Storm Water Management Report

VONDEROSA PROPERTIES

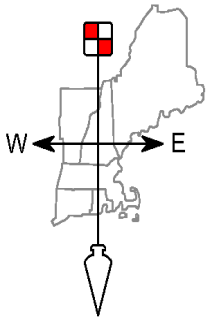
(RESIDENTIAL SUBDIVISION)

Project Location:
Tax Map 4, Lot 145
County Road & Upham Road
Amherst, NH 03031

Prepared for:
Vonderosa Properties, LLC
3 Huxley Lane
Amherst, NH 03031

Date: March 26, 2024

Surveying ⌖ Engineering ⌖ Land Planning ⌖ Permitting ⌖ Septic Designs



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LAND CONSULTANTS, PLLC

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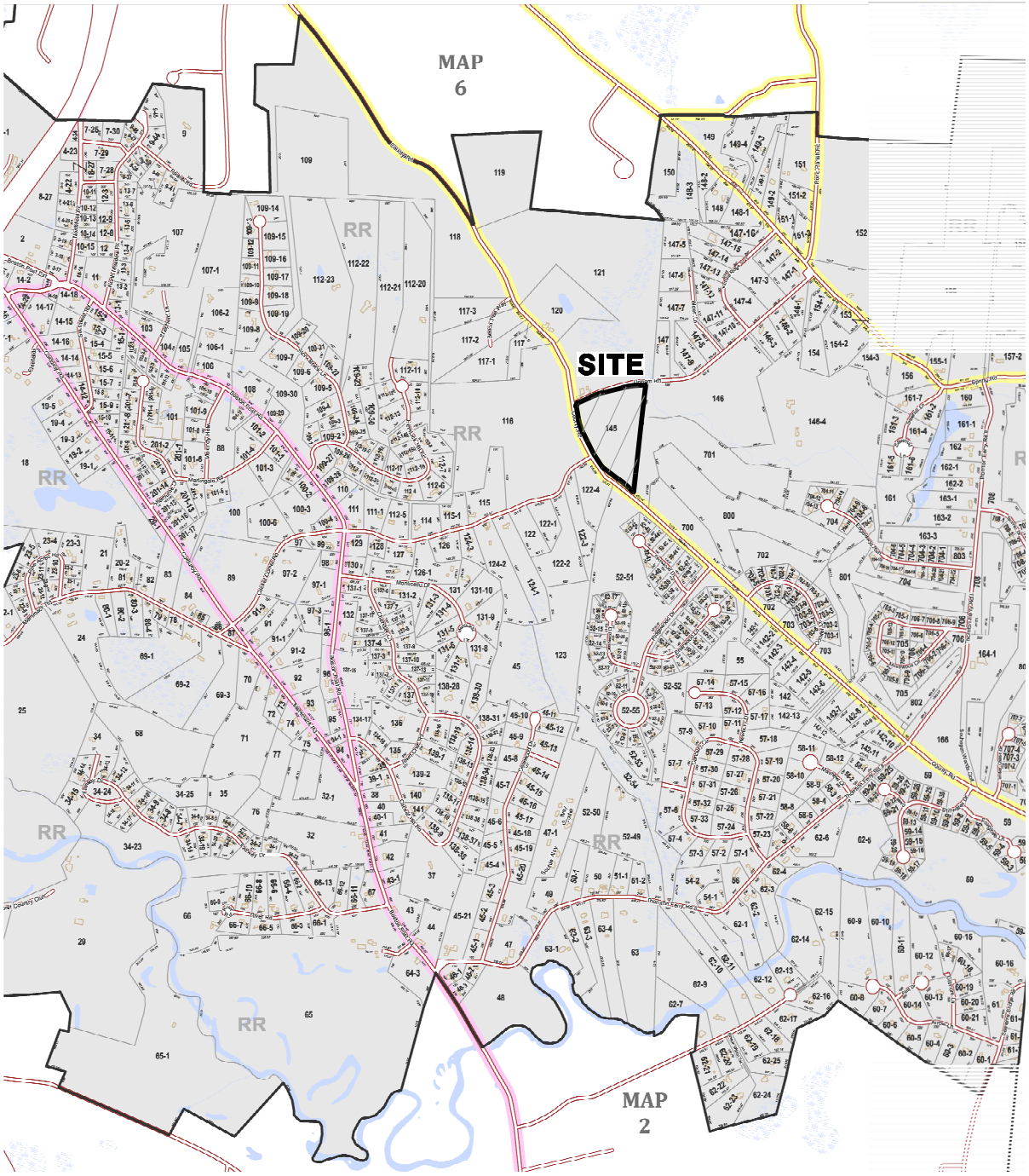
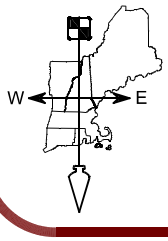


Surveying ✦ Engineering ✦ Land Planning ✦ Permitting ✦ Septic Designs



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TAX MAP 4 LOT 145

VONDEROSA PROPERTIES

COUNTY ROAD & UPHAM ROAD

AMHERST, NEW HAMPSHIRE

SCALE: 1" = 2,000' MARCH 25, 2024

FILE: 2341DP10.dwg	PROJ. NO. 2341.10	SHEET NO. 1 OF 1

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STORM WATER MANAGEMENT REPORT
MAP 4, LOT 145
AMHERST, NEW HAMPSHIRE

Prepared for:
Vonderosa Properties, LLC

March 26, 2024

I) INTRODUCTION

The following are storm water drainage calculations for the proposed Single Family Residential Subdivision on the corner of Upham Road and County Road in Amherst. The site is currently undeveloped. The subject parcel is 15.927 acres and is bordered single family residential to the north & southwest and undeveloped residential land and farms to the northwest and east. Further east is the Souhegan Woods Golf Club. The applicant is proposing to construct three driveways to access 5 single family residential lots. The proposed lots will be serviced by on-site wells and wastewater disposal, underground power and communication services. The project is located at the corner of the intersection of Upham Road and County Road and is known as Lot 145 on the Town of Amherst Assessor's Map 4.

The purpose of this report is to analyze the qualitative and quantitative impacts of the proposed development. The objective of the proposed stormwater management system for this project is to mitigate any increases resulting from the proposed development and to meet the drainage guidelines set forth in the Town of Amherst Stormwater Regulations.

II) SITE DESCRIPTION (EXISTING)

The subject property is comprised of a single lot totaling 15.927 acres. A long, narrow portion of the north side of the parcel is a cleared field and the southern portion is a large, undeveloped wooded area. There is a wetland that runs from west to east that splits the property. The entire site drains northeast to these wetlands that ultimately drain north to a 48" culvert under Upham Road. The wetland soils were excluded from the analysis as there is no development proposed within them and they tend to skew the post development curve numbers. The NRCS Soil maps have a small portion of the property as a Hydrologic Group "B" soil with the remaining area as an "A" soil. A single (1) Observation Point was used in the analysis. This observation point includes the flow from the site to the wetlands that drain to the culvert under Upham Road.

III) METHODOLOGY

The quantity of runoff and the conveyance of that flow through the site are determined using the software package HydroCAD R 10.0 by HydroCAD Software Solutions, LLC. HydroCAD is a computer aided design program for modeling storm water hydrology based on the Soil Conservation Service

(SCS) TR-20 method combined with standard hydraulics calculations used to model detention basins and culverts.

Stormwater management systems and erosion control are designed in accordance with the methodology for the "Best Management Practices" (BMP's), as outlined in the New Hampshire Storm Water Manual, Volume 2.

IV) DRAINAGE DESIGN

Town of Amherst Stormwater Regulations require that there be no increase in the peak rate of runoff in the 1" storm, 2-year design storm, ten (10) year storm frequency, twenty-five (25) year frequency storm event. The proposed drainage system has been designed to meet NHDES AoT requirements which is the same as the Town's requirements with the exception of the Bmp's/ ponds which are to be designed to the 50-year design storm. These design storms have therefore been analyzed to compare the pre and post-development peak flow rates for the site (see attached comparison tables).

Pre-Development Drainage Conditions:
As can be seen on the Pre-Development Drainage Plans, and discussed above, the study area is divided into two subcatchments flowing to a single observation point. To summarize, the northern field on the property drains to the wetlands to the east (Subcatchment E1S). The southern, wooded area (E2S) also drains east to the same wetlands, identified as observation point 1 (OP1).

Post-Development Drainage Conditions:
As can be seen on the attached Plans, the applicant is proposing to construct a common drive to access three of the lots. The proposed drive runs generally along the flat section of land the furthest from the wetlands. Stormwater from the common drive and associated lot development is manages through a variety of low impact design (LID) stormwater best management practices (BMP's). These bmp's include grass swales, bio-retention basins/rain gardens, and vegetated buffers. Two other bio-retention basins are proposed to mitigate runoff from the remaining two lots.

V) SUMMARY

The intent of the stormwater management system for this project is to address the qualitative and quantitative aspects of the stormwater runoff so that there are no downstream adverse impacts created by the project. To mitigate the resulting increases in stormwater runoff rates due to the development of subject parcel this project proposes seven bio-retention basins (BR-1 through BR-4). As well as vegetated buffers for treatment.

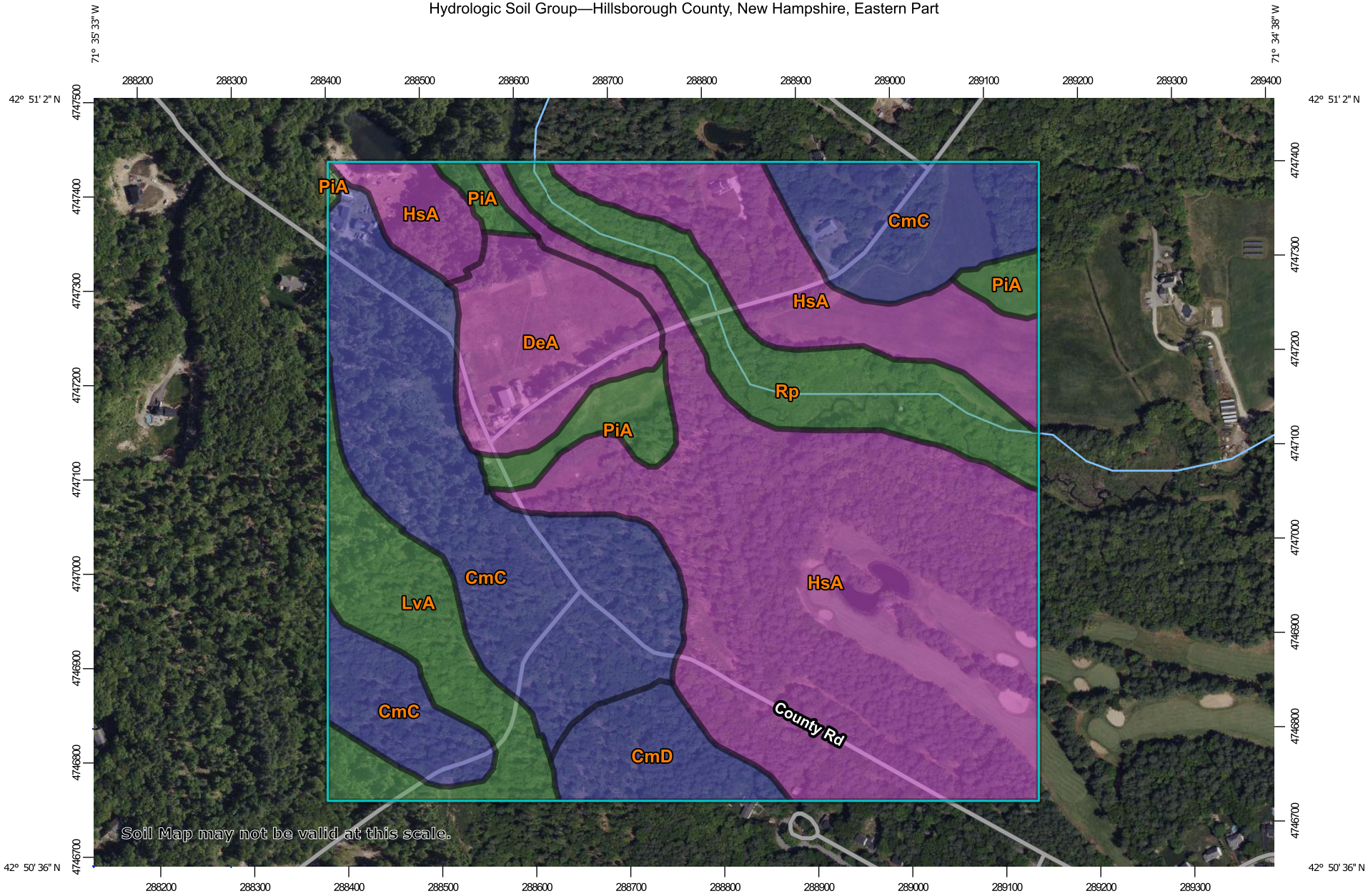
The net result is that new paved areas will receive qualitative treatment and that due to the detention/retention capabilities of the basin there will be no increase in the peak rates of runoff leaving the site.

