

November 30, 2021

Andrew Bevilacqua, P.E. Town Engineer  
Town of North Haven  
18 Church Street  
North Haven, CT 06473

Re: Planning and Zoning Comments  
#P21-29 & #P212-29A  
48 Giles Avenue

Dear Mr. Bevilacqua:

As a result of comments from town staff as well as comments provided by the commission members we have prepared this stormwater management memo and analysis. The original analysis presented to the town in 2010 and updated in October of 2021 focused on the areas of development directly adjacent to the proposed building subject to the application. It has been brought to our attention that the existing millings parking area has not received previous approvals from the town. This revised analysis has been expanded to examine the entire property to provide stormwater controls for the proposed structure as well as the existing millings parking area.

#### Existing Site Conditions and Stormwater Analysis:

Currently the site is developed with an existing 11,987 SF building, a bituminous pavement access drive and a parking areas consisting of compacted millings. For the purpose of this supplemental analysis we have looked at the existing conditions in two ways. First we analyzed the site assuming the existing milling parking areas at grass, second we analyzed the site as it is developed today. These two methods of analysis allow the applicant to demonstrate both the historic runoff characteristics prior to the full development of the property as well as the runoff characteristics of the site as it is found today.

The existing conditions analysis has also been revised to utilize HGS Soil Group B when determining the RCN for the lawn areas.

An updated Existing Drainage Area Map (EDA-1) is provided with the memo.

#### Proposed Site Conditions and Stormwater Analysis:

The proposed site conditions include the addition of a proposed 14,000 sf building and associated site improvements including parking, drive isles and landscaping. This updated analysis also takes into account the the existing millings parking area. The proposed stormwater

management system associated with the new building and related improvements is unchanged from the previous submittal. A vegetated swale along the south eastern property line is proposed to provide stormwater management of runoff from the existing milling lot. The swale provides the required water quality volume for the existing millings parking lot as well as providing runoff rate reduction.

Runoff Rate Table

PEAK FLOW (CFS)					
STORM	EXISTING (GRASS)	EXISTING (GRAVEL)	PROPOSED	PROPOSED CHANGE VS GRASS	PROPOSED CHANGE VS GRAVEL
2 YEAR	5.07	9.78	9.29	+4.22	-0.49
10 YEAR	12.09	18.33	15.04	+2.95	-3.29
25 YEAR	15.51	22.22	17.56	+2.05	-4.66
100 YEAR	22.74	30.25	22.8	+0.06	-7.45

Water Quality Analysis

The proposed vegetated swale will provide the required water quality treatment for the existing millings parking area.

WQV Required – 392.6 cuft  
 WQV Provided – 13,994 cuft

Summary:

The intent of this memo was to provide an analysis of the existing millings parking area and to demonstrate that the newly proposed vegetated swale provides the required stormwater mitigation measures for the site. The proposed swale reduces runoff rates below current existing conditions and meets the water quality standards for the existing milling parking area.

Sincerely,



Christopher D. Gagnon  
 BL Companies

# Water Quality Volume (WQV) & Water Quality Flow (WQF) PDA-102

PROJECT Millings Parking Area Water Quality  
DATE 11/30/2021  
ADDRESS Giles Ave, North Haven

## WATER QUALITY VOLUME (WQV) CALCULATION

Area (A) = 82898.00 square feet  
Area (A) = 1.90 acres  
Area (A) = 0.00297 square miles  
Design Precipitation (P) = 1 inch  
% Impervious Cover (I) = 0.76  
Volumetric Runoff Coefficient (R) = 0.057

<b>WQV =</b>	<b>0.009</b>	<b>ac-ft</b>
	<b>392.66</b>	<b>cu-ft</b>

## WATER QUALITY FLOW (WQF) CALCULATION

### RUNOFF CURVE NUMBER (CN)

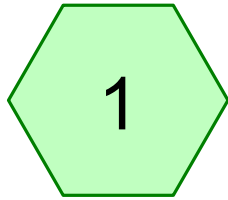
Runoff Depth (Q) = 0.057 inches  
CN = 78 Figure 2-1 (SWQM)

### TIME OF CONCENTRATION (Tc), 10 minute minimum

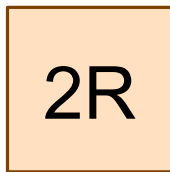
Tc = 10 min  
Tc = 0.17 hours

Initial Abstraction ( $I_a$ ) = 0.041 Table 4-1 (SWQM)  
 $I_a/P$  Calculation = 0.174  
Unit Peak Discharge ( $q_u$ ) = 650 Exhibit 4-111 (SWQM)

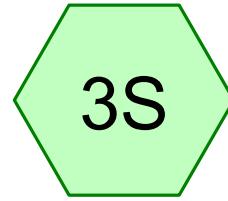
<b>WQF =</b>	<b>0.11</b>	<b>cfs</b>
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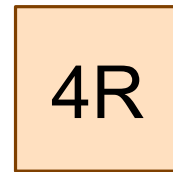
Existing



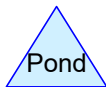
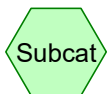
POI-1



Existing



ex alt



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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.649	61	>75% Grass cover, Good, HSG B (1, 3S)
4.972	98	Paved parking & roofs (1, 3S)
<b>13.621</b>	<b>75</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.649	HSG B	1, 3S
0.000	HSG C	
0.000	HSG D	
4.972	Other	1, 3S
<b>13.621</b>		<b>TOTAL AREA</b>

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**Ground Covers (all nodes)**

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	8.649	0.000	0.000	0.000	8.649	>75% Grass cover, Good	1, 3S
0.000	0.000	0.000	0.000	4.972	4.972	Paved parking & roofs	1, 3S
<b>0.000</b>	<b>8.649</b>	<b>0.000</b>	<b>0.000</b>	<b>4.972</b>	<b>13.621</b>	<b>TOTAL AREA</b>	

**07c2352 Existing-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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

**Subcatchment1: Existing**

Runoff Area=296,670 sf 22.88% Impervious Runoff Depth>0.81"  
Flow Length=369' Tc=12.8 min CN=69 Runoff=5.07 cfs 0.457 af

**Subcatchment3S: Existing**

Runoff Area=296,670 sf 50.13% Impervious Runoff Depth>1.44"  
Flow Length=369' Tc=12.8 min CN=80 Runoff=9.78 cfs 0.816 af

**Reach 2R: POI-1**

Inflow=5.07 cfs 0.457 af  
Outflow=5.07 cfs 0.457 af

**Reach 4R: ex alt**

Inflow=9.78 cfs 0.816 af  
Outflow=9.78 cfs 0.816 af

**Total Runoff Area = 13.621 ac Runoff Volume = 1.273 af Average Runoff Depth = 1.12"**  
**63.50% Pervious = 8.649 ac 36.50% Impervious = 4.972 ac**



**07c2352 Existing-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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**Summary for Subcatchment 1: Existing**

Runoff = 5.07 cfs @ 12.20 hrs, Volume= 0.457 af, Depth> 0.81"

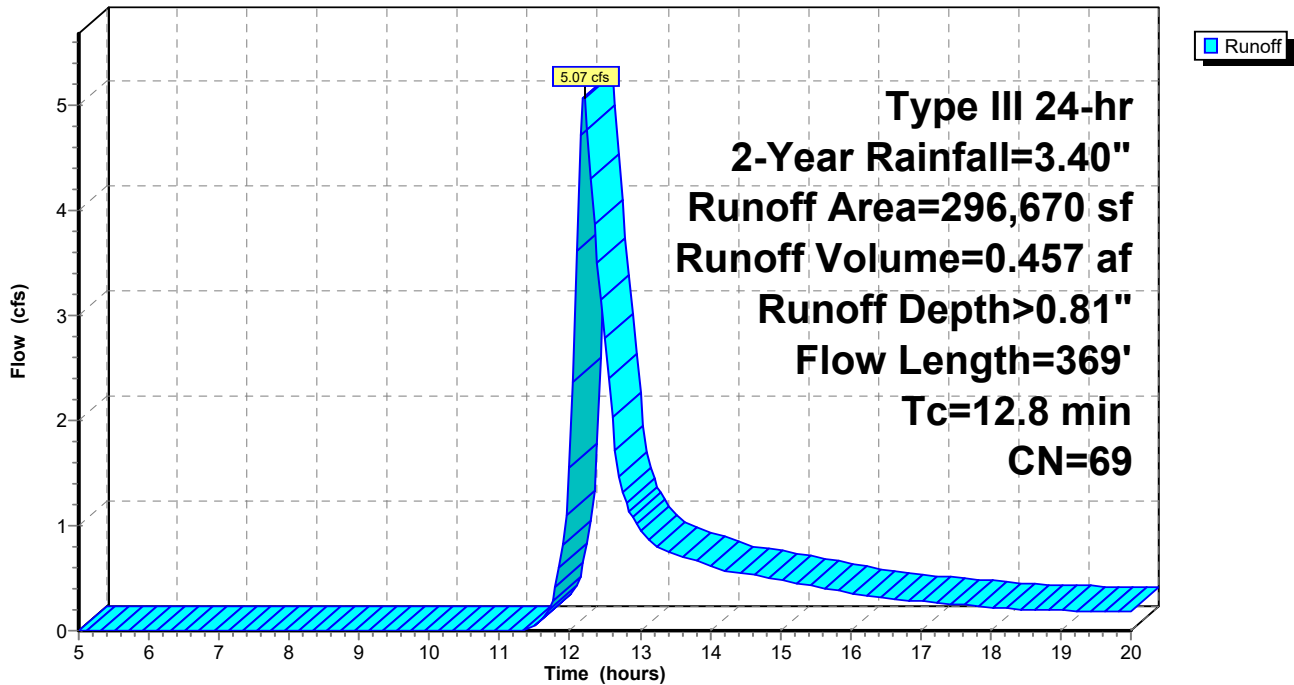
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
67,880	98	Paved parking & roofs
228,790	61	>75% Grass cover, Good, HSG B
296,670	69	Weighted Average
228,790		77.12% Pervious Area
67,880		22.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
0.2	58	0.0369	3.90		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 1: Existing**

Hydrograph



**07c2352 Existing-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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**Summary for Subcatchment 3S: Existing**

Runoff = 9.78 cfs @ 12.18 hrs, Volume= 0.816 af, Depth> 1.44"

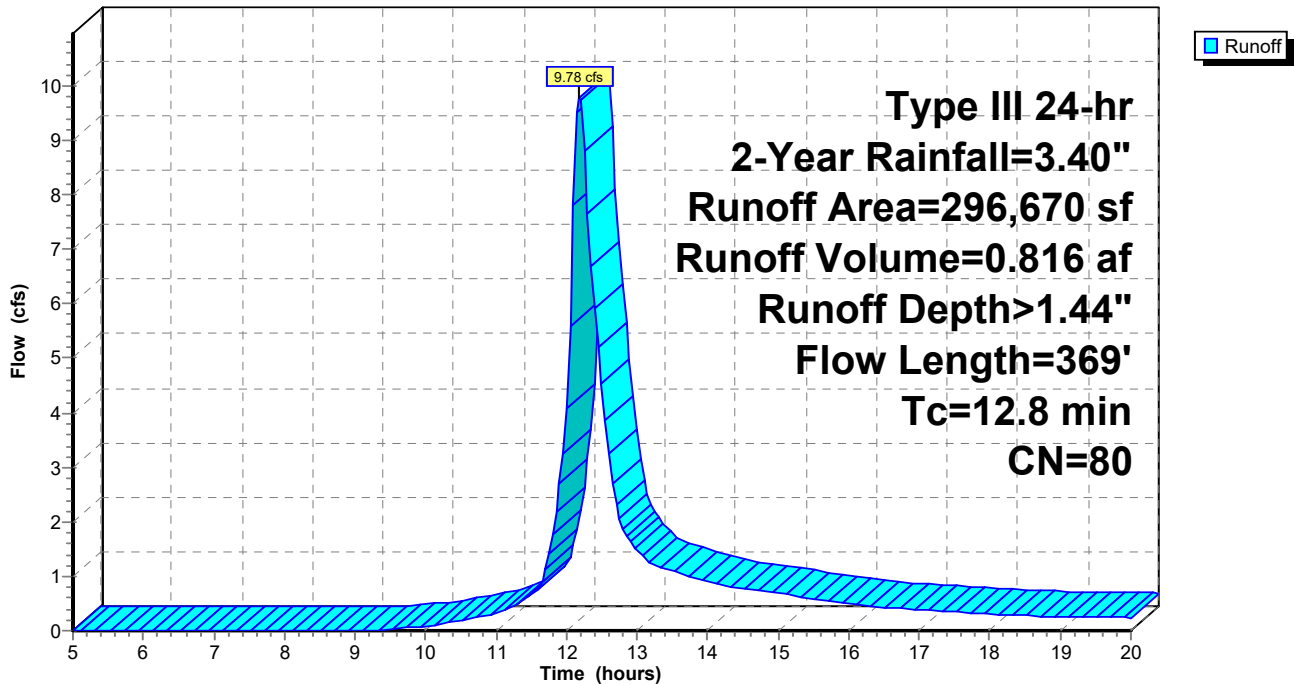
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
148,715	98	Paved parking & roofs
147,955	61	>75% Grass cover, Good, HSG B
296,670	80	Weighted Average
147,955		49.87% Pervious Area
148,715		50.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
0.2	58	0.0369	3.90		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 3S: Existing**

Hydrograph



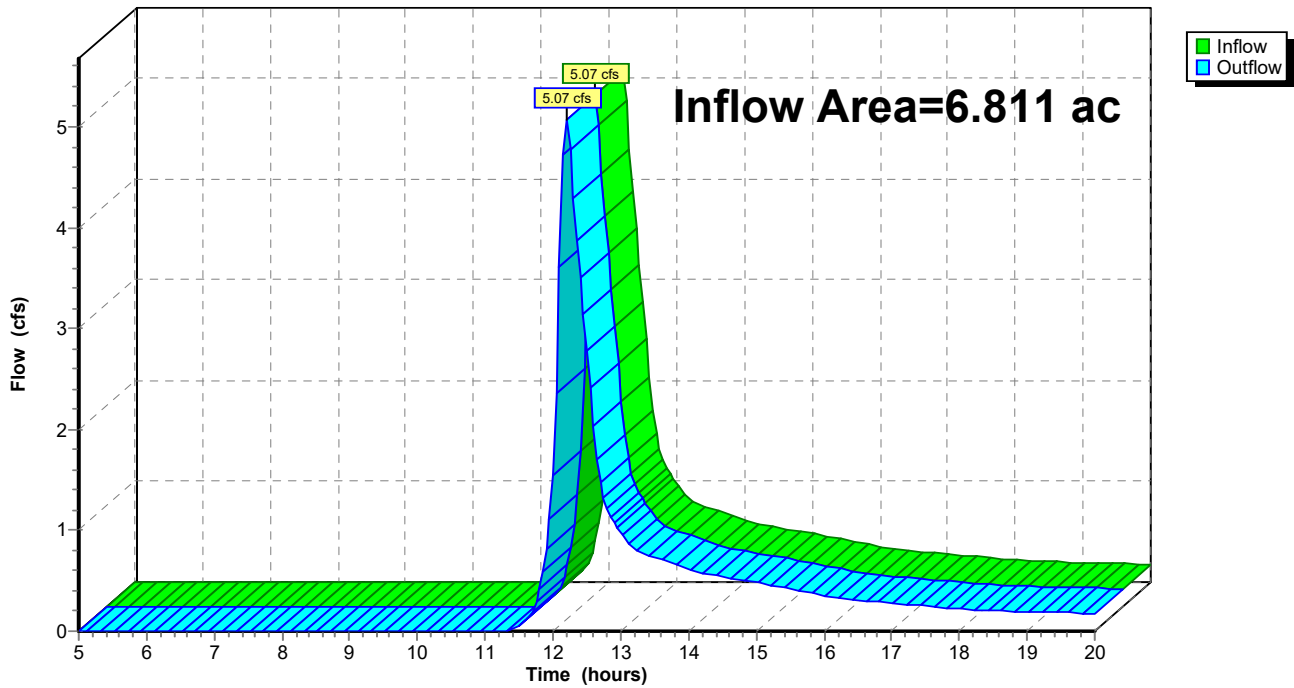
### Summary for Reach 2R: POI-1

Inflow Area = 6.811 ac, 22.88% Impervious, Inflow Depth > 0.81" for 2-Year event  
Inflow = 5.07 cfs @ 12.20 hrs, Volume= 0.457 af  
Outflow = 5.07 cfs @ 12.20 hrs, Volume= 0.457 af, Atten= 0%, Lag= 0.0 min

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

### Reach 2R: POI-1

Hydrograph



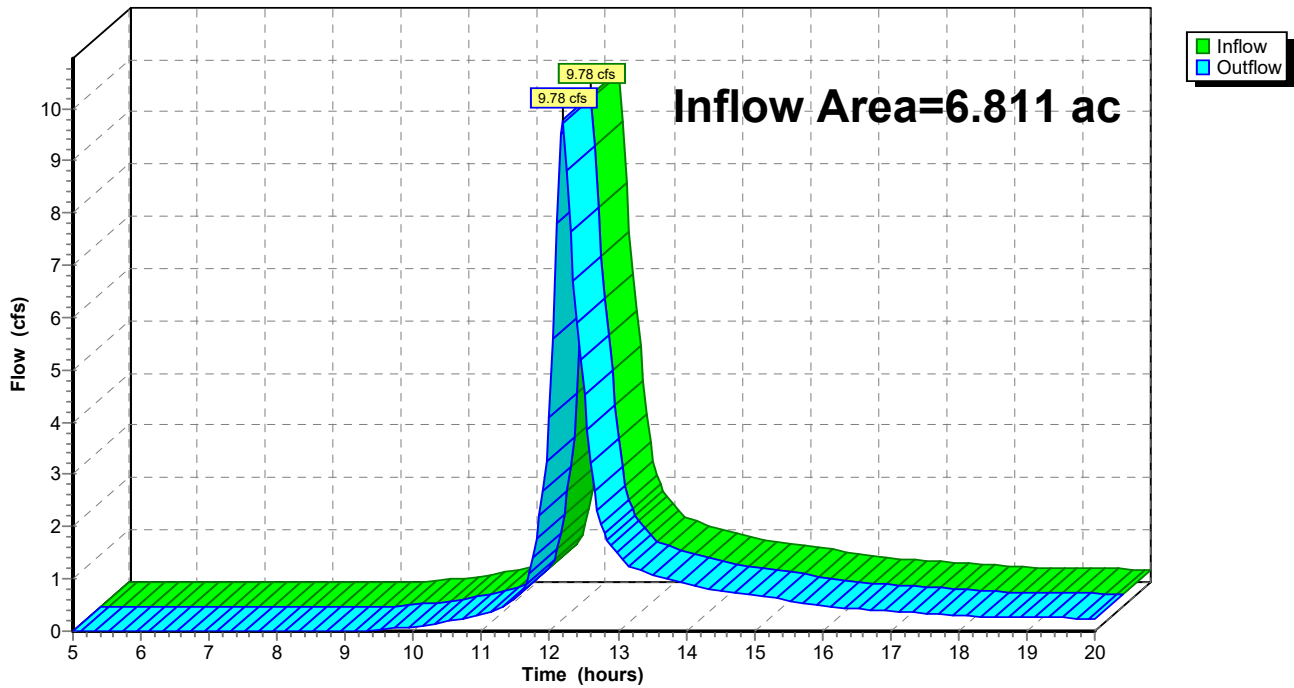
### Summary for Reach 4R: ex alt

Inflow Area = 6.811 ac, 50.13% Impervious, Inflow Depth > 1.44" for 2-Year event  
Inflow = 9.78 cfs @ 12.18 hrs, Volume= 0.816 af  
Outflow = 9.78 cfs @ 12.18 hrs, Volume= 0.816 af, Atten= 0%, Lag= 0.0 min

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

### Reach 4R: ex alt

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.00"

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

**Subcatchment1: Existing**

Runoff Area=296,670 sf 22.88% Impervious Runoff Depth>1.79"  
Flow Length=369' Tc=12.8 min CN=69 Runoff=12.09 cfs 1.018 af

**Subcatchment3S: Existing**

Runoff Area=296,670 sf 50.13% Impervious Runoff Depth>2.70"  
Flow Length=369' Tc=12.8 min CN=80 Runoff=18.33 cfs 1.530 af

**Reach 2R: POI-1**

Inflow=12.09 cfs 1.018 af  
Outflow=12.09 cfs 1.018 af

**Reach 4R: ex alt**

Inflow=18.33 cfs 1.530 af  
Outflow=18.33 cfs 1.530 af

**Total Runoff Area = 13.621 ac Runoff Volume = 2.549 af Average Runoff Depth = 2.25"**  
**63.50% Pervious = 8.649 ac 36.50% Impervious = 4.972 ac**

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Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment 1: Existing**

Runoff = 12.09 cfs @ 12.19 hrs, Volume= 1.018 af, Depth> 1.79"

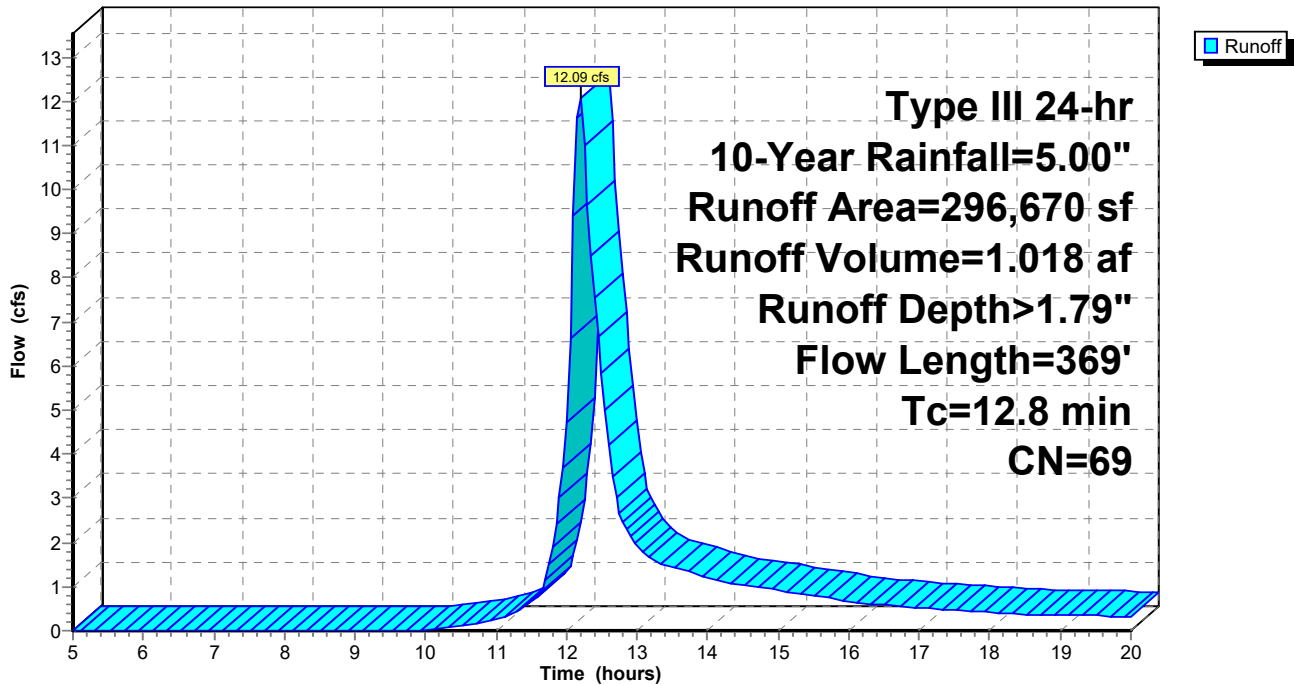
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
67,880	98	Paved parking & roofs
228,790	61	>75% Grass cover, Good, HSG B
296,670	69	Weighted Average
228,790		77.12% Pervious Area
67,880		22.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
1.0	151	0.0265	2.62		Grass: Short n= 0.150 P2= 3.40" <b>Shallow Concentrated Flow, B-C</b>
0.2	58	0.0369	3.90		Unpaved Kv= 16.1 fps <b>Shallow Concentrated Flow, C-D</b>
12.8	369	Total			Paved Kv= 20.3 fps

**Subcatchment 1: Existing**

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment 3S: Existing**

Runoff = 18.33 cfs @ 12.18 hrs, Volume= 1.530 af, Depth> 2.70"

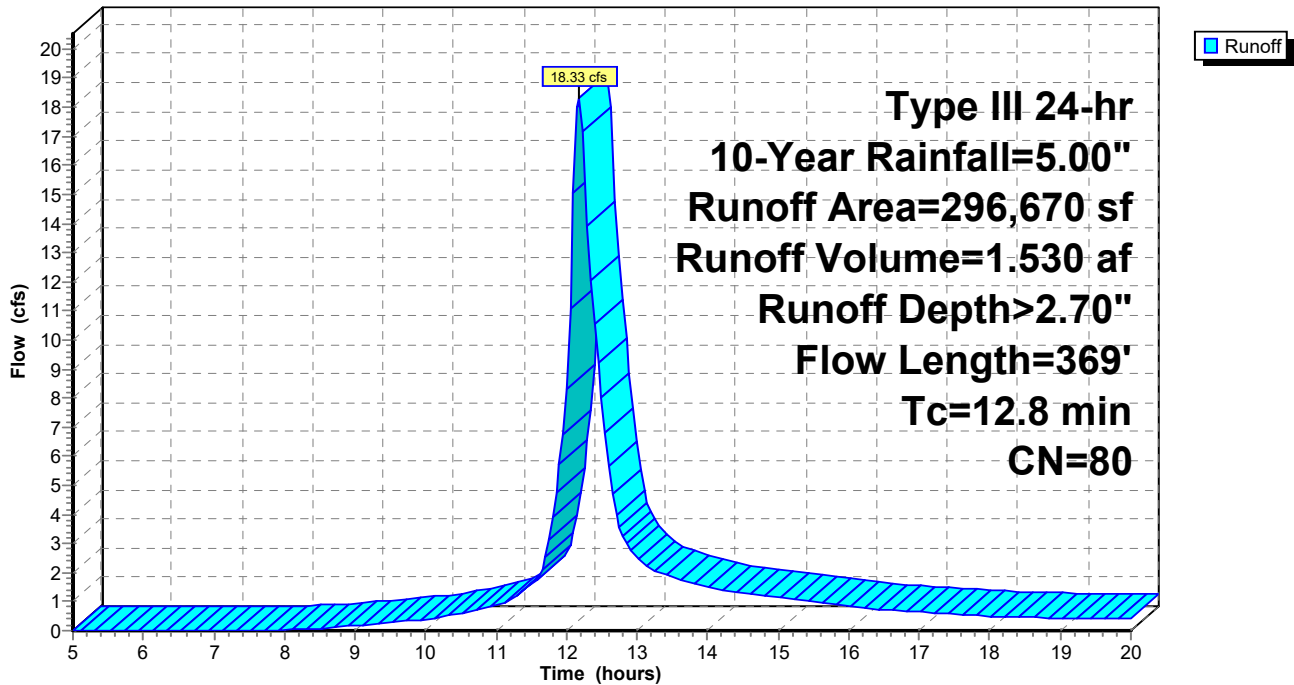
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
148,715	98	Paved parking & roofs
147,955	61	>75% Grass cover, Good, HSG B
296,670	80	Weighted Average
147,955		49.87% Pervious Area
148,715		50.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
0.2	58	0.0369	3.90		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 3S: Existing**

