	207.39'	604 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 1,510 cf Overall x 40.0% Voids
		3,350 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.39	4,577	456.8	0	0	4,577
206.39	4,577	456.8	4,577	4,577	5,034

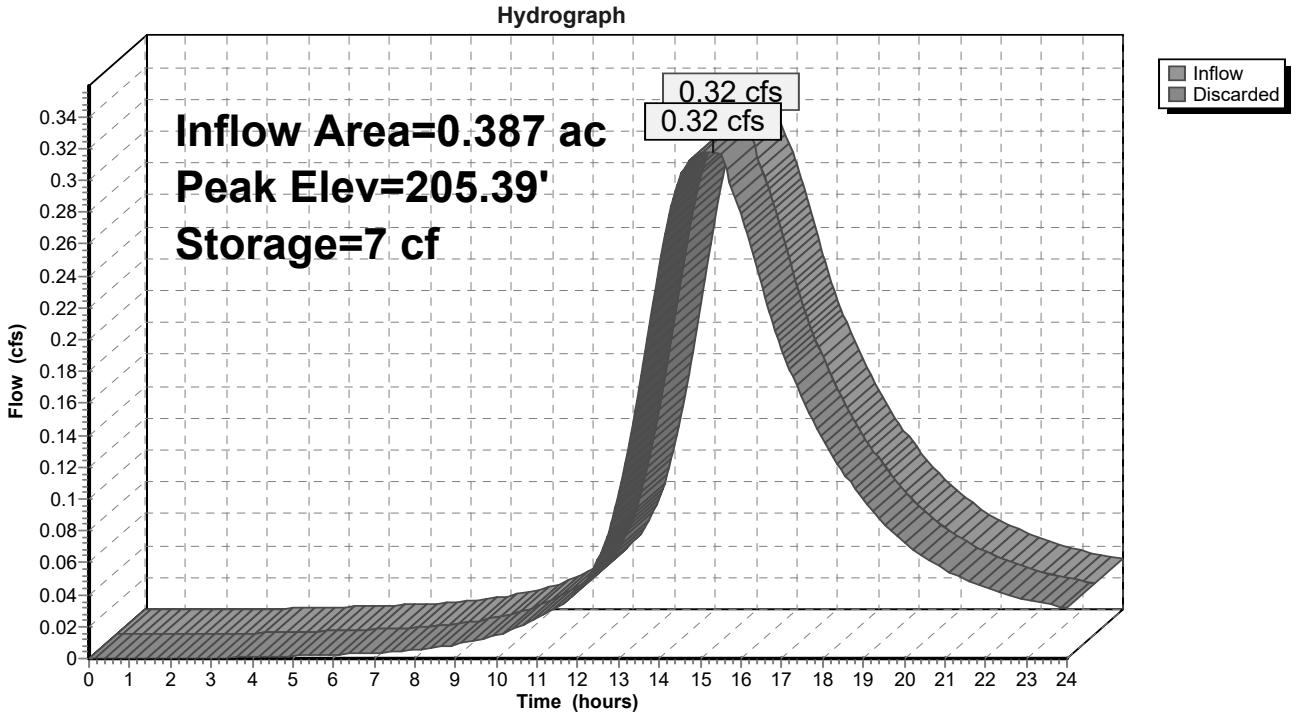
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.39	4,577	456.8	0	0	4,577
207.39	4,577	456.8	4,577	4,577	5,034

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.39	4,577	456.8	0	0	4,577
207.72	4,577	456.8	1,510	1,510	4,728

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.39'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.32 cfs @ 15.33 hrs HW=205.39' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.32 cfs)

Pond 201P: Porous Pavement W/ Infiltration #201



Summary for Pond 202P: Porous Pavement W/ Infiltration #202

Inflow Area = 0.207 ac, 96.90% Impervious, Inflow Depth > 6.26" for 25 Yr.-24 Hr. event
Inflow = 0.23 cfs @ 14.86 hrs, Volume= 0.108 af
Outflow = 0.23 cfs @ 14.86 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.23 cfs @ 14.86 hrs, Volume= 0.108 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 204.94' @ 14.86 hrs Surf.Area= 6,243 sf Storage= 0 cf
Flood Elev= 207.27' Surf.Area= 6,243 sf Storage= 4,570 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	204.94'	2,497 cf	**Stone (Irregular)** Listed below (Recalc) 6,243 cf Overall x 40.0% Voids
#2	205.94'	1,249 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 6,243 cf Overall x 20.0% Voids
#3	206.94'	824 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 2,060 cf Overall x 40.0% Voids
		4,570 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
204.94	6,243	382.1	0	0	6,243
205.94	6,243	382.1	6,243	6,243	6,625

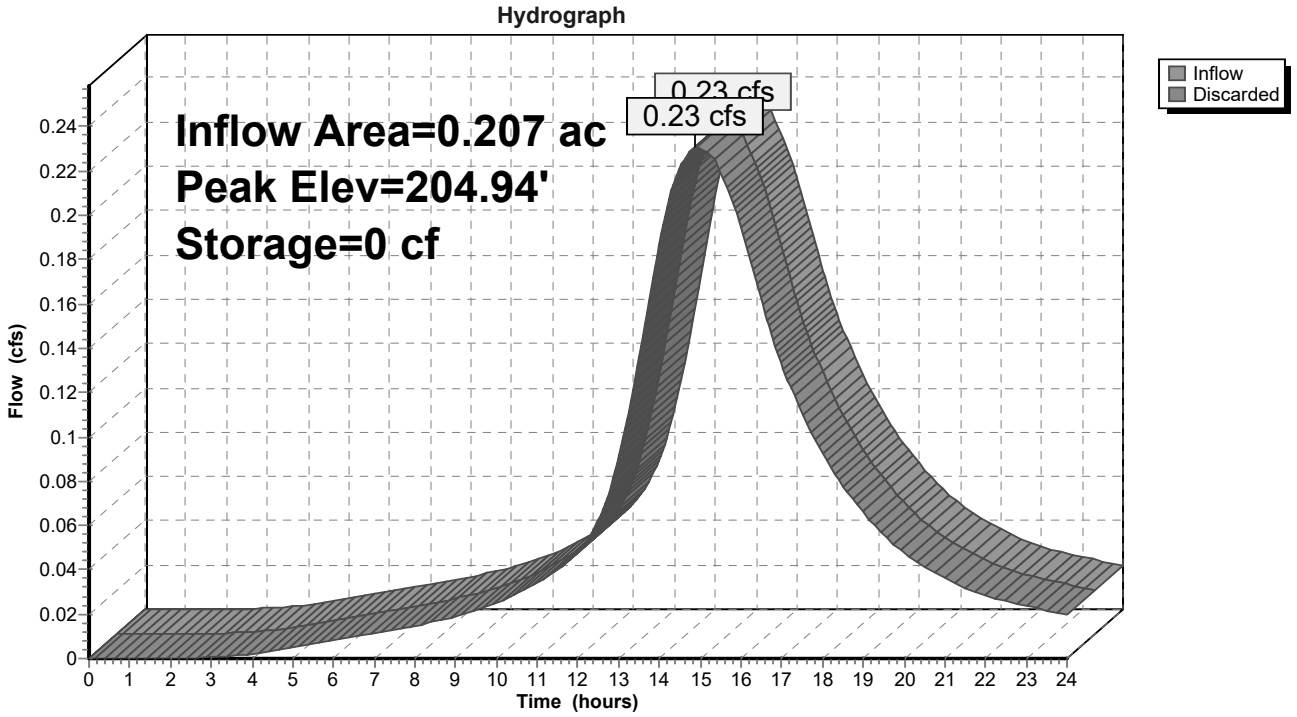
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.94	6,243	382.1	0	0	6,243
206.94	6,243	382.1	6,243	6,243	6,625

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.94	6,243	382.1	0	0	6,243
207.27	6,243	382.1	2,060	2,060	6,369

Device	Routing	Invert	Outlet Devices
#1	Discarded	204.94'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.43 cfs @ 14.86 hrs HW=204.94' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.43 cfs)

Pond 202P: Porous Pavement W/ Infiltration #202



Summary for Pond 203P: Porous Pavers W/ Infiltration #203

Inflow Area = 0.081 ac, 62.75% Impervious, Inflow Depth > 4.93" for 25 Yr.-24 Hr. event
Inflow = 0.15 cfs @ 13.17 hrs, Volume= 0.033 af
Outflow = 0.15 cfs @ 13.17 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.15 cfs @ 13.17 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 206.35' @ 13.17 hrs Surf.Area= 2,238 sf Storage= 0 cf
Flood Elev= 208.10' Surf.Area= 2,238 sf Storage= 1,455 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (864.4 - 864.4)

Volume	Invert	Avail.Storage	Storage Description
#1	206.35'	1,343 cf	**Stone (Irregular)** Listed below (Recalc) 3,357 cf Overall x 40.0% Voids
#2	207.85'	112 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 560 cf Overall x 20.0% Voids
		1,455 cf	Total Available Storage

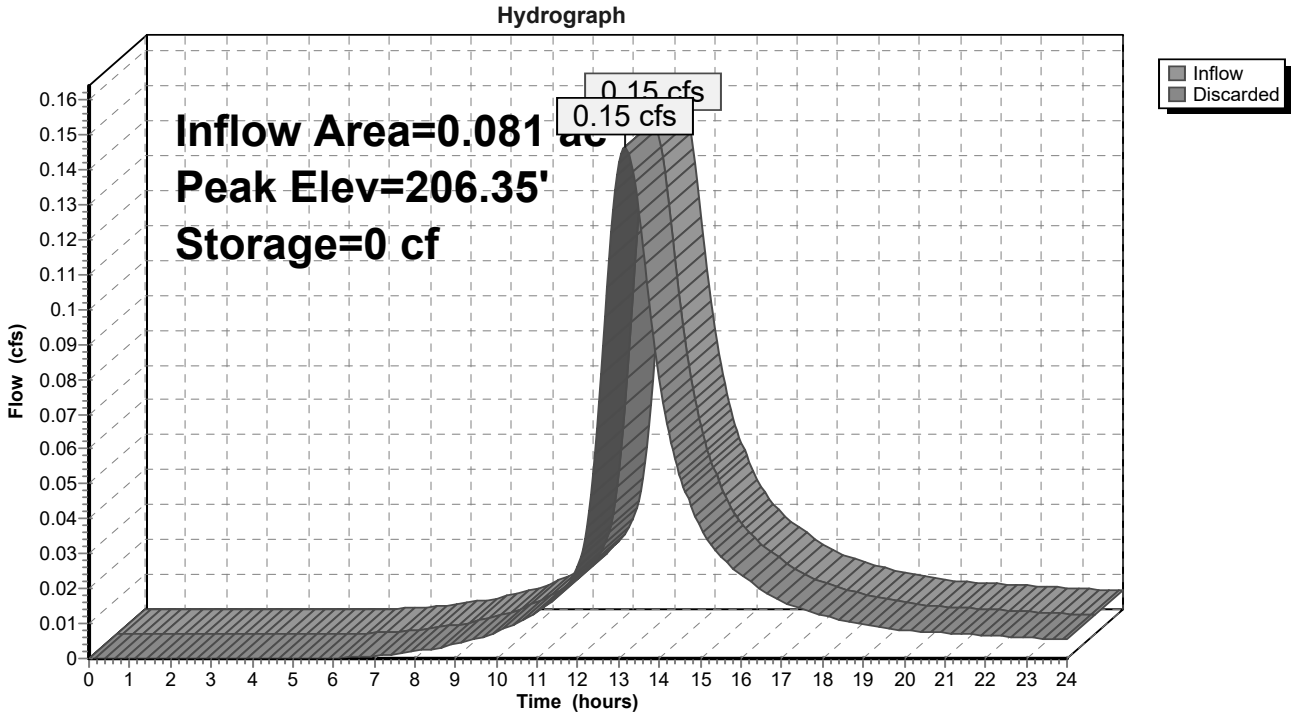
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.35	2,238	623.0	0	0	2,238
207.85	2,238	623.0	3,357	3,357	3,173

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.85	2,238	623.0	0	0	2,238
208.10	2,238	623.0	560	560	2,394

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.35'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.16 cfs @ 13.17 hrs HW=206.35' (Free Discharge)
↑—**1=Infiltration 3in/hr** (Exfiltration Controls 0.16 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=82)

Inflow Area = 0.042 ac, 66.72% Impervious, Inflow Depth > 5.16" for 25 Yr.-24 Hr. event
Inflow = 0.08 cfs @ 13.16 hrs, Volume= 0.018 af
Outflow = 0.04 cfs @ 12.75 hrs, Volume= 0.018 af, Atten= 43%, Lag= 0.0 min
Discarded = 0.04 cfs @ 12.75 hrs, Volume= 0.018 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= 208.38' @ 13.96 hrs Surf.Area= 633 sf Storage= 104 cf
Flood Elev= 209.22' Surf.Area= 633 sf Storage= 285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.2 min (873.3 - 859.1)

Volume	Invert	Avail.Storage	Storage Description
#1	207.97'	253 cf	**Stone (Irregular)** Listed below (Recalc) 633 cf Overall x 40.0% Voids
#2	208.97'	63 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 317 cf Overall x 20.0% Voids
		317 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.97	633	243.8	0	0	633
208.97	633	243.8	633	633	877

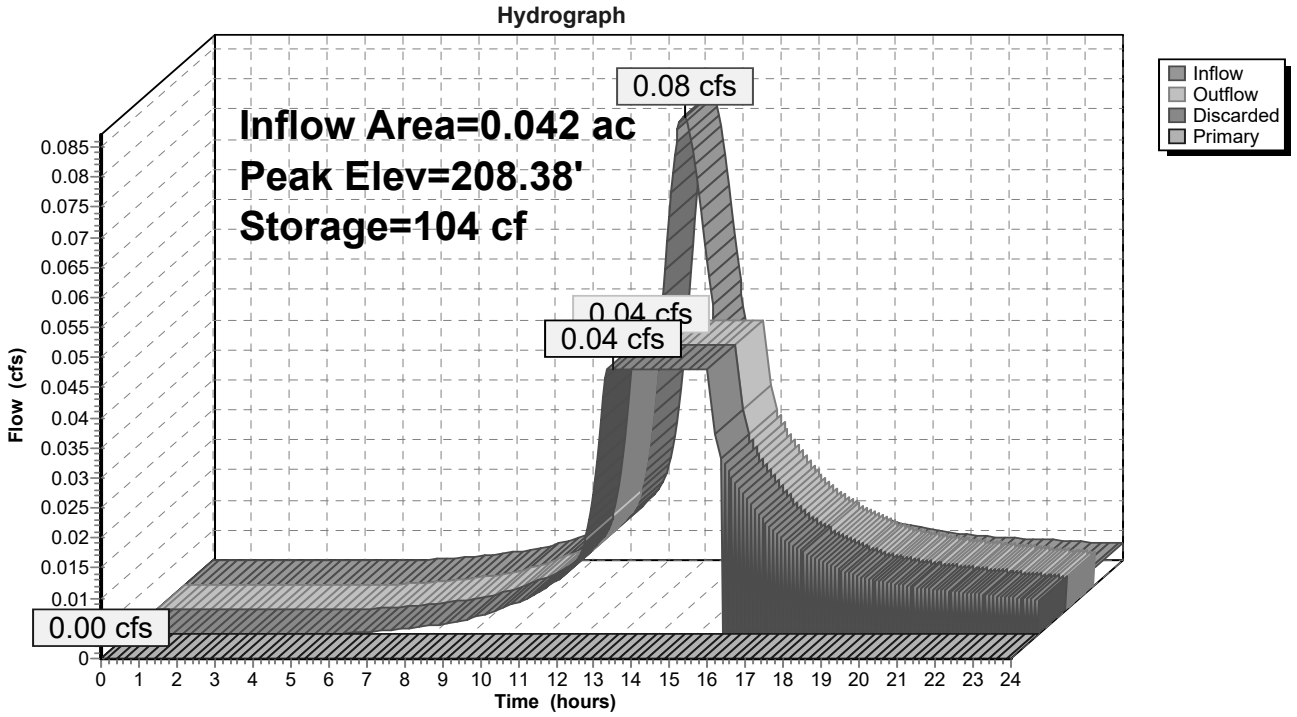
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.97	633	243.8	0	0	633
209.22	633	243.8	158	158	694
209.47	633	243.8	158	317	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.97'	**3.000 in/hr Infiltration 3in/hr over Surface area**
#2	Primary	209.22'	**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=0.04 cfs @ 12.75 hrs HW=208.00' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.97' TW=205.39' (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=25,537 sf 1.92% 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=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 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=13,424 sf 13.31% Impervious Runoff Depth>0.86"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=66 Runoff=0.27 cfs 0.022 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

Subcatchment 21S: Eastern Porous Runoff Area=12,627 sf 61.07% Impervious Runoff Depth>1.83"
Tc=234.0 min CN=83 Runoff=0.10 cfs 0.044 af

Subcatchment 22S: Western Porous Runoff Area=6,592 sf 95.75% Impervious Runoff Depth>3.12"
Tc=234.0 min CN=97 Runoff=0.09 cfs 0.039 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,546 sf 62.75% Impervious Runoff Depth>1.99"
Tc=88.0 min CN=84 Runoff=0.06 cfs 0.014 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=1,812 sf 66.72% Impervious Runoff Depth>2.16"
Tc=88.0 min CN=86 Runoff=0.03 cfs 0.007 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>3.23"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 33AS: Units #6&7 Runoff Area=488 sf 100.00% Impervious Runoff Depth>3.23"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.003 af

Subcatchment 33BS: Units #6&7 Runoff Area=487 sf 100.00% Impervious Runoff Depth>3.23"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.003 af

Subcatchment 34S: Units #8&9 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 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

Reach 100R: Final Reach #100 Inflow=0.35 cfs 0.040 af
Outflow=0.35 cfs 0.040 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=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 4P: Infiltration Sump Peak Elev=206.22' Storage=197 cf Inflow=0.27 cfs 0.022 af
Discarded=0.07 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.022 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

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.39' Storage=0 cf Inflow=0.13 cfs 0.059 af
Outflow=0.13 cfs 0.059 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=204.94' Storage=0 cf Inflow=0.12 cfs 0.054 af
Outflow=0.12 cfs 0.054 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.35' Storage=0 cf Inflow=0.06 cfs 0.014 af
Outflow=0.06 cfs 0.014 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=207.97' Storage=0 cf Inflow=0.03 cfs 0.007 af
Discarded=0.03 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.007 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.333 af Average Runoff Depth = 1.11"
62.33% Pervious = 2.239 ac 37.67% Impervious = 1.353 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=25,537 sf 1.92% Impervious Runoff Depth>0.58"
Flow Length=156' Tc=25.5 min CN=45 Runoff=0.14 cfs 0.029 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 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=13,424 sf 13.31% Impervious Runoff Depth>2.03"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=66 Runoff=0.70 cfs 0.052 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

Subcatchment 21S: Eastern Porous Runoff Area=12,627 sf 61.07% Impervious Runoff Depth>3.37"
Tc=234.0 min CN=83 Runoff=0.19 cfs 0.081 af

Subcatchment 22S: Western Porous Runoff Area=6,592 sf 95.75% Impervious Runoff Depth>4.86"
Tc=234.0 min CN=97 Runoff=0.13 cfs 0.061 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,546 sf 62.75% Impervious Runoff Depth>3.61"
Tc=88.0 min CN=84 Runoff=0.11 cfs 0.025 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=1,812 sf 66.72% Impervious Runoff Depth>3.82"
Tc=88.0 min CN=86 Runoff=0.06 cfs 0.013 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>4.98"
Tc=234.0 min CN=98 Runoff=0.02 cfs 0.009 af

Subcatchment 33AS: Units #6&7 Runoff Area=488 sf 100.00% Impervious Runoff Depth>4.98"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.005 af

Subcatchment 33BS: Units #6&7 Runoff Area=487 sf 100.00% Impervious Runoff Depth>4.98"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.005 af

Subcatchment 34S: Units #8&9 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 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

Reach 100R: Final Reach #100 Inflow=1.48 cfs 0.148 af
Outflow=1.48 cfs 0.148 af

Pond 1P: Infiltration Sump Peak Elev=206.09' Storage=187 cf Inflow=0.14 cfs 0.029 af
Discarded=0.06 cfs 0.029 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.029 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 4P: Infiltration Sump Peak Elev=206.76' Storage=793 cf Inflow=0.70 cfs 0.052 af
Discarded=0.09 cfs 0.052 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.052 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

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.39' Storage=0 cf Inflow=0.24 cfs 0.105 af
Outflow=0.24 cfs 0.105 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=204.94' Storage=0 cf Inflow=0.18 cfs 0.085 af
Outflow=0.18 cfs 0.085 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.35' Storage=0 cf Inflow=0.11 cfs 0.025 af
Outflow=0.11 cfs 0.025 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.09' Storage=31 cf Inflow=0.06 cfs 0.013 af
Discarded=0.04 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.013 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.661 af Average Runoff Depth = 2.21"
62.33% Pervious = 2.239 ac 37.67% Impervious = 1.353 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=25,537 sf 1.92% 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=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 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=13,424 sf 13.31% Impervious Runoff Depth>3.10"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=66 Runoff=1.09 cfs 0.080 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

Subcatchment 21S: Eastern Porous Runoff Area=12,627 sf 61.07% Impervious Runoff Depth>4.64"
Tc=234.0 min CN=83 Runoff=0.26 cfs 0.112 af

Subcatchment 22S: Western Porous Runoff Area=6,592 sf 95.75% Impervious Runoff Depth>6.23"
Tc=234.0 min CN=97 Runoff=0.17 cfs 0.079 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,546 sf 62.75% Impervious Runoff Depth>4.93"
Tc=88.0 min CN=84 Runoff=0.15 cfs 0.033 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=1,812 sf 66.72% Impervious Runoff Depth>5.16"
Tc=88.0 min CN=86 Runoff=0.08 cfs 0.018 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>6.35"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.012 af

Subcatchment 33AS: Units #6&7 Runoff Area=488 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 33BS: Units #6&7 Runoff Area=487 sf 100.00% Impervious Runoff Depth>6.35"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.006 af

Subcatchment 34S: Units #8&9 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 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

Reach 100R: Final Reach #100 Inflow=2.51 cfs 0.253 af
Outflow=2.51 cfs 0.253 af

Pond 1P: Infiltration Sump Peak Elev=206.52' Storage=599 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=207.69' 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 4P: Infiltration Sump Peak Elev=207.16' Storage=1,355 cf Inflow=1.09 cfs 0.080 af
Discarded=0.12 cfs 0.080 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.080 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

Pond 201P: Porous Pavement W/ Infiltration #201 Peak Elev=205.39' Storage=7 cf Inflow=0.32 cfs 0.142 af
Outflow=0.32 cfs 0.142 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=204.94' Storage=0 cf Inflow=0.23 cfs 0.108 af
Outflow=0.23 cfs 0.108 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.35' Storage=0 cf Inflow=0.15 cfs 0.033 af
Outflow=0.15 cfs 0.033 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.38' Storage=104 cf Inflow=0.08 cfs 0.018 af
Discarded=0.04 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.018 af

Total Runoff Area = 3.593 ac Runoff Volume = 0.956 af Average Runoff Depth = 3.19"
62.33% Pervious = 2.239 ac 37.67% Impervious = 1.353 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=25,537 sf 1.92% 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=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 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=13,424 sf 13.31% Impervious Runoff Depth>4.17"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=66 Runoff=1.48 cfs 0.107 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

Subcatchment 21S: Eastern Porous Runoff Area=12,627 sf 61.07% Impervious Runoff Depth>5.85"
Tc=234.0 min CN=83 Runoff=0.32 cfs 0.141 af

Subcatchment 22S: Western Porous Runoff Area=6,592 sf 95.75% Impervious Runoff Depth>7.50"
Tc=234.0 min CN=97 Runoff=0.20 cfs 0.095 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,546 sf 62.75% Impervious Runoff Depth>6.19"
Tc=88.0 min CN=84 Runoff=0.18 cfs 0.042 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=1,812 sf 66.72% Impervious Runoff Depth>6.43"
Tc=88.0 min CN=86 Runoff=0.10 cfs 0.022 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>7.62"
Tc=234.0 min CN=98 Runoff=0.03 cfs 0.014 af

Subcatchment 33AS: Units #6&7 Runoff Area=488 sf 100.00% Impervious Runoff Depth>7.62"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.007 af

Subcatchment 33BS: Units #6&7 Runoff Area=487 sf 100.00% Impervious Runoff Depth>7.62"
Tc=234.0 min CN=98 Runoff=0.01 cfs 0.007 af

Subcatchment 34S: Units #8&9 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 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

Reach 100R: Final Reach #100 Inflow=3.52 cfs 0.364 af
Outflow=3.52 cfs 0.364 af

Pond 1P: Infiltration Sump Peak Elev=206.88' Storage=1,129 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=207.88' 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 4P: Infiltration Sump Peak Elev=207.41' Storage=1,886 cf Inflow=1.48 cfs 0.107 af
Discarded=0.17 cfs 0.107 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.107 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

Pond 201P: Porous Pavement W/ Infiltration Peak Elev=205.62' Storage=423 cf Inflow=0.40 cfs 0.177 af
Outflow=0.32 cfs 0.177 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=204.94' Storage=0 cf Inflow=0.28 cfs 0.130 af
Outflow=0.28 cfs 0.130 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.40' Storage=46 cf Inflow=0.18 cfs 0.042 af
Outflow=0.16 cfs 0.042 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=208.71' Storage=186 cf Inflow=0.10 cfs 0.022 af
Discarded=0.04 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.022 af

Total Runoff Area = 3.593 ac Runoff Volume = 1.251 af Average Runoff Depth = 4.18"
62.33% Pervious = 2.239 ac 37.67% Impervious = 1.353 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=25,537 sf 1.92% Impervious Runoff Depth>2.74"
Flow Length=156' Tc=25.5 min CN=45 Runoff=1.05 cfs 0.134 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 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=13,424 sf 13.31% Impervious Runoff Depth>5.51"
Flow Length=69' Slope=0.0430 '/' Tc=6.0 min CN=66 Runoff=1.95 cfs 0.142 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

Subcatchment 21S: Eastern Porous Runoff Area=12,627 sf 61.07% Impervious Runoff Depth>7.31"
Tc=234.0 min CN=83 Runoff=0.40 cfs 0.177 af

Subcatchment 22S: Western Porous Runoff Area=6,592 sf 95.75% Impervious Runoff Depth>9.03"
Tc=234.0 min CN=97 Runoff=0.24 cfs 0.114 af

Subcatchment 23S: Western Porous Pavers Runoff Area=3,546 sf 62.75% Impervious Runoff Depth>7.71"
Tc=88.0 min CN=84 Runoff=0.22 cfs 0.052 af

Subcatchment 24S: Eastern Porous Pavers Runoff Area=1,812 sf 66.72% Impervious Runoff Depth>7.95"
Tc=88.0 min CN=86 Runoff=0.12 cfs 0.028 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>9.15"
Tc=234.0 min CN=98 Runoff=0.04 cfs 0.017 af

Subcatchment 33AS: Units #6&7 Runoff Area=488 sf 100.00% Impervious Runoff Depth>9.15"
Tc=234.0 min CN=98 Runoff=0.02 cfs 0.009 af

Subcatchment 33BS: Units #6&7 Runoff Area=487 sf 100.00% Impervious Runoff Depth>9.15"
Tc=234.0 min CN=98 Runoff=0.02 cfs 0.009 af

Subcatchment 34S: Units #8&9 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 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

Reach 100R: Final Reach #100 Inflow=4.75 cfs 0.530 af
Outflow=4.75 cfs 0.530 af

Pond 1P: Infiltration Sump Peak Elev=207.02' Storage=1,364 cf Inflow=1.09 cfs 0.139 af
Discarded=0.19 cfs 0.113 af Primary=1.05 cfs 0.024 af Outflow=1.24 cfs 0.137 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 4P: Infiltration Sump Peak Elev=207.63' Storage=2,505 cf Inflow=1.95 cfs 0.142 af
Discarded=0.22 cfs 0.134 af Primary=0.08 cfs 0.005 af Outflow=0.30 cfs 0.139 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

Pond 201P: Porous Pavement W/ Infiltration Peak Elev=206.07' Storage=1,236 cf Inflow=0.49 cfs 0.220 af
Outflow=0.32 cfs 0.220 af

Pond 202P: Porous Pavement W/ Infiltration #202 Peak Elev=204.94' Storage=0 cf Inflow=0.33 cfs 0.157 af
Outflow=0.33 cfs 0.157 af

Pond 203P: Porous Pavers W/ Infiltration #203 Peak Elev=206.55' Storage=175 cf Inflow=0.22 cfs 0.052 af
Outflow=0.16 cfs 0.052 af

Pond 204P: Porous Pavers W/ Infiltration #204 Peak Elev=209.22' Storage=285 cf Inflow=0.12 cfs 0.028 af
Discarded=0.04 cfs 0.027 af Primary=0.02 cfs 0.000 af Outflow=0.06 cfs 0.028 af

Total Runoff Area = 3.593 ac Runoff Volume = 1.624 af Average Runoff Depth = 5.42"
62.33% Pervious = 2.239 ac 37.67% Impervious = 1.353 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 Extension
Dover, NH

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH
6-Jul-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	0.08	1.00	7.1	10.1	0.00	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"
0.40	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	
0.102	ac-in	GRV = AI * Rd	
370	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).	
0.39	ac	A = Area draining to the practice	
0.26	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)	
0.25	ac-in	WQV= 1" x Rv x A	
921	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
230	cf	25% x WQV (check calc for sediment forebay volume)	
691	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:			
4,577	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)	
0.8	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**
206.39	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)	
206.39	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.81	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.81	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
205.62	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
207.72	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	
3.7	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		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

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=59)

Inflow Area = 0.387 ac, 67.30% Impervious, Inflow Depth > 5.48" for 50 Yr.-24 Hr. event
Inflow = 0.40 cfs @ 15.05 hrs, Volume= 0.177 af
Outflow = 0.32 cfs @ 14.45 hrs, Volume= 0.177 af, Atten= 20%, Lag= 0.0 min
Discarded = 0.32 cfs @ 14.45 hrs, Volume= 0.177 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 205.62' @ 16.26 hrs Surf.Area= 4,577 sf Storage= 423 cf
Flood Elev= 207.72' Surf.Area= 4,577 sf Storage= 3,350 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.6 min (973.6 - 966.0)

Volume	Invert	Avail.Storage	Storage Description
#1	205.39'	1,831 cf	**Stone (Irregular)** Listed below (Recalc) 4,577 cf Overall x 40.0% Voids
#2	206.39'	915 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 4,577 cf Overall x 20.0% Voids
#3	207.39'	604 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 1,510 cf Overall x 40.0% Voids
		3,350 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.39	4,577	456.8	0	0	4,577
206.39	4,577	456.8	4,577	4,577	5,034

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.39	4,577	456.8	0	0	4,577
207.39	4,577	456.8	4,577	4,577	5,034

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.39	4,577	456.8	0	0	4,577
207.72	4,577	456.8	1,510	1,510	4,728

Device	Routing	Invert	Outlet Devices
#1	Discarded	205.39'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.32 cfs @ 14.45 hrs HW=205.41' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.32 cfs)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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).	
0.21	ac	A = Area draining to the practice	
0.20	ac	A_I = Impervious area draining to the practice	
0.97	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.92	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.19	ac-in	WQV= 1" x Rv x A	
691	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
173	cf	25% x WQV (check calc for sediment forebay volume)	
518	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:			
6,243	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**
205.82	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)	
205.82	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
1.14	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.14	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
204.82	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
207.15	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 = 0.207 ac, 96.90% Impervious, Inflow Depth > 7.54" for 50 Yr.-24 Hr. event
Inflow = 0.28 cfs @ 14.86 hrs, Volume= 0.130 af
Outflow = 0.28 cfs @ 14.86 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.28 cfs @ 14.86 hrs, Volume= 0.130 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 204.82' @ 14.86 hrs Surf.Area= 6,243 sf Storage= 0 cf
Flood Elev= 207.15' Surf.Area= 6,243 sf Storage= 4,570 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	204.82'	2,497 cf	**Stone (Irregular)** Listed below (Recalc) 6,243 cf Overall x 40.0% Voids
#2	205.82'	1,249 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 6,243 cf Overall x 20.0% Voids
#3	206.82'	824 cf	**Choker Course (Irregular)** Listed below (Recalc) -Impervious 2,060 cf Overall x 40.0% Voids
		4,570 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
204.82	6,243	382.1	0	0	6,243
205.82	6,243	382.1	6,243	6,243	6,625

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
205.82	6,243	382.1	0	0	6,243
206.82	6,243	382.1	6,243	6,243	6,625

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.82	6,243	382.1	0	0	6,243
207.15	6,243	382.1	2,060	2,060	6,369

Device	Routing	Invert	Outlet Devices
#1	Discarded	204.82'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.43 cfs @ 14.86 hrs HW=204.82' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.43 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).	
0.08	ac	A = Area draining to the practice	
0.05	ac	A_I = Impervious area draining to the practice	
0.63	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.61	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.05	ac-in	WQV= 1" x Rv x A	
181	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
45	cf	25% x WQV (check calc for sediment forebay volume)	
136	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:			
2,238	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)	
0.3	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**
206.85	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)	
206.85	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
2.12	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
2.12	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
206.40	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
208.10	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**
	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	
1.7	: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=92)

Inflow Area = 0.081 ac, 62.75% Impervious, Inflow Depth > 6.19" for 50 Yr.-24 Hr. event
Inflow = 0.18 cfs @ 13.16 hrs, Volume= 0.042 af
Outflow = 0.16 cfs @ 13.10 hrs, Volume= 0.042 af, Atten= 15%, Lag= 0.0 min
Discarded = 0.16 cfs @ 13.10 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 206.40' @ 13.52 hrs Surf.Area= 2,238 sf Storage= 46 cf
Flood Elev= 208.10' Surf.Area= 2,238 sf Storage= 1,455 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.1 min (859.5 - 858.4)

Volume	Invert	Avail.Storage	Storage Description
#1	206.35'	1,343 cf	**Stone (Irregular)** Listed below (Recalc) 3,357 cf Overall x 40.0% Voids
#2	207.85'	112 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 560 cf Overall x 20.0% Voids
		1,455 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
206.35	2,238	623.0	0	0	2,238
207.85	2,238	623.0	3,357	3,357	3,173

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.85	2,238	623.0	0	0	2,238
208.10	2,238	623.0	560	560	2,394

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.35'	**3.000 in/hr Infiltration 3in/hr over Surface area**

Discarded OutFlow Max=0.16 cfs @ 13.10 hrs HW=206.37' (Free Discharge)
↑**1=Infiltration 3in/hr** (Exfiltration Controls 0.16 cfs)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

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).	
0.04	ac	A = Area draining to the practice	
0.03	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)	
0.03	ac-in	WQV= 1" x Rv x A	
99	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
25	cf	25% x WQV (check calc for sediment forebay volume)	
74	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:			
633	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**
207.97	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)	
207.97	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
3.39	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
3.39	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
208.71	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
209.22	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	
2.9	: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=72)

Inflow Area = 0.042 ac, 66.72% Impervious, Inflow Depth > 6.43" for 50 Yr.-24 Hr. event
Inflow = 0.10 cfs @ 13.15 hrs, Volume= 0.022 af
Outflow = 0.04 cfs @ 12.60 hrs, Volume= 0.022 af, Atten= 54%, Lag= 0.0 min
Discarded = 0.04 cfs @ 12.60 hrs, Volume= 0.022 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= 208.71' @ 14.18 hrs Surf.Area= 633 sf Storage= 186 cf
Flood Elev= 209.22' Surf.Area= 633 sf Storage= 285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 27.8 min (881.1 - 853.3)

Volume	Invert	Avail.Storage	Storage Description
#1	207.97'	253 cf	**Stone (Irregular)** Listed below (Recalc) 633 cf Overall x 40.0% Voids
#2	208.97'	63 cf	**Pavers (Irregular)** Listed below (Recalc) -Impervious 317 cf Overall x 20.0% Voids
		317 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.97	633	243.8	0	0	633
208.97	633	243.8	633	633	877

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
208.97	633	243.8	0	0	633
209.22	633	243.8	158	158	694
209.47	633	243.8	158	317	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	207.97'	**3.000 in/hr Infiltration 3in/hr over Surface area**
#2	Primary	209.22'	**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=0.04 cfs @ 12.60 hrs HW=207.99' (Free Discharge)
1=Infiltration 3in/hr (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=207.97' TW=205.39' (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.

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

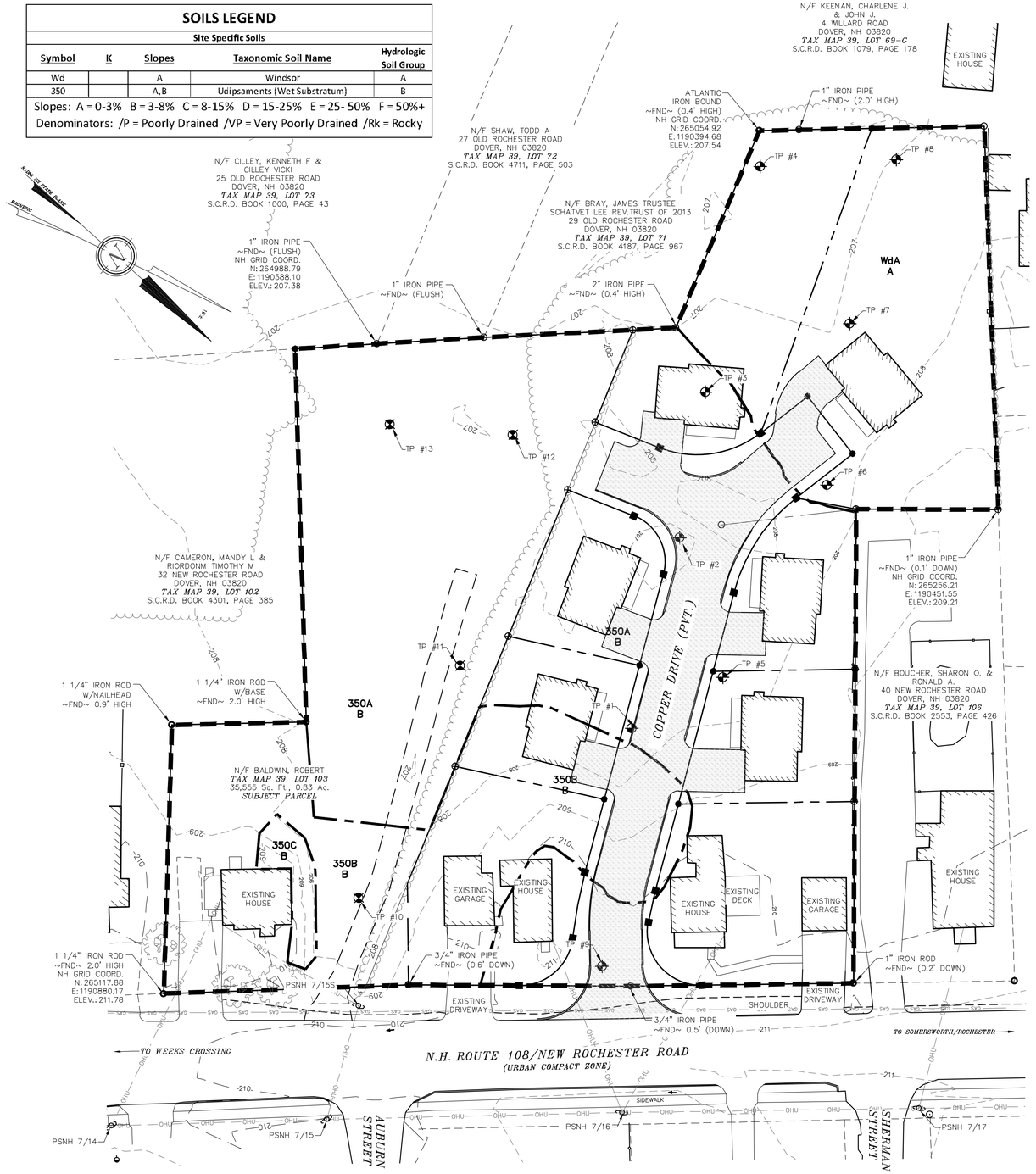
TEST PIT #13
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 32"
REFUSAL @ N/A

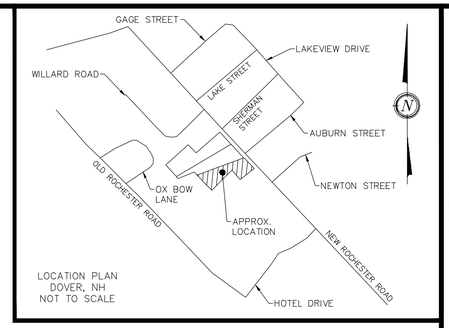
SOILS LEGEND

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.

