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September 26, 2013

Mr. Daniel Courtemanch
MeDEP
17 State House Station
Augusta, Maine 04333-0017

**Subject: Bingham Wind Project
Updated Rainfall Tables for O&M and
Substation Pre and Post Development Runoff Calculations**

Dear Mr. Courtemanch:

Pursuant to the discussion with Art McGlaulin, we have updated the pre and post development runoff calculations for the O&M Building and the Substation/DRD area based on the “Natural Resources Conservation Service – State of Maine – County Rainfall Data 24 Hour and Annual”, dated January 13, 2005. The original calculations were based on guidance from Volume III of the BMP Manual, Chapter 2, Table 2-1. Supporting calculations are attached and are based upon Somerset County South, Type II-24 Hour Distribution. Shown below is a tabular summary of the 2, 10, and 25 year peak runoff values:

Substation DRD Area						
	Pre Development			Post Development		
	2 Year (cfs)	10 Year (cfs)	25 Year (cfs)	2 Year (cfs)	10 Year (cfs)	25 Year (cfs)
POI #1	3.23	11.02	15.01	2.02	8.46	11.87
POI #2	3.60	10.63	14.15	3.28	10.37	13.95

O&M Building Area						
	Pre Development			Post Development		
	2 Year (cfs)	10 Year (cfs)	25 Year (cfs)	2 Year (cfs)	10 Year (cfs)	25 Year (cfs)
POI #1	0.00	0.00	0.00	0.00	0.04*	0.12*
POI #2	0.00	0.01	0.04	0.00	0.02*	0.07*

*Please note that post development runoff calculations show insignificant increases in runoff for POI's 1 and 2 in the 10 year and 25 year events.

The wet pond stage elevations for the previous analysis and updated analysis are shown below:

Wet Pond 1 Peak Elevations					
Previous Analysis			Updated Analysis		
2 Year (ft)	10 Year (ft)	25 Year (ft)	2 Year (ft)	10 Year (ft)	25 Year (ft)
1510.00	1510.76	1511.10	1510.13	1510.97	1511.31

Mrs. Daniel Courtemanch
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As shown above, there is a modest increase in the stage elevations but the peak elevations are still within acceptable operating ranges.

Also attached are calculations showing the 100 year storm conveyed independently by the emergency spillway.

If you have any questions regarding these materials, please contact our office.

Sincerely,

FAY, SPOFFORD & THORNDIKE

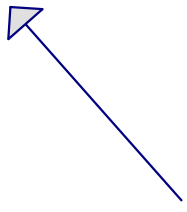


Steven J. Blake, P.E.
Project Engineer

Enc: Pre and Post Development Runoff Calculations (HydroCAD) for O&M and Substation Areas
100 Year Storm Calculation with Plugged Outlet Control Structure in Wet Pond 1

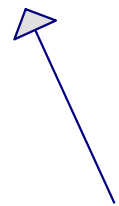
c: Art McGlaufflin, MeDEP
Josh Bagnato, First Wind
Dale Knapp, Stantec

POI 1

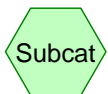


1S

POI 2



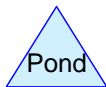
2S



Subcat



Reach



Pond



Link

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.022	30	Woods, Good, HSG A (1S,2S)
0.183	76	Gravel roads, HSG A (2S)
0.085	98	Paved parking & roofs (1S,2S)
3.289		TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
3.204	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.085	Other	1S, 2S
3.289		TOTAL AREA

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 1S:

Runoff Area=103,324 sf 2.59% Impervious Runoff Depth=0.00"
Flow Length=367' Tc=21.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment 2S:

Runoff Area=39,949 sf 2.56% Impervious Runoff Depth=0.00"
Flow Length=197' Tc=11.2 min CN=41 Runoff=0.00 cfs 0.000 af

Reach POI 1:

Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach POI 2:

Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
97.42% Pervious = 3.204 ac 2.58% Impervious = 0.085 ac

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Subcatchment 1S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
2,678	98	Paved parking & roofs
100,646	30	Woods, Good, HSG A
103,324	32	Weighted Average
100,646		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	150	0.1070	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	217	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
21.5	367	Total			

Summary for Subcatchment 2S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
7,950	76	Gravel roads, HSG A
30,975	30	Woods, Good, HSG A
39,949	41	Weighted Average
38,925		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	85	0.1290	0.14		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
0.2	21	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.9	91	0.1090	1.65		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
11.2	197	Total			

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Reach POI 1:

Inflow Area = 2.372 ac, 2.59% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach POI 2:

Inflow Area = 0.917 ac, 2.56% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 1S:

Runoff Area=103,324 sf 2.59% Impervious Runoff Depth=0.00"
Flow Length=367' Tc=21.5 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment 2S:

Runoff Area=39,949 sf 2.56% Impervious Runoff Depth>0.09"
Flow Length=197' Tc=11.2 min CN=41 Runoff=0.01 cfs 0.007 af

Reach POI 1:

Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach POI 2:

Inflow=0.01 cfs 0.007 af
Outflow=0.01 cfs 0.007 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.007 af Average Runoff Depth = 0.03"
97.42% Pervious = 3.204 ac 2.58% Impervious = 0.085 ac

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Subcatchment 1S:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
2,678	98	Paved parking & roofs
100,646	30	Woods, Good, HSG A
103,324	32	Weighted Average
100,646		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	150	0.1070	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	217	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
21.5	367	Total			

Summary for Subcatchment 2S:

Runoff = 0.01 cfs @ 13.53 hrs, Volume= 0.007 af, Depth> 0.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
7,950	76	Gravel roads, HSG A
30,975	30	Woods, Good, HSG A
39,949	41	Weighted Average
38,925		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	85	0.1290	0.14		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
0.2	21	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.9	91	0.1090	1.65		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
11.2	197	Total			

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Reach POI 1:

Inflow Area = 2.372 ac, 2.59% Impervious, Inflow Depth = 0.00" for 10 YEAR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach POI 2:

Inflow Area = 0.917 ac, 2.56% Impervious, Inflow Depth > 0.09" for 10 YEAR event
Inflow = 0.01 cfs @ 13.53 hrs, Volume= 0.007 af
Outflow = 0.01 cfs @ 13.53 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 1S:

Runoff Area=103,324 sf 2.59% Impervious Runoff Depth>0.01"
Flow Length=367' Tc=21.5 min CN=32 Runoff=0.00 cfs 0.002 af

Subcatchment 2S:

Runoff Area=39,949 sf 2.56% Impervious Runoff Depth>0.20"
Flow Length=197' Tc=11.2 min CN=41 Runoff=0.04 cfs 0.016 af

Reach POI 1:

Inflow=0.00 cfs 0.002 af
Outflow=0.00 cfs 0.002 af

Reach POI 2:

Inflow=0.04 cfs 0.016 af
Outflow=0.04 cfs 0.016 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.017 af Average Runoff Depth = 0.06"
97.42% Pervious = 3.204 ac 2.58% Impervious = 0.085 ac

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Subcatchment 1S:

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.002 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
2,678	98	Paved parking & roofs
100,646	30	Woods, Good, HSG A
103,324	32	Weighted Average
100,646		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	150	0.1070	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	217	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
21.5	367	Total			

Summary for Subcatchment 2S:

Runoff = 0.04 cfs @ 12.40 hrs, Volume= 0.016 af, Depth> 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
1,024	98	Paved parking & roofs
7,950	76	Gravel roads, HSG A
30,975	30	Woods, Good, HSG A
39,949	41	Weighted Average
38,925		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	85	0.1290	0.14		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
0.2	21	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.9	91	0.1090	1.65		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
11.2	197	Total			