Hydrograph



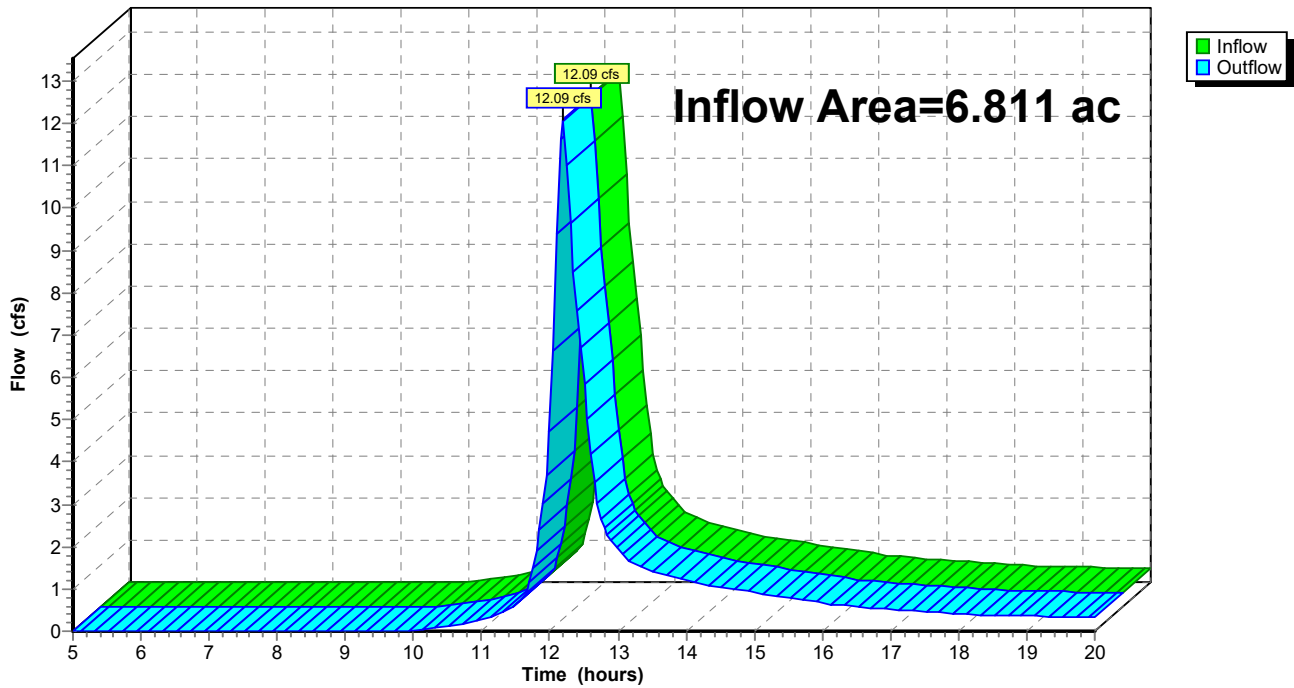
### Summary for Reach 2R: POI-1

Inflow Area = 6.811 ac, 22.88% Impervious, Inflow Depth > 1.79" for 10-Year event  
Inflow = 12.09 cfs @ 12.19 hrs, Volume= 1.018 af  
Outflow = 12.09 cfs @ 12.19 hrs, Volume= 1.018 af, Atten= 0%, Lag= 0.0 min

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

### Reach 2R: POI-1

Hydrograph





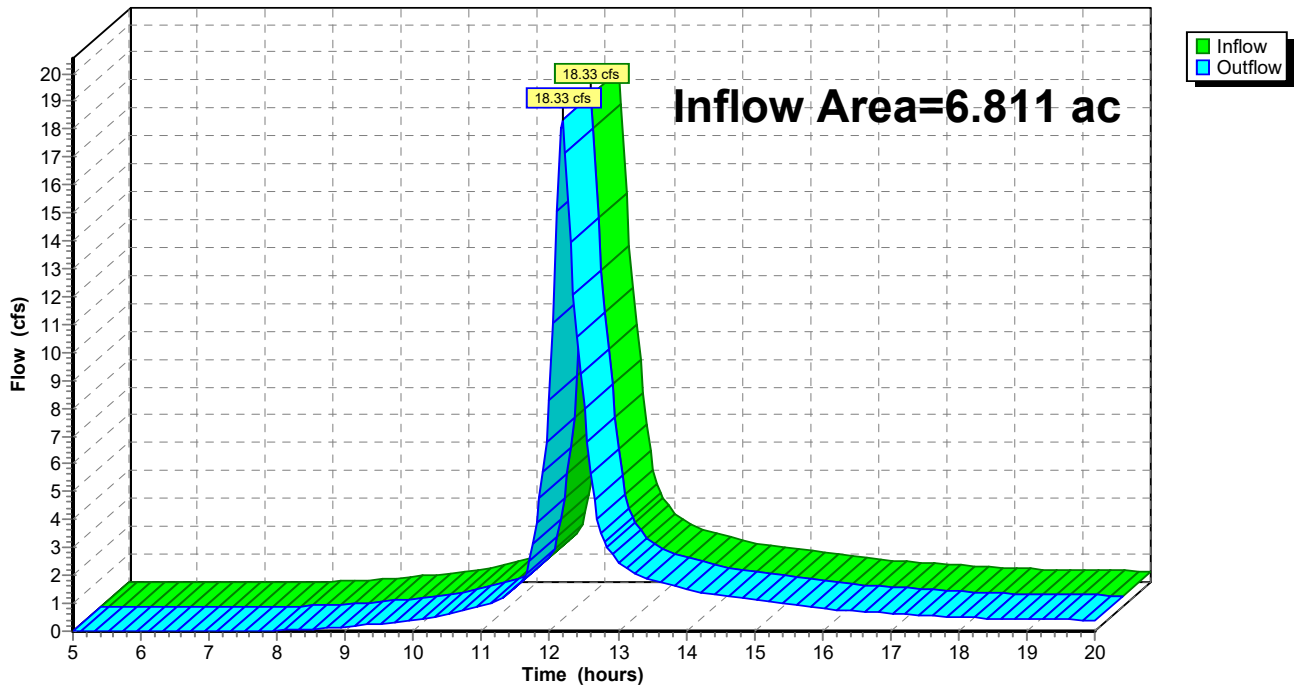
### Summary for Reach 4R: ex alt

Inflow Area = 6.811 ac, 50.13% Impervious, Inflow Depth > 2.70" for 10-Year event  
Inflow = 18.33 cfs @ 12.18 hrs, Volume= 1.530 af  
Outflow = 18.33 cfs @ 12.18 hrs, Volume= 1.530 af, Atten= 0%, Lag= 0.0 min

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

### Reach 4R: ex alt

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.70"

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

**Subcatchment1: Existing**

Runoff Area=296,670 sf 22.88% Impervious Runoff Depth>2.28"  
Flow Length=369' Tc=12.8 min CN=69 Runoff=15.51 cfs 1.297 af

**Subcatchment3S: Existing**

Runoff Area=296,670 sf 50.13% Impervious Runoff Depth>3.28"  
Flow Length=369' Tc=12.8 min CN=80 Runoff=22.22 cfs 1.863 af

**Reach 2R: POI-1**

Inflow=15.51 cfs 1.297 af  
Outflow=15.51 cfs 1.297 af

**Reach 4R: ex alt**

Inflow=22.22 cfs 1.863 af  
Outflow=22.22 cfs 1.863 af

**Total Runoff Area = 13.621 ac Runoff Volume = 3.159 af Average Runoff Depth = 2.78"**  
**63.50% Pervious = 8.649 ac 36.50% Impervious = 4.972 ac**

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Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment 1: Existing**

Runoff = 15.51 cfs @ 12.19 hrs, Volume= 1.297 af, Depth> 2.28"

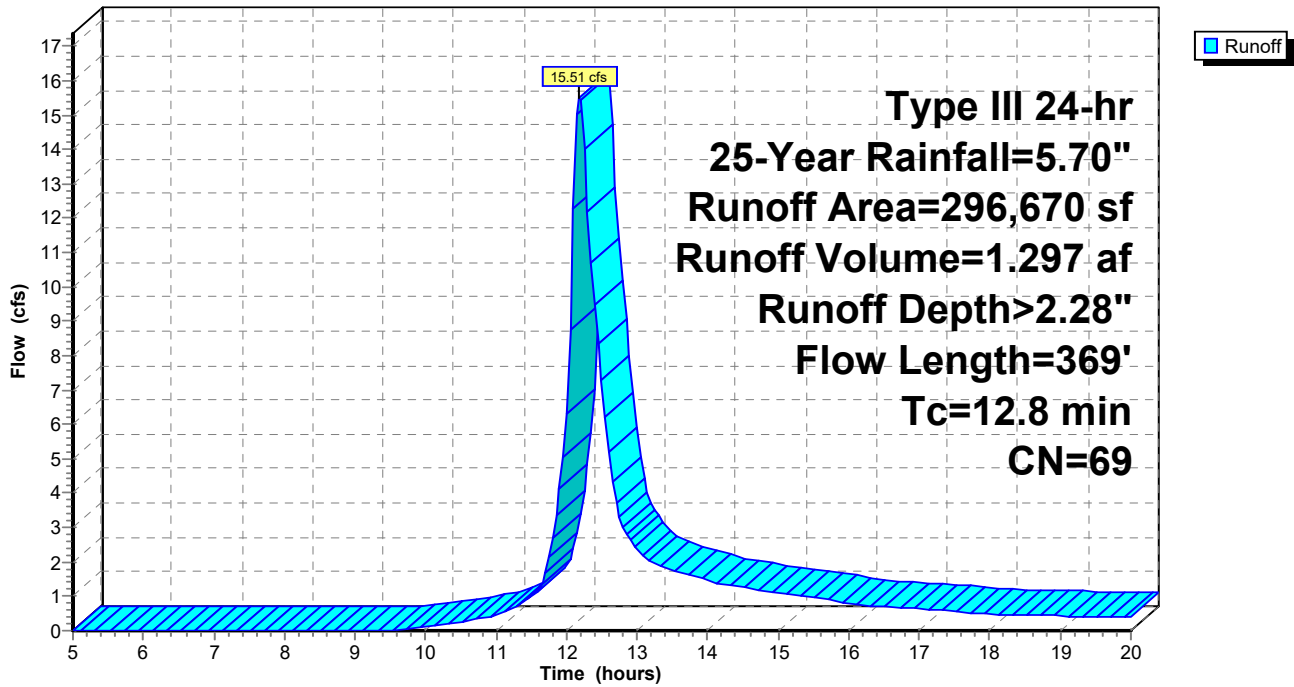
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
67,880	98	Paved parking & roofs
228,790	61	>75% Grass cover, Good, HSG B
296,670	69	Weighted Average
228,790		77.12% Pervious Area
67,880		22.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
0.2	58	0.0369	3.90		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 1: Existing**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment 3S: Existing**

Runoff = 22.22 cfs @ 12.18 hrs, Volume= 1.863 af, Depth> 3.28"

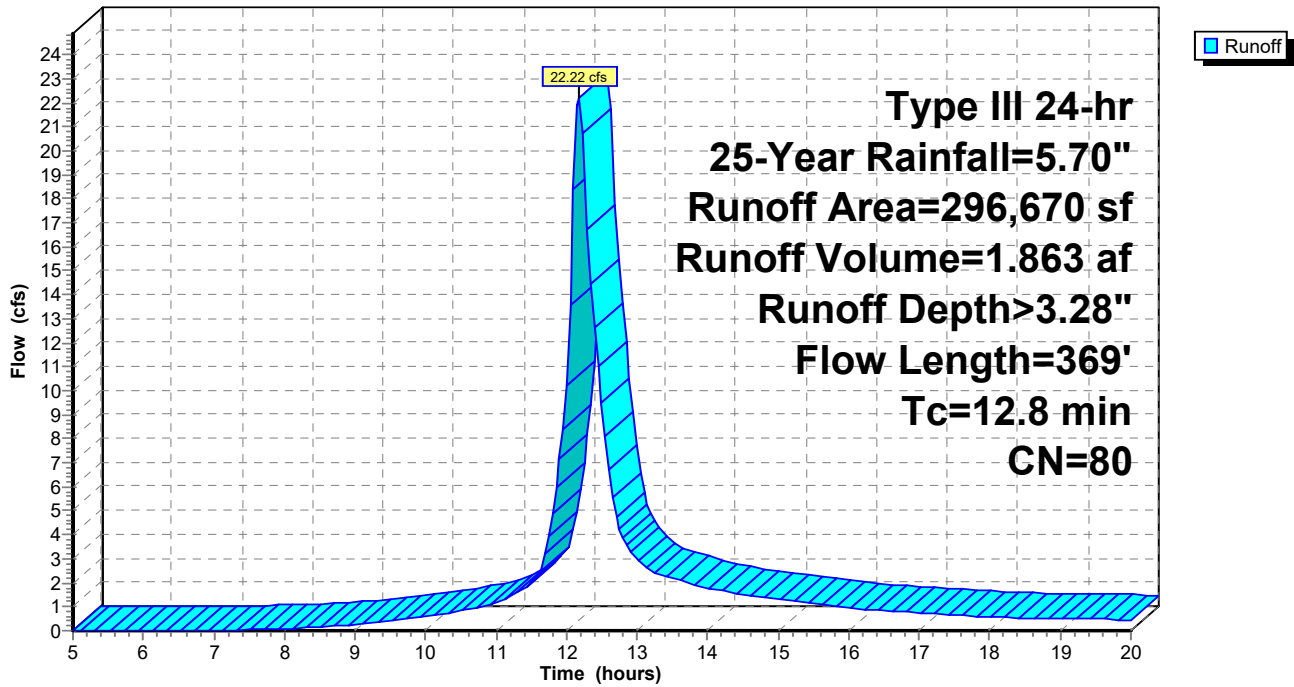
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
148,715	98	Paved parking & roofs
147,955	61	>75% Grass cover, Good, HSG B
296,670	80	Weighted Average
147,955		49.87% Pervious Area
148,715		50.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
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1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
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					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 3S: Existing**

Hydrograph



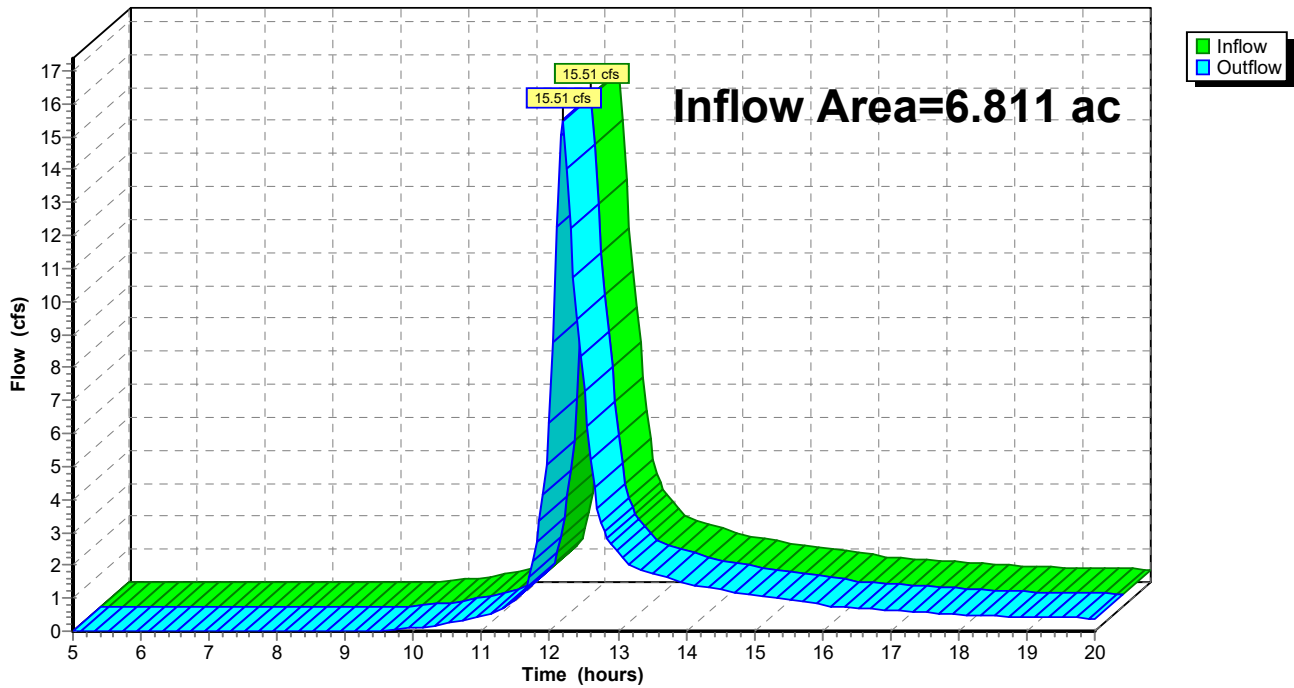
### Summary for Reach 2R: POI-1

Inflow Area = 6.811 ac, 22.88% Impervious, Inflow Depth > 2.28" for 25-Year event  
Inflow = 15.51 cfs @ 12.19 hrs, Volume= 1.297 af  
Outflow = 15.51 cfs @ 12.19 hrs, Volume= 1.297 af, Atten= 0%, Lag= 0.0 min

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

### Reach 2R: POI-1

Hydrograph



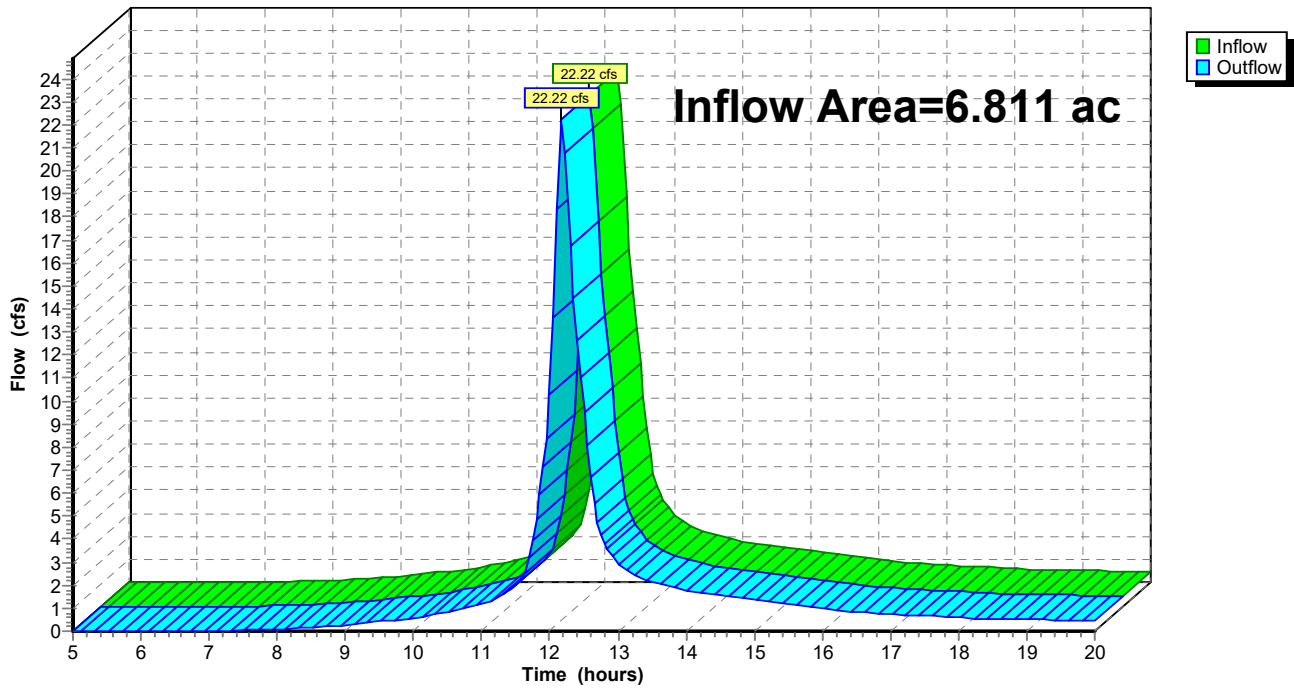
### Summary for Reach 4R: ex alt

Inflow Area = 6.811 ac, 50.13% Impervious, Inflow Depth > 3.28" for 25-Year event  
Inflow = 22.22 cfs @ 12.18 hrs, Volume= 1.863 af  
Outflow = 22.22 cfs @ 12.18 hrs, Volume= 1.863 af, Atten= 0%, Lag= 0.0 min

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

### Reach 4R: ex alt

Hydrograph



**07c2352 Existing-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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

**Subcatchment1: Existing**

Runoff Area=296,670 sf 22.88% Impervious Runoff Depth>3.33"  
Flow Length=369' Tc=12.8 min CN=69 Runoff=22.74 cfs 1.892 af

**Subcatchment3S: Existing**

Runoff Area=296,670 sf 50.13% Impervious Runoff Depth>4.49"  
Flow Length=369' Tc=12.8 min CN=80 Runoff=30.25 cfs 2.549 af

**Reach 2R: POI-1**

Inflow=22.74 cfs 1.892 af  
Outflow=22.74 cfs 1.892 af

**Reach 4R: ex alt**

Inflow=30.25 cfs 2.549 af  
Outflow=30.25 cfs 2.549 af

**Total Runoff Area = 13.621 ac Runoff Volume = 4.440 af Average Runoff Depth = 3.91"**  
**63.50% Pervious = 8.649 ac 36.50% Impervious = 4.972 ac**

**07c2352 Existing-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment 1: Existing**

Runoff = 22.74 cfs @ 12.18 hrs, Volume= 1.892 af, Depth> 3.33"

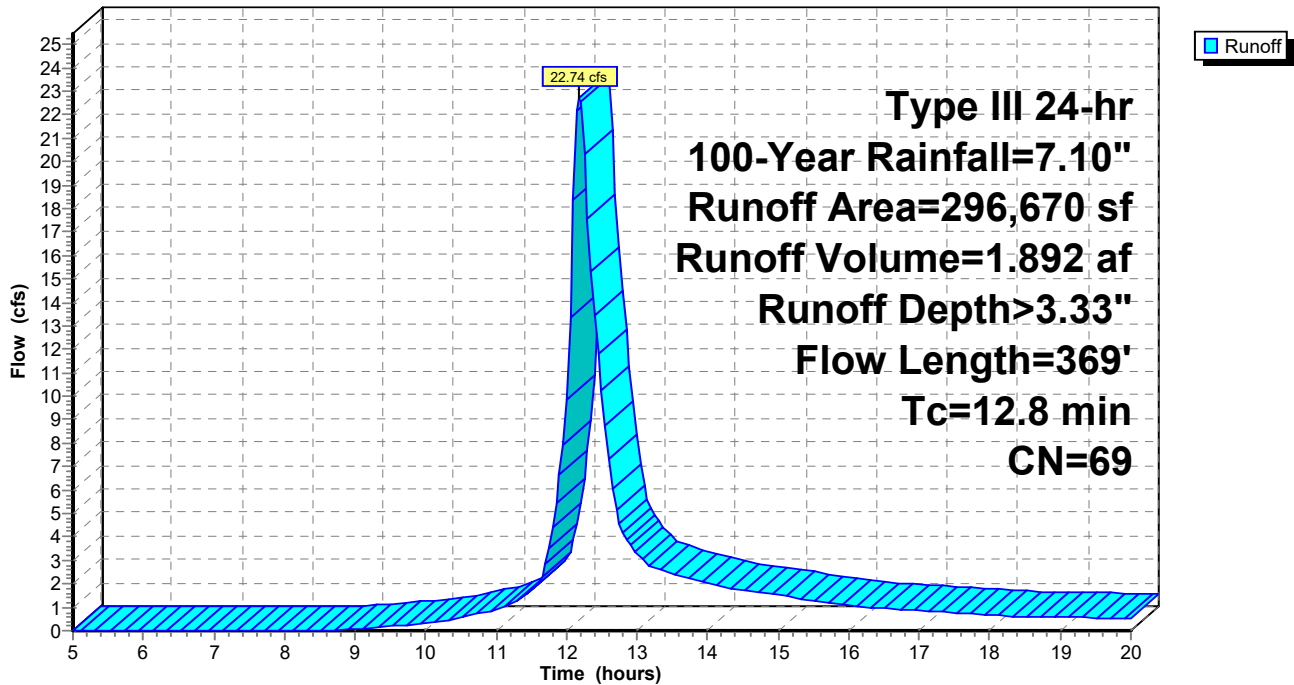
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
67,880	98	Paved parking & roofs
228,790	61	>75% Grass cover, Good, HSG B
296,670	69	Weighted Average
228,790		77.12% Pervious Area
67,880		22.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
0.2	58	0.0369	3.90		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 1: Existing**

