Attachment B – Revised Stormwater Data

2.4 Hydrology

Table 2.1

Existing Conditions Drainage Area Summary

Drainage Area Designation	Drainage Area Size (ac)	Composite Runoff Curve Number (RCN)	Time of Concentration (minutes)
Existing Drainage Area 1S	0.019	98	6.0
Existing Drainage Area 2S	1.00	58	13.9
Total	**1.02**	**48**	

Table 2.2

Proposed Conditions Drainage Area Summary

Drainage Area Designation	Drainage Area Size(acres)	Composite Runoff Curve Number (RCN)	Time of Concentration (minutes)
Proposed Drainage Area 1S	0.020	98	6.0
Proposed Drainage Area 2S	0.259	44	6.0
Proposed Drainage Area 3S	0.709	49	7.7
Proposed Drainage Area 4S	0.033	98	6.0
Total	**1.02**	**51**	

Table 2.3

Design Rainfall Depths

Storm Event	Rainfall Depth (inches)
2-Year	3.24
10-Year	4.89
25-Year	6.18
100-Year	8.83

Table 2.4

Existing Peak Discharge Rates – Design Point 1

	2-Year Storm Event (cfs)	10-Year Storm Event (cfs)	25-Year Storm Event (cfs)	100-Year Storm Event (cfs)
Design Point 1	0.06	0.26	0.71	2.08

Table 2.5

Proposed Peak Discharge Rates – Design Point 1

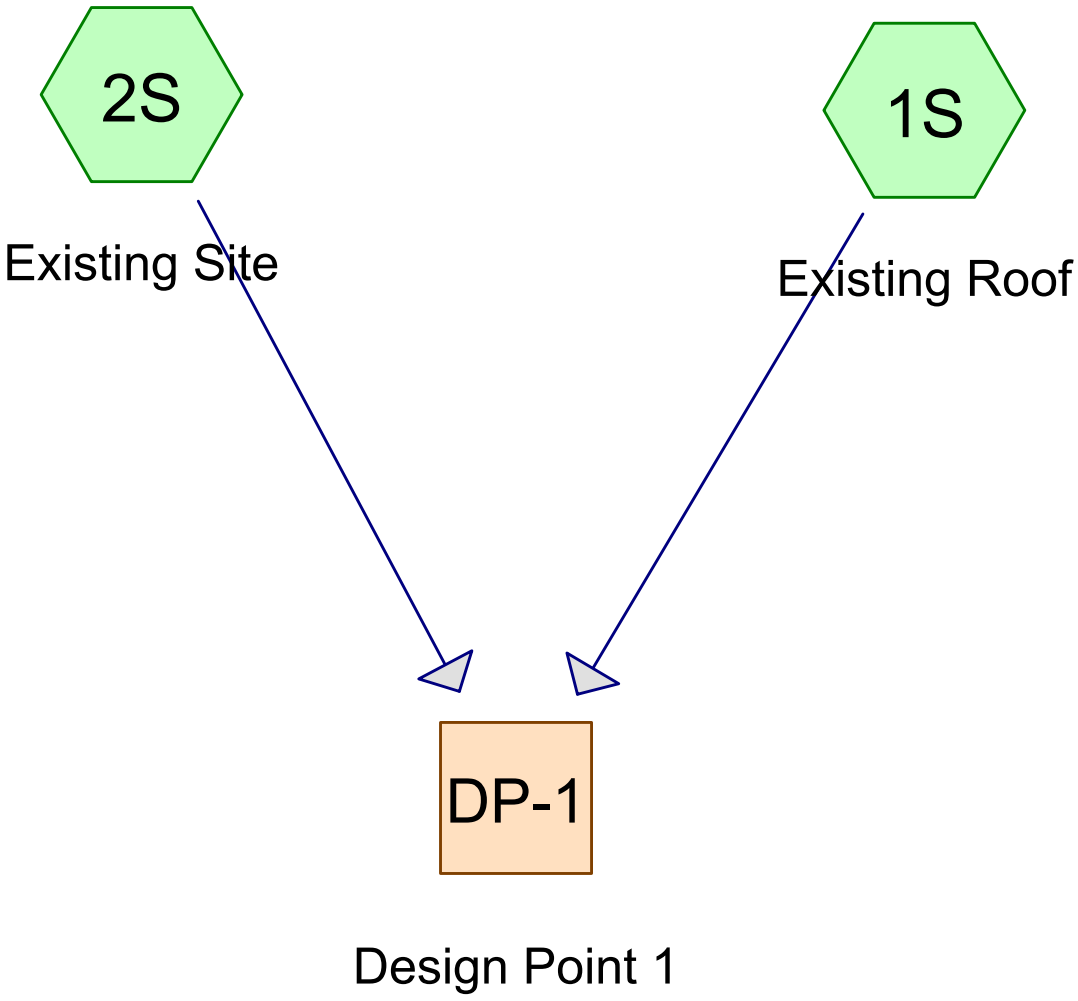
	2-Year Storm Event (cfs)	10-Year Storm Event (cfs)	25-Year Storm Event (cfs)	100-Year Storm Event (cfs)
Design Point 1	0.01	0.25	0.69	1.91
Percent Reduction	**83%**	**3.9%**	**2.8%**	**8.1%**

Table 2.6

Total Runoff Volume Comparison

		2-Year Storm Event (cf)	10-Year Storm Event (cf)	25-Year Storm Event (cf)	100-Year Storm Event (cf)
Design Point 1	Existing	400	1,838	3,609	8,481
	Proposed	232	1,330	2,646	6,206

J:\G\G0676 Grafton Worcester St. Well\Permitting\Stormwater\RevisedStormwaterNumbers.docx



Subcat Reach Pond Link

Routing Diagram for Existing Conditions
Prepared by Tighe & Bond, Printed 10/9/2019

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
30,907	39	>75% Grass cover, Good, HSG A (2S)
7,147	98	Paved parking, HSG A (2S)
809	98	Roofs, HSG A (1S)
5,623	30	Woods, Good, HSG A (2S)
44,486	**48**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
44,486	HSG A	1S, 2S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
44,486		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
30,907	0	0	0	0	30,907	>75% Grass cover, Good	
7,147	0	0	0	0	7,147	Paved parking	
809	0	0	0	0	809	Roofs	
5,623	0	0	0	0	5,623	Woods, Good	
44,486	**0**	**0**	**0**	**0**	**44,486**	**TOTAL AREA**	

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

Subcatchment1S: Existing Roof Runoff Area=809 sf 100.00% Impervious Runoff Depth>2.81"
Tc=6.0 min CN=98 Runoff=0.06 cfs 189 cf

Subcatchment2S: Existing Site Runoff Area=43,677 sf 16.36% Impervious Runoff Depth>0.06"
Flow Length=310' Tc=13.9 min CN=47 Runoff=0.01 cfs 211 cf

Reach DP-1: Design Point 1 Inflow=0.06 cfs 400 cf
Outflow=0.06 cfs 400 cf

Total Runoff Area = 44,486 sf Runoff Volume = 400 cf Average Runoff Depth = 0.11"
82.12% Pervious = 36,530 sf 17.88% Impervious = 7,956 sf

Summary for Subcatchment 1S: Existing Roof

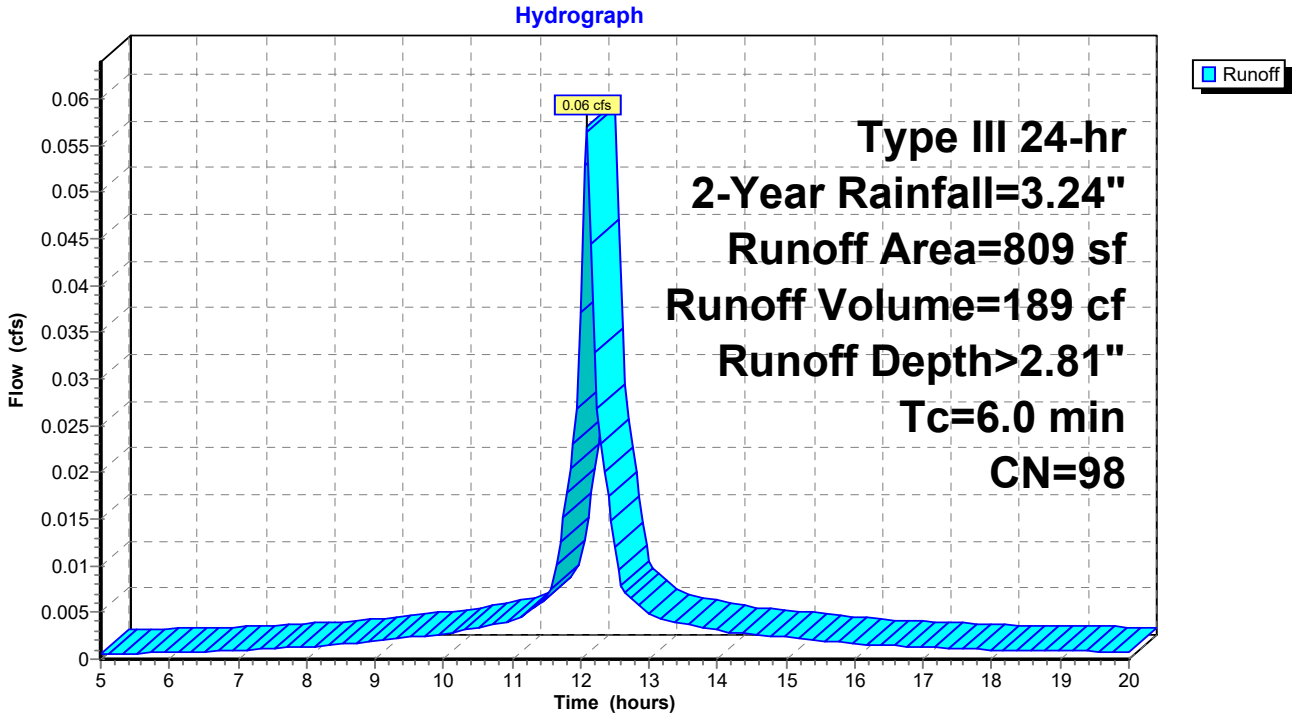
Runoff = 0.06 cfs @ 12.09 hrs, Volume= 189 cf, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.24"

Area (sf)	CN	Description
809	98	Roofs, HSG A
809		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 minutes**

Subcatchment 1S: Existing Roof



Summary for Subcatchment 2S: Existing Site

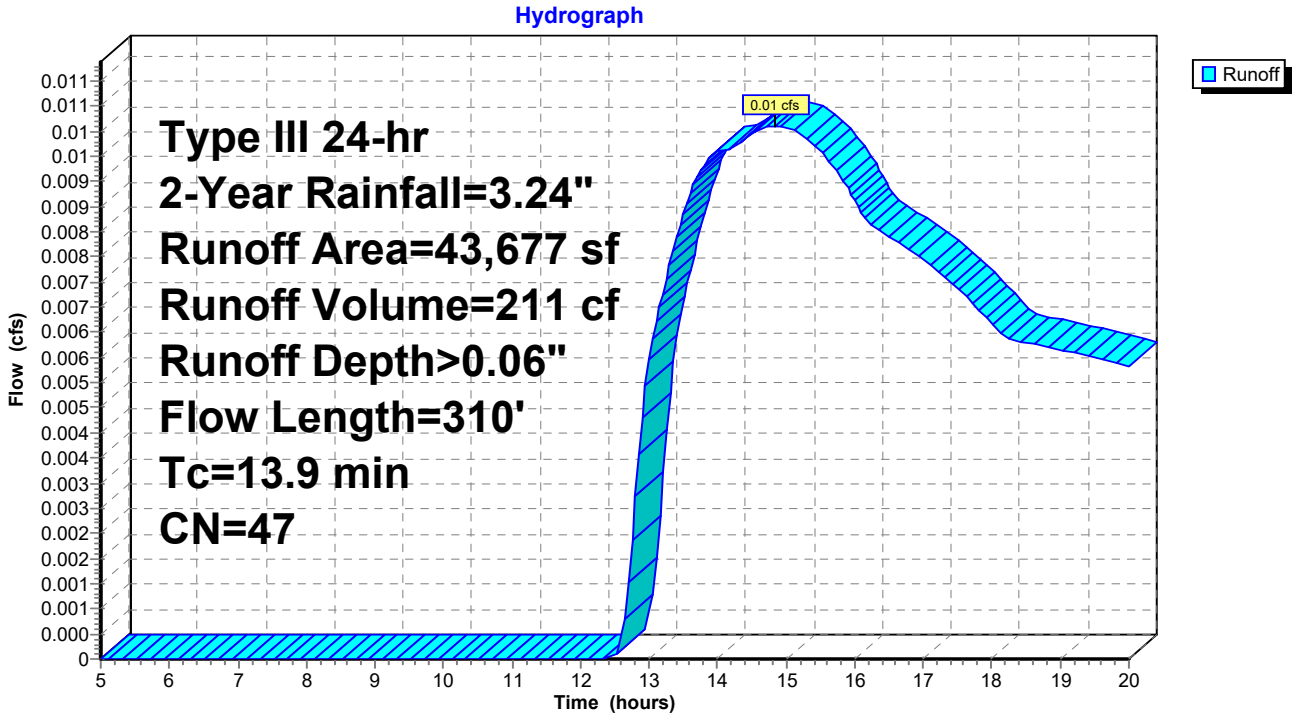
Runoff = 0.01 cfs @ 14.83 hrs, Volume= 211 cf, Depth> 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.24"

	Area (sf)	CN	Description
	5,623	30	Woods, Good, HSG A
	30,907	39	>75% Grass cover, Good, HSG A
*	7,147	98	Paved parking, HSG A
	43,677	47	Weighted Average
	36,530		83.64% Pervious Area
	7,147		16.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow, First 50'** Woods: Light underbrush n= 0.400 P2= 3.22"
0.5	70	0.0200	2.28		**Shallow Concentrated Flow, Next 70'** Unpaved Kv= 16.1 fps
0.9	150	0.0200	2.87		**Shallow Concentrated Flow, Next 150'** Paved Kv= 20.3 fps
0.2	40	0.0500	3.60		**Shallow Concentrated Flow, Last 40'** Unpaved Kv= 16.1 fps
13.9	310	Total			

Subcatchment 2S: Existing Site



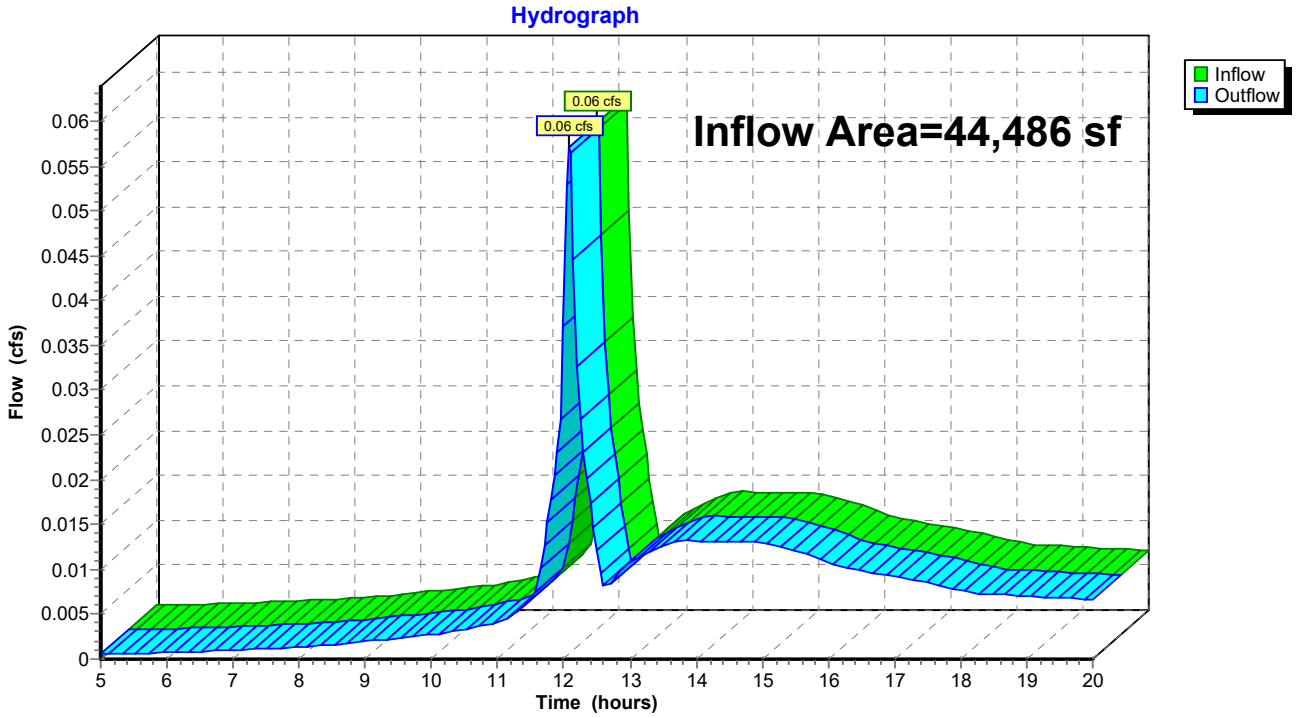
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 17.88% Impervious, Inflow Depth > 0.11" for 2-Year event
Inflow = 0.06 cfs @ 12.09 hrs, Volume= 400 cf
Outflow = 0.06 cfs @ 12.09 hrs, Volume= 400 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



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

Subcatchment1S: Existing Roof Runoff Area=809 sf 100.00% Impervious Runoff Depth>4.32"
Tc=6.0 min CN=98 Runoff=0.09 cfs 291 cf

Subcatchment2S: Existing Site Runoff Area=43,677 sf 16.36% Impervious Runoff Depth>0.43"
Flow Length=310' Tc=13.9 min CN=47 Runoff=0.23 cfs 1,547 cf

