

DRAINAGE REPORT

Prepared for

**PROPOSED MULTI-FAMILY DEVELOPMENT
LOUISE BERRY DRIVE
BROOKLYN, CT**

August 2020

Revised to December 2020

Prepared for

Shane Pollock

Prepared by

Killingly Engineering Associates

Civil Engineering & Surveying



Normand Thibeault Jr., P.E.
CT License #22834

Introduction

Shane Pollock has submitted a proposal to the Town of Brooklyn to construct a 51-unit condominium development with access from Louise Berry Drive in Brooklyn. The project will require construction of a 1000-foot-long paved roadway with a cul-de-sac turnaround, and public water and sewer. The proposal is the second version of the project, the first of which proposed 100-units. The current design results in creation of impervious surfaces consisting of pavement and roof but a significant reduction from the amount of impervious surface from the design that was originally proposed.

Summary

According to the USDA-SCS Soil Survey, the area of disturbance consists of Canton and Charlton fine sandy loams and wetlands consist of Ridgebury, Leicester and Whitman Soils. A walk of the property appears to verify that these descriptions are accurate. These soils are associated with hydrologic soil groups B and D. The site sheet flow primarily to the south to a linear wetlands system and west to areas off site. To the greatest degree possible, the drainage patterns will be preserved.

The bulk of the drainage from developed areas will be collected in a closed stormwater collection system consisting of catch basins and HDPE pipe and will be conveyed to a proposed stormwater basin at the southwestern portion of the property. Overland runoff from newly landscaped and grassed areas will be collected in a swale at the toe of fill slopes and also conveyed to the stormwater basin. Discharge from the basin will be directed back toward the wetlands that flows off the property at the southwestern boundary.

The calculations utilized HydroCAD® Stormwater Modeling System, a computer model, to analyze pre-and post-development drainage conditions, and to aid in the design of the stormwater detention system. The model used the Soil Conservation Service TR-20 method with a Type III 24-hour rainfall to calculate the runoff. The 2 through 100-year frequency storms were analyzed to evaluate peak runoff for pre-and post-construction conditions. Table 1 summarizes our findings:

Table 1. Existing & Proposed Peak Flows to

Design Storm	Depth (in)	Existing peak	Proposed peak	Difference
2-Year	3.37	2.52 CFS	2.47 CFS	-0.05 CFS
5-Year	4.28	6.48 CFS	5.48 CFS	-1.00 CFS
10-Year	5.04	10.87 CFS	8.96 CFS	-1.91 CFS
25-Year	6.08	17.63 CFS	14.21 CFS	-3.42 CFS
50-Year	6.85	23.03 CFS	18.01 CFS	-5.02 CFS
100-Year	7.68	29.21 CFS	25.66 CFS	-3.55 CFS

Installation of the proposed stormwater basin will reduce peak runoff rates from the site for all design storms. Based upon the channelized topography that the wetlands follow, it is our opinion that the discharge rates for this storm will not detrimentally impact downstream properties.

In addition to addressing pre- and post-construction peak runoff rates from the property to the wetlands and adjacent property, the design considers stormwater treatment and water quality for the project. Wherever possible, overland sheet flow is encouraged, catch basins will be constructed with 4ø sediment sumps, the final catch basin prior to discharge to the stormwater basin will be retrofitted with a hooded outlet, and the detention/water quality basin accounts for Water Quality Volume (WQV) in accordance with the parameters set forth in the 2004 CTDEEP Stormwater Quality Guidelines. Following are computation for the stormwater basin and the WQV provided.

Section 7.4.1 Water Quality Volume

Basin Water Quality Volume (WQV)

$$WQV = (1\ddot{o}) (R)(A)/12$$

$$R = 0.05 + 0.009(I) \quad I = \% \text{ Impervious} = 48.33\% \text{ (Stormwater System Drainage Area)}$$

$$R = 0.05 + 0.009(48.33) = 0.485$$

$$A = 4.781 \text{ acres}$$

$$WQV = (1\ddot{o}) (0.485) (4.781)/12 = 0.193 \text{ ac-ft}$$

$$8417 \text{ c.f.}$$

Basin forebay + outlet side of basin provides 8,628 c.f.

Section 7.4.2 Water Quality Volume

This section is utilized for treatment mechanisms such as grass swales or proprietary treatment devices. Although the project calls for a grassed swale at the toe of the fill slope, this swale will not convey runoff from impervious surfaces.

Section 7.5.1 Groundwater Recharge Volume (GRV)

Intended to maintain pre-development and groundwater recharge volumes by capturing and infiltrating stormwater runoff.

$$GRV = (D)(A)(I) / 12$$

D = Depth of runoff to be recharged per table 7-4 of the CSQM based upon soil type

A = Site Area in acres

I = Percent Impervious (or net increase in impervious)

D = 0.25 (Hydrologic Soil Group öBö)

A = 5.46 Acres

I = 40.6% (0.406)

$$GRV = 0.25 \times 5.46 \times 0.406 / 12 = 0.0462 \text{ ac-ft} \\ = 2,011 \text{ c.f.}$$

Based upon soil testing, the bottom of the basin will remain wet. The area of the basin from elevations 242.5 to 245 will be available to provide the opportunity to infiltrate. The percolation rate measured in this area was 6.7 minutes per inch (about 8.9 inches per hour). We utilized a conservative rate of 4.5 inches per hour over the horizontal area (assuming no infiltration in the basin bottom) which provides the following infiltration volumes for each design storm.

Table 2. Summary of Infiltration Volume

Design Storm	Depth (in)	Infiltration Volume (Ac-ft)	Infiltration Volume (Cubic ft.)
2-Year	3.37	0.433	18,861 CF
5-Year	4.27	0.562	24,481 CF
10-Year	5.02	0.628	27,355 CF
25-Year	6.05	0.679	29,577 CF
50-Year	6.85	0.718	31,276 CF
100-Year	7.64	0.755	32,888 CF

Infiltration requirements are exceeded for all design storms

Section 7.5.2 Runoff Capture Volume (RCV)

Not utilized for this application. This method is typically utilized to capture clean stormwater from surfaces such as rooftops and infiltrate it into the soil.

Section 7.6 Peak Flow Control

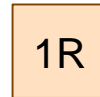
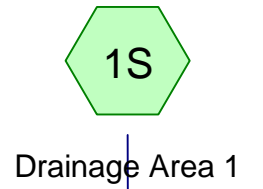
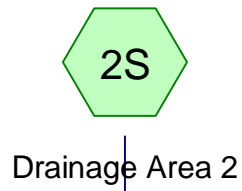
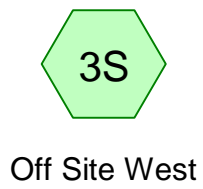
Summary of Peak Flow to Wetlands

Design Storm	Depth (in)	Existing peak	Proposed peak	Difference
10-Year	5.08	10.87 CFS	8.96 CFS	-1.91 CFS
25-Year	6.08	17.63 CFS	14.21 CFS	-3.42 CFS
100-Year	7.69	29.21 CFS	25.66 CFS	-3.55 CFS

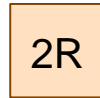
As shown above and in table 2 previously in this report, the peak flows will be attenuated for all design storms.

HYDROCAD CALCULATIONS

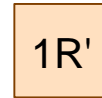
EXISTING CONDITIONS



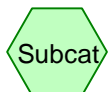
Wetland Section 1



Peak off Site



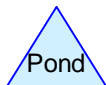
Wetland Section 2



Subcat



Reach



Pond



Link

Routing Diagram for Existing Conditions

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
11.986	55	Woods, Good, HSG B (1S, 2S, 3S)
2.348	77	Woods, Good, HSG D - Wetlands (1S, 2S)
14.334	59	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
11.986	HSG B	1S, 2S, 3S
0.000	HSG C	
2.348	HSG D	1S, 2S
0.000	Other	
14.334		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	11.986	0.000	2.348	0.000	14.334	Woods, Good	1S, 2S, 3S
0.000	11.986	0.000	2.348	0.000	14.334	TOTAL AREA	

Existing Conditions

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Type III 24-hr 2-year Rainfall=3.37"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1

Runoff Area=3.314 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=270' Slope=0.1110 '/' Tc=5.6 min CN=61 Runoff=1.37 cfs 0.125 af

Subcatchment 2S: Drainage Area 2

Runoff Area=7.387 ac 0.00% Impervious Runoff Depth>0.38"
Flow Length=600' Slope=0.1240 '/' Tc=10.6 min CN=59 Runoff=1.90 cfs 0.235 af

Subcatchment 3S: Off Site West

Runoff Area=3.633 ac 0.00% Impervious Runoff Depth>0.26"
Flow Length=564' Slope=0.1250 '/' Tc=11.2 min CN=55 Runoff=0.48 cfs 0.078 af

Reach 1R: Wetland Section 1

Avg. Flow Depth=0.07' Max Vel=1.02 fps Inflow=1.37 cfs 0.125 af
n=0.050 L=240.0' S=0.0667 '/' Capacity=1,610.63 cfs Outflow=1.17 cfs 0.124 af

Reach 1R': Wetland Section 2

Avg. Flow Depth=0.06' Max Vel=4.59 fps Inflow=1.17 cfs 0.124 af
n=0.013 L=145.0' S=0.1241 '/' Capacity=2,590.64 cfs Outflow=1.16 cfs 0.124 af

Reach 2R: Peak off Site

Avg. Flow Depth=0.14' Max Vel=1.19 fps Inflow=3.01 cfs 0.359 af
n=0.050 L=640.0' S=0.0375 '/' Capacity=789.38 cfs Outflow=2.52 cfs 0.351 af

Total Runoff Area = 14.334 ac Runoff Volume = 0.437 af Average Runoff Depth = 0.37"
100.00% Pervious = 14.334 ac 0.00% Impervious = 0.000 ac

Existing Conditions

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Type III 24-hr 2-year Rainfall=3.37"
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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 1.37 cfs @ 12.12 hrs, Volume= 0.125 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (ac)	CN	Description
* 0.930	77	Woods, Good, HSG D - Wetlands
2.384	55	Woods, Good, HSG B
3.314	61	Weighted Average
3.314		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	270	0.1110	0.80		Lag/CN Method, Tc 1

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 1.90 cfs @ 12.22 hrs, Volume= 0.235 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (ac)	CN	Description
* 1.418	77	Woods, Good, HSG D - Wetlands
5.969	55	Woods, Good, HSG B
7.387	59	Weighted Average
7.387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	600	0.1240	0.94		Lag/CN Method, Tc-2

Summary for Subcatchment 3S: Off Site West

Runoff = 0.48 cfs @ 12.38 hrs, Volume= 0.078 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (ac)	CN	Description
3.633	55	Woods, Good, HSG B
3.633		100.00% Pervious Area

Existing Conditions

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	564	0.1250	0.84		Lag/CN Method, Tc-3

Summary for Reach 1R: Wetland Section 1

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 0.45" for 2-year event
Inflow = 1.37 cfs @ 12.12 hrs, Volume= 0.125 af
Outflow = 1.17 cfs @ 12.25 hrs, Volume= 0.124 af, Atten= 15%, Lag= 8.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.02 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 7.3 min

Peak Storage= 283 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 173.3 sf, Capacity= 1,610.63 cfs

130.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 240.0' Slope= 0.0667 '/'
Inlet Invert= 296.00', Outlet Invert= 280.00'



Summary for Reach 1R': Wetland Section 2

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 0.45" for 2-year event
Inflow = 1.17 cfs @ 12.25 hrs, Volume= 0.124 af
Outflow = 1.16 cfs @ 12.27 hrs, Volume= 0.124 af, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.59 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.9 min

Peak Storage= 37 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 2.00' Flow Area= 53.3 sf, Capacity= 2,590.64 cfs

40.00' x 2.00' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 145.0' Slope= 0.1241 '/'
Inlet Invert= 280.00', Outlet Invert= 262.00'

Existing Conditions

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Type III 24-hr 2-year Rainfall=3.37"

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Summary for Reach 2R: Peak off Site

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth > 0.40" for 2-year event
Inflow = 3.01 cfs @ 12.26 hrs, Volume= 0.359 af
Outflow = 2.52 cfs @ 12.57 hrs, Volume= 0.351 af, Atten= 16%, Lag= 18.8 min

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

Max. Velocity= 1.19 fps, Min. Travel Time= 9.0 min

Avg. Velocity = 0.70 fps, Avg. Travel Time= 15.3 min

Peak Storage= 1,357 cf @ 12.42 hrs

Average Depth at Peak Storage= 0.14'

Bank-Full Depth= 2.00' Flow Area= 113.3 sf, Capacity= 789.38 cfs

85.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds

Length= 640.0' Slope= 0.0375 '/'

Inlet Invert= 262.00', Outlet Invert= 238.00'



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Type III 24-hr 5-year Rainfall=4.28"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1

Runoff Area=3.314 ac 0.00% Impervious Runoff Depth>0.86"
Flow Length=270' Slope=0.1110 '/' Tc=5.6 min CN=61 Runoff=3.17 cfs 0.237 af

Subcatchment 2S: Drainage Area 2

Runoff Area=7.387 ac 0.00% Impervious Runoff Depth>0.75"
Flow Length=600' Slope=0.1240 '/' Tc=10.6 min CN=59 Runoff=4.92 cfs 0.465 af

Subcatchment 3S: Off Site West

Runoff Area=3.633 ac 0.00% Impervious Runoff Depth>0.57"
Flow Length=564' Slope=0.1250 '/' Tc=11.2 min CN=55 Runoff=1.53 cfs 0.171 af

Reach 1R: Wetland Section 1

Avg. Flow Depth=0.11' Max Vel=1.33 fps Inflow=3.17 cfs 0.237 af
n=0.050 L=240.0' S=0.0667 '/' Capacity=1,610.63 cfs Outflow=2.90 cfs 0.236 af

Reach 1R': Wetland Section 2

Avg. Flow Depth=0.09' Max Vel=6.06 fps Inflow=2.90 cfs 0.236 af
n=0.013 L=145.0' S=0.1241 '/' Capacity=2,590.64 cfs Outflow=2.87 cfs 0.236 af

Reach 2R: Peak off Site

Avg. Flow Depth=0.22' Max Vel=1.59 fps Inflow=7.74 cfs 0.700 af
n=0.050 L=640.0' S=0.0375 '/' Capacity=789.38 cfs Outflow=6.48 cfs 0.690 af

Total Runoff Area = 14.334 ac Runoff Volume = 0.873 af Average Runoff Depth = 0.73"
100.00% Pervious = 14.334 ac 0.00% Impervious = 0.000 ac

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Type III 24-hr 5-year Rainfall=4.28"
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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 3.17 cfs @ 12.10 hrs, Volume= 0.237 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.28"

Area (ac)	CN	Description
* 0.930	77	Woods, Good, HSG D - Wetlands
2.384	55	Woods, Good, HSG B
3.314	61	Weighted Average
3.314		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	270	0.1110	0.80		Lag/CN Method, Tc 1

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 4.92 cfs @ 12.18 hrs, Volume= 0.465 af, Depth> 0.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.28"

Area (ac)	CN	Description
* 1.418	77	Woods, Good, HSG D - Wetlands
5.969	55	Woods, Good, HSG B
7.387	59	Weighted Average
7.387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	600	0.1240	0.94		Lag/CN Method, Tc-2

Summary for Subcatchment 3S: Off Site West

Runoff = 1.53 cfs @ 12.21 hrs, Volume= 0.171 af, Depth> 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.28"

Area (ac)	CN	Description
3.633	55	Woods, Good, HSG B
3.633		100.00% Pervious Area

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Type III 24-hr 5-year Rainfall=4.28"
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	564	0.1250	0.84		Lag/CN Method, Tc-3

Summary for Reach 1R: Wetland Section 1

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 0.86" for 5-year event
Inflow = 3.17 cfs @ 12.10 hrs, Volume= 0.237 af
Outflow = 2.90 cfs @ 12.20 hrs, Volume= 0.236 af, Atten= 9%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 6.2 min

Peak Storage= 521 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.00' Flow Area= 173.3 sf, Capacity= 1,610.63 cfs

130.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 240.0' Slope= 0.0667 '/'
Inlet Invert= 296.00', Outlet Invert= 280.00'



Summary for Reach 1R': Wetland Section 2

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 0.85" for 5-year event
Inflow = 2.90 cfs @ 12.20 hrs, Volume= 0.236 af
Outflow = 2.87 cfs @ 12.21 hrs, Volume= 0.236 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.06 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.94 fps, Avg. Travel Time= 0.8 min

Peak Storage= 70 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 2.00' Flow Area= 53.3 sf, Capacity= 2,590.64 cfs

40.00' x 2.00' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 145.0' Slope= 0.1241 '/'
Inlet Invert= 280.00', Outlet Invert= 262.00'

Existing Conditions

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Type III 24-hr 5-year Rainfall=4.28"

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Summary for Reach 2R: Peak off Site

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth > 0.79" for 5-year event
Inflow = 7.74 cfs @ 12.19 hrs, Volume= 0.700 af
Outflow = 6.48 cfs @ 12.41 hrs, Volume= 0.690 af, Atten= 16%, Lag= 12.7 min

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

Max. Velocity= 1.59 fps, Min. Travel Time= 6.7 min

Avg. Velocity = 0.82 fps, Avg. Travel Time= 13.0 min

Peak Storage= 2,615 cf @ 12.29 hrs

Average Depth at Peak Storage= 0.22'

Bank-Full Depth= 2.00' Flow Area= 113.3 sf, Capacity= 789.38 cfs

85.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds

Length= 640.0' Slope= 0.0375 '/'

Inlet Invert= 262.00', Outlet Invert= 238.00'



Existing Conditions

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Type III 24-hr 10-year Rainfall=5.04"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1

Runoff Area=3.314 ac 0.00% Impervious Runoff Depth>1.26"
Flow Length=270' Slope=0.1110 '/' Tc=5.6 min CN=61 Runoff=4.92 cfs 0.348 af

Subcatchment 2S: Drainage Area 2

Runoff Area=7.387 ac 0.00% Impervious Runoff Depth>1.13"
Flow Length=600' Slope=0.1240 '/' Tc=10.6 min CN=59 Runoff=8.13 cfs 0.696 af

Subcatchment 3S: Off Site West

Runoff Area=3.633 ac 0.00% Impervious Runoff Depth>0.89"
Flow Length=564' Slope=0.1250 '/' Tc=11.2 min CN=55 Runoff=2.81 cfs 0.269 af

Reach 1R: Wetland Section 1

Avg. Flow Depth=0.13' Max Vel=1.53 fps Inflow=4.92 cfs 0.348 af
n=0.050 L=240.0' S=0.0667 '/' Capacity=1,610.63 cfs Outflow=4.49 cfs 0.347 af

Reach 1R': Wetland Section 2

Avg. Flow Depth=0.11' Max Vel=6.89 fps Inflow=4.49 cfs 0.347 af
n=0.013 L=145.0' S=0.1241 '/' Capacity=2,590.64 cfs Outflow=4.46 cfs 0.346 af

Reach 2R: Peak off Site

Avg. Flow Depth=0.28' Max Vel=1.87 fps Inflow=12.42 cfs 1.042 af
n=0.050 L=640.0' S=0.0375 '/' Capacity=789.38 cfs Outflow=10.87 cfs 1.030 af

Total Runoff Area = 14.334 ac Runoff Volume = 1.313 af Average Runoff Depth = 1.10"
100.00% Pervious = 14.334 ac 0.00% Impervious = 0.000 ac

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Type III 24-hr 10-year Rainfall=5.04"
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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 4.92 cfs @ 12.10 hrs, Volume= 0.348 af, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.04"

Area (ac)	CN	Description
* 0.930	77	Woods, Good, HSG D - Wetlands
2.384	55	Woods, Good, HSG B
3.314	61	Weighted Average
3.314		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	270	0.1110	0.80		Lag/CN Method, Tc 1

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 8.13 cfs @ 12.17 hrs, Volume= 0.696 af, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.04"

Area (ac)	CN	Description
* 1.418	77	Woods, Good, HSG D - Wetlands
5.969	55	Woods, Good, HSG B
7.387	59	Weighted Average
7.387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	600	0.1240	0.94		Lag/CN Method, Tc-2

Summary for Subcatchment 3S: Off Site West

Runoff = 2.81 cfs @ 12.19 hrs, Volume= 0.269 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.04"

Area (ac)	CN	Description
3.633	55	Woods, Good, HSG B
3.633		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	564	0.1250	0.84		Lag/CN Method, Tc-3

Summary for Reach 1R: Wetland Section 1

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 1.26" for 10-year event
Inflow = 4.92 cfs @ 12.10 hrs, Volume= 0.348 af
Outflow = 4.49 cfs @ 12.18 hrs, Volume= 0.347 af, Atten= 9%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 2.6 min
Avg. Velocity= 0.70 fps, Avg. Travel Time= 5.7 min

Peak Storage= 714 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.00' Flow Area= 173.3 sf, Capacity= 1,610.63 cfs

130.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 240.0' Slope= 0.0667 '/'
Inlet Invert= 296.00', Outlet Invert= 280.00'



Summary for Reach 1R': Wetland Section 2

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 1.26" for 10-year event
Inflow = 4.49 cfs @ 12.18 hrs, Volume= 0.347 af
Outflow = 4.46 cfs @ 12.19 hrs, Volume= 0.346 af, Atten= 1%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.89 fps, Min. Travel Time= 0.4 min
Avg. Velocity= 3.21 fps, Avg. Travel Time= 0.8 min

