Preliminary Drainage Study

Treplus
Hawthorne Commons

Dublin, Ohio

Prepared By:

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INTRODUCTION:

The following report presents the preliminary design and analysis of the storm water management for Treplus Communities Hawthorne Commons in Dublin, Ohio. Detention for the site is provided through the use of an open air retention pond along with pervious pavement, and underground storage using manufactured chambers. The storage shall be governed by the release rates set forth by the City of Dublin Master Drainage Plan based upon the critical storm event and area tributary to the outfall of the site

The property area is approximately 13.4 acres in total. Approximately 0.8 acres of the property is utilized as a detention pond for Wyandotte Woods development to the north of the subject property. This pond is connected to the storm sewer system within Wyandotte Woods Boulevard and is also within a drainage easement. This pond will be maintained and operated by the Home Owners Association and/or the developer of Wyandotte Woods. Approximately 12.6 acres of the remaining site will drain through the proposed storm water management system to the south into the Dublin Schools drainage system. Of the 12.6 acres, approximately 0.9 acres will be released un-detained by virtue of the topography of the site. Water quality shall be handled within the proposed detention facility per Ohio EPA and City of Dublin requirements.

HYDROLOGIC ANALYSIS:

All hydrologic parameters were determined using methodology described in the City of Dublin Stormwater Management Design Manual, dated June 2013. Both Pre-Development and Post-Development runoff and peak discharge amounts were calculated through HydroCAD version 9.10 software.

The Master Drainage Plan for the City of Dublin was used in order to compute allowable release rates for the proposed improvements. This site is part of the two watersheds; The Hard Road Watersheds SubAreas 950 & 970.

The storage shall be governed by the release of the 1 year-allowable release rate to the critical storm, storms less frequent than the critical storm shall be released at a rate limited to that storms allowable rate pursuant to the Master Drainage Plan established rates of release.

PRE-DEVELOPED CONDITIONS:

The pre-developed condition of the site consists of a primarily vegetated and wooded site with gentle to moderate slopes from the north to the south. The area to the south and west of the site is owned by Dublin City Schools and is part of Dublin Scioto High School. Primarily these areas are athletic fields and similar facilities. The area to the north of the site is single family subdivision development. The area to the east is wooded and includes a multi-use trail owned and maintained by the City of Dublin. The site predominately drains over land into two structures at the north end of the football field for the High School.

Currently the site is divided into two tributary divides per the Master Drainage Study. These are sub areas 950 and 970, which both drain towards Hard Road and eventually into the Scioto River. The site is divided approximately in half by these two watersheds. Ultimately both water sheds are routed through the Dublin School system.

During our initial investigation of the Dublin School system, we identified that the record calculations provided did not appear to account for off-site drainage tributary into the School system. This left portions of the school system somewhat under-designed to convey less frequent storm events. Our analysis in this report will attempt to show the ponding elevations of the two primary collection structures both pre and post development. The objective of our design is to maintain these current elevations at the current level or lower for each respective storm event.

Tables 1 and 2 below designate the allowable flow rates by the Dublin Master Storm Water Drainage Plan by subareas 950 & 970.

Table 1 – Allowable Release Rate Tabulation (Hard Road North; Sub Area 950) (6.13 Ac.)

Storm Event	cfs/Acre Allowable	Site Allowable cfs/Acre
1 year	0.4	2.45
2 year	0.5	3.07
5 year	0.7	4.29
10 year	0.8	4.91
25 year	1.1	6.75
50 year	1.6	9.81
100 year	2.1	12.88

Table 2 – Allowable Release Rate Tabulation (Hard Road North; Sub Area 970) (6.49 Ac.)

Storm Event	cfs/Acre Allowable	Site Allowable cfs/Acre
1 year	0.3	1.95
2 year	0.4	2.60
5 year	0.5	3.25
10 year	0.6	3.89
25 year	0.8	5.19
50 year	1.2	7.79
100 year	1.6	10.38

POST-DEVELOPED CONDITIONS:

The post developed condition for the site will consist of a proposed 1-story apartment buildings with attached garages, associated driveways, private internal roadways, a clubhouse, and associated parking. The disturbed tributary acreage of the site draining to the south is approximately 12.6 acres. Approximately 0.8 acres consists of an existing retention pond for off-site development to the north. This existing pond drains into the storm system of Wyandotte Woods Boulevard and is not tributary to the site. The majority of the site will be collected an detained in the on-site drainage system. A small portion of the site will drain undetained towards the school property due to the topography of the site.

The proposed detention system consists of a network of pervious paver systems with underground storage as well as a open air retention pond. The underground storage is a combination of storage within open graded stone at a pore capacity of 40% voids and underground StormTech (or equal) chambers. In one pervious paver area at the North East corner of the site, there is stone only storage. The other two pervious paver areas on the site have a combination of StormTech chambers and stone to maximize the void space beneath the systems. One area of the site has underground storage chambers only with stone voids for storage.

Each separate system will have it's own control structure with a compound orifice plate system to control the releases to the master outlet of the site. This is modeled in HydroCAD and is best described by the network diagram in the appendix of this report.

The outlet flow rates will be controlled based upon the City of Dublin's Master Storm Water Management Plan. A critical storm was determined for the site by comparing pre to post 1 year, 24 hour storm runoff volumes and the increase created by the post developed condition (See calculation below). This project creates a 65.4% increase in the 1 year, 24-hour volume. According to the storm water regulations, this means the critical storm event is a 10-year storm. All events more frequent and equal to the 10-year storm must release at the 1-year pre-developed rate that is determined by the master drainage study.

Tables have been provided below summarizing the preliminary results of storm water management and calculations for the project. Table 3 describes the comparative release rates for pre and post developed storms as well as the allowable release rates based upon the critical storm and pond level information for each respective storm. Table4 is intended to show the capacity of each system as well as the total combined system capacity for the site.

Critical Storm Calculation:

The critical storm is determined by comparing the increase in runoff volume of the 1-year 24-hour rainfall event from the pre-developed condition to that of the post-developed.

Pre-Development 1-Year Storm Event: 0.677 af
Post-Development 1-Year Storm Event: 1.120 af
((1.120 af – 0.677 af) / 0.677 af) x 100% =65.4% **(10 year critical storm)**

Table 3 – Stormwater Management Summary Table

	1 year	**2 year**	**5 year**	**10 year (Crit.Stm)**	**25 year**	**50 year**	**100 year**
Predev. Q (cfs)	3.7	5.8	8.9	11.7	15.9	19.4	23.2
Postdev. Q (cfs)	14.8	19.8	27.2	33.4	42.1	49.3	56.9
Allowable Release (cfs)*	4.4	4.4	4.4	4.4	11.9	17.6	23.3
Actual Release (cfs)	1.9	2.4	3.1	3.60	5.6	8.0	13.6

Table 4 – Storm Management Summary by Pond/System:

	1 year	2 year	5 year	10 year (Crit.Stm)	25 year	50 year	100 year
Wet retention Pond (Area 'A') – Normal Pool @ 907.1							
Retention Elevation:	908.6	909.1	909.7	910.2	910.8	911.1	911.3
Storage (cf) @ Elev.	22,044	29,540	40,910	50,685	64,924	72,127	75,785
Storage Depth	1.5'	2.0'	2.6'	3.1'	3.7'	4.0'	4.2'
Pervious Paver/Underground System 1 (Area 'D')							
Storage Elevation:	911.1	911.3	911.7	912.0	912.5	913.1	913.7
Storage (cf) @ Elev.	1,293	1,667	2,211	2,647	3,264	3,772	4,300
Pervious Paver System 2 (Area 'B')							
Storage Elevation:	914.5	914.6	914.8	915.0	915.3	915.5	915.7
Storage (cf) @ Elev.	807	1,048	1,399	1,695	2,117	2,473	2,852
Pervious Paver/Underground System 3 (Area 'C')							
Storage Elevation:	907.9	908.2	908.6	909.0	909.3	909.5	909.8
Storage (cf) @ Elev.	1,849	2,572	3,730	4,749	5,502	5,964	6,433
Pervious Underground Detention System (Area 'UGS')							
Storage Elevation:	906.1	906.5	907.0	907.5	908.3	908.8	909.4
Storage (cf) @ Elev.	3,233	4,430	6,207	7,712	9,455	10,215	11,370

Total Storage	**1 year**	**2 year**	**5 year**	**10 year (Crit.Stm)**	**25 year**	**50 year**	**100 year**
Storage (cf)	**29,226**	**39,257**	**54,457**	**67,488**	**85,262**	**94,551**	**100,670**

WATER QUALITY:

Water quality storage and treatment shall be provided by pervious pavement green technology combined with traditional extended wet retention. Water quality for the site was calculated using the net drainage area not draining to pervious pavers. The total site area tributary to the management system is 12.6 acres. The area draining to the pervious paver network above grade is approximately 1.6 acres. A net 11 acres had to be treated using the extended retention by the wet pond. This equated to 17,969 cubic feet of total water quality volume available for water quality; of which 2,995 cubic feet is sediment storage below the permanent pool. The system provides more than adequate capacity above the normal pool to accommodate water quality for the site.

DUBLIN SCHOOL PROPERTY EFFECTS:

We were asked to review the effects the system will have on the Dublin School drainage inlets immediately south of the proposed development. We modeled the runoff going into each structure both pre and post developed runoff scenarios. We are providing in the table below a ponding elevation relationship for each respective storm event as it pertains to both the pre and post developed cases.

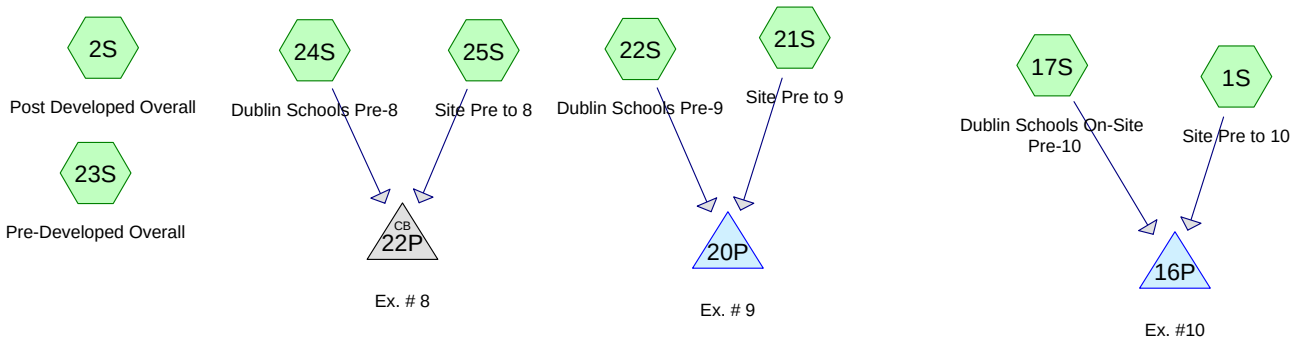
	Rim	**1 year**	**2 year**	**5 year**	**10 year (Crit.Stm)**	**25 year**	**50 year**	**100 year**
‘Ex 8’ Pre	904.16	902.7	902.9	903.3	903.84	*	*	*
‘Ex 8’ Post	904.16	902.5	902.7	902.8	903.1	903.5	904.0	*
‘Ex 9’ Pre	902.23	899.4	899.5	899.6	899.8	900.2	900.5	901.0
‘Ex 9’ Post	902.23	899.4	899.5	899.6	899.7	899.9	900.2	900.6
‘Ex 10’ Pre	901.29	903.2	903.9	904.1	904.1	*	*	*
‘Ex 10’ Post	901.29	899.7	899.9	900.4	901.6	903.3	904.0	904.1

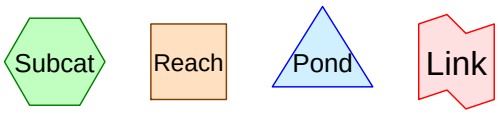
*flood routing occurs; which is defined as water leaving the basin area or overtopping the grate and flood routing to the next downstream structure over land.

SUMMARY:

The site provides controls for the required water quantity to meet the City of Dublin drainage manual and Master Drainage Plan. The quality aspect of the system will meet or exceed Ohio EPA general storm water permit requirements. More importantly, the impact to the school system is noted as reduced; especially for existing structure 10, which is the eastern-most structure that was overtopping the rim for every storm event. The overtopping does not occur until the 10 year storm in the proposed development case.

APPENDIX A
HydroCAD REPORT





Drainage Diagram for FDP Calculations-PRE-DEV
Prepared by Microsoft, Printed 11/23/2015
HydroCAD® 9.10 s/n 05053 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Site Pre to 10

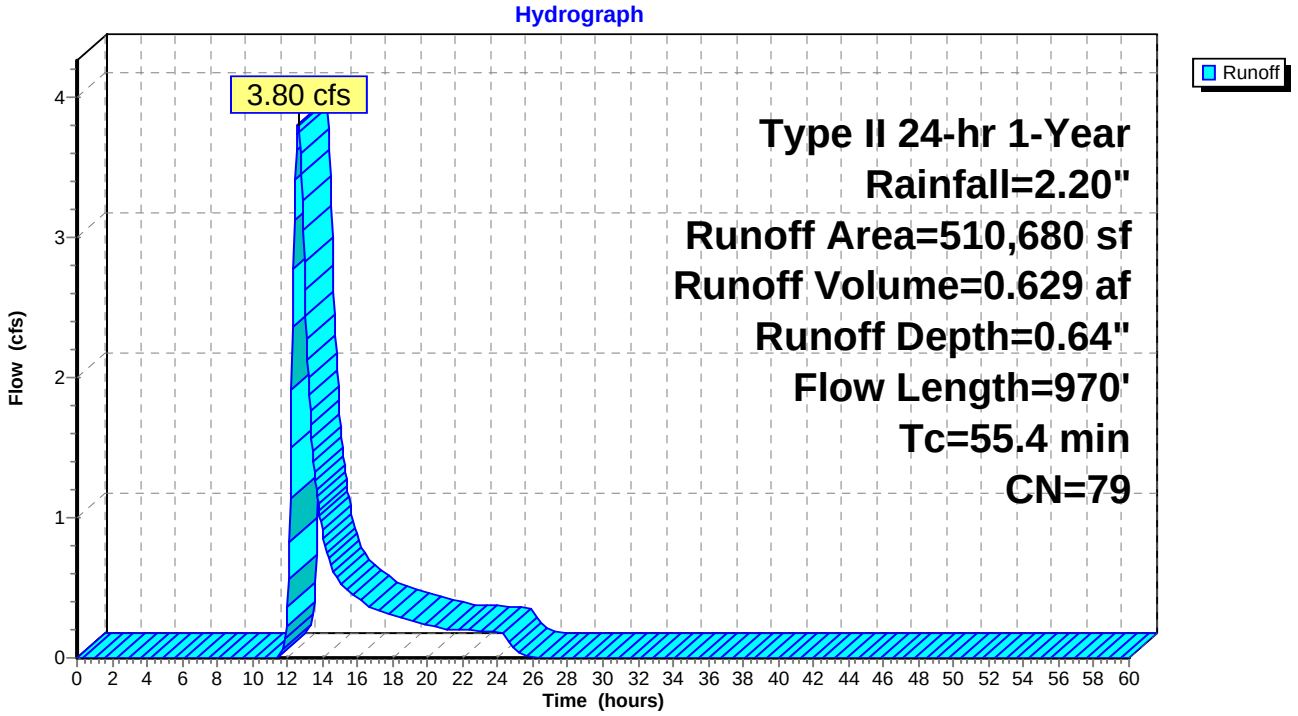
Runoff = 3.80 cfs @ 12.62 hrs, Volume= 0.629 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

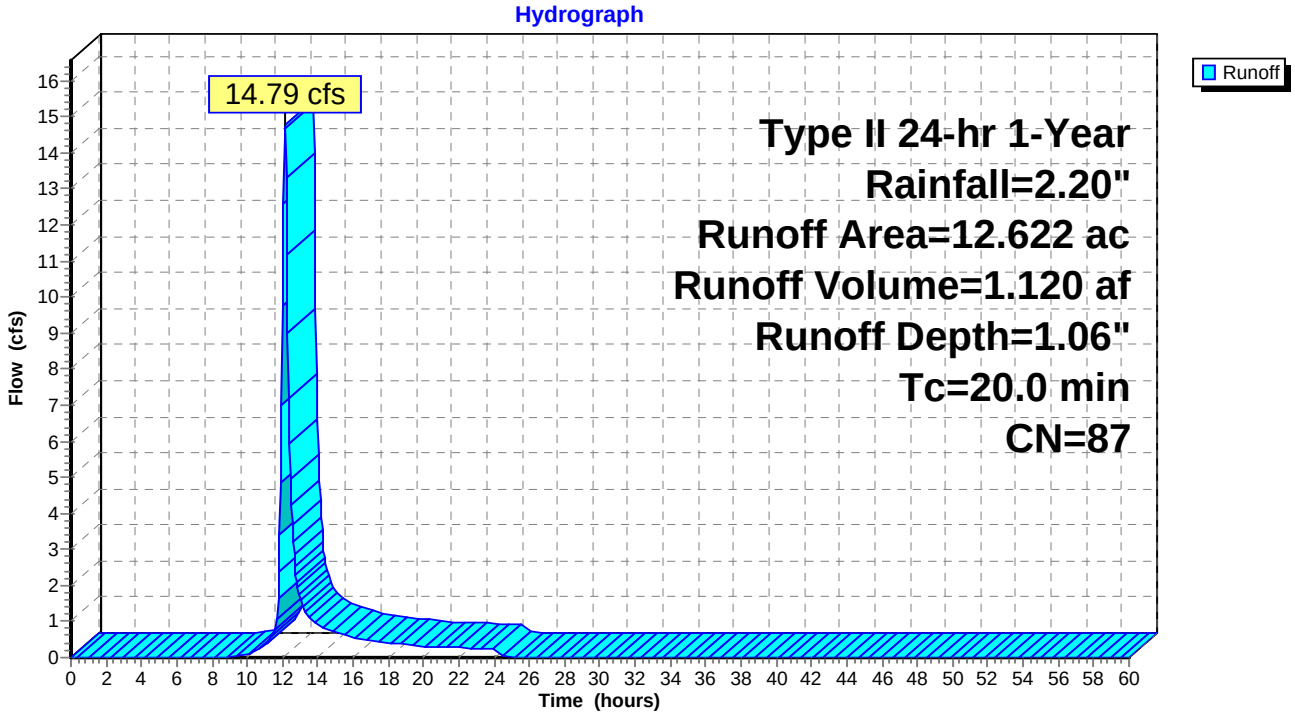
Runoff = 14.79 cfs @ 12.13 hrs, Volume= 1.120 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

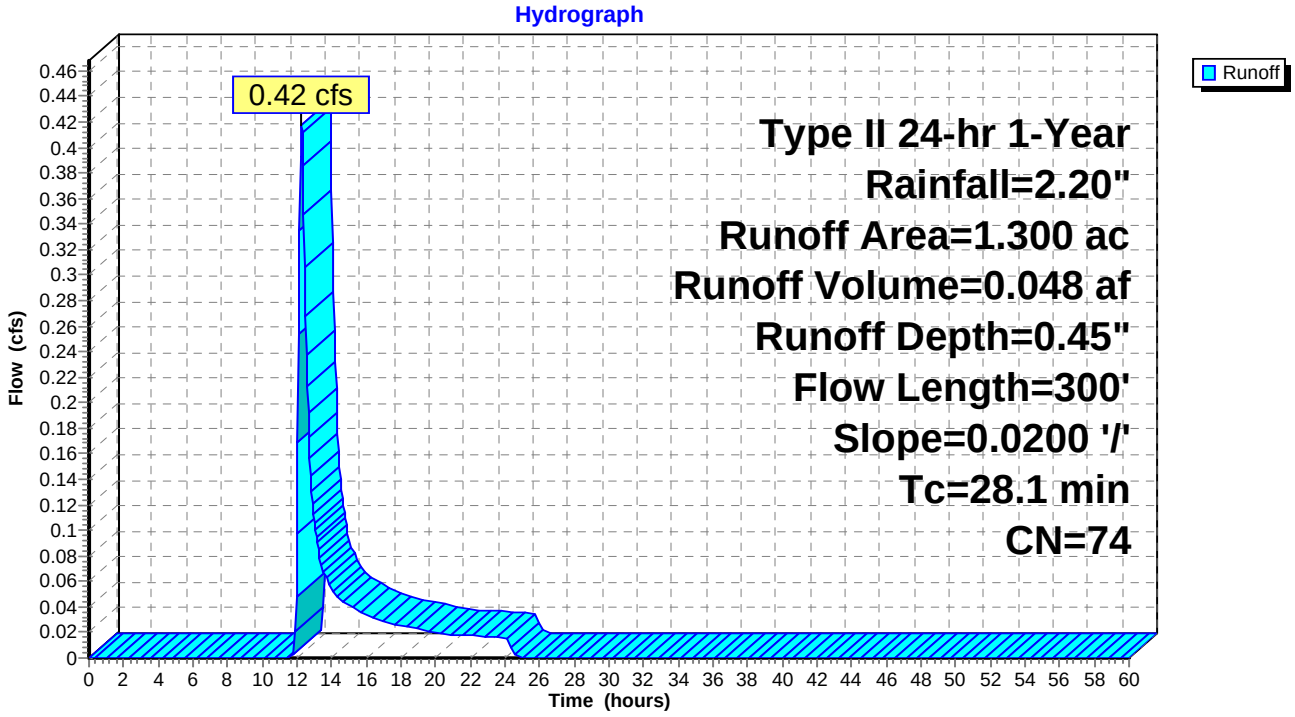
Runoff = 0.42 cfs @ 12.27 hrs, Volume= 0.048 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

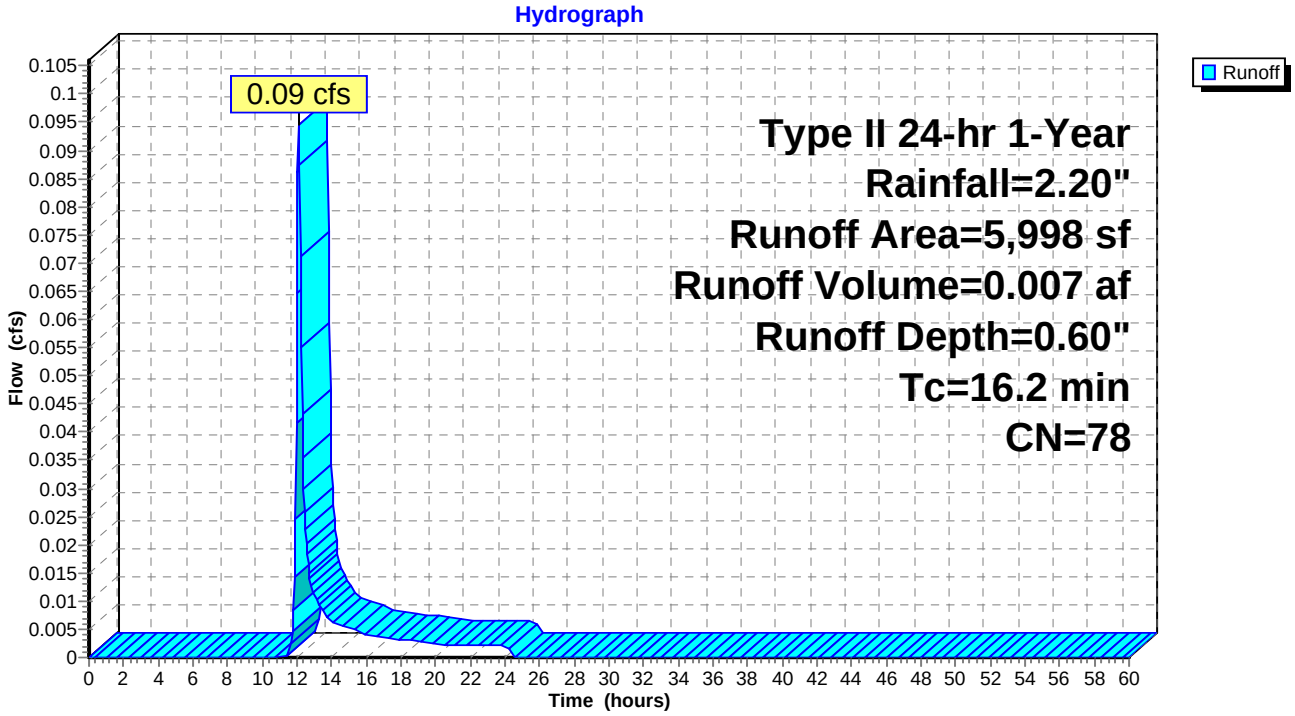
Runoff = 0.09 cfs @ 12.10 hrs, Volume= 0.007 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

