34 School Street, Littleton, NH 03561 • Ph 603-444-4111 • Fax 603-444-1343 • www.horizonsengineering.com

STORMWATER SUMMARY

Project: Effingham Gas Station

Issue Date: August 26, 2022
Revised: December 19, 2023

Applicant : Meena LLC

Project No : 220473

Location : 41 Route 25, Effingham, NH

PID : Map 401, Lot 5

Methodology : TR-20 using HydroCAD® 10.20-3g

Assumption(s):

- The "Existing Site Conditions" are the conditions that the site was in prior to the construction of the gas pumps, tank and canopy.
- Storm events have been used in these calculations under fully thawed ground conditions, antecedent moisture content two.

Approach:

- Review and verify, stormwater runoff flows from the concrete pads and parking lots.
- Identify potential oil and spill sources and install devices to keep fugitive oil from reaching the adjacent wetlands.
- Note that the site is all within Champlain Soils that are considered excessively well drained, and a droughty soil per NRCS Soils Mapping and Classification. The Hydrologic Soils Group for Colton soils is group A.
- Stormwater analysis completed was to determine the amount of flow to the NHDOT right of way and design an infiltration trench to treat the runoff from the canopy.
- The analysis is limited to the watershed on the project site.

Summary of Analysis:

Analysis

Point		2yr	10yr	25yr	50yr
POA1	EX	2.35cfs	3.44cfs	4.28cfs	5.33cfs
	POST	2.11cfs	3.13cfs	3.91cfs	5.13cfs

Town of Effingham Performance Standards:

The following in *italics* are the Zoning performance standards listed in Section 2210 and our narrative discussing how the project meets the standards is list directly below the standard:

2210 - 1. For any use that will render impervious more than 15% or more than 2,500 square feet of the groundwater protection district area of any lot, whichever is greater, a stormwater management plan shall be prepared which the planning board determines is consistent with New Hampshire Stormwater Manual Volumes 1-3, NH Department of Environmental Services December 2008 or any subsequent revisions.

The site has more than 15% impervious and 2,500 SF of impervious area within the groundwater protection district. Therefore, a stormwater/source control plan, narrative is included in this response, see attached revised SPCC & Source Control Plan.

2210 - 2. Special uses, as defined under Section 2208, Special Uses, shall develop stormwater management and pollution prevention plans and include information consistent with Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, US EPA #833R06004, May 2007 or any subsequent revisions. The plan shall demonstrate that the use will: a. Meet minimum stormwater discharge setbacks between water supply wells and constructed stormwater practices as found within Innovative Land Use Planning Techniques: A Handbook for Sustainable Development, Section 2.1 Permanent (Post-Construction) Stormwater Management,(DES, 2008 or later edition); b. Minimize, through a source control plan that identifies pollution prevention measures, the release of regulated substances into stormwater; c. Stipulate that expansion or redevelopment activities shall require an amended stormwater plan and may not infiltrate stormwater through areas containing contaminated soils without completing a Phase I Assessment in conformance with ASTM E 1527-05, also referred to as All Appropriate Inquiry (AAI); d. Maintain the following minimum vertical separation between the bottom of a stormwater practice and the average seasonal highwater table as determined by a licensed hydrogeologist, soil scientist, engineer or other qualified professional as determined by the Planning Board: four-foot vertical separation for a practice that infiltrates stormwater; one-foot vertical separation for a practice that filters stormwater.

The revised plans and reports include a stormwater management plan, source control plan and a pollution prevention plan. We have removed the infiltration system and replaced it with a new bioretention basin per North Points recommendations, and the new system maintains the required one-foot of separation to the average seasonal high water elevation.

2210 - 3. Animal manures, fertilizers, and compost must be stored in accordance with Manual of Best Management Practices for Agriculture in New Hampshire, NH Department of Agriculture, Markets, and Food, July 2008 and any subsequent revisions.

The project is a fueling station and does not anticipate or plan on storing manure, fertilizers, or composts at the project site. No above ground fuel storage.

2210 - 4. All regulated substances stored in containers with a capacity of five gallons or more must be stored in product-tight containers on an impervious surface designed and maintained to prevent flow to exposed soils, floor drains, and outside drains;

The project does not propose to store regulated substances in above ground containers that are larger than 5 gallons. Fueling stations are protected with concrete slabs that include Positive Limiting Barriers (PLB), that will direct excessive spills, should this occur to a series of additional protective stormwater devices; deep sump catch basins, oil water separator, and lined bioretention system. Runoff from the canopy goes to the infiltration trench. Treatment devices are in accordance with Stormwater Manuals and Source Control Plans.

2210 - 5. Facilities where regulated substances are stored must be secured against unauthorized entry by means of a door and/or gate that is locked when authorized personnel are not present and must be inspected weekly by the facility owner;

There are no special facilities or above ground storage containers proposed, and the main building will be locked, or under employee supervision at all times and shall be inspected by the facility owner.

2210 - 6. Outdoor storage areas for regulated substances, associated material or waste must be protected from exposure to precipitation and must be located at least 50 feet from surface water or storm drains, at least 75 feet from private wells, and outside the sanitary protective radius of wells used by public water systems.

The project does not propose outdoor, above ground storage containers for regulated substances. A screened in solid waste dumpster is proposed at a location that not within the sanitary protective radius of wells used by the public water system.

2210 - 7. Secondary containment must be provided for outdoor storage of regulated substances in regulated containers and the containment structure must include a cover to minimize accumulation of water in the containment area and contact between precipitation and storage container(s);

The project does not propose outdoor, above ground storage containers for regulated substances, and therefore secondary containment is not provided. Fueling stations are protected with a concrete slab that includes PLB. Precipitation runoff will be directed to a series of stormwater devices; deep sump catch basin, oil water separator, and a bioretention system.

2210 - 8. Containers in which regulated substances are stored must be clearly and visibly labeled and must be kept closed and sealed when material is not being transferred from one container to another;

There are no outdoor, above ground storage containers/areas proposed at the project site. Fueling stations, and the solid waste dumpster will be clearly labeled, and kept closed and sealed when material is not being transferred.

2210 - 9. Prior to any land disturbing activities, all inactive wells on the property not in use or properly maintained at the time the plan is submitted shall be considered abandoned and must be decommissioned in accordance with We 604, or must be properly maintained in accordance with We 603 of the New Hampshire Water Well Board Rules. Rev 3/11/22 57 of 70

There are no inactive wells on the project site.

2210 - 10. Blasting activities shall be planned and conducted to minimize groundwater contamination. Excavation activities should be planned and conducted to minimize adverse impacts to hydrology and the dewatering of nearby drinking water supply wells.

The project does not anticipate requiring blasting activities during construction.

2210 - 11. All transfers of petroleum from delivery trucks and storage containers over five gallons in capacity shall be conducted over an impervious surface having a positive limiting barrier at its perimeter.

The fueling pads have positive limiting barriers at their perimeters.

Conclusions:

- Stormwater runoff from the parking lot and buildings is directed to deep sump catch basins and an oil water separator. These are intended to capture the runoff and prevent any fugitive oil from reaching the adjacent wetlands. The runoff from the proposed canopy is directed to an infiltration trench, where the runoff will be captured, infiltrated and treated. There will be a post development decrease in peak rate at the analysis point due to the construction of the infiltration trench and bioretention basin and no change in impervious surfaces. Additionally, infiltration trench, catch basins, and bio-retention basin will add a level of protection not previously available.

Certification

This document contains engineering data including calculations of the post development surface drainage characteristics of this property. The engineering aspects of this document have been prepared by me and by those under my direct supervision; every such engineering aspect shown herein is based upon my best knowledge and opinion thereof.

2-year, 10-year, 25- year and 50- year storm events has been used in these calculations under fully thawed ground conditions, antecedent moisture content two. HydroCAD© 10.20-3g software has been used to perform the calculations.

This document does not constitute any guarantees but has been prepared with usual and customary standards of care. All references are submitted for general information and regulatory review purposes only.

Issue Date: 08/26/2022
Revision Date: 12/19/2023

Mark Lucy, P.E., C.P.E.S.C.

