

**Stormwater Management System
Revised Drainage Calculations**

**Needham Mews
692 & 744 Greendale Avenue
Needham, Massachusetts**

**Submitted to:
Needham Board of Appeals**

September 30, 2013

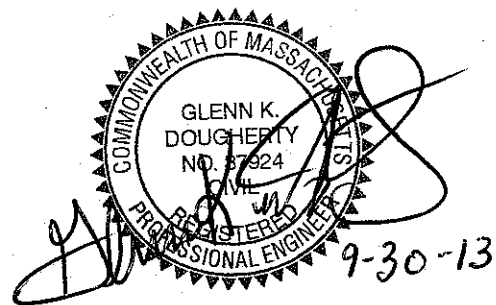
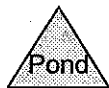
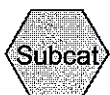
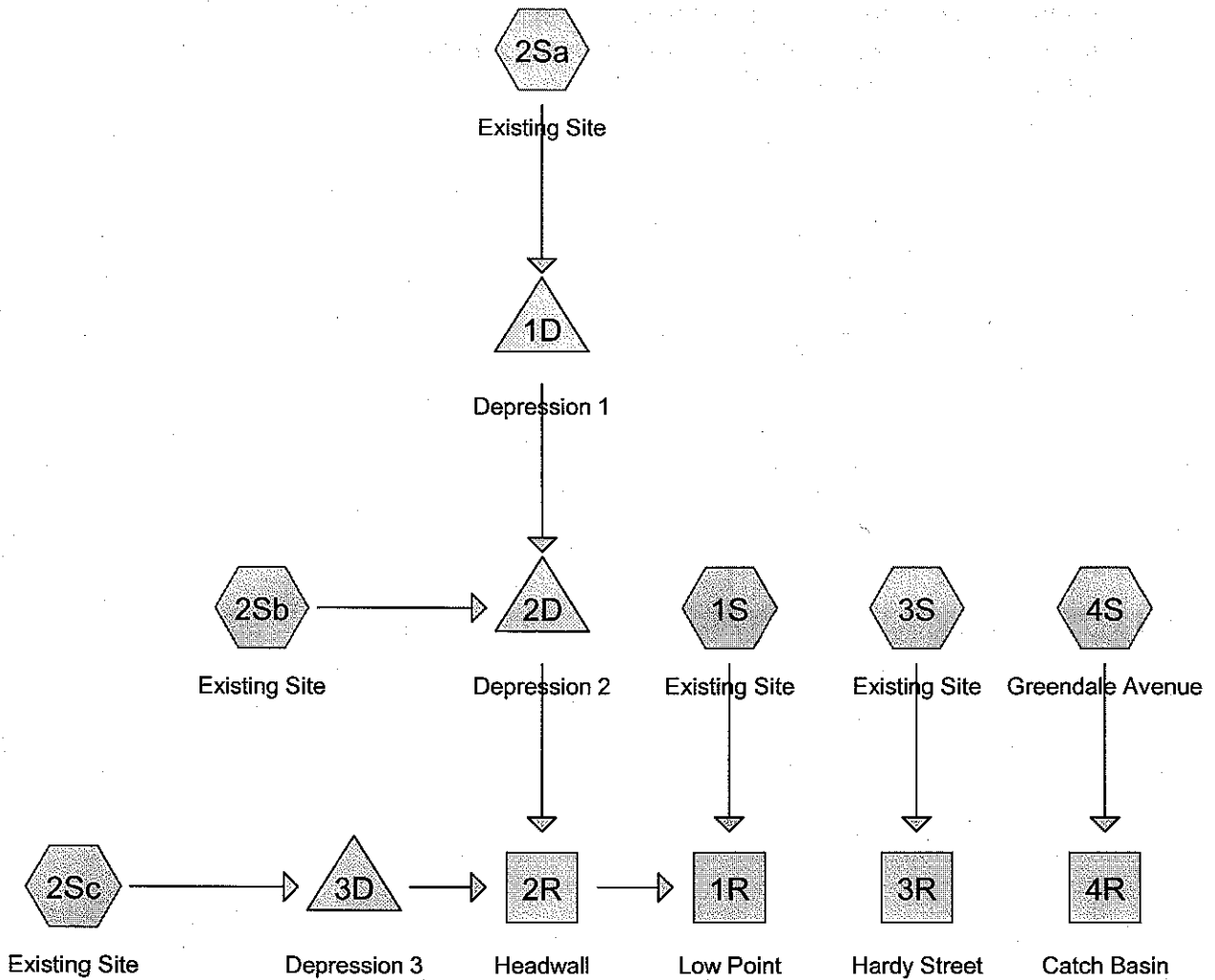


Table 3-1 Comparison of Peak Runoff Rates

Point of Analysis	2-Year Storm (cfs)			10-Year Storm (cfs)			25-Year Storm (cfs)			100-Year Storm (cfs)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
1R	0.00	0.00	-0.00	0.01	0.00	-0.01	0.03	0.00	-0.03	0.16	0.03	-0.13
2R	0.00	0.00	-0.00	0.01	0.00	-0.01	0.03	0.00	-0.03	0.14	0.02	-0.12
3R	0.00	0.00	-0.00	0.01	0.00	-0.01	0.04	0.00	-0.04	0.12	0.00	-0.12
4R	0.00	0.00	-0.00	0.01	0.00	-0.01	0.02	0.00	-0.02	0.04	0.02	-0.02

Table 3-1a Peak Runoff Rates at Proposed Flared End

5R	-	0.00	-	-	0.00	-	-	0.00	-	-	0.00	-
----	---	------	---	---	------	---	---	------	---	---	------	---



Routing Diagram for 143-82806-13003_EC-WATERSHED-rev2
 Prepared by Tetra Tech, Printed 9/30/2013
 HydroCAD® 10.00 s/n 05923 © 2012 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.330	49	50-75% Grass cover, Fair, HSG A (2Sc, 3S, 4S)
0.180	98	Pavement/Roof (2Sa, 2Sc, 3S)
6.310	30	Woods, Good, HSG A (1S, 2Sa, 2Sb, 2Sc, 3S)
6.820	33	TOTAL AREA

Time span=0.00-25.00 hrs, dt=0.10 hrs, 251 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Existing Site Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=265' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 2Sa: Existing Site Runoff Area=1.300 ac 9.23% Impervious Runoff Depth=0.00"
Flow Length=300' Tc=2.8 min CN=36 Runoff=0.00 cfs 0.000 af

Subcatchment 2Sb: Existing Site Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=188' Tc=4.4 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 2Sc: Existing Site Runoff Area=3.810 ac 1.05% Impervious Runoff Depth=0.00"
Flow Length=800' Tc=15.0 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: Existing Site Runoff Area=0.310 ac 6.45% Impervious Runoff Depth=0.00"
Flow Length=340' Tc=8.2 min CN=40 Runoff=0.00 cfs 0.000 af

Subcatchment 4S: Greendale Avenue Runoff Area=0.040 ac 0.00% Impervious Runoff Depth=0.11"
Flow Length=330' Tc=10.3 min CN=49 Runoff=0.00 cfs 0.000 af

Reach 1R: Low Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 2R: Headwall Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
15.0" Round Pipe n=0.012 L=36.0' S=0.0139 '/' Capacity=8.25 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Hardy Street Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 4R: Catch Basin Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1D: Depression 1 Peak Elev=119.90' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 2D: Depression 2 Peak Elev=120.60' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 3D: Depression 3 Peak Elev=106.70' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 6.820 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
97.36% Pervious = 6.640 ac 2.64% Impervious = 0.180 ac

Summary for Subcatchment 1S: Existing Site

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

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.960	30	Woods, Good, HSG A
0.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Overland Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	115	0.3000	2.74		Shallow Concentrated Flow, Forest Woodland Kv= 5.0 fps
2.2	130	0.0380	0.97		Shallow Concentrated Flow, Forest Woodland Kv= 5.0 fps
6.0	265	Total			

Summary for Subcatchment 2Sa: Existing Site

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

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.120	98	Pavement/Roof
1.180	30	Woods, Good, HSG A
1.300	36	Weighted Average
1.180		90.77% Pervious Area
0.120		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		Sheet Flow, Driveway Smooth surfaces n= 0.011 P2= 3.20"
0.2	55	0.0500	4.54		Shallow Concentrated Flow, Driveway Paved Kv= 20.3 fps
1.9	195	0.1150	1.70		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
2.8	300	Total			

Summary for Subcatchment 2Sb: Existing Site

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

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.400	30	Woods, Good, HSG A
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	168	0.2000	2.24		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
4.4	188	Total			

Summary for Subcatchment 2Sc: Existing Site

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.040	98	Pavement/Roof
3.570	30	Woods, Good, HSG A
0.200	49	50-75% Grass cover, Fair, HSG A
3.810	32	Weighted Average
3.770		98.95% Pervious Area
0.040		1.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0250	1.36		Sheet Flow, Driveway Smooth surfaces n= 0.011 P2= 3.20"
4.0	400	0.1130	1.68		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
10.3	340	0.0120	0.55		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
15.0	800	Total			

Summary for Subcatchment 3S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 23.90 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.020	98	Pavement/Roof
0.200	30	Woods, Good, HSG A
0.090	49	50-75% Grass cover, Fair, HSG A
0.310	40	Weighted Average
0.290		93.55% Pervious Area
0.020		6.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short $n=0.150$ $P2=3.20"$
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
8.2	340	Total			

Summary for Subcatchment 4S: Greendale Avenue[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.00 cfs @ 13.73 hrs, Volume= 0.000 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.040	49	50-75% Grass cover, Fair, HSG A
0.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	30	0.0200	0.06		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
2.1	300	0.0140	2.40		Shallow Concentrated Flow, Gutter Paved $K_v=20.3$ fps
10.3	330	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.470 ac, 2.47% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 5.510 ac, 2.90% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

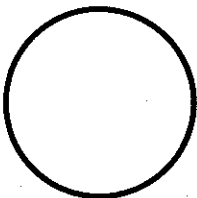
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 '/'

Inlet Invert= 106.70', Outlet Invert= 106.20'

**Summary for Reach 3R: Hardy Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.310 ac, 6.45% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 23.90 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.90 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth = 0.11" for 2 YEAR event
 Inflow = 0.00 cfs @ 13.73 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 13.73 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Pond 1D: Depression 1

Inflow Area = 1.300 ac, 9.23% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 119.90' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	119.90'	1,999 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)
119.90	0	0.0	0	0	0
120.00	9	17.0	0	0	23
121.00	777	122.0	290	290	1,187
121.80	2,318	211.0	1,183	1,473	3,549
122.00	2,946	229.0	525	1,999	4,181

Device	Routing	Invert	Outlet Devices
#1	Primary	121.80'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	119.90'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=119.90' (Free Discharge)

↑2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=119.90' TW=120.60' (Dynamic Tailwater)

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

Summary for Pond 2D: Depression 2

Inflow Area = 1.700 ac, 7.06% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2
 Peak Elev= 120.60' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description		
#1	120.60'	2,684 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)
120.60	0	0.0	0	0	0
121.00	828	126.0	110	110	1,264
121.10	1,705	182.0	124	234	2,636
122.00	3,885	286.0	2,449	2,684	6,515

Device	Routing	Invert	Outlet Devices
#1	Primary	121.10'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	120.60'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=120.60' (Free Discharge)
 ↳2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=120.60' TW=106.70' (Dynamic Tailwater)
 ↳1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3D: Depression 3

Inflow Area = 3.810 ac, 1.05% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2
 Peak Elev= 106.70' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description		
#1	106.70'	27,689 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	13,756	642.0	7,373	8,679	32,810
110.30	17,209	672.0	4,635	13,314	35,953
111.00	24,054	812.0	14,375	27,689	52,494

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=106.70' (Free Discharge)

↑ **3=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=106.70' TW=106.70' (Dynamic Tailwater)

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

↑ **2=Culvert** (Controls 0.00 cfs)

Time span=0.00-25.00 hrs, dt=0.10 hrs, 251 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Existing Site	Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=265' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 2Sa: Existing Site	Runoff Area=1.300 ac 9.23% Impervious Runoff Depth=0.07" Flow Length=300' Tc=2.8 min CN=36 Runoff=0.01 cfs 0.007 af
Subcatchment 2Sb: Existing Site	Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=188' Tc=4.4 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 2Sc: Existing Site	Runoff Area=3.810 ac 1.05% Impervious Runoff Depth>0.01" Flow Length=800' Tc=15.0 min CN=32 Runoff=0.01 cfs 0.003 af
Subcatchment 3S: Existing Site	Runoff Area=0.310 ac 6.45% Impervious Runoff Depth=0.17" Flow Length=340' Tc=8.2 min CN=40 Runoff=0.01 cfs 0.004 af
Subcatchment 4S: Greendale Avenue	Runoff Area=0.040 ac 0.00% Impervious Runoff Depth=0.53" Flow Length=330' Tc=10.3 min CN=49 Runoff=0.01 cfs 0.002 af
Reach 1R: Low Point	Inflow=0.01 cfs 0.003 af Outflow=0.01 cfs 0.003 af
Reach 2R: Headwall	Avg. Flow Depth=0.03' Max Vel=1.00 fps Inflow=0.01 cfs 0.003 af 15.0" Round Pipe n=0.012 L=36.0' S=0.0139 ' Capacity=8.25 cfs Outflow=0.01 cfs 0.003 af
Reach 3R: Hardy Street	Inflow=0.01 cfs 0.004 af Outflow=0.01 cfs 0.004 af
Reach 4R: Catch Basin	Inflow=0.01 cfs 0.002 af Outflow=0.01 cfs 0.002 af
Pond 1D: Depression 1	Peak Elev=120.19' Storage=6 cf Inflow=0.01 cfs 0.007 af Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af
Pond 2D: Depression 2	Peak Elev=120.61' Storage=0 cf Inflow=0.00 cfs 0.000 af Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond 3D: Depression 3	Peak Elev=106.77' Storage=0 cf Inflow=0.01 cfs 0.003 af Discarded=0.00 cfs 0.000 af Primary=0.01 cfs 0.003 af Outflow=0.01 cfs 0.003 af

Total Runoff Area = 6.820 ac Runoff Volume = 0.017 af Average Runoff Depth = 0.03"
97.36% Pervious = 6.640 ac 2.64% Impervious = 0.180 ac

Summary for Subcatchment 1S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 23.97 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.960	30	Woods, Good, HSG A
0.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
0.7	115	0.3000	2.74		Shallow Concentrated Flow, Forest Woodland $K_v=5.0$ fps
2.2	130	0.0380	0.97		Shallow Concentrated Flow, Forest Woodland $K_v=5.0$ fps
6.0	265	Total			

Summary for Subcatchment 2Sa: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.01 cfs @ 15.23 hrs, Volume= 0.007 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.120	98	Pavement/Roof
1.180	30	Woods, Good, HSG A
1.300	36	Weighted Average
1.180		90.77% Pervious Area
0.120		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		Sheet Flow, Driveway Smooth surfaces $n=0.011$ $P2=3.20"$
0.2	55	0.0500	4.54		Shallow Concentrated Flow, Driveway Paved $K_v=20.3$ fps
1.9	195	0.1150	1.70		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
2.8	300	Total			

Summary for Subcatchment 2Sb: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 23.96 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.400	30	Woods, Good, HSG A
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Woodland Woods: Light underbrush $n=0.400$ $P2=3.20"$
1.3	168	0.2000	2.24		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
4.4	188	Total			

Summary for Subcatchment 2Sc: Existing Site

Runoff = 0.01 cfs @ 23.00 hrs, Volume= 0.003 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.040	98	Pavement/Roof
3.570	30	Woods, Good, HSG A
0.200	49	50-75% Grass cover, Fair, HSG A
3.810	32	Weighted Average
3.770		98.95% Pervious Area
0.040		1.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0250	1.36		Sheet Flow, Driveway Smooth surfaces $n=0.011$ $P2=3.20"$
4.0	400	0.1130	1.68		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
10.3	340	0.0120	0.55		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
15.0	800	Total			

Summary for Subcatchment 3S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.01 cfs @ 12.89 hrs, Volume= 0.004 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.020	98	Pavement/Roof
0.200	30	Woods, Good, HSG A
0.090	49	50-75% Grass cover, Fair, HSG A
0.310	40	Weighted Average
0.290		93.55% Pervious Area
0.020		6.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short $n=0.150$ $P2=3.20"$
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
8.2	340	Total			

Summary for Subcatchment 4S: Greendale Avenue[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.040	49	50-75% Grass cover, Fair, HSG A
0.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	30	0.0200	0.06		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
2.1	300	0.0140	2.40		Shallow Concentrated Flow, Gutter Paved $K_v=20.3$ fps
10.3	330	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.470 ac, 2.47% Impervious, Inflow Depth > 0.01" for 10 YEAR event
 Inflow = 0.01 cfs @ 23.60 hrs, Volume= 0.003 af
 Outflow = 0.01 cfs @ 23.60 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 5.510 ac, 2.90% Impervious, Inflow Depth > 0.01" for 10 YEAR event
 Inflow = 0.01 cfs @ 23.00 hrs, Volume= 0.003 af
 Outflow = 0.01 cfs @ 23.01 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Max. Velocity= 1.00 fps, Min. Travel Time= 0.6 min

Avg. Velocity= 0.89 fps, Avg. Travel Time= 0.7 min

Peak Storage= 0 cf @ 23.01 hrs

Average Depth at Peak Storage= 0.03'

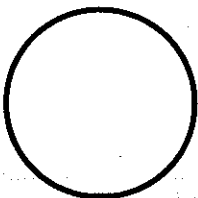
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 '/'

Inlet Invert= 106.70', Outlet Invert= 106.20'

**Summary for Reach 3R: Hardy Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.310 ac, 6.45% Impervious, Inflow Depth = 0.17" for 10 YEAR event
 Inflow = 0.01 cfs @ 12.89 hrs, Volume= 0.004 af
 Outflow = 0.01 cfs @ 12.89 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth = 0.53" for 10 YEAR event
 Inflow = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af
 Outflow = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Pond 1D: Depression 1

Inflow Area = 1.300 ac, 9.23% Impervious, Inflow Depth = 0.07" for 10 YEAR event
 Inflow = 0.01 cfs @ 15.23 hrs, Volume= 0.007 af
 Outflow = 0.01 cfs @ 15.46 hrs, Volume= 0.007 af, Atten= 1%, Lag= 13.7 min
 Discarded = 0.01 cfs @ 15.46 hrs, Volume= 0.007 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 120.19' @ 15.46 hrs Surf.Area= 60 sf Storage= 6 cf

Plug-Flow detention time= 7.7 min calculated for 0.007 af (100% of inflow)

Center-of-Mass det. time= 7.7 min (1,105.5 - 1,097.8)

Volume	Invert	Avail.Storage	Storage Description
#1	119.90'	1,999 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)
119.90	0	0.0	0	0	0
120.00	9	17.0	0	0	23
121.00	777	122.0	290	290	1,187
121.80	2,318	211.0	1,183	1,473	3,549
122.00	2,946	229.0	525	1,999	4,181

Device	Routing	Invert	Outlet Devices
#1	Primary	121.80'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	119.90'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 15.46 hrs HW=120.19' (Free Discharge)↑**2=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=119.90' TW=120.60' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2D: Depression 2

Inflow Area = 1.700 ac, 7.06% Impervious, Inflow Depth = 0.00" for 10 YEAR event
 Inflow = 0.00 cfs @ 23.96 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 23.96 hrs, Volume= 0.000 af, Atten= 1%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 23.96 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 120.61' @ 23.96 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.3 min (1,428.1 - 1,427.8)

Volume	Invert	Avail.Storage	Storage Description			
#1	120.60'	2,684 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)	
120.60	0	0.0	0	0	0	
121.00	828	126.0	110	110	1,264	
121.10	1,705	182.0	124	234	2,636	
122.00	3,885	286.0	2,449	2,684	6,515	

Device	Routing	Invert	Outlet Devices												
#1	Primary	121.10'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65												
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88												
#2	Discarded	120.60'	8.270 in/hr Exfiltration over Surface area												

Discarded OutFlow Max=0.00 cfs @ 23.96 hrs HW=120.61' (Free Discharge)

↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=120.60' TW=106.70' (Dynamic Tailwater)

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

Summary for Pond 3D: Depression 3

Inflow Area = 3.810 ac, 1.05% Impervious, Inflow Depth > 0.01" for 10 YEAR event
 Inflow = 0.01 cfs @ 23.00 hrs, Volume= 0.003 af
 Outflow = 0.01 cfs @ 23.00 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 23.01 hrs, Volume= 0.000 af
 Primary = 0.01 cfs @ 23.00 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 106.77' @ 23.01 hrs Surf.Area= 1 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.003 af (100% of inflow)

Center-of-Mass det. time= 0.0 min (1,276.7 - 1,276.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	106.70'	27,689 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	13,756	642.0	7,373	8,679	32,810
110.30	17,209	672.0	4,635	13,314	35,953
111.00	24,054	812.0	14,375	27,689	52,494

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' S= 0.0139 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 23.01 hrs HW=106.77' (Free Discharge)

↑ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.01 cfs @ 23.00 hrs HW=106.77' TW=106.73' (Dynamic Tailwater)

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

↑ **2=Culvert** (Outlet Controls 0.01 cfs @ 0.39 fps)

Time span=0.00-25.00 hrs, dt=0.10 hrs, 251 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Existing Site	Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=265' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.002 af
Subcatchment 2Sa: Existing Site	Runoff Area=1.300 ac 9.23% Impervious Runoff Depth=0.19" Flow Length=300' Tc=2.8 min CN=36 Runoff=0.04 cfs 0.021 af
Subcatchment 2Sb: Existing Site	Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=188' Tc=4.4 min CN=30 Runoff=0.00 cfs 0.001 af
Subcatchment 2Sc: Existing Site	Runoff Area=3.810 ac 1.05% Impervious Runoff Depth>0.07" Flow Length=800' Tc=15.0 min CN=32 Runoff=0.03 cfs 0.022 af
Subcatchment 3S: Existing Site	Runoff Area=0.310 ac 6.45% Impervious Runoff Depth=0.36" Flow Length=340' Tc=8.2 min CN=40 Runoff=0.04 cfs 0.009 af
Subcatchment 4S: Greendale Avenue	Runoff Area=0.040 ac 0.00% Impervious Runoff Depth=0.85" Flow Length=330' Tc=10.3 min CN=49 Runoff=0.02 cfs 0.003 af
Reach 1R: Low Point	Inflow=0.03 cfs 0.024 af Outflow=0.03 cfs 0.024 af
Reach 2R: Headwall	Avg. Flow Depth=0.06' Max Vel=1.64 fps Inflow=0.03 cfs 0.022 af 15.0" Round Pipe n=0.012 L=36.0' S=0.0139 '/' Capacity=8.25 cfs Outflow=0.03 cfs 0.022 af
Reach 3R: Hardy Street	Inflow=0.04 cfs 0.009 af Outflow=0.04 cfs 0.009 af
Reach 4R: Catch Basin	Inflow=0.02 cfs 0.003 af Outflow=0.02 cfs 0.003 af
Pond 1D: Depression 1	Peak Elev=120.42' Storage=32 cf Inflow=0.04 cfs 0.021 af Discarded=0.03 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.021 af
Pond 2D: Depression 2	Peak Elev=120.64' Storage=0 cf Inflow=0.00 cfs 0.001 af Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af
Pond 3D: Depression 3	Peak Elev=106.83' Storage=0 cf Inflow=0.03 cfs 0.022 af Discarded=0.00 cfs 0.000 af Primary=0.03 cfs 0.022 af Outflow=0.03 cfs 0.022 af
Total Runoff Area = 6.820 ac Runoff Volume = 0.058 af Average Runoff Depth = 0.10"	
97.36% Pervious = 6.640 ac 2.64% Impervious = 0.180 ac	

