Storm Water Management Report

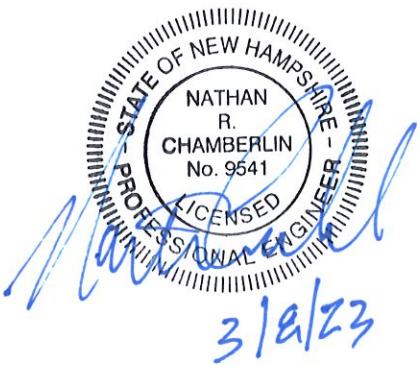
84 Lumber Company

(Non-Residential Site Plan)

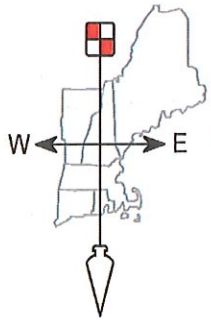
Project Location:
Tax Map 145, Lot 15
3 Sullivan Road
Hudson, NH

Prepared for:
84 Lumber Company
1019 Route 519, Building 4
Eighty-Four, PA 15330

Date: August 2, 2022
Revised: March 8, 2023



Surveying ⌖ Engineering ⌖ Land Planning ⌖ Permitting ⌖ Septic Designs



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STORM WATER MANAGEMENT REPORT
84 LUMBER COMPANY
MAP 145, LOT 15 – 3 SULLIVAN ROAD
HUDSON, NEW HAMPSHIRE

Prepared for:
84 Lumber Company

I) INTRODUCTION

The following are storm water drainage calculations for a proposed Site Plan Development for a lumber yard off Sullivan Street in Hudson, NH. The project area is bordered by single family residential to the north, east, and south and a vacant lot to the west. The project involves a single tax parcel (145-3) totaling 30.962 acres. The proposed development will consist of constructing 55,500 square feet, over two phases of construction. The terrain alteration associated with the proposed buildings and infrastructure is 440,000± square feet. The increase in impervious area, including the driveways, sidewalks and roof area is 328,400± square feet.

The purpose of this report is to analyze the qualitative and quantitative impacts of the proposed development. The objective of the proposed storm water 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 Hudson's storm water regulations.

II) SITE DESCRIPTION

The project consists of an existing 30.962-acre single family residential lot at the corner of Sullivan Road and Central Street with two curb cuts on Sullivan Road. The site is relatively level on the northern section of the lot where the existing house and curb cuts are located. A large wetland crosses the center of the lot, flowing west to east. At the south side of the lot the site is wooded and steeper with 8 to 15% grades. There are a few trails through the wooded area and a 50' gas easement. The area north of the wetlands, where all the proposed improvements are located, consists of Windsor Loamy Sand with a hydrologic soil group (HSG) rating "A".

There are two (2) observation points for the project. A small section of the northwest corner of the site drains into the closed drainage system in the Town right-of-way (OP1). The majority of the site drains south towards the wetlands in the center of the site (OP1).

NRCS soil survey maps indicated that the dominate soils present on the site consist of well-drained Windsor loamy sand. This is a Hydrologic Soil Group (HSG) "A" soil. There are no wetland or wetland buffer impacts proposed on the project. There will an increase of approximately 7.85± acres of impervious area as a result of the proposed development.

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.

Storm water management systems and erosion control outlet protection aprons (riprap aprons) 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

In accordance with the Town of Hudson Storm water Regulations require that the two (2), ten (10), twenty-five (25) and fifty (50) year frequency storm events also be evaluated. 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 Plan, approximately 90% of project area drains southerly to wetlands on-site (OP1). The remaining 10% of the site drains northwesterly to one of two catch basins in the Central Street right-of-way.

Post-Development Drainage Conditions:
As can be seen on the Post-Development Drainage Plans, the drainage for the proposed improvements flows to the east end of the site and is collected in a large stormwater basin. Subcatchments S301 to S313 are captures in catch basins, outlet into sediment forebays for pretreatment, and then into the infiltration basin where runoff is treated and recharged to the groundwater. The front of the site subcatchments S101 and S201 remain largely unchanged from predevelopment conditions.

The net result is that all new paved areas will receive qualitative treatment and, due to the detention capability of the stormwater basin, there will be a reduction of peak rates of runoff leaving this site for all storm events.

V) SUMMARY

The intent of the storm water management system for this project is to address the qualitative and quantitative aspects of the storm water runoff so that there are no downstream adverse impacts created by the project. Due to the proposed stormwater management system, there are no increases in storm water runoff resulting from the proposed development.

The storm water management design for this project therefore complies with the stormwater standards set forth in the Town of Hudson and the Alteration of Terrain regulations.

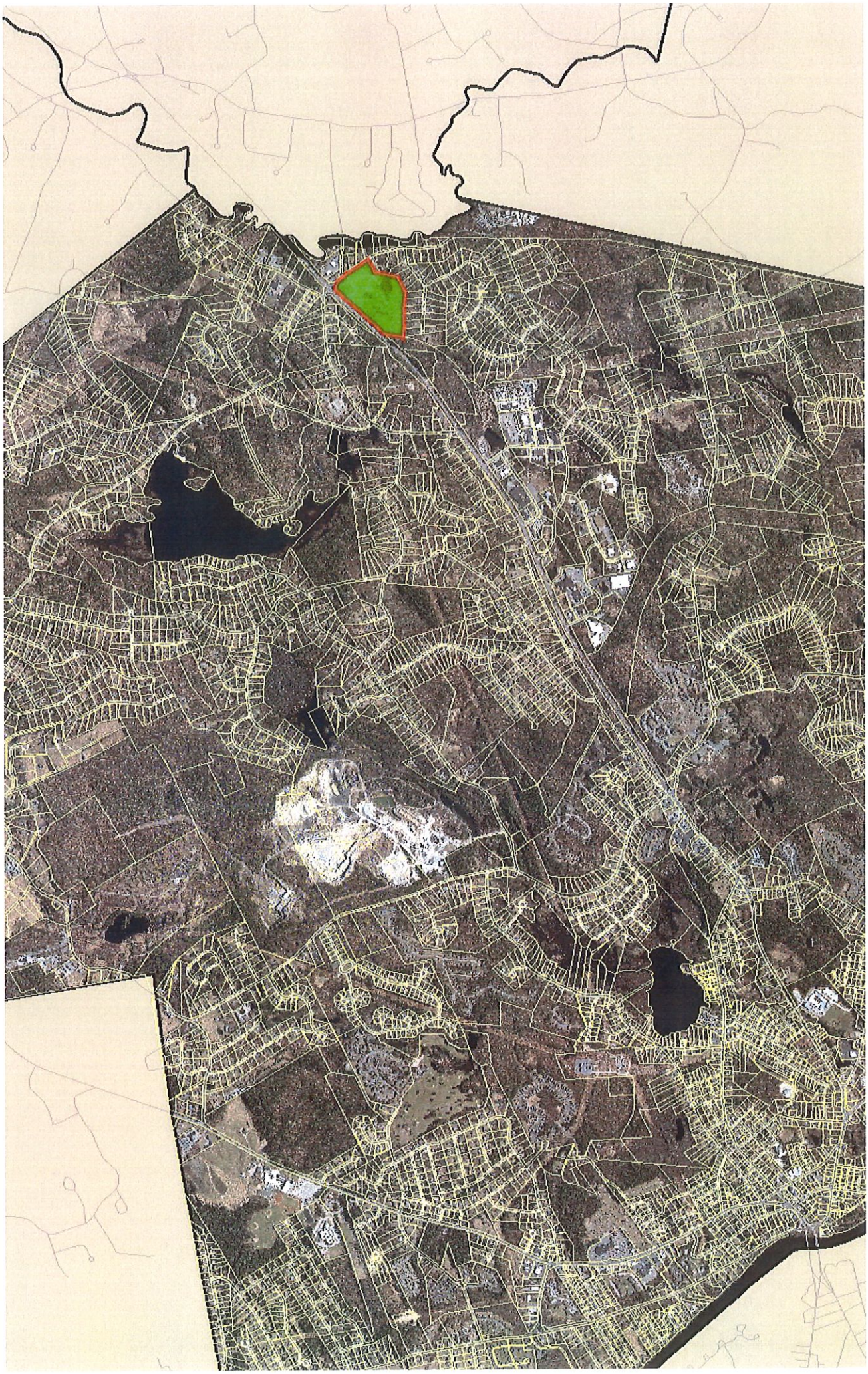
The following tables are a summary of the attached calculations and show a comparison of the peak flow rates at the outlet point for the site. The values presented are based on pre- and post-development conditions.

Table 1: Peak flow rates to OP1

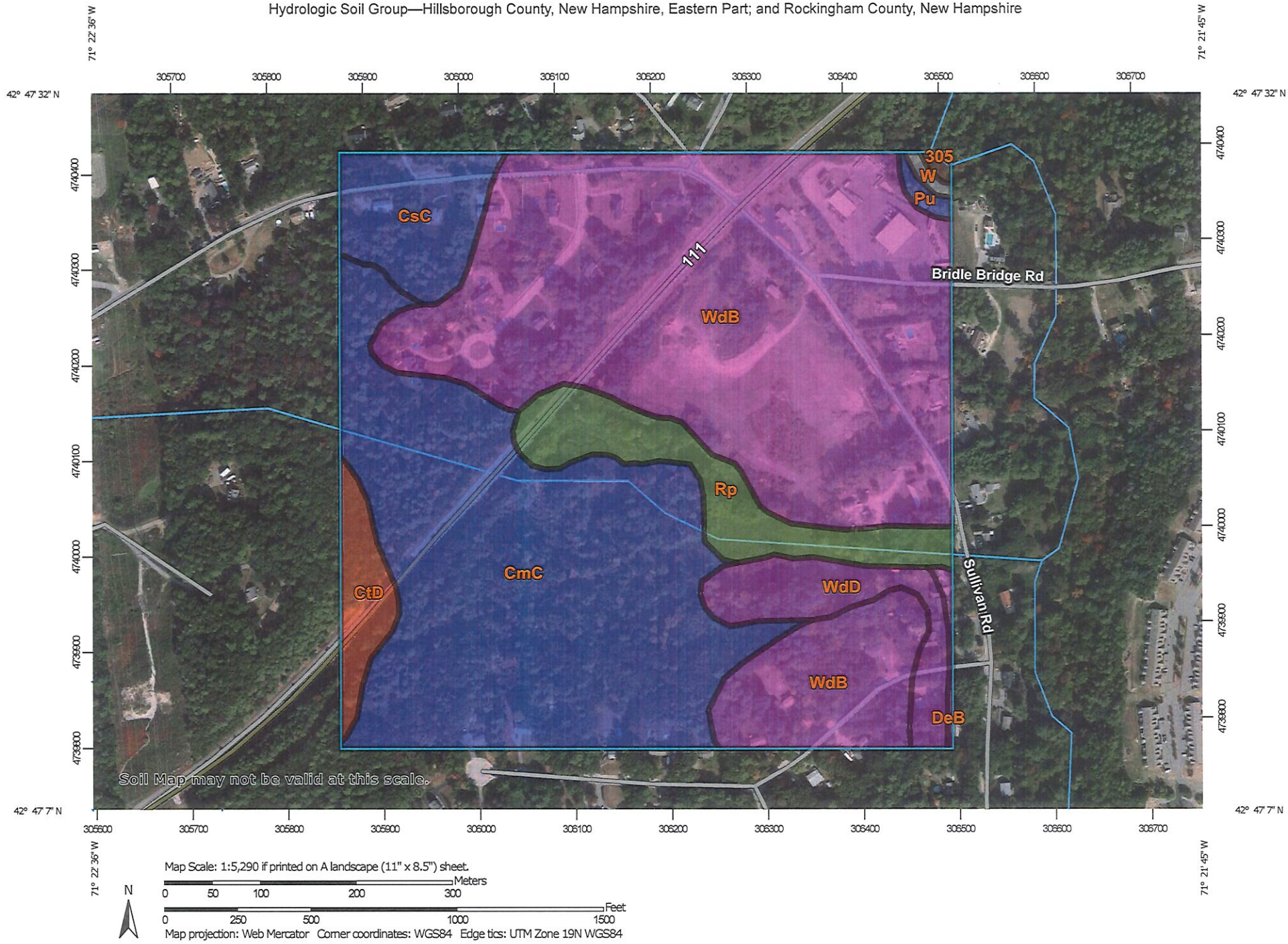
STORM FREQUENCY	PRE-DEVELOPMENT (CFS/AF)	POST-DEVELOPMENT (CFS/AF)	CHANGE (CFS/AF)
2-YEAR	0.03/0.011	0.03/0.008	0.00/-0.003
10-YEAR	0.52/0.056	0.41/0.044	-0.11/-0.012
25-YEAR	1.36/0.108	1.07/0.085	-0.29/-0.023
50-YEAR	2.30/0.168	1.81/0.132	-0.49/-0.036

Table 2: Peak flow rates to OP2

STORM FREQUENCY	PRE-DEVELOPMENT (CFS/AF)	POST-DEVELOPMENT (CFS/AF)	CHANGE (CFS/AF)
2-YEAR	0.00/0.000	0.00/0.000	0.00/0.000
10-YEAR	0.16/0.072	0.12/0.040	-0.04/-0.032
25-YEAR	1.02/0.304	0.74/0.299	-0.28/-0.005
50-YEAR	3.37/0.640	3.24/0.826	-0.13/+0.186



Hydrologic Soil Group—Hillsborough County, New Hampshire, Eastern Part; and Rockingham County, New Hampshire



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 scales ranging from 1:20,000 to 1:24,000.

