Attachment "D"

Stormwater Management & Erosion Control Plan (SMECP)

Proposed Drive-Thru Restaurant Building

MAP 165, LOT 155
HUDSON MALL, 77 DERRY STREET
HUDSON, NEW HAMPSHIRE

MARCH 4, 2024

PREPARED FOR:

HUDSON-VICKERRY, LLC
C/O THE MEG COS., 25 ORCHARD VIEW DRIVE
LONDONDERRY, NH 03053

PREPARED BY:

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street *131 Middlesex Turnpike*
Nashua, New Hampshire 03062 *Burlington, Massachusetts 01803*
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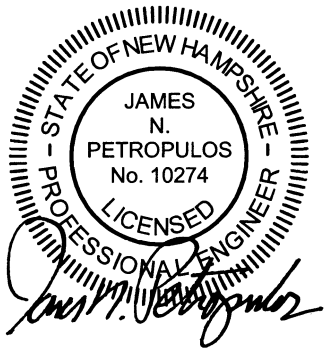
Attachment "D"

STORMWATER MANAGEMENT & EROSION CONTROL PLAN (SMECP)

Proposed Drive -Thru Restaurant
Tax Map 165, Lot 155
Hudson Mall, 77 Derry Street
Hudson, New Hampshire

March 4, 2024



Prepared for:
Hudson Vickerry, LLC
c/o the MEG Companies, 25 Orchard View Drive
Londonderry, NH 03053

Prepared by:
Hayner/Swanson, Inc.
3 Congress Street
Nashua, NH 03062

TABLE OF CONTENTS

Plan Reference: Site Plan (16 Sheets) Map 165, Lot 155, Proposed Drive-Thru restaurant, 77 Derry Street, Hudson, NH, prepared for: Hudson-Vickerry, LLC, Londonderry, NH, dated 16 February 2024 and prepared by Hayner/Swanson, Inc., Nashua, NH

I. INTRODUCTION

A. Abstract

The following report is a detailed stormwater study of the Proposed Drive-Thru Restaurant project located at the Hudson Mall, 77 Derry Street in Hudson, NH. The purpose of the study is to analyze the qualitative and quantitative stormwater impacts of the proposed building project. The goal of the stormwater management system for this project is to comply with the stormwater management regulations set forth in the Town of Hudson Stormwater Management Regulations (Chapter 290) and the New Hampshire Department of Environmental Services (NHDES) stormwater design standards.

B. Existing Conditions

The project area under consideration for this application is located at the northerly end of the Hudson Mall property, 77 Derry Street, Hudson, NH (see Figure 1). The site is known to the Hudson Assessors Department as Map 165, Lot 155. The parcel measures 10.602 acres and is located in the B - Business zoning district. The site is abutted by Derry Street, and commercial and residential properties to the west; and St. Patrick Cemetery to the north, east, and south.

The lot currently contains a 1-story, 114,800 square foot retail shopping center building, and a 3,100 square foot fast-food drive thru restaurant; along with associated parking and loading areas. Primary access to the site is provided via one non-signalized full-access driveway off Derry Street at the southerly end of the site, and one signalized full-access driveway off Derry Street near the northerly end of the site. The site is currently serviced by municipal sewer and water, natural gas, and overhead telecommunications and electric utilities from Derry Street. Existing stormwater management practices consist of a series of catch basins, and underground drain pipes. This collection system discharges via underground pipe connection to the municipal drainage system in Derry Street.

NRCS soil mapping shows that this site contains Windsor loamy sands. The proposed building improvements are entirely in the area of Windsor soils. The property is completely developed with 9.6+/-% open space, and no onsite wetlands. No portion of the subject site is located within the 100-year Flood Hazard Area.

C. Proposed Development

It is being proposed to construct a 1-story, 2,465 square foot coffee shop restaurant with drive-thru in the existing parking lot north of the main existing shopping center

building. The project proposes to remove 68 existing parking spaces and adjacent driveways to accommodate the new building, drive-thru, and parking lot with 20 new parking spaces. It is also proposed to eliminate 17 current employee parking spaces in the rear loading area to accommodate a truck maneuvering area. This results in a net reduction of 65 underutilized parking spaces. Associated site improvements include a new parking area, stormwater management systems, landscaping, site lighting, and utility services to the new building. To the best of our knowledge the sewer, water, gas, telecommunication, and electric utilities present onsite and in the adjacent roadway have adequate capacity to service this intended use.

Upon project completion the site will contain approximately 13.0+/-% open space, compared to the existing 9.6+/-%. There are no wetland impacts proposed. The layout for the proposed building and associated site improvements has been developed to integrate with the existing shopping center and minimize environmental issues. The site development associated with the overall construction of this project disturbs approximately 45,000 square feet of contiguous area and therefore a NHDES Alteration of Terrain permit is not required. It should be pointed out that 8,625 SF of the proposed disturbed area entails removing existing pavement areas outside the proposed project development pad (see post-development drainage subareas DA 1, DA 11, and DA 12) and converting them to landscape areas. This makes the effective disturbed area attributed to the proposed development equal to 36,375 SF. Construction is expected to begin in the summer of 2024 and will be completed in the summer of 2025.

II. STORM DRAINAGE ANALYSES

A. Intent

With regard to stormwater management, it is the intent of this design to address both qualitative and quantitative aspects of the runoff produced by the proposed improvements. The design shall address the requirements of the Town of Hudson Stormwater Management Regulations (Chapter 290) and NHDES stormwater design requirements by using, to the maximum practical extent, Low Impact Development (LID) strategies to promote recharge and reduce site disturbances. Furthermore, the design shall seek to maintain existing drainage patterns, provide permanent methods for protecting water quality and minimize impacts to downstream drainage facilities.

To meet these goals, the proposed project will include a combination of stormwater management practices that include offline deep-sump catch basins fitted with gas hoods for stormwater pretreatment, and a rain garden bioretention area for stormwater treatment and groundwater recharge. The catch basins are designed to capture pavement areas less than 0.25 acres in size to meet NHDES requirements for pretreatment practices. The rain garden bioretention area will have an engineered filter

media in the base. These measures are permanent methods for protecting water quality by providing pollutant removal through the use of vertical filtration through the filter media and native soils. Through settling, storage and recharge, infiltration practices can achieve high rates of removal for a number of urban pollutants (sediment, trace metals, hydrocarbons, BOD, nutrients, pesticides, etc.) and provide removal of total suspended solids, total nitrogen, and total phosphorous (New Hampshire Stormwater Manual). In addition to water quality benefits, the stormwater management area will provide flood control during large storm events by reducing the peak rates of runoff leaving this site.

B. Methodology

In accordance with the Town of Hudson and NHDES stormwater management design requirements; the 2-year, 10-year, 25-year and 50-year 24-hour storm events were evaluated. Evaluation of the quantitative runoff impacts of the proposed development were determined by comparing the post-development flows with the pre-development flows for the project portion of this site.

Total drainage area calculations for pre-development conditions and post-development conditions were evaluated and designed using the HydroCAD® version 10.10-5a stormwater modeling program for the Soil Conservation Service (SCS) Type III storm distribution. Values for time of concentration used in the analysis were calculated using the methodology contained within U.S.D.A-S.C.S. publication Urban Hydrology for Small Watersheds Technical Release No. 55 (TR55).

The Rational Method of determining peak rates of runoff was used to size and design the individual drain lines for this project based upon the 25-year storm frequency. Stormwater Management Areas were designed in accordance with the methodology for the "best management practice" (BMP), as presented in the New Hampshire Department of Environmental Services New Hampshire Stormwater Manual.

C. Pre-Development Drainage Conditions

As can be seen on the Pre-Development Drainage Area Map (in Exhibits), the existing project area is divided into two drainage subareas 1 and 2. Subarea 1 is the majority of the project area which is collected in the onsite closed drainage system and conducted to the municipal drainage system in Derry Street. Subarea 1 is predominantly paved parking area, with some landscaped areas. The summation of runoff leaving this portion of the project area is analyzed in this study as Point of Analysis A (POA A).

Subarea 2 is the much smaller remaining portion of the project area, which sheet flows onto the adjacent St. Patrick Cemetery property (Map 166, Lot 1) across the northerly property line. Subarea 2 is a paved parking area. The summation of runoff leaving this portion of the of the project area is analyzed at Point of Analysis B (POA B).

The pre-development drainage calculations are shown in Appendix A of this study and summarized in Table 1 below.

TABLE 1: SUMMARY OF PRE-DEVELOPMENT PEAK FLOWS

Location	Storm Frequency	Pre-Development Peak Flows (cfs)
POA A	2-year	2.27
	10-year	3.57
	25-year	4.57
	50-year	5.50
POA B	2-year	0.19
	10-year	0.29
	25-year	0.36
	50-year	0.43

D. Post-Development Drainage Conditions

The intent of the overall stormwater management design to address both qualitative and quantitative aspects of runoff in accordance with the Town of Hudson and NHDES stormwater design regulations, pre-treatment and treatment practices are included in the overall drainage system. The design intent is to capture, treat, and infiltrate the stormwater from proposed pavement areas to provide groundwater recharge; and improve stormwater treatment compared to the existing condition.

As can be seen on the Post-Development Drainage Area Map (in Exhibits), the existing project area is divided into 12 drainage subareas 1 through 12. Subarea 1 is an area of existing parking that is being converted to landscape area and sheet flows to Derry Street. Subareas 2 through 6, and 8 and 9 will be collected in a new closed drainage system, treated, a portion detained and infiltrated, and connected to the existing closed drainage system which connects to the municipal drainage system in Derry Street. Subareas 7 and 10 are small development areas that sheet flow to the existing drainage system; and Subareas 11 and 12 are existing pavement areas that are being converted to grass slopes and sheet flow onto the St. Patrick Cemetery property. The summation of runoff from the redevelopment Subareas 1 through 10 is analyzed in this study as Point of Analysis A (POA A). The summation of runoff from redevelopment Subareas 11 and 12 is analyzed in this study as Point of Analysis B (POA B).

The characteristics of the proposed stormwater management areas are shown below in Table 2. The post-development runoff computations are detailed in Appendix B.

TABLE 2: SUMMARY OF POST-DEVELOPMENT STORMWATER MANAGEMENT AREA CHARACTERISTICS

Location	Storm Frequency	Inflow (cfs)	Outflow (cfs)	Bottom of Practice Elevation	Top of Practice Elevation	Max. Water Elevation
SMA A Rain Garden	2-year	0.23	0.00	182.00	183.8	180.87
	10-year	0.51	0.00			182.11
	25-year	0.74	0.00			182.38
	50-year	0.97	0.00			182.62

A comparison of pre-development and post-development peak flows and volumes are summarized in Tables 3 and 4, respectfully below:

TABLE 3: COMPARISON OF PRE-DEVELOPMENT AND POST-DEVELOPMENT PEAK FLOWS

Location	Storm Frequency	Pre-Development Peak Flows (cfs)	Post-Development Peak Flows (cfs)	Δ (cfs)
POA A	2-year	2.27	1.06	-1.21
	10-year	3.57	1.88	-1.69
	25-year	4.57	2.54	-2.03
	50-year	5.50	3.18	-2.32
POA B	2-year	0.19	0.00	-0.19
	10-year	0.29	0.00	-0.29
	25-year	0.36	0.01	-0.35
	50-year	0.43	0.02	-0.41

TABLE 4: COMPARISON OF PRE-DEVELOPMENT AND POST-DEVELOPMENT VOLUMES

Location	Storm Frequency	Pre-Development Runoff (cf)	Post-Development Runoff (cf)	Δ (cf)
POA A	2-year	8,312	3,659	-4,653
	10-year	13,417	6,534	-6,883
	25-year	17,424	8,973	-8,451
	50-year	21,214	11,369	-9,845

POA B	2-year	697	0	-697
	10-year	1,089	44	-1,045
	25-year	1,394	87	-1,307
	50-year	1,655	174	-1,481

E. Impervious Area Calculations

This proposed building project results in a net decrease in onsite impervious area of 0.36 acres (15,680 SF). A summary of on-site impervious cover is provided below in table 5.

TABLE 5: COMPARISON OF PRE-DEVELOPMENT AND POST-DEVELOPMENT IMPERVIOUS AREAS (Acres)

	Pre-Development	**Post-Development**	**Δ**
Total Impervious Area (Ac)	9.58	9.22	-0.36
Treated Impervious Area (Ac)	0.0	0.52	+0.52

In order to comply with the Town of Hudson Stormwater Management standards, this project will meet the requirements of Section 290-5A by implementing treatment measures for proposed impervious cover. As previously stated above, the effective area of disturbance for the proposed redevelopment project is 36,375 SF, therefore the enhanced stormwater management standards outlined in Section 290-5B are not required.

F. Results

1. The project uses Low Impact Development techniques to accommodate stormwater runoff created by the proposed building and associated site improvements.
2. The project provides permanent methods for protecting water quality through the use of treatment practices such as deep-sump catch basins with gas hoods, and the rain garden bioretention basin to promote the recharge of runoff into native soils.
3. The proposed stormwater management systems provide sufficient recharge and storage volumes so that the post-development peak rates and volumes of runoff are less than the pre-development peak rates and volumes of runoff for the 2-, 10-, 25- and 50-year storm events to POA A and POA B.

4. The design complies with Chapter 290 of the Town of Hudson Stormwater Management standards with regard to treatment of impervious areas for redeveloped sites. Given that the project reduces peak rates and volumes leaving this site at both Points of Analysis, it is our opinion that there will be no adverse impact to the downstream drainage condition.

III. STORMWATER MANAGEMENT INFORMATION

A. Chapter 290 – Report/Plan Checklist:

Town of Hudson – Chapter 290 - Stormwater Management

Chapter 290-7A Report Checklist	
Item	**Applicant Comment**
1.Project Narrative	See SMECP report, Pages 1 & 2
2.Description of wetlands	See SMECP report, Page 1 & 2
3.Description of LID practices	See SMECP report, Page 6
4.Description of application buffers	See SMECP report, Page 1
5.Description of erosion control practices	See SMECP report, Page 8
6.Drainage Calculations	See SMECP report/Appendices A, B & C
7.Other studies	n/a
8.Stamped Report and Plans	See SMECP report and Plans
9.Inspection & Maintenance Manual	See SMECP Appendix E
10.BMP Maintenance Plan	See I & M Manual in SMECP Appendix E

Chapter 290-7B Plan Checklist	
Item	**Applicant Comment**
1.Locus Map	See Cover Sheet, Sheet 1 of 16
2.Parcel Map	See Sheet 1 of 16
3.Base Map Information	See Sheet 3 of 16 for Existing Conditions
4.Existing and Proposed Plan Information	See Sheet 1-6 of 16
5.Location of CRITICAL areas	n/a
6.Wetland Locations	n/a
7.Limits of Disturbance	See Plans and SMECP report Page 2
8.Proposed Erosion Control Measures	See Sheets 12 & 13 of 16
9.Proposed Construction Information	See Sheets 2, 4, & 5 of 13
10.Sanitary Waste Locations	See Sheets 5 & 7 of 16
11.Construction Schedule/Phasing	12 Month Construction Project
12.100-Year Flood Boundaries	n/a
13.Soils Information	See SMECP report Page 1 and Exhibits
14.Wetland Impact Areas	n/a
15.Permanent BMP's	See Sheets 5, and 11 of 16
16.Snow Storage Areas	See Sheet 6 of 16

17.Proposed Drainage Information	See Sheets 5, 7, & 11 of 16
18.Test Pit and Infiltration rates	See SMECP report and Sheet 2 & 3 of 13
19.Location of Nearest Receiving Wetland	Merrimack River (0.35 miles from property)
20.Downstream Drainage Capacity	See SMECP report, Page 7
21.Explanation of Downstream Impact	See SMECP report, Page 7

IV. EROSION CONTROL PROVISIONS

Temporary and permanent erosion control measures are proposed throughout the project, to ensure that the adjacent off-site areas and public roadways are protected from erosion and debris during and after construction of this project. A DRAFT copy of the prepared Stormwater Pollution Prevention Plan (SWPPP) for this project is also included as an Appendix to this report to provide additional information regarding erosion control measures during construction.

A. Temporary Erosion Control Measures

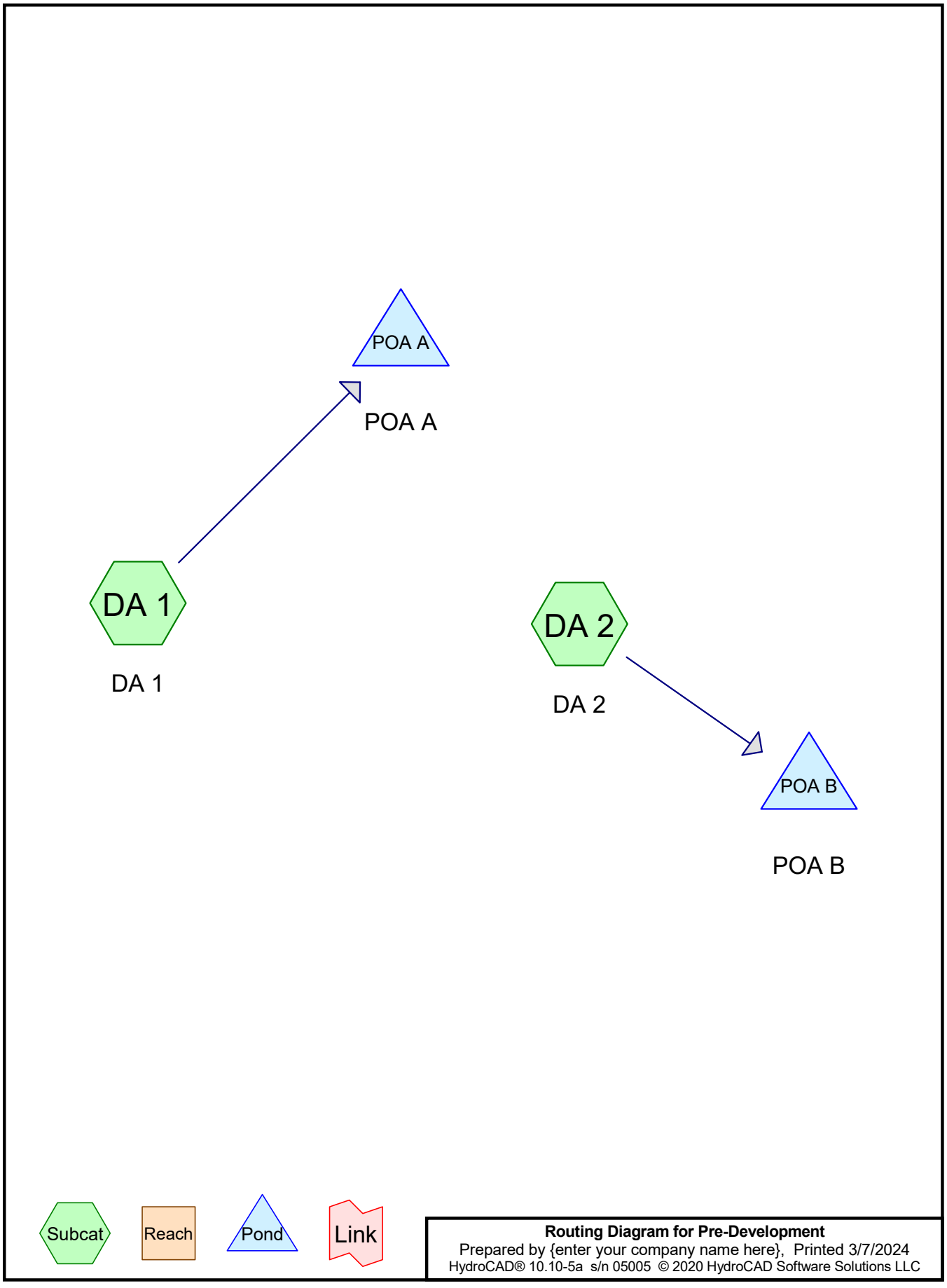
During the site construction phase of the project, specific erosion and sedimentation controls have been developed into the design of the project. Proposed locations and construction details of these devices are shown in greater detail on the attached site plans. Reference to the New Hampshire Stormwater Management Manual, Vol. 3, Construction Phase Erosion and Sediment Controls was made for the temporary erosion control devices such as silt socks, a gravel construction exit, and temporary seeding. The erosion control notes and construction sequence were developed to limit soil loss due to erosion and are therefore directed at minimizing the degradation of water quality on and off the site.

B. Permanent Erosion Control Measures

Permanent erosion control measures have been included in the design of the project to limit long-term erosion conditions. The proposed subsurface infiltration basins reduce peak rates of runoff which lessens he likelihood of downstream adverse impacts caused by erosion. Riprap aprons provide outlet protection at the new discharge headwall and where needed to reduce stormwater velocities to manageable levels. Loam and seed requirements have been specified to establish conditions that minimize erodible conditions. This is complemented by the minimization of stormwater flow lengths to keep runoff quantities and velocities as low as possible. These permanent measures, when completed and in place, provide treatment methods that will maintain long-term water quality in downstream waterways.

APPENDIX A

PRE-DEVELOPMENT DRAINAGE CALCULATIONS



Routing Diagram for Pre-Development
Prepared by {enter your company name here}, Printed 3/7/2024
HydroCAD® 10.10-5a s/n 05005 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	5.60	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.053	39	>75% Grass cover, Good, HSG A (DA 1)
0.976	98	Paved parking, HSG A (DA 1, DA 2)
1.029	**95**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.029	HSG A	DA 1, DA 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.029		**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
0.053	0.000	0.000	0.000	0.000	0.053	>75% Grass cover, Good	DA 1
0.976	0.000	0.000	0.000	0.000	0.976	Paved parking	DA 1, DA 2
1.029	**0.000**	**0.000**	**0.000**	**0.000**	**1.029**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.958 ac 94.47% Impervious Runoff Depth=5.01"
Tc=8.0 min CN=95 Runoff=4.57 cfs 0.400 af

Subcatchment DA 2: DA 2 Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.032 af

Pond POA A: POA A Inflow=4.57 cfs 0.400 af
Primary=4.57 cfs 0.400 af

Pond POA B: POA B Inflow=0.36 cfs 0.032 af
Primary=0.36 cfs 0.032 af

Total Runoff Area = 1.029 ac Runoff Volume = 0.432 af Average Runoff Depth = 5.04"
5.15% Pervious = 0.053 ac 94.85% Impervious = 0.976 ac

Summary for Subcatchment DA 1: DA 1

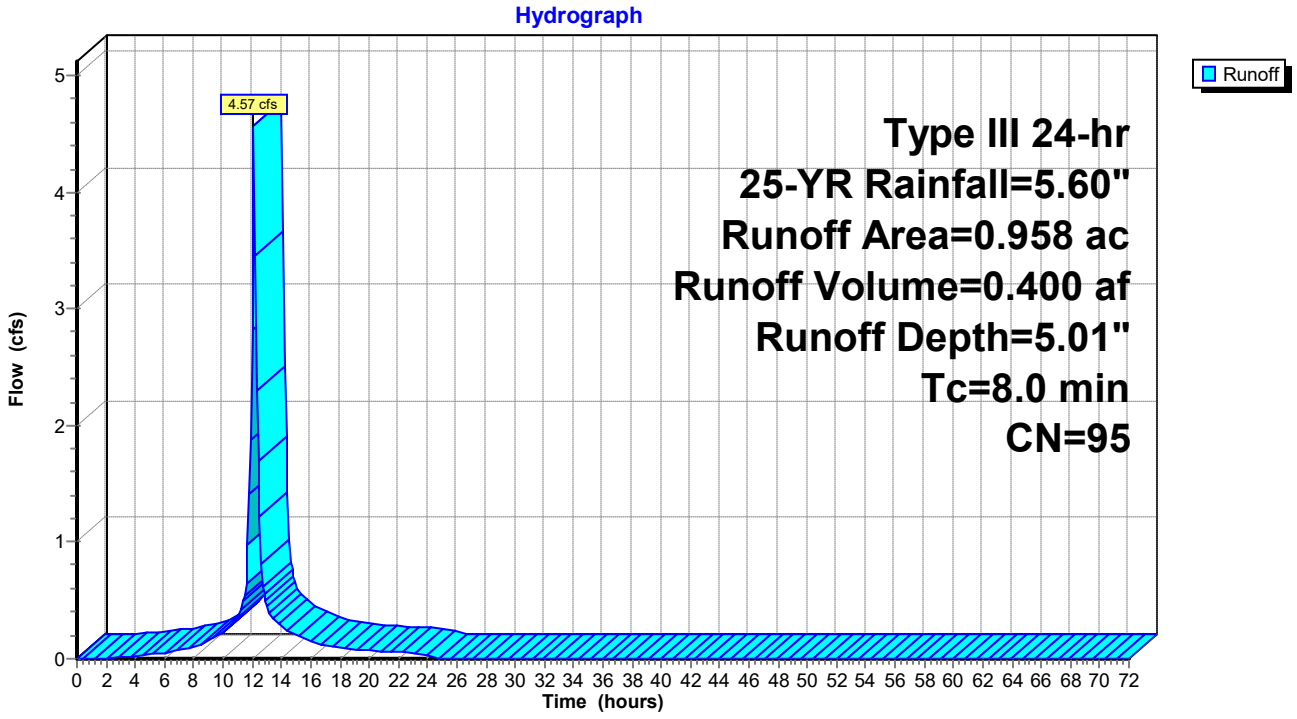
Runoff = 4.57 cfs @ 12.11 hrs, Volume= 0.400 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.053	39	>75% Grass cover, Good, HSG A
0.905	98	Paved parking, HSG A
0.958	95	Weighted Average
0.053		5.53% Pervious Area
0.905		94.47% Impervious Area

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

Subcatchment DA 1: DA 1



Summary for Subcatchment DA 2: DA 2

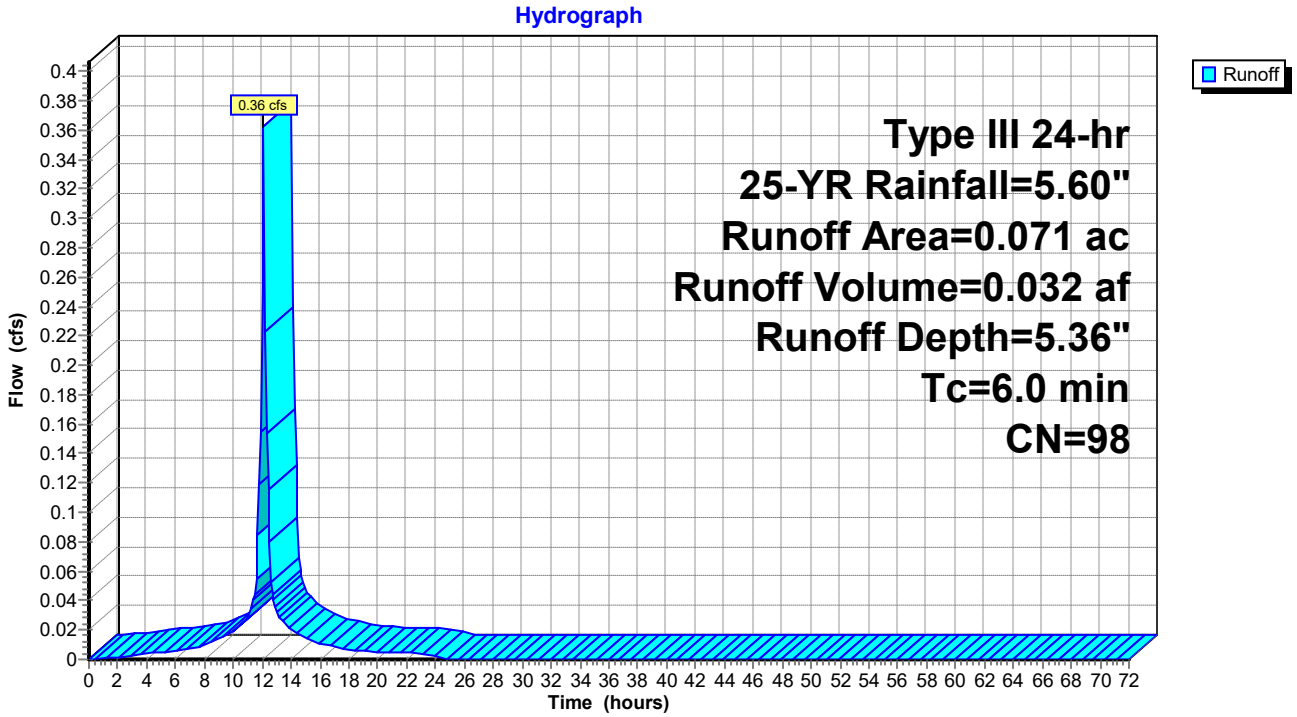
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.032 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.071	98	Paved parking, HSG A
0.071		100.00% Impervious Area

