STORMWATER QUANTITY

A. Modeling assumptions:

The "Hydro Cad" computer program was used to determine the peak storm water runoff for the pre- and post-development conditions. Hydro Cad is a storm water modeling system, which utilizes the TR-20 method developed by the Soil Conservation Service (SCS).

The design assumptions used for this project are:
Design storm: 24 hour, Type III rainfall distribution.

Rainfall: 24-hour precipitation values from U.S. Weather Bureau Technical Release No. 40:
2 year storm = 3.0 inches
10 year storm = 4.4 inches
25 year storm = 5.1 inches

Site-specific parameters for the project are listed on the next page:

Soils: Soils information to determine the hydrologic soil group for the site, are derived from the Soil Survey of Kennebec County by the United States Department of Agriculture Soil Conservation Service. The soils and hydrologic group are listed below:

Soil Classification	Hydrologic Group
Hartland (HfC)	*"B"*
Scio (SkB)	*"B"*

Ground Cover:
Pre-& Post Development: The watershed ground cover is modeled as impervious, woods, meadow and lawn.

Pre-project analysis: Three sub areas are utilized and are depicted the plan labeled "PRE".

Post-project analysis: Twenty sub areas are analyzed in the post-development condition, which is shown on the plan entitled "POST". Summary tables showing the input values and resulting peak flows for sub areas and ponds are also included at the end of the report. Three filter ponds provide treatment for the project to detain peak flows.

Three study points (SP1, SP2 & SP3) are utilized as points to compare the flows from the pre- and post-development condition. The pre- and post-development results for runoff are compared for the three different nodes in the tables on the next page:

STUDY POINT (SP1)			
Event	**PRE-DEV.**	**POST DEV.**	**Difference**
2-year	0.14 cfs	0.07 cfs	- 0.07 cfs
10-year	0.85 cfs	0.38 cfs	- 0.47 cfs
25-year	1.36 cfs	0.80 cfs	- 0.56 cfs

By comparing the nodes labeled SP1 the results show that the pre-development flows exceed post-development flows in regard to the 2-, 10- and 25-year peak storm events.

STUDY POINT (SP2)			
Event	**PRE-DEV.**	**POST DEV.**	**Difference**
2-year	0.29 cfs	0.29 cfs	- 0.00 cfs
10-year	1.57 cfs	1.18 cfs	- 0.39 cfs
25-year	2.50 cfs	1.69 cfs	- 0.81 cfs

By comparing the nodes labeled SP2 the results show that the pre-development flows exceed post-development flows in regard to the 2-, 10- and 25-year peak storm events.

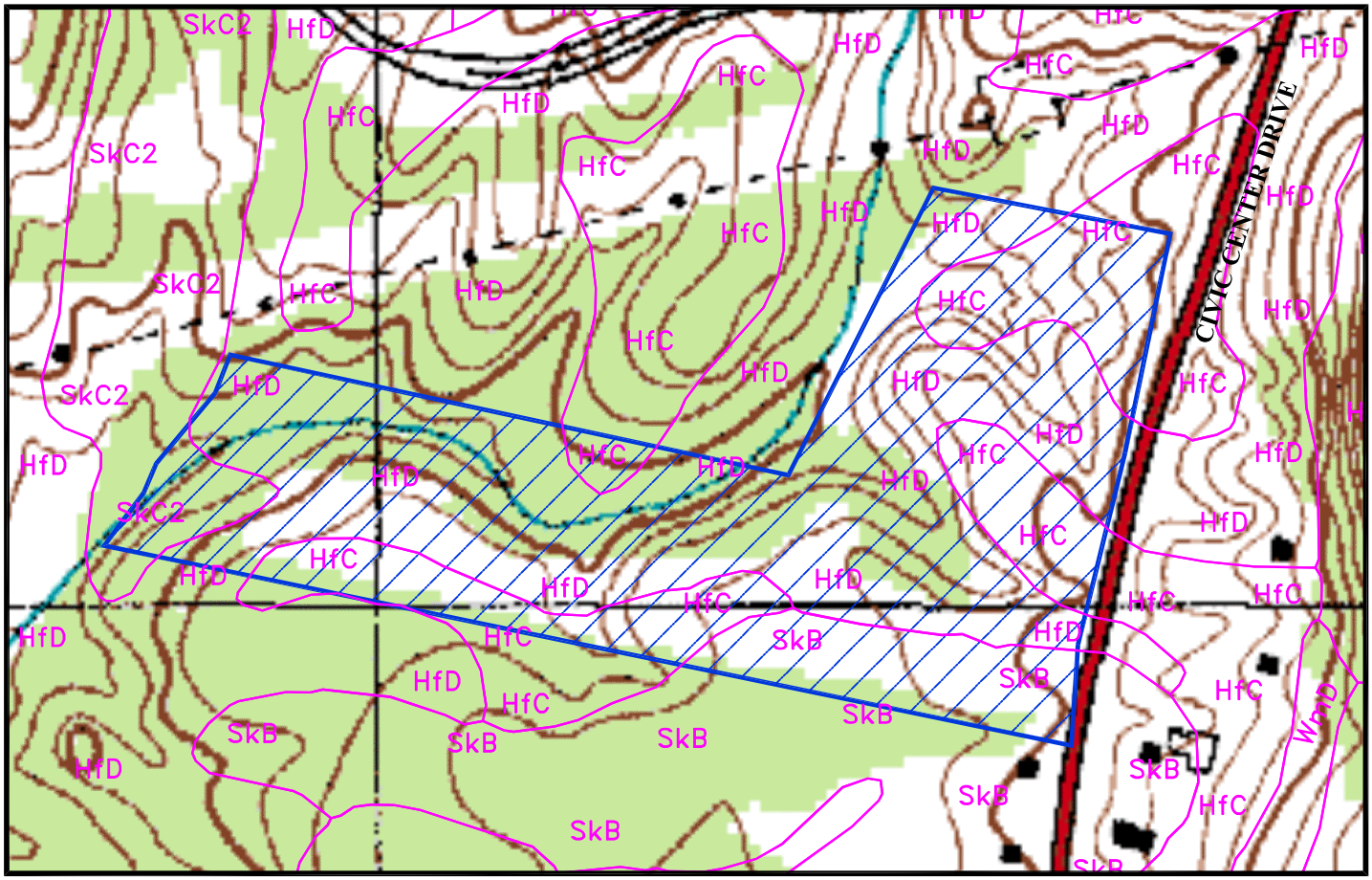
STUDY POINT (SP3)			
Event	**PRE-DEV.**	**POST DEV.**	**Difference**
2-year	0.11 cfs	1.10 cfs	+ 0.99 cfs
10-year	0.67 cfs	1.92 cfs	+ 1.25 cfs
25-year	1.07 cfs	2.38 cfs	+ 1.31 cfs

By comparing the nodes labeled SP3 the results show that the post-development flows exceed the pre-development flows in regard to all three peak storm events. This is predictable as it is impossible to detain runoff in the large ravine where the driveway crosses. There is a forty-two foot difference in elevation from Civic Center Drive to the ravine. There is a large amount of vegetated areas that are needed to "touch down" to existing grades and these areas can't be treated for stormwater quantity due to the terrain. This swale poses no threat in regard to flooding because of the large elevation differential. The unnamed drainage swale drains into a stream on the west side of the property and eventually to Bond Brook.

Respectfully Submitted,

James E. Coffin, PE

STATE OF MAINE
JAMES
E.
COFFIN
8500
LICENSED
PROFESSIONAL ENGINEER



SOILS MAP

SCALE: 1"=400'

SOILS FOUND ON-SITE	
CLASSIFICATION	NAME / DESCRIPTION
HfC (B)	HARTLAND VERY FINE SANDY LOAM, 8% TO 15% SLOPES
HfD (B)	HARTLAND VERY FINE SANDY LOAM, 15% TO 25% SLOPES
SkB (B)	SCIO VERY FINE SANDY LOAM, 3% TO 8% SLOPES
SkC2 (B)	SCIO VERY FINE SANDY LOAM, 8% TO 15% SLOPES, ERODED
INFORMATION REFERENCED FROM U.S. DEPT. OF AGRICULTURE S.C.S. "SOIL SURVEY OF KENNEBEC COUNTY OF MAINE" MAP 45.	

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

SOILS

CLIENT/PROJECT: **MAINE VETERANS' HOMES**

LOCATION: **CIVIC CENTER DRIVE**

TOWN: **AUGUSTA** COUNTY: **KENNEBEC** STATE: **MAINE**

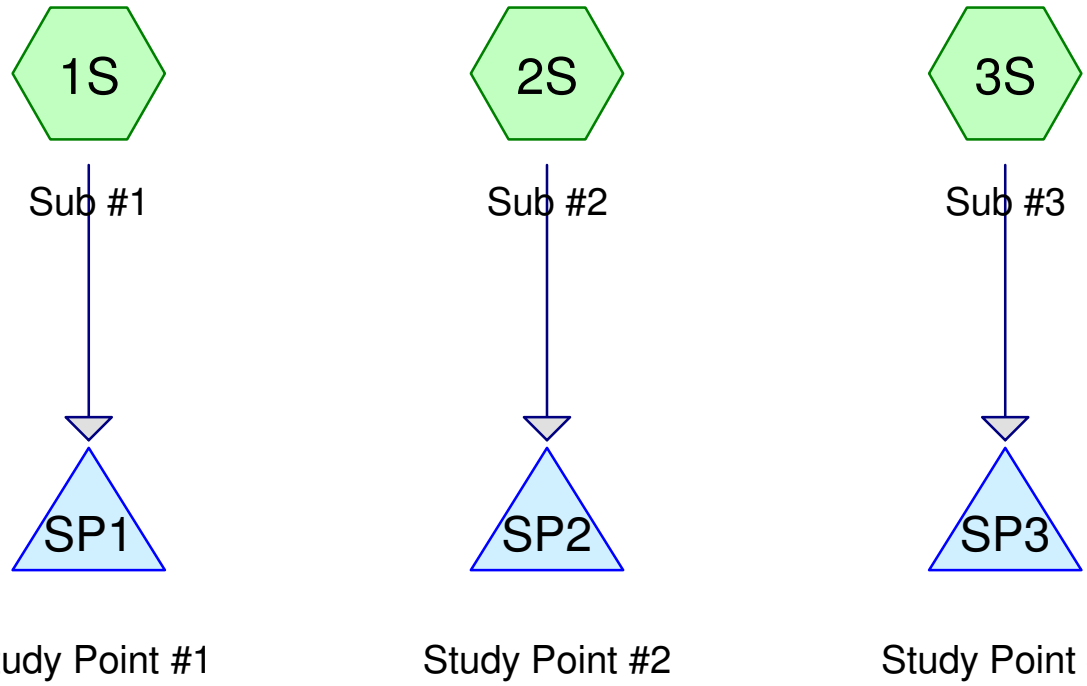
ENGINEERING E.S. COFFIN SURVEYING © 2013
E.S. COFFIN ENGINEERING & SURVEYING, INC.
432 Cony Road P.O. Box 4687 Augusta, Maine 04330
Ph. (207) 623-9474 Fax (207) 623-0016 Toll Free 1-800-244-9475

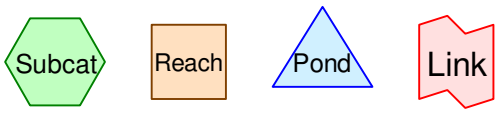
SHEET TITLE: **SOILS MAP**

SCALE: 1" = 400'

DATE: DECEMBER 31, 2013

PROJ. NO. 2013-251





Drainage Diagram for MVH Pre-Dev'mt
Prepared by E.S. Coffin Engineering & Surveying 1/16/2014
HydroCAD® 8.00 s/n 000434 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
0.941	55	Woods, Good, HSG B (1S,2S,3S)
3.892	58	Meadow, non-grazed, HSG B (1S,2S,3S)
4.833		

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

Subcatchment 1S: Sub #1 Runoff Area=61,925 sf Runoff Depth>0.21"
Flow Length=409' Tc=10.9 min CN=57 Runoff=0.14 cfs 0.024 af

Subcatchment 2S: Sub #2 Runoff Area=103,835 sf Runoff Depth>0.23"
Flow Length=346' Tc=10.9 min CN=58 Runoff=0.29 cfs 0.046 af

Subcatchment 3S: Sub #3 Runoff Area=44,775 sf Runoff Depth>0.21"
Flow Length=245' Tc=8.4 min CN=57 Runoff=0.11 cfs 0.018 af

Pond SP1: Study Point #1 Inflow=0.14 cfs 0.024 af
Primary=0.14 cfs 0.024 af

Pond SP2: Study Point #2 Inflow=0.29 cfs 0.046 af
Primary=0.29 cfs 0.046 af

Pond SP3: Study Point #3 Inflow=0.11 cfs 0.018 af
Primary=0.11 cfs 0.018 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.088 af Average Runoff Depth = 0.22"
100.00% Pervious Area = 4.833 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Sub #1

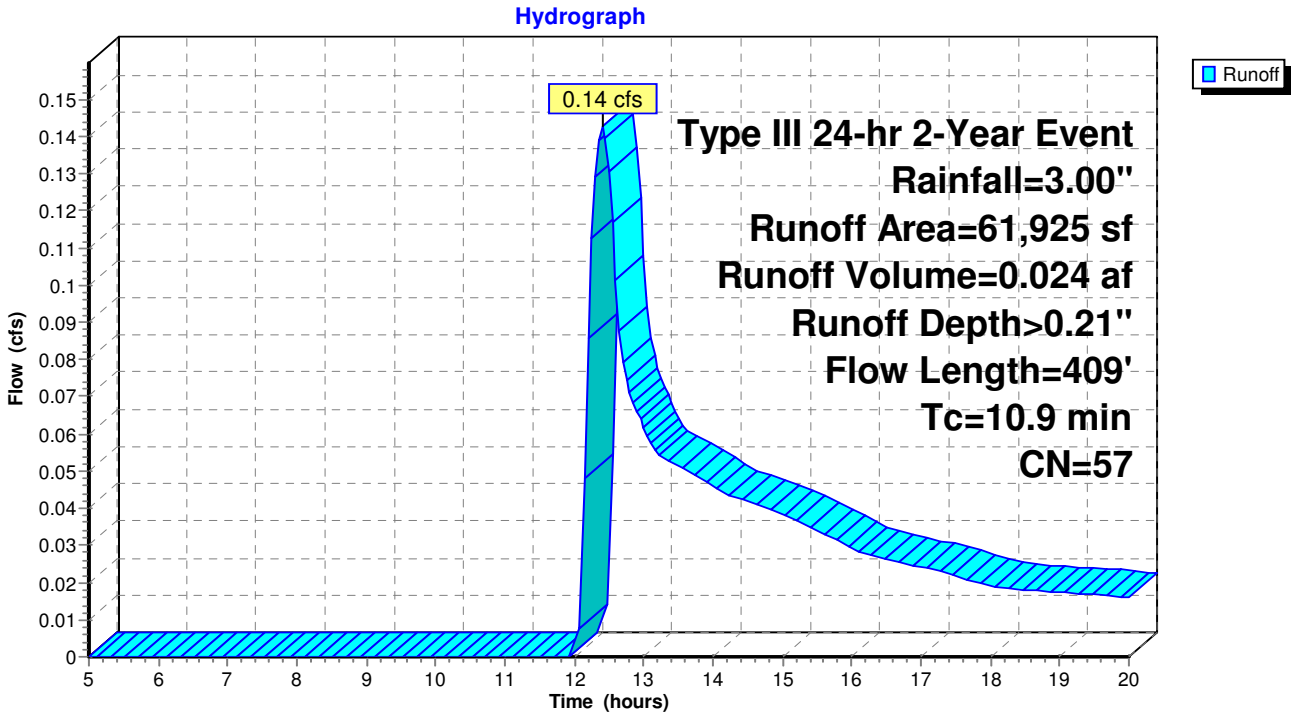
Runoff = 0.14 cfs @ 12.40 hrs, Volume= 0.024 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
47,315	58	Meadow, non-grazed, HSG B
14,610	55	Woods, Good, HSG B
61,925	57	Weighted Average
61,925		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0250	0.20		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
2.4	278	0.0773	1.95		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.3226	2.84		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
10.9	409	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

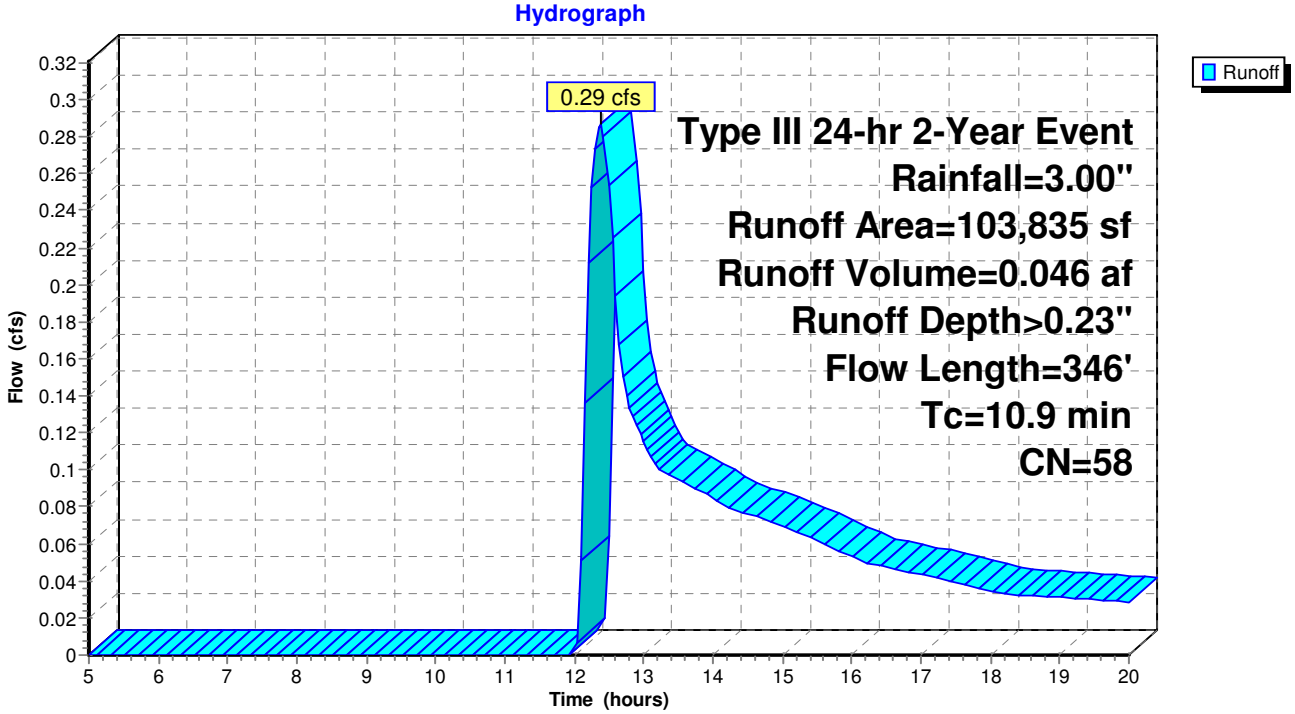
Runoff = 0.29 cfs @ 12.38 hrs, Volume= 0.046 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
99,730	58	Meadow, non-grazed, HSG B
4,105	55	Woods, Good, HSG B
103,835	58	Weighted Average
103,835		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
3.2	246	0.0325	1.26		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
10.9	346	Total			

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

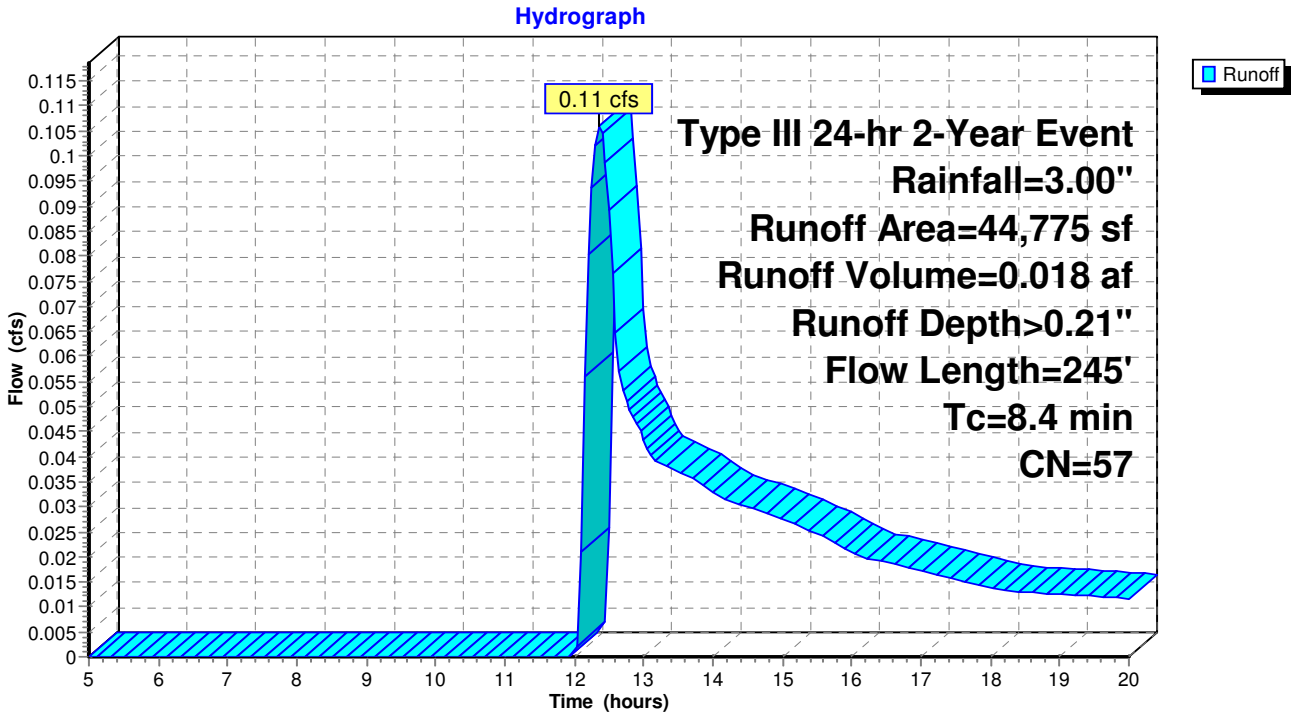
Runoff = 0.11 cfs @ 12.36 hrs, Volume= 0.018 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
22,510	58	Meadow, non-grazed, HSG B
22,265	55	Woods, Good, HSG B
44,775	57	Weighted Average
44,775		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0350	0.23		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
1.1	134	0.0896	2.10		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.2216	2.35		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
8.4	245	Total			

Subcatchment 3S: Sub #3

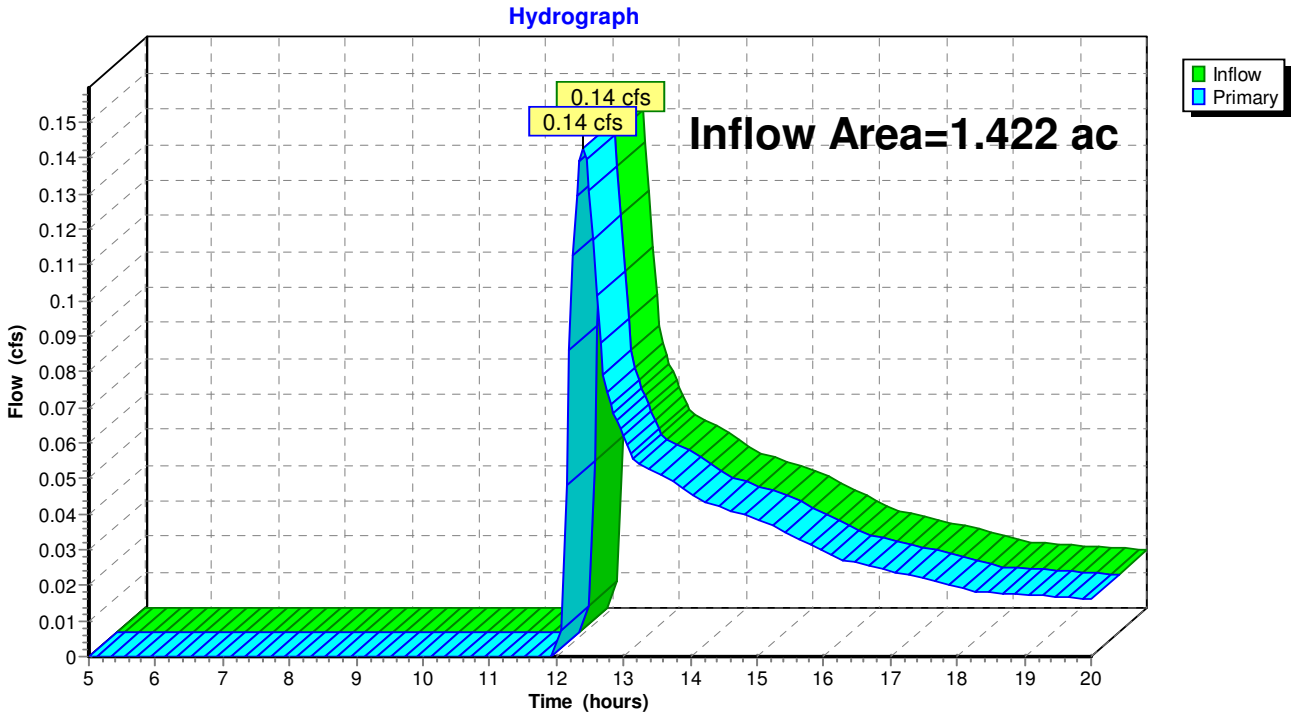


Pond SP1: Study Point #1

Inflow Area = 1.422 ac, Inflow Depth > 0.21" for 2-Year Event event
Inflow = 0.14 cfs @ 12.40 hrs, Volume= 0.024 af
Primary = 0.14 cfs @ 12.40 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

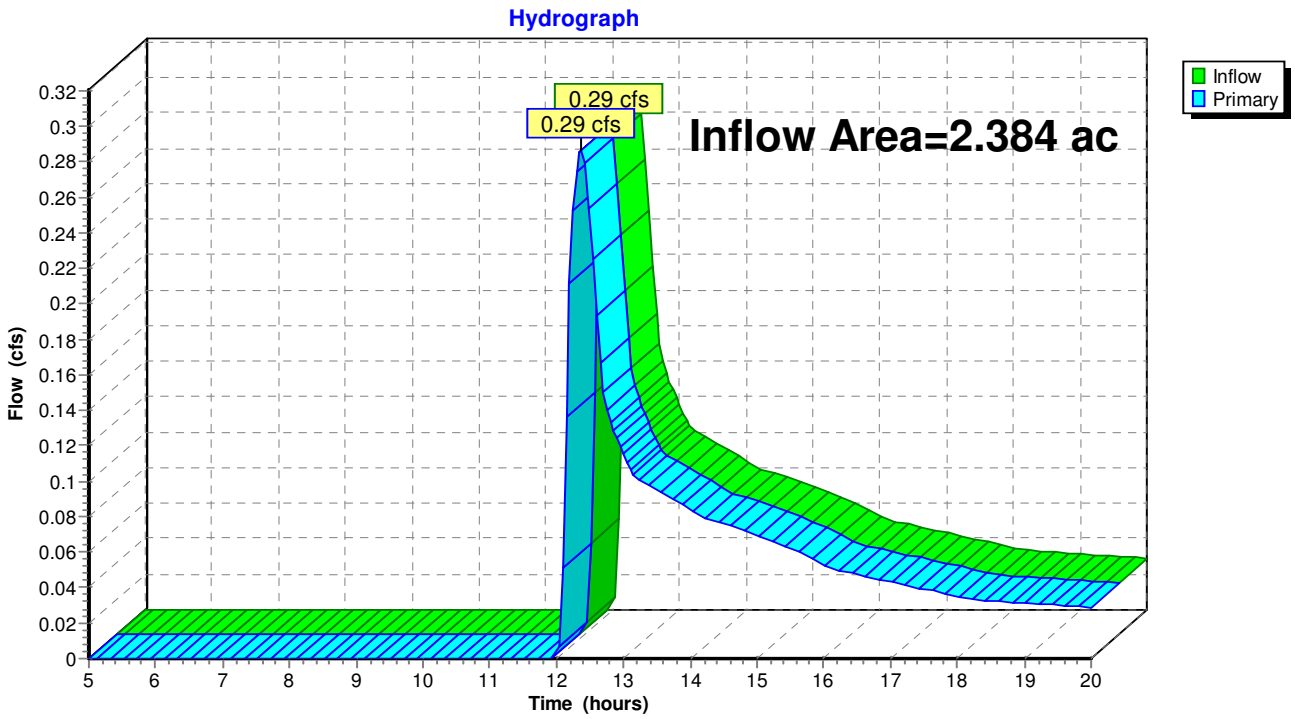


Pond SP2: Study Point #2

Inflow Area = 2.384 ac, Inflow Depth > 0.23" for 2-Year Event event
Inflow = 0.29 cfs @ 12.38 hrs, Volume= 0.046 af
Primary = 0.29 cfs @ 12.38 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

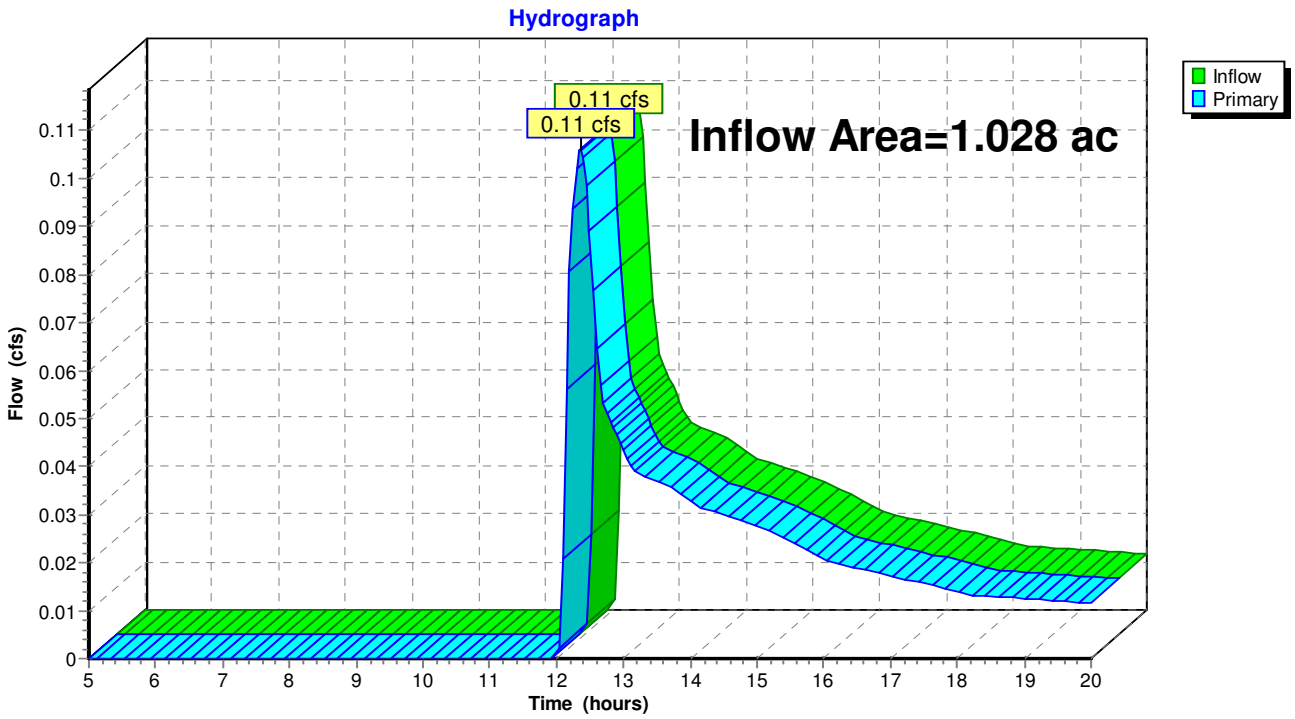


Pond SP3: Study Point #3

Inflow Area = 1.028 ac, Inflow Depth > 0.21" for 2-Year Event event
Inflow = 0.11 cfs @ 12.36 hrs, Volume= 0.018 af
Primary = 0.11 cfs @ 12.36 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #3



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

Subcatchment 1S: Sub #1 Runoff Area=61,925 sf Runoff Depth>0.71"
Flow Length=409' Tc=10.9 min CN=57 Runoff=0.85 cfs 0.084 af

Subcatchment 2S: Sub #2 Runoff Area=103,835 sf Runoff Depth>0.76"
Flow Length=346' Tc=10.9 min CN=58 Runoff=1.57 cfs 0.151 af

Subcatchment 3S: Sub #3 Runoff Area=44,775 sf Runoff Depth>0.71"
Flow Length=245' Tc=8.4 min CN=57 Runoff=0.67 cfs 0.061 af

Pond SP1: Study Point #1 Inflow=0.85 cfs 0.084 af
Primary=0.85 cfs 0.084 af

Pond SP2: Study Point #2 Inflow=1.57 cfs 0.151 af
Primary=1.57 cfs 0.151 af

Pond SP3: Study Point #3 Inflow=0.67 cfs 0.061 af
Primary=0.67 cfs 0.061 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.296 af Average Runoff Depth = 0.73"
100.00% Pervious Area = 4.833 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Sub #1

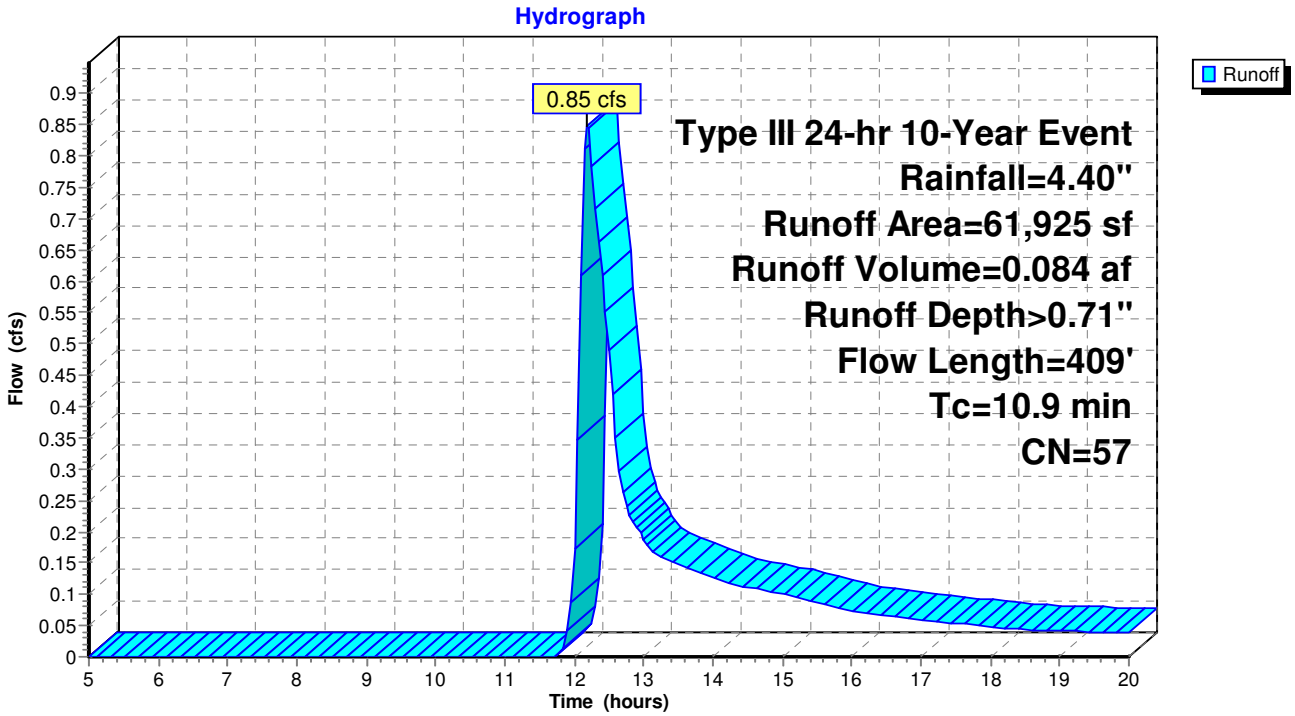
Runoff = 0.85 cfs @ 12.19 hrs, Volume= 0.084 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
47,315	58	Meadow, non-grazed, HSG B
14,610	55	Woods, Good, HSG B
61,925	57	Weighted Average
61,925		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0250	0.20		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
2.4	278	0.0773	1.95		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.3226	2.84		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
10.9	409	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

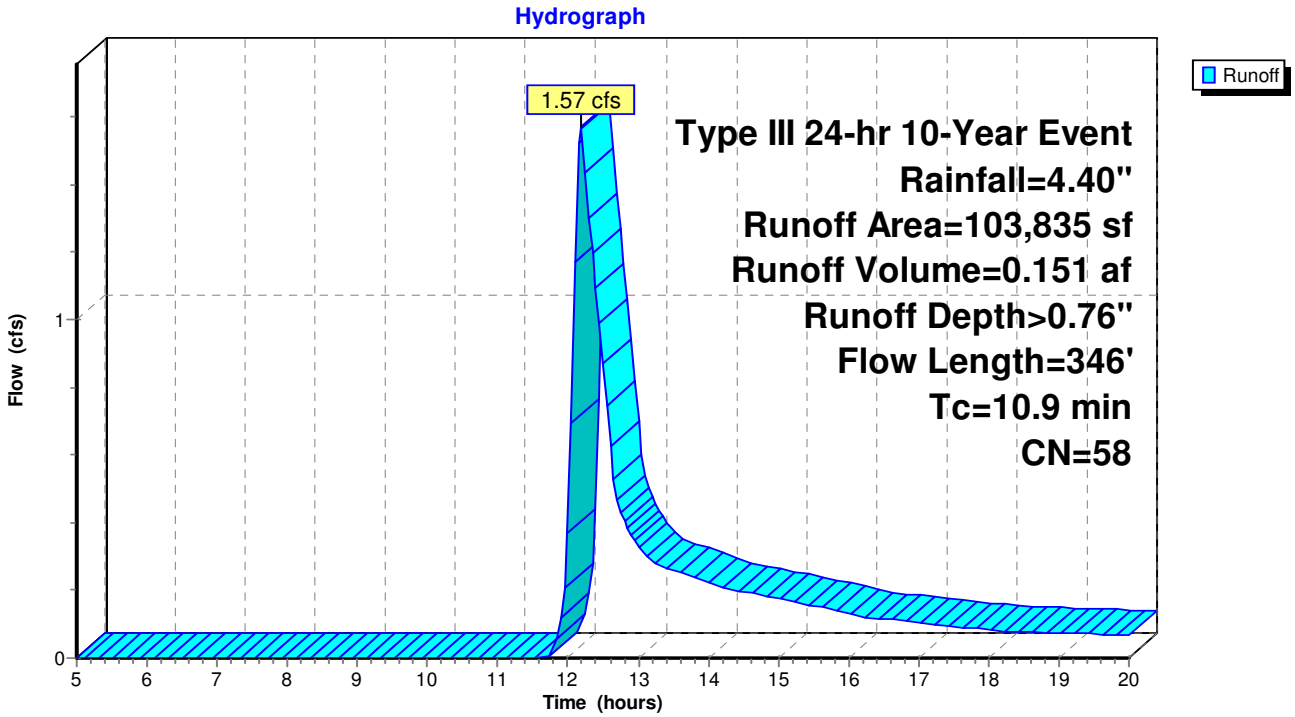
Runoff = 1.57 cfs @ 12.19 hrs, Volume= 0.151 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
99,730	58	Meadow, non-grazed, HSG B
4,105	55	Woods, Good, HSG B
103,835	58	Weighted Average
103,835		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
3.2	246	0.0325	1.26		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
10.9	346	Total			

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

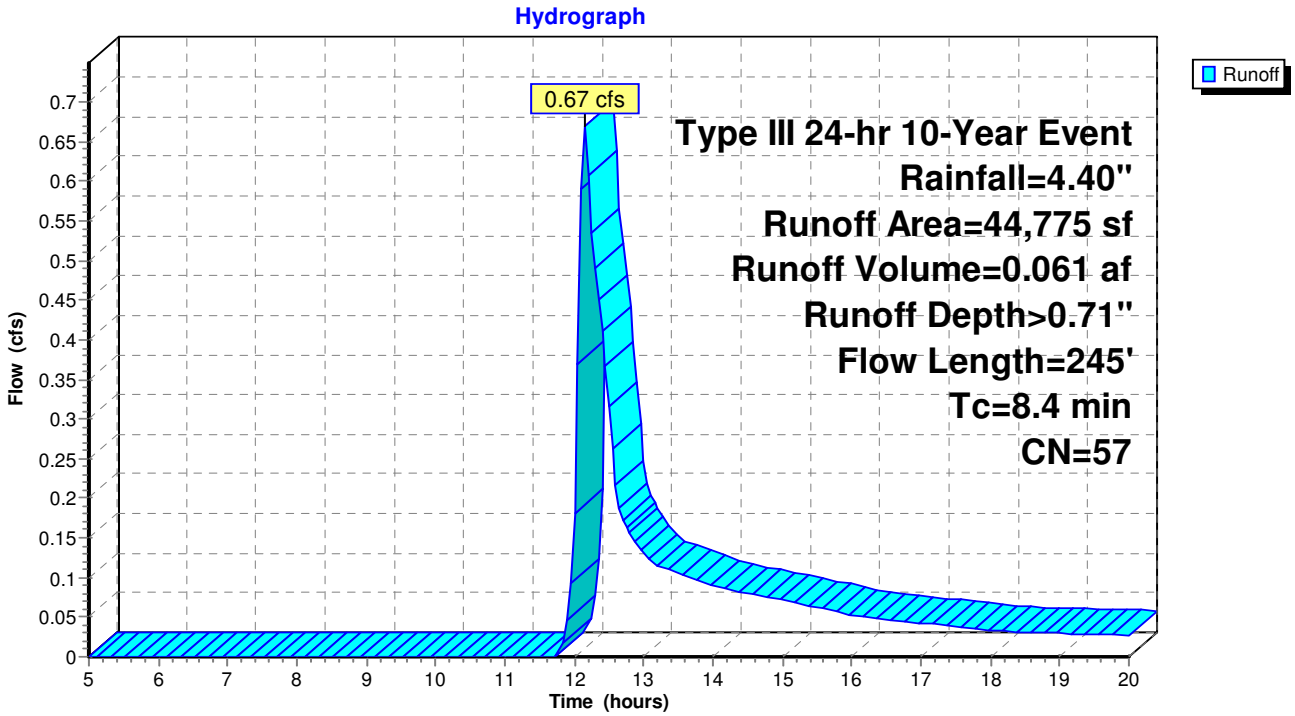
Runoff = 0.67 cfs @ 12.15 hrs, Volume= 0.061 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
22,510	58	Meadow, non-grazed, HSG B
22,265	55	Woods, Good, HSG B
44,775	57	Weighted Average
44,775		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0350	0.23		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
1.1	134	0.0896	2.10		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.2216	2.35		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
8.4	245	Total			

Subcatchment 3S: Sub #3

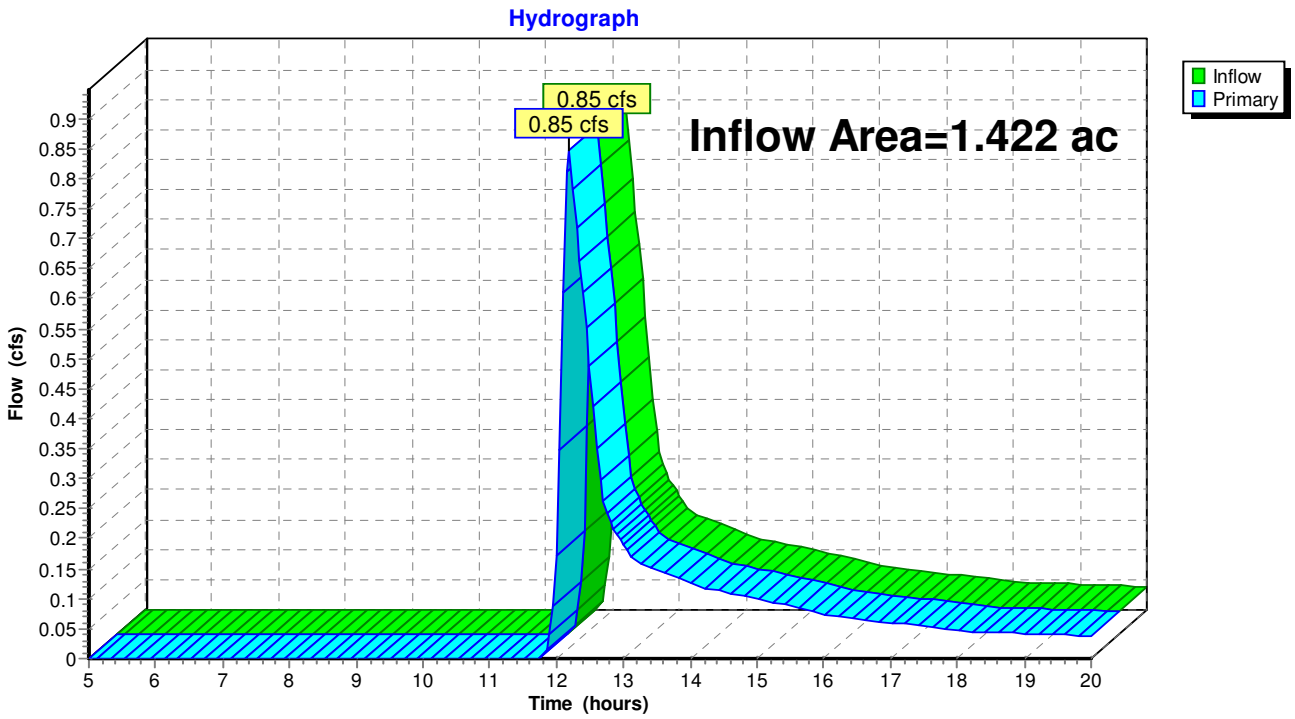


Pond SP1: Study Point #1

Inflow Area = 1.422 ac, Inflow Depth > 0.71" for 10-Year Event event
Inflow = 0.85 cfs @ 12.19 hrs, Volume= 0.084 af
Primary = 0.85 cfs @ 12.19 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

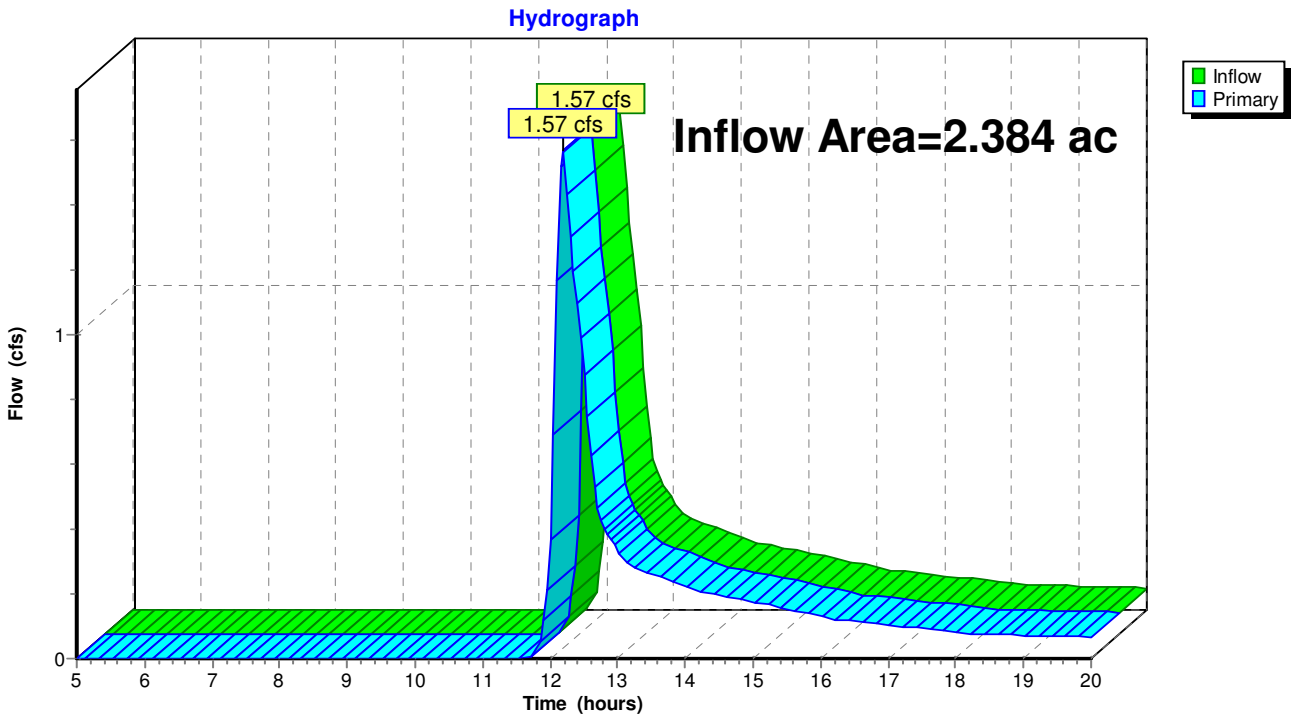


Pond SP2: Study Point #2

Inflow Area = 2.384 ac, Inflow Depth > 0.76" for 10-Year Event event
Inflow = 1.57 cfs @ 12.19 hrs, Volume= 0.151 af
Primary = 1.57 cfs @ 12.19 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

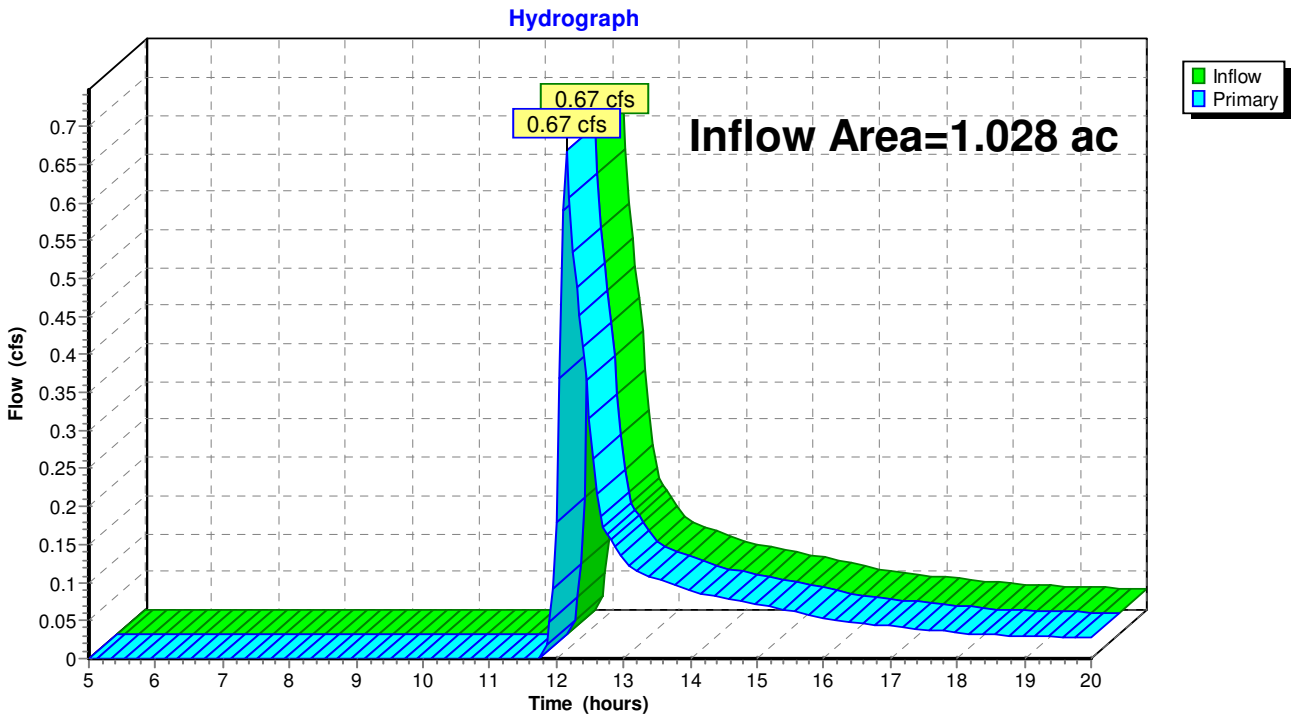


Pond SP3: Study Point #3

Inflow Area = 1.028 ac, Inflow Depth > 0.71" for 10-Year Event event
Inflow = 0.67 cfs @ 12.15 hrs, Volume= 0.061 af
Primary = 0.67 cfs @ 12.15 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #3



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

Subcatchment 1S: Sub #1 Runoff Area=61,925 sf Runoff Depth>1.04"
Flow Length=409' Tc=10.9 min CN=57 Runoff=1.36 cfs 0.123 af

Subcatchment 2S: Sub #2 Runoff Area=103,835 sf Runoff Depth>1.10"
Flow Length=346' Tc=10.9 min CN=58 Runoff=2.50 cfs 0.218 af

Subcatchment 3S: Sub #3 Runoff Area=44,775 sf Runoff Depth>1.04"
Flow Length=245' Tc=8.4 min CN=57 Runoff=1.07 cfs 0.089 af

Pond SP1: Study Point #1 Inflow=1.36 cfs 0.123 af
Primary=1.36 cfs 0.123 af

Pond SP2: Study Point #2 Inflow=2.50 cfs 0.218 af
Primary=2.50 cfs 0.218 af

Pond SP3: Study Point #3 Inflow=1.07 cfs 0.089 af
Primary=1.07 cfs 0.089 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.430 af Average Runoff Depth = 1.07"
100.00% Pervious Area = 4.833 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Sub #1

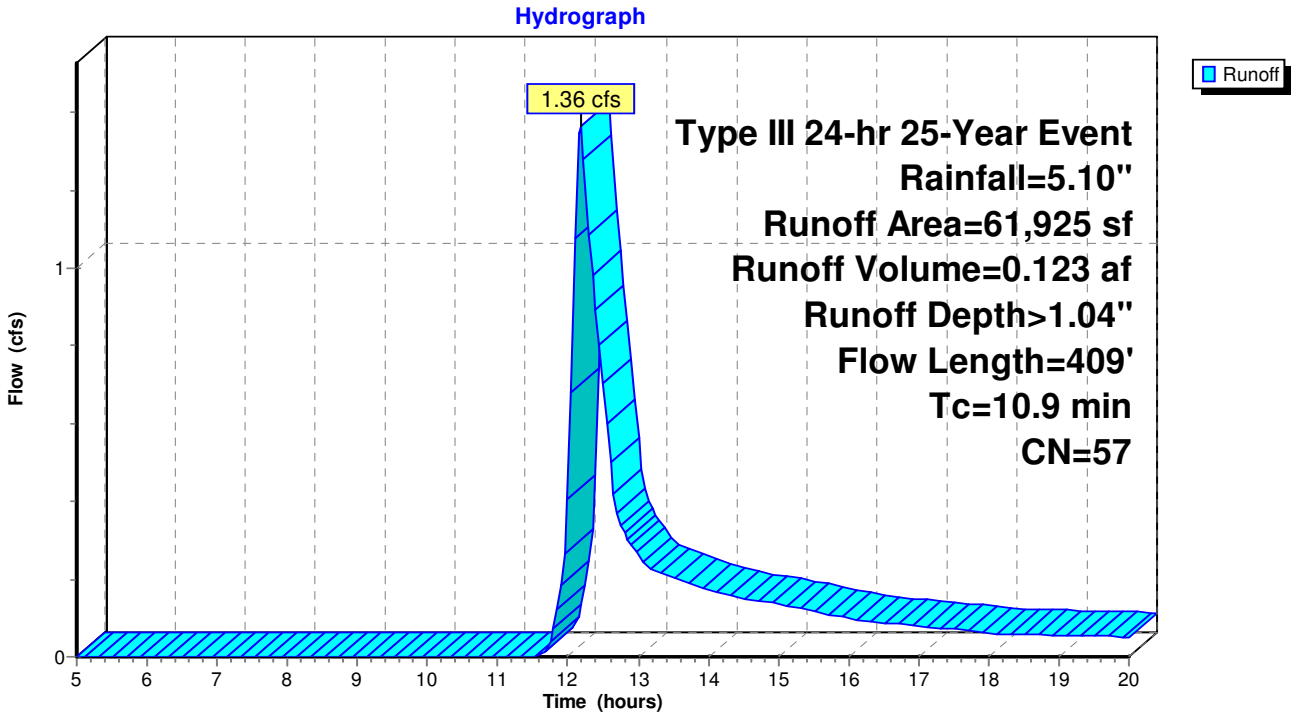
Runoff = 1.36 cfs @ 12.18 hrs, Volume= 0.123 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
47,315	58	Meadow, non-grazed, HSG B
14,610	55	Woods, Good, HSG B
61,925	57	Weighted Average
61,925		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0250	0.20		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
2.4	278	0.0773	1.95		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.3226	2.84		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
10.9	409	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

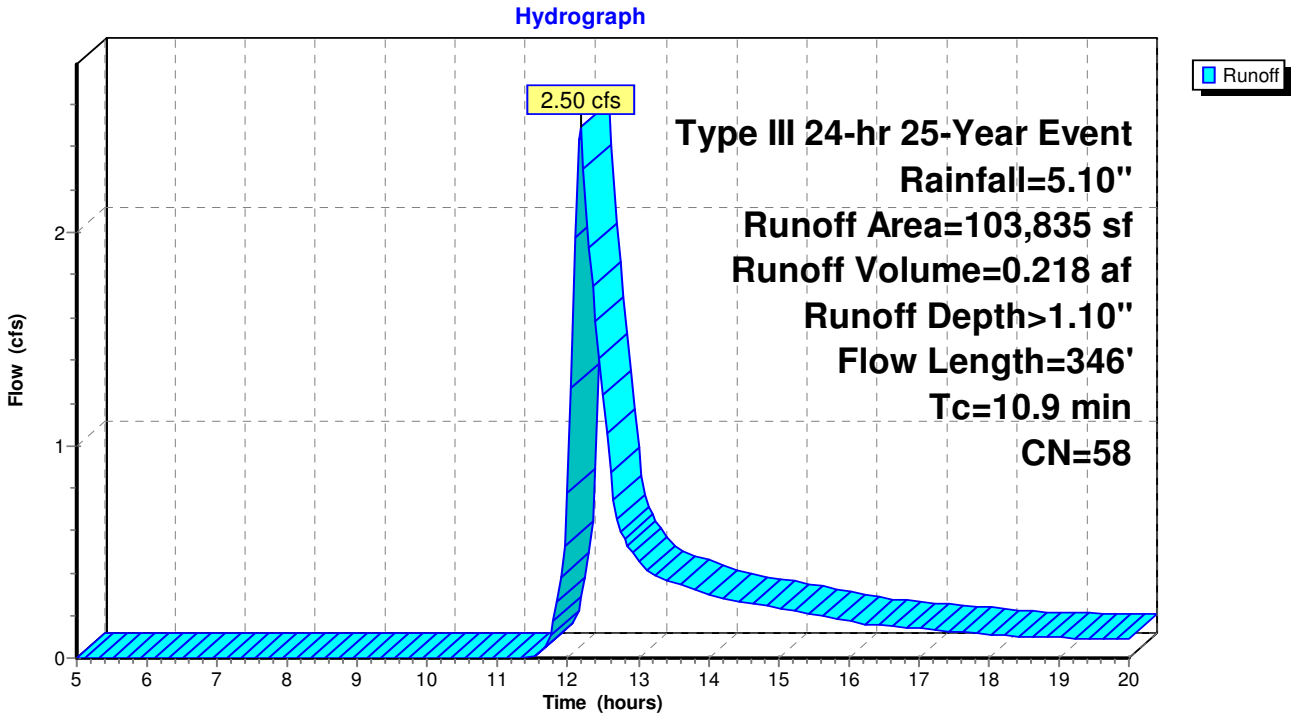
Runoff = 2.50 cfs @ 12.17 hrs, Volume= 0.218 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
99,730	58	Meadow, non-grazed, HSG B
4,105	55	Woods, Good, HSG B
103,835	58	Weighted Average
103,835		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
3.2	246	0.0325	1.26		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
10.9	346	Total			

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

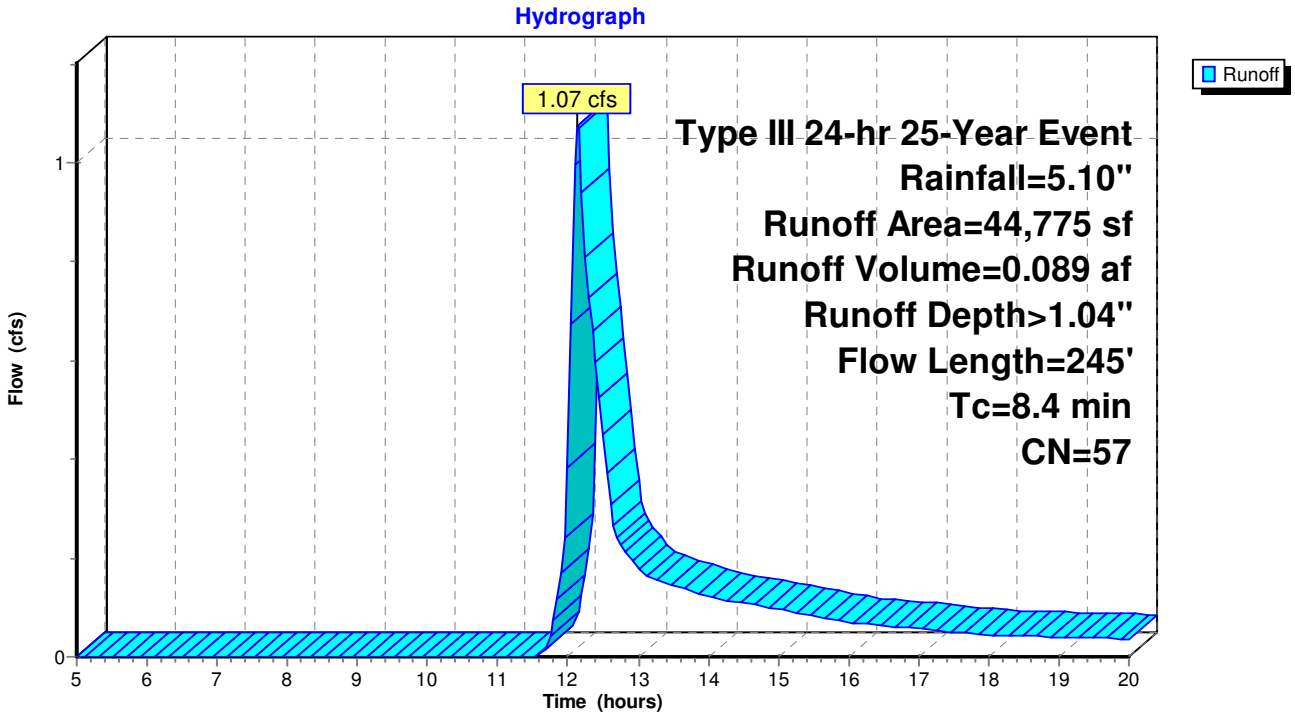
Runoff = 1.07 cfs @ 12.14 hrs, Volume= 0.089 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
22,510	58	Meadow, non-grazed, HSG B
22,265	55	Woods, Good, HSG B
44,775	57	Weighted Average
44,775		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0350	0.23		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
1.1	134	0.0896	2.10		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.2216	2.35		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
8.4	245	Total			

Subcatchment 3S: Sub #3

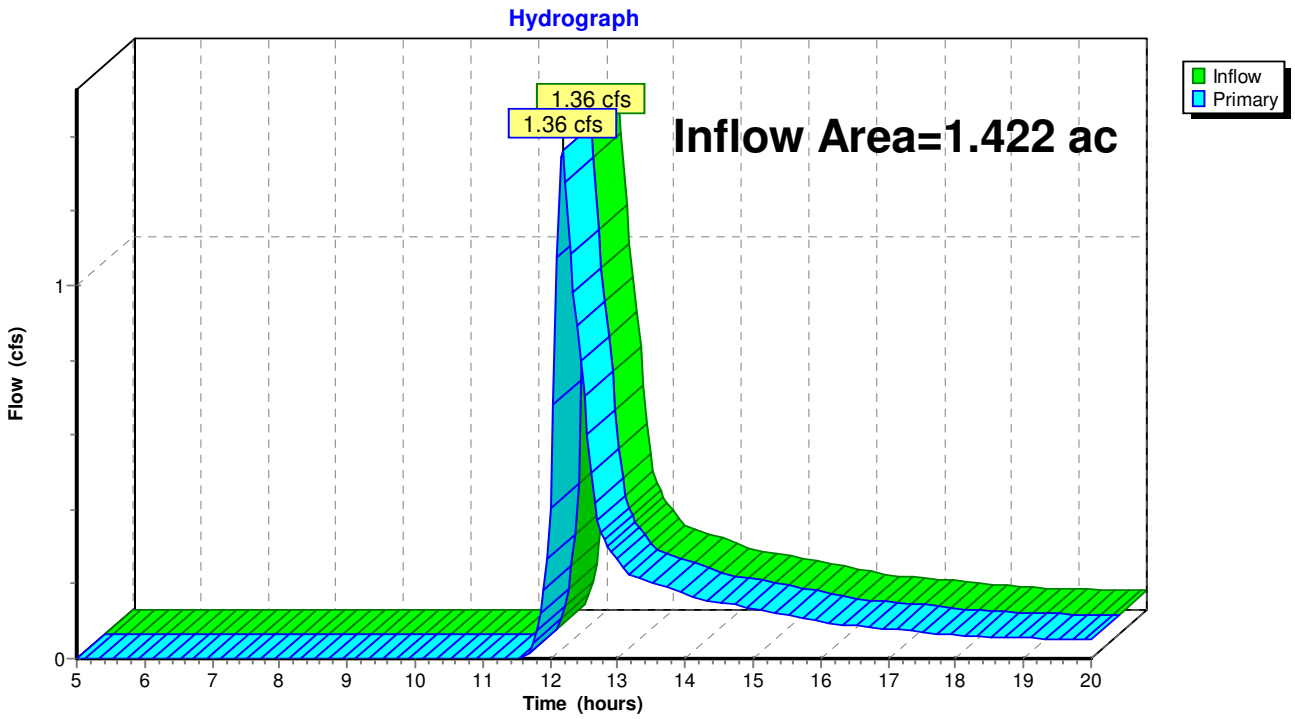


Pond SP1: Study Point #1

Inflow Area = 1.422 ac, Inflow Depth > 1.04" for 25-Year Event event
Inflow = 1.36 cfs @ 12.18 hrs, Volume= 0.123 af
Primary = 1.36 cfs @ 12.18 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

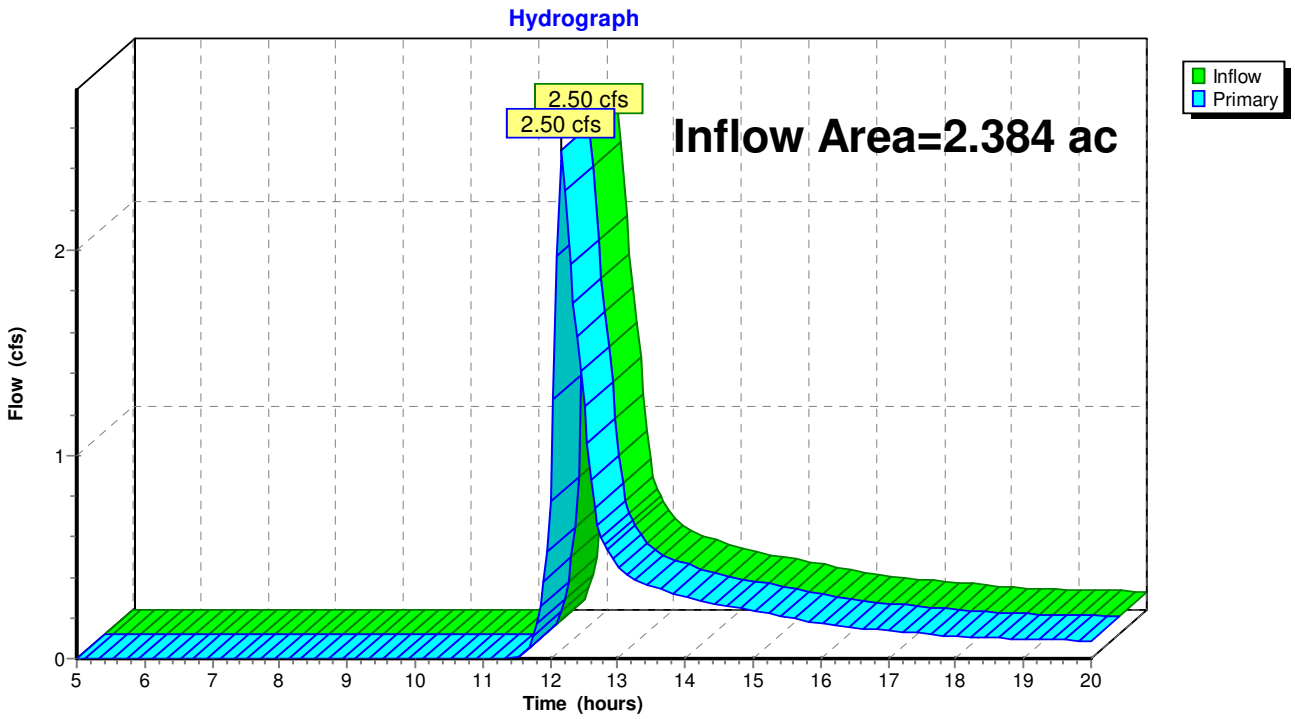


Pond SP2: Study Point #2

Inflow Area = 2.384 ac, Inflow Depth > 1.10" for 25-Year Event event
Inflow = 2.50 cfs @ 12.17 hrs, Volume= 0.218 af
Primary = 2.50 cfs @ 12.17 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

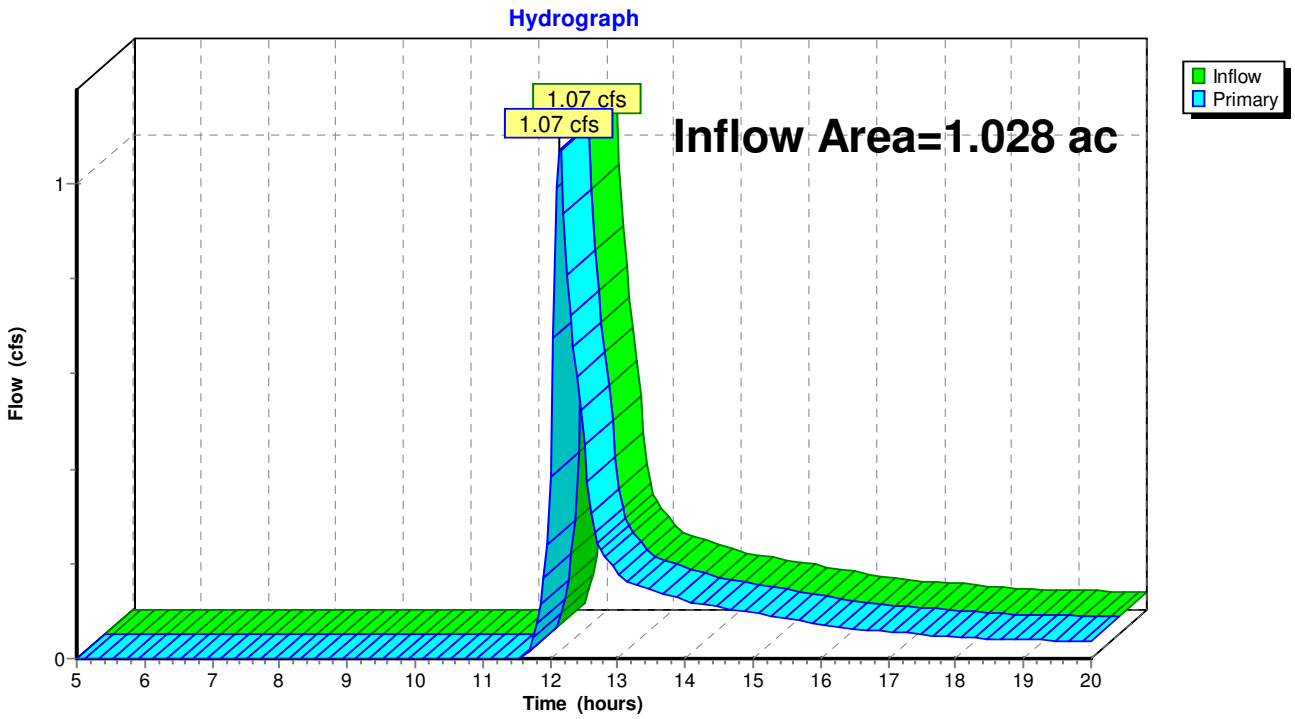


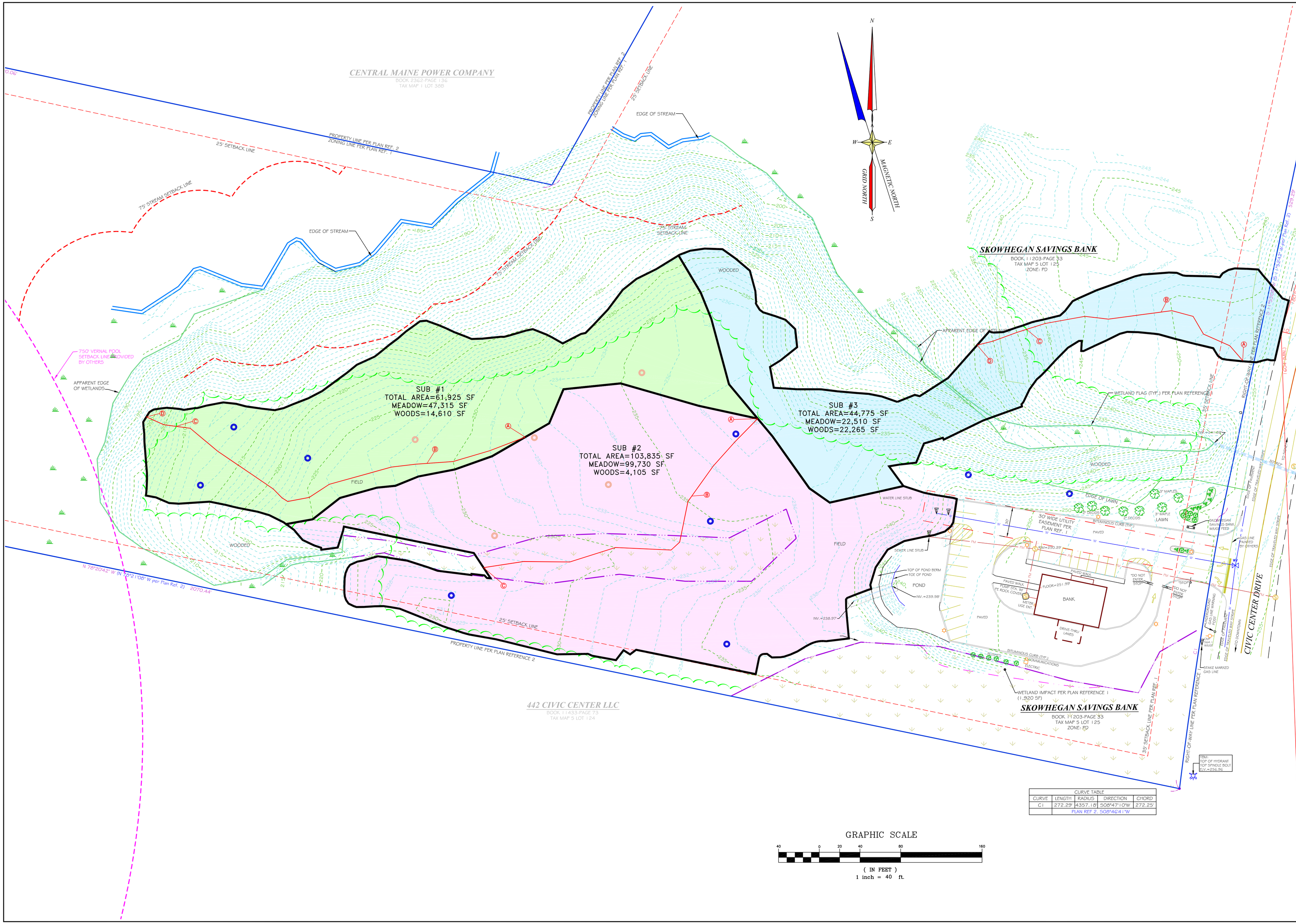
Pond SP3: Study Point #3

Inflow Area =	1.028 ac,	Inflow Depth >	1.04"	for	25-Year Event event	
Inflow =	1.07 cfs @	12.14 hrs,	Volume=		0.089 af	
Primary =	1.07 cfs @	12.14 hrs,	Volume=		0.089 af,	Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #3





CURVE TABLE				
CURVE	LENGTH	RADIUS	DIRECTION	CHORD
C1	272.29'	4357.18'	S08°47'10"W	272.25'
	PLAN REF 2, S08°46'41"W			

STATE OF MAINE
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NO.	REVISIONS	DATE

SHEET TITLE: PRE-DEVELOPMENT PLAN

SCALE: 1 INCH=40 FEET

DATE: DECEMBER 31, 2013

DRAWN BY: TGH

CHECKED BY: JEC

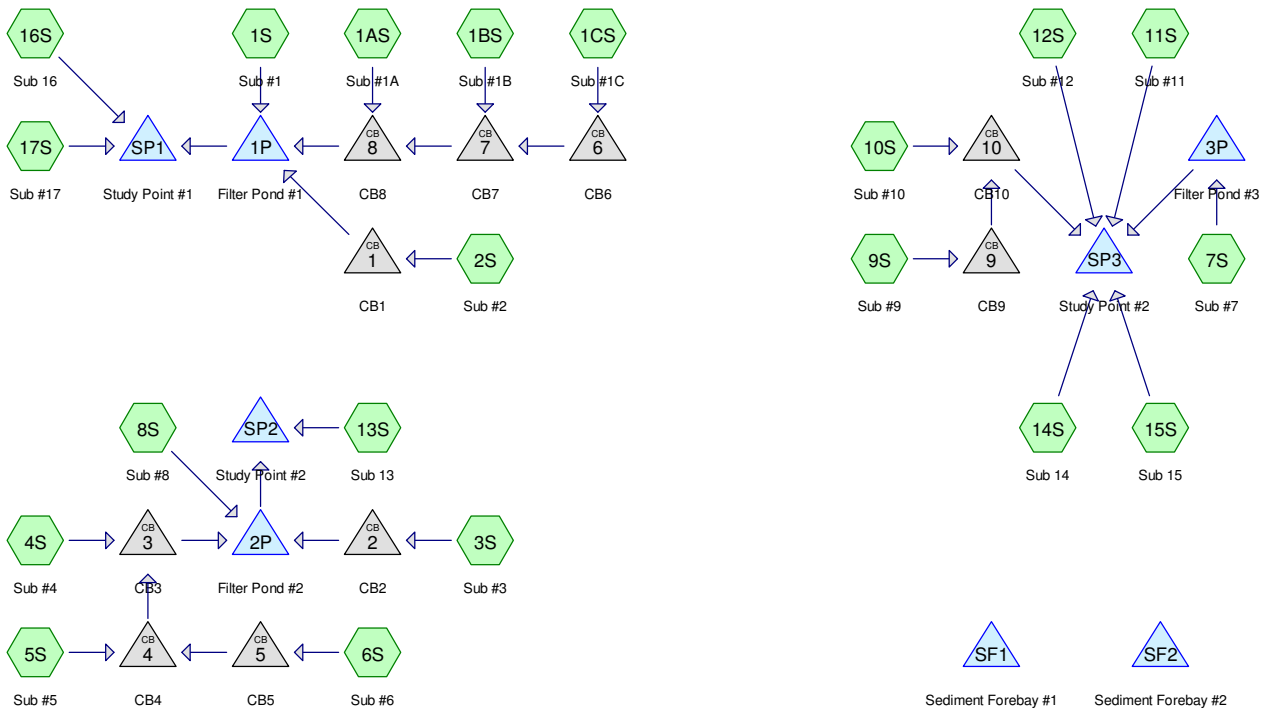
CLIENT/PROJECT: MAINE VETERANS' HOMES
SKOWHEGAN SAVINGS BANK PROPERTY

LOCATION: CIVIC CENTER DRIVE

TOWN: AUGUSTA COUNTY: KENNEBEC STATE: MAINE

PROJ. NO. 2013-251

PRE



Subcat Reach Pond Link

Drainage Diagram for MVH Post-Dev'mt

Prepared by E.S. Coffin Engineering & Surveying 1/16/2014

HydroCAD® 8.00 s/n 000434 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
1.309	58	Meadow, non-grazed, HSG B (1S,7S,8S,13S,14S,15S,16S,17S)
0.888	61	>75% Grass cover, Good, HSG B (1AS,1BS,1CS,1S,3S,4S,5S,6S,7S,11S,12S)
2.636	98	Paved parking & roofs (1AS,1BS,1CS,1S,2S,3S,4S,5S,6S,7S,9S,10S,11S,12S)
4.833		

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

Subcatchment 1AS: Sub #1A Runoff Area=11,725 sf Runoff Depth>1.86"
Flow Length=98' Tc=8.6 min CN=90 Runoff=0.56 cfs 0.042 af

Subcatchment 1BS: Sub #1B Runoff Area=4,165 sf Runoff Depth>1.34"
Tc=0.0 min CN=83 Runoff=0.19 cfs 0.011 af

Subcatchment 1CS: Sub #1C Runoff Area=3,840 sf Runoff Depth>1.41"
Flow Length=59' Slope=0.0200 '/' Tc=5.9 min CN=84 Runoff=0.15 cfs 0.010 af

Subcatchment 1S: Sub #1 Runoff Area=38,580 sf Runoff Depth>0.93"
Flow Length=314' Tc=0.9 min CN=76 Runoff=1.12 cfs 0.069 af

Subcatchment 2S: Sub #2 Runoff Area=4,060 sf Runoff Depth>2.59"
Flow Length=103' Slope=0.0400 '/' Tc=1.0 min CN=98 Runoff=0.30 cfs 0.020 af

Subcatchment 3S: Sub #3 Runoff Area=27,485 sf Runoff Depth>1.87"
Flow Length=184' Tc=1.3 min CN=90 Runoff=1.60 cfs 0.098 af

Subcatchment 4S: Sub #4 Runoff Area=6,165 sf Runoff Depth>2.50"
Flow Length=122' Slope=0.0400 '/' Tc=1.0 min CN=97 Runoff=0.45 cfs 0.030 af

Subcatchment 5S: Sub #5 Runoff Area=11,125 sf Runoff Depth>2.59"
Flow Length=98' Slope=0.0286 '/' Tc=1.1 min CN=98 Runoff=0.82 cfs 0.055 af

Subcatchment 6S: Sub #6 Runoff Area=18,880 sf Runoff Depth>2.13"
Flow Length=125' Tc=1.3 min CN=93 Runoff=1.22 cfs 0.077 af

Subcatchment 7S: Sub #7 Runoff Area=26,440 sf Runoff Depth>1.10"
Flow Length=87' Tc=1.0 min CN=79 Runoff=0.92 cfs 0.055 af

Subcatchment 8S: Sub #8 Runoff Area=9,960 sf Runoff Depth>0.23"
Flow Length=35' Slope=0.1714 '/' Tc=1.7 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 9S: Sub #9 Runoff Area=4,140 sf Runoff Depth>2.59"
Flow Length=290' Tc=1.3 min CN=98 Runoff=0.30 cfs 0.021 af

Subcatchment 10S: Sub #10 Runoff Area=4,145 sf Runoff Depth>2.59"
Flow Length=282' Tc=1.3 min CN=98 Runoff=0.30 cfs 0.021 af

Subcatchment 11S: Sub #11 Runoff Area=4,135 sf Runoff Depth>0.93"
Flow Length=50' Tc=2.3 min CN=76 Runoff=0.12 cfs 0.007 af

Subcatchment 12S: Sub #12 Runoff Area=5,800 sf Runoff Depth>0.78"
Flow Length=64' Tc=2.6 min CN=73 Runoff=0.14 cfs 0.009 af

Subcatchment 13S: Sub 13 Runoff Area=2,805 sf Runoff Depth>0.23"
Flow Length=18' Slope=0.5000 '/' Tc=0.6 min CN=58 Runoff=0.01 cfs 0.001 af

Subcatchment 14S: Sub 14 Runoff Area=9,215 sf Runoff Depth>0.23"
Flow Length=33' Slope=0.3636 '/' Tc=1.2 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 15S: Sub 15 Runoff Area=3,815 sf Runoff Depth>0.23"
Flow Length=24' Slope=0.2917 '/' Tc=1.0 min CN=58 Runoff=0.01 cfs 0.002 af

Subcatchment 16S: Sub 16 Runoff Area=9,285 sf Runoff Depth>0.23"
Flow Length=37' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 17S: Sub #17 Runoff Area=4,770 sf Runoff Depth>0.23"
Flow Length=35' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.01 cfs 0.002 af

Pond 1: CB1 Peak Elev=227.79' Inflow=0.30 cfs 0.020 af
15.0" x 47.0' Culvert Outflow=0.30 cfs 0.020 af

Pond 1P: Filter Pond #1 Peak Elev=212.68' Storage=5,560 cf Inflow=2.06 cfs 0.152 af
Outflow=0.07 cfs 0.026 af

Pond 2: CB2 Peak Elev=229.20' Inflow=1.60 cfs 0.098 af
15.0" x 39.0' Culvert Outflow=1.60 cfs 0.098 af

Pond 2P: Filter Pond #2 Peak Elev=229.40' Storage=7,572 cf Inflow=4.10 cfs 0.264 af
Outflow=0.29 cfs 0.118 af

Pond 3: CB3 Peak Elev=229.72' Inflow=2.50 cfs 0.162 af
15.0" x 26.0' Culvert Outflow=2.50 cfs 0.162 af

Pond 3P: Filter Pond #3 Peak Elev=235.00' Storage=498 cf Inflow=0.92 cfs 0.055 af
3.0" x 70.0' Culvert Outflow=0.24 cfs 0.055 af

Pond 4: CB4 Peak Elev=230.61' Inflow=2.05 cfs 0.132 af
15.0" x 86.0' Culvert Outflow=2.05 cfs 0.132 af

Pond 5: CB5 Peak Elev=232.03' Inflow=1.22 cfs 0.077 af
15.0" x 134.0' Culvert Outflow=1.22 cfs 0.077 af

Pond 6: CB6 Peak Elev=230.68' Inflow=0.15 cfs 0.010 af
15.0" x 60.0' Culvert Outflow=0.15 cfs 0.010 af

Pond 7: CB7 Peak Elev=229.85' Inflow=0.29 cfs 0.021 af
15.0" x 140.0' Culvert Outflow=0.29 cfs 0.021 af

Pond 8: CB8 Peak Elev=228.38' Inflow=0.80 cfs 0.063 af
15.0" x 89.0' Culvert Outflow=0.80 cfs 0.063 af

Pond 9: CB9 Peak Elev=226.25' Inflow=0.30 cfs 0.021 af
15.0" x 18.0' Culvert Outflow=0.30 cfs 0.021 af

Pond 10: CB10 Peak Elev=225.81' Inflow=0.61 cfs 0.041 af
15.0" x 26.0' Culvert Outflow=0.61 cfs 0.041 af

Pond SF1: Sediment Forebay #1 Peak Elev=0.00' Storage=0 cf

Pond SF2: Sediment Forebay #2 Peak Elev=0.00' Storage=0 cf

Pond SP1: Study Point #1 Inflow=0.07 cfs 0.033 af
Primary=0.07 cfs 0.033 af

Pond SP2: Study Point #2 Inflow=0.29 cfs 0.119 af
Primary=0.29 cfs 0.119 af

Pond SP3: Study Point #2 Inflow=1.10 cfs 0.118 af
Primary=1.10 cfs 0.118 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.542 af Average Runoff Depth = 1.34"
45.46% Pervious Area = 2.197 ac 54.54% Impervious Area = 2.636 ac

Subcatchment 1AS: Sub #1A

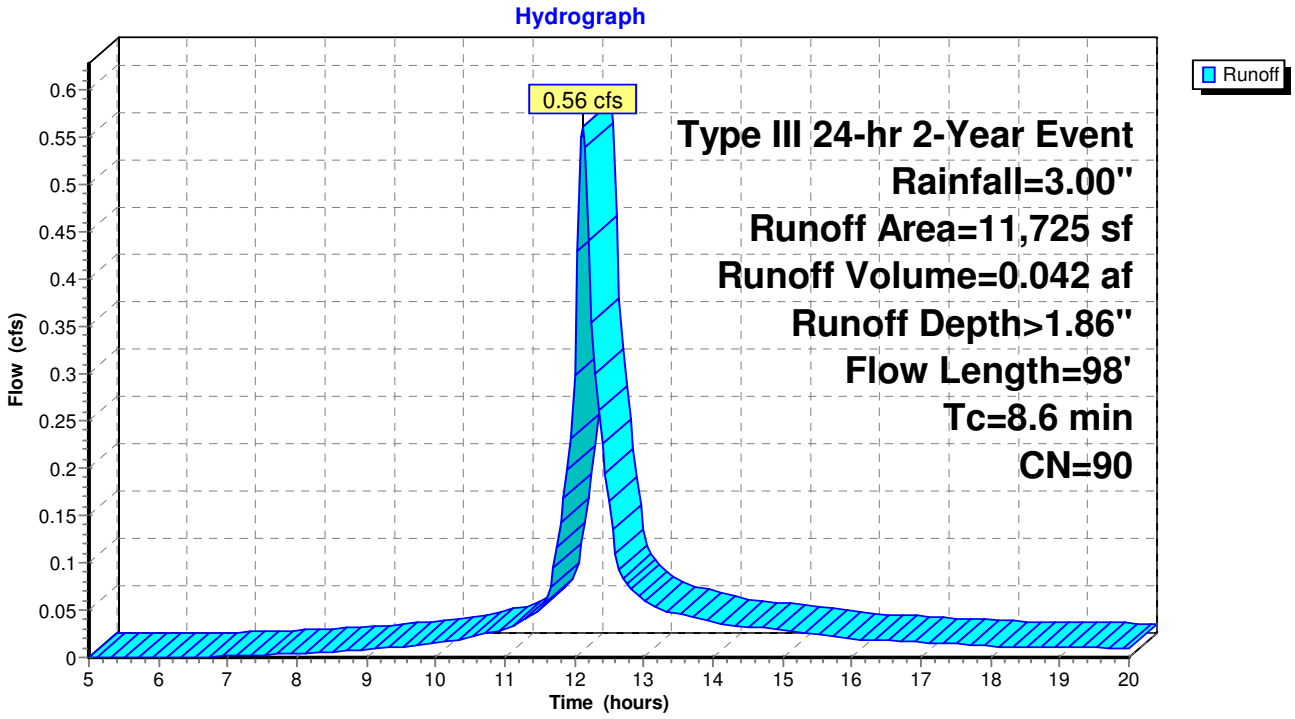
Runoff = 0.56 cfs @ 12.12 hrs, Volume= 0.042 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,225	98	Paved parking & roofs
2,500	61	>75% Grass cover, Good, HSG B
11,725	90	Weighted Average
2,500		Pervious Area
9,225		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
8.4	86	0.0233	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
8.6	98	Total			

Subcatchment 1AS: Sub #1A



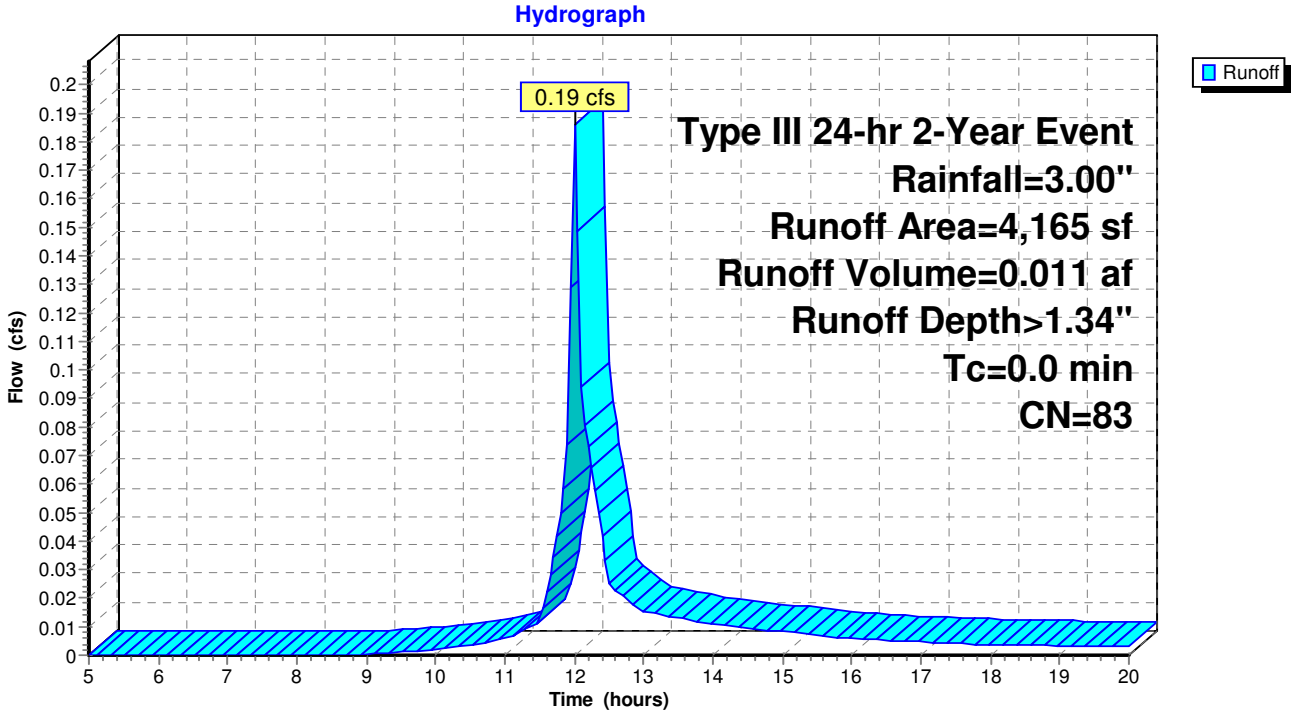
Subcatchment 1BS: Sub #1B

Runoff = 0.19 cfs @ 12.01 hrs, Volume= 0.011 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,505	98	Paved parking & roofs
1,660	61	>75% Grass cover, Good, HSG B
4,165	83	Weighted Average
1,660		Pervious Area
2,505		Impervious Area

Subcatchment 1BS: Sub #1B



Subcatchment 1CS: Sub #1C

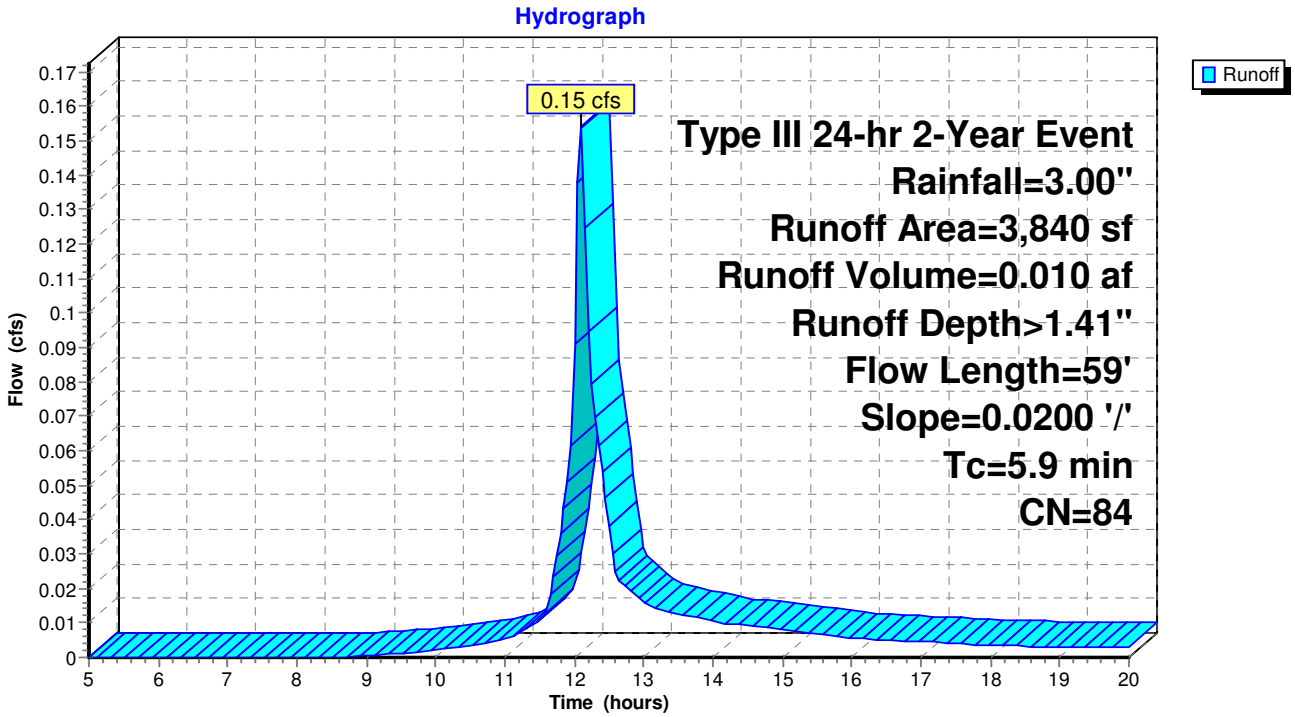
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,390	98	Paved parking & roofs
1,450	61	>75% Grass cover, Good, HSG B
3,840	84	Weighted Average
1,450		Pervious Area
2,390		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.84		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
5.7	49	0.0200	0.14		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
5.9	59	Total			

Subcatchment 1CS: Sub #1C



Subcatchment 1S: Sub #1

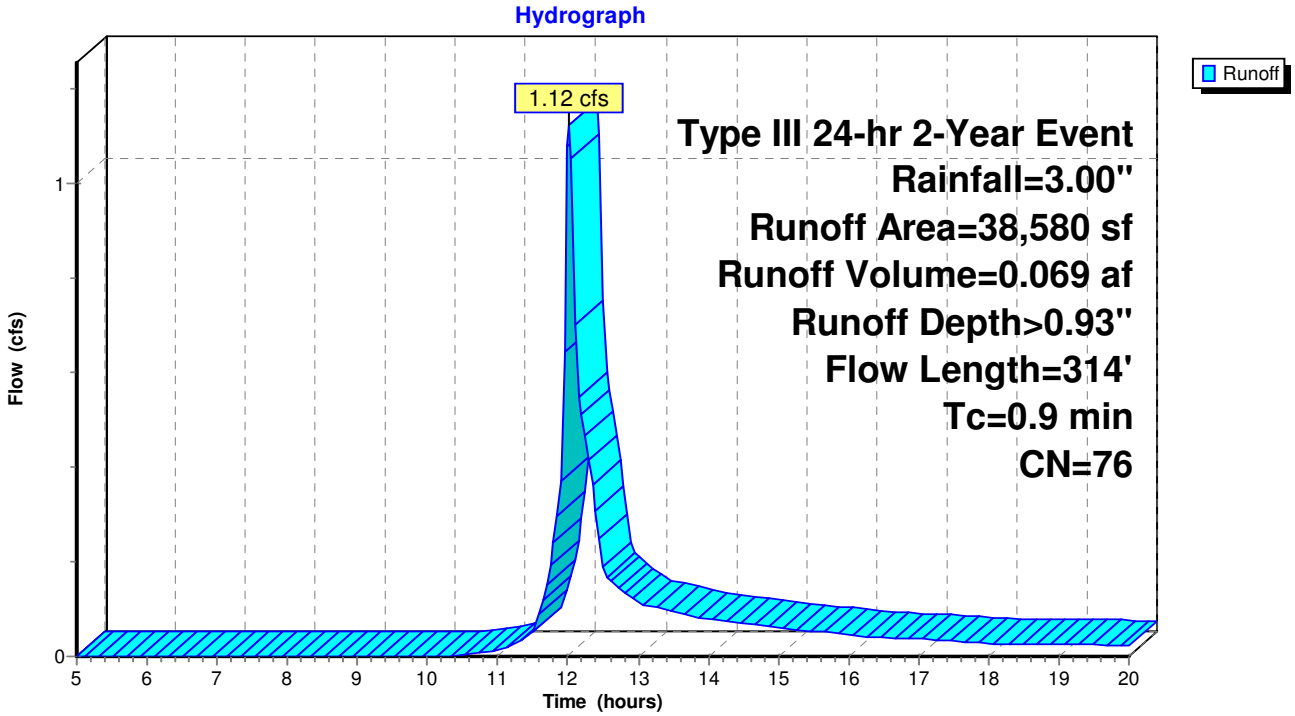
Runoff = 1.12 cfs @ 12.02 hrs, Volume= 0.069 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
16,145	98	Paved parking & roofs
16,000	61	>75% Grass cover, Good, HSG B
6,435	58	Meadow, non-grazed, HSG B
38,580	76	Weighted Average
22,435		Pervious Area
16,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	27	0.0370	3.90		**Shallow Concentrated Flow, AB** Paved Kv= 20.3 fps
0.2	50	0.0800	4.24		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.6	237	0.0649	6.40	25.58	**Channel Flow, CD** Area= 4.0 sf Perim= 7.2' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.9	314	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

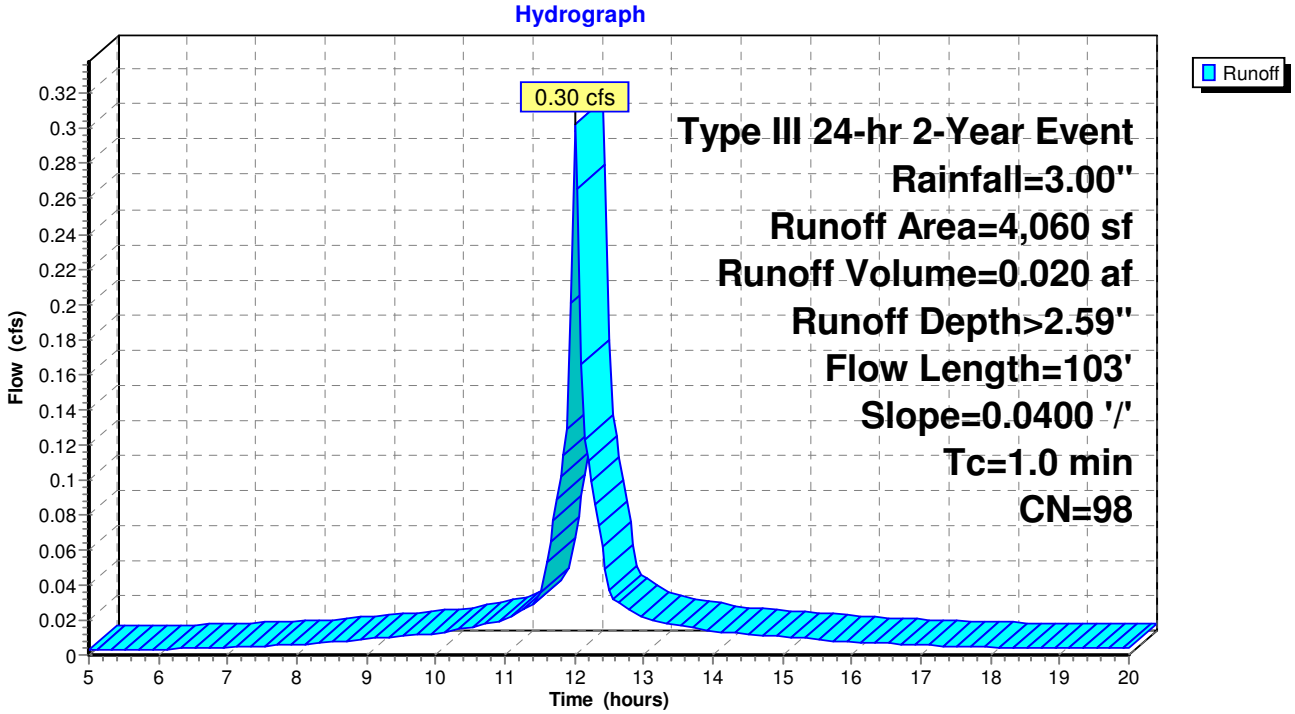
Runoff = 0.30 cfs @ 12.01 hrs, Volume= 0.020 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,060	98	Paved parking & roofs
4,060		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	103	0.0400	1.77		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

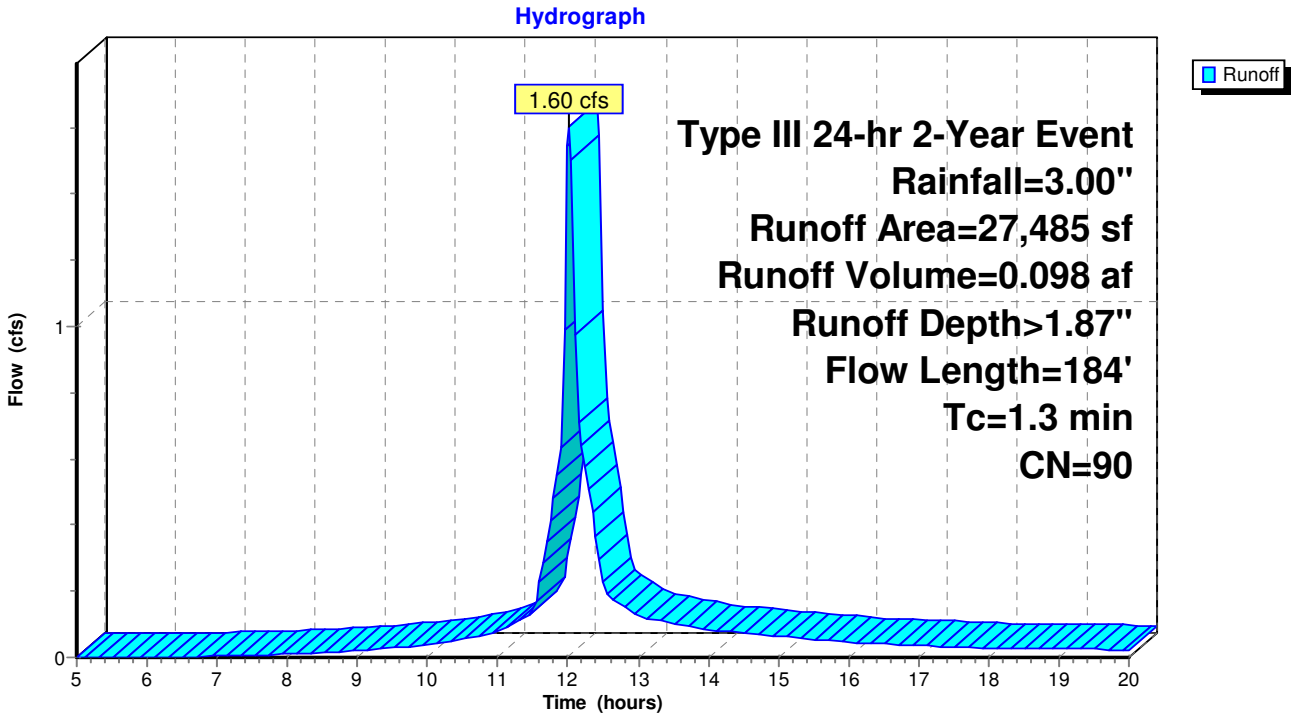
Runoff = 1.60 cfs @ 12.02 hrs, Volume= 0.098 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
21,855	98	Paved parking & roofs
5,630	61	>75% Grass cover, Good, HSG B
27,485	90	Weighted Average
5,630		Pervious Area
21,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0400	1.76		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	84	0.0250	3.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	184	Total			

Subcatchment 3S: Sub #3



Subcatchment 4S: Sub #4

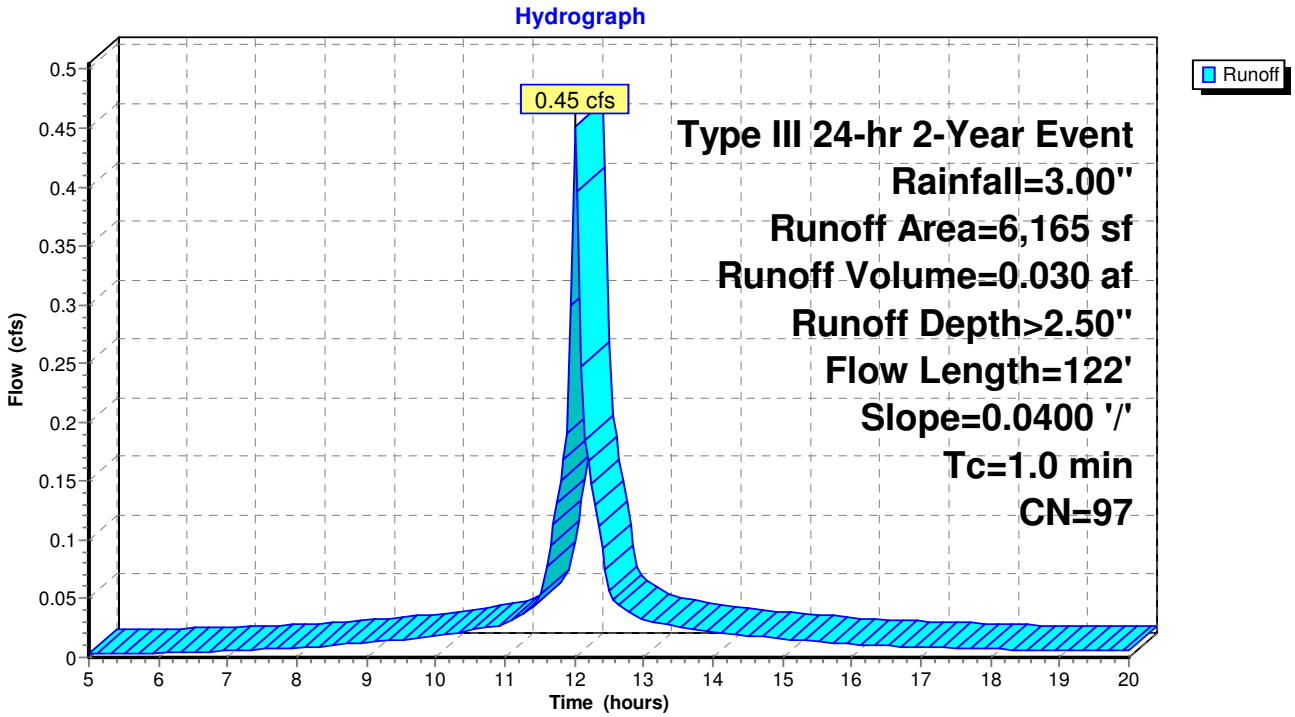
Runoff = 0.45 cfs @ 12.01 hrs, Volume= 0.030 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
5,950	98	Paved parking & roofs
215	61	>75% Grass cover, Good, HSG B
6,165	97	Weighted Average
215		Pervious Area
5,950		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	84	0.0400	1.70		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	38	0.0400	4.06		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.0	122	Total			

Subcatchment 4S: Sub #4



Subcatchment 5S: Sub #5

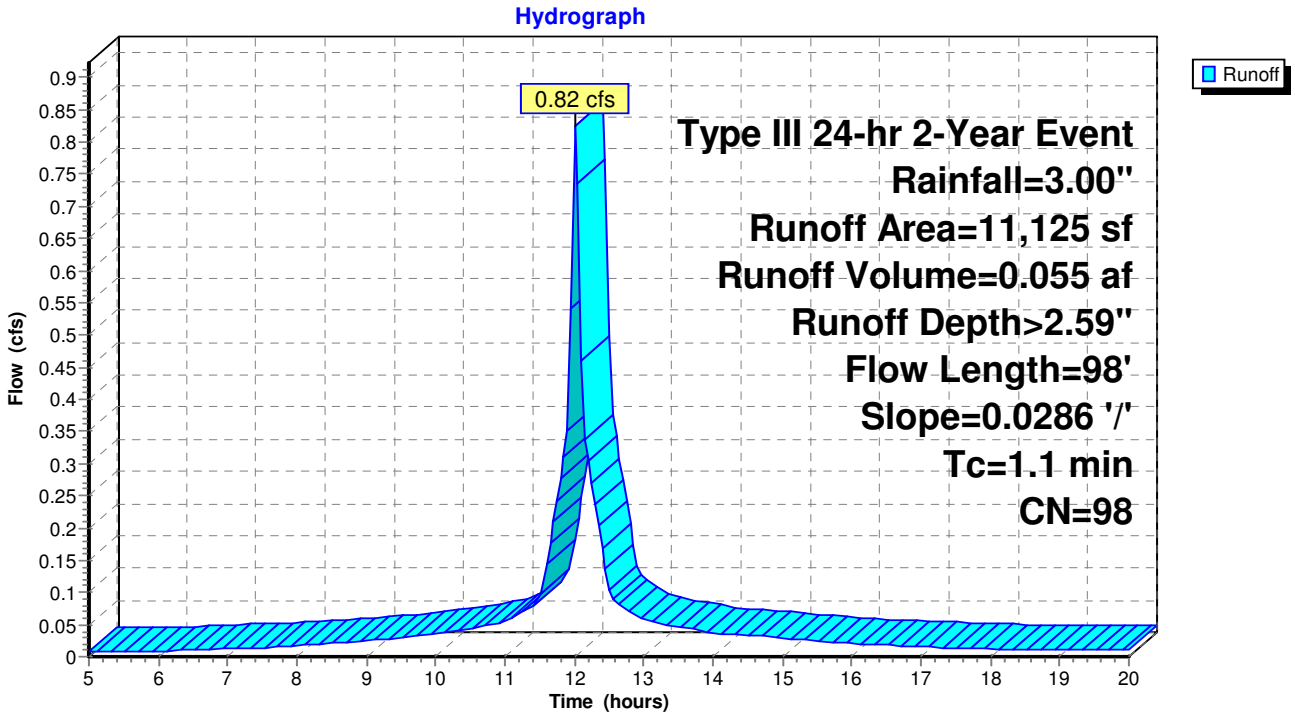
Runoff = 0.82 cfs @ 12.01 hrs, Volume= 0.055 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
10,990	98	Paved parking & roofs
135	61	>75% Grass cover, Good, HSG B
11,125	98	Weighted Average
135		Pervious Area
10,990		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	98	0.0286	1.53		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5S: Sub #5



Subcatchment 6S: Sub #6

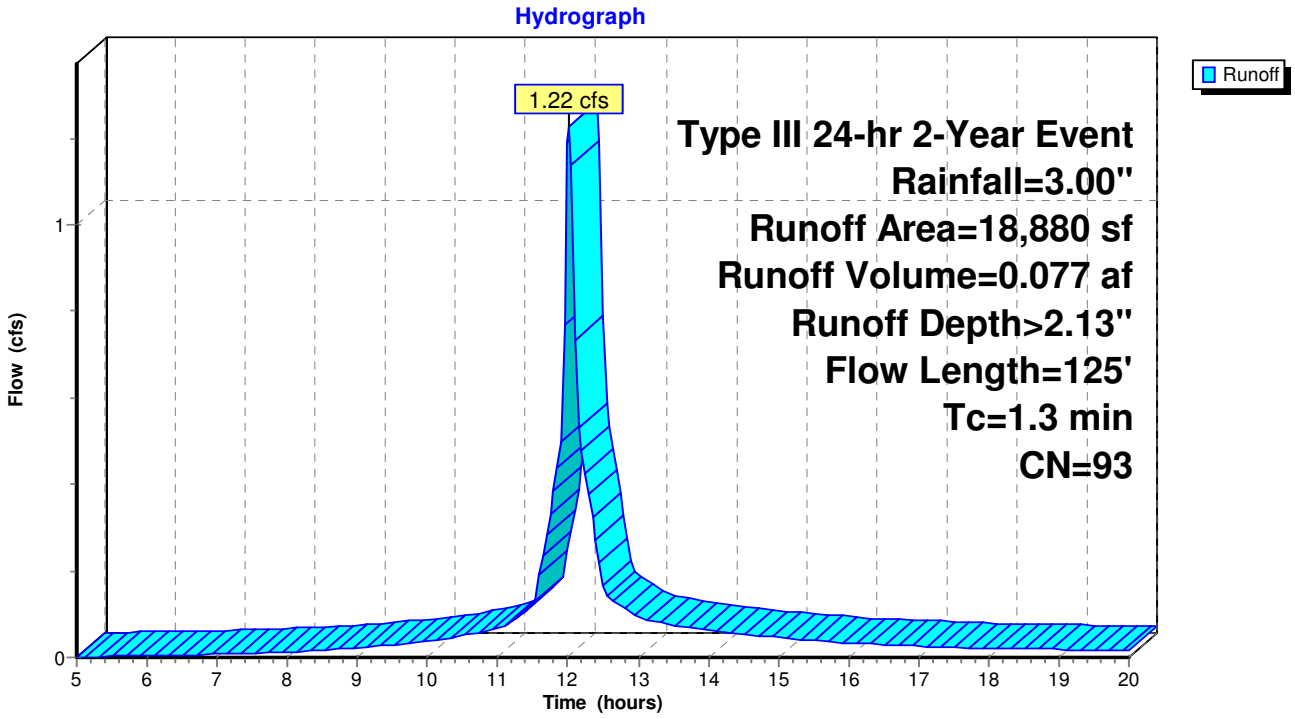
Runoff = 1.22 cfs @ 12.02 hrs, Volume= 0.077 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
16,260	98	Paved parking & roofs
2,620	61	>75% Grass cover, Good, HSG B
18,880	93	Weighted Average
2,620		Pervious Area
16,260		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0280	1.52		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment 6S: Sub #6