Peak Storage= 94 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.00' Flow Area= 53.3 sf, Capacity= 2,590.64 cfs

40.00' x 2.00' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 145.0' Slope= 0.1241 '/'
Inlet Invert= 280.00', Outlet Invert= 262.00'

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Type III 24-hr 10-year Rainfall=5.04"

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Summary for Reach 2R: Peak off Site

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth > 1.17" for 10-year event
Inflow = 12.42 cfs @ 12.18 hrs, Volume= 1.042 af
Outflow = 10.87 cfs @ 12.35 hrs, Volume= 1.030 af, Atten= 12%, Lag= 10.5 min

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

Max. Velocity= 1.87 fps, Min. Travel Time= 5.7 min

Avg. Velocity = 0.89 fps, Avg. Travel Time= 12.0 min

Peak Storage= 3,743 cf @ 12.25 hrs

Average Depth at Peak Storage= 0.28'

Bank-Full Depth= 2.00' Flow Area= 113.3 sf, Capacity= 789.38 cfs

85.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds

Length= 640.0' Slope= 0.0375 '/'

Inlet Invert= 262.00', Outlet Invert= 238.00'



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1

Runoff Area=3.314 ac 0.00% Impervious Runoff Depth>1.88"
Flow Length=270' Slope=0.1110 '/' Tc=5.6 min CN=61 Runoff=7.60 cfs 0.520 af

Subcatchment 2S: Drainage Area 2

Runoff Area=7.387 ac 0.00% Impervious Runoff Depth>1.72"
Flow Length=600' Slope=0.1240 '/' Tc=10.6 min CN=59 Runoff=13.01 cfs 1.057 af

Subcatchment 3S: Off Site West

Runoff Area=3.633 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=564' Slope=0.1250 '/' Tc=11.2 min CN=55 Runoff=4.88 cfs 0.426 af

Reach 1R: Wetland Section 1

Avg. Flow Depth=0.16' Max Vel=1.75 fps Inflow=7.60 cfs 0.520 af
n=0.050 L=240.0' S=0.0667 '/' Capacity=1,610.63 cfs Outflow=7.07 cfs 0.518 af

Reach 1R': Wetland Section 2

Avg. Flow Depth=0.13' Max Vel=7.91 fps Inflow=7.07 cfs 0.518 af
n=0.013 L=145.0' S=0.1241 '/' Capacity=2,590.64 cfs Outflow=6.97 cfs 0.517 af

Reach 2R: Peak off Site

Avg. Flow Depth=0.35' Max Vel=2.16 fps Inflow=19.96 cfs 1.574 af
n=0.050 L=640.0' S=0.0375 '/' Capacity=789.38 cfs Outflow=17.63 cfs 1.559 af

Total Runoff Area = 14.334 ac Runoff Volume = 2.003 af Average Runoff Depth = 1.68"
100.00% Pervious = 14.334 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 7.60 cfs @ 12.09 hrs, Volume= 0.520 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.08"

Area (ac)	CN	Description
* 0.930	77	Woods, Good, HSG D - Wetlands
2.384	55	Woods, Good, HSG B
3.314	61	Weighted Average
3.314		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	270	0.1110	0.80		Lag/CN Method, Tc 1

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 13.01 cfs @ 12.16 hrs, Volume= 1.057 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.08"

Area (ac)	CN	Description
* 1.418	77	Woods, Good, HSG D - Wetlands
5.969	55	Woods, Good, HSG B
7.387	59	Weighted Average
7.387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	600	0.1240	0.94		Lag/CN Method, Tc-2

Summary for Subcatchment 3S: Off Site West

Runoff = 4.88 cfs @ 12.18 hrs, Volume= 0.426 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.08"

Area (ac)	CN	Description
3.633	55	Woods, Good, HSG B
3.633		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	564	0.1250	0.84		Lag/CN Method, Tc-3

Summary for Reach 1R: Wetland Section 1

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 1.88" for 25-year event
Inflow = 7.60 cfs @ 12.09 hrs, Volume= 0.520 af
Outflow = 7.07 cfs @ 12.16 hrs, Volume= 0.518 af, Atten= 7%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 5.3 min

Peak Storage= 985 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00' Flow Area= 173.3 sf, Capacity= 1,610.63 cfs

130.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 240.0' Slope= 0.0667 '/'
Inlet Invert= 296.00', Outlet Invert= 280.00'



Summary for Reach 1R': Wetland Section 2

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 1.87" for 25-year event
Inflow = 7.07 cfs @ 12.16 hrs, Volume= 0.518 af
Outflow = 6.97 cfs @ 12.17 hrs, Volume= 0.517 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.91 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.49 fps, Avg. Travel Time= 0.7 min

Peak Storage= 129 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.00' Flow Area= 53.3 sf, Capacity= 2,590.64 cfs

40.00' x 2.00' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 145.0' Slope= 0.1241 '/'
Inlet Invert= 280.00', Outlet Invert= 262.00'

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Summary for Reach 2R: Peak off Site

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth > 1.77" for 25-year event
Inflow = 19.96 cfs @ 12.17 hrs, Volume= 1.574 af
Outflow = 17.63 cfs @ 12.31 hrs, Volume= 1.559 af, Atten= 12%, Lag= 8.9 min

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

Max. Velocity= 2.16 fps, Min. Travel Time= 4.9 min

Avg. Velocity = 0.97 fps, Avg. Travel Time= 11.0 min

Peak Storage= 5,237 cf @ 12.23 hrs

Average Depth at Peak Storage= 0.35'

Bank-Full Depth= 2.00' Flow Area= 113.3 sf, Capacity= 789.38 cfs

85.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds

Length= 640.0' Slope= 0.0375 '/'

Inlet Invert= 262.00', Outlet Invert= 238.00'



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1

Runoff Area=3.314 ac 0.00% Impervious Runoff Depth>2.38"
Flow Length=270' Slope=0.1110 '/' Tc=5.6 min CN=61 Runoff=9.74 cfs 0.658 af

Subcatchment 2S: Drainage Area 2

Runoff Area=7.387 ac 0.00% Impervious Runoff Depth>2.19"
Flow Length=600' Slope=0.1240 '/' Tc=10.6 min CN=59 Runoff=16.95 cfs 1.351 af

Subcatchment 3S: Off Site West

Runoff Area=3.633 ac 0.00% Impervious Runoff Depth>1.84"
Flow Length=564' Slope=0.1250 '/' Tc=11.2 min CN=55 Runoff=6.67 cfs 0.557 af

Reach 1R: Wetland Section 1

Avg. Flow Depth=0.19' Max Vel=1.90 fps Inflow=9.74 cfs 0.658 af
n=0.050 L=240.0' S=0.0667 '/' Capacity=1,610.63 cfs Outflow=9.08 cfs 0.655 af

Reach 1R': Wetland Section 2

Avg. Flow Depth=0.15' Max Vel=8.56 fps Inflow=9.08 cfs 0.655 af
n=0.013 L=145.0' S=0.1241 '/' Capacity=2,590.64 cfs Outflow=8.97 cfs 0.655 af

Reach 2R: Peak off Site

Avg. Flow Depth=0.40' Max Vel=2.36 fps Inflow=25.91 cfs 2.006 af
n=0.050 L=640.0' S=0.0375 '/' Capacity=789.38 cfs Outflow=23.03 cfs 1.989 af

Total Runoff Area = 14.334 ac Runoff Volume = 2.565 af Average Runoff Depth = 2.15"
100.00% Pervious = 14.334 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 9.74 cfs @ 12.09 hrs, Volume= 0.658 af, Depth> 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.85"

Area (ac)	CN	Description
* 0.930	77	Woods, Good, HSG D - Wetlands
2.384	55	Woods, Good, HSG B
3.314	61	Weighted Average
3.314		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	270	0.1110	0.80		Lag/CN Method, Tc 1

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 16.95 cfs @ 12.16 hrs, Volume= 1.351 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.85"

Area (ac)	CN	Description
* 1.418	77	Woods, Good, HSG D - Wetlands
5.969	55	Woods, Good, HSG B
7.387	59	Weighted Average
7.387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	600	0.1240	0.94		Lag/CN Method, Tc-2

Summary for Subcatchment 3S: Off Site West

Runoff = 6.67 cfs @ 12.17 hrs, Volume= 0.557 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.85"

Area (ac)	CN	Description
3.633	55	Woods, Good, HSG B
3.633		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	564	0.1250	0.84		Lag/CN Method, Tc-3

Summary for Reach 1R: Wetland Section 1

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 2.38" for 50-year event
Inflow = 9.74 cfs @ 12.09 hrs, Volume= 0.658 af
Outflow = 9.08 cfs @ 12.16 hrs, Volume= 0.655 af, Atten= 7%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 5.0 min

Peak Storage= 1,176 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00' Flow Area= 173.3 sf, Capacity= 1,610.63 cfs

130.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 240.0' Slope= 0.0667 '/'
Inlet Invert= 296.00', Outlet Invert= 280.00'



Summary for Reach 1R': Wetland Section 2

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 2.37" for 50-year event
Inflow = 9.08 cfs @ 12.16 hrs, Volume= 0.655 af
Outflow = 8.97 cfs @ 12.16 hrs, Volume= 0.655 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.56 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.66 fps, Avg. Travel Time= 0.7 min

Peak Storage= 154 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.00' Flow Area= 53.3 sf, Capacity= 2,590.64 cfs

40.00' x 2.00' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 145.0' Slope= 0.1241 '/'
Inlet Invert= 280.00', Outlet Invert= 262.00'

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Summary for Reach 2R: Peak off Site

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth > 2.25" for 50-year event
Inflow = 25.91 cfs @ 12.16 hrs, Volume= 2.006 af
Outflow = 23.03 cfs @ 12.30 hrs, Volume= 1.989 af, Atten= 11%, Lag= 8.2 min

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

Max. Velocity= 2.36 fps, Min. Travel Time= 4.5 min

Avg. Velocity= 1.02 fps, Avg. Travel Time= 10.5 min

Peak Storage= 6,367 cf @ 12.22 hrs

Average Depth at Peak Storage= 0.40'

Bank-Full Depth= 2.00' Flow Area= 113.3 sf, Capacity= 789.38 cfs

85.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds

Length= 640.0' Slope= 0.0375 '/'

Inlet Invert= 262.00', Outlet Invert= 238.00'



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Type III 24-hr 100-year Rainfall=7.68"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1

Runoff Area=3.314 ac 0.00% Impervious Runoff Depth>2.95"
Flow Length=270' Slope=0.1110 '/' Tc=5.6 min CN=61 Runoff=12.15 cfs 0.815 af

Subcatchment 2S: Drainage Area 2

Runoff Area=7.387 ac 0.00% Impervious Runoff Depth>2.74"
Flow Length=600' Slope=0.1240 '/' Tc=10.6 min CN=59 Runoff=21.44 cfs 1.688 af

Subcatchment 3S: Off Site West

Runoff Area=3.633 ac 0.00% Impervious Runoff Depth>2.34"
Flow Length=564' Slope=0.1250 '/' Tc=11.2 min CN=55 Runoff=8.67 cfs 0.708 af

Reach 1R: Wetland Section 1

Avg. Flow Depth=0.21' Max Vel=2.04 fps Inflow=12.15 cfs 0.815 af
n=0.050 L=240.0' S=0.0667 '/' Capacity=1,610.63 cfs Outflow=11.35 cfs 0.813 af

Reach 1R': Wetland Section 2

Avg. Flow Depth=0.16' Max Vel=9.17 fps Inflow=11.35 cfs 0.813 af
n=0.013 L=145.0' S=0.1241 '/' Capacity=2,590.64 cfs Outflow=11.23 cfs 0.812 af

Reach 2R: Peak off Site

Avg. Flow Depth=0.44' Max Vel=2.54 fps Inflow=32.66 cfs 2.500 af
n=0.050 L=640.0' S=0.0375 '/' Capacity=789.38 cfs Outflow=29.21 cfs 2.481 af

Total Runoff Area = 14.334 ac Runoff Volume = 3.211 af Average Runoff Depth = 2.69"
100.00% Pervious = 14.334 ac 0.00% Impervious = 0.000 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 12.15 cfs @ 12.09 hrs, Volume= 0.815 af, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.68"

Area (ac)	CN	Description
* 0.930	77	Woods, Good, HSG D - Wetlands
2.384	55	Woods, Good, HSG B
3.314	61	Weighted Average
3.314		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	270	0.1110	0.80		Lag/CN Method, Tc 1

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 21.44 cfs @ 12.16 hrs, Volume= 1.688 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.68"

Area (ac)	CN	Description
* 1.418	77	Woods, Good, HSG D - Wetlands
5.969	55	Woods, Good, HSG B
7.387	59	Weighted Average
7.387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	600	0.1240	0.94		Lag/CN Method, Tc-2

Summary for Subcatchment 3S: Off Site West

Runoff = 8.67 cfs @ 12.17 hrs, Volume= 0.708 af, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.68"

Area (ac)	CN	Description
3.633	55	Woods, Good, HSG B
3.633		100.00% Pervious Area

Existing Conditions

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	564	0.1250	0.84		Lag/CN Method, Tc-3

Summary for Reach 1R: Wetland Section 1

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 2.95" for 100-year event
Inflow = 12.15 cfs @ 12.09 hrs, Volume= 0.815 af
Outflow = 11.35 cfs @ 12.15 hrs, Volume= 0.813 af, Atten= 7%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.04 fps, Min. Travel Time= 2.0 min
Avg. Velocity= 0.83 fps, Avg. Travel Time= 4.8 min

Peak Storage= 1,378 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 2.00' Flow Area= 173.3 sf, Capacity= 1,610.63 cfs

130.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds
Length= 240.0' Slope= 0.0667 '/'
Inlet Invert= 296.00', Outlet Invert= 280.00'



Summary for Reach 1R': Wetland Section 2

Inflow Area = 3.314 ac, 0.00% Impervious, Inflow Depth > 2.94" for 100-year event
Inflow = 11.35 cfs @ 12.15 hrs, Volume= 0.813 af
Outflow = 11.23 cfs @ 12.16 hrs, Volume= 0.812 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.17 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 3.82 fps, Avg. Travel Time= 0.6 min

Peak Storage= 180 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00' Flow Area= 53.3 sf, Capacity= 2,590.64 cfs

40.00' x 2.00' deep Parabolic Channel, n= 0.013 Asphalt, smooth
Length= 145.0' Slope= 0.1241 '/'
Inlet Invert= 280.00', Outlet Invert= 262.00'

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Summary for Reach 2R: Peak off Site

Inflow Area = 10.701 ac, 0.00% Impervious, Inflow Depth > 2.80" for 100-year event
Inflow = 32.66 cfs @ 12.16 hrs, Volume= 2.500 af
Outflow = 29.21 cfs @ 12.28 hrs, Volume= 2.481 af, Atten= 11%, Lag= 7.5 min

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

Max. Velocity= 2.54 fps, Min. Travel Time= 4.2 min

Avg. Velocity = 1.07 fps, Avg. Travel Time= 10.0 min

Peak Storage= 7,527 cf @ 12.21 hrs

Average Depth at Peak Storage= 0.44'

Bank-Full Depth= 2.00' Flow Area= 113.3 sf, Capacity= 789.38 cfs

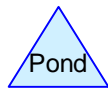
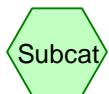
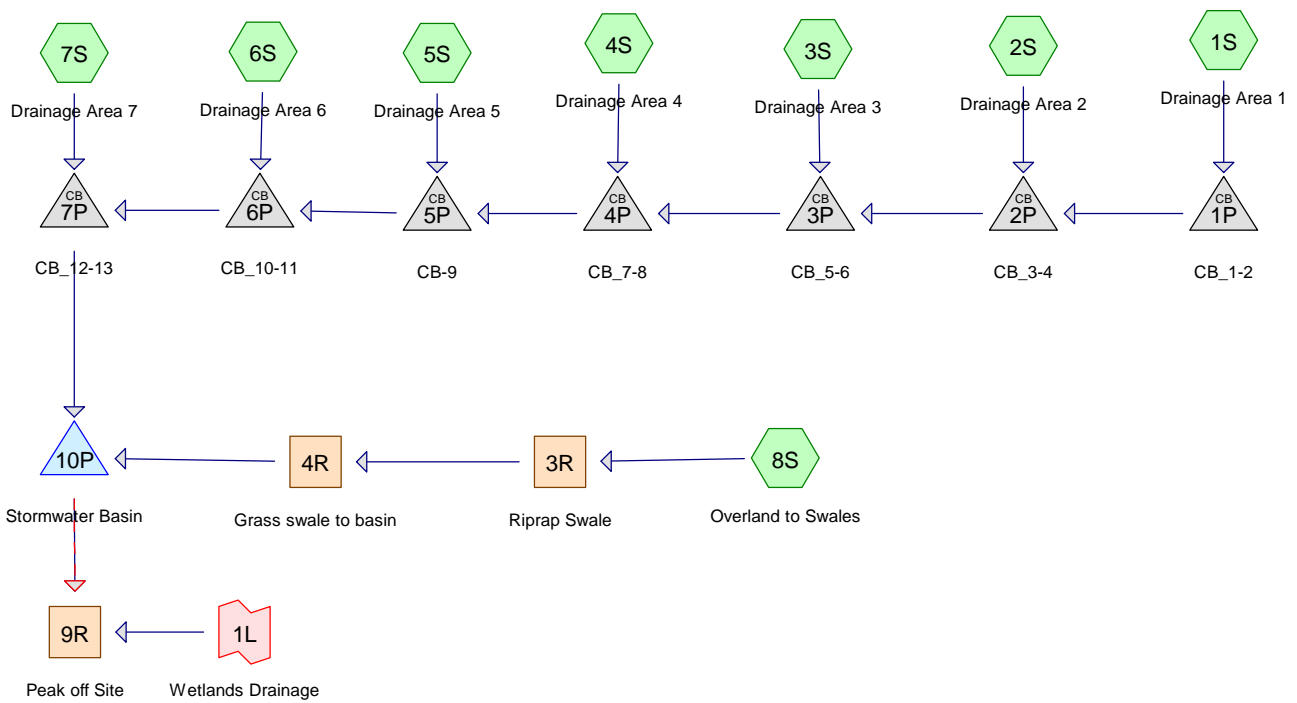
85.00' x 2.00' deep Parabolic Channel, n= 0.050 Scattered brush, heavy weeds

Length= 640.0' Slope= 0.0375 '/'

Inlet Invert= 262.00', Outlet Invert= 238.00'



PROPOSED CONDITIONS



Routing Diagram for Proposed Conditions
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.523	55	Woods, Good, HSG B (4S, 6S)
0.772	58	>75% Grass cover, Good, HSG B (8S)
1.786	61	>75% Grass cover, Good, HSG B (1S, 3S, 4S, 5S, 6S)
0.161	74	>75% Grass cover, Good, HSG B/D (2S, 7S)
0.693	98	Paved parking & roof HSG A (4S)
0.095	98	Paved parking, HSG B (1S)
0.196	98	Paved parking/roof (3S)
0.309	98	Paved surfaces & roof (5S)
0.483	98	Pavement/Roofs, HSG B (6S)
0.282	98	Roof & Pavement (7S)
0.161	98	Roof/pavement (2S)
5.461	75	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.693	HSG A	4S
3.820	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	HSG C	
0.000	HSG D	
0.948	Other	2S, 3S, 5S, 7S
5.461		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.719	0.000	0.000	0.000	2.719	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	0.095	0.000	0.000	0.000	0.095	Paved parking	1S
0.693	0.000	0.000	0.000	0.000	0.693	Paved parking & roof	4S
0.000	0.000	0.000	0.000	0.196	0.196	Paved parking/roof	3S
0.000	0.000	0.000	0.000	0.309	0.309	Paved surfaces & roof	5S
0.000	0.483	0.000	0.000	0.000	0.483	Pavement/Roofs	6S
0.000	0.000	0.000	0.000	0.282	0.282	Roof & Pavement	7S
0.000	0.000	0.000	0.000	0.161	0.161	Roof/pavement	2S
0.000	0.523	0.000	0.000	0.000	0.523	Woods, Good	4S, 6S
0.693	3.820	0.000	0.000	0.948	5.461	TOTAL AREA	

