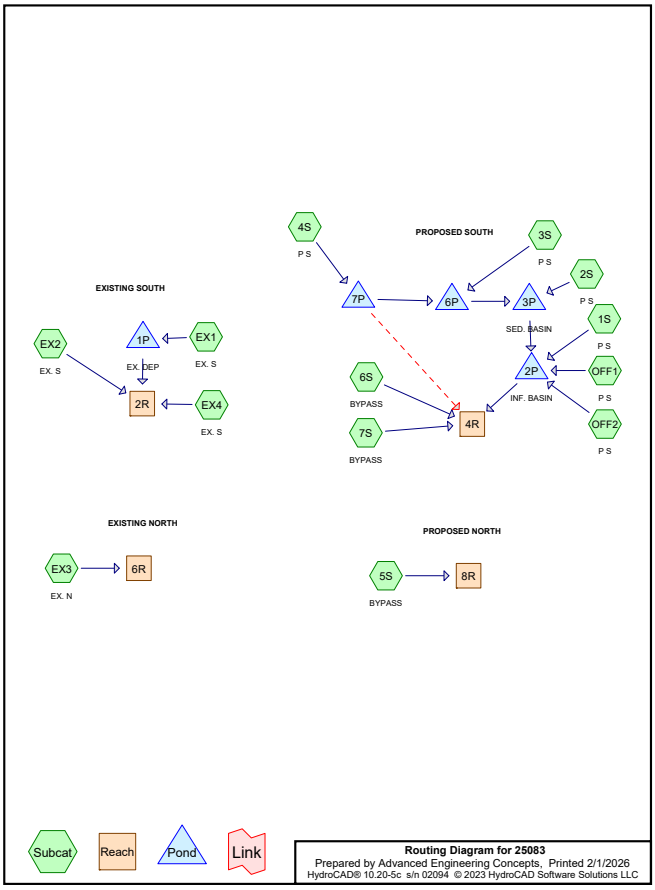


Project Notes

Rainfall events imported from "NRCS2-Rain.txt" for 1242 WI St. Croix
Rainfall events imported from "NRCS2-Rain.txt" for 1242 WI St. Croix

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	MSE 24-hr	3	Default	24.00	1	2.46	2
2	2-Year	MSE 24-hr	3	Default	24.00	1	2.82	2
3	10-Year	MSE 24-hr	3	Default	24.00	1	4.12	2
4	25-Year	MSE 24-hr	3	Default	24.00	1	5.10	2
5	100-Year	MSE 24-hr	3	Default	24.00	1	6.89	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.897	39	>75% Grass cover, Good, HSG A (1S, 2S, 7S)
10.582	61	>75% Grass cover, Good, HSG B (3S, 4S, 5S, 6S)
16.742	39	Pasture/grassland/range, Good, HSG A (1S, 2S, 5S, 6S, EX1, EX2, EX3, OFF2)
8.416	61	Pasture/grassland/range, Good, HSG B (2S, 3S, 5S, 6S, EX1, EX2, EX3, EX4, OFF2)
1.864	74	Pasture/grassland/range, Good, HSG C (1S, EX1, OFF1)
1.902	98	Paved parking, HSG A (1S, 2S, 3S, 4S, 5S, 6S, 7S, EX1, EX2, EX3)
11.014	70	Row crops, SR + CR, Good, HSG B (EX2, EX3)
0.596	56	Row crops, straight row, Good, HSG A (EX3)
0.735	98	Unconnected roofs, HSG A (1S, 3S, 5S, 6S)
0.664	98	Water Surface, HSG A (1S, 2S)
25.442	30	Woods, Good, HSG A (1S, 3S, 5S, 6S, EX1, EX2, EX3, EX4, OFF2)
0.764	55	Woods, Good, HSG B (5S, EX1, EX3, OFF2)
2.826	70	Woods, Good, HSG C (1S, EX1, OFF1)
82.445	**50**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
46.978	HSG A	1S, 2S, 3S, 4S, 5S, 6S, 7S, EX1, EX2, EX3, EX4, OFF2
30.776	HSG B	2S, 3S, 4S, 5S, 6S, EX1, EX2, EX3, EX4, OFF2
4.690	HSG C	1S, EX1, OFF1
0.000	HSG D	
0.000	Other	
82.445		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.897	10.582	0.000	0.000	0.000	11.479	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S
16.742	8.416	1.864	0.000	0.000	27.022	Pasture/grassland/range, Good	1S, 2S, 3S, 5S, 6S, EX1, EX2, EX3, EX4, OFF1, OFF2
1.902	0.000	0.000	0.000	0.000	1.902	Paved parking	1S, 2S, 3S, 4S, 5S, 6S, 7S, EX1, EX2, EX3
0.000	11.014	0.000	0.000	0.000	11.014	Row crops, SR + CR, Good	EX2, EX3
0.596	0.000	0.000	0.000	0.000	0.596	Row crops, straight row, Good	EX3
0.735	0.000	0.000	0.000	0.000	0.735	Unconnected roofs	1S, 3S, 5S, 6S

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.664	0.000	0.000	0.000	0.000	0.664	Water Surface	1S, 2S
25.442	0.764	2.826	0.000	0.000	29.032	Woods, Good	1S, 3S, 5S, 6S, EX1, EX2, EX3, EX4, OFF1, OFF2
46.978	**30.776**	**4.690**	**0.000**	**0.000**	**82.445**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1P	832.07	830.98	22.0	0.0495	0.012	0.0	24.0	0.0	
2	2P	832.00	831.60	80.0	0.0050	0.012	0.0	18.0	0.0	
3	3P	831.50	831.50	40.0	0.0000	0.012	0.0	8.0	0.0	
4	6P	837.84	831.50	127.0	0.0499	0.013	0.0	18.0	0.0	
5	7P	838.04	837.84	49.0	0.0041	0.013	0.0	18.0	0.0	

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

Subcatchment 1S: P S Runoff Area=9.224 ac 8.68% Impervious Runoff Depth>0.25"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=3.70 cfs 0.190 af

Subcatchment 2S: P S Runoff Area=0.870 ac 24.60% Impervious Runoff Depth>0.56"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=0.76 cfs 0.041 af

Subcatchment 3S: P S Runoff Area=7.471 ac 8.42% Impervious Runoff Depth>0.30"
Flow Length=172' Tc=6.1 min UI Adjusted CN=WQ Runoff=2.71 cfs 0.187 af

Subcatchment 4S: P S Runoff Area=1.536 ac 27.28% Impervious Runoff Depth>0.71"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=1.55 cfs 0.091 af

Subcatchment 5S: BYPASS Runoff Area=460,253 sf 5.89% Impervious Runoff Depth>0.22"
Flow Length=580' Tc=13.2 min UI Adjusted CN=WQ Runoff=2.07 cfs 0.190 af

Subcatchment 6S: BYPASS Runoff Area=96,237 sf 7.07% Impervious Runoff Depth>0.17"
Flow Length=475' Tc=12.0 min UI Adjusted CN=WQ Runoff=0.46 cfs 0.031 af

Subcatchment 7S: BYPASS Runoff Area=0.257 ac 46.30% Impervious Runoff Depth>1.00"
Flow Length=475' Tc=12.0 min CN=WQ Runoff=0.34 cfs 0.021 af

Subcatchment EX1: EX. S Runoff Area=834,494 sf 0.48% Impervious Runoff Depth>0.08"
Flow Length=1,565' Tc=15.9 min CN=WQ Runoff=1.55 cfs 0.126 af

Subcatchment EX2: EX. S Runoff Area=180,439 sf 4.57% Impervious Runoff Depth>0.36"
Flow Length=1,025' Tc=18.2 min CN=WQ Runoff=1.47 cfs 0.126 af

Subcatchment EX3: EX. N Runoff Area=702,335 sf 0.37% Impervious Runoff Depth>0.25"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=3.88 cfs 0.335 af

Subcatchment EX4: EX. S Runoff Area=78,427 sf 0.00% Impervious Runoff Depth>0.09"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=0.09 cfs 0.013 af

Subcatchment OFF1: P S Runoff Area=1.118 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=0.93 cfs 0.044 af

Subcatchment OFF2: P S Runoff Area=7.970 ac 0.00% Impervious Runoff Depth>0.03"
Flow Length=376' Tc=15.7 min CN=WQ Runoff=0.14 cfs 0.019 af

Reach 2R: Inflow=1.54 cfs 0.139 af
Outflow=1.54 cfs 0.139 af

Reach 4R: Inflow=0.79 cfs 0.052 af
Outflow=0.79 cfs 0.052 af

Reach 6R: Inflow=3.88 cfs 0.335 af
Outflow=3.88 cfs 0.335 af

Reach 8R: Inflow=2.07 cfs 0.190 af
Outflow=2.07 cfs 0.190 af

Pond 1P: EX. DEP Peak Elev=826.80' Storage=4,675 cf Inflow=1.55 cfs 0.126 af
Discarded=0.03 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.019 af

Pond 2P: INF. BASIN Peak Elev=830.76' Storage=20,448 cf Inflow=5.44 cfs 0.551 af
Discarded=0.08 cfs 0.082 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.082 af

Pond 3P: SED. BASIN Peak Elev=832.92' Storage=4,949 cf Inflow=4.19 cfs 0.317 af
Outflow=1.33 cfs 0.298 af

Pond 6P: Peak Elev=838.73' Storage=325 cf Inflow=3.82 cfs 0.277 af
Outflow=3.49 cfs 0.277 af

Pond 7P: Peak Elev=838.81' Storage=428 cf Inflow=1.55 cfs 0.091 af
Primary=1.11 cfs 0.090 af Secondary=0.00 cfs 0.000 af Outflow=1.11 cfs 0.090 af

Total Runoff Area = 82.445 ac Runoff Volume = 1.413 af Average Runoff Depth = 0.21"
96.00% Pervious = 79.143 ac 4.00% Impervious = 3.301 ac

Summary for Subcatchment 1S: P S

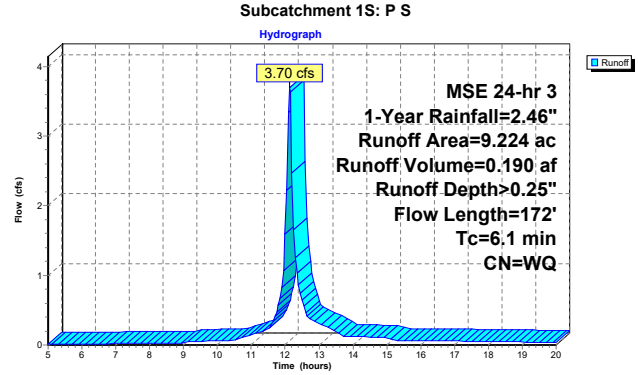
Runoff = 3.70 cfs @ 12.13 hrs, Volume= 0.190 af, Depth> 0.25"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Description
5.387	30	Woods, Good, HSG A
0.843	70	Woods, Good, HSG C
1.427	39	Pasture/grassland/range, Good, HSG A
0.381	74	Pasture/grassland/range, Good, HSG C
0.385	39	>75% Grass cover, Good, HSG A
0.092	98	Unconnected roofs, HSG A
0.112	98	Paved parking, HSG A
0.597	98	Water Surface, HSG A
9.224		Weighted Average
8.423		91.32% Pervious Area
0.801		8.68% Impervious Area
0.092		11.49% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 1S: P S



Summary for Subcatchment 2S: P S

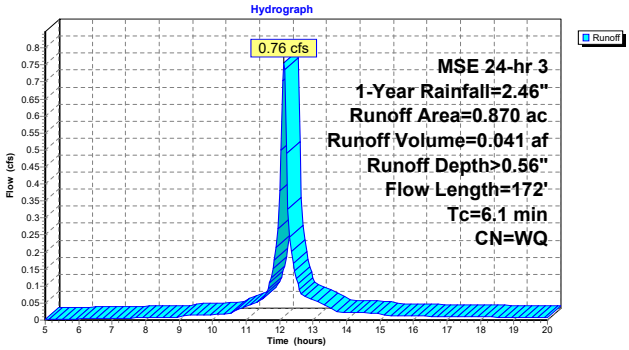
Runoff = 0.76 cfs @ 12.13 hrs, Volume= 0.041 af, Depth> 0.56"
Routed to Pond 3P : SED. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Description
0.115	39	Pasture/grassland/range, Good, HSG A
0.167	61	Pasture/grassland/range, Good, HSG B
0.374	39	>75% Grass cover, Good, HSG A
0.147	98	Paved parking, HSG A
0.067	98	Water Surface, HSG A
0.870		Weighted Average
0.656		75.40% Pervious Area
0.214		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 2S: P S



Summary for Subcatchment 3S: P S

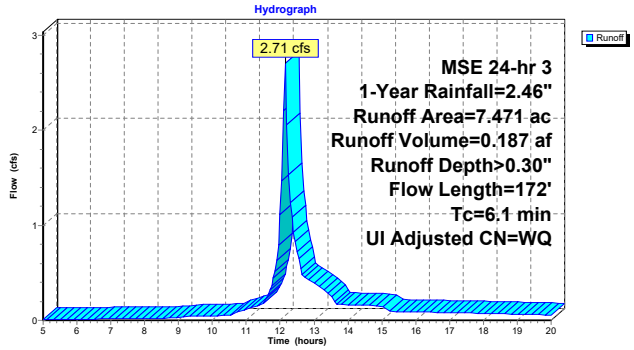
Runoff = 2.71 cfs @ 12.15 hrs, Volume= 0.187 af, Depth> 0.30"
Routed to Pond 6P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Adj	Description
1.509	30	30	Woods, Good, HSG A
0.430	61	61	Pasture/grassland/range, Good, HSG B
4.903	61	61	>75% Grass cover, Good, HSG B
0.184	98	98	Unconnected roofs, HSG A
0.445	98	98	Paved parking, HSG A
7.471			Weighted Average
6.842			91.58% Pervious Area
0.629			8.42% Impervious Area
0.184			29.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 3S: P S



Summary for Subcatchment 4S: P S

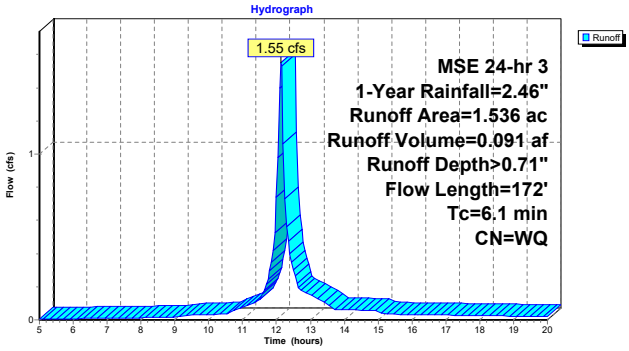
Runoff = 1.55 cfs @ 12.14 hrs, Volume= 0.091 af, Depth> 0.71"
Routed to Pond 7P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Description
1.117	61	>75% Grass cover, Good, HSG B
0.419	98	Paved parking, HSG A
1.536		Weighted Average
1.117		72.72% Pervious Area
0.419		27.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 4S: P S



Summary for Subcatchment 5S: BYPASS

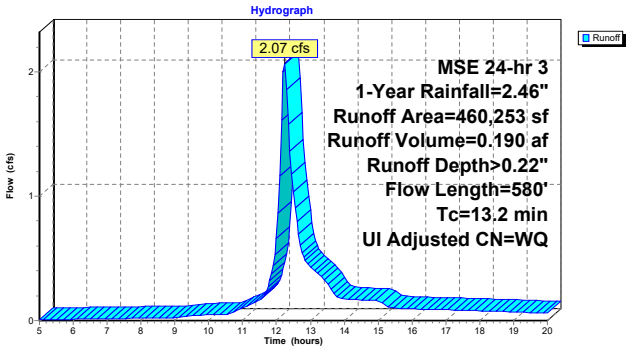
Runoff = 2.07 cfs @ 12.24 hrs, Volume= 0.190 af, Depth> 0.22"
Routed to Reach 8R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (sf)	CN	Adj	Description
163,516	30	30	Woods, Good, HSG A
10,629	55	55	Woods, Good, HSG B
16,422	39	39	Pasture/grassland/range, Good, HSG A
48,047	61	61	Pasture/grassland/range, Good, HSG B
194,539	61	61	>75% Grass cover, Good, HSG B
16,000	98	98	Unconnected roofs, HSG A
11,100	98	98	Paved parking, HSG A
460,253			Weighted Average
433,153			94.11% Pervious Area
27,100			5.89% Impervious Area
16,000			59.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.2	105	0.0300	1.44	66.42	**Channel Flow,** Area= 46.0 sf Perim= 153.0' r= 0.30' n= 0.080 Earth, long dense weeds
13.2	580	Total			

Subcatchment 5S: BYPASS



Summary for Subcatchment 6S: BYPASS

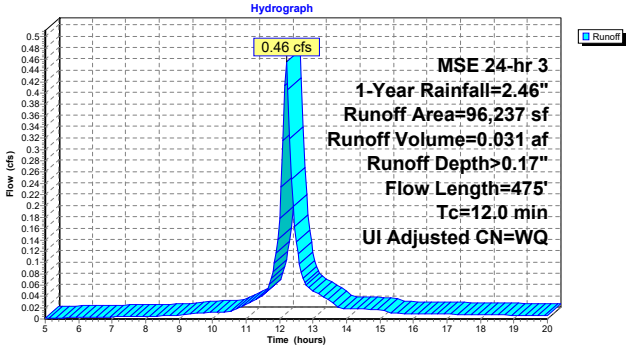
Runoff = 0.46 cfs @ 12.20 hrs, Volume= 0.031 af, Depth> 0.17"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (sf)	CN	Adj	Description
72,405	30	30	Woods, Good, HSG A
8,668	39	39	Pasture/grassland/range, Good, HSG A
4,182	61	61	Pasture/grassland/range, Good, HSG B
4,182	61	61	>75% Grass cover, Good, HSG B
4,000	98	98	Unconnected roofs, HSG A
2,800	98	98	Paved parking, HSG A
96,237			Weighted Average
89,437			92.93% Pervious Area
6,800			7.07% Impervious Area
4,000			58.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 6S: BYPASS



Summary for Subcatchment 7S: BYPASS

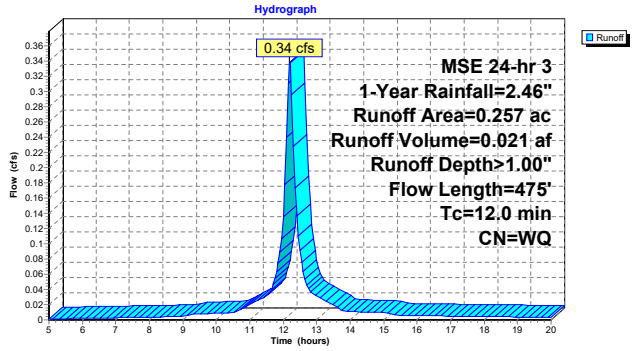
Runoff = 0.34 cfs @ 12.19 hrs, Volume= 0.021 af, Depth> 1.00"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Description
0.138	39	>75% Grass cover, Good, HSG A
0.119	98	Paved parking, HSG A
0.257		Weighted Average
0.138		53.70% Pervious Area
0.119		46.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 7S: BYPASS



Summary for Subcatchment EX1: EX. S

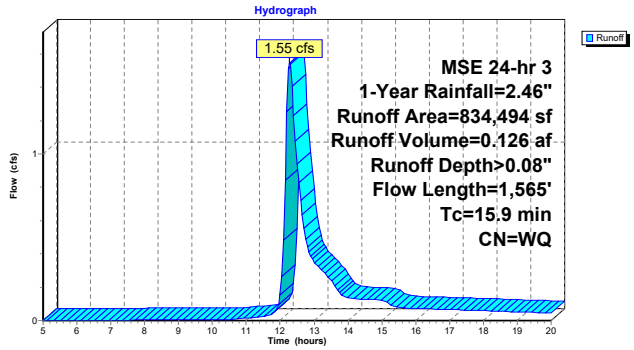
Runoff = 1.55 cfs @ 12.28 hrs, Volume= 0.126 af, Depth> 0.08"
Routed to Pond 1P : EX. DEP

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (sf)	CN	Description
315,214	30	Woods, Good, HSG A
5,112	55	Woods, Good, HSG B
61,557	70	Woods, Good, HSG C
348,487	39	Pasture/grassland/range, Good, HSG A
59,335	61	Pasture/grassland/range, Good, HSG B
40,743	74	Pasture/grassland/range, Good, HSG C
4,046	98	Paved parking, HSG A
834,494		Weighted Average
830,448		99.52% Pervious Area
4,046		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0300	0.21		**Sheet Flow,** Range n= 0.130 P2= 2.82"
8.0	1,465	0.0410	3.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.9	1,565	Total			

Subcatchment EX1: EX. S



Summary for Subcatchment EX2: EX. S

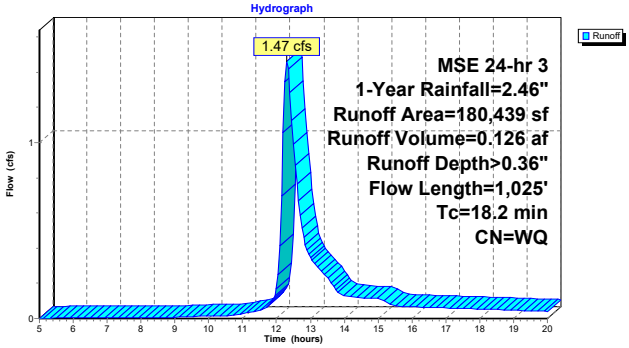
Runoff = 1.47 cfs @ 12.31 hrs, Volume= 0.126 af, Depth> 0.36"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

	Area (sf)	CN	Description
	10,838	30	Woods, Good, HSG A
	24,569	39	Pasture/grassland/range, Good, HSG A
	30,535	61	Pasture/grassland/range, Good, HSG B
*	106,256	70	Row crops, SR + CR, Good, HSG B
	8,241	98	Paved parking, HSG A
	180,439		Weighted Average
	172,198		95.43% Pervious Area
	8,241		4.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0710	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.82"
11.3	925	0.0230	1.36		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.2	1,025	Total			

Subcatchment EX2: EX. S



Summary for Subcatchment EX3: EX. N

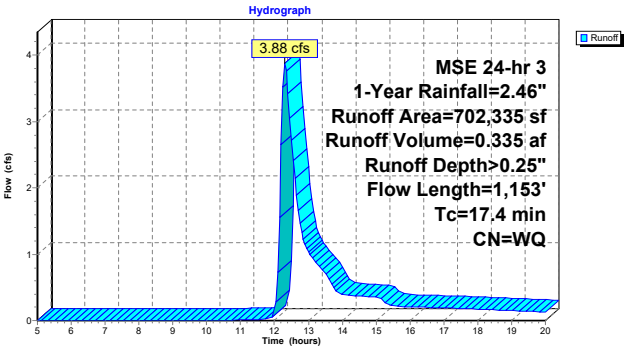
Runoff = 3.88 cfs @ 12.31 hrs, Volume= 0.335 af, Depth> 0.25"
Routed to Reach 6R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

	Area (sf)	CN	Description
	168,679	30	Woods, Good, HSG A
	12,456	55	Woods, Good, HSG B
	21,969	39	Pasture/grassland/range, Good, HSG A
	97,188	61	Pasture/grassland/range, Good, HSG B
*	25,963	56	Row crops, straight row, Good, HSG A
*	373,505	70	Row crops, SR + CR, Good, HSG B
	2,575	98	Paved parking, HSG A
	702,335		Weighted Average
	699,760		99.63% Pervious Area
	2,575		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX3: EX. N



Summary for Subcatchment EX4: EX. S

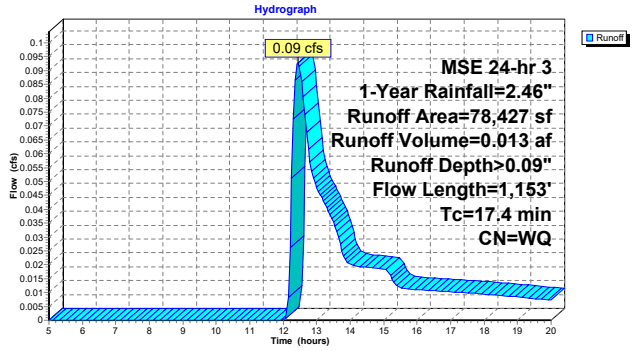
Runoff = 0.09 cfs @ 12.43 hrs, Volume= 0.013 af, Depth> 0.09"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (sf)	CN	Description
36,439	30	Woods, Good, HSG A
41,988	61	Pasture/grassland/range, Good, HSG B
78,427		Weighted Average
78,427		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX4: EX. S