Subcatchment 7S: Sub #7

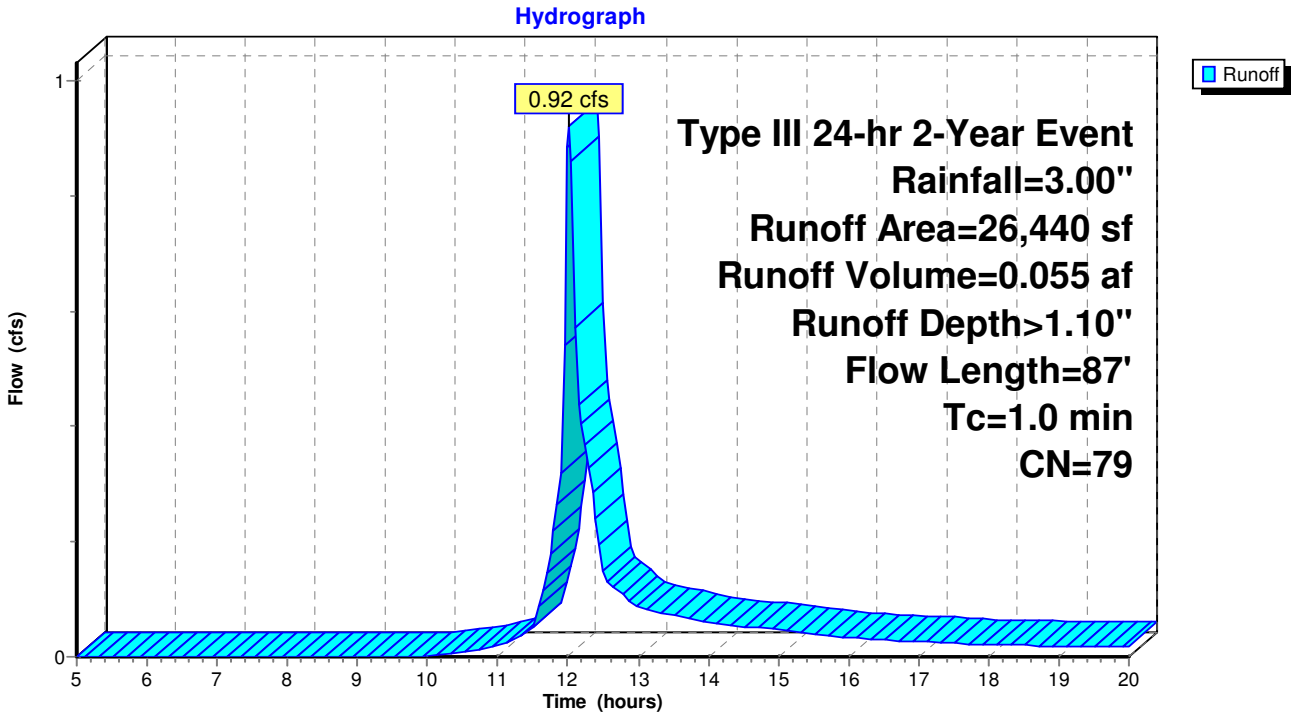
Runoff = 0.92 cfs @ 12.02 hrs, Volume= 0.055 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
13,630	98	Paved parking & roofs
2,065	61	>75% Grass cover, Good, HSG B
10,745	58	Meadow, non-grazed, HSG B
26,440	79	Weighted Average
12,810		Pervious Area
13,630		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	66	0.0227	1.29		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	21	0.0952	4.63		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
1.0	87	Total			

Subcatchment 7S: Sub #7



Subcatchment 8S: Sub #8

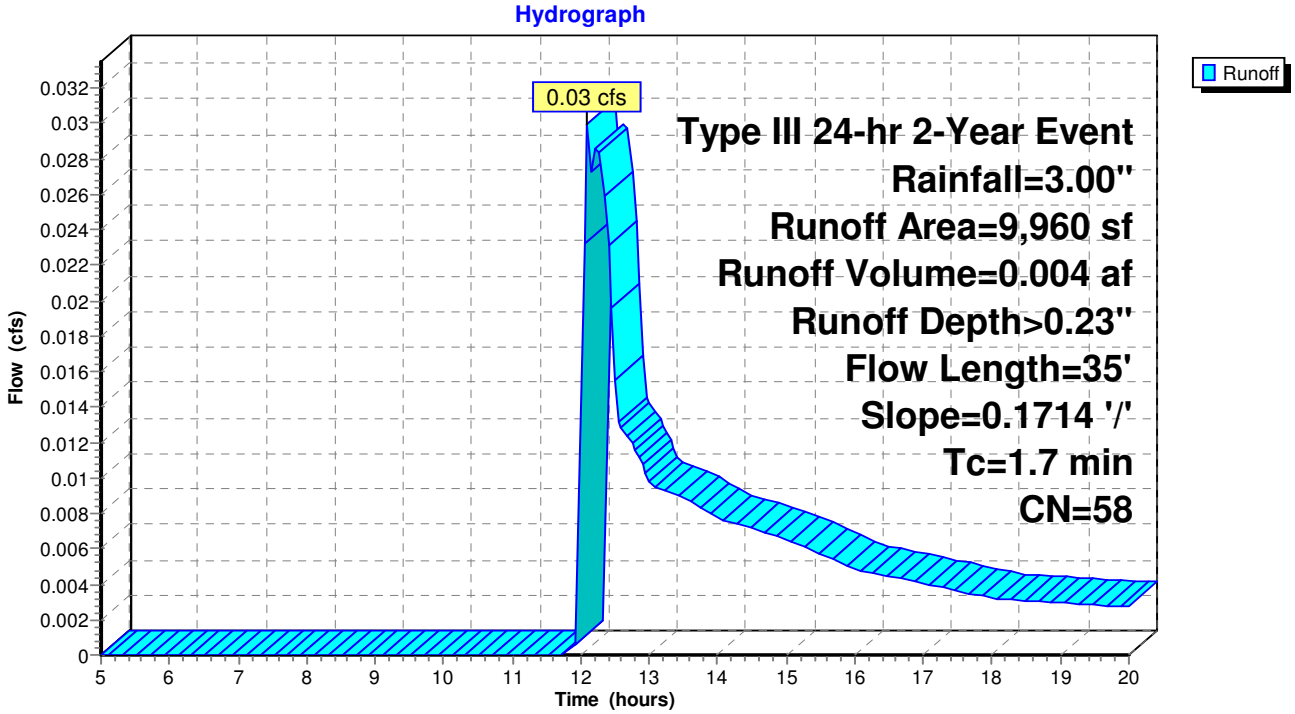
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,960	58	Meadow, non-grazed, HSG B
9,960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	35	0.1714	0.35		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 8S: Sub #8



Subcatchment 9S: Sub #9

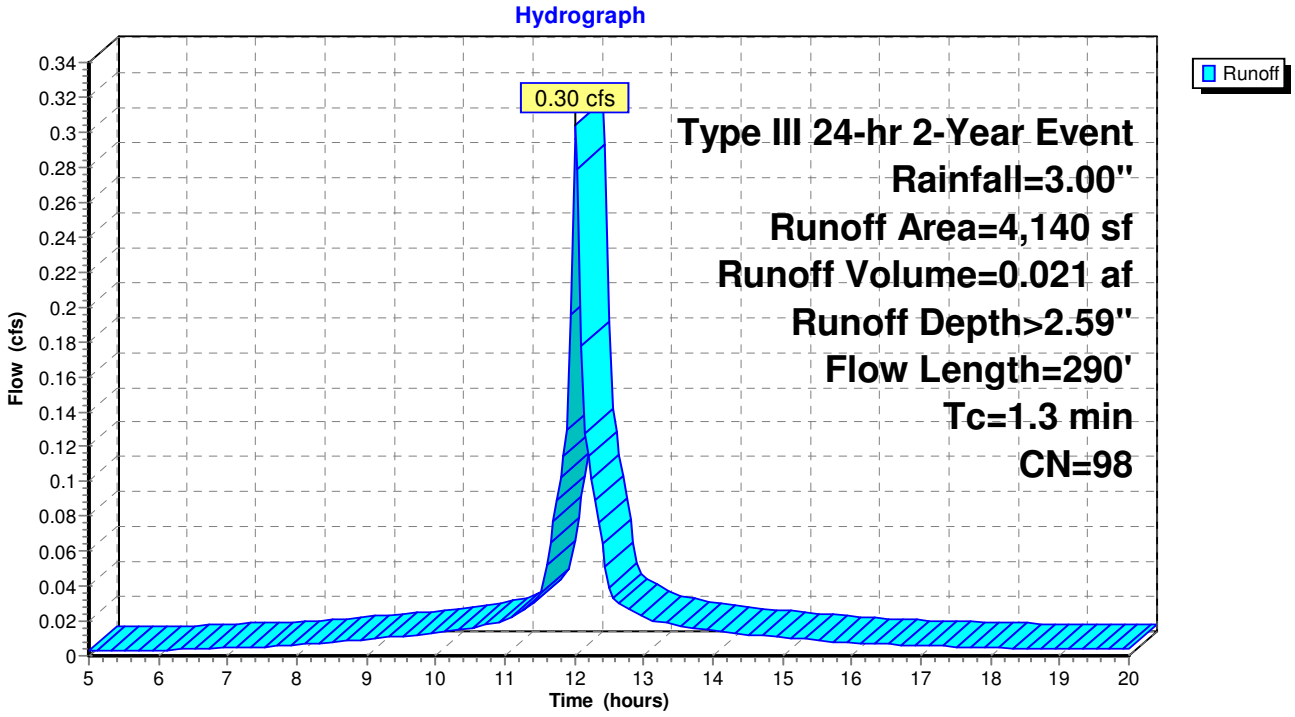
Runoff = 0.30 cfs @ 12.02 hrs, Volume= 0.021 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,140	98	Paved parking & roofs
4,140		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	190	0.0605	4.99		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	290	Total			

Subcatchment 9S: Sub #9



Subcatchment 10S: Sub #10

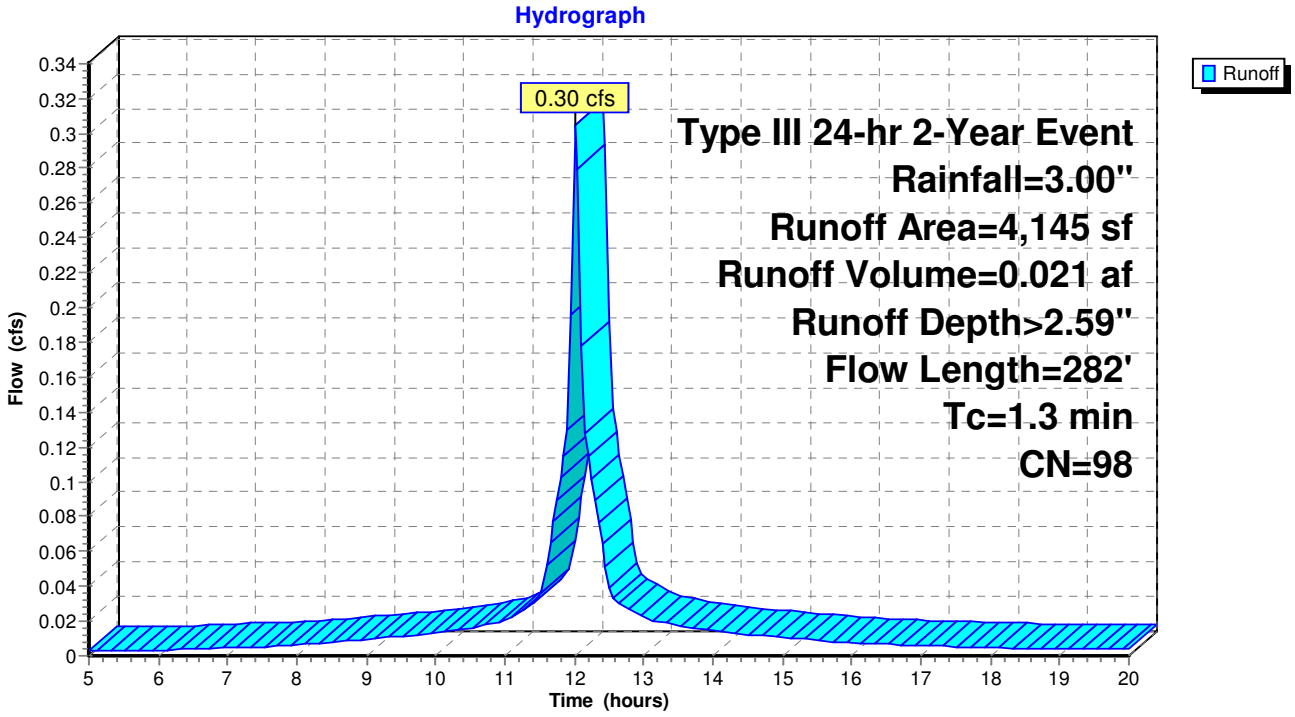
Runoff = 0.30 cfs @ 12.02 hrs, Volume= 0.021 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,145	98	Paved parking & roofs
4,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	182	0.0659	5.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	282	Total			

Subcatchment 10S: Sub #10



Subcatchment 11S: Sub #11

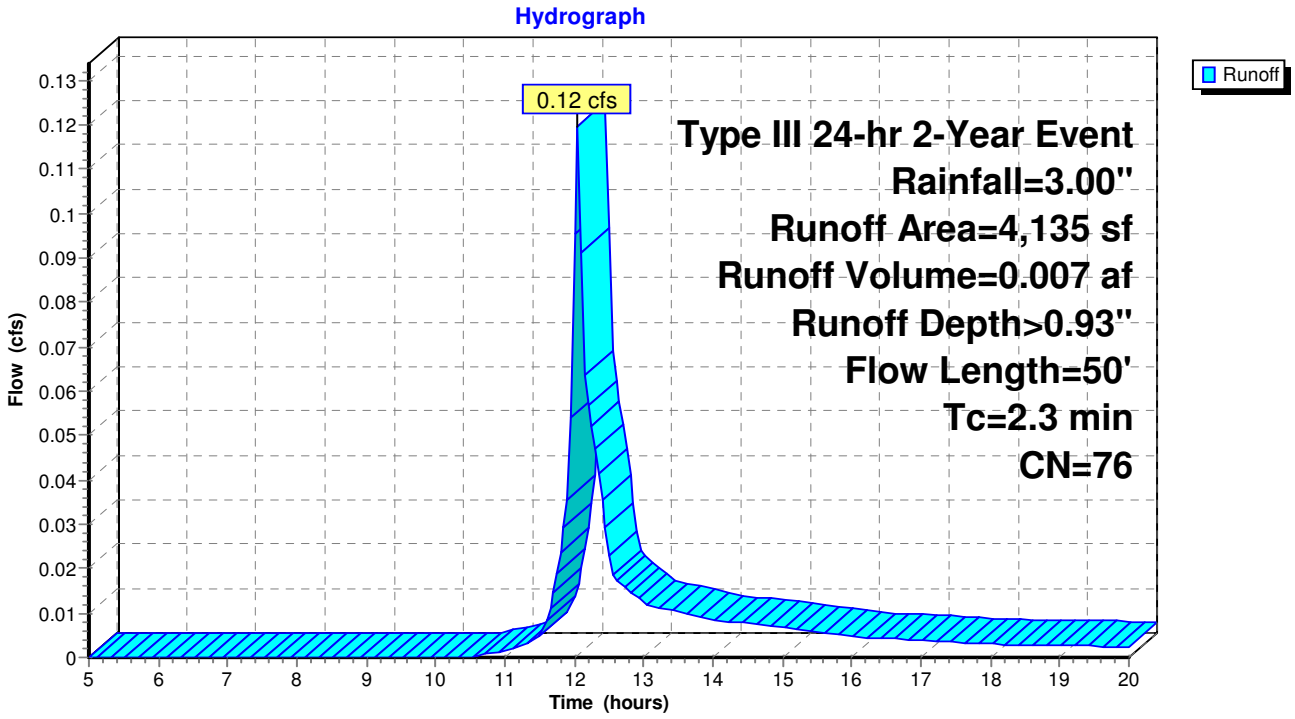
Runoff = 0.12 cfs @ 12.05 hrs, Volume= 0.007 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
1,625	98	Paved parking & roofs
2,510	61	>75% Grass cover, Good, HSG B
4,135	76	Weighted Average
2,510		Pervious Area
1,625		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.0	33	0.1212	0.27		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.3	50	Total			

Subcatchment 11S: Sub #11



Subcatchment 12S: Sub #12

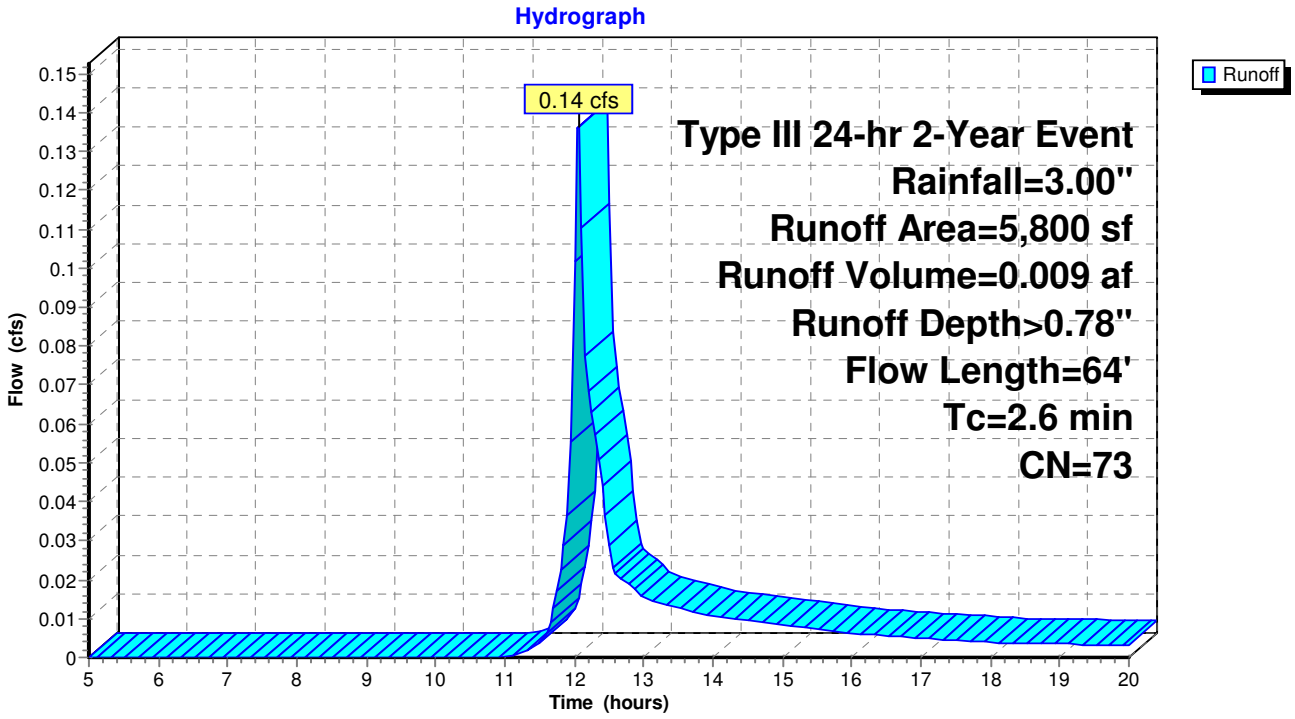
Runoff = 0.14 cfs @ 12.05 hrs, Volume= 0.009 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
1,900	98	Paved parking & roofs
3,900	61	>75% Grass cover, Good, HSG B
5,800	73	Weighted Average
3,900		Pervious Area
1,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.3	47	0.1702	0.33		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.6	64	Total			

Subcatchment 12S: Sub #12



Subcatchment 13S: Sub 13

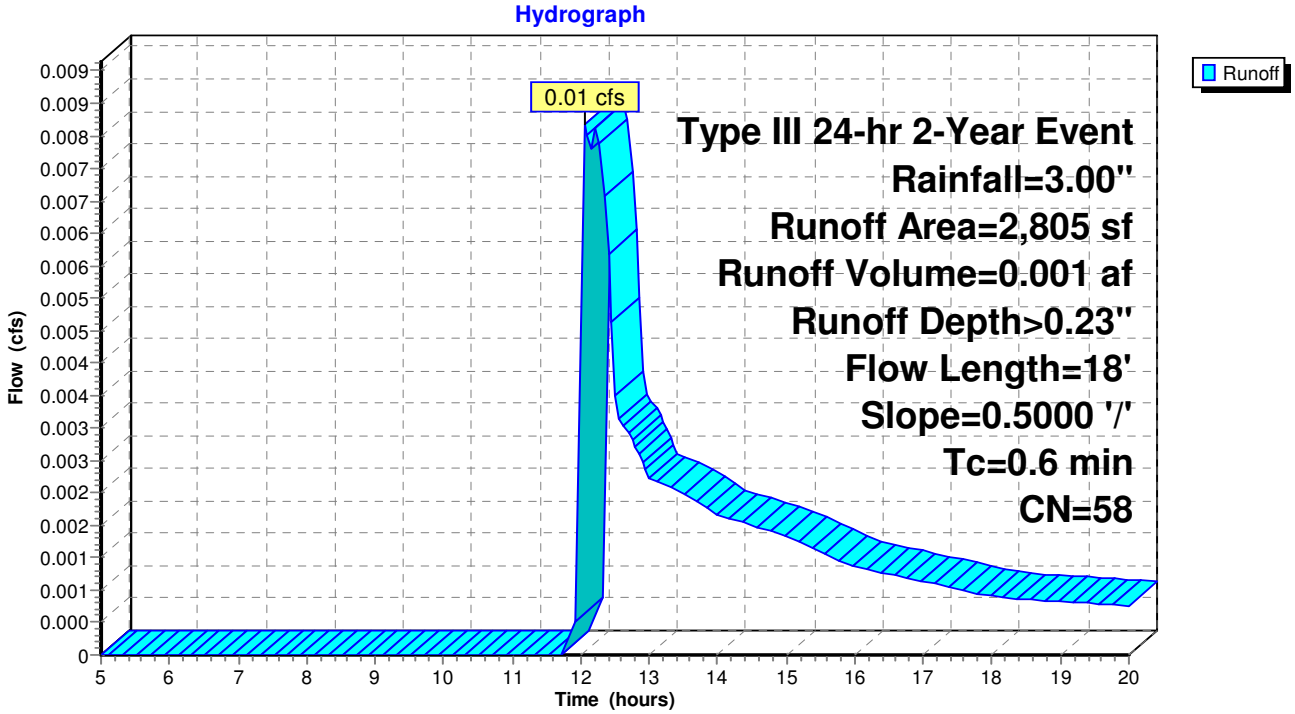
Runoff = 0.01 cfs @ 12.05 hrs, Volume= 0.001 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,805	58	Meadow, non-grazed, HSG B
2,805		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	18	0.5000	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 13S: Sub 13



Subcatchment 14S: Sub 14

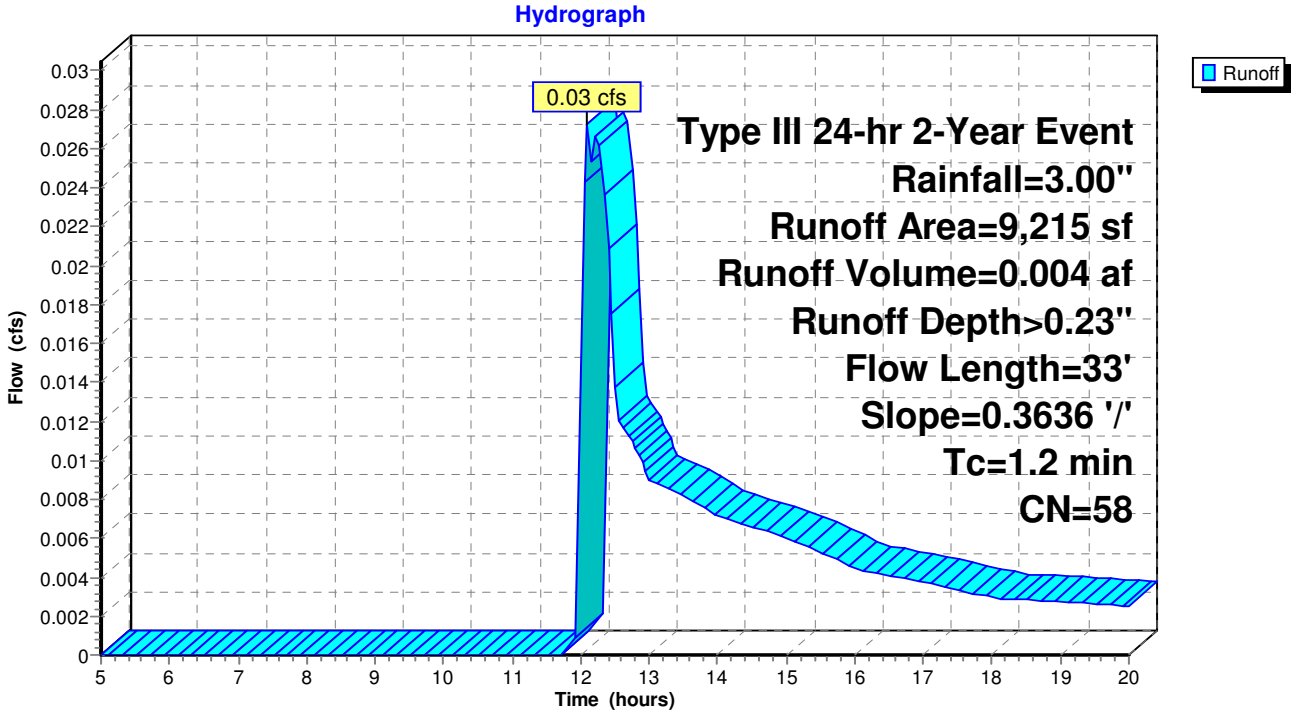
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,215	58	Meadow, non-grazed, HSG B
9,215		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	33	0.3636	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 14S: Sub 14



Subcatchment 15S: Sub 15

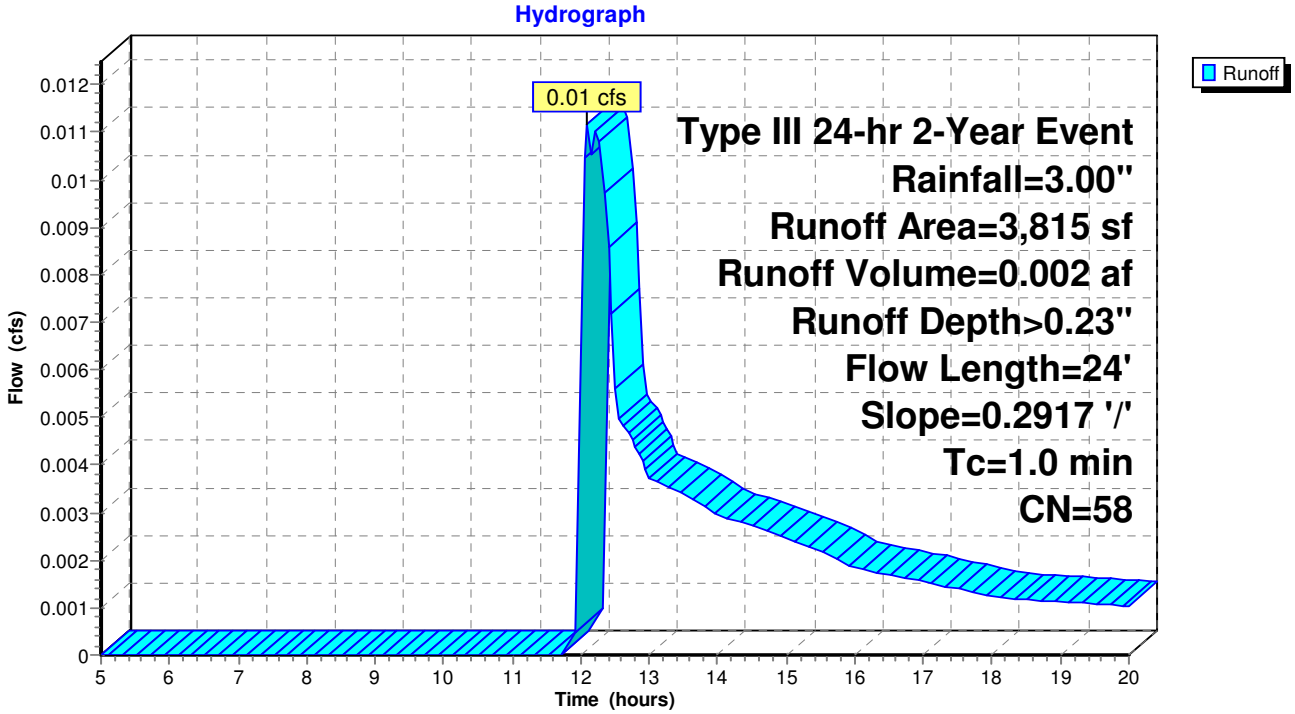
Runoff = 0.01 cfs @ 12.10 hrs, Volume= 0.002 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
3,815	58	Meadow, non-grazed, HSG B
3,815		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	24	0.2917	0.41		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 15S: Sub 15



Subcatchment 16S: Sub 16

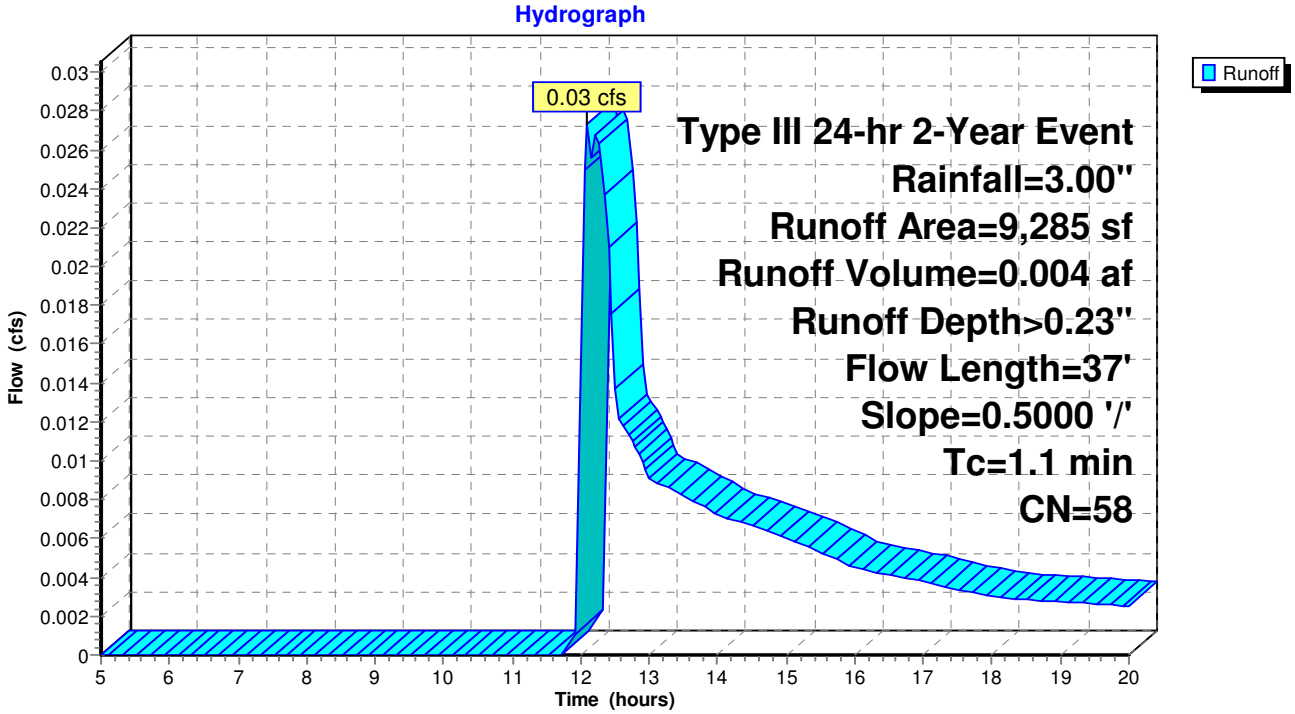
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,285	58	Meadow, non-grazed, HSG B
9,285		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	37	0.5000	0.55		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 16S: Sub 16



Subcatchment 17S: Sub #17

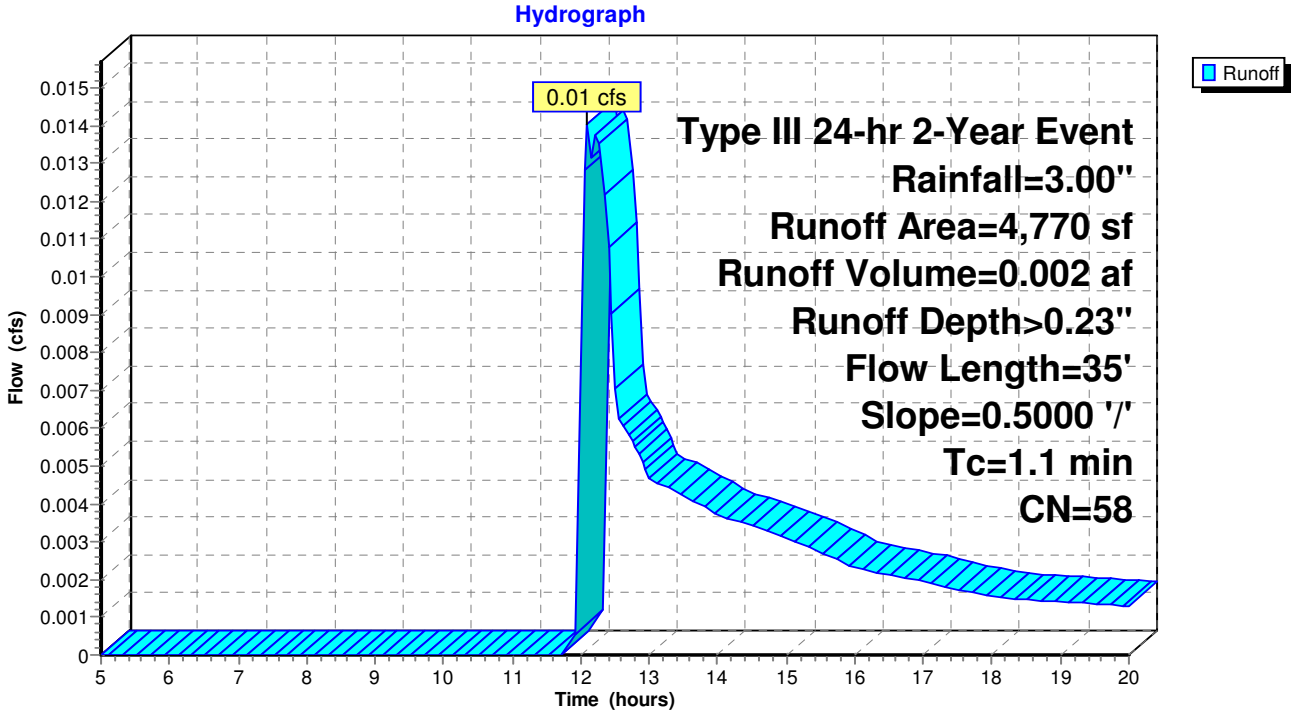
Runoff = 0.01 cfs @ 12.10 hrs, Volume= 0.002 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,770	58	Meadow, non-grazed, HSG B
4,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	35	0.5000	0.54		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 17S: Sub #17



Pond 1: CB1

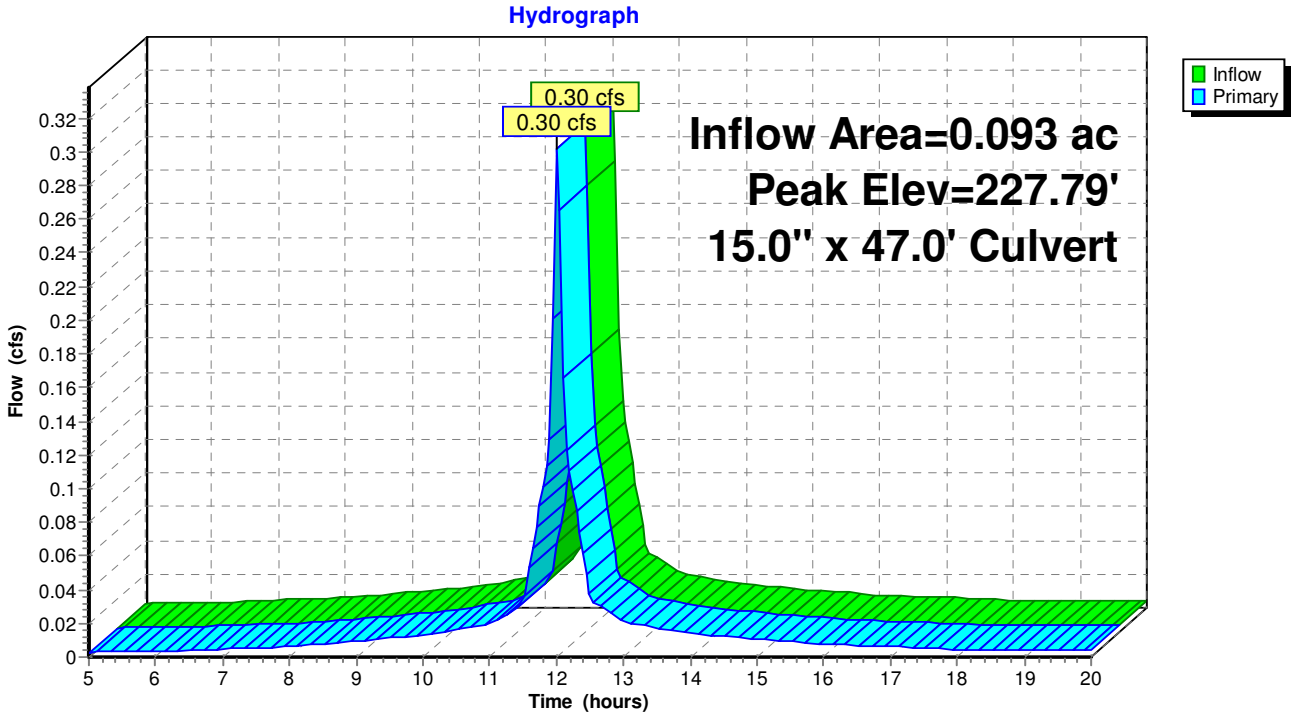
Inflow Area =	0.093 ac,	Inflow Depth >	2.59"	for	2-Year Event event
Inflow =	0.30 cfs @	12.01 hrs,	Volume=	0.020 af	
Outflow =	0.30 cfs @	12.01 hrs,	Volume=	0.020 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.30 cfs @	12.01 hrs,	Volume=	0.020 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.79' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.50'	**15.0" x 47.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.29 cfs @ 12.01 hrs HW=227.78' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.29 cfs @ 1.42 fps)

Pond 1: CB1



Pond 1P: Filter Pond #1

Inflow Area = 1.432 ac, Inflow Depth > 1.27" for 2-Year Event event
Inflow = 2.06 cfs @ 12.03 hrs, Volume= 0.152 af
Outflow = 0.07 cfs @ 16.96 hrs, Volume= 0.026 af, Atten= 97%, Lag= 295.7 min
Primary = 0.07 cfs @ 16.96 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 212.68' @ 16.96 hrs Surf.Area= 3,934 sf Storage= 5,560 cf

Plug-Flow detention time= 384.7 min calculated for 0.026 af (17% of inflow)
Center-of-Mass det. time= 251.2 min (1,041.7 - 790.5)

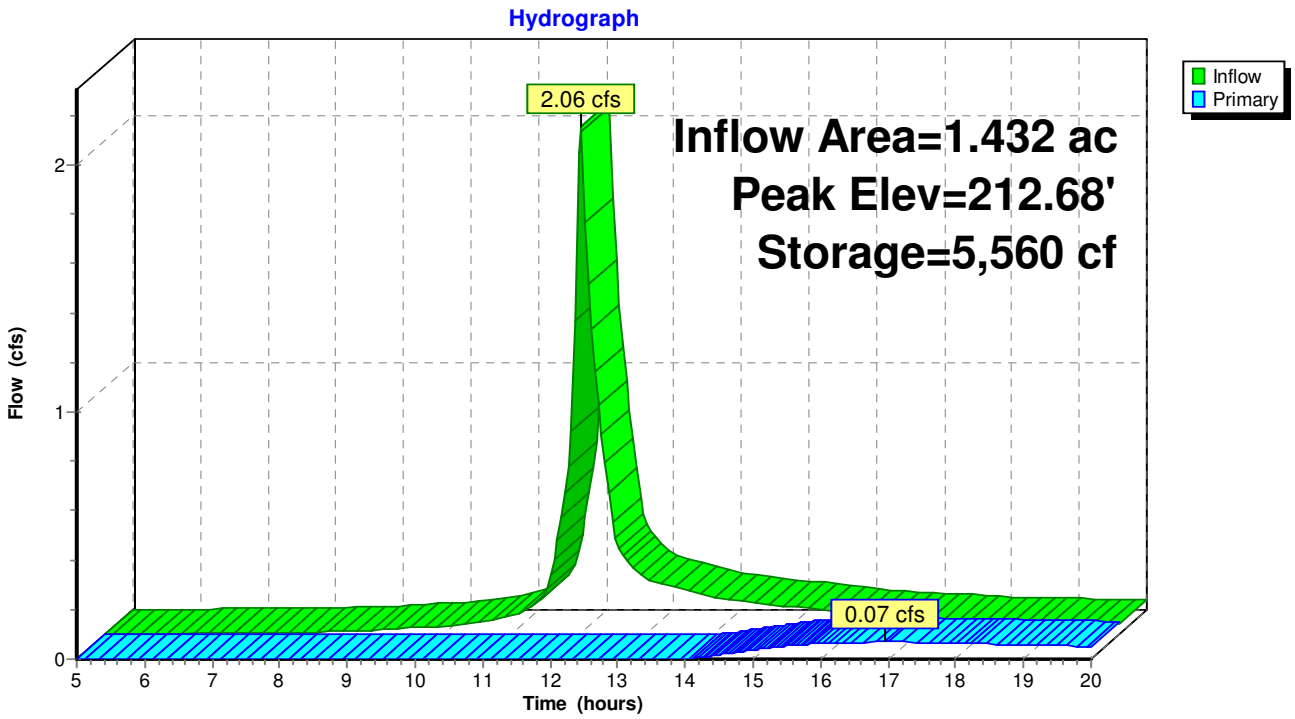
Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	16,887 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	2,725	0	0	2,725
212.00	3,425	3,068	3,068	3,452
212.50	3,800	1,805	4,874	3,842
213.00	4,185	1,995	6,869	4,243
214.00	5,000	4,586	11,456	5,092
215.00	5,875	5,432	16,887	6,006

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**15.0" x 30.5' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 208.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	212.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	213.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.07 cfs @ 16.96 hrs HW=212.68' (Free Discharge)
└─**1=Culvert** (Passes 0.07 cfs of 8.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.43 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Filter Pond #1



Pond 2: CB2

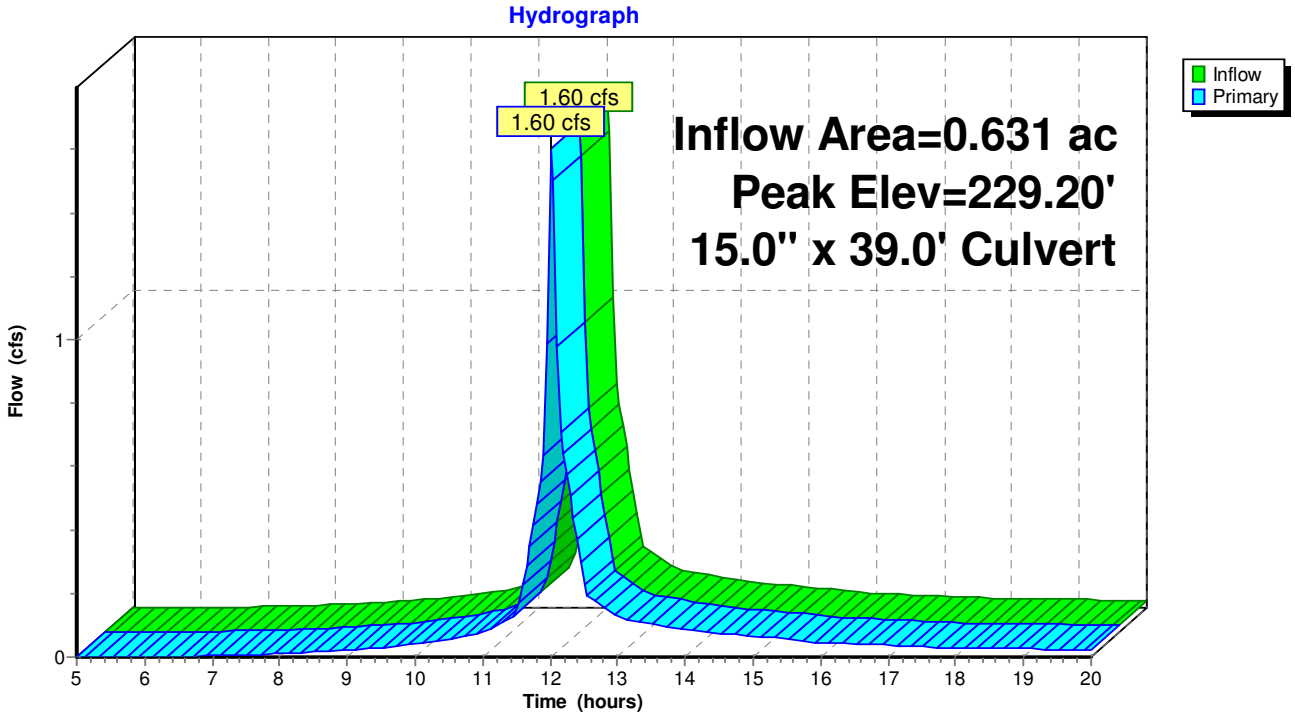
Inflow Area =	0.631 ac,	Inflow Depth >	1.87"	for	2-Year Event event
Inflow =	1.60 cfs @	12.02 hrs,	Volume=	0.098 af	
Outflow =	1.60 cfs @	12.02 hrs,	Volume=	0.098 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.60 cfs @	12.02 hrs,	Volume=	0.098 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.20' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**15.0" x 39.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0128 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.53 cfs @ 12.02 hrs HW=229.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.53 cfs @ 2.22 fps)

Pond 2: CB2



Pond 2P: Filter Pond #2

Inflow Area =	1.690 ac,	Inflow Depth >	1.88"	for	2-Year Event event
Inflow =	4.10 cfs @	12.02 hrs,	Volume=	0.264 af	
Outflow =	0.29 cfs @	13.19 hrs,	Volume=	0.118 af,	Atten= 93%, Lag= 70.2 min
Primary =	0.29 cfs @	13.19 hrs,	Volume=	0.118 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.40' @ 13.19 hrs Surf.Area= 5,462 sf Storage= 7,572 cf

Plug-Flow detention time= 250.6 min calculated for 0.118 af (45% of inflow)
Center-of-Mass det. time= 155.8 min (915.5 - 759.6)

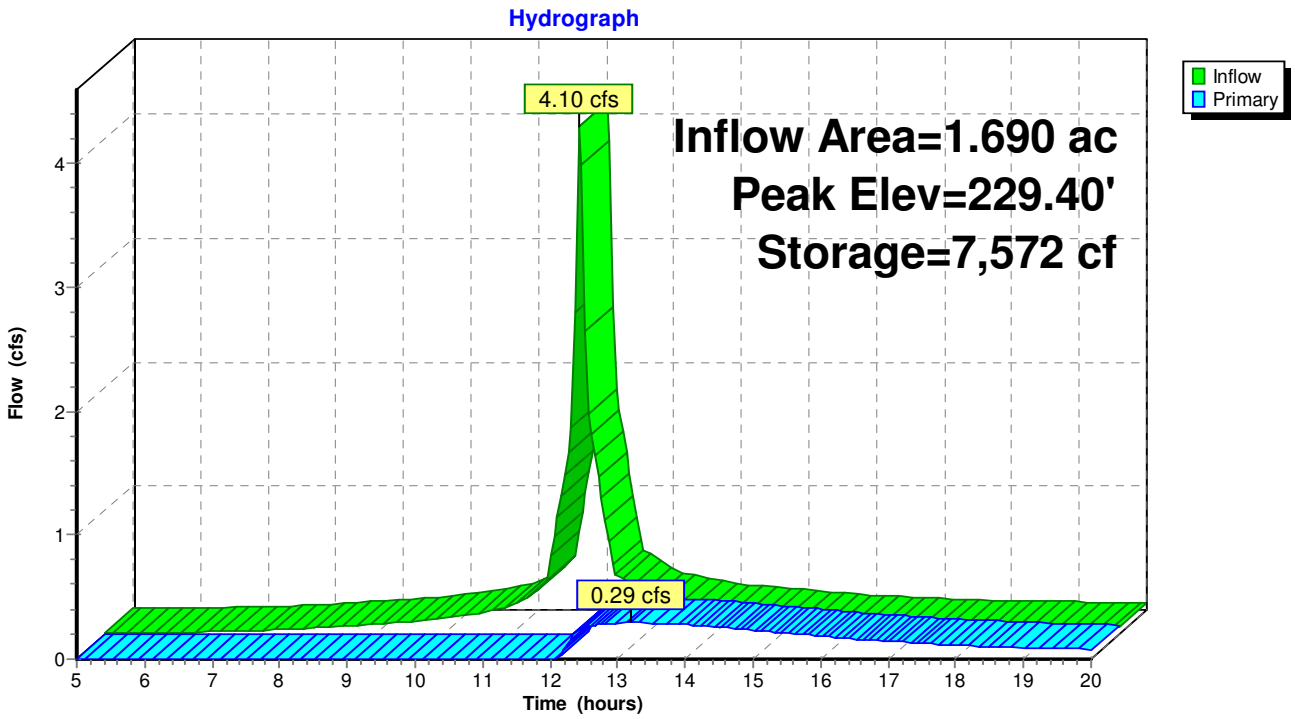
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	14,679 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
227.50	2,550	0	0	2,550
228.00	3,290	1,456	1,456	3,296
229.00	4,840	4,040	5,496	4,862
230.00	6,450	5,626	11,122	6,494
230.50	7,800	3,557	14,679	7,852

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**15.0" x 23.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 223.00' S= 0.0870 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	229.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	229.50'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.29 cfs @ 13.19 hrs HW=229.40' (Free Discharge)
└─**1=Culvert** (Passes 0.29 cfs of 9.07 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 2.16 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Filter Pond #2



Pond 3: CB3

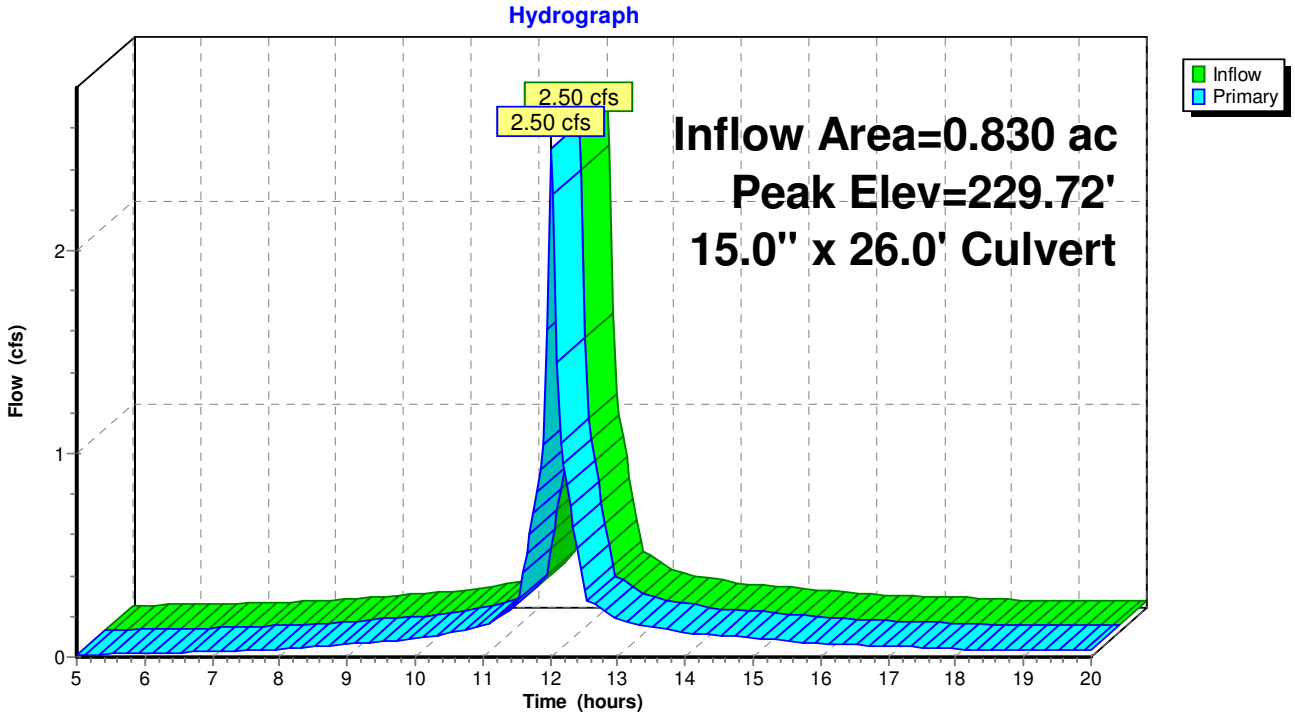
Inflow Area =	0.830 ac,	Inflow Depth >	2.34"	for	2-Year Event event
Inflow =	2.50 cfs @	12.02 hrs,	Volume=	0.162 af	
Outflow =	2.50 cfs @	12.02 hrs,	Volume=	0.162 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.50 cfs @	12.02 hrs,	Volume=	0.162 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.72' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.80'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0308 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.39 cfs @ 12.02 hrs HW=229.69' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.39 cfs @ 2.54 fps)

Pond 3: CB3



Pond 3P: Filter Pond #3

Inflow Area = 0.607 ac, Inflow Depth > 1.10" for 2-Year Event event
Inflow = 0.92 cfs @ 12.02 hrs, Volume= 0.055 af
Outflow = 0.24 cfs @ 12.40 hrs, Volume= 0.055 af, Atten= 74%, Lag= 22.9 min
Primary = 0.24 cfs @ 12.40 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 235.00' @ 12.40 hrs Surf.Area= 1,227 sf Storage= 498 cf

Plug-Flow detention time= 12.1 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 11.9 min (816.9 - 805.0)

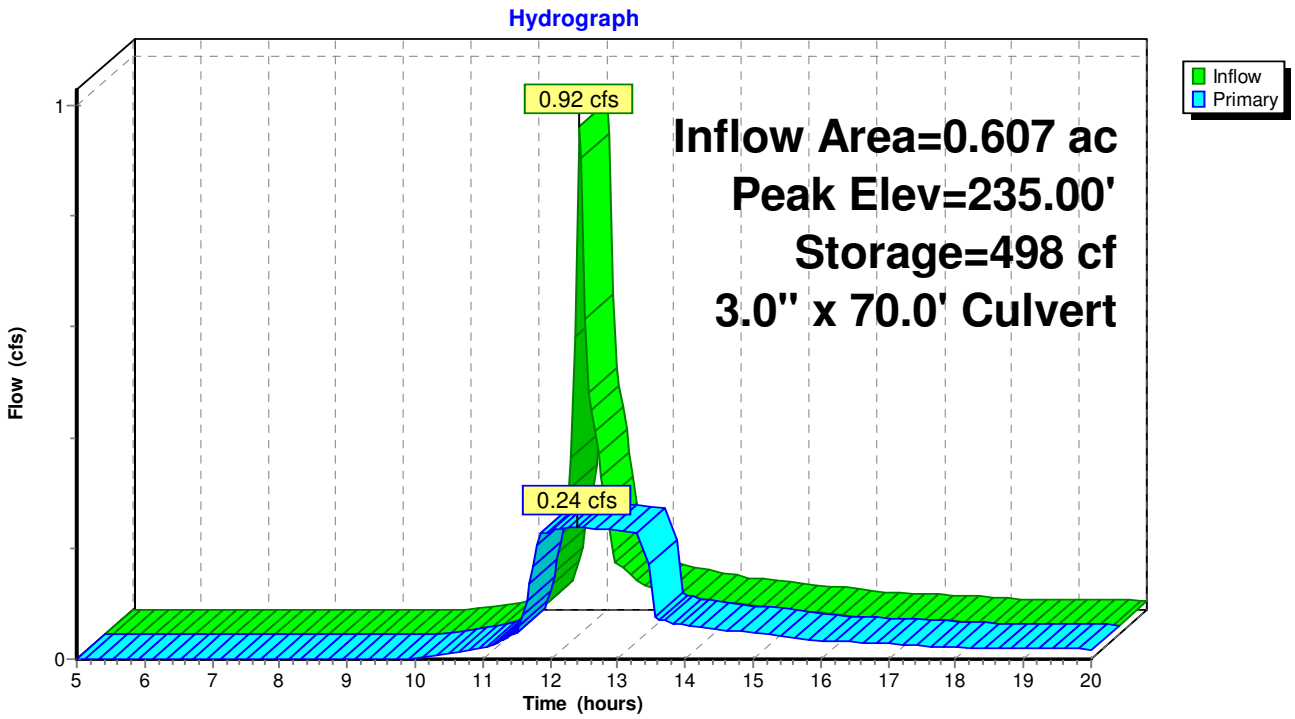
Volume	Invert	Avail.Storage	Storage Description
#1	234.50'	2,272 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
234.50	790	0	0	790
235.00	1,230	501	501	1,234
236.00	2,375	1,771	2,272	2,388

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	**3.0" x 70.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 229.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.24 cfs @ 12.40 hrs HW=235.00' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.24 cfs @ 4.83 fps)

Pond 3P: Filter Pond #3



Pond 4: CB4

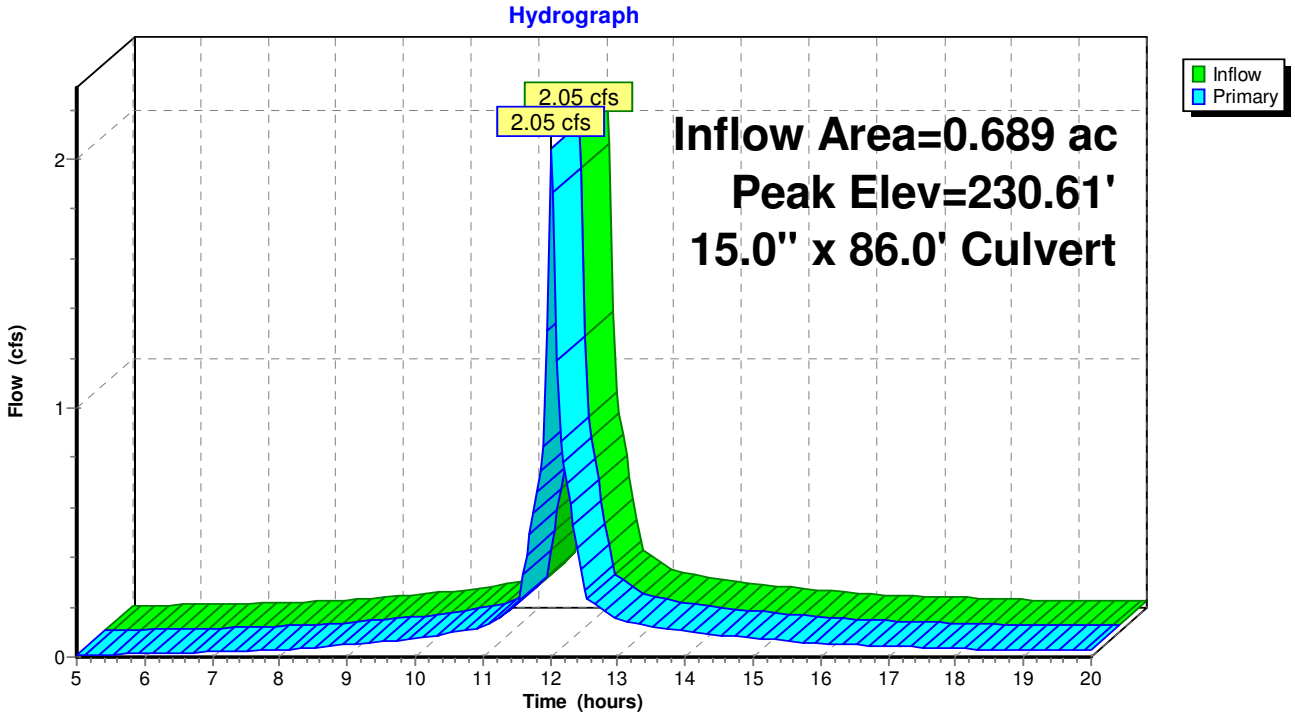
Inflow Area = 0.689 ac, Inflow Depth > 2.30" for 2-Year Event event
Inflow = 2.05 cfs @ 12.02 hrs, Volume= 0.132 af
Outflow = 2.05 cfs @ 12.02 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Primary = 2.05 cfs @ 12.02 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.61' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.90'	**15.0" x 86.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.00' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.95 cfs @ 12.02 hrs HW=230.59' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.95 cfs @ 2.82 fps)

Pond 4: CB4



Pond 5: CB5

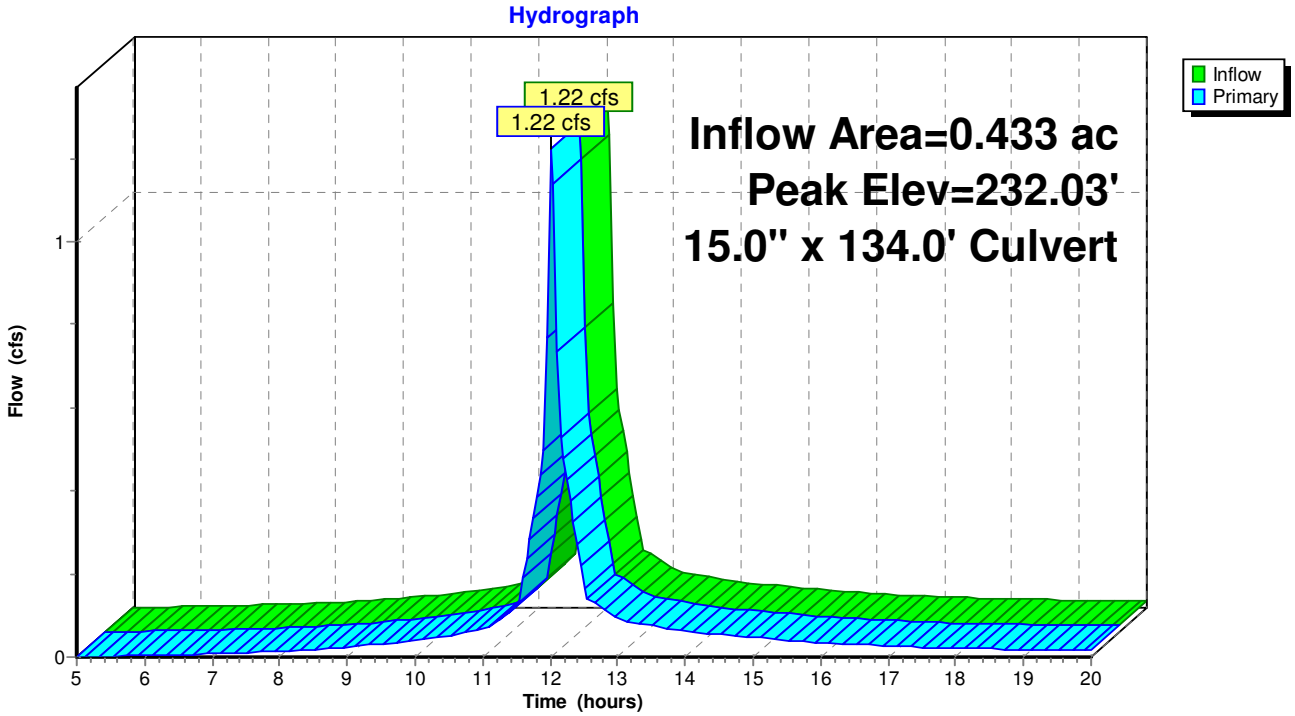
Inflow Area =	0.433 ac,	Inflow Depth >	2.13"	for	2-Year Event event
Inflow =	1.22 cfs @	12.02 hrs,	Volume=	0.077 af	
Outflow =	1.22 cfs @	12.02 hrs,	Volume=	0.077 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.22 cfs @	12.02 hrs,	Volume=	0.077 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 232.03' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	231.50'	**15.0" x 134.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 230.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.17 cfs @ 12.02 hrs HW=232.02' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.17 cfs @ 2.44 fps)

Pond 5: CB5



Pond 6: CB6

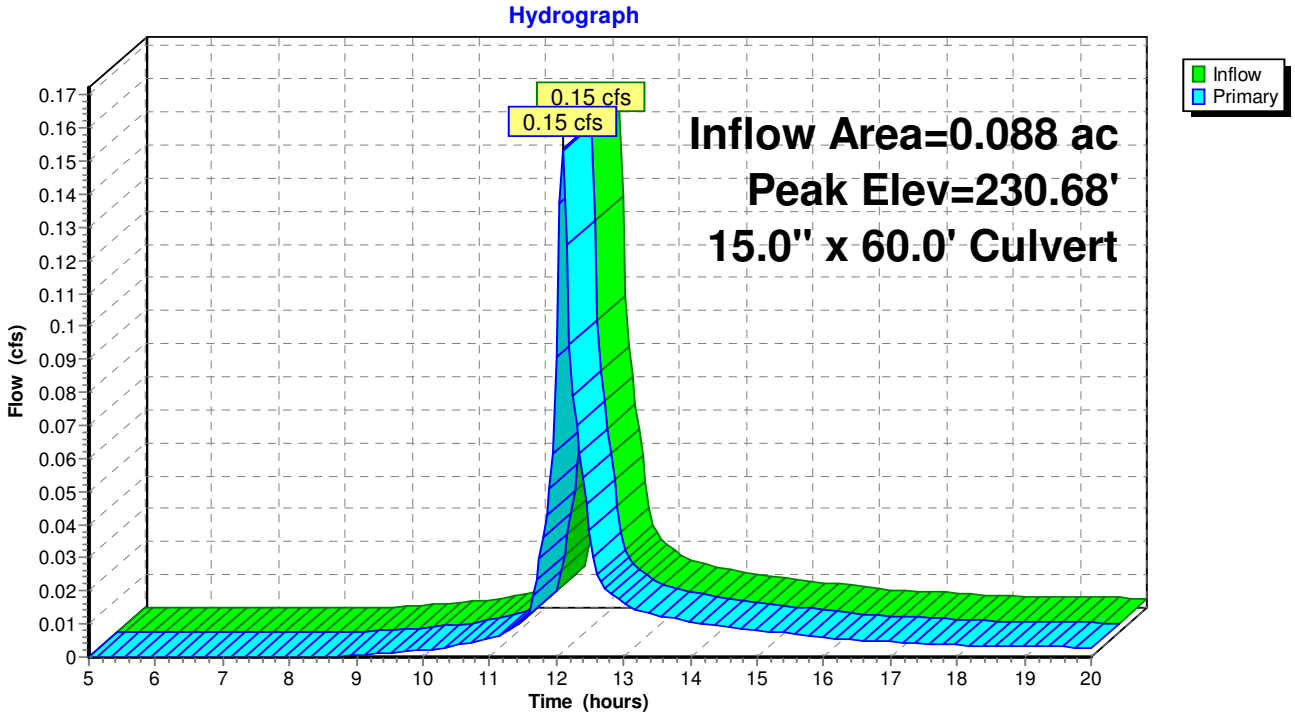
Inflow Area =	0.088 ac,	Inflow Depth >	1.41"	for	2-Year Event event
Inflow =	0.15 cfs @	12.09 hrs,	Volume=	0.010 af	
Outflow =	0.15 cfs @	12.09 hrs,	Volume=	0.010 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.15 cfs @	12.09 hrs,	Volume=	0.010 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.80' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=230.68' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.15 cfs @ 1.43 fps)

Pond 6: CB6



Pond 7: CB7

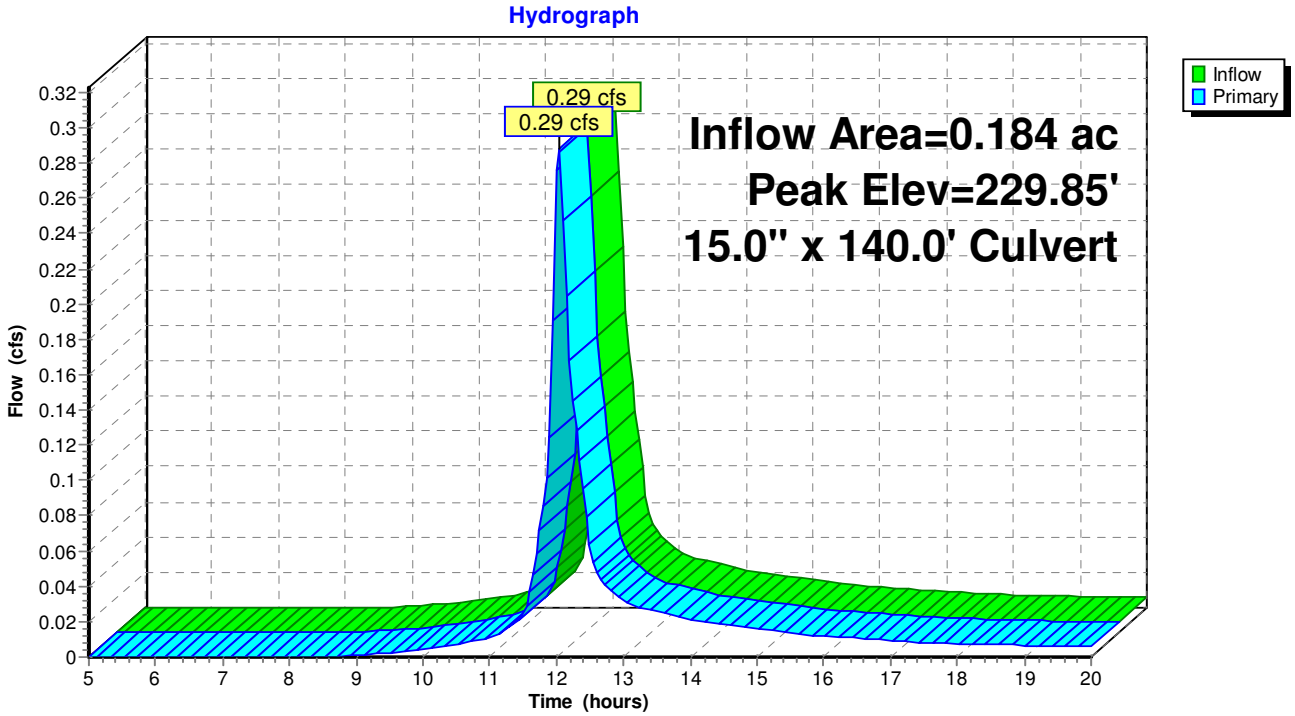
Inflow Area =	0.184 ac,	Inflow Depth >	1.38"	for	2-Year Event event
Inflow =	0.29 cfs @	12.04 hrs,	Volume=	0.021 af	
Outflow =	0.29 cfs @	12.04 hrs,	Volume=	0.021 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.29 cfs @	12.04 hrs,	Volume=	0.021 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.85' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.60'	**15.0" x 140.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 228.10' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.28 cfs @ 12.04 hrs HW=229.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.28 cfs @ 1.68 fps)

Pond 7: CB7



Pond 8: CB8

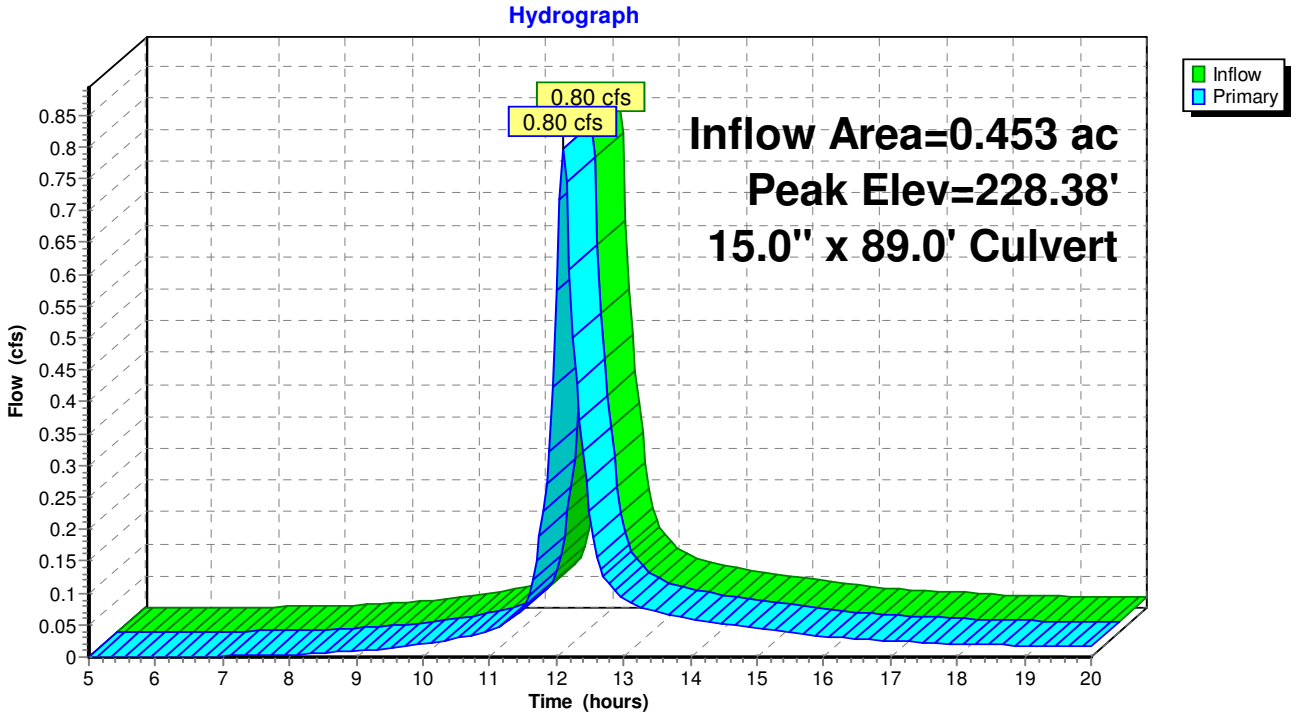
Inflow Area = 0.453 ac, Inflow Depth > 1.66" for 2-Year Event event
Inflow = 0.80 cfs @ 12.10 hrs, Volume= 0.063 af
Outflow = 0.80 cfs @ 12.10 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.10 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.38' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.90'	**15.0" x 89.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.79 cfs @ 12.10 hrs HW=228.37' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.79 cfs @ 1.85 fps)

Pond 8: CB8



Pond 9: CB9

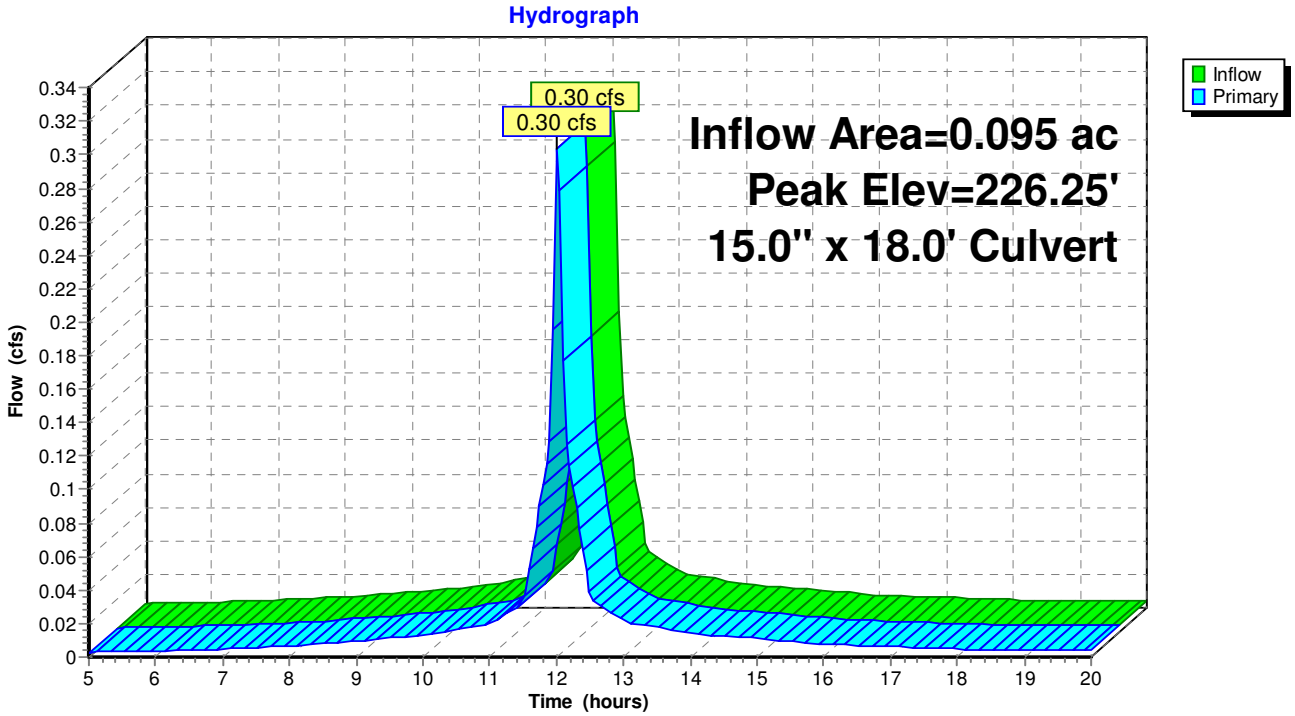
Inflow Area =	0.095 ac,	Inflow Depth >	2.59"	for	2-Year Event event
Inflow =	0.30 cfs @	12.02 hrs,	Volume=	0.021 af	
Outflow =	0.30 cfs @	12.02 hrs,	Volume=	0.021 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.30 cfs @	12.02 hrs,	Volume=	0.021 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.25' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**15.0" x 18.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 225.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.29 cfs @ 12.02 hrs HW=226.25' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.29 cfs @ 1.69 fps)

Pond 9: CB9



Pond 10: CB10

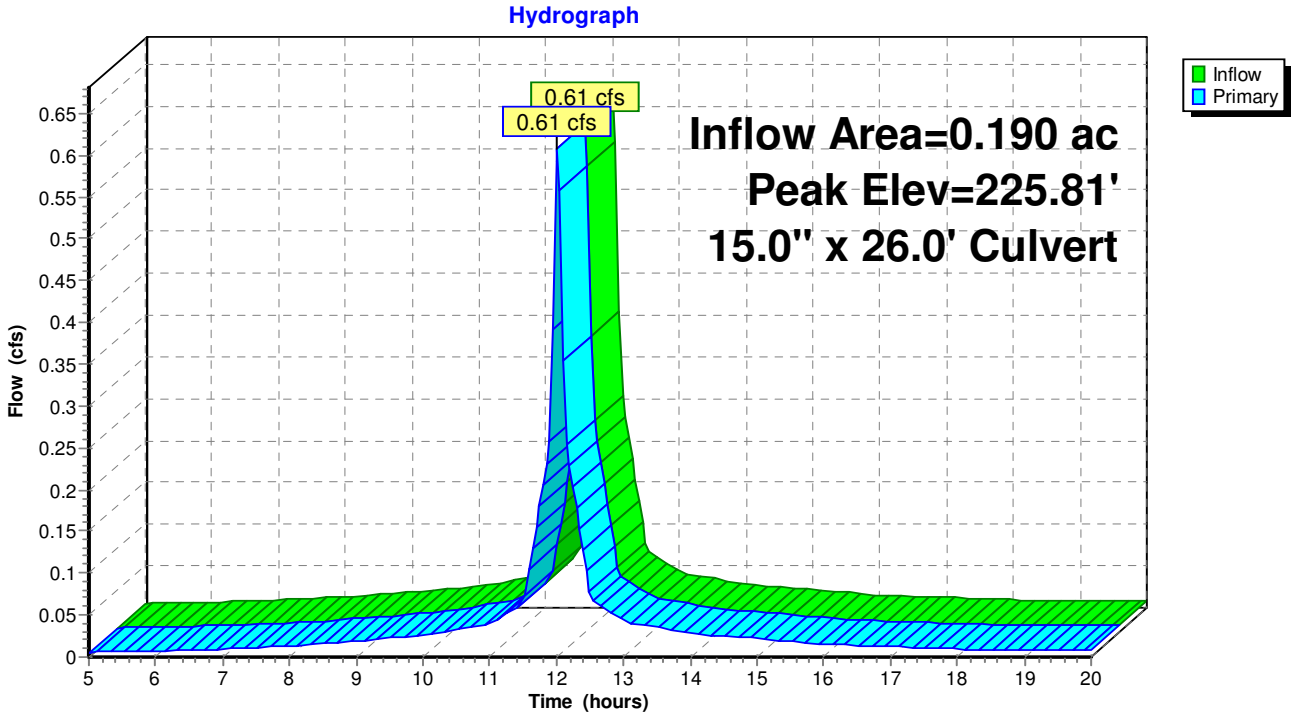
Inflow Area =	0.190 ac,	Inflow Depth >	2.59"	for	2-Year Event event
Inflow =	0.61 cfs @	12.02 hrs,	Volume=	0.041 af	
Outflow =	0.61 cfs @	12.02 hrs,	Volume=	0.041 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.61 cfs @	12.02 hrs,	Volume=	0.041 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 225.81' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 224.00' S= 0.0538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.58 cfs @ 12.02 hrs HW=225.80' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.58 cfs @ 1.70 fps)

Pond 10: CB10



Pond SF1: Sediment Forebay #1

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	82 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	30	0	0	30
212.00	150	82	82	154

Pond SF2: Sediment Forebay #2

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	449 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

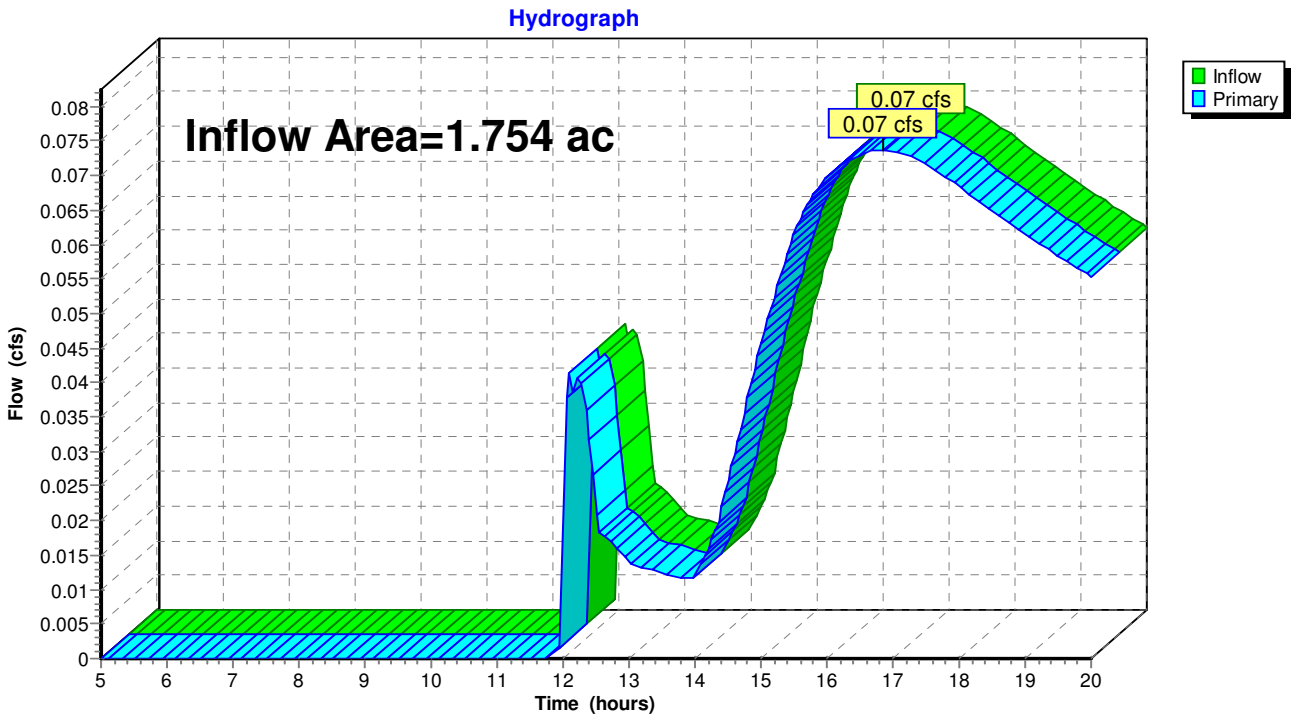
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	275	0	0	275
229.00	650	449	449	657

Pond SP1: Study Point #1

Inflow Area =	1.754 ac,	Inflow Depth >	0.22"	for	2-Year Event event
Inflow =	0.07 cfs @	16.84 hrs,	Volume=	0.033 af	
Primary =	0.07 cfs @	16.84 hrs,	Volume=	0.033 af,	Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

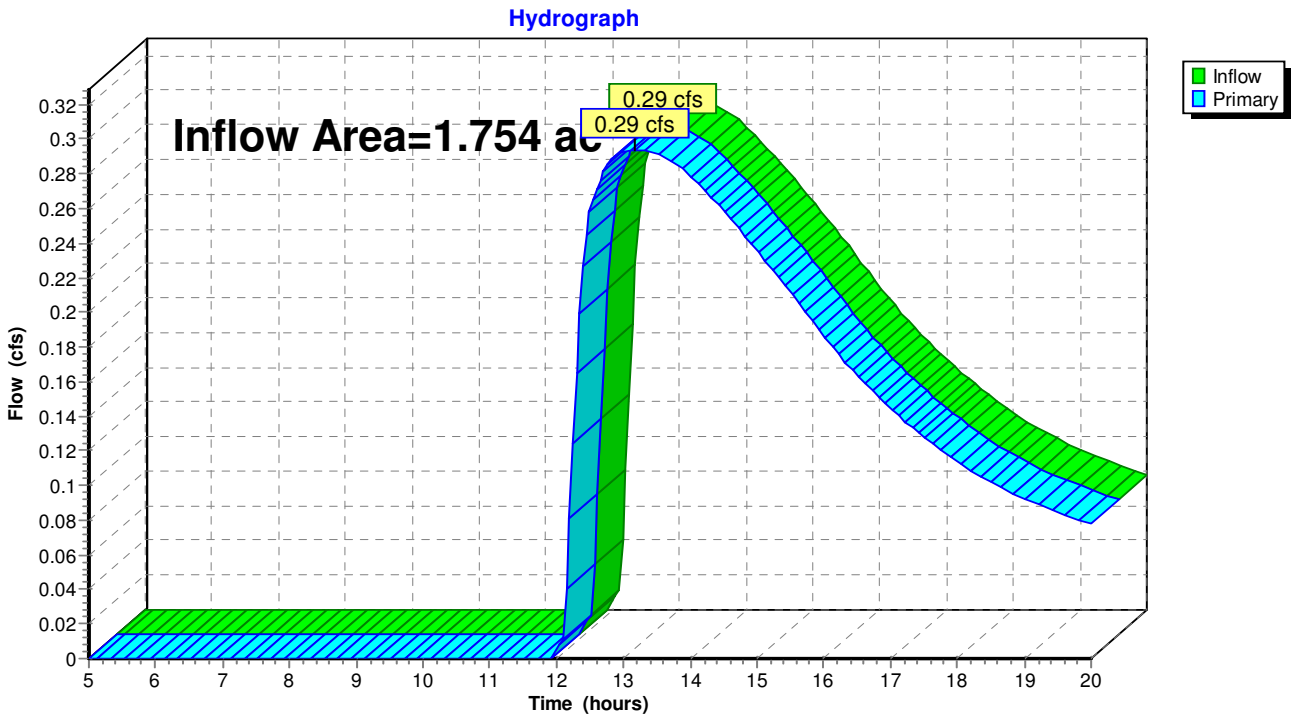


Pond SP2: Study Point #2

Inflow Area = 1.754 ac, Inflow Depth > 0.82" for 2-Year Event event
Inflow = 0.29 cfs @ 13.18 hrs, Volume= 0.119 af
Primary = 0.29 cfs @ 13.18 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

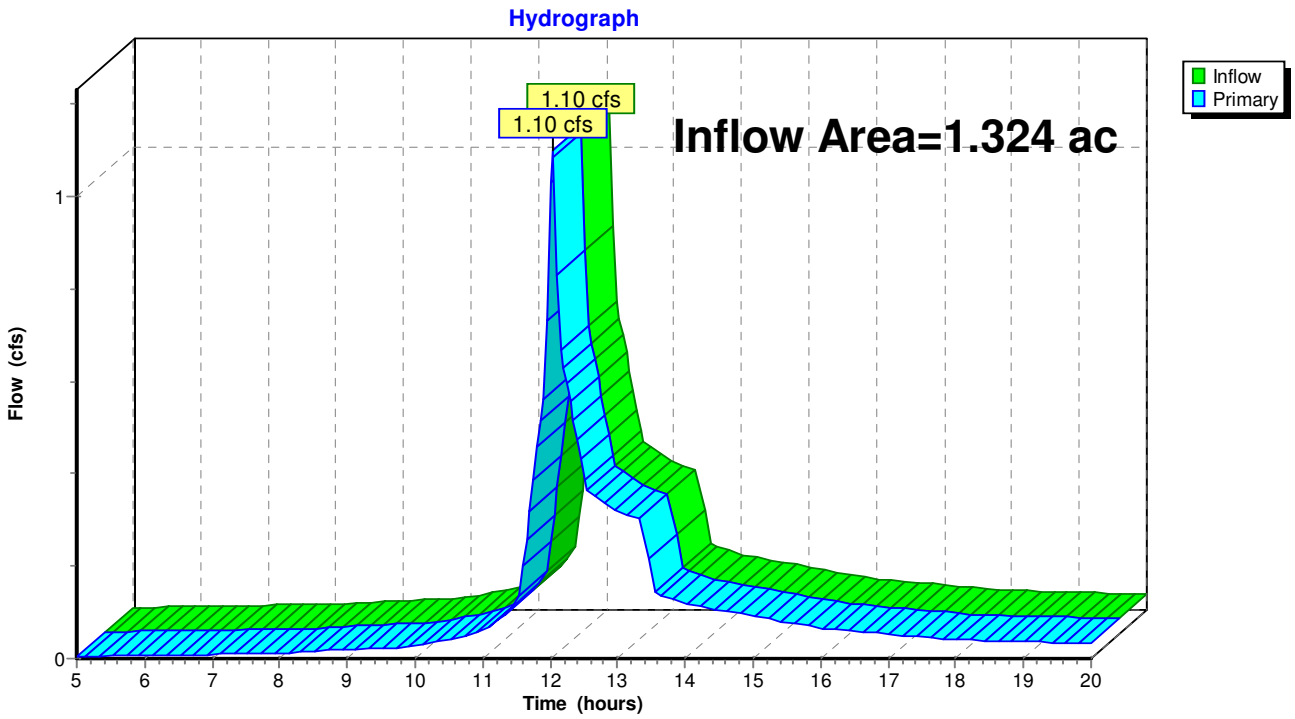


Pond SP3: Study Point #2

Inflow Area = 1.324 ac, Inflow Depth > 1.07" for 2-Year Event event
Inflow = 1.10 cfs @ 12.03 hrs, Volume= 0.118 af
Primary = 1.10 cfs @ 12.03 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #2



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

Subcatchment 1AS: Sub #1A Runoff Area=11,725 sf Runoff Depth>3.11"
Flow Length=98' Tc=8.6 min CN=90 Runoff=0.92 cfs 0.070 af

Subcatchment 1BS: Sub #1B Runoff Area=4,165 sf Runoff Depth>2.47"
Tc=0.0 min CN=83 Runoff=0.34 cfs 0.020 af

Subcatchment 1CS: Sub #1C Runoff Area=3,840 sf Runoff Depth>2.55"
Flow Length=59' Slope=0.0200 '/' Tc=5.9 min CN=84 Runoff=0.28 cfs 0.019 af

Subcatchment 1S: Sub #1 Runoff Area=38,580 sf Runoff Depth>1.90"
Flow Length=314' Tc=0.9 min CN=76 Runoff=2.36 cfs 0.140 af

Subcatchment 2S: Sub #2 Runoff Area=4,060 sf Runoff Depth>3.87"
Flow Length=103' Slope=0.0400 '/' Tc=1.0 min CN=98 Runoff=0.45 cfs 0.030 af

Subcatchment 3S: Sub #3 Runoff Area=27,485 sf Runoff Depth>3.12"
Flow Length=184' Tc=1.3 min CN=90 Runoff=2.61 cfs 0.164 af

Subcatchment 4S: Sub #4 Runoff Area=6,165 sf Runoff Depth>3.79"
Flow Length=122' Slope=0.0400 '/' Tc=1.0 min CN=97 Runoff=0.67 cfs 0.045 af

Subcatchment 5S: Sub #5 Runoff Area=11,125 sf Runoff Depth>3.87"
Flow Length=98' Slope=0.0286 '/' Tc=1.1 min CN=98 Runoff=1.22 cfs 0.082 af

Subcatchment 6S: Sub #6 Runoff Area=18,880 sf Runoff Depth>3.41"
Flow Length=125' Tc=1.3 min CN=93 Runoff=1.91 cfs 0.123 af

Subcatchment 7S: Sub #7 Runoff Area=26,440 sf Runoff Depth>2.14"
Flow Length=87' Tc=1.0 min CN=79 Runoff=1.81 cfs 0.108 af

Subcatchment 8S: Sub #8 Runoff Area=9,960 sf Runoff Depth>0.76"
Flow Length=35' Slope=0.1714 '/' Tc=1.7 min CN=58 Runoff=0.21 cfs 0.015 af

Subcatchment 9S: Sub #9 Runoff Area=4,140 sf Runoff Depth>3.87"
Flow Length=290' Tc=1.3 min CN=98 Runoff=0.45 cfs 0.031 af

Subcatchment 10S: Sub #10 Runoff Area=4,145 sf Runoff Depth>3.87"
Flow Length=282' Tc=1.3 min CN=98 Runoff=0.45 cfs 0.031 af

Subcatchment 11S: Sub #11 Runoff Area=4,135 sf Runoff Depth>1.90"
Flow Length=50' Tc=2.3 min CN=76 Runoff=0.25 cfs 0.015 af

Subcatchment 12S: Sub #12 Runoff Area=5,800 sf Runoff Depth>1.68"
Flow Length=64' Tc=2.6 min CN=73 Runoff=0.31 cfs 0.019 af

Subcatchment 13S: Sub 13 Runoff Area=2,805 sf Runoff Depth>0.76"
Flow Length=18' Slope=0.5000 '/' Tc=0.6 min CN=58 Runoff=0.06 cfs 0.004 af

Subcatchment 14S: Sub 14 Runoff Area=9,215 sf Runoff Depth>0.76"
Flow Length=33' Slope=0.3636 '/' Tc=1.2 min CN=58 Runoff=0.19 cfs 0.013 af

Subcatchment 15S: Sub 15 Runoff Area=3,815 sf Runoff Depth>0.76"
Flow Length=24' Slope=0.2917 '/' Tc=1.0 min CN=58 Runoff=0.08 cfs 0.006 af

Subcatchment 16S: Sub 16 Runoff Area=9,285 sf Runoff Depth>0.76"
Flow Length=37' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.19 cfs 0.014 af

Subcatchment 17S: Sub #17 Runoff Area=4,770 sf Runoff Depth>0.76"
Flow Length=35' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.10 cfs 0.007 af

Pond 1: CB1 Peak Elev=227.85' Inflow=0.45 cfs 0.030 af
15.0" x 47.0' Culvert Outflow=0.45 cfs 0.030 af

Pond 1P: Filter Pond #1 Peak Elev=213.14' Storage=7,446 cf Inflow=3.87 cfs 0.279 af
Outflow=0.34 cfs 0.147 af

Pond 2: CB2 Peak Elev=229.45' Inflow=2.61 cfs 0.164 af
15.0" x 39.0' Culvert Outflow=2.61 cfs 0.164 af

Pond 2P: Filter Pond #2 Peak Elev=229.96' Storage=10,874 cf Inflow=6.59 cfs 0.429 af
Outflow=1.17 cfs 0.277 af

Pond 3: CB3 Peak Elev=230.08' Inflow=3.80 cfs 0.250 af
15.0" x 26.0' Culvert Outflow=3.80 cfs 0.250 af

Pond 3P: Filter Pond #3 Peak Elev=235.66' Storage=1,540 cf Inflow=1.81 cfs 0.108 af
3.0" x 70.0' Culvert Outflow=0.25 cfs 0.108 af

Pond 4: CB4 Peak Elev=230.81' Inflow=3.13 cfs 0.206 af
15.0" x 86.0' Culvert Outflow=3.13 cfs 0.206 af

Pond 5: CB5 Peak Elev=232.18' Inflow=1.91 cfs 0.123 af
15.0" x 134.0' Culvert Outflow=1.91 cfs 0.123 af

Pond 6: CB6 Peak Elev=230.74' Inflow=0.28 cfs 0.019 af
15.0" x 60.0' Culvert Outflow=0.28 cfs 0.019 af

Pond 7: CB7 Peak Elev=229.94' Inflow=0.52 cfs 0.038 af
15.0" x 140.0' Culvert Outflow=0.52 cfs 0.038 af

Pond 8: CB8 Peak Elev=228.53' Inflow=1.34 cfs 0.108 af
15.0" x 89.0' Culvert Outflow=1.34 cfs 0.108 af

Pond 9: CB9 Peak Elev=226.31' Inflow=0.45 cfs 0.031 af
15.0" x 18.0' Culvert Outflow=0.45 cfs 0.031 af

Pond 10: CB10 Peak Elev=225.91' Inflow=0.90 cfs 0.061 af
15.0" x 26.0' Culvert Outflow=0.90 cfs 0.061 af

Pond SF1: Sediment Forebay #1 Peak Elev=0.00' Storage=0 cf

Pond SF2: Sediment Forebay #2 Peak Elev=0.00' Storage=0 cf

Pond SP1: Study Point #1 Inflow=0.38 cfs 0.167 af
Primary=0.38 cfs 0.167 af

Pond SP2: Study Point #2 Inflow=1.18 cfs 0.281 af
Primary=1.18 cfs 0.281 af

Pond SP3: Study Point #2 Inflow=1.92 cfs 0.222 af
Primary=1.92 cfs 0.222 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.955 af Average Runoff Depth = 2.37"
45.46% Pervious Area = 2.197 ac 54.54% Impervious Area = 2.636 ac

Subcatchment 1AS: Sub #1A

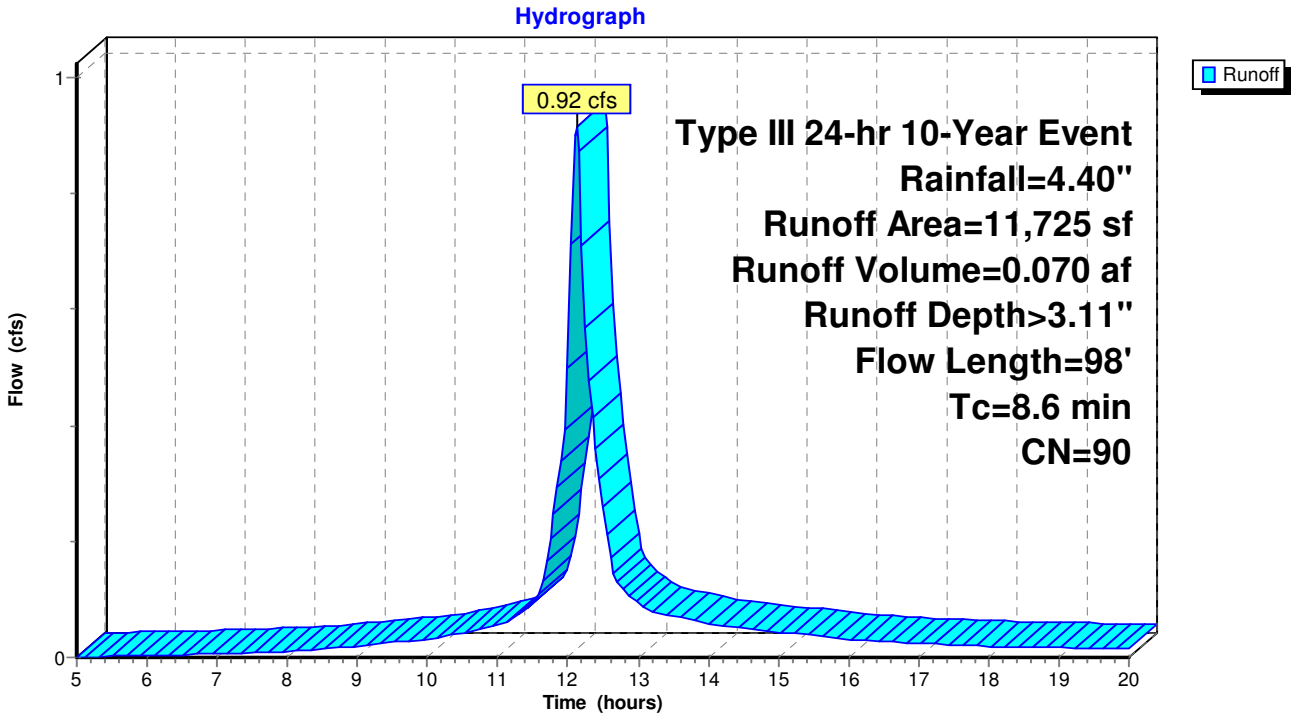
Runoff = 0.92 cfs @ 12.12 hrs, Volume= 0.070 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,225	98	Paved parking & roofs
2,500	61	>75% Grass cover, Good, HSG B
11,725	90	Weighted Average
2,500		Pervious Area
9,225		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
8.4	86	0.0233	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
8.6	98	Total			

Subcatchment 1AS: Sub #1A



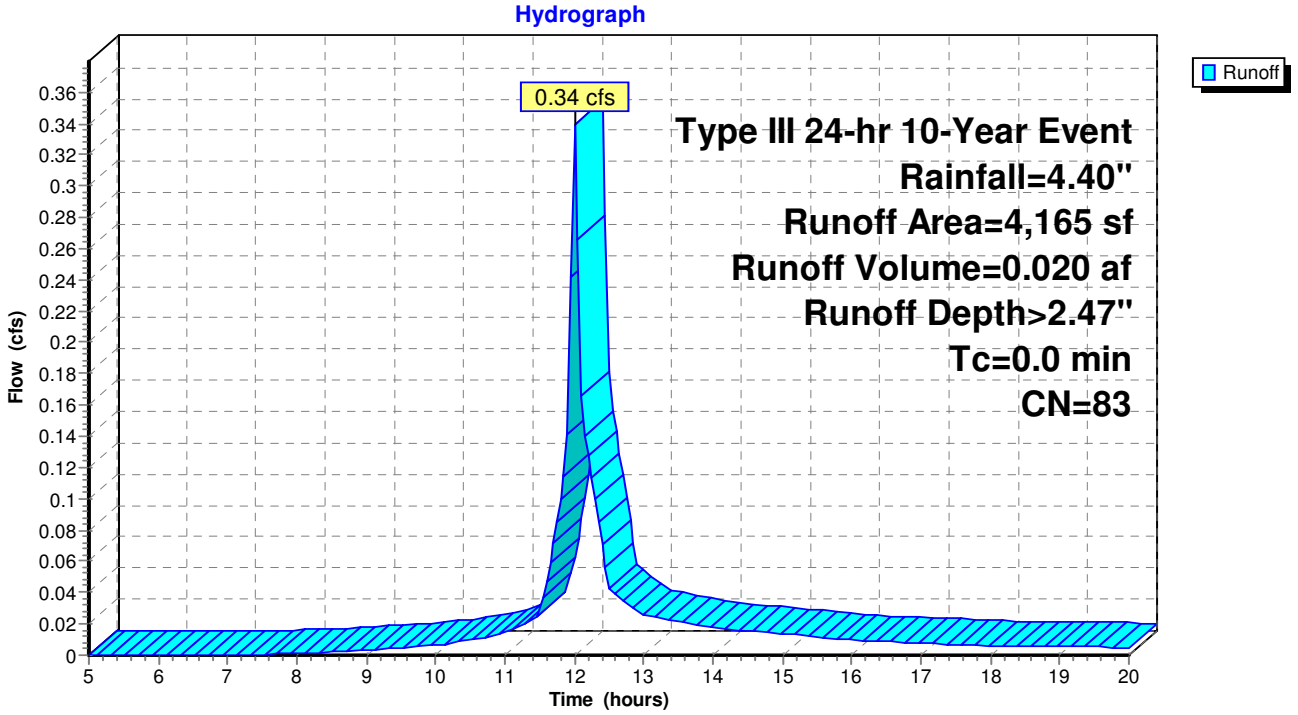
Subcatchment 1BS: Sub #1B

Runoff = 0.34 cfs @ 12.00 hrs, Volume= 0.020 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,505	98	Paved parking & roofs
1,660	61	>75% Grass cover, Good, HSG B
4,165	83	Weighted Average
1,660		Pervious Area
2,505		Impervious Area

Subcatchment 1BS: Sub #1B



Subcatchment 1CS: Sub #1C

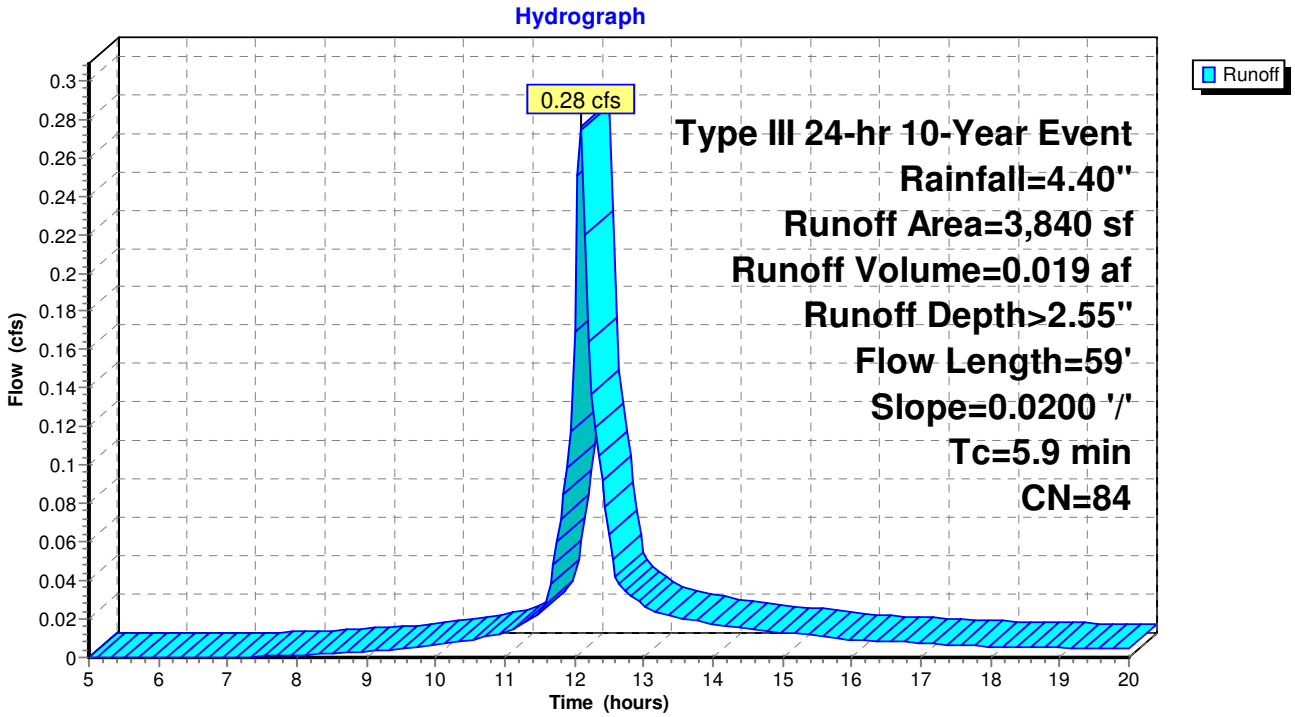
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,390	98	Paved parking & roofs
1,450	61	>75% Grass cover, Good, HSG B
3,840	84	Weighted Average
1,450		Pervious Area
2,390		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.84		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
5.7	49	0.0200	0.14		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
5.9	59	Total			

Subcatchment 1CS: Sub #1C



Subcatchment 1S: Sub #1

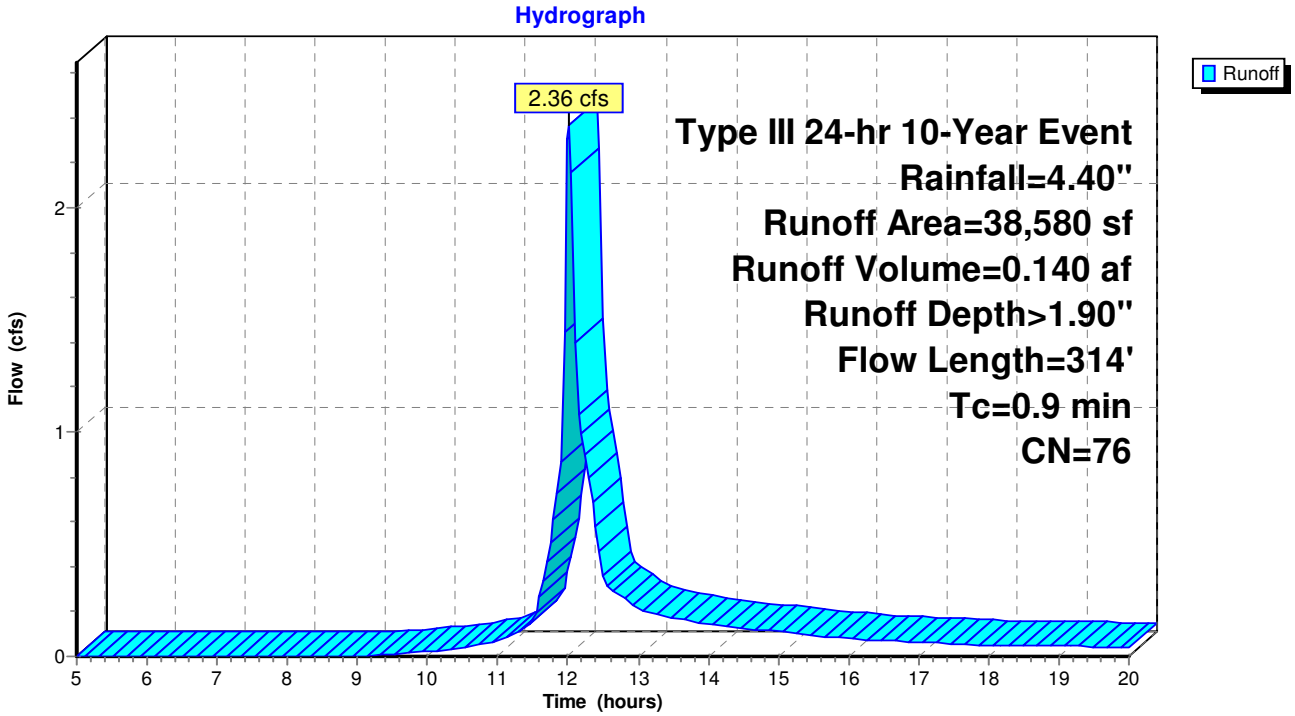
Runoff = 2.36 cfs @ 12.02 hrs, Volume= 0.140 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
16,145	98	Paved parking & roofs
16,000	61	>75% Grass cover, Good, HSG B
6,435	58	Meadow, non-grazed, HSG B
38,580	76	Weighted Average
22,435		Pervious Area
16,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	27	0.0370	3.90		**Shallow Concentrated Flow, AB** Paved Kv= 20.3 fps
0.2	50	0.0800	4.24		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.6	237	0.0649	6.40	25.58	**Channel Flow, CD** Area= 4.0 sf Perim= 7.2' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.9	314	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

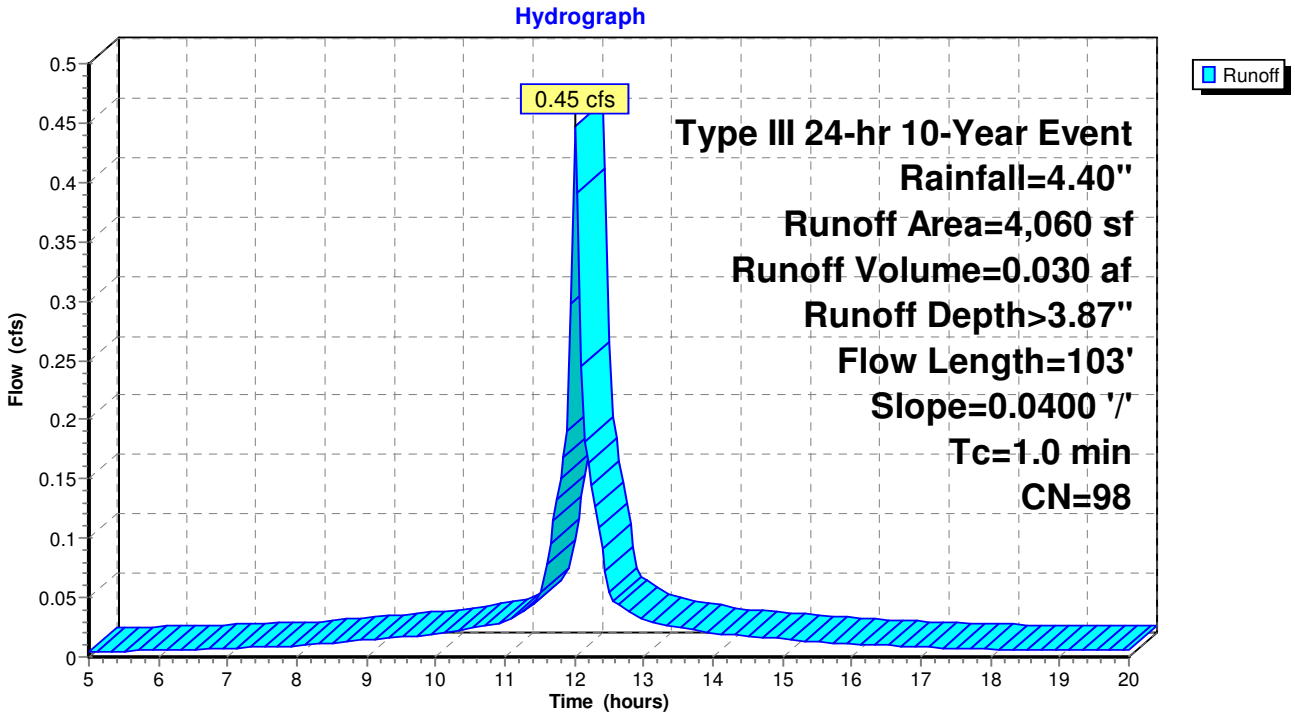
Runoff = 0.45 cfs @ 12.01 hrs, Volume= 0.030 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,060	98	Paved parking & roofs
4,060		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	103	0.0400	1.77		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