Hydrograph





**07c2352 Existing-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment 3S: Existing**

Runoff = 30.25 cfs @ 12.17 hrs, Volume= 2.549 af, Depth> 4.49"

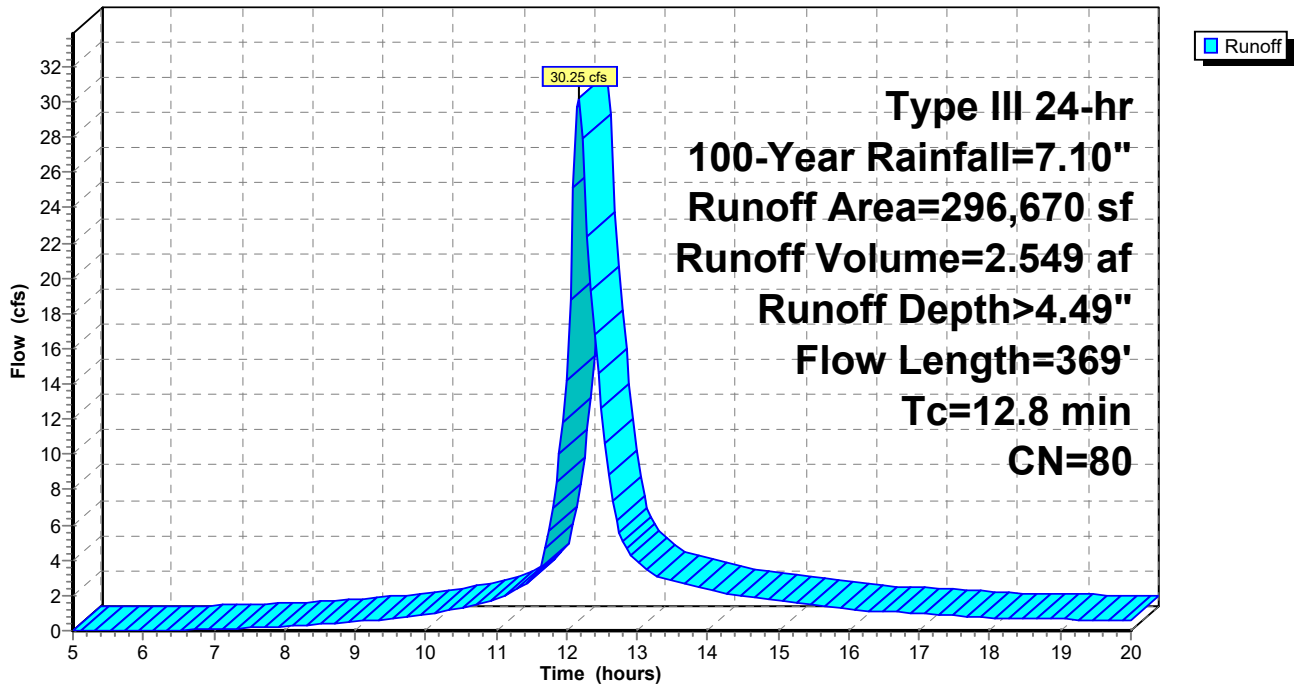
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
148,715	98	Paved parking & roofs
147,955	61	>75% Grass cover, Good, HSG B
296,670	80	Weighted Average
147,955		49.87% Pervious Area
148,715		50.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	160	0.0312	0.23		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
1.0	151	0.0265	2.62		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
0.2	58	0.0369	3.90		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
12.8	369	Total			

**Subcatchment 3S: Existing**

Hydrograph



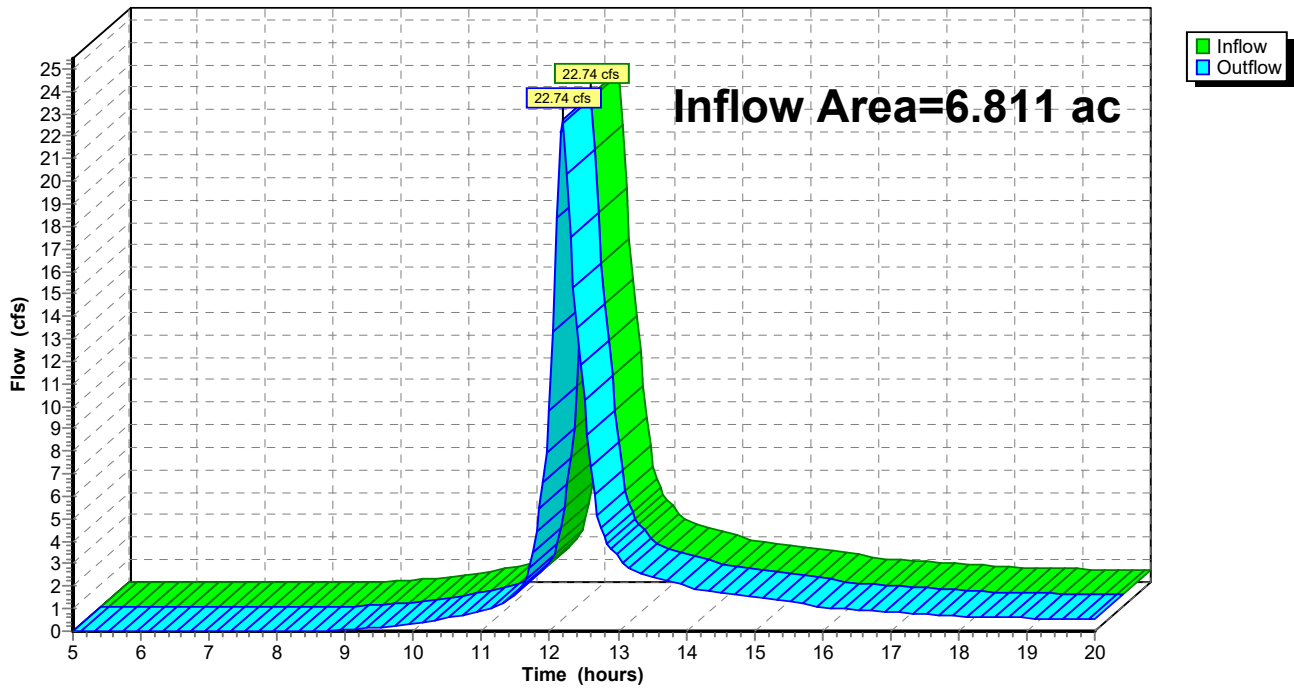
### Summary for Reach 2R: POI-1

Inflow Area = 6.811 ac, 22.88% Impervious, Inflow Depth > 3.33" for 100-Year event  
Inflow = 22.74 cfs @ 12.18 hrs, Volume= 1.892 af  
Outflow = 22.74 cfs @ 12.18 hrs, Volume= 1.892 af, Atten= 0%, Lag= 0.0 min

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

### Reach 2R: POI-1

Hydrograph



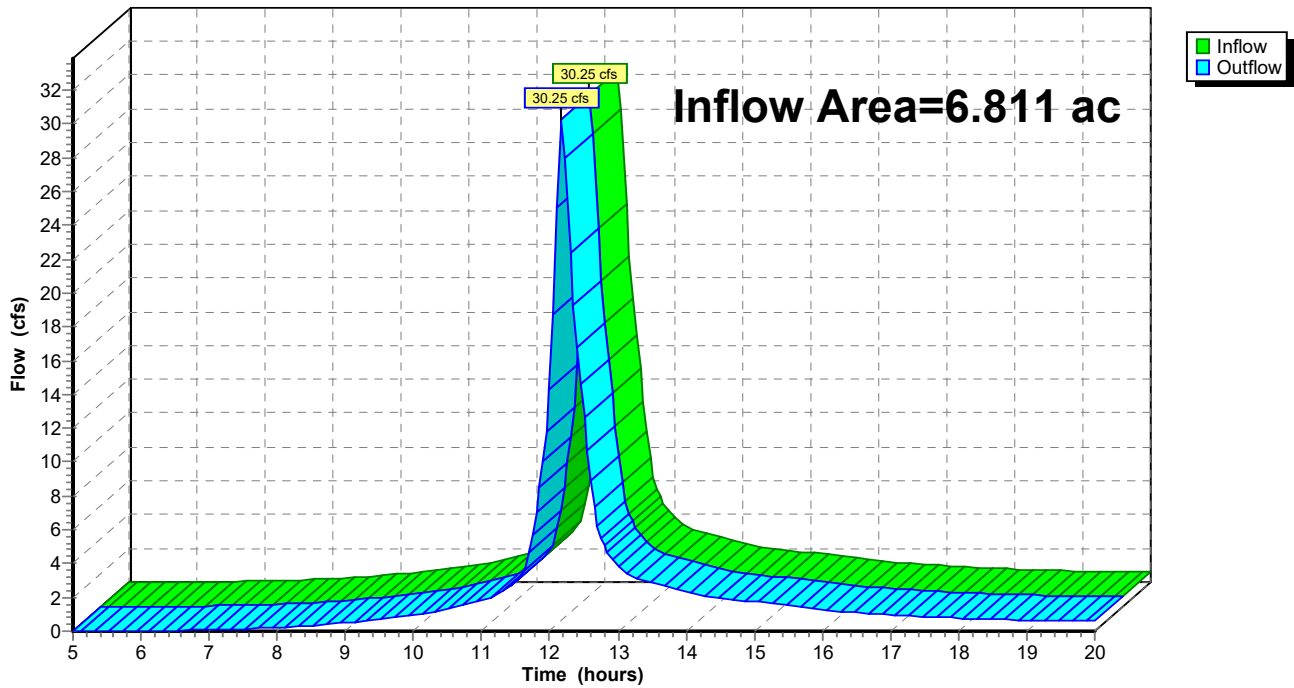
### Summary for Reach 4R: ex alt

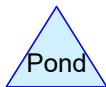
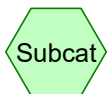
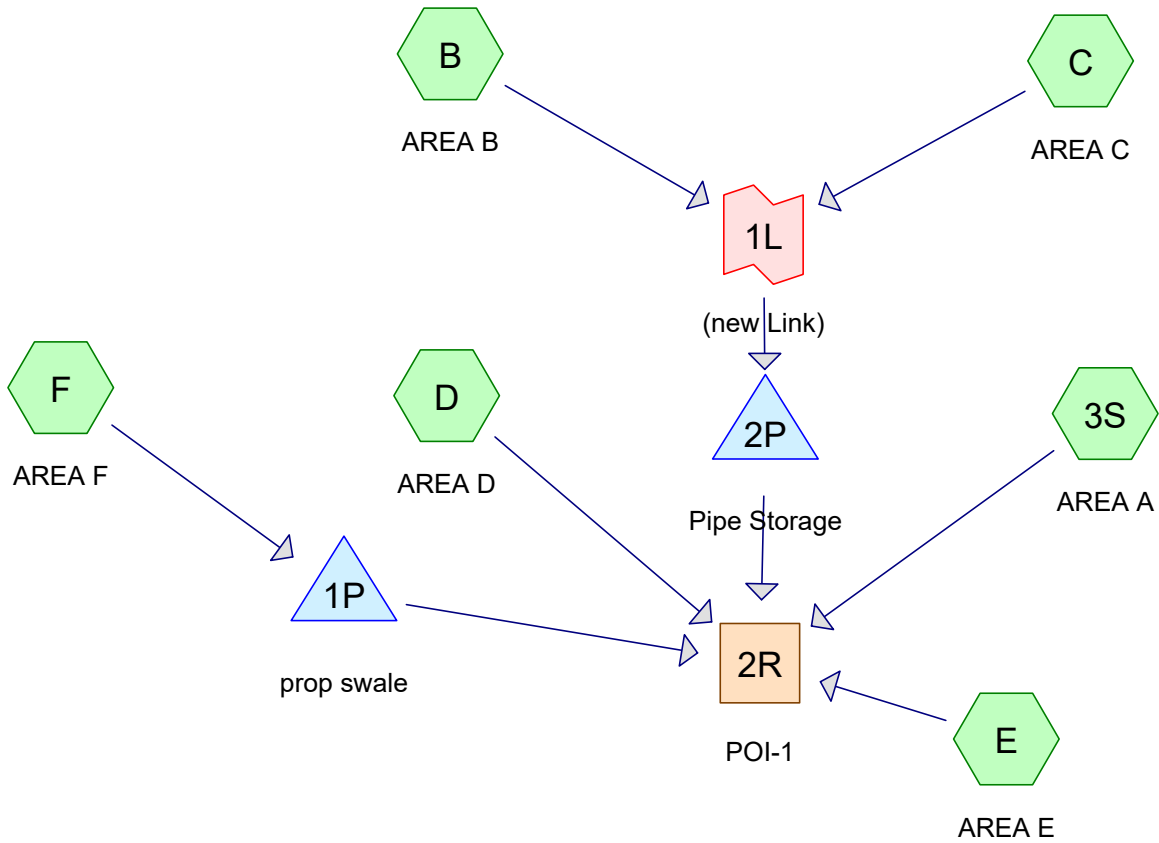
Inflow Area = 6.811 ac, 50.13% Impervious, Inflow Depth > 4.49" for 100-Year event  
Inflow = 30.25 cfs @ 12.17 hrs, Volume= 2.549 af  
Outflow = 30.25 cfs @ 12.17 hrs, Volume= 2.549 af, Atten= 0%, Lag= 0.0 min

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

### Reach 4R: ex alt

Hydrograph





**Routing Diagram for 07c2352 Proposed-NEW**  
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## Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.258	98	(3S, B, C, D, E, F)
2.683	74	>75% Grass cover, Good, HSG C (3S, B, C, D, E, F)
<b>6.940</b>	<b>89</b>	<b>TOTAL AREA</b>

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## Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.683	HSG C	3S, B, C, D, E, F
0.000	HSG D	
4.258	Other	3S, B, C, D, E, F
<b>6.940</b>		<b>TOTAL AREA</b>

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**Ground Covers (all nodes)**

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	4.258	4.258		3S, B, C, D, E, F
0.000	0.000	2.683	0.000	0.000	2.683	>75% Grass cover, Good	3S, B, C, D, E, F
<b>0.000</b>	<b>0.000</b>	<b>2.683</b>	<b>0.000</b>	<b>4.258</b>	<b>6.940</b>	<b>TOTAL AREA</b>	

**07c2352 Proposed-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment3S: AREAA</b>	Runoff Area=89,620 sf 28.40% Impervious Runoff Depth>1.50" Flow Length=711' Tc=17.8 min CN=81 Runoff=2.75 cfs 0.258 af
<b>SubcatchmentB: AREAB</b>	Runoff Area=10,575 sf 75.61% Impervious Runoff Depth>2.40" Tc=5.0 min CN=92 Runoff=0.71 cfs 0.049 af
<b>SubcatchmentC: AREAC</b>	Runoff Area=14,414 sf 55.43% Impervious Runoff Depth>1.96" Tc=5.0 min CN=87 Runoff=0.81 cfs 0.054 af
<b>SubcatchmentD: AREAD</b>	Runoff Area=31,369 sf 87.60% Impervious Runoff Depth>2.70" Tc=5.0 min CN=95 Runoff=2.27 cfs 0.162 af
<b>SubcatchmentE: AREAE</b>	Runoff Area=75,577 sf 71.94% Impervious Runoff Depth>2.31" Tc=5.0 min CN=91 Runoff=4.91 cfs 0.334 af
<b>SubcatchmentF: AREAF</b>	Runoff Area=80,759 sf 76.99% Impervious Runoff Depth>2.40" Tc=5.0 min CN=92 Runoff=5.41 cfs 0.371 af
<b>Reach 2R: POI-1</b>	Inflow=9.29 cfs 0.839 af Outflow=9.29 cfs 0.839 af
<b>Pond 1P: prop swale</b>	Peak Elev=12.38' Storage=16,141 cf Inflow=5.41 cfs 0.371 af Outflow=0.00 cfs 0.000 af
<b>Pond 2P: Pipe Storage</b>	Peak Elev=18.36' Storage=1,521 cf Inflow=1.52 cfs 0.103 af Outflow=0.74 cfs 0.086 af
<b>Link 1L: (new Link)</b>	Inflow=1.52 cfs 0.103 af Primary=1.52 cfs 0.103 af

**Total Runoff Area = 6.940 ac Runoff Volume = 1.226 af Average Runoff Depth = 2.12"**  
**38.65% Pervious = 2.683 ac 61.35% Impervious = 4.258 ac**



**07c2352 Proposed-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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**Summary for Subcatchment 3S: AREA A**

Runoff = 2.75 cfs @ 12.25 hrs, Volume= 0.258 af, Depth> 1.50"

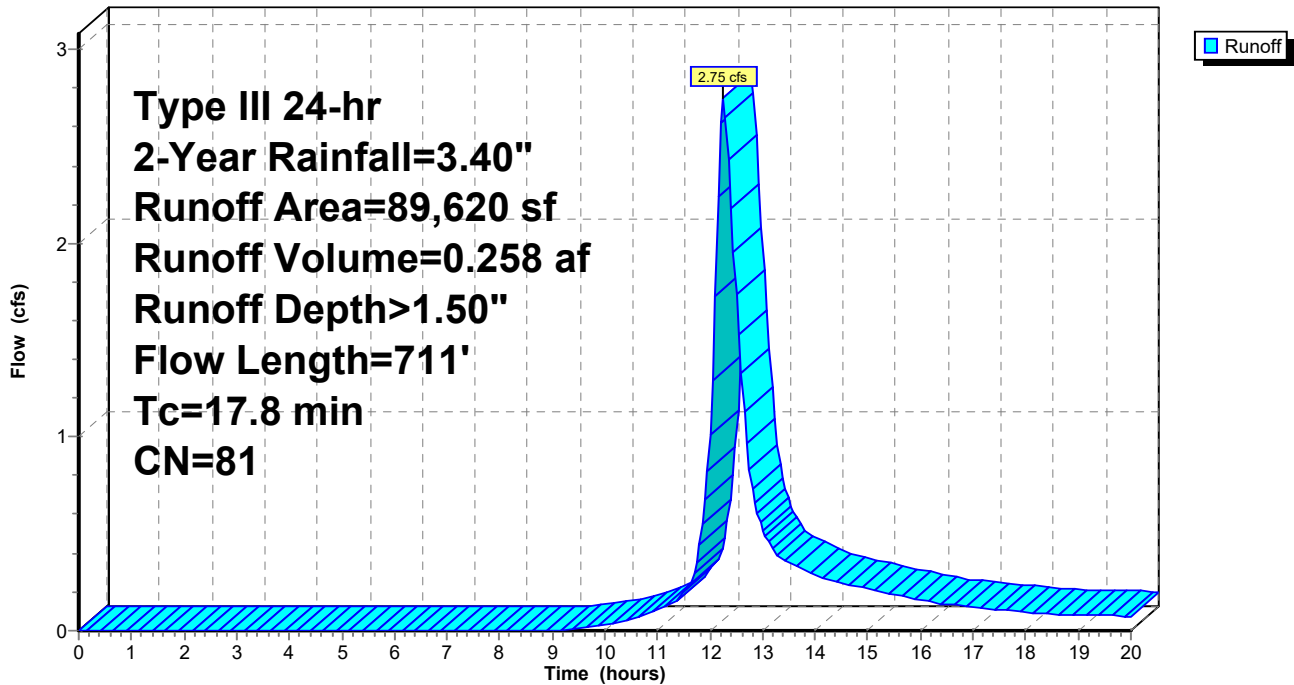
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
64,169	74	>75% Grass cover, Good, HSG C
* 25,451	98	
89,620	81	Weighted Average
64,169		71.60% Pervious Area
25,451		28.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	153	0.0163	0.18		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
0.7	129	0.0388	3.17		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
2.6	429	0.0179	2.72		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
17.8	711	Total			

**Subcatchment 3S: AREA A**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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**Summary for Subcatchment B: AREA B**

Runoff = 0.71 cfs @ 12.07 hrs, Volume= 0.049 af, Depth> 2.40"

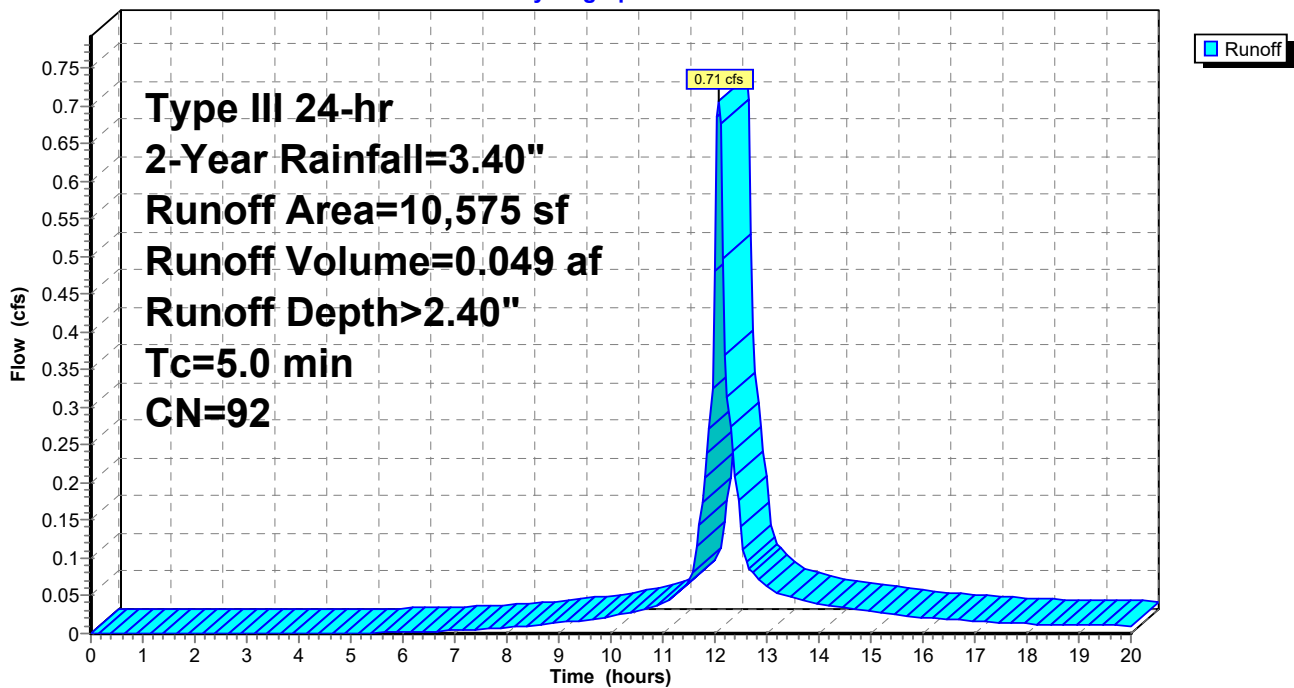
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	7,996	98	
	2,579	74	>75% Grass cover, Good, HSG C
	10,575	92	Weighted Average
	2,579		24.39% Pervious Area
	7,996		75.61% Impervious Area

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

**Subcatchment B: AREA B**

Hydrograph



**Summary for Subcatchment C: AREA C**

Runoff = 0.81 cfs @ 12.08 hrs, Volume= 0.054 af, Depth> 1.96"

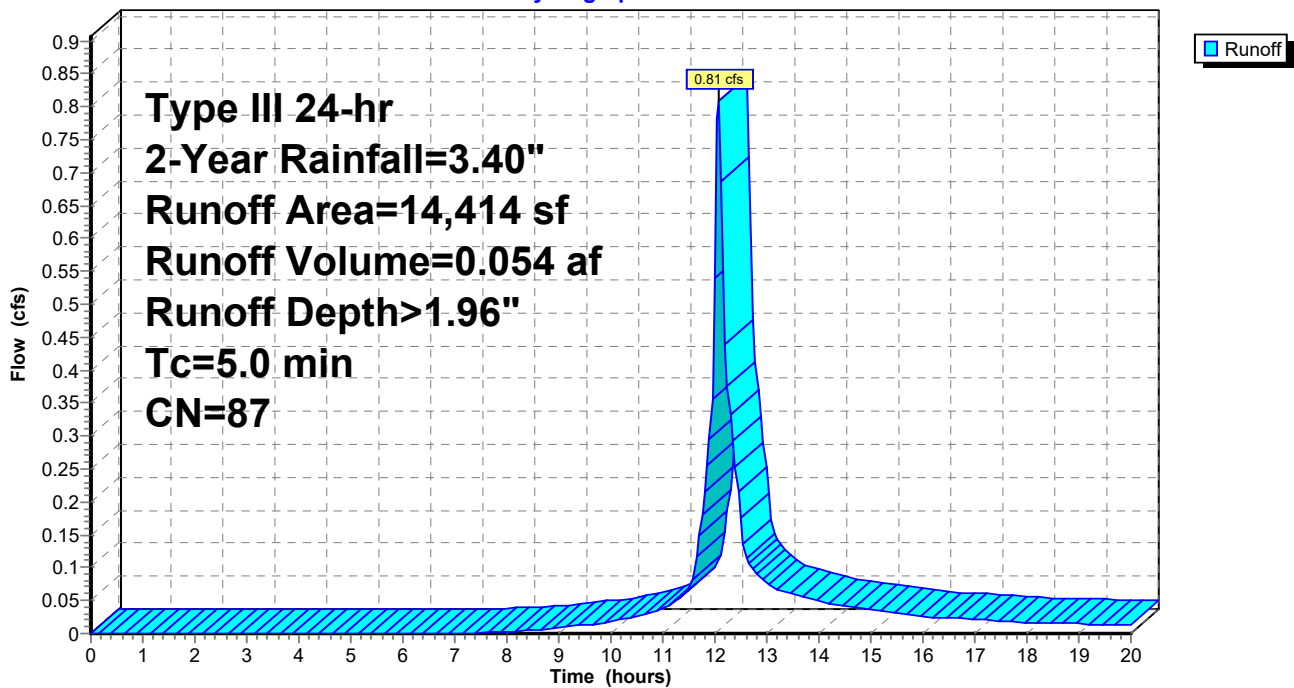
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	7,989	98	
	6,425	74	>75% Grass cover, Good, HSG C
	14,414	87	Weighted Average
	6,425		44.57% Pervious Area
	7,989		55.43% Impervious Area