The following table is a summary of the attached calculations and shows a comparison of the peak flow rates at the outlet point for the site. The values presented are based on pre- and post-development conditions.

Table 1

Peak Flow Rate (CFS) and Volume (AF) to Wetlands (OP1) - with Post-Development Detention

STORM FREQUENCY	PRE-DEVELOPMENT (CFS/AF)	POST DEVELOPMENT (CFS)	CHANGE (CFS/AF)
1" STORM	0/0	0/0	-/-
2-YEAR	0.00/0.001	0.00/0.001	-/-
10-YEAR	0.22/0.177	0.14/0.116	-0.08/-0.061
25-YEAR	1.27/0.517	0.80/0.359	-0.47/-0.158
50-YEAR	4.48/0.958	2.83/0.752	-1.65/-0.206



Map Scale: 1:5,740 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsborough County, New Hampshire, Eastern Part
Survey Area Data: Version 26, Aug 22, 2023

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CmC	Canton fine sandy loam, 8 to 15 percent slopes, very stony	B	34.2	26.9%
CmD	Canton fine sandy loam, 15 to 25 percent slopes, very stony	B	5.0	3.9%
DeA	Deerfield loamy fine sand, 0 to 3 percent slopes	A	8.8	6.9%
HsA	Hinckley loamy sand, 0 to 3 percent slopes	A	54.7	43.0%
LvA	Leicester-Walpole complex stony, 0 to 3 percent slopes	A/D	9.3	7.3%
PiA	Pipestone loamy sand, 0 to 3 percent slopes	A/D	4.7	3.7%
Rp	Rippowam fine sandy loam	A/D	10.6	8.3%
Totals for Area of Interest			**127.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

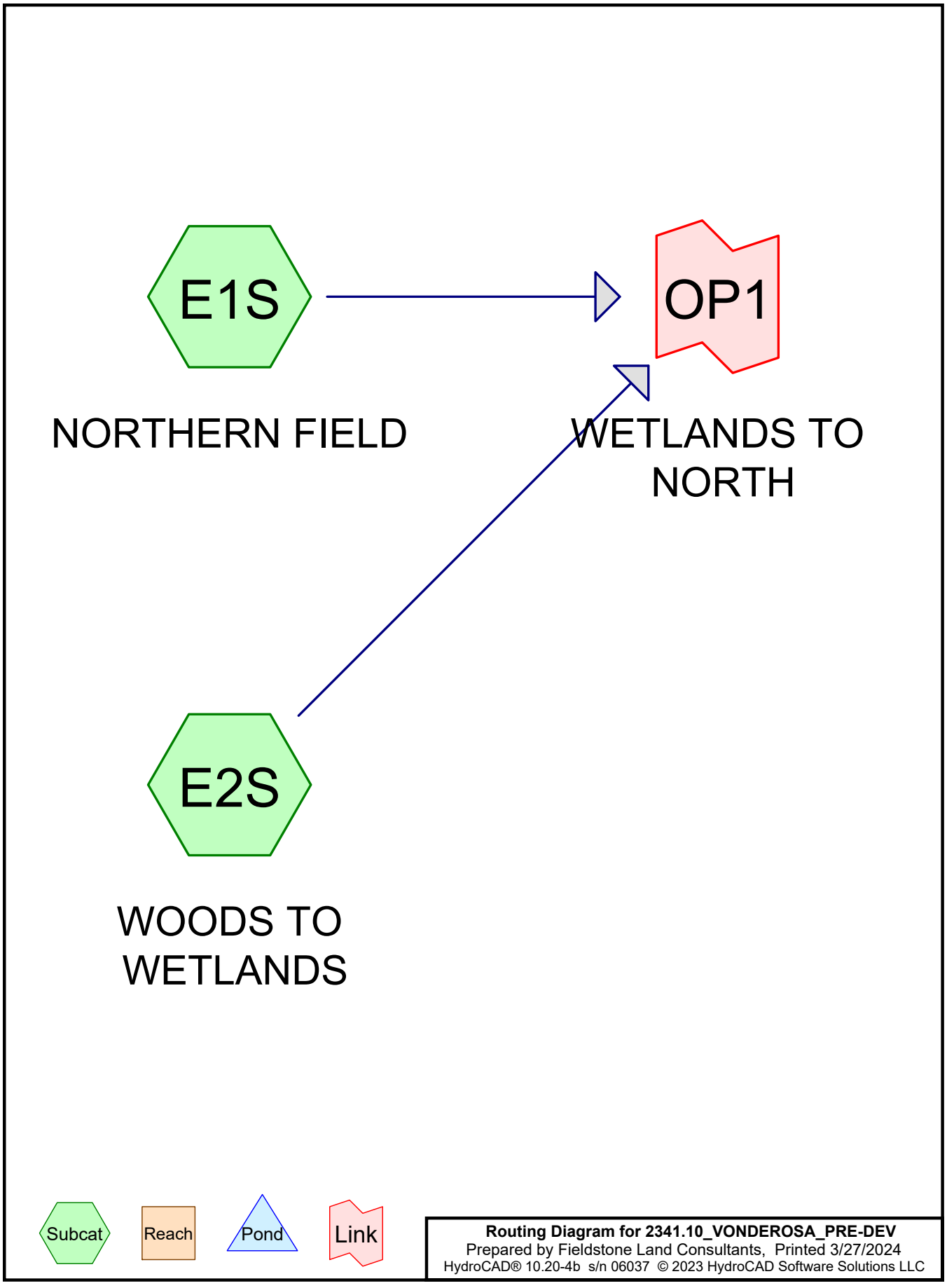
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Section 1.1

Existing Conditions
1", 2, 10, 50 Year Storm Node List



Routing Diagram for 2341.10_VONDEROSA_PRE-DEV
Prepared by Fieldstone Land Consultants, Printed 3/27/2024

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
12.056	HSG A	E1S, E2S
3.924	HSG B	E2S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
15.980		**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
4.849	0.097	0.000	0.000	0.000	4.946	>75% Grass cover, Good	E1S, E2S
0.376	0.206	0.000	0.000	0.000	0.583	Paved parking	E1S, E2S
6.831	3.621	0.000	0.000	0.000	10.452	Woods, Good	E1S, E2S
12.056	**3.924**	**0.000**	**0.000**	**0.000**	**15.980**	**TOTAL AREA**	

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth=0.00"
Flow Length=590' Tc=21.0 min CN=43 Runoff=0.00 cfs 0.000 af

Subcatchment E2S: WOODS TO Runoff Area=554,563 sf 2.54% Impervious Runoff Depth=0.00"
Flow Length=890' Tc=14.3 min CN=41 Runoff=0.00 cfs 0.000 af

Link OP1: WETLANDS TO NORTH Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
96.35% Pervious = 15.398 ac 3.65% Impervious = 0.583 ac

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth>0.00"
Flow Length=590' Tc=21.0 min CN=43 Runoff=0.00 cfs 0.001 af

Subcatchment E2S: WOODS TO Runoff Area=554,563 sf 2.54% Impervious Runoff Depth=0.00"
Flow Length=890' Tc=14.3 min CN=41 Runoff=0.00 cfs 0.000 af

Link OP1: WETLANDS TO NORTH Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.001 af Average Runoff Depth = 0.00"
96.35% Pervious = 15.398 ac 3.65% Impervious = 0.583 ac

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth>0.17"
Flow Length=590' Tc=21.0 min CN=43 Runoff=0.07 cfs 0.047 af

Subcatchment E2S: WOODS TO Runoff Area=554,563 sf 2.54% Impervious Runoff Depth>0.12"
Flow Length=890' Tc=14.3 min CN=41 Runoff=0.16 cfs 0.130 af

Link OP1: WETLANDS TO NORTH Inflow=0.22 cfs 0.177 af
Primary=0.22 cfs 0.177 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.177 af Average Runoff Depth = 0.13"
96.35% Pervious = 15.398 ac 3.65% Impervious = 0.583 ac

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth>0.82"
Flow Length=590' Tc=21.0 min CN=43 Runoff=1.09 cfs 0.223 af

Subcatchment E2S: WOODS TO Runoff Area=554,563 sf 2.54% Impervious Runoff Depth>0.69"
Flow Length=890' Tc=14.3 min CN=41 Runoff=3.49 cfs 0.735 af

Link OP1: WETLANDS TO NORTH Inflow=4.48 cfs 0.958 af
Primary=4.48 cfs 0.958 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.958 af Average Runoff Depth = 0.72"
96.35% Pervious = 15.398 ac 3.65% Impervious = 0.583 ac

Section 1.2

Existing Conditions

25 Year Storm Full Summary

Summary for Subcatchment E1S: NORTHERN FIELD

Runoff = 0.37 cfs @ 12.47 hrs, Volume= 0.125 af, Depth> 0.46"
Routed to Link OP1 : WETLANDS TO NORTH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
11,290	98	Paved parking, HSG A
9,421	30	Woods, Good, HSG A
120,830	39	>75% Grass cover, Good, HSG A
141,541	43	Weighted Average
130,251		92.02% Pervious Area
11,290		7.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0300	0.13		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 2.86"
8.2	490	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
21.0	590	Total			

Summary for Subcatchment E2S: WOODS TO WETLANDS

Runoff = 0.90 cfs @ 12.47 hrs, Volume= 0.392 af, Depth> 0.37"
Routed to Link OP1 : WETLANDS TO NORTH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
8,995	98	Paved parking, HSG B
157,734	55	Woods, Good, HSG B
4,205	61	>75% Grass cover, Good, HSG B
288,138	30	Woods, Good, HSG A
5,090	98	Paved parking, HSG A
90,401	39	>75% Grass cover, Good, HSG A
554,563	41	Weighted Average
540,478		97.46% Pervious Area
14,085		2.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2000	0.18		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
5.3	790	0.2500	2.50		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
14.3	890	Total			