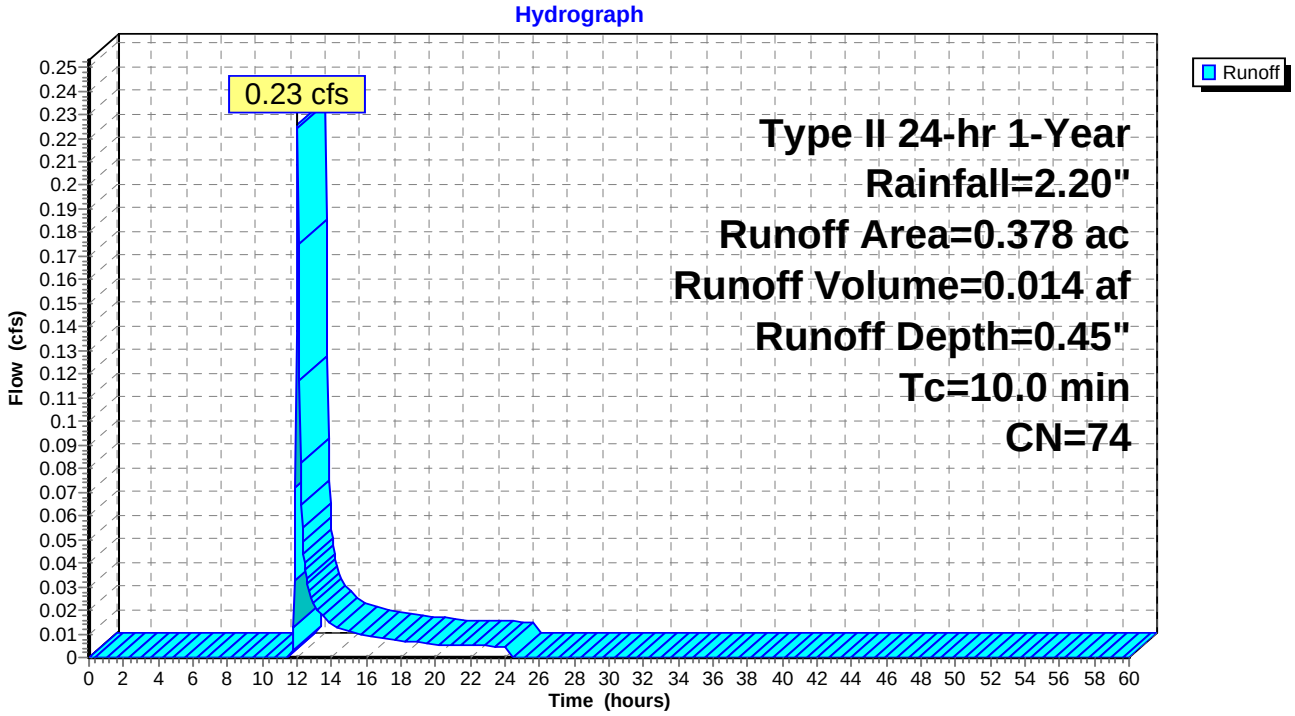
Runoff = 0.23 cfs @ 12.04 hrs, Volume= 0.014 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

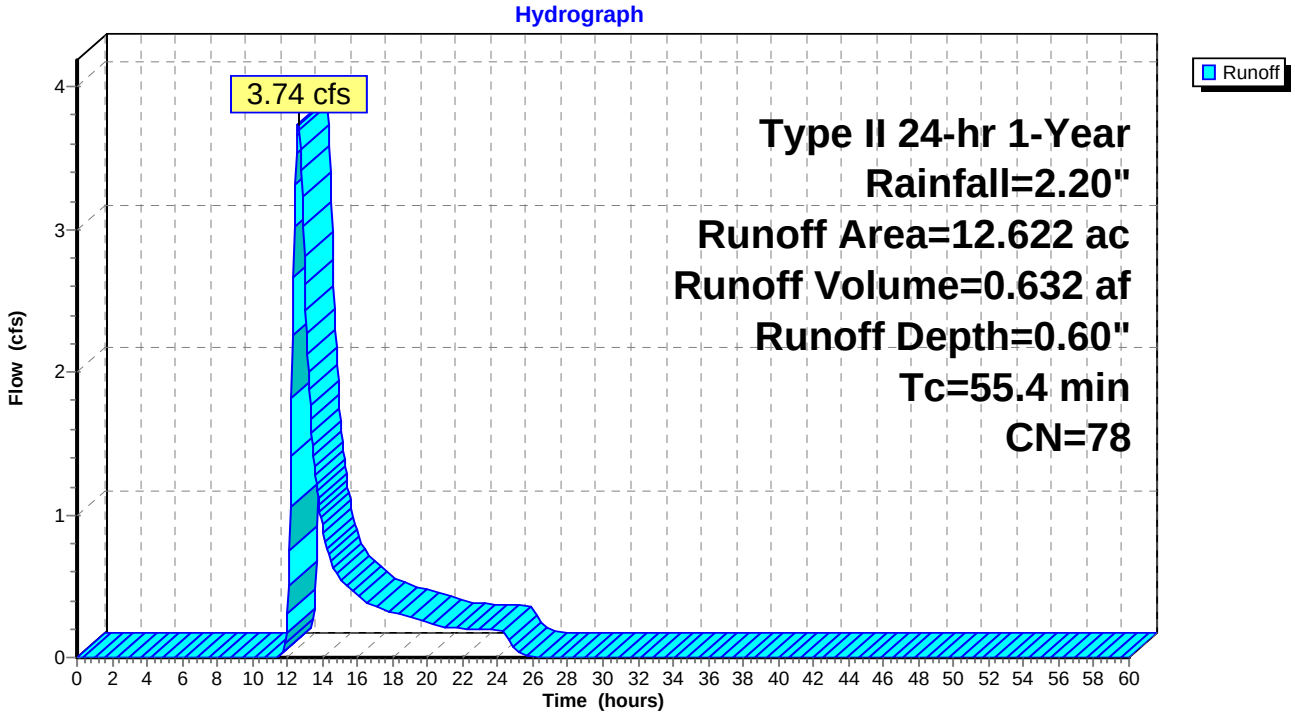
Runoff = 3.74 cfs @ 12.62 hrs, Volume= 0.632 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

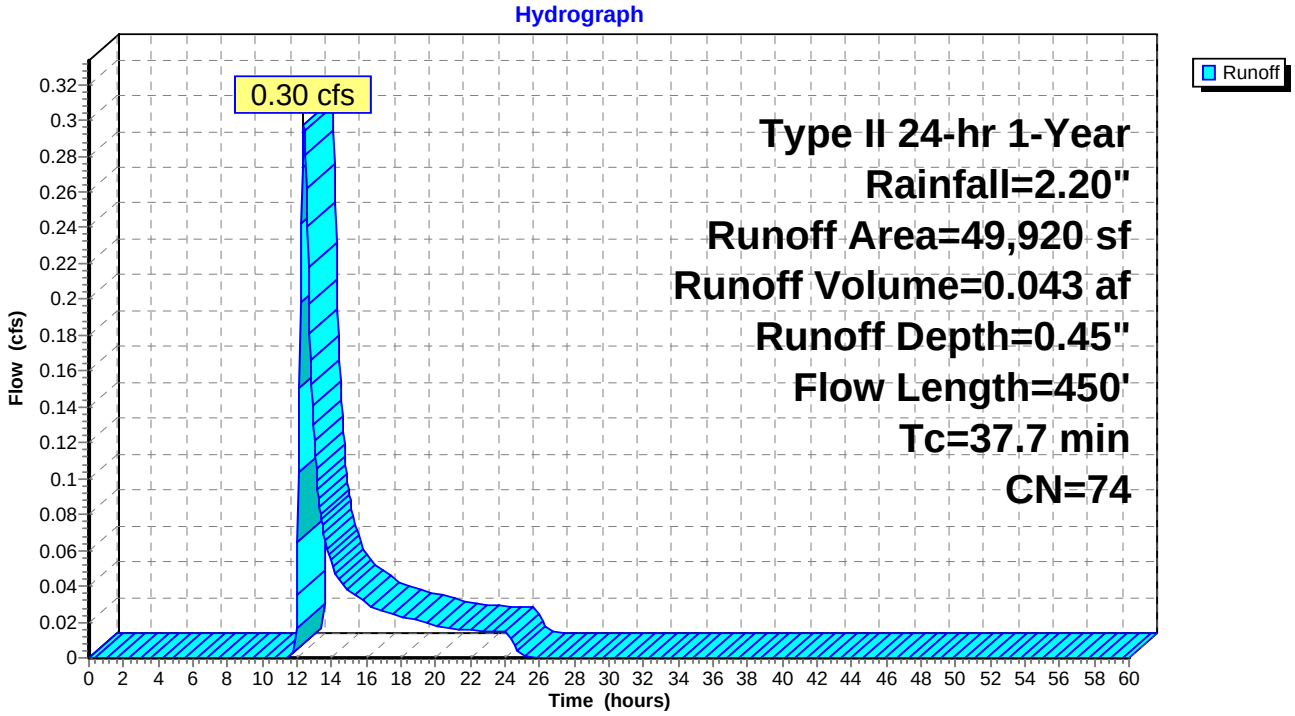
Runoff = 0.30 cfs @ 12.40 hrs, Volume= 0.043 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

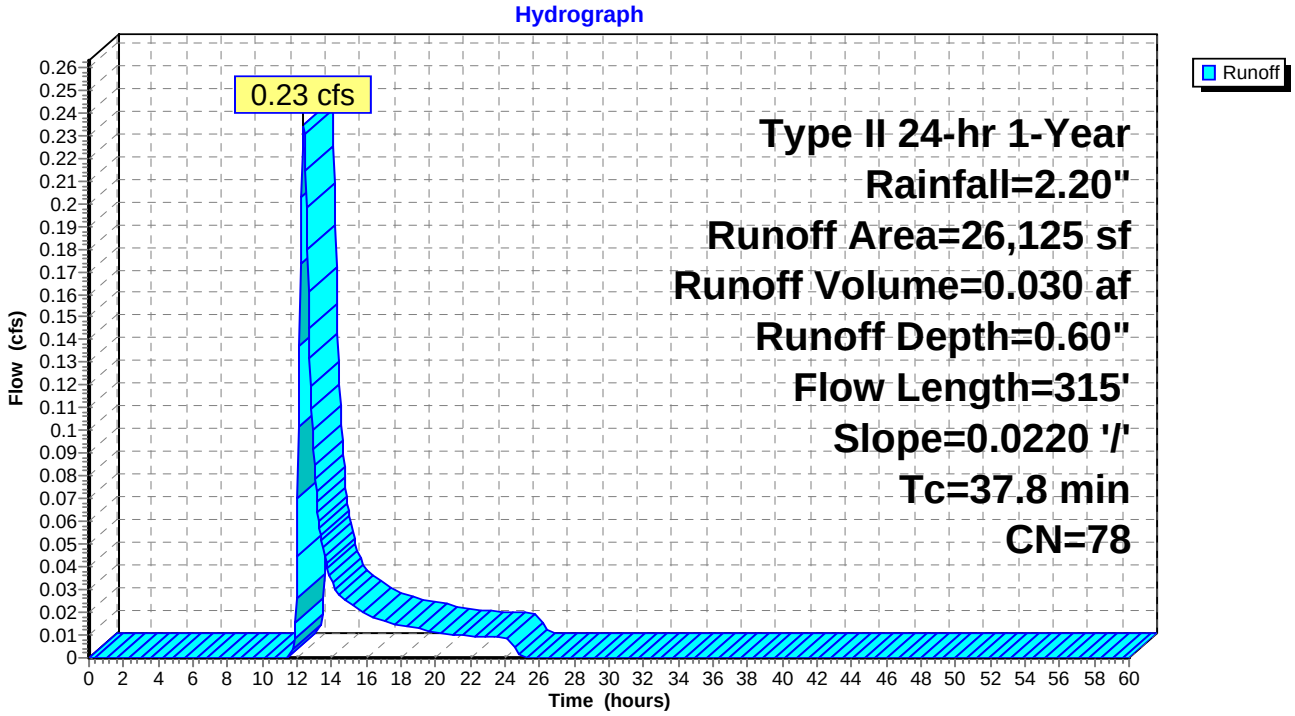
Runoff = 0.23 cfs @ 12.38 hrs, Volume= 0.030 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 0.62" for 1-Year event
Inflow = 4.01 cfs @ 12.60 hrs, Volume= 0.677 af
Outflow = 4.01 cfs @ 12.60 hrs, Volume= 0.677 af, Atten= 0%, Lag= 0.0 min
Primary = 4.01 cfs @ 12.60 hrs, Volume= 0.677 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 903.21' @ 12.60 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.676 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (910.7 - 910.7)

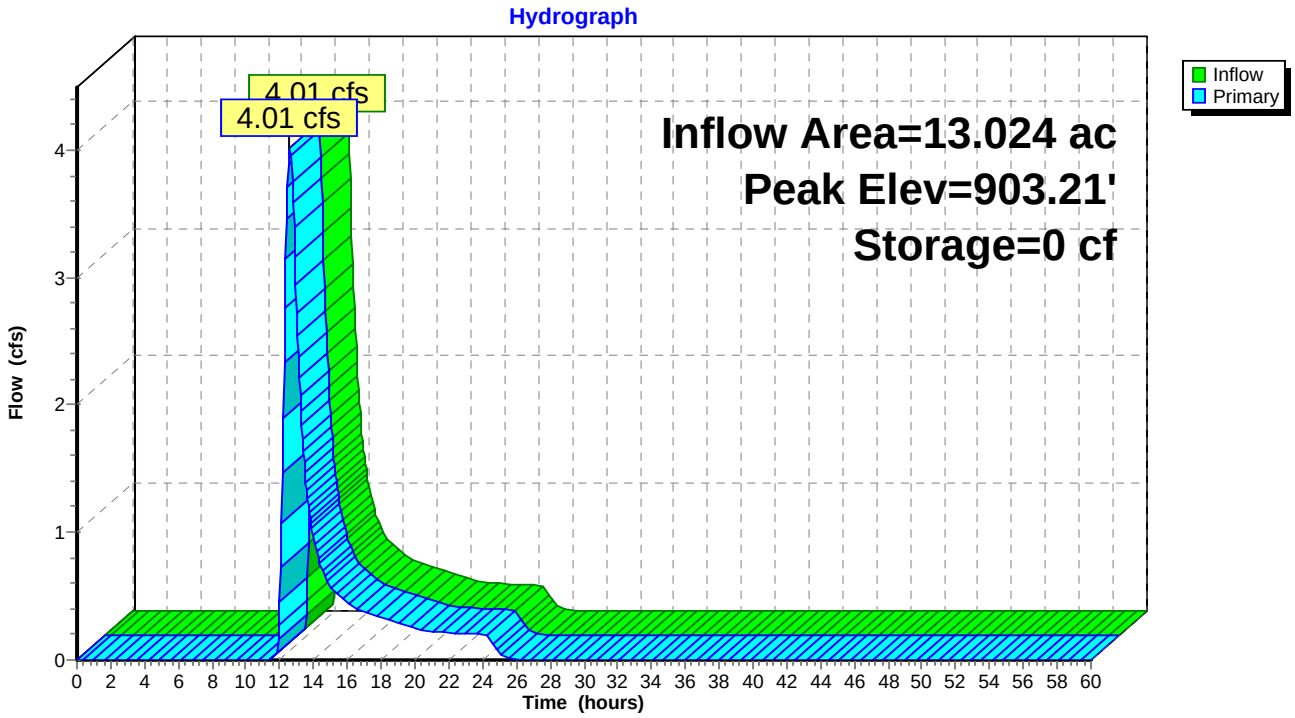
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.72 cfs @ 12.60 hrs HW=903.21' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 4.72 cfs @ 6.01 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 0.49" for 1-Year event
Inflow = 0.31 cfs @ 12.05 hrs, Volume= 0.021 af
Outflow = 0.31 cfs @ 12.05 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.05 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.39' @ 12.05 hrs Surf.Area= 4 sf Storage= 1 cf

Plug-Flow detention time= 0.0 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (887.3 - 887.3)

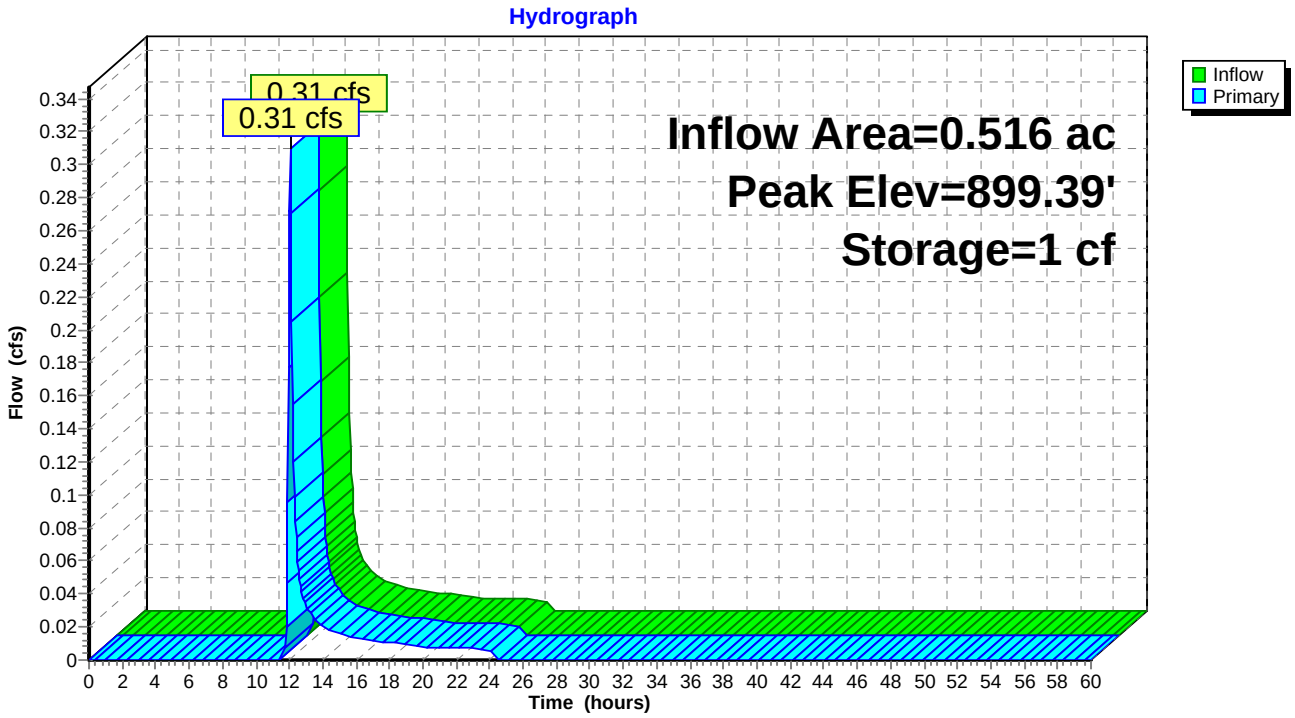
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.31 cfs @ 12.05 hrs HW=899.39' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.31 cfs @ 1.91 fps)

Pond 20P: Ex. # 9


Hydrograph
0.31 cfs
0.31 cfs
Inflow Area=0.516 ac
Peak Elev=899.39'
Storage=1 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 22P: Ex. # 8

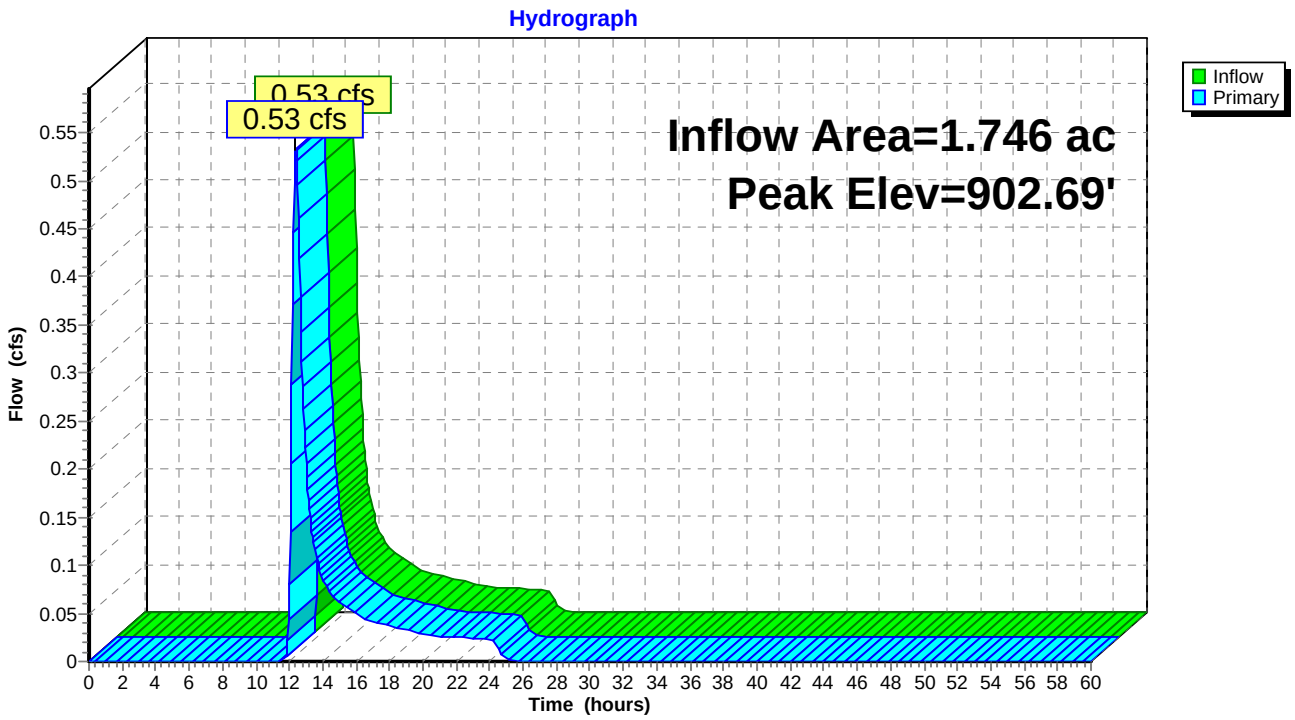
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	0.50"	for 1-Year event
Inflow =	0.53 cfs @	12.39 hrs,	Volume=	0.073 af	
Outflow =	0.53 cfs @	12.39 hrs,	Volume=	0.073 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.53 cfs @	12.39 hrs,	Volume=	0.073 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 902.69' @ 12.39 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.53 cfs @ 12.39 hrs HW=902.69' (Free Discharge)
└**1=Pipe Leaving Structure** (Orifice Controls 0.53 cfs @ 2.23 fps)