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

**Subcatchment C: AREA C**

Hydrograph



**Summary for Subcatchment D: AREA D**

Runoff = 2.27 cfs @ 12.07 hrs, Volume= 0.162 af, Depth> 2.70"

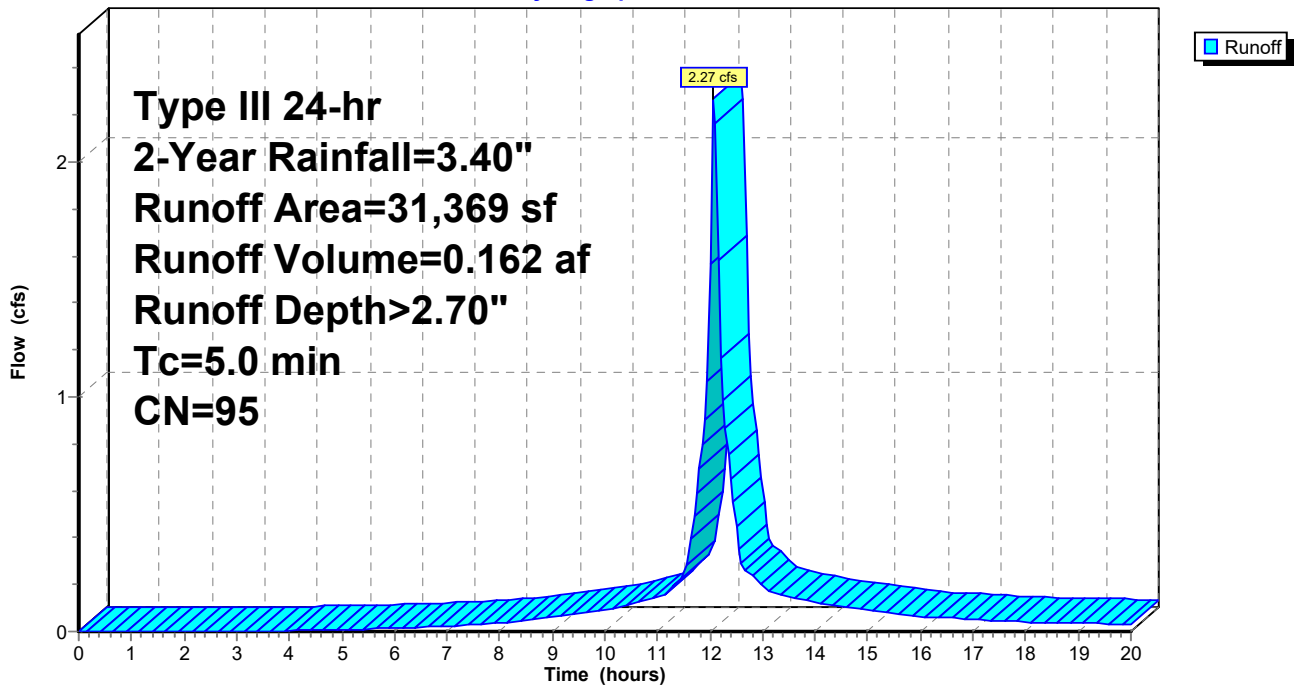
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	27,479	98	
	3,890	74	>75% Grass cover, Good, HSG C
	31,369	95	Weighted Average
	3,890		12.40% Pervious Area
	27,479		87.60% Impervious Area

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

**Subcatchment D: AREA D**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.40"

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**Summary for Subcatchment E: AREA E**

Runoff = 4.91 cfs @ 12.07 hrs, Volume= 0.334 af, Depth> 2.31"

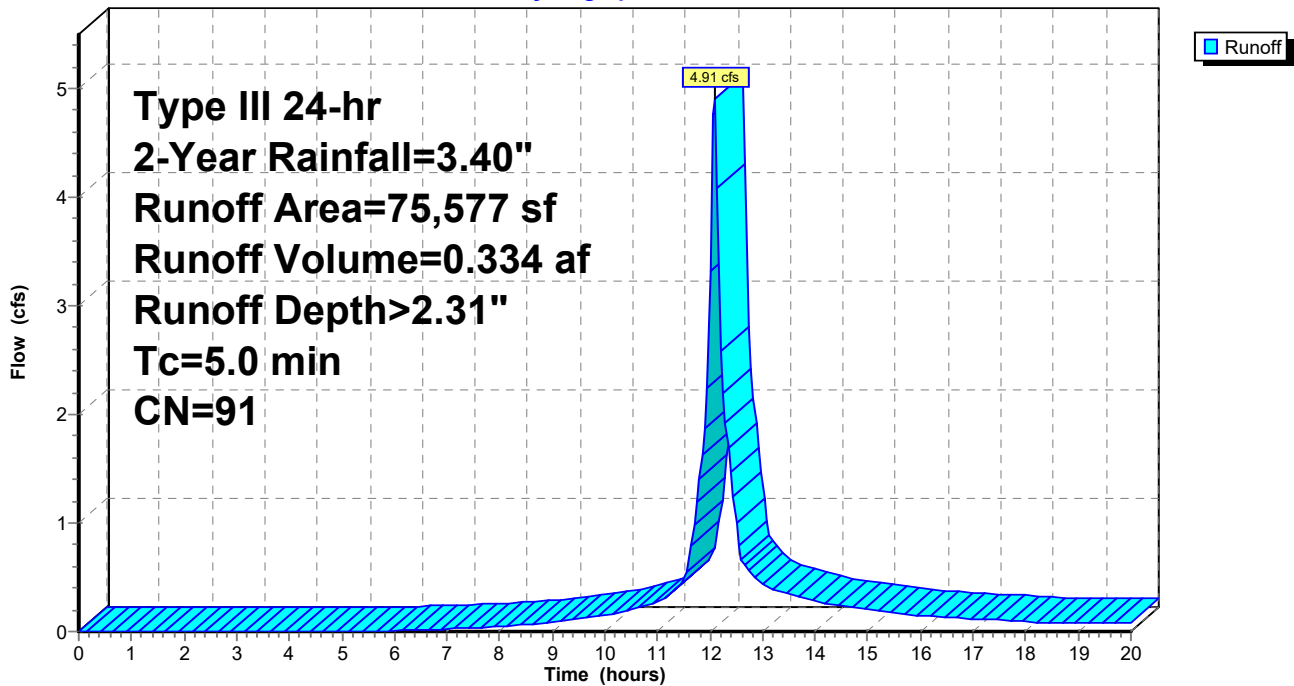
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	54,371	98	
	21,206	74	>75% Grass cover, Good, HSG C
	75,577	91	Weighted Average
	21,206		28.06% Pervious Area
	54,371		71.94% Impervious Area

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

**Subcatchment E: AREA E**

Hydrograph



**Summary for Subcatchment F: AREA F**

Runoff = 5.41 cfs @ 12.07 hrs, Volume= 0.371 af, Depth> 2.40"

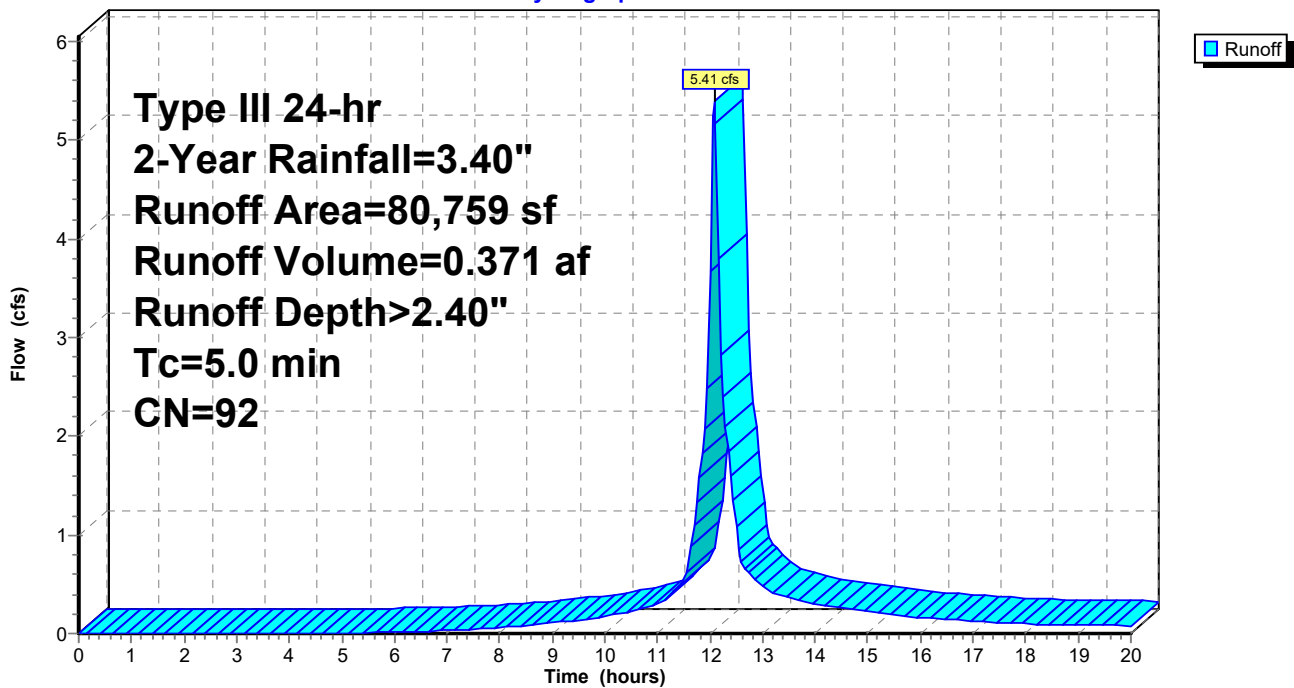
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-Year Rainfall=3.40"

	Area (sf)	CN	Description
*	62,177	98	
	18,582	74	>75% Grass cover, Good, HSG C
	80,759	92	Weighted Average
	18,582		23.01% Pervious Area
	62,177		76.99% Impervious Area

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

**Subcatchment F: AREA F**

Hydrograph



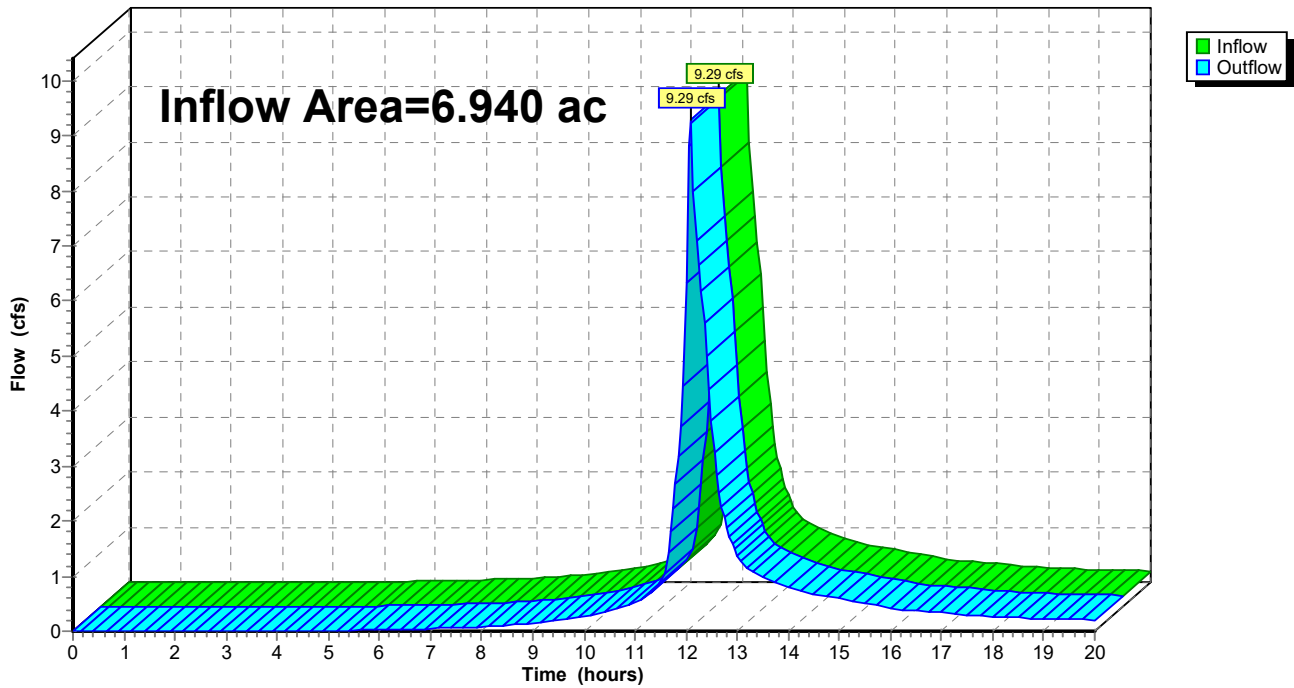
### Summary for Reach 2R: POI-1

Inflow Area = 6.940 ac, 61.35% Impervious, Inflow Depth > 1.45" for 2-Year event  
Inflow = 9.29 cfs @ 12.09 hrs, Volume= 0.839 af  
Outflow = 9.29 cfs @ 12.09 hrs, Volume= 0.839 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Reach 2R: POI-1

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 2-Year Rainfall=3.40"

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**Summary for Pond 1P: prop swale**

Inflow Area = 1.854 ac, 76.99% Impervious, Inflow Depth > 2.40" for 2-Year event  
 Inflow = 5.41 cfs @ 12.07 hrs, Volume= 0.371 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 12.38' @ 20.00 hrs Surf.Area= 5,971 sf Storage= 16,141 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	28,176 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	540	0	0
8.00	1,482	2,022	2,022
10.00	2,580	4,062	6,084
12.00	5,330	7,910	13,994
13.00	7,017	6,174	20,168
14.00	9,000	8,009	28,176

Device	Routing	Invert	Outlet Devices
#1	Primary	13.00'	<b>20.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

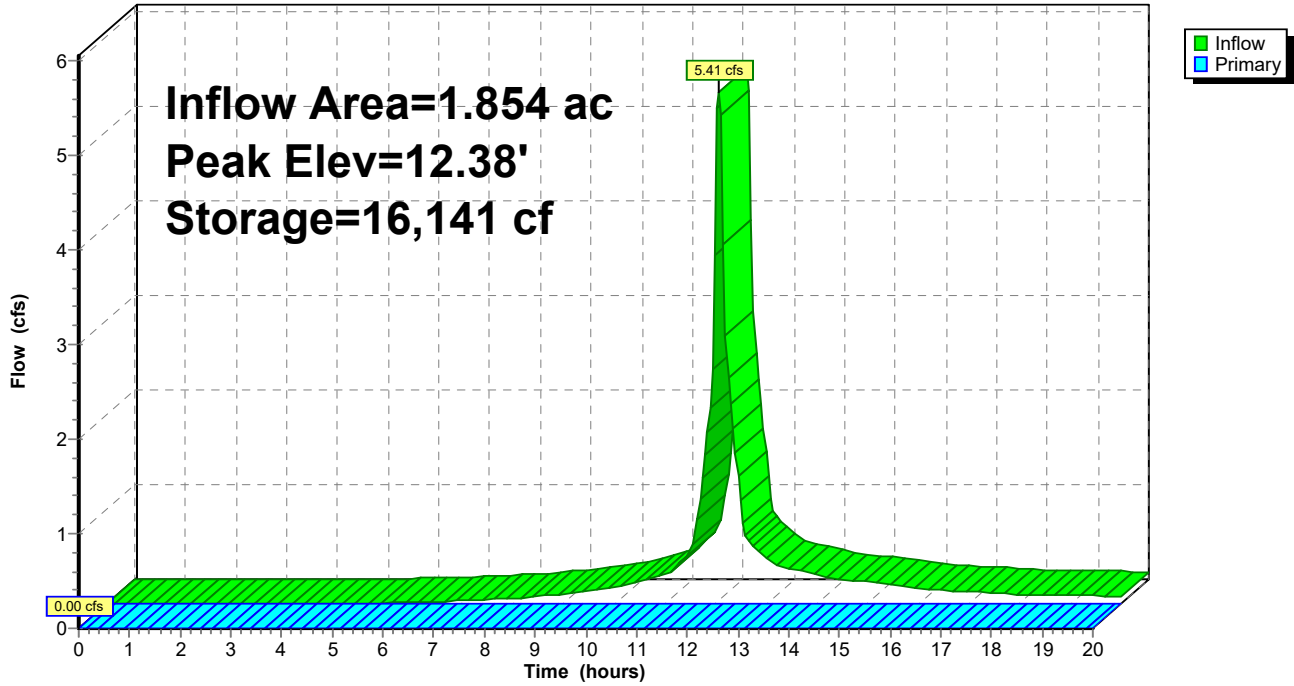
**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=6.00' (Free Discharge)

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



### Pond 1P: prop swale

Hydrograph



### Summary for Pond 2P: Pipe Storage

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 2.15" for 2-Year event  
 Inflow = 1.52 cfs @ 12.07 hrs, Volume= 0.103 af  
 Outflow = 0.74 cfs @ 12.23 hrs, Volume= 0.086 af, Atten= 52%, Lag= 9.5 min  
 Primary = 0.74 cfs @ 12.23 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 18.36' @ 12.23 hrs Surf.Area= 1,615 sf Storage= 1,521 cf

Plug-Flow detention time= 88.1 min calculated for 0.086 af (84% of inflow)  
 Center-of-Mass det. time= 42.9 min ( 816.2 - 773.3 )

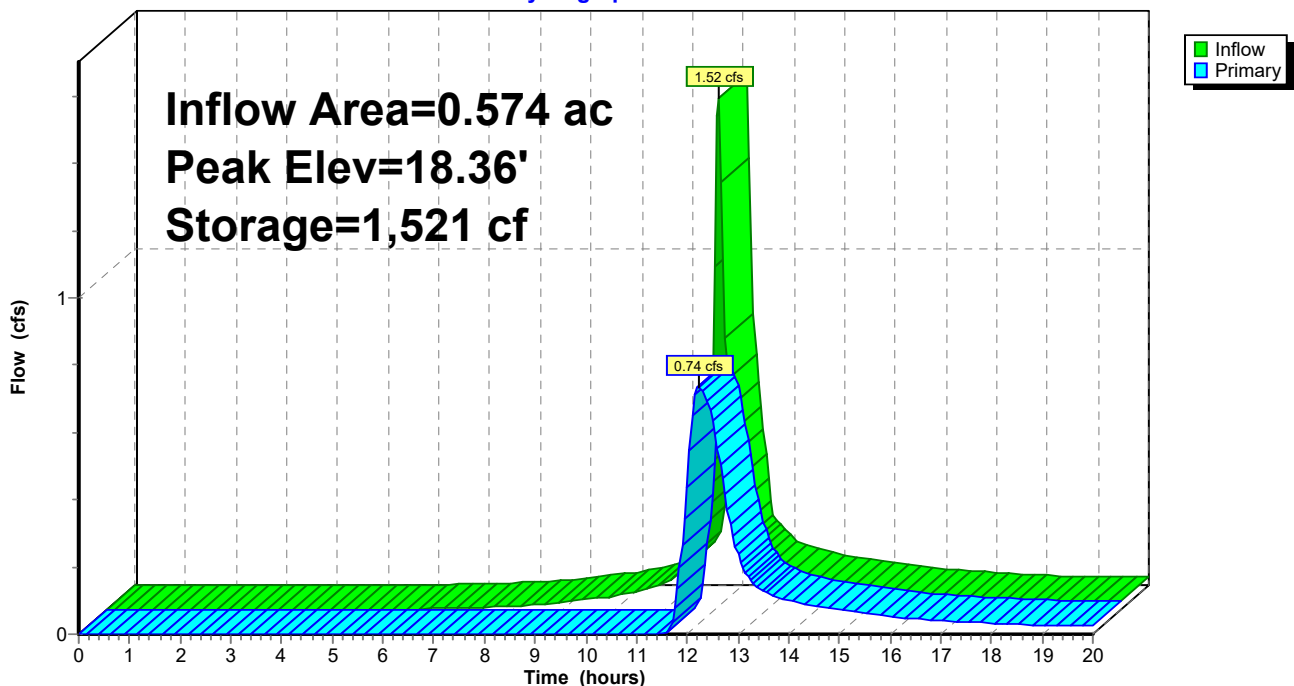
Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	2,283 cf	<b>36.0" Round Pipe Storage</b> Inside #2 L= 323.0'
#2	16.50'	2,317 cf	<b>5.00'W x 323.00'L x 5.00'H Prismatic</b> 8,075 cf Overall - 2,283 cf Embedded = 5,792 cf x 40.0% Voids
		4,600 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.73 cfs @ 12.23 hrs HW=18.35' (Free Discharge)  
 ↳1=Orifice/Grate (Orifice Controls 0.73 cfs @ 3.74 fps)

### Pond 2P: Pipe Storage

Hydrograph



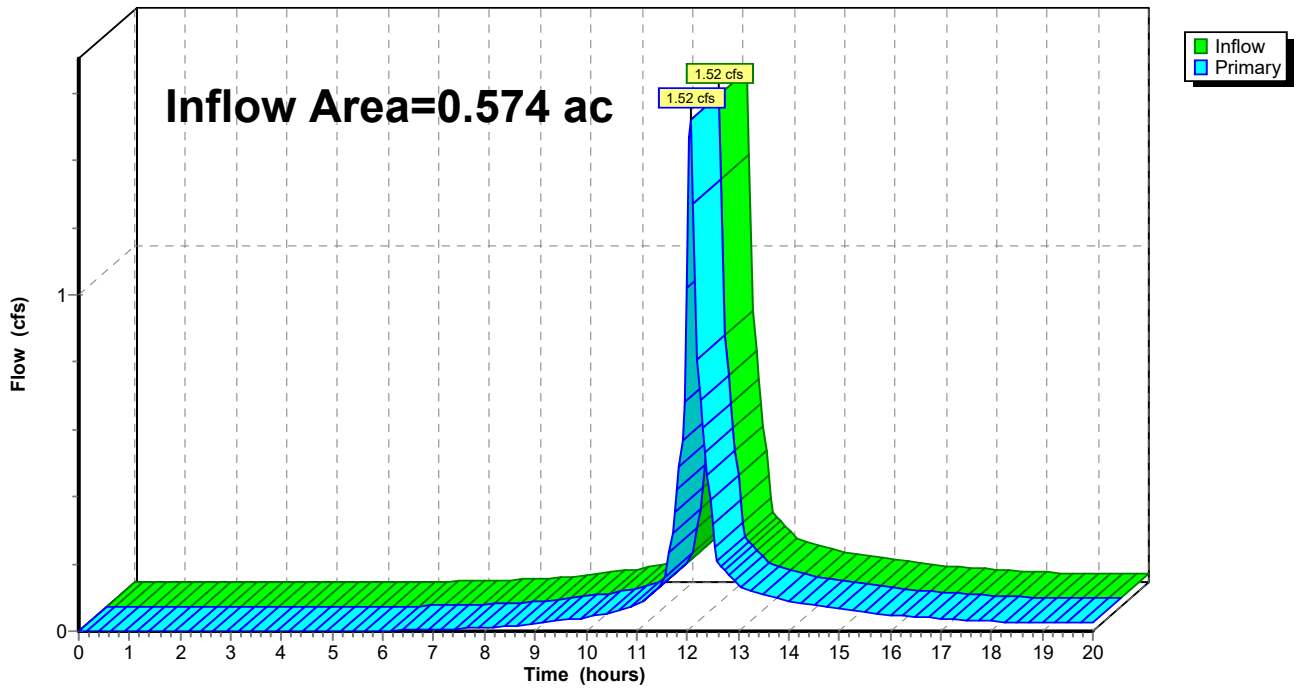
### Summary for Link 1L: (new Link)

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 2.15" for 2-Year event  
Inflow = 1.52 cfs @ 12.07 hrs, Volume= 0.103 af  
Primary = 1.52 cfs @ 12.07 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Link 1L: (new Link)

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment3S: AREAA</b>	Runoff Area=89,620 sf 28.40% Impervious Runoff Depth>2.78" Flow Length=711' Tc=17.8 min CN=81 Runoff=5.07 cfs 0.477 af
<b>SubcatchmentB: AREAB</b>	Runoff Area=10,575 sf 75.61% Impervious Runoff Depth>3.88" Tc=5.0 min CN=92 Runoff=1.11 cfs 0.078 af
<b>SubcatchmentC: AREAC</b>	Runoff Area=14,414 sf 55.43% Impervious Runoff Depth>3.36" Tc=5.0 min CN=87 Runoff=1.37 cfs 0.093 af
<b>SubcatchmentD: AREAD</b>	Runoff Area=31,369 sf 87.60% Impervious Runoff Depth>4.20" Tc=5.0 min CN=95 Runoff=3.45 cfs 0.252 af
<b>SubcatchmentE: AREAE</b>	Runoff Area=75,577 sf 71.94% Impervious Runoff Depth>3.77" Tc=5.0 min CN=91 Runoff=7.80 cfs 0.545 af
<b>SubcatchmentF: AREAF</b>	Runoff Area=80,759 sf 76.99% Impervious Runoff Depth>3.88" Tc=5.0 min CN=92 Runoff=8.49 cfs 0.599 af
<b>Reach 2R: POI-1</b>	Inflow=15.04 cfs 1.563 af Outflow=15.04 cfs 1.563 af
<b>Pond 1P: prop swale</b>	Peak Elev=13.04' Storage=20,454 cf Inflow=8.49 cfs 0.599 af Outflow=0.48 cfs 0.134 af
<b>Pond 2P: Pipe Storage</b>	Peak Elev=18.96' Storage=2,247 cf Inflow=2.48 cfs 0.171 af Outflow=1.04 cfs 0.154 af
<b>Link 1L: (new Link)</b>	Inflow=2.48 cfs 0.171 af Primary=2.48 cfs 0.171 af

**Total Runoff Area = 6.940 ac Runoff Volume = 2.044 af Average Runoff Depth = 3.53"**  
**38.65% Pervious = 2.683 ac 61.35% Impervious = 4.258 ac**