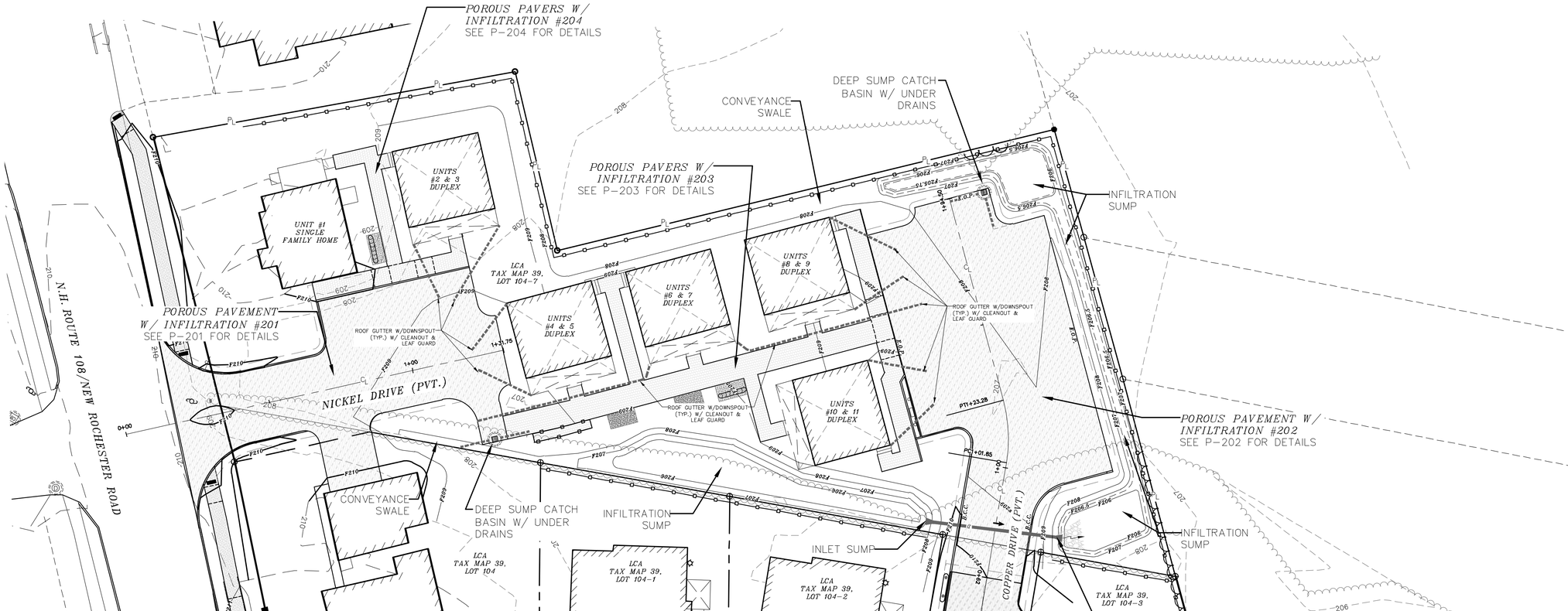
7.) THIS PLAN IS TO ACCOMPANY THE INSPECTION, OPERATIONS, & MAINTENANCE PLAN FOR EXISTING COPPER DRIVE FOR COMPLETE SITE OPERATIONS.

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.



DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

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. 14247
LICENSED
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

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

Stormwater System Management:

Inspection and Maintenance Manual

Copper Drive & Nickel Drive
Dover, NH 03820

Prepared for:

Knox Marsh Development LLC
242 Central Avenue
Dover, NH 03820

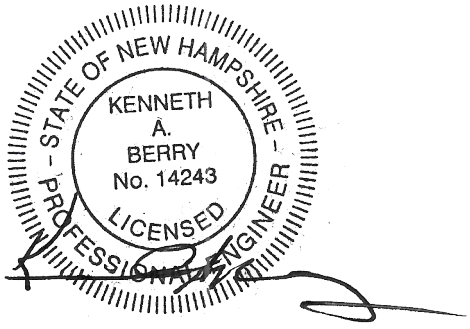
Land of

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

Stormwater System Management:

Inspection and Maintenance Manual

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Site Plans Attached – 1 Page

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.

The owner of Tax Map 39, Lot 103, Robert Baldwin, is proposing the construction of five additional duplex units in addition to the existing house located on the subject parcel for a total of eleven units.

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 149-14 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 & Nickel 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 & Nickel 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 & Nickel 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 & Nickel Drive
Dover, NH 03820

Prepared for:

Knox Marsh Development LLC
242 Central Avenue
DOVER, NH 03820

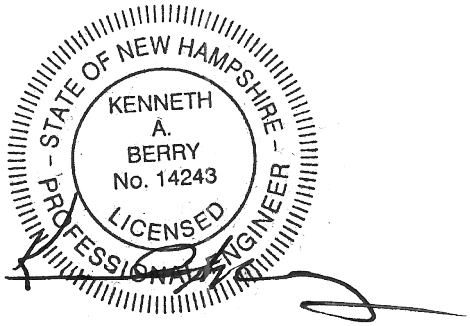
Land of

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: September 25, 2023

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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 Nickel 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 #4-11. 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.

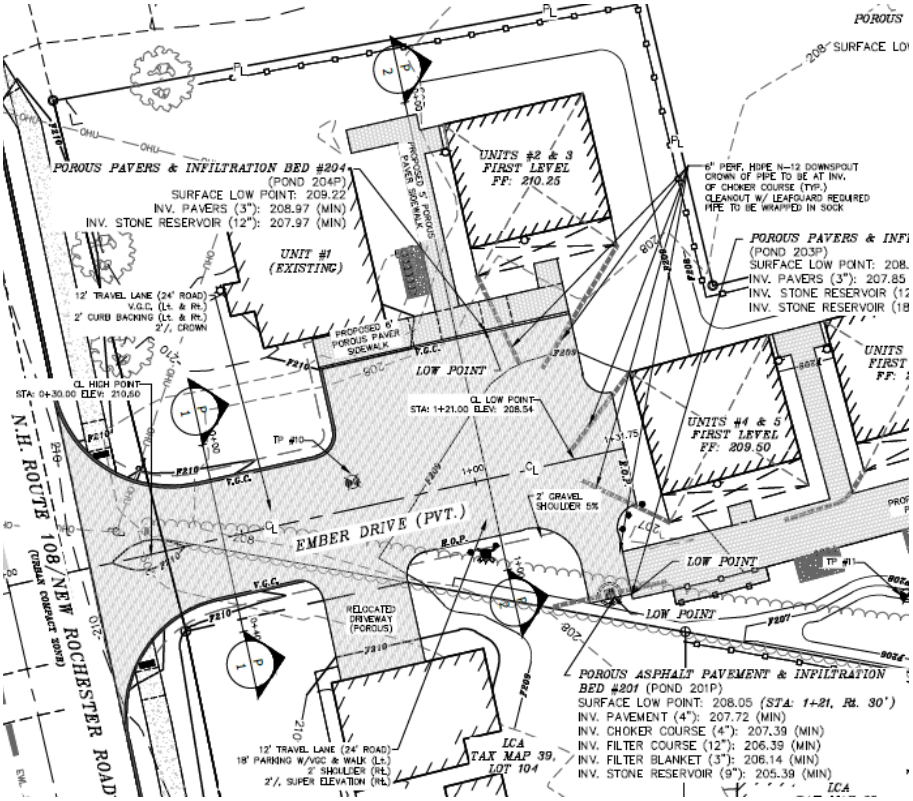
3.0 Test Pit Locations

Porous Pavement #201 (Pond 201) – This practice has a modeled surface area of 4,577 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.

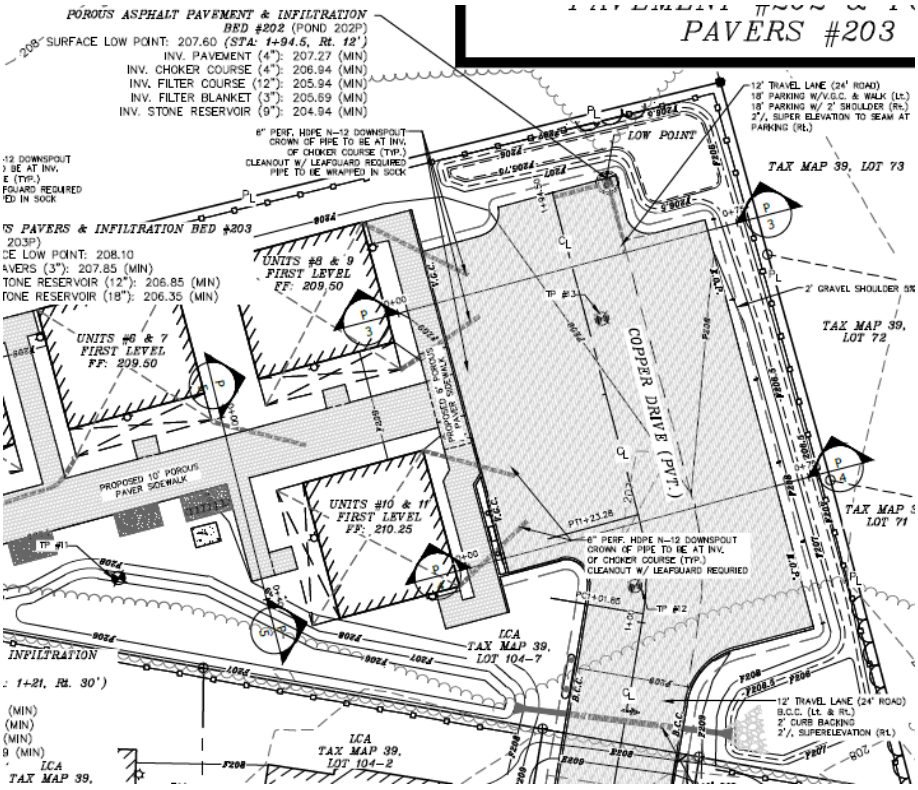
Porous Pavement #202 (Pond 202) – This practice has a modeled surface area of 6,243 square feet (SF) and is proposed to be constructed over approximately test pits #12 & 13. See test pit profiles below. See test pit locations on Porous Pavement w/ Infiltration#202, sheet #9. These test pits were completed 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 2,238 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.

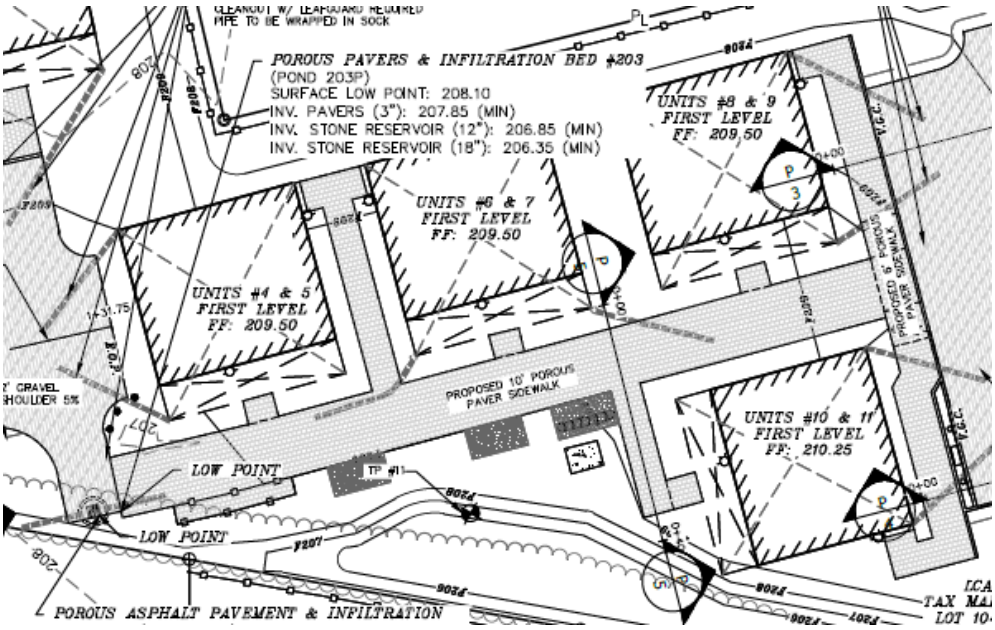
Porous Pavers #204 (Pond 204) – This practice has a modeled surface area of 633 square feet (SF) and is proposed to be constructed over approximately test pit #10. See test pit profiles below. See test pit locations on Porous Pavers w/ Infiltration #204, sheet #9. These test pits were completed in July 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.



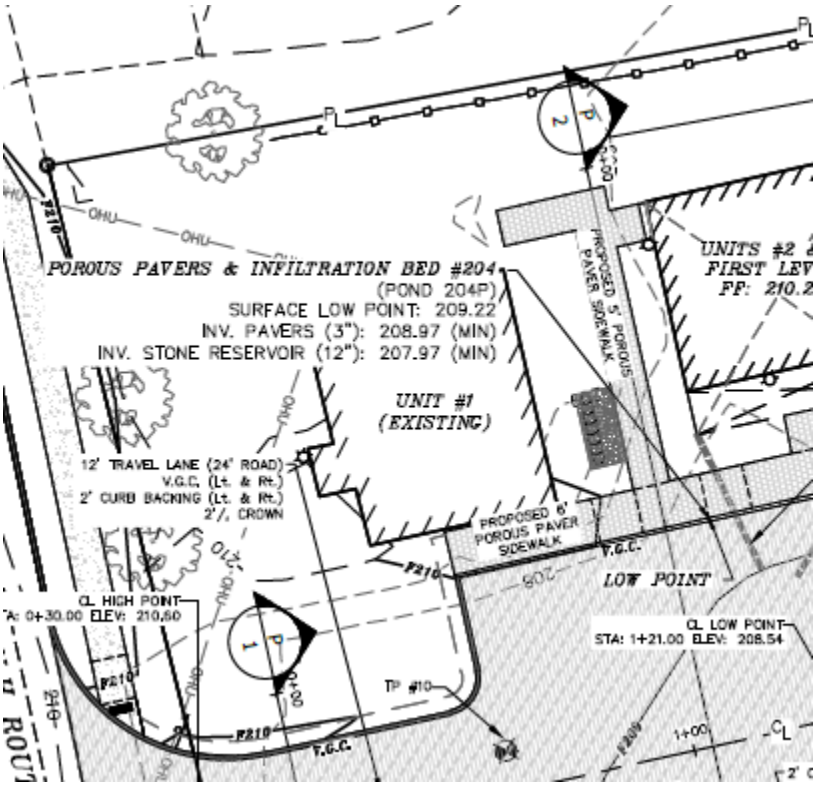
Porous Pavement w/ Infiltration #201 (Pond 201)



Porous Pavement w/ Infiltration #202 (Pond 202)



Porous Pavers w/ Infiltration #203 (Pond 203)



Porous Pavers w/ Infiltration #204 (Pond 204)

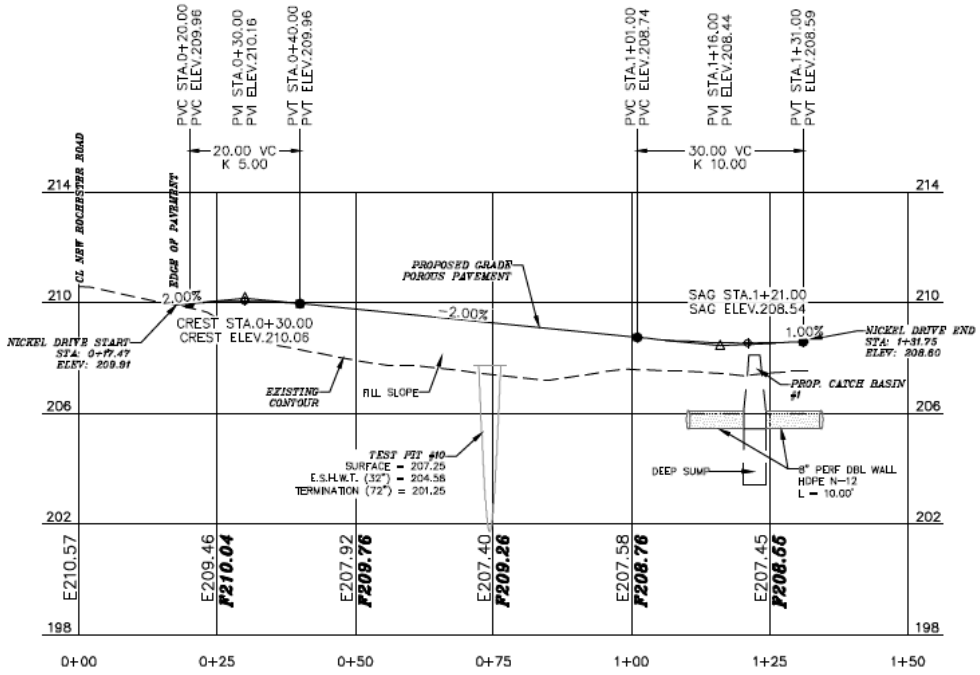
4.0 Seasonal High Water Table (SHWT) and bedrock elevations

Porous Pavement w/ Infiltration #201 (Pond 201)

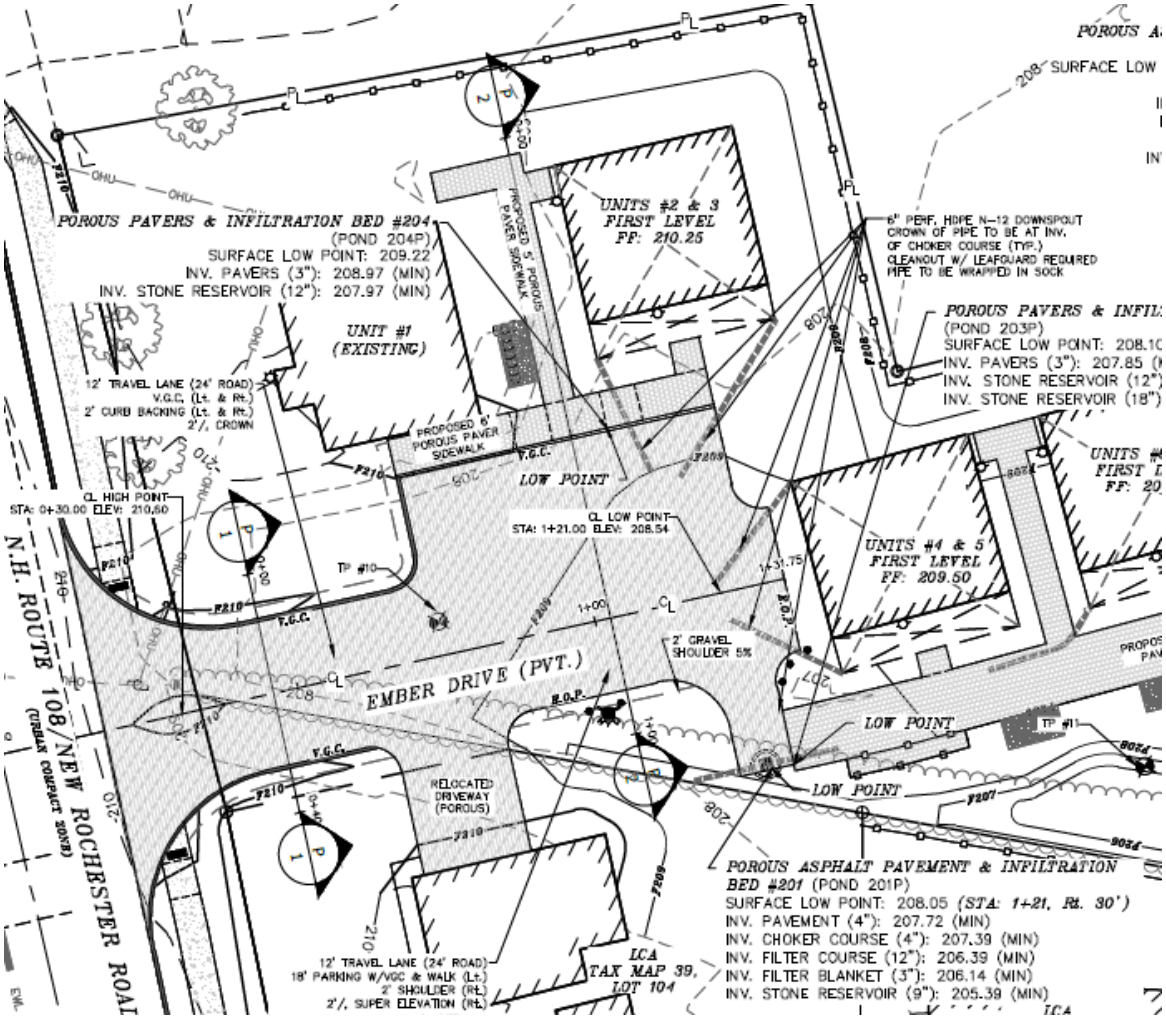
TP#10:	Existing Surface Elevation of TP =	207.25′
	SHWT = 32 – Inches	>204.58′
	Bedrock = > 72 – Inches	>201.25′
	Ground Water = N/A	
	Deepest Elevation of TP =	201.25′

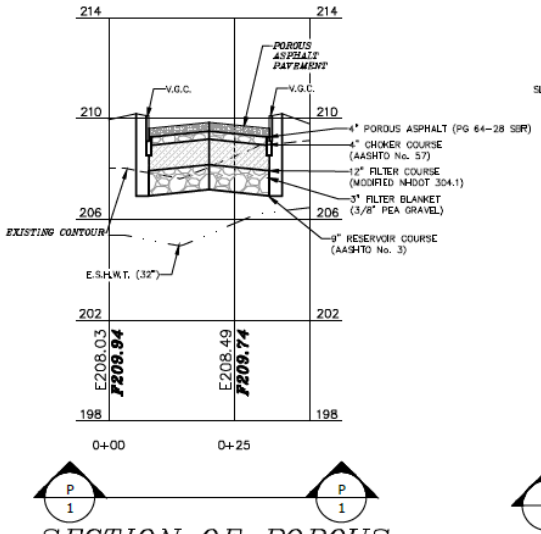
Porous Pavement #101 (Pond 101) Lowest Point: 208.05′

Profile Porous Pavement w/ Infiltration #201

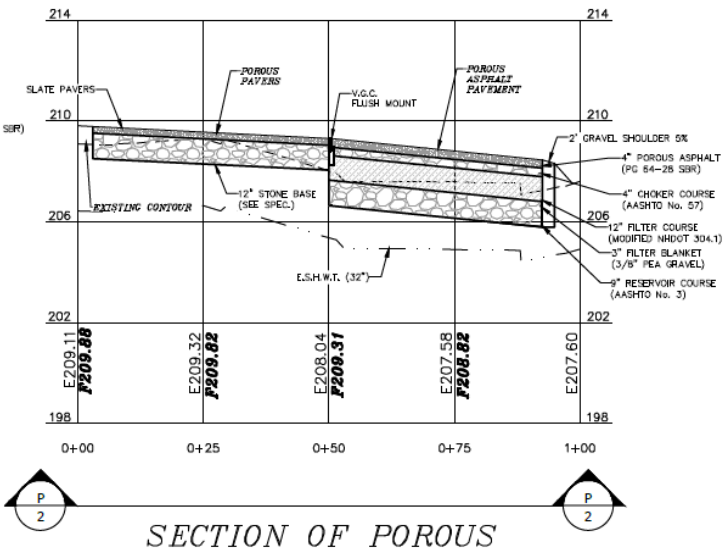


Cross Sections Porous Pavement w/ Infiltration #201





SECTION OF POROUS PAVEMENT #201



SECTION OF POROUS PAVEMENT #201 & POROUS PAVERS #204

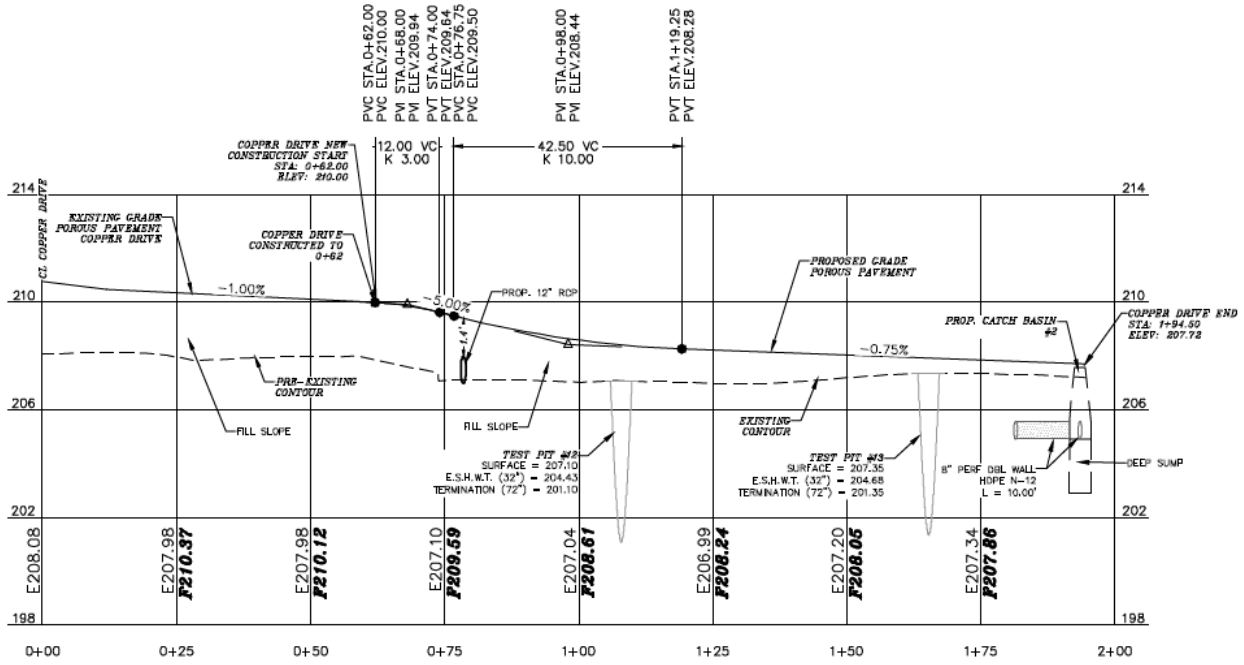
Porous Pavement w/ Infiltration #202 (Pond 202)

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′

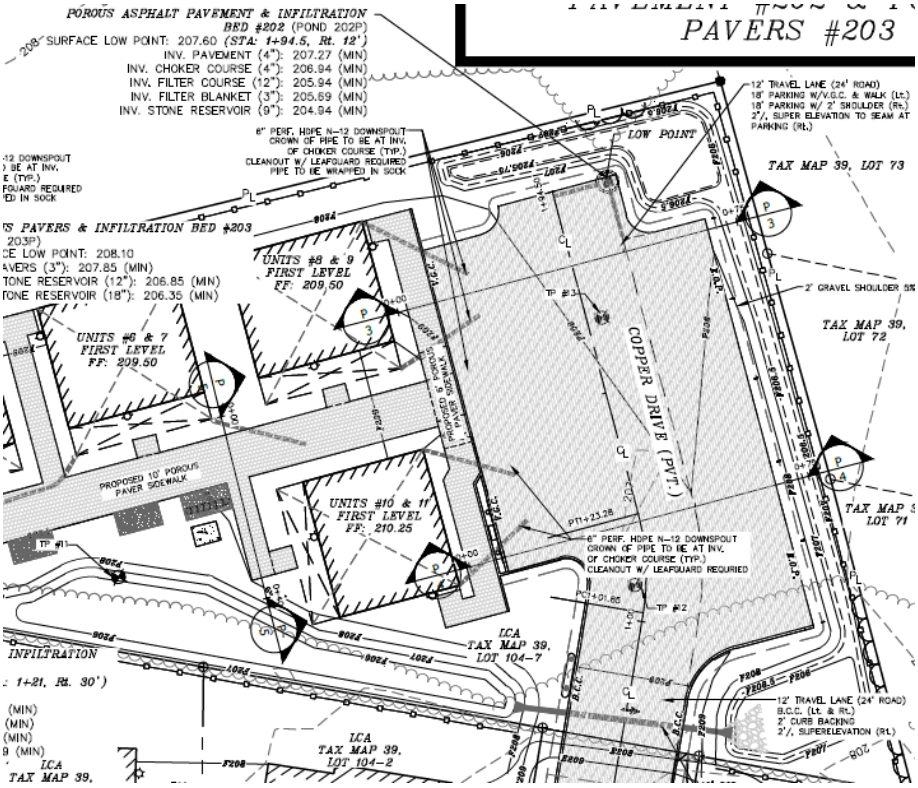
TP#13:	Existing Surface Elevation of TP =	207.35′
	SHWT = 32 – Inches	>204.68′
	Bedrock = > 72 – Inches	>201.35′
	Ground Water = N/A	
	Deepest Elevation of TP =	201.35′

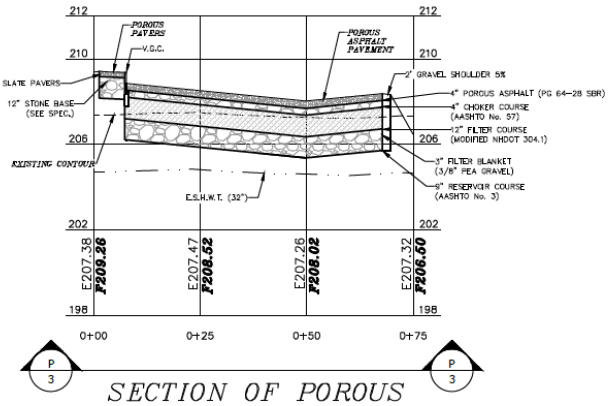
Porous Pavement #202 (Pond 202) Lowest Point: 207.60′

Profile Porous Pavement w/ Infiltration #202

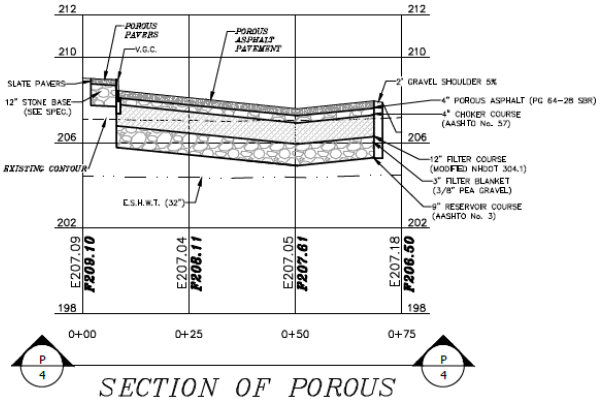


Cross Sections Porous Pavement w/ Infiltration #202





SECTION OF POROUS PAVEMENT #202 & POROUS PAVERS #203



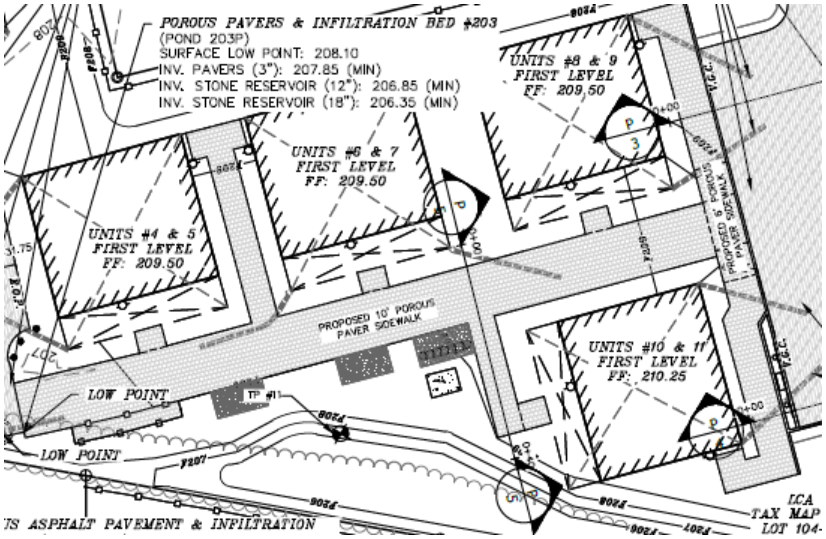
SECTION OF POROUS PAVEMENT #202 & POROUS PAVERS #203

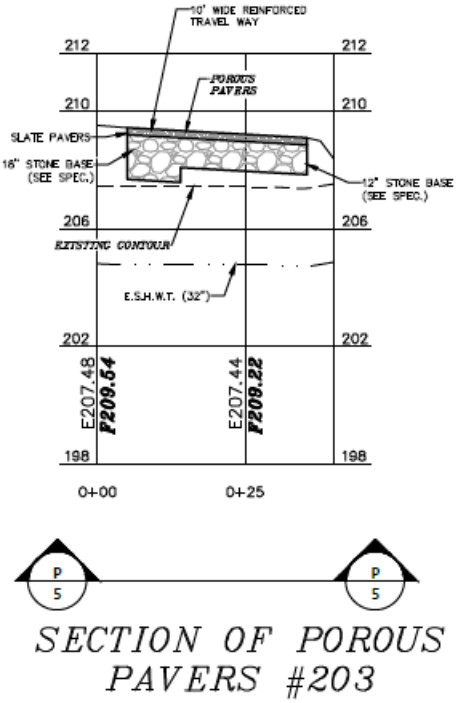
Porous Pavers w/ Infiltration #203 (Pond 203)

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: 208.10′

Cross Sections Porous Pavers w/ Infiltration #203





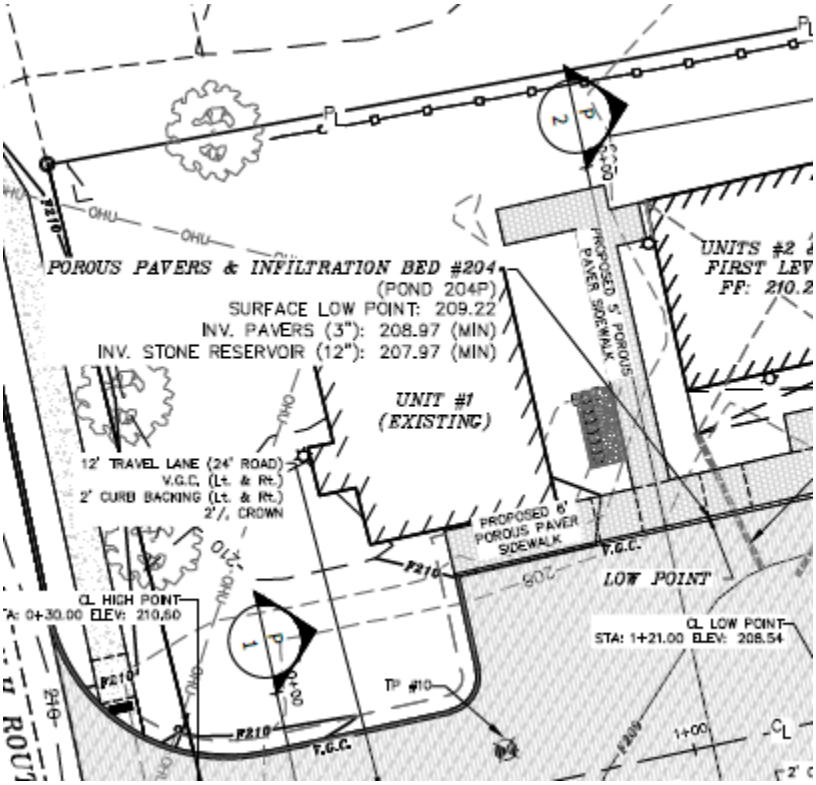
SECTION OF POROUS PAVERS #203

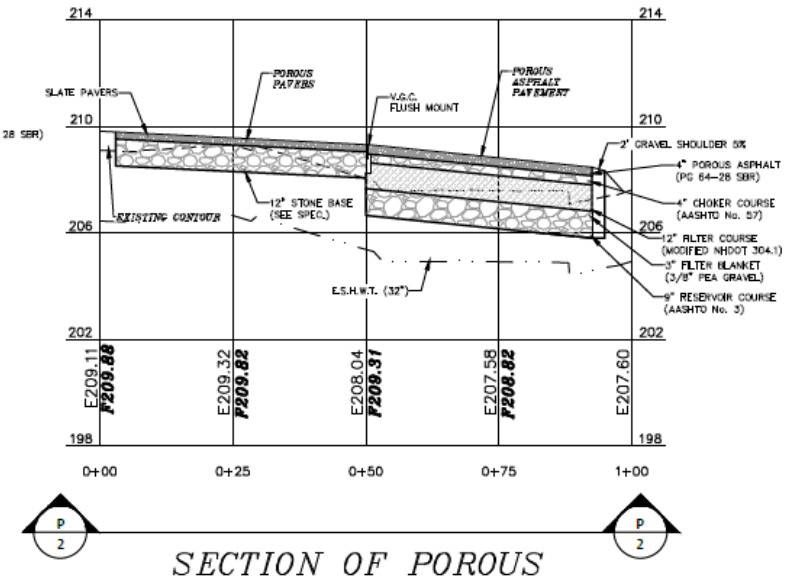
Porous Pavers w/ Infiltration #204 (Pond 204)

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: 209.22′

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

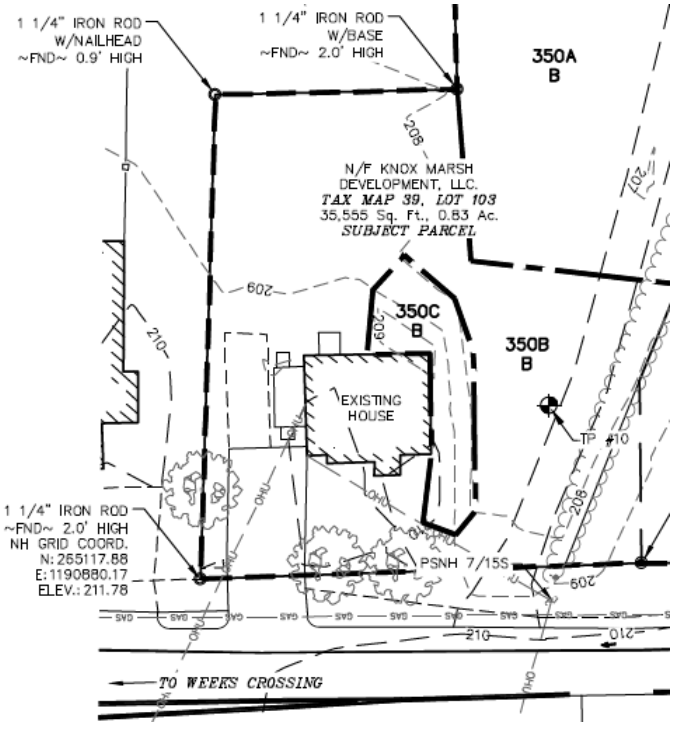
GROUND WATER @ N/A

TERMINATED @ 72"

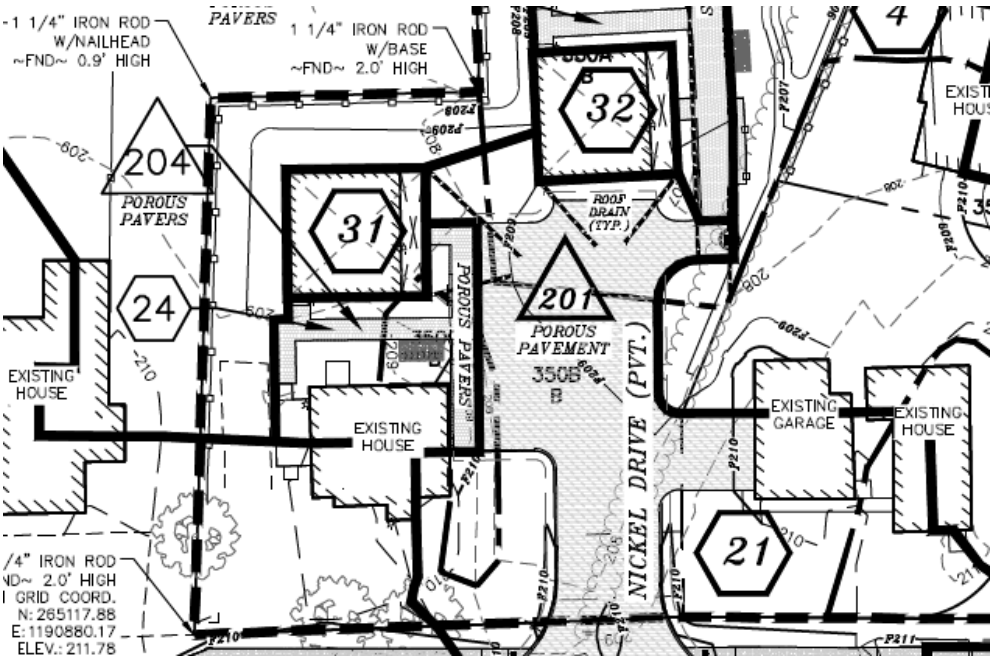
REFUSAL @ N/A

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.

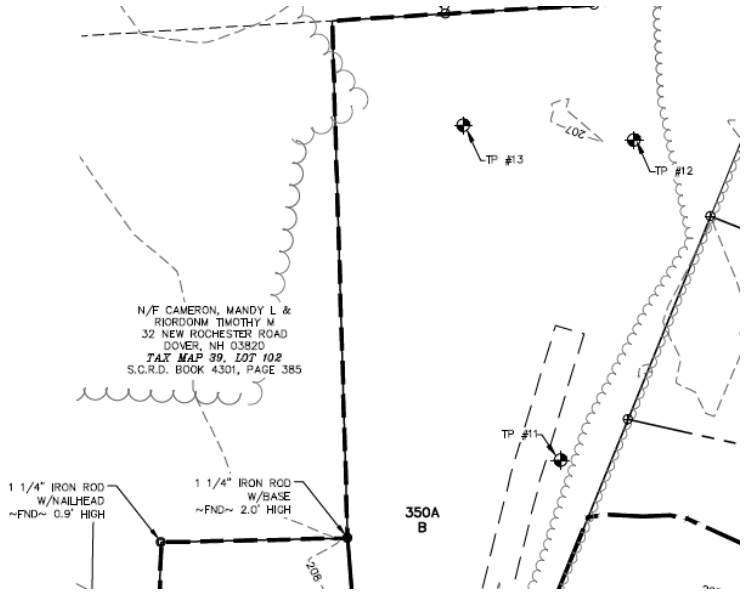


Existing



Proposed

Porous Pavement w/ Infiltration #202 is located over Udipsamments (derived from Deerfield Series). (Pond #202) See Test Pits #12 & 13.