Reach DP-1: Design Point 1 Inflow=0.26 cfs 1,838 cf
Outflow=0.26 cfs 1,838 cf

Total Runoff Area = 44,486 sf Runoff Volume = 1,838 cf Average Runoff Depth = 0.50"
82.12% Pervious = 36,530 sf 17.88% Impervious = 7,956 sf

Summary for Subcatchment 1S: Existing Roof

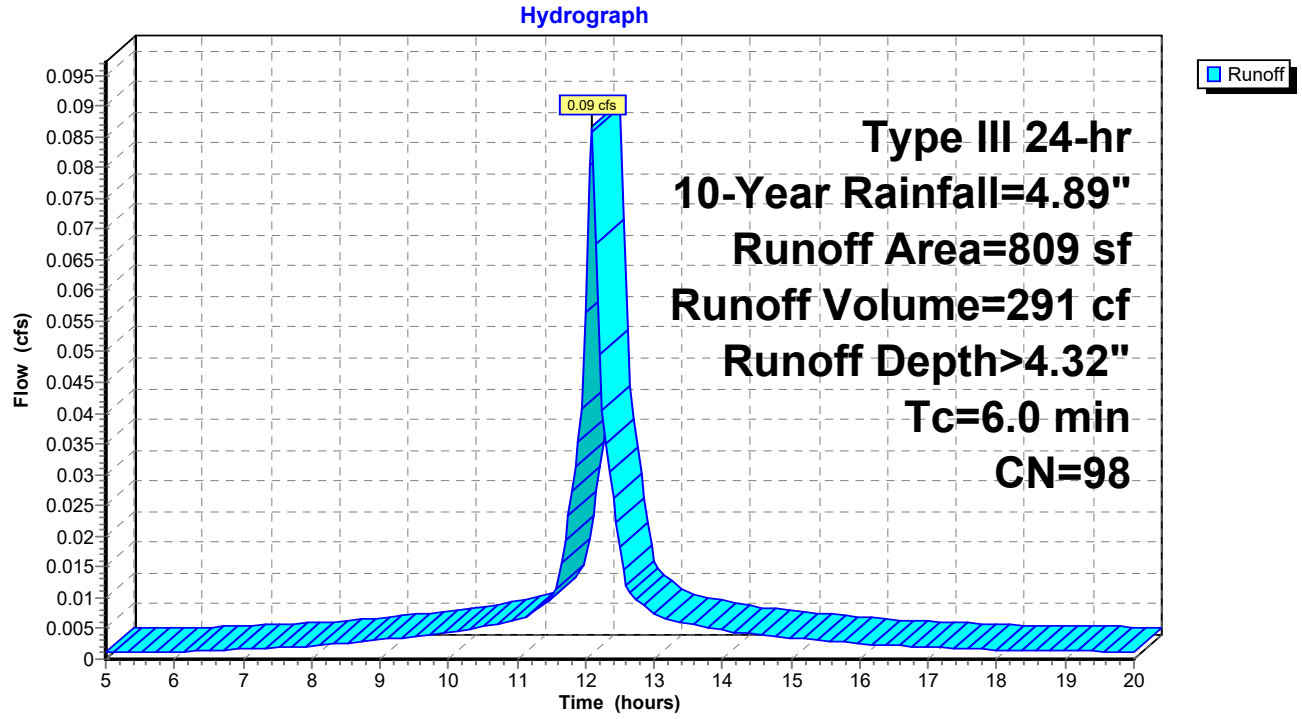
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 291 cf, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
809	98	Roofs, HSG A
809		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 minutes**

Subcatchment 1S: Existing Roof



Summary for Subcatchment 2S: Existing Site

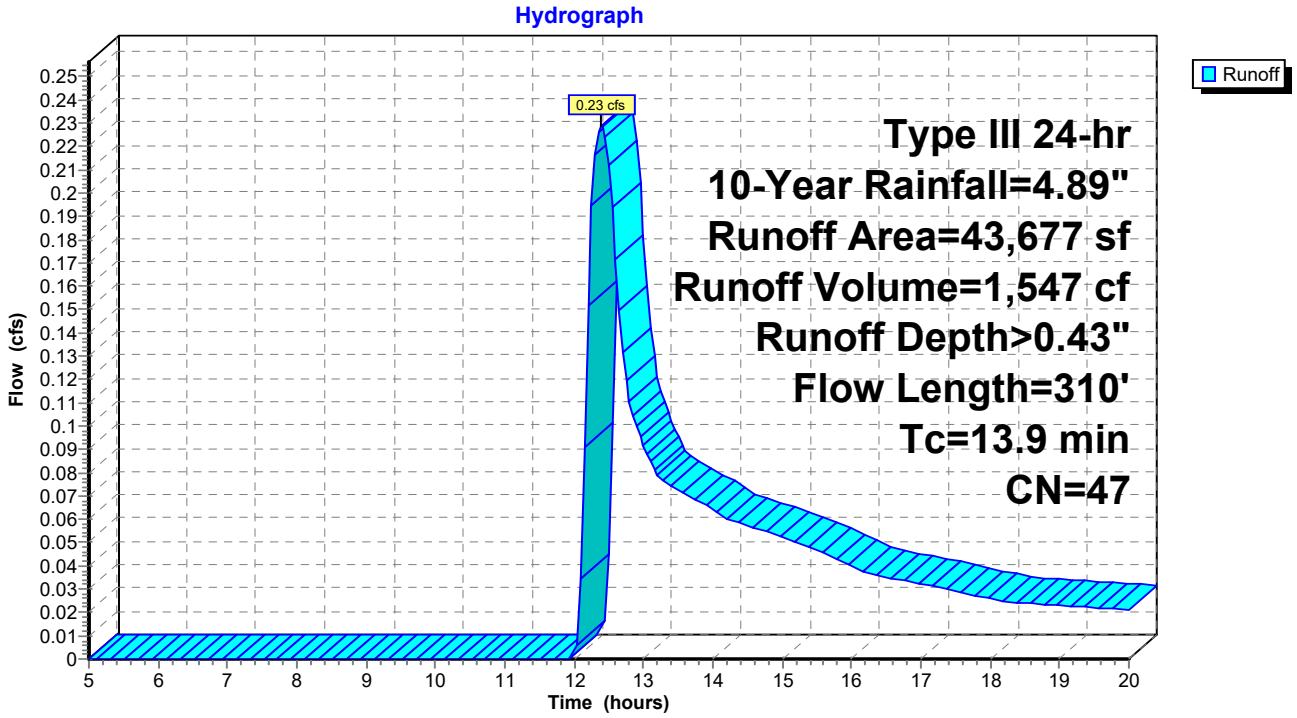
Runoff = 0.23 cfs @ 12.39 hrs, Volume= 1,547 cf, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

	Area (sf)	CN	Description
	5,623	30	Woods, Good, HSG A
	30,907	39	>75% Grass cover, Good, HSG A
*	7,147	98	Paved parking, HSG A
	43,677	47	Weighted Average
	36,530		83.64% Pervious Area
	7,147		16.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow, First 50'** Woods: Light underbrush n= 0.400 P2= 3.22"
0.5	70	0.0200	2.28		**Shallow Concentrated Flow, Next 70'** Unpaved Kv= 16.1 fps
0.9	150	0.0200	2.87		**Shallow Concentrated Flow, Next 150'** Paved Kv= 20.3 fps
0.2	40	0.0500	3.60		**Shallow Concentrated Flow, Last 40'** Unpaved Kv= 16.1 fps
13.9	310	Total			

Subcatchment 2S: Existing Site



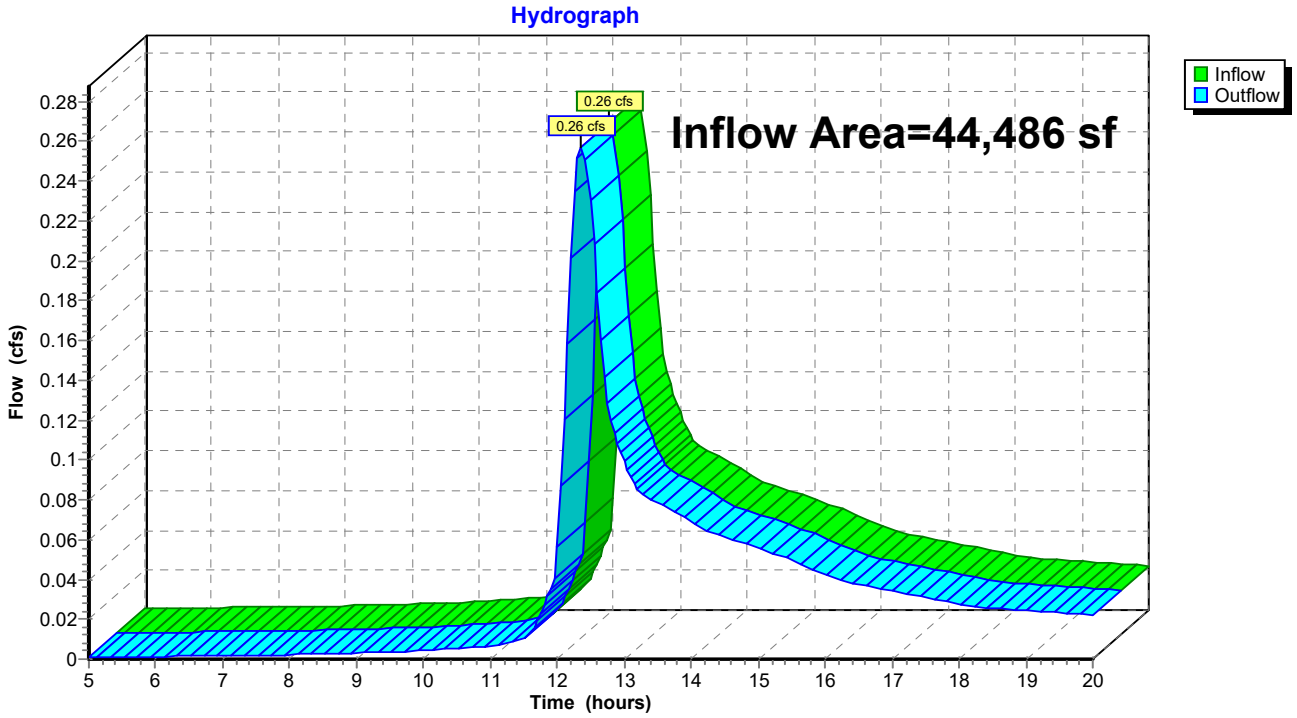
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 17.88% Impervious, Inflow Depth > 0.50" for 10-Year event
Inflow = 0.26 cfs @ 12.36 hrs, Volume= 1,838 cf
Outflow = 0.26 cfs @ 12.36 hrs, Volume= 1,838 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



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

Subcatchment1S: Existing Roof Runoff Area=809 sf 100.00% Impervious Runoff Depth>5.49"
Tc=6.0 min CN=98 Runoff=0.11 cfs 370 cf

Subcatchment2S: Existing Site Runoff Area=43,677 sf 16.36% Impervious Runoff Depth>0.89"
Flow Length=310' Tc=13.9 min CN=47 Runoff=0.65 cfs 3,238 cf

Reach DP-1: Design Point 1 Inflow=0.71 cfs 3,609 cf
Outflow=0.71 cfs 3,609 cf

Total Runoff Area = 44,486 sf Runoff Volume = 3,609 cf Average Runoff Depth = 0.97"
82.12% Pervious = 36,530 sf 17.88% Impervious = 7,956 sf

Summary for Subcatchment 1S: Existing Roof

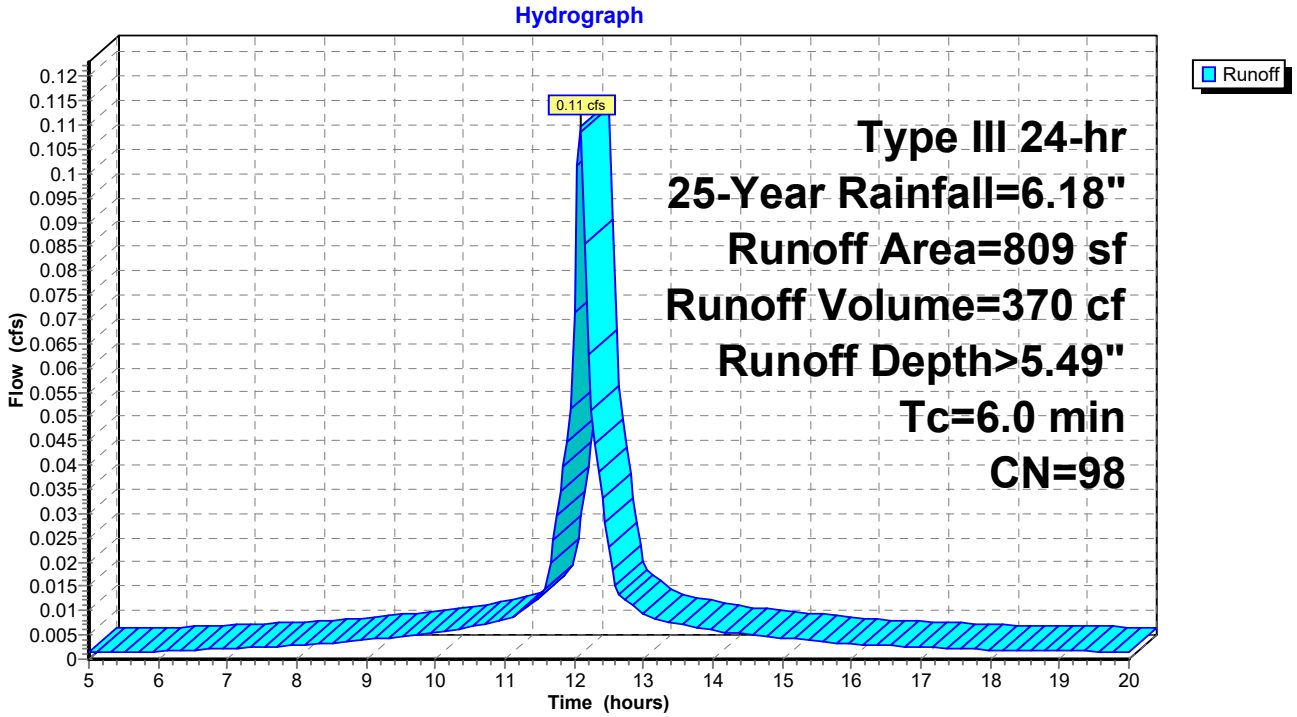
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 370 cf, Depth> 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.18"

Area (sf)	CN	Description
809	98	Roofs, HSG A
809		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 minutes**

Subcatchment 1S: Existing Roof



Summary for Subcatchment 2S: Existing Site

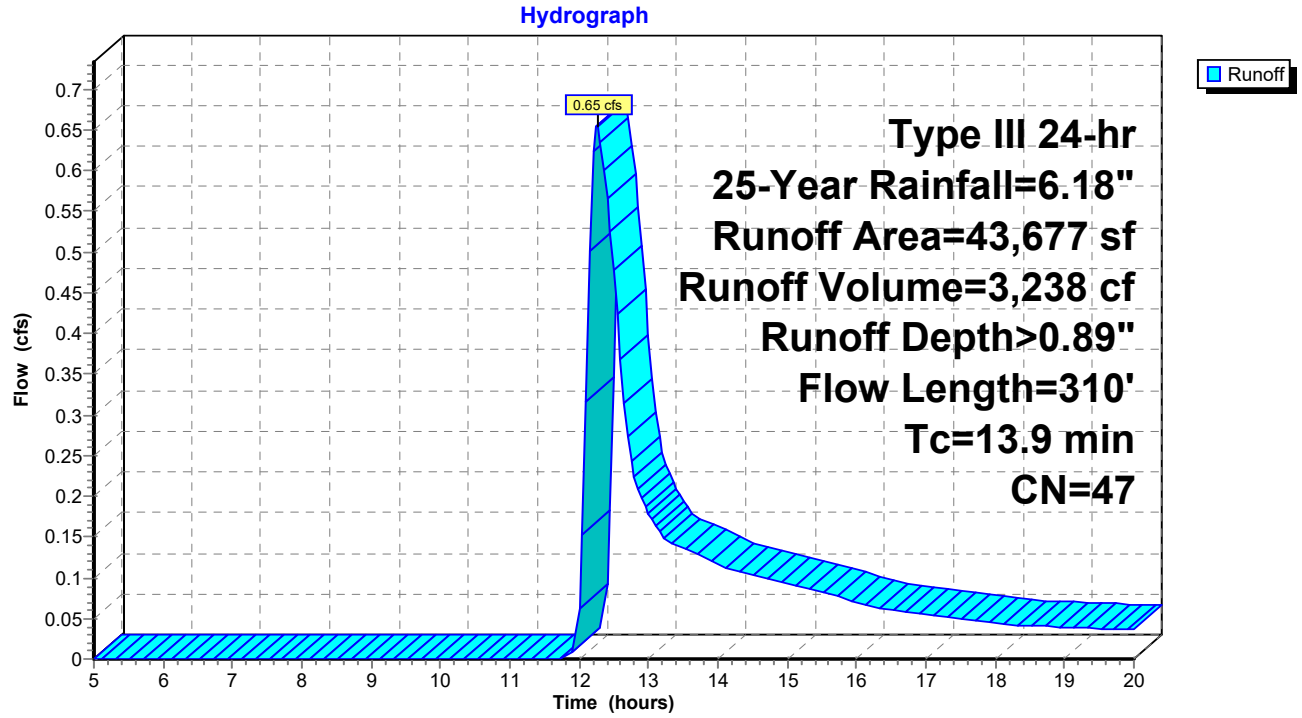
Runoff = 0.65 cfs @ 12.26 hrs, Volume= 3,238 cf, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.18"