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1	Runoff Area=8,570 sf 48.07% Impervious Runoff Depth>1.35"
Flow Length=111'	Slope=0.0710 '/' Tc=9.1 min CN=79 Runoff=0.29 cfs 0.022 af
Subcatchment 2S: Drainage Area 2	Runoff Area=13,320 sf 52.80% Impervious Runoff Depth>1.94"
Flow Length=125'	Slope=0.0100 '/' Tc=1.0 min CN=87 Runoff=0.82 cfs 0.049 af
Subcatchment 3S: Drainage Area 3	Runoff Area=24,738 sf 34.48% Impervious Runoff Depth>1.05"
Flow Length=265'	Tc=5.7 min CN=74 Runoff=0.73 cfs 0.050 af
Subcatchment 4S: Drainage Area 4	Runoff Area=69,700 sf 43.33% Impervious Runoff Depth>1.11"
Flow Length=130'	Slope=0.0100 '/' Tc=1.9 min CN=75 Runoff=2.43 cfs 0.148 af
Subcatchment 5S: Drainage Area 5	Runoff Area=27,597 sf 48.74% Impervious Runoff Depth>1.36"
Flow Length=180'	Slope=0.0500 '/' Tc=1.3 min CN=79 Runoff=1.18 cfs 0.072 af
Subcatchment 6S: Drainage Area 6	Runoff Area=47,315 sf 44.44% Impervious Runoff Depth>1.23"
Flow Length=180'	Slope=0.0500 '/' Tc=3.9 min CN=77 Runoff=1.75 cfs 0.111 af
Subcatchment 7S: Drainage Area 7	Runoff Area=13,011 sf 94.50% Impervious Runoff Depth>2.84"
Flow Length=175'	Slope=0.0580 '/' Tc=1.2 min CN=97 Runoff=1.07 cfs 0.071 af
Subcatchment 8S: Overland to Swales	Runoff Area=33,644 sf 0.00% Impervious Runoff Depth>0.35"
Flow Length=130'	Slope=0.1240 '/' Tc=8.3 min CN=58 Runoff=0.18 cfs 0.022 af
Reach 3R: Riprap Swale	Avg. Flow Depth=0.04' Max Vel=1.13 fps Inflow=0.18 cfs 0.022 af
	n=0.045 L=210.0' S=0.0952 '/' Capacity=48.58 cfs Outflow=0.17 cfs 0.022 af
Reach 4R: Grass swale to basin	Avg. Flow Depth=0.04' Max Vel=1.02 fps Inflow=0.17 cfs 0.022 af
	n=0.035 L=205.0' S=0.0439 '/' Capacity=42.41 cfs Outflow=0.17 cfs 0.022 af
Reach 9R: Peak off Site	Inflow=2.62 cfs 0.342 af
	Outflow=2.62 cfs 0.342 af
Pond 1P: CB_1-2	Peak Elev=311.75' Inflow=0.29 cfs 0.022 af
	15.0" Round Culvert n=0.012 L=128.7' S=0.0975 '/' Outflow=0.29 cfs 0.022 af
Pond 2P: CB_3-4	Peak Elev=299.32' Inflow=0.97 cfs 0.072 af
	15.0" Round Culvert n=0.012 L=131.1' S=0.0934 '/' Outflow=0.97 cfs 0.072 af
Pond 3P: CB_5-6	Peak Elev=287.11' Inflow=1.59 cfs 0.121 af
	15.0" Round Culvert n=0.012 L=168.9' S=0.0823 '/' Outflow=1.59 cfs 0.121 af
Pond 4P: CB_7-8	Peak Elev=273.58' Inflow=4.00 cfs 0.269 af
	15.0" Round Culvert n=0.012 L=128.2' S=0.0686 '/' Outflow=4.00 cfs 0.269 af
Pond 5P: CB-9	Peak Elev=264.99' Inflow=5.16 cfs 0.341 af
	15.0" Round Culvert n=0.012 L=100.6' S=0.1044 '/' Outflow=5.16 cfs 0.341 af

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Pond 6P: CB_10-11

Peak Elev=254.39' Inflow=6.86 cfs 0.452 af
18.0" Round Culvert n=0.012 L=172.0' S=0.0459 '/ Outflow=6.86 cfs 0.452 af

Pond 7P: CB_12-13

Peak Elev=246.60' Inflow=7.84 cfs 0.523 af
18.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/ Outflow=7.84 cfs 0.523 af

Pond 10P: Stormwater Basin

Peak Elev=243.67' Storage=8,459 cf Inflow=7.84 cfs 0.545 af
Discarded=0.81 cfs 0.477 af Primary=0.38 cfs 0.066 af Secondary=0.00 cfs 0.000 af Outflow=1.18 cfs 0.543 af

Link 1L:

2-year Outflow Imported from Proposed Wetlands Drainage--Reach 2R.hce Inflow=2.24 cfs 0.276 af
Area= 5.540 ac 1.13% Imperv. Primary=2.24 cfs 0.276 af

Total Runoff Area = 5.461 ac Runoff Volume = 0.545 af Average Runoff Depth = 1.20"
59.37% Pervious = 3.242 ac 40.63% Impervious = 2.219 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 0.29 cfs @ 12.14 hrs, Volume= 0.022 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
4,120	98	Paved parking, HSG B
4,450	61	>75% Grass cover, Good, HSG B
8,570	79	Weighted Average
4,450		51.93% Pervious Area
4,120		48.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	111	0.0710	0.20		Sheet Flow, Tc-1 Grass: Dense n= 0.240 P2= 3.37"

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 0.82 cfs @ 12.02 hrs, Volume= 0.049 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
* 6,287	74	>75% Grass cover, Good, HSG B/D
* 7,033	98	Roof/pavement
13,320	87	Weighted Average
6,287		47.20% Pervious Area
7,033		52.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	125	0.0100	2.03		Shallow Concentrated Flow, Tc-2 Paved Kv= 20.3 fps

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 0.73 cfs @ 12.10 hrs, Volume= 0.050 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=3.37"

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	Area (sf)	CN	Description
*	8,529	98	Paved parking/roof
	16,209	61	>75% Grass cover, Good, HSG B
	24,738	74	Weighted Average
	16,209		65.52% Pervious Area
	8,529		34.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	105	0.1100	0.35		Sheet Flow, Tc-4a Grass: Short n= 0.150 P2= 3.37"
0.7	160	0.0310	3.57		Shallow Concentrated Flow, Tc-4b Paved Kv= 20.3 fps
5.7	265	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 2.43 cfs @ 12.04 hrs, Volume= 0.148 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.37"

	Area (sf)	CN	Description
*	30,200	98	Paved parking & roof HSG A
	20,000	61	>75% Grass cover, Good, HSG B
	19,500	55	Woods, Good, HSG B
	69,700	75	Weighted Average
	39,500		56.67% Pervious Area
	30,200		43.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0100	1.13		Sheet Flow, Tc-3 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 1.18 cfs @ 12.03 hrs, Volume= 0.072 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.37"

	Area (sf)	CN	Description
*	13,450	98	Paved surfaces & roof
	14,147	61	>75% Grass cover, Good, HSG B
	27,597	79	Weighted Average
	14,147		51.26% Pervious Area
	13,450		48.74% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	180	0.0500	2.29		Sheet Flow, Tc-5 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 1.75 cfs @ 12.06 hrs, Volume= 0.111 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
* 21,025	98	Pavement/Roofs, HSG B
22,990	61	>75% Grass cover, Good, HSG B
3,300	55	Woods, Good, HSG B
47,315	77	Weighted Average
26,290		55.56% Pervious Area
21,025		44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	180	0.0500	0.76		Lag/CN Method, Tc-6

Summary for Subcatchment 7S: Drainage Area 7

Runoff = 1.07 cfs @ 12.02 hrs, Volume= 0.071 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
* 12,295	98	Roof & Pavement
* 716	74	>75% Grass cover, Good, HSG B/D
13,011	97	Weighted Average
716		5.50% Pervious Area
12,295		94.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	175	0.0580	2.42		Sheet Flow, Tc-7 Smooth surfaces n= 0.011 P2= 3.37"

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Summary for Subcatchment 8S: Overland to Swales

Runoff = 0.18 cfs @ 12.19 hrs, Volume= 0.022 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
* 33,644	58	>75% Grass cover, Good, HSG B
33,644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	130	0.1240	0.26		Sheet Flow, Tc=8 Grass: Dense n= 0.240 P2= 3.37"

Summary for Reach 3R: Riprap Swale

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 0.35" for 2-year event
Inflow = 0.18 cfs @ 12.19 hrs, Volume= 0.022 af
Outflow = 0.17 cfs @ 12.31 hrs, Volume= 0.022 af, Atten= 3%, Lag= 6.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.13 fps, Min. Travel Time= 3.1 min
Avg. Velocity= 0.58 fps, Avg. Travel Time= 6.0 min

Peak Storage= 32 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 48.58 cfs

4.00' x 1.00' deep channel, n= 0.045
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 210.0' Slope= 0.0952 '/'
Inlet Invert= 276.00', Outlet Invert= 256.00'



Summary for Reach 4R: Grass swale to basin

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 0.35" for 2-year event
Inflow = 0.17 cfs @ 12.31 hrs, Volume= 0.022 af
Outflow = 0.17 cfs @ 12.42 hrs, Volume= 0.022 af, Atten= 2%, Lag= 7.0 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.02 fps, Min. Travel Time= 3.3 min
Avg. Velocity= 0.53 fps, Avg. Travel Time= 6.5 min

Peak Storage= 33 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 42.41 cfs

4.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 205.0' Slope= 0.0439 '/'
Inlet Invert= 256.00', Outlet Invert= 247.00'



Summary for Reach 9R: Peak off Site

Inflow Area = 11.002 ac, 20.74% Impervious, Inflow Depth > 0.37" for 2-year event
Inflow = 2.62 cfs @ 12.60 hrs, Volume= 0.342 af
Outflow = 2.62 cfs @ 12.60 hrs, Volume= 0.342 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: CB_1-2

Inflow Area = 0.197 ac, 48.07% Impervious, Inflow Depth > 1.35" for 2-year event
Inflow = 0.29 cfs @ 12.14 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.14 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.14 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 311.75' @ 12.14 hrs
Flood Elev= 316.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.50'	15.0" Round Culvert L= 128.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 311.50' / 298.95' S= 0.0975 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.29 cfs @ 12.14 hrs HW=311.75' (Free Discharge)
↑ **1=Culvert** (Inlet Controls 0.29 cfs @ 1.69 fps)

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Summary for Pond 2P: CB_3-4

Inflow Area = 0.503 ac, 50.95% Impervious, Inflow Depth > 1.71" for 2-year event
Inflow = 0.97 cfs @ 12.03 hrs, Volume= 0.072 af
Outflow = 0.97 cfs @ 12.03 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.03 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 299.32' @ 12.03 hrs
Flood Elev= 303.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.85'	15.0" Round Culvert L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 298.85' / 286.60' S= 0.0934 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.95 cfs @ 12.03 hrs HW=299.31' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.95 cfs @ 2.31 fps)

Summary for Pond 3P: CB_5-6

Inflow Area = 1.070 ac, 42.21% Impervious, Inflow Depth > 1.36" for 2-year event
Inflow = 1.59 cfs @ 12.06 hrs, Volume= 0.121 af
Outflow = 1.59 cfs @ 12.06 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.06 hrs, Volume= 0.121 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 287.11' @ 12.06 hrs
Flood Elev= 291.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	286.50'	15.0" Round Culvert L= 168.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.50' / 272.60' S= 0.0823 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.56 cfs @ 12.06 hrs HW=287.11' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.56 cfs @ 2.65 fps)

Summary for Pond 4P: CB_7-8

Inflow Area = 2.671 ac, 42.88% Impervious, Inflow Depth > 1.21" for 2-year event
Inflow = 4.00 cfs @ 12.05 hrs, Volume= 0.269 af
Outflow = 4.00 cfs @ 12.05 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min
Primary = 4.00 cfs @ 12.05 hrs, Volume= 0.269 af

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

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Peak Elev= 273.58' @ 12.05 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	15.0" Round Culvert L= 128.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 263.70' S= 0.0686 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.96 cfs @ 12.05 hrs HW=273.57' (Free Discharge)
↑**1=Culvert** (Inlet Controls 3.96 cfs @ 3.53 fps)

Summary for Pond 5P: CB-9

Inflow Area = 3.304 ac, 44.00% Impervious, Inflow Depth > 1.24" for 2-year event
Inflow = 5.16 cfs @ 12.04 hrs, Volume= 0.341 af
Outflow = 5.16 cfs @ 12.04 hrs, Volume= 0.341 af, Atten= 0%, Lag= 0.0 min
Primary = 5.16 cfs @ 12.04 hrs, Volume= 0.341 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 264.99' @ 12.04 hrs
Flood Elev= 267.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	263.60'	15.0" Round Culvert L= 100.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.60' / 253.10' S= 0.1044 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.05 cfs @ 12.04 hrs HW=264.95' (Free Discharge)
↑**1=Culvert** (Inlet Controls 5.05 cfs @ 4.11 fps)

Summary for Pond 6P: CB_10-11

Inflow Area = 4.390 ac, 44.11% Impervious, Inflow Depth > 1.24" for 2-year event
Inflow = 6.86 cfs @ 12.05 hrs, Volume= 0.452 af
Outflow = 6.86 cfs @ 12.05 hrs, Volume= 0.452 af, Atten= 0%, Lag= 0.0 min
Primary = 6.86 cfs @ 12.05 hrs, Volume= 0.452 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 254.39' @ 12.05 hrs
Flood Elev= 259.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	18.0" Round Culvert L= 172.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 253.00' / 245.10' S= 0.0459 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=6.84 cfs @ 12.05 hrs HW=254.39' (Free Discharge)
↑**1=Culvert** (Inlet Controls 6.84 cfs @ 4.01 fps)

Summary for Pond 7P: CB_12-13

Inflow Area = 4.689 ac, 47.32% Impervious, Inflow Depth > 1.34" for 2-year event
Inflow = 7.84 cfs @ 12.04 hrs, Volume= 0.523 af
Outflow = 7.84 cfs @ 12.04 hrs, Volume= 0.523 af, Atten= 0%, Lag= 0.0 min
Primary = 7.84 cfs @ 12.04 hrs, Volume= 0.523 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 246.60' @ 12.05 hrs
Flood Elev= 249.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	245.00'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 245.00' / 244.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.72 cfs @ 12.04 hrs HW=246.57' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.72 cfs @ 4.37 fps)

Summary for Pond 10P: Stormwater Basin

Inflow Area = 5.461 ac, 40.63% Impervious, Inflow Depth > 1.20" for 2-year event
Inflow = 7.84 cfs @ 12.04 hrs, Volume= 0.545 af
Outflow = 1.18 cfs @ 12.70 hrs, Volume= 0.543 af, Atten= 85%, Lag= 39.0 min
Discarded = 0.81 cfs @ 12.70 hrs, Volume= 0.477 af
Primary = 0.38 cfs @ 12.70 hrs, Volume= 0.066 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 243.67' @ 12.70 hrs Surf.Area= 7,762 sf Storage= 8,459 cf

Plug-Flow detention time= 78.0 min calculated for 0.543 af (100% of inflow)
Center-of-Mass det. time= 76.8 min (876.2 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	242.50'	29,538 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.50	6,754	0	0
244.00	8,051	11,104	11,104
245.00	9,184	8,618	19,721
246.00	10,450	9,817	29,538

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Device	Routing	Invert	Outlet Devices
#1	Primary	242.50'	15.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 242.50' / 242.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	243.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	243.50'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	244.00'	10.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	246.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Secondary	247.00'	18.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#7	Discarded	242.50'	4.500 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.81 cfs @ 12.70 hrs HW=243.67' (Free Discharge)

↑ **7=Exfiltration** (Exfiltration Controls 0.81 cfs)

Primary OutFlow Max=0.38 cfs @ 12.70 hrs HW=243.67' (Free Discharge)

↑ **1=Culvert** (Passes 0.38 cfs of 3.72 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 3.40 fps)
↑ **3=Orifice/Grate** (Orifice Controls 0.08 cfs @ 1.38 fps)
↑ **4=Orifice/Grate** (Controls 0.00 cfs)
↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=242.50' (Free Discharge)

↑ **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Wetlands Drainage

Inflow Area = 5.540 ac, 1.13% Impervious, Inflow Depth > 0.60" for 2-year event
Inflow = 2.24 cfs @ 12.59 hrs, Volume= 0.276 af
Primary = 2.24 cfs @ 12.59 hrs, Volume= 0.276 af, Atten= 0%, Lag= 0.0 min

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

2-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1	Runoff Area=8,570 sf 48.07% Impervious Runoff Depth>2.03"
Flow Length=111'	Slope=0.0710 '/ Tc=9.1 min CN=79 Runoff=0.44 cfs 0.033 af
Subcatchment 2S: Drainage Area 2	Runoff Area=13,320 sf 52.80% Impervious Runoff Depth>2.72"
Flow Length=125'	Slope=0.0100 '/ Tc=1.0 min CN=87 Runoff=1.14 cfs 0.069 af
Subcatchment 3S: Drainage Area 3	Runoff Area=24,738 sf 34.48% Impervious Runoff Depth>1.66"
Flow Length=265'	Tc=5.7 min CN=74 Runoff=1.17 cfs 0.078 af
Subcatchment 4S: Drainage Area 4	Runoff Area=69,700 sf 43.33% Impervious Runoff Depth>1.73"
Flow Length=130'	Slope=0.0100 '/ Tc=1.9 min CN=75 Runoff=3.83 cfs 0.231 af
Subcatchment 5S: Drainage Area 5	Runoff Area=27,597 sf 48.74% Impervious Runoff Depth>2.03"
Flow Length=180'	Slope=0.0500 '/ Tc=1.3 min CN=79 Runoff=1.78 cfs 0.107 af
Subcatchment 6S: Drainage Area 6	Runoff Area=47,315 sf 44.44% Impervious Runoff Depth>1.88"
Flow Length=180'	Slope=0.0500 '/ Tc=3.9 min CN=77 Runoff=2.71 cfs 0.170 af
Subcatchment 7S: Drainage Area 7	Runoff Area=13,011 sf 94.50% Impervious Runoff Depth>3.67"
Flow Length=175'	Slope=0.0580 '/ Tc=1.2 min CN=97 Runoff=1.36 cfs 0.091 af
Subcatchment 8S: Overland to Swales	Runoff Area=33,644 sf 0.00% Impervious Runoff Depth>0.70"
Flow Length=130'	Slope=0.1240 '/ Tc=8.3 min CN=58 Runoff=0.50 cfs 0.045 af
Reach 3R: Riprap Swale	Avg. Flow Depth=0.07' Max Vel=1.68 fps Inflow=0.50 cfs 0.045 af
	n=0.045 L=210.0' S=0.0952 '/ Capacity=48.58 cfs Outflow=0.48 cfs 0.045 af
Reach 4R: Grass swale to basin	Avg. Flow Depth=0.07' Max Vel=1.53 fps Inflow=0.48 cfs 0.045 af
	n=0.035 L=205.0' S=0.0439 '/ Capacity=42.41 cfs Outflow=0.46 cfs 0.045 af
Reach 9R: Peak off Site	Inflow=5.92 cfs 0.714 af
	Outflow=5.92 cfs 0.714 af
Pond 1P: CB_1-2	Peak Elev=311.81' Inflow=0.44 cfs 0.033 af
15.0" Round Culvert	n=0.012 L=128.7' S=0.0975 '/ Outflow=0.44 cfs 0.033 af
Pond 2P: CB_3-4	Peak Elev=299.41' Inflow=1.37 cfs 0.102 af
15.0" Round Culvert	n=0.012 L=131.1' S=0.0934 '/ Outflow=1.37 cfs 0.102 af
Pond 3P: CB_5-6	Peak Elev=287.28' Inflow=2.40 cfs 0.181 af
15.0" Round Culvert	n=0.012 L=168.9' S=0.0823 '/ Outflow=2.40 cfs 0.181 af
Pond 4P: CB_7-8	Peak Elev=274.22' Inflow=6.19 cfs 0.412 af
15.0" Round Culvert	n=0.012 L=128.2' S=0.0686 '/ Outflow=6.19 cfs 0.412 af
Pond 5P: CB-9	Peak Elev=266.02' Inflow=7.92 cfs 0.519 af
15.0" Round Culvert	n=0.012 L=100.6' S=0.1044 '/ Outflow=7.92 cfs 0.519 af

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Pond 6P: CB_10-11

Peak Elev=255.29' Inflow=10.56 cfs 0.689 af
18.0" Round Culvert n=0.012 L=172.0' S=0.0459 '/ Outflow=10.56 cfs 0.689 af

Pond 7P: CB_12-13

Peak Elev=247.68' Inflow=11.82 cfs 0.781 af
18.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/ Outflow=11.82 cfs 0.781 af

Pond 10P: Stormwater Basin

Peak Elev=244.26' Storage=13,214 cf Inflow=11.84 cfs 0.825 af
Discarded=0.87 cfs 0.597 af Primary=1.36 cfs 0.226 af Secondary=0.00 cfs 0.000 af Outflow=2.23 cfs 0.823 af

Link 1L:

5-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce Inflow=4.58 cfs 0.488 af
Area= 5.540 ac 1.13% Imperv. Primary=4.58 cfs 0.488 af

Total Runoff Area = 5.461 ac Runoff Volume = 0.826 af Average Runoff Depth = 1.81"
59.37% Pervious = 3.242 ac 40.63% Impervious = 2.219 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 0.44 cfs @ 12.13 hrs, Volume= 0.033 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 5-year Rainfall=4.27"

Area (sf)	CN	Description
4,120	98	Paved parking, HSG B
4,450	61	>75% Grass cover, Good, HSG B
8,570	79	Weighted Average
4,450		51.93% Pervious Area
4,120		48.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	111	0.0710	0.20		Sheet Flow, Tc-1 Grass: Dense n= 0.240 P2= 3.37"

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 1.14 cfs @ 12.02 hrs, Volume= 0.069 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 5-year Rainfall=4.27"