Summary for Subcatchment 1S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.00 cfs @ 21.05 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.960	30	Woods, Good, HSG A
0.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
0.7	115	0.3000	2.74		Shallow Concentrated Flow, Forest Woodland $K_v=5.0$ fps
2.2	130	0.0380	0.97		Shallow Concentrated Flow, Forest Woodland $K_v=5.0$ fps
6.0	265	Total			

Summary for Subcatchment 2Sa: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.04 cfs @ 13.59 hrs, Volume= 0.021 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.120	98	Pavement/Roof
1.180	30	Woods, Good, HSG A
1.300	36	Weighted Average
1.180		90.77% Pervious Area
0.120		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		Sheet Flow, Driveway Smooth surfaces $n=0.011$ $P2=3.20"$
0.2	55	0.0500	4.54		Shallow Concentrated Flow, Driveway Paved $K_v=20.3$ fps
1.9	195	0.1150	1.70		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
2.8	300	Total			

Summary for Subcatchment 2Sb: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.00 cfs @ 21.04 hrs, Volume= 0.001 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.400	30	Woods, Good, HSG A
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Woodland Woods: Light underbrush $n=0.400$ $P2=3.20"$
1.3	168	0.2000	2.24		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
4.4	188	Total			

Summary for Subcatchment 2Sc: Existing Site

Runoff = 0.03 cfs @ 15.59 hrs, Volume= 0.022 af, Depth> 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.040	98	Pavement/Roof
3.570	30	Woods, Good, HSG A
0.200	49	50-75% Grass cover, Fair, HSG A
3.810	32	Weighted Average
3.770		98.95% Pervious Area
0.040		1.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0250	1.36		Sheet Flow, Driveway Smooth surfaces $n=0.011$ $P2=3.20"$
4.0	400	0.1130	1.68		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
10.3	340	0.0120	0.55		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
15.0	800	Total			

Summary for Subcatchment 3S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.04 cfs @ 12.41 hrs, Volume= 0.009 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.020	98	Pavement/Roof
0.200	30	Woods, Good, HSG A
0.090	49	50-75% Grass cover, Fair, HSG A
0.310	40	Weighted Average
0.290		93.55% Pervious Area
0.020		6.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short $n=0.150$ $P2=3.20"$
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
8.2	340	Total			

Summary for Subcatchment 4S: Greendale Avenue[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.02 cfs @ 12.22 hrs, Volume= 0.003 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.040	49	50-75% Grass cover, Fair, HSG A
0.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	30	0.0200	0.06		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
2.1	300	0.0140	2.40		Shallow Concentrated Flow, Gutter Paved $K_v=20.3$ fps
10.3	330	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.470 ac, 2.47% Impervious, Inflow Depth > 0.04" for 25 YEAR event
Inflow = 0.03 cfs @ 15.72 hrs, Volume= 0.024 af
Outflow = 0.03 cfs @ 15.72 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 5.510 ac, 2.90% Impervious, Inflow Depth > 0.05" for 25 YEAR event
Inflow = 0.03 cfs @ 15.59 hrs, Volume= 0.022 af
Outflow = 0.03 cfs @ 15.59 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Max. Velocity= 1.64 fps, Min. Travel Time= 0.4 min

Avg. Velocity= 1.44 fps, Avg. Travel Time= 0.4 min

Peak Storage= 1 cf @ 15.59 hrs

Average Depth at Peak Storage= 0.06'

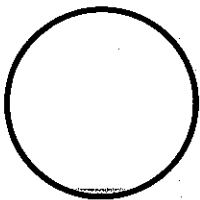
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 '/

Inlet Invert= 106.70', Outlet Invert= 106.20'

**Summary for Reach 3R: Hardy Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.310 ac, 6.45% Impervious, Inflow Depth = 0.36" for 25 YEAR event
Inflow = 0.04 cfs @ 12.41 hrs, Volume= 0.009 af
Outflow = 0.04 cfs @ 12.41 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth = 0.85" for 25 YEAR event
 Inflow = 0.02 cfs @ 12.22 hrs, Volume= 0.003 af
 Outflow = 0.02 cfs @ 12.22 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Pond 1D: Depression 1

Inflow Area = 1.300 ac, 9.23% Impervious, Inflow Depth = 0.19" for 25 YEAR event
 Inflow = 0.04 cfs @ 13.59 hrs, Volume= 0.021 af
 Outflow = 0.03 cfs @ 13.92 hrs, Volume= 0.021 af, Atten= 3%, Lag= 19.9 min
 Discarded = 0.03 cfs @ 13.92 hrs, Volume= 0.021 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 120.42' @ 13.92 hrs Surf.Area= 178 sf Storage= 32 cf

Plug-Flow detention time= 12.8 min calculated for 0.021 af (100% of inflow)

Center-of-Mass det. time= 12.8 min (1,032.2 - 1,019.4)

Volume	Invert	Avail.Storage	Storage Description
#1	119.90'	1,999 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)
119.90	0	0.0	0	0	0
120.00	9	17.0	0	0	23
121.00	777	122.0	290	290	1,187
121.80	2,318	211.0	1,183	1,473	3,549
122.00	2,946	229.0	525	1,999	4,181

Device	Routing	Invert	Outlet Devices
#1	Primary	121.80'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	119.90'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 13.92 hrs HW=120.42' (Free Discharge)

↑2=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=119.90' TW=120.60' (Dynamic Tailwater)

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

Summary for Pond 2D: Depression 2

Inflow Area = 1.700 ac, 7.06% Impervious, Inflow Depth = 0.01" for 25 YEAR event
 Inflow = 0.00 cfs @ 21.04 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 21.07 hrs, Volume= 0.001 af, Atten= 0%, Lag= 1.7 min
 Discarded = 0.00 cfs @ 21.07 hrs, Volume= 0.001 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 120.64' @ 21.07 hrs Surf.Area= 8 sf Storage= 0 cf

Plug-Flow detention time= 1.1 min calculated for 0.001 af (100% of inflow)

Center-of-Mass det. time= 1.2 min (1,192.8 - 1,191.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	120.60'	2,684 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)	
120.60	0	0.0	0	0	0	
121.00	828	126.0	110	110	1,264	
121.10	1,705	182.0	124	234	2,636	
122.00	3,885	286.0	2,449	2,684	6,515	

Device	Routing	Invert	Outlet Devices											
#1	Primary	121.10'	7.0' long x 5.0' 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)	2.34	2.50	2.70	2.68	2.68	2.66	2.65	2.65	2.65		
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88			
#2	Discarded	120.60'	8.270 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.00 cfs @ 21.07 hrs HW=120.64' (Free Discharge)

↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=120.60' TW=106.70' (Dynamic Tailwater)

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

Summary for Pond 3D: Depression 3

Inflow Area = 3.810 ac, 1.05% Impervious, Inflow Depth > 0.07" for 25 YEAR event
 Inflow = 0.03 cfs @ 15.59 hrs, Volume= 0.022 af
 Outflow = 0.03 cfs @ 15.59 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 15.59 hrs, Volume= 0.000 af
 Primary = 0.03 cfs @ 15.59 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 106.83' @ 15.59 hrs Surf.Area= 3 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 0.022 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (1,123.2 - 1,123.2)

Volume	Invert	Avail.Storage	Storage Description
#1	106.70'	27,689 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	13,756	642.0	7,373	8,679	32,810
110.30	17,209	672.0	4,635	13,314	35,953
111.00	24,054	812.0	14,375	27,689	52,494

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' S= 0.0139 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 15.59 hrs HW=106.83' (Free Discharge)

↑ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 15.59 hrs HW=106.83' TW=106.76' (Dynamic Tailwater)

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

↑ **2=Culvert** (Outlet Controls 0.03 cfs @ 0.76 fps)

Time span=0.00-25.00 hrs, dt=0.10 hrs, 251 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Existing Site	Runoff Area=0.960 ac 0.00% Impervious Runoff Depth=0.16" Flow Length=265' Tc=6.0 min CN=30 Runoff=0.02 cfs 0.013 af
Subcatchment 2Sa: Existing Site	Runoff Area=1.300 ac 9.23% Impervious Runoff Depth=0.47" Flow Length=300' Tc=2.8 min CN=36 Runoff=0.24 cfs 0.051 af
Subcatchment 2Sb: Existing Site	Runoff Area=0.400 ac 0.00% Impervious Runoff Depth=0.16" Flow Length=188' Tc=4.4 min CN=30 Runoff=0.01 cfs 0.005 af
Subcatchment 2Sc: Existing Site	Runoff Area=3.810 ac 1.05% Impervious Runoff Depth>0.25" Flow Length=800' Tc=15.0 min CN=32 Runoff=0.14 cfs 0.080 af
Subcatchment 3S: Existing Site	Runoff Area=0.310 ac 6.45% Impervious Runoff Depth=0.73" Flow Length=340' Tc=8.2 min CN=40 Runoff=0.12 cfs 0.019 af
Subcatchment 4S: Greendale Avenue	Runoff Area=0.040 ac 0.00% Impervious Runoff Depth=1.42" Flow Length=330' Tc=10.3 min CN=49 Runoff=0.04 cfs 0.005 af
Reach 1R: Low Point	Inflow=0.16 cfs 0.092 af Outflow=0.16 cfs 0.092 af
Reach 2R: Headwall	Avg. Flow Depth=0.11' Max Vel=2.52 fps Inflow=0.14 cfs 0.079 af 15.0" Round Pipe n=0.012 L=36.0' S=0.0139 ' Capacity=8.25 cfs Outflow=0.14 cfs 0.079 af
Reach 3R: Hardy Street	Inflow=0.12 cfs 0.019 af Outflow=0.12 cfs 0.019 af
Reach 4R: Catch Basin	Inflow=0.04 cfs 0.005 af Outflow=0.04 cfs 0.005 af
Pond 1D: Depression 1	Peak Elev=120.87' Storage=202 cf Inflow=0.24 cfs 0.051 af Discarded=0.12 cfs 0.051 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.051 af
Pond 2D: Depression 2	Peak Elev=120.69' Storage=1 cf Inflow=0.01 cfs 0.005 af Discarded=0.01 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af
Pond 3D: Depression 3	Peak Elev=106.93' Storage=1 cf Inflow=0.14 cfs 0.080 af Discarded=0.00 cfs 0.001 af Primary=0.14 cfs 0.079 af Outflow=0.14 cfs 0.080 af
Total Runoff Area = 6.820 ac Runoff Volume = 0.174 af Average Runoff Depth = 0.31"	
97.36% Pervious = 6.640 ac 2.64% Impervious = 0.180 ac	

Summary for Subcatchment 1S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.02 cfs @ 14.72 hrs, Volume= 0.013 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.960	30	Woods, Good, HSG A
0.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
0.7	115	0.3000	2.74		Shallow Concentrated Flow, Forest Woodland $K_v=5.0$ fps
2.2	130	0.0380	0.97		Shallow Concentrated Flow, Forest Woodland $K_v=5.0$ fps
6.0	265	Total			

Summary for Subcatchment 2Sa: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.24 cfs @ 12.31 hrs, Volume= 0.051 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs

Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.120	98	Pavement/Roof
1.180	30	Woods, Good, HSG A
1.300	36	Weighted Average
1.180		90.77% Pervious Area
0.120		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		Sheet Flow, Driveway Smooth surfaces $n=0.011$ $P2=3.20"$
0.2	55	0.0500	4.54		Shallow Concentrated Flow, Driveway Paved $K_v=20.3$ fps
1.9	195	0.1150	1.70		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
2.8	300	Total			

Summary for Subcatchment 2Sb: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.01 cfs @ 14.70 hrs, Volume= 0.005 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.400	30	Woods, Good, HSG A
0.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	20	0.1000	0.11		Sheet Flow, Woodland Woods: Light underbrush $n=0.400$ $P2=3.20"$
1.3	168	0.2000	2.24		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
4.4	188	Total			

Summary for Subcatchment 2Sc: Existing Site

Runoff = 0.14 cfs @ 12.97 hrs, Volume= 0.080 af, Depth> 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.040	98	Pavement/Roof
3.570	30	Woods, Good, HSG A
0.200	49	50-75% Grass cover, Fair, HSG A
3.810	32	Weighted Average
3.770		98.95% Pervious Area
0.040		1.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0250	1.36		Sheet Flow, Driveway Smooth surfaces $n=0.011$ $P2=3.20"$
4.0	400	0.1130	1.68		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
10.3	340	0.0120	0.55		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
15.0	800	Total			

Summary for Subcatchment 3S: Existing Site[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.12 cfs @ 12.25 hrs, Volume= 0.019 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.020	98	Pavement/Roof
0.200	30	Woods, Good, HSG A
0.090	49	50-75% Grass cover, Fair, HSG A
0.310	40	Weighted Average
0.290		93.55% Pervious Area
0.020		6.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short $n=0.150$ $P2=3.20"$
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland $K_v=5.0$ fps
8.2	340	Total			

Summary for Subcatchment 4S: Greendale Avenue[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.04 cfs @ 12.20 hrs, Volume= 0.005 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.10$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.040	49	50-75% Grass cover, Fair, HSG A
0.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	30	0.0200	0.06		Sheet Flow, Overland Woods: Light underbrush $n=0.400$ $P2=3.20"$
2.1	300	0.0140	2.40		Shallow Concentrated Flow, Gutter Paved $K_v=20.3$ fps
10.3	330	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.470 ac, 2.47% Impervious, Inflow Depth > 0.17" for 100 YEAR event
Inflow = 0.16 cfs @ 13.75 hrs, Volume= 0.092 af
Outflow = 0.16 cfs @ 13.75 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 5.510 ac, 2.90% Impervious, Inflow Depth > 0.17" for 100 YEAR event
Inflow = 0.14 cfs @ 12.97 hrs, Volume= 0.079 af
Outflow = 0.14 cfs @ 12.97 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Max. Velocity= 2.52 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 2.04 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2 cf @ 12.97 hrs

Average Depth at Peak Storage= 0.11'

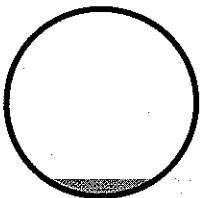
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 1'

Inlet Invert= 106.70', Outlet Invert= 106.20'

**Summary for Reach 3R: Hardy Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.310 ac, 6.45% Impervious, Inflow Depth = 0.73" for 100 YEAR event
Inflow = 0.12 cfs @ 12.25 hrs, Volume= 0.019 af
Outflow = 0.12 cfs @ 12.25 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.040 ac, 0.00% Impervious, Inflow Depth = 1.42" for 100 YEAR event
 Inflow = 0.04 cfs @ 12.20 hrs, Volume= 0.005 af
 Outflow = 0.04 cfs @ 12.20 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Summary for Pond 1D: Depression 1

Inflow Area = 1.300 ac, 9.23% Impervious, Inflow Depth = 0.47" for 100 YEAR event
 Inflow = 0.24 cfs @ 12.31 hrs, Volume= 0.051 af
 Outflow = 0.12 cfs @ 12.72 hrs, Volume= 0.051 af, Atten= 51%, Lag= 24.8 min
 Discarded = 0.12 cfs @ 12.72 hrs, Volume= 0.051 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 120.87' @ 12.72 hrs Surf.Area= 610 sf Storage= 202 cf

Plug-Flow detention time= 21.2 min calculated for 0.051 af (100% of inflow)

Center-of-Mass det. time= 21.2 min (981.7 - 960.6)

Volume	Invert	Avail.Storage	Storage Description
#1	119.90'	1,999 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)
119.90	0	0.0	0	0	0
120.00	9	17.0	0	0	23
121.00	777	122.0	290	290	1,187
121.80	2,318	211.0	1,183	1,473	3,549
122.00	2,946	229.0	525	1,999	4,181

Device	Routing	Invert	Outlet Devices
#1	Primary	121.80'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	119.90'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.12 cfs @ 12.72 hrs HW=120.87' (Free Discharge)↑ **2=Exfiltration** (Exfiltration Controls 0.12 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=119.90' TW=120.60' (Dynamic Tailwater)↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2D: Depression 2

Inflow Area = 1.700 ac, 7.06% Impervious, Inflow Depth = 0.04" for 100 YEAR event
 Inflow = 0.01 cfs @ 14.70 hrs, Volume= 0.005 af
 Outflow = 0.01 cfs @ 14.76 hrs, Volume= 0.005 af, Atten= 0%, Lag= 4.1 min
 Discarded = 0.01 cfs @ 14.76 hrs, Volume= 0.005 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 120.69' @ 14.76 hrs Surf.Area= 46 sf Storage= 1 cf

Plug-Flow detention time= 2.3 min calculated for 0.005 af (100% of inflow)

Center-of-Mass det. time= 2.4 min (1,055.6 - 1,053.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	120.60'	2,684 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)
120.60	0	0.0	0	0	0
121.00	828	126.0	110	110	1,264
121.10	1,705	182.0	124	234	2,636
122.00	3,885	286.0	2,449	2,684	6,515

Device	Routing	Invert	Outlet Devices
#1	Primary	121.10'	7.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	120.60'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 14.76 hrs HW=120.69' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=120.60' TW=106.70' (Dynamic Tailwater)

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

Summary for Pond 3D: Depression 3

Inflow Area = 3.810 ac, 1.05% Impervious, Inflow Depth > 0.25" for 100 YEAR event
 Inflow = 0.14 cfs @ 12.97 hrs, Volume= 0.080 af
 Outflow = 0.14 cfs @ 12.97 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.2 min
 Discarded = 0.00 cfs @ 12.97 hrs, Volume= 0.001 af
 Primary = 0.14 cfs @ 12.97 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.10 hrs / 2

Peak Elev= 106.93' @ 12.97 hrs Surf.Area= 8 sf Storage= 1 cf

Plug-Flow detention time= 0.1 min calculated for 0.080 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (1,023.7 - 1,023.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	106.70'	27,689 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	13,756	642.0	7,373	8,679	32,810
110.30	17,209	672.0	4,635	13,314	35,953
111.00	24,054	812.0	14,375	27,689	52,494

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' S= 0.0139 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

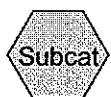
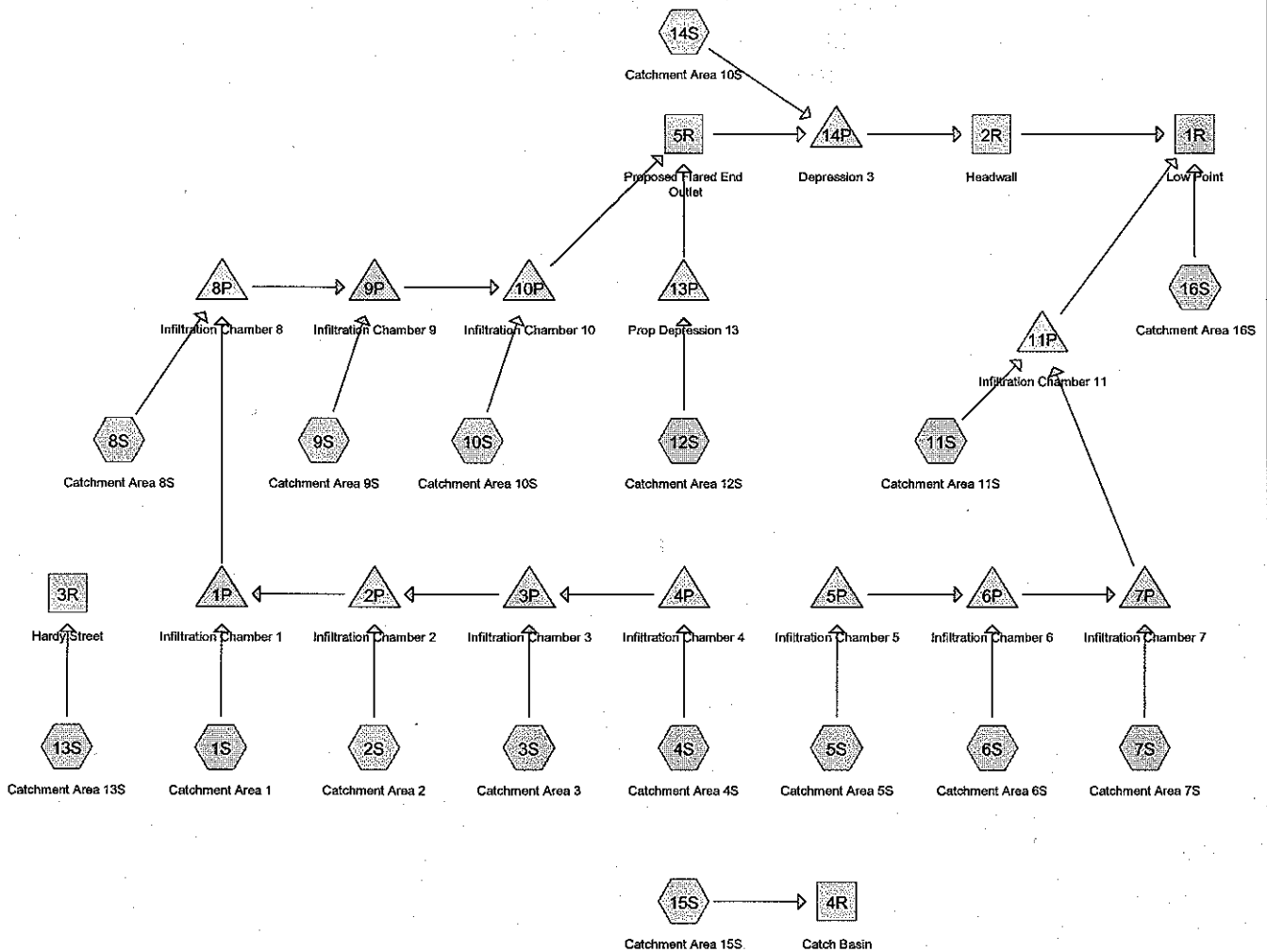
Discarded OutFlow Max=0.00 cfs @ 12.97 hrs HW=106.93' (Free Discharge)