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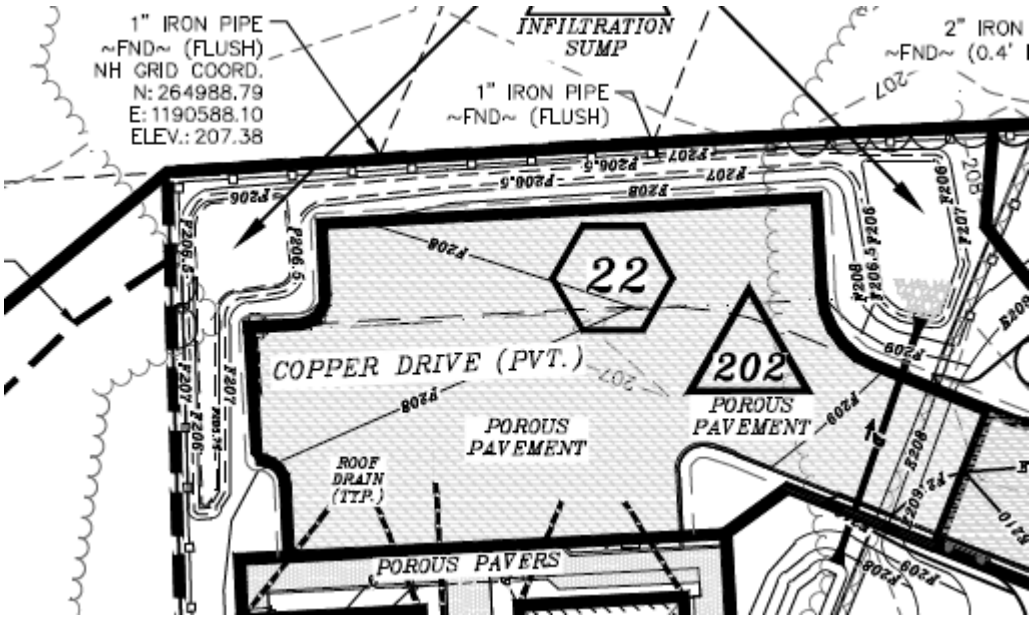
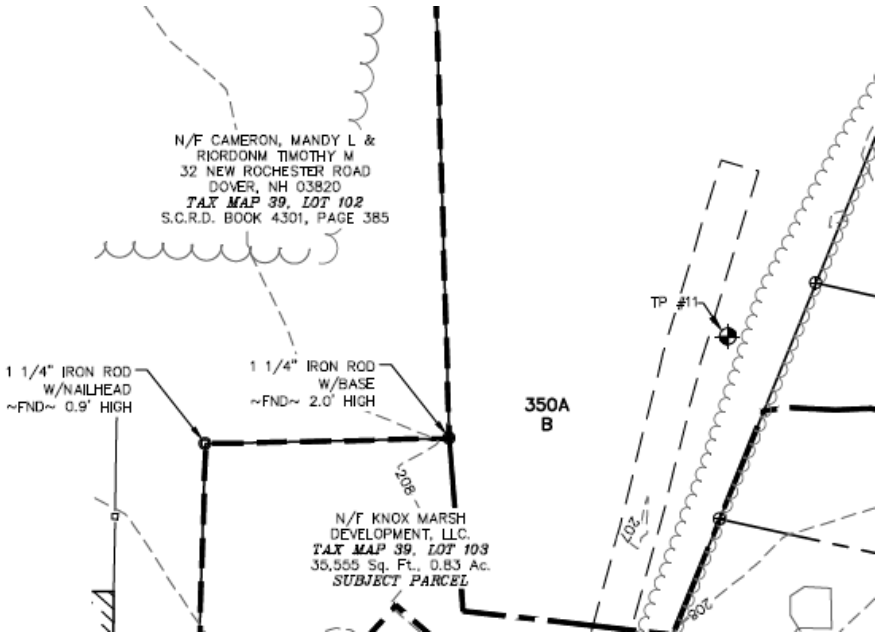
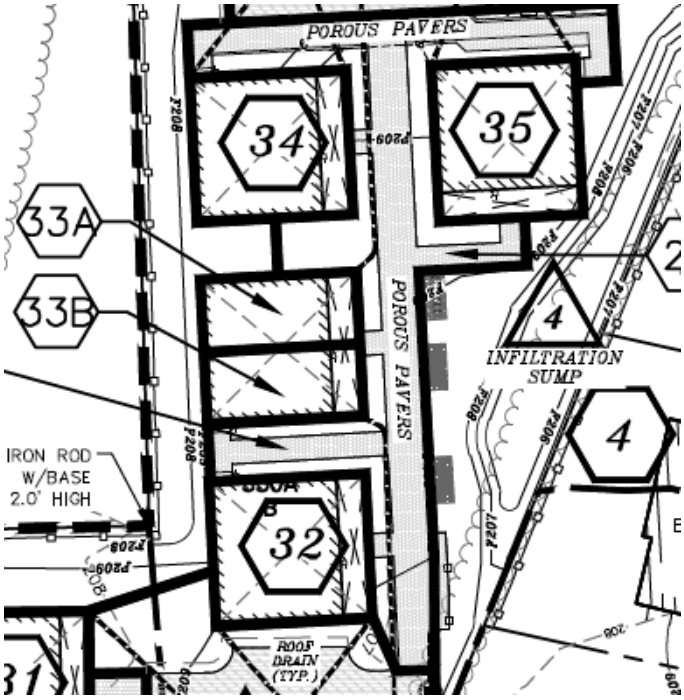


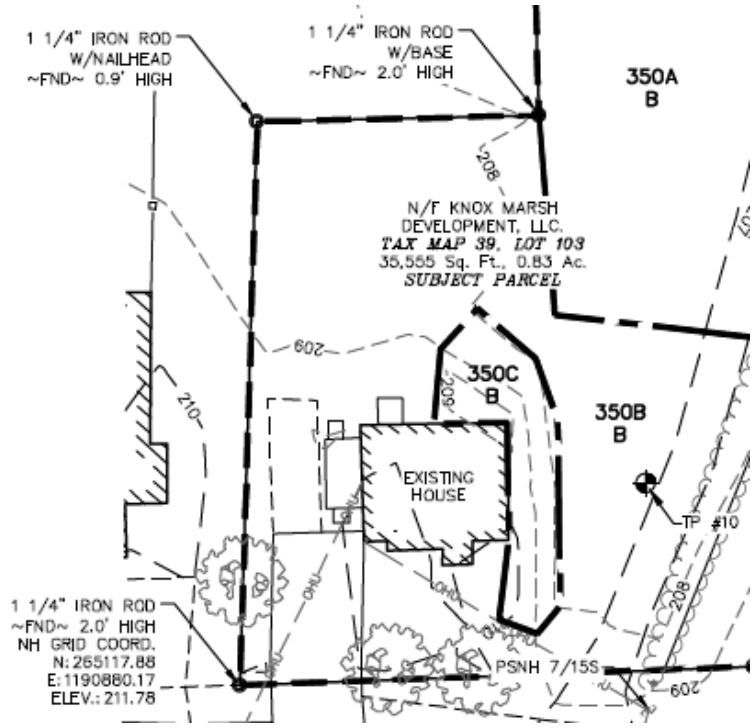
Proposed Porous Pavers w/ Infiltration #203 is located over Udipsamments (derived from Deerfield Series). (Pond #203) See Test Pit #11.



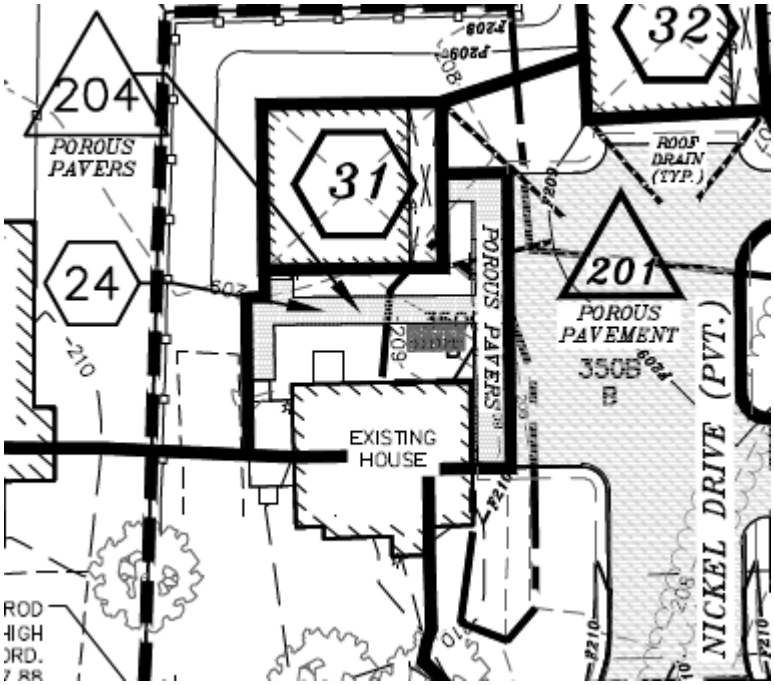
Existing



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:

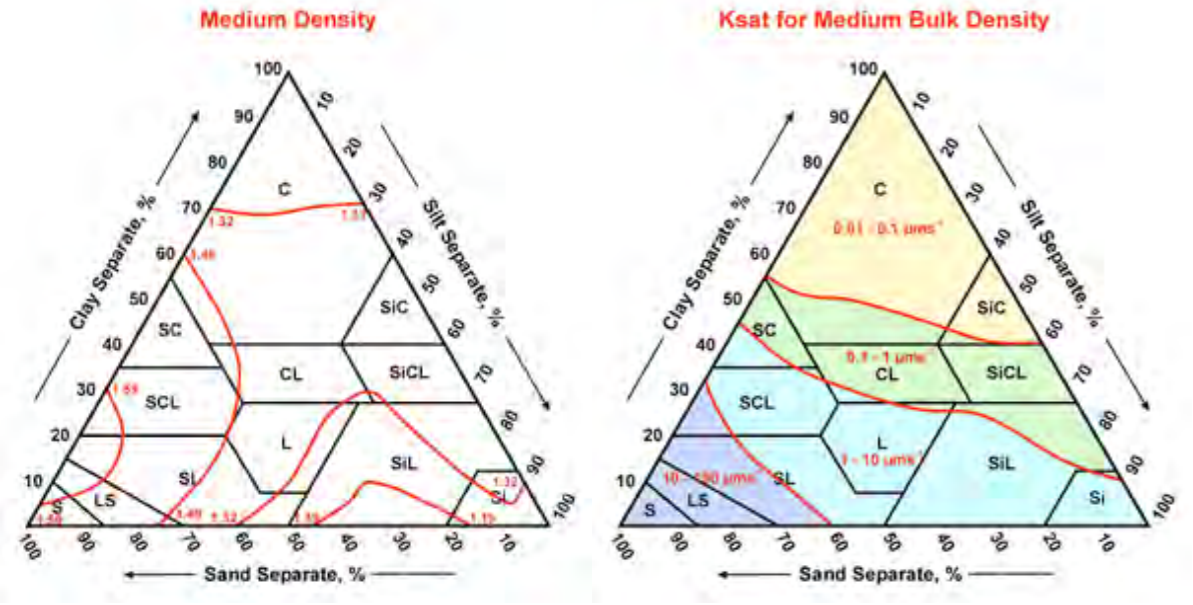
BERRY SURVEYING & ENGINEERING

Kevin R. Poulin, PE
Project Engineer

Kenneth A. Berry, PE, LLS
CPSWQ, CPESC, CESSWI
Principal, VP – Technical Operations

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)

Sponsored by the Society of Soil Scientists of Northern New England
SSSNNE Special Publication No. 5
September, 2009

K_{sat} VALUES FOR NEW HAMPSHIRE SOILS

ABOUT THE SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND

The Society of Soil Scientists of Northern New England (SSSNNE) is a non-profit professional organization of soil scientists, both in the private and public sectors, which is dedicated to the advancement of soil science. The Society fosters the profession of soil classification, mapping and interpretation, and encourages the dissemination of information concerning soil science. With the intent of contributing to the general human welfare, the Society seeks to educate the public on the wise use of soils and the associated natural resources.

INTRODUCTION

The publication "K_{sat} Values for New Hampshire Soils" is designed to assist soil scientists, engineers, and other professionals by assembling tables of existing data for all soil series currently on the state soil legend with regard to K_{sat} values and hydrologic groupings (Hyd.Grp.). The need for this information has become more important since the adoption by the New Hampshire Department of Environmental Services of the revised Alteration of Terrain rules for stormwater management. Additional information has been provided for each soil series with regard to landform, temperature regime (Temp.), soil textures, NHDES Soil Lot Size Groupings (Group), whether the soil is a Spodosol (Spodosol?) and other information which will be valuable to a variety of soil information users.

The data for each soil series has been sorted 3 ways for ease of searching:

Table A-Sorted by Numerical Legend
Table B-Sorted by Soil Series Name
Table C-Sorted by NHDES Soil Group for Establishing Lot Size

The report represents cumulative efforts by private soil scientists and NHDES staff with assistance from the USDA Natural Resource Conservation Service.

Comments or inquires on the information in this publication may be directed to the Board of Directors at the following address:

Society of Soil Scientists
of Northern New England
PO Box 76
Durham, NH 03824

SATURATED HYDRAULIC CONDUCTIVITY (K_{SAT})

K_{sat} refers to the ease with which pores in a saturated soil transmit water. The estimates presented here are expressed in terms of inches per hour (NRCS official data presents K_{sat} in both micrometers per second and inches per hour). K_{sat} values are based on soil characteristics observed in the field, particularly structure, consistence, porosity, and texture. (USDA NRCS, Web Soil Survey)

Saturated flow occurs when the soil water pressure is positive; that is, when the soil matric potential is zero (satiated wet condition). In most soils this situation takes place when about 95 percent of the total pore space is filled with water. The remaining 5 percent is filled with entrapped air. Saturated hydraulic conductivity cannot be used to describe water movement under unsaturated conditions. (Soil Survey Manual, 1993)

It is commonly known that soil features (and thus data) for a certain soil series name may be slightly different from one county soil survey to the next and the range in characteristics (via the Typical Pedon) may be slightly different. For example – a Marlow soil (series) in Carroll County may have a higher sand content in its B horizon as opposed to a Marlow soil (series) in Coos County; resulting in a slightly different Ksat range for the B horizon.

The K_{sat} data for this publication was obtained from the USDA-NRCS Soil Data Mart using the Typical Pedon from the county that best reflected the soil and/or had the most acres of that soil. This data is presented in B and C horizons only as it is assumed that the topsoil (A or A_p horizon) will be removed in typical construction practices.

References:

Web Soil Survey. *Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/.*

Soil Data Mart. *http://soildatamart.nrcs.usda.gov/.*

Soil Survey Manual. *Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.*

HYDROLOGIC SOIL GROUPS

Hydrologic group is a group of soils having the same runoff potential under similar storm and cover conditions.

Hydrologic groups are used in equations that estimate runoff from rainfall. These estimates are needed for solving hydrologic problems that arise in planning stormwater management, watershed protection, and flood-prevention projects and for planning or designing structures for the use, control, and disposal of water.

Classifications assigned to soils were based on the use of rainfall-runoff data from small watersheds and infiltrometer plots. From these data, relationships between soil properties and hydrologic groups were established. Assignment of soils to hydrologic groups is based on the relationship between soil properties and hydrologic groups. Wetness characteristics, permeability after prolonged wetting, and depth to very slowly permeable layers are properties that assist in estimating hydrologic groups. Minimum annual steady ponded infiltration rate for a bare ground surface determines the hydrologic soil groups.

Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonally high water table, intake rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. (The influence of ground cover is treated independently, not in hydrologic soil groups.).

The soils in the United States are placed into four groups, A, B, C, and D, and three dual classes, *A/D, B/D,* and *C/D.* In the definitions of the classes, infiltration rate is the rate at which water enters the soil at the surface and is controlled by the surface conditions. Transmission rate is the rate at which water moves in the soil and is controlled by soil properties. Definitions of the classes are as follows:

Group A- Saturated hydraulic conductivity is very high or in the upper half of high and internal free water occurrence is very deep. Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group A are as follows. The saturated hydraulic conductivity of all soil layers exceeds 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 10 micrometers per second (1.42 inches per hour).

Group B- Saturated hydraulic conductivity is in the lower half of high or in the upper half of moderately high and free water occurrence is deep or very deep. Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group B are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] ranges from 10.0 micrometers per second (1.42 inches per hour) to 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 4.0 micrometers per second (0.57 inches per hour) but is less than 10.0 micrometers per second (1.42 inches per hour).

Group C- Saturated hydraulic conductivity is in the lower half of moderately high or in the upper half of moderately low and internal free water occurrence is deeper than shallow. Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group C are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] is between 1.0 micrometers per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 0.40 micrometers per second (0.06 inches per hour) but is less than 4.0 micrometers per second (0.57 inches per hour). .

Group D- Saturated hydraulic conductivity is below the upper half of moderately low, and/or internal free water occurrence is shallow or very shallow and transitory through permanent. Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 50 centimeters [20 inches] and all soils with a water table within 60 centimeters [24 inches] of the surface are in this group, although some may have a dual classification, as described in the next section, if they can be adequately drained. The limits on the physical diagnostic characteristics of group D are as follows. For soils with a water impermeable layer at a depth between 50 centimeters and 100 centimeters [20 and 40 inches], the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 1.0 micrometers per second (0.14 inches per hour). For soils that are deeper than 100 centimeters [40 inches] to a restriction or water table, the saturated hydraulic

conductivity of all soil layers within 100 centimeters [40 inches] of the surface is less than or equal to 0.40 micrometers per second (0.06 inches per hour).

Dual hydrologic soil groups-Certain wet soils are placed in group D based solely on the presence of a water table within 60 centimeters [24 inches] of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups *(A/D, B/D,* and *C/D)* based on their saturated hydraulic conductivity and the water table depth when drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters [24 inches] below the surface in a soil where it would be higher in a natural state.

References:

National Engineering Handbook, Natural Resource Conservation Service, U.S. Department of Agriculture.

Soil Data Mart. *http://soildatamart.nrcs.usda.gov/*.

Soil Survey Manual. *Soil Survey Division Staff. 1993. Soil survey manual. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 18.*

TABLE A

NUMERICAL LEGEND

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Madawaska, aquentic	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	loamy over sandy, sandy-skeletal	yes	gravelly loamy sand in C
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Ricker	674	2.0	6.0	2.00	6.0	A	4	Organic over bedrock (up to 4" of mineral)	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep

no longer recognized

organic materials

TABLE B

SOIL SERIES

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Ricker	674	2.0	6.0	2.00	6.0	A	4	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep

no longer recognized
organic materials

TABLE C

NHDES SOIL GROUPINGS

SSSNNE
Special Publilcation No. 5
September, 2009

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Adams	36	1	6.0	20.0	20.00	99.0	A	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Caesar	526	1	20.0	100.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	coarse sand	no	
Champlain	35	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	gravelly sand	no	
Colton	22	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Gloucester	11	1	6.0	20.0	6.00	20.0	A	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hermon	55	1	2.0	20.0	6.00	20.0	A	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Hinckley	12	1	6.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Hoosic	510	1	2.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Masardis	23	1	6.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Merrimac	10	1	2.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Quonset	310	1	2.0	20.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Redstone	665	1	2.0	6.0	6.00	20.0	A	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Success	154	1	2.0	6.0	6.00	20.0	A	Sandy Till	frigid	sandy-skeletal	yes	cemented
Suncook	2	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Suncook	402	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Sunday	102	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Sunday	202	1	6.0	20.0	6.00	20.0	A	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Warwick	210	1	2.0	6.0	20.00	100.0	A	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Windsor	26	1	6.0	20.0	6.00	20.0	A	Outwash and Stream Terraces	mesic	sandy	no	
Abenaki	501	2	0.6	2.0	6.00	99.0	B	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Agawam	24	2	6.0	20.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	2	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Bangor	572	2	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Berkshire	72	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bice	226	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	no	sandy loam
Canton	42	2	2.0	6.0	6.00	20.0	B	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Charlton	62	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Dutchess	366	2	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Fryeburg	208	2	0.6	2.0	2.00	6.0	B	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Groveton	27	2	0.6	2.0	0.60	6.0	B	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Hadley	8	2	0.6	2.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Hadley	108	2	0.6	2.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Hartland	31	2	0.6	2.0	0.20	2.0	B	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Haven	410	2	0.6	2.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Houghtonville	795	2	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Lombard	259	2	0.6	6.0	2.00	20.0	C/D	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Monadnock	142	2	0.6	2.0	2.00	6.0	B	Loose till, sandy textures	frigid	oamy over sandy, sandy-skeleta	yes	gravelly loamy sand in C
Occum	1	2	0.6	2.0	6.00	20.0	B	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	2	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	2	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Salmon	630	2	0.6	2.0	0.60	2.0	B	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Stetson	523	2	0.6	6.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Unadilla	30	2	0.6	2.0	2.00	20.0	B	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Chichester	442	2	0.6	2.0	2.00	6.0	B	Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Acton	146	3	2.0	20.0	2.00	20.0	B	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Becket	56	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	3	0.6	2.0	0.06	2.0	B	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bernardston	330	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Boxford	32	3	0.1	0.2	0.00	0.2	C	Silt and Clay Deposits	mesic	fine	no	silty clay loam

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Buckland	237	3	0.6	2.0	0.06	0.2	C	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Buxton	232	3	0.1	0.6	0.00	0.2	C	Silt and Clay Deposits	frigid	fine	no	silty clay
Canterbury	166	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Chatfield Var.	289	3	0.6	6.0	0.60	6.0	B	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	3	0.6	2.0	0.02	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Colonel	927	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Croghan	613	3	20.0	100.0	20.00	100.0	B	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	3	0.6	2.0	0.06	0.6	B	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	3	6.0	20.0	20.00	100.0	B	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	3	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	3	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Eldridge	38	3	6.0	20.0	0.06	0.6	C	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elmridge	238	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116	3					C	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Gilmanton	478	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Henniker	46	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Hitchcock	130	3	0.6	2.0	0.06	0.6	B	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Howland	566	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Lanesboro	228	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Lovewell	307	3	0.6	2.0	0.60	2.0	B	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Machias	520	3	2.0	6.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Madawaska	28	3	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Madawaska, aquer	48	3	0.6	2.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Marlow	76	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Melrose	37	3	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Metacomet	458	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Metallak	404	3	6.0	100.0	6.00	100.0	B	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Millis	39	3					C	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Montauk	44	3	0.6	6.0	0.06	0.6	C	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Mundal	610	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Newfields	444	3	0.6	2.0	0.60	2.0	B	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	3	0.6	2.0	0.60	2.0	C	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	3	0.6	6.0	6.00	20.0	B	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Paxton	66	3	0.6	2.0	0.00	0.2	C	Firm, platy, loamy till	mesic	loamy	no	
Peru	78	3	0.6	2.0	0.06	0.6	C	Firm, platy, loamy till	frigid	loamy	yes	
Pittstown	334	3	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	3	0.6	2.0	0.06	0.6	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	3	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Poocham	230	3	0.6	2.0	0.20	2.0	B	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	3	0.6	6.0	6.00	20.0	B	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Scio	531	3	0.6	2.0	0.60	2.0	B	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scituate	448	3	0.6	2.0	0.06	0.2	C	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Sheepscot	14	3	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	3	0.6	2.0	0.06	0.6	C	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Sudbury	118	3	2.0	6.0	2.00	20.0	B	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Suffield	536	3	0.6	2.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Sunapee	168	3	0.6	2.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	
Sunapee var	269	3	0.6	2.0	0.60	6.0	B	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Surplus	669	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Sutton	68	3	0.6	6.0	0.60	6.0	B	Loose till, loamy textures	mesic	loamy	no	
Telos	123	3	0.6	2.0	0.02	0.2	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Waumbeck	58	3	2.0	20.0	6.00	20.0	B	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Winooski	103	3	0.6	6.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Woodbridge	29	3	0.6	2.0	0.00	0.6	C	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Winooski	9	3	0.6	6.0	0.60	6.0	B	Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Canaan	663	4	2.0	20.0	2.00	20.0	C	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Cardigan	357	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Chatfield	89	4	0.6	6.0	0.60	6.0	B	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Elliottsville	128	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Glebe	671	4	2.0	6.0	2.00	6.0	C	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Glover	NA	4	0.6	2.0	0.60	2	D	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep
Hogback	91	4	2.0	6.0	2.00	6.0	C	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Hollis	86	4	0.6	6.0	0.60	6.0	C/D	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Kearsarge	359	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Lyman	92	4	2.0	6.0	2.00	6.0	A/D	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Macomber	252	4	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Millsite	251	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Monson	133	4	0.6	2.0	0.60	2.0	D	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Pennichuck	460	4	0.6	2.0	0.60	2.0	B	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Rawsonville	98	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Ricker	674	4	2.0	6.0	2.00	6.0	A	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Saddleback	673	4	0.6	2.0	0.60	2.0	C/D	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Shapleigh	136	4					C/D	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Thorndike	84	4	0.6	2.0	0.60	2.0	C/D	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Tunbridge	99	4	0.6	6.0	0.60	6.0	C	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Winnecook	88	4	0.6	2.0	0.60	2.0	C	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Woodstock	93	4	2.0	6.0	2.00	6.0	C/D	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Au Gres	516	5					B	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bemis	224	5	0.6	0.2	0.00	0.2	C	Firm, platy, loamy till	cryic	loamy	no	
Binghamville	534	5	0.2	2.0	0.06	0.2	D	Terraces and glacial lake plains	mesic	silty	no	
Brayton	240	5	0.6	2.0	0.06	0.6	C	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Cabot	589	5	0.6	2.0	0.06	0.2	D	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Charles	209	5	0.6	100.0	0.60	100.0	C	Flood Plain (Bottom Land)	frigid	silty	no	
Cohas	505	5	0.6	2.0	0.60	100.0	C	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Grange	433	5	0.6	2.0	0.60	2.0	C	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Kinsman	614	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	frigid	sandy	yes	
Leicester	514	5	0.6	6.0	0.60	20.0	C	Loose till, loamy textures	mesic	loamy	no	
Lim	3	5	0.6	2.0	6.00	20.0	C	Flood Plain (Bottom Land)	mesic	loamy	no	
Limerick	109	5	0.6	2.0	0.60	2.0	C	Flood Plain (Bottom Land)	mesic	silty	no	
Lyme	246	5	0.6	6.0	0.60	6.0	C	Loose till, sandy textures	frigid	loamy	no	
Mashpee	315	5	6.0	20.0	6.00	20.0	B	Outwash and Stream Terraces	mesic	sandy	yes	
Monarda	569	5	0.2	2.0	0.02	0.2	D	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Moosilauke	414	5	6.0	20.0	6.00	20.0	C	Loose till, sandy textures	frigid	sandy	no	
Naumburg	214	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	frigid	sandy	yes	
Pemi	633	5	0.6	2.0	0.06	0.6	C	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	5	0.6	2.0	0.06	0.2	C	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314	5					B	Outwash and Stream Terraces	mesic	sandy	yes	
Raynham	533	5	0.2	2.0	0.06	0.2	C	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	5	0.6	2.0	6.00	100.0	D	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Ridgebury	656	5	0.6	6.0	0.00	0.2	C	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	5	0.6	6.0	6.00	20.0	C	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	5	0.2	2.0	0.06	0.6	C	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	5	0.6	6.0	6.00	20.0	C	Flood Plain (Bottom Land)	frigid	loamy	no	

Soil Series	number	NHDES Soil Group	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Saugatuck	16	5	0.06	0.2	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	5	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	frigid	fine	no	
Scitico	33	5	0.0	0.2	0.00	0.2	C	Silt and Clay Deposits	mesic	fine	no	
Shaker	439	5	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Squamscott	538	5	6.0	20.0	0.06	0.6	C	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stissing	340	5	0.6	2.0	0.06	0.2	C	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Swanton	438	5	2.0	6.0	0.00	0.2	C	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Walpole	546	5	2.0	6.0	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	no	
Wareham	34	5	6.0	20.0	6.00	20.0	C	Outwash and Stream Terraces	mesic	sandy	no	
Biddeford	234	6	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	frigid	fine	no	organic over clay
Bucksport	895	6					D	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	6	0.2	6.0	0.02	0.2	D	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Catden	296	6					A/D	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Chocorua	395	6			6.00	20.0	D	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Greenwood	295	6					A/D	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Ipswich	397	6					D	Tidal Flat	mesic	hemic/sapric	no	deep organic
Matunuck	797	6			20.00	100.0	D	Tidal Flat	mesic	sandy	no	organic over sand
Maybid	134	6	0.0	0.2	0.00	0.2	D	Silt and Clay Deposits	mesic	fine	no	silt over clay
Meadowsedge	894	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Medomak	406	6	0.6	2.0	0.60	2.0	D	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Natchaug	496	6			0.20	2.0	D	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Ossipee	495	6			0.20	2.0	D	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497	6			20.00	100.0	D	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Peacham	549	6	0.6	2.0	0.00	0.2	D	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pondicherry	992	6			6.00	20.0	D	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Saco	6	6	0.6	2.0	6.00	20.0	D	Flood Plain (Bottom Land)	mesic	silty	no	strata
Scarboro	115	6	6.0	20.0	6.00	20.0	D	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Searsport	15	6	6.0	20.0	6.00	20.0	D	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Timakwa	393	6			6.00	100.0	D	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Vassalboro	150	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Waskish	195	6					D	Organic Materials - Freshwater	frigid	peat	no	deep organic
Westbrook	597	6			0.00	2.0	D	Tidal Flat	mesic	loamy	no	organic over loam
Whitman	49	6	0.0	0.2	0.00	0.2	D	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Wonsqueak	995	6			0.20	2.0	D	Organic Materials - Freshwater	frigid	loamy	no	organic over loam

no longer recognized

organic materials

denotes break betweenSoil Group

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K_{sat} B and C horizons
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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

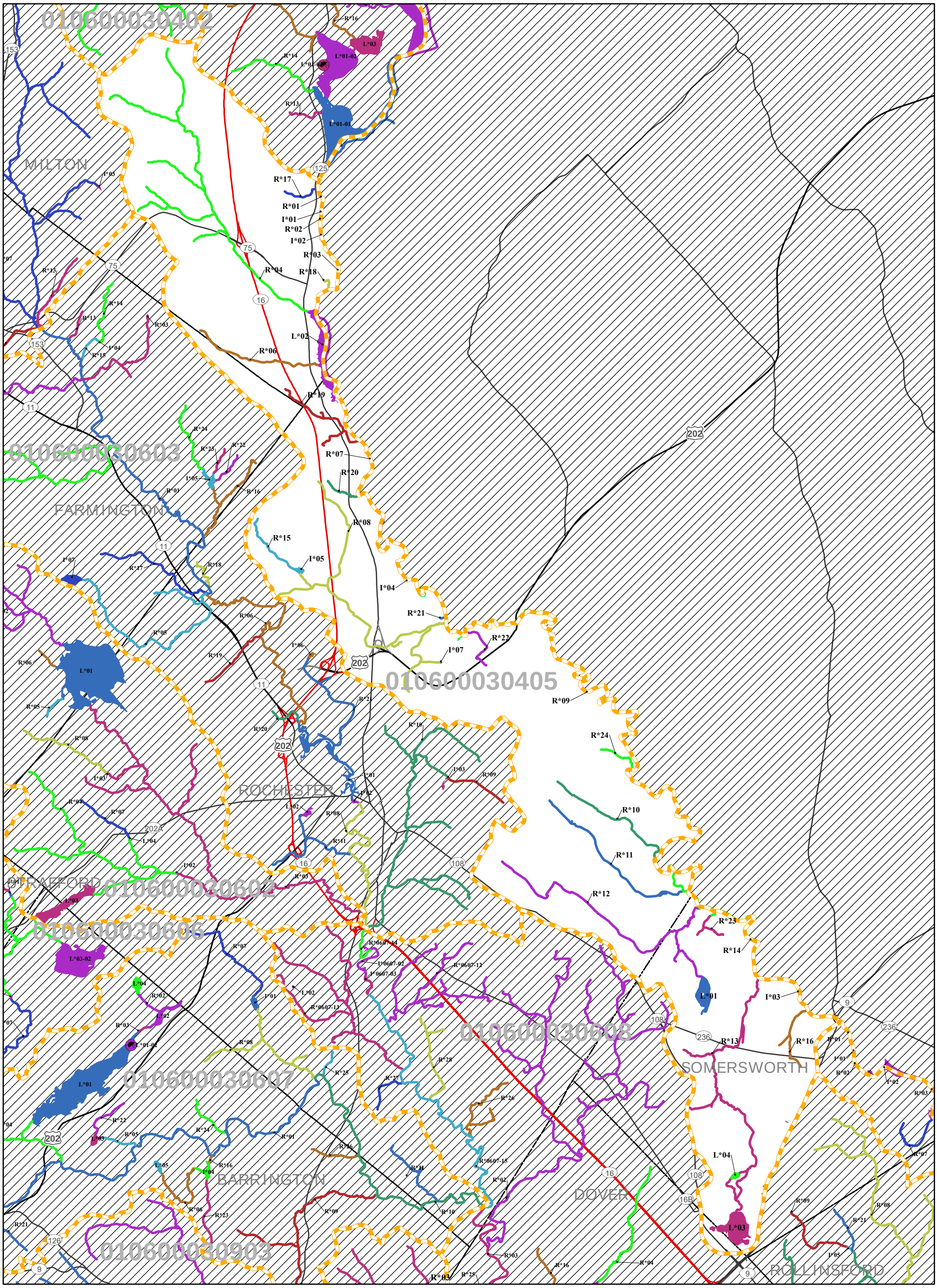
(Locator map on next page only applies to this HUC12)

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 =		4 =	
1 =		5 =	
2 =		6 =	
3 =		7 =	
		8 =	
		9 =	

N
W E
S

Abbrv. Label	HUC 12
L* 03	010 700060201

AUID = NH LAK700060201 - 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

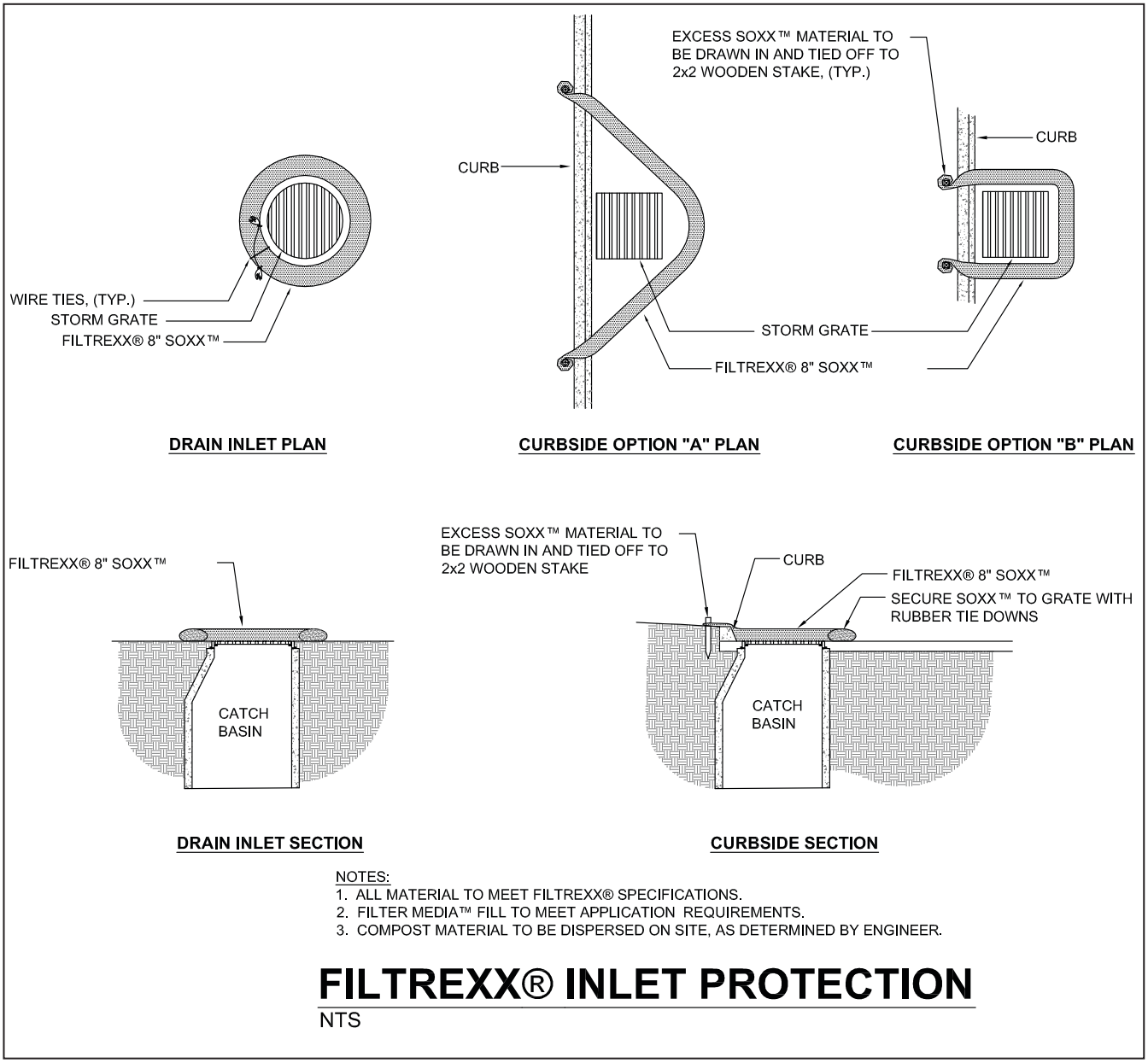
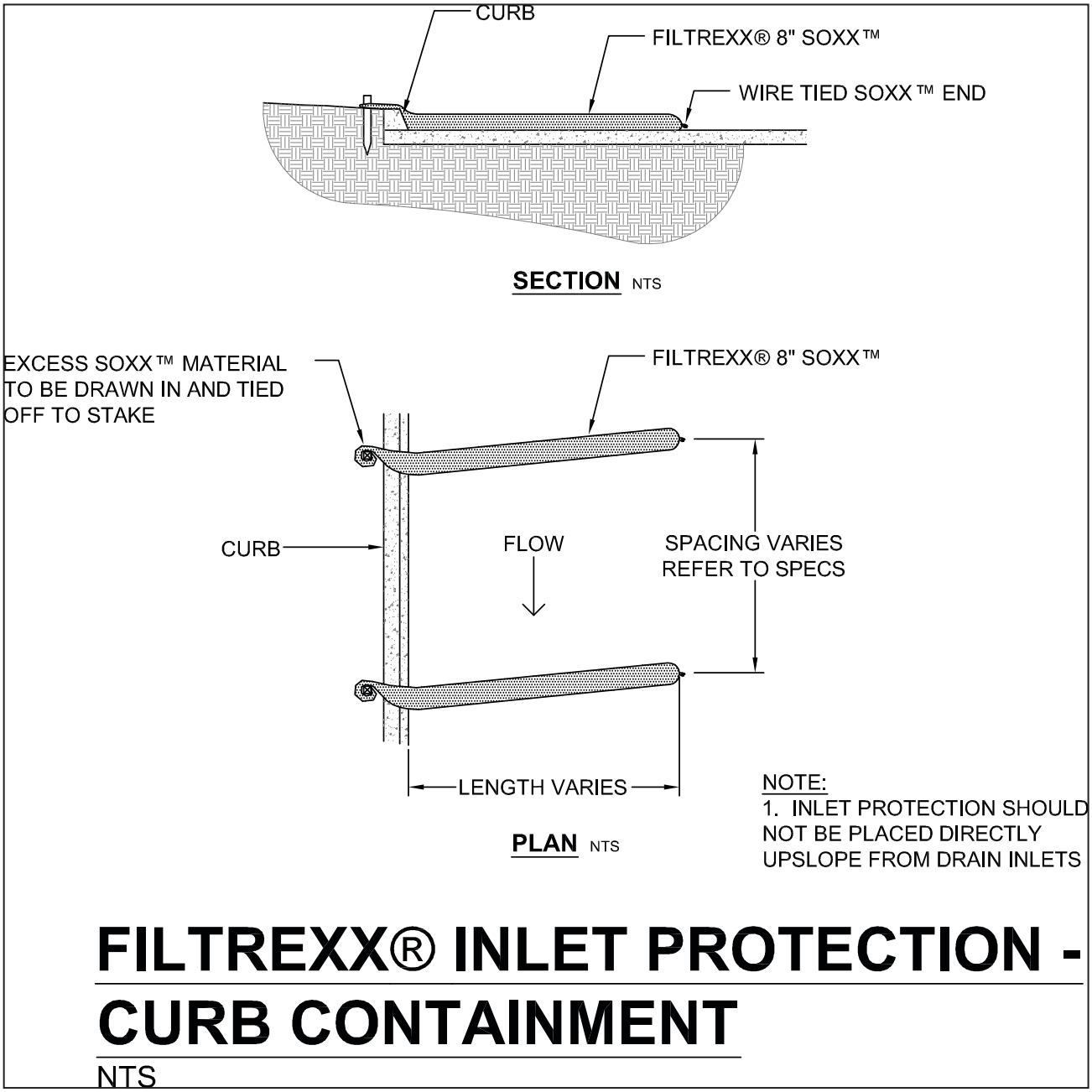


Figure 2.2. Engineering Design Drawing for Curb Sediment Containment Inlet Protection



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

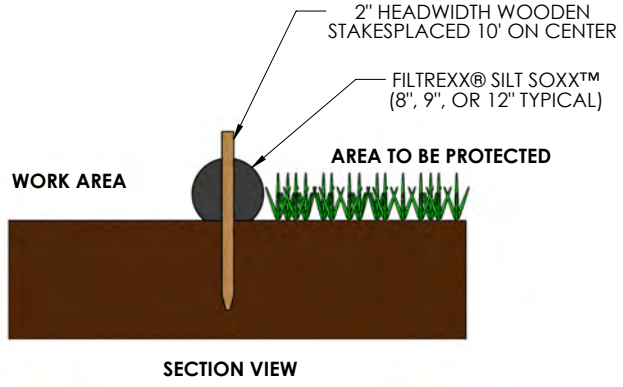
1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of 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)

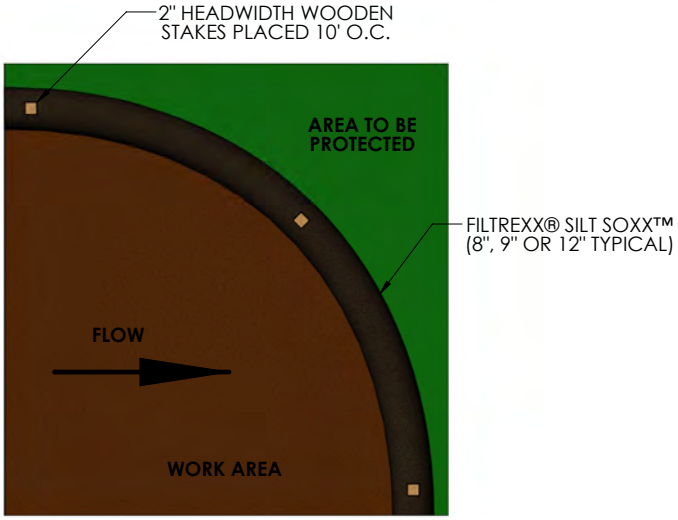
* Based on a failure point of 36 in (0.9 m) super silt fence (wire reinforced) at 1000 ft (303 m) of slope, watershed width equivalent to receiving length of sediment control device, 1 in/ 24 hr (25 mm/24 hr) rain event.