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 24, Aug 31, 2021

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: May 22, 2020—Sep 25, 2020

MAP LEGEND

MAP INFORMATION

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	32.1	32.5%
CsC	Chatfield-Hollis complex, 8 to 15 percent slopes, rocky	B	5.1	5.1%
CtD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	D	2.5	2.5%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	A	0.3	0.3%
Pu	Pootatuck fine sandy loam	B	0.4	0.4%
Rp	Rippowam fine sandy loam	A/D	6.3	6.4%
W	Water (less than 40 acres)		0.2	0.2%
WdB	Windsor loamy sand, 3 to 8 percent slopes	A	47.4	48.0%
WdD	Windsor loamy sand, 15 to 35 percent slopes	A	4.3	4.3%
Subtotals for Soil Survey Area			**98.6**	**99.8%**
Totals for Area of Interest			**98.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
305	Lim-Pootatuck complex	B/D	0.2	0.2%
Subtotals for Soil Survey Area			**0.2**	**0.2%**
Totals for Area of Interest			**98.8**	**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

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.370 degrees West
Latitude	42.788 degrees North
Elevation	0 feet
Date/Time	Tue, 19 Jul 2022 11:15:00 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.68	0.85	1.07	**1yr**	0.73	1.01	1.23	1.55	1.96	2.48	2.71	**1yr**	2.19	2.60	3.03	3.71	4.33	**1yr**
2yr	0.33	0.51	0.63	0.84	1.05	1.32	**2yr**	0.91	1.21	1.53	1.91	2.38	2.97	3.29	**2yr**	2.63	3.16	3.67	4.39	4.99	**2yr**
5yr	0.39	0.61	0.76	1.02	1.31	1.66	**5yr**	1.13	1.51	1.93	2.42	3.02	3.76	4.19	**5yr**	3.33	4.03	4.66	5.52	6.25	**5yr**
10yr	0.44	0.69	0.88	1.19	1.55	1.99	**10yr**	1.34	1.79	2.31	2.90	3.62	4.50	5.04	**10yr**	3.98	4.85	5.58	6.56	7.41	**10yr**
25yr	0.52	0.83	1.06	1.46	1.93	2.50	**25yr**	1.67	2.24	2.92	3.68	4.60	5.70	6.43	**25yr**	5.04	6.18	7.09	8.26	9.28	**25yr**
50yr	0.59	0.94	1.21	1.70	2.29	3.00	**50yr**	1.98	2.66	3.52	4.44	5.53	6.82	7.74	**50yr**	6.04	7.44	8.50	9.83	11.02	**50yr**
100yr	0.68	1.09	1.41	1.99	2.72	3.57	**100yr**	2.35	3.15	4.20	5.31	6.62	8.17	9.31	**100yr**	7.23	8.96	10.19	11.71	13.08	**100yr**
200yr	0.77	1.25	1.63	2.33	3.22	4.27	**200yr**	2.78	3.74	5.04	6.38	7.95	9.79	11.22	**200yr**	8.67	10.79	12.23	13.95	15.53	**200yr**
500yr	0.92	1.52	1.98	2.88	4.05	5.40	**500yr**	3.49	4.70	6.39	8.11	10.11	12.45	14.35	**500yr**	11.02	13.80	15.56	17.59	19.51	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.35	0.43	0.58	0.71	0.82	**1yr**	0.61	0.80	1.08	1.31	1.67	2.20	2.54	**1yr**	1.95	2.44	2.70	3.03	3.87	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.17	1.37	1.79	2.30	2.84	3.17	**2yr**	2.52	3.05	3.55	4.24	4.82	**2yr**
5yr	0.36	0.55	0.69	0.94	1.20	1.42	**5yr**	1.03	1.39	1.62	2.10	2.68	3.52	3.78	**5yr**	3.11	3.64	4.22	5.06	5.73	**5yr**
10yr	0.39	0.61	0.75	1.05	1.36	1.61	**10yr**	1.17	1.58	1.83	2.37	3.02	4.07	4.31	**10yr**	3.60	4.14	4.83	5.77	6.49	**10yr**
25yr	0.45	0.68	0.85	1.21	1.60	1.89	**25yr**	1.38	1.85	2.16	2.79	3.51	4.92	5.12	**25yr**	4.36	4.93	5.77	6.91	7.58	**25yr**
50yr	0.49	0.75	0.93	1.33	1.80	2.15	**50yr**	1.55	2.10	2.46	3.17	3.95	5.70	5.86	**50yr**	5.04	5.64	6.64	7.92	8.50	**50yr**
100yr	0.54	0.82	1.02	1.48	2.03	2.43	**100yr**	1.75	2.38	2.79	3.60	4.44	5.75	6.72	**100yr**	5.09	6.46	7.66	9.11	9.54	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.76	**200yr**	1.98	2.70	3.14	4.10	5.02	6.49	7.71	**200yr**	5.74	7.41	8.86	10.49	10.68	**200yr**
500yr	0.68	1.02	1.31	1.90	2.70	3.28	**500yr**	2.33	3.21	3.72	4.87	5.92	7.59	9.33	**500yr**	6.72	8.97	10.77	12.69	12.42	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.47	0.58	0.77	0.95	1.11	**1yr**	0.82	1.09	1.26	1.64	2.08	2.72	2.87	**1yr**	2.41	2.76	3.40	4.13	4.83	**1yr**
2yr	0.35	0.54	0.66	0.90	1.11	1.30	**2yr**	0.96	1.27	1.48	1.92	2.46	3.12	3.49	**2yr**	2.76	3.35	3.84	4.58	5.27	**2yr**
5yr	0.43	0.67	0.83	1.14	1.45	1.66	**5yr**	1.25	1.62	1.89	2.43	3.05	4.04	4.66	**5yr**	3.58	4.48	5.10	6.03	6.79	**5yr**
10yr	0.53	0.81	1.00	1.40	1.81	2.02	**10yr**	1.56	1.97	2.28	2.91	3.63	5.01	5.84	**10yr**	4.43	5.62	6.34	7.45	8.35	**10yr**
25yr	0.68	1.04	1.29	1.84	2.42	2.61	**25yr**	2.09	2.56	2.94	3.69	4.53	6.65	7.89	**25yr**	5.89	7.59	8.45	9.82	11.02	**25yr**
50yr	0.83	1.26	1.57	2.25	3.03	3.19	**50yr**	2.61	3.12	3.57	4.42	5.36	8.25	9.92	**50yr**	7.30	9.54	10.48	12.08	13.59	**50yr**
100yr	1.01	1.53	1.91	2.76	3.79	3.89	**100yr**	3.27	3.80	4.34	5.30	6.36	11.36	12.46	**100yr**	10.06	11.98	12.99	14.89	16.79	**100yr**
200yr	1.23	1.86	2.35	3.40	4.75	4.74	**200yr**	4.10	4.63	5.26	6.34	7.54	14.33	15.61	**200yr**	12.68	15.01	16.08	18.34	20.74	**200yr**
500yr	1.62	2.40	3.09	4.49	6.39	6.15	**500yr**	5.51	6.01	6.81	8.05	9.45	19.50	21.05	**500yr**	17.26	20.24	21.33	24.15	27.44	**500yr**

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INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **IB1 - NODE 14P**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
8.98	ac	A = Area draining to the practice	
7.46	ac	A_I = Impervious area draining to the practice	
0.83	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.80	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
7.16	ac-in	WQV= 1" x Rv x A	
26,002	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
6,501	cf	25% x WQV (check calc for sediment forebay volume)	
f		Method of pretreatment? (not required for clean or roof runoff)	
12,000	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
51,765	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
10,970	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
9.5	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
181.00	feet	E_{BTM} = Elevation of the bottom of the basin	
178.00	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
178.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
3.0	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
Y	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
3.0	:1	If a basin is proposed, pond side slopes.	≥3:1
184.08	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
185.35	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
186.50	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Stage-Area-Storage for Pond 14P: IB1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
177.00	300	0
177.10	300	12
177.20	300	24
177.30	300	36
177.40	300	48
177.50	300	60
177.60	300	72
177.70	300	84
177.80	300	96
177.90	300	108
178.00	300	120
178.10	300	134
178.20	300	151
178.30	300	168
178.40	300	186
178.50	300	204
178.60	300	222
178.70	300	239
178.80	300	256
178.90	300	273
179.00	300	287
179.10	300	299
179.20	300	311
179.30	300	323
179.40	300	335
179.50	300	347
179.60	300	359
179.70	300	371
179.80	300	383
179.90	300	395
180.00	300	407
180.10	300	419
180.20	300	431
180.30	300	443
180.40	300	455
180.50	300	467
180.60	300	479
180.70	300	491
180.80	300	503
180.90	300	515
181.00	10,970	527
181.10	11,150	1,603
181.20	11,332	2,697
181.30	11,515	3,810
181.40	11,700	4,940
181.50	11,886	6,090
181.60	12,074	7,258
181.70	12,263	8,444
181.80	12,454	9,650
181.90	12,646	10,875
182.00	12,840	12,120
182.10	13,759	13,419
182.20	14,710	14,812
182.30	15,694	16,302
182.40	16,710	17,892
182.50	17,759	19,585
182.60	18,840	21,385
182.70	19,954	23,295
182.80	21,100	25,317
182.90	22,279	27,456
183.00	23,490	29,714
183.10	23,777	32,047
183.20	24,066	34,409
183.30	24,356	36,800
183.40	24,649	39,221
183.50	24,943	41,670
183.60	25,239	44,149
183.70	25,536	46,658
183.80	25,836	49,197
183.90	26,137	51,765
184.00	26,440	54,364
184.10	26,730	56,993
184.20	27,021	59,650
184.30	27,314	62,337
184.40	27,609	65,053
184.50	27,905	67,799
184.60	28,203	70,574
184.70	28,502	73,379
184.80	28,803	76,215
184.90	29,106	79,080
185.00	29,410	81,976
185.10	29,716	84,902
185.20	30,023	87,859
185.30	30,332	90,847
185.40	30,643	93,866
185.50	30,955	96,916
185.60	31,269	99,997
185.70	31,584	103,109
185.80	31,901	106,254
185.90	32,220	109,430
186.00	32,540	112,638
186.10	32,847	115,877
186.20	33,156	119,147
186.30	33,466	122,448
186.40	33,777	125,780
186.50	**34,090**	**129,144**

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

7.50	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.40	inches	Rd = Weighted groundwater recharge depth	
3	ac-in	GRV = AI * Rd	
10,890	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

The GRV Field is not large enough for the results which in this case = (3 ac-in)(43560 sf/ac)(1 ft/12") = 10,890 cubic feet. The proposed infiltration basin discharges 1.172 ac-ft to groundwater in the the 2 year storm which equals 51,052 cubic feet. This far exceeds the minimum requirement of 10,890 CF.

Summary for Pond 17P: FOREBAY 1

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	12,070 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
181.00	4,240	0	0
183.00	7,830	12,070	12,070

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INFILTRATION FEASIBILITY REPORT
84 LUMBER, SINGLE FAMILY RESIDENTIAL
NASHUA, NEW HAMPSHIRE

The project proposes one system that incorporates an infiltration component. This system is identified on the plans as Infiltration Basins 1 (IB1).

I. Location of the practice

Infiltration Basin 1 – this practice is located in southeast end of the lot. This is a basin that receives runoff from the proposed buildings and impervious surfaces. This basin discharges approximately 100 feet from the on-site wetlands in the center of the lot. The discharge from the closed drainage system (CB6, 9, and 12) is being pre-treated with forebays upstream of the practice.

II. Existing topography at the location of the practices

Infiltration Basins 1 (IB1) - This infiltration basin is situated at the lower end of the site in nearly flat area. The site currently slopes gently towards this area at a 3-8% grade. This area is at the low point between the subject parcel and abutting property. The low point also slopes west towards the wetlands on site. The area is mostly cleared with some areas of vegetation.

III. Test pit or boring locations

In accordance with Env-Wq 1504.13(c), several test pits have been performed on-site.

Infiltration Basin 1 (IB1) – this basin has a bottom area of 17,800 square feet in area and therefore a minimum of three test pits are required in the location of the proposed practice. Four (4) test pits were performed in this location and are identified as TP-3, TP-4, TP-5, and TP-6 on the attached plans.

IV. Seasonal high-water table (SHWT) and bedrock elevations

The following test pit data was collected on October 13, 2022.

Infiltration Basin 1 (IB1) – Bottom of Pond Elevation = 181.0'

TP-3: Existing Surface Elevation of TP = 183.2'
SHWT => 176.8'
BEDROCK= > 176.8'
Deepest Elevation of TP = 176.8'

Infiltration Basin 2 (IB2) – Bottom of Pond Elevation = 188.0'

TP-4: Existing Surface Elevation of TP = 183.8
SHWT =>178.0'
BEDROCK= > 178.0'
Deepest Elevation of TP = 178.0'

TP-5: Existing Surface Elevation of TP = 183.4
SHWT =>176.7'
BEDROCK= > 176.7'
Deepest Elevation of TP = 176.7'

TP-6: Existing Surface Elevation of TP = 182.8
SHWT =>177.1'
BEDROCK= > 177.1'
Deepest Elevation of TP = 177.1'

V. Profile descriptions

Test Pit #3
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-76"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None Observed Water = None Ledge/Boulders = 76" Roots = None

Test Pit #4
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-70"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None Observed Water = None Ledge/Boulders = 70" Roots = None

Test Pit #5
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-80"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None Observed Water = None Ledge/Boulders = None Roots = 6"

Test Pit #6

0-15"- 10YR 3/3 dark brown, loamy sand, granular, friable

15-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose

24-68"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose

ESHWT = None Observed Water = None Ledge/Boulders = 68" Roots = None

VI. Soil plan in the area of the proposed practice(s)

See attached plan sheets.

VII. Summary of Field-Testing data used to determine the infiltration rate

Infiltration Basins 1 – the infiltration rate was determined using the Default Values method described in Env-Wq 1504.14.

The basins are located within native material identified in the Soil Series Survey as Windsor loamy sand.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the weighted value under the basin floor elevation is: 6 inch per hour.

After applying a factor of safety, the design rate used in the drainage analysis is 3 inches per hour.

3184.01_POST_DEVELOPMENT_B_PIPE_VELOCITY

Prepared by Fieldstone Land Consultants, PLLC

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1R	192.90	190.90	200.0	0.0100	0.013	0.0	12.0	0.0
2	2R	190.80	189.40	140.0	0.0100	0.013	0.0	12.0	0.0
3	3R	189.15	187.80	150.0	0.0090	0.013	0.0	15.0	0.0
4	4R	187.55	186.05	150.0	0.0100	0.013	0.0	15.0	0.0
5	5R	185.80	182.85	286.0	0.0103	0.013	0.0	18.0	0.0
6	6R	182.35	182.00	26.0	0.0135	0.013	0.0	24.0	0.0
7	7R	189.00	185.85	220.0	0.0143	0.013	0.0	12.0	0.0
8	8R	185.60	182.74	286.0	0.0100	0.013	0.0	15.0	0.0
9	9R	182.50	182.00	25.0	0.0200	0.013	0.0	18.0	0.0
10	10R	182.65	182.00	26.0	0.0250	0.013	0.0	18.0	0.0
11	11R	191.50	185.90	300.0	0.0187	0.013	0.0	12.0	0.0
12	12R	185.40	182.68	272.0	0.0100	0.013	0.0	18.0	0.0
13	13R	182.18	182.00	28.0	0.0064	0.013	0.0	24.0	0.0
14	14R	183.00	181.00	25.0	0.0800	0.013	0.0	15.0	0.0

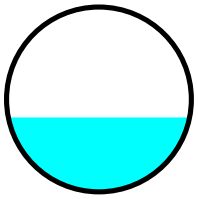
Summary for Reach 1R: CB1

Inflow Area = 0.348 ac, 61.78% Impervious, Inflow Depth > 2.82" for 25-Year event
Inflow = 1.21 cfs @ 12.09 hrs, Volume= 0.082 af
Outflow = 1.21 cfs @ 12.10 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 2R : CB2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 2.1 min

Peak Storage= 59 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 192.90', Outlet Invert= 190.90'



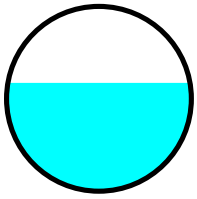
Summary for Reach 2R: CB2

Inflow Area = 0.609 ac, 66.83% Impervious, Inflow Depth > 3.10" for 25-Year event
Inflow = 2.31 cfs @ 12.10 hrs, Volume= 0.157 af
Outflow = 2.30 cfs @ 12.10 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.4 min
Routed to Reach 3R : CB3

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.82 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 1.3 min

Peak Storage= 67 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 140.0' Slope= 0.0100 '/'
Inlet Invert= 190.80', Outlet Invert= 189.40'



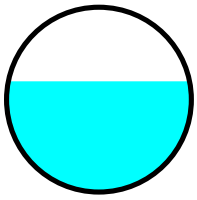
Summary for Reach 3R: CB3

Inflow Area = 1.060 ac, 67.83% Impervious, Inflow Depth > 3.18" for 25-Year event
Inflow = 4.11 cfs @ 12.10 hrs, Volume= 0.281 af
Outflow = 4.10 cfs @ 12.10 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.4 min
Routed to Reach 4R : CB4

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.35 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 1.2 min