↑ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.14 cfs @ 12.97 hrs HW=106.93' TW=106.81' (Dynamic Tailwater)

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

↑ **2=Culvert** (Outlet Controls 0.14 cfs @ 1.32 fps)



Routing Diagram for 143-82806-13003_PC-WATERSHED-rev5
 Prepared by Tetra Tech, Printed 9/30/2013
 HydroCAD® 10.00 s/n 05923 © 2012 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.540	39	>75% Grass cover, Good, HSG A (1S, 3S, 5S, 6S, 8S, 10S, 11S, 12S, 15S)
1.740	98	Pavement (1S, 3S, 5S, 6S, 8S, 10S, 11S)
2.210	98	Roof (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 11S)
1.330	30	Woods, Good, HSG A (13S, 14S, 16S)
6.820	71	TOTAL AREA

Time span=0.00-25.00 hrs, dt=0.05 hrs, 501 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Catchment Area 1	Runoff Area=0.470 ac 59.57% Impervious Runoff Depth=1.04" Tc=5.0 min CN=74 Runoff=0.55 cfs 0.041 af
Subcatchment 2S: Catchment Area 2	Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=2.97" Tc=5.0 min CN=98 Runoff=0.50 cfs 0.040 af
Subcatchment 3S: Catchment Area 3	Runoff Area=0.420 ac 69.05% Impervious Runoff Depth=1.40" Tc=5.0 min CN=80 Runoff=0.69 cfs 0.049 af
Subcatchment 4S: Catchment Area 4S	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=2.97" Tc=5.0 min CN=98 Runoff=0.88 cfs 0.069 af
Subcatchment 5S: Catchment Area 5S	Runoff Area=0.610 ac 75.41% Impervious Runoff Depth=1.61" Tc=5.0 min CN=83 Runoff=1.15 cfs 0.082 af
Subcatchment 6S: Catchment Area 6S	Runoff Area=0.370 ac 81.08% Impervious Runoff Depth=1.91" Tc=5.0 min CN=87 Runoff=0.83 cfs 0.059 af
Subcatchment 7S: Catchment Area 7S	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=2.97" Tc=5.0 min CN=98 Runoff=0.16 cfs 0.012 af
Subcatchment 8S: Catchment Area 8S	Runoff Area=0.860 ac 62.79% Impervious Runoff Depth=1.15" Tc=5.0 min CN=76 Runoff=1.13 cfs 0.083 af
Subcatchment 9S: Catchment Area 9S	Runoff Area=0.500 ac 100.00% Impervious Runoff Depth=2.97" Tc=5.0 min CN=98 Runoff=1.56 cfs 0.124 af
Subcatchment 10S: Catchment Area 10S	Runoff Area=0.610 ac 80.33% Impervious Runoff Depth=1.84" Tc=5.0 min CN=86 Runoff=1.31 cfs 0.093 af
Subcatchment 11S: Catchment Area 11S	Runoff Area=0.680 ac 88.24% Impervious Runoff Depth=2.26" Tc=5.0 min CN=91 Runoff=1.78 cfs 0.128 af
Subcatchment 12S: Catchment Area 12S	Runoff Area=0.430 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=280' Tc=3.5 min CN=39 Runoff=0.00 cfs 0.000 af
Subcatchment 13S: Catchment Area 13S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 14S: Catchment Area 10S	Runoff Area=0.790 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 15S: Catchment Area 15S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=340' Tc=8.2 min CN=39 Runoff=0.00 cfs 0.000 af
Subcatchment 16S: Catchment Area 16S	Runoff Area=0.490 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=115' Tc=18.1 min CN=30 Runoff=0.00 cfs 0.000 af

Reach 1R: Low PointInflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 2R: Headwall**Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
15.0" Round Pipe n=0.012 L=36.0' S=0.0139 '/' Capacity=8.25 cfs Outflow=0.00 cfs 0.000 af**Reach 3R: Hardy Street**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 4R: Catch Basin**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 5R: Proposed Flared End Outlet**Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=90.0' S=0.0367 '/' Capacity=47.44 cfs Outflow=0.00 cfs 0.000 af**Pond 1P: Infiltration Chamber 1**Peak Elev=138.18' Storage=263 cf Inflow=0.55 cfs 0.041 af
Discarded=0.18 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.041 af**Pond 2P: Infiltration Chamber 2**Peak Elev=139.46' Storage=395 cf Inflow=0.50 cfs 0.040 af
Discarded=0.10 cfs 0.040 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.040 af**Pond 3P: Infiltration Chamber 3**Peak Elev=139.54' Storage=413 cf Inflow=0.69 cfs 0.049 af
Discarded=0.18 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.049 af**Pond 4P: Infiltration Chamber 4**Peak Elev=140.55' Storage=720 cf Inflow=0.88 cfs 0.069 af
Discarded=0.16 cfs 0.069 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.069 af**Pond 5P: Infiltration Chamber 5**Peak Elev=135.38' Storage=879 cf Inflow=1.15 cfs 0.082 af
Discarded=0.23 cfs 0.082 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.082 af**Pond 6P: Infiltration Chamber 6**Peak Elev=134.76' Storage=592 cf Inflow=0.83 cfs 0.059 af
Discarded=0.18 cfs 0.059 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.059 af**Pond 7P: Infiltration Chamber 7**Peak Elev=133.24' Storage=39 cf Inflow=0.16 cfs 0.012 af
Discarded=0.08 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.012 af**Pond 8P: Infiltration Chamber 8**Peak Elev=121.94' Storage=639 cf Inflow=1.13 cfs 0.083 af
Discarded=0.33 cfs 0.083 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.083 af**Pond 9P: Infiltration Chamber 9**Peak Elev=119.34' Storage=1,178 cf Inflow=1.56 cfs 0.124 af
Discarded=0.33 cfs 0.124 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.124 af**Pond 10P: Infiltration Chamber 10**Peak Elev=108.17' Storage=881 cf Inflow=1.31 cfs 0.093 af
Discarded=0.31 cfs 0.093 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.093 af**Pond 11P: Infiltration Chamber 11**Peak Elev=110.89' Storage=1,367 cf Inflow=1.78 cfs 0.128 af
Discarded=0.36 cfs 0.128 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.128 af**Pond 13P: Prop Depression 13**Peak Elev=111.51' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 14P: Depression 3

Peak Elev=106.70' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 6.820 ac Runoff Volume = 0.779 af Average Runoff Depth = 1.37"
42.08% Pervious = 2.870 ac 57.92% Impervious = 3.950 ac

Summary for Subcatchment 1S: Catchment Area 1[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.041 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.170	98	Roof
0.190	39	>75% Grass cover, Good, HSG A
* 0.110	98	Pavement
0.470	74	Weighted Average
0.190		40.43% Pervious Area
0.280		59.57% Impervious Area

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

Summary for Subcatchment 2S: Catchment Area 2[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.160	98	Roof
0.160		100.00% Impervious Area

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

Summary for Subcatchment 3S: Catchment Area 3[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.69 cfs @ 12.08 hrs, Volume= 0.049 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.130	39	>75% Grass cover, Good, HSG A
* 0.050	98	Roof
* 0.240	98	Pavement
0.420	80	Weighted Average
0.130		30.95% Pervious Area
0.290		69.05% Impervious Area

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

Summary for Subcatchment 4S: Catchment Area 4S

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

Runoff = 0.88 cfs @ 12.07 hrs, Volume= 0.069 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.280	98	Roof
0.280		100.00% Impervious Area

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

Summary for Subcatchment 5S: Catchment Area 5S

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

Runoff = 1.15 cfs @ 12.08 hrs, Volume= 0.082 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.230	98	Pavement
0.150	39	>75% Grass cover, Good, HSG A
* 0.230	98	Roof
0.610	83	Weighted Average
0.150		24.59% Pervious Area
0.460		75.41% Impervious Area

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

Summary for Subcatchment 6S: Catchment Area 6S

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

Runoff = 0.83 cfs @ 12.08 hrs, Volume= 0.059 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.110	98	Pavement
0.070	39	>75% Grass cover, Good, HSG A
* 0.190	98	Roof
0.370	87	Weighted Average
0.070		18.92% Pervious Area
0.300		81.08% Impervious Area

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

Summary for Subcatchment 7S: Catchment Area 7S

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

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 0.012 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.050	98	Roof
0.050		100.00% Impervious Area

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

Summary for Subcatchment 8S: Catchment Area 8S

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

Runoff = 1.13 cfs @ 12.08 hrs, Volume= 0.083 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
* 0.370	98	Pavement
* 0.170	98	Roof
0.860	76	Weighted Average
0.320		37.21% Pervious Area
0.540		62.79% Impervious Area

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

Summary for Subcatchment 9S: Catchment Area 9S

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

Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.124 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
* 0.500	98	Roof
0.500		100.00% Impervious Area

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

Summary for Subcatchment 10S: Catchment Area 10S

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

Runoff = 1.31 cfs @ 12.08 hrs, Volume= 0.093 af, Depth= 1.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.120	39	>75% Grass cover, Good, HSG A
* 0.490	98	Pavement
0.610	86	Weighted Average
0.120		19.67% Pervious Area
0.490		80.33% Impervious Area

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

Summary for Subcatchment 11S: Catchment Area 11S

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

Runoff = 1.78 cfs @ 12.07 hrs, Volume= 0.128 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
* 0.190	98	Pavement
* 0.410	98	Roof
0.680	91	Weighted Average
0.080		11.76% Pervious Area
0.600		88.24% Impervious Area

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

Summary for Subcatchment 12S: Catchment Area 12S

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

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.430	39	>75% Grass cover, Good, HSG A
0.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.3600	0.47		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
1.7	230	0.1060	2.28		Shallow Concentrated Flow, Overland Existing Sewer Short Grass Pasture Kv= 7.0 fps
3.5	280	Total			

Summary for Subcatchment 13S: Catchment Area 13S

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 14S: Catchment Area 10S

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.790	30	Woods, Good, HSG A
0.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 15S: Catchment Area 15S

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 16S: Catchment Area 16S

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 YEAR Rainfall=3.20"

Area (ac)	CN	Description
0.490	30	Woods, Good, HSG A
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	65	0.0150	0.61		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
18.1	115	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.720 ac, 58.78% Impervious, Inflow Depth = 0.00" for 2 YEAR event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

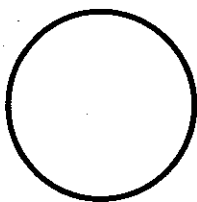
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 1'

Inlet Invert= 106.70', Outlet Invert= 106.20'

**Summary for Reach 3R: Hardy Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 5R: Proposed Flared End Outlet

Inflow Area = 3.730 ac, 68.10% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 47.44 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding

Length= 90.0' Slope= 0.0367 ' /'

Inlet Invert= 110.00', Outlet Invert= 106.70'

**Summary for Pond 1P: Infiltration Chamber 1**

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.330 ac, 75.94% Impervious, Inflow Depth = 0.37" for 2 YEAR event
 Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.041 af
 Outflow = 0.18 cfs @ 12.05 hrs, Volume= 0.041 af, Atten= 66%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 12.05 hrs, Volume= 0.041 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 138.18' @ 12.44 hrs Surf.Area= 960 sf Storage= 263 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 7.0 min (868.1 - 861.1)

Volume	Invert	Avail.Storage	Storage Description
#1	137.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	138.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	12.0" Round Pipe L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 141.40' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	137.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 12.05 hrs HW=137.64' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.50' TW=121.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Chamber 2

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.860 ac, 84.88% Impervious, Inflow Depth = 0.55" for 2 YEAR event
 Inflow = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af
 Outflow = 0.10 cfs @ 11.80 hrs, Volume= 0.040 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 11.80 hrs, Volume= 0.040 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 139.46' @ 12.50 hrs Surf.Area= 512 sf Storage= 395 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 20.1 min (775.6 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	905 cf	16.00'W x 32.00'L x 6.50'H Crushed Stone 3,328 cf Overall - 1,066 cf Embedded = 2,262 cf x 40.0% Voids
#2	139.00'	1,066 cf	Cultec R-900HD x 8 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		1,971 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.00'	12.0" Round Pipe L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 142.00' / 141.80' S= 0.0200 ' S= 0.0200 ' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.10 cfs @ 11.80 hrs HW=138.07' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=137.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 3P: Infiltration Chamber 3

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.700 ac, 81.43% Impervious, Inflow Depth = 0.84" for 2 YEAR event
 Inflow = 0.69 cfs @ 12.08 hrs, Volume= 0.049 af
 Outflow = 0.18 cfs @ 12.00 hrs, Volume= 0.049 af, Atten= 73%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 12.00 hrs, Volume= 0.049 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 139.54' @ 12.47 hrs Surf.Area= 960 sf Storage= 413 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (853.6 - 841.8)

Volume	Invert	Avail.Storage	Storage Description
#1	138.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	139.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 142.50' / 142.40' S= 0.0100 1' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 12.00 hrs HW=138.62' (Free Discharge)
 ↑2=Exfiltration (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.50' TW=138.00' (Dynamic Tailwater)
 ↑1=Pipe (Controls 0.00 cfs)

Summary for Pond 4P: Infiltration Chamber 4

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.280 ac, 100.00% Impervious, Inflow Depth = 2.97" for 2 YEAR event
 Inflow = 0.88 cfs @ 12.07 hrs, Volume= 0.069 af
 Outflow = 0.16 cfs @ 11.80 hrs, Volume= 0.069 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 11.80 hrs, Volume= 0.069 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 140.55' @ 12.51 hrs Surf.Area= 848 sf Storage= 720 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 22.6 min (778.1 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	139.00'	1,483 cf	16.00'W x 53.00'L x 6.50'H Crushed Stone 5,512 cf Overall - 1,806 cf Embedded = 3,706 cf x 40.0% Voids
#2	140.00'	1,806 cf	Cultec R-900HD x 14 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,288 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	143.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 143.00' / 142.90' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	139.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.16 cfs @ 11.80 hrs HW=139.09' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=139.00' TW=138.50' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 5P: Infiltration Chamber 5

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.610 ac, 75.41% Impervious, Inflow Depth = 1.61" for 2 YEAR event
 Inflow = 1.15 cfs @ 12.08 hrs, Volume= 0.082 af
 Outflow = 0.23 cfs @ 11.90 hrs, Volume= 0.082 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.23 cfs @ 11.90 hrs, Volume= 0.082 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 135.38' @ 12.53 hrs Surf.Area= 1,219 sf Storage= 879 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 22.2 min (854.2 - 832.0)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	2,086 cf	23.00'W x 53.00'L x 6.50'H Crushed Stone 7,923 cf Overall - 2,708 cf Embedded = 5,215 cf x 40.0% Voids
#2	135.00'	2,708 cf	Cultec R-900HD x 21 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		4,794 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 137.90' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	134.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.23 cfs @ 11.90 hrs HW=134.08' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.00' TW=133.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Chamber 6

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.980 ac, 77.55% Impervious, Inflow Depth = 0.72" for 2 YEAR event
 Inflow = 0.83 cfs @ 12.08 hrs, Volume= 0.059 af
 Outflow = 0.18 cfs @ 11.90 hrs, Volume= 0.059 af, Atten= 78%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.90 hrs, Volume= 0.059 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 134.76' @ 12.50 hrs Surf.Area= 960 sf Storage= 592 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 17.8 min (835.7 - 817.9)

Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	134.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.30' S= 0.0200 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.90 hrs HW=133.58' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.50' TW=133.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 7P: Infiltration Chamber 7

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.030 ac, 78.64% Impervious, Inflow Depth = 0.14" for 2 YEAR event
 Inflow = 0.16 cfs @ 12.07 hrs, Volume= 0.012 af
 Outflow = 0.08 cfs @ 12.05 hrs, Volume= 0.012 af, Atten= 51%, Lag= 0.0 min
 Discarded = 0.08 cfs @ 12.05 hrs, Volume= 0.012 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 133.24' @ 12.22 hrs Surf.Area= 400 sf Storage= 39 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 2.0 min (757.5 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	133.00'	712 cf	16.00'W x 25.00'L x 6.50'H Crushed Stone 2,600 cf Overall - 819 cf Embedded = 1,781 cf x 40.0% Voids
#2	134.00'	819 cf	Cultec R-900HD x 6 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		1,531 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.00' / 136.90' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.08 cfs @ 12.05 hrs HW=133.08' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.00' TW=109.50' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 8P: Infiltration Chamber 8

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 2.190 ac, 70.78% Impervious, Inflow Depth = 0.45" for 2 YEAR event
 Inflow = 1.13 cfs @ 12.08 hrs, Volume= 0.083 af
 Outflow = 0.33 cfs @ 12.00 hrs, Volume= 0.083 af, Atten= 71%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 12.00 hrs, Volume= 0.083 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 121.94' @ 12.47 hrs Surf.Area= 1,702 sf Storage= 639 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 10.0 min (864.6 - 854.7)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	2,866 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,897 cf Embedded = 7,166 cf x 40.0% Voids
#2	122.00'	3,897 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 5 rows
		6,764 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 125.00' / 120.00' S= 0.5000 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	121.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 12.00 hrs HW=121.07' (Free Discharge)

↳ **2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=121.00' TW=118.00' (Dynamic Tailwater)

↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 9P: Infiltration Chamber 9

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	2.690 ac, 76.21% Impervious, Inflow Depth = 0.55" for 2 YEAR event
Inflow =	1.56 cfs @ 12.07 hrs, Volume= 0.124 af
Outflow =	0.33 cfs @ 11.85 hrs, Volume= 0.124 af, Atten= 79%, Lag= 0.0 min
Discarded =	0.33 cfs @ 11.85 hrs, Volume= 0.124 af
Primary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 119.34' @ 12.48 hrs Surf.Area= 1,702 sf Storage= 1,178 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 17.7 min (773.2 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	118.00'	2,898 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,818 cf Embedded = 7,245 cf x 40.0% Voids
#2	119.00'	3,818 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,716 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	122.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 122.00' / 121.90' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	118.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.85 hrs HW=118.11' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=118.00' TW=107.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 10P: Infiltration Chamber 10

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 3.300 ac, 76.97% Impervious, Inflow Depth = 0.34" for 2 YEAR event
 Inflow = 1.31 cfs @ 12.08 hrs, Volume= 0.093 af
 Outflow = 0.31 cfs @ 11.95 hrs, Volume= 0.093 af, Atten= 76%, Lag= 0.0 min
 Discarded = 0.31 cfs @ 11.95 hrs, Volume= 0.093 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 108.17' @ 12.48 hrs Surf.Area= 1,632 sf Storage= 881 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 15.2 min (836.8 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	2,815 cf	16.00'W x 102.00'L x 6.50'H Crushed Stone 10,608 cf Overall - 3,571 cf Embedded = 7,037 cf x 40.0% Voids
#2	108.00'	3,571 cf	Cultec R-900HD x 28 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,386 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	111.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 111.00' / 110.90' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	107.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.31 cfs @ 11.95 hrs HW=107.11' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=107.00' TW=110.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 11P: Infiltration Chamber 11

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.710 ac, 82.46% Impervious, Inflow Depth = 0.90" for 2 YEAR event
 Inflow = 1.78 cfs @ 12.07 hrs, Volume= 0.128 af
 Outflow = 0.36 cfs @ 11.85 hrs, Volume= 0.128 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.36 cfs @ 11.85 hrs, Volume= 0.128 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 110.89' @ 12.51 hrs Surf.Area= 1,863 sf Storage= 1,367 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 21.3 min (822.9 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	3,169 cf	23.00'W x 81.00'L x 6.50'H Crushed Stone 12,110 cf Overall - 4,188 cf Embedded = 7,922 cf x 40.0% Voids
#2	110.50'	4,188 cf	Cultec R-900HD x 33 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		7,357 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 113.40' S= 0.0100 ' / ' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	109.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.36 cfs @ 11.85 hrs HW=109.58' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=109.50' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 13P: Prop Depression 13

Inflow Area = 0.430 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 111.51' @ 24.00 hrs Surf.Area= 1 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.2 min (1,394.5 - 1,394.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	111.50'	15,610 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)
111.50	0	0.0	0	0	0
112.00	1,579	207.0	263	263	3,410
113.00	2,783	261.0	2,153	2,416	5,435
114.00	3,800	293.0	3,278	5,694	6,873
115.00	4,953	329.0	4,364	10,058	8,681
116.00	6,174	366.0	5,552	15,610	10,757

Device	Routing	Invert	Outlet Devices											
#1	Primary	115.50'	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											
#2	Discarded	111.50'	8.270 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.00 cfs @ 24.00 hrs HW=111.51' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=111.50' TW=110.00' (Dynamic Tailwater)

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

Summary for Pond 14P: Depression 3

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.00" for 2 YEAR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 106.70' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description	
#1	106.70'	8,941 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	3,920	373.0	3,183	4,489	11,139
110.30	4,206	399.0	1,219	5,707	12,740
111.00	5,045	460.0	3,233	8,941	16,921

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=106.70' (Free Discharge)

↑ **3=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=106.70' TW=106.70' (Dynamic Tailwater)

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

↑ **2=Culvert** (Controls 0.00 cfs)