	Area (sf)	CN	Description
	5,623	30	Woods, Good, HSG A
	30,907	39	>75% Grass cover, Good, HSG A
*	7,147	98	Paved parking, HSG A
	43,677	47	Weighted Average
	36,530		83.64% Pervious Area
	7,147		16.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow, First 50'** Woods: Light underbrush n= 0.400 P2= 3.22"
0.5	70	0.0200	2.28		**Shallow Concentrated Flow, Next 70'** Unpaved Kv= 16.1 fps
0.9	150	0.0200	2.87		**Shallow Concentrated Flow, Next 150'** Paved Kv= 20.3 fps
0.2	40	0.0500	3.60		**Shallow Concentrated Flow, Last 40'** Unpaved Kv= 16.1 fps
13.9	310	Total			

Subcatchment 2S: Existing Site



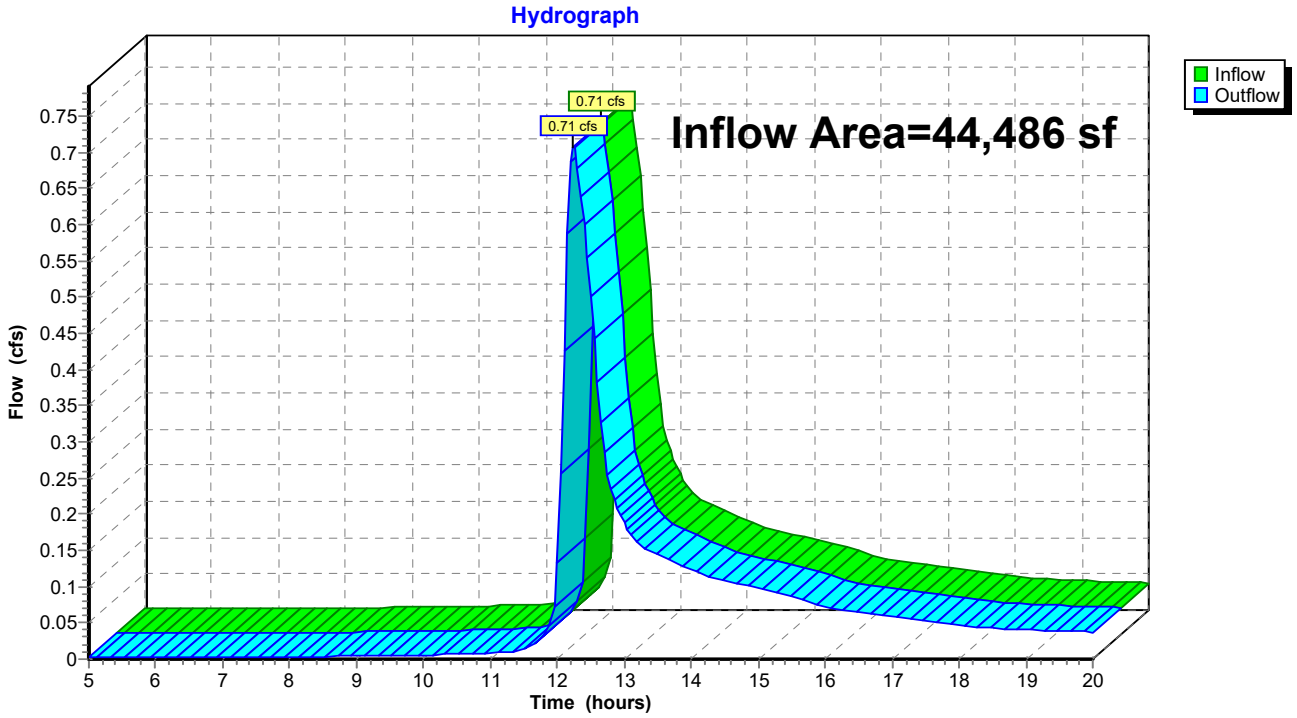
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 17.88% Impervious, Inflow Depth > 0.97" for 25-Year event
Inflow = 0.71 cfs @ 12.25 hrs, Volume= 3,609 cf
Outflow = 0.71 cfs @ 12.25 hrs, Volume= 3,609 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



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

Subcatchment1S: Existing Roof Runoff Area=809 sf 100.00% Impervious Runoff Depth>7.90"
Tc=6.0 min CN=98 Runoff=0.16 cfs 532 cf

Subcatchment2S: Existing Site Runoff Area=43,677 sf 16.36% Impervious Runoff Depth>2.18"
Flow Length=310' Tc=13.9 min CN=47 Runoff=1.99 cfs 7,948 cf

Reach DP-1: Design Point 1 Inflow=2.08 cfs 8,481 cf
Outflow=2.08 cfs 8,481 cf

Total Runoff Area = 44,486 sf Runoff Volume = 8,481 cf Average Runoff Depth = 2.29"
82.12% Pervious = 36,530 sf 17.88% Impervious = 7,956 sf

Summary for Subcatchment 1S: Existing Roof

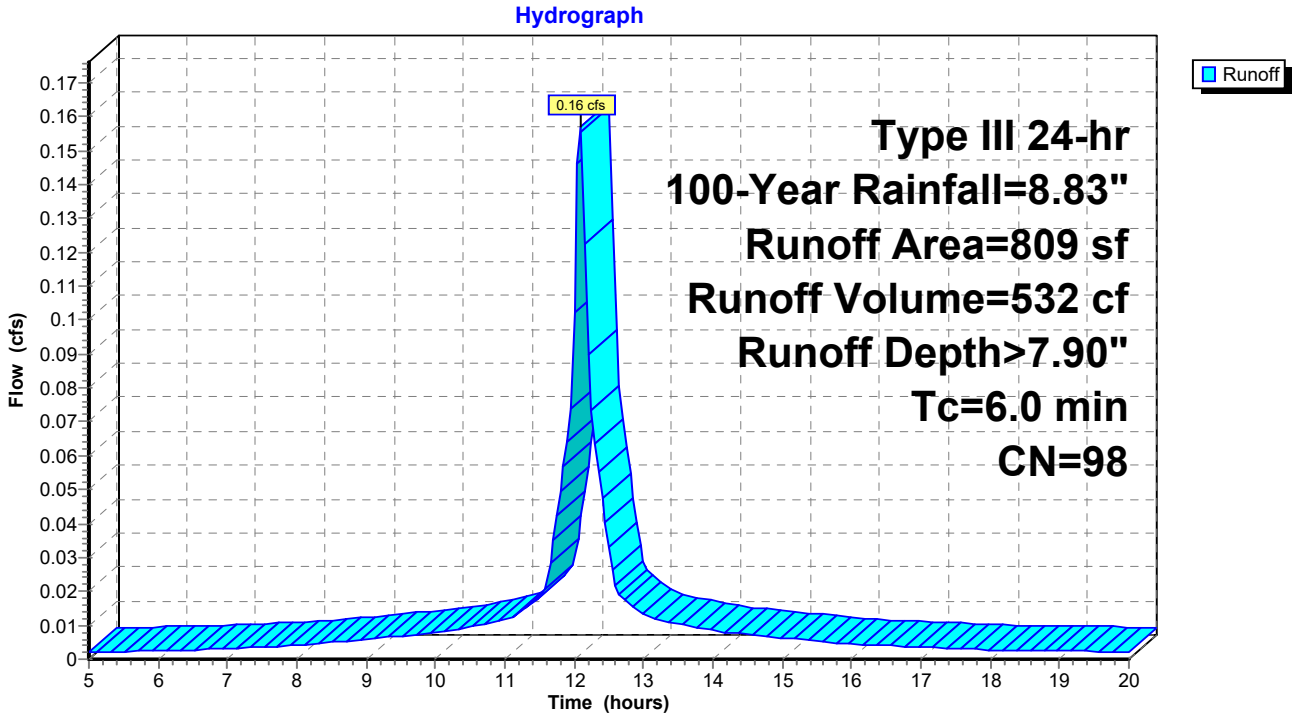
Runoff = 0.16 cfs @ 12.09 hrs, Volume= 532 cf, Depth> 7.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
809	98	Roofs, HSG A
809		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 minutes**

Subcatchment 1S: Existing Roof



Summary for Subcatchment 2S: Existing Site

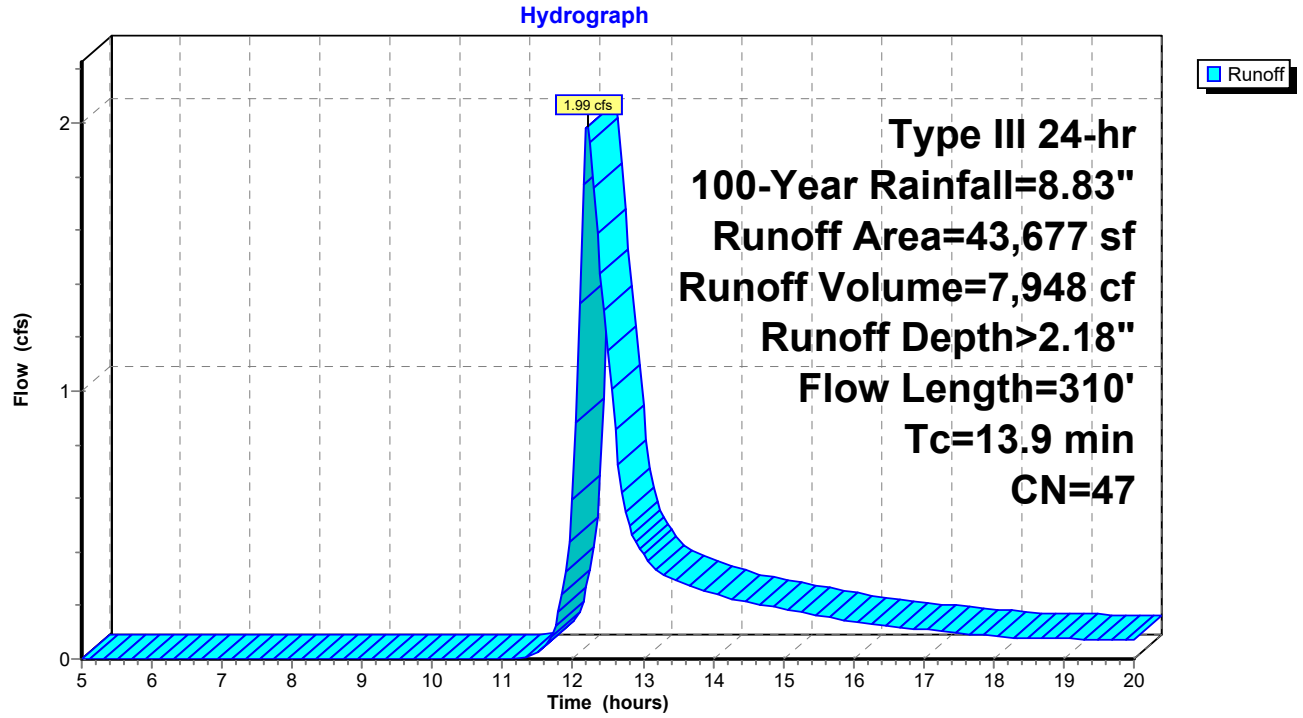
Runoff = 1.99 cfs @ 12.21 hrs, Volume= 7,948 cf, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.83"

	Area (sf)	CN	Description
	5,623	30	Woods, Good, HSG A
	30,907	39	>75% Grass cover, Good, HSG A
*	7,147	98	Paved parking, HSG A
	43,677	47	Weighted Average
	36,530		83.64% Pervious Area
	7,147		16.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow, First 50'** Woods: Light underbrush n= 0.400 P2= 3.22"
0.5	70	0.0200	2.28		**Shallow Concentrated Flow, Next 70'** Unpaved Kv= 16.1 fps
0.9	150	0.0200	2.87		**Shallow Concentrated Flow, Next 150'** Paved Kv= 20.3 fps
0.2	40	0.0500	3.60		**Shallow Concentrated Flow, Last 40'** Unpaved Kv= 16.1 fps
13.9	310	Total			

Subcatchment 2S: Existing Site



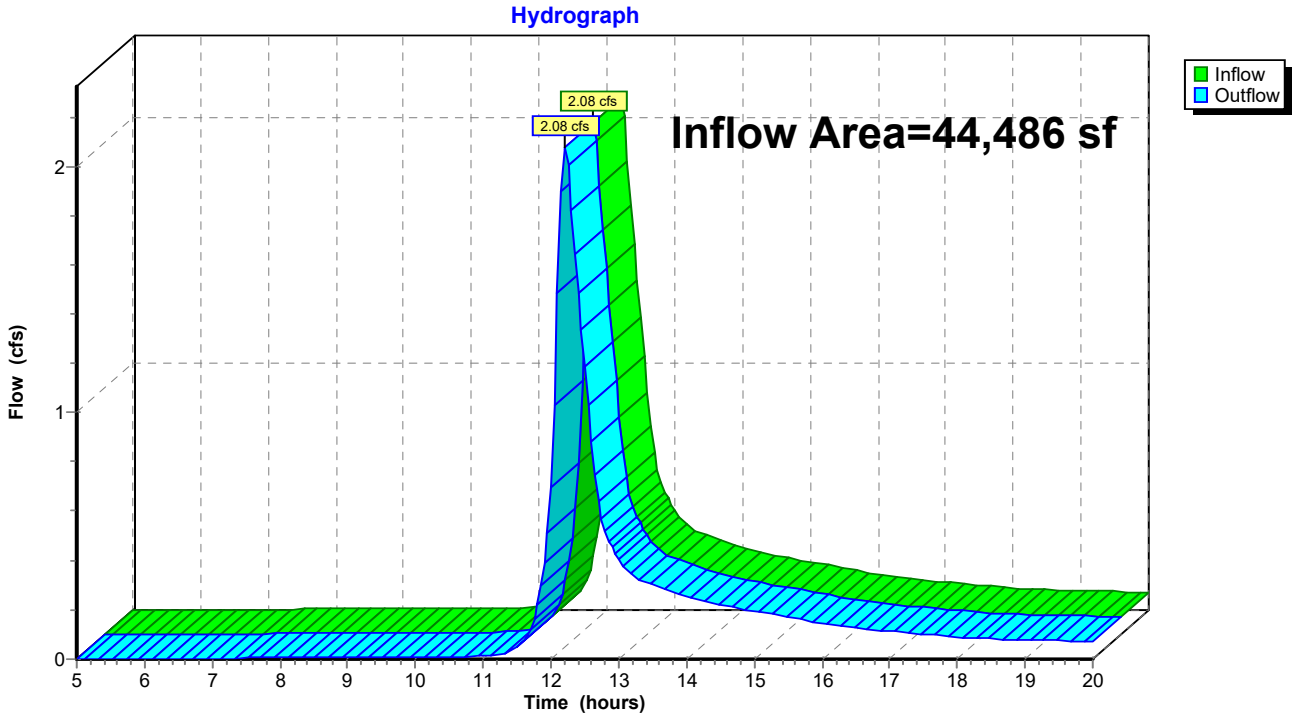
Summary for Reach DP-1: Design Point 1

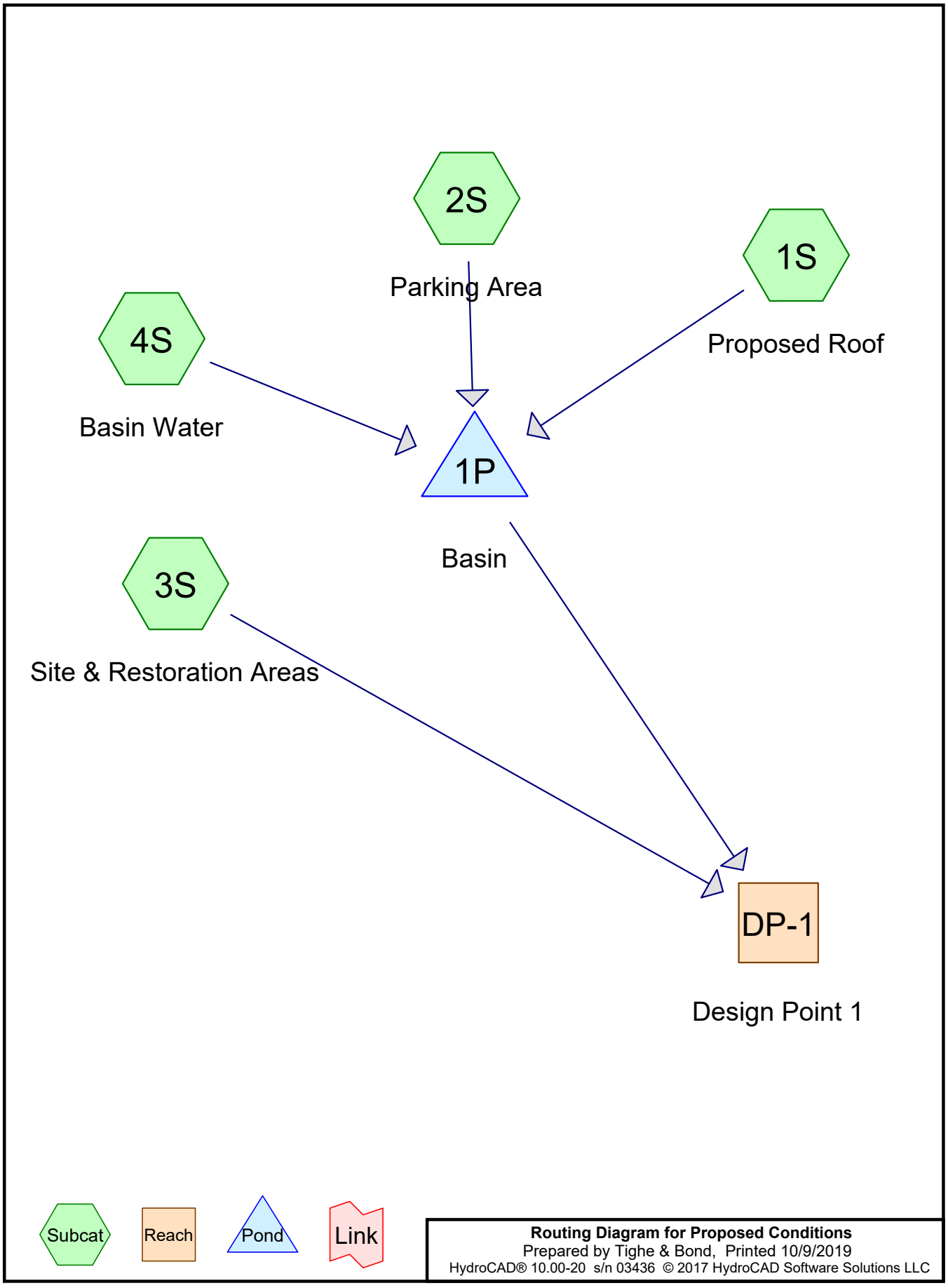
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 44,486 sf, 17.88% Impervious, Inflow Depth > 2.29" for 100-Year event
Inflow = 2.08 cfs @ 12.21 hrs, Volume= 8,481 cf
Outflow = 2.08 cfs @ 12.21 hrs, Volume= 8,481 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1





