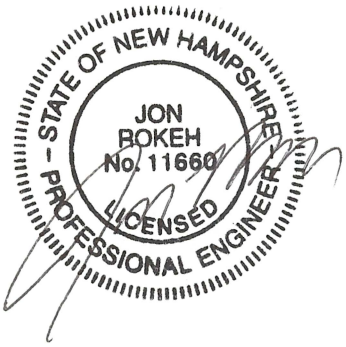
STORMWATER MANAGEMENT PLAN
Tax Map 31 Lot 48
Tax Map 33 Lot 18
Kearsarge Mountain Road
Warner, NH

STORMWATER MANAGEMENT REPORT

PROPOSED RESIDENTIAL DEVELOPMENT
KEARSARGE MOUNTAIN ROAD
WARNER, NH

June 28, 2023
February 21, 2024
July 24, 2024



PREPARED FOR:

Sydney Elizabeth Boyer
Kearsarge Mountain Road
Warner NH 03278

PREPARED BY:

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Rokeh Consulting, LLC
89 King Road, Chichester, NH
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STORMWATER MANAGEMENT REPORT
Residential Subdivision
Kearsarge MT. Road
Warner NH

INTRODUCTION

The proposed project is located on Map 33 Lot 18 off of Kearsarge Mountain Road in Warner NH. The lot is a 10+ acre parcel moderately sloping and wooded parcel of land.
The project consists of a 24 foot roadway 700 feet long and ending in a culdesac turn around. The roadway will provide access to 4 new single family lots. The lots will be serviced municipal sewer and water.. The total area disturbed during construction of the road is approximately 68,000 SF.

The intent of this drainage report is to provide calculations for the proposed drainage improvements and evaluate pre and post development conditions in accordance with the Town of Warner Subdivision Regulations and NHDES requirements.

EXISTING CONDITIONS

The property is currently a undeveloped moderately sloping wood lot with some small areas of wetland along the frontage and to the west of the proposed developed area. On average the slopes vary from 3 to 25%. The entire property was mapped as 55C Hermon sandy loam series with 8% to 25% slopes as derived from NRCS Web Soil Survey.
The property has 2 distinct flow patterns as shown on the predevelopment drainage area plan. Design node 1 is in the southerly corner of the lot where the existing drainage from the wetland noted above flows in the corner of the lot and under Kearsarge Mt Road. The other Design node, node 2 is located in the easterly corner of the property with the existing drainage flowing from North to south into the exiting wetlands and then to the east as seen in the existing drainage area plan.

PROPOSED CONDITIONS

The proposed will consist of a 700+ foot roadway providing access and frontage to 4 new single family homes. The homes will be serviced by both municipal water and sewer. All of the stormwater generated from the site will be directed primarily by open drainage to two micro pool extended detention ponds and one infiltration trench located at CB2. The ponds will be preceded by forebays for sediment removal prior stormwater entering the ponds. The ponds have been design to treat the water quality volume before detaining and releasing the stormwater to the exiting site. Micro-pool ponds use extended detention and a wet micro pool for treatment. The ponds are located adjacent to wetlands making them ideal for this treatment condition. The one infiltration trench is located at CB 2 it consists of a 4'x6' stone trench with a perferorated pipe. A infiltration rate of 3 inches per hour is used. This rate is 50% of the slowest rate in the C horizon or 50%of 6 inches as depicted in SSSNNE Special Publication No. 5.

METHODOLOGY

The drainage analysis was completed using HydroCad Version 10.00-22, a stormwater modeling program utilizing TR-20 and TR-55 methodology. This program performs both the hydrologic

computations for determination of runoff flows, and the hydraulic calculations for pipe, ditch, and pond design. Calculations were performed for the 2, 10, 25 and 50-year frequency storms in accordance with Town and NHDES regulations.

The following design parameters were used:

Rainfall distribution:	Type III
2-year storm rainfall:	2.76 inches
10-year storm rainfall:	4.02 inches
25-year storm rainfall:	4.98 inches
50-year storm rainfall:	5.87 inches

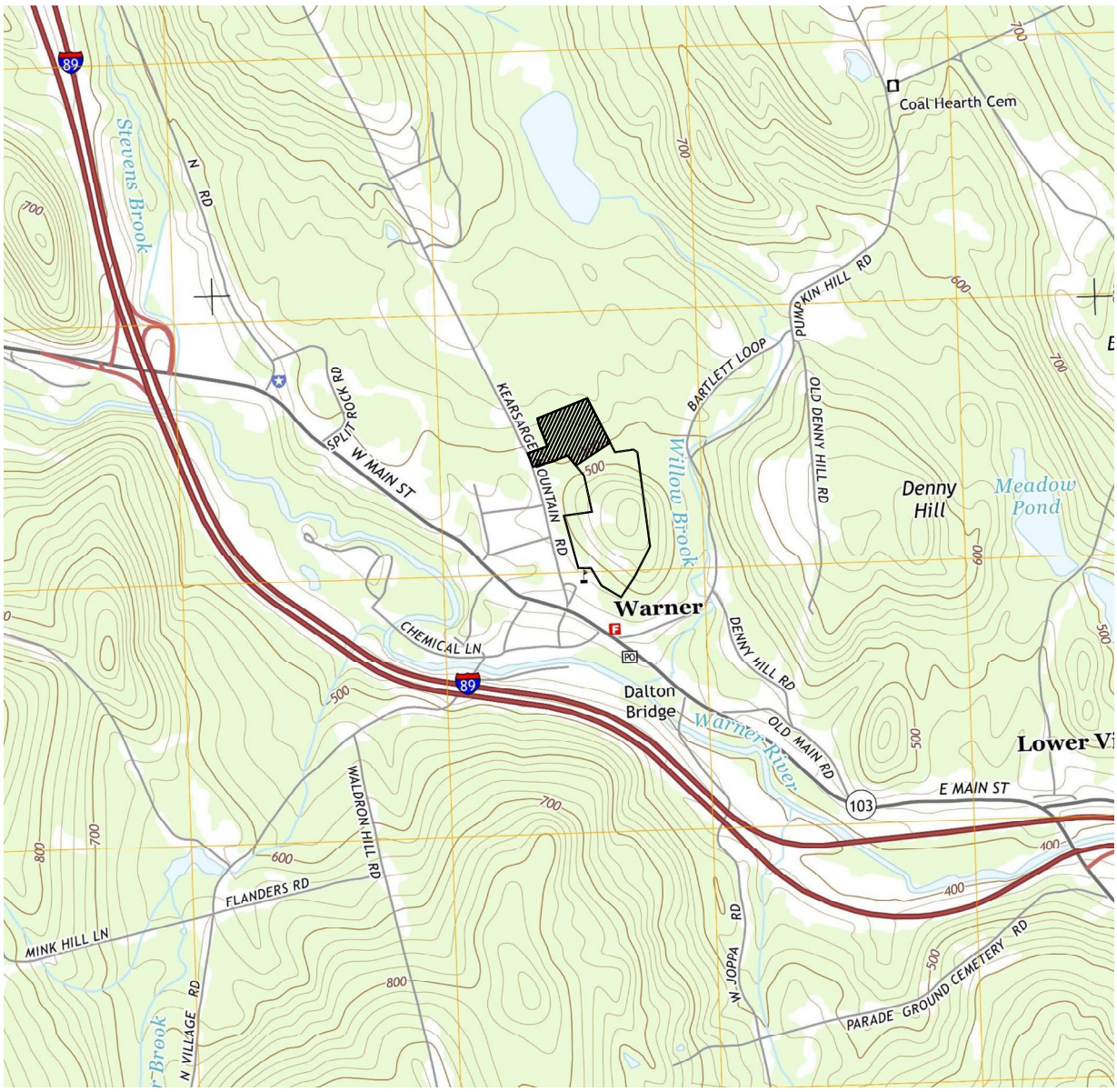
FINDINGS*:*

Based on the results of this analysis we expect that the project will not adversely affect any downstream properties or receiving waters.

	CFS 2 YEAR	CFS 10 YEAR	CFS 25 YEAR	CFS 50 YEAR
POA1				
Pre-Development	0.00	0.00	0.02	0.07
Post Development	0.00	0.00	0.00	0.06
POA2				
Pre-Development	0.00	0.00	0.03	0.14
Post Development	0.00	0.00	0.03	0.14

STORMWATER MANAGEMENT REPORT
Residential Subdivision
Kearsarge MT. Road
Warner NH

USGS



Graphic Scale

2000 1000 0 2000

SCALE: 1"=2000'

Owner / Applicant:
Sydney Elizabeth Boyer
Kearsarge Mountain Road
Warner, NH 03278

JUNE 28, 2023

USGS TOPOGRAPHIC MAP
PROPOSED LAND SUBDIVISION
TAX MAP 31 LOT 48
TAX MAP 33 LOT 18
Kearsarge Mountain Road
Warner, New Hampshire

PREPARED BY:
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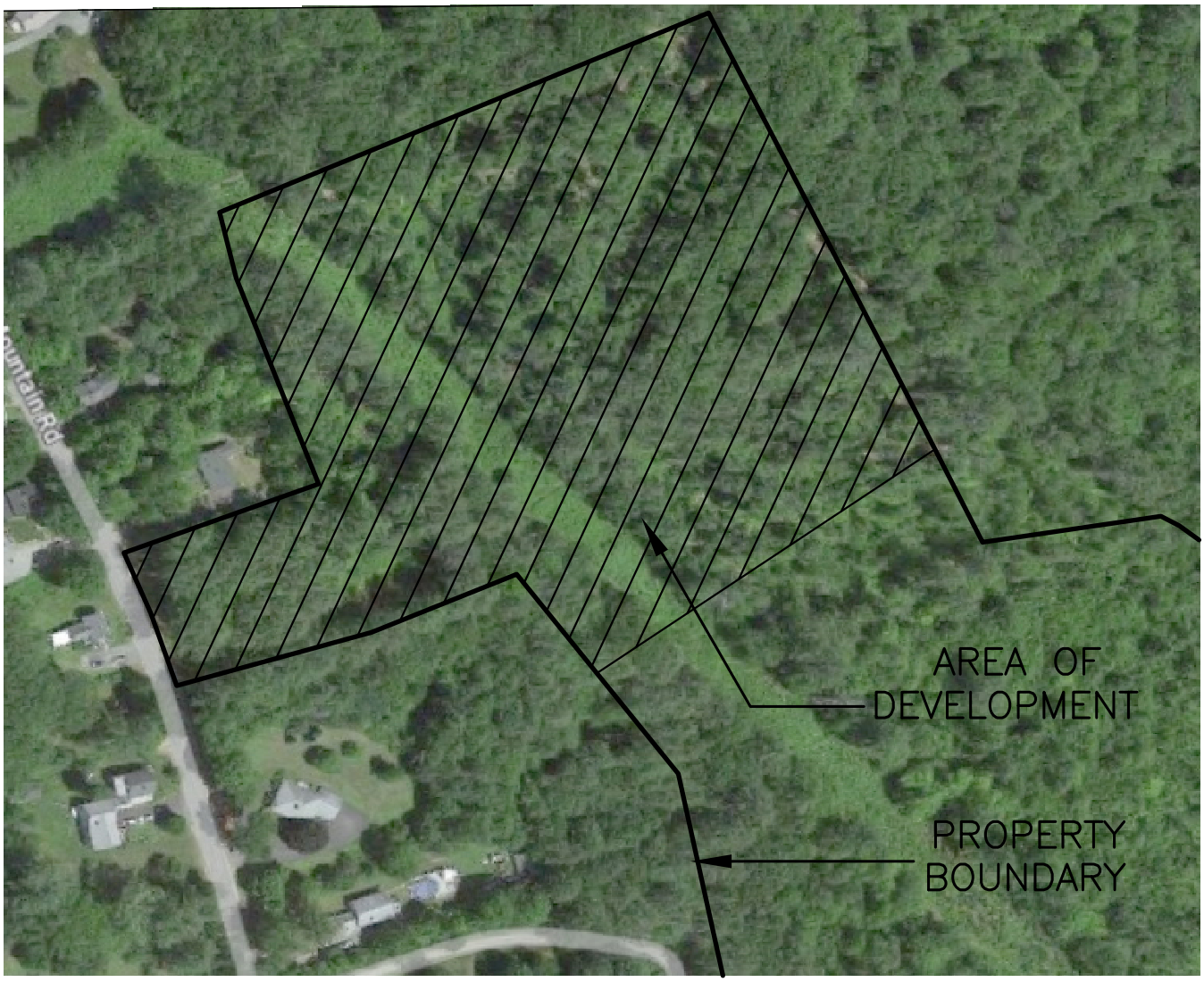
AERIAL & SITE PHOTOS

NORTH



Graphic Scale
200 100 0 200

SCALE: 1"=200'

Owner / Applicant:
Sydney Elizabeth Boyer
Kearsarge Mountain Road
Warner, NH 03278

JUNE 28, 2023

AERIAL PHOTO
PROPOSED LAND SUBDIVISION
TAX MAP 31 LOT 48
TAX MAP 33 LOT 18
Kearsarge Mountain Road
Warner, New Hampshire