James Hayden

From: Perry, C. Bradley <cbradley.perry@eversource.com>
Sent: Thursday, October 13, 2022 11:29 AM
To: James Hayden
Subject: RE: Meena Effingham

James, I don't foresee any issue with the tank or trench. And as I indicated this morning, the pole is set deeper than normal, so I don't believe the amount of material you indicated will be removed will have any effect. But again, should any questions or concerns arise during any phase of construction, please don't hesitate to call.

Brad

From: James Hayden <jhayden@horizonsengineering.com>
Sent: Thursday, October 13, 2022 11:02 AM
To: Perry, C. Bradley <cbradley.perry@eversource.com>
Cc: Jim <jdoucet@worldpath.net>
Subject: Meena Effingham

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Good Morning Brad,

Thank you for taking the time to meet with us on site at the Meena project this morning. I wanted to confirm what we discussed on site, in that Eversource does not have an issue with the underground tank, infiltration trench and bio-retention rain garden in the easement, and that the pole within the side slope of the stormwater pond does not need to be moved. Thanks again

James Hayden
Engineering II & Project Manager
Horizons Engineering, Inc.
Maine - New Hampshire - Vermont
P. 603.444.4111 F. 603.444.1343
O.603.539.7912

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Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point

Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	43.788 degrees North
Longitude	71.088 degrees West
Elevation	120 feet
Date/Time	Sun Apr 02 2023 16:46:39 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2da
1yr	0.25	0.38	0.47	0.62	0.78	0.99	**1yr**	0.67	0.94	1.15	1.47	1.90	2.48	2.74	**1yr**	2.19	2.6
2yr	0.31	0.48	0.60	0.79	0.99	1.25	**2yr**	0.85	1.15	1.45	1.83	2.32	2.95	3.32	**2yr**	2.61	3.1
5yr	0.37	0.57	0.72	0.96	1.23	1.56	**5yr**	1.06	1.42	1.82	2.30	2.89	3.65	4.16	**5yr**	3.23	4.0
10yr	0.41	0.65	0.82	1.11	1.44	1.86	**10yr**	1.25	1.68	2.17	2.74	3.43	4.29	4.93	**10yr**	3.79	4.7
25yr	0.48	0.77	0.98	1.35	1.79	2.32	**25yr**	1.55	2.09	2.72	3.43	4.29	5.31	6.18	**25yr**	4.70	5.9
50yr	0.55	0.88	1.13	1.57	2.12	2.76	**50yr**	1.83	2.47	3.23	4.08	5.07	6.25	7.34	**50yr**	5.53	7.0
100yr	0.62	1.00	1.29	1.84	2.50	3.29	**100yr**	2.16	2.93	3.86	4.85	6.01	7.36	8.71	**100yr**	6.51	8.3
200yr	0.71	1.16	1.50	2.15	2.96	3.90	**200yr**	2.55	3.47	4.58	5.76	7.11	8.66	10.36	**200yr**	7.67	9.9
500yr	0.85	1.39	1.82	2.64	3.70	4.90	**500yr**	3.19	4.34	5.77	7.23	8.88	10.76	13.02	**500yr**	9.52	12.5

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2da
1yr	0.22	0.34	0.41	0.55	0.68	0.84	**1yr**	0.59	0.82	0.97	1.26	1.39	2.04	2.45	**1yr**	1.80	2.3

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **p-5 Bioretention basin**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.31	ac	A = Area draining to the practice	
0.26	ac	A_I = Impervious area draining to the practice	
0.84	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.80	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.25	ac-in	WQV= 1" x Rv x A	
906	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
226	cf	25% x WQV (check calc for sediment forebay volume)	
679	cf	75% x WQV (check calc for surface sand filter volume)	
Deep sump CBs		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
45	sf	A_{SA} = Surface area of the practice	
10.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
yes	Yes/No	(Use the calculations below)	
24.2	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
416.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
415.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
415.50	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
412.25	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
4.25	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.00	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
421.70	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
422.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

Stage-Area-Storage for Pond P-5: Bio retention basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
415.50	45	0
415.60	45	2
415.70	45	4
415.80	45	5
415.90	45	7
416.00	45	9
416.10	45	11
416.20	45	13
416.30	45	14
416.40	45	16
416.50	90	18
416.60	90	19
416.70	90	20
416.80	90	21
416.90	90	22
417.00	90	23
417.10	90	23
417.20	90	24
417.30	90	25
417.40	90	26
417.50	90	27
417.60	90	28
417.70	90	29
417.80	90	30
417.90	90	31
418.00	90	32
418.10	90	32
418.20	90	33
418.30	90	34
418.40	90	35
418.50	135	36
418.60	142	41
418.70	150	46
418.80	159	53
418.90	168	60
419.00	177	68
419.10	187	78
419.20	198	88
419.30	209	99
419.40	221	112
419.50	233	125
419.60	246	140
419.70	259	157
419.80	273	174
419.90	288	193
420.00	303	214
420.10	326	236
420.20	350	261
420.30	375	288
420.40	401	318
420.50	429	351
420.60	458	386
420.70	488	424
420.80	519	466
420.90	551	510
421.00	584	558
421.10	619	609
421.20	654	664
421.30	691	722
421.40	729	784
421.50	769	850
421.60	809	920
421.70	850	994
421.80	893	1,072
421.90	937	1,154
422.00	**982**	**1,241**

Calculations 25 year storm

Project:	Meena Route 25 Effingham
Performed By:	JFH
Checked By:	DEB
Date:	12/14/2023

Apron Length

When Tail water depth at pipe outlet is **less (<)** than 1/2 the dia. pipe

use **Eq 1**: $La = \frac{1.8 \times Q}{D^{3/2}} + 7 \times D$

When Tail water depth at pipe outlet is **greater (>)** than 1/2 the dia. pipe

use **Eq 2**: $La = \frac{3 \times Q}{D^{3/2}} + 7 \times D$

Apron Width at Outlet = 3 x D **Eq3** or channel bottom width, when there is a well defined channel

Downstream Apron Width when there is **NO** well defined channel at pipe outlet

and the Tailwater Depth is less (<) than the elevation of the center of the pipe use **Eq 4**

W=3D+La

or if the Tailwater Depth is greater (>) than the elevation of the center of the pipe use **Eq 5**