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

Subcatchment DA 2: DA 2

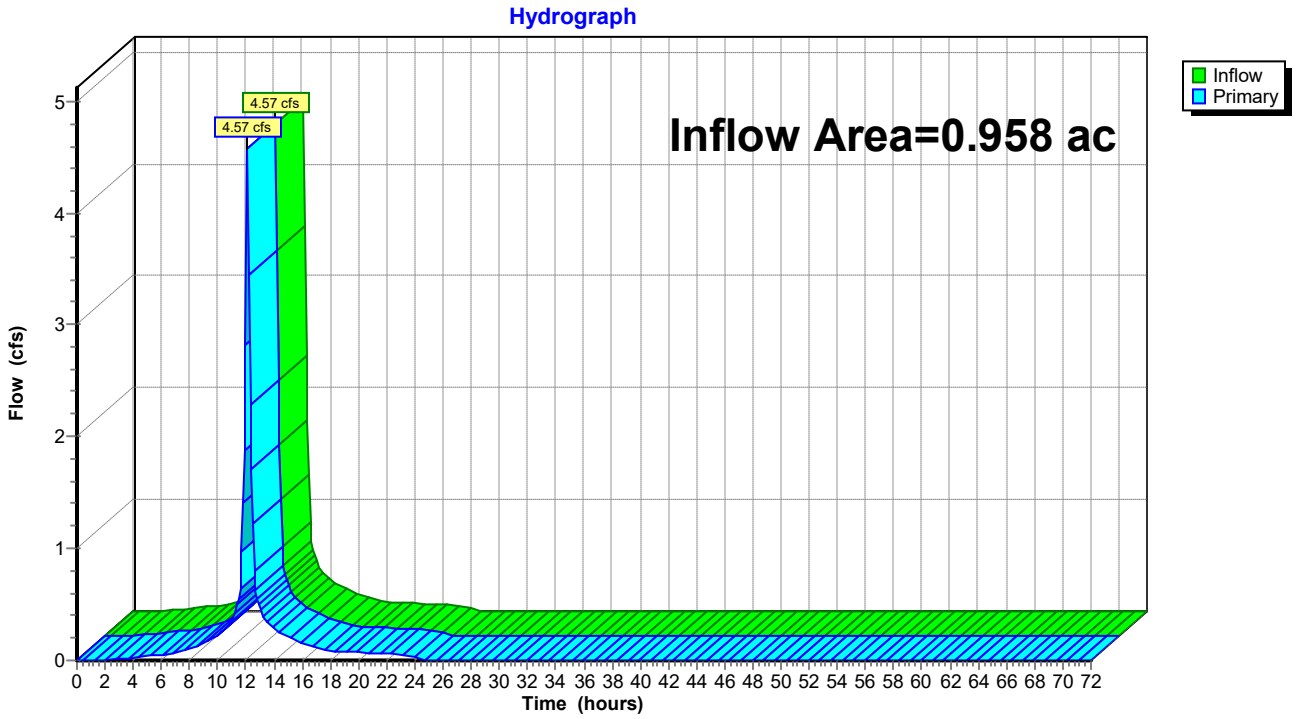


Summary for Pond POA A: POA A

Inflow Area = 0.958 ac, 94.47% Impervious, Inflow Depth = 5.01" for 25-YR event
Inflow = 4.57 cfs @ 12.11 hrs, Volume= 0.400 af
Primary = 4.57 cfs @ 12.11 hrs, Volume= 0.400 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Pond POA A: POA A

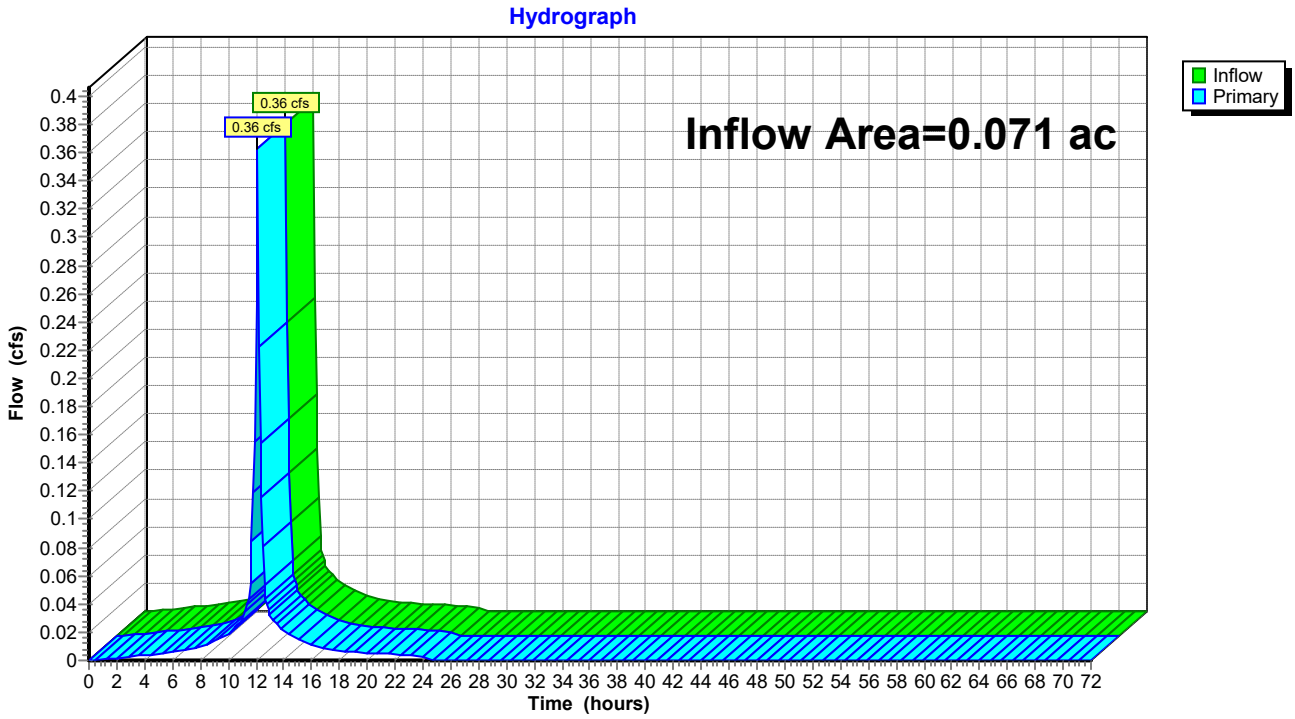


Summary for Pond POA B: POA B

Inflow Area = 0.071 ac,100.00% Impervious, Inflow Depth = 5.36" for 25-YR event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.032 af
Primary = 0.36 cfs @ 12.09 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Pond POA B: POA B



Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.958 ac 94.47% Impervious Runoff Depth=2.39"
Tc=8.0 min CN=95 Runoff=2.27 cfs 0.191 af

Subcatchment DA 2: DA 2 Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=2.71"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.016 af

Pond POA A: POA A Inflow=2.27 cfs 0.191 af
Primary=2.27 cfs 0.191 af

Pond POA B: POA B Inflow=0.19 cfs 0.016 af
Primary=0.19 cfs 0.016 af

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.958 ac 94.47% Impervious Runoff Depth=3.86"
Tc=8.0 min CN=95 Runoff=3.57 cfs 0.308 af

Subcatchment DA 2: DA 2 Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.025 af

Pond POA A: POA A Inflow=3.57 cfs 0.308 af
Primary=3.57 cfs 0.308 af

Pond POA B: POA B Inflow=0.29 cfs 0.025 af
Primary=0.29 cfs 0.025 af

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.958 ac 94.47% Impervious Runoff Depth=6.10"
Tc=8.0 min CN=95 Runoff=5.50 cfs 0.487 af

Subcatchment DA 2: DA 2 Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.038 af

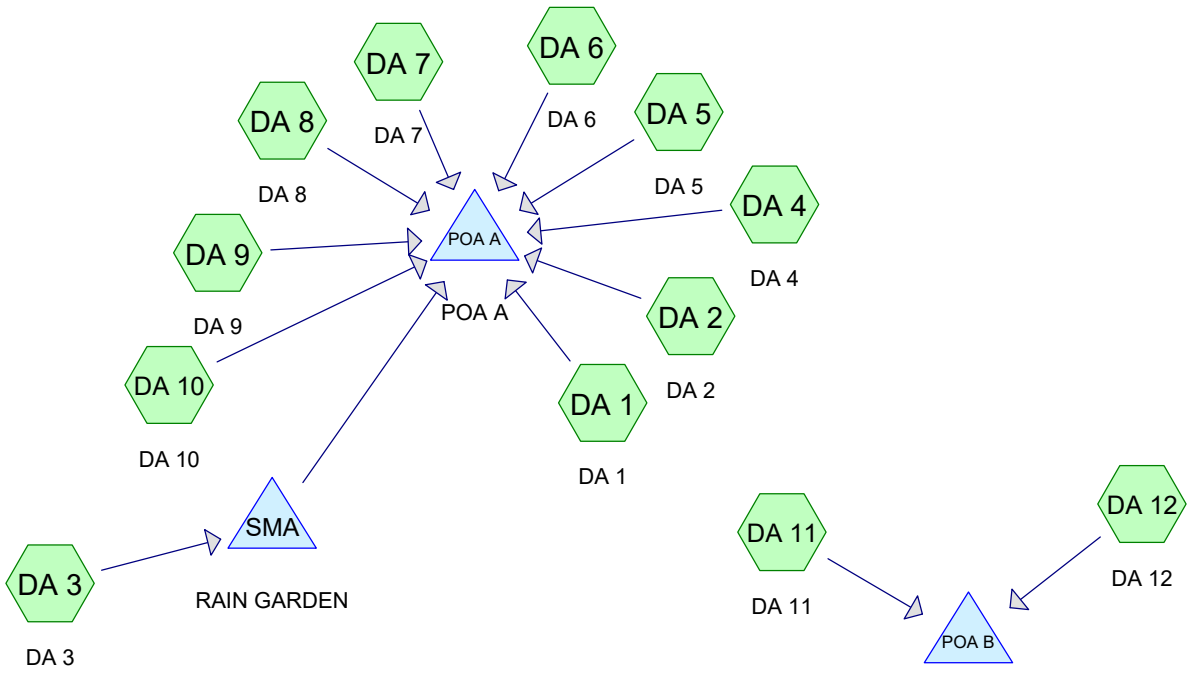
Pond POA A: POA A Inflow=5.50 cfs 0.487 af
Primary=5.50 cfs 0.487 af

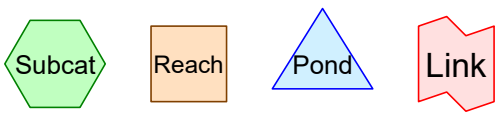
Pond POA B: POA B Inflow=0.43 cfs 0.038 af
Primary=0.43 cfs 0.038 af

APPENDIX B

POST DEVELOPMENT DRAINAGE CALCULATIONS

Attachment "D"





Routing Diagram for Post-Development
Prepared by {enter your company name here}, Printed 3/7/2024

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Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR	Type III 24-hr		Default	24.00	1	5.60	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.413	39	>75% Grass cover, Good, HSG A (DA 1, DA 10, DA 11, DA 12, DA 2, DA 3, DA 5, DA 6, DA 7, DA 9)
0.560	98	Paved parking, HSG A (DA 10, DA 2, DA 3, DA 5, DA 6, DA 7, DA 8, DA 9)
0.056	98	Roofs, HSG A (DA 4)
1.029	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.029	HSG A	DA 1, DA 10, DA 11, DA 12, DA 2, DA 3, DA 4, DA 5, DA 6, DA 7, DA 8, DA 9
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.029		**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
0.413	0.000	0.000	0.000	0.000	0.413	>75% Grass cover, Good	DA 1, DA 10, DA 11, DA 12, DA 2, DA 3, DA 5, DA 6, DA 7, DA 9
0.560	0.000	0.000	0.000	0.000	0.560	Paved parking	DA 10, DA 2, DA 3, DA 5, DA 6, DA 7, DA 8, DA 9
0.056	0.000	0.000	0.000	0.000	0.056	Roofs	DA 4
1.029	**0.000**	**0.000**	**0.000**	**0.000**	**1.029**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.139 ac 0.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.004 af

Subcatchment DA 10: DA 10 Runoff Area=0.035 ac 62.86% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=76 Runoff=0.12 cfs 0.009 af

Subcatchment DA 11: DA 11 Runoff Area=0.017 ac 0.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 12: DA 12 Runoff Area=0.053 ac 0.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.001 af

Subcatchment DA 2: DA 2 Runoff Area=0.109 ac 73.39% Impervious Runoff Depth=3.62"
Tc=6.0 min CN=82 Runoff=0.43 cfs 0.033 af

Subcatchment DA 3: DA 3 Runoff Area=0.222 ac 62.61% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=76 Runoff=0.74 cfs 0.056 af

Subcatchment DA 4: DA 4 Runoff Area=0.056 ac 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.025 af

Subcatchment DA 5: DA 5 Runoff Area=0.061 ac 90.16% Impervious Runoff Depth=4.68"
Tc=6.0 min CN=92 Runoff=0.29 cfs 0.024 af

Subcatchment DA 6: DA 6 Runoff Area=0.088 ac 84.09% Impervious Runoff Depth=4.35"
Tc=6.0 min CN=89 Runoff=0.40 cfs 0.032 af

Subcatchment DA 7: DA 7 Runoff Area=0.045 ac 44.44% Impervious Runoff Depth=2.06"
Tc=6.0 min CN=65 Runoff=0.10 cfs 0.008 af

Subcatchment DA 8: DA 8 Runoff Area=0.031 ac 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af

Subcatchment DA 9: DA 9 Runoff Area=0.173 ac 80.35% Impervious Runoff Depth=4.03"
Tc=6.0 min CN=86 Runoff=0.75 cfs 0.058 af

Pond POA A: POA A Inflow=2.54 cfs 0.206 af
Primary=2.54 cfs 0.206 af

Pond POA B: POA B Inflow=0.01 cfs 0.002 af
Primary=0.01 cfs 0.002 af

Pond SMA: RAIN GARDEN Peak Elev=182.38' Storage=492 cf Inflow=0.74 cfs 0.056 af
Discarded=0.27 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.056 af

Total Runoff Area = 1.029 ac Runoff Volume = 0.264 af Average Runoff Depth = 3.08"
40.14% Pervious = 0.413 ac 59.86% Impervious = 0.616 ac

Summary for Subcatchment DA 1: DA 1

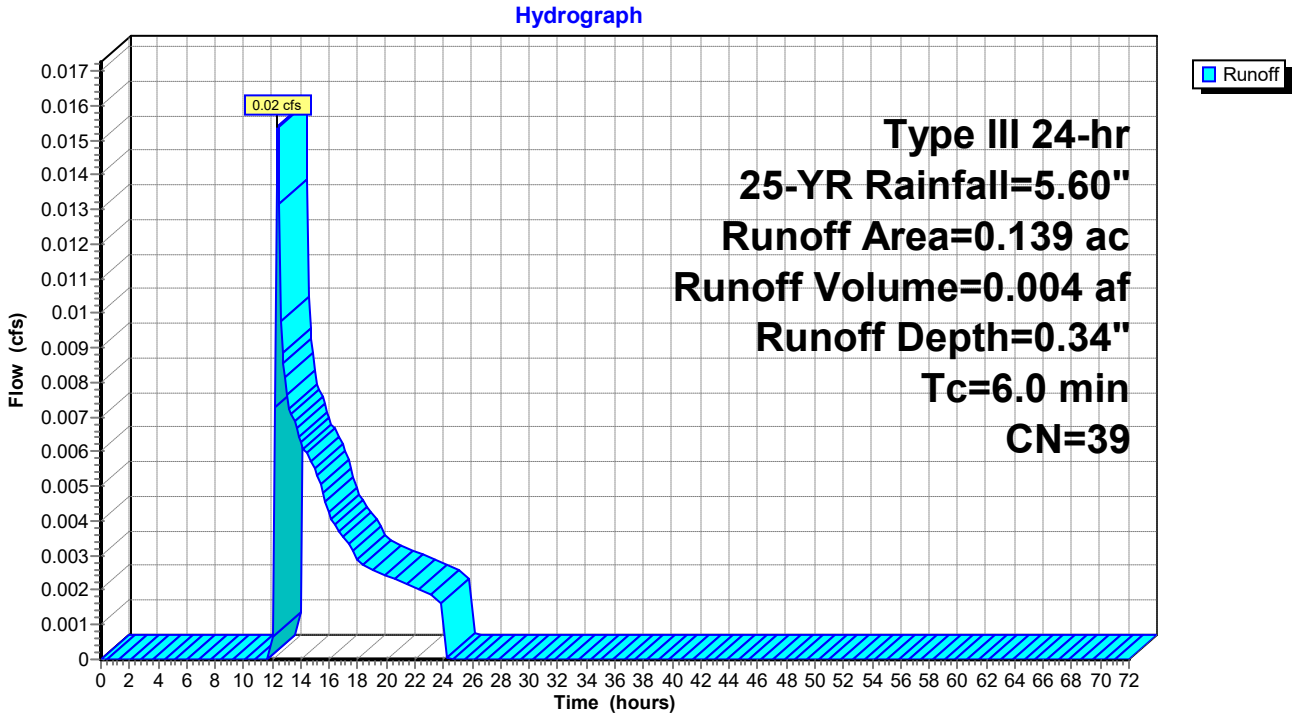
Runoff = 0.02 cfs @ 12.39 hrs, Volume= 0.004 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.139	39	>75% Grass cover, Good, HSG A
0.139		100.00% Pervious Area

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

Subcatchment DA 1: DA 1



Summary for Subcatchment DA 10: DA 10

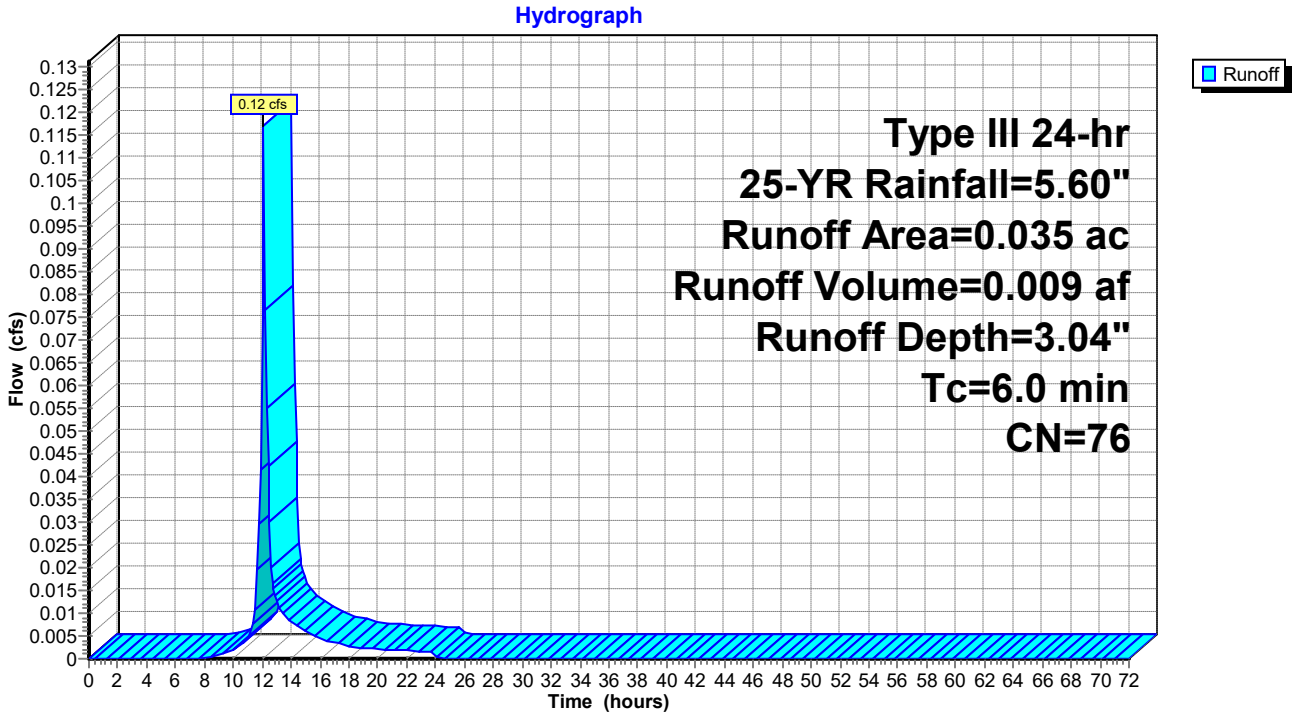
Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.022	98	Paved parking, HSG A
0.013	39	>75% Grass cover, Good, HSG A
0.035	76	Weighted Average
0.013		37.14% Pervious Area
0.022		62.86% Impervious Area

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

Subcatchment DA 10: DA 10



Summary for Subcatchment DA 11: DA 11

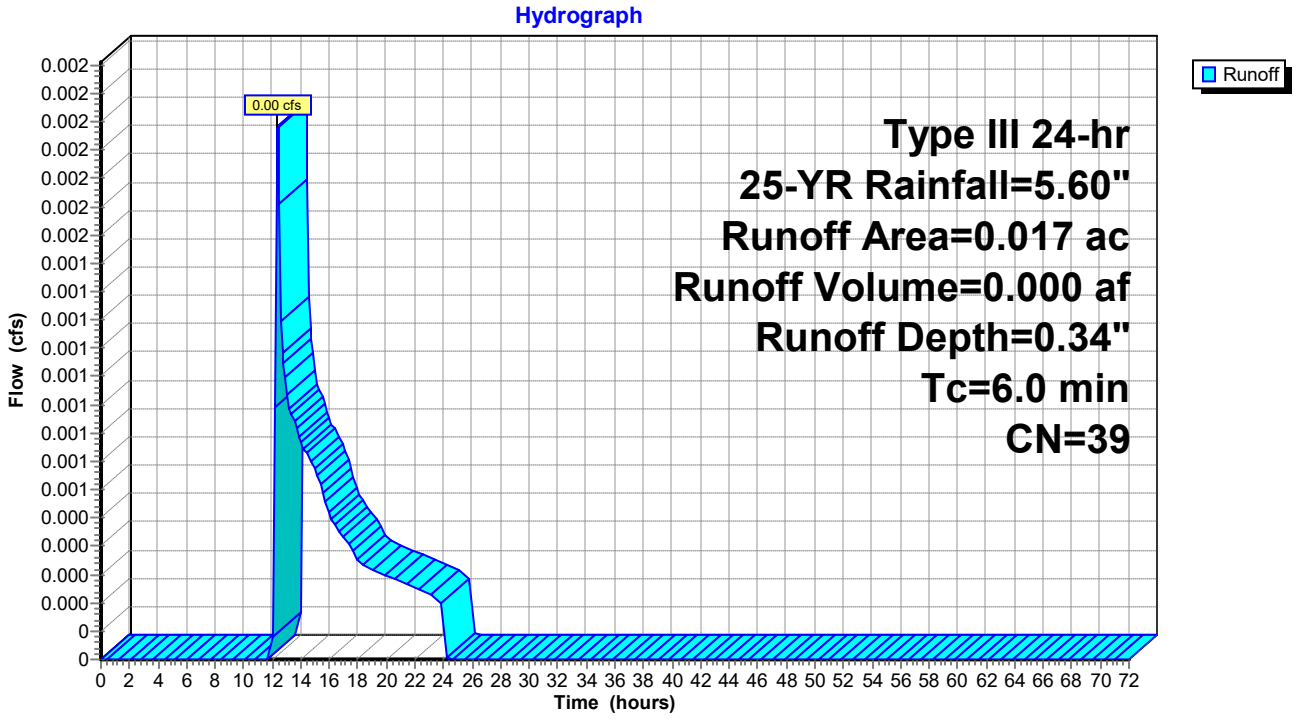
Runoff = 0.00 cfs @ 12.39 hrs, Volume= 0.000 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.017	39	>75% Grass cover, Good, HSG A
0.017		100.00% Pervious Area

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

Subcatchment DA 11: DA 11



Summary for Subcatchment DA 12: DA 12

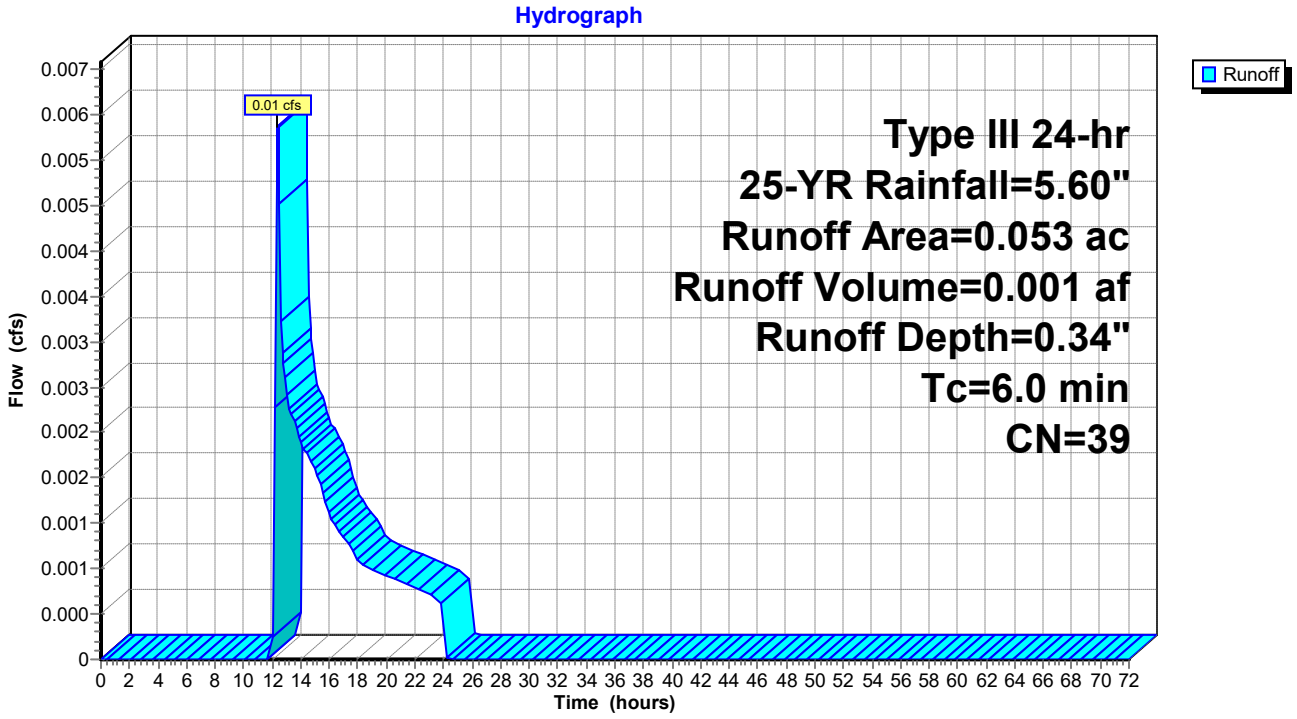
Runoff = 0.01 cfs @ 12.39 hrs, Volume= 0.001 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.053	39	>75% Grass cover, Good, HSG A
0.053		100.00% Pervious Area

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

Subcatchment DA 12: DA 12



Summary for Subcatchment DA 2: DA 2

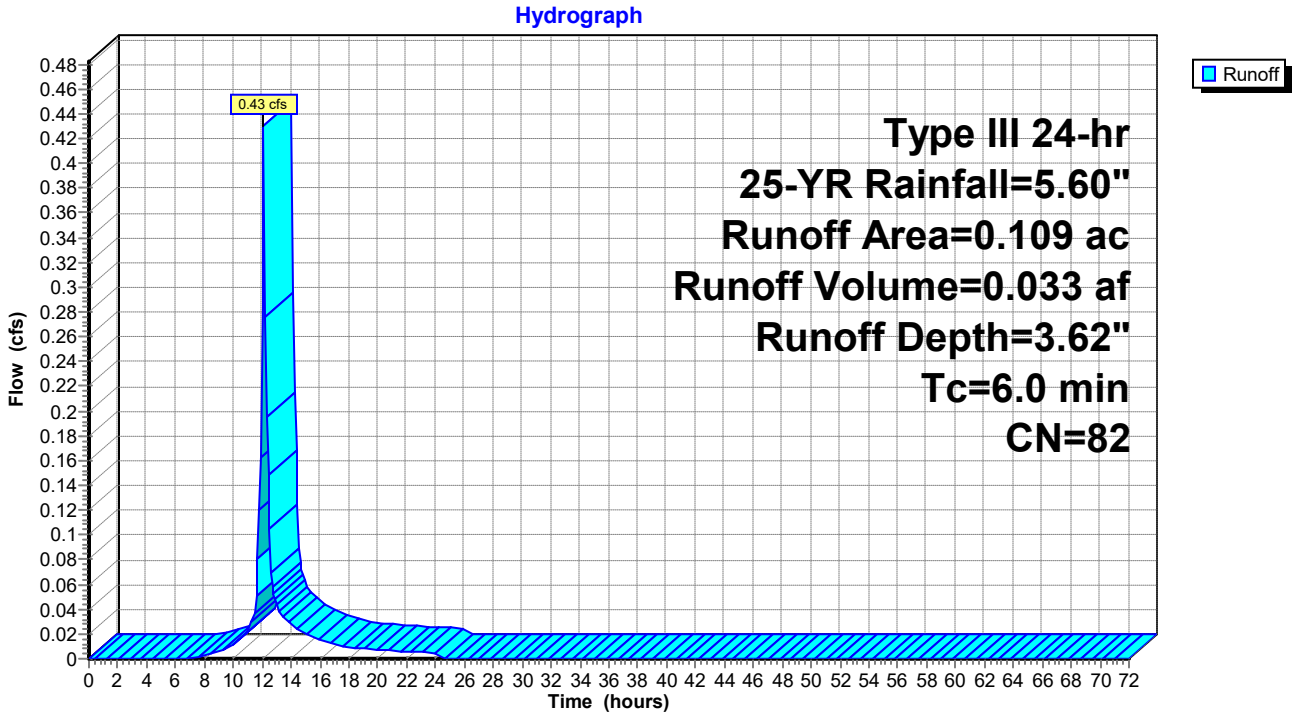
Runoff = 0.43 cfs @ 12.10 hrs, Volume= 0.033 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.080	98	Paved parking, HSG A
0.029	39	>75% Grass cover, Good, HSG A
0.109	82	Weighted Average
0.029		26.61% Pervious Area
0.080		73.39% Impervious Area