Summary for Subcatchment OFF1: P S

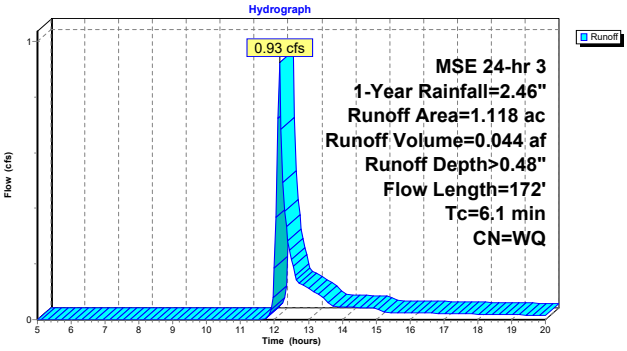
Runoff = 0.93 cfs @ 12.15 hrs, Volume= 0.044 af, Depth> 0.48"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Description
0.570	70	Woods, Good, HSG C
0.548	74	Pasture/grassland/range, Good, HSG C
1.118		Weighted Average
1.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment OFF1: P S



Summary for Subcatchment OFF2: P S

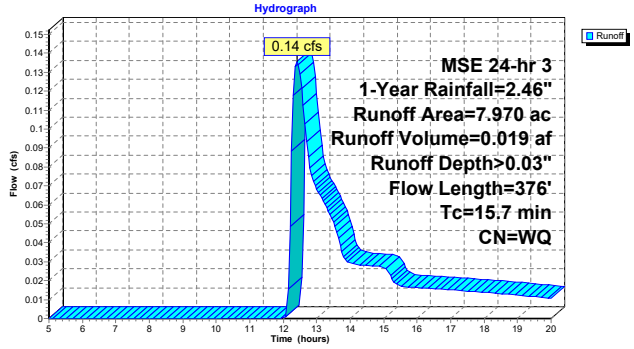
Runoff = 0.14 cfs @ 12.41 hrs, Volume= 0.019 af, Depth> 0.03"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.46"

Area (ac)	CN	Description
0.936	30	Woods, Good, HSG A
0.117	55	Woods, Good, HSG B
5.555	39	Pasture/grassland/range, Good, HSG A
1.362	61	Pasture/grassland/range, Good, HSG B
7.970		Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	204	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.7	376	Total			

Subcatchment OFF2: P S



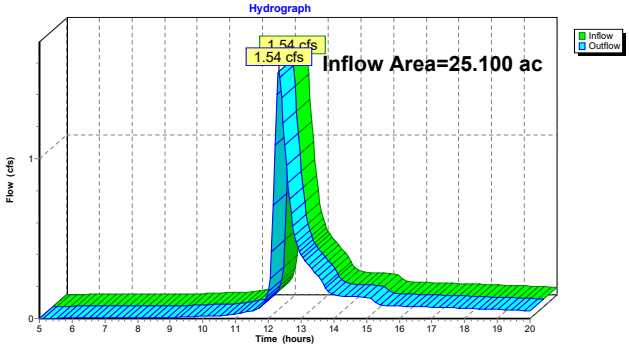
Summary for Reach 2R:

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

Inflow Area = 25.100 ac, 1.12% Impervious, Inflow Depth > 0.07" for 1-Year event
Inflow = 1.54 cfs @ 12.32 hrs, Volume= 0.139 af
Outflow = 1.54 cfs @ 12.32 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min

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

Reach 2R:



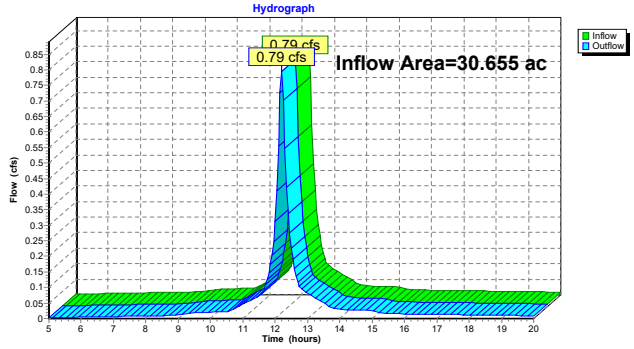
Summary for Reach 4R:

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

Inflow Area = 30.655 ac, 7.63% Impervious, Inflow Depth > 0.02" for 1-Year event
Inflow = 0.79 cfs @ 12.20 hrs, Volume= 0.052 af
Outflow = 0.79 cfs @ 12.20 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

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

Reach 4R:



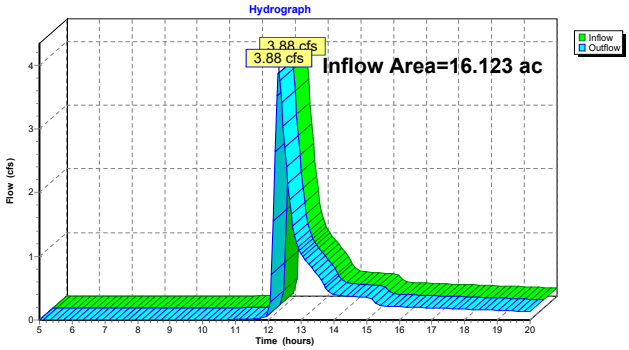
Summary for Reach 6R:

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

Inflow Area = 16.123 ac, 0.37% Impervious, Inflow Depth > 0.25" for 1-Year event
Inflow = 3.88 cfs @ 12.31 hrs, Volume= 0.335 af
Outflow = 3.88 cfs @ 12.31 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.0 min

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

Reach 6R:



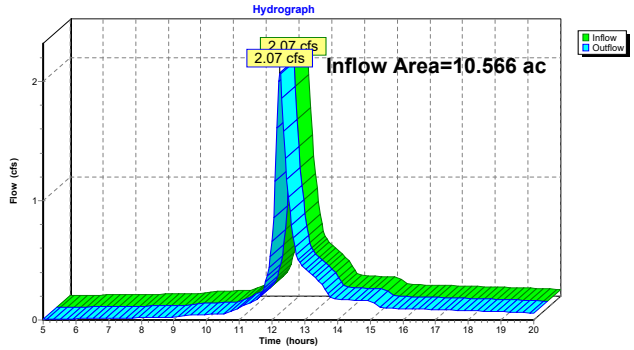
Summary for Reach 8R:

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

Inflow Area = 10.566 ac, 5.89% Impervious, Inflow Depth > 0.22" for 1-Year event
Inflow = 2.07 cfs @ 12.24 hrs, Volume= 0.190 af
Outflow = 2.07 cfs @ 12.24 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

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

Reach 8R:



Summary for Pond 1P: EX. DEP

Inflow Area = 19.157 ac, 0.48% Impervious, Inflow Depth > 0.08" for 1-Year event
Inflow = 1.55 cfs @ 12.28 hrs, Volume= 0.126 af
Outflow = 0.03 cfs @ 20.00 hrs, Volume= 0.019 af, Atten= 98%, Lag= 463.0 min
Discarded = 0.03 cfs @ 20.00 hrs, Volume= 0.019 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 2R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 826.80' @ 20.00 hrs Surf.Area= 9,019 sf Storage= 4,675 cf

Plug-Flow detention time= 216.0 min calculated for 0.019 af (15% of inflow)
Center-of-Mass det. time= 101.8 min (923.8 - 822.0)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	376,605 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

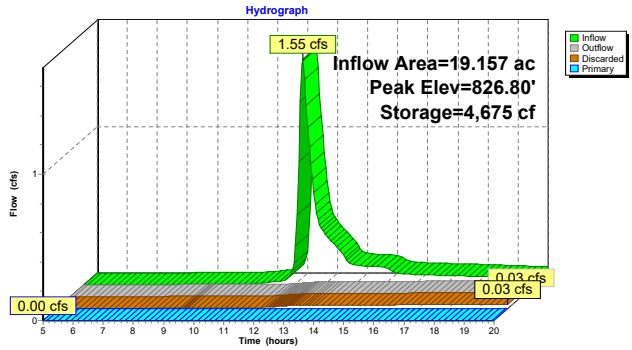
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	2,722	0	0
827.00	10,628	6,675	6,675
828.00	16,690	13,659	20,334
829.00	21,060	18,875	39,209
830.00	25,080	23,070	62,279
831.00	28,823	26,952	89,231
832.00	32,621	30,722	119,953
833.00	36,625	34,623	154,576
834.00	41,540	39,083	193,658
835.00	49,750	45,645	239,303
836.00	56,060	52,905	292,208
837.00	62,070	59,065	351,273
837.40	64,590	25,332	376,605

Device	Routing	Invert	Outlet Devices
#1	Primary	832.07'	**24.0" Round Culvert** L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 832.07' / 830.98' S= 0.0495 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	826.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.03 cfs @ 20.00 hrs HW=826.80' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=826.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 1P: EX. DEP



Summary for Pond 2P: INF. BASIN

[82] Warning: Early inflow requires earlier time span

Inflow Area = 28.189 ac, 7.32% Impervious, Inflow Depth > 0.23" for 1-Year event
Inflow = 5.44 cfs @ 12.14 hrs, Volume= 0.551 af
Outflow = 0.08 cfs @ 20.00 hrs, Volume= 0.082 af, Atten= 98%, Lag= 471.5 min
Discarded = 0.08 cfs @ 20.00 hrs, Volume= 0.082 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 830.76' @ 20.00 hrs Surf.Area= 28,089 sf Storage= 20,448 cf

Plug-Flow detention time= 179.5 min calculated for 0.082 af (15% of inflow)
Center-of-Mass det. time= 31.3 min (839.7 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1	830.00'	287,056 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

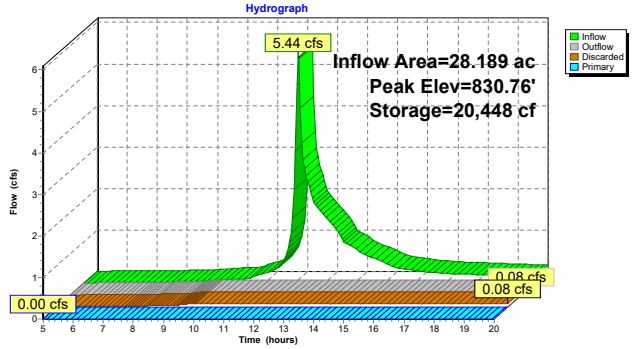
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
830.00	26,019	0	0
831.00	28,758	27,389	27,389
832.00	33,264	31,011	58,400
833.00	36,368	34,816	93,216
834.00	39,582	37,975	131,191
835.00	42,803	41,193	172,383
836.00	60,176	51,490	223,873
837.00	66,191	63,184	287,056

Device	Routing	Invert	Outlet Devices
#1	Primary	832.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 832.00' / 831.60' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	830.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.08 cfs @ 20.00 hrs HW=830.76' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=830.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 2P: INF. BASIN



Summary for Pond 3P: SED. BASIN

Inflow Area = 9.877 ac, 12.78% Impervious, Inflow Depth > 0.39" for 1-Year event
Inflow = 4.19 cfs @ 12.16 hrs, Volume= 0.317 af
Outflow = 1.33 cfs @ 12.52 hrs, Volume= 0.298 af, Atten= 68%, Lag= 21.2 min
Primary = 1.33 cfs @ 12.52 hrs, Volume= 0.298 af
Routed to Pond 2P : INF. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 832.92' @ 12.52 hrs Surf.Area= 4,034 sf Storage= 4,949 cf

Plug-Flow detention time= 77.4 min calculated for 0.298 af (94% of inflow)
Center-of-Mass det. time= 54.6 min (833.6 - 779.0)

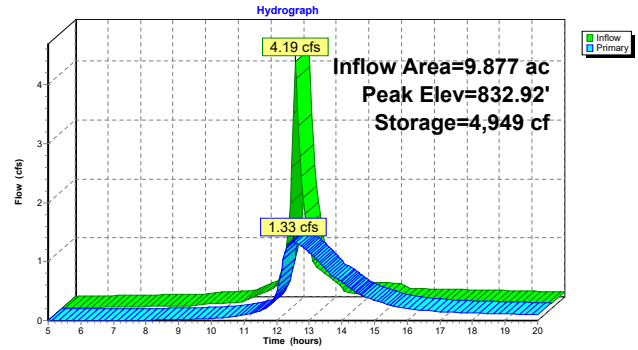
Volume	Invert	Avail.Storage	Storage Description
#1	831.50'	111,112 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
831.50	2,930	0	0
835.00	5,650	15,015	15,015
836.00	60,176	32,913	47,928
837.00	66,191	63,184	111,112

Device	Routing	Invert	Outlet Devices
#1	Primary	831.50'	**8.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.50' / 831.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	834.00'	**20.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.33 cfs @ 12.52 hrs HW=832.92' TW=830.31' (Dynamic Tailwater)
└1=**Culvert** (Barrel Controls 1.33 cfs @ 3.81 fps)
└2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: SED. BASIN



Summary for Pond 6P:

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.007 ac, 11.64% Impervious, Inflow Depth > 0.37" for 1-Year event
Inflow = 3.82 cfs @ 12.15 hrs, Volume= 0.277 af
Outflow = 3.49 cfs @ 12.18 hrs, Volume= 0.277 af, Atten= 9%, Lag= 1.6 min
Primary = 3.49 cfs @ 12.18 hrs, Volume= 0.277 af
Routed to Pond 3P : SED. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.73' @ 12.18 hrs Surf.Area= 737 sf Storage= 325 cf

Plug-Flow detention time= 1.5 min calculated for 0.277 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (783.5 - 782.3)

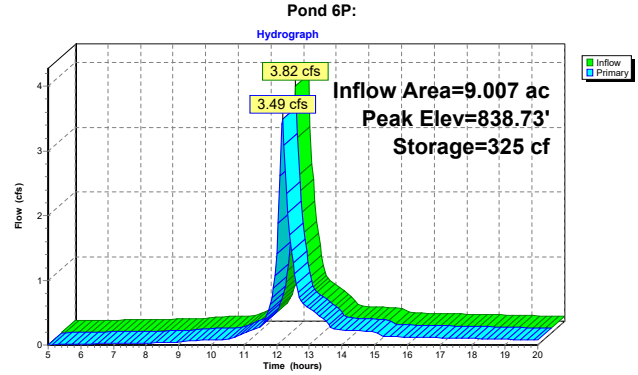
Volume	Invert	Avail.Storage	Storage Description
#1	837.84'	5,398 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.84	41	0	0
838.00	120	13	13
839.00	968	544	557
840.00	3,323	2,146	2,702
840.60	5,661	2,695	5,398

Device	Routing	Invert	Outlet Devices
#1	Primary	837.84'	**18.0" Round Culvert** L= 127.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.84' / 831.50' S= 0.0499 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Primary	840.20'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.41 cfs @ 12.18 hrs HW=838.72' TW=832.54' (Dynamic Tailwater)
└1=**Culvert** (Inlet Controls 3.41 cfs @ 3.19 fps)
└2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P:



Summary for Pond 7P:

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.536 ac, 27.28% Impervious, Inflow Depth > 0.71" for 1-Year event
Inflow = 1.55 cfs @ 12.14 hrs, Volume= 0.091 af
Outflow = 1.11 cfs @ 12.15 hrs, Volume= 0.090 af, Atten= 29%, Lag= 0.9 min
Primary = 1.11 cfs @ 12.15 hrs, Volume= 0.090 af
Routed to Pond 6P :
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.81' @ 12.22 hrs Surf.Area= 911 sf Storage= 428 cf

Plug-Flow detention time= 10.4 min calculated for 0.090 af (99% of inflow)
Center-of-Mass det. time= 7.5 min (769.6 - 762.1)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	4,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

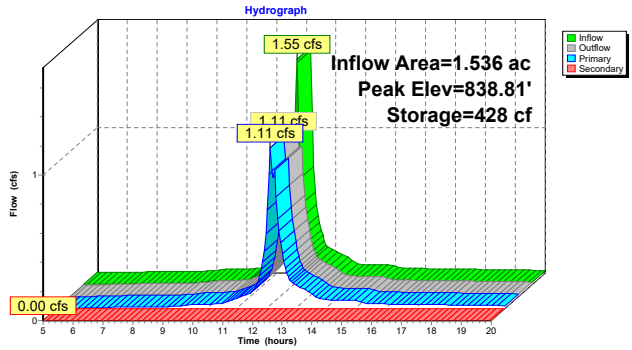
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	149	0	0
838.80	890	416	416
839.00	1,186	208	623
840.00	3,724	2,455	3,078
840.40	5,162	1,777	4,855

Device	Routing	Invert	Outlet Devices
#1	Primary	838.04'	**18.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.04' / 837.84' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	840.00'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.56 cfs @ 12.15 hrs HW=838.76' TW=838.72' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.56 cfs @ 0.98 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P:



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

Subcatchment 1S: P S Runoff Area=9.224 ac 8.68% Impervious Runoff Depth>0.30"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=4.56 cfs 0.231 af

Subcatchment 2S: P S Runoff Area=0.870 ac 24.60% Impervious Runoff Depth>0.67"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=0.90 cfs 0.048 af

Subcatchment 3S: P S Runoff Area=7.471 ac 8.42% Impervious Runoff Depth>0.41"
Flow Length=172' Tc=6.1 min UI Adjusted CN=WQ Runoff=4.16 cfs 0.253 af

Subcatchment 4S: P S Runoff Area=1.536 ac 27.28% Impervious Runoff Depth>0.88"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=2.00 cfs 0.113 af

Subcatchment 5S: BYPASS Runoff Area=460,253 sf 5.89% Impervious Runoff Depth>0.29"
Flow Length=580' Tc=13.2 min UI Adjusted CN=WQ Runoff=3.10 cfs 0.259 af

Subcatchment 6S: BYPASS Runoff Area=96,237 sf 7.07% Impervious Runoff Depth>0.20"
Flow Length=475' Tc=12.0 min UI Adjusted CN=WQ Runoff=0.55 cfs 0.037 af

Subcatchment 7S: BYPASS Runoff Area=0.257 ac 46.30% Impervious Runoff Depth>1.16"
Flow Length=475' Tc=12.0 min CN=WQ Runoff=0.39 cfs 0.025 af

Subcatchment EX1: EX. S Runoff Area=834,494 sf 0.48% Impervious Runoff Depth>0.11"
Flow Length=1,565' Tc=15.9 min CN=WQ Runoff=2.34 cfs 0.177 af

Subcatchment EX2: EX. S Runoff Area=180,439 sf 4.57% Impervious Runoff Depth>0.50"
Flow Length=1,025' Tc=18.2 min CN=WQ Runoff=2.15 cfs 0.172 af

Subcatchment EX3: EX. N Runoff Area=702,335 sf 0.37% Impervious Runoff Depth>0.36"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=6.11 cfs 0.484 af

Subcatchment EX4: EX. S Runoff Area=78,427 sf 0.00% Impervious Runoff Depth>0.15"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=0.20 cfs 0.022 af

Subcatchment OFF1: P S Runoff Area=1.118 ac 0.00% Impervious Runoff Depth>0.66"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=1.34 cfs 0.062 af

Subcatchment OFF2: P S Runoff Area=7.970 ac 0.00% Impervious Runoff Depth>0.05"
Flow Length=376' Tc=15.7 min CN=WQ Runoff=0.30 cfs 0.032 af

Reach 2R: Inflow=2.34 cfs 0.194 af
Outflow=2.34 cfs 0.194 af

Reach 4R: Inflow=0.94 cfs 0.062 af
Outflow=0.94 cfs 0.062 af

Reach 6R: Inflow=6.11 cfs 0.484 af
Outflow=6.11 cfs 0.484 af

Reach 8R: Inflow=3.10 cfs 0.259 af
Outflow=3.10 cfs 0.259 af

Pond 1P: EX. DEP Peak Elev=827.01' Storage=6,759 cf Inflow=2.34 cfs 0.177 af
Discarded=0.03 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.022 af

Pond 2P: INF. BASIN Peak Elev=831.00' Storage=27,443 cf Inflow=6.94 cfs 0.716 af
Discarded=0.09 cfs 0.085 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.085 af

Pond 3P: SED. BASIN Peak Elev=833.29' Storage=6,488 cf Inflow=5.67 cfs 0.413 af
Outflow=1.63 cfs 0.391 af

Pond 6P: Peak Elev=838.92' Storage=483 cf Inflow=5.45 cfs 0.365 af
Outflow=4.83 cfs 0.364 af

Pond 7P: Peak Elev=838.98' Storage=600 cf Inflow=2.00 cfs 0.113 af
Primary=1.36 cfs 0.112 af Secondary=0.00 cfs 0.000 af Outflow=1.36 cfs 0.112 af

Total Runoff Area = 82.445 ac Runoff Volume = 1.914 af Average Runoff Depth = 0.28"
96.00% Pervious = 79.143 ac 4.00% Impervious = 3.301 ac

Summary for Subcatchment 1S: P S

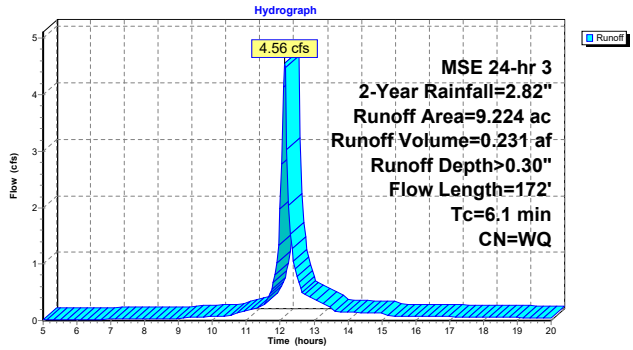
Runoff = 4.56 cfs @ 12.13 hrs, Volume= 0.231 af, Depth> 0.30"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Description
5.387	30	Woods, Good, HSG A
0.843	70	Woods, Good, HSG C
1.427	39	Pasture/grassland/range, Good, HSG A
0.381	74	Pasture/grassland/range, Good, HSG C
0.385	39	>75% Grass cover, Good, HSG A
0.092	98	Unconnected roofs, HSG A
0.112	98	Paved parking, HSG A
0.597	98	Water Surface, HSG A
9.224		Weighted Average
8.423		91.32% Pervious Area
0.801		8.68% Impervious Area
0.092		11.49% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 1S: P S



Summary for Subcatchment 2S: P S

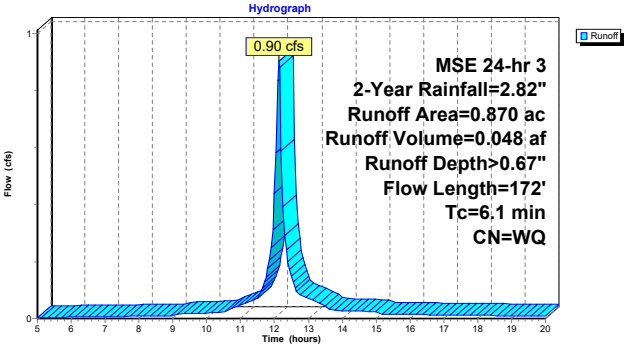
Runoff = 0.90 cfs @ 12.13 hrs, Volume= 0.048 af, Depth> 0.67"
Routed to Pond 3P : SED. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Description
0.115	39	Pasture/grassland/range, Good, HSG A
0.167	61	Pasture/grassland/range, Good, HSG B
0.374	39	>75% Grass cover, Good, HSG A
0.147	98	Paved parking, HSG A
0.067	98	Water Surface, HSG A
0.870		Weighted Average
0.656		75.40% Pervious Area
0.214		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 2S: P S



Summary for Subcatchment 3S: P S

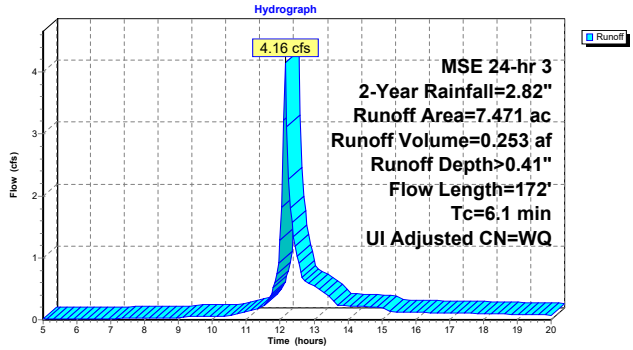
Runoff = 4.16 cfs @ 12.15 hrs, Volume= 0.253 af, Depth> 0.41"
Routed to Pond 6P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Adj	Description
1.509	30	30	Woods, Good, HSG A
0.430	61	61	Pasture/grassland/range, Good, HSG B
4.903	61	61	>75% Grass cover, Good, HSG B
0.184	98	98	Unconnected roofs, HSG A
0.445	98	98	Paved parking, HSG A
7.471			Weighted Average
6.842			91.58% Pervious Area
0.629			8.42% Impervious Area
0.184			29.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 3S: P S