Area (sf)	CN	Description
* 6,287	74	>75% Grass cover, Good, HSG B/D
* 7,033	98	Roof/pavement
13,320	87	Weighted Average
6,287		47.20% Pervious Area
7,033		52.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	125	0.0100	2.03		Shallow Concentrated Flow, Tc-2 Paved Kv= 20.3 fps

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.078 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
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	Area (sf)	CN	Description
*	8,529	98	Paved parking/roof
	16,209	61	>75% Grass cover, Good, HSG B
	24,738	74	Weighted Average
	16,209		65.52% Pervious Area
	8,529		34.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	105	0.1100	0.35		Sheet Flow, Tc-4a Grass: Short n= 0.150 P2= 3.37"
0.7	160	0.0310	3.57		Shallow Concentrated Flow, Tc-4b Paved Kv= 20.3 fps
5.7	265	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 3.83 cfs @ 12.04 hrs, Volume= 0.231 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.27"

	Area (sf)	CN	Description
*	30,200	98	Paved parking & roof HSG A
	20,000	61	>75% Grass cover, Good, HSG B
	19,500	55	Woods, Good, HSG B
	69,700	75	Weighted Average
	39,500		56.67% Pervious Area
	30,200		43.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0100	1.13		Sheet Flow, Tc-3 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 1.78 cfs @ 12.02 hrs, Volume= 0.107 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.27"

	Area (sf)	CN	Description
*	13,450	98	Paved surfaces & roof
	14,147	61	>75% Grass cover, Good, HSG B
	27,597	79	Weighted Average
	14,147		51.26% Pervious Area
	13,450		48.74% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	180	0.0500	2.29		Sheet Flow, Tc-5 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 2.71 cfs @ 12.06 hrs, Volume= 0.170 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 5-year Rainfall=4.27"

Area (sf)	CN	Description
* 21,025	98	Pavement/Roofs, HSG B
22,990	61	>75% Grass cover, Good, HSG B
3,300	55	Woods, Good, HSG B
47,315	77	Weighted Average
26,290		55.56% Pervious Area
21,025		44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	180	0.0500	0.76		Lag/CN Method, Tc-6

Summary for Subcatchment 7S: Drainage Area 7

Runoff = 1.36 cfs @ 12.02 hrs, Volume= 0.091 af, Depth> 3.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 5-year Rainfall=4.27"

Area (sf)	CN	Description
* 12,295	98	Roof & Pavement
* 716	74	>75% Grass cover, Good, HSG B/D
13,011	97	Weighted Average
716		5.50% Pervious Area
12,295		94.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	175	0.0580	2.42		Sheet Flow, Tc-7 Smooth surfaces n= 0.011 P2= 3.37"

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Summary for Subcatchment 8S: Overland to Swales

Runoff = 0.50 cfs @ 12.15 hrs, Volume= 0.045 af, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-year Rainfall=4.27"

	Area (sf)	CN	Description
*	33,644	58	>75% Grass cover, Good, HSG B
	33,644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	130	0.1240	0.26		Sheet Flow, Tc=8 Grass: Dense n= 0.240 P2= 3.37"

Summary for Reach 3R: Riprap Swale

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 0.70" for 5-year event
Inflow = 0.50 cfs @ 12.15 hrs, Volume= 0.045 af
Outflow = 0.48 cfs @ 12.22 hrs, Volume= 0.045 af, Atten= 3%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.68 fps, Min. Travel Time= 2.1 min
Avg. Velocity= 0.71 fps, Avg. Travel Time= 4.9 min

Peak Storage= 61 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 48.58 cfs

4.00' x 1.00' deep channel, n= 0.045
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 210.0' Slope= 0.0952 '/'
Inlet Invert= 276.00', Outlet Invert= 256.00'



Summary for Reach 4R: Grass swale to basin

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 0.70" for 5-year event
Inflow = 0.48 cfs @ 12.22 hrs, Volume= 0.045 af
Outflow = 0.46 cfs @ 12.29 hrs, Volume= 0.045 af, Atten= 4%, Lag= 4.4 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 5.2 min

Peak Storage= 63 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 42.41 cfs

4.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 205.0' Slope= 0.0439 '/'
Inlet Invert= 256.00', Outlet Invert= 247.00'



Summary for Reach 9R: Peak off Site

Inflow Area = 11.002 ac, 20.74% Impervious, Inflow Depth > 0.78" for 5-year event
Inflow = 5.92 cfs @ 12.49 hrs, Volume= 0.714 af
Outflow = 5.92 cfs @ 12.49 hrs, Volume= 0.714 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: CB_1-2

Inflow Area = 0.197 ac, 48.07% Impervious, Inflow Depth > 2.03" for 5-year event
Inflow = 0.44 cfs @ 12.13 hrs, Volume= 0.033 af
Outflow = 0.44 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.13 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 311.81' @ 12.13 hrs
Flood Elev= 316.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.50'	15.0" Round Culvert L= 128.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 311.50' / 298.95' S= 0.0975 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.43 cfs @ 12.13 hrs HW=311.80' (Free Discharge)
↑ **1=Culvert** (Inlet Controls 0.43 cfs @ 1.88 fps)

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Summary for Pond 2P: CB_3-4

Inflow Area = 0.503 ac, 50.95% Impervious, Inflow Depth > 2.45" for 5-year event
Inflow = 1.37 cfs @ 12.03 hrs, Volume= 0.102 af
Outflow = 1.37 cfs @ 12.03 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.03 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 299.41' @ 12.03 hrs
Flood Elev= 303.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.85'	15.0" Round Culvert L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 298.85' / 286.60' S= 0.0934 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.34 cfs @ 12.03 hrs HW=299.41' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.34 cfs @ 2.54 fps)

Summary for Pond 3P: CB_5-6

Inflow Area = 1.070 ac, 42.21% Impervious, Inflow Depth > 2.03" for 5-year event
Inflow = 2.40 cfs @ 12.06 hrs, Volume= 0.181 af
Outflow = 2.40 cfs @ 12.06 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Primary = 2.40 cfs @ 12.06 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 287.28' @ 12.06 hrs
Flood Elev= 291.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	286.50'	15.0" Round Culvert L= 168.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.50' / 272.60' S= 0.0823 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.35 cfs @ 12.06 hrs HW=287.27' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.35 cfs @ 2.98 fps)

Summary for Pond 4P: CB_7-8

Inflow Area = 2.671 ac, 42.88% Impervious, Inflow Depth > 1.85" for 5-year event
Inflow = 6.19 cfs @ 12.04 hrs, Volume= 0.412 af
Outflow = 6.19 cfs @ 12.04 hrs, Volume= 0.412 af, Atten= 0%, Lag= 0.0 min
Primary = 6.19 cfs @ 12.04 hrs, Volume= 0.412 af

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

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Peak Elev= 274.22' @ 12.05 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	15.0" Round Culvert L= 128.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 263.70' S= 0.0686 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=6.10 cfs @ 12.04 hrs HW=274.19' (Free Discharge)
↑**1=Culvert** (Inlet Controls 6.10 cfs @ 4.97 fps)

Summary for Pond 5P: CB-9

Inflow Area = 3.304 ac, 44.00% Impervious, Inflow Depth > 1.89" for 5-year event
Inflow = 7.92 cfs @ 12.04 hrs, Volume= 0.519 af
Outflow = 7.92 cfs @ 12.04 hrs, Volume= 0.519 af, Atten= 0%, Lag= 0.0 min
Primary = 7.92 cfs @ 12.04 hrs, Volume= 0.519 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 266.02' @ 12.04 hrs
Flood Elev= 267.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	263.60'	15.0" Round Culvert L= 100.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.60' / 253.10' S= 0.1044 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=7.73 cfs @ 12.04 hrs HW=265.94' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.73 cfs @ 6.30 fps)

Summary for Pond 6P: CB_10-11

Inflow Area = 4.390 ac, 44.11% Impervious, Inflow Depth > 1.88" for 5-year event
Inflow = 10.56 cfs @ 12.05 hrs, Volume= 0.689 af
Outflow = 10.56 cfs @ 12.05 hrs, Volume= 0.689 af, Atten= 0%, Lag= 0.0 min
Primary = 10.56 cfs @ 12.05 hrs, Volume= 0.689 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 255.29' @ 12.05 hrs
Flood Elev= 259.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	18.0" Round Culvert L= 172.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 253.00' / 245.10' S= 0.0459 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=10.45 cfs @ 12.05 hrs HW=255.26' (Free Discharge)
↑**1=Culvert** (Inlet Controls 10.45 cfs @ 5.92 fps)

Summary for Pond 7P: CB_12-13

Inflow Area = 4.689 ac, 47.32% Impervious, Inflow Depth > 2.00" for 5-year event
Inflow = 11.82 cfs @ 12.04 hrs, Volume= 0.781 af
Outflow = 11.82 cfs @ 12.04 hrs, Volume= 0.781 af, Atten= 0%, Lag= 0.0 min
Primary = 11.82 cfs @ 12.04 hrs, Volume= 0.781 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 247.68' @ 12.04 hrs
Flood Elev= 249.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	245.00'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 245.00' / 244.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.60 cfs @ 12.04 hrs HW=247.61' (Free Discharge)
↑**1=Culvert** (Inlet Controls 11.60 cfs @ 6.57 fps)

Summary for Pond 10P: Stormwater Basin

Inflow Area = 5.461 ac, 40.63% Impervious, Inflow Depth > 1.81" for 5-year event
Inflow = 11.84 cfs @ 12.04 hrs, Volume= 0.825 af
Outflow = 2.23 cfs @ 12.54 hrs, Volume= 0.823 af, Atten= 81%, Lag= 30.1 min
Discarded = 0.87 cfs @ 12.54 hrs, Volume= 0.597 af
Primary = 1.36 cfs @ 12.54 hrs, Volume= 0.226 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 244.26' @ 12.54 hrs Surf.Area= 8,343 sf Storage= 13,214 cf

Plug-Flow detention time= 86.5 min calculated for 0.823 af (100% of inflow)
Center-of-Mass det. time= 85.3 min (877.6 - 792.3)

Volume	Invert	Avail.Storage	Storage Description
#1	242.50'	29,538 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.50	6,754	0	0
244.00	8,051	11,104	11,104
245.00	9,184	8,618	19,721
246.00	10,450	9,817	29,538

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Device	Routing	Invert	Outlet Devices
#1	Primary	242.50'	15.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 242.50' / 242.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	243.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	243.50'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	244.00'	10.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	246.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Secondary	247.00'	18.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#7	Discarded	242.50'	4.500 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.87 cfs @ 12.54 hrs HW=244.26' (Free Discharge)

↑ **7=Exfiltration** (Exfiltration Controls 0.87 cfs)

Primary OutFlow Max=1.36 cfs @ 12.54 hrs HW=244.26' (Free Discharge)

↑ **1=Culvert** (Passes 1.36 cfs of 5.29 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.44 cfs @ 5.03 fps)
↑ **3=Orifice/Grate** (Orifice Controls 0.67 cfs @ 3.43 fps)
↑ **4=Orifice/Grate** (Orifice Controls 0.25 cfs @ 1.73 fps)
↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=242.50' (Free Discharge)

↑ **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Wetlands Drainage

Inflow Area = 5.540 ac, 1.13% Impervious, Inflow Depth > 1.06" for 5-year event
Inflow = 4.58 cfs @ 12.49 hrs, Volume= 0.488 af
Primary = 4.58 cfs @ 12.49 hrs, Volume= 0.488 af, Atten= 0%, Lag= 0.0 min

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

5-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1	Runoff Area=8,570 sf 48.07% Impervious Runoff Depth>2.63"
Flow Length=111'	Slope=0.0710 '/ Tc=9.1 min CN=79 Runoff=0.57 cfs 0.043 af
Subcatchment 2S: Drainage Area 2	Runoff Area=13,320 sf 52.80% Impervious Runoff Depth>3.38"
Flow Length=125'	Slope=0.0100 '/ Tc=1.0 min CN=87 Runoff=1.41 cfs 0.086 af
Subcatchment 3S: Drainage Area 3	Runoff Area=24,738 sf 34.48% Impervious Runoff Depth>2.21"
Flow Length=265'	Tc=5.7 min CN=74 Runoff=1.56 cfs 0.104 af
Subcatchment 4S: Drainage Area 4	Runoff Area=69,700 sf 43.33% Impervious Runoff Depth>2.29"
Flow Length=130'	Slope=0.0100 '/ Tc=1.9 min CN=75 Runoff=5.07 cfs 0.306 af
Subcatchment 5S: Drainage Area 5	Runoff Area=27,597 sf 48.74% Impervious Runoff Depth>2.63"
Flow Length=180'	Slope=0.0500 '/ Tc=1.3 min CN=79 Runoff=2.30 cfs 0.139 af
Subcatchment 6S: Drainage Area 6	Runoff Area=47,315 sf 44.44% Impervious Runoff Depth>2.46"
Flow Length=180'	Slope=0.0500 '/ Tc=3.9 min CN=77 Runoff=3.54 cfs 0.222 af
Subcatchment 7S: Drainage Area 7	Runoff Area=13,011 sf 94.50% Impervious Runoff Depth>4.36"
Flow Length=175'	Slope=0.0580 '/ Tc=1.2 min CN=97 Runoff=1.61 cfs 0.109 af
Subcatchment 8S: Overland to Swales	Runoff Area=33,644 sf 0.00% Impervious Runoff Depth>1.06"
Flow Length=130'	Slope=0.1240 '/ Tc=8.3 min CN=58 Runoff=0.83 cfs 0.068 af
Reach 3R: Riprap Swale	Avg. Flow Depth=0.10' Max Vel=2.06 fps Inflow=0.83 cfs 0.068 af
	n=0.045 L=210.0' S=0.0952 '/ Capacity=48.58 cfs Outflow=0.80 cfs 0.068 af
Reach 4R: Grass swale to basin	Avg. Flow Depth=0.10' Max Vel=1.86 fps Inflow=0.80 cfs 0.068 af
	n=0.035 L=205.0' S=0.0439 '/ Capacity=42.41 cfs Outflow=0.78 cfs 0.068 af
Reach 9R: Peak off Site	Inflow=9.67 cfs 1.093 af
	Outflow=9.67 cfs 1.093 af
Pond 1P: CB_1-2	Peak Elev=311.85' Inflow=0.57 cfs 0.043 af
	15.0" Round Culvert n=0.012 L=128.7' S=0.0975 '/ Outflow=0.57 cfs 0.043 af
Pond 2P: CB_3-4	Peak Elev=299.49' Inflow=1.71 cfs 0.129 af
	15.0" Round Culvert n=0.012 L=131.1' S=0.0934 '/ Outflow=1.71 cfs 0.129 af
Pond 3P: CB_5-6	Peak Elev=287.41' Inflow=3.10 cfs 0.234 af
	15.0" Round Culvert n=0.012 L=168.9' S=0.0823 '/ Outflow=3.10 cfs 0.234 af
Pond 4P: CB_7-8	Peak Elev=275.01' Inflow=8.12 cfs 0.539 af
	15.0" Round Culvert n=0.012 L=128.2' S=0.0686 '/ Outflow=8.12 cfs 0.539 af
Pond 5P: CB-9	Peak Elev=267.28' Inflow=10.35 cfs 0.678 af
	15.0" Round Culvert n=0.012 L=100.6' S=0.1044 '/ Outflow=10.35 cfs 0.678 af

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Pond 6P: CB_10-11

Peak Elev=256.38' Inflow=13.80 cfs 0.901 af
18.0" Round Culvert n=0.012 L=172.0' S=0.0459 '/' Outflow=13.80 cfs 0.901 af

Pond 7P: CB_12-13

Peak Elev=248.97' Inflow=15.29 cfs 1.009 af
18.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/' Outflow=15.29 cfs 1.009 af

Pond 10P: Stormwater Basin

Peak Elev=244.69' Storage=16,898 cf Inflow=15.46 cfs 1.077 af
Discarded=0.92 cfs 0.651 af Primary=2.79 cfs 0.401 af Secondary=0.00 cfs 0.000 af Outflow=3.71 cfs 1.052 af

Link 1L:

10-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce Inflow=6.89 cfs 0.691 af
Area= 5.540 ac 1.13% Imperv. Primary=6.89 cfs 0.691 af

Total Runoff Area = 5.461 ac Runoff Volume = 1.077 af Average Runoff Depth = 2.37"
59.37% Pervious = 3.242 ac 40.63% Impervious = 2.219 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 0.57 cfs @ 12.13 hrs, Volume= 0.043 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
4,120	98	Paved parking, HSG B
4,450	61	>75% Grass cover, Good, HSG B
8,570	79	Weighted Average
4,450		51.93% Pervious Area
4,120		48.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	111	0.0710	0.20		Sheet Flow, Tc-1 Grass: Dense n= 0.240 P2= 3.37"

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 1.41 cfs @ 12.01 hrs, Volume= 0.086 af, Depth> 3.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
* 6,287	74	>75% Grass cover, Good, HSG B/D
* 7,033	98	Roof/pavement
13,320	87	Weighted Average
6,287		47.20% Pervious Area
7,033		52.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	125	0.0100	2.03		Shallow Concentrated Flow, Tc-2 Paved Kv= 20.3 fps

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 1.56 cfs @ 12.09 hrs, Volume= 0.104 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

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	Area (sf)	CN	Description
*	8,529	98	Paved parking/roof
	16,209	61	>75% Grass cover, Good, HSG B
	24,738	74	Weighted Average
	16,209		65.52% Pervious Area
	8,529		34.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	105	0.1100	0.35		Sheet Flow, Tc-4a Grass: Short n= 0.150 P2= 3.37"
0.7	160	0.0310	3.57		Shallow Concentrated Flow, Tc-4b Paved Kv= 20.3 fps
5.7	265	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 5.07 cfs @ 12.04 hrs, Volume= 0.306 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

	Area (sf)	CN	Description
*	30,200	98	Paved parking & roof HSG A
	20,000	61	>75% Grass cover, Good, HSG B
	19,500	55	Woods, Good, HSG B
	69,700	75	Weighted Average
	39,500		56.67% Pervious Area
	30,200		43.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0100	1.13		Sheet Flow, Tc-3 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 2.30 cfs @ 12.02 hrs, Volume= 0.139 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

	Area (sf)	CN	Description
*	13,450	98	Paved surfaces & roof
	14,147	61	>75% Grass cover, Good, HSG B
	27,597	79	Weighted Average
	14,147		51.26% Pervious Area
	13,450		48.74% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	180	0.0500	2.29		Sheet Flow, Tc-5 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 3.54 cfs @ 12.06 hrs, Volume= 0.222 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
* 21,025	98	Pavement/Roofs, HSG B
22,990	61	>75% Grass cover, Good, HSG B
3,300	55	Woods, Good, HSG B
47,315	77	Weighted Average
26,290		55.56% Pervious Area
21,025		44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	180	0.0500	0.76		Lag/CN Method, Tc-6

Summary for Subcatchment 7S: Drainage Area 7

Runoff = 1.61 cfs @ 12.02 hrs, Volume= 0.109 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
* 12,295	98	Roof & Pavement
* 716	74	>75% Grass cover, Good, HSG B/D
13,011	97	Weighted Average
716		5.50% Pervious Area
12,295		94.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	175	0.0580	2.42		Sheet Flow, Tc-7 Smooth surfaces n= 0.011 P2= 3.37"

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Summary for Subcatchment 8S: Overland to Swales

Runoff = 0.83 cfs @ 12.14 hrs, Volume= 0.068 af, Depth> 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
* 33,644	58	>75% Grass cover, Good, HSG B
33,644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	130	0.1240	0.26		Sheet Flow, Tc=8 Grass: Dense n= 0.240 P2= 3.37"

Summary for Reach 3R: Riprap Swale

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 1.06" for 10-year event
Inflow = 0.83 cfs @ 12.14 hrs, Volume= 0.068 af
Outflow = 0.80 cfs @ 12.20 hrs, Volume= 0.068 af, Atten= 4%, Lag= 3.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 1.7 min
Avg. Velocity= 0.81 fps, Avg. Travel Time= 4.3 min

Peak Storage= 85 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 48.58 cfs

4.00' x 1.00' deep channel, n= 0.045
Side Slope Z-value= 2.0 ' Top Width= 8.00'
Length= 210.0' Slope= 0.0952 '
Inlet Invert= 276.00', Outlet Invert= 256.00'



Summary for Reach 4R: Grass swale to basin

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 1.05" for 10-year event
Inflow = 0.80 cfs @ 12.20 hrs, Volume= 0.068 af
Outflow = 0.78 cfs @ 12.25 hrs, Volume= 0.068 af, Atten= 3%, Lag= 3.4 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.86 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 4.6 min

Peak Storage= 87 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 42.41 cfs

4.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 205.0' Slope= 0.0439 '/'
Inlet Invert= 256.00', Outlet Invert= 247.00'



Summary for Reach 9R: Peak off Site

Inflow Area = 11.002 ac, 20.74% Impervious, Inflow Depth > 1.19" for 10-year event
Inflow = 9.67 cfs @ 12.45 hrs, Volume= 1.093 af
Outflow = 9.67 cfs @ 12.45 hrs, Volume= 1.093 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: CB_1-2