**07c2352 Proposed-NEW**

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Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment 3S: AREA A**

Runoff = 5.07 cfs @ 12.25 hrs, Volume= 0.477 af, Depth> 2.78"

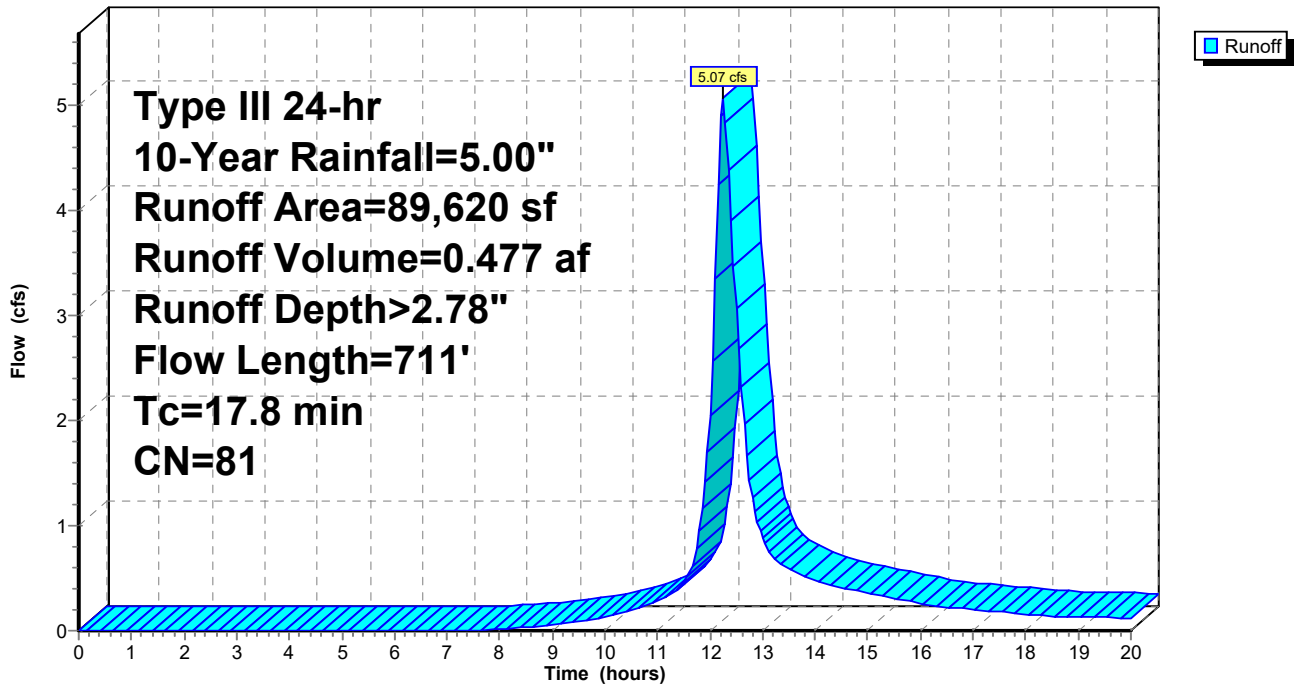
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

Area (sf)	CN	Description
64,169	74	>75% Grass cover, Good, HSG C
* 25,451	98	
89,620	81	Weighted Average
64,169		71.60% Pervious Area
25,451		28.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	153	0.0163	0.18		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
0.7	129	0.0388	3.17		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
2.6	429	0.0179	2.72		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
17.8	711	Total			

**Subcatchment 3S: AREA A**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment B: AREA B**

Runoff = 1.11 cfs @ 12.07 hrs, Volume= 0.078 af, Depth> 3.88"

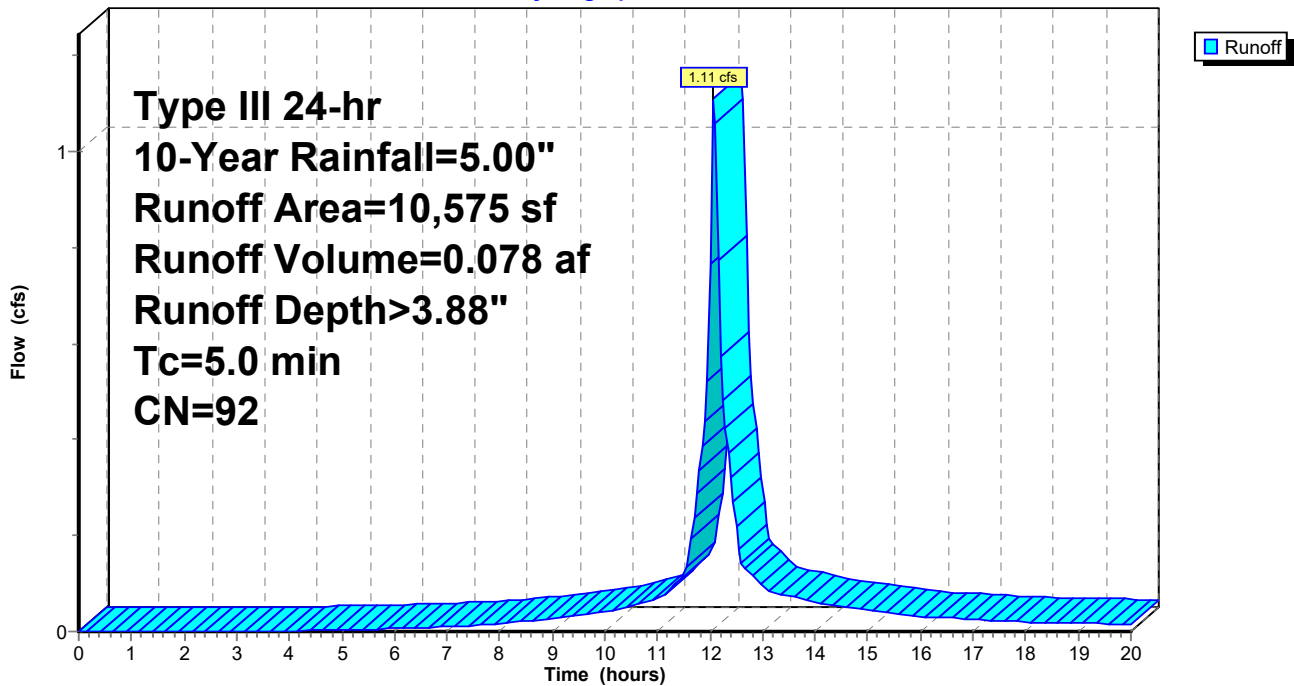
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	7,996	98	
	2,579	74	>75% Grass cover, Good, HSG C
	10,575	92	Weighted Average
	2,579		24.39% Pervious Area
	7,996		75.61% Impervious Area

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

**Subcatchment B: AREA B**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment C: AREA C**

Runoff = 1.37 cfs @ 12.07 hrs, Volume= 0.093 af, Depth> 3.36"

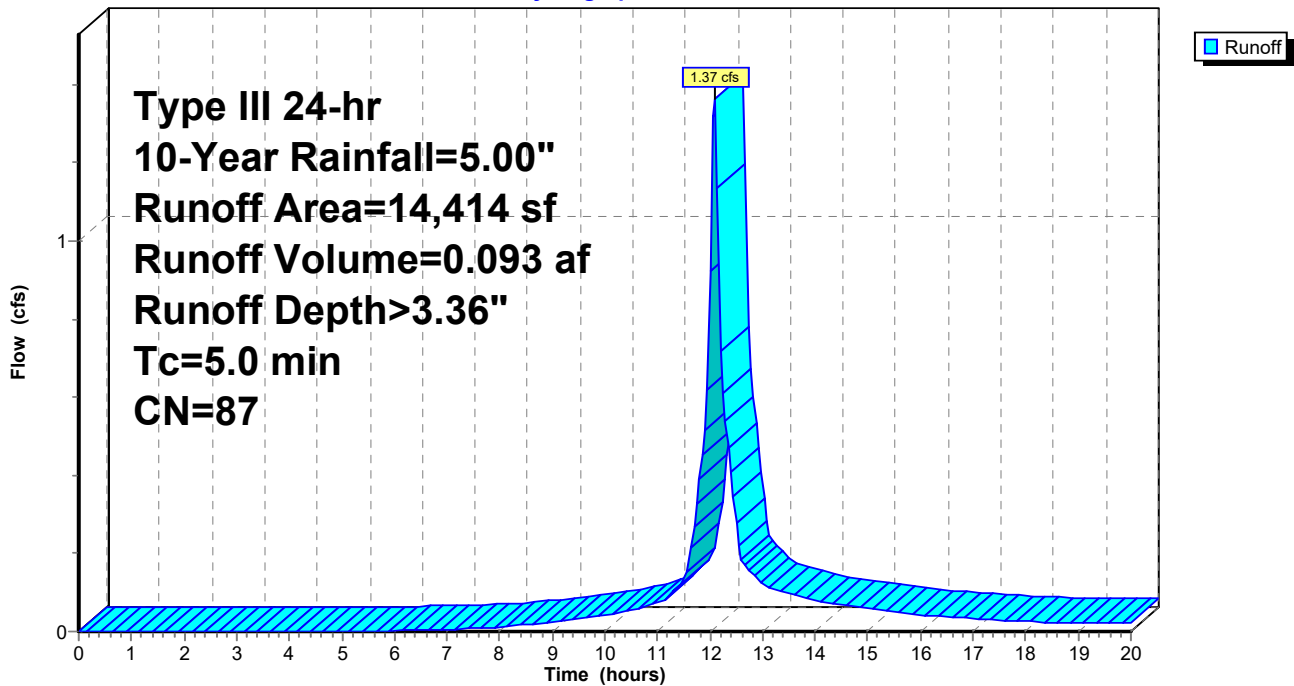
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	7,989	98	
	6,425	74	>75% Grass cover, Good, HSG C
	14,414	87	Weighted Average
	6,425		44.57% Pervious Area
	7,989		55.43% Impervious Area

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

**Subcatchment C: AREA C**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment D: AREA D**

Runoff = 3.45 cfs @ 12.07 hrs, Volume= 0.252 af, Depth> 4.20"

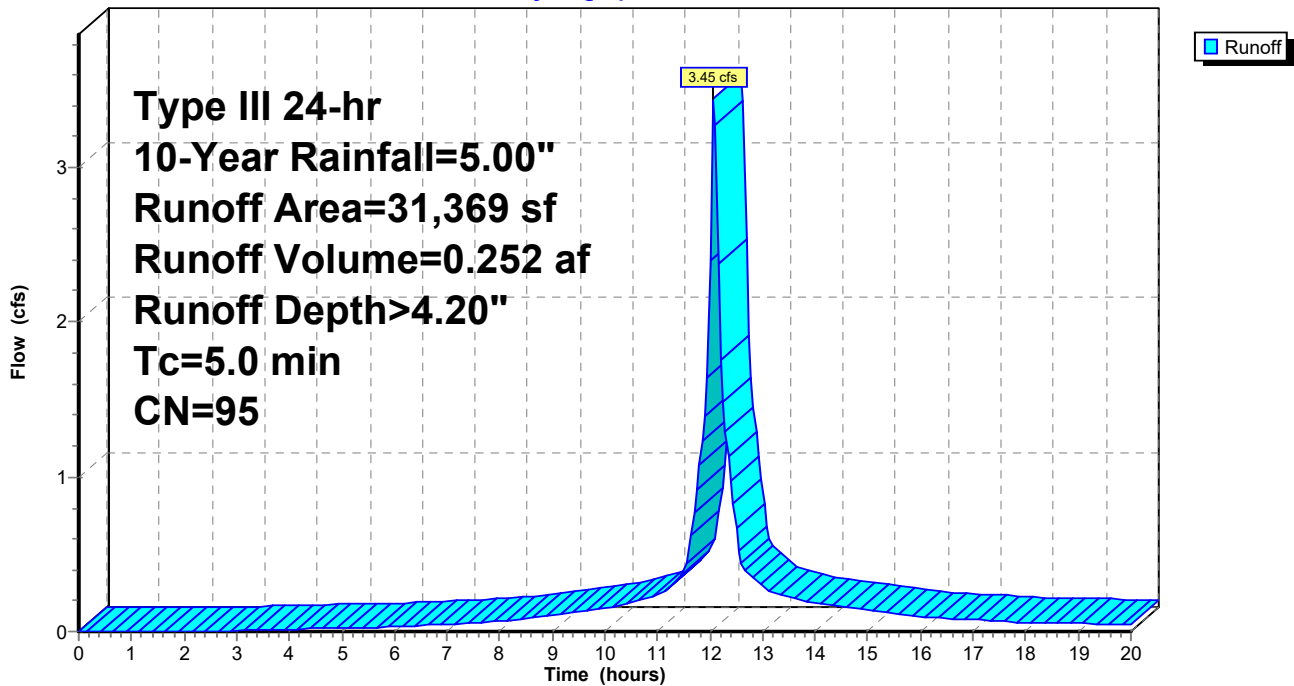
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	27,479	98	
	3,890	74	>75% Grass cover, Good, HSG C
	31,369	95	Weighted Average
	3,890		12.40% Pervious Area
	27,479		87.60% Impervious Area

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

**Subcatchment D: AREA D**

Hydrograph





**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment E: AREA E**

Runoff = 7.80 cfs @ 12.07 hrs, Volume= 0.545 af, Depth> 3.77"

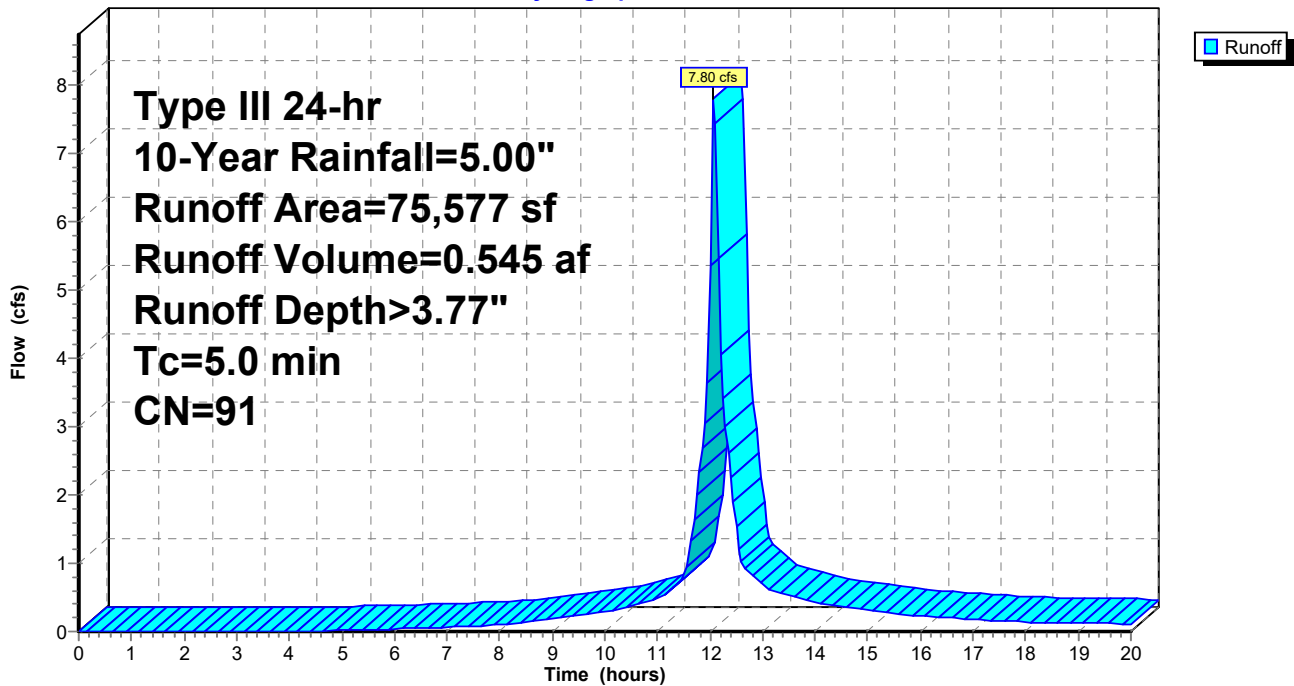
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	54,371	98	
	21,206	74	>75% Grass cover, Good, HSG C
	75,577	91	Weighted Average
	21,206		28.06% Pervious Area
	54,371		71.94% Impervious Area

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

**Subcatchment E: AREA E**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Subcatchment F: AREA F**

Runoff = 8.49 cfs @ 12.07 hrs, Volume= 0.599 af, Depth> 3.88"

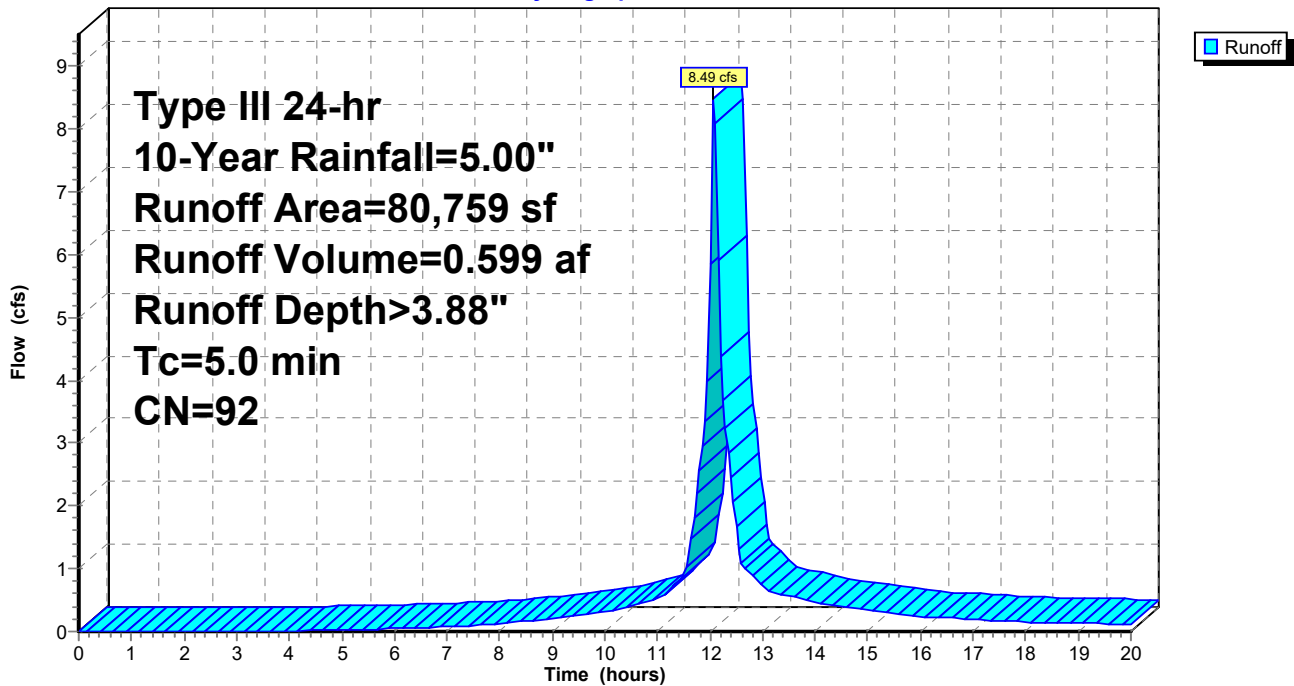
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	62,177	98	
	18,582	74	>75% Grass cover, Good, HSG C
	80,759	92	Weighted Average
	18,582		23.01% Pervious Area
	62,177		76.99% Impervious Area

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

**Subcatchment F: AREA F**

Hydrograph



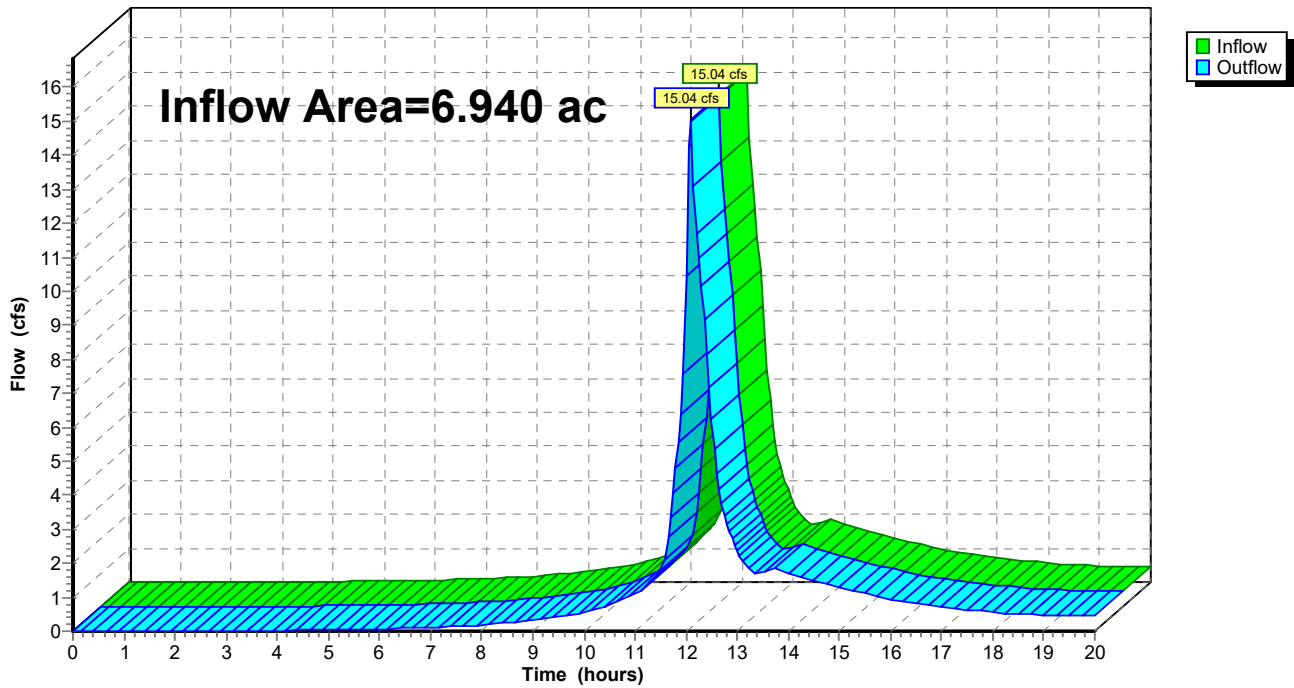
### Summary for Reach 2R: POI-1

Inflow Area = 6.940 ac, 61.35% Impervious, Inflow Depth > 2.70" for 10-Year event  
Inflow = 15.04 cfs @ 12.09 hrs, Volume= 1.563 af  
Outflow = 15.04 cfs @ 12.09 hrs, Volume= 1.563 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Reach 2R: POI-1

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 10-Year Rainfall=5.00"

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**Summary for Pond 1P: prop swale**

Inflow Area = 1.854 ac, 76.99% Impervious, Inflow Depth > 3.88" for 10-Year event  
 Inflow = 8.49 cfs @ 12.07 hrs, Volume= 0.599 af  
 Outflow = 0.48 cfs @ 13.90 hrs, Volume= 0.134 af, Atten= 94%, Lag= 109.5 min  
 Primary = 0.48 cfs @ 13.90 hrs, Volume= 0.134 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 13.04' @ 13.90 hrs Surf.Area= 7,098 sf Storage= 20,454 cf

Plug-Flow detention time= 360.4 min calculated for 0.134 af (22% of inflow)  
 Center-of-Mass det. time= 204.6 min ( 957.1 - 752.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	28,176 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	540	0	0
8.00	1,482	2,022	2,022
10.00	2,580	4,062	6,084
12.00	5,330	7,910	13,994
13.00	7,017	6,174	20,168
14.00	9,000	8,009	28,176

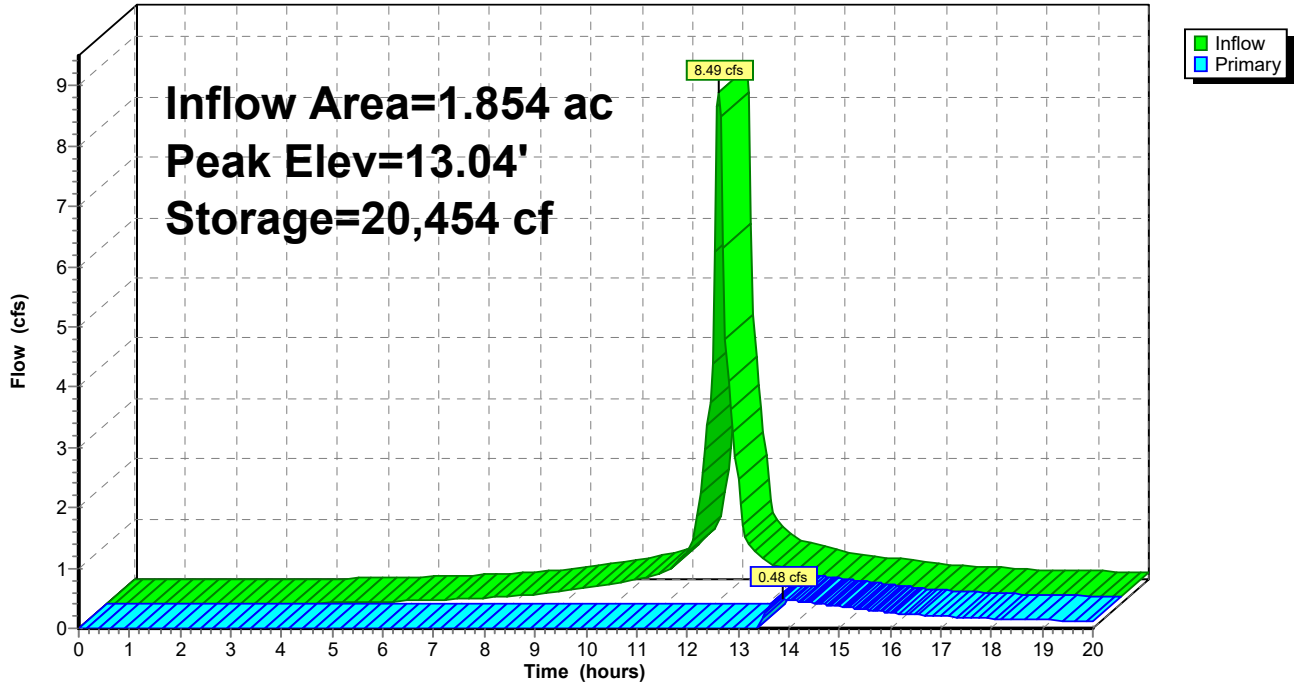
Device	Routing	Invert	Outlet Devices
#1	Primary	13.00'	<b>20.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