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Reach POI 1:

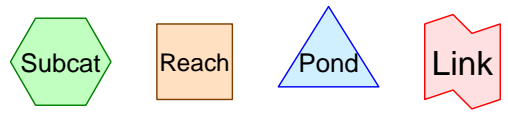
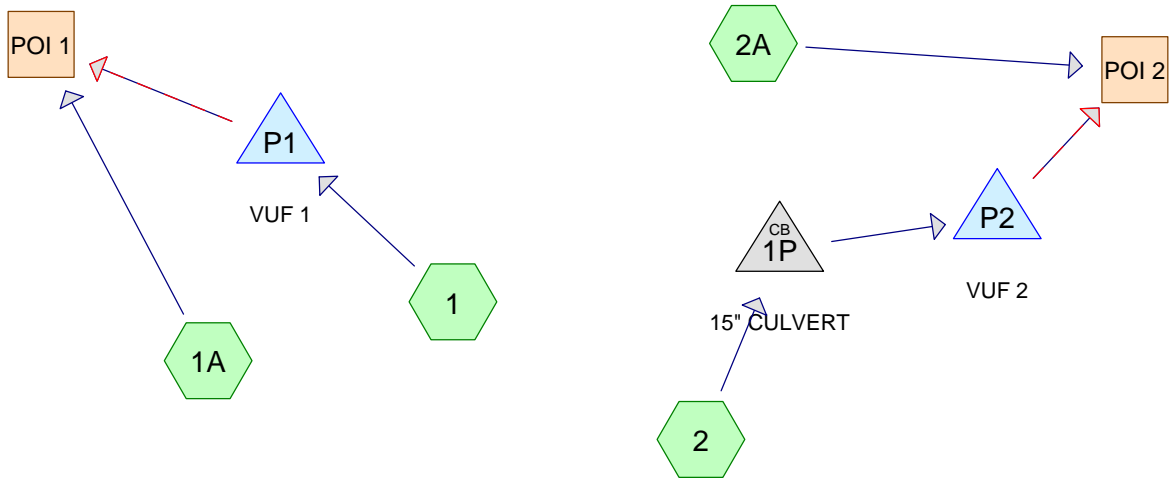
Inflow Area = 2.372 ac, 2.59% Impervious, Inflow Depth > 0.01" for 25 YEAR event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.002 af
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach POI 2:

Inflow Area = 0.917 ac, 2.56% Impervious, Inflow Depth > 0.20" for 25 YEAR event
Inflow = 0.04 cfs @ 12.40 hrs, Volume= 0.016 af
Outflow = 0.04 cfs @ 12.40 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs



Drainage Diagram for 3048 OM BLDG POST
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.177	30	Woods, Good, HSG A (1A)
1.189	39	>75% Grass cover, Good, HSG A (1,1A,2,2A)
0.703	76	Gravel roads, HSG A (1,2)
0.220	98	Paved parking & roofs (1,1A,2A)
3.289		TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
3.069	HSG A	1, 1A, 2, 2A
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.220	Other	1, 1A, 2A
3.289		TOTAL AREA

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Type II 24-hr 2 YEAR Rainfall=2.70"

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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 1: Runoff Area=36,768 sf 15.99% Impervious Runoff Depth>0.42"
Flow Length=177' Slope=0.0200 '/ Tc=2.4 min CN=68 Runoff=0.72 cfs 0.029 af

Subcatchment 1A: Runoff Area=66,557 sf 4.02% Impervious Runoff Depth=0.00"
Flow Length=387' Tc=20.7 min CN=34 Runoff=0.00 cfs 0.000 af

Pond 1P: 15" CULVERT Peak Elev=1,315.05' Inflow=0.01 cfs 0.004 af
15.0" x 81.0' Culvert Outflow=0.01 cfs 0.004 af

Subcatchment 2: Runoff Area=29,801 sf 0.00% Impervious Runoff Depth>0.07"
Flow Length=107' Tc=4.0 min CN=53 Runoff=0.01 cfs 0.004 af

Subcatchment 2A: Runoff Area=10,148 sf 10.09% Impervious Runoff Depth>0.00"
Flow Length=174' Tc=2.6 min CN=45 Runoff=0.00 cfs 0.000 af

Pond P1: VUF 1 Peak Elev=1,317.76' Storage=1,282 cf Inflow=0.72 cfs 0.029 af
Outflow=0.00 cfs 0.000 af

Pond P2: VUF 2 Peak Elev=1,312.12' Storage=162 cf Inflow=0.01 cfs 0.004 af
Outflow=0.00 cfs 0.000 af

Reach POI 1: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach POI 2: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.033 af Average Runoff Depth = 0.12"
93.31% Pervious = 3.069 ac 6.69% Impervious = 0.220 ac

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Subcatchment 1:

Runoff = 0.72 cfs @ 11.94 hrs, Volume= 0.029 af, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
5,880	98	Paved parking & roofs
19,652	76	Gravel roads, HSG A
11,236	39	>75% Grass cover, Good, HSG A
36,768	68	Weighted Average
30,888		Pervious Area
5,880		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
0.5	27	0.0200	0.99		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
2.4	177	Total			

Summary for Subcatchment 1A:

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
12,600	39	>75% Grass cover, Good, HSG A
2,678	98	Paved parking & roofs
51,279	30	Woods, Good, HSG A
66,557	34	Weighted Average
63,879		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.1200	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	237	0.0170	0.91		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
20.7	387	Total			

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Pond 1P: 15" CULVERT

Inflow Area = 0.684 ac, 0.00% Impervious, Inflow Depth > 0.07" for 2 YEAR event
 Inflow = 0.01 cfs @ 12.41 hrs, Volume= 0.004 af
 Outflow = 0.01 cfs @ 12.41 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.01 cfs @ 12.41 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.05' @ 12.41 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,315.00'	15.0" x 81.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,312.00' S= 0.0370 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.01 cfs @ 12.41 hrs HW=1,315.05' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.01 cfs @ 0.57 fps)

Summary for Subcatchment 2:

Runoff = 0.01 cfs @ 12.41 hrs, Volume= 0.004 af, Depth> 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
10,962	76	Gravel roads, HSG A
18,839	39	>75% Grass cover, Good, HSG A
29,801	53	Weighted Average
29,801		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	74	0.1600	0.33		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.50"
0.2	33	0.2000	3.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
4.0	107	Total			

Summary for Subcatchment 2A:

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2 YEAR Rainfall=2.70"

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Area (sf)	CN	Description
1,024	98	Paved parking & roofs
9,124	39	>75% Grass cover, Good, HSG A
10,148	45	Weighted Average
9,124		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	29	0.0200	0.95		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
2.1	145	0.0550	1.17		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
2.6	174	Total			

Summary for Pond P1: VUF 1

Inflow Area = 0.844 ac, 15.99% Impervious, Inflow Depth > 0.42" for 2 YEAR event
 Inflow = 0.72 cfs @ 11.94 hrs, Volume= 0.029 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 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= 1,317.76' @ 20.00 hrs Surf.Area= 1,997 sf Storage= 1,282 cf

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

Volume #1	Invert	Avail.Storage	Storage Description
	1,317.00'	7,927 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,317.00	1,414	255.0	0	0	1,414
1,318.00	2,208	274.0	1,796	1,796	2,256
1,319.00	3,063	293.0	2,624	4,420	3,159
1,320.00	3,971	312.0	3,507	7,927	4,123

Device #1	Routing	Invert	Outlet Devices
	Primary	1,318.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,317.00' (Free Discharge)
 ↳1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Pond P2: VUF 2