PREPARED BY:
Rokeh Consulting, LLC
89 KING ROAD, CHICHESTER, NH
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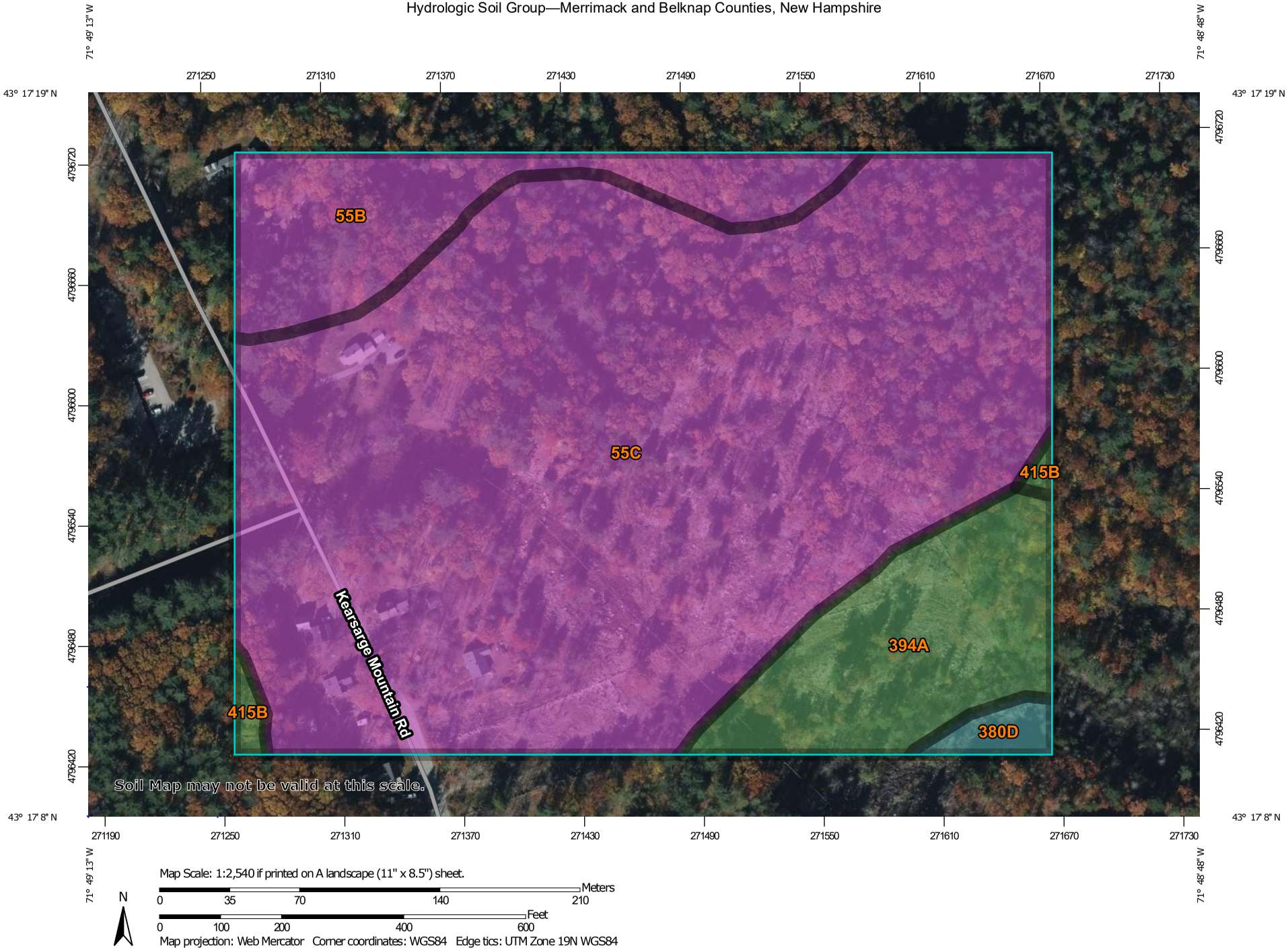
NRCS WEBB SOIL SURVEY



Map Scale: 1:2,540 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 28, Sep 6, 2022

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

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
55B	Hermon sandy loam, 0 to 8 percent slopes, very stony	A	3.2	10.6%
55C	Hermon sandy loam, 8 to 15 percent slopes, very stony	A	23.2	76.2%
380D	Tunbridge-Lyman-Becket complex, 15 to 25 percent slopes, very stony	C	0.3	1.1%
394A	Chocorua mucky peat, 0 to 1 percent slopes	A/D	3.5	11.4%
415B	Moosilauke fine sandy loam, 3 to 8 percent slopes, very stony	A/D	0.2	0.7%
Totals for Area of Interest			**30.5**	**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

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NORTHEAST REGIONAL CLIMATE CENTER

Northeast Regional Climate Center

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

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.281 degrees North
Longitude	71.817 degrees West
Elevation	130 feet
Date/Time	Sat Jun 24 2023 13:36:45 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.49	0.65	0.81	1.02	**1yr**	0.70	0.96	1.17	1.47	1.85	2.33	2.56	**1yr**	2.06	2.46	2.90	3.60	4.13	**1yr**
2yr	0.31	0.48	0.60	0.79	0.99	1.25	**2yr**	0.86	1.14	1.44	1.79	2.22	2.76	3.10	**2yr**	2.44	2.98	3.47	4.15	4.75	**2yr**
5yr	0.37	0.58	0.72	0.97	1.24	1.57	**5yr**	1.07	1.44	1.81	2.25	2.78	3.42	3.92	**5yr**	3.03	3.77	4.37	5.13	5.82	**5yr**
10yr	0.42	0.66	0.83	1.13	1.46	1.87	**10yr**	1.26	1.71	2.16	2.68	3.29	4.02	4.68	**10yr**	3.56	4.50	5.19	6.03	6.80	**10yr**
25yr	0.49	0.79	1.00	1.38	1.83	2.35	**25yr**	1.58	2.16	2.72	3.37	4.12	4.98	5.92	**25yr**	4.41	5.69	6.54	7.47	8.34	**25yr**
50yr	0.56	0.90	1.15	1.61	2.17	2.80	**50yr**	1.87	2.58	3.25	4.02	4.89	5.87	7.07	**50yr**	5.19	6.80	7.79	8.78	9.75	**50yr**
100yr	0.64	1.03	1.33	1.89	2.57	3.34	**100yr**	2.22	3.08	3.88	4.78	5.79	6.91	8.45	**100yr**	6.12	8.13	9.27	10.33	11.39	**100yr**
200yr	0.73	1.19	1.55	2.21	3.05	3.97	**200yr**	2.63	3.68	4.62	5.69	6.86	8.15	10.11	**200yr**	7.21	9.72	11.05	12.16	13.31	**200yr**
500yr	0.88	1.44	1.88	2.73	3.82	5.00	**500yr**	3.30	4.65	5.82	7.15	8.58	10.13	12.81	**500yr**	8.97	12.32	13.94	15.10	16.37	**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	0.36	0.44	0.59	0.72	0.86	**1yr**	0.62	0.84	0.94	1.28	1.59	1.90	2.34	**1yr**	1.68	2.25	2.59	3.17	3.66	**1yr**
2yr	0.30	0.46	0.57	0.77	0.95	1.13	**2yr**	0.82	1.10	1.29	1.71	2.21	2.68	2.99	**2yr**	2.37	2.88	3.35	4.02	4.61	**2yr**
5yr	0.34	0.52	0.65	0.89	1.13	1.33	**5yr**	0.97	1.30	1.51	1.97	2.54	3.17	3.59	**5yr**	2.81	3.45	3.98	4.73	5.41	**5yr**
10yr	0.38	0.58	0.72	1.00	1.30	1.51	**10yr**	1.12	1.48	1.69	2.19	2.83	3.61	4.11	**10yr**	3.20	3.95	4.53	5.36	6.07	**10yr**
25yr	0.43	0.65	0.81	1.15	1.51	1.76	**25yr**	1.31	1.72	1.97	2.51	3.24	4.29	4.89	**25yr**	3.80	4.71	5.38	6.33	7.08	**25yr**
50yr	0.46	0.71	0.88	1.26	1.70	1.97	**50yr**	1.47	1.92	2.21	2.80	3.59	4.90	5.58	**50yr**	4.34	5.36	6.12	7.19	7.98	**50yr**
100yr	0.50	0.76	0.96	1.38	1.89	2.20	**100yr**	1.63	2.15	2.47	3.12	3.99	5.61	6.36	**100yr**	4.97	6.12	6.97	8.18	8.99	**100yr**
200yr	0.55	0.82	1.04	1.51	2.10	2.46	**200yr**	1.82	2.41	2.76	3.48	4.43	6.43	7.26	**200yr**	5.69	6.98	7.92	9.33	10.12	**200yr**
500yr	0.62	0.92	1.18	1.71	2.43	2.83	**500yr**	2.10	2.77	3.20	4.04	5.10	7.72	8.63	**500yr**	6.83	8.30	9.39	11.12	11.85	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.55	0.74	0.90	1.11	**1yr**	0.78	1.08	1.22	1.59	1.96	2.55	2.78	**1yr**	2.26	2.68	3.16	3.91	4.46	**1yr**

BMP WORK SHEETS

STORMWATER POND DESIGN CRITERIA
Env-Wq 1508.03

Type/Node Name: **WET POND 1 2-20-24**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable

2.83	ac	A = Area draining to the practice	
0.44	ac	A_I = Impervious area draining to the practice	
0.15	decimal	I = percent impervious area draining to the practice, in decimal form	
0.19	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.53	ac-in	WQV= 1" x Rv x A	
1,935	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
193	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
967	cf	50% x WQV (check calc for extended detention volume)	
200	cf	V_{SED} = sediment forebay volume	← ≥ 10%WQV
1,508	cf	V_{PP} = permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
yes	cf	Extended Detention?[1]	← ≤ 50% WQV
427		V_{ED} = Volume of Extended detention (if "yes is given in box above)	
500.15		E_{ED} = elevation of WQV if "yes" is given in box above[2]	
0.01	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
0.01	cfs	Q_{EDmax} = discharge at the E_{ED} (attach stage-discharge table)	← <$2Q_{avg}$
26.35	hours	T_{ED} = drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	← ≥ 24-hrs
3.00	:1	Pond side slopes	← ≥3:1
502.00	ft	Elevation of seasonal high water table	
500.00	ft	Elevation of lowest pond outlet	
497.00	ft	Max floor = maximum elevation of pond bottom (ft)	
492.00	ft	Minimum floor (to maintain depth at less than 8')	← ≤ 8 ft
497.00	ft	Elevation of pond floor[3]	← ≤ Max floor and > Min floor
75.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
25.00	ft	Average Width ([average of the top width + average bottom width]/2)	
3.00	:1	Length to Average Width ratio	← ≥ 3:1
yes	Yes/No	The perimeter should be curvilinear.	
yes	Yes/No	The inlet and outlet should be located as far apart as possible.	
N	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:			
NOT NECESSARY		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
501.56	ft	Peak elevation of the 50-year storm event	
503.00	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	← yes

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.
2. This is the elevation of WQV if the hydrologic analysis is set up to include the permanent pool storage in the node description.
3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

WETLANDS ON ALL SIDES

Stage-Discharge for Pond 1P: MICRO POOL 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
497.00	0.00	499.16	0.00	501.32	0.03
497.04	0.00	499.20	0.00	501.36	0.03
497.08	0.00	499.24	0.00	501.40	0.03
497.12	0.00	499.28	0.00	501.44	0.03
497.16	0.00	499.32	0.00	501.48	0.03
497.20	0.00	499.36	0.00	501.52	0.03
497.24	0.00	499.40	0.00	501.56	0.03
497.28	0.00	499.44	0.00	501.60	0.03
497.32	0.00	499.48	0.00	501.64	0.03
497.36	0.00	499.52	0.00	501.68	0.03
497.40	0.00	499.56	0.00	501.72	0.03
497.44	0.00	499.60	0.00	501.76	0.03
497.48	0.00	499.64	0.00	501.80	0.03
497.52	0.00	499.68	0.00	501.84	0.04
497.56	0.00	499.72	0.00	501.88	0.04
497.60	0.00	499.76	0.00	501.92	0.04
497.64	0.00	499.80	0.00	501.96	0.04
497.68	0.00	499.84	0.00	502.00	0.04
497.72	0.00	499.88	0.00	502.04	0.25
497.76	0.00	499.92	0.00	502.08	0.63
497.80	0.00	499.96	0.00	502.12	1.13
497.84	0.00	500.00	0.00	502.16	1.71
497.88	0.00	500.04	0.00	502.20	2.38
497.92	0.00	500.08	0.01	502.24	3.11
497.96	0.00	500.12	0.01	502.28	3.92
498.00	0.00	500.16	0.01	502.32	4.78
498.04	0.00	500.20	0.01	502.36	5.69
498.08	0.00	500.24	0.01	502.40	6.66
498.12	0.00	500.28	0.01	502.44	7.68
498.16	0.00	500.32	0.01	502.48	8.74
498.20	0.00	500.36	0.01	502.52	9.85
498.24	0.00	500.40	0.02	502.56	10.95
498.28	0.00	500.44	0.02	502.60	11.01
498.32	0.00	500.48	0.02	502.64	11.08
498.36	0.00	500.52	0.02	502.68	11.14
498.40	0.00	500.56	0.02	502.72	11.20
498.44	0.00	500.60	0.02	502.76	11.27
498.48	0.00	500.64	0.02	502.80	11.33
498.52	0.00	500.68	0.02	502.84	11.39
498.56	0.00	500.72	0.02	502.88	11.45
498.60	0.00	500.76	0.02	502.92	11.51
498.64	0.00	500.80	0.02	502.96	11.57
498.68	0.00	500.84	0.02	503.00	**11.63**
498.72	0.00	500.88	0.02		
498.76	0.00	500.92	0.02		
498.80	0.00	500.96	0.03		
498.84	0.00	501.00	0.03		
498.88	0.00	501.04	0.03		
498.92	0.00	501.08	0.03		
498.96	0.00	501.12	0.03		
499.00	0.00	501.16	0.03		
499.04	0.00	501.20	0.03		
499.08	0.00	501.24	0.03		
499.12	0.00	501.28	0.03		