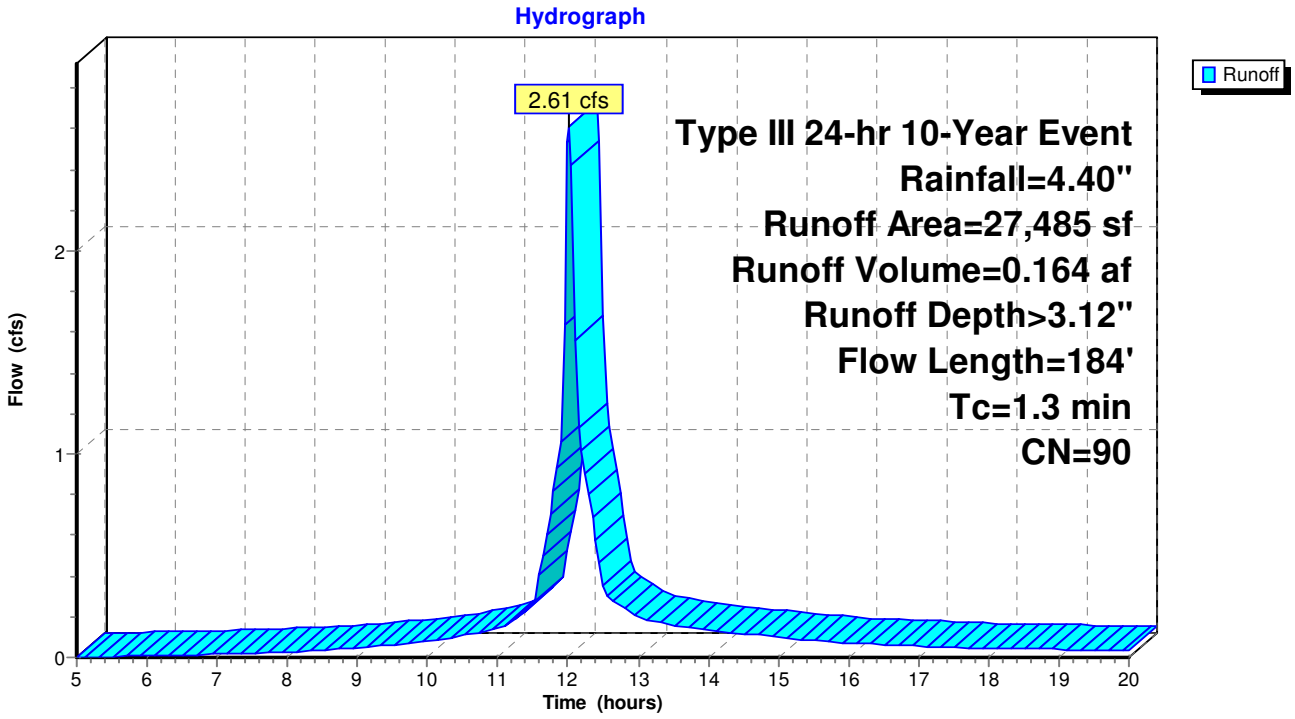
Runoff = 2.61 cfs @ 12.02 hrs, Volume= 0.164 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
21,855	98	Paved parking & roofs
5,630	61	>75% Grass cover, Good, HSG B
27,485	90	Weighted Average
5,630		Pervious Area
21,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0400	1.76		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	84	0.0250	3.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	184	Total			

Subcatchment 3S: Sub #3



Subcatchment 4S: Sub #4

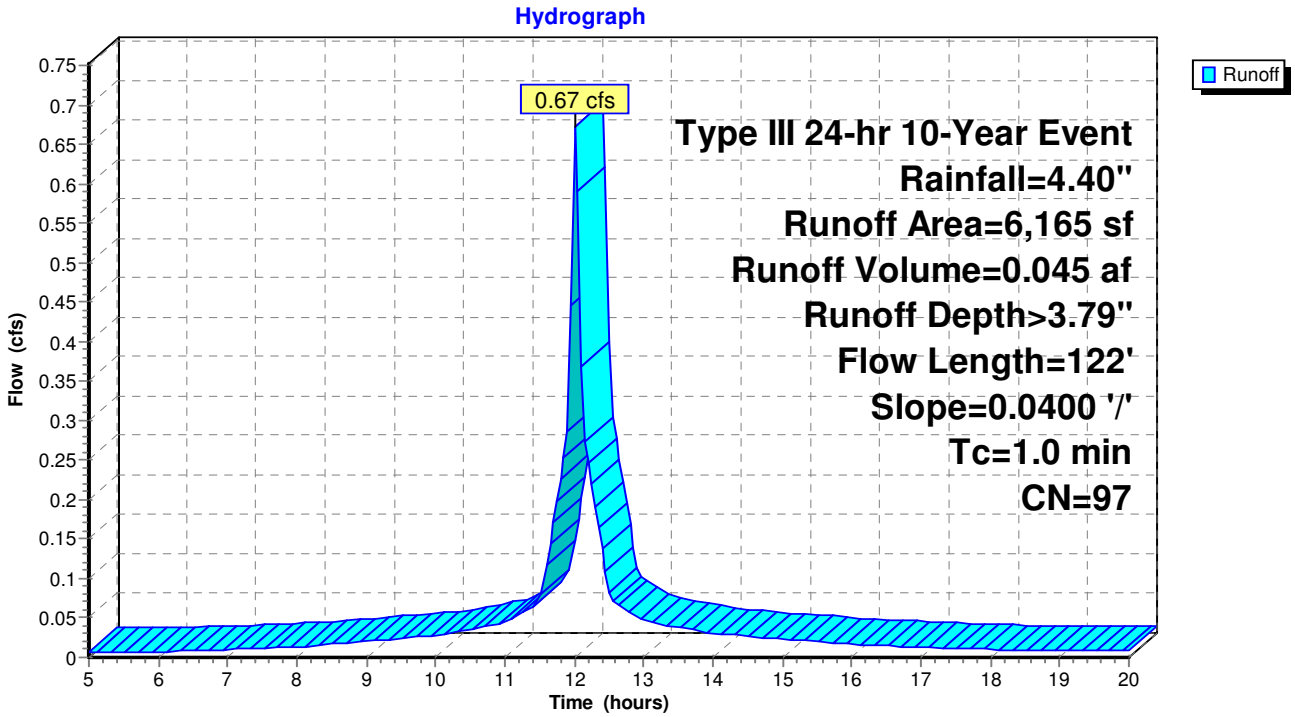
Runoff = 0.67 cfs @ 12.01 hrs, Volume= 0.045 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
5,950	98	Paved parking & roofs
215	61	>75% Grass cover, Good, HSG B
6,165	97	Weighted Average
215		Pervious Area
5,950		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	84	0.0400	1.70		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	38	0.0400	4.06		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.0	122	Total			

Subcatchment 4S: Sub #4



Subcatchment 5S: Sub #5

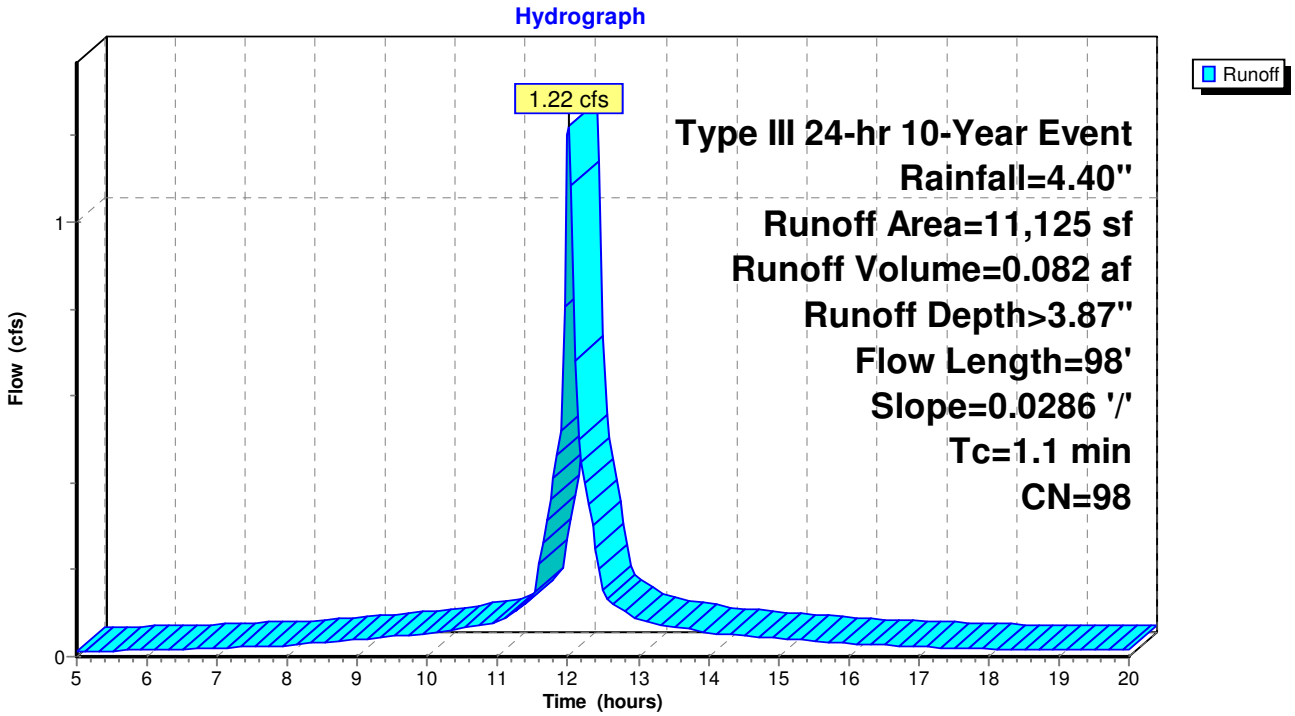
Runoff = 1.22 cfs @ 12.01 hrs, Volume= 0.082 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
10,990	98	Paved parking & roofs
135	61	>75% Grass cover, Good, HSG B
11,125	98	Weighted Average
135		Pervious Area
10,990		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	98	0.0286	1.53		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5S: Sub #5



Subcatchment 6S: Sub #6

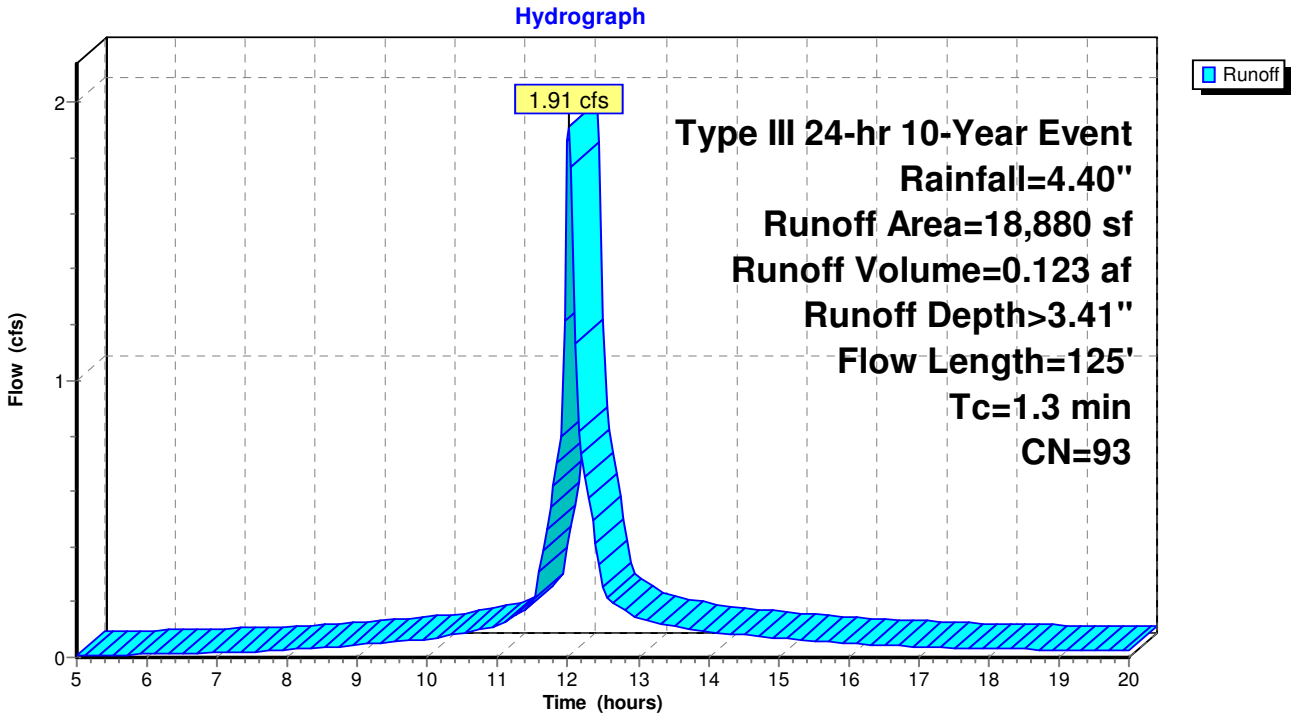
Runoff = 1.91 cfs @ 12.02 hrs, Volume= 0.123 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
16,260	98	Paved parking & roofs
2,620	61	>75% Grass cover, Good, HSG B
18,880	93	Weighted Average
2,620		Pervious Area
16,260		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0280	1.52		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment 6S: Sub #6



Subcatchment 7S: Sub #7

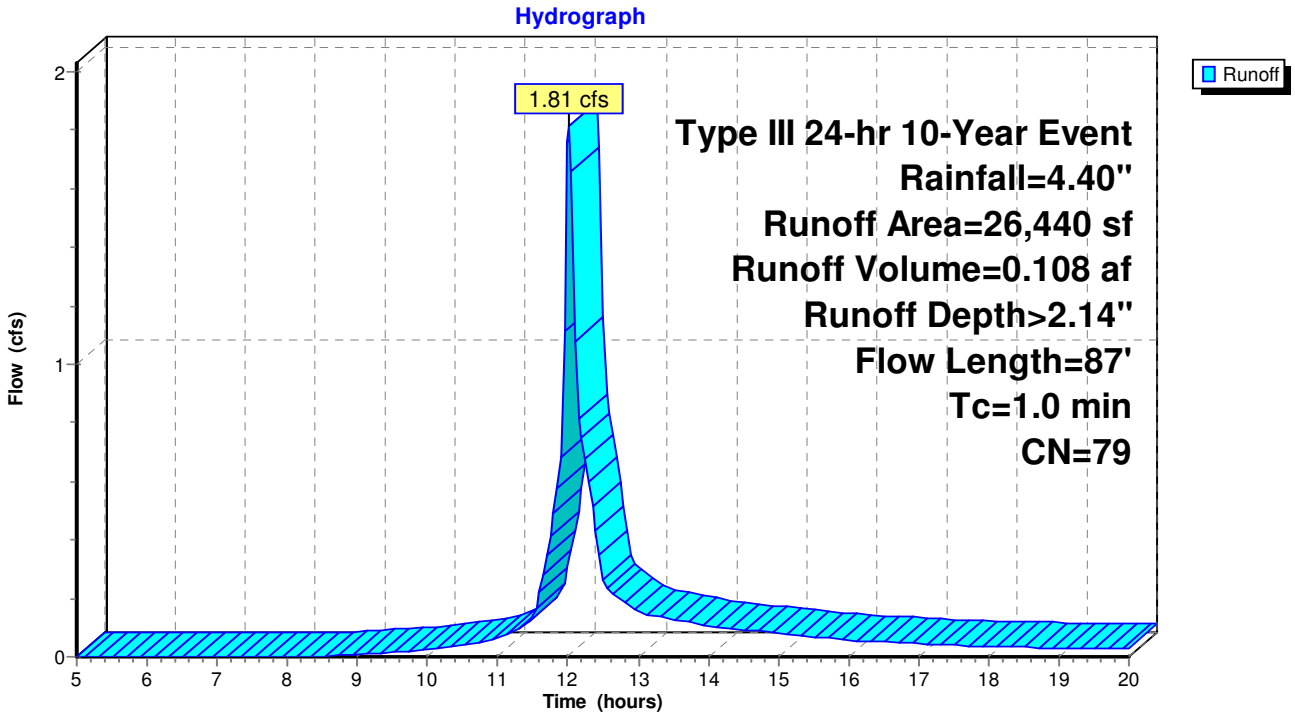
Runoff = 1.81 cfs @ 12.02 hrs, Volume= 0.108 af, Depth> 2.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
13,630	98	Paved parking & roofs
2,065	61	>75% Grass cover, Good, HSG B
10,745	58	Meadow, non-grazed, HSG B
26,440	79	Weighted Average
12,810		Pervious Area
13,630		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	66	0.0227	1.29		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	21	0.0952	4.63		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
1.0	87	Total			

Subcatchment 7S: Sub #7



Subcatchment 8S: Sub #8

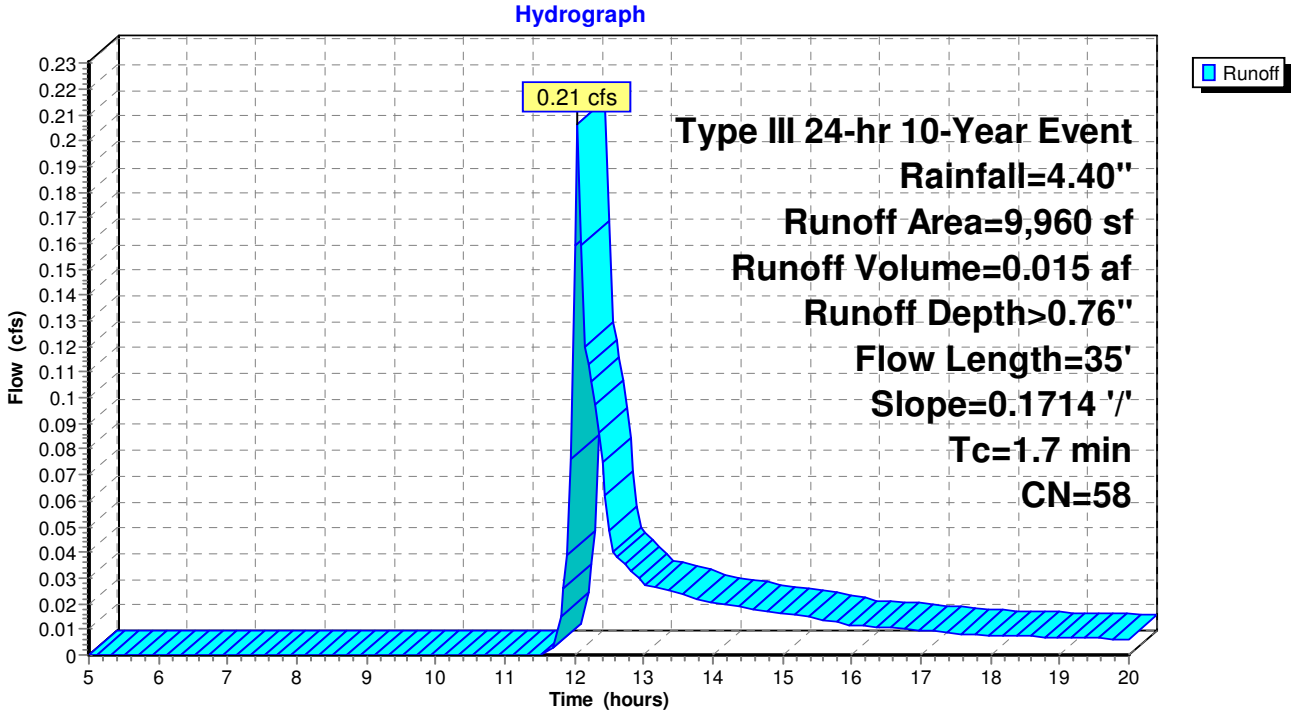
Runoff = 0.21 cfs @ 12.05 hrs, Volume= 0.015 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,960	58	Meadow, non-grazed, HSG B
9,960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	35	0.1714	0.35		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 8S: Sub #8



Subcatchment 9S: Sub #9

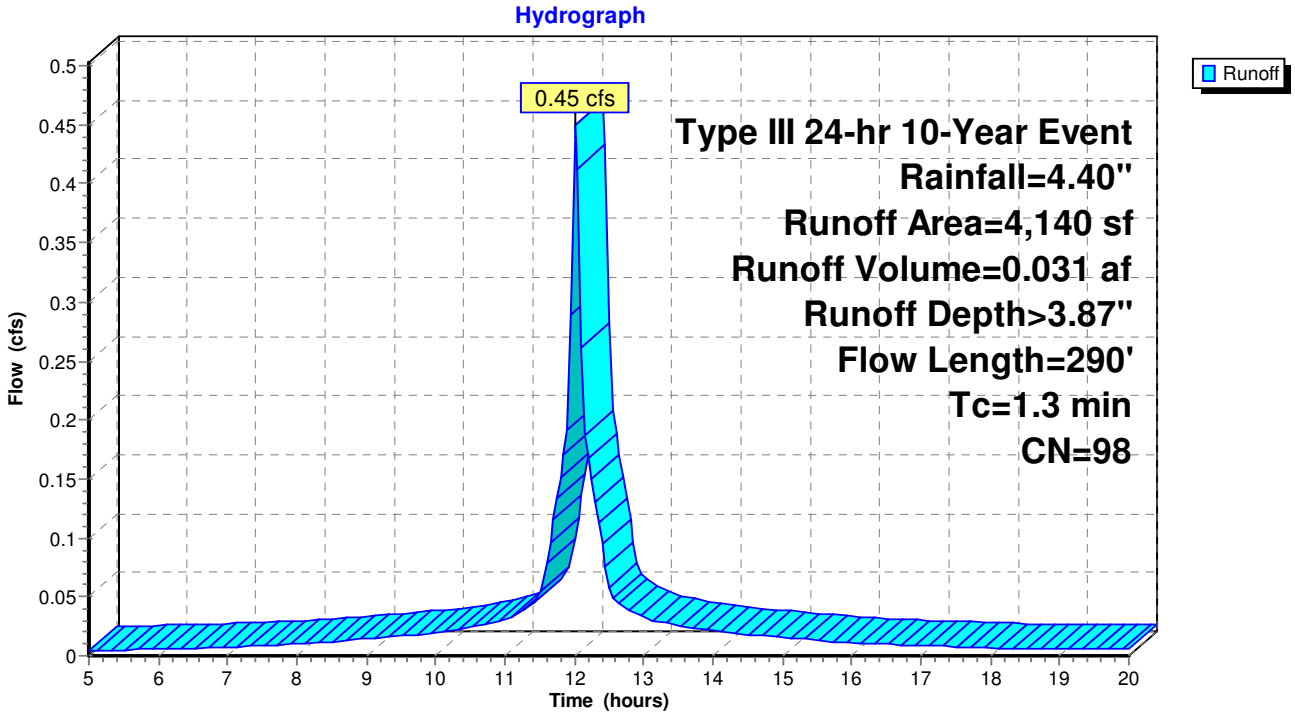
Runoff = 0.45 cfs @ 12.02 hrs, Volume= 0.031 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,140	98	Paved parking & roofs
4,140		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	190	0.0605	4.99		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	290	Total			

Subcatchment 9S: Sub #9



Subcatchment 10S: Sub #10

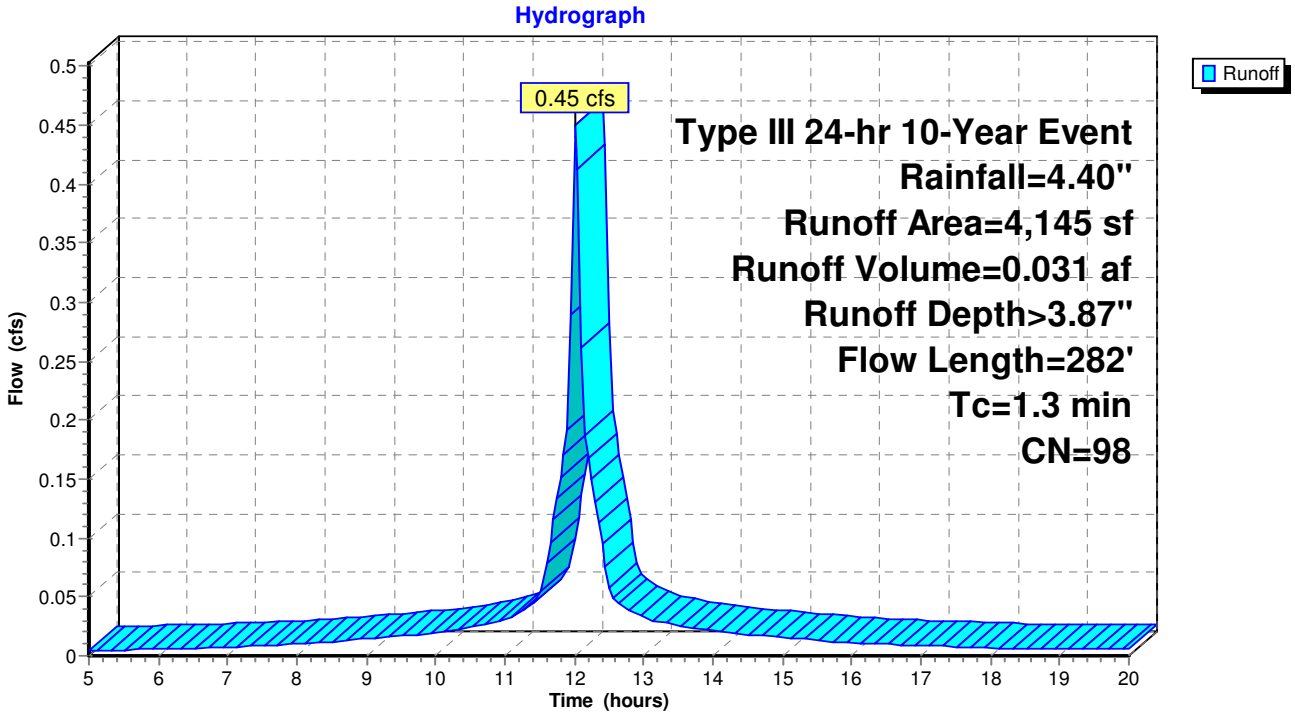
Runoff = 0.45 cfs @ 12.02 hrs, Volume= 0.031 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,145	98	Paved parking & roofs
4,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	182	0.0659	5.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	282	Total			

Subcatchment 10S: Sub #10



Subcatchment 11S: Sub #11

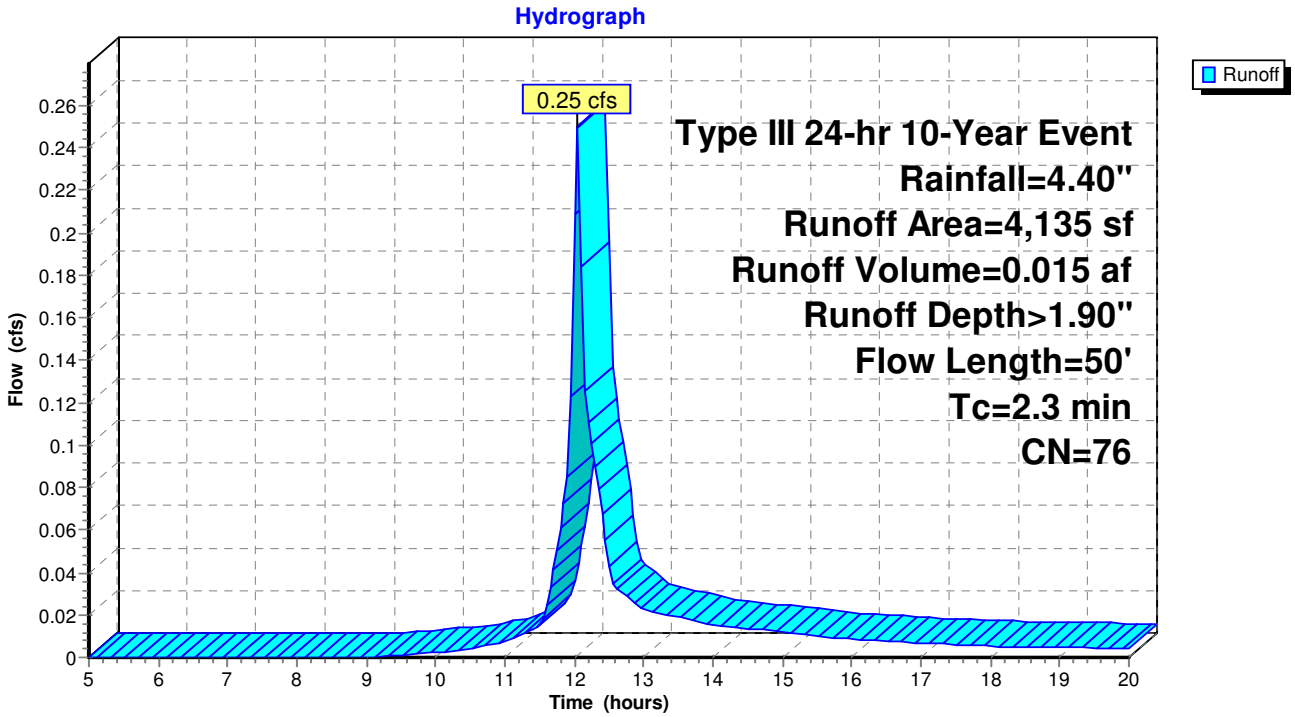
Runoff = 0.25 cfs @ 12.04 hrs, Volume= 0.015 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
1,625	98	Paved parking & roofs
2,510	61	>75% Grass cover, Good, HSG B
4,135	76	Weighted Average
2,510		Pervious Area
1,625		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.0	33	0.1212	0.27		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.3	50	Total			

Subcatchment 11S: Sub #11



Subcatchment 12S: Sub #12

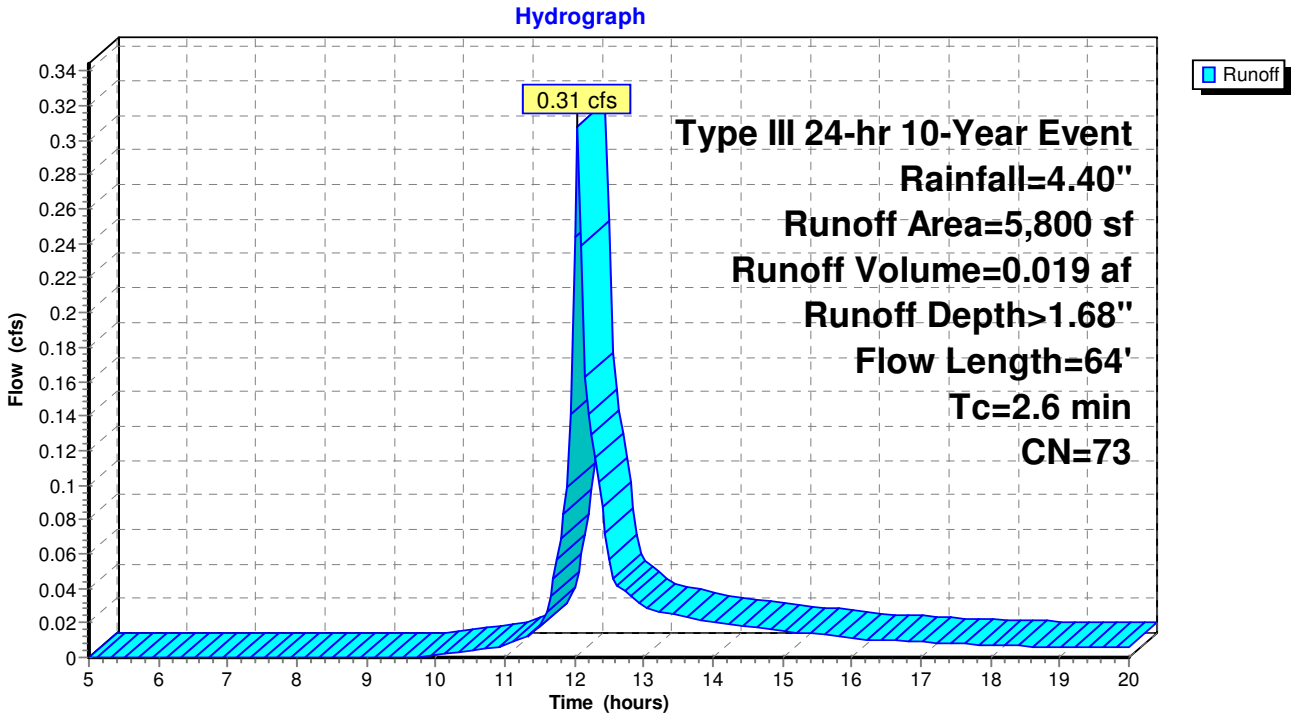
Runoff = 0.31 cfs @ 12.05 hrs, Volume= 0.019 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
1,900	98	Paved parking & roofs
3,900	61	>75% Grass cover, Good, HSG B
5,800	73	Weighted Average
3,900		Pervious Area
1,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.3	47	0.1702	0.33		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.6	64	Total			

Subcatchment 12S: Sub #12



Subcatchment 13S: Sub 13

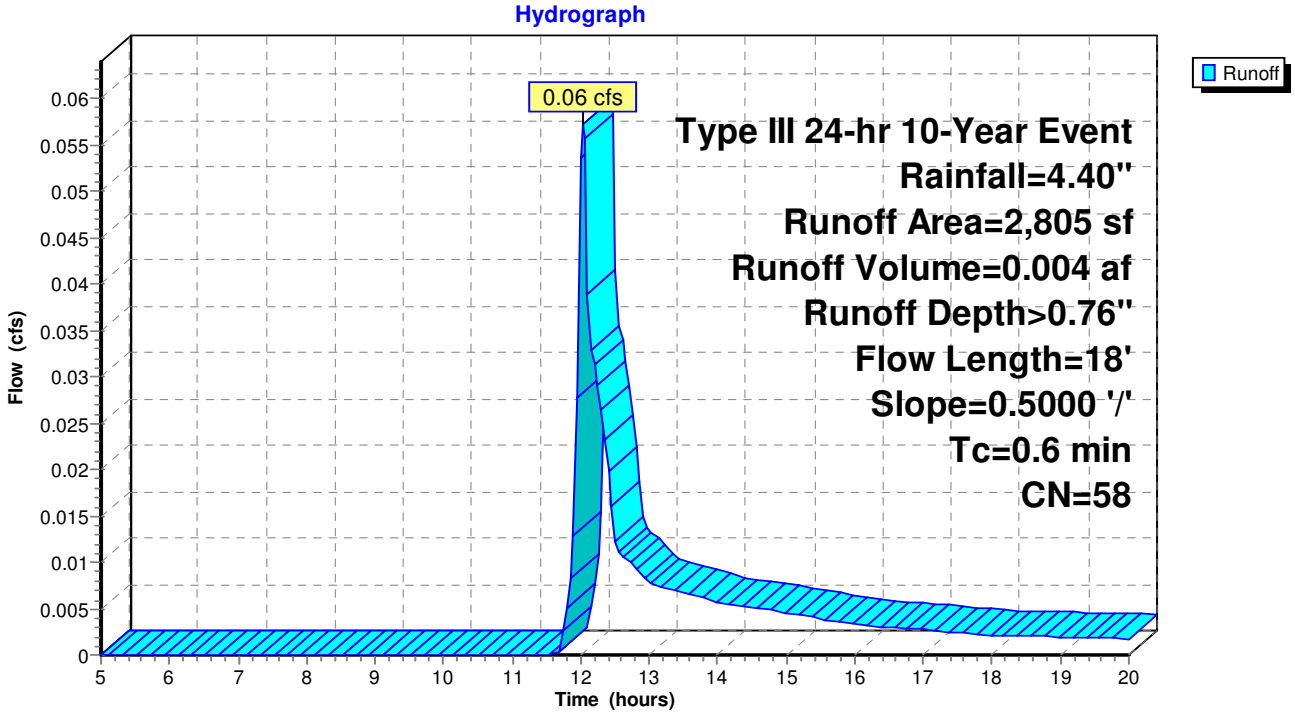
Runoff = 0.06 cfs @ 12.03 hrs, Volume= 0.004 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,805	58	Meadow, non-grazed, HSG B
2,805		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	18	0.5000	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 13S: Sub 13



Subcatchment 14S: Sub 14

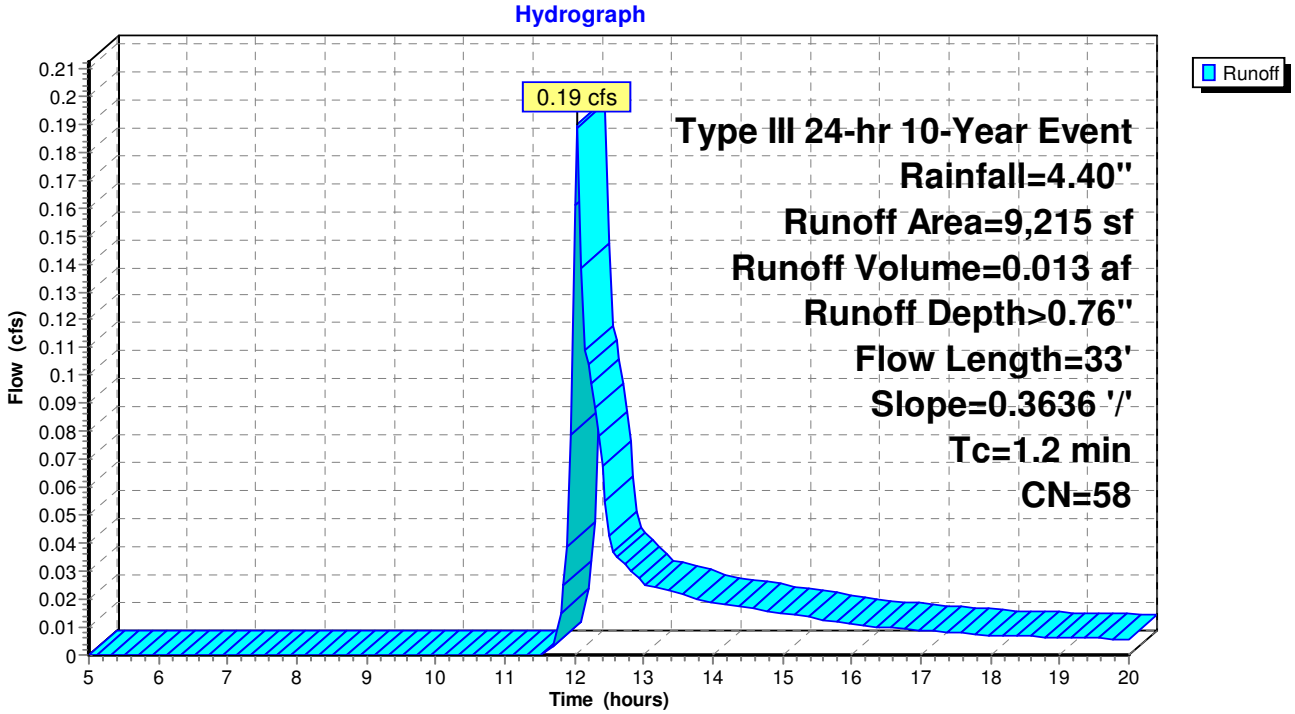
Runoff = 0.19 cfs @ 12.04 hrs, Volume= 0.013 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,215	58	Meadow, non-grazed, HSG B
9,215		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	33	0.3636	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 14S: Sub 14



Subcatchment 15S: Sub 15

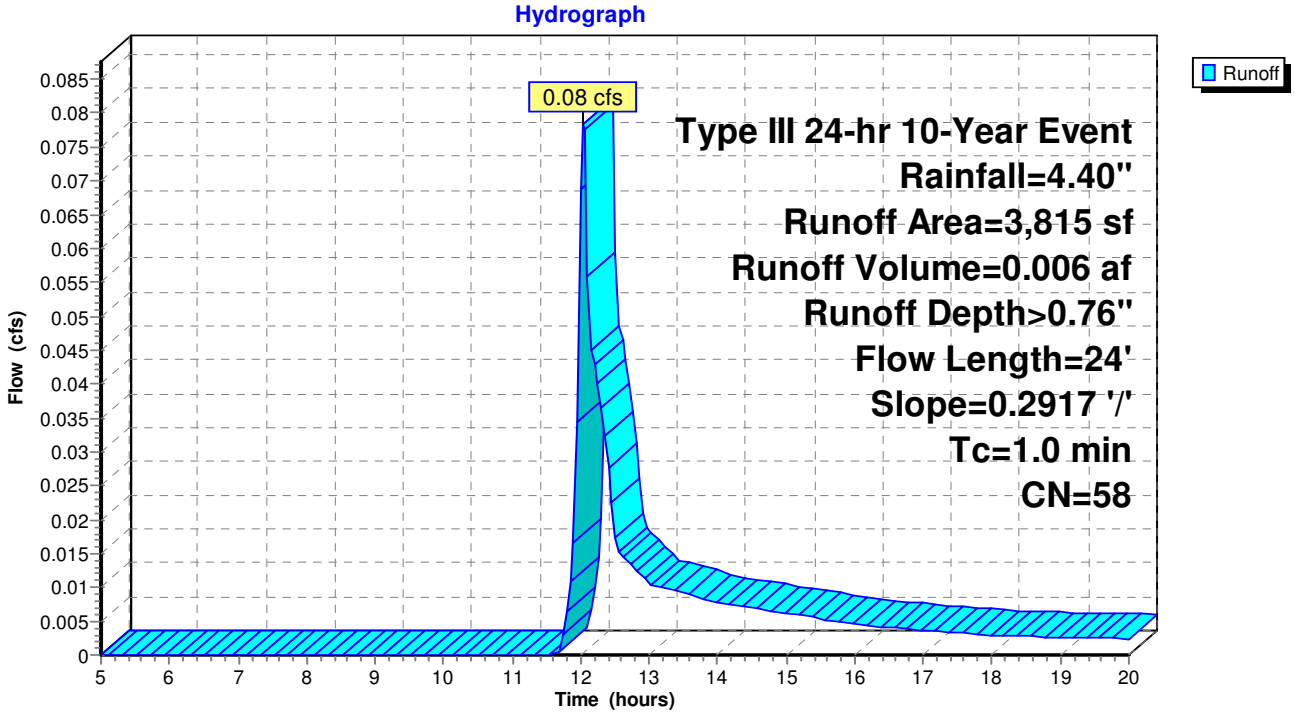
Runoff = 0.08 cfs @ 12.04 hrs, Volume= 0.006 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
3,815	58	Meadow, non-grazed, HSG B
3,815		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	24	0.2917	0.41		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 15S: Sub 15



Subcatchment 16S: Sub 16

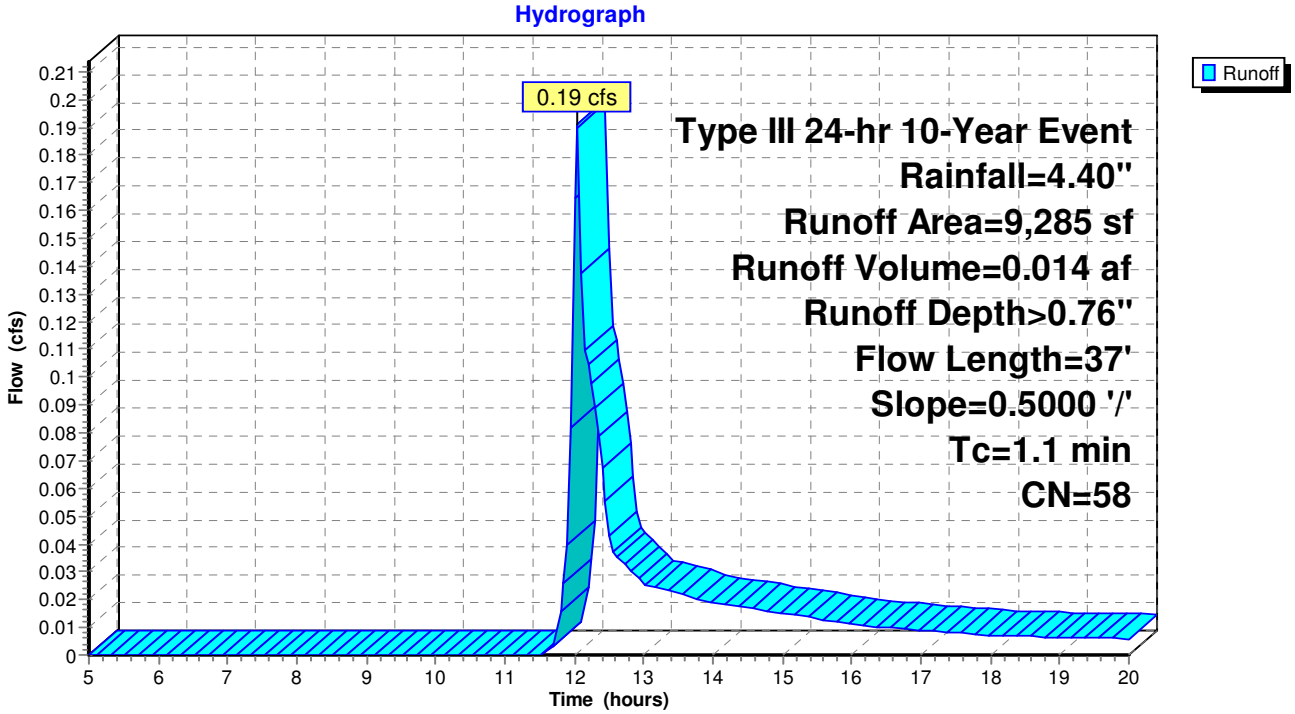
Runoff = 0.19 cfs @ 12.04 hrs, Volume= 0.014 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,285	58	Meadow, non-grazed, HSG B
9,285		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	37	0.5000	0.55		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 16S: Sub 16



Subcatchment 17S: Sub #17

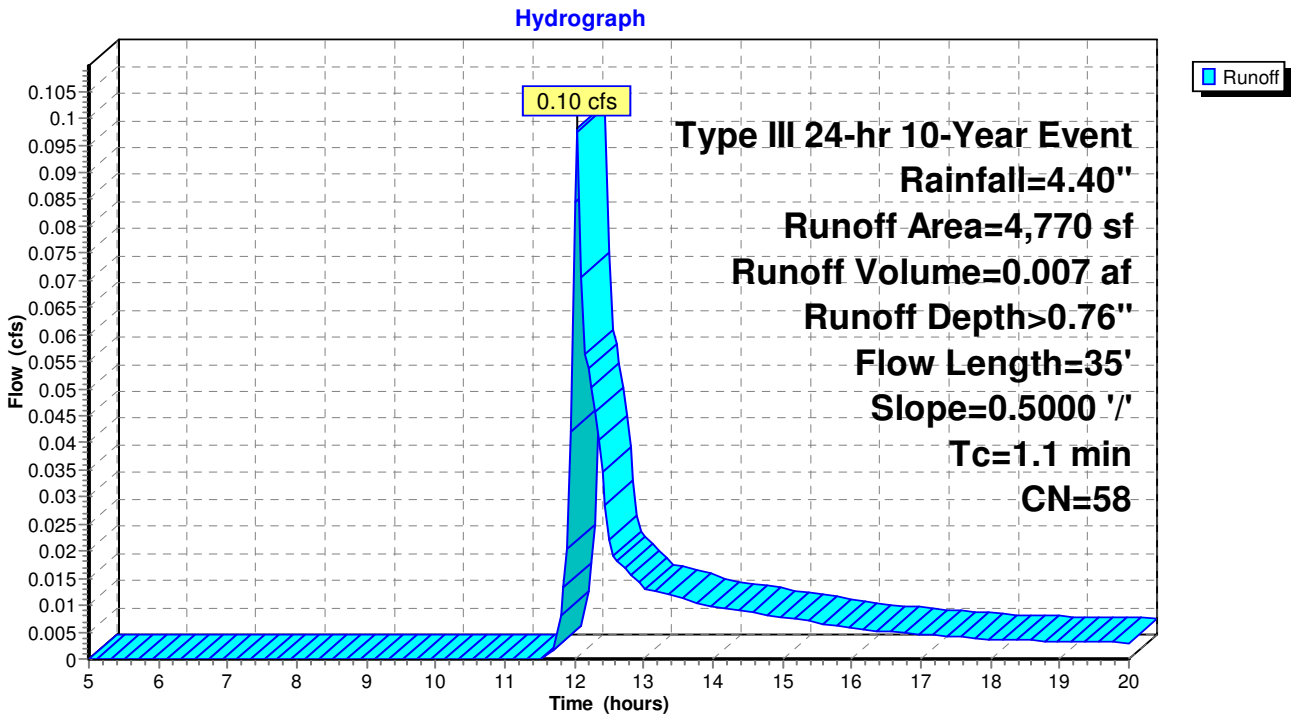
Runoff = 0.10 cfs @ 12.04 hrs, Volume= 0.007 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,770	58	Meadow, non-grazed, HSG B
4,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	35	0.5000	0.54		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 17S: Sub #17



Pond 1: CB1

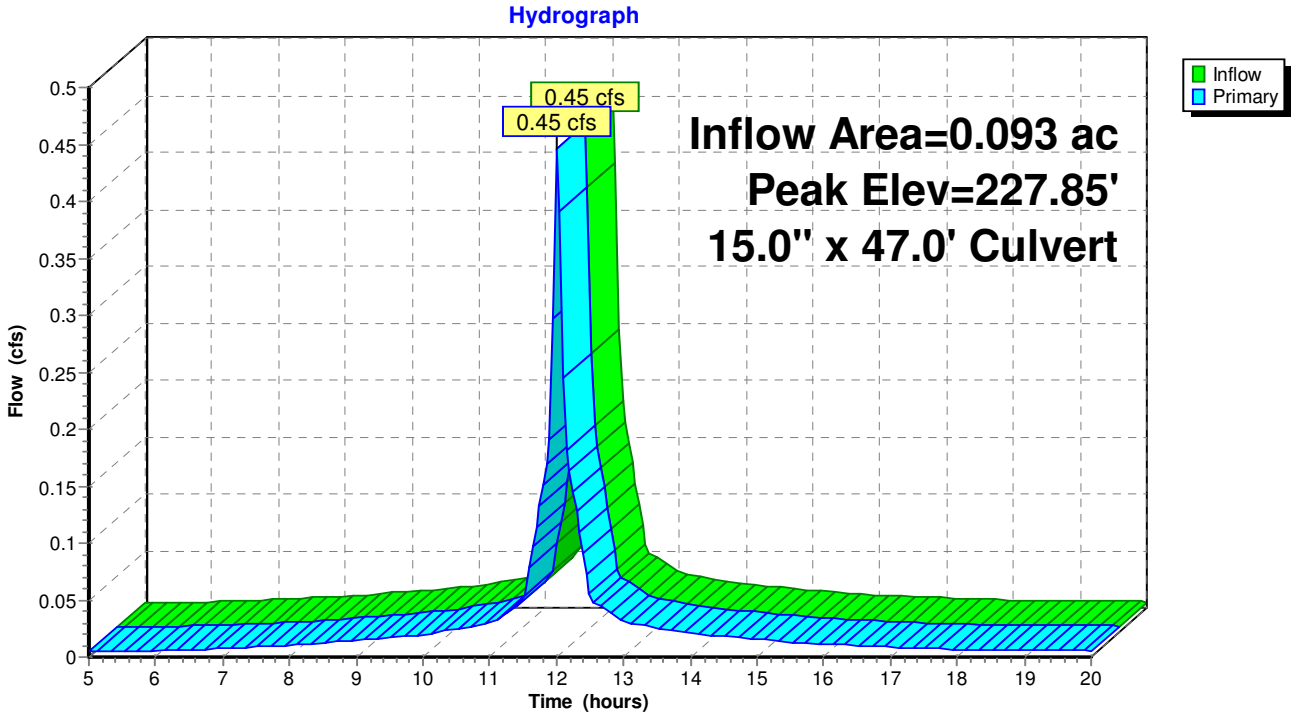
Inflow Area =	0.093 ac,	Inflow Depth >	3.87"	for	10-Year Event event
Inflow =	0.45 cfs @	12.01 hrs,	Volume=	0.030 af	
Outflow =	0.45 cfs @	12.01 hrs,	Volume=	0.030 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.45 cfs @	12.01 hrs,	Volume=	0.030 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.85' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.50'	**15.0" x 47.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.43 cfs @ 12.01 hrs HW=227.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 1.57 fps)

Pond 1: CB1



Pond 1P: Filter Pond #1

Inflow Area = 1.432 ac, Inflow Depth > 2.34" for 10-Year Event event
Inflow = 3.87 cfs @ 12.03 hrs, Volume= 0.279 af
Outflow = 0.34 cfs @ 13.24 hrs, Volume= 0.147 af, Atten= 91%, Lag= 72.7 min
Primary = 0.34 cfs @ 13.24 hrs, Volume= 0.147 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 213.14' @ 13.24 hrs Surf.Area= 4,292 sf Storage= 7,446 cf

Plug-Flow detention time= 229.4 min calculated for 0.146 af (52% of inflow)
Center-of-Mass det. time= 146.1 min (926.0 - 779.8)

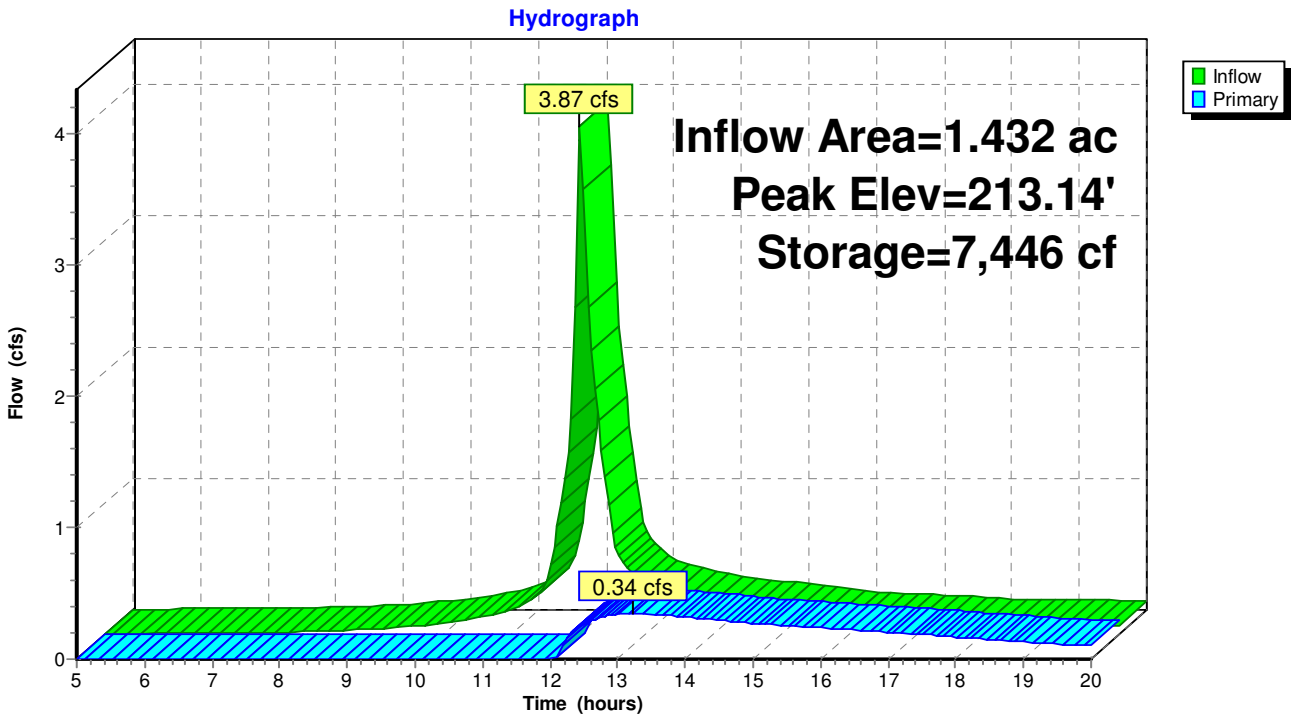
Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	16,887 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	2,725	0	0	2,725
212.00	3,425	3,068	3,068	3,452
212.50	3,800	1,805	4,874	3,842
213.00	4,185	1,995	6,869	4,243
214.00	5,000	4,586	11,456	5,092
215.00	5,875	5,432	16,887	6,006

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**15.0" x 30.5' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 208.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	212.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	213.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.34 cfs @ 13.24 hrs HW=213.14' (Free Discharge)
└─**1=Culvert** (Passes 0.34 cfs of 9.34 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 3.30 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.26 fps)

Pond 1P: Filter Pond #1



Pond 2: CB2

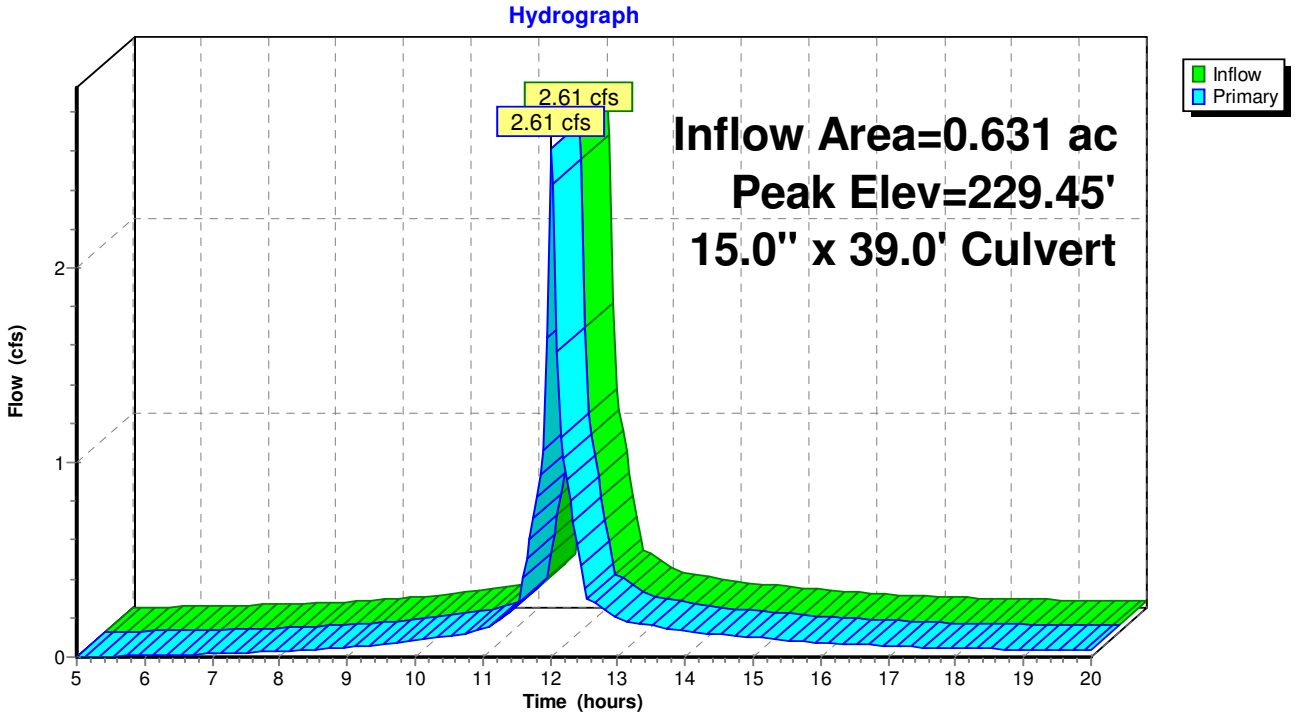
Inflow Area =	0.631 ac,	Inflow Depth >	3.12"	for	10-Year Event event
Inflow =	2.61 cfs @	12.02 hrs,	Volume=	0.164 af	
Outflow =	2.61 cfs @	12.02 hrs,	Volume=	0.164 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.61 cfs @	12.02 hrs,	Volume=	0.164 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.45' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**15.0" x 39.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0128 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.49 cfs @ 12.02 hrs HW=229.42' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.49 cfs @ 2.58 fps)

Pond 2: CB2



Pond 2P: Filter Pond #2

Inflow Area = 1.690 ac, Inflow Depth > 3.05" for 10-Year Event event
Inflow = 6.59 cfs @ 12.02 hrs, Volume= 0.429 af
Outflow = 1.17 cfs @ 12.45 hrs, Volume= 0.277 af, Atten= 82%, Lag= 26.0 min
Primary = 1.17 cfs @ 12.45 hrs, Volume= 0.277 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.96' @ 12.45 hrs Surf.Area= 6,383 sf Storage= 10,874 cf

Plug-Flow detention time= 198.3 min calculated for 0.277 af (65% of inflow)
Center-of-Mass det. time= 124.0 min (876.4 - 752.4)

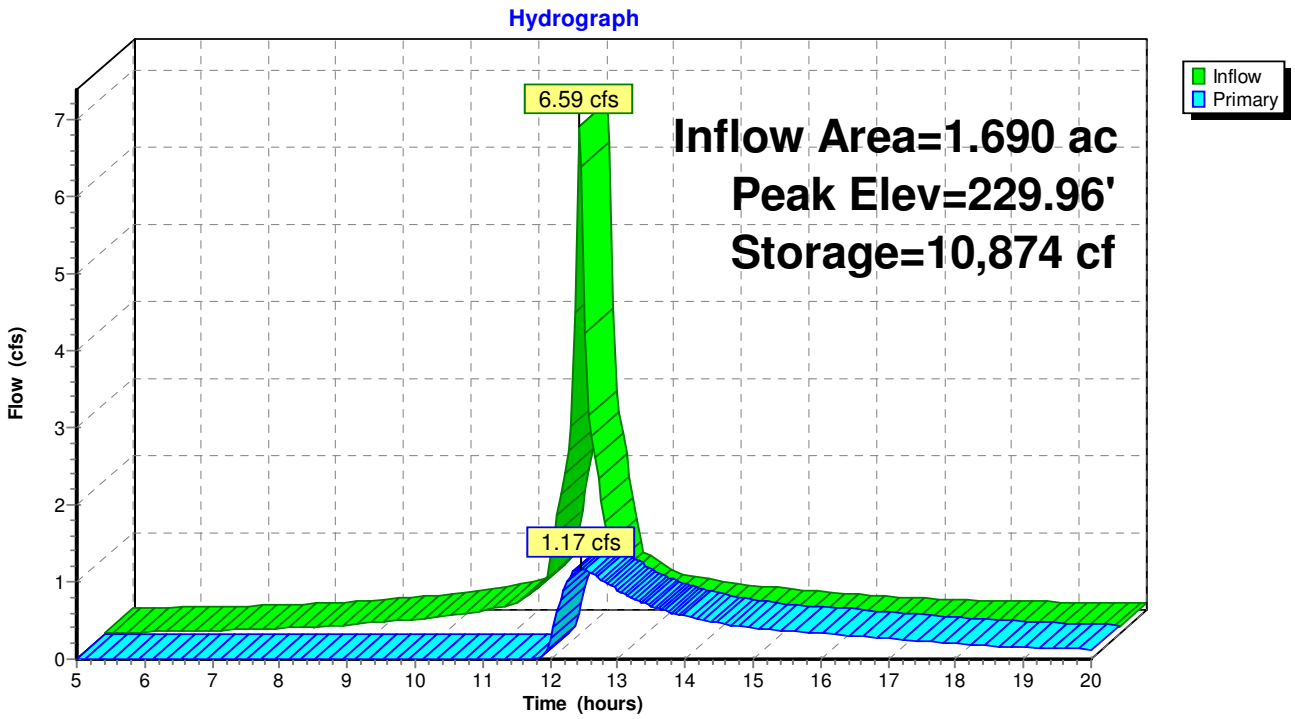
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	14,679 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
227.50	2,550	0	0	2,550
228.00	3,290	1,456	1,456	3,296
229.00	4,840	4,040	5,496	4,862
230.00	6,450	5,626	11,122	6,494
230.50	7,800	3,557	14,679	7,852

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**15.0" x 23.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 223.00' S= 0.0870 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	229.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	229.50'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.17 cfs @ 12.45 hrs HW=229.96' (Free Discharge)
└─**1=Culvert** (Passes 1.17 cfs of 9.71 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 4.18 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.60 cfs @ 2.31 fps)

Pond 2P: Filter Pond #2



Pond 3: CB3

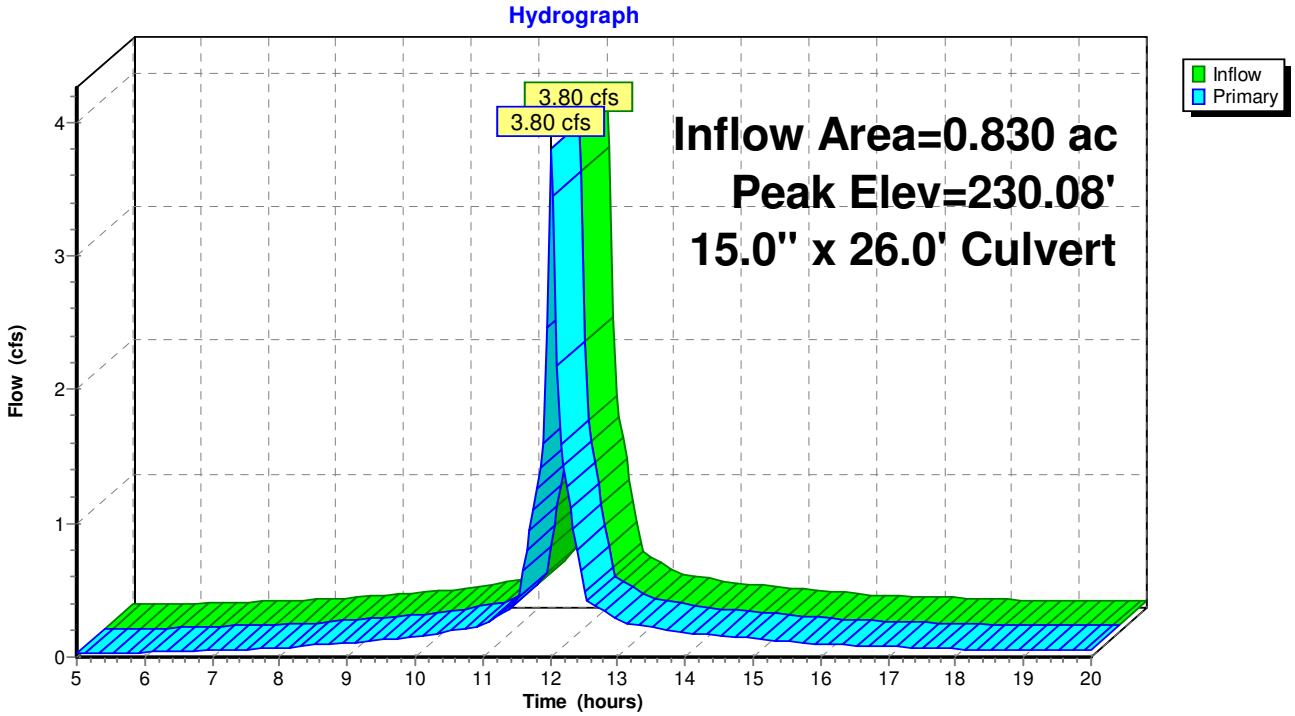
Inflow Area =	0.830 ac,	Inflow Depth >	3.62"	for	10-Year Event event
Inflow =	3.80 cfs @	12.02 hrs,	Volume=	0.250 af	
Outflow =	3.80 cfs @	12.02 hrs,	Volume=	0.250 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.80 cfs @	12.02 hrs,	Volume=	0.250 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.08' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.80'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0308 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.65 cfs @ 12.02 hrs HW=230.03' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.65 cfs @ 2.98 fps)

Pond 3: CB3



Pond 3P: Filter Pond #3

Inflow Area = 0.607 ac, Inflow Depth > 2.14" for 10-Year Event event
Inflow = 1.81 cfs @ 12.02 hrs, Volume= 0.108 af
Outflow = 0.25 cfs @ 12.52 hrs, Volume= 0.108 af, Atten= 86%, Lag= 30.3 min
Primary = 0.25 cfs @ 12.52 hrs, Volume= 0.108 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 235.66' @ 12.52 hrs Surf.Area= 1,944 sf Storage= 1,540 cf

Plug-Flow detention time= 46.7 min calculated for 0.108 af (100% of inflow)
Center-of-Mass det. time= 46.4 min (836.3 - 789.9)

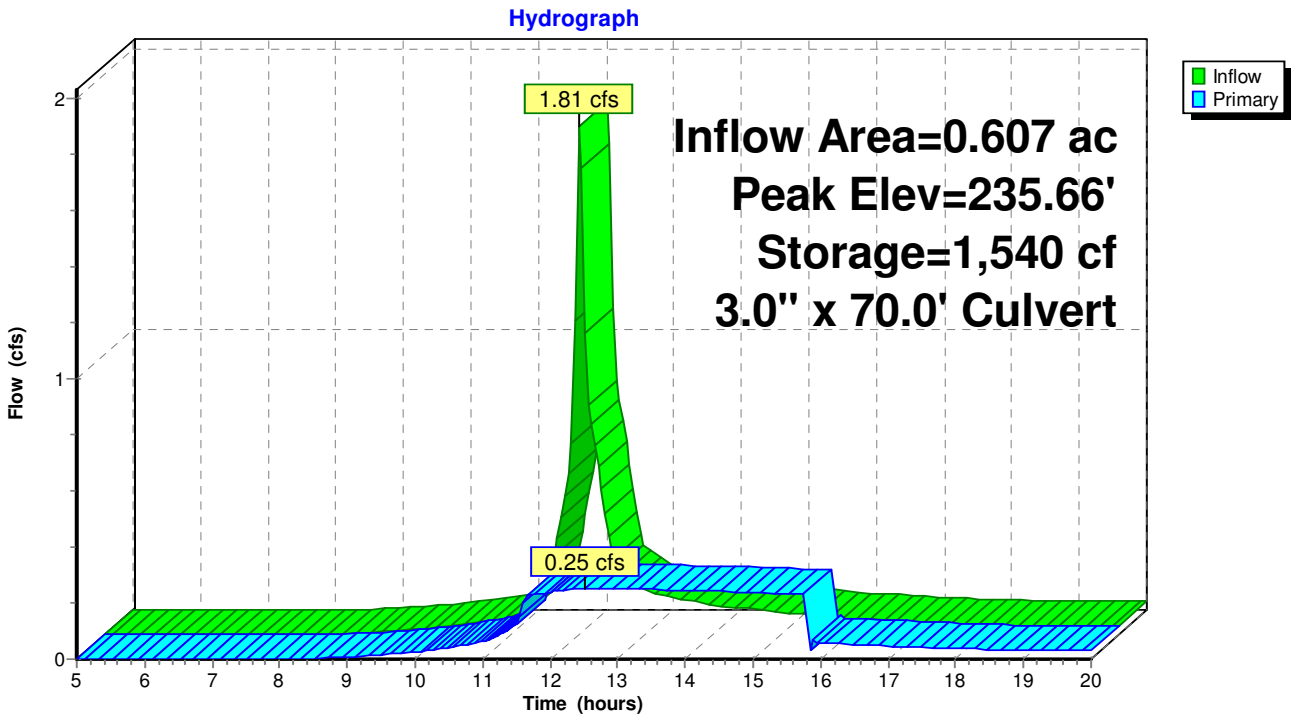
Volume	Invert	Avail.Storage	Storage Description
#1	234.50'	2,272 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
234.50	790	0	0	790
235.00	1,230	501	501	1,234
236.00	2,375	1,771	2,272	2,388

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	**3.0" x 70.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 229.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.25 cfs @ 12.52 hrs HW=235.66' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.25 cfs @ 5.10 fps)

Pond 3P: Filter Pond #3



Pond 4: CB4

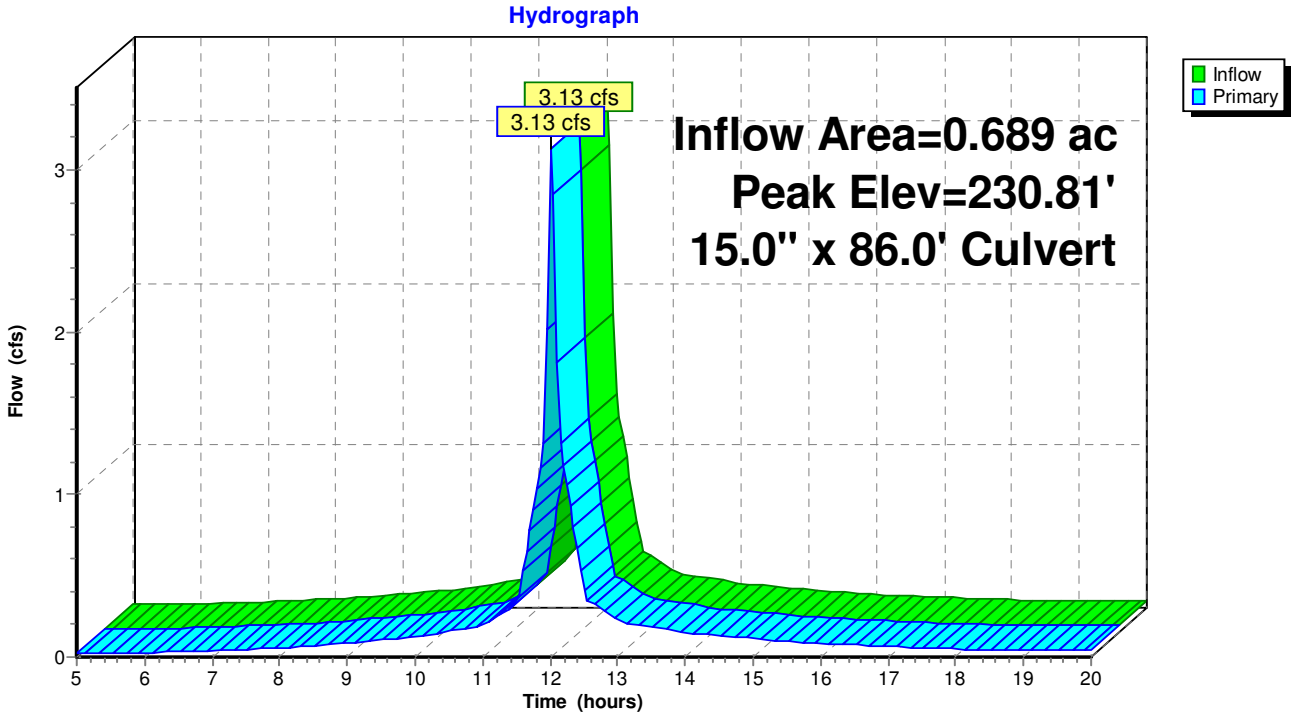
Inflow Area =	0.689 ac,	Inflow Depth >	3.58"	for	10-Year Event event
Inflow =	3.13 cfs @	12.02 hrs,	Volume=	0.206 af	
Outflow =	3.13 cfs @	12.02 hrs,	Volume=	0.206 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.13 cfs @	12.02 hrs,	Volume=	0.206 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.81' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.90'	**15.0" x 86.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.00' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.99 cfs @ 12.02 hrs HW=230.79' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.99 cfs @ 3.21 fps)

Pond 4: CB4



Pond 5: CB5

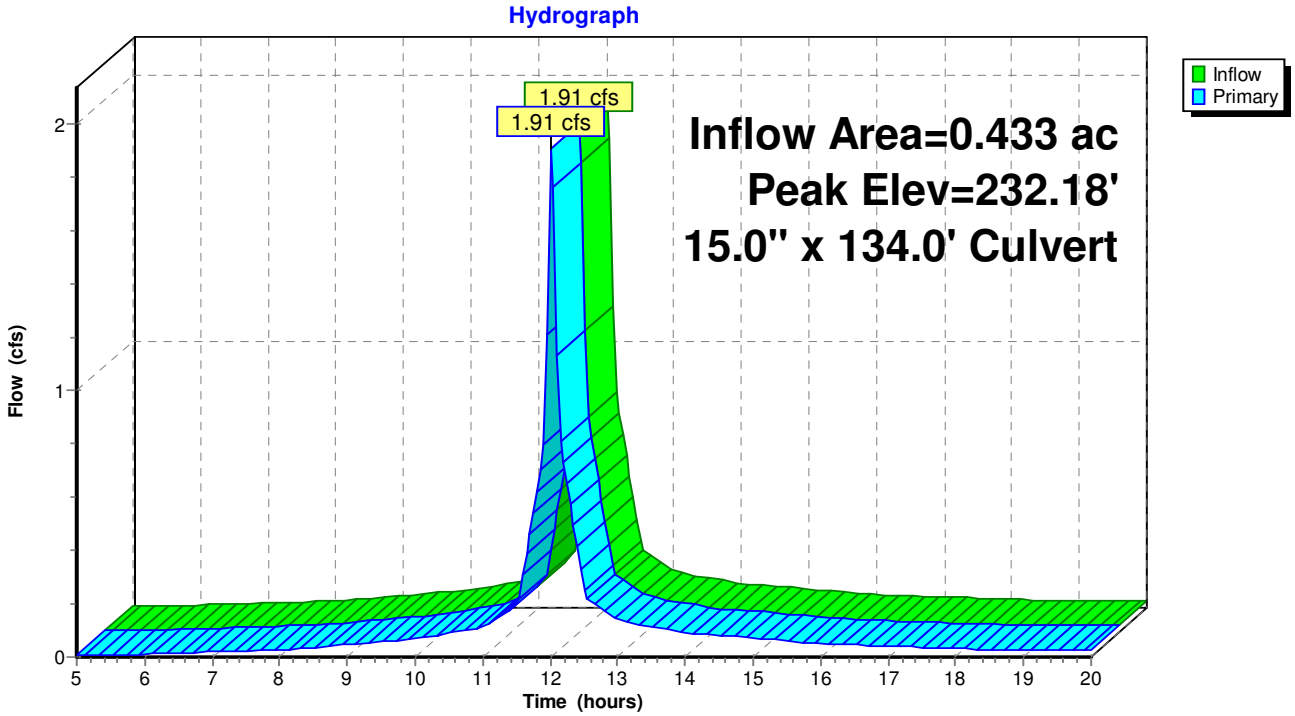
Inflow Area =	0.433 ac,	Inflow Depth >	3.41"	for	10-Year Event event
Inflow =	1.91 cfs @	12.02 hrs,	Volume=	0.123 af	
Outflow =	1.91 cfs @	12.02 hrs,	Volume=	0.123 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.91 cfs @	12.02 hrs,	Volume=	0.123 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 232.18' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	231.50'	**15.0" x 134.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 230.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.83 cfs @ 12.02 hrs HW=232.16' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.83 cfs @ 2.77 fps)

Pond 5: CB5



Pond 6: CB6

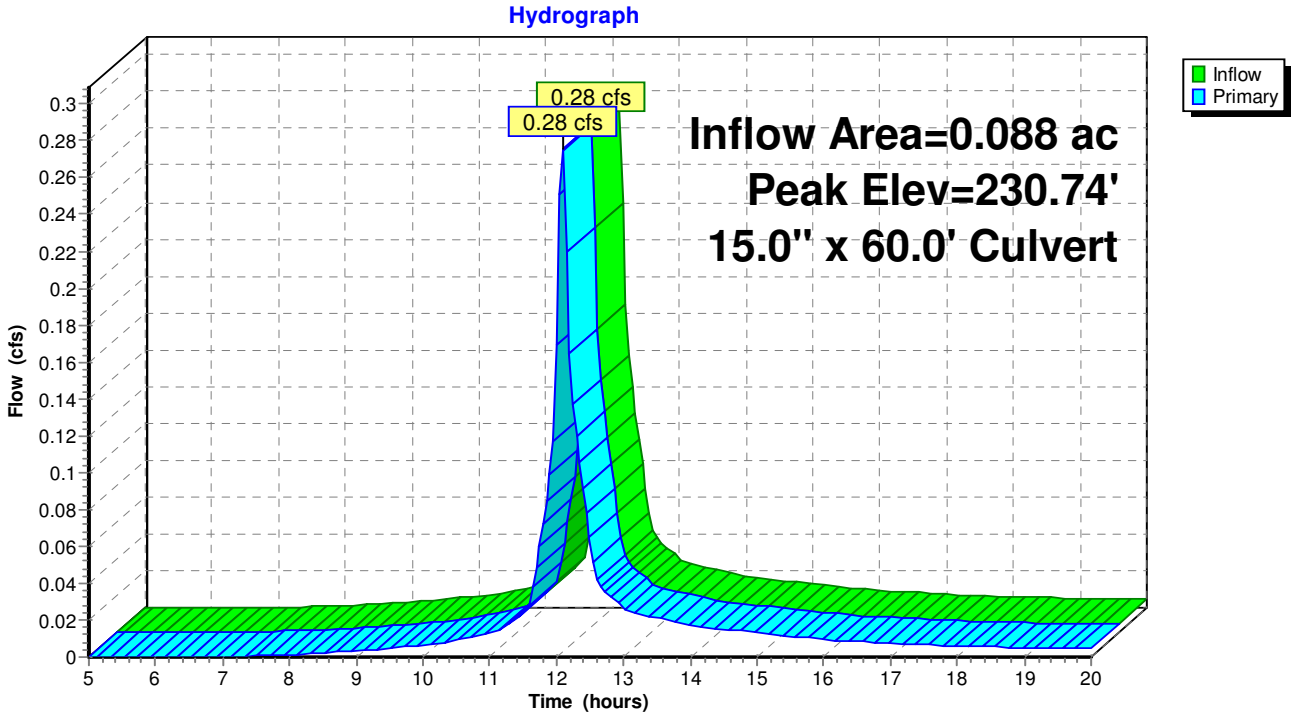
Inflow Area =	0.088 ac,	Inflow Depth >	2.55"	for	10-Year Event event
Inflow =	0.28 cfs @	12.09 hrs,	Volume=	0.019 af	
Outflow =	0.28 cfs @	12.09 hrs,	Volume=	0.019 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.28 cfs @	12.09 hrs,	Volume=	0.019 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.80' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=230.74' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.27 cfs @ 1.66 fps)

Pond 6: CB6



Pond 7: CB7

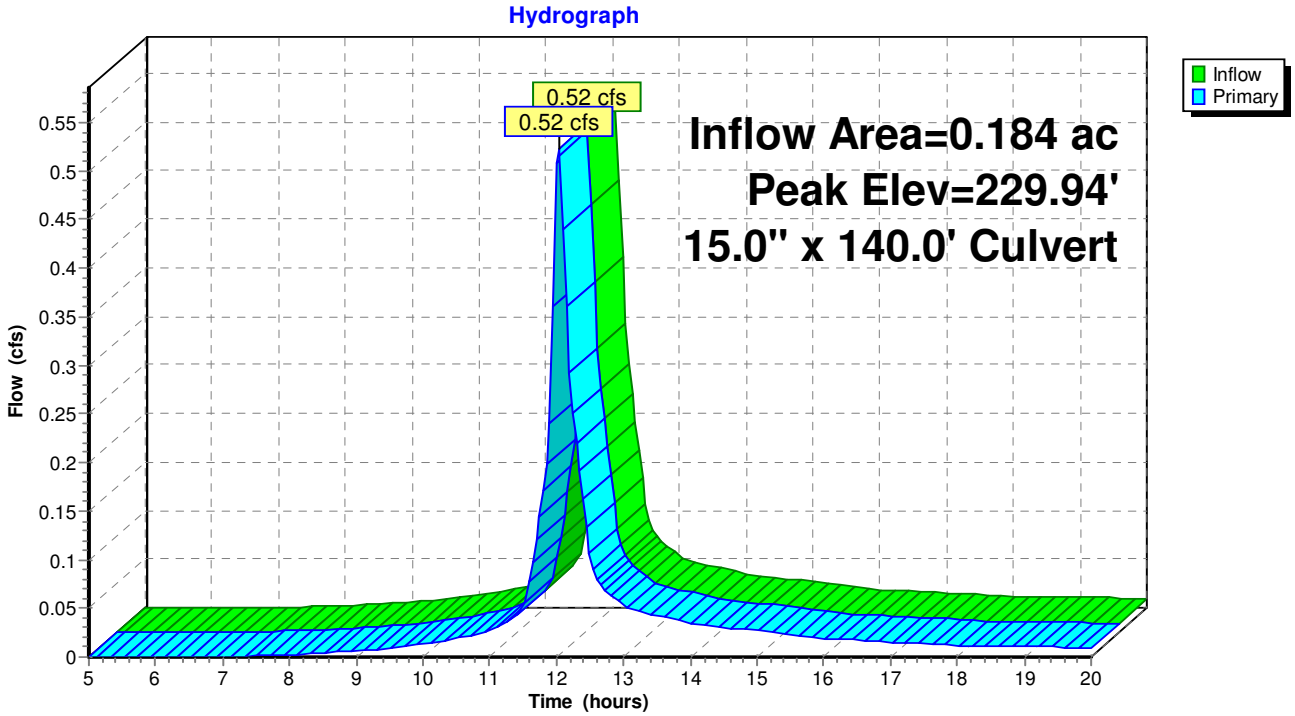
Inflow Area =	0.184 ac,	Inflow Depth >	2.51"	for	10-Year Event event
Inflow =	0.52 cfs @	12.03 hrs,	Volume=	0.038 af	
Outflow =	0.52 cfs @	12.03 hrs,	Volume=	0.038 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.03 hrs,	Volume=	0.038 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.94' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.60'	**15.0" x 140.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 228.10' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.51 cfs @ 12.03 hrs HW=229.93' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.51 cfs @ 1.96 fps)

Pond 7: CB7



Pond 8: CB8

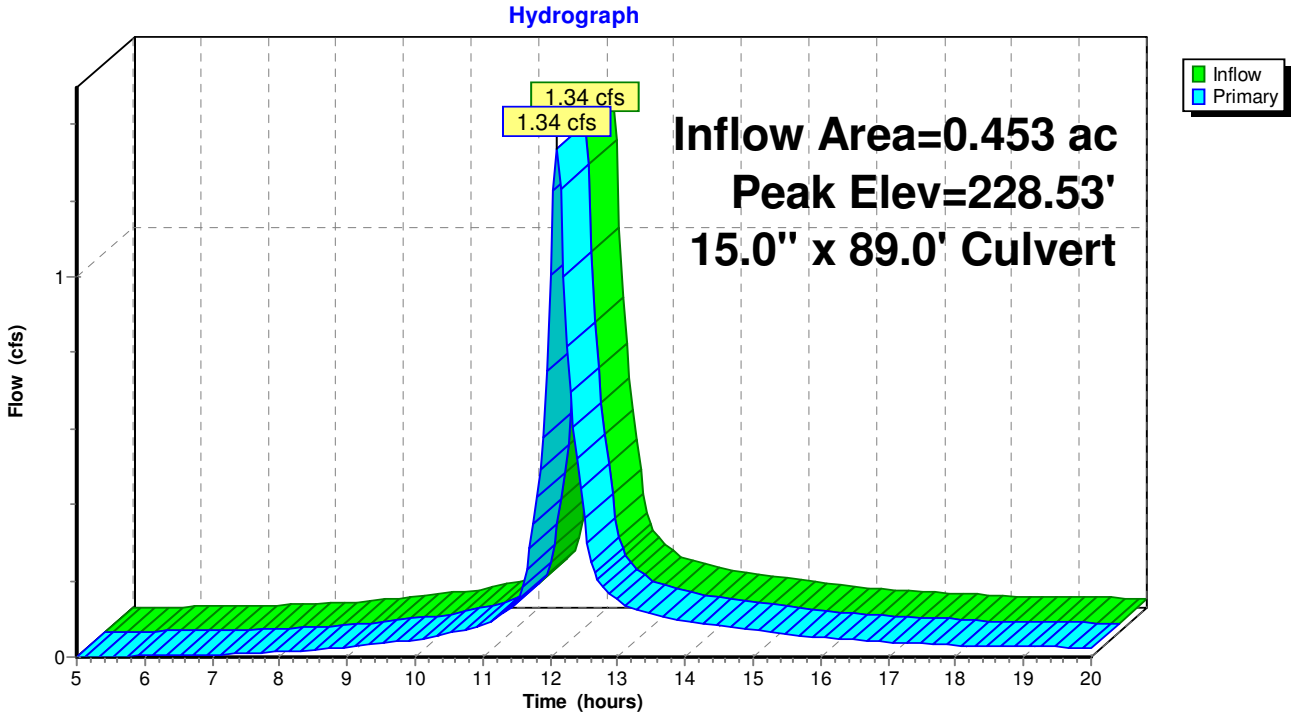
Inflow Area =	0.453 ac,	Inflow Depth >	2.87"	for	10-Year Event event
Inflow =	1.34 cfs @	12.10 hrs,	Volume=	0.108 af	
Outflow =	1.34 cfs @	12.10 hrs,	Volume=	0.108 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.34 cfs @	12.10 hrs,	Volume=	0.108 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.53' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.90'	**15.0" x 89.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.34 cfs @ 12.10 hrs HW=228.53' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.34 cfs @ 2.14 fps)

Pond 8: CB8



Pond 9: CB9

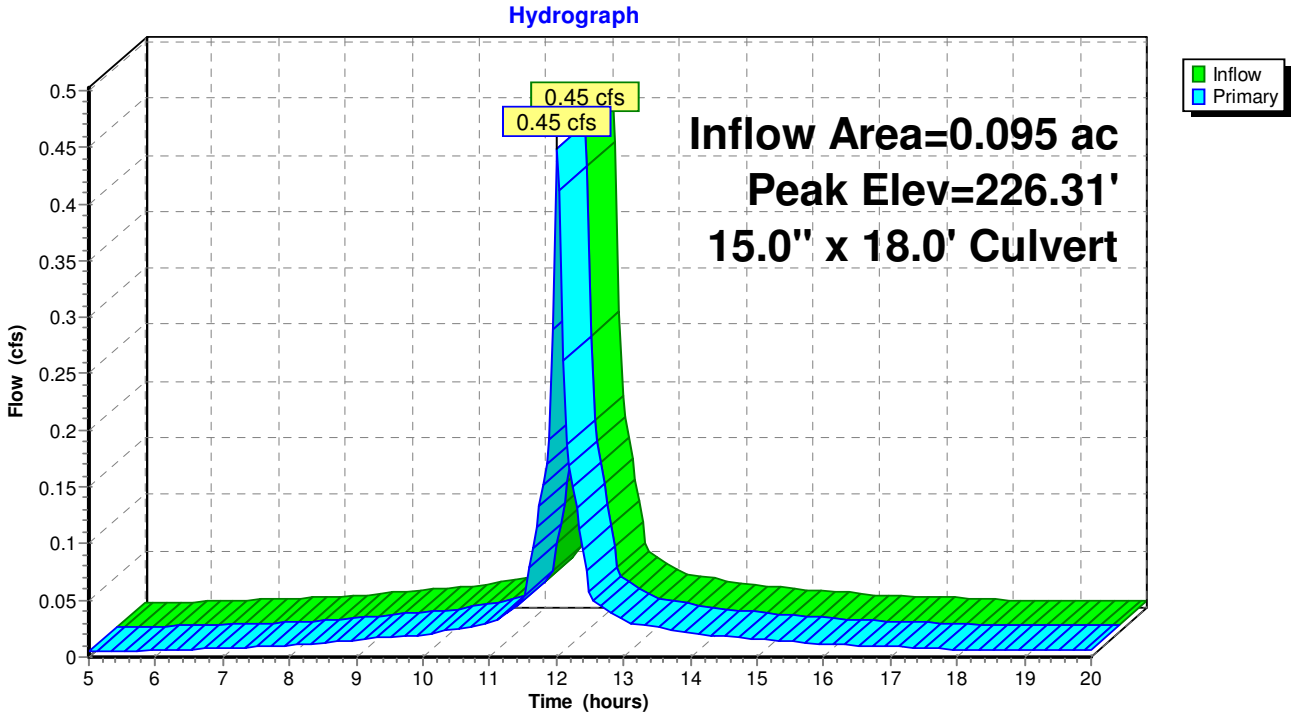
Inflow Area =	0.095 ac,	Inflow Depth >	3.87"	for	10-Year Event event
Inflow =	0.45 cfs @	12.02 hrs,	Volume=	0.031 af	
Outflow =	0.45 cfs @	12.02 hrs,	Volume=	0.031 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.45 cfs @	12.02 hrs,	Volume=	0.031 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.31' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**15.0" x 18.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 225.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.43 cfs @ 12.02 hrs HW=226.30' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 1.87 fps)

Pond 9: CB9



Pond 10: CB10

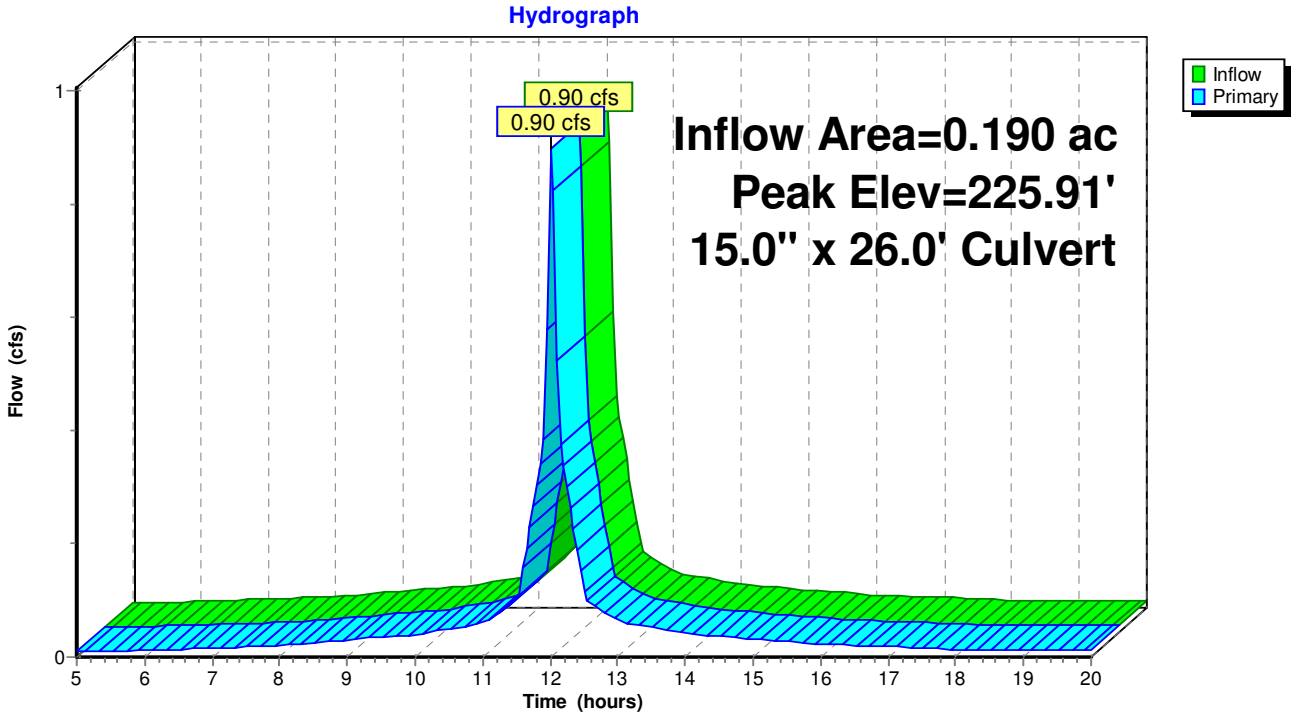
Inflow Area =	0.190 ac,	Inflow Depth >	3.87"	for	10-Year Event event	
Inflow =	0.90 cfs @	12.02 hrs,	Volume=	0.061 af		
Outflow =	0.90 cfs @	12.02 hrs,	Volume=	0.061 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.90 cfs @	12.02 hrs,	Volume=	0.061 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 225.91' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 224.00' S= 0.0538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=225.90' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.86 cfs @ 1.89 fps)

Pond 10: CB10



Pond SF1: Sediment Forebay #1

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	82 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	30	0	0	30
212.00	150	82	82	154

Pond SF2: Sediment Forebay #2

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	449 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

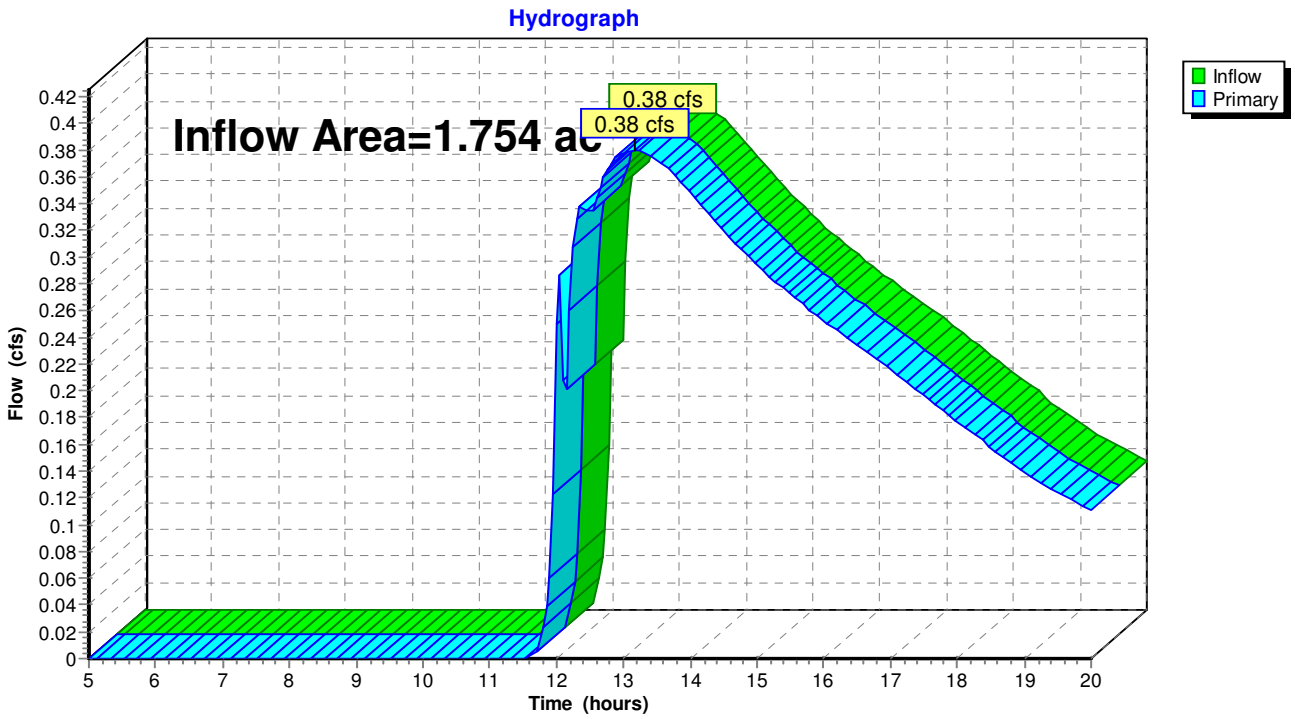
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	275	0	0	275
229.00	650	449	449	657

Pond SP1: Study Point #1

Inflow Area = 1.754 ac, Inflow Depth > 1.14" for 10-Year Event event
Inflow = 0.38 cfs @ 13.16 hrs, Volume= 0.167 af
Primary = 0.38 cfs @ 13.16 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

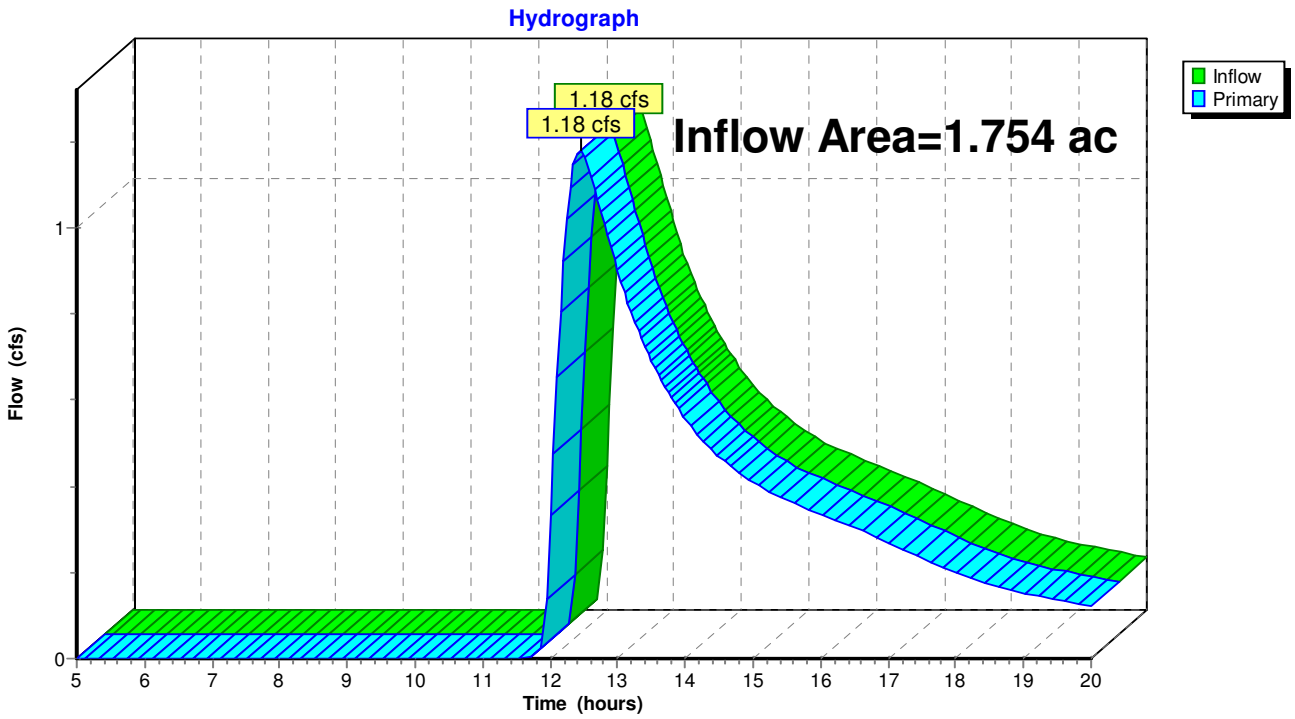


Pond SP2: Study Point #2

Inflow Area = 1.754 ac, Inflow Depth > 1.92" for 10-Year Event event
Inflow = 1.18 cfs @ 12.44 hrs, Volume= 0.281 af
Primary = 1.18 cfs @ 12.44 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

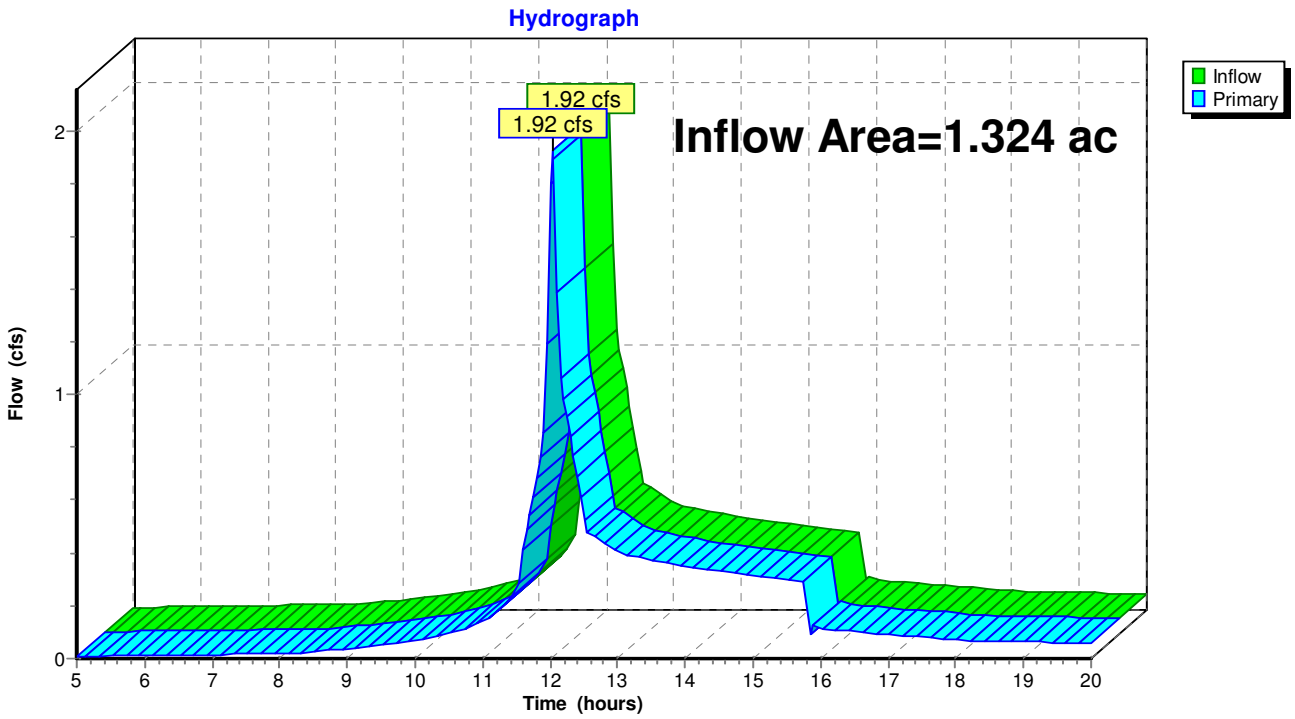


Pond SP3: Study Point #2

Inflow Area = 1.324 ac, Inflow Depth > 2.01" for 10-Year Event event
Inflow = 1.92 cfs @ 12.03 hrs, Volume= 0.222 af
Primary = 1.92 cfs @ 12.03 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #2



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

Subcatchment 1AS: Sub #1A Runoff Area=11,725 sf Runoff Depth>3.75"
Flow Length=98' Tc=8.6 min CN=90 Runoff=1.09 cfs 0.084 af

Subcatchment 1BS: Sub #1B Runoff Area=4,165 sf Runoff Depth>3.07"
Tc=0.0 min CN=83 Runoff=0.42 cfs 0.024 af

Subcatchment 1CS: Sub #1C Runoff Area=3,840 sf Runoff Depth>3.16"
Flow Length=59' Slope=0.0200 '/' Tc=5.9 min CN=84 Runoff=0.34 cfs 0.023 af

Subcatchment 1S: Sub #1 Runoff Area=38,580 sf Runoff Depth>2.44"
Flow Length=314' Tc=0.9 min CN=76 Runoff=3.04 cfs 0.180 af

Subcatchment 2S: Sub #2 Runoff Area=4,060 sf Runoff Depth>4.51"
Flow Length=103' Slope=0.0400 '/' Tc=1.0 min CN=98 Runoff=0.52 cfs 0.035 af

Subcatchment 3S: Sub #3 Runoff Area=27,485 sf Runoff Depth>3.76"
Flow Length=184' Tc=1.3 min CN=90 Runoff=3.11 cfs 0.198 af

Subcatchment 4S: Sub #4 Runoff Area=6,165 sf Runoff Depth>4.43"
Flow Length=122' Slope=0.0400 '/' Tc=1.0 min CN=97 Runoff=0.78 cfs 0.052 af

Subcatchment 5S: Sub #5 Runoff Area=11,125 sf Runoff Depth>4.51"
Flow Length=98' Slope=0.0286 '/' Tc=1.1 min CN=98 Runoff=1.41 cfs 0.096 af

Subcatchment 6S: Sub #6 Runoff Area=18,880 sf Runoff Depth>4.06"
Flow Length=125' Tc=1.3 min CN=93 Runoff=2.25 cfs 0.147 af

Subcatchment 7S: Sub #7 Runoff Area=26,440 sf Runoff Depth>2.70"
Flow Length=87' Tc=1.0 min CN=79 Runoff=2.29 cfs 0.137 af

Subcatchment 8S: Sub #8 Runoff Area=9,960 sf Runoff Depth>1.10"
Flow Length=35' Slope=0.1714 '/' Tc=1.7 min CN=58 Runoff=0.32 cfs 0.021 af

Subcatchment 9S: Sub #9 Runoff Area=4,140 sf Runoff Depth>4.51"
Flow Length=290' Tc=1.3 min CN=98 Runoff=0.52 cfs 0.036 af

Subcatchment 10S: Sub #10 Runoff Area=4,145 sf Runoff Depth>4.51"
Flow Length=282' Tc=1.3 min CN=98 Runoff=0.52 cfs 0.036 af

Subcatchment 11S: Sub #11 Runoff Area=4,135 sf Runoff Depth>2.44"
Flow Length=50' Tc=2.3 min CN=76 Runoff=0.32 cfs 0.019 af

Subcatchment 12S: Sub #12 Runoff Area=5,800 sf Runoff Depth>2.19"
Flow Length=64' Tc=2.6 min CN=73 Runoff=0.40 cfs 0.024 af

Subcatchment 13S: Sub 13 Runoff Area=2,805 sf Runoff Depth>1.10"
Flow Length=18' Slope=0.5000 '/' Tc=0.6 min CN=58 Runoff=0.09 cfs 0.006 af

Subcatchment 14S: Sub 14 Runoff Area=9,215 sf Runoff Depth>1.10"
Flow Length=33' Slope=0.3636 '/' Tc=1.2 min CN=58 Runoff=0.29 cfs 0.019 af

Subcatchment 15S: Sub 15 Runoff Area=3,815 sf Runoff Depth>1.10"
Flow Length=24' Slope=0.2917 '/' Tc=1.0 min CN=58 Runoff=0.12 cfs 0.008 af

Subcatchment 16S: Sub 16 Runoff Area=9,285 sf Runoff Depth>1.10"
Flow Length=37' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.30 cfs 0.020 af

Subcatchment 17S: Sub #17 Runoff Area=4,770 sf Runoff Depth>1.10"
Flow Length=35' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.15 cfs 0.010 af

Pond 1: CB1 Peak Elev=227.88' Inflow=0.52 cfs 0.035 af
15.0" x 47.0' Culvert Outflow=0.52 cfs 0.035 af

Pond 1P: Filter Pond #1 Peak Elev=213.40' Storage=8,596 cf Inflow=4.89 cfs 0.347 af
Outflow=0.72 cfs 0.212 af

Pond 2: CB2 Peak Elev=229.57' Inflow=3.11 cfs 0.198 af
15.0" x 39.0' Culvert Outflow=3.11 cfs 0.198 af

Pond 2P: Filter Pond #2 Peak Elev=230.19' Storage=12,412 cf Inflow=7.85 cfs 0.514 af
Outflow=1.66 cfs 0.359 af

Pond 3: CB3 Peak Elev=230.32' Inflow=4.45 cfs 0.295 af
15.0" x 26.0' Culvert Outflow=4.45 cfs 0.295 af

Pond 3P: Filter Pond #3 Peak Elev=235.95' Storage=2,151 cf Inflow=2.29 cfs 0.137 af
3.0" x 70.0' Culvert Outflow=0.26 cfs 0.137 af

Pond 4: CB4 Peak Elev=230.92' Inflow=3.67 cfs 0.243 af
15.0" x 86.0' Culvert Outflow=3.67 cfs 0.243 af

Pond 5: CB5 Peak Elev=232.25' Inflow=2.25 cfs 0.147 af
15.0" x 134.0' Culvert Outflow=2.25 cfs 0.147 af

Pond 6: CB6 Peak Elev=230.77' Inflow=0.34 cfs 0.023 af
15.0" x 60.0' Culvert Outflow=0.34 cfs 0.023 af

Pond 7: CB7 Peak Elev=229.97' Inflow=0.64 cfs 0.048 af
15.0" x 140.0' Culvert Outflow=0.64 cfs 0.048 af

Pond 8: CB8 Peak Elev=228.61' Inflow=1.61 cfs 0.132 af
15.0" x 89.0' Culvert Outflow=1.61 cfs 0.132 af

Pond 9: CB9 Peak Elev=226.34' Inflow=0.52 cfs 0.036 af
15.0" x 18.0' Culvert Outflow=0.52 cfs 0.036 af

Pond 10: CB10 Peak Elev=225.95' Inflow=1.04 cfs 0.071 af
15.0" x 26.0' Culvert Outflow=1.04 cfs 0.071 af

Pond SF1: Sediment Forebay #1 Peak Elev=0.00' Storage=0 cf

Pond SF2: Sediment Forebay #2 Peak Elev=0.00' Storage=0 cf

Pond SP1: Study Point #1 Inflow=0.80 cfs 0.241 af
Primary=0.80 cfs 0.241 af

Pond SP2: Study Point #2 Inflow=1.69 cfs 0.365 af
Primary=1.69 cfs 0.365 af

Pond SP3: Study Point #2 Inflow=2.38 cfs 0.279 af
Primary=2.38 cfs 0.279 af

Total Runoff Area = 4.833 ac Runoff Volume = 1.175 af Average Runoff Depth = 2.92"
45.46% Pervious Area = 2.197 ac 54.54% Impervious Area = 2.636 ac

Subcatchment 1AS: Sub #1A

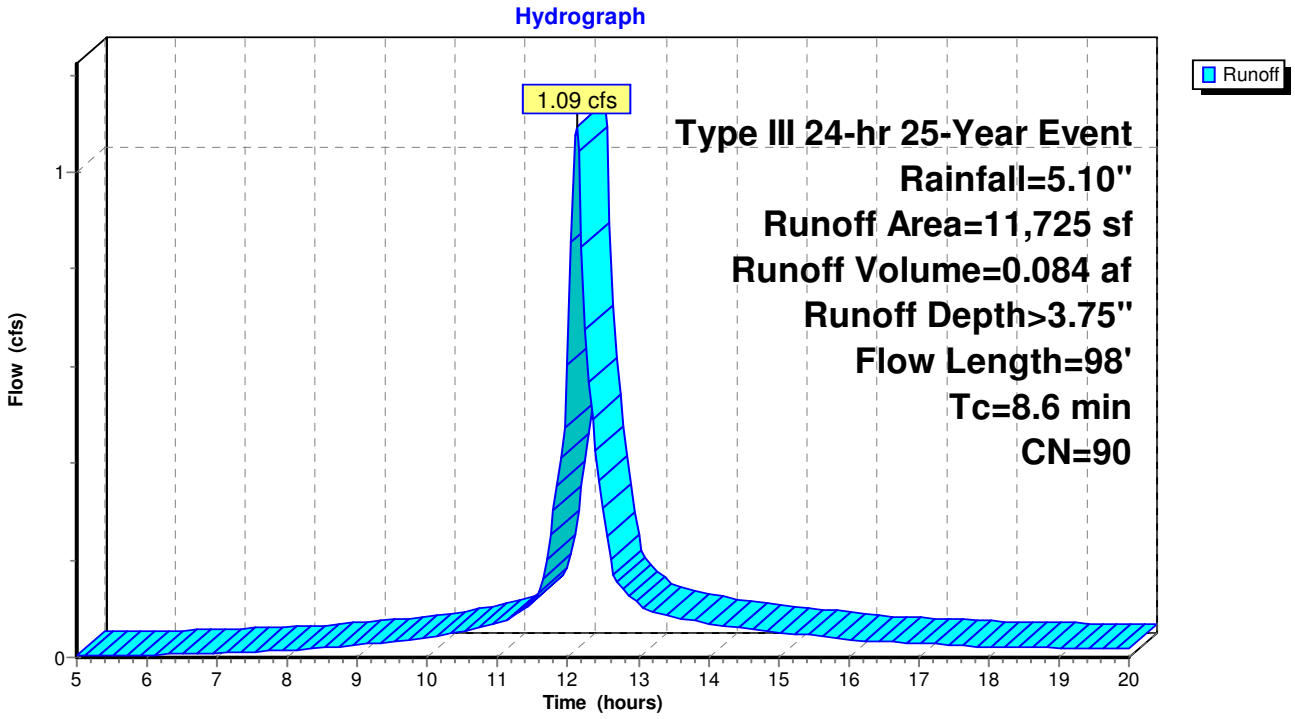
Runoff = 1.09 cfs @ 12.12 hrs, Volume= 0.084 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,225	98	Paved parking & roofs
2,500	61	>75% Grass cover, Good, HSG B
11,725	90	Weighted Average
2,500		Pervious Area
9,225		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
8.4	86	0.0233	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
8.6	98	Total			

Subcatchment 1AS: Sub #1A



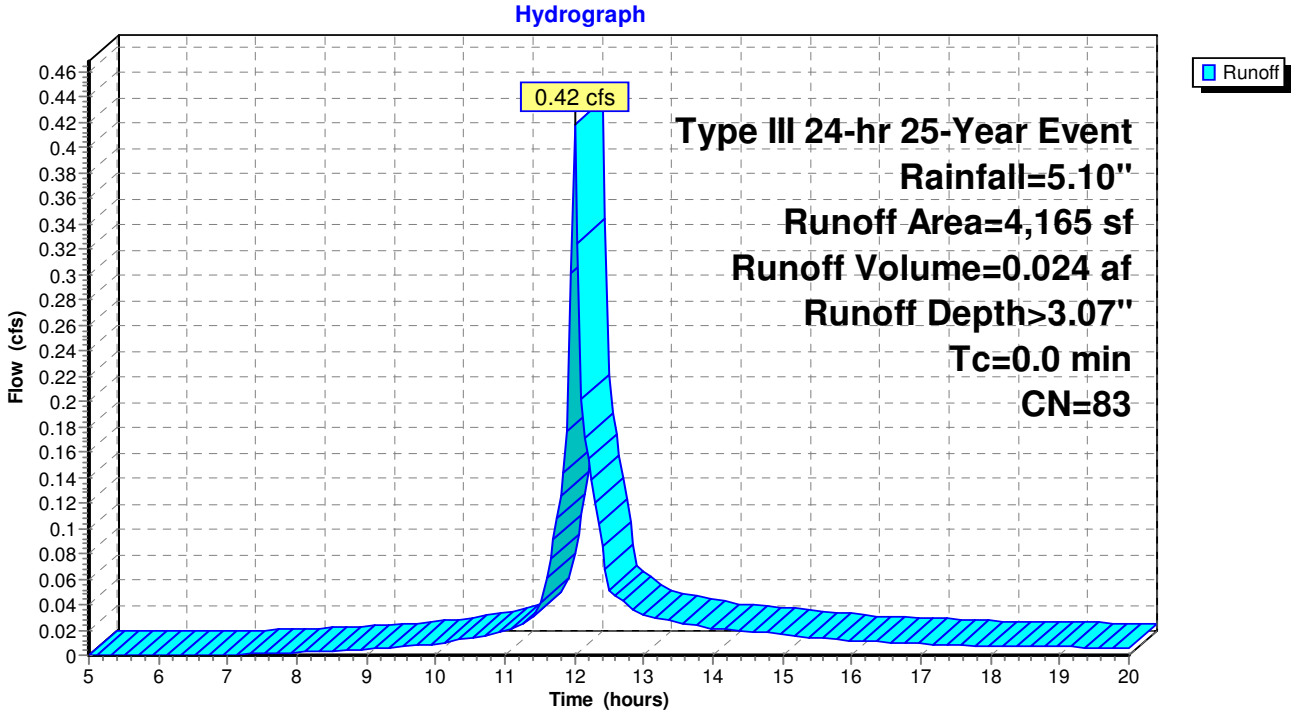
Subcatchment 1BS: Sub #1B

Runoff = 0.42 cfs @ 12.00 hrs, Volume= 0.024 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,505	98	Paved parking & roofs
1,660	61	>75% Grass cover, Good, HSG B
4,165	83	Weighted Average
1,660		Pervious Area
2,505		Impervious Area