Pond 22P: Ex. # 8



Summary for Subcatchment 1S: Site Pre to 10

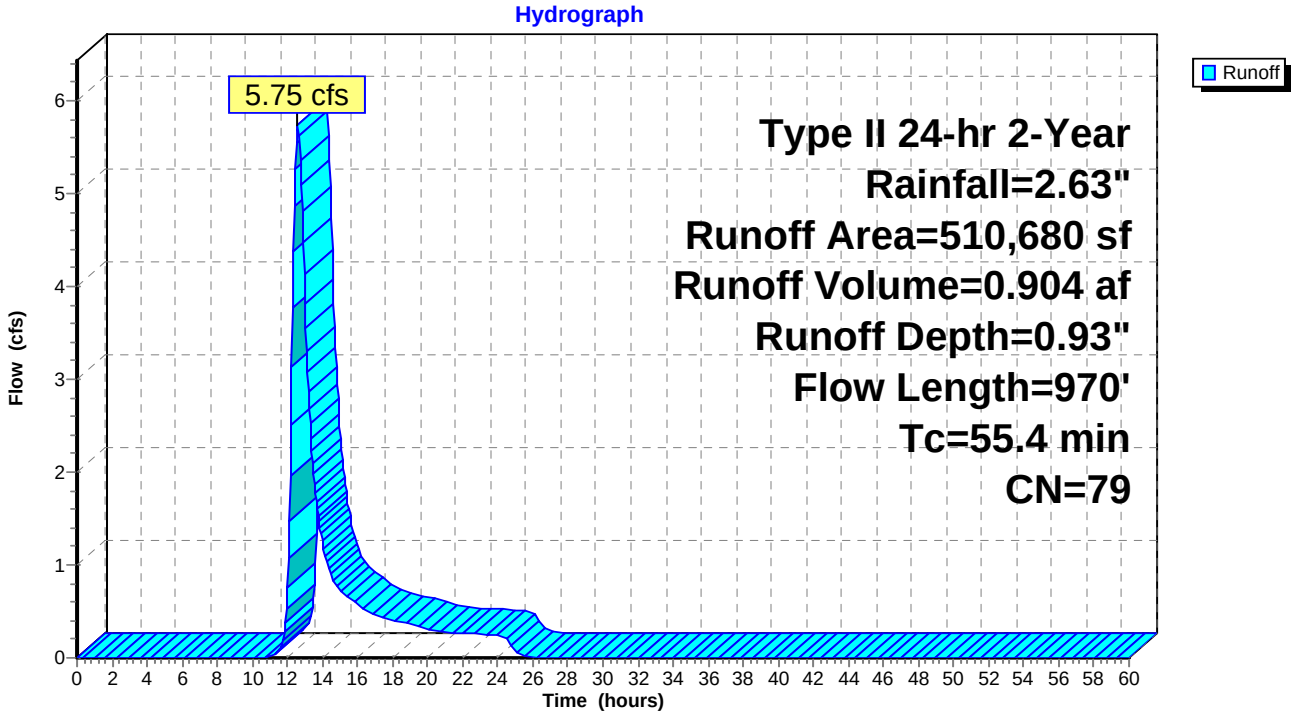
Runoff = 5.75 cfs @ 12.60 hrs, Volume= 0.904 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

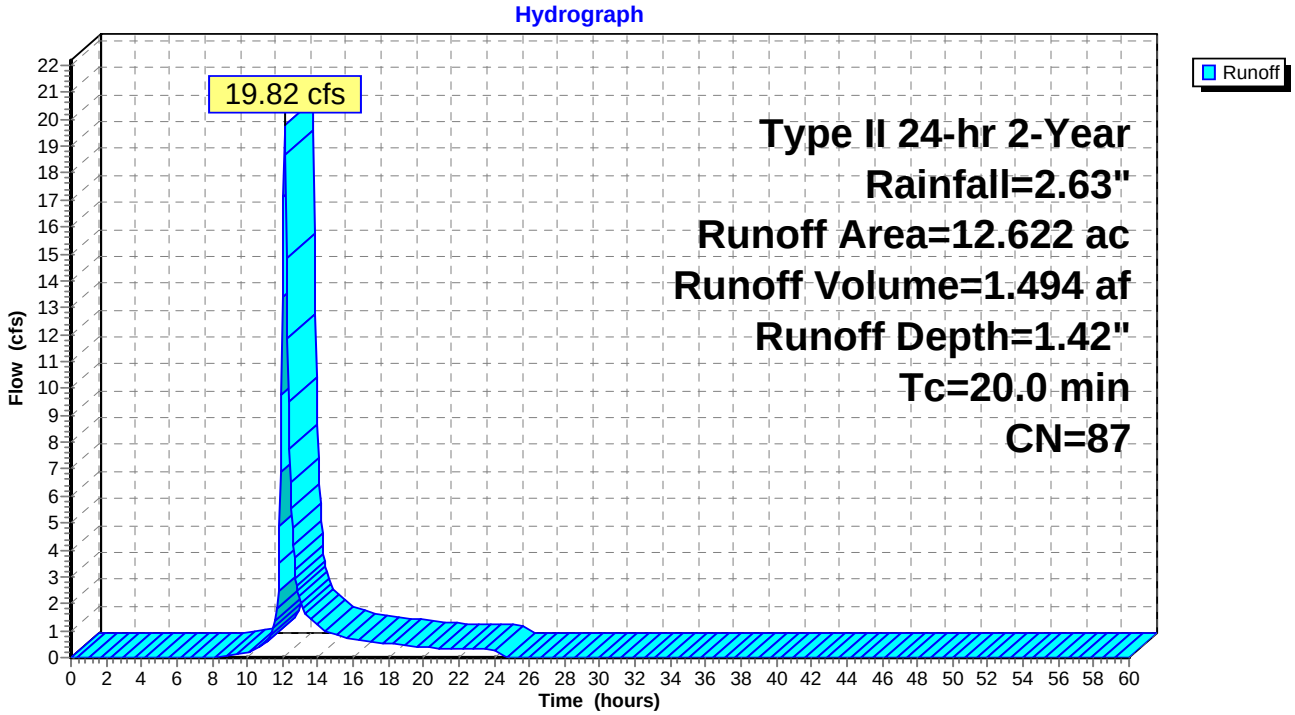
Runoff = 19.82 cfs @ 12.13 hrs, Volume= 1.494 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

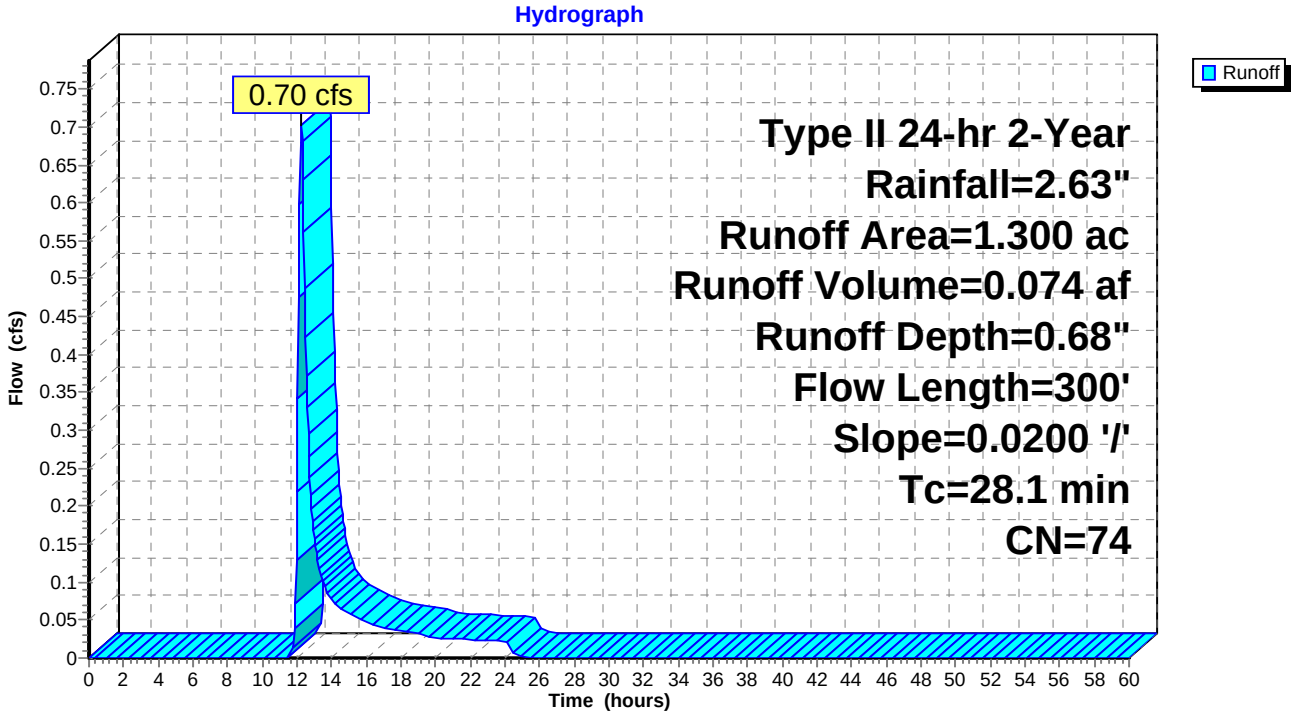
Runoff = 0.70 cfs @ 12.25 hrs, Volume= 0.074 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

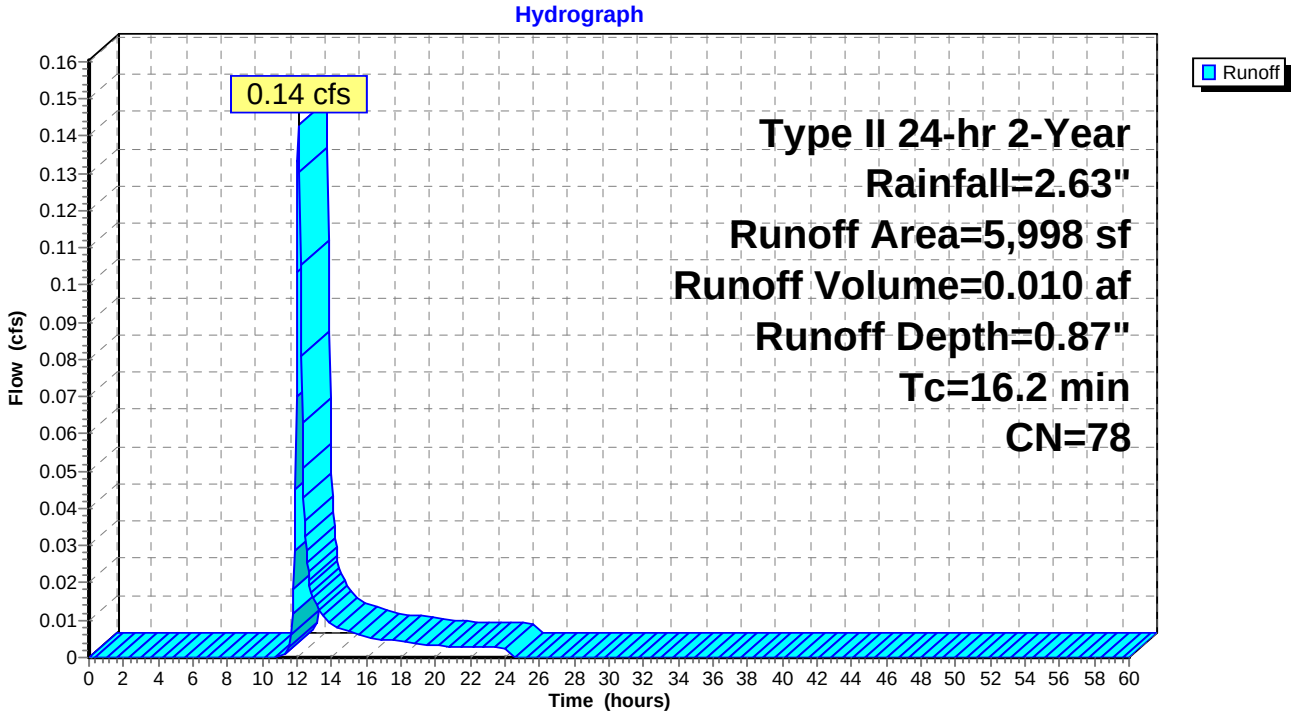
Runoff = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

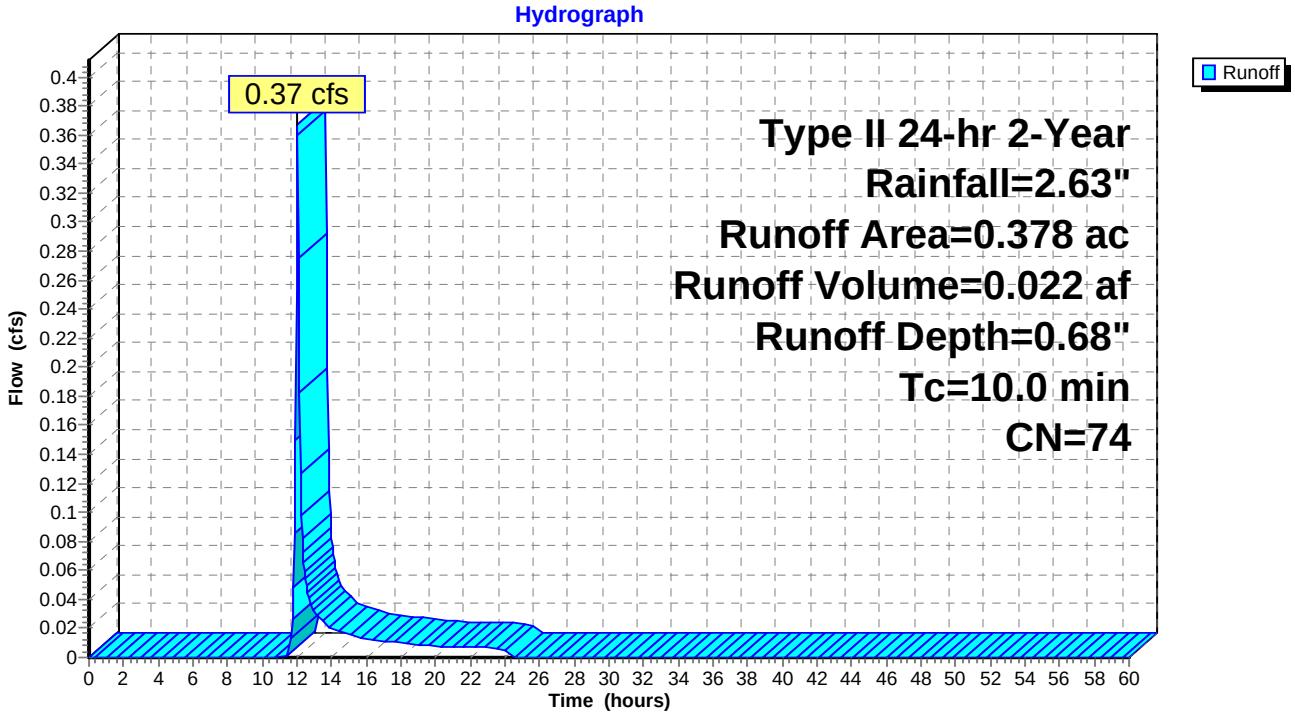
Runoff = 0.37 cfs @ 12.03 hrs, Volume= 0.022 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

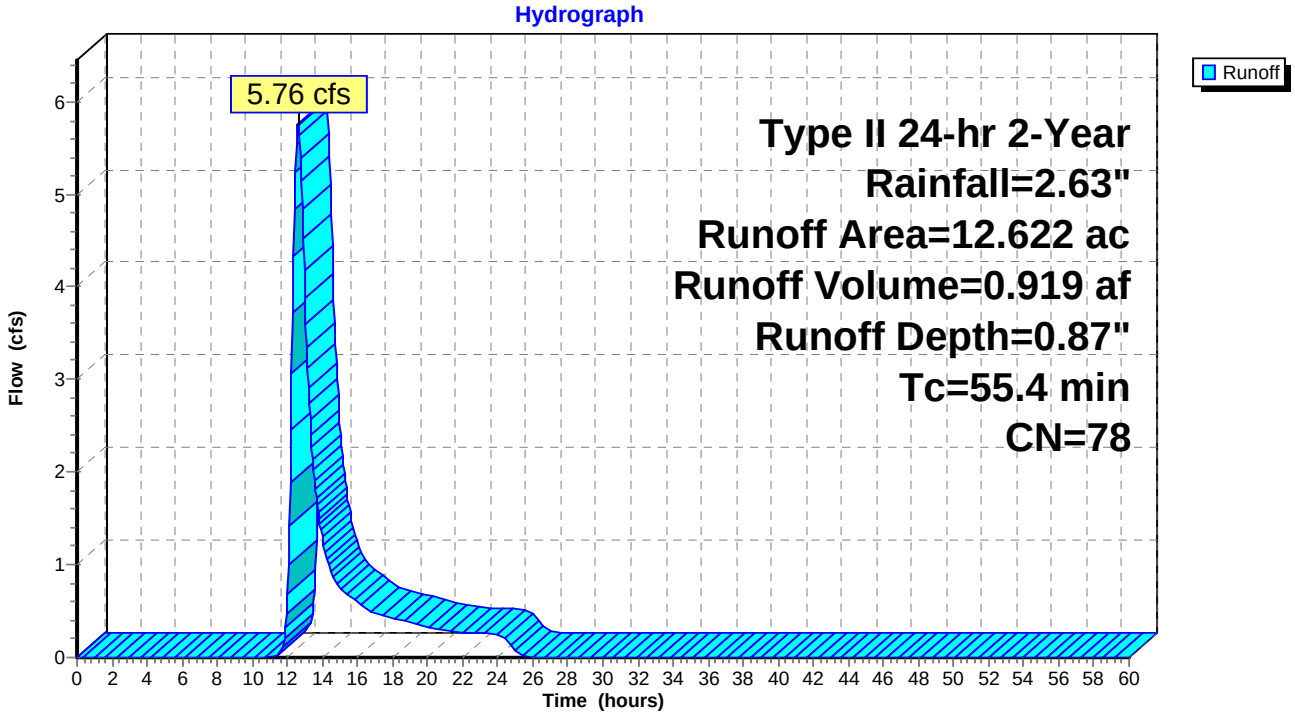
Runoff = 5.76 cfs @ 12.61 hrs, Volume= 0.919 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

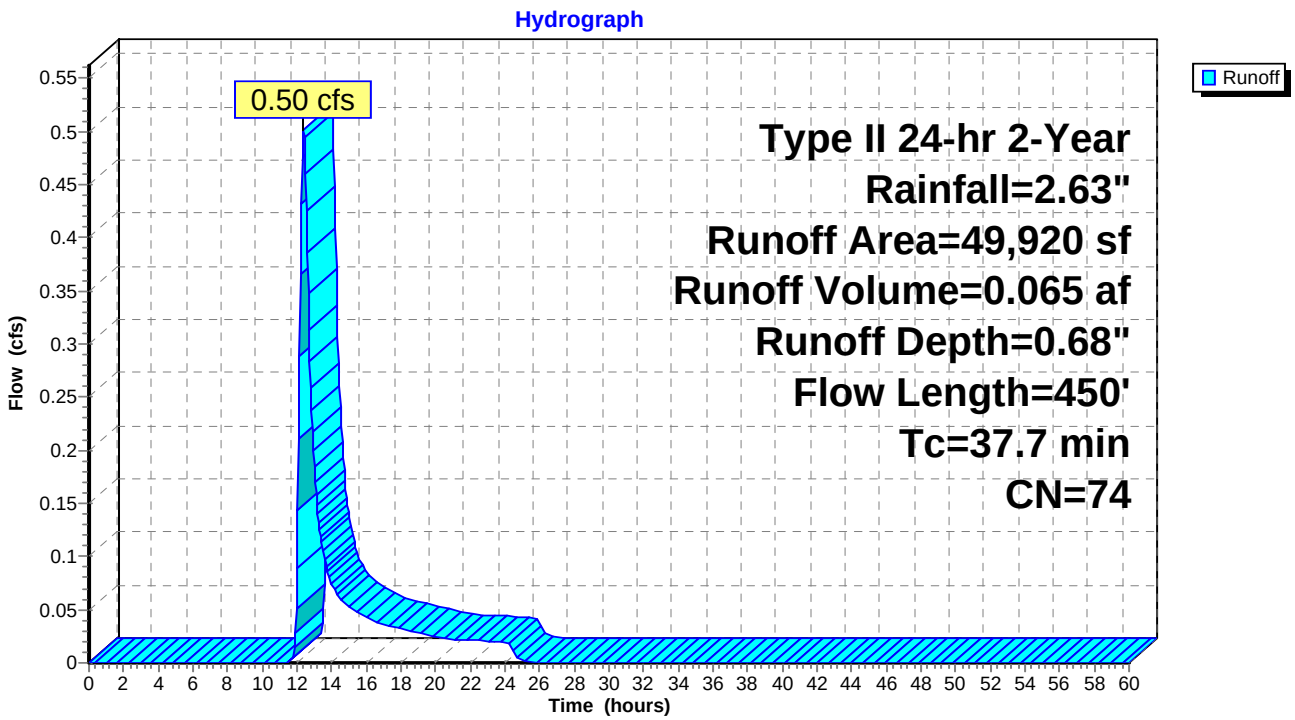
Runoff = 0.50 cfs @ 12.38 hrs, Volume= 0.065 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

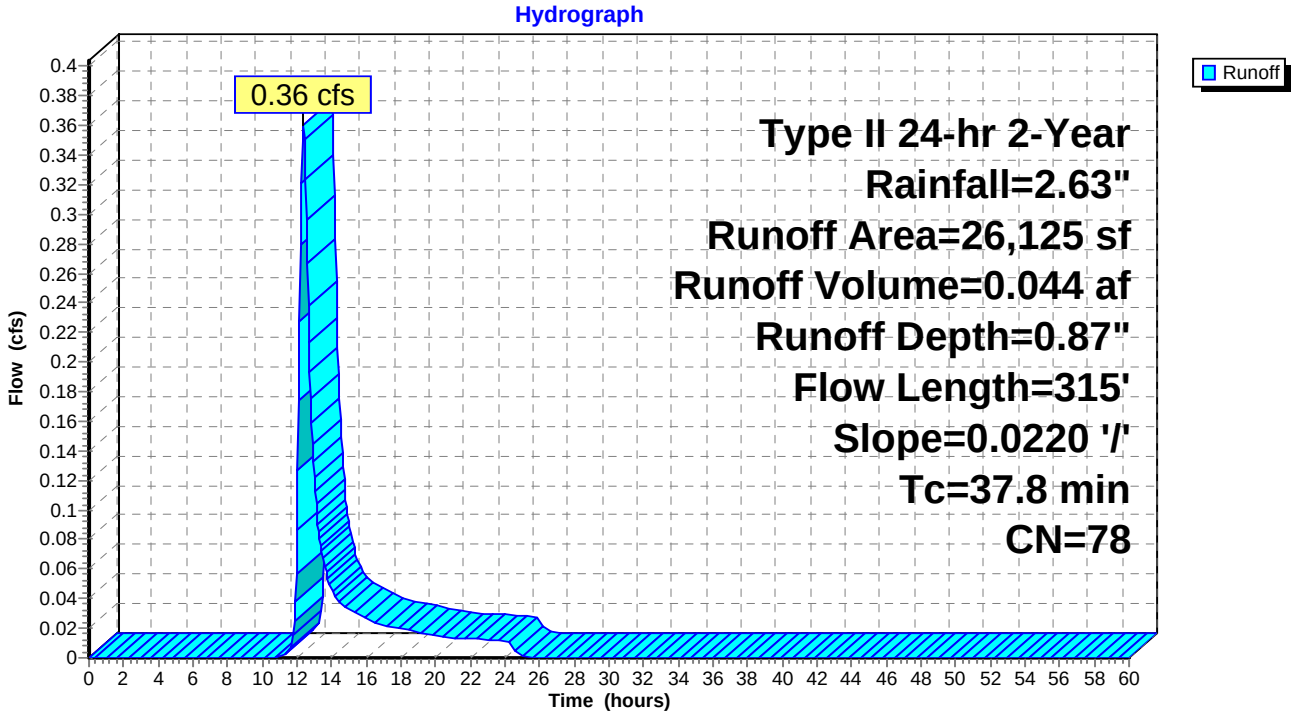
Runoff = 0.36 cfs @ 12.37 hrs, Volume= 0.044 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 0.90" for 2-Year event
Inflow = 6.08 cfs @ 12.58 hrs, Volume= 0.978 af
Outflow = 4.95 cfs @ 12.86 hrs, Volume= 0.482 af, Atten= 19%, Lag= 16.4 min
Primary = 4.95 cfs @ 12.86 hrs, Volume= 0.482 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 903.87' @ 12.86 hrs Surf.Area= 6,412 sf Storage= 1,470 cf

Plug-Flow detention time= 4.3 min calculated for 0.481 af (49% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