Stage-Area-Storage for Pond 1P: MICRO POOL 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
497.00	150	0
497.10	164	16
497.20	180	33
497.30	195	52
497.40	212	72
497.50	229	94
497.60	247	118
497.70	265	144
497.80	285	171
497.90	304	200
498.00	325	232
498.10	347	266
498.20	370	301
498.30	394	340
498.40	419	380
498.50	444	423
498.60	470	469
498.70	497	517
498.80	524	568
498.90	552	622
499.00	581	679
499.10	611	738
499.20	641	801
499.30	672	867
499.40	704	936
499.50	737	1,008
499.60	770	1,083
499.70	805	1,162
499.80	839	1,244
499.90	875	1,330
500.00	2,895	1,508
500.10	2,959	1,801
500.20	3,024	2,100
500.30	3,089	2,406
500.40	3,156	2,718
500.50	3,222	3,037
500.60	3,290	3,363
500.70	3,358	3,695
500.80	3,427	4,034
500.90	3,497	4,381
501.00	3,567	4,734
501.10	3,639	5,094
501.20	3,710	5,461
501.30	3,783	5,836
501.40	3,856	6,218
501.50	3,930	6,607
501.60	4,005	7,004
501.70	4,080	7,408
501.80	4,156	7,820
501.90	4,233	8,239
502.00	4,310	8,667
502.10	4,392	9,102
502.20	4,475	9,545
502.30	4,558	9,997
502.40	4,643	10,457
502.50	4,728	10,925
502.60	4,814	11,402
502.70	4,900	11,888
502.80	4,988	12,382
502.90	5,076	12,886
503.00	**5,165**	**13,398**

STORMWATER POND DESIGN CRITERIA
Env-Wq 1508.03

Type/Node Name: **WET POND 2 2-20-24**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable

3.16	ac	A = Area draining to the practice	
0.52	ac	A_I = Impervious area draining to the practice	
0.16	decimal	I = percent impervious area draining to the practice, in decimal form	
0.20	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.63	ac-in	WQV= 1" x Rv x A	
2,272	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
227	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
1,136	cf	50% x WQV (check calc for extended detention volume)	
OREBAY	cf	V_{SED} = sediment forebay volume	← ≥ 10%WQV
250	cf	V_{PP} = permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
yes	cf	Extended Detention?[1]	← ≤ 50% WQV
2,022		V_{ED} = Volume of Extended detention (if "yes is given in box above)	
487.80		E_{ED} = elevation of WQV if "yes" is given in box above[2]	
0.05	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
0.02	cfs	Q_{EDmax} = discharge at the E_{ED} (attach stage-discharge table)	← <$2Q_{avg}$
56.18	hours	T_{ED} = drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	← ≥ 24-hrs
3.00	:1	Pond side slopes	← ≥3:1
490.00	ft	Elevation of seasonal high water table	
487.00	ft	Elevation of lowest pond outlet	
484.00	ft	Max floor = maximum elevation of pond bottom (ft)	
479.00	ft	Minimum floor (to maintain depth at less than 8')	← ≤ 8 ft
484.00	ft	Elevation of pond floor[3]	← ≤ Max floor and > Min floor
54.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
15.00	ft	Average Width ([average of the top width + average bottom width]/2)	
3.60	:1	Length to Average Width ratio	← ≥ 3:1
yes	Yes/No	The perimeter should be curvilinear.	
yes	Yes/No	The inlet and outlet should be located as far apart as possible.	
N	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:			
NOT NECESSARY		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
488.25	ft	Peak elevation of the 50-year storm event	
489.25	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	← yes

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.
2. This is the elevation of WQV if the hydrologic analysis is set up to include the permanent pool storage in the node description.
3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

WETLANDS ON ALL SIDES

Stage-Discharge for Pond 4P: MICRO POOL POND 2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
484.00	0.00	486.70	0.00
484.05	0.00	486.75	0.00
484.10	0.00	486.80	0.00
484.15	0.00	486.85	0.00
484.20	0.00	486.90	0.00
484.25	0.00	486.95	0.00
484.30	0.00	487.00	0.00
484.35	0.00	487.05	0.00
484.40	0.00	487.10	0.01
484.45	0.00	487.15	0.01
484.50	0.00	487.20	0.01
484.55	0.00	487.25	0.01
484.60	0.00	487.30	0.01
484.65	0.00	487.35	0.01
484.70	0.00	487.40	0.02
484.75	0.00	487.45	0.02
484.80	0.00	487.50	0.02
484.85	0.00	487.55	0.02
484.90	0.00	487.60	0.02
484.95	0.00	487.65	0.02
485.00	0.00	487.70	0.02
485.05	0.00	487.75	0.02
485.10	0.00	487.80	0.02
485.15	0.00	487.85	0.02
485.20	0.00	487.90	0.02
485.25	0.00	487.95	0.03
485.30	0.00	488.00	0.03
485.35	0.00	488.05	0.03
485.40	0.00	488.10	0.03
485.45	0.00	488.15	0.03
485.50	0.00	488.20	0.03
485.55	0.00	488.25	0.03
485.60	0.00	488.30	0.32
485.65	0.00	488.35	0.86
485.70	0.00	488.40	1.55
485.75	0.00	488.45	2.37
485.80	0.00	488.50	3.30
485.85	0.00	488.55	4.33
485.90	0.00	488.60	5.45
485.95	0.00	488.65	6.65
486.00	0.00	488.70	7.93
486.05	0.00	488.75	9.28
486.10	0.00	488.80	10.71
486.15	0.00	488.85	10.94
486.20	0.00	488.90	11.01
486.25	0.00	488.95	11.09
486.30	0.00	489.00	**11.17**
486.35	0.00		
486.40	0.00		
486.45	0.00		
486.50	0.00		
486.55	0.00		
486.60	0.00		
486.65	0.00		

Stage-Area-Storage for Pond 4P: MICRO POOL POND 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
484.00	80	0
484.05	90	4
484.10	99	9
484.15	108	14
484.20	118	20
484.25	128	26
484.30	137	33
484.35	147	40
484.40	156	47
484.45	165	55
484.50	175	64
484.55	185	73
484.60	194	82
484.65	203	92
484.70	213	103
484.75	223	113
484.80	232	125
484.85	242	137
484.90	251	149
484.95	260	162
485.00	270	175
485.05	280	189
485.10	289	203
485.15	298	218
485.20	308	233
485.25	318	248
485.30	327	265
485.35	337	281
485.40	346	298
485.45	355	316
485.50	365	334
485.55	375	352
485.60	384	371
485.65	393	391
485.70	403	411
485.75	413	431
485.80	422	452
485.85	432	473
485.90	441	495
485.95	450	517
486.00	460	540
486.05	476	563
486.10	492	588
486.15	508	613
486.20	524	638
486.25	541	665
486.30	557	693
486.35	573	721
486.40	589	750
486.45	605	780
486.50	621	810
486.55	637	842
486.60	653	874
486.65	669	907
486.70	686	941
486.75	702	976
486.80	718	1,011
486.85	734	1,047
486.90	750	1,084
486.95	900	1,126
487.00	1,051	1,175
487.05	1,080	1,228
487.10	1,109	1,283
487.15	1,138	1,339
487.20	1,167	1,396
487.25	1,197	1,455
487.30	1,226	1,516
487.35	1,255	1,578
487.40	1,284	1,642
487.45	1,313	1,706
487.50	1,342	1,773
487.55	1,371	1,841
487.60	1,400	1,910
487.65	1,429	1,981
487.70	1,458	2,053
487.75	1,488	2,126
487.80	1,517	2,202
487.85	1,546	2,278
487.90	1,575	2,356
487.95	1,604	2,436
488.00	1,633	2,517
488.05	1,666	2,599
488.10	1,699	2,683
488.15	1,731	2,769
488.20	1,764	2,856
488.25	1,797	2,945
488.30	1,830	3,036
488.35	1,862	3,128
488.40	1,895	3,222
488.45	1,928	3,318
488.50	1,961	3,415
488.55	1,993	3,514
488.60	2,026	3,614
488.65	2,059	3,716
488.70	2,091	3,820
488.75	2,124	3,926
488.80	2,157	4,033
488.85	2,190	4,141
488.90	2,222	4,252
488.95	2,255	4,363
489.00	**2,288**	**4,477**

OUTLET PROTECTION

RIPRAP CALCULATIONS DESIGN STORM: 25 YEARS

DATE: 2/20/24 REVISED:

PROJECT NAME: KEARSARGE ROAD

LOCATION: WARNER JOB NO.

VARIABLES:

Q = DISCHARGE FROM OUTLET
Do = PIPE DIAMETER
Tw = TAIL WATER
La = LENGTH OF RIPRAP
Wi = WIDTH OF RIPRAP AT OUTLET
We = WIDTH OF RIPRAP DOWNSTREAM FROM OUTLET
d50 = RIPRAP SIZE

EQUATIONS:

FOR Tw < 1/2 Do

La = (1.8Q/Do^1.5) + 7Do
Wi = 3Do
We = Do + La
d50 = (0.02Q^1.33)/(Tw)(Do)

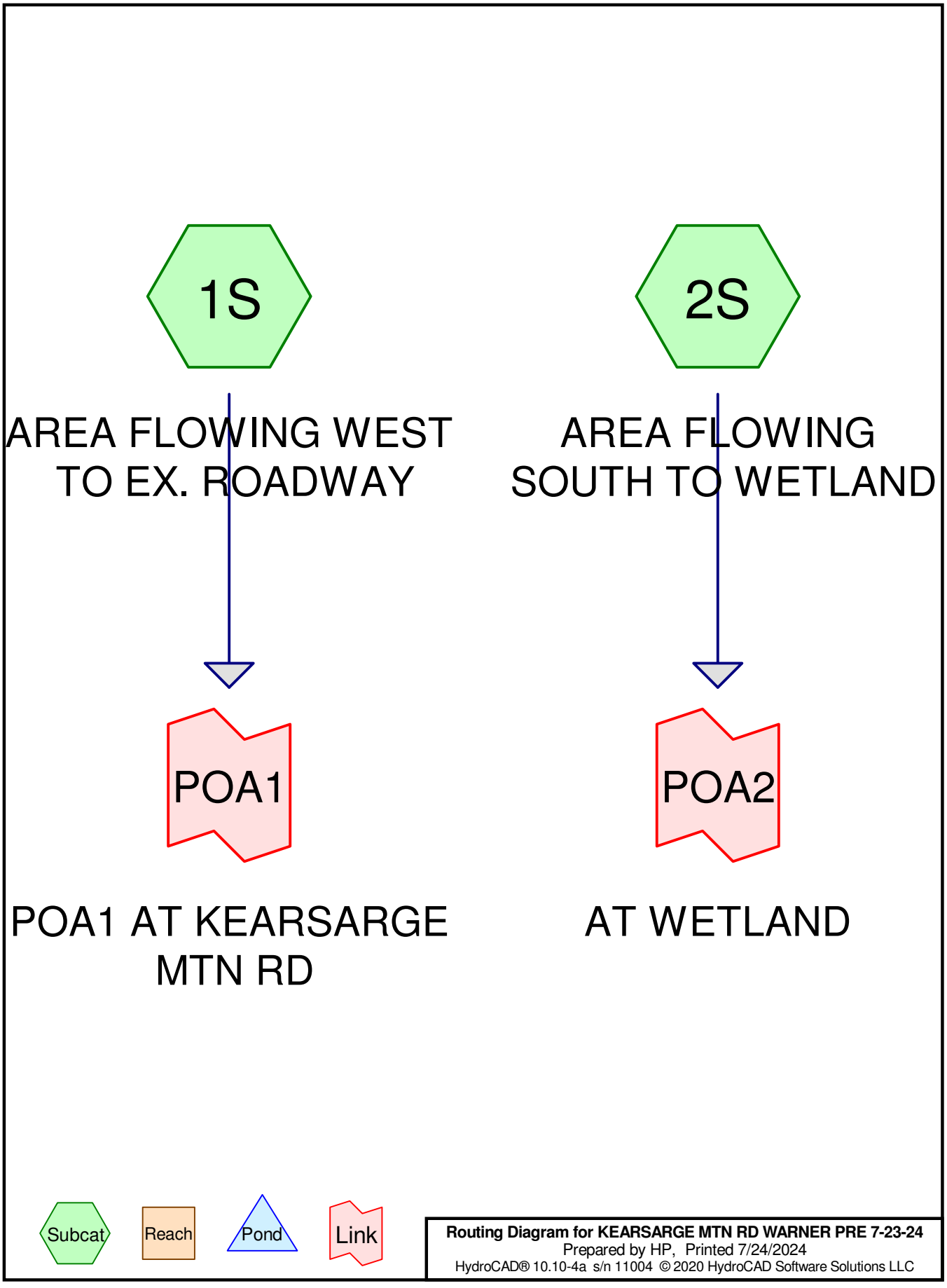
FOR Tw > or = 1/2 Do

La = (3Q)/(Do^1.5)
Wi = 3Do
We = Do + 0.4La
d50 = (0.02Q^1.33)/(Tw)(Do)

OUTLET	Q CFS	Do FEET	Tw FEET	La FEET	Wi FEET	We FEET	d50 INCHES
FES 1	0.72	1.25	0.10	9.68	3.75	10.93	1.24
FES 2	0.02	1.25	0.10	8.78	3.75	10.03	0.01