Inflow Area = 0.684 ac, 0.00% Impervious, Inflow Depth > 0.07" for 2 YEAR event
 Inflow = 0.01 cfs @ 12.41 hrs, Volume= 0.004 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 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= 1,312.12' @ 20.00 hrs Surf.Area= 1,386 sf Storage= 162 cf

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

Volume	Invert	Avail.Storage	Storage Description			
#1	1,312.00'	8,052 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,312.00	1,306	237.0	0	0	1,306	
1,313.00	2,046	256.0	1,662	1,662	2,091	
1,314.00	3,206	339.0	2,604	4,267	6,032	
1,315.00	4,396	370.0	3,785	8,052	7,817	

Device	Routing	Invert	Outlet Devices												
#1	Primary	1,313.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir												
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00												
			2.50 3.00 3.50 4.00 4.50 5.00 5.50												
			Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65												
			2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83												

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,312.00' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Reach POI 1:

Inflow Area = 2.372 ac, 8.28% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 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 Reach POI 2:

Inflow Area = 0.917 ac, 2.56% Impervious, Inflow Depth > 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

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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 1: Runoff Area=36,768 sf 15.99% Impervious Runoff Depth>1.14"
Flow Length=177' Slope=0.0200 '/' Tc=2.4 min CN=68 Runoff=2.09 cfs 0.080 af

Subcatchment 1A: Runoff Area=66,557 sf 4.02% Impervious Runoff Depth>0.00"
Flow Length=387' Tc=20.7 min CN=34 Runoff=0.00 cfs 0.000 af

Pond 1P: 15" CULVERT Peak Elev=1,315.35' Inflow=0.45 cfs 0.023 af
15.0" x 81.0' Culvert Outflow=0.45 cfs 0.023 af

Subcatchment 2: Runoff Area=29,801 sf 0.00% Impervious Runoff Depth>0.41"
Flow Length=107' Tc=4.0 min CN=53 Runoff=0.45 cfs 0.023 af

Subcatchment 2A: Runoff Area=10,148 sf 10.09% Impervious Runoff Depth>0.16"
Flow Length=174' Tc=2.6 min CN=45 Runoff=0.02 cfs 0.003 af

Pond P1: VUF 1 Peak Elev=1,318.51' Storage=3,029 cf Inflow=2.09 cfs 0.080 af
Outflow=0.04 cfs 0.011 af

Pond P2: VUF 2 Peak Elev=1,312.66' Storage=1,021 cf Inflow=0.45 cfs 0.023 af
Outflow=0.00 cfs 0.000 af

Reach POI 1: Inflow=0.04 cfs 0.011 af
Outflow=0.04 cfs 0.011 af

Reach POI 2: Inflow=0.02 cfs 0.003 af
Outflow=0.02 cfs 0.003 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.107 af Average Runoff Depth = 0.39"
93.31% Pervious = 3.069 ac 6.69% Impervious = 0.220 ac

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Subcatchment 1:

Runoff = 2.09 cfs @ 11.94 hrs, Volume= 0.080 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
5,880	98	Paved parking & roofs
19,652	76	Gravel roads, HSG A
11,236	39	>75% Grass cover, Good, HSG A
36,768	68	Weighted Average
30,888		Pervious Area
5,880		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
0.5	27	0.0200	0.99		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
2.4	177	Total			

Summary for Subcatchment 1A:

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
12,600	39	>75% Grass cover, Good, HSG A
2,678	98	Paved parking & roofs
51,279	30	Woods, Good, HSG A
66,557	34	Weighted Average
63,879		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.1200	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	237	0.0170	0.91		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
20.7	387	Total			

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Pond 1P: 15" CULVERT

Inflow Area = 0.684 ac, 0.00% Impervious, Inflow Depth > 0.41" for 10 YEAR event
 Inflow = 0.45 cfs @ 11.98 hrs, Volume= 0.023 af
 Outflow = 0.45 cfs @ 11.98 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.45 cfs @ 11.98 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.35' @ 11.98 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,315.00'	15.0" x 81.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,312.00' S= 0.0370 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.42 cfs @ 11.98 hrs HW=1,315.34' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.42 cfs @ 1.56 fps)

Summary for Subcatchment 2:

Runoff = 0.45 cfs @ 11.98 hrs, Volume= 0.023 af, Depth> 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
10,962	76	Gravel roads, HSG A
18,839	39	>75% Grass cover, Good, HSG A
29,801	53	Weighted Average
29,801		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	74	0.1600	0.33		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.50"
0.2	33	0.2000	3.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
4.0	107	Total			

Summary for Subcatchment 2A:

Runoff = 0.02 cfs @ 12.01 hrs, Volume= 0.003 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10 YEAR Rainfall=4.10"

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Area (sf)	CN	Description
1,024	98	Paved parking & roofs
9,124	39	>75% Grass cover, Good, HSG A
10,148	45	Weighted Average
9,124		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	29	0.0200	0.95		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
2.1	145	0.0550	1.17		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
2.6	174	Total			

Summary for Pond P1: VUF 1

Inflow Area = 0.844 ac, 15.99% Impervious, Inflow Depth > 1.14" for 10 YEAR event
 Inflow = 2.09 cfs @ 11.94 hrs, Volume= 0.080 af
 Outflow = 0.04 cfs @ 17.03 hrs, Volume= 0.011 af, Atten= 98%, Lag= 305.6 min
 Primary = 0.04 cfs @ 17.03 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,318.51' @ 17.03 hrs Surf.Area= 2,627 sf Storage= 3,029 cf

Plug-Flow detention time= 381.4 min calculated for 0.011 af (14% of inflow)
 Center-of-Mass det. time= 279.1 min (1,087.1 - 807.9)

Volume #1	Invert	Avail.Storage	Storage Description
	1,317.00'	7,927 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,317.00	1,414	255.0	0	0	1,414
1,318.00	2,208	274.0	1,796	1,796	2,256
1,319.00	3,063	293.0	2,624	4,420	3,159
1,320.00	3,971	312.0	3,507	7,927	4,123

Device #1	Routing	Invert	Outlet Devices
	Primary	1,318.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.03 cfs @ 17.03 hrs HW=1,318.51' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 0.03 cfs @ 0.24 fps)

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Pond P2: VUF 2

Inflow Area = 0.684 ac, 0.00% Impervious, Inflow Depth > 0.41" for 10 YEAR event
 Inflow = 0.45 cfs @ 11.98 hrs, Volume= 0.023 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 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= 1,312.66' @ 20.00 hrs Surf.Area= 1,779 sf Storage= 1,021 cf

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

Volume	Invert	Avail.Storage	Storage Description			
#1	1,312.00'	8,052 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,312.00	1,306	237.0	0	0	1,306	
1,313.00	2,046	256.0	1,662	1,662	2,091	
1,314.00	3,206	339.0	2,604	4,267	6,032	
1,315.00	4,396	370.0	3,785	8,052	7,817	

Device	Routing	Invert	Outlet Devices													
#1	Primary	1,313.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir													
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00													
			2.50 3.00 3.50 4.00 4.50 5.00 5.50													
			Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65													
			2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83													

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,312.00' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Reach POI 1:

Inflow Area = 2.372 ac, 8.28% Impervious, Inflow Depth > 0.06" for 10 YEAR event
 Inflow = 0.04 cfs @ 17.03 hrs, Volume= 0.011 af
 Outflow = 0.04 cfs @ 17.03 hrs, Volume= 0.011 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 Reach POI 2:

Inflow Area = 0.917 ac, 2.56% Impervious, Inflow Depth > 0.04" for 10 YEAR event
 Inflow = 0.02 cfs @ 12.01 hrs, Volume= 0.003 af
 Outflow = 0.02 cfs @ 12.01 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