Subcatchment 1BS: Sub #1B



Subcatchment 1CS: Sub #1C

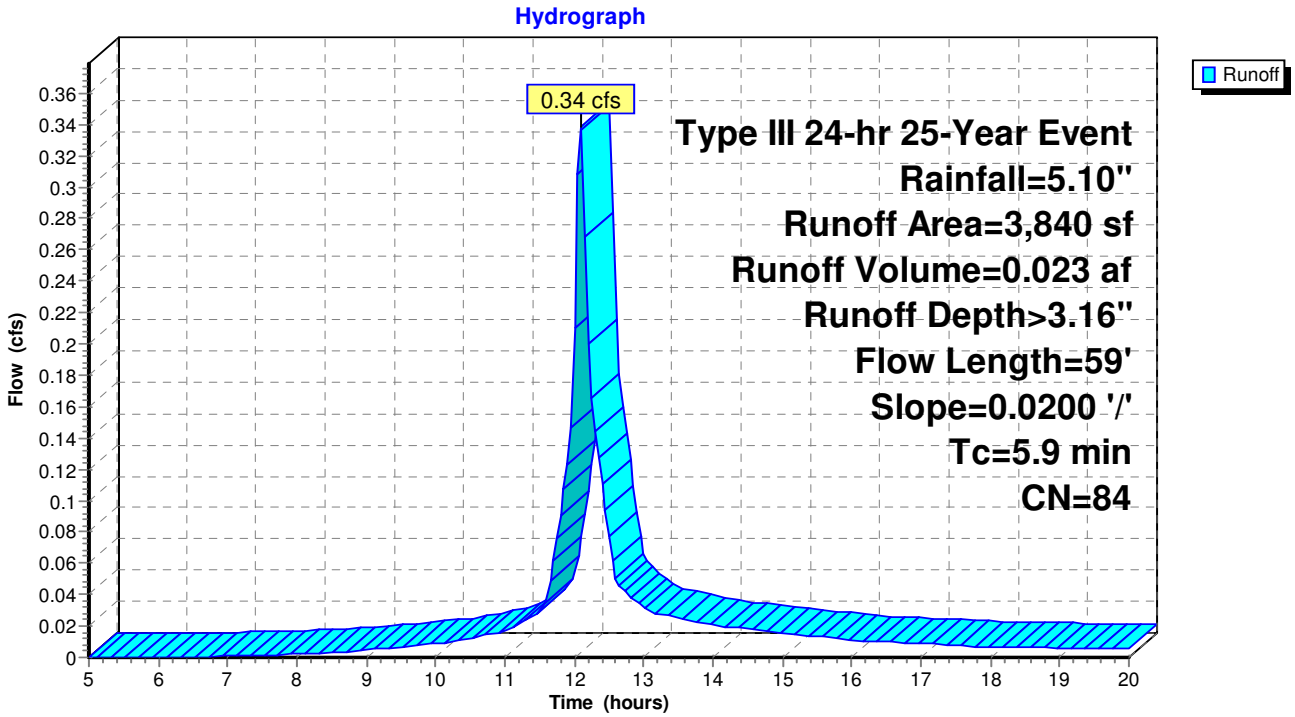
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,390	98	Paved parking & roofs
1,450	61	>75% Grass cover, Good, HSG B
3,840	84	Weighted Average
1,450		Pervious Area
2,390		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.84		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
5.7	49	0.0200	0.14		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
5.9	59	Total			

Subcatchment 1CS: Sub #1C



Subcatchment 1S: Sub #1

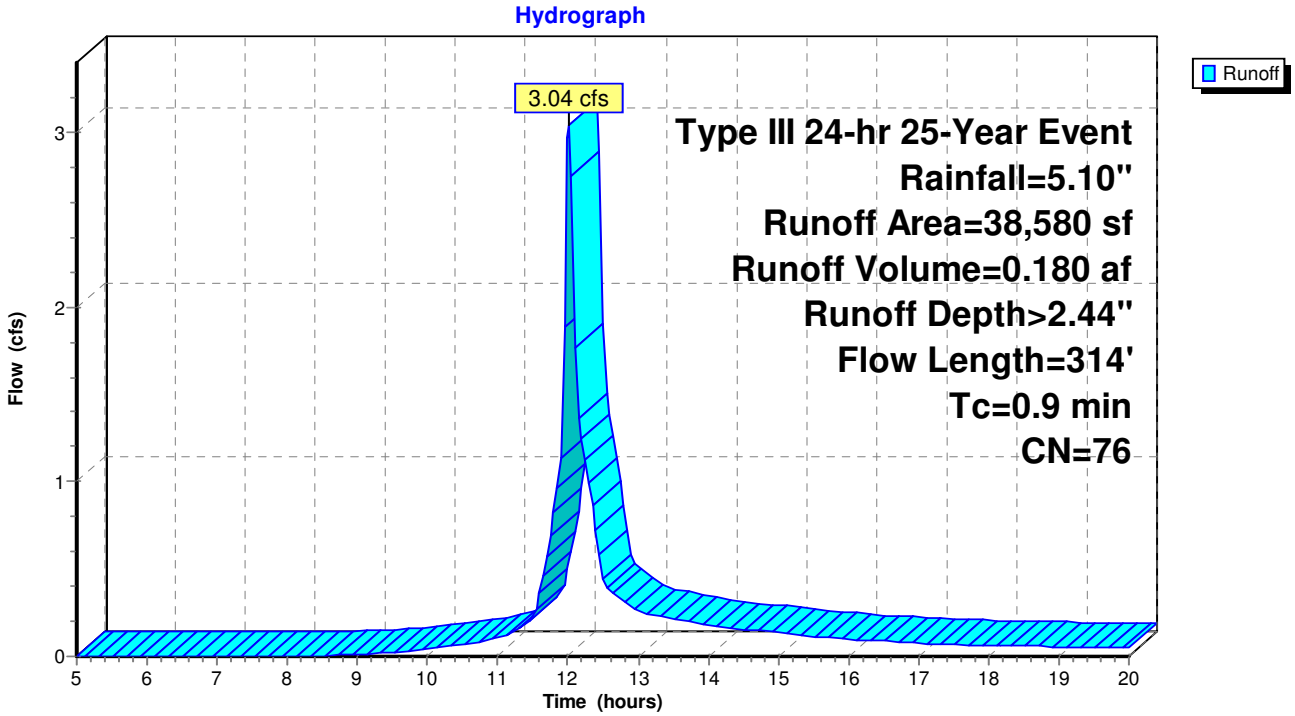
Runoff = 3.04 cfs @ 12.02 hrs, Volume= 0.180 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
16,145	98	Paved parking & roofs
16,000	61	>75% Grass cover, Good, HSG B
6,435	58	Meadow, non-grazed, HSG B
38,580	76	Weighted Average
22,435		Pervious Area
16,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	27	0.0370	3.90		**Shallow Concentrated Flow, AB** Paved Kv= 20.3 fps
0.2	50	0.0800	4.24		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.6	237	0.0649	6.40	25.58	**Channel Flow, CD** Area= 4.0 sf Perim= 7.2' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.9	314	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

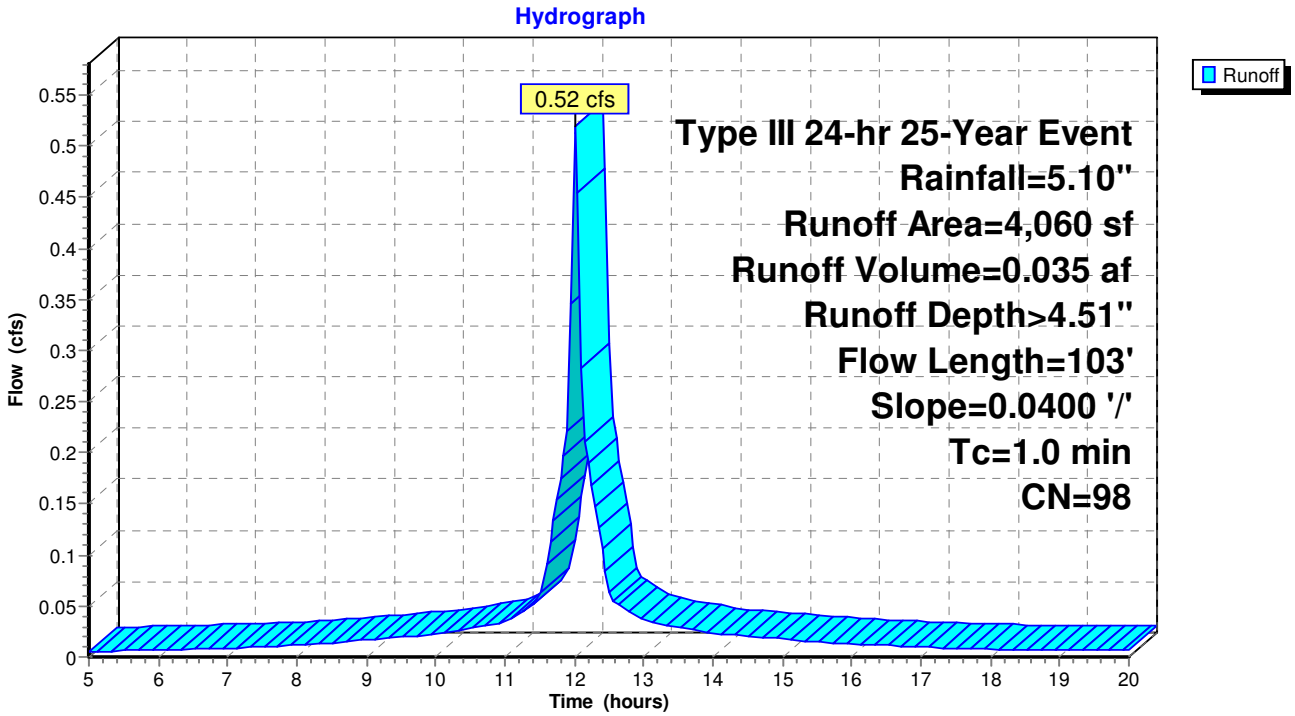
Runoff = 0.52 cfs @ 12.01 hrs, Volume= 0.035 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,060	98	Paved parking & roofs
4,060		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	103	0.0400	1.77		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

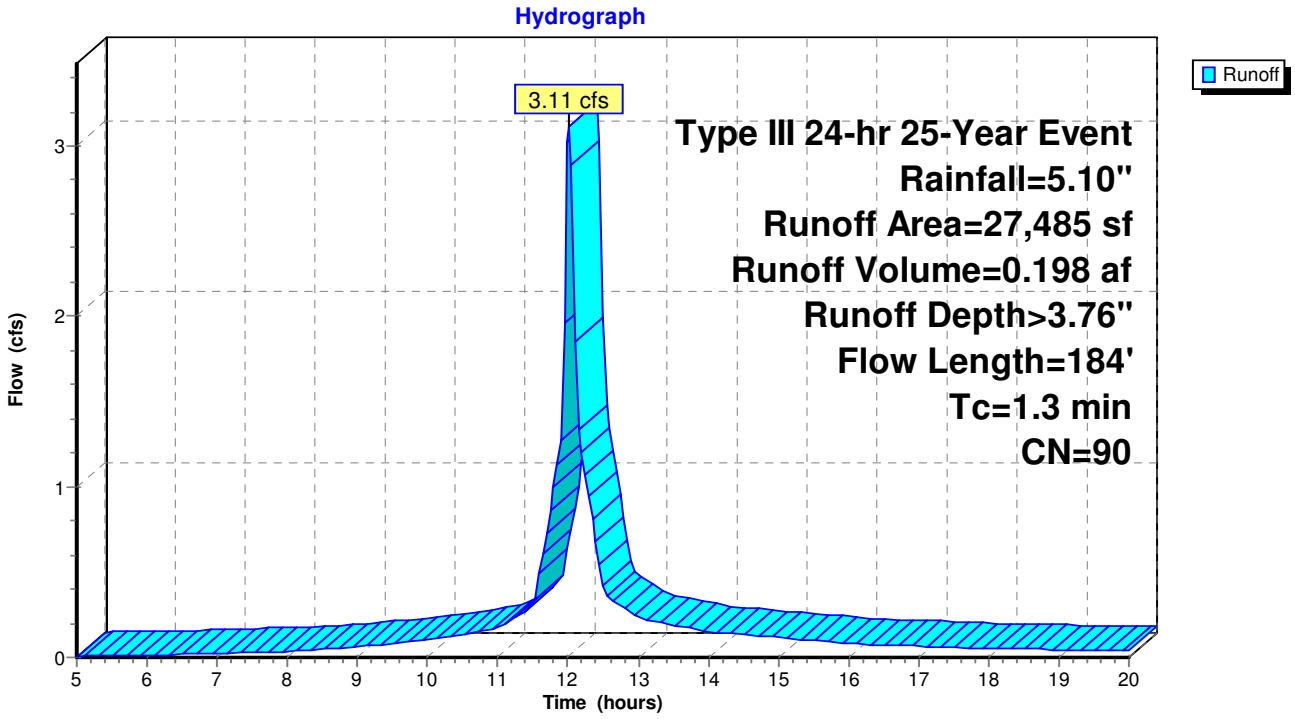
Runoff = 3.11 cfs @ 12.02 hrs, Volume= 0.198 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
21,855	98	Paved parking & roofs
5,630	61	>75% Grass cover, Good, HSG B
27,485	90	Weighted Average
5,630		Pervious Area
21,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0400	1.76		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	84	0.0250	3.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	184	Total			

Subcatchment 3S: Sub #3



Subcatchment 4S: Sub #4

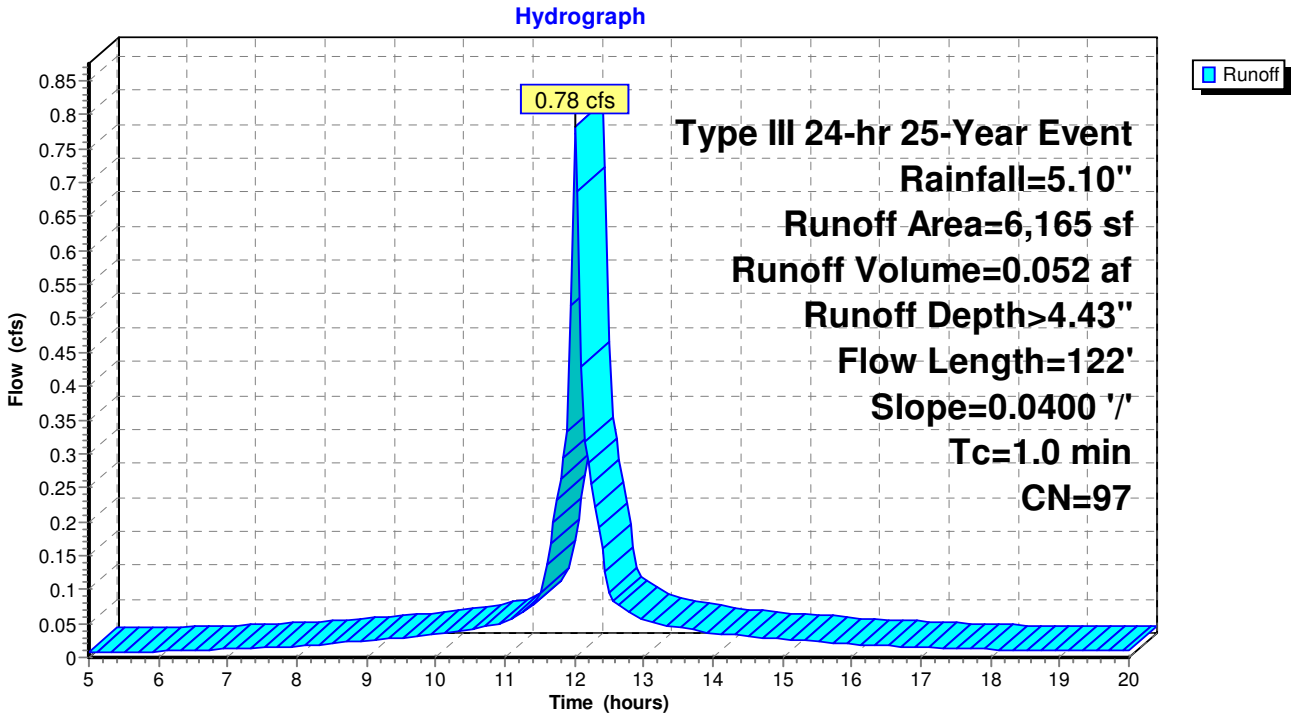
Runoff = 0.78 cfs @ 12.01 hrs, Volume= 0.052 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
5,950	98	Paved parking & roofs
215	61	>75% Grass cover, Good, HSG B
6,165	97	Weighted Average
215		Pervious Area
5,950		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	84	0.0400	1.70		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	38	0.0400	4.06		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.0	122	Total			

Subcatchment 4S: Sub #4



Subcatchment 5S: Sub #5

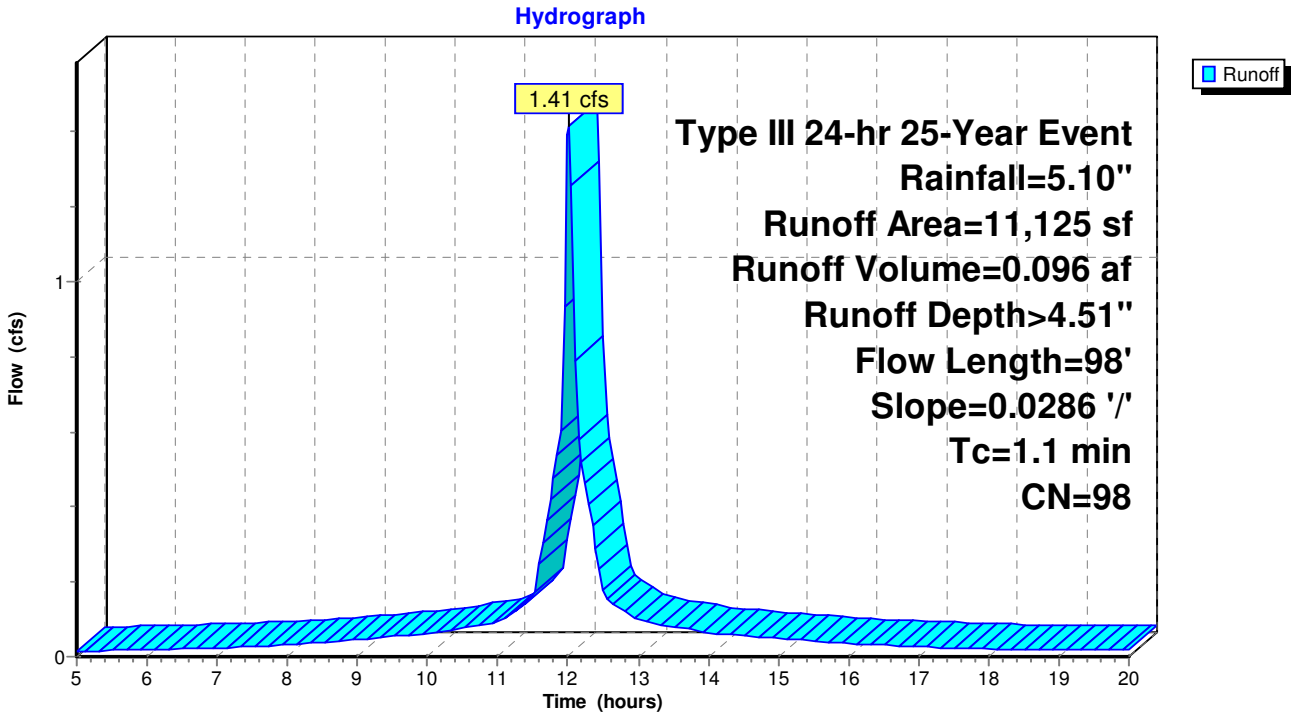
Runoff = 1.41 cfs @ 12.01 hrs, Volume= 0.096 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
10,990	98	Paved parking & roofs
135	61	>75% Grass cover, Good, HSG B
11,125	98	Weighted Average
135		Pervious Area
10,990		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	98	0.0286	1.53		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5S: Sub #5



Subcatchment 6S: Sub #6

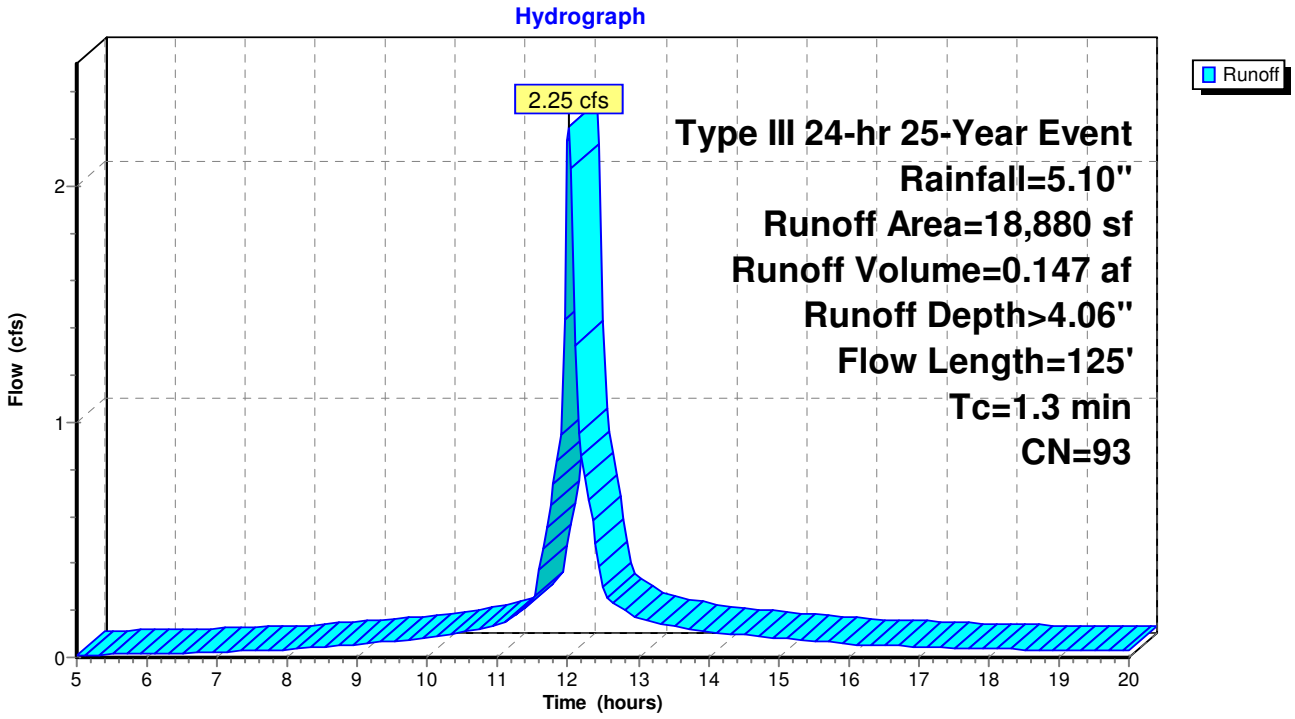
Runoff = 2.25 cfs @ 12.02 hrs, Volume= 0.147 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
16,260	98	Paved parking & roofs
2,620	61	>75% Grass cover, Good, HSG B
18,880	93	Weighted Average
2,620		Pervious Area
16,260		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0280	1.52		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment 6S: Sub #6



Subcatchment 7S: Sub #7

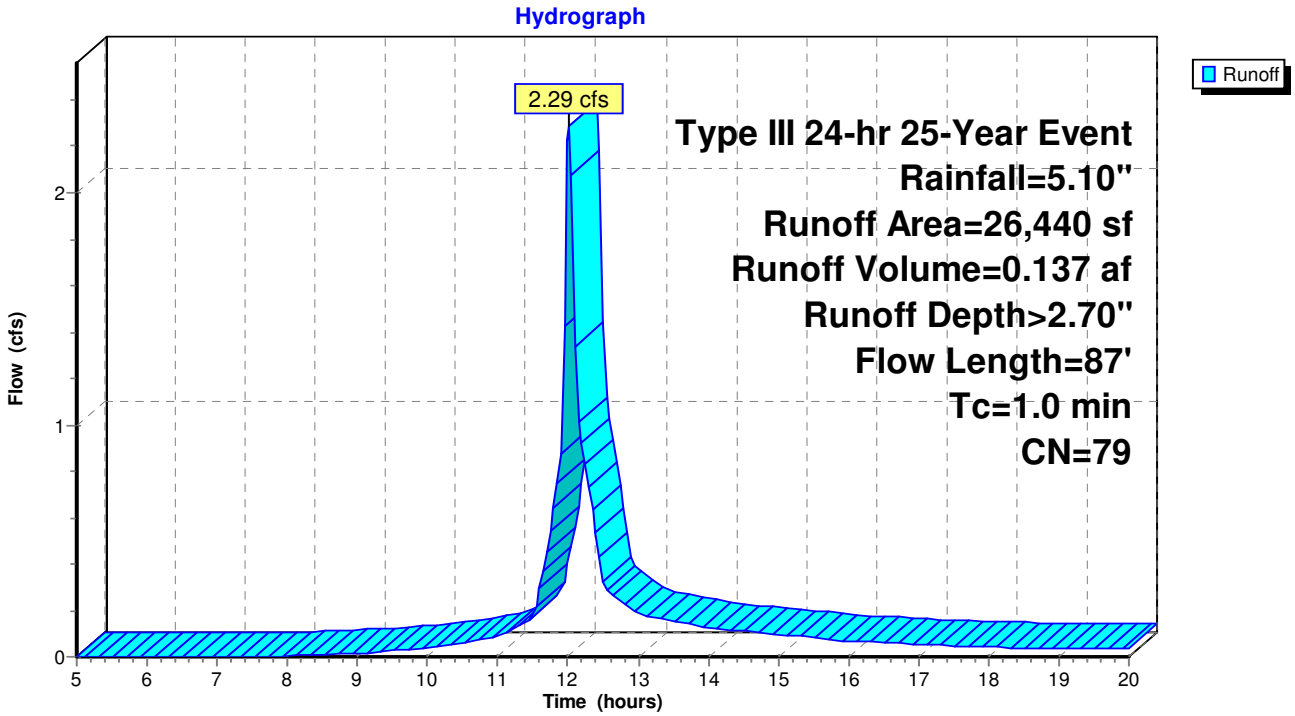
Runoff = 2.29 cfs @ 12.02 hrs, Volume= 0.137 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
13,630	98	Paved parking & roofs
2,065	61	>75% Grass cover, Good, HSG B
10,745	58	Meadow, non-grazed, HSG B
26,440	79	Weighted Average
12,810		Pervious Area
13,630		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	66	0.0227	1.29		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	21	0.0952	4.63		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
1.0	87	Total			

Subcatchment 7S: Sub #7



Subcatchment 8S: Sub #8

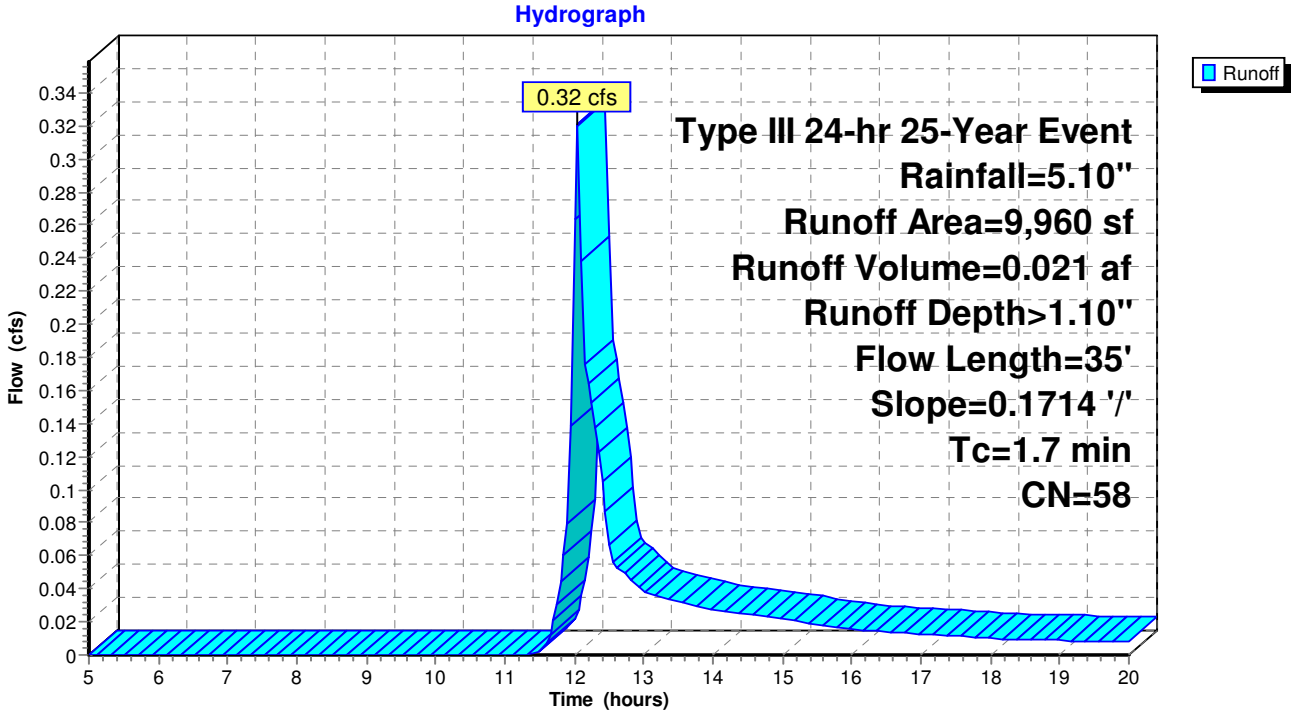
Runoff = 0.32 cfs @ 12.05 hrs, Volume= 0.021 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,960	58	Meadow, non-grazed, HSG B
9,960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	35	0.1714	0.35		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 8S: Sub #8



Subcatchment 9S: Sub #9

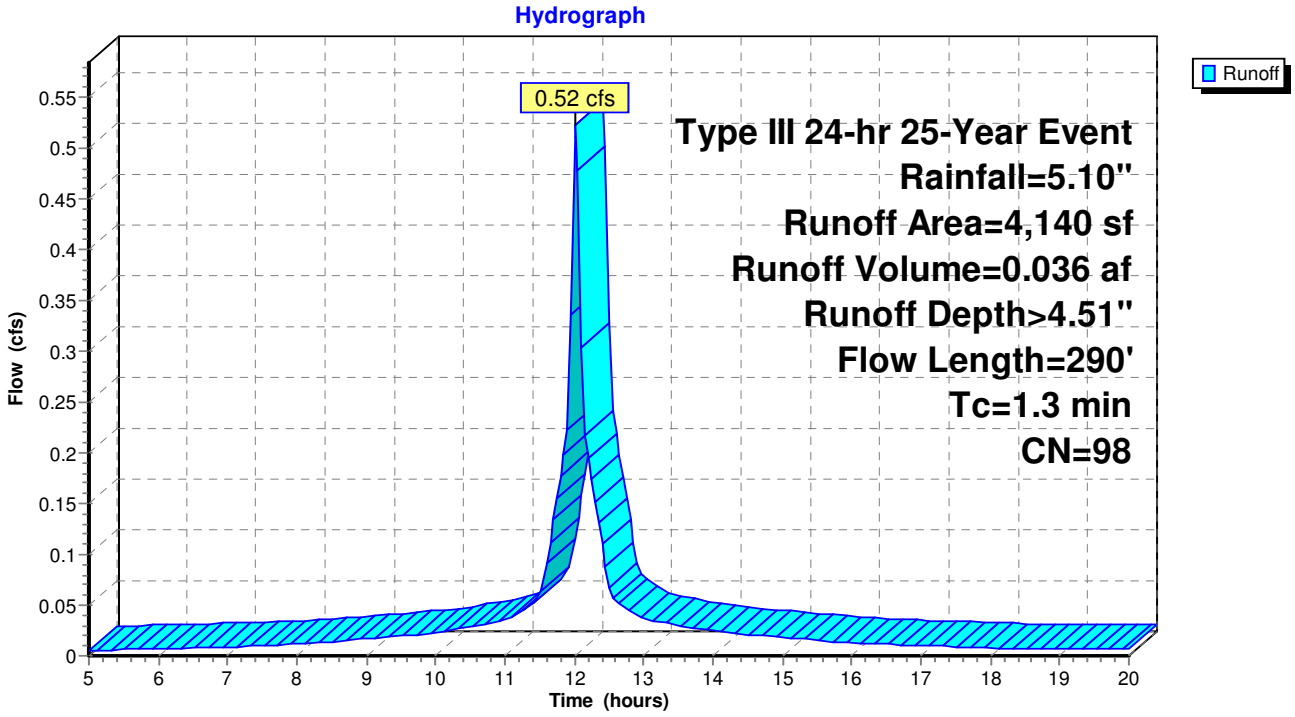
Runoff = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,140	98	Paved parking & roofs
4,140		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	190	0.0605	4.99		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	290	Total			

Subcatchment 9S: Sub #9



Subcatchment 10S: Sub #10

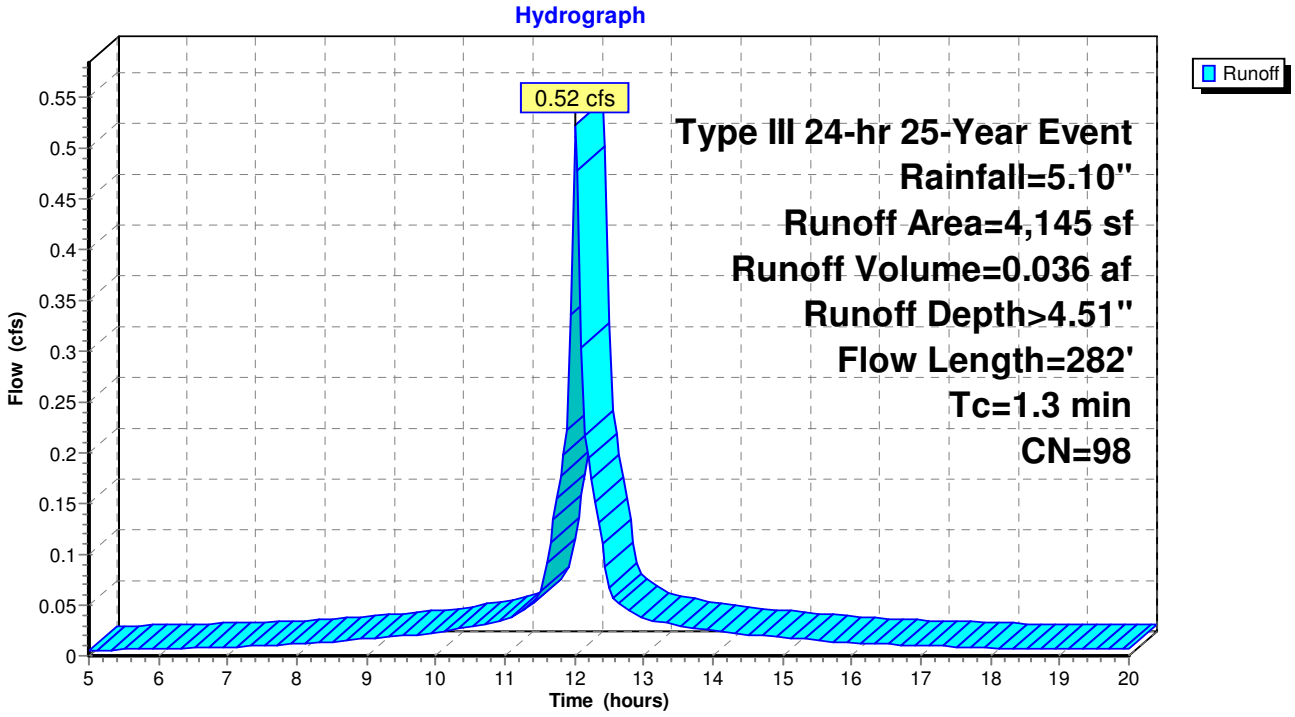
Runoff = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,145	98	Paved parking & roofs
4,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	182	0.0659	5.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	282	Total			

Subcatchment 10S: Sub #10



Subcatchment 11S: Sub #11

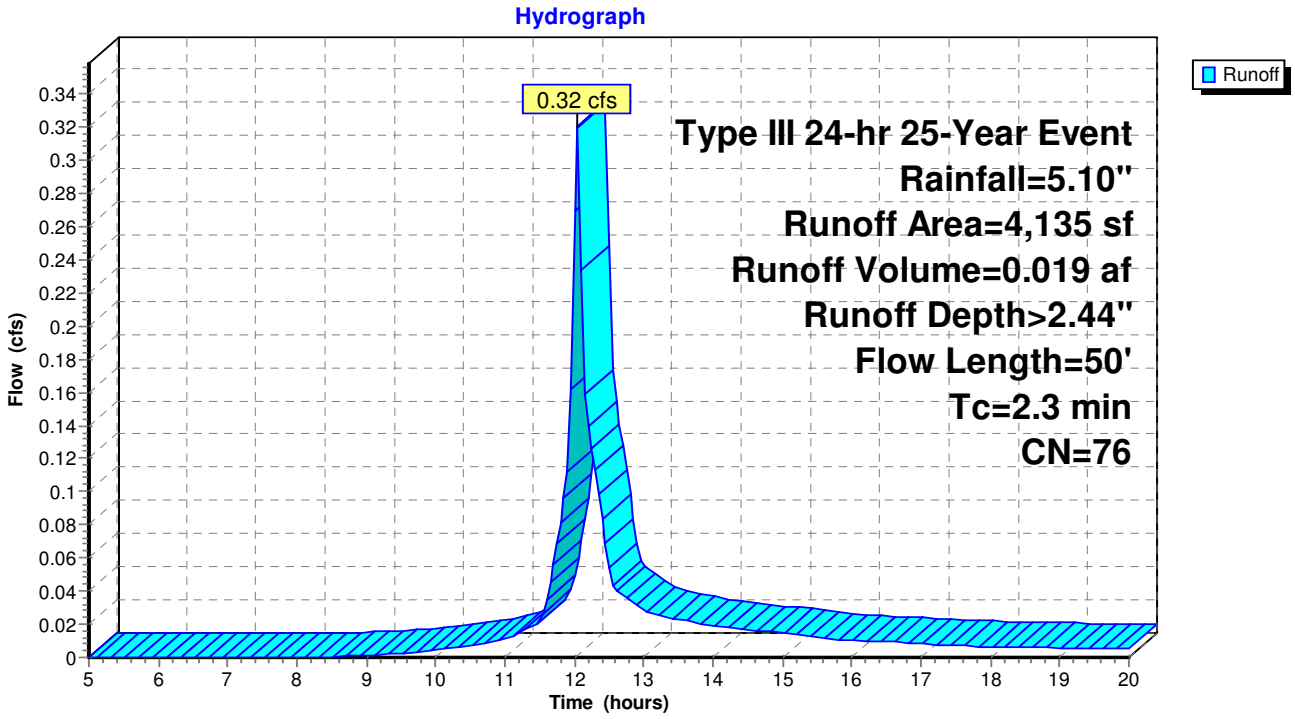
Runoff = 0.32 cfs @ 12.04 hrs, Volume= 0.019 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
1,625	98	Paved parking & roofs
2,510	61	>75% Grass cover, Good, HSG B
4,135	76	Weighted Average
2,510		Pervious Area
1,625		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.0	33	0.1212	0.27		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.3	50	Total			

Subcatchment 11S: Sub #11



Subcatchment 12S: Sub #12

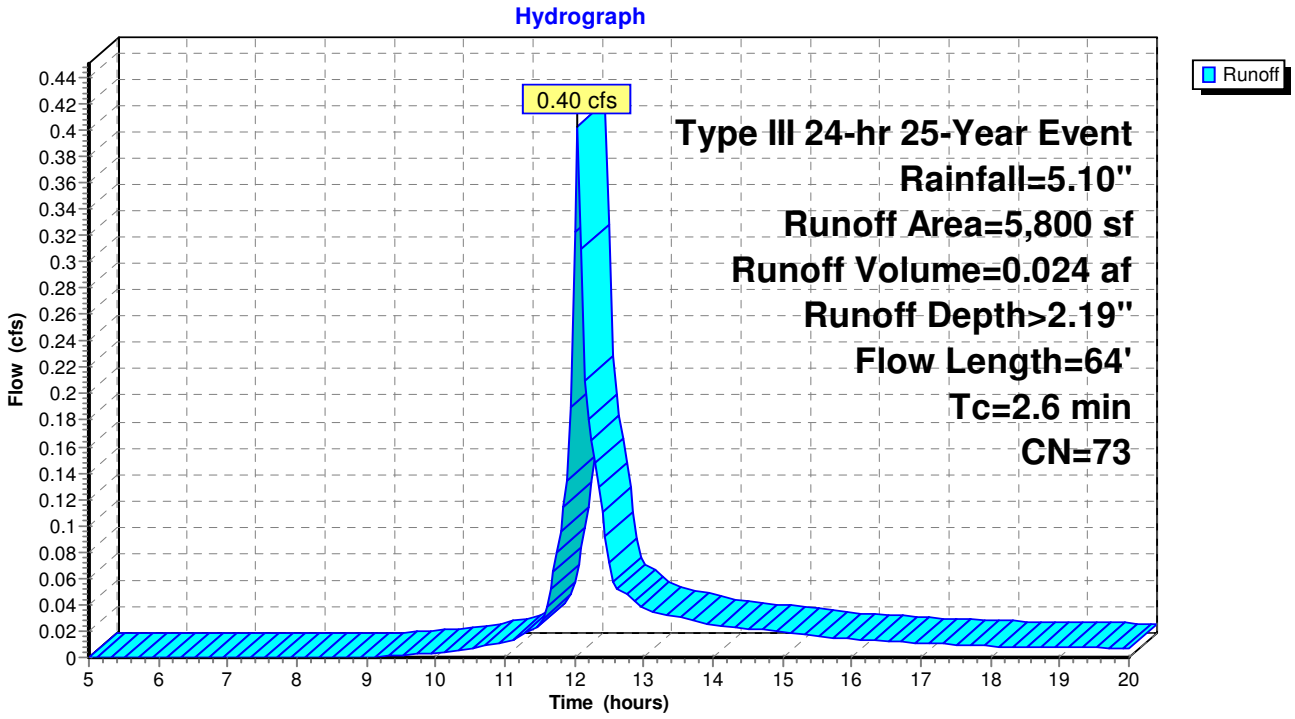
Runoff = 0.40 cfs @ 12.05 hrs, Volume= 0.024 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
1,900	98	Paved parking & roofs
3,900	61	>75% Grass cover, Good, HSG B
5,800	73	Weighted Average
3,900		Pervious Area
1,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.3	47	0.1702	0.33		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.6	64	Total			

Subcatchment 12S: Sub #12



Subcatchment 13S: Sub 13

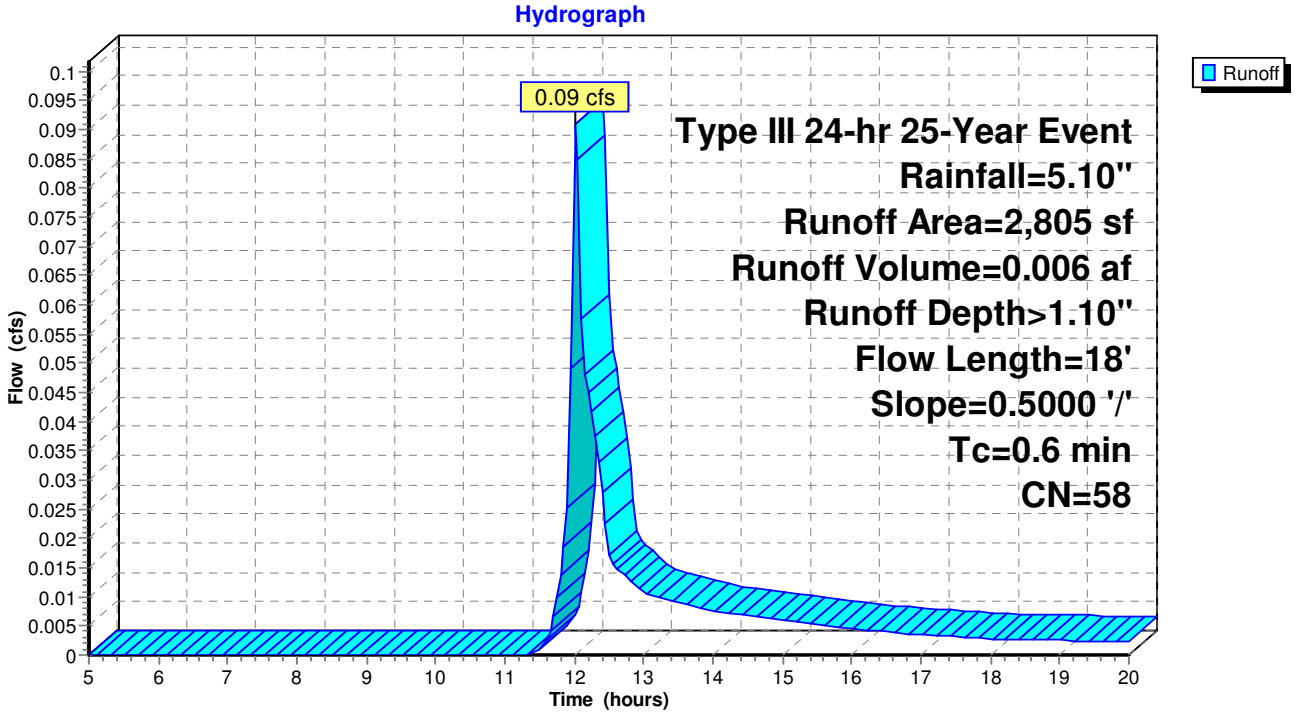
Runoff = 0.09 cfs @ 12.02 hrs, Volume= 0.006 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,805	58	Meadow, non-grazed, HSG B
2,805		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	18	0.5000	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 13S: Sub 13



Subcatchment 14S: Sub 14

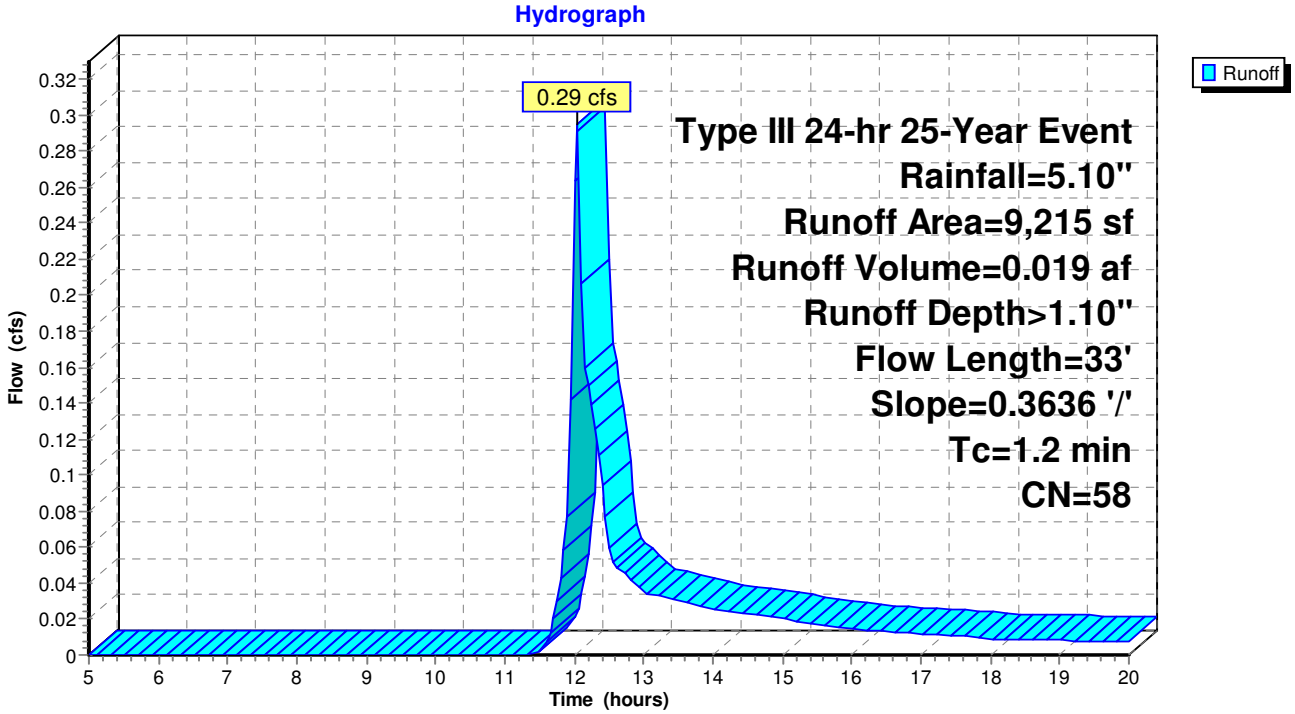
Runoff = 0.29 cfs @ 12.04 hrs, Volume= 0.019 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,215	58	Meadow, non-grazed, HSG B
9,215		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	33	0.3636	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 14S: Sub 14



Subcatchment 15S: Sub 15

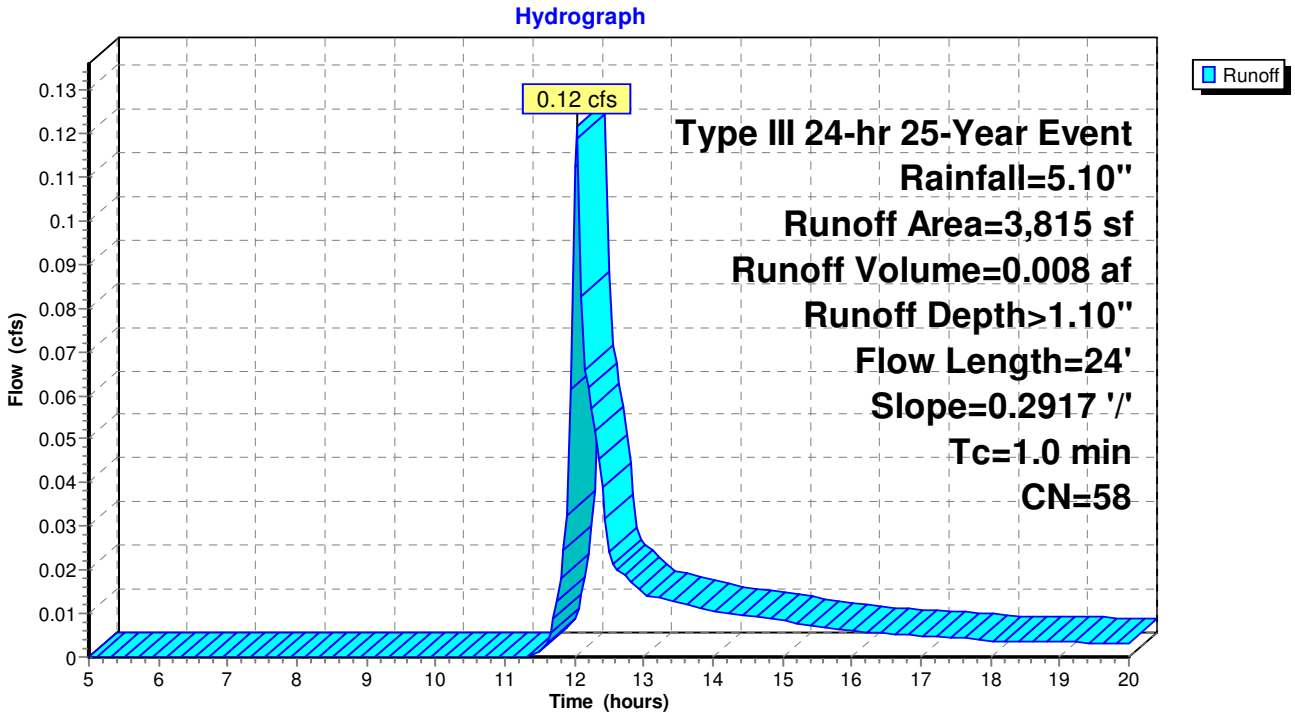
Runoff = 0.12 cfs @ 12.03 hrs, Volume= 0.008 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
3,815	58	Meadow, non-grazed, HSG B
3,815		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	24	0.2917	0.41		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 15S: Sub 15



Subcatchment 16S: Sub 16

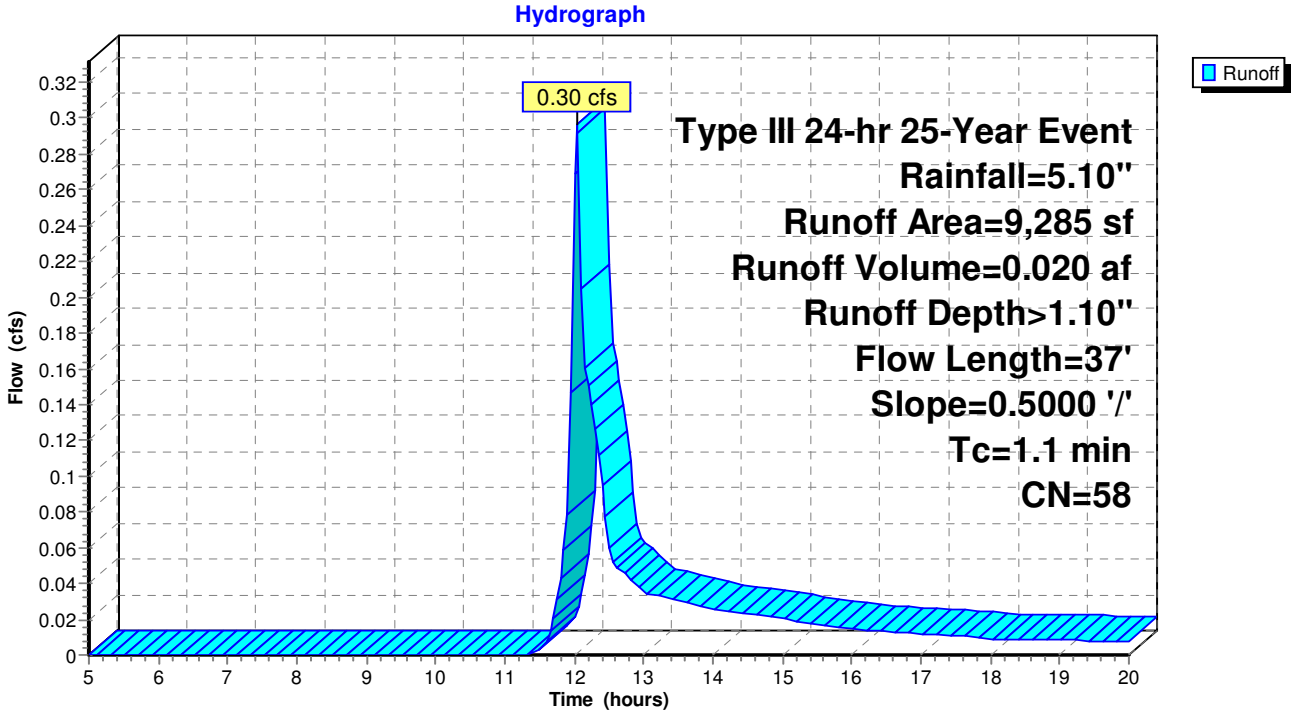
Runoff = 0.30 cfs @ 12.04 hrs, Volume= 0.020 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,285	58	Meadow, non-grazed, HSG B
9,285		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	37	0.5000	0.55		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 16S: Sub 16



Subcatchment 17S: Sub #17

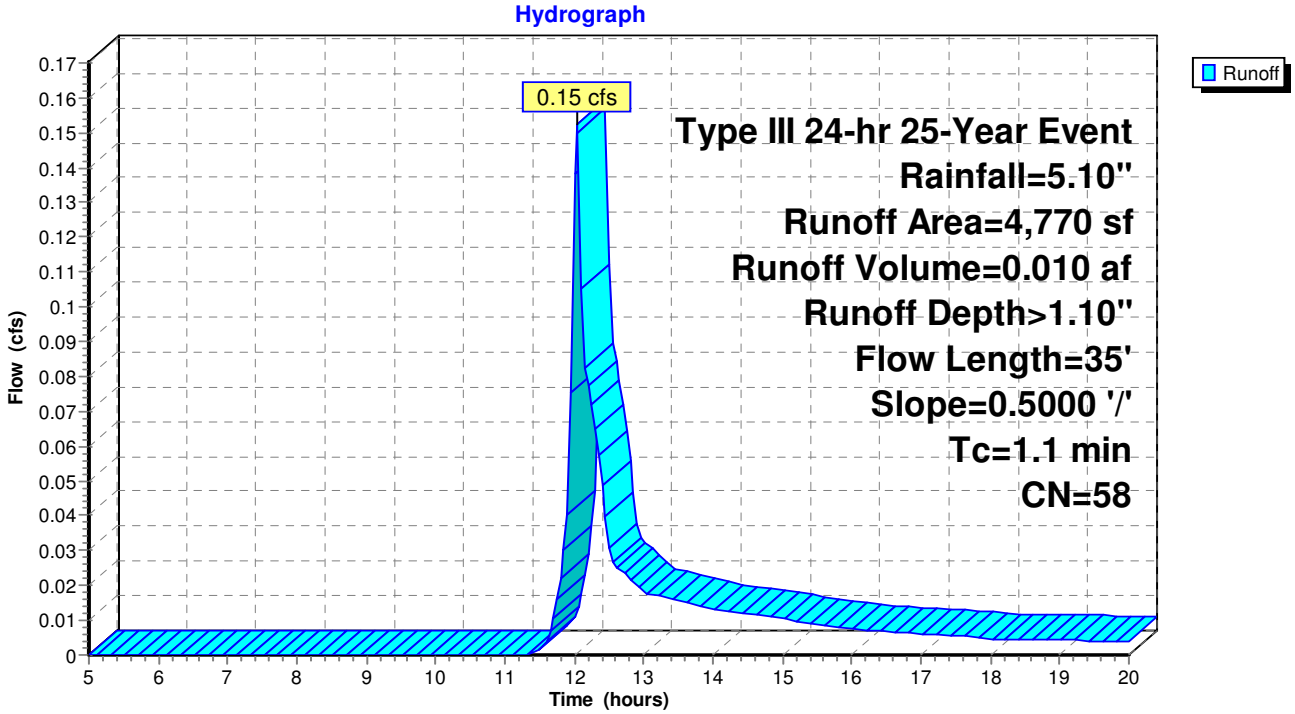
Runoff = 0.15 cfs @ 12.04 hrs, Volume= 0.010 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,770	58	Meadow, non-grazed, HSG B
4,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	35	0.5000	0.54		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 17S: Sub #17



Pond 1: CB1

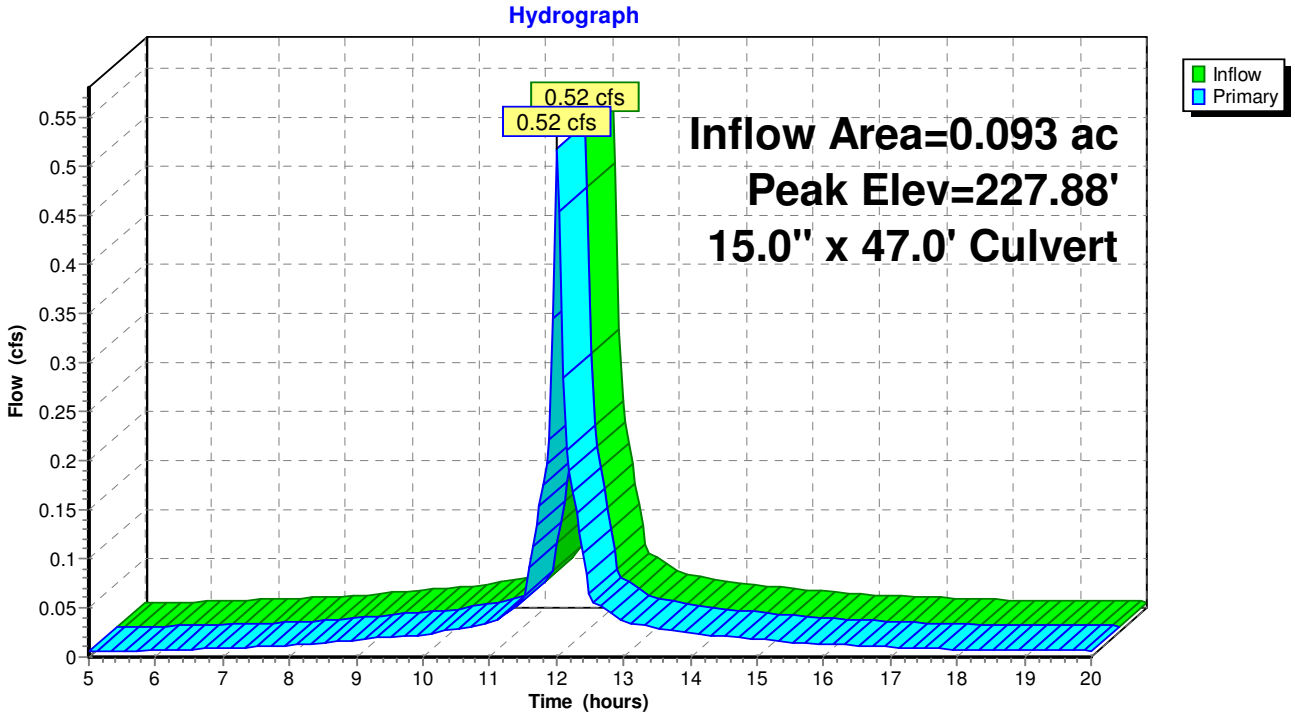
Inflow Area =	0.093 ac,	Inflow Depth >	4.51"	for	25-Year Event event
Inflow =	0.52 cfs @	12.01 hrs,	Volume=	0.035 af	
Outflow =	0.52 cfs @	12.01 hrs,	Volume=	0.035 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.01 hrs,	Volume=	0.035 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.88' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.50'	**15.0" x 47.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.50 cfs @ 12.01 hrs HW=227.87' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 1.64 fps)

Pond 1: CB1



Pond 1P: Filter Pond #1

Inflow Area = 1.432 ac, Inflow Depth > 2.91" for 25-Year Event event
Inflow = 4.89 cfs @ 12.02 hrs, Volume= 0.347 af
Outflow = 0.72 cfs @ 12.61 hrs, Volume= 0.212 af, Atten= 85%, Lag= 35.1 min
Primary = 0.72 cfs @ 12.61 hrs, Volume= 0.212 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 213.40' @ 12.61 hrs Surf.Area= 4,500 sf Storage= 8,596 cf

Plug-Flow detention time= 200.1 min calculated for 0.212 af (61% of inflow)
Center-of-Mass det. time= 123.3 min (899.1 - 775.8)

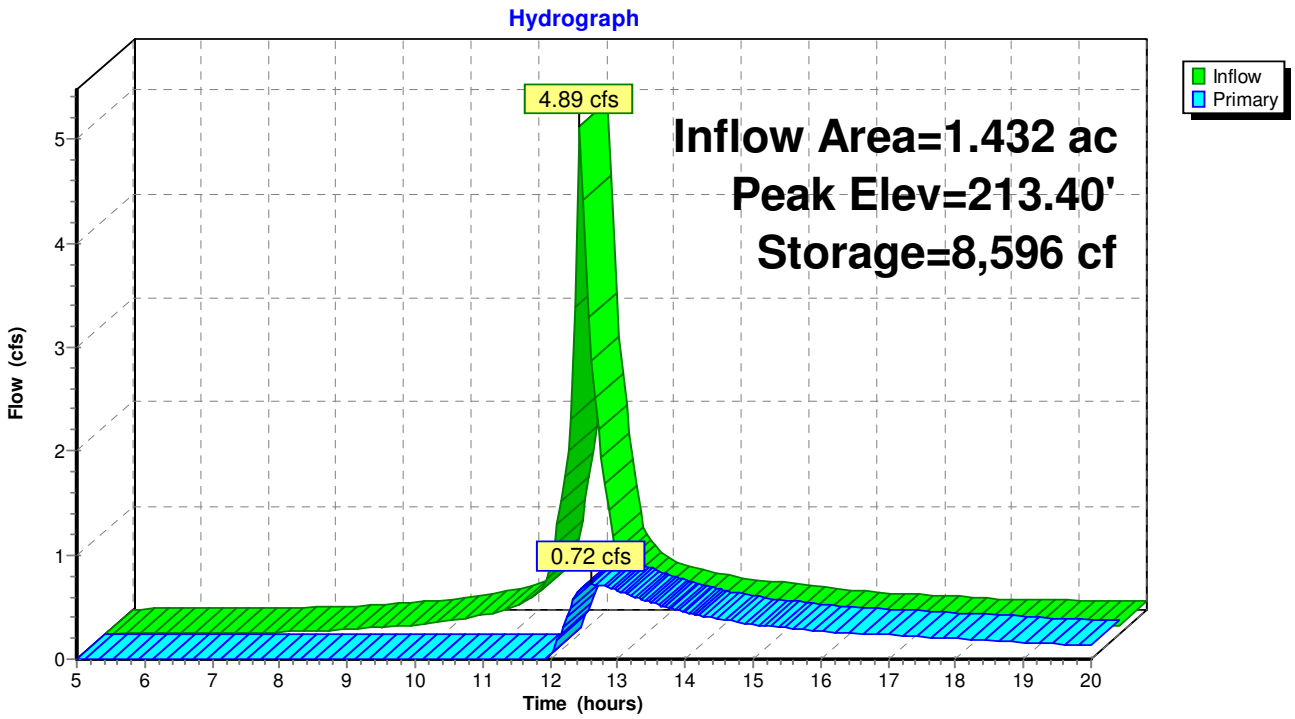
Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	16,887 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	2,725	0	0	2,725
212.00	3,425	3,068	3,068	3,452
212.50	3,800	1,805	4,874	3,842
213.00	4,185	1,995	6,869	4,243
214.00	5,000	4,586	11,456	5,092
215.00	5,875	5,432	16,887	6,006

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**15.0" x 30.5' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 208.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	212.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	213.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.72 cfs @ 12.61 hrs HW=213.40' (Free Discharge)
└─**1=Culvert** (Passes 0.72 cfs of 9.64 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.36 cfs @ 4.12 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.36 cfs @ 2.15 fps)

Pond 1P: Filter Pond #1



Pond 2: CB2

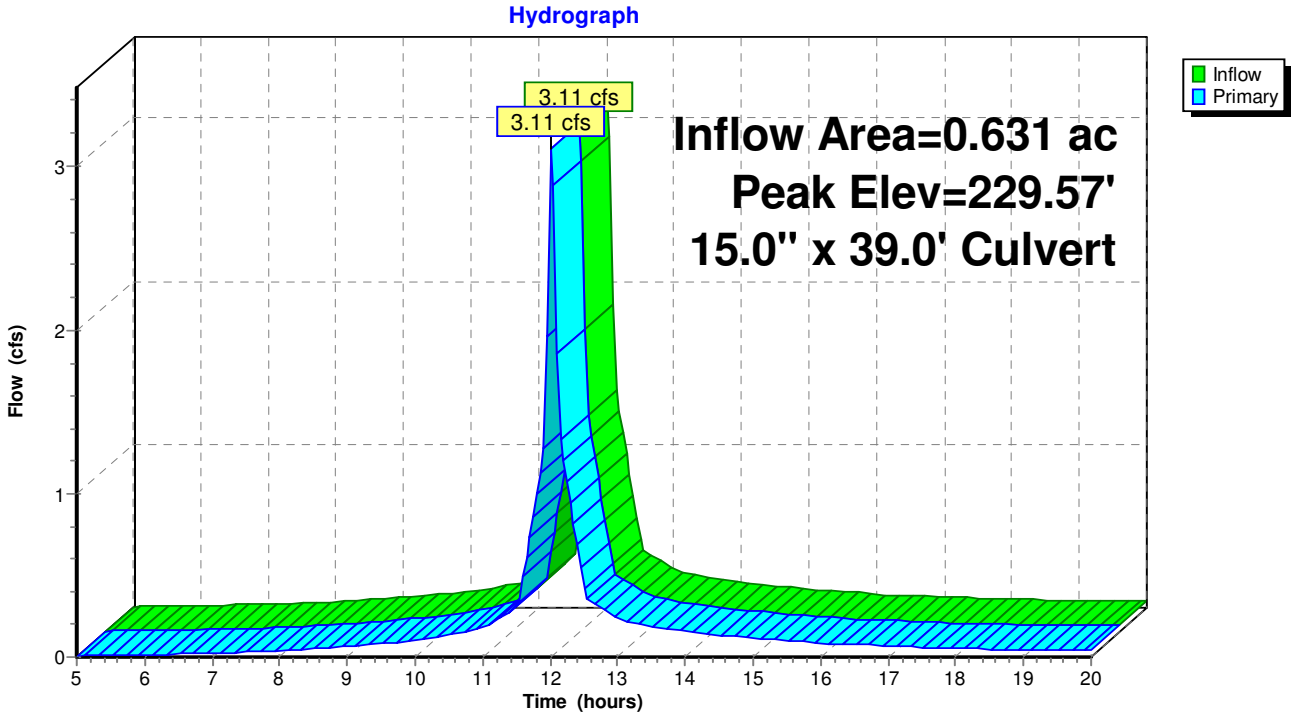
Inflow Area =	0.631 ac,	Inflow Depth >	3.76"	for	25-Year Event event
Inflow =	3.11 cfs @	12.02 hrs,	Volume=	0.198 af	
Outflow =	3.11 cfs @	12.02 hrs,	Volume=	0.198 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.11 cfs @	12.02 hrs,	Volume=	0.198 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.57' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**15.0" x 39.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0128 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.97 cfs @ 12.02 hrs HW=229.53' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.97 cfs @ 2.73 fps)

Pond 2: CB2



Pond 2P: Filter Pond #2

Inflow Area =	1.690 ac,	Inflow Depth >	3.65"	for	25-Year Event event
Inflow =	7.85 cfs @	12.02 hrs,	Volume=	0.514 af	
Outflow =	1.66 cfs @	12.41 hrs,	Volume=	0.359 af,	Atten= 79%, Lag= 23.5 min
Primary =	1.66 cfs @	12.41 hrs,	Volume=	0.359 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.19' @ 12.41 hrs Surf.Area= 6,955 sf Storage= 12,412 cf

Plug-Flow detention time= 181.4 min calculated for 0.358 af (70% of inflow)
Center-of-Mass det. time= 113.5 min (863.4 - 749.9)

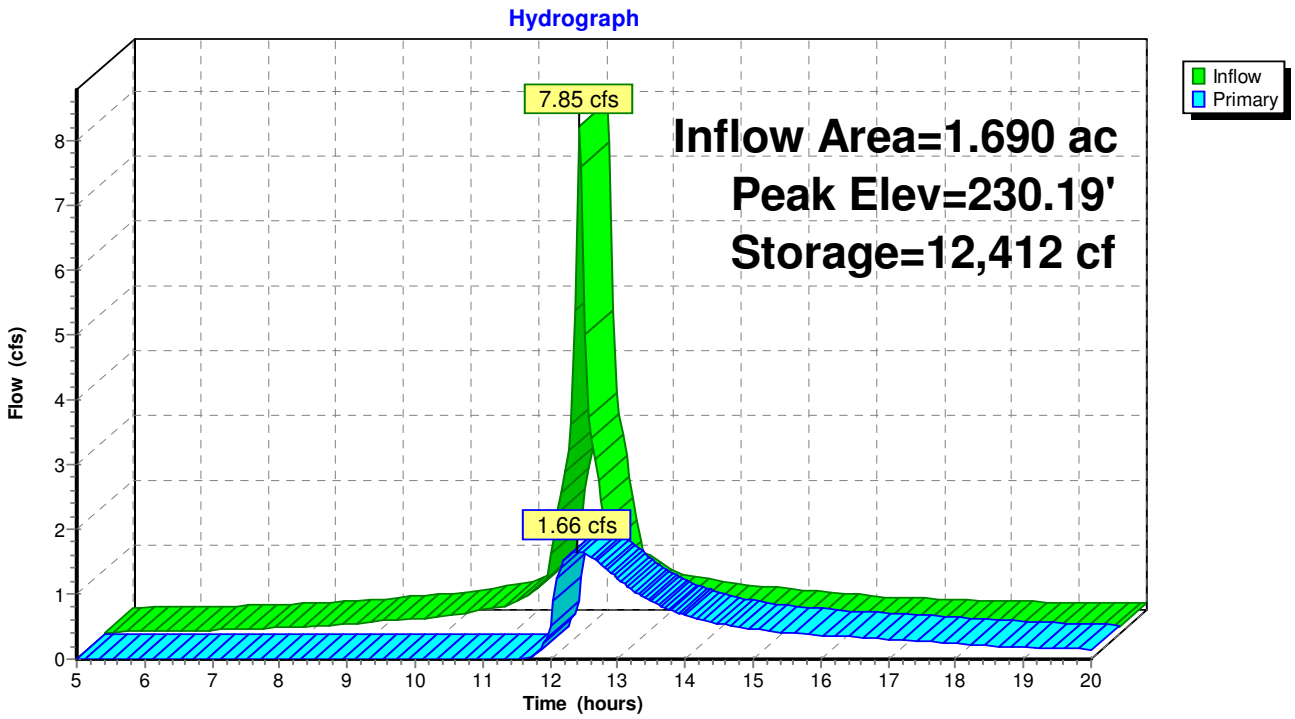
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	14,679 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
227.50	2,550	0	0	2,550
228.00	3,290	1,456	1,456	3,296
229.00	4,840	4,040	5,496	4,862
230.00	6,450	5,626	11,122	6,494
230.50	7,800	3,557	14,679	7,852

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**15.0" x 23.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 223.00' S= 0.0870 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	229.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	229.50'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.66 cfs @ 12.41 hrs HW=230.19' (Free Discharge)
└─**1=Culvert** (Passes 1.66 cfs of 9.97 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.65 cfs @ 4.78 fps)
  └─**3=Orifice/Grate** (Orifice Controls 1.01 cfs @ 2.88 fps)

Pond 2P: Filter Pond #2



Pond 3: CB3

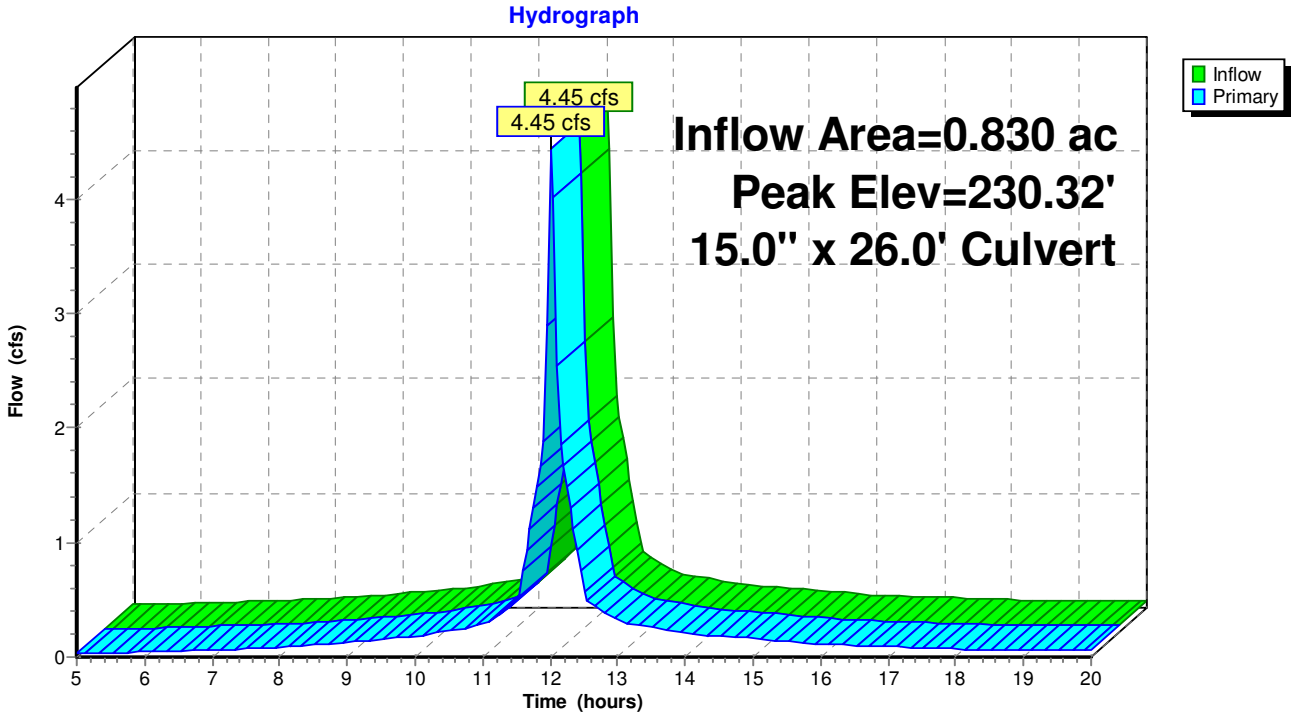
Inflow Area =	0.830 ac,	Inflow Depth >	4.26"	for	25-Year Event event
Inflow =	4.45 cfs @	12.02 hrs,	Volume=	0.295 af	
Outflow =	4.45 cfs @	12.02 hrs,	Volume=	0.295 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.45 cfs @	12.02 hrs,	Volume=	0.295 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.32' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.80'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0308 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=4.26 cfs @ 12.02 hrs HW=230.26' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.26 cfs @ 3.47 fps)

Pond 3: CB3



Pond 3P: Filter Pond #3

Inflow Area = 0.607 ac, Inflow Depth > 2.70" for 25-Year Event event
Inflow = 2.29 cfs @ 12.02 hrs, Volume= 0.137 af
Outflow = 0.26 cfs @ 12.68 hrs, Volume= 0.137 af, Atten= 89%, Lag= 39.8 min
Primary = 0.26 cfs @ 12.68 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 235.95' @ 12.68 hrs Surf.Area= 2,307 sf Storage= 2,151 cf

Plug-Flow detention time= 69.5 min calculated for 0.136 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (853.6 - 784.5)

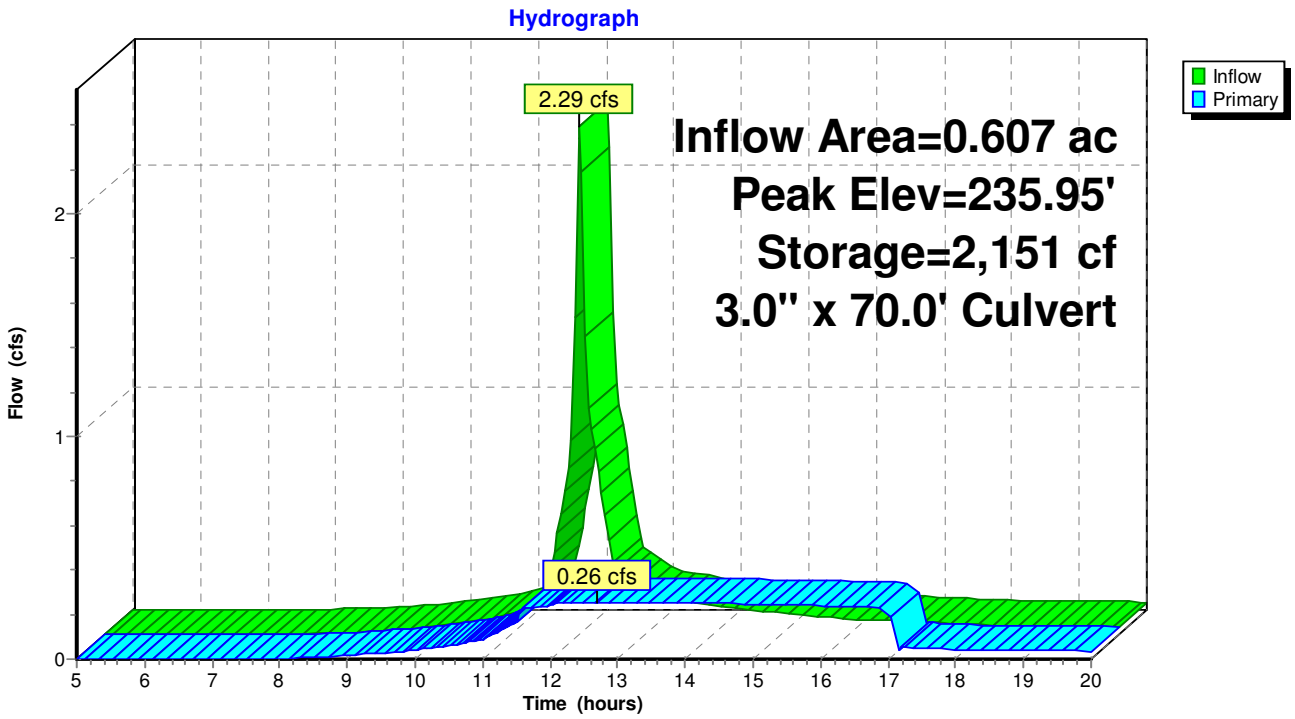
Volume	Invert	Avail.Storage	Storage Description
#1	234.50'	2,272 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
234.50	790	0	0	790
235.00	1,230	501	501	1,234
236.00	2,375	1,771	2,272	2,388

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	**3.0" x 70.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 229.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.26 cfs @ 12.68 hrs HW=235.95' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.26 cfs @ 5.22 fps)

Pond 3P: Filter Pond #3



Pond 4: CB4

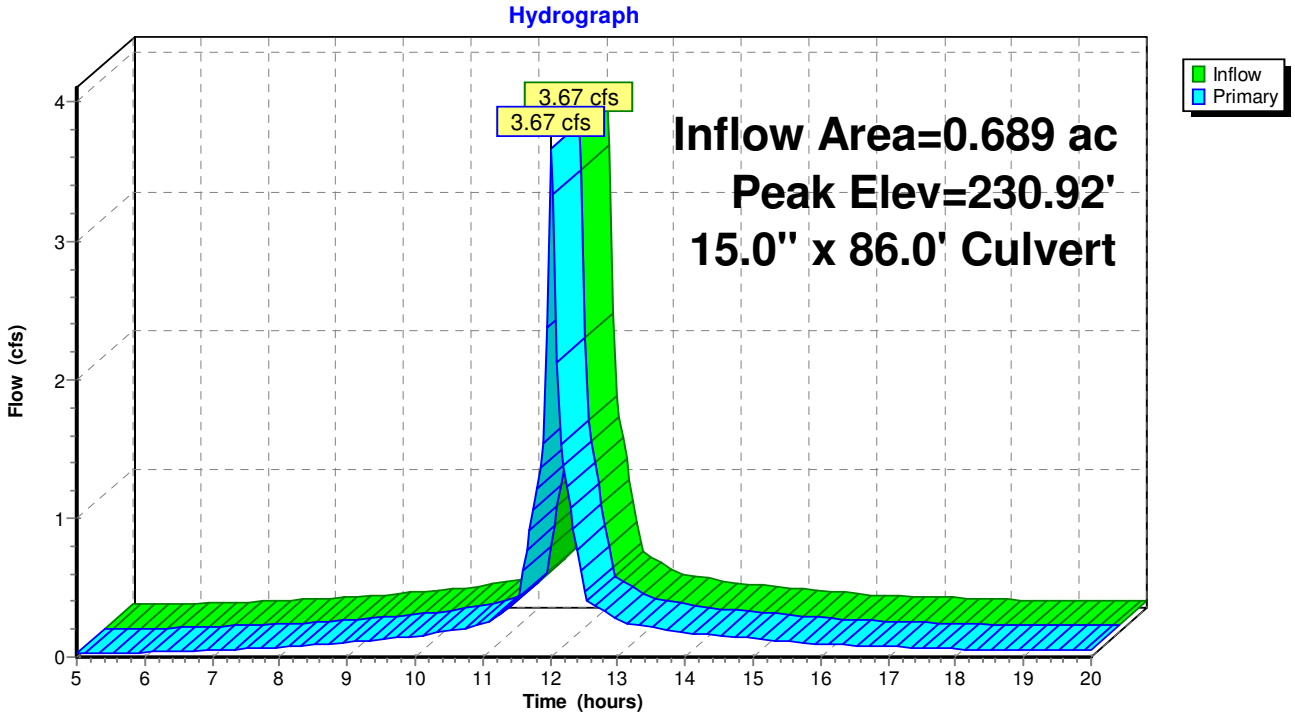
Inflow Area =	0.689 ac,	Inflow Depth >	4.23"	for	25-Year Event event
Inflow =	3.67 cfs @	12.02 hrs,	Volume=	0.243 af	
Outflow =	3.67 cfs @	12.02 hrs,	Volume=	0.243 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.67 cfs @	12.02 hrs,	Volume=	0.243 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.92' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.90'	**15.0" x 86.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.00' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.50 cfs @ 12.02 hrs HW=230.88' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.50 cfs @ 3.38 fps)

Pond 4: CB4



Pond 5: CB5

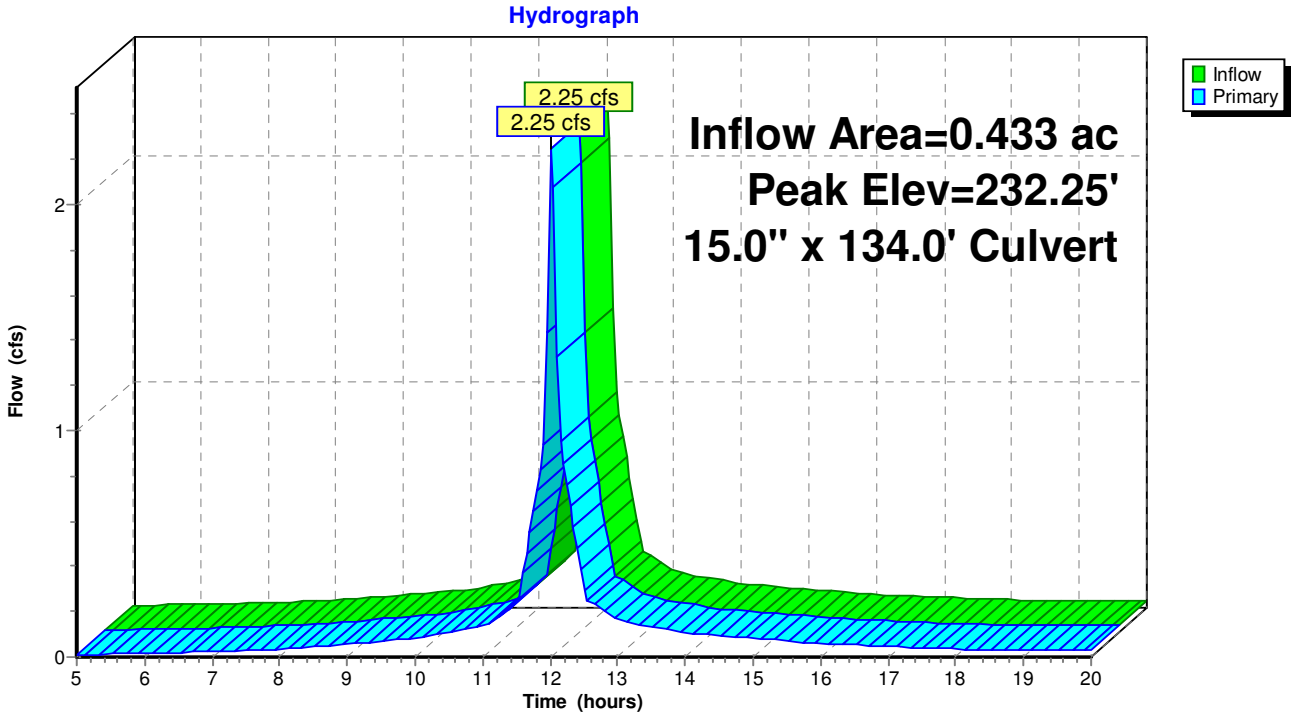
Inflow Area =	0.433 ac,	Inflow Depth >	4.06"	for	25-Year Event event
Inflow =	2.25 cfs @	12.02 hrs,	Volume=	0.147 af	
Outflow =	2.25 cfs @	12.02 hrs,	Volume=	0.147 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.25 cfs @	12.02 hrs,	Volume=	0.147 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 232.25' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	231.50'	**15.0" x 134.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 230.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.15 cfs @ 12.02 hrs HW=232.23' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.15 cfs @ 2.90 fps)

Pond 5: CB5



Pond 6: CB6

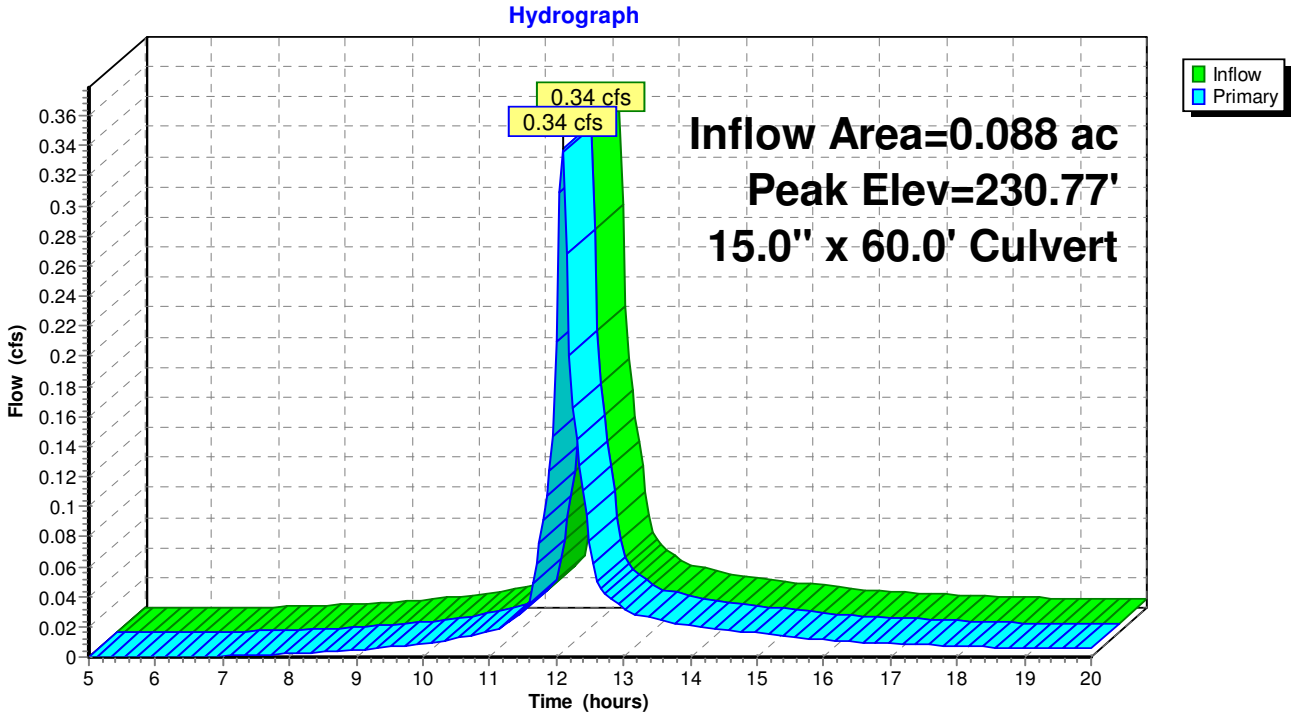
Inflow Area =	0.088 ac,	Inflow Depth >	3.16"	for	25-Year Event event
Inflow =	0.34 cfs @	12.09 hrs,	Volume=	0.023 af	
Outflow =	0.34 cfs @	12.09 hrs,	Volume=	0.023 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.34 cfs @	12.09 hrs,	Volume=	0.023 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.77' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.80' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=230.76' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.33 cfs @ 1.75 fps)

Pond 6: CB6



Pond 7: CB7

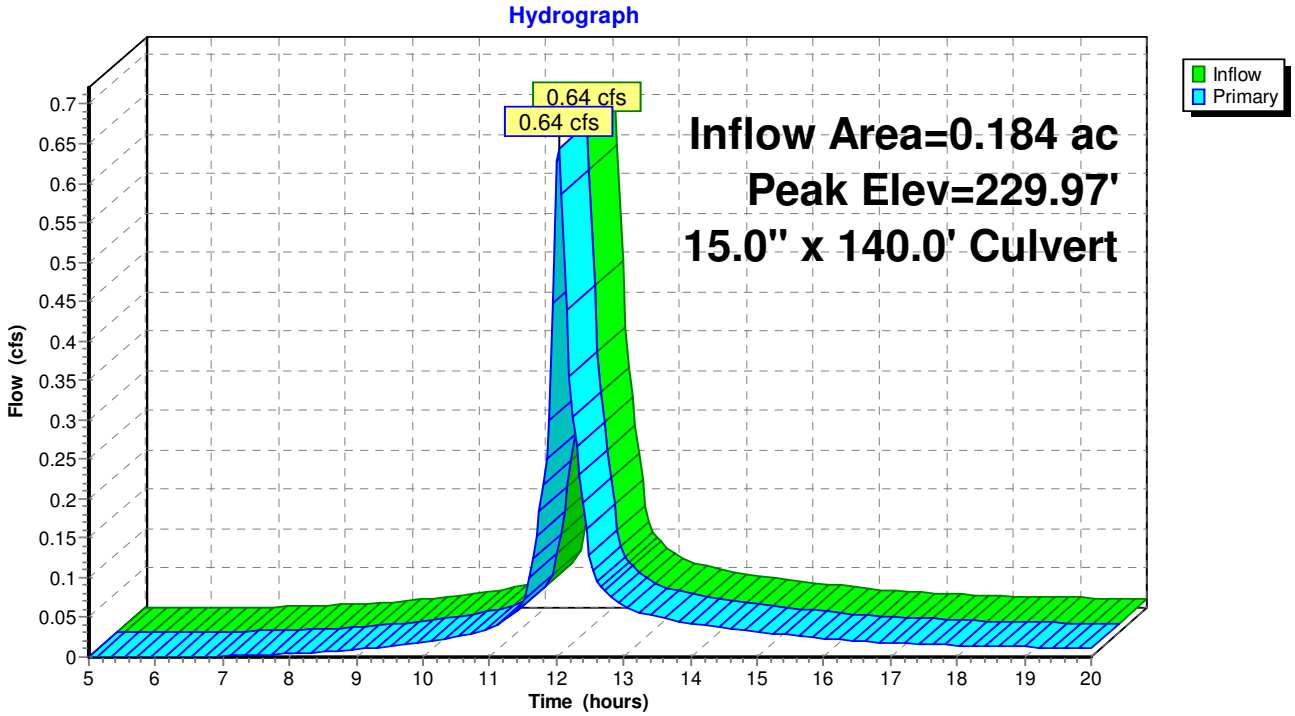
Inflow Area =	0.184 ac,	Inflow Depth >	3.11"	for	25-Year Event event
Inflow =	0.64 cfs @	12.03 hrs,	Volume=	0.048 af	
Outflow =	0.64 cfs @	12.03 hrs,	Volume=	0.048 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.03 hrs,	Volume=	0.048 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.97' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.60'	**15.0" x 140.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 228.10' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.63 cfs @ 12.03 hrs HW=229.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.63 cfs @ 2.07 fps)

Pond 7: CB7



Pond 8: CB8

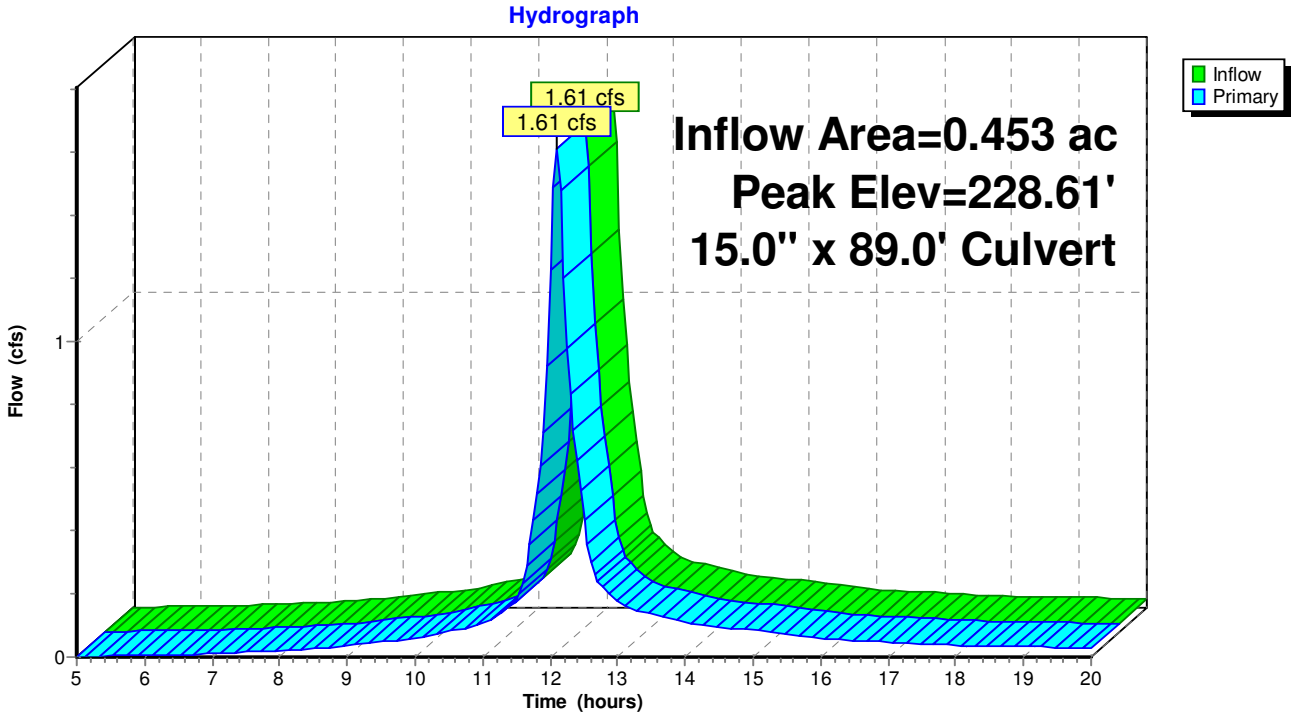
Inflow Area =	0.453 ac,	Inflow Depth >	3.49"	for	25-Year Event event
Inflow =	1.61 cfs @	12.10 hrs,	Volume=	0.132 af	
Outflow =	1.61 cfs @	12.10 hrs,	Volume=	0.132 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.61 cfs @	12.10 hrs,	Volume=	0.132 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.61' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.90'	**15.0" x 89.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.61 cfs @ 12.10 hrs HW=228.61' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.61 cfs @ 2.26 fps)

Pond 8: CB8



Pond 9: CB9

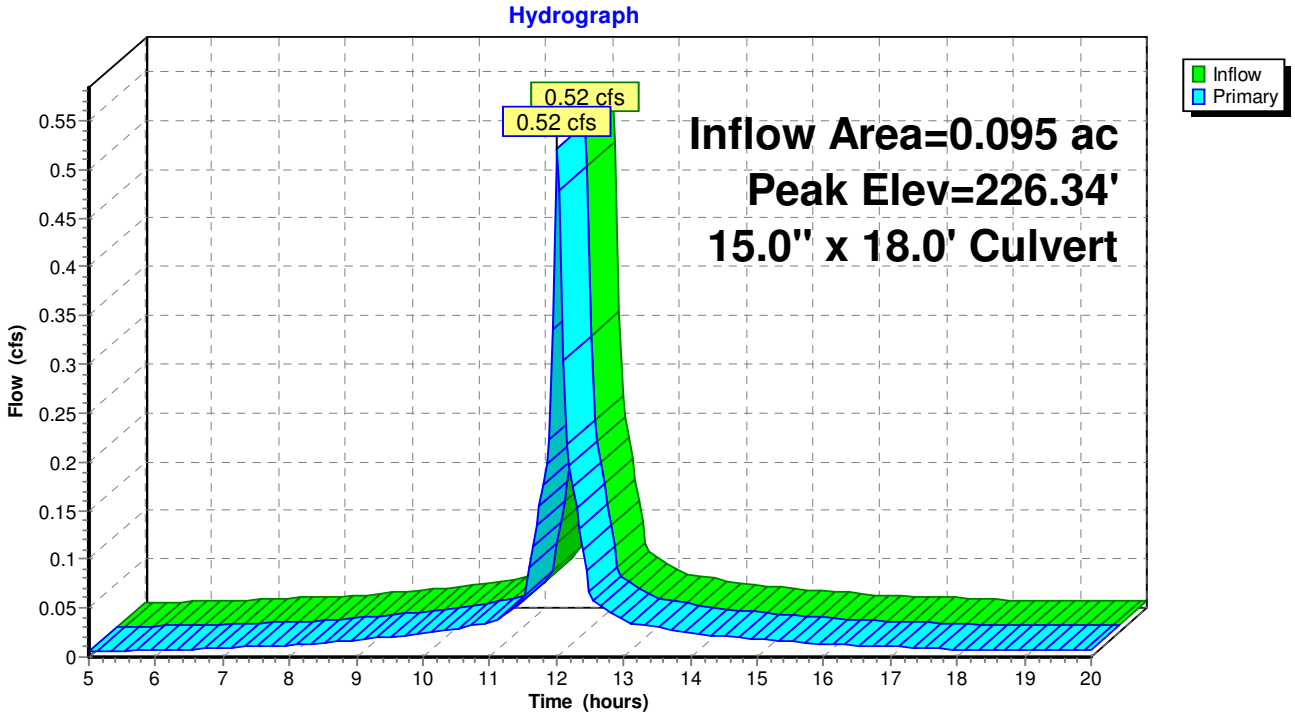
Inflow Area = 0.095 ac, Inflow Depth > 4.51" for 25-Year Event event
Inflow = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af
Outflow = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.34' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**15.0" x 18.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 225.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.50 cfs @ 12.02 hrs HW=226.33' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 1.95 fps)

Pond 9: CB9



Pond 10: CB10

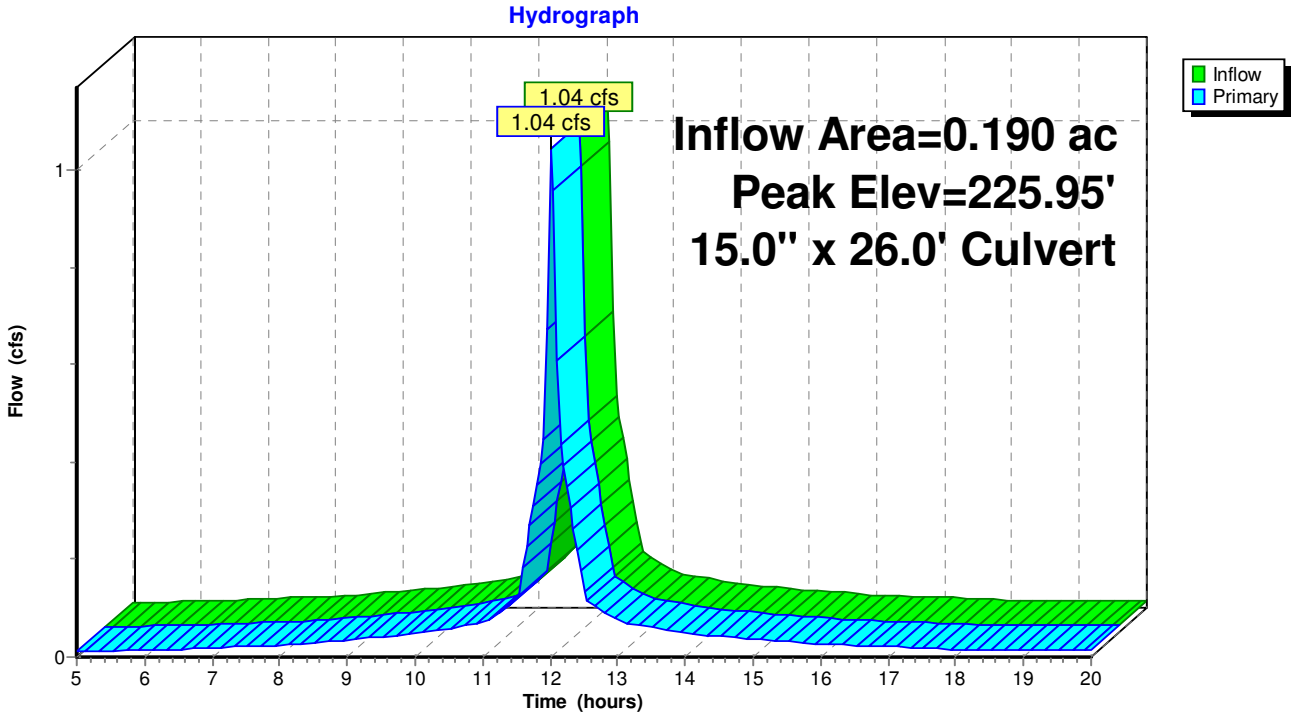
Inflow Area =	0.190 ac,	Inflow Depth >	4.51"	for	25-Year Event event
Inflow =	1.04 cfs @	12.02 hrs,	Volume=	0.071 af	
Outflow =	1.04 cfs @	12.02 hrs,	Volume=	0.071 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.04 cfs @	12.02 hrs,	Volume=	0.071 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 225.95' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 224.00' S= 0.0538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.00 cfs @ 12.02 hrs HW=225.94' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.00 cfs @ 1.97 fps)

Pond 10: CB10



Pond SF1: Sediment Forebay #1

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	82 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	30	0	0	30
212.00	150	82	82	154

Pond SF2: Sediment Forebay #2

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	449 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

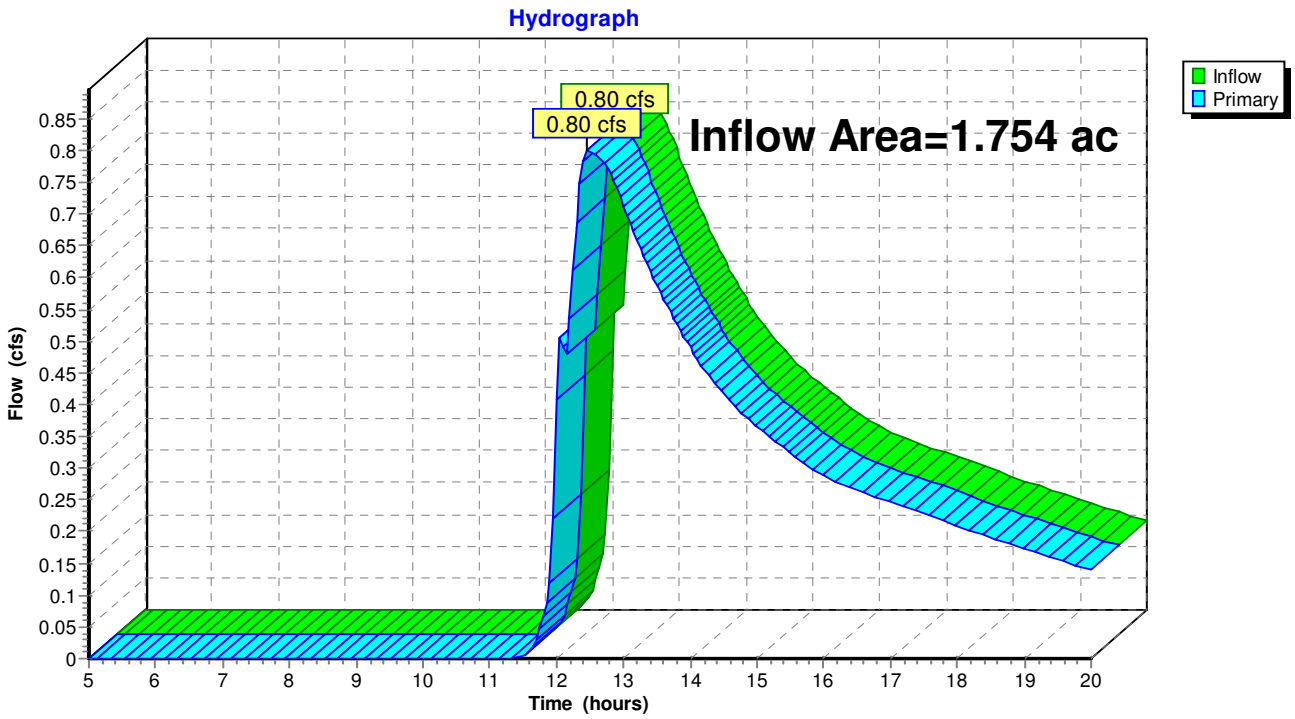
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	275	0	0	275
229.00	650	449	449	657

Pond SP1: Study Point #1

Inflow Area = 1.754 ac, Inflow Depth > 1.65" for 25-Year Event event
Inflow = 0.80 cfs @ 12.47 hrs, Volume= 0.241 af
Primary = 0.80 cfs @ 12.47 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

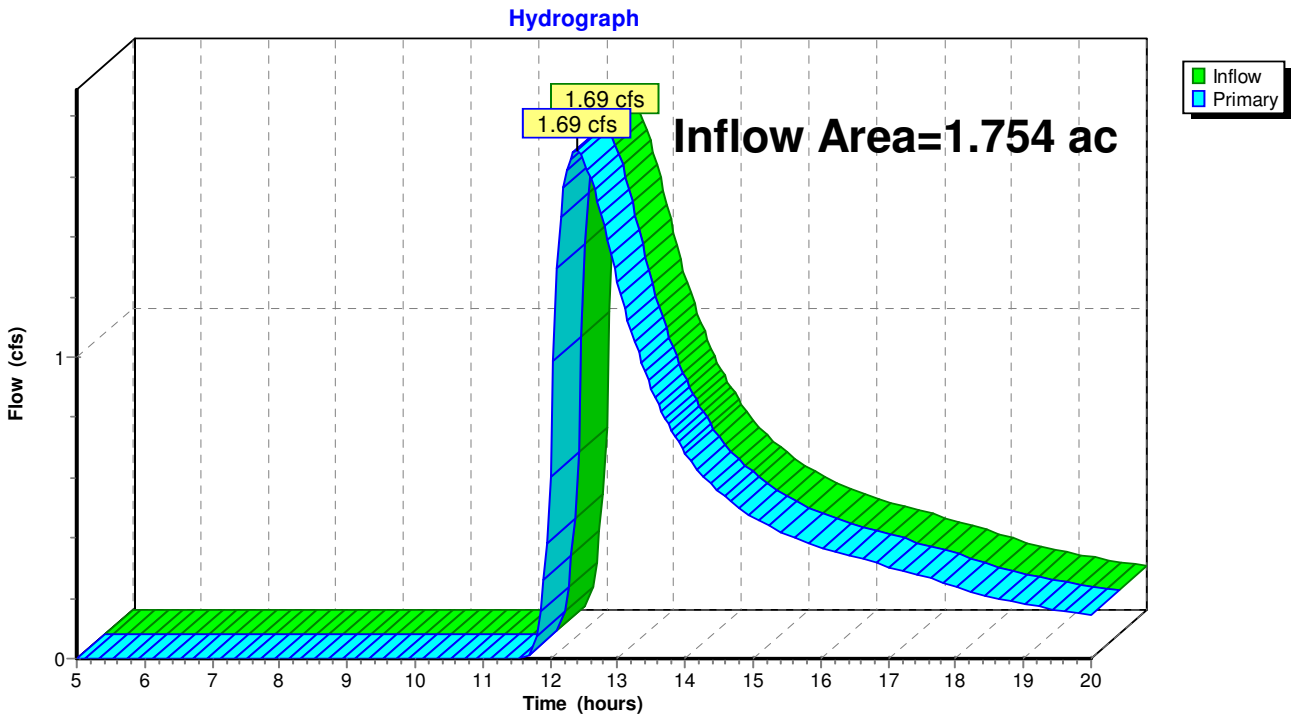


Pond SP2: Study Point #2

Inflow Area = 1.754 ac, Inflow Depth > 2.49" for 25-Year Event event
Inflow = 1.69 cfs @ 12.39 hrs, Volume= 0.365 af
Primary = 1.69 cfs @ 12.39 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

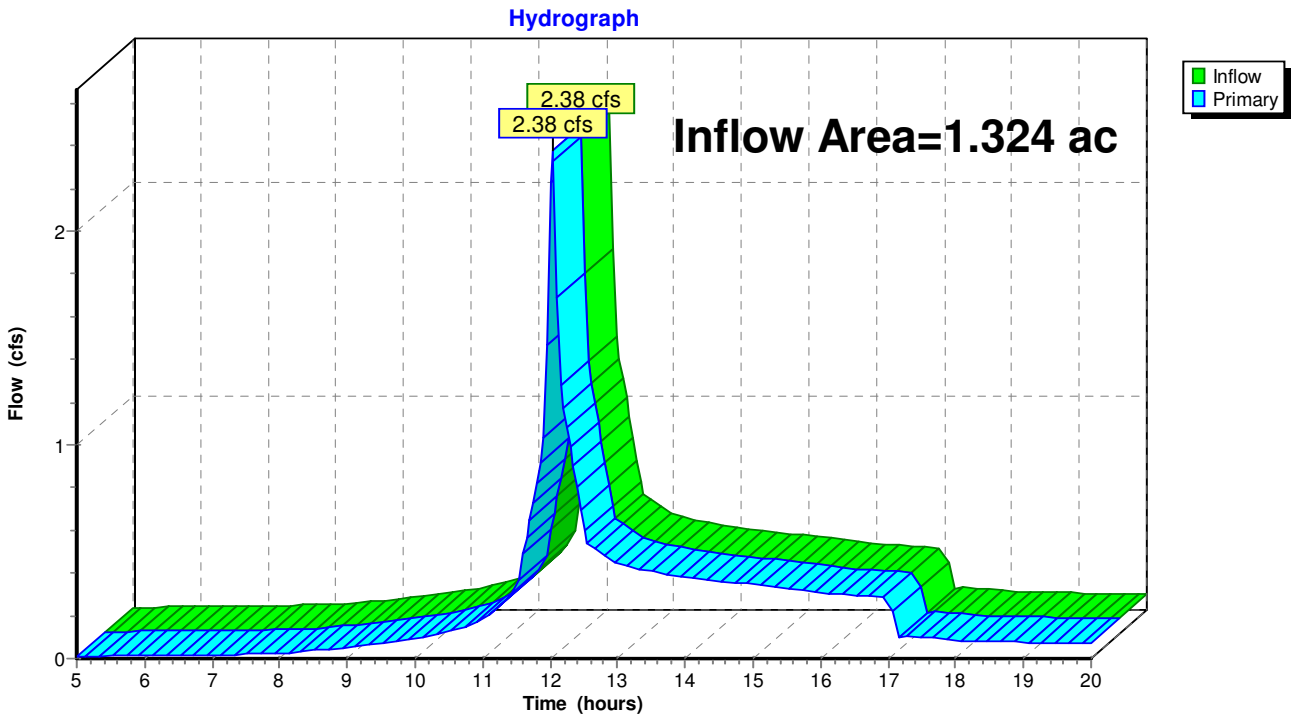


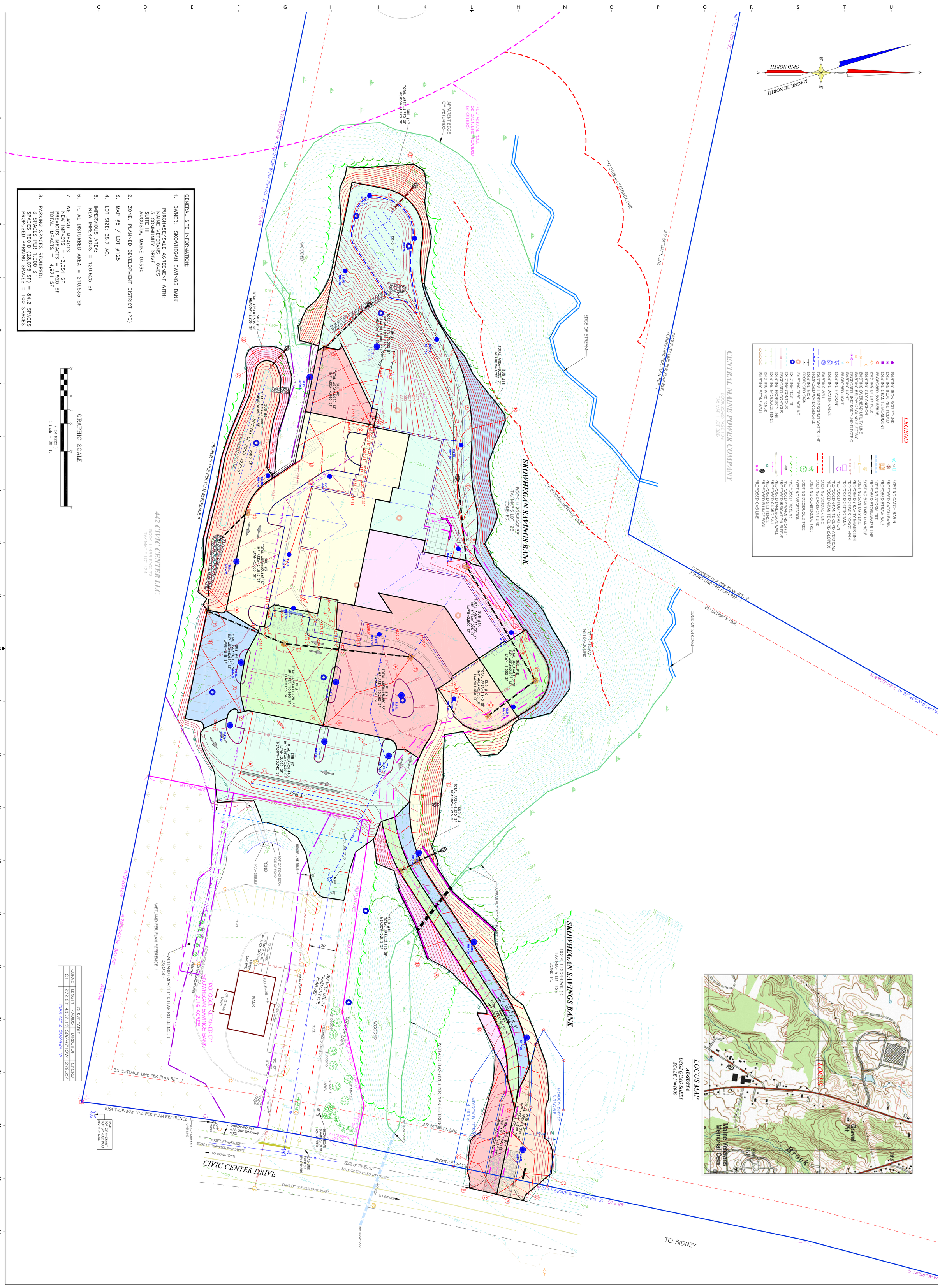
Pond SP3: Study Point #2

Inflow Area =	1.324 ac,	Inflow Depth >	2.53"	for	25-Year Event event
Inflow =	2.38 cfs @	12.03 hrs,	Volume=	0.279 af	
Primary =	2.38 cfs @	12.03 hrs,	Volume=	0.279 af,	Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #2