Routing Diagram for Proposed Conditions
Prepared by Tighe & Bond, Printed 10/9/2019

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
20,519	39	>75% Grass cover, Good, HSG A (2S, 3S)
2,670	96	Gravel surface, HSG A (3S)
13,060	30	Meadow, non-grazed, HSG A (3S)
3,382	98	Paved driveway, HSG A (3S)
2,546	98	Paved parking, HSG A (2S, 3S)
871	98	Roofs, HSG A (1S)
1,438	98	Water Surface, HSG A (4S)
44,486	**51**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
44,486	HSG A	1S, 2S, 3S, 4S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
44,486		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
20,519	0	0	0	0	20,519	>75% Grass cover, Good	
2,670	0	0	0	0	2,670	Gravel surface	
13,060	0	0	0	0	13,060	Meadow, non-grazed	
3,382	0	0	0	0	3,382	Paved driveway	
2,546	0	0	0	0	2,546	Paved parking	
871	0	0	0	0	871	Roofs	
1,438	0	0	0	0	1,438	Water Surface	
44,486	**0**	**0**	**0**	**0**	**44,486**	**TOTAL AREA**	

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

Subcatchment1S: Proposed Roof Runoff Area=871 sf 100.00% Impervious Runoff Depth>2.81"
Tc=6.0 min CN=98 Runoff=0.06 cfs 204 cf

Subcatchment2S: Parking Area Runoff Area=11,288 sf 9.09% Impervious Runoff Depth>0.02"
Tc=6.0 min CN=44 Runoff=0.00 cfs 22 cf

Subcatchment3S: Site & Restoration Runoff Area=30,889 sf 15.87% Impervious Runoff Depth>0.09"
Flow Length=251' Tc=7.7 min CN=49 Runoff=0.01 cfs 232 cf

Subcatchment4S: Basin Water Runoff Area=1,438 sf 100.00% Impervious Runoff Depth>2.81"
Tc=6.0 min CN=98 Runoff=0.10 cfs 337 cf

Reach DP-1: Design Point 1 Inflow=0.01 cfs 232 cf
Outflow=0.01 cfs 232 cf

Pond 1P: Basin Peak Elev=309.09' Storage=92 cf Inflow=0.16 cfs 562 cf
Discarded=0.06 cfs 561 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 561 cf

Total Runoff Area = 44,486 sf Runoff Volume = 795 cf Average Runoff Depth = 0.21"
81.48% Pervious = 36,249 sf 18.52% Impervious = 8,237 sf

Summary for Subcatchment 1S: Proposed Roof

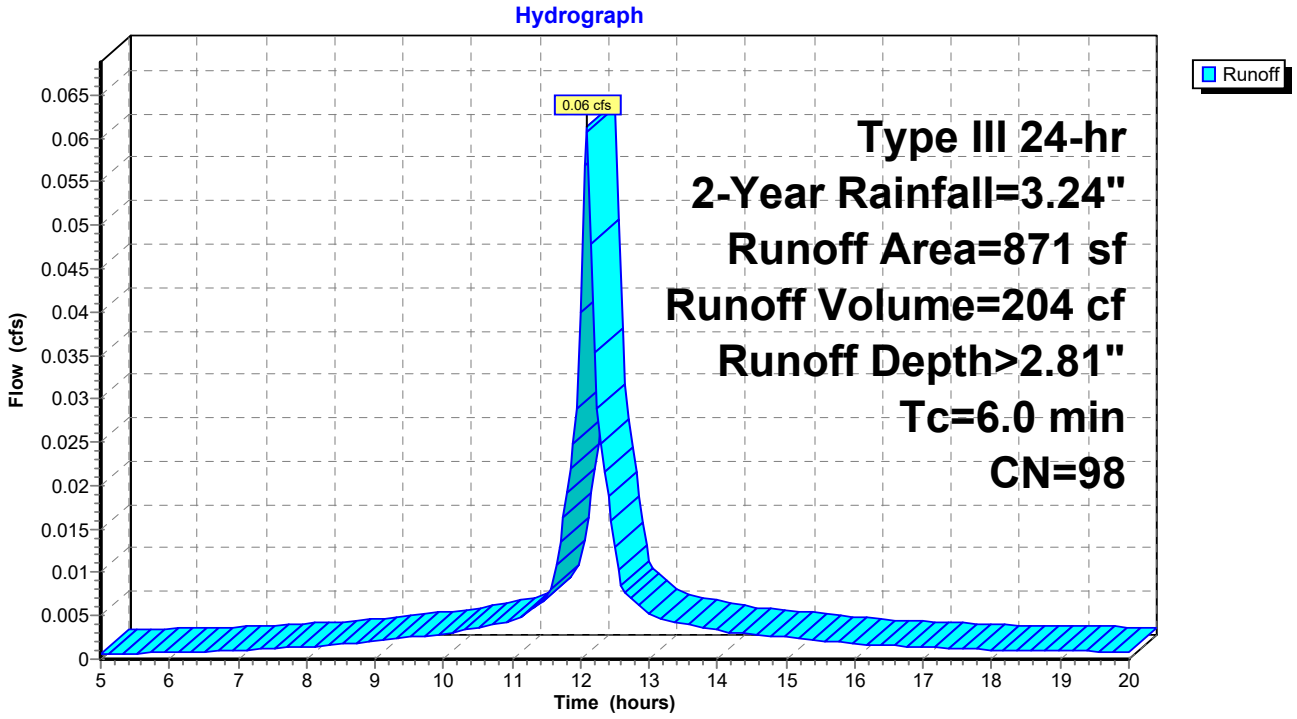
Runoff = 0.06 cfs @ 12.09 hrs, Volume= 204 cf, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.24"

Area (sf)	CN	Description
871	98	Roofs, HSG A
871		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 1S: Proposed Roof



Summary for Subcatchment 2S: Parking Area

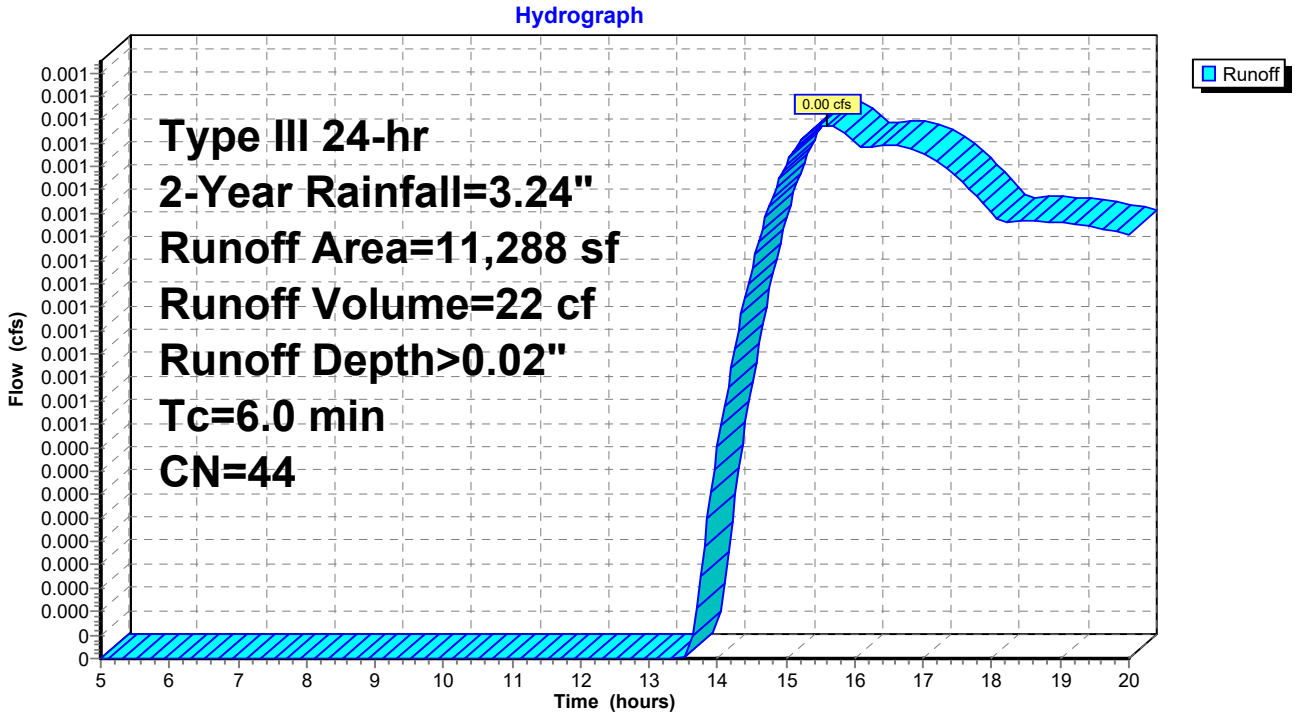
Runoff = 0.00 cfs @ 15.58 hrs, Volume= 22 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.24"

Area (sf)	CN	Description
1,026	98	Paved parking, HSG A
10,262	39	>75% Grass cover, Good, HSG A
11,288	44	Weighted Average
10,262		90.91% Pervious Area
1,026		9.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 2S: Parking Area



Summary for Subcatchment 3S: Site & Restoration Areas

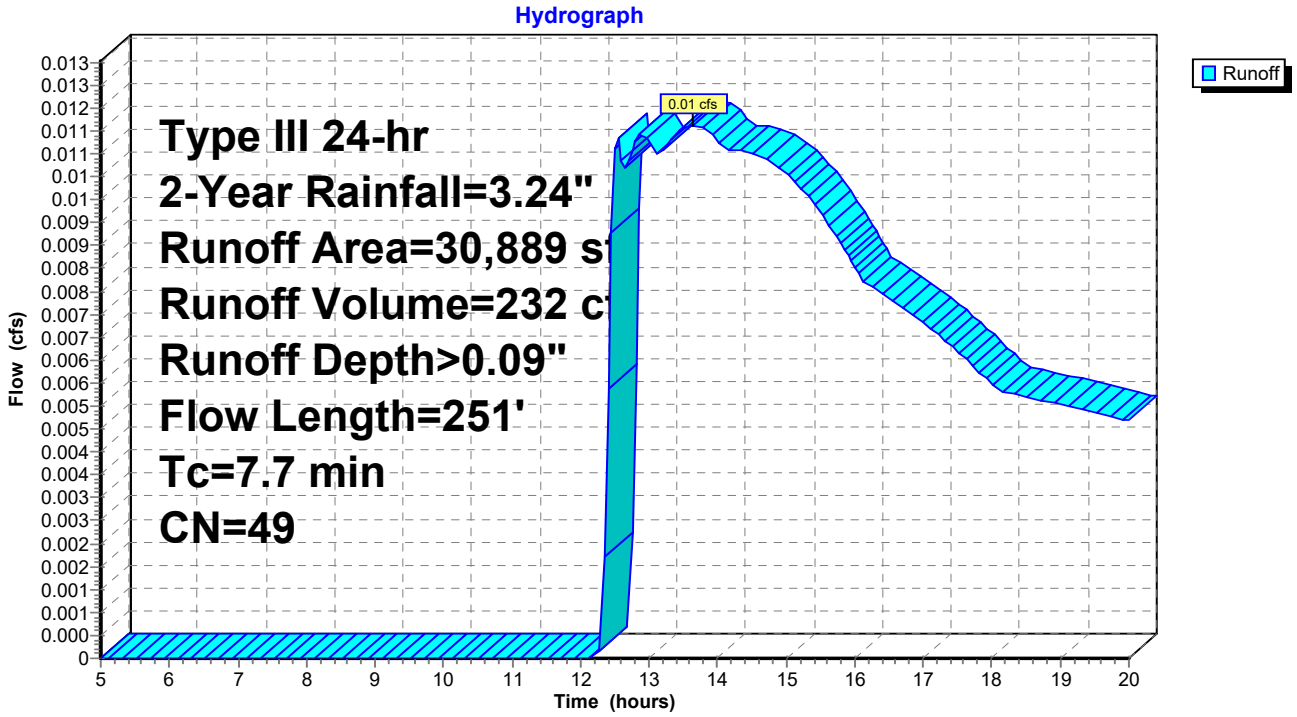
Runoff = 0.01 cfs @ 13.64 hrs, Volume= 232 cf, Depth> 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.24"

	Area (sf)	CN	Description
	10,257	39	>75% Grass cover, Good, HSG A
	1,520	98	Paved parking, HSG A
*	3,382	98	Paved driveway, HSG A
	13,060	30	Meadow, non-grazed, HSG A
	2,670	96	Gravel surface, HSG A
	30,889	49	Weighted Average
	25,987		84.13% Pervious Area
	4,902		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, First 50'** Grass: Short n= 0.150 P2= 3.22"
0.3	45	0.0200	2.28		**Shallow Concentrated Flow, Next 45'** Unpaved Kv= 16.1 fps
1.3	113	0.0050	1.44		**Shallow Concentrated Flow, Next 113'** Paved Kv= 20.3 fps
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Last 43'** Short Grass Pasture Kv= 7.0 fps
7.7	251	Total			

Subcatchment 3S: Site & Restoration Areas



Summary for Subcatchment 4S: Basin Water

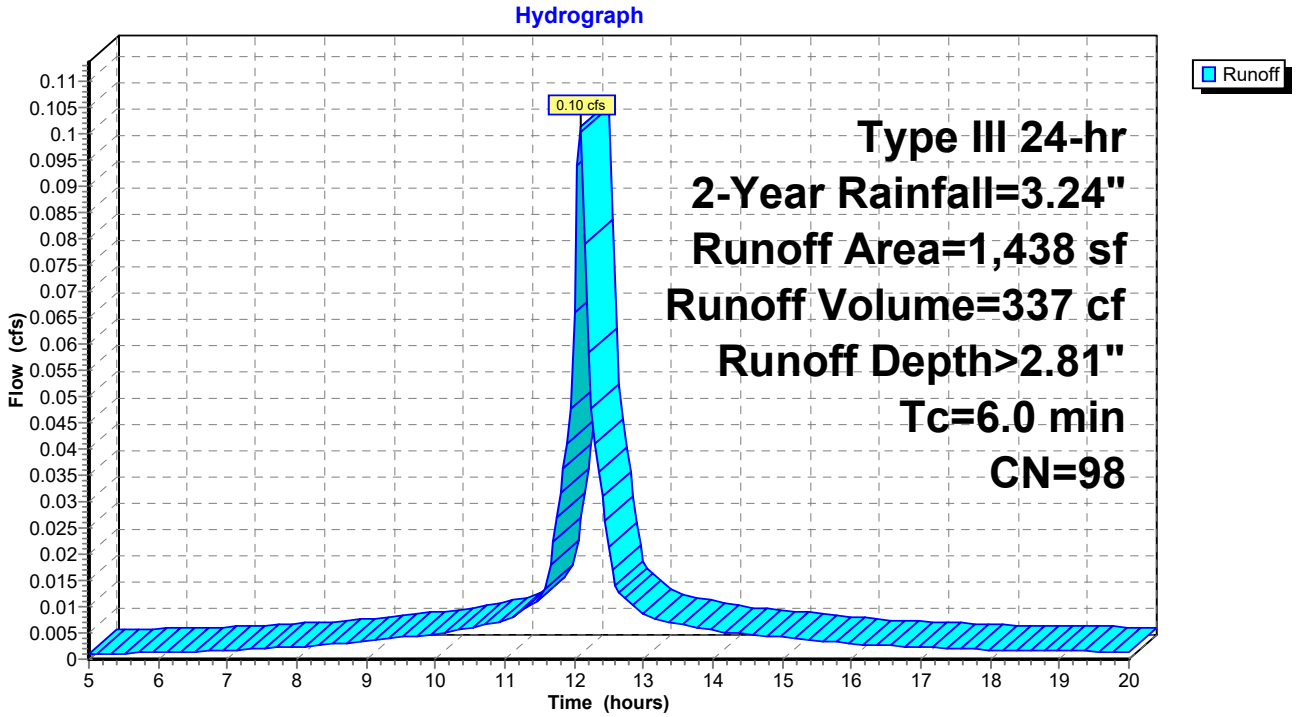
Runoff = 0.10 cfs @ 12.09 hrs, Volume= 337 cf, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.24"

Area (sf)	CN	Description
1,438	98	Water Surface, HSG A
1,438		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 4S: Basin Water