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

Subcatchment DA 2: DA 2



Summary for Subcatchment DA 3: DA 3

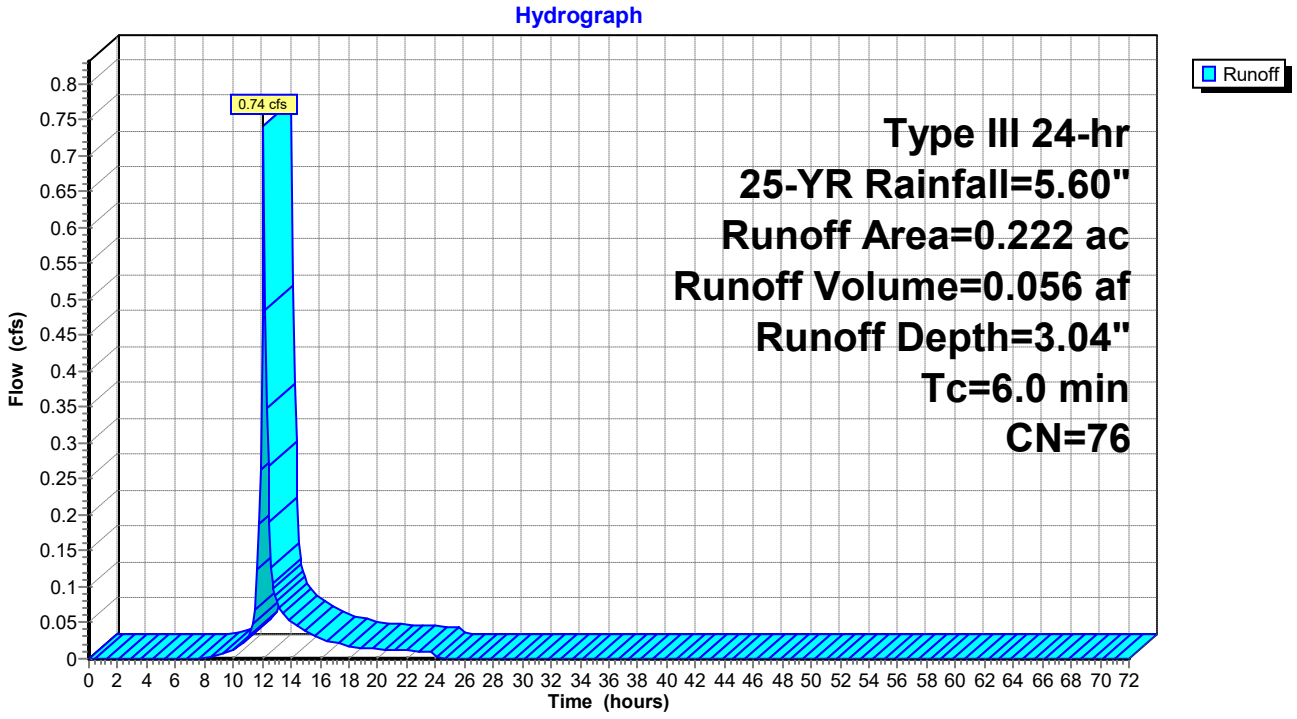
Runoff = 0.74 cfs @ 12.10 hrs, Volume= 0.056 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.139	98	Paved parking, HSG A
0.083	39	>75% Grass cover, Good, HSG A
0.222	76	Weighted Average
0.083		37.39% Pervious Area
0.139		62.61% Impervious Area

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

Subcatchment DA 3: DA 3



Summary for Subcatchment DA 4: DA 4

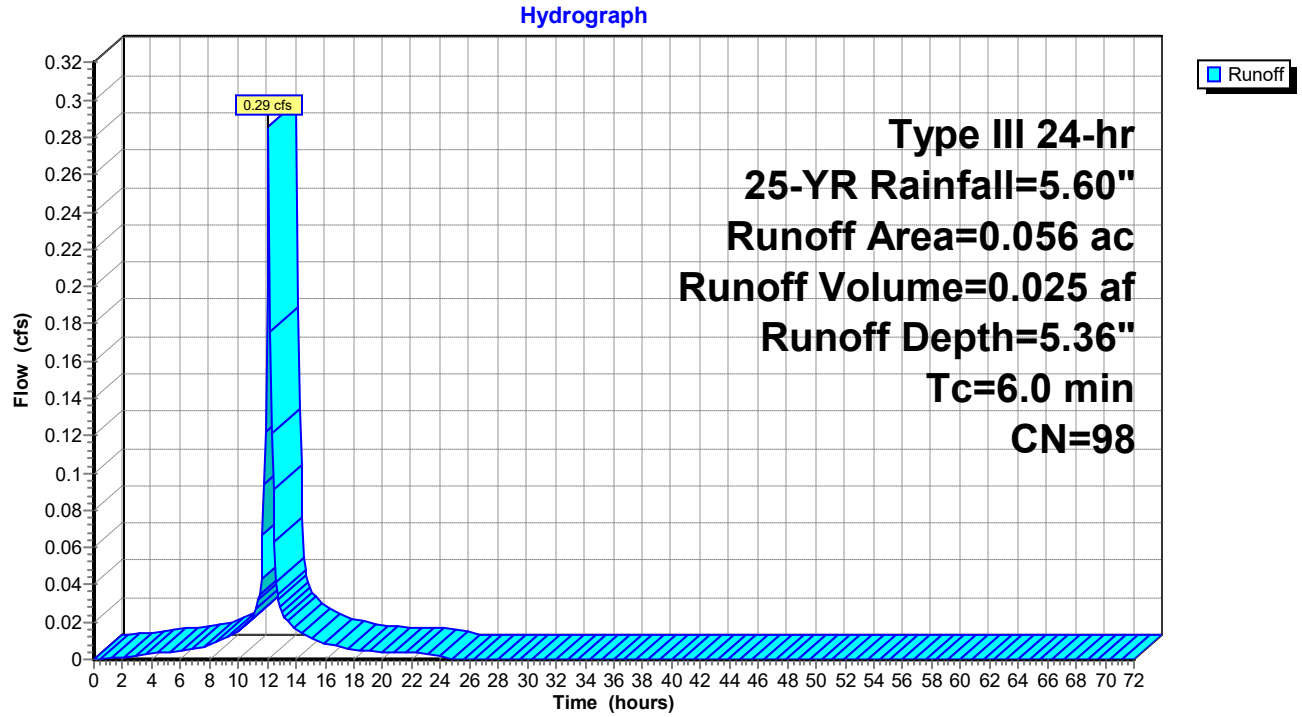
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.056	98	Roofs, HSG A
0.056		100.00% Impervious Area

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

Subcatchment DA 4: DA 4



Summary for Subcatchment DA 5: DA 5

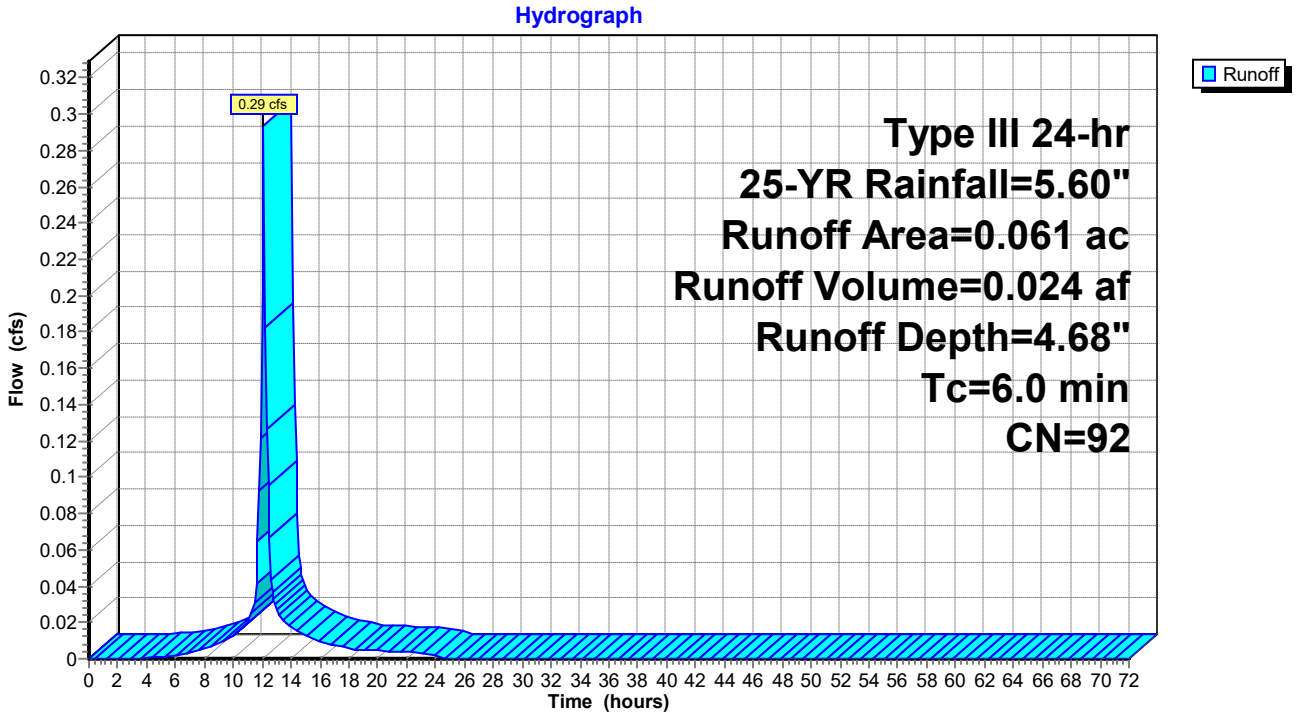
Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.024 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.055	98	Paved parking, HSG A
0.006	39	>75% Grass cover, Good, HSG A
0.061	92	Weighted Average
0.006		9.84% Pervious Area
0.055		90.16% Impervious Area

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

Subcatchment DA 5: DA 5



Summary for Subcatchment DA 6: DA 6

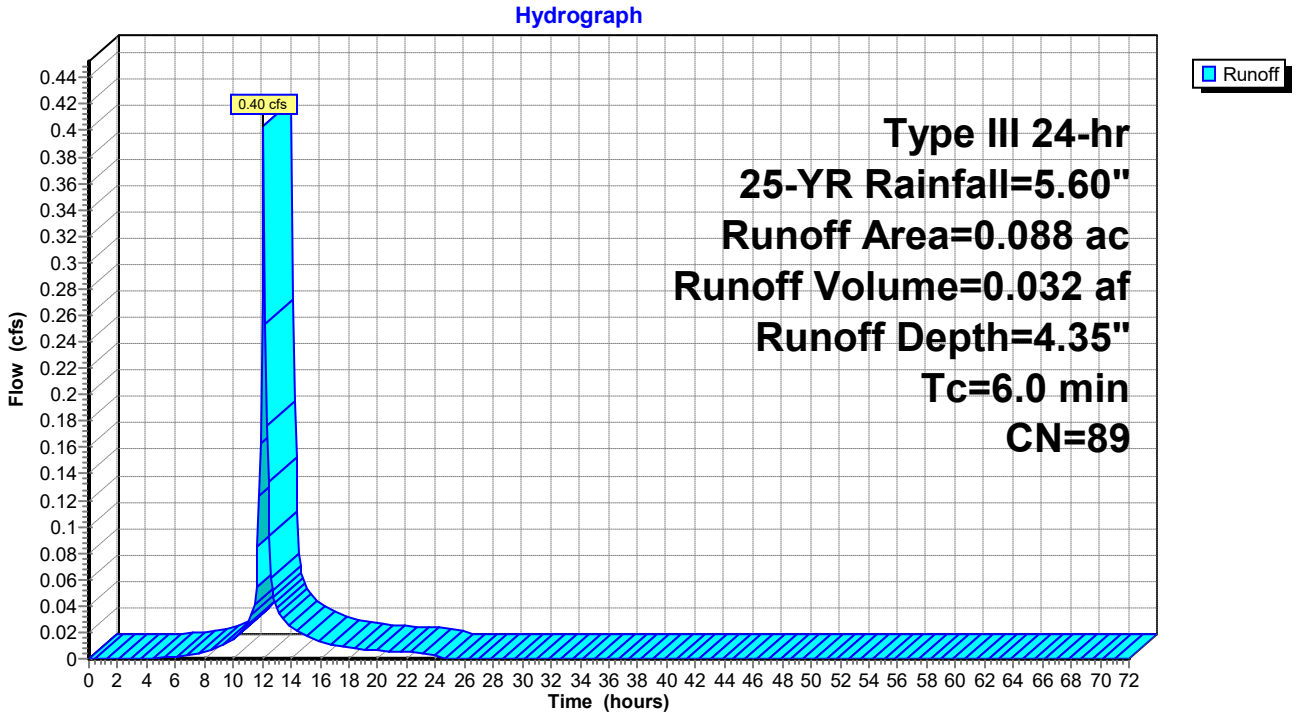
Runoff = 0.40 cfs @ 12.10 hrs, Volume= 0.032 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.074	98	Paved parking, HSG A
0.014	39	>75% Grass cover, Good, HSG A
0.088	89	Weighted Average
0.014		15.91% Pervious Area
0.074		84.09% Impervious Area

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

Subcatchment DA 6: DA 6



Summary for Subcatchment DA 7: DA 7

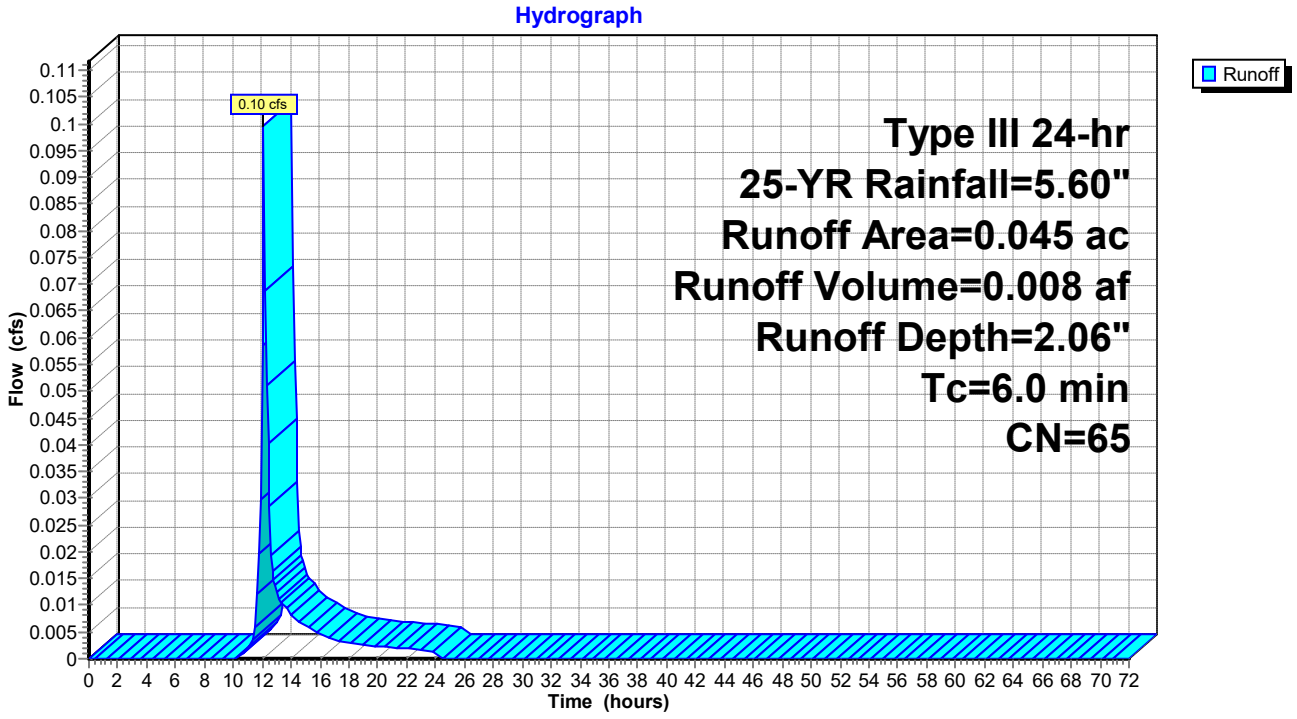
Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.008 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.020	98	Paved parking, HSG A
0.025	39	>75% Grass cover, Good, HSG A
0.045	65	Weighted Average
0.025		55.56% Pervious Area
0.020		44.44% Impervious Area

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

Subcatchment DA 7: DA 7



Summary for Subcatchment DA 8: DA 8

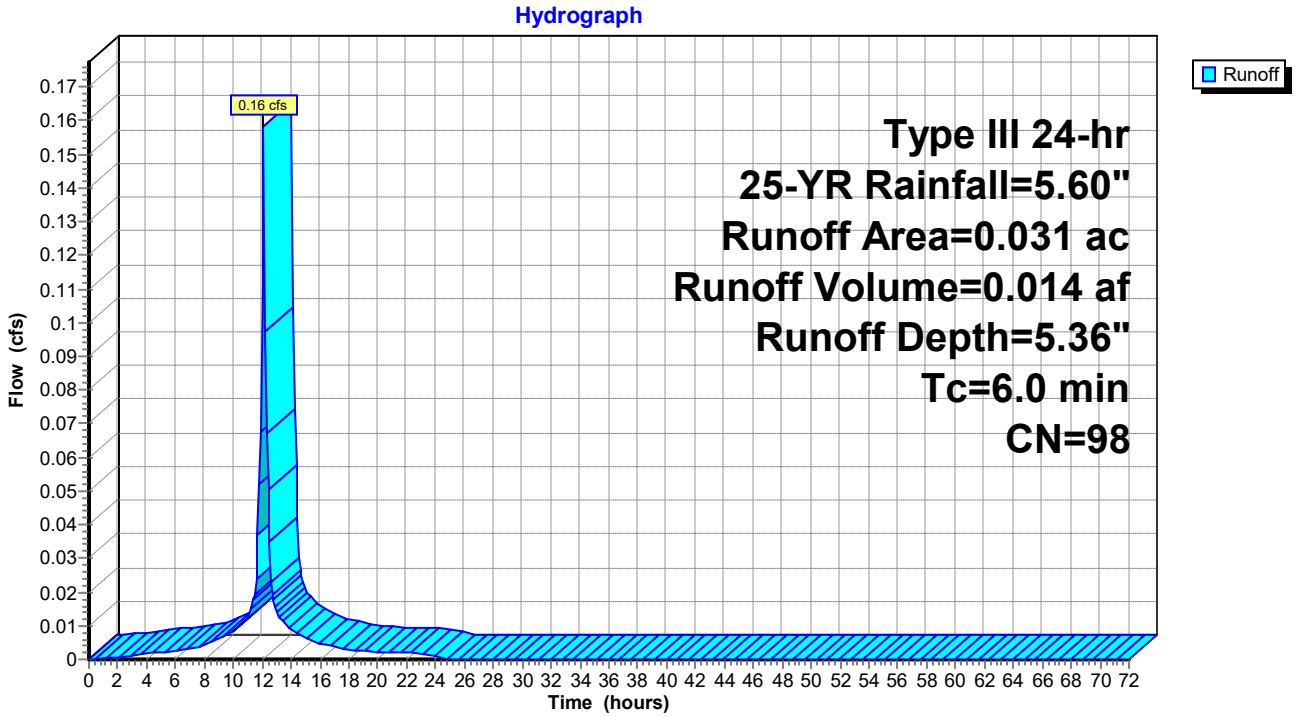
Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.031	98	Paved parking, HSG A
0.031		100.00% Impervious Area

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

Subcatchment DA 8: DA 8



Summary for Subcatchment DA 9: DA 9

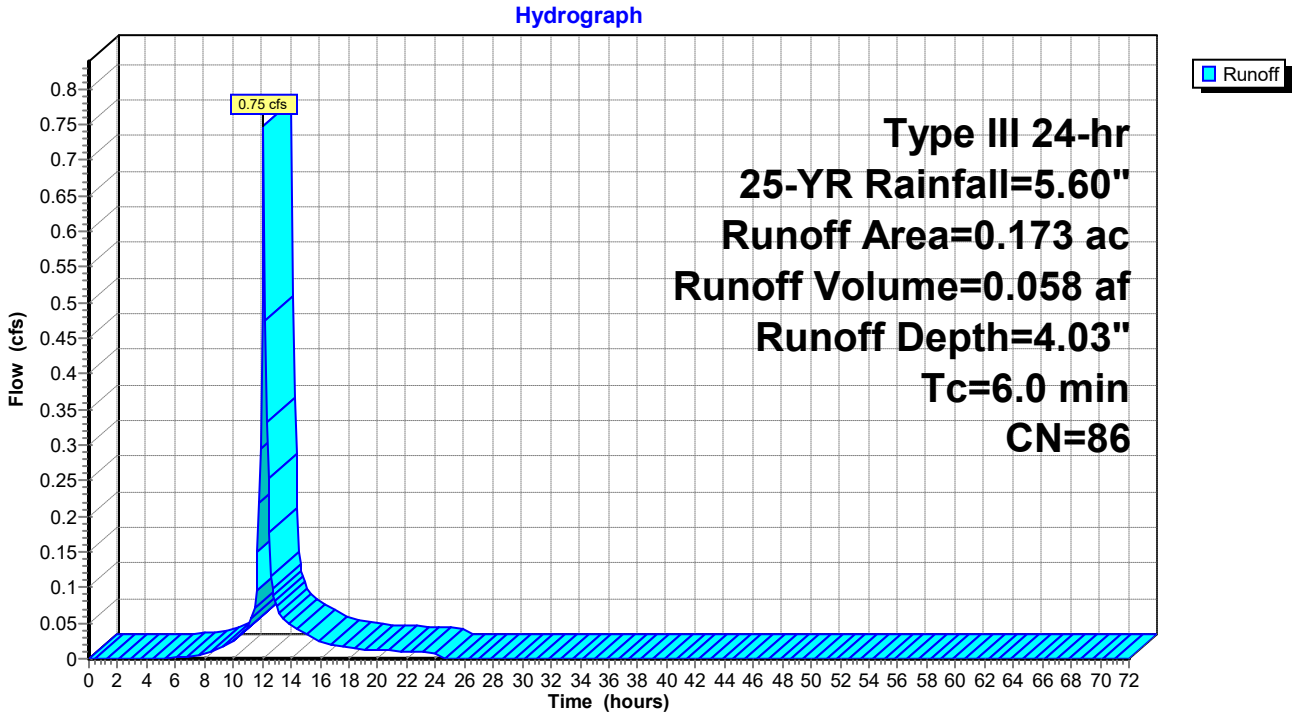
Runoff = 0.75 cfs @ 12.10 hrs, Volume= 0.058 af, Depth= 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-YR Rainfall=5.60"

Area (ac)	CN	Description
0.139	98	Paved parking, HSG A
0.034	39	>75% Grass cover, Good, HSG A
0.173	86	Weighted Average
0.034		19.65% Pervious Area
0.139		80.35% Impervious Area

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

Subcatchment DA 9: DA 9

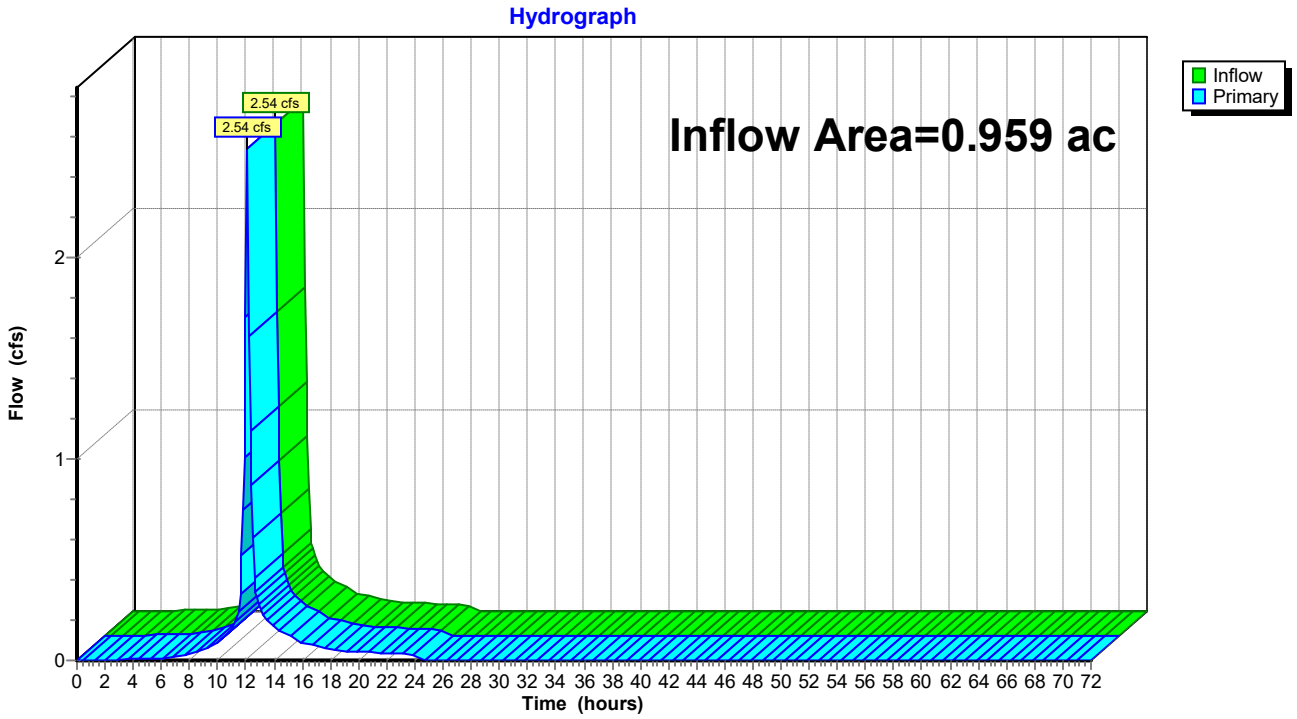


Summary for Pond POA A: POA A

Inflow Area = 0.959 ac, 64.23% Impervious, Inflow Depth = 2.58" for 25-YR event
Inflow = 2.54 cfs @ 12.10 hrs, Volume= 0.206 af
Primary = 2.54 cfs @ 12.10 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Pond POA A: POA A