W=3D+0.4xLa

Where D= pipe Diameter La= apron length W= apron width

Q=Discharge from pipe CFS Tw=Tailwater

P-2

	CFS	Feet	Feet	Channel (Y or N)
Data:	Q= 0.75	D= 1	Tw= 0.28	n

1) Apron Width at Outlet
   Use Eq 3 — 3 Feet

2) Apron Length
   Use Eq 1 — 8 Feet

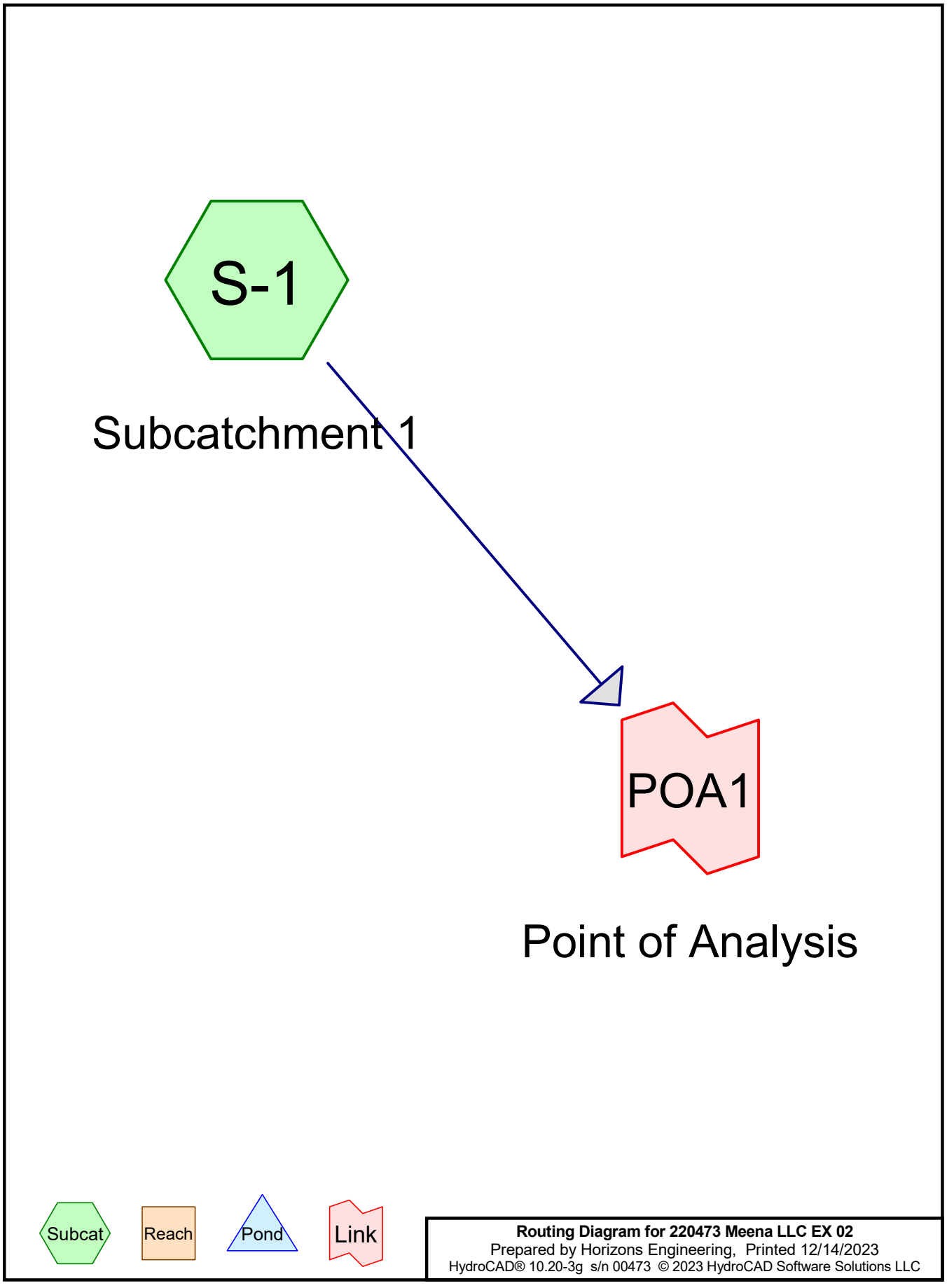
3) Downstream Apron Width
   Use Eq 4 — 11 Feet

4) Stone Size

$d50 = \frac{0.02 \times Q^{4/3}}{Tw \times D}$

0.05 Feet

Use NHDOT Class C Stone Fill



Routing Diagram for 220473 Meena LLC EX 02
Prepared by Horizons Engineering, Printed 12/14/2023
HydroCAD® 10.20-3g s/n 00473 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year	TYPE II 24-hr		Default	24.00	1	2.95	2
2	10 Year	TYPE II 24-hr		Default	24.00	1	4.29	2
3	25 Year	TYPE II 24-hr		Default	24.00	1	5.31	2
4	50 Year	TYPE II 24-hr		Default	24.00	1	6.25	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.898	39	>75% Grass cover, Good, HSG A (S-1)
0.482	98	Paved parking, HSG A (S-1)
0.080	98	Roofs, HSG A (S-1)
1.461	**62**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.461	HSG A	S-1
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.461		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=63,633 sf 38.53% Impervious Runoff Depth=1.05"
Flow Length=224' Slope=0.1200 '/' Tc=5.9 min CN=WQ Runoff=2.35 cfs 0.127 af

Link POA1: Point of Analysis Inflow=2.35 cfs 0.127 af
Primary=2.35 cfs 0.127 af

Total Runoff Area = 1.461 ac Runoff Volume = 0.127 af Average Runoff Depth = 1.05"
61.47% Pervious = 0.898 ac 38.53% Impervious = 0.563 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=63,633 sf 38.53% Impervious Runoff Depth=1.61"
Flow Length=224' Slope=0.1200 '/' Tc=5.9 min CN=WQ Runoff=3.44 cfs 0.196 af

Link POA1: Point of Analysis Inflow=3.44 cfs 0.196 af
Primary=3.44 cfs 0.196 af

Total Runoff Area = 1.461 ac Runoff Volume = 0.196 af Average Runoff Depth = 1.61"
61.47% Pervious = 0.898 ac 38.53% Impervious = 0.563 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=63,633 sf 38.53% Impervious Runoff Depth=2.12"
Flow Length=224' Slope=0.1200 '/' Tc=5.9 min CN=WQ Runoff=4.28 cfs 0.258 af

Link POA1: Point of Analysis Inflow=4.28 cfs 0.258 af
Primary=4.28 cfs 0.258 af

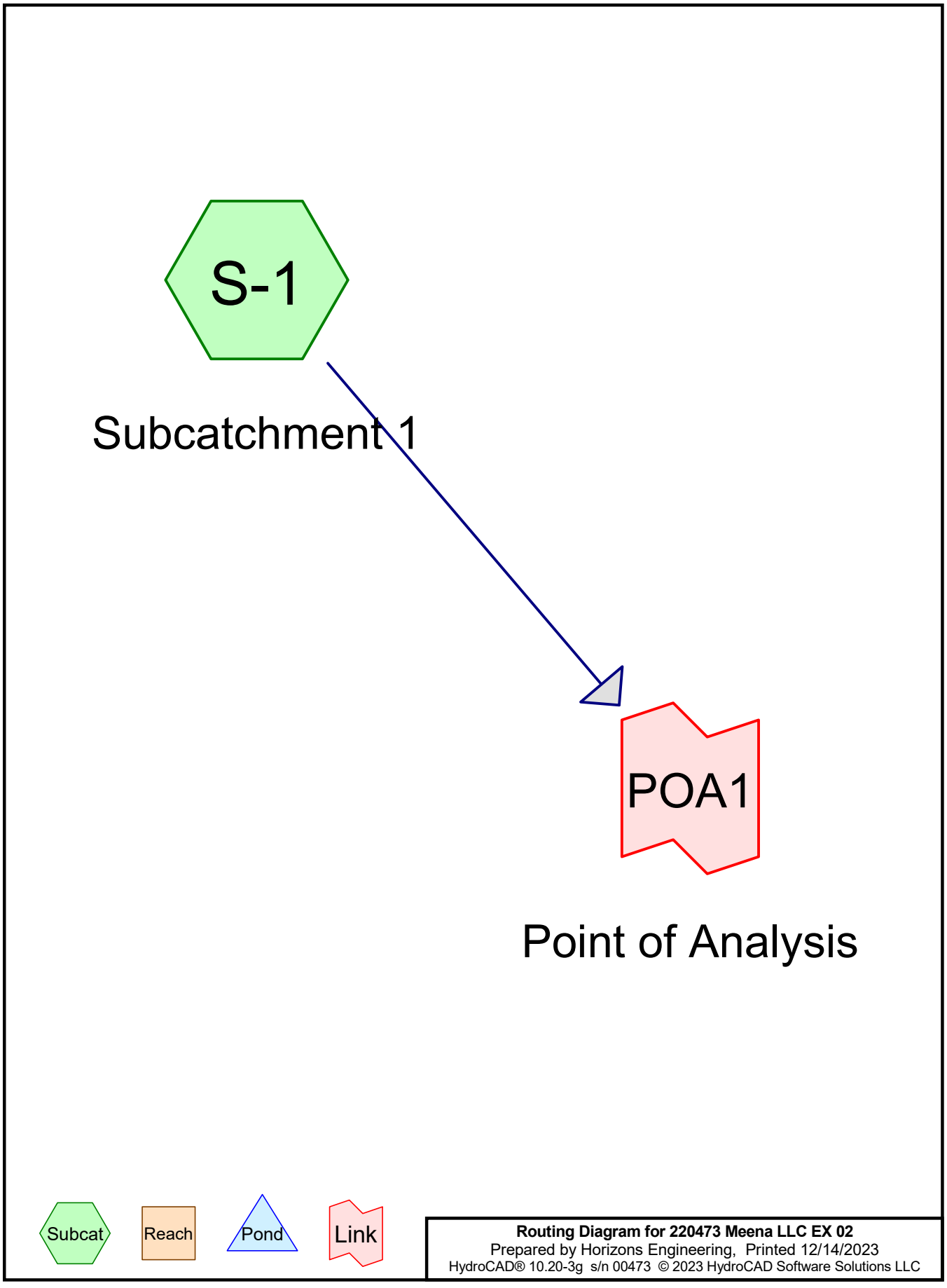
Total Runoff Area = 1.461 ac Runoff Volume = 0.258 af Average Runoff Depth = 2.12"
61.47% Pervious = 0.898 ac 38.53% Impervious = 0.563 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=63,633 sf 38.53% Impervious Runoff Depth=2.64"
Flow Length=224' Slope=0.1200 '/' Tc=5.9 min CN=WQ Runoff=5.33 cfs 0.321 af