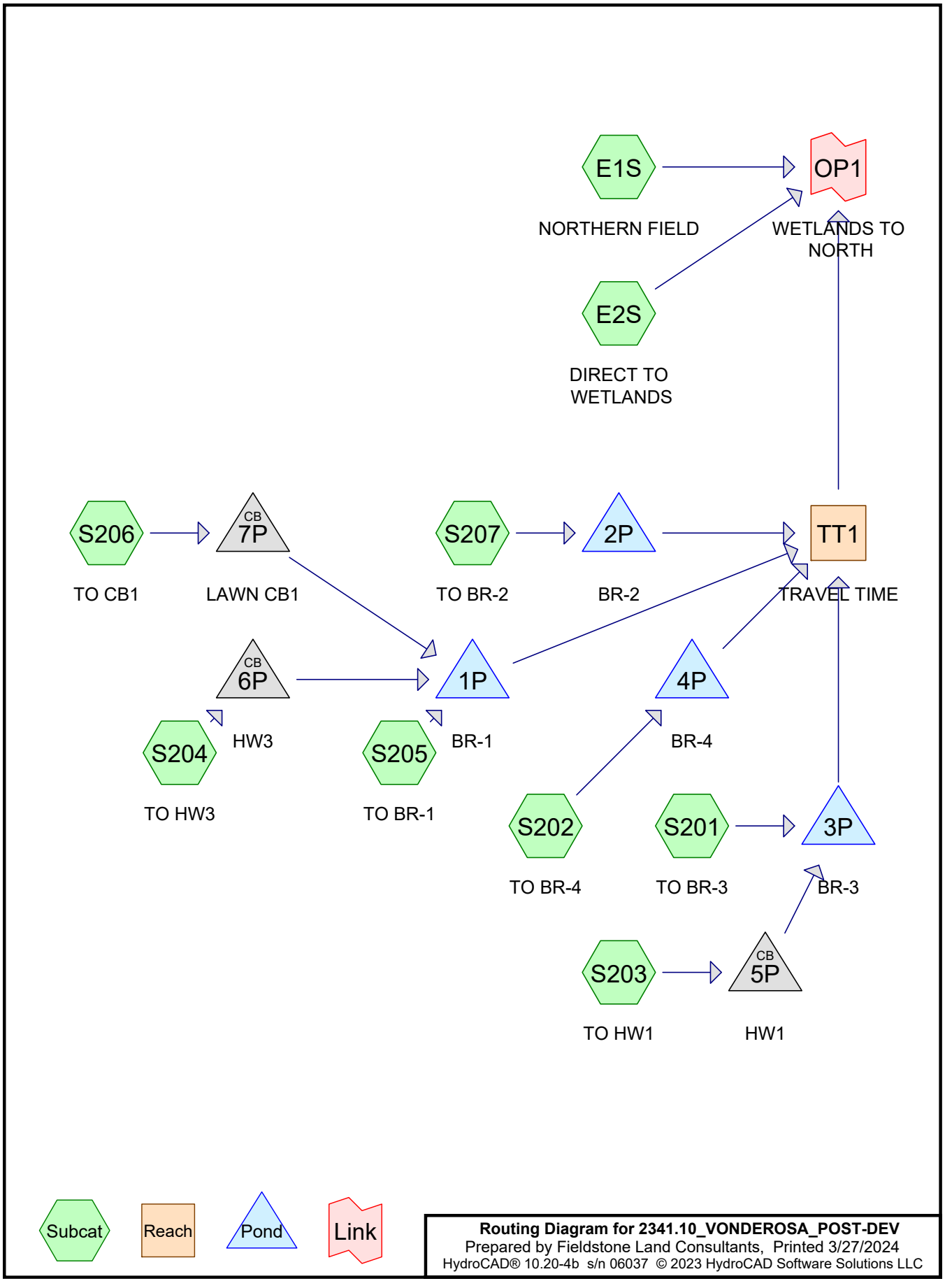
Summary for Link OP1: WETLANDS TO NORTH

Inflow Area = 15.980 ac, 3.65% Impervious, Inflow Depth > 0.39" for 25-Year event
Inflow = 1.27 cfs @ 12.47 hrs, Volume= 0.517 af
Primary = 1.27 cfs @ 12.47 hrs, Volume= 0.517 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Section 2.1

Proposed Conditions
1”, 2, 10, 50 Year Storm Node List



Routing Diagram for 2341.10_VONDEROSA_POST-DEV
Prepared by Fieldstone Land Consultants, Printed 3/27/2024

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
12.056	HSG A	E1S, E2S, S201, S202, S203, S204, S205, S206, S207
3.924	HSG B	E2S, S203, S204, S205
0.000	HSG C	
0.000	HSG D	
0.000	Other	
15.980		**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
5.091	0.757	0.000	0.000	0.000	5.849	>75% Grass cover, Good	E1S, E2S, S201, S202, S203, S204, S205, S206, S207
0.667	0.346	0.000	0.000	0.000	1.013	Paved parking	E1S, E2S, S201, S202, S203, S204, S205, S206, S207
0.231	0.026	0.000	0.000	0.000	0.257	Roofs	E2S, S201, S202, S205, S206, S207
6.067	2.795	0.000	0.000	0.000	8.862	Woods, Good	E1S, E2S, S201, S202, S203, S204, S205
12.056	**3.924**	**0.000**	**0.000**	**0.000**	**15.980**	**TOTAL AREA**	

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth=0.00"
Flow Length=590' Tc=21.0 min CN=43 Runoff=0.00 cfs 0.000 af

Subcatchment E2S: DIRECT TO Runoff Area=363,329 sf 1.68% Impervious Runoff Depth=0.00"
Flow Length=890' Tc=14.3 min CN=40 Runoff=0.00 cfs 0.000 af

Subcatchment S201: TO BR-3 Runoff Area=33,710 sf 23.55% Impervious Runoff Depth=0.00"
Flow Length=257' Tc=17.6 min CN=52 Runoff=0.00 cfs 0.000 af

Subcatchment S202: TO BR-4 Runoff Area=26,355 sf 16.73% Impervious Runoff Depth=0.00"
Flow Length=207' Tc=13.7 min CN=45 Runoff=0.00 cfs 0.000 af

Subcatchment S203: TO HW1 Runoff Area=35,688 sf 15.04% Impervious Runoff Depth=0.00"
Flow Length=500' Tc=14.4 min CN=41 Runoff=0.00 cfs 0.000 af

Subcatchment S204: TO HW3 Runoff Area=38,593 sf 17.57% Impervious Runoff Depth=0.00"
Flow Length=250' Tc=8.4 min CN=59 Runoff=0.00 cfs 0.000 af

Subcatchment S205: TO BR-1 Runoff Area=40,977 sf 19.68% Impervious Runoff Depth=0.00"
Flow Length=225' Tc=12.2 min CN=57 Runoff=0.00 cfs 0.000 af

Subcatchment S206: TO CB1 Runoff Area=4,383 sf 38.88% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=62 Runoff=0.00 cfs 0.000 af

Subcatchment S207: TO BR-2 Runoff Area=11,533 sf 31.77% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=58 Runoff=0.00 cfs 0.000 af

Reach TT1: TRAVEL TIME Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=850.0' S=0.0071 '/' Capacity=8.52 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: BR-1 Peak Elev=235.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 2P: BR-2 Peak Elev=235.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 3P: BR-3 Peak Elev=233.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 4P: BR-4 Peak Elev=236.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 5P: HW1 Peak Elev=240.10' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0100 '/' Outflow=0.00 cfs 0.000 af

Pond 6P: HW3 Peak Elev=241.00' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.00 cfs 0.000 af

Pond 7P: LAWN CB1 Peak Elev=241.00' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.00 cfs 0.000 af

Link OP1: WETLANDS TO NORTH Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
92.05% Pervious = 14.711 ac 7.95% Impervious = 1.270 ac

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth>0.00"
Flow Length=590' Tc=21.0 min CN=43 Runoff=0.00 cfs 0.001 af

Subcatchment E2S: DIRECT TO Runoff Area=363,329 sf 1.68% Impervious Runoff Depth=0.00"
Flow Length=890' Tc=14.3 min CN=40 Runoff=0.00 cfs 0.000 af

Subcatchment S201: TO BR-3 Runoff Area=33,710 sf 23.55% Impervious Runoff Depth>0.10"
Flow Length=257' Tc=17.6 min CN=52 Runoff=0.01 cfs 0.006 af

Subcatchment S202: TO BR-4 Runoff Area=26,355 sf 16.73% Impervious Runoff Depth>0.01"
Flow Length=207' Tc=13.7 min CN=45 Runoff=0.00 cfs 0.001 af

Subcatchment S203: TO HW1 Runoff Area=35,688 sf 15.04% Impervious Runoff Depth=0.00"
Flow Length=500' Tc=14.4 min CN=41 Runoff=0.00 cfs 0.000 af

Subcatchment S204: TO HW3 Runoff Area=38,593 sf 17.57% Impervious Runoff Depth>0.26"
Flow Length=250' Tc=8.4 min CN=59 Runoff=0.08 cfs 0.019 af

Subcatchment S205: TO BR-1 Runoff Area=40,977 sf 19.68% Impervious Runoff Depth>0.20"
Flow Length=225' Tc=12.2 min CN=57 Runoff=0.04 cfs 0.016 af

Subcatchment S206: TO CB1 Runoff Area=4,383 sf 38.88% Impervious Runoff Depth>0.34"
Tc=6.0 min CN=62 Runoff=0.02 cfs 0.003 af

Subcatchment S207: TO BR-2 Runoff Area=11,533 sf 31.77% Impervious Runoff Depth>0.23"
Tc=6.0 min CN=58 Runoff=0.02 cfs 0.005 af

Reach TT1: TRAVEL TIME Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=850.0' S=0.0071 '/' Capacity=8.52 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: BR-1 Peak Elev=235.65' Storage=131 cf Inflow=0.12 cfs 0.038 af
Discarded=0.07 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.038 af

Pond 2P: BR-2 Peak Elev=235.00' Storage=0 cf Inflow=0.02 cfs 0.005 af
Discarded=0.02 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.005 af

Pond 3P: BR-3 Peak Elev=233.50' Storage=0 cf Inflow=0.01 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 4P: BR-4 Peak Elev=236.00' Storage=0 cf Inflow=0.00 cfs 0.001 af
Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Pond 5P: HW1 Peak Elev=240.10' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0100 '/' Outflow=0.00 cfs 0.000 af

Pond 6P: HW3 Peak Elev=241.15' Inflow=0.08 cfs 0.019 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.08 cfs 0.019 af

Pond 7P: LAWN CB1 Peak Elev=241.08' Inflow=0.02 cfs 0.003 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.02 cfs 0.003 af

Link OP1: WETLANDS TO NORTH Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.051 af Average Runoff Depth = 0.04"
92.05% Pervious = 14.711 ac 7.95% Impervious = 1.270 ac

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth>0.17"
Flow Length=590' Tc=21.0 min CN=43 Runoff=0.07 cfs 0.047 af

Subcatchment E2S: DIRECT TO Runoff Area=363,329 sf 1.68% Impervious Runoff Depth>0.10"
Flow Length=890' Tc=14.3 min CN=40 Runoff=0.08 cfs 0.069 af

Subcatchment S201: TO BR-3 Runoff Area=33,710 sf 23.55% Impervious Runoff Depth>0.50"
Flow Length=257' Tc=17.6 min CN=52 Runoff=0.16 cfs 0.032 af

Subcatchment S202: TO BR-4 Runoff Area=26,355 sf 16.73% Impervious Runoff Depth>0.24"
Flow Length=207' Tc=13.7 min CN=45 Runoff=0.02 cfs 0.012 af

Subcatchment S203: TO HW1 Runoff Area=35,688 sf 15.04% Impervious Runoff Depth>0.12"
Flow Length=500' Tc=14.4 min CN=41 Runoff=0.01 cfs 0.008 af

Subcatchment S204: TO HW3 Runoff Area=38,593 sf 17.57% Impervious Runoff Depth>0.85"
Flow Length=250' Tc=8.4 min CN=59 Runoff=0.62 cfs 0.062 af

Subcatchment S205: TO BR-1 Runoff Area=40,977 sf 19.68% Impervious Runoff Depth>0.74"
Flow Length=225' Tc=12.2 min CN=57 Runoff=0.47 cfs 0.058 af

Subcatchment S206: TO CB1 Runoff Area=4,383 sf 38.88% Impervious Runoff Depth>1.01"
Tc=6.0 min CN=62 Runoff=0.10 cfs 0.008 af

Subcatchment S207: TO BR-2 Runoff Area=11,533 sf 31.77% Impervious Runoff Depth>0.79"
Tc=6.0 min CN=58 Runoff=0.19 cfs 0.018 af

Reach TT1: TRAVEL TIME Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=850.0' S=0.0071 '/' Capacity=8.52 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: BR-1 Peak Elev=236.86' Storage=1,411 cf Inflow=1.12 cfs 0.129 af
Discarded=0.19 cfs 0.126 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.126 af

Pond 2P: BR-2 Peak Elev=235.51' Storage=99 cf Inflow=0.19 cfs 0.018 af
Discarded=0.05 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.018 af