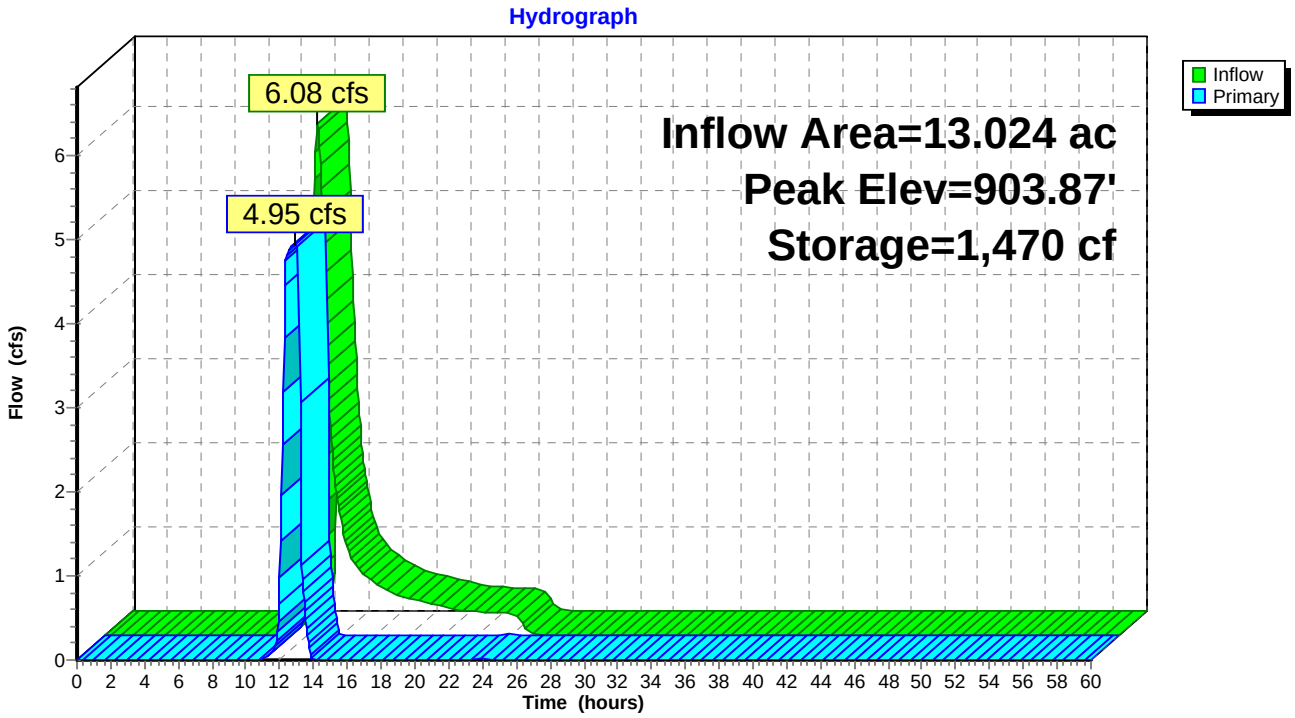
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.95 cfs @ 12.86 hrs HW=903.87' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 4.95 cfs @ 6.30 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 0.73" for 2-Year event
Inflow = 0.49 cfs @ 12.04 hrs, Volume= 0.032 af
Outflow = 0.50 cfs @ 12.04 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.04 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.49' @ 12.04 hrs Surf.Area= 4 sf Storage= 1 cf

Plug-Flow detention time= 0.0 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (873.2 - 873.1)

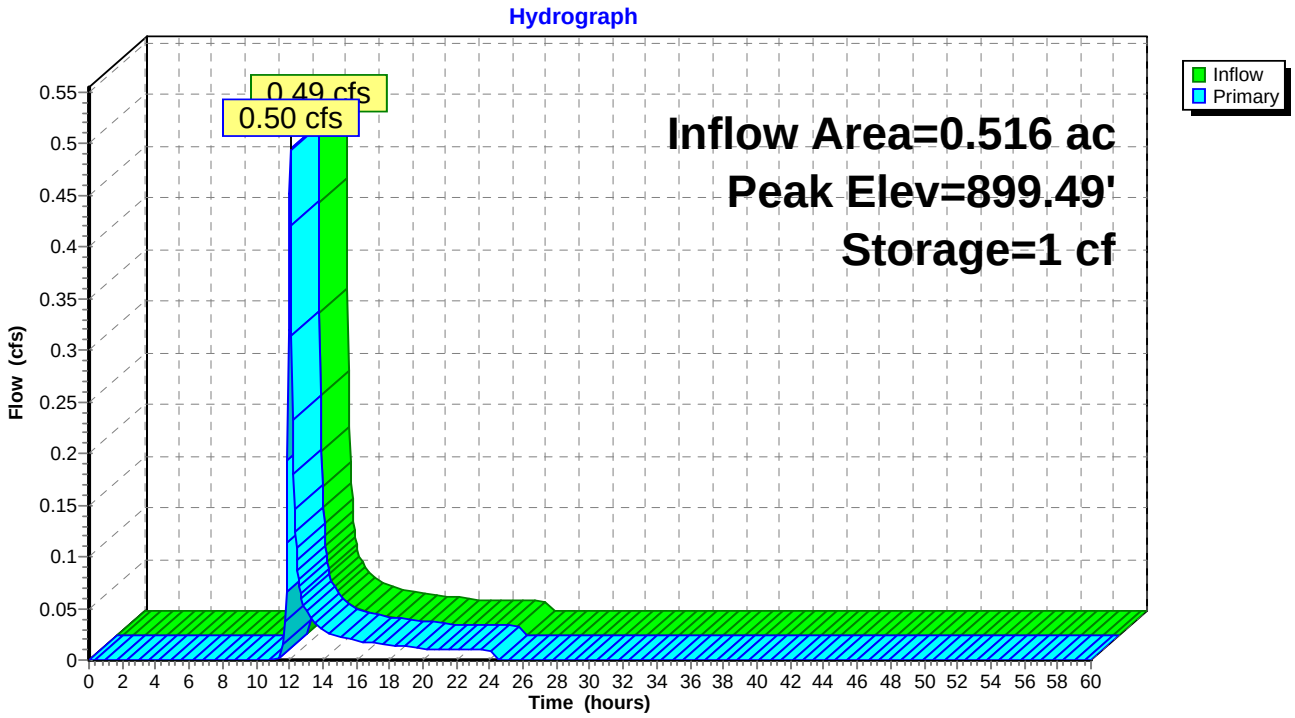
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.49 cfs @ 12.04 hrs HW=899.49' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.49 cfs @ 2.18 fps)

Pond 20P: Ex. # 9


Hydrograph
Inflow
Primary
0.49 cfs
0.50 cfs
Inflow Area=0.516 ac
Peak Elev=899.49'
Storage=1 cf
Flow (cfs)
Time (hours)

Summary for Pond 22P: Ex. # 8

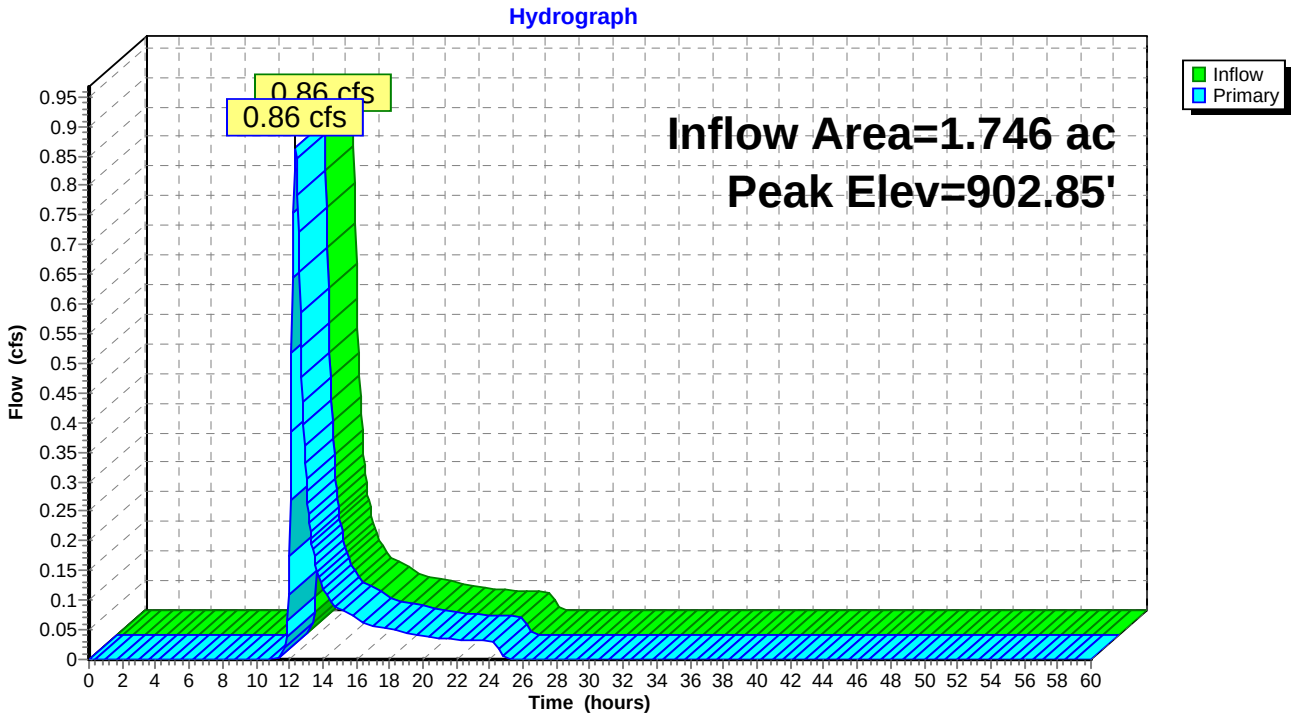
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	0.75"	for 2-Year event
Inflow =	0.86 cfs @	12.37 hrs,	Volume=	0.109 af	
Outflow =	0.86 cfs @	12.37 hrs,	Volume=	0.109 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.86 cfs @	12.37 hrs,	Volume=	0.109 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 902.85' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.86 cfs @ 12.37 hrs HW=902.85' (Free Discharge)
└─**1=Pipe Leaving Structure** (Orifice Controls 0.86 cfs @ 2.62 fps)

Pond 22P: Ex. # 8



Summary for Subcatchment 1S: Site Pre to 10

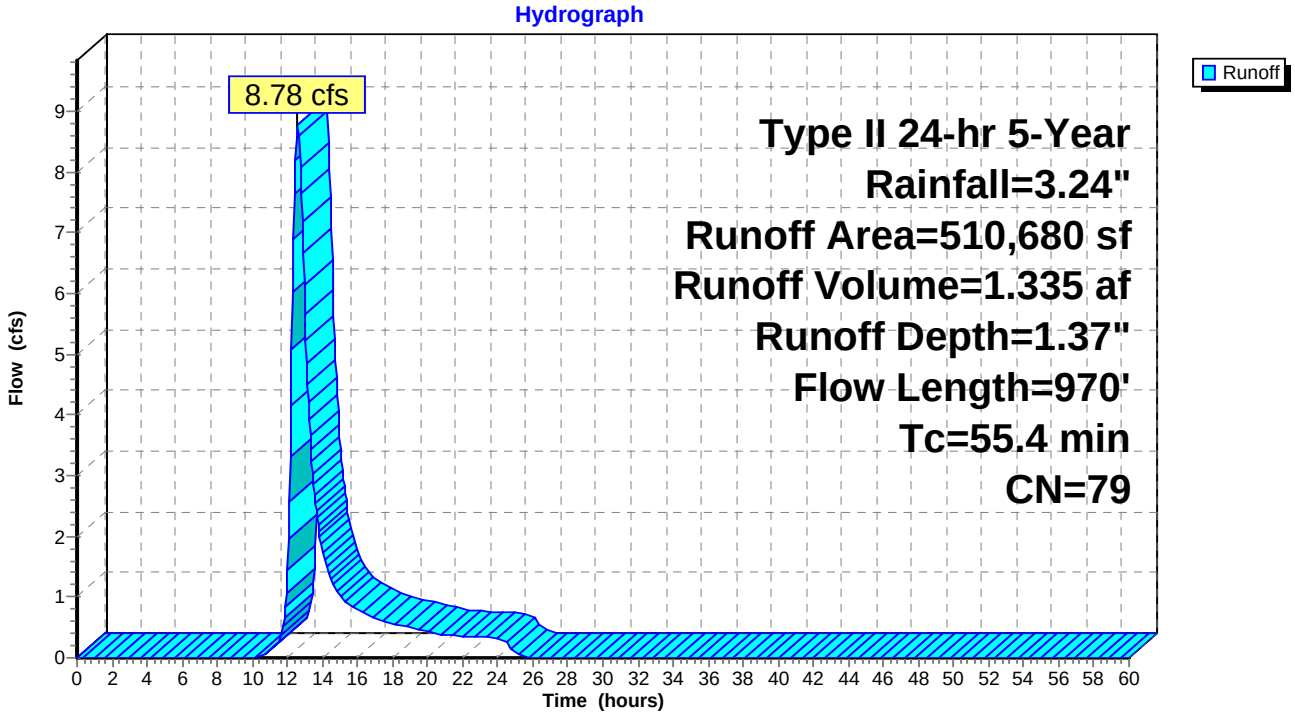
Runoff = 8.78 cfs @ 12.59 hrs, Volume= 1.335 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

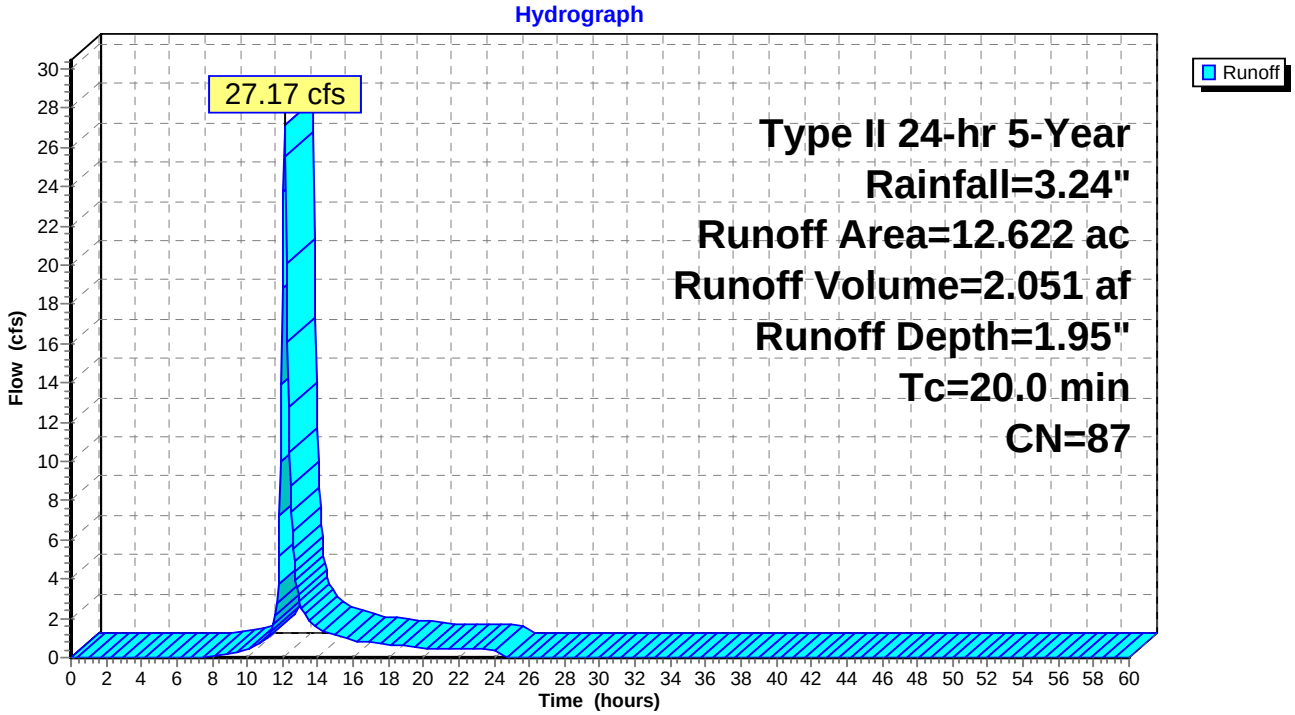
Runoff = 27.17 cfs @ 12.13 hrs, Volume= 2.051 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

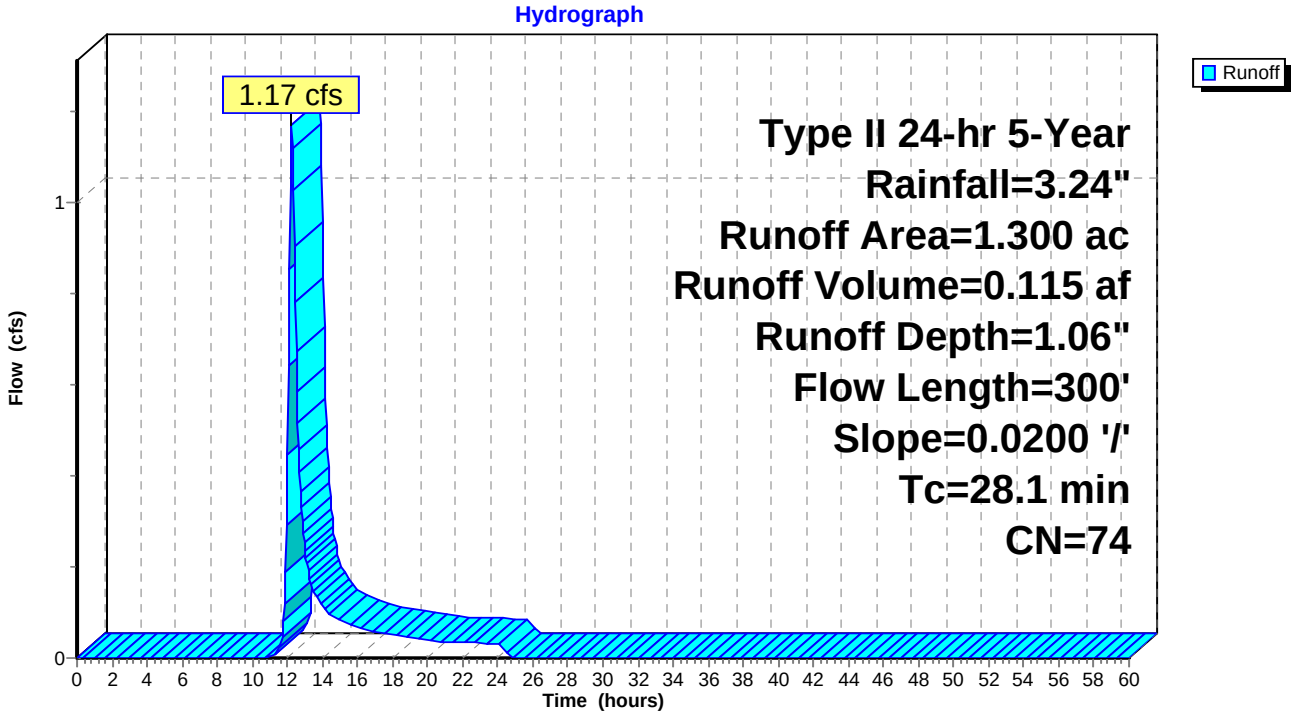
Runoff = 1.17 cfs @ 12.24 hrs, Volume= 0.115 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

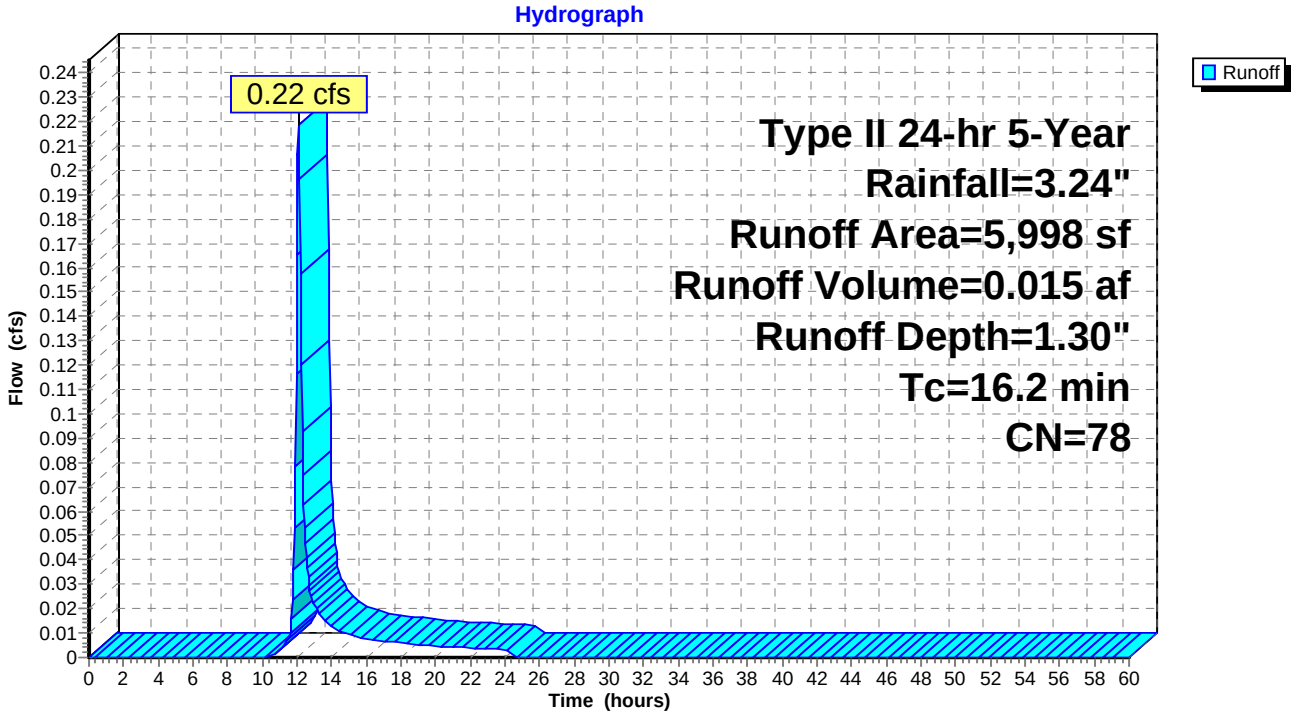
Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

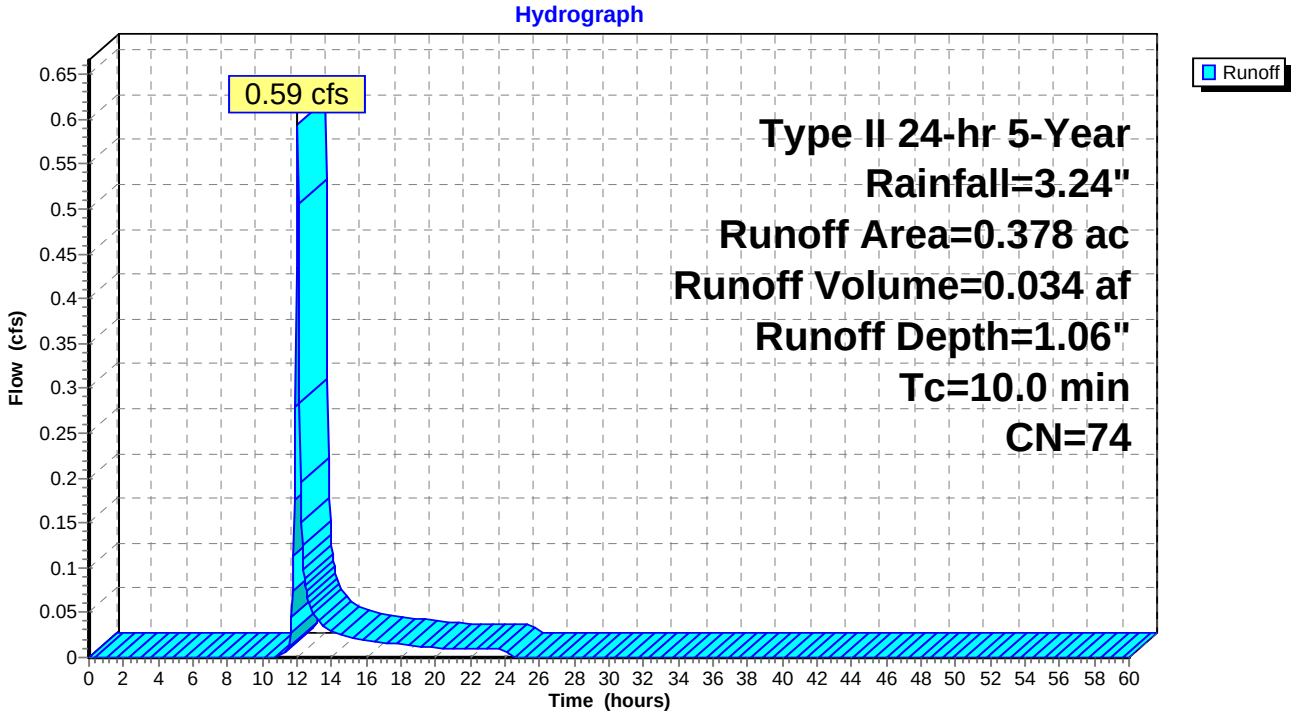
Runoff = 0.59 cfs @ 12.03 hrs, Volume= 0.034 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