MAINE VETERANS' HOMES

CIVIC CENTER DRIVE AUGUSTA, MAINE

NOT FOR CONSTRUCITON

REVISIONS

#	DATE	DESCRIPTION

DATE:	12.31.13
PROJECT #	2013-251
DRAWN BY:	TGH
CHECKED BY:	JEC
DRAWING SCALE	1"=30'

SHEET TITLE

POST-DEVELOPMENT PLAN

POST

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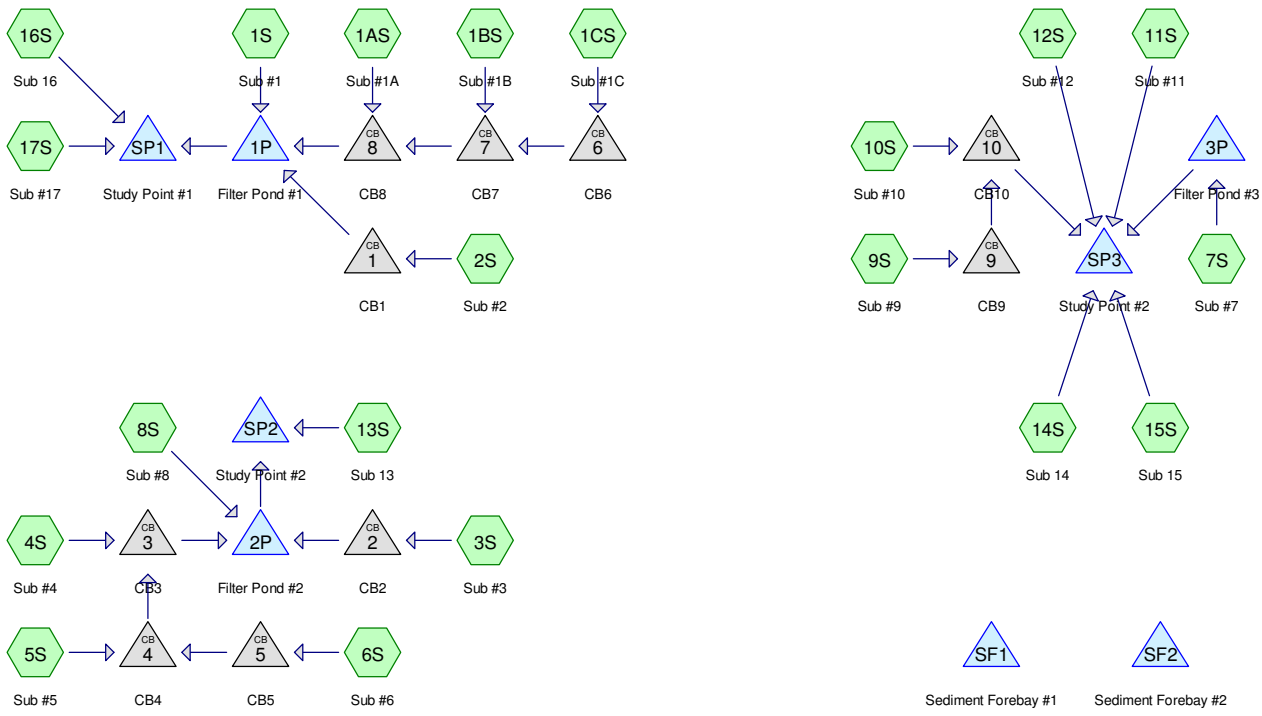
432 Cony Road P.O. Box 4687 Augusta, Maine 04330
Ph. (207) 623-9475 Fax (207) 623-0016 Toll Free 1-800-244-9475

STATE OF MAINE JAMES E. COFFIN 8500 LICENSED PROFESSIONAL ENGINEER



Subcat Reach Pond Link

Drainage Diagram for MVH Post-Dev'mt

Prepared by E.S. Coffin Engineering & Surveying 1/16/2014

HydroCAD® 8.00 s/n 000434 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
1.309	58	Meadow, non-grazed, HSG B (1S,7S,8S,13S,14S,15S,16S,17S)
0.888	61	>75% Grass cover, Good, HSG B (1AS,1BS,1CS,1S,3S,4S,5S,6S,7S,11S,12S)
2.636	98	Paved parking & roofs (1AS,1BS,1CS,1S,2S,3S,4S,5S,6S,7S,9S,10S,11S,12S)
4.833		

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

Subcatchment 1AS: Sub #1A Runoff Area=11,725 sf Runoff Depth>1.86"
Flow Length=98' Tc=8.6 min CN=90 Runoff=0.56 cfs 0.042 af

Subcatchment 1BS: Sub #1B Runoff Area=4,165 sf Runoff Depth>1.34"
Tc=0.0 min CN=83 Runoff=0.19 cfs 0.011 af

Subcatchment 1CS: Sub #1C Runoff Area=3,840 sf Runoff Depth>1.41"
Flow Length=59' Slope=0.0200 '/' Tc=5.9 min CN=84 Runoff=0.15 cfs 0.010 af

Subcatchment 1S: Sub #1 Runoff Area=38,580 sf Runoff Depth>0.93"
Flow Length=314' Tc=0.9 min CN=76 Runoff=1.12 cfs 0.069 af

Subcatchment 2S: Sub #2 Runoff Area=4,060 sf Runoff Depth>2.59"
Flow Length=103' Slope=0.0400 '/' Tc=1.0 min CN=98 Runoff=0.30 cfs 0.020 af

Subcatchment 3S: Sub #3 Runoff Area=27,485 sf Runoff Depth>1.87"
Flow Length=184' Tc=1.3 min CN=90 Runoff=1.60 cfs 0.098 af

Subcatchment 4S: Sub #4 Runoff Area=6,165 sf Runoff Depth>2.50"
Flow Length=122' Slope=0.0400 '/' Tc=1.0 min CN=97 Runoff=0.45 cfs 0.030 af

Subcatchment 5S: Sub #5 Runoff Area=11,125 sf Runoff Depth>2.59"
Flow Length=98' Slope=0.0286 '/' Tc=1.1 min CN=98 Runoff=0.82 cfs 0.055 af

Subcatchment 6S: Sub #6 Runoff Area=18,880 sf Runoff Depth>2.13"
Flow Length=125' Tc=1.3 min CN=93 Runoff=1.22 cfs 0.077 af

Subcatchment 7S: Sub #7 Runoff Area=26,440 sf Runoff Depth>1.10"
Flow Length=87' Tc=1.0 min CN=79 Runoff=0.92 cfs 0.055 af

Subcatchment 8S: Sub #8 Runoff Area=9,960 sf Runoff Depth>0.23"
Flow Length=35' Slope=0.1714 '/' Tc=1.7 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 9S: Sub #9 Runoff Area=4,140 sf Runoff Depth>2.59"
Flow Length=290' Tc=1.3 min CN=98 Runoff=0.30 cfs 0.021 af

Subcatchment 10S: Sub #10 Runoff Area=4,145 sf Runoff Depth>2.59"
Flow Length=282' Tc=1.3 min CN=98 Runoff=0.30 cfs 0.021 af

Subcatchment 11S: Sub #11 Runoff Area=4,135 sf Runoff Depth>0.93"
Flow Length=50' Tc=2.3 min CN=76 Runoff=0.12 cfs 0.007 af

Subcatchment 12S: Sub #12 Runoff Area=5,800 sf Runoff Depth>0.78"
Flow Length=64' Tc=2.6 min CN=73 Runoff=0.14 cfs 0.009 af

Subcatchment 13S: Sub 13 Runoff Area=2,805 sf Runoff Depth>0.23"
Flow Length=18' Slope=0.5000 '/' Tc=0.6 min CN=58 Runoff=0.01 cfs 0.001 af

Subcatchment 14S: Sub 14 Runoff Area=9,215 sf Runoff Depth>0.23"
Flow Length=33' Slope=0.3636 '/' Tc=1.2 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 15S: Sub 15 Runoff Area=3,815 sf Runoff Depth>0.23"
Flow Length=24' Slope=0.2917 '/' Tc=1.0 min CN=58 Runoff=0.01 cfs 0.002 af

Subcatchment 16S: Sub 16 Runoff Area=9,285 sf Runoff Depth>0.23"
Flow Length=37' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 17S: Sub #17 Runoff Area=4,770 sf Runoff Depth>0.23"
Flow Length=35' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.01 cfs 0.002 af

Pond 1: CB1 Peak Elev=227.79' Inflow=0.30 cfs 0.020 af
15.0" x 47.0' Culvert Outflow=0.30 cfs 0.020 af

Pond 1P: Filter Pond #1 Peak Elev=212.68' Storage=5,560 cf Inflow=2.06 cfs 0.152 af
Outflow=0.07 cfs 0.026 af

Pond 2: CB2 Peak Elev=229.20' Inflow=1.60 cfs 0.098 af
15.0" x 39.0' Culvert Outflow=1.60 cfs 0.098 af

Pond 2P: Filter Pond #2 Peak Elev=229.40' Storage=7,572 cf Inflow=4.10 cfs 0.264 af
Outflow=0.29 cfs 0.118 af

Pond 3: CB3 Peak Elev=229.72' Inflow=2.50 cfs 0.162 af
15.0" x 26.0' Culvert Outflow=2.50 cfs 0.162 af

Pond 3P: Filter Pond #3 Peak Elev=235.00' Storage=498 cf Inflow=0.92 cfs 0.055 af
3.0" x 70.0' Culvert Outflow=0.24 cfs 0.055 af

Pond 4: CB4 Peak Elev=230.61' Inflow=2.05 cfs 0.132 af
15.0" x 86.0' Culvert Outflow=2.05 cfs 0.132 af

Pond 5: CB5 Peak Elev=232.03' Inflow=1.22 cfs 0.077 af
15.0" x 134.0' Culvert Outflow=1.22 cfs 0.077 af

Pond 6: CB6 Peak Elev=230.68' Inflow=0.15 cfs 0.010 af
15.0" x 60.0' Culvert Outflow=0.15 cfs 0.010 af

Pond 7: CB7 Peak Elev=229.85' Inflow=0.29 cfs 0.021 af
15.0" x 140.0' Culvert Outflow=0.29 cfs 0.021 af

Pond 8: CB8 Peak Elev=228.38' Inflow=0.80 cfs 0.063 af
15.0" x 89.0' Culvert Outflow=0.80 cfs 0.063 af

Pond 9: CB9 Peak Elev=226.25' Inflow=0.30 cfs 0.021 af
15.0" x 18.0' Culvert Outflow=0.30 cfs 0.021 af

Pond 10: CB10 Peak Elev=225.81' Inflow=0.61 cfs 0.041 af
15.0" x 26.0' Culvert Outflow=0.61 cfs 0.041 af

Pond SF1: Sediment Forebay #1 Peak Elev=0.00' Storage=0 cf

Pond SF2: Sediment Forebay #2 Peak Elev=0.00' Storage=0 cf

Pond SP1: Study Point #1 Inflow=0.07 cfs 0.033 af
Primary=0.07 cfs 0.033 af

Pond SP2: Study Point #2 Inflow=0.29 cfs 0.119 af
Primary=0.29 cfs 0.119 af

Pond SP3: Study Point #2 Inflow=1.10 cfs 0.118 af
Primary=1.10 cfs 0.118 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.542 af Average Runoff Depth = 1.34"
45.46% Pervious Area = 2.197 ac 54.54% Impervious Area = 2.636 ac

Subcatchment 1AS: Sub #1A

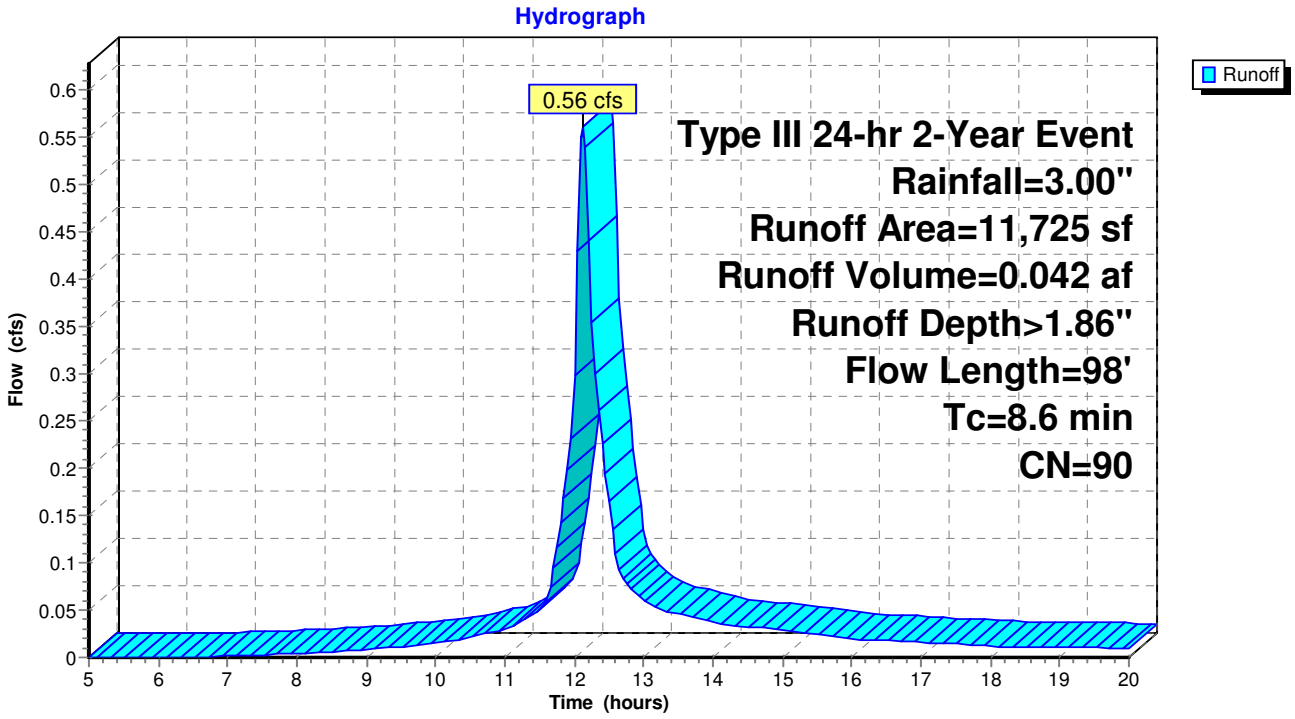
Runoff = 0.56 cfs @ 12.12 hrs, Volume= 0.042 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,225	98	Paved parking & roofs
2,500	61	>75% Grass cover, Good, HSG B
11,725	90	Weighted Average
2,500		Pervious Area
9,225		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
8.4	86	0.0233	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
8.6	98	Total			

Subcatchment 1AS: Sub #1A



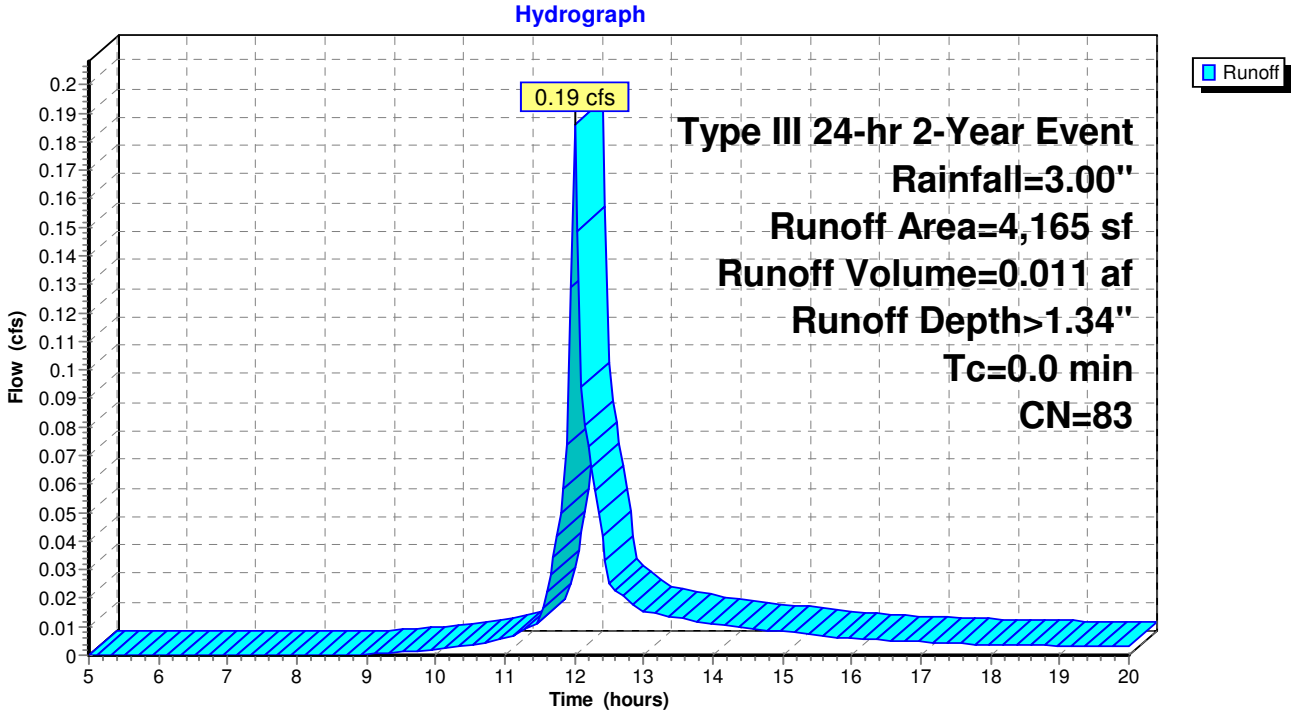
Subcatchment 1BS: Sub #1B

Runoff = 0.19 cfs @ 12.01 hrs, Volume= 0.011 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,505	98	Paved parking & roofs
1,660	61	>75% Grass cover, Good, HSG B
4,165	83	Weighted Average
1,660		Pervious Area
2,505		Impervious Area

Subcatchment 1BS: Sub #1B



Subcatchment 1CS: Sub #1C

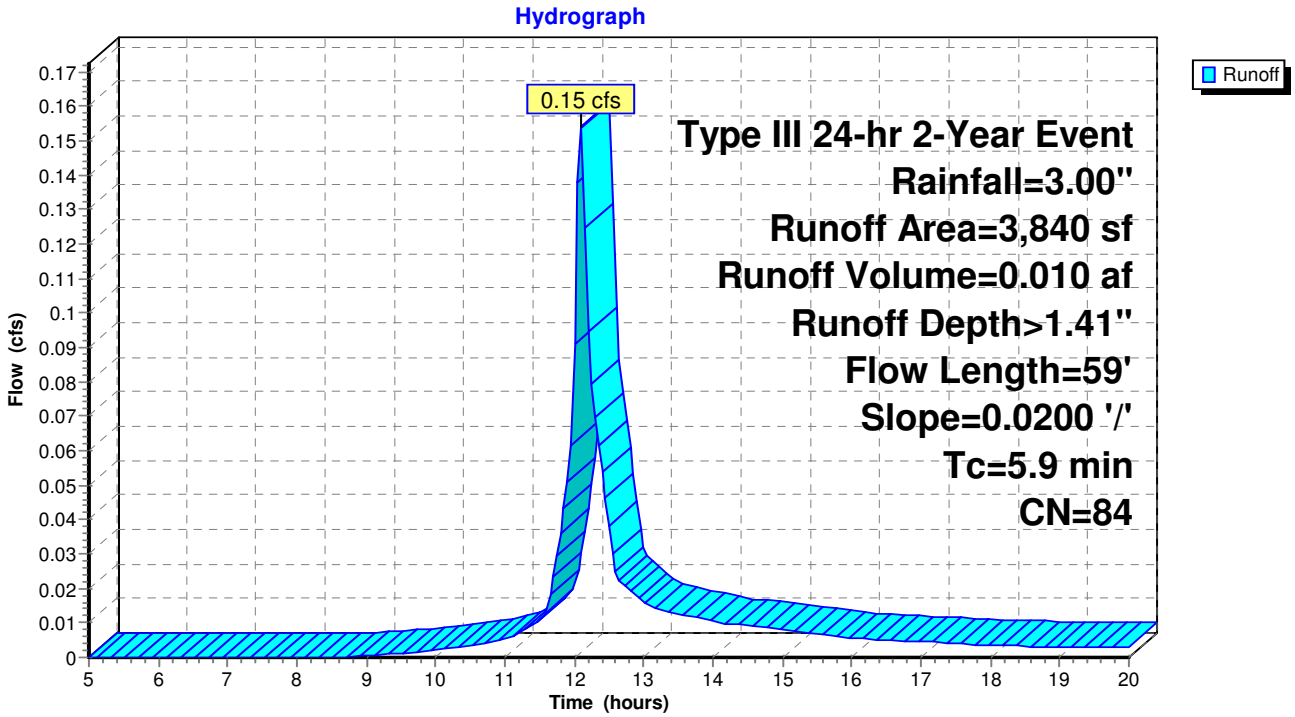
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,390	98	Paved parking & roofs
1,450	61	>75% Grass cover, Good, HSG B
3,840	84	Weighted Average
1,450		Pervious Area
2,390		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.84		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
5.7	49	0.0200	0.14		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
5.9	59	Total			

Subcatchment 1CS: Sub #1C



Subcatchment 1S: Sub #1

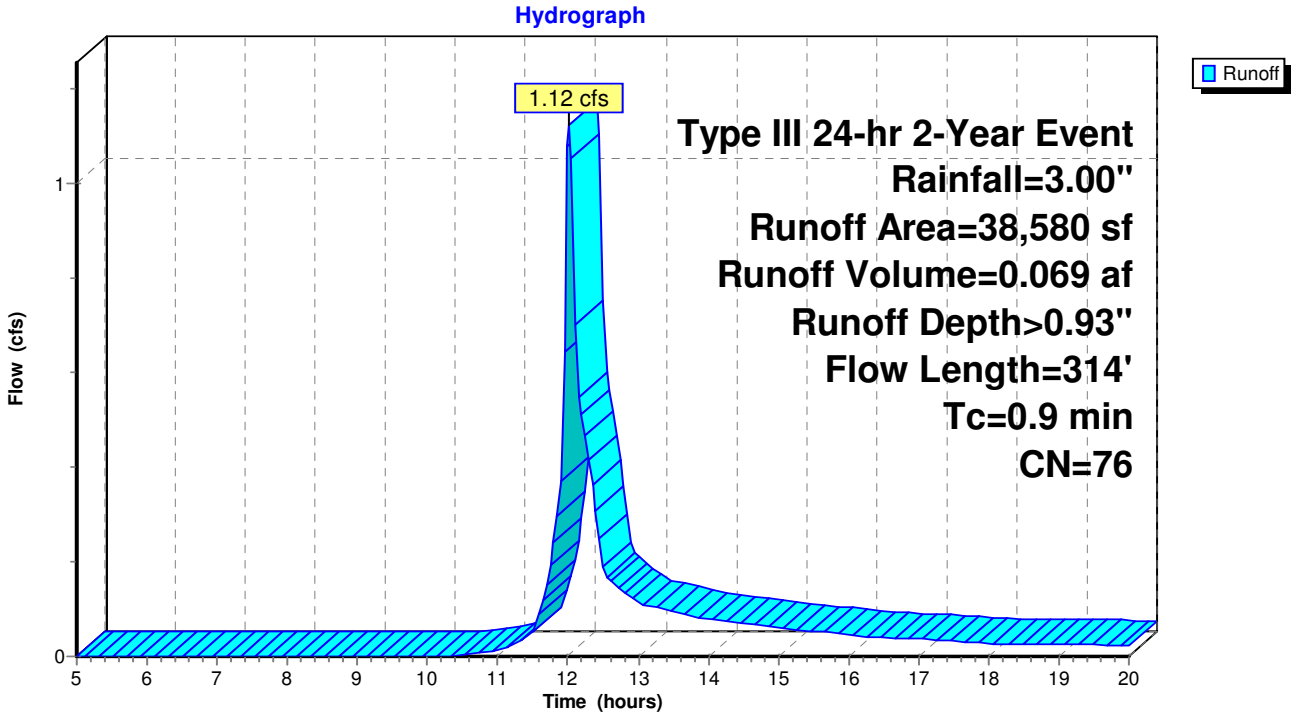
Runoff = 1.12 cfs @ 12.02 hrs, Volume= 0.069 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
16,145	98	Paved parking & roofs
16,000	61	>75% Grass cover, Good, HSG B
6,435	58	Meadow, non-grazed, HSG B
38,580	76	Weighted Average
22,435		Pervious Area
16,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	27	0.0370	3.90		**Shallow Concentrated Flow, AB** Paved Kv= 20.3 fps
0.2	50	0.0800	4.24		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.6	237	0.0649	6.40	25.58	**Channel Flow, CD** Area= 4.0 sf Perim= 7.2' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.9	314	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

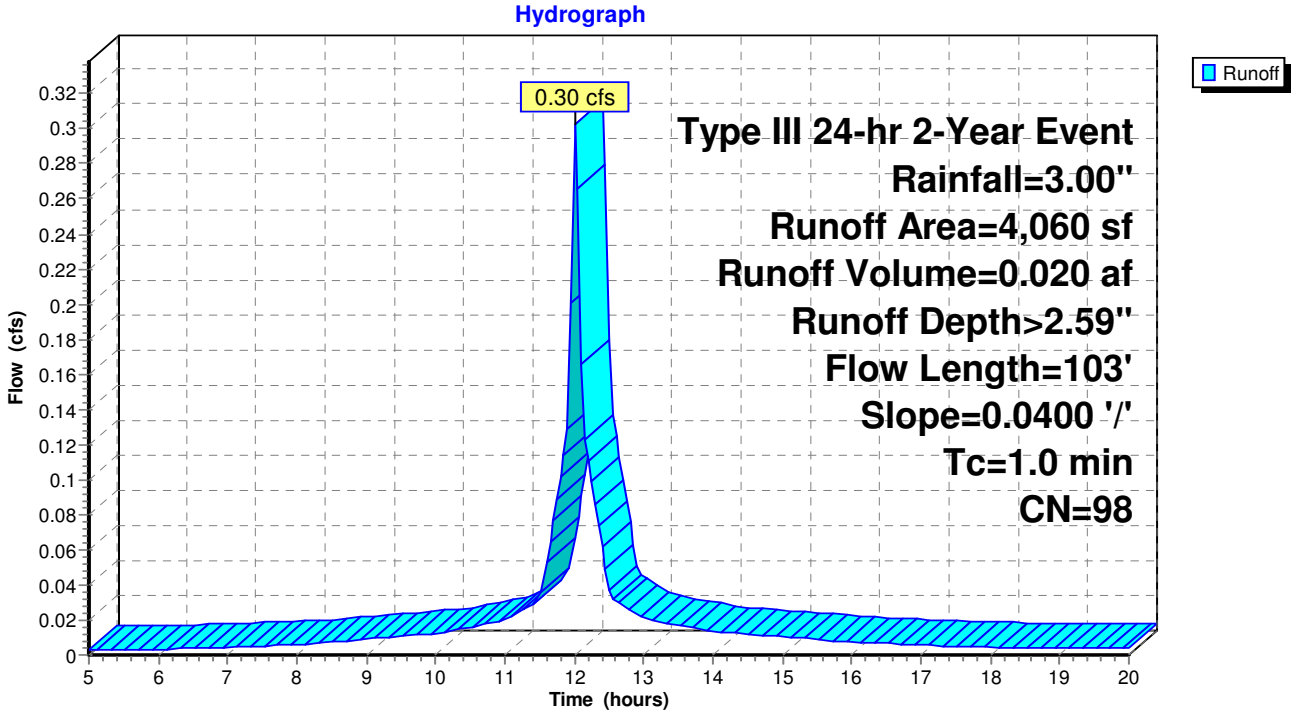
Runoff = 0.30 cfs @ 12.01 hrs, Volume= 0.020 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,060	98	Paved parking & roofs
4,060		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	103	0.0400	1.77		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

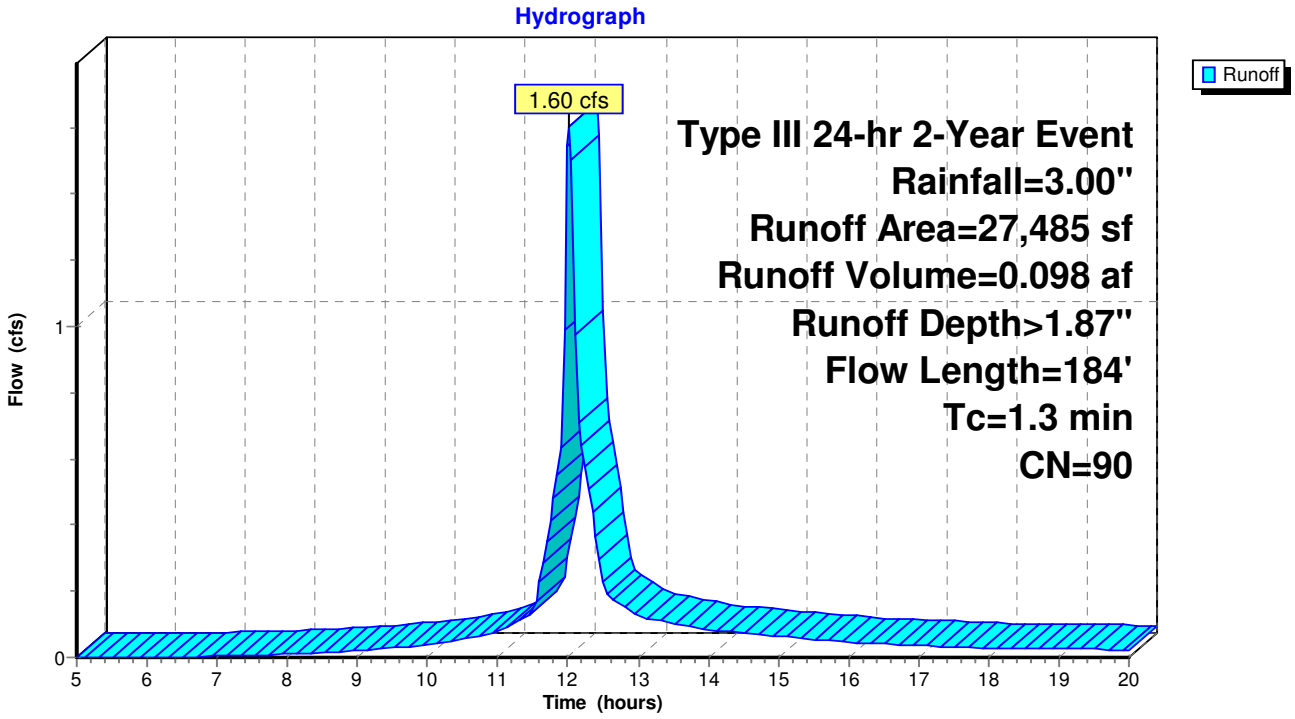
Runoff = 1.60 cfs @ 12.02 hrs, Volume= 0.098 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
21,855	98	Paved parking & roofs
5,630	61	>75% Grass cover, Good, HSG B
27,485	90	Weighted Average
5,630		Pervious Area
21,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0400	1.76		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	84	0.0250	3.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	184	Total			

Subcatchment 3S: Sub #3



Subcatchment 4S: Sub #4

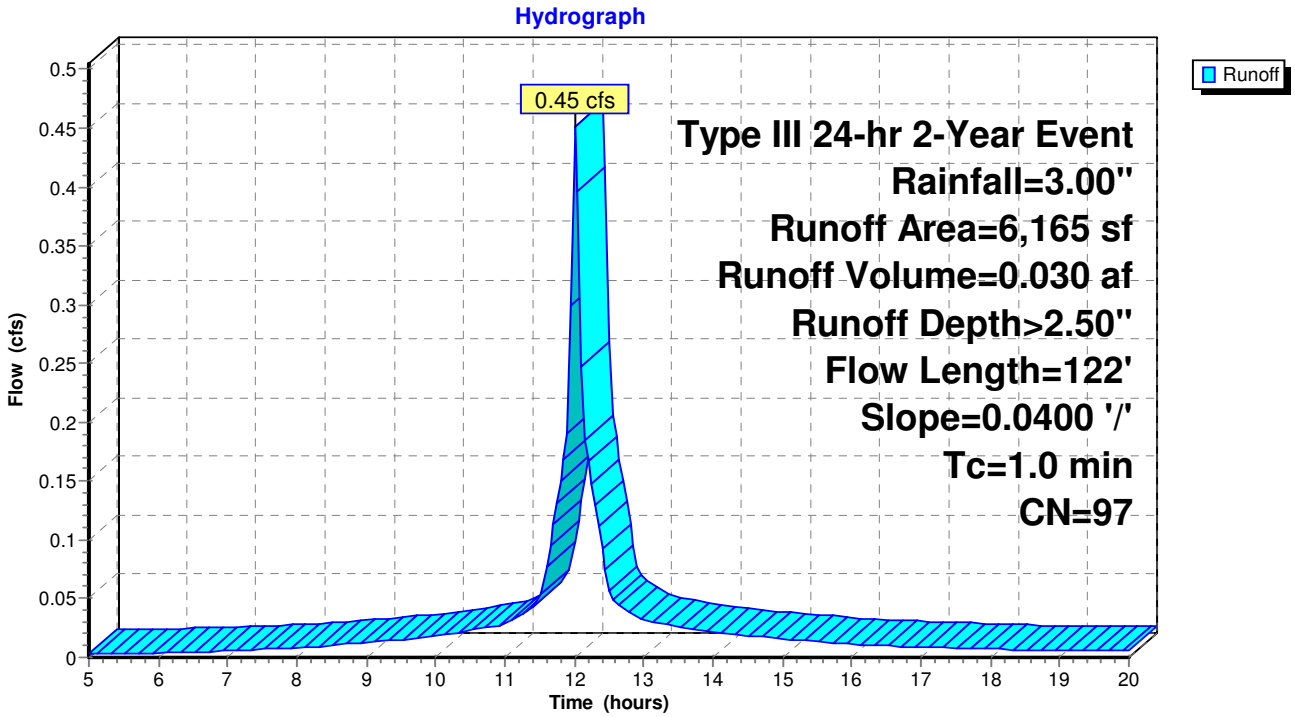
Runoff = 0.45 cfs @ 12.01 hrs, Volume= 0.030 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
5,950	98	Paved parking & roofs
215	61	>75% Grass cover, Good, HSG B
6,165	97	Weighted Average
215		Pervious Area
5,950		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	84	0.0400	1.70		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	38	0.0400	4.06		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.0	122	Total			

Subcatchment 4S: Sub #4



Subcatchment 5S: Sub #5

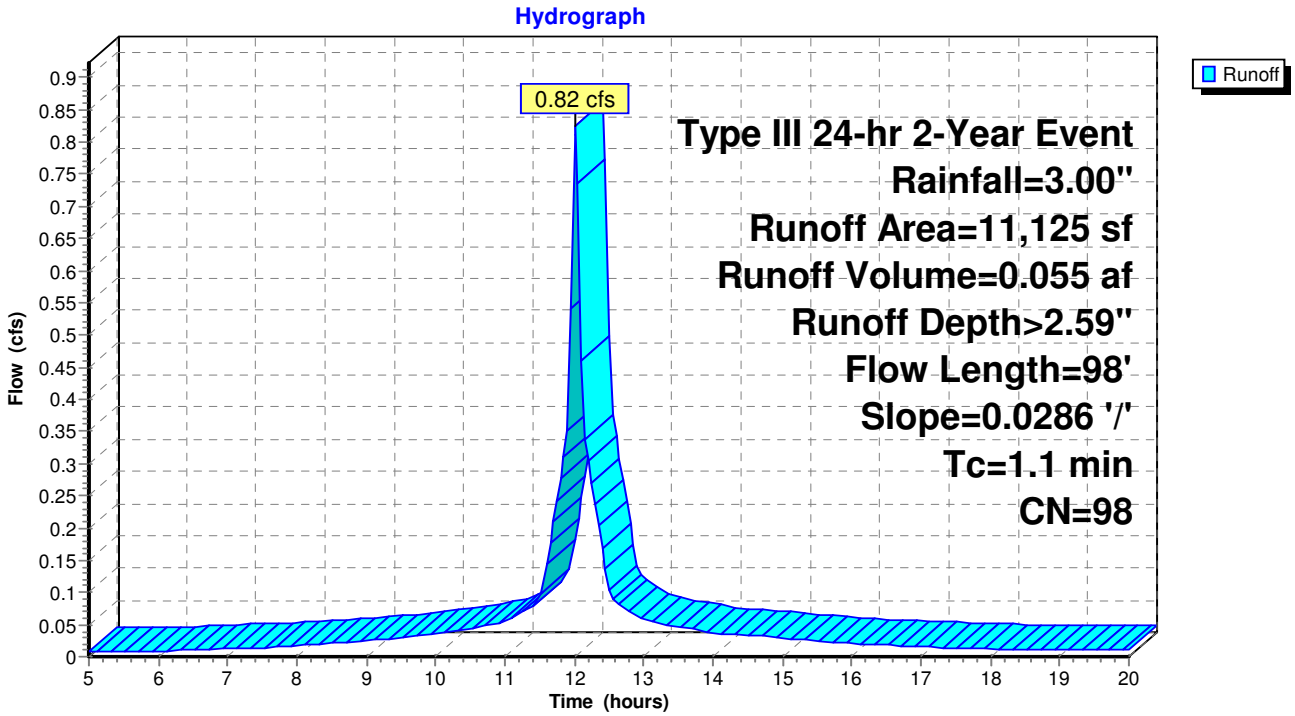
Runoff = 0.82 cfs @ 12.01 hrs, Volume= 0.055 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
10,990	98	Paved parking & roofs
135	61	>75% Grass cover, Good, HSG B
11,125	98	Weighted Average
135		Pervious Area
10,990		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	98	0.0286	1.53		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5S: Sub #5



Subcatchment 6S: Sub #6

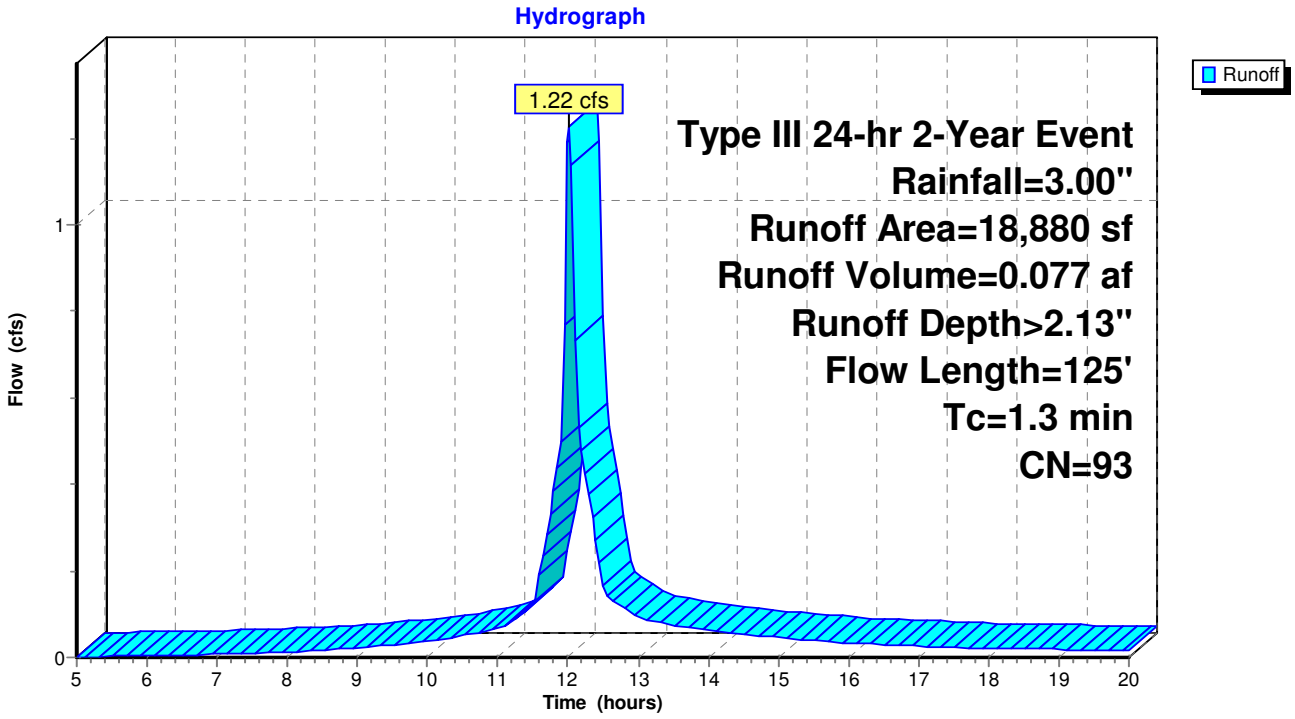
Runoff = 1.22 cfs @ 12.02 hrs, Volume= 0.077 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
16,260	98	Paved parking & roofs
2,620	61	>75% Grass cover, Good, HSG B
18,880	93	Weighted Average
2,620		Pervious Area
16,260		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0280	1.52		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment 6S: Sub #6



Subcatchment 7S: Sub #7

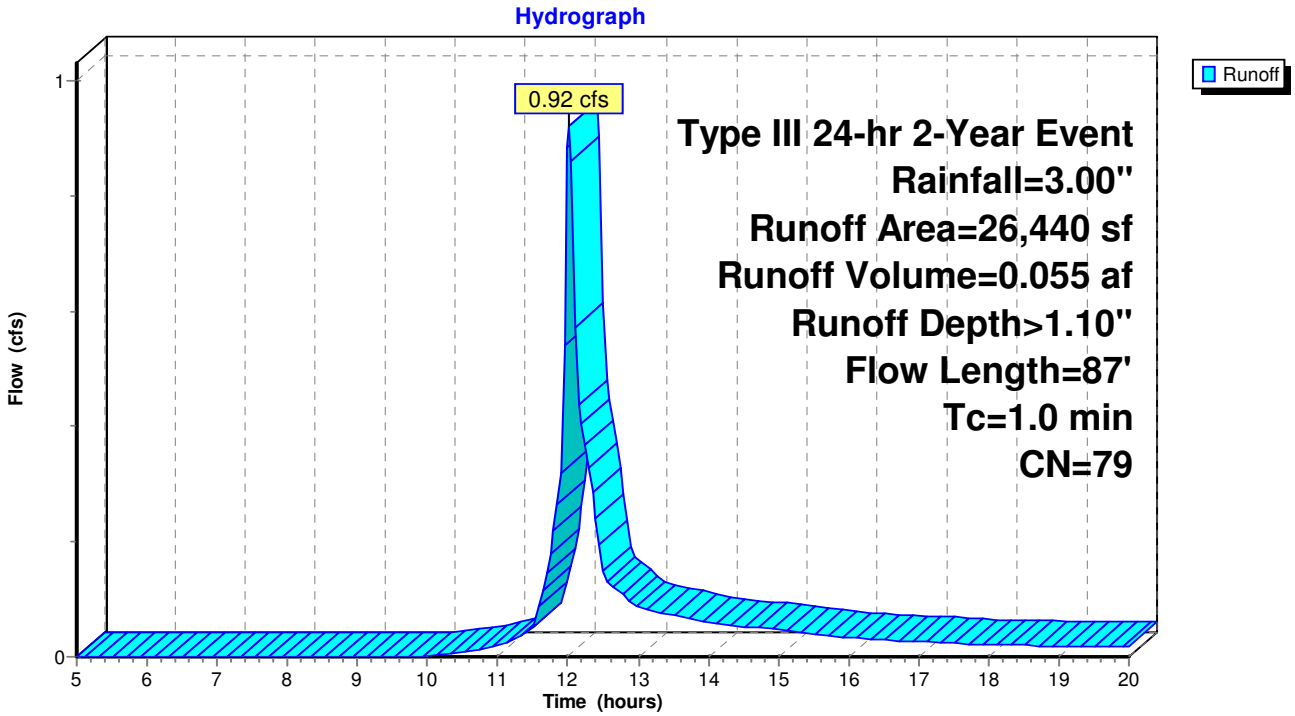
Runoff = 0.92 cfs @ 12.02 hrs, Volume= 0.055 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
13,630	98	Paved parking & roofs
2,065	61	>75% Grass cover, Good, HSG B
10,745	58	Meadow, non-grazed, HSG B
26,440	79	Weighted Average
12,810		Pervious Area
13,630		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	66	0.0227	1.29		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	21	0.0952	4.63		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
1.0	87	Total			

Subcatchment 7S: Sub #7



Subcatchment 8S: Sub #8

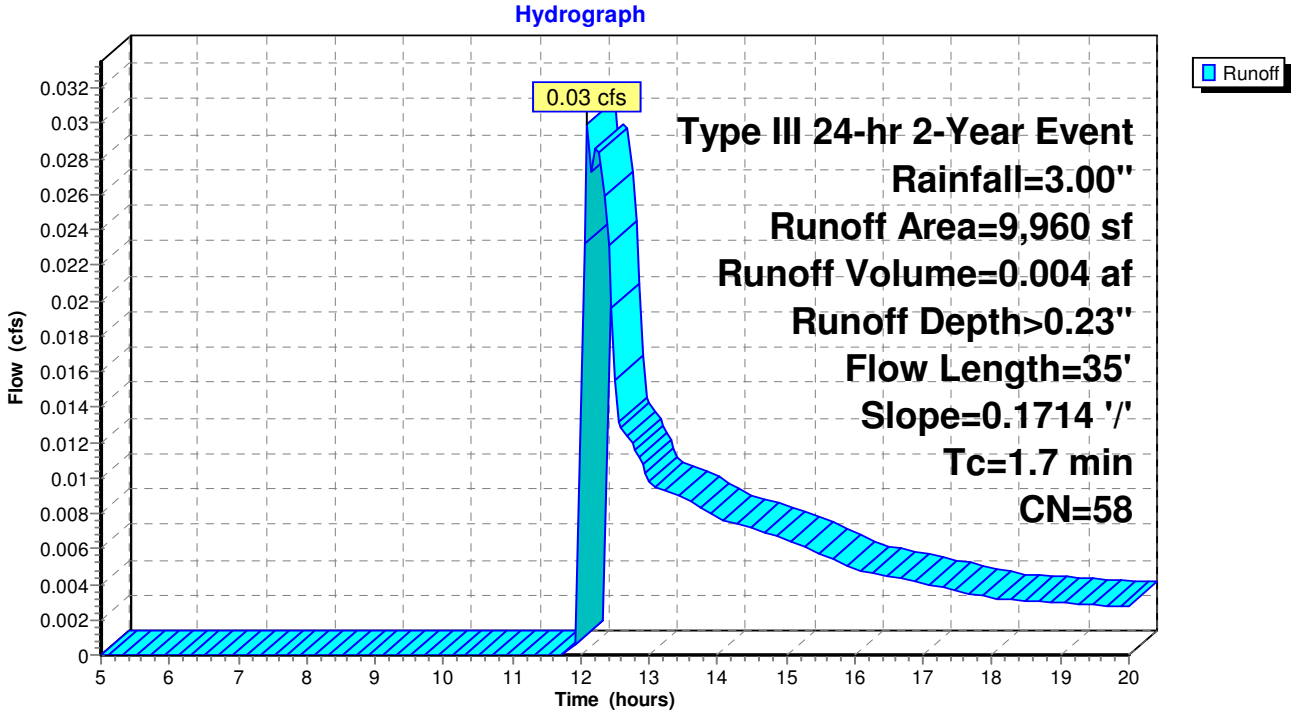
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,960	58	Meadow, non-grazed, HSG B
9,960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	35	0.1714	0.35		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 8S: Sub #8



Subcatchment 9S: Sub #9

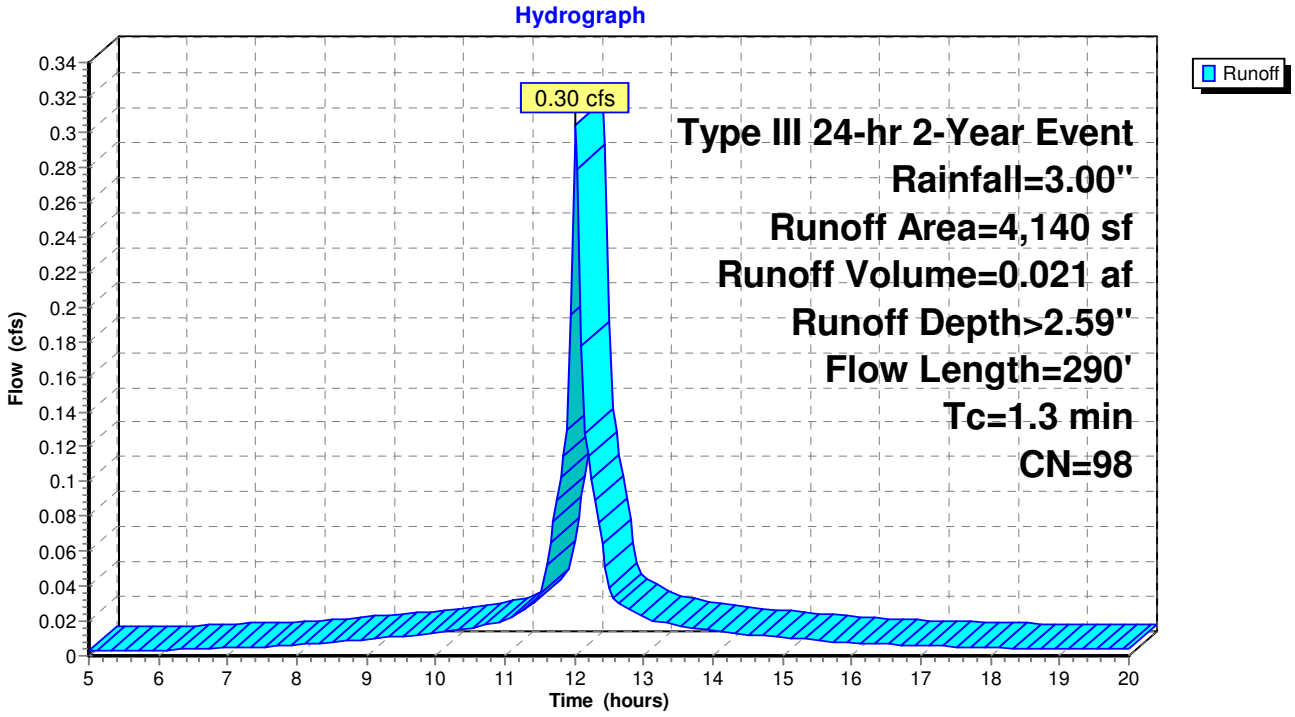
Runoff = 0.30 cfs @ 12.02 hrs, Volume= 0.021 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,140	98	Paved parking & roofs
4,140		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	190	0.0605	4.99		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	290	Total			

Subcatchment 9S: Sub #9



Subcatchment 10S: Sub #10

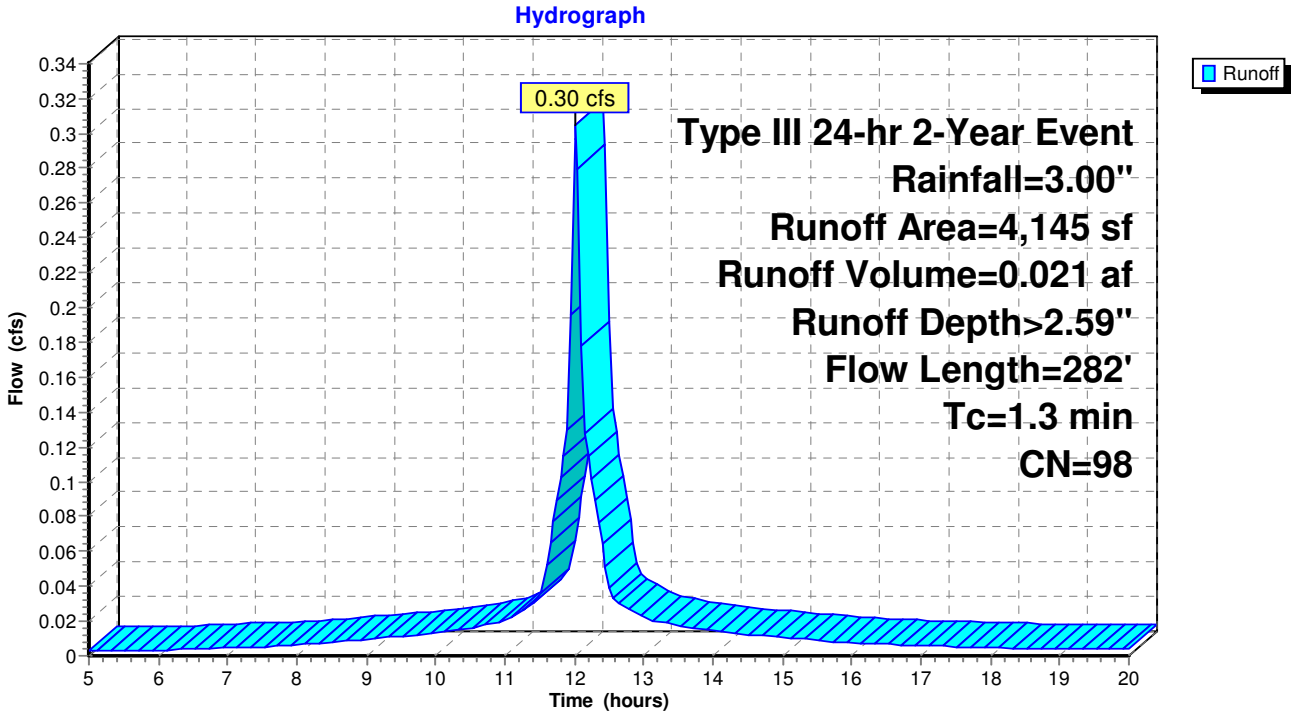
Runoff = 0.30 cfs @ 12.02 hrs, Volume= 0.021 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,145	98	Paved parking & roofs
4,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	182	0.0659	5.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	282	Total			

Subcatchment 10S: Sub #10



Subcatchment 11S: Sub #11

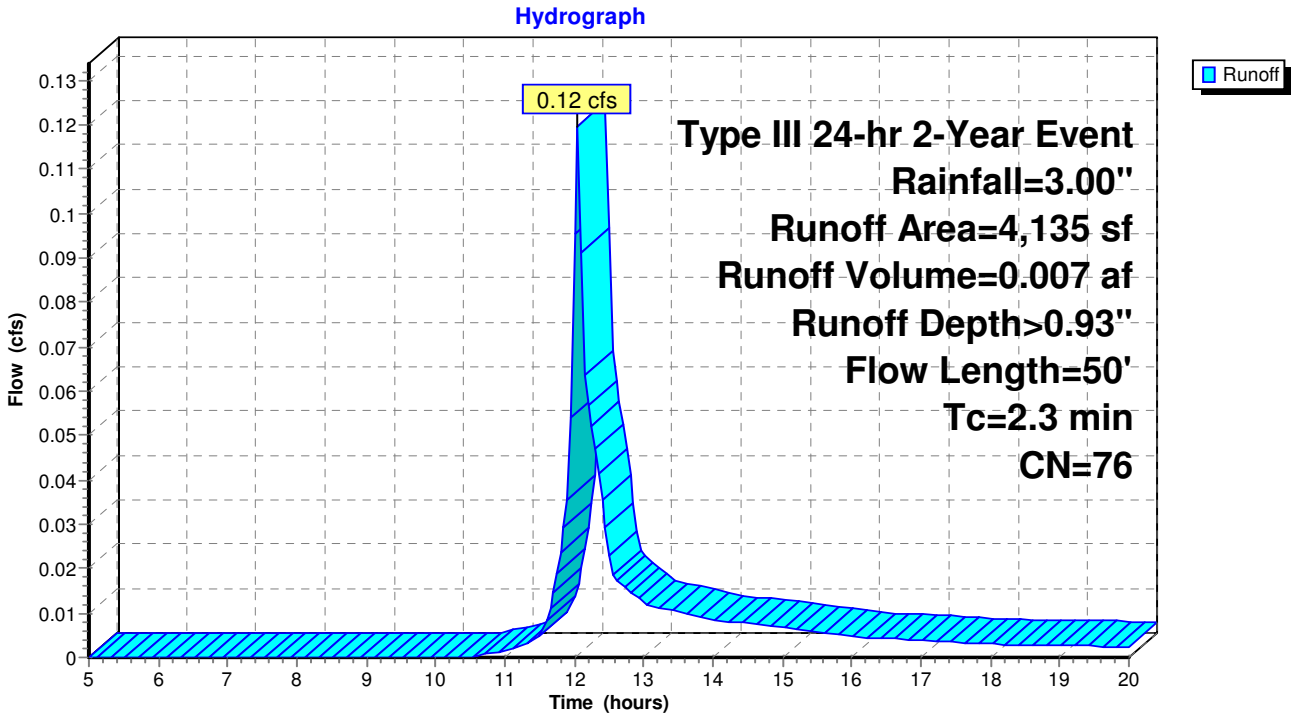
Runoff = 0.12 cfs @ 12.05 hrs, Volume= 0.007 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
1,625	98	Paved parking & roofs
2,510	61	>75% Grass cover, Good, HSG B
4,135	76	Weighted Average
2,510		Pervious Area
1,625		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.0	33	0.1212	0.27		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.3	50	Total			

Subcatchment 11S: Sub #11



Subcatchment 12S: Sub #12

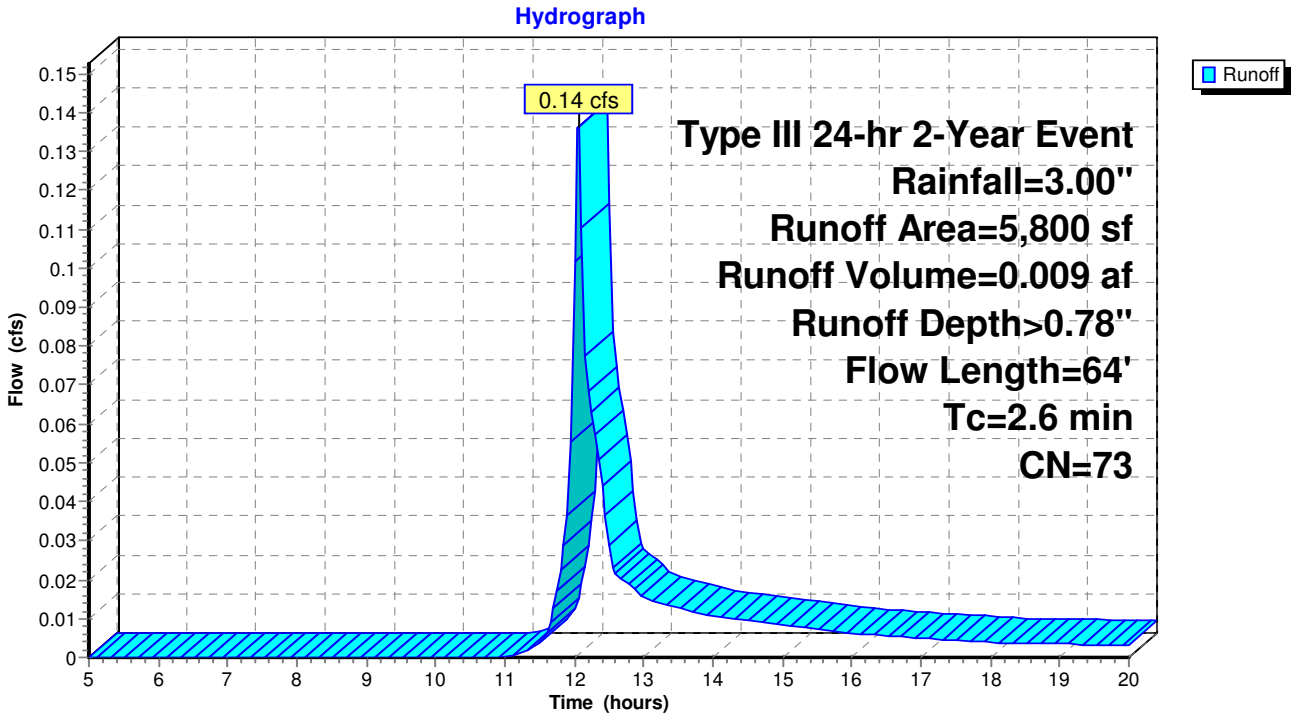
Runoff = 0.14 cfs @ 12.05 hrs, Volume= 0.009 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
1,900	98	Paved parking & roofs
3,900	61	>75% Grass cover, Good, HSG B
5,800	73	Weighted Average
3,900		Pervious Area
1,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.3	47	0.1702	0.33		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.6	64	Total			

Subcatchment 12S: Sub #12



Subcatchment 13S: Sub 13

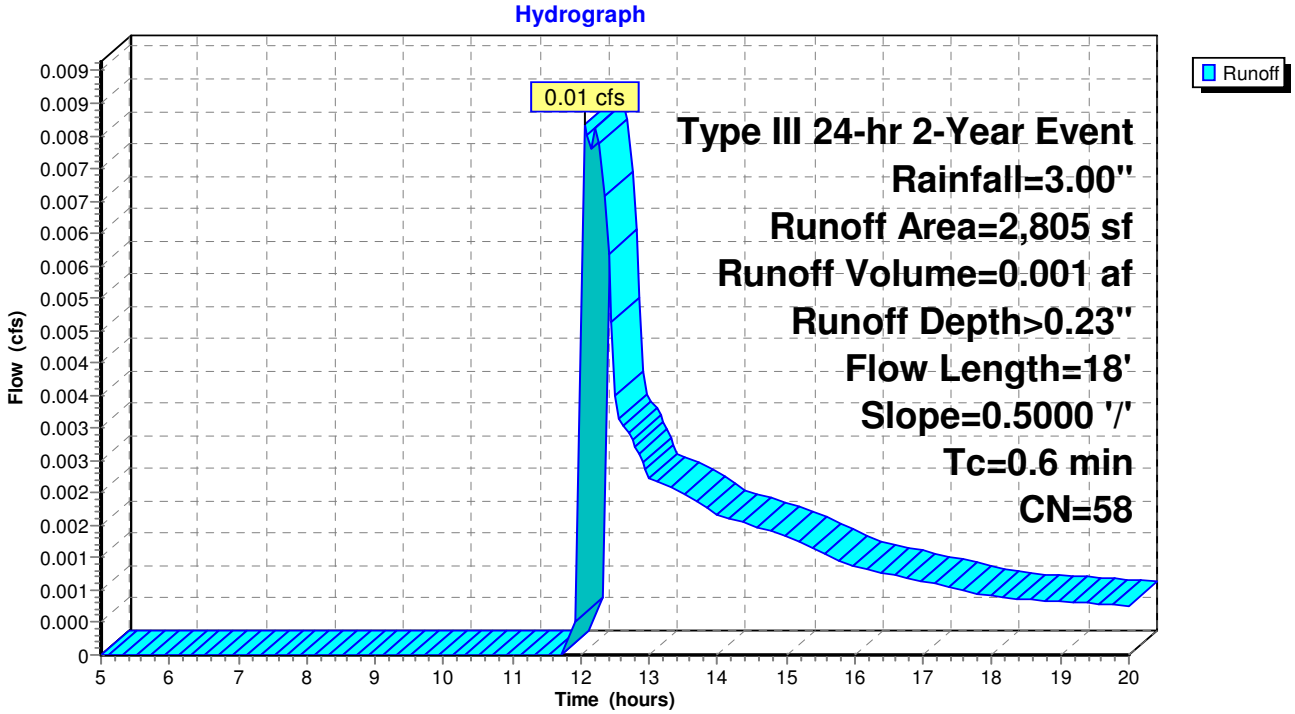
Runoff = 0.01 cfs @ 12.05 hrs, Volume= 0.001 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
2,805	58	Meadow, non-grazed, HSG B
2,805		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	18	0.5000	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 13S: Sub 13



Subcatchment 14S: Sub 14

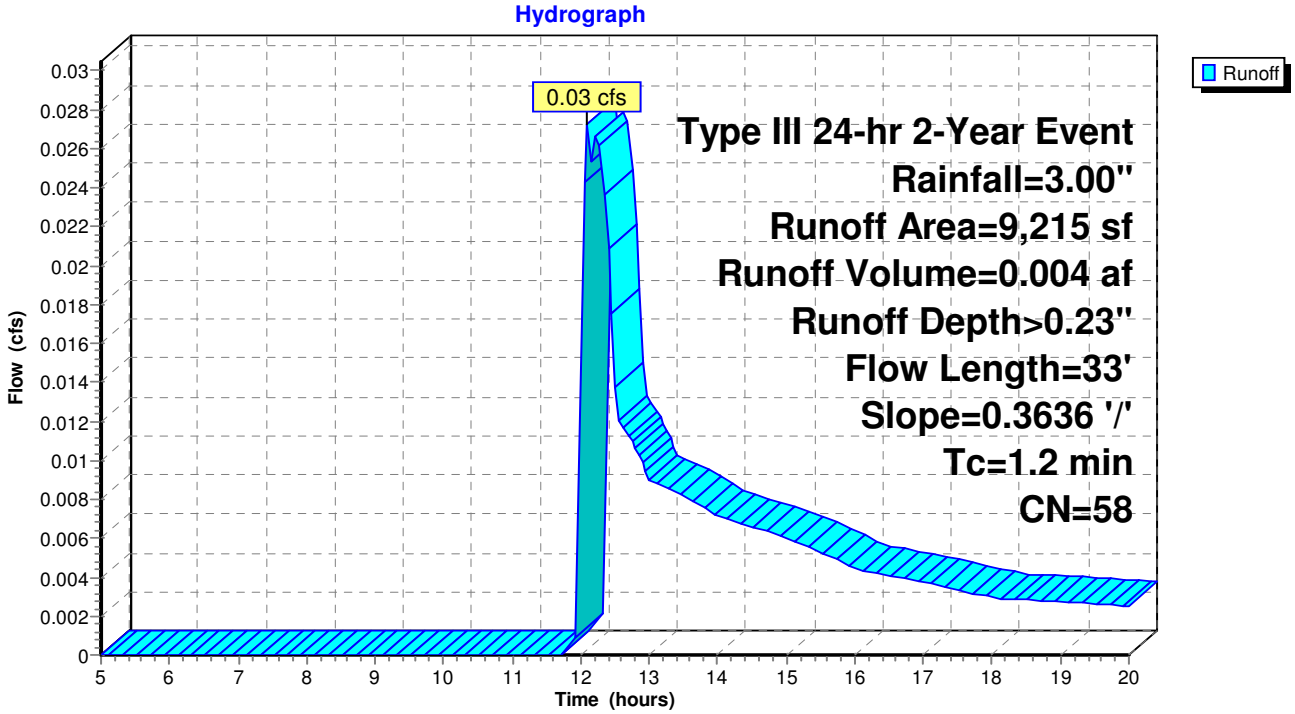
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,215	58	Meadow, non-grazed, HSG B
9,215		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	33	0.3636	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 14S: Sub 14



Subcatchment 15S: Sub 15

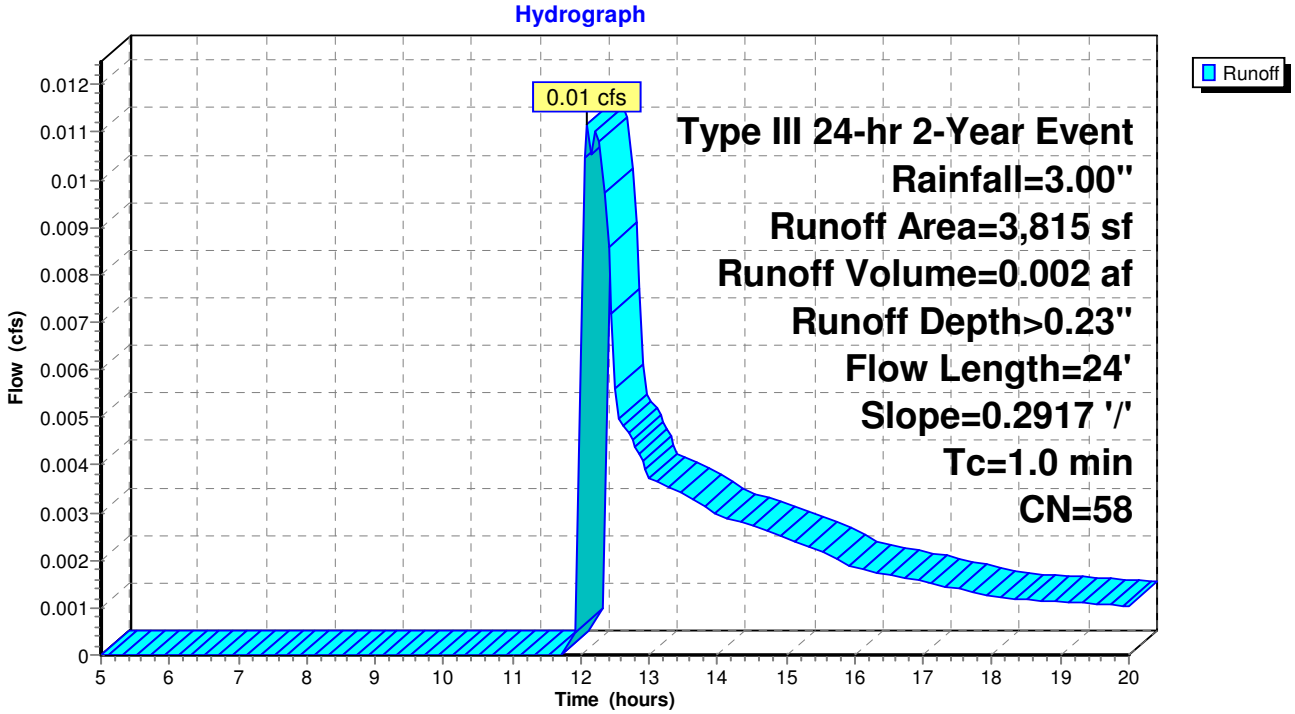
Runoff = 0.01 cfs @ 12.10 hrs, Volume= 0.002 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
3,815	58	Meadow, non-grazed, HSG B
3,815		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	24	0.2917	0.41		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 15S: Sub 15



Subcatchment 16S: Sub 16

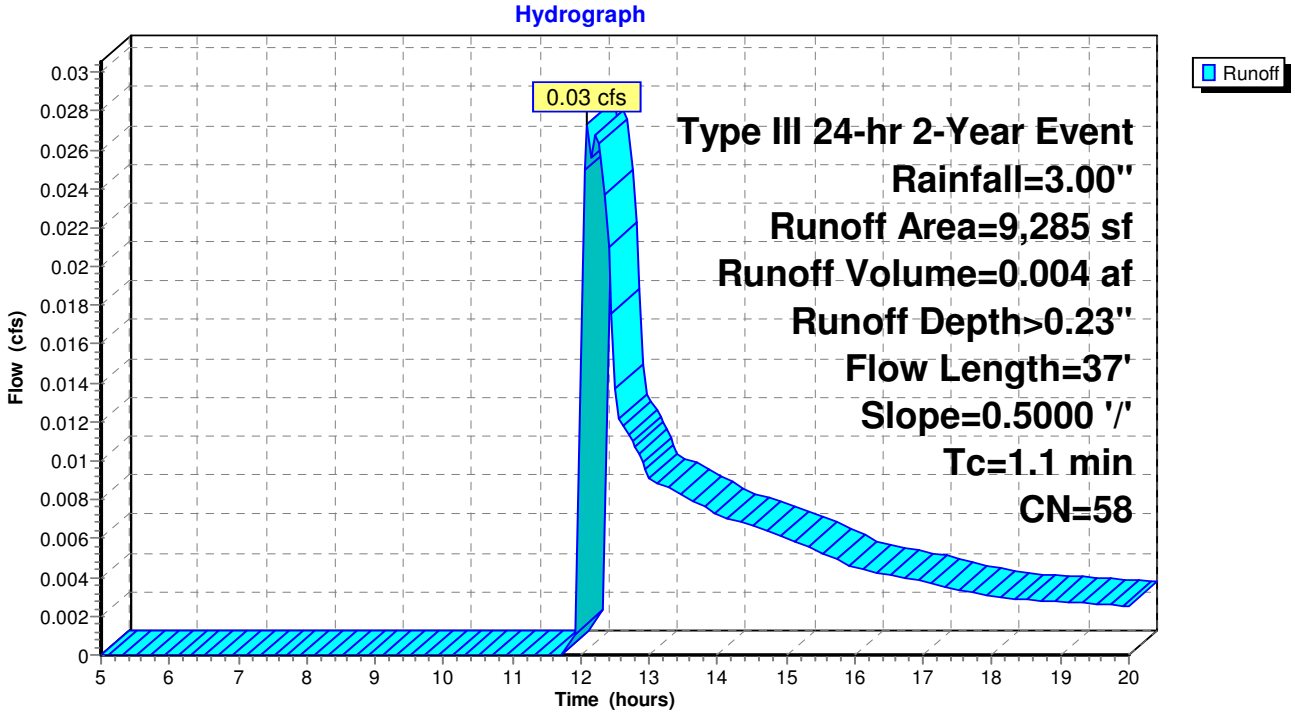
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.004 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
9,285	58	Meadow, non-grazed, HSG B
9,285		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	37	0.5000	0.55		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 16S: Sub 16



Subcatchment 17S: Sub #17

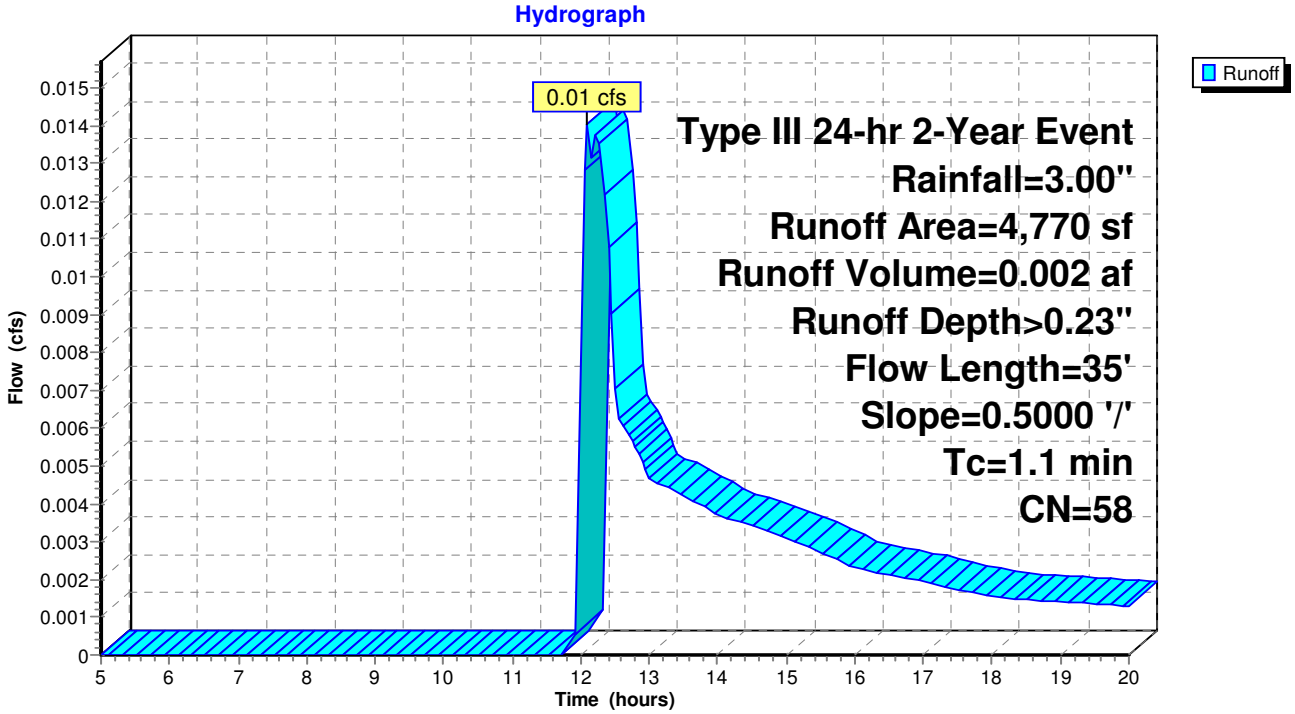
Runoff = 0.01 cfs @ 12.10 hrs, Volume= 0.002 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
4,770	58	Meadow, non-grazed, HSG B
4,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	35	0.5000	0.54		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 17S: Sub #17



Pond 1: CB1

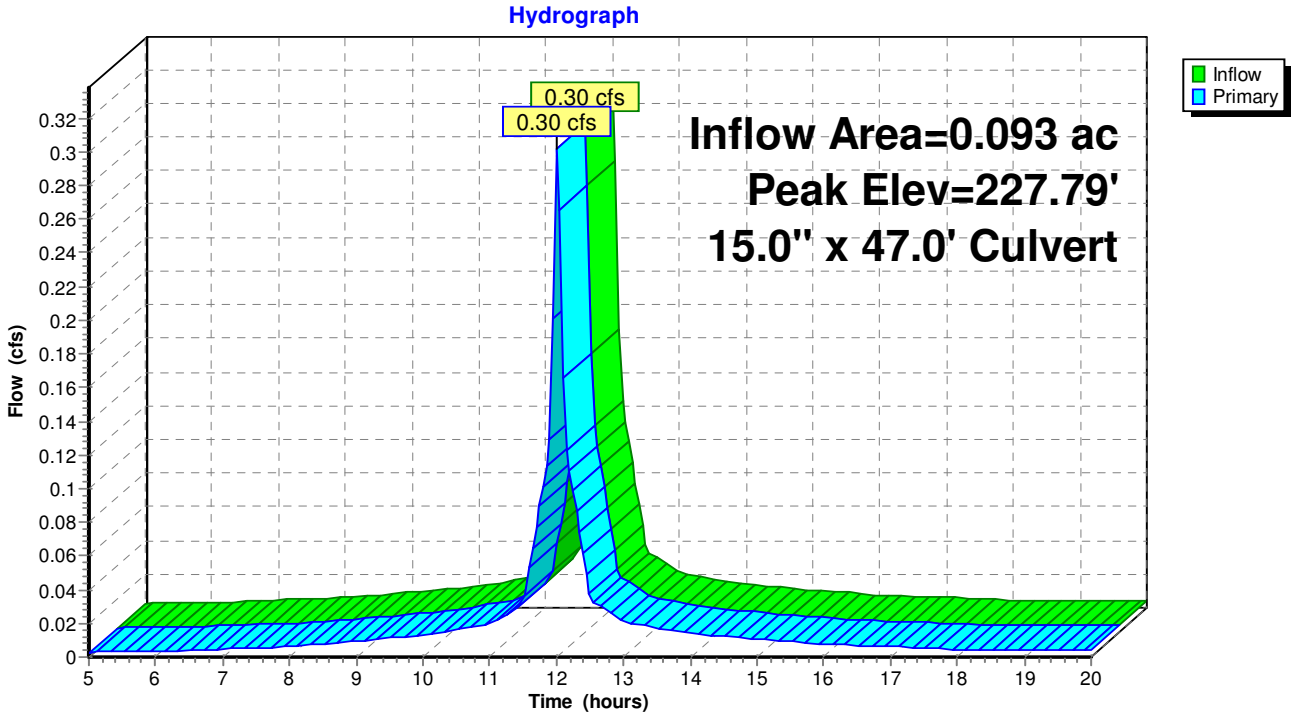
Inflow Area =	0.093 ac,	Inflow Depth >	2.59"	for	2-Year Event event
Inflow =	0.30 cfs @	12.01 hrs,	Volume=	0.020 af	
Outflow =	0.30 cfs @	12.01 hrs,	Volume=	0.020 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.30 cfs @	12.01 hrs,	Volume=	0.020 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.79' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.50'	**15.0" x 47.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.29 cfs @ 12.01 hrs HW=227.78' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.29 cfs @ 1.42 fps)

Pond 1: CB1



Pond 1P: Filter Pond #1

Inflow Area = 1.432 ac, Inflow Depth > 1.27" for 2-Year Event event
Inflow = 2.06 cfs @ 12.03 hrs, Volume= 0.152 af
Outflow = 0.07 cfs @ 16.96 hrs, Volume= 0.026 af, Atten= 97%, Lag= 295.7 min
Primary = 0.07 cfs @ 16.96 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 212.68' @ 16.96 hrs Surf.Area= 3,934 sf Storage= 5,560 cf

Plug-Flow detention time= 384.7 min calculated for 0.026 af (17% of inflow)
Center-of-Mass det. time= 251.2 min (1,041.7 - 790.5)

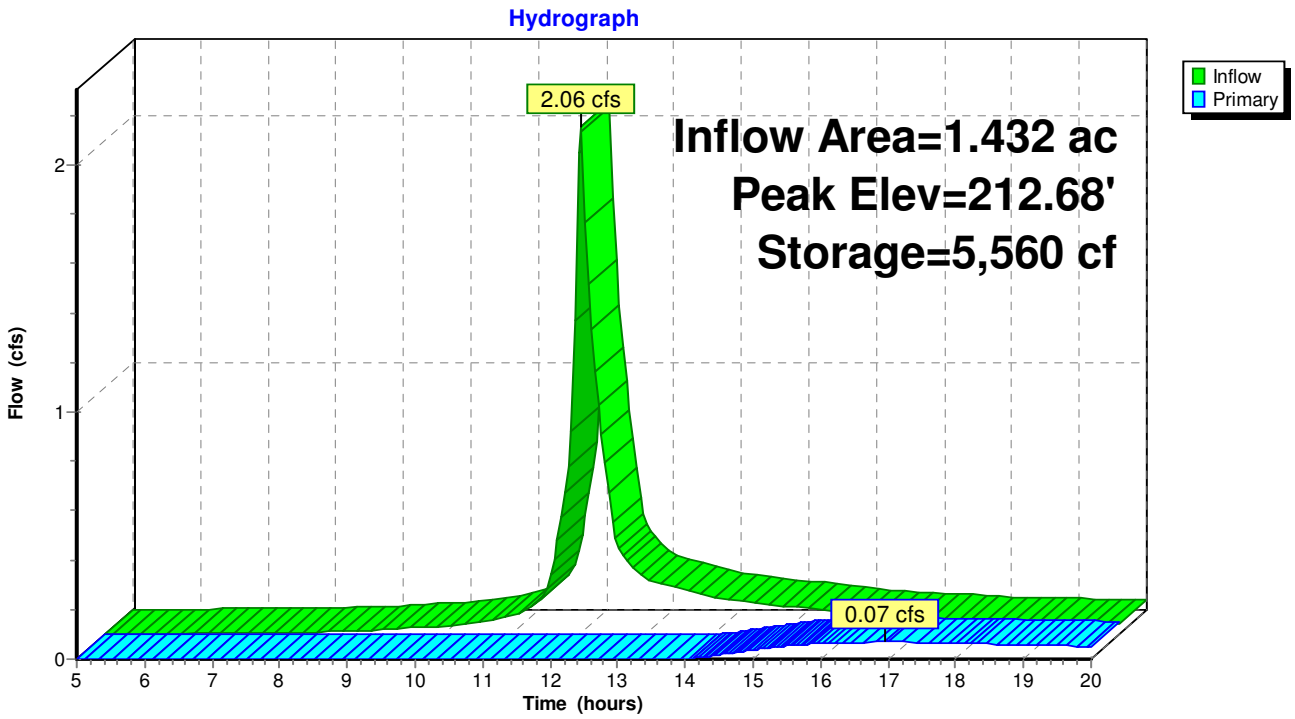
Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	16,887 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	2,725	0	0	2,725
212.00	3,425	3,068	3,068	3,452
212.50	3,800	1,805	4,874	3,842
213.00	4,185	1,995	6,869	4,243
214.00	5,000	4,586	11,456	5,092
215.00	5,875	5,432	16,887	6,006

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**15.0" x 30.5' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 208.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	212.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	213.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.07 cfs @ 16.96 hrs HW=212.68' (Free Discharge)
└─**1=Culvert** (Passes 0.07 cfs of 8.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.43 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Filter Pond #1



Pond 2: CB2

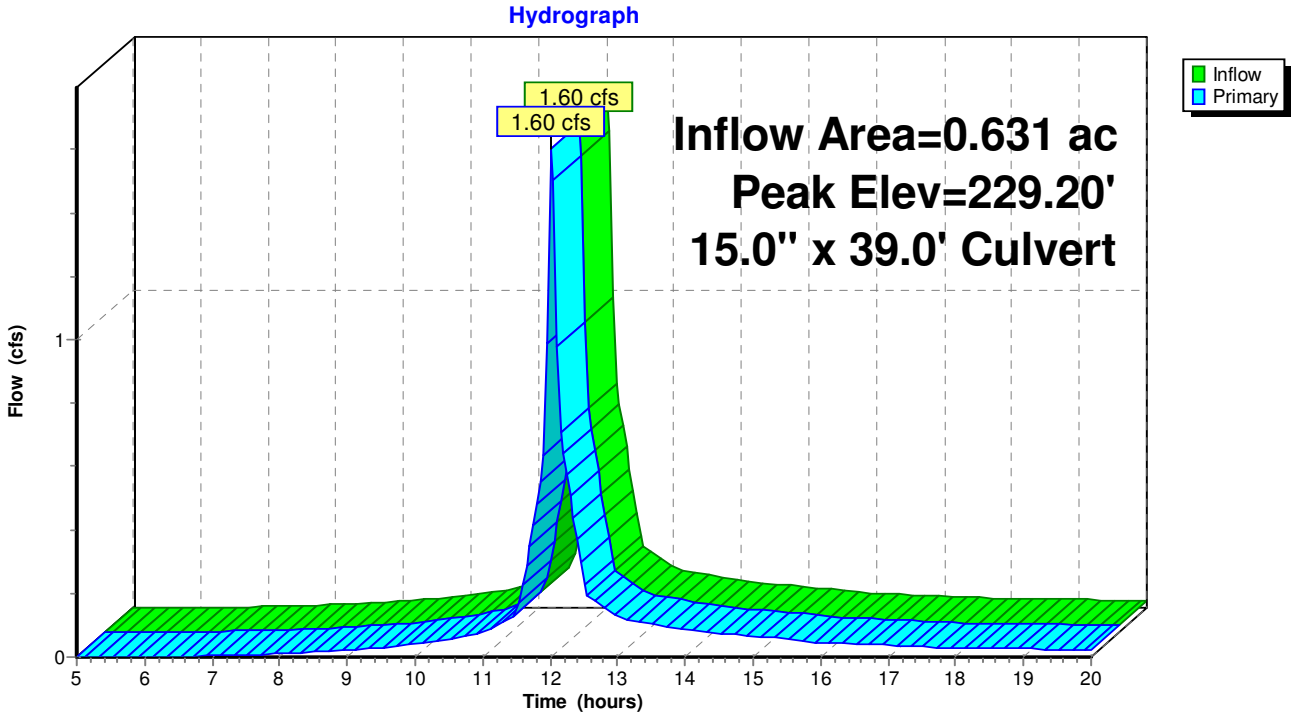
Inflow Area =	0.631 ac,	Inflow Depth >	1.87"	for	2-Year Event event
Inflow =	1.60 cfs @	12.02 hrs,	Volume=	0.098 af	
Outflow =	1.60 cfs @	12.02 hrs,	Volume=	0.098 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.60 cfs @	12.02 hrs,	Volume=	0.098 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.20' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**15.0" x 39.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0128 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.53 cfs @ 12.02 hrs HW=229.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.53 cfs @ 2.22 fps)

Pond 2: CB2



Pond 2P: Filter Pond #2

Inflow Area =	1.690 ac,	Inflow Depth >	1.88"	for	2-Year Event event
Inflow =	4.10 cfs @	12.02 hrs,	Volume=	0.264 af	
Outflow =	0.29 cfs @	13.19 hrs,	Volume=	0.118 af,	Atten= 93%, Lag= 70.2 min
Primary =	0.29 cfs @	13.19 hrs,	Volume=	0.118 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.40' @ 13.19 hrs Surf.Area= 5,462 sf Storage= 7,572 cf

Plug-Flow detention time= 250.6 min calculated for 0.118 af (45% of inflow)
Center-of-Mass det. time= 155.8 min (915.5 - 759.6)

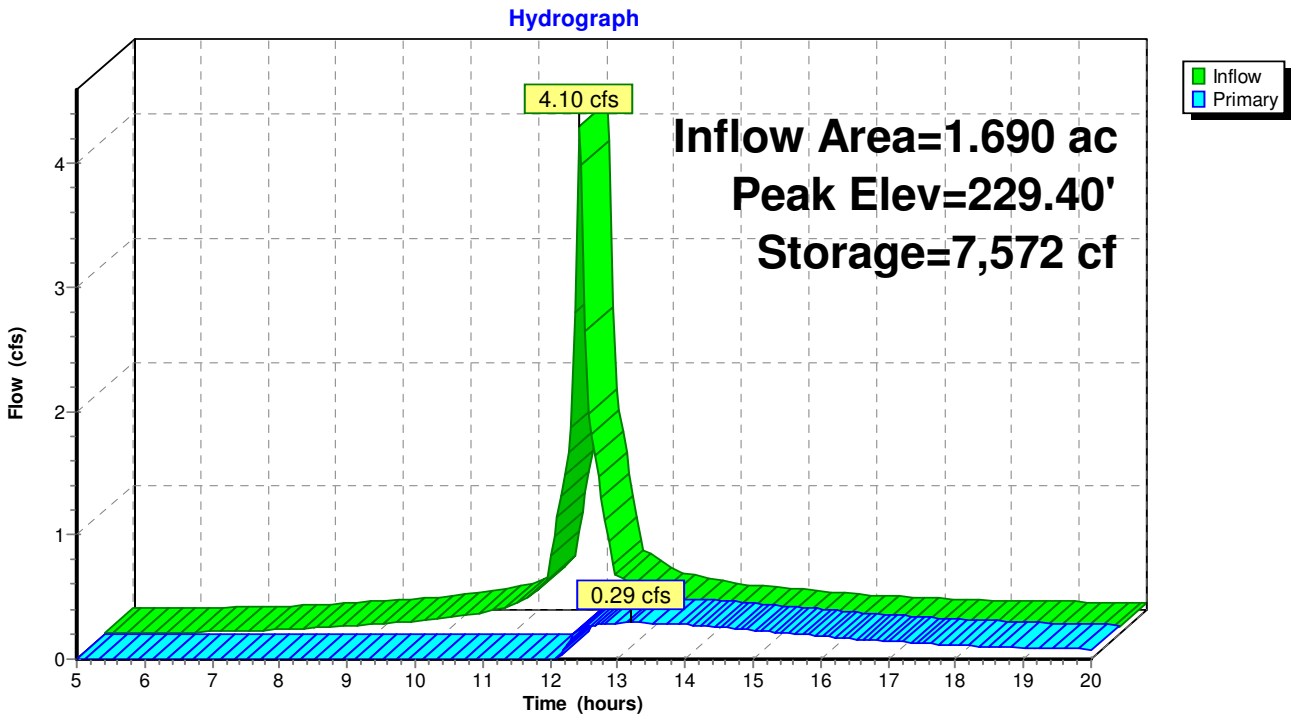
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	14,679 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
227.50	2,550	0	0	2,550
228.00	3,290	1,456	1,456	3,296
229.00	4,840	4,040	5,496	4,862
230.00	6,450	5,626	11,122	6,494
230.50	7,800	3,557	14,679	7,852

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**15.0" x 23.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 223.00' S= 0.0870 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	229.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	229.50'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.29 cfs @ 13.19 hrs HW=229.40' (Free Discharge)
└─**1=Culvert** (Passes 0.29 cfs of 9.07 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 2.16 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Filter Pond #2



Pond 3: CB3

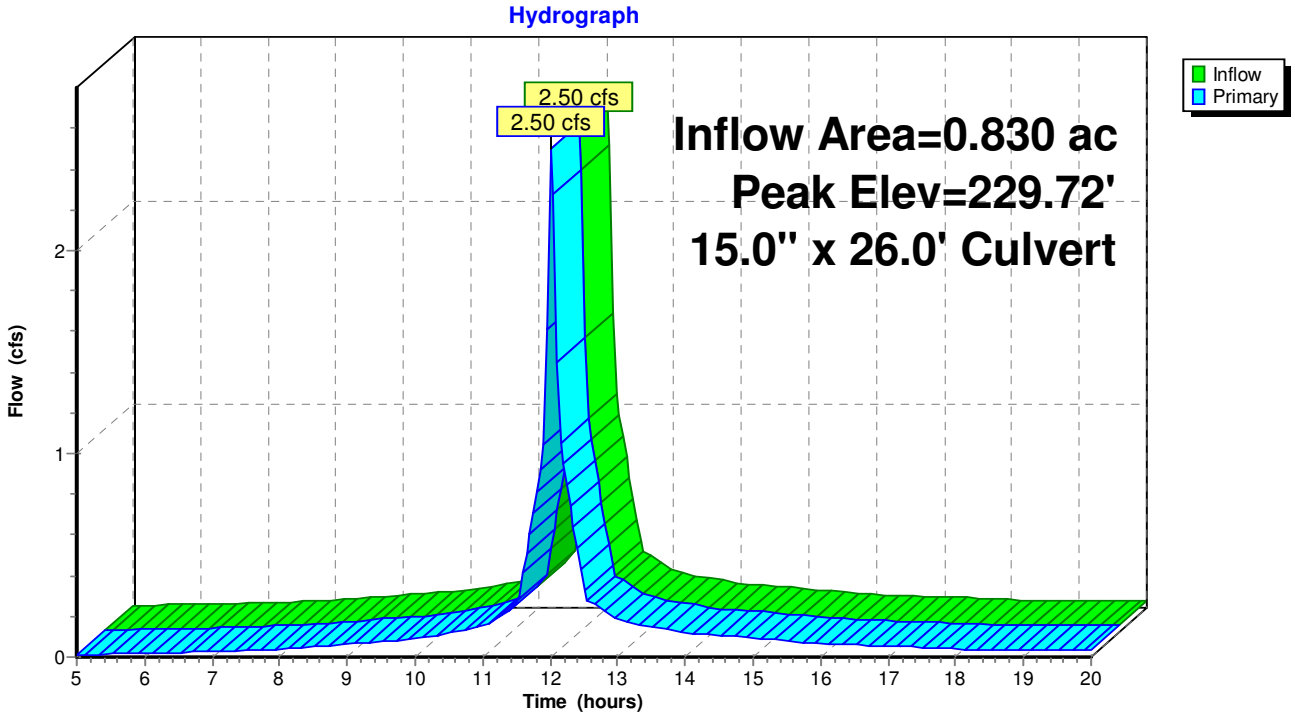
Inflow Area =	0.830 ac,	Inflow Depth >	2.34"	for	2-Year Event event
Inflow =	2.50 cfs @	12.02 hrs,	Volume=	0.162 af	
Outflow =	2.50 cfs @	12.02 hrs,	Volume=	0.162 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.50 cfs @	12.02 hrs,	Volume=	0.162 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.72' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.80'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0308 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.39 cfs @ 12.02 hrs HW=229.69' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.39 cfs @ 2.54 fps)

Pond 3: CB3



Pond 3P: Filter Pond #3

Inflow Area = 0.607 ac, Inflow Depth > 1.10" for 2-Year Event event
Inflow = 0.92 cfs @ 12.02 hrs, Volume= 0.055 af
Outflow = 0.24 cfs @ 12.40 hrs, Volume= 0.055 af, Atten= 74%, Lag= 22.9 min
Primary = 0.24 cfs @ 12.40 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 235.00' @ 12.40 hrs Surf.Area= 1,227 sf Storage= 498 cf

Plug-Flow detention time= 12.1 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 11.9 min (816.9 - 805.0)

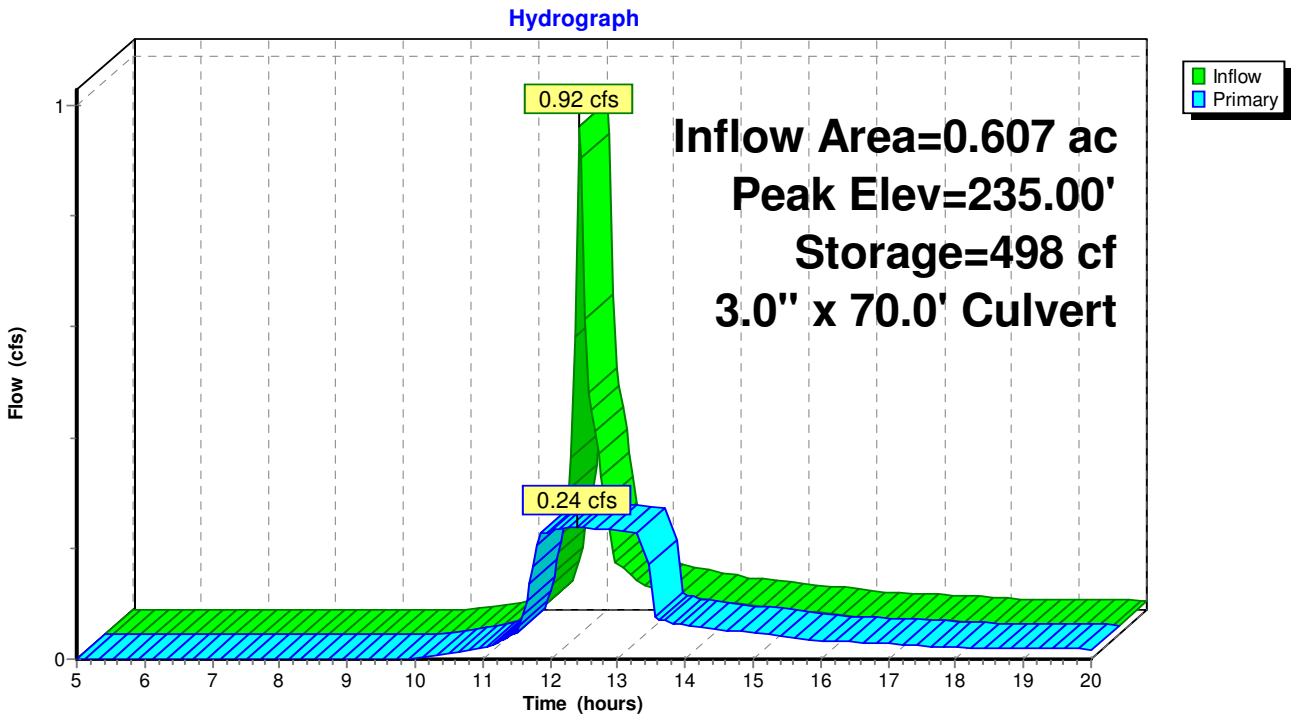
Volume	Invert	Avail.Storage	Storage Description
#1	234.50'	2,272 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
234.50	790	0	0	790
235.00	1,230	501	501	1,234
236.00	2,375	1,771	2,272	2,388

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	**3.0" x 70.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 229.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.24 cfs @ 12.40 hrs HW=235.00' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.24 cfs @ 4.83 fps)

Pond 3P: Filter Pond #3



Pond 4: CB4

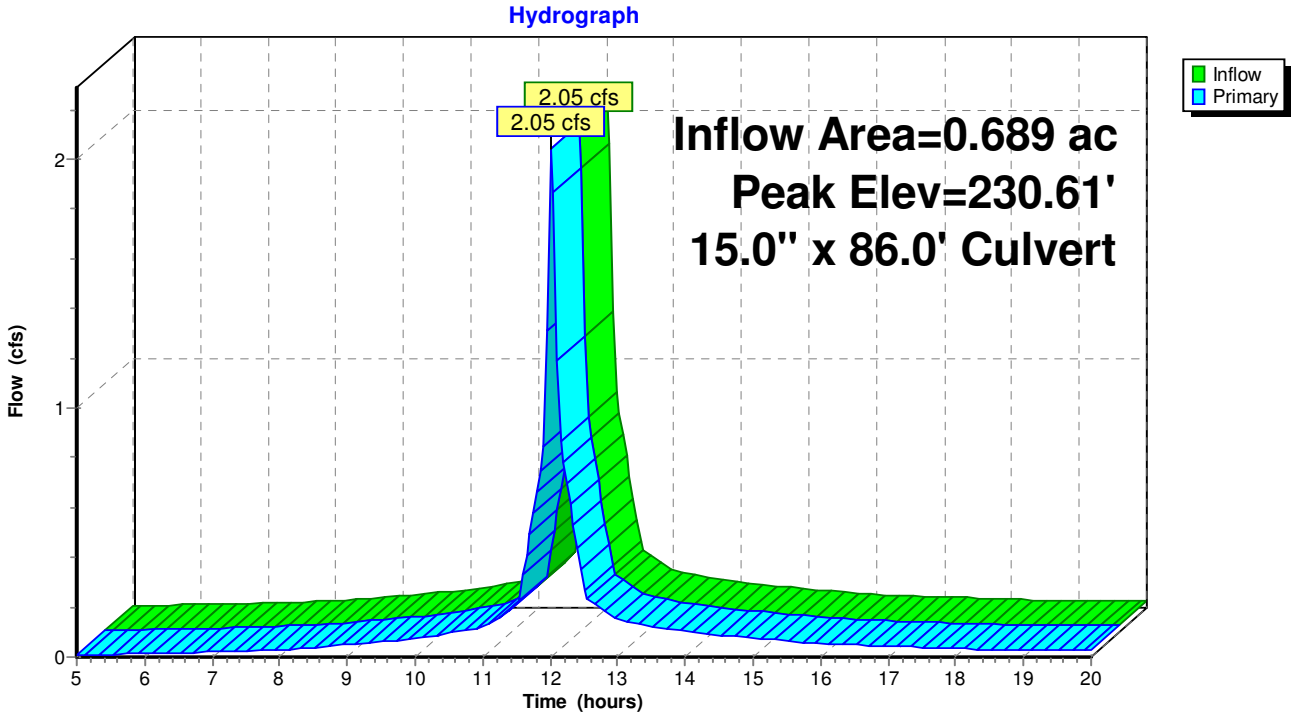
Inflow Area = 0.689 ac, Inflow Depth > 2.30" for 2-Year Event event
Inflow = 2.05 cfs @ 12.02 hrs, Volume= 0.132 af
Outflow = 2.05 cfs @ 12.02 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Primary = 2.05 cfs @ 12.02 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.61' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.90'	**15.0" x 86.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.00' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.95 cfs @ 12.02 hrs HW=230.59' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.95 cfs @ 2.82 fps)

Pond 4: CB4



Pond 5: CB5

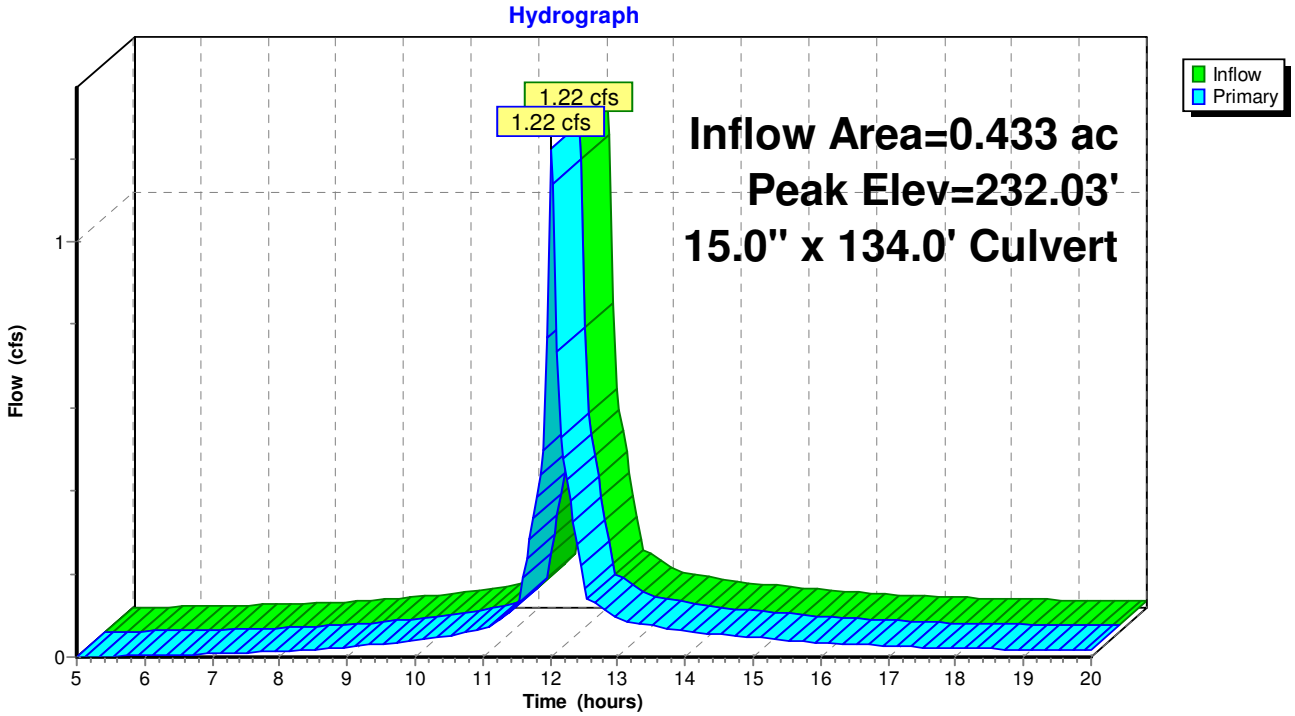
Inflow Area =	0.433 ac,	Inflow Depth >	2.13"	for	2-Year Event event
Inflow =	1.22 cfs @	12.02 hrs,	Volume=	0.077 af	
Outflow =	1.22 cfs @	12.02 hrs,	Volume=	0.077 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.22 cfs @	12.02 hrs,	Volume=	0.077 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 232.03' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	231.50'	**15.0" x 134.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 230.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.17 cfs @ 12.02 hrs HW=232.02' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.17 cfs @ 2.44 fps)

Pond 5: CB5



Pond 6: CB6

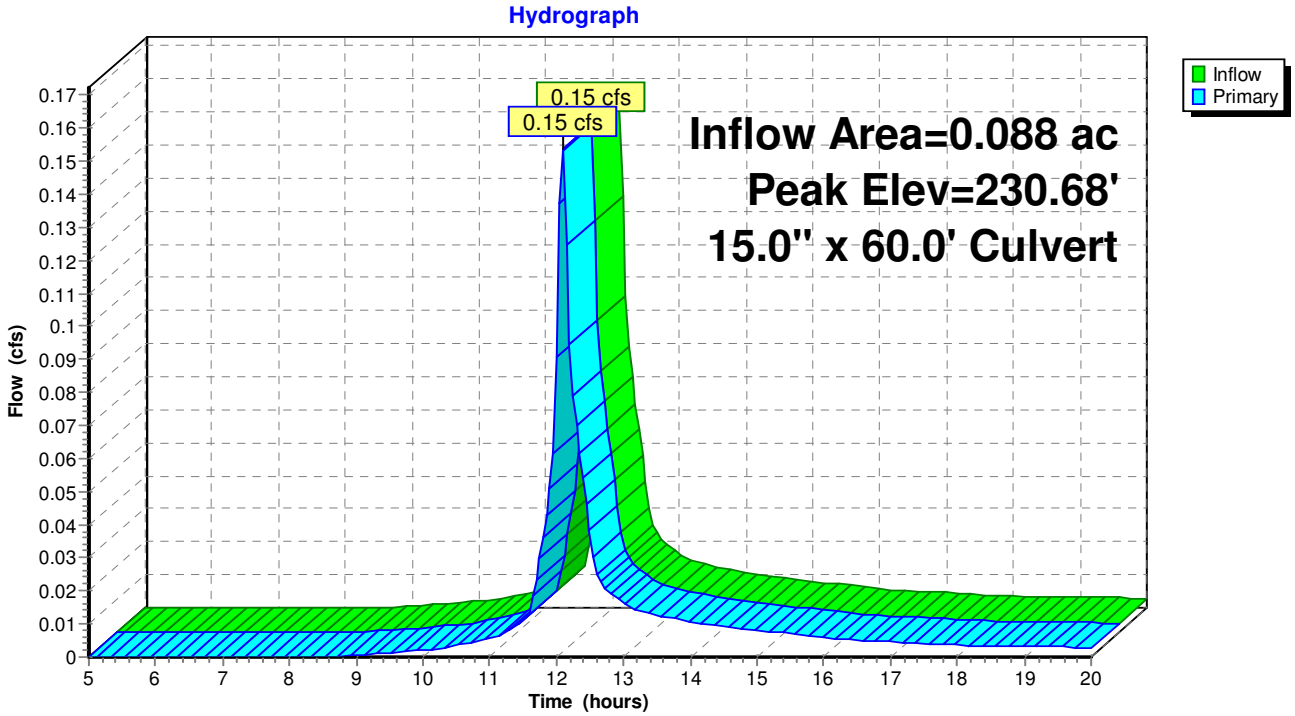
Inflow Area =	0.088 ac,	Inflow Depth >	1.41"	for	2-Year Event event
Inflow =	0.15 cfs @	12.09 hrs,	Volume=	0.010 af	
Outflow =	0.15 cfs @	12.09 hrs,	Volume=	0.010 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.15 cfs @	12.09 hrs,	Volume=	0.010 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.80' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=230.68' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.15 cfs @ 1.43 fps)

Pond 6: CB6



Pond 7: CB7

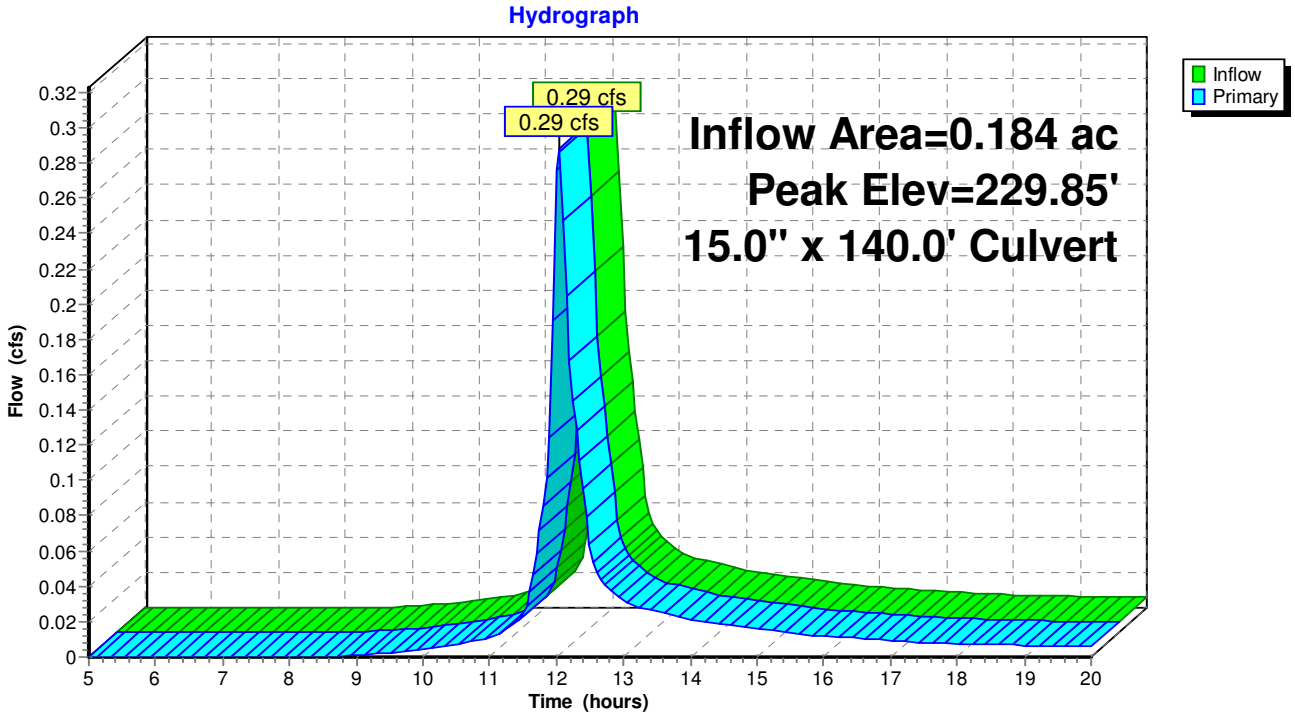
Inflow Area =	0.184 ac,	Inflow Depth >	1.38"	for	2-Year Event event
Inflow =	0.29 cfs @	12.04 hrs,	Volume=	0.021 af	
Outflow =	0.29 cfs @	12.04 hrs,	Volume=	0.021 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.29 cfs @	12.04 hrs,	Volume=	0.021 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.85' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.60'	**15.0" x 140.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 228.10' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.28 cfs @ 12.04 hrs HW=229.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.28 cfs @ 1.68 fps)

Pond 7: CB7



Pond 8: CB8

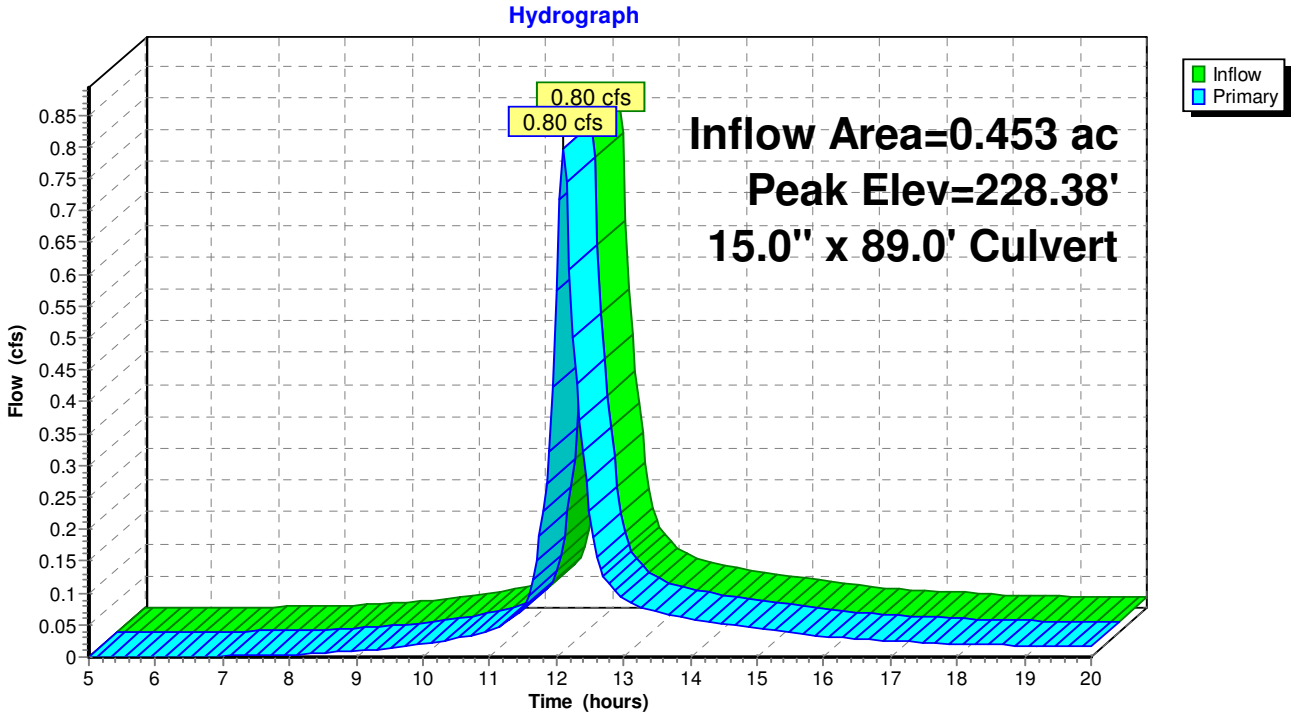
Inflow Area = 0.453 ac, Inflow Depth > 1.66" for 2-Year Event event
Inflow = 0.80 cfs @ 12.10 hrs, Volume= 0.063 af
Outflow = 0.80 cfs @ 12.10 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.10 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.38' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.90'	**15.0" x 89.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.79 cfs @ 12.10 hrs HW=228.37' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.79 cfs @ 1.85 fps)