Inflow Area = 0.197 ac, 48.07% Impervious, Inflow Depth > 2.63" for 10-year event
Inflow = 0.57 cfs @ 12.13 hrs, Volume= 0.043 af
Outflow = 0.57 cfs @ 12.13 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 12.13 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 311.85' @ 12.13 hrs
Flood Elev= 316.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.50'	15.0" Round Culvert L= 128.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 311.50' / 298.95' S= 0.0975 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.56 cfs @ 12.13 hrs HW=311.85' (Free Discharge)
↑ **1=Culvert** (Inlet Controls 0.56 cfs @ 2.01 fps)

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Summary for Pond 2P: CB_3-4

Inflow Area = 0.503 ac, 50.95% Impervious, Inflow Depth > 3.09" for 10-year event
Inflow = 1.71 cfs @ 12.03 hrs, Volume= 0.129 af
Outflow = 1.71 cfs @ 12.03 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.0 min
Primary = 1.71 cfs @ 12.03 hrs, Volume= 0.129 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 299.49' @ 12.03 hrs
Flood Elev= 303.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.85'	15.0" Round Culvert L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 298.85' / 286.60' S= 0.0934 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.67 cfs @ 12.03 hrs HW=299.48' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.67 cfs @ 2.70 fps)

Summary for Pond 3P: CB_5-6

Inflow Area = 1.070 ac, 42.21% Impervious, Inflow Depth > 2.62" for 10-year event
Inflow = 3.10 cfs @ 12.06 hrs, Volume= 0.234 af
Outflow = 3.10 cfs @ 12.06 hrs, Volume= 0.234 af, Atten= 0%, Lag= 0.0 min
Primary = 3.10 cfs @ 12.06 hrs, Volume= 0.234 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 287.41' @ 12.06 hrs
Flood Elev= 291.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	286.50'	15.0" Round Culvert L= 168.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.50' / 272.60' S= 0.0823 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.04 cfs @ 12.06 hrs HW=287.40' (Free Discharge)
↑**1=Culvert** (Inlet Controls 3.04 cfs @ 3.23 fps)

Summary for Pond 4P: CB_7-8

Inflow Area = 2.671 ac, 42.88% Impervious, Inflow Depth > 2.42" for 10-year event
Inflow = 8.12 cfs @ 12.04 hrs, Volume= 0.539 af
Outflow = 8.12 cfs @ 12.04 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.0 min
Primary = 8.12 cfs @ 12.04 hrs, Volume= 0.539 af

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

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Peak Elev= 275.01' @ 12.04 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	15.0" Round Culvert L= 128.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 263.70' S= 0.0686 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=7.98 cfs @ 12.04 hrs HW=274.95' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.98 cfs @ 6.50 fps)

Summary for Pond 5P: CB-9

Inflow Area = 3.304 ac, 44.00% Impervious, Inflow Depth > 2.46" for 10-year event
Inflow = 10.35 cfs @ 12.04 hrs, Volume= 0.678 af
Outflow = 10.35 cfs @ 12.04 hrs, Volume= 0.678 af, Atten= 0%, Lag= 0.0 min
Primary = 10.35 cfs @ 12.04 hrs, Volume= 0.678 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 267.28' @ 12.04 hrs
Flood Elev= 267.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	263.60'	15.0" Round Culvert L= 100.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.60' / 253.10' S= 0.1044 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=10.08 cfs @ 12.04 hrs HW=267.13' (Free Discharge)
↑**1=Culvert** (Inlet Controls 10.08 cfs @ 8.21 fps)

Summary for Pond 6P: CB_10-11

Inflow Area = 4.390 ac, 44.11% Impervious, Inflow Depth > 2.46" for 10-year event
Inflow = 13.80 cfs @ 12.05 hrs, Volume= 0.901 af
Outflow = 13.80 cfs @ 12.05 hrs, Volume= 0.901 af, Atten= 0%, Lag= 0.0 min
Primary = 13.80 cfs @ 12.05 hrs, Volume= 0.901 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 256.38' @ 12.05 hrs
Flood Elev= 259.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	18.0" Round Culvert L= 172.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 253.00' / 245.10' S= 0.0459 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=13.63 cfs @ 12.05 hrs HW=256.31' (Free Discharge)
↑**1=Culvert** (Inlet Controls 13.63 cfs @ 7.71 fps)

Summary for Pond 7P: CB_12-13

Inflow Area = 4.689 ac, 47.32% Impervious, Inflow Depth > 2.58" for 10-year event
Inflow = 15.29 cfs @ 12.04 hrs, Volume= 1.009 af
Outflow = 15.29 cfs @ 12.04 hrs, Volume= 1.009 af, Atten= 0%, Lag= 0.0 min
Primary = 15.29 cfs @ 12.04 hrs, Volume= 1.009 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 248.97' @ 12.04 hrs
Flood Elev= 249.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	245.00'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 245.00' / 244.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=14.99 cfs @ 12.04 hrs HW=248.85' (Free Discharge)
↑**1=Culvert** (Inlet Controls 14.99 cfs @ 8.48 fps)

Summary for Pond 10P: Stormwater Basin

Inflow Area = 5.461 ac, 40.63% Impervious, Inflow Depth > 2.37" for 10-year event
Inflow = 15.46 cfs @ 12.04 hrs, Volume= 1.077 af
Outflow = 3.71 cfs @ 12.47 hrs, Volume= 1.052 af, Atten= 76%, Lag= 25.9 min
Discarded = 0.92 cfs @ 12.47 hrs, Volume= 0.651 af
Primary = 2.79 cfs @ 12.47 hrs, Volume= 0.401 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 244.69' @ 12.47 hrs Surf.Area= 8,829 sf Storage= 16,898 cf

Plug-Flow detention time= 84.9 min calculated for 1.052 af (98% of inflow)
Center-of-Mass det. time= 75.8 min (863.4 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1	242.50'	29,538 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.50	6,754	0	0
244.00	8,051	11,104	11,104
245.00	9,184	8,618	19,721
246.00	10,450	9,817	29,538

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Device	Routing	Invert	Outlet Devices
#1	Primary	242.50'	15.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 242.50' / 242.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	243.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	243.50'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	244.00'	10.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	246.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Secondary	247.00'	18.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#7	Discarded	242.50'	4.500 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.92 cfs @ 12.47 hrs HW=244.68' (Free Discharge)

↑ **7=Exfiltration** (Exfiltration Controls 0.92 cfs)

Primary OutFlow Max=2.78 cfs @ 12.47 hrs HW=244.68' (Free Discharge)

↑ **1=Culvert** (Passes 2.78 cfs of 6.32 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.52 cfs @ 5.93 fps)
↑ **3=Orifice/Grate** (Orifice Controls 0.91 cfs @ 4.65 fps)
↑ **4=Orifice/Grate** (Orifice Controls 1.35 cfs @ 2.82 fps)
↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=242.50' (Free Discharge)

↑ **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Wetlands Drainage

Inflow Area = 5.540 ac, 1.13% Impervious, Inflow Depth > 1.50" for 10-year event
Inflow = 6.89 cfs @ 12.44 hrs, Volume= 0.691 af
Primary = 6.89 cfs @ 12.44 hrs, Volume= 0.691 af, Atten= 0%, Lag= 0.0 min

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

10-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1	Runoff Area=8,570 sf 48.07% Impervious Runoff Depth>3.48"
Flow Length=111'	Slope=0.0710 '/ Tc=9.1 min CN=79 Runoff=0.76 cfs 0.057 af
Subcatchment 2S: Drainage Area 2	Runoff Area=13,320 sf 52.80% Impervious Runoff Depth>4.32"
Flow Length=125'	Slope=0.0100 '/ Tc=1.0 min CN=87 Runoff=1.77 cfs 0.110 af
Subcatchment 3S: Drainage Area 3	Runoff Area=24,738 sf 34.48% Impervious Runoff Depth>3.00"
Flow Length=265'	Tc=5.7 min CN=74 Runoff=2.12 cfs 0.142 af
Subcatchment 4S: Drainage Area 4	Runoff Area=69,700 sf 43.33% Impervious Runoff Depth>3.10"
Flow Length=130'	Slope=0.0100 '/ Tc=1.9 min CN=75 Runoff=6.84 cfs 0.414 af
Subcatchment 5S: Drainage Area 5	Runoff Area=27,597 sf 48.74% Impervious Runoff Depth>3.49"
Flow Length=180'	Slope=0.0500 '/ Tc=1.3 min CN=79 Runoff=3.03 cfs 0.184 af
Subcatchment 6S: Drainage Area 6	Runoff Area=47,315 sf 44.44% Impervious Runoff Depth>3.29"
Flow Length=180'	Slope=0.0500 '/ Tc=3.9 min CN=77 Runoff=4.73 cfs 0.298 af
Subcatchment 7S: Drainage Area 7	Runoff Area=13,011 sf 94.50% Impervious Runoff Depth>5.30"
Flow Length=175'	Slope=0.0580 '/ Tc=1.2 min CN=97 Runoff=1.95 cfs 0.132 af
Subcatchment 8S: Overland to Swales	Runoff Area=33,644 sf 0.00% Impervious Runoff Depth>1.62"
Flow Length=130'	Slope=0.1240 '/ Tc=8.3 min CN=58 Runoff=1.35 cfs 0.104 af
Reach 3R: Riprap Swale	Avg. Flow Depth=0.13' Max Vel=2.47 fps Inflow=1.35 cfs 0.104 af
	n=0.045 L=210.0' S=0.0952 '/ Capacity=48.58 cfs Outflow=1.30 cfs 0.104 af
Reach 4R: Grass swale to basin	Avg. Flow Depth=0.14' Max Vel=2.23 fps Inflow=1.30 cfs 0.104 af
	n=0.035 L=205.0' S=0.0439 '/ Capacity=42.41 cfs Outflow=1.26 cfs 0.104 af
Reach 9R: Peak off Site	Inflow=14.70 cfs 1.675 af
	Outflow=14.70 cfs 1.675 af
Pond 1P: CB_1-2	Peak Elev=311.91' Inflow=0.76 cfs 0.057 af
	15.0" Round Culvert n=0.012 L=128.7' S=0.0975 '/ Outflow=0.76 cfs 0.057 af
Pond 2P: CB_3-4	Peak Elev=299.58' Inflow=2.19 cfs 0.167 af
	15.0" Round Culvert n=0.012 L=131.1' S=0.0934 '/ Outflow=2.19 cfs 0.167 af
Pond 3P: CB_5-6	Peak Elev=287.60' Inflow=4.09 cfs 0.309 af
	15.0" Round Culvert n=0.012 L=168.9' S=0.0823 '/ Outflow=4.09 cfs 0.309 af
Pond 4P: CB_7-8	Peak Elev=276.49' Inflow=10.85 cfs 0.723 af
	15.0" Round Culvert n=0.012 L=128.2' S=0.0686 '/ Outflow=10.85 cfs 0.723 af
Pond 5P: CB-9	Peak Elev=269.65' Inflow=13.79 cfs 0.908 af
	15.0" Round Culvert n=0.012 L=100.6' S=0.1044 '/ Outflow=13.79 cfs 0.908 af

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Pond 6P: CB_10-11

Peak Elev=258.42' Inflow=18.39 cfs 1.206 af
18.0" Round Culvert n=0.012 L=172.0' S=0.0459 '/' Outflow=18.39 cfs 1.206 af

Pond 7P: CB_12-13

Peak Elev=251.37' Inflow=20.20 cfs 1.338 af
18.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/' Outflow=20.20 cfs 1.338 af

Pond 10P: Stormwater Basin

Peak Elev=245.30' Storage=22,510 cf Inflow=20.63 cfs 1.441 af
Discarded=1.00 cfs 0.705 af Primary=4.25 cfs 0.675 af Secondary=0.00 cfs 0.000 af Outflow=5.25 cfs 1.380 af

Link 1L:

25-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce Inflow=10.47 cfs 1.000 af
Area= 5.540 ac 1.13% Imperv. Primary=10.47 cfs 1.000 af

Total Runoff Area = 5.461 ac Runoff Volume = 1.442 af Average Runoff Depth = 3.17"
59.37% Pervious = 3.242 ac 40.63% Impervious = 2.219 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 0.76 cfs @ 12.13 hrs, Volume= 0.057 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
4,120	98	Paved parking, HSG B
4,450	61	>75% Grass cover, Good, HSG B
8,570	79	Weighted Average
4,450		51.93% Pervious Area
4,120		48.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	111	0.0710	0.20		Sheet Flow, Tc-1 Grass: Dense n= 0.240 P2= 3.37"

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 1.77 cfs @ 12.01 hrs, Volume= 0.110 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
* 6,287	74	>75% Grass cover, Good, HSG B/D
* 7,033	98	Roof/pavement
13,320	87	Weighted Average
6,287		47.20% Pervious Area
7,033		52.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	125	0.0100	2.03		Shallow Concentrated Flow, Tc-2 Paved Kv= 20.3 fps

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 2.12 cfs @ 12.09 hrs, Volume= 0.142 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

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	Area (sf)	CN	Description
*	8,529	98	Paved parking/roof
	16,209	61	>75% Grass cover, Good, HSG B
	24,738	74	Weighted Average
	16,209		65.52% Pervious Area
	8,529		34.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	105	0.1100	0.35		Sheet Flow, Tc-4a Grass: Short n= 0.150 P2= 3.37"
0.7	160	0.0310	3.57		Shallow Concentrated Flow, Tc-4b Paved Kv= 20.3 fps
5.7	265	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 6.84 cfs @ 12.04 hrs, Volume= 0.414 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

	Area (sf)	CN	Description
*	30,200	98	Paved parking & roof HSG A
	20,000	61	>75% Grass cover, Good, HSG B
	19,500	55	Woods, Good, HSG B
	69,700	75	Weighted Average
	39,500		56.67% Pervious Area
	30,200		43.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0100	1.13		Sheet Flow, Tc-3 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 3.03 cfs @ 12.02 hrs, Volume= 0.184 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

	Area (sf)	CN	Description
*	13,450	98	Paved surfaces & roof
	14,147	61	>75% Grass cover, Good, HSG B
	27,597	79	Weighted Average
	14,147		51.26% Pervious Area
	13,450		48.74% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	180	0.0500	2.29		Sheet Flow, Tc-5 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 4.73 cfs @ 12.06 hrs, Volume= 0.298 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
* 21,025	98	Pavement/Roofs, HSG B
22,990	61	>75% Grass cover, Good, HSG B
3,300	55	Woods, Good, HSG B
47,315	77	Weighted Average
26,290		55.56% Pervious Area
21,025		44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	180	0.0500	0.76		Lag/CN Method, Tc-6

Summary for Subcatchment 7S: Drainage Area 7

Runoff = 1.95 cfs @ 12.02 hrs, Volume= 0.132 af, Depth> 5.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
* 12,295	98	Roof & Pavement
* 716	74	>75% Grass cover, Good, HSG B/D
13,011	97	Weighted Average
716		5.50% Pervious Area
12,295		94.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	175	0.0580	2.42		Sheet Flow, Tc-7 Smooth surfaces n= 0.011 P2= 3.37"

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Summary for Subcatchment 8S: Overland to Swales

Runoff = 1.35 cfs @ 12.13 hrs, Volume= 0.104 af, Depth> 1.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
* 33,644	58	>75% Grass cover, Good, HSG B
33,644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	130	0.1240	0.26		Sheet Flow, Tc=8 Grass: Dense n= 0.240 P2= 3.37"

Summary for Reach 3R: Riprap Swale

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 1.62" for 25-year event
Inflow = 1.35 cfs @ 12.13 hrs, Volume= 0.104 af
Outflow = 1.30 cfs @ 12.18 hrs, Volume= 0.104 af, Atten= 4%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 1.4 min
Avg. Velocity= 0.92 fps, Avg. Travel Time= 3.8 min

Peak Storage= 115 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 48.58 cfs

4.00' x 1.00' deep channel, n= 0.045
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 210.0' Slope= 0.0952 '/'
Inlet Invert= 276.00', Outlet Invert= 256.00'



Summary for Reach 4R: Grass swale to basin

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 1.62" for 25-year event
Inflow = 1.30 cfs @ 12.18 hrs, Volume= 0.104 af
Outflow = 1.26 cfs @ 12.22 hrs, Volume= 0.104 af, Atten= 3%, Lag= 2.9 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 4.1 min

Peak Storage= 119 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 42.41 cfs

4.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 205.0' Slope= 0.0439 '/'
Inlet Invert= 256.00', Outlet Invert= 247.00'



Summary for Reach 9R: Peak off Site

Inflow Area = 11.002 ac, 20.74% Impervious, Inflow Depth > 1.83" for 25-year event
Inflow = 14.70 cfs @ 12.41 hrs, Volume= 1.675 af
Outflow = 14.70 cfs @ 12.41 hrs, Volume= 1.675 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: CB_1-2

Inflow Area = 0.197 ac, 48.07% Impervious, Inflow Depth > 3.48" for 25-year event
Inflow = 0.76 cfs @ 12.13 hrs, Volume= 0.057 af
Outflow = 0.76 cfs @ 12.13 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
Primary = 0.76 cfs @ 12.13 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 311.91' @ 12.13 hrs
Flood Elev= 316.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.50'	15.0" Round Culvert L= 128.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 311.50' / 298.95' S= 0.0975 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.74 cfs @ 12.13 hrs HW=311.90' (Free Discharge)
↑ **1=Culvert** (Inlet Controls 0.74 cfs @ 2.16 fps)

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Summary for Pond 2P: CB_3-4

Inflow Area = 0.503 ac, 50.95% Impervious, Inflow Depth > 3.99" for 25-year event
Inflow = 2.19 cfs @ 12.03 hrs, Volume= 0.167 af
Outflow = 2.19 cfs @ 12.03 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min
Primary = 2.19 cfs @ 12.03 hrs, Volume= 0.167 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 299.58' @ 12.03 hrs
Flood Elev= 303.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.85'	15.0" Round Culvert L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 298.85' / 286.60' S= 0.0934 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.13 cfs @ 12.03 hrs HW=299.57' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.13 cfs @ 2.90 fps)

Summary for Pond 3P: CB_5-6

Inflow Area = 1.070 ac, 42.21% Impervious, Inflow Depth > 3.47" for 25-year event
Inflow = 4.09 cfs @ 12.06 hrs, Volume= 0.309 af
Outflow = 4.09 cfs @ 12.06 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.0 min
Primary = 4.09 cfs @ 12.06 hrs, Volume= 0.309 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 287.60' @ 12.06 hrs
Flood Elev= 291.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	286.50'	15.0" Round Culvert L= 168.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.50' / 272.60' S= 0.0823 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.02 cfs @ 12.06 hrs HW=287.59' (Free Discharge)
↑**1=Culvert** (Inlet Controls 4.02 cfs @ 3.55 fps)

Summary for Pond 4P: CB_7-8

Inflow Area = 2.671 ac, 42.88% Impervious, Inflow Depth > 3.25" for 25-year event
Inflow = 10.85 cfs @ 12.04 hrs, Volume= 0.723 af
Outflow = 10.85 cfs @ 12.04 hrs, Volume= 0.723 af, Atten= 0%, Lag= 0.0 min
Primary = 10.85 cfs @ 12.04 hrs, Volume= 0.723 af

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

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Peak Elev= 276.49' @ 12.04 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	15.0" Round Culvert L= 128.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 263.70' S= 0.0686 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=10.64 cfs @ 12.04 hrs HW=276.37' (Free Discharge)
↑**1=Culvert** (Inlet Controls 10.64 cfs @ 8.67 fps)

Summary for Pond 5P: CB-9

Inflow Area = 3.304 ac, 44.00% Impervious, Inflow Depth > 3.30" for 25-year event
Inflow = 13.79 cfs @ 12.04 hrs, Volume= 0.908 af
Outflow = 13.79 cfs @ 12.04 hrs, Volume= 0.908 af, Atten= 0%, Lag= 0.0 min
Primary = 13.79 cfs @ 12.04 hrs, Volume= 0.908 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 269.65' @ 12.04 hrs
Flood Elev= 267.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	263.60'	15.0" Round Culvert L= 100.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.60' / 253.10' S= 0.1044 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=13.40 cfs @ 12.04 hrs HW=269.37' (Free Discharge)
↑**1=Culvert** (Inlet Controls 13.40 cfs @ 10.92 fps)

Summary for Pond 6P: CB_10-11

Inflow Area = 4.390 ac, 44.11% Impervious, Inflow Depth > 3.30" for 25-year event
Inflow = 18.39 cfs @ 12.04 hrs, Volume= 1.206 af
Outflow = 18.39 cfs @ 12.04 hrs, Volume= 1.206 af, Atten= 0%, Lag= 0.0 min
Primary = 18.39 cfs @ 12.04 hrs, Volume= 1.206 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 258.42' @ 12.05 hrs
Flood Elev= 259.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	18.0" Round Culvert L= 172.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 253.00' / 245.10' S= 0.0459 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=18.11 cfs @ 12.04 hrs HW=258.28' (Free Discharge)

↑**1=Culvert** (Inlet Controls 18.11 cfs @ 10.25 fps)

Summary for Pond 7P: CB_12-13

Inflow Area = 4.689 ac, 47.32% Impervious, Inflow Depth > 3.42" for 25-year event
Inflow = 20.20 cfs @ 12.04 hrs, Volume= 1.338 af
Outflow = 20.20 cfs @ 12.04 hrs, Volume= 1.338 af, Atten= 0%, Lag= 0.0 min
Primary = 20.20 cfs @ 12.04 hrs, Volume= 1.338 af