Summary for Subcatchment 4S: P S

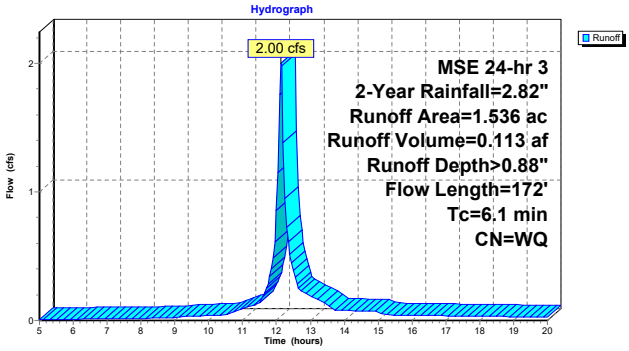
Runoff = 2.00 cfs @ 12.14 hrs, Volume= 0.113 af, Depth> 0.88"
Routed to Pond 7P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Description
1.117	61	>75% Grass cover, Good, HSG B
0.419	98	Paved parking, HSG A
1.536		Weighted Average
1.117		72.72% Pervious Area
0.419		27.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 4S: P S



Summary for Subcatchment 5S: BYPASS

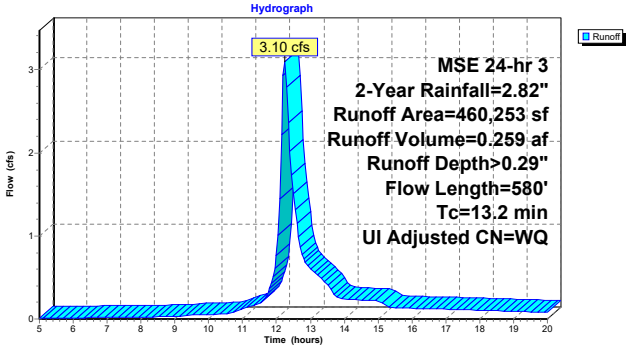
Runoff = 3.10 cfs @ 12.24 hrs, Volume= 0.259 af, Depth> 0.29"
Routed to Reach 8R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (sf)	CN	Adj	Description
163,516	30	30	Woods, Good, HSG A
10,629	55	55	Woods, Good, HSG B
16,422	39	39	Pasture/grassland/range, Good, HSG A
48,047	61	61	Pasture/grassland/range, Good, HSG B
194,539	61	61	>75% Grass cover, Good, HSG B
16,000	98	98	Unconnected roofs, HSG A
11,100	98	98	Paved parking, HSG A
460,253			Weighted Average
433,153			94.11% Pervious Area
27,100			5.89% Impervious Area
16,000			59.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.2	105	0.0300	1.44	66.42	**Channel Flow,** Area= 46.0 sf Perim= 153.0' r= 0.30' n= 0.080 Earth, long dense weeds
13.2	580	Total			

Subcatchment 5S: BYPASS



Summary for Subcatchment 6S: BYPASS

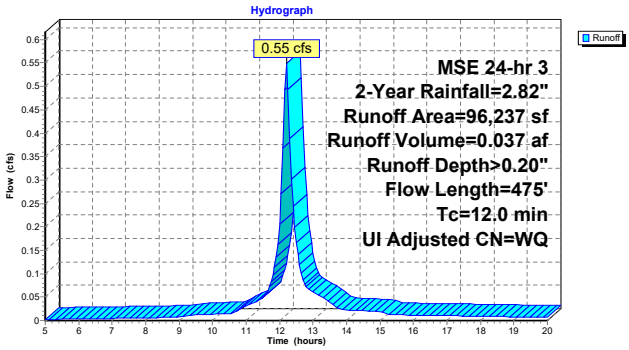
Runoff = 0.55 cfs @ 12.20 hrs, Volume= 0.037 af, Depth> 0.20"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (sf)	CN	Adj	Description
72,405	30	30	Woods, Good, HSG A
8,668	39	39	Pasture/grassland/range, Good, HSG A
4,182	61	61	Pasture/grassland/range, Good, HSG B
4,182	61	61	>75% Grass cover, Good, HSG B
4,000	98	98	Unconnected roofs, HSG A
2,800	98	98	Paved parking, HSG A
96,237			Weighted Average
89,437			92.93% Pervious Area
6,800			7.07% Impervious Area
4,000			58.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 6S: BYPASS



Summary for Subcatchment 7S: BYPASS

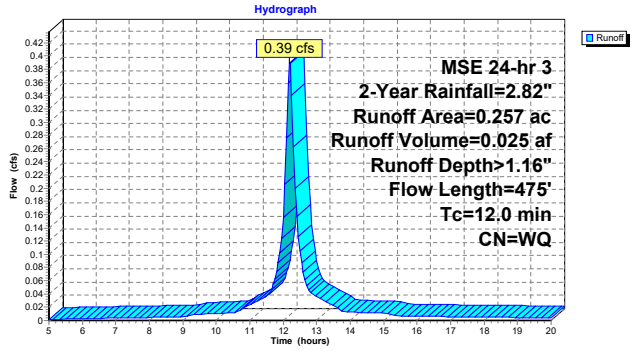
Runoff = 0.39 cfs @ 12.19 hrs, Volume= 0.025 af, Depth> 1.16"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Description
0.138	39	>75% Grass cover, Good, HSG A
0.119	98	Paved parking, HSG A
0.257		Weighted Average
0.138		53.70% Pervious Area
0.119		46.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 7S: BYPASS



Summary for Subcatchment EX1: EX. S

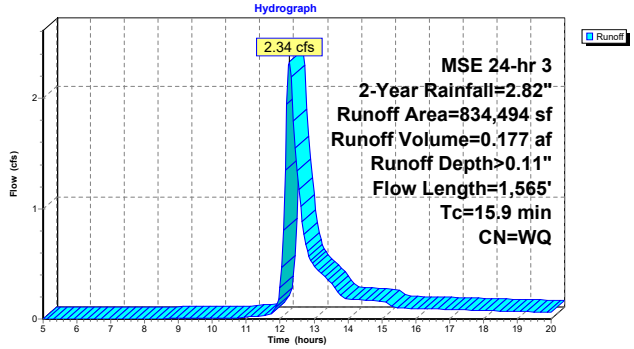
Runoff = 2.34 cfs @ 12.28 hrs, Volume= 0.177 af, Depth> 0.11"
Routed to Pond 1P : EX. DEP

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (sf)	CN	Description
315,214	30	Woods, Good, HSG A
5,112	55	Woods, Good, HSG B
61,557	70	Woods, Good, HSG C
348,487	39	Pasture/grassland/range, Good, HSG A
59,335	61	Pasture/grassland/range, Good, HSG B
40,743	74	Pasture/grassland/range, Good, HSG C
4,046	98	Paved parking, HSG A
834,494		Weighted Average
830,448		99.52% Pervious Area
4,046		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0300	0.21		**Sheet Flow,** Range n= 0.130 P2= 2.82"
8.0	1,465	0.0410	3.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.9	1,565	Total			

Subcatchment EX1: EX. S



Summary for Subcatchment EX2: EX. S

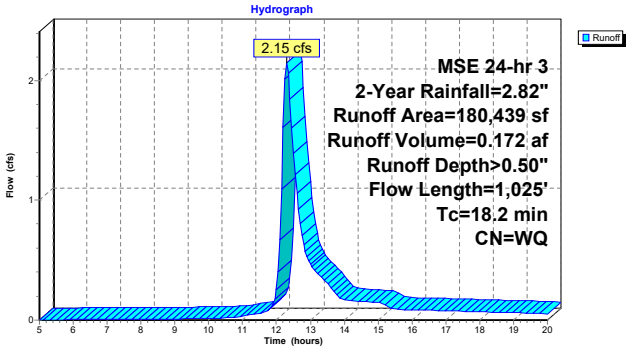
Runoff = 2.15 cfs @ 12.31 hrs, Volume= 0.172 af, Depth> 0.50"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

	Area (sf)	CN	Description
	10,838	30	Woods, Good, HSG A
	24,569	39	Pasture/grassland/range, Good, HSG A
	30,535	61	Pasture/grassland/range, Good, HSG B
*	106,256	70	Row crops, SR + CR, Good, HSG B
	8,241	98	Paved parking, HSG A
	180,439		Weighted Average
	172,198		95.43% Pervious Area
	8,241		4.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0710	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.82"
11.3	925	0.0230	1.36		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.2	1,025	Total			

Subcatchment EX2: EX. S



Summary for Subcatchment EX3: EX. N

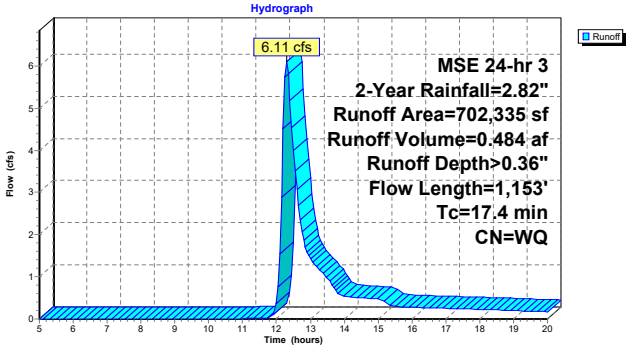
Runoff = 6.11 cfs @ 12.30 hrs, Volume= 0.484 af, Depth> 0.36"
Routed to Reach 6R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

	Area (sf)	CN	Description
	168,679	30	Woods, Good, HSG A
	12,456	55	Woods, Good, HSG B
	21,969	39	Pasture/grassland/range, Good, HSG A
	97,188	61	Pasture/grassland/range, Good, HSG B
*	25,963	56	Row crops, straight row, Good, HSG A
*	373,505	70	Row crops, SR + CR, Good, HSG B
	2,575	98	Paved parking, HSG A
	702,335		Weighted Average
	699,760		99.63% Pervious Area
	2,575		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX3: EX. N



Summary for Subcatchment EX4: EX. S

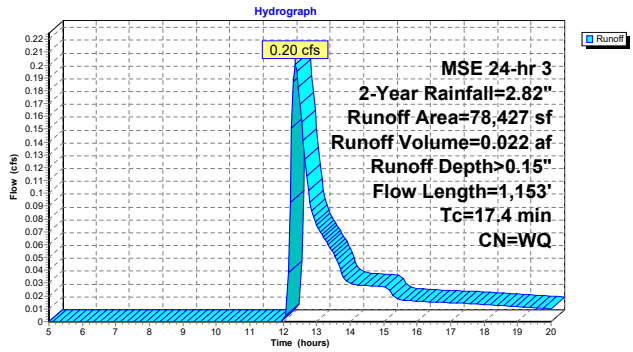
Runoff = 0.20 cfs @ 12.36 hrs, Volume= 0.022 af, Depth> 0.15"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (sf)	CN	Description
36,439	30	Woods, Good, HSG A
41,988	61	Pasture/grassland/range, Good, HSG B
78,427		Weighted Average
78,427		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX4: EX. S



Summary for Subcatchment OFF1: P S

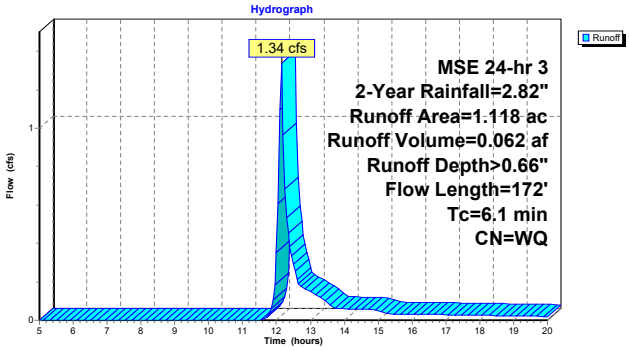
Runoff = 1.34 cfs @ 12.14 hrs, Volume= 0.062 af, Depth> 0.66"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Description
0.570	70	Woods, Good, HSG C
0.548	74	Pasture/grassland/range, Good, HSG C
1.118		Weighted Average
1.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment OFF1: P S



Summary for Subcatchment OFF2: P S

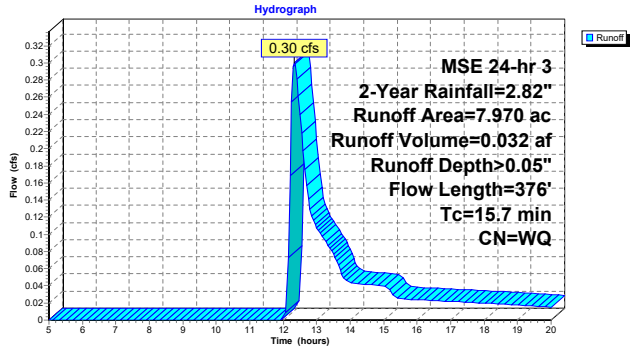
Runoff = 0.30 cfs @ 12.33 hrs, Volume= 0.032 af, Depth> 0.05"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

Area (ac)	CN	Description
0.936	30	Woods, Good, HSG A
0.117	55	Woods, Good, HSG B
5.555	39	Pasture/grassland/range, Good, HSG A
1.362	61	Pasture/grassland/range, Good, HSG B
7.970		Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	204	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.7	376	Total			

Subcatchment OFF2: P S



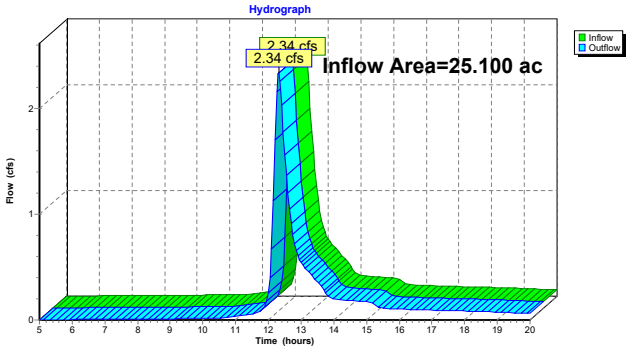
Summary for Reach 2R:

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

Inflow Area = 25.100 ac, 1.12% Impervious, Inflow Depth > 0.09" for 2-Year event
Inflow = 2.34 cfs @ 12.31 hrs, Volume= 0.194 af
Outflow = 2.34 cfs @ 12.31 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min

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

Reach 2R:



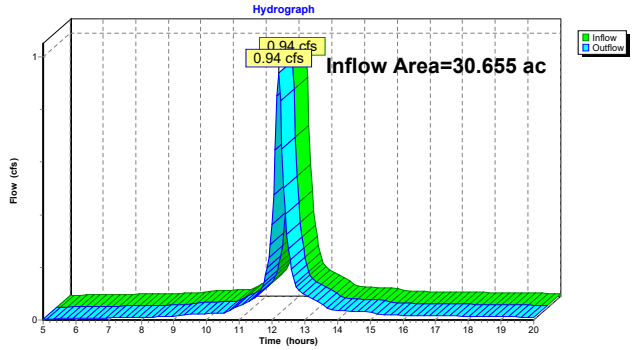
Summary for Reach 4R:

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

Inflow Area = 30.655 ac, 7.63% Impervious, Inflow Depth > 0.02" for 2-Year event
Inflow = 0.94 cfs @ 12.20 hrs, Volume= 0.062 af
Outflow = 0.94 cfs @ 12.20 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

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

Reach 4R:



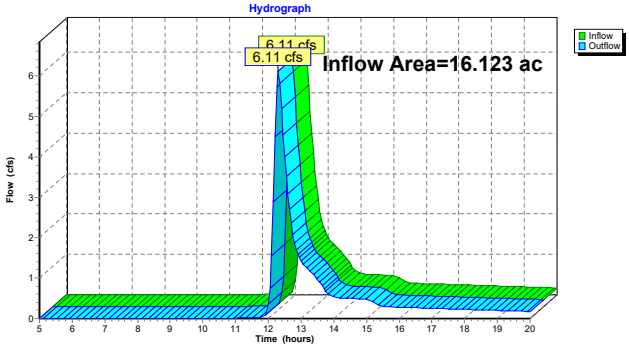
Summary for Reach 6R:

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

Inflow Area = 16.123 ac, 0.37% Impervious, Inflow Depth > 0.36" for 2-Year event
Inflow = 6.11 cfs @ 12.30 hrs, Volume= 0.484 af
Outflow = 6.11 cfs @ 12.30 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min

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

Reach 6R:



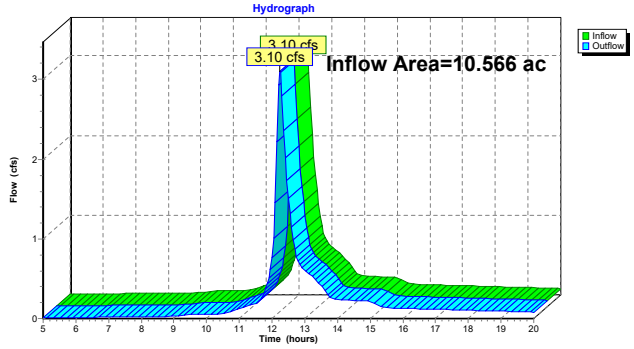
Summary for Reach 8R:

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

Inflow Area = 10.566 ac, 5.89% Impervious, Inflow Depth > 0.29" for 2-Year event
Inflow = 3.10 cfs @ 12.24 hrs, Volume= 0.259 af
Outflow = 3.10 cfs @ 12.24 hrs, Volume= 0.259 af, Atten= 0%, Lag= 0.0 min

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

Reach 8R:



Summary for Pond 1P: EX. DEP

Inflow Area = 19.157 ac, 0.48% Impervious, Inflow Depth > 0.11" for 2-Year event
Inflow = 2.34 cfs @ 12.28 hrs, Volume= 0.177 af
Outflow = 0.03 cfs @ 20.00 hrs, Volume= 0.022 af, Atten= 99%, Lag= 463.4 min
Discarded = 0.03 cfs @ 20.00 hrs, Volume= 0.022 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 2R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 827.01' @ 20.00 hrs Surf.Area= 10,676 sf Storage= 6,759 cf

Plug-Flow detention time= 219.5 min calculated for 0.022 af (12% of inflow)
Center-of-Mass det. time= 107.6 min (924.8 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	376,605 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

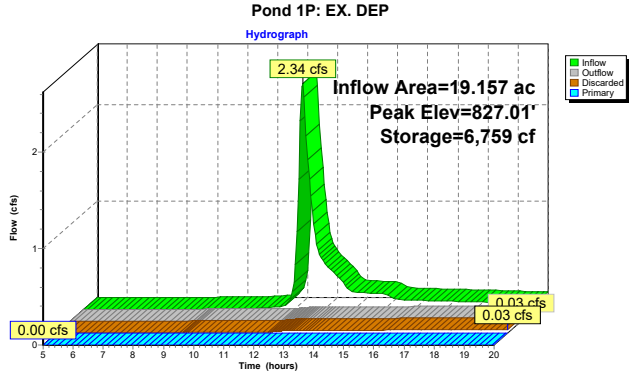
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	2,722	0	0
827.00	10,628	6,675	6,675
828.00	16,690	13,659	20,334
829.00	21,060	18,875	39,209
830.00	25,080	23,070	62,279
831.00	28,823	26,952	89,231
832.00	32,621	30,722	119,953
833.00	36,625	34,623	154,576
834.00	41,540	39,083	193,658
835.00	49,750	45,645	239,303
836.00	56,060	52,905	292,208
837.00	62,070	59,065	351,273
837.40	64,590	25,332	376,605

Device	Routing	Invert	Outlet Devices
#1	Primary	832.07'	**24.0" Round Culvert** L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 832.07' / 830.98' S= 0.0495 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	826.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.03 cfs @ 20.00 hrs HW=827.01' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=826.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 1P: EX. DEP



Summary for Pond 2P: INF. BASIN

[82] Warning: Early inflow requires earlier time span

Inflow Area = 28.189 ac, 7.32% Impervious, Inflow Depth > 0.30" for 2-Year event
Inflow = 6.94 cfs @ 12.14 hrs, Volume= 0.716 af
Outflow = 0.09 cfs @ 20.00 hrs, Volume= 0.085 af, Atten= 99%, Lag= 471.4 min
Discarded = 0.09 cfs @ 20.00 hrs, Volume= 0.085 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 831.00' @ 20.00 hrs Surf.Area= 28,767 sf Storage= 27,443 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 20.1 min (829.9 - 809.8)

Volume	Invert	Avail.Storage	Storage Description
#1	830.00'	287,056 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

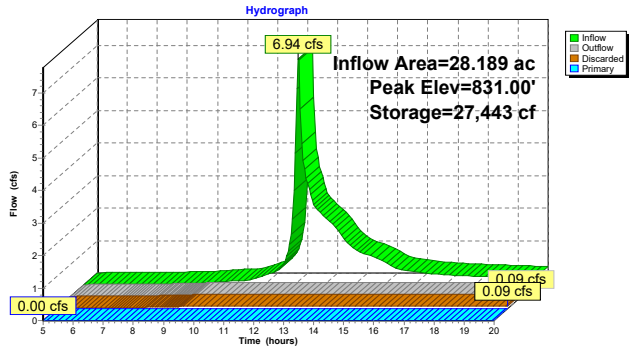
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
830.00	26,019	0	0
831.00	28,758	27,389	27,389
832.00	33,264	31,011	58,400
833.00	36,368	34,816	93,216
834.00	39,582	37,975	131,191
835.00	42,803	41,193	172,383
836.00	60,176	51,490	223,873
837.00	66,191	63,184	287,056

Device	Routing	Invert	Outlet Devices
#1	Primary	832.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 832.00' / 831.60' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	830.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.09 cfs @ 20.00 hrs HW=831.00' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=830.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 2P: INF. BASIN



Summary for Pond 3P: SED. BASIN

Inflow Area = 9.877 ac, 12.78% Impervious, Inflow Depth > 0.50" for 2-Year event
Inflow = 5.67 cfs @ 12.17 hrs, Volume= 0.413 af
Outflow = 1.63 cfs @ 12.56 hrs, Volume= 0.391 af, Atten= 71%, Lag= 23.5 min
Primary = 1.63 cfs @ 12.56 hrs, Volume= 0.391 af
Routed to Pond 2P : INF. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 833.29' @ 12.56 hrs Surf.Area= 4,321 sf Storage= 6,488 cf

Plug-Flow detention time= 74.2 min calculated for 0.391 af (95% of inflow)
Center-of-Mass det. time= 54.3 min (835.4 - 781.2)

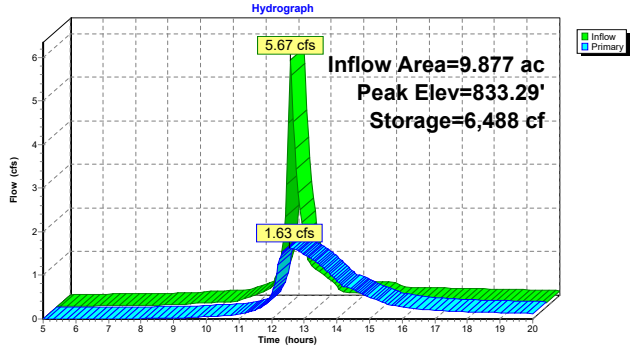
Volume	Invert	Avail.Storage	Storage Description
#1	831.50'	111,112 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
831.50	2,930	0	0
835.00	5,650	15,015	15,015
836.00	60,176	32,913	47,928
837.00	66,191	63,184	111,112

Device	Routing	Invert	Outlet Devices
#1	Primary	831.50'	**8.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.50' / 831.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	834.00'	**20.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.62 cfs @ 12.56 hrs HW=833.29' TW=830.42' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.62 cfs @ 4.65 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: SED. BASIN



Summary for Pond 6P:

[82] Warning: Early inflow requires earlier time span
[80] Warning: Exceeded Pond 7P by 0.05' @ 12.15 hrs (0.79 cfs 0.003 af)

Inflow Area = 9.007 ac, 11.64% Impervious, Inflow Depth > 0.49" for 2-Year event
Inflow = 5.45 cfs @ 12.15 hrs, Volume= 0.365 af
Outflow = 4.83 cfs @ 12.18 hrs, Volume= 0.364 af, Atten= 11%, Lag= 1.8 min
Primary = 4.83 cfs @ 12.18 hrs, Volume= 0.364 af
Routed to Pond 3P : SED. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.92' @ 12.18 hrs Surf.Area= 901 sf Storage= 483 cf

Plug-Flow detention time= 1.5 min calculated for 0.364 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (785.5 - 784.3)