Peak Storage= 115 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.75' , Surface Width= 1.23'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.13 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 150.0' Slope= 0.0090 '/'
Inlet Invert= 189.15', Outlet Invert= 187.80'



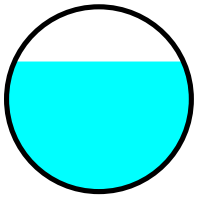
Summary for Reach 4R: CB4

Inflow Area = 1.313 ac, 74.03% Impervious, Inflow Depth > 3.54" for 25-Year event
Inflow = 5.46 cfs @ 12.10 hrs, Volume= 0.387 af
Outflow = 5.45 cfs @ 12.11 hrs, Volume= 0.387 af, Atten= 0%, Lag= 0.3 min
Routed to Reach 5R : CB5

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.90 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 1.1 min

Peak Storage= 138 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.88' , Surface Width= 1.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.46 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 150.0' Slope= 0.0100 '/'
Inlet Invert= 187.55', Outlet Invert= 186.05'



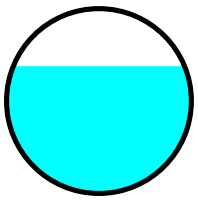
Summary for Reach 5R: CB5

Inflow Area = 1.935 ac, 82.38% Impervious, Inflow Depth > 4.03" for 25-Year event
Inflow = 8.79 cfs @ 12.10 hrs, Volume= 0.649 af
Outflow = 8.72 cfs @ 12.11 hrs, Volume= 0.649 af, Atten= 1%, Lag= 0.6 min
Routed to Reach 6R : CB6

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.73 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 1.8 min

Peak Storage= 370 cf @ 12.11 hrs
Average Depth at Peak Storage= 1.03' , Surface Width= 1.39'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.67 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 286.0' Slope= 0.0103 '/'
Inlet Invert= 185.80', Outlet Invert= 182.85'



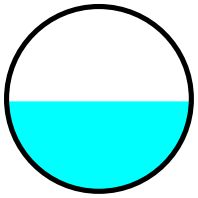
Summary for Reach 6R: CB6

Inflow Area = 2.635 ac, 87.06% Impervious, Inflow Depth > 4.30" for 25-Year event
Inflow = 12.47 cfs @ 12.10 hrs, Volume= 0.944 af
Outflow = 12.47 cfs @ 12.10 hrs, Volume= 0.944 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.25 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.20 fps, Avg. Travel Time= 0.1 min

Peak Storage= 39 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.97' , Surface Width= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 26.25 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 26.0' Slope= 0.0135 '/'
Inlet Invert= 182.35', Outlet Invert= 182.00'



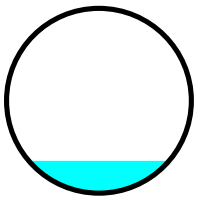
Summary for Reach 7R: CB7

Inflow Area = 0.052 ac,100.00% Impervious, Inflow Depth > 5.06" for 25-Year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 1%, Lag= 0.9 min
Routed to Reach 8R : CB8

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 3.1 min

Peak Storage= 20 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.76'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 220.0' Slope= 0.0143 '/'
Inlet Invert= 189.00', Outlet Invert= 185.85'



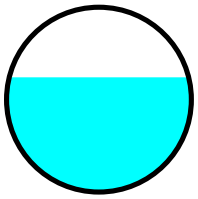
Summary for Reach 8R: CB8

Inflow Area = 0.841 ac,100.00% Impervious, Inflow Depth > 5.06" for 25-Year event
Inflow = 4.58 cfs @ 12.09 hrs, Volume= 0.354 af
Outflow = 4.56 cfs @ 12.10 hrs, Volume= 0.354 af, Atten= 0%, Lag= 0.7 min
Routed to Reach 9R : CB9

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.71 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 2.1 min

Peak Storage= 229 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.78' , Surface Width= 1.21'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.46 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 286.0' Slope= 0.0100 '/'
Inlet Invert= 185.60', Outlet Invert= 182.74'



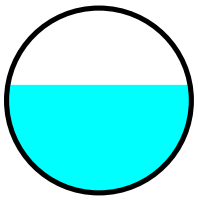
Summary for Reach 9R: CB9

Inflow Area = 1.761 ac,100.00% Impervious, Inflow Depth > 5.05" for 25-Year event
Inflow = 9.56 cfs @ 12.09 hrs, Volume= 0.742 af
Outflow = 9.56 cfs @ 12.09 hrs, Volume= 0.742 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.92 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.59 fps, Avg. Travel Time= 0.1 min

Peak Storage= 27 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.88' , Surface Width= 1.48'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.86 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0200 '/'
Inlet Invert= 182.50', Outlet Invert= 182.00'



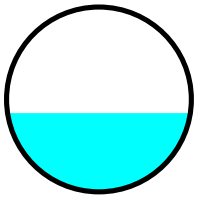
Summary for Reach 10R: CB10

Inflow Area = 1.142 ac,100.00% Impervious, Inflow Depth > 5.06" for 25-Year event
Inflow = 6.23 cfs @ 12.09 hrs, Volume= 0.481 af
Outflow = 6.23 cfs @ 12.09 hrs, Volume= 0.481 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.71 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.42 fps, Avg. Travel Time= 0.1 min

Peak Storage= 19 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.64' , Surface Width= 1.48'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 16.61 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 26.0' Slope= 0.0250 '/'
Inlet Invert= 182.65', Outlet Invert= 182.00'



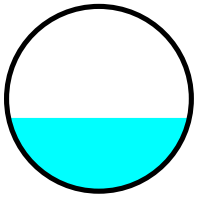
Summary for Reach 11R: CB11

Inflow Area = 0.401 ac, 69.58% Impervious, Inflow Depth > 3.29" for 25-Year event
Inflow = 1.61 cfs @ 12.09 hrs, Volume= 0.110 af
Outflow = 1.61 cfs @ 12.10 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.7 min
Routed to Reach 12R : CB12

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.56 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.09 fps, Avg. Travel Time= 2.4 min

Peak Storage= 87 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.87 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 300.0' Slope= 0.0187 '/'
Inlet Invert= 191.50', Outlet Invert= 185.90'



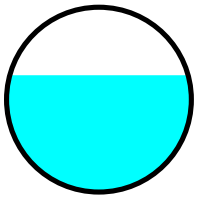
Summary for Reach 12R: CB12

Inflow Area = 1.576 ac, 85.28% Impervious, Inflow Depth > 4.20" for 25-Year event
Inflow = 7.63 cfs @ 12.09 hrs, Volume= 0.551 af
Outflow = 7.62 cfs @ 12.10 hrs, Volume= 0.551 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 13R : CB13

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.48 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 1.8 min

Peak Storage= 320 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.95' , Surface Width= 1.45'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.50 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 272.0' Slope= 0.0100 '/'
Inlet Invert= 185.40', Outlet Invert= 182.68'



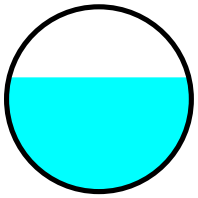
Summary for Reach 13R: CB13

Inflow Area = 2.530 ac, 89.53% Impervious, Inflow Depth > 4.46" for 25-Year event
Inflow = 12.72 cfs @ 12.10 hrs, Volume= 0.940 af
Outflow = 12.72 cfs @ 12.10 hrs, Volume= 0.940 af, Atten= 0%, Lag= 0.1 min
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.25 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.44 fps, Avg. Travel Time= 0.2 min

Peak Storage= 57 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.23' , Surface Width= 1.94'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 18.14 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 28.0' Slope= 0.0064 '/'
Inlet Invert= 182.18', Outlet Invert= 182.00'



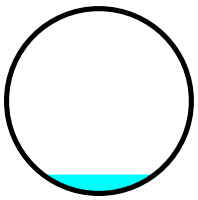
Summary for Reach 14R: OS1

Inflow Area = 8.984 ac, 83.06% Impervious, Inflow Depth > 0.24" for 25-Year event
Inflow = 0.39 cfs @ 13.96 hrs, Volume= 0.179 af
Outflow = 0.39 cfs @ 13.97 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.3 min
Routed to Link OP2 : STREAM

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.01 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 5.30 fps, Avg. Travel Time= 0.1 min

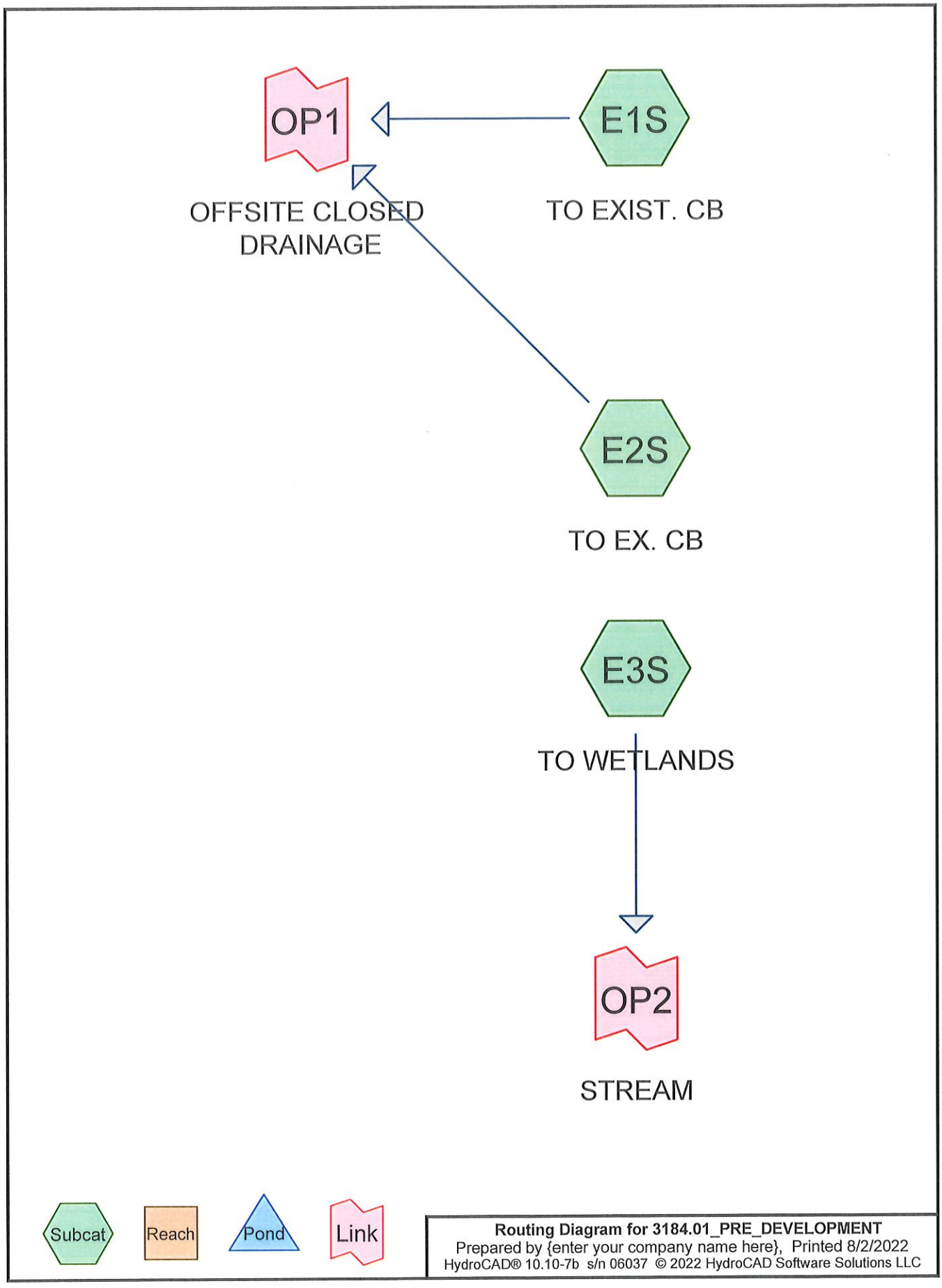
Peak Storage= 2 cf @ 13.97 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.75'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 18.27 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0800 '/'
Inlet Invert= 183.00', Outlet Invert= 181.00'



Section 1.1

Existing Conditions
2, 25, 50 Year Storm Node List



Routing Diagram for 3184.01_PRE_DEVELOPMENT
Prepared by {enter your company name here}, Printed 8/2/2022
HydroCAD® 10.10-7b s/n 06037 © 2022 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
10.519	39	>75% Grass cover, Good, HSG A (E1S, E2S, E3S)
0.106	76	Gravel roads, HSG A (E1S, E3S)
0.643	98	Paved parking, HSG A (E1S, E2S, E3S)
4.388	30	Woods, Good, HSG A (E1S, E2S, E3S)
15.656	**39**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
15.656	HSG A	E1S, E2S, E3S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
15.656		**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
10.519	0.000	0.000	0.000	0.000	10.519	>75% Grass cover, Good	E1S, E2S, E3S
0.106	0.000	0.000	0.000	0.000	0.106	Gravel roads	E1S, E3S
0.643	0.000	0.000	0.000	0.000	0.643	Paved parking	E1S, E2S, E3S
4.388	0.000	0.000	0.000	0.000	4.388	Woods, Good	E1S, E2S, E3S
15.656	**0.000**	**0.000**	**0.000**	**0.000**	**15.656**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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: TO EXIST. CB Runoff Area=0.670 ac 25.97% Impervious Runoff Depth>0.13"
Tc=6.0 min CN=54 Runoff=0.03 cfs 0.007 af

Subcatchment E2S: TO EX. CB Runoff Area=0.603 ac 19.40% Impervious Runoff Depth>0.07"
Tc=6.0 min CN=50 Runoff=0.01 cfs 0.003 af

Subcatchment E3S: TO WETLANDS Runoff Area=14.383 ac 2.45% Impervious Runoff Depth=0.00"
Flow Length=750' Tc=25.6 min CN=38 Runoff=0.00 cfs 0.000 af

Link OP1: OFFSITE CLOSED DRAINAGE Inflow=0.03 cfs 0.011 af
Primary=0.03 cfs 0.011 af

Link OP2: STREAM Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 15.656 ac Runoff Volume = 0.011 af Average Runoff Depth = 0.01"
95.89% Pervious = 15.013 ac 4.11% Impervious = 0.643 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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: TO EXIST. CB Runoff Area=0.670 ac 25.97% Impervious Runoff Depth>1.14"
Tc=6.0 min CN=54 Runoff=0.84 cfs 0.064 af

Subcatchment E2S: TO EX. CB Runoff Area=0.603 ac 19.40% Impervious Runoff Depth>0.88"
Tc=6.0 min CN=50 Runoff=0.52 cfs 0.044 af

Subcatchment E3S: TO WETLANDS Runoff Area=14.383 ac 2.45% Impervious Runoff Depth>0.25"
Flow Length=750' Tc=25.6 min CN=38 Runoff=1.02 cfs 0.304 af

Link OP1: OFFSITE CLOSED DRAINAGE Inflow=1.36 cfs 0.108 af
Primary=1.36 cfs 0.108 af

Link OP2: STREAM Inflow=1.02 cfs 0.304 af
Primary=1.02 cfs 0.304 af

Total Runoff Area = 15.656 ac Runoff Volume = 0.412 af Average Runoff Depth = 0.32"
95.89% Pervious = 15.013 ac 4.11% Impervious = 0.643 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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: TO EXIST. CB Runoff Area=0.670 ac 25.97% Impervious Runoff Depth>1.74"
Tc=6.0 min CN=54 Runoff=1.36 cfs 0.097 af