** Effective height of Sediment control after installation and with constant head from runoff as determined by Ohio State University.

FILTREXX® SILT SOXX™

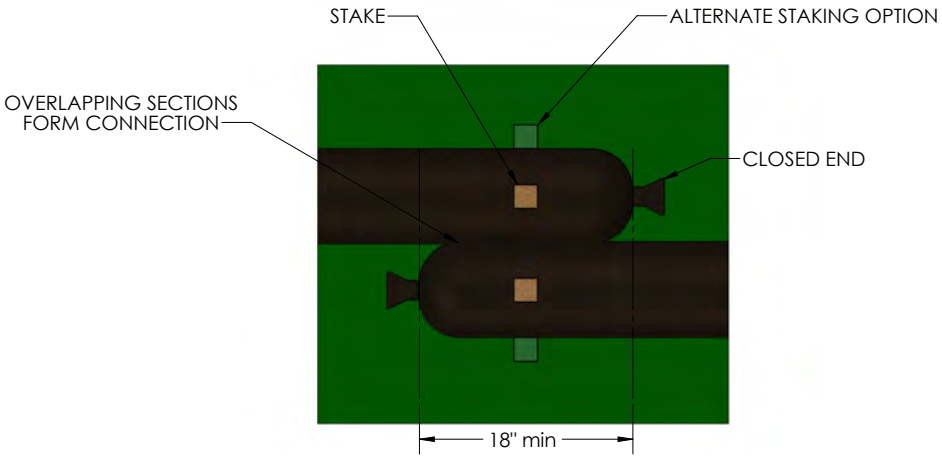


SECTION VIEW

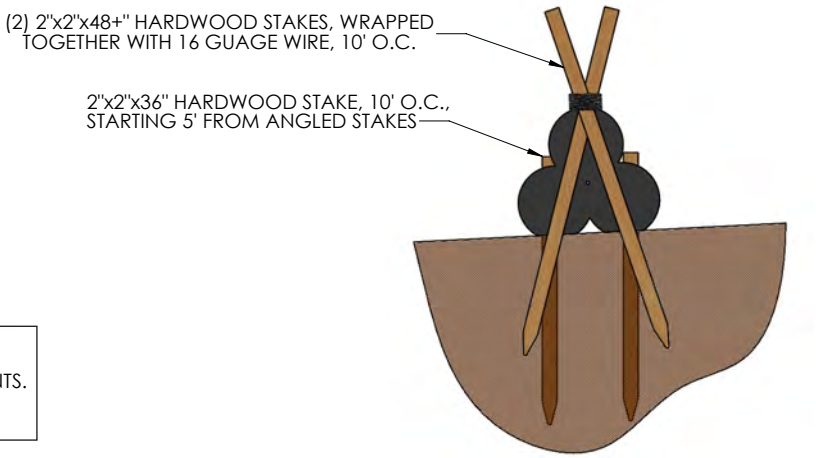


TOP VIEW

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*

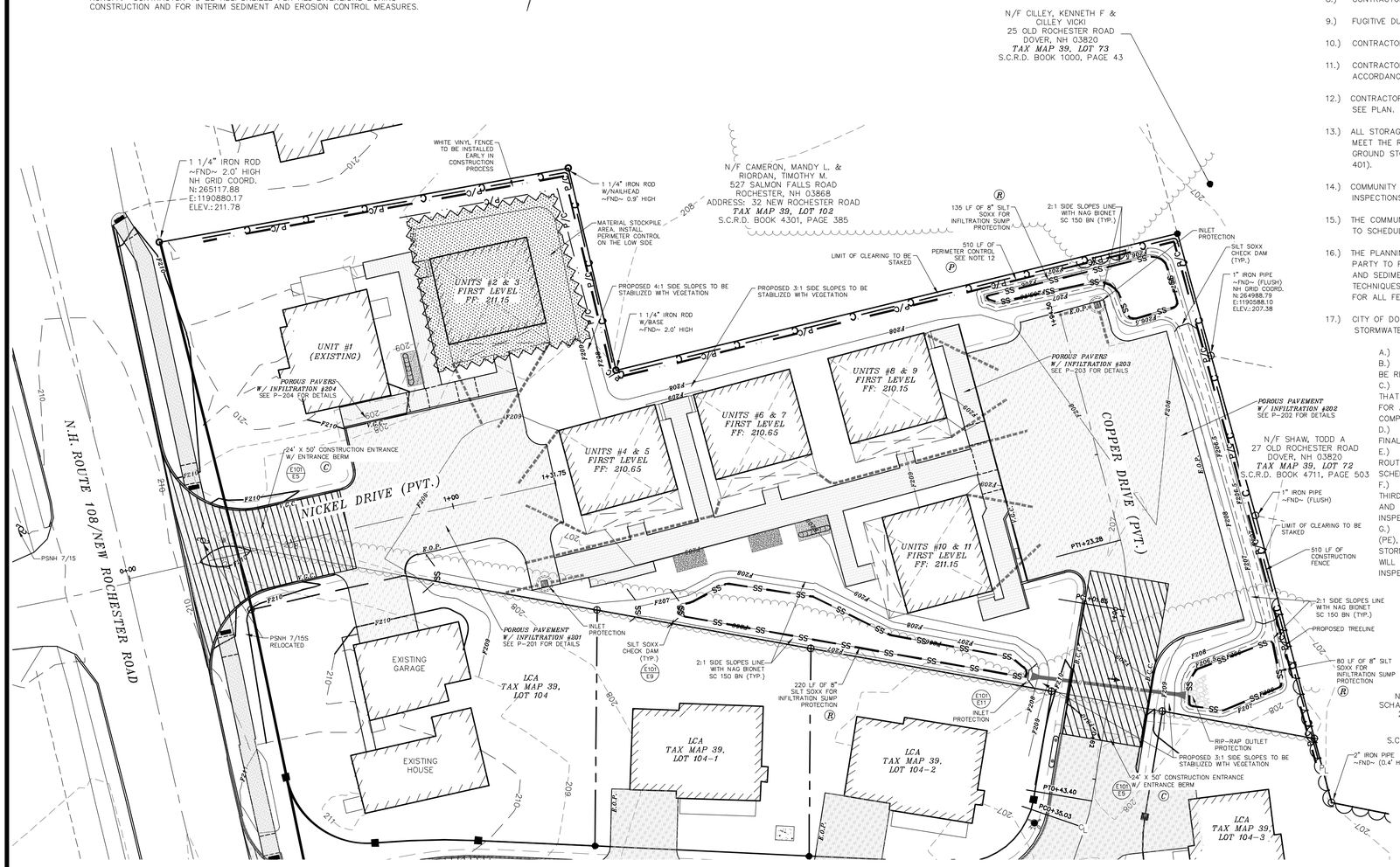
(350A&B)

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.



LEGEND:

- (R) POND PROTECTION
- (P) PERIMETER CONTROL
- (C) RESIDENTIAL/ROADWAY CONSTRUCTION
- REBAR (FND)
- IRON BOUND (FND)
- IRON PIPE (FND)
- UTILITY POLE
- BENCHMARK
- P/C — PERIMETER CONTROL
- SS — FILTREXX SILTSOXX
- C — 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.

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).

DOVER PLANNING FILE #

REVISION	DATE	DESCRIPTION

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. 14244 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;
☐	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 Extension of SDP D2022-1107		
Project Location - Street Address: 34 New Rochester Road		
Project Location - Town / City: Dover		
Name Of Receiving WWTF: Dover		
Average Design Flow (ADF, gal/day): 3,000		
Proposed Sewer Length (Linear ft)	Pipe Diameter (inches)	Pipe Material
170.75	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: $300	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 & Nickel 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	8
# Bedrooms	16
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
10.00	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.024	
Cumulative Infiltration (gpm)	
0.024	
Total Flow Received (BR Flow + INF) (gpm)	
10.02	
Prop. SMH #12	
Rim Elev	209.20
Inv In (Units #8 & 9)	203.37
Inv In (Units #10 & 11)	203.37
Inv Out (Prop. SMH #2)	203.20
Depth SMH	6.00

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)	203.20
Inv Out (Prop. SMH #11)	202.85
Length (ft)	75.00
Slope	0.005
Full Velocity (ft/s)	2.79
Discharge Rate (gpm)	437.65

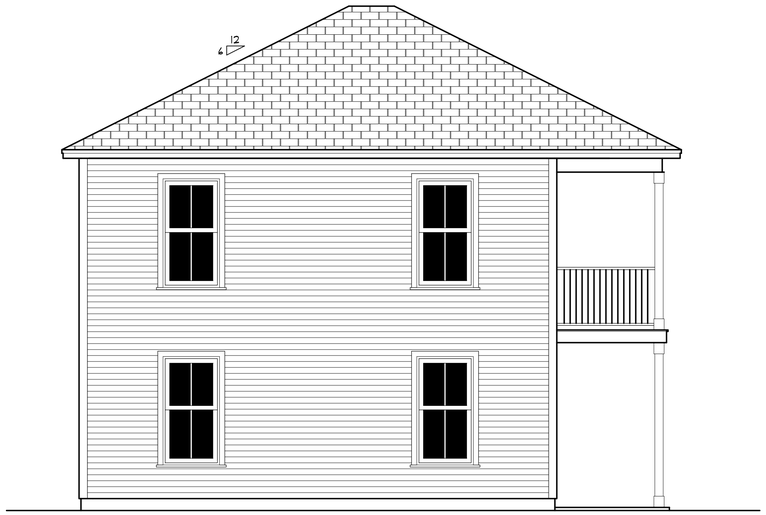
# 2br Units	10
# Bedrooms	20
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
12.50	
Flow Received from Infiltration (gpm)	
Inf. Rate = ((300 GPD*8IN*LF)/5280 LF)/1440 min/day	
0.030	
Cumulative Infiltration (gpm)	
0.054	
Total Flow Received (BR Flow + INF) (gpm)	
12.55	
Prop. SMH #11	
Rim Elev	208.10
Inv In (Units #2 & 3)	202.92
Inv In (Prop. SMH #12)	202.85
Inv Out (Prop. SMH #10)	202.75
Depth SMH	5.35

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)	202.75
Inv Out (Prop. SMH #10)	202.32
Length (ft)	95.75
Slope	0.004
Full Velocity (ft/s)	2.74
Discharge Rate (gpm)	429.33

# 2br Units	10
# Bedrooms	20
Flow Received from Units (gpm)	
GPM=(150GPD * #BR * 6)/1440min/day	
12.50	
Cumulative Infiltration (gpm)	
0.054	
Total Flow Received (BR Flow + INF) (gpm)	
12.55	
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

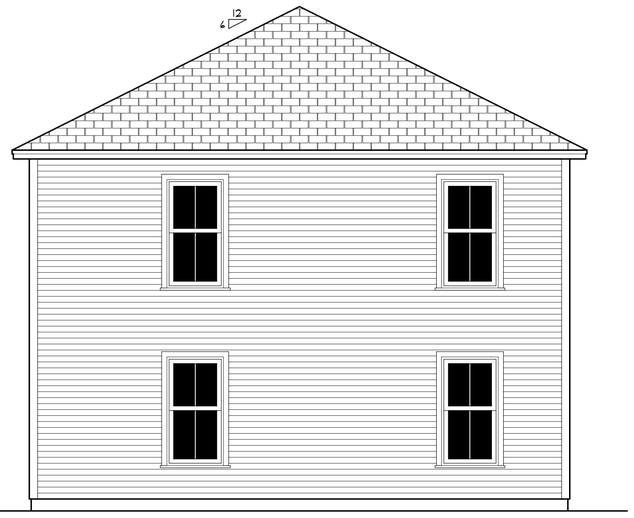
23-053 Sewer Calculations		
Peaking Factor		6
Flow/Bedroom (gpd)		150
Units are two (2) bedrooms		
Total 8" SDR 35 Length (Ft):	Total Rate (Design Flow)(GPD):	Total Rate (Design Flow)(GPM):
170.75	3,000	12.50
	Total Rate (Infiltration)(GPD):	Total Rate (Infiltration)(GPM):
	78	0.05
	Total Flow Received (GPD):	Total Flow Received (GPM):
	3,078	12.55
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		

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

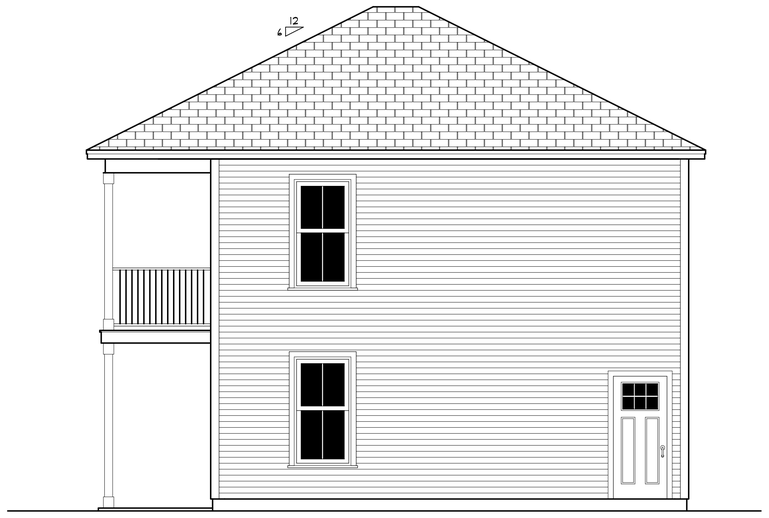


② SIDE ELEVATION
SCALE 1/4"=1'0"

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

STAMP

ELEVATIONS

A-2

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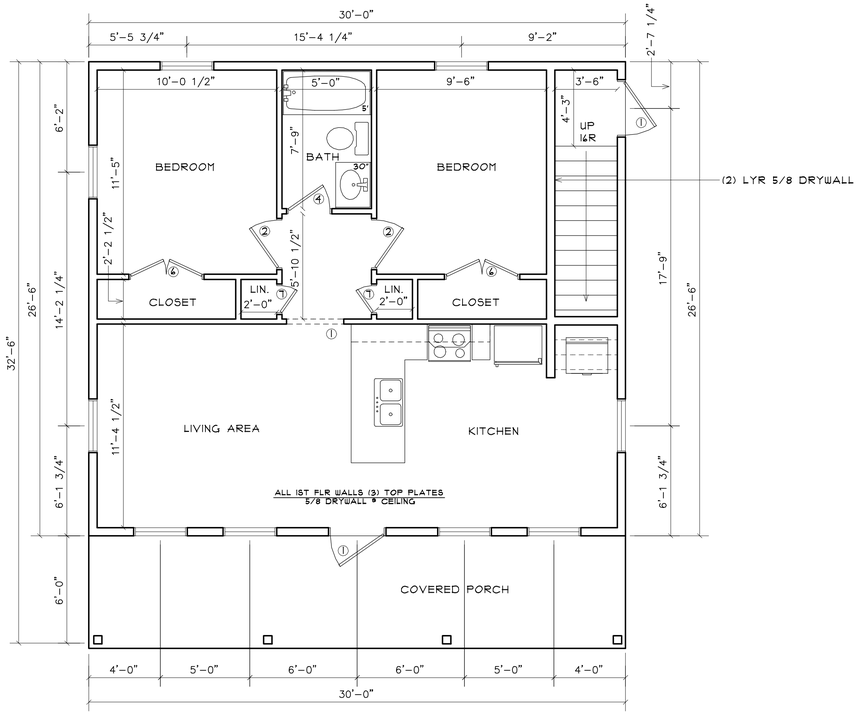
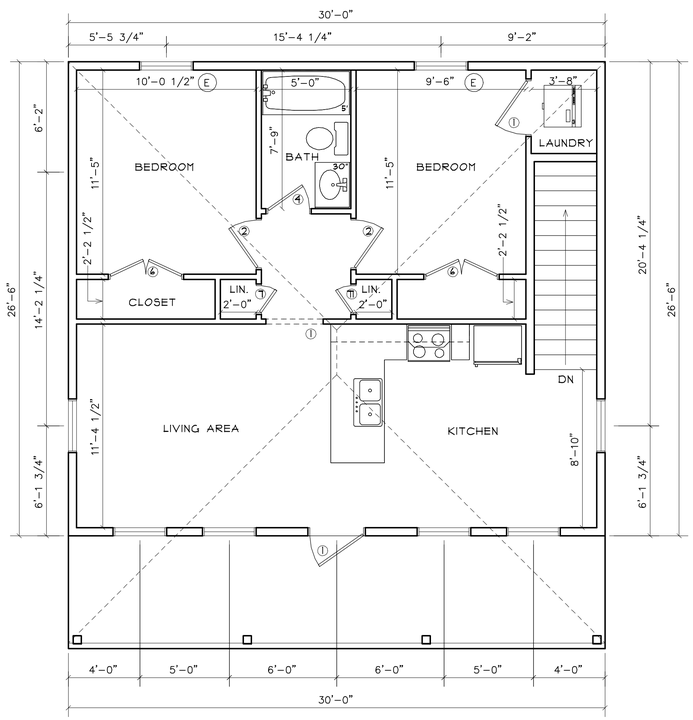


1 FIRST FLOOR PLAN
SCALE 1/4"=1'0"

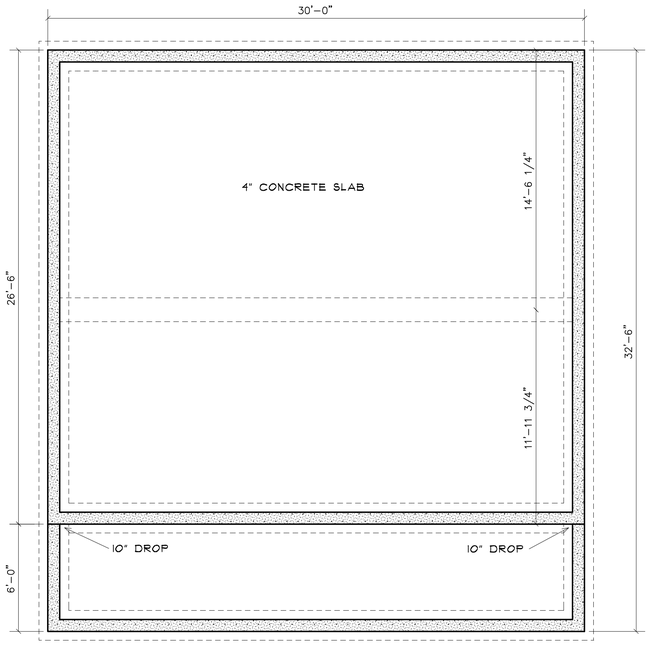


2 SECOND FLOOR PLAN
SCALE 1/4"=1'0"

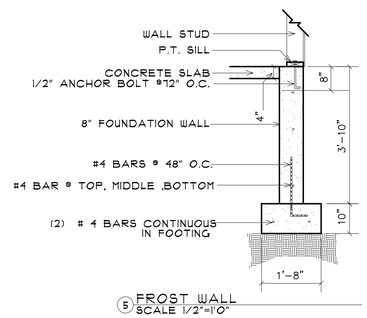
E WINDOWS WILL MEET OR EXCEED A CLEAR OPENABLE AREA OF 5.7 SQ. FT. & A CLEAR OPENABLE WIDTH OF 20" & A CLEAR OPENABLE HEIGHT OF 24"

DOOR SCHEDULE

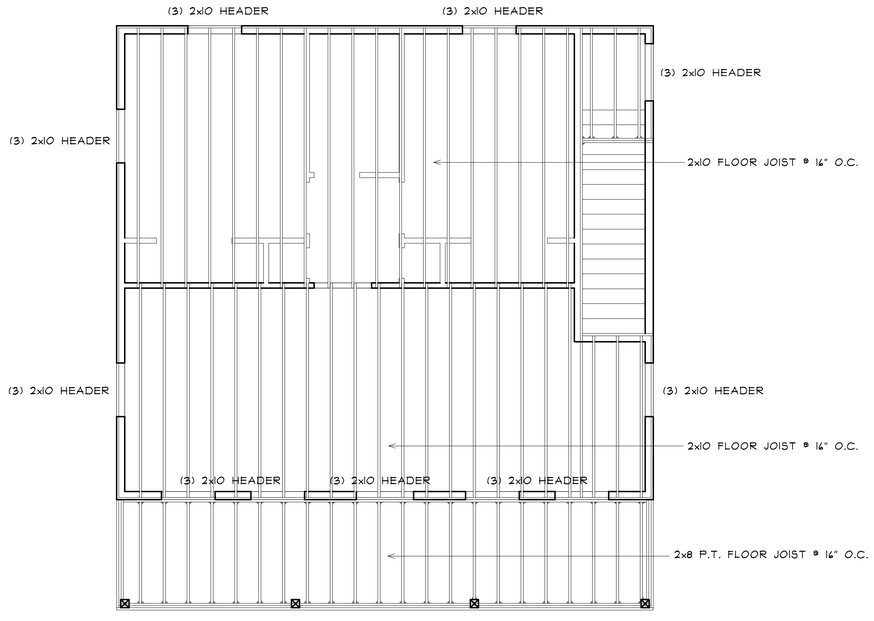
1	3'-0" x 6'-8"	7	1'-6" x 6'-8"
2	2'-8" x 6'-8"		
3	2'-6" x 6'-8"		
4	2'-4" x 6'-8"		
5	5'-0" x 6'-8"		
6	4'-0" x 6'-8"		



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:
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LOCATION

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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 PLANS

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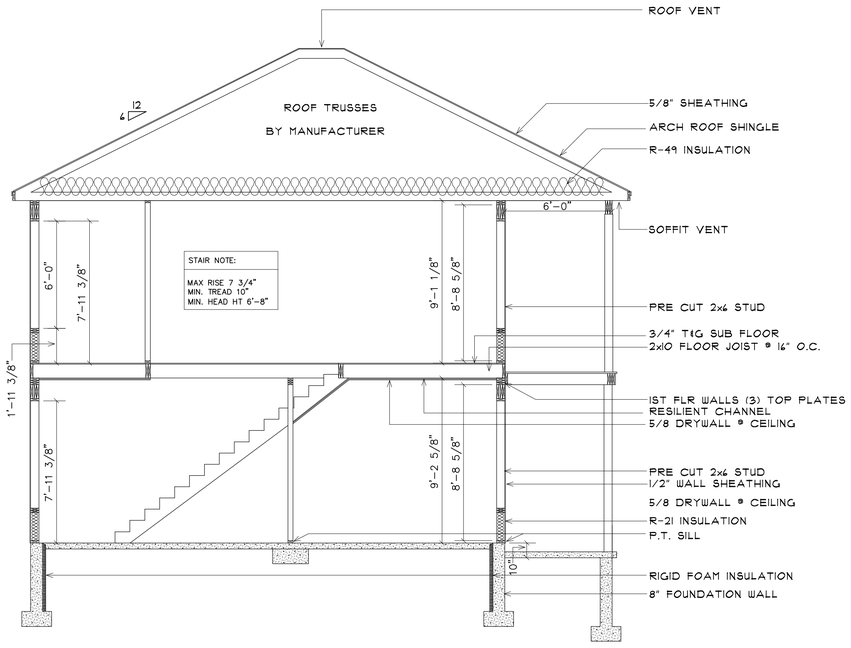


M. MORELAND CONSTRUCTION
ARCHITECTURAL DESIGNER

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

STAMP

FLOOR PLAN

A-1

Copper Dr
Copper Dr
Copper Dr
Rochester Rd
Auburn St
New Rochester
38
36
32
30

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 NICKEL DRIVE
SHEET 9 ~ P201-204-POROUS PAVEMENT/PAVERS PLANS
SHEET 10 ~ EROSION & SEDIMENT CONTROL PLAN
SHEET 11 ~ UTILITY PLAN & PROFILE COPPER DRIVE
SHEET 12 ~ UTILITY PLAN & PROFILE SEWER/WATER LINES
SHEET 13 ~ CROSS SECTIONS COPPER DRIVE & NICKEL DRIVE
SHEET 14 ~ LIGHTING PLAN
SHEET 15 ~ LANDSCAPING PLAN
SHEET 16 ~ SIGHT DISTANCE SOUTHBOUND
SHEET 17 ~ SIGHT DISTANCE NORTHBOUND
SHEET 18 ~ E101-EROSION & SEDIMENT CONTROL DETAILS
SHEET 19 ~ E102-EROSION & SEDIMENT CONTROL DETAILS
SHEET 20 ~ C101-CONSTRUCTION DETAILS
SHEET 21 ~ C102-CONSTRUCTION DETAILS
SHEET 22 ~ C103-CONSTRUCTION DETAILS
SHEET 23 ~ U101-UTILITY DETAILS
SHEET 24 ~ U102-UTILITY DETAILS
SHEET 25 ~ L101-LANDSCAPING DETAILS
SHEET 26 ~ DOVER FIRE TRUCK TURN TEMPLATE
SHEET 27 ~ DOVER FIRE TRUCK TURN TEMPLATE

* INDICATES PLAN IS TO BE RECORDED AT S.C.R.D.

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.

OWNER: ROBERT BALDWIN
242 CENTRAL AVE
DOVER, NH 03820

APPLICANT: KNOX MARSH DEVELOPMENT, LLC
242 CENTRAL AVE
DOVER, NH 03820

ROBERT BALDWIN

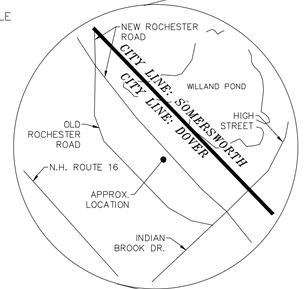
SURVEYOR OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

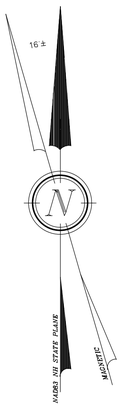
ENGINEER OF RECORD: KENNETH A. BERRY, PE, LLS
CPSWQ, CPESC, CESSWI
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
(603) 332-2863

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

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: PENDING
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
#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. 14241 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:

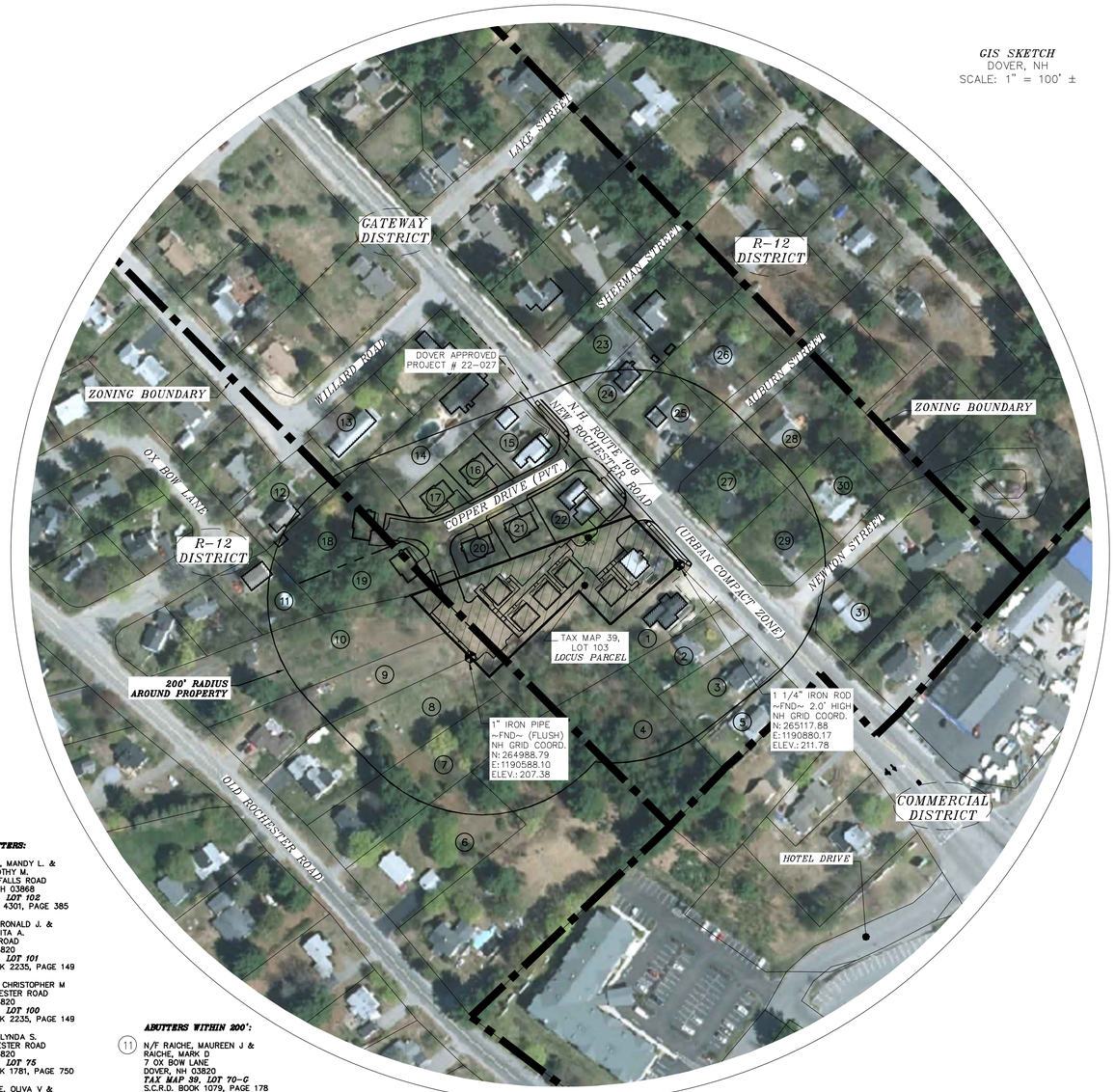
- IRON PIPE ~FND~
- IRON BOUND ~FND~
- 3/4" REBAR W/ID CAP ~SET~
- UTILITY POLE
- SIGNAGE
- DRAINAGE CULVERT
- DRAIN MANHOLE W/ STRUCTURE
- SEWER MANHOLE W/ STRUCTURE
- CATCH BASIN W/ STRUCTURE
- WATER GATE VALVE
- WATER SHUT OFF
- FIRE HYDRANT
- GAS VALVE
- SEWER LINE
- WATER LINE
- OVERHEAD UTILITIES
- 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
- 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
- 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	2	BLUE	WHITE	WHITE	U–CHANNEL (2)
CUSTOM	12"x18"	NO PARKING SNOW EMERGENCY ROUTE		2	WHITE	RED	RED	SQUARE (2)
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' ±



16±

NAD83 NH STATE PLANE

MAGNETIC

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 26 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-C*** 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-C*** 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 36*** 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 2686, 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

STATE OF NEW HAMPSHIRE — No. 805 KENNETH A. BERRY — LICENSED LAND SURVEYOR
SIGNATURE

DOVER PLANNING FILE #SITE–2023–0007

REVISION	DATE	DESCRIPTION
#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 — KENNETH A. BERRY No. 14243 — 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.

SOIL DATA:

WdA ~ WINDSOR LOAMY SAND 0 TO 3% SLOPES

SEE: USDA/NRCS WEBSOIL

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

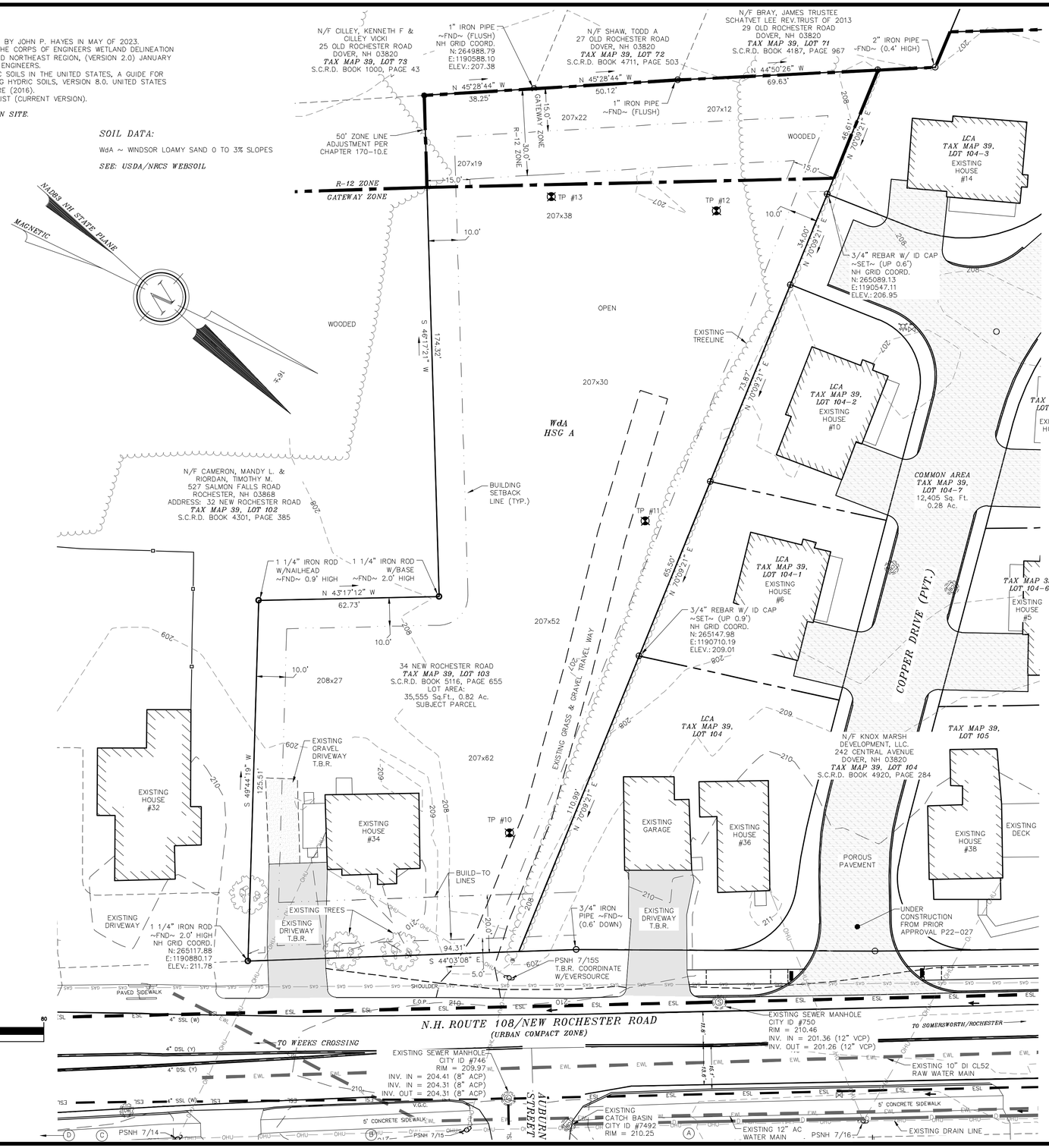
GRAPHIC SCALE

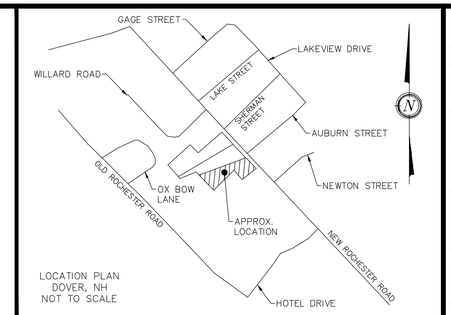
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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 LLS. 805 DATE





LOCATION PLAN
DOVER, NH
NOT TO SCALE

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
1		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

SHEET 2 OF 27

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 WTH 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

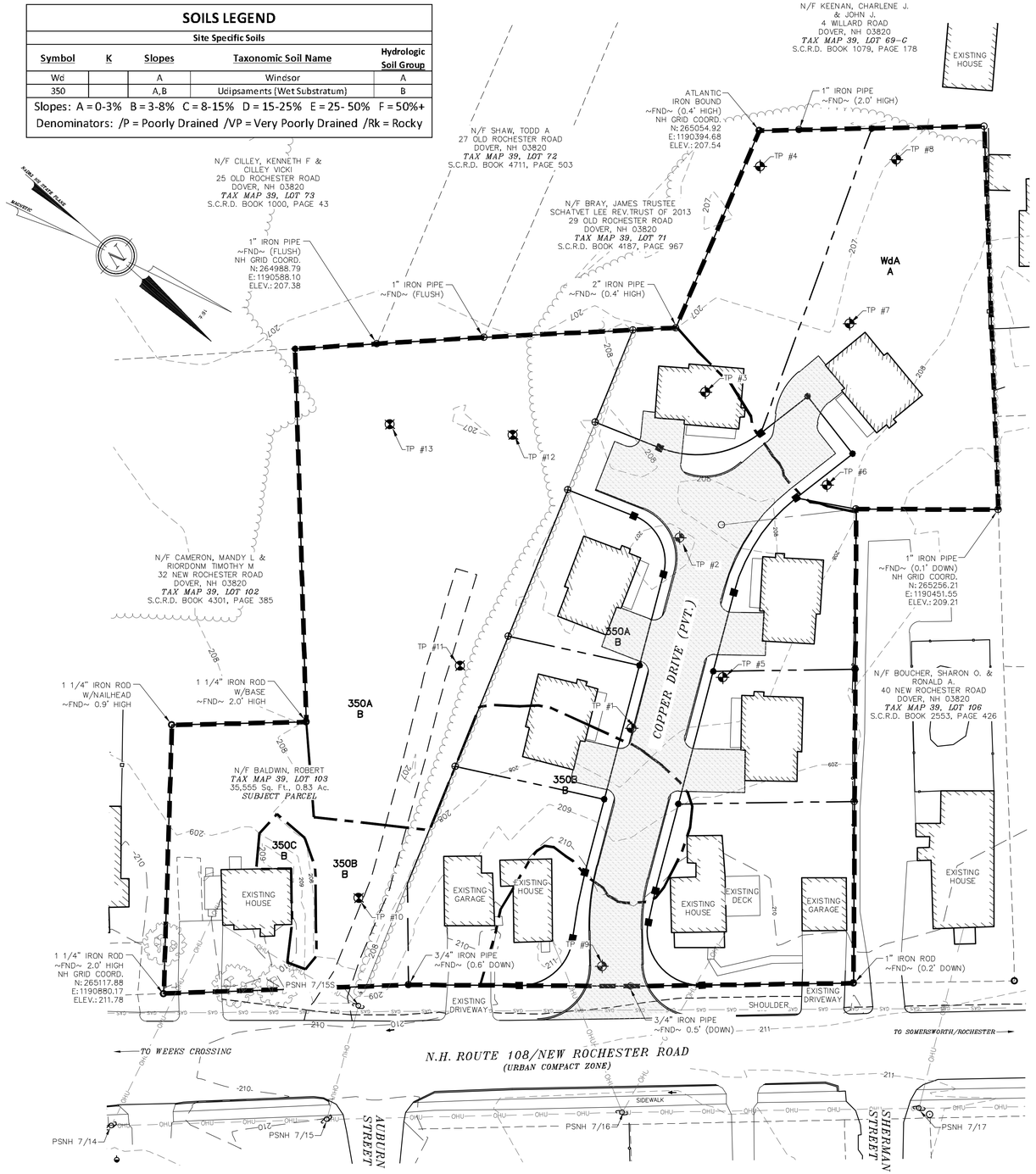
TEST PIT #13
0–12" 10YR 3/2 VERY DARK GRAYISH BROWN, FINE SANDY LOAM, GRANULAR, FRIABLE
12–25" 10YR 5/4 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
25–32" 10YR 5/6 YELLOWISH BROWN, GRAVELLY LOAMY SAND, GRANULAR, FRIABLE
32–72" 10YR 6/2 LIGHT BROWNISH GRAY, GRAVELLY SAND W/REDOX. FEAT. PRESENT, SINGLE GRAIN, LOOSE
E.S.H.W.T. @ 32"
RESTRICTIVE LAYER @ N/A
GROUND WATER @ N/A
TERMINATED @ 72"
REFUSAL @ N/A

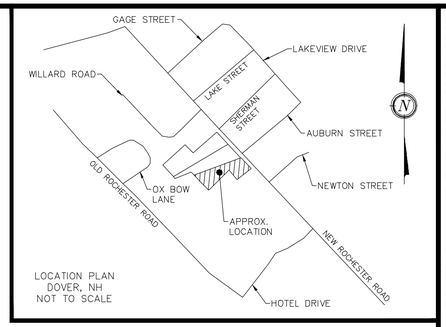
SOILS LEGEND

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

#	REVISION	DATE	DESCRIPTION
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 — KENNETH A BERRY — LICENSED LAND SURVEYOR — 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

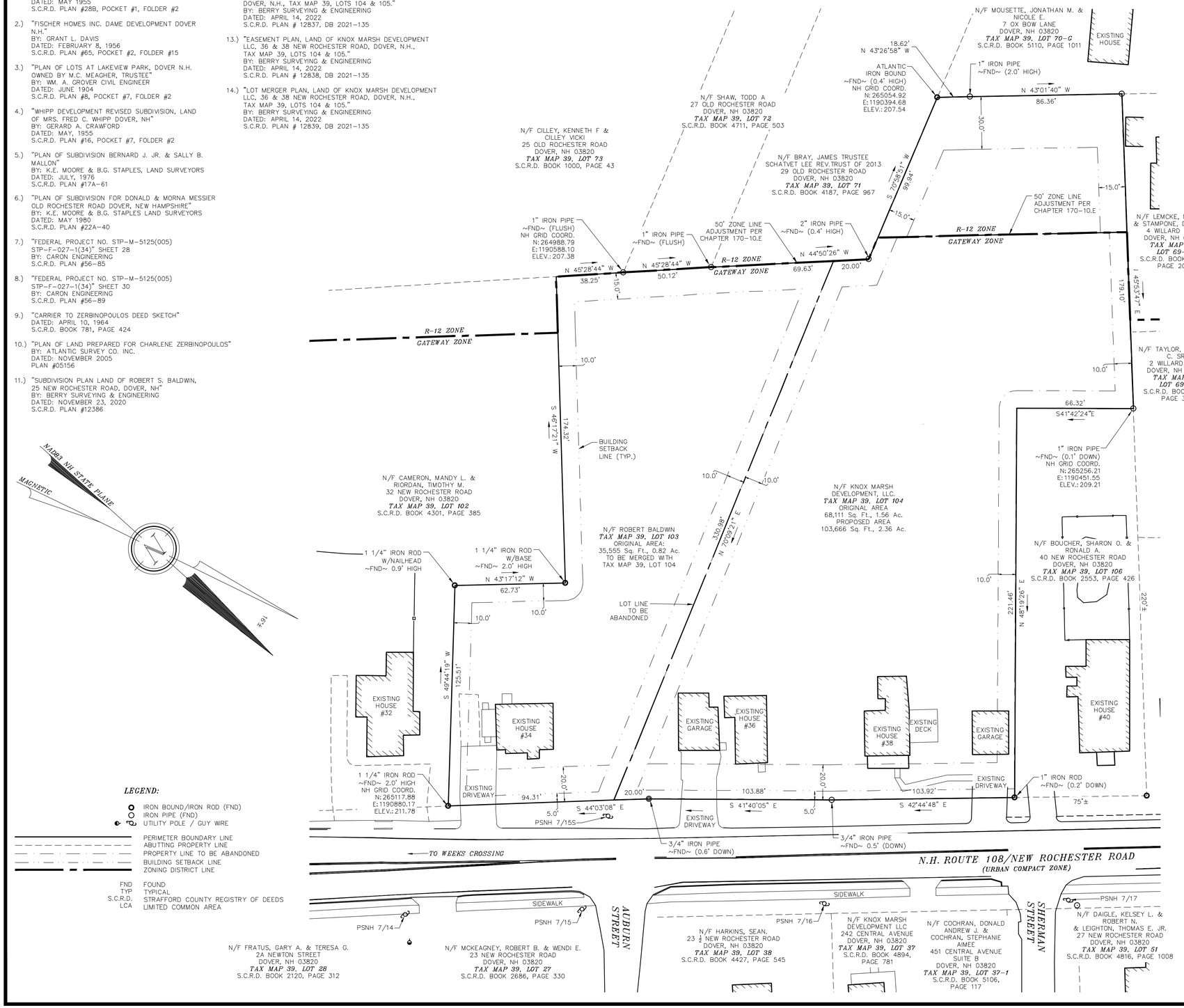
11.) "SUBDIVISION PLAN LAND OF ROBERT S. BALDWIN,
25 NEW ROCHESTER ROAD, DOVER, NH"
BY: BERRY SURVEYING & ENGINEERING
DATED: NOVEMBER 23, 2020
S.C.R.D. PLAN #12386

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

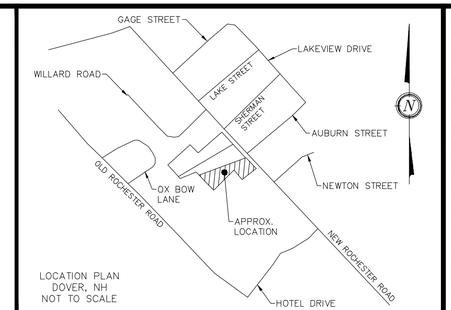
14.) "LOT MERGER PLAN, LAND OF KNOX MARSH DEVELOPMENT LLC, 36 & 38 NEW ROCHESTER ROAD, DOVER, N.H., TAX MAP 39, LOTS 104 & 105."
BY: BERRY SURVEYING & ENGINEERING
DATED: APRIL 14, 2022
S.C.R.D. PLAN # 12839, DB 2021-135



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

#	REVISION	DATE	DESCRIPTION
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

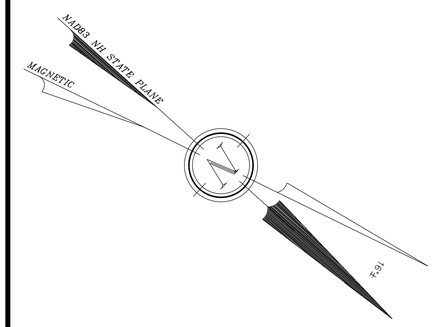
11.) "SUBDIVISION PLAN LAND OF ROBERT S. BALDWIN, 25 NEW ROCHESTER ROAD, DOVER, NH"
BY: BERRY SURVEYING & ENGINEERING
DATED: NOVEMBER 23, 2020
S.C.R.D. PLAN #12386

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

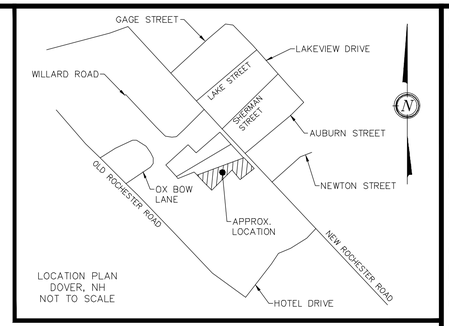


LEGEND:

- ● 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

FND FOUND
TYP TYPICAL
S.C.R.D. STRAFFORD COUNTY REGISTRY OF DEEDS
LCA LIMITED COMMON AREA
TBS TO BE SET



LOCATION PLAN
DOVER, NH
NOT TO SCALE

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: 48,430 Sq.Ft., 1.11 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.