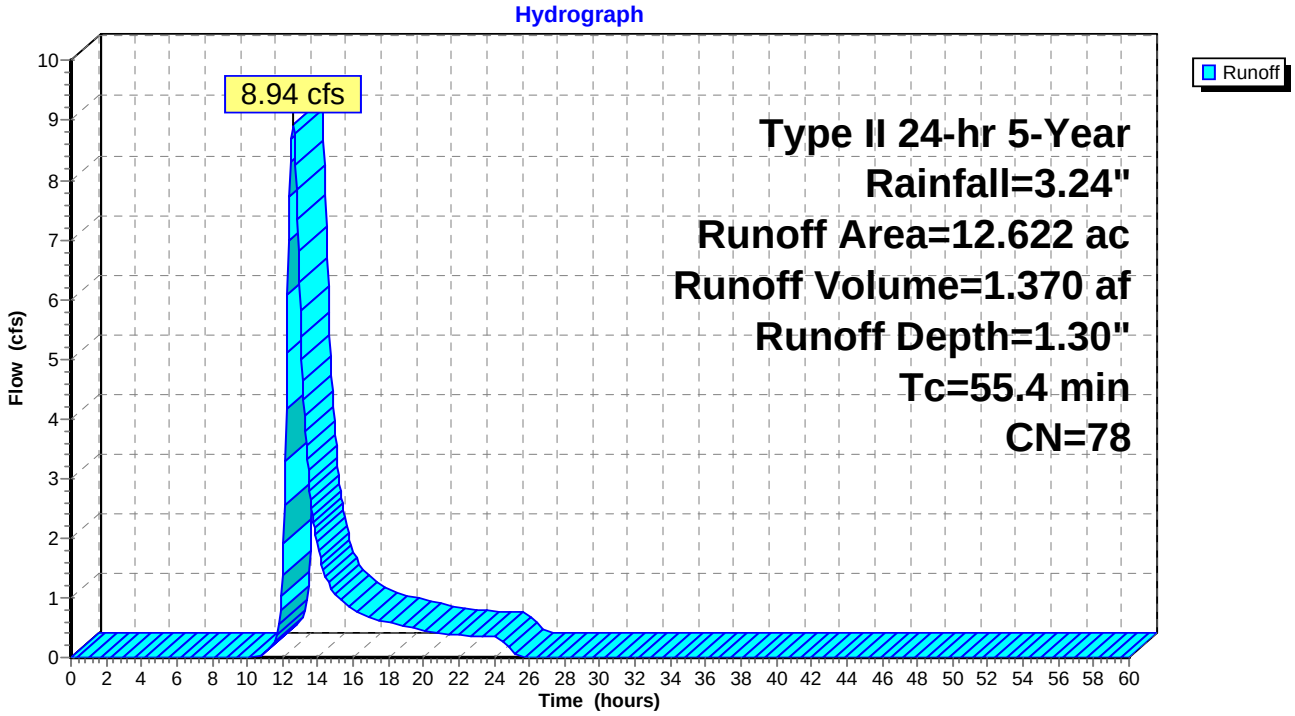
Runoff = 8.94 cfs @ 12.59 hrs, Volume= 1.370 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

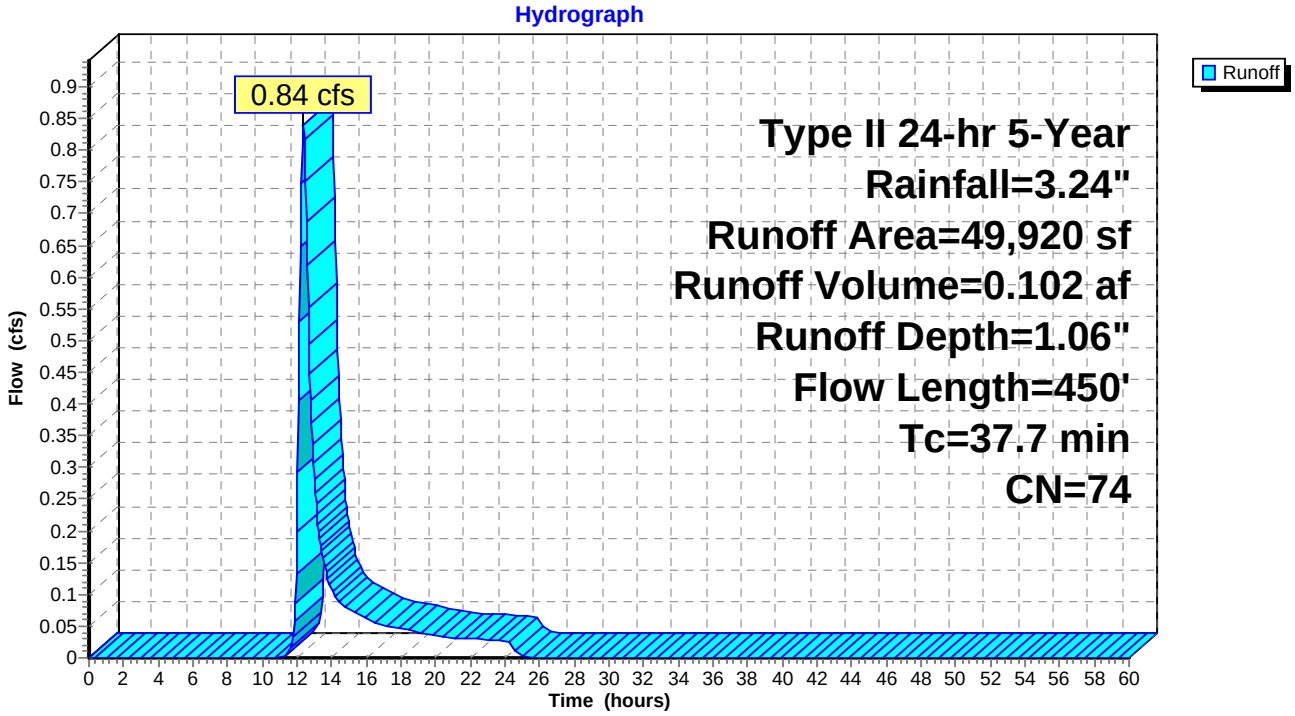
Runoff = 0.84 cfs @ 12.36 hrs, Volume= 0.102 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

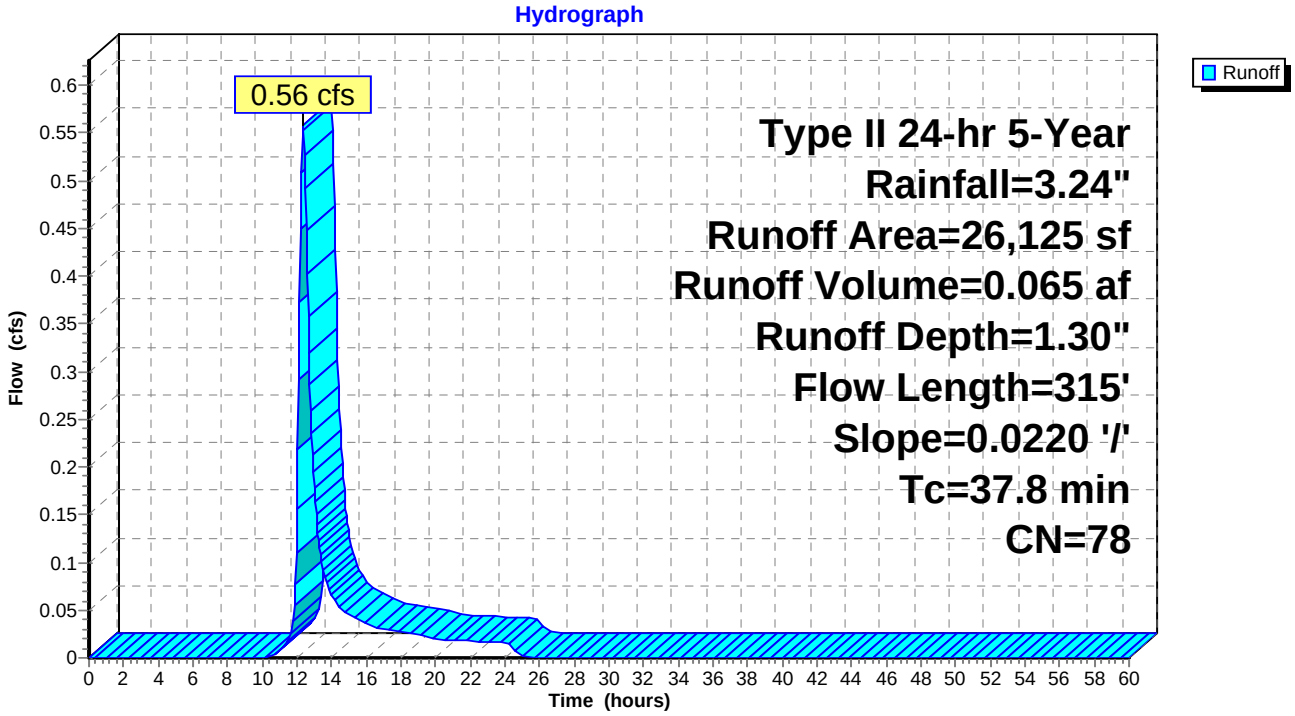
Runoff = 0.56 cfs @ 12.36 hrs, Volume= 0.065 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 1.34" for 5-Year event
Inflow = 9.32 cfs @ 12.56 hrs, Volume= 1.451 af
Outflow = 9.13 cfs @ 12.65 hrs, Volume= 1.536 af, Atten= 2%, Lag= 5.0 min
Primary = 9.13 cfs @ 12.65 hrs, Volume= 1.536 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.08' @ 12.65 hrs Surf.Area= 11,533 sf Storage= 3,329 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 17.2 min (904.3 - 887.0)

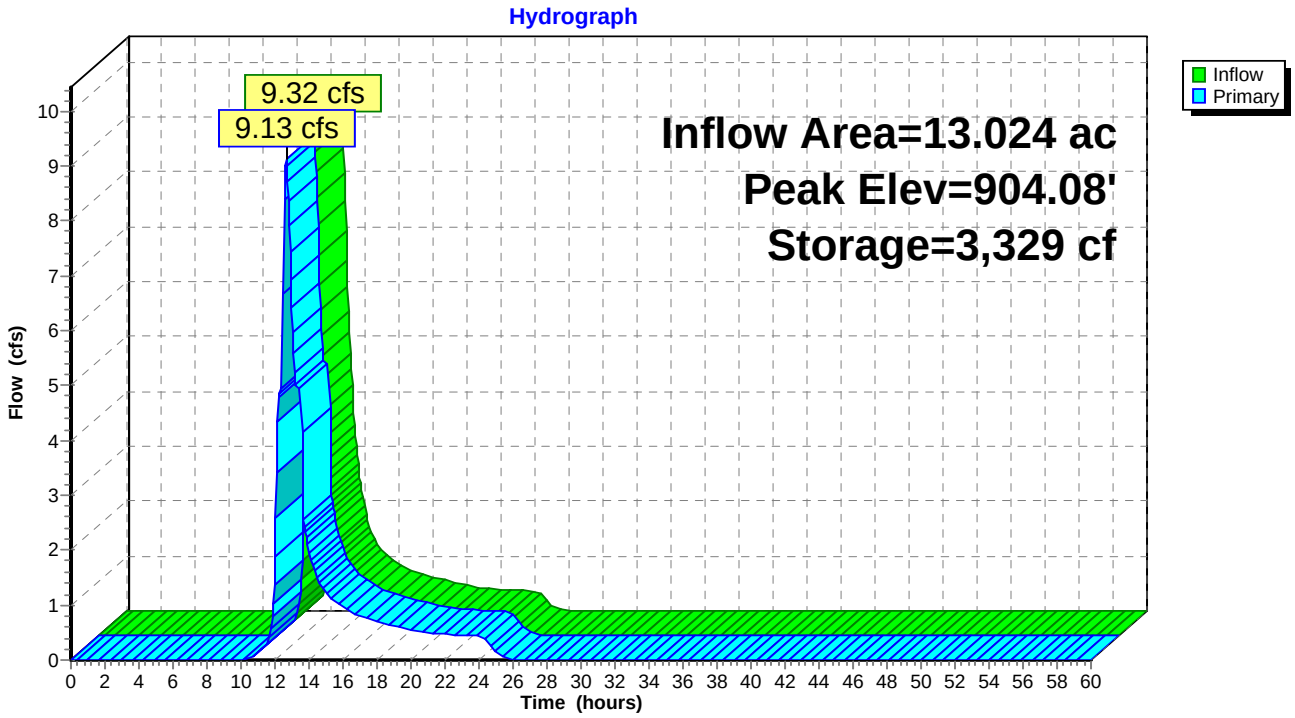
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=9.12 cfs @ 12.65 hrs HW=904.08' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.02 cfs @ 6.39 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 4.10 cfs @ 0.81 fps)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 1.13" for 5-Year event
Inflow = 0.79 cfs @ 12.04 hrs, Volume= 0.048 af
Outflow = 0.79 cfs @ 12.04 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.04 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.64' @ 12.04 hrs Surf.Area= 4 sf Storage= 2 cf

Plug-Flow detention time= 0.0 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (859.5 - 859.5)

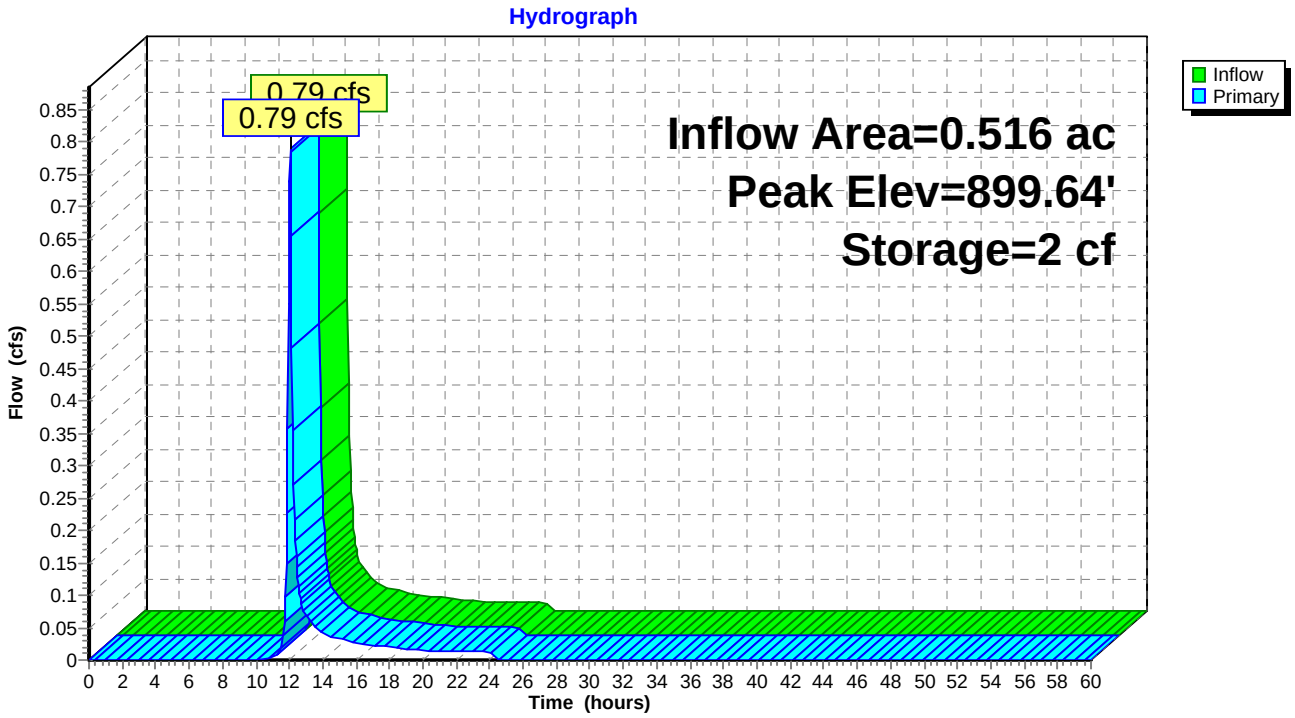
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.77 cfs @ 12.04 hrs HW=899.63' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.77 cfs @ 2.52 fps)

Pond 20P: Ex. # 9


Hydrograph
0.79 cfs
0.79 cfs
Inflow Area=0.516 ac
Peak Elev=899.64'
Storage=2 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 22P: Ex. # 8

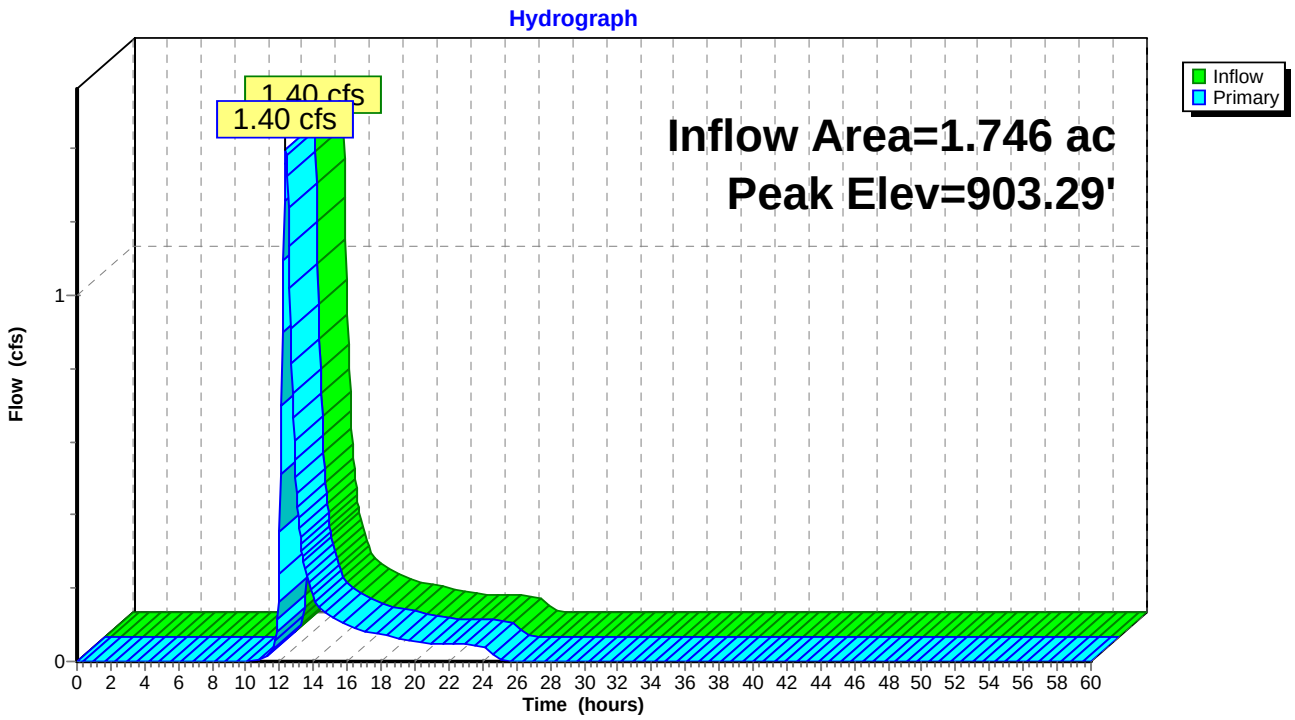
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	1.15"	for 5-Year event
Inflow =	1.40 cfs @	12.36 hrs,	Volume=	0.167 af	
Outflow =	1.40 cfs @	12.36 hrs,	Volume=	0.167 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.40 cfs @	12.36 hrs,	Volume=	0.167 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 903.29' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.39 cfs @ 12.36 hrs HW=903.28' (Free Discharge)
└**1=Pipe Leaving Structure** (Orifice Controls 1.39 cfs @ 4.00 fps)

Pond 22P: Ex. # 8



Summary for Subcatchment 1S: Site Pre to 10

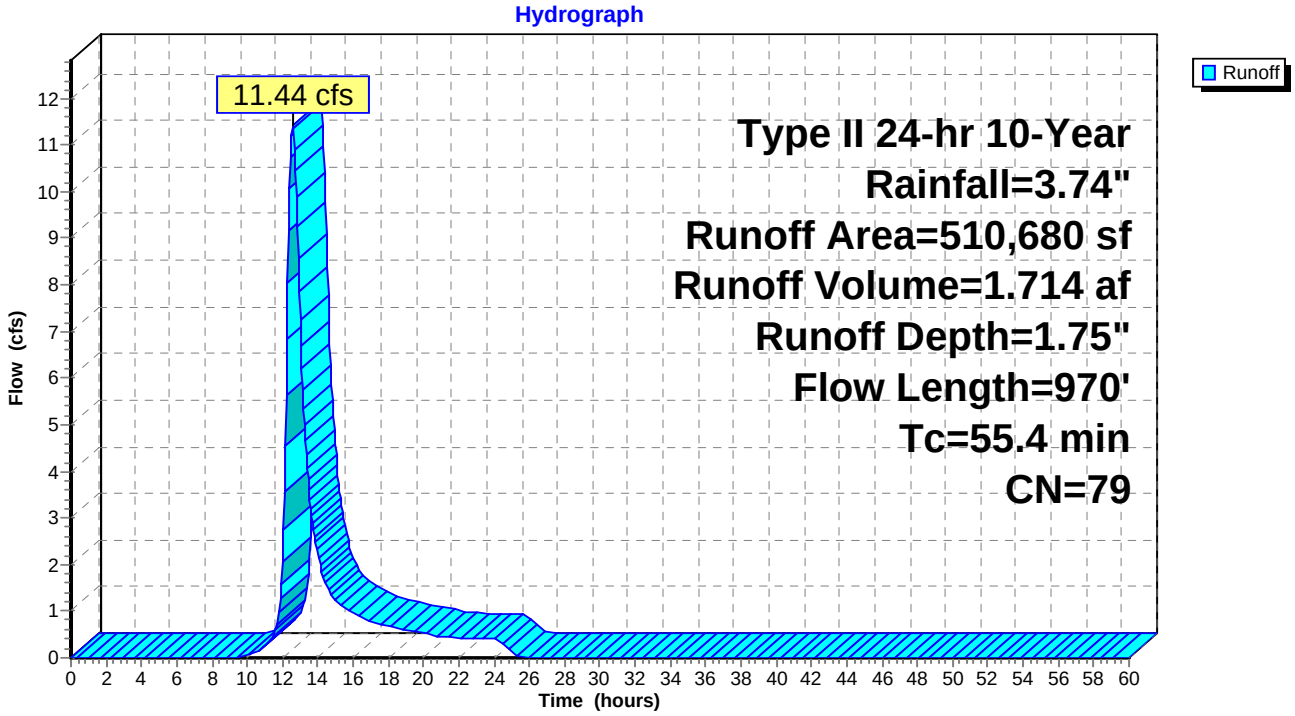
Runoff = 11.44 cfs @ 12.58 hrs, Volume= 1.714 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