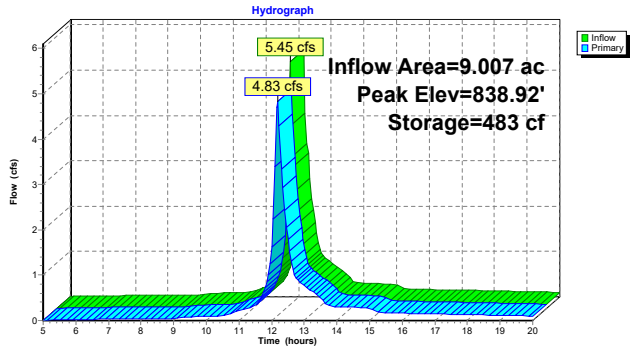
Volume	Invert	Avail.Storage	Storage Description
#1	837.84'	5,398 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.84	41	0	0
838.00	120	13	13
839.00	968	544	557
840.00	3,323	2,146	2,702
840.60	5,661	2,695	5,398

Device	Routing	Invert	Outlet Devices
#1	Primary	837.84'	**18.0" Round Culvert** L= 127.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.84' / 831.50' S= 0.0499 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Primary	840.20'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.72 cfs @ 12.18 hrs HW=838.91' TW=832.73' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.72 cfs @ 3.51 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P:



Summary for Pond 7P:

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.536 ac, 27.28% Impervious, Inflow Depth > 0.88" for 2-Year event
Inflow = 2.00 cfs @ 12.14 hrs, Volume= 0.113 af
Outflow = 1.36 cfs @ 12.30 hrs, Volume= 0.112 af, Atten= 32%, Lag= 9.5 min
Primary = 1.36 cfs @ 12.30 hrs, Volume= 0.112 af
Routed to Pond 6P :
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.98' @ 12.24 hrs Surf.Area= 1,157 sf Storage= 600 cf

Plug-Flow detention time= 10.0 min calculated for 0.112 af (99% of inflow)
Center-of-Mass det. time= 7.4 min (771.1 - 763.7)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	4,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

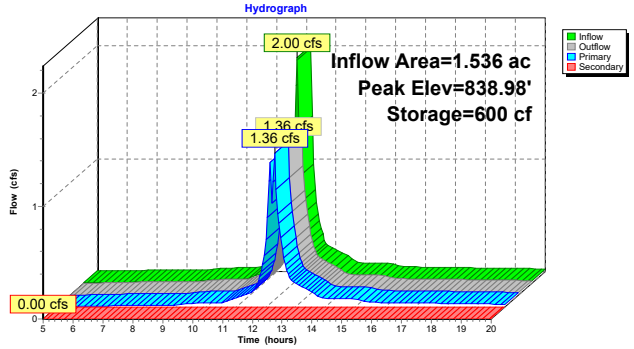
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	149	0	0
838.80	890	416	416
839.00	1,186	208	623
840.00	3,724	2,455	3,078
840.40	5,162	1,777	4,855

Device	Routing	Invert	Outlet Devices
#1	Primary	838.04'	**18.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.04' / 837.84' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	840.00'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.72 cfs @ 12.30 hrs HW=838.92' TW=838.71' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.72 cfs @ 2.31 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=838.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P:



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

Subcatchment 1S: P S Runoff Area=9.224 ac 8.68% Impervious Runoff Depth>0.52"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=7.95 cfs 0.401 af

Subcatchment 2S: P S Runoff Area=0.870 ac 24.60% Impervious Runoff Depth>1.10"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=1.49 cfs 0.080 af

Subcatchment 3S: P S Runoff Area=7.471 ac 8.42% Impervious Runoff Depth>0.90"
Flow Length=172' Tc=6.1 min UI Adjusted CN=WQ Runoff=11.28 cfs 0.559 af

Subcatchment 4S: P S Runoff Area=1.536 ac 27.28% Impervious Runoff Depth>1.61"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=4.04 cfs 0.207 af

Subcatchment 5S: BYPASS Runoff Area=460,253 sf 5.89% Impervious Runoff Depth>0.66"
Flow Length=580' Tc=13.2 min UI Adjusted CN=WQ Runoff=8.64 cfs 0.584 af

Subcatchment 6S: BYPASS Runoff Area=96,237 sf 7.07% Impervious Runoff Depth>0.34"
Flow Length=475' Tc=12.0 min UI Adjusted CN=WQ Runoff=0.96 cfs 0.062 af

Subcatchment 7S: BYPASS Runoff Area=0.257 ac 46.30% Impervious Runoff Depth>1.75"
Flow Length=475' Tc=12.0 min CN=WQ Runoff=0.57 cfs 0.038 af

Subcatchment EX1: EX. S Runoff Area=834,494 sf 0.48% Impervious Runoff Depth>0.27"
Flow Length=1,565' Tc=15.9 min CN=WQ Runoff=6.08 cfs 0.439 af

Subcatchment EX2: EX. S Runoff Area=180,439 sf 4.57% Impervious Runoff Depth>1.10"
Flow Length=1,025' Tc=18.2 min CN=WQ Runoff=5.23 cfs 0.379 af

Subcatchment EX3: EX. N Runoff Area=702,335 sf 0.37% Impervious Runoff Depth>0.87"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=16.63 cfs 1.164 af

Subcatchment EX4: EX. S Runoff Area=78,427 sf 0.00% Impervious Runoff Depth>0.44"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=0.86 cfs 0.065 af

Subcatchment OFF1: P S Runoff Area=1.118 ac 0.00% Impervious Runoff Depth>1.47"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=3.08 cfs 0.137 af

Subcatchment OFF2: P S Runoff Area=7.970 ac 0.00% Impervious Runoff Depth>0.18"
Flow Length=376' Tc=15.7 min CN=WQ Runoff=1.35 cfs 0.119 af

Reach 2R: Inflow=6.09 cfs 0.444 af
Outflow=6.09 cfs 0.444 af

Reach 4R: Inflow=1.53 cfs 0.100 af
Outflow=1.53 cfs 0.100 af

Reach 6R: Inflow=16.63 cfs 1.164 af
Outflow=16.63 cfs 1.164 af

Reach 8R: Inflow=8.64 cfs 0.584 af
Outflow=8.64 cfs 0.584 af

Pond 1P: EX. DEP Peak Elev=827.84' Storage=17,703 cf Inflow=6.08 cfs 0.439 af
Discarded=0.05 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.032 af

Pond 2P: INF. BASIN Peak Elev=832.02' Storage=59,232 cf Inflow=13.26 cfs 1.461 af
Discarded=0.10 cfs 0.101 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.101 af

Pond 3P: SED. BASIN Peak Elev=834.23' Storage=10,909 cf Inflow=10.31 cfs 0.844 af
Outflow=7.61 cfs 0.804 af

Pond 6P: Peak Elev=839.72' Storage=1,872 cf Inflow=12.31 cfs 0.765 af
Outflow=9.06 cfs 0.764 af

Pond 7P: Peak Elev=839.74' Storage=2,190 cf Inflow=4.04 cfs 0.207 af
Primary=3.51 cfs 0.206 af Secondary=0.00 cfs 0.000 af Outflow=3.51 cfs 0.206 af

Total Runoff Area = 82.445 ac Runoff Volume = 4.233 af Average Runoff Depth = 0.62"
96.00% Pervious = 79.143 ac 4.00% Impervious = 3.301 ac

Summary for Subcatchment 1S: P S

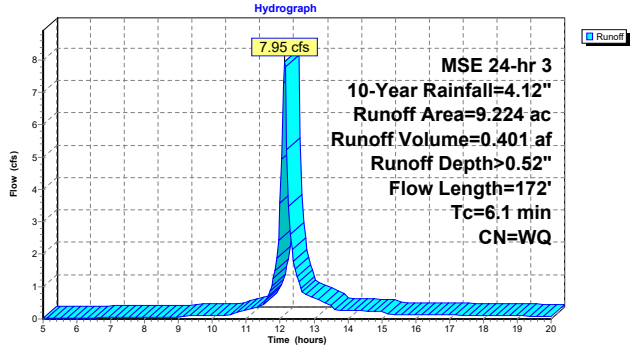
Runoff = 7.95 cfs @ 12.13 hrs, Volume= 0.401 af, Depth> 0.52"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Description
5.387	30	Woods, Good, HSG A
0.843	70	Woods, Good, HSG C
1.427	39	Pasture/grassland/range, Good, HSG A
0.381	74	Pasture/grassland/range, Good, HSG C
0.385	39	>75% Grass cover, Good, HSG A
0.092	98	Unconnected roofs, HSG A
0.112	98	Paved parking, HSG A
0.597	98	Water Surface, HSG A
9.224		Weighted Average
8.423		91.32% Pervious Area
0.801		8.68% Impervious Area
0.092		11.49% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 1S: P S



Summary for Subcatchment 2S: P S

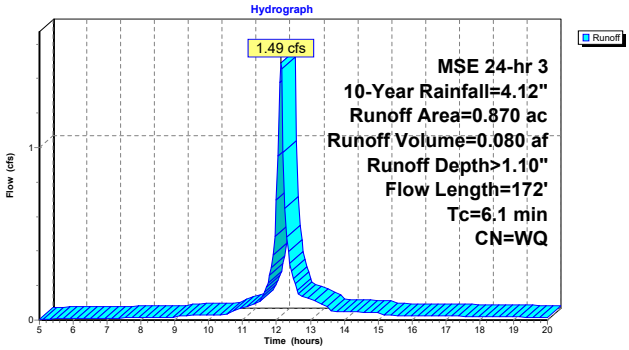
Runoff = 1.49 cfs @ 12.13 hrs, Volume= 0.080 af, Depth> 1.10"
Routed to Pond 3P : SED. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Description
0.115	39	Pasture/grassland/range, Good, HSG A
0.167	61	Pasture/grassland/range, Good, HSG B
0.374	39	>75% Grass cover, Good, HSG A
0.147	98	Paved parking, HSG A
0.067	98	Water Surface, HSG A
0.870		Weighted Average
0.656		75.40% Pervious Area
0.214		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 2S: P S



Summary for Subcatchment 3S: P S

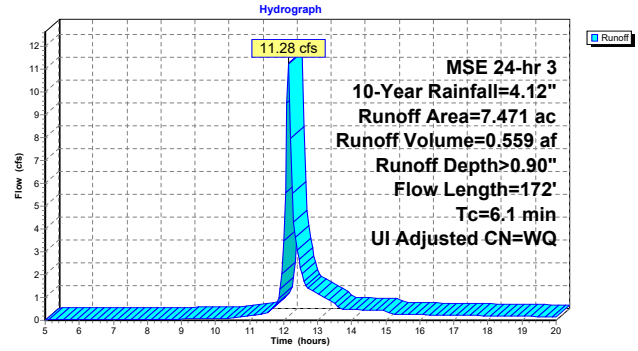
Runoff = 11.28 cfs @ 12.14 hrs, Volume= 0.559 af, Depth> 0.90"
Routed to Pond 6P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Adj	Description
1.509	30	30	Woods, Good, HSG A
0.430	61	61	Pasture/grassland/range, Good, HSG B
4.903	61	61	>75% Grass cover, Good, HSG B
0.184	98	98	Unconnected roofs, HSG A
0.445	98	98	Paved parking, HSG A
7.471			Weighted Average
6.842			91.58% Pervious Area
0.629			8.42% Impervious Area
0.184			29.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 3S: P S



Summary for Subcatchment 4S: P S

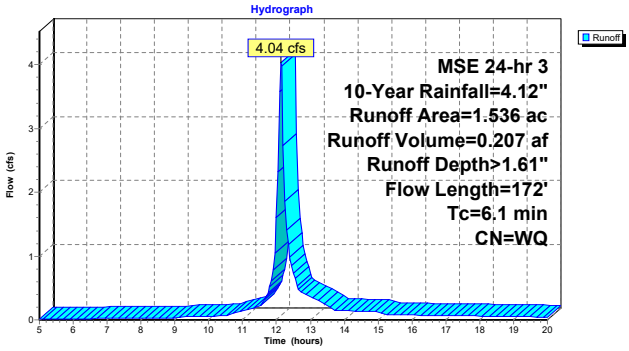
Runoff = 4.04 cfs @ 12.14 hrs, Volume= 0.207 af, Depth> 1.61"
Routed to Pond 7P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Description
1.117	61	>75% Grass cover, Good, HSG B
0.419	98	Paved parking, HSG A
1.536		Weighted Average
1.117		72.72% Pervious Area
0.419		27.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 4S: P S



Summary for Subcatchment 5S: BYPASS

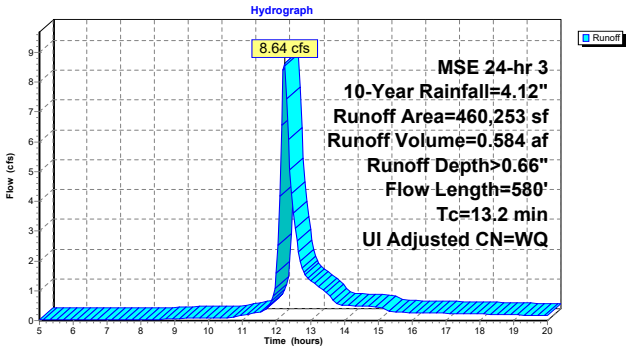
Runoff = 8.64 cfs @ 12.23 hrs, Volume= 0.584 af, Depth> 0.66"
Routed to Reach 8R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (sf)	CN	Adj	Description
163,516	30	30	Woods, Good, HSG A
10,629	55	55	Woods, Good, HSG B
16,422	39	39	Pasture/grassland/range, Good, HSG A
48,047	61	61	Pasture/grassland/range, Good, HSG B
194,539	61	61	>75% Grass cover, Good, HSG B
16,000	98	98	Unconnected roofs, HSG A
11,100	98	98	Paved parking, HSG A
460,253			Weighted Average
433,153			94.11% Pervious Area
27,100			5.89% Impervious Area
16,000			59.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.2	105	0.0300	1.44	66.42	**Channel Flow,** Area= 46.0 sf Perim= 153.0' r= 0.30' n= 0.080 Earth, long dense weeds
13.2	580	Total			

Subcatchment 5S: BYPASS



Summary for Subcatchment 6S: BYPASS

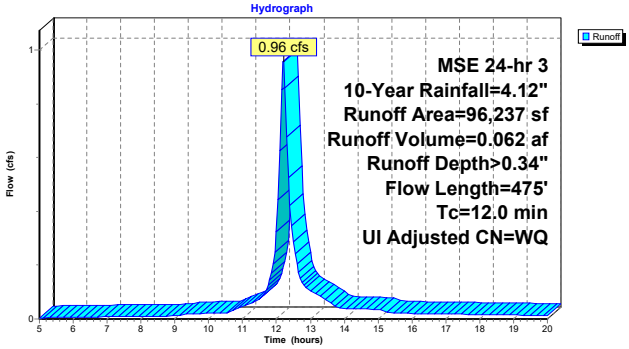
Runoff = 0.96 cfs @ 12.20 hrs, Volume= 0.062 af, Depth> 0.34"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (sf)	CN	Adj	Description
72,405	30	30	Woods, Good, HSG A
8,668	39	39	Pasture/grassland/range, Good, HSG A
4,182	61	61	Pasture/grassland/range, Good, HSG B
4,182	61	61	>75% Grass cover, Good, HSG B
4,000	98	98	Unconnected roofs, HSG A
2,800	98	98	Paved parking, HSG A
96,237			Weighted Average
89,437			92.93% Pervious Area
6,800			7.07% Impervious Area
4,000			58.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 6S: BYPASS



Summary for Subcatchment 7S: BYPASS

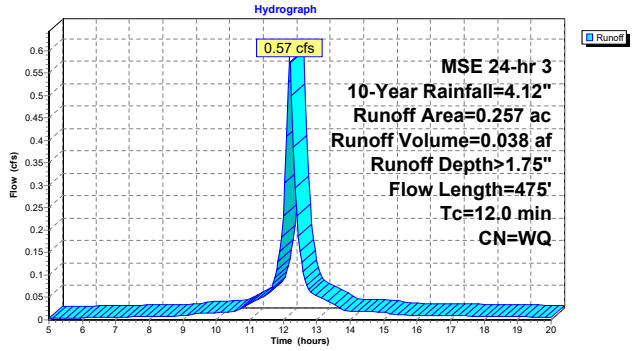
Runoff = 0.57 cfs @ 12.19 hrs, Volume= 0.038 af, Depth> 1.75"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Description
0.138	39	>75% Grass cover, Good, HSG A
0.119	98	Paved parking, HSG A
0.257		Weighted Average
0.138		53.70% Pervious Area
0.119		46.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 7S: BYPASS



Summary for Subcatchment EX1: EX. S

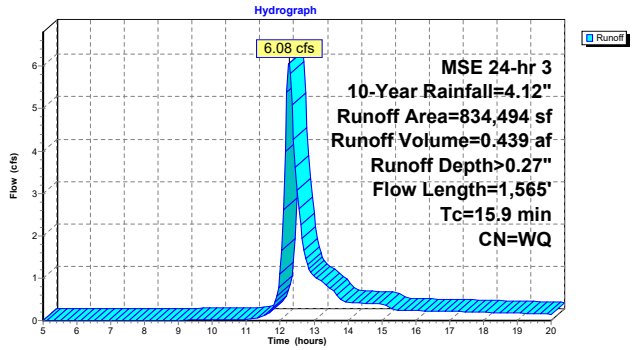
Runoff = 6.08 cfs @ 12.26 hrs, Volume= 0.439 af, Depth> 0.27"
Routed to Pond 1P : EX. DEP

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (sf)	CN	Description
315,214	30	Woods, Good, HSG A
5,112	55	Woods, Good, HSG B
61,557	70	Woods, Good, HSG C
348,487	39	Pasture/grassland/range, Good, HSG A
59,335	61	Pasture/grassland/range, Good, HSG B
40,743	74	Pasture/grassland/range, Good, HSG C
4,046	98	Paved parking, HSG A
834,494		Weighted Average
830,448		99.52% Pervious Area
4,046		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0300	0.21		**Sheet Flow,** Range n= 0.130 P2= 2.82"
8.0	1,465	0.0410	3.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.9	1,565	Total			

Subcatchment EX1: EX. S



Summary for Subcatchment EX2: EX. S

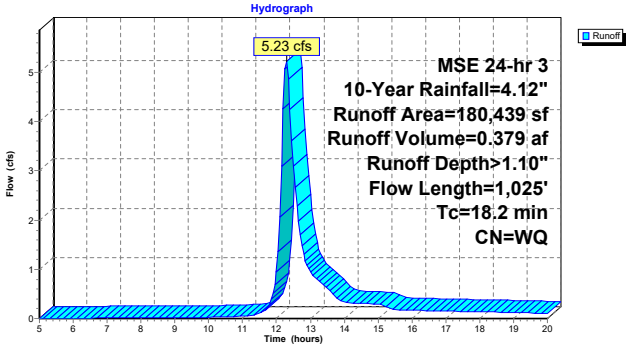
Runoff = 5.23 cfs @ 12.29 hrs, Volume= 0.379 af, Depth> 1.10"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

	Area (sf)	CN	Description
	10,838	30	Woods, Good, HSG A
	24,569	39	Pasture/grassland/range, Good, HSG A
	30,535	61	Pasture/grassland/range, Good, HSG B
*	106,256	70	Row crops, SR + CR, Good, HSG B
	8,241	98	Paved parking, HSG A
	180,439		Weighted Average
	172,198		95.43% Pervious Area
	8,241		4.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0710	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.82"
11.3	925	0.0230	1.36		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.2	1,025	Total			

Subcatchment EX2: EX. S



Summary for Subcatchment EX3: EX. N

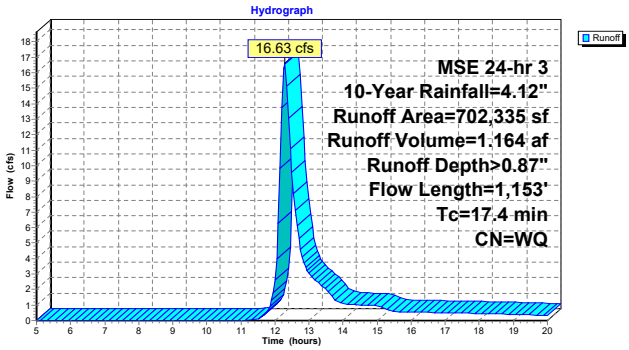
Runoff = 16.63 cfs @ 12.28 hrs, Volume= 1.164 af, Depth> 0.87"
Routed to Reach 6R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

	Area (sf)	CN	Description
	168,679	30	Woods, Good, HSG A
	12,456	55	Woods, Good, HSG B
	21,969	39	Pasture/grassland/range, Good, HSG A
	97,188	61	Pasture/grassland/range, Good, HSG B
*	25,963	56	Row crops, straight row, Good, HSG A
*	373,505	70	Row crops, SR + CR, Good, HSG B
	2,575	98	Paved parking, HSG A
	702,335		Weighted Average
	699,760		99.63% Pervious Area
	2,575		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX3: EX. N



Summary for Subcatchment EX4: EX. S

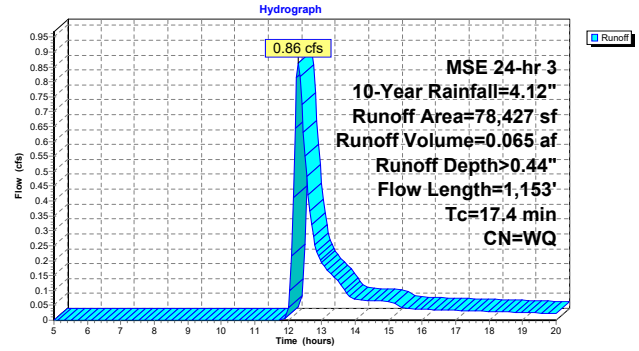
Runoff = 0.86 cfs @ 12.30 hrs, Volume= 0.065 af, Depth> 0.44"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (sf)	CN	Description
36,439	30	Woods, Good, HSG A
41,988	61	Pasture/grassland/range, Good, HSG B
78,427		Weighted Average
78,427		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX4: EX. S



Summary for Subcatchment OFF1: P S

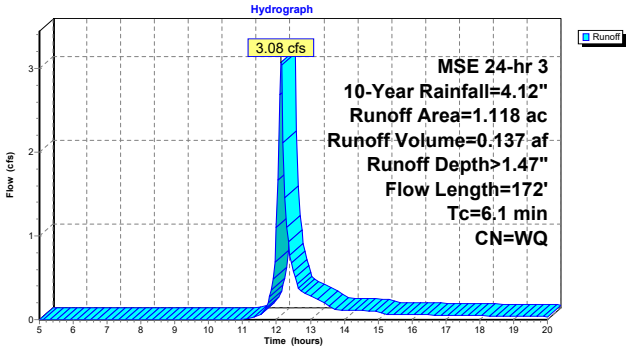
Runoff = 3.08 cfs @ 12.14 hrs, Volume= 0.137 af, Depth> 1.47"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Description
0.570	70	Woods, Good, HSG C
0.548	74	Pasture/grassland/range, Good, HSG C
1.118		Weighted Average
1.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment OFF1: P S



Summary for Subcatchment OFF2: P S

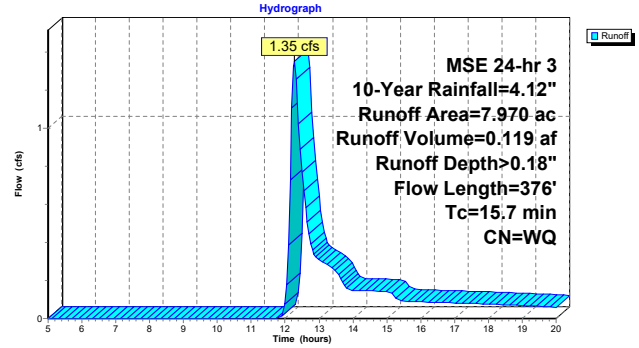
Runoff = 1.35 cfs @ 12.27 hrs, Volume= 0.119 af, Depth> 0.18"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.12"

Area (ac)	CN	Description
0.936	30	Woods, Good, HSG A
0.117	55	Woods, Good, HSG B
5.555	39	Pasture/grassland/range, Good, HSG A
1.362	61	Pasture/grassland/range, Good, HSG B
7.970		Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	204	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.7	376	Total			

Subcatchment OFF2: P S



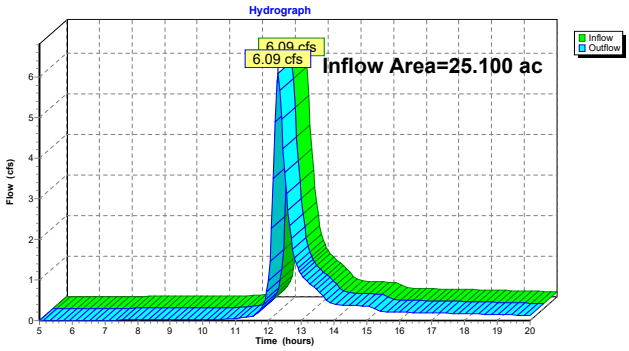
Summary for Reach 2R:

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

Inflow Area = 25.100 ac, 1.12% Impervious, Inflow Depth > 0.21" for 10-Year event
Inflow = 6.09 cfs @ 12.29 hrs, Volume= 0.444 af
Outflow = 6.09 cfs @ 12.29 hrs, Volume= 0.444 af, Atten= 0%, Lag= 0.0 min

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

Reach 2R:



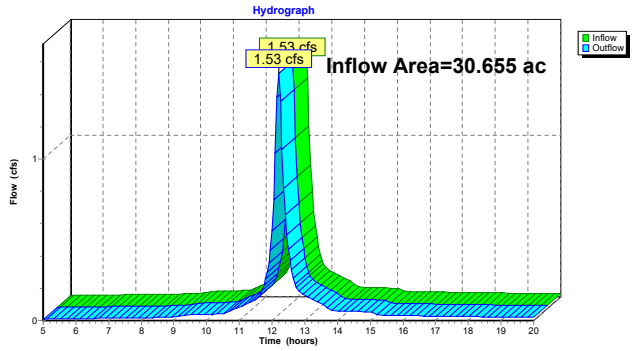
Summary for Reach 4R:

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

Inflow Area = 30.655 ac, 7.63% Impervious, Inflow Depth > 0.04" for 10-Year event
Inflow = 1.53 cfs @ 12.20 hrs, Volume= 0.100 af
Outflow = 1.53 cfs @ 12.20 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min

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

Reach 4R:



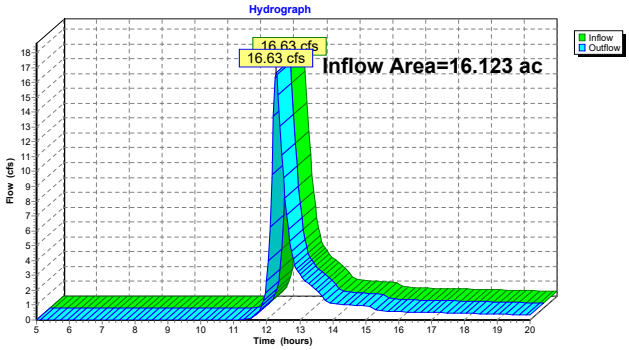
Summary for Reach 6R:

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

Inflow Area = 16.123 ac, 0.37% Impervious, Inflow Depth > 0.87" for 10-Year event
Inflow = 16.63 cfs @ 12.28 hrs, Volume= 1.164 af
Outflow = 16.63 cfs @ 12.28 hrs, Volume= 1.164 af, Atten= 0%, Lag= 0.0 min

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

Reach 6R:



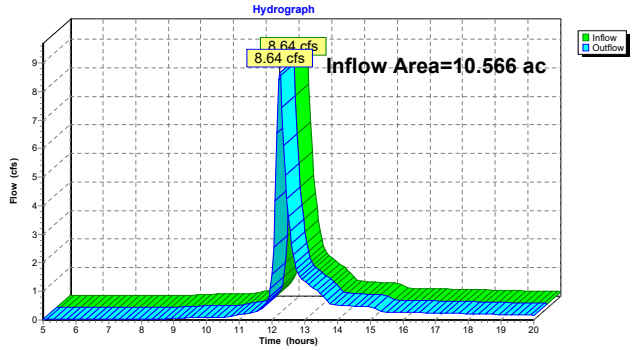
Summary for Reach 8R:

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

Inflow Area = 10.566 ac, 5.89% Impervious, Inflow Depth > 0.66" for 10-Year event
Inflow = 8.64 cfs @ 12.23 hrs, Volume= 0.584 af
Outflow = 8.64 cfs @ 12.23 hrs, Volume= 0.584 af, Atten= 0%, Lag= 0.0 min

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

Reach 8R:



Summary for Pond 1P: EX. DEP

Inflow Area = 19.157 ac, 0.48% Impervious, Inflow Depth > 0.27" for 10-Year event
Inflow = 6.08 cfs @ 12.26 hrs, Volume= 0.439 af
Outflow = 0.05 cfs @ 20.00 hrs, Volume= 0.032 af, Atten= 99%, Lag= 464.2 min
Discarded = 0.05 cfs @ 20.00 hrs, Volume= 0.032 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 2R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 827.84' @ 20.00 hrs Surf.Area= 15,705 sf Storage= 17,703 cf

Plug-Flow detention time= 233.0 min calculated for 0.032 af (7% of inflow)
Center-of-Mass det. time= 109.8 min (926.1 - 816.3)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	376,605 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

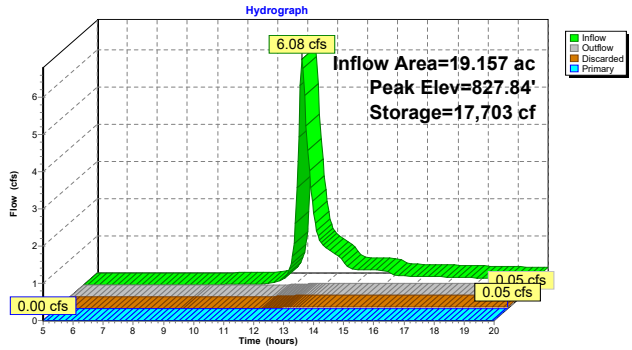
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	2,722	0	0
827.00	10,628	6,675	6,675
828.00	16,690	13,659	20,334
829.00	21,060	18,875	39,209
830.00	25,080	23,070	62,279
831.00	28,823	26,952	89,231
832.00	32,621	30,722	119,953
833.00	36,625	34,623	154,576
834.00	41,540	39,083	193,658
835.00	49,750	45,645	239,303
836.00	56,060	52,905	292,208
837.00	62,070	59,065	351,273
837.40	64,590	25,332	376,605

Device	Routing	Invert	Outlet Devices
#1	Primary	832.07'	**24.0" Round Culvert** L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 832.07' / 830.98' S= 0.0495 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	826.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.05 cfs @ 20.00 hrs HW=827.84' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=826.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 1P: EX. DEP



Summary for Pond 2P: INF. BASIN

[82] Warning: Early inflow requires earlier time span

Inflow Area = 28.189 ac, 7.32% Impervious, Inflow Depth > 0.62" for 10-Year event
Inflow = 13.26 cfs @ 12.14 hrs, Volume= 1.461 af
Outflow = 0.10 cfs @ 20.00 hrs, Volume= 0.101 af, Atten= 99%, Lag= 471.5 min
Discarded = 0.10 cfs @ 20.00 hrs, Volume= 0.101 af
Primary = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 832.02' @ 20.00 hrs Surf.Area= 33,342 sf Storage= 59,232 cf

Plug-Flow detention time= 200.1 min calculated for 0.101 af (7% of inflow)
Center-of-Mass det. time= 1.3 min (810.2 - 809.0)

Volume	Invert	Avail.Storage	Storage Description
#1	830.00'	287,056 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

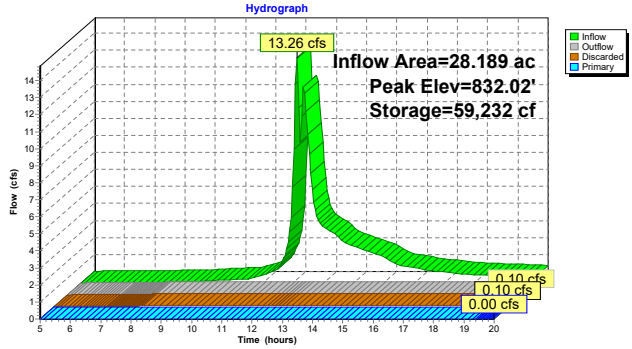
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
830.00	26,019	0	0
831.00	28,758	27,389	27,389
832.00	33,264	31,011	58,400
833.00	36,368	34,816	93,216
834.00	39,582	37,975	131,191
835.00	42,803	41,193	172,383
836.00	60,176	51,490	223,873
837.00	66,191	63,184	287,056

Device	Routing	Invert	Outlet Devices
#1	Primary	832.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 832.00' / 831.60' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	830.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.10 cfs @ 20.00 hrs HW=832.02' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 20.00 hrs HW=832.02' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.00 cfs @ 0.47 fps)

Pond 2P: INF. BASIN



Summary for Pond 3P: SED. BASIN

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.877 ac, 12.78% Impervious, Inflow Depth > 1.03" for 10-Year event
Inflow = 10.31 cfs @ 12.17 hrs, Volume= 0.844 af
Outflow = 7.61 cfs @ 12.39 hrs, Volume= 0.804 af, Atten= 26%, Lag= 13.4 min
Primary = 7.61 cfs @ 12.39 hrs, Volume= 0.804 af
Routed to Pond 2P : INF. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 834.23' @ 12.39 hrs Surf.Area= 5,054 sf Storage= 10,909 cf

Plug-Flow detention time= 62.5 min calculated for 0.804 af (95% of inflow)
Center-of-Mass det. time= 44.8 min (828.3 - 783.5)

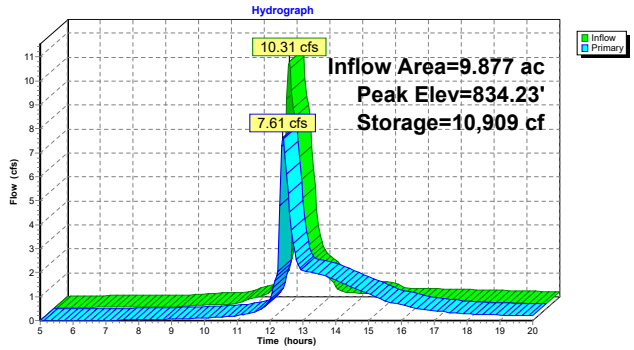
Volume	Invert	Avail.Storage	Storage Description
#1	831.50'	111,112 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
831.50	2,930	0	0
835.00	5,650	15,015	15,015
836.00	60,176	32,913	47,928
837.00	66,191	63,184	111,112

Device	Routing	Invert	Outlet Devices
#1	Primary	831.50'	**8.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.50' / 831.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	834.00'	**20.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.55 cfs @ 12.39 hrs HW=834.23' TW=830.74' (Dynamic Tailwater)
└1=**Culvert** (Barrel Controls 2.20 cfs @ 6.31 fps)
└2=**Broad-Crested Rectangular Weir** (Weir Controls 5.35 cfs @ 1.16 fps)

Pond 3P: SED. BASIN



Summary for Pond 6P:

[82] Warning: Early inflow requires earlier time span
[80] Warning: Exceeded Pond 7P by 0.28' @ 12.15 hrs (4.37 cfs 0.053 af)

Inflow Area = 9.007 ac, 11.64% Impervious, Inflow Depth > 1.02" for 10-Year event
Inflow = 12.31 cfs @ 12.13 hrs, Volume= 0.765 af
Outflow = 9.06 cfs @ 12.19 hrs, Volume= 0.764 af, Atten= 26%, Lag= 3.5 min
Primary = 9.06 cfs @ 12.19 hrs, Volume= 0.764 af
Routed to Pond 3P : SED. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 839.72' @ 12.19 hrs Surf.Area= 2,670 sf Storage= 1,872 cf

Plug-Flow detention time= 1.9 min calculated for 0.762 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (786.6 - 785.0)

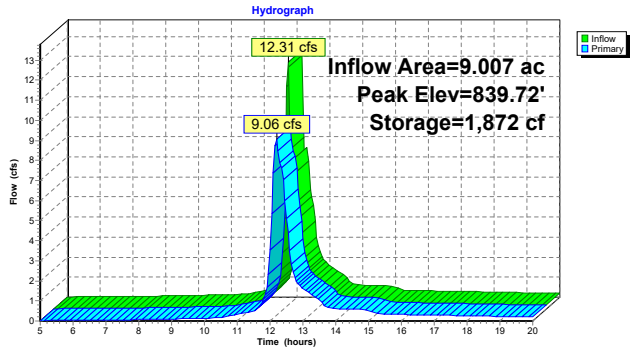
Volume	Invert	Avail.Storage	Storage Description
#1	837.84'	5,398 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.84	41	0	0
838.00	120	13	13
839.00	968	544	557
840.00	3,323	2,146	2,702
840.60	5,661	2,695	5,398

Device	Routing	Invert	Outlet Devices
#1	Primary	837.84'	**18.0" Round Culvert** L= 127.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.84' / 831.50' S= 0.0499 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Primary	840.20'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.00 cfs @ 12.19 hrs HW=839.71' TW=833.61' (Dynamic Tailwater)
└1=**Culvert** (Inlet Controls 9.00 cfs @ 5.10 fps)
└2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P:



Summary for Pond 7P:

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.536 ac, 27.28% Impervious, Inflow Depth > 1.61" for 10-Year event
Inflow = 4.04 cfs @ 12.14 hrs, Volume= 0.207 af
Outflow = 3.51 cfs @ 12.32 hrs, Volume= 0.206 af, Atten= 13%, Lag= 11.3 min
Primary = 3.51 cfs @ 12.32 hrs, Volume= 0.206 af
Routed to Pond 6P :
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 839.74' @ 12.27 hrs Surf.Area= 3,060 sf Storage= 2,190 cf

Plug-Flow detention time= 11.1 min calculated for 0.206 af (100% of inflow)
Center-of-Mass det. time= 9.1 min (775.2 - 766.1)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	4,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

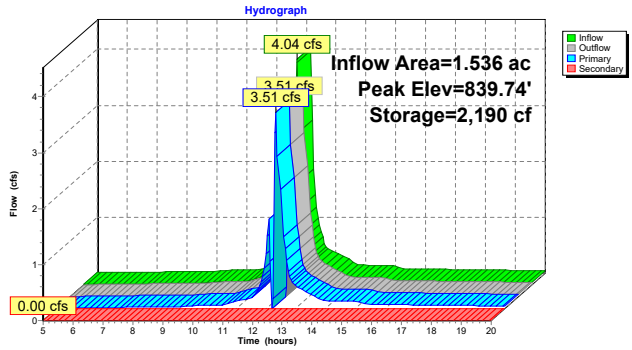
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	149	0	0
838.80	890	416	416
839.00	1,186	208	623
840.00	3,724	2,455	3,078
840.40	5,162	1,777	4,855

Device	Routing	Invert	Outlet Devices
#1	Primary	838.04'	**18.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.04' / 837.84' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	840.00'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.08 cfs @ 12.32 hrs HW=839.66' TW=839.42' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 4.08 cfs @ 2.66 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=838.01' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P:



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

Subcatchment 1S: P S Runoff Area=9.224 ac 8.68% Impervious Runoff Depth>0.73"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=10.69 cfs 0.558 af

Subcatchment 2S: P S Runoff Area=0.870 ac 24.60% Impervious Runoff Depth>1.51"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=1.97 cfs 0.110 af

Subcatchment 3S: P S Runoff Area=7.471 ac 8.42% Impervious Runoff Depth>1.36"
Flow Length=172' Tc=6.1 min UI Adjusted CN=WQ Runoff=17.77 cfs 0.844 af

Subcatchment 4S: P S Runoff Area=1.536 ac 27.28% Impervious Runoff Depth>2.25"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=5.81 cfs 0.288 af

Subcatchment 5S: BYPASS Runoff Area=460,253 sf 5.89% Impervious Runoff Depth>1.01"
Flow Length=580' Tc=13.2 min UI Adjusted CN=WQ Runoff=14.01 cfs 0.892 af

Subcatchment 6S: BYPASS Runoff Area=96,237 sf 7.07% Impervious Runoff Depth>0.47"
Flow Length=475' Tc=12.0 min UI Adjusted CN=WQ Runoff=1.30 cfs 0.086 af

Subcatchment 7S: BYPASS Runoff Area=0.257 ac 46.30% Impervious Runoff Depth>2.26"
Flow Length=475' Tc=12.0 min CN=WQ Runoff=0.71 cfs 0.048 af

Subcatchment EX1: EX. S Runoff Area=834,494 sf 0.48% Impervious Runoff Depth>0.47"
Flow Length=1,565' Tc=15.9 min CN=WQ Runoff=9.52 cfs 0.745 af

Subcatchment EX2: EX. S Runoff Area=180,439 sf 4.57% Impervious Runoff Depth>1.64"
Flow Length=1,025' Tc=18.2 min CN=WQ Runoff=7.96 cfs 0.568 af

Subcatchment EX3: EX. N Runoff Area=702,335 sf 0.37% Impervious Runoff Depth>1.33"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=26.31 cfs 1.785 af

Subcatchment EX4: EX. S Runoff Area=78,427 sf 0.00% Impervious Runoff Depth>0.72"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=1.53 cfs 0.108 af

Subcatchment OFF1: P S Runoff Area=1.118 ac 0.00% Impervious Runoff Depth>2.17"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=4.55 cfs 0.202 af

Subcatchment OFF2: P S Runoff Area=7.970 ac 0.00% Impervious Runoff Depth>0.38"
Flow Length=376' Tc=15.7 min CN=WQ Runoff=2.50 cfs 0.250 af

Reach 2R: Inflow=9.49 cfs 0.676 af
Outflow=9.49 cfs 0.676 af

Reach 4R: Inflow=3.68 cfs 0.536 af
Outflow=3.68 cfs 0.536 af

Reach 6R: Inflow=26.31 cfs 1.785 af
Outflow=26.31 cfs 1.785 af

Reach 8R: Inflow=14.01 cfs 0.892 af
Outflow=14.01 cfs 0.892 af

Pond 1P: EX. DEP Peak Elev=828.58' Storage=30,700 cf Inflow=9.52 cfs 0.745 af
Discarded=0.06 cfs 0.039 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.039 af

Pond 2P: INF. BASIN Peak Elev=832.47' Storage=74,394 cf Inflow=21.57 cfs 2.153 af
Discarded=0.10 cfs 0.108 af Primary=0.89 cfs 0.378 af Outflow=1.00 cfs 0.486 af

Pond 3P: SED. BASIN Peak Elev=834.35' Storage=11,529 cf Inflow=14.30 cfs 1.217 af
Outflow=12.73 cfs 1.143 af

Pond 6P: Peak Elev=840.31' Storage=3,920 cf Inflow=18.02 cfs 1.107 af
Outflow=13.01 cfs 1.107 af

Pond 7P: Peak Elev=840.12' Storage=3,552 cf Inflow=5.81 cfs 0.288 af
Primary=3.57 cfs 0.264 af Secondary=2.17 cfs 0.024 af Outflow=3.58 cfs 0.287 af

Total Runoff Area = 82.445 ac Runoff Volume = 6.484 af Average Runoff Depth = 0.94"
96.00% Pervious = 79.143 ac 4.00% Impervious = 3.301 ac

Summary for Subcatchment 1S: P S

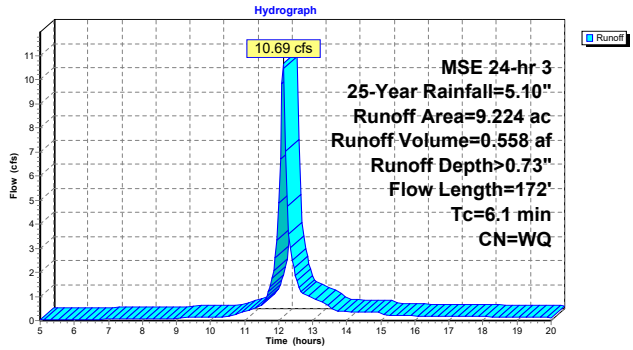
Runoff = 10.69 cfs @ 12.13 hrs, Volume= 0.558 af, Depth> 0.73"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Description
5.387	30	Woods, Good, HSG A
0.843	70	Woods, Good, HSG C
1.427	39	Pasture/grassland/range, Good, HSG A
0.381	74	Pasture/grassland/range, Good, HSG C
0.385	39	>75% Grass cover, Good, HSG A
0.092	98	Unconnected roofs, HSG A
0.112	98	Paved parking, HSG A
0.597	98	Water Surface, HSG A
9.224		Weighted Average
8.423		91.32% Pervious Area
0.801		8.68% Impervious Area
0.092		11.49% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 1S: P S



Summary for Subcatchment 2S: P S

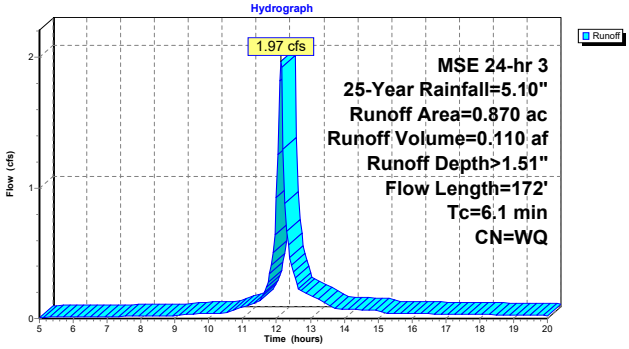
Runoff = 1.97 cfs @ 12.13 hrs, Volume= 0.110 af, Depth> 1.51"
Routed to Pond 3P : SED. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Description
0.115	39	Pasture/grassland/range, Good, HSG A
0.167	61	Pasture/grassland/range, Good, HSG B
0.374	39	>75% Grass cover, Good, HSG A
0.147	98	Paved parking, HSG A
0.067	98	Water Surface, HSG A
0.870		Weighted Average
0.656		75.40% Pervious Area
0.214		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 2S: P S



Summary for Subcatchment 3S: P S

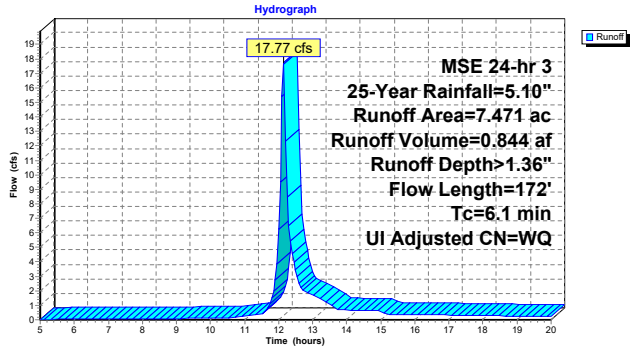
Runoff = 17.77 cfs @ 12.14 hrs, Volume= 0.844 af, Depth> 1.36"
Routed to Pond 6P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Adj	Description
1.509	30	30	Woods, Good, HSG A
0.430	61	61	Pasture/grassland/range, Good, HSG B
4.903	61	61	>75% Grass cover, Good, HSG B
0.184	98	98	Unconnected roofs, HSG A
0.445	98	98	Paved parking, HSG A
7.471			Weighted Average
6.842			91.58% Pervious Area
0.629			8.42% Impervious Area
0.184			29.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 3S: P S



Summary for Subcatchment 4S: P S

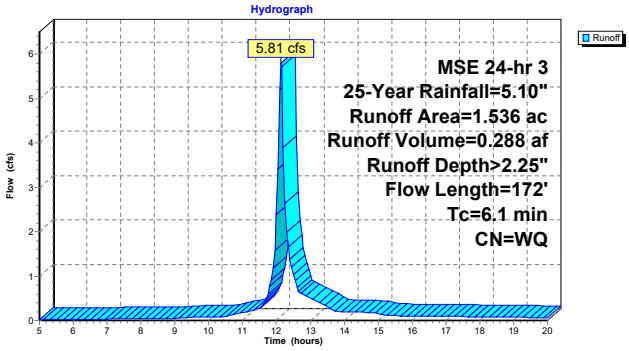
Runoff = 5.81 cfs @ 12.14 hrs, Volume= 0.288 af, Depth> 2.25"
Routed to Pond 7P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Description
1.117	61	>75% Grass cover, Good, HSG B
0.419	98	Paved parking, HSG A
1.536		Weighted Average
1.117		72.72% Pervious Area
0.419		27.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 4S: P S