Subcatchment E2S: TO EX. CB Runoff Area=0.603 ac 19.40% Impervious Runoff Depth>1.41"
Tc=6.0 min CN=50 Runoff=0.94 cfs 0.071 af

Subcatchment E3S: TO WETLANDS Runoff Area=14.383 ac 2.45% Impervious Runoff Depth>0.53"
Flow Length=750' Tc=25.6 min CN=38 Runoff=3.37 cfs 0.640 af

Link OP1: OFFSITE CLOSED DRAINAGE Inflow=2.30 cfs 0.168 af
Primary=2.30 cfs 0.168 af

Link OP2: STREAM Inflow=3.37 cfs 0.640 af
Primary=3.37 cfs 0.640 af

Total Runoff Area = 15.656 ac Runoff Volume = 0.808 af Average Runoff Depth = 0.62"
95.89% Pervious = 15.013 ac 4.11% Impervious = 0.643 ac

Section 1.2

Existing Conditions

10 Year Storm Full Summary

Summary for Subcatchment E1S: TO EXIST. CB

Runoff = 0.37 cfs @ 12.12 hrs, Volume= 0.034 af, Depth> 0.61"
Routed to Link OP1 : OFFSITE CLOSED DRAINAGE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.131	30	Woods, Good, HSG A
0.029	76	Gravel roads, HSG A
0.174	98	Paved parking, HSG A
0.336	39	>75% Grass cover, Good, HSG A
0.670	54	Weighted Average
0.496		74.03% Pervious Area
0.174		25.97% Impervious Area

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

Summary for Subcatchment E2S: TO EX. CB

Runoff = 0.17 cfs @ 12.16 hrs, Volume= 0.022 af, Depth> 0.43"
Routed to Link OP1 : OFFSITE CLOSED DRAINAGE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.117	98	Paved parking, HSG A
0.436	39	>75% Grass cover, Good, HSG A
0.603	50	Weighted Average
0.486		80.60% Pervious Area
0.117		19.40% Impervious Area

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

Summary for Subcatchment E3S: TO WETLANDS

Runoff = 0.16 cfs @ 15.29 hrs, Volume= 0.072 af, Depth> 0.06"
Routed to Link OP2 : STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
4.207	30	Woods, Good, HSG A
0.077	76	Gravel roads, HSG A
0.352	98	Paved parking, HSG A
9.747	39	>75% Grass cover, Good, HSG A
14.383	38	Weighted Average
14.031		97.55% Pervious Area
0.352		2.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	85	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
5.4	390	0.0300	1.21		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.7	275	0.0500	6.60	13.20	**Parabolic Channel, C-D** W=4.00' D=0.75' Area=2.0 sf Perim=4.3' n= 0.030 Earth, grassed & winding
25.6	750	Total			

Summary for Link OP1: OFFSITE CLOSED DRAINAGE

Inflow Area = 1.273 ac, 22.86% Impervious, Inflow Depth > 0.52" for 10-Year event
Inflow = 0.52 cfs @ 12.13 hrs, Volume= 0.056 af
Primary = 0.52 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

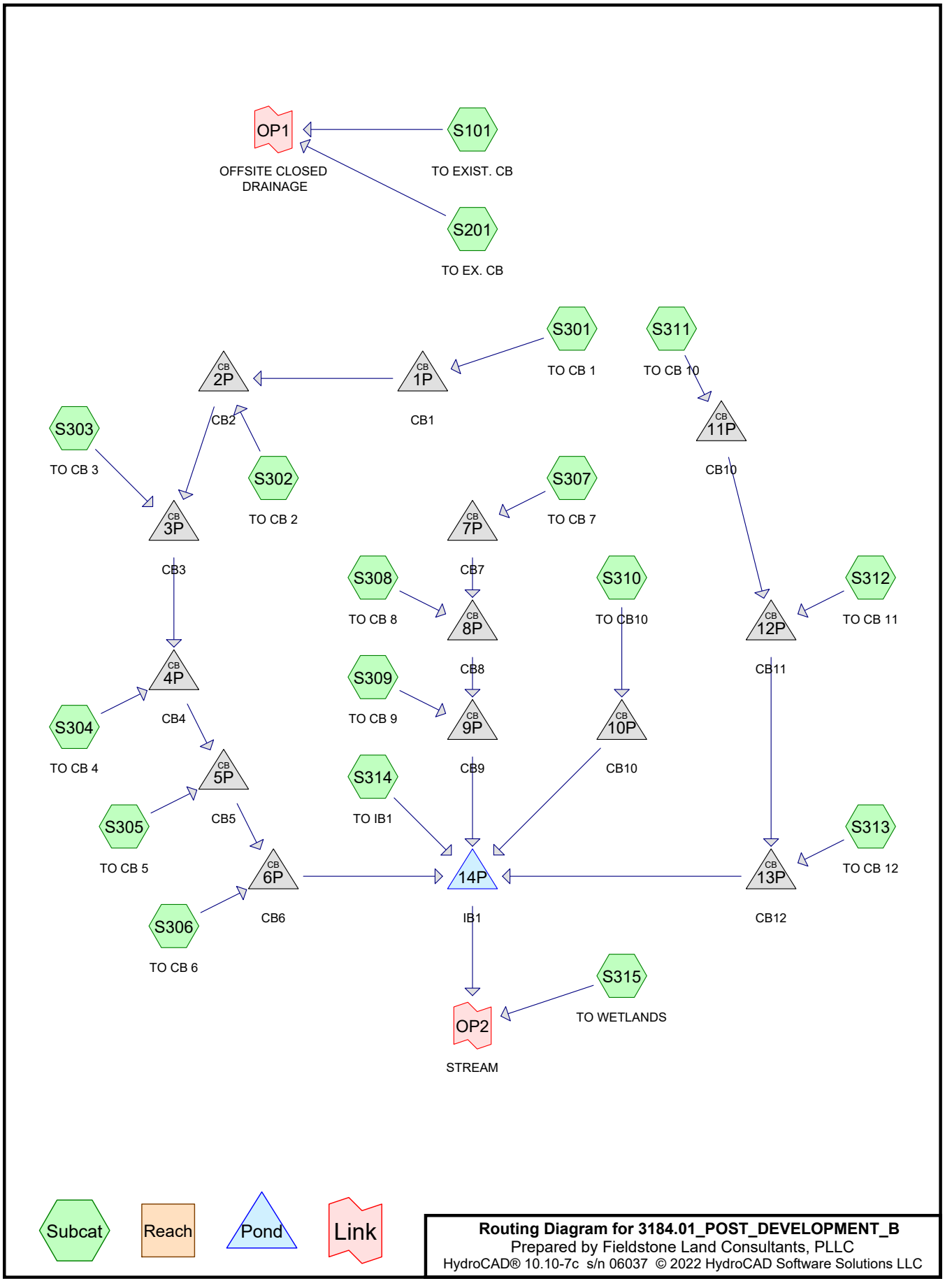
Summary for Link OP2: STREAM

Inflow Area = 14.383 ac, 2.45% Impervious, Inflow Depth > 0.06" for 10-Year event
Inflow = 0.16 cfs @ 15.29 hrs, Volume= 0.072 af
Primary = 0.16 cfs @ 15.29 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Section 2.1

Proposed Conditions
2, 25, 50 Year Storm Node List



Routing Diagram for 3184.01_POST_DEVELOPMENT_B
Prepared by Fieldstone Land Consultants, PLLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.038	39	>75% Grass cover, Good, HSG A (S101, S201, S301, S302, S303, S311, S312, S313, S314, S315)
0.052	76	Gravel roads, HSG A (S101, S315)
6.364	98	Paved parking, HSG A (S101, S201, S301, S302, S303, S304, S305, S306, S307, S308, S309, S310, S311, S312, S313, S315)
1.460	98	Roofs, HSG A (S301, S302, S303, S304, S305, S306, S307, S308, S309, S310, S312, S313)
1.742	30	Woods, Good, HSG A (S101, S201, S315)
15.656	**68**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
15.656	HSG A	S101, S201, S301, S302, S303, S304, S305, S306, S307, S308, S309, S310, S311, S312, S313, S314, S315
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
15.656		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 S101: TO EXIST. CB Runoff Area=0.523 ac 26.00% Impervious Runoff Depth>0.13"
Tc=6.0 min CN=54 Runoff=0.03 cfs 0.006 af

Subcatchment S201: TO EX. CB Runoff Area=0.479 ac 19.42% Impervious Runoff Depth>0.07"
Tc=6.0 min CN=50 Runoff=0.01 cfs 0.003 af

Subcatchment S301: TO CB 1 Runoff Area=0.348 ac 61.78% Impervious Runoff Depth>0.86"
Tc=6.0 min CN=75 Runoff=0.36 cfs 0.025 af

Subcatchment S302: TO CB 2 Runoff Area=0.261 ac 73.56% Impervious Runoff Depth>1.25"
Tc=6.0 min CN=82 Runoff=0.40 cfs 0.027 af

Subcatchment S303: TO CB 3 Runoff Area=0.451 ac 69.18% Impervious Runoff Depth>1.13"
Tc=6.0 min CN=80 Runoff=0.63 cfs 0.043 af

Subcatchment S304: TO CB 4 Runoff Area=0.253 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=0.71 cfs 0.054 af

Subcatchment S305: TO CB 5 Runoff Area=0.622 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=1.75 cfs 0.133 af

Subcatchment S306: TO CB 6 Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=1.97 cfs 0.149 af

Subcatchment S307: TO CB 7 Runoff Area=0.052 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.011 af

Subcatchment S308: TO CB 8 Runoff Area=0.789 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=2.22 cfs 0.168 af

Subcatchment S309: TO CB 9 Runoff Area=0.920 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=2.59 cfs 0.196 af

Subcatchment S310: TO CB10 Runoff Area=1.142 ac 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=3.21 cfs 0.244 af

Subcatchment S311: TO CB 10 Runoff Area=0.401 ac 69.58% Impervious Runoff Depth>1.13"
Tc=6.0 min CN=80 Runoff=0.56 cfs 0.038 af

Subcatchment S312: TO CB 11 Runoff Area=1.175 ac 90.64% Impervious Runoff Depth>2.01"
Tc=6.0 min CN=92 Runoff=2.82 cfs 0.197 af

Subcatchment S313: TO CB 12 Runoff Area=0.954 ac 96.54% Impervious Runoff Depth>2.38"
Tc=6.0 min CN=96 Runoff=2.58 cfs 0.189 af

Subcatchment S314: TO IB1 Runoff Area=0.916 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment S315: TO WETLANDS Runoff Area=5.670 ac 2.35% Impervious Runoff Depth=0.00"
Flow Length=750' Tc=25.6 min CN=38 Runoff=0.00 cfs 0.000 af

Pond 1P: CB1 Peak Elev=193.23' Inflow=0.36 cfs 0.025 af
12.0" Round Culvert n=0.013 L=200.0' S=0.0100 '/' Outflow=0.36 cfs 0.025 af

Pond 2P: CB2 Peak Elev=190.39' Inflow=0.76 cfs 0.052 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0029 '/' Outflow=0.76 cfs 0.052 af

Pond 3P: CB3 Peak Elev=189.80' Inflow=1.39 cfs 0.095 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0090 '/' Outflow=1.39 cfs 0.095 af

Pond 4P: CB4 Peak Elev=188.37' Inflow=2.10 cfs 0.149 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0100 '/' Outflow=2.10 cfs 0.149 af

Pond 5P: CB5 Peak Elev=186.89' Inflow=3.84 cfs 0.282 af
18.0" Round Culvert n=0.013 L=286.0' S=0.0103 '/' Outflow=3.84 cfs 0.282 af

Pond 6P: CB6 Peak Elev=183.55' Inflow=5.81 cfs 0.431 af
24.0" Round Culvert n=0.013 L=26.0' S=0.0135 '/' Outflow=5.81 cfs 0.431 af

Pond 7P: CB7 Peak Elev=189.21' Inflow=0.15 cfs 0.011 af
12.0" Round Culvert n=0.013 L=220.0' S=0.0143 '/' Outflow=0.15 cfs 0.011 af

Pond 8P: CB8 Peak Elev=186.49' Inflow=2.36 cfs 0.180 af
15.0" Round Culvert n=0.013 L=286.0' S=0.0100 '/' Outflow=2.36 cfs 0.180 af

Pond 9P: CB9 Peak Elev=183.79' Inflow=4.95 cfs 0.376 af
18.0" Round Culvert n=0.013 L=25.0' S=0.0200 '/' Outflow=4.95 cfs 0.376 af

Pond 10P: CB10 Peak Elev=183.50' Inflow=3.21 cfs 0.244 af
18.0" Round Culvert n=0.013 L=26.0' S=0.0250 '/' Outflow=3.21 cfs 0.244 af

Pond 11P: CB10 Peak Elev=191.93' Inflow=0.56 cfs 0.038 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0187 '/' Outflow=0.56 cfs 0.038 af

Pond 12P: CB11 Peak Elev=186.40' Inflow=3.37 cfs 0.235 af
18.0" Round Culvert n=0.013 L=272.0' S=0.0100 '/' Outflow=3.37 cfs 0.235 af

Pond 13P: CB12 Peak Elev=183.43' Inflow=5.95 cfs 0.424 af
24.0" Round Culvert n=0.013 L=28.0' S=0.0100 '/' Outflow=5.95 cfs 0.424 af

Pond 14P: IB1 Peak Elev=183.02' Storage=30,239 cf Inflow=19.91 cfs 1.475 af
Discarded=1.64 cfs 1.172 af Primary=0.00 cfs 0.000 af Outflow=1.64 cfs 1.172 af

Link OP1: OFFSITE CLOSED DRAINAGE Inflow=0.03 cfs 0.008 af
Primary=0.03 cfs 0.008 af

Link OP2: STREAM Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 15.656 ac Runoff Volume = 1.483 af Average Runoff Depth = 1.14"
50.03% Pervious = 7.832 ac 49.97% Impervious = 7.824 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 S101: TO EXIST. CB Runoff Area=0.523 ac 26.00% Impervious Runoff Depth>1.14"
Tc=6.0 min CN=54 Runoff=0.66 cfs 0.050 af

Subcatchment S201: TO EX. CB Runoff Area=0.479 ac 19.42% Impervious Runoff Depth>0.88"
Tc=6.0 min CN=50 Runoff=0.42 cfs 0.035 af

Subcatchment S301: TO CB 1 Runoff Area=0.348 ac 61.78% Impervious Runoff Depth>2.82"
Tc=6.0 min CN=75 Runoff=1.21 cfs 0.082 af

Subcatchment S302: TO CB 2 Runoff Area=0.261 ac 73.56% Impervious Runoff Depth>3.48"
Tc=6.0 min CN=82 Runoff=1.10 cfs 0.076 af

Subcatchment S303: TO CB 3 Runoff Area=0.451 ac 69.18% Impervious Runoff Depth>3.29"
Tc=6.0 min CN=80 Runoff=1.81 cfs 0.124 af

Subcatchment S304: TO CB 4 Runoff Area=0.253 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=1.38 cfs 0.107 af

Subcatchment S305: TO CB 5 Runoff Area=0.622 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=3.39 cfs 0.262 af

Subcatchment S306: TO CB 6 Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=3.82 cfs 0.295 af

Subcatchment S307: TO CB 7 Runoff Area=0.052 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.022 af

Subcatchment S308: TO CB 8 Runoff Area=0.789 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=4.30 cfs 0.332 af

