DRAINAGE REPORT

Prepared for:

BW2 LLC
c/o Housing Initiatives of New England Corp.
264 US Route 1
Building 300 Suite 2A
Scarborough, ME 04074

TAX MAP 2 LOT 10-4

Prepared on:

June 8, 2020

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL

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1. Project Background / Purpose

The subject parcel is located in the Professional Office district at 38 Madbury Road. The parcel has been owned by Housing Initiatives of New England Corp. (HINEC) since 1994. The existing building was originally constructed in about 1982. The intent of this project is to permit the expansion of the existing senior living community currently known as Bagdad Wood. The existing three-story building has 40 affordable senior apartments and the proposal is to construct a three-story addition on the southeasterly side of the existing building with an additional 26 senior living units. The building footprint will be approximately 8800 SF and add an additional 33 parking spaces. The parcel is "ell" shaped and bordered by three streets, on the west by Madbury Road, the northwest by Bagdad Road and on the north and east by Dennison Road. The existing building is set to the northerly corner of the property against Bagdad and Dennison Road, but the parcel is accessed from Madbury Road. There is a two-lane driveway leading into the property with a circular turn around for pickup and drop off and there is an existing parking lot with 41 parking spaces. The developed portion of the parcel is surrounded on all sides by a wooded/lawn buffer. The proposed development will increase the impervious surface ratio to approximately 49%. To minimize the impact of the proposed development a stormwater collection and treatment system is included in the site design meeting the site plan requirements.

2. Methodology

The watershed areas have been determined via inspection by our office and a topographical survey of the site. This analysis utilizes HydroCAD modeling software which models the runoff based on the SCS TR-20 method and the time of concentration based on the SCS TR-55 method. This analysis compares the runoff rates for the 1-inch, 2, 10, and 25-year USDA/SCS Type III 24-hour extreme storm events. The rainfall data used in the model is referenced from the Cornell extreme precipitation rainfall table found in Appendix D of this report.

3. Soils

The soils on site consist mostly of very rocky fine sandy loam and silt loam. The soils in this analysis have been identified in NRCS Web Soil Survey. Test pits showed that the soils in the area of the development are more typical of a Hollis soil. The soils present were determined to be HSG B, based on the criteria set in the National Engineering Handbook (Part 630, Chapter 7 Hydrologic Soil Groups) and the soil values from SSSNNE publication Ksat Values for New Hampshire Soils.

4. Pre-Development Conditions

The enclosed Pre-Development portion of the Drainage Plan (Appendix B) depicts the contributing runoff area of the property. The watershed areas have been determined via inspection by our office as well as a topographical survey. The watershed boundary only encompasses areas that are directly impacted by the development of the site.

The parcel has an existing parking lot that drains primarily two catch basins. There are additional catch basins that capture runoff from the driveway and runoff from the south west portion of the existing building. These catch basins are all connected by storm sewer to a catch basin located to the west in Madbury Road. The runoff from the unpaved/undisturbed areas to the

south and east of the existing parking lot drain towards the south of the property into abutting lots. The runoff from the north and east portions of the existing building drains north, travelling parallel to Dennison Road to two beehive grates that are connected to the storm sewer.

The cover types used in the model are impervious and lawn areas. The lawn areas are considered to be in good condition.

The hydrologic analysis of the existing runoff conditions is provided as HydroCAD report PRE output in Appendix B.

5. Post-Development Conditions

The proposal includes the construction of a new parking lot with a net of 41 spaces on Lot 55.

The location of the POA used in the Pre-Development Analysis has been maintained for the Post-Development Analysis. The hydrologic evaluation of the proposed runoff conditions is provided in the enclosed HydroCAD report POST output (Appendix C). The subcatchment areas have changed to reflect the proposed grading of the site. The overall outer boundary has been maintained. The soil types are the same as in the Pre-Development. The cover types have been modified to show the new areas of impervious surface.

The existing parking lot has been expanded to the south and east, while portions in the north will be removed to construct the building expansion. The existing catch basins have been reused to capture runoff from the northwest portion of the proposed parking lot. The southern portion of the lot drains towards the proposed stormwater pond (13P). This pond outlets into the existing catch basin (2P). The northwest and southwest portions of the parking lot drain to ponds 15P and 14P respectively. These ponds buffer the peak flows and allow for infiltration and outlet towards Dennison Road. The building expansion to the southwest of the existing building drains into the existing storm sewer. The eastern portion of the expansion will drain to a proposed pond (16P)

The design infiltration rate is taken as the saturated hydraulic conductivity (Ksat) for the limiting layer of the Hollis-Charlton soil series, which 0.6 inches per hour in accordance with SSSNNE Ksat values.

The hydrologic analysis of the proposed runoff conditions is provided in Appendix C.

6. Comparison of Pre- and Post-Development Conditions

The following tables quantify the peak rate of discharge and discharge volume leaving the parcel as shown on the Pre- and Post-Development Drainage Plan. The analysis has been modeled using the extreme rainfall quantities.

Table 1: Peak Rate of Runoff in cubic feet per second (CFS)

	Design Storm Event							
	1"		2-year		10-year		25-year	
POA	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	**0.41**	0.35	**2.66**	2.59	**4.56**	4.49	**6.08**	6.01
2	0.00	0.00	0.53	**0.56**	1.26	**1.28**	1.91	1.91
3	0.00	0.00	**0.18**	0.08	**0.45**	0.27	**0.70**	0.45
4	0.00	0.00	**0.14**	0.00	**0.56**	0.00	**0.97**	0.00
5	0.00	0.00	**0.12**	0.15	**0.53**	0.50	**0.95**	0.86
6	0.00	0.00	**0.09**	0.00	**0.29**	0.06	**0.49**	0.37

Table 2: Discharge Runoff Volume in cubic feet (CF)

	Design Storm Event			
	1"	2-year	10-year	25-year
POA	Pre / Post	Pre / Post	Pre / Post	Pre / Post
1	**1247** / 1171	7691 / **8237**	13360 / **15428**	17991 / **21483**
2	34 / **43**	1825 / **1862**	4057 / **4059**	**6056** / 6009
3	**5** / 0	**520** / 283	**1195** / 742	**1808** / 1179
4	0 / 0	**678** / 0	**1923** / 0	**3150** / 0
5	0 / 0	560 / **597**	1638 / **2228**	2711 / **3828**
6	0 / 0	**352** / 0	**944** / 344	**1516** / 1067
SUM	**1286** / 1214	**11626** / 10979	**23117** / 22801	33232 / **33566**

There is a reduction in the peak rate of runoff during all the design storm events at all points of analysis except for POA2. At this point, the flows in the pre- and post- development conditions are nearly equal or have a negligible increase (0.03 cfs). The reduction in peak rate of discharge is attributed to stormwater ponds, which provides peak flow attenuation and volume reduction.

During a 25-year storm the runoff volume from the entire parcel increased approximately 1% (334 cf) while runoff volumes are decreased for smaller storm events. Although overall runoff volumes are generally decreasing on net, there are increases of runoff at certain locations on the parcel. Primarily, the runoff routed to POA1 through the existing storm sewer has been increased.

7. WQV Calculations

The groundwater recharge volume (GRV) based on the NHDES requirement is calculated by applying a factor to the area of soil replaced by impervious surfaces. A factor of 0.25 is applied to HSG B soils. The required volume to be infiltrated for this project is as follows;

Proposed impervious area: 15,991 sf HSG B Soil
15,991 sf x 0.25 x (1'/12") = 333 cf

Table 3: Sum Stormwater Pond Infiltration Volume	
Storm	Volume Infiltrated (cf)
1 inch	117
2 Year	2,850
10 Year	3,830
25 Year	4,037

As shown in Table 3, the stormwater ponds infiltrate the required GRV.

8. Erosion & Sediment Control

Temporary and permanent practices are used to prevent and minimize erosion and sedimentation on site. The installation of Silt Soxx at the perimeter of construction areas will provide sediment retention during the construction phase of the development. Erosion control matting is proposed on all spillways, steep slopes and swales to prevent erosion prior to the establishment of permanent vegetation. In addition, stone check dams will be used to help control erosion in the treatment swale.

9. Conclusion

The enclosed comparative hydrologic model provides sufficient evidence that the stormwater design will mitigate the typical increase in peak rate of stormwater discharge resulting from the proposed development of the site. Stormwater treatment practices will provide treatment of runoff from proposed paved surfaces. The use of erosion and sediment controls and proper construction practices will minimize the impact of this project to downstream surface waters.

APPENDIX A

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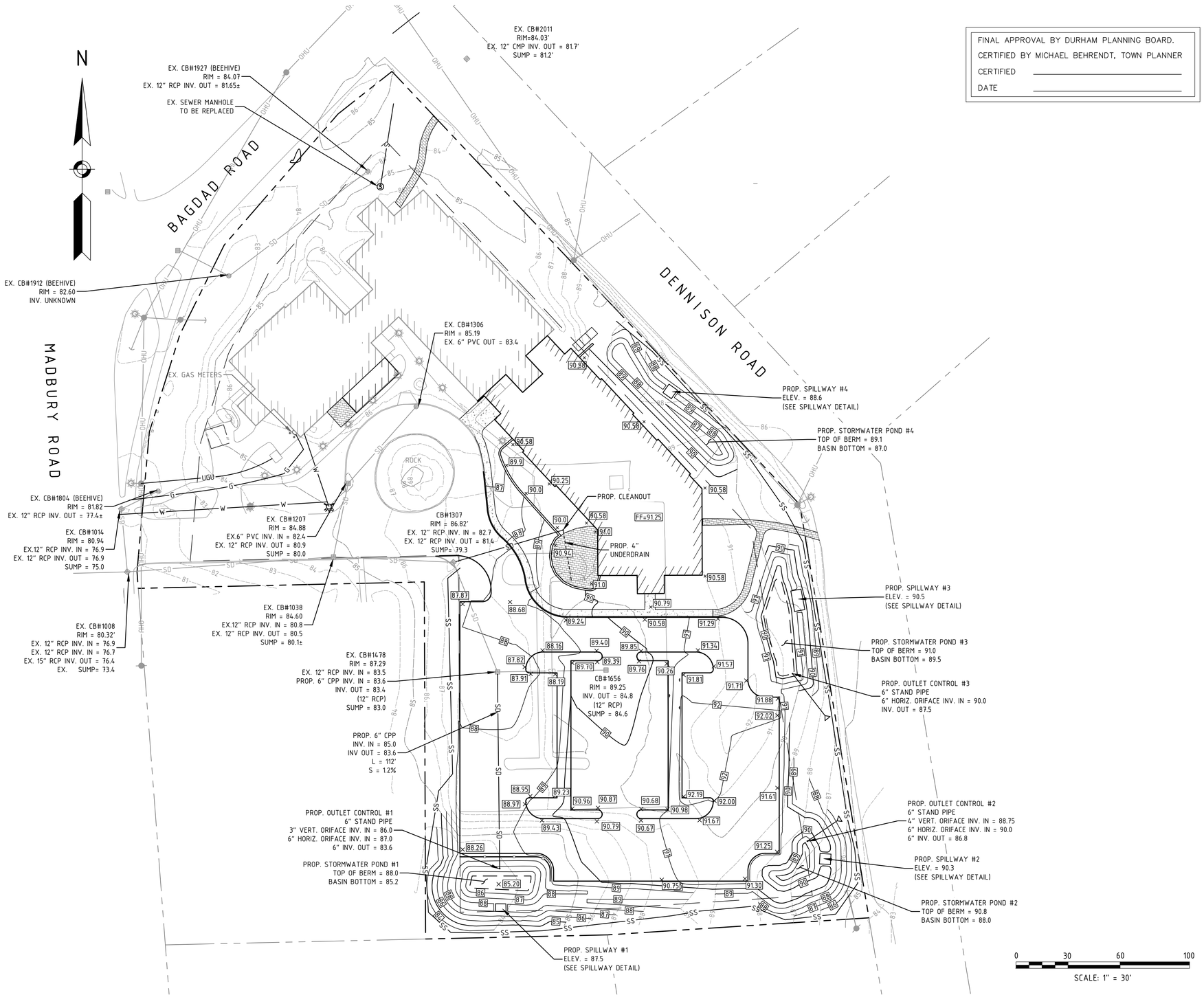

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

NOTES:

1. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVABLE PHYSICAL EVIDENCE, NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.
2. GEOSYNTHETIC FILTER BAGS SHOULD BE INSTALLED IN ALL CATCH BASINS LOCATED NEAR THE WORKING AREA. SEE DETAIL FOR MOST INFORMATION.

NO.	REVISIONS	DATE	INT.
0.	INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD	6/3/20	MCS

SEAL

DATE ISSUED: 6/3/20
SCALE: 1"=30'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19057 CivilD.dwg

UTILITIES & GRADING PLAN

prepared for
BW2 LLC C/O
HOUSING INITIATIVES OF NEW ENGLAND
TAX MAP 2, LOT 10-4
BAGDAD ROAD, DURHAM, NH

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JOB: 19-057

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APPENDIX B

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N

BAGDAD ROAD

MADBURY ROAD

DENNISON ROAD

POA1

POA2

POA3

POA4

POA5

POA6

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1P 2P 3P 4P 5P 6P 7P 8P 9P 10P

ROCK

LEGEND

SUBCATCHMENT

POND / CATCH BASIN

REACH

POINT OF ANALYSIS

POA#

TIME OF CONCENTRATION TRAVEL PATH

0 30 60 100

SCALE: 1" = 30'

NO.	DATE	INT.
0.	6/3/20	MCS

REVISIONS

INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD

SEAL

DATE ISSUED: 6/3/20
SCALE: 1"=30'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19057 Civil3D.dwg

PRE-DEVELOPMENT
DRAINAGE PLAN
prepared for
BW2 LLC C/O
HOUSING INITIATIVES OF NEW ENGLAND
TAX MAP 2, LOT 10-4
BAGDAD ROAD, DURHAM, NH