Time span=0.00-25.00 hrs, dt=0.05 hrs, 501 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Catchment Area 1	Runoff Area=0.470 ac 59.57% Impervious Runoff Depth=2.13" Tc=5.0 min CN=74 Runoff=1.17 cfs 0.083 af
Subcatchment 2S: Catchment Area 2	Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=4.46" Tc=5.0 min CN=98 Runoff=0.74 cfs 0.060 af
Subcatchment 3S: Catchment Area 3	Runoff Area=0.420 ac 69.05% Impervious Runoff Depth=2.63" Tc=5.0 min CN=80 Runoff=1.30 cfs 0.092 af
Subcatchment 4S: Catchment Area 4S	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=4.46" Tc=5.0 min CN=98 Runoff=1.29 cfs 0.104 af
Subcatchment 5S: Catchment Area 5S	Runoff Area=0.610 ac 75.41% Impervious Runoff Depth=2.90" Tc=5.0 min CN=83 Runoff=2.07 cfs 0.148 af
Subcatchment 6S: Catchment Area 6S	Runoff Area=0.370 ac 81.08% Impervious Runoff Depth=3.29" Tc=5.0 min CN=87 Runoff=1.41 cfs 0.101 af
Subcatchment 7S: Catchment Area 7S	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=4.46" Tc=5.0 min CN=98 Runoff=0.23 cfs 0.019 af
Subcatchment 8S: Catchment Area 8S	Runoff Area=0.860 ac 62.79% Impervious Runoff Depth=2.29" Tc=5.0 min CN=76 Runoff=2.31 cfs 0.164 af
Subcatchment 9S: Catchment Area 9S	Runoff Area=0.500 ac 100.00% Impervious Runoff Depth=4.46" Tc=5.0 min CN=98 Runoff=2.31 cfs 0.186 af
Subcatchment 10S: Catchment Area 10S	Runoff Area=0.610 ac 80.33% Impervious Runoff Depth=3.19" Tc=5.0 min CN=86 Runoff=2.27 cfs 0.162 af
Subcatchment 11S: Catchment Area 11S	Runoff Area=0.680 ac 88.24% Impervious Runoff Depth=3.69" Tc=5.0 min CN=91 Runoff=2.85 cfs 0.209 af
Subcatchment 12S: Catchment Area 12S	Runoff Area=0.430 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=280' Tc=3.5 min CN=39 Runoff=0.01 cfs 0.005 af
Subcatchment 13S: Catchment Area 13S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 14S: Catchment Area 10S	Runoff Area=0.790 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 15S: Catchment Area 15S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=340' Tc=8.2 min CN=39 Runoff=0.00 cfs 0.001 af
Subcatchment 16S: Catchment Area 16S	Runoff Area=0.490 ac 0.00% Impervious Runoff Depth>0.00" Flow Length=115' Tc=18.1 min CN=30 Runoff=0.00 cfs 0.000 af

Reach 1R: Low PointInflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 2R: Headwall**Avg. Flow Depth=0.00' Max Vel=0.60 fps Inflow=0.00 cfs 0.000 af
15.0" Round Pipe n=0.012 L=36.0' S=0.0139 '/' Capacity=8.25 cfs Outflow=0.00 cfs 0.000 af**Reach 3R: Hardy Street**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 4R: Catch Basin**Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af**Reach 5R: Proposed Flared End Outlet**Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=90.0' S=0.0367 '/' Capacity=47.44 cfs Outflow=0.00 cfs 0.000 af**Pond 1P: Infiltration Chamber 1**Peak Elev=139.34' Storage=1,047 cf Inflow=1.17 cfs 0.083 af
Discarded=0.18 cfs 0.083 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.083 af**Pond 2P: Infiltration Chamber 2**Peak Elev=140.30' Storage=739 cf Inflow=0.74 cfs 0.060 af
Discarded=0.10 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.060 af**Pond 3P: Infiltration Chamber 3**Peak Elev=140.59' Storage=1,237 cf Inflow=1.30 cfs 0.092 af
Discarded=0.18 cfs 0.092 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.092 af**Pond 4P: Infiltration Chamber 4**Peak Elev=141.44' Storage=1,328 cf Inflow=1.29 cfs 0.104 af
Discarded=0.16 cfs 0.104 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.104 af**Pond 5P: Infiltration Chamber 5**Peak Elev=136.72' Storage=2,211 cf Inflow=2.07 cfs 0.148 af
Discarded=0.23 cfs 0.148 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.148 af**Pond 6P: Infiltration Chamber 6**Peak Elev=135.80' Storage=1,400 cf Inflow=1.41 cfs 0.101 af
Discarded=0.18 cfs 0.102 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.102 af**Pond 7P: Infiltration Chamber 7**Peak Elev=133.67' Storage=106 cf Inflow=0.23 cfs 0.019 af
Discarded=0.08 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.019 af**Pond 8P: Infiltration Chamber 8**Peak Elev=123.05' Storage=2,198 cf Inflow=2.31 cfs 0.164 af
Discarded=0.33 cfs 0.164 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.164 af**Pond 9P: Infiltration Chamber 9**Peak Elev=120.10' Storage=2,241 cf Inflow=2.31 cfs 0.186 af
Discarded=0.33 cfs 0.186 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.186 af**Pond 10P: Infiltration Chamber 10**Peak Elev=109.14' Storage=2,186 cf Inflow=2.27 cfs 0.162 af
Discarded=0.31 cfs 0.162 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.162 af**Pond 11P: Infiltration Chamber 11**Peak Elev=111.88' Storage=2,887 cf Inflow=2.85 cfs 0.209 af
Discarded=0.36 cfs 0.210 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.210 af**Pond 13P: Prop Depression 13**Peak Elev=111.58' Storage=1 cf Inflow=0.01 cfs 0.005 af
Discarded=0.01 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af

Pond 14P: Depression 3

Peak Elev=106.71' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 6.820 ac Runoff Volume = 1.334 af Average Runoff Depth = 2.35"
42.08% Pervious = 2.870 ac 57.92% Impervious = 3.950 ac

Summary for Subcatchment 1S: Catchment Area 1[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.17 cfs @ 12.08 hrs, Volume= 0.083 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.170	98	Roof
0.190	39	>75% Grass cover, Good, HSG A
* 0.110	98	Pavement
0.470	74	Weighted Average
0.190		40.43% Pervious Area
0.280		59.57% Impervious Area

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

Summary for Subcatchment 2S: Catchment Area 2[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.74 cfs @ 12.07 hrs, Volume= 0.060 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.160	98	Roof
0.160		100.00% Impervious Area

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

Summary for Subcatchment 3S: Catchment Area 3[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.092 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.130	39	>75% Grass cover, Good, HSG A
* 0.050	98	Roof
* 0.240	98	Pavement
0.420	80	Weighted Average
0.130		30.95% Pervious Area
0.290		69.05% Impervious Area

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

Summary for Subcatchment 4S: Catchment Area 4S

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

Runoff = 1.29 cfs @ 12.07 hrs, Volume= 0.104 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.280	98	Roof
0.280		100.00% Impervious Area

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

Summary for Subcatchment 5S: Catchment Area 5S

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

Runoff = 2.07 cfs @ 12.08 hrs, Volume= 0.148 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.230	98	Pavement
0.150	39	>75% Grass cover, Good, HSG A
* 0.230	98	Roof
0.610	83	Weighted Average
0.150		24.59% Pervious Area
0.460		75.41% Impervious Area

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

Summary for Subcatchment 6S: Catchment Area 6S

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

Runoff = 1.41 cfs @ 12.07 hrs, Volume= 0.101 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.110	98	Pavement
0.070	39	>75% Grass cover, Good, HSG A
* 0.190	98	Roof
0.370	87	Weighted Average
0.070		18.92% Pervious Area
0.300		81.08% Impervious Area

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

Summary for Subcatchment 7S: Catchment Area 7S

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

Runoff = 0.23 cfs @ 12.07 hrs, Volume= 0.019 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.050	98	Roof
0.050		100.00% Impervious Area

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

Summary for Subcatchment 8S: Catchment Area 8S

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

Runoff = 2.31 cfs @ 12.08 hrs, Volume= 0.164 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
* 0.370	98	Pavement
* 0.170	98	Roof
0.860	76	Weighted Average
0.320		37.21% Pervious Area
0.540		62.79% Impervious Area

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

Summary for Subcatchment 9S: Catchment Area 9S

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.31 cfs @ 12.07 hrs, Volume= 0.186 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
* 0.500	98	Roof
0.500		100.00% Impervious Area

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

Summary for Subcatchment 10S: Catchment Area 10S

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.27 cfs @ 12.07 hrs, Volume= 0.162 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.120	39	>75% Grass cover, Good, HSG A
* 0.490	98	Pavement
0.610	86	Weighted Average
0.120		19.67% Pervious Area
0.490		80.33% Impervious Area

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

Summary for Subcatchment 11S: Catchment Area 11S

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

Runoff = 2.85 cfs @ 12.07 hrs, Volume= 0.209 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
* 0.190	98	Pavement
* 0.410	98	Roof
0.680	91	Weighted Average
0.080		11.76% Pervious Area
0.600		88.24% Impervious Area

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

Summary for Subcatchment 12S: Catchment Area 12S

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

Runoff = 0.01 cfs @ 13.72 hrs, Volume= 0.005 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.430	39	>75% Grass cover, Good, HSG A
0.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.3600	0.47		Sheet Flow, Overland
					Grass: Short n= 0.150 P2= 3.20"
1.7	230	0.1060	2.28		Shallow Concentrated Flow, Overland Existing Sewer
					Short Grass Pasture Kv= 7.0 fps
3.5	280	Total			

Summary for Subcatchment 13S: Catchment Area 13S

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 14S: Catchment Area 10S

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.790	30	Woods, Good, HSG A
0.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 15S: Catchment Area 15S

Runoff = 0.00 cfs @ 13.79 hrs, Volume= 0.001 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 16S: Catchment Area 16S

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 24.09 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (ac)	CN	Description
0.490	30	Woods, Good, HSG A
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	65	0.0150	0.61		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
18.1	115	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.720 ac, 58.78% Impervious, Inflow Depth > 0.00" for 10 YEAR event
Inflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 2R: Headwall

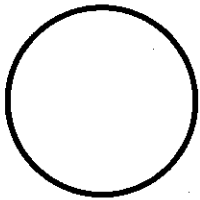
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.00" for 10 YEAR event
Inflow = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Max. Velocity= 0.60 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 0.60 fps, Avg. Travel Time= 1.0 min

Peak Storage= 0 cf @ 24.03 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe
 n= 0.012 Concrete pipe, finished
 Length= 36.0' Slope= 0.0139 '/
 Inlet Invert= 106.70', Outlet Invert= 106.20'



Summary for Reach 3R: Hardy Street

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10 YEAR event
 Inflow = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10 YEAR event
 Inflow = 0.00 cfs @ 13.79 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 13.79 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 5R: Proposed Flared End Outlet

Inflow Area = 3.730 ac, 68.10% Impervious, Inflow Depth = 0.00" for 10 YEAR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 47.44 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding

Length= 90.0' Slope= 0.0367 '/'

Inlet Invert= 110.00', Outlet Invert= 106.70'



Summary for Pond 1P: Infiltration Chamber 1

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.330 ac, 75.94% Impervious, Inflow Depth = 0.75" for 10 YEAR event
 Inflow = 1.17 cfs @ 12.08 hrs, Volume= 0.083 af
 Outflow = 0.18 cfs @ 11.85 hrs, Volume= 0.083 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.85 hrs, Volume= 0.083 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 139.34' @ 12.61 hrs Surf.Area= 960 sf Storage= 1,047 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 39.1 min (878.7 - 839.6)

Volume	Invert	Avail.Storage	Storage Description
#1	137.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	138.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	12.0" Round Pipe L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 141.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	137.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.85 hrs HW=137.58' (Free Discharge)

↑2=Exfiltration (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.50' TW=121.00' (Dynamic Tailwater)

↑1=Pipe (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Chamber 2

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.860 ac, 84.88% Impervious, Inflow Depth = 0.83" for 10 YEAR event
 Inflow = 0.74 cfs @ 12.07 hrs, Volume= 0.060 af
 Outflow = 0.10 cfs @ 11.70 hrs, Volume= 0.060 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 11.70 hrs, Volume= 0.060 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 140.30' @ 12.59 hrs Surf.Area= 512 sf Storage= 739 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 44.0 min (792.1 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	905 cf	16.00'W x 32.00'L x 6.50'H Crushed Stone 3,328 cf Overall - 1,066 cf Embedded = 2,262 cf x 40.0% Voids
#2	139.00'	1,066 cf	Cultec R-900HD x 8 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		1,971 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.00'	12.0" Round Pipe L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 142.00' / 141.80' S= 0.0200 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.10 cfs @ 11.70 hrs HW=138.08' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=137.50' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 3P: Infiltration Chamber 3

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.700 ac, 81.43% Impervious, Inflow Depth = 1.58" for 10 YEAR event
 Inflow = 1.30 cfs @ 12.08 hrs, Volume= 0.092 af
 Outflow = 0.18 cfs @ 11.80 hrs, Volume= 0.092 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.80 hrs, Volume= 0.092 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 140.59' @ 12.62 hrs Surf.Area= 960 sf Storage= 1,237 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 47.0 min (870.6 - 823.6)

Volume	Invert	Avail.Storage	Storage Description
#1	138.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	139.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 142.50' / 142.40' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.80 hrs HW=138.60' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.50' TW=138.00' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 4P: Infiltration Chamber 4

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.280 ac, 100.00% Impervious, Inflow Depth = 4.46" for 10 YEAR event
 Inflow = 1.29 cfs @ 12.07 hrs, Volume= 0.104 af
 Outflow = 0.16 cfs @ 11.70 hrs, Volume= 0.104 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 11.70 hrs, Volume= 0.104 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 141.44' @ 12.61 hrs Surf.Area= 848 sf Storage= 1,328 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 48.3 min (796.4 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	139.00'	1,483 cf	16.00'W x 53.00'L x 6.50'H Crushed Stone 5,512 cf Overall - 1,806 cf Embedded = 3,706 cf x 40.0% Voids
#2	140.00'	1,806 cf	Cultec R-900HD x 14 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,288 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	143.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 143.00' / 142.90' S= 0.0100 1' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	139.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.16 cfs @ 11.70 hrs HW=139.09' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=139.00' TW=138.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 5P: Infiltration Chamber 5

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.610 ac, 75.41% Impervious, Inflow Depth = 2.90" for 10 YEAR event
 Inflow = 2.07 cfs @ 12.08 hrs, Volume= 0.148 af
 Outflow = 0.23 cfs @ 11.75 hrs, Volume= 0.148 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.23 cfs @ 11.75 hrs, Volume= 0.148 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 136.72' @ 12.82 hrs Surf.Area= 1,219 sf Storage= 2,211 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 71.5 min (886.6 - 815.1)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	2,086 cf	23.00'W x 53.00'L x 6.50'H Crushed Stone 7,923 cf Overall - 2,708 cf Embedded = 5,215 cf x 40.0% Voids
#2	135.00'	2,708 cf	Cultec R-900HD x 21 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		4,794 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 137.90' S= 0.0100 1' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	134.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.23 cfs @ 11.75 hrs HW=134.12' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.00' TW=133.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Chamber 6

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.980 ac, 77.55% Impervious, Inflow Depth = 1.24" for 10 YEAR event
 Inflow = 1.41 cfs @ 12.07 hrs, Volume= 0.101 af
 Outflow = 0.18 cfs @ 11.75 hrs, Volume= 0.102 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.75 hrs, Volume= 0.102 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 135.80' @ 12.63 hrs Surf.Area= 960 sf Storage= 1,400 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 52.1 min (854.7 - 802.6)

Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	134.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.30' S= 0.0200 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.75 hrs HW=133.60' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.50' TW=133.00' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 7P: Infiltration Chamber 7

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.030 ac, 78.64% Impervious, Inflow Depth = 0.22" for 10 YEAR event
 Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.019 af
 Outflow = 0.08 cfs @ 12.00 hrs, Volume= 0.019 af, Atten= 67%, Lag= 0.0 min
 Discarded = 0.08 cfs @ 12.00 hrs, Volume= 0.019 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 133.67' @ 12.34 hrs Surf.Area= 400 sf Storage= 106 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 5.7 min (753.8 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	133.00'	712 cf	16.00'W x 25.00'L x 6.50'H Crushed Stone 2,600 cf Overall - 819 cf Embedded = 1,781 cf x 40.0% Voids
#2	134.00'	819 cf	Cultec R-900HD x 6 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
1,531 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.00' / 136.90' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.08 cfs @ 12.00 hrs HW=133.12' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.00' TW=109.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 8P: Infiltration Chamber 8

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 2.190 ac, 70.78% Impervious, Inflow Depth = 0.90" for 10 YEAR event
 Inflow = 2.31 cfs @ 12.08 hrs, Volume= 0.164 af
 Outflow = 0.33 cfs @ 11.80 hrs, Volume= 0.164 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 11.80 hrs, Volume= 0.164 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 123.05' @ 12.66 hrs Surf.Area= 1,702 sf Storage= 2,198 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 48.7 min (883.0 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	2,866 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,897 cf Embedded = 7,166 cf x 40.0% Voids
#2	122.00'	3,897 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 5 rows
6,764 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 125.00' / 120.00' S= 0.5000 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	121.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.80 hrs HW=121.07' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=121.00' TW=118.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 9P: Infiltration Chamber 9

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 2.690 ac, 76.21% Impervious, Inflow Depth = 0.83" for 10 YEAR event
 Inflow = 2.31 cfs @ 12.07 hrs, Volume= 0.186 af
 Outflow = 0.33 cfs @ 11.75 hrs, Volume= 0.186 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 11.75 hrs, Volume= 0.186 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 120.10' @ 12.57 hrs Surf.Area= 1,702 sf Storage= 2,241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 38.9 min (787.0 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	118.00'	2,898 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,818 cf Embedded = 7,245 cf x 40.0% Voids
#2	119.00'	3,818 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,716 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	122.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 122.00' / 121.90' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	118.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.75 hrs HW=118.13' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=118.00' TW=107.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 10P: Infiltration Chamber 10

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 3.300 ac, 76.97% Impervious, Inflow Depth = 0.59" for 10 YEAR event
 Inflow = 2.27 cfs @ 12.07 hrs, Volume= 0.162 af
 Outflow = 0.31 cfs @ 11.75 hrs, Volume= 0.162 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.31 cfs @ 11.75 hrs, Volume= 0.162 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 109.14' @ 12.61 hrs Surf.Area= 1,632 sf Storage= 2,186 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 46.9 min (852.7 - 805.9)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	2,815 cf	16.00'W x 102.00'L x 6.50'H Crushed Stone 10,608 cf Overall - 3,571 cf Embedded = 7,037 cf x 40.0% Voids
#2	108.00'	3,571 cf	Cultec R-900HD x 28 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,386 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	111.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 111.00' / 110.90' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	107.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.31 cfs @ 11.75 hrs HW=107.07' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=107.00' TW=110.00' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 11P: Infiltration Chamber 11

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.710 ac, 82.46% Impervious, Inflow Depth = 1.47" for 10 YEAR event
 Inflow = 2.85 cfs @ 12.07 hrs, Volume= 0.209 af
 Outflow = 0.36 cfs @ 11.75 hrs, Volume= 0.210 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.36 cfs @ 11.75 hrs, Volume= 0.210 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 111.88' @ 12.63 hrs Surf.Area= 1,863 sf Storage= 2,887 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 53.8 min (841.8 - 788.0)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	3,169 cf	23.00'W x 81.00'L x 6.50'H Crushed Stone 12,110 cf Overall - 4,188 cf Embedded = 7,922 cf x 40.0% Voids
#2	110.50'	4,188 cf	Cultec R-900HD x 33 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		7,357 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 113.40' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	109.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.36 cfs @ 11.75 hrs HW=109.64' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=109.50' TW=0.00' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 13P: Prop Depression 13

Inflow Area = 0.430 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10 YEAR event
 Inflow = 0.01 cfs @ 13.72 hrs, Volume= 0.005 af
 Outflow = 0.01 cfs @ 13.78 hrs, Volume= 0.005 af, Atten= 0%, Lag= 3.8 min
 Discarded = 0.01 cfs @ 13.78 hrs, Volume= 0.005 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 111.58' @ 13.78 hrs Surf.Area= 44 sf Storage= 1 cf

Plug-Flow detention time= 2.0 min calculated for 0.005 af (100% of inflow)

Center-of-Mass det. time= 2.0 min (1,033.9 - 1,031.9)

Volume	Invert	Avail.Storage	Storage Description
#1	111.50'	15,610 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)
111.50	0	0.0	0	0	0
112.00	1,579	207.0	263	263	3,410
113.00	2,783	261.0	2,153	2,416	5,435
114.00	3,800	293.0	3,278	5,694	6,873
115.00	4,953	329.0	4,364	10,058	8,681
116.00	6,174	366.0	5,552	15,610	10,757

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	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
#2	Discarded	111.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 13.78 hrs HW=111.58' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=111.50' TW=110.00' (Dynamic Tailwater)

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

Summary for Pond 14P: Depression 3

[62] Hint: Exceeded Reach 5R OUTLET depth by 0.01' @ 24.00 hrs

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.00" for 10 YEAR event
 Inflow = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 106.71' @ 24.02 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

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

Volume	Invert	Avail.Storage	Storage Description
#1	106.70'	8,941 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	3,920	373.0	3,183	4,489	11,139
110.30	4,206	399.0	1,219	5,707	12,740
111.00	5,045	460.0	3,233	8,941	16,921

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' S= 0.0139 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 24.02 hrs HW=106.71' (Free Discharge)

↑ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 24.02 hrs HW=106.71' TW=106.70' (Dynamic Tailwater)

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

↑ **2=Culvert** (Outlet Controls 0.00 cfs @ 0.07 fps)

Time span=0.00-25.00 hrs, dt=0.05 hrs, 501 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Catchment Area 1	Runoff Area=0.470 ac 59.57% Impervious Runoff Depth=2.77" Tc=5.0 min CN=74 Runoff=1.53 cfs 0.108 af
Subcatchment 2S: Catchment Area 2	Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=5.26" Tc=5.0 min CN=98 Runoff=0.87 cfs 0.070 af
Subcatchment 3S: Catchment Area 3	Runoff Area=0.420 ac 69.05% Impervious Runoff Depth=3.33" Tc=5.0 min CN=80 Runoff=1.64 cfs 0.117 af
Subcatchment 4S: Catchment Area 4S	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=5.26" Tc=5.0 min CN=98 Runoff=1.52 cfs 0.123 af
Subcatchment 5S: Catchment Area 5S	Runoff Area=0.610 ac 75.41% Impervious Runoff Depth=3.63" Tc=5.0 min CN=83 Runoff=2.59 cfs 0.185 af
Subcatchment 6S: Catchment Area 6S	Runoff Area=0.370 ac 81.08% Impervious Runoff Depth=4.04" Tc=5.0 min CN=87 Runoff=1.72 cfs 0.125 af
Subcatchment 7S: Catchment Area 7S	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=5.26" Tc=5.0 min CN=98 Runoff=0.27 cfs 0.022 af
Subcatchment 8S: Catchment Area 8S	Runoff Area=0.860 ac 62.79% Impervious Runoff Depth=2.95" Tc=5.0 min CN=76 Runoff=2.98 cfs 0.212 af
Subcatchment 9S: Catchment Area 9S	Runoff Area=0.500 ac 100.00% Impervious Runoff Depth=5.26" Tc=5.0 min CN=98 Runoff=2.71 cfs 0.219 af
Subcatchment 10S: Catchment Area 10S	Runoff Area=0.610 ac 80.33% Impervious Runoff Depth=3.94" Tc=5.0 min CN=86 Runoff=2.78 cfs 0.200 af
Subcatchment 11S: Catchment Area 11S	Runoff Area=0.680 ac 88.24% Impervious Runoff Depth=4.47" Tc=5.0 min CN=91 Runoff=3.41 cfs 0.253 af
Subcatchment 12S: Catchment Area 12S	Runoff Area=0.430 ac 0.00% Impervious Runoff Depth=0.31" Flow Length=280' Tc=3.5 min CN=39 Runoff=0.04 cfs 0.011 af
Subcatchment 13S: Catchment Area 13S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment 14S: Catchment Area 10S	Runoff Area=0.790 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.002 af
Subcatchment 15S: Catchment Area 15S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.31" Flow Length=340' Tc=8.2 min CN=39 Runoff=0.00 cfs 0.001 af
Subcatchment 16S: Catchment Area 16S	Runoff Area=0.490 ac 0.00% Impervious Runoff Depth>0.03" Flow Length=115' Tc=18.1 min CN=30 Runoff=0.00 cfs 0.001 af