Subcatchment S309: TO CB 9 Runoff Area=0.920 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=5.02 cfs 0.388 af

Subcatchment S310: TO CB10 Runoff Area=1.142 ac 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=6.23 cfs 0.481 af

Subcatchment S311: TO CB 10 Runoff Area=0.401 ac 69.58% Impervious Runoff Depth>3.29"
Tc=6.0 min CN=80 Runoff=1.61 cfs 0.110 af

Subcatchment S312: TO CB 11 Runoff Area=1.175 ac 90.64% Impervious Runoff Depth>4.51"
Tc=6.0 min CN=92 Runoff=6.05 cfs 0.442 af

Subcatchment S313: TO CB 12 Runoff Area=0.954 ac 96.54% Impervious Runoff Depth>4.90"
Tc=6.0 min CN=96 Runoff=5.14 cfs 0.389 af

Subcatchment S314: TO IB1 Runoff Area=0.916 ac 0.00% Impervious Runoff Depth>0.30"
Tc=6.0 min CN=39 Runoff=0.12 cfs 0.023 af

Subcatchment S315: TO WETLANDS Runoff Area=5.670 ac 2.35% Impervious Runoff Depth>0.25"
Flow Length=750' Tc=25.6 min CN=38 Runoff=0.40 cfs 0.120 af

Pond 1P: CB1 Peak Elev=193.56' Inflow=1.21 cfs 0.082 af
12.0" Round Culvert n=0.013 L=200.0' S=0.0100 '/' Outflow=1.21 cfs 0.082 af

Pond 2P: CB2 Peak Elev=191.26' Inflow=2.32 cfs 0.158 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0029 '/' Outflow=2.32 cfs 0.158 af

Pond 3P: CB3 Peak Elev=190.55' Inflow=4.13 cfs 0.281 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0090 '/' Outflow=4.13 cfs 0.281 af

Pond 4P: CB4 Peak Elev=189.69' Inflow=5.51 cfs 0.388 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0100 '/' Outflow=5.51 cfs 0.388 af

Pond 5P: CB5 Peak Elev=188.30' Inflow=8.90 cfs 0.650 af
18.0" Round Culvert n=0.013 L=286.0' S=0.0103 '/' Outflow=8.90 cfs 0.650 af

Pond 6P: CB6 Peak Elev=184.84' Inflow=12.71 cfs 0.945 af
24.0" Round Culvert n=0.013 L=26.0' S=0.0135 '/' Outflow=12.71 cfs 0.945 af

Pond 7P: CB7 Peak Elev=189.30' Inflow=0.28 cfs 0.022 af
12.0" Round Culvert n=0.013 L=220.0' S=0.0143 '/' Outflow=0.28 cfs 0.022 af

Pond 8P: CB8 Peak Elev=187.19' Inflow=4.59 cfs 0.354 af
15.0" Round Culvert n=0.013 L=286.0' S=0.0100 '/' Outflow=4.59 cfs 0.354 af

Pond 9P: CB9 Peak Elev=185.37' Inflow=9.60 cfs 0.742 af
18.0" Round Culvert n=0.013 L=25.0' S=0.0200 '/' Outflow=9.60 cfs 0.742 af

Pond 10P: CB10 Peak Elev=184.84' Inflow=6.23 cfs 0.481 af
18.0" Round Culvert n=0.013 L=26.0' S=0.0250 '/' Outflow=6.23 cfs 0.481 af

Pond 11P: CB10 Peak Elev=192.30' Inflow=1.61 cfs 0.110 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0187 '/' Outflow=1.61 cfs 0.110 af

Pond 12P: CB11 Peak Elev=187.45' Inflow=7.66 cfs 0.552 af
18.0" Round Culvert n=0.013 L=272.0' S=0.0100 '/' Outflow=7.66 cfs 0.552 af

Pond 13P: CB12 Peak Elev=184.84' Inflow=12.79 cfs 0.941 af
24.0" Round Culvert n=0.013 L=28.0' S=0.0100 '/' Outflow=12.79 cfs 0.941 af

Pond 14P: IB1 Peak Elev=184.84' Storage=77,244 cf Inflow=41.33 cfs 3.132 af
Discarded=2.01 cfs 1.703 af Primary=0.39 cfs 0.180 af Outflow=2.40 cfs 1.882 af

Link OP1: OFFSITE CLOSED DRAINAGE Inflow=1.07 cfs 0.085 af
Primary=1.07 cfs 0.085 af

Link OP2: STREAM Inflow=0.74 cfs 0.299 af
Primary=0.74 cfs 0.299 af

Total Runoff Area = 15.656 ac Runoff Volume = 3.337 af Average Runoff Depth = 2.56"
50.03% Pervious = 7.832 ac 49.97% Impervious = 7.824 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 S101: TO EXIST. CB Runoff Area=0.523 ac 26.00% Impervious Runoff Depth>1.74"
Tc=6.0 min CN=54 Runoff=1.06 cfs 0.076 af

Subcatchment S201: TO EX. CB Runoff Area=0.479 ac 19.42% Impervious Runoff Depth>1.41"
Tc=6.0 min CN=50 Runoff=0.75 cfs 0.056 af

Subcatchment S301: TO CB 1 Runoff Area=0.348 ac 61.78% Impervious Runoff Depth>3.73"
Tc=6.0 min CN=75 Runoff=1.59 cfs 0.108 af

Subcatchment S302: TO CB 2 Runoff Area=0.261 ac 73.56% Impervious Runoff Depth>4.47"
Tc=6.0 min CN=82 Runoff=1.40 cfs 0.097 af

Subcatchment S303: TO CB 3 Runoff Area=0.451 ac 69.18% Impervious Runoff Depth>4.25"
Tc=6.0 min CN=80 Runoff=2.32 cfs 0.160 af

Subcatchment S304: TO CB 4 Runoff Area=0.253 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=1.65 cfs 0.128 af

Subcatchment S305: TO CB 5 Runoff Area=0.622 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=4.06 cfs 0.315 af

Subcatchment S306: TO CB 6 Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=4.57 cfs 0.354 af

Subcatchment S307: TO CB 7 Runoff Area=0.052 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.026 af

Subcatchment S308: TO CB 8 Runoff Area=0.789 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=5.15 cfs 0.399 af

Subcatchment S309: TO CB 9 Runoff Area=0.920 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=6.01 cfs 0.466 af

Subcatchment S310: TO CB10 Runoff Area=1.142 ac 100.00% Impervious Runoff Depth>6.07"
Tc=6.0 min CN=98 Runoff=7.46 cfs 0.578 af

Subcatchment S311: TO CB 10 Runoff Area=0.401 ac 69.58% Impervious Runoff Depth>4.25"
Tc=6.0 min CN=80 Runoff=2.07 cfs 0.142 af

Subcatchment S312: TO CB 11 Runoff Area=1.175 ac 90.64% Impervious Runoff Depth>5.54"
Tc=6.0 min CN=92 Runoff=7.35 cfs 0.543 af

Subcatchment S313: TO CB 12 Runoff Area=0.954 ac 96.54% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=96 Runoff=6.17 cfs 0.471 af

Subcatchment S314: TO IB1 Runoff Area=0.916 ac 0.00% Impervious Runoff Depth>0.60"
Tc=6.0 min CN=39 Runoff=0.33 cfs 0.046 af

Subcatchment S315: TO WETLANDS Runoff Area=5.670 ac 2.35% Impervious Runoff Depth>0.53"
Flow Length=750' Tc=25.6 min CN=38 Runoff=1.33 cfs 0.252 af

Pond 1P: CB1 Peak Elev=193.69' Inflow=1.59 cfs 0.108 af
12.0" Round Culvert n=0.013 L=200.0' S=0.0100 '/' Outflow=1.59 cfs 0.108 af

Pond 2P: CB2 Peak Elev=193.05' Inflow=3.00 cfs 0.205 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0029 '/' Outflow=3.00 cfs 0.205 af

Pond 3P: CB3 Peak Elev=192.50' Inflow=5.32 cfs 0.365 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0090 '/' Outflow=5.32 cfs 0.365 af

Pond 4P: CB4 Peak Elev=191.54' Inflow=6.97 cfs 0.493 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0100 '/' Outflow=6.97 cfs 0.493 af

Pond 5P: CB5 Peak Elev=189.26' Inflow=11.03 cfs 0.808 af
18.0" Round Culvert n=0.013 L=286.0' S=0.0103 '/' Outflow=11.03 cfs 0.808 af

Pond 6P: CB6 Peak Elev=185.49' Inflow=15.60 cfs 1.162 af
24.0" Round Culvert n=0.013 L=26.0' S=0.0135 '/' Outflow=15.60 cfs 1.162 af

Pond 7P: CB7 Peak Elev=189.35' Inflow=0.34 cfs 0.026 af
12.0" Round Culvert n=0.013 L=220.0' S=0.0143 '/' Outflow=0.34 cfs 0.026 af

Pond 8P: CB8 Peak Elev=188.73' Inflow=5.49 cfs 0.426 af
15.0" Round Culvert n=0.013 L=286.0' S=0.0100 '/' Outflow=5.49 cfs 0.426 af

Pond 9P: CB9 Peak Elev=186.68' Inflow=11.50 cfs 0.891 af
18.0" Round Culvert n=0.013 L=25.0' S=0.0200 '/' Outflow=11.50 cfs 0.891 af

Pond 10P: CB10 Peak Elev=185.35' Inflow=7.46 cfs 0.578 af
18.0" Round Culvert n=0.013 L=26.0' S=0.0250 '/' Outflow=7.46 cfs 0.578 af

Pond 11P: CB10 Peak Elev=192.47' Inflow=2.07 cfs 0.142 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0187 '/' Outflow=2.07 cfs 0.142 af

Pond 12P: CB11 Peak Elev=188.11' Inflow=9.42 cfs 0.685 af
18.0" Round Culvert n=0.013 L=272.0' S=0.0100 '/' Outflow=9.42 cfs 0.685 af

Pond 13P: CB12 Peak Elev=185.48' Inflow=15.59 cfs 1.156 af
24.0" Round Culvert n=0.013 L=28.0' S=0.0100 '/' Outflow=15.59 cfs 1.156 af

Pond 14P: IB1 Peak Elev=185.35' Storage=92,293 cf Inflow=50.39 cfs 3.834 af
Discarded=2.12 cfs 1.808 af Primary=2.39 cfs 0.574 af Outflow=4.50 cfs 2.382 af

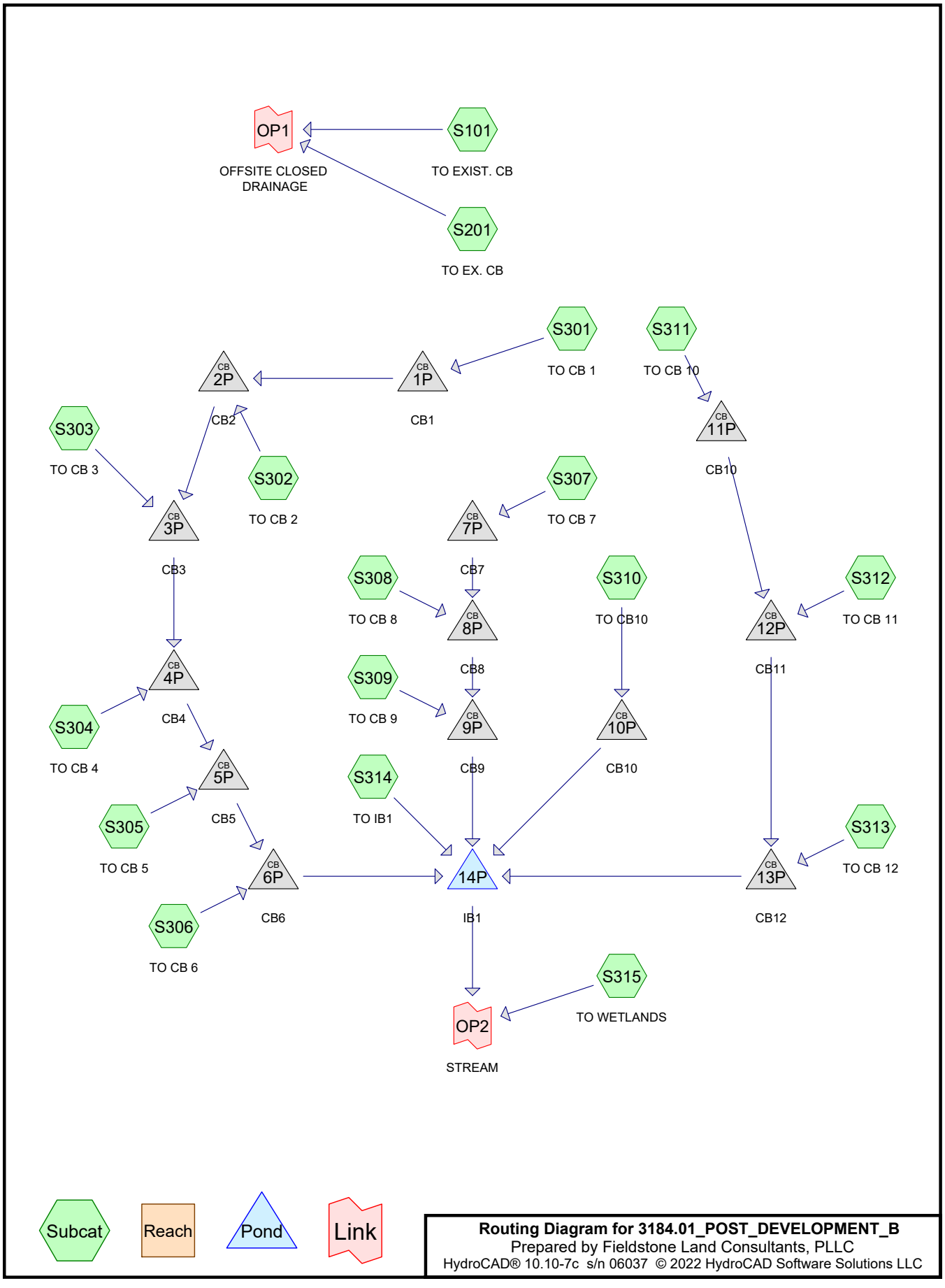
Link OP1: OFFSITE CLOSED DRAINAGE Inflow=1.81 cfs 0.132 af
Primary=1.81 cfs 0.132 af

Link OP2: STREAM Inflow=3.24 cfs 0.826 af
Primary=3.24 cfs 0.826 af

Total Runoff Area = 15.656 ac Runoff Volume = 4.218 af Average Runoff Depth = 3.23"
50.03% Pervious = 7.832 ac 49.97% Impervious = 7.824 ac

Section 2.2

Proposed Conditions
10 Year Storm Full Summary



Routing Diagram for 3184.01_POST_DEVELOPMENT_B
Prepared by Fieldstone Land Consultants, PLLC