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

#	REVISION	DATE	DESCRIPTION
1		9-25-23	REVISED PER DOVER TRC COMMENT

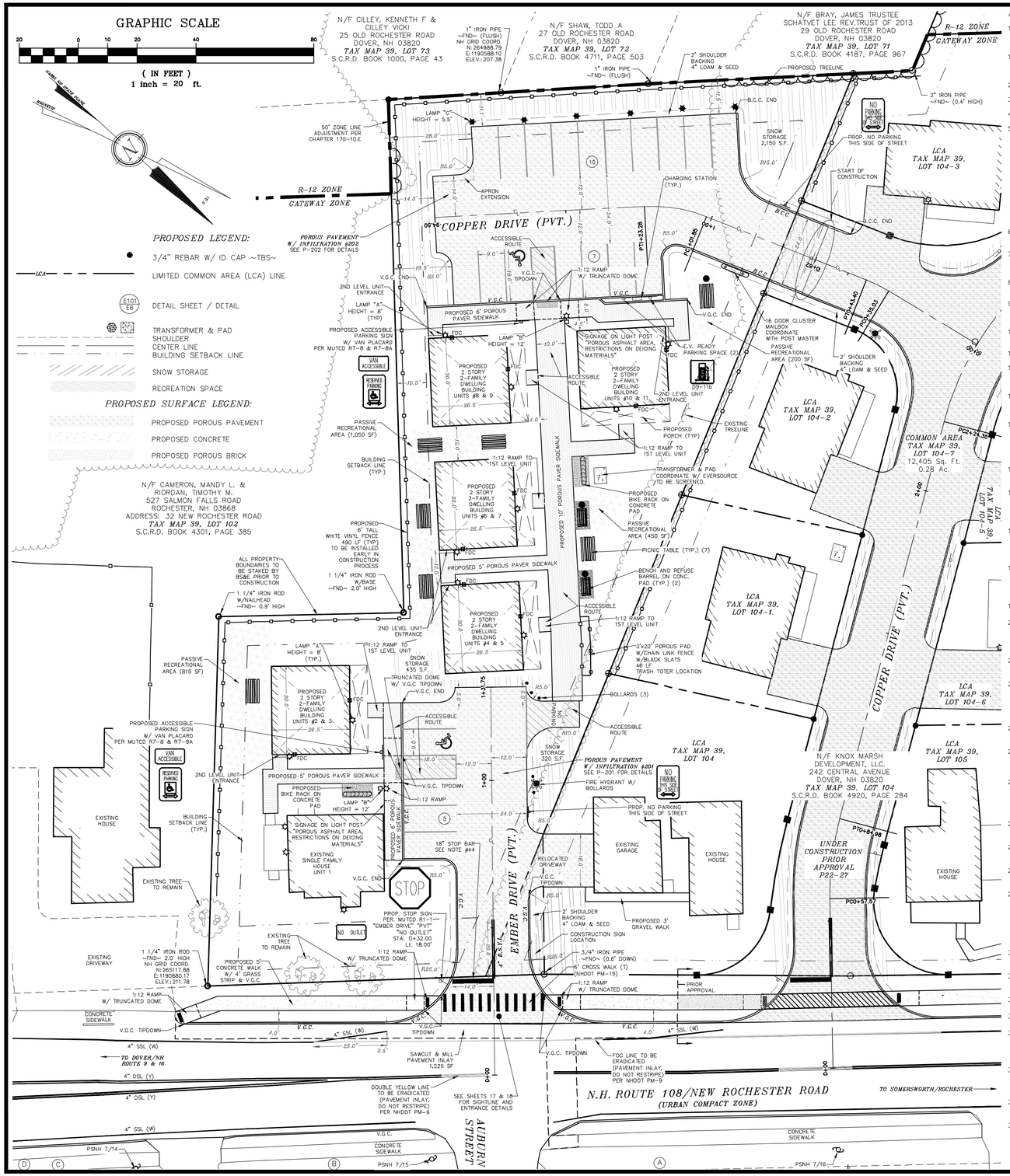
LIMITED COMMON AREA REVISION PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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



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
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% (FUNCTION OF LOT MERGER) 22.1% PROVIDED (SEE CUP)

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 FOR WHICH DEVELOPMENT IS 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 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 FIVE NEW 2–FAMILY DWELLINGS IN ADDITION TO ONE EXISTING SINGLE FAMILY HOME FOR A TOTAL OF ELEVEN UNITS. COPPPER DRIVE HAS 8 UNITS APPROVED, BRINGING THE TOTAL UNIT COUNT POST LOT MERGER TO 19 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: PENDING

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.

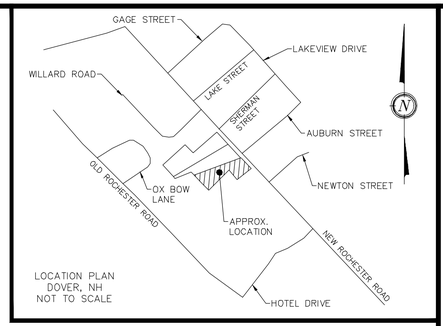
33.) SITE IS TO COMPLY WITH NFPA 1 CHAPTER 18.

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.



NOTES CONTINUED:

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.

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 USED THROUGH THE USE OF TOTERS PLACED AT THE END OF EMBER DRIVE IN THE DESIGNATED TOTER LOCATION, ENCLOSED BY CHAINLINK FENCE W/ SLATS.

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
PROPOSED IMPERVIOUS AREA/LOT COVERAGE IS A FUNCTION OF TOTAL PROJECT
POROUS PAVEMENT 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: 19,036 Sq. Ft. (18.4%)
PROPOSED IMPERVIOUS AREA (CURB & GRAVEL) & EX PAVED: 3,923 Sq. Ft. (3.8%)
TOTAL PROPOSED IMPERVIOUS COVER IS 22,959 Sq. Ft. (22.1%) (SEE CUP REQUEST)

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' WHITE VINYL 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.

WAIVER REQUESTS:

SUBDIVISION REGULATION ARTICLE 157–40–B(5): MINIMUM PIPE COVER
SITE PLAN REGULATION ARTICLE 153–14–D(6): ILLUMINATION RATIO (STAT ZONE #3)

CONDITIONAL USE PERMITS: (% ARE FUNCTIONS OF LOT MERGER)

FRONTAGE BUILD–OUT OF 39.1% WHERE 60% IS REQ. (NEW ROCHESTER ROAD)
LOT COVERAGE OF 18.4% WHERE 50% IS REQ.
NOT MEETING FRONT BUILT–TO LINE ON NEW ROCHESTER ROAD
GREATER THAN 20% IMPERVIOUS IN SECONDARY GROUNDWATER RECHARGE OVERLAY (22.1% PROPOSED)

RECREATION SPACE REQUIREMENTS (DOVER CODE ARTICLE V , 170–15.)

PROPOSED NUMBER OF BEDROOMS: 20 (10 2BR)
RECREATION SPACE REQUIREMENT (100 SF PER BEDROOM): 2,000 SF
½ RECREATION SPACE FOR PASSIVE USE: 1,000 SF
2,515 SF PROVIDED (SATISFIED ON SITE)
½ RECREATION SPACE FOR ACTIVE USE: 1,000 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, 19 UNITS ON PROJECT
  - 3 EXISTING SINGLE FAMILY HOMES ON SITE (ORIGINAL TAX MAP 39, LOTS 103, 104, 105)
  - 6 ADDITIONAL SINGLE FAMILY HOMES CONSTRUCTED (PRIOR APPROVAL)
  - 5 ADDITIONAL 2–FAMILY DWELLING (10 UNITS) PROPOSED

PARKING REQUIREMENTS:

CHAPTER 153–14D PARKING TABLE
- RESIDENTIAL
  - RESIDENTIAL (GATEWAY) 1.9 SPACES PER UNIT:
    - 11 UNITS x 1.9 SPACES = 20.9 SPACES

TOTAL MAXIMUM = 21 SPACES
TOTAL PROPOSED = 22 SPACES, DETERMINED BY PLANNING DIRECTOR TO NOT NEED CUP FOR ONE PARKING SPACE OVER THE MAXIMUM.

5% EV REQUIREMENT = 1.10 SPACES, 2 PROPOSED ON COPPER DRIVE PARKING LOT
5% BIKE PARKING = 1.10 SPACES, 14 PROVIDED

SNOW STORAGE CALCULATION:

- STORAGE CALCULATION (6:1 RATIO USED) (POROUS PAVEMENT)
  - PAVED AREA = 13,496 Sq.Ft. / 6 = 2,250 Sq.Ft.
  - >2,820 Sq.Ft. PROVIDED

DOVER PLANNING FILE #SITE–2023–0007

#	REVISION	DATE	DESCRIPTION
1		9–25–23	REVISED PER DOVER TRC COMMENT

SITE PLAN
LAND OF: ROBERT BALDWIN
KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103
FOR: KNOX MARSH DEVELOPMENT LLC

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

SHEET 6 OF 27

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.

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

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 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.

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.

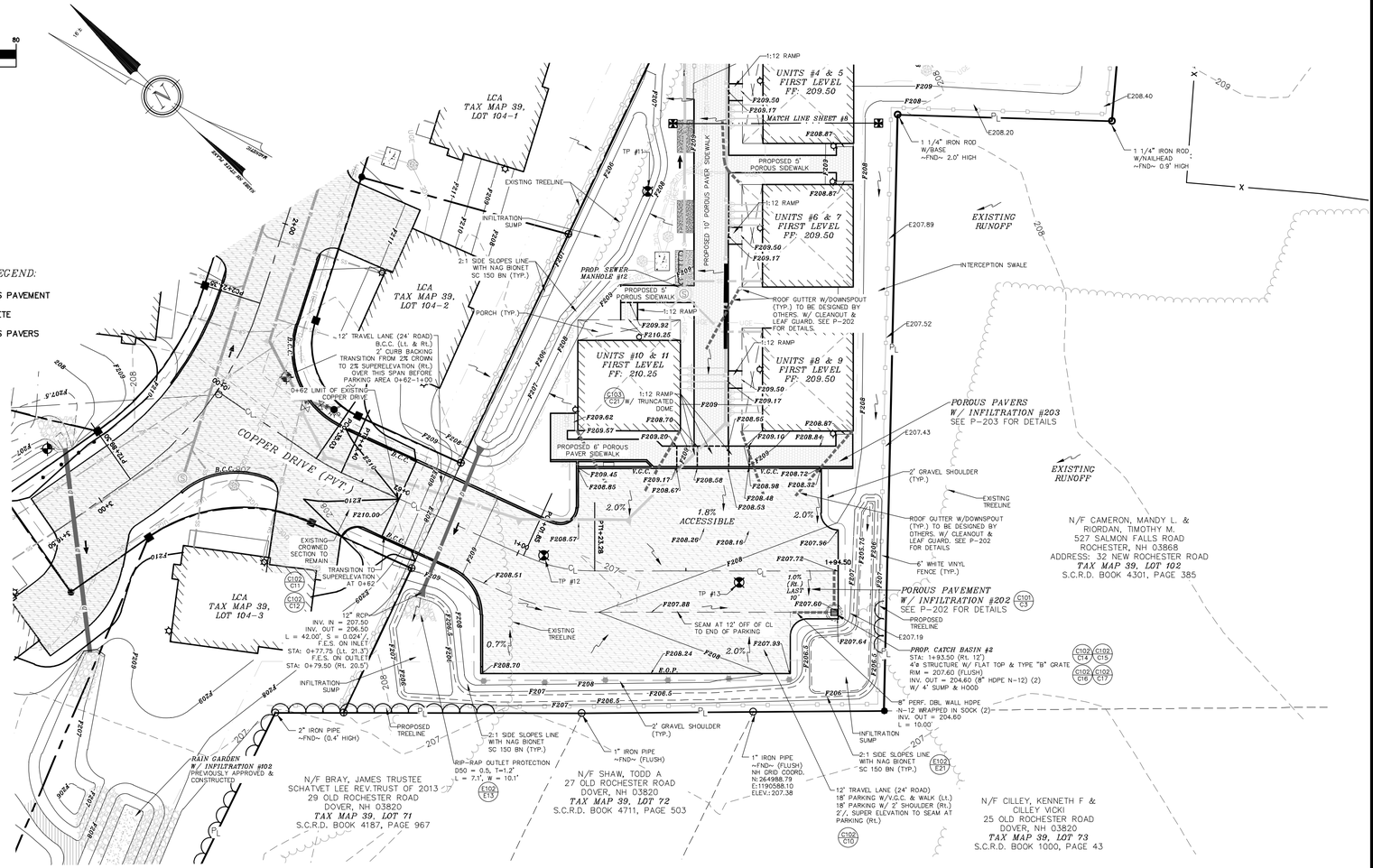
16.) WRITTEN DIMENSION ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. 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.

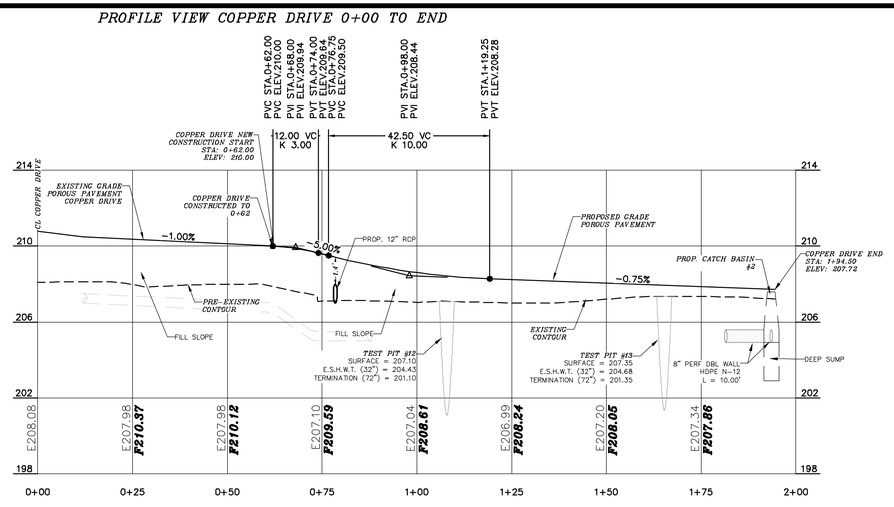
19.) SEE DETAILS CONCERNING SITE LAYOUT, DRAINAGE, UTILITY, AND SEDIMENT AND EROSION CONTROLS.

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'

#	REVISION	DATE	DESCRIPTION
1		9-25-23	REVISED PER DOVER TRC COMMENT

DOVER PLANNING FILE #SITE-2023-0007

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.

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(IN FEET)
1 inch = 20 ft.

PROPOSED LEGEND:

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- F211 / F210 / D — CONTOUR MINOR, PROPOSED; CONTOUR MAJOR, PROPOSED; DRAINAGE CULVERT
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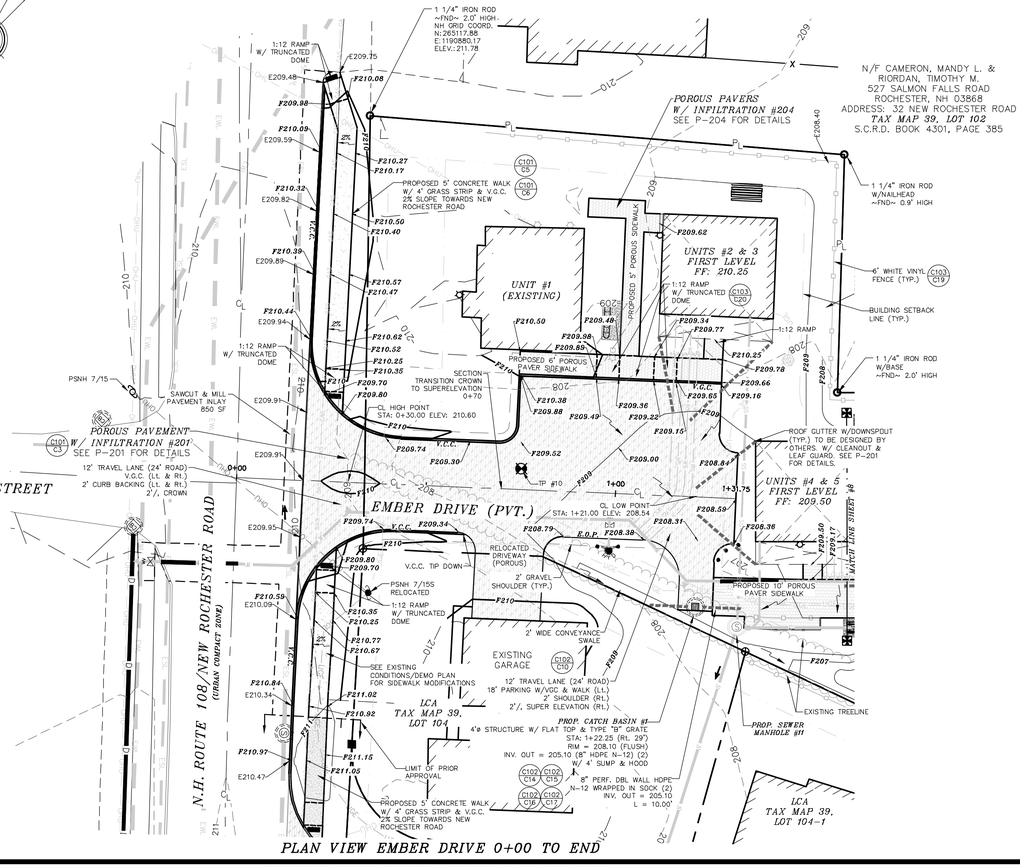
- F109.31 — PROPOSED SPOT ELEVATION

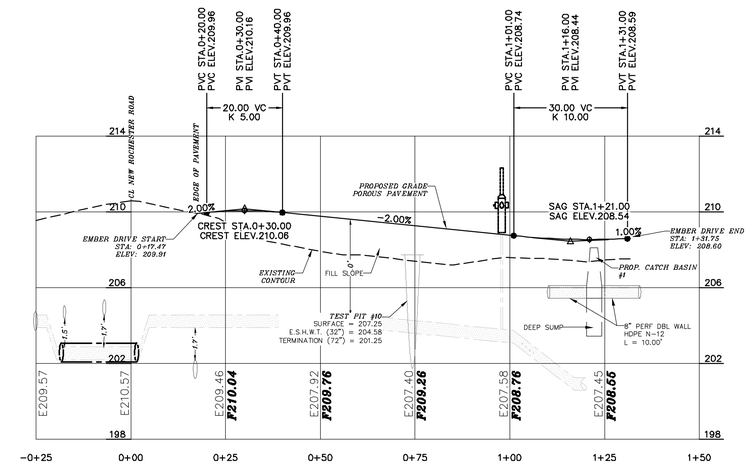
PROPOSED SURFACE LEGEND:

- 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

#	DATE	DESCRIPTION
1	9-25-23	REVISED PER DOVER TRC COMMENT

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. 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 *

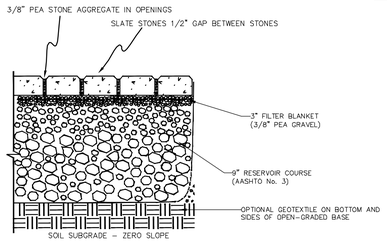
SIEVE SIZE	% PASSING BY WEIGHT
1/2"	100
3/8"	95 – 100
# 4	22 – 55
# 8	0 – 10

* EQUIVALENT TO STANDARD WASHED STONE – SECTION 702 OF NHDOT NHDOT STANDARD SPECIFICATIONS

RESERVOIR COURSE *

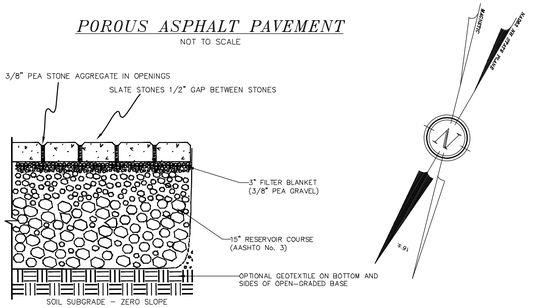
SIEVE SIZE	% PASSING BY WEIGHT
2 1/2"	100
2"	90 – 100
1 1/2"	35 – 70
1"	0 – 15
1/2"	0 – 5

* 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

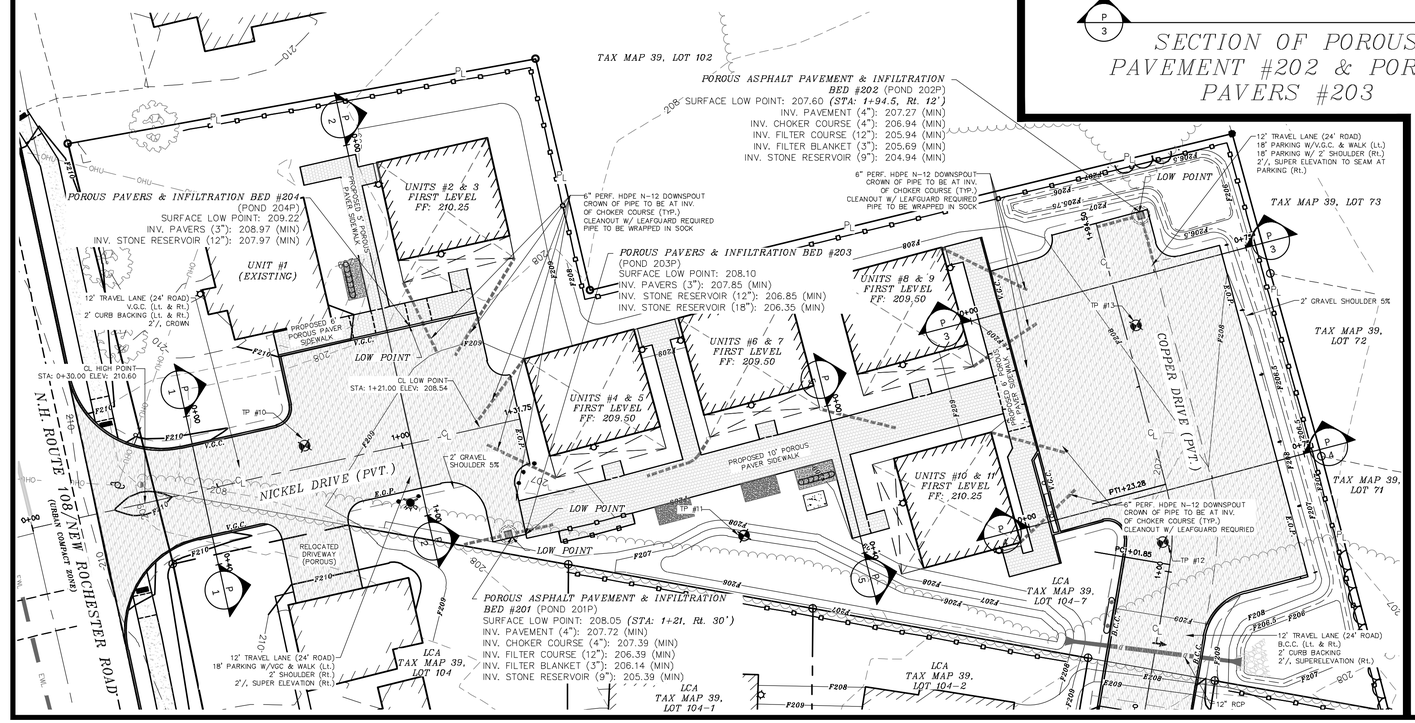
PROPOSED CONCRETE

PROPOSED POROUS PAVERS

GRAPHIC SCALE

20 0 10 20 40 80

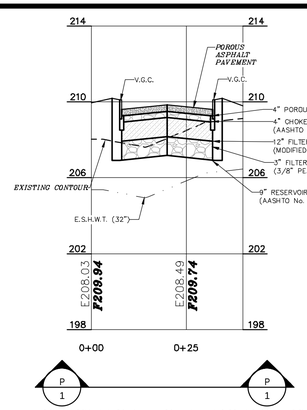
(IN FEET)
1 inch = 20 ft.



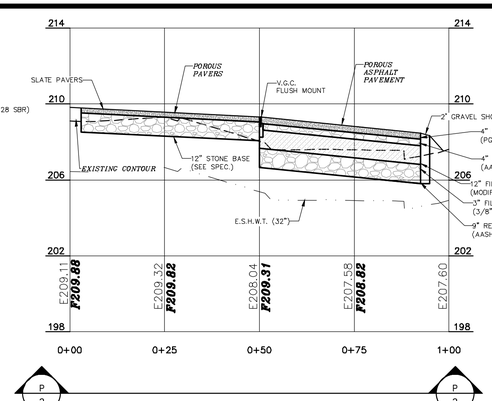
POROUS PAVEMENT TOTAL SECTION DEPTH = 32" TOTAL SECTION REQUIRED = 31.2" (65% OF FROST DEPTH) FROST DEPTH = 48" (UNHSC)

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

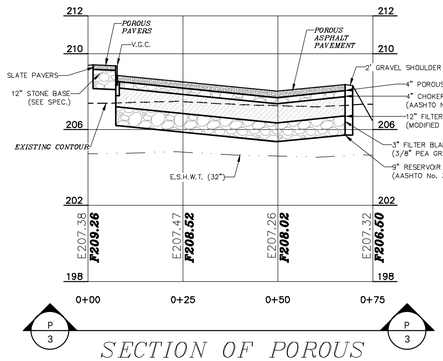
SEE GRADING PLAN & PROFILES FOR SPOT ELEVATIONS



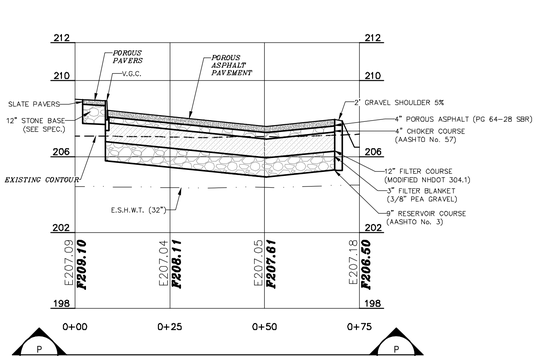
SECTION OF POROUS PAVEMENT #201



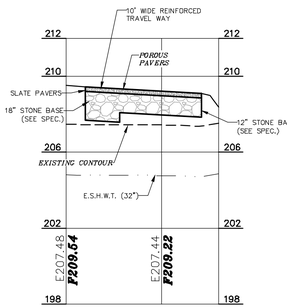
SECTION OF POROUS PAVEMENT #201 & POROUS PAVERS #204



SECTION OF POROUS PAVEMENT #202 & POROUS PAVERS #203



SECTION OF POROUS PAVEMENT #202 & POROUS PAVERS #203



SECTION OF POROUS PAVERS #203

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
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. 14243
LICENSED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

SOILS & DEWATERING:

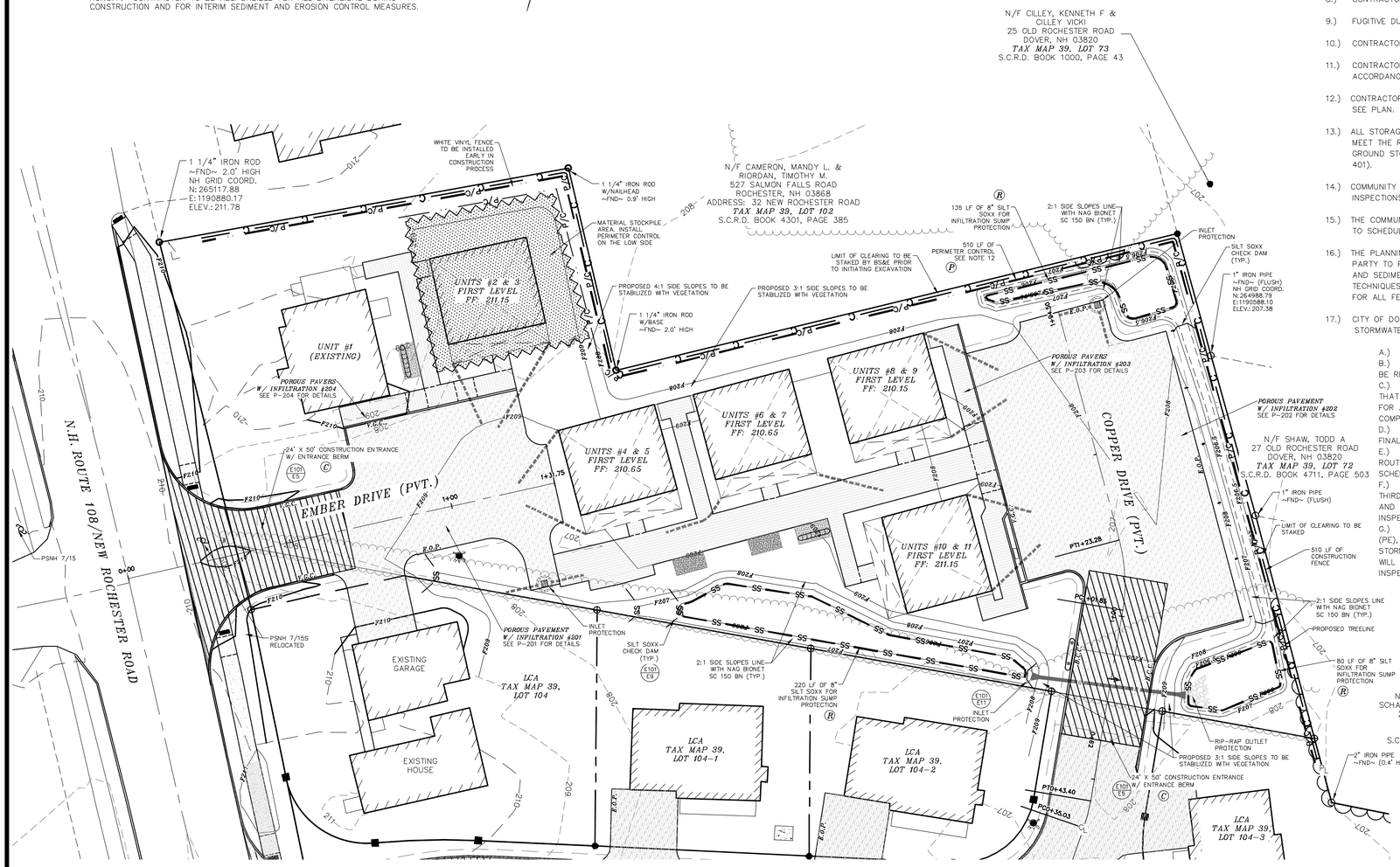
WdA	*WINDSOR*	*LOAMY SAND*	*K= 0.17*
DeA	*DEEREFIELD*	*LOAMY SAND*	*K= 0.17*
(350A&B)			

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
- P/C — PERIMETER CONTROL
- SS — FILTREXX SILTSOXX
- C — 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

#1	9–25–23	REVISED PER DOVER TRC COMMENT
REVISION	DATE	DESCRIPTION

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 10' HIGH
- SEWER MANHOLE W/ STRUCTURE
- E101 / E6 — DETAIL SHEET / DETAIL
- F101 / F100 — CONTOUR MINOR, PROPOSED; CONTOUR MAJOR, PROPOSED
- D — DRAINAGE CULVERT
- SHOULDER
- CENTER LINE
- UGE — PROPOSED UTILITY POLE; TRANSFORMER / J.BOX; 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 RUNOGF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAGFIC IN SENSITIVE AREAS, AND MAINTAINING AN EGFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL MEETING THE ENGINEERS SPECIFIC RECOMMENDED CRITERIA.

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 METALIC 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.

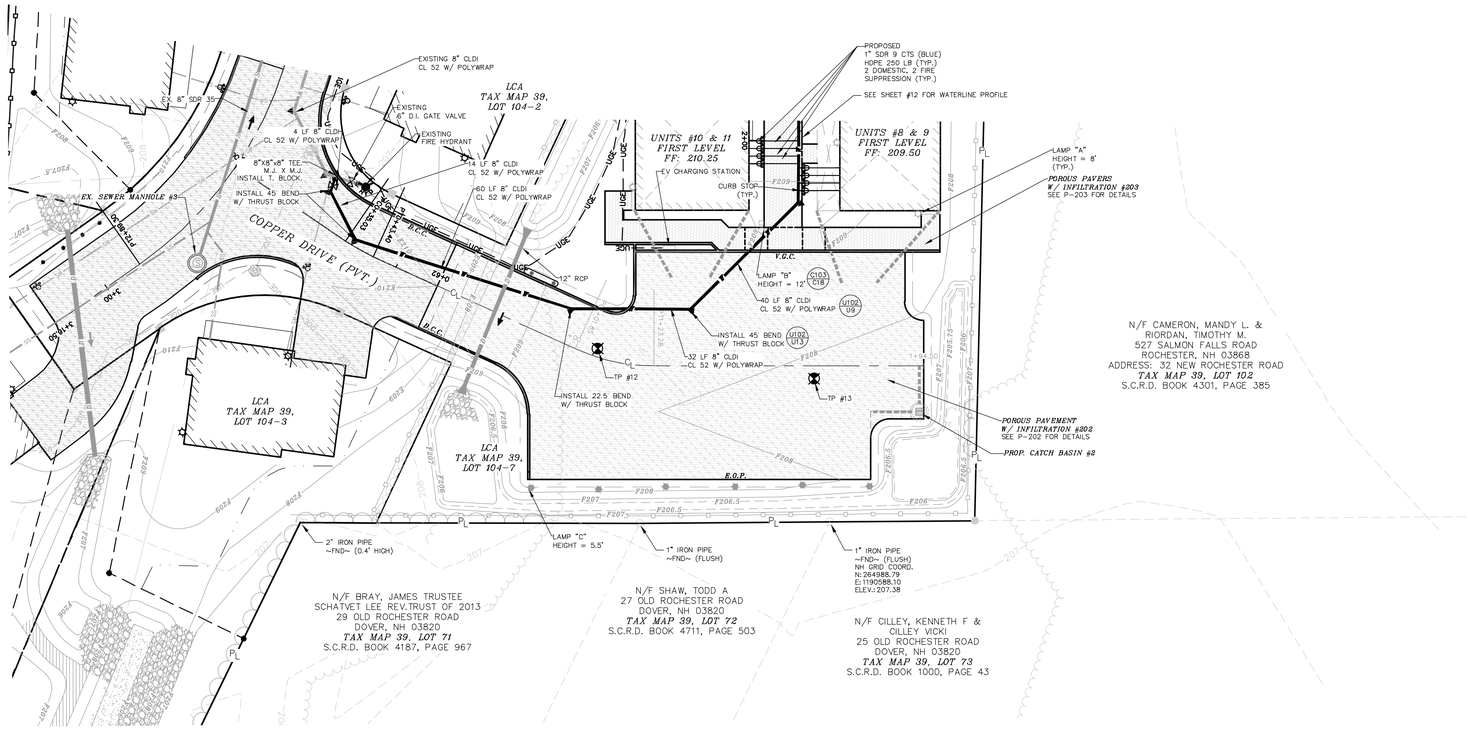
20.) THE SINGLE FAMILY HOME WILL CONTINUE TO UTILIZE THEIR EXISTING SERVICES

21.) HEATING AND COOLING FOR PROPOSED UNITS WILL BE DONE VIA MINI-SPLIT.