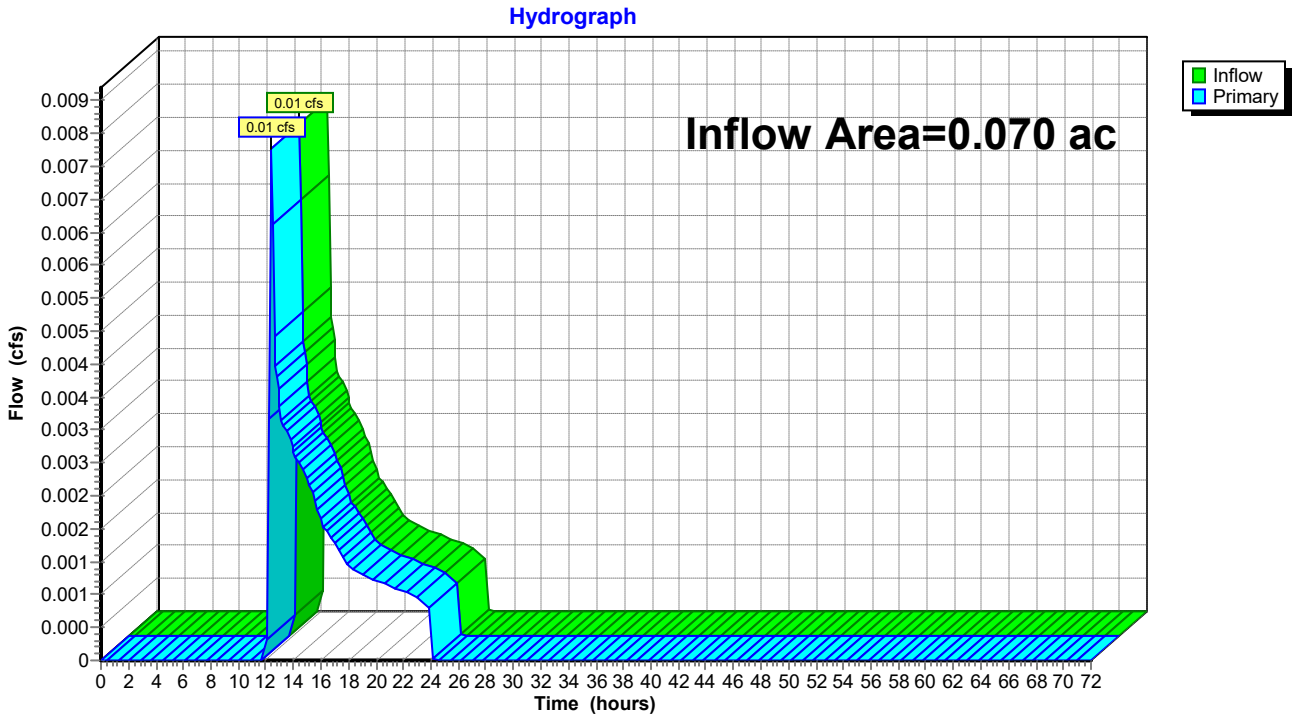


Summary for Pond POA B: POA B

Inflow Area = 0.070 ac, 0.00% Impervious, Inflow Depth = 0.34" for 25-YR event
Inflow = 0.01 cfs @ 12.39 hrs, Volume= 0.002 af
Primary = 0.01 cfs @ 12.39 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Pond POA B: POA B



Summary for Pond SMA: RAIN GARDEN

Inflow Area = 0.222 ac, 62.61% Impervious, Inflow Depth = 3.04" for 25-YR event
Inflow = 0.74 cfs @ 12.10 hrs, Volume= 0.056 af
Outflow = 0.27 cfs @ 12.40 hrs, Volume= 0.056 af, Atten= 63%, Lag= 17.7 min
Discarded = 0.27 cfs @ 12.40 hrs, Volume= 0.056 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 182.38' @ 12.40 hrs Surf.Area= 1,764 sf Storage= 492 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.5 min (838.6 - 827.1)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	2,391 cf	**Surface (Conic)** Listed below (Recalc)
#2	180.00'	155 cf	**Filter Media (Conic)** Listed below (Recalc) 1,548 cf Overall x 10.0% Voids
		2,546 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
182.00	774	0	0	774
183.00	1,393	1,068	1,068	1,404
183.80	1,928	1,323	2,391	1,951

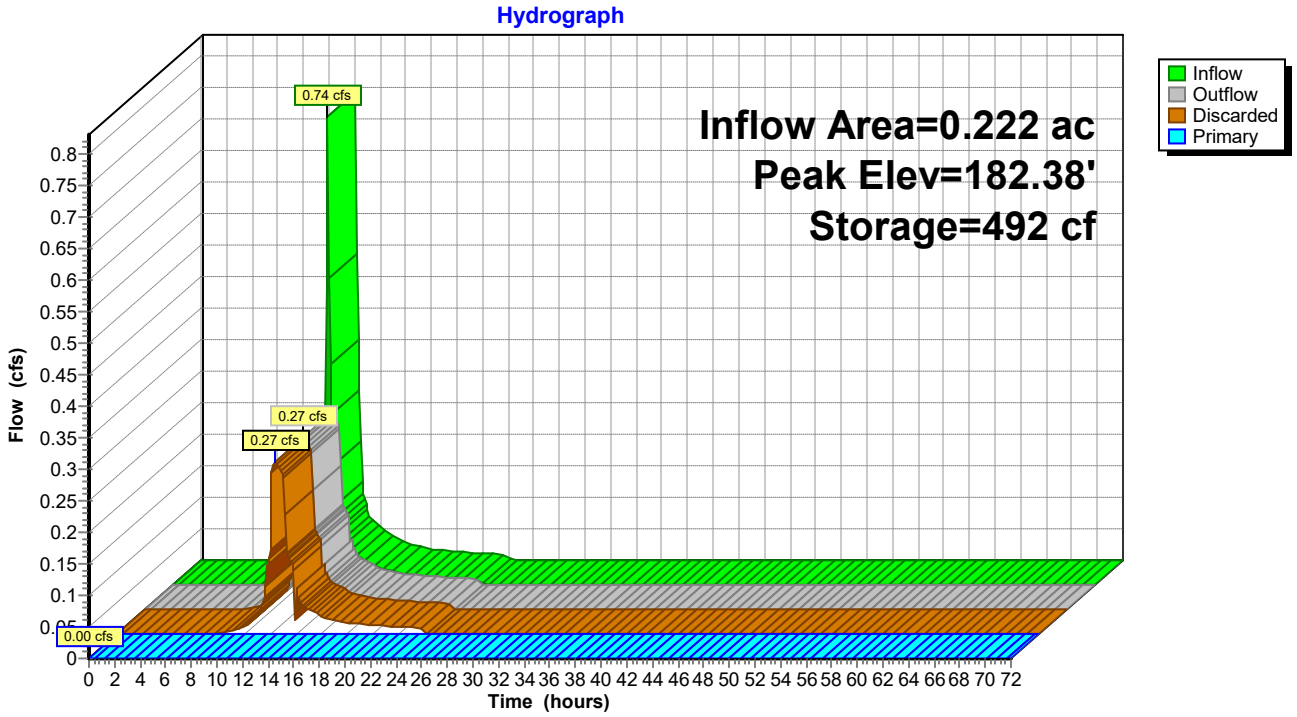
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
180.00	774	0	0	774
181.00	774	774	774	873
182.00	774	774	1,548	971

Device	Routing	Invert	Outlet Devices
#1	Discarded	180.00'	**6.000 in/hr Exfiltration over Wetted area** Phase-In= 0.05'
#2	Primary	182.70'	**2.0" x 2.0" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.27 cfs @ 12.40 hrs HW=182.38' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=180.00' TW=0.00' (Dynamic Tailwater)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Pond SMA: RAIN GARDEN



Stage-Discharge for Pond SMA: RAIN GARDEN

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
180.00	0.00	0.00	0.00
180.05	0.11	0.11	0.00
180.10	0.11	0.11	0.00
180.15	0.11	0.11	0.00
180.20	0.11	0.11	0.00
180.25	0.11	0.11	0.00
180.30	0.11	0.11	0.00
180.35	0.11	0.11	0.00
180.40	0.11	0.11	0.00
180.45	0.11	0.11	0.00
180.50	0.11	0.11	0.00
180.55	0.12	0.12	0.00
180.60	0.12	0.12	0.00
180.65	0.12	0.12	0.00
180.70	0.12	0.12	0.00
180.75	0.12	0.12	0.00
180.80	0.12	0.12	0.00
180.85	0.12	0.12	0.00
180.90	0.12	0.12	0.00
180.95	0.12	0.12	0.00
181.00	0.12	0.12	0.00
181.05	0.12	0.12	0.00
181.10	0.12	0.12	0.00
181.15	0.12	0.12	0.00
181.20	0.12	0.12	0.00
181.25	0.12	0.12	0.00
181.30	0.13	0.13	0.00
181.35	0.13	0.13	0.00
181.40	0.13	0.13	0.00
181.45	0.13	0.13	0.00
181.50	0.13	0.13	0.00
181.55	0.13	0.13	0.00
181.60	0.13	0.13	0.00
181.65	0.13	0.13	0.00
181.70	0.13	0.13	0.00
181.75	0.13	0.13	0.00
181.80	0.13	0.13	0.00
181.85	0.13	0.13	0.00
181.90	0.13	0.13	0.00
181.95	0.13	0.13	0.00
182.00	0.24	0.24	0.00
182.05	0.25	0.25	0.00
182.10	0.25	0.25	0.00
182.15	0.25	0.25	0.00
182.20	0.26	0.26	0.00
182.25	0.26	0.26	0.00
182.30	0.27	0.27	0.00
182.35	0.27	0.27	0.00
182.40	0.27	0.27	0.00
182.45	0.28	0.28	0.00
182.50	0.28	0.28	0.00
182.55	0.29	0.29	0.00
182.60	0.29	0.29	0.00
182.65	0.30	0.30	0.00
182.70	0.30	0.30	0.00
182.75	1.18	0.31	0.88
182.80	1.83	0.31	1.52
182.85	2.18	0.32	1.86
182.90	2.47	0.32	2.15
182.95	2.73	0.32	2.41
183.00	2.97	0.33	2.64
183.05	3.18	0.33	2.85
183.10	3.38	0.34	3.05
183.15	3.57	0.34	3.23
183.20	3.75	0.35	3.40
183.25	3.92	0.35	3.57
183.30	4.09	0.36	3.73
183.35	4.24	0.36	3.88
183.40	4.39	0.37	4.03
183.45	4.54	0.37	4.17
183.50	4.68	0.38	4.31
183.55	4.82	0.38	4.44
183.60	4.95	0.39	4.57
183.65	5.08	0.39	4.69
183.70	5.21	0.40	4.81
183.75	5.33	0.40	4.93
183.80	**5.46**	**0.41**	**5.05**

Stage-Area-Storage for Pond SMA: RAIN GARDEN

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
180.00	774	0
180.05	779	4
180.10	784	8
180.15	789	12
180.20	794	15
180.25	799	19
180.30	804	23
180.35	809	27
180.40	813	31
180.45	818	35
180.50	823	39
180.55	828	43
180.60	833	46
180.65	838	50
180.70	843	54
180.75	848	58
180.80	853	62
180.85	858	66
180.90	863	70
180.95	868	74
181.00	873	77
181.05	878	81
181.10	882	85
181.15	887	89
181.20	892	93
181.25	897	97
181.30	902	101
181.35	907	104
181.40	912	108
181.45	917	112
181.50	922	116
181.55	927	120
181.60	932	124
181.65	937	128
181.70	942	132
181.75	947	135
181.80	952	139
181.85	956	143
181.90	961	147
181.95	966	151
182.00	1,745	155
182.05	1,772	194
182.10	1,800	235
182.15	1,828	277
182.20	1,856	320
182.25	1,885	365
182.30	1,915	412
182.35	1,945	459
182.40	1,975	509
182.45	2,006	559
182.50	2,037	612
182.55	2,069	665
182.60	2,101	721
182.65	2,134	778
182.70	2,167	836
182.75	2,200	897
182.80	2,234	959
182.85	2,269	1,022
182.90	2,304	1,087
182.95	2,339	1,154
183.00	2,375	1,223
183.05	2,407	1,294
183.10	2,438	1,366
183.15	2,471	1,439
183.20	2,503	1,514
183.25	2,536	1,591
183.30	2,570	1,669
183.35	2,603	1,749
183.40	2,637	1,831
183.45	2,672	1,914
183.50	2,707	1,999
183.55	2,742	2,086
183.60	2,777	2,175
183.65	2,813	2,265
183.70	2,849	2,357
183.75	2,885	2,450
183.80	**2,922**	**2,546**

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.139 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 10: DA 10 Runoff Area=0.035 ac 62.86% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=76 Runoff=0.04 cfs 0.003 af

Subcatchment DA 11: DA 11 Runoff Area=0.017 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 12: DA 12 Runoff Area=0.053 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 2: DA 2 Runoff Area=0.109 ac 73.39% Impervious Runoff Depth=1.33"
Tc=6.0 min CN=82 Runoff=0.16 cfs 0.012 af

Subcatchment DA 3: DA 3 Runoff Area=0.222 ac 62.61% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=76 Runoff=0.23 cfs 0.018 af

Subcatchment DA 4: DA 4 Runoff Area=0.056 ac 100.00% Impervious Runoff Depth=2.71"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.013 af

Subcatchment DA 5: DA 5 Runoff Area=0.061 ac 90.16% Impervious Runoff Depth=2.10"
Tc=6.0 min CN=92 Runoff=0.14 cfs 0.011 af

Subcatchment DA 6: DA 6 Runoff Area=0.088 ac 84.09% Impervious Runoff Depth=1.85"
Tc=6.0 min CN=89 Runoff=0.18 cfs 0.014 af

Subcatchment DA 7: DA 7 Runoff Area=0.045 ac 44.44% Impervious Runoff Depth=0.48"
Tc=6.0 min CN=65 Runoff=0.02 cfs 0.002 af

Subcatchment DA 8: DA 8 Runoff Area=0.031 ac 100.00% Impervious Runoff Depth=2.71"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af

Subcatchment DA 9: DA 9 Runoff Area=0.173 ac 80.35% Impervious Runoff Depth=1.61"
Tc=6.0 min CN=86 Runoff=0.31 cfs 0.023 af

Pond POA A: POA A Inflow=1.06 cfs 0.084 af
Primary=1.06 cfs 0.084 af

Pond POA B: POA B Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond SMA: RAIN GARDEN Peak Elev=180.87' Storage=67 cf Inflow=0.23 cfs 0.018 af
Discarded=0.12 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.018 af

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.139 ac 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment DA 10: DA 10 Runoff Area=0.035 ac 62.86% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=76 Runoff=0.08 cfs 0.006 af

Subcatchment DA 11: DA 11 Runoff Area=0.017 ac 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 12: DA 12 Runoff Area=0.053 ac 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment DA 2: DA 2 Runoff Area=0.109 ac 73.39% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=82 Runoff=0.31 cfs 0.023 af

Subcatchment DA 3: DA 3 Runoff Area=0.222 ac 62.61% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=76 Runoff=0.51 cfs 0.038 af

Subcatchment DA 4: DA 4 Runoff Area=0.056 ac 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.020 af

Subcatchment DA 5: DA 5 Runoff Area=0.061 ac 90.16% Impervious Runoff Depth=3.53"
Tc=6.0 min CN=92 Runoff=0.23 cfs 0.018 af

Subcatchment DA 6: DA 6 Runoff Area=0.088 ac 84.09% Impervious Runoff Depth=3.23"
Tc=6.0 min CN=89 Runoff=0.30 cfs 0.024 af

Subcatchment DA 7: DA 7 Runoff Area=0.045 ac 44.44% Impervious Runoff Depth=1.29"
Tc=6.0 min CN=65 Runoff=0.06 cfs 0.005 af

Subcatchment DA 8: DA 8 Runoff Area=0.031 ac 100.00% Impervious Runoff Depth=4.19"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.011 af

Subcatchment DA 9: DA 9 Runoff Area=0.173 ac 80.35% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=86 Runoff=0.55 cfs 0.042 af

Pond POA A: POA A Inflow=1.88 cfs 0.150 af
Primary=1.88 cfs 0.150 af

Pond POA B: POA B Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Pond SMA: RAIN GARDEN Peak Elev=182.11' Storage=243 cf Inflow=0.51 cfs 0.038 af
Discarded=0.25 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.038 af

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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 DA 1: DA 1 Runoff Area=0.139 ac 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.05 cfs 0.008 af

Subcatchment DA 10: DA 10 Runoff Area=0.035 ac 62.86% Impervious Runoff Depth=3.98"
Tc=6.0 min CN=76 Runoff=0.15 cfs 0.012 af

Subcatchment DA 11: DA 11 Runoff Area=0.017 ac 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.001 af

Subcatchment DA 12: DA 12 Runoff Area=0.053 ac 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.003 af

Subcatchment DA 2: DA 2 Runoff Area=0.109 ac 73.39% Impervious Runoff Depth=4.63"
Tc=6.0 min CN=82 Runoff=0.55 cfs 0.042 af

Subcatchment DA 3: DA 3 Runoff Area=0.222 ac 62.61% Impervious Runoff Depth=3.98"
Tc=6.0 min CN=76 Runoff=0.97 cfs 0.074 af

Subcatchment DA 4: DA 4 Runoff Area=0.056 ac 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.030 af

Subcatchment DA 5: DA 5 Runoff Area=0.061 ac 90.16% Impervious Runoff Depth=5.75"
Tc=6.0 min CN=92 Runoff=0.36 cfs 0.029 af

Subcatchment DA 6: DA 6 Runoff Area=0.088 ac 84.09% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=89 Runoff=0.50 cfs 0.040 af

Subcatchment DA 7: DA 7 Runoff Area=0.045 ac 44.44% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=65 Runoff=0.14 cfs 0.011 af

Subcatchment DA 8: DA 8 Runoff Area=0.031 ac 100.00% Impervious Runoff Depth=6.45"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.017 af

Subcatchment DA 9: DA 9 Runoff Area=0.173 ac 80.35% Impervious Runoff Depth=5.07"
Tc=6.0 min CN=86 Runoff=0.93 cfs 0.073 af

Pond POA A: POA A Inflow=3.18 cfs 0.261 af
Primary=3.18 cfs 0.261 af

Pond POA B: POA B Inflow=0.02 cfs 0.004 af
Primary=0.02 cfs 0.004 af

Pond SMA: RAIN GARDEN Peak Elev=182.62' Storage=745 cf Inflow=0.97 cfs 0.074 af
Discarded=0.29 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.074 af

APPENDIX C

INDIVIDUAL DRAIN LINE SIZING

Attachment "D"

STORM DRAIN DESIGN

PROJECT:	PROPOSED RESTAURANT W/ DRIVE-THRU, 77 DERRY STREET
HSI JOB #:	1708-S
DESIGN METHOD:	RATIONAL METHOD
DESIGN STORM EVENT:	25-YR (PER TOWN OF HUDSON STORMWATER REGULATIONS)
COMPUTED BY:	EDB
DATE:	3/4/2024

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street Nashua, New Hampshire 03062-3301
Tel (603) 883-2057 www.hayner-swanson.com Fax (603) 883-5057

FROM PIPE INLET				TO PIPE OUTLET				SUBCATCHMENT AREA					PIPE SIZE & MATERIAL					PIPE CAPACITY						Water Velocity			
LOCATION	RIM	INVERT	COVER	LOCATION	RIM	INVERT	COVER	ACRES (ACRES)	C	CA (ACRES)	ΣCA (ACRES)	Tc (MIN)	LENGTH (FT)	SLOPE (FT/FT)	DIA. (IN)	MATERIAL	n	I (in/hr)	Q_{DESIGN} (cfs)	Q_{FULL} (cfs)	V_{FULL} (fps)	T_{FLOW} (min)	Q CHECK:	q/Q	d/D	v/V	Vdesign
CB 6	184.5	178.91	3.74	CB 5	184.7	178.53	5.17	0.09	0.76	0.07	0.07	6.0	51	0.008	12	HDPE	0.012	6.5	0.44	3.46	4.40	0.2	OK	13%	24%	67%	2.95
CB 5	184.7	178.43	5.27	DMH 3	185.4	177.92	6.48	0.06	0.84	0.08	0.14	6.2	38	0.012	12	HDPE	0.012	6.5	0.94	4.23	5.39	0.1	OK	22%	32%	80%	4.31
RD 4	-	180.50	-	DMH 3	185.4	180.43	4.14	0.06	0.90	0.05	0.05	6.0	4	0.016	10	DI	0.011	6.5	0.33	2.99	5.49	0.0	OK	11%	22%	64%	3.51
DMH 3	185.4	177.68	6.72	EXIST. CB	182.7	178.49	3.21			0.00	0.19	6.3	12	0.006	12	HDPE	0.012	6.4	1.22	2.99	3.81	0.1	OK	41%	44%	95%	3.60
CB 2	183.9	178.70	4.20	DMH 1	184.1	178.70	5.20	0.11	0.74	0.08	0.08	6.0	42	0.005	12	HDPE	0.012	6.5	0.52	2.73	3.48	0.2	OK	19%	29%	77%	2.68
CB 8	182.8	177.50	5.30	DMH 7	183.7	177.39	5.31	0.03	0.90	0.03	0.03	6.0	22	0.005	12	HDPE	0.012	6.5	0.18	2.73	3.48	0.1	OK	7%	17%	55%	1.91
CB 9	182.0	176.70	5.30	DMH 7	183.7	176.70	6.00	0.17	0.78	0.13	0.13	6.0	20	0.005	12	HDPE	0.012	6.5	0.85	2.73	3.48	0.0	OK	52%	41%	95%	3.65

APPENDIX D

NHDES BMP/GRV WORKSHEETS

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR (UNH Stormwater Center Specification)

Type/Node Name: _____

Enter the node name in the drainage analysis if applicable.

0.22	ac	A = Area draining to the practice	
0.14	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)	
0.14	ac-in	WQV= 1" x Rv x A	
494	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
49	cf	10% x WQV (check calc for sediment forebay)	
124	cf	25% x WQV (check calc for water stored in saturated zone)	
		Method of Pretreatment	
	cf	If pretrt is sed forebay: V_{SED} (sediment forebay volume)	**≥ 10%WQV**
836	cf	Volume below lowest orifice[1]	**≥ 100%WQV**
155	cf	Water stored in voids of saturated zone	**≥ 26%WQV**
0.01	cfs	$2Q_{avg}$ = 2* WQV / 24 hrs * (1hr / 3600 sec)[2]	
182.39	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
-	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	**< $2Q_{WQV}$**
-	hours	T_{ED} = Drawdown time of extended detention = 2WQV/Q_{WQV}	**≥ 24-hrs**
24.00	in	Depth of Filter Media	**≥ 18"**
3.00	:1	Pond side slopes	**≥ 3:1**
		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤6")?	
182.62	ft	Peak elevation of the 50-year storm event (E_{50})	
183.80	ft	Berm elevation of the pond	
YES		E_{50} ≤ the berm elevation?	**← yes**

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

APPENDIX E

DRAINAGE DESIGN SUPPORT MATERIAL

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	42.773 degrees North
Longitude	71.445 degrees West
Elevation	40 feet
Date/Time	Wed Mar 06 2024 08:43:19 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2da
1yr	0.27	0.42	0.52	0.68	0.85	1.07	**1yr**	0.74	1.01	1.24	1.56	1.96	2.47	2.71	**1yr**	2.19	2.6
2yr	0.33	0.51	0.64	0.84	1.05	1.32	**2yr**	0.91	1.21	1.53	1.90	2.37	2.94	3.27	**2yr**	2.61	3.1
5yr	0.39	0.61	0.77	1.03	1.31	1.67	**5yr**	1.13	1.52	1.93	2.41	3.00	3.72	4.16	**5yr**	3.29	4.0
10yr	0.44	0.70	0.88	1.20	1.55	1.99	**10yr**	1.34	1.80	2.31	2.89	3.59	4.43	4.99	**10yr**	3.92	4.8
25yr	0.53	0.83	1.06	1.46	1.94	2.51	**25yr**	1.68	2.24	2.92	3.67	4.55	5.60	6.36	**25yr**	4.96	6.1
50yr	0.59	0.95	1.21	1.70	2.30	3.00	**50yr**	1.99	2.66	3.51	4.41	5.46	6.69	7.64	**50yr**	5.92	7.3
100yr	0.68	1.10	1.42	2.00	2.73	3.58	**100yr**	2.36	3.15	4.20	5.27	6.53	8.00	9.18	**100yr**	7.08	8.8
200yr	0.77	1.26	1.63	2.34	3.24	4.28	**200yr**	2.79	3.74	5.03	6.33	7.83	9.56	11.04	**200yr**	8.46	10.6
500yr	0.93	1.53	1.99	2.90	4.06	5.40	**500yr**	3.51	4.69	6.37	8.03	9.93	12.11	14.09	**500yr**	10.72	13.5

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2da
1yr	0.22	0.34	0.42	0.57	0.70	0.80	**1yr**	0.60	0.78	1.06	1.32	1.67	2.28	2.56	**1yr**	2.02	2.4

Attachment "D"

INSPECTION & MAINTENANCE (I&M) MANUAL

Proposed Drive-Thru Restaurant Building Project
Tax Map 165, Lot 155
Hudson Mall, 77 Derry Street
Hudson, New Hampshire

March 4, 2024

Prepared for:
Hudson-Vickerry, LLC
c/o The MEG Cos., 25 Orchard View Drive
Londonderry, NH 03053

Prepared by:
Hayner/Swanson, Inc.
3 Congress Street
Nashua, NH 03062

In accordance with the Town of Hudson Stormwater Regulations Section 290, the mechanism for providing long-term inspection and maintenance of stormwater management practices for this development are as follows:

I. RESPONSIBLE MAINTENANCE PARTY

Hudson-Vickerry, LLC
c/o The MEG Cos., 25 Orchard View Drive
Londonderry, NH 03053

Attn: Dan Gordon
Phone: (603) 434-6700
Email: gorstar@icloud.com

For Hudon-Vickerry, LLC:

_____ _____
Name Date

II. MAINTENANCE RECOMMENDATIONS FOR BMP's

The following recommendations are to be used as a guide for the inspection and maintenance of the permanent erosion and sediment control measures.

A. PARKING/LOADING AREA SWEEPING

- Inspect parking and loading areas at least semi-annually for the accumulation of sediment along drainage flow lines. Additional inspections recommended particularly during and after the winter months if the ice conditions during the winter were severe.
- Sweep parking and loading areas to remove sediment buildup along and drainage flow lines.
- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.

B. DEEP-SUMP CATCH BASINS, DRAIN MANHOLES, AND INLET STRUCTURES

- Inspect structures at least semi-annually at the same time that the parking lot and loading areas are inspected.
- Vacuum the sediment in the catch basins when the sediment reaches one-half the depth from the bottom of the sump to the invert of the outlet pipe.
- Repair damaged catch basin structure grates immediately after the inspection.
- Repair pavement damage around structures immediately after the inspection to prevent further damage.

- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.

C. DETENTION/INFILTRATION BASIN

- Inspect the basins at least twice annually, and following any rainfall event exceeding 2.5-inches in a 24-hour period, with maintenance or rehabilitation as warranted by such inspection.
- Inspect, repair and remove debris from basin, grass swales, and areas around the associated and inlet structures as needed.
- Dispose of sediments and other wastes in conformance with applicable local, state, and federal regulations.
- If the systems do 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.
- Mowing of the detention basin shall occur, on average, twice a year during the growing season.

III. INSPECTION CHECKLIST/MAINTENANCE AND DEICING LOGS

The accompanying sheets to this section are to be used as a guide for the inspection reporting for this project. Inspection reports shall include photographs of the above-referenced practices.

Completed inspection reports should be kept on-site and be easily accessible to the Town Engineer.

Inspection Checklist & Maintenance Log

Project Name: Proposed Drive-Thru Restaurant, 77 Derry St., Hudson, NH

☐ Deep-sump catch basins, and drain manholes.

☐ Stormwater management area slope stability and debris removal.

Inspection Date	Inspector Name(s)	Description of BMP Condition	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

Deicing Log

Project Name: Proposed Drive-Thru Restaurant, 77 Derry St., Hudson, NH

Application Date	Application	Type of Deicer	Amount of Deicer

INFILTRATION FEASIBILITY REPORT

Proposed Drive-Thru Restaurant Building Project
Site Plan
Hudson Mall, 77 Derry Street
Hudson, NH

The proposed development project contains one stormwater practice that will require infiltration to properly function. The project proposes one stormwater detention/infiltration basin (SMA).

A. Infiltration Report:

1. Location of the practice:

Stormwater Management Area – Located in the northwestern corner of the site.

2. Existing Topography:

The subject property is currently developed as a commercial retail building site. Parking and pavement areas surround the building on four sides. The majority of the site contains slight to moderate topography.

3. Test Pit Location:

Because the proposed infiltration practice is to be located in an area that is currently a paved parking lot, a test pit will be conducted under Hayner/Swanson's supervision during construction to confirm design infiltration rates and seasonal high water table.

4. Test Pit Logs:

Test pits logs will be submitted to the Hudson Engineering Department upon completion.

5. Soil Plan in the area of the proposed stormwater practices:

According to NRCS Soils mapping, the subject property contains Windsor loamy sand (WdA) type soils in the area of the proposed infiltration practice (rain garden – SMA).

6. Infiltration Rate Testing:

The proposed rain garden infiltration practice is designed with a 24" filter media with an infiltration rate of 6.0 inches/hour. Infiltration rate testing (Ksat) will be performed in one test pit during construction to confirm the infiltration rate of the underlying soil is 6.0 inches/hour or faster.