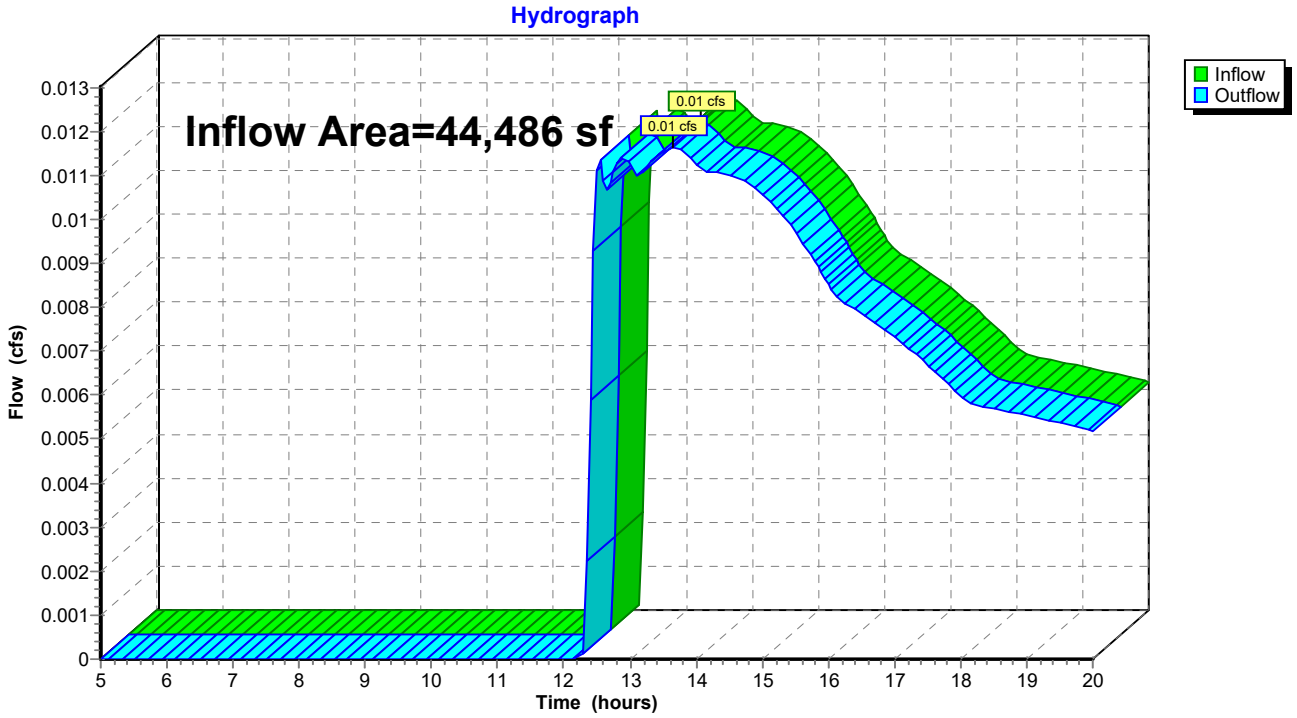
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 18.52% Impervious, Inflow Depth > 0.06" for 2-Year event
Inflow = 0.01 cfs @ 13.64 hrs, Volume= 232 cf
Outflow = 0.01 cfs @ 13.64 hrs, Volume= 232 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



Summary for Pond 1P: Basin

[82] Warning: Early inflow requires earlier time span

Inflow Area = 13,597 sf, 24.53% Impervious, Inflow Depth > 0.50" for 2-Year event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 562 cf
Outflow = 0.06 cfs @ 12.35 hrs, Volume= 561 cf, Atten= 64%, Lag= 15.6 min
Discarded = 0.06 cfs @ 12.35 hrs, Volume= 561 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 309.09' @ 12.35 hrs Surf.Area= 1,039 sf Storage= 92 cf

Plug-Flow detention time= 10.9 min calculated for 559 cf (99% of inflow)
Center-of-Mass det. time= 9.8 min (759.0 - 749.2)

Volume	Invert	Avail.Storage	Storage Description
#1	309.00'	3,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

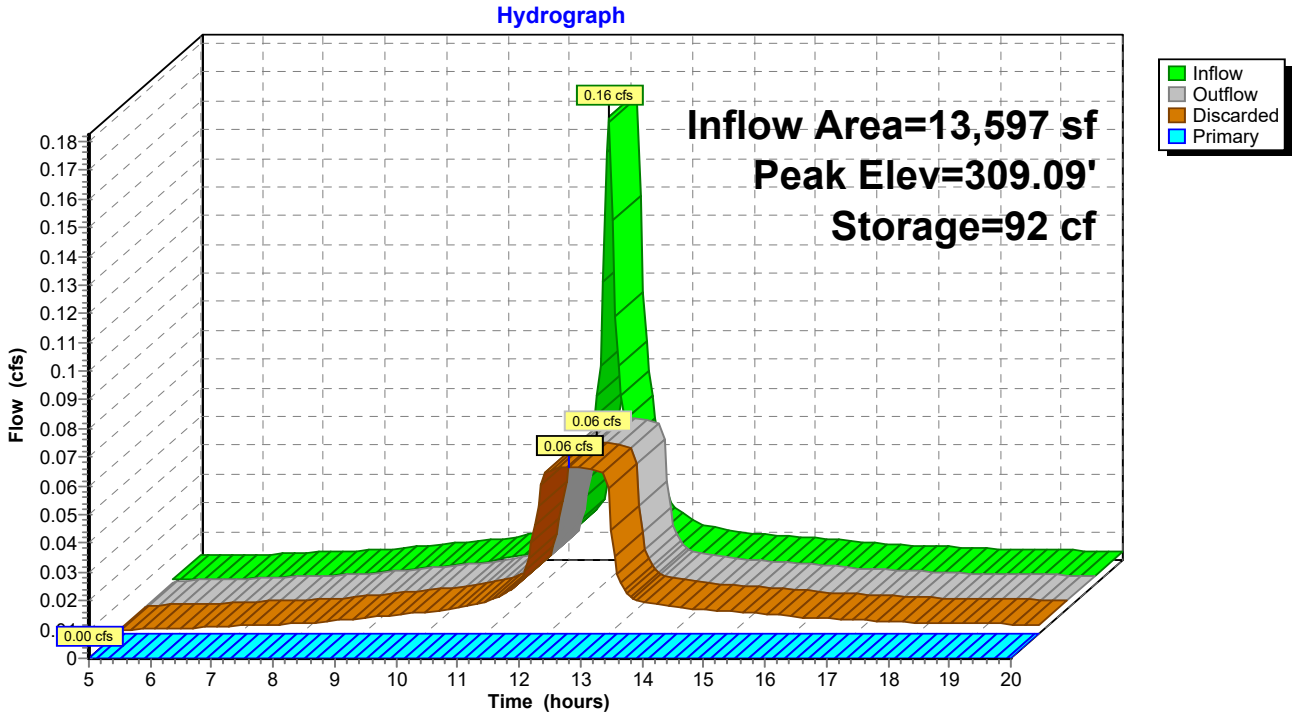
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
309.00	995	190.0	0	0	995
310.00	1,540	229.0	1,258	1,258	2,312
311.00	2,106	166.0	1,816	3,073	4,302

Device	Routing	Invert	Outlet Devices
#1	Discarded	309.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 100.00'
#2	Primary	310.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.06 cfs @ 12.35 hrs HW=309.09' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=309.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Basin



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

Subcatchment1S: Proposed Roof Runoff Area=871 sf 100.00% Impervious Runoff Depth>4.32"
Tc=6.0 min CN=98 Runoff=0.09 cfs 313 cf

Subcatchment2S: Parking Area Runoff Area=11,288 sf 9.09% Impervious Runoff Depth>0.31"
Tc=6.0 min CN=44 Runoff=0.04 cfs 287 cf

Subcatchment3S: Site & Restoration Runoff Area=30,889 sf 15.87% Impervious Runoff Depth>0.52"
Flow Length=251' Tc=7.7 min CN=49 Runoff=0.25 cfs 1,330 cf

Subcatchment4S: Basin Water Runoff Area=1,438 sf 100.00% Impervious Runoff Depth>4.32"
Tc=6.0 min CN=98 Runoff=0.15 cfs 517 cf

Reach DP-1: Design Point 1 Inflow=0.25 cfs 1,330 cf
Outflow=0.25 cfs 1,330 cf

Pond 1P: Basin Peak Elev=309.23' Storage=241 cf Inflow=0.25 cfs 1,118 cf
Discarded=0.06 cfs 1,115 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 1,115 cf

Total Runoff Area = 44,486 sf Runoff Volume = 2,449 cf Average Runoff Depth = 0.66"
81.48% Pervious = 36,249 sf 18.52% Impervious = 8,237 sf

Summary for Subcatchment 1S: Proposed Roof

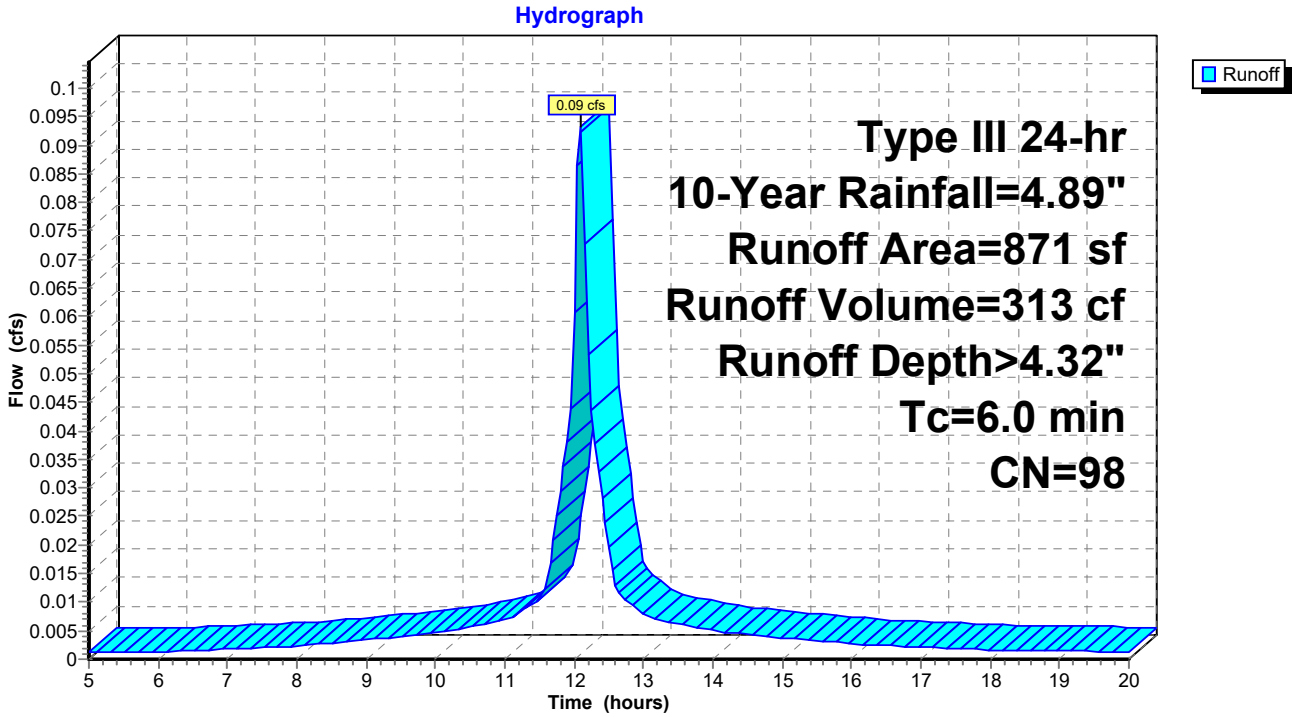
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 313 cf, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
871	98	Roofs, HSG A
871		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 1S: Proposed Roof



Summary for Subcatchment 2S: Parking Area

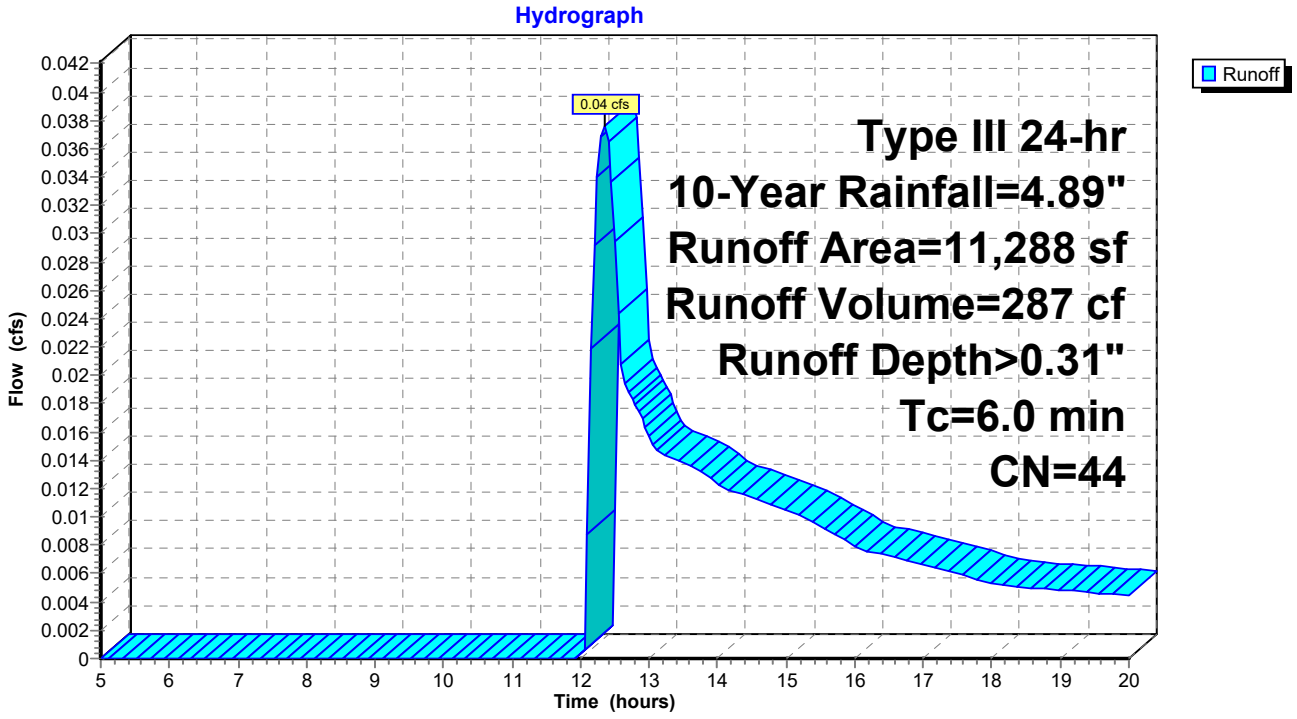
Runoff = 0.04 cfs @ 12.34 hrs, Volume= 287 cf, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
1,026	98	Paved parking, HSG A
10,262	39	>75% Grass cover, Good, HSG A
11,288	44	Weighted Average
10,262		90.91% Pervious Area
1,026		9.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 2S: Parking Area



Summary for Subcatchment 3S: Site & Restoration Areas

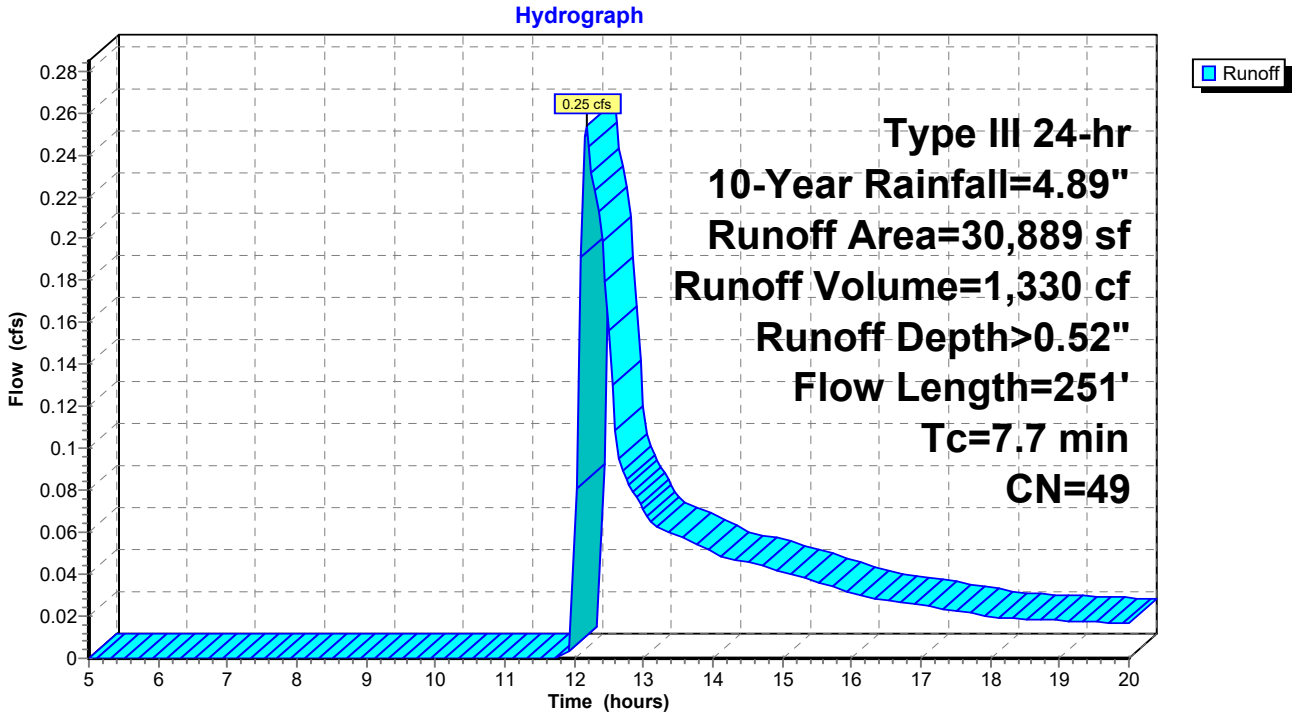
Runoff = 0.25 cfs @ 12.17 hrs, Volume= 1,330 cf, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