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Type II 24-hr 10 YEAR Rainfall=4.10"

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

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Type II 24-hr 25 YEAR Rainfall=4.70"

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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 1: Runoff Area=36,768 sf 15.99% Impervious Runoff Depth>1.51"
Flow Length=177' Slope=0.0200 '/ Tc=2.4 min CN=68 Runoff=2.76 cfs 0.107 af

Subcatchment 1A: Runoff Area=66,557 sf 4.02% Impervious Runoff Depth>0.02"
Flow Length=387' Tc=20.7 min CN=34 Runoff=0.01 cfs 0.002 af

Pond 1P: 15" CULVERT Peak Elev=1,315.47' Inflow=0.79 cfs 0.036 af
15.0" x 81.0' Culvert Outflow=0.79 cfs 0.036 af

Subcatchment 2: Runoff Area=29,801 sf 0.00% Impervious Runoff Depth>0.63"
Flow Length=107' Tc=4.0 min CN=53 Runoff=0.79 cfs 0.036 af

Subcatchment 2A: Runoff Area=10,148 sf 10.09% Impervious Runoff Depth>0.29"
Flow Length=174' Tc=2.6 min CN=45 Runoff=0.07 cfs 0.006 af

Pond P1: VUF 1 Peak Elev=1,318.53' Storage=3,075 cf Inflow=2.76 cfs 0.107 af
Outflow=0.12 cfs 0.037 af

Pond P2: VUF 2 Peak Elev=1,312.95' Storage=1,562 cf Inflow=0.79 cfs 0.036 af
Outflow=0.00 cfs 0.000 af

Reach POI 1: Inflow=0.12 cfs 0.039 af
Outflow=0.12 cfs 0.039 af

Reach POI 2: Inflow=0.07 cfs 0.006 af
Outflow=0.07 cfs 0.006 af

Total Runoff Area = 3.289 ac Runoff Volume = 0.150 af Average Runoff Depth = 0.55"
93.31% Pervious = 3.069 ac 6.69% Impervious = 0.220 ac

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Subcatchment 1:

Runoff = 2.76 cfs @ 11.93 hrs, Volume= 0.107 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
5,880	98	Paved parking & roofs
19,652	76	Gravel roads, HSG A
11,236	39	>75% Grass cover, Good, HSG A
36,768	68	Weighted Average
30,888		Pervious Area
5,880		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
0.5	27	0.0200	0.99		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
2.4	177	Total			

Summary for Subcatchment 1A:

Runoff = 0.01 cfs @ 18.92 hrs, Volume= 0.002 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
12,600	39	>75% Grass cover, Good, HSG A
2,678	98	Paved parking & roofs
51,279	30	Woods, Good, HSG A
66,557	34	Weighted Average
63,879		Pervious Area
2,678		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.1200	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 2.50"
4.3	237	0.0170	0.91		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
20.7	387	Total			

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Pond 1P: 15" CULVERT

Inflow Area = 0.684 ac, 0.00% Impervious, Inflow Depth > 0.63" for 25 YEAR event
 Inflow = 0.79 cfs @ 11.97 hrs, Volume= 0.036 af
 Outflow = 0.79 cfs @ 11.97 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.79 cfs @ 11.97 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.47' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,315.00'	15.0" x 81.0' long Culvert CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 1,312.00' S= 0.0370 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.74 cfs @ 11.97 hrs HW=1,315.46' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 0.74 cfs @ 1.82 fps)

Summary for Subcatchment 2:

Runoff = 0.79 cfs @ 11.97 hrs, Volume= 0.036 af, Depth> 0.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
10,962	76	Gravel roads, HSG A
18,839	39	>75% Grass cover, Good, HSG A
29,801	53	Weighted Average
29,801		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	74	0.1600	0.33		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.50"
0.2	33	0.2000	3.13		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
4.0	107	Total			

Summary for Subcatchment 2A:

Runoff = 0.07 cfs @ 11.98 hrs, Volume= 0.006 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25 YEAR Rainfall=4.70"

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Area (sf)	CN	Description
1,024	98	Paved parking & roofs
9,124	39	>75% Grass cover, Good, HSG A
10,148	45	Weighted Average
9,124		Pervious Area
1,024		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	29	0.0200	0.95		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
2.1	145	0.0550	1.17		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
2.6	174	Total			

Summary for Pond P1: VUF 1

Inflow Area = 0.844 ac, 15.99% Impervious, Inflow Depth > 1.51" for 25 YEAR event
 Inflow = 2.76 cfs @ 11.93 hrs, Volume= 0.107 af
 Outflow = 0.12 cfs @ 13.52 hrs, Volume= 0.037 af, Atten= 96%, Lag= 95.4 min
 Primary = 0.12 cfs @ 13.52 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,318.53' @ 13.52 hrs Surf.Area= 2,642 sf Storage= 3,075 cf

Plug-Flow detention time= 246.4 min calculated for 0.037 af (35% of inflow)
 Center-of-Mass det. time= 153.5 min (955.4 - 801.9)

Volume #1	Invert	Avail.Storage	Storage Description
1,317.00'		7,927 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,317.00	1,414	255.0	0	0	1,414
1,318.00	2,208	274.0	1,796	1,796	2,256
1,319.00	3,063	293.0	2,624	4,420	3,159
1,320.00	3,971	312.0	3,507	7,927	4,123

Device #1	Routing	Invert	Outlet Devices
Primary	1,318.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir	
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65
			2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.11 cfs @ 13.52 hrs HW=1,318.53' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 0.11 cfs @ 0.40 fps)

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Pond P2: VUF 2

Inflow Area = 0.684 ac, 0.00% Impervious, Inflow Depth > 0.63" for 25 YEAR event
 Inflow = 0.79 cfs @ 11.97 hrs, Volume= 0.036 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 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= 1,312.95' @ 20.00 hrs Surf.Area= 2,005 sf Storage= 1,562 cf

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

Volume	Invert	Avail.Storage	Storage Description			
#1	1,312.00'	8,052 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,312.00	1,306	237.0	0	0	1,306	
1,313.00	2,046	256.0	1,662	1,662	2,091	
1,314.00	3,206	339.0	2,604	4,267	6,032	
1,315.00	4,396	370.0	3,785	8,052	7,817	

Device	Routing	Invert	Outlet Devices													
#1	Primary	1,313.50'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir													
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00													
			2.50 3.00 3.50 4.00 4.50 5.00 5.50													
			Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65													
			2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83													

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,312.00' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Reach POI 1:

Inflow Area = 2.372 ac, 8.28% Impervious, Inflow Depth > 0.20" for 25 YEAR event
 Inflow = 0.12 cfs @ 13.52 hrs, Volume= 0.039 af
 Outflow = 0.12 cfs @ 13.52 hrs, Volume= 0.039 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 Reach POI 2:

Inflow Area = 0.917 ac, 2.56% Impervious, Inflow Depth > 0.07" for 25 YEAR event
 Inflow = 0.07 cfs @ 11.98 hrs, Volume= 0.006 af
 Outflow = 0.07 cfs @ 11.98 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

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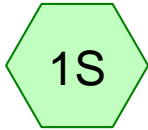
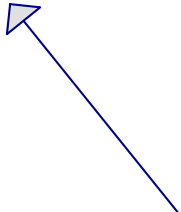
Type II 24-hr 25 YEAR Rainfall=4.70"

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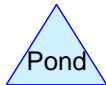
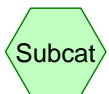
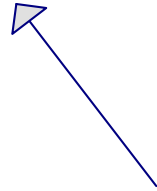
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Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