Pond 8: CB8



Pond 9: CB9

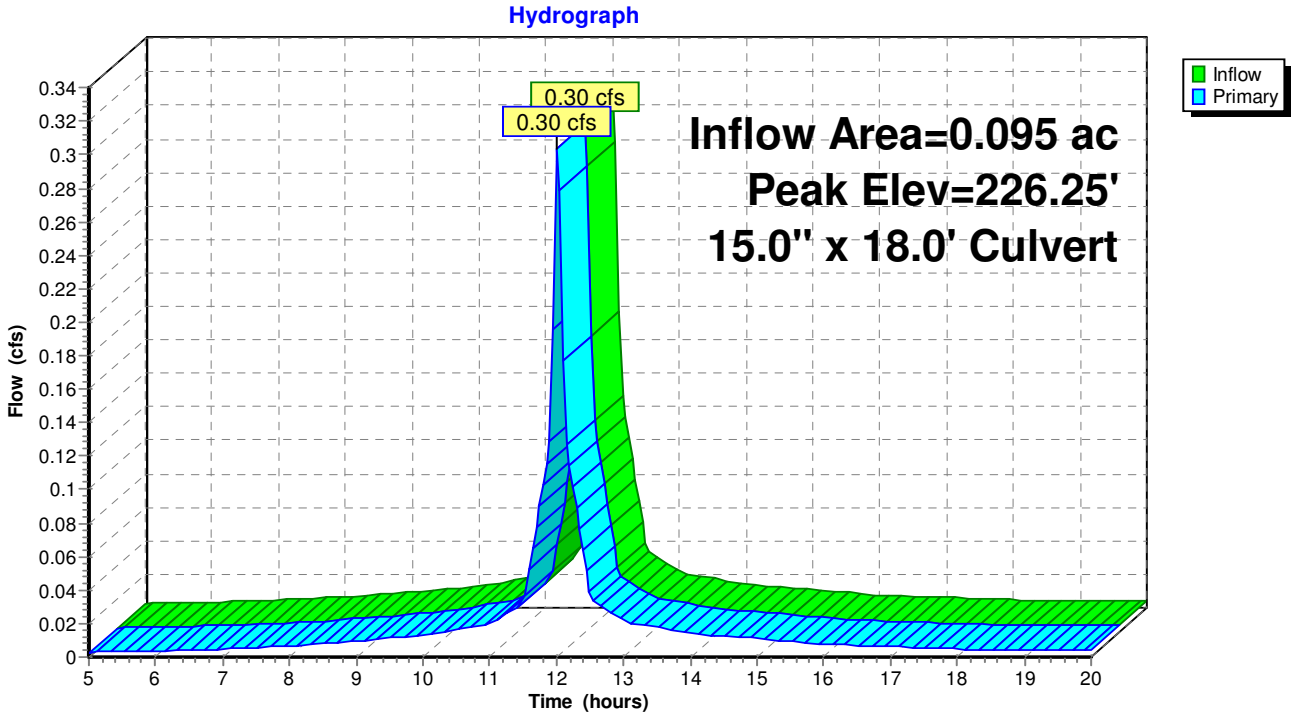
Inflow Area =	0.095 ac,	Inflow Depth >	2.59"	for	2-Year Event event
Inflow =	0.30 cfs @	12.02 hrs,	Volume=	0.021 af	
Outflow =	0.30 cfs @	12.02 hrs,	Volume=	0.021 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.30 cfs @	12.02 hrs,	Volume=	0.021 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.25' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**15.0" x 18.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 225.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.29 cfs @ 12.02 hrs HW=226.25' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.29 cfs @ 1.69 fps)

Pond 9: CB9



Pond 10: CB10

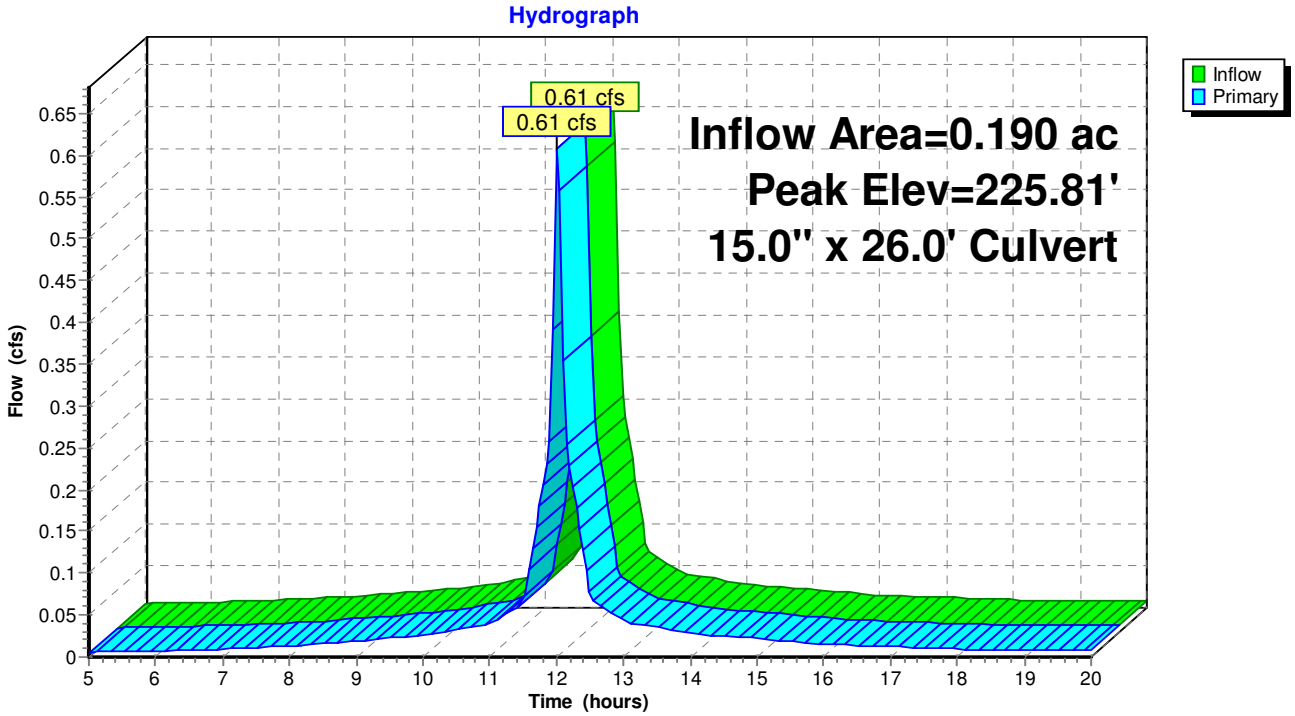
Inflow Area =	0.190 ac,	Inflow Depth >	2.59"	for	2-Year Event event
Inflow =	0.61 cfs @	12.02 hrs,	Volume=	0.041 af	
Outflow =	0.61 cfs @	12.02 hrs,	Volume=	0.041 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.61 cfs @	12.02 hrs,	Volume=	0.041 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 225.81' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 224.00' S= 0.0538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.58 cfs @ 12.02 hrs HW=225.80' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.58 cfs @ 1.70 fps)

Pond 10: CB10



Pond SF1: Sediment Forebay #1

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	82 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	30	0	0	30
212.00	150	82	82	154

Pond SF2: Sediment Forebay #2

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	449 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

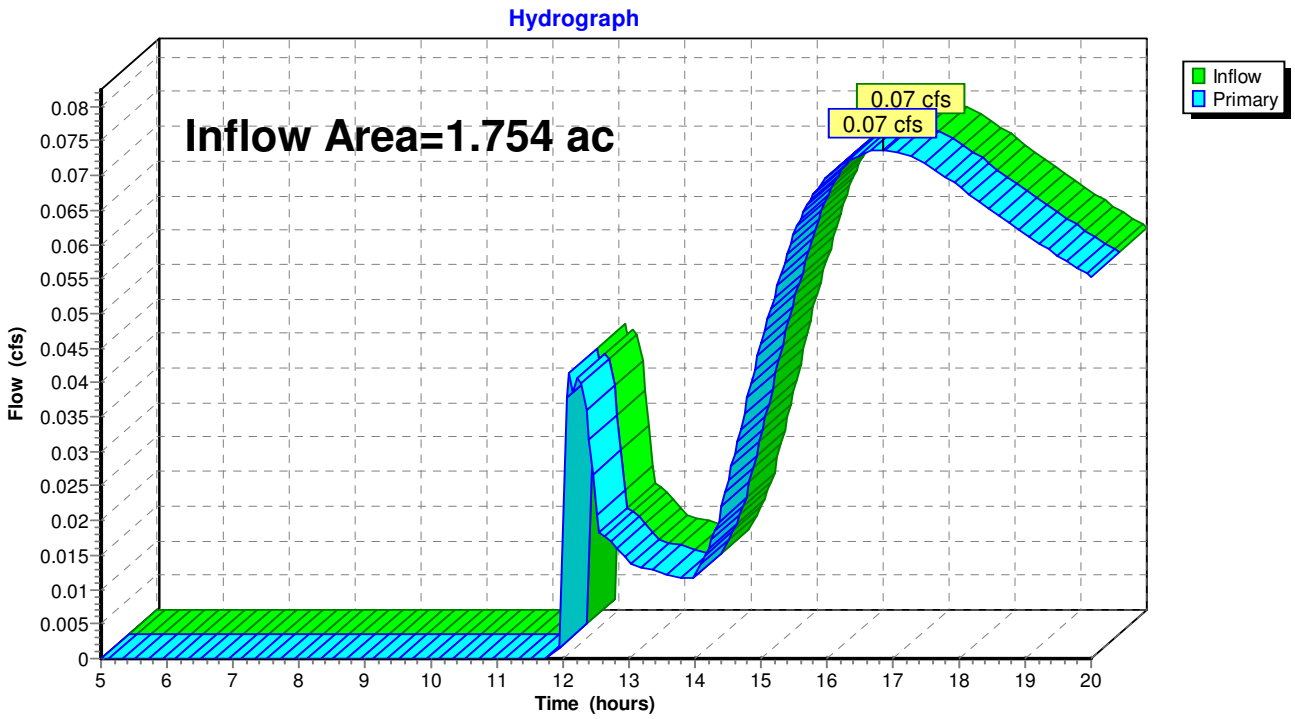
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	275	0	0	275
229.00	650	449	449	657

Pond SP1: Study Point #1

Inflow Area =	1.754 ac,	Inflow Depth >	0.22"	for	2-Year Event event
Inflow =	0.07 cfs @	16.84 hrs,	Volume=	0.033 af	
Primary =	0.07 cfs @	16.84 hrs,	Volume=	0.033 af,	Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

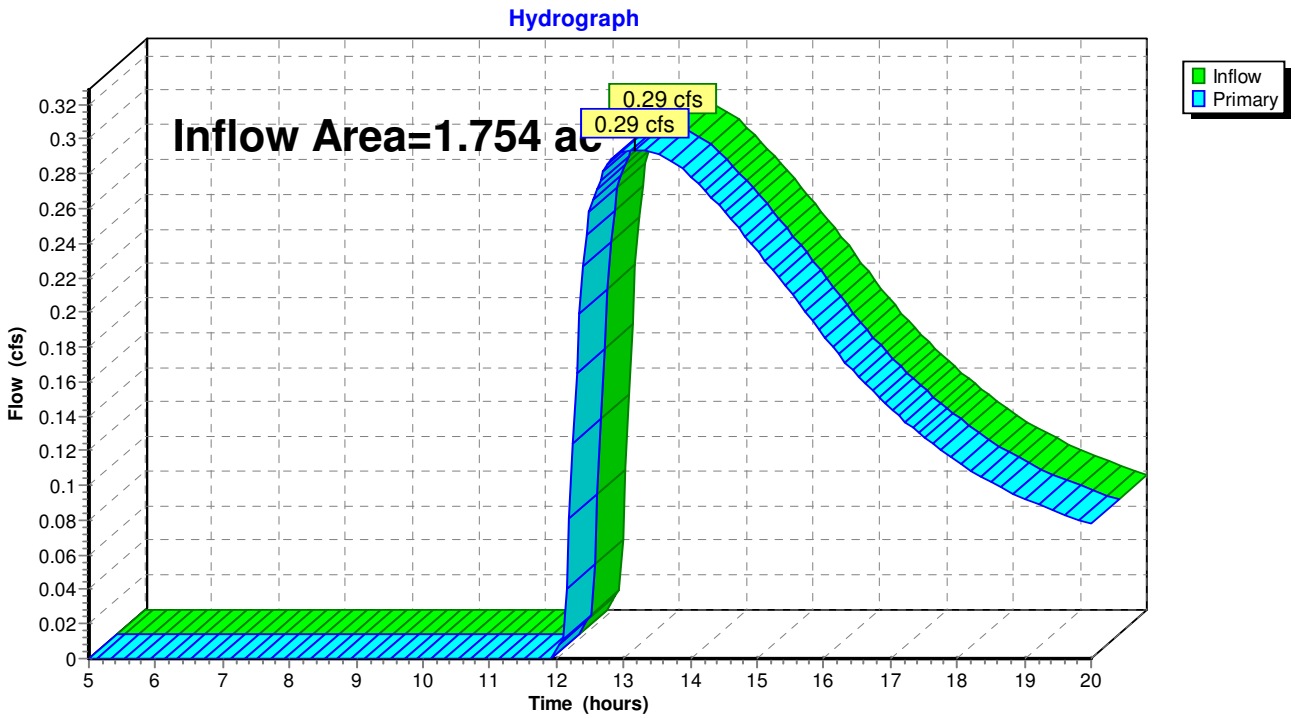


Pond SP2: Study Point #2

Inflow Area = 1.754 ac, Inflow Depth > 0.82" for 2-Year Event event
Inflow = 0.29 cfs @ 13.18 hrs, Volume= 0.119 af
Primary = 0.29 cfs @ 13.18 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

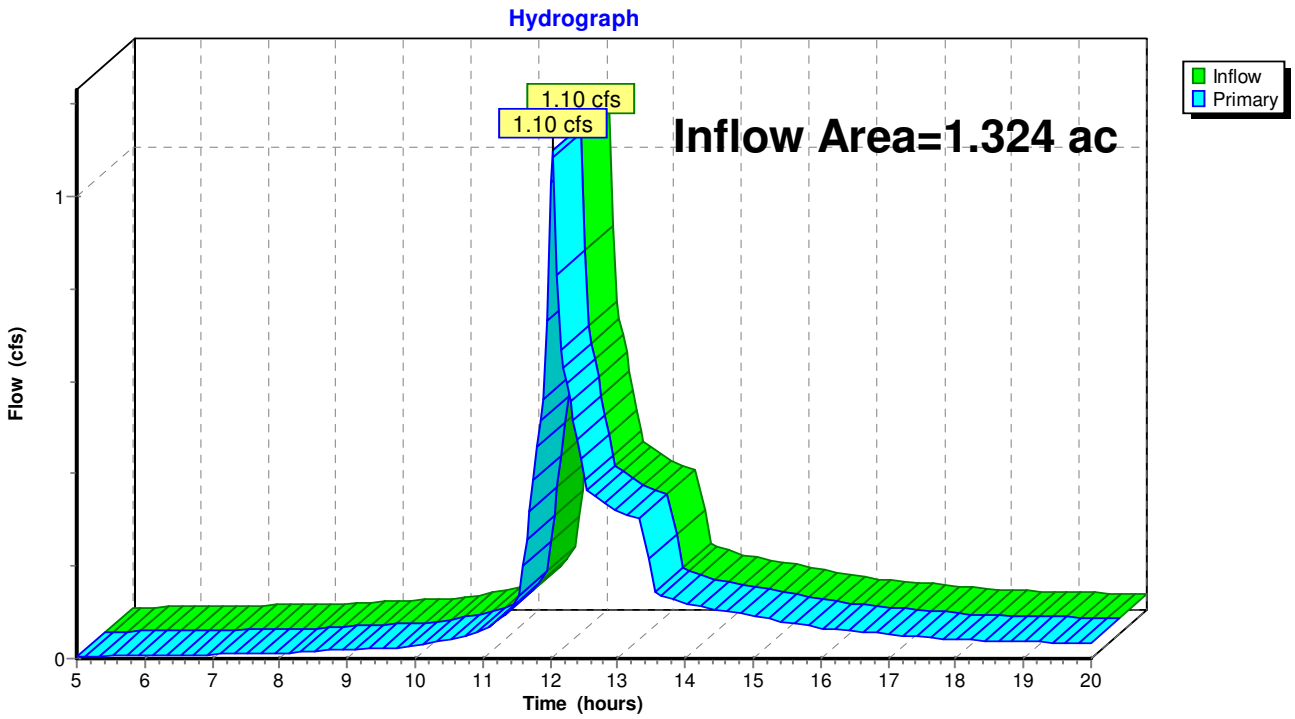


Pond SP3: Study Point #2

Inflow Area = 1.324 ac, Inflow Depth > 1.07" for 2-Year Event event
Inflow = 1.10 cfs @ 12.03 hrs, Volume= 0.118 af
Primary = 1.10 cfs @ 12.03 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #2



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

Subcatchment 1AS: Sub #1A Runoff Area=11,725 sf Runoff Depth>3.11"
Flow Length=98' Tc=8.6 min CN=90 Runoff=0.92 cfs 0.070 af

Subcatchment 1BS: Sub #1B Runoff Area=4,165 sf Runoff Depth>2.47"
Tc=0.0 min CN=83 Runoff=0.34 cfs 0.020 af

Subcatchment 1CS: Sub #1C Runoff Area=3,840 sf Runoff Depth>2.55"
Flow Length=59' Slope=0.0200 '/' Tc=5.9 min CN=84 Runoff=0.28 cfs 0.019 af

Subcatchment 1S: Sub #1 Runoff Area=38,580 sf Runoff Depth>1.90"
Flow Length=314' Tc=0.9 min CN=76 Runoff=2.36 cfs 0.140 af

Subcatchment 2S: Sub #2 Runoff Area=4,060 sf Runoff Depth>3.87"
Flow Length=103' Slope=0.0400 '/' Tc=1.0 min CN=98 Runoff=0.45 cfs 0.030 af

Subcatchment 3S: Sub #3 Runoff Area=27,485 sf Runoff Depth>3.12"
Flow Length=184' Tc=1.3 min CN=90 Runoff=2.61 cfs 0.164 af

Subcatchment 4S: Sub #4 Runoff Area=6,165 sf Runoff Depth>3.79"
Flow Length=122' Slope=0.0400 '/' Tc=1.0 min CN=97 Runoff=0.67 cfs 0.045 af

Subcatchment 5S: Sub #5 Runoff Area=11,125 sf Runoff Depth>3.87"
Flow Length=98' Slope=0.0286 '/' Tc=1.1 min CN=98 Runoff=1.22 cfs 0.082 af

Subcatchment 6S: Sub #6 Runoff Area=18,880 sf Runoff Depth>3.41"
Flow Length=125' Tc=1.3 min CN=93 Runoff=1.91 cfs 0.123 af

Subcatchment 7S: Sub #7 Runoff Area=26,440 sf Runoff Depth>2.14"
Flow Length=87' Tc=1.0 min CN=79 Runoff=1.81 cfs 0.108 af

Subcatchment 8S: Sub #8 Runoff Area=9,960 sf Runoff Depth>0.76"
Flow Length=35' Slope=0.1714 '/' Tc=1.7 min CN=58 Runoff=0.21 cfs 0.015 af

Subcatchment 9S: Sub #9 Runoff Area=4,140 sf Runoff Depth>3.87"
Flow Length=290' Tc=1.3 min CN=98 Runoff=0.45 cfs 0.031 af

Subcatchment 10S: Sub #10 Runoff Area=4,145 sf Runoff Depth>3.87"
Flow Length=282' Tc=1.3 min CN=98 Runoff=0.45 cfs 0.031 af

Subcatchment 11S: Sub #11 Runoff Area=4,135 sf Runoff Depth>1.90"
Flow Length=50' Tc=2.3 min CN=76 Runoff=0.25 cfs 0.015 af

Subcatchment 12S: Sub #12 Runoff Area=5,800 sf Runoff Depth>1.68"
Flow Length=64' Tc=2.6 min CN=73 Runoff=0.31 cfs 0.019 af

Subcatchment 13S: Sub 13 Runoff Area=2,805 sf Runoff Depth>0.76"
Flow Length=18' Slope=0.5000 '/' Tc=0.6 min CN=58 Runoff=0.06 cfs 0.004 af

Subcatchment 14S: Sub 14 Runoff Area=9,215 sf Runoff Depth>0.76"
Flow Length=33' Slope=0.3636 '/' Tc=1.2 min CN=58 Runoff=0.19 cfs 0.013 af

Subcatchment 15S: Sub 15 Runoff Area=3,815 sf Runoff Depth>0.76"
Flow Length=24' Slope=0.2917 '/' Tc=1.0 min CN=58 Runoff=0.08 cfs 0.006 af

Subcatchment 16S: Sub 16 Runoff Area=9,285 sf Runoff Depth>0.76"
Flow Length=37' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.19 cfs 0.014 af

Subcatchment 17S: Sub #17 Runoff Area=4,770 sf Runoff Depth>0.76"
Flow Length=35' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.10 cfs 0.007 af

Pond 1: CB1 Peak Elev=227.85' Inflow=0.45 cfs 0.030 af
15.0" x 47.0' Culvert Outflow=0.45 cfs 0.030 af

Pond 1P: Filter Pond #1 Peak Elev=213.14' Storage=7,446 cf Inflow=3.87 cfs 0.279 af
Outflow=0.34 cfs 0.147 af

Pond 2: CB2 Peak Elev=229.45' Inflow=2.61 cfs 0.164 af
15.0" x 39.0' Culvert Outflow=2.61 cfs 0.164 af

Pond 2P: Filter Pond #2 Peak Elev=229.96' Storage=10,874 cf Inflow=6.59 cfs 0.429 af
Outflow=1.17 cfs 0.277 af

Pond 3: CB3 Peak Elev=230.08' Inflow=3.80 cfs 0.250 af
15.0" x 26.0' Culvert Outflow=3.80 cfs 0.250 af

Pond 3P: Filter Pond #3 Peak Elev=235.66' Storage=1,540 cf Inflow=1.81 cfs 0.108 af
3.0" x 70.0' Culvert Outflow=0.25 cfs 0.108 af

Pond 4: CB4 Peak Elev=230.81' Inflow=3.13 cfs 0.206 af
15.0" x 86.0' Culvert Outflow=3.13 cfs 0.206 af

Pond 5: CB5 Peak Elev=232.18' Inflow=1.91 cfs 0.123 af
15.0" x 134.0' Culvert Outflow=1.91 cfs 0.123 af

Pond 6: CB6 Peak Elev=230.74' Inflow=0.28 cfs 0.019 af
15.0" x 60.0' Culvert Outflow=0.28 cfs 0.019 af

Pond 7: CB7 Peak Elev=229.94' Inflow=0.52 cfs 0.038 af
15.0" x 140.0' Culvert Outflow=0.52 cfs 0.038 af

Pond 8: CB8 Peak Elev=228.53' Inflow=1.34 cfs 0.108 af
15.0" x 89.0' Culvert Outflow=1.34 cfs 0.108 af

Pond 9: CB9 Peak Elev=226.31' Inflow=0.45 cfs 0.031 af
15.0" x 18.0' Culvert Outflow=0.45 cfs 0.031 af

Pond 10: CB10 Peak Elev=225.91' Inflow=0.90 cfs 0.061 af
15.0" x 26.0' Culvert Outflow=0.90 cfs 0.061 af

Pond SF1: Sediment Forebay #1 Peak Elev=0.00' Storage=0 cf

Pond SF2: Sediment Forebay #2 Peak Elev=0.00' Storage=0 cf

Pond SP1: Study Point #1 Inflow=0.38 cfs 0.167 af
Primary=0.38 cfs 0.167 af

Pond SP2: Study Point #2 Inflow=1.18 cfs 0.281 af
Primary=1.18 cfs 0.281 af

Pond SP3: Study Point #2 Inflow=1.92 cfs 0.222 af
Primary=1.92 cfs 0.222 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.955 af Average Runoff Depth = 2.37"
45.46% Pervious Area = 2.197 ac 54.54% Impervious Area = 2.636 ac

Subcatchment 1AS: Sub #1A

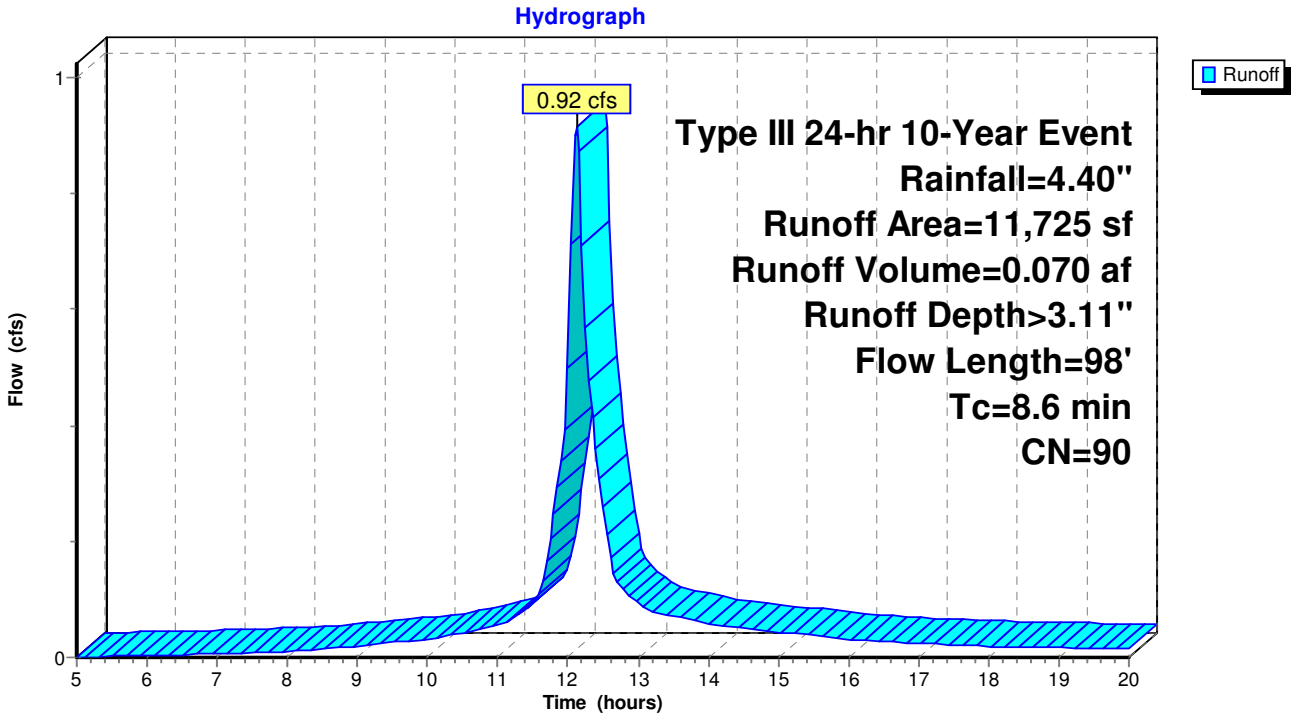
Runoff = 0.92 cfs @ 12.12 hrs, Volume= 0.070 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,225	98	Paved parking & roofs
2,500	61	>75% Grass cover, Good, HSG B
11,725	90	Weighted Average
2,500		Pervious Area
9,225		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
8.4	86	0.0233	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
8.6	98	Total			

Subcatchment 1AS: Sub #1A



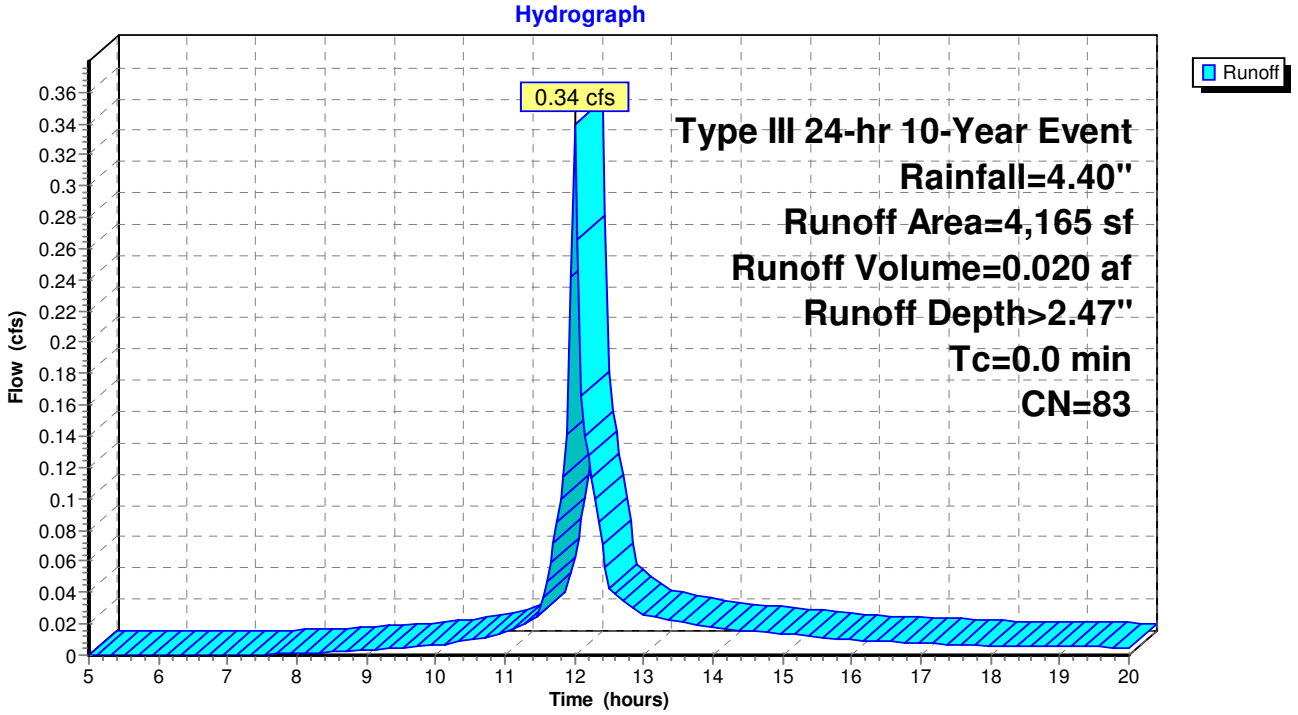
Subcatchment 1BS: Sub #1B

Runoff = 0.34 cfs @ 12.00 hrs, Volume= 0.020 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,505	98	Paved parking & roofs
1,660	61	>75% Grass cover, Good, HSG B
4,165	83	Weighted Average
1,660		Pervious Area
2,505		Impervious Area

Subcatchment 1BS: Sub #1B



Subcatchment 1CS: Sub #1C

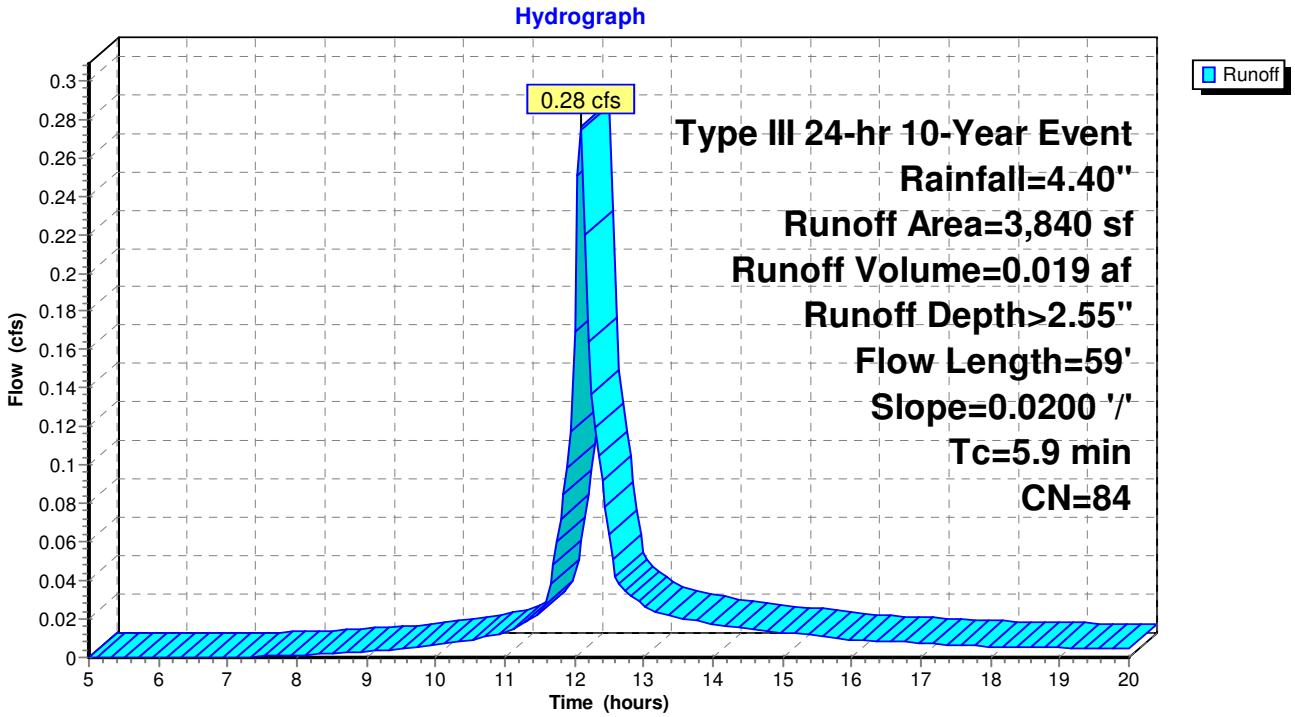
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,390	98	Paved parking & roofs
1,450	61	>75% Grass cover, Good, HSG B
3,840	84	Weighted Average
1,450		Pervious Area
2,390		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.84		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
5.7	49	0.0200	0.14		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
5.9	59	Total			

Subcatchment 1CS: Sub #1C



Subcatchment 1S: Sub #1

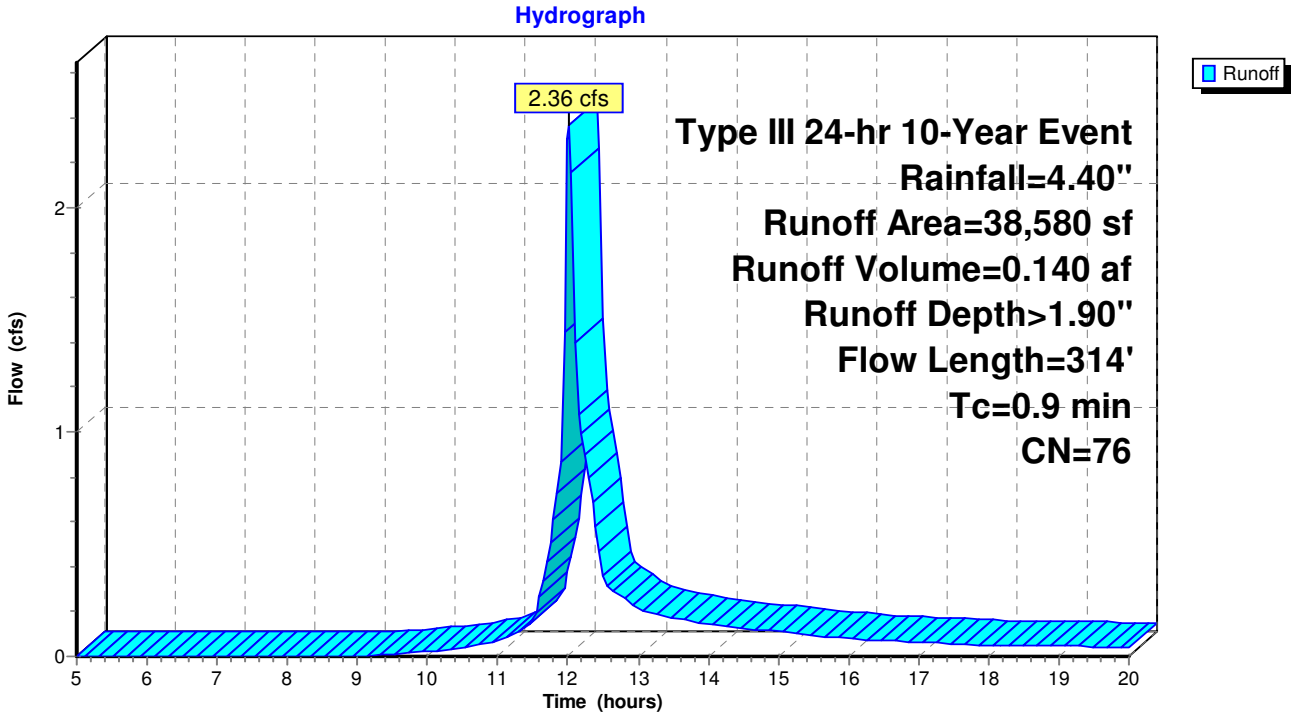
Runoff = 2.36 cfs @ 12.02 hrs, Volume= 0.140 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
16,145	98	Paved parking & roofs
16,000	61	>75% Grass cover, Good, HSG B
6,435	58	Meadow, non-grazed, HSG B
38,580	76	Weighted Average
22,435		Pervious Area
16,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	27	0.0370	3.90		**Shallow Concentrated Flow, AB** Paved Kv= 20.3 fps
0.2	50	0.0800	4.24		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.6	237	0.0649	6.40	25.58	**Channel Flow, CD** Area= 4.0 sf Perim= 7.2' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.9	314	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

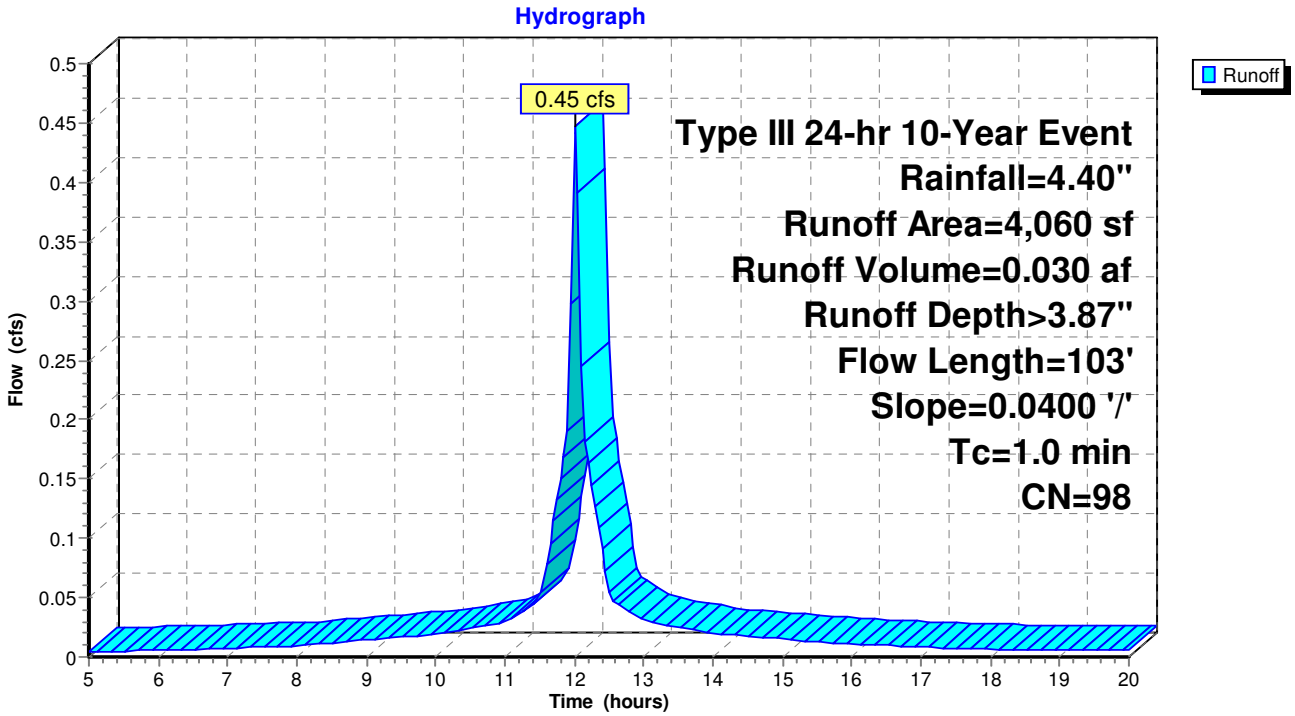
Runoff = 0.45 cfs @ 12.01 hrs, Volume= 0.030 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,060	98	Paved parking & roofs
4,060		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	103	0.0400	1.77		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

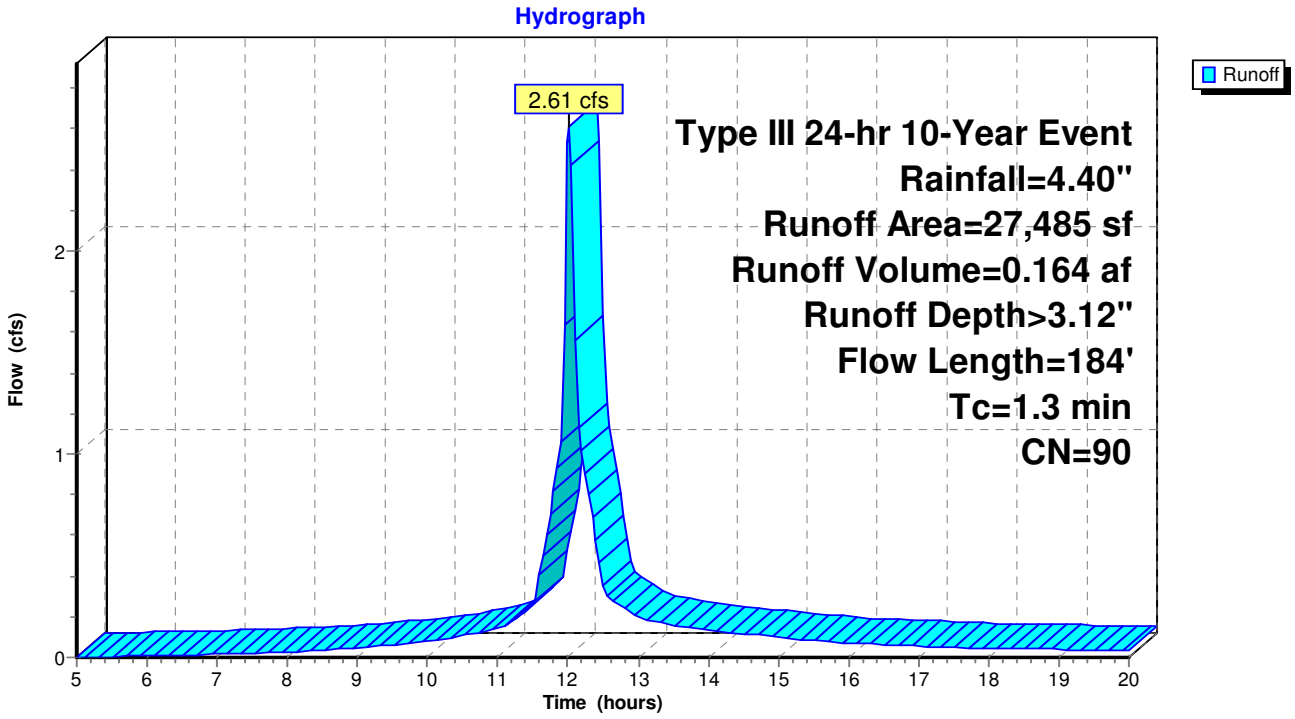
Runoff = 2.61 cfs @ 12.02 hrs, Volume= 0.164 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
21,855	98	Paved parking & roofs
5,630	61	>75% Grass cover, Good, HSG B
27,485	90	Weighted Average
5,630		Pervious Area
21,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0400	1.76		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	84	0.0250	3.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	184	Total			

Subcatchment 3S: Sub #3



Subcatchment 4S: Sub #4

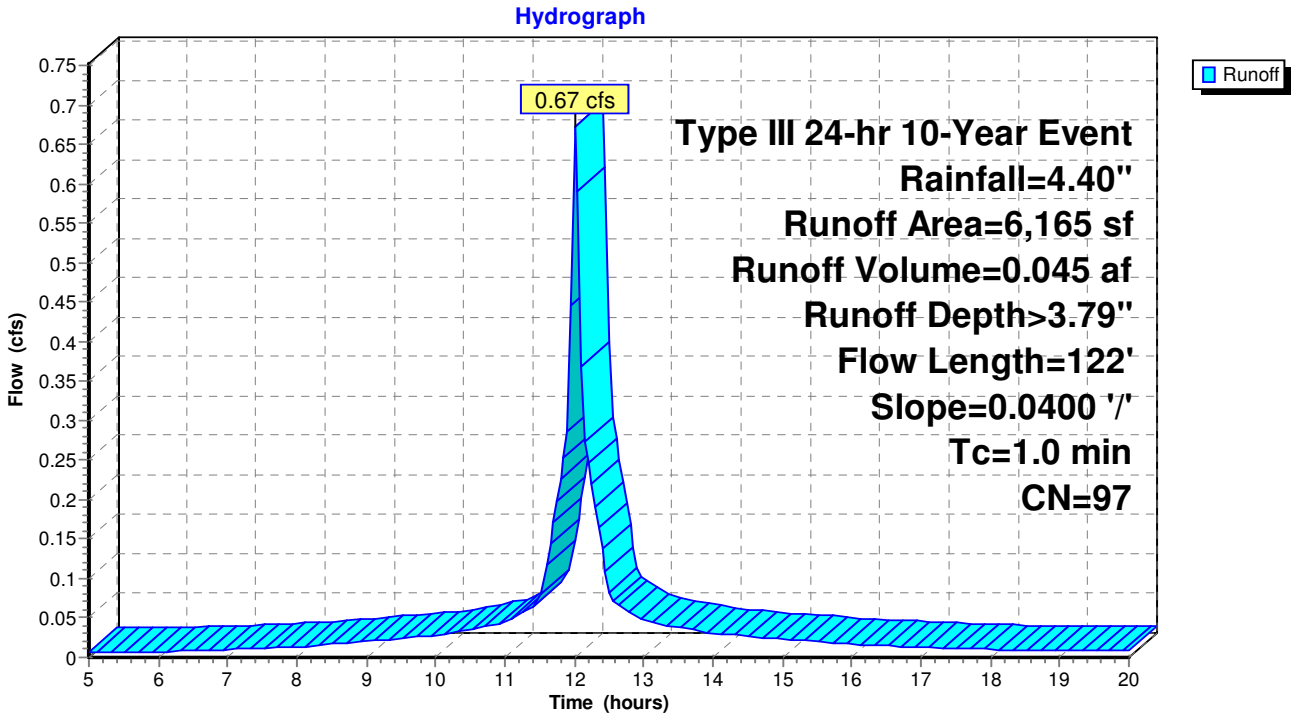
Runoff = 0.67 cfs @ 12.01 hrs, Volume= 0.045 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
5,950	98	Paved parking & roofs
215	61	>75% Grass cover, Good, HSG B
6,165	97	Weighted Average
215		Pervious Area
5,950		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	84	0.0400	1.70		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	38	0.0400	4.06		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.0	122	Total			

Subcatchment 4S: Sub #4



Subcatchment 5S: Sub #5

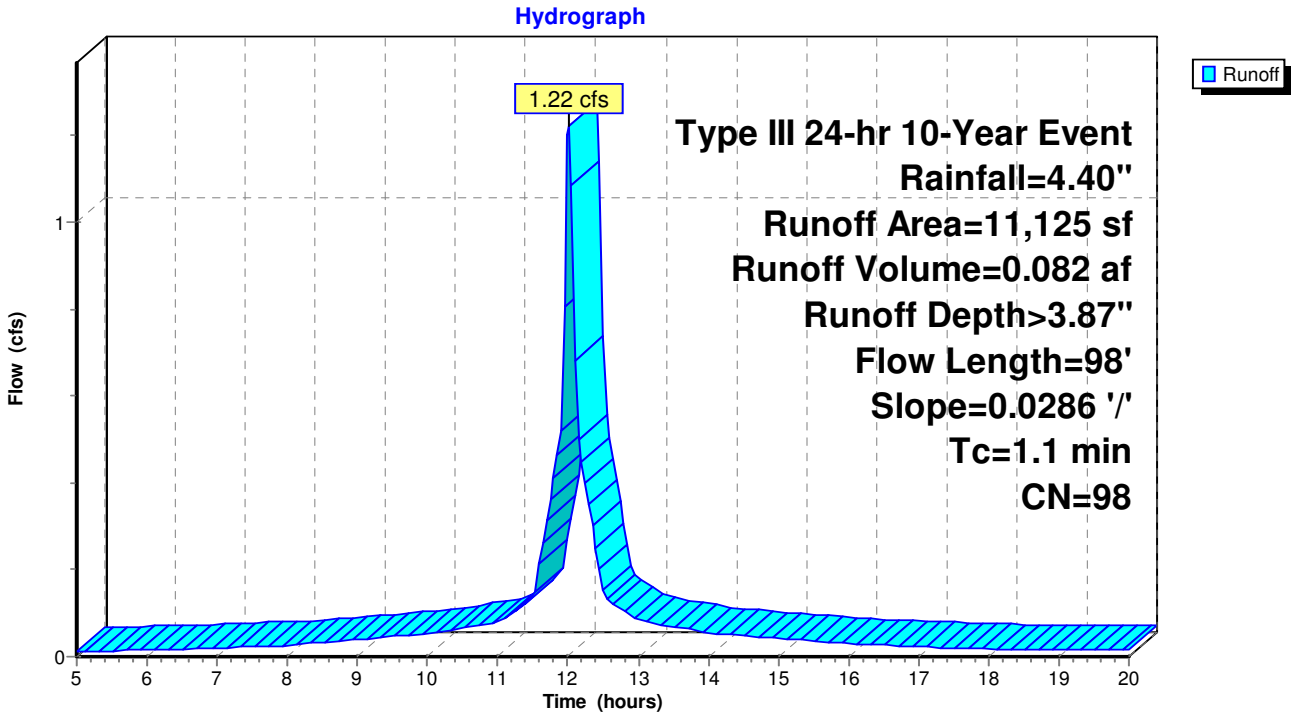
Runoff = 1.22 cfs @ 12.01 hrs, Volume= 0.082 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
10,990	98	Paved parking & roofs
135	61	>75% Grass cover, Good, HSG B
11,125	98	Weighted Average
135		Pervious Area
10,990		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	98	0.0286	1.53		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5S: Sub #5



Subcatchment 6S: Sub #6

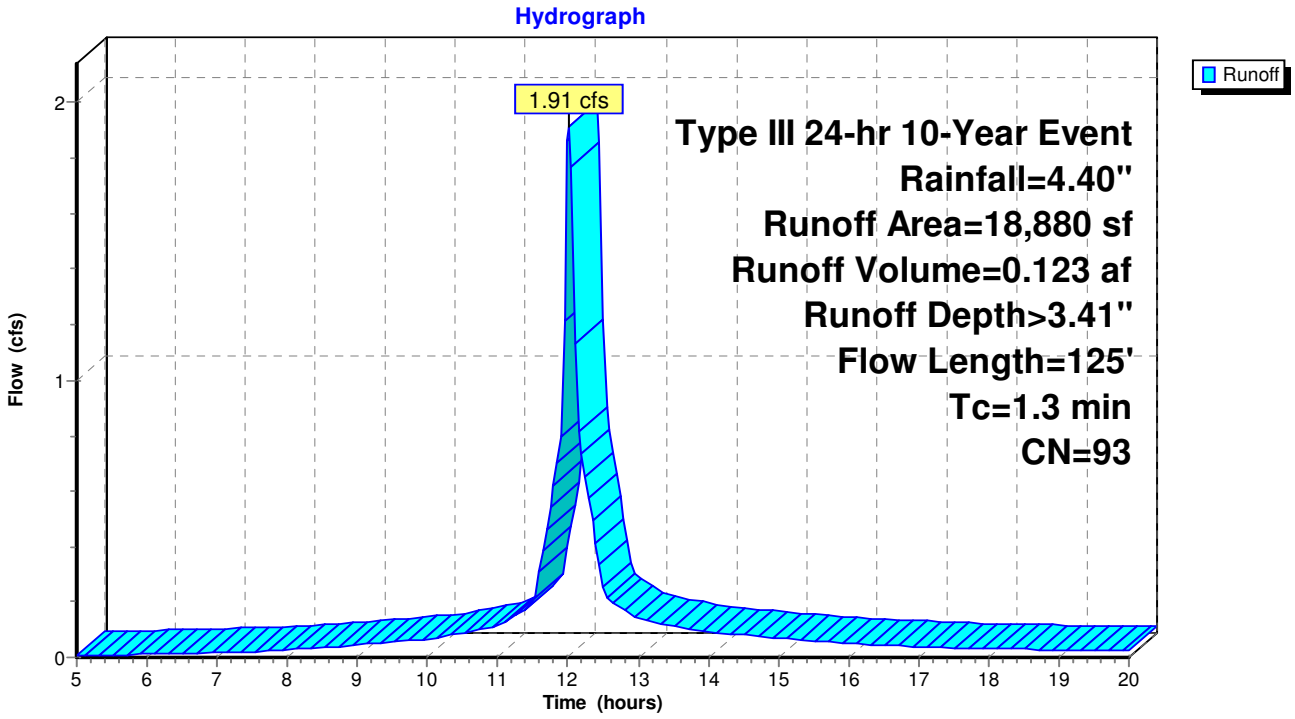
Runoff = 1.91 cfs @ 12.02 hrs, Volume= 0.123 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
16,260	98	Paved parking & roofs
2,620	61	>75% Grass cover, Good, HSG B
18,880	93	Weighted Average
2,620		Pervious Area
16,260		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0280	1.52		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment 6S: Sub #6



Subcatchment 7S: Sub #7

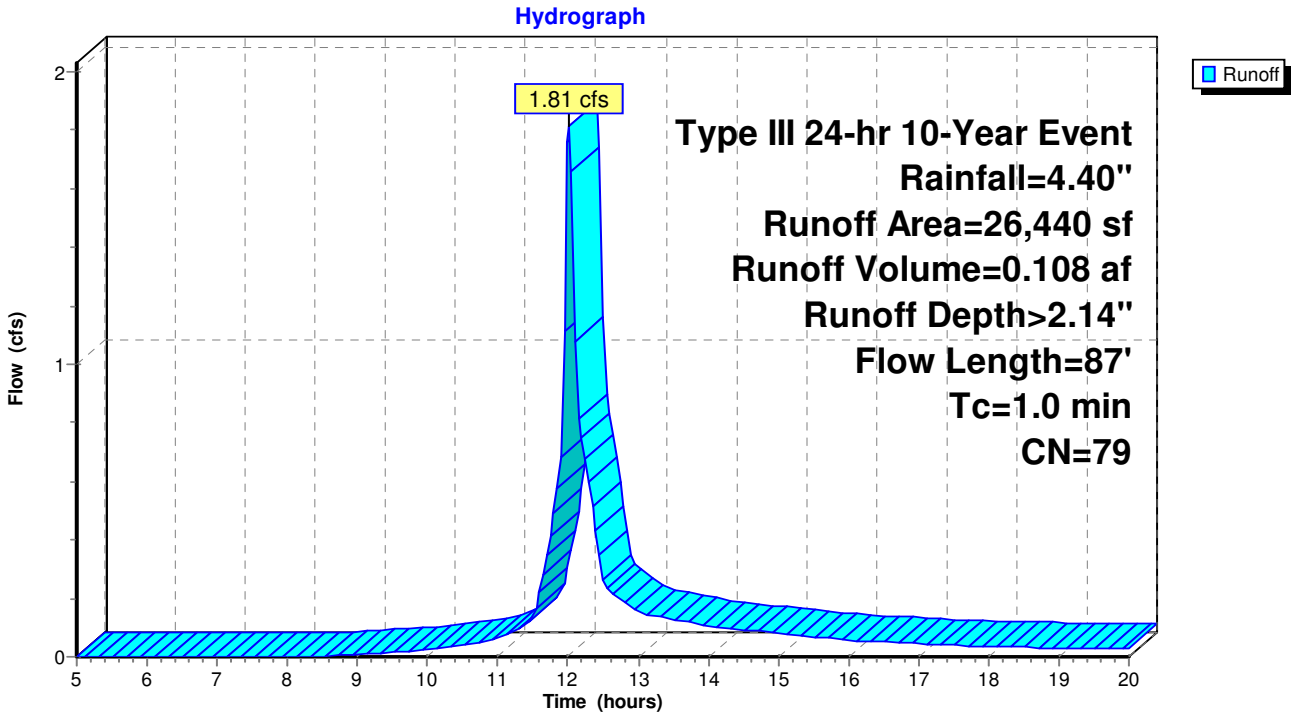
Runoff = 1.81 cfs @ 12.02 hrs, Volume= 0.108 af, Depth> 2.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
13,630	98	Paved parking & roofs
2,065	61	>75% Grass cover, Good, HSG B
10,745	58	Meadow, non-grazed, HSG B
26,440	79	Weighted Average
12,810		Pervious Area
13,630		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	66	0.0227	1.29		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	21	0.0952	4.63		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
1.0	87	Total			

Subcatchment 7S: Sub #7



Subcatchment 8S: Sub #8

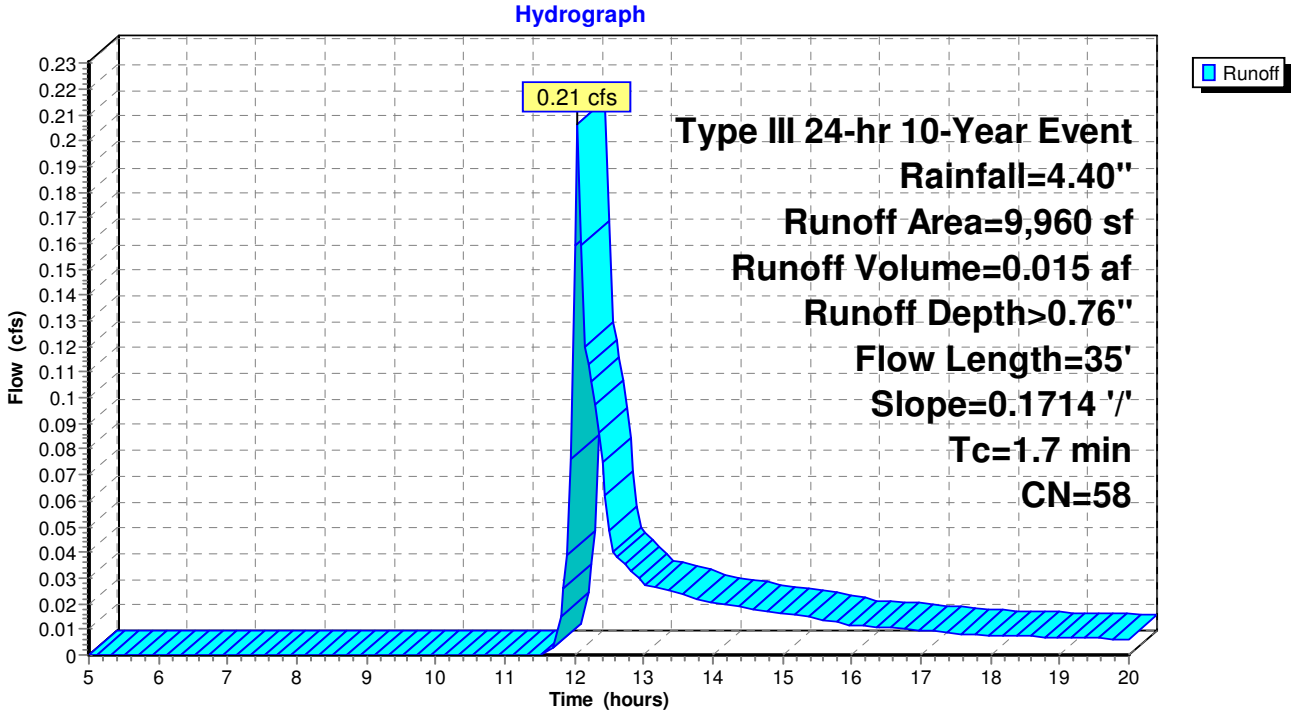
Runoff = 0.21 cfs @ 12.05 hrs, Volume= 0.015 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,960	58	Meadow, non-grazed, HSG B
9,960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	35	0.1714	0.35		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 8S: Sub #8



Subcatchment 9S: Sub #9

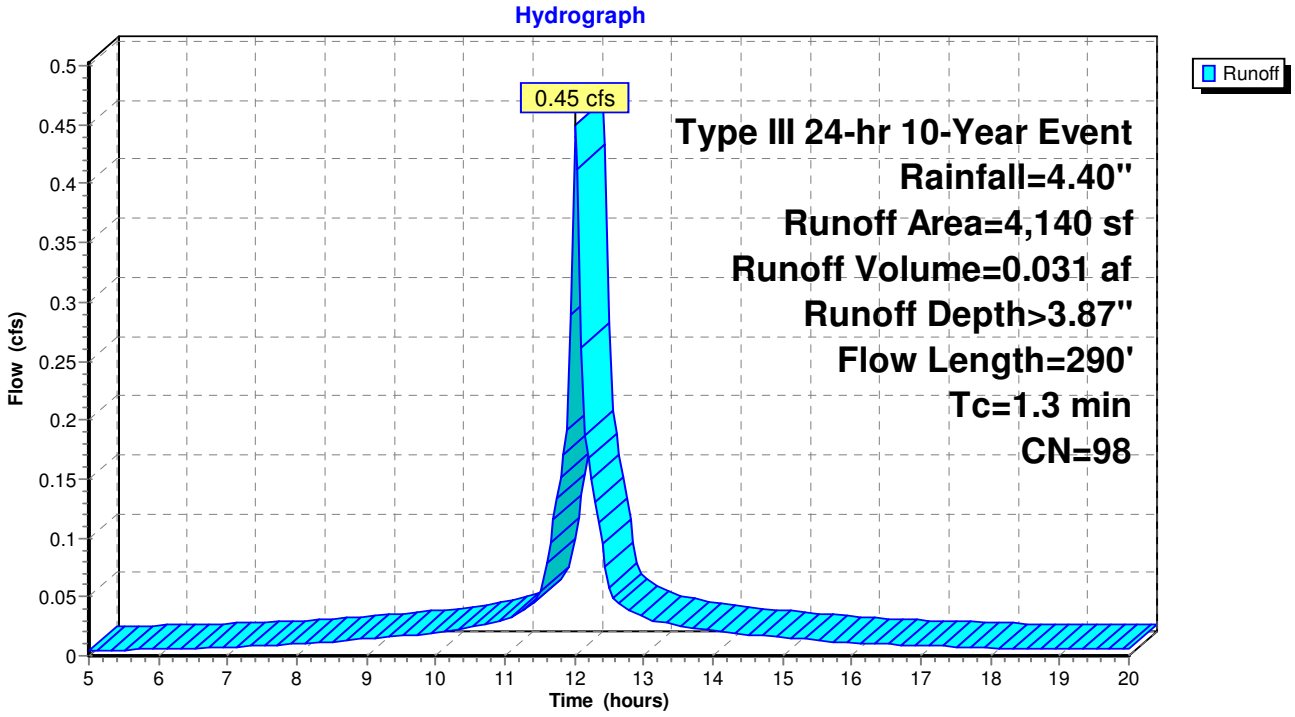
Runoff = 0.45 cfs @ 12.02 hrs, Volume= 0.031 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,140	98	Paved parking & roofs
4,140		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	190	0.0605	4.99		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	290	Total			

Subcatchment 9S: Sub #9



Subcatchment 10S: Sub #10

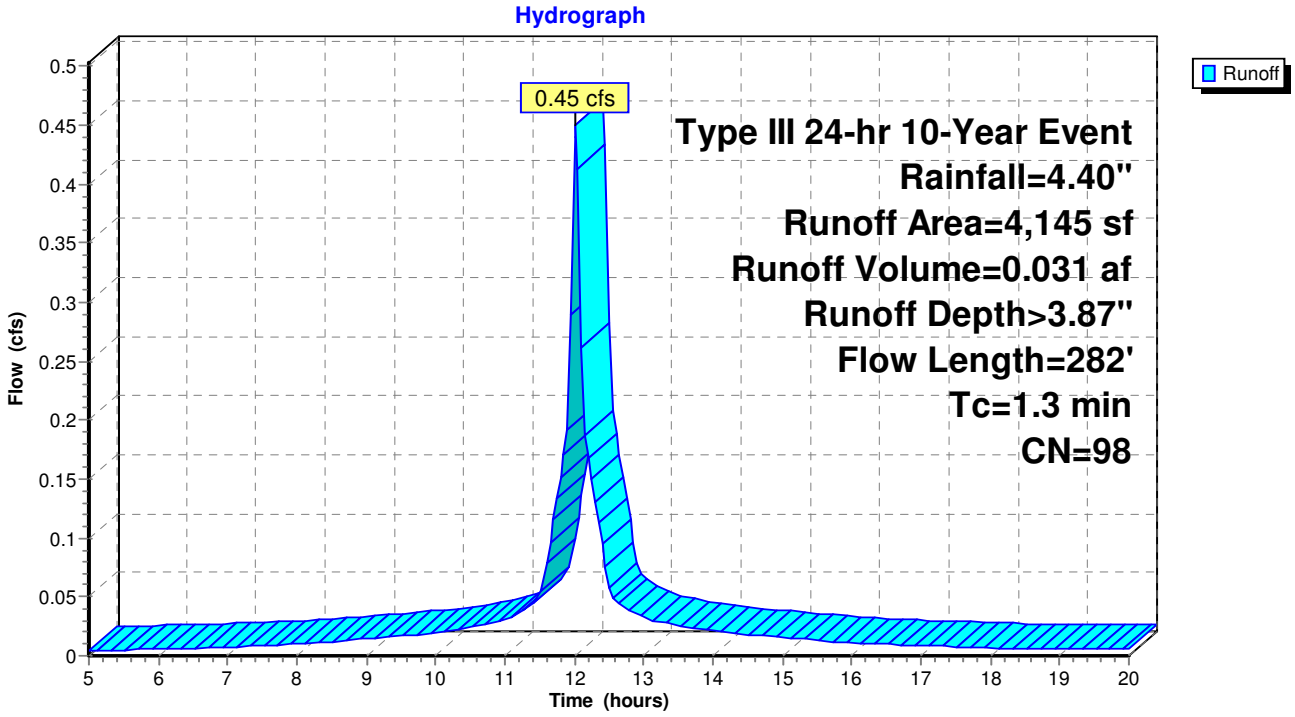
Runoff = 0.45 cfs @ 12.02 hrs, Volume= 0.031 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,145	98	Paved parking & roofs
4,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	182	0.0659	5.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	282	Total			

Subcatchment 10S: Sub #10



Subcatchment 11S: Sub #11

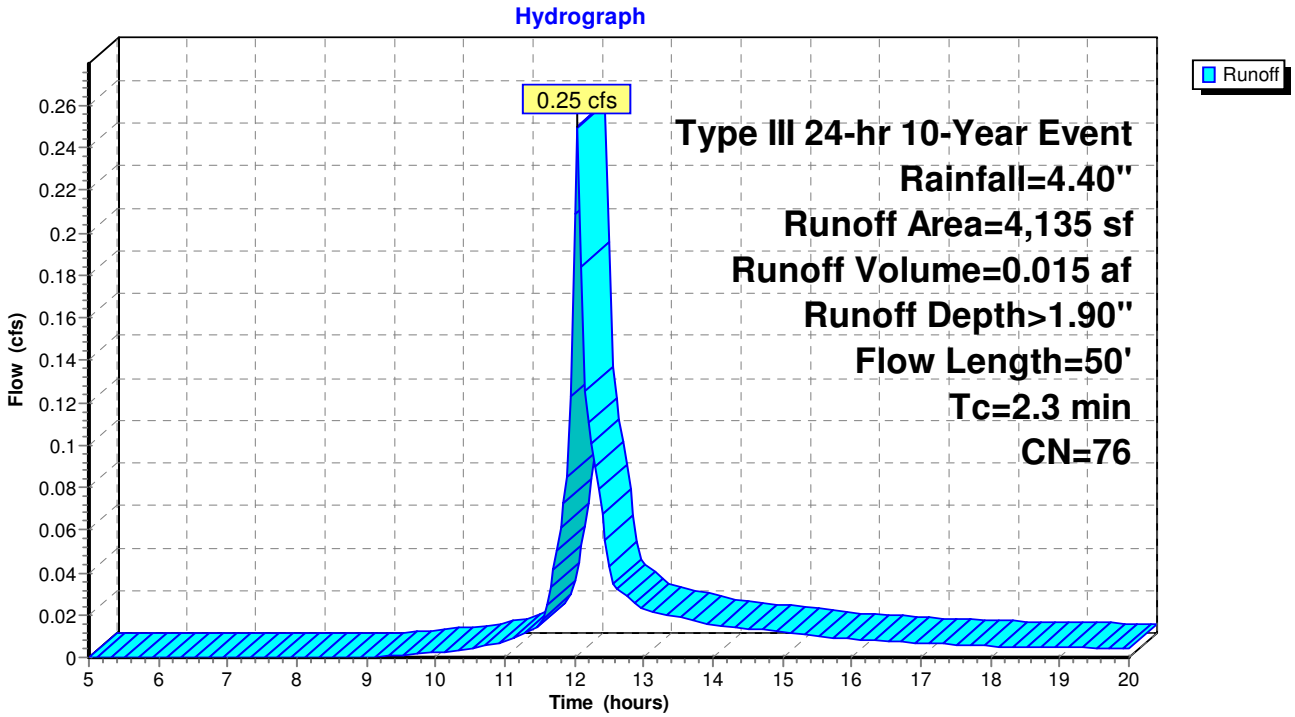
Runoff = 0.25 cfs @ 12.04 hrs, Volume= 0.015 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
1,625	98	Paved parking & roofs
2,510	61	>75% Grass cover, Good, HSG B
4,135	76	Weighted Average
2,510		Pervious Area
1,625		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.0	33	0.1212	0.27		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.3	50	Total			

Subcatchment 11S: Sub #11



Subcatchment 12S: Sub #12

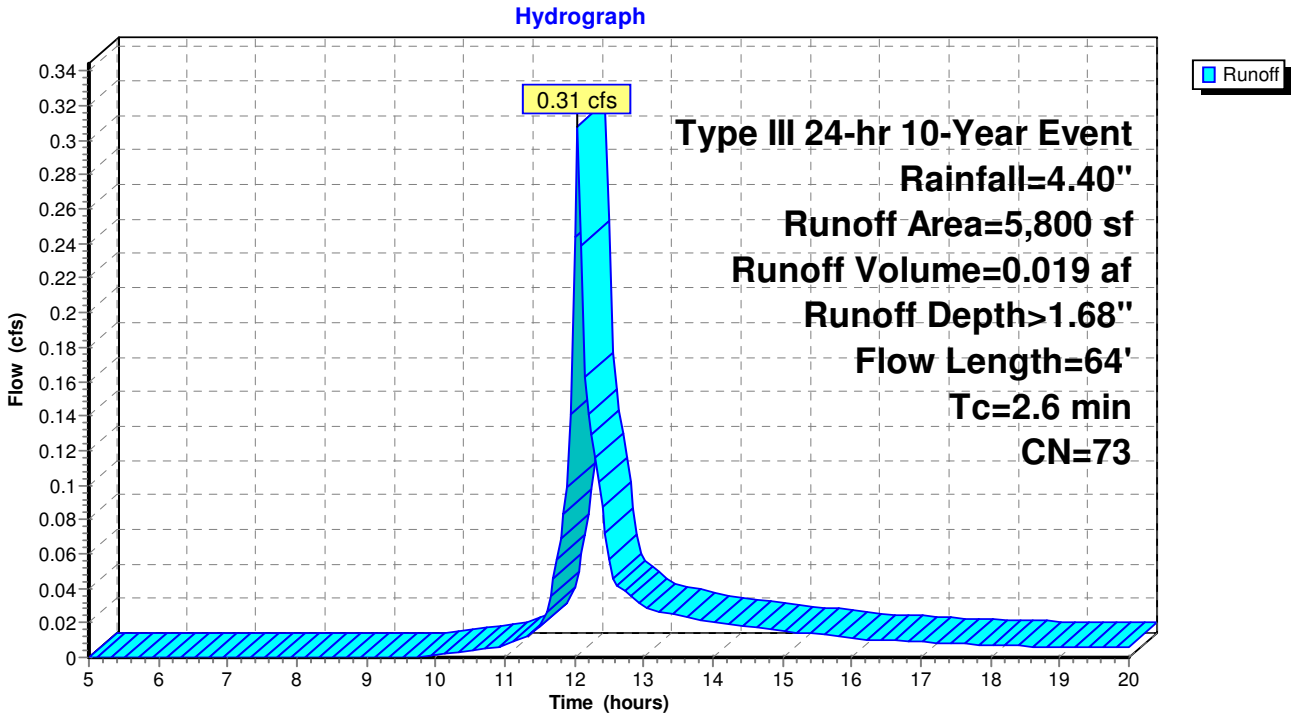
Runoff = 0.31 cfs @ 12.05 hrs, Volume= 0.019 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
1,900	98	Paved parking & roofs
3,900	61	>75% Grass cover, Good, HSG B
5,800	73	Weighted Average
3,900		Pervious Area
1,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.3	47	0.1702	0.33		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.6	64	Total			

Subcatchment 12S: Sub #12



Subcatchment 13S: Sub 13

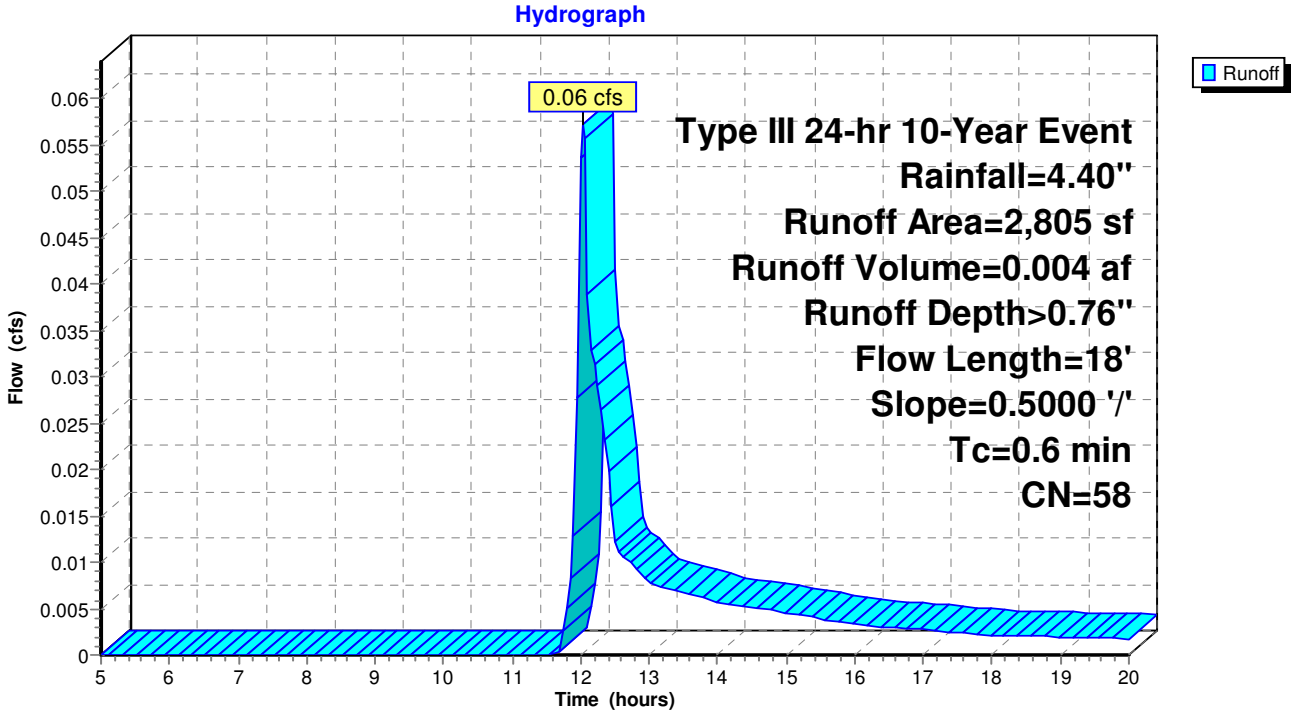
Runoff = 0.06 cfs @ 12.03 hrs, Volume= 0.004 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
2,805	58	Meadow, non-grazed, HSG B
2,805		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	18	0.5000	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 13S: Sub 13



Subcatchment 14S: Sub 14

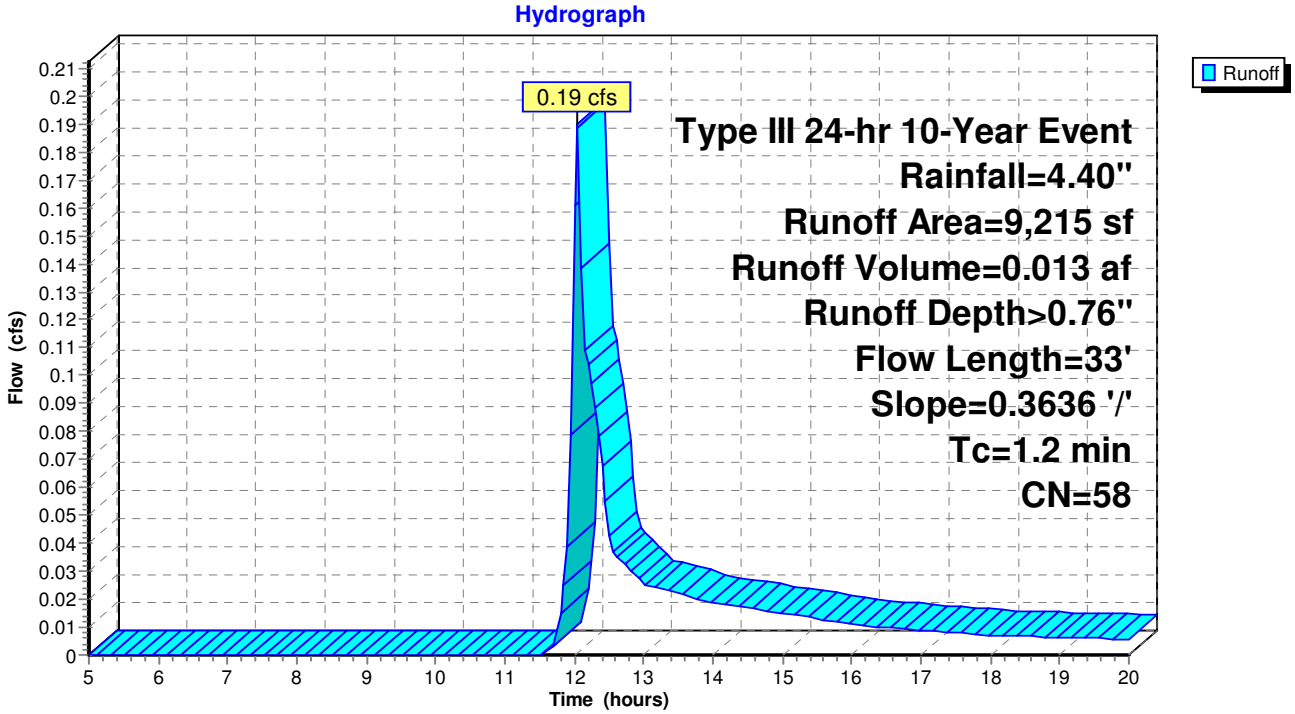
Runoff = 0.19 cfs @ 12.04 hrs, Volume= 0.013 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,215	58	Meadow, non-grazed, HSG B
9,215		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	33	0.3636	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 14S: Sub 14



Subcatchment 15S: Sub 15

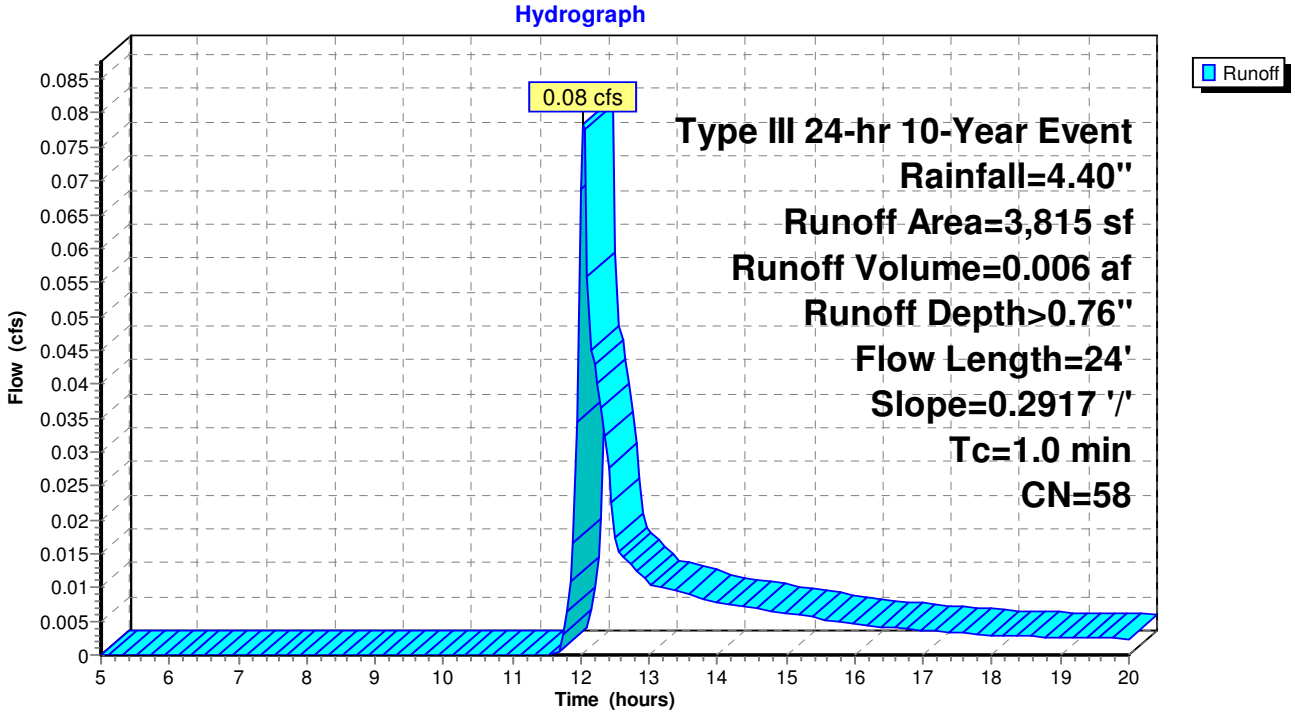
Runoff = 0.08 cfs @ 12.04 hrs, Volume= 0.006 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
3,815	58	Meadow, non-grazed, HSG B
3,815		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	24	0.2917	0.41		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 15S: Sub 15



Subcatchment 16S: Sub 16

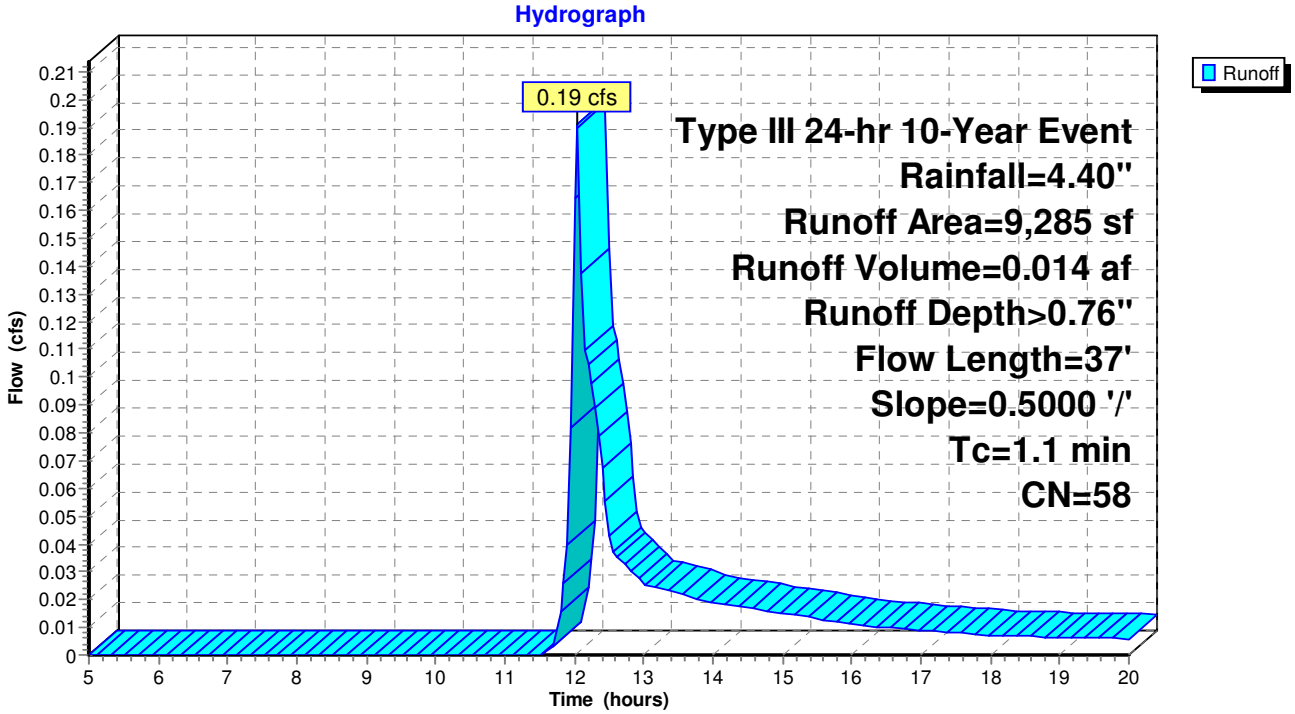
Runoff = 0.19 cfs @ 12.04 hrs, Volume= 0.014 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
9,285	58	Meadow, non-grazed, HSG B
9,285		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	37	0.5000	0.55		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 16S: Sub 16



Subcatchment 17S: Sub #17

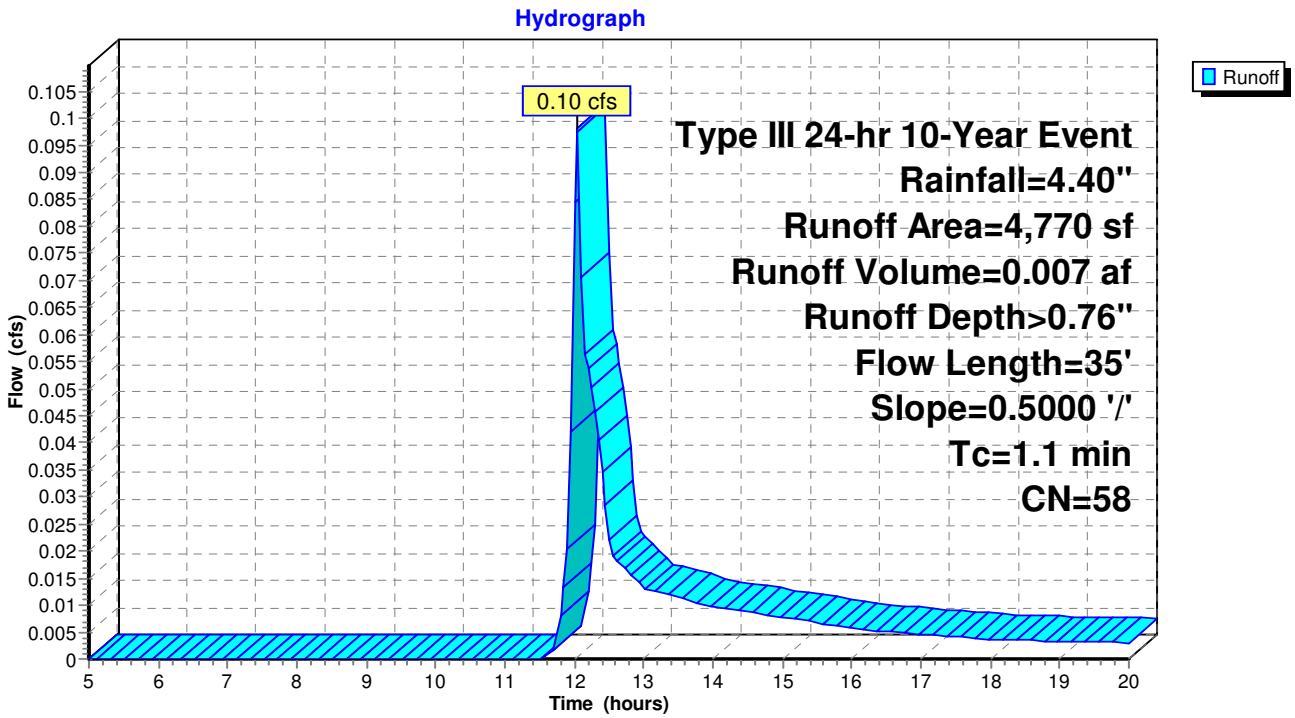
Runoff = 0.10 cfs @ 12.04 hrs, Volume= 0.007 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
4,770	58	Meadow, non-grazed, HSG B
4,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	35	0.5000	0.54		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 17S: Sub #17



Pond 1: CB1

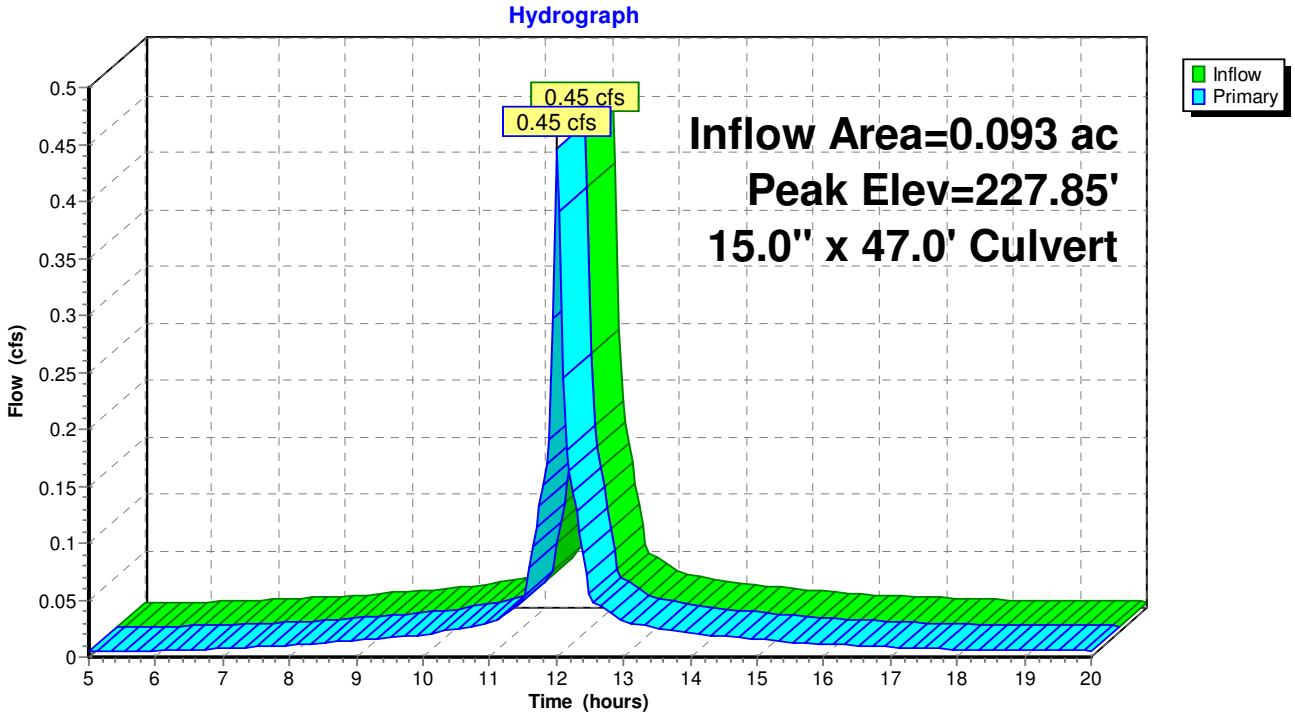
Inflow Area =	0.093 ac,	Inflow Depth >	3.87"	for	10-Year Event event
Inflow =	0.45 cfs @	12.01 hrs,	Volume=	0.030 af	
Outflow =	0.45 cfs @	12.01 hrs,	Volume=	0.030 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.45 cfs @	12.01 hrs,	Volume=	0.030 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.85' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.50'	**15.0" x 47.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.43 cfs @ 12.01 hrs HW=227.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 1.57 fps)

Pond 1: CB1



Pond 1P: Filter Pond #1

Inflow Area = 1.432 ac, Inflow Depth > 2.34" for 10-Year Event event
Inflow = 3.87 cfs @ 12.03 hrs, Volume= 0.279 af
Outflow = 0.34 cfs @ 13.24 hrs, Volume= 0.147 af, Atten= 91%, Lag= 72.7 min
Primary = 0.34 cfs @ 13.24 hrs, Volume= 0.147 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 213.14' @ 13.24 hrs Surf.Area= 4,292 sf Storage= 7,446 cf

Plug-Flow detention time= 229.4 min calculated for 0.146 af (52% of inflow)
Center-of-Mass det. time= 146.1 min (926.0 - 779.8)

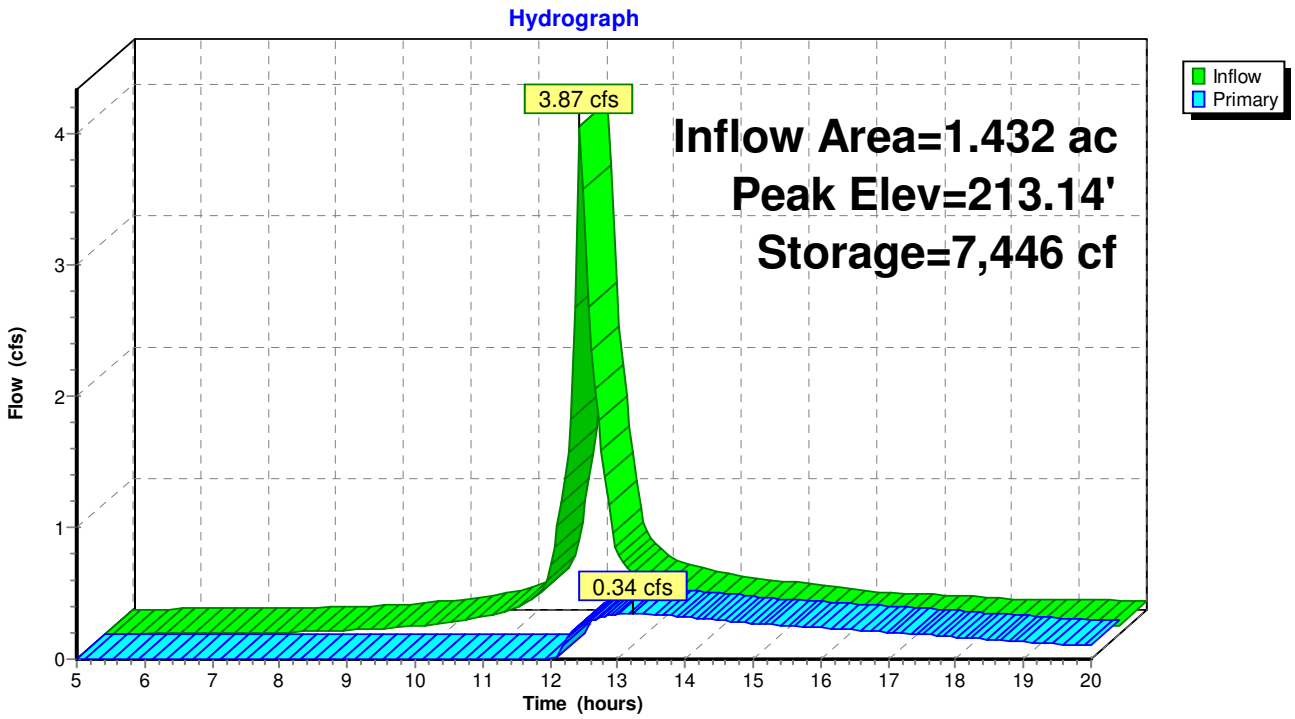
Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	16,887 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	2,725	0	0	2,725
212.00	3,425	3,068	3,068	3,452
212.50	3,800	1,805	4,874	3,842
213.00	4,185	1,995	6,869	4,243
214.00	5,000	4,586	11,456	5,092
215.00	5,875	5,432	16,887	6,006

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**15.0" x 30.5' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 208.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	212.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	213.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.34 cfs @ 13.24 hrs HW=213.14' (Free Discharge)
└─**1=Culvert** (Passes 0.34 cfs of 9.34 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 3.30 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.26 fps)

Pond 1P: Filter Pond #1



Pond 2: CB2

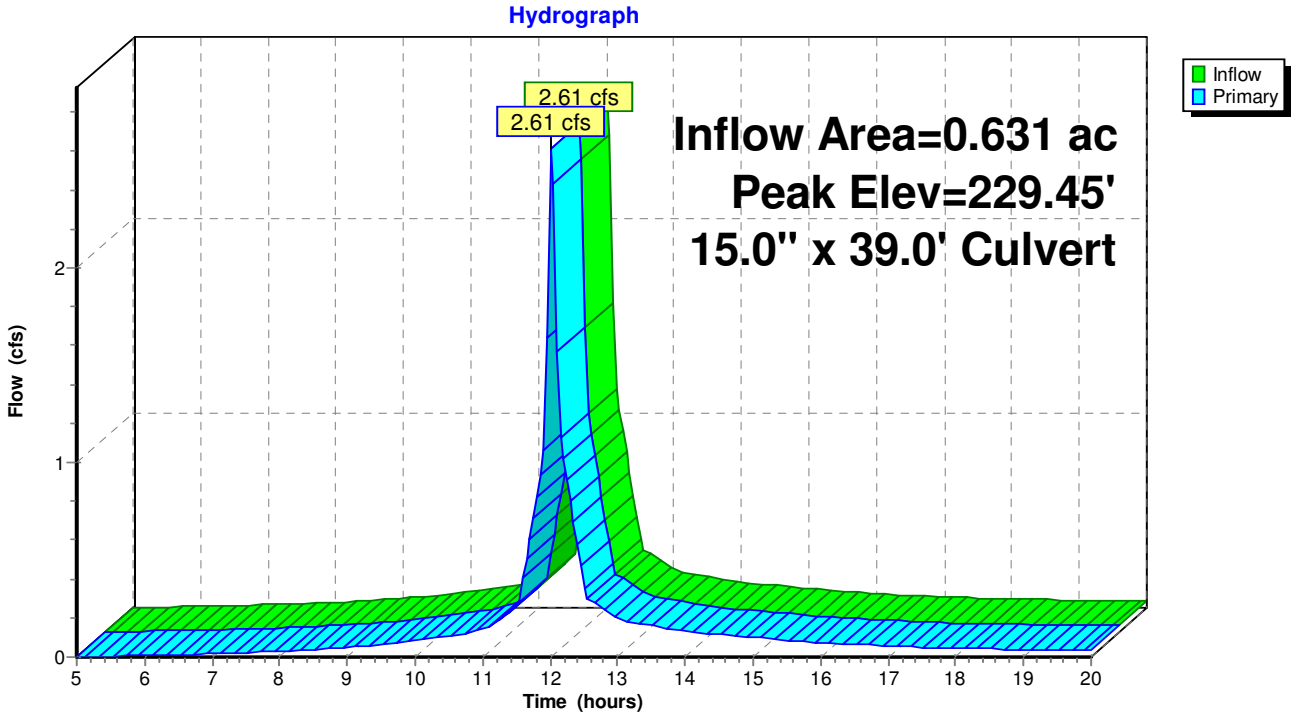
Inflow Area =	0.631 ac,	Inflow Depth >	3.12"	for	10-Year Event event
Inflow =	2.61 cfs @	12.02 hrs,	Volume=	0.164 af	
Outflow =	2.61 cfs @	12.02 hrs,	Volume=	0.164 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.61 cfs @	12.02 hrs,	Volume=	0.164 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.45' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**15.0" x 39.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0128 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.49 cfs @ 12.02 hrs HW=229.42' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.49 cfs @ 2.58 fps)

Pond 2: CB2



Pond 2P: Filter Pond #2

Inflow Area = 1.690 ac, Inflow Depth > 3.05" for 10-Year Event event
Inflow = 6.59 cfs @ 12.02 hrs, Volume= 0.429 af
Outflow = 1.17 cfs @ 12.45 hrs, Volume= 0.277 af, Atten= 82%, Lag= 26.0 min
Primary = 1.17 cfs @ 12.45 hrs, Volume= 0.277 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.96' @ 12.45 hrs Surf.Area= 6,383 sf Storage= 10,874 cf

Plug-Flow detention time= 198.3 min calculated for 0.277 af (65% of inflow)
Center-of-Mass det. time= 124.0 min (876.4 - 752.4)

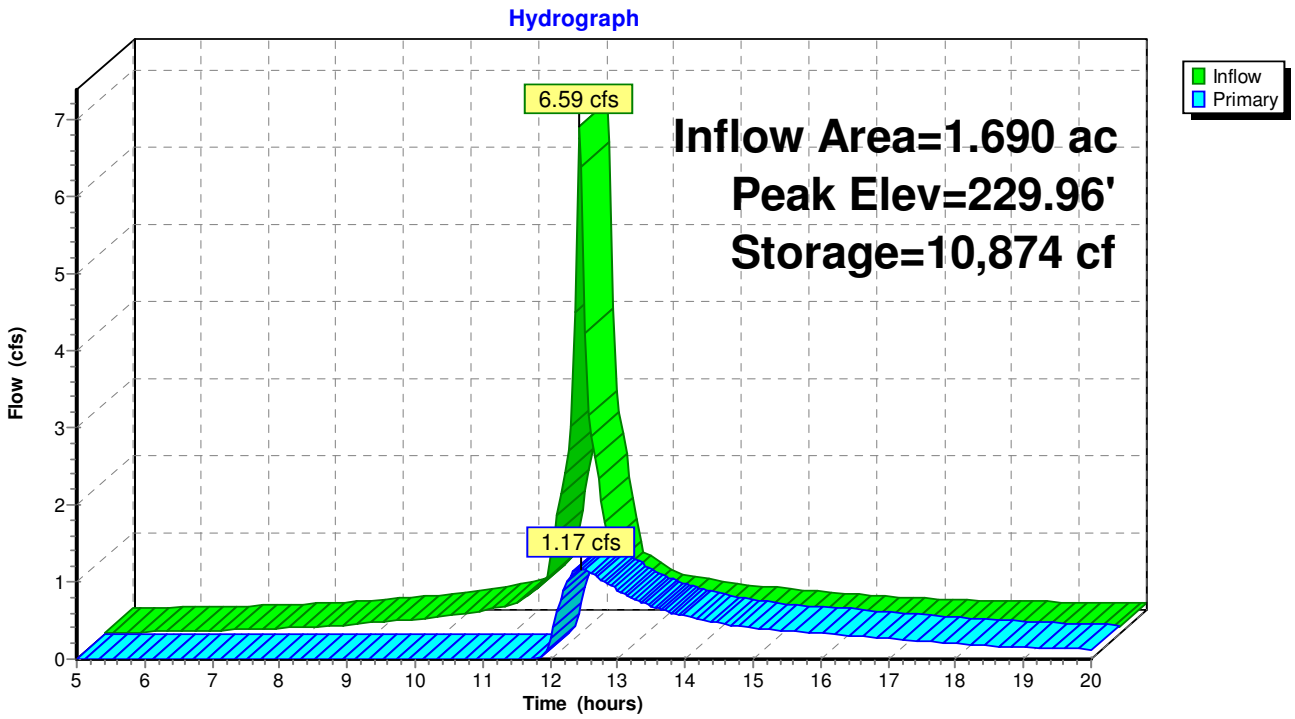
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	14,679 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
227.50	2,550	0	0	2,550
228.00	3,290	1,456	1,456	3,296
229.00	4,840	4,040	5,496	4,862
230.00	6,450	5,626	11,122	6,494
230.50	7,800	3,557	14,679	7,852

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**15.0" x 23.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 223.00' S= 0.0870 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	229.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	229.50'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.17 cfs @ 12.45 hrs HW=229.96' (Free Discharge)
└─**1=Culvert** (Passes 1.17 cfs of 9.71 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 4.18 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.60 cfs @ 2.31 fps)

Pond 2P: Filter Pond #2



Pond 3: CB3

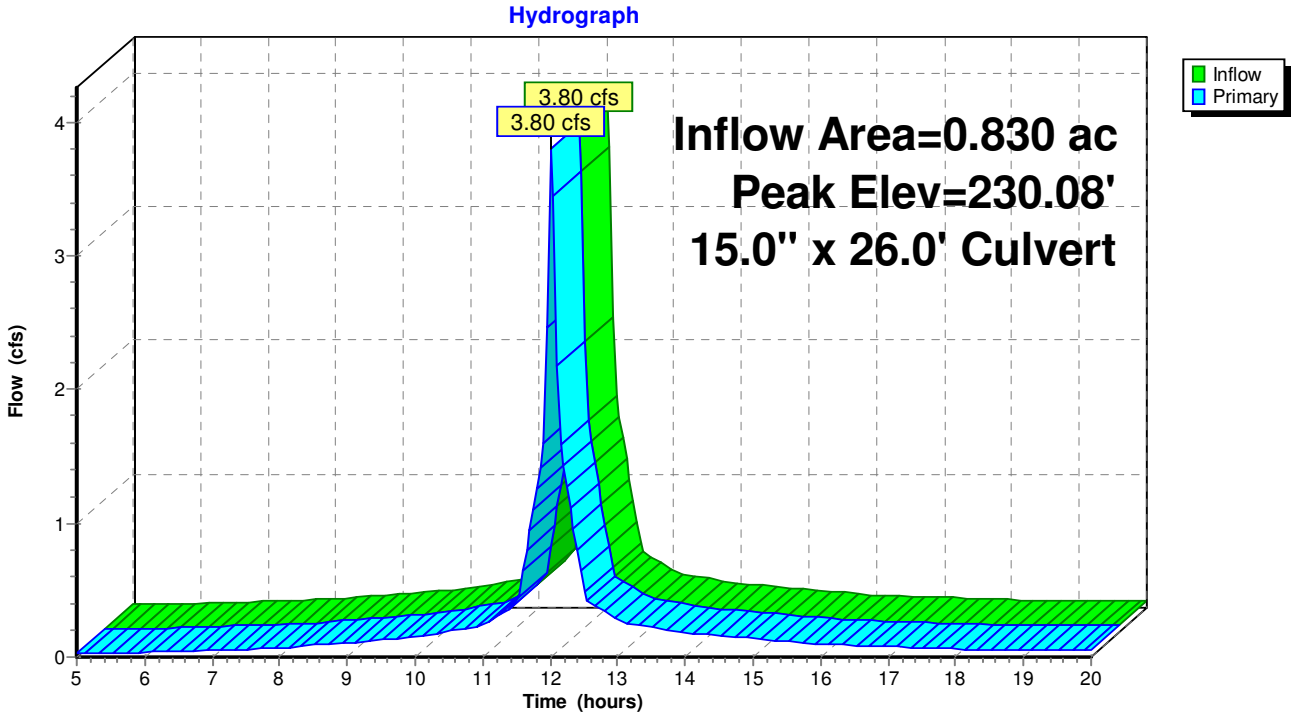
Inflow Area =	0.830 ac,	Inflow Depth >	3.62"	for	10-Year Event event
Inflow =	3.80 cfs @	12.02 hrs,	Volume=	0.250 af	
Outflow =	3.80 cfs @	12.02 hrs,	Volume=	0.250 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.80 cfs @	12.02 hrs,	Volume=	0.250 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.08' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.80'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0308 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.65 cfs @ 12.02 hrs HW=230.03' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.65 cfs @ 2.98 fps)

Pond 3: CB3



Pond 3P: Filter Pond #3

Inflow Area = 0.607 ac, Inflow Depth > 2.14" for 10-Year Event event
Inflow = 1.81 cfs @ 12.02 hrs, Volume= 0.108 af
Outflow = 0.25 cfs @ 12.52 hrs, Volume= 0.108 af, Atten= 86%, Lag= 30.3 min
Primary = 0.25 cfs @ 12.52 hrs, Volume= 0.108 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 235.66' @ 12.52 hrs Surf.Area= 1,944 sf Storage= 1,540 cf

Plug-Flow detention time= 46.7 min calculated for 0.108 af (100% of inflow)
Center-of-Mass det. time= 46.4 min (836.3 - 789.9)

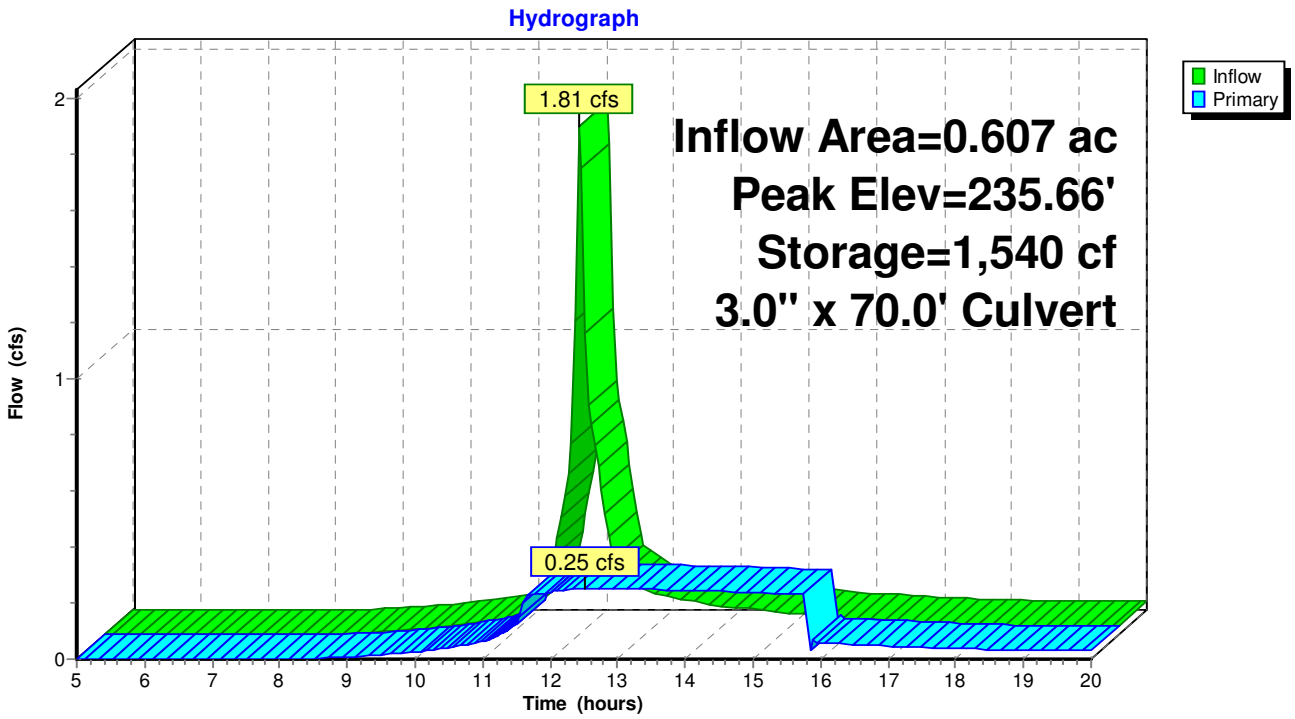
Volume	Invert	Avail.Storage	Storage Description
#1	234.50'	2,272 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
234.50	790	0	0	790
235.00	1,230	501	501	1,234
236.00	2,375	1,771	2,272	2,388

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	**3.0" x 70.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 229.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.25 cfs @ 12.52 hrs HW=235.66' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.25 cfs @ 5.10 fps)

Pond 3P: Filter Pond #3



Pond 4: CB4

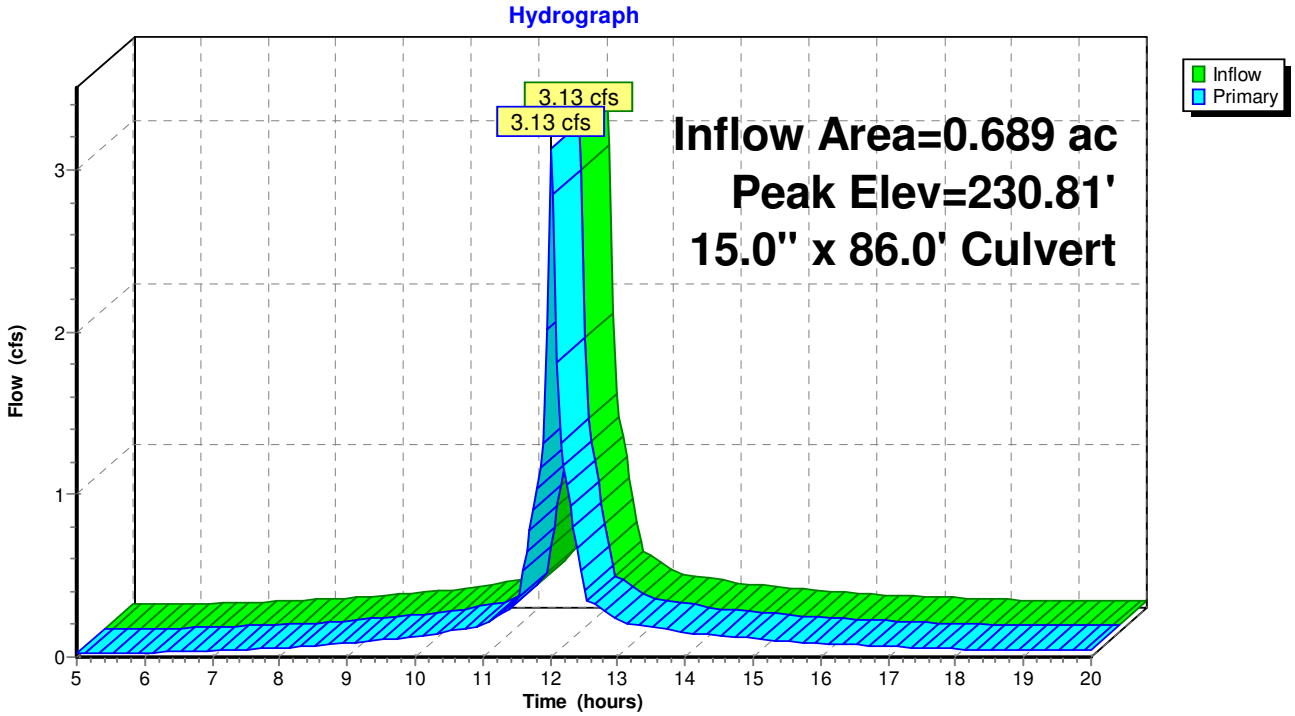
Inflow Area =	0.689 ac,	Inflow Depth >	3.58"	for	10-Year Event event
Inflow =	3.13 cfs @	12.02 hrs,	Volume=	0.206 af	
Outflow =	3.13 cfs @	12.02 hrs,	Volume=	0.206 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.13 cfs @	12.02 hrs,	Volume=	0.206 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.81' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.90'	**15.0" x 86.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.00' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.99 cfs @ 12.02 hrs HW=230.79' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.99 cfs @ 3.21 fps)