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

Peak Elev= 251.37' @ 12.04 hrs

Flood Elev= 249.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	245.00'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 245.00' / 244.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=19.77 cfs @ 12.04 hrs HW=251.15' (Free Discharge)

↑**1=Culvert** (Inlet Controls 19.77 cfs @ 11.19 fps)

Summary for Pond 10P: Stormwater Basin

Inflow Area = 5.461 ac, 40.63% Impervious, Inflow Depth > 3.17" for 25-year event
Inflow = 20.63 cfs @ 12.04 hrs, Volume= 1.441 af
Outflow = 5.25 cfs @ 12.46 hrs, Volume= 1.380 af, Atten= 75%, Lag= 24.8 min
Discarded = 1.00 cfs @ 12.46 hrs, Volume= 0.705 af
Primary = 4.25 cfs @ 12.46 hrs, Volume= 0.675 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 245.30' @ 12.46 hrs Surf.Area= 9,561 sf Storage= 22,510 cf

Plug-Flow detention time= 80.0 min calculated for 1.375 af (95% of inflow)

Center-of-Mass det. time= 64.0 min (846.1 - 782.1)

Volume	Invert	Avail.Storage	Storage Description
#1	242.50'	29,538 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.50	6,754	0	0
244.00	8,051	11,104	11,104
245.00	9,184	8,618	19,721
246.00	10,450	9,817	29,538

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Device	Routing	Invert	Outlet Devices
#1	Primary	242.50'	15.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 242.50' / 242.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	243.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	243.50'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	244.00'	10.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	246.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Secondary	247.00'	18.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#7	Discarded	242.50'	4.500 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.00 cfs @ 12.46 hrs HW=245.30' (Free Discharge)

↑ **7=Exfiltration** (Exfiltration Controls 1.00 cfs)

Primary OutFlow Max=4.25 cfs @ 12.46 hrs HW=245.30' (Free Discharge)

↑ **1=Culvert** (Passes 4.25 cfs of 7.54 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.61 cfs @ 7.03 fps)
↑ **3=Orifice/Grate** (Orifice Controls 1.18 cfs @ 5.99 fps)
↑ **4=Orifice/Grate** (Orifice Controls 2.46 cfs @ 4.52 fps)
↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=242.50' (Free Discharge)

↑ **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Wetlands Drainage

Inflow Area = 5.540 ac, 1.13% Impervious, Inflow Depth > 2.17" for 25-year event
Inflow = 10.47 cfs @ 12.40 hrs, Volume= 1.000 af
Primary = 10.47 cfs @ 12.40 hrs, Volume= 1.000 af, Atten= 0%, Lag= 0.0 min

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

25-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1	Runoff Area=8,570 sf 48.07% Impervious Runoff Depth>4.17"
Flow Length=111'	Slope=0.0710 '/ Tc=9.1 min CN=79 Runoff=0.90 cfs 0.068 af
Subcatchment 2S: Drainage Area 2	Runoff Area=13,320 sf 52.80% Impervious Runoff Depth>5.05"
Flow Length=125'	Slope=0.0100 '/ Tc=1.0 min CN=87 Runoff=2.05 cfs 0.129 af
Subcatchment 3S: Drainage Area 3	Runoff Area=24,738 sf 34.48% Impervious Runoff Depth>3.65"
Flow Length=265'	Tc=5.7 min CN=74 Runoff=2.57 cfs 0.173 af
Subcatchment 4S: Drainage Area 4	Runoff Area=69,700 sf 43.33% Impervious Runoff Depth>3.76"
Flow Length=130'	Slope=0.0100 '/ Tc=1.9 min CN=75 Runoff=8.25 cfs 0.501 af
Subcatchment 5S: Drainage Area 5	Runoff Area=27,597 sf 48.74% Impervious Runoff Depth>4.18"
Flow Length=180'	Slope=0.0500 '/ Tc=1.3 min CN=79 Runoff=3.61 cfs 0.221 af
Subcatchment 6S: Drainage Area 6	Runoff Area=47,315 sf 44.44% Impervious Runoff Depth>3.97"
Flow Length=180'	Slope=0.0500 '/ Tc=3.9 min CN=77 Runoff=5.67 cfs 0.359 af
Subcatchment 7S: Drainage Area 7	Runoff Area=13,011 sf 94.50% Impervious Runoff Depth>6.03"
Flow Length=175'	Slope=0.0580 '/ Tc=1.2 min CN=97 Runoff=2.21 cfs 0.150 af
Subcatchment 8S: Overland to Swales	Runoff Area=33,644 sf 0.00% Impervious Runoff Depth>2.11"
Flow Length=130'	Slope=0.1240 '/ Tc=8.3 min CN=58 Runoff=1.79 cfs 0.136 af
Reach 3R: Riprap Swale	Avg. Flow Depth=0.15' Max Vel=2.75 fps Inflow=1.79 cfs 0.136 af
	n=0.045 L=210.0' S=0.0952 '/ Capacity=48.58 cfs Outflow=1.74 cfs 0.135 af
Reach 4R: Grass swale to basin	Avg. Flow Depth=0.16' Max Vel=2.47 fps Inflow=1.74 cfs 0.135 af
	n=0.035 L=205.0' S=0.0439 '/ Capacity=42.41 cfs Outflow=1.69 cfs 0.135 af
Reach 9R: Peak off Site	Inflow=18.45 cfs 2.164 af
	Outflow=18.45 cfs 2.164 af
Pond 1P: CB_1-2	Peak Elev=311.95' Inflow=0.90 cfs 0.068 af
	15.0" Round Culvert n=0.012 L=128.7' S=0.0975 '/ Outflow=0.90 cfs 0.068 af
Pond 2P: CB_3-4	Peak Elev=299.66' Inflow=2.55 cfs 0.197 af
	15.0" Round Culvert n=0.012 L=131.1' S=0.0934 '/ Outflow=2.55 cfs 0.197 af
Pond 3P: CB_5-6	Peak Elev=287.80' Inflow=4.88 cfs 0.370 af
	15.0" Round Culvert n=0.012 L=168.9' S=0.0823 '/ Outflow=4.88 cfs 0.370 af
Pond 4P: CB_7-8	Peak Elev=277.97' Inflow=13.02 cfs 0.871 af
	15.0" Round Culvert n=0.012 L=128.2' S=0.0686 '/ Outflow=13.02 cfs 0.871 af
Pond 5P: CB-9	Peak Elev=272.00' Inflow=16.51 cfs 1.092 af
	15.0" Round Culvert n=0.012 L=100.6' S=0.1044 '/ Outflow=16.51 cfs 1.092 af

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Pond 6P: CB_10-11

Peak Elev=260.44' Inflow=22.02 cfs 1.451 af
18.0" Round Culvert n=0.012 L=172.0' S=0.0459 '/ Outflow=22.02 cfs 1.451 af

Pond 7P: CB_12-13

Peak Elev=253.74' Inflow=24.08 cfs 1.601 af
18.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/ Outflow=24.08 cfs 1.601 af

Pond 10P: Stormwater Basin

Peak Elev=245.81' Storage=27,604 cf Inflow=24.74 cfs 1.736 af
Discarded=1.06 cfs 0.747 af Primary=5.14 cfs 0.906 af Secondary=0.00 cfs 0.000 af Outflow=6.21 cfs 1.653 af

Link 1L:

50-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce Inflow=13.34 cfs 1.257 af
Area= 5.540 ac 1.13% Imperv. Primary=13.34 cfs 1.257 af

Total Runoff Area = 5.461 ac Runoff Volume = 1.737 af Average Runoff Depth = 3.82"
59.37% Pervious = 3.242 ac 40.63% Impervious = 2.219 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 0.90 cfs @ 12.13 hrs, Volume= 0.068 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

Area (sf)	CN	Description
4,120	98	Paved parking, HSG B
4,450	61	>75% Grass cover, Good, HSG B
8,570	79	Weighted Average
4,450		51.93% Pervious Area
4,120		48.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	111	0.0710	0.20		Sheet Flow, Tc-1 Grass: Dense n= 0.240 P2= 3.37"

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 2.05 cfs @ 12.01 hrs, Volume= 0.129 af, Depth> 5.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

Area (sf)	CN	Description
* 6,287	74	>75% Grass cover, Good, HSG B/D
* 7,033	98	Roof/pavement
13,320	87	Weighted Average
6,287		47.20% Pervious Area
7,033		52.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	125	0.0100	2.03		Shallow Concentrated Flow, Tc-2 Paved Kv= 20.3 fps

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 2.57 cfs @ 12.09 hrs, Volume= 0.173 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

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	Area (sf)	CN	Description
*	8,529	98	Paved parking/roof
	16,209	61	>75% Grass cover, Good, HSG B
	24,738	74	Weighted Average
	16,209		65.52% Pervious Area
	8,529		34.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	105	0.1100	0.35		Sheet Flow, Tc-4a Grass: Short n= 0.150 P2= 3.37"
0.7	160	0.0310	3.57		Shallow Concentrated Flow, Tc-4b Paved Kv= 20.3 fps
5.7	265	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 8.25 cfs @ 12.04 hrs, Volume= 0.501 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

	Area (sf)	CN	Description
*	30,200	98	Paved parking & roof HSG A
	20,000	61	>75% Grass cover, Good, HSG B
	19,500	55	Woods, Good, HSG B
	69,700	75	Weighted Average
	39,500		56.67% Pervious Area
	30,200		43.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0100	1.13		Sheet Flow, Tc-3 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 3.61 cfs @ 12.02 hrs, Volume= 0.221 af, Depth> 4.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

	Area (sf)	CN	Description
*	13,450	98	Paved surfaces & roof
	14,147	61	>75% Grass cover, Good, HSG B
	27,597	79	Weighted Average
	14,147		51.26% Pervious Area
	13,450		48.74% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	180	0.0500	2.29		Sheet Flow, Tc-5 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 5.67 cfs @ 12.06 hrs, Volume= 0.359 af, Depth> 3.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

Area (sf)	CN	Description
* 21,025	98	Pavement/Roofs, HSG B
22,990	61	>75% Grass cover, Good, HSG B
3,300	55	Woods, Good, HSG B
47,315	77	Weighted Average
26,290		55.56% Pervious Area
21,025		44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	180	0.0500	0.76		Lag/CN Method, Tc-6

Summary for Subcatchment 7S: Drainage Area 7

Runoff = 2.21 cfs @ 12.02 hrs, Volume= 0.150 af, Depth> 6.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-year Rainfall=6.85"

Area (sf)	CN	Description
* 12,295	98	Roof & Pavement
* 716	74	>75% Grass cover, Good, HSG B/D
13,011	97	Weighted Average
716		5.50% Pervious Area
12,295		94.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	175	0.0580	2.42		Sheet Flow, Tc-7 Smooth surfaces n= 0.011 P2= 3.37"

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Summary for Subcatchment 8S: Overland to Swales

Runoff = 1.79 cfs @ 12.13 hrs, Volume= 0.136 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.85"

	Area (sf)	CN	Description
*	33,644	58	>75% Grass cover, Good, HSG B
	33,644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	130	0.1240	0.26		Sheet Flow, Tc=8 Grass: Dense n= 0.240 P2= 3.37"

Summary for Reach 3R: Riprap Swale

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 2.11" for 50-year event
Inflow = 1.79 cfs @ 12.13 hrs, Volume= 0.136 af
Outflow = 1.74 cfs @ 12.17 hrs, Volume= 0.135 af, Atten= 3%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.75 fps, Min. Travel Time= 1.3 min
Avg. Velocity= 0.98 fps, Avg. Travel Time= 3.6 min

Peak Storage= 137 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 48.58 cfs

4.00' x 1.00' deep channel, n= 0.045
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 210.0' Slope= 0.0952 '/'
Inlet Invert= 276.00', Outlet Invert= 256.00'



Summary for Reach 4R: Grass swale to basin

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 2.10" for 50-year event
Inflow = 1.74 cfs @ 12.17 hrs, Volume= 0.135 af
Outflow = 1.69 cfs @ 12.21 hrs, Volume= 0.135 af, Atten= 3%, Lag= 2.6 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 3.8 min

Peak Storage= 142 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 42.41 cfs

4.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 205.0' Slope= 0.0439 '/'
Inlet Invert= 256.00', Outlet Invert= 247.00'



Summary for Reach 9R: Peak off Site

Inflow Area = 11.002 ac, 20.74% Impervious, Inflow Depth > 2.36" for 50-year event
Inflow = 18.45 cfs @ 12.39 hrs, Volume= 2.164 af
Outflow = 18.45 cfs @ 12.39 hrs, Volume= 2.164 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: CB_1-2

Inflow Area = 0.197 ac, 48.07% Impervious, Inflow Depth > 4.17" for 50-year event
Inflow = 0.90 cfs @ 12.13 hrs, Volume= 0.068 af
Outflow = 0.90 cfs @ 12.13 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 0.90 cfs @ 12.13 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 311.95' @ 12.13 hrs
Flood Elev= 316.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.50'	15.0" Round Culvert L= 128.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 311.50' / 298.95' S= 0.0975 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.88 cfs @ 12.13 hrs HW=311.94' (Free Discharge)
↑ **1=Culvert** (Inlet Controls 0.88 cfs @ 2.26 fps)

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Summary for Pond 2P: CB_3-4

Inflow Area = 0.503 ac, 50.95% Impervious, Inflow Depth > 4.70" for 50-year event
Inflow = 2.55 cfs @ 12.03 hrs, Volume= 0.197 af
Outflow = 2.55 cfs @ 12.03 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min
Primary = 2.55 cfs @ 12.03 hrs, Volume= 0.197 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 299.66' @ 12.03 hrs
Flood Elev= 303.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.85'	15.0" Round Culvert L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 298.85' / 286.60' S= 0.0934 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.49 cfs @ 12.03 hrs HW=299.64' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.49 cfs @ 3.03 fps)

Summary for Pond 3P: CB_5-6

Inflow Area = 1.070 ac, 42.21% Impervious, Inflow Depth > 4.15" for 50-year event
Inflow = 4.88 cfs @ 12.06 hrs, Volume= 0.370 af
Outflow = 4.88 cfs @ 12.06 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min
Primary = 4.88 cfs @ 12.06 hrs, Volume= 0.370 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 287.80' @ 12.06 hrs
Flood Elev= 291.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	286.50'	15.0" Round Culvert L= 168.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.50' / 272.60' S= 0.0823 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.78 cfs @ 12.06 hrs HW=287.78' (Free Discharge)
↑**1=Culvert** (Inlet Controls 4.78 cfs @ 3.89 fps)

Summary for Pond 4P: CB_7-8

Inflow Area = 2.671 ac, 42.88% Impervious, Inflow Depth > 3.91" for 50-year event
Inflow = 13.02 cfs @ 12.04 hrs, Volume= 0.871 af
Outflow = 13.02 cfs @ 12.04 hrs, Volume= 0.871 af, Atten= 0%, Lag= 0.0 min
Primary = 13.02 cfs @ 12.04 hrs, Volume= 0.871 af

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

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Peak Elev= 277.97' @ 12.04 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	15.0" Round Culvert L= 128.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 263.70' S= 0.0686 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=12.75 cfs @ 12.04 hrs HW=277.78' (Free Discharge)
↑**1=Culvert** (Inlet Controls 12.75 cfs @ 10.39 fps)

Summary for Pond 5P: CB-9

Inflow Area = 3.304 ac, 44.00% Impervious, Inflow Depth > 3.97" for 50-year event
Inflow = 16.51 cfs @ 12.04 hrs, Volume= 1.092 af
Outflow = 16.51 cfs @ 12.04 hrs, Volume= 1.092 af, Atten= 0%, Lag= 0.0 min
Primary = 16.51 cfs @ 12.04 hrs, Volume= 1.092 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 272.00' @ 12.04 hrs
Flood Elev= 267.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	263.60'	15.0" Round Culvert L= 100.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.60' / 253.10' S= 0.1044 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=16.03 cfs @ 12.04 hrs HW=271.58' (Free Discharge)
↑**1=Culvert** (Inlet Controls 16.03 cfs @ 13.06 fps)

Summary for Pond 6P: CB_10-11

Inflow Area = 4.390 ac, 44.11% Impervious, Inflow Depth > 3.97" for 50-year event
Inflow = 22.02 cfs @ 12.04 hrs, Volume= 1.451 af
Outflow = 22.02 cfs @ 12.04 hrs, Volume= 1.451 af, Atten= 0%, Lag= 0.0 min
Primary = 22.02 cfs @ 12.04 hrs, Volume= 1.451 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 260.44' @ 12.04 hrs
Flood Elev= 259.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	18.0" Round Culvert L= 172.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 253.00' / 245.10' S= 0.0459 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=21.66 cfs @ 12.04 hrs HW=260.23' (Free Discharge)

↑**1=Culvert** (Inlet Controls 21.66 cfs @ 12.26 fps)

Summary for Pond 7P: CB_12-13

Inflow Area = 4.689 ac, 47.32% Impervious, Inflow Depth > 4.10" for 50-year event
Inflow = 24.08 cfs @ 12.04 hrs, Volume= 1.601 af
Outflow = 24.08 cfs @ 12.04 hrs, Volume= 1.601 af, Atten= 0%, Lag= 0.0 min
Primary = 24.08 cfs @ 12.04 hrs, Volume= 1.601 af

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

Peak Elev= 253.74' @ 12.04 hrs

Flood Elev= 249.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	245.00'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 245.00' / 244.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=23.55 cfs @ 12.04 hrs HW=253.41' (Free Discharge)

↑**1=Culvert** (Inlet Controls 23.55 cfs @ 13.33 fps)

Summary for Pond 10P: Stormwater Basin

Inflow Area = 5.461 ac, 40.63% Impervious, Inflow Depth > 3.81" for 50-year event
Inflow = 24.74 cfs @ 12.04 hrs, Volume= 1.736 af
Outflow = 6.21 cfs @ 12.46 hrs, Volume= 1.653 af, Atten= 75%, Lag= 24.8 min
Discarded = 1.06 cfs @ 12.46 hrs, Volume= 0.747 af
Primary = 5.14 cfs @ 12.46 hrs, Volume= 0.906 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 245.81' @ 12.46 hrs Surf.Area= 10,213 sf Storage= 27,604 cf

Plug-Flow detention time= 78.1 min calculated for 1.653 af (95% of inflow)

Center-of-Mass det. time= 60.1 min (838.7 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1	242.50'	29,538 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.50	6,754	0	0
244.00	8,051	11,104	11,104
245.00	9,184	8,618	19,721
246.00	10,450	9,817	29,538

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Device	Routing	Invert	Outlet Devices
#1	Primary	242.50'	15.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 242.50' / 242.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	243.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	243.50'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	244.00'	10.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	246.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Secondary	247.00'	18.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#7	Discarded	242.50'	4.500 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.06 cfs @ 12.46 hrs HW=245.81' (Free Discharge)

↑ **7=Exfiltration** (Exfiltration Controls 1.06 cfs)

Primary OutFlow Max=5.14 cfs @ 12.46 hrs HW=245.81' (Free Discharge)

↑ **1=Culvert** (Passes 5.14 cfs of 8.44 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.83 fps)
↑ **3=Orifice/Grate** (Orifice Controls 1.36 cfs @ 6.91 fps)
↑ **4=Orifice/Grate** (Orifice Controls 3.10 cfs @ 5.69 fps)
↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=242.50' (Free Discharge)

↑ **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Wetlands Drainage

Inflow Area = 5.540 ac, 1.13% Impervious, Inflow Depth > 2.72" for 50-year event
Inflow = 13.34 cfs @ 12.39 hrs, Volume= 1.257 af
Primary = 13.34 cfs @ 12.39 hrs, Volume= 1.257 af, Atten= 0%, Lag= 0.0 min

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

50-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=8,570 sf 48.07% Impervious Runoff Depth>4.86"
Flow Length=111' Slope=0.0710 '/' Tc=9.1 min CN=79 Runoff=1.04 cfs 0.080 af

Subcatchment 2S: Drainage Area 2 Runoff Area=13,320 sf 52.80% Impervious Runoff Depth>5.77"
Flow Length=125' Slope=0.0100 '/' Tc=1.0 min CN=87 Runoff=2.33 cfs 0.147 af

Subcatchment 3S: Drainage Area 3 Runoff Area=24,738 sf 34.48% Impervious Runoff Depth>4.31"
Flow Length=265' Tc=5.7 min CN=74 Runoff=3.02 cfs 0.204 af

Subcatchment 4S: Drainage Area 4 Runoff Area=69,700 sf 43.33% Impervious Runoff Depth>4.42"
Flow Length=130' Slope=0.0100 '/' Tc=1.9 min CN=75 Runoff=9.65 cfs 0.590 af

Subcatchment 5S: Drainage Area 5 Runoff Area=27,597 sf 48.74% Impervious Runoff Depth>4.87"
Flow Length=180' Slope=0.0500 '/' Tc=1.3 min CN=79 Runoff=4.18 cfs 0.257 af

Subcatchment 6S: Drainage Area 6 Runoff Area=47,315 sf 44.44% Impervious Runoff Depth>4.64"
Flow Length=180' Slope=0.0500 '/' Tc=3.9 min CN=77 Runoff=6.60 cfs 0.420 af