Summary for Subcatchment 5S: BYPASS

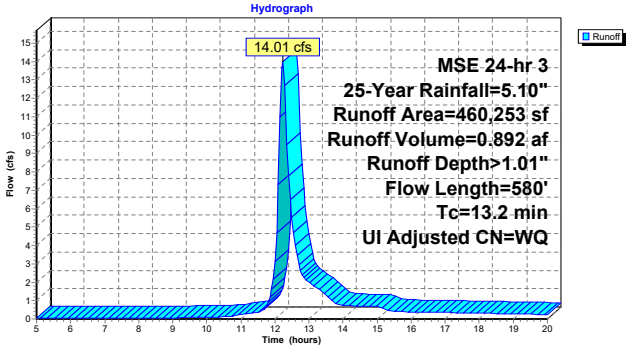
Runoff = 14.01 cfs @ 12.22 hrs, Volume= 0.892 af, Depth> 1.01"
Routed to Reach 8R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (sf)	CN	Adj	Description
163,516	30	30	Woods, Good, HSG A
10,629	55	55	Woods, Good, HSG B
16,422	39	39	Pasture/grassland/range, Good, HSG A
48,047	61	61	Pasture/grassland/range, Good, HSG B
194,539	61	61	>75% Grass cover, Good, HSG B
16,000	98	98	Unconnected roofs, HSG A
11,100	98	98	Paved parking, HSG A
460,253			Weighted Average
433,153			94.11% Pervious Area
27,100			5.89% Impervious Area
16,000			59.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.2	105	0.0300	1.44	66.42	**Channel Flow,** Area= 46.0 sf Perim= 153.0' r= 0.30' n= 0.080 Earth, long dense weeds
13.2	580	Total			

Subcatchment 5S: BYPASS



Summary for Subcatchment 6S: BYPASS

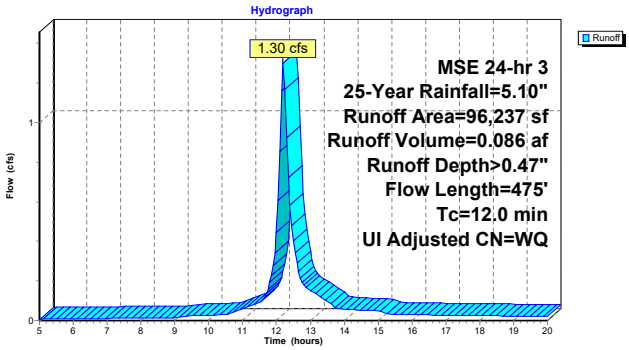
Runoff = 1.30 cfs @ 12.20 hrs, Volume= 0.086 af, Depth> 0.47"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (sf)	CN	Adj	Description
72,405	30	30	Woods, Good, HSG A
8,668	39	39	Pasture/grassland/range, Good, HSG A
4,182	61	61	Pasture/grassland/range, Good, HSG B
4,182	61	61	>75% Grass cover, Good, HSG B
4,000	98	98	Unconnected roofs, HSG A
2,800	98	98	Paved parking, HSG A
96,237			Weighted Average
89,437			92.93% Pervious Area
6,800			7.07% Impervious Area
4,000			58.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 6S: BYPASS



Summary for Subcatchment 7S: BYPASS

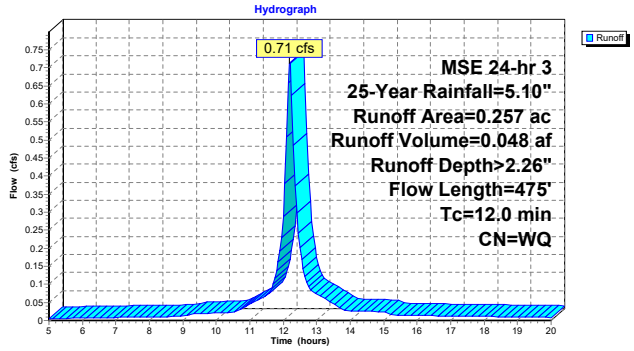
Runoff = 0.71 cfs @ 12.19 hrs, Volume= 0.048 af, Depth> 2.26"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Description
0.138	39	>75% Grass cover, Good, HSG A
0.119	98	Paved parking, HSG A
0.257		Weighted Average
0.138		53.70% Pervious Area
0.119		46.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 7S: BYPASS



Summary for Subcatchment EX1: EX. S

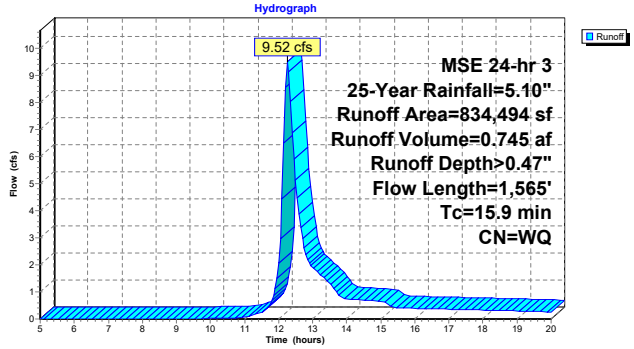
Runoff = 9.52 cfs @ 12.26 hrs, Volume= 0.745 af, Depth> 0.47"
Routed to Pond 1P : EX. DEP

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (sf)	CN	Description
315,214	30	Woods, Good, HSG A
5,112	55	Woods, Good, HSG B
61,557	70	Woods, Good, HSG C
348,487	39	Pasture/grassland/range, Good, HSG A
59,335	61	Pasture/grassland/range, Good, HSG B
40,743	74	Pasture/grassland/range, Good, HSG C
4,046	98	Paved parking, HSG A
834,494		Weighted Average
830,448		99.52% Pervious Area
4,046		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0300	0.21		**Sheet Flow,** Range n= 0.130 P2= 2.82"
8.0	1,465	0.0410	3.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.9	1,565	Total			

Subcatchment EX1: EX. S



Summary for Subcatchment EX2: EX. S

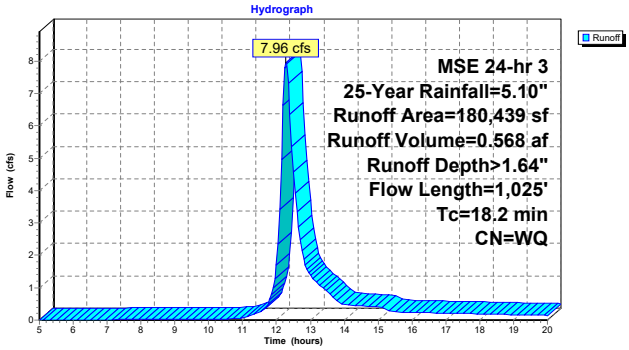
Runoff = 7.96 cfs @ 12.28 hrs, Volume= 0.568 af, Depth> 1.64"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

	Area (sf)	CN	Description
	10,838	30	Woods, Good, HSG A
	24,569	39	Pasture/grassland/range, Good, HSG A
	30,535	61	Pasture/grassland/range, Good, HSG B
*	106,256	70	Row crops, SR + CR, Good, HSG B
	8,241	98	Paved parking, HSG A
	180,439		Weighted Average
	172,198		95.43% Pervious Area
	8,241		4.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0710	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.82"
11.3	925	0.0230	1.36		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.2	1,025	Total			

Subcatchment EX2: EX. S



Summary for Subcatchment EX3: EX. N

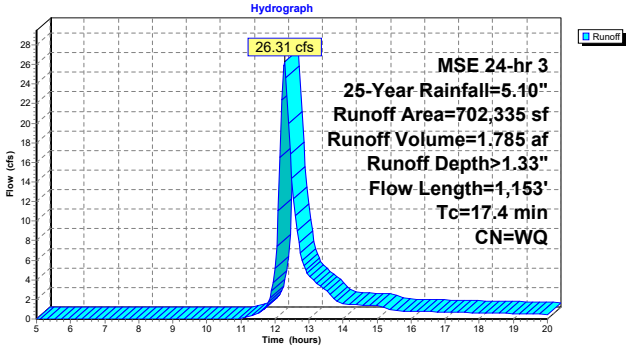
Runoff = 26.31 cfs @ 12.27 hrs, Volume= 1.785 af, Depth> 1.33"
Routed to Reach 6R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

	Area (sf)	CN	Description
	168,679	30	Woods, Good, HSG A
	12,456	55	Woods, Good, HSG B
	21,969	39	Pasture/grassland/range, Good, HSG A
	97,188	61	Pasture/grassland/range, Good, HSG B
*	25,963	56	Row crops, straight row, Good, HSG A
*	373,505	70	Row crops, SR + CR, Good, HSG B
	2,575	98	Paved parking, HSG A
	702,335		Weighted Average
	699,760		99.63% Pervious Area
	2,575		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX3: EX. N



Summary for Subcatchment EX4: EX. S

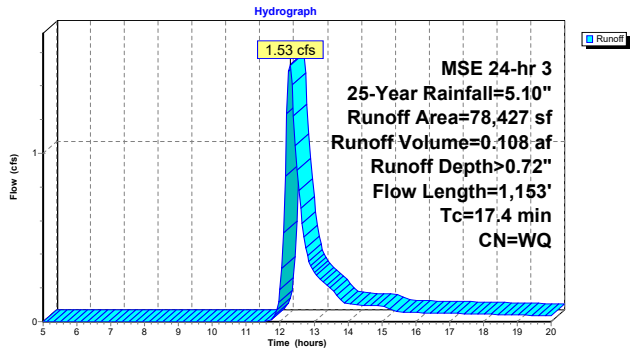
Runoff = 1.53 cfs @ 12.29 hrs, Volume= 0.108 af, Depth> 0.72"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (sf)	CN	Description
36,439	30	Woods, Good, HSG A
41,988	61	Pasture/grassland/range, Good, HSG B
78,427		Weighted Average
78,427		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX4: EX. S



Summary for Subcatchment OFF1: P S

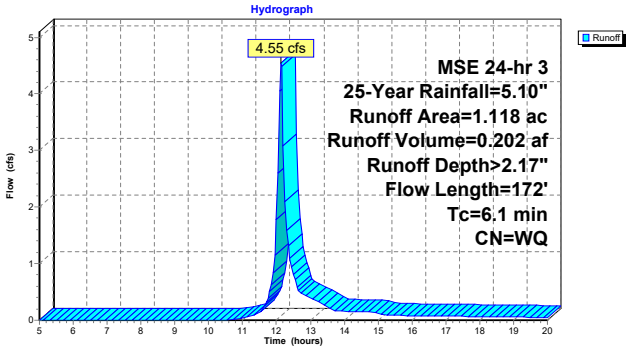
Runoff = 4.55 cfs @ 12.14 hrs, Volume= 0.202 af, Depth> 2.17"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Description
0.570	70	Woods, Good, HSG C
0.548	74	Pasture/grassland/range, Good, HSG C
1.118		Weighted Average
1.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment OFF1: P S



Summary for Subcatchment OFF2: P S

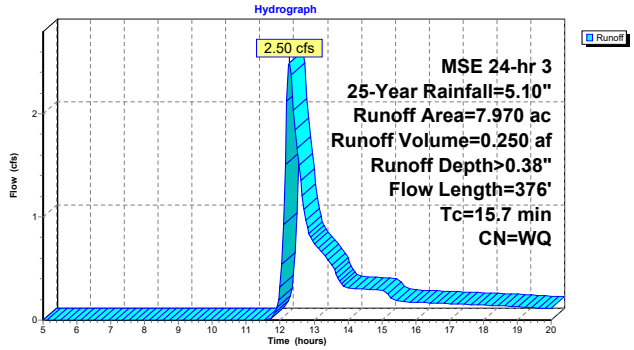
Runoff = 2.50 cfs @ 12.28 hrs, Volume= 0.250 af, Depth> 0.38"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=5.10"

Area (ac)	CN	Description
0.936	30	Woods, Good, HSG A
0.117	55	Woods, Good, HSG B
5.555	39	Pasture/grassland/range, Good, HSG A
1.362	61	Pasture/grassland/range, Good, HSG B
7.970		Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	204	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.7	376	Total			

Subcatchment OFF2: P S



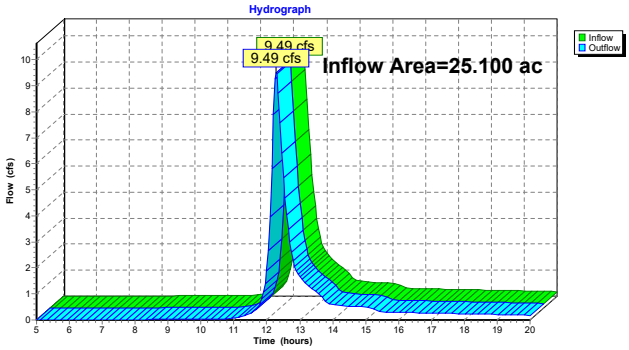
Summary for Reach 2R:

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

Inflow Area = 25.100 ac, 1.12% Impervious, Inflow Depth > 0.32" for 25-Year event
Inflow = 9.49 cfs @ 12.28 hrs, Volume= 0.676 af
Outflow = 9.49 cfs @ 12.28 hrs, Volume= 0.676 af, Atten= 0%, Lag= 0.0 min

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

Reach 2R:



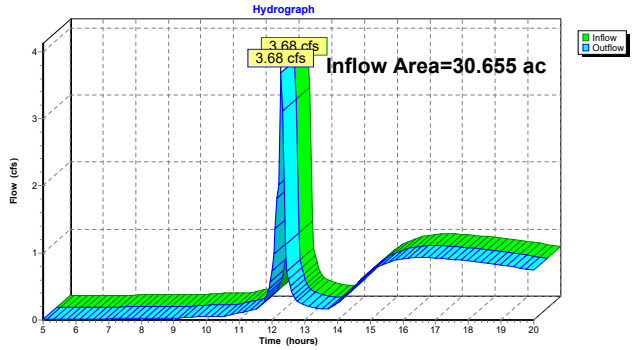
Summary for Reach 4R:

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

Inflow Area = 30.655 ac, 7.63% Impervious, Inflow Depth > 0.21" for 25-Year event
Inflow = 3.68 cfs @ 12.28 hrs, Volume= 0.536 af
Outflow = 3.68 cfs @ 12.28 hrs, Volume= 0.536 af, Atten= 0%, Lag= 0.0 min

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

Reach 4R:



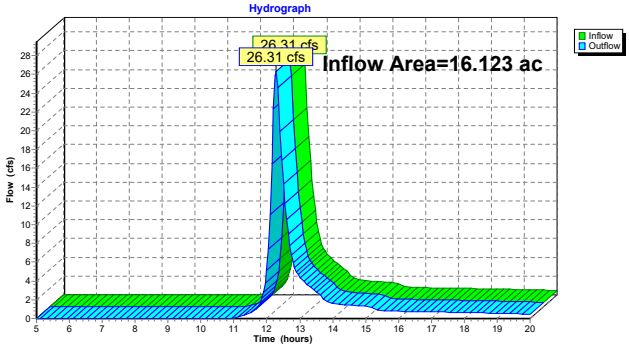
Summary for Reach 6R:

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

Inflow Area = 16.123 ac, 0.37% Impervious, Inflow Depth > 1.33" for 25-Year event
Inflow = 26.31 cfs @ 12.27 hrs, Volume= 1.785 af
Outflow = 26.31 cfs @ 12.27 hrs, Volume= 1.785 af, Atten= 0%, Lag= 0.0 min

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

Reach 6R:



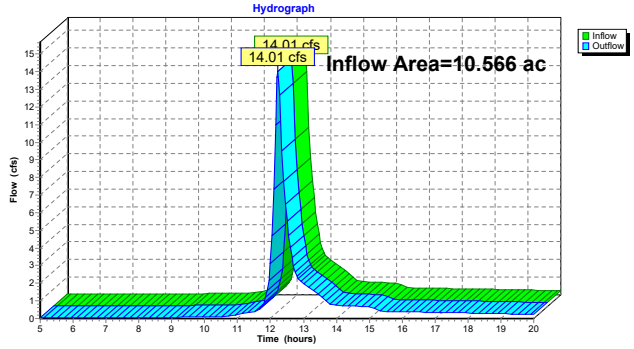
Summary for Reach 8R:

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

Inflow Area = 10.566 ac, 5.89% Impervious, Inflow Depth > 1.01" for 25-Year event
Inflow = 14.01 cfs @ 12.22 hrs, Volume= 0.892 af
Outflow = 14.01 cfs @ 12.22 hrs, Volume= 0.892 af, Atten= 0%, Lag= 0.0 min

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

Reach 8R:



Summary for Pond 1P: EX. DEP

Inflow Area = 19.157 ac, 0.48% Impervious, Inflow Depth > 0.47" for 25-Year event
Inflow = 9.52 cfs @ 12.26 hrs, Volume= 0.745 af
Outflow = 0.06 cfs @ 20.00 hrs, Volume= 0.039 af, Atten= 99%, Lag= 464.3 min
Discarded = 0.06 cfs @ 20.00 hrs, Volume= 0.039 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 2R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 828.58' @ 20.00 hrs Surf.Area= 19,213 sf Storage= 30,700 cf

Plug-Flow detention time= 243.3 min calculated for 0.039 af (5% of inflow)
Center-of-Mass det. time= 109.5 min (926.0 - 816.5)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	376,605 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

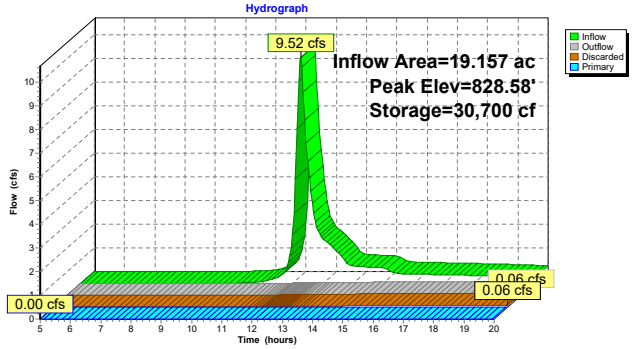
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	2,722	0	0
827.00	10,628	6,675	6,675
828.00	16,690	13,659	20,334
829.00	21,060	18,875	39,209
830.00	25,080	23,070	62,279
831.00	28,823	26,952	89,231
832.00	32,621	30,722	119,953
833.00	36,625	34,623	154,576
834.00	41,540	39,083	193,658
835.00	49,750	45,645	239,303
836.00	56,060	52,905	292,208
837.00	62,070	59,065	351,273
837.40	64,590	25,332	376,605

Device	Routing	Invert	Outlet Devices
#1	Primary	832.07'	**24.0" Round Culvert** L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 832.07' / 830.98' S= 0.0495 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	826.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.06 cfs @ 20.00 hrs HW=828.58' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=826.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 1P: EX. DEP



Summary for Pond 2P: INF. BASIN

[82] Warning: Early inflow requires earlier time span

Inflow Area = 28.189 ac, 7.32% Impervious, Inflow Depth > 0.92" for 25-Year event
Inflow = 21.57 cfs @ 12.25 hrs, Volume= 2.153 af
Outflow = 1.00 cfs @ 16.58 hrs, Volume= 0.486 af, Atten= 95%, Lag= 259.6 min
Discarded = 0.10 cfs @ 16.58 hrs, Volume= 0.108 af
Primary = 0.89 cfs @ 16.58 hrs, Volume= 0.378 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 832.47' @ 16.58 hrs Surf.Area= 34,724 sf Storage= 74,394 cf

Plug-Flow detention time= 290.0 min calculated for 0.486 af (23% of inflow)
Center-of-Mass det. time= 174.2 min (979.8 - 805.6)

Volume	Invert	Avail.Storage	Storage Description
#1	830.00'	287,056 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

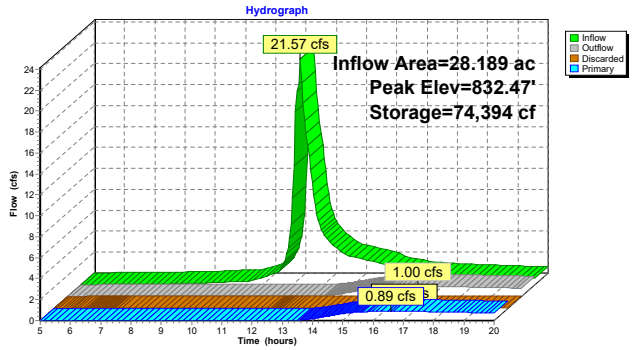
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
830.00	26,019	0	0
831.00	28,758	27,389	27,389
832.00	33,264	31,011	58,400
833.00	36,368	34,816	93,216
834.00	39,582	37,975	131,191
835.00	42,803	41,193	172,383
836.00	60,176	51,490	223,873
837.00	66,191	63,184	287,056

Device	Routing	Invert	Outlet Devices
#1	Primary	832.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 832.00' / 831.60' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	830.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.10 cfs @ 16.58 hrs HW=832.47' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.89 cfs @ 16.58 hrs HW=832.47' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.89 cfs @ 2.81 fps)

Pond 2P: INF. BASIN



Summary for Pond 3P: SED. BASIN

[82] Warning: Early inflow requires earlier time span

Inflow Area = 9.877 ac, 12.78% Impervious, Inflow Depth > 1.48" for 25-Year event
Inflow = 14.30 cfs @ 12.20 hrs, Volume= 1.217 af
Outflow = 12.73 cfs @ 12.27 hrs, Volume= 1.143 af, Atten= 11%, Lag= 4.4 min
Primary = 12.73 cfs @ 12.27 hrs, Volume= 1.143 af
Routed to Pond 2P : INF. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 834.35' @ 12.27 hrs Surf.Area= 5,148 sf Storage= 11,529 cf

Plug-Flow detention time= 56.3 min calculated for 1.140 af (94% of inflow)
Center-of-Mass det. time= 34.9 min (819.5 - 784.6)

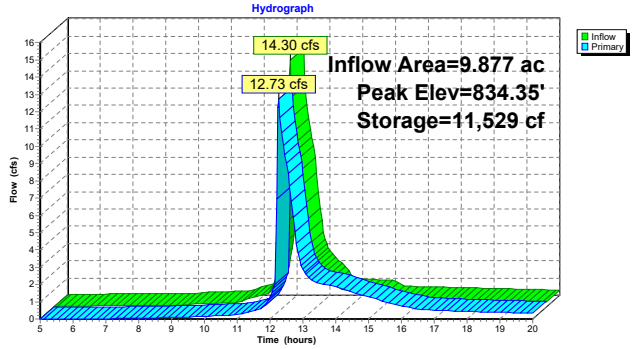
Volume	Invert	Avail.Storage	Storage Description
#1	831.50'	111,112 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
831.50	2,930	0	0
835.00	5,650	15,015	15,015
836.00	60,176	32,913	47,928
837.00	66,191	63,184	111,112

Device	Routing	Invert	Outlet Devices
#1	Primary	831.50'	**8.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.50' / 831.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	834.00'	**20.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=12.02 cfs @ 12.27 hrs HW=834.34' TW=830.91' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.26 cfs @ 6.47 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 9.76 cfs @ 1.45 fps)

Pond 3P: SED. BASIN



Summary for Pond 6P:

[82] Warning: Early inflow requires earlier time span
[80] Warning: Exceeded Pond 7P by 0.44' @ 12.15 hrs (5.63 cfs 0.100 af)

Inflow Area = 9.007 ac, 11.64% Impervious, Inflow Depth > 1.48" for 25-Year event
Inflow = 18.02 cfs @ 12.13 hrs, Volume= 1.107 af
Outflow = 13.01 cfs @ 12.20 hrs, Volume= 1.107 af, Atten= 28%, Lag= 4.3 min
Primary = 13.01 cfs @ 12.20 hrs, Volume= 1.107 af
Routed to Pond 3P : SED. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 840.31' @ 12.21 hrs Surf.Area= 4,531 sf Storage= 3,920 cf

Plug-Flow detention time= 2.5 min calculated for 1.103 af (100% of inflow)
Center-of-Mass det. time= 2.3 min (787.2 - 784.9)

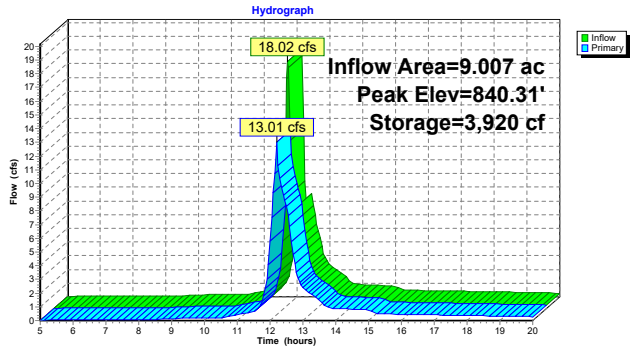
Volume	Invert	Avail.Storage	Storage Description
#1	837.84'	5,398 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.84	41	0	0
838.00	120	13	13
839.00	968	544	557
840.00	3,323	2,146	2,702
840.60	5,661	2,695	5,398

Device	Routing	Invert	Outlet Devices
#1	Primary	837.84'	**18.0" Round Culvert** L= 127.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.84' / 831.50' S= 0.0499 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Primary	840.20'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=12.86 cfs @ 12.20 hrs HW=840.30' TW=834.22' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.14 cfs @ 6.30 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 1.72 cfs @ 0.79 fps)