Pond 3P: BR-3 Peak Elev=234.98' Storage=259 cf Inflow=0.16 cfs 0.041 af
Discarded=0.05 cfs 0.040 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.040 af

Pond 4P: BR-4 Peak Elev=236.26' Storage=18 cf Inflow=0.02 cfs 0.012 af
Discarded=0.02 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.012 af

Pond 5P: HW1 Peak Elev=240.15' Inflow=0.01 cfs 0.008 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0100 '/' Outflow=0.01 cfs 0.008 af

Pond 6P: HW3 Peak Elev=241.45' Inflow=0.62 cfs 0.062 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.62 cfs 0.062 af

Pond 7P: LAWN CB1 Peak Elev=241.17' Inflow=0.10 cfs 0.008 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.10 cfs 0.008 af

Link OP1: WETLANDS TO NORTH Inflow=0.14 cfs 0.116 af
Primary=0.14 cfs 0.116 af

Total Runoff Area = 15.980 ac Runoff Volume = 0.315 af Average Runoff Depth = 0.24"
92.05% Pervious = 14.711 ac 7.95% Impervious = 1.270 ac

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 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 E1S: NORTHERN FIELD Runoff Area=141,541 sf 7.98% Impervious Runoff Depth>0.82"
Flow Length=590' Tc=21.0 min CN=43 Runoff=1.09 cfs 0.223 af

Subcatchment E2S: DIRECT TO Runoff Area=363,329 sf 1.68% Impervious Runoff Depth>0.63"
Flow Length=890' Tc=14.3 min CN=40 Runoff=1.81 cfs 0.437 af

Subcatchment S201: TO BR-3 Runoff Area=33,710 sf 23.55% Impervious Runoff Depth>1.50"
Flow Length=257' Tc=17.6 min CN=52 Runoff=0.76 cfs 0.097 af

Subcatchment S202: TO BR-4 Runoff Area=26,355 sf 16.73% Impervious Runoff Depth>0.97"
Flow Length=207' Tc=13.7 min CN=45 Runoff=0.34 cfs 0.049 af

Subcatchment S203: TO HW1 Runoff Area=35,688 sf 15.04% Impervious Runoff Depth>0.69"
Flow Length=500' Tc=14.4 min CN=41 Runoff=0.22 cfs 0.047 af

Subcatchment S204: TO HW3 Runoff Area=38,593 sf 17.57% Impervious Runoff Depth>2.11"
Flow Length=250' Tc=8.4 min CN=59 Runoff=1.80 cfs 0.155 af

Subcatchment S205: TO BR-1 Runoff Area=40,977 sf 19.68% Impervious Runoff Depth>1.93"
Flow Length=225' Tc=12.2 min CN=57 Runoff=1.50 cfs 0.151 af

Subcatchment S206: TO CB1 Runoff Area=4,383 sf 38.88% Impervious Runoff Depth>2.38"
Tc=6.0 min CN=62 Runoff=0.26 cfs 0.020 af

Subcatchment S207: TO BR-2 Runoff Area=11,533 sf 31.77% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=58 Runoff=0.56 cfs 0.045 af

Reach TT1: TRAVEL TIME Avg. Flow Depth=0.32' Max Vel=1.24 fps Inflow=0.89 cfs 0.092 af
n=0.035 L=850.0' S=0.0071 '/' Capacity=8.52 cfs Outflow=0.75 cfs 0.092 af

Pond 1P: BR-1 Peak Elev=237.62' Storage=4,299 cf Inflow=3.41 cfs 0.326 af
Discarded=0.33 cfs 0.264 af Primary=0.44 cfs 0.038 af Outflow=0.76 cfs 0.302 af

Pond 2P: BR-2 Peak Elev=236.66' Storage=543 cf Inflow=0.56 cfs 0.045 af
Discarded=0.07 cfs 0.045 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.045 af

Pond 3P: BR-3 Peak Elev=235.65' Storage=931 cf Inflow=0.98 cfs 0.144 af
Discarded=0.08 cfs 0.078 af Primary=0.56 cfs 0.050 af Outflow=0.65 cfs 0.128 af

Pond 4P: BR-4 Peak Elev=238.03' Storage=466 cf Inflow=0.34 cfs 0.049 af
Discarded=0.05 cfs 0.040 af Primary=0.06 cfs 0.005 af Outflow=0.10 cfs 0.045 af

Pond 5P: HW1 Peak Elev=240.34' Inflow=0.22 cfs 0.047 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0100 '/' Outflow=0.22 cfs 0.047 af

Pond 6P: HW3 Peak Elev=241.86' Inflow=1.80 cfs 0.155 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=1.80 cfs 0.155 af

Pond 7P: LAWN CB1 Peak Elev=241.28' Inflow=0.26 cfs 0.020 af
12.0" Round Culvert n=0.013 L=110.0' S=0.0091 '/' Outflow=0.26 cfs 0.020 af

Link OP1: WETLANDS TO NORTH Inflow=2.83 cfs 0.752 af
Primary=2.83 cfs 0.752 af

Total Runoff Area = 15.980 ac Runoff Volume = 1.224 af Average Runoff Depth = 0.92"
92.05% Pervious = 14.711 ac 7.95% Impervious = 1.270 ac

Section 2.2

Proposed Conditions

25 Year Storm Full Summary

Summary for Subcatchment E1S: NORTHERN FIELD

Runoff = 0.37 cfs @ 12.47 hrs, Volume= 0.125 af, Depth> 0.46"
Routed to Link OP1 : WETLANDS TO NORTH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
11,290	98	Paved parking, HSG A
9,421	30	Woods, Good, HSG A
120,830	39	>75% Grass cover, Good, HSG A
141,541	43	Weighted Average
130,251		92.02% Pervious Area
11,290		7.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.0300	0.13		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 2.86"
8.2	490	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
21.0	590	Total			

Summary for Subcatchment E2S: DIRECT TO WETLANDS

Runoff = 0.45 cfs @ 12.63 hrs, Volume= 0.226 af, Depth> 0.32"
Routed to Link OP1 : WETLANDS TO NORTH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
100,284	55	Woods, Good, HSG B
14,205	61	>75% Grass cover, Good, HSG B
198,669	30	Woods, Good, HSG A
5,090	98	Paved parking, HSG A
44,081	39	>75% Grass cover, Good, HSG A
1,000	98	Roofs, HSG A
363,329	40	Weighted Average
357,239		98.32% Pervious Area
6,090		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.2000	0.18		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
5.3	790	0.2500	2.50		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
14.3	890	Total			

Summary for Subcatchment S201: TO BR-3

Runoff = 0.44 cfs @ 12.30 hrs, Volume= 0.063 af, Depth> 0.97"
Routed to Pond 3P : BR-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
4,407	30	Woods, Good, HSG A
5,704	98	Paved parking, HSG A
21,363	39	>75% Grass cover, Good, HSG A
2,236	98	Roofs, HSG A
33,710	52	Weighted Average
25,770		76.45% Pervious Area
7,940		23.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	65	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
0.9	55	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.5	125	0.0100	4.23	21.16	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.025 Earth, clean & winding
17.6	257	Total			

Summary for Subcatchment S202: TO BR-4

Runoff = 0.13 cfs @ 12.29 hrs, Volume= 0.029 af, Depth> 0.57"
Routed to Pond 4P : BR-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
10,090	30	Woods, Good, HSG A
2,172	98	Paved parking, HSG A
11,857	39	>75% Grass cover, Good, HSG A
2,236	98	Roofs, HSG A
26,355	45	Weighted Average
21,947		83.27% Pervious Area
4,408		16.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
0.3	20	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.3	75	0.0100	4.23	21.16	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.025 Earth, clean & winding
13.7	207	Total			

Summary for Subcatchment S203: TO HW1

Runoff = 0.06 cfs @ 12.45 hrs, Volume= 0.025 af, Depth> 0.37"
Routed to Pond 5P : HW1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
27,675	30	Woods, Good, HSG A
0	55	Woods, Good, HSG B
5,368	98	Paved parking, HSG B
2,645	39	>75% Grass cover, Good, HSG A
0	98	Roofs, HSG A
35,688	41	Weighted Average
30,320		84.96% Pervious Area
5,368		15.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
1.4	400	0.0150	4.86	19.46	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=1.00' D=1.00' Z= 3.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
14.4	500	Total			

Summary for Subcatchment S204: TO HW3

Runoff = 1.20 cfs @ 12.16 hrs, Volume= 0.108 af, Depth> 1.46"
Routed to Pond 6P : HW3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
8,005	30	Woods, Good, HSG A
15,475	55	Woods, Good, HSG B
6,779	98	Paved parking, HSG B
8,334	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG A
38,593	59	Weighted Average
31,814		82.43% Pervious Area
6,779		17.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0800	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
0.9	200	0.0100	3.62	10.85	**Trap/Vee/Rect Channel Flow, B-C** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.025 Earth, clean & winding
8.4	250	Total			

Summary for Subcatchment S205: TO BR-1

Runoff = 0.96 cfs @ 12.21 hrs, Volume= 0.103 af, Depth> 1.31"
Routed to Pond 1P : BR-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
6,003	30	Woods, Good, HSG A
2,914	98	Paved parking, HSG A
10,453	39	>75% Grass cover, Good, HSG A
1,118	98	Roofs, HSG A
6,003	55	Woods, Good, HSG B
2,915	98	Paved parking, HSG B
10,453	61	>75% Grass cover, Good, HSG B
1,118	98	Roofs, HSG B
40,977	57	Weighted Average
32,912		80.32% Pervious Area
8,065		19.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.1500	0.16		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 2.86"
2.1	125	0.0200	0.99		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
12.2	225	Total			

Summary for Subcatchment S206: TO CB1

Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.014 af, Depth> 1.68"
Routed to Pond 7P : LAWN CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
0	30	Woods, Good, HSG A
468	98	Paved parking, HSG A
2,679	39	>75% Grass cover, Good, HSG A
1,236	98	Roofs, HSG A
4,383	62	Weighted Average
2,679		61.12% Pervious Area
1,704		38.88% Impervious Area

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

Summary for Subcatchment S207: TO BR-2

Runoff = 0.37 cfs @ 12.14 hrs, Volume= 0.031 af, Depth> 1.39"
Routed to Pond 2P : BR-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.39"

Area (sf)	CN	Description
0	30	Woods, Good, HSG A
1,428	98	Paved parking, HSG A
7,869	39	>75% Grass cover, Good, HSG A
2,236	98	Roofs, HSG A
11,533	58	Weighted Average
7,869		68.23% Pervious Area
3,664		31.77% Impervious Area

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

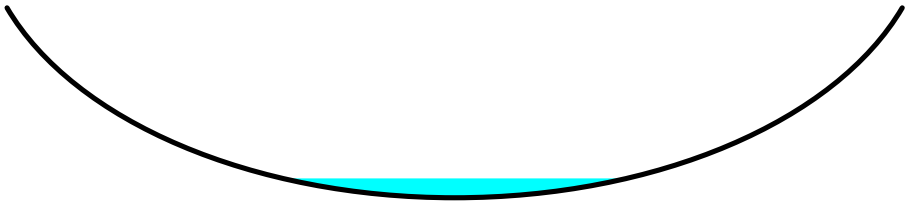
Summary for Reach TT1: TRAVEL TIME

Inflow Area = 4.390 ac, 19.83% Impervious, Inflow Depth = 0.02" for 25-Year event
Inflow = 0.09 cfs @ 13.18 hrs, Volume= 0.008 af
Outflow = 0.06 cfs @ 13.60 hrs, Volume= 0.008 af, Atten= 30%, Lag= 24.9 min
Routed to Link OP1 : WETLANDS TO NORTH

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.58 fps, Min. Travel Time= 24.3 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 61.6 min

Peak Storage= 90 cf @ 13.60 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 1.58'
Bank-Full Depth= 1.00' Flow Area= 3.3 sf, Capacity= 8.52 cfs

5.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 850.0' Slope= 0.0071 '/'
Inlet Invert= 234.00', Outlet Invert= 228.00'