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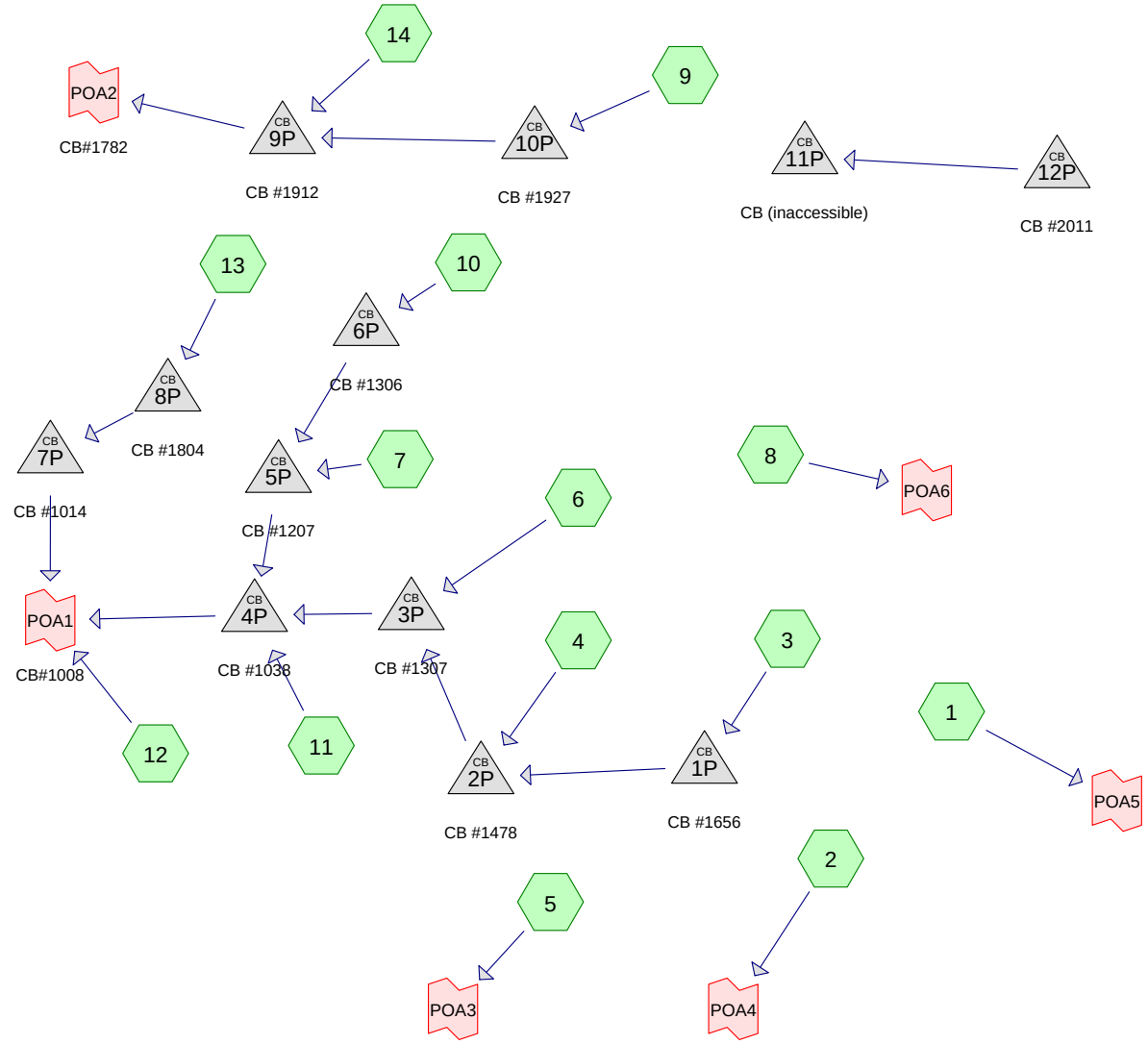
JOB: 19-057

PRE



Subcat Reach Pond Link

Routing Diagram for 19057 PreB

Prepared by MJS Engineering, PC, Printed 6/8/2020

HydroCAD® 10.00-25 s/n 08064 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
74,946	61	>75% Grass cover, Good, HSG B (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14)
44,692	98	Roofs, HSG B (2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14)
119,638	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
119,638	HSG B	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
0	HSG C	
0	HSG D	
0	Other	
119,638		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	74,946	0	0	0	74,946	>75% Grass cover, Good
0	44,692	0	0	0	44,692	Roofs
0	**119,638**	**0**	**0**	**0**	**119,638**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 1: Runoff Area=0.371 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=90' Slope=0.1800 '/' Tc=2.6 min CN=61 Runoff=0.00 cfs 0 cf

Subcatchment 2: Runoff Area=0.414 ac 2.52% Impervious Runoff Depth=0.00"
Flow Length=320' Tc=6.3 min CN=62 Runoff=0.00 cfs 0 cf

Subcatchment 3: Runoff Area=6,828 sf 99.88% Impervious Runoff Depth=0.79"
Flow Length=75' Slope=0.0150 '/' Tc=1.0 min CN=98 Runoff=0.17 cfs 450 cf

Subcatchment 4: Runoff Area=6,851 sf 84.22% Impervious Runoff Depth=0.40"
Flow Length=140' Tc=1.2 min CN=92 Runoff=0.09 cfs 230 cf

Subcatchment 5: Runoff Area=7,463 sf 27.18% Impervious Runoff Depth=0.01"
Flow Length=100' Tc=1.0 min CN=71 Runoff=0.00 cfs 5 cf

Subcatchment 6: Runoff Area=1,346 sf 68.49% Impervious Runoff Depth=0.20"
Flow Length=90' Tc=5.4 min CN=86 Runoff=0.01 cfs 22 cf

Subcatchment 7: Runoff Area=7,428 sf 79.39% Impervious Runoff Depth=0.32"
Flow Length=190' Tc=1.5 min CN=90 Runoff=0.07 cfs 198 cf

Subcatchment 8: Runoff Area=8,010 sf 8.04% Impervious Runoff Depth=0.00"
Flow Length=90' Tc=5.3 min CN=64 Runoff=0.00 cfs 0 cf

Subcatchment 9: Runoff Area=13,797 sf 26.79% Impervious Runoff Depth=0.01"
Flow Length=240' Tc=6.4 min CN=71 Runoff=0.00 cfs 9 cf

Subcatchment 10: Runoff Area=10,804 sf 67.60% Impervious Runoff Depth=0.20"
Flow Length=100' Slope=0.0300 '/' Tc=3.9 min CN=86 Runoff=0.05 cfs 178 cf

Subcatchment 11: Runoff Area=866 sf 97.80% Impervious Runoff Depth=0.71"
Flow Length=60' Slope=0.0300 '/' Tc=0.7 min CN=97 Runoff=0.02 cfs 51 cf

Subcatchment 12: Runoff Area=6,230 sf 67.94% Impervious Runoff Depth=0.20"
Flow Length=180' Tc=1.1 min CN=86 Runoff=0.03 cfs 103 cf

Subcatchment 13: Runoff Area=5,927 sf 38.23% Impervious Runoff Depth=0.03"
Flow Length=110' Tc=2.3 min CN=75 Runoff=0.00 cfs 15 cf

Subcatchment 14: Runoff Area=9,896 sf 38.54% Impervious Runoff Depth=0.03"
Flow Length=85' Tc=7.0 min CN=75 Runoff=0.00 cfs 25 cf

Pond 1P: CB #1656 Peak Elev=89.26' Inflow=0.17 cfs 450 cf
Outflow=0.17 cfs 450 cf

Pond 2P: CB #1478 Peak Elev=87.30' Inflow=0.25 cfs 680 cf
Outflow=0.25 cfs 680 cf

Pond 3P: CB #1307 Peak Elev=86.90' Inflow=0.26 cfs 702 cf
Outflow=0.26 cfs 702 cf

Pond 4P: CB #1038 Peak Elev=84.61' Inflow=0.38 cfs 1,129 cf
Outflow=0.38 cfs 1,129 cf

Pond 5P: CB #1207 Peak Elev=84.89' Inflow=0.11 cfs 376 cf
Outflow=0.11 cfs 376 cf

Pond 6P: CB #1306 Peak Elev=85.19' Inflow=0.05 cfs 178 cf
Outflow=0.05 cfs 178 cf

Pond 7P: CB #1014 Peak Elev=80.95' Inflow=0.00 cfs 15 cf
Outflow=0.00 cfs 15 cf

Pond 8P: CB #1804 Peak Elev=81.82' Inflow=0.00 cfs 15 cf
Outflow=0.00 cfs 15 cf

Pond 9P: CB #1912 Peak Elev=82.60' Inflow=0.00 cfs 34 cf
Outflow=0.00 cfs 34 cf

Pond 10P: CB #1927 Peak Elev=84.07' Inflow=0.00 cfs 9 cf
Outflow=0.00 cfs 9 cf

Pond 11P: CB (inaccessible) Peak Elev=81.54' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.025 L=66.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 12P: CB #2011 Peak Elev=0.00'
Primary=0.00 cfs 0 cf

Link POA1: CB#1008 Inflow=0.41 cfs 1,247 cf
Primary=0.41 cfs 1,247 cf

Link POA2: CB#1782 Inflow=0.00 cfs 34 cf
Primary=0.00 cfs 34 cf

Link POA3: Inflow=0.00 cfs 5 cf
Primary=0.00 cfs 5 cf

Link POA4: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA5: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA6: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 119,638 sf Runoff Volume = 1,285 cf Average Runoff Depth = 0.13"
62.64% Pervious = 74,946 sf 37.36% Impervious = 44,692 sf

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 1: Runoff Area=0.371 ac 0.00% Impervious Runoff Depth=0.42"
Flow Length=90' Slope=0.1800 '/' Tc=2.6 min CN=61 Runoff=0.12 cfs 560 cf

Subcatchment 2: Runoff Area=0.414 ac 2.52% Impervious Runoff Depth=0.45"
Flow Length=320' Tc=6.3 min CN=62 Runoff=0.14 cfs 678 cf

Subcatchment 3: Runoff Area=6,828 sf 99.88% Impervious Runoff Depth=2.90"
Flow Length=75' Slope=0.0150 '/' Tc=1.0 min CN=98 Runoff=0.57 cfs 1,649 cf

Subcatchment 4: Runoff Area=6,851 sf 84.22% Impervious Runoff Depth=2.28"
Flow Length=140' Tc=1.2 min CN=92 Runoff=0.49 cfs 1,304 cf

Subcatchment 5: Runoff Area=7,463 sf 27.18% Impervious Runoff Depth=0.84"
Flow Length=100' Tc=1.0 min CN=71 Runoff=0.18 cfs 520 cf

Subcatchment 6: Runoff Area=1,346 sf 68.49% Impervious Runoff Depth=1.77"
Flow Length=90' Tc=5.4 min CN=86 Runoff=0.07 cfs 199 cf

Subcatchment 7: Runoff Area=7,428 sf 79.39% Impervious Runoff Depth=2.10"
Flow Length=190' Tc=1.5 min CN=90 Runoff=0.49 cfs 1,302 cf

Subcatchment 8: Runoff Area=8,010 sf 8.04% Impervious Runoff Depth=0.53"
Flow Length=90' Tc=5.3 min CN=64 Runoff=0.09 cfs 352 cf

Subcatchment 9: Runoff Area=13,797 sf 26.79% Impervious Runoff Depth=0.84"
Flow Length=240' Tc=6.4 min CN=71 Runoff=0.28 cfs 962 cf

Subcatchment 10: Runoff Area=10,804 sf 67.60% Impervious Runoff Depth=1.77"
Flow Length=100' Slope=0.0300 '/' Tc=3.9 min CN=86 Runoff=0.56 cfs 1,598 cf

Subcatchment 11: Runoff Area=866 sf 97.80% Impervious Runoff Depth=2.79"
Flow Length=60' Slope=0.0300 '/' Tc=0.7 min CN=97 Runoff=0.07 cfs 201 cf

Subcatchment 12: Runoff Area=6,230 sf 67.94% Impervious Runoff Depth=1.77"
Flow Length=180' Tc=1.1 min CN=86 Runoff=0.35 cfs 921 cf

Subcatchment 13: Runoff Area=5,927 sf 38.23% Impervious Runoff Depth=1.05"
Flow Length=110' Tc=2.3 min CN=75 Runoff=0.18 cfs 517 cf

Subcatchment 14: Runoff Area=9,896 sf 38.54% Impervious Runoff Depth=1.05"
Flow Length=85' Tc=7.0 min CN=75 Runoff=0.26 cfs 863 cf

Pond 1P: CB #1656 Peak Elev=89.27' Inflow=0.57 cfs 1,649 cf
Outflow=0.57 cfs 1,649 cf

Pond 2P: CB #1478 Peak Elev=87.32' Inflow=1.05 cfs 2,953 cf
Outflow=1.05 cfs 2,953 cf

Pond 3P: CB #1307 Peak Elev=87.04' Inflow=1.10 cfs 3,152 cf
Outflow=1.10 cfs 3,152 cf

Pond 4P: CB #1038 Peak Elev=84.65' Inflow=2.13 cfs 6,253 cf
Outflow=2.13 cfs 6,253 cf

Pond 5P: CB #1207 Peak Elev=84.91' Inflow=1.00 cfs 2,900 cf
Outflow=1.00 cfs 2,900 cf

Pond 6P: CB #1306 Peak Elev=85.68' Inflow=0.56 cfs 1,598 cf
Outflow=0.56 cfs 1,598 cf

Pond 7P: CB #1014 Peak Elev=80.96' Inflow=0.18 cfs 517 cf
Outflow=0.18 cfs 517 cf

Pond 8P: CB #1804 Peak Elev=81.86' Inflow=0.18 cfs 517 cf
Outflow=0.18 cfs 517 cf

Pond 9P: CB #1912 Peak Elev=82.69' Inflow=0.53 cfs 1,825 cf
Outflow=0.53 cfs 1,825 cf

Pond 10P: CB #1927 Peak Elev=84.13' Inflow=0.28 cfs 962 cf
Outflow=0.28 cfs 962 cf

Pond 11P: CB (inaccessible) Peak Elev=81.54' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.025 L=66.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 12P: CB #2011 Peak Elev=0.00'
Primary=0.00 cfs 0 cf

Link POA1: CB#1008 Inflow=2.66 cfs 7,691 cf
Primary=2.66 cfs 7,691 cf

Link POA2: CB#1782 Inflow=0.53 cfs 1,825 cf
Primary=0.53 cfs 1,825 cf

Link POA3: Inflow=0.18 cfs 520 cf
Primary=0.18 cfs 520 cf

Link POA4: Inflow=0.14 cfs 678 cf
Primary=0.14 cfs 678 cf

Link POA5: Inflow=0.12 cfs 560 cf
Primary=0.12 cfs 560 cf

Link POA6: Inflow=0.09 cfs 352 cf
Primary=0.09 cfs 352 cf

Total Runoff Area = 119,638 sf Runoff Volume = 11,626 cf Average Runoff Depth = 1.17"
62.64% Pervious = 74,946 sf 37.36% Impervious = 44,692 sf

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 1: Runoff Area=0.371 ac 0.00% Impervious Runoff Depth=2.01"
Flow Length=90' Slope=0.1800 '/' Tc=2.6 min CN=61 Runoff=0.95 cfs 2,711 cf

Subcatchment 2: Runoff Area=0.414 ac 2.52% Impervious Runoff Depth=2.10"
Flow Length=320' Tc=6.3 min CN=62 Runoff=0.97 cfs 3,150 cf

Subcatchment 3: Runoff Area=6,828 sf 99.88% Impervious Runoff Depth=5.77"
Flow Length=75' Slope=0.0150 '/' Tc=1.0 min CN=98 Runoff=1.10 cfs 3,284 cf

Subcatchment 4: Runoff Area=6,851 sf 84.22% Impervious Runoff Depth=5.08"
Flow Length=140' Tc=1.2 min CN=92 Runoff=1.04 cfs 2,900 cf

Subcatchment 5: Runoff Area=7,463 sf 27.18% Impervious Runoff Depth=2.91"
Flow Length=100' Tc=1.0 min CN=71 Runoff=0.70 cfs 1,808 cf