POI 1



POI 2



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.190	48	Brush, Good, HSG B (1S)
5.570	65	Brush, Good, HSG C (1S,2S)
10.407	70	Woods, Good, HSG C (1S,2S)
0.305	89	Gravel roads, HSG C (1S,2S)
16.472		TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
0.000	HSG A	
0.190	HSG B	1S
16.281	HSG C	1S, 2S
0.000	HSG D	
0.000	Other	
16.472		TOTAL AREA

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Type II 24-hr 2 YEAR Rainfall=2.70"

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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:

Runoff Area=373,731 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=1,485' Tc=18.8 min CN=67 Runoff=3.23 cfs 0.273 af

Subcatchment 2S:

Runoff Area=343,770 sf 0.00% Impervious Runoff Depth>0.48"
Flow Length=900' Tc=23.2 min CN=70 Runoff=3.60 cfs 0.318 af

Reach POI 1:

Inflow=3.23 cfs 0.273 af
Outflow=3.23 cfs 0.273 af

Reach POI 2:

Inflow=3.60 cfs 0.318 af
Outflow=3.60 cfs 0.318 af

Total Runoff Area = 16.472 ac Runoff Volume = 0.591 af Average Runoff Depth = 0.43"
100.00% Pervious = 16.472 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Subcatchment 1S:

Runoff = 3.23 cfs @ 12.16 hrs, Volume= 0.273 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
12,692	89	Gravel roads, HSG C
141,393	70	Woods, Good, HSG C
211,366	65	Brush, Good, HSG C
8,280	48	Brush, Good, HSG B
373,731	67	Weighted Average
373,731		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	60	0.0200	1.10		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
5.0	395	0.0700	1.32		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.5	440	0.0900	2.10		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
9.4	590	0.0440	1.05		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
18.8	1,485	Total			

Summary for Subcatchment 2S:

Runoff = 3.60 cfs @ 12.20 hrs, Volume= 0.318 af, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
311,919	70	Woods, Good, HSG C
31,268	65	Brush, Good, HSG C
583	89	Gravel roads, HSG C
343,770	70	Weighted Average
343,770		Pervious Area

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	140	0.0430	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.50"
4.8	435	0.0910	1.51		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.5	220	0.1270	2.49		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
1.3	105	0.0760	1.38		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
23.2	900	Total			

Summary for Reach POI 1:

Inflow Area = 8.580 ac, 0.00% Impervious, Inflow Depth > 0.38" for 2 YEAR event
 Inflow = 3.23 cfs @ 12.16 hrs, Volume= 0.273 af
 Outflow = 3.23 cfs @ 12.16 hrs, Volume= 0.273 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 Reach POI 2:

Inflow Area = 7.892 ac, 0.00% Impervious, Inflow Depth > 0.48" for 2 YEAR event
 Inflow = 3.60 cfs @ 12.20 hrs, Volume= 0.318 af
 Outflow = 3.60 cfs @ 12.20 hrs, Volume= 0.318 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 10 YEAR Rainfall=4.10"

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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:

Runoff Area=373,731 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=1,485' Tc=18.8 min CN=67 Runoff=11.02 cfs 0.770 af

Subcatchment 2S:

Runoff Area=343,770 sf 0.00% Impervious Runoff Depth>1.25"
Flow Length=900' Tc=23.2 min CN=70 Runoff=10.63 cfs 0.824 af

Reach POI 1:

Inflow=11.02 cfs 0.770 af
Outflow=11.02 cfs 0.770 af

Reach POI 2:

Inflow=10.63 cfs 0.824 af
Outflow=10.63 cfs 0.824 af

Total Runoff Area = 16.472 ac Runoff Volume = 1.594 af Average Runoff Depth = 1.16"
100.00% Pervious = 16.472 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Subcatchment 1S:

Runoff = 11.02 cfs @ 12.13 hrs, Volume= 0.770 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
12,692	89	Gravel roads, HSG C
141,393	70	Woods, Good, HSG C
211,366	65	Brush, Good, HSG C
8,280	48	Brush, Good, HSG B
373,731	67	Weighted Average
373,731		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	60	0.0200	1.10		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
5.0	395	0.0700	1.32		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.5	440	0.0900	2.10		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
9.4	590	0.0440	1.05		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
18.8	1,485	Total			

Summary for Subcatchment 2S:

Runoff = 10.63 cfs @ 12.18 hrs, Volume= 0.824 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
311,919	70	Woods, Good, HSG C
31,268	65	Brush, Good, HSG C
583	89	Gravel roads, HSG C
343,770	70	Weighted Average
343,770		Pervious Area

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	140	0.0430	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.50"
4.8	435	0.0910	1.51		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.5	220	0.1270	2.49		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
1.3	105	0.0760	1.38		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
23.2	900	Total			

Summary for Reach POI 1:

Inflow Area = 8.580 ac, 0.00% Impervious, Inflow Depth > 1.08" for 10 YEAR event
 Inflow = 11.02 cfs @ 12.13 hrs, Volume= 0.770 af
 Outflow = 11.02 cfs @ 12.13 hrs, Volume= 0.770 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 Reach POI 2:

Inflow Area = 7.892 ac, 0.00% Impervious, Inflow Depth > 1.25" for 10 YEAR event
 Inflow = 10.63 cfs @ 12.18 hrs, Volume= 0.824 af
 Outflow = 10.63 cfs @ 12.18 hrs, Volume= 0.824 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 25 YEAR Rainfall=4.70"

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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:

Runoff Area=373,731 sf 0.00% Impervious Runoff Depth>1.44"
Flow Length=1,485' Tc=18.8 min CN=67 Runoff=15.01 cfs 1.027 af

Subcatchment 2S:

Runoff Area=343,770 sf 0.00% Impervious Runoff Depth>1.64"
Flow Length=900' Tc=23.2 min CN=70 Runoff=14.15 cfs 1.079 af

Reach POI 1:

Inflow=15.01 cfs 1.027 af
Outflow=15.01 cfs 1.027 af

Reach POI 2:

Inflow=14.15 cfs 1.079 af
Outflow=14.15 cfs 1.079 af

Total Runoff Area = 16.472 ac Runoff Volume = 2.106 af Average Runoff Depth = 1.53"
100.00% Pervious = 16.472 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Subcatchment 1S:

Runoff = 15.01 cfs @ 12.13 hrs, Volume= 1.027 af, Depth> 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
12,692	89	Gravel roads, HSG C
141,393	70	Woods, Good, HSG C
211,366	65	Brush, Good, HSG C
8,280	48	Brush, Good, HSG B
373,731	67	Weighted Average
373,731		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	60	0.0200	1.10		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
5.0	395	0.0700	1.32		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.5	440	0.0900	2.10		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
9.4	590	0.0440	1.05		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
18.8	1,485	Total			

Summary for Subcatchment 2S:

Runoff = 14.15 cfs @ 12.17 hrs, Volume= 1.079 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
311,919	70	Woods, Good, HSG C
31,268	65	Brush, Good, HSG C
583	89	Gravel roads, HSG C
343,770	70	Weighted Average
343,770		Pervious Area

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	140	0.0430	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.50"
4.8	435	0.0910	1.51		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.5	220	0.1270	2.49		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
1.3	105	0.0760	1.38		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
23.2	900	Total			

Summary for Reach POI 1:

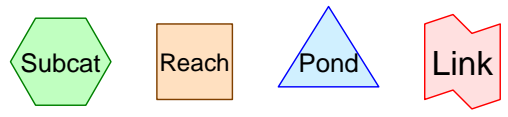
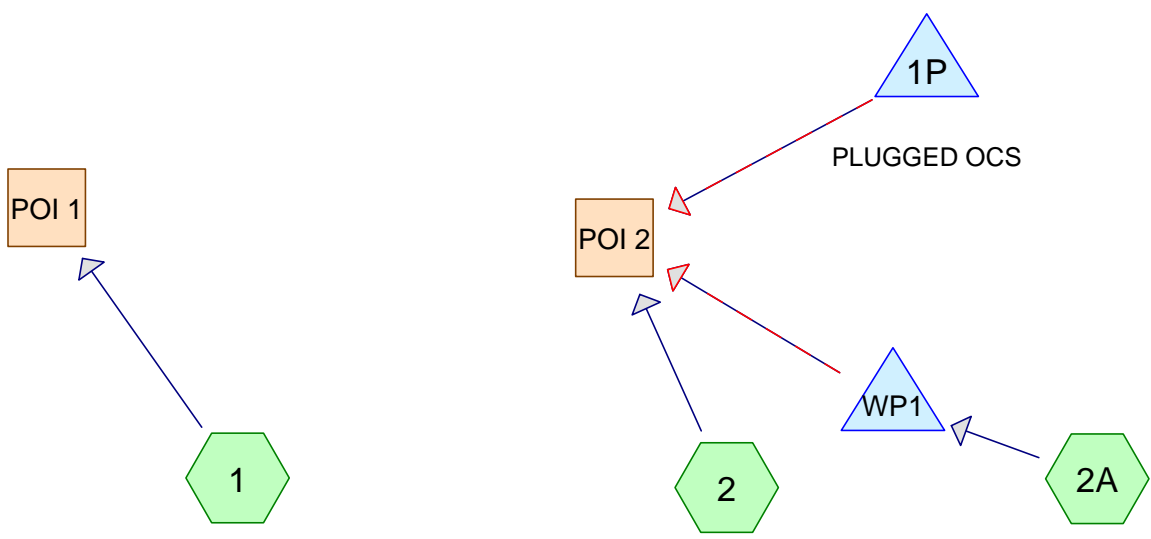
Inflow Area = 8.580 ac, 0.00% Impervious, Inflow Depth > 1.44" for 25 YEAR event
 Inflow = 15.01 cfs @ 12.13 hrs, Volume= 1.027 af
 Outflow = 15.01 cfs @ 12.13 hrs, Volume= 1.027 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach POI 2:

Inflow Area = 7.892 ac, 0.00% Impervious, Inflow Depth > 1.64" for 25 YEAR event
 Inflow = 14.15 cfs @ 12.17 hrs, Volume= 1.079 af
 Outflow = 14.15 cfs @ 12.17 hrs, Volume= 1.079 af, Atten= 0%, Lag= 0.0 min

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



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.463	55	Substation Pad, HSG C (2)
2.607	55	Substation Section HSG C (1)
6.245	65	Brush, Good, HSG C (1,2,2A)
5.248	70	Woods, Good, HSG C (1,2)
0.281	89	Gravel roads, HSG C (1,2)
1.109	98	Paved parking & roofs (2A)
0.079	98	Water Surface (2A)
16.031		TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Goup	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
14.843	HSG C	1, 2, 2A
0.000	HSG D	
1.188	Other	2A
16.031		TOTAL AREA

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Type II 24-hr 2 YEAR Rainfall=2.70"

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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 1: Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>0.29"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=2.02 cfs 0.175 af

Subcatchment 2: Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=890' Tc=16.9 min CN=67 Runoff=2.87 cfs 0.228 af

Subcatchment 2A: Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>1.44"
Flow Length=342' Tc=1.4 min CN=88 Runoff=5.12 cfs 0.205 af

Reach POI 1: Inflow=2.02 cfs 0.175 af
Outflow=2.02 cfs 0.175 af

Reach POI 2: Inflow=3.28 cfs 0.416 af
Outflow=3.28 cfs 0.416 af

Pond 1P: PLUGGED OCS Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0.000 af

Pond WP1: Peak Elev=1,510.13' Storage=4,625 cf Inflow=5.12 cfs 0.205 af
Primary=0.41 cfs 0.188 af Secondary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.188 af

Total Runoff Area = 16.031 ac Runoff Volume = 0.608 af Average Runoff Depth = 0.46"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Subcatchment 1:

Runoff = 2.02 cfs @ 12.12 hrs, Volume= 0.175 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
9,545	89	Gravel roads, HSG C
88,766	70	Woods, Good, HSG C
100,349	65	Brush, Good, HSG C
* 113,559	55	Substation Section HSG C
312,219	64	Weighted Average
312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 2.87 cfs @ 12.13 hrs, Volume= 0.228 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
139,851	70	Woods, Good, HSG C
149,027	65	Brush, Good, HSG C
* 20,147	55	Substation Pad, HSG C
2,678	89	Gravel roads, HSG C
311,703	67	Weighted Average
311,703		Pervious Area

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 5.12 cfs @ 11.91 hrs, Volume= 0.205 af, Depth> 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=2.70"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	Channel Flow, C-D Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

Summary for Reach POI 1:

Inflow Area = 7.168 ac, 0.00% Impervious, Inflow Depth > 0.29" for 2 YEAR event
Inflow = 2.02 cfs @ 12.12 hrs, Volume= 0.175 af
Outflow = 2.02 cfs @ 12.12 hrs, Volume= 0.175 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Summary for Reach POI 2:

Inflow Area = 8.863 ac, 13.40% Impervious, Inflow Depth > 0.56" for 2 YEAR event
 Inflow = 3.28 cfs @ 12.13 hrs, Volume= 0.416 af
 Outflow = 3.28 cfs @ 12.13 hrs, Volume= 0.416 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: PLUGGED OCS

Primary = 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= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated)

Center-of-Mass det. time= (not calculated)

Volume	Invert	Avail.Storage	Storage Description
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,509.00	3,422	233.0	0	0	3,422
1,510.00	4,622	296.0	4,007	4,007	6,087
1,511.00	5,561	323.0	5,084	9,091	7,453
1,512.00	6,595	364.0	6,071	15,162	9,720
1,513.00	7,724	407.0	7,152	22,314	12,387
1,514.00	8,952	449.0	8,330	30,644	15,279

Device	Routing	Invert	Outlet Devices
#1	Primary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

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

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond WP1:

Inflow Area = 1.708 ac, 69.56% Impervious, Inflow Depth > 1.44" for 2 YEAR event
 Inflow = 5.12 cfs @ 11.91 hrs, Volume= 0.205 af
 Outflow = 0.41 cfs @ 12.42 hrs, Volume= 0.188 af, Atten= 92%, Lag= 30.5 min
 Primary = 0.41 cfs @ 12.42 hrs, Volume= 0.188 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

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Type II 24-hr 2 YEAR Rainfall=2.70"

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Peak Elev= 1,510.13' @ 12.42 hrs Surf.Area= 4,741 sf Storage= 4,625 cf

Plug-Flow detention time= 145.5 min calculated for 0.188 af (91% of inflow)

Center-of-Mass det. time= 116.4 min (892.1 - 775.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,509.00	3,422	233.0	0	0	3,422	
1,510.00	4,622	296.0	4,007	4,007	6,087	
1,511.00	5,561	323.0	5,084	9,091	7,453	
1,512.00	6,595	364.0	6,071	15,162	9,720	
1,513.00	7,724	407.0	7,152	22,314	12,387	
1,514.00	8,952	449.0	8,330	30,644	15,279	