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1P	192.90	190.90	200.0	0.0100	0.013	0.0	12.0	0.0
2	2P	189.80	189.40	140.0	0.0029	0.013	0.0	12.0	0.0
3	3P	189.15	187.80	150.0	0.0090	0.013	0.0	15.0	0.0
4	4P	187.55	186.05	150.0	0.0100	0.013	0.0	15.0	0.0
5	5P	185.80	182.85	286.0	0.0103	0.013	0.0	18.0	0.0
6	6P	182.35	182.00	26.0	0.0135	0.013	0.0	24.0	0.0
7	7P	189.00	185.85	220.0	0.0143	0.013	0.0	12.0	0.0
8	8P	185.60	182.74	286.0	0.0100	0.013	0.0	15.0	0.0
9	9P	182.50	182.00	25.0	0.0200	0.013	0.0	18.0	0.0
10	10P	182.65	182.00	26.0	0.0250	0.013	0.0	18.0	0.0
11	11P	191.50	185.90	300.0	0.0187	0.013	0.0	12.0	0.0
12	12P	185.40	182.68	272.0	0.0100	0.013	0.0	18.0	0.0
13	13P	182.18	181.90	28.0	0.0100	0.013	0.0	24.0	0.0
14	14P	183.00	181.00	25.0	0.0800	0.013	0.0	15.0	0.0

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 S101: TO EXIST. CB Runoff Area=0.523 ac 26.00% Impervious Runoff Depth>0.61"
Tc=6.0 min CN=54 Runoff=0.29 cfs 0.026 af

Subcatchment S201: TO EX. CB Runoff Area=0.479 ac 19.42% Impervious Runoff Depth>0.43"
Tc=6.0 min CN=50 Runoff=0.13 cfs 0.017 af

Subcatchment S301: TO CB 1 Runoff Area=0.348 ac 61.78% Impervious Runoff Depth>1.90"
Tc=6.0 min CN=75 Runoff=0.82 cfs 0.055 af

Subcatchment S302: TO CB 2 Runoff Area=0.261 ac 73.56% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=82 Runoff=0.79 cfs 0.054 af

Subcatchment S303: TO CB 3 Runoff Area=0.451 ac 69.18% Impervious Runoff Depth>2.29"
Tc=6.0 min CN=80 Runoff=1.28 cfs 0.086 af

Subcatchment S304: TO CB 4 Runoff Area=0.253 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=1.09 cfs 0.084 af

Subcatchment S305: TO CB 5 Runoff Area=0.622 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=2.67 cfs 0.205 af

Subcatchment S306: TO CB 6 Runoff Area=0.700 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=3.01 cfs 0.231 af

Subcatchment S307: TO CB 7 Runoff Area=0.052 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af

Subcatchment S308: TO CB 8 Runoff Area=0.789 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=3.39 cfs 0.261 af

Subcatchment S309: TO CB 9 Runoff Area=0.920 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=3.95 cfs 0.304 af

Subcatchment S310: TO CB10 Runoff Area=1.142 ac 100.00% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=98 Runoff=4.90 cfs 0.377 af

Subcatchment S311: TO CB 10 Runoff Area=0.401 ac 69.58% Impervious Runoff Depth>2.29"
Tc=6.0 min CN=80 Runoff=1.13 cfs 0.077 af

Subcatchment S312: TO CB 11 Runoff Area=1.175 ac 90.64% Impervious Runoff Depth>3.40"
Tc=6.0 min CN=92 Runoff=4.64 cfs 0.333 af

Subcatchment S313: TO CB 12 Runoff Area=0.954 ac 96.54% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=96 Runoff=4.02 cfs 0.302 af

Subcatchment S314: TO IB1 Runoff Area=0.916 ac 0.00% Impervious Runoff Depth>0.08"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.006 af

Subcatchment S315: TO WETLANDS Runoff Area=5.670 ac 2.35% Impervious Runoff Depth>0.06"
Flow Length=750' Tc=25.6 min CN=38 Runoff=0.06 cfs 0.028 af

Pond 1P: CB1 Peak Elev=193.43' Inflow=0.82 cfs 0.055 af
12.0" Round Culvert n=0.013 L=200.0' S=0.0100 '/' Outflow=0.82 cfs 0.055 af

Pond 2P: CB2 Peak Elev=190.73' Inflow=1.60 cfs 0.109 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0029 '/' Outflow=1.60 cfs 0.109 af

Pond 3P: CB3 Peak Elev=190.16' Inflow=2.88 cfs 0.195 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0090 '/' Outflow=2.88 cfs 0.195 af

Pond 4P: CB4 Peak Elev=188.90' Inflow=3.97 cfs 0.278 af
15.0" Round Culvert n=0.013 L=150.0' S=0.0100 '/' Outflow=3.97 cfs 0.278 af

Pond 5P: CB5 Peak Elev=187.52' Inflow=6.63 cfs 0.484 af
18.0" Round Culvert n=0.013 L=286.0' S=0.0103 '/' Outflow=6.63 cfs 0.484 af

Pond 6P: CB6 Peak Elev=184.08' Inflow=9.64 cfs 0.715 af
24.0" Round Culvert n=0.013 L=26.0' S=0.0135 '/' Outflow=9.64 cfs 0.715 af

Pond 7P: CB7 Peak Elev=189.26' Inflow=0.22 cfs 0.017 af
12.0" Round Culvert n=0.013 L=220.0' S=0.0143 '/' Outflow=0.22 cfs 0.017 af

Pond 8P: CB8 Peak Elev=186.81' Inflow=3.61 cfs 0.278 af
15.0" Round Culvert n=0.013 L=286.0' S=0.0100 '/' Outflow=3.61 cfs 0.278 af

Pond 9P: CB9 Peak Elev=184.51' Inflow=7.56 cfs 0.582 af
18.0" Round Culvert n=0.013 L=25.0' S=0.0200 '/' Outflow=7.56 cfs 0.582 af

Pond 10P: CB10 Peak Elev=184.08' Inflow=4.90 cfs 0.377 af
18.0" Round Culvert n=0.013 L=26.0' S=0.0250 '/' Outflow=4.90 cfs 0.377 af

Pond 11P: CB10 Peak Elev=192.14' Inflow=1.13 cfs 0.077 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0187 '/' Outflow=1.13 cfs 0.077 af

Pond 12P: CB11 Peak Elev=186.88' Inflow=5.77 cfs 0.410 af
18.0" Round Culvert n=0.013 L=272.0' S=0.0100 '/' Outflow=5.77 cfs 0.410 af

Pond 13P: CB12 Peak Elev=184.08' Inflow=9.79 cfs 0.712 af
24.0" Round Culvert n=0.013 L=28.0' S=0.0100 '/' Outflow=9.79 cfs 0.712 af

Pond 14P: IB1 Peak Elev=184.08' Storage=56,345 cf Inflow=31.88 cfs 2.391 af
Discarded=1.85 cfs 1.543 af Primary=0.07 cfs 0.012 af Outflow=1.92 cfs 1.555 af

Link OP1: OFFSITE CLOSED DRAINAGE Inflow=0.41 cfs 0.044 af
Primary=0.41 cfs 0.044 af

Link OP2: STREAM Inflow=0.12 cfs 0.040 af
Primary=0.12 cfs 0.040 af

Total Runoff Area = 15.656 ac Runoff Volume = 2.464 af Average Runoff Depth = 1.89"
50.03% Pervious = 7.832 ac 49.97% Impervious = 7.824 ac

Summary for Subcatchment S101: TO EXIST. CB

Runoff = 0.29 cfs @ 12.12 hrs, Volume= 0.026 af, Depth> 0.61"
Routed to Link OP1 : OFFSITE CLOSED DRAINAGE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.102	30	Woods, Good, HSG A
0.023	76	Gravel roads, HSG A
0.136	98	Paved parking, HSG A
0.262	39	>75% Grass cover, Good, HSG A
0.523	54	Weighted Average
0.387		74.00% Pervious Area
0.136		26.00% Impervious Area

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

Summary for Subcatchment S201: TO EX. CB

Runoff = 0.13 cfs @ 12.16 hrs, Volume= 0.017 af, Depth> 0.43"
Routed to Link OP1 : OFFSITE CLOSED DRAINAGE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.040	30	Woods, Good, HSG A
0.093	98	Paved parking, HSG A
0.346	39	>75% Grass cover, Good, HSG A
0.479	50	Weighted Average
0.386		80.58% Pervious Area
0.093		19.42% Impervious Area

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

Summary for Subcatchment S301: TO CB 1

Runoff = 0.82 cfs @ 12.10 hrs, Volume= 0.055 af, Depth> 1.90"
Routed to Pond 1P : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.000	30	Woods, Good, HSG A
0.115	98	Roofs, HSG A
0.100	98	Paved parking, HSG A
0.133	39	>75% Grass cover, Good, HSG A
0.348	75	Weighted Average
0.133		38.22% Pervious Area
0.215		61.78% Impervious Area

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

Summary for Subcatchment S302: TO CB 2

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 2.46"
Routed to Pond 2P : CB2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.096	98	Roofs, HSG A
0.096	98	Paved parking, HSG A
0.069	39	>75% Grass cover, Good, HSG A
0.261	82	Weighted Average
0.069		26.44% Pervious Area
0.192		73.56% Impervious Area

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

Summary for Subcatchment S303: TO CB 3

Runoff = 1.28 cfs @ 12.09 hrs, Volume= 0.086 af, Depth> 2.29"
Routed to Pond 3P : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.131	98	Roofs, HSG A
0.181	98	Paved parking, HSG A
0.139	39	>75% Grass cover, Good, HSG A
0.451	80	Weighted Average
0.139		30.82% Pervious Area
0.312		69.18% Impervious Area

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

Summary for Subcatchment S304: TO CB 4

Runoff = 1.09 cfs @ 12.09 hrs, Volume= 0.084 af, Depth> 3.96"
Routed to Pond 4P : CB4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.060	98	Roofs, HSG A
0.193	98	Paved parking, HSG A
0.000	39	>75% Grass cover, Good, HSG A
0.253	98	Weighted Average
0.253		100.00% Impervious Area

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

Summary for Subcatchment S305: TO CB 5

Runoff = 2.67 cfs @ 12.09 hrs, Volume= 0.205 af, Depth> 3.96"
Routed to Pond 5P : CB5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.072	98	Roofs, HSG A
0.550	98	Paved parking, HSG A
0.622	98	Weighted Average
0.622		100.00% Impervious Area

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

Summary for Subcatchment S306: TO CB 6

Runoff = 3.01 cfs @ 12.09 hrs, Volume= 0.231 af, Depth> 3.96"
Routed to Pond 6P : CB6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.112	98	Roofs, HSG A
0.588	98	Paved parking, HSG A
0.700	98	Weighted Average
0.700		100.00% Impervious Area

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

Summary for Subcatchment S307: TO CB 7

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 3.96"
Routed to Pond 7P : CB7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.026	98	Roofs, HSG A
0.026	98	Paved parking, HSG A
0.052	98	Weighted Average
0.052		100.00% Impervious Area

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

Summary for Subcatchment S308: TO CB 8

Runoff = 3.39 cfs @ 12.09 hrs, Volume= 0.261 af, Depth> 3.96"
Routed to Pond 8P : CB8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.150	98	Roofs, HSG A
0.639	98	Paved parking, HSG A
0.789	98	Weighted Average
0.789		100.00% Impervious Area

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

Summary for Subcatchment S309: TO CB 9

Runoff = 3.95 cfs @ 12.09 hrs, Volume= 0.304 af, Depth> 3.96"
Routed to Pond 9P : CB9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.270	98	Roofs, HSG A
0.650	98	Paved parking, HSG A
0.920	98	Weighted Average
0.920		100.00% Impervious Area

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

Summary for Subcatchment S310: TO CB10

Runoff = 4.90 cfs @ 12.09 hrs, Volume= 0.377 af, Depth> 3.96"
Routed to Pond 10P : CB10

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.284	98	Roofs, HSG A
0.858	98	Paved parking, HSG A
1.142	98	Weighted Average
1.142		100.00% Impervious Area

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

Summary for Subcatchment S311: TO CB 10

Runoff = 1.13 cfs @ 12.09 hrs, Volume= 0.077 af, Depth> 2.29"
Routed to Pond 11P : CB10

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.122	39	>75% Grass cover, Good, HSG A
0.000	98	Roofs, HSG A
0.279	98	Paved parking, HSG A
0.401	80	Weighted Average
0.122		30.42% Pervious Area
0.279		69.58% Impervious Area

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

Summary for Subcatchment S312: TO CB 11

Runoff = 4.64 cfs @ 12.09 hrs, Volume= 0.333 af, Depth> 3.40"
Routed to Pond 12P : CB11

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.110	39	>75% Grass cover, Good, HSG A
0.067	98	Roofs, HSG A
0.998	98	Paved parking, HSG A
1.175	92	Weighted Average
0.110		9.36% Pervious Area
1.065		90.64% Impervious Area

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

Summary for Subcatchment S313: TO CB 12

Runoff = 4.02 cfs @ 12.09 hrs, Volume= 0.302 af, Depth> 3.79"
Routed to Pond 13P : CB12

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.033	39	>75% Grass cover, Good, HSG A
0.077	98	Roofs, HSG A
0.844	98	Paved parking, HSG A
0.954	96	Weighted Average
0.033		3.46% Pervious Area
0.921		96.54% Impervious Area

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

Summary for Subcatchment S314: TO IB1

Runoff = 0.01 cfs @ 14.71 hrs, Volume= 0.006 af, Depth> 0.08"
Routed to Pond 14P : IB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
0.916	39	>75% Grass cover, Good, HSG A
0.916		100.00% Pervious Area

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

Summary for Subcatchment S315: TO WETLANDS

Runoff = 0.06 cfs @ 15.29 hrs, Volume= 0.028 af, Depth> 0.06"
Routed to Link OP2 : STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (ac)	CN	Description
1.600	30	Woods, Good, HSG A
0.029	76	Gravel roads, HSG A
0.133	98	Paved parking, HSG A
3.908	39	>75% Grass cover, Good, HSG A
5.670	38	Weighted Average
5.537		97.65% Pervious Area
0.133		2.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	85	0.0200	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
5.4	390	0.0300	1.21		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.7	275	0.0500	6.60	13.20	**Parabolic Channel, C-D** W=4.00' D=0.75' Area=2.0 sf Perim=4.3' n= 0.030 Earth, grassed & winding
25.6	750	Total			

Summary for Pond 1P: CB1

Inflow Area = 0.348 ac, 61.78% Impervious, Inflow Depth > 1.90" for 10-Year event
Inflow = 0.82 cfs @ 12.10 hrs, Volume= 0.055 af
Outflow = 0.82 cfs @ 12.10 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.10 hrs, Volume= 0.055 af
Routed to Pond 2P : CB2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 193.43' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	192.90'	**12.0" Round Culvert** L= 200.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 192.90' / 190.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.10 hrs HW=193.42' TW=190.72' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.80 cfs @ 1.94 fps)

Summary for Pond 2P: CB2

Inflow Area = 0.609 ac, 66.83% Impervious, Inflow Depth > 2.14" for 10-Year event
Inflow = 1.60 cfs @ 12.09 hrs, Volume= 0.109 af
Outflow = 1.60 cfs @ 12.09 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min
Primary = 1.60 cfs @ 12.09 hrs, Volume= 0.109 af
Routed to Pond 3P : CB3

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.73' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	189.80'	**12.0" Round Culvert** L= 140.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 189.80' / 189.40' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.50 cfs @ 12.09 hrs HW=190.72' TW=190.15' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.50 cfs @ 2.60 fps)

Summary for Pond 3P: CB3

Inflow Area = 1.060 ac, 67.83% Impervious, Inflow Depth > 2.21" for 10-Year event
Inflow = 2.88 cfs @ 12.09 hrs, Volume= 0.195 af
Outflow = 2.88 cfs @ 12.09 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min
Primary = 2.88 cfs @ 12.09 hrs, Volume= 0.195 af
Routed to Pond 4P : CB4