Summary for Pond 1P: BR-1

Inflow Area = 1.927 ac, 19.71% Impervious, Inflow Depth > 1.40" for 25-Year event
Inflow = 2.21 cfs @ 12.18 hrs, Volume= 0.224 af
Outflow = 0.28 cfs @ 13.60 hrs, Volume= 0.213 af, Atten= 87%, Lag= 85.3 min
Discarded = 0.28 cfs @ 13.60 hrs, Volume= 0.213 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 237.37' @ 13.60 hrs Surf.Area= 4,097 sf Storage= 3,182 cf

Plug-Flow detention time= 139.3 min calculated for 0.213 af (95% of inflow)
Center-of-Mass det. time= 114.4 min (1,027.0 - 912.6)

Volume	Invert	Avail.Storage	Storage Description
#1	235.00'	6,262 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.00	400	0.0	0	0
236.40	1,550	30.0	410	410
236.50	1,875	100.0	171	581
238.00	5,700	100.0	5,681	6,262

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	235.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.28 cfs @ 13.60 hrs HW=237.37' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=235.00' TW=234.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: BR-2

Inflow Area = 0.265 ac, 31.77% Impervious, Inflow Depth > 1.39" for 25-Year event
Inflow = 0.37 cfs @ 12.14 hrs, Volume= 0.031 af
Outflow = 0.06 cfs @ 12.93 hrs, Volume= 0.031 af, Atten= 84%, Lag= 47.4 min
Discarded = 0.06 cfs @ 12.93 hrs, Volume= 0.031 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 236.36' @ 12.93 hrs Surf.Area= 843 sf Storage= 294 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 37.6 min (948.6 - 910.9)

Volume	Invert	Avail.Storage	Storage Description
#1	235.00'	2,476 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.00	600	0.0	0	0
236.40	850	30.0	305	305
236.50	875	100.0	86	391
238.00	1,905	100.0	2,085	2,476

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	235.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 12.93 hrs HW=236.36' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=235.00' TW=234.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: BR-3

Inflow Area = 1.593 ac, 19.18% Impervious, Inflow Depth > 0.66" for 25-Year event
Inflow = 0.48 cfs @ 12.31 hrs, Volume= 0.088 af
Outflow = 0.17 cfs @ 13.18 hrs, Volume= 0.080 af, Atten= 65%, Lag= 52.1 min
Discarded = 0.08 cfs @ 13.18 hrs, Volume= 0.071 af
Primary = 0.09 cfs @ 13.18 hrs, Volume= 0.008 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 235.54' @ 13.18 hrs Surf.Area= 1,146 sf Storage= 808 cf

Plug-Flow detention time= 121.9 min calculated for 0.080 af (90% of inflow)
Center-of-Mass det. time= 79.3 min (1,045.5 - 966.2)

Volume	Invert	Avail.Storage	Storage Description
#1	233.50'	1,395 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
233.50	375	0.0	0	0
234.90	600	30.0	205	205
235.00	815	100.0	71	275
236.00	1,425	100.0	1,120	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	235.50'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	233.50'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.08 cfs @ 13.18 hrs HW=235.54' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.09 cfs @ 13.18 hrs HW=235.54' TW=234.07' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.09 cfs @ 0.51 fps)

Summary for Pond 4P: BR-4

Inflow Area = 0.605 ac, 16.73% Impervious, Inflow Depth > 0.57" for 25-Year event
Inflow = 0.13 cfs @ 12.29 hrs, Volume= 0.029 af
Outflow = 0.04 cfs @ 14.42 hrs, Volume= 0.028 af, Atten= 74%, Lag= 127.7 min
Discarded = 0.04 cfs @ 14.42 hrs, Volume= 0.028 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 237.64' @ 14.42 hrs Surf.Area= 506 sf Storage= 239 cf

Plug-Flow detention time= 81.9 min calculated for 0.028 af (97% of inflow)
Center-of-Mass det. time= 68.3 min (1,052.5 - 984.1)

Volume	Invert	Avail.Storage	Storage Description
#1	236.00'	1,288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
236.00	210	0.0	0	0
237.40	400	30.0	128	128
237.50	450	100.0	42	171
239.00	1,040	100.0	1,118	1,288

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	236.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 14.42 hrs HW=237.64' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=236.00' TW=234.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: HW1

Inflow Area = 0.819 ac, 15.04% Impervious, Inflow Depth > 0.37" for 25-Year event
Inflow = 0.06 cfs @ 12.45 hrs, Volume= 0.025 af
Outflow = 0.06 cfs @ 12.45 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.06 cfs @ 12.45 hrs, Volume= 0.025 af
Routed to Pond 3P : BR-3

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 240.22' @ 12.45 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 240.10' / 239.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.45 hrs HW=240.22' TW=235.20' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.06 cfs @ 1.62 fps)

Summary for Pond 6P: HW3

Inflow Area = 0.886 ac, 17.57% Impervious, Inflow Depth > 1.46" for 25-Year event
Inflow = 1.20 cfs @ 12.16 hrs, Volume= 0.108 af
Outflow = 1.20 cfs @ 12.16 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.16 hrs, Volume= 0.108 af
Routed to Pond 1P : BR-1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 241.66' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	241.00'	**12.0" Round Culvert** L= 110.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 241.00' / 240.00' S= 0.0091 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.16 cfs @ 12.16 hrs HW=241.65' TW=236.75' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.16 cfs @ 2.16 fps)

Summary for Pond 7P: LAWN CB1

Inflow Area = 0.101 ac, 38.88% Impervious, Inflow Depth > 1.68" for 25-Year event
Inflow = 0.18 cfs @ 12.14 hrs, Volume= 0.014 af
Outflow = 0.18 cfs @ 12.14 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.14 hrs, Volume= 0.014 af
Routed to Pond 1P : BR-1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 241.23' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	241.00'	**12.0" Round Culvert** L= 110.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 241.00' / 240.00' S= 0.0091 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.17 cfs @ 12.14 hrs HW=241.23' TW=236.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.17 cfs @ 1.28 fps)

Summary for Link OP1: WETLANDS TO NORTH

Inflow Area = 15.980 ac, 7.95% Impervious, Inflow Depth > 0.27" for 25-Year event
Inflow = 0.80 cfs @ 12.58 hrs, Volume= 0.359 af
Primary = 0.80 cfs @ 12.58 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Section 2.3

Proposed Conditions

50 Year Storm Pond Summaries

Summary for Pond 1P: BR-1

Inflow Area = 1.927 ac, 19.71% Impervious, Inflow Depth > 2.03" for 50-Year event
Inflow = 3.41 cfs @ 12.17 hrs, Volume= 0.326 af
Outflow = 0.76 cfs @ 12.71 hrs, Volume= 0.302 af, Atten= 78%, Lag= 32.1 min
Discarded = 0.33 cfs @ 12.71 hrs, Volume= 0.264 af
Primary = 0.44 cfs @ 12.71 hrs, Volume= 0.038 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 237.62' @ 12.71 hrs Surf.Area= 4,741 sf Storage= 4,299 cf

Plug-Flow detention time= 142.7 min calculated for 0.301 af (92% of inflow)
Center-of-Mass det. time= 104.8 min (1,002.6 - 897.8)

Volume	Invert	Avail.Storage	Storage Description
#1	235.00'	6,262 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.00	400	0.0	0	0
236.40	1,550	30.0	410	410
236.50	1,875	100.0	171	581
238.00	5,700	100.0	5,681	6,262

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	235.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.33 cfs @ 12.71 hrs HW=237.62' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.43 cfs @ 12.71 hrs HW=237.62' TW=234.31' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.43 cfs @ 0.88 fps)

Summary for Pond 2P: BR-2

Inflow Area = 0.265 ac, 31.77% Impervious, Inflow Depth > 2.02" for 50-Year event
Inflow = 0.56 cfs @ 12.14 hrs, Volume= 0.045 af
Outflow = 0.07 cfs @ 13.17 hrs, Volume= 0.045 af, Atten= 88%, Lag= 61.9 min
Discarded = 0.07 cfs @ 13.17 hrs, Volume= 0.045 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 236.66' @ 13.17 hrs Surf.Area= 987 sf Storage= 543 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 70.2 min (966.1 - 895.9)

Volume	Invert	Avail.Storage	Storage Description
#1	235.00'	2,476 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.00	600	0.0	0	0
236.40	850	30.0	305	305
236.50	875	100.0	86	391
238.00	1,905	100.0	2,085	2,476

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	235.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 13.17 hrs HW=236.66' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=235.00' TW=234.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: BR-3

Inflow Area = 1.593 ac, 19.18% Impervious, Inflow Depth > 1.09" for 50-Year event
Inflow = 0.98 cfs @ 12.29 hrs, Volume= 0.144 af
Outflow = 0.65 cfs @ 12.50 hrs, Volume= 0.128 af, Atten= 34%, Lag= 12.4 min
Discarded = 0.08 cfs @ 12.50 hrs, Volume= 0.078 af
Primary = 0.56 cfs @ 12.50 hrs, Volume= 0.050 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 235.65' @ 12.50 hrs Surf.Area= 1,210 sf Storage= 931 cf

Plug-Flow detention time= 88.3 min calculated for 0.128 af (89% of inflow)
Center-of-Mass det. time= 36.4 min (980.3 - 943.9)

Volume	Invert	Avail.Storage	Storage Description
#1	233.50'	1,395 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
233.50	375	0.0	0	0
234.90	600	30.0	205	205
235.00	815	100.0	71	275
236.00	1,425	100.0	1,120	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	235.50'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

#2 Discarded 233.50' **3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.08 cfs @ 12.50 hrs HW=235.65' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.56 cfs @ 12.50 hrs HW=235.65' TW=234.19' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.56 cfs @ 0.95 fps)

Summary for Pond 4P: BR-4

Inflow Area = 0.605 ac, 16.73% Impervious, Inflow Depth > 0.97" for 50-Year event
Inflow = 0.34 cfs @ 12.26 hrs, Volume= 0.049 af
Outflow = 0.10 cfs @ 12.99 hrs, Volume= 0.045 af, Atten= 69%, Lag= 44.3 min
Discarded = 0.05 cfs @ 12.99 hrs, Volume= 0.040 af
Primary = 0.06 cfs @ 12.99 hrs, Volume= 0.005 af
Routed to Reach TT1 : TRAVEL TIME

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 238.03' @ 12.99 hrs Surf.Area= 659 sf Storage= 466 cf

Plug-Flow detention time= 122.7 min calculated for 0.045 af (91% of inflow)
Center-of-Mass det. time= 83.0 min (1,038.4 - 955.4)

Volume	Invert	Avail.Storage	Storage Description
#1	236.00'	1,288 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
236.00	210	0.0	0	0
237.40	400	30.0	128	128
237.50	450	100.0	42	171
239.00	1,040	100.0	1,118	1,288

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	**4.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	236.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.99 hrs HW=238.03' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.06 cfs @ 12.99 hrs HW=238.03' TW=234.31' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.06 cfs @ 0.45 fps)

Section 3.1

Test Pit Data

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TEST PIT DATA
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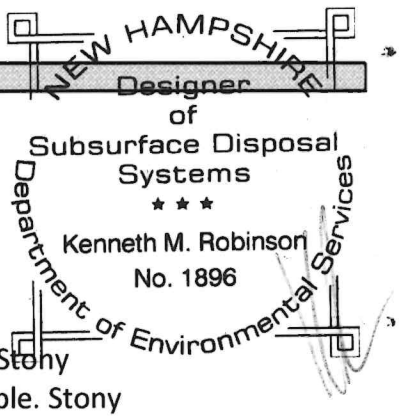
4/13/22
Test Pit #7 (4-145)
0-8"- 10YR 3/3 Dark brown loam, granular, friable
8-42" - 2.5Y 5/6 Light olive brown coarse-to-fine sand, granular, friable
42-84" – 2.5 Y 6/4 Light yellow brown coarse-to-fine sand, granular, friable
ESHWT = 43" **Observed Water = None** **Ledge/Boulders = None** **Roots = 46"**
Perc = 3 minutes per inch (mpi) @ 32"