Attachment "D"

Map by NH GRANIT

Legend

- Remediation Sites
- Coastal and Great Bay Reg
- Designated Rivers Quarter
- Public Water Supply Wells
- Groundwater Classification
- Groundwater Classification
- Water Supply Intake Protec
- Wellhead Protection Areas
- Class A Lakes with a Quar
- Class A - All Features
- All Lakes, with a Quarter M
- Outstanding Resource Wat
- Surface Waters with Impair Mile Buffer
- Watersheds with Chloride I
- Parcels

Map Scale

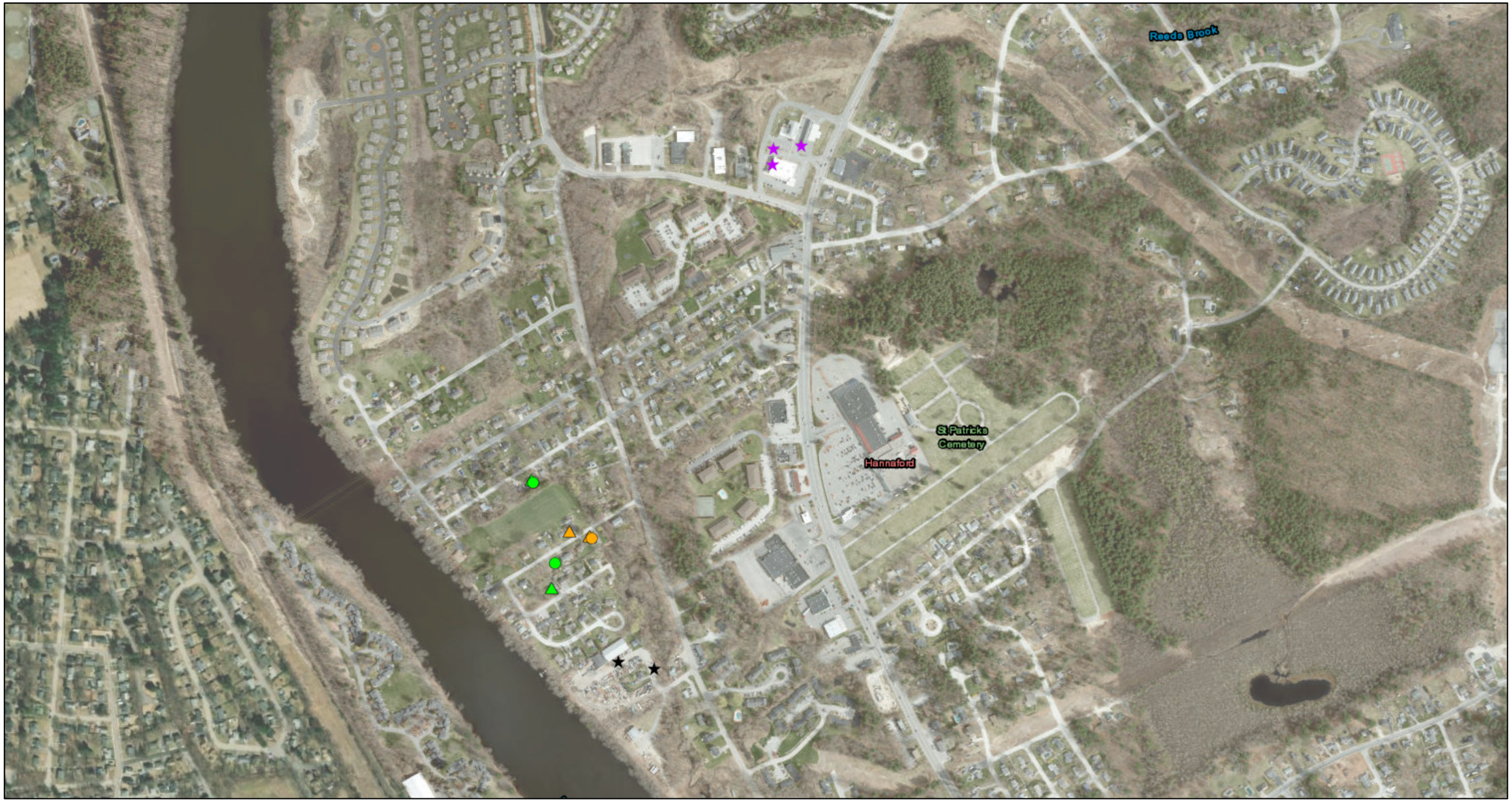
1: 3,247

Map Generated: 12/8/2023

Notes:

NHDES PFAS SAMPLING

Attachment "D"



December 8, 2023

1:9,028

Groundwater Samples

- PFAS > AGQS / MCL
- PFAS ≤ AGQS / MCL

Other Sample Type

- PFAS > AGQS / MCL
- PFAS ≤ AGQS / MCL

Sites Screening for PFAS

- Site with PFAS > AGQS
- Site with PFAS Detections

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

Town of Hudson, NH, VCGI, Maxar, City of Nashua, Esri, HERE, Garmin, iPC

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Background:

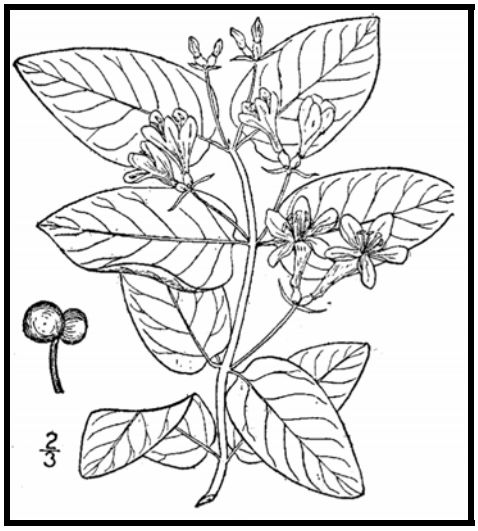
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants,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

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

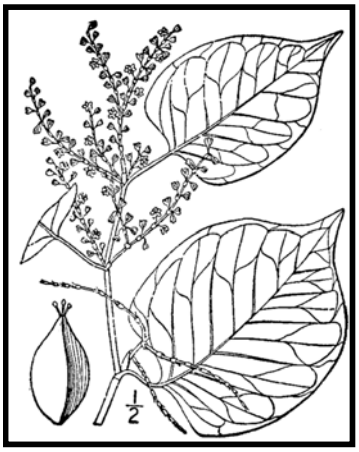
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

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

Attachment "D"

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

January 2010

Attachment "D"

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.*

Attachment "D"

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.

Attachment "D"

DRAFT

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Attachment "D"

DRAFT STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Proposed Drive-Thru Restaurant

HUDSON MALL, 77 DERRY STREET
HUDSON, NEW HAMPSHIRE

MARCH 4, 2024

PREPARED FOR:

HUDSON-VICKERRY, LLC
C/O THE MEG COMPANIES
25 ORCHARD VIEW LANE
LONDONDERRY, NH 03053

PREPARED BY:

HSI Hayner/Swanson, Inc.

Civil Engineers/Land Surveyors

3 Congress Street
Nashua, New Hampshire 03062
(603) 883-2057

131 Middlesex Turnpike
Burlington, Massachusetts 01803
(781) 203-1501

www.hayner-swanson.com

Attachment "D"

CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or 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.

Name: James N. Petropulos, P.E. Title: President/Principal Engineer

Signature: _____ Date: _____

FOR HUDSON-VICKERRY, LLC :
I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) Permit that authorizes the storm water discharge associated with activity from the construction site identified as part of this certification.

Name: _____ Title: _____

Signature: _____ Date: _____

FOR SELECTED SITE CONTRACTOR:
I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) Permit that authorizes the storm water discharge associated with activity from the construction site identified as part of this certification.

Name: _____ Title: _____

Signature: _____ Date: _____

Attachment "D"

March 4, 2024
Job No. 1708-S

Mr. Daniel Gordon
Hudson-Vickerry, LLC
c/o The MEG Companies, 25 Orchard View Drive
Londonderry, NH 03053

RE: STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
PROPOSED DRIVE-THRU RESTAURANT
HUDSON MALL, 77 DERRY STREET
HUDSON, NEW HAMPSHIRE

Dear Mr. Gordon:

Pursuant to the above referenced project, please find attached a Stormwater Pollution Prevention Plan (SWPPP) as required by the 2022 EPA NPDES Construction General Permit (CGP). The SWPPP has been prepared for use by your office and by the Site Contractor during the construction of this project. Amendments to the SWPPP are possible as the project progresses or if site conditions change.

Please feel free to contact me if you have any questions regarding this project.

Sincerely,

Earle D. Blatchford
Senior Project Manager
Hayner/Swanson, Inc.

Attachment "D"

SWPPP Amendment Log

Project Name: **Proposed Drive-Thru Restaurant**
Project Location: **Hudson Mall, 77 Derry Street, Hudson, NH**
SWPPP Contact: **Dan Gordon, Hudson-Vickerry, LLC, c/o The MEG Cos., 25 Orchard View Drive, Londonderry, NH**

Number	Date	Description of the Amendment	Authorized Representative Signature

Attachment "D"

DRAFT
STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

PROPOSED DRIVE-THRU RESTAURANT
HUDSON MALL
TAX MAP 165, LOT 155
77 DERRY STREET
HUDSON, NEW HAMPSHIRE 03051

MARCH 4, 2024

PREPARED FOR:

HUDOSN-VICKERRY, LLC
C/O THE MEG COS., 25 ORCHARD VIEW DRIVE
LONDONDERRY, NH 03053

PREPARED BY:

HAYNER/SWANSON, INC.
3 CONGRESS STREET
NASHUA, NEW HAMPSHIRE 03062

TABLE OF CONTENTS

SECTION 1: INTRODUCTION

1.1 Background

Federal law (40 CFR Part 122) requires that all construction sites with disturbed areas over one-acre comply with notification and other requirements of the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit. The law requires the "Operator" of the site to prepare a Stormwater Pollution Prevention Plan (SWPPP) and submit a Notice of Intent for Stormwater Discharges Associated with Construction Activity (NOI) form to the EPA at least fourteen (14) days prior to commencement of construction activity. The SWPPP needs to be maintained and retained at the construction site. The Contractor shall assume or delegate the duties of the "Operator" of the SWPPP, which shall include signing and forwarding a copy of the NOI to the EPA and performing the duties of the "Operator" during construction activities and provide to the EPA a Notice of Termination (NOT) form at the completion of the work.

1.2 Purpose of SWPPP

The goal of the SWPPP is to protect and improve the quality of the surface waters of the United States by reducing the amount of pollutants potentially contained in strormwater runoff through implementation, inspection and maintenance of the SWPPP. The purpose of the SWPPP is to identify potential sources of pollution and implement best management practices to reduce/prevent pollution caused by stormwater runoff.

SECTION 2: PROJECT OPERATORS, CONTACTS & PERMIT INFORMATION

2.1 Project Operators

1) Hudson-Vickerry, LLC, Londonderry, NH

2.2 Stormwater Team

Owner/ Applicant:	Hudson-Vickerry, LLC c/o The MEG Cos., 25 Orchard View Drive Londonderry, NH 03053 Attn: Dan Gordon (603) 434-6700 gorstar@icloud.com
Site Contractor:	(To be selected at a later date)
Engineer/SWPPP Preparer:	Hayner/Swanson, Inc. 3 Congress Street Nashua, NH 03062 Attn: James, N. Petropulos, P.E. (603) 882-2057 jpetropulos@hayner-swanson.com
Persons Conducting Inspections:	Hayner/Swanson, Inc. 3 Congress Street Nashua, NH 03062 Attn: James, N. Petropulos, P.E. (603) 882-2057 jpetropulos@hayner-swanson.com

Verification should be included with the SWPPP that the stormwater team has received the training required in Part 6.2 of the CGP. Documentation should be included that demonstrate that the persons performing inspections have received the training required by Part 6.3 such as a certificate showing that the personnel have completed the training and passed the exam pursuant to Part 6.3b.

2.3 Location of SWPPP

The SWPPP shall be available in the Contractor's construction trailer on the site. In the event that the project is inactive, or the SWPPP is otherwise inaccessible, the SWPPP may be viewed at the office of Site Contractor.

2.4 Posting of Permit

Per Section 1.5 of the 2022 Construction General Permit, the Contractor shall post a sign or other notice of the permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located to that it is visible

from the public road that is nearest to the active part of the construction site, and it must use a font large enough to be readily viewed from a public right-of-way. At a minimum, the notice must include the following the NPDES ID, a contact name and phone number for obtaining additional construction site information, and the following statements:

- "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Region 1 Office at (617) 918-1014."
- "If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

SECTION 3: PROJECT SITE/INFORMATION:

3.1 Project Location and Description:

The project area under consideration for this application is located at the north end of the Hudson Mall at 77 Derry Street, Hudson, NH (see Figure 1). The site is known to the Hudson Assessors Department as Map 165, Lot 155. The parcel measures 10.602 acres and is located in the B - Business zoning district. The site is abutted by Derry Street, and commercial and residential properties to the west; and St. Patrick Cemetery to the north, east, and south.

Latitude: 42° 46' 30" N Longitude: 71° 26' 37" W (per Google Earth)

3.2 Existing Conditions:

The lot currently contains a 1-story, 114,800 square foot retail shopping center building, and a 3,100 square foot fast-food drive thru restaurant; along with associated parking and loading areas. Primary access to the site is provided via one non-signalized full- access driveway off Derry Street at the southerly end of the site, and one signalized full-access driveway off Derry Street near the northerly end of the site. The site is currently serviced by municipal sewer and water, natural gas, and overhead telecommunications and electric utilities from Derry Street. Existing stormwater management practices consist of a series of catch basins, and underground drain pipes. This collection system discharges via underground pipe connection to the municipal drainage system in Derry Street.

NRCS soil mapping shows that this site contains Windsor loamy sands. The proposed building improvements are entirely in the area of Windsor soils. The property is completely developed with 9.6+/-% open space, and no onsite wetlands. No portion of the subject site is located within the 100-year Flood Hazard Area.

3.3 Project Description:

It is being proposed to construct a 1-story, 2,465 square foot coffee shop restaurant with drive-thru in the existing parking lot north of the main existing shopping center building. The project proposes to remove 68 existing parking spaces and adjacent

driveways to accommodate the new building, drive-thru, and parking lot with 20 new parking spaces. It is also proposed to eliminate 17 current employee parking spaces in the rear loading area to accommodate a truck maneuvering area. This results in a net reduction of 65 underutilized parking spaces. Associated site improvements include a new parking area, stormwater management systems, landscaping, site lighting, and utility services to the new building. To the best of our knowledge the sewer, water, gas, telecommunication, and electric utilities present onsite and in the adjacent roadway have adequate capacity to service this intended use.

Upon project completion the site will contain approximately 13.0+/-% open space, compared to the existing 9.6+/-%. There are no wetland impacts proposed. The layout for the proposed building and associated site improvements has been developed to integrate with the existing shopping center and minimize environmental issues. The site development associated with the overall construction of this project disturbs approximately 45,000 square feet of contiguous area and therefore a NHDES Alteration of Terrain permit is not required. It should be pointed out that 8,625 SF of the proposed disturbed area entails removing existing pavement areas outside the proposed project development pad (see post-development drainage subareas DA 1, DA 11, and DA 12) and converting them to landscape areas. This makes the effective disturbed area attributed to the proposed development equal to 36,375 SF. Construction is expected to begin in the summer of 2024 and will be completed in the summer of 2025.

The project scope will include, but is not limited to, the following activites:

- Erosion and sediment control.
- Earthwork including excavation, borrow and disposal of excess materials if necessary.
- Dust control.
- Demolition of site items
- Construction of new site driveways, and parking areas.
- Construction of building pad.
- Construction of on-site, drainage and stormwater management area.
- Construction of site lighting.
- Construction of utility main extensions/services
- Loam, seed, and landscaping improvements.
- All other work incidental to these items as shown on the drawings and specified herein.

3.4 Stormwater Management Description/Intent:

With regard to stormwater management, it is the intent of this design to address both qualitative and quantitative aspects of the runoff produced by the proposed improvements. The design shall address the requirements of the Town of Hudson Stormwater Management Regulations (Chapter 290) and NHDES stormwater design requirements by using, to the maximum practical extent, Low Impact Development (LID) strategies to promote recharge and reduce site disturbances. Furthermore, the

design shall seek to maintain existing drainage patterns, provide permanent methods for protecting water quality and minimize impacts to downstream drainage facilities.

To meet these goals, the proposed project will include a combination of stormwater management practices that include offline deep-sump catch basins fitted with gas hoods for stormwater pretreatment, and a rain garden bioretention area for stormwater treatment and groundwater recharge. The catch basins are designed to capture pavement areas less than 0.25 acres in size to meet NHDES requirements for pretreatment practices. The rain garden bioretention area will have an engineered filter media in the base. These measures are permanent methods for protecting water quality by providing pollutant removal through the use of vertical filtration through the filter media and native soils. Through settling, storage and recharge, infiltration practices can achieve high rates of removal for a number of urban pollutants (sediment, trace metals, hydrocarbons, BOD, nutrients, pesticides, etc.) and provide removal of total suspended solids, total nitrogen, and total phosphorous (New Hampshire Stormwater Manual). In addition to water quality benefits, the stormwater management area will provide flood control during large storm events by reducing the peak rates of runoff leaving this site.

3.5 Project Area and Runoff Information:

The site development associated with the overall construction of this project disturbs approximately 45,000+/- square feet (including 8,625+/- square feet of new landscape area outside the proposed development pad) of contiguous area and reduces existing impervious area by 0.35 +/- acres.

The proposed design provides qualitative treatment of stormwater and the removal of pollutants through the use of the above-referenced practices. The proposed stormwater management areas provide sufficient storage volumes so that the post-development peak flows leaving the project area are less than or equal to the pre-development peak flows for the 2, 10, 25 and 50-year storm events.

3.6 Receiving Waters:

Existing stormwater management practices consist of a series of catch basins, underground drain pipes, and swales. This collection system discharges to the municipal drainage system in Derry Street, which flows in the direction of the Merrimack River. The site is located 0.35+ miles from the Merrimack River “as the crow flies”.

3.7 Site Features and Sensitive Areas to be Protected:

The overall project layout for the Proposed Drive-Thru Restaurant project, including the layout of the access driveways, parking, and, building pad areas has been developed to minimize land disturbance in order to protect the natural resources of the site. There are no proposed wetland impacts associated with the proposed development.

3.8 Potential Sources of Pollution:

Potential sources of pollution for this project include the following:

- Petroleum products associated with fueling/servicing of construction vehicles including clean and used motor oil, transmission fluid, anti-freeze, and hydraulic fluid.
- Leakage of petroleum fluids from construction equipment.
- Eroded soil/turbidity transported by stormwater.
- Dust.
- Solid waste/debris from construction activity.
- Waste asphalt/concrete.
- Earthwork operations.
- Landscaping operations.

3.9 Allowable Sources of Non-Stormwater Discharges:

The following non-stormwater discharges may occur during the construction activity:

- Uncontaminated groundwater from dewatering.
- Irrigation water.
- Pavement wash-waters.
- Water from dust control.
- Fire hydrant flushing and uncontaminated water line flushing.
- Water used to wash vehicles where detergents are not used.
- Emergency fire-fighting activities.

Dewatering Requirements: Any construction dewatering must comply with the requirements in sections 2.4 and 3 of the CGP. In general, dewatering water should be routed through a sediment control such as a sediment trap, basin or dewatering bag. Sediment laden waters or water with visible floating solids, foam, sheen or oil deposits should not be discharged from the site. To prevent dewatering related erosion, water should only be discharged to stable, erosion resistant surfaces where velocity dissipation requirements can be met. For sites discharging to sensitive waters, consult CGP section 3.3 for additional turbidity monitoring requirements.

3.10 Endangered Species:

There is no federally-designated Critical Habitat in New Hampshire. The only federally-listed endangered and threatened species listed for the subject site is the Northern Long-eared Bat, which is threatened statewide (see Appendix E). **It is recommended that tree clearing minimized from June 1 to July 31 in order to mitigate potential impacts to bat habitats.**

3.11 Historic Preservation:

The property is currently developed as an existing retail shopping center which disturbed the majority of the site. The prior disturbances likely preclude the possibility that historical resources exist on the site.

3.12 References:

This SWPPP is subject to other documentation and reports that have been prepared for this project. These materials include the following:

- National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit (CGP) authorized February 17, 2022.
- New Hampshire Stormwater Manual, Volume 3, December 2008, prepared by NHDES.
- Best Management Practices for Roadside Invasive Plants, 2008, prepared by NHDOT.
- Site Plan (16 Sheets), Proposed Drive-Thru Restaurant, 77 Derry Street, Hudson, NH, prepared for Hudson-Vickerry, LLC, dated 16 February 2024 and prepared by Hayner/Swanson, Inc., Nashua, NH.
- Stormwater Management Report, Proposed Drive-Thru Restaurant, 77 Derry Street, Hudson, NH, prepared for Hudson-Vickerry, LLC, dated March 4, 2024 and prepared by Hayner/Swanson, Inc., Nashua, NH.

SECTION 4: EROSION & SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMP'S)

The following is a summary of temporary soil erosion and sediment control measures that are proposed for the project construction.

4.1 Minimize Disturbed Area and Protect Natural Features and Soil

The contractor shall minimize the area disturbed at any one-time during construction to minimize the potential for erosion from the construction site.

4.2 Control Storm Water Flow onto and through Project Site

The use of diversion berms/trenches shall be utilized where needed to divert and off-site stormwater from flowing through the construction site. Any diversion trench shall be stabilized prior to allowing stormwater to flow directly through the swale.

4.3 Street Cleaning and Construction Vehicle Tracking

Stabilized Construction Entrance/Exits:
Anti-tracking pads consisting of stone will be installed at the exit to the construction area to prevent the off-site transport of sediment by construction vehicles. The pad will be a minimum of 75 feet in length.

Street Cleaning:
If sediment is accidentally transported onto the adjacent streets accessing the construction site it will be removed from the street surface on a daily basis. Sediment will be swept or shoveled from the street and disposed of in a manner which prevents contamination with stormwater or surface water.

4.4 Establish Perimeter Controls and Sediment Barriers

Silt Socks:
Silt socks shall be installed as indicated and detailed on the plans and directed in the field along fill slopes and areas with erosion potential. The barrier should be maintained to remove sediment build-up and protect abutting areas. Install parallel to contour across the direction of expected flow and prevent by-pass by sweeping the ends in an up-gradient direction.

Temporary Stone Check Dams:
Temporary stone check dams shall be installed as indicated and detailed on the plans and directed in the field at the stormwater outfalls and other areas of concentrated flow as needed. The stone check dams should be maintained to remove sediment build-up and reduce velocities and provide protection to existing sediment/detention basins. Install across the direction of expected flow and extend upslope to prevent by-passing of the check dam.

4.5 Stabilize Soils

Temporary Stabilization of Soils:
Portions of the site where construction activities will temporarily cease for more than 14 days shall be temporarily stabilized with mulch. Winter stabilization will occur between October 15th and March 15th.

Permanent Stabilization of Soils:
Permanent stabilization will be done immediately after the final design grades are achieved but no later than 14 days after construction ceases within the area.

Dust Control:
Dust from the site will be controlled by using a water distribution truck to apply potable water to disturbed areas during windy days and dry conditions. In difficult areas/conditions, the contractor may choose to use an alternate product with soil bonding properties to control dust. The water truck will apply water at a rate which keeps the dust controlled but minimized as to prevent runoff and ponding. Dust control will be implemented as needed once construction activities start.

Stockpile Areas:
All temporary stockpiles will be mulched and seeded prior to the onset of wet weather. Long term stockpiles will be compacted, hydroseeded and silt socks installed around the perimeter.

4.6 Protect Slopes

Erosion Control Blankets:
Erosion control blankets will be used to provide stabilization for slopes greater than 3:1 or in difficult areas of the project.

4.7 Protect Drain Inlets

Inlet Protection:
Storm drain inlets existing within the vicinity of the construction activities and those to be installed as part of this project will be properly protected and maintained using approved inlet protection devices as shown of the plans. A NHDES approved BMP should be used at all catch basins which include the use of SiltSaks and block and gravel inlet filters.

4.8 Protect Downstream Waterbodies

Construction Dewatering:
Proper construction dewatering practices must be used in order to prevent discharged water from eroding soil on site and the sedimentation of downstream water resources. There are a number of methods for settling or filtering sediment from dewatering, including temporary basins or sediment traps, and manufactured fabric bags designed for filtering pumped discharges. During active dewatering process, inspection of the dewatering facility should be reviewed daily, with more frequent or continuous supervision warranted by site conditions.

SECTION 5: MATERIAL MANAGEMENT AND SPILL PREVENTION

The operator shall employ measures and practices to reduce the risk of spills or other accidental exposure of materials to stormwater runoff. The operator shall pay special attention to the handling, use and disposal of materials such as petroleum products, fertilizers and paints to ensure that the risk associated with the use of these products is minimized. The following "Good Housekeeping" practices shall be followed during construction of the project:

- An effort shall be made to store only enough product required to do the job.
- All materials stored on-site shall be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products shall be kept in their original containers with their manufacturers' label.
- Whenever possible, all of a product shall be used before disposing of the container.
- Manufacturers' recommendations for proper use and disposal shall be followed.
- The operator shall inspect daily to ensure proper use and disposal of materials.

5.1 Potential Sources of Non-Sediment Pollutants

All potential pollutants other than sediment shall be handled and disposed of in a manner that does not cause contamination of stormwater. Non-sediment pollutants that may be present during construction of this project include:

- Petroleum products including fuel, lubricants, hydraulic fluids and form oils
- Water treatment chemicals (coagulant, acid, chlorine, sodium bicarbonate)
- Concrete
- Paints
- Fertilizers

These materials and other materials used during construction with the potential to impact strormwater shall be stored, managed, used and disposed of in a manner that minimizes the potential for release to the environment and stormwater.

5.2 Waste Management

The operator shall provide dumpsters within the materials storage area. Dumpsters shall have a water tight lid, be positioned away from stormwater conveyances and drains. Only trash and construction debris form the site shall be disposed of in the dumpsters.

5.3 Hazardous Materials

These practices are used to reduce the risk associated with hazardous materials:

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data will be retained; they contain important product information
- If surplus product must be disposed of, manufacturers'' or local and State recommended methods for proper disposal will be followed

5.4 Product Specific Practices

The following product specific practices will be followed onsite:

Petroleum Products:

All onsite vehicles will be monitored daily for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturers' recommendations. Vehicles should be fueled in the parking and storage areas to help contain any spills that may occur. Designated areas shall be flat and not within 75 feet of surface water or wetlands.

Fertilizers:

Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater. Fertilizers shall be stored in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paints:

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system, but will be properly disposed of according to the manufacturers' recommendations.

Concrete:

Concrete washout areas shall be provided for and shown on the site map. Washout areas shall be clearly marked on the site. All concrete trucks shall utilize the designated washout areas.

5.5 Spill Control Practices

In addition to the previous measures discussed for good housekeeping and material handling practices, the following practices will be followed for spill prevention and cleanup:

- Material Safety Data Sheets (MSDS) shall be kept onsite for reference to the Manufacturer's recommended methods of cleanup
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury form contact with hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State and local government agency, regardless of size.
- The spill control measures shall be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The site superintendent will be responsible for day to day operations and will be the spill prevention and cleanup coordinator.

5.6 Requirements for Reporting Spills

Spill of toxic or hazardous materials or of a material of an amount that exceeds the reportable quantity (RQ) as defined in 40CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, then the SWPPP coordinator shall do the following:

- Call the National Response Center to report the spill at (800)424-8802 or (202)267-2675
- Call NHDES to report a spill between 8 am and 4 pm at (603) 271-3899 or contact NH State Police at (603) 271-3636.
- Quantities of oil requiring reporting: 1) discharge of any oil into surface water or groundwater of the state; 2) A discharge of 25 gallons or more of oil to land; 3) A discharge oil that results in the presence of vapors that pose an imminent threat to human health; 4) A discharge of oil resulting in a violation of the groundwater quality criteria of ENV-OR 603.01 in a sample collected from a water supply well.
- Within 14 days, modify SWPPP to include a description of spill details and file a spill report.

SECTION 6: EROSION AND SEDIMENT INSPECTION AND MAINTENANCE

Inspection requirements are outlined in section 4 of the CGP. The requirements below are the general requirements for inspecting and maintaining sites. Sites with environmentally sensitive areas or are discharging to impaired waterbodies and require dewatering inspections require an increase in inspection frequency.

In general, these are the inspection and maintenance practices that will be used to maintain erosion and sediment controls for the project:

- All BMP's will be inspected at least once every seven (7) calendar days or;
- Once every 14 calendar days and within 24 hours following any storm event of 0.25 inches or more within a 24-hour period.
- All measures shall be maintained in good working order; repairs, if necessary, shall be initiated within 24 hours of the inspection report depicting the deficiency.
- Sediments will be removed from silt socks when it has reached one-third the height of the barrier
- Silt socks will be inspected for depth of sediment, tears, to see if the barrier is properly attached to posts and is adequately anchored in the ground.
- Sediment basins will be inspected for depth of sediment. Sediment build up will be removed when it reaches 10 percent of the design capacity or at the end of the job.
- Temporary stone check dams will be inspected after each rainfall and daily during extended storm periods. Damaged check dams, undermining, and end-run erosion shall be repaired promptly. Sediment shall be removed once it reaches a depth of one-half the check dam height.
- Storm Drain Inlet Protections shall be inspected daily during extended storm periods. Remove collected sediments weekly, or more frequently during extended storm periods.
- Temporary and permanent seeding and landscape areas shall be inspected for rills, bare spots, washouts, and healthy growth and repaired as needed.
- A maintenance inspection report will be made after each inspection. A copy of the report form to be completed by the inspector is attached.