STORMWATER MANAGEMENT REPORT
Residential Subdivision
Kearsarge MT. Road
Warner NH

PREDEVELOPMENT DRAINAGE CALCULATIONS



Routing Diagram for KEARSARGE MTN RD WARNER PRE 7-23-24
Prepared by HP, Printed 7/24/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.231	39	>75% Grass cover, Good, HSG A (1S, 2S)
0.046	98	Existing roadway, HSG A (1S)
9.647	30	Woods, Good, HSG A (1S, 2S)
12.924	**32**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
12.924	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
12.924		**TOTAL AREA**

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: AREA FLOWING WEST TO Runoff Area=164,744 sf 1.22% Impervious Runoff Depth=0.00"
Flow Length=818' Tc=19.9 min CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: AREA FLOWING SOUTH TO Runoff Area=398,245 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,365' Tc=35.2 min CN=32 Runoff=0.00 cfs 0.000 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA2: AT WETLAND Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
99.64% Pervious = 12.878 ac 0.36% Impervious = 0.046 ac

Summary for Subcatchment 1S: AREA FLOWING WEST TO EX. ROADWAY

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	126,890	30	Woods, Good, HSG A
	164,744	33	Weighted Average
	162,740		98.78% Pervious Area
	2,004		1.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 2.76"
9.0	718	0.0700	1.32		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
19.9	818	Total			

Summary for Subcatchment 2S: AREA FLOWING SOUTH TO WETLAND

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

Area (sf)	CN	Description
19,384	39	>75% Grass cover, Good, HSG A
131,943	30	Woods, Good, HSG A
85,506	39	>75% Grass cover, Good, HSG A
161,412	30	Woods, Good, HSG A
398,245	32	Weighted Average
398,245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 3.782 ac, 1.22% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 9.142 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: AREA FLOWING WEST TO Runoff Area=164,744 sf 1.22% Impervious Runoff Depth=0.00"
Flow Length=818' Tc=19.9 min CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: AREA FLOWING SOUTH TO Runoff Area=398,245 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,365' Tc=35.2 min CN=32 Runoff=0.00 cfs 0.000 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA2: AT WETLAND Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
99.64% Pervious = 12.878 ac 0.36% Impervious = 0.046 ac

Summary for Subcatchment 1S: AREA FLOWING WEST TO EX. ROADWAY

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	126,890	30	Woods, Good, HSG A
	164,744	33	Weighted Average
	162,740		98.78% Pervious Area
	2,004		1.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 2.76"
9.0	718	0.0700	1.32		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
19.9	818	Total			

Summary for Subcatchment 2S: AREA FLOWING SOUTH TO WETLAND

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

Area (sf)	CN	Description
19,384	39	>75% Grass cover, Good, HSG A
131,943	30	Woods, Good, HSG A
85,506	39	>75% Grass cover, Good, HSG A
161,412	30	Woods, Good, HSG A
398,245	32	Weighted Average
398,245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 3.782 ac, 1.22% Impervious, Inflow Depth = 0.00" for 10YR event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 9.142 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10YR event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: AREA FLOWING WEST TO Runoff Area=164,744 sf 1.22% Impervious Runoff Depth=0.04"
Flow Length=818' Tc=19.9 min CN=33 Runoff=0.02 cfs 0.013 af

Subcatchment 2S: AREA FLOWING SOUTH TO Runoff Area=398,245 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=1,365' Tc=35.2 min CN=32 Runoff=0.03 cfs 0.018 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.02 cfs 0.013 af
Primary=0.02 cfs 0.013 af

Link POA2: AT WETLAND Inflow=0.03 cfs 0.018 af
Primary=0.03 cfs 0.018 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.031 af Average Runoff Depth = 0.03"
99.64% Pervious = 12.878 ac 0.36% Impervious = 0.046 ac

Summary for Subcatchment 1S: AREA FLOWING WEST TO EX. ROADWAY

Runoff = 0.02 cfs @ 17.18 hrs, Volume= 0.013 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	126,890	30	Woods, Good, HSG A
	164,744	33	Weighted Average
	162,740		98.78% Pervious Area
	2,004		1.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 2.76"
9.0	718	0.0700	1.32		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
19.9	818	Total			

Summary for Subcatchment 2S: AREA FLOWING SOUTH TO WETLAND

Runoff = 0.03 cfs @ 21.69 hrs, Volume= 0.018 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

Area (sf)	CN	Description
19,384	39	>75% Grass cover, Good, HSG A
131,943	30	Woods, Good, HSG A
85,506	39	>75% Grass cover, Good, HSG A
161,412	30	Woods, Good, HSG A
398,245	32	Weighted Average
398,245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 3.782 ac, 1.22% Impervious, Inflow Depth = 0.04" for 25YR event
Inflow = 0.02 cfs @ 17.18 hrs, Volume= 0.013 af
Primary = 0.02 cfs @ 17.18 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 9.142 ac, 0.00% Impervious, Inflow Depth = 0.02" for 25YR event
Inflow = 0.03 cfs @ 21.69 hrs, Volume= 0.018 af
Primary = 0.03 cfs @ 21.69 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: AREA FLOWING WEST TO Runoff Area=164,744 sf 1.22% Impervious Runoff Depth=0.15"
Flow Length=818' Tc=19.9 min CN=33 Runoff=0.07 cfs 0.047 af

Subcatchment 2S: AREA FLOWING SOUTH TO Runoff Area=398,245 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=1,365' Tc=35.2 min CN=32 Runoff=0.14 cfs 0.087 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.07 cfs 0.047 af
Primary=0.07 cfs 0.047 af

Link POA2: AT WETLAND Inflow=0.14 cfs 0.087 af
Primary=0.14 cfs 0.087 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.134 af Average Runoff Depth = 0.12"
99.64% Pervious = 12.878 ac 0.36% Impervious = 0.046 ac

Summary for Subcatchment 1S: AREA FLOWING WEST TO EX. ROADWAY

Runoff = 0.07 cfs @ 14.90 hrs, Volume= 0.047 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	126,890	30	Woods, Good, HSG A
	164,744	33	Weighted Average
	162,740		98.78% Pervious Area
	2,004		1.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 2.76"
9.0	718	0.0700	1.32		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
19.9	818	Total			

Summary for Subcatchment 2S: AREA FLOWING SOUTH TO WETLAND

Runoff = 0.14 cfs @ 15.44 hrs, Volume= 0.087 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

Area (sf)	CN	Description
19,384	39	>75% Grass cover, Good, HSG A
131,943	30	Woods, Good, HSG A
85,506	39	>75% Grass cover, Good, HSG A
161,412	30	Woods, Good, HSG A
398,245	32	Weighted Average
398,245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 3.782 ac, 1.22% Impervious, Inflow Depth = 0.15" for 50YR event
Inflow = 0.07 cfs @ 14.90 hrs, Volume= 0.047 af
Primary = 0.07 cfs @ 14.90 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

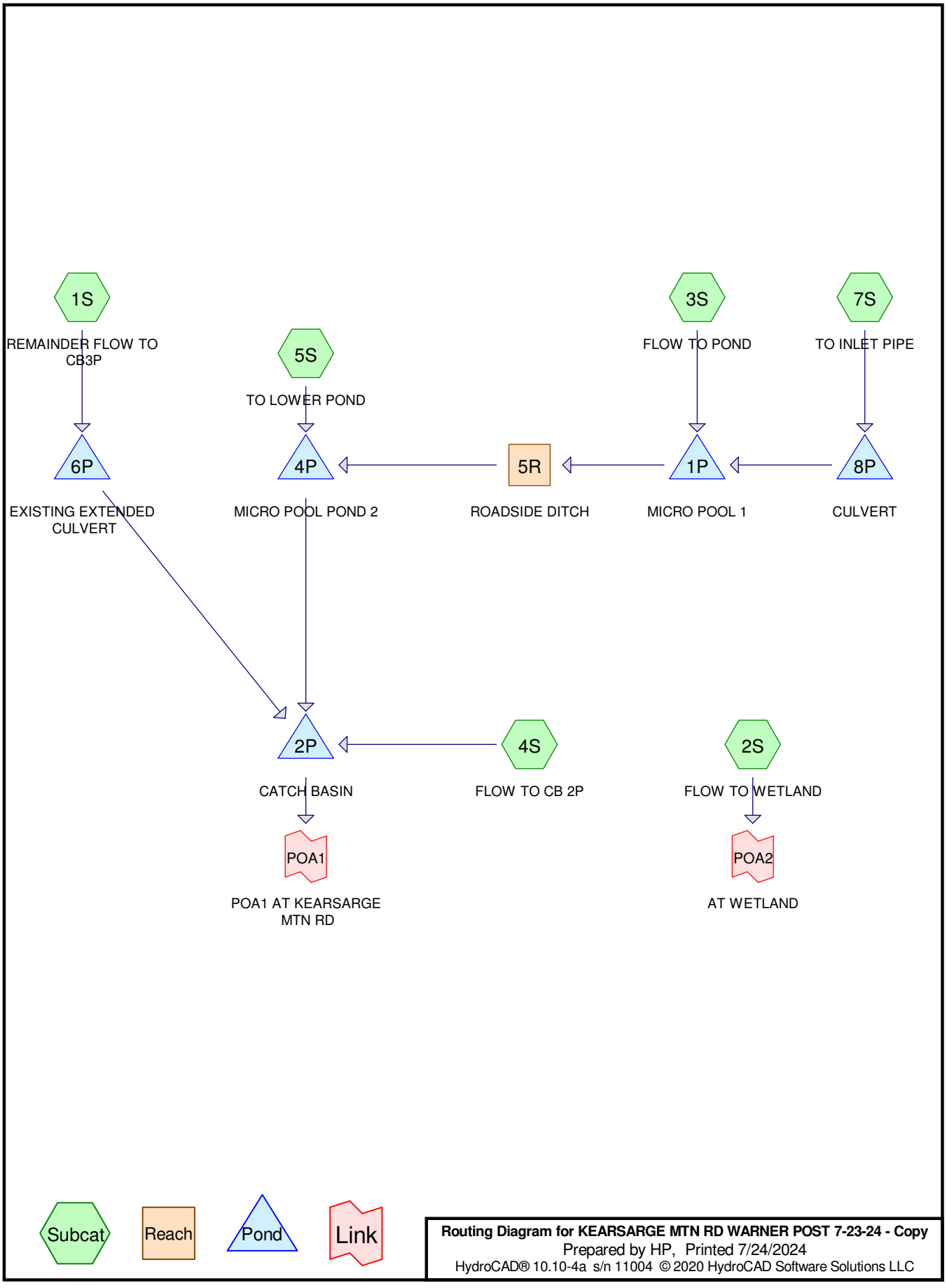
Summary for Link POA2: AT WETLAND

Inflow Area = 9.142 ac, 0.00% Impervious, Inflow Depth = 0.11" for 50YR event
Inflow = 0.14 cfs @ 15.44 hrs, Volume= 0.087 af
Primary = 0.14 cfs @ 15.44 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

STORMWATER MANAGEMENT REPORT
Residential Subdivision
Kearsarge MT. Road
Warner NH

POST DEVELOPMENT DRAINAGE CALCULATIONS



Routing Diagram for KEARSARGE MTN RD WARNER POST 7-23-24 - Copy

Prepared by HP, Printed 7/24/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.926	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 4S, 5S, 7S)
0.046	98	Existing roadway, HSG A (1S)
0.420	98	Paved parking, HSG A (2S, 3S, 5S, 7S)
0.162	98	Paved roadway, HSG A (3S, 4S)
0.046	98	Roofs, HSG A (3S)
0.046	98	Unconnected roofs, HSG A (2S)
7.278	30	Woods, Good, HSG A (1S, 2S, 3S, 4S)
12.924	**37**	**TOTAL AREA**

Soil Listing (selected nodes)

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

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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

Pond 1P: MICRO POOL 1 Peak Elev=498.96' Storage=654 cf Inflow=0.16 cfs 0.015 af
Outflow=0.00 cfs 0.000 af

Subcatchment 1S: REMAINDER FLOW TO Runoff Area=102,813 sf 1.95% Impervious Runoff Depth=0.00"
Flow Length=791' Tc=19.1 min CN=34 Runoff=0.00 cfs 0.000 af

Pond 2P: CATCH BASIN Peak Elev=484.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Subcatchment 2S: FLOW TO WETLAND Runoff Area=315,168 sf 0.98% Impervious Runoff Depth=0.00"
Flow Length=1,365' Tc=35.2 min UI Adjusted CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: FLOW TO POND Runoff Area=108,551 sf 10.79% Impervious Runoff Depth=0.00"
Flow Length=627' Tc=17.0 min CN=42 Runoff=0.00 cfs 0.000 af

Pond 4P: MICRO POOL POND 2 Peak Elev=485.89' Storage=493 cf Inflow=0.10 cfs 0.011 af
Outflow=0.00 cfs 0.000 af

Subcatchment 4S: FLOW TO CB 2P Runoff Area=7,292 sf 13.33% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=45 Runoff=0.00 cfs 0.000 af

Reach 5R: ROADSIDE DITCH Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.050 L=180.0' S=0.0467 '/' Capacity=11.71 cfs Outflow=0.00 cfs 0.000 af

Subcatchment 5S: TO LOWER POND Runoff Area=14,751 sf 43.31% Impervious Runoff Depth=0.40"
Tc=6.0 min CN=65 Runoff=0.10 cfs 0.011 af

Pond 6P: EXISTING EXTENDED CULVERT Peak Elev=487.73' Storage=0 cf Inflow=0.00 cfs 0.000 af
15.0" Round Culvert n=0.013 L=62.0' S=0.0553 '/' Outflow=0.00 cfs 0.000 af