4/13/22
Test Pit #8 (4-145)
0-12"- 10YR 3/3 Dark brown loam, granular, friable
12-28" - 2.5Y 5/6 Light olive brown coarse-to-fine sand, granular, friable
28-64" – 10 YR 5/2 Gray fine-to-coarse sand, massive, friable
ESHWT = 28" **Observed Water = 28"** **Ledge/Boulders = None** **Roots = 30"**
Perc = 2 mpi @ 20"

4/13/22
Test Pit #9 (4-145)
0-16"- 10YR 3/3 Dark brown loam, granular, friable
16-24" – 7.5 YR 4/4 Brown coarse-to-fine sand, granular, friable
24-60" – 2.5 Y 5/6 Light olive brown coarse-to-fine sand, massive, friable
ESHWT = 26" **Observed Water = 28"** **Ledge/Boulders = None** **Roots = 30"**
Perc = 2 mpi @ 24"



4/13/22
Test Pit #10 (4-145)
0-6"- 10YR 3/3 Dark brown loam, granular, friable
6-24" - 2.5Y 5/6 Light olive brown coarse-to-fine sandy loam, granular, friable. Stony
24-72" – 2.5 Y 6/4 Light yellow brown loamy fine-to-coarse sand, granular, friable. Stony
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 18"**
Perc = 3 mpi @ 32"

4/13/22
Test Pit #11 (4-145)
0-12"- 10YR 3/3 Dark brown loam, granular, friable
12-40" - 2.5Y 5/6 Light olive brown coarse-to-fine sand, granular, friable
40-84" – 2.5 Y 6/4 Light yellow brown coarse-to-fine sand, granular, friable
ESHWT = 40" **Observed Water = 60"** **Ledge/Boulders = None** **Roots = None**
Perc = 4 mpi @ 18"

4/13/22
Test Pit #7 (4-145)
0-14"- 10YR 3/3 Dark brown loam, granular, friable
14-32" - 2.5Y 5/6 Light olive brown coarse-to-fine sand, granular, friable
32-60" – 2.5 Y 6/4 Light yellow brown coarse-to-fine sand, granular, friable
ESHWT = 34" **Observed Water = 52"** **Ledge/Boulders = None** **Roots = 36"**
Perc = 4 mpi @ 24"

5/22/23
Test Pit #1
0-10" – 10YR 3/2 Very dark grayish brown loam, granular, friable
10-30" – 7.5 YR 4/4 Brown fine sandy loam, granular, friable. Very stony.
30-72" – 10 YR 5/2 Gray loamy fine sand, granular, friable. Very stony.
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 40"**
Perc: 6 mpi @ 36"

5/22/23
Test Pit #2
0-10" – 10YR 3/2 Very dark grayish brown loam, granular, friable
10-36" – 7.5 YR 4/4 Brown fine sandy loam, granular, friable. Very stony.
36-68" – 10 YR 5/2 Gray loamy fine sand, granular, friable. Very stony.
ESHWT = 62" **Observed Water = None** **Ledge/Boulders = None** **Roots = 30"**
Perc: 8 mpi @ 38"

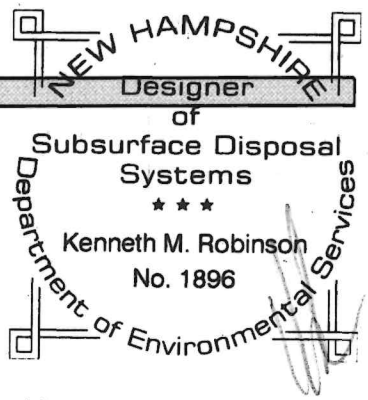
5/22/23
Test Pit #3
0-8" – 10YR 3/2 Very dark grayish brown loam, granular, friable
8-46" – 2.5 Y 5/4 Light yellowish brown fine-to-medium sand, granular, friable
46-64" – 10 YR 5/2 Gray loamy fine sand, granular, friable. Very stony.
ESHWT = 40" **Observed Water = 64"** **Ledge/Boulders = None** **Roots = 58"**
Perc: 4 mpi @ 32"

5/22/23
Test Pit #4
0-6" – 10YR 3/2 Very dark grayish brown loam, granular, friable
6-20" – 10 YR 5/8 Yellowish brown fine sandy loam, granular, friable
20-40" – 2.5 Y 5/4 Light yellowish brown loamy fine-to-coarse sand, granular, friable. Stony
40-76" – 10 YR 5/2 Gray coarse-to-fine sand, blocky, friable
ESHWT = 54" **Observed Water = None** **Ledge/Boulders = None** **Roots = 50"**
Perc: 8 mpi@42"

5/22/23
Test Pit #5
0-8" – 10YR 3/2 Very dark grayish brown loam, granular, friable
8-22" – 7.5 Y 6/6 Strong brown fine sandy loam, granular, friable. Very bouldery.
22-36" – 2.5 Y 6/4 Light olive brown fine sandy loam, massive, friable
36-70" – 10 YR 5/2 Gray coarse-to-fine sand, blocky, friable
ESHWT = 30" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 40"**
Perc: 12 mpi @ 24"

5/22/23
Test Pit #6
0-8" – 10YR 3/2 Very dark grayish brown loam, granular, friable
8-36" – 7.5 YR 4/4 Brown fine sandy loam, granular, friable. Very stony.
36-70" – 10 YR 5/2 Gray loamy fine sand, granular, friable. Very stony.
ESHWT = 30" **Observed Water = None** **Ledge/Boulders = None** **Roots = 60"**
Perc: 6 mpi @ 24"

5/22/23
Test Pit #7
0-12" – 10YR 3/2 Very dark grayish brown loam, granular, friable
12-33" – 2.5 Y 5/4 Light yellowish brown fine sandy loam, granular, friable. Few stones.
33-70" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
ESHWT = 56" **Observed Water = None** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 34"



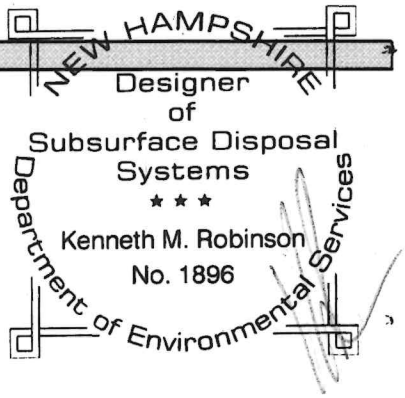
5/22/23
Test Pit #8
0-12" – 10YR 3/3 Dark brown loam, granular, friable
12-24" – 7.5 YR 4/4 Brown fine sandy loam, granular, friable.
24-68" – 2.5 Y 5/4 Light yellowish brown gravelly coarse-to-fine sand granular friable
ESHWT = 62" **Observed Water = None** **Ledge/Boulders = None** **Roots = 30"**
Perc: 4 mpi @ 28"

5/22/23
Test Pit #9
0-7" – 10YR 3/2 Very dark grayish brown loam, granular, friable
7-20" – 10 YR 5/8 Yellowish brown fine sandy loam, granular, friable
20-32" – 2.5 Y 5/4 Light yellowish brown loamy fine-to-coarse sand, granular, friable. Stony
32-74 – 10 YR 5/2 Gray coarse-to-fine sand, blocky, friable
ESHWT = 40" **Observed Water = None** **Ledge/Boulders = None** **Roots = 46"**
Perc: 6 mpi@ 34"

5/22/23
Test Pit #10
0-8" – 10YR 3/2 Very dark grayish brown loam, granular, friable
8-36" – 10 yr 5/8 Orange brown loamy fine sand, granular, friable
36-72" – 2.5 Y 5/4 Light yellowish brown fine sand, granular, friable
ESHWT = 50" **Observed Water = None** **Ledge/Boulders = None** **Roots = 48"**
Perc: 8 mpi @ 42"

5/22/23
Test Pit #11
0-12" – 10YR 3/3 Dark brown loam, granular, friable
12-33" – 2.5 Y 5/6 Light olive brown fine sand, granular, friable
33-60" – 2.5 Y 5/6 Light olive brown very fine sand, massive, friable
ESHWT = 32" **Observed Water = None** **Ledge/Boulders = None** **Roots = 30"**
Perc: 9 mpi @ 24"

5/22/23
Test Pit #12
0-8" – 10YR 3/3 Dark brown loam, granular, friable
8-24" – 2.5 Y 5/6 Light olive brown fine sand, granular, friable
24-65" – 2.5 Y 5/6 Light olive brown very fine sand, massive, friable
ESHWT = 50" **Observed Water = None** **Ledge/Boulders = None** **Roots = 26"**
Perc: 8 mpi @ 30"



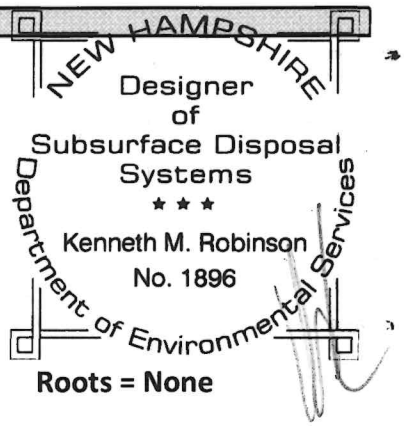
5/22/23
Test Pit #13
0-12" – 10YR 3/2 Very dark grayish brown loam, granular, friable
12-28" – 2.5 Y 5/4 Light yellowish brown loamy fine sand, granular, friable
28-64" – 2.5 Y 5/6 Light olive brown fine-to-coarse sand, single grain, loose
ESHWT = 30" **Observed Water = None** **Ledge/Boulders = None** **Roots = 18"**
Perc: 4 mpi @ 28"

5/22/23
Test Pit #14
0-12" – 10YR 3/2 Very dark grayish brown loam, granular, friable
12-18" – 2.5 Y 5/4 Light yellowish brown loamy fine sand, granular, friable
18-60" – 2.5 Y 5/6 Light olive brown fine-to-coarse sand, single grain, loose
ESHWT = 44" **Observed Water = None** **Ledge/Boulders = None** **Roots = 14"**
Perc: 5 mpi @ 20"

5/22/23
Test Pit #15
0-12" – 10YR 3/2 Very dark grayish brown loam, granular, friable
12-28" – 10 YR 5/8 Orange brown loamy fine-to-medium sand, granular, friable
28-64" – 2.5 Y 6/6 Olive brown coarse-to-fine sand, single grain, loose
ESHWT = 28" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 32"**
Perc: 5 mpi @ 18"

5/22/23
Test Pit #16
0-12" – 10YR 3/2 Very dark grayish brown loam, granular, friable
12-20" – 10 YR 5/8 Orange brown loamy fine-to-medium sand, granular, friable
20-64" – 2.5 Y 6/6 Olive brown coarse-to-fine sand, single grain, loose
ESHWT = 24" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 28"**
Perc: 6 mpi @ 20"

5/22/23
Test Pit #16A
0-10" – 10YR 3/2 Very dark grayish brown loam, granular, friable
10-16" – 10 YR 5/8 Orange brown loamy fine-to-medium sand, granular, friable
16-54" – 2.5 Y 6/6 Olive brown coarse-to-fine sand, single grain, loose
ESHWT = 22" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 28"**
Perc: 8 mpi @ 18"



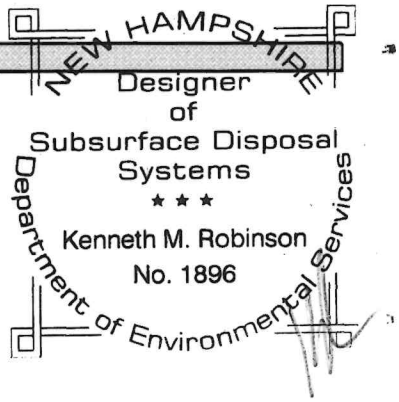
5/22/23
Test Pit #17
0-14" – 10YR 3/3 Dark brown loam, granular, friable
14-24" – 7.5 YR 4/4 Brown loamy fine sand, granular, friable
24-64" – 2.5 Y 5/4 Light yellowish brown loamy fine sand, granular, friable
ESHWT = 30" **Observed Water = None** **Ledge/Boulders = None** **Roots = None**
Perc: 8 mpi @ 26"