**Primary OutFlow** Max=0.48 cfs @ 13.90 hrs HW=13.04' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.48 cfs @ 0.59 fps)

### Pond 1P: prop swale

Hydrograph



### Summary for Pond 2P: Pipe Storage

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 3.58" for 10-Year event  
 Inflow = 2.48 cfs @ 12.07 hrs, Volume= 0.171 af  
 Outflow = 1.04 cfs @ 12.27 hrs, Volume= 0.154 af, Atten= 58%, Lag= 12.0 min  
 Primary = 1.04 cfs @ 12.27 hrs, Volume= 0.154 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 18.96' @ 12.27 hrs Surf.Area= 1,615 sf Storage= 2,247 cf

Plug-Flow detention time= 72.0 min calculated for 0.154 af (90% of inflow)  
 Center-of-Mass det. time= 40.0 min ( 801.4 - 761.4 )

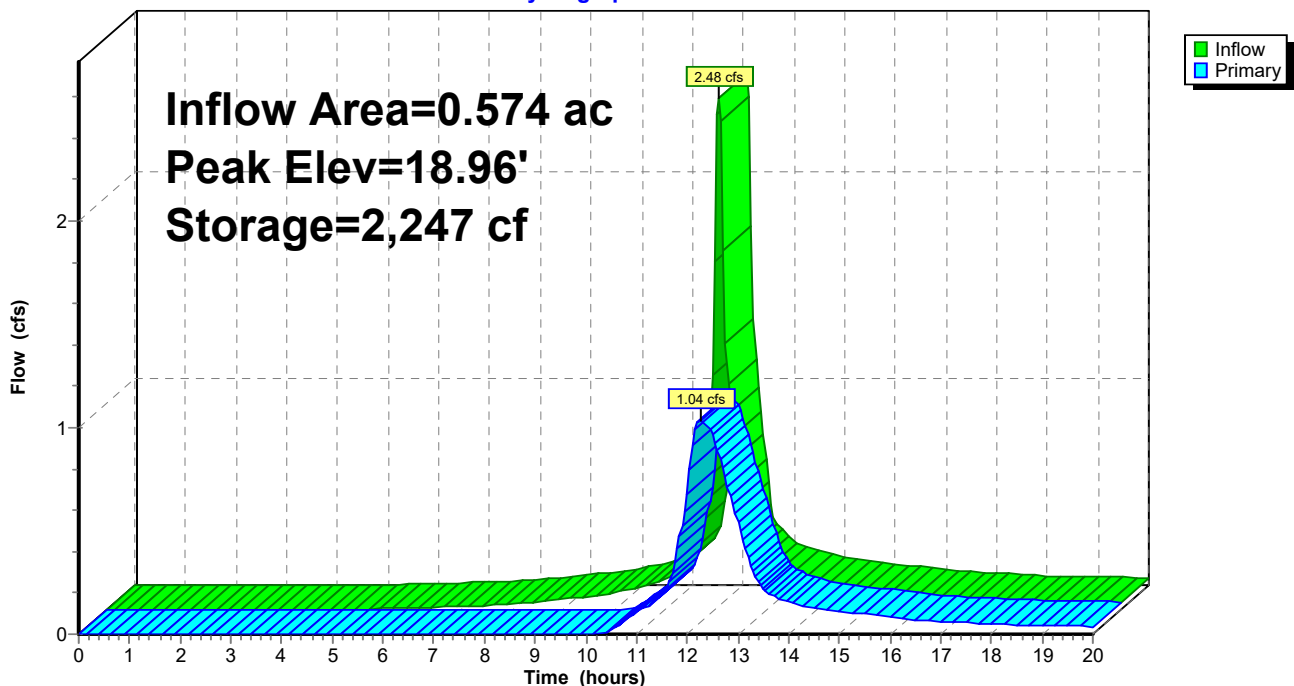
Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	2,283 cf	<b>36.0" Round Pipe Storage</b> Inside #2 L= 323.0'
#2	16.50'	2,317 cf	<b>5.00'W x 323.00'L x 5.00'H Prismatic</b> 8,075 cf Overall - 2,283 cf Embedded = 5,792 cf x 40.0% Voids
		4,600 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.04 cfs @ 12.27 hrs HW=18.95' (Free Discharge)  
 ↑1=Orifice/Grate (Orifice Controls 1.04 cfs @ 5.28 fps)

### Pond 2P: Pipe Storage

Hydrograph



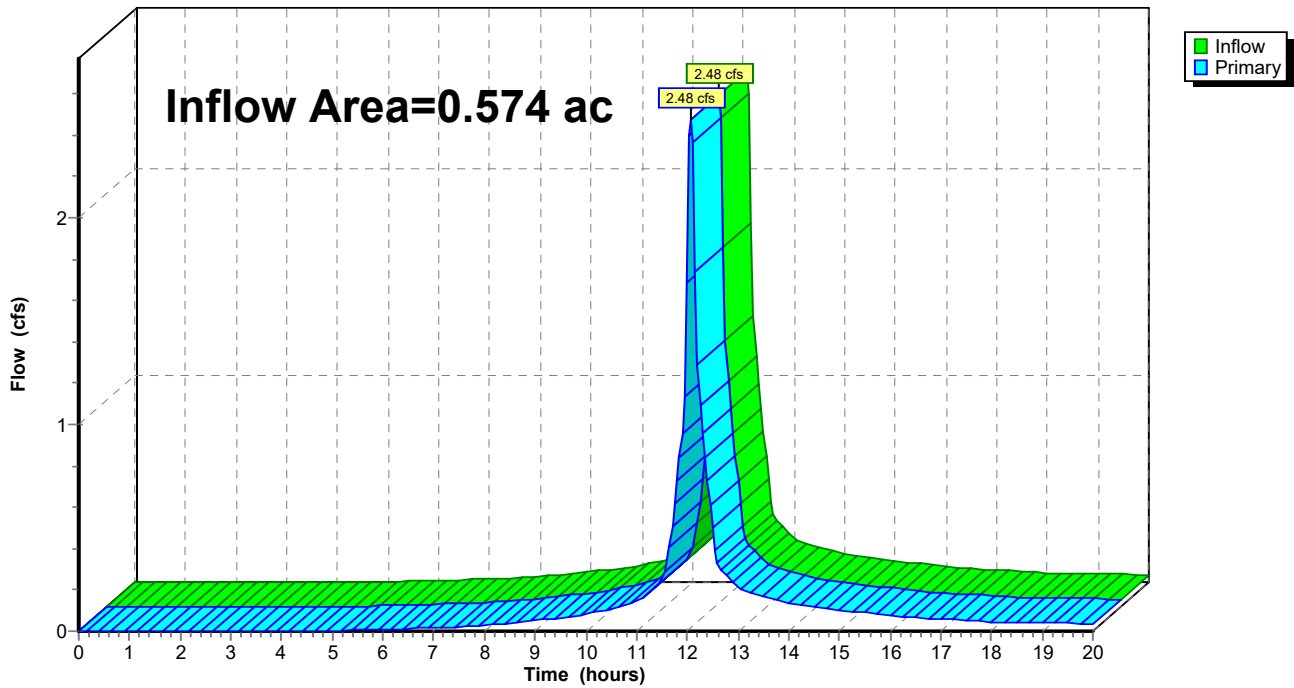
### Summary for Link 1L: (new Link)

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 3.58" for 10-Year event  
Inflow = 2.48 cfs @ 12.07 hrs, Volume= 0.171 af  
Primary = 2.48 cfs @ 12.07 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Link 1L: (new Link)

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment3S: AREAA**

Runoff Area=89,620 sf 28.40% Impervious Runoff Depth>3.37"  
Flow Length=711' Tc=17.8 min CN=81 Runoff=6.12 cfs 0.578 af

**SubcatchmentB: AREAB**

Runoff Area=10,575 sf 75.61% Impervious Runoff Depth>4.53"  
Tc=5.0 min CN=92 Runoff=1.29 cfs 0.092 af

**SubcatchmentC: AREAC**

Runoff Area=14,414 sf 55.43% Impervious Runoff Depth>3.99"  
Tc=5.0 min CN=87 Runoff=1.61 cfs 0.110 af

**SubcatchmentD: AREAD**

Runoff Area=31,369 sf 87.60% Impervious Runoff Depth>4.87"  
Tc=5.0 min CN=95 Runoff=3.96 cfs 0.292 af

**SubcatchmentE: AREAE**

Runoff Area=75,577 sf 71.94% Impervious Runoff Depth>4.42"  
Tc=5.0 min CN=91 Runoff=9.06 cfs 0.639 af

**SubcatchmentF: AREAF**

Runoff Area=80,759 sf 76.99% Impervious Runoff Depth>4.53"  
Tc=5.0 min CN=92 Runoff=9.82 cfs 0.700 af

**Reach 2R: POI-1**

Inflow=17.56 cfs 1.929 af  
Outflow=17.56 cfs 1.929 af

**Pond 1P: prop swale**

Peak Elev=13.07' Storage=20,676 cf Inflow=9.82 cfs 0.700 af  
Outflow=1.24 cfs 0.235 af

**Pond 2P: Pipe Storage**

Peak Elev=19.24' Storage=2,588 cf Inflow=2.90 cfs 0.202 af  
Outflow=1.15 cfs 0.185 af

**Link 1L: (new Link)**

Inflow=2.90 cfs 0.202 af  
Primary=2.90 cfs 0.202 af

**Total Runoff Area = 6.940 ac Runoff Volume = 2.411 af Average Runoff Depth = 4.17"**  
**38.65% Pervious = 2.683 ac 61.35% Impervious = 4.258 ac**



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment 3S: AREA A**

Runoff = 6.12 cfs @ 12.24 hrs, Volume= 0.578 af, Depth> 3.37"

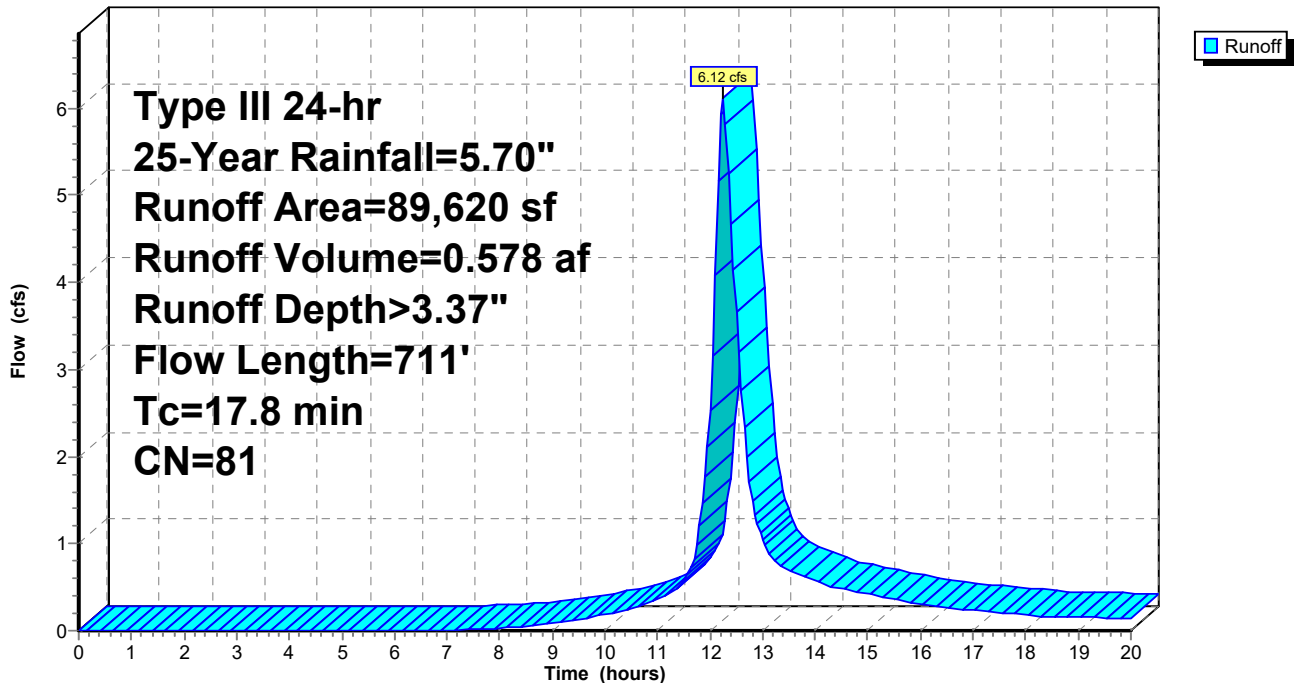
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
64,169	74	>75% Grass cover, Good, HSG C
* 25,451	98	
89,620	81	Weighted Average
64,169		71.60% Pervious Area
25,451		28.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	153	0.0163	0.18		<b>Sheet Flow, A-B</b>
					Grass: Short n= 0.150 P2= 3.40"
0.7	129	0.0388	3.17		<b>Shallow Concentrated Flow, B-C</b>
					Unpaved Kv= 16.1 fps
2.6	429	0.0179	2.72		<b>Shallow Concentrated Flow, C-D</b>
					Paved Kv= 20.3 fps
17.8	711	Total			

**Subcatchment 3S: AREA A**

Hydrograph



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Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment B: AREA B**

Runoff = 1.29 cfs @ 12.07 hrs, Volume= 0.092 af, Depth> 4.53"

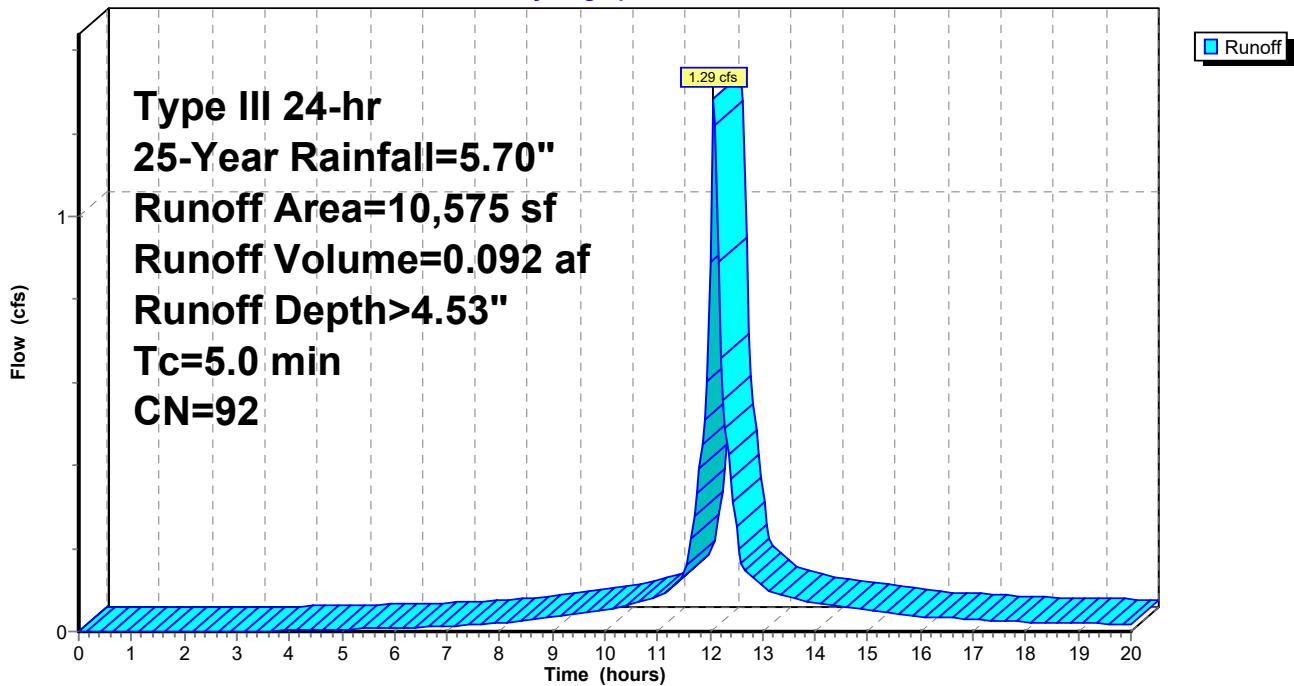
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	7,996	98	
	2,579	74	>75% Grass cover, Good, HSG C
	10,575	92	Weighted Average
	2,579		24.39% Pervious Area
	7,996		75.61% Impervious Area

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

**Subcatchment B: AREA B**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment C: AREA C**

Runoff = 1.61 cfs @ 12.07 hrs, Volume= 0.110 af, Depth> 3.99"

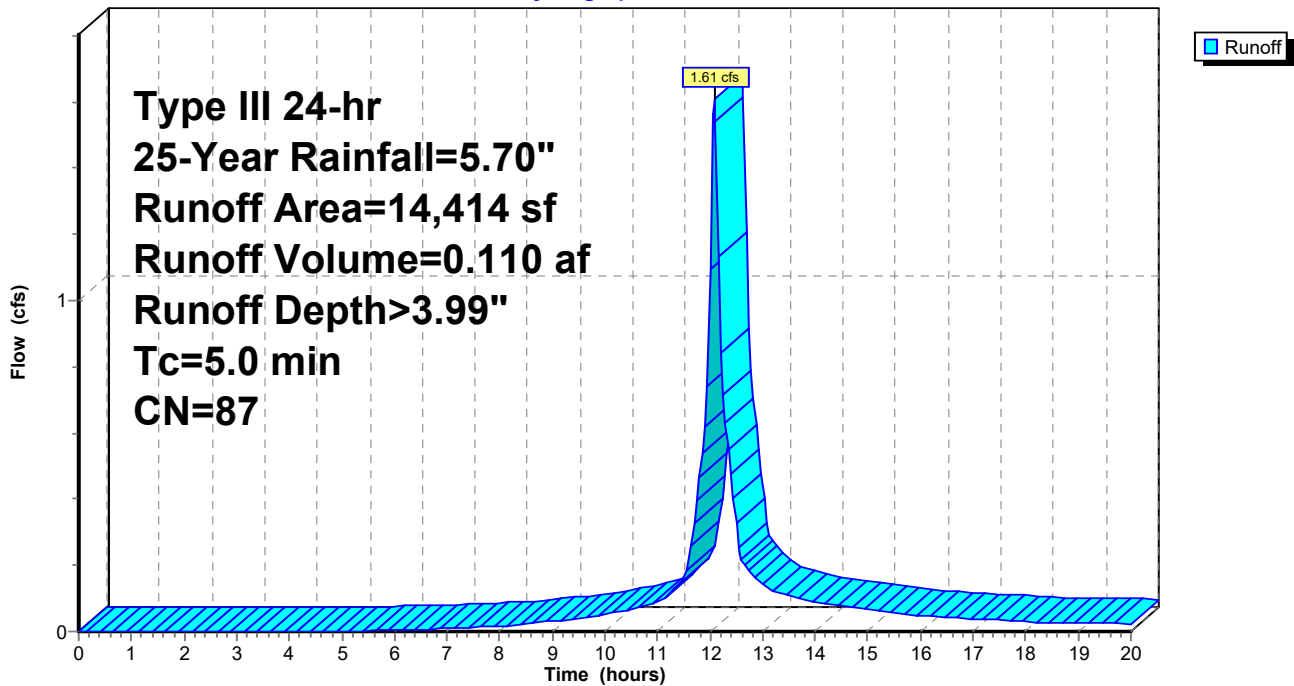
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	7,989	98	
	6,425	74	>75% Grass cover, Good, HSG C
	14,414	87	Weighted Average
	6,425		44.57% Pervious Area
	7,989		55.43% Impervious Area

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

**Subcatchment C: AREA C**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment D: AREA D**

Runoff = 3.96 cfs @ 12.07 hrs, Volume= 0.292 af, Depth> 4.87"

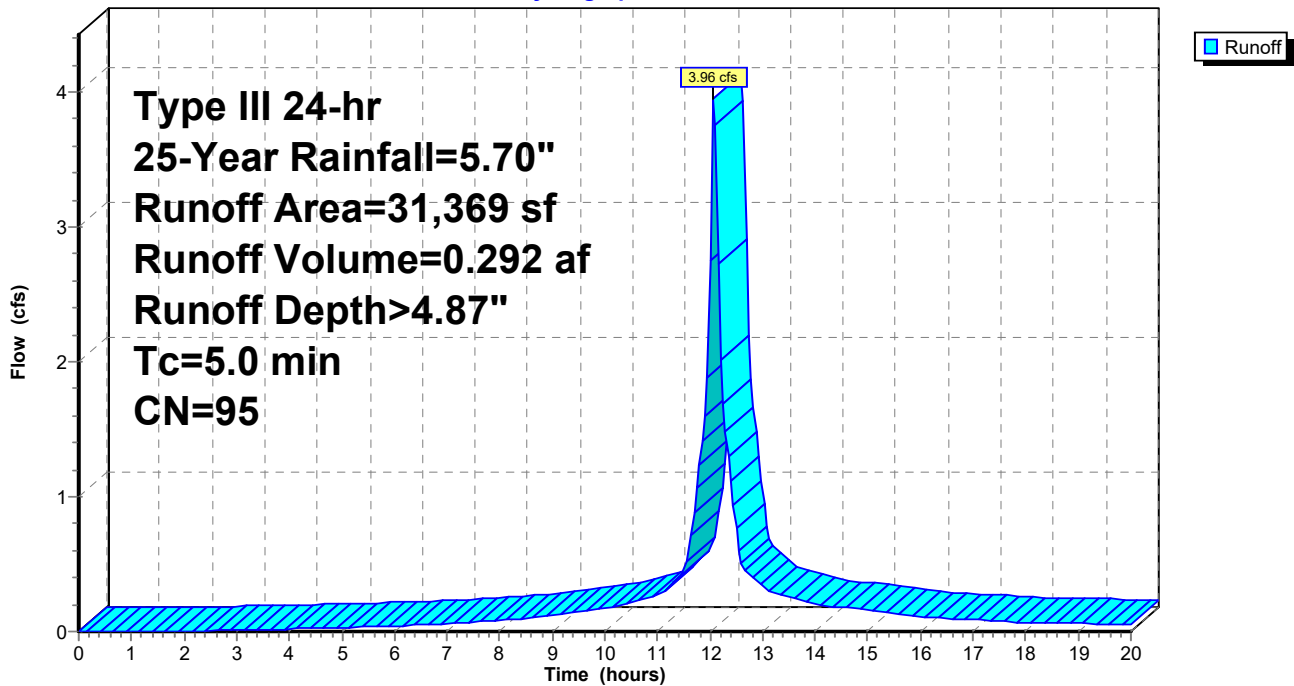
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	27,479	98	
	3,890	74	>75% Grass cover, Good, HSG C
	31,369	95	Weighted Average
	3,890		12.40% Pervious Area
	27,479		87.60% Impervious Area

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

**Subcatchment D: AREA D**

Hydrograph



**07c2352 Proposed-NEW**

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Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment E: AREA E**

Runoff = 9.06 cfs @ 12.07 hrs, Volume= 0.639 af, Depth> 4.42"

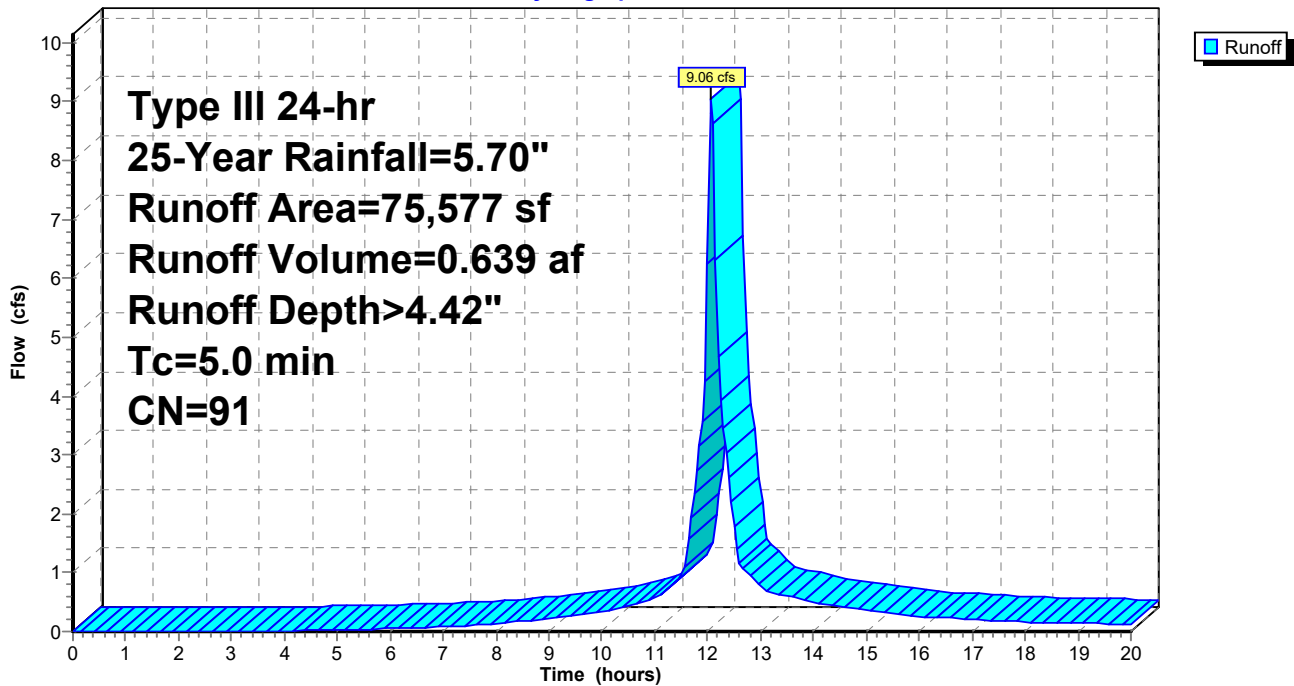
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	54,371	98	
	21,206	74	>75% Grass cover, Good, HSG C
	75,577	91	Weighted Average
	21,206		28.06% Pervious Area
	54,371		71.94% Impervious Area