Subcatchment 7S: TO INLET PIPE Runoff Area=14,399 sf 50.23% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=69 Runoff=0.17 cfs 0.015 af

Pond 8P: CULVERT Peak Elev=499.62' Storage=10 cf Inflow=0.17 cfs 0.015 af
15.0" Round Culvert n=0.013 L=80.0' S=0.0050 '/' Outflow=0.16 cfs 0.015 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA2: AT WETLAND Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.026 af Average Runoff Depth = 0.02"
94.42% Pervious = 12.203 ac 5.58% Impervious = 0.721 ac

Summary for Pond 1P: MICRO POOL 1

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth = 0.06" for 2yr event
Inflow = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 498.96' @ 36.00 hrs Surf.Area= 569 sf Storage= 654 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	497.00'	13,398 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
497.00	150	48.0	0	0	150
498.00	325	66.0	232	232	323
499.90	875	102.0	1,098	1,330	830
500.00	2,895	237.0	179	1,508	4,472
502.00	4,310	276.0	7,158	8,667	6,145
503.00	5,165	294.0	4,731	13,398	7,009

Device	Routing	Invert	Outlet Devices
#1	Primary	498.50'	**15.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 498.50' / 498.00' S= 0.0135 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	500.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	502.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=497.00' TW=498.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 1S: REMAINDER FLOW TO CB3P

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	64,959	30	Woods, Good, HSG A
	102,813	34	Weighted Average
	100,809		98.05% Pervious Area
	2,004		1.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 2.76"
8.1	646	0.0710	1.33		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
0.1	45	0.0200	6.13	24.53	**Parabolic Channel, ROADSIDE SWALE** W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.025 Earth, clean & winding
19.1	791	Total			

Summary for Pond 2P: CATCH BASIN

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 22.22 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 22.22 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 22.22 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 484.00' @ 1.00 hrs Surf.Area= 0.010 ac Storage= 0.000 af
Flood Elev= 488.00' Surf.Area= 0.010 ac Storage= 0.019 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,241.2 - 1,241.2)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	0.017 af	**6.00'W x 75.00'L x 4.00'H Prismatoid** 0.041 af Overall x 40.0% Voids
#2	484.25'	0.002 af	**15.0" Round Pipe Storage** L= 75.0'
		0.019 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	484.30'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 484.30' / 483.80' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Discarded	484.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 22.22 hrs HW=484.00' (Free Discharge)
2=Exfiltration (Passes 0.00 cfs of 0.03 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=484.00' TW=0.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Subcatchment 2S: FLOW TO WETLAND

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

Area (sf)	CN	Adj	Description
2,004	98		Unconnected roofs, HSG A
1,076	98		Paved parking, HSG A
20,000	39		>75% Grass cover, Good, HSG A
45,170	30		Woods, Good, HSG A
85,506	39		>75% Grass cover, Good, HSG A
161,412	30		Woods, Good, HSG A
315,168	34	33	Weighted Average, UI Adjusted
312,088			99.02% Pervious Area
3,080			0.98% Impervious Area
2,004			65.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Subcatchment 3S: FLOW TO POND

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

	Area (sf)	CN	Description
	2,004	98	Roofs, HSG A
*	6,098	98	Paved roadway, HSG A
	3,615	98	Paved parking, HSG A
	53,013	39	>75% Grass cover, Good, HSG A
	43,821	30	Woods, Good, HSG A
	108,551	42	Weighted Average
	96,834		89.21% Pervious Area
	11,717		10.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
0.7	90	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	412	0.0300	3.13	9.39	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.050
17.0	627	Total			

Summary for Pond 4P: MICRO POOL POND 2

Inflow Area = 3.161 ac, 18.40% Impervious, Inflow Depth = 0.04" for 2yr event
Inflow = 0.10 cfs @ 12.12 hrs, Volume= 0.011 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 485.89' @ 24.40 hrs Surf.Area= 440 sf Storage= 493 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	4,477 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.00	80	0	0
486.00	460	540	540
486.90	750	544	1,084
487.00	1,051	90	1,175
488.00	1,633	1,342	2,517
489.00	2,288	1,961	4,477

Device	Routing	Invert	Outlet Devices
#1	Primary	484.80'	**15.0" Round Culvert** L= 46.7' Ke= 0.500 Inlet / Outlet Invert= 484.80' / 484.40' S= 0.0086 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	487.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	488.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=484.00' TW=484.00' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)
↑**2=Orifice/Grate** (Controls 0.00 cfs)
3=Orifice/Grate (Controls 0.00 cfs)

Summary for Subcatchment 4S: FLOW TO CB 2P

Runoff = 0.00 cfs @ 22.22 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

	Area (sf)	CN	Description
*	972	98	Paved roadway, HSG A
	4,670	39	>75% Grass cover, Good, HSG A
	1,650	30	Woods, Good, HSG A
	7,292	45	Weighted Average
	6,320		86.67% Pervious Area
	972		13.33% Impervious Area

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

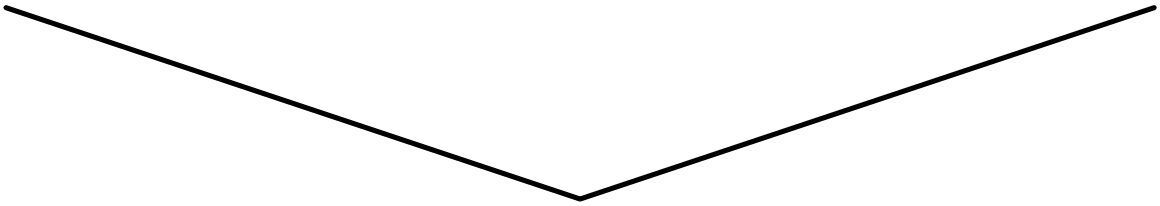
Summary for Reach 5R: ROADSIDE DITCH

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 1.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 11.71 cfs

0.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 180.0' Slope= 0.0467 '/'
Inlet Invert= 498.00', Outlet Invert= 489.60'



Summary for Subcatchment 5S: TO LOWER POND

Runoff = 0.10 cfs @ 12.12 hrs, Volume= 0.011 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

Area (sf)	CN	Description
8,362	39	>75% Grass cover, Good, HSG A
6,389	98	Paved parking, HSG A
14,751	65	Weighted Average
8,362		56.69% Pervious Area
6,389		43.31% Impervious Area

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

Summary for Pond 6P: EXISTING EXTENDED CULVERT

Inflow Area = 2.360 ac, 1.95% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 487.73' @ 1.00 hrs Surf.Area= 12 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	487.73'	1,003 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
487.73	12	0	0
488.00	50	8	8
490.00	945	995	1,003

Device	Routing	Invert	Outlet Devices
#1	Primary	487.83'	**15.0" Round Culvert** L= 62.0' Ke= 0.500 Inlet / Outlet Invert= 487.83' / 484.40' S= 0.0553 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=487.73' TW=484.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Subcatchment 7S: TO INLET PIPE

Runoff = 0.17 cfs @ 12.11 hrs, Volume= 0.015 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=2.76"

Area (sf)	CN	Description
7,233	98	Paved parking, HSG A
7,166	39	>75% Grass cover, Good, HSG A
14,399	69	Weighted Average
7,166		49.77% Pervious Area
7,233		50.23% Impervious Area

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

Summary for Pond 8P: CULVERT

Inflow Area = 0.331 ac, 50.23% Impervious, Inflow Depth = 0.55" for 2yr event
Inflow = 0.17 cfs @ 12.11 hrs, Volume= 0.015 af
Outflow = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af, Atten= 3%, Lag= 0.9 min
Primary = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 499.62' @ 12.13 hrs Surf.Area= 70 sf Storage= 10 cf

Plug-Flow detention time= 2.3 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 2.3 min (894.5 - 892.2)

Volume	Invert	Avail.Storage	Storage Description
#1	499.40'	253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
499.40	25	0	0
500.00	150	53	53
501.00	250	200	253

Device	Routing	Invert	Outlet Devices
#1	Primary	499.40'	**15.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 499.40' / 499.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.16 cfs @ 12.13 hrs HW=499.61' TW=497.38' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.16 cfs @ 1.72 fps)

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 7.235 ac, 0.98% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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

Pond 1P: MICRO POOL 1 Peak Elev=500.22' Storage=2,167 cf Inflow=0.46 cfs 0.056 af
Outflow=0.01 cfs 0.014 af

Subcatchment 1S: REMAINDER FLOW TO Runoff Area=102,813 sf 1.95% Impervious Runoff Depth=0.00"
Flow Length=791' Tc=19.1 min CN=34 Runoff=0.00 cfs 0.000 af

Pond 2P: CATCH BASIN Peak Elev=484.00' Storage=0.000 af Inflow=0.01 cfs 0.015 af
Discarded=0.01 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.015 af

Subcatchment 2S: FLOW TO WETLAND Runoff Area=315,168 sf 0.98% Impervious Runoff Depth=0.00"
Flow Length=1,365' Tc=35.2 min UI Adjusted CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: FLOW TO POND Runoff Area=108,551 sf 10.79% Impervious Runoff Depth=0.11"
Flow Length=627' Tc=17.0 min CN=42 Runoff=0.04 cfs 0.022 af

Pond 4P: MICRO POOL POND 2 Peak Elev=487.20' Storage=1,391 cf Inflow=0.36 cfs 0.043 af
Outflow=0.01 cfs 0.012 af

Subcatchment 4S: FLOW TO CB 2P Runoff Area=7,292 sf 13.33% Impervious Runoff Depth=0.18"
Tc=6.0 min CN=45 Runoff=0.01 cfs 0.003 af

Reach 5R: ROADSIDE DITCH Avg. Flow Depth=0.07' Max Vel=0.69 fps Inflow=0.01 cfs 0.014 af
n=0.050 L=180.0' S=0.0467 '/' Capacity=11.71 cfs Outflow=0.01 cfs 0.014 af

Subcatchment 5S: TO LOWER POND Runoff Area=14,751 sf 43.31% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=65 Runoff=0.36 cfs 0.029 af

Pond 6P: EXISTING EXTENDED CULVERT Peak Elev=487.84' Storage=2 cf Inflow=0.00 cfs 0.000 af
15.0" Round Culvert n=0.013 L=62.0' S=0.0553 '/' Outflow=0.00 cfs 0.000 af

Subcatchment 7S: TO INLET PIPE Runoff Area=14,399 sf 50.23% Impervious Runoff Depth=1.28"
Tc=6.0 min CN=69 Runoff=0.46 cfs 0.035 af

Pond 8P: CULVERT Peak Elev=500.22' Storage=88 cf Inflow=0.46 cfs 0.035 af
15.0" Round Culvert n=0.013 L=80.0' S=0.0050 '/' Outflow=0.46 cfs 0.034 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA2: AT WETLAND Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.089 af Average Runoff Depth = 0.08"
94.42% Pervious = 12.203 ac 5.58% Impervious = 0.721 ac

Summary for Pond 1P: MICRO POOL 1

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth > 0.24" for 10YR event
Inflow = 0.46 cfs @ 12.11 hrs, Volume= 0.056 af
Outflow = 0.01 cfs @ 24.18 hrs, Volume= 0.014 af, Atten= 98%, Lag= 723.9 min
Primary = 0.01 cfs @ 24.18 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 500.22' @ 24.18 hrs Surf.Area= 3,038 sf Storage= 2,167 cf

Plug-Flow detention time= 856.8 min calculated for 0.014 af (25% of inflow)
Center-of-Mass det. time= 640.6 min (1,583.8 - 943.3)

Volume	Invert	Avail.Storage	Storage Description
#1	497.00'	13,398 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
497.00	150	48.0	0	0	150
498.00	325	66.0	232	232	323
499.90	875	102.0	1,098	1,330	830
500.00	2,895	237.0	179	1,508	4,472
502.00	4,310	276.0	7,158	8,667	6,145
503.00	5,165	294.0	4,731	13,398	7,009

Device	Routing	Invert	Outlet Devices
#1	Primary	498.50'	**15.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 498.50' / 498.00' S= 0.0135 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	500.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	502.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.18 hrs HW=500.22' TW=498.07' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.01 cfs of 6.19 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 2.05 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 1S: REMAINDER FLOW TO CB3P

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	64,959	30	Woods, Good, HSG A
	102,813	34	Weighted Average
	100,809		98.05% Pervious Area
	2,004		1.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 2.76"
8.1	646	0.0710	1.33		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
0.1	45	0.0200	6.13	24.53	**Parabolic Channel, ROADSIDE SWALE** W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.025 Earth, clean & winding
19.1	791	Total			

Summary for Pond 2P: CATCH BASIN

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth > 0.03" for 10YR event
Inflow = 0.01 cfs @ 23.99 hrs, Volume= 0.015 af
Outflow = 0.01 cfs @ 23.99 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.01 cfs @ 23.99 hrs, Volume= 0.015 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 484.00' @ 1.00 hrs Surf.Area= 0.010 ac Storage= 0.000 af
Flood Elev= 488.00' Surf.Area= 0.010 ac Storage= 0.019 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	0.017 af	**6.00'W x 75.00'L x 4.00'H Prismatoid** 0.041 af Overall x 40.0% Voids
#2	484.25'	0.002 af	**15.0" Round Pipe Storage** L= 75.0'
		0.019 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	484.30'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 484.30' / 483.80' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Discarded	484.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 23.99 hrs HW=484.00' (Free Discharge)
2=Exfiltration (Passes 0.00 cfs of 0.03 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=484.00' TW=0.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Subcatchment 2S: FLOW TO WETLAND