Pond 6P:



Summary for Pond 7P:

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.536 ac, 27.28% Impervious, Inflow Depth > 2.25" for 25-Year event
Inflow = 5.81 cfs @ 12.14 hrs, Volume= 0.288 af
Outflow = 3.58 cfs @ 12.44 hrs, Volume= 0.287 af, Atten= 38%, Lag= 18.2 min
Primary = 3.57 cfs @ 12.45 hrs, Volume= 0.264 af
Routed to Pond 6P :
Secondary = 2.17 cfs @ 12.29 hrs, Volume= 0.024 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 840.12' @ 12.29 hrs Surf.Area= 4,156 sf Storage= 3,552 cf

Plug-Flow detention time= 13.0 min calculated for 0.287 af (100% of inflow)
Center-of-Mass det. time= 11.3 min (777.6 - 766.3)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	4,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

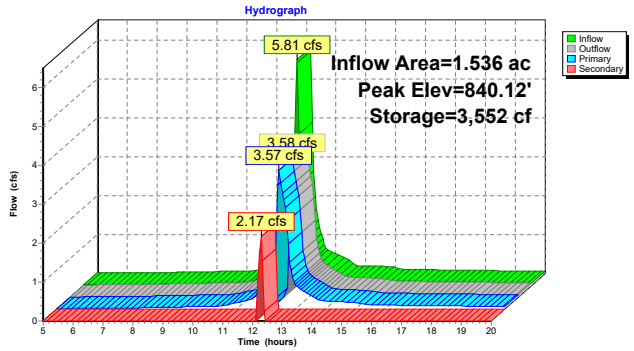
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	149	0	0
838.80	890	416	416
839.00	1,186	208	623
840.00	3,724	2,455	3,078
840.40	5,162	1,777	4,855

Device	Routing	Invert	Outlet Devices
#1	Primary	838.04'	**18.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.04' / 837.84' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	840.00'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.39 cfs @ 12.45 hrs HW=839.92' TW=839.65' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.39 cfs @ 2.49 fps)

Secondary OutFlow Max=2.13 cfs @ 12.29 hrs HW=840.12' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.13 cfs @ 0.85 fps)

Pond 7P:



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

Subcatchment 1S: P S Runoff Area=9.224 ac 8.68% Impervious Runoff Depth>1.24"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=17.17 cfs 0.956 af

Subcatchment 2S: P S Runoff Area=0.870 ac 24.60% Impervious Runoff Depth>2.42"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=3.24 cfs 0.175 af

Subcatchment 3S: P S Runoff Area=7.471 ac 8.42% Impervious Runoff Depth>2.35"
Flow Length=172' Tc=6.1 min UI Adjusted CN=WQ Runoff=31.15 cfs 1.461 af

Subcatchment 4S: P S Runoff Area=1.536 ac 27.28% Impervious Runoff Depth>3.55"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=9.35 cfs 0.454 af

Subcatchment 5S: BYPASS Runoff Area=460,253 sf 5.89% Impervious Runoff Depth>1.81"
Flow Length=580' Tc=13.2 min UI Adjusted CN=WQ Runoff=25.25 cfs 1.594 af

Subcatchment 6S: BYPASS Runoff Area=96,237 sf 7.07% Impervious Runoff Depth>0.85"
Flow Length=475' Tc=12.0 min UI Adjusted CN=WQ Runoff=2.07 cfs 0.156 af

Subcatchment 7S: BYPASS Runoff Area=0.257 ac 46.30% Impervious Runoff Depth>3.30"
Flow Length=475' Tc=12.0 min CN=WQ Runoff=1.03 cfs 0.071 af

Subcatchment EX1: EX. S Runoff Area=834,494 sf 0.48% Impervious Runoff Depth>0.99"
Flow Length=1,565' Tc=15.9 min CN=WQ Runoff=19.83 cfs 1.580 af

Subcatchment EX2: EX. S Runoff Area=180,439 sf 4.57% Impervious Runoff Depth>2.79"
Flow Length=1,025' Tc=18.2 min CN=WQ Runoff=13.64 cfs 0.963 af

Subcatchment EX3: EX. N Runoff Area=702,335 sf 0.37% Impervious Runoff Depth>2.32"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=45.97 cfs 3.123 af

Subcatchment EX4: EX. S Runoff Area=78,427 sf 0.00% Impervious Runoff Depth>1.40"
Flow Length=1,153' Tc=17.4 min CN=WQ Runoff=2.98 cfs 0.211 af

Subcatchment OFF1: P S Runoff Area=1.118 ac 0.00% Impervious Runoff Depth>3.58"
Flow Length=172' Tc=6.1 min CN=WQ Runoff=7.42 cfs 0.333 af

Subcatchment OFF2: P S Runoff Area=7.970 ac 0.00% Impervious Runoff Depth>0.93"
Flow Length=376' Tc=15.7 min CN=WQ Runoff=7.38 cfs 0.620 af

Reach 2R: Inflow=16.59 cfs 1.174 af
Outflow=16.59 cfs 1.174 af

Reach 4R: Inflow=10.73 cfs 2.165 af
Outflow=10.73 cfs 2.165 af

Reach 6R: Inflow=45.97 cfs 3.123 af
Outflow=45.97 cfs 3.123 af

Reach 8R: Inflow=25.25 cfs 1.594 af
Outflow=25.25 cfs 1.594 af

Pond 1P: EX. DEP Peak Elev=830.17' Storage=66,504 cf Inflow=19.83 cfs 1.580 af
Discarded=0.08 cfs 0.052 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.052 af

Pond 2P: INF. BASIN Peak Elev=833.18' Storage=99,666 cf Inflow=56.78 cfs 3.765 af
Discarded=0.11 cfs 0.116 af Primary=4.48 cfs 1.807 af Outflow=4.59 cfs 1.923 af

Pond 3P: SED. BASIN Peak Elev=834.65' Storage=13,073 cf Inflow=34.15 cfs 1.958 af
Outflow=30.45 cfs 1.856 af

Pond 6P: Peak Elev=840.66' Storage=5,398 cf Inflow=31.15 cfs 1.783 af
Outflow=31.01 cfs 1.783 af

Pond 7P: Peak Elev=840.27' Storage=4,197 cf Inflow=9.35 cfs 0.454 af
Primary=3.18 cfs 0.322 af Secondary=7.63 cfs 0.130 af Outflow=7.63 cfs 0.453 af

Total Runoff Area = 82.445 ac Runoff Volume = 11.697 af Average Runoff Depth = 1.70"
96.00% Pervious = 79.143 ac 4.00% Impervious = 3.301 ac

Summary for Subcatchment 1S: P S

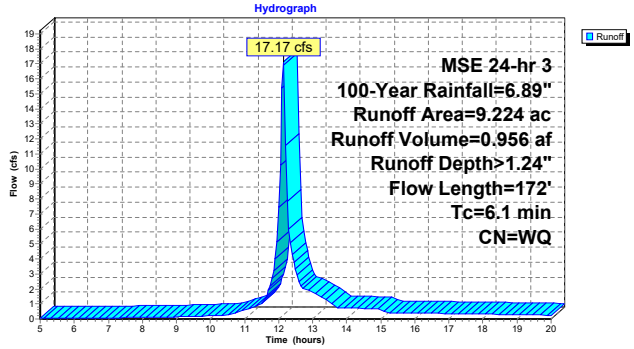
Runoff = 17.17 cfs @ 12.14 hrs, Volume= 0.956 af, Depth> 1.24"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Description
5.387	30	Woods, Good, HSG A
0.843	70	Woods, Good, HSG C
1.427	39	Pasture/grassland/range, Good, HSG A
0.381	74	Pasture/grassland/range, Good, HSG C
0.385	39	>75% Grass cover, Good, HSG A
0.092	98	Unconnected roofs, HSG A
0.112	98	Paved parking, HSG A
0.597	98	Water Surface, HSG A
9.224		Weighted Average
8.423		91.32% Pervious Area
0.801		8.68% Impervious Area
0.092		11.49% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 1S: P S



Summary for Subcatchment 2S: P S

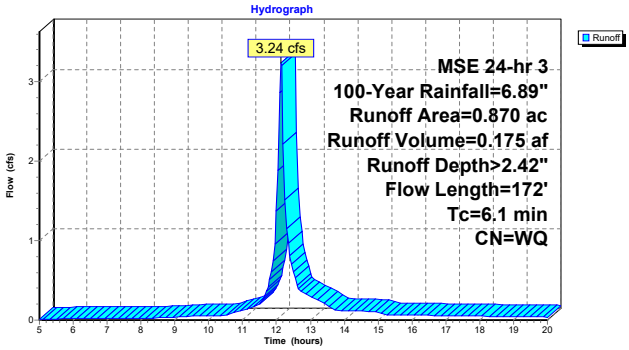
Runoff = 3.24 cfs @ 12.14 hrs, Volume= 0.175 af, Depth> 2.42"
Routed to Pond 3P : SED. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Description
0.115	39	Pasture/grassland/range, Good, HSG A
0.167	61	Pasture/grassland/range, Good, HSG B
0.374	39	>75% Grass cover, Good, HSG A
0.147	98	Paved parking, HSG A
0.067	98	Water Surface, HSG A
0.870		Weighted Average
0.656		75.40% Pervious Area
0.214		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 2S: P S



Summary for Subcatchment 3S: P S

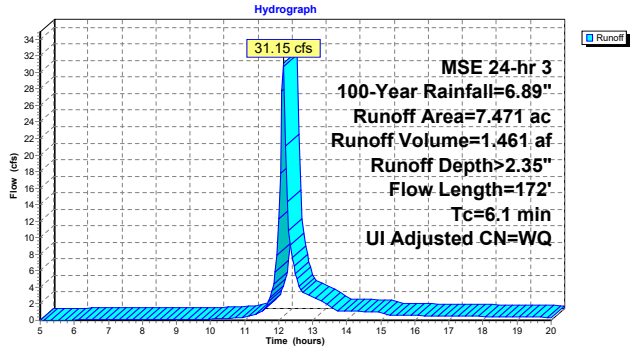
Runoff = 31.15 cfs @ 12.14 hrs, Volume= 1.461 af, Depth> 2.35"
Routed to Pond 6P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Adj	Description
1.509	30	30	Woods, Good, HSG A
0.430	61	61	Pasture/grassland/range, Good, HSG B
4.903	61	61	>75% Grass cover, Good, HSG B
0.184	98	98	Unconnected roofs, HSG A
0.445	98	98	Paved parking, HSG A
7.471			Weighted Average
6.842			91.58% Pervious Area
0.629			8.42% Impervious Area
0.184			29.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 3S: P S



Summary for Subcatchment 4S: P S

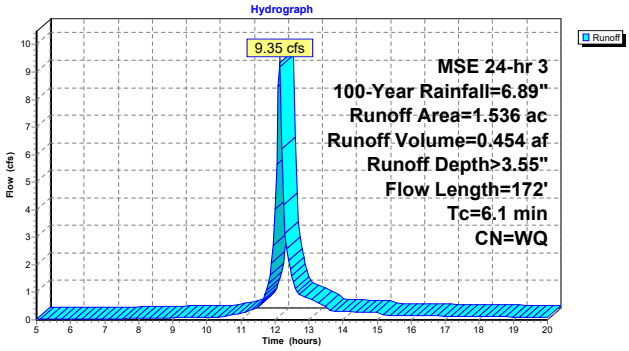
Runoff = 9.35 cfs @ 12.13 hrs, Volume= 0.454 af, Depth> 3.55"
Routed to Pond 7P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Description
1.117	61	>75% Grass cover, Good, HSG B
0.419	98	Paved parking, HSG A
1.536		Weighted Average
1.117		72.72% Pervious Area
0.419		27.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment 4S: P S



Summary for Subcatchment 5S: BYPASS

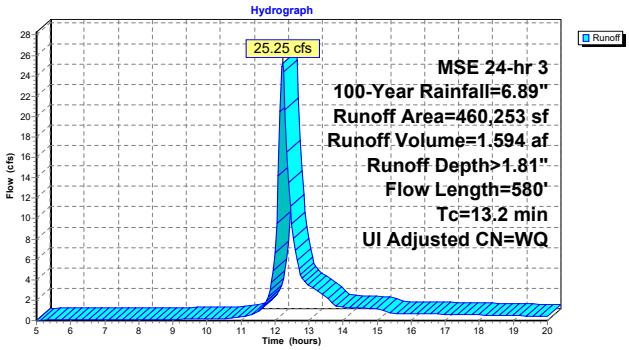
Runoff = 25.25 cfs @ 12.22 hrs, Volume= 1.594 af, Depth> 1.81"
Routed to Reach 8R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (sf)	CN	Adj	Description
163,516	30	30	Woods, Good, HSG A
10,629	55	55	Woods, Good, HSG B
16,422	39	39	Pasture/grassland/range, Good, HSG A
48,047	61	61	Pasture/grassland/range, Good, HSG B
194,539	61	61	>75% Grass cover, Good, HSG B
16,000	98	98	Unconnected roofs, HSG A
11,100	98	98	Paved parking, HSG A
460,253			Weighted Average
433,153			94.11% Pervious Area
27,100			5.89% Impervious Area
16,000			59.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.2	105	0.0300	1.44	66.42	**Channel Flow,** Area= 46.0 sf Perim= 153.0' r= 0.30' n= 0.080 Earth, long dense weeds
13.2	580	Total			

Subcatchment 5S: BYPASS



Summary for Subcatchment 6S: BYPASS

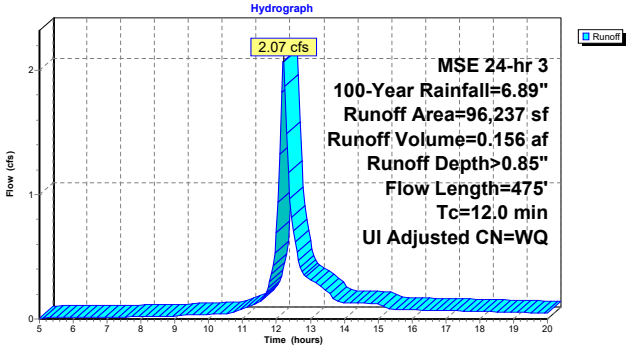
Runoff = 2.07 cfs @ 12.20 hrs, Volume= 0.156 af, Depth> 0.85"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (sf)	CN	Adj	Description
72,405	30	30	Woods, Good, HSG A
8,668	39	39	Pasture/grassland/range, Good, HSG A
4,182	61	61	Pasture/grassland/range, Good, HSG B
4,182	61	61	>75% Grass cover, Good, HSG B
4,000	98	98	Unconnected roofs, HSG A
2,800	98	98	Paved parking, HSG A
96,237			Weighted Average
89,437			92.93% Pervious Area
6,800			7.07% Impervious Area
4,000			58.82% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 6S: BYPASS



Summary for Subcatchment 7S: BYPASS

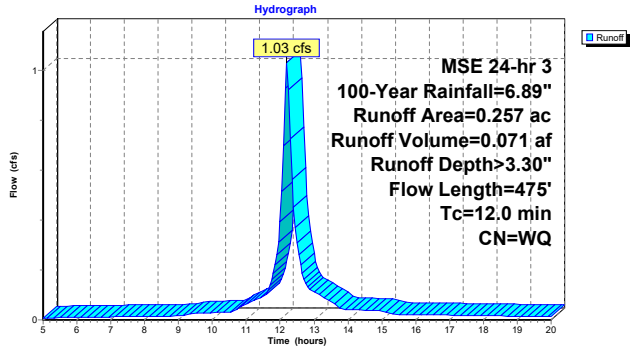
Runoff = 1.03 cfs @ 12.20 hrs, Volume= 0.071 af, Depth> 3.30"
Routed to Reach 4R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Description
0.138	39	>75% Grass cover, Good, HSG A
0.119	98	Paved parking, HSG A
0.257		Weighted Average
0.138		53.70% Pervious Area
0.119		46.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.82"
2.2	375	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	475	Total			

Subcatchment 7S: BYPASS



Summary for Subcatchment EX1: EX. S

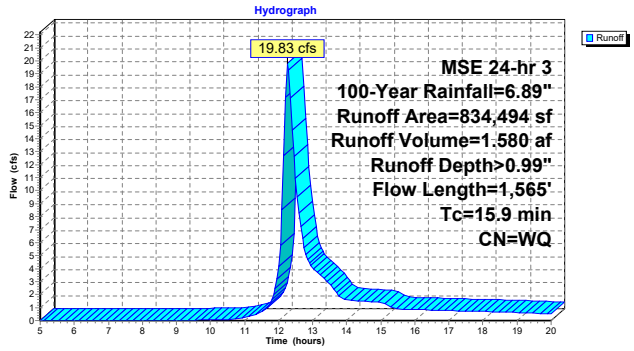
Runoff = 19.83 cfs @ 12.27 hrs, Volume= 1.580 af, Depth> 0.99"
Routed to Pond 1P : EX. DEP

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (sf)	CN	Description
315,214	30	Woods, Good, HSG A
5,112	55	Woods, Good, HSG B
61,557	70	Woods, Good, HSG C
348,487	39	Pasture/grassland/range, Good, HSG A
59,335	61	Pasture/grassland/range, Good, HSG B
40,743	74	Pasture/grassland/range, Good, HSG C
4,046	98	Paved parking, HSG A
834,494		Weighted Average
830,448		99.52% Pervious Area
4,046		0.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0300	0.21		**Sheet Flow,** Range n= 0.130 P2= 2.82"
8.0	1,465	0.0410	3.04		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.9	1,565	Total			

Subcatchment EX1: EX. S



Summary for Subcatchment EX2: EX. S

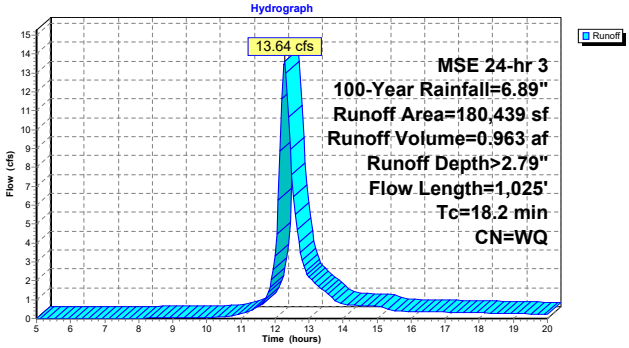
Runoff = 13.64 cfs @ 12.28 hrs, Volume= 0.963 af, Depth> 2.79"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

	Area (sf)	CN	Description
	10,838	30	Woods, Good, HSG A
	24,569	39	Pasture/grassland/range, Good, HSG A
	30,535	61	Pasture/grassland/range, Good, HSG B
*	106,256	70	Row crops, SR + CR, Good, HSG B
	8,241	98	Paved parking, HSG A
	180,439		Weighted Average
	172,198		95.43% Pervious Area
	8,241		4.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0710	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.82"
11.3	925	0.0230	1.36		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.2	1,025	Total			

Subcatchment EX2: EX. S



Summary for Subcatchment EX3: EX. N

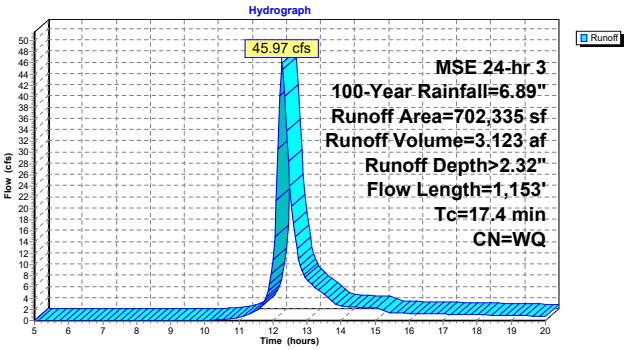
Runoff = 45.97 cfs @ 12.27 hrs, Volume= 3.123 af, Depth> 2.32"
Routed to Reach 6R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

	Area (sf)	CN	Description
	168,679	30	Woods, Good, HSG A
	12,456	55	Woods, Good, HSG B
	21,969	39	Pasture/grassland/range, Good, HSG A
	97,188	61	Pasture/grassland/range, Good, HSG B
*	25,963	56	Row crops, straight row, Good, HSG A
*	373,505	70	Row crops, SR + CR, Good, HSG B
	2,575	98	Paved parking, HSG A
	702,335		Weighted Average
	699,760		99.63% Pervious Area
	2,575		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX3: EX. N



Summary for Subcatchment EX4: EX. S

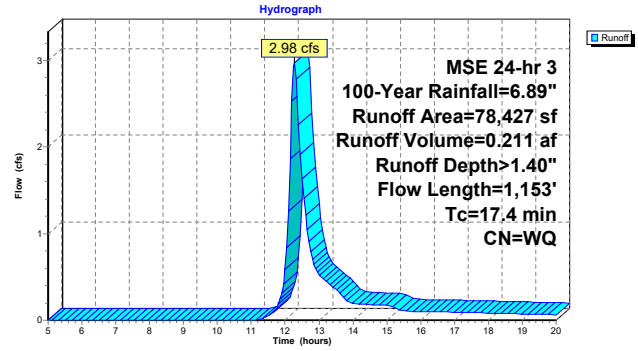
Runoff = 2.98 cfs @ 12.27 hrs, Volume= 0.211 af, Depth> 1.40"
Routed to Reach 2R :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (sf)	CN	Description
36,439	30	Woods, Good, HSG A
41,988	61	Pasture/grassland/range, Good, HSG B
78,427		Weighted Average
78,427		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.1077	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.82"
5.7	1,053	0.0428	3.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.4	1,153	Total			

Subcatchment EX4: EX. S



Summary for Subcatchment OFF1: P S

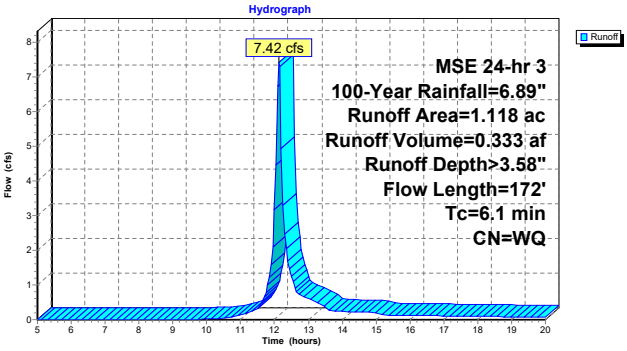
Runoff = 7.42 cfs @ 12.13 hrs, Volume= 0.333 af, Depth> 3.58"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Description
0.570	70	Woods, Good, HSG C
0.548	74	Pasture/grassland/range, Good, HSG C
1.118		Weighted Average
1.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.1	172	Total			

Subcatchment OFF1: P S



Summary for Subcatchment OFF2: P S

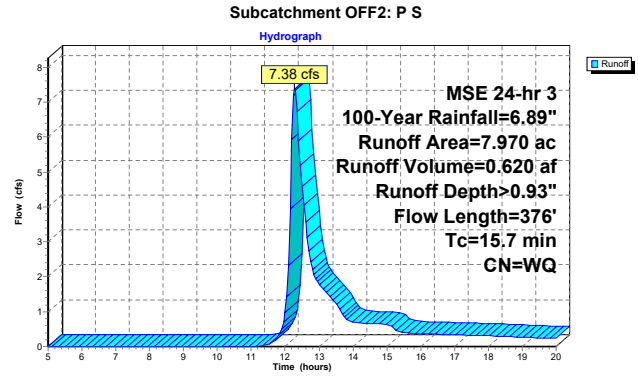
Runoff = 7.38 cfs @ 12.28 hrs, Volume= 0.620 af, Depth> 0.93"
Routed to Pond 2P : INF. BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.89"

Area (ac)	CN	Description
0.936	30	Woods, Good, HSG A
0.117	55	Woods, Good, HSG B
5.555	39	Pasture/grassland/range, Good, HSG A
1.362	61	Pasture/grassland/range, Good, HSG B
7.970		Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0700	0.30		**Sheet Flow,** Range n= 0.130 P2= 2.82"
0.5	72	0.0281	2.51		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.6	204	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.7	376	Total			

Subcatchment OFF2: P S



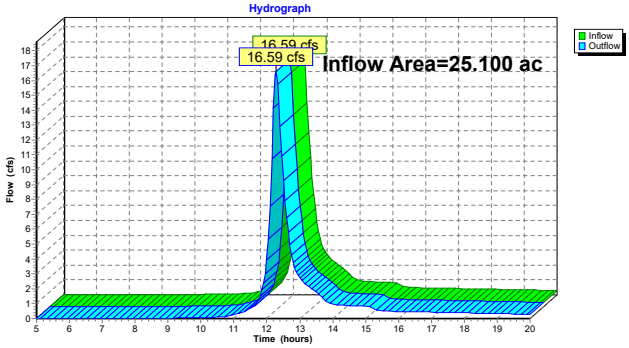
Summary for Reach 2R:

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

Inflow Area = 25.100 ac, 1.12% Impervious, Inflow Depth > 0.56" for 100-Year event
Inflow = 16.59 cfs @ 12.28 hrs, Volume= 1.174 af
Outflow = 16.59 cfs @ 12.28 hrs, Volume= 1.174 af, Atten= 0%, Lag= 0.0 min

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

Reach 2R:



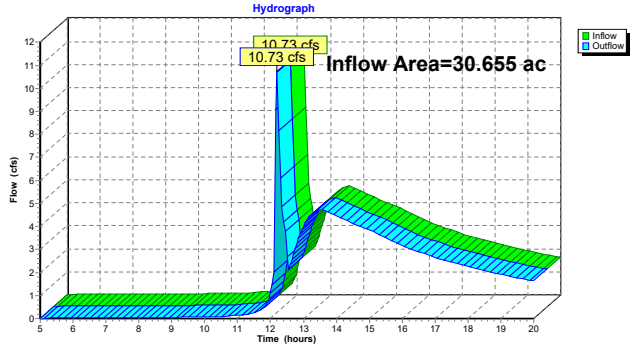
Summary for Reach 4R:

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

Inflow Area = 30.655 ac, 7.63% Impervious, Inflow Depth > 0.85" for 100-Year event
Inflow = 10.73 cfs @ 12.19 hrs, Volume= 2.165 af
Outflow = 10.73 cfs @ 12.19 hrs, Volume= 2.165 af, Atten= 0%, Lag= 0.0 min

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

Reach 4R:



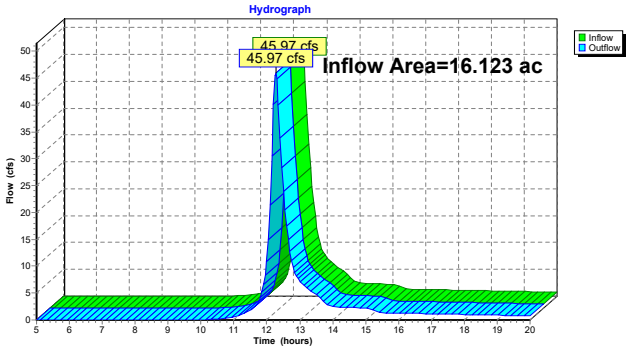
Summary for Reach 6R:

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

Inflow Area = 16.123 ac, 0.37% Impervious, Inflow Depth > 2.32" for 100-Year event
Inflow = 45.97 cfs @ 12.27 hrs, Volume= 3.123 af
Outflow = 45.97 cfs @ 12.27 hrs, Volume= 3.123 af, Atten= 0%, Lag= 0.0 min

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

Reach 6R:



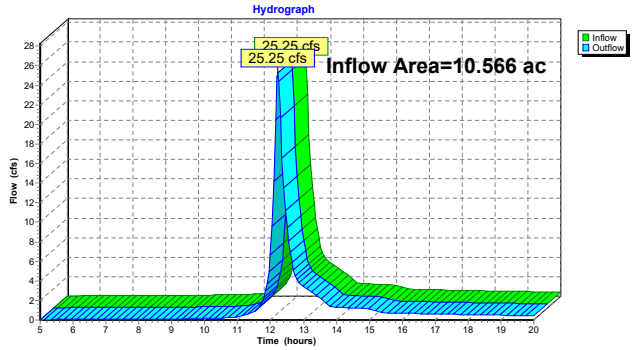
Summary for Reach 8R:

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

Inflow Area = 10.566 ac, 5.89% Impervious, Inflow Depth > 1.81" for 100-Year event
Inflow = 25.25 cfs @ 12.22 hrs, Volume= 1.594 af
Outflow = 25.25 cfs @ 12.22 hrs, Volume= 1.594 af, Atten= 0%, Lag= 0.0 min

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

Reach 8R:



Summary for Pond 1P: EX. DEP

Inflow Area = 19.157 ac, 0.48% Impervious, Inflow Depth > 0.99" for 100-Year event
Inflow = 19.83 cfs @ 12.27 hrs, Volume= 1.580 af
Outflow = 0.08 cfs @ 20.00 hrs, Volume= 0.052 af, Atten= 100%, Lag= 463.9 min
Discarded = 0.08 cfs @ 20.00 hrs, Volume= 0.052 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach 2R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 830.17' @ 20.00 hrs Surf.Area= 25,703 sf Storage= 66,504 cf

Plug-Flow detention time= 268.7 min calculated for 0.052 af (3% of inflow)
Center-of-Mass det. time= 112.6 min (928.8 - 816.2)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	376,605 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

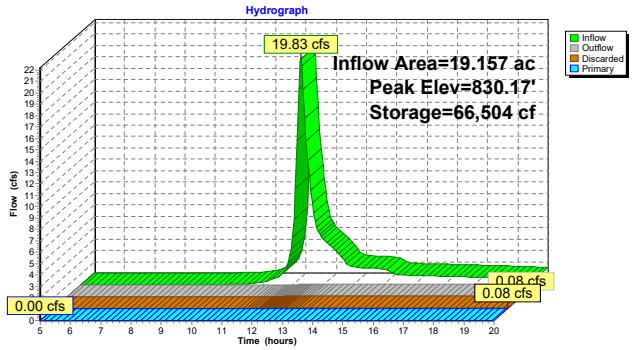
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	2,722	0	0
827.00	10,628	6,675	6,675
828.00	16,690	13,659	20,334
829.00	21,060	18,875	39,209
830.00	25,080	23,070	62,279
831.00	28,823	26,952	89,231
832.00	32,621	30,722	119,953
833.00	36,625	34,623	154,576
834.00	41,540	39,083	193,658
835.00	49,750	45,645	239,303
836.00	56,060	52,905	292,208
837.00	62,070	59,065	351,273
837.40	64,590	25,332	376,605

Device	Routing	Invert	Outlet Devices
#1	Primary	832.07'	**24.0" Round Culvert** L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 832.07' / 830.98' S= 0.0495 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	826.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.08 cfs @ 20.00 hrs HW=830.17' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=826.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Pond 1P: EX. DEP



Summary for Pond 2P: INF. BASIN

Inflow Area = 28.189 ac, 7.32% Impervious, Inflow Depth > 1.60" for 100-Year event
Inflow = 56.78 cfs @ 12.17 hrs, Volume= 3.765 af
Outflow = 4.59 cfs @ 13.62 hrs, Volume= 1.923 af, Atten= 92%, Lag= 87.1 min
Discarded = 0.11 cfs @ 13.62 hrs, Volume= 0.116 af
Primary = 4.48 cfs @ 13.62 hrs, Volume= 1.807 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 833.18' @ 13.62 hrs Surf.Area= 36,934 sf Storage= 99,666 cf

Plug-Flow detention time= 213.9 min calculated for 1.923 af (51% of inflow)
Center-of-Mass det. time= 128.0 min (933.1 - 805.1)

Volume	Invert	Avail.Storage	Storage Description
#1	830.00'	287,056 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

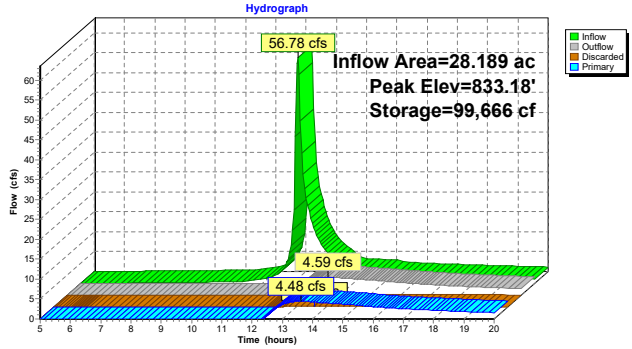
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
830.00	26,019	0	0
831.00	28,758	27,389	27,389
832.00	33,264	31,011	58,400
833.00	36,368	34,816	93,216
834.00	39,582	37,975	131,191
835.00	42,803	41,193	172,383
836.00	60,176	51,490	223,873
837.00	66,191	63,184	287,056

Device	Routing	Invert	Outlet Devices
#1	Primary	832.00'	**18.0" Round Culvert** L= 80.0' Ke= 0.500 Inlet / Outlet Invert= 832.00' / 831.60' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	830.00'	**0.130 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.11 cfs @ 13.62 hrs HW=833.18' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=4.48 cfs @ 13.62 hrs HW=833.18' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 4.48 cfs @ 4.15 fps)

Pond 2P: INF. BASIN



Summary for Pond 3P: SED. BASIN

Inflow Area = 9.877 ac, 12.78% Impervious, Inflow Depth > 2.38" for 100-Year event
Inflow = 34.15 cfs @ 12.16 hrs, Volume= 1.958 af
Outflow = 30.45 cfs @ 12.19 hrs, Volume= 1.856 af, Atten= 11%, Lag= 1.9 min
Primary = 30.45 cfs @ 12.19 hrs, Volume= 1.856 af
Routed to Pond 2P : INF. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 834.65' @ 12.19 hrs Surf.Area= 5,376 sf Storage= 13,073 cf

Plug-Flow detention time= 49.3 min calculated for 1.856 af (95% of inflow)
Center-of-Mass det. time= 30.3 min (815.5 - 785.1)

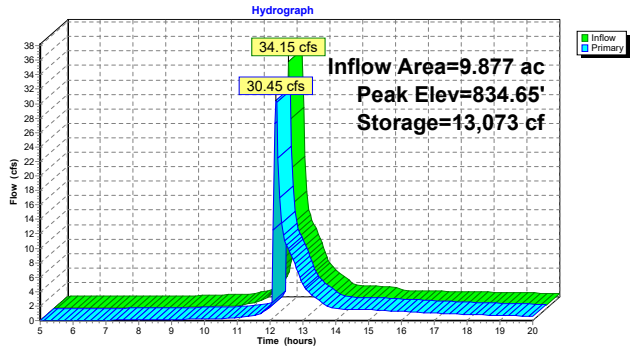
Volume	Invert	Avail.Storage	Storage Description
#1	831.50'	111,112 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
831.50	2,930	0	0
835.00	5,650	15,015	15,015
836.00	60,176	32,913	47,928
837.00	66,191	63,184	111,112

Device	Routing	Invert	Outlet Devices
#1	Primary	831.50'	**8.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.50' / 831.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	834.00'	**20.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=29.53 cfs @ 12.19 hrs HW=834.63' TW=831.42' (Dynamic Tailwater)
└1=**Culvert** (Barrel Controls 2.41 cfs @ 6.90 fps)
└2=**Broad-Crested Rectangular Weir** (Weir Controls 27.12 cfs @ 2.14 fps)

Pond 3P: SED. BASIN



Summary for Pond 6P:

[82] Warning: Early inflow requires earlier time span
[93] Warning: Storage range exceeded by 0.06'
[80] Warning: Exceeded Pond 7P by 0.44' @ 12.10 hrs (5.62 cfs 0.165 af)

Inflow Area = 9.007 ac, 11.64% Impervious, Inflow Depth > 2.38" for 100-Year event
Inflow = 31.15 cfs @ 12.14 hrs, Volume= 1.783 af
Outflow = 31.01 cfs @ 12.16 hrs, Volume= 1.783 af, Atten= 0%, Lag= 1.3 min
Primary = 31.01 cfs @ 12.16 hrs, Volume= 1.783 af
Routed to Pond 3P : SED. BASIN

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 840.66' @ 12.16 hrs Surf.Area= 5,661 sf Storage= 5,398 cf

Plug-Flow detention time= 2.6 min calculated for 1.777 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (787.3 - 784.9)

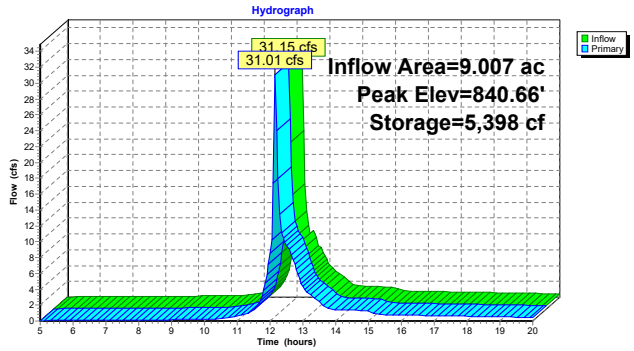
Volume	Invert	Avail.Storage	Storage Description
#1	837.84'	5,398 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.84	41	0	0
838.00	120	13	13
839.00	968	544	557
840.00	3,323	2,146	2,702
840.60	5,661	2,695	5,398

Device	Routing	Invert	Outlet Devices
#1	Primary	837.84'	**18.0" Round Culvert** L= 127.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 837.84' / 831.50' S= 0.0499 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Primary	840.20'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=29.52 cfs @ 12.16 hrs HW=840.63' TW=834.60' (Dynamic Tailwater)
└1=**Culvert** (Inlet Controls 12.17 cfs @ 6.88 fps)
└2=**Broad-Crested Rectangular Weir** (Weir Controls 17.36 cfs @ 1.64 fps)

Pond 6P:



Summary for Pond 7P:

[82] Warning: Early inflow requires earlier time span
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 1.536 ac, 27.28% Impervious, Inflow Depth > 3.55" for 100-Year event
Inflow = 9.35 cfs @ 12.13 hrs, Volume= 0.454 af
Outflow = 7.63 cfs @ 12.19 hrs, Volume= 0.453 af, Atten= 18%, Lag= 3.5 min
Primary = 3.18 cfs @ 12.56 hrs, Volume= 0.322 af
Routed to Pond 6P :
Secondary = 7.63 cfs @ 12.19 hrs, Volume= 0.130 af
Routed to Reach 4R :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 840.27' @ 12.19 hrs Surf.Area= 4,681 sf Storage= 4,197 cf

Plug-Flow detention time= 12.2 min calculated for 0.451 af (99% of inflow)
Center-of-Mass det. time= 10.8 min (776.1 - 765.4)

Volume	Invert	Avail.Storage	Storage Description
#1	838.00'	4,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

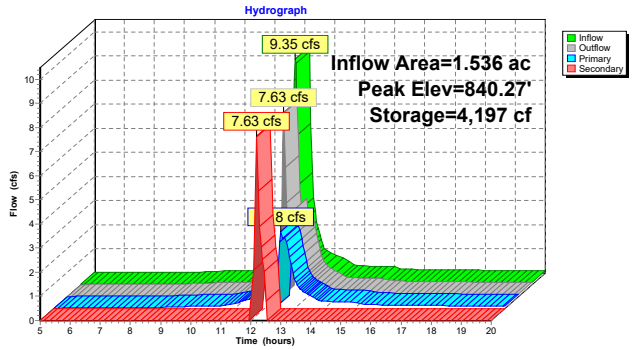
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
838.00	149	0	0
838.80	890	416	416
839.00	1,186	208	623
840.00	3,724	2,455	3,078
840.40	5,162	1,777	4,855

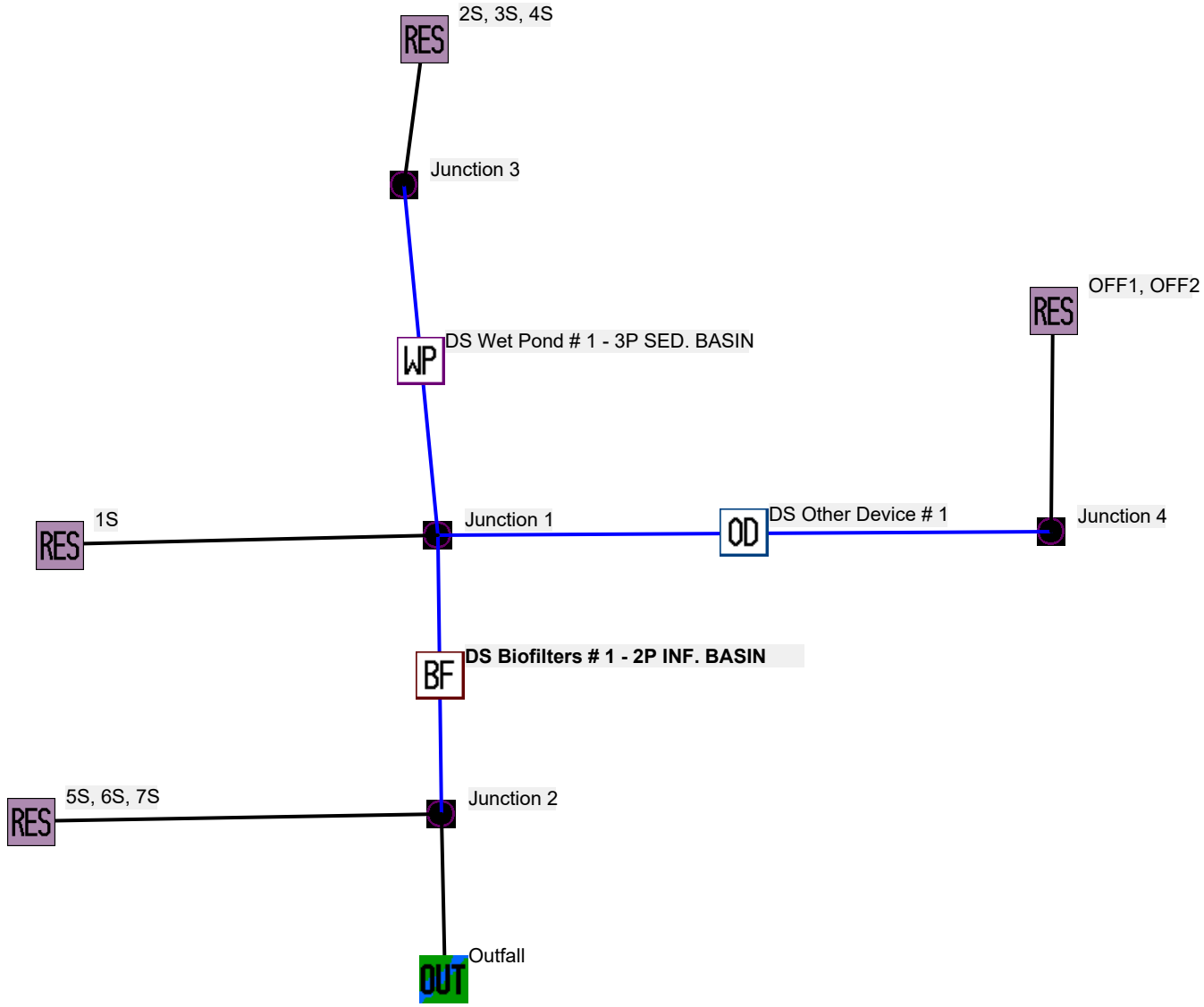
Device	Routing	Invert	Outlet Devices
#1	Primary	838.04'	**18.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.04' / 837.84' S= 0.0041 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	840.00'	**20.0' long + 10.0 '/' SideZ x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.88 cfs @ 12.56 hrs HW=839.96' TW=839.76' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.88 cfs @ 2.19 fps)

Secondary OutFlow Max=7.42 cfs @ 12.19 hrs HW=840.26' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 7.42 cfs @ 1.25 fps)

Pond 7P:

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Junction 3
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1S
Junction 1
OD
DS Other Device # 1
Junction 4
BF
DS Biofilters # 1 - 2P INF. BASIN
RES
5S, 6S, 7S
Junction 2
OUT
Outfall

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Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
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Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
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Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/02/59 Study period ending date: 12/28/59
Start of Winter Season: 11/04 End of Winter Season: 03/13
Date: 02-01-2026 Time: 20:44:00
Site information:

LU# 1 - Residential: 1S Total area (ac): 9.224
1 - Roofs 1: 0.092 ac. Pitched Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.112 ac. Disconnected Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c
45 - Large Landscaped Areas 1: 0.385 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 6.814 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
58 - Undeveloped Areas 2: 1.224 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.597 ac. PSD File: Source Area PSD File:

LU# 2 - Residential: 2S, 3S, 4S Total area (ac): 9.877
1 - Roofs 1: 0.184 ac. Pitched Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.926 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.374 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
46 - Large Landscaped Areas 2: 6.105 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 1.624 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
58 - Undeveloped Areas 2: 0.597 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.067 ac. PSD File: Source Area PSD File:

LU# 3 - Residential: OFF1, OFF2 Total area (ac): 9.087
57 - Undeveloped Areas 1: 6.490 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
58 - Undeveloped Areas 2: 1.479 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
59 - Undeveloped Areas 3: 1.118 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Residential: 5S, 6S, 7S Total area (ac): 13.034
1 - Roofs 1: 0.459 ac. Pitched Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.429 ac. Disconnected Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c
45 - Large Landscaped Areas 1: 0.138 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
46 - Large Landscaped Areas 2: 1.125 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 5.992 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
58 - Undeveloped Areas 2: 4.891 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Biofilter CP# 1 (DS) - DS Biofilters # 1 - 2P INF. BASIN
1. Top area (square feet) = 42802
2. Bottom aea (square feet) = 26019
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.13
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 4
3. Height of datum to bottom of weir opening: 4.99
Outlet type: Surface Discharge Pipe
1. Surface discharge pipe outlet diameter (ft): 1.5
2. Pipe invert elevation above datum (ft): 2
3. Number of surface pipe outlets: 1

Control Practice 2: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 1 - 3P SED. BASIN

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.67
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 4
3. Height from datum to bottom of weir opening: 7.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0061	0.00	0.00
2	4.00	0.0306	0.00	0.00
3	5.00	0.0673	0.00	0.00
4	6.50	0.0921	0.00	0.00
5	8.50	0.1297	0.00	0.00

Control Practice 3: Other Device CP# 1 (DS) - DS Other Device # 1

Fraction of drainage area served by device (ac) = 1.00

Particulate Concentration reduction fraction = 1.00

Filterable Concentration reduction fraction = 0.80

Runoff volume reduction fraction = 0

SLAMM for Windows Version 10.5.0
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Data file name: S:\Projects_2018\AEC 25 Projects\25083\Project Management-Civil\Design\WinSLAMM\25083.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Minneapolis MN 1959.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/02/59 Study period ending date: 12/28/59
Start of Winter Season: 11/04 End of Winter Season: 03/13
Model Run Start Date: 01/02/59 Model Run End Date: 12/28/59
Date of run: 02-01-2026 Time of run: 20:45:58
Total Area Modeled (acres): 41.222
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	168326	-	59.66	626.9	-
Outfall Total with Controls:	38094	77.37%	50.59	120.3	80.81%
Annualized Total After Outfall Controls:	38623			122.0	

Pollutant	Conc. No Controls	Conc. With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units	Percent Reduction
Particulate Solids	59.66	50.59	mg/L	626.9	120.3	lbs	80.81 %
Particulate Phosphorus	0.2380	0.1705	mg/L	2.501	0.4054	lbs	83.79 %
Filterable Phosphorus	0.3025	0.5699	mg/L	3.179	1.355	lbs	57.38 %
Total Phosphorus	0.5405	0.7404	mg/L	5.679	1.761	lbs	68.99 %

. Percent Solids Reduction due to Engineered Media Not Used

Data File: S:\Projects_2018\AEC 25 Projects\25083\Project Management-Civil\Design\WinSLAMM\25083.mdb								
Rain File: WisReg - Minneapolis MN 1959.RAN								
Date: 02-01-26 Time: 8:45:00 PM								
Site Description:								
Col. #:	2	3	4	5	6	7	8	9
Control Practice No.	Control Practice Type	Control Practice Name or Location	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction
1	Biofilter	DS Biofilters # 1 - 2P INF. BASIN	130278	0	100	190.3	0	100
2	Wet Detention Pond	DS Wet Pond # 1 - 3P SED. BASIN	47175	47222	-0.0996	488.9	172.7	64.68
3	Other Device	DS Other Device # 1	18317	18317	0	18.3	0	100

10	11	12	13	14	15	16	17	18
Flow Weighted Influe	Flow Weighted Effluen	Percent Conc. Reduction	Influent Median Part. Size	Effluent Median Part. Size (micro	Notes	Maximum Flushing Ratio	Maximum Peak Reductio	Maximum Stage (ft)
23.4	0	100	2.32	0	No Biofilter Overflows			0.94
166	58.57	64.719	7.69	2.37	No Pond Overflows	2.7	0.41	5.6
16	0	100	7.8	7.8				

19	20	21	22	23	24	25	26	27
Hydraulic Volume Ou	Minimum Volume (cf)	% Device Volume Full	Bypass Volume (cf)	Treated Volume (cf)	Number of Cartridges	Days Dry (days)	Percent of Clogging Facto	Maximum Surface Ponding Time (hrs)
0				0				51.7
47222	5338							