	Area (sf)	CN	Description
	10,257	39	>75% Grass cover, Good, HSG A
	1,520	98	Paved parking, HSG A
*	3,382	98	Paved driveway, HSG A
	13,060	30	Meadow, non-grazed, HSG A
	2,670	96	Gravel surface, HSG A
	30,889	49	Weighted Average
	25,987		84.13% Pervious Area
	4,902		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, First 50'** Grass: Short n= 0.150 P2= 3.22"
0.3	45	0.0200	2.28		**Shallow Concentrated Flow, Next 45'** Unpaved Kv= 16.1 fps
1.3	113	0.0050	1.44		**Shallow Concentrated Flow, Next 113'** Paved Kv= 20.3 fps
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Last 43'** Short Grass Pasture Kv= 7.0 fps
7.7	251	Total			

Subcatchment 3S: Site & Restoration Areas



Summary for Subcatchment 4S: Basin Water

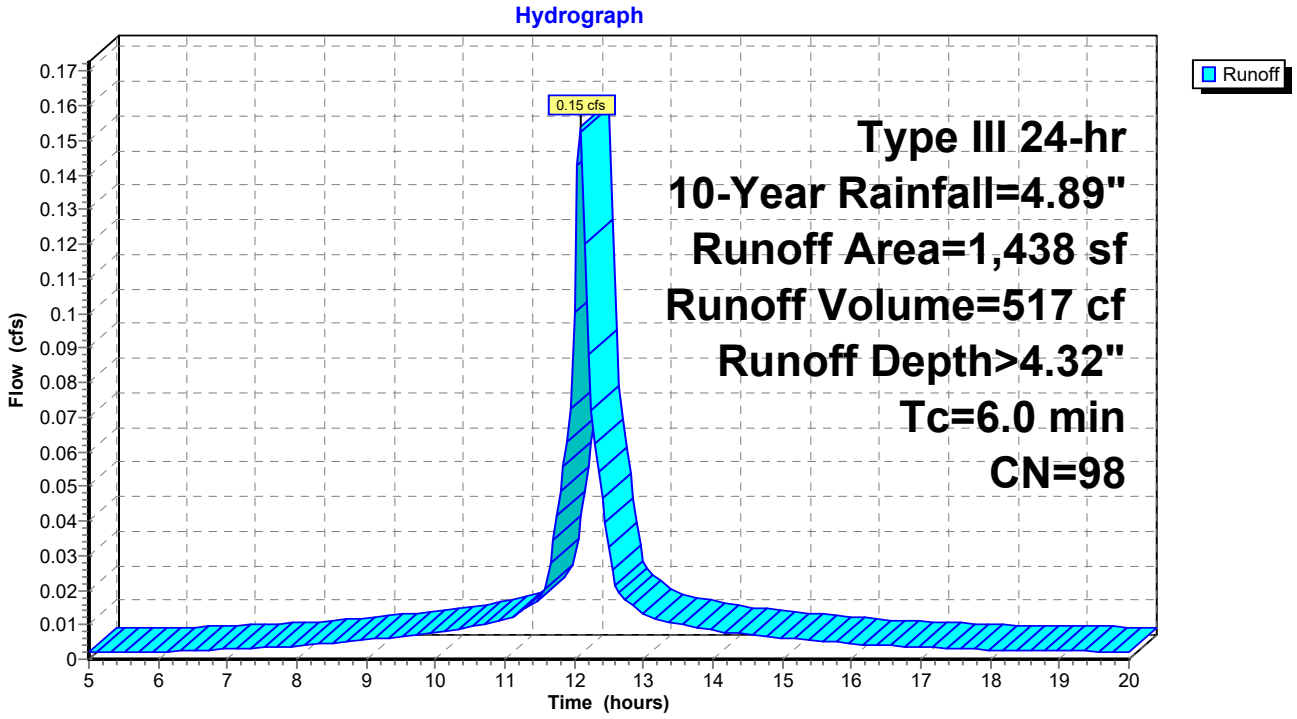
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 517 cf, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
1,438	98	Water Surface, HSG A
1,438		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 4S: Basin Water



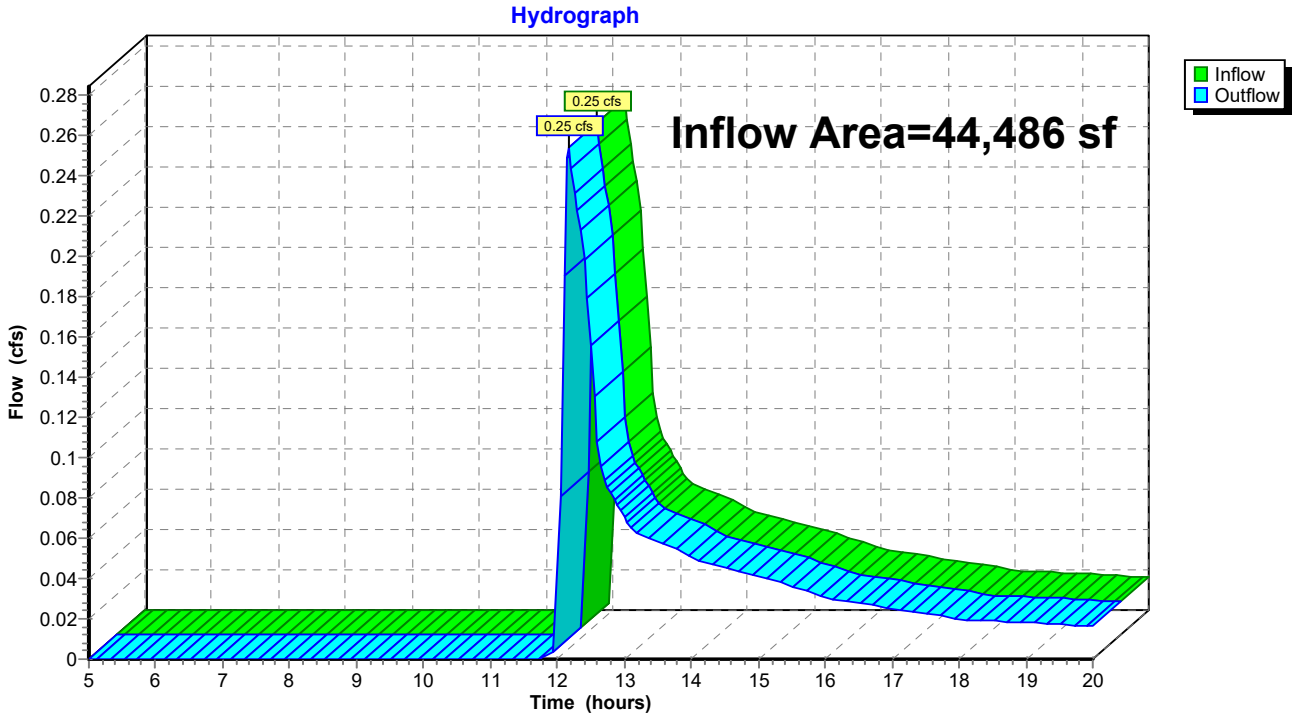
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 18.52% Impervious, Inflow Depth > 0.36" for 10-Year event
Inflow = 0.25 cfs @ 12.17 hrs, Volume= 1,330 cf
Outflow = 0.25 cfs @ 12.17 hrs, Volume= 1,330 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



Summary for Pond 1P: Basin

[82] Warning: Early inflow requires earlier time span

Inflow Area = 13,597 sf, 24.53% Impervious, Inflow Depth > 0.99" for 10-Year event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 1,118 cf
Outflow = 0.06 cfs @ 12.57 hrs, Volume= 1,115 cf, Atten= 76%, Lag= 28.5 min
Discarded = 0.06 cfs @ 12.57 hrs, Volume= 1,115 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 309.23' @ 12.57 hrs Surf.Area= 1,109 sf Storage= 241 cf

Plug-Flow detention time= 25.4 min calculated for 1,115 cf (100% of inflow)
Center-of-Mass det. time= 24.2 min (799.1 - 774.9)

Volume	Invert	Avail.Storage	Storage Description
#1	309.00'	3,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

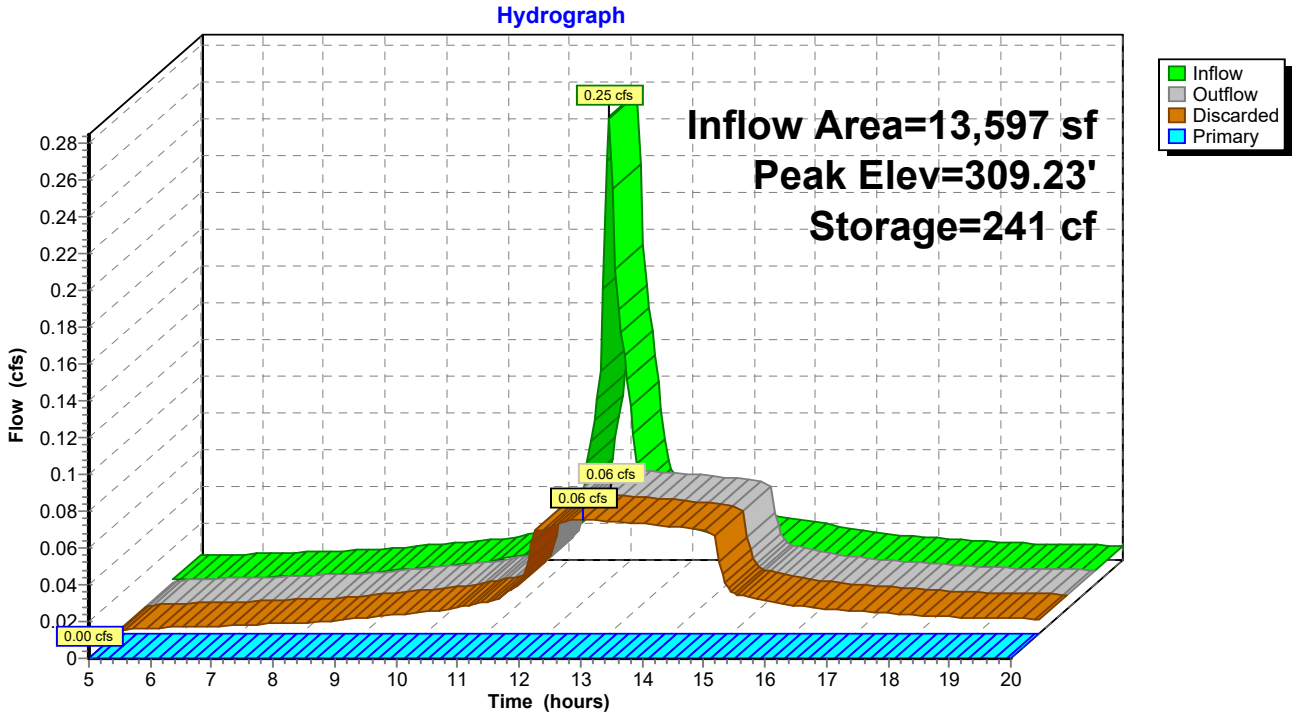
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
309.00	995	190.0	0	0	995
310.00	1,540	229.0	1,258	1,258	2,312
311.00	2,106	166.0	1,816	3,073	4,302

Device	Routing	Invert	Outlet Devices
#1	Discarded	309.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 100.00'
#2	Primary	310.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.06 cfs @ 12.57 hrs HW=309.23' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=309.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Basin



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

Subcatchment1S: Proposed Roof Runoff Area=871 sf 100.00% Impervious Runoff Depth>5.49"
Tc=6.0 min CN=98 Runoff=0.12 cfs 399 cf

Subcatchment2S: Parking Area Runoff Area=11,288 sf 9.09% Impervious Runoff Depth>0.70"
Tc=6.0 min CN=44 Runoff=0.14 cfs 661 cf

Subcatchment3S: Site & Restoration Runoff Area=30,889 sf 15.87% Impervious Runoff Depth>1.03"
Flow Length=251' Tc=7.7 min CN=49 Runoff=0.69 cfs 2,646 cf

Subcatchment4S: Basin Water Runoff Area=1,438 sf 100.00% Impervious Runoff Depth>5.49"
Tc=6.0 min CN=98 Runoff=0.20 cfs 658 cf

Reach DP-1: Design Point 1 Inflow=0.69 cfs 2,646 cf
Outflow=0.69 cfs 2,646 cf

Pond 1P: Basin Peak Elev=309.44' Storage=492 cf Inflow=0.44 cfs 1,718 cf
Discarded=0.07 cfs 1,714 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 1,714 cf

Total Runoff Area = 44,486 sf Runoff Volume = 4,364 cf Average Runoff Depth = 1.18"
81.48% Pervious = 36,249 sf 18.52% Impervious = 8,237 sf

Summary for Subcatchment 1S: Proposed Roof

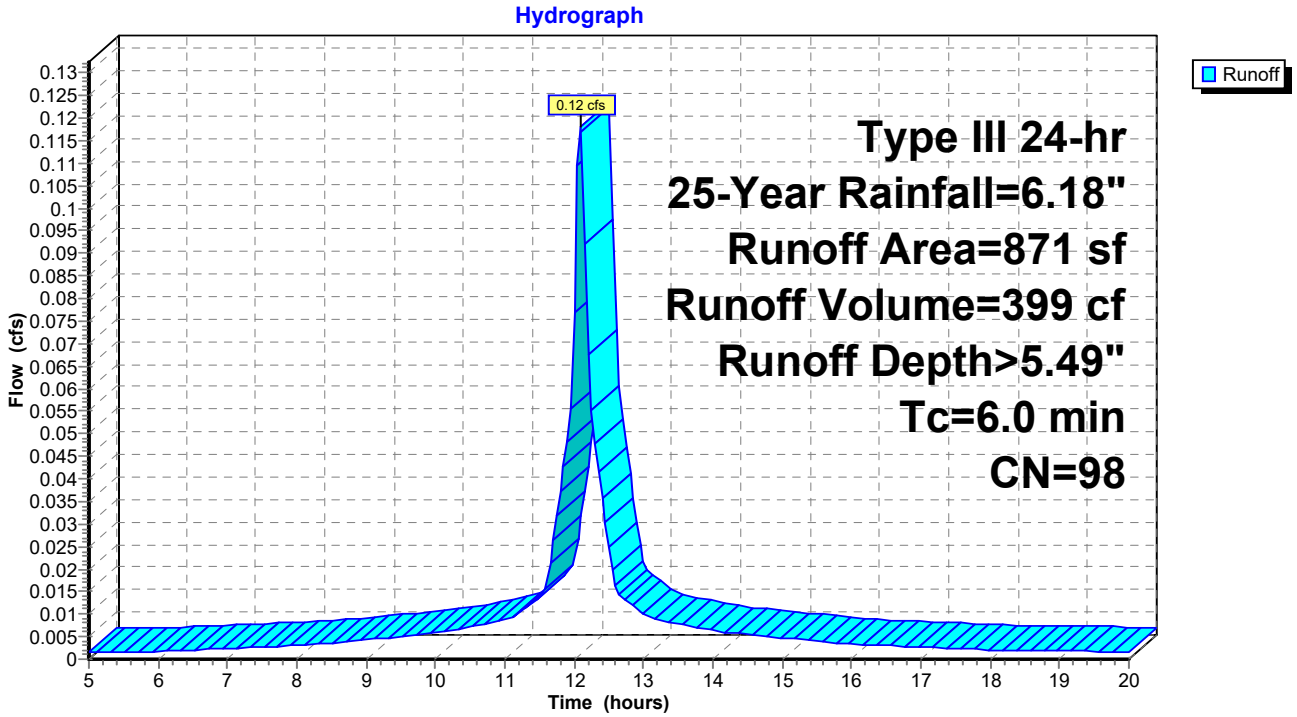
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 399 cf, Depth> 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.18"

Area (sf)	CN	Description
871	98	Roofs, HSG A
871		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 1S: Proposed Roof



Summary for Subcatchment 2S: Parking Area

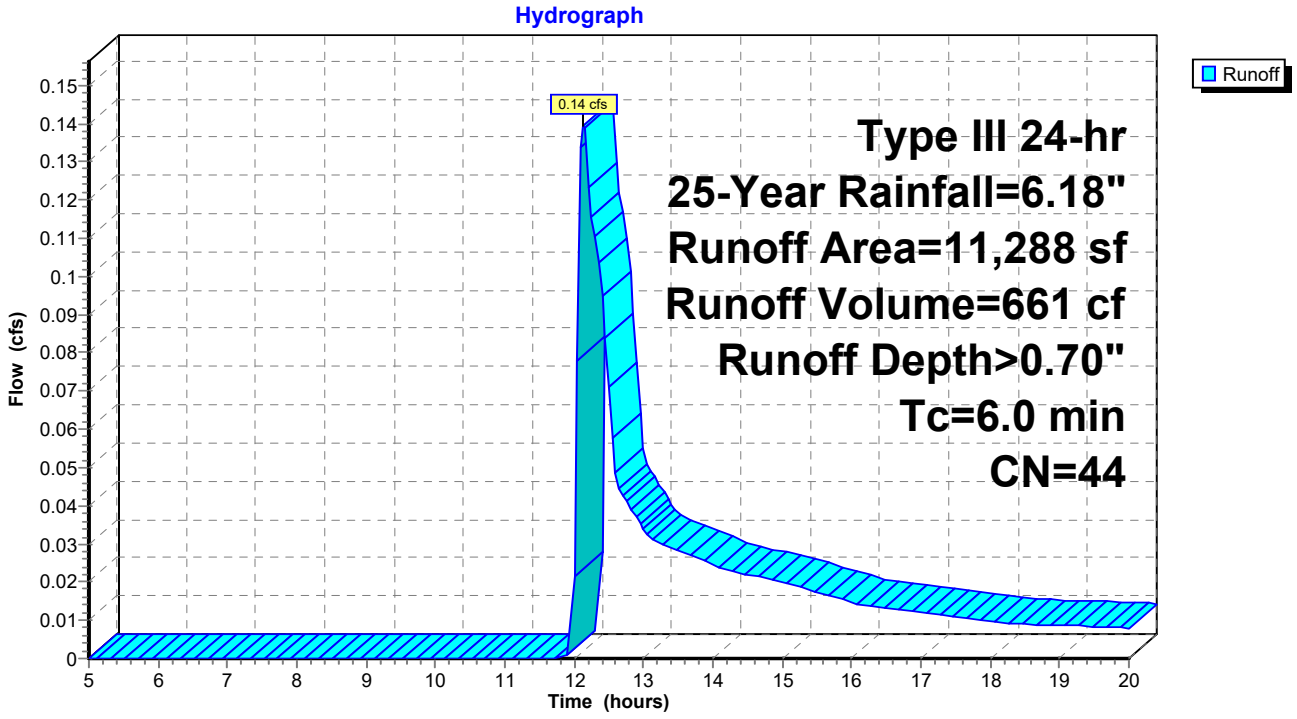
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 661 cf, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.18"