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

Area (sf)	CN	Adj	Description
2,004	98		Unconnected roofs, HSG A
1,076	98		Paved parking, HSG A
20,000	39		>75% Grass cover, Good, HSG A
45,170	30		Woods, Good, HSG A
85,506	39		>75% Grass cover, Good, HSG A
161,412	30		Woods, Good, HSG A
315,168	34	33	Weighted Average, UI Adjusted
312,088			99.02% Pervious Area
3,080			0.98% Impervious Area
2,004			65.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Subcatchment 3S: FLOW TO POND

Runoff = 0.04 cfs @ 14.82 hrs, Volume= 0.022 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

	Area (sf)	CN	Description
	2,004	98	Roofs, HSG A
*	6,098	98	Paved roadway, HSG A
	3,615	98	Paved parking, HSG A
	53,013	39	>75% Grass cover, Good, HSG A
	43,821	30	Woods, Good, HSG A
	108,551	42	Weighted Average
	96,834		89.21% Pervious Area
	11,717		10.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
0.7	90	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	412	0.0300	3.13	9.39	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.050
17.0	627	Total			

Summary for Pond 4P: MICRO POOL POND 2

Inflow Area = 3.161 ac, 18.40% Impervious, Inflow Depth > 0.16" for 10YR event
Inflow = 0.36 cfs @ 12.10 hrs, Volume= 0.043 af
Outflow = 0.01 cfs @ 26.60 hrs, Volume= 0.012 af, Atten= 97%, Lag= 869.5 min
Primary = 0.01 cfs @ 26.60 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 487.20' @ 26.60 hrs Surf.Area= 1,165 sf Storage= 1,391 cf

Plug-Flow detention time= 968.8 min calculated for 0.012 af (28% of inflow)
Center-of-Mass det. time= 597.5 min (1,700.9 - 1,103.4)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	4,477 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.00	80	0	0
486.00	460	540	540
486.90	750	544	1,084
487.00	1,051	90	1,175
488.00	1,633	1,342	2,517
489.00	2,288	1,961	4,477

Device	Routing	Invert	Outlet Devices
#1	Primary	484.80'	**15.0" Round Culvert** L= 46.7' Ke= 0.500 Inlet / Outlet Invert= 484.80' / 484.40' S= 0.0086 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	487.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	488.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 26.60 hrs HW=487.20' TW=484.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.01 cfs of 7.61 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 1.89 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 4S: FLOW TO CB 2P

Runoff = 0.01 cfs @ 12.45 hrs, Volume= 0.003 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

	Area (sf)	CN	Description
*	972	98	Paved roadway, HSG A
	4,670	39	>75% Grass cover, Good, HSG A
	1,650	30	Woods, Good, HSG A
	7,292	45	Weighted Average
	6,320		86.67% Pervious Area
	972		13.33% Impervious Area

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

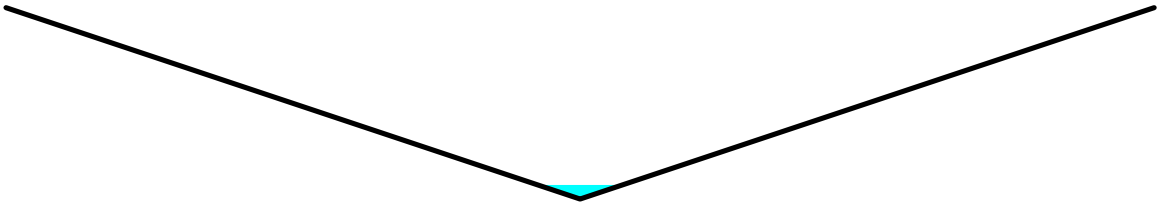
Summary for Reach 5R: ROADSIDE DITCH

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth > 0.06" for 10YR event
Inflow = 0.01 cfs @ 24.18 hrs, Volume= 0.014 af
Outflow = 0.01 cfs @ 24.23 hrs, Volume= 0.014 af, Atten= 0%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.69 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 4.7 min

Peak Storage= 3 cf @ 24.23 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 0.44'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 11.71 cfs

0.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 180.0' Slope= 0.0467 '/'
Inlet Invert= 498.00', Outlet Invert= 489.60'



Summary for Subcatchment 5S: TO LOWER POND

Runoff = 0.36 cfs @ 12.10 hrs, Volume= 0.029 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

Area (sf)	CN	Description
8,362	39	>75% Grass cover, Good, HSG A
6,389	98	Paved parking, HSG A
14,751	65	Weighted Average
8,362		56.69% Pervious Area
6,389		43.31% Impervious Area

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

Summary for Pond 6P: EXISTING EXTENDED CULVERT

Inflow Area = 2.360 ac, 1.95% Impervious, Inflow Depth = 0.00" for 10YR event
Inflow = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.05 hrs, Volume= 0.000 af, Atten= 1%, Lag= 1.4 min
Primary = 0.00 cfs @ 24.05 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 487.84' @ 24.05 hrs Surf.Area= 28 sf Storage= 2 cf

Plug-Flow detention time= 45.9 min calculated for 0.000 af (77% of inflow)
Center-of-Mass det. time= 28.7 min (1,414.0 - 1,385.3)

Volume	Invert	Avail.Storage	Storage Description
#1	487.73'	1,003 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
487.73	12	0	0
488.00	50	8	8
490.00	945	995	1,003

Device	Routing	Invert	Outlet Devices
#1	Primary	487.83'	**15.0" Round Culvert** L= 62.0' Ke= 0.500 Inlet / Outlet Invert= 487.83' / 484.40' S= 0.0553 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 24.05 hrs HW=487.84' TW=484.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.00 cfs @ 0.41 fps)

Summary for Subcatchment 7S: TO INLET PIPE

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.02"

Area (sf)	CN	Description
7,233	98	Paved parking, HSG A
7,166	39	>75% Grass cover, Good, HSG A
14,399	69	Weighted Average
7,166		49.77% Pervious Area
7,233		50.23% Impervious Area

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

Summary for Pond 8P: CULVERT

Inflow Area = 0.331 ac, 50.23% Impervious, Inflow Depth = 1.28" for 10YR event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.11 hrs, Volume= 0.034 af, Atten= 1%, Lag= 0.7 min
Primary = 0.46 cfs @ 12.11 hrs, Volume= 0.034 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 500.22' @ 24.14 hrs Surf.Area= 172 sf Storage= 88 cf

Plug-Flow detention time= 28.2 min calculated for 0.034 af (95% of inflow)
Center-of-Mass det. time= 5.5 min (868.7 - 863.2)

Volume	Invert	Avail.Storage	Storage Description
#1	499.40'	253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
499.40	25	0	0
500.00	150	53	53
501.00	250	200	253

Device	Routing	Invert	Outlet Devices
#1	Primary	499.40'	**15.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 499.40' / 499.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.44 cfs @ 12.11 hrs HW=499.76' TW=498.14' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.44 cfs @ 2.29 fps)

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth = 0.00" for 10YR event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 7.235 ac, 0.98% Impervious, Inflow Depth = 0.00" for 10YR event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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

Pond 1P: MICRO POOL 1 Peak Elev=500.82' Storage=4,112 cf Inflow=0.72 cfs 0.114 af
Outflow=0.02 cfs 0.039 af

Subcatchment 1S: REMAINDER FLOW TO Runoff Area=102,813 sf 1.95% Impervious Runoff Depth=0.06"
Flow Length=791' Tc=19.1 min CN=34 Runoff=0.02 cfs 0.012 af

Pond 2P: CATCH BASIN Peak Elev=484.32' Storage=0.001 af Inflow=0.04 cfs 0.054 af
Discarded=0.03 cfs 0.053 af Primary=0.00 cfs 0.001 af Outflow=0.04 cfs 0.054 af

Subcatchment 2S: FLOW TO WETLAND Runoff Area=315,168 sf 0.98% Impervious Runoff Depth=0.04"
Flow Length=1,365' Tc=35.2 min UI Adjusted CN=33 Runoff=0.03 cfs 0.024 af

Subcatchment 3S: FLOW TO POND Runoff Area=108,551 sf 10.79% Impervious Runoff Depth=0.31"
Flow Length=627' Tc=17.0 min CN=42 Runoff=0.22 cfs 0.064 af

Pond 4P: MICRO POOL POND 2 Peak Elev=487.75' Storage=2,128 cf Inflow=0.61 cfs 0.085 af
Outflow=0.02 cfs 0.037 af

Subcatchment 4S: FLOW TO CB 2P Runoff Area=7,292 sf 13.33% Impervious Runoff Depth=0.44"
Tc=6.0 min CN=45 Runoff=0.03 cfs 0.006 af

Reach 5R: ROADSIDE DITCH Avg. Flow Depth=0.10' Max Vel=0.83 fps Inflow=0.02 cfs 0.039 af
n=0.050 L=180.0' S=0.0467 '/' Capacity=11.71 cfs Outflow=0.02 cfs 0.038 af

Subcatchment 5S: TO LOWER POND Runoff Area=14,751 sf 43.31% Impervious Runoff Depth=1.64"
Tc=6.0 min CN=65 Runoff=0.61 cfs 0.046 af

Pond 6P: EXISTING EXTENDED CULVERT Peak Elev=487.89' Storage=4 cf Inflow=0.02 cfs 0.012 af
15.0" Round Culvert n=0.013 L=62.0' S=0.0553 '/' Outflow=0.02 cfs 0.012 af

Subcatchment 7S: TO INLET PIPE Runoff Area=14,399 sf 50.23% Impervious Runoff Depth=1.94"
Tc=6.0 min CN=69 Runoff=0.72 cfs 0.054 af

Pond 8P: CULVERT Peak Elev=500.82' Storage=209 cf Inflow=0.72 cfs 0.054 af
15.0" Round Culvert n=0.013 L=80.0' S=0.0050 '/' Outflow=0.72 cfs 0.050 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link POA2: AT WETLAND Inflow=0.03 cfs 0.024 af
Primary=0.03 cfs 0.024 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.205 af Average Runoff Depth = 0.19"
94.42% Pervious = 12.203 ac 5.58% Impervious = 0.721 ac

Summary for Pond 1P: MICRO POOL 1

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth > 0.48" for 25YR event
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 0.114 af
Outflow = 0.02 cfs @ 24.17 hrs, Volume= 0.039 af, Atten= 97%, Lag= 723.7 min
Primary = 0.02 cfs @ 24.17 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 500.82' @ 24.17 hrs Surf.Area= 3,443 sf Storage= 4,112 cf

Plug-Flow detention time= 760.3 min calculated for 0.039 af (34% of inflow)
Center-of-Mass det. time= 564.4 min (1,497.9 - 933.5)

Volume	Invert	Avail.Storage	Storage Description
#1	497.00'	13,398 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
497.00	150	48.0	0	0	150
498.00	325	66.0	232	232	323
499.90	875	102.0	1,098	1,330	830
500.00	2,895	237.0	179	1,508	4,472
502.00	4,310	276.0	7,158	8,667	6,145
503.00	5,165	294.0	4,731	13,398	7,009

Device	Routing	Invert	Outlet Devices
#1	Primary	498.50'	**15.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 498.50' / 498.00' S= 0.0135 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	500.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	502.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 24.17 hrs HW=500.82' TW=498.10' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.02 cfs of 7.70 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.26 fps)
—**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 1S: REMAINDER FLOW TO CB3P

Runoff = 0.02 cfs @ 15.72 hrs, Volume= 0.012 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	64,959	30	Woods, Good, HSG A
	102,813	34	Weighted Average
	100,809		98.05% Pervious Area
	2,004		1.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS**
					Woods: Light underbrush n= 0.400 P2= 2.76"
8.1	646	0.0710	1.33		**Shallow Concentrated Flow, WOODS**
					Woodland Kv= 5.0 fps
0.1	45	0.0200	6.13	24.53	**Parabolic Channel, ROADSIDE SWALE**
					W=6.00' D=1.00' Area=4.0 sf Perim=6.4'
					n= 0.025 Earth, clean & winding
19.1	791	Total			

Summary for Pond 2P: CATCH BASIN

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth > 0.11" for 25YR event
Inflow = 0.04 cfs @ 15.77 hrs, Volume= 0.054 af
Outflow = 0.04 cfs @ 21.28 hrs, Volume= 0.054 af, Atten= 4%, Lag= 330.5 min
Discarded = 0.03 cfs @ 21.28 hrs, Volume= 0.053 af
Primary = 0.00 cfs @ 21.28 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 484.32' @ 21.28 hrs Surf.Area= 0.011 ac Storage= 0.001 af
Flood Elev= 488.00' Surf.Area= 0.010 ac Storage= 0.019 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.5 min (1,404.1 - 1,390.6)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	0.017 af	**6.00'W x 75.00'L x 4.00'H Prismatoid**
			0.041 af Overall x 40.0% Voids
#2	484.25'	0.002 af	**15.0" Round Pipe Storage**
			L= 75.0'
		0.019 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	484.30'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 484.30' / 483.80' S= 0.0100 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Discarded	484.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 21.28 hrs HW=484.32' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 21.28 hrs HW=484.32' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.00 cfs @ 0.71 fps)

Summary for Subcatchment 2S: FLOW TO WETLAND

Runoff = 0.03 cfs @ 17.40 hrs, Volume= 0.024 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

Area (sf)	CN	Adj	Description
2,004	98		Unconnected roofs, HSG A
1,076	98		Paved parking, HSG A
20,000	39		>75% Grass cover, Good, HSG A
45,170	30		Woods, Good, HSG A
85,506	39		>75% Grass cover, Good, HSG A
161,412	30		Woods, Good, HSG A
315,168	34	33	Weighted Average, UI Adjusted
312,088			99.02% Pervious Area
3,080			0.98% Impervious Area
2,004			65.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Subcatchment 3S: FLOW TO POND