Link POA1: Point of Analysis Inflow=5.33 cfs 0.321 af
Primary=5.33 cfs 0.321 af

Total Runoff Area = 1.461 ac Runoff Volume = 0.321 af Average Runoff Depth = 2.64"
61.47% Pervious = 0.898 ac 38.53% Impervious = 0.563 ac



Routing Diagram for 220473 Meena LLC EX 02
Prepared by Horizons Engineering, Printed 12/14/2023
HydroCAD® 10.20-3g s/n 00473 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10 Year	TYPE II 24-hr		Default	24.00	1	4.29	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.898	39	>75% Grass cover, Good, HSG A (S-1)
0.482	98	Paved parking, HSG A (S-1)
0.080	98	Roofs, HSG A (S-1)
1.461	**62**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.461	HSG A	S-1
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.461		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=63,633 sf 38.53% Impervious Runoff Depth=1.61"
Flow Length=224' Slope=0.1200 '/' Tc=5.9 min CN=WQ Runoff=3.44 cfs 0.196 af

Link POA1: Point of Analysis Inflow=3.44 cfs 0.196 af
Primary=3.44 cfs 0.196 af

Total Runoff Area = 1.461 ac Runoff Volume = 0.196 af Average Runoff Depth = 1.61"
61.47% Pervious = 0.898 ac 38.53% Impervious = 0.563 ac

Summary for Subcatchment S-1: Subcatchment 1

Runoff = 3.44 cfs @ 11.97 hrs, Volume= 0.196 af, Depth= 1.61"
Routed to Link POA1 : Point of Analysis

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

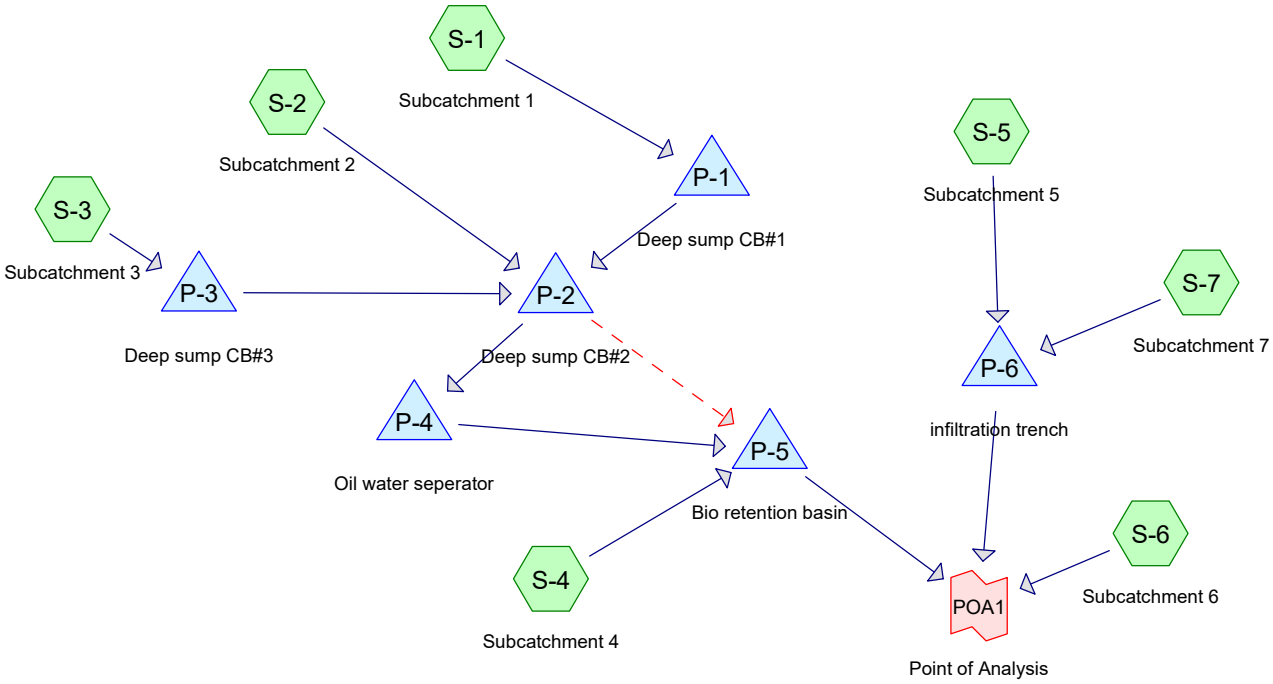
Area (sf)	CN	Description
3,500	98	Roofs, HSG A
21,016	98	Paved parking, HSG A
39,117	39	>75% Grass cover, Good, HSG A
63,633		Weighted Average
39,117		61.47% Pervious Area
24,516		38.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1200	0.33		**Sheet Flow, 100** Grass: Short n= 0.150 P2= 2.93"
0.9	124	0.1200	2.42		**Shallow Concentrated Flow, Segment 2** Short Grass Pasture Kv= 7.0 fps
5.9	224	Total			

Summary for Link POA1: Point of Analysis

Inflow Area = 1.461 ac, 38.53% Impervious, Inflow Depth = 1.61" for 10 Year event
Inflow = 3.44 cfs @ 11.97 hrs, Volume= 0.196 af
Primary = 3.44 cfs @ 11.97 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs



Subcat Reach Pond Link

Routing Diagram for 220473 Meena LLC 08
Prepared by Horizons Engineering, Printed 12/14/2023
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year	TYPE II 24-hr		Default	24.00	1	2.95	2
2	10 Year	TYPE II 24-hr		Default	24.00	1	4.29	2
3	25 Year	TYPE II 24-hr		Default	24.00	1	5.31	2
4	50 Year	TYPE II 24-hr		Default	24.00	1	6.25	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.904	39	>75% Grass cover, Good, HSG A (S-3, S-4, S-6)
0.470	98	Paved parking, HSG A (S-1, S-2, S-3, S-6)
0.087	98	Roofs, HSG A (S-2, S-3, S-5, S-6, S-7)
1.460	**61**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.460	HSG A	S-1, S-2, S-3, S-4, S-5, S-6, S-7
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.460		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=483 sf 100.00% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.003 af

Subcatchment S-2: Subcatchment 2 Runoff Area=4,111 sf 100.00% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=WQ Runoff=0.39 cfs 0.021 af

Subcatchment S-3: Subcatchment 3 Runoff Area=7,330 sf 93.74% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=WQ Runoff=0.66 cfs 0.036 af

Subcatchment S-4: Subcatchment 4 Runoff Area=1,430 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment S-5: Subcatchment 5 Runoff Area=1,056 sf 100.00% Impervious Runoff Depth=2.72"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.12 cfs 0.005 af

Subcatchment S-6: Subcatchment 6 Runoff Area=48,824 sf 23.24% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=WQ Runoff=1.08 cfs 0.059 af