Subcatchment 6: Runoff Area=1,346 sf 68.49% Impervious Runoff Depth=4.42"
Flow Length=90' Tc=5.4 min CN=86 Runoff=0.16 cfs 496 cf

Subcatchment 7: Runoff Area=7,428 sf 79.39% Impervious Runoff Depth=4.86"
Flow Length=190' Tc=1.5 min CN=90 Runoff=1.09 cfs 3,006 cf

Subcatchment 8: Runoff Area=8,010 sf 8.04% Impervious Runoff Depth=2.27"
Flow Length=90' Tc=5.3 min CN=64 Runoff=0.49 cfs 1,516 cf

Subcatchment 9: Runoff Area=13,797 sf 26.79% Impervious Runoff Depth=2.91"
Flow Length=240' Tc=6.4 min CN=71 Runoff=1.06 cfs 3,342 cf

Subcatchment 10: Runoff Area=10,804 sf 67.60% Impervious Runoff Depth=4.42"
Flow Length=100' Slope=0.0300 '/' Tc=3.9 min CN=86 Runoff=1.35 cfs 3,979 cf

Subcatchment 11: Runoff Area=866 sf 97.80% Impervious Runoff Depth=5.65"
Flow Length=60' Slope=0.0300 '/' Tc=0.7 min CN=97 Runoff=0.14 cfs 408 cf

Subcatchment 12: Runoff Area=6,230 sf 67.94% Impervious Runoff Depth=4.42"
Flow Length=180' Tc=1.1 min CN=86 Runoff=0.86 cfs 2,294 cf

Subcatchment 13: Runoff Area=5,927 sf 38.23% Impervious Runoff Depth=3.29"
Flow Length=110' Tc=2.3 min CN=75 Runoff=0.60 cfs 1,625 cf

Subcatchment 14: Runoff Area=9,896 sf 38.54% Impervious Runoff Depth=3.29"
Flow Length=85' Tc=7.0 min CN=75 Runoff=0.85 cfs 2,714 cf

Pond 1P: CB #1656 Peak Elev=89.28' Inflow=1.10 cfs 3,284 cf
Outflow=1.10 cfs 3,284 cf

Pond 2P: CB #1478 Peak Elev=87.67' Inflow=2.14 cfs 6,184 cf
Outflow=2.14 cfs 6,184 cf

Pond 3P: CB #1307 Peak Elev=87.17' Inflow=2.26 cfs 6,680 cf
Outflow=2.26 cfs 6,680 cf

Pond 4P: CB #1038 Peak Elev=84.84' Inflow=4.65 cfs 14,072 cf
Outflow=4.65 cfs 14,072 cf

Pond 5P: CB #1207 Peak Elev=85.71' Inflow=2.33 cfs 6,984 cf
Outflow=2.33 cfs 6,984 cf

Pond 6P: CB #1306 Peak Elev=90.21' Inflow=1.35 cfs 3,979 cf
Outflow=1.35 cfs 3,979 cf

Pond 7P: CB #1014 Peak Elev=80.97' Inflow=0.60 cfs 1,625 cf
Outflow=0.60 cfs 1,625 cf

Pond 8P: CB #1804 Peak Elev=81.91' Inflow=0.60 cfs 1,625 cf
Outflow=0.60 cfs 1,625 cf

Pond 9P: CB #1912 Peak Elev=82.80' Inflow=1.91 cfs 6,056 cf
Outflow=1.91 cfs 6,056 cf

Pond 10P: CB #1927 Peak Elev=84.21' Inflow=1.06 cfs 3,342 cf
Outflow=1.06 cfs 3,342 cf

Pond 11P: CB (inaccessible) Peak Elev=81.54' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.025 L=66.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 12P: CB #2011 Peak Elev=0.00'
Primary=0.00 cfs 0 cf

Link POA1: CB#1008 Inflow=6.08 cfs 17,991 cf
Primary=6.08 cfs 17,991 cf

Link POA2: CB#1782 Inflow=1.91 cfs 6,056 cf
Primary=1.91 cfs 6,056 cf

Link POA3: Inflow=0.70 cfs 1,808 cf
Primary=0.70 cfs 1,808 cf

Link POA4: Inflow=0.97 cfs 3,150 cf
Primary=0.97 cfs 3,150 cf

Link POA5: Inflow=0.95 cfs 2,711 cf
Primary=0.95 cfs 2,711 cf

Link POA6: Inflow=0.49 cfs 1,516 cf
Primary=0.49 cfs 1,516 cf

Total Runoff Area = 119,638 sf Runoff Volume = 33,232 cf Average Runoff Depth = 3.33"
62.64% Pervious = 74,946 sf 37.36% Impervious = 44,692 sf

Summary for Subcatchment 1:

Runoff = 0.53 cfs @ 12.05 hrs, Volume= 1,638 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.371	61	>75% Grass cover, Good, HSG B
0.371		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	50	0.1800	0.35		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
0.2	40	0.1800	2.97		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
2.6	90	Total			

Summary for Subcatchment 2:

Runoff = 0.56 cfs @ 12.10 hrs, Volume= 1,923 cf, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.010	98	Roofs, HSG B
0.403	61	>75% Grass cover, Good, HSG B
0.001	98	Roofs, HSG B
0.414	62	Weighted Average
0.403		97.48% Pervious Area
0.010		2.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	20	0.0500	0.18		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
2.6	140	0.0100	0.90		**Shallow Concentrated Flow, B-->C** Cultivated Straight Rows Kv= 9.0 fps
1.8	160	0.0440	1.47		**Shallow Concentrated Flow, C-->D** Short Grass Pasture Kv= 7.0 fps
6.3	320	Total			

Summary for Subcatchment 3:

Runoff = 0.87 cfs @ 12.01 hrs, Volume= 2,562 cf, Depth= 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
6,819	98	Roofs, HSG B
8	61	>75% Grass cover, Good, HSG B
6,828	98	Weighted Average
8		0.12% Pervious Area
6,819		99.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, B-->C** Paved Kv= 20.3 fps
1.0	75	Total			

Summary for Subcatchment 4:

Runoff = 0.80 cfs @ 12.02 hrs, Volume= 2,190 cf, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
8	98	Roofs, HSG B
5,762	98	Roofs, HSG B
1,081	61	>75% Grass cover, Good, HSG B
6,851	92	Weighted Average
1,081		15.78% Pervious Area
5,770		84.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.6	90	0.0150	2.49		**Shallow Concentrated Flow, B-->C** Paved Kv= 20.3 fps
1.2	140	Total			

Summary for Subcatchment 5:

Runoff = 0.45 cfs @ 12.02 hrs, Volume= 1,195 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
2,028	98	Roofs, HSG B
3,268	61	>75% Grass cover, Good, HSG B
398	61	>75% Grass cover, Good, HSG B
1,769	61	>75% Grass cover, Good, HSG B
7,463	71	Weighted Average
5,434		72.82% Pervious Area
2,028		27.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.39		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.2	30	0.0100	2.03		**Shallow Concentrated Flow, B-->C** Paved Kv= 20.3 fps
0.2	20	0.1000	2.21		**Shallow Concentrated Flow, C-->D** Short Grass Pasture Kv= 7.0 fps
1.0	100	Total			

Summary for Subcatchment 6:

Runoff = 0.12 cfs @ 12.08 hrs, Volume= 362 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
416	61	>75% Grass cover, Good, HSG B
8	61	>75% Grass cover, Good, HSG B
922	98	Roofs, HSG B
1,346	86	Weighted Average
424		31.51% Pervious Area
922		68.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0300	1.06		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
5.0	37	0.0150	0.12		**Sheet Flow, B-->C** Grass: Short n= 0.150 P2= 3.13"
0.2	40	0.0300	3.52		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
5.4	90	Total			

Summary for Subcatchment 7:

Runoff = 0.83 cfs @ 12.02 hrs, Volume= 2,244 cf, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
11	61	>75% Grass cover, Good, HSG B
5	61	>75% Grass cover, Good, HSG B
5,897	98	Roofs, HSG B
47	61	>75% Grass cover, Good, HSG B
503	61	>75% Grass cover, Good, HSG B
966	61	>75% Grass cover, Good, HSG B
7,428	90	Weighted Average
1,531		20.61% Pervious Area
5,897		79.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0167	1.10		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.7	140	0.0250	3.21		**Shallow Concentrated Flow, B-->C** Paved Kv= 20.3 fps
1.5	190	Total			

Summary for Subcatchment 8:

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 944 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
567	98	Roofs, HSG B
7,367	61	>75% Grass cover, Good, HSG B
77	98	Roofs, HSG B
8,010	64	Weighted Average
7,367		91.96% Pervious Area
644		8.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0300	0.17		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
0.5	40	0.0400	1.40		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
5.3	90	Total			

Summary for Subcatchment 9:

Runoff = 0.69 cfs @ 12.10 hrs, Volume= 2,210 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
10,102	61	>75% Grass cover, Good, HSG B
3,696	98	Roofs, HSG B
13,797	71	Weighted Average
10,102		73.21% Pervious Area
3,696		26.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	20	0.1500	0.27		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
5.2	220	0.0100	0.70		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
6.4	240	Total			

Summary for Subcatchment 10:

Runoff = 1.00 cfs @ 12.06 hrs, Volume= 2,904 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
7,303	98	Roofs, HSG B
1,356	61	>75% Grass cover, Good, HSG B
40	61	>75% Grass cover, Good, HSG B
297	61	>75% Grass cover, Good, HSG B
649	61	>75% Grass cover, Good, HSG B
38	61	>75% Grass cover, Good, HSG B
623	61	>75% Grass cover, Good, HSG B
95	61	>75% Grass cover, Good, HSG B
402	61	>75% Grass cover, Good, HSG B
0	61	>75% Grass cover, Good, HSG B
10,804	86	Weighted Average
3,501		32.40% Pervious Area
7,303		67.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0300	1.01		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
3.2	30	0.0300	0.16		**Sheet Flow, B-->C** Grass: Short n= 0.150 P2= 3.13"
0.3	20	0.0300	1.21		**Shallow Concentrated Flow, C-->D** Short Grass Pasture Kv= 7.0 fps
0.2	40	0.0300	3.52		**Shallow Concentrated Flow, D-->E** Paved Kv= 20.3 fps
3.9	100	Total			

Summary for Subcatchment 11:

Runoff = 0.11 cfs @ 12.01 hrs, Volume= 317 cf, Depth= 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
847	98	Roofs, HSG B
2	61	>75% Grass cover, Good, HSG B
0	61	>75% Grass cover, Good, HSG B
17	61	>75% Grass cover, Good, HSG B
866	97	Weighted Average
19		2.20% Pervious Area
847		97.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0300	1.44		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"

Summary for Subcatchment 12:

Runoff = 0.64 cfs @ 12.02 hrs, Volume= 1,674 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
4,224	98	Roofs, HSG B
1	61	>75% Grass cover, Good, HSG B
2	61	>75% Grass cover, Good, HSG B
9	98	Roofs, HSG B
16	61	>75% Grass cover, Good, HSG B
1,348	61	>75% Grass cover, Good, HSG B
630	61	>75% Grass cover, Good, HSG B
6,230	86	Weighted Average
1,998		32.06% Pervious Area
4,232		67.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.5	60	0.0800	1.98		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
0.4	90	0.0400	4.06		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
1.1	180	Total			

Summary for Subcatchment 13:

Runoff = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
1	98	Roofs, HSG B
2,244	98	Roofs, HSG B
0	98	Roofs, HSG B
1	98	Roofs, HSG B
20	98	Roofs, HSG B
2,803	61	>75% Grass cover, Good, HSG B
513	61	>75% Grass cover, Good, HSG B
178	61	>75% Grass cover, Good, HSG B
167	61	>75% Grass cover, Good, HSG B
5,927	75	Weighted Average
3,661		61.77% Pervious Area
2,266		38.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	35	0.1200	2.26		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
1.5	15	0.0500	0.17		**Sheet Flow, B-->C** Grass: Short n= 0.150 P2= 3.13"
0.1	20	0.0500	4.54		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
0.4	40	0.0500	1.57		**Shallow Concentrated Flow, D-->E** Short Grass Pasture Kv= 7.0 fps
2.3	110	Total			

Summary for Subcatchment 14:

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 1,847 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (sf)	CN	Description
3,814	98	Roofs, HSG B
6,082	61	>75% Grass cover, Good, HSG B
9,896	75	Weighted Average
6,082		61.46% Pervious Area
3,814		38.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0150	0.13		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
0.6	35	0.0200	0.99		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
7.0	85	Total			

Summary for Pond 1P: CB #1656

Inflow Area = 6,828 sf, 99.88% Impervious, Inflow Depth = 4.50" for 10Y NRCC 24h event
Inflow = 0.87 cfs @ 12.01 hrs, Volume= 2,562 cf
Outflow = 0.87 cfs @ 12.01 hrs, Volume= 2,562 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.01 hrs, Volume= 2,562 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 89.28' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	84.80'	**12.0" Round Culvert** L= 62.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 84.80' / 83.50' S= 0.0208 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	89.25'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.86 cfs @ 12.01 hrs HW=89.28' TW=87.41' (Dynamic Tailwater)
1=Culvert (Passes 0.86 cfs of 4.24 cfs potential flow)
2=Orifice/Grate (Weir Controls 0.86 cfs @ 0.52 fps)

Summary for Pond 2P: CB #1478

Inflow Area = 13,679 sf, 92.04% Impervious, Inflow Depth = 4.17" for 10Y NRCC 24h event
Inflow = 1.66 cfs @ 12.02 hrs, Volume= 4,752 cf
Outflow = 1.66 cfs @ 12.02 hrs, Volume= 4,752 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.66 cfs @ 12.02 hrs, Volume= 4,752 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.42' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	**12.0" Round Culvert** L= 68.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 82.70' S= 0.0103 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	87.29'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.65 cfs @ 12.02 hrs HW=87.41' TW=87.11' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.65 cfs @ 2.10 fps)
2=Orifice/Grate (Passes 1.65 cfs of 3.34 cfs potential flow)

Summary for Pond 3P: CB #1307

Inflow Area = 15,025 sf, 89.93% Impervious, Inflow Depth = 4.08" for 10Y NRCC 24h event
Inflow = 1.75 cfs @ 12.02 hrs, Volume= 5,114 cf
Outflow = 1.75 cfs @ 12.02 hrs, Volume= 5,114 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.75 cfs @ 12.02 hrs, Volume= 5,114 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.11' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	81.40'	**12.0" Round Culvert** L= 69.1' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 81.40' / 80.80' S= 0.0087 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	86.82'	**0.8" W x 7.0" H Vert. Orifice/Grate X 51.00** C= 0.600

Primary OutFlow Max=1.74 cfs @ 12.02 hrs HW=87.11' TW=84.73' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.74 cfs of 4.64 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.74 cfs @ 1.74 fps)