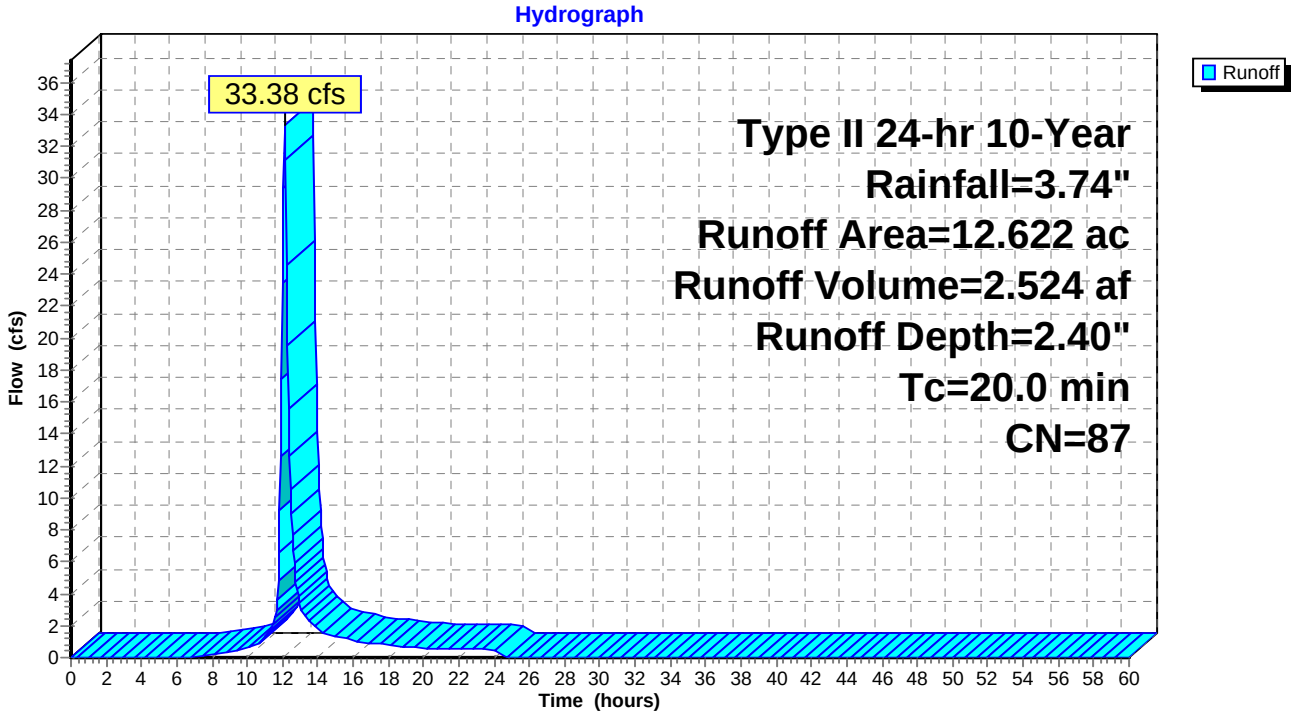
Runoff = 33.38 cfs @ 12.12 hrs, Volume= 2.524 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

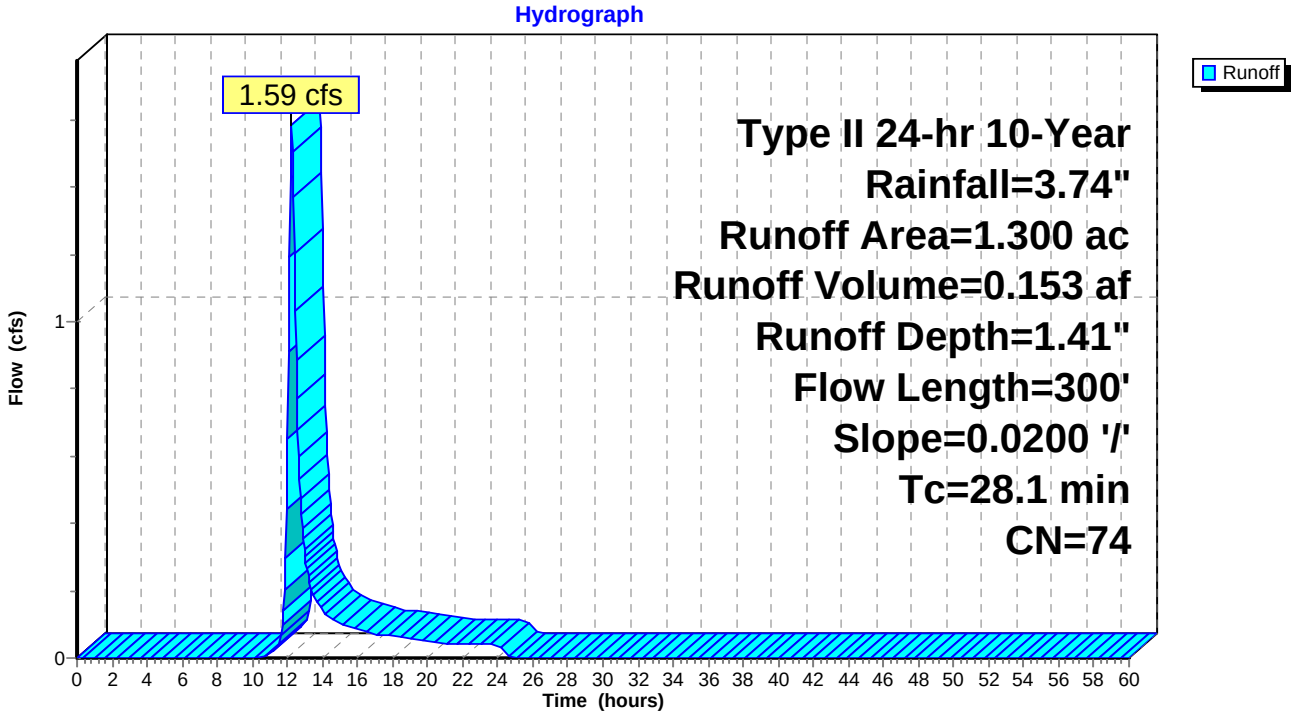
Runoff = 1.59 cfs @ 12.24 hrs, Volume= 0.153 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

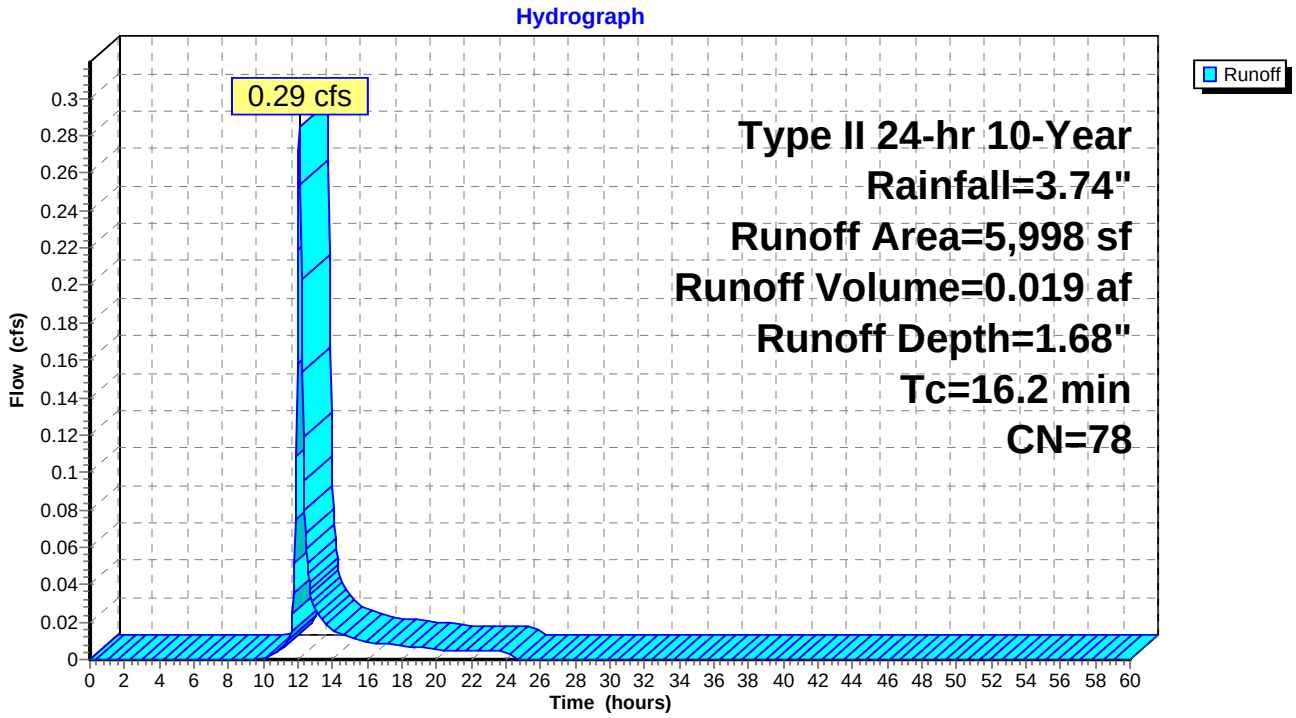
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.019 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

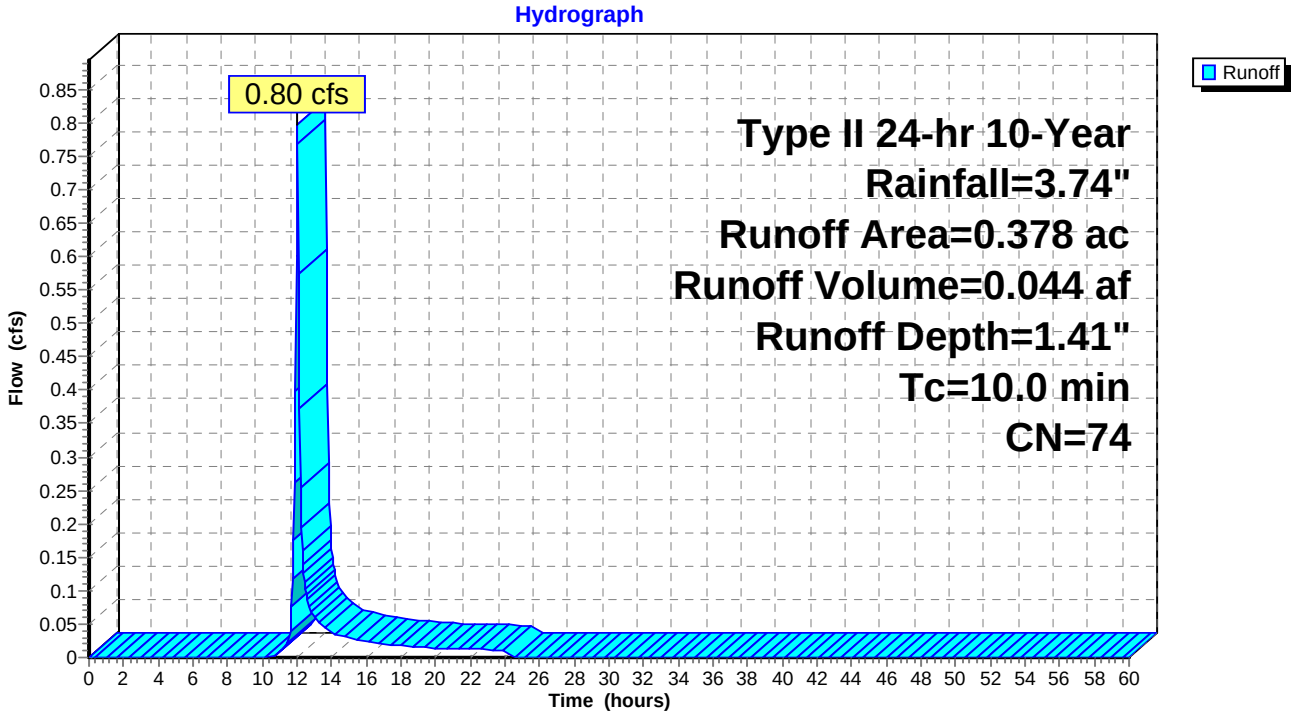
Runoff = 0.80 cfs @ 12.02 hrs, Volume= 0.044 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

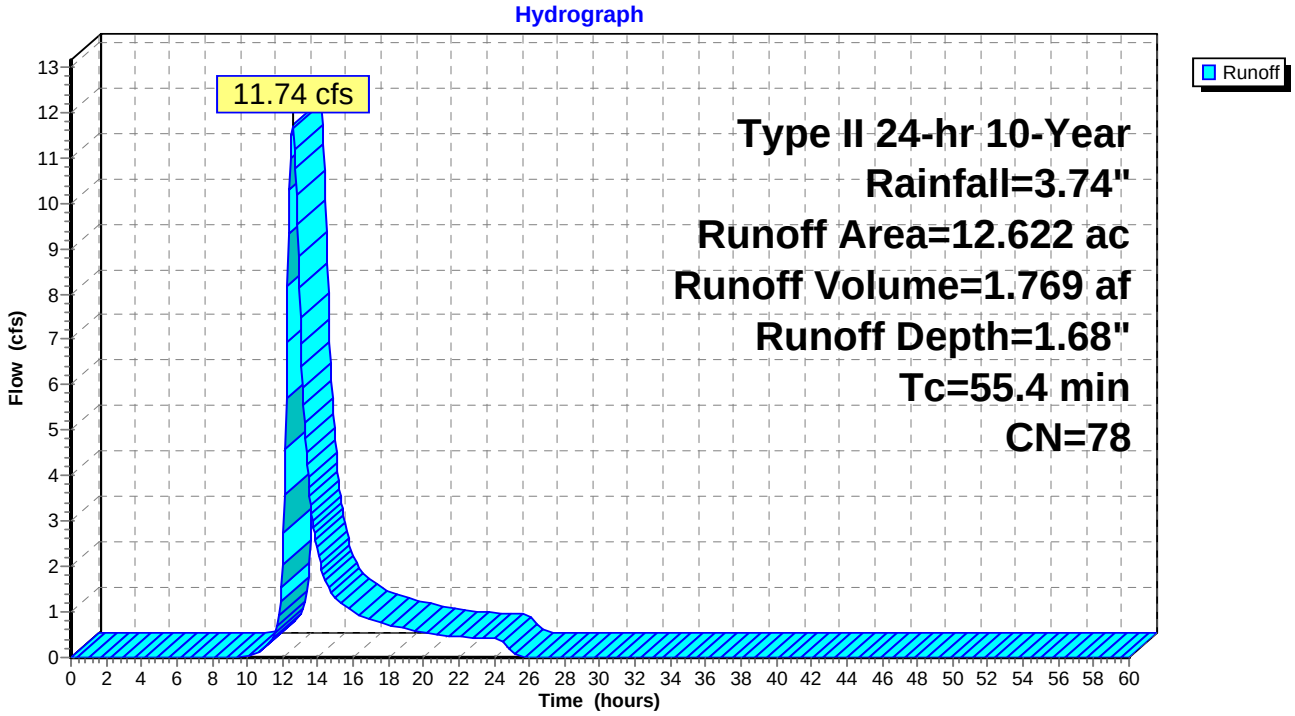
Runoff = 11.74 cfs @ 12.58 hrs, Volume= 1.769 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

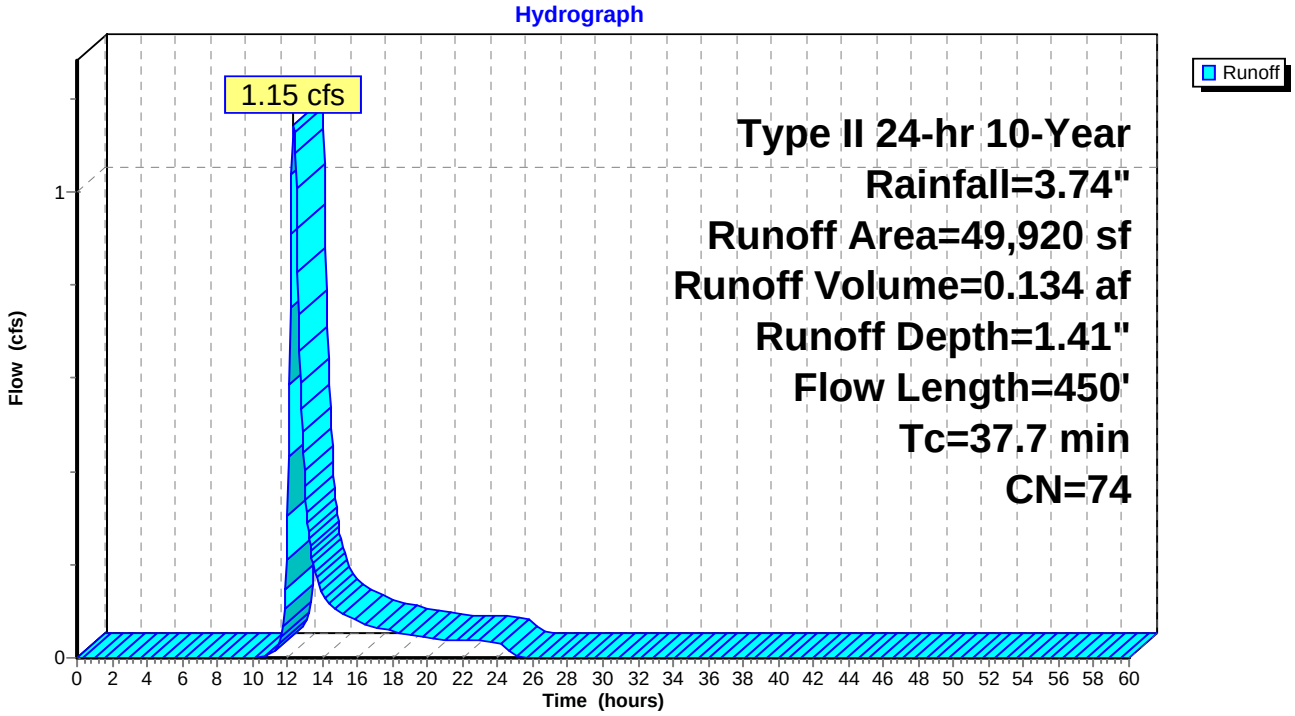
Runoff = 1.15 cfs @ 12.36 hrs, Volume= 0.134 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

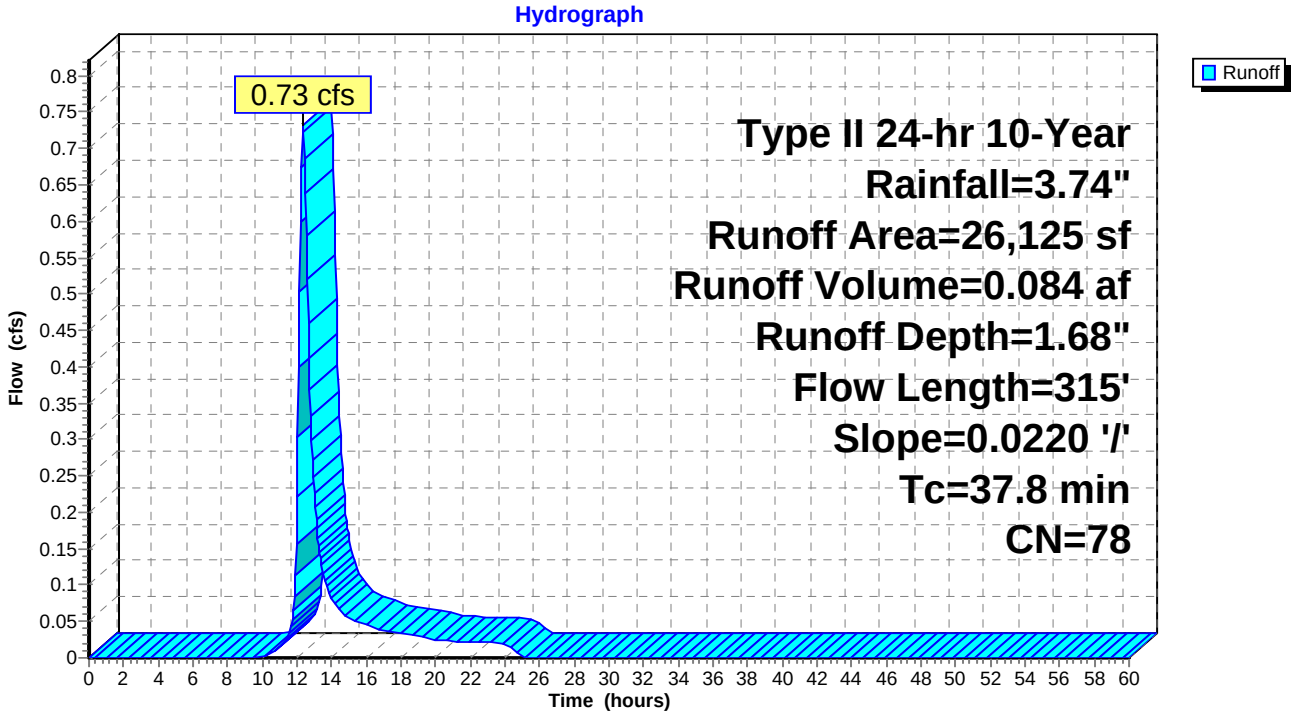
Runoff = 0.73 cfs @ 12.35 hrs, Volume= 0.084 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 1.72" for 10-Year event
Inflow = 12.17 cfs @ 12.55 hrs, Volume= 1.867 af
Outflow = 12.09 cfs @ 12.60 hrs, Volume= 1.297 af, Atten= 1%, Lag= 2.9 min
Primary = 12.09 cfs @ 12.60 hrs, Volume= 1.297 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.12' @ 12.60 hrs Surf.Area= 12,706 sf Storage= 3,773 cf

Plug-Flow detention time= 10.1 min calculated for 1.297 af (69% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

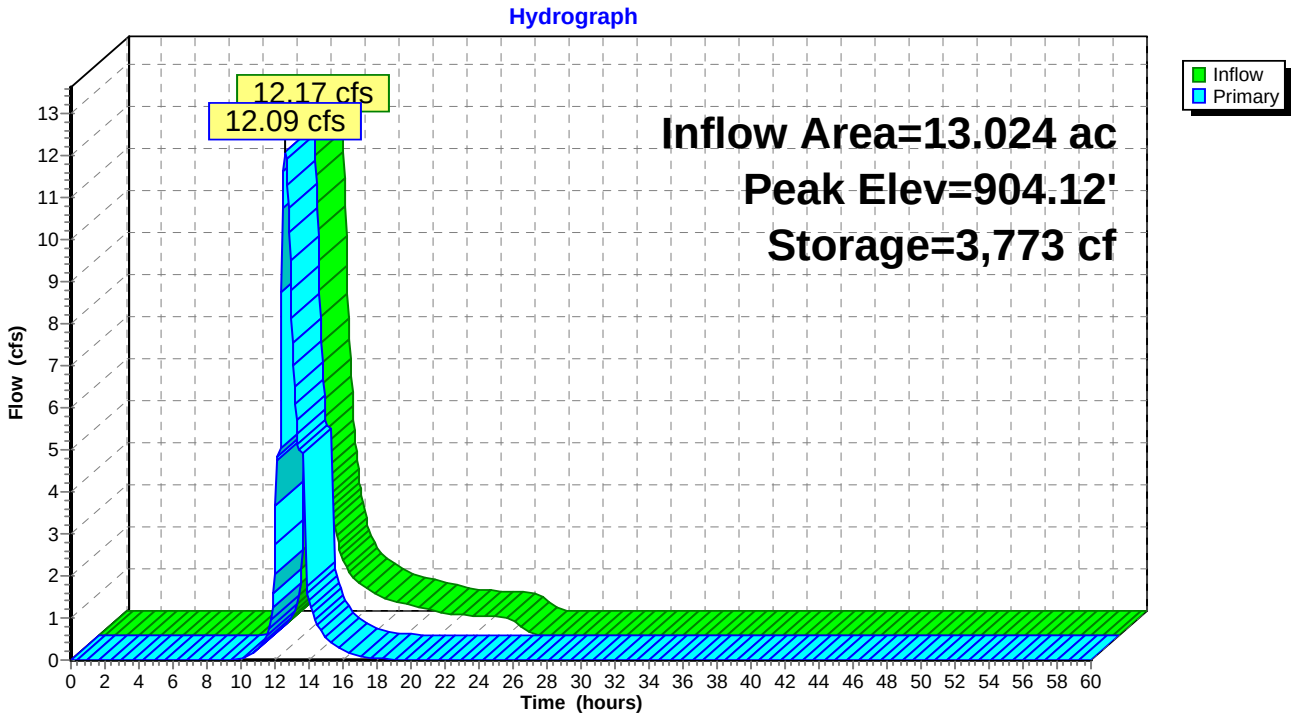
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=12.08 cfs @ 12.60 hrs HW=904.12' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.03 cfs @ 6.40 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 7.05 cfs @ 0.97 fps)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 1.48" for 10-Year event
Inflow = 1.05 cfs @ 12.03 hrs, Volume= 0.064 af
Outflow = 1.05 cfs @ 12.04 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.1 min
Primary = 1.05 cfs @ 12.04 hrs, Volume= 0.064 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.80' @ 12.04 hrs Surf.Area= 4 sf Storage= 2 cf