Area (sf)	CN	Description
1,026	98	Paved parking, HSG A
10,262	39	>75% Grass cover, Good, HSG A
11,288	44	Weighted Average
10,262		90.91% Pervious Area
1,026		9.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 2S: Parking Area



Summary for Subcatchment 3S: Site & Restoration Areas

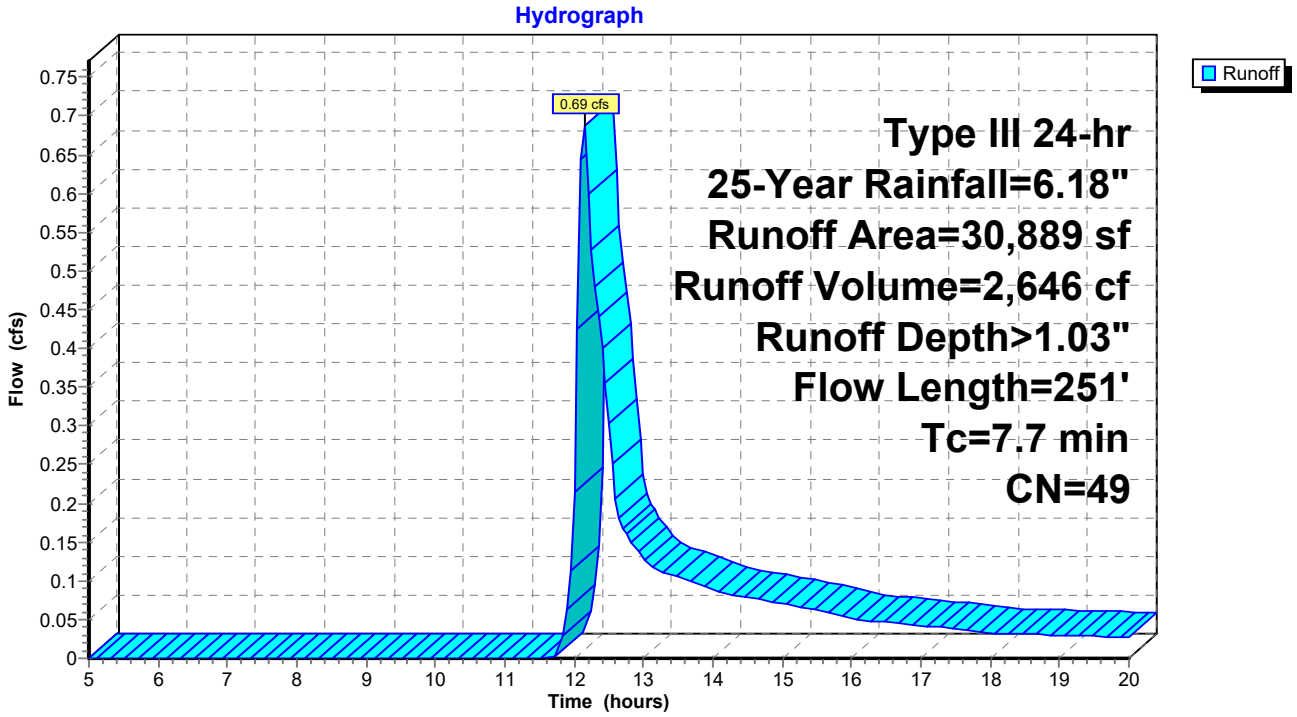
Runoff = 0.69 cfs @ 12.14 hrs, Volume= 2,646 cf, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.18"

	Area (sf)	CN	Description
	10,257	39	>75% Grass cover, Good, HSG A
	1,520	98	Paved parking, HSG A
*	3,382	98	Paved driveway, HSG A
	13,060	30	Meadow, non-grazed, HSG A
	2,670	96	Gravel surface, HSG A
	30,889	49	Weighted Average
	25,987		84.13% Pervious Area
	4,902		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, First 50'** Grass: Short n= 0.150 P2= 3.22"
0.3	45	0.0200	2.28		**Shallow Concentrated Flow, Next 45'** Unpaved Kv= 16.1 fps
1.3	113	0.0050	1.44		**Shallow Concentrated Flow, Next 113'** Paved Kv= 20.3 fps
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Last 43'** Short Grass Pasture Kv= 7.0 fps
7.7	251	Total			

Subcatchment 3S: Site & Restoration Areas



Summary for Subcatchment 4S: Basin Water

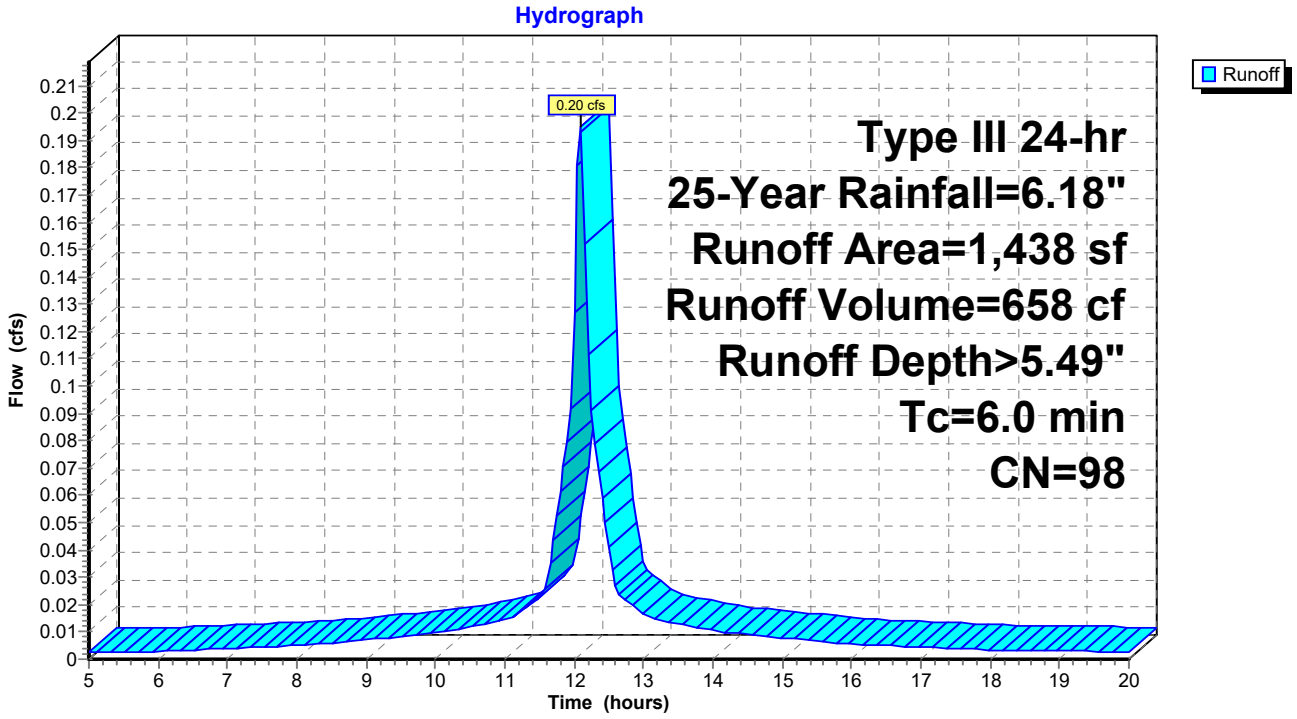
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 658 cf, Depth> 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.18"

Area (sf)	CN	Description
1,438	98	Water Surface, HSG A
1,438		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 4S: Basin Water



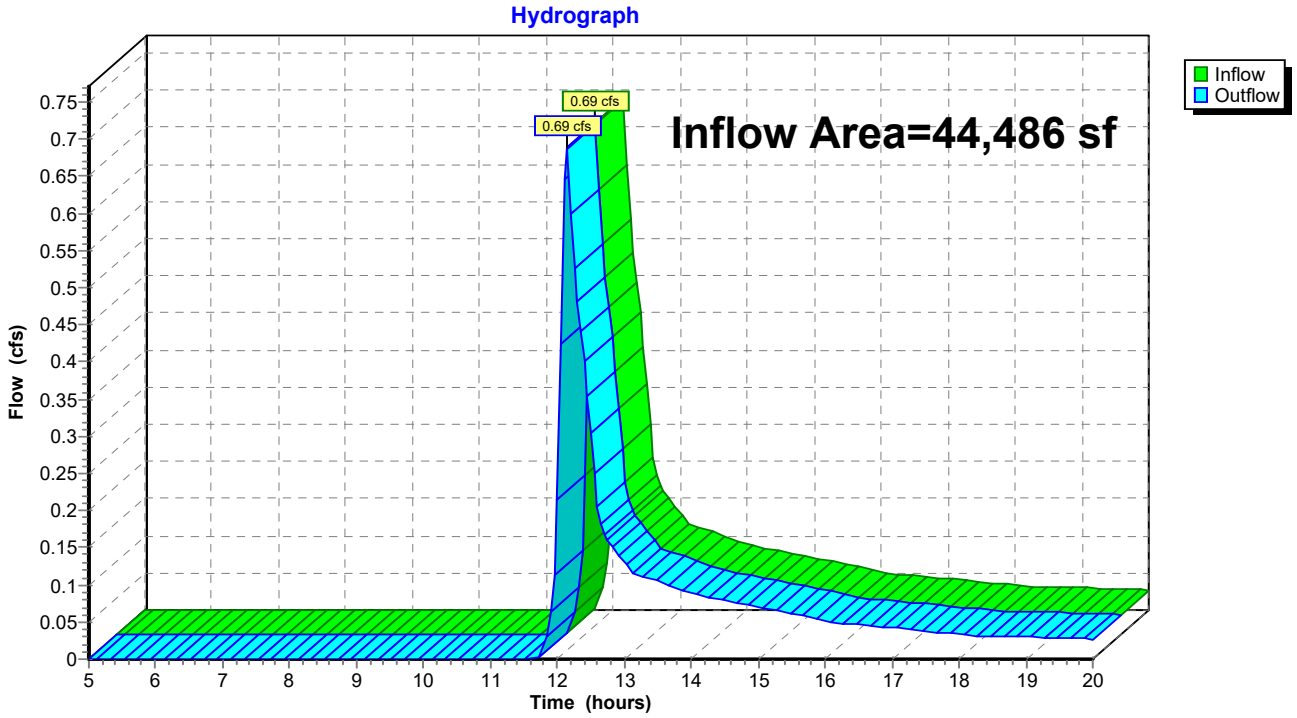
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 18.52% Impervious, Inflow Depth > 0.71" for 25-Year event
Inflow = 0.69 cfs @ 12.14 hrs, Volume= 2,646 cf
Outflow = 0.69 cfs @ 12.14 hrs, Volume= 2,646 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



Summary for Pond 1P: Basin

[82] Warning: Early inflow requires earlier time span

Inflow Area = 13,597 sf, 24.53% Impervious, Inflow Depth > 1.52" for 25-Year event
Inflow = 0.44 cfs @ 12.10 hrs, Volume= 1,718 cf
Outflow = 0.07 cfs @ 12.87 hrs, Volume= 1,714 cf, Atten= 85%, Lag= 46.3 min
Discarded = 0.07 cfs @ 12.87 hrs, Volume= 1,714 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 309.44' @ 12.87 hrs Surf.Area= 1,222 sf Storage= 492 cf

Plug-Flow detention time= 59.7 min calculated for 1,713 cf (100% of inflow)
Center-of-Mass det. time= 58.4 min (840.9 - 782.4)

Volume	Invert	Avail.Storage	Storage Description
#1	309.00'	3,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

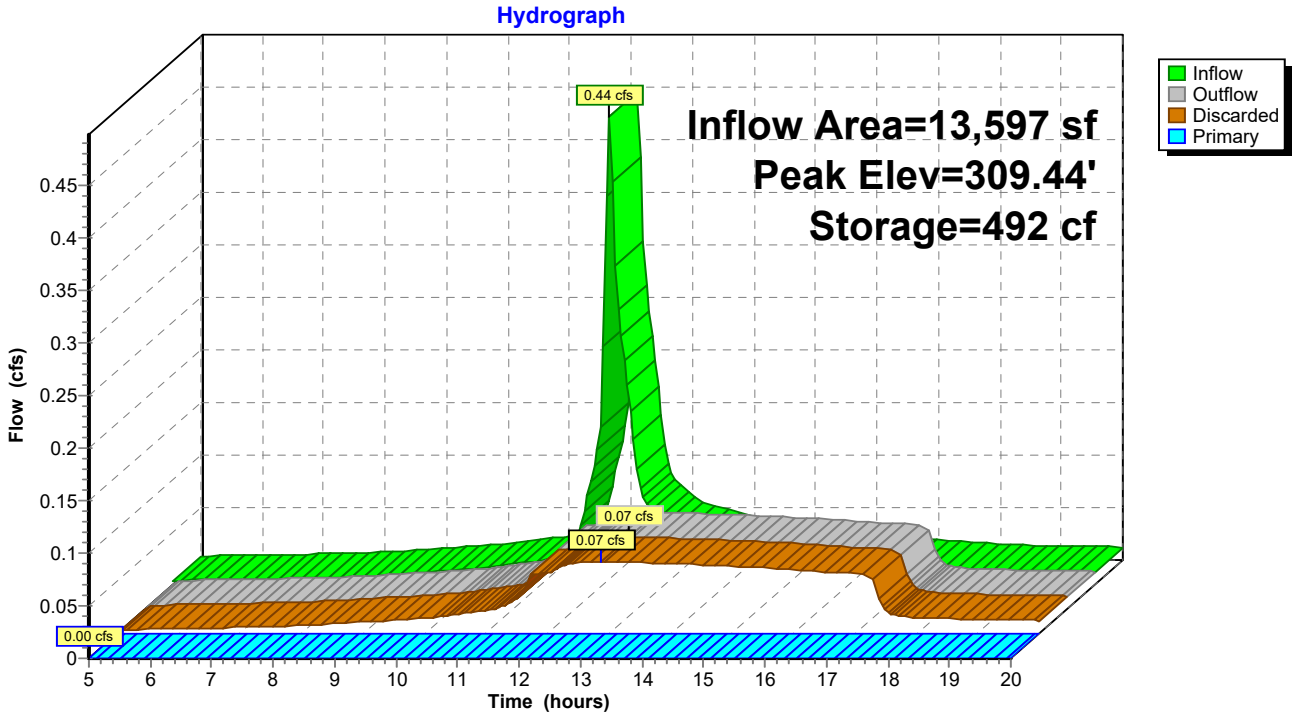
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
309.00	995	190.0	0	0	995
310.00	1,540	229.0	1,258	1,258	2,312
311.00	2,106	166.0	1,816	3,073	4,302

Device	Routing	Invert	Outlet Devices
#1	Discarded	309.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 100.00'
#2	Primary	310.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.07 cfs @ 12.87 hrs HW=309.44' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=309.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Basin



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

Subcatchment1S: Proposed Roof Runoff Area=871 sf 100.00% Impervious Runoff Depth>7.90"
Tc=6.0 min CN=98 Runoff=0.17 cfs 573 cf

Subcatchment2S: Parking Area Runoff Area=11,288 sf 9.09% Impervious Runoff Depth>1.87"
Tc=6.0 min CN=44 Runoff=0.54 cfs 1,756 cf

Subcatchment3S: Site & Restoration Runoff Area=30,889 sf 15.87% Impervious Runoff Depth>2.41"
Flow Length=251' Tc=7.7 min CN=49 Runoff=1.91 cfs 6,206 cf

Subcatchment4S: Basin Water Runoff Area=1,438 sf 100.00% Impervious Runoff Depth>7.90"
Tc=6.0 min CN=98 Runoff=0.28 cfs 946 cf

Reach DP-1: Design Point 1 Inflow=1.91 cfs 6,206 cf
Outflow=1.91 cfs 6,206 cf

Pond 1P: Basin Peak Elev=310.05' Storage=1,331 cf Inflow=0.98 cfs 3,276 cf
Discarded=0.09 cfs 2,800 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 2,800 cf

Total Runoff Area = 44,486 sf Runoff Volume = 9,482 cf Average Runoff Depth = 2.56"
81.48% Pervious = 36,249 sf 18.52% Impervious = 8,237 sf