Subcatchment S-7: Subcatchment 7 Runoff Area=384 sf 100.00% Impervious Runoff Depth=2.72"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.04 cfs 0.002 af

Pond P-1: Deep sump CB#1 Peak Elev=420.61' Storage=1 cf Inflow=0.05 cfs 0.003 af
12.0" Round Culvert n=0.012 L=39.0' S=0.0128 '/' Outflow=0.05 cfs 0.003 af

Pond P-2: Deep sump CB#2 Peak Elev=420.08' Storage=19 cf Inflow=1.10 cfs 0.060 af
Primary=0.98 cfs 0.059 af Secondary=0.11 cfs 0.001 af Outflow=1.09 cfs 0.059 af

Pond P-3: Deep sump CB#3 Peak Elev=420.97' Storage=6 cf Inflow=0.66 cfs 0.036 af
12.0" Round Culvert n=0.012 L=46.0' S=0.0109 '/' Outflow=0.66 cfs 0.036 af

Pond P-4: Oil water seperator Peak Elev=419.72' Storage=176 cf Inflow=0.98 cfs 0.059 af
8.0" Round Culvert n=0.012 L=36.0' S=0.0097 '/' Outflow=0.98 cfs 0.056 af

Pond P-5: Bio retention basin Peak Elev=421.62' Storage=933 cf Inflow=1.08 cfs 0.056 af
Discarded=0.01 cfs 0.009 af Primary=1.05 cfs 0.031 af Outflow=1.06 cfs 0.039 af

Pond P-6: infiltration trench Peak Elev=420.80' Storage=168 cf Inflow=0.16 cfs 0.007 af
Discarded=0.00 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.007 af

Link POA1: Point of Analysis Inflow=2.11 cfs 0.090 af
Primary=2.11 cfs 0.090 af

Total Runoff Area = 1.460 ac Runoff Volume = 0.126 af Average Runoff Depth = 1.04"
61.88% Pervious = 0.904 ac 38.12% Impervious = 0.557 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=483 sf 100.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.004 af

Subcatchment S-2: Subcatchment 2 Runoff Area=4,111 sf 100.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=WQ Runoff=0.58 cfs 0.032 af

Subcatchment S-3: Subcatchment 3 Runoff Area=7,330 sf 93.74% Impervious Runoff Depth=3.81"
Tc=6.0 min CN=WQ Runoff=0.96 cfs 0.053 af

Subcatchment S-4: Subcatchment 4 Runoff Area=1,430 sf 0.00% Impervious Runoff Depth=0.08"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment S-5: Subcatchment 5 Runoff Area=1,056 sf 100.00% Impervious Runoff Depth=4.05"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.17 cfs 0.008 af

Subcatchment S-6: Subcatchment 6 Runoff Area=48,824 sf 23.24% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=WQ Runoff=1.59 cfs 0.094 af

Subcatchment S-7: Subcatchment 7 Runoff Area=384 sf 100.00% Impervious Runoff Depth=4.05"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.06 cfs 0.003 af

Pond P-1: Deep sump CB#1 Peak Elev=420.64' Storage=2 cf Inflow=0.07 cfs 0.004 af
12.0" Round Culvert n=0.012 L=39.0' S=0.0128 '/' Outflow=0.07 cfs 0.004 af

Pond P-2: Deep sump CB#2 Peak Elev=420.28' Storage=21 cf Inflow=1.60 cfs 0.089 af
Primary=1.15 cfs 0.085 af Secondary=0.46 cfs 0.004 af Outflow=1.60 cfs 0.089 af

Pond P-3: Deep sump CB#3 Peak Elev=421.08' Storage=7 cf Inflow=0.96 cfs 0.053 af
12.0" Round Culvert n=0.012 L=46.0' S=0.0109 '/' Outflow=0.96 cfs 0.053 af

Pond P-4: Oil water seperator Peak Elev=419.92' Storage=185 cf Inflow=1.15 cfs 0.085 af
8.0" Round Culvert n=0.012 L=36.0' S=0.0097 '/' Outflow=1.14 cfs 0.081 af

Pond P-5: Bio retention basin Peak Elev=421.65' Storage=959 cf Inflow=1.59 cfs 0.086 af
Discarded=0.01 cfs 0.009 af Primary=1.56 cfs 0.060 af Outflow=1.57 cfs 0.069 af

Pond P-6: infiltration trench Peak Elev=422.55' Storage=273 cf Inflow=0.24 cfs 0.011 af
Discarded=0.00 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.009 af

Link POA1: Point of Analysis Inflow=3.13 cfs 0.153 af
Primary=3.13 cfs 0.153 af

Total Runoff Area = 1.460 ac Runoff Volume = 0.194 af Average Runoff Depth = 1.60"
61.88% Pervious = 0.904 ac 38.12% Impervious = 0.557 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=483 sf 100.00% Impervious Runoff Depth=5.07"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.005 af

Subcatchment S-2: Subcatchment 2 Runoff Area=4,111 sf 100.00% Impervious Runoff Depth=5.07"
Tc=6.0 min CN=WQ Runoff=0.71 cfs 0.040 af

Subcatchment S-3: Subcatchment 3 Runoff Area=7,330 sf 93.74% Impervious Runoff Depth=4.77"
Tc=6.0 min CN=WQ Runoff=1.19 cfs 0.067 af

Subcatchment S-4: Subcatchment 4 Runoff Area=1,430 sf 0.00% Impervious Runoff Depth=0.27"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment S-5: Subcatchment 5 Runoff Area=1,056 sf 100.00% Impervious Runoff Depth=5.07"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.22 cfs 0.010 af

Subcatchment S-6: Subcatchment 6 Runoff Area=48,824 sf 23.24% Impervious Runoff Depth=1.38"
Tc=6.0 min CN=WQ Runoff=1.98 cfs 0.129 af

Subcatchment S-7: Subcatchment 7 Runoff Area=384 sf 100.00% Impervious Runoff Depth=5.07"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.08 cfs 0.004 af

Pond P-1: Deep sump CB#1 Peak Elev=420.66' Storage=2 cf Inflow=0.08 cfs 0.005 af
12.0" Round Culvert n=0.012 L=39.0' S=0.0128 '/' Outflow=0.08 cfs 0.005 af

Pond P-2: Deep sump CB#2 Peak Elev=420.40' Storage=23 cf Inflow=1.99 cfs 0.111 af
Primary=1.24 cfs 0.103 af Secondary=0.75 cfs 0.008 af Outflow=1.99 cfs 0.111 af

Pond P-3: Deep sump CB#3 Peak Elev=421.16' Storage=8 cf Inflow=1.19 cfs 0.067 af
12.0" Round Culvert n=0.012 L=46.0' S=0.0109 '/' Outflow=1.19 cfs 0.067 af

Pond P-4: Oil water seperator Peak Elev=420.04' Storage=191 cf Inflow=1.24 cfs 0.103 af
8.0" Round Culvert n=0.012 L=36.0' S=0.0097 '/' Outflow=1.23 cfs 0.100 af

Pond P-5: Bio retention basin Peak Elev=421.68' Storage=978 cf Inflow=1.97 cfs 0.109 af
Discarded=0.01 cfs 0.010 af Primary=1.95 cfs 0.082 af Outflow=1.95 cfs 0.092 af

Pond P-6: infiltration trench Peak Elev=423.00' Storage=300 cf Inflow=0.29 cfs 0.014 af
Discarded=0.00 cfs 0.009 af Primary=0.03 cfs 0.001 af Outflow=0.04 cfs 0.011 af

Link POA1: Point of Analysis Inflow=3.91 cfs 0.213 af
Primary=3.91 cfs 0.213 af

Total Runoff Area = 1.460 ac Runoff Volume = 0.255 af Average Runoff Depth = 2.10"
61.88% Pervious = 0.904 ac 38.12% Impervious = 0.557 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=483 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.006 af

Subcatchment S-2: Subcatchment 2 Runoff Area=4,111 sf 100.00% Impervious Runoff Depth=6.01"
Tc=6.0 min CN=WQ Runoff=0.84 cfs 0.047 af