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

**Subcatchment E: AREA E**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Subcatchment F: AREA F**

Runoff = 9.82 cfs @ 12.07 hrs, Volume= 0.700 af, Depth> 4.53"

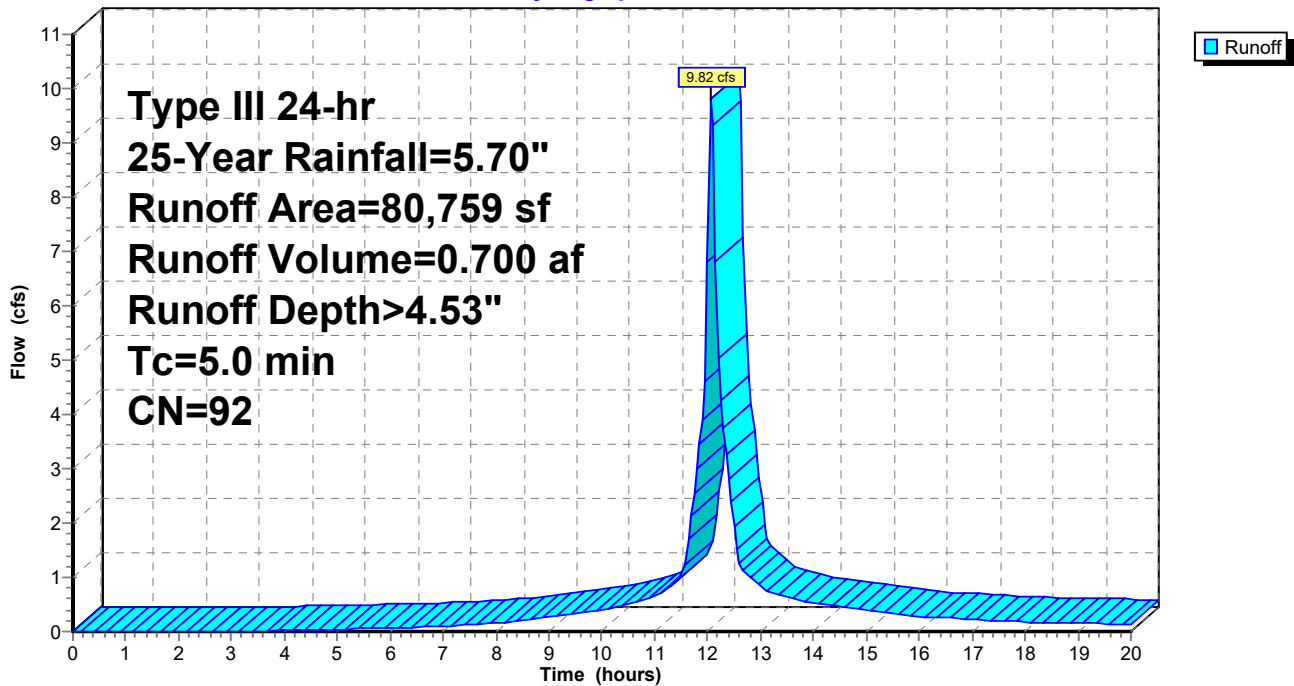
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	62,177	98	
	18,582	74	>75% Grass cover, Good, HSG C
	80,759	92	Weighted Average
	18,582		23.01% Pervious Area
	62,177		76.99% Impervious Area

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

**Subcatchment F: AREA F**

Hydrograph



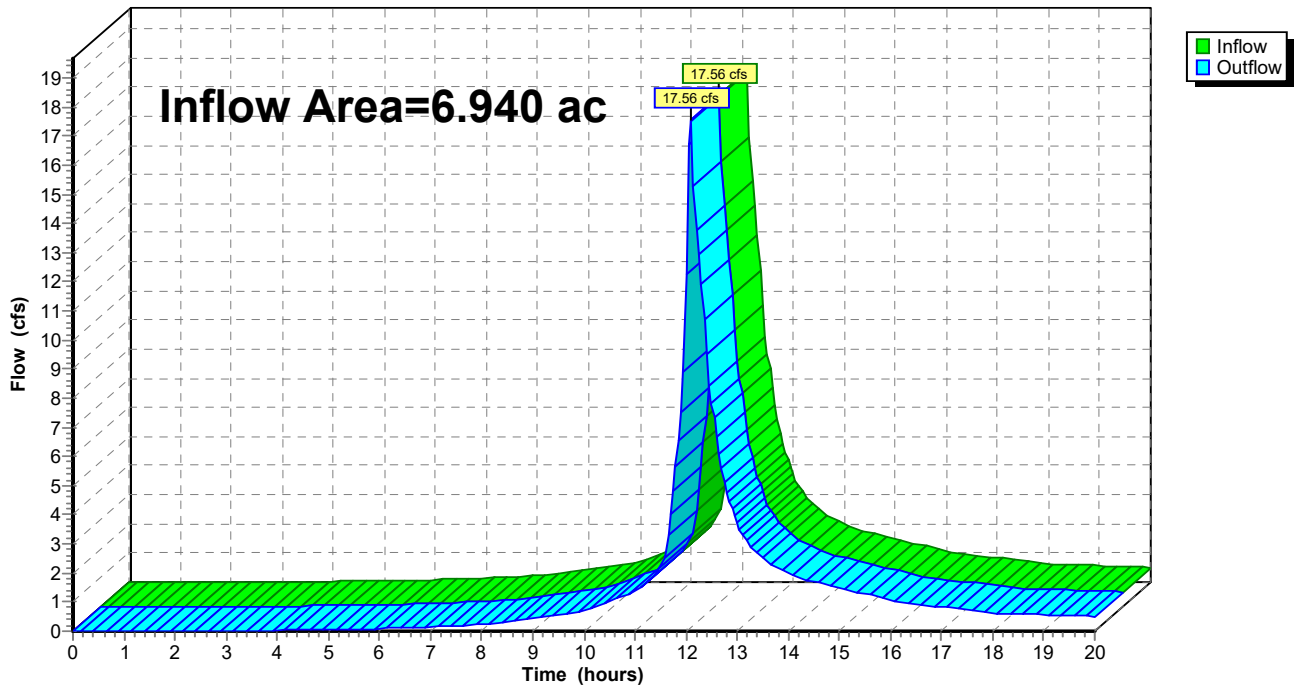
### Summary for Reach 2R: POI-1

Inflow Area = 6.940 ac, 61.35% Impervious, Inflow Depth > 3.34" for 25-Year event  
Inflow = 17.56 cfs @ 12.09 hrs, Volume= 1.929 af  
Outflow = 17.56 cfs @ 12.09 hrs, Volume= 1.929 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Reach 2R: POI-1

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Pond 1P: prop swale**

Inflow Area = 1.854 ac, 76.99% Impervious, Inflow Depth > 4.53" for 25-Year event  
 Inflow = 9.82 cfs @ 12.07 hrs, Volume= 0.700 af  
 Outflow = 1.24 cfs @ 12.62 hrs, Volume= 0.235 af, Atten= 87%, Lag= 33.1 min  
 Primary = 1.24 cfs @ 12.62 hrs, Volume= 0.235 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 13.07' @ 12.62 hrs Surf.Area= 7,159 sf Storage= 20,676 cf

Plug-Flow detention time= 268.2 min calculated for 0.235 af (34% of inflow)  
 Center-of-Mass det. time= 146.7 min ( 895.5 - 748.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	28,176 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	540	0	0
8.00	1,482	2,022	2,022
10.00	2,580	4,062	6,084
12.00	5,330	7,910	13,994
13.00	7,017	6,174	20,168
14.00	9,000	8,009	28,176

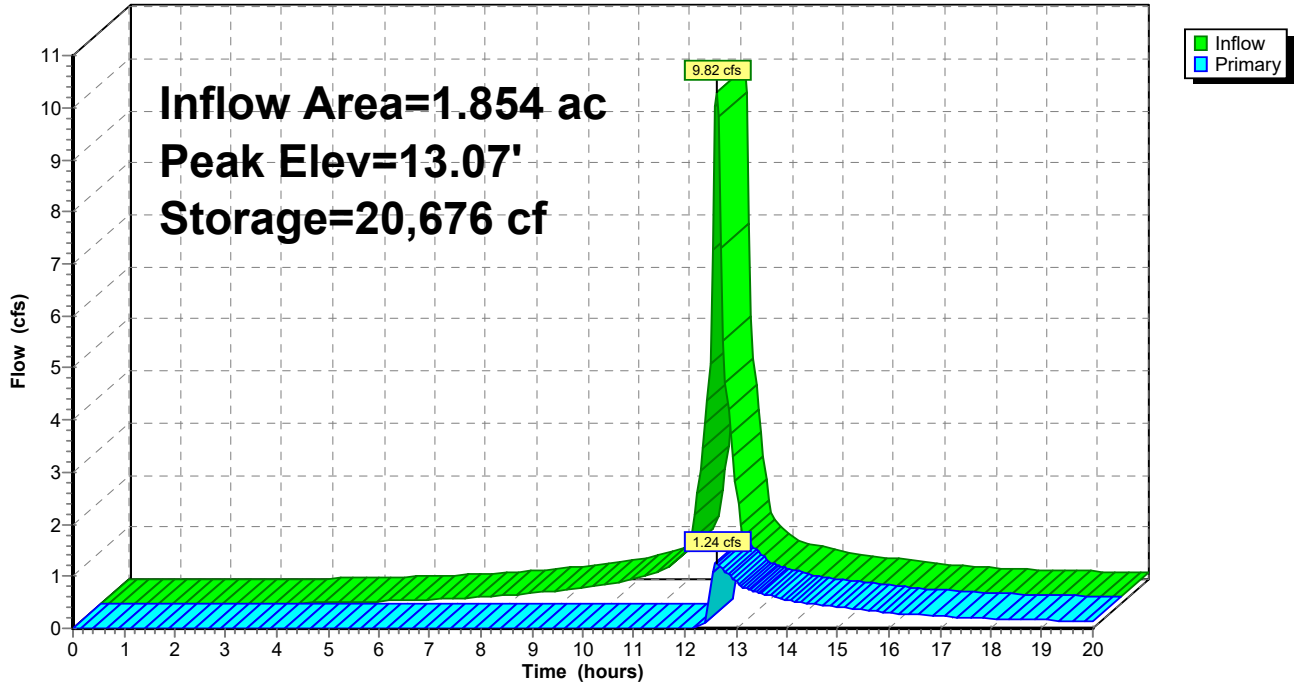
Device	Routing	Invert	Outlet Devices
#1	Primary	13.00'	<b>20.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

**Primary OutFlow** Max=1.10 cfs @ 12.62 hrs HW=13.07' (Free Discharge)  
 ↳ **1=Broad-Crested Rectangular Weir**(Weir Controls 1.10 cfs @ 0.78 fps)



### Pond 1P: prop swale

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 25-Year Rainfall=5.70"

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**Summary for Pond 2P: Pipe Storage**

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 4.22" for 25-Year event  
 Inflow = 2.90 cfs @ 12.07 hrs, Volume= 0.202 af  
 Outflow = 1.15 cfs @ 12.29 hrs, Volume= 0.185 af, Atten= 60%, Lag= 13.0 min  
 Primary = 1.15 cfs @ 12.29 hrs, Volume= 0.185 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 19.24' @ 12.29 hrs Surf.Area= 1,615 sf Storage= 2,588 cf

Plug-Flow detention time= 68.3 min calculated for 0.185 af (92% of inflow)  
 Center-of-Mass det. time= 39.4 min ( 796.9 - 757.5 )

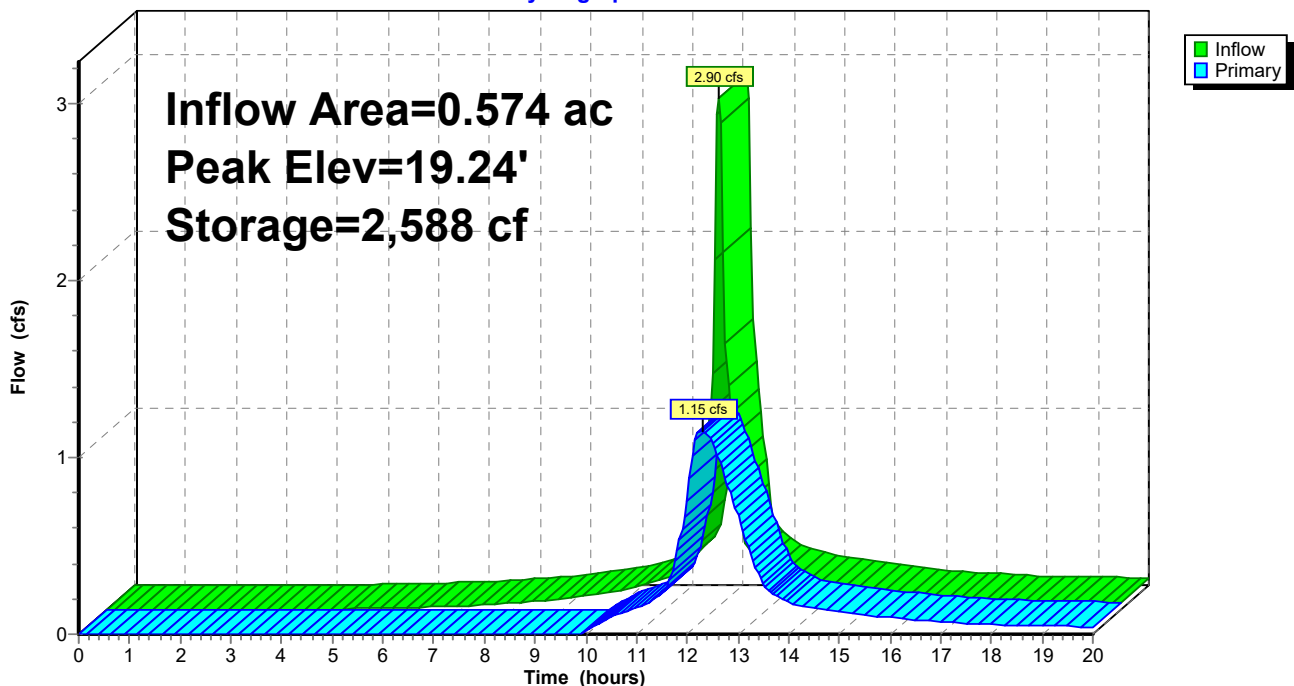
Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	2,283 cf	<b>36.0" Round Pipe Storage</b> Inside #2 L= 323.0'
#2	16.50'	2,317 cf	<b>5.00'W x 323.00'L x 5.00'H Prismatic</b> 8,075 cf Overall - 2,283 cf Embedded = 5,792 cf x 40.0% Voids
		4,600 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.15 cfs @ 12.29 hrs HW=19.23' (Free Discharge)  
 ↳1=Orifice/Grate (Orifice Controls 1.15 cfs @ 5.86 fps)

**Pond 2P: Pipe Storage**

Hydrograph



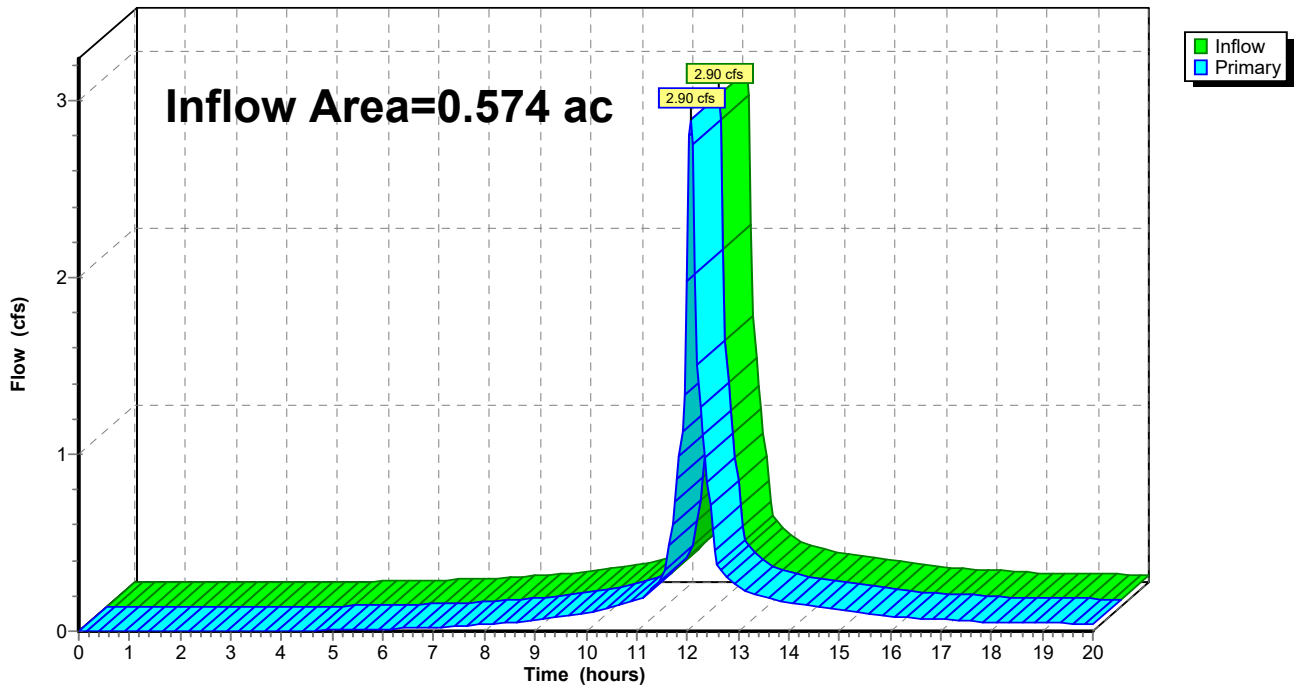
### Summary for Link 1L: (new Link)

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 4.22" for 25-Year event  
Inflow = 2.90 cfs @ 12.07 hrs, Volume= 0.202 af  
Primary = 2.90 cfs @ 12.07 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Link 1L: (new Link)

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment3S: AREAA</b>	Runoff Area=89,620 sf 28.40% Impervious Runoff Depth>4.59" Flow Length=711' Tc=17.8 min CN=81 Runoff=8.24 cfs 0.787 af
<b>SubcatchmentB: AREAB</b>	Runoff Area=10,575 sf 75.61% Impervious Runoff Depth>5.85" Tc=5.0 min CN=92 Runoff=1.63 cfs 0.118 af
<b>SubcatchmentC: AREAC</b>	Runoff Area=14,414 sf 55.43% Impervious Runoff Depth>5.28" Tc=5.0 min CN=87 Runoff=2.09 cfs 0.145 af
<b>SubcatchmentD: AREAD</b>	Runoff Area=31,369 sf 87.60% Impervious Runoff Depth>6.20" Tc=5.0 min CN=95 Runoff=4.97 cfs 0.372 af
<b>SubcatchmentE: AREAE</b>	Runoff Area=75,577 sf 71.94% Impervious Runoff Depth>5.73" Tc=5.0 min CN=91 Runoff=11.55 cfs 0.829 af
<b>SubcatchmentF: AREAF</b>	Runoff Area=80,759 sf 76.99% Impervious Runoff Depth>5.85" Tc=5.0 min CN=92 Runoff=12.48 cfs 0.903 af
<b>Reach 2R: POI-1</b>	Inflow=22.80 cfs 2.673 af Outflow=22.80 cfs 2.673 af
<b>Pond 1P: prop swale</b>	Peak Elev=13.21' Storage=21,669 cf Inflow=12.48 cfs 0.903 af Outflow=5.55 cfs 0.438 af
<b>Pond 2P: Pipe Storage</b>	Peak Elev=19.85' Storage=3,312 cf Inflow=3.73 cfs 0.264 af Outflow=1.37 cfs 0.246 af
<b>Link 1L: (new Link)</b>	Inflow=3.73 cfs 0.264 af Primary=3.73 cfs 0.264 af

**Total Runoff Area = 6.940 ac Runoff Volume = 3.155 af Average Runoff Depth = 5.46"**  
**38.65% Pervious = 2.683 ac 61.35% Impervious = 4.258 ac**

**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment 3S: AREA A**

Runoff = 8.24 cfs @ 12.24 hrs, Volume= 0.787 af, Depth> 4.59"

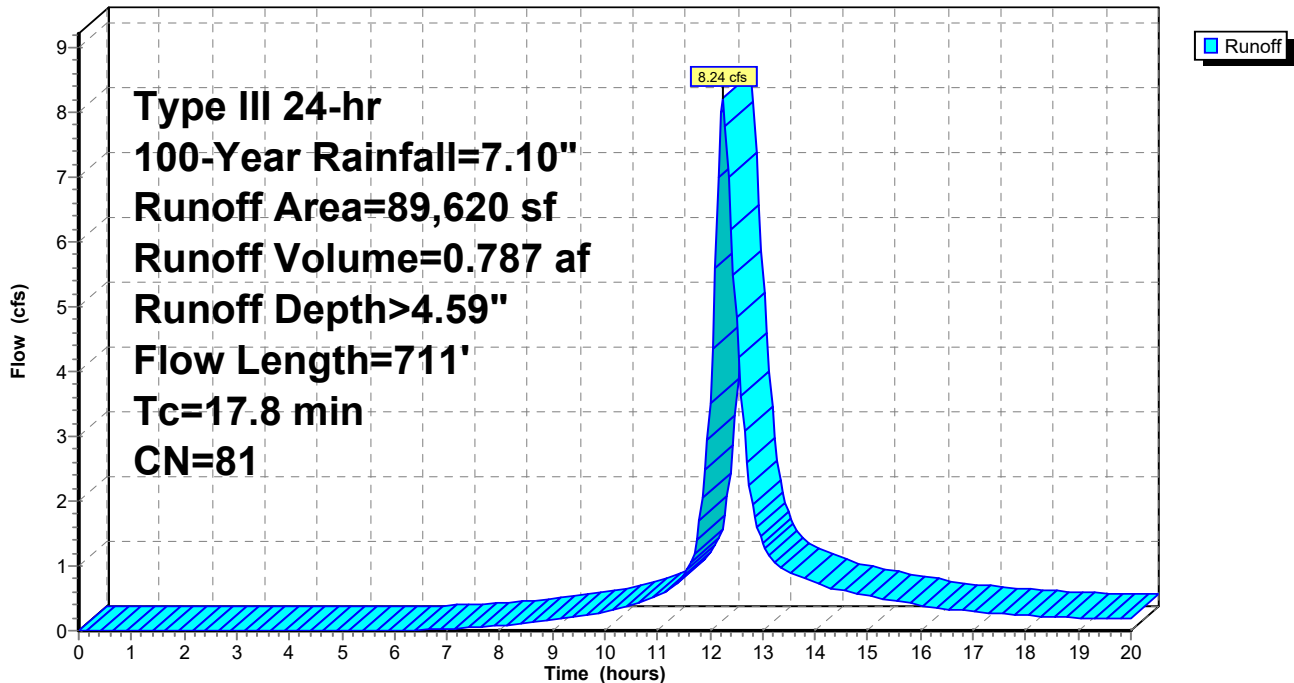
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
64,169	74	>75% Grass cover, Good, HSG C
* 25,451	98	
89,620	81	Weighted Average
64,169		71.60% Pervious Area
25,451		28.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	153	0.0163	0.18		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 3.40"
0.7	129	0.0388	3.17		<b>Shallow Concentrated Flow, B-C</b> Unpaved Kv= 16.1 fps
2.6	429	0.0179	2.72		<b>Shallow Concentrated Flow, C-D</b> Paved Kv= 20.3 fps
17.8	711	Total			

**Subcatchment 3S: AREA A**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment B: AREA B**

Runoff = 1.63 cfs @ 12.07 hrs, Volume= 0.118 af, Depth> 5.85"

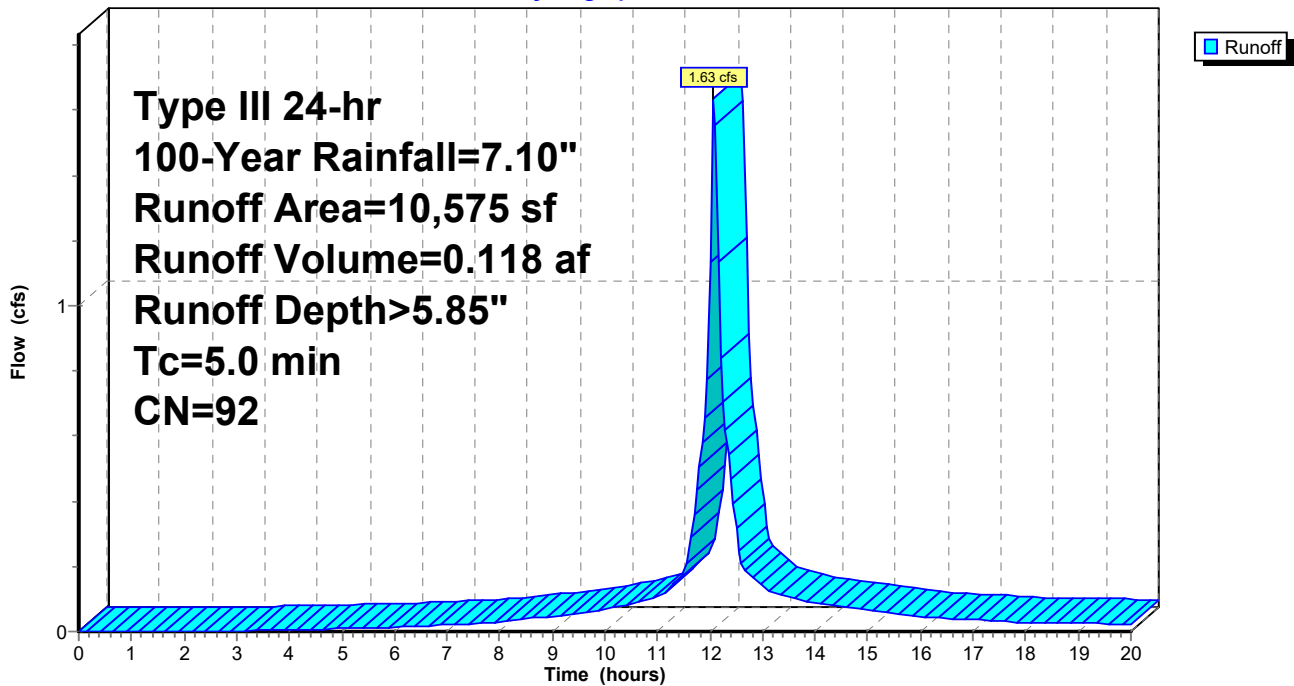
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	7,996	98	
	2,579	74	>75% Grass cover, Good, HSG C
	10,575	92	Weighted Average
	2,579		24.39% Pervious Area
	7,996		75.61% Impervious Area