Summary for Pond 4P: CB #1038

Inflow Area = 34,124 sf, 80.76% Impervious, Inflow Depth = 3.72" for 10Y NRCC 24h event
Inflow = 3.54 cfs @ 12.02 hrs, Volume= 10,579 cf
Outflow = 3.54 cfs @ 12.02 hrs, Volume= 10,579 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.54 cfs @ 12.02 hrs, Volume= 10,579 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 84.74' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**12.0" Round Culvert** L= 119.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 76.90' S= 0.0303 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	84.60'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.52 cfs @ 12.02 hrs HW=84.74' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.52 cfs of 6.48 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 3.52 cfs @ 1.78 fps)

Summary for Pond 5P: CB #1207

Inflow Area = 18,232 sf, 72.40% Impervious, Inflow Depth = 3.39" for 10Y NRCC 24h event
Inflow = 1.74 cfs @ 12.04 hrs, Volume= 5,148 cf
Outflow = 1.74 cfs @ 12.04 hrs, Volume= 5,148 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.74 cfs @ 12.04 hrs, Volume= 5,148 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 85.23' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	80.90'	**12.0" Round Culvert**
			L= 119.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 80.90' / 80.70' S= 0.0017 '/' Cc= 0.900
			n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	84.88'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=1.74 cfs @ 12.04 hrs HW=85.22' TW=84.73' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.74 cfs @ 2.22 fps)
↑**2=Orifice/Grate** (Passes 1.74 cfs of 5.60 cfs potential flow)

Summary for Pond 6P: CB #1306

Inflow Area = 10,804 sf, 67.60% Impervious, Inflow Depth = 3.23" for 10Y NRCC 24h event
Inflow = 1.00 cfs @ 12.06 hrs, Volume= 2,904 cf
Outflow = 1.00 cfs @ 12.06 hrs, Volume= 2,904 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.06 hrs, Volume= 2,904 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.68' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	**6.0" Round Culvert**
			L= 59.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 83.40' / 82.40' S= 0.0169 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	85.19'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=1.00 cfs @ 12.06 hrs HW=87.66' TW=85.18' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.00 cfs @ 5.09 fps)
↑**2=Orifice/Grate** (Passes 1.00 cfs of 15.02 cfs potential flow)

Summary for Pond 7P: CB #1014

Inflow Area = 5,927 sf, 38.23% Impervious, Inflow Depth = 2.24" for 10Y NRCC 24h event
Inflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf
Outflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 80.97' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	76.90'	**12.0" Round Culvert**
			L= 36.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 76.90' / 76.70' S= 0.0056 '/' Cc= 0.900
			n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf

#2	Device 1	80.95'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.41 cfs @ 12.04 hrs HW=80.97' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.41 cfs of 6.57 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.41 cfs @ 0.40 fps)

Summary for Pond 8P: CB #1804

Inflow Area = 5,927 sf, 38.23% Impervious, Inflow Depth = 2.24" for 10Y NRCC 24h event
Inflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf
Outflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 81.89' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	77.40'	**12.0" Round Culvert** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 77.40' / 76.90' S= 0.0217 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	81.82'	**24.0" Horiz. Beehive Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.41 cfs @ 12.04 hrs HW=81.89' TW=80.97' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.41 cfs of 3.64 cfs potential flow)
└**2=Beehive Grate** (Weir Controls 0.41 cfs @ 0.88 fps)

Summary for Pond 9P: CB #1912

Inflow Area = 23,693 sf, 31.70% Impervious, Inflow Depth = 2.05" for 10Y NRCC 24h event
Inflow = 1.26 cfs @ 12.10 hrs, Volume= 4,057 cf
Outflow = 1.26 cfs @ 12.10 hrs, Volume= 4,057 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.26 cfs @ 12.10 hrs, Volume= 4,057 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 82.76' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**12.0" Round Culvert** L= 119.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 79.50' S= 0.0084 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	82.60'	**24.0" Horiz. Beehive Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.26 cfs @ 12.10 hrs HW=82.76' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.26 cfs of 3.72 cfs potential flow)
└**2=Beehive Grate** (Weir Controls 1.26 cfs @ 1.29 fps)

Summary for Pond 10P: CB #1927

Inflow Area = 13,797 sf, 26.79% Impervious, Inflow Depth = 1.92" for 10Y NRCC 24h event
Inflow = 0.69 cfs @ 12.10 hrs, Volume= 2,210 cf
Outflow = 0.69 cfs @ 12.10 hrs, Volume= 2,210 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.10 hrs, Volume= 2,210 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 84.17' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	81.65'	**12.0" Round Culvert** L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 81.65' / 80.65' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	84.07'	**24.0" Horiz. Beehive Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 12.10 hrs HW=84.17' TW=82.76' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.69 cfs of 2.07 cfs potential flow)
↑**2=Beehive Grate** (Weir Controls 0.69 cfs @ 1.06 fps)

Summary for Pond 11P: CB (inaccessible)

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 81.54' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	81.54'	**12.0" Round Culvert** L= 66.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 81.54' / 81.54' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=81.54' (Free Discharge)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 12P: CB #2011

Device	Routing	Invert	Outlet Devices
#1	Primary	81.70'	**12.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 81.70' / 81.54' S= 0.0053 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	84.03'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=81.54' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link POA1: CB#1008

Inflow Area = 46,280 sf, 73.59% Impervious, Inflow Depth = 3.46" for 10Y NRCC 24h event
Inflow = 4.56 cfs @ 12.02 hrs, Volume= 13,360 cf
Primary = 4.56 cfs @ 12.02 hrs, Volume= 13,360 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA2: CB#1782

Inflow Area = 23,693 sf, 31.70% Impervious, Inflow Depth = 2.05" for 10Y NRCC 24h event
Inflow = 1.26 cfs @ 12.10 hrs, Volume= 4,057 cf
Primary = 1.26 cfs @ 12.10 hrs, Volume= 4,057 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA3:

Inflow Area = 7,463 sf, 27.18% Impervious, Inflow Depth = 1.92" for 10Y NRCC 24h event
Inflow = 0.45 cfs @ 12.02 hrs, Volume= 1,195 cf
Primary = 0.45 cfs @ 12.02 hrs, Volume= 1,195 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA4:

Inflow Area = 18,022 sf, 2.52% Impervious, Inflow Depth = 1.28" for 10Y NRCC 24h event
Inflow = 0.56 cfs @ 12.10 hrs, Volume= 1,923 cf
Primary = 0.56 cfs @ 12.10 hrs, Volume= 1,923 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA5:

Inflow Area = 16,170 sf, 0.00% Impervious, Inflow Depth = 1.22" for 10Y NRCC 24h event
Inflow = 0.53 cfs @ 12.05 hrs, Volume= 1,638 cf
Primary = 0.53 cfs @ 12.05 hrs, Volume= 1,638 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA6:

Inflow Area = 8,010 sf, 8.04% Impervious, Inflow Depth = 1.41" for 10Y NRCC 24h event
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 944 cf
Primary = 0.29 cfs @ 12.09 hrs, Volume= 944 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

APPENDIX C

C:\Users\Max\Documents\mjs\projects\2019\19057\internal\dwg\19057 CivilD.dwg
2020-06-08 01:20 pm

LEGEND

- ## SUBCATCHMENT
- ## POND / CATCH BASIN
- ## REACH
- POINT OF ANALYSIS
- POA#
- TIME OF CONCENTRATION TRAVEL PATH

NO.	DATE	INT.
0	6/3/20	MCS

REVISIONS

INITIAL SUBMISSION TO THE DURHAM PLANNING BOARD

SEAL

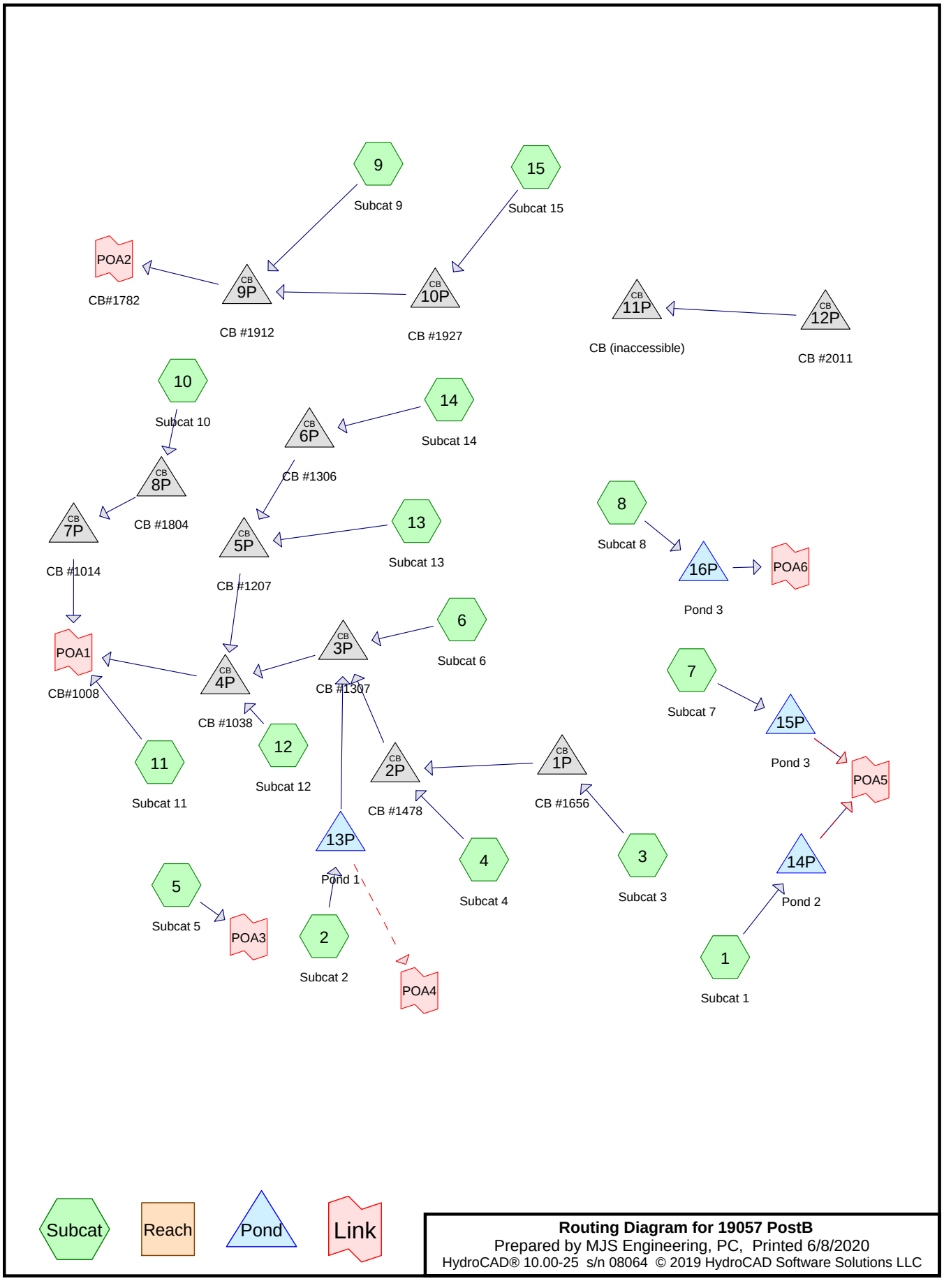
DATE ISSUED: 6/3/20
SCALE: 1"=30'
DESIGNED BY: MCS
DRAWN BY: MCS
APPROVED BY: MJS
DWG FILE: 19057 CivilD.dwg

POST-DEVELOPMENT
DRAINAGE PLAN
prepared for
BW2 LLC C/O
HOUSING INITIATIVES OF NEW ENGLAND
TAX MAP 2, LOT 10-4
BAGDAD ROAD, DURHAM, NH

MJS ENGINEERING, P.C.
CIVIL • STRUCTURAL • ENVIRONMENTAL
5 Railroad St., P.O. Box 359
Newmarket, NH 03857
Phone: (603) 659-4975, Fax: (603) 659-4627
Email: mjs@mjs-engineering.com

JOB: 19-057

POST


9
Subcat 9
15
Subcat 15
POA2
CB#1782
CB 9P
CB #1912
CB 10P
CB #1927
CB 11P
CB (inaccessible)
CB 12P
CB #2011
10
Subcat 10
14
Subcat 14
CB 6P
CB #1306
CB 8P
CB #1804
CB 7P
CB #1014
CB 5P
CB #1207
13
Subcat 13
8
Subcat 8
16P
Pond 3
POA6
6
Subcat 6
CB 3P
CB #1307
POA1
CB#1008
CB 4P
CB #1038
12
Subcat 12
11
Subcat 11
CB 2P
CB #1478
CB 1P
CB #1656
7
Subcat 7
15P
Pond 3
POA5
13P
Pond 1
4
Subcat 4
3
Subcat 3
14P
Pond 2
5
Subcat 5
POA3
2
Subcat 2
POA4
1
Subcat 1
Subcat
Reach
Pond
Link
Routing Diagram for 19057 PostB
Prepared by MJS Engineering, PC, Printed 6/8/2020
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
59,180	61	>75% Grass cover, Good, HSG B (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)
60,452	98	Roofs, HSG B (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)
119,632	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
119,632	HSG B	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
0	HSG C	
0	HSG D	
0	Other	
119,632		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	59,180	0	0	0	59,180	>75% Grass cover, Good
0	60,452	0	0	0	60,452	Roofs
0	**119,632**	**0**	**0**	**0**	**119,632**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 1: Subcat 1 Runoff Area=0.224 ac 42.91% Impervious Runoff Depth=0.05"
Flow Length=110' Tc=1.8 min CN=77 Runoff=0.00 cfs 39 cf

Subcatchment 2: Subcat 2 Runoff Area=0.280 ac 38.83% Impervious Runoff Depth=0.03"
Flow Length=100' Slope=0.0200 '/' Tc=1.1 min CN=75 Runoff=0.00 cfs 31 cf

Subcatchment 3: Subcat 3 Runoff Area=0.163 ac 86.04% Impervious Runoff Depth=0.45"
Flow Length=100' Slope=0.0150 '/' Tc=1.1 min CN=93 Runoff=0.10 cfs 267 cf

Subcatchment 4: Subcat 4 Runoff Area=0.177 ac 85.22% Impervious Runoff Depth=0.45"
Flow Length=235' Tc=2.4 min CN=93 Runoff=0.11 cfs 290 cf

Subcatchment 5: Subcat 5 Runoff Area=0.138 ac 11.52% Impervious Runoff Depth=0.00"
Flow Length=60' Tc=0.9 min CN=65 Runoff=0.00 cfs 0 cf

Subcatchment 6: Subcat 6 Runoff Area=0.132 ac 65.23% Impervious Runoff Depth=0.17"
Flow Length=115' Tc=6.4 min CN=85 Runoff=0.02 cfs 83 cf

Subcatchment 7: Subcat 7 Runoff Area=0.219 ac 35.51% Impervious Runoff Depth=0.02"
Flow Length=30' Slope=0.1200 '/' Tc=0.2 min CN=74 Runoff=0.00 cfs 18 cf