Subcatchment S-3: Subcatchment 3 Runoff Area=7,330 sf 93.74% Impervious Runoff Depth=5.67"
Tc=6.0 min CN=WQ Runoff=1.41 cfs 0.079 af

Subcatchment S-4: Subcatchment 4 Runoff Area=1,430 sf 0.00% Impervious Runoff Depth=0.52"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.001 af

Subcatchment S-5: Subcatchment 5 Runoff Area=1,056 sf 100.00% Impervious Runoff Depth=6.01"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.25 cfs 0.012 af

Subcatchment S-6: Subcatchment 6 Runoff Area=48,824 sf 23.24% Impervious Runoff Depth=1.80"
Tc=6.0 min CN=WQ Runoff=2.62 cfs 0.168 af

Subcatchment S-7: Subcatchment 7 Runoff Area=384 sf 100.00% Impervious Runoff Depth=6.01"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.09 cfs 0.004 af

Pond P-1: Deep sump CB#1 Peak Elev=420.67' Storage=2 cf Inflow=0.10 cfs 0.006 af
12.0" Round Culvert n=0.012 L=39.0' S=0.0128 '/' Outflow=0.10 cfs 0.006 af

Pond P-2: Deep sump CB#2 Peak Elev=420.51' Storage=24 cf Inflow=2.35 cfs 0.132 af
Primary=1.31 cfs 0.119 af Secondary=1.04 cfs 0.013 af Outflow=2.35 cfs 0.132 af

Pond P-3: Deep sump CB#3 Peak Elev=421.23' Storage=9 cf Inflow=1.41 cfs 0.079 af
12.0" Round Culvert n=0.012 L=46.0' S=0.0109 '/' Outflow=1.41 cfs 0.079 af

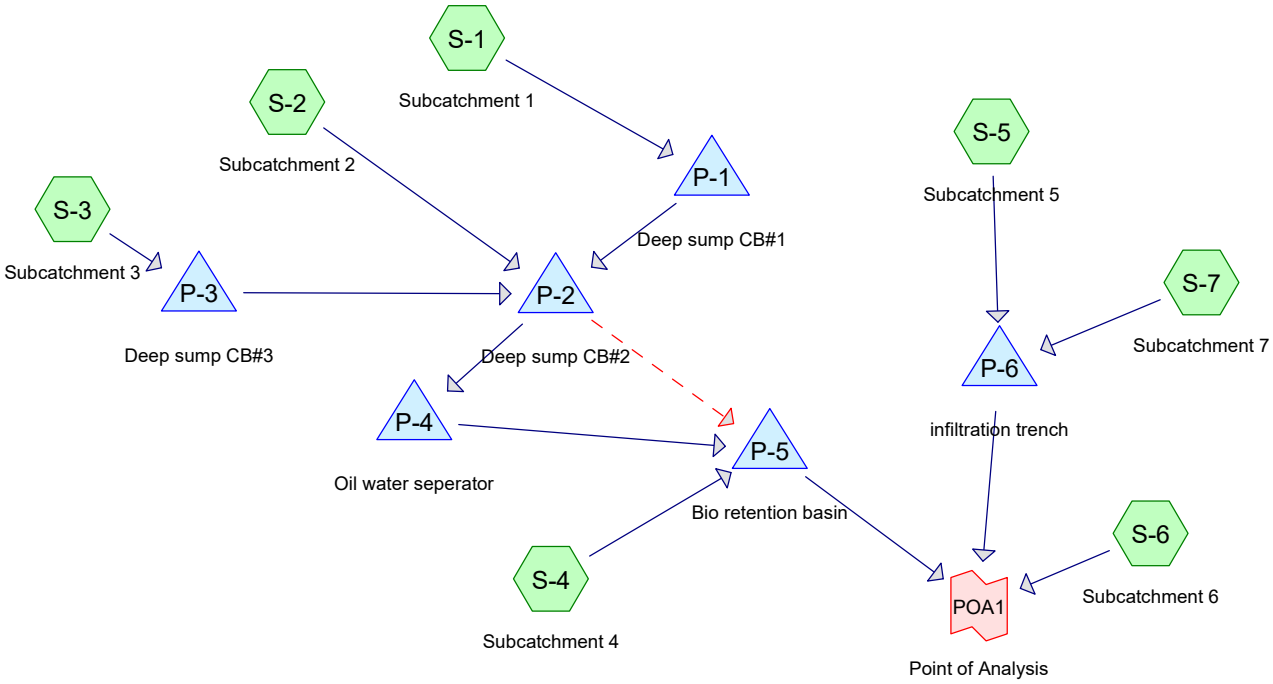
Pond P-4: Oil water seperator Peak Elev=420.16' Storage=194 cf Inflow=1.31 cfs 0.119 af
8.0" Round Culvert n=0.012 L=36.0' S=0.0097 '/' Outflow=1.31 cfs 0.116 af

Pond P-5: Bio retention basin Peak Elev=421.70' Storage=995 cf Inflow=2.36 cfs 0.130 af
Discarded=0.01 cfs 0.010 af Primary=2.32 cfs 0.103 af Outflow=2.33 cfs 0.113 af

Pond P-6: infiltration trench Peak Elev=423.02' Storage=301 cf Inflow=0.35 cfs 0.017 af
Discarded=0.00 cfs 0.009 af Primary=0.42 cfs 0.003 af Outflow=0.43 cfs 0.013 af

Link POA1: Point of Analysis Inflow=5.13 cfs 0.275 af
Primary=5.13 cfs 0.275 af

Total Runoff Area = 1.460 ac Runoff Volume = 0.318 af Average Runoff Depth = 2.61"
61.88% Pervious = 0.904 ac 38.12% Impervious = 0.557 ac



Subcat Reach Pond Link

Routing Diagram for 220473 Meena LLC 08
Prepared by Horizons Engineering, Printed 12/14/2023
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10 Year	TYPE II 24-hr		Default	24.00	1	4.29	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.904	39	>75% Grass cover, Good, HSG A (S-3, S-4, S-6)
0.470	98	Paved parking, HSG A (S-1, S-2, S-3, S-6)
0.087	98	Roofs, HSG A (S-2, S-3, S-5, S-6, S-7)
1.460	**61**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.460	HSG A	S-1, S-2, S-3, S-4, S-5, S-6, S-7
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.460		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Subcatchment 1 Runoff Area=483 sf 100.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.004 af

Subcatchment S-2: Subcatchment 2 Runoff Area=4,111 sf 100.00% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=WQ Runoff=0.58 cfs 0.032 af

Subcatchment S-3: Subcatchment 3 Runoff Area=7,330 sf 93.74% Impervious Runoff Depth=3.81"
Tc=6.0 min CN=WQ Runoff=0.96 cfs 0.053 af

Subcatchment S-4: Subcatchment 4 Runoff Area=1,430 sf 0.00% Impervious Runoff Depth=0.08"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment S-5: Subcatchment 5 Runoff Area=1,056 sf 100.00% Impervious Runoff Depth=4.05"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.17 cfs 0.008 af

Subcatchment S-6: Subcatchment 6 Runoff Area=48,824 sf 23.24% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=WQ Runoff=1.59 cfs 0.094 af

Subcatchment S-7: Subcatchment 7 Runoff Area=384 sf 100.00% Impervious Runoff Depth=4.05"
Flow Length=100' Tc=0.7 min CN=98 Runoff=0.06 cfs 0.003 af

Pond P-1: Deep sump CB#1 Peak Elev=420.64' Storage=2 cf Inflow=0.07 cfs 0.004 af
12.0" Round Culvert n=0.012 L=39.0' S=0.0128 '/' Outflow=0.07 cfs 0.004 af

Pond P-2: Deep sump CB#2 Peak Elev=420.28' Storage=21 cf Inflow=1.60 cfs 0.089 af
Primary=1.15 cfs 0.085 af Secondary=0.46 cfs 0.004 af Outflow=1.60 cfs 0.089 af