Subcatchment 7S: Drainage Area 7 Runoff Area=13,011 sf 94.50% Impervious Runoff Depth>6.75"
Flow Length=175' Slope=0.0580 '/' Tc=1.2 min CN=97 Runoff=2.47 cfs 0.168 af

Subcatchment 8S: Overland to Swales Runoff Area=33,644 sf 0.00% Impervious Runoff Depth>2.62"
Flow Length=130' Slope=0.1240 '/' Tc=8.3 min CN=58 Runoff=2.26 cfs 0.168 af

Reach 3R: Riprap Swale Avg. Flow Depth=0.17' Max Vel=2.98 fps Inflow=2.26 cfs 0.168 af
n=0.045 L=210.0' S=0.0952 '/' Capacity=48.58 cfs Outflow=2.20 cfs 0.168 af

Reach 4R: Grass swale to basin Avg. Flow Depth=0.18' Max Vel=2.68 fps Inflow=2.20 cfs 0.168 af
n=0.035 L=205.0' S=0.0439 '/' Capacity=42.41 cfs Outflow=2.13 cfs 0.167 af

Reach 9R: Peak off Site Inflow=29.81 cfs 2.676 af
Outflow=29.81 cfs 2.676 af

Pond 1P: CB_1-2 Peak Elev=311.98' Inflow=1.04 cfs 0.080 af
15.0" Round Culvert n=0.012 L=128.7' S=0.0975 '/' Outflow=1.04 cfs 0.080 af

Pond 2P: CB_3-4 Peak Elev=299.72' Inflow=2.91 cfs 0.227 af
15.0" Round Culvert n=0.012 L=131.1' S=0.0934 '/' Outflow=2.91 cfs 0.227 af

Pond 3P: CB_5-6 Peak Elev=288.04' Inflow=5.66 cfs 0.431 af
15.0" Round Culvert n=0.012 L=168.9' S=0.0823 '/' Outflow=5.66 cfs 0.431 af

Pond 4P: CB_7-8 Peak Elev=279.71' Inflow=15.18 cfs 1.021 af
15.0" Round Culvert n=0.012 L=128.2' S=0.0686 '/' Outflow=15.18 cfs 1.021 af

Pond 5P: CB-9 Peak Elev=274.76' Inflow=19.22 cfs 1.278 af
15.0" Round Culvert n=0.012 L=100.6' S=0.1044 '/' Outflow=19.22 cfs 1.278 af

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Pond 6P: CB_10-11

Peak Elev=262.82' Inflow=25.64 cfs 1.698 af
18.0" Round Culvert n=0.012 L=172.0' S=0.0459 '/' Outflow=25.64 cfs 1.698 af

Pond 7P: CB_12-13

Peak Elev=256.51' Inflow=27.94 cfs 1.866 af
18.0" Round Culvert n=0.012 L=36.0' S=0.0278 '/' Outflow=27.94 cfs 1.866 af

Pond 10P: Stormwater Basin

Peak Elev=247.26' Storage=29,538 cf Inflow=28.85 cfs 2.034 af
Discarded=1.09 cfs 0.781 af Primary=10.57 cfs 1.114 af Secondary=6.24 cfs 0.039 af Outflow=17.90 cfs 1.934 af

Link 1L:

100-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce Inflow=16.37 cfs 1.524 af
Area= 5.540 ac 1.13% Imperv. Primary=16.37 cfs 1.524 af

Total Runoff Area = 5.461 ac Runoff Volume = 2.035 af Average Runoff Depth = 4.47"
59.37% Pervious = 3.242 ac 40.63% Impervious = 2.219 ac

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Summary for Subcatchment 1S: Drainage Area 1

Runoff = 1.04 cfs @ 12.13 hrs, Volume= 0.080 af, Depth> 4.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
4,120	98	Paved parking, HSG B
4,450	61	>75% Grass cover, Good, HSG B
8,570	79	Weighted Average
4,450		51.93% Pervious Area
4,120		48.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	111	0.0710	0.20		Sheet Flow, Tc-1 Grass: Dense n= 0.240 P2= 3.37"

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 2.33 cfs @ 12.01 hrs, Volume= 0.147 af, Depth> 5.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
* 6,287	74	>75% Grass cover, Good, HSG B/D
* 7,033	98	Roof/pavement
13,320	87	Weighted Average
6,287		47.20% Pervious Area
7,033		52.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	125	0.0100	2.03		Shallow Concentrated Flow, Tc-2 Paved Kv= 20.3 fps

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 3.02 cfs @ 12.09 hrs, Volume= 0.204 af, Depth> 4.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

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Area (sf)	CN	Description
* 8,529	98	Paved parking/roof
16,209	61	>75% Grass cover, Good, HSG B
24,738	74	Weighted Average
16,209		65.52% Pervious Area
8,529		34.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	105	0.1100	0.35		Sheet Flow, Tc-4a Grass: Short n= 0.150 P2= 3.37"
0.7	160	0.0310	3.57		Shallow Concentrated Flow, Tc-4b Paved Kv= 20.3 fps
5.7	265	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 9.65 cfs @ 12.04 hrs, Volume= 0.590 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
* 30,200	98	Paved parking & roof HSG A
20,000	61	>75% Grass cover, Good, HSG B
19,500	55	Woods, Good, HSG B
69,700	75	Weighted Average
39,500		56.67% Pervious Area
30,200		43.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	130	0.0100	1.13		Sheet Flow, Tc-3 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 4.18 cfs @ 12.02 hrs, Volume= 0.257 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
* 13,450	98	Paved surfaces & roof
14,147	61	>75% Grass cover, Good, HSG B
27,597	79	Weighted Average
14,147		51.26% Pervious Area
13,450		48.74% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	180	0.0500	2.29		Sheet Flow, Tc-5 Smooth surfaces n= 0.011 P2= 3.37"

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 6.60 cfs @ 12.06 hrs, Volume= 0.420 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
* 21,025	98	Pavement/Roofs, HSG B
22,990	61	>75% Grass cover, Good, HSG B
3,300	55	Woods, Good, HSG B
47,315	77	Weighted Average
26,290		55.56% Pervious Area
21,025		44.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	180	0.0500	0.76		Lag/CN Method, Tc-6

Summary for Subcatchment 7S: Drainage Area 7

Runoff = 2.47 cfs @ 12.02 hrs, Volume= 0.168 af, Depth> 6.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
* 12,295	98	Roof & Pavement
* 716	74	>75% Grass cover, Good, HSG B/D
13,011	97	Weighted Average
716		5.50% Pervious Area
12,295		94.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	175	0.0580	2.42		Sheet Flow, Tc-7 Smooth surfaces n= 0.011 P2= 3.37"

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Summary for Subcatchment 8S: Overland to Swales

Runoff = 2.26 cfs @ 12.13 hrs, Volume= 0.168 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.64"

Area (sf)	CN	Description
* 33,644	58	>75% Grass cover, Good, HSG B
33,644		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	130	0.1240	0.26		Sheet Flow, Tc=8 Grass: Dense n= 0.240 P2= 3.37"

Summary for Reach 3R: Riprap Swale

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 2.62" for 100-year event
Inflow = 2.26 cfs @ 12.13 hrs, Volume= 0.168 af
Outflow = 2.20 cfs @ 12.16 hrs, Volume= 0.168 af, Atten= 3%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.98 fps, Min. Travel Time= 1.2 min
Avg. Velocity= 1.04 fps, Avg. Travel Time= 3.4 min

Peak Storage= 159 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 48.58 cfs

4.00' x 1.00' deep channel, n= 0.045
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 210.0' Slope= 0.0952 '/'
Inlet Invert= 276.00', Outlet Invert= 256.00'



Summary for Reach 4R: Grass swale to basin

Inflow Area = 0.772 ac, 0.00% Impervious, Inflow Depth > 2.61" for 100-year event
Inflow = 2.20 cfs @ 12.16 hrs, Volume= 0.168 af
Outflow = 2.13 cfs @ 12.20 hrs, Volume= 0.167 af, Atten= 3%, Lag= 2.5 min

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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.68 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 3.6 min

Peak Storage= 165 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 42.41 cfs

4.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 205.0' Slope= 0.0439 '/'
Inlet Invert= 256.00', Outlet Invert= 247.00'



Summary for Reach 9R: Peak off Site

Inflow Area = 11.002 ac, 20.74% Impervious, Inflow Depth > 2.92" for 100-year event
Inflow = 29.81 cfs @ 12.35 hrs, Volume= 2.676 af
Outflow = 29.81 cfs @ 12.35 hrs, Volume= 2.676 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: CB_1-2

Inflow Area = 0.197 ac, 48.07% Impervious, Inflow Depth > 4.86" for 100-year event
Inflow = 1.04 cfs @ 12.13 hrs, Volume= 0.080 af
Outflow = 1.04 cfs @ 12.13 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.13 hrs, Volume= 0.080 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 311.98' @ 12.13 hrs
Flood Elev= 316.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.50'	15.0" Round Culvert L= 128.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 311.50' / 298.95' S= 0.0975 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.02 cfs @ 12.13 hrs HW=311.98' (Free Discharge)
↑ **1=Culvert** (Inlet Controls 1.02 cfs @ 2.36 fps)

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Summary for Pond 2P: CB_3-4

Inflow Area = 0.503 ac, 50.95% Impervious, Inflow Depth > 5.41" for 100-year event
Inflow = 2.91 cfs @ 12.03 hrs, Volume= 0.227 af
Outflow = 2.91 cfs @ 12.03 hrs, Volume= 0.227 af, Atten= 0%, Lag= 0.0 min
Primary = 2.91 cfs @ 12.03 hrs, Volume= 0.227 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 299.72' @ 12.03 hrs
Flood Elev= 303.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.85'	15.0" Round Culvert L= 131.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 298.85' / 286.60' S= 0.0934 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.85 cfs @ 12.03 hrs HW=299.71' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.85 cfs @ 3.16 fps)

Summary for Pond 3P: CB_5-6

Inflow Area = 1.070 ac, 42.21% Impervious, Inflow Depth > 4.83" for 100-year event
Inflow = 5.66 cfs @ 12.06 hrs, Volume= 0.431 af
Outflow = 5.66 cfs @ 12.06 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 5.66 cfs @ 12.06 hrs, Volume= 0.431 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 288.04' @ 12.06 hrs
Flood Elev= 291.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	286.50'	15.0" Round Culvert L= 168.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 286.50' / 272.60' S= 0.0823 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.55 cfs @ 12.06 hrs HW=288.01' (Free Discharge)
↑**1=Culvert** (Inlet Controls 5.55 cfs @ 4.52 fps)

Summary for Pond 4P: CB_7-8

Inflow Area = 2.671 ac, 42.88% Impervious, Inflow Depth > 4.59" for 100-year event
Inflow = 15.18 cfs @ 12.04 hrs, Volume= 1.021 af
Outflow = 15.18 cfs @ 12.04 hrs, Volume= 1.021 af, Atten= 0%, Lag= 0.0 min
Primary = 15.18 cfs @ 12.04 hrs, Volume= 1.021 af

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

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Peak Elev= 279.71' @ 12.04 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	15.0" Round Culvert L= 128.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 263.70' S= 0.0686 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=14.86 cfs @ 12.04 hrs HW=279.45' (Free Discharge)
↑**1=Culvert** (Inlet Controls 14.86 cfs @ 12.11 fps)

Summary for Pond 5P: CB-9

Inflow Area = 3.304 ac, 44.00% Impervious, Inflow Depth > 4.64" for 100-year event
Inflow = 19.22 cfs @ 12.04 hrs, Volume= 1.278 af
Outflow = 19.22 cfs @ 12.04 hrs, Volume= 1.278 af, Atten= 0%, Lag= 0.0 min
Primary = 19.22 cfs @ 12.04 hrs, Volume= 1.278 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 274.76' @ 12.04 hrs
Flood Elev= 267.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	263.60'	15.0" Round Culvert L= 100.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 263.60' / 253.10' S= 0.1044 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=18.65 cfs @ 12.04 hrs HW=274.19' (Free Discharge)
↑**1=Culvert** (Inlet Controls 18.65 cfs @ 15.20 fps)

Summary for Pond 6P: CB_10-11

Inflow Area = 4.390 ac, 44.11% Impervious, Inflow Depth > 4.64" for 100-year event
Inflow = 25.64 cfs @ 12.04 hrs, Volume= 1.698 af
Outflow = 25.64 cfs @ 12.04 hrs, Volume= 1.698 af, Atten= 0%, Lag= 0.0 min
Primary = 25.64 cfs @ 12.04 hrs, Volume= 1.698 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 262.82' @ 12.04 hrs
Flood Elev= 259.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	18.0" Round Culvert L= 172.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 253.00' / 245.10' S= 0.0459 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=25.20 cfs @ 12.04 hrs HW=262.52' (Free Discharge)

↑**1=Culvert** (Inlet Controls 25.20 cfs @ 14.26 fps)

Summary for Pond 7P: CB_12-13

Inflow Area = 4.689 ac, 47.32% Impervious, Inflow Depth > 4.78" for 100-year event
Inflow = 27.94 cfs @ 12.04 hrs, Volume= 1.866 af
Outflow = 27.94 cfs @ 12.04 hrs, Volume= 1.866 af, Atten= 0%, Lag= 0.0 min
Primary = 27.94 cfs @ 12.04 hrs, Volume= 1.866 af

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

Peak Elev= 256.51' @ 12.04 hrs

Flood Elev= 249.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	245.00'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 245.00' / 244.00' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=27.31 cfs @ 12.04 hrs HW=256.05' (Free Discharge)

↑**1=Culvert** (Inlet Controls 27.31 cfs @ 15.45 fps)

Summary for Pond 10P: Stormwater Basin

Inflow Area = 5.461 ac, 40.63% Impervious, Inflow Depth > 4.47" for 100-year event
Inflow = 28.85 cfs @ 12.04 hrs, Volume= 2.034 af
Outflow = 17.90 cfs @ 12.25 hrs, Volume= 1.934 af, Atten= 38%, Lag= 12.5 min
Discarded = 1.09 cfs @ 12.25 hrs, Volume= 0.781 af
Primary = 10.57 cfs @ 12.25 hrs, Volume= 1.114 af
Secondary = 6.24 cfs @ 12.25 hrs, Volume= 0.039 af

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

Peak Elev= 247.26' @ 12.25 hrs Surf.Area= 10,450 sf Storage= 29,538 cf

Plug-Flow detention time= 73.8 min calculated for 1.934 af (95% of inflow)

Center-of-Mass det. time= 55.4 min (830.8 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1	242.50'	29,538 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.50	6,754	0	0
244.00	8,051	11,104	11,104
245.00	9,184	8,618	19,721
246.00	10,450	9,817	29,538

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Device	Routing	Invert	Outlet Devices
#1	Primary	242.50'	15.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 242.50' / 242.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	243.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	243.50'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	244.00'	10.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	246.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Secondary	247.00'	18.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#7	Discarded	242.50'	4.500 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.09 cfs @ 12.25 hrs HW=247.26' (Free Discharge)

↑ **7=Exfiltration** (Exfiltration Controls 1.09 cfs)

Primary OutFlow Max=10.57 cfs @ 12.25 hrs HW=247.26' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 10.57 cfs @ 8.61 fps)
↑ **2=Orifice/Grate** (Passes < 0.85 cfs potential flow)
↑ **3=Orifice/Grate** (Passes < 1.77 cfs potential flow)
↑ **4=Orifice/Grate** (Passes < 4.43 cfs potential flow)
↑ **5=Orifice/Grate** (Passes < 38.26 cfs potential flow)

Secondary OutFlow Max=6.23 cfs @ 12.25 hrs HW=247.26' (Free Discharge)

↑ **6=Broad-Crested Rectangular Weir** (Weir Controls 6.23 cfs @ 1.31 fps)

Summary for Link 1L: Wetlands Drainage

Inflow Area = 5.540 ac, 1.13% Impervious, Inflow Depth > 3.30" for 100-year event
Inflow = 16.37 cfs @ 12.37 hrs, Volume= 1.524 af
Primary = 16.37 cfs @ 12.37 hrs, Volume= 1.524 af, Atten= 0%, Lag= 0.0 min

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

100-year Outflow Imported from Proposed Wetlands Drainage~Reach 2R.hce

SUPPORTING DOCUMENTATION

NOAA Point Precipitation Estimates Web Soil Survey



NOAA Atlas 14, Volume 10, Version 3
Location name: Brooklyn, Connecticut, USA*
Latitude: 41.7827°, Longitude: -71.9363°
Elevation: 329.49 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.337 (0.256-0.442)	0.400 (0.304-0.525)	0.503 (0.381-0.662)	0.587 (0.443-0.777)	0.704 (0.515-0.965)	0.793 (0.569-1.11)	0.884 (0.618-1.27)	0.982 (0.658-1.45)	1.12 (0.723-1.70)	1.23 (0.775-1.89)
10-min	0.477 (0.363-0.626)	0.566 (0.430-0.743)	0.711 (0.539-0.937)	0.831 (0.627-1.10)	0.997 (0.730-1.37)	1.12 (0.807-1.57)	1.25 (0.876-1.80)	1.39 (0.932-2.05)	1.58 (1.02-2.40)	1.74 (1.10-2.68)
15-min	0.562 (0.427-0.737)	0.666 (0.506-0.875)	0.836 (0.634-1.10)	0.978 (0.738-1.30)	1.17 (0.859-1.61)	1.32 (0.949-1.84)	1.47 (1.03-2.12)	1.64 (1.10-2.41)	1.86 (1.21-2.83)	2.04 (1.29-3.15)
30-min	0.775 (0.590-1.02)	0.919 (0.699-1.21)	1.16 (0.875-1.52)	1.35 (1.02-1.79)	1.62 (1.19-2.22)	1.82 (1.31-2.54)	2.03 (1.42-2.92)	2.26 (1.51-3.33)	2.57 (1.66-3.90)	2.82 (1.78-4.35)
60-min	0.988 (0.752-1.30)	1.17 (0.891-1.54)	1.47 (1.12-1.94)	1.72 (1.30-2.28)	2.07 (1.51-2.83)	2.33 (1.67-3.25)	2.59 (1.81-3.73)	2.88 (1.93-4.24)	3.28 (2.12-4.97)	3.59 (2.28-5.55)
2-hr	1.26 (0.966-1.65)	1.50 (1.15-1.96)	1.89 (1.44-2.47)	2.21 (1.67-2.91)	2.65 (1.95-3.62)	2.98 (2.15-4.15)	3.32 (2.35-4.78)	3.72 (2.49-5.44)	4.28 (2.78-6.45)	4.74 (3.01-7.28)
3-hr	1.46 (1.12-1.90)	1.73 (1.33-2.26)	2.18 (1.66-2.85)	2.55 (1.93-3.35)	3.06 (2.26-4.17)	3.44 (2.50-4.78)	3.84 (2.72-5.52)	4.31 (2.90-6.28)	4.99 (3.24-7.49)	5.55 (3.53-8.49)
6-hr	1.87 (1.44-2.42)	2.22 (1.70-2.88)	2.79 (2.13-3.63)	3.26 (2.49-4.26)	3.91 (2.90-5.32)	4.40 (3.21-6.10)	4.92 (3.51-7.05)	5.53 (3.73-8.02)	6.43 (4.19-9.60)	7.19 (4.58-10.9)
12-hr	2.36 (1.82-3.05)	2.81 (2.17-3.63)	3.53 (2.72-4.58)	4.14 (3.17-5.39)	4.97 (3.70-6.72)	5.59 (4.09-7.71)	6.25 (4.47-8.91)	7.03 (4.76-10.1)	8.17 (5.34-12.1)	9.14 (5.85-13.8)
24-hr	2.82 (2.19-3.62)	3.37 (2.61-4.34)	4.28 (3.30-5.52)	5.03 (3.87-6.52)	6.06 (4.54-8.16)	6.84 (5.03-9.38)	7.66 (5.50-10.9)	8.62 (5.86-12.4)	10.1 (6.59-14.8)	11.3 (7.22-16.9)
2-day	3.17 (2.47-4.06)	3.84 (2.99-4.92)	4.92 (3.82-6.33)	5.83 (4.50-7.52)	7.07 (5.31-9.48)	7.99 (5.90-10.9)	8.98 (6.48-12.7)	10.2 (6.92-14.5)	11.9 (7.83-17.4)	13.4 (8.62-19.9)
3-day	3.44 (2.68-4.39)	4.16 (3.25-5.32)	5.35 (4.16-6.85)	6.33 (4.90-8.14)	7.68 (5.79-10.3)	8.69 (6.44-11.8)	9.77 (7.08-13.8)	11.1 (7.55-15.7)	13.0 (8.58-19.0)	14.7 (9.48-21.8)
4-day	3.67 (2.88-4.68)	4.45 (3.47-5.67)	5.71 (4.45-7.30)	6.75 (5.23-8.67)	8.19 (6.18-10.9)	9.25 (6.87-12.6)	10.4 (7.56-14.7)	11.8 (8.06-16.7)	13.9 (9.17-20.2)	15.7 (10.1-23.2)
7-day	4.34	5.21	6.63	7.81	9.43	10.6	11.9	13.5	15.9	18.0