GRAPHIC SCALE

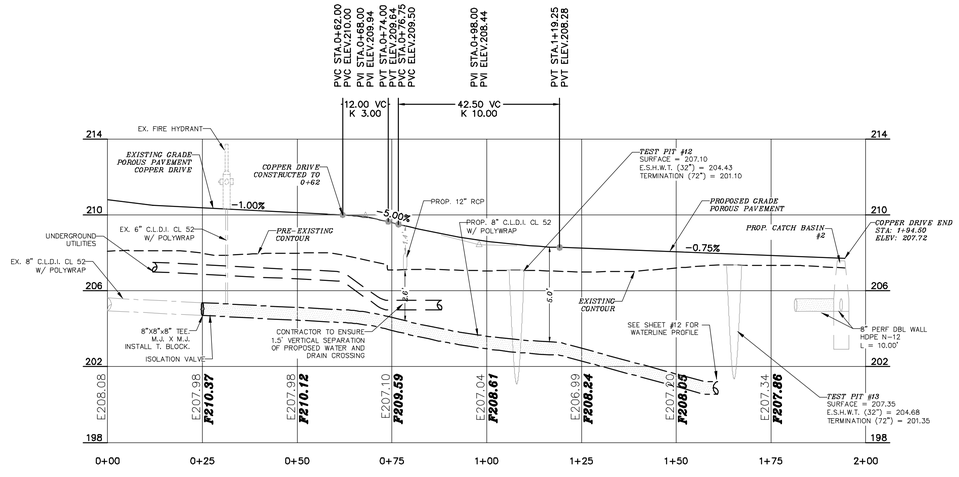
20 0 10 20 40 80

(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
1		9-25-23	REVISED PER DOVER TRC COMMENT

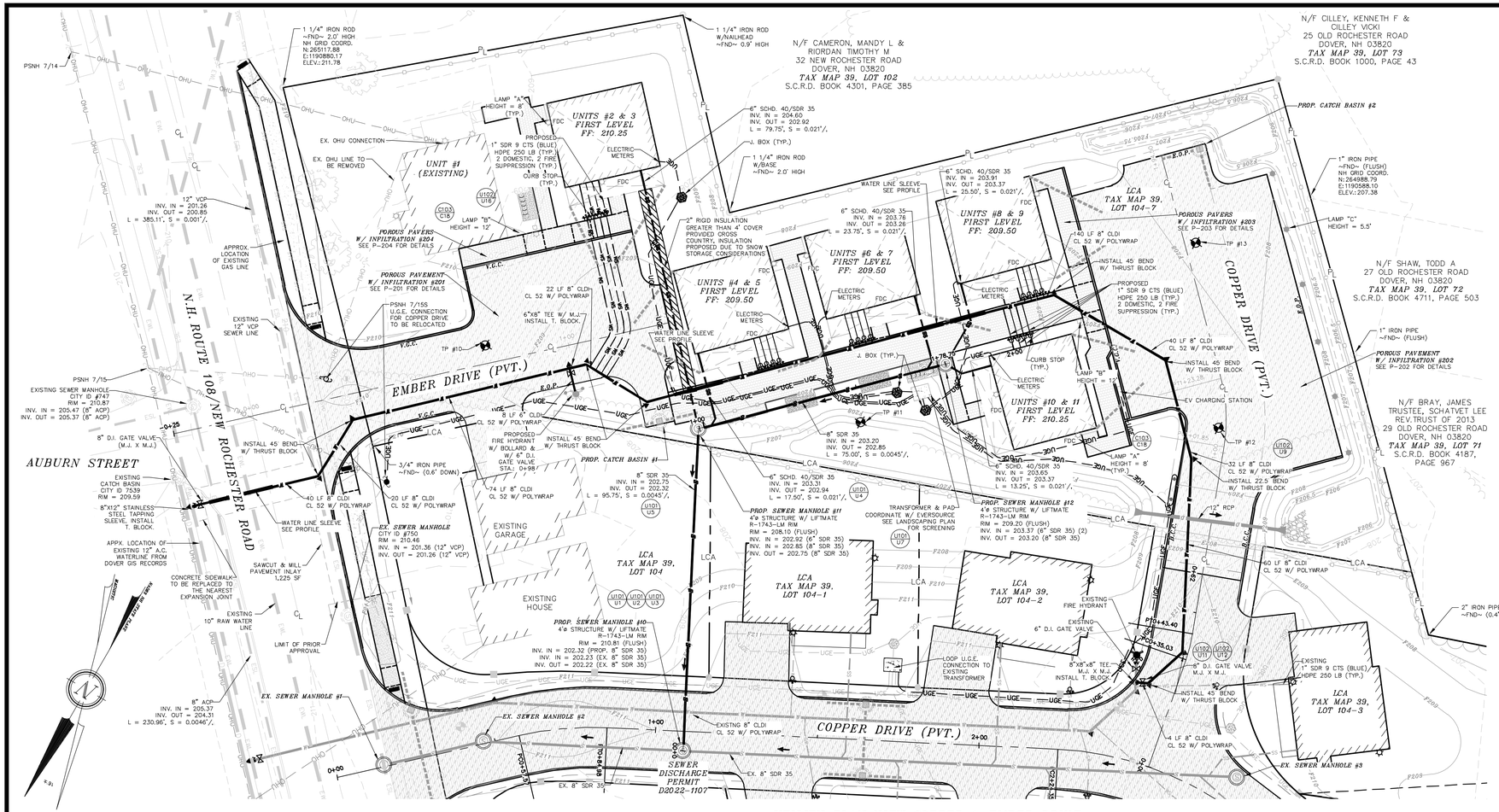
UTILITY PLAN & PROFILE COPPER DRIVE 0+00 TO END
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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



UTILITY PLAN VIEW COPPER & EMBER DRIVE

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 10' 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:

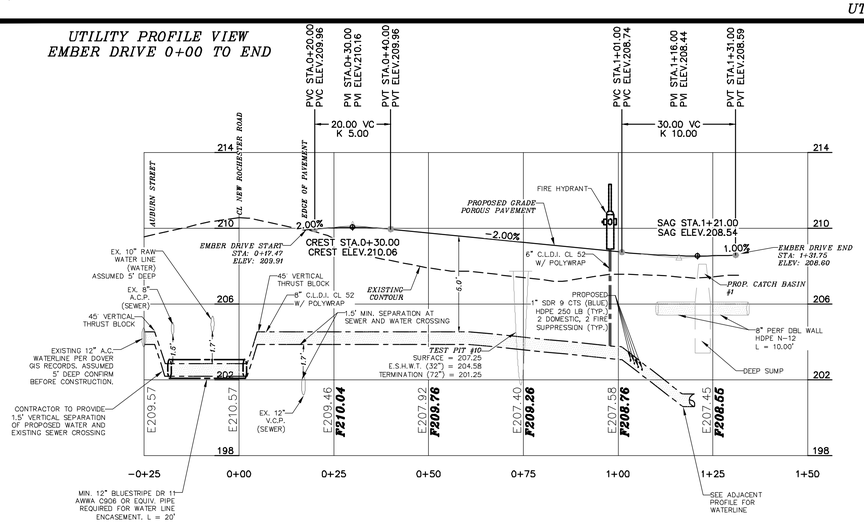
- PROPOSED POROUS PAVEMENT
- PROPOSED CONCRETE
- PROPOSED POROUS PAVERS

GRAPHIC SCALE

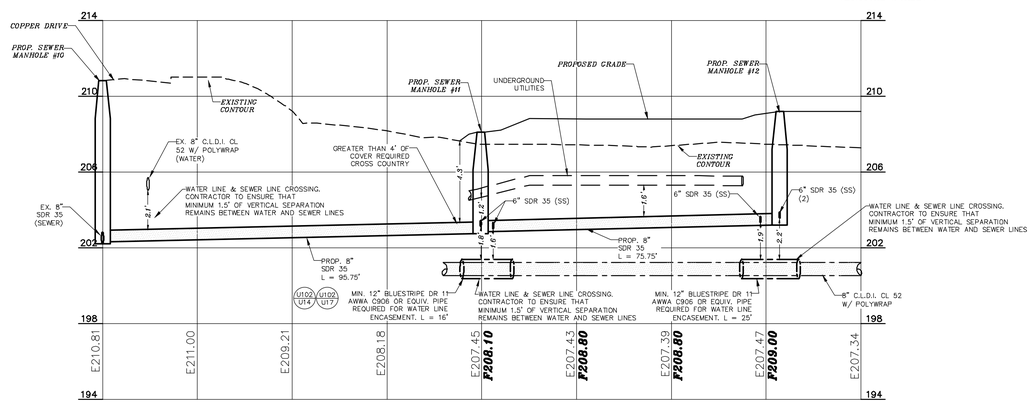
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

UTILITY 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'

DOVER PLANNING FILE #SITE-2023-0007

#	REVISION	DATE	DESCRIPTION
1		9-25-23	REVISED PER DOVER TRC COMMENT

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

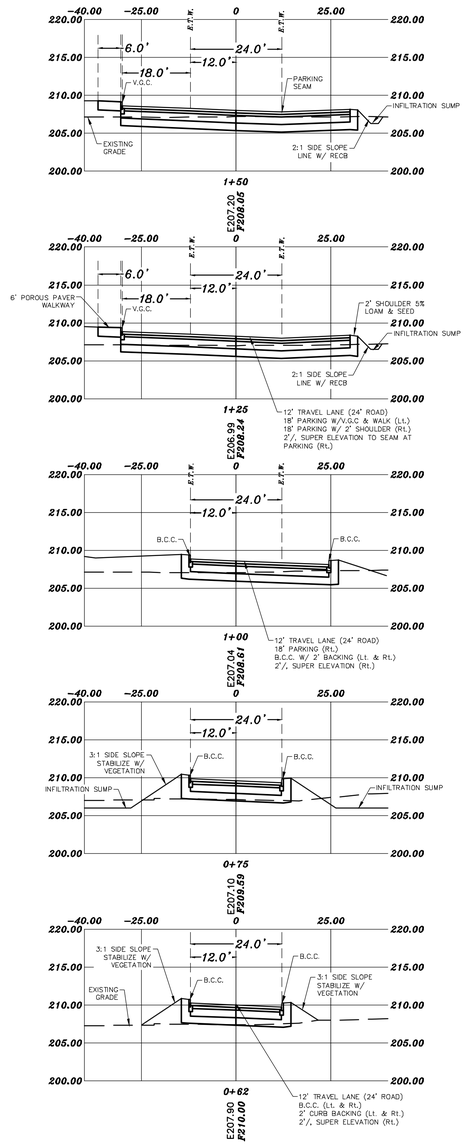
SCALE : 1 IN. EQUALS 20 FT.
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

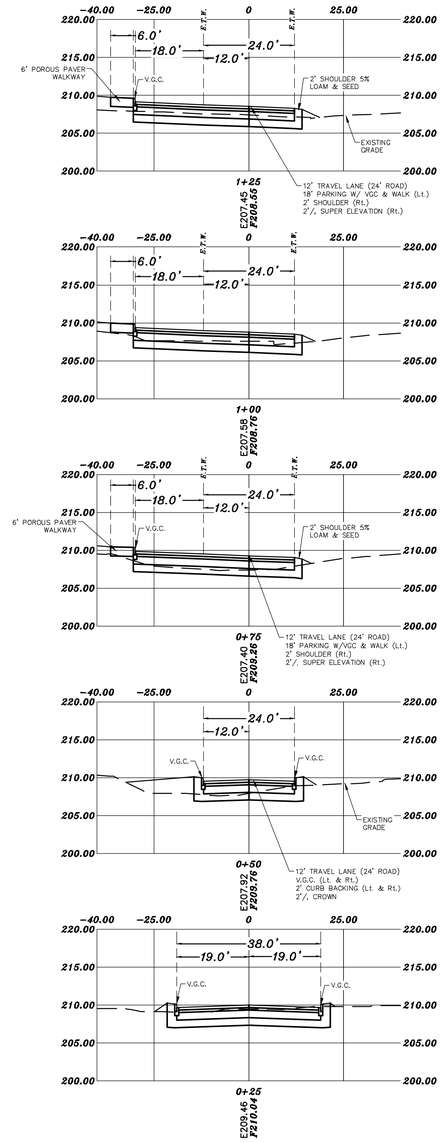
NOT FOR CONSTRUCTION

NOTE
SEE C-101
FOR TYPICAL
POROUS
PAVEMENT
SECTION

COPPER DRIVE



EMBER DRIVE



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
Vertical Scale 1 Inch = 10 ft.

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#1	9-25-23	REVISED PER DOVER TRC COMMENT

CROSS SECTIONS COPPER DRIVE & EMBER DRIVE
LAND OF: ROBERT BALDWIN
MARSH DEVELOPMENT LLC
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:

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 5 TWO FAMILY RESIDENCES.

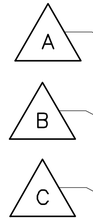
6.) SEE CONSTRUCTION DETAILS FOR LIGHT PRODUCT CUT SHEETS.

7.) LAMP "A" IS A TYPICAL RESIDENTIAL LAMP MOUNTED ON THE BUILDINGS THAT IS MOUNTED APPROXIMATELY 8' OFF THE GROUND.

8.) LAMP "B" IS A TYPICAL POLE MOUNTED RESIDENTIAL LAMP THAT IS MOUNTED APPROXIMATELY 12' 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.



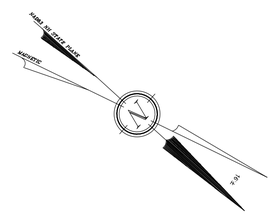
Schedule

Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Lumens Per Lamp	Light Loss Factor	Wattage
	A		24	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		2	Lithonia Lighting	DSX1 LED P1 30K T3M MVOLT	DSX1 LED P1 30K T3M MVOLT	1	8279	1	54
	C		6	Lithonia Lighting	KBR8 LED 12C 530 50K ASY MVOLT	KBR8 WITH 3 LIGHT BOARDS (12 LEDs) 530mA DRIVER, 5000K COLOR TEMP AND ASYMMETRIC OPTIC	1	1753	1	22

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Stat Zone # 1	X	2.0 fc	4.9 fc	0.4 fc	12.3:1	5.0:1
Stat Zone # 2	X	2.0 fc	4.0 fc	0.4 fc	10.0:1	5.0:1
Stat Zone # 3	X	2.8 fc	7.8 fc	0.2 fc	39.0:1	14.0:1

SEE WAIVER REQUEST FOR STATISTICAL ZONE #3 FOR ILLUMINATION RATIO DUE TO THE PROXIMITY TO ABUTTING RESIDENTIAL PROPERTIES



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#1	9-25-23	REVISED PER DOVER TRC COMMENT

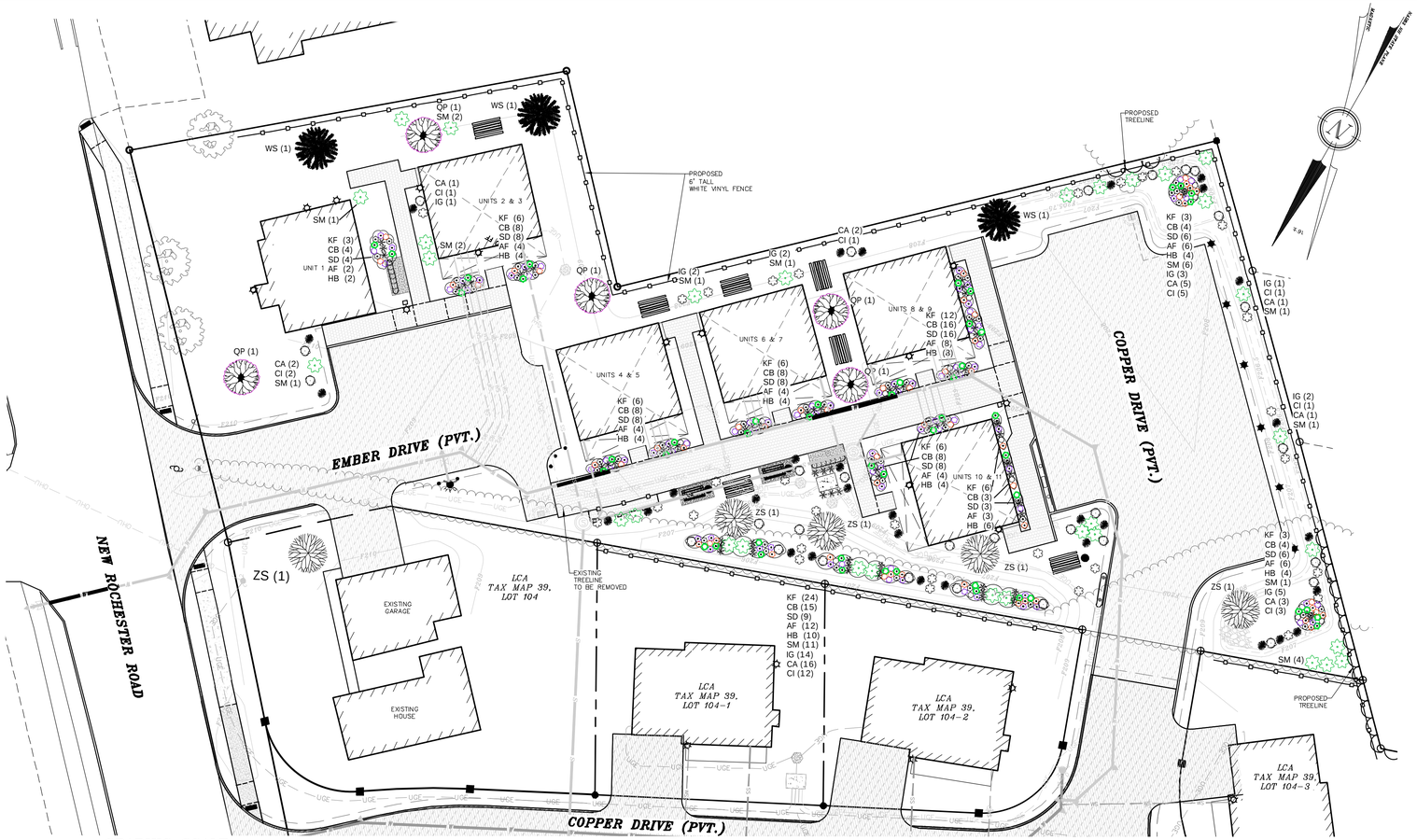
LIGHTING PLAN
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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.	5	QP
Zelkova serrata 'Green Vase' / Green Vase Zelkova	4" Cal.	5	ZS
Picea glauca / White Spruce	4" Cal.	3	WS
Shrubs			
Clethra alnifolia 'Sixteen Candles' / Sixteen Candles Summersweet	3 Gal.	31	CA
Cornus alba 'Ivory Halo' / Ivory Halo Dogwood	3 Gal.	26	CI
Ilex glabra 'Shamrock' / Shamrock Inkberry	3 Gal.	30	IG
Syringa meyeri 'Palibin' / Dwarf Korean Lilac	3 Gal.	32	SM
Grasses			
Calamagrostis acutifolia 'Karl Foerster' / Feather Reed Grass	#2	75	KF
Perennials			
Geranium sanguineum 'New Hampshire Purple' / Cransebill	#1	78	CB
Hemerocallis 'Happy Returns' / Happy Returns Daylily	#1	76	SD
Astilbe x arendsii 'Bridal Veil' / Bridal Veil Astilbe	#1	53	AF
Hosta 'Big Daddy' / Big daddy Plantain Lily	#1	50	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

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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.

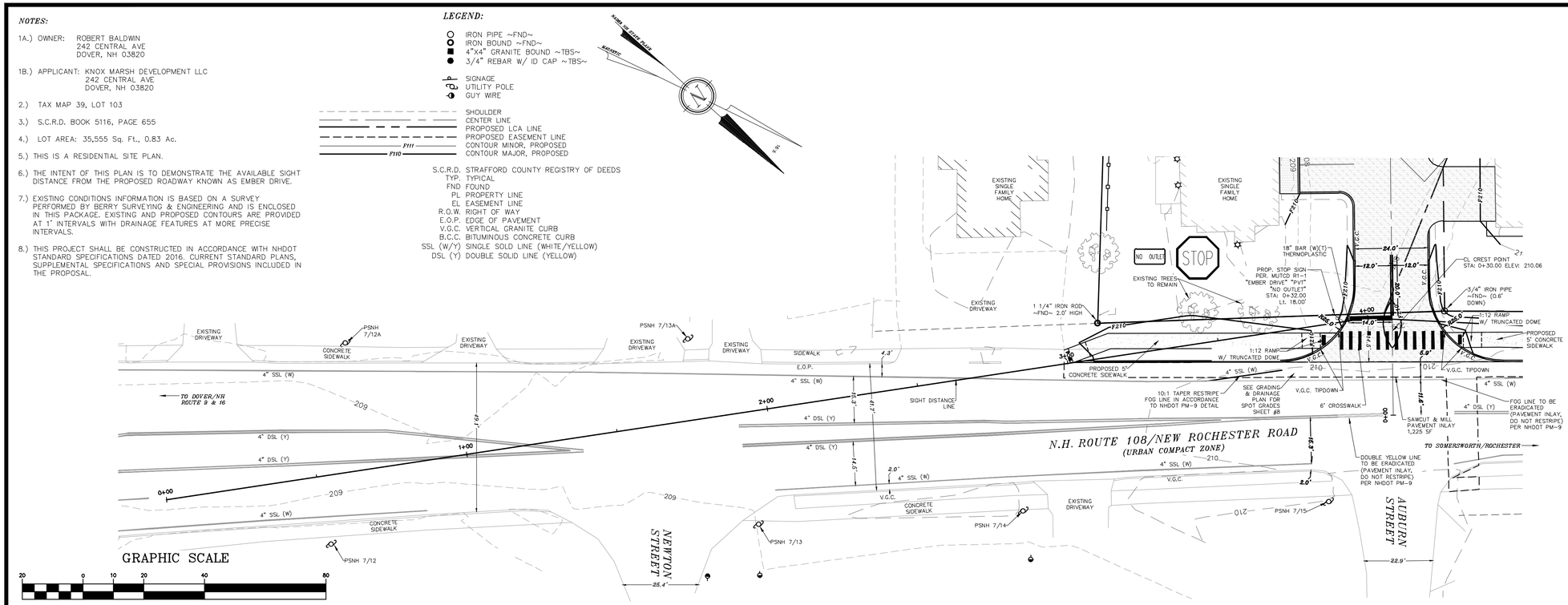
7.) EXISTING CONDITIONS INFORMATION IS BASED ON A SURVEY PERFORMED BY BERRY SURVEYING & ENGINEERING AND IS ENCLOSED IN THIS PACKAGE. EXISTING AND PROPOSED CONTOURS ARE PROVIDED AT 1' INTERVALS WITH DRAINAGE FEATURES AT MORE PRECISE INTERVALS.

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
- P111 CONTOUR MINOR, PROPOSED
- P110 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.

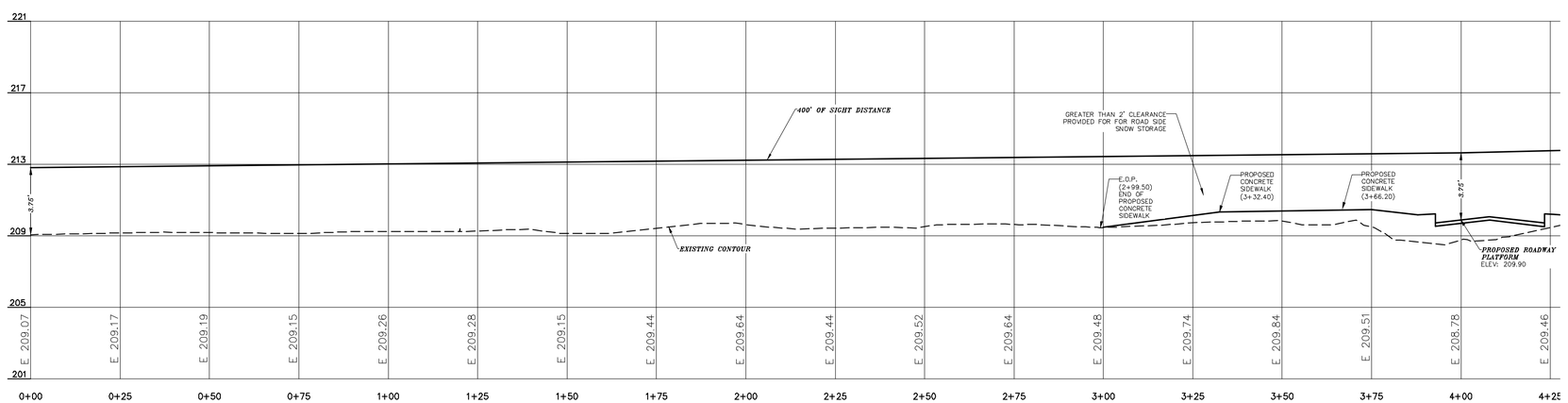
PLAN VIEW N.H. ROUTE 108/NEW ROCHESTER ROAD & EMBER DRIVE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.
VERTICAL SCALE: 1" = 4'

PROFILE VIEW SIGHT LINE



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
1		9-25-23	REVISED PER DOVER TRC COMMENT

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

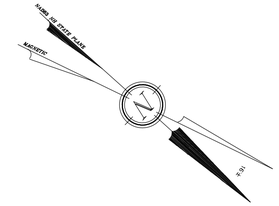
SD-1

NOT FOR CONSTRUCTION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



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- 4"X4" GRANITE BOUND ~TBS~
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- SIGNAGE
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- CENTER LINE
- PROPOSED LCA LINE
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- CONTOUR MINOR, PROPOSED
- 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
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SSL (W/Y) SINGLE SOLID LINE (WHITE/YELLOW)
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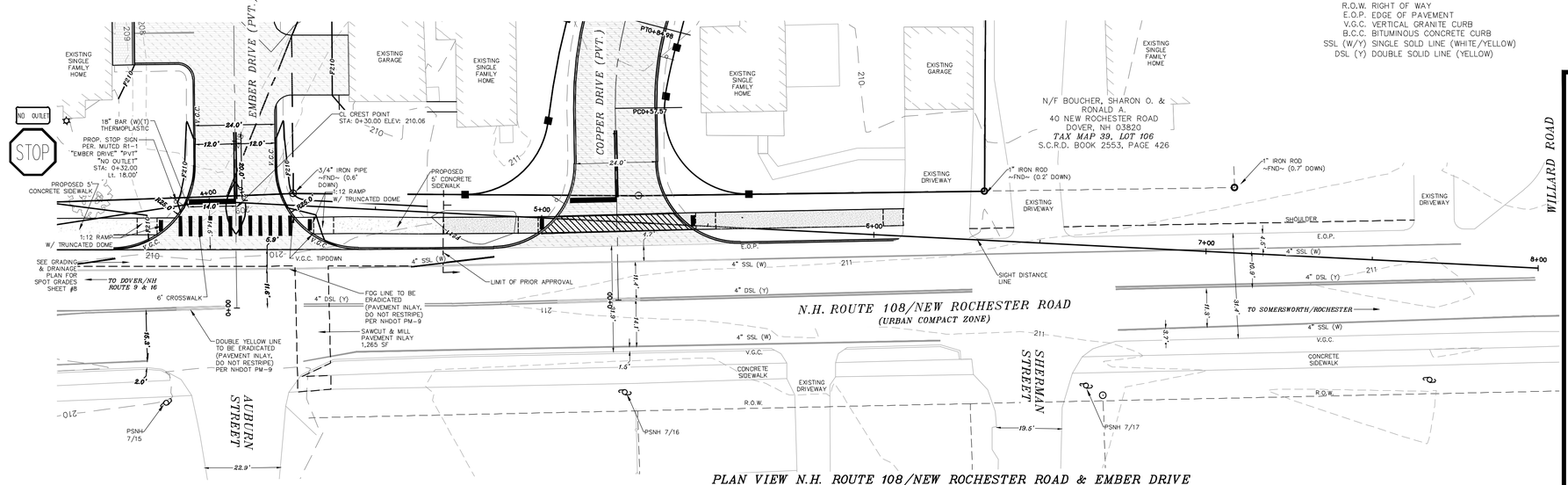
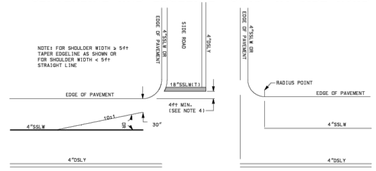


PLAN VIEW N.H. ROUTE 108/NEW ROCHESTER ROAD & EMBER DRIVE

CENTERLINE AND EDGELINE "CUTS" AT SIDE ROAD



MAINLINE

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.

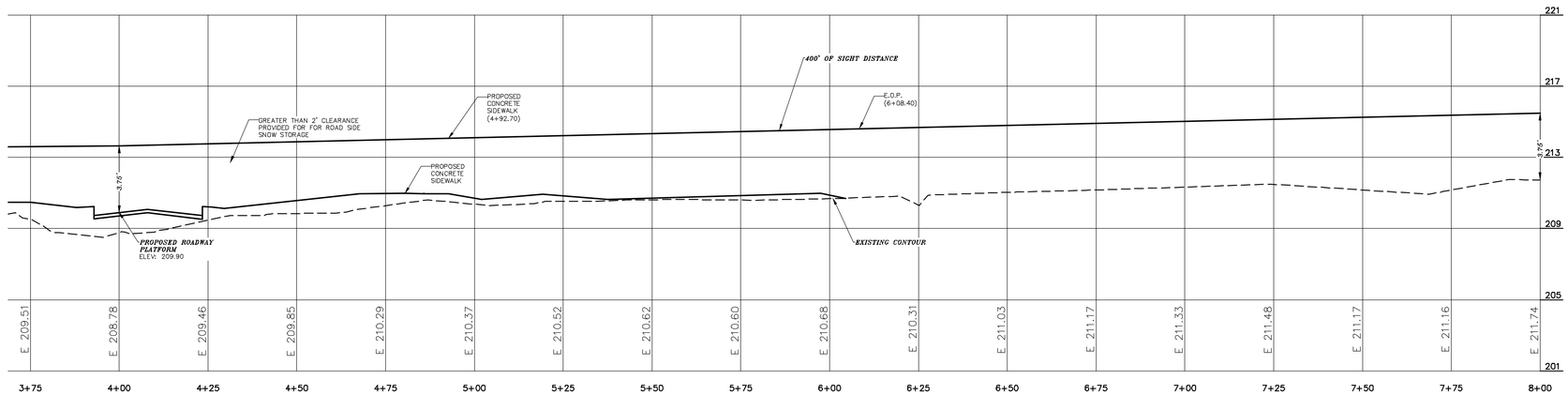
6.) STOP BARS, WORDS, LANE LINES, SYMBOLS AND ARROWS SHALL BE THERMOPLASTIC (T).

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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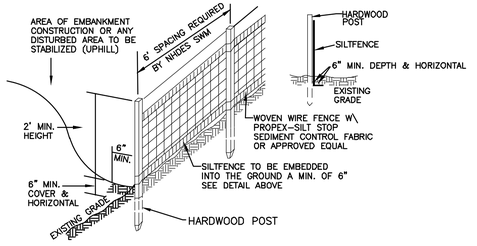
E1



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

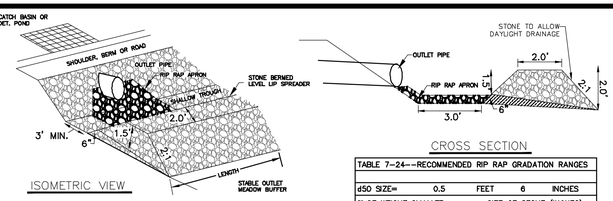
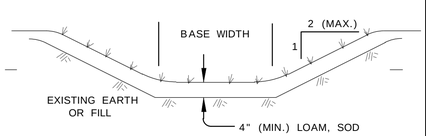


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES				
d50 SIZE=	0.5	FEET	6	INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM		TO	
100%	9		12	
85%	8		11	
50%	6		9	
15%	2		3	

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

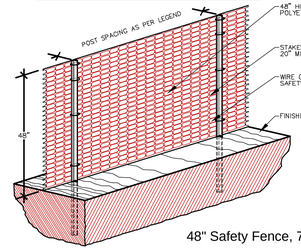
TO BE CONSTRUCTED IAW NH SWM #2 CHAPTER 4, #5 TREATMENT SWALES, PAGE 123.

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.

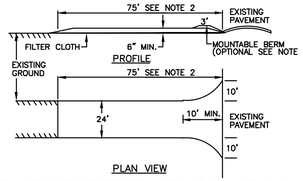


48" Safety Fence, 72" T-Posts

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.

E5

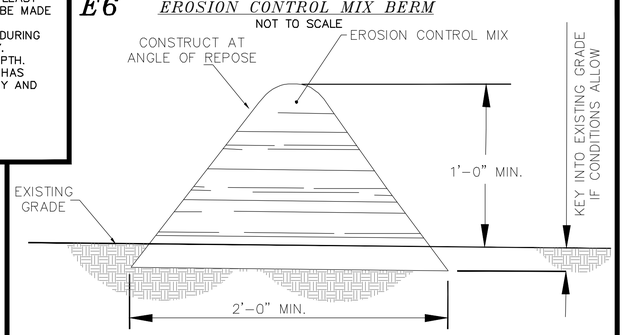
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



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

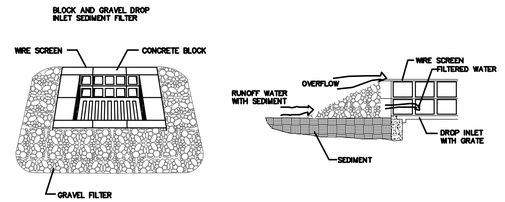
EROSION CONTROL MIX BERM
NOT TO SCALE



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.

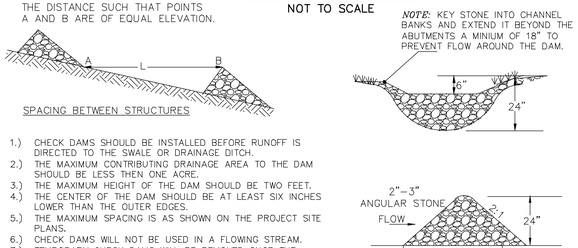
E8

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)

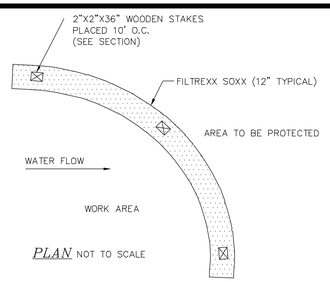
E9

STONE CHECK DAM
NOT TO SCALE



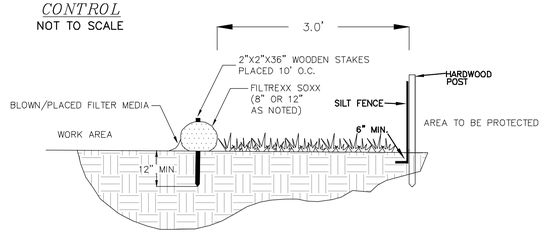
1.) CHECK DAMS SHOULD BE INSTALLED BEFORE RUNOFF IS DIRECTED TO THE SWALE OR DRAINAGE DITCH.
2.) THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE DAM SHOULD BE LESS THEN ONE ACRE.
3.) THE MAXIMUM HEIGHT OF THE DAM SHOULD BE TWO FEET.
4.) THE CENTER OF THE DAM SHOULD BE AT LEAST SIX INCHES LOWER THAN THE 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



PLAN NOT TO SCALE

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

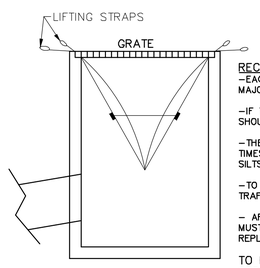
NOTE: FOR AREAS REQUIRING DOUBLE PERIMETER CONTROL WITHIN 50' OF JURISDICTIONAL WETLANDS AND NOT FOR ALL SILT SOXX APPLICATIONS. THIS DUPLICATION MAY BE SPECIFIED AS 12" SILT SOXX OR ORANGE CONSTRUCTION FENCE AS NOTED.

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

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

DOVER PLANNING FILE #SITE-2023-0007

#1	9-25-23	REVISED PER DOVER TRC COMMENT
REVISION	DATE	DESCRIPTION

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

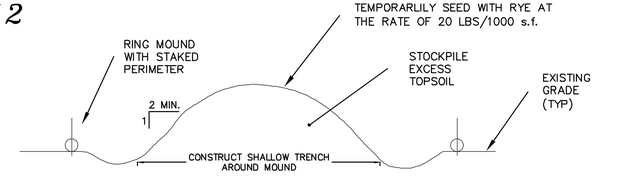
SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

E-101

NOT FOR CONSTRUCTION

E12



TO BE CONSTRUCTED IAW NH SWM #3 4–1 EROSION CONTROL PRACTICES, SOIL STOCKPILE PRACTICES, PAGE 46.

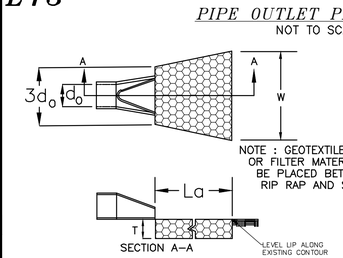
TOPSOIL STOCKPILE MOUND

NOT TO SCALE

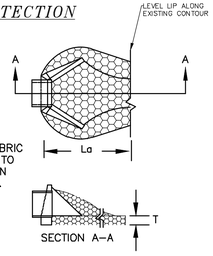
E13

PIPE OUTLET PROTECTION

NOT TO SCALE



PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL



PIPE OUTLET TO WELL–DEFINED CHANNEL

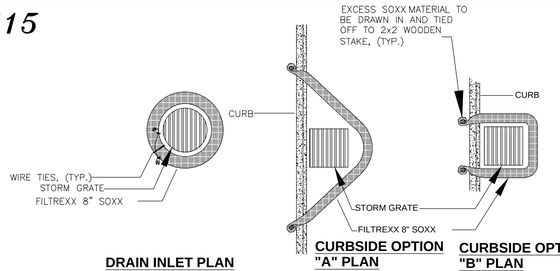
PIPE OUTLET PROTECTION CONSTRUCTION SPECIFICATIONS

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

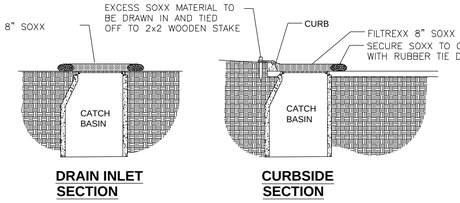
E15



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 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

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.

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:

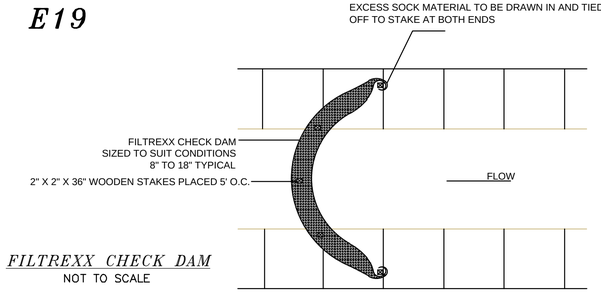
PER ENV–WQ 1500 ALTERATION OF TERRAIN

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

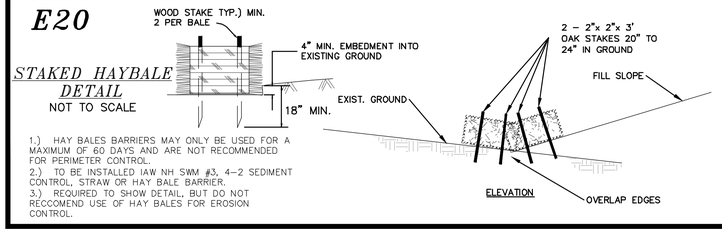


FILTREXX CHECK DAM

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

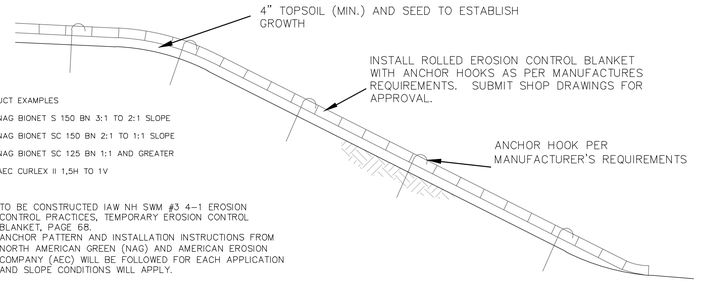


STAKED HAYBALE DETAIL

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

#	REVISION	DATE	DESCRIPTION
#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

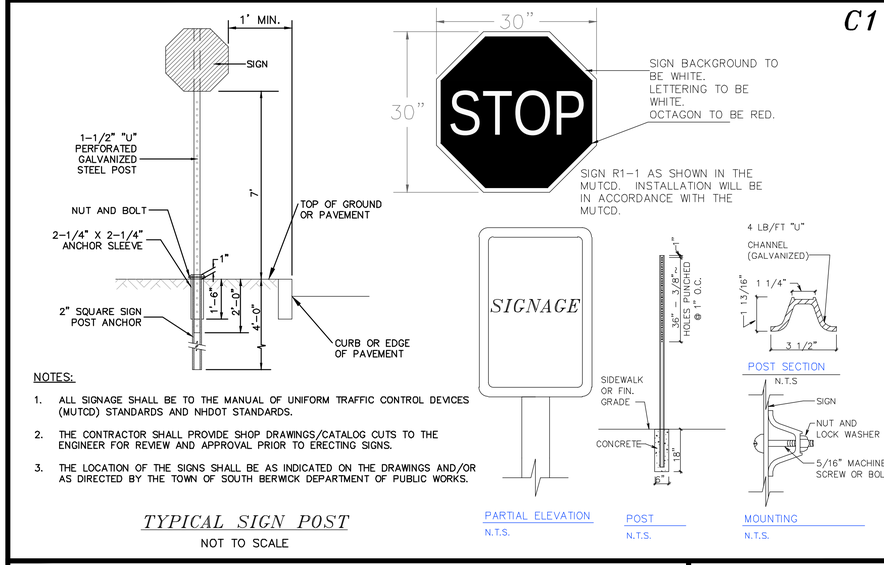
SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

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

SHEET 19 OF 27

NOT FOR CONSTRUCTION

C1

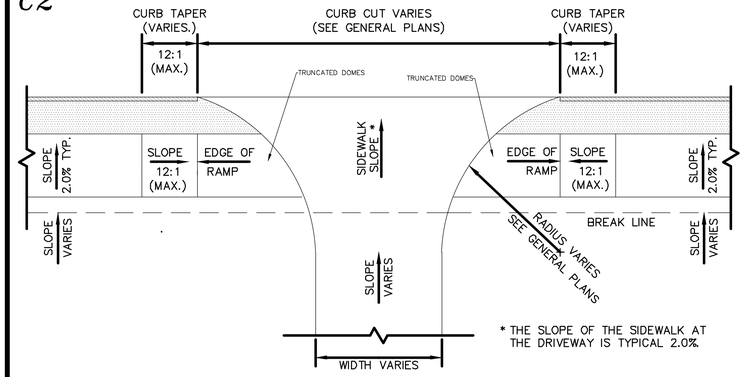


NOTES:

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

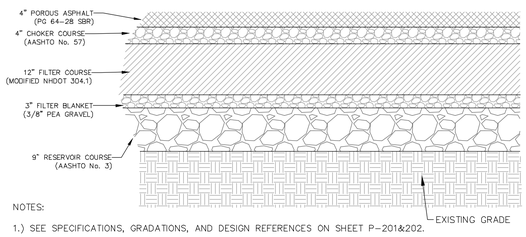
C2



* THE SLOPE OF THE SIDEWALK AT THE DRIVEWAY IS TYPICAL 2.0%

PLAN VIEW (SIDEWALK WITH GRASS PANEL)
NOT TO SCALE

C3

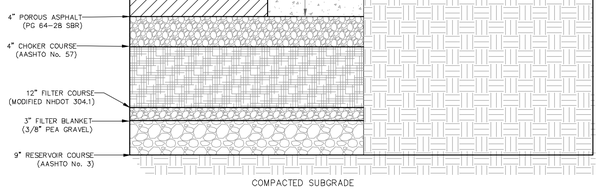


NOTES:

1.) SEE SPECIFICATIONS, GRADATIONS, AND DESIGN REFERENCES ON SHEET P-201&202.