Summary for Subcatchment 1S: Proposed Roof

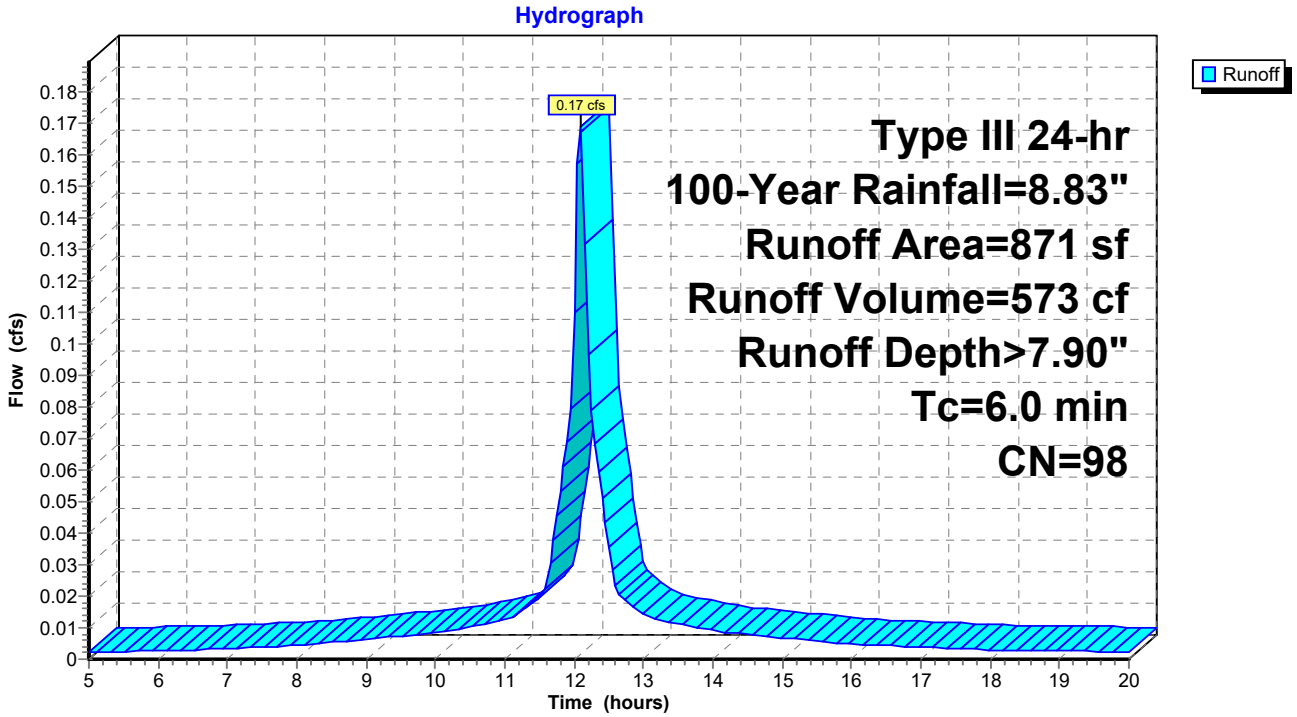
Runoff = 0.17 cfs @ 12.09 hrs, Volume= 573 cf, Depth> 7.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
871	98	Roofs, HSG A
871		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 1S: Proposed Roof



Summary for Subcatchment 2S: Parking Area

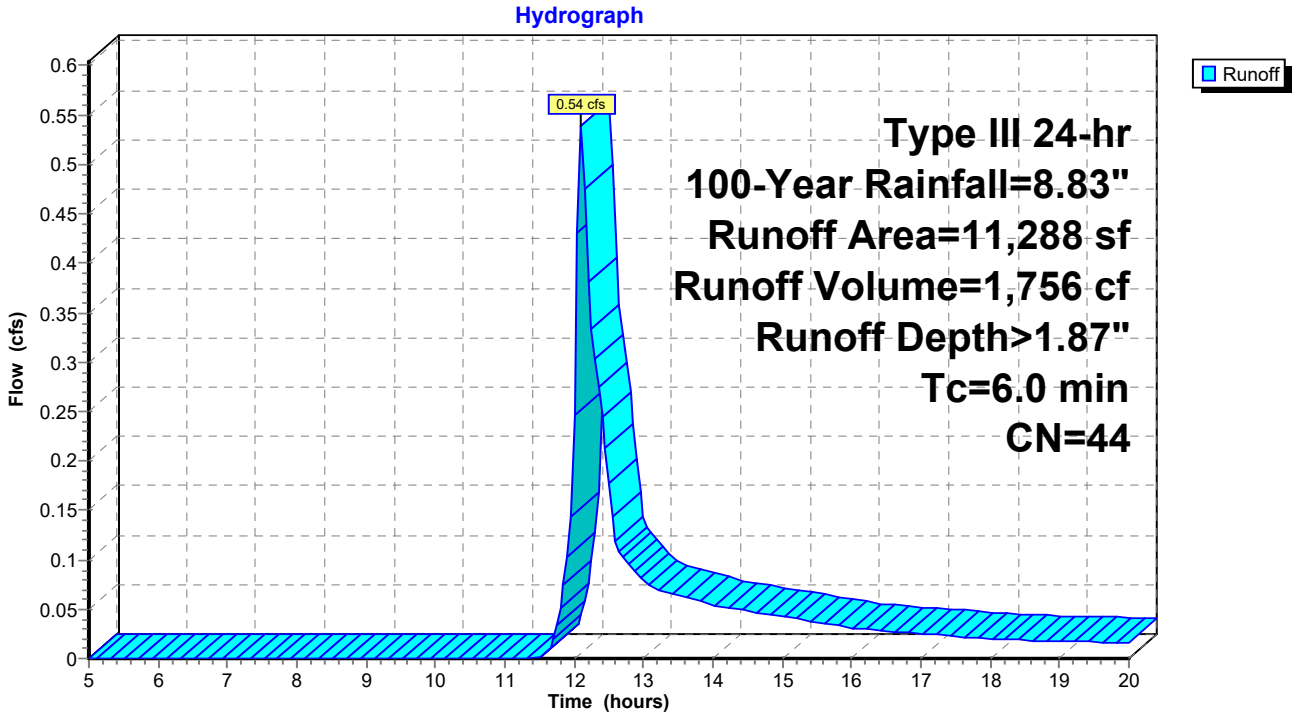
Runoff = 0.54 cfs @ 12.11 hrs, Volume= 1,756 cf, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
1,026	98	Paved parking, HSG A
10,262	39	>75% Grass cover, Good, HSG A
11,288	44	Weighted Average
10,262		90.91% Pervious Area
1,026		9.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 2S: Parking Area



Summary for Subcatchment 3S: Site & Restoration Areas

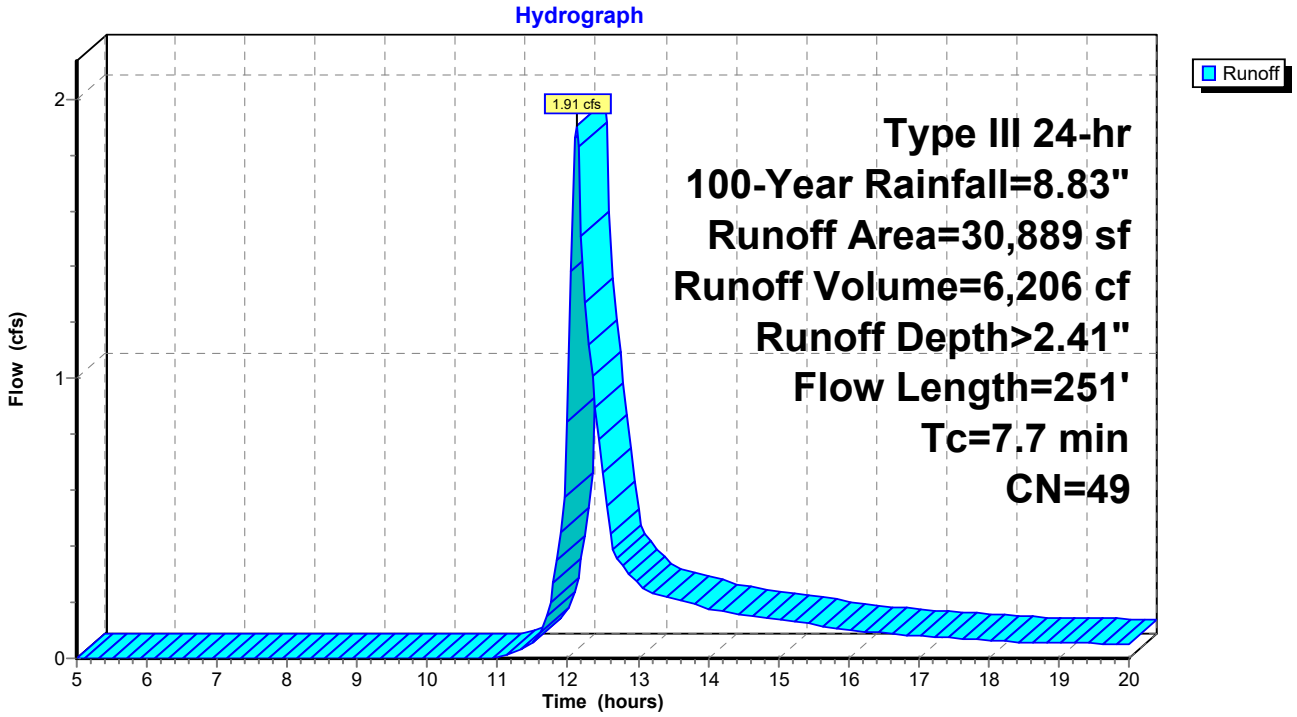
Runoff = 1.91 cfs @ 12.12 hrs, Volume= 6,206 cf, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.83"

	Area (sf)	CN	Description
	10,257	39	>75% Grass cover, Good, HSG A
	1,520	98	Paved parking, HSG A
*	3,382	98	Paved driveway, HSG A
	13,060	30	Meadow, non-grazed, HSG A
	2,670	96	Gravel surface, HSG A
	30,889	49	Weighted Average
	25,987		84.13% Pervious Area
	4,902		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, First 50'** Grass: Short n= 0.150 P2= 3.22"
0.3	45	0.0200	2.28		**Shallow Concentrated Flow, Next 45'** Unpaved Kv= 16.1 fps
1.3	113	0.0050	1.44		**Shallow Concentrated Flow, Next 113'** Paved Kv= 20.3 fps
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Last 43'** Short Grass Pasture Kv= 7.0 fps
7.7	251	Total			

Subcatchment 3S: Site & Restoration Areas



Summary for Subcatchment 4S: Basin Water

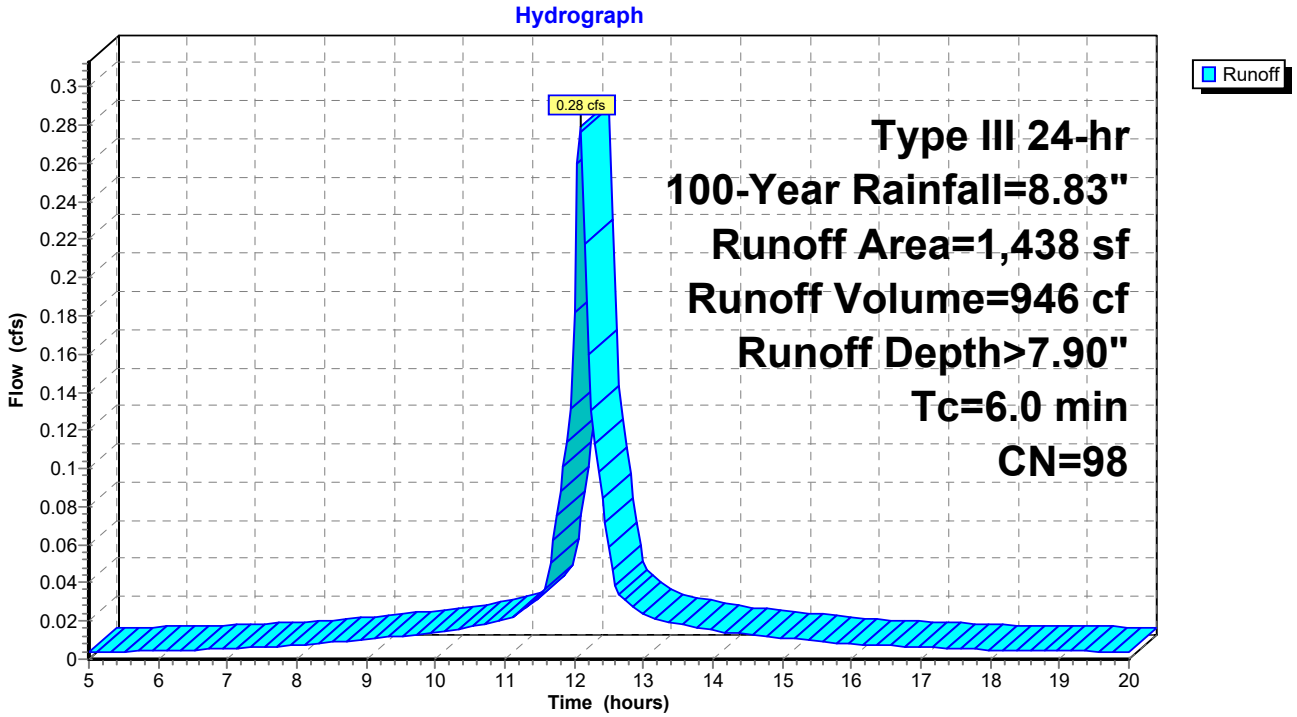
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 946 cf, Depth> 7.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
1,438	98	Water Surface, HSG A
1,438		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Tc = 6 min**

Subcatchment 4S: Basin Water



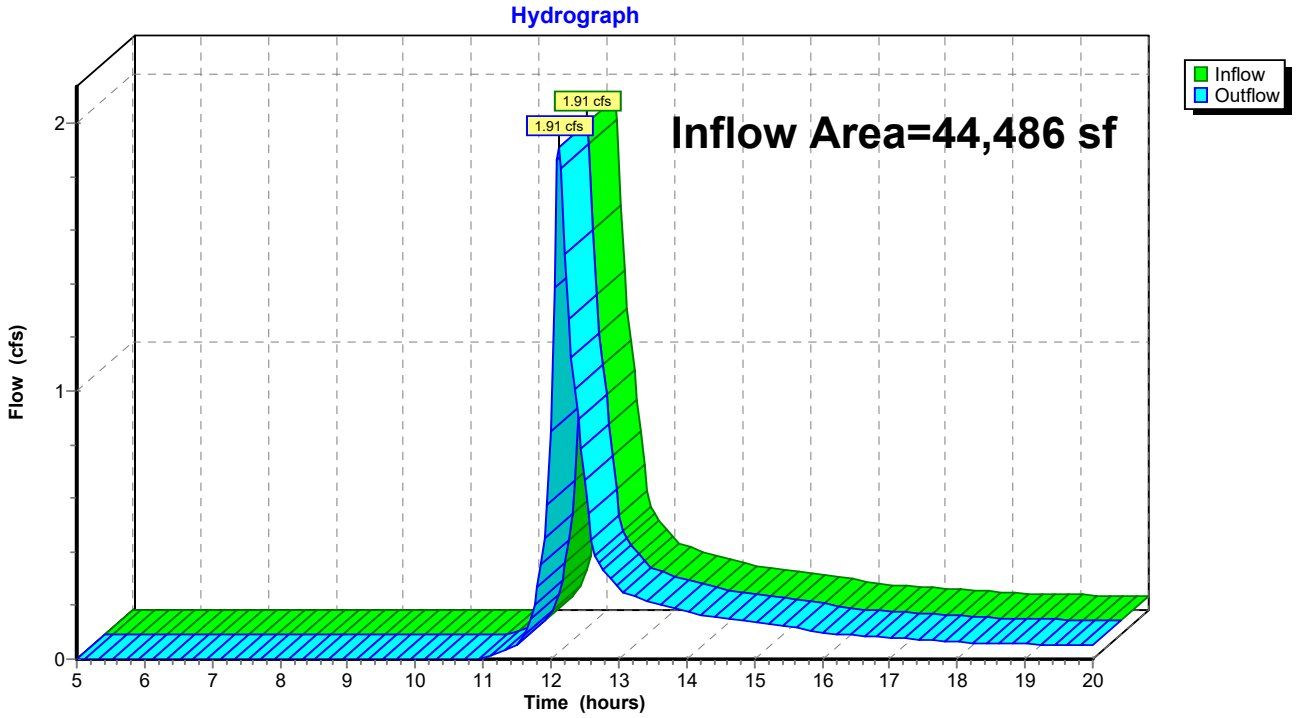
Summary for Reach DP-1: Design Point 1

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

Inflow Area = 44,486 sf, 18.52% Impervious, Inflow Depth > 1.67" for 100-Year event
Inflow = 1.91 cfs @ 12.12 hrs, Volume= 6,206 cf
Outflow = 1.91 cfs @ 12.12 hrs, Volume= 6,206 cf, Atten= 0%, Lag= 0.0 min

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

Reach DP-1: Design Point 1



Summary for Pond 1P: Basin

[82] Warning: Early inflow requires earlier time span

Inflow Area = 13,597 sf, 24.53% Impervious, Inflow Depth > 2.89" for 100-Year event
Inflow = 0.98 cfs @ 12.10 hrs, Volume= 3,276 cf
Outflow = 0.09 cfs @ 13.72 hrs, Volume= 2,800 cf, Atten= 91%, Lag= 97.1 min
Discarded = 0.09 cfs @ 13.72 hrs, Volume= 2,800 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 310.05' @ 13.72 hrs Surf.Area= 1,565 sf Storage= 1,331 cf

Plug-Flow detention time= 151.3 min calculated for 2,790 cf (85% of inflow)
Center-of-Mass det. time= 105.6 min (891.9 - 786.3)

Volume	Invert	Avail.Storage	Storage Description
#1	309.00'	3,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
309.00	995	190.0	0	0	995
310.00	1,540	229.0	1,258	1,258	2,312
311.00	2,106	166.0	1,816	3,073	4,302

Device	Routing	Invert	Outlet Devices
#1	Discarded	309.00'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 100.00'
#2	Primary	310.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.09 cfs @ 13.72 hrs HW=310.05' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=309.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Basin