	(3.41-5.52)	(4.09-6.62)	(5.19-8.45)	(6.08-9.99)	(7.15-12.5)	(7.92-14.4)	(8.70-16.7)	(9.26-19.0)	(10.5-23.0)	(11.6-26.4)
10-day	5.02 (3.95-6.36)	5.95 (4.68-7.54)	7.46 (5.84-9.48)	8.71 (6.79-11.1)	10.4 (7.92-13.8)	11.7 (8.74-15.8)	13.1 (9.54-18.3)	14.7 (10.1-20.7)	17.2 (11.4-24.8)	19.3 (12.5-28.3)
20-day	7.17 (5.67-9.05)	8.16 (6.45-10.3)	9.78 (7.70-12.4)	11.1 (8.71-14.1)	13.0 (9.85-17.0)	14.4 (10.7-19.1)	15.8 (11.4-21.6)	17.4 (12.0-24.2)	19.6 (13.0-28.0)	21.3 (13.9-31.0)
30-day	8.99 (7.12-11.3)	10.0 (7.92-12.6)	11.7 (9.20-14.7)	13.0 (10.2-16.5)	14.9 (11.3-19.4)	16.4 (12.2-21.6)	17.8 (12.8-24.1)	19.3 (13.4-26.8)	21.2 (14.2-30.2)	22.6 (14.7-32.8)
45-day	11.2 (8.93-14.1)	12.3 (9.74-15.4)	14.0 (11.1-17.6)	15.4 (12.1-19.5)	17.3 (13.2-22.4)	18.9 (14.0-24.7)	20.3 (14.6-27.1)	21.7 (15.1-29.9)	23.3 (15.6-33.0)	24.3 (15.9-35.1)
60-day	13.1 (10.4-16.4)	14.2 (11.3-17.8)	15.9 (12.6-20.0)	17.4 (13.7-21.9)	19.4 (14.7-24.9)	21.0 (15.6-27.3)	22.4 (16.1-29.8)	23.7 (16.5-32.6)	25.1 (16.9-35.5)	26.0 (17.0-37.4)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

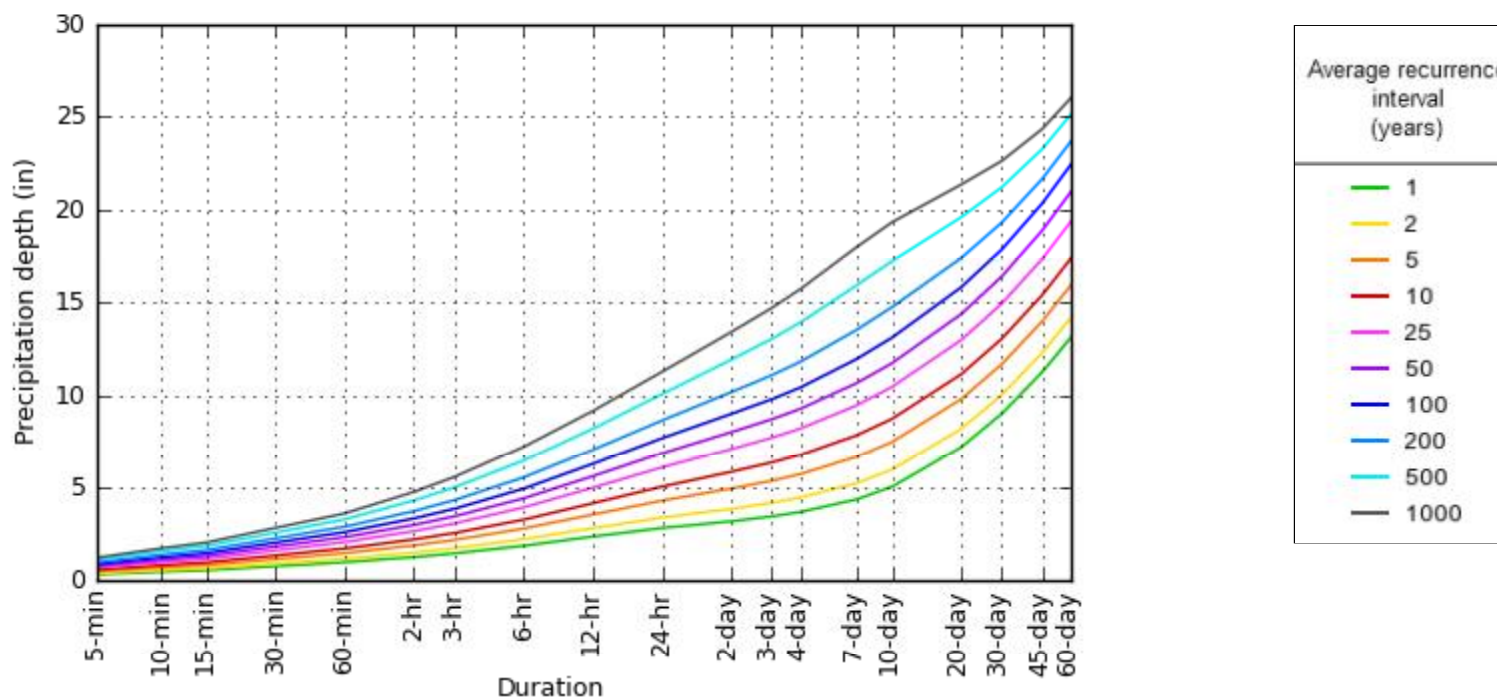
Please refer to NOAA Atlas 14 document for more information.

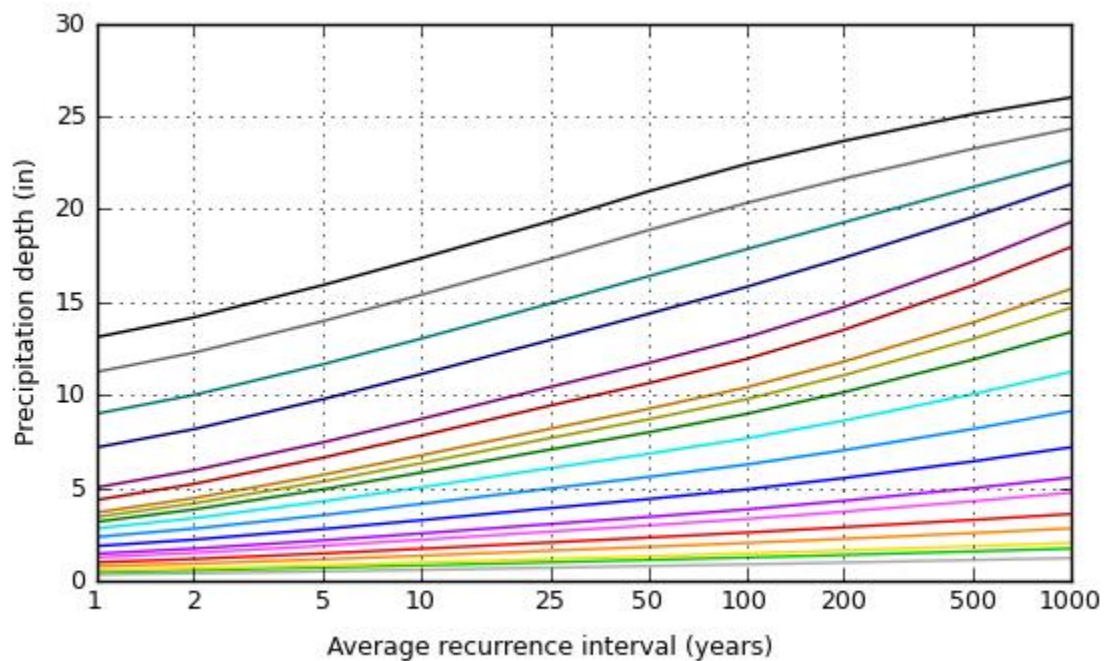
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PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.7827°, Longitude: -71.9363°





Duration	
5-min	2-day
10-min	3-day
15-min	4-day
30-min	7-day
60-min	10-day
2-hr	20-day
3-hr	30-day
6-hr	45-day
12-hr	60-day
24-hr	

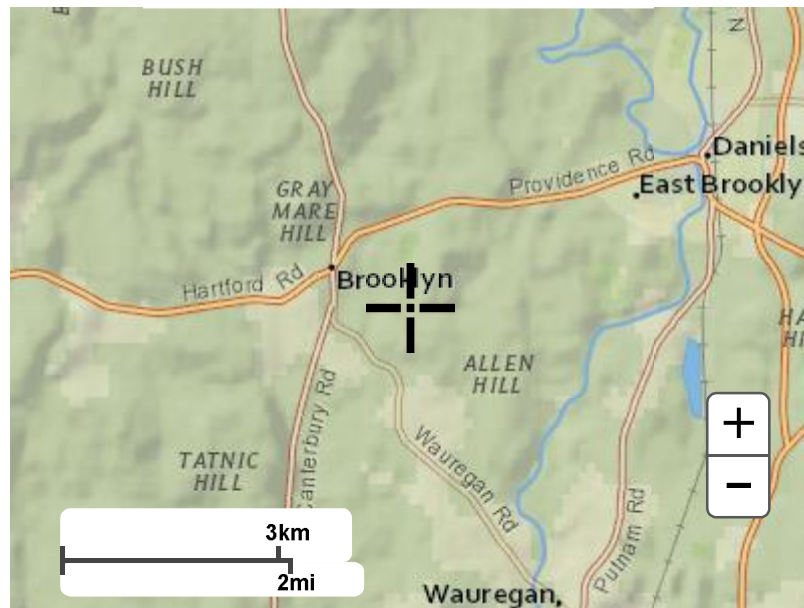
NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Tue Dec 8 14:02:09 2020

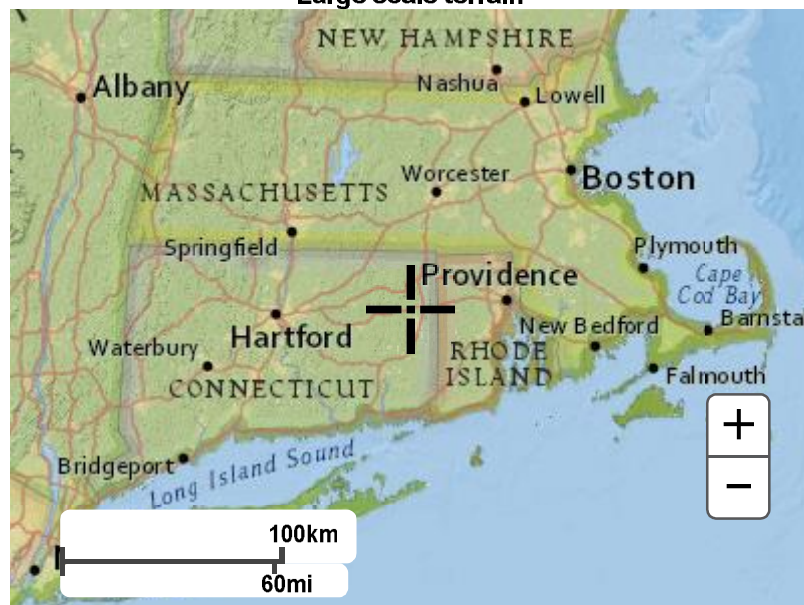
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Maps & aeriels

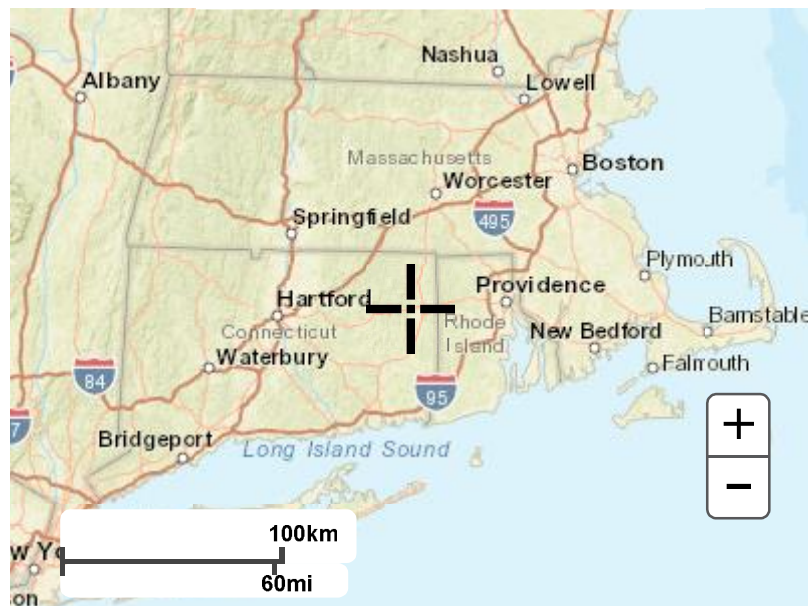
Small scale terrain



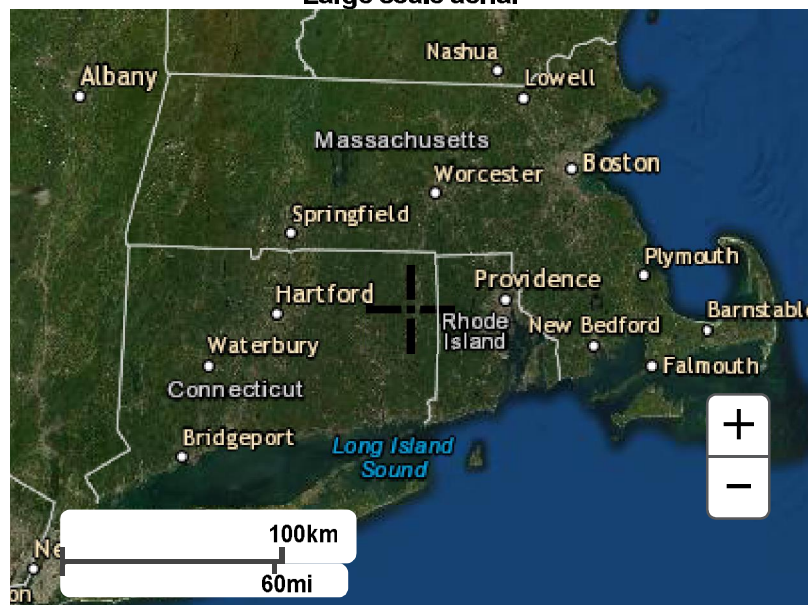
Large scale terrain



Large scale map



Large scale aerial

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[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov


[Disclaimer](#)

Hydrologic Soil Group—State of Connecticut (Louise Berry Drive)



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines


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

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: State of Connecticut

Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Apr 14, 2011—Aug 27, 2016

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	3.1	27.8%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	0.0	0.4%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	4.7	42.9%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	2.9	26.0%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	B	0.1	0.7%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	C	0.2	2.2%
Totals for Area of Interest			11.0	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

DRAINAGE AREA PLANS

LEGEND

- IRON PIN TO BE SET
- IRON PIN FOUND
- DH DRILL HOLE FOUND
- UTILITY POLE
- CB CATCH BASIN
- SMH SANITARY MANHOLE
- 260--- EXISTING CONTOURS
- INLAND WETLANDS FLAG
- ○ ○ ○ ○ STONE WALL
- ○ ○ ○ ○ STONE WALL REMAINS

n/f
Pierce Baptist Home, Inc.
Map 19, Block 24, Lot 148

SEWER EASEMENT IN FAVOR OF
THE TOWN OF BROOKLYN
VOL. 617, PG. 278

ACCESS RIGHT OF WAY
OVER LANEWAY IN FAVOR OF
THE TOWN OF BROOKLYN
VOL. 31, PG. 130

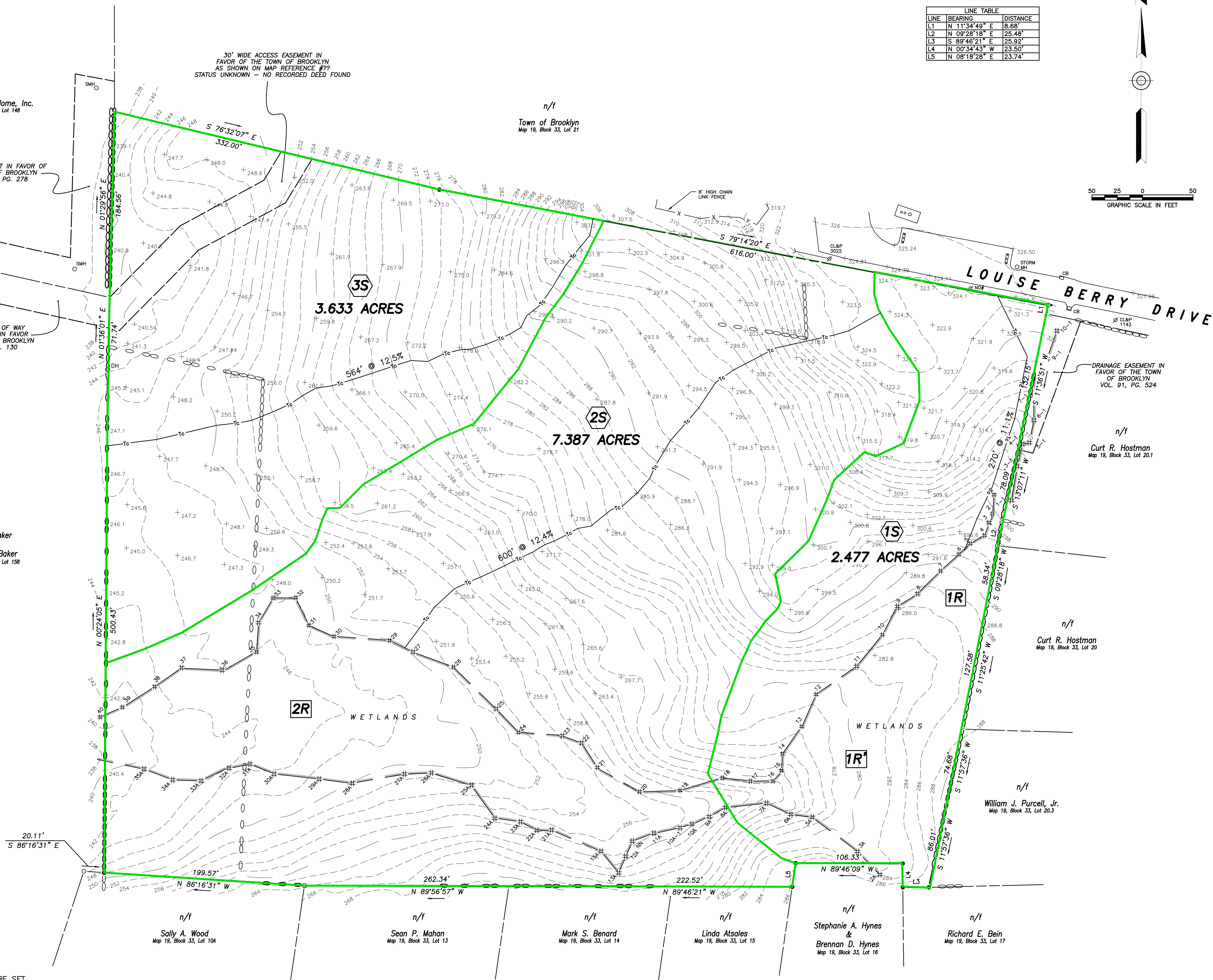
n/f
Carl R. Baker
&
Darlene A. Baker
Map 19, Block 24, Lot 158

30' WIDE ACCESS EASEMENT IN
FAVOR OF THE TOWN OF BROOKLYN
AS SHOWN ON MAP REFERENCE #??
STATUS UNKNOWN - NO RECORDED DEED FOUND

n/f
Town of Brooklyn
Map 19, Block 33, Lot 21

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 11°34'49" E	8.88'
L2	N 09°28'18" E	25.48'
L3	S 89°46'21" E	25.92'
L4	N 00°34'43" W	23.50'
L5	N 08°18'28" E	23.74'

50 25 0 50
GRAPHIC SCALE IN FEET



DATE	DESCRIPTION
08/24/2020	PER TOWN REVIEW
DATE	DESCRIPTION
	REVISIONS

EXISTING DRAINAGE AREAS

PREPARED FOR

SHANE POLLOCK

LOUISE BERRY DRIVE
BROOKLYN, CONNECTICUT



Killingly Engineering Associates
Civil Engineering & Surveying

114 Westcott Road
P.O. Box 421
Killingly, Connecticut 06241
(860) 779-7299
www.killinglyengineering.com

DATE: 4/23/2020	DRAWN: NET
SCALE: 1" = 50'	DESIGN: NET
SHEET: 1 OF 2	CHK BY: ---
DWG. No: CLIENT FILE	JOB No: 20014

K:\2014\Drawings\1_P_DRAINAGE.dwg Dec 08, 2020 9:28 AM



DATE	DESCRIPTION
	REVISIONS

PROPOSED DRAINAGE AREAS

PREPARED FOR

SHANE POLLOCK

LOUISE BERRY DRIVE
BROOKLYN, CONNECTICUT

Killingly Engineering Associates
Civil Engineering & Surveying

114 Westcott Road
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Killingly, Connecticut 06241
(860) 779-7299
www.killinglyengineering.com

DATE: 4/23/2020	DRAWN: DNE
SCALE: 1" = 40'	DESIGN: NET
SHEET: 5 OF 9	CHK BY: ---
DWG. No: CLIENT FILE	JOB No: 20014

NORMAND E. THIBEAULT, JR., P.E. LIC #PEN 0022834	DATE
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