Subcatchment 8: Subcat 8 Runoff Area=0.210 ac 41.76% Impervious Runoff Depth=0.04"
Flow Length=45' Tc=0.3 min CN=76 Runoff=0.00 cfs 29 cf

Subcatchment 9: Subcat 9 Runoff Area=0.227 ac 38.54% Impervious Runoff Depth=0.03"
Flow Length=85' Tc=7.0 min CN=75 Runoff=0.00 cfs 25 cf

Subcatchment 10: Subcat 10 Runoff Area=0.136 ac 38.23% Impervious Runoff Depth=0.03"
Flow Length=110' Tc=2.3 min CN=75 Runoff=0.00 cfs 15 cf

Subcatchment 11: Subcat 11 Runoff Area=0.143 ac 65.22% Impervious Runoff Depth=0.17"
Flow Length=180' Tc=1.1 min CN=85 Runoff=0.03 cfs 90 cf

Subcatchment 12: Subcat 12 Runoff Area=0.020 ac 97.43% Impervious Runoff Depth=0.71"
Flow Length=60' Slope=0.0300 '/' Tc=0.7 min CN=97 Runoff=0.02 cfs 51 cf

Subcatchment 13: Subcat 13 Runoff Area=0.154 ac 59.54% Impervious Runoff Depth=0.13"
Flow Length=163' Tc=6.7 min CN=83 Runoff=0.01 cfs 74 cf

Subcatchment 14: Subcat 14 Runoff Area=0.231 ac 80.57% Impervious Runoff Depth=0.36"
Flow Length=91' Tc=4.1 min CN=91 Runoff=0.10 cfs 301 cf

Subcatchment 15: Subcat 15 Runoff Area=0.293 ac 32.29% Impervious Runoff Depth=0.02"
Flow Length=200' Tc=3.1 min CN=73 Runoff=0.00 cfs 18 cf

Pond 1P: CB #1656 Peak Elev=89.26' Inflow=0.10 cfs 267 cf
Outflow=0.10 cfs 267 cf

Pond 2P: CB #1478 Peak Elev=87.30' Inflow=0.20 cfs 557 cf
Outflow=0.20 cfs 557 cf

Pond 3P: CB #1307 Peak Elev=86.89' Inflow=0.21 cfs 640 cf
Outflow=0.21 cfs 640 cf

Pond 4P: CB #1038 Peak Elev=84.61' Inflow=0.33 cfs 1,065 cf
Outflow=0.33 cfs 1,066 cf

Pond 5P: CB #1207 Peak Elev=84.89' Inflow=0.11 cfs 375 cf
Outflow=0.11 cfs 375 cf

Pond 6P: CB #1306 Peak Elev=85.20' Inflow=0.10 cfs 301 cf
Outflow=0.10 cfs 301 cf

Pond 7P: CB #1014 Peak Elev=80.95' Inflow=0.00 cfs 15 cf
Outflow=0.00 cfs 15 cf

Pond 8P: CB #1804 Peak Elev=81.82' Inflow=0.00 cfs 15 cf
Outflow=0.00 cfs 15 cf

Pond 9P: CB #1912 Peak Elev=82.60' Inflow=0.00 cfs 43 cf
Outflow=0.00 cfs 43 cf

Pond 10P: CB #1927 Peak Elev=84.07' Inflow=0.00 cfs 18 cf
Outflow=0.00 cfs 18 cf

Pond 11P: CB (inaccessible) Peak Elev=81.54' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.025 L=66.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 12P: CB #2011 Peak Elev=0.00'
Primary=0.00 cfs 0 cf

Pond 13P: Pond 1 Peak Elev=85.02' Storage=6 cf Inflow=0.00 cfs 31 cf
Discarded=0.00 cfs 31 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 31 cf

Pond 14P: Pond 2 Peak Elev=88.01' Storage=1 cf Inflow=0.00 cfs 39 cf
Discarded=0.00 cfs 39 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 39 cf

Pond 15P: Pond 3 Peak Elev=89.50' Storage=0 cf Inflow=0.00 cfs 18 cf
Discarded=0.00 cfs 18 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 18 cf

Pond 16P: Pond 3 Peak Elev=87.04' Storage=6 cf Inflow=0.00 cfs 29 cf
Discarded=0.00 cfs 29 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 29 cf

Link POA1: CB#1008 Inflow=0.35 cfs 1,171 cf
Primary=0.35 cfs 1,171 cf

Link POA2: CB#1782 Inflow=0.00 cfs 43 cf
Primary=0.00 cfs 43 cf

Link POA3: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA4: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA5: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA6: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 119,632 sf Runoff Volume = 1,331 cf Average Runoff Depth = 0.13"
49.47% Pervious = 59,180 sf 50.53% Impervious = 60,452 sf

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 1: Subcat 1 Runoff Area=0.224 ac 42.91% Impervious Runoff Depth=1.16"
Flow Length=110' Tc=1.8 min CN=77 Runoff=0.35 cfs 946 cf

Subcatchment 2: Subcat 2 Runoff Area=0.280 ac 38.83% Impervious Runoff Depth=1.05"
Flow Length=100' Slope=0.0200 '/' Tc=1.1 min CN=75 Runoff=0.39 cfs 1,062 cf

Subcatchment 3: Subcat 3 Runoff Area=0.163 ac 86.04% Impervious Runoff Depth=2.38"
Flow Length=100' Slope=0.0150 '/' Tc=1.1 min CN=93 Runoff=0.52 cfs 1,409 cf

Subcatchment 4: Subcat 4 Runoff Area=0.177 ac 85.22% Impervious Runoff Depth=2.38"
Flow Length=235' Tc=2.4 min CN=93 Runoff=0.55 cfs 1,531 cf

Subcatchment 5: Subcat 5 Runoff Area=0.138 ac 11.52% Impervious Runoff Depth=0.57"
Flow Length=60' Tc=0.9 min CN=65 Runoff=0.08 cfs 283 cf

Subcatchment 6: Subcat 6 Runoff Area=0.132 ac 65.23% Impervious Runoff Depth=1.70"
Flow Length=115' Tc=6.4 min CN=85 Runoff=0.26 cfs 813 cf

Subcatchment 7: Subcat 7 Runoff Area=0.219 ac 35.51% Impervious Runoff Depth=0.99"
Flow Length=30' Slope=0.1200 '/' Tc=0.2 min CN=74 Runoff=0.29 cfs 789 cf

Subcatchment 8: Subcat 8 Runoff Area=0.210 ac 41.76% Impervious Runoff Depth=1.10"
Flow Length=45' Tc=0.3 min CN=76 Runoff=0.32 cfs 840 cf

Subcatchment 9: Subcat 9 Runoff Area=0.227 ac 38.54% Impervious Runoff Depth=1.05"
Flow Length=85' Tc=7.0 min CN=75 Runoff=0.26 cfs 863 cf

Subcatchment 10: Subcat 10 Runoff Area=0.136 ac 38.23% Impervious Runoff Depth=1.05"
Flow Length=110' Tc=2.3 min CN=75 Runoff=0.18 cfs 517 cf

Subcatchment 11: Subcat 11 Runoff Area=0.143 ac 65.22% Impervious Runoff Depth=1.70"
Flow Length=180' Tc=1.1 min CN=85 Runoff=0.34 cfs 882 cf

Subcatchment 12: Subcat 12 Runoff Area=0.020 ac 97.43% Impervious Runoff Depth=2.79"
Flow Length=60' Slope=0.0300 '/' Tc=0.7 min CN=97 Runoff=0.07 cfs 201 cf

Subcatchment 13: Subcat 13 Runoff Area=0.154 ac 59.54% Impervious Runoff Depth=1.55"
Flow Length=163' Tc=6.7 min CN=83 Runoff=0.27 cfs 866 cf

Subcatchment 14: Subcat 14 Runoff Area=0.231 ac 80.57% Impervious Runoff Depth=2.19"
Flow Length=91' Tc=4.1 min CN=91 Runoff=0.63 cfs 1,836 cf

Subcatchment 15: Subcat 15 Runoff Area=0.293 ac 32.29% Impervious Runoff Depth=0.94"
Flow Length=200' Tc=3.1 min CN=73 Runoff=0.33 cfs 998 cf

Pond 1P: CB #1656 Peak Elev=89.27' Inflow=0.52 cfs 1,409 cf
Outflow=0.52 cfs 1,409 cf

Pond 2P: CB #1478 Peak Elev=87.32' Inflow=1.05 cfs 2,940 cf
Outflow=1.05 cfs 2,940 cf

Pond 3P: CB #1307 Peak Elev=87.05' Inflow=1.24 cfs 3,936 cf
Outflow=1.24 cfs 3,936 cf

Pond 4P: CB #1038 Peak Elev=84.65' Inflow=2.10 cfs 6,839 cf
Outflow=2.10 cfs 6,839 cf

Pond 5P: CB #1207 Peak Elev=84.91' Inflow=0.87 cfs 2,702 cf
Outflow=0.87 cfs 2,702 cf

Pond 6P: CB #1306 Peak Elev=85.88' Inflow=0.63 cfs 1,836 cf
Outflow=0.63 cfs 1,836 cf

Pond 7P: CB #1014 Peak Elev=80.96' Inflow=0.18 cfs 517 cf
Outflow=0.18 cfs 517 cf

Pond 8P: CB #1804 Peak Elev=81.86' Inflow=0.18 cfs 517 cf
Outflow=0.18 cfs 517 cf

Pond 9P: CB #1912 Peak Elev=82.69' Inflow=0.56 cfs 1,862 cf
Outflow=0.56 cfs 1,862 cf

Pond 10P: CB #1927 Peak Elev=84.13' Inflow=0.33 cfs 998 cf
Outflow=0.33 cfs 998 cf

Pond 11P: CB (inaccessible) Peak Elev=81.54' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.025 L=66.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 12P: CB #2011 Peak Elev=0.00'
Primary=0.00 cfs 0 cf

Pond 13P: Pond 1 Peak Elev=86.54' Storage=709 cf Inflow=0.39 cfs 1,062 cf
Discarded=0.01 cfs 873 cf Primary=0.13 cfs 183 cf Secondary=0.00 cfs 0 cf Outflow=0.14 cfs 1,056 cf

Pond 14P: Pond 2 Peak Elev=89.04' Storage=245 cf Inflow=0.35 cfs 946 cf
Discarded=0.00 cfs 349 cf Primary=0.15 cfs 597 cf Secondary=0.00 cfs 0 cf Outflow=0.15 cfs 946 cf

Pond 15P: Pond 3 Peak Elev=90.09' Storage=425 cf Inflow=0.29 cfs 789 cf
Discarded=0.01 cfs 789 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 789 cf

Pond 16P: Pond 3 Peak Elev=88.18' Storage=504 cf Inflow=0.32 cfs 840 cf
Discarded=0.01 cfs 839 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 839 cf

Link POA1: CB#1008 Inflow=2.59 cfs 8,238 cf
Primary=2.59 cfs 8,238 cf

Link POA2: CB#1782 Inflow=0.56 cfs 1,862 cf
Primary=0.56 cfs 1,862 cf

Link POA3: Inflow=0.08 cfs 283 cf
Primary=0.08 cfs 283 cf

Link POA4: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA5: Inflow=0.15 cfs 597 cf
Primary=0.15 cfs 597 cf

Link POA6: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 119,632 sf Runoff Volume = 13,837 cf Average Runoff Depth = 1.39"
49.47% Pervious = 59,180 sf 50.53% Impervious = 60,452 sf

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 1: Subcat 1 Runoff Area=0.224 ac 42.91% Impervious Runoff Depth=3.49"
Flow Length=110' Tc=1.8 min CN=77 Runoff=1.07 cfs 2,839 cf

Subcatchment 2: Subcat 2 Runoff Area=0.280 ac 38.83% Impervious Runoff Depth=3.29"
Flow Length=100' Slope=0.0200 '/' Tc=1.1 min CN=75 Runoff=1.29 cfs 3,339 cf

Subcatchment 3: Subcat 3 Runoff Area=0.163 ac 86.04% Impervious Runoff Depth=5.19"
Flow Length=100' Slope=0.0150 '/' Tc=1.1 min CN=93 Runoff=1.10 cfs 3,077 cf

Subcatchment 4: Subcat 4 Runoff Area=0.177 ac 85.22% Impervious Runoff Depth=5.19"
Flow Length=235' Tc=2.4 min CN=93 Runoff=1.14 cfs 3,342 cf

Subcatchment 5: Subcat 5 Runoff Area=0.138 ac 11.52% Impervious Runoff Depth=2.36"
Flow Length=60' Tc=0.9 min CN=65 Runoff=0.45 cfs 1,179 cf

Subcatchment 6: Subcat 6 Runoff Area=0.132 ac 65.23% Impervious Runoff Depth=4.31"
Flow Length=115' Tc=6.4 min CN=85 Runoff=0.64 cfs 2,064 cf

Subcatchment 7: Subcat 7 Runoff Area=0.219 ac 35.51% Impervious Runoff Depth=3.19"
Flow Length=30' Slope=0.1200 '/' Tc=0.2 min CN=74 Runoff=1.00 cfs 2,541 cf

Subcatchment 8: Subcat 8 Runoff Area=0.210 ac 41.76% Impervious Runoff Depth=3.39"
Flow Length=45' Tc=0.3 min CN=76 Runoff=1.01 cfs 2,578 cf

Subcatchment 9: Subcat 9 Runoff Area=0.227 ac 38.54% Impervious Runoff Depth=3.29"
Flow Length=85' Tc=7.0 min CN=75 Runoff=0.85 cfs 2,714 cf

Subcatchment 10: Subcat 10 Runoff Area=0.136 ac 38.23% Impervious Runoff Depth=3.29"
Flow Length=110' Tc=2.3 min CN=75 Runoff=0.60 cfs 1,625 cf

Subcatchment 11: Subcat 11 Runoff Area=0.143 ac 65.22% Impervious Runoff Depth=4.31"
Flow Length=180' Tc=1.1 min CN=85 Runoff=0.84 cfs 2,239 cf

Subcatchment 12: Subcat 12 Runoff Area=0.020 ac 97.43% Impervious Runoff Depth=5.65"
Flow Length=60' Slope=0.0300 '/' Tc=0.7 min CN=97 Runoff=0.14 cfs 408 cf

Subcatchment 13: Subcat 13 Runoff Area=0.154 ac 59.54% Impervious Runoff Depth=4.10"
Flow Length=163' Tc=6.7 min CN=83 Runoff=0.71 cfs 2,287 cf

Subcatchment 14: Subcat 14 Runoff Area=0.231 ac 80.57% Impervious Runoff Depth=4.97"
Flow Length=91' Tc=4.1 min CN=91 Runoff=1.36 cfs 4,159 cf

Subcatchment 15: Subcat 15 Runoff Area=0.293 ac 32.29% Impervious Runoff Depth=3.10"
Flow Length=200' Tc=3.1 min CN=73 Runoff=1.18 cfs 3,295 cf

Pond 1P: CB #1656 Peak Elev=89.28' Inflow=1.10 cfs 3,077 cf
Outflow=1.10 cfs 3,077 cf