Pond 4: CB4



Pond 5: CB5

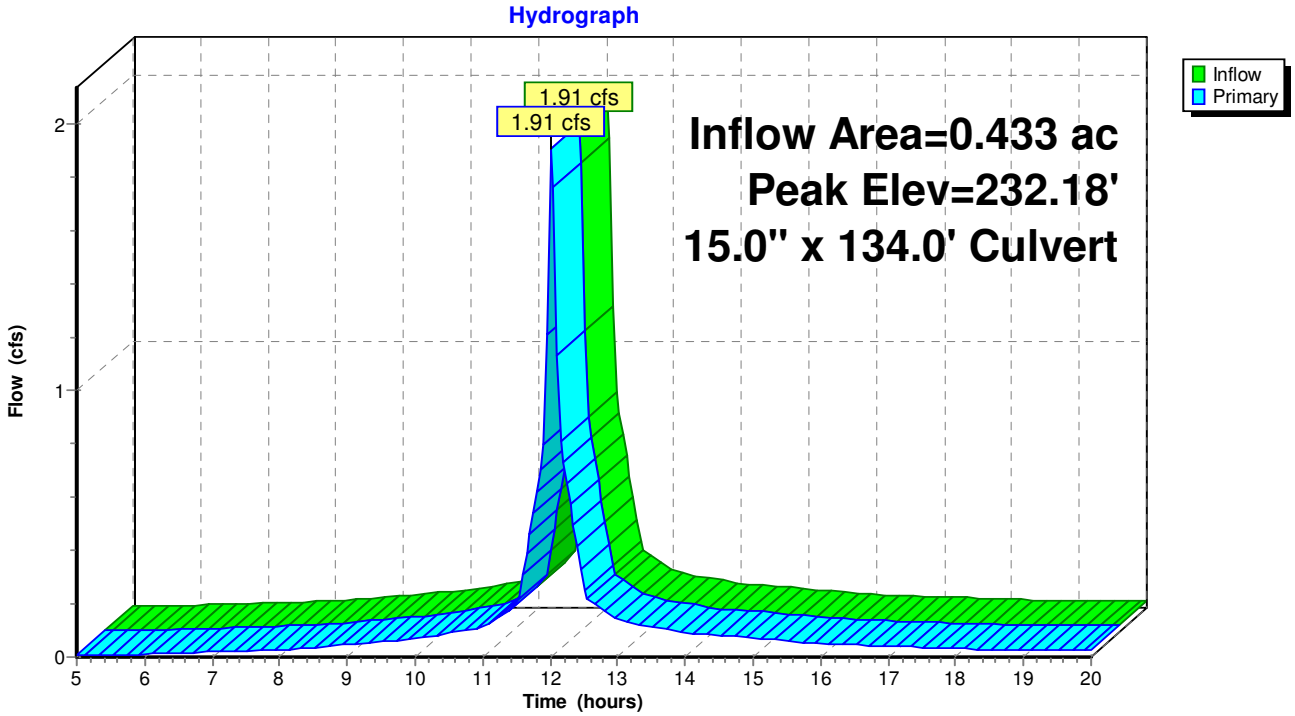
Inflow Area =	0.433 ac,	Inflow Depth >	3.41"	for	10-Year Event event
Inflow =	1.91 cfs @	12.02 hrs,	Volume=	0.123 af	
Outflow =	1.91 cfs @	12.02 hrs,	Volume=	0.123 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.91 cfs @	12.02 hrs,	Volume=	0.123 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 232.18' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	231.50'	**15.0" x 134.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 230.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.83 cfs @ 12.02 hrs HW=232.16' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.83 cfs @ 2.77 fps)

Pond 5: CB5



Pond 6: CB6

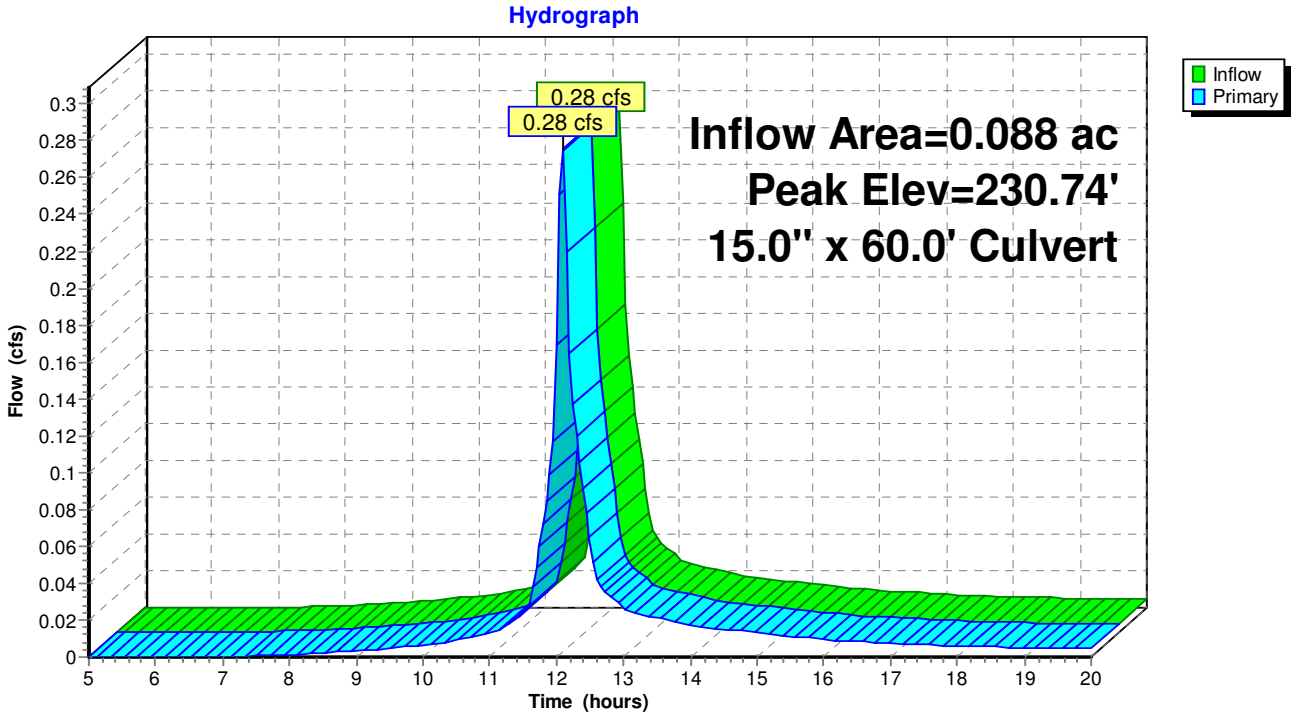
Inflow Area =	0.088 ac,	Inflow Depth >	2.55"	for	10-Year Event event
Inflow =	0.28 cfs @	12.09 hrs,	Volume=	0.019 af	
Outflow =	0.28 cfs @	12.09 hrs,	Volume=	0.019 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.28 cfs @	12.09 hrs,	Volume=	0.019 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.80' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=230.74' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.27 cfs @ 1.66 fps)

Pond 6: CB6



Pond 7: CB7

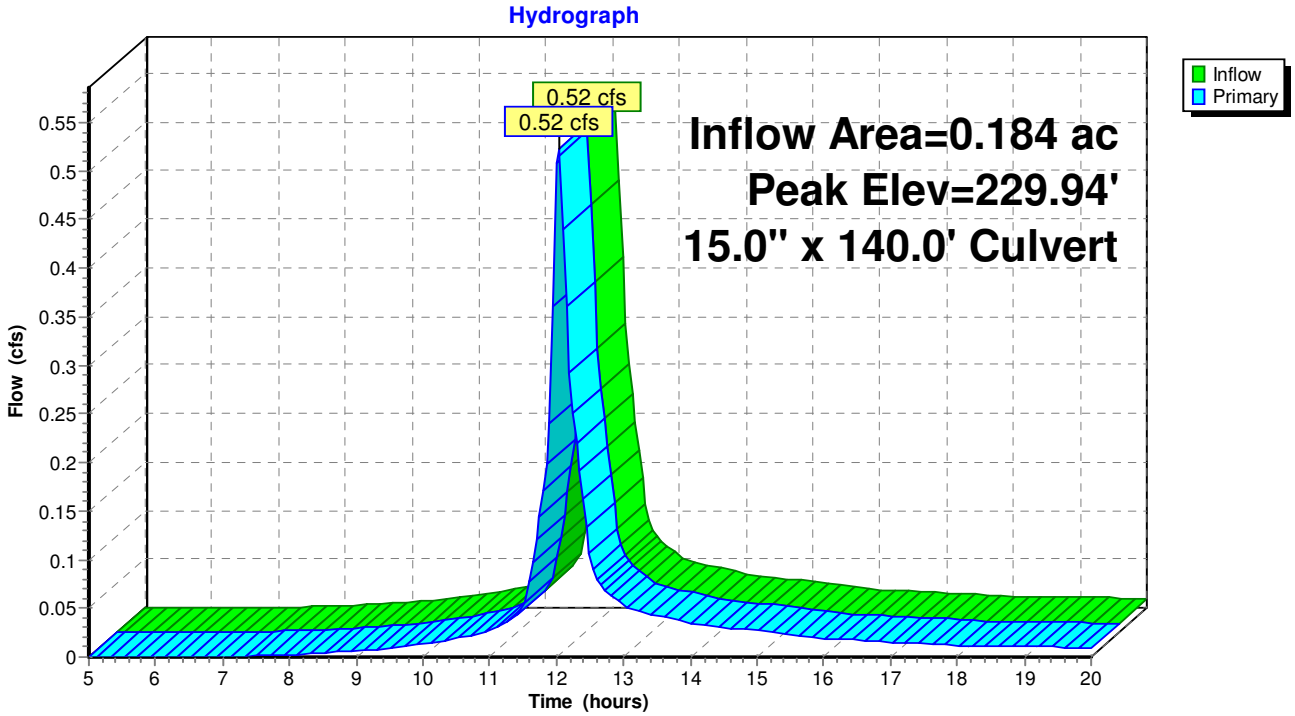
Inflow Area =	0.184 ac,	Inflow Depth >	2.51"	for	10-Year Event event
Inflow =	0.52 cfs @	12.03 hrs,	Volume=	0.038 af	
Outflow =	0.52 cfs @	12.03 hrs,	Volume=	0.038 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.03 hrs,	Volume=	0.038 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.94' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.60'	**15.0" x 140.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 228.10' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.51 cfs @ 12.03 hrs HW=229.93' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.51 cfs @ 1.96 fps)

Pond 7: CB7



Pond 8: CB8

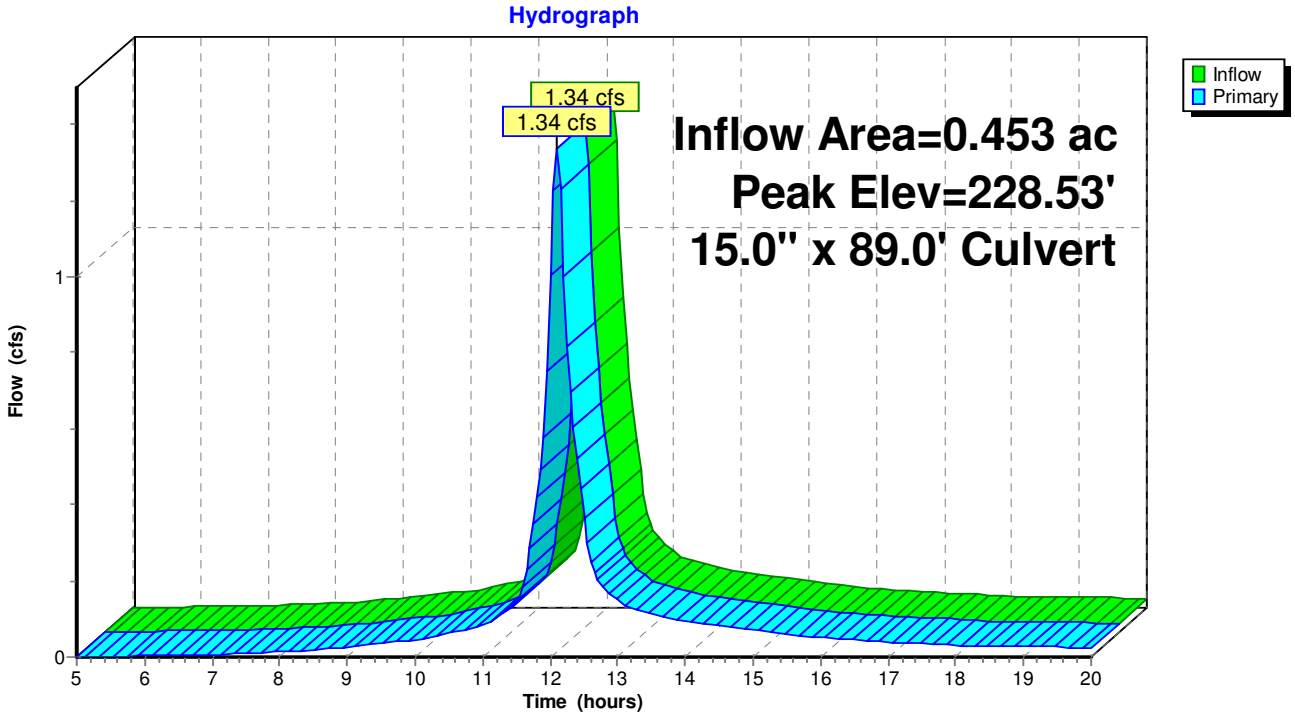
Inflow Area =	0.453 ac,	Inflow Depth >	2.87"	for	10-Year Event event
Inflow =	1.34 cfs @	12.10 hrs,	Volume=	0.108 af	
Outflow =	1.34 cfs @	12.10 hrs,	Volume=	0.108 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.34 cfs @	12.10 hrs,	Volume=	0.108 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.53' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.90'	**15.0" x 89.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.34 cfs @ 12.10 hrs HW=228.53' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.34 cfs @ 2.14 fps)

Pond 8: CB8



Pond 9: CB9

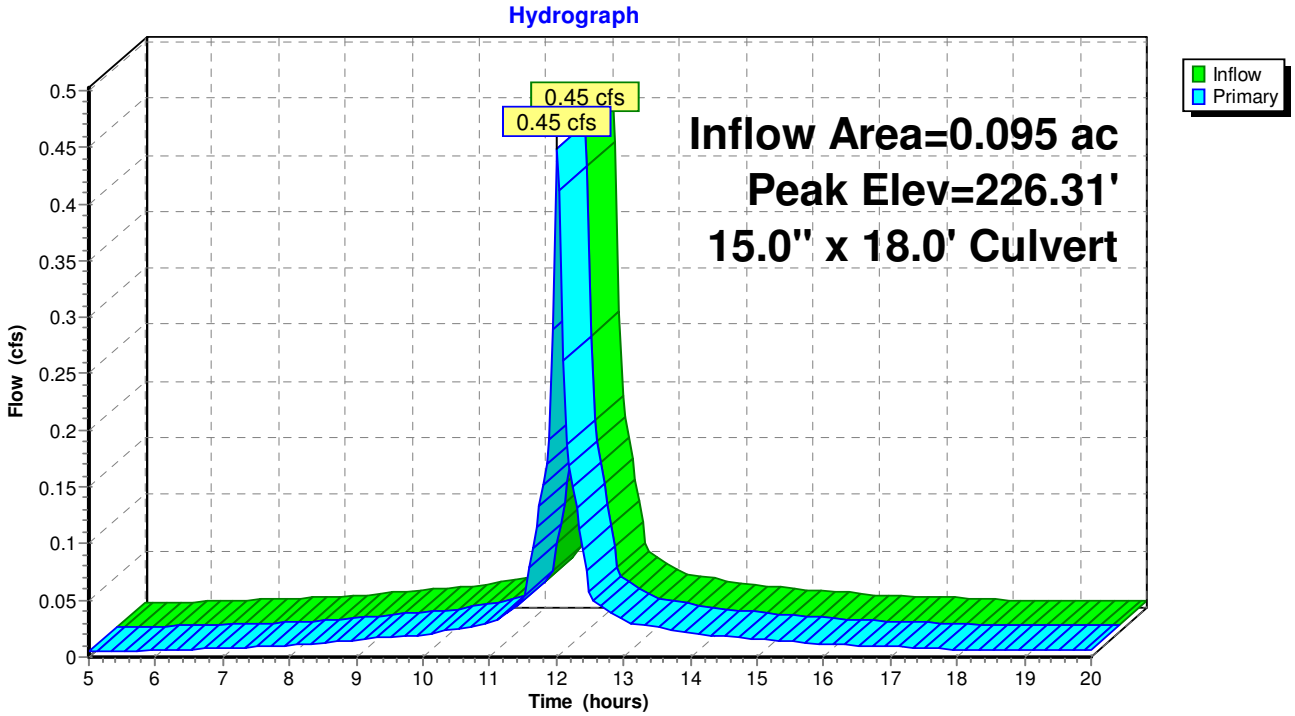
Inflow Area =	0.095 ac,	Inflow Depth >	3.87"	for	10-Year Event event
Inflow =	0.45 cfs @	12.02 hrs,	Volume=	0.031 af	
Outflow =	0.45 cfs @	12.02 hrs,	Volume=	0.031 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.45 cfs @	12.02 hrs,	Volume=	0.031 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.31' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**15.0" x 18.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 225.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.43 cfs @ 12.02 hrs HW=226.30' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 1.87 fps)

Pond 9: CB9



Pond 10: CB10

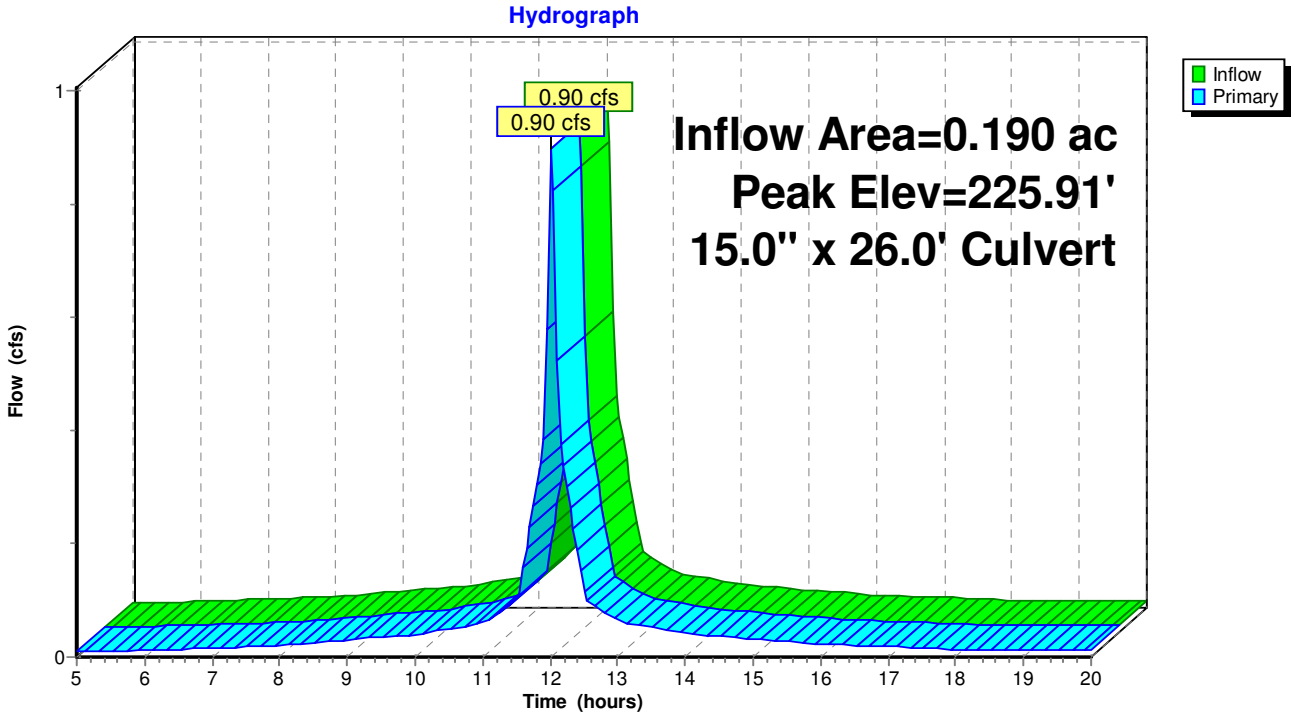
Inflow Area =	0.190 ac,	Inflow Depth >	3.87"	for	10-Year Event event	
Inflow =	0.90 cfs @	12.02 hrs,	Volume=	0.061 af		
Outflow =	0.90 cfs @	12.02 hrs,	Volume=	0.061 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.90 cfs @	12.02 hrs,	Volume=	0.061 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 225.91' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 224.00' S= 0.0538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=225.90' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.86 cfs @ 1.89 fps)

Pond 10: CB10



Pond SF1: Sediment Forebay #1

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	82 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	30	0	0	30
212.00	150	82	82	154

Pond SF2: Sediment Forebay #2

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	449 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

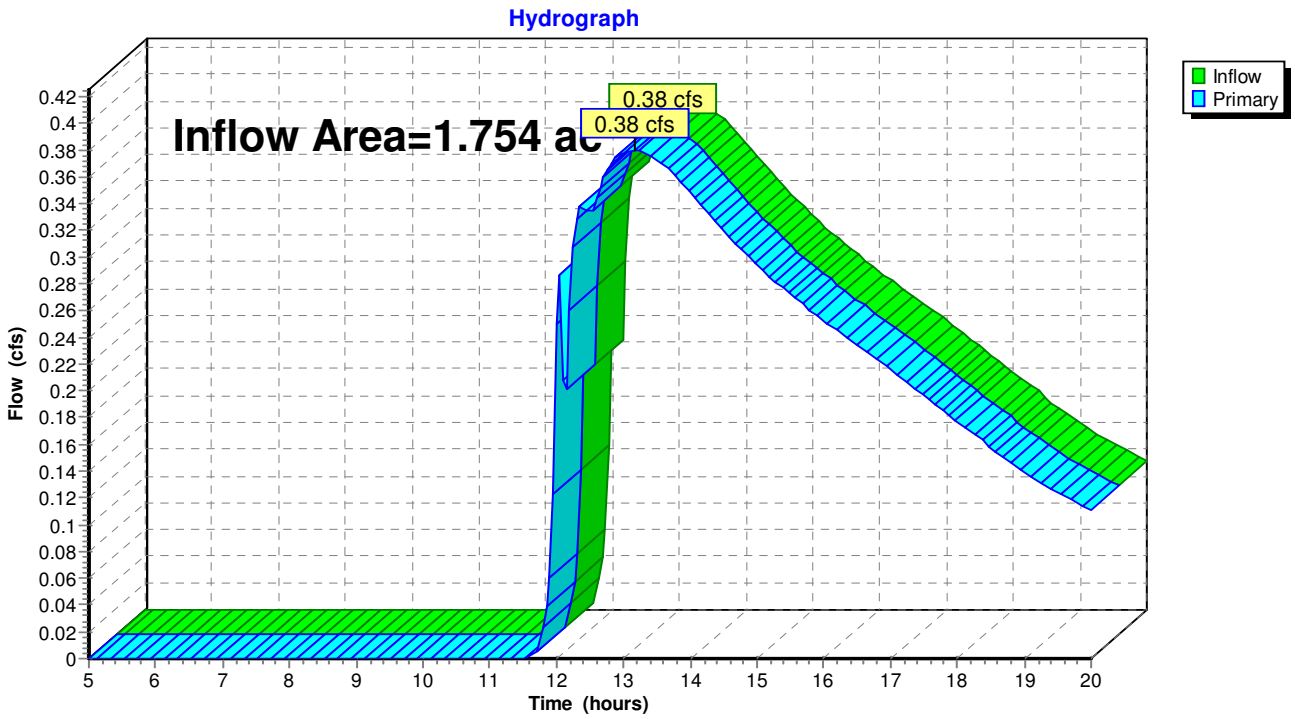
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	275	0	0	275
229.00	650	449	449	657

Pond SP1: Study Point #1

Inflow Area = 1.754 ac, Inflow Depth > 1.14" for 10-Year Event event
Inflow = 0.38 cfs @ 13.16 hrs, Volume= 0.167 af
Primary = 0.38 cfs @ 13.16 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

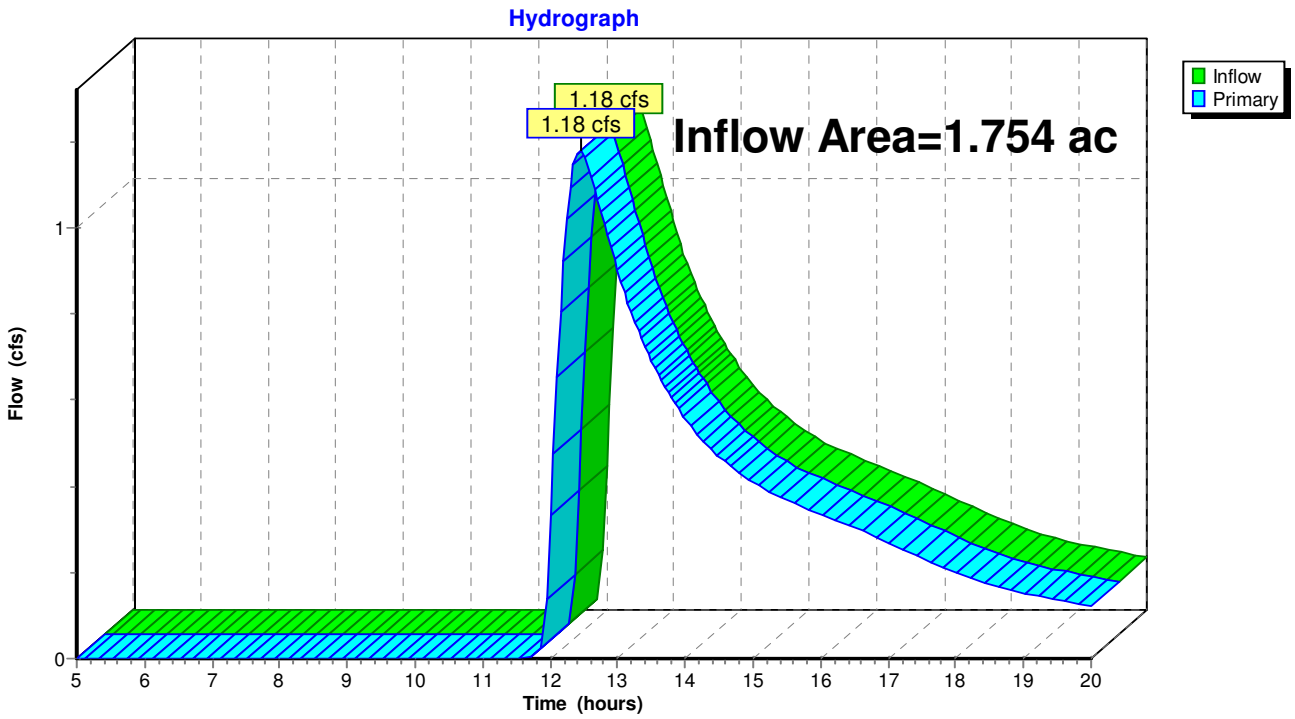


Pond SP2: Study Point #2

Inflow Area = 1.754 ac, Inflow Depth > 1.92" for 10-Year Event event
Inflow = 1.18 cfs @ 12.44 hrs, Volume= 0.281 af
Primary = 1.18 cfs @ 12.44 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

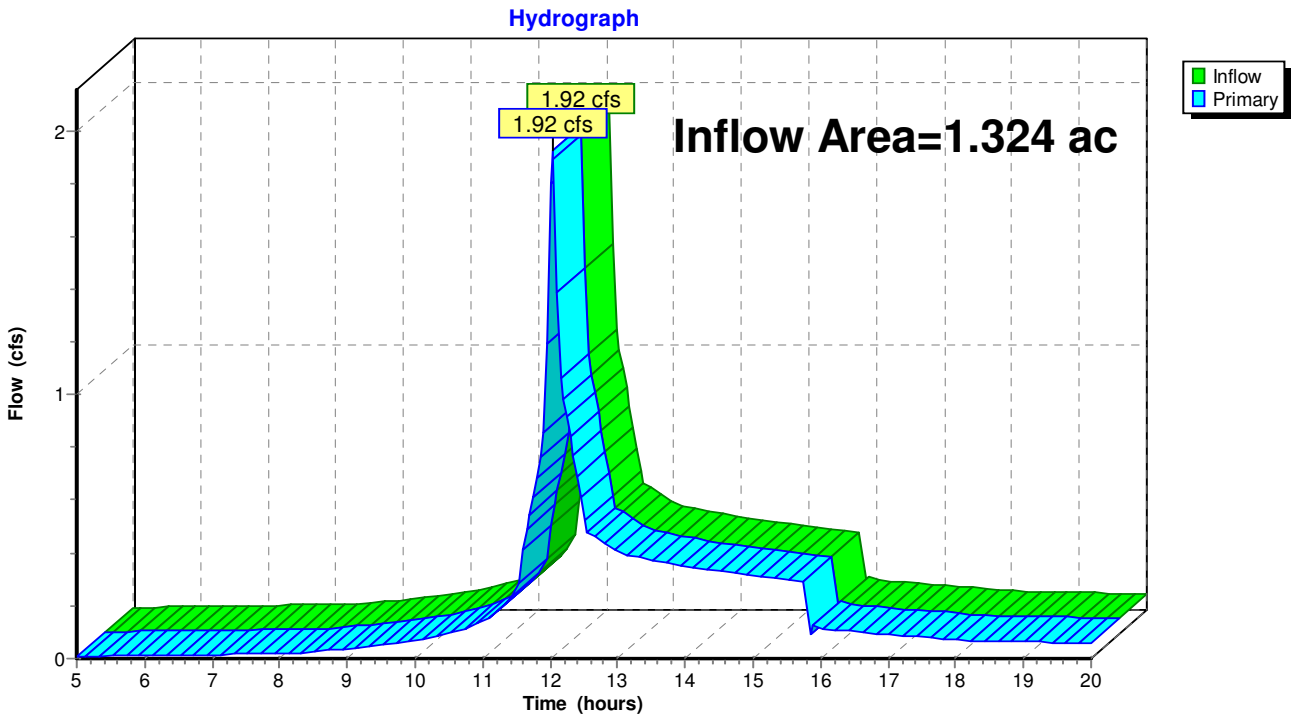


Pond SP3: Study Point #2

Inflow Area = 1.324 ac, Inflow Depth > 2.01" for 10-Year Event event
Inflow = 1.92 cfs @ 12.03 hrs, Volume= 0.222 af
Primary = 1.92 cfs @ 12.03 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #2



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

Subcatchment 1AS: Sub #1A Runoff Area=11,725 sf Runoff Depth>3.75"
Flow Length=98' Tc=8.6 min CN=90 Runoff=1.09 cfs 0.084 af

Subcatchment 1BS: Sub #1B Runoff Area=4,165 sf Runoff Depth>3.07"
Tc=0.0 min CN=83 Runoff=0.42 cfs 0.024 af

Subcatchment 1CS: Sub #1C Runoff Area=3,840 sf Runoff Depth>3.16"
Flow Length=59' Slope=0.0200 '/' Tc=5.9 min CN=84 Runoff=0.34 cfs 0.023 af

Subcatchment 1S: Sub #1 Runoff Area=38,580 sf Runoff Depth>2.44"
Flow Length=314' Tc=0.9 min CN=76 Runoff=3.04 cfs 0.180 af

Subcatchment 2S: Sub #2 Runoff Area=4,060 sf Runoff Depth>4.51"
Flow Length=103' Slope=0.0400 '/' Tc=1.0 min CN=98 Runoff=0.52 cfs 0.035 af

Subcatchment 3S: Sub #3 Runoff Area=27,485 sf Runoff Depth>3.76"
Flow Length=184' Tc=1.3 min CN=90 Runoff=3.11 cfs 0.198 af

Subcatchment 4S: Sub #4 Runoff Area=6,165 sf Runoff Depth>4.43"
Flow Length=122' Slope=0.0400 '/' Tc=1.0 min CN=97 Runoff=0.78 cfs 0.052 af

Subcatchment 5S: Sub #5 Runoff Area=11,125 sf Runoff Depth>4.51"
Flow Length=98' Slope=0.0286 '/' Tc=1.1 min CN=98 Runoff=1.41 cfs 0.096 af

Subcatchment 6S: Sub #6 Runoff Area=18,880 sf Runoff Depth>4.06"
Flow Length=125' Tc=1.3 min CN=93 Runoff=2.25 cfs 0.147 af

Subcatchment 7S: Sub #7 Runoff Area=26,440 sf Runoff Depth>2.70"
Flow Length=87' Tc=1.0 min CN=79 Runoff=2.29 cfs 0.137 af

Subcatchment 8S: Sub #8 Runoff Area=9,960 sf Runoff Depth>1.10"
Flow Length=35' Slope=0.1714 '/' Tc=1.7 min CN=58 Runoff=0.32 cfs 0.021 af

Subcatchment 9S: Sub #9 Runoff Area=4,140 sf Runoff Depth>4.51"
Flow Length=290' Tc=1.3 min CN=98 Runoff=0.52 cfs 0.036 af

Subcatchment 10S: Sub #10 Runoff Area=4,145 sf Runoff Depth>4.51"
Flow Length=282' Tc=1.3 min CN=98 Runoff=0.52 cfs 0.036 af

Subcatchment 11S: Sub #11 Runoff Area=4,135 sf Runoff Depth>2.44"
Flow Length=50' Tc=2.3 min CN=76 Runoff=0.32 cfs 0.019 af

Subcatchment 12S: Sub #12 Runoff Area=5,800 sf Runoff Depth>2.19"
Flow Length=64' Tc=2.6 min CN=73 Runoff=0.40 cfs 0.024 af

Subcatchment 13S: Sub 13 Runoff Area=2,805 sf Runoff Depth>1.10"
Flow Length=18' Slope=0.5000 '/' Tc=0.6 min CN=58 Runoff=0.09 cfs 0.006 af

Subcatchment 14S: Sub 14 Runoff Area=9,215 sf Runoff Depth>1.10"
Flow Length=33' Slope=0.3636 '/' Tc=1.2 min CN=58 Runoff=0.29 cfs 0.019 af

Subcatchment 15S: Sub 15 Runoff Area=3,815 sf Runoff Depth>1.10"
Flow Length=24' Slope=0.2917 '/' Tc=1.0 min CN=58 Runoff=0.12 cfs 0.008 af

Subcatchment 16S: Sub 16 Runoff Area=9,285 sf Runoff Depth>1.10"
Flow Length=37' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.30 cfs 0.020 af

Subcatchment 17S: Sub #17 Runoff Area=4,770 sf Runoff Depth>1.10"
Flow Length=35' Slope=0.5000 '/' Tc=1.1 min CN=58 Runoff=0.15 cfs 0.010 af

Pond 1: CB1 Peak Elev=227.88' Inflow=0.52 cfs 0.035 af
15.0" x 47.0' Culvert Outflow=0.52 cfs 0.035 af

Pond 1P: Filter Pond #1 Peak Elev=213.40' Storage=8,596 cf Inflow=4.89 cfs 0.347 af
Outflow=0.72 cfs 0.212 af

Pond 2: CB2 Peak Elev=229.57' Inflow=3.11 cfs 0.198 af
15.0" x 39.0' Culvert Outflow=3.11 cfs 0.198 af

Pond 2P: Filter Pond #2 Peak Elev=230.19' Storage=12,412 cf Inflow=7.85 cfs 0.514 af
Outflow=1.66 cfs 0.359 af

Pond 3: CB3 Peak Elev=230.32' Inflow=4.45 cfs 0.295 af
15.0" x 26.0' Culvert Outflow=4.45 cfs 0.295 af

Pond 3P: Filter Pond #3 Peak Elev=235.95' Storage=2,151 cf Inflow=2.29 cfs 0.137 af
3.0" x 70.0' Culvert Outflow=0.26 cfs 0.137 af

Pond 4: CB4 Peak Elev=230.92' Inflow=3.67 cfs 0.243 af
15.0" x 86.0' Culvert Outflow=3.67 cfs 0.243 af

Pond 5: CB5 Peak Elev=232.25' Inflow=2.25 cfs 0.147 af
15.0" x 134.0' Culvert Outflow=2.25 cfs 0.147 af

Pond 6: CB6 Peak Elev=230.77' Inflow=0.34 cfs 0.023 af
15.0" x 60.0' Culvert Outflow=0.34 cfs 0.023 af

Pond 7: CB7 Peak Elev=229.97' Inflow=0.64 cfs 0.048 af
15.0" x 140.0' Culvert Outflow=0.64 cfs 0.048 af

Pond 8: CB8 Peak Elev=228.61' Inflow=1.61 cfs 0.132 af
15.0" x 89.0' Culvert Outflow=1.61 cfs 0.132 af

Pond 9: CB9 Peak Elev=226.34' Inflow=0.52 cfs 0.036 af
15.0" x 18.0' Culvert Outflow=0.52 cfs 0.036 af

Pond 10: CB10 Peak Elev=225.95' Inflow=1.04 cfs 0.071 af
15.0" x 26.0' Culvert Outflow=1.04 cfs 0.071 af

Pond SF1: Sediment Forebay #1 Peak Elev=0.00' Storage=0 cf

Pond SF2: Sediment Forebay #2 Peak Elev=0.00' Storage=0 cf

Pond SP1: Study Point #1 Inflow=0.80 cfs 0.241 af
Primary=0.80 cfs 0.241 af

Pond SP2: Study Point #2 Inflow=1.69 cfs 0.365 af
Primary=1.69 cfs 0.365 af

Pond SP3: Study Point #2 Inflow=2.38 cfs 0.279 af
Primary=2.38 cfs 0.279 af

Total Runoff Area = 4.833 ac Runoff Volume = 1.175 af Average Runoff Depth = 2.92"
45.46% Pervious Area = 2.197 ac 54.54% Impervious Area = 2.636 ac

Subcatchment 1AS: Sub #1A

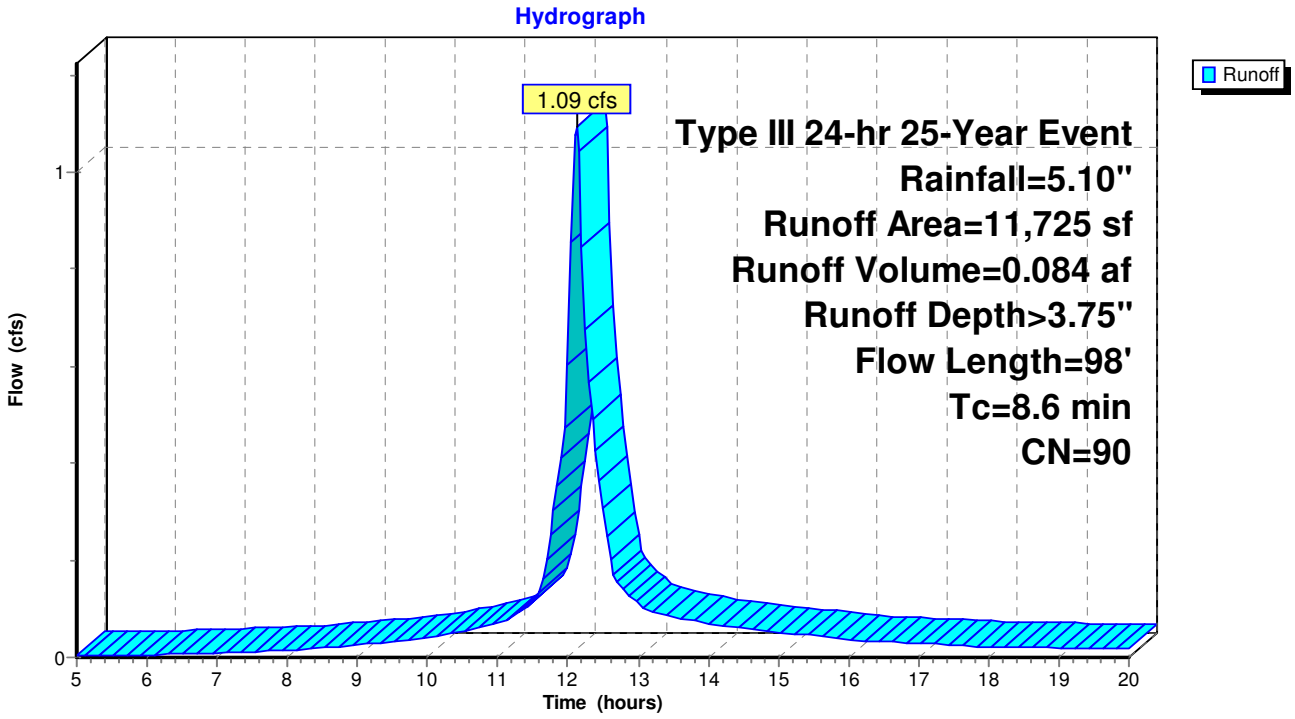
Runoff = 1.09 cfs @ 12.12 hrs, Volume= 0.084 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,225	98	Paved parking & roofs
2,500	61	>75% Grass cover, Good, HSG B
11,725	90	Weighted Average
2,500		Pervious Area
9,225		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
8.4	86	0.0233	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
8.6	98	Total			

Subcatchment 1AS: Sub #1A



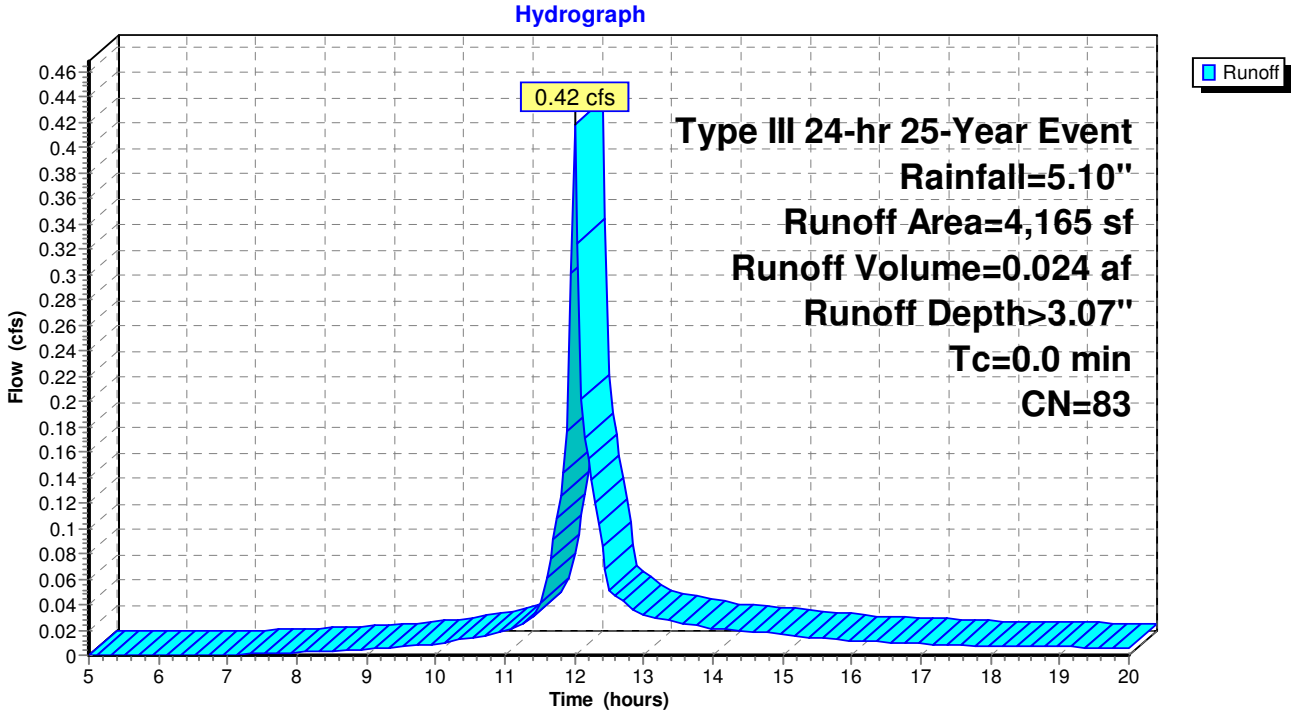
Subcatchment 1BS: Sub #1B

Runoff = 0.42 cfs @ 12.00 hrs, Volume= 0.024 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,505	98	Paved parking & roofs
1,660	61	>75% Grass cover, Good, HSG B
4,165	83	Weighted Average
1,660		Pervious Area
2,505		Impervious Area

Subcatchment 1BS: Sub #1B



Subcatchment 1CS: Sub #1C

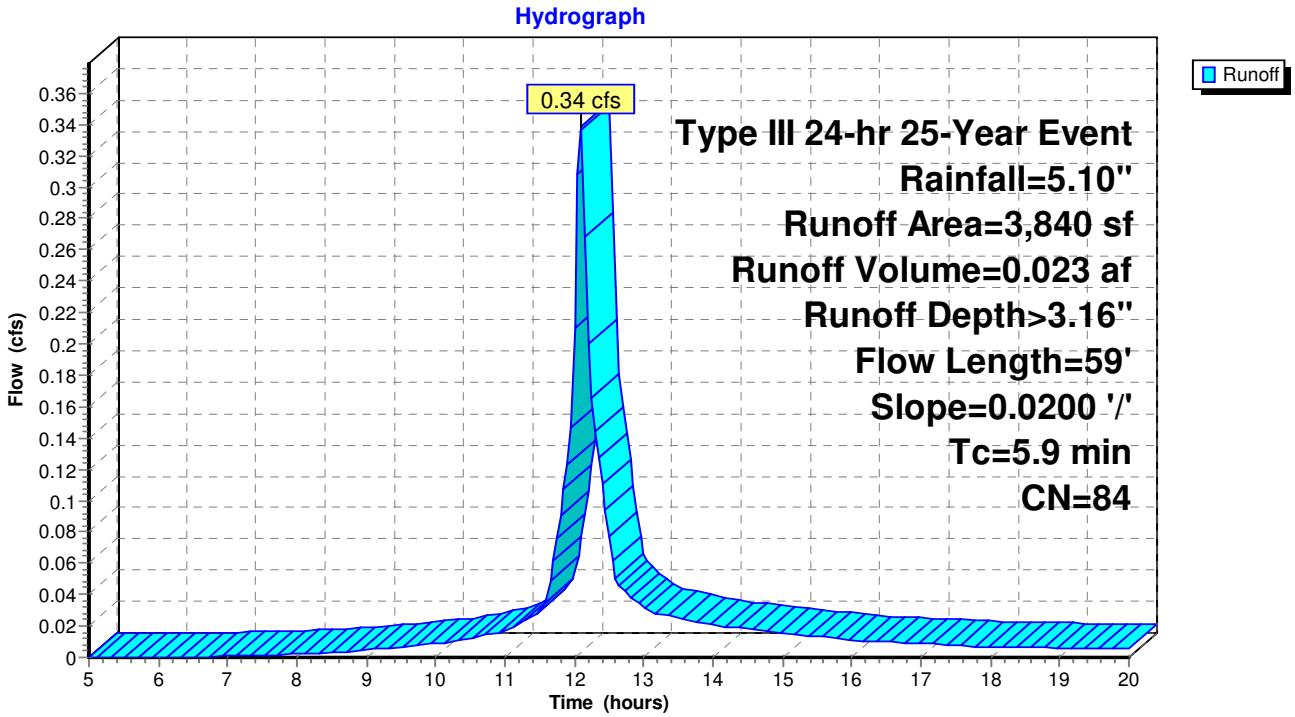
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,390	98	Paved parking & roofs
1,450	61	>75% Grass cover, Good, HSG B
3,840	84	Weighted Average
1,450		Pervious Area
2,390		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.84		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
5.7	49	0.0200	0.14		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
5.9	59	Total			

Subcatchment 1CS: Sub #1C



Subcatchment 1S: Sub #1

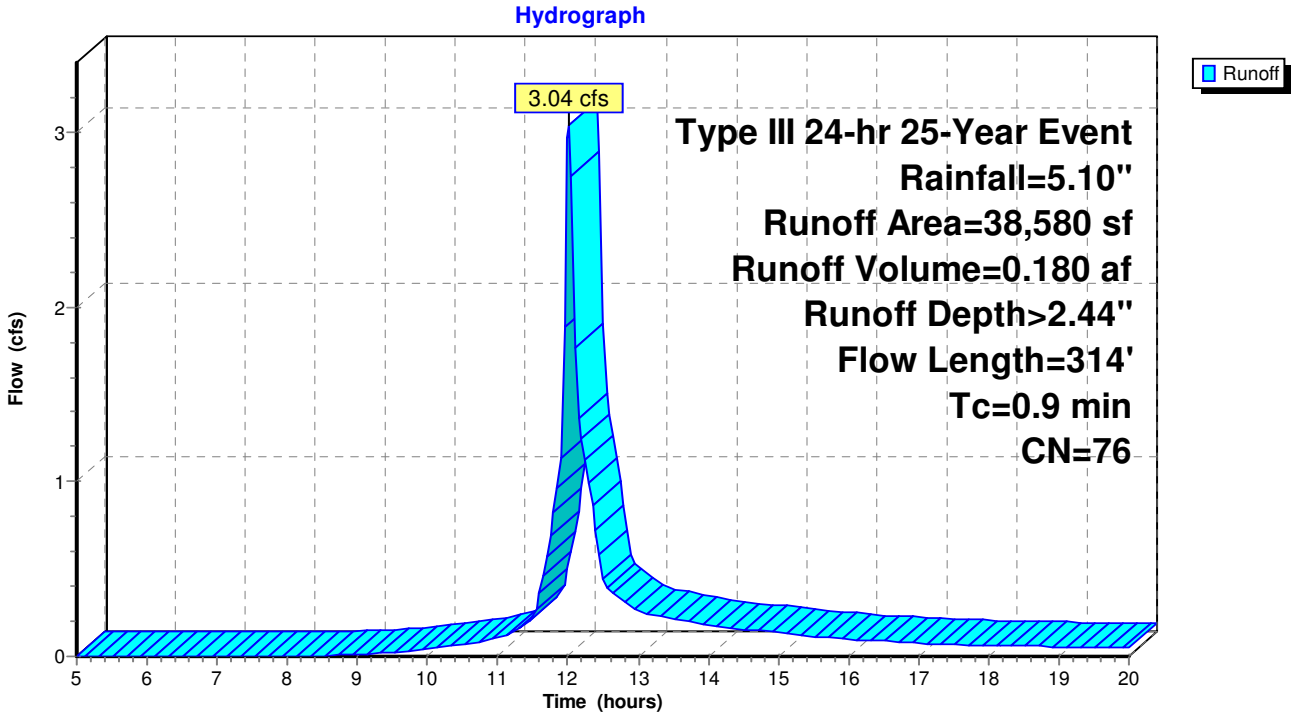
Runoff = 3.04 cfs @ 12.02 hrs, Volume= 0.180 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
16,145	98	Paved parking & roofs
16,000	61	>75% Grass cover, Good, HSG B
6,435	58	Meadow, non-grazed, HSG B
38,580	76	Weighted Average
22,435		Pervious Area
16,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	27	0.0370	3.90		**Shallow Concentrated Flow, AB** Paved Kv= 20.3 fps
0.2	50	0.0800	4.24		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.6	237	0.0649	6.40	25.58	**Channel Flow, CD** Area= 4.0 sf Perim= 7.2' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.9	314	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

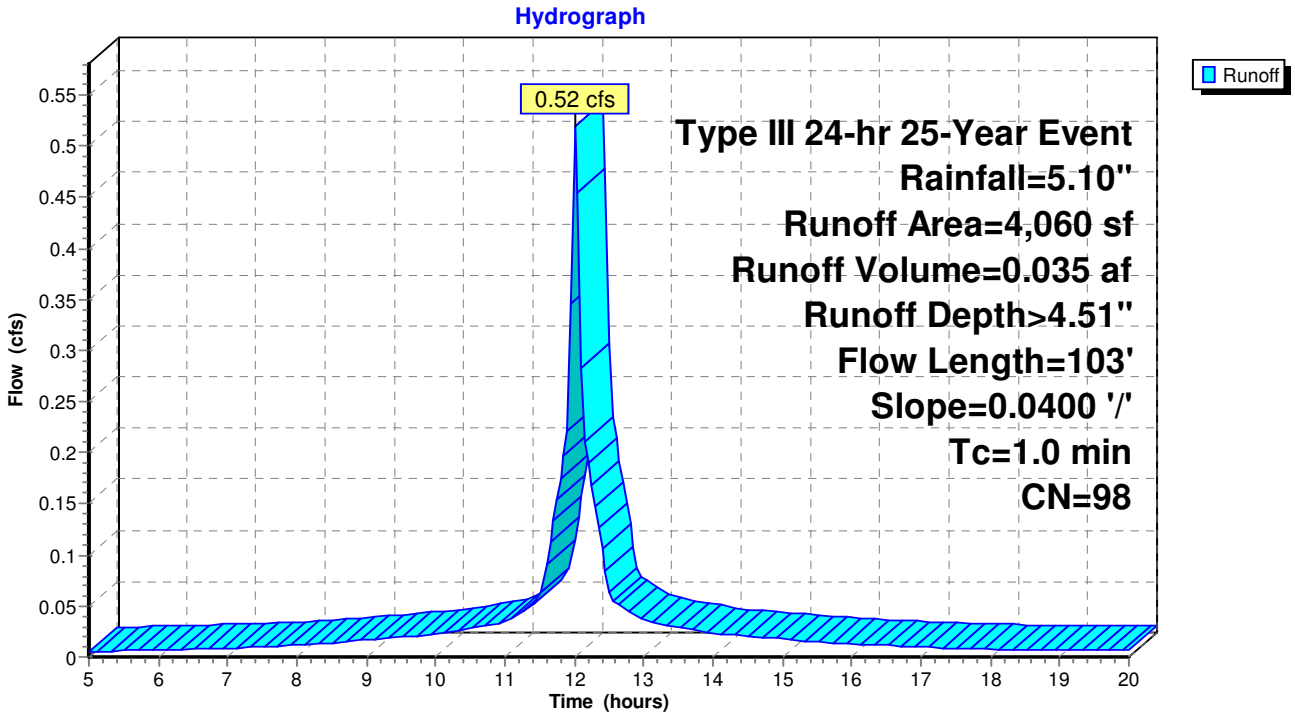
Runoff = 0.52 cfs @ 12.01 hrs, Volume= 0.035 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,060	98	Paved parking & roofs
4,060		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	103	0.0400	1.77		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

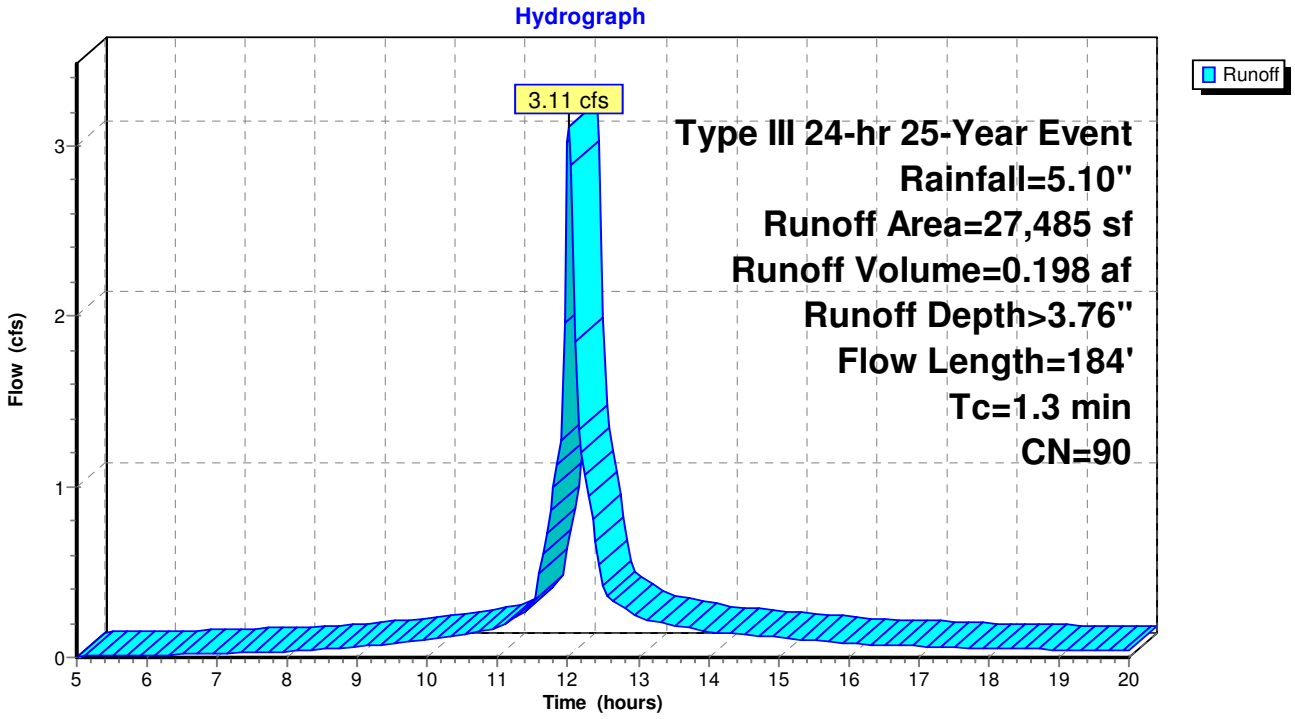
Runoff = 3.11 cfs @ 12.02 hrs, Volume= 0.198 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
21,855	98	Paved parking & roofs
5,630	61	>75% Grass cover, Good, HSG B
27,485	90	Weighted Average
5,630		Pervious Area
21,855		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0400	1.76		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	84	0.0250	3.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	184	Total			

Subcatchment 3S: Sub #3



Subcatchment 4S: Sub #4

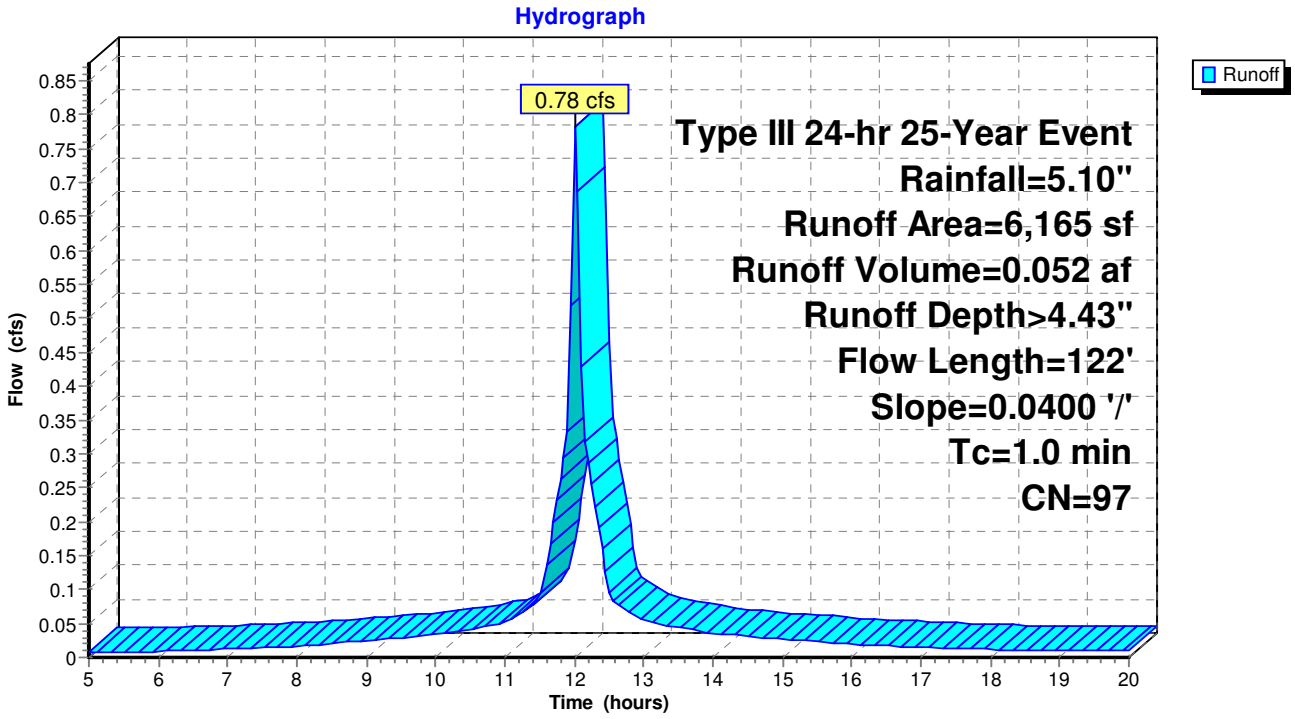
Runoff = 0.78 cfs @ 12.01 hrs, Volume= 0.052 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
5,950	98	Paved parking & roofs
215	61	>75% Grass cover, Good, HSG B
6,165	97	Weighted Average
215		Pervious Area
5,950		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	84	0.0400	1.70		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	38	0.0400	4.06		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.0	122	Total			

Subcatchment 4S: Sub #4



Subcatchment 5S: Sub #5

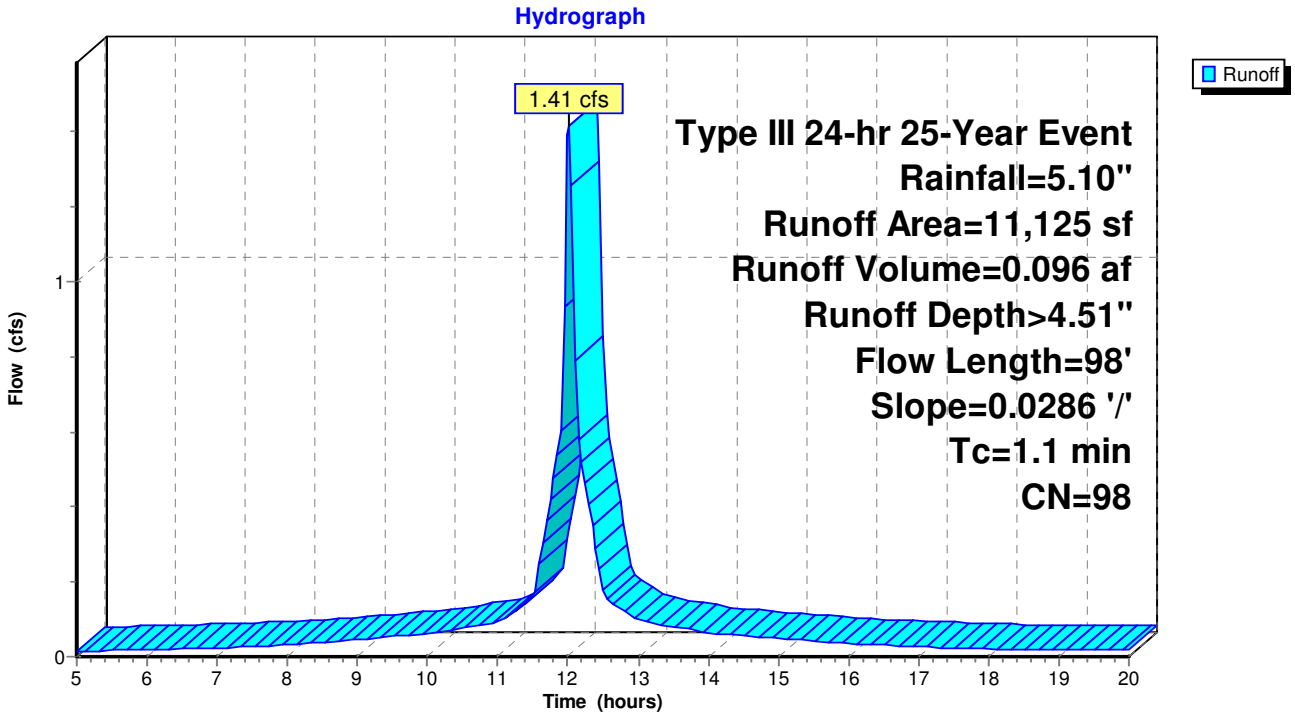
Runoff = 1.41 cfs @ 12.01 hrs, Volume= 0.096 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
10,990	98	Paved parking & roofs
135	61	>75% Grass cover, Good, HSG B
11,125	98	Weighted Average
135		Pervious Area
10,990		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	98	0.0286	1.53		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 5S: Sub #5



Subcatchment 6S: Sub #6

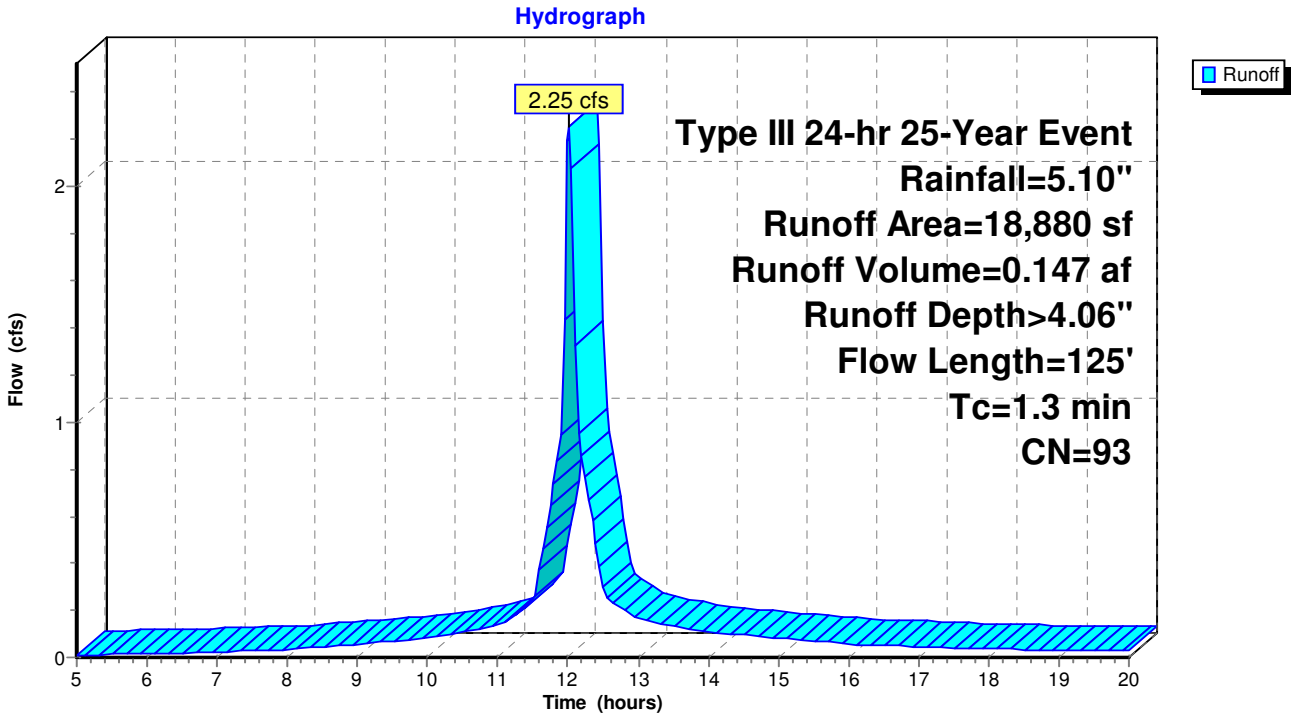
Runoff = 2.25 cfs @ 12.02 hrs, Volume= 0.147 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
16,260	98	Paved parking & roofs
2,620	61	>75% Grass cover, Good, HSG B
18,880	93	Weighted Average
2,620		Pervious Area
16,260		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0280	1.52		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	25	0.0150	2.49		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	125	Total			

Subcatchment 6S: Sub #6



Subcatchment 7S: Sub #7

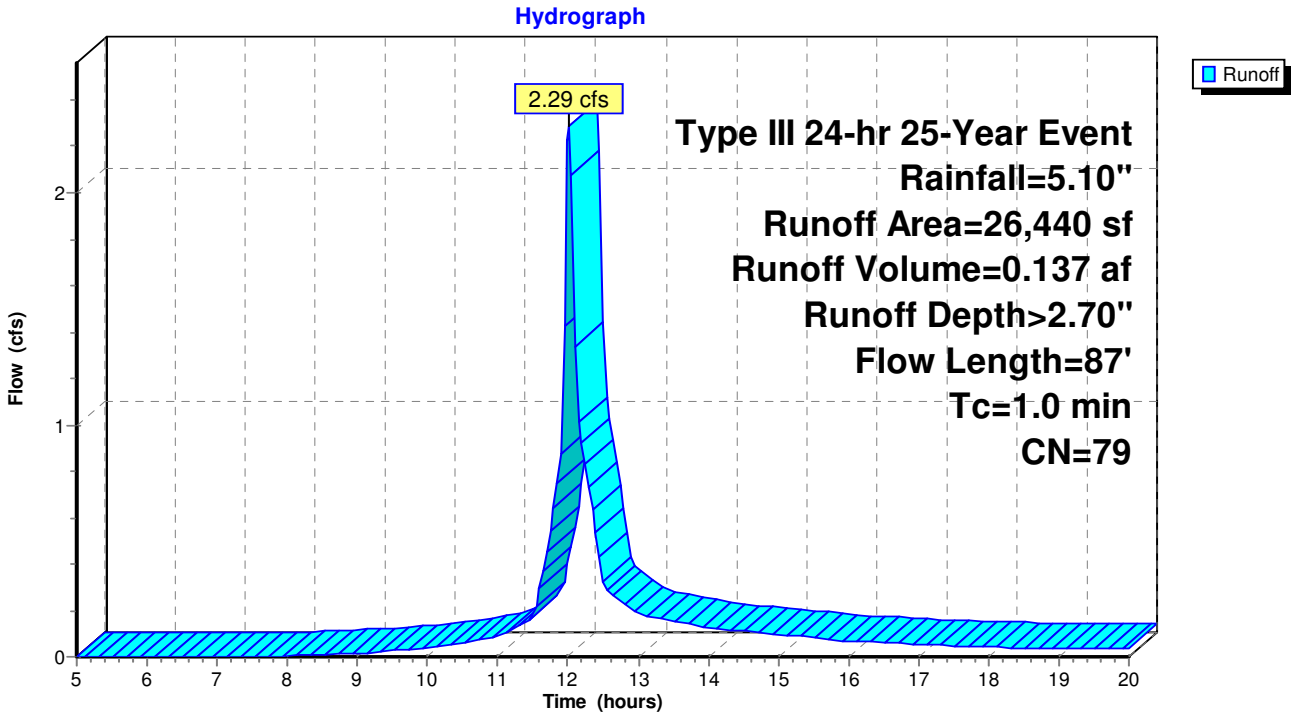
Runoff = 2.29 cfs @ 12.02 hrs, Volume= 0.137 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
13,630	98	Paved parking & roofs
2,065	61	>75% Grass cover, Good, HSG B
10,745	58	Meadow, non-grazed, HSG B
26,440	79	Weighted Average
12,810		Pervious Area
13,630		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	66	0.0227	1.29		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	21	0.0952	4.63		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
1.0	87	Total			

Subcatchment 7S: Sub #7



Subcatchment 8S: Sub #8

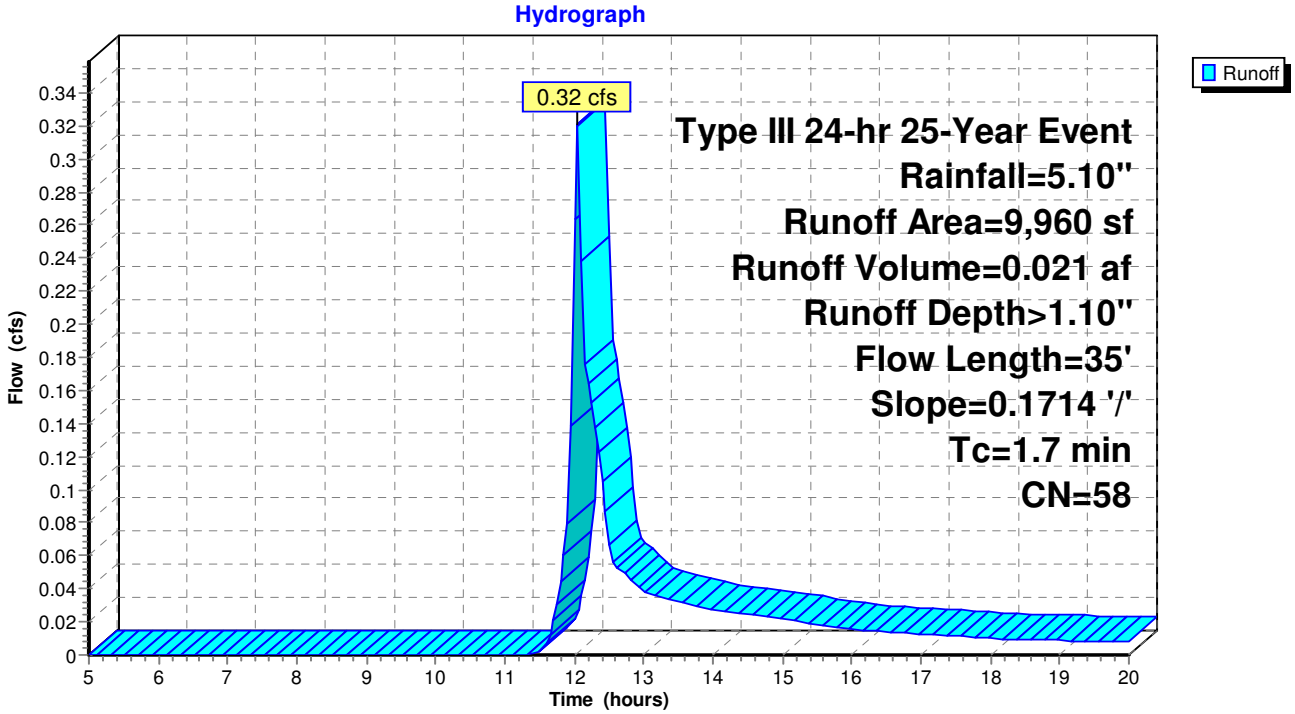
Runoff = 0.32 cfs @ 12.05 hrs, Volume= 0.021 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,960	58	Meadow, non-grazed, HSG B
9,960		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	35	0.1714	0.35		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 8S: Sub #8



Subcatchment 9S: Sub #9

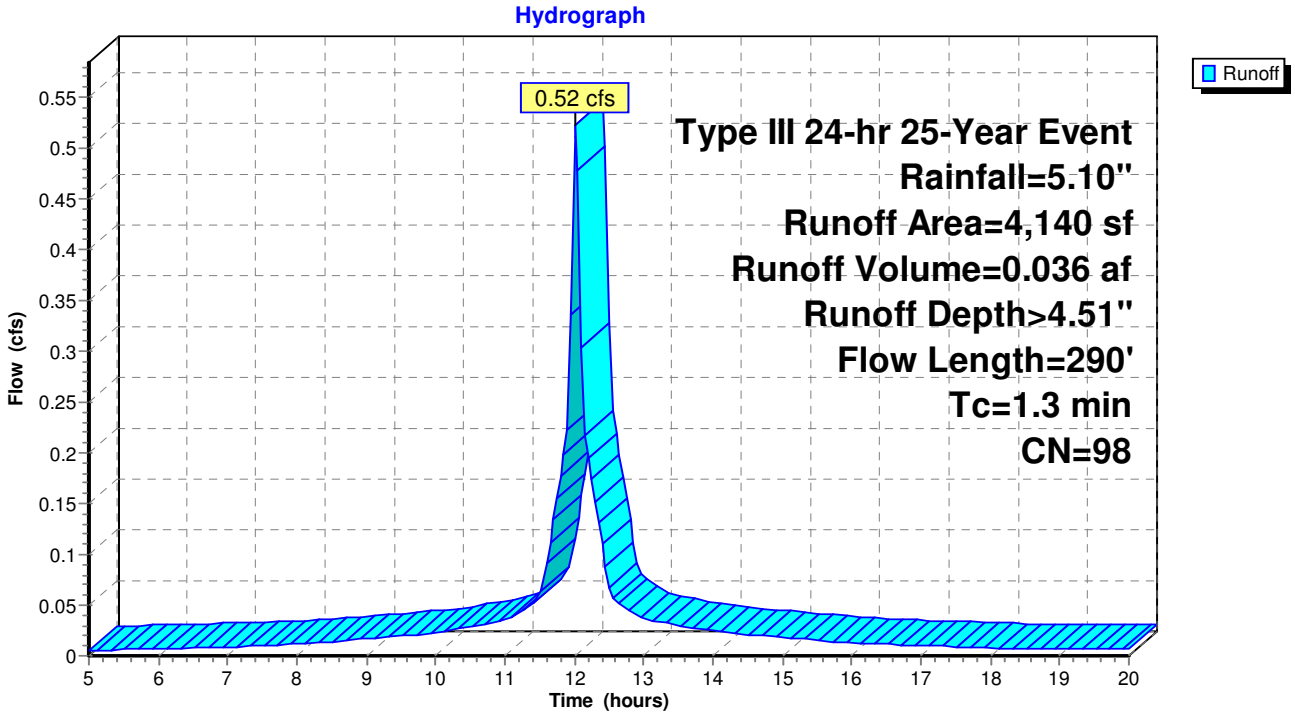
Runoff = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,140	98	Paved parking & roofs
4,140		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	190	0.0605	4.99		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	290	Total			

Subcatchment 9S: Sub #9



Subcatchment 10S: Sub #10

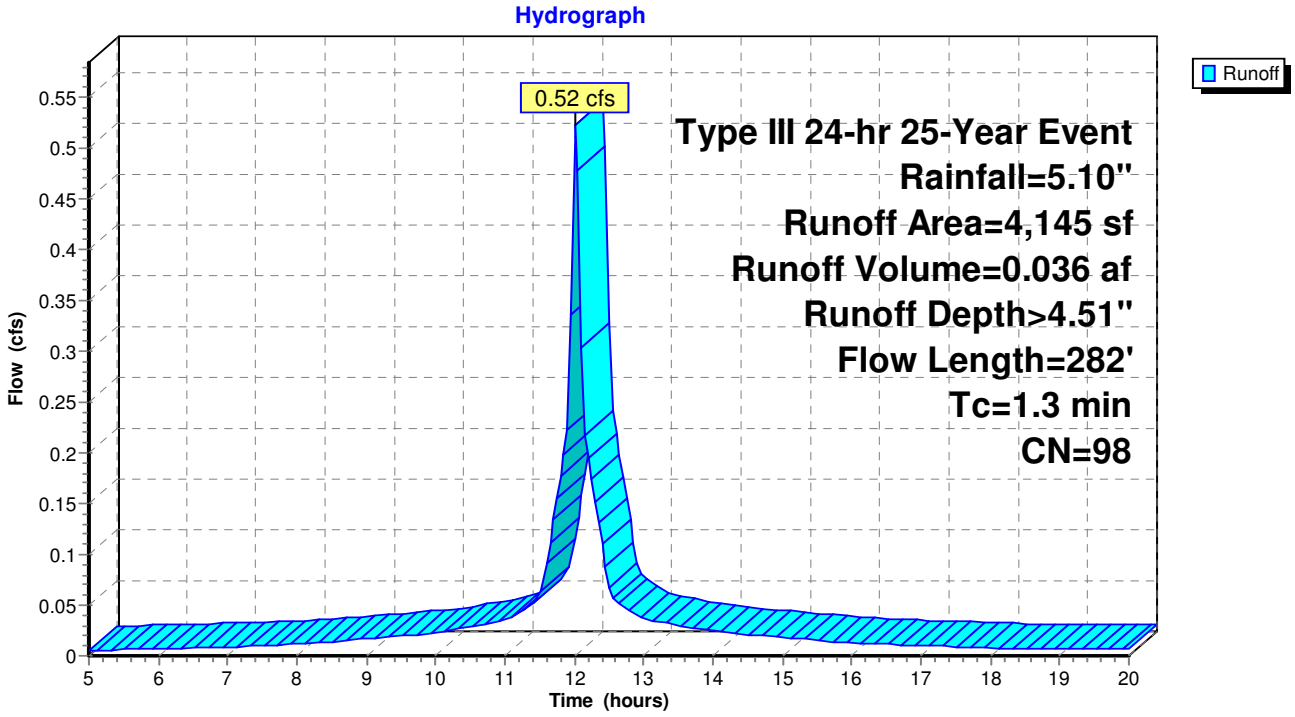
Runoff = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,145	98	Paved parking & roofs
4,145		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.26		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.6	182	0.0659	5.21		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.3	282	Total			

Subcatchment 10S: Sub #10



Subcatchment 11S: Sub #11

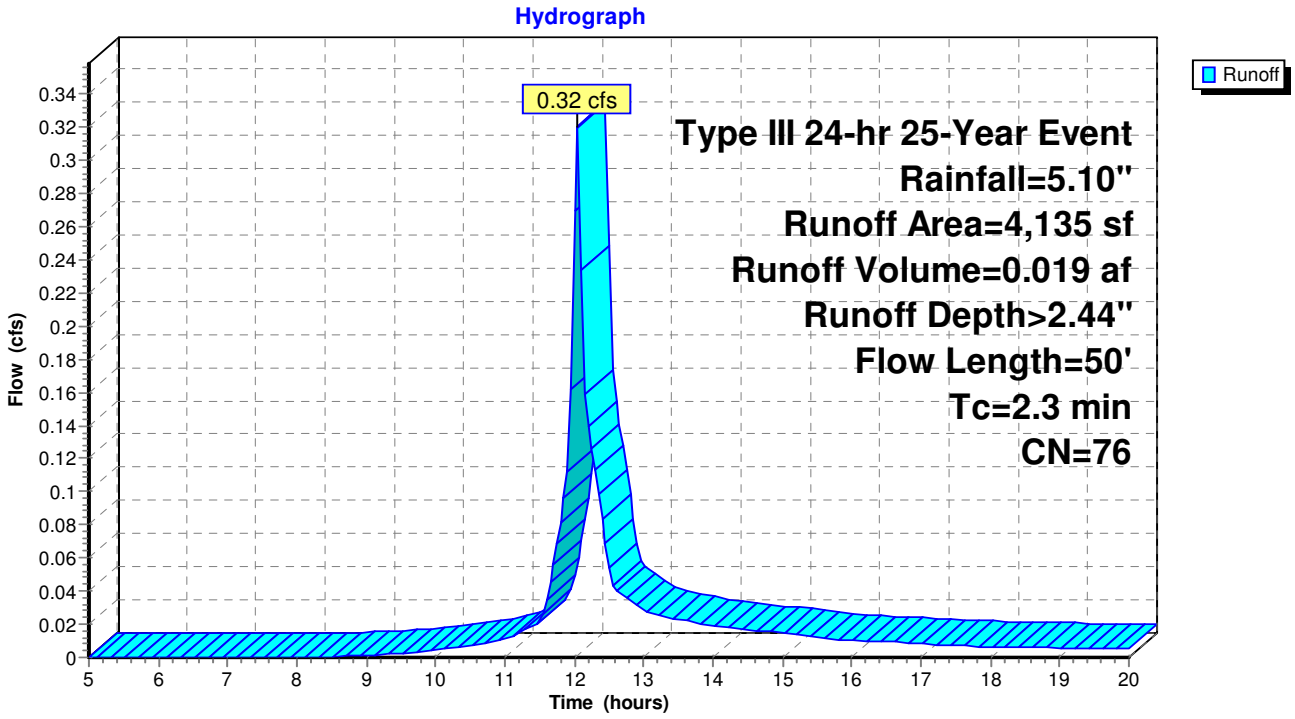
Runoff = 0.32 cfs @ 12.04 hrs, Volume= 0.019 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
1,625	98	Paved parking & roofs
2,510	61	>75% Grass cover, Good, HSG B
4,135	76	Weighted Average
2,510		Pervious Area
1,625		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.0	33	0.1212	0.27		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.3	50	Total			

Subcatchment 11S: Sub #11



Subcatchment 12S: Sub #12

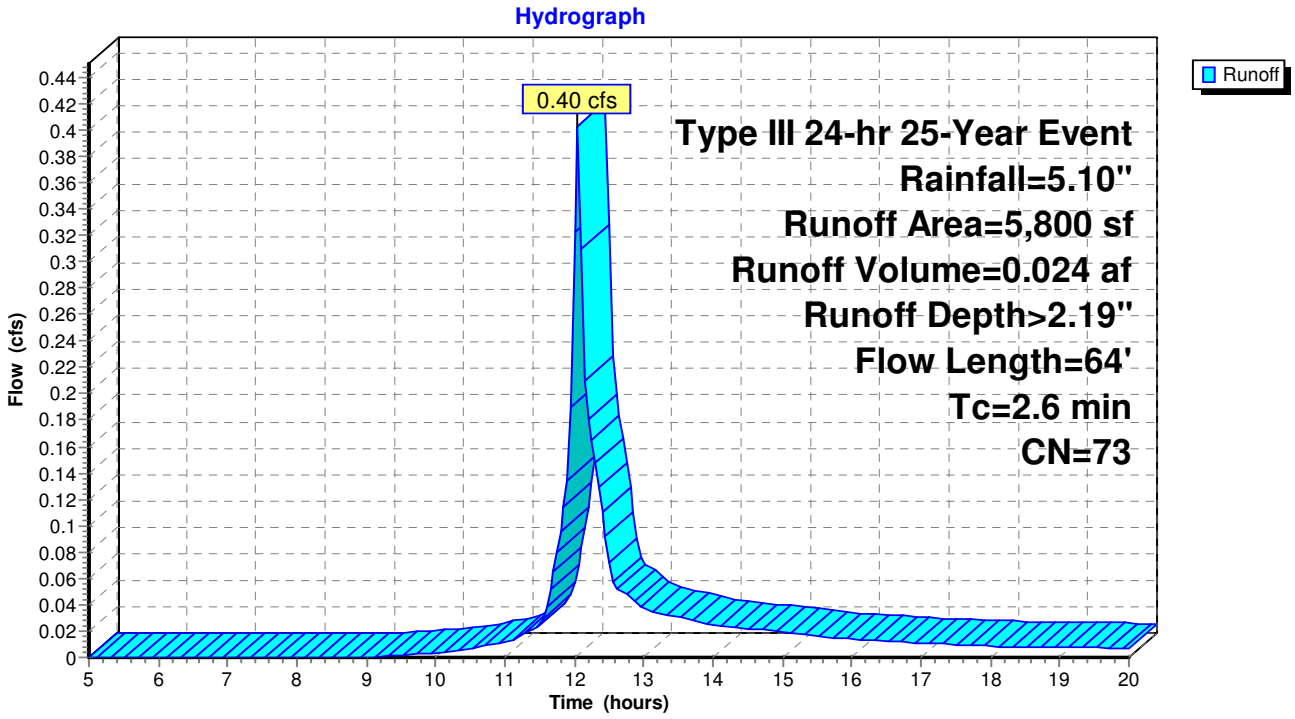
Runoff = 0.40 cfs @ 12.05 hrs, Volume= 0.024 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
1,900	98	Paved parking & roofs
3,900	61	>75% Grass cover, Good, HSG B
5,800	73	Weighted Average
3,900		Pervious Area
1,900		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.93		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
2.3	47	0.1702	0.33		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
2.6	64	Total			

Subcatchment 12S: Sub #12



Subcatchment 13S: Sub 13

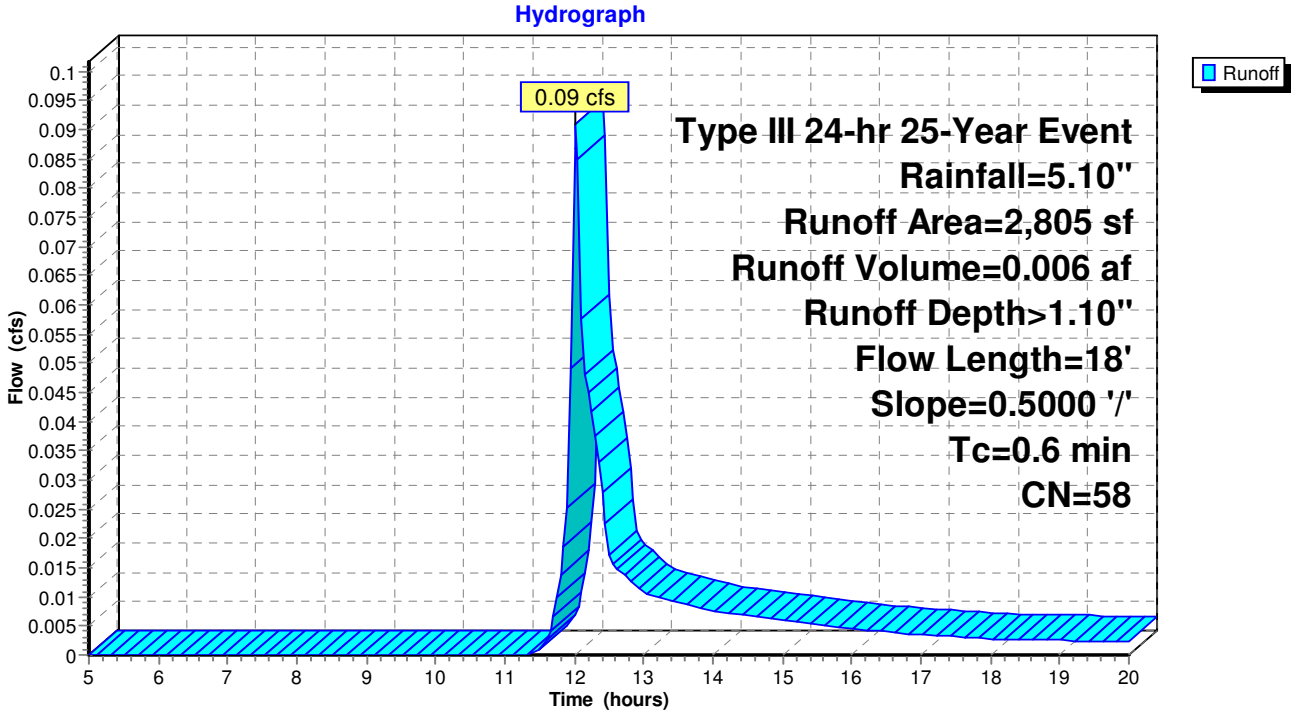
Runoff = 0.09 cfs @ 12.02 hrs, Volume= 0.006 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
2,805	58	Meadow, non-grazed, HSG B
2,805		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	18	0.5000	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 13S: Sub 13



Subcatchment 14S: Sub 14

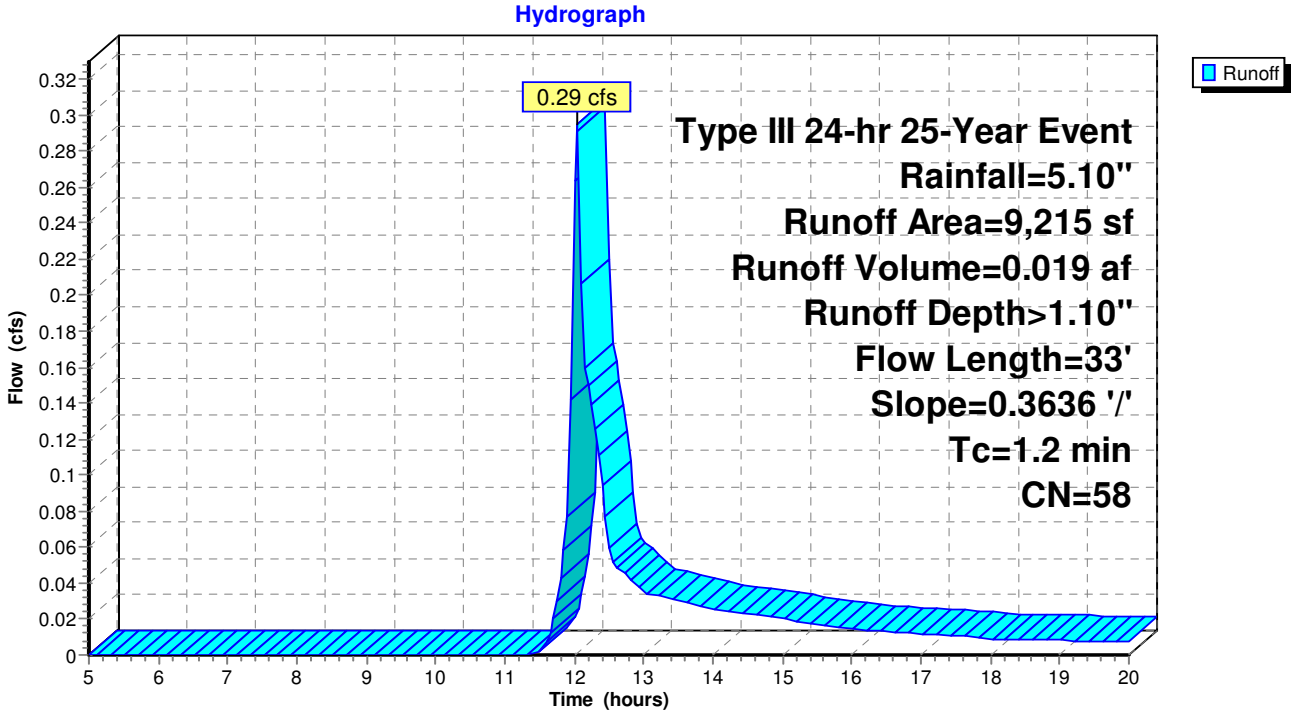
Runoff = 0.29 cfs @ 12.04 hrs, Volume= 0.019 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,215	58	Meadow, non-grazed, HSG B
9,215		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	33	0.3636	0.47		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 14S: Sub 14



Subcatchment 15S: Sub 15

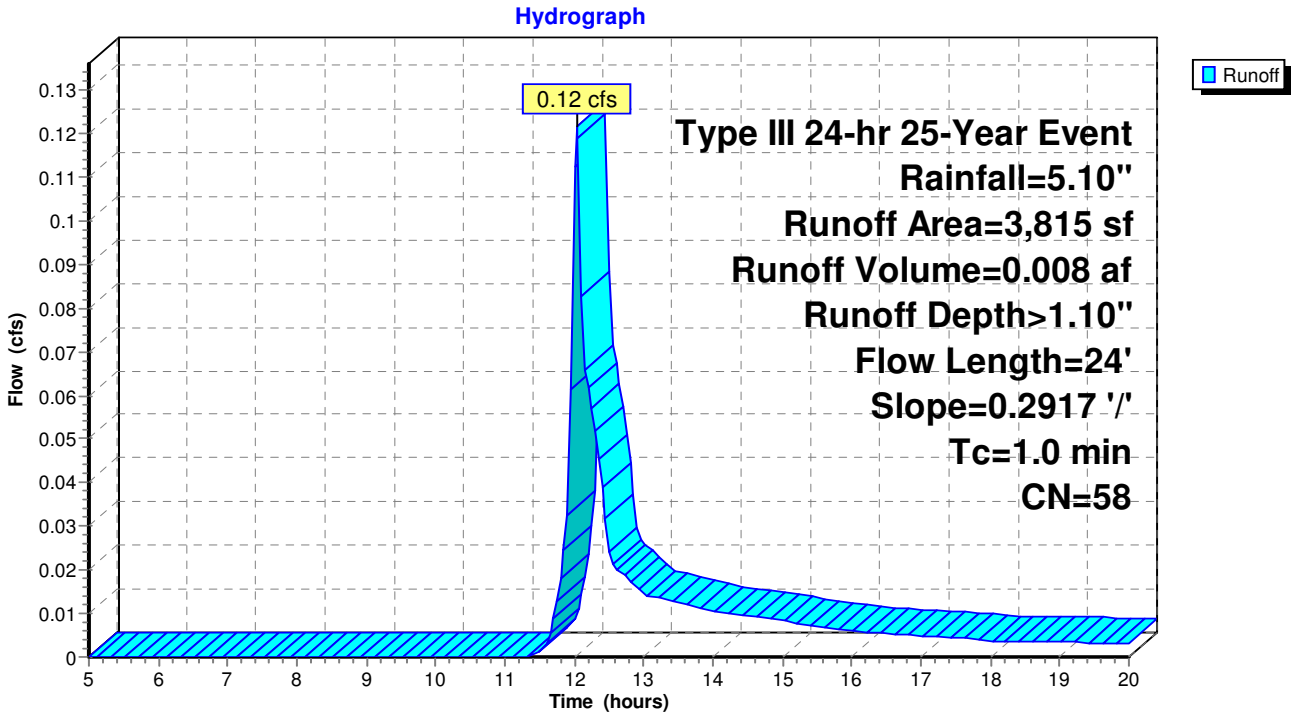
Runoff = 0.12 cfs @ 12.03 hrs, Volume= 0.008 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
3,815	58	Meadow, non-grazed, HSG B
3,815		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	24	0.2917	0.41		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 15S: Sub 15



Subcatchment 16S: Sub 16

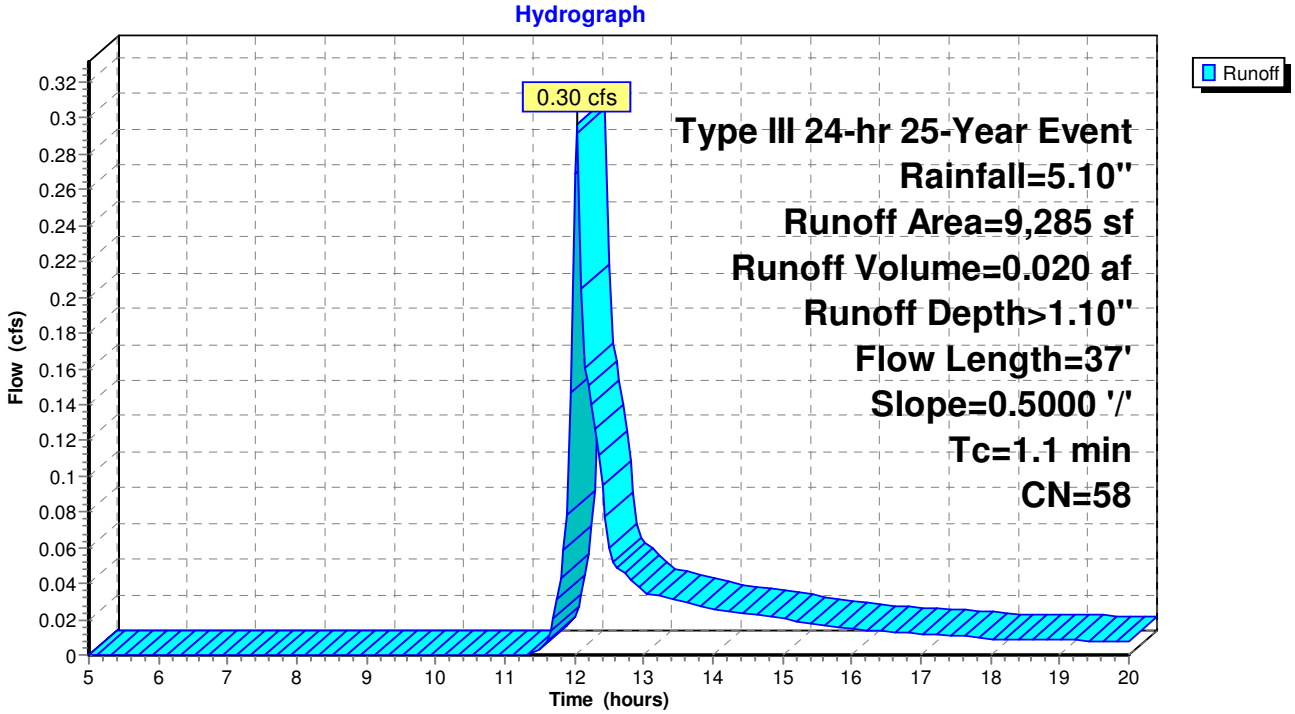
Runoff = 0.30 cfs @ 12.04 hrs, Volume= 0.020 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
9,285	58	Meadow, non-grazed, HSG B
9,285		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	37	0.5000	0.55		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 16S: Sub 16



Subcatchment 17S: Sub #17

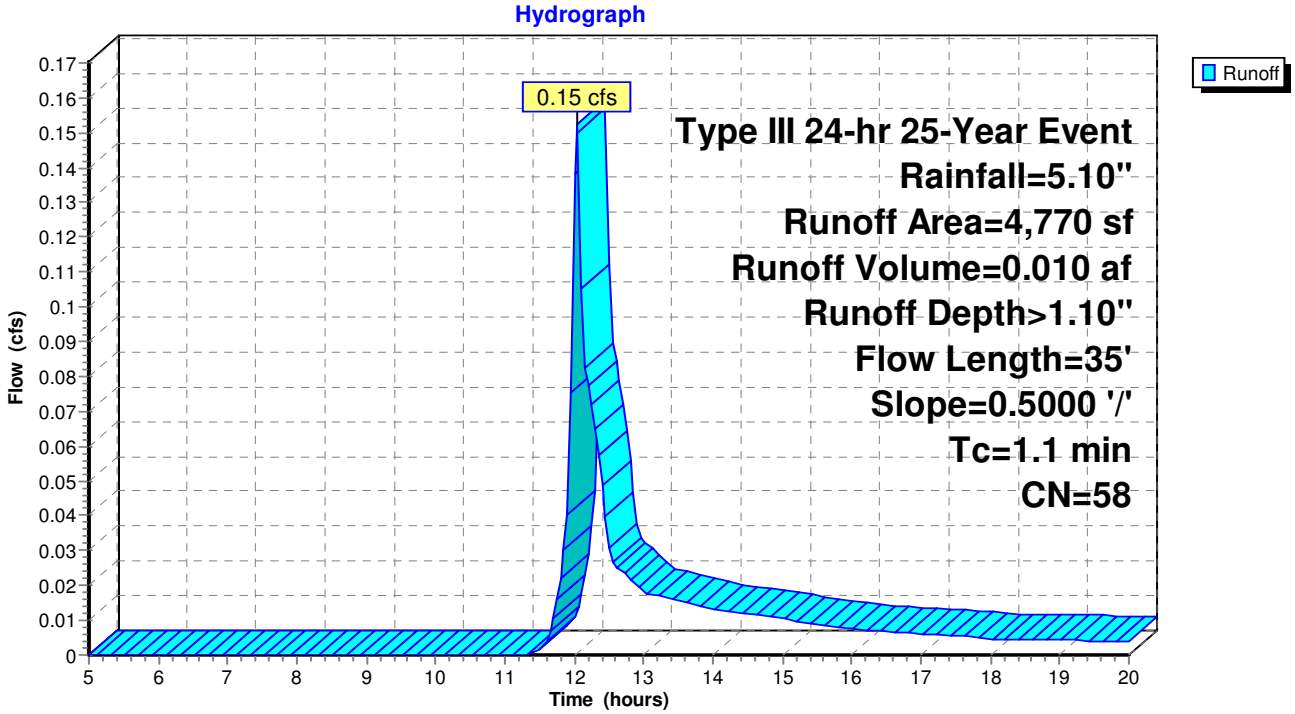
Runoff = 0.15 cfs @ 12.04 hrs, Volume= 0.010 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
4,770	58	Meadow, non-grazed, HSG B
4,770		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	35	0.5000	0.54		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"

Subcatchment 17S: Sub #17



Pond 1: CB1

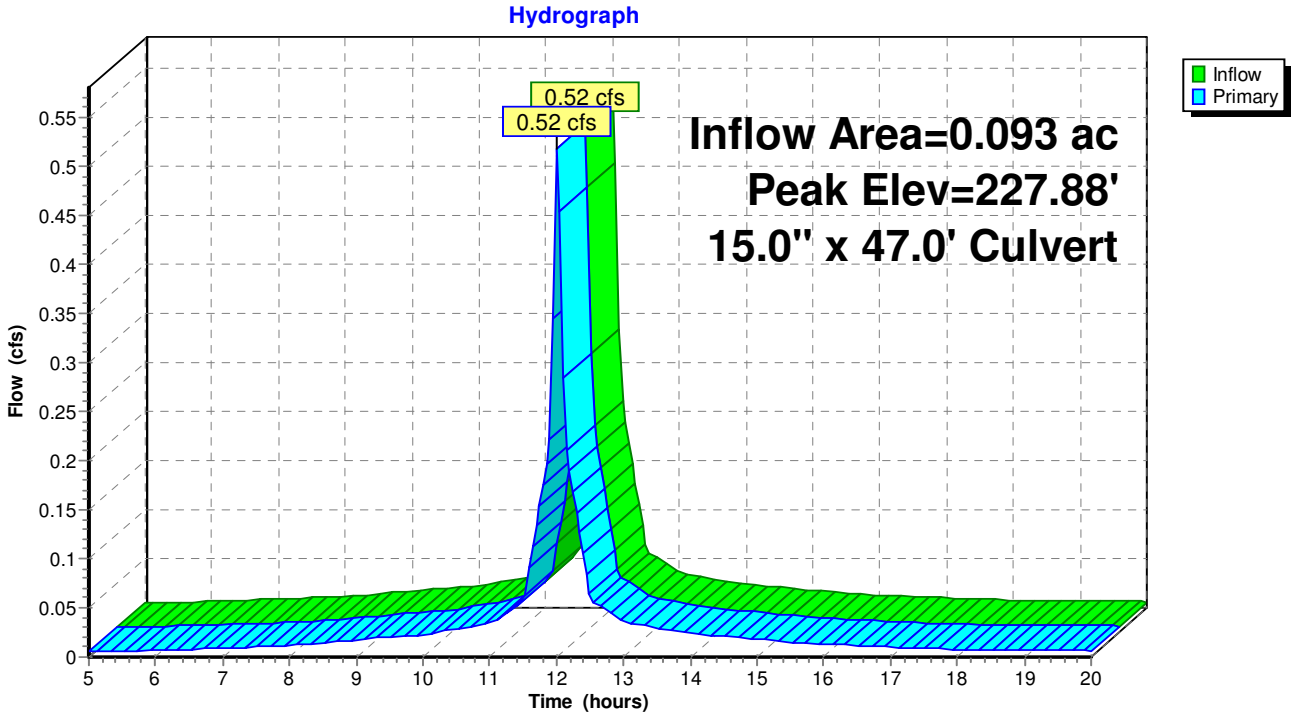
Inflow Area =	0.093 ac,	Inflow Depth >	4.51"	for	25-Year Event event
Inflow =	0.52 cfs @	12.01 hrs,	Volume=	0.035 af	
Outflow =	0.52 cfs @	12.01 hrs,	Volume=	0.035 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.52 cfs @	12.01 hrs,	Volume=	0.035 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.88' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.50'	**15.0" x 47.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.50 cfs @ 12.01 hrs HW=227.87' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 1.64 fps)

Pond 1: CB1



Pond 1P: Filter Pond #1

Inflow Area = 1.432 ac, Inflow Depth > 2.91" for 25-Year Event event
Inflow = 4.89 cfs @ 12.02 hrs, Volume= 0.347 af
Outflow = 0.72 cfs @ 12.61 hrs, Volume= 0.212 af, Atten= 85%, Lag= 35.1 min
Primary = 0.72 cfs @ 12.61 hrs, Volume= 0.212 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 213.40' @ 12.61 hrs Surf.Area= 4,500 sf Storage= 8,596 cf

Plug-Flow detention time= 200.1 min calculated for 0.212 af (61% of inflow)
Center-of-Mass det. time= 123.3 min (899.1 - 775.8)

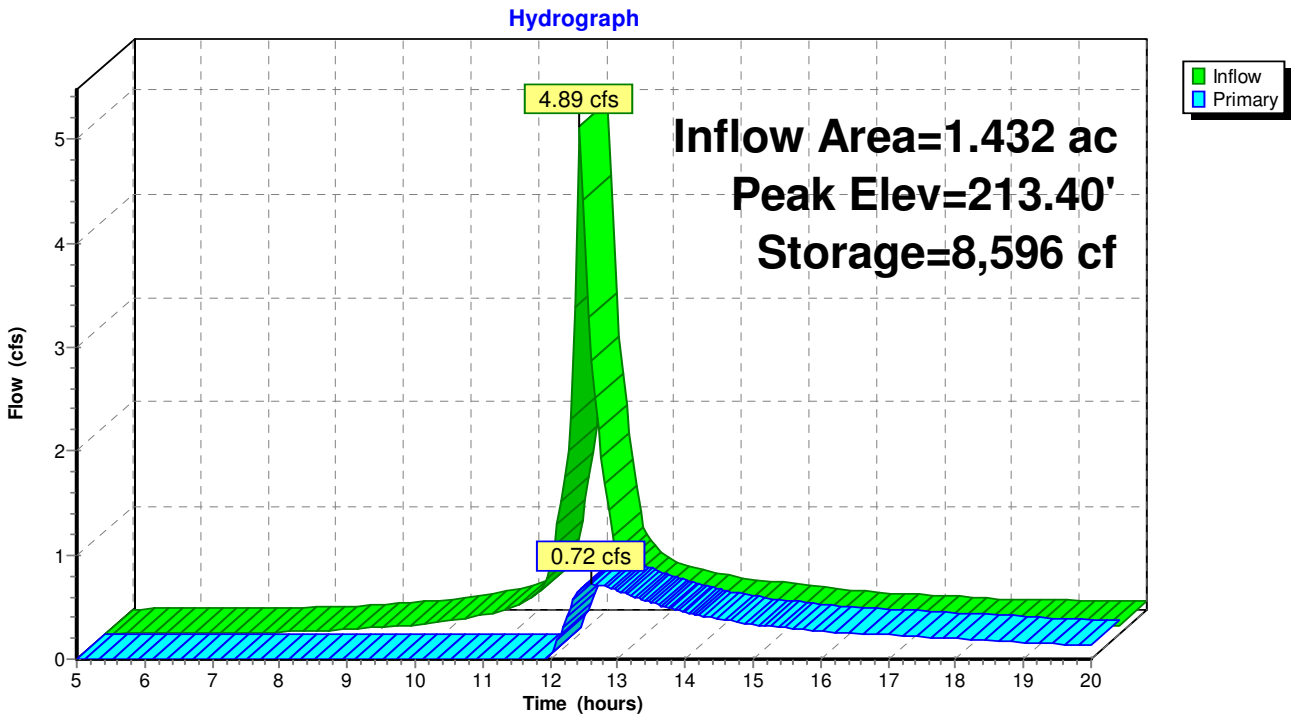
Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	16,887 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	2,725	0	0	2,725
212.00	3,425	3,068	3,068	3,452
212.50	3,800	1,805	4,874	3,842
213.00	4,185	1,995	6,869	4,243
214.00	5,000	4,586	11,456	5,092
215.00	5,875	5,432	16,887	6,006

Device	Routing	Invert	Outlet Devices
#1	Primary	208.50'	**15.0" x 30.5' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 208.00' S= 0.0164 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	212.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	213.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.72 cfs @ 12.61 hrs HW=213.40' (Free Discharge)
└─**1=Culvert** (Passes 0.72 cfs of 9.64 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.36 cfs @ 4.12 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.36 cfs @ 2.15 fps)

Pond 1P: Filter Pond #1



Pond 2: CB2

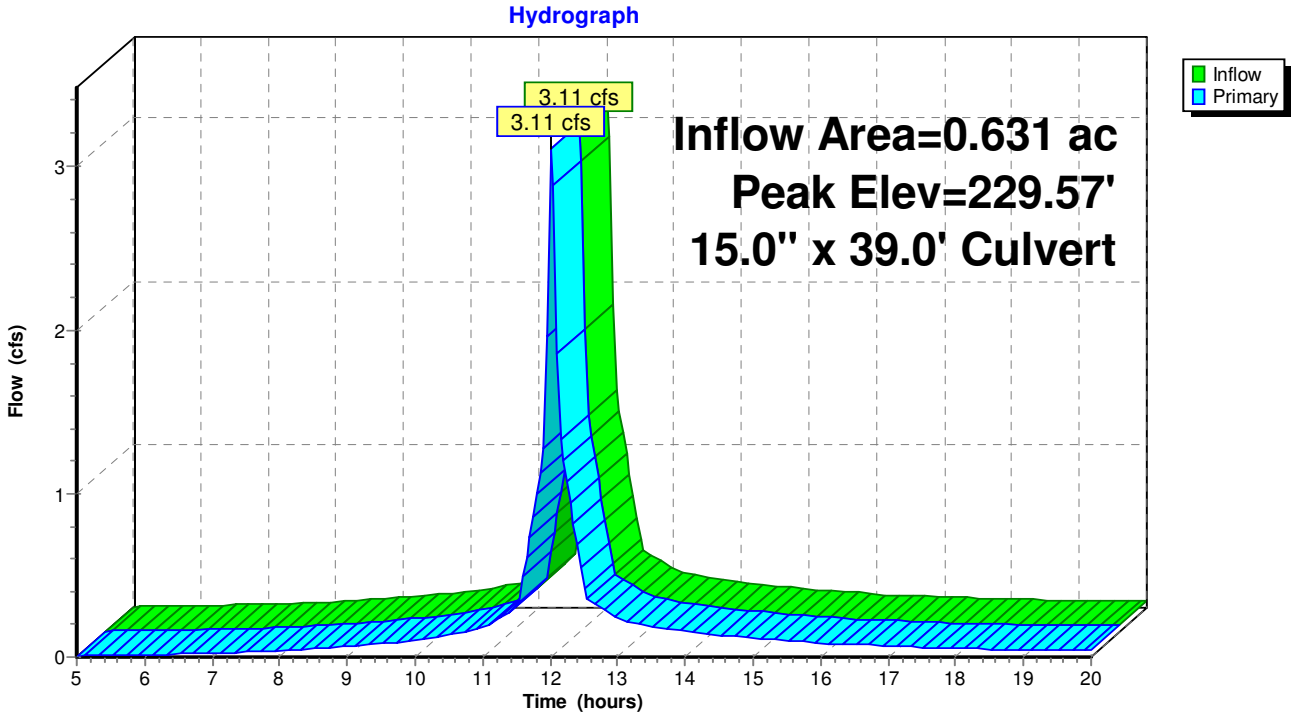
Inflow Area =	0.631 ac,	Inflow Depth >	3.76"	for	25-Year Event event
Inflow =	3.11 cfs @	12.02 hrs,	Volume=	0.198 af	
Outflow =	3.11 cfs @	12.02 hrs,	Volume=	0.198 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.11 cfs @	12.02 hrs,	Volume=	0.198 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.57' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**15.0" x 39.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0128 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.97 cfs @ 12.02 hrs HW=229.53' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.97 cfs @ 2.73 fps)

Pond 2: CB2



Pond 2P: Filter Pond #2

Inflow Area =	1.690 ac,	Inflow Depth >	3.65"	for	25-Year Event event
Inflow =	7.85 cfs @	12.02 hrs,	Volume=	0.514 af	
Outflow =	1.66 cfs @	12.41 hrs,	Volume=	0.359 af,	Atten= 79%, Lag= 23.5 min
Primary =	1.66 cfs @	12.41 hrs,	Volume=	0.359 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.19' @ 12.41 hrs Surf.Area= 6,955 sf Storage= 12,412 cf

Plug-Flow detention time= 181.4 min calculated for 0.358 af (70% of inflow)
Center-of-Mass det. time= 113.5 min (863.4 - 749.9)

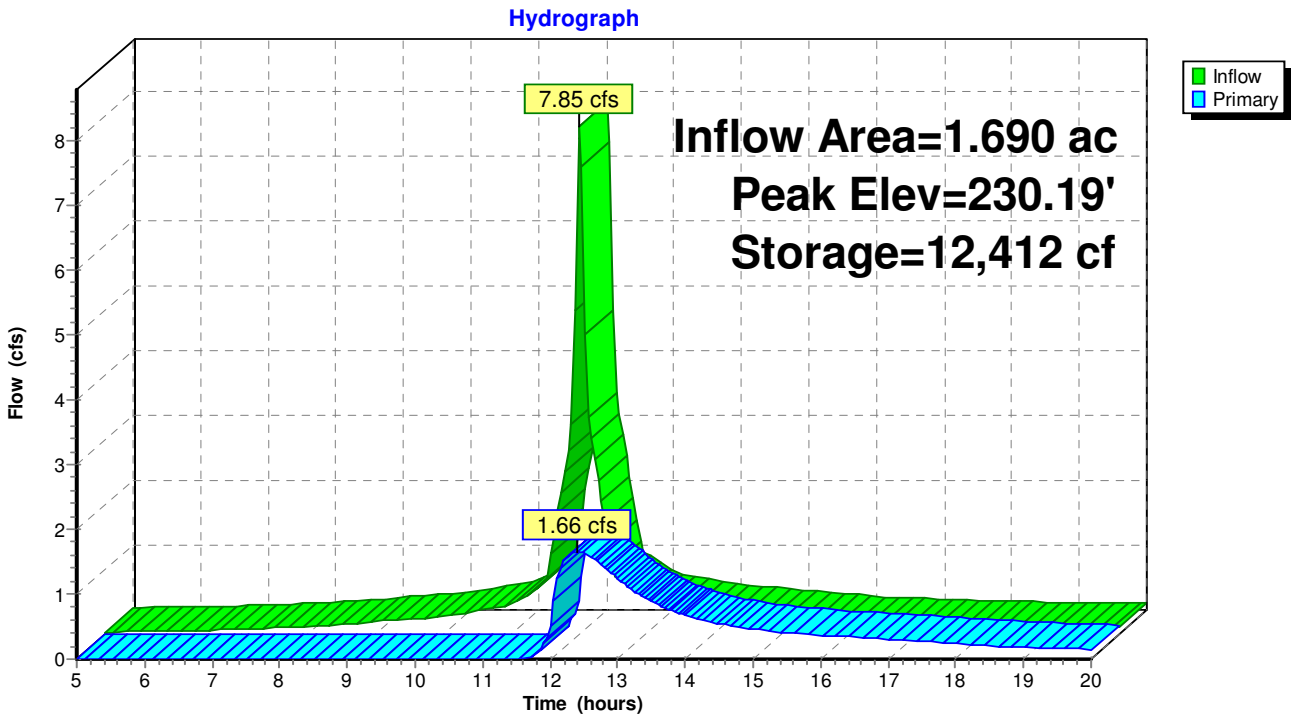
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	14,679 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
227.50	2,550	0	0	2,550
228.00	3,290	1,456	1,456	3,296
229.00	4,840	4,040	5,496	4,862
230.00	6,450	5,626	11,122	6,494
230.50	7,800	3,557	14,679	7,852