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 190.16' @ 12.09 hrs
Flood Elev= 195.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	189.15'	**15.0" Round Culvert** L= 150.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 189.15' / 187.80' S= 0.0090 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.83 cfs @ 12.09 hrs HW=190.15' TW=188.87' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.83 cfs @ 2.69 fps)

Summary for Pond 4P: CB4

Inflow Area = 1.313 ac, 74.03% Impervious, Inflow Depth > 2.54" for 10-Year event
Inflow = 3.97 cfs @ 12.09 hrs, Volume= 0.278 af
Outflow = 3.97 cfs @ 12.09 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
Primary = 3.97 cfs @ 12.09 hrs, Volume= 0.278 af
Routed to Pond 5P : CB5

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.90' @ 12.09 hrs
Flood Elev= 193.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	187.55'	**15.0" Round Culvert** L= 150.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 187.55' / 186.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.88 cfs @ 12.09 hrs HW=188.87' TW=187.49' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.88 cfs @ 3.17 fps)

Summary for Pond 5P: CB5

Inflow Area = 1.935 ac, 82.38% Impervious, Inflow Depth > 3.00" for 10-Year event
Inflow = 6.63 cfs @ 12.09 hrs, Volume= 0.484 af
Outflow = 6.63 cfs @ 12.09 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min
Primary = 6.63 cfs @ 12.09 hrs, Volume= 0.484 af
Routed to Pond 6P : CB6

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 187.52' @ 12.09 hrs
Flood Elev= 190.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	185.80'	**18.0" Round Culvert** L= 286.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.80' / 182.85' S= 0.0103 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.48 cfs @ 12.09 hrs HW=187.48' TW=183.98' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 6.48 cfs @ 3.67 fps)

Summary for Pond 6P: CB6

Inflow Area = 2.635 ac, 87.06% Impervious, Inflow Depth > 3.26" for 10-Year event
Inflow = 9.64 cfs @ 12.09 hrs, Volume= 0.715 af
Outflow = 9.64 cfs @ 12.09 hrs, Volume= 0.715 af, Atten= 0%, Lag= 0.0 min
Primary = 9.64 cfs @ 12.09 hrs, Volume= 0.715 af
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 184.08' @ 13.89 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	182.35'	**24.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 182.35' / 182.00' S= 0.0135 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=9.40 cfs @ 12.09 hrs HW=183.98' TW=183.05' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 9.40 cfs @ 3.43 fps)

Summary for Pond 7P: CB7

Inflow Area = 0.052 ac,100.00% Impervious, Inflow Depth > 3.96" for 10-Year event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Routed to Pond 8P : CB8

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 189.26' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	189.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 189.00' / 185.85' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=189.26' TW=186.78' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.22 cfs @ 1.36 fps)

Summary for Pond 8P: CB8

Inflow Area = 0.841 ac,100.00% Impervious, Inflow Depth > 3.96" for 10-Year event
Inflow = 3.61 cfs @ 12.09 hrs, Volume= 0.278 af
Outflow = 3.61 cfs @ 12.09 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
Primary = 3.61 cfs @ 12.09 hrs, Volume= 0.278 af
Routed to Pond 9P : CB9

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.81' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	185.60'	**15.0" Round Culvert** L= 286.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.60' / 182.74' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.52 cfs @ 12.09 hrs HW=186.78' TW=184.45' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.52 cfs @ 2.93 fps)

Summary for Pond 9P: CB9

Inflow Area = 1.761 ac,100.00% Impervious, Inflow Depth > 3.96" for 10-Year event
Inflow = 7.56 cfs @ 12.09 hrs, Volume= 0.582 af
Outflow = 7.56 cfs @ 12.09 hrs, Volume= 0.582 af, Atten= 0%, Lag= 0.0 min
Primary = 7.56 cfs @ 12.09 hrs, Volume= 0.582 af
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 184.51' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	182.50'	**18.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 182.50' / 182.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.36 cfs @ 12.09 hrs HW=184.45' TW=183.05' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.36 cfs @ 4.16 fps)

Summary for Pond 10P: CB10

Inflow Area = 1.142 ac,100.00% Impervious, Inflow Depth > 3.96" for 10-Year event
Inflow = 4.90 cfs @ 12.09 hrs, Volume= 0.377 af
Outflow = 4.90 cfs @ 12.09 hrs, Volume= 0.377 af, Atten= 0%, Lag= 0.0 min
Primary = 4.90 cfs @ 12.09 hrs, Volume= 0.377 af
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 184.08' @ 13.90 hrs
Flood Elev= 186.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	182.65'	**18.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 182.65' / 182.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.57 cfs @ 12.09 hrs HW=183.72' TW=183.05' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 4.57 cfs @ 4.73 fps)

Summary for Pond 11P: CB10

Inflow Area = 0.401 ac, 69.58% Impervious, Inflow Depth > 2.29" for 10-Year event
Inflow = 1.13 cfs @ 12.09 hrs, Volume= 0.077 af
Outflow = 1.13 cfs @ 12.09 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.09 hrs, Volume= 0.077 af
Routed to Pond 12P : CB11

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 192.14' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	191.50'	**12.0" Round Culvert** L= 300.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 191.50' / 185.90' S= 0.0187 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.11 cfs @ 12.09 hrs HW=192.13' TW=186.85' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.11 cfs @ 2.14 fps)

Summary for Pond 12P: CB11

Inflow Area = 1.576 ac, 85.28% Impervious, Inflow Depth > 3.12" for 10-Year event
Inflow = 5.77 cfs @ 12.09 hrs, Volume= 0.410 af
Outflow = 5.77 cfs @ 12.09 hrs, Volume= 0.410 af, Atten= 0%, Lag= 0.0 min
Primary = 5.77 cfs @ 12.09 hrs, Volume= 0.410 af
Routed to Pond 13P : CB12

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.88' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	185.40'	**18.0" Round Culvert** L= 272.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.40' / 182.68' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.64 cfs @ 12.09 hrs HW=186.85' TW=183.87' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.64 cfs @ 3.23 fps)

Summary for Pond 13P: CB12

Inflow Area = 2.530 ac, 89.53% Impervious, Inflow Depth > 3.38" for 10-Year event
Inflow = 9.79 cfs @ 12.09 hrs, Volume= 0.712 af
Outflow = 9.79 cfs @ 12.09 hrs, Volume= 0.712 af, Atten= 0%, Lag= 0.0 min
Primary = 9.79 cfs @ 12.09 hrs, Volume= 0.712 af
Routed to Pond 14P : IB1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 184.08' @ 13.89 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	182.18'	**24.0" Round Culvert** L= 28.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 182.18' / 181.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=9.54 cfs @ 12.09 hrs HW=183.87' TW=183.05' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 9.54 cfs @ 4.54 fps)

Summary for Pond 14P: IB1

Inflow Area = 8.984 ac, 83.06% Impervious, Inflow Depth > 3.19" for 10-Year event
Inflow = 31.88 cfs @ 12.09 hrs, Volume= 2.391 af
Outflow = 1.92 cfs @ 13.86 hrs, Volume= 1.555 af, Atten= 94%, Lag= 106.2 min
Discarded = 1.85 cfs @ 13.86 hrs, Volume= 1.543 af
Primary = 0.07 cfs @ 13.86 hrs, Volume= 0.012 af
Routed to Link OP2 : STREAM

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 184.08' @ 13.86 hrs Surf.Area= 26,659 sf Storage= 56,345 cf

Plug-Flow detention time= 193.9 min calculated for 1.554 af (65% of inflow)
Center-of-Mass det. time= 119.4 min (866.1 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1	181.00'	128,616 cf	**Custom Stage Data (Conic)**Listed below (Recalc)
#2	177.00'	449 cf	**3.00'W x 100.00'L x 4.00'H Prismatoid** 1,200 cf Overall - 79 cf Embedded = 1,121 cf x 40.0% Voids
#3	178.00'	79 cf	**12.0" Round Pipe Storage** Inside #2 L= 100.0'
		129,144 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
181.00	10,670	0	0	10,670
182.00	12,540	11,592	11,592	12,579
183.00	23,190	17,594	29,187	23,239
184.00	26,140	24,650	53,837	26,241
186.00	32,240	58,273	112,111	32,460
186.50	33,790	16,506	128,616	34,043

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.00'	**3.000 in/hr Exfiltration over Surface area**
#2	Primary	185.50'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#3	Primary	183.00'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 183.00' / 181.00' S= 0.0800 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Device 3	183.90'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	184.80'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 3	185.30'	**4.0" x 4.0" Horiz. Orifice/Grate X 10.00 columns** X 10 rows C= 0.600 in 56.0" x 56.0" Grate (51% open area) Limited to weir flow at low heads

Discarded OutFlow Max=1.85 cfs @ 13.86 hrs HW=184.08' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.85 cfs)

Primary OutFlow Max=0.07 cfs @ 13.86 hrs HW=184.08' TW=0.00' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Passes 0.07 cfs of 3.97 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.43 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**6=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link OP1: OFFSITE CLOSED DRAINAGE

Inflow Area = 1.002 ac, 22.85% Impervious, Inflow Depth > 0.52" for 10-Year event
Inflow = 0.41 cfs @ 12.13 hrs, Volume= 0.044 af
Primary = 0.41 cfs @ 12.13 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link OP2: STREAM

Inflow Area = 14.654 ac, 51.83% Impervious, Inflow Depth > 0.03" for 10-Year event
Inflow = 0.12 cfs @ 14.13 hrs, Volume= 0.040 af
Primary = 0.12 cfs @ 14.13 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Section 3.1

Inspection & Maintenance Manual

84 Lumber Company
3 Sullivan Road, Hudson, 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: 84 Lumber Company
1019 Route 519, Building 4
Eighty Four, PA 15330

Report Information:

- 84 Lumber Company will be the entity responsible for implementing the required reporting, inspection, and maintenance activities identified in the I & M manual.
- 84 Lumber Company 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 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.

In-Ground Infiltration Basin

- Removal of debris from inlet and outlet structures.
- Removal of accumulated sediment.
- Inspection and repair of outlet structures and appurtenances.
- Inspection of infiltration components at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Periodic mowing of embankments.
- Removal of woody vegetation form embankments.
- Inspection and repair of embankments and spillways.
- If an infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore infiltration function, including but not limited to removal of accumulated sediments or reconstruction of the infiltration trench.
- Vegetation should be inspected at least annually, and maintained in healthy condition, including pruning, removal and replacement of dead or diseased vegetation, and removal of invasive species.

Sediment Forebays

- Inspect Forebays monthly for first year to determine sediment load. If sediment load is heavy then maintain monthly inspections. If sediment load is light then reduce inspection accordingly but inspect at least semi-annually.
- Remove trash upon inspection and accumulated sedimentation when sediments have accumulated to within 6 inches of the outlet and/or when there is evidence of excessive sediment being conveyed to downstream BMP.
- Repair any damage in the forebay as a result of erosion immediately after the inspection to minimize sediment transport.
- Dispose of sediments and other wastes in conformance with applicable local, state and federal regulations.

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.

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.

Inspection Checklist

- ☐ Infiltration Basins
- ☐ Sediment Forebays
- ☐ Catch Basin
- ☐ Headwall Inlets
- ☐ Headwall Outlets/Aprons

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	

Winter Deicing Operations

The use of deicing materials on-site shall be minimized. The use of deicing materials on-site shall be in compliance with the requirements of Town of Merrimack's Aquifer Conservation District and Well Head Protection Area. The individual overseeing the winter maintenance operations shall receive and maintain the New Hampshire Green Snowpro certification as offered by the New Hampshire Technology Center at the University of New Hampshire, Durham, NH.

A log of winter deicing operations, tracking the type and amount of deicing materials applied on site, shall be maintained by the entity responsible for on-site winter maintenance operations. A copy of the completed logs for each season shall be filed with the BMP Inspection and Maintenance Logs.

Winter Maintenance Basics

- Anti-ice before the storm.
- Remove snow from surfaces as quickly as possible to reduce compaction.
  No snow should be plowed over the proposed infiltration basin.
- Plow before applying deicers to avoid dilution of the salt.
- Minimize deicer use during the storm.
- Never plow or blow snow into bodies of water, wetlands, traffic or into streets.
- Minimize back-up maneuvers to reduce chance of accidents.
- Limit use of salt and sand during the storm; use only to reduce bonding.
- Do not use salt to burn off snow.
- Use application rate chart to determine how much salt to use.
- Don't apply dry salt (sodium chloride) below 15º F pavement temperature. It will not melt fast enough to help.
- Below 15° F, use a wetted salt.
- For extreme cold, skip melting and use sand.
- Clean up spills.
- Accurately record the material used at each site.
- Pay attention to its effectiveness and record observations.
- Use only what is needed based on proper application rates for the conditions.
- Put extra back in salt pile or return extra bags.

Deicing Application Rate Guidelines for Parking Lots and Sidewalks

These rates are based on road application guidelines (LRRB 2012). Develop specific application rates by adjusting the current rates incrementally downward toward the guidelines. Where temperature categories overlap, select the rate most applicable to the present situation.

Pavement Temp. (ºF) and Trend (↑↓)	Weather Condition	Maintenance Actions	Application Rate in lbs./per 1000 square foot area			
			Salt Pre-wetted/ Pretreated With Salt Brine	Salt Pre-wetted/ Pretreated With Other Blends	Dry Salt	Winter Sand (abrasives)
>30º ↑	Snow	Plow, treat intersections only	0.75	0.5	0.75	not recommended
	Frz. Rain	Apply chemical	1.25	1.0	1.5	not recommended
30º ↓	Snow	Plow & apply chemical	1.25	1.0	1.5	not recommended
	Frz. Rain	Apply chemical	1.5	1.25	1.75.	not recommended
25 - 30º ↑	Snow	Plow & apply chemical	1.25	1.0	1.5	not recommended
	Frz. Rain	Apply chemical	1.5	1.25	1.75	not recommended
25 - 30º ↓	Snow	Plow & apply chemical	1.25	1.0	1.5	not recommended
	Frz. Rain	Apply chemical	1.75	1.5	2.25	3.25
20 - 25º ↑	Snow or Frz. Rain	Plow & apply chemical	1.75	1.5	2.25	3.25 for frz. rain
20 - 25º ↓	Snow	Plow & apply chemical	2.0	2.0	2.75	not recommended
	Frz. Rain	Apply chemical	2.5	2.0	3.0	3.25
15º to 20º ↑	Snow	Plow & apply chemical	2.0	2.0	2.75	not recommended
	Frz. Rain	Apply chemical	2.5	2.0	3.0	3.25
15º to 20º ↓	Snow or Frz. Rain	Plow & apply chemical	2.5	2.0	3.0	3.25 for frz. rain
0 to 15º ↑ ↓	Snow	Plow, treat with blends, sand hazardous areas	not recommended	3.0	not recommended	5.0 spot treat as needed
< 0º	Snow	Plow, treat with blends, sand hazardous areas	not recommended	4.5	not recommended	5.0 spot treat as needed

Instructions for using application rate table for calibrated spreaders

1. Using Deicing Application Rate Guidelines for Parking Lots and Sidewalks. Select the row (⟶) with the appropriate pavement temperature, temperature trend, and weather conditions.
2. Select the column (↓) that has the type of material used.
3. Find the box where the row (⟶) and columns (↓) intersect to find the application rate.
4. Compare those values to the calibration chart for the spreader.*
5. Select the correct spreader setting for the rate calculated.