Pond P-3: Deep sump CB#3 Peak Elev=421.08' Storage=7 cf Inflow=0.96 cfs 0.053 af
12.0" Round Culvert n=0.012 L=46.0' S=0.0109 '/' Outflow=0.96 cfs 0.053 af

Pond P-4: Oil water seperator Peak Elev=419.92' Storage=185 cf Inflow=1.15 cfs 0.085 af
8.0" Round Culvert n=0.012 L=36.0' S=0.0097 '/' Outflow=1.14 cfs 0.081 af

Pond P-5: Bio retention basin Peak Elev=421.65' Storage=959 cf Inflow=1.59 cfs 0.086 af
Discarded=0.01 cfs 0.009 af Primary=1.56 cfs 0.060 af Outflow=1.57 cfs 0.069 af

Pond P-6: infiltration trench Peak Elev=422.55' Storage=273 cf Inflow=0.24 cfs 0.011 af
Discarded=0.00 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.009 af

Link POA1: Point of Analysis Inflow=3.13 cfs 0.153 af
Primary=3.13 cfs 0.153 af

Total Runoff Area = 1.460 ac Runoff Volume = 0.194 af Average Runoff Depth = 1.60"
61.88% Pervious = 0.904 ac 38.12% Impervious = 0.557 ac

Summary for Subcatchment S-1: Subcatchment 1

Runoff = 0.07 cfs @ 11.97 hrs, Volume= 0.004 af, Depth= 4.05"
Routed to Pond P-1 : Deep sump CB#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
483	98	Paved parking, HSG A
483		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment 1**

Summary for Subcatchment S-2: Subcatchment 2

Runoff = 0.58 cfs @ 11.97 hrs, Volume= 0.032 af, Depth= 4.05"
Routed to Pond P-2 : Deep sump CB#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
468	98	Roofs, HSG A
3,643	98	Paved parking, HSG A
4,111		Weighted Average
4,111		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment 1**

Summary for Subcatchment S-3: Subcatchment 3

Runoff = 0.96 cfs @ 11.97 hrs, Volume= 0.053 af, Depth= 3.81"
Routed to Pond P-3 : Deep sump CB#3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
1,258	98	Roofs, HSG A
5,613	98	Paved parking, HSG A
459	39	>75% Grass cover, Good, HSG A
7,330		Weighted Average
459		6.26% Pervious Area
6,871		93.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment 1**

Summary for Subcatchment S-4: Subcatchment 4

Runoff = 0.00 cfs @ 15.06 hrs, Volume= 0.000 af, Depth= 0.08"
Routed to Pond P-5 : Bio retention basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
1,430	39	>75% Grass cover, Good, HSG A
1,430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment 1**

Summary for Subcatchment S-5: Subcatchment 5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.17 cfs @ 11.91 hrs, Volume= 0.008 af, Depth= 4.05"
Routed to Pond P-6 : infiltration trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
1,056	98	Roofs, HSG A
1,056		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	0.95		**Sheet Flow, Segment 1** Smooth surfaces n= 0.011 P2= 2.93"
0.4	80	0.0100	3.10	0.61	**Pipe Channel, Segment 2** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.012 Corrugated PP, smooth interior
0.7	100	Total			

Summary for Subcatchment S-6: Subcatchment 6

Runoff = 1.59 cfs @ 11.97 hrs, Volume= 0.094 af, Depth= 1.00"
Routed to Link POA1 : Point of Analysis

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
10,722	98	Paved parking, HSG A
623	98	Roofs, HSG A
37,479	39	>75% Grass cover, Good, HSG A
48,824		Weighted Average
37,479		76.76% Pervious Area
11,345		23.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Segment 1**

Summary for Subcatchment S-7: Subcatchment 7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.06 cfs @ 11.91 hrs, Volume= 0.003 af, Depth= 4.05"
Routed to Pond P-6 : infiltration trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
TYPE II 24-hr 10 Year Rainfall=4.29"

Area (sf)	CN	Description
384	98	Roofs, HSG A
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0200	0.95		**Sheet Flow, Segment 1** Smooth surfaces n= 0.011 P2= 2.93"
0.4	80	0.0100	3.10	0.61	**Pipe Channel, Segment 2** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.012 Corrugated PP, smooth interior
0.7	100	Total			

Summary for Pond P-1: Deep sump CB#1

Inflow Area = 0.011 ac,100.00% Impervious, Inflow Depth = 4.05" for 10 Year event
Inflow = 0.07 cfs @ 11.97 hrs, Volume= 0.004 af
Outflow = 0.07 cfs @ 11.97 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.2 min
Primary = 0.07 cfs @ 11.97 hrs, Volume= 0.004 af
Routed to Pond P-2 : Deep sump CB#2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 420.64' @ 11.97 hrs Surf.Area= 13 sf Storage= 2 cf
Flood Elev= 423.50' Surf.Area= 13 sf Storage= 38 cf

Plug-Flow detention time= 1.3 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (748.0 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1	420.50'	38 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	420.50'	**12.0" Round 12" hdpe** L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 420.50' / 420.00' S= 0.0128 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.07 cfs @ 11.97 hrs HW=420.64' (Free Discharge)
↑—**1=12" hdpe** (Inlet Controls 0.07 cfs @ 1.00 fps)

Summary for Pond P-2: Deep sump CB#2

[79] Warning: Submerged Pond P-1 Primary device # 1 OUTLET by 0.28'
[79] Warning: Submerged Pond P-3 Primary device # 1 OUTLET by 0.28'

Inflow Area = 0.274 ac, 96.15% Impervious, Inflow Depth = 3.90" for 10 Year event
Inflow = 1.60 cfs @ 11.97 hrs, Volume= 0.089 af
Outflow = 1.60 cfs @ 11.97 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.1 min
Primary = 1.15 cfs @ 11.97 hrs, Volume= 0.085 af
Routed to Pond P-4 : Oil water seperator
Secondary = 0.46 cfs @ 11.97 hrs, Volume= 0.004 af
Routed to Pond P-5 : Bio retention basin

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 420.28' @ 11.97 hrs Surf.Area= 13 sf Storage= 21 cf
Flood Elev= 423.50' Surf.Area= 13 sf Storage= 62 cf

Plug-Flow detention time= 3.1 min calculated for 0.089 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (749.0 - 747.3)

Volume	Invert	Avail.Storage	Storage Description
#1	418.60'	62 cf	**4.00'D x 4.90'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	419.20'	**8.0" Round 8" hdpe** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 419.20' / 419.10' S= 0.0143 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf
#2	Secondary	419.90'	**12.0" Round 12" hdpe** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 419.90' / 418.50' S= 0.0350 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 11.97 hrs HW=420.28' (Free Discharge)
↑—**1=8" hdpe** (Inlet Controls 1.15 cfs @ 3.29 fps)

Secondary OutFlow Max=0.45 cfs @ 11.97 hrs HW=420.28' (Free Discharge)
↑—**2=12" hdpe** (Inlet Controls 0.45 cfs @ 1.66 fps)

Summary for Pond P-3: Deep sump CB#3

Inflow Area = 0.168 ac, 93.74% Impervious, Inflow Depth = 3.81" for 10 Year event
Inflow = 0.96 cfs @ 11.97 hrs, Volume= 0.053 af
Outflow = 0.96 cfs @ 11.97 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.1 min
Primary = 0.96 cfs @ 11.97 hrs, Volume= 0.053 af
Routed to Pond P-2 : Deep sump CB#2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 421.08' @ 11.97 hrs Surf.Area= 13 sf Storage= 7 cf
Flood Elev= 423.50' Surf.Area= 13 sf Storage= 38 cf

Plug-Flow detention time= 0.5 min calculated for 0.053 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (747.6 - 747.1)

Volume	Invert	Avail.Storage	Storage Description
#1	420.50'	38 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	420.50'	**12.0" Round 12" hdpe** L= 46.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 420.50' / 420.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 11.97 hrs HW=421.08' (Free Discharge)
1=12" hdpe (Inlet Controls 0.96 cfs @ 2.04 fps)

Summary for Pond P-4: Oil water seperator

[79] Warning: Submerged Pond P-2 Primary device # 1 INLET by 0.72'