Plug-Flow detention time= 0.0 min calculated for 0.064 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (851.3 - 851.3)

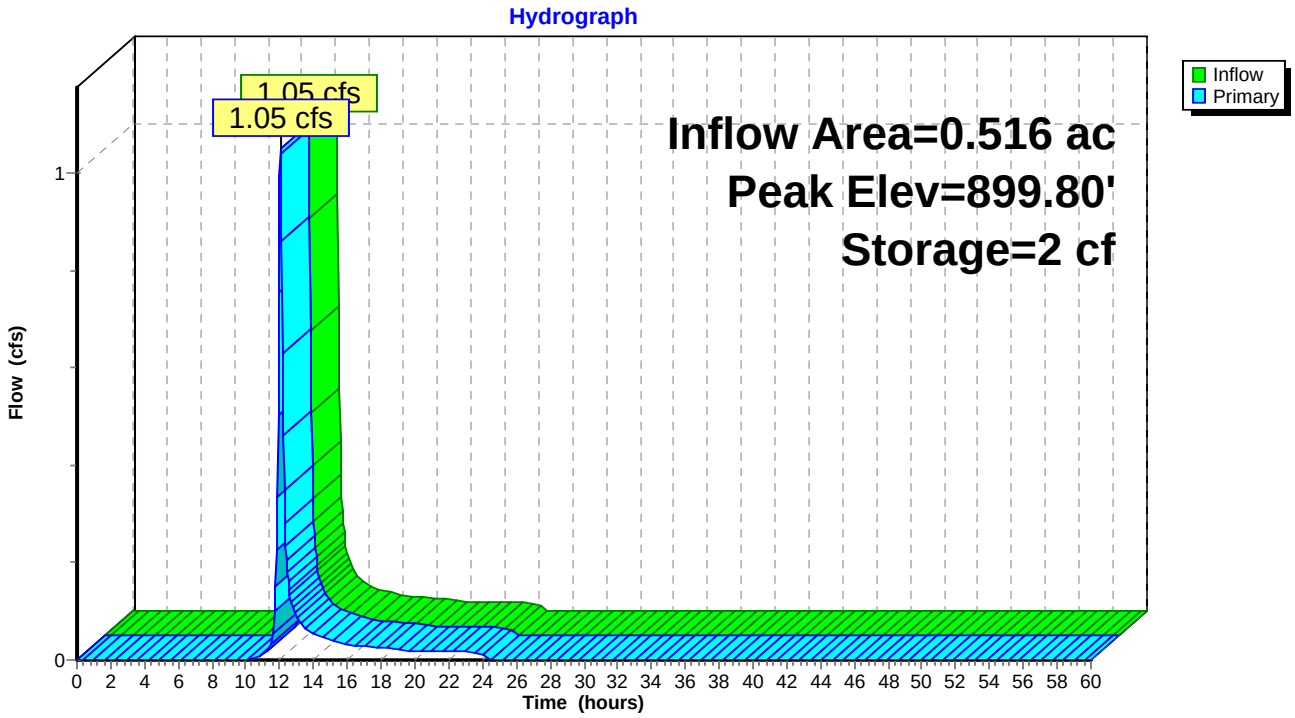
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.03 cfs @ 12.04 hrs HW=899.79' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 1.03 cfs @ 2.95 fps)

Pond 20P: Ex. # 9


Hydrograph
1.05 cfs
1.05 cfs
Inflow Area=0.516 ac
Peak Elev=899.80'
Storage=2 cf
Inflow
Primary
Flow (cfs)
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 22P: Ex. # 8

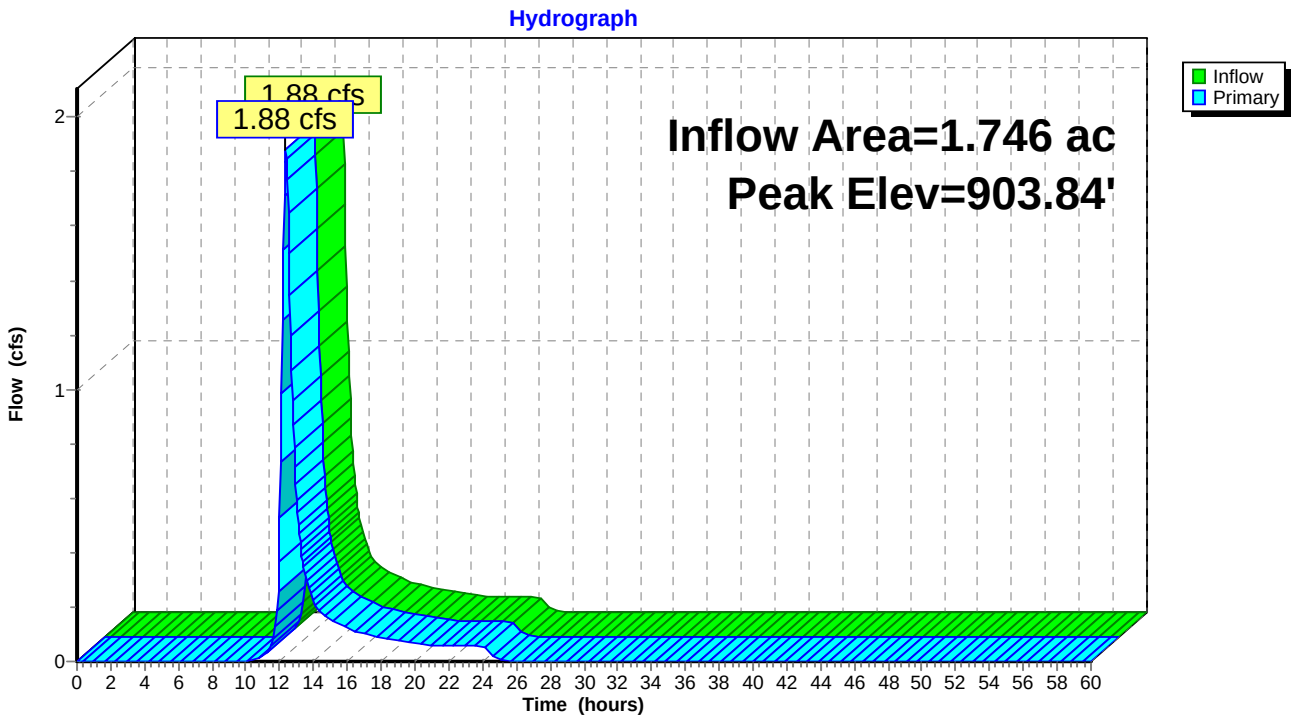
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	1.50"	for 10-Year event
Inflow =	1.88 cfs @	12.35 hrs,	Volume=	0.219 af	
Outflow =	1.88 cfs @	12.35 hrs,	Volume=	0.219 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.88 cfs @	12.35 hrs,	Volume=	0.219 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 903.84' @ 12.35 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.88 cfs @ 12.35 hrs HW=903.84' (Free Discharge)
└**1=Pipe Leaving Structure** (Orifice Controls 1.88 cfs @ 5.37 fps)

Pond 22P: Ex. # 8



Summary for Subcatchment 1S: Site Pre to 10

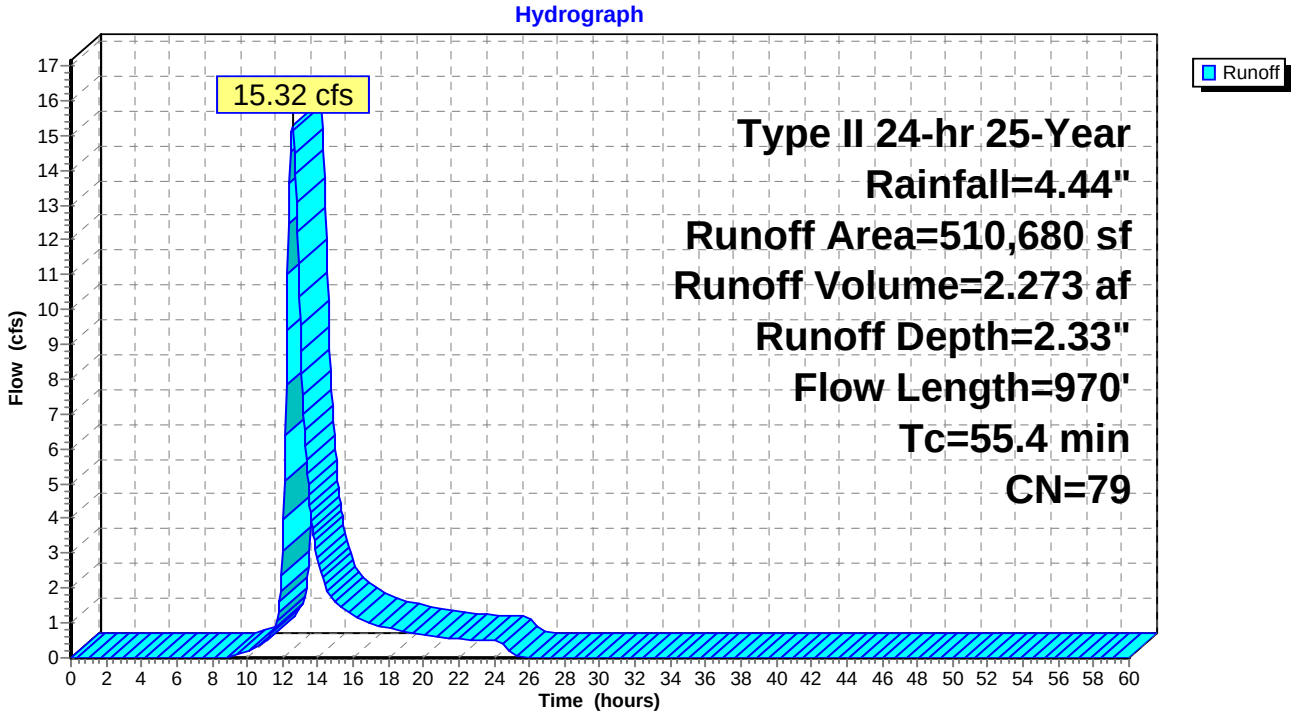
Runoff = 15.32 cfs @ 12.57 hrs, Volume= 2.273 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

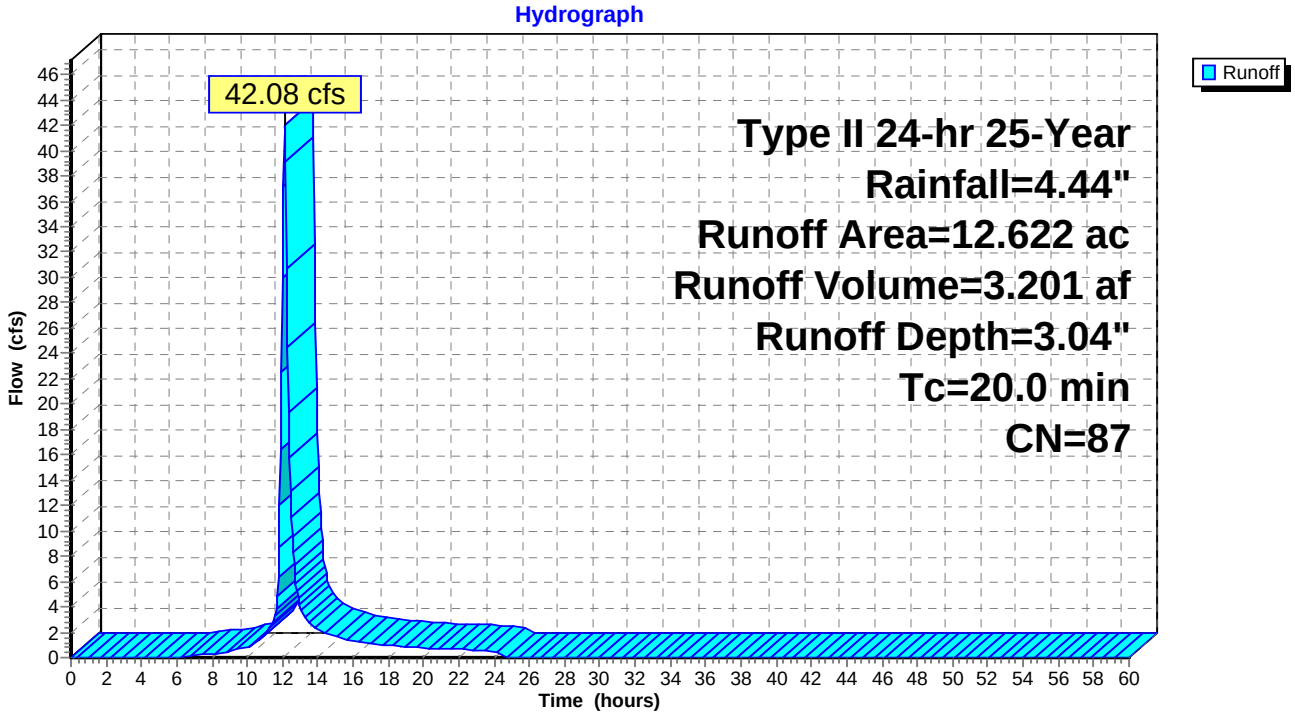
Runoff = 42.08 cfs @ 12.12 hrs, Volume= 3.201 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

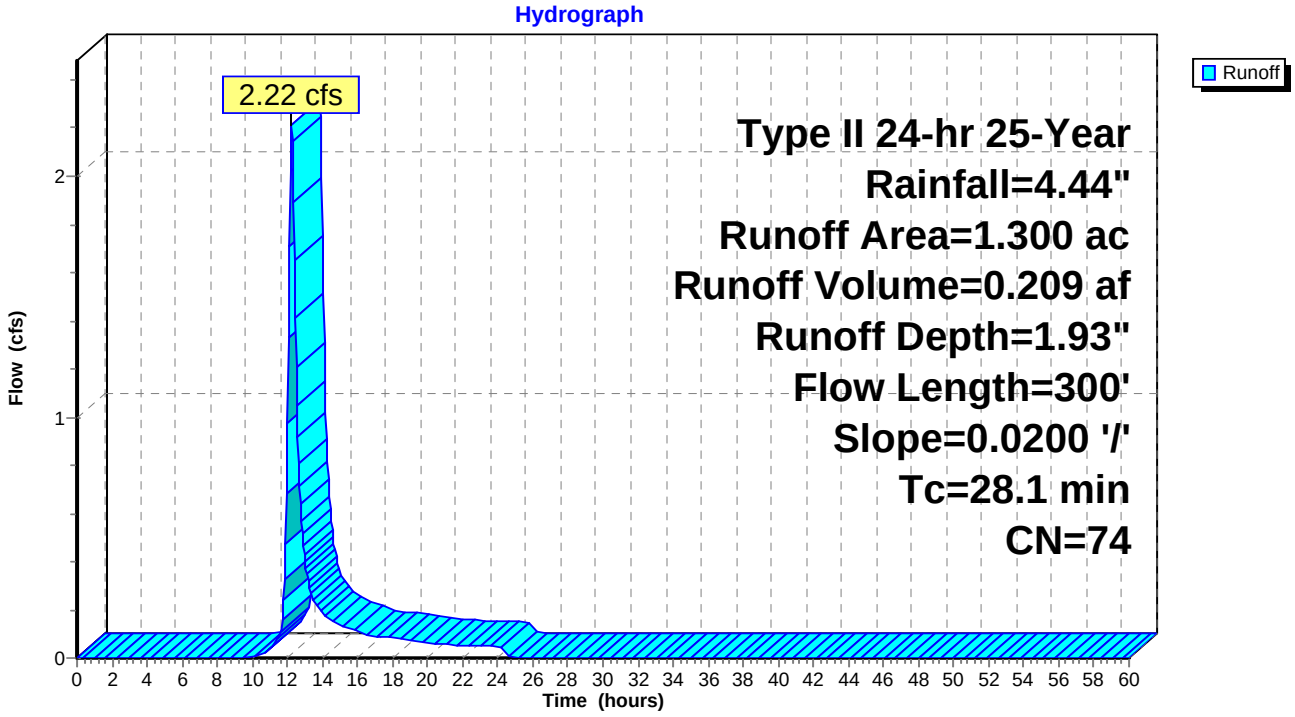
Runoff = 2.22 cfs @ 12.23 hrs, Volume= 0.209 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

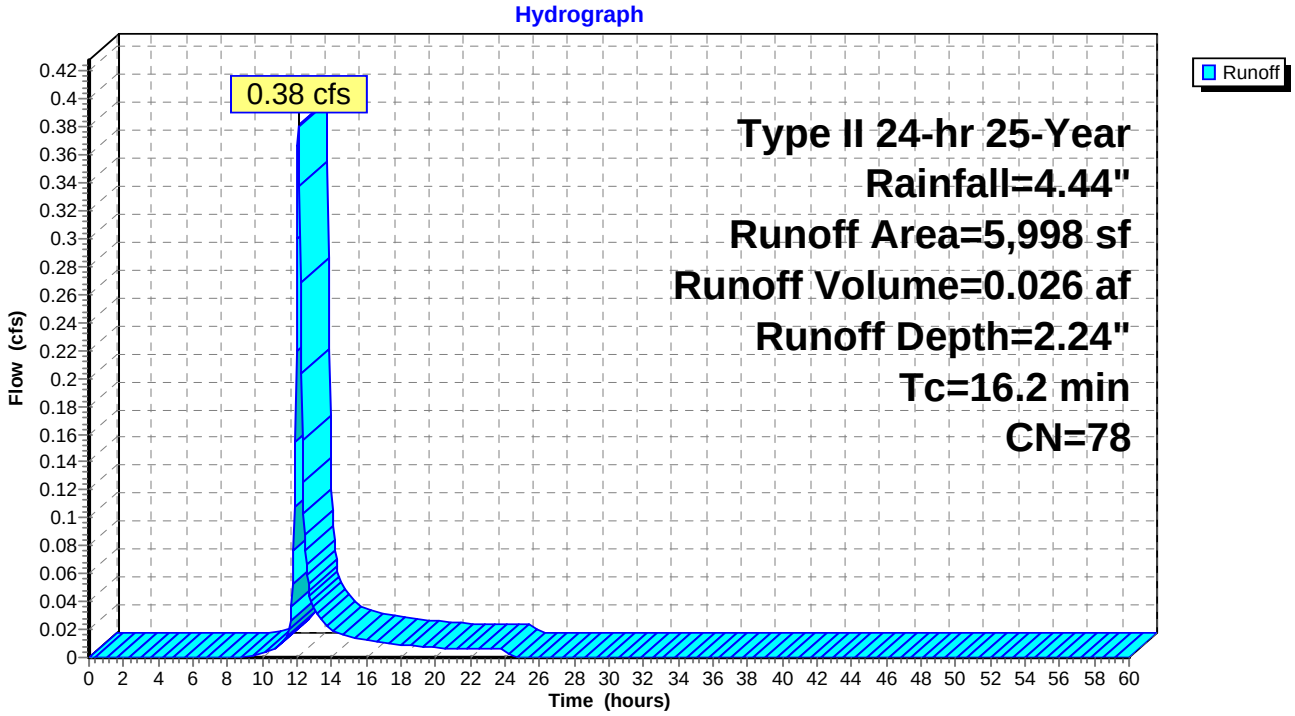
Runoff = 0.38 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

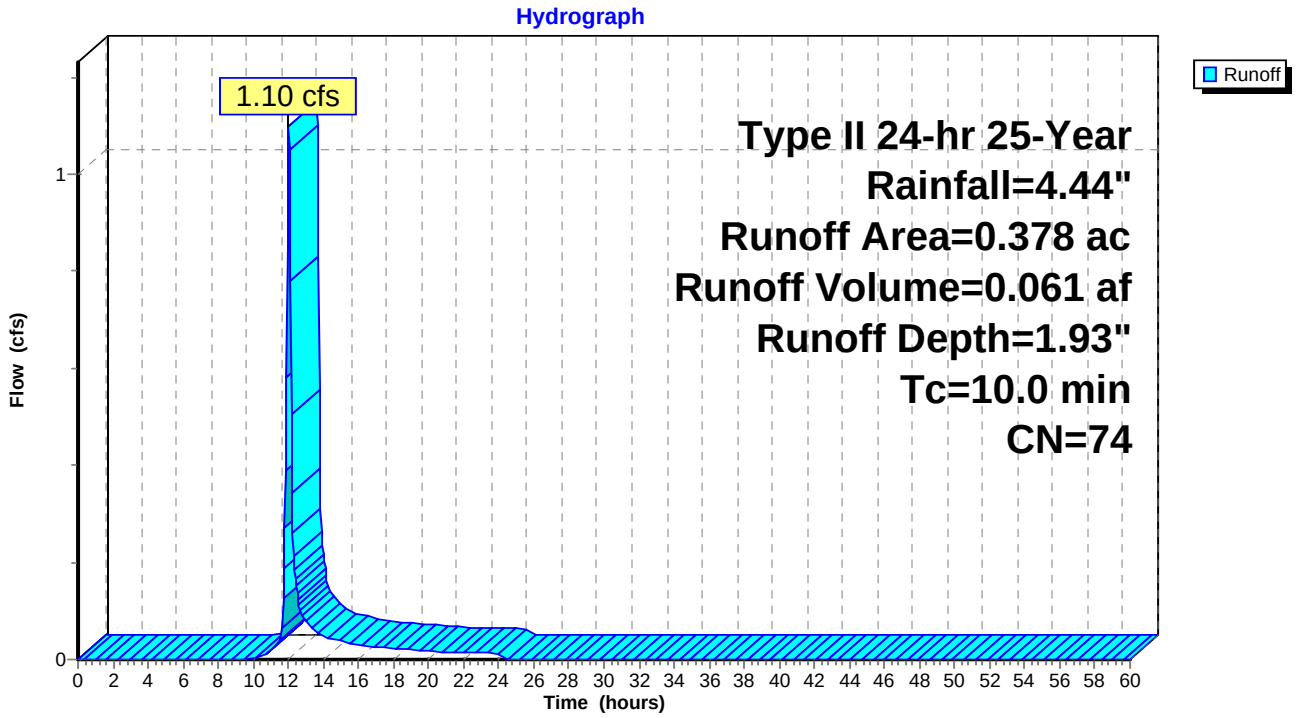
Runoff = 1.10 cfs @ 12.02 hrs, Volume= 0.061 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

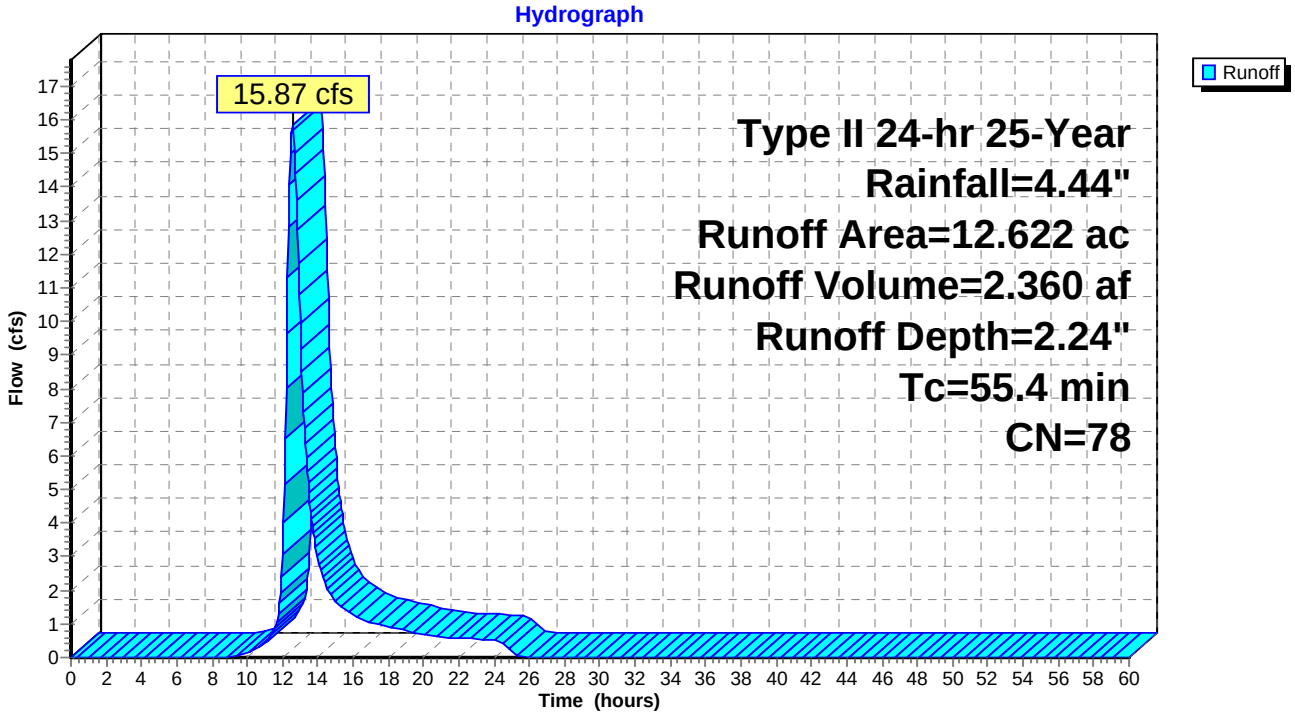
Runoff = 15.87 cfs @ 12.58 hrs, Volume= 2.360 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