POROUS ASPHALT PAVEMENT SECTION
NOT TO SCALE

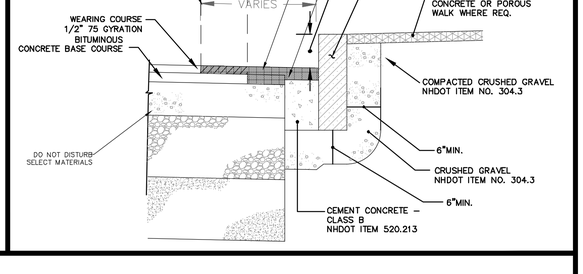
C4



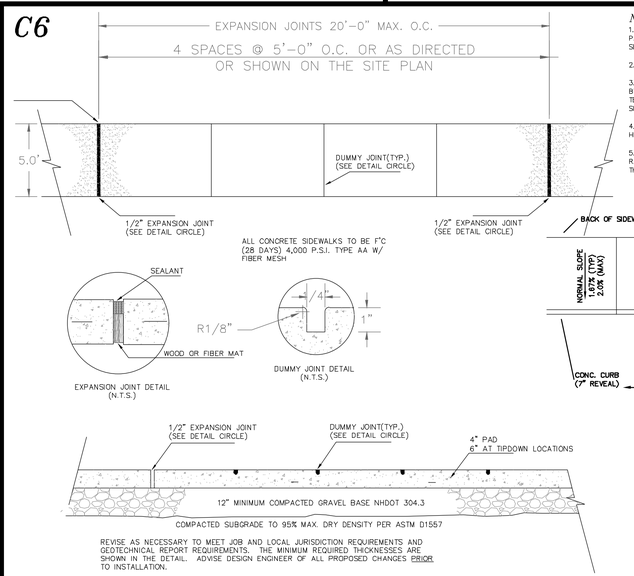
BITUMINOUS CONCRETE CURB
NOT TO SCALE

C5

VERTICAL GRANITE CURB DETAIL
NOT TO SCALE



C6



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

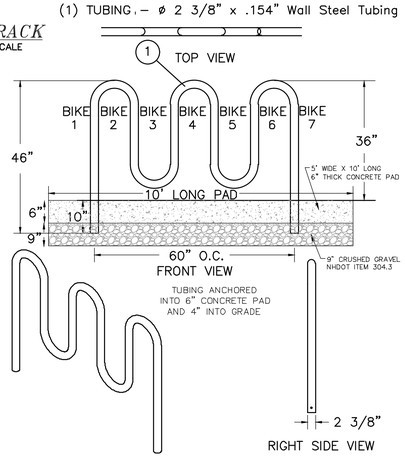
REVISE AS NECESSARY TO MEET JOB AND LOCAL JURISDICTION REQUIREMENTS AND GEOTECHNICAL REPORT REQUIREMENTS. THE MINIMUM REQUIRED THICKNESSES ARE SHOWN IN THE DETAIL. ADVISE DESIGN ENGINEER OF ALL PROPOSED CHANGES PRIOR TO INSTALLATION.

CONCRETE SIDEWALK
NOT TO SCALE

C7

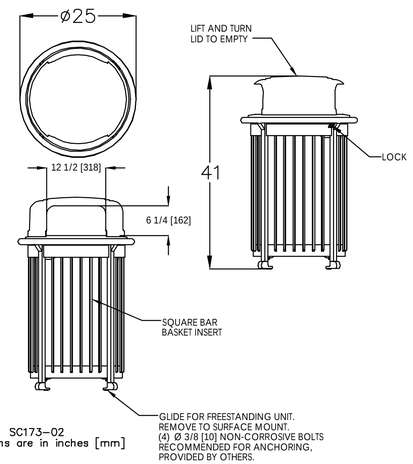
BIKE RACK
NOT TO SCALE

MATERIALS LIST
(1) TUBING, – ø 2 3/8" x .154" Wall Steel Tubing



C8

BIN DETAIL
(NOT TO SCALE)



landscapeforms Drawing: SC173-02
Dimensions are in inches [mm]

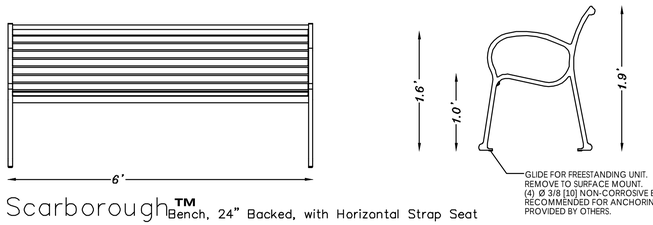
C9

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

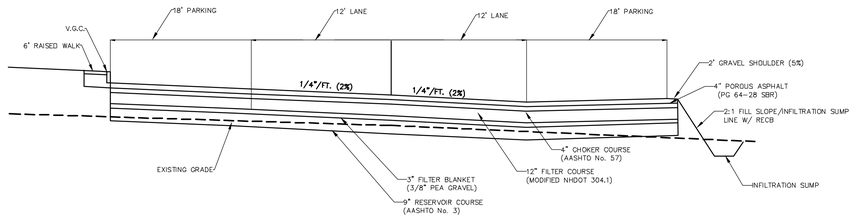
SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

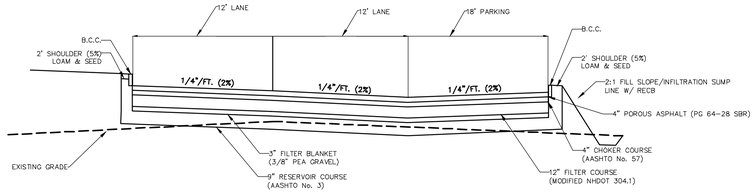
C-101

NOT FOR CONSTRUCTION

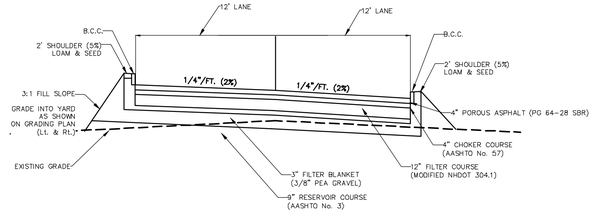
C10



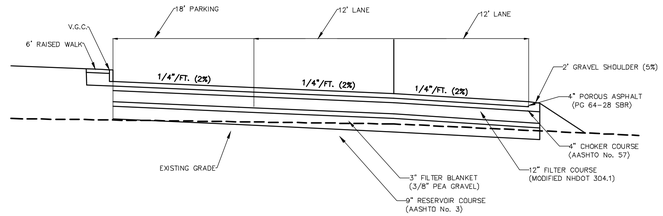
TYPICAL ROADWAY SECTION COPPER DRIVE
1+10–END (POROUS PAVEMENT)
NOT TO SCALE



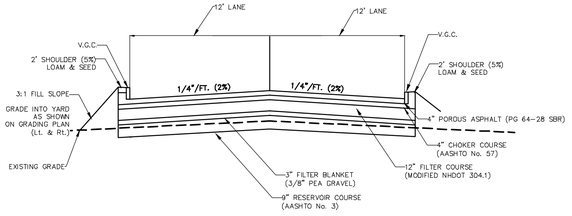
TYPICAL ROADWAY SECTION COPPER DRIVE
0+95–1+10 (POROUS PAVEMENT)
NOT TO SCALE



TYPICAL ROADWAY SECTION COPPER DRIVE
0+62–0+95 (POROUS PAVEMENT)
NOT TO SCALE

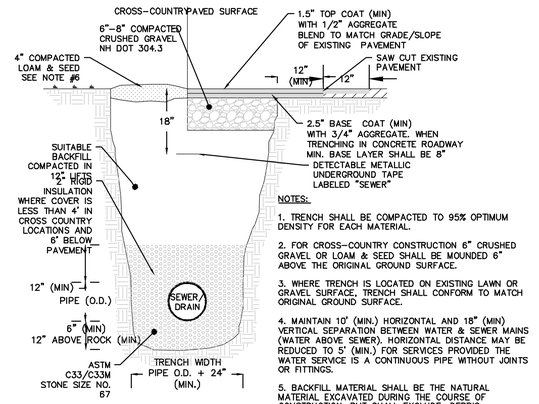


TYPICAL ROADWAY SECTION EMBER DRIVE
0+74–END (POROUS PAVEMENT)
NOT TO SCALE



TYPICAL ROADWAY SECTION EMBER DRIVE
0+00–0+74 (POROUS PAVEMENT)
NOT TO SCALE

C11

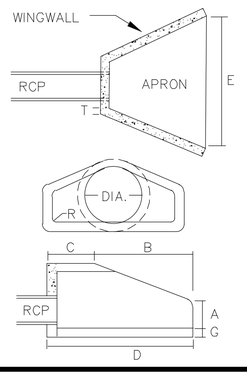


NOTES:

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

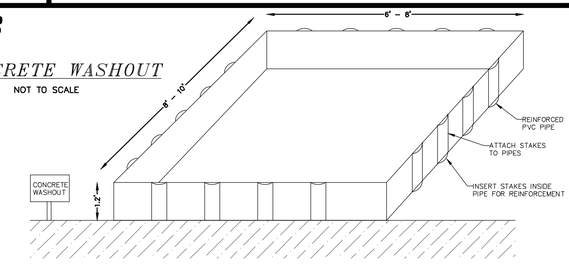
C12



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.

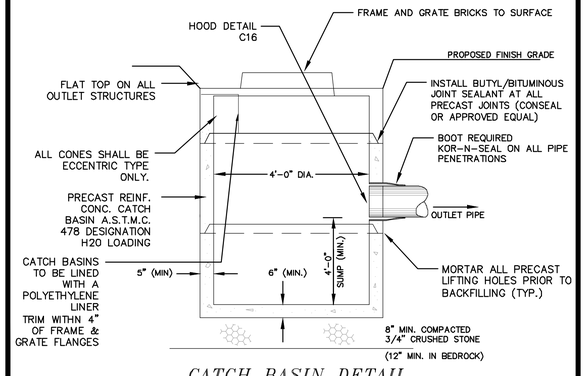
3.) CONTRACTOR IS IRRESPONSIBLE TO MAINTAIN AND REPLACE WASHOUT AREA AS NEEDED.

4.) RESIDUE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

5.) DO NOT WASH CONCRETE TRUCKS OUT INTO DRAINAGE AREAS, SWALES, STREETS OR UNDISTURBED AREAS.

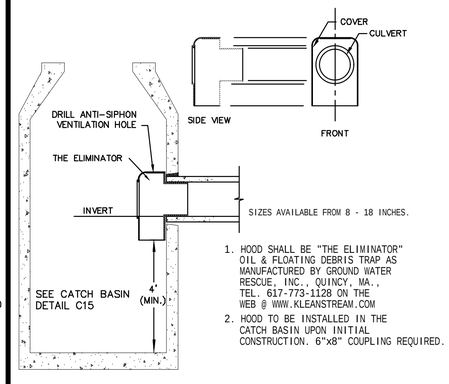
6.) WASHOUT AREA SHALL BE PLACED AWAY FROM DRAINAGE FEATURES AND OUTSIDE AND WETLAND BUFFERS.

C14



CATCH BASIN DETAIL
NOT TO SCALE

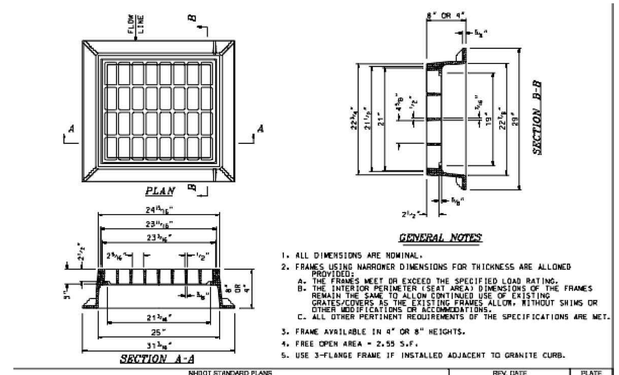
C15



CATCH BASIN HOOD DETAIL
NOT TO SCALE

C16

CATCH BASIN GRATE (TYPE "B")
NOT TO SCALE



GENERAL NOTES:

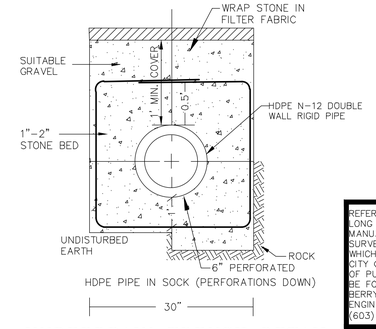
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING 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

DOVER PLANNING FILE #SITE–2023–0007

#	REVISION	DATE	DESCRIPTION
#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

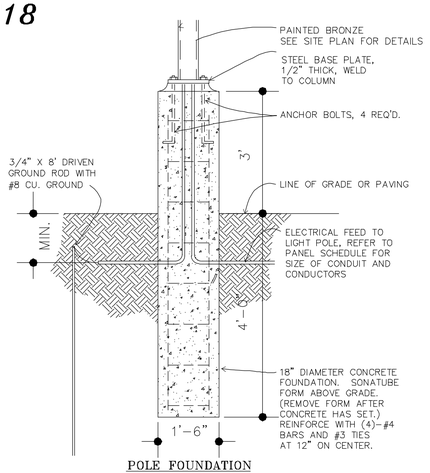
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 – 053

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

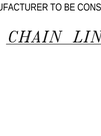
NOT FOR CONSTRUCTION

C18



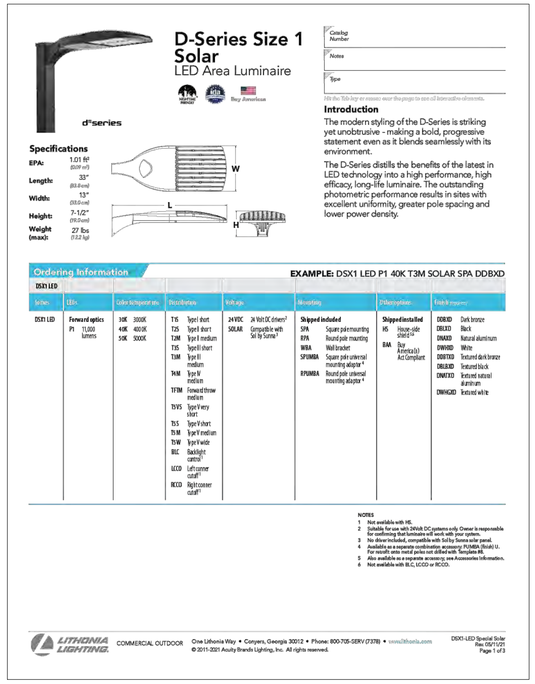
LIGHT BASE DETAIL

NOT TO SCALE



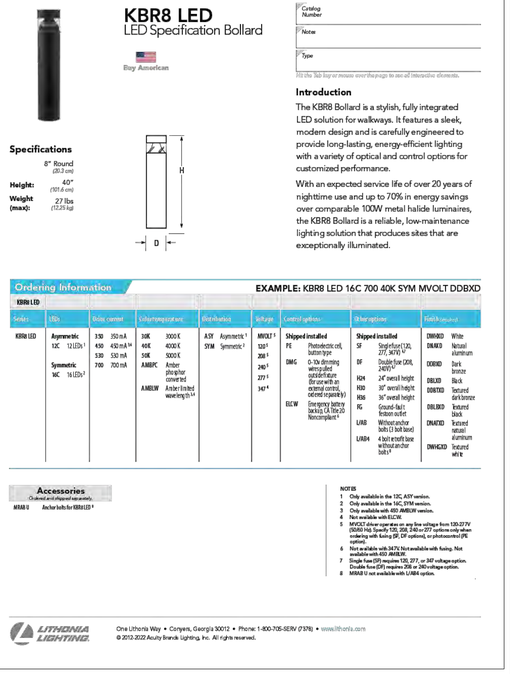
TYPICAL RESIDENTIAL LAMP MOUNTED AT 8' +/- AS SHOWN

NOT TO SCALE



TYPICAL POLE LAMP MOUNTED AT 12' +/- AS SHOWN

NOT TO SCALE



LAMP "C" MOUNTED 5.5'

NOT TO SCALE

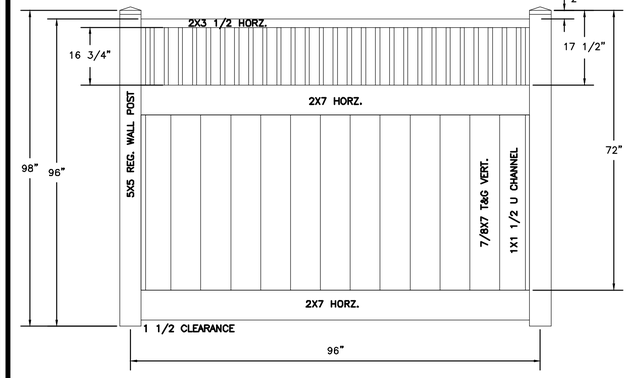
STANDARD 3.5' HEIGHT, 2' PEDISTAL REQUIRED FOR MOUNTING HEIGHT

C19

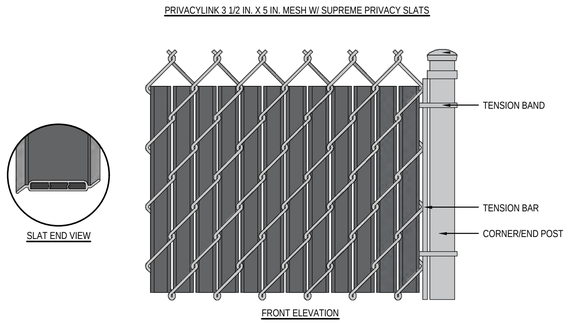
WHITE VINYL FENCE DETAIL

NOT TO SCALE

MONTAUK 72X96



C20

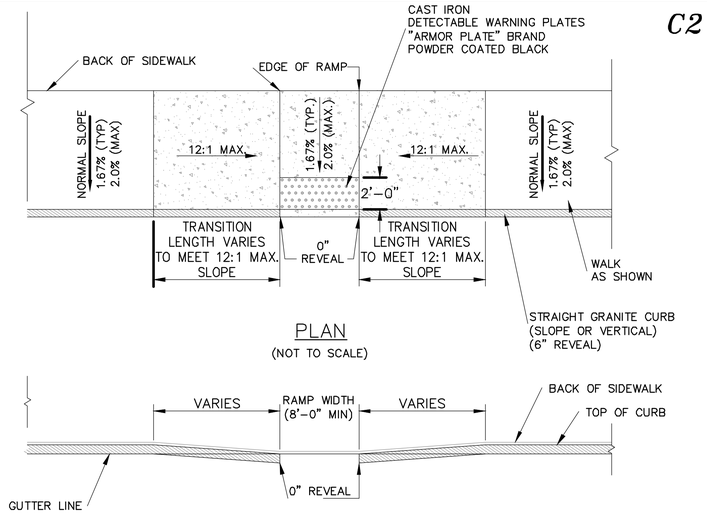


NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWING.
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.

CHAIN LINK FENCE W/ SLATS DETAIL

NOT TO SCALE

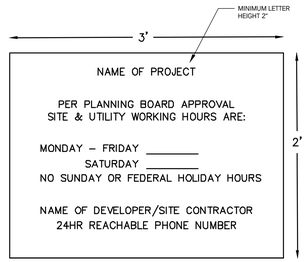
C21



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

#	REVISION	DATE	DESCRIPTION
1		9-25-23	REVISED PER DOVER TRC COMMENT

CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
KNOX MARSH DEVELOPMENT LLC
FOR: 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

SHEET 22 OF 27

NOT FOR CONSTRUCTION

NOTES ON MANHOLE AND SEWER CONSTRUCTION:

1) IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT AND ADEQUATE JOINTING. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND HS-20-44 LOADING, INCLUDING THE COVER. ALL SMH CONSTRUCTION AND MATERIALS WILL BE IAW ENV.-WQ 704.13 ADOPTED OCTOBER 15, 2014

2) BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE. (IAW ENV.-WQ 704.12 (d))

3) SEWER MANHOLE DIAMETER SHALL BE AS INDICATED ON THE PLANS.

4) PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.

5) GRAVITY SEWER PIPE TESTING WILL BE IN ACCORDANCE WITH ENV.-WQ 704.06 AND MAN HOLE TESTING IAW ENV.-WQ 704.17 DATED OCTOBER 15, 2014.

6) INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. INVERT BRICKS SHALL BE LAID ON EDGE AND THE BASE SECTION SHALL BE FULL. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. (IAW ENV.-WQ 704.13 (a) (9)), MORTAR SHALL CONFORM WITH REQUIREMENTS OF IAW ENV.-WQ 704.13 (c).

   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 6 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.

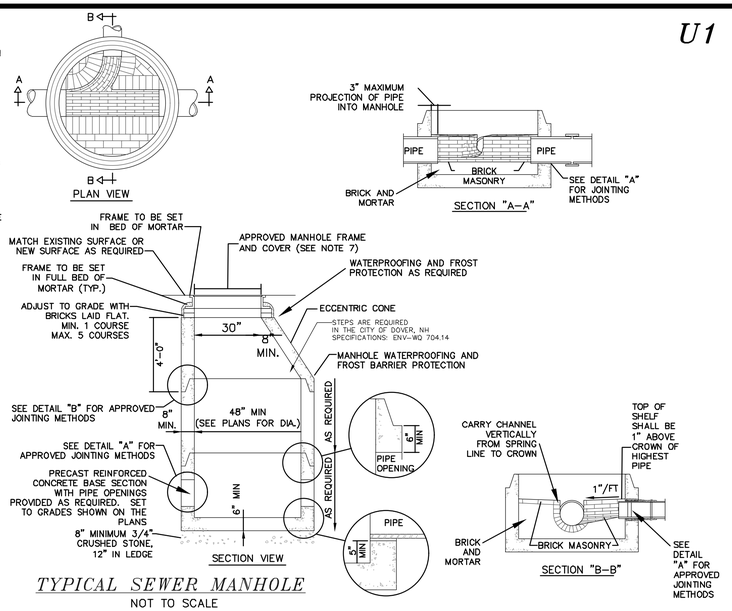
12.) THE CONTRACTOR TO WORK WITH CITY OF DOVER REVIEW ENGINEER AND SEWER DEPARTMENT ON THE MEANS AND METHODS USED TO INSTALL ALL SEWER STRUCTURES.

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.

U1



TYPICAL SEWER MANHOLE
NOT TO SCALE

U2

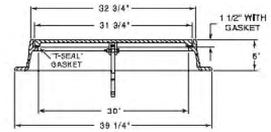
R-1743-LM
LiftMate Frame, Solid Gasketed Lid

Heavy Duty

Furnished with four 1" anchor holes on 36-7/8" diameter bolt circle.

Hinge plug available for self-seal application.

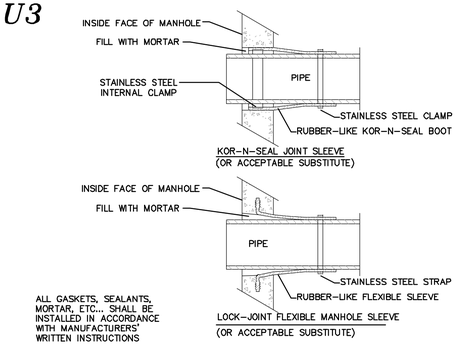
See p. 13 for LiftMate information.



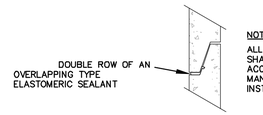
SEWER MANHOLE FRAME AND GRATE WILL BE LIFTMATE R-1743-LM, OR APPROVED EQUAL, 32 INCH OPENING, CAST IRON, H20 LOADING.

SEWER MANHOLE COVER DETAIL
NOT TO SCALE

U3



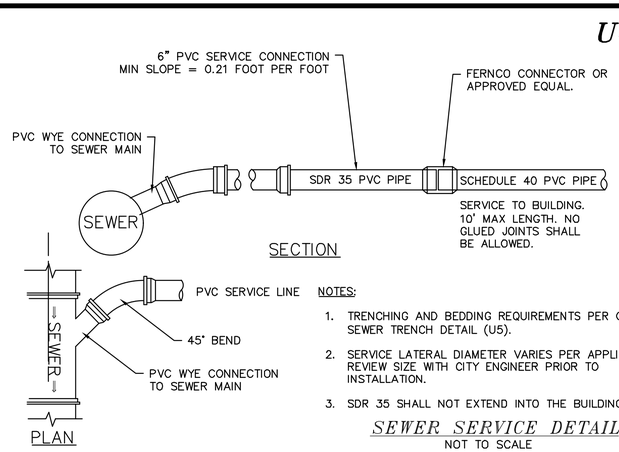
DETAIL "A" - PIPE TO MANHOLE JOINTS
NOT TO SCALE



NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

DETAIL "B" HORIZONTAL JOINTS
NOT TO SCALE

U4

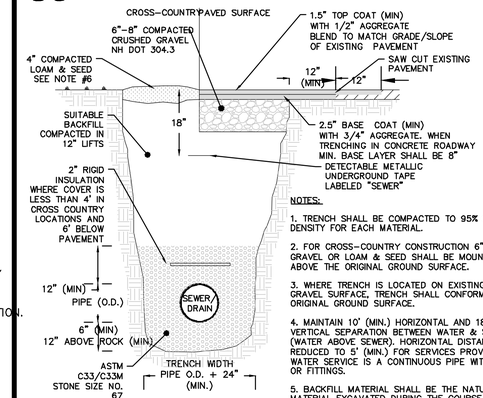


NOTES:

1. TRENCHING AND BEDDING REQUIREMENTS PER CITY SEWER TRENCH DETAIL (U5).
2. SERVICE LATERAL DIAMETER VARIES PER APPLICATION. REVIEW SIZE WITH CITY ENGINEER PRIOR TO INSTALLATION.
3. SDR 35 SHALL NOT EXTEND INTO THE BUILDING

SEWER SERVICE DETAIL
NOT TO SCALE

U5

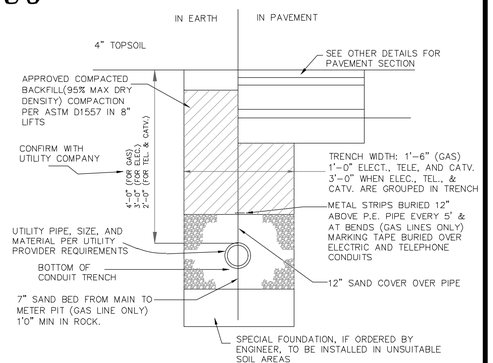


NOTES:

1. TRENCH SHALL BE COMPACTED TO 95% OPTIMUM DENSITY FOR EACH MATERIAL.
2. FOR CROSS-COUNTRY CONSTRUCTION 6" CRUSHED GRAVEL OR LOAM & SEED SHALL BE MOUNDED 6" ABOVE THE ORIGINAL GROUND SURFACE.
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.
4. MAINTAIN 10' (MIN.) HORIZONTAL AND 18" (MIN) VERTICAL SEPARATION BETWEEN WATER & SEWER MAINS (WATER ABOVE SEWER). HORIZONTAL DISTANCE MAY BE REDUCED TO 5' (MIN.) FOR SERVICES PROVIDED THE WATER SERVICE IS A CONTINUOUS PIPE WITHOUT JOINTS OR FITTINGS.
5. BACKFILL MATERIAL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE; DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, MUCK, PEAT AND ROCKS OVER 6" IN LARGEST DIMENSION
6. LOAM AND SEED SHOULD BE IN COMPLIANCE WITH NH DOT 641, 642, 643, 644 AND 645.

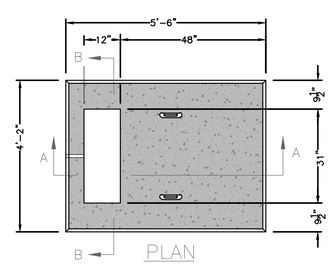
TYPICAL SEWER PIPE TRENCH
NOT TO SCALE

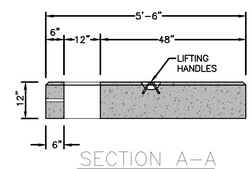
U6

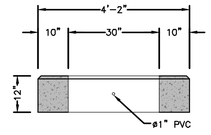


ELECTRICAL, TELEPHONE, AND GAS TRENCH
NOT TO SCALE

U7



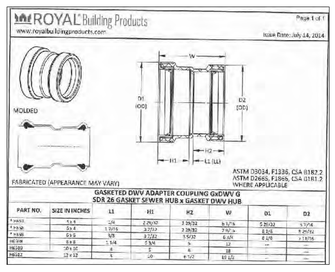




NOTES:
1. CONCRETE MINIMUM STRENGTH 4,000 PSI AFTER 28 DAYS
2. REINFORCEMENT STEEL CONFORMS TO ASTM A615 GRADE 60 #6 REBAR.
3. MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS.
4. MUST BE A SHEA CONCRETE PRODUCT OR EQUAL.

TRANSFORMER AND PAD DETAIL
NOT TO SCALE

U8



PART NO.	SIZE IN INCHES	L1	H1	W2	W	D1	D2
* 4350	4 x 4	4	2.75/10	3.19/76	5.47/4	5.39/137	5.12/4
* 4360	6 x 4	1 13/16	3.27/3	3.38/80	7.36/4	8.0/5	8.49/216
* 4380	8 x 6	5/8	3.72/82	5.9/150	9.65	9.29	11.61/16
43100	10 x 8	1 1/4	5.3/6	7/-	12	—	—
43120	12 x 10	4	5	8	14	—	—
43140	14 x 12	5	6	9.5/21	16 1/2	—	—

COUPLING DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION

DOVER PLANNING FILE #SITE-2023-0007

#	REVISION	DATE	DESCRIPTION
#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

U-101

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.

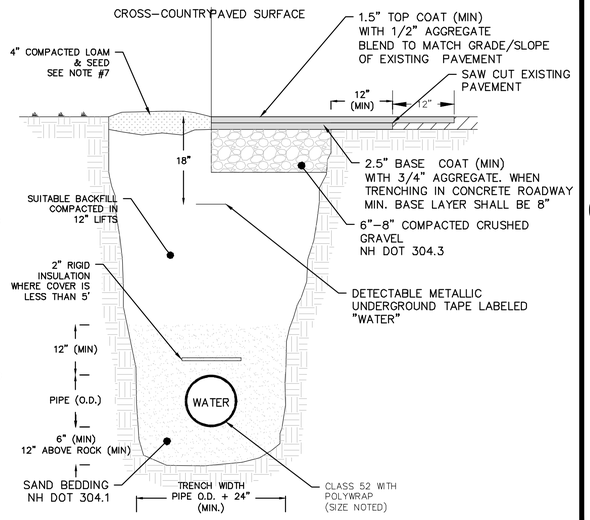
3. WHERE TRENCH IS LOCATED ON EXISTING LAWN OR GRAVEL SURFACE, TRENCH SHALL CONFORM TO MATCH ORIGINAL GROUND SURFACE.

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

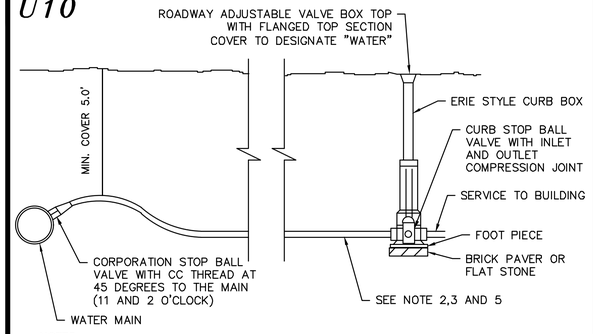
6. PROVIDE MINIMUM 5' OF COVER. ENGINEERING APPROVAL REQUIRED FOR LESS THAN 5' OF COVER.

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.

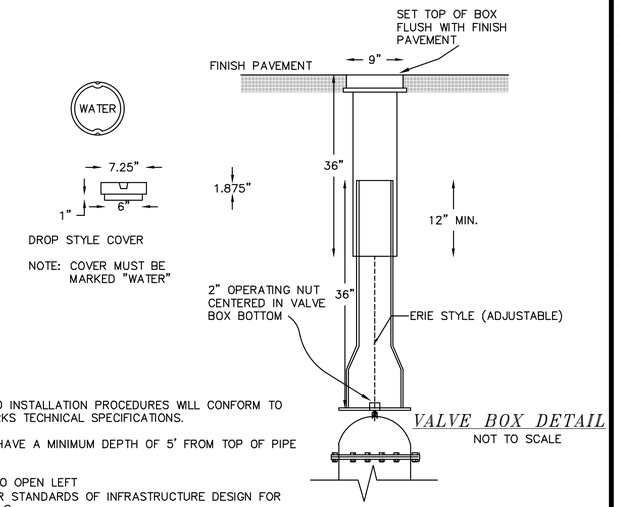
3. SERVICE BETWEEN CURB STOP AND BUILDING MAY BE (BLUE OR BLACK) CTS SDR 9 PLASTIC POLYETHYLENE RATED FOR 250 psi.

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.

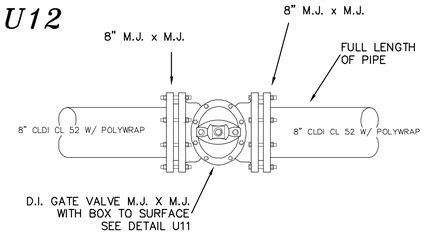
2.) ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

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

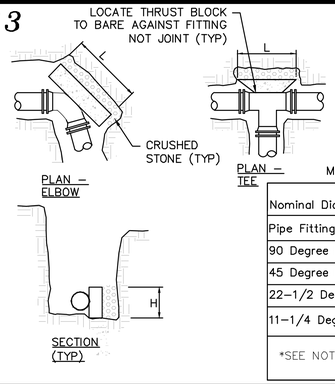
U12



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.

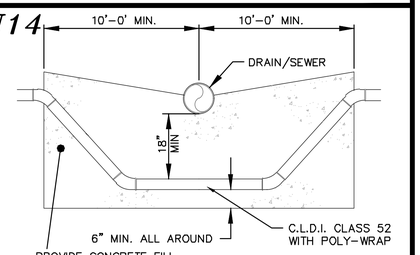
6. PLACE THRUST BLOCK ALONG MAXIMUM LENGTH OF THE FITTING TO MAXIMIZE BEARING AREA.

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

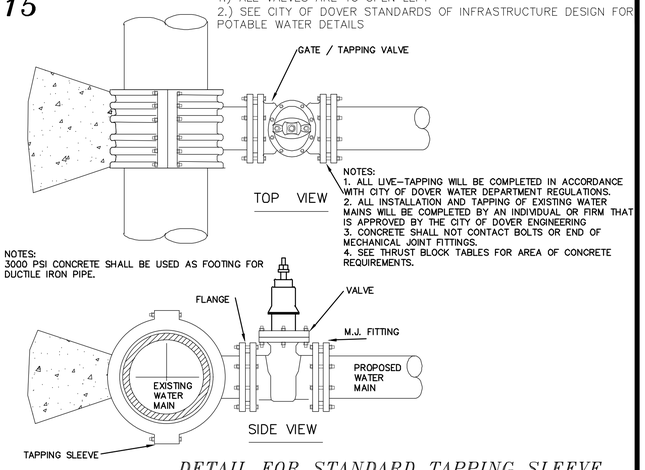


1.) SEE CITY OF DOVER STANDARDS OF INFRASTRUCTURE DESIGN FOR POTABLE WATER DETAILS

WATER MAIN INSTALLATION - BELOW DRAIN & SEWER
NOT TO SCALE

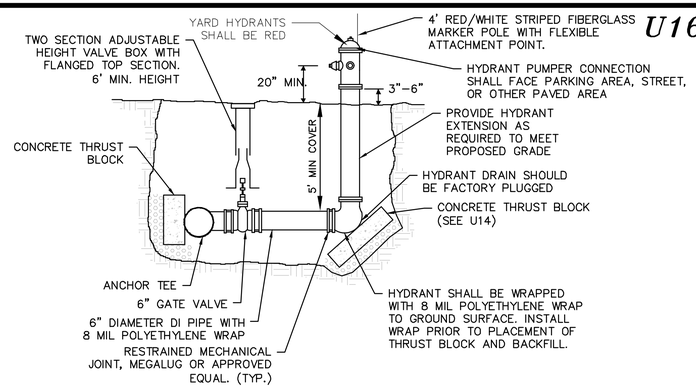
U15

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:

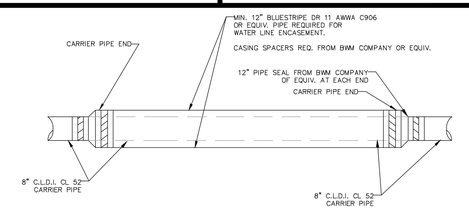
1. FIRE HYDRANTS SHALL BE FACTORY SEALED EDDY STYLE 2641.

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

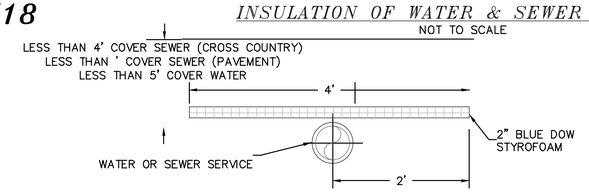
U17



WATERLINE SLEEVE DETAIL
NOT TO SCALE

U18

INSULATION OF WATER & SEWER SERVICES
NOT TO SCALE



U-102

DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#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

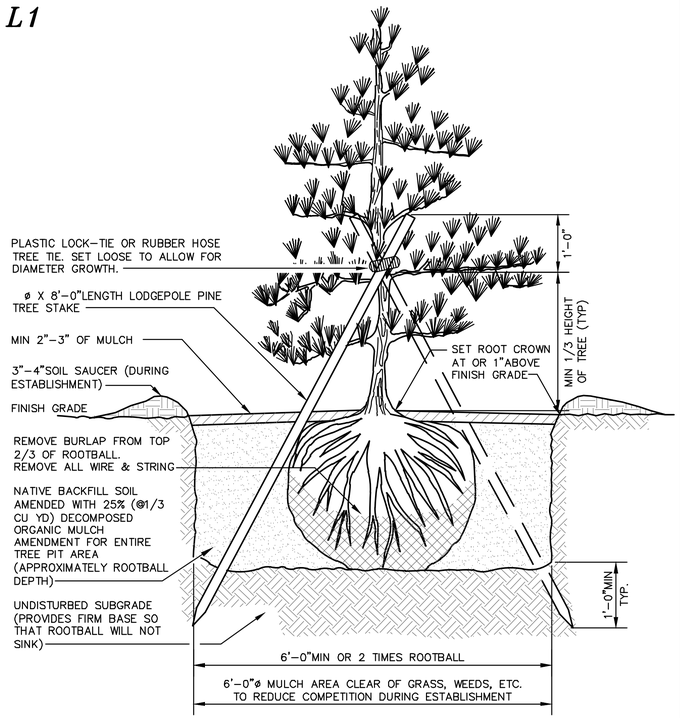
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : AS SHOWN
DATE : JULY 6, 2023
FILE NO. : DB 2023 - 053

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

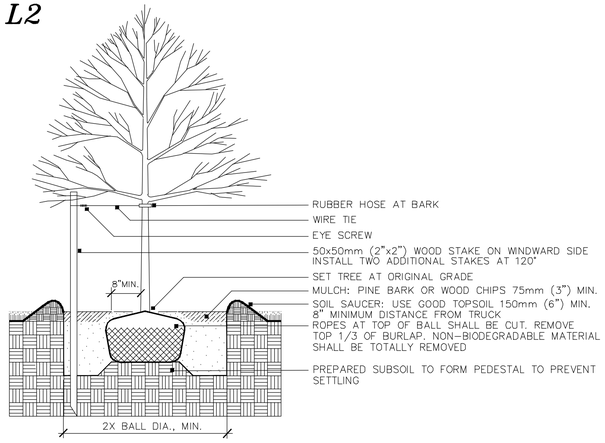
NOT FOR CONSTRUCTION

L1



CONIFEROUS TREE PLANTING

L2



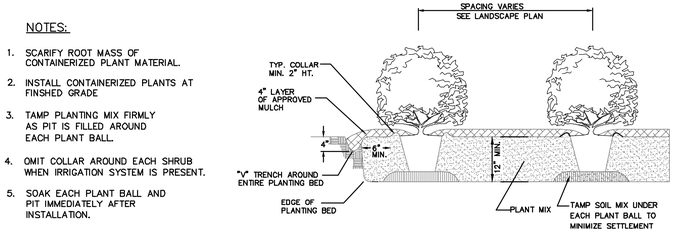
DECIDUOUS TREE PLANTING

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

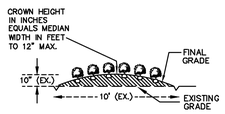
L3

NOTES:

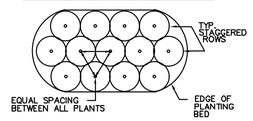
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL



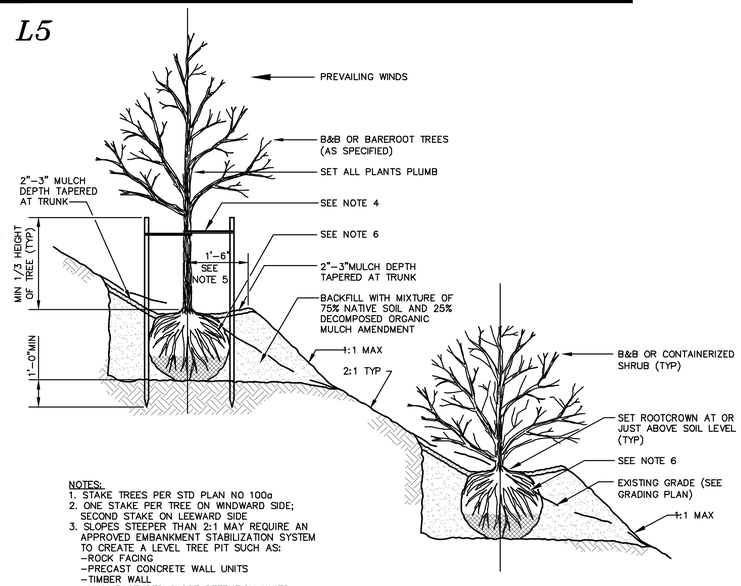
TYPICAL BED CROWNING



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 MOWNG 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 GROWNG 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.)