Inflow Area = 0.274 ac, 96.15% Impervious, Inflow Depth = 3.71" for 10 Year event
Inflow = 1.15 cfs @ 11.97 hrs, Volume= 0.085 af
Outflow = 1.14 cfs @ 11.98 hrs, Volume= 0.081 af, Atten= 1%, Lag= 0.9 min
Primary = 1.14 cfs @ 11.98 hrs, Volume= 0.081 af
Routed to Pond P-5 : Bio retention basin

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 419.92' @ 11.98 hrs Surf.Area= 47 sf Storage= 185 cf
Flood Elev= 424.00' Surf.Area= 47 sf Storage= 197 cf

Plug-Flow detention time= 44.0 min calculated for 0.081 af (96% of inflow)
Center-of-Mass det. time= 20.8 min (771.4 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1	416.00'	90 cf	**5.30'D x 4.10'H Chamber 1**
#2	416.00'	90 cf	**5.30'D x 4.10'H Chamber 2**
#3	416.00'	16 cf	**2.00'D x 5.10'H Chamber 3**
		197 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	418.85'	**8.0" Round 8" hdpe** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 418.85' / 418.50' S= 0.0097 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.14 cfs @ 11.98 hrs HW=419.92' (Free Discharge)
↑—**1=8" hdpe** (Inlet Controls 1.14 cfs @ 3.26 fps)

Summary for Pond P-5: Bio retention basin

[81] Warning: Exceeded Pond P-2 by 2.30' @ 24.35 hrs
[81] Warning: Exceeded Pond P-4 by 2.64' @ 24.55 hrs

Inflow Area = 0.307 ac, 85.85% Impervious, Inflow Depth = 3.36" for 10 Year event
Inflow = 1.59 cfs @ 11.97 hrs, Volume= 0.086 af
Outflow = 1.57 cfs @ 11.99 hrs, Volume= 0.069 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.01 cfs @ 11.99 hrs, Volume= 0.009 af
Primary = 1.56 cfs @ 11.99 hrs, Volume= 0.060 af
Routed to Link POA1 : Point of Analysis

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 421.65' @ 11.99 hrs Surf.Area= 831 sf Storage= 959 cf
Flood Elev= 422.00' Surf.Area= 982 sf Storage= 1,241 cf

Plug-Flow detention time= 161.1 min calculated for 0.069 af (80% of inflow)
Center-of-Mass det. time= 82.0 min (851.5 - 769.6)

Volume	Invert	Avail.Storage	Storage Description
#1	415.50'	18 cf	**stone (Irregular)** Listed below (Recalc) 45 cf Overall x 40.0% Voids
#2	416.50'	18 cf	**Bio-media (Irregular)** Listed below (Recalc) 90 cf Overall x 20.0% Voids
#3	418.50'	1,205 cf	**Open water storage (Irregular)** Listed below (Recalc)
		1,241 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
415.50	45	44.0	0	0	45
416.50	45	44.0	45	45	89

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
416.50	45	44.0	0	0	45
418.50	45	44.0	90	90	133

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
418.50	45	44.0	0	0	45
420.00	213	81.0	178	178	425
422.00	892	201.0	1,027	1,205	3,132

Device	Routing	Invert	Outlet Devices
#1	Primary	421.50'	**10.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	415.50'	**0.300 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.99 hrs HW=421.65' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.54 cfs @ 11.99 hrs HW=421.65' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.54 cfs @ 1.00 fps)

Summary for Pond P-6: infiltration trench

Inflow Area = 0.033 ac,100.00% Impervious, Inflow Depth = 4.05" for 10 Year event
Inflow = 0.24 cfs @ 11.91 hrs, Volume= 0.011 af
Outflow = 0.00 cfs @ 10.26 hrs, Volume= 0.009 af, Atten= 98%, Lag= 0.0 min
Discarded = 0.00 cfs @ 10.26 hrs, Volume= 0.009 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link POA1 : Point of Analysis

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 422.55' @ 14.77 hrs Surf.Area= 150 sf Storage= 273 cf
Flood Elev= 423.50' Surf.Area= 150 sf Storage= 330 cf

Plug-Flow detention time= 427.3 min calculated for 0.009 af (79% of inflow)
Center-of-Mass det. time= 343.4 min (1,085.1 - 741.7)

Volume	Invert	Avail.Storage	Storage Description
#1	418.00'	330 cf	**Stone (Irregular)** Listed below (Recalc) 825 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
418.00	150	79.0	0	0	150
419.00	150	79.0	150	150	229
420.00	150	79.0	150	300	308
421.00	150	79.0	150	450	387
422.00	150	79.0	150	600	466
423.50	150	79.0	225	825	585

Device	Routing	Invert	Outlet Devices
#1	Discarded	418.00'	**1.300 in/hr Exfiltration over Surface area** Phase-In= 0.20'
#2	Primary	423.00'	**40.0' 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

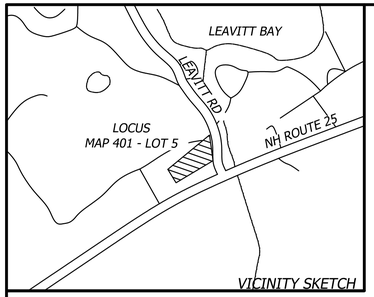
Discarded OutFlow Max=0.00 cfs @ 10.26 hrs HW=418.22' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=418.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link POA1: Point of Analysis

Inflow Area = 1.460 ac, 38.12% Impervious, Inflow Depth = 1.26" for 10 Year event
Inflow = 3.13 cfs @ 11.98 hrs, Volume= 0.153 af
Primary = 3.13 cfs @ 11.98 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs



VICINITY SKETCH

GRID

LEGEND

S-1 SUBCATCHMENT

POA1 POINT OF ANALYSIS

DRAINAGE AREA BOUNDARY

GAS STATION

APARTMENT BUILDING

UGE

LEAVITT ROAD

POA1

S-1 ⚠3

LOT AREA
103,803 SF
2.38 AC

N.H. ROUTE 125

0 10 20 40 80

SCALE IN FEET

DATE OF PRINT
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MEENA LLC

41 NH ROUTE 25

EFFINGHAM, NEW HAMPSHIRE

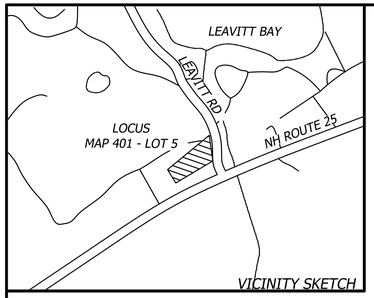
EXISTING CONDITION DRAINAGE PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
⚠3	12/19/23	REVISED SUBCATCHMENT AREA	ML	JFH

STATE OF NEW HAMPSHIRE
MARK LUCY
NO. 7260
LICENSED PROFESSIONAL ENGINEER

DATE:	PROJECT #:
7/7/22	220473
ENGIN'D BY:	DRAWN BY:
JFH	JFH
CHECK'D BY:	ARCHIVE #:
ML	H-___

DR 1.01



LEGEND

- S-5 — SUBCATCHMENT
- P-2 — POND
- POA1 — POINT OF ANALYSIS
- SUBCATCHMENT BOUNDARY

GAS STATION

APARTMENT BUILDING

LEAVITT ROAD

N.H. ROUTE 125

S-1 S-2 S-3 S-4 S-5 S-6 S-7

P-1 P-2 P-3 P-4 P-5 P-6

POA1

418.50

0 10 20 40 80

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POST DEVELOPMENT DRAINAGE PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG
1	9/08/22	REVISED PER PEER REVIEW	JH	WWS
2	4/12/23	REVISED PER PEER REVIEW	ML	JFH
3	12/19/23	REVISED SUBCATCHMENT AREA	ML	JFH

STATE OF NEW HAMPSHIRE — MARK LUCY NO. 7260 — LICENSED PROFESSIONAL ENGINEER

DATE:	PROJECT #:
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ML	H-___

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