- The owner and/or site contractor will select individuals who will be responsible for inspections, maintenance and repair activities.

Training requirements for Persons Conducting Inspections can be found in section 6.3 of the CGP: Starting February 17, 2023, persons conducting inspections must have at a minimum:

- Completed the EPA construction inspection course developed for this permit and have passed the exam; or
- Hold a current valid construction inspection certification or license from a program that, at a minimum, covers the following:
  - Principles and practices of erosion and sediment control and pollution prevention practices at construction sites;
  - Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites; and
  - Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirement of Part 4

For persons conducting inspections under this permit prior to February 17, 2023, at a minimum must be knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention and possess the appropriate skills and training to assess the conditions and effectiveness of stormwater controls installed to meet the requirement of this permit.

SECTION 7: RECORD KEEPING

7.1 Recordkeeping

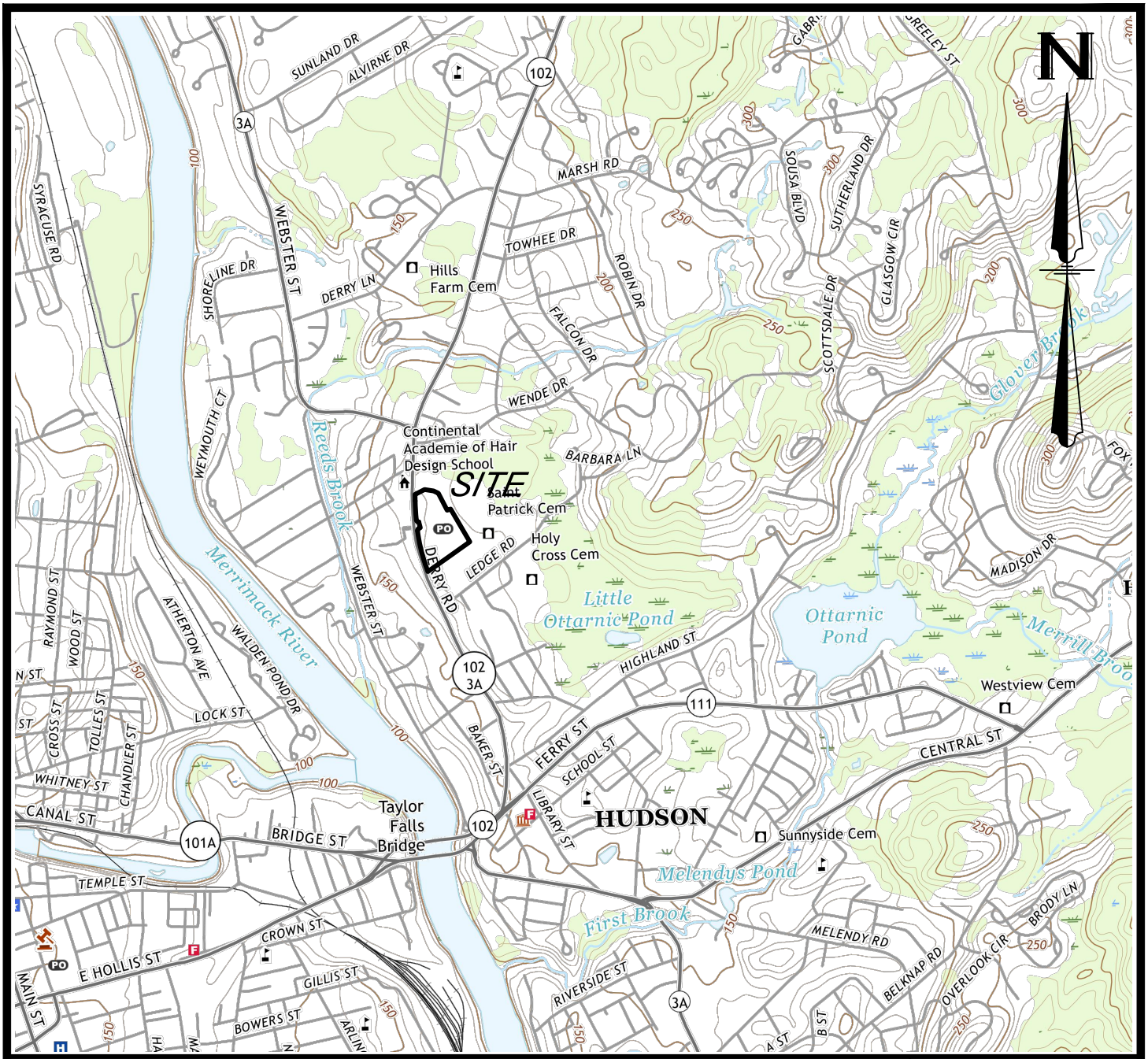
The General Permit requires that copies of the SWPPP and all documentation required by the permit, including records of all data used to complete the NOI to be cover by the permit, must be retained for a least three years from the date the permit coverage expires or is terminated. This period may be extended by the request of the EPA at any time.

7.2 Amendments to SWPPP

The operator shall update the SWPPP as necessary to reflect the project conditions. A SWPPP Amendment Log shall be kept up to date and can be found at the front of this report.

Appendix A:

Site Locus Map



1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

NASHUA NORTH, NH
QUAD MAP (2021)

FIG. 1

VICINITY PLAN

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD
HUDSON, NH

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

OCTOBER 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 1708SB-USGS
Location: J:\1000\1708\DWG\1708 SB

1708-SB
File Number

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SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPT. OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/ ACCESSED OCTOBER 5, 2023.

NRCS SOILS MAP

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 2

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

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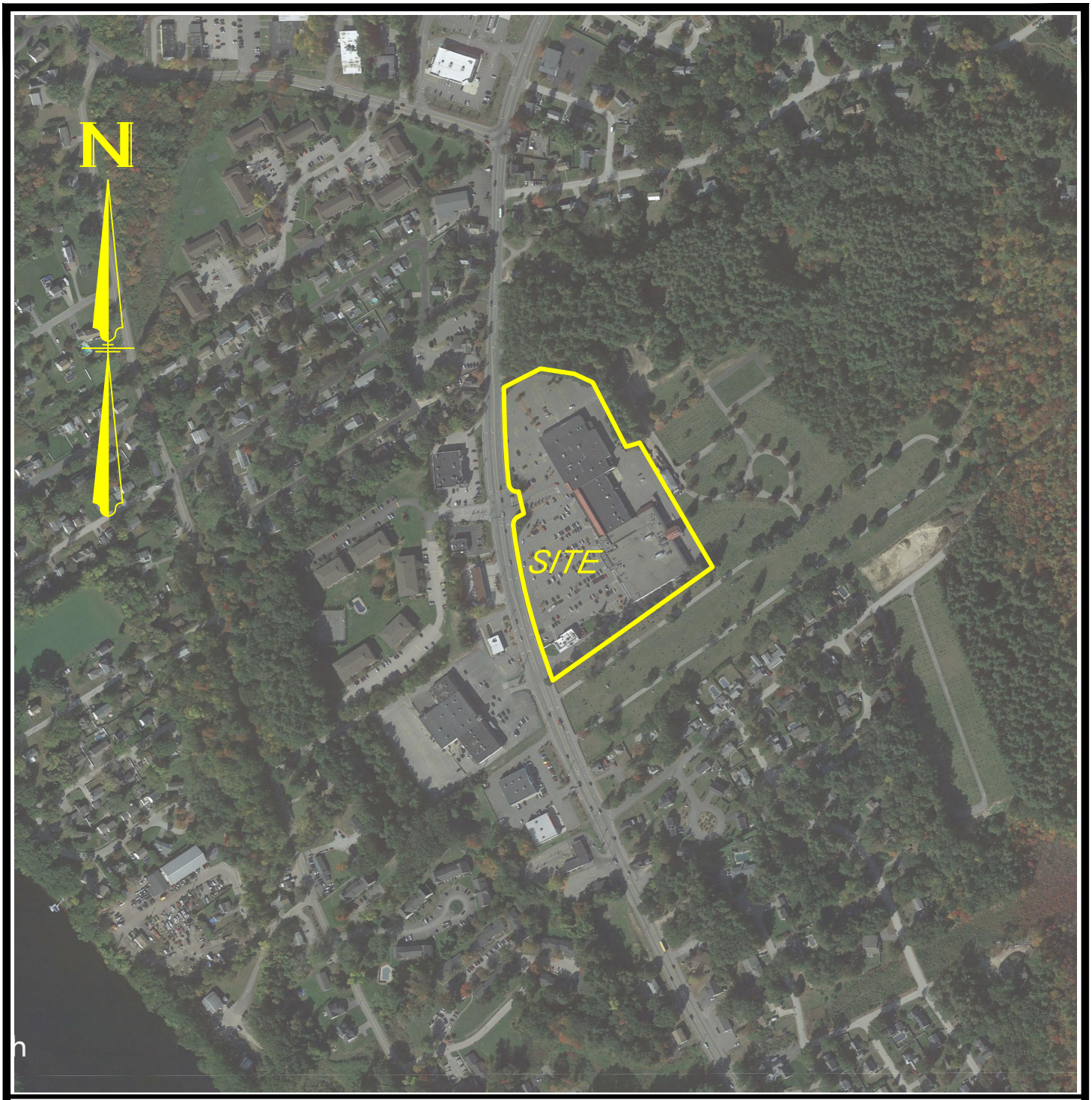
Location: J:\1000\1708\DWG\1708 SB

1708-SB

File Number



0 500 1,000 1,500 FEET

AERIAL DISPLAY PLAN

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 3

PREPARED FOR:

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Drawing: 1708SB-USGS

Location: J:\1000\1708\DWG\1708 SB

1708-SB

File Number

0 400 800 1,200 FEET

TAX MAP

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 4

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

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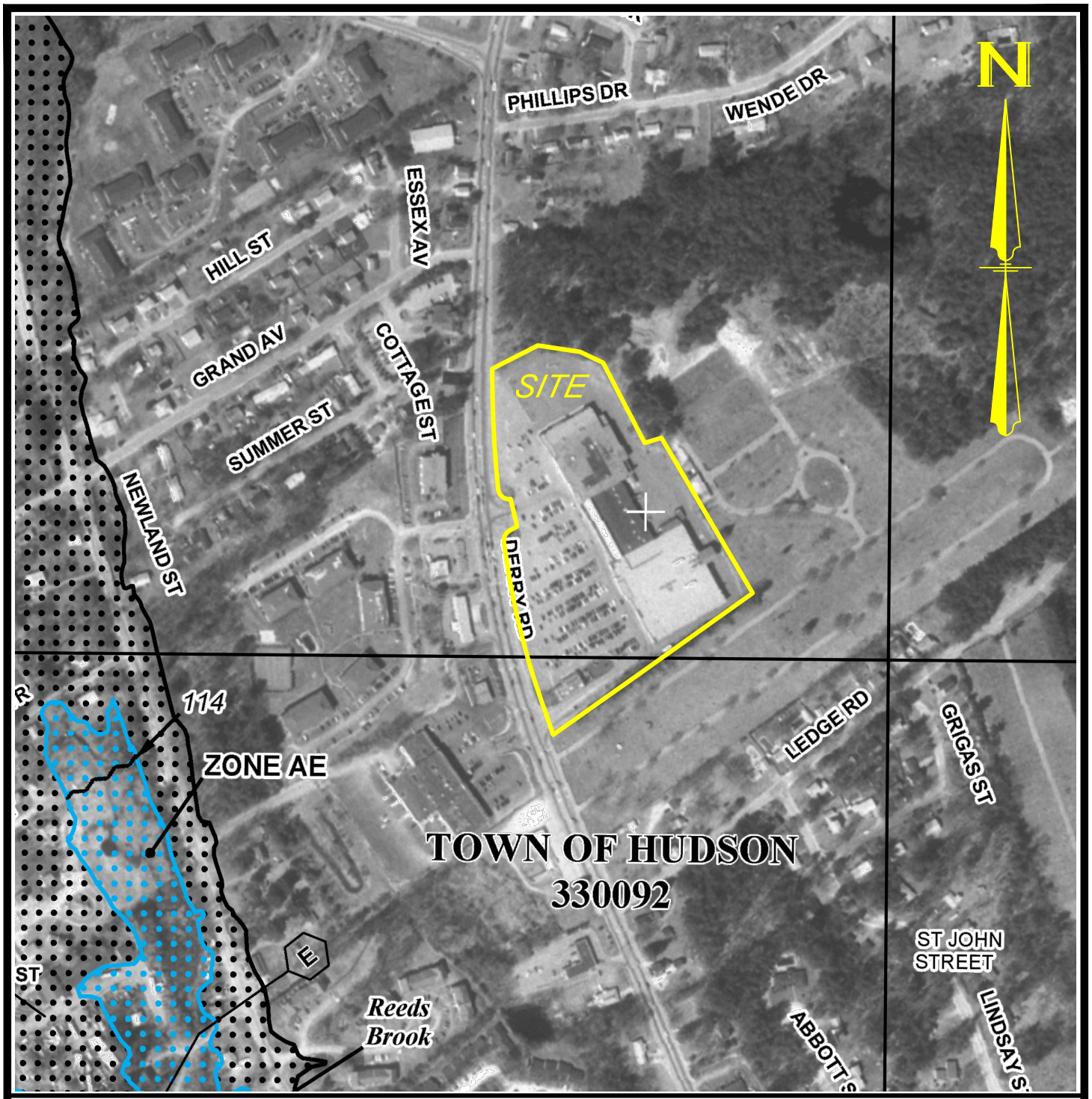
1708-SB

File Number



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FIRM: HILLSBOROUGH COUNTY, NEW HAMPSHIRE
TOWN OF HUDSON COMMUNITY No. 330092
MAP No. 33011C0514E
EFFECTIVE DATE: APRIL 18, 2011

FLOOD INSURANCE RATE MAP

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 5

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

OCTOBER 2023

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Drawing: 1708SB-USGS
Location: J:\1000\1708\DWG\1708 SB

1708-SB
File Number

Appendix B:

EPA Construction General Permit

Appendix C:

Notice of Intent & EPA Acknowledgement Letter

Appendix D:

Notice of Termination

(To be inserted by the contractor)

Appendix E:

Endangered Species Documentation

Attachment "D"

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW HAMPSHIRE

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Belknap	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Meredith, Alton and Laconia
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Carroll	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Albany, Brookfield, Eaton, Effingham, Madison, Ossipee, Wakefield and Wolfeboro
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Coos	Canada Lynx	Threatened	Regenerating softwood forest, usually with a high density of snowshoe hare.	All Towns
	Dwarf wedgemussel	Endangered	Connecticut River main channel and Johns River	Northumberland, Lancaster and Dalton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Cheshire	Dwarf wedgemussel	Endangered	S. Branch Ashuelot River and Ashuelot River	Swanzey, Keene and Surry
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Grafton	Dwarf wedgemussel	Endangered	Connecticut River main channel	Haverhill, Piermont, Orford and Lyme
	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Holderness
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hillsborough	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Manchester, Weare
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Merrimack	Karner Blue Butterfly	Endangered	Pine Barrens with wild blue lupine	Concord and Pembroke
	Small whorled Pogonia	Threatened	Forests	Bow, Danbury, Epsom, Loudon, Warner and Allenstown
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

Attachment "D"

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW HAMPSHIRE

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Rockingham	Piping Plover	Threatened	Coastal Beaches	Hampton and Seabrook
	Roseate Tern	Endangered	Atlantic Ocean and nesting at the Isle of Shoals	
	Red knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal towns
	Small whorled Pogonia	Threatened	Forests	Deerfield, Northwood, Nottingham, and Epping
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Strafford	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Middleton, New Durham, Milton, Farmington, Strafford, Barrington, and Madbury
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Sullivan	Northeastern bulrush	Endangered	Wetlands	Acworth, Charlestown, Langdon
	Dwarf wedgemussel	Endangered	Connecticut River main channel	Plainfield, Cornish, Claremont and Charlestown
	Jesup's milk-vetch	Endangered	Banks of the Connecticut River	Plainfield and Claremont
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

[1]Migratory only, scattered along the coast in small numbers

-Eastern cougar, gray wolf and Puritan tiger beetle are considered extirpated in New Hampshire.

-Endangered gray wolves are not known to be present in New Hampshire, but dispersing individuals from source populations in Canada may occur statewide.-There is no federally-designated Critical Habitat in New Hampshire

Updated 02/05/2016

Appendix F:

Inspection Forms/ Reports/Corrective Action Logs

Stormwater Construction Site Inspection Report

General Information			
Project Name			
NPDES Tracking No.		**Location**	
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications	Insert qualifications or add reference to the SWPPP. (See Section 5 of the SWPPP Template)		
Describe present phase of construction			
Type of Inspection: ❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ❑Yes ❑No **If yes, provide:** Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		❑Yes ❑No	❑Yes ❑No	
2		❑Yes ❑No	❑Yes ❑No	
3		❑Yes ❑No	❑Yes ❑No	
4		❑Yes ❑No	❑Yes ❑No	
5		❑Yes ❑No	❑Yes ❑No	
6		❑Yes ❑No	❑Yes ❑No	
7		❑Yes ❑No	❑Yes ❑No	
8		❑Yes ❑No	❑Yes ❑No	
9		❑Yes ❑No	❑Yes ❑No	
10		❑Yes ❑No	❑Yes ❑No	
11		❑Yes ❑No	❑Yes ❑No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
12		❑Yes ❑No	❑Yes ❑No	
13		❑Yes ❑No	❑Yes ❑No	
14		❑Yes ❑No	❑Yes ❑No	
15		❑Yes ❑No	❑Yes ❑No	
16		❑Yes ❑No	❑Yes ❑No	
17		❑Yes ❑No	❑Yes ❑No	
18		❑Yes ❑No	❑Yes ❑No	
19		❑Yes ❑No	❑Yes ❑No	
20		❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	
4	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
6	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
12	(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or 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."

Print name and title: _____

Signature:_____ **Date:**_____

Attachment "D"

Corrective Action Log

Project Name: **Proposed Drive-Thru Restaurant**
Project Location: **Hudson Mall, 77 Derry Street, Hudson, NH**
SWPPP Contact: **Dan Gordon, Hudson-Vickerry, LLC, c/o The MEG Cos., 25 Orchard View Drive, Londonderry, NH**

Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

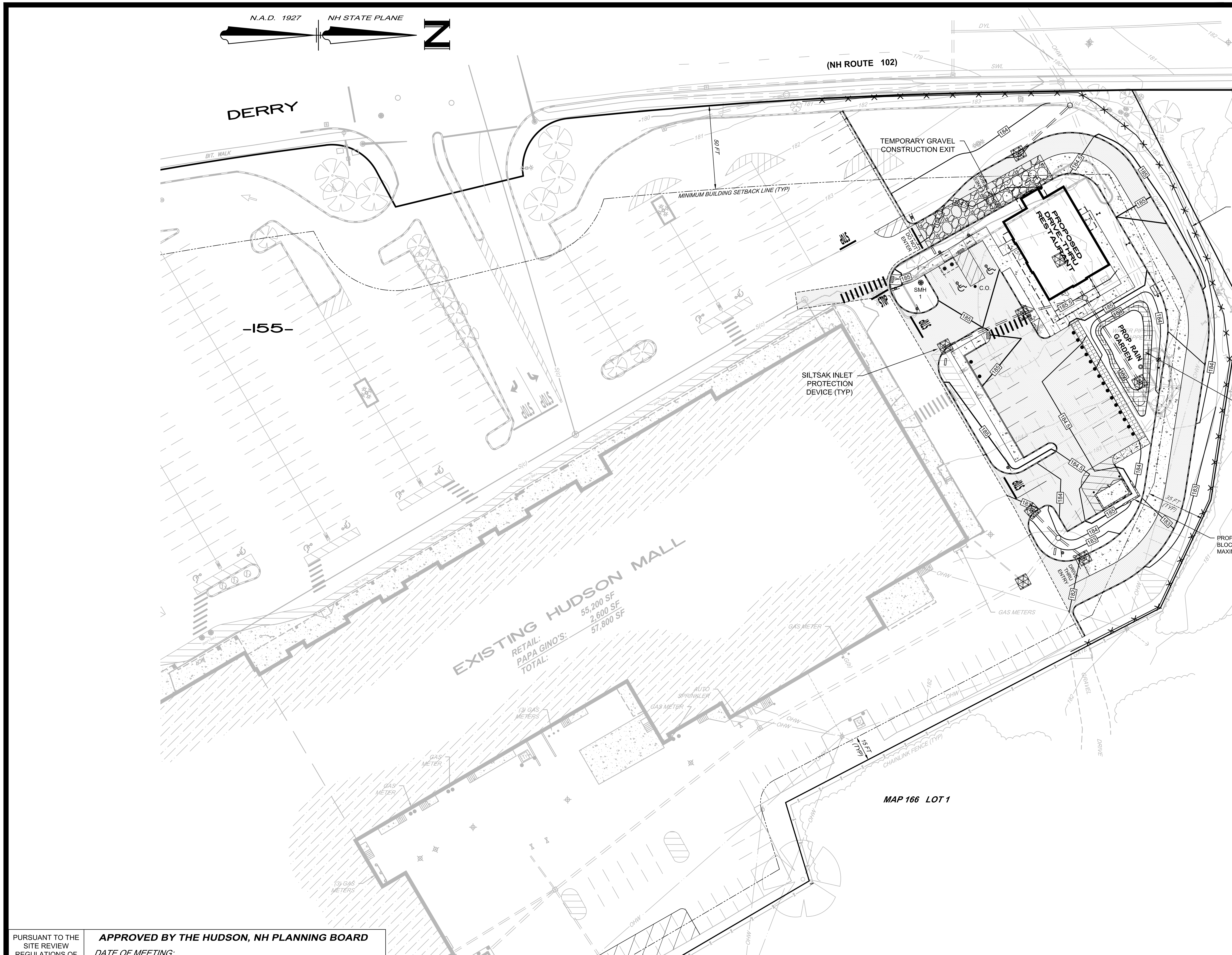
Appendix G:

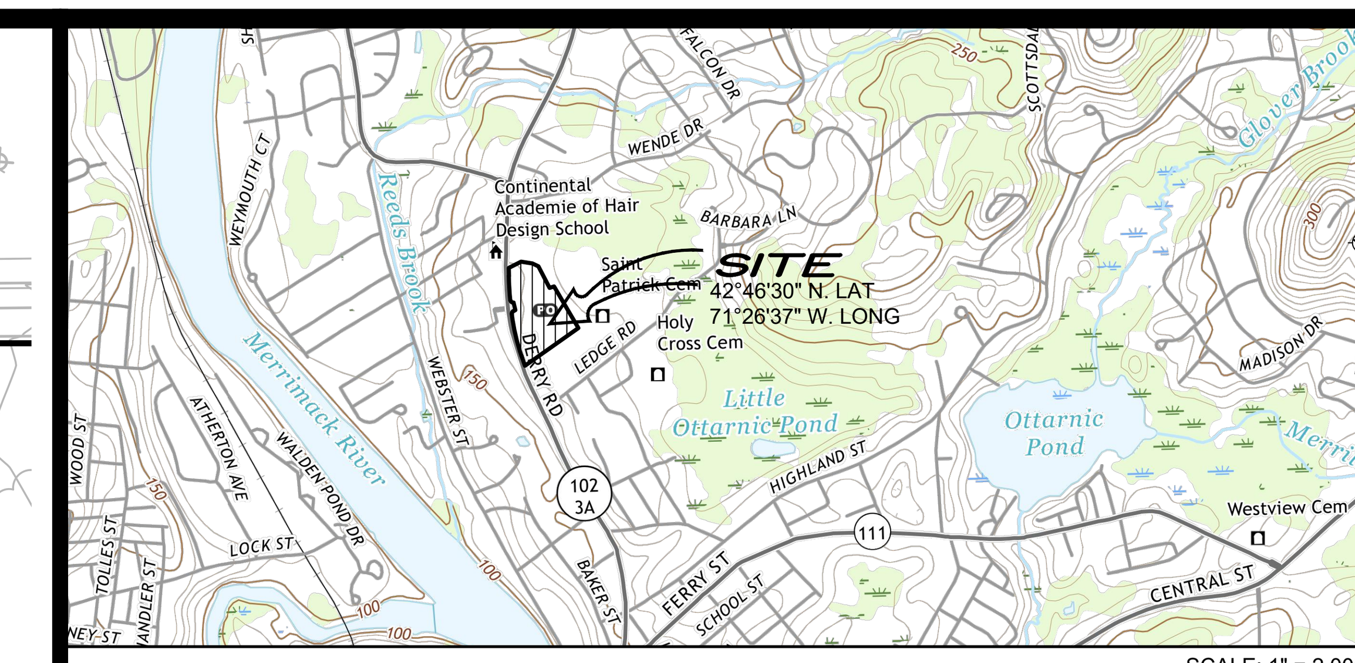
Site-Related Permit Approvals

Appendix H:

Erosion & Sediment Control Maps

Attachment "D"





VICINITY MAP

SCALE: 1" = 2,000'±

LEGEND

— 100 —	EXISTING GROUND CONTOUR
—[100]—	PROPOSED GRADE
—×—×—	SILT SOCK
⊠	SILT-SACK INLET PROTECTION DEVICES
	GRAVEL CONSTRUCTION EXIT
	STABILIZATION MATTING
	TEMPORARY STONE CHECK DAM
— —	LIMIT OF WORK

No.	DATE	REVISION	BY
		REVIEW ONLY	

EROSION CONTROL PLAN
(MAP 165, LOT 155)

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY STREET
HUDSON, NEW HAMPSHIRE

PREPARED FOR/ RECORD OWNER:

HUDSON-VICKERRY, LLC

c/o THE MEG COMPANIES 25 ORCHARD VIEW DRIVE LONDONDERRY, NH 03053 (603) 434-6700

30 0 30 60 90 120 FEET
15 0 15 30 METERS
SCALE: 1"=30 Feet
1"=9.144 Meters

16 FEBRUARY 2024

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street
Nashua, NH 03062
(603) 883-2057
131 Middlesex Turnpike
Burlington, MA 01803
(781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 1161 | DRAWING NAME: 1708SB-ER31 | 1708-SB File Number | 12 OF 16 Sheet
DRAWING LOC: J:\1000\1708\DWG\1708 SB

NOTE

THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE THAT DERRY STREET IS KEPT FREE OF DIRT AND DEBRIS FOR THE DURATION OF THE CONTRACT.

NOTE

PRIOR TO COMMENCEMENT OF WORK THE CONTRACTOR SHALL ARRANGE A PRE-CONSTRUCTION MEETING WITH THE TOWN ENGINEER TO REVIEW THE INSTALLED EROSION CONTROL MEASURES

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

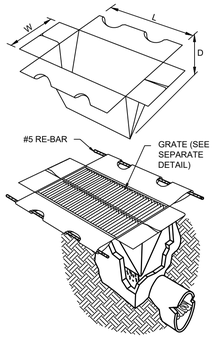
APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING: ____________

CHAIRMAN: ____________ SIGNATURE DATE: ____________

SECRETARY: ____________ SIGNATURE DATE: ____________

SITE PLANS ARE VALID FOR TWO (2) YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECIEVES FINAL APPROVAL.



SILTSAK® NOTES:

1.0 THE SILTSAK® SHALL BE MANUFACTURED FROM WOVEN POLYPROPYLENE AND SEWN BY A DOUBLE NEEDLE MACHINE, USING A HIGH STRENGTH NYLON THREAD.

2.0 THE SILTSAK® SEAMS SHALL HAVE A CERTIFIED AVERAGE WIDE WIDTH STRENGTH PER ASTM D-4884 STANDARDS AS FOLLOWS:

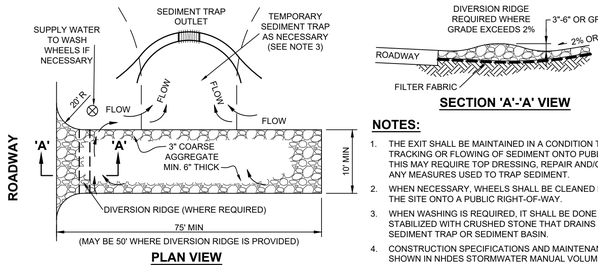
SILTSAK® STYLE	*TEST METHOD*	*TEST METHOD*
REGULAR FLOW	ASTM D-4884	165.O LBS/IN
HI-FLOW	ASTM D-4884	114.6 LBS/IN

3.0 THE SILTSAK® WILL BE MANUFACTURED TO FIT THE OPENING OF THE CATCH BASIN OR DROP INLET. THE SILTSAK® WILL HAVE THE FOLLOWING FEATURES: TWO DUMP STRAPS ATTACHED AT THE BOTTOM TO FACILITATE THE EMPTYING OF THE SILTSAK®; THE SILTSAK® SHALL HAVE LIFTING LOOPS AS AN INTEGRAL PART OF THE SYSTEM TO BE USED TO LIFT THE SILTSAK® FROM THE BASIN; THE SILTSAK® SHALL HAVE A RESTRAINT CORD APPROXIMATELY HALFWAY UP THE SACK TO KEEP THE SIDES AWAY FROM THE CATCH BASIN WALLS, THIS YELLOW CORD IS ALSO A VISIBLE MEANS OF INDICATING WHEN THE SACK SHOULD BE EMPTIED, CLEANED, AND PLACED BACK INTO THE BASIN.