Reach 1R: Low PointInflow=0.00 cfs 0.003 af
Outflow=0.00 cfs 0.003 af**Reach 2R: Headwall**Avg. Flow Depth=0.02' Max Vel=0.81 fps Inflow=0.00 cfs 0.002 af
15.0" Round Pipe n=0.012 L=36.0' S=0.0139 '/' Capacity=8.25 cfs Outflow=0.00 cfs 0.002 af**Reach 3R: Hardy Street**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 4R: Catch Basin**Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af**Reach 5R: Proposed Flared End Outlet**Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=90.0' S=0.0367 '/' Capacity=47.44 cfs Outflow=0.00 cfs 0.000 af**Pond 1P: Infiltration Chamber 1**Peak Elev=140.03' Storage=1,577 cf Inflow=1.53 cfs 0.108 af
Discarded=0.18 cfs 0.109 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.109 af**Pond 2P: Infiltration Chamber 2**Peak Elev=140.79' Storage=932 cf Inflow=0.87 cfs 0.070 af
Discarded=0.10 cfs 0.070 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.070 af**Pond 3P: Infiltration Chamber 3**Peak Elev=141.27' Storage=1,753 cf Inflow=1.64 cfs 0.117 af
Discarded=0.18 cfs 0.117 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.117 af**Pond 4P: Infiltration Chamber 4**Peak Elev=141.96' Storage=1,672 cf Inflow=1.52 cfs 0.123 af
Discarded=0.16 cfs 0.123 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.123 af**Pond 5P: Infiltration Chamber 5**Peak Elev=137.60' Storage=3,025 cf Inflow=2.59 cfs 0.185 af
Discarded=0.23 cfs 0.185 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.185 af**Pond 6P: Infiltration Chamber 6**Peak Elev=136.43' Storage=1,873 cf Inflow=1.72 cfs 0.125 af
Discarded=0.18 cfs 0.125 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.125 af**Pond 7P: Infiltration Chamber 7**Peak Elev=133.95' Storage=153 cf Inflow=0.27 cfs 0.022 af
Discarded=0.08 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.022 af**Pond 8P: Infiltration Chamber 8**Peak Elev=123.79' Storage=3,227 cf Inflow=2.98 cfs 0.212 af
Discarded=0.33 cfs 0.212 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.212 af**Pond 9P: Infiltration Chamber 9**Peak Elev=120.52' Storage=2,834 cf Inflow=2.71 cfs 0.219 af
Discarded=0.33 cfs 0.219 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.219 af**Pond 10P: Infiltration Chamber 10**Peak Elev=109.72' Storage=2,951 cf Inflow=2.78 cfs 0.200 af
Discarded=0.31 cfs 0.201 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.201 af**Pond 11P: Infiltration Chamber 11**Peak Elev=112.46' Storage=3,756 cf Inflow=3.41 cfs 0.253 af
Discarded=0.36 cfs 0.253 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.253 af**Pond 13P: Prop Depression 13**Peak Elev=111.68' Storage=11 cf Inflow=0.04 cfs 0.011 af
Discarded=0.04 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.011 af

Pond 14P: Depression 3

Peak Elev=106.75' Storage=0 cf Inflow=0.00 cfs 0.002 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.002 af Outflow=0.00 cfs 0.002 af

Total Runoff Area = 6.820 ac Runoff Volume = 1.649 af Average Runoff Depth = 2.90"
42.08% Pervious = 2.870 ac 57.92% Impervious = 3.950 ac

Summary for Subcatchment 1S: Catchment Area 1[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.53 cfs @ 12.08 hrs, Volume= 0.108 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.170	98	Roof
0.190	39	>75% Grass cover, Good, HSG A
* 0.110	98	Pavement
0.470	74	Weighted Average
0.190		40.43% Pervious Area
0.280		59.57% Impervious Area

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

Summary for Subcatchment 2S: Catchment Area 2[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.87 cfs @ 12.07 hrs, Volume= 0.070 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.160	98	Roof
0.160		100.00% Impervious Area

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

Summary for Subcatchment 3S: Catchment Area 3[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.64 cfs @ 12.08 hrs, Volume= 0.117 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.130	39	>75% Grass cover, Good; HSG A
* 0.050	98	Roof
* 0.240	98	Pavement
0.420	80	Weighted Average
0.130		30.95% Pervious Area
0.290		69.05% Impervious Area

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

Summary for Subcatchment 4S: Catchment Area 4S

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

Runoff = 1.52 cfs @ 12.07 hrs, Volume= 0.123 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.280	98	Roof
0.280		100.00% Impervious Area

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

Summary for Subcatchment 5S: Catchment Area 5S

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

Runoff = 2.59 cfs @ 12.07 hrs, Volume= 0.185 af, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.230	98	Pavement
0.150	39	>75% Grass cover, Good, HSG A
* 0.230	98	Roof
0.610	83	Weighted Average
0.150		24.59% Pervious Area
0.460		75.41% Impervious Area

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

Summary for Subcatchment 6S: Catchment Area 6S

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

Runoff = 1.72 cfs @ 12.07 hrs, Volume= 0.125 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.110	98	Pavement
0.070	39	>75% Grass cover, Good, HSG A
* 0.190	98	Roof
0.370	87	Weighted Average
0.070		18.92% Pervious Area
0.300		81.08% Impervious Area

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

Summary for Subcatchment 7S: Catchment Area 7S

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

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.050	98	Roof
0.050		100.00% Impervious Area

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

Summary for Subcatchment 8S: Catchment Area 8S

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

Runoff = 2.98 cfs @ 12.08 hrs, Volume= 0.212 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
* 0.370	98	Pavement
* 0.170	98	Roof
0.860	76	Weighted Average
0.320		37.21% Pervious Area
0.540		62.79% Impervious Area

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

Summary for Subcatchment 9S: Catchment Area 9S

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

Runoff = 2.71 cfs @ 12.07 hrs, Volume= 0.219 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
* 0.500	98	Roof
0.500		100.00% Impervious Area

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

Summary for Subcatchment 10S: Catchment Area 10S

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

Runoff = 2.78 cfs @ 12.07 hrs, Volume= 0.200 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.120	39	>75% Grass cover, Good, HSG A
* 0.490	98	Pavement
0.610	86	Weighted Average
0.120		19.67% Pervious Area
0.490		80.33% Impervious Area

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

Summary for Subcatchment 11S: Catchment Area 11S

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

Runoff = 3.41 cfs @ 12.07 hrs, Volume= 0.253 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
* 0.190	98	Pavement
* 0.410	98	Roof
0.680	91	Weighted Average
0.080		11.76% Pervious Area
0.600		88.24% Impervious Area

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

Summary for Subcatchment 12S: Catchment Area 12S

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

Runoff = 0.04 cfs @ 12.36 hrs, Volume= 0.011 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.430	39	>75% Grass cover, Good, HSG A
0.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.3600	0.47		Sheet Flow, Overland
					Grass: Short n= 0.150 P2= 3.20"
1.7	230	0.1060	2.28		Shallow Concentrated Flow, Overland Existing Sewer
					Short Grass Pasture Kv= 7.0 fps
3.5	280	Total			

Summary for Subcatchment 13S: Catchment Area 13S

Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 14S: Catchment Area 10S

Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.790	30	Woods, Good, HSG A
0.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 15S: Catchment Area 15S

Runoff = 0.00 cfs @ 12.44 hrs, Volume= 0.001 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 16S: Catchment Area 16S

Runoff = 0.00 cfs @ 21.21 hrs, Volume= 0.001 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (ac)	CN	Description
0.490	30	Woods, Good, HSG A
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	65	0.0150	0.61		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
18.1	115	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.720 ac, 58.78% Impervious, Inflow Depth > 0.01" for 25 YEAR event
Inflow = 0.00 cfs @ 21.19 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 21.19 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.00" for 25 YEAR event
Inflow = 0.00 cfs @ 21.15 hrs, Volume= 0.002 af
Outflow = 0.00 cfs @ 21.15 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Max. Velocity= 0.81 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 0.77 fps, Avg. Travel Time= 0.8 min

Peak Storage= 0 cf @ 21.15 hrs

Average Depth at Peak Storage= 0.02'

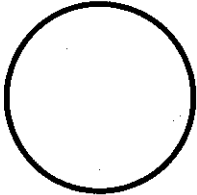
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 '/

Inlet Invert= 106.70', Outlet Invert= 106.20'



Summary for Reach 3R: Hardy Street

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.03" for 25 YEAR event

Inflow = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.31" for 25 YEAR event

Inflow = 0.00 cfs @ 12.44 hrs, Volume= 0.001 af

Outflow = 0.00 cfs @ 12.44 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 5R: Proposed Flared End Outlet

Inflow Area = 3.730 ac, 68.10% Impervious, Inflow Depth = 0.00" for 25 YEAR event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 47.44 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 90.0' Slope= 0.0367 '/
 Inlet Invert= 110.00', Outlet Invert= 106.70'



Summary for Pond 1P: Infiltration Chamber 1

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.330 ac, 75.94% Impervious, Inflow Depth = 0.98" for 25 YEAR event
 Inflow = 1.53 cfs @ 12.08 hrs, Volume= 0.108 af
 Outflow = 0.18 cfs @ 11.80 hrs, Volume= 0.109 af, Atten= 88%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.80 hrs, Volume= 0.109 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 140.03' @ 12.83 hrs Surf.Area= 960 sf Storage= 1,577 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 66.5 min (898.4 - 831.9)

Volume	Invert	Avail.Storage	Storage Description
#1	137.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	138.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
3,727 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	12.0" Round Pipe L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 141.40' S= 0.0100 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	137.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.80 hrs HW=137.63' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.50' TW=121.00' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Chamber 2

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.860 ac, 84.88% Impervious, Inflow Depth = 0.98" for 25 YEAR event
 Inflow = 0.87 cfs @ 12.07 hrs, Volume= 0.070 af
 Outflow = 0.10 cfs @ 11.70 hrs, Volume= 0.070 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 11.70 hrs, Volume= 0.070 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 140.79' @ 12.68 hrs Surf.Area= 512 sf Storage= 932 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 58.8 min (804.3 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	905 cf	16.00'W x 32.00'L x 6.50'H Crushed Stone 3,328 cf Overall - 1,066 cf Embedded = 2,262 cf x 40.0% Voids
#2	139.00'	1,066 cf	Cultec R-900HD x 8 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
1,971 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.00'	12.0" Round Pipe L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 142.00' / 141.80' S= 0.0200 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.10 cfs @ 11.70 hrs HW=138.13' (Free Discharge)
 ↳2=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=137.50' (Dynamic Tailwater)
 ↳1=Pipe (Controls 0.00 cfs)

Summary for Pond 3P: Infiltration Chamber 3

Inflow Area = 0.700 ac, 81.43% Impervious, Inflow Depth = 2.00" for 25 YEAR event
 Inflow = 1.64 cfs @ 12.08 hrs, Volume= 0.117 af
 Outflow = 0.18 cfs @ 11.75 hrs, Volume= 0.117 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.75 hrs, Volume= 0.117 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 141.27' @ 12.83 hrs Surf.Area= 960 sf Storage= 1,753 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 72.3 min (889.1 - 816.8)

Volume	Invert	Avail.Storage	Storage Description
#1	138.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	139.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 142.50' / 142.40' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.75 hrs HW=138.62' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.50' TW=138.00' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 4P: Infiltration Chamber 4

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.280 ac, 100.00% Impervious, Inflow Depth = 5.26" for 25 YEAR event
 Inflow = 1.52 cfs @ 12.07 hrs, Volume= 0.123 af
 Outflow = 0.16 cfs @ 11.65 hrs, Volume= 0.123 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 11.65 hrs, Volume= 0.123 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 141.96' @ 12.73 hrs Surf.Area= 848 sf Storage= 1,672 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 64.9 min (810.5 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	139.00'	1,483 cf	16.00'W x 53.00'L x 6.50'H Crushed Stone 5,512 cf Overall - 1,806 cf Embedded = 3,706 cf x 40.0% Voids
#2	140.00'	1,806 cf	Cultec R-900HD x 14 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,288 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	143.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500

Inlet / Outlet Invert= 143.00' / 142.90' S= 0.0100 '/' Cc= 0.900
 n= 0.013, Flow Area= 0.79 sf

#2 Discarded 139.00' **8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.16 cfs @ 11.65 hrs HW=139.08' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=139.00' TW=138.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 5P: Infiltration Chamber 5

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.610 ac, 75.41% Impervious, Inflow Depth = 3.63" for 25 YEAR event
 Inflow = 2.59 cfs @ 12.07 hrs, Volume= 0.185 af
 Outflow = 0.23 cfs @ 11.70 hrs, Volume= 0.185 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.23 cfs @ 11.70 hrs, Volume= 0.185 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 137.60' @ 13.01 hrs Surf.Area= 1,219 sf Storage= 3,025 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 104.6 min (913.3 - 808.7)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	2,086 cf	23.00'W x 53.00'L x 6.50'H Crushed Stone 7,923 cf Overall - 2,708 cf Embedded = 5,215 cf x 40.0% Voids
#2	135.00'	2,708 cf	Cultec R-900HD x 21 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		4,794 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 137.90' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	134.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.23 cfs @ 11.70 hrs HW=134.14' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.00' TW=133.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Chamber 6

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.980 ac, 77.55% Impervious, Inflow Depth = 1.53" for 25 YEAR event
 Inflow = 1.72 cfs @ 12.07 hrs, Volume= 0.125 af
 Outflow = 0.18 cfs @ 11.70 hrs, Volume= 0.125 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.70 hrs, Volume= 0.125 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 136.43' @ 12.81 hrs Surf.Area= 960 sf Storage= 1,873 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 74.3 min (871.2 - 796.8)

Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	134.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
3,727 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.30' S= 0.0200 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.70 hrs HW=133.60' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.50' TW=133.00' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 7P: Infiltration Chamber 7

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.030 ac, 78.64% Impervious, Inflow Depth = 0.26" for 25 YEAR event
 Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.022 af
 Outflow = 0.08 cfs @ 11.95 hrs, Volume= 0.022 af, Atten= 72%, Lag= 0.0 min
 Discarded = 0.08 cfs @ 11.95 hrs, Volume= 0.022 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 133.95' @ 12.40 hrs Surf.Area= 400 sf Storage= 153 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 8.6 min (754.1 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	133.00'	712 cf	16.00'W x 25.00'L x 6.50'H Crushed Stone 2,600 cf Overall - 819 cf Embedded = 1,781 cf x 40.0% Voids
#2	134.00'	819 cf	Cultec R-900HD x 6 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		1,531 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.00' / 136.90' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.08 cfs @ 11.95 hrs HW=133.11' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.00' TW=109.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 8P: Infiltration Chamber 8

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 2.190 ac, 70.78% Impervious, Inflow Depth = 1.16" for 25 YEAR event
 Inflow = 2.98 cfs @ 12.08 hrs, Volume= 0.212 af
 Outflow = 0.33 cfs @ 11.75 hrs, Volume= 0.212 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 11.75 hrs, Volume= 0.212 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 123.79' @ 12.91 hrs Surf.Area= 1,702 sf Storage= 3,227 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 78.8 min (905.8 - 827.0)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	2,866 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,897 cf Embedded = 7,166 cf x 40.0% Voids
#2	122.00'	3,897 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 5 rows
		6,764 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 125.00' / 120.00' S= 0.5000 1' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	121.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.75 hrs HW=121.10' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=121.00' TW=118.00' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 9P: Infiltration Chamber 9

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 2.690 ac, 76.21% Impervious, Inflow Depth = 0.98" for 25 YEAR event
 Inflow = 2.71 cfs @ 12.07 hrs, Volume= 0.219 af
 Outflow = 0.33 cfs @ 11.70 hrs, Volume= 0.219 af, Atten= 88%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 11.70 hrs, Volume= 0.219 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 120.52' @ 12.63 hrs Surf.Area= 1,702 sf Storage= 2,834 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 52.2 min (797.8 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	118.00'	2,898 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,818 cf Embedded = 7,245 cf x 40.0% Voids
#2	119.00'	3,818 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,716 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	122.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 122.00' / 121.90' S= 0.0100 1' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	118.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.70 hrs HW=118.11' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=118.00' TW=107.00' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 10P: Infiltration Chamber 10

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 3.300 ac, 76.97% Impervious, Inflow Depth = 0.73" for 25 YEAR event
 Inflow = 2.78 cfs @ 12.07 hrs, Volume= 0.200 af
 Outflow = 0.31 cfs @ 11.70 hrs, Volume= 0.201 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.31 cfs @ 11.70 hrs, Volume= 0.201 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 109.72' @ 12.76 hrs Surf.Area= 1,632 sf Storage= 2,951 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 68.2 min (868.1 - 799.9)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	2,815 cf	16.00'W x 102.00'L x 6.50'H Crushed Stone 10,608 cf Overall - 3,571 cf Embedded = 7,037 cf x 40.0% Voids
#2	108.00'	3,571 cf	Cultec R-900HD x 28 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,386 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	111.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 111.00' / 110.90' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	107.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.31 cfs @ 11.70 hrs HW=107.08' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=107.00' TW=110.00' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 11P: Infiltration Chamber 11

Inflow Area = 1.710 ac, 82.46% Impervious, Inflow Depth = 1.78" for 25 YEAR event
 Inflow = 3.41 cfs @ 12.07 hrs, Volume= 0.253 af
 Outflow = 0.36 cfs @ 11.70 hrs, Volume= 0.253 af, Atten= 90%, Lag= 0.0 min
 Discarded = 0.36 cfs @ 11.70 hrs, Volume= 0.253 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 112.46' @ 12.80 hrs Surf.Area= 1,863 sf Storage= 3,756 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 73.6 min (856.5 - 782.8)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	3,169 cf	23.00'W x 81.00'L x 6.50'H Crushed Stone 12,110 cf Overall - 4,188 cf Embedded = 7,922 cf x 40.0% Voids
#2	110.50'	4,188 cf	Cultec R-900HD x 33 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		7,357 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 113.40' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	109.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.36 cfs @ 11.70 hrs HW=109.63' (Free Discharge)

↳ **2=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=109.50' TW=0.00' (Dynamic Tailwater)

↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 13P: Prop Depression 13

Inflow Area = 0.430 ac, 0.00% Impervious, Inflow Depth = 0.31" for 25 YEAR event
 Inflow = 0.04 cfs @ 12.36 hrs, Volume= 0.011 af
 Outflow = 0.04 cfs @ 12.46 hrs, Volume= 0.011 af, Atten= 13%, Lag= 6.0 min
 Discarded = 0.04 cfs @ 12.46 hrs, Volume= 0.011 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 111.68' @ 12.46 hrs Surf.Area= 194 sf Storage= 11 cf

Plug-Flow detention time= 3.1 min calculated for 0.011 af (100% of inflow)

Center-of-Mass det. time= 3.1 min (981.7 - 978.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	111.50'	15,610 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)
111.50	0	0.0	0	0	0
112.00	1,579	207.0	263	263	3,410
113.00	2,783	261.0	2,153	2,416	5,435
114.00	3,800	293.0	3,278	5,694	6,873
115.00	4,953	329.0	4,364	10,058	8,681
116.00	6,174	366.0	5,552	15,610	10,757

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	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
#2	Discarded	111.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.04 cfs @ 12.46 hrs HW=111.68' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=111.50' TW=110.00' (Dynamic Tailwater)

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

Summary for Pond 14P: Depression 3

[62] Hint: Exceeded Reach 5R OUTLET depth by 0.05' @ 21.15 hrs

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.01" for 25 YEAR event
 Inflow = 0.00 cfs @ 21.14 hrs, Volume= 0.002 af
 Outflow = 0.00 cfs @ 21.15 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 21.15 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 21.15 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 106.75' @ 21.15 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.002 af (100% of inflow)

Center-of-Mass det. time= 0.0 min (1,195.1 - 1,195.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	106.70'	8,941 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	3,920	373.0	3,183	4,489	11,139
110.30	4,206	399.0	1,219	5,707	12,740
111.00	5,045	460.0	3,233	8,941	16,921

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' S= 0.0139 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 21.15 hrs HW=106.75' (Free Discharge)

↳ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 21.15 hrs HW=106.75' TW=106.72' (Dynamic Tailwater)

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

↳ **2=Culvert** (Outlet Controls 0.00 cfs @ 0.28 fps)