Example:

1. Parking lot is 54,000 sq. ft.
2. Temperature: 22ºF and falling. It has finished snowing. (⟶)
3. Using salt pretreated with salt brine. (↓)
4. Find the 20 – 25º ↓ box. Follow it to the right to the column labeled "Salt Pre-wetted/pretreated with salt brine." Read the rate in the box. The box where the column and row intersect shows a rate of 2.0 /1000 square feet. (⟶↓)
5. Refer to the calibration chart in the vehicle and set the spreader to the setting that most closely matches the 2.0 lbs. /1000 square feet.
6. The mixture is ready to apply.

Instructions for using application rate table for spreaders that are NOT calibrated

Using the example above:

1. Calculate size factor: Divide the parking lot size (54,000 sq. ft.) by 1,000 sq. ft. 54,000/1,000 = 54. The size factor is 54.
2. Find application rate (2.0).
3. Multiply application rate by size factor 2 x 54 = 108.
4. The amount needed for the entire lot is 108 lbs. pre-wetted/pretreated salt brine.
5. Because the spreader is not calibrated, the setting is unknown.
6. Although the calibration setting is not known, this establishes the amount of salt to use and increases efficiency.
7. Determine the best method to spread the 108 pounds evenly across the parking lot.

Pavement area of the proposed Commerce Park R&D = 338,000 sq.ft.

Deicing Log					
Air Temp.	**Weather Conditions**	**Date of Application**	**Type of Deicer Used**	**Amount of Deicer Used**	**Deicer Applied By**

Section 3.2

Test Pit Data

FIELDSTONE
LAND CONSULTANTS, PLLC
Surveying ⌖ Engineering
Land Planning ⌖ Septic Designs
206 Elm Street, Milford, NH 03055 - Phone: 603-672-5456 - Fax: 603-413-5456
www.FieldstoneLandConsultants.com

Test Pit Data
Map 145 Lot 15
3 Sullivan Road
Hudson, NH

10/13/22

Test Pit #1
0-6"- 10YR 3/3 dark brown, loamy sand, granular, friable
6-12"- 10YR 5/6 yellowish brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = 12"** **Roots = None**

Test Pit #2
0-7"- 10YR 3/3 dark brown, loamy sand, granular, friable
7-72"- 10YR 5/6 yellowish brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

Test Pit #3
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-76"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = 76"** **Roots = None**

Test Pit #4
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-70"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = 70"** **Roots = None**

Test Pit #5
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-80"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = 6"**

Test Pit #6
0-15"- 10YR 3/3 dark brown, loamy sand, granular, friable
15-24"- 10YR 4/4 dark yellowish brown, loamy medium to coarse sand, single grain, loose
24-68"- 2.5Y 6/6 olive brown, gravelly medium to coarse sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = 68"** **Roots = None**

Test Pit #7
0-9"- 10YR 3/3 dark brown, loamy fine sand, granular, friable
9-16"- 10YR 5/6 yellowish brown, loamy fine sand, massive, friable
16"- 2.5Y 6/3 light yellowish brown, loamy fine sand, massive, friable
ESHWT = 66" **Observed Water = None** **Ledge/Boulders = None** **Roots = 4"**

Test Pit #8
0-56"- 10YR 3/3 dark brown, gravelly sandy loam, massive, friable *fill
56-78"- 2.5Y 6/3 light yellowish brown, loamy fine sand, massive, friable
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

Test Pit #9
0-26"- 10YR 3/3 dark brown, sandy loam, massive, friable *fill
26-44"- 10YR 4/6 dark yellowish brown, stony/gravelly sandy loam, massive, friable
44-72" - 2.5Y 5/3 light olive brown, stony/gravelly sandy loam, massive, firm
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

Test Pit #10
0-6"- 10YR 3/3 dark brown, loamy sand, granular, friable
6-19"- 10YR 5/6 yellowish brown, loamy sand, massive, friable
19-32"- 2.5Y 6/3 light olive brown, medium to coarse sand, single grain, loose
32-80"- 2.5Y 6/4 light olive brown, fine to medium sand, single grain, loose
ESHWT = 64" **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

Test Pit #11
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-24"- 10YR 5/6 yellowish brown, loamy sand, massive, friable
24-36"- 2.5Y 6/4 light yellowish brown, sandy loam, massive, friable
36-76"- 2.5Y 5/4 light olive brown, silty loam, massive, friable
ESHWT = 60" **Observed Water = None** **Ledge/Boulders = None** **Roots = 22"**

Test Pit #12
0-36"- 10YR 3/3 dark brown, stony sandy loam, granular, friable *fill
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

Test Pit #12A
0-12"- 10YR 3/3 dark brown, loamy sand, granular, friable
12-23"- 10YR 5/6 yellowish brown, loamy sand, massive, friable
23-36"- 2.5Y 6/4 light yellowish brown, sandy loam, massive, friable
36-68"- 2.5Y 5/4 light olive brown, silty loam, massive, friable
ESHWT = 60" **Observed Water = None** **Ledge/Boulders = None** **Roots = 24"**

Test Pit #13
0-36"- 10YR 3/3 dark brown, sandy loam, massive, friable *fill
36-48"- 10YR 4/6 dark yellowish brown, stony/gravelly sandy loam, massive, friable
48-80" - 2.5Y 5/3 light olive brown, stony/gravelly sandy loam, massive, firm
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

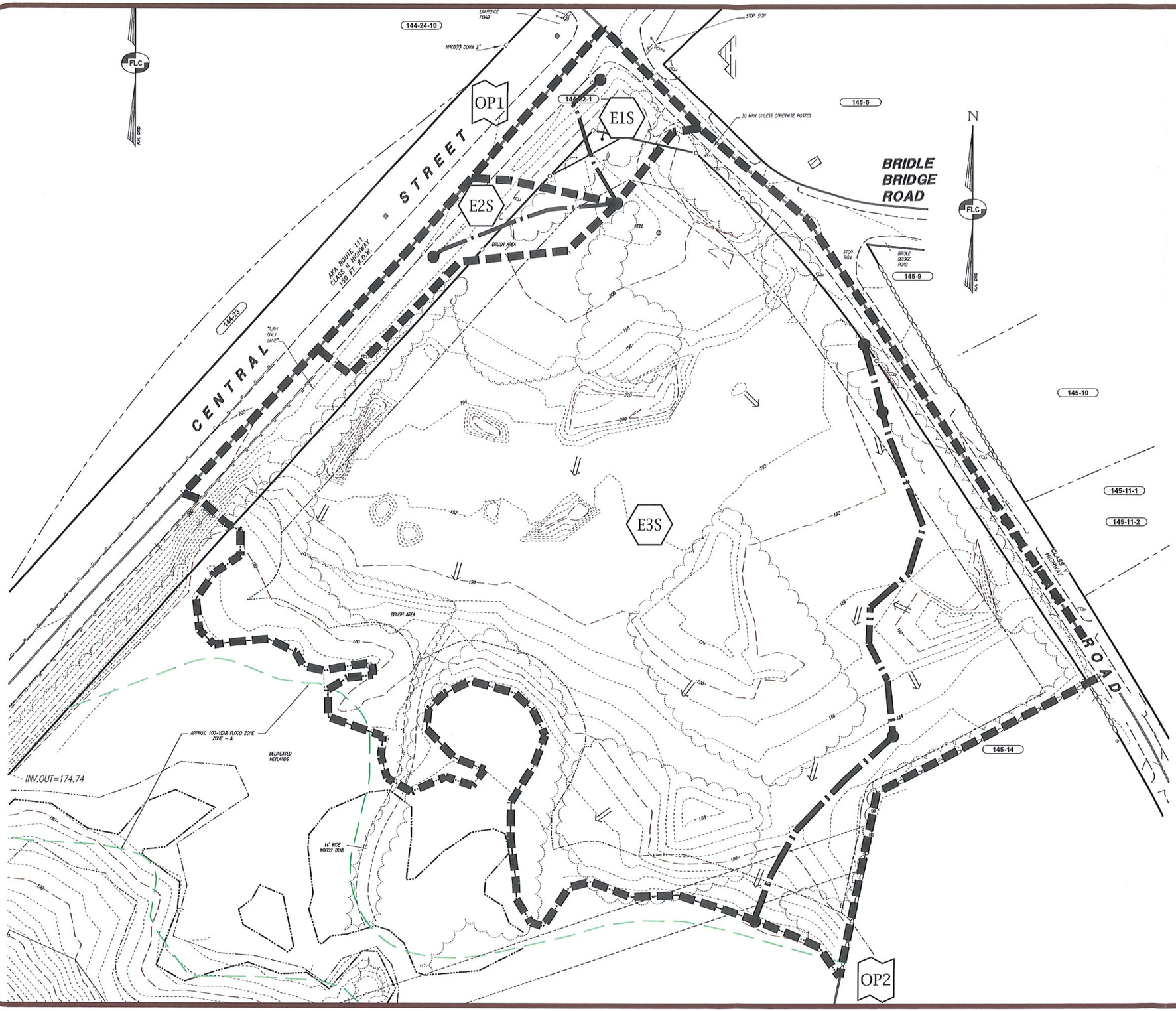
Test Pit #14
0-12"- 10YR 3/3 dark brown, loamy sand, massive, friable *fill
12-48"- 2.5Y 6/3 light yellowish brown, medium to coarse sand, single grain, loose
48-72" - 2.5Y 6/3 light yellowish brown, fine to medium sand, single grain, loose
ESHWT = None **Observed Water = None** **Ledge/Boulders = None** **Roots = None**

Logged By: Christopher Guida

Christopher A. Guida, CSS, CWS
Certified Soil & Wetland Scientist
NH Licensed Designer #1401

Section 3.3

Drainage Plans



LEGEND:

DRAINAGE ANALYSIS

- E1P — POND OR PIPE
- E1S — SUBCATCHMENT
- E1R — REACH
- OP1 — OBSERVATION POINTS
- HYDROLOGIC PATH
- WATERSHED BOUNDARY
- SURFACE WATER FLOW

GRAPHIC SCALE

50' 25' 0 50' 100' 150'

IMPERIAL: 1"=50'

REV.	DATE	DESCRIPTION	C/O	DR	CK

PRE-DEVELOPMENT DRAINAGE PLAN

TAX MAP 145 LOT 15
(3 SULLIVAN ROAD)
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

84 LUMBER COMPANY
1019 ROUTE 519, BUILDING 4 EIGHTY FOUR, PA 15330

SCALE: 1" = 50' MARCH 22, 2022

Surveying ◆ Engineering ◆ Land Planning ◆ Permitting ◆ Septic Designs

FIELDSTONE LAND CONSULTANTS, PLLC

206 Elm Street, Milford, NH 03055
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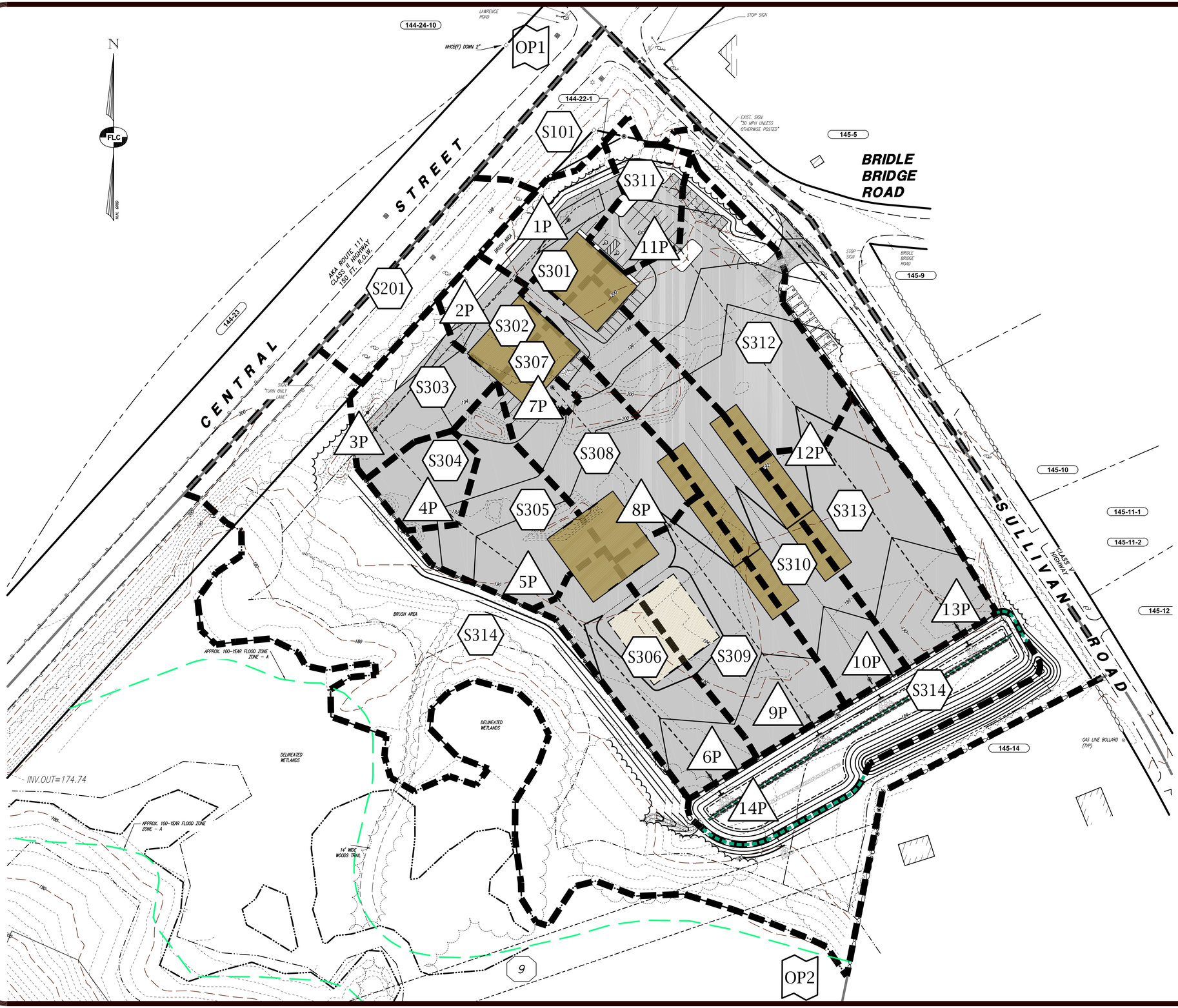

LEGEND:

DRAINAGE ANALYSIS

- E1P — POND OR PIPE
- E1S — SUBCATCHMENT
- E1R — REACH
- OP1 — OBSERVATION POINTS
- HYDROLOGIC PATH
- WATERSHED BOUNDARY
- SURFACE WATER FLOW

GRAPHIC SCALE

60' 30' 0 60' 120' 180'

IMPERIAL: 1"=60'

REV.	DATE	DESCRIPTION	C/O	DR	CK
D	3/8/23	REVISED PER PLANNING BOARD MEETING	---	NRC	NRC
C	2/8/23	REVISED PER PLANNING BOARD MEETING	---	DSL	CEB
B	12/28/22	REVISED PER STAFF & PEER REVIEW COMMENTS	---	CLR	CEB

POST-DEVELOPMENT DRAINAGE PLAN

TAX MAP 145 LOT 15
(3 SULLIVAN ROAD)
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

84 LUMBER COMPANY
1019 ROUTE 519, BUILDING 4 EIGHTY FOUR, PA 15330

SCALE: 1" = 60' MARCH 22, 2022

Surveying ⌖ Engineering ⌖ Land Planning ⌖ Permitting ⌖ Septic Designs

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