Pond 2P: CB #1478 Peak Elev=87.74' Inflow=2.20 cfs 6,419 cf
Outflow=2.20 cfs 6,419 cf

Pond 3P: CB #1307 Peak Elev=87.21' Inflow=2.68 cfs 10,764 cf
Outflow=2.68 cfs 10,764 cf

Pond 4P: CB #1038 Peak Elev=84.84' Inflow=4.66 cfs 17,619 cf
Outflow=4.66 cfs 17,619 cf

Pond 5P: CB #1207 Peak Elev=85.49' Inflow=2.02 cfs 6,447 cf
Outflow=2.02 cfs 6,447 cf

Pond 6P: CB #1306 Peak Elev=90.08' Inflow=1.36 cfs 4,159 cf
Outflow=1.36 cfs 4,159 cf

Pond 7P: CB #1014 Peak Elev=80.97' Inflow=0.60 cfs 1,625 cf
Outflow=0.60 cfs 1,625 cf

Pond 8P: CB #1804 Peak Elev=81.91' Inflow=0.60 cfs 1,625 cf
Outflow=0.60 cfs 1,625 cf

Pond 9P: CB #1912 Peak Elev=82.81' Inflow=1.91 cfs 6,009 cf
Outflow=1.91 cfs 6,009 cf

Pond 10P: CB #1927 Peak Elev=84.22' Inflow=1.18 cfs 3,295 cf
Outflow=1.18 cfs 3,295 cf

Pond 11P: CB (inaccessible) Peak Elev=81.54' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.025 L=66.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 12P: CB #2011 Peak Elev=0.00'
Primary=0.00 cfs 0 cf

Pond 13P: Pond 1 Peak Elev=87.40' Storage=1,432 cf Inflow=1.29 cfs 3,339 cf
Discarded=0.01 cfs 1,048 cf Primary=0.29 cfs 2,281 cf Secondary=0.00 cfs 0 cf Outflow=0.31 cfs 3,329 cf

Pond 14P: Pond 2 Peak Elev=89.88' Storage=648 cf Inflow=1.07 cfs 2,839 cf
Discarded=0.01 cfs 402 cf Primary=0.41 cfs 2,437 cf Secondary=0.00 cfs 0 cf Outflow=0.42 cfs 2,839 cf

Pond 15P: Pond 3 Peak Elev=90.43' Storage=741 cf Inflow=1.00 cfs 2,541 cf
Discarded=0.01 cfs 1,150 cf Primary=0.45 cfs 1,391 cf Secondary=0.00 cfs 0 cf Outflow=0.47 cfs 2,541 cf

Pond 16P: Pond 3 Peak Elev=88.69' Storage=970 cf Inflow=1.01 cfs 2,578 cf
Discarded=0.01 cfs 1,437 cf Primary=0.37 cfs 1,067 cf Outflow=0.38 cfs 2,503 cf

Link POA1: CB#1008 Inflow=6.01 cfs 21,483 cf
Primary=6.01 cfs 21,483 cf

Link POA2: CB#1782 Inflow=1.91 cfs 6,009 cf
Primary=1.91 cfs 6,009 cf

Link POA3: Inflow=0.45 cfs 1,179 cf
Primary=0.45 cfs 1,179 cf

Link POA4: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA5: Inflow=0.86 cfs 3,828 cf
Primary=0.86 cfs 3,828 cf

Link POA6: Inflow=0.37 cfs 1,067 cf
Primary=0.37 cfs 1,067 cf

Total Runoff Area = 119,632 sf Runoff Volume = 37,687 cf Average Runoff Depth = 3.78"
49.47% Pervious = 59,180 sf 50.53% Impervious = 60,452 sf

Summary for Subcatchment 1: Subcat 1

Runoff = 0.74 cfs @ 12.03 hrs, Volume= 1,959 cf, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.126	61	>75% Grass cover, Good, HSG B
0.096	98	Roofs, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.224	77	Weighted Average
0.128		57.09% Pervious Area
0.096		42.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.1	20	0.0300	3.52		**Shallow Concentrated Flow, B-->C** Paved Kv= 20.3 fps
1.0	40	0.0100	0.70		**Shallow Concentrated Flow, C-->D** Short Grass Pasture Kv= 7.0 fps
1.8	110	Total			

Summary for Subcatchment 2: Subcat 2

Runoff = 0.87 cfs @ 12.02 hrs, Volume= 2,273 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.006	61	>75% Grass cover, Good, HSG B
0.160	61	>75% Grass cover, Good, HSG B
0.109	98	Roofs, HSG B
0.005	61	>75% Grass cover, Good, HSG B
0.280	75	Weighted Average
0.171		61.17% Pervious Area
0.109		38.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, B-->C** Grassed Waterway Kv= 15.0 fps
1.1	100	Total			

Summary for Subcatchment 3: Subcat 3

Runoff = 0.85 cfs @ 12.02 hrs, Volume= 2,336 cf, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.001	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.138	98	Roofs, HSG B
0.002	98	Roofs, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.021	61	>75% Grass cover, Good, HSG B
0.000	98	Roofs, HSG B
0.163	93	Weighted Average
0.023		13.96% Pervious Area
0.140		86.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.3	50	0.0150	2.49		**Shallow Concentrated Flow, B-->C** Paved Kv= 20.3 fps
1.1	100	Total			

Summary for Subcatchment 4: Subcat 4

Runoff = 0.88 cfs @ 12.03 hrs, Volume= 2,538 cf, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.148	98	Roofs, HSG B
0.003	98	Roofs, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.003	61	>75% Grass cover, Good, HSG B
0.023	61	>75% Grass cover, Good, HSG B
0.000	98	Roofs, HSG B
0.177	93	Weighted Average
0.026		14.78% Pervious Area
0.151		85.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2500	0.29		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
0.7	40	0.0150	1.01		**Sheet Flow, B-->C** Smooth surfaces n= 0.011 P2= 3.13"
1.1	185	0.0200	2.87		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
2.4	235	Total			

Summary for Subcatchment 5: Subcat 5

Runoff = 0.27 cfs @ 12.02 hrs, Volume= 742 cf, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.081	61	>75% Grass cover, Good, HSG B
0.015	98	Roofs, HSG B
0.001	98	Roofs, HSG B
0.041	61	>75% Grass cover, Good, HSG B
0.138	65	Weighted Average
0.122		88.48% Pervious Area
0.016		11.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.86		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
0.9	60	Total			

Summary for Subcatchment 6: Subcat 6

Runoff = 0.47 cfs @ 12.09 hrs, Volume= 1,498 cf, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.022	98	Roofs, HSG B
0.064	98	Roofs, HSG B
0.026	61	>75% Grass cover, Good, HSG B
0.009	61	>75% Grass cover, Good, HSG B
0.011	61	>75% Grass cover, Good, HSG B
0.132	85	Weighted Average
0.046		34.77% Pervious Area
0.086		65.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
0.3	20	0.0300	1.21		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
0.2	15	0.0300	1.21		**Shallow Concentrated Flow, D-->E** Short Grass Pasture Kv= 7.0 fps
6.4	115	Total			

Summary for Subcatchment 7: Subcat 7

Runoff = 0.67 cfs @ 12.00 hrs, Volume= 1,717 cf, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.078	98	Roofs, HSG B
0.141	61	>75% Grass cover, Good, HSG B
0.219	74	Weighted Average
0.141		64.49% Pervious Area
0.078		35.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"

Summary for Subcatchment 8: Subcat 8

Runoff = 0.69 cfs @ 12.01 hrs, Volume= 1,768 cf, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.122	61	>75% Grass cover, Good, HSG B
0.088	98	Roofs, HSG B
0.210	76	Weighted Average
0.122		58.24% Pervious Area
0.088		41.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.1	15	0.0800	1.98		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
0.3	45	Total			

Summary for Subcatchment 9: Subcat 9

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 1,847 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.075	98	Roofs, HSG B
0.140	61	>75% Grass cover, Good, HSG B
0.013	98	Roofs, HSG B
0.227	75	Weighted Average
0.140		61.46% Pervious Area
0.088		38.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0150	0.13		**Sheet Flow, A-->B** Grass: Short n= 0.150 P2= 3.13"
0.6	35	0.0200	0.99		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
7.0	85	Total			

Summary for Subcatchment 10: Subcat 10

Runoff = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.004	61	>75% Grass cover, Good, HSG B
0.000	98	Roofs, HSG B
0.000	98	Roofs, HSG B
0.000	98	Roofs, HSG B
0.052	98	Roofs, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.004	61	>75% Grass cover, Good, HSG B
0.064	61	>75% Grass cover, Good, HSG B
0.012	61	>75% Grass cover, Good, HSG B
0.000	98	Roofs, HSG B
0.136	75	Weighted Average
0.084		61.77% Pervious Area
0.052		38.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	35	0.1200	2.26		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
1.5	15	0.0500	0.17		**Sheet Flow, B-->C** Grass: Short n= 0.150 P2= 3.13"
0.1	20	0.0500	4.54		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
0.4	40	0.0500	1.57		**Shallow Concentrated Flow, D-->E** Short Grass Pasture Kv= 7.0 fps
2.3	110	Total			

Summary for Subcatchment 11: Subcat 11

Runoff = 0.62 cfs @ 12.02 hrs, Volume= 1,624 cf, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.004	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.093	98	Roofs, HSG B
0.014	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.031	61	>75% Grass cover, Good, HSG B
0.000	98	Roofs, HSG B
0.143	85	Weighted Average
0.050		34.78% Pervious Area
0.093		65.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
0.5	60	0.0800	1.98		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
0.4	90	0.0400	4.06		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
1.1	180	Total			

Summary for Subcatchment 12: Subcat 12

Runoff = 0.11 cfs @ 12.01 hrs, Volume= 317 cf, Depth= 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.019	98	Roofs, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.000	61	>75% Grass cover, Good, HSG B
0.020	97	Weighted Average
0.001		2.57% Pervious Area
0.019		97.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0300	1.44		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"

Summary for Subcatchment 13: Subcat 13

Runoff = 0.52 cfs @ 12.10 hrs, Volume= 1,640 cf, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.019	61	>75% Grass cover, Good, HSG B
0.020	61	>75% Grass cover, Good, HSG B
0.022	61	>75% Grass cover, Good, HSG B
0.001	61	>75% Grass cover, Good, HSG B
0.091	98	Roofs, HSG B
0.154	83	Weighted Average
0.062		40.46% Pervious Area
0.091		59.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
4.0	23	0.0100	0.10		**Sheet Flow, B-->C** Grass: Short n= 0.150 P2= 3.13"
2.1	20	0.0400	0.16		**Sheet Flow, C-->D** Grass: Short n= 0.150 P2= 3.13"
0.4	90	0.0300	3.52		**Shallow Concentrated Flow, D-->E** Paved Kv= 20.3 fps
6.7	163	Total			

Summary for Subcatchment 14: Subcat 14

Runoff = 1.04 cfs @ 12.06 hrs, Volume= 3,124 cf, Depth= 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.009	61	>75% Grass cover, Good, HSG B
0.186	98	Roofs, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.002	61	>75% Grass cover, Good, HSG B
0.016	61	>75% Grass cover, Good, HSG B
0.014	61	>75% Grass cover, Good, HSG B
0.001	61	>75% Grass cover, Good, HSG B
0.001	61	>75% Grass cover, Good, HSG B
0.231	91	Weighted Average
0.045		19.43% Pervious Area
0.186		80.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
3.6	20	0.0100	0.09		**Sheet Flow, B-->C** Grass: Short n= 0.150 P2= 3.13"
0.3	41	0.0150	2.49		**Shallow Concentrated Flow, C-->D** Paved Kv= 20.3 fps
4.1	91	Total			

Summary for Subcatchment 15: Subcat 15

Runoff = 0.79 cfs @ 12.05 hrs, Volume= 2,211 cf, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Y NRCC 24h Rainfall=4.74"

Area (ac)	CN	Description
0.018	61	>75% Grass cover, Good, HSG B
0.181	61	>75% Grass cover, Good, HSG B
0.095	98	Roofs, HSG B
0.293	73	Weighted Average
0.198		67.71% Pervious Area
0.095		32.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1200	2.19		**Sheet Flow, A-->B** Smooth surfaces n= 0.011 P2= 3.13"
2.9	170	0.0200	0.99		**Shallow Concentrated Flow, B-->C** Short Grass Pasture Kv= 7.0 fps
3.1	200	Total			

Summary for Pond 1P: CB #1656

Inflow Area = 7,110 sf, 86.04% Impervious, Inflow Depth = 3.94" for 10Y NRCC 24h event
Inflow = 0.85 cfs @ 12.02 hrs, Volume= 2,336 cf
Outflow = 0.85 cfs @ 12.02 hrs, Volume= 2,336 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.02 hrs, Volume= 2,336 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 89.27' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	84.80'	**12.0" Round Culvert** L= 62.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 84.80' / 83.50' S= 0.0208 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	89.25'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 12.02 hrs HW=89.27' TW=87.45' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.84 cfs of 4.20 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 0.84 cfs @ 0.51 fps)

Summary for Pond 2P: CB #1478

Inflow Area = 14,834 sf, 85.62% Impervious, Inflow Depth = 3.94" for 10Y NRCC 24h event
Inflow = 1.70 cfs @ 12.02 hrs, Volume= 4,874 cf
Outflow = 1.70 cfs @ 12.02 hrs, Volume= 4,874 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.70 cfs @ 12.02 hrs, Volume= 4,874 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.46' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	**12.0" Round Culvert** L= 68.0' RCP, sq.cut end projecting, Ke= 0.500

			Inlet / Outlet Invert= 83.40' / 82.70' S= 0.0103 '/' Cc= 0.900
			n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	87.29'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=1.69 cfs @ 12.02 hrs HW=87.46' TW=87.15' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.69 cfs @ 2.15 fps)
└**2=Orifice/Grate** (Passes 1.69 cfs of 3.91 cfs potential flow)

Summary for Pond 3P: CB #1307

Inflow Area = 32,756 sf, 64.65% Impervious, Inflow Depth = 2.79" for 10Y NRCC 24h event
Inflow = 2.04 cfs @ 12.03 hrs, Volume= 7,618 cf
Outflow = 2.04 cfs @ 12.03 hrs, Volume= 7,618 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.04 cfs @ 12.03 hrs, Volume= 7,618 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.15' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	81.40'	**12.0" Round Culvert**
			L= 69.1' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 81.40' / 80.80' S= 0.0087 '/' Cc= 0.900
			n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	86.82'	**0.8" W x 7.0" H Vert. Orifice/Grate X 51.00** C= 0.600

Primary OutFlow Max=2.04 cfs @ 12.03 hrs HW=87.15' TW=84.73' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.04 cfs of 4.68 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 2.04 cfs @ 1.84 fps)