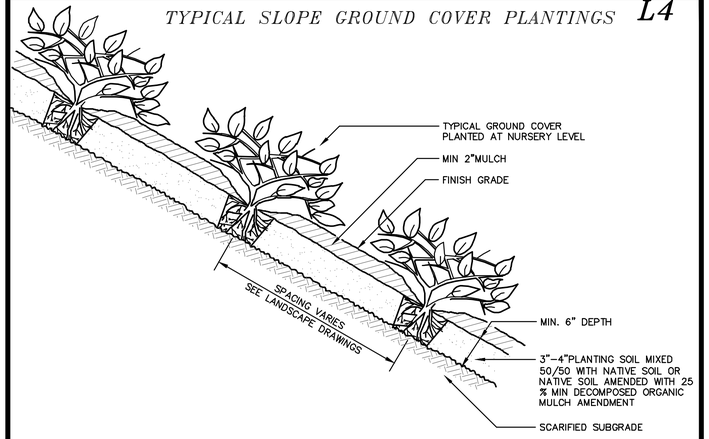
21.) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY–PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUND COVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.

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.

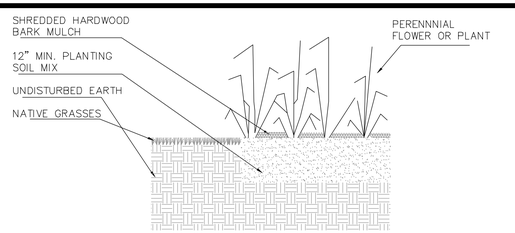
23.) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.

L4

TYPICAL SLOPE GROUND COVER PLANTINGS

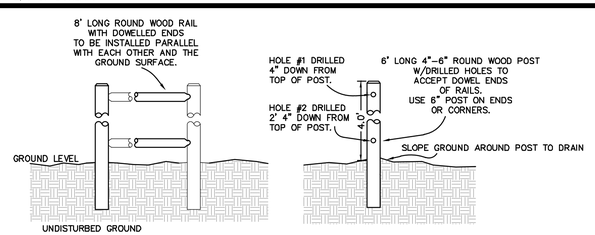


L8



PERENNIAL PLANTING DETAIL

L7



TYPICAL POST & RAIL FENCE DETAIL

N.T.S.

L–101

DOVER PLANNING FILE #SITE–2023–0007

REVISION	DATE	DESCRIPTION
#1	9–25–23	REVISED PER DOVER TRC COMMENT

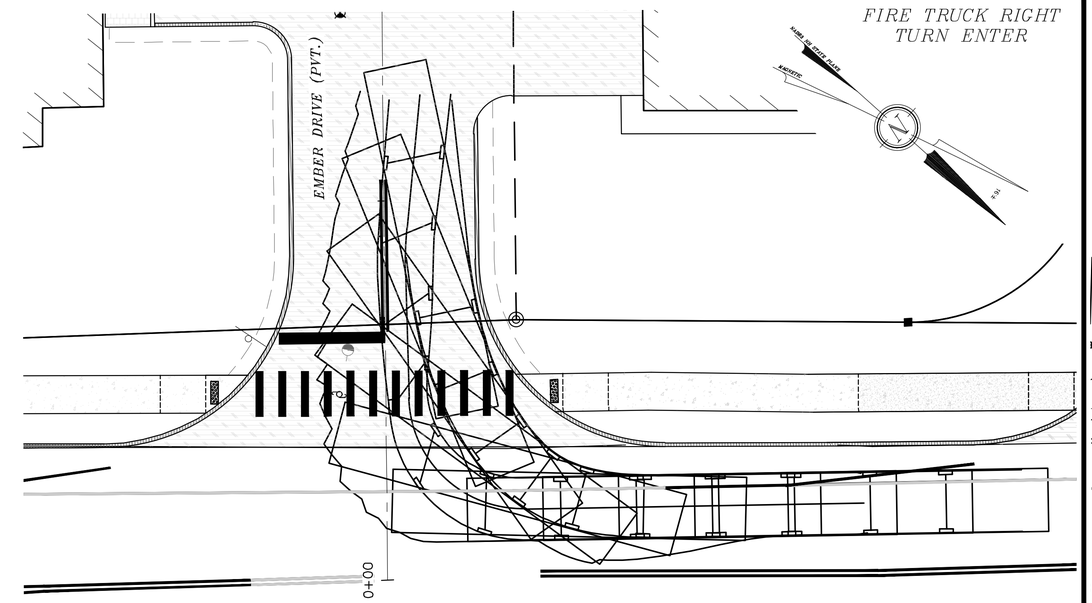
LANDSCAPING CONSTRUCTION DETAILS
LAND OF: ROBERT BALDWIN
FOR: KNOX MARSH DEVELOPMENT LLC
34 NEW ROCHESTER ROAD
DOVER, N.H.
TAX MAP 39, LOT 103

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. 14243 LICENSED PROFESSIONAL ENGINEER

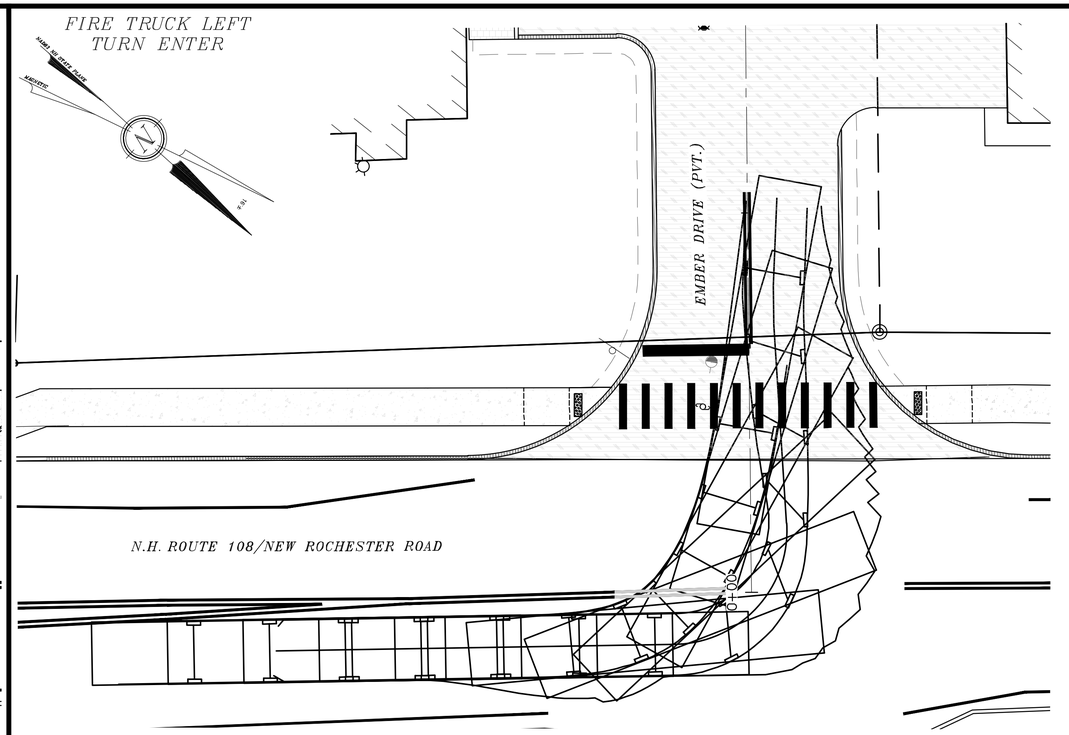
NOT FOR CONSTRUCTION

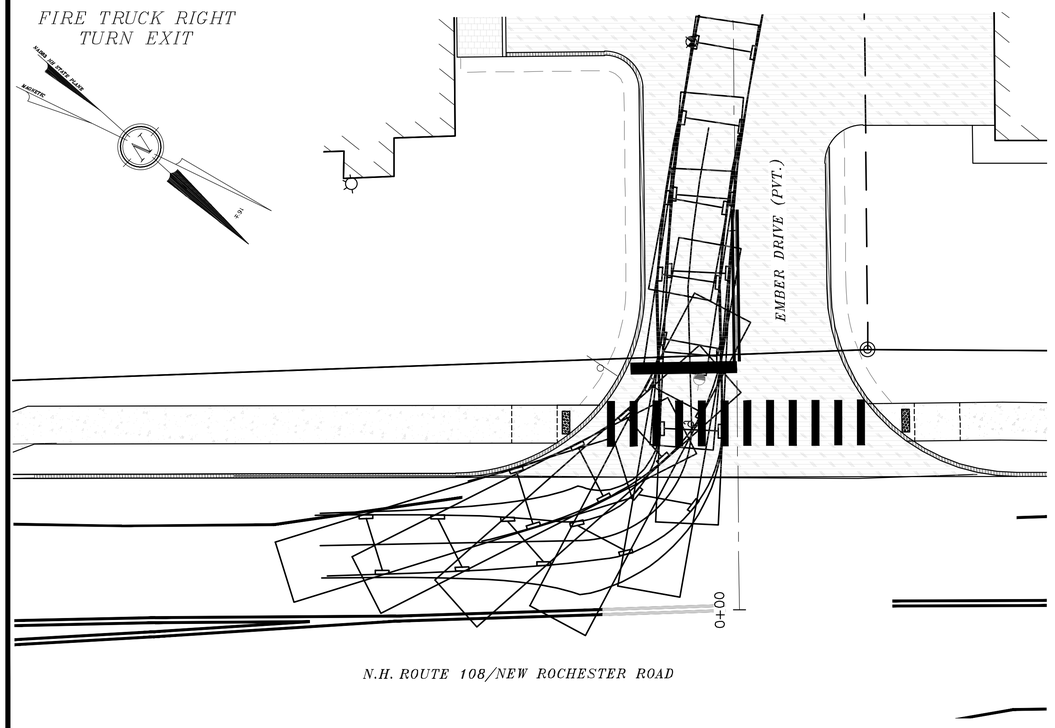


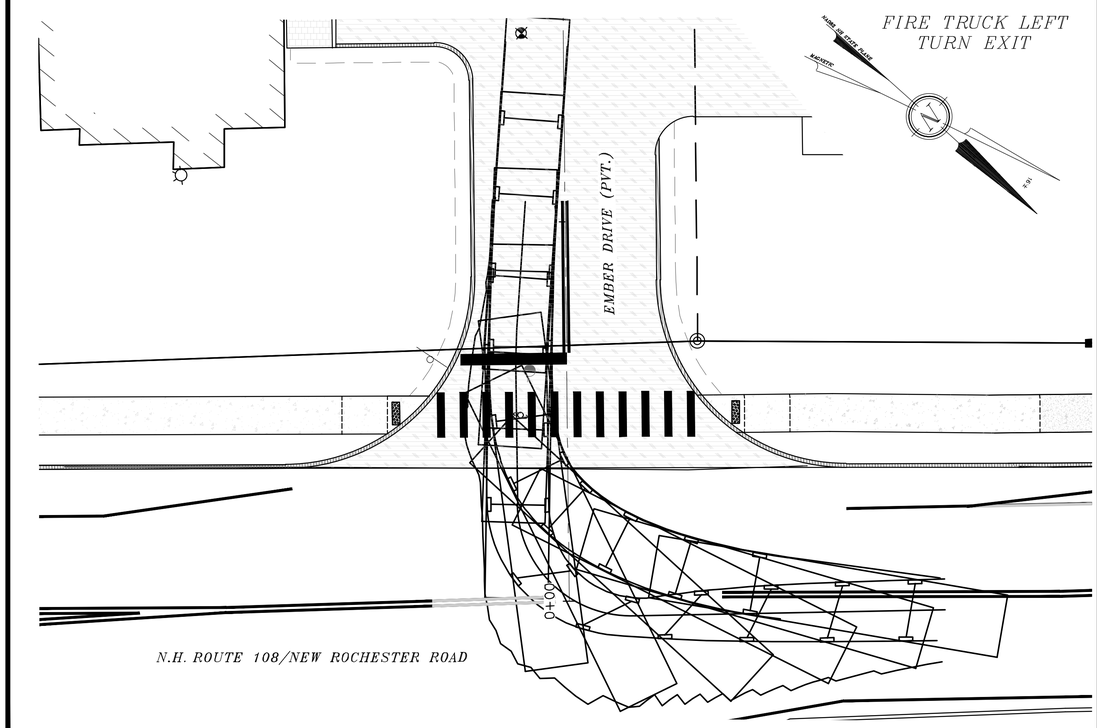
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.







DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#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

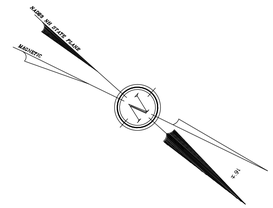
SHEET 26 OF 27

NOT FOR CONSTRUCTION

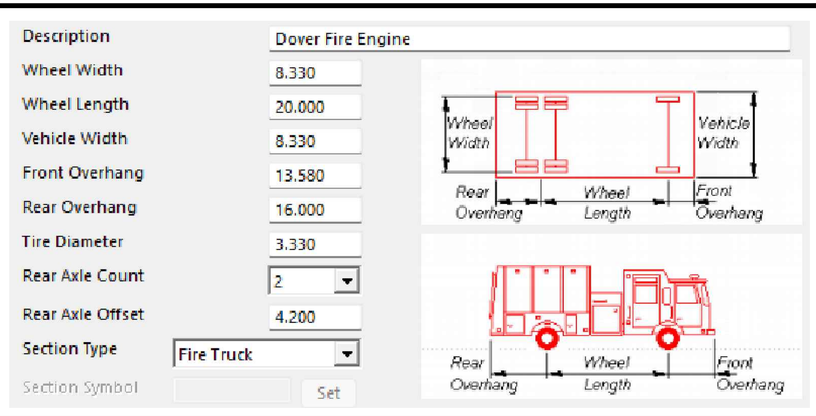
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



FIRE TRUCK HAMMERHEAD



DOVER PLANNING FILE #SITE-2023-0007

REVISION	DATE	DESCRIPTION
#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

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

NOT FOR CONSTRUCTION

PLAN SNAPSHOT REPORT SITE-2023-0014
FOR CITY OF DOVER, N.H.

Plan Type:	Site Plan - Major	**Project:**		**App Date:**	09/14/2023
Work Class:	Alteration / Addition	**District:**	None	**Exp Date:**	11/18/2023
Status:	On Hold	**Square Feet:**	0.00	**Completed:**	NOT COMPLETED
Valuation:	$0.00	**Assigned To:**	Blonigen, Rachel	**Approval Expire Date:**	

Description: Convert 2nd fl commercial space into two residential units and one remaining smaller commercial space

Parcel:	02019-000000	Main	**Address:**	333 Central Av Dover, NH	Main

Zone: CBD-G(Central Business District - Genera

Applicant
Janice Bell
5 Railroad Street
Newmarket, NH 03857
Home: (603) 200-4015
Business: (603) 659-4979
Mobile: (603) 892-5973

Engineer
Michael Sievert
Business: (603) 659-4979
Mobile: (603) 828-6655

Plan Custom Fields

Total	0	Total2	0	Total3	0
Total4	0	Total5	0	Total6	2
Total7	0	Total8	0	Total9	0
Street Classification Type	Municipal	Net Change in # Parking Spaces (+/-)	0	Water Service	Municipal
Recording Number		Sewer Service	Municipal	Total Acres (GIS)	1.03
Deed Book	4523	Total SQFT	44866.8	Deed Page	235
Deed Date		Proposed Property Use	Convert 2nd fl commercial unit #3 into two residential units and one remaining smaller commercial space	Area of Parcel to be Developed (SQFT)	3155
Number of Parking Spaces Existing	56	Number of Parking Spaces Proposed	56	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	Conversion of existing space	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		

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Janice_Bell_9/14/2023.jpg	09/14/2023 14:35	Bell, Janice		Uploaded via CSS

Note	Created By	Date and Time Created

PLAN SNAPSHOT REPORT (SITE-2023-0014)

1.	Per conversation with DB on Site Amendment on hold. Applicant put in contact Business Develpoment for Commercial users. RLB	Rachel Blonigen	09/25/2023 10:20

Invoice No.	Fee		Fee Amount	Amount Paid
INV-00005094	Planning General Application Fee		$200.00	$200.00
		Total for Invoice INV-00005094	$200.00	$200.00
INV-00005120	Planning Residential Fee		$200.00	$200.00
		Total for Invoice INV-00005120	$200.00	$200.00
		Grand Total for Plan	**$400.00**	**$400.00**

Meeting Type	Location	Scheduled Date	Subject
Technical Review Committee Meeting v.1	City Hall, Second Floor Conference Room	10/12/2023	Technical Review Committee Meeting

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Land Use Plan Technical Review v.1	In Review	10/04/2023	11/01/2023		No	No

Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Business Development	Business Development	Parker, Christopher	In Review	10/04/2023	11/01/2023	
City Engineer	Community Services - Engineering	Mavrogeorge, Kenneth	In Review	10/04/2023	11/01/2023	
IS Building Official	Fire / Inspection Services	Maxfield, Jim	In Review	10/04/2023	11/01/2023	
Planning	Planning	Benton, Donna	In Review	10/04/2023	11/01/2023	
Zoning Administrator	Planning	Kypfer, Natasha	In Review	10/04/2023	11/01/2023	
Traffic Bureau	Police	Speidel, Marn	In Review	10/04/2023	11/01/2023	

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		09/15/2023 11:58	
Confirm application complete v.1	Generic Action		09/15/2023 11:58
Technical Review Committee Meeting Agenda v.1	Task	09/15/2023 11:58	10/04/2023 11:41
Land Use Plan Technical Review v.1	Receive Submittal	10/04/2023 0:00	
Technical Review Committee Meeting v.1	Hold Meeting	10/04/2023 11:41	
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, New Hampshire
SITE REVIEW APPLICATION

[Revision Date: July 1, 2021]

Office Use Only	Project #:	SITE-2023-0014	Date Received:	
	Amount Paid:		Time Received:	

APPLICANT AND OWNER INFORMATION

Name of Applicant: Hellenic Realty Partners, LLC Telephone #_603-652-1104

Address of Applicant: 263 Central Ave. Dover, NH 03821

E-Mail Address: nick@kostisenterprises.com

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

Address of Property Owner:

PROPERTY INFORMATION

Address of Property: 333 Central Avenue

Assessor's Map # 2 / Lot(s) # 19

Zoning District(s) CBD Overlay District(s)

Size of Parcel: 45,021 sq. ft. 1.03 ac. Property' Deed: Book 4523 Page: 235

Existing Use of Property: Commercial

SITE PLAN INFORMATION

Describe Proposed Lise: Convert 2nd floor commercial space into two residential units and one remaining smaller commercial space.

Area of Parcel to be Developed: There is no change to the site. sq. ft.

If Multi-family Residential: Number of Units 2 & Buildings Proposed 0

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

Number of Parking Spaces: Existing Proposed 56 residential=45 onsite/14 offsite

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

Number of Employees Total: n/a In Maximum Shift:

Disposition of Parcel:

Building Footprint 20,300 sq. ft.

Total Building Area 95,900 sq. ft.

Paved Area 12,000 sq. ft.

Building Setbacks:

Front Yard 0 ft.

Rear Yard 10 ft.

Side Yard: Right_724 ft. Left 0 ft.

City Water? _X_Yes ___ No How far is city water from the property? __onsite_____

City Sewer? _X_Yes ___ No How far is city sewer from the property? __onsite_____

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: _____

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.) _Norway Plains Associates (Randy Tetreault)____

Address _2 Continental Blvd, P.O.Box 249 Rochester, NH 03866_____Telephone #: 603-335-3948

Professional License #: ___729_____ E-mail address: _rtetreault@norwayplains.com___

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) _Horizons Engineering, Inc._(Michael Sievert)___

Address __5 Railroad Street Newmarket, NH 03857_____Telephone #: 603-659-4979

Professional License #: ___8397_____ E-mail address: _msievert@horizonsengineering.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: 9/8/23

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

Signature of Agent: _____ Date: 9/11/23

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: 9/8/23

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: 9/8/23

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: 9/8/23

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
2	19	Hellenic Realty Partners, LLC	263 Central Ave, Dover, NH 03821

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
same		

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Randy Tetreault	Norway Plains Assoc.	P.O. Box 249 Rochester, NH 03866
Michael Sievert	Horizons Engineering, Inc.	5 Railroad St. Newmarket, NH 03857

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

City of Dover, New Hampshire
SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

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

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

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

The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan Review Regulations for full details.

APPLICANT: Hellenic Realty Partners, LLC File Number: _____

PROJECT TITLE: Foster's Apartments

PROPERTY LOCATION: 333 Central Avenue Tax Map: 2 Lot: 19

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

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

REVIEWED BY: _____ DATE_____ TRC DATE_____

5 Railroad Street, Newmarket, NH 03857 • Ph 603-659-4979 • Fax 603-659-4627 • www.horizonsengineering.com

Letter of Intent – Site Plan Review Application
For
Hellenic Realty Partners, LLC
Mixed Use Development
Tax Map 2 Lot 19

September 8, 2023

The Subject Property

The subject parcel is located within the General sub district of the Central Business District (CBD). The 1.05 acre parcel is bordered on the north and west by Central Avenue, Williams Street to the south and Henry Law Avenue to the east. The property is serviced by municipal water, sewer and a closed drainage system. Overhead utilities are also currently provided to the site from along Henry Law Avenue and a transformer located at the corner of Henry Law Avenue and Williams Street. Natural gas is provided through the rear parking lot off Henry Law Avenue.

The parcel has been renovated and expanded to include the development of 33 residential units and four commercial units. Commercial unit 1 is on the ground floor accessed from Henry Law Ave., commercial units 2&3 are on the second floor and accessed from the plaza on Central Ave. and commercial unit 4 is on the third floor accessed southerly on Central Ave. The remaining disposition of the ground floor is covered parking, mechanical and storage and the residential units are throughout the 2-4 floors.

Prior to the development by Hellenic Realty Partners the property was all commercial use dating to c. 1900. The building, known as the Foster's Building, previously was the corporate office and production facility for the Foster's Daily Democrat newspaper.

Hellenic Realty Partners, LLC Amended Development Proposal

The proposal by Hellenic is to convert a portion of commercial unit #3 to residential space. Commercial space 3 totals 5,030 sf, is on the second floor and access is via the plaza on Central Ave. The specific change is to convert 3,155 sf into two residential units and retain the

remaining 1,875 sf for commercial space. The plans accompanying this application show the overall location relative to the site layout and schematic building plans show the specific changes to the interior space. There is no change to the site with this proposal. The only changes are the reconfiguration of the interior space and installation of windows on the exterior of the building facing the parking lot. The alarm system and the sprinkler system will be updated for the interior changes. The building access and parking meet the ADA requirements and access to the new space(s) will also meet the same requirements. The site plan has been updated to reflect the change in area for commercial and residential space and the parking requirements have been updated to reflect these changes. In addition, the calculation of the number of bike racks has been updated and the general notes have been updated on the site plan for this proposal. There are adequate bike racks provided on the site in the covered parking garage.

As previously discussed, Horizons Engineering on behalf of Hellenic Realty Partners is requesting a meeting with the Technical Review Committee only, since there are no changes proposed to the site plan.

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

Michael J. Sievert PE
VP President Structural

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS AND TO CONVERT 5,030 SF OF EXISTING UNDEVELOPED COMMERCIAL SPACE ON THE SECOND FLOOR TO 3,155 SF OF RESIDENTIAL SPACE ADDING TWO UNITS AND RETAINING 1,875 SF OF COMMERCIAL SPACE.

2. SUBJECT PARCEL: (TAX MAP 2, LOT 19)
333 CENTRAL AVENUE
DOVER, NH 03821

3. TOTAL PARCEL AREA OF LOT: 1.03 ACRES OR 45,021 SQUARE FEET.

4. OWNER OF RECORD: HELLENIC REALTY PARTNERS, LLC
263 CENTRAL AVENUE
DOVER, NH 03821
S.C.R.D. BOOK 4523, PAGE 235

5. PLAN REFERENCE:
   1. "PLAN OF LAND 333 CENTRAL AVENUE DOVER, STRAFFORD COUNTY, NH", FOR HELLENIC REALTY PARTNERS, LLC BY NORWAY PLAINS ASSOCIATES, INC. DATED JANUARY 2018.

6. ZONE: CBD GENERAL SUB-DISTRICT
DIMENSIONAL REQUIREMENTS:

		PROVIDED
MIN. LOT AREA	NA	45,021 S.F.
MIN. LOT COVERAGE	75%	84%
MIN. FRONTAGE BUILD-OUT	70%	47% (EXISTING)
FRONT PRIMARY BUILD TO LINE	*SEE BELOW	EXISTING COND.
FRONT SECONDARY BUILD TO LINE	*SEE BELOW	EXISTING COND.
SIDE SETBACK	0' MIN – 24' MAX	EXISTING COND.
REAR SETBACK	10' MIN.	57'
BUILDING HEIGHT	2 STORY MIN./5 STORY MAX.	4 STORIES

*THE PROPERTY OWNER SHALL CALCULATE THE AVERAGE FRONT SETBACKS OF ALL LOTS WITHIN THE SAME ZONE LOCATED ON THE SAME SIDE OF THE STREET, TWO HUNDRED FIFTY (250) FEET IN EACH DIRECTION FROM THE CENTER OF THE FRONT LOT LINE. THIS FRONT SETBACK DIMENSION SHALL BE CONSIDERED TO BE A BUILD TO LINE. STRUCTURES MAY BE CONSTRUCTED WITHIN FIVE (5) FEET PLUS OR MINUS OF THE AVERAGE. PORCHES OR STEPS MAY BE LOCATED AN ADDITIONAL FIVE (5) FEET BEYOND THE FRONT FAÇADE OF THE STRUCTURE. EXPANSIONS TO EXISTING STRUCTURES SHALL BE SUBJECT TO A MINIMUM SETBACK EQUAL TO THE CALCULATED AVERAGE SETBACK MINUS FIVE (5) FEET. CONDITIONAL USE PERMIT MAY BE USED TO ADJUST STANDARDS.

7. PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM "PLAN OF LAND 333 CENTRAL AVENUE DOVER, STRAFFORD COUNTY, NH". FOR HELLENIC REALTY PARTNERS, LLC BY NORWAY PLAINS ASSOCIATES, INC. DATED JANUARY 2018.

8. HORIZONTAL DATUM BASED ON STATE PLANE COORDINATES NAD83. VERTICAL DATUM BASED ON NAVD88.

9. A PORTION OF THE LOT IS LOCATED WITHIN THE 100 YEAR FLOOD ZONE AE AS SHOWN ON THE FLOOD INSURANCE RATE MAP DATED 9/30/15 COMMUNITY PANEL 33017C0330E PANEL 330 OF 405.

10. THERE WILL BE NO AS-BUILT PLAN SINCE NO CHANGES TO THE SITE ARE PROPOSED.

11. EXTERIOR LIGHTING WILL NOT CHANGE WITH THIS PROPOSAL.

12. THE MAXIMUM PARKING SPACE CALCULATION IS 58 FOR THE RESIDENTIAL UNITS ONLY AND 45 SPACES ARE PROVIDED ONSITE AND 14 ADDITIONAL SPACES ARE PROVIDED OFFSITE.

13. A SECURITY SYSTEM HAS BEEN INSTALLED THAT MEETS CHAPTER 58, ARTICLE I, SECTION 58-2 OF THE CODE OF THE CITY OF DOVER.

14. UNDERGROUND UTILITIES CURRENTLY SERVE THE SITE AND WILL NOT CHANGE WITH THIS PROPOSAL.

15. THE SUBJECT PARCEL IS SERVED BY MUNICIPAL WATER AND SEWER.

16. SITE CONSTRUCTION HOURS SHALL BE LIMITED TO MONDY-FRIDAY 7AM-6PM, SATURDAYS 9AM-4PM. HOURS OF CONSTRUCTION MUST BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTAC INFORMATION FOR THE GENERAL CONTRACTOR. SAID SIGNAGE MUST BE LOCATED AND APPROVED BY THE CITY ENGINEER OR ASSISTANT CITY MANAGER.

17. ALL INTERIOR CONSTRUCTION SHALL COMPLY WITH IBC AND CITY OF COVER BUILDING CODES.

18. BACKFLOW PREVENTERS HAVE BEEN INSTALLED FOR BOTH FIRE AND DOMESTIC WATER LINES.

19. THE EXISTING STRUCTURE IS SERVED BY A SPRINKLER SYSTEM AS REQUIRED UNDER CHAPTER 109-30 OF THE CODE OF THE CITY OF DOVER AND THE 2018 STATE BUILDING CODES.

20. 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.

22. THE BUILDING ADDRESS HAS BEEN ASSIGNED AND THE NEW RESIDENTIAL UNITS WILL BE NUMBERED ACCORDINGLY AND APPROVED BY THE FIRE DEPARTMENT.

23. THE SITE LAYOUT IS DESIGNED IN COMPLIANCE WITH APPLICABLE ACCESSIBILITY REGULATIONS. THE PROPOSED RENOVATION WILL ALSO BE DESIGNED IN ACCORDANCE WITH RSA 155A:5.

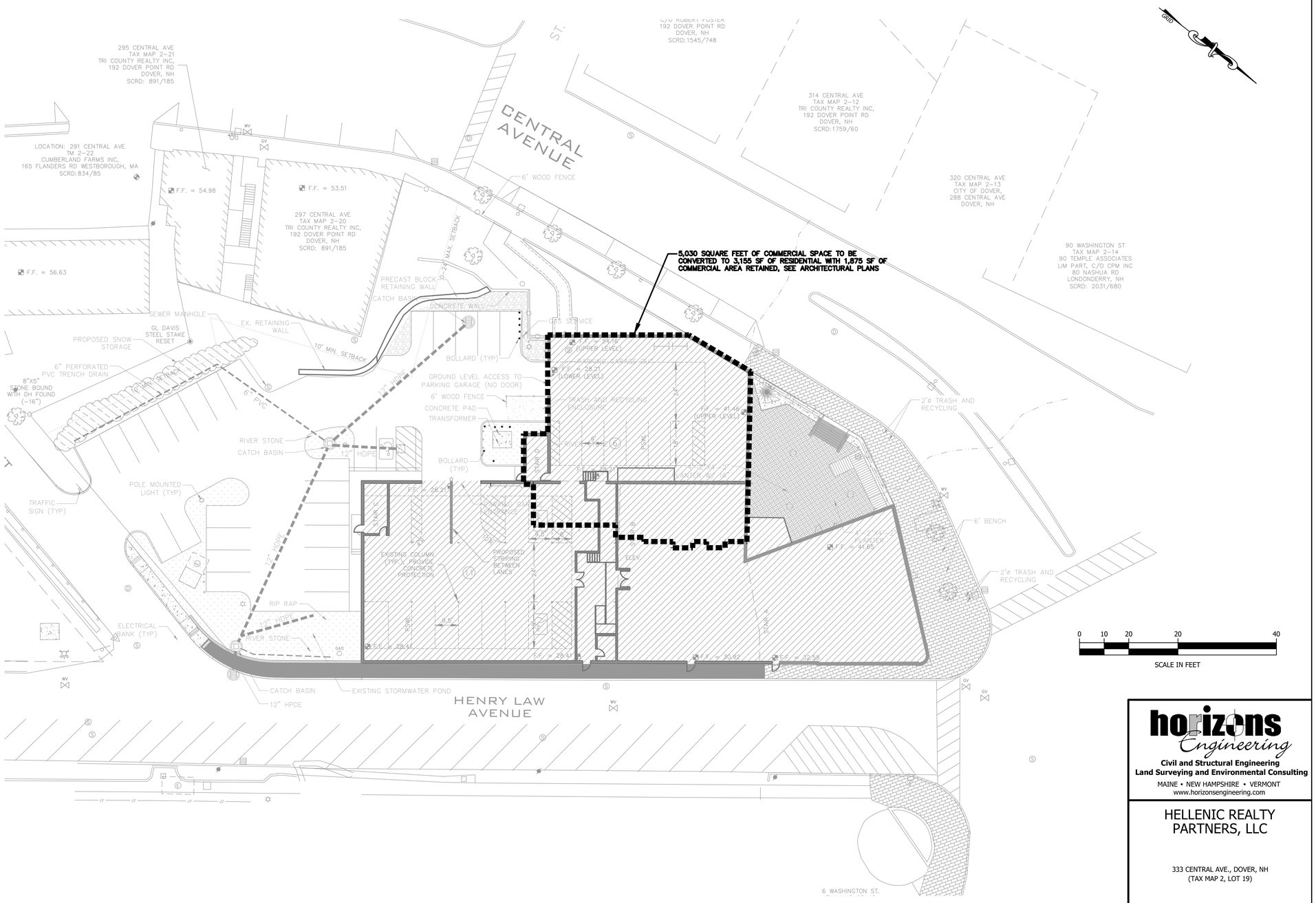
24. THE PROPOSED USES FOR THE SITE ARE RESIDENTIAL APARTMENTS AND COMMERCIAL USES TO INCLUDE RETAIL, OFFICE, AND RESTAURANTS.

25. THE ENTRANCES AND EXITS TO BOTH PARKING GARAGES WILL BE OPEN.

26. PROVIDE SIGNAGE AT ALL NON-ACCESSIBLE ENTRANCES GIVING DIRECTION TO ACCESSIBLE ENTRANCES.

27. BOTH OF THE COVERED PARKING AREAS HAVE BEEN DESIGNED AS CONVERTIBLE SPACE. THE FUTURE USE IS ANTICIPATED TO BE COMMERCIAL.

28. TOPOGRAPHIC SURVEY PERFORMED BY NORWAY PLAINS ASSOCIATES INC IN DECEMBER 2017



PARKING CALCULATIONS

USE	UNITS/S.F.	STANDARD	REQUIRED	PROVIDED
RESIDENTIAL	35 UNITS	1.25 SPACES/UNIT + 0.4 VISITOR SPACES/UNIT	58	45
COMMERCIAL				
RETAIL/SERVICE	9,850± S.F.	1 SPACE/275 S.F.	36	0*
OFFICE	4,700± S.F.	1 SPACE/300 S.F.	11	0*
OFF SITE RESIDENTIAL SPACES			0	14
		TOTAL SPACES	105	59**

* WHERE COMMERCIAL AND RESIDENTIAL USES ARE CO-LOCATED, ONLY THE RESIDENTIAL PARKING SHALL BE PROVIDED.

** THE 59 REQUIRED RESIDENTIAL SPACES INCLUDE THE 17 COVERED SPACES AND 28 UNCOVERED ONSITE SPACES. THE PROPERTY OWNERS HAVE 14 ADDITIONAL OFF SITE SPACES LOCATED AT THE TRAVEL AGENCY AT 251 CENTRAL AVE. AVAILABLE FOR OVERNIGHT PARKING

BICYCLE RACK CALCULATION

THE NUMBER OF SPACES FOR BICYCLES SHALL BE EQUAL TO 5% OF THE REQUIRED NUMBER OF PARKING SPACES.

105 REQUIRED SPACES X 0.05 = 6 BICYCLE SPACES.

UTILITIES NOTE

ALL ELECTRIC, GAS, TELEPHONE, WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION. THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATION FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE: 1-888-DIG-SAFE (1-888-344-7233).

FOR REVIEW
NOT FOR CONSTRUCTION

DATE OF PRINT
SEPTEMBER 08 2023
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HELLENIC REALTY PARTNERS, LLC

333 CENTRAL AVE., DOVER, NH
(TAX MAP 2, LOT 19)

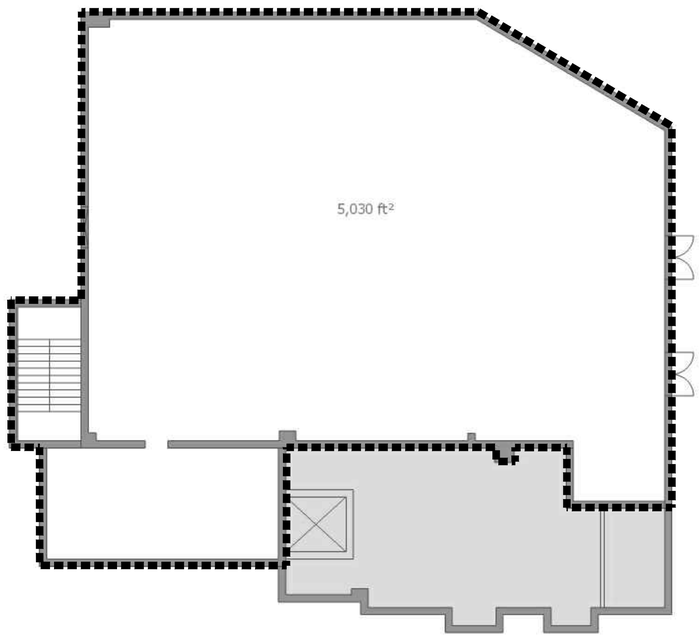
AMENDED SITE PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

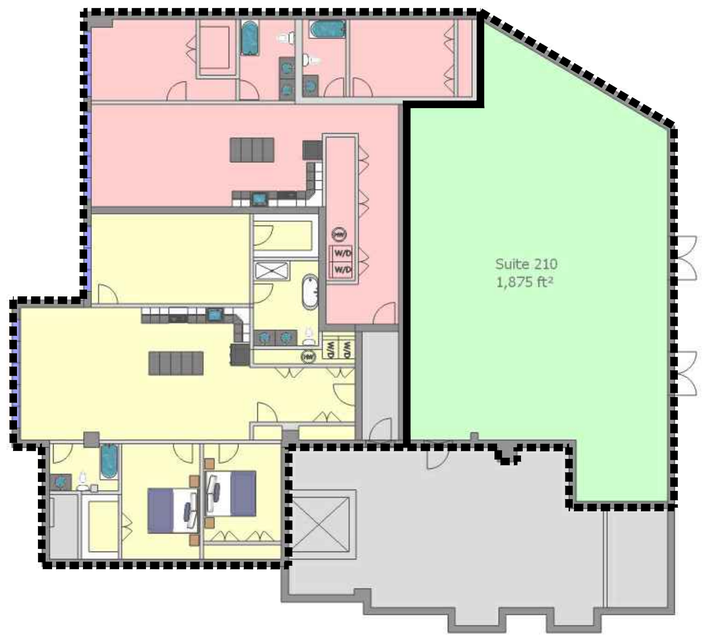
STATE OF NEW HAMPSHIRE
MICHAEL J. SIEVERT
No. 8397
LICENSED PROFESSIONAL ENGINEER

DATE: 09/08/23	PROJECT #: 221203
ENGIN'D BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #:

C101



EXISTING APPROVED PARTIAL SECOND FLOOR PLAN
5,030 SF COMMERCIAL SPACE



PROPOSED PARTIAL SECOND FLOOR PLAN
1,875 SF COMMERCIAL SPACE
3,155 SF RESIDENTIAL SPACE

GRID

CENTRAL AVE.

PLAZA ENTRY

ADA ACCESS RAMP

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AUGUST 07 2023
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HELLENIC REALTY
PARTNERS, LLC

333 CENTRAL AVE., DOVER, NH
(TAX MAP 2, LOT 19)

ARCHITECTURAL PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: 8/08/23	PROJECT #: 221203
ENGIN'D BY: TAL	DRAWN BY: TAL
CHECK'D BY: MJS	ARCHIVE #:

C101

From: Nick Kostis <nick@kostisenterprises.com>
Sent: Tuesday, October 3, 2023 9:37 AM
To: Benton, Donna <d.benton@dover.nh.gov>
Subject: Re: 333 Central

Security Notice: External sender. Use caution with hyperlinks or attachments.

Sorry Donna, I misunderstood. The numbers I provided are what we currently are approved for (one admin approval) and what we are proposing. I also broke down the numbers between residential and nonresidential (commercial, support, egress, etc...).

Your 2018 figures I believe are correct.

However, in 2019 we went back to the planning board (not administrative approval) for an additional 14 residential units. This was a total of 32 residential units, and 15,000 +/- sf of commercial.

In 2022, we were administratively approved to convert 2,700 +/- sf of commercial space into an office of 900 +/- sf and one additional residential unit, a total of 33 residential units and 13,200 +/- sf of commercial.

We are now proposing to convert 5,000 +/- sf of commercial space into a commercial space of 1800 +/- sf and two additional residential units, a total of 35 residential units and 10,000 +/- sf of commercial.

I have attached a current floor plan of commercial space Suite 210. I have also attached our proposed changes to Suite 210, which is two additional residential units (apartments 204 and 206) and a reduced Suite 210. If you would like a floor plan of the entire floor, please let me know.

Sorry again for the confusion. If you would like to discuss further, please do not hesitate to let me know.

Thanks,
Nick

Nick Kostis
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