Runoff = 0.22 cfs @ 12.55 hrs, Volume= 0.064 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

	Area (sf)	CN	Description
	2,004	98	Roofs, HSG A
*	6,098	98	Paved roadway, HSG A
	3,615	98	Paved parking, HSG A
	53,013	39	>75% Grass cover, Good, HSG A
	43,821	30	Woods, Good, HSG A
	108,551	42	Weighted Average
	96,834		89.21% Pervious Area
	11,717		10.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
0.7	90	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	412	0.0300	3.13	9.39	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.050
17.0	627	Total			

Summary for Pond 4P: MICRO POOL POND 2

Inflow Area = 3.161 ac, 18.40% Impervious, Inflow Depth > 0.32" for 25YR event
Inflow = 0.61 cfs @ 12.10 hrs, Volume= 0.085 af
Outflow = 0.02 cfs @ 27.54 hrs, Volume= 0.037 af, Atten= 96%, Lag= 926.3 min
Primary = 0.02 cfs @ 27.54 hrs, Volume= 0.037 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 487.75' @ 27.54 hrs Surf.Area= 1,488 sf Storage= 2,128 cf

Plug-Flow detention time= 769.9 min calculated for 0.037 af (43% of inflow)
Center-of-Mass det. time= 392.0 min (1,543.2 - 1,151.2)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	4,477 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.00	80	0	0
486.00	460	540	540
486.90	750	544	1,084
487.00	1,051	90	1,175
488.00	1,633	1,342	2,517
489.00	2,288	1,961	4,477

Device	Routing	Invert	Outlet Devices
#1	Primary	484.80'	**15.0" Round Culvert** L= 46.7' Ke= 0.500 Inlet / Outlet Invert= 484.80' / 484.40' S= 0.0086 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	487.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	488.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 27.54 hrs HW=487.75' TW=484.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.02 cfs of 8.87 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.06 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Summary for Subcatchment 4S: FLOW TO CB 2P

Runoff = 0.03 cfs @ 12.31 hrs, Volume= 0.006 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

	Area (sf)	CN	Description
*	972	98	Paved roadway, HSG A
	4,670	39	>75% Grass cover, Good, HSG A
	1,650	30	Woods, Good, HSG A
	7,292	45	Weighted Average
	6,320		86.67% Pervious Area
	972		13.33% Impervious Area

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

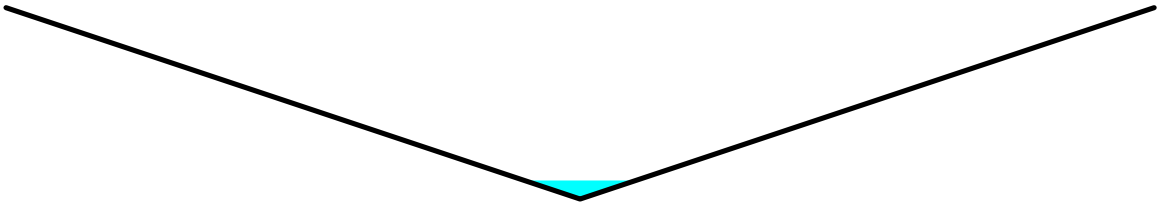
Summary for Reach 5R: ROADSIDE DITCH

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth > 0.16" for 25YR event
Inflow = 0.02 cfs @ 24.17 hrs, Volume= 0.039 af
Outflow = 0.02 cfs @ 24.22 hrs, Volume= 0.038 af, Atten= 0%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.83 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 3.8 min

Peak Storage= 5 cf @ 24.22 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 0.58'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 11.71 cfs

0.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 180.0' Slope= 0.0467 '/'
Inlet Invert= 498.00', Outlet Invert= 489.60'



Summary for Subcatchment 5S: TO LOWER POND

Runoff = 0.61 cfs @ 12.10 hrs, Volume= 0.046 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

Area (sf)	CN	Description
8,362	39	>75% Grass cover, Good, HSG A
6,389	98	Paved parking, HSG A
14,751	65	Weighted Average
8,362		56.69% Pervious Area
6,389		43.31% Impervious Area

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

Summary for Pond 6P: EXISTING EXTENDED CULVERT

Inflow Area = 2.360 ac, 1.95% Impervious, Inflow Depth = 0.06" for 25YR event
Inflow = 0.02 cfs @ 15.72 hrs, Volume= 0.012 af
Outflow = 0.02 cfs @ 15.74 hrs, Volume= 0.012 af, Atten= 0%, Lag= 1.0 min
Primary = 0.02 cfs @ 15.74 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 487.89' @ 15.74 hrs Surf.Area= 34 sf Storage= 4 cf

Plug-Flow detention time= 4.8 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (1,136.3 - 1,133.2)

Volume	Invert	Avail.Storage	Storage Description
#1	487.73'	1,003 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
487.73	12	0	0
488.00	50	8	8
490.00	945	995	1,003

Device	Routing	Invert	Outlet Devices
#1	Primary	487.83'	**15.0" Round Culvert** L= 62.0' Ke= 0.500 Inlet / Outlet Invert= 487.83' / 484.40' S= 0.0553 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.02 cfs @ 15.74 hrs HW=487.89' TW=484.11' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.02 cfs @ 0.82 fps)

Summary for Subcatchment 7S: TO INLET PIPE

Runoff = 0.72 cfs @ 12.10 hrs, Volume= 0.054 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.98"

Area (sf)	CN	Description
7,233	98	Paved parking, HSG A
7,166	39	>75% Grass cover, Good, HSG A
14,399	69	Weighted Average
7,166		49.77% Pervious Area
7,233		50.23% Impervious Area

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

Summary for Pond 8P: CULVERT

Inflow Area = 0.331 ac, 50.23% Impervious, Inflow Depth = 1.94" for 25YR event
Inflow = 0.72 cfs @ 12.10 hrs, Volume= 0.054 af
Outflow = 0.72 cfs @ 12.11 hrs, Volume= 0.050 af, Atten= 1%, Lag= 0.7 min
Primary = 0.72 cfs @ 12.11 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 500.82' @ 24.06 hrs Surf.Area= 232 sf Storage= 209 cf

Plug-Flow detention time= 52.3 min calculated for 0.050 af (93% of inflow)
Center-of-Mass det. time= 18.1 min (868.6 - 850.5)

Volume	Invert	Avail.Storage	Storage Description
#1	499.40'	253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
499.40	25	0	0
500.00	150	53	53
501.00	250	200	253

Device	Routing	Invert	Outlet Devices
#1	Primary	499.40'	**15.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 499.40' / 499.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.70 cfs @ 12.11 hrs HW=499.85' TW=498.70' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.70 cfs @ 2.59 fps)

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth = 0.00" for 25YR event
Inflow = 0.00 cfs @ 21.28 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 21.28 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 7.235 ac, 0.98% Impervious, Inflow Depth = 0.04" for 25YR event
Inflow = 0.03 cfs @ 17.40 hrs, Volume= 0.024 af
Primary = 0.03 cfs @ 17.40 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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

Pond 1P: MICRO POOL 1 Peak Elev=501.56' Storage=6,846 cf Inflow=1.04 cfs 0.185 af
Outflow=0.03 cfs 0.057 af

Subcatchment 1S: REMAINDER FLOW TO Runoff Area=102,813 sf 1.95% Impervious Runoff Depth=0.18"
Flow Length=791' Tc=19.1 min CN=34 Runoff=0.06 cfs 0.036 af

Pond 2P: CATCH BASIN Peak Elev=484.41' Storage=0.002 af Inflow=0.09 cfs 0.100 af
Discarded=0.04 cfs 0.066 af Primary=0.06 cfs 0.033 af Outflow=0.09 cfs 0.100 af

Subcatchment 2S: FLOW TO WETLAND Runoff Area=315,168 sf 0.98% Impervious Runoff Depth=0.15"
Flow Length=1,365' Tc=35.2 min UI Adjusted CN=33 Runoff=0.14 cfs 0.089 af

Subcatchment 3S: FLOW TO POND Runoff Area=108,551 sf 10.79% Impervious Runoff Depth=0.57"
Flow Length=627' Tc=17.0 min CN=42 Runoff=0.61 cfs 0.119 af

Pond 4P: MICRO POOL POND 2 Peak Elev=488.25' Storage=2,949 cf Inflow=0.86 cfs 0.121 af
Outflow=0.03 cfs 0.053 af

Subcatchment 4S: FLOW TO CB 2P Runoff Area=7,292 sf 13.33% Impervious Runoff Depth=0.75"
Tc=6.0 min CN=45 Runoff=0.08 cfs 0.010 af

Reach 5R: ROADSIDE DITCH Avg. Flow Depth=0.11' Max Vel=0.90 fps Inflow=0.03 cfs 0.057 af
n=0.050 L=180.0' S=0.0467 '/' Capacity=11.71 cfs Outflow=0.03 cfs 0.057 af

Subcatchment 5S: TO LOWER POND Runoff Area=14,751 sf 43.31% Impervious Runoff Depth=2.26"
Tc=6.0 min CN=65 Runoff=0.86 cfs 0.064 af

Pond 6P: EXISTING EXTENDED CULVERT Peak Elev=487.94' Storage=6 cf Inflow=0.06 cfs 0.036 af
15.0" Round Culvert n=0.013 L=62.0' S=0.0553 '/' Outflow=0.06 cfs 0.036 af

Subcatchment 7S: TO INLET PIPE Runoff Area=14,399 sf 50.23% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=69 Runoff=0.98 cfs 0.072 af

Pond 8P: CULVERT Peak Elev=501.56' Storage=253 cf Inflow=0.98 cfs 0.072 af
15.0" Round Culvert n=0.013 L=80.0' S=0.0050 '/' Outflow=0.98 cfs 0.066 af

Link POA1: POA1 AT KEARSARGE MTN RD Inflow=0.06 cfs 0.033 af
Primary=0.06 cfs 0.033 af

Link POA2: AT WETLAND Inflow=0.14 cfs 0.089 af
Primary=0.14 cfs 0.089 af

Total Runoff Area = 12.924 ac Runoff Volume = 0.390 af Average Runoff Depth = 0.36"
94.42% Pervious = 12.203 ac 5.58% Impervious = 0.721 ac

Summary for Pond 1P: MICRO POOL 1

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth = 0.79" for 50YR event
Inflow = 1.04 cfs @ 12.12 hrs, Volume= 0.185 af
Outflow = 0.03 cfs @ 24.17 hrs, Volume= 0.057 af, Atten= 97%, Lag= 723.0 min
Primary = 0.03 cfs @ 24.17 hrs, Volume= 0.057 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 501.56' @ 24.17 hrs Surf.Area= 3,975 sf Storage= 6,846 cf

Plug-Flow detention time= 748.5 min calculated for 0.057 af (31% of inflow)
Center-of-Mass det. time= 566.6 min (1,479.2 - 912.6)

Volume	Invert	Avail.Storage	Storage Description
#1	497.00'	13,398 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
497.00	150	48.0	0	0	150
498.00	325	66.0	232	232	323
499.90	875	102.0	1,098	1,330	830
500.00	2,895	237.0	179	1,508	4,472
502.00	4,310	276.0	7,158	8,667	6,145
503.00	5,165	294.0	4,731	13,398	7,009

Device	Routing	Invert	Outlet Devices
#1	Primary	498.50'	**15.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 498.50' / 498.00' S= 0.0135 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	500.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	502.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.03 cfs @ 24.17 hrs HW=501.56' TW=498.11' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.03 cfs of 9.22 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 5.93 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 1S: REMAINDER FLOW TO CB3P

Runoff = 0.06 cfs @ 13.94 hrs, Volume= 0.036 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

	Area (sf)	CN	Description
*	2,004	98	Existing roadway, HSG A
	35,850	39	>75% Grass cover, Good, HSG A
	64,959	30	Woods, Good, HSG A
	102,813	34	Weighted Average
	100,809		98.05% Pervious Area
	2,004		1.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1300	0.15		**Sheet Flow, WOODS**
					Woods: Light underbrush n= 0.400 P2= 2.76"
8.1	646	0.0710	1.33		**Shallow Concentrated Flow, WOODS**
					Woodland Kv= 5.0 fps
0.1	45	0.0200	6.13	24.53	**Parabolic Channel, ROADSIDE SWALE**
					W=6.00' D=1.00' Area=4.0 sf Perim=6.4'
					n= 0.025 Earth, clean & winding
19.1	791	Total			

Summary for Pond 2P: CATCH BASIN

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth > 0.21" for 50YR event
Inflow = 0.09 cfs @ 13.90 hrs, Volume= 0.100 af
Outflow = 0.09 cfs @ 13.97 hrs, Volume= 0.100 af, Atten= 0%, Lag= 3.9 min
Discarded = 0.04 cfs @ 13.97 hrs, Volume= 0.066 af
Primary = 0.06 cfs @ 13.97 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 484.41' @ 13.97 hrs Surf.Area= 0.012 ac Storage= 0.002 af
Flood Elev= 488.00' Surf.Area= 0.010 ac Storage= 0.019 af

Plug-Flow detention time= 18.5 min calculated for 0.099 af (100% of inflow)
Center-of-Mass det. time= 16.4 min (1,294.7 - 1,278.3)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	0.017 af	**6.00'W x 75.00'L x 4.00'H Prismatoid**
			0.041 af Overall x 40.0% Voids
#2	484.25'	0.002 af	**15.0" Round Pipe Storage**
			L= 75.0'
		0.019 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	484.30'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 484.30' / 483.80' S= 0.0100 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Discarded	484.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 13.97 hrs HW=484.41' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.06 cfs @ 13.97 hrs HW=484.41' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.06 cfs @ 1.12 fps)