Device	Routing	Invert	Outlet Devices
#1	Primary	225.00'	**15.0" x 23.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 223.00' S= 0.0870 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior
#2	Device 1	229.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	229.50'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.66 cfs @ 12.41 hrs HW=230.19' (Free Discharge)
└─**1=Culvert** (Passes 1.66 cfs of 9.97 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.65 cfs @ 4.78 fps)
  └─**3=Orifice/Grate** (Orifice Controls 1.01 cfs @ 2.88 fps)

Pond 2P: Filter Pond #2



Pond 3: CB3

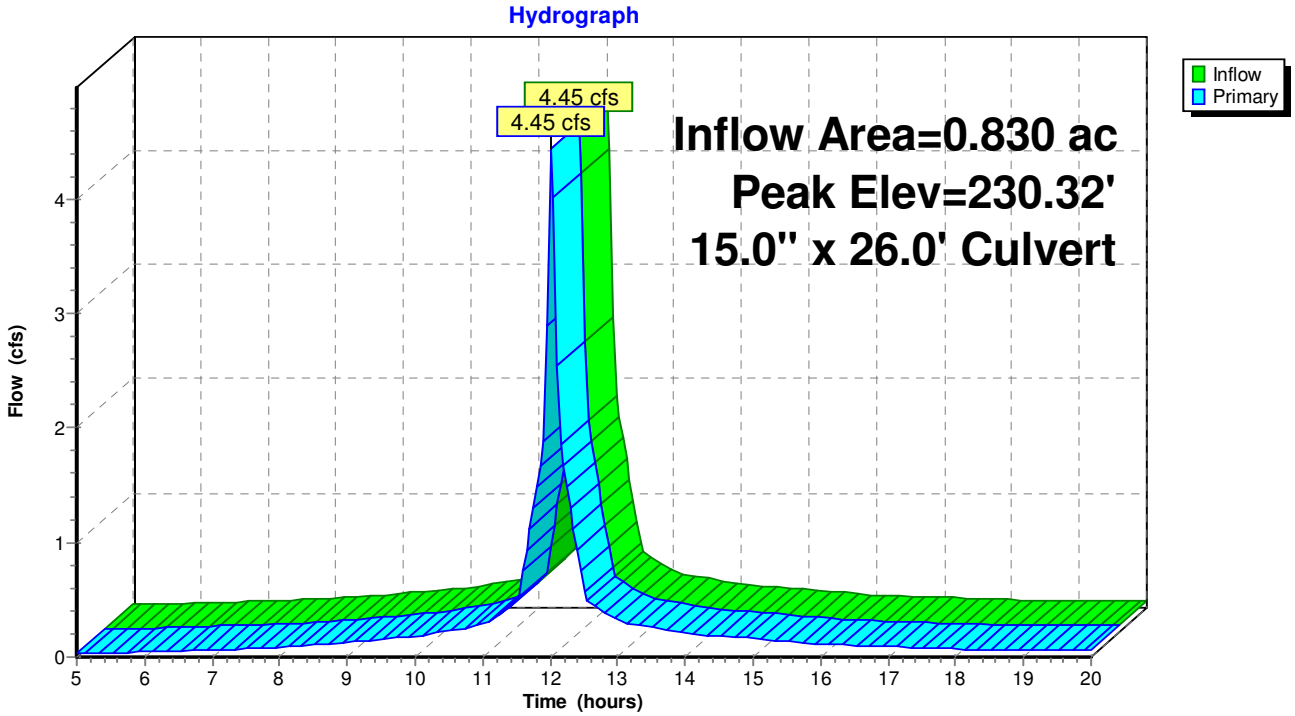
Inflow Area =	0.830 ac,	Inflow Depth >	4.26"	for	25-Year Event event
Inflow =	4.45 cfs @	12.02 hrs,	Volume=	0.295 af	
Outflow =	4.45 cfs @	12.02 hrs,	Volume=	0.295 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.45 cfs @	12.02 hrs,	Volume=	0.295 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.32' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	228.80'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 228.00' S= 0.0308 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=4.26 cfs @ 12.02 hrs HW=230.26' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.26 cfs @ 3.47 fps)

Pond 3: CB3



Pond 3P: Filter Pond #3

Inflow Area = 0.607 ac, Inflow Depth > 2.70" for 25-Year Event event
Inflow = 2.29 cfs @ 12.02 hrs, Volume= 0.137 af
Outflow = 0.26 cfs @ 12.68 hrs, Volume= 0.137 af, Atten= 89%, Lag= 39.8 min
Primary = 0.26 cfs @ 12.68 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 235.95' @ 12.68 hrs Surf.Area= 2,307 sf Storage= 2,151 cf

Plug-Flow detention time= 69.5 min calculated for 0.136 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (853.6 - 784.5)

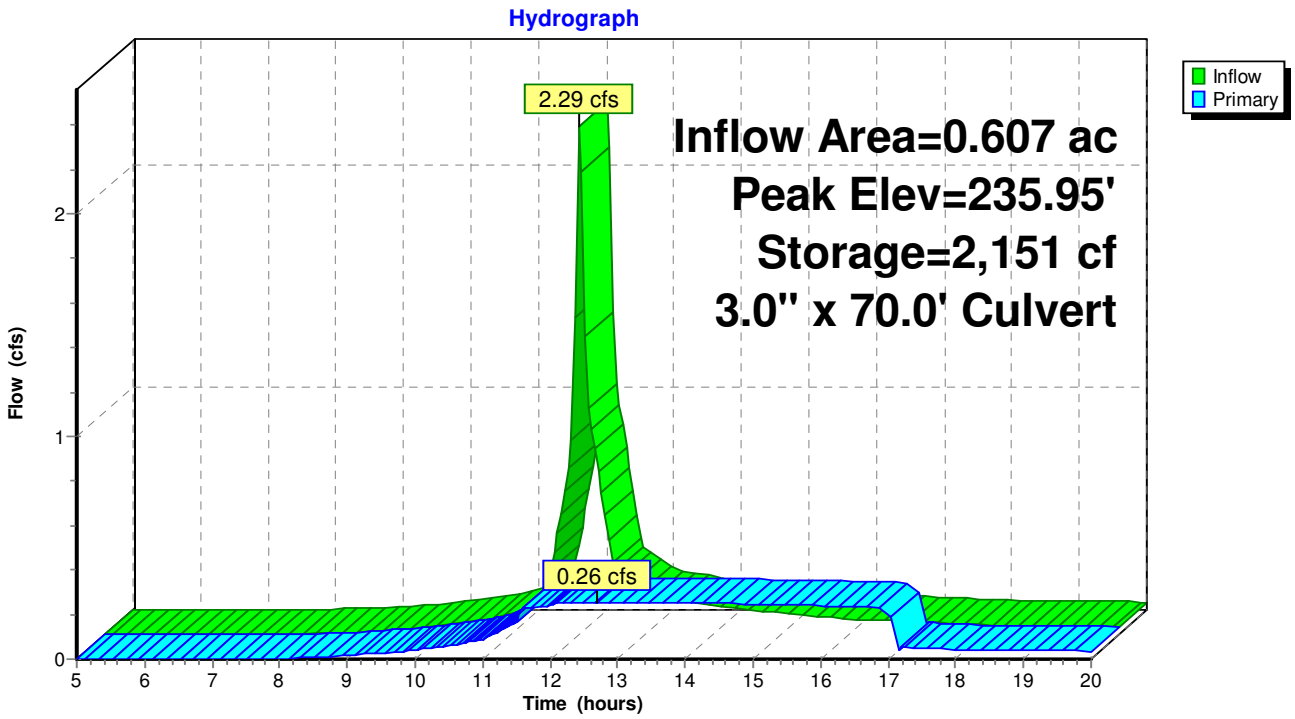
Volume	Invert	Avail.Storage	Storage Description
#1	234.50'	2,272 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
234.50	790	0	0	790
235.00	1,230	501	501	1,234
236.00	2,375	1,771	2,272	2,388

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	**3.0" x 70.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 229.00' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.26 cfs @ 12.68 hrs HW=235.95' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.26 cfs @ 5.22 fps)

Pond 3P: Filter Pond #3



Pond 4: CB4

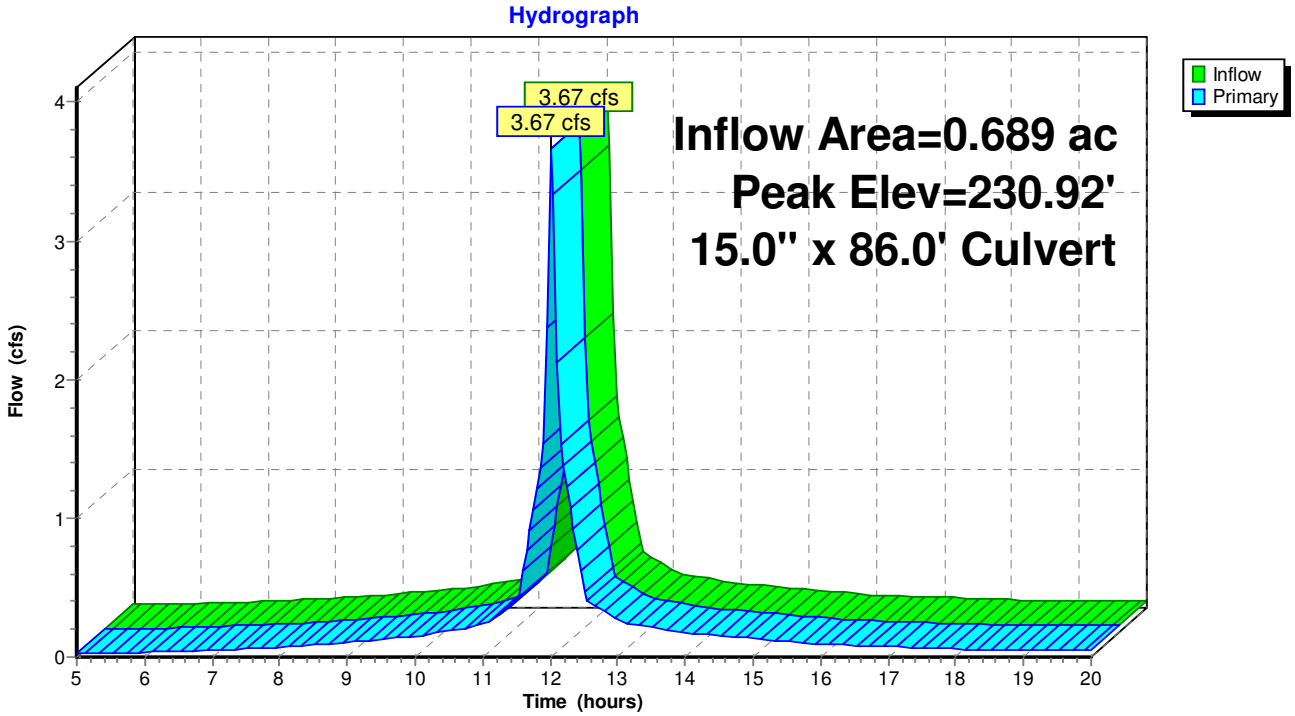
Inflow Area =	0.689 ac,	Inflow Depth >	4.23"	for	25-Year Event event
Inflow =	3.67 cfs @	12.02 hrs,	Volume=	0.243 af	
Outflow =	3.67 cfs @	12.02 hrs,	Volume=	0.243 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.67 cfs @	12.02 hrs,	Volume=	0.243 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.92' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.90'	**15.0" x 86.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.00' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=3.50 cfs @ 12.02 hrs HW=230.88' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.50 cfs @ 3.38 fps)

Pond 4: CB4



Pond 5: CB5

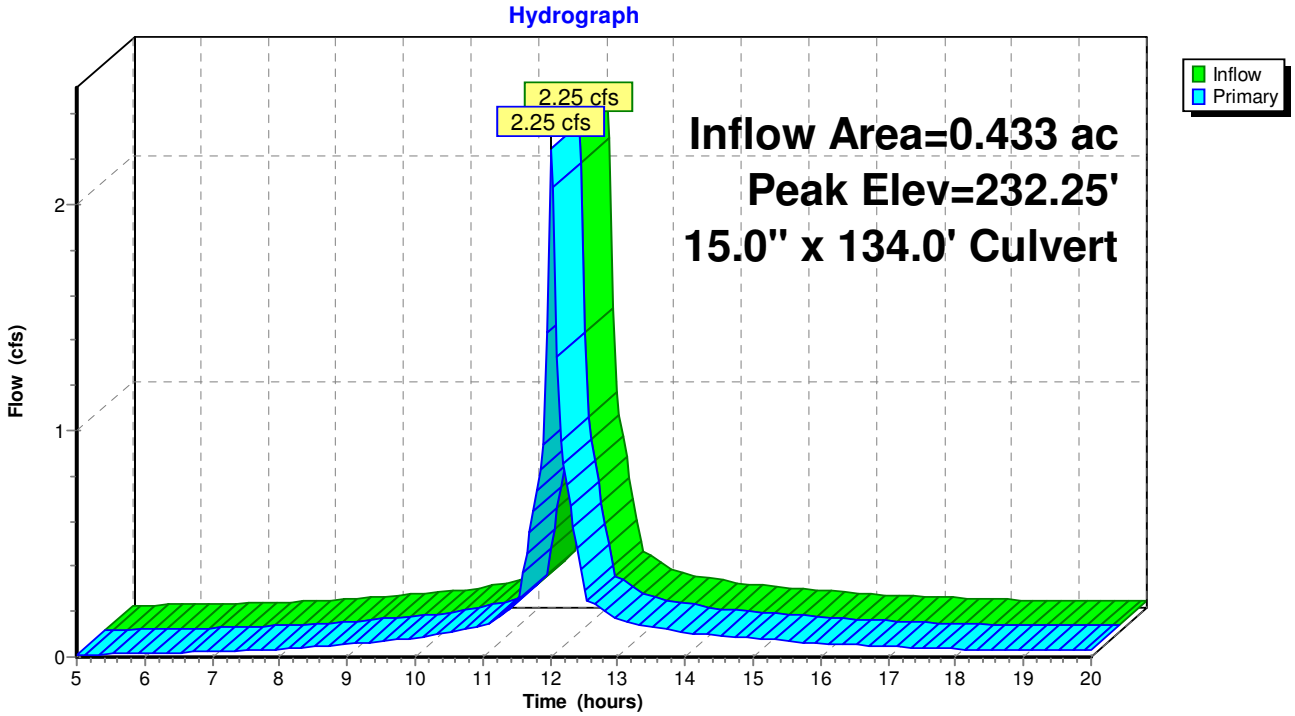
Inflow Area =	0.433 ac,	Inflow Depth >	4.06"	for	25-Year Event event
Inflow =	2.25 cfs @	12.02 hrs,	Volume=	0.147 af	
Outflow =	2.25 cfs @	12.02 hrs,	Volume=	0.147 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.25 cfs @	12.02 hrs,	Volume=	0.147 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 232.25' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	231.50'	**15.0" x 134.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 230.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=2.15 cfs @ 12.02 hrs HW=232.23' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.15 cfs @ 2.90 fps)

Pond 5: CB5



Pond 6: CB6

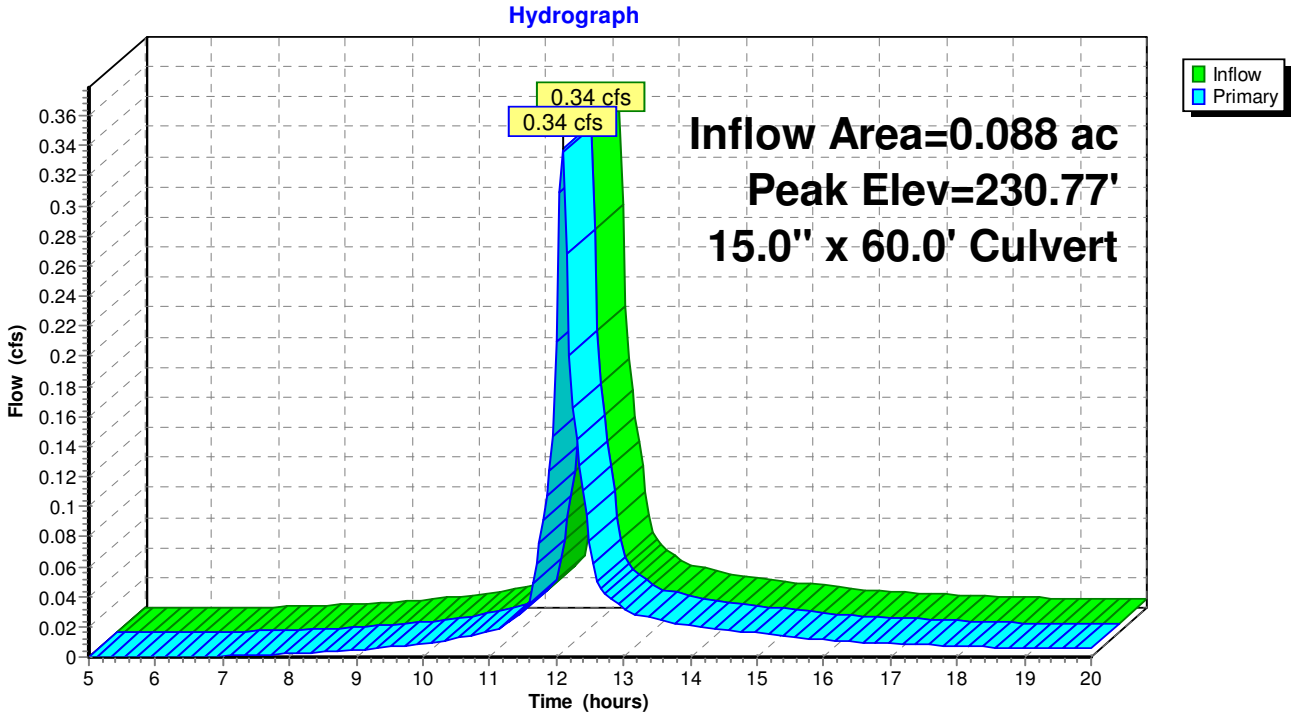
Inflow Area =	0.088 ac,	Inflow Depth >	3.16"	for	25-Year Event event
Inflow =	0.34 cfs @	12.09 hrs,	Volume=	0.023 af	
Outflow =	0.34 cfs @	12.09 hrs,	Volume=	0.023 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.34 cfs @	12.09 hrs,	Volume=	0.023 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 230.77' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**15.0" x 60.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 229.80' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=230.76' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.33 cfs @ 1.75 fps)

Pond 6: CB6



Pond 7: CB7

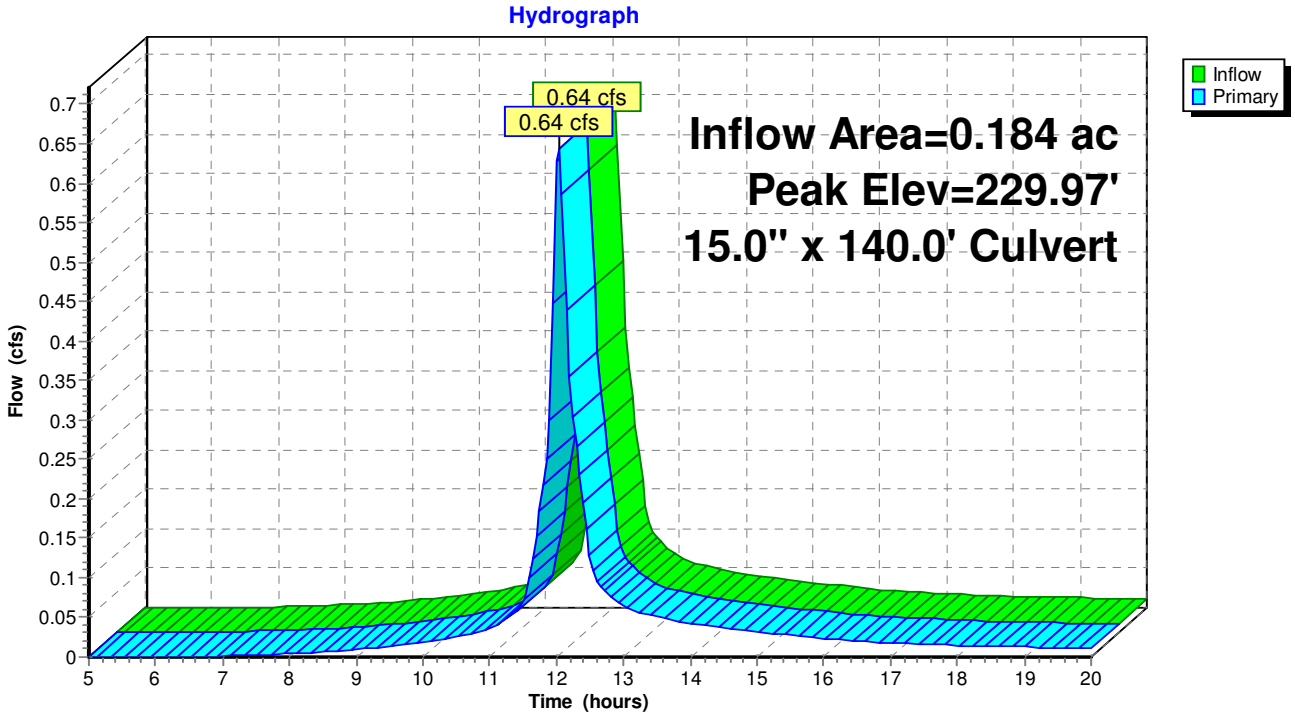
Inflow Area =	0.184 ac,	Inflow Depth >	3.11"	for	25-Year Event event
Inflow =	0.64 cfs @	12.03 hrs,	Volume=	0.048 af	
Outflow =	0.64 cfs @	12.03 hrs,	Volume=	0.048 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.03 hrs,	Volume=	0.048 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.97' @ 12.03 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	229.60'	**15.0" x 140.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 228.10' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.63 cfs @ 12.03 hrs HW=229.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.63 cfs @ 2.07 fps)

Pond 7: CB7



Pond 8: CB8

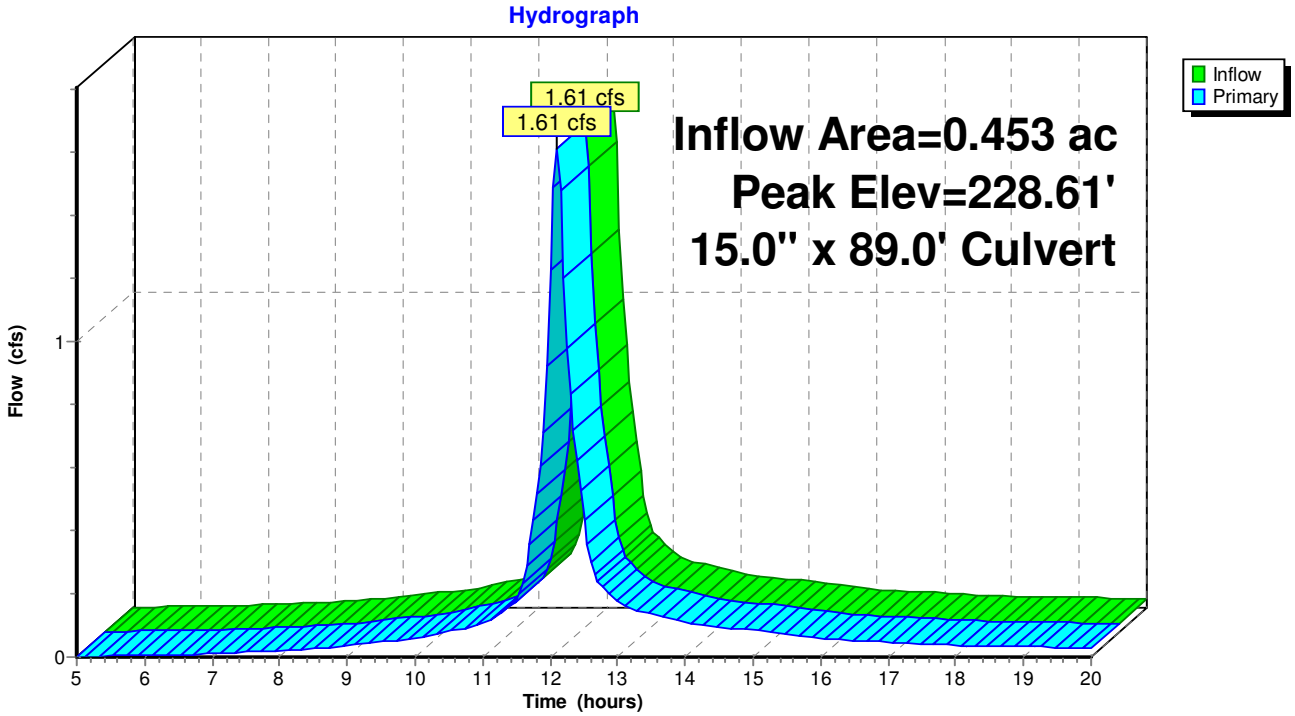
Inflow Area =	0.453 ac,	Inflow Depth >	3.49"	for	25-Year Event event
Inflow =	1.61 cfs @	12.10 hrs,	Volume=	0.132 af	
Outflow =	1.61 cfs @	12.10 hrs,	Volume=	0.132 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.61 cfs @	12.10 hrs,	Volume=	0.132 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.61' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	227.90'	**15.0" x 89.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 227.00' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.61 cfs @ 12.10 hrs HW=228.61' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.61 cfs @ 2.26 fps)

Pond 8: CB8



Pond 9: CB9

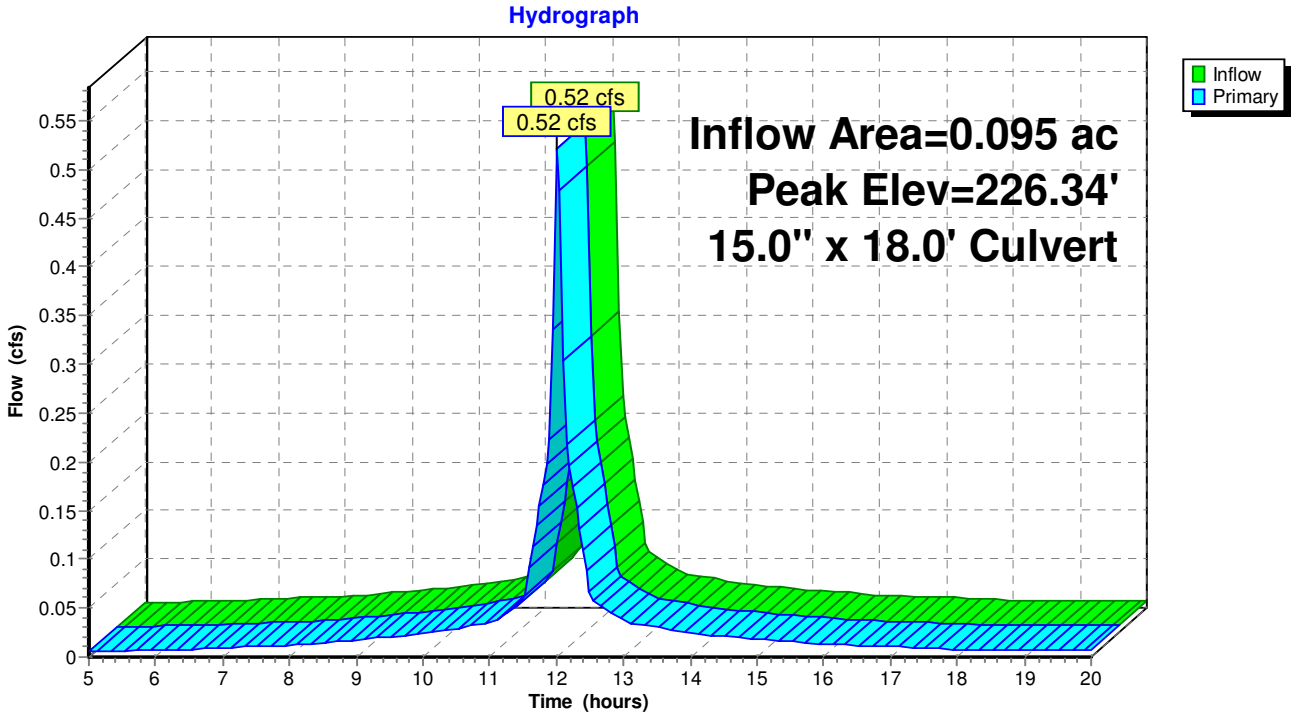
Inflow Area = 0.095 ac, Inflow Depth > 4.51" for 25-Year Event event
Inflow = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af
Outflow = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.02 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.34' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**15.0" x 18.0' long Culvert** CPP, square edge headwall, Ke= 0.500 Outlet Invert= 225.60' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=0.50 cfs @ 12.02 hrs HW=226.33' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 1.95 fps)

Pond 9: CB9



Pond 10: CB10

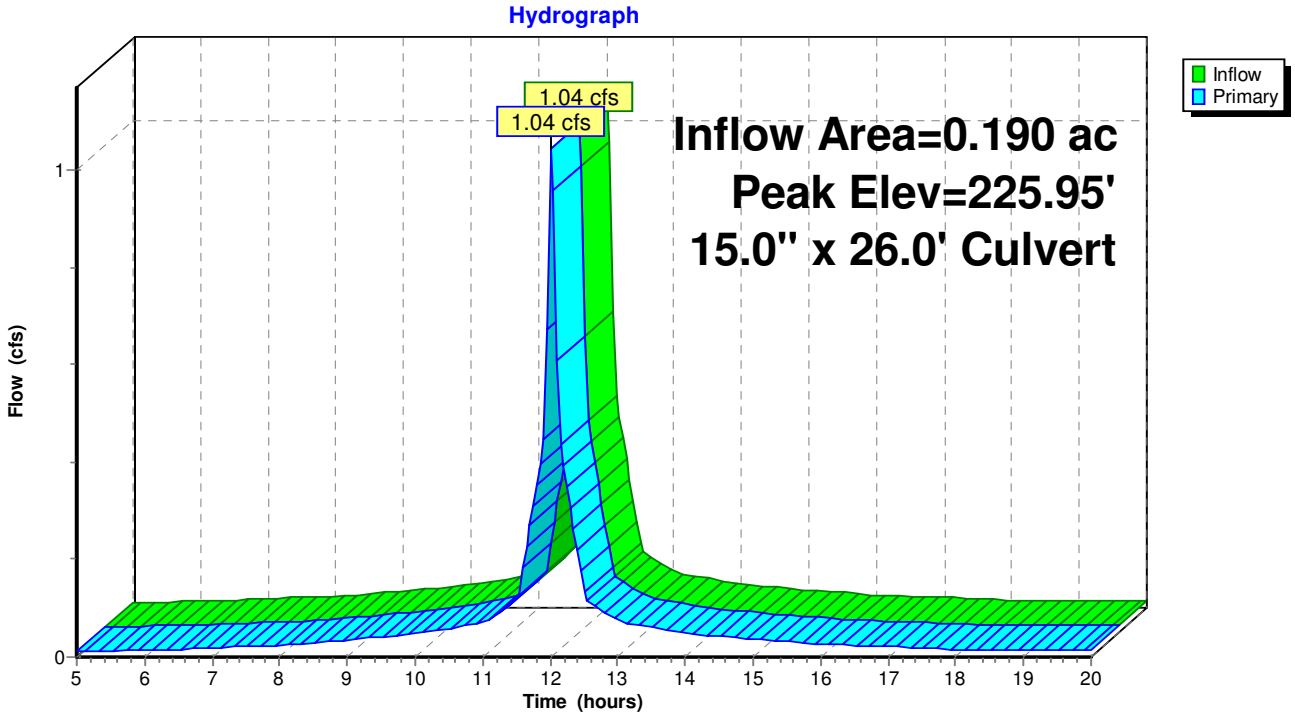
Inflow Area =	0.190 ac,	Inflow Depth >	4.51"	for	25-Year Event event
Inflow =	1.04 cfs @	12.02 hrs,	Volume=	0.071 af	
Outflow =	1.04 cfs @	12.02 hrs,	Volume=	0.071 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.04 cfs @	12.02 hrs,	Volume=	0.071 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 225.95' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**15.0" x 26.0' long Culvert** CPP, projecting, no headwall, Ke= 0.900 Outlet Invert= 224.00' S= 0.0538 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior

Primary OutFlow Max=1.00 cfs @ 12.02 hrs HW=225.94' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.00 cfs @ 1.97 fps)

Pond 10: CB10



Pond SF1: Sediment Forebay #1

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	211.00'	82 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
211.00	30	0	0	30
212.00	150	82	82	154

Pond SF2: Sediment Forebay #2

Routing by Stor-Ind method
Peak Elev= 0.00' @ 0.00 hrs Surf.Area= 0 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	449 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

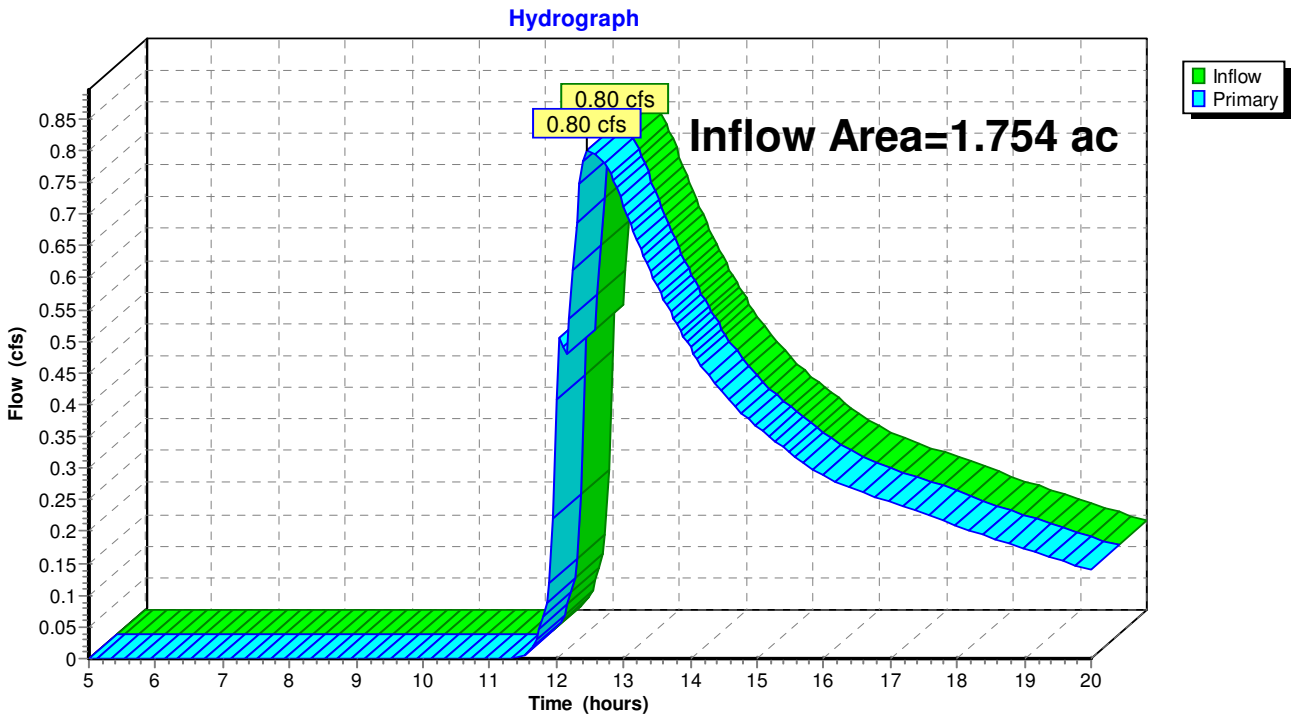
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	275	0	0	275
229.00	650	449	449	657

Pond SP1: Study Point #1

Inflow Area = 1.754 ac, Inflow Depth > 1.65" for 25-Year Event event
Inflow = 0.80 cfs @ 12.47 hrs, Volume= 0.241 af
Primary = 0.80 cfs @ 12.47 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

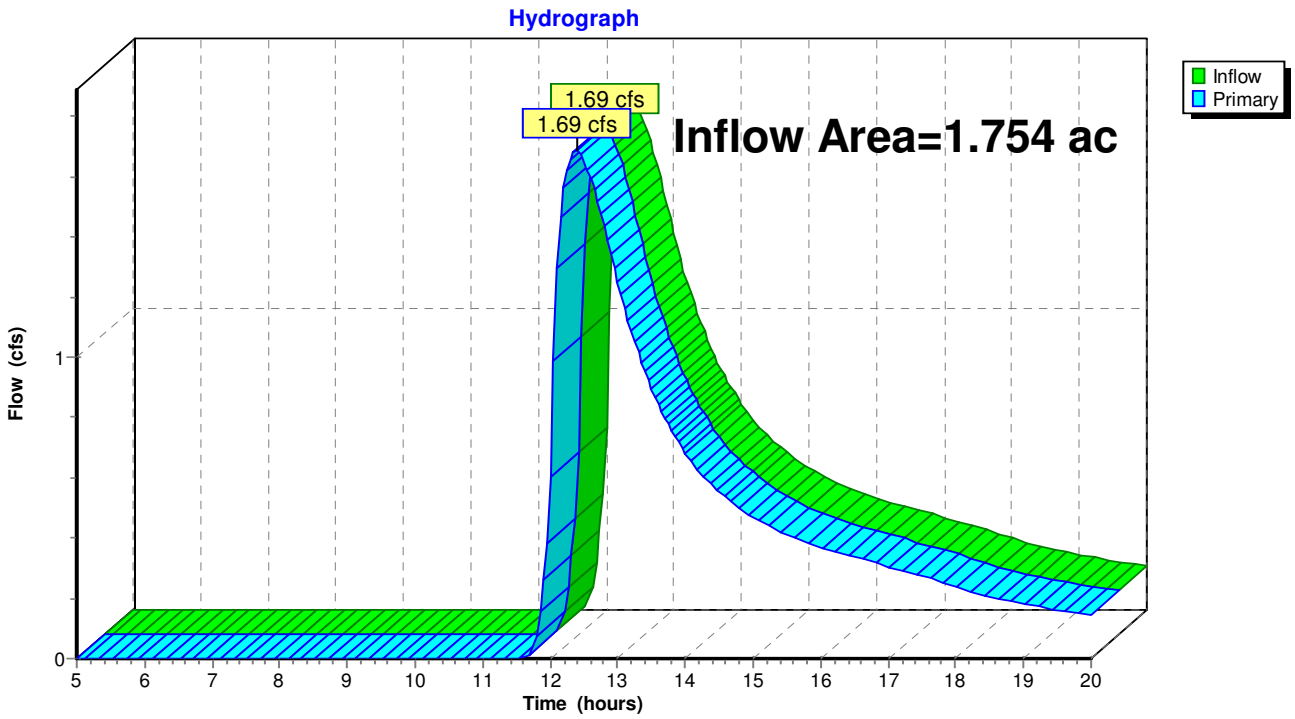


Pond SP2: Study Point #2

Inflow Area = 1.754 ac, Inflow Depth > 2.49" for 25-Year Event event
Inflow = 1.69 cfs @ 12.39 hrs, Volume= 0.365 af
Primary = 1.69 cfs @ 12.39 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

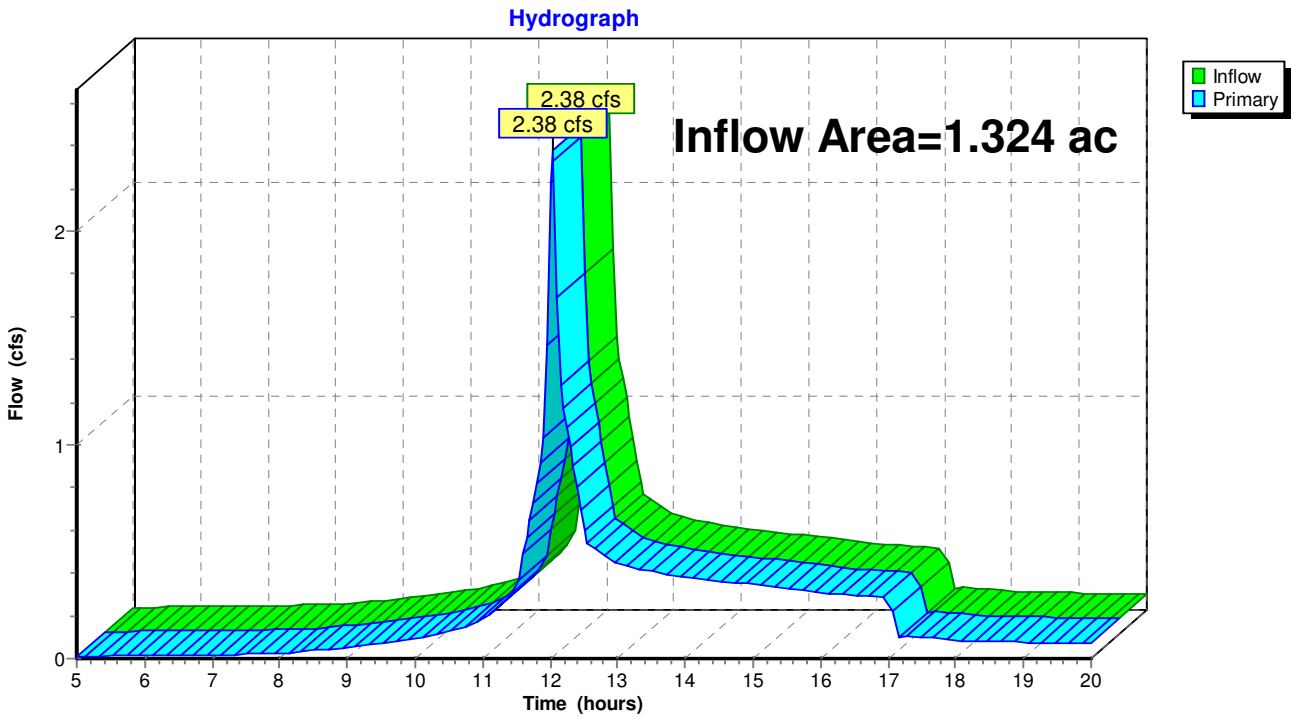


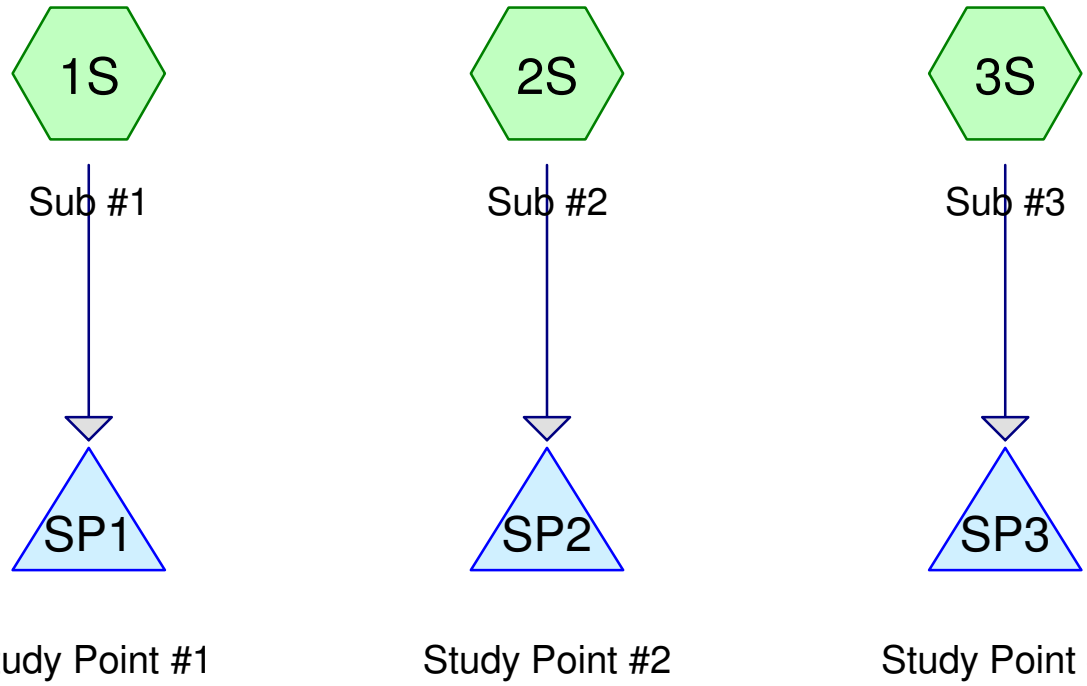
Pond SP3: Study Point #2

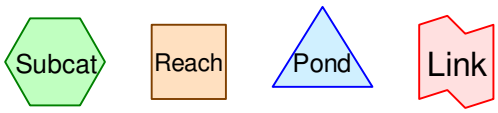
Inflow Area =	1.324 ac,	Inflow Depth >	2.53"	for	25-Year Event event
Inflow =	2.38 cfs @	12.03 hrs,	Volume=	0.279 af	
Primary =	2.38 cfs @	12.03 hrs,	Volume=	0.279 af,	Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #2







Drainage Diagram for MVH Pre-Dev'mt
Prepared by E.S. Coffin Engineering & Surveying 1/16/2014
HydroCAD® 8.00 s/n 000434 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
0.941	55	Woods, Good, HSG B (1S,2S,3S)
3.892	58	Meadow, non-grazed, HSG B (1S,2S,3S)
4.833		

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

Subcatchment 1S: Sub #1 Runoff Area=61,925 sf Runoff Depth>0.21"
Flow Length=409' Tc=10.9 min CN=57 Runoff=0.14 cfs 0.024 af

Subcatchment 2S: Sub #2 Runoff Area=103,835 sf Runoff Depth>0.23"
Flow Length=346' Tc=10.9 min CN=58 Runoff=0.29 cfs 0.046 af

Subcatchment 3S: Sub #3 Runoff Area=44,775 sf Runoff Depth>0.21"
Flow Length=245' Tc=8.4 min CN=57 Runoff=0.11 cfs 0.018 af

Pond SP1: Study Point #1 Inflow=0.14 cfs 0.024 af
Primary=0.14 cfs 0.024 af

Pond SP2: Study Point #2 Inflow=0.29 cfs 0.046 af
Primary=0.29 cfs 0.046 af

Pond SP3: Study Point #3 Inflow=0.11 cfs 0.018 af
Primary=0.11 cfs 0.018 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.088 af Average Runoff Depth = 0.22"
100.00% Pervious Area = 4.833 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Sub #1

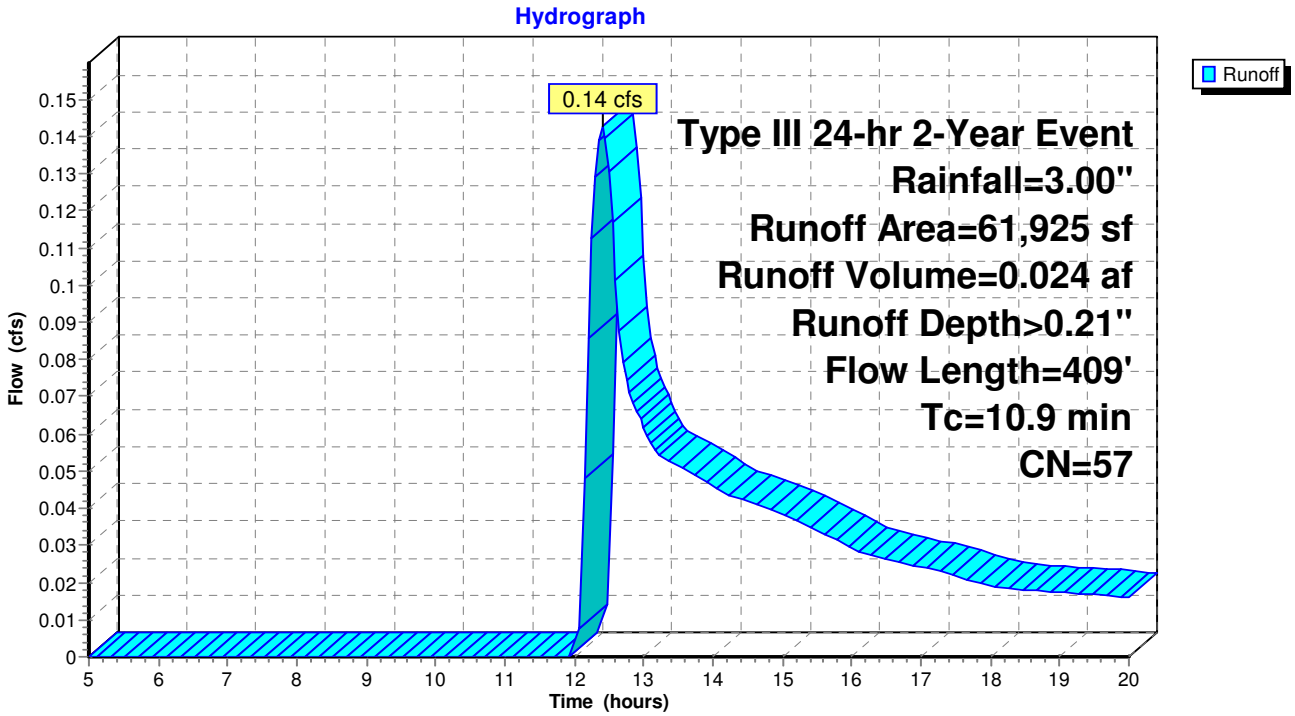
Runoff = 0.14 cfs @ 12.40 hrs, Volume= 0.024 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
47,315	58	Meadow, non-grazed, HSG B
14,610	55	Woods, Good, HSG B
61,925	57	Weighted Average
61,925		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0250	0.20		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
2.4	278	0.0773	1.95		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.3226	2.84		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
10.9	409	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

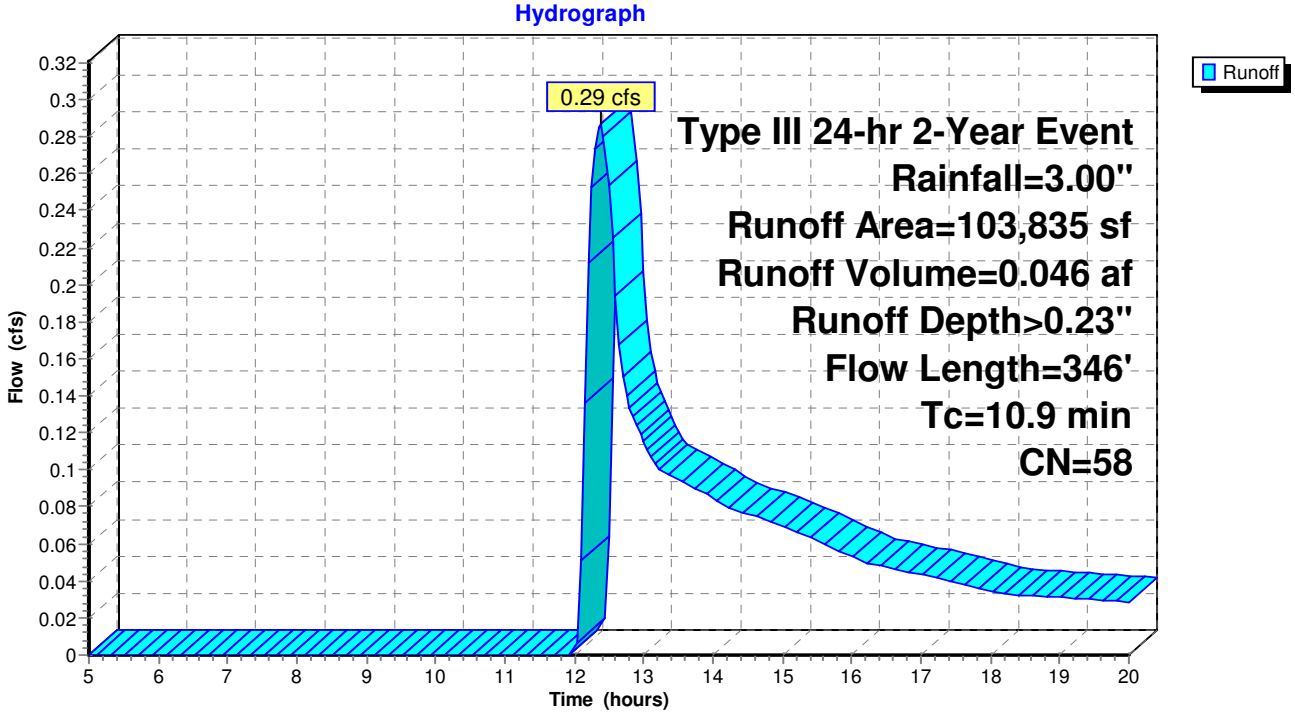
Runoff = 0.29 cfs @ 12.38 hrs, Volume= 0.046 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
99,730	58	Meadow, non-grazed, HSG B
4,105	55	Woods, Good, HSG B
103,835	58	Weighted Average
103,835		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
3.2	246	0.0325	1.26		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
10.9	346	Total			

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

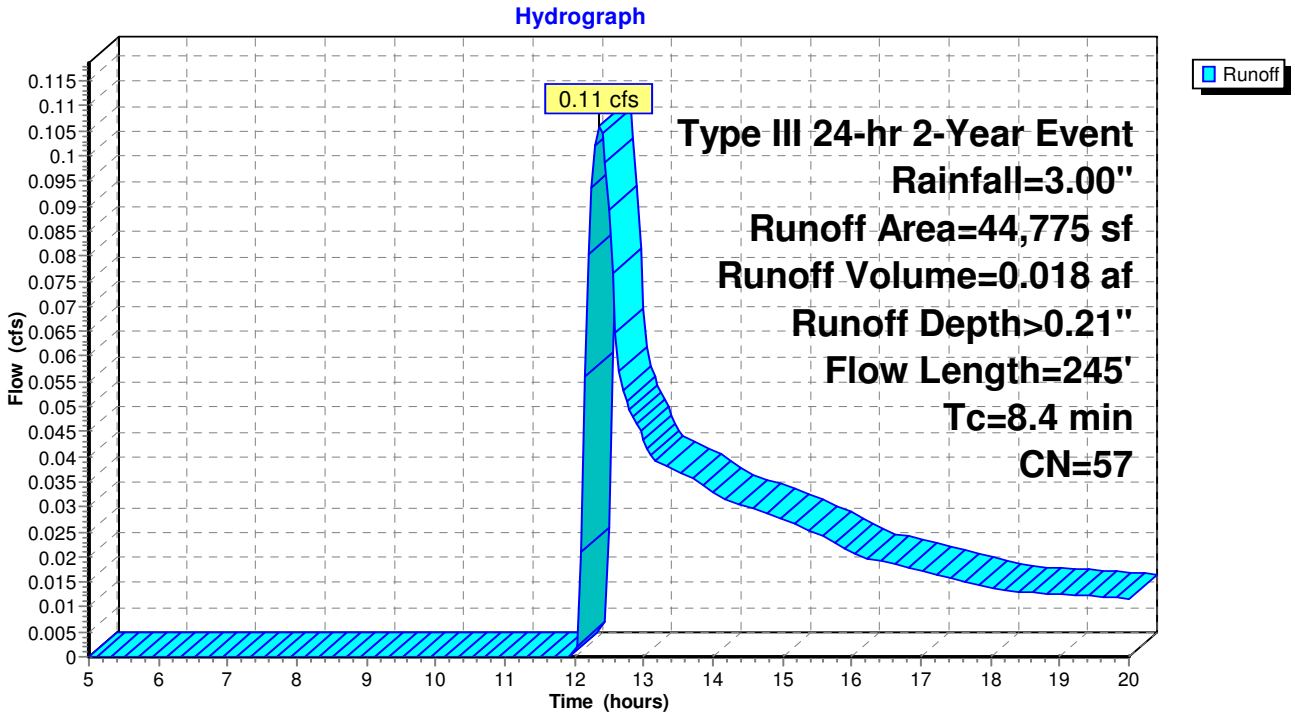
Runoff = 0.11 cfs @ 12.36 hrs, Volume= 0.018 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Event Rainfall=3.00"

Area (sf)	CN	Description
22,510	58	Meadow, non-grazed, HSG B
22,265	55	Woods, Good, HSG B
44,775	57	Weighted Average
44,775		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0350	0.23		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
1.1	134	0.0896	2.10		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.2216	2.35		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
8.4	245	Total			

Subcatchment 3S: Sub #3

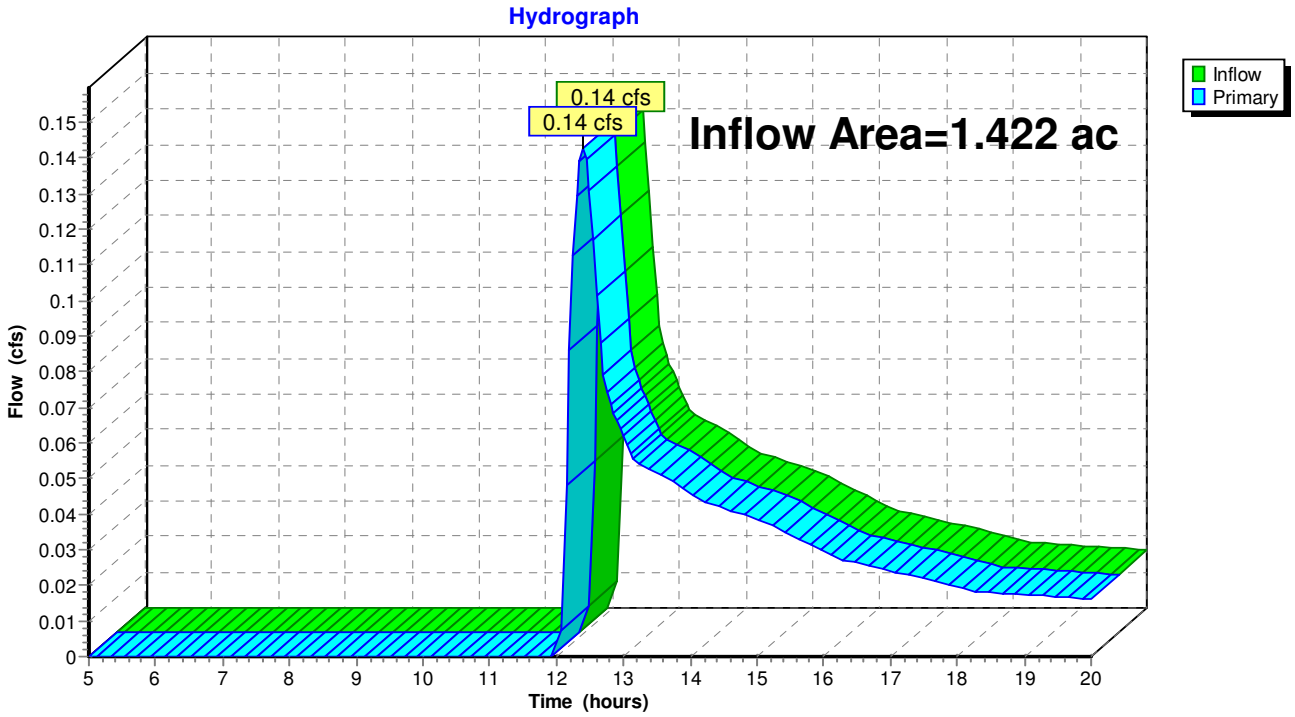


Pond SP1: Study Point #1

Inflow Area = 1.422 ac, Inflow Depth > 0.21" for 2-Year Event event
Inflow = 0.14 cfs @ 12.40 hrs, Volume= 0.024 af
Primary = 0.14 cfs @ 12.40 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

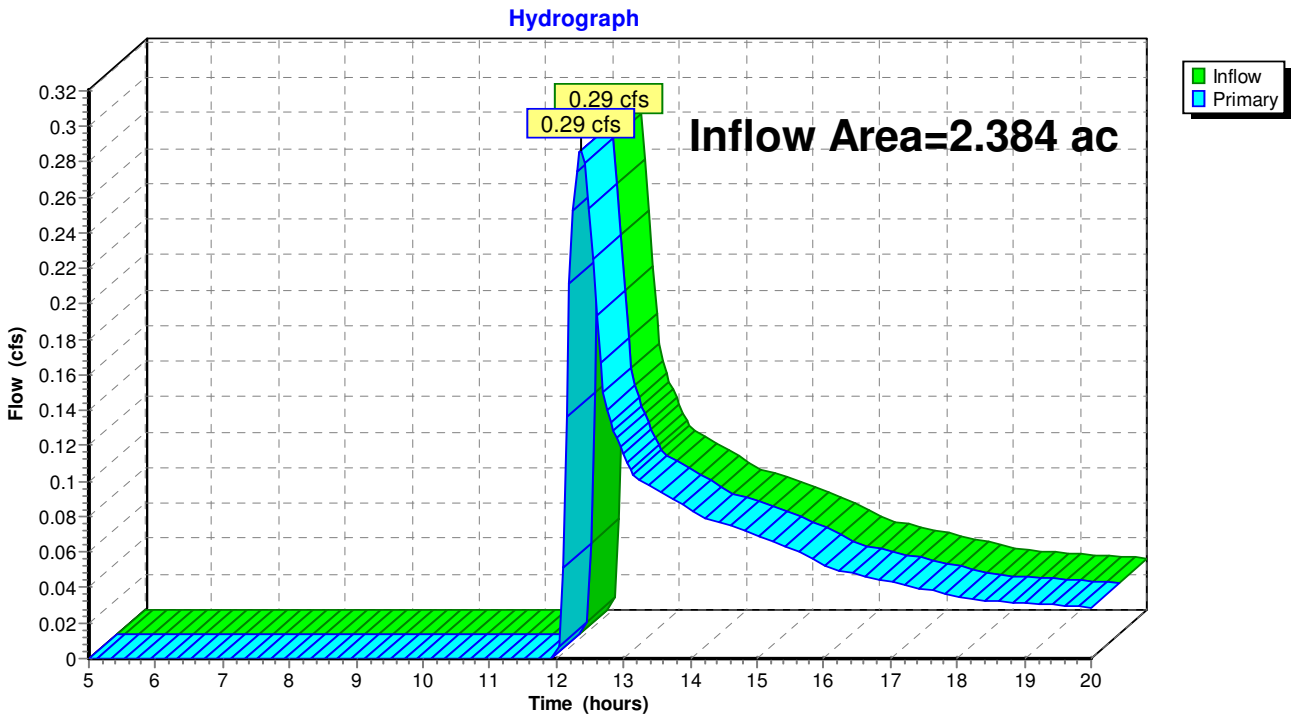


Pond SP2: Study Point #2

Inflow Area = 2.384 ac, Inflow Depth > 0.23" for 2-Year Event event
Inflow = 0.29 cfs @ 12.38 hrs, Volume= 0.046 af
Primary = 0.29 cfs @ 12.38 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

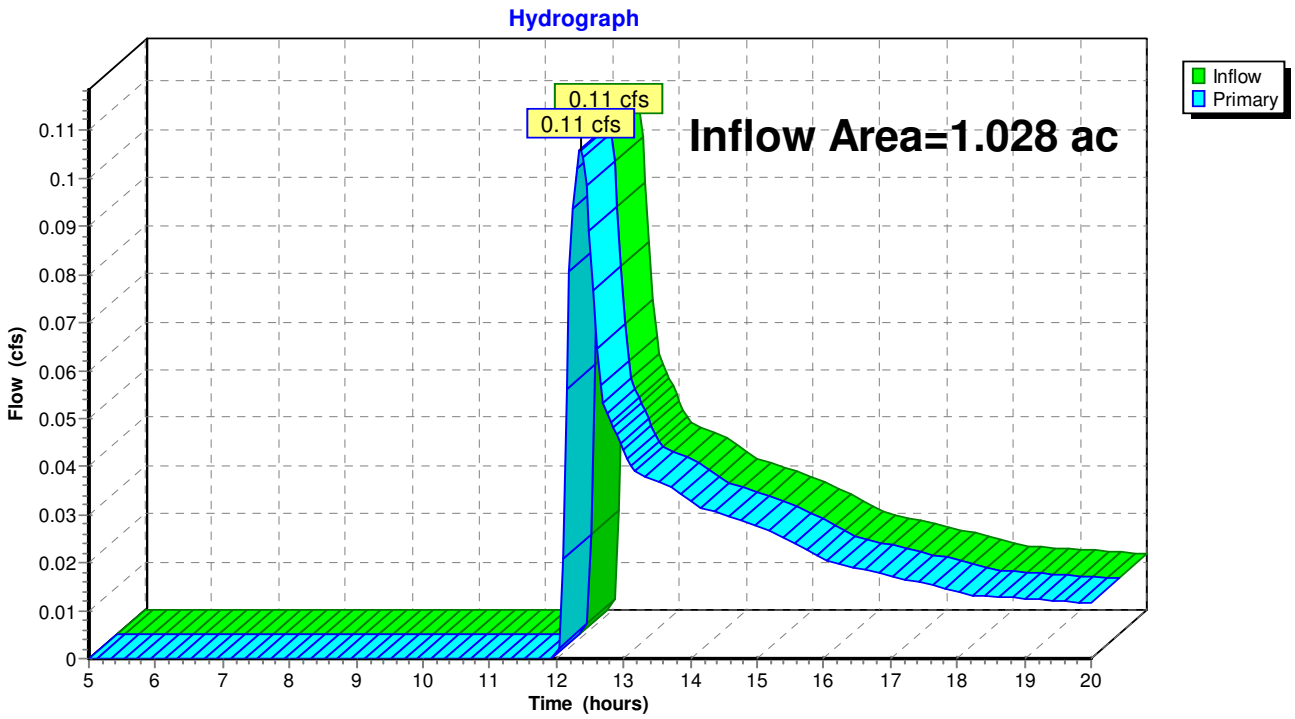


Pond SP3: Study Point #3

Inflow Area = 1.028 ac, Inflow Depth > 0.21" for 2-Year Event event
Inflow = 0.11 cfs @ 12.36 hrs, Volume= 0.018 af
Primary = 0.11 cfs @ 12.36 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #3



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

Subcatchment 1S: Sub #1 Runoff Area=61,925 sf Runoff Depth>0.71"
Flow Length=409' Tc=10.9 min CN=57 Runoff=0.85 cfs 0.084 af

Subcatchment 2S: Sub #2 Runoff Area=103,835 sf Runoff Depth>0.76"
Flow Length=346' Tc=10.9 min CN=58 Runoff=1.57 cfs 0.151 af

Subcatchment 3S: Sub #3 Runoff Area=44,775 sf Runoff Depth>0.71"
Flow Length=245' Tc=8.4 min CN=57 Runoff=0.67 cfs 0.061 af

Pond SP1: Study Point #1 Inflow=0.85 cfs 0.084 af
Primary=0.85 cfs 0.084 af

Pond SP2: Study Point #2 Inflow=1.57 cfs 0.151 af
Primary=1.57 cfs 0.151 af

Pond SP3: Study Point #3 Inflow=0.67 cfs 0.061 af
Primary=0.67 cfs 0.061 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.296 af Average Runoff Depth = 0.73"
100.00% Pervious Area = 4.833 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Sub #1

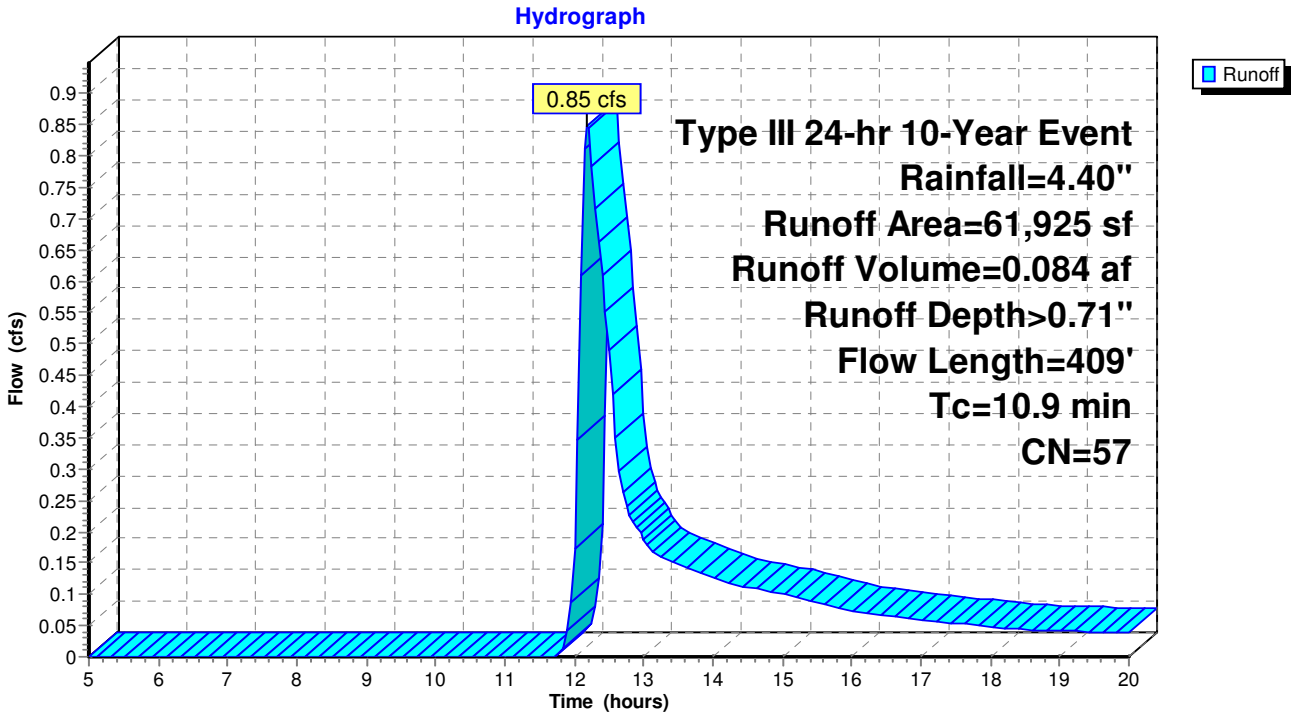
Runoff = 0.85 cfs @ 12.19 hrs, Volume= 0.084 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
47,315	58	Meadow, non-grazed, HSG B
14,610	55	Woods, Good, HSG B
61,925	57	Weighted Average
61,925		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0250	0.20		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
2.4	278	0.0773	1.95		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.3226	2.84		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
10.9	409	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

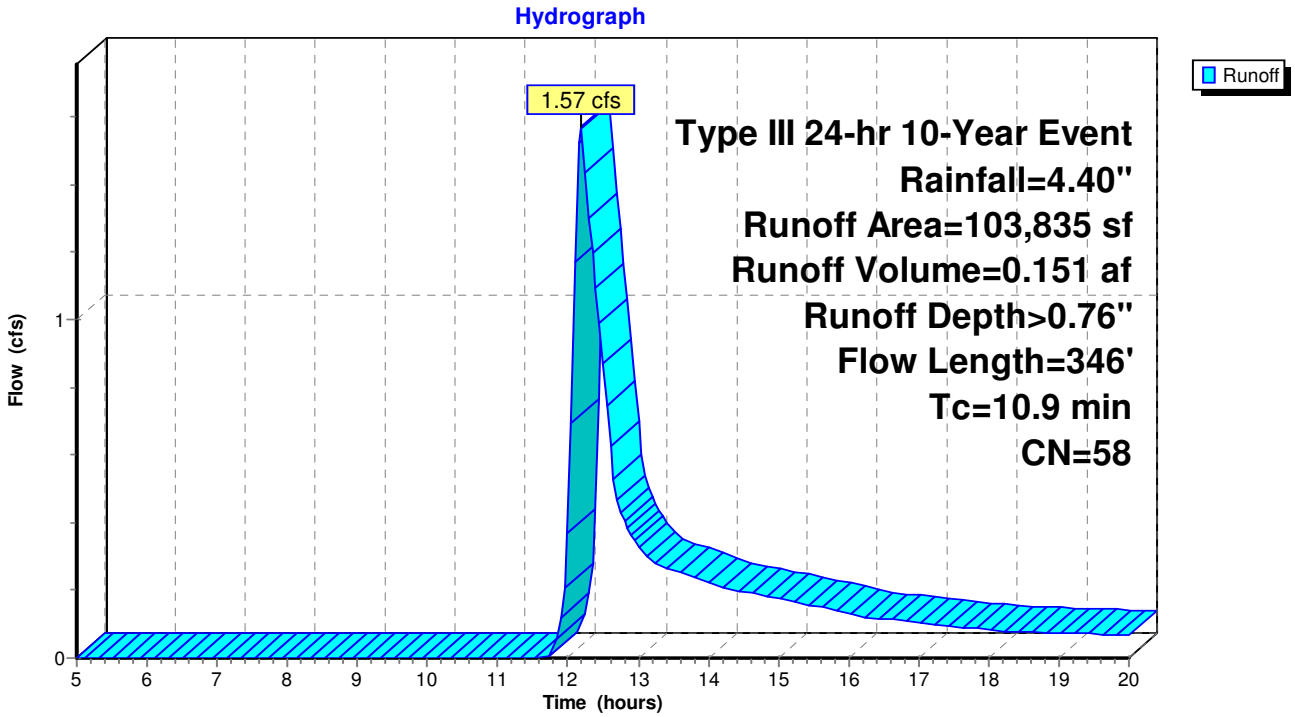
Runoff = 1.57 cfs @ 12.19 hrs, Volume= 0.151 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
99,730	58	Meadow, non-grazed, HSG B
4,105	55	Woods, Good, HSG B
103,835	58	Weighted Average
103,835		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
3.2	246	0.0325	1.26		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
10.9	346	Total			

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

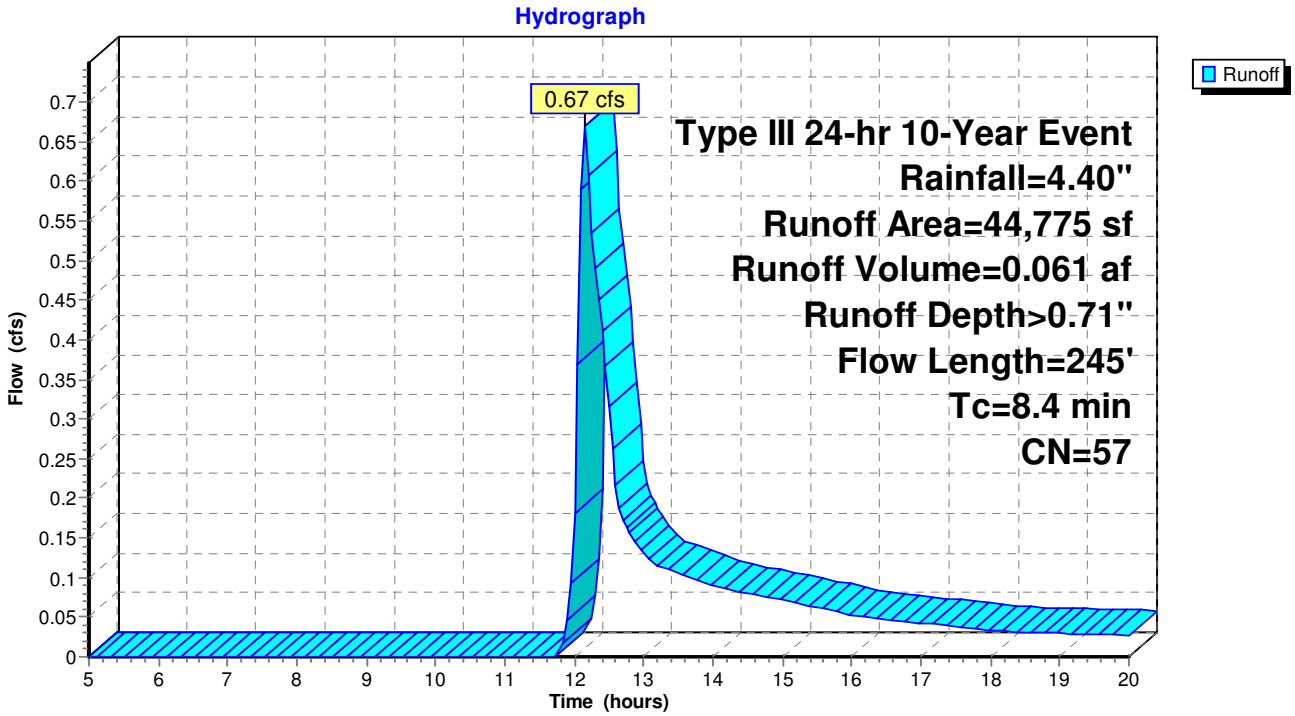
Runoff = 0.67 cfs @ 12.15 hrs, Volume= 0.061 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Event Rainfall=4.40"

Area (sf)	CN	Description
22,510	58	Meadow, non-grazed, HSG B
22,265	55	Woods, Good, HSG B
44,775	57	Weighted Average
44,775		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0350	0.23		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
1.1	134	0.0896	2.10		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.2216	2.35		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
8.4	245	Total			

Subcatchment 3S: Sub #3

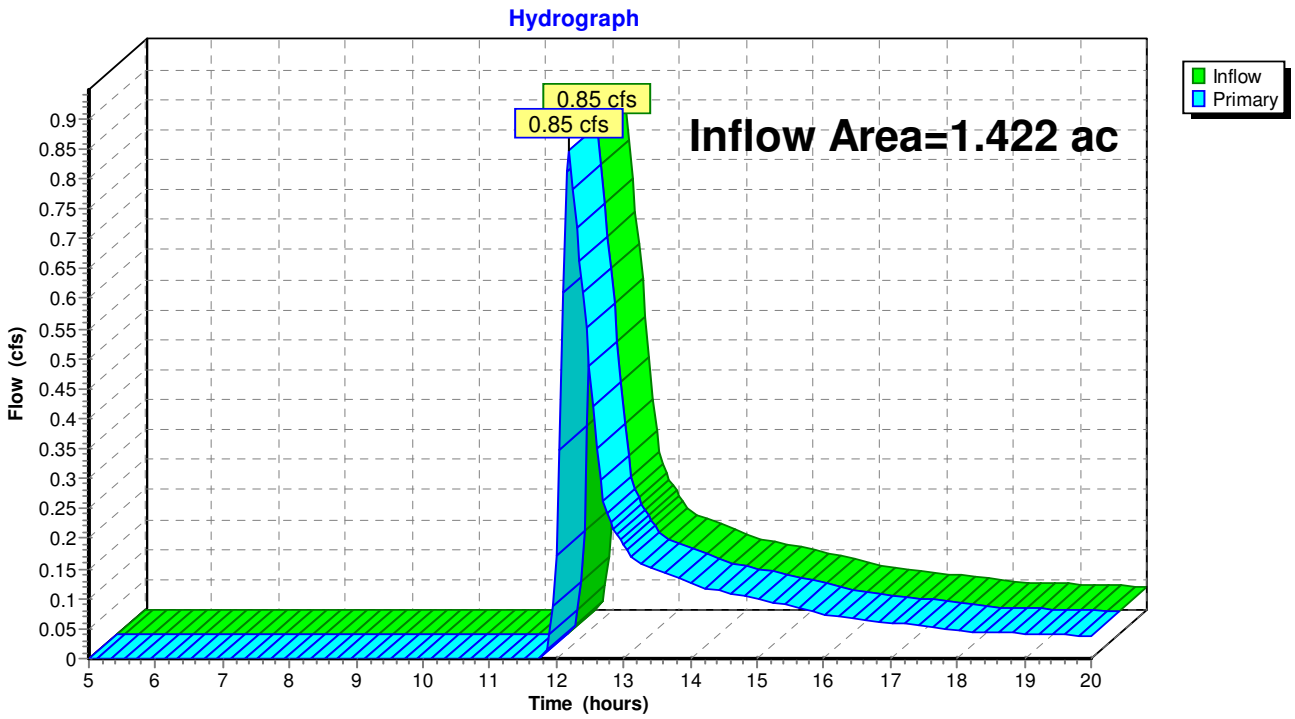


Pond SP1: Study Point #1

Inflow Area = 1.422 ac, Inflow Depth > 0.71" for 10-Year Event event
Inflow = 0.85 cfs @ 12.19 hrs, Volume= 0.084 af
Primary = 0.85 cfs @ 12.19 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

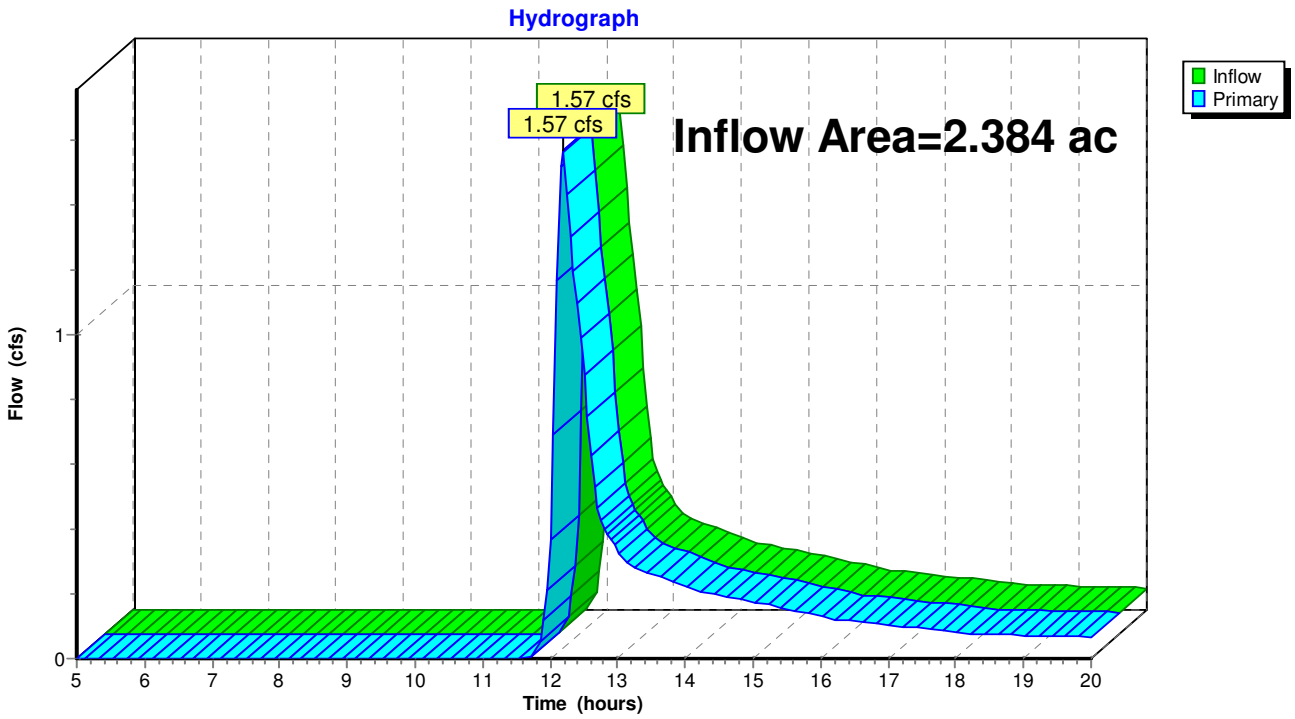


Pond SP2: Study Point #2

Inflow Area = 2.384 ac, Inflow Depth > 0.76" for 10-Year Event event
Inflow = 1.57 cfs @ 12.19 hrs, Volume= 0.151 af
Primary = 1.57 cfs @ 12.19 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

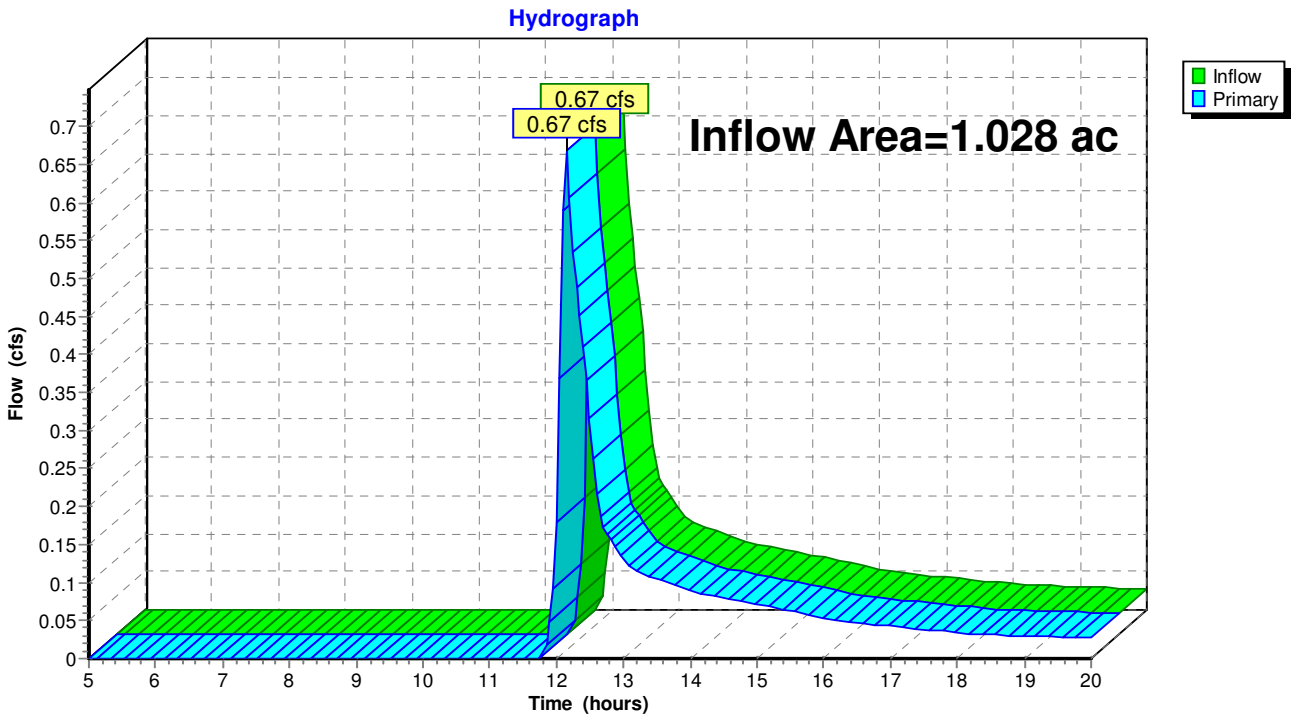


Pond SP3: Study Point #3

Inflow Area = 1.028 ac, Inflow Depth > 0.71" for 10-Year Event event
Inflow = 0.67 cfs @ 12.15 hrs, Volume= 0.061 af
Primary = 0.67 cfs @ 12.15 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #3



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

Subcatchment 1S: Sub #1 Runoff Area=61,925 sf Runoff Depth>1.04"
Flow Length=409' Tc=10.9 min CN=57 Runoff=1.36 cfs 0.123 af

Subcatchment 2S: Sub #2 Runoff Area=103,835 sf Runoff Depth>1.10"
Flow Length=346' Tc=10.9 min CN=58 Runoff=2.50 cfs 0.218 af

Subcatchment 3S: Sub #3 Runoff Area=44,775 sf Runoff Depth>1.04"
Flow Length=245' Tc=8.4 min CN=57 Runoff=1.07 cfs 0.089 af

Pond SP1: Study Point #1 Inflow=1.36 cfs 0.123 af
Primary=1.36 cfs 0.123 af

Pond SP2: Study Point #2 Inflow=2.50 cfs 0.218 af
Primary=2.50 cfs 0.218 af

Pond SP3: Study Point #3 Inflow=1.07 cfs 0.089 af
Primary=1.07 cfs 0.089 af

Total Runoff Area = 4.833 ac Runoff Volume = 0.430 af Average Runoff Depth = 1.07"
100.00% Pervious Area = 4.833 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Sub #1

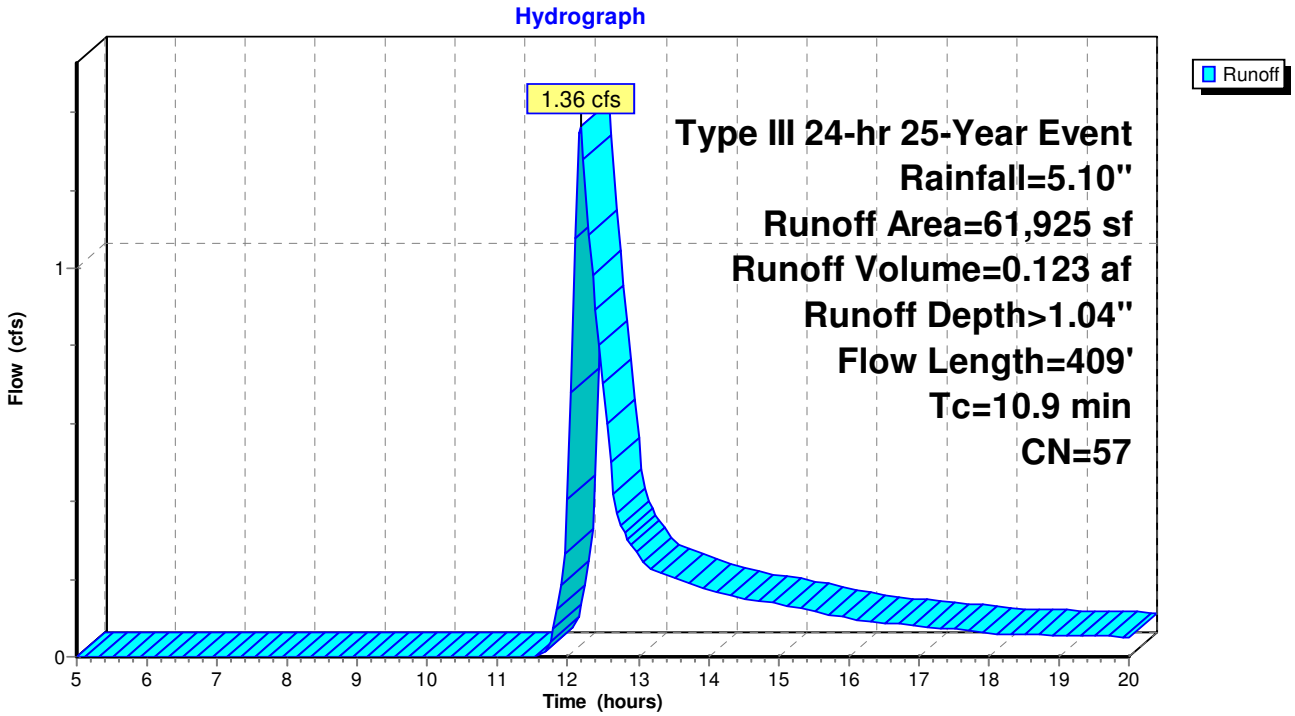
Runoff = 1.36 cfs @ 12.18 hrs, Volume= 0.123 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
47,315	58	Meadow, non-grazed, HSG B
14,610	55	Woods, Good, HSG B
61,925	57	Weighted Average
61,925		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0250	0.20		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
2.4	278	0.0773	1.95		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.2	31	0.3226	2.84		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
10.9	409	Total			

Subcatchment 1S: Sub #1



Subcatchment 2S: Sub #2

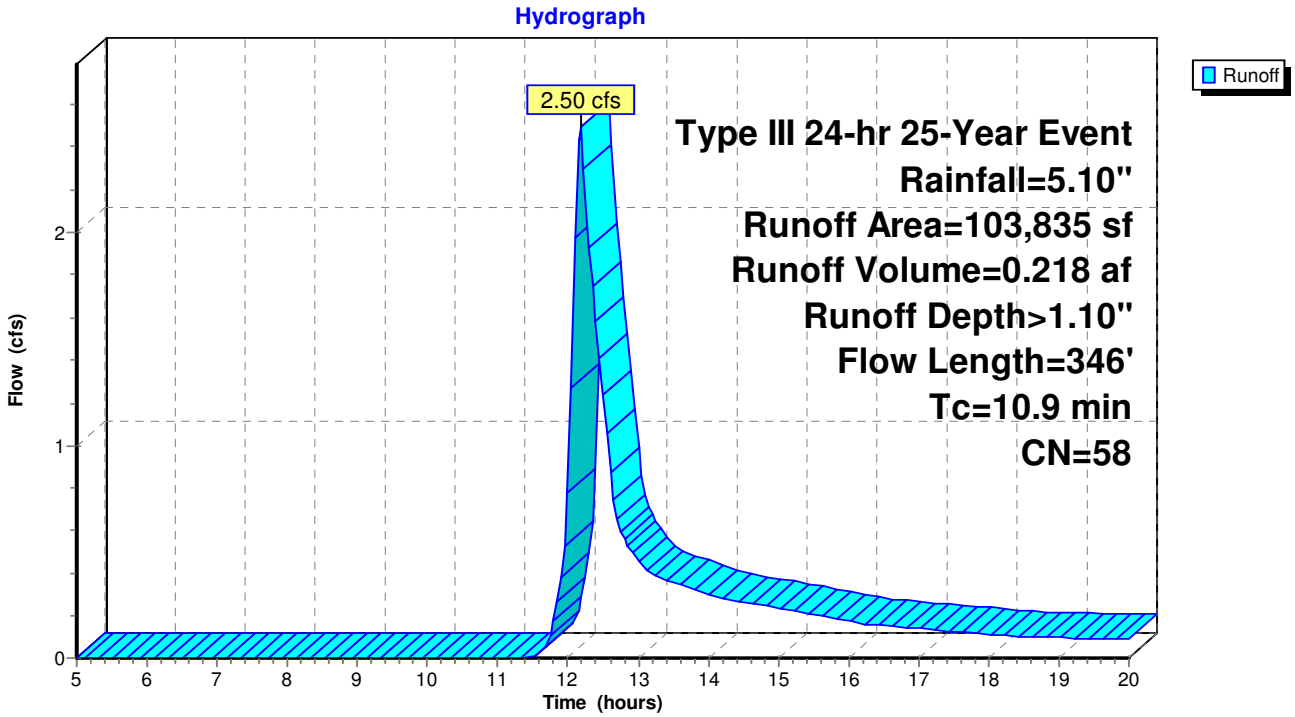
Runoff = 2.50 cfs @ 12.17 hrs, Volume= 0.218 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
99,730	58	Meadow, non-grazed, HSG B
4,105	55	Woods, Good, HSG B
103,835	58	Weighted Average
103,835		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0300	0.22		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
3.2	246	0.0325	1.26		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
10.9	346	Total			

Subcatchment 2S: Sub #2



Subcatchment 3S: Sub #3

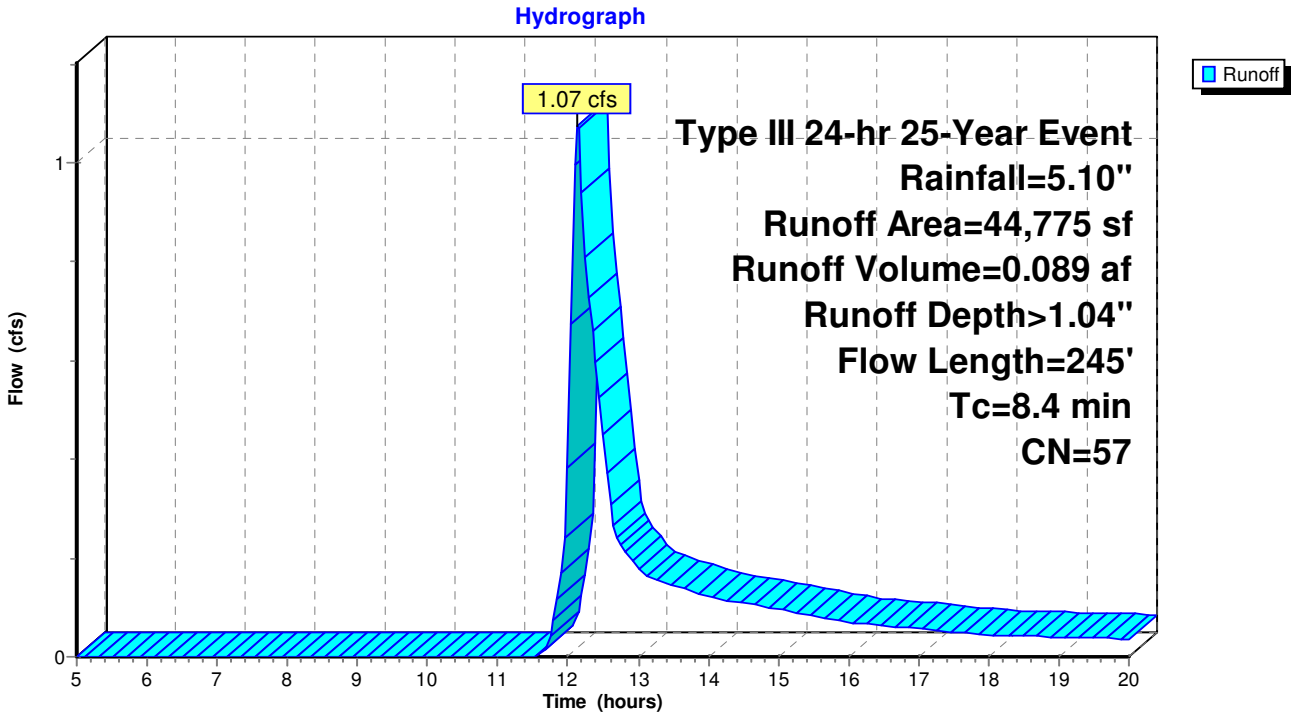
Runoff = 1.07 cfs @ 12.14 hrs, Volume= 0.089 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Event Rainfall=5.10"

Area (sf)	CN	Description
22,510	58	Meadow, non-grazed, HSG B
22,265	55	Woods, Good, HSG B
44,775	57	Weighted Average
44,775		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0350	0.23		**Sheet Flow, AB** Range n= 0.130 P2= 3.00"
1.1	134	0.0896	2.10		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.2216	2.35		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
8.4	245	Total			

Subcatchment 3S: Sub #3

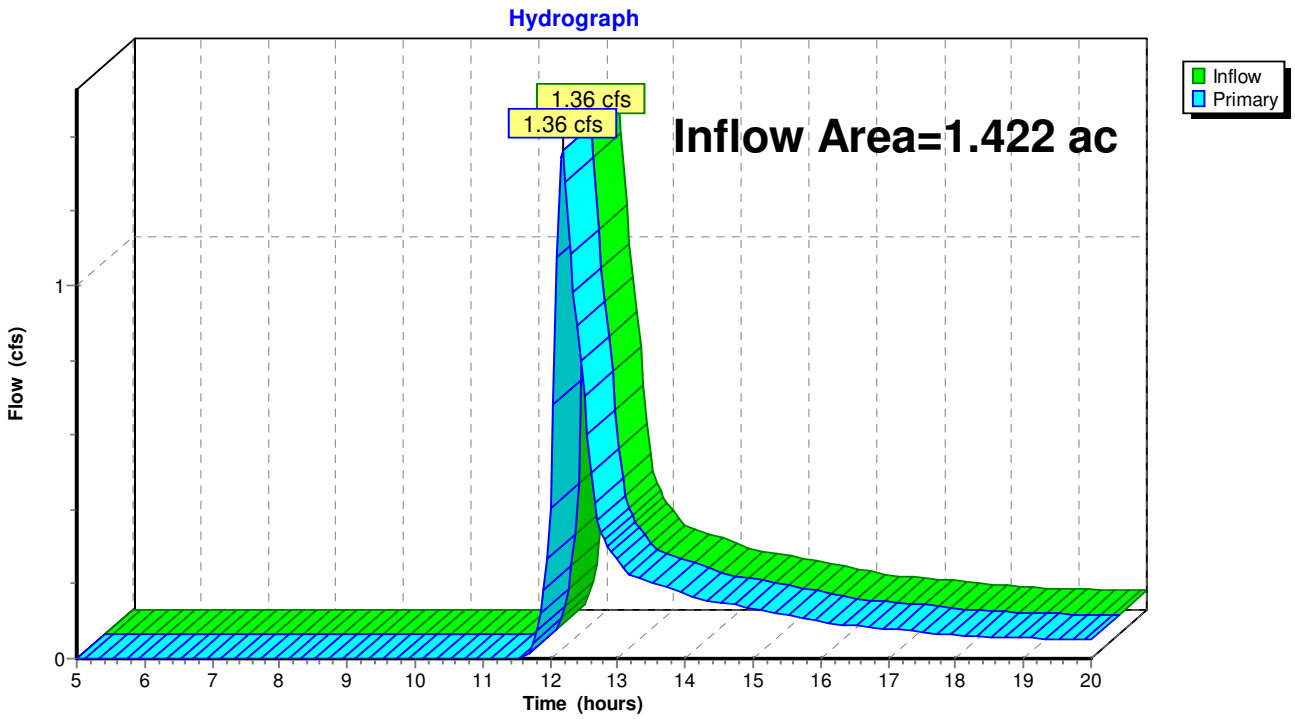


Pond SP1: Study Point #1

Inflow Area = 1.422 ac, Inflow Depth > 1.04" for 25-Year Event event
Inflow = 1.36 cfs @ 12.18 hrs, Volume= 0.123 af
Primary = 1.36 cfs @ 12.18 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

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

Pond SP1: Study Point #1

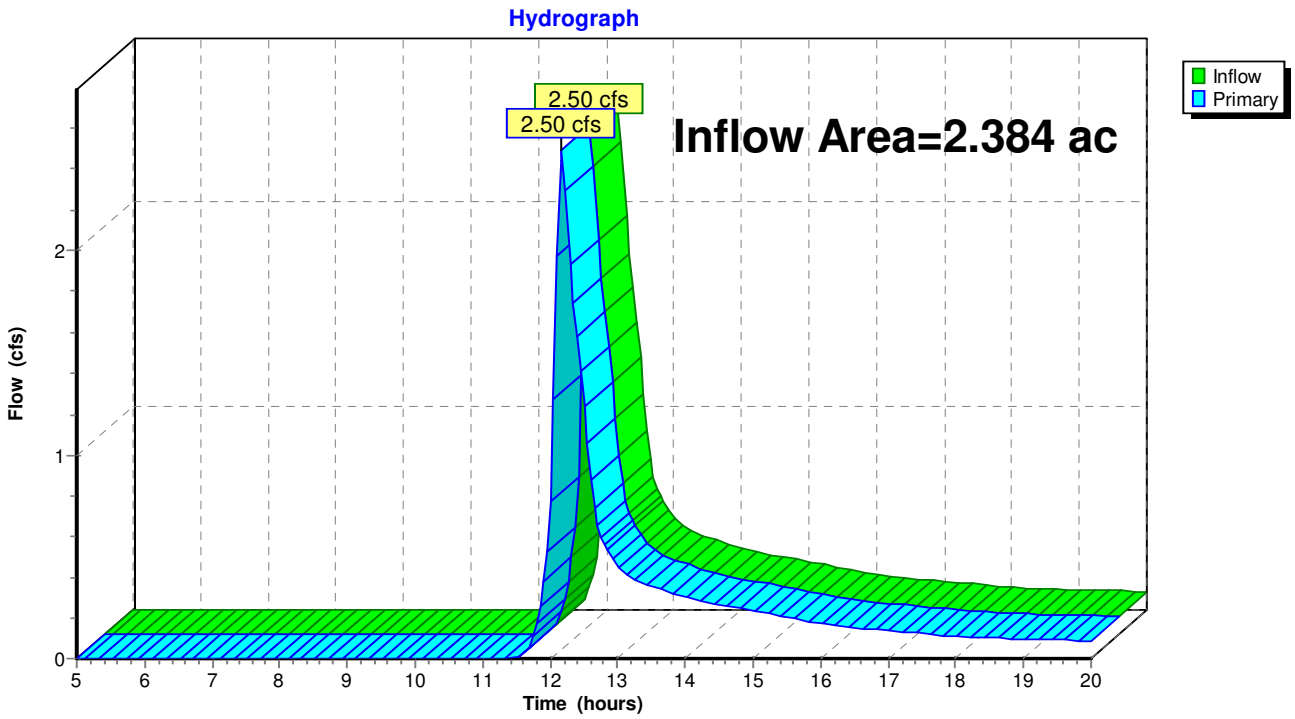


Pond SP2: Study Point #2

Inflow Area = 2.384 ac, Inflow Depth > 1.10" for 25-Year Event event
Inflow = 2.50 cfs @ 12.17 hrs, Volume= 0.218 af
Primary = 2.50 cfs @ 12.17 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min

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

Pond SP2: Study Point #2

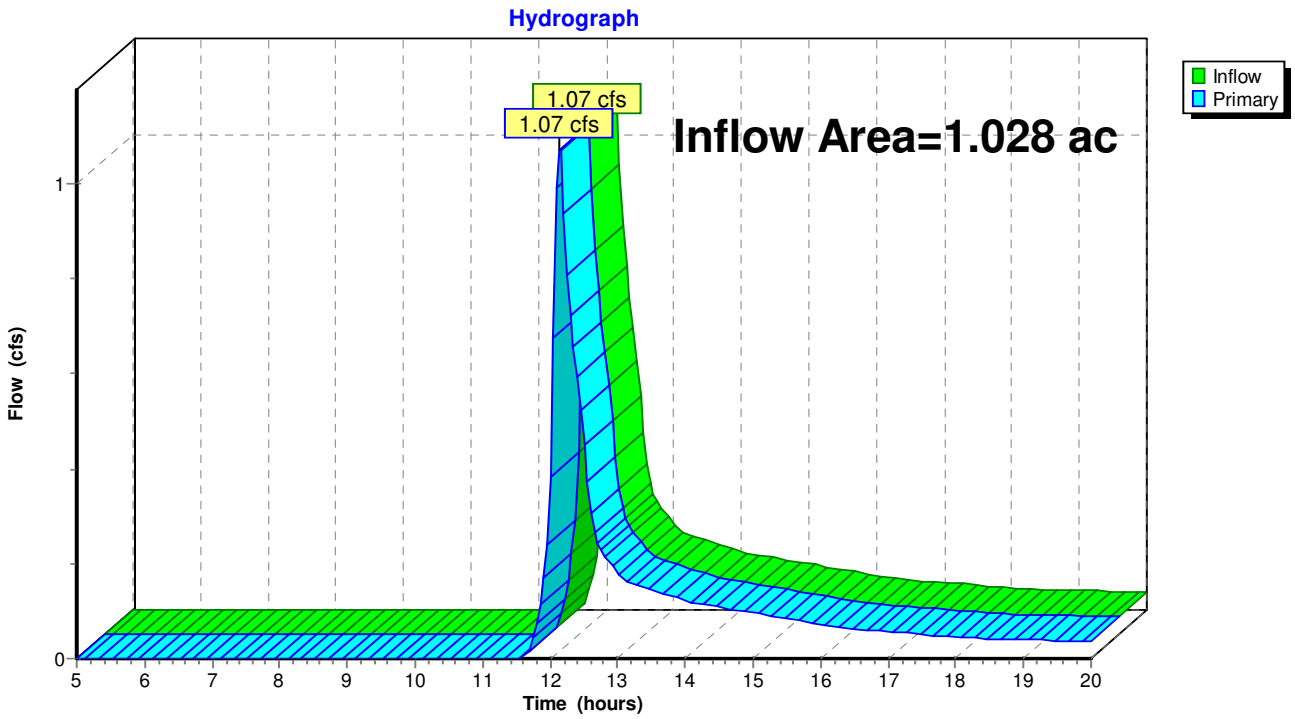


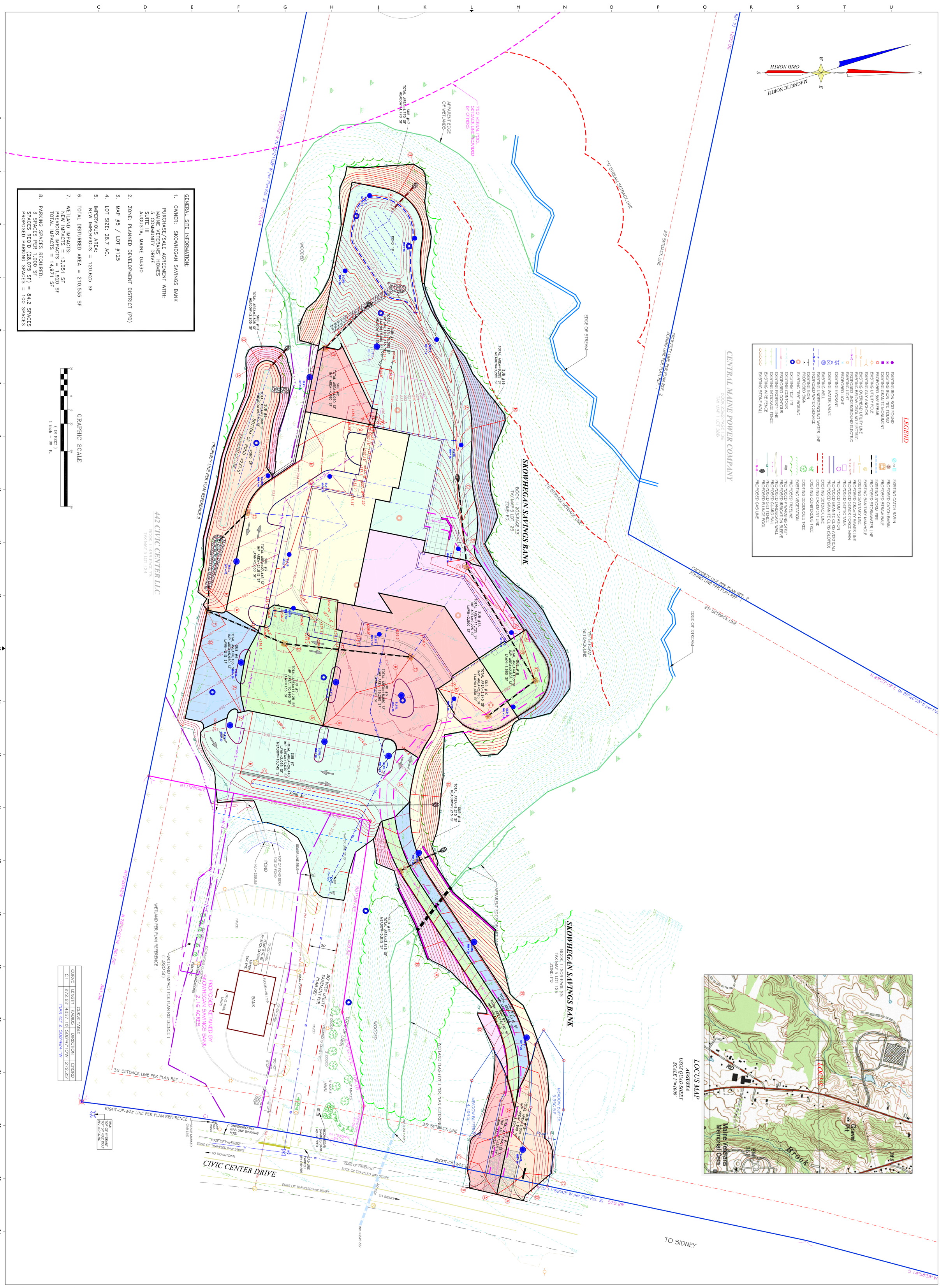
Pond SP3: Study Point #3

Inflow Area =	1.028 ac,	Inflow Depth >	1.04"	for	25-Year Event event	
Inflow =	1.07 cfs @	12.14 hrs,	Volume=		0.089 af	
Primary =	1.07 cfs @	12.14 hrs,	Volume=		0.089 af,	Atten= 0%, Lag= 0.0 min

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

Pond SP3: Study Point #3





MAINE VETERANS' HOMES

CIVIC CENTER DRIVE AUGUSTA, MAINE

NOT FOR CONSTRUCITON

REVISIONS

#	DATE	DESCRIPTION

DATE:	12.31.13
PROJECT #	2013-251
DRAWN BY:	TGH
CHECKED BY:	JEC
DRAWING SCALE	1"=30'

SHEET TITLE

POST-DEVELOPMENT PLAN

POST

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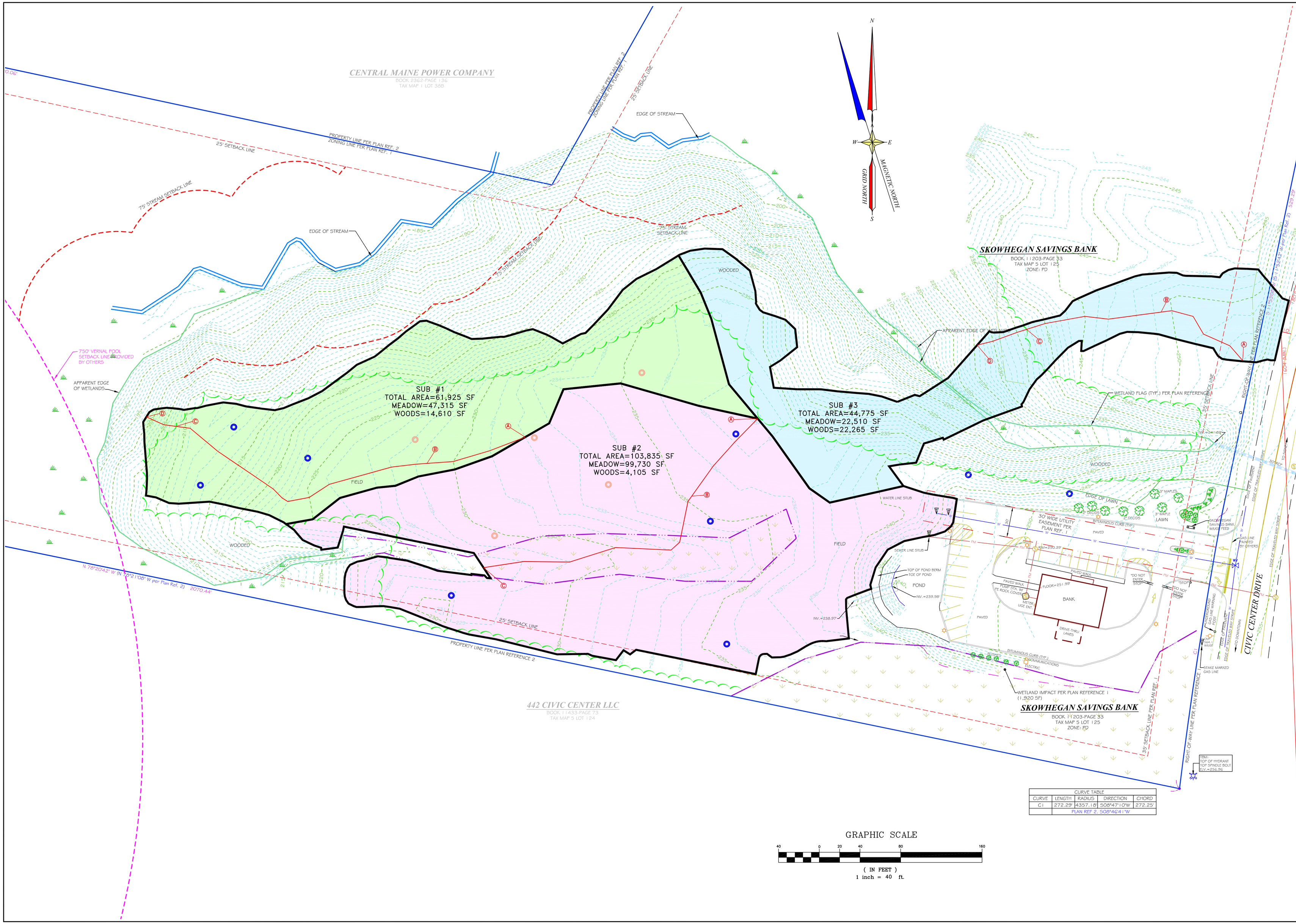
E.S. COFFIN ENGINEERING & SURVEYING, INC.
432 Cony Road P.O. Box 4687 Augusta, Maine 04330
Ph. (207) 623-9475 Fax (207) 623-0016 Toll Free 1-800-244-9475

STATE OF MAINE JAMES E. COFFIN 8500 LICENSED PROFESSIONAL ENGINEER



CURVE TABLE				
CURVE	LENGTH	RADIUS	DIRECTION	CHORD
C1	272.29'	4357.18'	S08°47'10"W	272.25'
	PLAN REF 2, S08°46'41"W			

STATE OF MAINE
JAMES E. COFFIN
8500
LICENSED
PROFESSIONAL ENGINEER

E.S. COFFIN
ENGINEERING SURVEYING
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E.S. COFFIN ENGINEERING & SURVEYING, INC.
432 Cony Road P.O. Box 4687 Augusta, Maine 04330
Ph. (207) 623-9475 Fax (207) 623-0016 Toll Free 1-800-244-9475

NO.	REVISIONS	DATE

SHEET TITLE: PRE-DEVELOPMENT PLAN

SCALE: 1 INCH=40 FEET

DATE: DECEMBER 31, 2013

DRAWN BY: TGH

CHECKED BY: JEC

CLIENT/PROJECT: MAINE VETERANS' HOMES
SKOWHEGAN SAVINGS BANK PROPERTY

LOCATION: CIVIC CENTER DRIVE

TOWN: AUGUSTA COUNTY: KENNEBEC STATE: MAINE

PROJ. NO. 2013-251

PRE