Time span=0.00-25.00 hrs, dt=0.05 hrs, 501 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Catchment Area 1	Runoff Area=0.470 ac 59.57% Impervious Runoff Depth=3.78" Tc=5.0 min CN=74 Runoff=2.09 cfs 0.148 af
Subcatchment 2S: Catchment Area 2	Runoff Area=0.160 ac 100.00% Impervious Runoff Depth=6.46" Tc=5.0 min CN=98 Runoff=1.06 cfs 0.086 af
Subcatchment 3S: Catchment Area 3	Runoff Area=0.420 ac 69.05% Impervious Runoff Depth=4.42" Tc=5.0 min CN=80 Runoff=2.17 cfs 0.155 af
Subcatchment 4S: Catchment Area 4S	Runoff Area=0.280 ac 100.00% Impervious Runoff Depth=6.46" Tc=5.0 min CN=98 Runoff=1.85 cfs 0.151 af
Subcatchment 5S: Catchment Area 5S	Runoff Area=0.610 ac 75.41% Impervious Runoff Depth=4.75" Tc=5.0 min CN=83 Runoff=3.35 cfs 0.241 af
Subcatchment 6S: Catchment Area 6S	Runoff Area=0.370 ac 81.08% Impervious Runoff Depth=5.19" Tc=5.0 min CN=87 Runoff=2.18 cfs 0.160 af
Subcatchment 7S: Catchment Area 7S	Runoff Area=0.050 ac 100.00% Impervious Runoff Depth=6.46" Tc=5.0 min CN=98 Runoff=0.33 cfs 0.027 af
Subcatchment 8S: Catchment Area 8S	Runoff Area=0.860 ac 62.79% Impervious Runoff Depth=3.99" Tc=5.0 min CN=76 Runoff=4.02 cfs 0.286 af
Subcatchment 9S: Catchment Area 9S	Runoff Area=0.500 ac 100.00% Impervious Runoff Depth=6.46" Tc=5.0 min CN=98 Runoff=3.31 cfs 0.269 af
Subcatchment 10S: Catchment Area 10S	Runoff Area=0.610 ac 80.33% Impervious Runoff Depth=5.08" Tc=5.0 min CN=86 Runoff=3.54 cfs 0.258 af
Subcatchment 11S: Catchment Area 11S	Runoff Area=0.680 ac 88.24% Impervious Runoff Depth=5.64" Tc=5.0 min CN=91 Runoff=4.25 cfs 0.320 af
Subcatchment 12S: Catchment Area 12S	Runoff Area=0.430 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=280' Tc=3.5 min CN=39 Runoff=0.15 cfs 0.024 af
Subcatchment 13S: Catchment Area 13S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.16" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.00 cfs 0.001 af
Subcatchment 14S: Catchment Area 10S	Runoff Area=0.790 ac 0.00% Impervious Runoff Depth=0.16" Flow Length=340' Tc=8.2 min CN=30 Runoff=0.02 cfs 0.011 af
Subcatchment 15S: Catchment Area 15S	Runoff Area=0.050 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=340' Tc=8.2 min CN=39 Runoff=0.02 cfs 0.003 af
Subcatchment 16S: Catchment Area 16S	Runoff Area=0.490 ac 0.00% Impervious Runoff Depth>0.16" Flow Length=115' Tc=18.1 min CN=30 Runoff=0.01 cfs 0.007 af

Reach 1R: Low PointInflow=0.03 cfs 0.017 af
Outflow=0.03 cfs 0.017 af**Reach 2R: Headwall**Avg. Flow Depth=0.04' Max Vel=1.35 fps Inflow=0.02 cfs 0.011 af
15.0" Round Pipe n=0.012 L=36.0' S=0.0139 '/' Capacity=8.25 cfs Outflow=0.02 cfs 0.011 af**Reach 3R: Hardy Street**Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af**Reach 4R: Catch Basin**Inflow=0.02 cfs 0.003 af
Outflow=0.02 cfs 0.003 af**Reach 5R: Proposed Flared End Outlet**Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=90.0' S=0.0367 '/' Capacity=47.44 cfs Outflow=0.00 cfs 0.000 af**Pond 1P: Infiltration Chamber 1**Peak Elev=141.30' Storage=2,480 cf Inflow=2.09 cfs 0.148 af
Discarded=0.18 cfs 0.148 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.148 af**Pond 2P: Infiltration Chamber 2**Peak Elev=141.62' Storage=1,245 cf Inflow=1.06 cfs 0.086 af
Discarded=0.10 cfs 0.086 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.086 af**Pond 3P: Infiltration Chamber 3**Peak Elev=142.49' Storage=2,601 cf Inflow=2.17 cfs 0.155 af
Discarded=0.18 cfs 0.155 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.155 af**Pond 4P: Infiltration Chamber 4**Peak Elev=142.88' Storage=2,234 cf Inflow=1.85 cfs 0.151 af
Discarded=0.16 cfs 0.151 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.151 af**Pond 5P: Infiltration Chamber 5**Peak Elev=138.44' Storage=3,713 cf Inflow=3.35 cfs 0.241 af
Discarded=0.23 cfs 0.219 af Primary=0.60 cfs 0.022 af Outflow=0.83 cfs 0.241 af**Pond 6P: Infiltration Chamber 6**Peak Elev=137.88' Storage=2,843 cf Inflow=2.18 cfs 0.182 af
Discarded=0.18 cfs 0.162 af Primary=0.57 cfs 0.020 af Outflow=0.75 cfs 0.182 af**Pond 7P: Infiltration Chamber 7**Peak Elev=136.51' Storage=935 cf Inflow=0.61 cfs 0.047 af
Discarded=0.08 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.047 af**Pond 8P: Infiltration Chamber 8**Peak Elev=125.11' Storage=4,890 cf Inflow=4.02 cfs 0.286 af
Discarded=0.33 cfs 0.284 af Primary=0.05 cfs 0.003 af Outflow=0.38 cfs 0.287 af**Pond 9P: Infiltration Chamber 9**Peak Elev=121.25' Storage=3,802 cf Inflow=3.31 cfs 0.272 af
Discarded=0.33 cfs 0.272 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.272 af**Pond 10P: Infiltration Chamber 10**Peak Elev=110.74' Storage=4,190 cf Inflow=3.54 cfs 0.258 af
Discarded=0.31 cfs 0.258 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.258 af**Pond 11P: Infiltration Chamber 11**Peak Elev=113.50' Storage=5,168 cf Inflow=4.25 cfs 0.320 af
Discarded=0.36 cfs 0.320 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.320 af**Pond 13P: Prop Depression 13**Peak Elev=111.81' Storage=61 cf Inflow=0.15 cfs 0.024 af
Discarded=0.11 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.024 af

Pond 14P: Depression 3

Peak Elev=106.80' Storage=0 cf Inflow=0.02 cfs 0.011 af
Discarded=0.00 cfs 0.000 af Primary=0.02 cfs 0.011 af Outflow=0.02 cfs 0.011 af

Total Runoff Area = 6.820 ac Runoff Volume = 2.146 af Average Runoff Depth = 3.78"
42.08% Pervious = 2.870 ac 57.92% Impervious = 3.950 ac

Summary for Subcatchment 1S: Catchment Area 1[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.09 cfs @ 12.08 hrs, Volume= 0.148 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.170	98	Roof
0.190	39	>75% Grass cover, Good, HSG A
* 0.110	98	Pavement
0.470	74	Weighted Average
0.190		40.43% Pervious Area
0.280		59.57% Impervious Area

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

Summary for Subcatchment 2S: Catchment Area 2[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.06 cfs @ 12.07 hrs, Volume= 0.086 af, Depth= 6.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.160	98	Roof
0.160		100.00% Impervious Area

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

Summary for Subcatchment 3S: Catchment Area 3[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 2.17 cfs @ 12.07 hrs, Volume= 0.155 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.130	39	>75% Grass cover, Good, HSG A
* 0.050	98	Roof
* 0.240	98	Pavement
0.420	80	Weighted Average
0.130		30.95% Pervious Area
0.290		69.05% Impervious Area

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

Summary for Subcatchment 4S: Catchment Area 4S

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

Runoff = 1.85 cfs @ 12.07 hrs, Volume= 0.151 af, Depth= 6.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.280	98	Roof
0.280		100.00% Impervious Area

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

Summary for Subcatchment 5S: Catchment Area 5S

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

Runoff = 3.35 cfs @ 12.07 hrs, Volume= 0.241 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.230	98	Pavement
0.150	39	>75% Grass cover, Good, HSG A
* 0.230	98	Roof
0.610	83	Weighted Average
0.150		24.59% Pervious Area
0.460		75.41% Impervious Area

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

Summary for Subcatchment 6S: Catchment Area 6S

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

Runoff = 2.18 cfs @ 12.07 hrs, Volume= 0.160 af, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.110	98	Pavement
0.070	39	>75% Grass cover, Good, HSG A
* 0.190	98	Roof
0.370	87	Weighted Average
0.070		18.92% Pervious Area
0.300		81.08% Impervious Area

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

Summary for Subcatchment 7S: Catchment Area 7S

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

Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.027 af, Depth= 6.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.050	98	Roof
0.050		100.00% Impervious Area

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

Summary for Subcatchment 8S: Catchment Area 8S

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

Runoff = 4.02 cfs @ 12.08 hrs, Volume= 0.286 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
* 0.370	98	Pavement
* 0.170	98	Roof
0.860	76	Weighted Average
0.320		37.21% Pervious Area
0.540		62.79% Impervious Area

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

Summary for Subcatchment 9S: Catchment Area 9S

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 3.31 cfs @ 12.07 hrs, Volume= 0.269 af, Depth= 6.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs

Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
* 0.500	98	Roof
0.500		100.00% Impervious Area

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

Summary for Subcatchment 10S: Catchment Area 10S

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 3.54 cfs @ 12.07 hrs, Volume= 0.258 af, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, $dt=0.05$ hrs

Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.120	39	>75% Grass cover, Good, HSG A
* 0.490	98	Pavement
0.610	86	Weighted Average
0.120		19.67% Pervious Area
0.490		80.33% Impervious Area

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

Summary for Subcatchment 11S: Catchment Area 11S

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

Runoff = 4.25 cfs @ 12.07 hrs, Volume= 0.320 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
* 0.190	98	Pavement
* 0.410	98	Roof
0.680	91	Weighted Average
0.080		11.76% Pervious Area
0.600		88.24% Impervious Area

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

Summary for Subcatchment 12S: Catchment Area 12S

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

Runoff = 0.15 cfs @ 12.12 hrs, Volume= 0.024 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.430	39	>75% Grass cover, Good, HSG A
0.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.3600	0.47		Sheet Flow, Overland
					Grass: Short n= 0.150 P2= 3.20"
1.7	230	0.1060	2.28		Shallow Concentrated Flow, Overland Existing Sewer
					Short Grass Pasture Kv= 7.0 fps
3.5	280	Total			

Summary for Subcatchment 13S: Catchment Area 13S

Runoff = 0.00 cfs @ 14.75 hrs, Volume= 0.001 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.050	30	Woods, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 14S: Catchment Area 10S

Runoff = 0.02 cfs @ 14.75 hrs, Volume= 0.011 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.790	30	Woods, Good, HSG A
0.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 15S: Catchment Area 15S

Runoff = 0.02 cfs @ 12.30 hrs, Volume= 0.003 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.050	39	>75% Grass cover, Good, HSG A
0.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	60	0.0350	0.19		Sheet Flow, Overland
					Grass: Short n= 0.150 P2= 3.20"
3.0	280	0.1000	1.58		Shallow Concentrated Flow, Woodland
					Woodland Kv= 5.0 fps
8.2	340	Total			

Summary for Subcatchment 16S: Catchment Area 16S

Runoff = 0.01 cfs @ 14.91 hrs, Volume= 0.007 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=6.70"

Area (ac)	CN	Description
0.490	30	Woods, Good, HSG A
0.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woodland
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	65	0.0150	0.61		Shallow Concentrated Flow, Woodland
					Woodland Kv= 5.0 fps
18.1	115	Total			

Summary for Reach 1R: Low Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.720 ac, 58.78% Impervious, Inflow Depth > 0.03" for 100 YEAR event
Inflow = 0.03 cfs @ 14.81 hrs, Volume= 0.017 af
Outflow = 0.03 cfs @ 14.81 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 2R: Headwall

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.03" for 100 YEAR event
Inflow = 0.02 cfs @ 14.75 hrs, Volume= 0.011 af
Outflow = 0.02 cfs @ 14.76 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Max. Velocity= 1.35 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.5 min

Peak Storage= 0 cf @ 14.76 hrs

Average Depth at Peak Storage= 0.04'

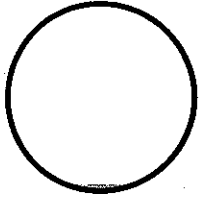
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 8.25 cfs

15.0" Round Pipe

n= 0.012 Concrete pipe, finished

Length= 36.0' Slope= 0.0139 '/

Inlet Invert= 106.70', Outlet Invert= 106.20'



Summary for Reach 3R: Hardy Street

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.16" for 100 YEAR event

Inflow = 0.00 cfs @ 14.75 hrs, Volume= 0.001 af

Outflow = 0.00 cfs @ 14.75 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 4R: Catch Basin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.050 ac, 0.00% Impervious, Inflow Depth = 0.66" for 100 YEAR event

Inflow = 0.02 cfs @ 12.30 hrs, Volume= 0.003 af

Outflow = 0.02 cfs @ 12.30 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Summary for Reach 5R: Proposed Flared End Outlet

Inflow Area = 3.730 ac, 68.10% Impervious, Inflow Depth = 0.00" for 100 YEAR event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 47.44 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 90.0' Slope= 0.0367 '/
 Inlet Invert= 110.00', Outlet Invert= 106.70'



Summary for Pond 1P: Infiltration Chamber 1

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.330 ac, 75.94% Impervious, Inflow Depth = 1.34" for 100 YEAR event
 Inflow = 2.09 cfs @ 12.08 hrs, Volume= 0.148 af
 Outflow = 0.18 cfs @ 11.70 hrs, Volume= 0.148 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.70 hrs, Volume= 0.148 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 141.30' @ 13.12 hrs Surf.Area= 960 sf Storage= 2,480 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 115.0 min (937.9 - 822.9)

Volume	Invert	Avail.Storage	Storage Description
#1	137.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	138.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
3,727 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	141.50'	12.0" Round Pipe L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 141.50' / 141.40' S= 0.0100 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	137.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.70 hrs HW=137.60' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.50' TW=121.00' (Dynamic Tailwater)
 ↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Chamber 2

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.860 ac, 84.88% Impervious, Inflow Depth = 1.20" for 100 YEAR event
 Inflow = 1.06 cfs @ 12.07 hrs, Volume= 0.086 af
 Outflow = 0.10 cfs @ 11.55 hrs, Volume= 0.086 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 11.55 hrs, Volume= 0.086 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 141.62' @ 12.88 hrs Surf.Area= 512 sf Storage= 1,245 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 84.2 min (826.9 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	905 cf	16.00'W x 32.00'L x 6.50'H Crushed Stone 3,328 cf Overall - 1,066 cf Embedded = 2,262 cf x 40.0% Voids
#2	139.00'	1,066 cf	Cultec R-900HD x 8 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		1,971 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.00'	12.0" Round Pipe L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 142.00' / 141.80' S= 0.0200 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.10 cfs @ 11.55 hrs HW=138.07' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=137.50' (Dynamic Tailwater)
 ↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 3P: Infiltration Chamber 3

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.700 ac, 81.43% Impervious, Inflow Depth = 2.65" for 100 YEAR event
 Inflow = 2.17 cfs @ 12.07 hrs, Volume= 0.155 af
 Outflow = 0.18 cfs @ 11.65 hrs, Volume= 0.155 af, Atten= 92%, Lag= 0.0 min
 Discarded = 0.18 cfs @ 11.65 hrs, Volume= 0.155 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 142.49' @ 13.08 hrs Surf.Area= 960 sf Storage= 2,601 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 116.4 min (925.2 - 808.8)

Volume	Invert	Avail.Storage	Storage Description
#1	138.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	139.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 142.50' / 142.40' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	138.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.65 hrs HW=138.58' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.50' TW=138.00' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 4P: Infiltration Chamber 4

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.280 ac, 100.00% Impervious, Inflow Depth = 6.46" for 100 YEAR event
 Inflow = 1.85 cfs @ 12.07 hrs, Volume= 0.151 af
 Outflow = 0.16 cfs @ 11.50 hrs, Volume= 0.151 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 11.50 hrs, Volume= 0.151 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 142.88' @ 12.94 hrs Surf.Area= 848 sf Storage= 2,234 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 93.1 min (835.7 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	139.00'	1,483 cf	16.00'W x 53.00'L x 6.50'H Crushed Stone 5,512 cf Overall - 1,806 cf Embedded = 3,706 cf x 40.0% Voids
#2	140.00'	1,806 cf	Cultec R-900HD x 14 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,288 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	143.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 143.00' / 142.90' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	139.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.16 cfs @ 11.50 hrs HW=139.07' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=139.00' TW=138.50' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 5P: Infiltration Chamber 5

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.610 ac, 75.41% Impervious, Inflow Depth = 4.75" for 100 YEAR event
 Inflow = 3.35 cfs @ 12.07 hrs, Volume= 0.241 af
 Outflow = 0.83 cfs @ 12.46 hrs, Volume= 0.241 af, Atten= 75%, Lag= 23.3 min
 Discarded = 0.23 cfs @ 11.50 hrs, Volume= 0.219 af
 Primary = 0.60 cfs @ 12.46 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 138.44' @ 12.46 hrs Surf.Area= 1,219 sf Storage= 3,713 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 113.4 min (914.6 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	2,086 cf	23.00'W x 53.00'L x 6.50'H Crushed Stone 7,923 cf Overall - 2,708 cf Embedded = 5,215 cf x 40.0% Voids
#2	135.00'	2,708 cf	Cultec R-900HD x 21 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
4,794 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 137.90' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	134.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.23 cfs @ 11.50 hrs HW=134.07' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.59 cfs @ 12.46 hrs HW=138.44' TW=137.63' (Dynamic Tailwater)

↑**1=Pipe** (Barrel Controls 0.59 cfs @ 2.62 fps)

Summary for Pond 6P: Infiltration Chamber 6

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 0.980 ac, 77.55% Impervious, Inflow Depth = 2.23" for 100 YEAR event
 Inflow = 2.18 cfs @ 12.07 hrs, Volume= 0.182 af
 Outflow = 0.75 cfs @ 12.58 hrs, Volume= 0.182 af, Atten= 66%, Lag= 30.7 min
 Discarded = 0.18 cfs @ 11.60 hrs, Volume= 0.162 af
 Primary = 0.57 cfs @ 12.58 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 137.88' @ 12.58 hrs Surf.Area= 960 sf Storage= 2,843 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 102.7 min (889.2 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,675 cf	16.00'W x 60.00'L x 6.50'H Crushed Stone 6,240 cf Overall - 2,052 cf Embedded = 4,188 cf x 40.0% Voids
#2	134.50'	2,052 cf	Cultec R-900HD x 16 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
		3,727 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.30' S= 0.0200 1' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.18 cfs @ 11.60 hrs HW=133.58' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.56 cfs @ 12.58 hrs HW=137.88' TW=134.76' (Dynamic Tailwater)
 ↑ **1=Pipe** (Barrel Controls 0.56 cfs @ 3.04 fps)

Summary for Pond 7P: Infiltration Chamber 7

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.030 ac, 78.64% Impervious, Inflow Depth = 0.55" for 100 YEAR event
 Inflow = 0.61 cfs @ 12.58 hrs, Volume= 0.047 af
 Outflow = 0.08 cfs @ 11.85 hrs, Volume= 0.047 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.08 cfs @ 11.85 hrs, Volume= 0.047 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 136.51' @ 13.37 hrs Surf.Area= 400 sf Storage= 935 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 83.6 min (837.2 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1	133.00'	712 cf	16.00'W x 25.00'L x 6.50'H Crushed Stone 2,600 cf Overall - 819 cf Embedded = 1,781 cf x 40.0% Voids
#2	134.00'	819 cf	Cultec R-900HD x 6 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 2 rows
1,531 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	137.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.00' / 136.90' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	133.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.08 cfs @ 11.85 hrs HW=133.08' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.00' TW=109.50' (Dynamic Tailwater)

↑ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 8P: Infiltration Chamber 8

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	2.190 ac, 70.78% Impervious, Inflow Depth = 1.57" for 100 YEAR event
Inflow =	4.02 cfs @ 12.08 hrs, Volume= 0.286 af
Outflow =	0.38 cfs @ 13.01 hrs, Volume= 0.287 af, Atten= 91%, Lag= 56.1 min
Discarded =	0.33 cfs @ 11.65 hrs, Volume= 0.284 af
Primary =	0.05 cfs @ 13.01 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 125.11' @ 13.01 hrs Surf.Area= 1,702 sf Storage= 4,890 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 127.6 min (945.9 - 818.3)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	2,866 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,897 cf Embedded = 7,166 cf x 40.0% Voids
#2	122.00'	3,897 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 5 rows
6,764 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 125.00' / 120.00' S= 0.5000 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	121.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.65 hrs HW=121.07' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.05 cfs @ 13.01 hrs HW=125.11' TW=121.25' (Dynamic Tailwater)

↑**1=Pipe** (Inlet Controls 0.05 cfs @ 1.13 fps)

Summary for Pond 9P: Infiltration Chamber 9

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 2.690 ac, 76.21% Impervious, Inflow Depth = 1.21" for 100 YEAR event
 Inflow = 3.31 cfs @ 12.07 hrs, Volume= 0.272 af
 Outflow = 0.33 cfs @ 11.60 hrs, Volume= 0.272 af, Atten= 90%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 11.60 hrs, Volume= 0.272 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 121.25' @ 12.99 hrs Surf.Area= 1,702 sf Storage= 3,802 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 77.3 min (820.3 - 743.1)

Volume	Invert	Avail.Storage	Storage Description
#1	118.00'	2,898 cf	37.00'W x 46.00'L x 6.50'H Crushed Stone 11,063 cf Overall - 3,818 cf Embedded = 7,245 cf x 40.0% Voids
#2	119.00'	3,818 cf	Cultec R-900HD x 30 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,716 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	122.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 122.00' / 121.90' S= 0.0100 ' /' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	118.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.33 cfs @ 11.60 hrs HW=118.07' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=118.00' TW=107.00' (Dynamic Tailwater)

↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 10P: Infiltration Chamber 10

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 3.300 ac, 76.97% Impervious, Inflow Depth = 0.94" for 100 YEAR event
 Inflow = 3.54 cfs @ 12.07 hrs, Volume= 0.258 af
 Outflow = 0.31 cfs @ 11.65 hrs, Volume= 0.258 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.31 cfs @ 11.65 hrs, Volume= 0.258 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 110.74' @ 12.99 hrs Surf.Area= 1,632 sf Storage= 4,190 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 103.4 min (896.3 - 792.9)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	2,815 cf	16.00'W x 102.00'L x 6.50'H Crushed Stone 10,608 cf Overall - 3,571 cf Embedded = 7,037 cf x 40.0% Voids
#2	108.00'	3,571 cf	Cultec R-900HD x 28 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		6,386 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	111.00'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 111.00' / 110.90' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	107.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.31 cfs @ 11.65 hrs HW=107.11' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=107.00' TW=110.00' (Dynamic Tailwater)
 ↑**1=Pipe** (Controls 0.00 cfs)