Summary for Subcatchment 2S: FLOW TO WETLAND

Runoff = 0.14 cfs @ 15.14 hrs, Volume= 0.089 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

Area (sf)	CN	Adj	Description
2,004	98		Unconnected roofs, HSG A
1,076	98		Paved parking, HSG A
20,000	39		>75% Grass cover, Good, HSG A
45,170	30		Woods, Good, HSG A
85,506	39		>75% Grass cover, Good, HSG A
161,412	30		Woods, Good, HSG A
315,168	34	33	Weighted Average, UI Adjusted
312,088			99.02% Pervious Area
3,080			0.98% Impervious Area
2,004			65.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	100	0.0800	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
9.5	900	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	365	0.0010	0.49	10.99	**Trap/Vee/Rect Channel Flow,** Bot.W=30.00' D=0.50' Z= 30.0 '/' Top.W=60.00' n= 0.050
35.2	1,365	Total			

Summary for Subcatchment 3S: FLOW TO POND

Runoff = 0.61 cfs @ 12.45 hrs, Volume= 0.119 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

	Area (sf)	CN	Description
	2,004	98	Roofs, HSG A
*	6,098	98	Paved roadway, HSG A
	3,615	98	Paved parking, HSG A
	53,013	39	>75% Grass cover, Good, HSG A
	43,821	30	Woods, Good, HSG A
	108,551	42	Weighted Average
	96,834		89.21% Pervious Area
	11,717		10.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.76"
0.7	90	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	25	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.2	412	0.0300	3.13	9.39	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.050
17.0	627	Total			

Summary for Pond 4P: MICRO POOL POND 2

Inflow Area = 3.161 ac, 18.40% Impervious, Inflow Depth > 0.46" for 50YR event
Inflow = 0.86 cfs @ 12.10 hrs, Volume= 0.121 af
Outflow = 0.03 cfs @ 25.97 hrs, Volume= 0.053 af, Atten= 96%, Lag= 832.3 min
Primary = 0.03 cfs @ 25.97 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 488.25' @ 25.97 hrs Surf.Area= 1,798 sf Storage= 2,949 cf

Plug-Flow detention time= 740.1 min calculated for 0.053 af (44% of inflow)
Center-of-Mass det. time= 359.7 min (1,508.2 - 1,148.5)

Volume	Invert	Avail.Storage	Storage Description
#1	484.00'	4,477 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.00	80	0	0
486.00	460	540	540
486.90	750	544	1,084
487.00	1,051	90	1,175
488.00	1,633	1,342	2,517
489.00	2,288	1,961	4,477

Device	Routing	Invert	Outlet Devices
#1	Primary	484.80'	**15.0" Round Culvert** L= 46.7' Ke= 0.500 Inlet / Outlet Invert= 484.80' / 484.40' S= 0.0086 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	487.00'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	488.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.03 cfs @ 25.97 hrs HW=488.25' TW=484.26' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.03 cfs of 9.87 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 5.30 fps)
3=Orifice/Grate (Weir Controls 0.00 cfs @ 0.16 fps)

Summary for Subcatchment 4S: FLOW TO CB 2P

Runoff = 0.08 cfs @ 12.14 hrs, Volume= 0.010 af, Depth= 0.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

	Area (sf)	CN	Description
*	972	98	Paved roadway, HSG A
	4,670	39	>75% Grass cover, Good, HSG A
	1,650	30	Woods, Good, HSG A
	7,292	45	Weighted Average
	6,320		86.67% Pervious Area
	972		13.33% Impervious Area

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

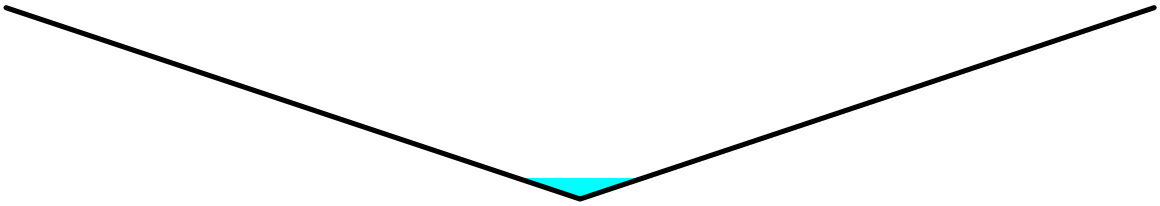
Summary for Reach 5R: ROADSIDE DITCH

Inflow Area = 2.823 ac, 15.41% Impervious, Inflow Depth > 0.24" for 50YR event
Inflow = 0.03 cfs @ 24.17 hrs, Volume= 0.057 af
Outflow = 0.03 cfs @ 24.22 hrs, Volume= 0.057 af, Atten= 0%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.90 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 3.5 min

Peak Storage= 7 cf @ 24.22 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.66'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 11.71 cfs

0.00' x 1.00' deep channel, n= 0.050
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 180.0' Slope= 0.0467 '/'
Inlet Invert= 498.00', Outlet Invert= 489.60'



Summary for Subcatchment 5S: TO LOWER POND

Runoff = 0.86 cfs @ 12.10 hrs, Volume= 0.064 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

Area (sf)	CN	Description
8,362	39	>75% Grass cover, Good, HSG A
6,389	98	Paved parking, HSG A
14,751	65	Weighted Average
8,362		56.69% Pervious Area
6,389		43.31% Impervious Area

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

Summary for Pond 6P: EXISTING EXTENDED CULVERT

Inflow Area = 2.360 ac, 1.95% Impervious, Inflow Depth = 0.18" for 50YR event
Inflow = 0.06 cfs @ 13.94 hrs, Volume= 0.036 af
Outflow = 0.06 cfs @ 13.95 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.6 min
Primary = 0.06 cfs @ 13.95 hrs, Volume= 0.036 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 487.94' @ 13.95 hrs Surf.Area= 42 sf Storage= 6 cf

Plug-Flow detention time= 2.1 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (1,045.3 - 1,043.7)

Volume	Invert	Avail.Storage	Storage Description
#1	487.73'	1,003 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
487.73	12	0	0
488.00	50	8	8
490.00	945	995	1,003

Device	Routing	Invert	Outlet Devices
#1	Primary	487.83'	**15.0" Round Culvert** L= 62.0' Ke= 0.500 Inlet / Outlet Invert= 487.83' / 484.40' S= 0.0553 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.06 cfs @ 13.95 hrs HW=487.94' TW=484.41' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.06 cfs @ 1.13 fps)

Summary for Subcatchment 7S: TO INLET PIPE

Runoff = 0.98 cfs @ 12.10 hrs, Volume= 0.072 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=5.87"

Area (sf)	CN	Description
7,233	98	Paved parking, HSG A
7,166	39	>75% Grass cover, Good, HSG A
14,399	69	Weighted Average
7,166		49.77% Pervious Area
7,233		50.23% Impervious Area

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

Summary for Pond 8P: CULVERT

Inflow Area = 0.331 ac, 50.23% Impervious, Inflow Depth = 2.61" for 50YR event
Inflow = 0.98 cfs @ 12.10 hrs, Volume= 0.072 af
Outflow = 0.98 cfs @ 12.11 hrs, Volume= 0.066 af, Atten= 1%, Lag= 0.7 min
Primary = 0.98 cfs @ 12.11 hrs, Volume= 0.066 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 501.56' @ 24.10 hrs Surf.Area= 250 sf Storage= 253 cf

Plug-Flow detention time= 45.3 min calculated for 0.066 af (92% of inflow)
Center-of-Mass det. time= 4.5 min (846.2 - 841.7)

Volume	Invert	Avail.Storage	Storage Description
#1	499.40'	253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
499.40	25	0	0
500.00	150	53	53
501.00	250	200	253

Device	Routing	Invert	Outlet Devices
#1	Primary	499.40'	**15.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 499.40' / 499.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.96 cfs @ 12.11 hrs HW=499.94' TW=499.17' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.96 cfs @ 2.81 fps)

Summary for Link POA1: POA1 AT KEARSARGE MTN RD

Inflow Area = 5.689 ac, 11.43% Impervious, Inflow Depth = 0.07" for 50YR event
Inflow = 0.06 cfs @ 13.97 hrs, Volume= 0.033 af
Primary = 0.06 cfs @ 13.97 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POA2: AT WETLAND

Inflow Area = 7.235 ac, 0.98% Impervious, Inflow Depth = 0.15" for 50YR event
Inflow = 0.14 cfs @ 15.14 hrs, Volume= 0.089 af
Primary = 0.14 cfs @ 15.14 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

OPERATION AND MAINTENANCE PLAN

STORM-WATER OPERATION AND MAINTENANCE MANUAL

PROPOSED RESIDENTIAL DEVELOPMENT
KEARSARGE MOUNTAIN ROAD
WARNER, NH

February 21, 2024

Owner: Sydney Elizabeth Boyer
Kearsarge Mountain Road
Warner NH 03278

The responsibility of the maintenance and management of the storm-water facilities is the "owner of record"

This manual has been prepared in order to assist in the long term functionality of the storm-water system.

The owner is responsible to construct and maintain the storm-water system in accordance with the approved subdivision plan, and for implementing the requirements of this document. The approved plan is considered to be part of this manual.

This site utilizes forebays, stone lined and grass lined swales, deep sump catch basins and two micro pool extended detention ponds to mitigate the storm-water associated with the building and roadway design.

Owner: Sydney Elizabeth Boyer
Kearsarge Mountain Road
Warner NH 03278

Responsibility: The storm water management facilities proposed to be constructed on the site located off of Kearsarge Mountain Road in Warner NH will remain under the ownership as described above. The owner will be responsible for the continued maintenance of the drainage features particular to this development.

1. Inspection & Maintenance Schedule The storm water management systems on the project consist of a number of different drainage management systems that need to be addressed. The systems on the proposed site consist of one infiltration pond, and two forebays.

Inspections

All of the system's elements must be inspected after a heavy rain storm event. As well as:

- **Micro pool extended detention ponds** should be inspected after major storms and every 6 months for accumulated debris and siltation within the basin as well as debris accumulation on the over flow weir. Woody and herbaceous vegetation should be removed from the rock rip rap with the basin annually. Embankments and slopes will be mowed and woody and herbaceous vegetation shall be removed. Outlet control devices and grates to be inspected for debris and clogging.

- **swales** will
- within the basin or swale as well as debris accumulation on the over flow weir. Woody and herbaceous vegetation shall be removed from swale annually. Embankments and slopes will be mowed and woody and herbaceous vegetation shall be removed. be inspected after major storms and every 6 months for accumulated debris and siltation

- **Forebays** should be inspected after major storms and every 6 months for accumulated sediment and debris. Grass and woody vegetation should be removed from the forebay annually. Staff gage or other measuring device shall be installed to indicate the depth of the sediment.
- **Catch Basins, Drainage Manholes, Pipes and Outlets** – Remove accumulated sediment from the structures and the outlets every year during late winter or early spring. Accumulated sediment shall be disposed of off-site in accordance with applicable local, State and/or Federal guidelines

Maintenance

Sediment and Debris found in any of the storm water management system elements shall be immediately removed and disposed of in a manner consistent with all state and local permits. Wherever damage to slopes, lawns or basins is discovered, such damage shall be repaired immediately, in addition a regular schedule of maintenance shall be followed:

Good Housekeeping

Sanding of drives and walks to be performed as needed, excess sanding to be minimized. Salting to be restricted to potassium chloride only.

Drives & Parking Areas – Remove accumulated sand in the spring of each year. Provide for sweeping of drives at least twice every year in addition to the spring cleaning. Accumulated sediment shall be disposed of to prevent accumulation in the storm water management systems.

Lawns and landscaped areas to be well maintained fall leaves and heavy clippings as well as any loose landscape materials to be raked up and removed to prevent clogging of inlets grates, deep sumps and stone.

Owner: Sydney Elizabeth Boyer
Kearsarge Mountain Road
Warner NH 03278

MAINTENANCE LOG

Any required or completed maintenance is to be recorded and maintained with this manual for perpetuity.

Annually, copies of the completed maintenance logs are to be provided to the Town of Loudon and the Department of Public Works.

Micro pool extended Detention ponds

Maintenance Required: **Mow embankments at least annually to control woody vegetation Remove debris inspect overflow and inlet.**

Work performed by:

Maintenance Competed: _____

Date Completed:_____

Swales:

Maintenance Required:

Control woody vegetation Remove debris and sediment, mow embankments Remove accumulated sediment.

Maintenance Competed: Work performed by: _____
Date Completed: _____

Forebays:

Maintenance Required:

Control woody vegetation Remove debris and sediment, Install gage / measuring device to indicate sediment depth Remove accumulated sediment.

Maintenance Competed: Work performed by: _____
Date Completed: _____

<u>Catch Basins, Drainage Manholes, Pipes and Outlets</u>:

Maintenance
Required:

- Remove accumulated sediment from the structures and the outlets every year during late winter or early spring. Accumulated sediment shall be disposed of off-site in accordance with applicable local, State and/or Federal guidelines

.

Maintenance Competed: Work performed by: _____
Date Completed: _____

Good Housekeeping Practices:

Maintenance
Required: **Roadways – Sweeping of drives.**
Fall and Spring clean up

Maintenance Competed: Work performed by: _____

Date Completed: _____

DRAINAGE AREA PLANS