4.0 THE GEOTEXTILE FABRIC SHALL BE WOVEN POLYPROPYLENE FABRIC WITH THE PROPERTIES OF **SILTSAK® REGULAR FLOW OR SILTSAK® HI-FLOW** PER MANUFACTURERS SPECIFICATIONS.

SILTSAK® DETAIL

NOT TO SCALE



PLAN VIEW

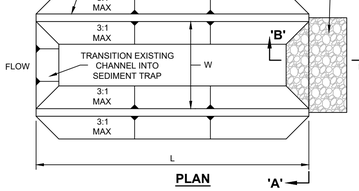
SECTION 'A'-'A' VIEW

NOTES:

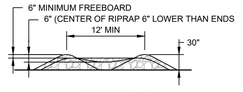
1. THE EXIT SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO EXITING THE SITE ONTO A PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. CONSTRUCTION SPECIFICATIONS AND MAINTENANCE REQUIREMENTS SHOWN IN NHDES STORMWATER MANUAL VOLUME 3.

TEMPORARY GRAVEL CONSTRUCTION EXIT

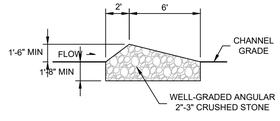
NOT TO SCALE



PLAN



SECTION A



SECTION B

SEDIMENT TRAP INSTALLATION NOTES:

1. SEE PLAN VIEW FOR:
-LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
2. SEDIMENT TRAPS SHALL BE SIZED TO PROVIDE A VOLUME OF 3,600 PER ACRE OF CONTRIBUTING DRAINAGE AREA.
3. SEDIMENT TRAPS SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.
4. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
5. SEDIMENT TRAP OUTLET TO BE CONSTRUCTED OF WELL-GRADED ANGULAR 2"-3" CRUSHED STONE.
6. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE OUTLET STRUCTURE.
7. THE ENDS OF THE OUTLET STRUCTURE SHALL BE A MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES:

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. REMOVE SEDIMENT ACCUMULATED IN TRAP AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP. TYPICALLY WHEN THE SEDIMENT DEPTH REACHES 1/2 THE HEIGHT OF THE OUTLET.
5. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE CONTRIBUTING DISTURBED AREA IS STABILIZED.
6. WHEN SEDIMENT TRAPS ARE REMOVED. THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED.

SEDIMENT TRAP DETAIL

NOT TO SCALE

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL

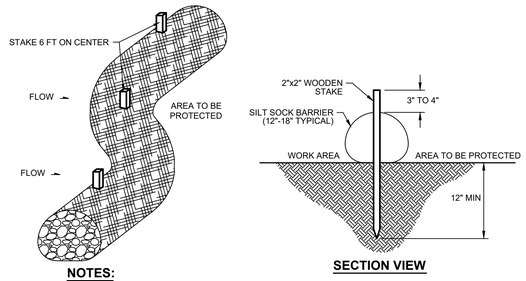
APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING: _____

CHAIRMAN: _____ *SIGNATURE DATE:* _____

SECRETARY: _____ *SIGNATURE DATE:* _____

SITE PLANS ARE VALID FOR TWO (2) YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECIEVES FINAL APPROVAL.



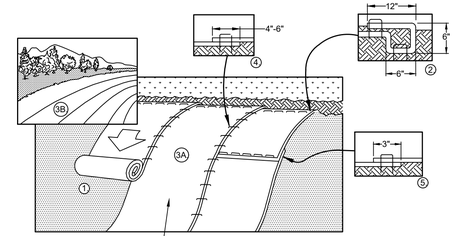
SECTION VIEW

NOTES:

1. SILT SOCK BARRIER SHALL BE FILTREXX SILTSOXX NATURAL PLUS (OR APPROVED EQUAL) AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. SILT SOCK BARRIER SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
3. IF THE SILT SOCK SHOULD DECOMPOSE OR BECOME INEFFECTIVE, THE BARRIER SHALL BE REPLACED PROMPTLY.
4. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
5. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE BARRIER HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.
6. COMPOST TO BE REMOVED OR DISPOSED ON-SITE AS DETERMINED BY THE ENGINEER.

SILT SOCK DETAIL

NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS PER MANUFACTURES RECOMMENDATION.
4. 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH MINIMUM 6" OVERLAP. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
6. PLACE STAPLES/STAKES PER MANUFACTURE RECOMMENDATION FOR THE APPROPRIATE SLOPE BEING APPLIED.

NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

STABILIZATION MATTING DETAIL

NOT TO SCALE

EPA

THE CONTRACTOR SHALL FILE THE EPA NOTICE OF INTENT (NOI) FORM AT LEAST 14 DAYS PRIOR TO CONSTRUCTION

GENERAL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS THEREOF IN NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES STORMWATER MANUALS, VOLUME 1-3, LATEST EDITION.
2. THE WORK AREA SHALL BE GRADED, SHAPED, AND OTHERWISE DRAINED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE THE LIMITS OF THE WORK AREA. SILT FENCES, STRAW BALES AND/OR DETENTION BASINS WILL BE NECESSARY TO ACCOMPLISH THIS END.
3. STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION IN ACCORDANCE WITH "TEMPORARY STABILIZATION OF DISTURBED AREAS", AS OUTLINED IN NOTE No. 4.
4. TEMPORARY STABILIZATION OF DISTURBED AREAS:
   SEED BED PREPARATION: 10-10-10 FERTILIZATION TO BE SPREAD AT THE RATE OF 7 LBS PER 1,000 SF AND AGRICULTURAL LIMESTONE AT A RATE OF 90 LBS PER 1,000 SF AND INCORPORATED INTO THE SOIL THE SOIL, FERTILIZER AND LIMESTONE SHALL BE TILLED TO PREPARE FOR SEEDING.
   A. SEED MIXTURE: USE ANY OF THE FOLLOWNG:

SPECIES	RATE PER 1,000 SF	DEPTH	SEEDING DATES
WINTER RYE	2.5 LBS	1"	08/15 TO 09/15
OATS	2.5 LBS	1"	04/15 TO 10/15
ANNUAL RYE GRASS	1.0 LBS	0.25"	08/15 TO 09/15

   B. MULCHING: MULCH SHOULD BE USED ON HIGHLY ERODABLE AREAS, AND WHERE CONSERVATION OF MOISTURE WILL FACILITATE PLANT ESTABLISHMENT AS FOLLOWS:

TYPE	RATE PER 1,000 SF	USE & COMMENTS
STRAW	70 TO 90 LBS	MAY BE USED WITH PLANTINGS, MUST BE ANCHORED TO BE USED ALONE
WOOD CHIPS OR BARK MULCH	460 TO 920 LBS	USED WITH TREE AND SHRUB PLANTINGS
FIBROUS MATTING	AS RECOMMENDED BY MANUFACTURER	MUST BE BIODEGRADABLE. USE IN SLOPE AREAS AND AREAS DIFFICULT TO VEGETATE.
CRUSHED STONE ¼" TO 1 ½" DIA	SPREAD TO GREATER THAN ½" THICKNESS	USE IN SPECIFIC AREAS AS SHOWN ON PLAN OR AS NEEDED.

5. PERMANENT STABILIZATION OF DISTURBED AREAS:
   A. ALL ROADWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
   B. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
6. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
7. AN AREA SHALL BE CONSIDERED STABILIZED IF ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED.
   C. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED.
   D. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
8. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
9. SITE LOCATION:
   42° 46' 30" N LATITUDE, 71° 26' 37" W LONGITUDE (PER GOOGLE EARTH)
10. TOTAL AREA OF DISTURBED SOILS: 45,000± SF.
11. REFERENCE IS MADE TO THE LATEST EDITION OF THE FEDERAL REGISTER (63 FR 7857), ENVIRONMENTAL PROTECTION AGENCY NPDES GENERAL PERMITS FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. FOR ADDITIONAL INFORMATION CONTACT (202) 564-9545 OR www.epa.gov/npdes/stormwater.
12. THE ENTIRE CONTENTS OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE RETAINED ON-SITE FOR THE DURATION OF THE CONTRACT AND BE MADE AVAILABLE TO LOCAL, STATE AND FEDERAL CODE ENFORCEMENT PERSONNEL.
13. THIS PROJECT SHALL BE MANAGED TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:63 AND AGR 3800 RELATIVE TO INVASIVE SPECIES; AND FUGITIVE DUST IS CONTROLLED IN ACCORDANCE WITH ENV-A 1000.
14. TURF REINFORCEMENT MATS, IF UTILIZED, SHALL BE COVERED WITH SOIL TO PREVENT EXPOSURE OF THE MATS TO THE SURFACE.
15. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED (NOT APPLICABLE TO TURF REINFORCEMENT MATS).

CONSTRUCTION SEQUENCE

1. CLEAR SITE ACCORDING TO PLAN.
2. CONSTRUCTION OF TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES, INCLUDING HAY BALE BARRIERS TO BE IN ACCORDANCE WITH THE PLANS.
3. GRUB SITE ACCORDING TO PLAN.
4. CUT AND DISPOSE OF ANY DEBRIS PRODUCED DURING THE CLEARING AND GRUBBING ACTIVITY.
5. CONSTRUCT RAIN GARDEN PRIOR TO ROUGH GRADING. SEED AND MULCH IMMEDIATELY.
6. SITE GRADING OF BUILDING AND PARKING AREAS. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED AFTER BEING CONSTRUCTED.
7. INSTALLATION OF UNDERGROUND UTILITIES AND CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT IN ACCORDANCE WITH THE " SEDIMENT CONTROL AT CATCH BASIN DETAIL " . THE CONTROL SHALL REMAIN UNTIL THE SITE IS SUFFICIENTLY STABILIZED. RIPRAP SHALL BE PLACED AT EACH HEADWALL OUTLET.
8. AS THE BUILDING IS COMPLETED, ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED.
9. NO PORTION OF THE PROJECT SHALL BE LEFT DISTURBED AND UNSTABILIZED FOR A PERIOD OF TWO (2) MONTHS OR GREATER. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED PRIOR TO WINTER CONDITIONS. STABILIZATION SHALL BE DEFINED AS 70% VEGETATIVE GROWTH BY NOVEMBER 1ST OR INSTALLATION OF EROSION CONTROL MATTING.
10. COMPLETED AREAS SHALL BE STABILIZED 72 HOURS AFTER COMPLETION.
11. ALL PERMANENT STORM WATER MANAGEMENT MEASURES SHALL HAVE A HEALTHY STAND OF VEGETATION ESTABLISHED PRIOR TO DIRECTING RUNOFF INTO THEM
12. FINAL PAVING OF PARKING LOT.
13. LOAM AND SEED ALL DISTURBED AREAS.
14. INSPECTION OF ALL SEDIMENT AND EROSION CONTROL MEASURES.
15. SITE LANDSCAPING ALONG WITH PERMANENT SEEDING OF ALL DISTURBED AREAS.
16. REMOVE ANY TEMPORARY EROSION CONTROL MEASURES NOT NEEDED.

NOTE
SEE SHEET 2 OF 16 FOR CONSTRUCTION SEQUENCE

SITE MAINTENANCE/INSPECTION PROGRAM

THE FOLLOWING PROVIDES AN ITEMIZATION OF SPECIFIC SITE MAINTENANCE PRACTICES THAT WILL BE EMPLOYED ON THE SITE TO MINIMIZE POLLUTANT GENERATION AND TRANSPORT FROM THE SITE. THE SITE MAINTENANCE PROGRAM INCLUDES ROUTINE INSPECTIONS, PREVENTATIVE MAINTENANCE AND "GOOD HOUSEKEEPING" PRACTICES.

ROUTINE INSPECTIONS

THE CONTRACTOR SHALL INSPECT ALL CONTROL MEASURES AT LEAST ONCE A WEEK AND WITHIN TWENTY-FOUR (24) HOURS OF THE END OF A STORM WITH RAINFALL AMOUNT GREATER THAN 0.5 INCHES. THE INSPECTIONS WILL VERIFY THAT THE STRUCTURAL BMPs DESCRIBED IN THE PLANS ARE IN GOOD CONDITION AND ARE MINIMIZING EROSION. A MAINTENANCE INSPECTION REPORT WILL BE MADE WITH EACH INSPECTION. COMPLETED INSPECTION FORMS SHALL BE KEPT ON-SITE FOR THE DURATION OF THE PROJECT. FOLLOWING CONSTRUCTION, THE COMPLETED FORMS SHALL BE RETAINED AT THE CONTRACTOR'S OFFICE FOR A MINIMUM OF ONE YEAR.

PREVENTATIVE MAINTENANCE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL TEMPORARY AND PERMANENT CONTROLS THROUGHOUT THE DURATION OF THIS CONTRACT. MAINTENANCE PRACTICES SHALL INCLUDE, BUT ARE NOT LIMITED TO:

1. CLEANING OF CATCH BASINS TWICE PER YEAR OR MORE FREQUENTLY AS DICTATED BY QUARTERLY INSPECTIONS.
2. CLEANING OF SEDIMENT AND DEBRIS FROM STORMWATER MANAGEMENT AREA FOREBAY TWICE PER YEAR OR MORE FREQUENTLY AS DICTATED BY MONTHLY INSPECTIONS.
3. IMPLEMENTATION OF OTHER MAINTENANCE OR REPAIR ACTIVITIES AS DEEMED NECESSARY BASED UPON WEEKLY INSPECTIONS.
4. REMOVAL OF BUILT UP SEDIMENT ALONG SILT FENCES AND/OR HAY BALE BARRIERS.
5. REMOVAL OF BUILT UP SEDIMENT IN BOTH TEMPORARY AND PERMANENT CONTROLS SUCH AS GRASS SWALES, SEDIMENT FOREBAYS AND RECHARGE/DETENTION BASINS.
6. RECONSTRUCTING THE TEMPORARY GRAVEL CONSTRUCTION EXIT IF NOT WORKING PROPERLY.
7. TREATMENT OF NON-STORM WATER DISCHARGES SUCH AS WATER FROM WATER LINE FLUSHINGS OR GROUNDWATER FROM DEWATERING EXCAVATIONS. SUCH FLOWS SHOULD BE DIRECTED TO A TEMPORARY SEDIMENTATION BASIN OR STORMWATER MANAGEMENT AREA.
8. SWEEP PARKING LOTS AND DRIVES REGULARLY TO MINIMIZE SEDIMENT ACCUMULATION. FREQUENCY WILL VARY SEASONALLY ACCORDING TO SEDIMENT ACCUMULATION ON PAVE SURFACES (E.G., MORE FREQUENT SWEEPING DURING THE WINTER AND SPRING).

GOOD HOUSEKEEPING PRACTICES

THE CONTRACTOR SHALL EMPLOY MEASURES AND PRACTICES TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS TO STORM AND WATER RUNOFF. THE CONTRACTOR SHALL PAY SPECIAL ATTENTION TO THE HANDLING, USE AND DISPOSAL OF MATERIALS SUCH AS PETROLEUM PRODUCTS, FERTILIZERS AND PAINTS TO ENSURE THAT THE RISK ASSOCIATED WITH THE USE OF THESE PRODUCTS IS MINIMIZED. THE FOLLOWING "GOOD HOUSEKEEPING" PRACTICES SHALL BE FOLLOWED DURING CONSTRUCTION OF THE PROJECT:

A. AN EFFORT SHALL BE MADE TO STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB.
B. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.
C. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THEIR MANUFACTURERS' LABELS.
D. WHENEVER POSSIBLE, ALL OF A PRODUCT SHALL BE USED BEFORE DISPOSING OF THE CONTAINER.
E. MANUFACTURERS' RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.
F. THE CONTRACTOR SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.

SPILL PREVENTION AND CLEANUP PRACTICES

A. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON-SITE. EQUIPMENT AND MATERIAL WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.
C. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.
D. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.
E. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.
F. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL IF THERE IS ANOTHER ONE. A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.

WINTER CONDITION NOTES

1. ALL PROPOSED POST-DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOR OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3-INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

REVIEW ONLY

NO.	DATE	REVISION	BY

DETAIL SHEET - EROSION CONTROL
(MAP 165, LOT 155)

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY STREET
HUDSON, NEW HAMPSHIRE

PREPARED FOR/ RECORD OWNER:

HUDSON-VICKERRY, LLC

c/o THE MEG COMPANIES 25 ORCHARD VIEW DRIVE LONDONDERRY, NH 03053 (603) 434-6700

SCALE AS SHOWN

16 FEBRUARY 2024

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street *131 Middlesex Turnpike*
Nashua, NH 03062 *Burlington, MA 01803*
(603) 883-2057 *(781) 203-1501*
www.hayner-swanson.com

FIELD BOOK: 1161	DRAWING NAME: 1708SB-DET1	1708-SB	13 OF 16
DRAWING LOC: J:\1000\1708\DWG\1708 SB		File Number	Sheet

Welcome to New Hampshire's Watershed Report Cards built from the 2018, 305(b)/303(d)

Each Watershed Report Card covers a single 12 digit Hydrologic Unit Code (HUC12), on average a 34 square mile area. Each Watershed Report Card has three components;

1. REPORT CARD - A one page card that summarizes the overall use support for Aquatic Life Integrity, Primary Contact (i.e. Swimming), and Secondary Contact (i.e. Boating) Designated Uses on every Assessment Unit ID (AUID) within the HUC12.
2. HUC 12 MAP - A map of the watershed with abbreviated labels for each AUID within the HUC12.
3. ASSESSMENT DETAILS - Anywhere from one to forty pages with the detailed assessment information for each and every AUID in the Report Card and Map.

How are the Surface Water Quality Assessment determinations made?

All readily available data with reliable Quality Assurance/Quality Control is used in the biennial surface water quality assessments. For a full understanding of how the Surface Water Quality Standards (Env-Wq 1700) are translated into surface water quality assessments we urge the reader to review the 2018 Consolidated Assessment and Listing Methodology (CALM) at https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/documents/r-wd-19-04.pdf.

Where can I find more advanced mapping resources?

GIS files are available by assessment cycle at ftp://pubftp.nh.gov/DES/wmb/WaterQuality/SWQA/2018/GIS

I'd like to see the more raw water quality data?

The web mapping tool allows you to download the data used in the assessment of the primary contact and aquatic life designated uses by clicking on the "Data Access Waterbody Data (Aquatic Life and Swimming Uses)" link for any assessment unit. (https://www.des.nh.gov/organization/divisions/water/wmb/swqa/assessment-viewers.htm)

How are assessments coded in the report card?

Assessment outcomes are displayed on a color scale as well as an alpha numeric scale that provides additional distinctions for the designated use and parameter level assessments as outlined in the table below.

		Severe Not Supporting, Severe	**Poor** Not Supporting, Marginal	**Likely Bad** Insufficient Information – Potentially Not Supporting	**No Data** No Data	**Likely Good** Insufficient Information – Potentially Full Supporting	**Marginal** Full Support, Marginal	**Good** Full Support, Good
CATEGORY	**Description**							
Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL* Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL^ Needed	5-P	5-M or 5-T					

* TMDL stands for Total Maximum Daily Load studies (http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm)

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010700061206

HUC 12 NAME MERRIMACK MAINSTEM-NASHUA RIVER TO CONCORD RIVER

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

Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe

ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHIMP700061206-01	I*01	MERRILL BROOK - ICE POND DAM	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-03	I*03	FIRST BROOK - FARM POND	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-04	I*04	FIRST BROOK - MELENDY POND	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-05	I*05	FIRE POND DAM	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-06	I*06	SPIT BROOK	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-07	I*07	SPIT BROOK	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-08	I*08	SPIT BROOK	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-09	I*09	VILLAGE AT BARRETTS HILL UPPER POND	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-10	I*10	VILLAGE AT BARRETTS HILL LOWER POND	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-11	I*11	UNNAMED BROOK - GOLF COURSE POND DAM	3-ND	3-ND	3-ND	4A-M
NHIMP700061206-12	I*12	MERRIL BROOK DAM	3-ND	3-ND	3-ND	4A-M
NHLAK700061206-01	L*01	AYERS POND	3-ND	3-ND	3-ND	4A-M
NHLAK700061206-02	L*02	OTTERNICK POND	5-P	5-P	3-ND	4A-M
NHLAK700061206-03	L*03	UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHLAK700061206-04	L*04	UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHLAK700061206-05	L*05	UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHLAK700061206-06	L*06	UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHLAK700061206-07	L*07	UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-01	R*01	GLOVER BROOK	5-M	3-ND	3-ND	4A-M
NHRIV700061206-02	R*02	MERRILL BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-03	R*03	MERRILL BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-04	R*04	MERRILL BROOK - UNNAMED BROOK	5-P	3-ND	3-ND	4A-M
NHRIV700061206-05	R*05	FIRST BROOK	5-M	3-ND	3-ND	4A-M
NHRIV700061206-06	R*06	FIRST BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-07	R*07	FIRST BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-08	R*08	SECOND BROOK - UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-09	R*09	SECOND BROOK - UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-10	R*10	SECOND BROOK	5-M	3-ND	3-ND	4A-M

WATERSHED 305(b) ASSESSMENT SUMMARY REPORT:

HUC 12 010700061206

HUC 12 NAME MERRIMACK MAINSTEM-NASHUA RIVER TO CONCORD RIVER

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

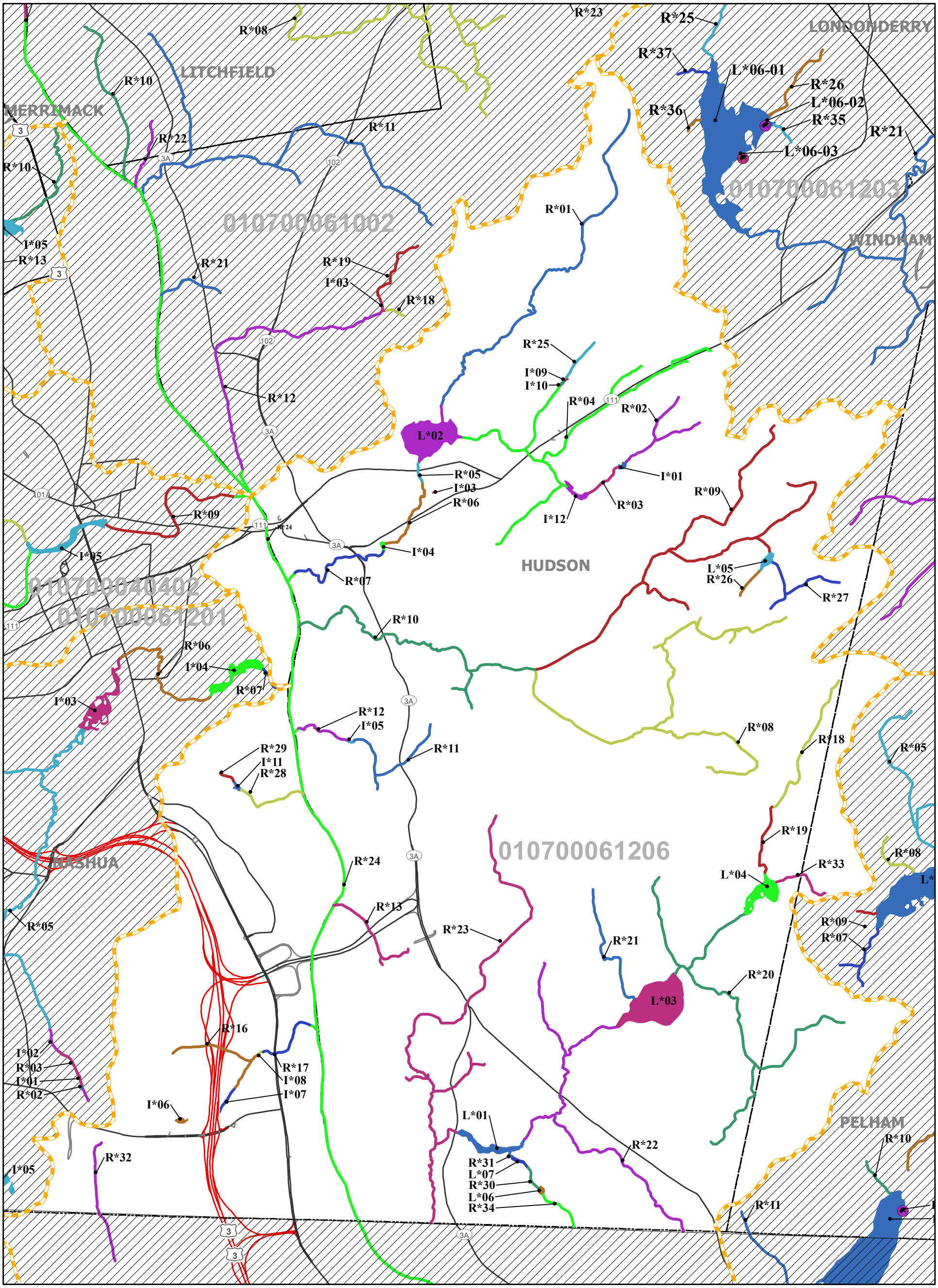
Assessment Cycle 2018

Good		Full Support Good
Marginal		Full Support Marginal
Likely Good		Insufficient Information – Potentially Full Support
No Data		No Data
Likely Bad		Insufficient Information – Potentially Not Support
Poor		Not Support Marginal
Severe		Not Support Severe

ASSESSMENT UNIT ID	MAP LABEL	ASSESSMENT UNIT NAME	AQUATIC LIFE	SWIMMING	BOATING	FISH CONSUMP.
NHRIV700061206-11	R*11	UNNAMED BROOK - TO FIRE POND	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-12	R*12	UNNAMED BROOK - FROM FIRE POND TO MERRIMACK RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-13	R*13	UNNAMED BROOK - TO MERRIMACK RIVER	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-16	R*16	SPIT BROOK - UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-17	R*17	SPIT BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-18	R*18	MUSQUASH BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-19	R*19	MUSQUASH BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-20	R*20	MUSQUASH BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-21	R*21	UNNAMED BROOK - TO UNNAMED POND	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-22	R*22	MUSQUASH BROOK - LAWRENCE BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-23	R*23	MUSQUASH BROOK - LIMIT BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-24	R*24	MERRIMACK RIVER	5-M	5-M	4A-M	4A-M
NHRIV700061206-25	R*25	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-26	R*26	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-27	R*27	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-28	R*28	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-29	R*29	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-30	R*30	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-31	R*31	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-32	R*32	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-33	R*33	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M
NHRIV700061206-34	R*34	UNNAMED BROOK	3-ND	3-ND	3-ND	4A-M

AUIDs For HUC12: 010700061206 - Merrimack mainstem-Nashua River to Concord River

Attachment "D"



HUC12 Boundaries
Town Boundaries
Major Roads
Interstate Highway
US Highway
State Highway

Assessment Unit Coloring
AUs Ending with:
0 =
1 =
2 =
3 =
4 =
5 =
6 =
7 =
8 =
9 =

N
W E
S

Abbrv. Label	HUC 12
L* 03	010 700060201

AUID = NH L AK 700060201 - 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 0.35 0.7 1.05 1.4 Miles

Scale:1:37,190

S:\WD-Watershed\WQ_Planning\305b_303d\2018\AUIDs\HUC12Maps

Assessment Unit ID NHRIV700061206-24
Assessment Unit Name MERRIMACK RIVER
Primary Town NASHUA

Size 5.1510 MILES
Beach N
Assessment Unit Category*~ 5-M

Attachment "D"
2018, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

Designated Use Description	*Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority
Aquatic Life Integrity	5-M	ALKALINITY, CARBONATE AS CACO3	N	2012	2012	3-PNS	
		AMMONIA (TOTAL)	N	2012	N/A	3-PAS	
		ARSENIC	N	1995	N/A	3-ND	
		Aluminum	N	2017	2014	5-M	LOW
		CADMIUM	N	2005	2005	3-ND	
		CHLORIDE	N	2018	N/A	3-PAS	
		COPPER	N	2016	2004	3-PAS	
		DISSOLVED OXYGEN SATURATION	N	2018	N/A	3-PAS	
		IRON	N	1995	N/A	3-ND	
		LEAD	N	2005	2005	3-ND	
		NICKEL	N	2005	2005	3-ND	
		Nonnative Fish, Shellfish, or Zooplankton	N			3-PNS	
		OXYGEN, DISSOLVED	N	2018	N/A	2-G	
		PHOSPHORUS (TOTAL)	N	2017	NLV	3-PAS	
		SELENIUM	N	1995	N/A	3-ND	
		TURBIDITY	N	2017	2012	3-PAS	
		ZINC	N	2004	2004	3-ND	
		pH	N	2018	2017	5-M	LOW
Fish Consumption	4A-M	ARSENIC	N	1995	N/A	3-ND	
		COPPER	N	2016	N/A	3-PNS	
		MANGANESE	N	1994	N/A	3-ND	
		Mercury	N			4A-M	
		NICKEL	N	2005	N/A	3-ND	
		SELENIUM	N	1995	N/A	3-ND	
		ZINC	N	2004	N/A	3-ND	
Potential Drinking Water Supply	2-G	ARSENIC	N	1995	N/A	3-ND	
		COPPER	N	2016	N/A	3-PAS	
		ESCHERICHIA COLI	N	2017	2017	3-PNS	
		FECAL COLIFORM	N	2004	2004	3-ND	