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

**Subcatchment B: AREA B**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment C: AREA C**

Runoff = 2.09 cfs @ 12.07 hrs, Volume= 0.145 af, Depth> 5.28"

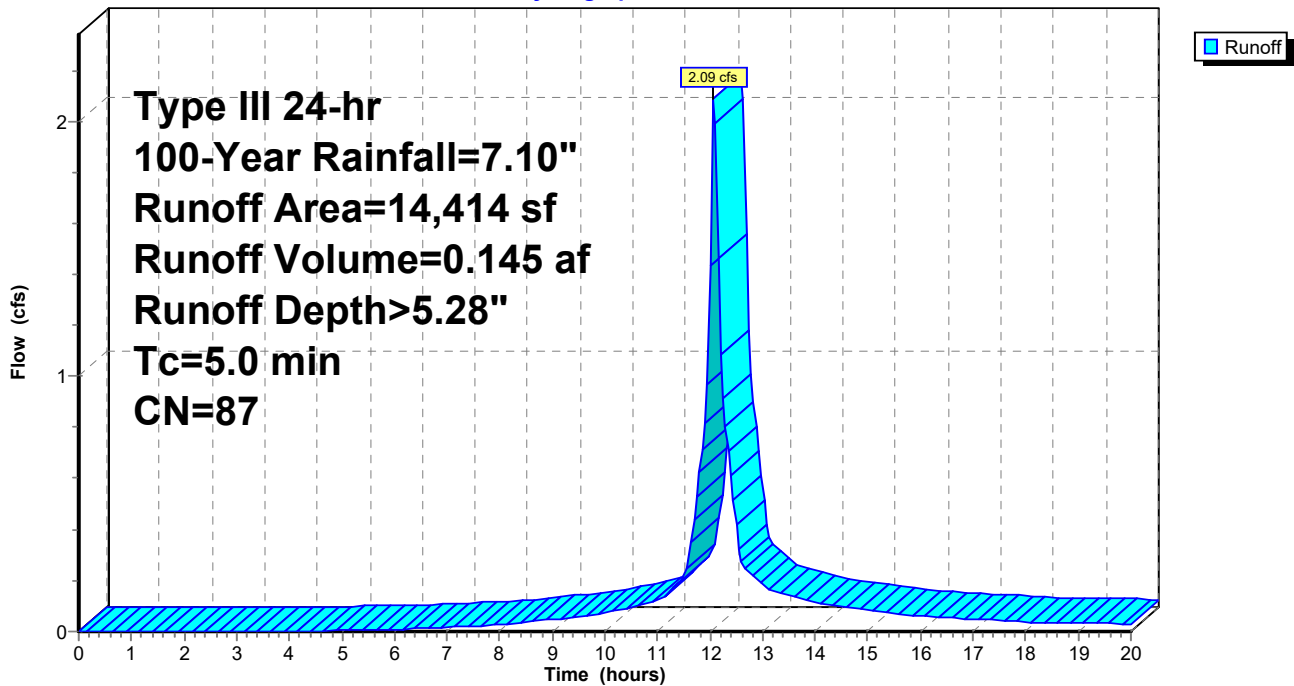
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	7,989	98	
	6,425	74	>75% Grass cover, Good, HSG C
	14,414	87	Weighted Average
	6,425		44.57% Pervious Area
	7,989		55.43% Impervious Area

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

**Subcatchment C: AREA C**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment D: AREA D**

Runoff = 4.97 cfs @ 12.07 hrs, Volume= 0.372 af, Depth> 6.20"

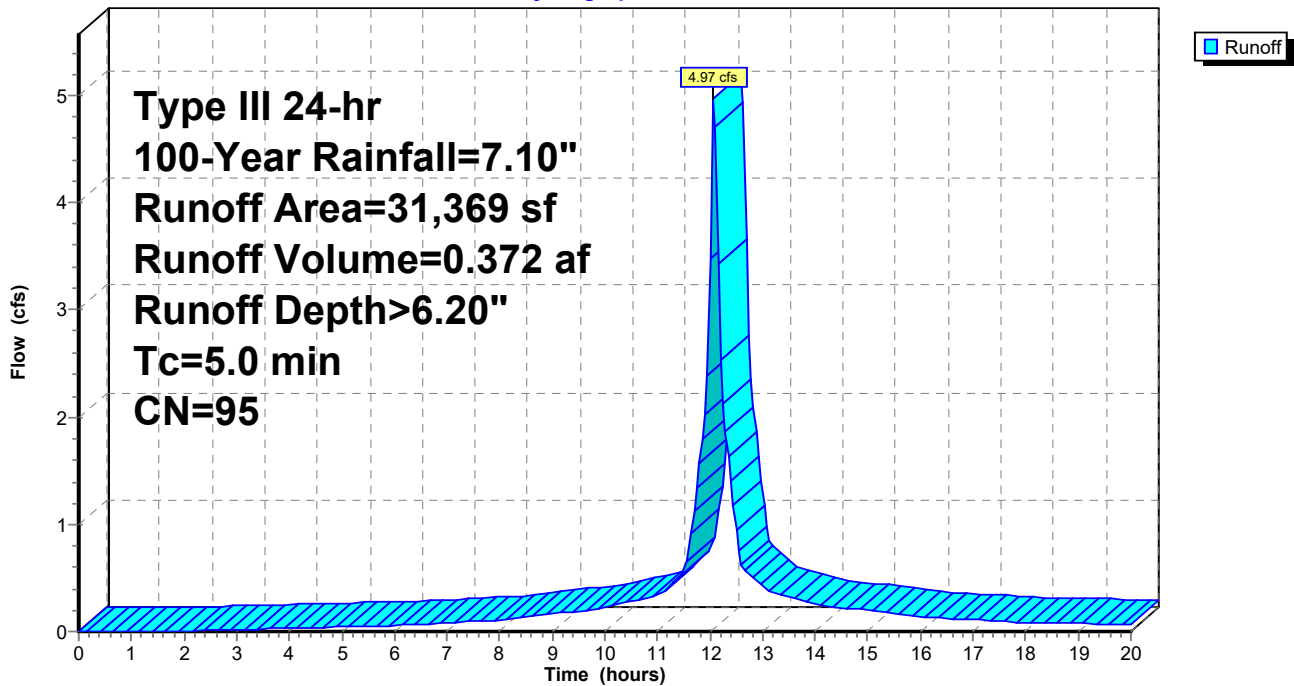
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	27,479	98	
	3,890	74	>75% Grass cover, Good, HSG C
	31,369	95	Weighted Average
	3,890		12.40% Pervious Area
	27,479		87.60% Impervious Area

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

**Subcatchment D: AREA D**

Hydrograph





**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment E: AREA E**

Runoff = 11.55 cfs @ 12.07 hrs, Volume= 0.829 af, Depth> 5.73"

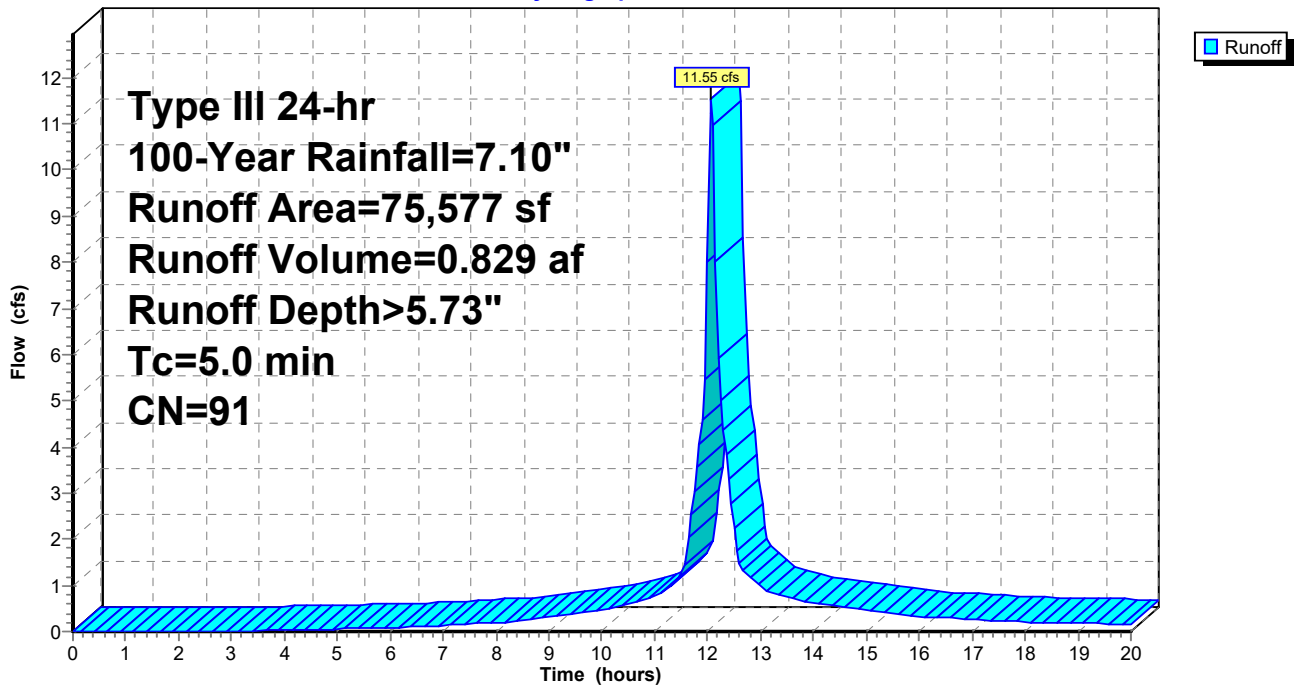
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	54,371	98	
	21,206	74	>75% Grass cover, Good, HSG C
	75,577	91	Weighted Average
	21,206		28.06% Pervious Area
	54,371		71.94% Impervious Area

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

**Subcatchment E: AREA E**

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Subcatchment F: AREA F**

Runoff = 12.48 cfs @ 12.07 hrs, Volume= 0.903 af, Depth> 5.85"

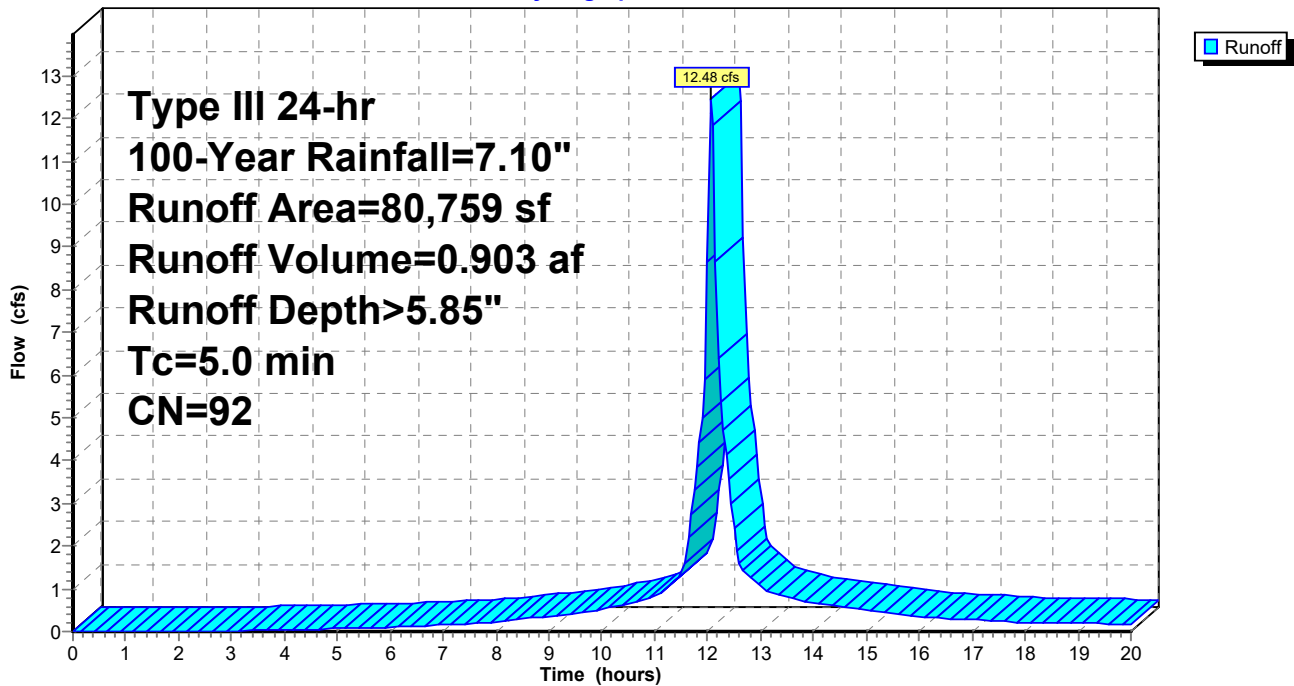
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	62,177	98	
	18,582	74	>75% Grass cover, Good, HSG C
	80,759	92	Weighted Average
	18,582		23.01% Pervious Area
	62,177		76.99% Impervious Area

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

**Subcatchment F: AREA F**

Hydrograph



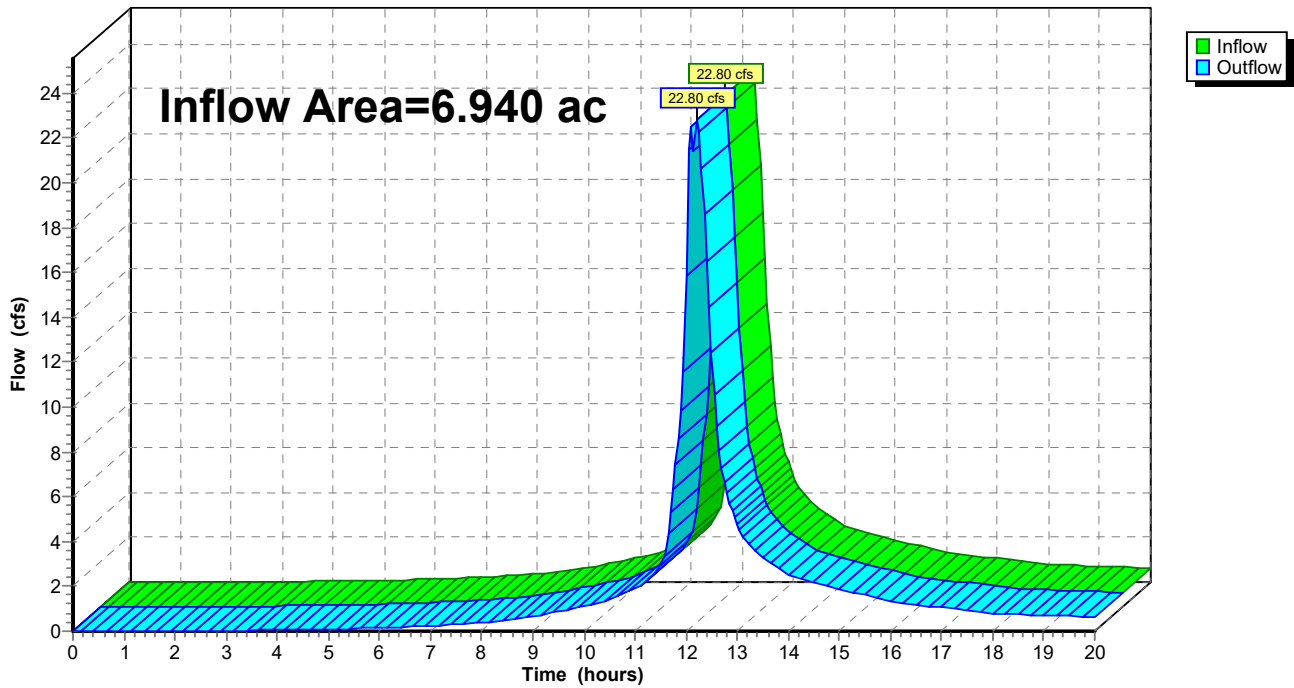
### Summary for Reach 2R: POI-1

Inflow Area = 6.940 ac, 61.35% Impervious, Inflow Depth > 4.62" for 100-Year event  
Inflow = 22.80 cfs @ 12.21 hrs, Volume= 2.673 af  
Outflow = 22.80 cfs @ 12.21 hrs, Volume= 2.673 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Reach 2R: POI-1

Hydrograph



**07c2352 Proposed-NEW**

Type III 24-hr 100-Year Rainfall=7.10"

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**Summary for Pond 1P: prop swale**

Inflow Area = 1.854 ac, 76.99% Impervious, Inflow Depth > 5.85" for 100-Year event  
 Inflow = 12.48 cfs @ 12.07 hrs, Volume= 0.903 af  
 Outflow = 5.55 cfs @ 12.26 hrs, Volume= 0.438 af, Atten= 55%, Lag= 11.1 min  
 Primary = 5.55 cfs @ 12.26 hrs, Volume= 0.438 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 13.21' @ 12.26 hrs Surf.Area= 7,429 sf Storage= 21,669 cf

Plug-Flow detention time= 196.7 min calculated for 0.438 af (48% of inflow)  
 Center-of-Mass det. time= 101.6 min ( 844.6 - 743.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	28,176 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

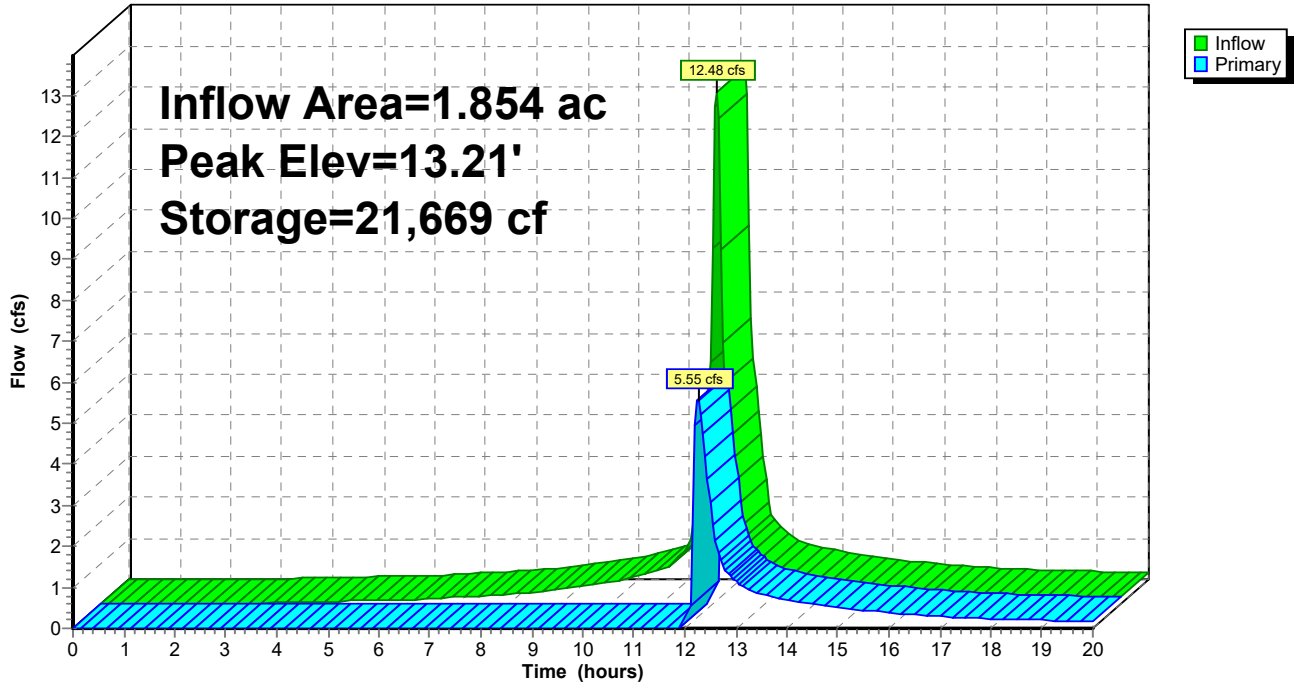
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	540	0	0
8.00	1,482	2,022	2,022
10.00	2,580	4,062	6,084
12.00	5,330	7,910	13,994
13.00	7,017	6,174	20,168
14.00	9,000	8,009	28,176

Device	Routing	Invert	Outlet Devices
#1	Primary	13.00'	<b>20.0' long (Profile 1) Broad-Crested Rectangular Weir</b> Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

**Primary OutFlow** Max=5.48 cfs @ 12.26 hrs HW=13.21' (Free Discharge)  
 ↑1=**Broad-Crested Rectangular Weir**(Weir Controls 5.48 cfs @ 1.33 fps)

### Pond 1P: prop swale

Hydrograph



### Summary for Pond 2P: Pipe Storage

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 5.52" for 100-Year event  
 Inflow = 3.73 cfs @ 12.07 hrs, Volume= 0.264 af  
 Outflow = 1.37 cfs @ 12.32 hrs, Volume= 0.246 af, Atten= 63%, Lag= 14.7 min  
 Primary = 1.37 cfs @ 12.32 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 19.85' @ 12.32 hrs Surf.Area= 1,615 sf Storage= 3,312 cf

Plug-Flow detention time= 62.6 min calculated for 0.246 af (93% of inflow)  
 Center-of-Mass det. time= 38.7 min ( 790.0 - 751.3 )

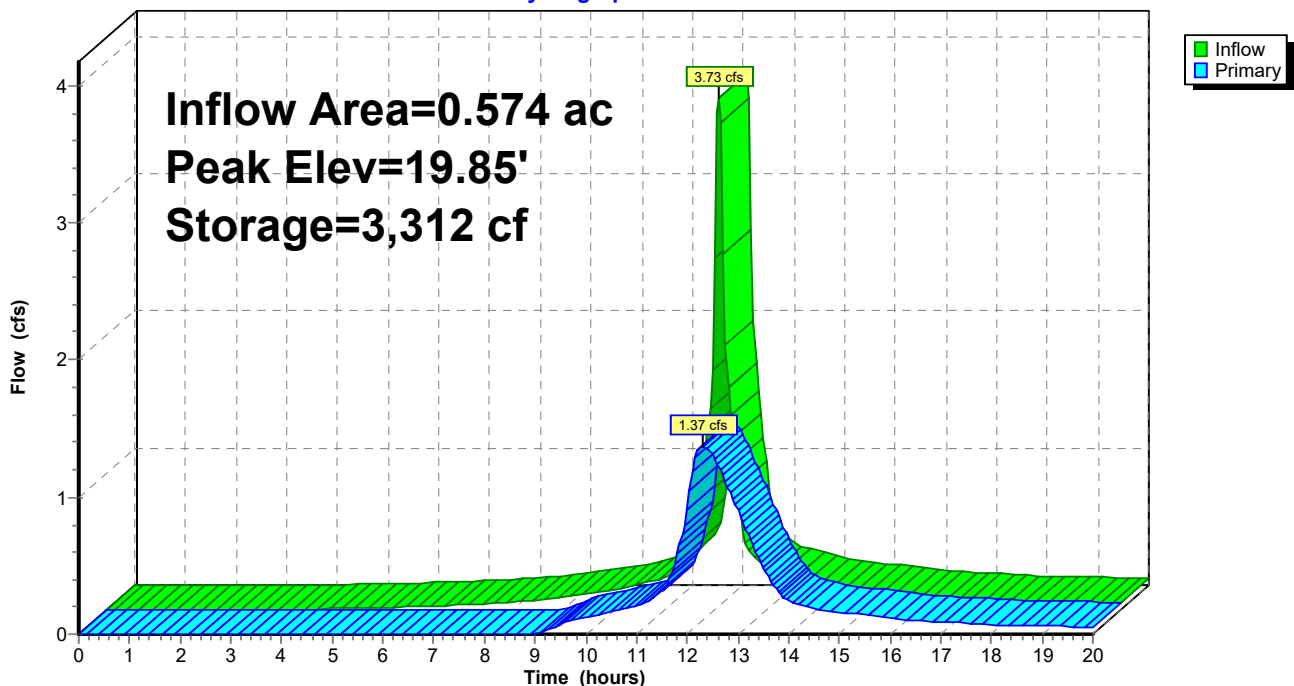
Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	2,283 cf	<b>36.0" Round Pipe Storage</b> Inside #2 L= 323.0'
#2	16.50'	2,317 cf	<b>5.00'W x 323.00'L x 5.00'H Prismatic</b> 8,075 cf Overall - 2,283 cf Embedded = 5,792 cf x 40.0% Voids
		4,600 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.37 cfs @ 12.32 hrs HW=19.84' (Free Discharge)  
 ↑1=Orifice/Grate (Orifice Controls 1.37 cfs @ 6.97 fps)

### Pond 2P: Pipe Storage

Hydrograph



### Summary for Link 1L: (new Link)

Inflow Area = 0.574 ac, 63.97% Impervious, Inflow Depth > 5.52" for 100-Year event  
Inflow = 3.73 cfs @ 12.07 hrs, Volume= 0.264 af  
Primary = 3.73 cfs @ 12.07 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

### Link 1L: (new Link)

Hydrograph