Summary for Pond 11P: Infiltration Chamber 11

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area = 1.710 ac, 82.46% Impervious, Inflow Depth = 2.24" for 100 YEAR event
 Inflow = 4.25 cfs @ 12.07 hrs, Volume= 0.320 af
 Outflow = 0.36 cfs @ 11.55 hrs, Volume= 0.320 af, Atten= 92%, Lag= 0.0 min
 Discarded = 0.36 cfs @ 11.55 hrs, Volume= 0.320 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 113.50' @ 13.00 hrs Surf.Area= 1,863 sf Storage= 5,168 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 108.1 min (884.9 - 776.8)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	3,169 cf	23.00'W x 81.00'L x 6.50'H Crushed Stone 12,110 cf Overall - 4,188 cf Embedded = 7,922 cf x 40.0% Voids
#2	110.50'	4,188 cf	Cultec R-900HD x 33 Inside #1 Effective Size= 72.7"W x 48.0"H => 17.61 sf x 7.00'L = 123.3 cf Overall Size= 78.0"W x 48.0"H x 9.25'L with 2.25' Overlap Row Length Adjustment= +2.25' x 17.61 sf x 3 rows
		7,357 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	113.50'	12.0" Round Pipe L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 113.50' / 113.40' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	109.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.36 cfs @ 11.55 hrs HW=109.58' (Free Discharge)

↳ **2=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=109.50' TW=0.00' (Dynamic Tailwater)

↳ **1=Pipe** (Controls 0.00 cfs)

Summary for Pond 13P: Prop Depression 13

Inflow Area = 0.430 ac, 0.00% Impervious, Inflow Depth = 0.66" for 100 YEAR event
 Inflow = 0.15 cfs @ 12.12 hrs, Volume= 0.024 af
 Outflow = 0.11 cfs @ 12.40 hrs, Volume= 0.024 af, Atten= 25%, Lag= 16.9 min
 Discarded = 0.11 cfs @ 12.40 hrs, Volume= 0.024 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 111.81' @ 12.40 hrs Surf.Area= 598 sf Storage= 61 cf

Plug-Flow detention time= 5.1 min calculated for 0.024 af (100% of inflow)

Center-of-Mass det. time= 5.1 min (940.8 - 935.7)

Volume	Invert	Avail.Storage	Storage Description
#1	111.50'	15,610 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)
111.50	0	0.0	0	0	0
112.00	1,579	207.0	263	263	3,410
113.00	2,783	261.0	2,153	2,416	5,435
114.00	3,800	293.0	3,278	5,694	6,873
115.00	4,953	329.0	4,364	10,058	8,681
116.00	6,174	366.0	5,552	15,610	10,757

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	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
#2	Discarded	111.50'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.11 cfs @ 12.40 hrs HW=111.81' (Free Discharge)

↑2=Exfiltration (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=111.50' TW=110.00' (Dynamic Tailwater)

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

Summary for Pond 14P: Depression 3

[62] Hint: Exceeded Reach 5R OUTLET depth by 0.10' @ 14.75 hrs

Inflow Area = 4.520 ac, 56.19% Impervious, Inflow Depth = 0.03" for 100 YEAR event
 Inflow = 0.02 cfs @ 14.75 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 14.75 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 14.75 hrs, Volume= 0.000 af
 Primary = 0.02 cfs @ 14.75 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 106.80' @ 14.75 hrs Surf.Area= 1 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.011 af (100% of inflow)

Center-of-Mass det. time= 0.0 min (1,056.8 - 1,056.8)

Volume	Invert	Avail.Storage	Storage Description
#1	106.70'	8,941 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)
106.70	0	0.0	0	0	0
108.00	263	91.0	114	114	662
109.00	2,500	355.0	1,191	1,305	10,034
110.00	3,920	373.0	3,183	4,489	11,139
110.30	4,206	399.0	1,219	5,707	12,740
111.00	5,045	460.0	3,233	8,941	16,921

Device	Routing	Invert	Outlet Devices
#1	Primary	110.20'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	106.70'	15.0" Round Culvert L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.70' / 106.20' S= 0.0139 ' S= 0.0139 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Discarded	106.70'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 14.75 hrs HW=106.80' (Free Discharge)

↑ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.02 cfs @ 14.75 hrs HW=106.80' TW=106.74' (Dynamic Tailwater)

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

↑ **2=Culvert** (Outlet Controls 0.02 cfs @ 0.59 fps)

TETRA TECH
25 Year Storm

Project: Greendale Avenue
City: Needham
State: MA

Proj. No: 143-82806
Date: 30-Sep-13
Comp: SJW
Check:

Structure	Pavement / Roof		Grass / Pervious		Forest		Total Area (acres)	Composite C	Q (cfs)
	Area (acres)	C Factor	Area (acres)	C Factor	Area (acres)	C Factor			
CB-1	0.17	0.98	0.07	0.50	0.00	0.40	0.24	0.84	1.21
CB-2	0.07	0.98	0.06	0.50	0.00	0.40	0.13	0.76	0.59
CB-3	0.03	0.98	0.06	0.50	0.00	0.40	0.09	0.66	0.36
CB-4	0.28	0.98	0.09	0.50	0.00	0.40	0.37	0.86	1.92
CB-5	0.21	0.98	0.03	0.50	0.00	0.40	0.24	0.92	1.32
CB-6	0.20	0.98	0.01	0.50	0.00	0.40	0.21	0.96	1.21
CB-7	0.17	0.98	0.31	0.50	0.00	0.40	0.48	0.67	1.93
AD	0.00	0.98	0.37	0.50	0.00	0.40	0.37	0.50	1.11
STC-1	0.11	0.98	0.19	0.50	0.00	0.40	0.30	0.68	1.22
STC-2	0.23	0.98	0.15	0.50	0.00	0.40	0.38	0.79	1.80
STC-3	0.11	0.98	0.07	0.50	0.00	0.40	0.18	0.79	0.86
STC-4	0.16	0.98	0.02	0.50	0.00	0.40	0.18	0.93	1.00
BLDG 1	0.05	0.98	0.00	0.50	0.00	0.40	0.05	0.98	0.29
BLDG 2	0.05	0.98	0.00	0.50	0.00	0.40	0.05	0.98	0.29
BLDG 3	0.05	0.98	0.00	0.50	0.00	0.40	0.05	0.98	0.29
BLDG 4	0.05	0.98	0.00	0.50	0.00	0.40	0.05	0.98	0.29
BLDG 5	0.05	0.98	0.00	0.50	0.00	0.40	0.05	0.98	0.29
BLDG A-1	0.16	0.98	0.00	0.50	0.00	0.40	0.16	0.98	0.94
BLDG A-2	0.23	0.98	0.00	0.50	0.00	0.40	0.23	0.98	1.35
BLDG A-3	0.50	0.98	0.00	0.50	0.00	0.40	0.50	0.98	2.94
BLDG B-1	0.18	0.98	0.00	0.50	0.00	0.40	0.18	0.98	1.06
BLDG B-2	0.19	0.98	0.00	0.50	0.00	0.40	0.19	0.98	1.12
BLDG B-3	0.17	0.98	0.00	0.50	0.00	0.40	0.17	0.98	1.00
BLDG B-4	0.24	0.98	0.00	0.50	0.00	0.40	0.24	0.98	1.41
CLUB HOUSE	0.17	0.98	0.00	0.50	0.00	0.40	0.17	0.98	1.00
POOL DECK	0.17	0.98	0.00	0.50	0.00	0.40	0.17	0.98	1.00
TOTAL	4.00		1.43		0.00		5.43		

Notes:

- 1.) Shaded columns indicate input values.
- 2.) Storm Event = 25 Year.
- 3.) $Q = \text{Flow} = C \times I \times \text{Area}$,
where $I = 6.0$ inches/hour (5 min. duration) for the 25 year storm event.

Greendale Avenue - Needham, MA
StormCAD Report

Label	Upstream Structure	Upstream Elevation Ground (ft)	Downstream Structure	Downstream Elevation Ground (ft)	Diameter (in)	Length (ft)	Slope (ft/ft)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Velocity (Average) (ft/s)	Flow (ft³/s)	Capacity (Full Flow) (ft³/s)	Upstream Cover (ft)	Downstream Cover (ft)
P-86	CB-6	132.40	DMH	132.50	12	3	0.010	128.40	128.37	4.96	1.21	4.63	3.00	3.13
P-88	DMH-14	131.70	INF-8	131.30	12	4	0.010	125.04	125.00	6.71	4.43	4.63	5.66	5.30
P-90	POOL DECK	133.00	DMH-14	131.70	12	35	0.037	129.00	127.70	7.51	1.00	8.93	3.00	3.00
P-103	BLDG-4	144.90	DMH-27	144.10	12	50	0.016	140.90	140.10	3.88	0.29	5.86	3.00	3.00
P-104	DMH-27	144.10	INF-5	144.10	12	4	0.010	138.04	138.00	6.34	3.15	4.63	5.06	5.10
P-105	STC-2	144.00	DMH-27	144.10	12	4	0.010	140.00	139.96	5.53	1.80	4.63	3.00	3.14
P-106	ROOF B-1	145.00	DMH-27	144.10	12	10	0.090	141.00	140.10	10.46	1.06	13.89	3.00	3.00
P-107	STC-3	142.00	DMH-28	145.40	12	82	0.005	138.19	137.78	3.51	0.86	3.27	2.81	6.62
P-108	ROOF B-2	145.00	DMH-28	145.40	12	10	0.322	141.00	137.78	16.64	1.12	26.28	3.00	6.62
P-109	DMH-28	145.40	DMH-29	146.80	12	4	0.010	137.68	137.64	5.67	1.98	4.63	6.72	8.16
P-110	DMH-29	146.80	INF-6	145.70	12	4	0.010	137.54	137.50	5.67	1.98	4.63	8.26	7.20
P-111	BLDG 5	144.10	DMH-30	143.30	12	42	0.071	140.10	137.12	10.31	1.35	12.34	3.00	5.18
P-112	DMH-30	143.30	INF-7	143.00	12	2	0.010	137.02	137.00	5.12	1.35	4.63	5.28	5.00
P-113	BLDG-3	148.50	DMH-31	148.50	12	50	0.027	144.50	143.14	4.67	0.29	7.64	3.00	4.36
P-114	DMH-31	148.50	INF-4	148.70	12	4	0.010	143.04	143.00	5.39	1.64	4.63	4.46	4.70
P-115	ROOF A-2	149.00	DMH-31	148.50	12	17	0.109	145.00	143.14	12.02	1.35	15.32	3.00	4.36
P-116	BLDG 2	149.20	DMH-33	147.90	12	51	0.044	145.20	142.94	5.54	0.29	9.75	3.00	3.96
P-117	DMH-33	147.90	INF-3	148.00	12	20	0.010	142.70	142.50	5.75	2.09	4.63	4.20	4.50
P-118	CB-2	146.10	STC-1	147.90	12	131	0.005	143.59	142.93	3.17	0.59	3.29	1.51	3.97
P-119	STC-1	147.90	DMH-33	147.90	12	4	0.008	142.83	142.80	4.97	1.80	4.01	4.07	4.10
P-120	CB-1	147.80	STC-1	147.90	12	4	0.010	143.80	143.76	4.96	1.21	4.63	3.00	3.14
P-122	ROOF A-1	149.00	DMH-34	148.10	12	22	0.130	145.00	142.14	11.48	0.94	16.70	3.00	4.96
P-123	DMH-34	148.10	INF-2	148.00	12	4	0.010	142.04	142.00	4.62	0.94	4.63	5.06	5.00
P-124	CLUBHOUSE	149.00	DMH-35	147.90	12	22	0.063	145.00	143.62	9.04	1.00	11.60	3.00	3.28
P-125	DMH-35	147.90	INF-1	148.00	12	4	0.010	141.54	141.50	5.84	2.22	4.63	5.36	5.50
P-126	STC-1	147.70	DMH-35	147.90	12	10	0.008	143.70	143.62	4.59	1.22	4.14	3.00	3.28
P-127	DMH	132.50	STC-3	132.00	12	9	0.030	128.27	128.00	9.82	3.43	8.02	3.23	3.00
P-128	STC-3	132.00	DMH-14	131.70	12	4	0.050	127.90	127.70	11.84	3.43	10.36	3.10	3.00
P-129	BLDG 1	148.30	DMH-37	146.90	12	46	0.030	144.30	142.90	4.86	0.29	8.08	3.00	3.00
P-130	DMH-37	146.90	DMH-38	139.30	12	115	0.053	141.36	135.30	5.88	0.29	10.63	4.54	3.00
P-131	CB-7	139.10	DMH-38	139.30	12	19	0.010	135.10	134.91	5.62	1.93	4.63	3.00	3.39
P-132	DMH-38	139.30	DMH	132.50	12	115	0.055	134.81	128.50	10.86	2.22	10.85	3.49	3.00
P-133	ROOF A-3	129.30	DMH-39	128.40	12	28	0.014	125.30	124.92	7.31	3.51	5.40	3.00	2.48
P-134	DMH-39	128.40	INF-9	128.00	12	4	0.020	122.08	122.00	8.48	3.51	6.55	5.32	5.00
P-135	CB-5	124.60	STC-2	124.30	12	4	0.010	120.60	120.56	5.08	1.32	4.63	3.00	2.74
P-136	STC-2	124.30	DMH-41	125.50	12	4	0.185	111.91	111.17	18.67	3.24	19.92	11.39	13.33
P-137	DMH-41	125.50	INF-10	124.00	12	4	0.017	111.07	111.00	7.91	3.24	6.13	13.43	12.00
P-138	CB-4	115.60	STC-2	124.30	12	119	0.005	112.60	112.01	4.32	1.92	3.26	2.00	11.29
P-139	AD-11	111.91	DMH-42	116.50	12	40	0.005	109.91	109.71	4.34	1.93	3.27	1.00	5.79

Label	Upstream Structure	Upstream Elevation Ground (ft)	Downstream Structure	Downstream Elevation Ground (ft)	Diameter (in)	Length (ft)	Slope (ft/ft)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Velocity (Average) (ft/s)	Flow (ft³/s)	Capacity (Full Flow) (ft³/s)	Upstream Cover (ft)	Downstream Cover (ft)
P-140	DMH-42	116.50	FES	113.50	12	22	0.005	109.61	109.50	4.34	1.93	3.27	5.89	3.00
P-141	CB-3	140.40	DMH-45	140.30	12	8	0.012	136.40	136.30	3.79	0.36	5.18	3.00	3.00
P-142	DMH-45	140.30	DMH-46	128.90	12	200	0.056	136.20	124.90	6.45	0.36	11.01	3.10	3.00
P-143	DMH-46	128.90	DMH-44	125.20	12	60	0.060	124.80	121.20	9.74	1.36	11.34	3.10	3.00
P-144	STC-4	129.70	DMH-46	128.90	12	12	0.067	125.70	124.90	9.24	1.00	11.96	3.00	3.00
P-145	ROOF B-4	125.50	DMH-44	125.20	12	22	0.014	121.50	121.20	0.00	0.00	5.41	3.00	3.00
P-146	ROOF B-3	117.50	DMH-43	117.50	12	20	0.014	113.50	113.22	5.31	1.00	5.48	3.00	3.28
P-147	DMH-43	117.50	INF-11A	118.00	12	10	0.012	113.12	113.00	5.02	1.00	5.07	3.38	4.00
P-148	DMH-44	125.20	INF-11B	124.30	12	12	0.020	113.24	113.00	6.58	1.36	6.55	10.96	10.30

Calc. By: SJW
Chk. By: _____

Date: 30-Sep-13
Date: _____

**Greendale Avenue
Needham, MA**

Groundwater Recharge Calculations

Required Recharge Volume¹

$R_v = F \times \text{impervious area}$

Where: R_v = required recharge volume (acre-feet)

F = target depth factor associated with each hydrologic soil group (inches)

Impervious Area = pavement and rooftop area on site (acres)

NRCS Hydrologic Soil Type	Approx. Soil Texture	Target Depth Factor (inches)	Impervious Area (acre)	R_v (acre-feet)	R_v (cf)
A	sand	0.60	3.95	0.198	8,603
B	loam	0.35	0.00	0.000	0
C	silty loam	0.25	0.00	0.000	0
D	clay	0.10	0.00	0.000	0
Total =			3.95	0.198	8,603

Provided Recharge Volume²

Infiltration Chamber	Static Storage Volume (acre-feet)	Static Storage Volume (cf)
1	0.060	2,610
2	0.032	1,377
3	0.060	2,610
4	0.053	2,302
5	0.077	3,368
6	0.060	2,610
7	0.025	1,069
8	0.109	4,763
9	0.108	4,722
10	0.103	4,481
11	0.119	5,173
Total =	0.805	35,085

Notes:

- 1.) Refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 15 dated February 2008.
- 2.) Provided recharge volume is based on the Static Method, refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 18 dated February 2008.

Calc. By: SJW
Chk. By: _____

Date: 30-Sep-13
Date: _____

**Greendale Avenue
Needham, MA**

Drawdown Calculations

Drawdown Time¹

$$\text{Time}_{\text{drawdown}} = \frac{R_v}{(K)(\text{Bottom Area})}$$

Where: $\text{Time}_{\text{drawdown}}$ = time it takes the basin to drain completely (hours)

R_v = static storage volume (cubic feet)

K = saturated hydraulic conductivity² (inches/hour)

Bottom Area = bottom area of recharge structure (square feet)

Infiltration Chamber	R_v (cf)	K (in/hr)	Bottom Area (sf)	Drawdown Time (hr)
1	2,610	8.27	960	3.9
2	1,377	8.27	512	3.9
3	2,610	8.27	960	3.9
4	2,302	8.27	848	3.9
5	3,368	8.27	1,219	4.0
6	2,610	8.27	960	3.9
7	1,069	8.27	400	3.9
8	4,763	8.27	1,702	4.1
9	4,722	8.27	1,702	4.0
10	4,481	8.27	1,632	4.0
11	5,173	8.27	1,863	4.0

Notes:

- 1.) Refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 25 dated February 2008.
- 2.) Refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 22 dated February 2008 (Rawls Rates Table).

Stage-Area-Storage for Pond 1P: Infiltration Chamber 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
137.50	960	0	142.70	960	3,228
137.60	960	38	142.80	960	3,266
137.70	960	77	142.90	960	3,305
137.80	960	115	143.00	960	3,343
137.90	960	154	143.10	960	3,382
138.00	960	192	143.20	960	3,420
138.10	960	230	143.30	960	3,458
138.20	960	269	143.40	960	3,497
138.30	960	307	143.50	960	3,535
138.40	960	346	143.60	960	3,574
138.50	960	384	143.70	960	3,612
138.60	960	464	143.80	960	3,650
138.70	960	544	143.90	960	3,689
138.80	960	623	144.00	960	3,727
138.90	960	702			
139.00	960	780			
139.10	960	858			
139.20	960	936			
139.30	960	1,014			
139.40	960	1,092			
139.50	960	1,169			
139.60	960	1,246			
139.70	960	1,323			
139.80	960	1,400			
139.90	960	1,476			
140.00	960	1,551			
140.10	960	1,626			
140.20	960	1,701			
140.30	960	1,775			
140.40	960	1,849			
140.50	960	1,922			
140.60	960	1,995			
140.70	960	2,067			
140.80	960	2,138			
140.90	960	2,208			
141.00	960	2,277			
141.10	960	2,346			
141.20	960	2,414			
141.30	960	2,480			
141.40	960	2,546			
*141.50	960	2,610			
141.60	960	2,673			
141.70	960	2,735			
141.80	960	2,795			
141.90	960	2,854			
142.00	960	2,911			
142.10	960	2,965			
142.20	960	3,017			
142.30	960	3,066			
142.40	960	3,110			
142.50	960	3,151			
142.60	960	3,190			

* outlet elevation

Stage-Area-Storage for Pond 2P: Infiltration Chamber 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
138.00	512	0	143.20	512	1,704
138.10	512	20	143.30	512	1,725
138.20	512	41	143.40	512	1,745
138.30	512	61	143.50	512	1,766
138.40	512	82	143.60	512	1,786
138.50	512	102	143.70	512	1,807
138.60	512	123	143.80	512	1,827
138.70	512	143	143.90	512	1,848
138.80	512	164	144.00	512	1,868
138.90	512	184	144.10	512	1,889
139.00	512	205	144.20	512	1,909
139.10	512	247	144.30	512	1,930
139.20	512	289	144.40	512	1,950
139.30	512	330	144.50	512	1,971
139.40	512	372			
139.50	512	413			
139.60	512	454			
139.70	512	495			
139.80	512	536			
139.90	512	577			
140.00	512	618			
140.10	512	659			
140.20	512	699			
140.30	512	739			
140.40	512	779			
140.50	512	819			
140.60	512	859			
140.70	512	898			
140.80	512	937			
140.90	512	976			
141.00	512	1,014			
141.10	512	1,053			
141.20	512	1,090			
141.30	512	1,128			
141.40	512	1,165			
141.50	512	1,201			
141.60	512	1,238			
141.70	512	1,273			
141.80	512	1,308			
141.90	512	1,343			
*142.00	512	1,377			
142.10	512	1,410			
142.20	512	1,443			
142.30	512	1,475			
142.40	512	1,506			
142.50	512	1,536			
142.60	512	1,565			
142.70	512	1,592			
142.80	512	1,618			
142.90	512	1,642			
143.00	512	1,663			
143.10	512	1,684			

* outlet elevation

Stage-Area-Storage for Pond 3P: Infiltration Chamber 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
138.50	960	0	143.70	960	3,228
138.60	960	38	143.80	960	3,266
138.70	960	77	143.90	960	3,305
138.80	960	115	144.00	960	3,343
138.90	960	154	144.10	960	3,382
139.00	960	192	144.20	960	3,420
139.10	960	230	144.30	960	3,458
139.20	960	269	144.40	960	3,497
139.30	960	307	144.50	960	3,535
139.40	960	346	144.60	960	3,574
139.50	960	384	144.70	960	3,612
139.60	960	464	144.80	960	3,650
139.70	960	544	144.90	960	3,689
139.80	960	623	145.00	960	3,727
139.90	960	702			
140.00	960	780			
140.10	960	858			
140.20	960	936			
140.30	960	1,014			
140.40	960	1,092			
140.50	960	1,169			
140.60	960	1,246			
140.70	960	1,323			
140.80	960	1,400			
140.90	960	1,476			
141.00	960	1,551			
141.10	960	1,626			
141.20	960	1,701			
141.30	960	1,775			
141.40	960	1,849			
141.50	960	1,922			
141.60	960	1,995			
141.70	960	2,067			
141.80	960	2,138			
141.90	960	2,208			
142.00	960	2,277			
142.10	960	2,346			
142.20	960	2,414			
142.30	960	2,480			
142.40	960	2,546			
*142.50	960	2,610			
142.60	960	2,673			
142.70	960	2,735			
142.80	960	2,795			
142.90	960	2,854			
143.00	960	2,911			
143.10	960	2,965			
143.20	960	3,017			
143.30	960	3,066			
143.40	960	3,110			
143.50	960	3,151			
143.60	960	3,190			