Summary for Pond 4P: CB #1038

Inflow Area = 50,365 sf, 67.71% Impervious, Inflow Depth = 3.03" for 10Y NRCC 24h event
Inflow = 3.53 cfs @ 12.05 hrs, Volume= 12,698 cf
Outflow = 3.53 cfs @ 12.05 hrs, Volume= 12,698 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.53 cfs @ 12.05 hrs, Volume= 12,698 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 84.74' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**12.0" Round Culvert**
			L= 119.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 80.50' / 76.90' S= 0.0303 '/' Cc= 0.900
			n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	84.60'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=3.53 cfs @ 12.05 hrs HW=84.74' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.53 cfs of 6.48 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 3.53 cfs @ 1.78 fps)

Summary for Pond 5P: CB #1207

Inflow Area = 16,743 sf, 72.16% Impervious, Inflow Depth = 3.41" for 10Y NRCC 24h event
Inflow = 1.51 cfs @ 12.07 hrs, Volume= 4,763 cf
Outflow = 1.51 cfs @ 12.07 hrs, Volume= 4,763 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.07 hrs, Volume= 4,763 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 85.10' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	80.90'	**12.0" Round Culvert** L= 119.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.90' / 80.70' S= 0.0017 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	84.88'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.51 cfs @ 12.07 hrs HW=85.10' TW=84.73' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.51 cfs @ 1.93 fps)
2=Orifice/Grate (Passes 1.51 cfs of 4.49 cfs potential flow)

Summary for Pond 6P: CB #1306

Inflow Area = 10,049 sf, 80.57% Impervious, Inflow Depth = 3.73" for 10Y NRCC 24h event
Inflow = 1.04 cfs @ 12.06 hrs, Volume= 3,124 cf
Outflow = 1.04 cfs @ 12.06 hrs, Volume= 3,124 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.06 hrs, Volume= 3,124 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.78' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	**6.0" Round Culvert** L= 59.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 82.40' S= 0.0169 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	85.19'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.04 cfs @ 12.06 hrs HW=87.77' TW=85.10' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.04 cfs @ 5.28 fps)
2=Orifice/Grate (Passes 1.04 cfs of 15.35 cfs potential flow)

Summary for Pond 7P: CB #1014

Inflow Area = 5,927 sf, 38.23% Impervious, Inflow Depth = 2.24" for 10Y NRCC 24h event
Inflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf
Outflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 80.97' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	76.90'	**12.0" Round Culvert** L= 36.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 76.90' / 76.70' S= 0.0056 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	80.95'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.41 cfs @ 12.04 hrs HW=80.97' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.41 cfs of 6.57 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 0.41 cfs @ 0.40 fps)

Summary for Pond 8P: CB #1804

Inflow Area = 5,927 sf, 38.23% Impervious, Inflow Depth = 2.24" for 10Y NRCC 24h event
Inflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf
Outflow = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.04 hrs, Volume= 1,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 81.89' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	77.40'	**12.0" Round Culvert** L= 23.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 77.40' / 76.90' S= 0.0217 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2	Device 1	81.82'	**24.0" Horiz. Beehive Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.41 cfs @ 12.04 hrs HW=81.89' TW=80.97' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.41 cfs of 3.64 cfs potential flow)
↑—**2=Beehive Grate** (Weir Controls 0.41 cfs @ 0.88 fps)

Summary for Pond 9P: CB #1912

Inflow Area = 22,664 sf, 35.02% Impervious, Inflow Depth = 2.15" for 10Y NRCC 24h event
Inflow = 1.28 cfs @ 12.07 hrs, Volume= 4,059 cf
Outflow = 1.28 cfs @ 12.07 hrs, Volume= 4,059 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.28 cfs @ 12.07 hrs, Volume= 4,059 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 82.76' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**12.0" Round Culvert** L= 119.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 79.50' S= 0.0084 '/' Cc= 0.900

n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf
#2 Device 1 82.60' **24.0" Horiz. Beehive Grate** C= 0.600
Limited to weir flow at low heads

Primary OutFlow Max=1.28 cfs @ 12.07 hrs HW=82.76' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.28 cfs of 3.72 cfs potential flow)
└**2=Beehive Grate** (Weir Controls 1.28 cfs @ 1.30 fps)

Summary for Pond 10P: CB #1927

Inflow Area = 12,767 sf, 32.29% Impervious, Inflow Depth = 2.08" for 10Y NRCC 24h event
Inflow = 0.79 cfs @ 12.05 hrs, Volume= 2,211 cf
Outflow = 0.79 cfs @ 12.05 hrs, Volume= 2,211 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.05 hrs, Volume= 2,211 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 84.18' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	81.65'	**12.0" Round Culvert**
			L= 100.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 81.65' / 80.65' S= 0.0100 '/' Cc= 0.900
			n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	84.07'	**24.0" Horiz. Beehive Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.79 cfs @ 12.05 hrs HW=84.18' TW=82.75' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.79 cfs of 2.08 cfs potential flow)
└**2=Beehive Grate** (Weir Controls 0.79 cfs @ 1.10 fps)

Summary for Pond 11P: CB (inaccessible)

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 81.54' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	81.54'	**12.0" Round Culvert**
			L= 66.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 81.54' / 81.54' S= 0.0000 '/' Cc= 0.900
			n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=81.54' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 12P: CB #2011

Device	Routing	Invert	Outlet Devices
#1	Device 2	84.03'	**0.8" x 7.0" Horiz. Orifice/Grate X 51.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	81.70'	**12.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 81.70' / 81.54' S= 0.0053 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=81.54' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 13P: Pond 1

Inflow Area = 12,177 sf, 38.83% Impervious, Inflow Depth = 2.24" for 10Y NRCC 24h event
Inflow = 0.87 cfs @ 12.02 hrs, Volume= 2,273 cf
Outflow = 0.20 cfs @ 24.57 hrs, Volume= 2,263 cf, Atten= 77%, Lag= 753.0 min
Discarded = 0.01 cfs @ 12.50 hrs, Volume= 1,017 cf
Primary = 0.19 cfs @ 24.57 hrs, Volume= 1,246 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 87.04' @ 12.50 hrs Surf.Area= 871 sf Storage= 1,096 cf

Plug-Flow detention time= 454.5 min calculated for 2,263 cf (100% of inflow)
Center-of-Mass det. time= 451.8 min (1,284.7 - 832.9)

Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	2,124 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)
85.00	263	82.0	0	0	263
88.00	1,281	141.0	2,124	2,124	1,362

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.00'	**0.600 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	85.00'	**6.0" Round Culvert** L= 120.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.00' / 83.60' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 2	86.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	87.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	87.50'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65

2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.01 cfs @ 12.50 hrs HW=87.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 24.57 hrs HW=86.80' TW=86.89' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: Pond 2

Inflow Area = 9,769 sf, 42.91% Impervious, Inflow Depth = 2.41" for 10Y NRCC 24h event
Inflow = 0.74 cfs @ 12.03 hrs, Volume= 1,959 cf
Outflow = 0.34 cfs @ 12.14 hrs, Volume= 1,959 cf, Atten= 54%, Lag= 6.8 min
Discarded = 0.01 cfs @ 12.14 hrs, Volume= 379 cf
Primary = 0.33 cfs @ 12.14 hrs, Volume= 1,580 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 89.53' @ 12.14 hrs Surf.Area= 497 sf Storage= 453 cf

Plug-Flow detention time= 107.7 min calculated for 1,959 cf (100% of inflow)
Center-of-Mass det. time= 107.9 min (936.2 - 828.3)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	1,393 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)
88.00	130	66.0	0	0	130
89.00	350	88.0	231	231	410
90.83	972	130.0	1,162	1,393	1,166

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**6.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.00' / 86.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	88.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	90.10'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	88.00'	**0.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#5	Secondary	90.30'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.01 cfs @ 12.14 hrs HW=89.53' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.14 hrs HW=89.53' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.33 cfs of 1.34 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 3.76 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 15P: Pond 3

Inflow Area = 9,547 sf, 35.51% Impervious, Inflow Depth = 2.16" for 10Y NRCC 24h event
Inflow = 0.67 cfs @ 12.00 hrs, Volume= 1,717 cf
Outflow = 0.20 cfs @ 12.31 hrs, Volume= 1,717 cf, Atten= 71%, Lag= 18.4 min
Discarded = 0.01 cfs @ 12.31 hrs, Volume= 1,070 cf
Primary = 0.18 cfs @ 12.31 hrs, Volume= 647 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 90.31' @ 12.31 hrs Surf.Area= 944 sf Storage= 622 cf

Plug-Flow detention time= 322.0 min calculated for 1,717 cf (100% of inflow)
Center-of-Mass det. time= 322.1 min (1,156.8 - 834.7)

Volume	Invert	Avail.Storage	Storage Description
#1	89.50'	1,392 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)
89.50	607	132.0	0	0	607
91.00	1,292	169.0	1,392	1,392	1,522

Device	Routing	Invert	Outlet Devices
#1	Secondary	90.50'	**12.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	88.60'	**6.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 88.60' / 88.50' S= 0.0067 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 2	90.20'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	89.50'	**0.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.01 cfs @ 12.31 hrs HW=90.31' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.18 cfs @ 12.31 hrs HW=90.31' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.18 cfs of 0.90 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.18 cfs @ 1.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=89.50' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 16P: Pond 3

Inflow Area = 9,131 sf, 41.76% Impervious, Inflow Depth = 2.32" for 10Y NRCC 24h event
Inflow = 0.69 cfs @ 12.01 hrs, Volume= 1,768 cf
Outflow = 0.07 cfs @ 12.73 hrs, Volume= 1,708 cf, Atten= 90%, Lag= 43.1 min
Discarded = 0.01 cfs @ 12.73 hrs, Volume= 1,364 cf
Primary = 0.06 cfs @ 12.73 hrs, Volume= 344 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 88.63' @ 12.73 hrs Surf.Area= 1,038 sf Storage= 904 cf

Plug-Flow detention time= 610.4 min calculated for 1,708 cf (97% of inflow)
Center-of-Mass det. time= 591.5 min (1,421.0 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	1,485 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)
87.00	134	89.0	0	0	134
88.00	678	194.0	371	371	2,503
89.00	1,291	213.0	968	1,339	3,151
89.10	1,619	223.0	145	1,485	3,499

Device	Routing	Invert	Outlet Devices
#1	Primary	88.60'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	87.00'	**0.600 in/hr Exfiltration over Surface area** Phase-In= 0.10'

Discarded OutFlow Max=0.01 cfs @ 12.73 hrs HW=88.63' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.06 cfs @ 12.73 hrs HW=88.63' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.38 fps)

Summary for Link POA1: CB#1008

Inflow Area = 62,522 sf, 64.67% Impervious, Inflow Depth = 2.96" for 10Y NRCC 24h event
Inflow = 4.49 cfs @ 12.04 hrs, Volume= 15,429 cf
Primary = 4.49 cfs @ 12.04 hrs, Volume= 15,429 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA2: CB#1782

Inflow Area = 22,664 sf, 35.02% Impervious, Inflow Depth = 2.15" for 10Y NRCC 24h event
Inflow = 1.28 cfs @ 12.07 hrs, Volume= 4,059 cf
Primary = 1.28 cfs @ 12.07 hrs, Volume= 4,059 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA3:

Inflow Area = 6,000 sf, 11.52% Impervious, Inflow Depth = 1.48" for 10Y NRCC 24h event
Inflow = 0.27 cfs @ 12.02 hrs, Volume= 742 cf
Primary = 0.27 cfs @ 12.02 hrs, Volume= 742 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA4:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA5:

Inflow Area = 19,316 sf, 39.25% Impervious, Inflow Depth = 1.38" for 10Y NRCC 24h event
Inflow = 0.50 cfs @ 12.29 hrs, Volume= 2,228 cf
Primary = 0.50 cfs @ 12.29 hrs, Volume= 2,228 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link POA6:

Inflow Area = 9,131 sf, 41.76% Impervious, Inflow Depth = 0.45" for 10Y NRCC 24h event
Inflow = 0.06 cfs @ 12.73 hrs, Volume= 344 cf
Primary = 0.06 cfs @ 12.73 hrs, Volume= 344 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

APPENDIX D

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.917 degrees West
Latitude	43.129 degrees North
Elevation	0 feet
Date/Time	Mon, 23 Oct 2017 15:42:17 -0400

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	0.50	0.65	0.81	1.03	**1yr**	0.70	0.98	1.20	1.55	2.00	2.61	2.84	**1yr**	2.31	2.74	3.14	3.86	4.44	**1yr**
2yr	0.32	0.49	0.61	0.81	1.01	1.29	**2yr**	0.88	1.17	1.50	1.91	2.44	3.14	3.48	**2yr**	2.78	3.34	3.84	4.57	5.21	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.58	**5yr**	1.06	1.44	1.85	2.38	3.07	3.98	4.46	**5yr**	3.52	4.29	4.90	5.79	6.55	**5yr**
10yr	0.40	0.63	0.80	1.09	1.42	1.85	**10yr**	1.22	1.69	2.18	2.83	3.66	4.76	5.39	**10yr**	4.21	5.18	5.90	6.92	7.80	**10yr**
25yr	0.46	0.74	0.94	1.29	1.72	2.27	**25yr**	1.48	2.09	2.69	3.53	4.62	6.03	6.91	**25yr**	5.34	6.65	7.53	8.78	9.83	**25yr**
50yr	0.51	0.83	1.06	1.48	2.00	2.66	**50yr**	1.72	2.46	3.18	4.19	5.51	7.22	8.36	**50yr**	6.39	8.04	9.06	10.51	11.72	**50yr**
100yr	0.58	0.93	1.20	1.70	2.32	3.12	**100yr**	2.00	2.89	3.74	4.97	6.56	8.64	10.11	**100yr**	7.65	9.72	10.91	12.58	13.97	**100yr**
200yr	0.64	1.04	1.35	1.95	2.69	3.67	**200yr**	2.32	3.40	4.43	5.91	7.84	10.36	12.22	**200yr**	9.16	11.75	13.14	15.07	16.66	**200yr**
500yr	0.75	1.24	1.61	2.34	3.29	4.53	**500yr**	2.84	4.22	5.50	7.40	9.89	13.16	15.72	**500yr**	11.64	15.12	16.81	19.15	21.05	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.91	1.26	1.56	2.02	2.52	**1yr**	1.79	2.42	2.93	3.27	4.01	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.37	1.83	2.36	3.04	3.39	**2yr**	2.69	3.26	3.74	4.46	5.05	**2yr**
5yr	0.35	0.54	0.67	0.92	1.16	1.40	**5yr**	1.01	1.37	1.62	2.15	2.78	3.72	4.14	**5yr**	3.29	3.98	4.59	5.43	6.14	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.57	1.82	2.45	3.13	4.30	4.82	**10yr**	3.80	4.63	5.34	6.30	7.08	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.91	**25yr**	1.35	1.87	2.11	2.85	3.66	5.03	5.87	**25yr**	4.45	5.65	6.54	7.68	8.56	**25yr**
50yr	0.48	0.74	0.92	1.32	1.77	2.19	**50yr**	1.53	2.14	2.36	3.20	4.11	5.77	6.81	**50yr**	5.11	6.55	7.63	8.92	9.87	**50yr**
100yr	0.54	0.82	1.02	1.48	2.03	2.51	**100yr**	1.75	2.45	2.64	3.59	4.60	6.60	7.89	**100yr**	5.84	7.59	8.91	10.35	11.35	**100yr**
200yr	0.60	0.90	1.15	1.66	2.31	2.87	**200yr**	2.00	2.80	2.94	4.01	5.14	7.55	9.15	**200yr**	6.68	8.80	10.41	12.02	13.08	**200yr**
500yr	0.70	1.05	1.34	1.95	2.78	3.45	**500yr**	2.40	3.37	3.42	4.65	5.98	8.99	11.12	**500yr**	7.95	10.69	12.80	14.67	15.72	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.24	1.75	2.22	2.84	3.03	**1yr**	2.51	2.91	3.38	4.18	4.78	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.25	**2yr**	0.90	1.22	1.48	1.95	2.50	3.26	3.58	**2yr**	2.88	3.44	3.95	4.71	5.40	**2yr**
5yr	0.39	0.60	0.75	1.03	1.31	1.58	**5yr**	1.13	1.55	1.85	2.50	3.19	4.23	4.77	**5yr**	3.74	4.59	5.22	6.16	6.93	**5yr**
10yr	0.46	0.70	0.87	1.21	1.57	1.92	**10yr**	1.35	1.88	2.23	3.04	3.84	5.21	5.94	**10yr**	4.61	5.71	6.48	7.56	8.45	**10yr**
25yr	0.55	0.84	1.05	1.50	1.97	2.48	**25yr**	1.70	2.42	2.87	3.96	4.93	7.05	7.95	**25yr**	6.24	7.65	8.59	9.94	11.01	**25yr**
50yr	0.64	0.97	1.21	1.74	2.34	2.99	**50yr**	2.02	2.92	3.48	4.83	5.99	8.73	9.93	**50yr**	7.73	9.55	10.65	12.21	13.47	**50yr**
100yr	0.74	1.12	1.41	2.03	2.79	3.61	**100yr**	2.40	3.53	4.23	5.91	7.27	10.81	12.40	**100yr**	9.57	11.92	13.19	15.02	16.48	**100yr**
200yr	0.86	1.29	1.64	2.37	3.31	4.38	**200yr**	2.86	4.28	5.14	7.23	8.81	13.43	15.50	**200yr**	11.88	14.91	16.34	18.47	20.19	**200yr**
500yr	1.05	1.56	2.01	2.92	4.15	5.63	**500yr**	3.58	5.50	6.63	9.47	11.40	17.92	20.82	**500yr**	15.86	20.02	21.69	24.30	26.43	**500yr**