Device	Routing	Invert	Outlet Devices											
#1	Secondary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64											
			2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74											
#2	Primary	1,506.40'	24.0" x 27.0' long Culvert CPP, square edge headwall, Ke= 0.500											
			Outlet Invert= 1,505.00' S= 0.0519 '/' Cc= 0.900 n= 0.012											
#3	Device 2	1,512.00'	6.0' long x 0.5' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00											
			Coef. (English) 2.80 2.92 3.08 3.30 3.32											
#4	Device 2	1,509.00'	4.0" Vert. Orifice/Grate C= 0.600											

Primary OutFlow Max=0.41 cfs @ 12.42 hrs HW=1,510.13' (Free Discharge)

- ↑ 2=Culvert (Passes 0.41 cfs of 25.00 cfs potential flow)
- ↑ 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
- ↑ 4=Orifice/Grate (Orifice Controls 0.41 cfs @ 4.73 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,509.00' (Free Discharge)

- ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type II 24-hr 10 YEAR Rainfall=4.10"

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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 1: Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>0.91"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=8.46 cfs 0.545 af

Subcatchment 2: Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=890' Tc=16.9 min CN=67 Runoff=9.82 cfs 0.643 af

Subcatchment 2A: Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>2.64"
Flow Length=342' Tc=1.4 min CN=88 Runoff=9.03 cfs 0.376 af

Reach POI 1: Inflow=8.46 cfs 0.545 af
Outflow=8.46 cfs 0.545 af

Reach POI 2: Inflow=10.37 cfs 0.970 af
Outflow=10.37 cfs 0.970 af

Pond 1P: PLUGGED OCS Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0.000 af

Pond WP1: Peak Elev=1,510.97' Storage=8,917 cf Inflow=9.03 cfs 0.376 af
Primary=0.56 cfs 0.327 af Secondary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.327 af

Total Runoff Area = 16.031 ac Runoff Volume = 1.563 af Average Runoff Depth = 1.17"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Subcatchment 1:

Runoff = 8.46 cfs @ 12.10 hrs, Volume= 0.545 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
9,545	89	Gravel roads, HSG C
88,766	70	Woods, Good, HSG C
100,349	65	Brush, Good, HSG C
* 113,559	55	Substation Section HSG C
312,219	64	Weighted Average
312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 9.82 cfs @ 12.11 hrs, Volume= 0.643 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
139,851	70	Woods, Good, HSG C
149,027	65	Brush, Good, HSG C
* 20,147	55	Substation Pad, HSG C
2,678	89	Gravel roads, HSG C
311,703	67	Weighted Average
311,703		Pervious Area

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 9.03 cfs @ 11.91 hrs, Volume= 0.376 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type II 24-hr 10 YEAR Rainfall=4.10"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	Channel Flow, C-D Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

Summary for Reach POI 1:

Inflow Area = 7.168 ac, 0.00% Impervious, Inflow Depth > 0.91" for 10 YEAR event

Inflow = 8.46 cfs @ 12.10 hrs, Volume= 0.545 af

Outflow = 8.46 cfs @ 12.10 hrs, Volume= 0.545 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Summary for Reach POI 2:

Inflow Area = 8.863 ac, 13.40% Impervious, Inflow Depth > 1.31" for 10 YEAR event
 Inflow = 10.37 cfs @ 12.11 hrs, Volume= 0.970 af
 Outflow = 10.37 cfs @ 12.11 hrs, Volume= 0.970 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: PLUGGED OCS

Primary = 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= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated)

Center-of-Mass det. time= (not calculated)

Volume	Invert	Avail.Storage	Storage Description
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,509.00	3,422	233.0	0	0	3,422
1,510.00	4,622	296.0	4,007	4,007	6,087
1,511.00	5,561	323.0	5,084	9,091	7,453
1,512.00	6,595	364.0	6,071	15,162	9,720
1,513.00	7,724	407.0	7,152	22,314	12,387
1,514.00	8,952	449.0	8,330	30,644	15,279

Device	Routing	Invert	Outlet Devices
#1	Primary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

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

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond WP1:

Inflow Area = 1.708 ac, 69.56% Impervious, Inflow Depth > 2.64" for 10 YEAR event
 Inflow = 9.03 cfs @ 11.91 hrs, Volume= 0.376 af
 Outflow = 0.56 cfs @ 12.52 hrs, Volume= 0.327 af, Atten= 94%, Lag= 36.9 min
 Primary = 0.56 cfs @ 12.52 hrs, Volume= 0.327 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

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Type II 24-hr 10 YEAR Rainfall=4.10"

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Peak Elev= 1,510.97' @ 12.52 hrs Surf.Area= 5,530 sf Storage= 8,917 cf

Plug-Flow detention time= 185.6 min calculated for 0.326 af (87% of inflow)

Center-of-Mass det. time= 144.2 min (906.1 - 761.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,509.00	3,422	233.0	0	0	3,422	
1,510.00	4,622	296.0	4,007	4,007	6,087	
1,511.00	5,561	323.0	5,084	9,091	7,453	
1,512.00	6,595	364.0	6,071	15,162	9,720	
1,513.00	7,724	407.0	7,152	22,314	12,387	
1,514.00	8,952	449.0	8,330	30,644	15,279	

Device	Routing	Invert	Outlet Devices											
#1	Secondary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74											
#2	Primary	1,506.40'	24.0" x 27.0' long Culvert CPP, square edge headwall, Ke= 0.500											
			Outlet Invert= 1,505.00' S= 0.0519 '/' Cc= 0.900 n= 0.012											
#3	Device 2	1,512.00'	6.0' long x 0.5' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00											
			Coef. (English) 2.80 2.92 3.08 3.30 3.32											
#4	Device 2	1,509.00'	4.0" Vert. Orifice/Grate C= 0.600											

Primary OutFlow Max=0.56 cfs @ 12.52 hrs HW=1,510.97' (Free Discharge)

- ↑ 2=Culvert (Passes 0.56 cfs of 28.57 cfs potential flow)
- ↑ 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
- ↑ 4=Orifice/Grate (Orifice Controls 0.56 cfs @ 6.46 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,509.00' (Free Discharge)

- ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type II 24-hr 25 YEAR Rainfall=4.70"

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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 1:

Runoff Area=312,219 sf 0.00% Impervious Runoff Depth>1.24"
Flow Length=1,225' Tc=15.5 min CN=64 Runoff=11.87 cfs 0.742 af

Subcatchment 2:

Runoff Area=311,703 sf 0.00% Impervious Runoff Depth>1.44"
Flow Length=890' Tc=16.9 min CN=67 Runoff=13.35 cfs 0.857 af

Subcatchment 2A:

Runoff Area=74,388 sf 69.56% Impervious Runoff Depth>3.17"
Flow Length=342' Tc=1.4 min CN=88 Runoff=10.72 cfs 0.451 af

Reach POI 1:

Inflow=11.87 cfs 0.742 af
Outflow=11.87 cfs 0.742 af

Reach POI 2:

Inflow=13.95 cfs 1.235 af
Outflow=13.95 cfs 1.235 af

Pond 1P: PLUGGED OCS

Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0.000 af

Pond WP1:

Peak Elev=1,511.31' Storage=10,864 cf Inflow=10.72 cfs 0.451 af
Primary=0.62 cfs 0.378 af Secondary=0.00 cfs 0.000 af Outflow=0.62 cfs 0.378 af

Total Runoff Area = 16.031 ac Runoff Volume = 2.050 af Average Runoff Depth = 1.53"
92.59% Pervious = 14.843 ac 7.41% Impervious = 1.188 ac

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Subcatchment 1:

Runoff = 11.87 cfs @ 12.09 hrs, Volume= 0.742 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
9,545	89	Gravel roads, HSG C
88,766	70	Woods, Good, HSG C
100,349	65	Brush, Good, HSG C
* 113,559	55	Substation Section HSG C
312,219	64	Weighted Average
312,219		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0200	1.32		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
4.6	440	0.0100	1.61		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.3	85	0.5000	4.95		Shallow Concentrated Flow, C-D Short Grass Pasture Kv= 7.0 fps
8.7	550	0.0440	1.05		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
15.5	1,225	Total			

Summary for Subcatchment 2:

Runoff = 13.35 cfs @ 12.10 hrs, Volume= 0.857 af, Depth> 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
139,851	70	Woods, Good, HSG C
149,027	65	Brush, Good, HSG C
* 20,147	55	Substation Pad, HSG C
2,678	89	Gravel roads, HSG C
311,703	67	Weighted Average
311,703		Pervious Area

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	85	0.0580	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.50"
1.5	125	0.0400	1.40		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
1.9	190	0.1110	1.67		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
2.8	380	0.1070	2.29		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
1.4	110	0.0720	1.34		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
16.9	890	Total			

Summary for Subcatchment 2A:

Runoff = 10.72 cfs @ 11.90 hrs, Volume= 0.451 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YEAR Rainfall=4.70"

Area (sf)	CN	Description
48,322	98	Paved parking & roofs
3,421	98	Water Surface
22,645	65	Brush, Good, HSG C
74,388	88	Weighted Average
22,645		Pervious Area
51,743		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0200	1.06		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 2.50"
0.0	12	0.3300	4.02		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.6	280	0.0500	7.65	91.82	Channel Flow, C-D Area= 12.0 sf Perim= 20.9' r= 0.57' n= 0.030
1.4	342	Total			

Summary for Reach POI 1:

Inflow Area = 7.168 ac, 0.00% Impervious, Inflow Depth > 1.24" for 25 YEAR event

Inflow = 11.87 cfs @ 12.09 hrs, Volume= 0.742 af

Outflow = 11.87 cfs @ 12.09 hrs, Volume= 0.742 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Summary for Reach POI 2:

Inflow Area = 8.863 ac, 13.40% Impervious, Inflow Depth > 1.67" for 25 YEAR event
 Inflow = 13.95 cfs @ 12.10 hrs, Volume= 1.235 af
 Outflow = 13.95 cfs @ 12.10 hrs, Volume= 1.235 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: PLUGGED OCS

Primary = 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= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated)

Center-of-Mass det. time= (not calculated)

Volume	Invert	Avail.Storage	Storage Description
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,509.00	3,422	233.0	0	0	3,422
1,510.00	4,622	296.0	4,007	4,007	6,087
1,511.00	5,561	323.0	5,084	9,091	7,453
1,512.00	6,595	364.0	6,071	15,162	9,720
1,513.00	7,724	407.0	7,152	22,314	12,387
1,514.00	8,952	449.0	8,330	30,644	15,279

Device	Routing	Invert	Outlet Devices
#1	Primary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

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

↑1=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WP1:

Inflow Area = 1.708 ac, 69.56% Impervious, Inflow Depth > 3.17" for 25 YEAR event
 Inflow = 10.72 cfs @ 11.90 hrs, Volume= 0.451 af
 Outflow = 0.62 cfs @ 12.59 hrs, Volume= 0.378 af, Atten= 94%, Lag= 41.2 min
 Primary = 0.62 cfs @ 12.59 hrs, Volume= 0.378 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

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Type II 24-hr 25 YEAR Rainfall=4.70"

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Peak Elev= 1,511.31' @ 12.59 hrs Surf.Area= 5,872 sf Storage= 10,864 cf

Plug-Flow detention time= 196.9 min calculated for 0.377 af (83% of inflow)

Center-of-Mass det. time= 148.8 min (906.4 - 757.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,509.00	3,422	233.0	0	0	3,422	
1,510.00	4,622	296.0	4,007	4,007	6,087	
1,511.00	5,561	323.0	5,084	9,091	7,453	
1,512.00	6,595	364.0	6,071	15,162	9,720	
1,513.00	7,724	407.0	7,152	22,314	12,387	
1,514.00	8,952	449.0	8,330	30,644	15,279	

Device	Routing	Invert	Outlet Devices											
#1	Secondary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74											
#2	Primary	1,506.40'	24.0" x 27.0' long Culvert CPP, square edge headwall, Ke= 0.500 Outlet Invert= 1,505.00' S= 0.0519 '/' Cc= 0.900 n= 0.012											
#3	Device 2	1,512.00'	6.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32											
#4	Device 2	1,509.00'	4.0" Vert. Orifice/Grate C= 0.600											

Primary OutFlow Max=0.62 cfs @ 12.59 hrs HW=1,511.31' (Free Discharge)

- ↑ 2=Culvert (Passes 0.62 cfs of 29.91 cfs potential flow)
- ↑ 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
- ↑ 4=Orifice/Grate (Orifice Controls 0.62 cfs @ 7.05 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,509.00' (Free Discharge)

- ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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100 YEAR PLUGGED OCS
Type II 24-hr 100 YEAR Rainfall=5.70"
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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

Pond 1P: PLUGGED OCS

Peak Elev=1,512.14' Storage=16,102 cf Inflow=13.52 cfs 0.579 af
Outflow=1.30 cfs 0.228 af

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100 YEAR PLUGGED OCS
 Type II 24-hr 100 YEAR Rainfall=5.70"
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Summary for Pond 1P: PLUGGED OCS

Inflow Area = 1.708 ac, 69.56% Impervious, Inflow Depth > 4.07" for 100 YEAR event
 Inflow = 13.52 cfs @ 11.90 hrs, Volume= 0.579 af
 Outflow = 1.30 cfs @ 12.28 hrs, Volume= 0.228 af, Atten= 90%, Lag= 22.8 min
 Primary = 1.30 cfs @ 12.28 hrs, Volume= 0.228 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,512.14' @ 12.28 hrs Surf.Area= 6,749 sf Storage= 16,102 cf

Plug-Flow detention time= 214.9 min calculated for 0.228 af (39% of inflow)
 Center-of-Mass det. time= 122.0 min (874.2 - 752.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	1,509.00'	30,644 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
1,509.00	3,422	233.0	0	0	3,422	
1,510.00	4,622	296.0	4,007	4,007	6,087	
1,511.00	5,561	323.0	5,084	9,091	7,453	
1,512.00	6,595	364.0	6,071	15,162	9,720	
1,513.00	7,724	407.0	7,152	22,314	12,387	
1,514.00	8,952	449.0	8,330	30,644	15,279	

Device	Routing	Invert	Outlet Devices													
#1	Primary	1,512.00'	10.0' long x 8.0' breadth Broad-Crested Rectangular Weir													
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00													
			2.50 3.00 3.50 4.00 4.50 5.00 5.50													
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64													
			2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74													

Primary OutFlow Max=1.28 cfs @ 12.28 hrs HW=1,512.14' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 1.28 cfs @ 0.91 fps)

Channel Report

<Name>

Trapezoidal

Bottom Width (ft) = 10.00
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 1512.00
Slope (%) = 2.00
N-Value = 0.030

Highlighted

Depth (ft) = 0.10
Q (cfs) = 1.300
Area (sqft) = 1.02
Velocity (ft/s) = 1.27
Wetted Perim (ft) = 10.45
Crit Depth, Yc (ft) = 0.09
Top Width (ft) = 10.40
EGL (ft) = 0.13

Calculations

Compute by:

Known Q (cfs)

Known Q

= 1.30

FROM HYDROCAD 100
YR STORM WITH
PLUGGED OCS