5/22/23
Test Pit #18
0-14" – 10YR 3/3 Dark brown loam, granular, friable
14-36" – 7.5 YR 4/4 Brown loamy fine sand, granular, friable
36-60" – 2.5 Y 5/4 Light yellowish brown fine-to-coarse sand, granular, friable
ESHWT = 30" **Observed Water = None** **Ledge/Boulders = None** **Roots = None**
Perc: 5 mpi @ 26"

5/22/23
Test Pit #19
0-14" – 10YR 3/3 Dark brown loam, granular, friable
14-35" – 7.5 YR 4/4 Brown loamy fine sand, granular, friable
35-70" – 2.5 Y 5/4 Light yellowish brown fine-to-coarse sand, granular, friable
ESHWT = 22" **Observed Water = 38"** **Ledge/Boulders = None** **Roots = 12"**
Perc: 6 mpi @ 16"

5/22/23
Test Pit #20
0-14" – 10YR 3/3 Dark brown loam, granular, friable
14-40" – 7.5 YR 4/4 Brown loamy fine sand, granular, friable
40-62" – 2.5 Y 5/4 Light yellowish brown fine-to-coarse sand, granular, friable
ESHWT = 27" **Observed Water = 32'** **Ledge/Boulders = None** **Roots = 12"**
Perc: 10 mpi @ 18"

5/22/23
Test Pit #21
0-12" – 10YR 3/3 Dark brown loam, granular, friable
12-30" – 7.5 YR 4/4 Brown loamy fine sand, granular, friable
30-64" – 2.5 Y 5/4 Light yellowish brown fine-to-coarse sand, granular, friable
ESHWT = 22" **Observed Water = 28"** **Ledge/Boulders = None** **Roots = 12"**
Perc: 9 mpi @ 26"



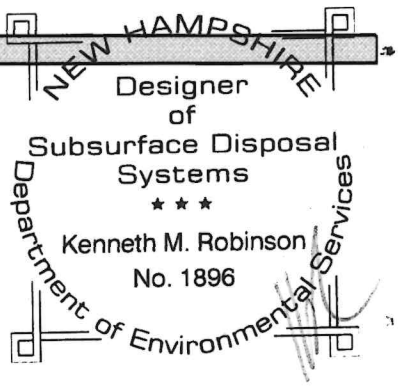
5/22/23
Test Pit #22
0-13" – 10YR 3/2 Very dark graying brown loam, granular, friable
13-32" – 2.5 Y 5/4 Light yellowish brown loamy fine sand, granular, friable
32-72" – 2.5 Y 6/6 Olive brown loamy fine sand, blocky, friable
ESHWT = 56" **Observed Water = None** **Ledge/Boulders = None** **Roots = 60"**
Perc: 8 mpi @ 36"

5/22/23
Test Pit #23
0-13" – 10YR 3/2 Very dark graying brown loam, granular, friable
13-30" – 2.5 Y 5/4 Light yellowish brown loamy fine sand, granular, friable
30-72" – 2.5 Y 6/6 Olive brown loamy fine sand, blocky, friable
ESHWT = 32" **Observed Water = 34"** **Ledge/Boulders = None** **Roots = 36"**
Perc: 10 mpi @ 30"

5/22/23
Test Pit #24
0-14" – 10 YR 3/3 Dark brown loam, granular, friable
14-24" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
24-60" – 2.5 Y 6/6 Olive brown gravelly fine sandy loam, blocky, friable
ESHWT = 24" **Observed Water = 30"** **Ledge/Boulders = None** **Roots = 26"**
Perc: 8 mpi @ 36"

5/22/23
Test Pit #25
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-24" – 7.5 YR 4/4 Brown fine sandy loam, granular, friable. Stony
24-60" – 2.5 Y 6/6 Olive brown gravelly fine sandy loam, granular, friable. Very stony
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 36"

5/23/23
Test Pit #26
0-6" – 10 YR 3/3 Dark brown loam, granular, friable
6-18" – 2.5 y 5/4 Light yellow brown fine sandy loam, granular, friable
18-70" – 2.5 Y 6/6 Olive brown gravelly fine sandy loam, massive, friable. Stony
ESHWT = 24" **Observed Water = 30"** **Ledge/Boulders = None** **Roots = 26"**
Perc: 9 mpi @ 20"



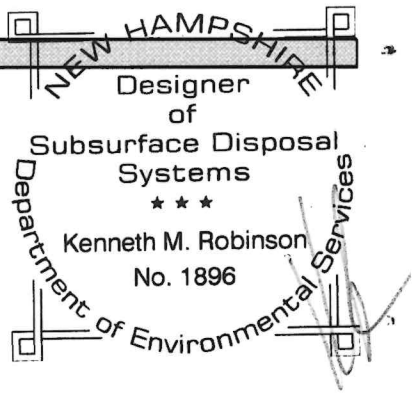
5/23/23
Test Pit #27
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-22" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
22-60" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 20" **Observed Water = 28"** **Ledge/Boulders = None** **Roots = 32"**
Perc: 10 mpi @ 24"

5/23/23
Test Pit #28
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-22" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
22-64" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 22" **Observed Water = 30"** **Ledge/Boulders = None** **Roots = 34"**
Perc: 8 mpi @ 36"

5/23/23
Test Pit #29
0-14" – 10 YR 3/3 Dark brown loam, granular, friable
14-28" – 2.5 y 5/4 Light yellow brown fine sandy loam, granular, friable
28-74" – 2.5 Y 6/6 Olive brown gravelly fine sandy loam, massive, friable. Stony
ESHWT = 36" **Observed Water = 54"** **Ledge/Boulders = None** **Roots = 40"**
Perc: 9 mpi @ 20"

5/23/23
Test Pit #30
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-28" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
28-60" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 19" **Observed Water = 27"** **Ledge/Boulders = None** **Roots = 30"**
Perc: 10 mpi @ 16"

5/23/23
Test Pit #31
0-12" – 10 YR 3/3 Dark brown loam, granular, friable
12-46" – 2.5 Y 5/4 Light yellow brown fine sandy loam, granular, friable
46-70" – 2.5 Y 6/6 Olive brown gravelly fine sandy loam, massive, friable. Stony
ESHWT = 29" **Observed Water = 40"** **Ledge/Boulders = None** **Roots = 40"**
Perc: 9 mpi @ 18"



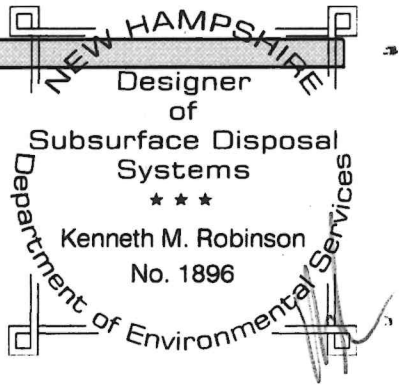
5/23/23
Test Pit #32
0-6" – 10 YR 3/3 Dark brown loam, granular, friable
6-32" – 2.5 Y 6/4 Light yellowish brown fine sandy loam, granular, friable
32-60" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 34"

5/23/23
Test Pit #33
0-8" – 10 YR 3/3 Dark brown loam, granular, friable
8-27" – 2.5 Y 5/4 Light yellowish brown gravelly fine sandy loam, granular, friable
27-38" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
38-70" – 2.5 Y 6/6 Olive brown fine sandy loam, blocky, friable
ESHWT = 38" **Observed Water = None** **Ledge/Boulders = None** **Roots = 38"**
Perc: 6 mpi @ 28"

5/23/23
Test Pit #34
0-7" – 10 YR 3/3 Dark brown loam, granular, friable
7-27" – 2.5 Y 5/4 Light yellowish brown gravelly fine sandy loam, granular, friable
27-42" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
42-72" – 2.5 Y 6/6 Olive brown fine sandy loam, blocky, friable
ESHWT = 52" **Observed Water = None** **Ledge/Boulders = 70"** **Roots = None**
Perc: 6 mpi @ 28"

5/23/23
Test Pit #35
0-6" – 10 YR 3/3 Dark brown loam, granular, friable
6-18" – 2.5 Y 5/4 Light yellowish brown gravelly fine sandy loam, granular, friable
18-24" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
24-70" – 2.5 Y 6/6 Olive brown fine sandy loam, blocky, friable
ESHWT = 40" **Observed Water = 68"** **Ledge/Boulders = None** **Roots = 46"**
Perc: 6 mpi @ 28"

5/23/23
Test Pit #36
0-8" – 10 YR 3/3 Dark brown loam, granular, friable
8-20" – 2.5 Y 5/4 Light yellowish brown gravelly fine sandy loam, granular, friable
20-64" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
ESHWT = 20" **Observed Water = 30"** **Ledge/Boulders = None** **Roots = 20"**
Perc: 10 mpi @ 12"



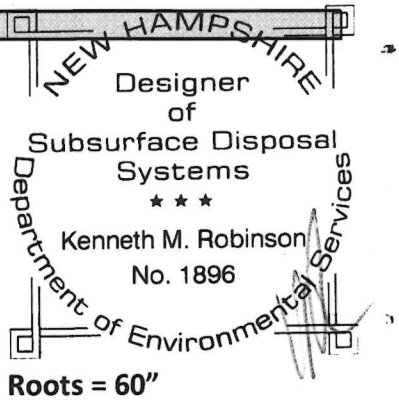
5/23/23
Test Pit #37
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-28" – 2.5 Y 6/4 Light yellowish brown fine sandy loam, granular, friable
28-68" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
ESHWT = 25" **Observed Water = 40"** **Ledge/Boulders = None** **Roots = 40"**
Perc: 8 mpi @ 18"

5/23/23
Test Pit #39
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-24" – 2.5 Y 6/4 Light yellowish brown fine sandy loam, granular, friable
24-60" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 34"

5/23/23
Test Pit #40
0-13" – 10 YR 3/3 Dark brown loam, granular, friable
13-46" – 2.5 Y 6/4 Light yellowish brown fine sandy loam, granular, friable
46-72" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 48"**
Perc: 8 mpi @ 48"

5/23/23
Test Pit #41
0-8" – 10 YR 3/2 Very dark grayish brown loam, granular, friable
8-21" – 7.5 Y 4/4 Strong brown loamy fine sand, granular, friable
21-62" – 2.5 Y 6/6 Olive brown fine sandy loam, platy, friable
ESHWT = 30" **Observed Water = None** **Ledge/Boulders = None** **Roots = 36"**
Perc: 6 mpi @ 24"

5/23/23
Test Pit #42
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-24" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
22-60" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 50" **Observed Water = None** **Ledge/Boulders = None** **Roots = 54"**
Perc: 4 mpi @ 28"



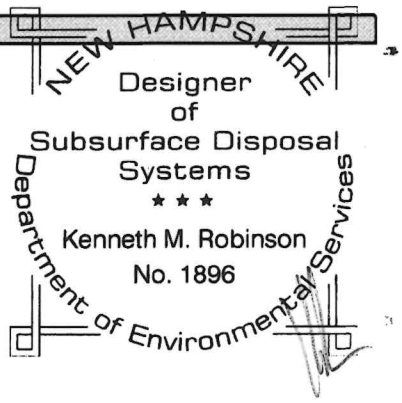
5/23/23
Test Pit #43
0-8" – 10 YR 3/3 Dark brown loam, granular, friable
8-32" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
32-64" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 55" **Observed Water = None** **Ledge/Boulders = None** **Roots = 60"**
Perc: 5 mpi @ 36"

5/23/23
Test Pit #44
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
10-24" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
24-65" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 50" **Observed Water = None** **Ledge/Boulders = None** **Roots = 50"**
Perc: 4 mpi @ 30"