Severe	Poor	Likely Bad	No Data	Likely Good	Marginal	Good
Not Supporting, Severe	Not Supporting, Marginal	Insufficient Information – Potentially Full Supporting	No Data	Insufficient Information – Potentially Full Supporting	Full Support, Marginal	Full Support, Good

*DES Categories; 2-G = Supports Parameter well above criteria, 2-M = Supports Parameter marginally above criteria, 2-OBS = Exceeds WQ criteria but natural therefore not a WQ exceedence, 3-ND = Insufficient Information/No data, 3-PAS= Insufficient Information/Potentially Attaining Standard, 3-PNS= Insufficient Information/Potentially Not Attaining Standard, (4A=Impaired/TMDL Completed, 4B=Impaired/Other Measure will rectify Impairment, 4C=Impaired/Non-Pollutant, 5=Impaired/TMDL needed) M=Marginal Impairment, P=Severe Impairment, T=Threatened (http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

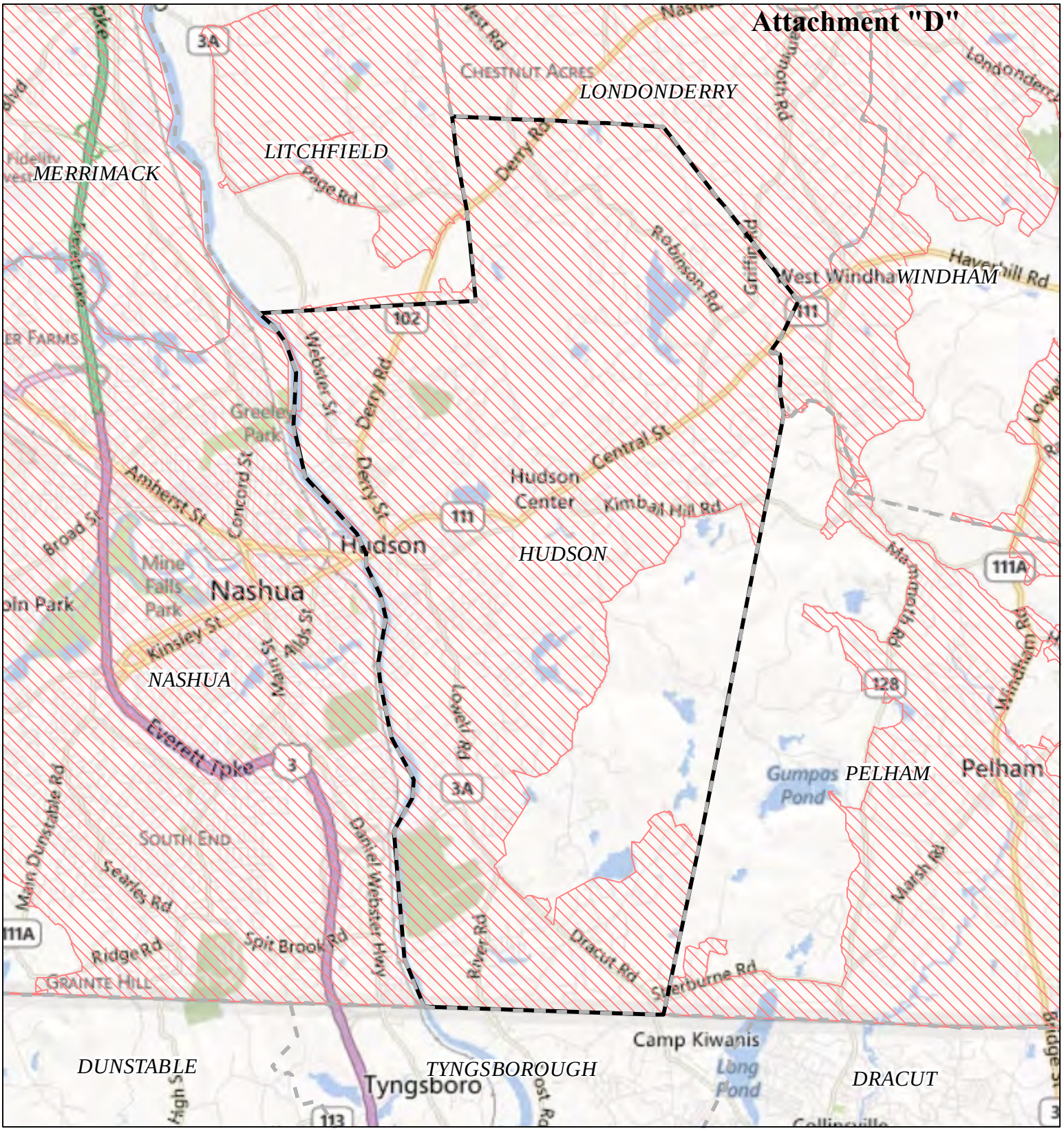
Attachment "D"
2018, 305(b)/303(d) - All Reviewed Parameters by Assessment Unit

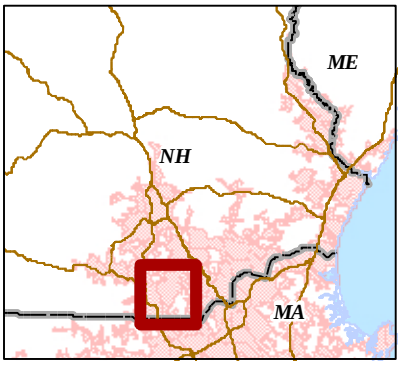
Assessment Unit ID NHRIV700061206-24
Assessment Unit Name MERRIMACK RIVER
Primary Town NASHUA
Size 5.1510 MILES
Beach N
Assessment Unit Category*~ 5-M

Designated Use Description	*Desig. Use Category	Parameter Name	Parameter Threatened (Y/N)	Last Sample	Last Exceed	Parameter Category*	TMDL Priority
Potential Drinking Water Supply	2-G	IRON	N	1995	1995	3-ND	
		MANGANESE	N	1994	1994	3-ND	
		NICKEL	N	2005	N/A	3-ND	
		SELENIUM	N	1995	N/A	3-ND	
		SULFATES	N	2016	N/A	3-PAS	
		ZINC	N	2004	N/A	3-ND	
Primary Contact Recreation	5-M	Chlorophyll-a	N	2017	2011	5-M	LOW
		Escherichia coli	N	2017	2015	4A-M	
Secondary Contact Recreation	4A-M	Escherichia coli	N	2017	2015	4A-M	
Wildlife	3-ND						

Severe	Poor	Likely Bad	No Data	Likely Good	Marginal	Good
Not Supporting, Severe	Not Supporting, Marginal	Insufficient Information – Potentially Full Supporting	No Data	Insufficient Information – Potentially Full Supporting	Full Support, Marginal	Full Support, Good

*DES Categories; 2-G = Supports Parameter well above criteria, 2-M = Supports Parameter marginally above criteria, 2-OBS = Exceeds WQ criteria but natural therefore not a WQ exceedence, 3-ND = Insufficient Information/No data, 3-PAS= Insufficient Information/Potentially Attaining Standard, 3-PNS= Insufficient Information/Potentially Not Attaining Standard, (4A=Impaired/TMDL Completed, 4B=Impaired/Other Measure will rectify Impairment, 4C=Impaired/Non-Pollutant, 5=Impaired/TMDL needed) M=Marginal Impairment, P=Severe Impairment, T=Threatened (http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Hudson NH

Regulated Area (2000 + 2010 Urbanized Area)

0 1 2 3 4 5 Kilometers

0 1 2 3 4 5 Miles

Town Population: 24351

Regulated Population: 23373

(Populations estimated from 2010 Census)

Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map © 2010 Microsoft Corporation
and its data suppliers

US EPA Region 1 GIS Center Map #8824, 11/19/2012

Attachment "D"

New Hampshire

NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Regulated Area:

UA Based on 2000 Census

UA Based on 2010 Census

0 10 20 30 Kilometers

0 10 20 Miles

Urbanized Areas, Town Boundaries: US Census (2000, 2010)
Base map: GEBCO, NOAA, National Geographic, DeLorme, and Esri

US EPA Region 1 GIS Center
Map #8824, 3/12/2012

Montpelier

Vermont

New Hampshire

Concord

Dover--Rochester, NH--ME

Portsmouth, NH--ME

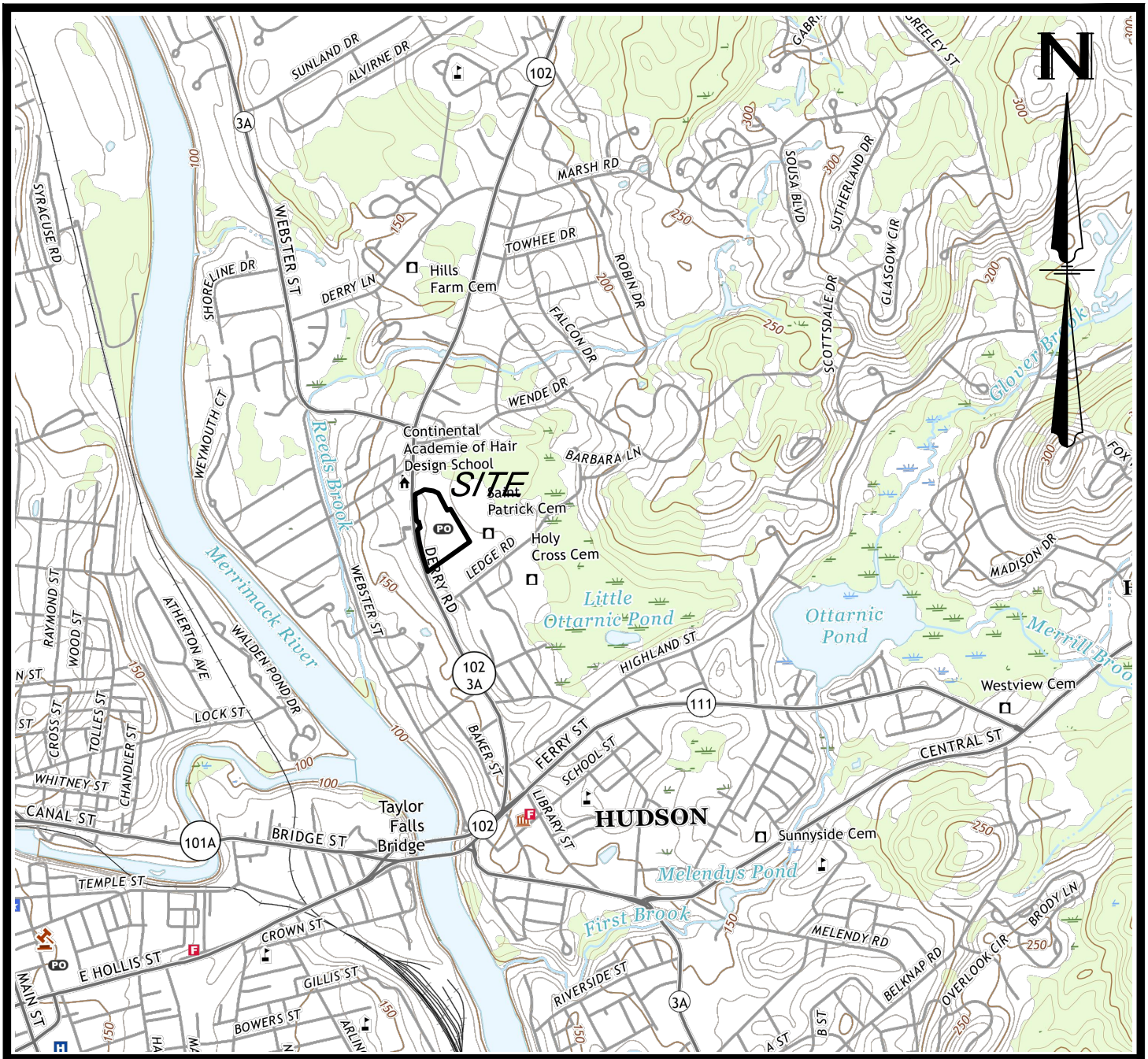
Manchester, NH

Nashua, NH--MA

Boston, MA--NH--RI

Attachment "D"

EXHIBITS



1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

NASHUA NORTH, NH
QUAD MAP (2021)

FIG. 1

VICINITY PLAN

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD
HUDSON, NH

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

OCTOBER 2023

HSI Hayner/Swanson, Inc.
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 1708SB-USGS
Location: J:\1000\1708\DWG\1708 SB

1708-SB
File Number

0 500 1,000 1,500 FEET

SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPT. OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/ ACCESSED OCTOBER 5, 2023.

NRCS SOILS MAP

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 2

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

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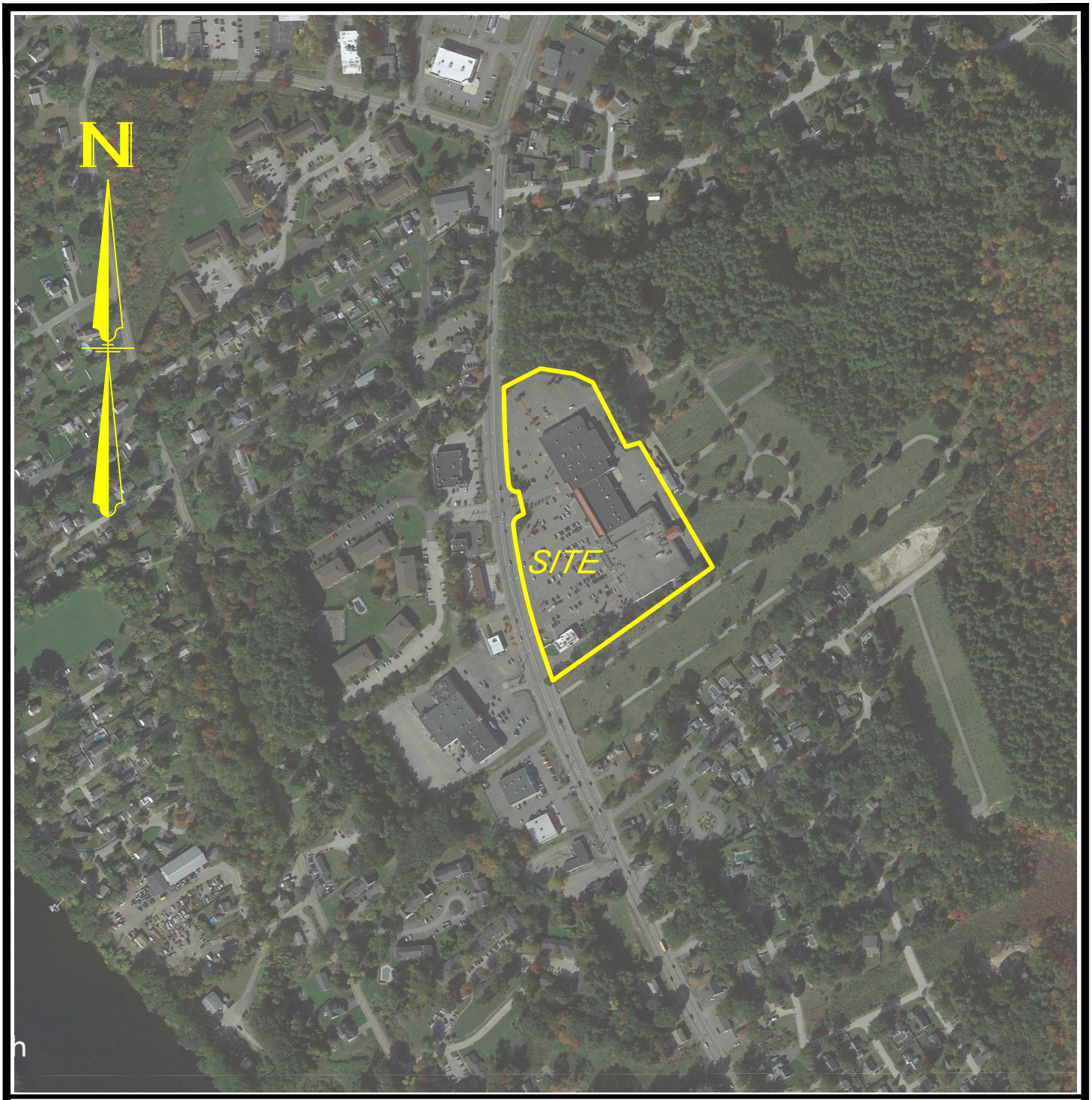
Drawing: 1708SB-USGS

Location: J:\1000\1708\DWG\1708 SB

1708-SB

File Number



0 500 1,000 1,500 FEET

AERIAL DISPLAY PLAN

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 3

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

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131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 1708SB-USGS

Location: J:\1000\1708\DWG\1708 SB

1708-SB

File Number

0 400 800 1,200 FEET

TAX MAP

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 4

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

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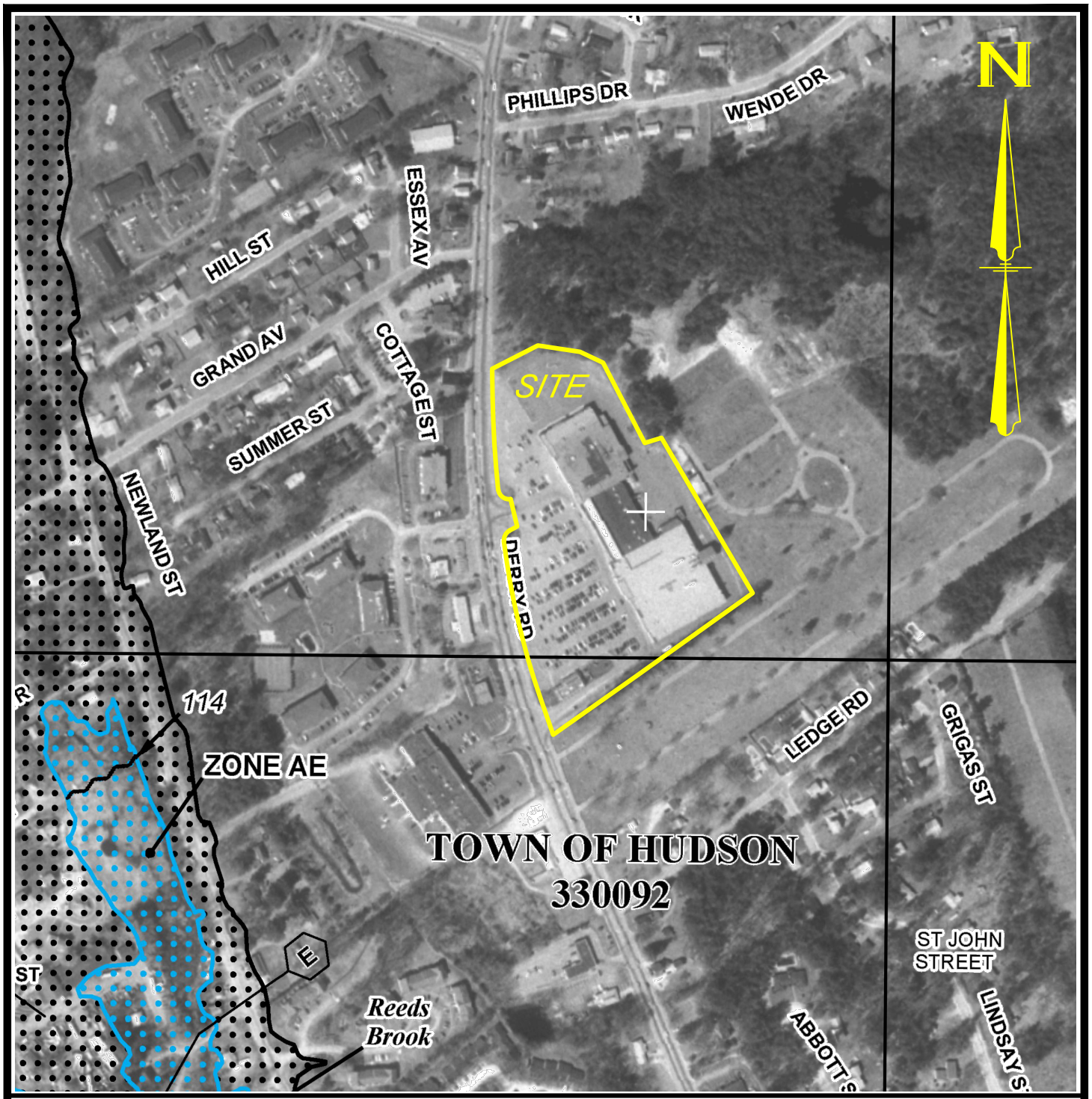
www.hayner-swanson.com

Drawing: 1708SB-USGS

Location: J:\1000\1708\DWG\1708 SB

1708-SB

File Number



0 400 800 1,200 FEET

FIRM: HILLSBOROUGH COUNTY, NEW HAMPSHIRE
TOWN OF HUDSON COMMUNITY No. 330092
MAP No. 33011C0514E
EFFECTIVE DATE: APRIL 18, 2011

FLOOD INSURANCE RATE MAP

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY ROAD

HUDSON, NH

FIG. 5

PREPARED FOR:

HUDSON-VICKERRY, LLC

25 ORCHARD VIEW DR, LONDONDERRY, NH 03053

OCTOBER 2023

HSI Hayner/Swanson, Inc.
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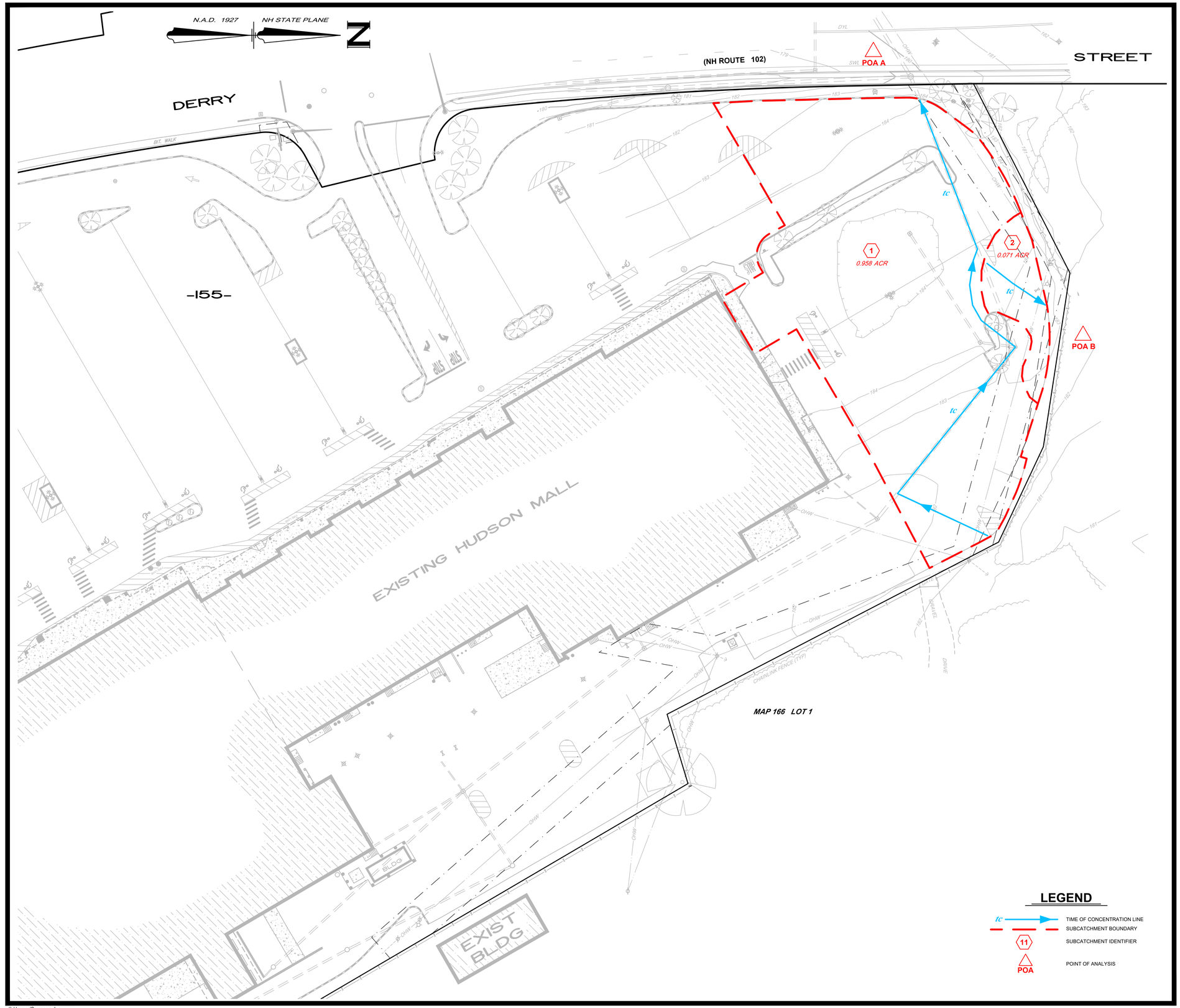
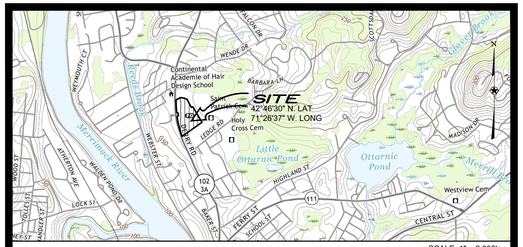
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

Drawing: 1708SB-USGS
Location: J:\1000\1708\DWG\1708 SB

1708-SB
File Number





REVIEW ONLY

NO.	DATE	REVISION	BY

DRAINAGE AREA MAP
PRE-DEVELOPMENT
(MAP 165, LOT 155)

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY STREET
HUDSON, NEW HAMPSHIRE

PREPARED FOR/ RECORD OWNER:

HUDSON-VICKERRY, LLC

c/o THE MEG COMPANIES 25 ORCHARD VIEW DRIVE LONDONDERRY, NH 03053 (603) 434-6700

30 0 30 60 90 120 FEET
15 0 15 30 METERS
SCALE: 1"=30 Feet
1"=9.144 Meters

16 FEBRUARY 2024

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street
Nashua, NH 03062
(603) 883-2057
131 Middlesex Turnpike
Burlington, MA 01803
(781) 203-1501
www.hayner-swanson.com

FIELD BOOK: 1161	DRAWING NAME: 1708SB DA31	1708-SB	1 OF 1
DRAWING LOC: J:\1000\1708\DWG\1708 SB		File Number	Sheet

N.A.D. 1927 NH STATE PLANE

N

(NH ROUTE 102) STREET

DERRY

-155-

MAP 166 LOT 1

EXISTING HUDSON MALL

EXIST BLDG

PROPOSED DRIVE-THRU RESTAURANT

PROP RAIN GARDEN

POA A

POA B

DMH 1

CB 2

CB 6

CB 8

DMH 7

CB 9

1 0.139 ACR

2 0.199 ACR

3 0.222 ACR

4 0.056 ACR

5 0.061 ACR

6 0.088 ACR

7 0.045 ACR

8 0.031 ACR

9 0.173 ACR

10 0.035 ACR

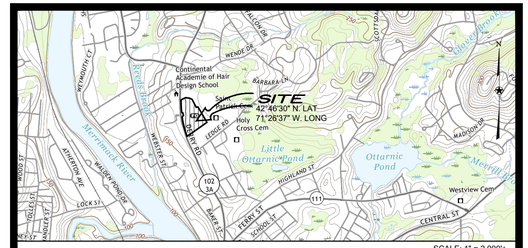
11 0.017 ACR

12 0.053 ACR

tc

LEGEND

- tc — TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- 11 — SUBCATCHMENT IDENTIFIER
- POA — POINT OF ANALYSIS



VICINITY MAP SCALE: 1" = 2,000'±

REVIEW ONLY

No.	DATE	REVISION	BY

DRAINAGE AREA MAP
POST-DEVELOPMENT
(MAP 165, LOT 155)

PROPOSED DRIVE-THRU RESTAURANT

77 DERRY STREET
HUDSON, NEW HAMPSHIRE

PREPARED FOR/ RECORD OWNER:

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c/o THE MEG COMPANIES 25 ORCHARD VIEW DRIVE LONDONDERRY, NH 03053 (603) 434-6700

30 0 30 60 90 120 FEET
15 0 15 30 METERS
SCALE: 1"=30 Feet
1"=9.144 Meters

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DRAWING LOC: J:\1000\1708\DWG\1708 SB		File Number	Sheet