*atlet elevation

Stage-Area-Storage for Pond 4P: Infiltration Chamber 4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
139.00	848	0	144.20	848	2,847
139.10	848	34	144.30	848	2,881
139.20	848	68	144.40	848	2,915
139.30	848	102	144.50	848	2,949
139.40	848	136	144.60	848	2,983
139.50	848	170	144.70	848	3,017
139.60	848	204	144.80	848	3,051
139.70	848	237	144.90	848	3,085
139.80	848	271	145.00	848	3,119
139.90	848	305	145.10	848	3,152
140.00	848	339	145.20	848	3,186
140.10	848	410	145.30	848	3,220
140.20	848	480	145.40	848	3,254
140.30	848	550	145.50	848	3,288
140.40	848	619			
140.50	848	688			
140.60	848	757			
140.70	848	826			
140.80	848	895			
140.90	848	963			
141.00	848	1,031			
141.10	848	1,099			
141.20	848	1,167			
141.30	848	1,235			
141.40	848	1,302			
141.50	848	1,368			
141.60	848	1,435			
141.70	848	1,500			
141.80	848	1,566			
141.90	848	1,631			
142.00	848	1,695			
142.10	848	1,759			
142.20	848	1,822			
142.30	848	1,885			
142.40	848	1,947			
142.50	848	2,008			
142.60	848	2,069			
142.70	848	2,128			
142.80	848	2,187			
142.90	848	2,245			
*143.00	848	2,302			
143.10	848	2,358			
143.20	848	2,412			
143.30	848	2,465			
143.40	848	2,517			
143.50	848	2,567			
143.60	848	2,615			
143.70	848	2,661			
143.80	848	2,704			
143.90	848	2,743			
144.00	848	2,779			
144.10	848	2,813			

* outlet elevation

Stage-Area-Storage for Pond 5P: Infiltration Chamber 5

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
134.00	1,219	0	139.20	1,219	4,160
134.10	1,219	49	139.30	1,219	4,209
134.20	1,219	98	139.40	1,219	4,258
134.30	1,219	146	139.50	1,219	4,307
134.40	1,219	195	139.60	1,219	4,356
134.50	1,219	244	139.70	1,219	4,404
134.60	1,219	293	139.80	1,219	4,453
134.70	1,219	341	139.90	1,219	4,502
134.80	1,219	390	140.00	1,219	4,551
134.90	1,219	439	140.10	1,219	4,599
135.00	1,219	488	140.20	1,219	4,648
135.10	1,219	592	140.30	1,219	4,697
135.20	1,219	695	140.40	1,219	4,746
135.30	1,219	797	140.50	1,219	4,794
135.40	1,219	899			
135.50	1,219	1,001			
135.60	1,219	1,102			
135.70	1,219	1,203			
135.80	1,219	1,304			
135.90	1,219	1,405			
136.00	1,219	1,505			
136.10	1,219	1,605			
136.20	1,219	1,704			
136.30	1,219	1,803			
136.40	1,219	1,901			
136.50	1,219	1,999			
136.60	1,219	2,097			
136.70	1,219	2,193			
136.80	1,219	2,289			
136.90	1,219	2,385			
137.00	1,219	2,479			
137.10	1,219	2,573			
137.20	1,219	2,666			
137.30	1,219	2,758			
137.40	1,219	2,849			
137.50	1,219	2,938			
137.60	1,219	3,027			
137.70	1,219	3,114			
137.80	1,219	3,200			
137.90	1,219	3,285			
*138.00	1,219	3,368			
138.10	1,219	3,449			
138.20	1,219	3,529			
138.30	1,219	3,607			
138.40	1,219	3,682			
138.50	1,219	3,755			
138.60	1,219	3,825			
138.70	1,219	3,892			
138.80	1,219	3,954			
138.90	1,219	4,011			
139.00	1,219	4,063			
139.10	1,219	4,112			

* outlet elevation

Stage-Area-Storage for Pond 6P: Infiltration Chamber 6

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.50	960	0	138.70	960	3,228
133.60	960	38	138.80	960	3,266
133.70	960	77	138.90	960	3,305
133.80	960	115	139.00	960	3,343
133.90	960	154	139.10	960	3,382
134.00	960	192	139.20	960	3,420
134.10	960	230	139.30	960	3,458
134.20	960	269	139.40	960	3,497
134.30	960	307	139.50	960	3,535
134.40	960	346	139.60	960	3,574
134.50	960	384	139.70	960	3,612
134.60	960	464	139.80	960	3,650
134.70	960	544	139.90	960	3,689
134.80	960	623	140.00	960	3,727
134.90	960	702			
135.00	960	780			
135.10	960	858			
135.20	960	936			
135.30	960	1,014			
135.40	960	1,092			
135.50	960	1,169			
135.60	960	1,246			
135.70	960	1,323			
135.80	960	1,400			
135.90	960	1,476			
136.00	960	1,551			
136.10	960	1,626			
136.20	960	1,701			
136.30	960	1,775			
136.40	960	1,849			
136.50	960	1,922			
136.60	960	1,995			
136.70	960	2,067			
136.80	960	2,138			
136.90	960	2,208			
137.00	960	2,277			
137.10	960	2,346			
137.20	960	2,414			
137.30	960	2,480			
137.40	960	2,546			
*137.50	960	2,610			
137.60	960	2,673			
137.70	960	2,735			
137.80	960	2,795			
137.90	960	2,854			
138.00	960	2,911			
138.10	960	2,965			
138.20	960	3,017			
138.30	960	3,066			
138.40	960	3,110			
138.50	960	3,151			
138.60	960	3,190			

* outlet elevation

Stage-Area-Storage for Pond 7P: Infiltration Chamber 7

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.00	400	0	138.20	400	1,323
133.10	400	16	138.30	400	1,339
133.20	400	32	138.40	400	1,355
133.30	400	48	138.50	400	1,371
133.40	400	64	138.60	400	1,387
133.50	400	80	138.70	400	1,403
133.60	400	96	138.80	400	1,419
133.70	400	112	138.90	400	1,435
133.80	400	128	139.00	400	1,451
133.90	400	144	139.10	400	1,467
134.00	400	160	139.20	400	1,483
134.10	400	193	139.30	400	1,499
134.20	400	225	139.40	400	1,515
134.30	400	257	139.50	400	1,531
134.40	400	289			
134.50	400	321			
134.60	400	353			
134.70	400	385			
134.80	400	417			
134.90	400	449			
135.00	400	480			
135.10	400	512			
135.20	400	543			
135.30	400	574			
135.40	400	605			
135.50	400	636			
135.60	400	667			
135.70	400	697			
135.80	400	728			
135.90	400	758			
136.00	400	787			
136.10	400	817			
136.20	400	846			
136.30	400	875			
136.40	400	904			
136.50	400	933			
136.60	400	961			
136.70	400	988			
136.80	400	1,016			
136.90	400	1,042			
*137.00	400	1,069			
137.10	400	1,095			
137.20	400	1,120			
137.30	400	1,145			
137.40	400	1,169			
137.50	400	1,192			
137.60	400	1,214			
137.70	400	1,236			
137.80	400	1,256			
137.90	400	1,274			
138.00	400	1,291			
138.10	400	1,307			

* outlet elevation

Stage-Area-Storage for Pond 8P: Infiltration Chamber 8

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
121.00	1,702	0	126.20	1,702	5,879
121.10	1,702	68	126.30	1,702	5,947
121.20	1,702	136	126.40	1,702	6,015
121.30	1,702	204	126.50	1,702	6,083
121.40	1,702	272	126.60	1,702	6,151
121.50	1,702	340	126.70	1,702	6,219
121.60	1,702	408	126.80	1,702	6,287
121.70	1,702	477	126.90	1,702	6,355
121.80	1,702	545	127.00	1,702	6,423
121.90	1,702	613	127.10	1,702	6,491
122.00	1,702	681	127.20	1,702	6,559
122.10	1,702	829	127.30	1,702	6,627
122.20	1,702	974	127.40	1,702	6,695
122.30	1,702	1,120	127.50	1,702	6,764
122.40	1,702	1,264			
122.50	1,702	1,409			
122.60	1,702	1,553			
122.70	1,702	1,696			
122.80	1,702	1,839			
122.90	1,702	1,981			
123.00	1,702	2,124			
123.10	1,702	2,265			
123.20	1,702	2,406			
123.30	1,702	2,547			
123.40	1,702	2,686			
123.50	1,702	2,825			
123.60	1,702	2,963			
123.70	1,702	3,100			
123.80	1,702	3,236			
123.90	1,702	3,371			
124.00	1,702	3,505			
124.10	1,702	3,638			
124.20	1,702	3,769			
124.30	1,702	3,900			
124.40	1,702	4,028			
124.50	1,702	4,155			
124.60	1,702	4,281			
124.70	1,702	4,404			
124.80	1,702	4,526			
124.90	1,702	4,646			
*125.00	1,702	4,763			
125.10	1,702	4,878			
125.20	1,702	4,991			
125.30	1,702	5,100			
125.40	1,702	5,207			
125.50	1,702	5,310			
125.60	1,702	5,408			
125.70	1,702	5,502			
125.80	1,702	5,590			
125.90	1,702	5,669			
126.00	1,702	5,742			
126.10	1,702	5,810			

* outlet elevation

Stage-Area-Storage for Pond 9P: Infiltration Chamber 9

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
118.00	1,702	0	123.20	1,702	5,831
118.10	1,702	68	123.30	1,702	5,899
118.20	1,702	136	123.40	1,702	5,967
118.30	1,702	204	123.50	1,702	6,035
118.40	1,702	272	123.60	1,702	6,103
118.50	1,702	340	123.70	1,702	6,171
118.60	1,702	408	123.80	1,702	6,239
118.70	1,702	477	123.90	1,702	6,308
118.80	1,702	545	124.00	1,702	6,376
118.90	1,702	613	124.10	1,702	6,444
119.00	1,702	681	124.20	1,702	6,512
119.10	1,702	827	124.30	1,702	6,580
119.20	1,702	971	124.40	1,702	6,648
119.30	1,702	1,115	124.50	1,702	6,716
119.40	1,702	1,258			
119.50	1,702	1,401			
119.60	1,702	1,543			
119.70	1,702	1,685			
119.80	1,702	1,827			
119.90	1,702	1,967			
120.00	1,702	2,108			
120.10	1,702	2,248			
120.20	1,702	2,388			
120.30	1,702	2,527			
120.40	1,702	2,665			
120.50	1,702	2,802			
120.60	1,702	2,939			
120.70	1,702	3,074			
120.80	1,702	3,209			
120.90	1,702	3,343			
121.00	1,702	3,475			
121.10	1,702	3,607			
121.20	1,702	3,737			
121.30	1,702	3,866			
121.40	1,702	3,993			
121.50	1,702	4,119			
121.60	1,702	4,243			
121.70	1,702	4,366			
121.80	1,702	4,487			
121.90	1,702	4,605			
*122.00	1,702	4,722			
122.10	1,702	4,836			
122.20	1,702	4,947			
122.30	1,702	5,056			
122.40	1,702	5,162			
122.50	1,702	5,264			
122.60	1,702	5,362			
122.70	1,702	5,455			
122.80	1,702	5,542			
122.90	1,702	5,622			
123.00	1,702	5,695			
123.10	1,702	5,763			

* outlet elevation

Stage-Area-Storage for Pond 10P: Infiltration Chamber 10

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
107.00	1,632	0	112.20	1,632	5,537
107.10	1,632	65	112.30	1,632	5,603
107.20	1,632	131	112.40	1,632	5,668
107.30	1,632	196	112.50	1,632	5,733
107.40	1,632	261	112.60	1,632	5,799
107.50	1,632	326	112.70	1,632	5,864
107.60	1,632	392	112.80	1,632	5,929
107.70	1,632	457	112.90	1,632	5,994
107.80	1,632	522	113.00	1,632	6,060
107.90	1,632	588	113.10	1,632	6,125
108.00	1,632	653	113.20	1,632	6,190
108.10	1,632	791	113.30	1,632	6,255
108.20	1,632	928	113.40	1,632	6,321
108.30	1,632	1,064	113.50	1,632	6,386
108.40	1,632	1,199			
108.50	1,632	1,334			
108.60	1,632	1,469			
108.70	1,632	1,603			
108.80	1,632	1,737			
108.90	1,632	1,871			
109.00	1,632	2,004			
109.10	1,632	2,136			
109.20	1,632	2,269			
109.30	1,632	2,400			
109.40	1,632	2,531			
109.50	1,632	2,661			
109.60	1,632	2,790			
109.70	1,632	2,919			
109.80	1,632	3,047			
109.90	1,632	3,173			
110.00	1,632	3,299			
110.10	1,632	3,423			
110.20	1,632	3,547			
110.30	1,632	3,669			
110.40	1,632	3,790			
110.50	1,632	3,909			
110.60	1,632	4,027			
110.70	1,632	4,143			
110.80	1,632	4,257			
110.90	1,632	4,370			
*111.00	1,632	4,481			
111.10	1,632	4,589			
111.20	1,632	4,695			
111.30	1,632	4,798			
111.40	1,632	4,899			
111.50	1,632	4,996			
111.60	1,632	5,089			
111.70	1,632	5,178			
111.80	1,632	5,261			
111.90	1,632	5,337			
112.00	1,632	5,407			
112.10	1,632	5,472			

* outlet elevation

Stage-Area-Storage for Pond 11P: Infiltration Chamber 11

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.50	1,863	0	114.70	1,863	6,388
109.60	1,863	75	114.80	1,863	6,462
109.70	1,863	149	114.90	1,863	6,537
109.80	1,863	224	115.00	1,863	6,611
109.90	1,863	298	115.10	1,863	6,686
110.00	1,863	373	115.20	1,863	6,760
110.10	1,863	447	115.30	1,863	6,835
110.20	1,863	522	115.40	1,863	6,909
110.30	1,863	596	115.50	1,863	6,984
110.40	1,863	671	115.60	1,863	7,058
110.50	1,863	745	115.70	1,863	7,133
110.60	1,863	905	115.80	1,863	7,208
110.70	1,863	1,064	115.90	1,863	7,282
110.80	1,863	1,221	116.00	1,863	7,357
110.90	1,863	1,378			
111.00	1,863	1,534			
111.10	1,863	1,690			
111.20	1,863	1,846			
111.30	1,863	2,001			
111.40	1,863	2,155			
111.50	1,863	2,309			
111.60	1,863	2,463			
111.70	1,863	2,616			
111.80	1,863	2,768			
111.90	1,863	2,919			
112.00	1,863	3,070			
112.10	1,863	3,219			
112.20	1,863	3,368			
112.30	1,863	3,516			
112.40	1,863	3,662			
112.50	1,863	3,808			
112.60	1,863	3,952			
112.70	1,863	4,094			
112.80	1,863	4,235			
112.90	1,863	4,375			
113.00	1,863	4,513			
113.10	1,863	4,649			
113.20	1,863	4,783			
113.30	1,863	4,915			
113.40	1,863	5,045			
*113.50	1,863	5,173			
113.60	1,863	5,298			
113.70	1,863	5,420			
113.80	1,863	5,539			
113.90	1,863	5,655			
114.00	1,863	5,767			
114.10	1,863	5,874			
114.20	1,863	5,977			
114.30	1,863	6,072			
114.40	1,863	6,159			
114.50	1,863	6,239			
114.60	1,863	6,313			

* outlet elevation

Greendale Avenue
Needham, MA

MaDEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate

Stormceptor Unit	Area (A)		WQV (inches)	CN	Tc		qu (csm/in)	Q (cfs)	Stormceptor Model	Stormceptor Capacity (cfs)
	(ac)	(mi ²)			(min)	(hrs)				
Stormceptor Inlet #1	0.11	0.0002	0.5	98	5.0	0.08	773	0.07	STC 450i	0.28
Stormceptor Inlet #2	0.23	0.0004	0.5	98	5.0	0.08	773	0.14	STC 450i	0.28
Stormceptor Inlet #3	0.11	0.0002	0.5	98	5.0	0.08	773	0.07	STC 450i	0.28
Stormceptor Inlet #4	0.16	0.0003	0.5	98	5.0	0.08	773	0.10	STC 450i	0.28
Stormceptor #1	0.17	0.0003	0.5	98	5.0	0.08	773	0.10	STC 450	0.28
Stormceptor #2	0.21	0.0003	0.5	98	5.0	0.08	773	0.13	STC 450	0.28
Stormceptor #3	0.37	0.0006	0.5	98	5.0	0.08	773	0.22	STC 450	0.28

Water Quality Flow (WQF) = Q = (qu) (A) (WQV)

Where: qu = the unit peak discharge (in csm/in)

A = impervious surface drainage area (in square miles)

WQV = water quality volume (in inches)

Notes:

1. Refer to MaDEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices, dated September 10, 2013.

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP	20	20.0	0.0013
ID #	770	60	20.0	0.0052
Elev. (ft)	20	150	20.0	0.0351
Latitude	N 42 deg 21 min	400	20.0	0.2116
Longitude	W 71 deg min	2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.3			
Imperviousness (%)	37			
Impervious Area (ac)	.11			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	95.8	90.2
STC 900	99.3	94.2
STC 1200	99.3	94.4
STC 1800	99.3	94.6
STC 2400	99.9	96.0
STC 3600	99.9	96.3
STC 4800	100.0	97.3
STC 6000	100.0	97.4
STC 7200	100.0	98.0
STC 11000	100.0	98.6
STC 13000	100.0	98.7
STC 16000	100.0	99.0

Comments :

STC-1

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP			
ID #	770	20	20.0	0.0013
Elev. (ft)	20	60	20.0	0.0052
Latitude	N 42 deg 21 min	150	20.0	0.0351
Longitude	W 71 deg min	400	20.0	0.2116
		2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.38			
Imperviousness (%)	61			
Impervious Area (ac)	.23			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	91.3	87.6
STC 900	98.2	92.5
STC 1200	98.2	92.6
STC 1800	98.2	92.8
STC 2400	99.5	94.6
STC 3600	99.5	95.0
STC 4800	99.9	96.2
STC 6000	99.9	96.4
STC 7200	100.0	97.1
STC 11000	100.0	98.1
STC 13000	100.0	98.2
STC 16000	100.0	98.6

Comments :

STC-2

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP	20	20.0	0.0013
ID #	770	60	20.0	0.0052
Elev. (ft)	20	150	20.0	0.0351
Latitude	N 42 deg 21 min	400	20.0	0.2116
Longitude	W 71 deg min	2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.18			
Imperviousness (%)	61			
Impervious Area (ac)	.11			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	95.8	90.2
STC 900	99.3	94.2
STC 1200	99.3	94.4
STC 1800	99.3	94.6
STC 2400	99.9	96.0
STC 3600	99.9	96.3
STC 4800	100.0	97.3
STC 6000	100.0	97.4
STC 7200	100.0	98.0
STC 11000	100.0	98.6
STC 13000	100.0	98.7
STC 16000	100.0	99.0

Comments :

STC-3

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP	20	20.0	0.0013
ID #	770	60	20.0	0.0052
Elev. (ft)	20	150	20.0	0.0351
Latitude	N 42 deg 21 min	400	20.0	0.2116
Longitude	W 71 deg min	2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.18			
Imperviousness (%)	89			
Impervious Area (ac)	.16			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	95.8	90.2
STC 900	99.3	94.2
STC 1200	99.3	94.4
STC 1800	99.3	94.6
STC 2400	99.9	96.0
STC 3600	99.9	96.3
STC 4800	100.0	97.3
STC 6000	100.0	97.4
STC 7200	100.0	98.0
STC 11000	100.0	98.6
STC 13000	100.0	98.7
STC 16000	100.0	99.0

Comments :

STC-4

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP	20	20.0	0.0013
ID #	770	60	20.0	0.0052
Elev. (ft)	20	150	20.0	0.0351
Latitude	N 42 deg 21 min	400	20.0	0.2116
Longitude	W 71 deg min	2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.24			
Imperviousness (%)	71			
Impervious Area (ac)	.17			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	95.8	90.2
STC 900	99.3	94.2
STC 1200	99.3	94.4
STC 1800	99.3	94.6
STC 2400	99.9	96.0
STC 3600	99.9	96.3
STC 4800	100.0	97.3
STC 6000	100.0	97.4
STC 7200	100.0	98.0
STC 11000	100.0	98.6
STC 13000	100.0	98.7
STC 16000	100.0	99.0

Comments :

Stormceptor #1

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP	20	20.0	0.0013
ID #	770	60	20.0	0.0052
Elev. (ft)	20	150	20.0	0.0351
Latitude	N 42 deg 21 min	400	20.0	0.2116
Longitude	W 71 deg min	2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.24			
Imperviousness (%)	88			
Impervious Area (ac)	.21			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	91.3	87.6
STC 900	98.2	92.5
STC 1200	98.2	92.6
STC 1800	98.2	92.8
STC 2400	99.5	94.6
STC 3600	99.5	95.0
STC 4800	99.9	96.2
STC 6000	99.9	96.4
STC 7200	100.0	97.1
STC 11000	100.0	98.1
STC 13000	100.0	98.2
STC 16000	100.0	98.6

Comments :

Stormceptor #2

Stormceptor Sizing Table

Version 3.0.0

Selected Rainfall Station		Particle Size Distribution		
State	MASSACHUSETTS	Diameter (um)	Percent (%)	Velocity (ft/s)
Name	BOSTON LOGAN AP	20	20.0	0.0013
ID #	770	60	20.0	0.0052
Elev. (ft)	20	150	20.0	0.0351
Latitude	N 42 deg 21 min	400	20.0	0.2116
Longitude	W 71 deg min	2000	20.0	0.9416
Site Parameters		Note : Sizing Results vary with particle size distribution. BMP comparisons must use the same particle size distribution. Please call (800) 909-7763 for sizing with other distributions		
Total Area (ac)	.69			
Imperviousness (%)	54			
Impervious Area (ac)	.37			

Stormceptor Sizing Table		
Stormceptor Model	% Runoff Treated	% TSS Removal
STC 450i	86.7	85.8
STC 900	96.8	91.3
STC 1200	96.8	91.4
STC 1800	96.8	91.6
STC 2400	99.0	93.6
STC 3600	99.0	94.0
STC 4800	99.8	95.4
STC 6000	99.8	95.6
STC 7200	100.0	96.5
STC 11000	100.0	97.6
STC 13000	100.0	97.7
STC 16000	100.0	98.2

Comments :

Stormceptor #3