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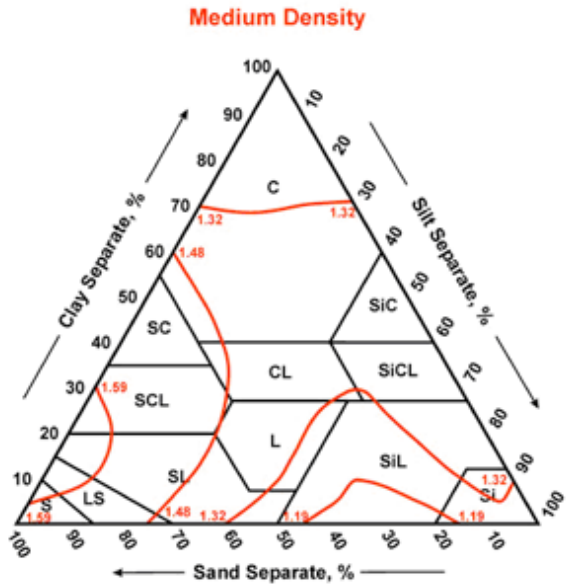
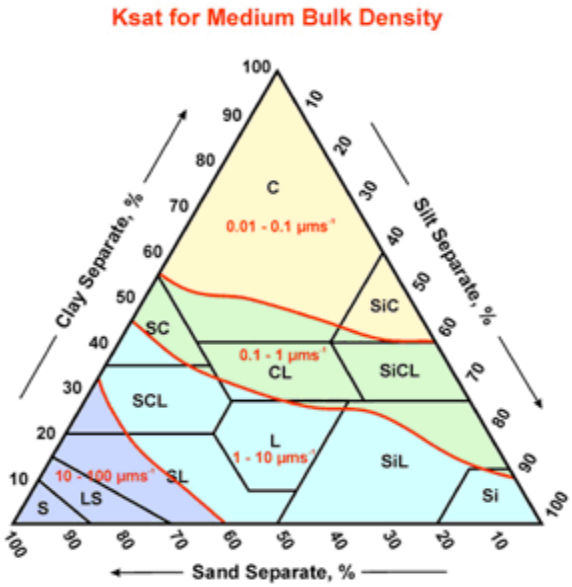
APPENDIX E

K_{sat} VALUES
FOR
NEW HAMPSHIRE SOILS
(Including Hydrologic and DES Soil Lot Sizing Groups)





From: Guide for Estimating Ksat from Soil Properties (**Exhibit 618-9**). (http://soils.usda.gov/technical/handbook/contents/part618ex.html)

Sponsored by the Society of Soil Scientists of Northern New England
SSSNNE Special Publication No. 5
September, 2009

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Suncook	2	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	occasionally flooded
Lim	3	0.6	2.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Hadley	8	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand
Winooski	9	0.6	6.0	0.60	6.0	B		Flood Plain (Bottom Land)	mesic	silty over loamy	no	
Merrimac	10	2.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	gravelly sand	no	loamy cap
Gloucester	11	6.0	20.0	6.00	20.0	A	1	Sandy Till	mesic	sandy-skeletal	no	loamy cap
Hinckley	12	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Masardis	23	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	slate, loamy cap
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Windsor	26	6.0	20.0	6.00	20.0	A	1	Outwash and Stream Terraces	mesic	sandy	no	
Groveton	27	0.6	2.0	0.60	6.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Madawaska	28	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Woodbridge	29	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	mesic	loamy	no	sandy loam in Cd
Unadilla	30	0.6	2.0	2.00	20.0	B	2	Terraces and glacial lake plains	mesic	silty	no	silty over gravelly
Hartland	31	0.6	2.0	0.20	2.0	B	2	Terraces and glacial lake plains	mesic	silty	no	very fine sandy loam
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Wareham	34	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Melrose	37	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	silty clay loam in C
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Millis	39					C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Montauk	44	0.6	6.0	0.06	0.6	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Henniker	46	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Madawaska, aquentic	48	0.6	2.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	loamy over sandy	yes	sandy or sandy-skeletal
Whitman	49	0.0	0.2	0.00	0.2	D	6	Firm, platy, loamy till	mesic	loamy	no	mucky loam
Hermon	55	2.0	20.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	loamy cap
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Waumbeck	58	2.0	20.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal	yes	very cobbly loamy sand
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Sutton	68	0.6	6.0	0.60	6.0	B	3	Loose till, loamy textures	mesic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Marlow	76	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Thorndike	84	0.6	2.0	0.60	2.0	C/D	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	less than 20 in. deep
Hollis	86	0.6	6.0	0.60	6.0	C/D	4	Loose till, bedrock	mesic	loamy	no	less than 20 in. deep
Winnecook	88	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Hogback	91	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Lyman	92	2.0	6.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes	less than 20 in. deep
Woodstock	93	2.0	6.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no	less than 20 in. deep
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Tunbridge	99	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	occasionally flooded
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Monson	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Maybid	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Monadnock	142	0.6	2.0	2.00	6.0	B	2	Loose till, sandy textures	frigid	loamy over sandy, sandy-skeletal	yes	gravelly loamy sand in C
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Vassalboro	150					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	
Waskish	195					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Sunday	202	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no	frequently flooded
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	loamy over slate gravel
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	channery silt loam in Cd
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Millsite	251	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	20 to 40 in. deep
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	yes	20 to 40 in. deep
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	no	very channery
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	frigid dystrudept
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Greenwood	295					A/D	6	Organic Materials - Freshwater	frigid	hemic	no	deep organic
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Lovewell	307	0.6	2.0	0.60	2.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Mashpee	315	6.0	20.0	6.00	20.0	B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Kearsarge	359	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	less than 20 in. deep
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Timakwa	393			6.00	100.0	D	6	Organic Materials - Freshwater	mesic	sandy or sandy-skeletal	no	organic over sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Ipswich	397					D	6	Tidal Flat	mesic	hemic/sapric	no	deep organic
Suncook	402	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	mesic	sandy	no	frequent flooding
Metallak	404	6.0	100.0	6.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	loamy over sandy	no	sandy or sandy-skeletal
Medomak	406	0.6	2.0	0.60	2.0	D	6	Flood Plain (Bottom Land)	frigid	silty	no	organic over silt
Haven	410	0.6	2.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Moosilauke	414	6.0	20.0	6.00	20.0	C	5	Loose till, sandy textures	frigid	sandy	no	
Grange	433	0.6	2.0	0.60	2.0	C	5	Outwash and Stream Terraces	frigid	co. loamy over sandy (skeletal)	no	
Swanton	438	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	frigid	co. loamy over clayey	no	
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Metacomet	458	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no	loamy sand in Cd
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Gilmanton	478	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	fine sandy loam in Cd
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Hoosic	510	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	slate, loamy cap
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Leicester	514	0.6	6.0	0.60	20.0	C	5	Loose till, loamy textures	mesic	loamy	no	
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Machias	520	2.0	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy or sandy-skeletal	yes	strata sand/gravel in C
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Suffield	536	0.6	2.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	silty over clayey	no	deep to clay C
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Walpole	546	2.0	6.0	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Howland	566	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	silt loam, platy in Cd
Monarda	569	0.2	2.0	0.02	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Westbrook	597			0.00	2.0	D	6	Tidal Flat	mesic	loamy	no	organic over loam
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Kinsman	614	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Surplus	669	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	mwd, sandy loam in Cd
Glebe	671	2.0	6.0	2.00	6.0	C	4	Loose till, bedrock	cryic	loamy	yes	20 to 40 in. deep
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Ricker	674	2.0	6.0	2.00	6.0	A	4	Organic over bedrock (up to 4" of mineral)	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Houghtonville	795	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	cobbly fine sandy loam
Matunuck	797			20.00	100.0	D	6	Tidal Flat	mesic	sandy	no	organic over sand
Meadowsedge	894					D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Wonsqueak	995			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Glover	NA	0.6	2.0	0.60	2	D	4	Friable till, silty, schist & phyllite	frigid	loamy	no	less than 20 in. deep

no longer recognized

organic materials

APPENDIX F

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Strafford County, New Hampshire

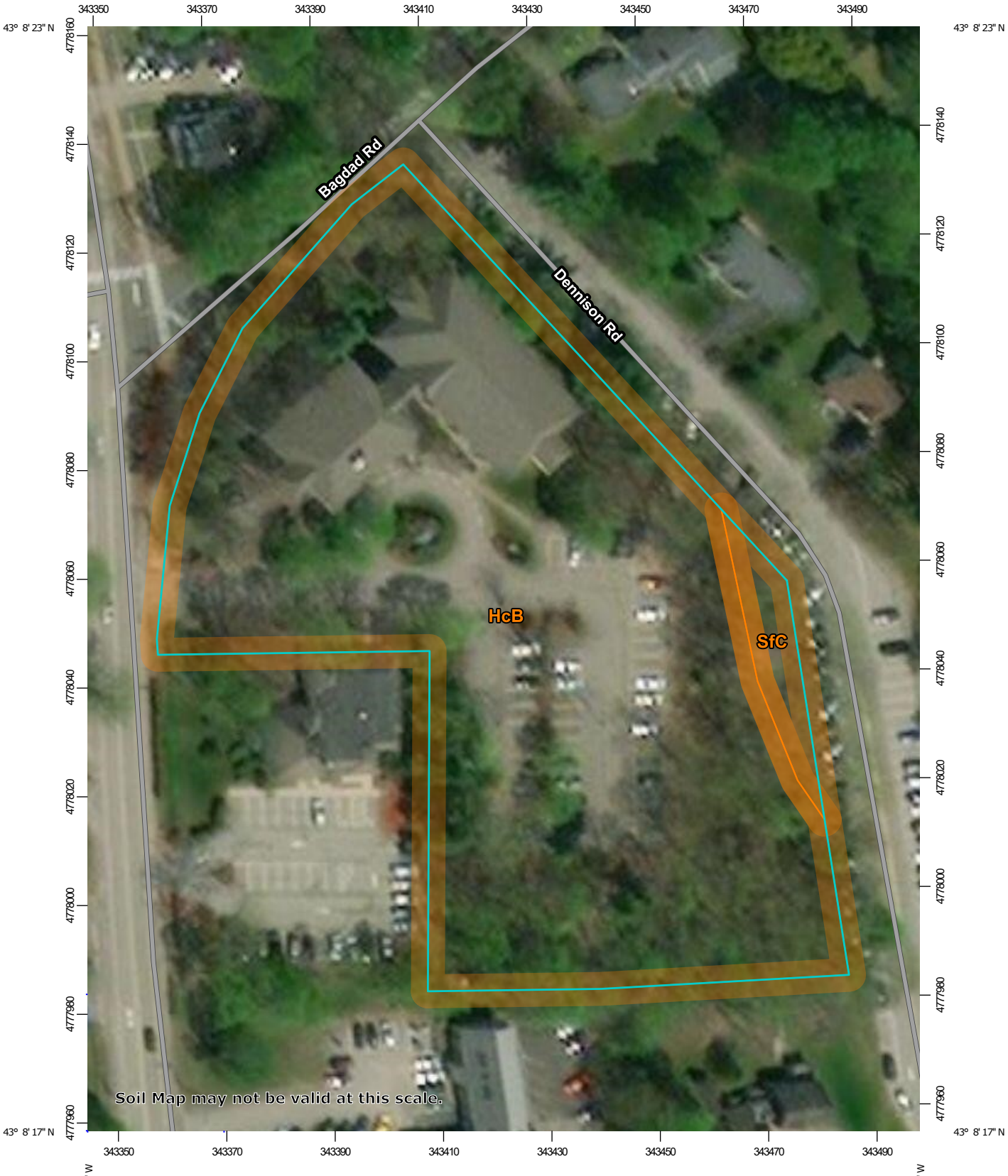
March 11, 2020

Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:990 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Strafford County, New Hampshire
Survey Area Data: Version 19, Sep 16, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HcB	Hollis-Charlton fine sandy loams, 3 to 8 percent slopes	2.6	96.8%
SfC	Suffield silt loam, 8 to 15 percent slopes	0.1	3.2%
Totals for Area of Interest		**2.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Strafford County, New Hampshire

HcB—Hollis-Charlton fine sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d7j
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hollis and similar soils: 55 percent
Charlton and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 5 percent
Hydric soil rating: No

Buxton

Percent of map unit: 5 percent
Hydric soil rating: No

SfC—Suffield silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d8v
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Suffield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffield

Typical profile

H1 - 0 to 19 inches: silt loam
H2 - 19 to 28 inches: silt loam
H3 - 28 to 41 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 9 percent
Hydric soil rating: No

Buxton

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No