5/23/23
Test Pit #45
0-4" – 10 YR 3/3 Dark brown loam, granular, friable
4-20" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
20-65" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 50" **Observed Water = None** **Ledge/Boulders = None** **Roots = 50"**
Perc: 5 mpi @ 24"

5/26/23
Auger Pit #1
0-4" – 10 YR 3/3 Dark brown loam, granular, friable
4-20" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
20-48" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 22" **Observed Water = None** **Ledge/Boulders = None** **Roots = 24"**
Perc: 8 mpi @ 16"

5/26/23
Auger Pit #2
0-7" – 10 YR 3/3 Dark brown loam, granular, friable
7-24" – 2.5 Y 6/6 Olive brown fine sandy loam, massive, friable
24-48" – 10 YR 5/4 Light yellowish brown loamy fine sand, granular, friable
ESHWT = 20" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 36"**
Perc: 7 mpi @ 12"



5/26/23
Auger Pit #3
0-3" – 10 YR 3/3 Dark brown loam, granular, friable
3-6" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
6-16" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
16-48" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 24" **Observed Water = None** **Ledge/Boulders = None** **Roots = 30"**
Perc: 6 mpi @ 16"

5/26/23
Auger Pit #4
0-5" – 10 YR 3/3 Dark brown loam, granular, friable
5-11" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
11-22" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
22-48" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 24" **Observed Water = None** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 18"

5/26/23
Auger Pit #5
0-4" – 10 YR 3/3 Dark brown loam, granular, friable
4-8" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
6-16" – 2.5 Y 6/4 Light olive brown fine sandy loam, granular, friable
16-48" – 10 YR 5/2 Gray fine sandy loam, massive, friable
ESHWT = 24" **Observed Water = None** **Ledge/Boulders = None** **Roots = 30"**
Perc: 6 mpi @ 16"

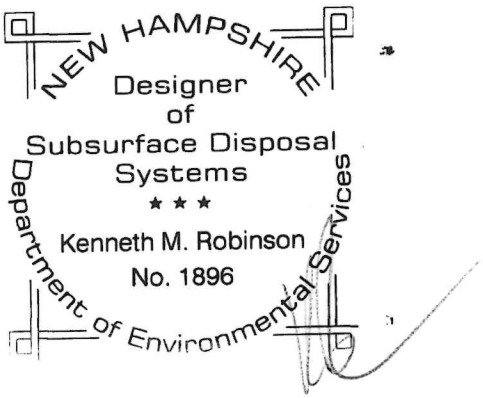
5/26/23
Auger Pit #6
0-7" – 10 YR 3/3 Dark brown loam, granular, friable
7-24" – 2.5 Y 6/6 Olive brown fine sandy loam, massive, friable
24-48" – 10 YR 5/4 Light yellowish brown loamy fine sand, granular, friable
ESHWT = 20" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 36"**
Perc: 7 mpi @ 12"

5/26/23
Auger Pit #7
0-10" – 10 YR 3/3 Dark brown loam, granular, friable
7-24" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
24-48" – 10 YR 5/4 Light yellowish brown loamy fine sand, granular, friable
ESHWT = 32" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 18"

5/26/23
Auger Pit #8
0-8" – 10 YR 3/3 Dark brown loam, granular, friable
8-20" – 2.5 Y 6/6 Olive brown fine sandy loam, granular, friable
20-48" – 10 YR 5/4 Light yellowish brown loamy fine sand, granular, friable
ESHWT = 22" **Observed Water = 36"** **Ledge/Boulders = None** **Roots = 36"**
Perc: 8 mpi @ 16"

Test Pits were logged by:

Kenneth Robinson, CWS
NH Licensed Designer #1896



Section 3.2

Stormwater Maintenance Manual

VONDEROSA PROPERTIES, LLC
Upham & County Roads, Amherst New Hampshire
Storm Water Management System
Inspection and Maintenance Manual

Introduction

The operation and maintenance of a storm water management system and its individual components is as critical to system performance as the design. Without proper maintenance, best management practices (BMPs) are likely to become functionally impaired or to fail, providing reduced or no treatment of storm water. Proper operation and maintenance will ensure that the storm water system and individual BMPs will remain effective at removing pollutants as designed and meeting New Hampshire's water quality objectives. Proper maintenance will:

- Maintain the volume of storm water treated over the long term;
- Sustain the pollutant removal efficiency of the BMP;
- Reduce the risk of re-suspending sediment and other pollutants captured by the BMP;
- Prevent structural deterioration of the BMP and minimize the need for expensive repairs;
- Decrease the potential for failure of the BMP.

The NH Department of Environmental Services Alteration of Terrain (AoT) regulations (Env-Wq 1500) require the long term maintenance of storm water practices, and stipulate the establishment of a mechanism to provide for ongoing inspections and maintenance.

In accordance with Env-Wq 1507.08 Long-Term Maintenance the mechanism for providing long-term maintenance practices for this development are as follows:

Responsible Maintenance Party:

Owner: Vonderosa Properties, LLC
3 Huxley Lane
Amherst, NH 03031

Report Information:

- Vonderosa Properties, LLC and/or the homeowner will be the individual responsible for implementing the required reporting, inspection, and maintenance activities identified in the I & M manual.
- Vonderosa Properties, LLC and/or the homeowner will maintain all record keeping required by the I & M manual. Any transfer of responsibility for I & M activities or transfer in ownership shall be documented to the DES and the town in writing.
- Inspection and maintenance reports shall be completed after each inspection. Copies of the report forms to be completed by the inspector are attached at the end of this manual, including:
    - Inspection checklist to be used during each inspection;

- Inspection and maintenance logs to document each inspection and maintenance activity;

- A plan showing the locations of all the storm water practices described in the I&M manual is attached at the end of this manual.

Maintenance Recommendations for Best Management Practices:

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

Bio Retention Basin and/or Rain Garden

- Basins should be inspected monthly during growing season and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Inspect and remove trash monthly during growing season.
- Inspect, repair and remove debris (other than trash) annually in spring.
- Replace mulch annually in the spring.
- Remove dead vegetation annually in spring or fall.
- Replace dead vegetation annually in spring.

Drainage Catch Basins

- Inspect basins at least semi-annually.
- Vacuum the sediment basins when the sediment reaches one-half the depth from the bottom of the catch basin to the invert of the outlet pipe.
- Repair damaged basin grates immediately after the inspection.
- Repair pavement damage around the basins immediately after the inspection to prevent further damage to the structure or paved area.
- Dispose of sediments and other wastes in conformance with applicable local, state and federal regulations.

Outlet Protection - Riprap Aprons

- Inspect the outlet protection annually for damage and deterioration. Repair damages immediately.
- Remove debris from apron area.

Conveyance Swales

- Inspect the annually for accumulation of sediment and debris and for signs of erosion vegetation loss, and presence of invasive species.

- Perform periodic mowing; frequency depends on location and type of grass. Grass shall not be cut less than four (4) inches to maintain water quality flow depth.
- Remove debris and accumulated sediment whenever observed during inspection.
- Repair any eroded areas, remove invasive species and dead vegetation, and reseed with applicable grass mix as warranted by inspection.

Inspection Checklist /Maintenance Logs

The inspection checklist and maintenance logs following this report shall be used as a guide for the inspection reporting for this project.

Exhibit Plan

The accompanying plan identifies the stormwater practices that will need to be inspected as part of this I & M program.

Invasive Species Response

Description:

With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

Maintenance:

1. Remove invasive plant species from the storm water management practices by pulling, either by hand for small plants or by hand shovel for shrubs and bushes.
2. Refer to the fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species. (Attached to the back of this report)

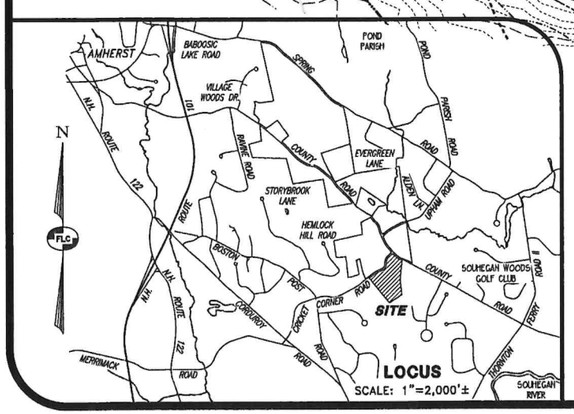
Inspection Checklist

- ☐ Surface at Each Drainage Catch Basin
- ☐ Drainage Catch Basin Sumps
- ☐ Drainage Ditches/Conveyance Swales
- ☐ Stone Check Dams (if required to remain due to on-site operations)
- ☐ Riprap Aprons at Headwall Outlets
- ☐ Riprap Spillways
- ☐ Bio-Retention Basins
- ☐ Headwall Inlets

Inspection and Maintenance Log					
	BMP	**Inspection Date**	**Inspected By**	**Maintenance Required?**	**Maintenance Performed**
1				❑Yes ❑No	
2				❑Yes ❑No	
3				❑Yes ❑No	
4				❑Yes ❑No	
5				❑Yes ❑No	
6				❑Yes ❑No	
7				❑Yes ❑No	
8				❑Yes ❑No	
9				❑Yes ❑No	

Section 3.3

Drainage Area Plans



GRAPHIC SCALES
100' 50' 0 100' 200' 300'
IMPERIAL: 1"=100'

DRAINAGE LEGEND:

- E2P — PIPE OR BASIN
- E2S — SUBCATCHMENT
- E2R — REACH
- OP1 — OBSERVATION POINT
- PROJECT AREA
- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- => FLOW ARROWS

NRCS SOILS LEGEND:
SOURCE: USDA NRCS WEB SOIL SURVEY

---------- SOIL BOUNDARY

CmC	CANTON FINE SANDY LOAM 8 TO 15% SLOPES, VERY STONY
CmD	CANTON FINE SANDY LOAM 15 TO 25% SLOPES, VERY STONY
CmE	CANTON FINE SANDY LOAM 25 TO 35% SLOPES
LvA	LEICESTER-WALPOLE COMPLEX 0 TO 3% SLOPES, STONY

REV.	DATE	DESCRIPTION	C/O	DR	CK
-	-	-	-	-	-

PRE-DEVELOPMENT DRAINAGE AREA PLAN
TAX MAP 4 LOT 145
(UPHAM ROAD & COUNTY ROAD)
AMHERST, NEW HAMPSHIRE

PREPARED FOR AND LAND OF:
VONDEROSA PROPERTIES, LLC
3 HUXLEY LANE, AMHERST, NH 03031

SCALE: 1" = 100' MARCH 26, 2024

Surveying ✦ Engineering ✦ Land Planning ✦ Permitting ✦ Septic Designs
FIELDSTONE LAND CONSULTANTS, PLLC
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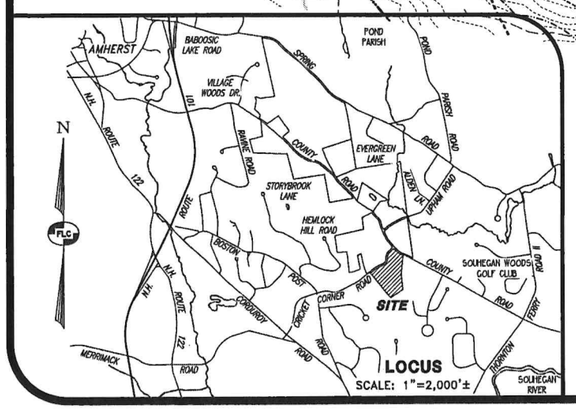

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REV.	DATE	DESCRIPTION	C/O	DR	CK
–	–	–	–	–	–

PRE-DEVELOPMENT DRAINAGE AREA PLAN

TAX MAP 4 LOT 122

(CRICKET CORNER ROAD & COUNTY ROAD)

AMHERST, NEW HAMPSHIRE

PREPARED FOR AND LAND OF:

VONDEROSA PROPERTIES, LLC

3 HUXLEY LANE, AMHERST, NH 03031

SCALE: 1" = 100' APRIL 30, 2022

Surveying ✦ Engineering ✦ Land Planning ✦ Permitting ✦ Septic Designs

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