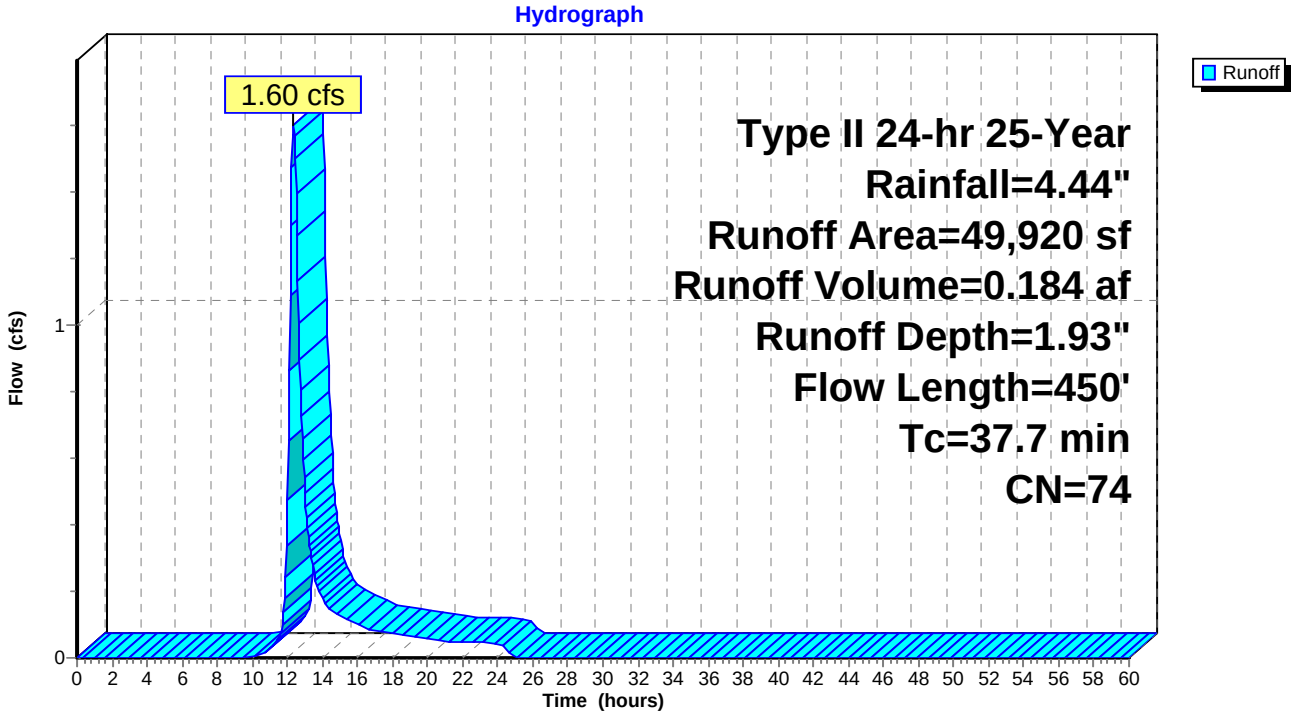
Runoff = 1.60 cfs @ 12.35 hrs, Volume= 0.184 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

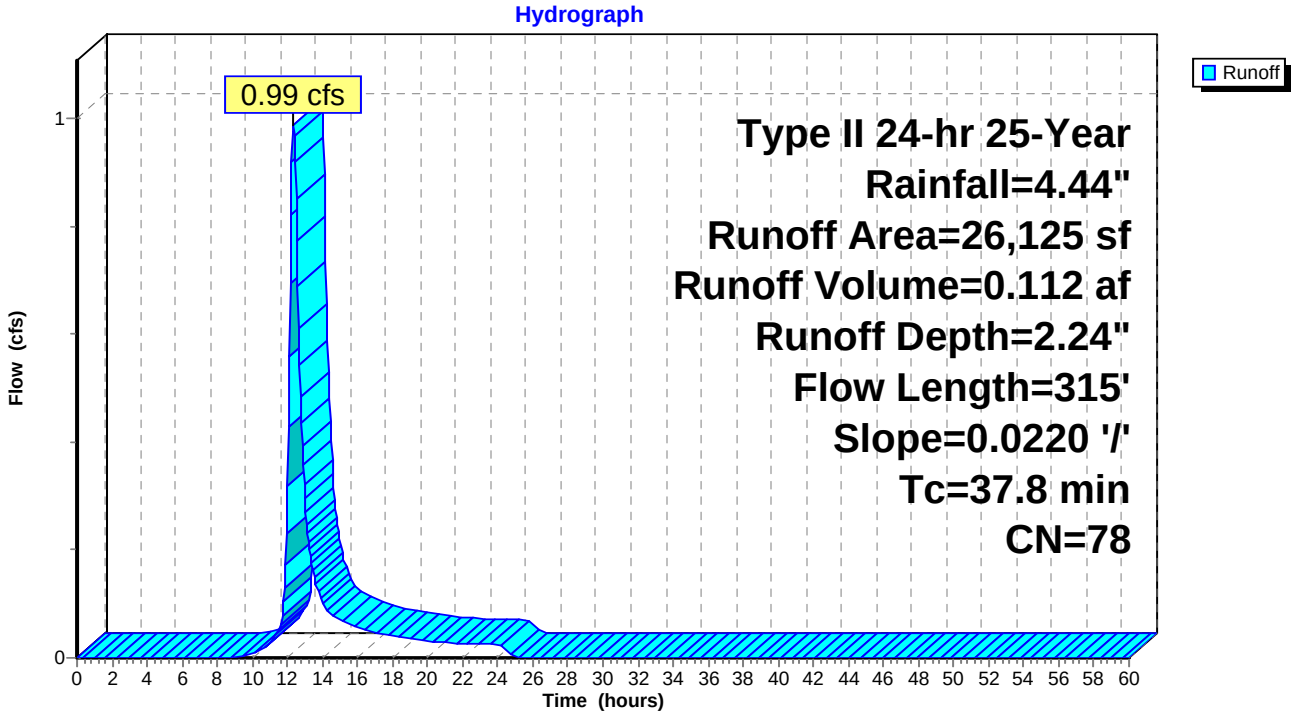
Runoff = 0.99 cfs @ 12.34 hrs, Volume= 0.112 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 2.29" for 25-Year event
Inflow = 16.35 cfs @ 12.54 hrs, Volume= 2.481 af
Outflow = 16.27 cfs @ 12.58 hrs, Volume= 1.678 af, Atten= 0%, Lag= 2.7 min
Primary = 16.27 cfs @ 12.58 hrs, Volume= 1.678 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.16' @ 12.58 hrs Surf.Area= 14,186 sf Storage= 4,361 cf

Plug-Flow detention time= 5.3 min calculated for 1.676 af (68% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

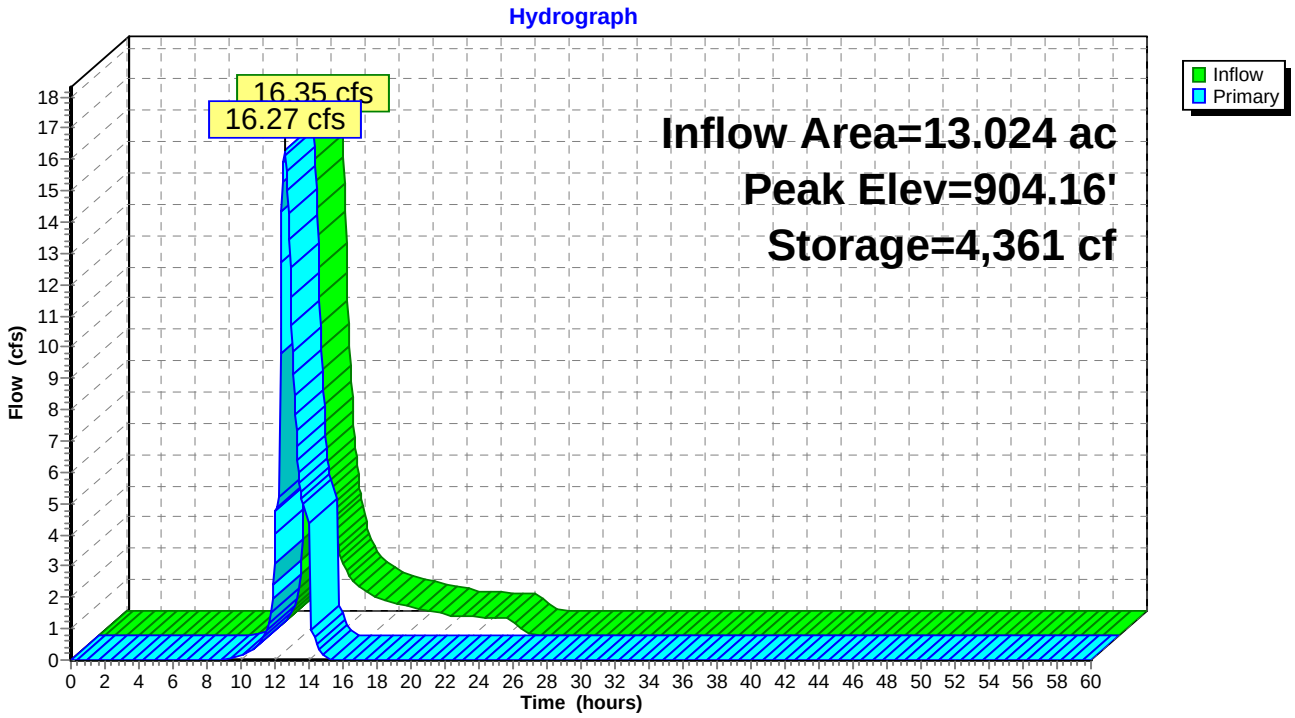
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=16.23 cfs @ 12.58 hrs HW=904.16' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.04 cfs @ 6.42 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 11.19 cfs @ 1.13 fps)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 2.01" for 25-Year event
Inflow = 1.44 cfs @ 12.03 hrs, Volume= 0.086 af
Outflow = 1.44 cfs @ 12.03 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.1 min
Primary = 1.44 cfs @ 12.03 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 900.15' @ 12.03 hrs Surf.Area= 4 sf Storage= 4 cf

Plug-Flow detention time= 0.0 min calculated for 0.086 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (842.4 - 842.4)

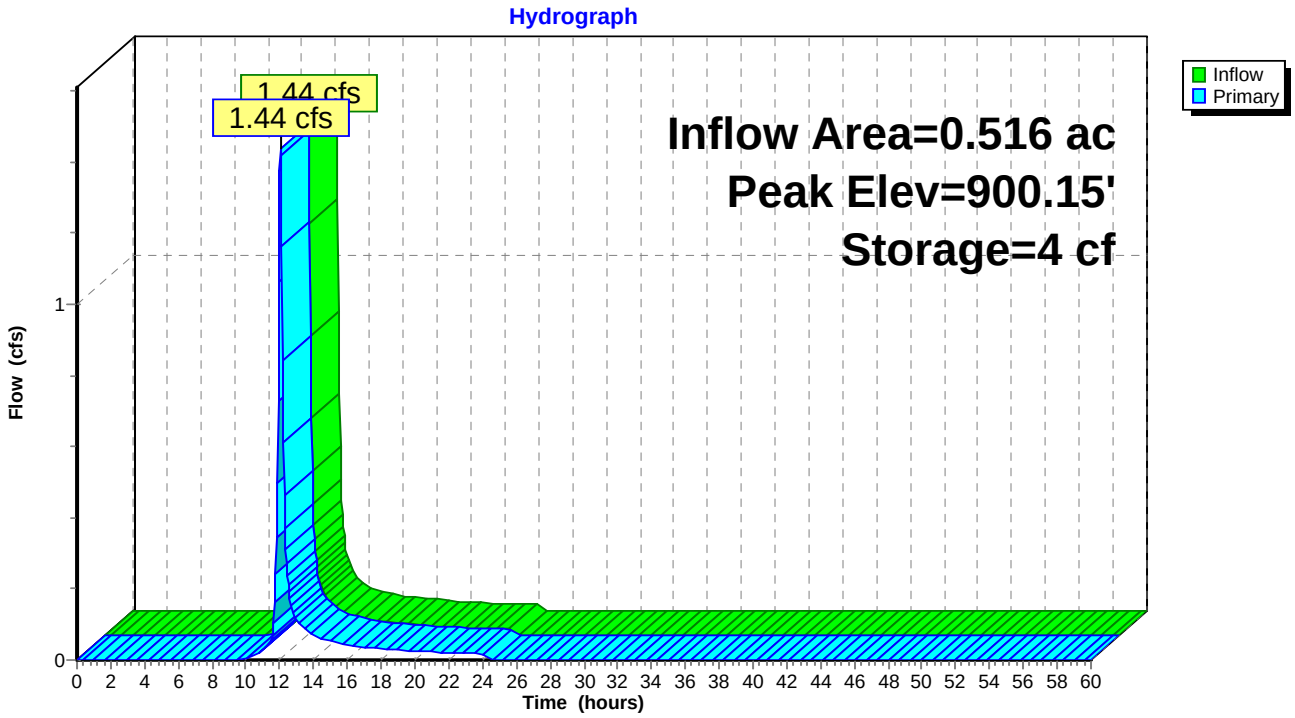
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.41 cfs @ 12.03 hrs HW=900.11' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 1.41 cfs @ 4.03 fps)

Pond 20P: Ex. # 9


Hydrograph
1.44 cfs
1.44 cfs
Inflow Area=0.516 ac
Peak Elev=900.15'
Storage=4 cf
Inflow
Primary
Flow (cfs)
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 22P: Ex. # 8

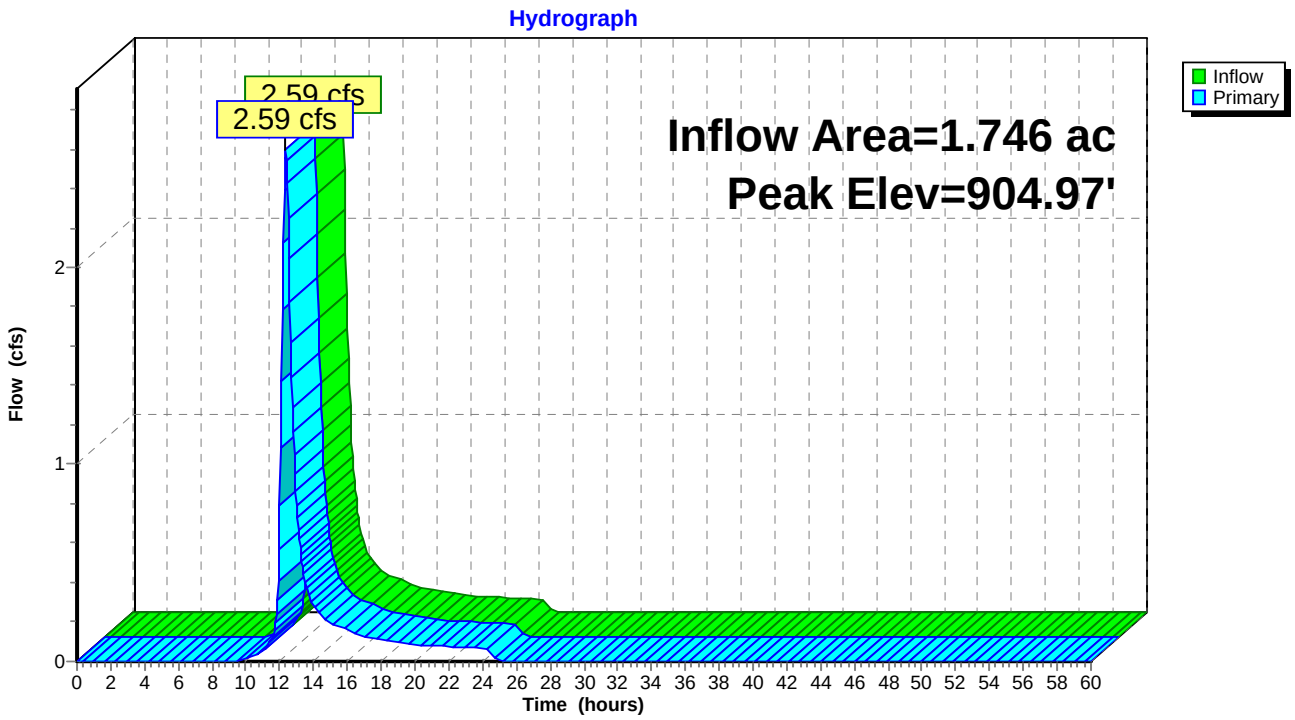
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	2.04"	for 25-Year event
Inflow =	2.59 cfs @	12.35 hrs,	Volume=	0.296 af	
Outflow =	2.59 cfs @	12.35 hrs,	Volume=	0.296 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.59 cfs @	12.35 hrs,	Volume=	0.296 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 904.97' @ 12.35 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=2.59 cfs @ 12.35 hrs HW=904.97' (Free Discharge)
└**1=Pipe Leaving Structure** (Orifice Controls 2.59 cfs @ 7.42 fps)

Pond 22P: Ex. # 8



Summary for Subcatchment 1S: Site Pre to 10

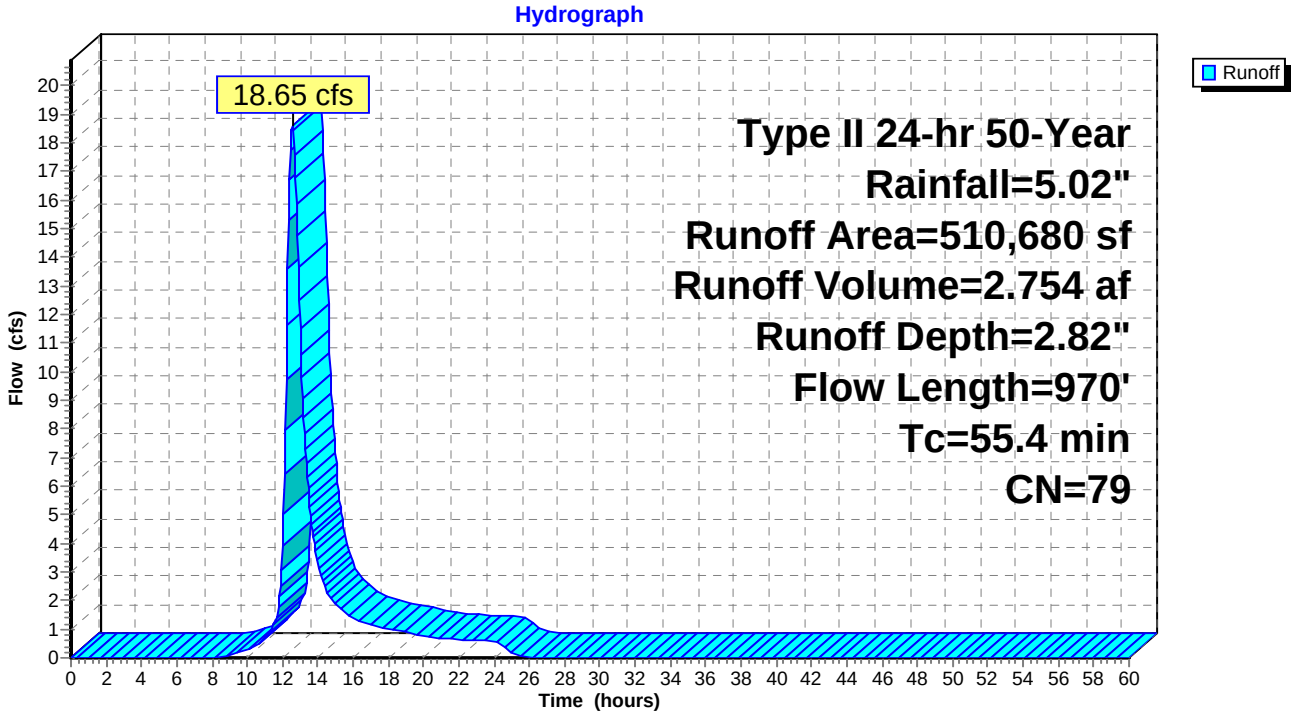
Runoff = 18.65 cfs @ 12.57 hrs, Volume= 2.754 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

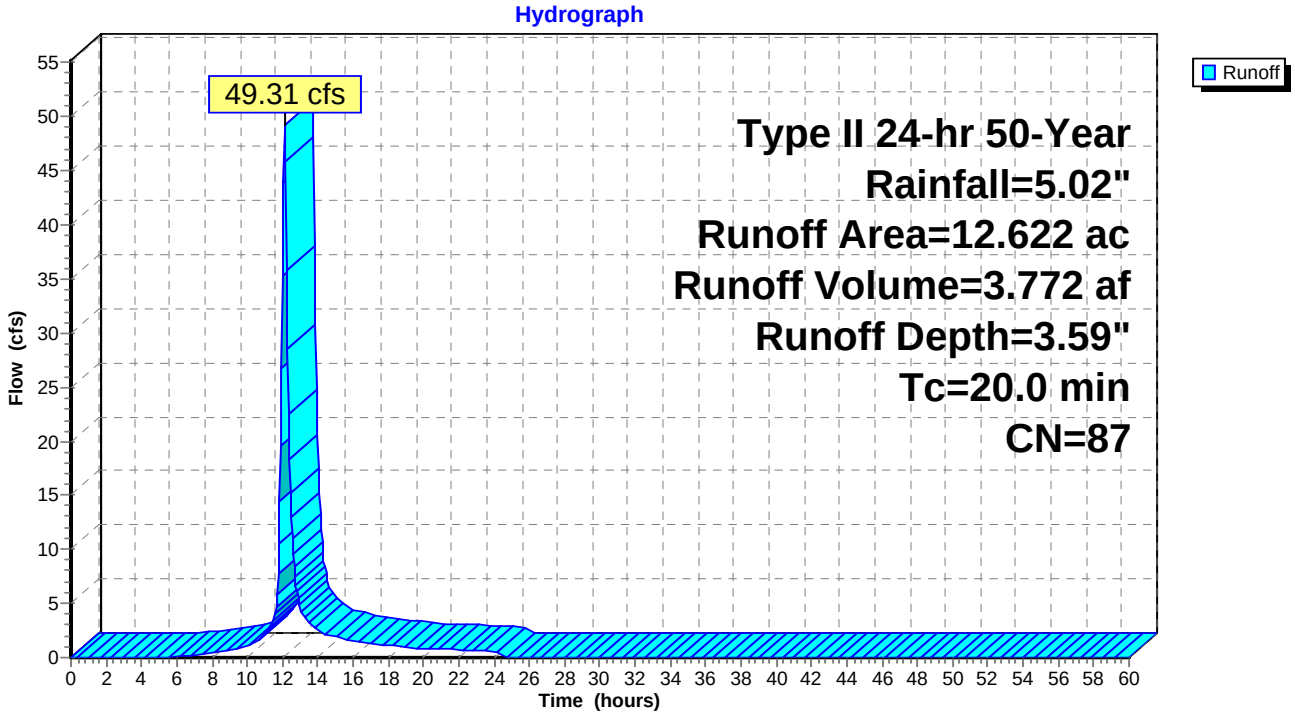
Runoff = 49.31 cfs @ 12.12 hrs, Volume= 3.772 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

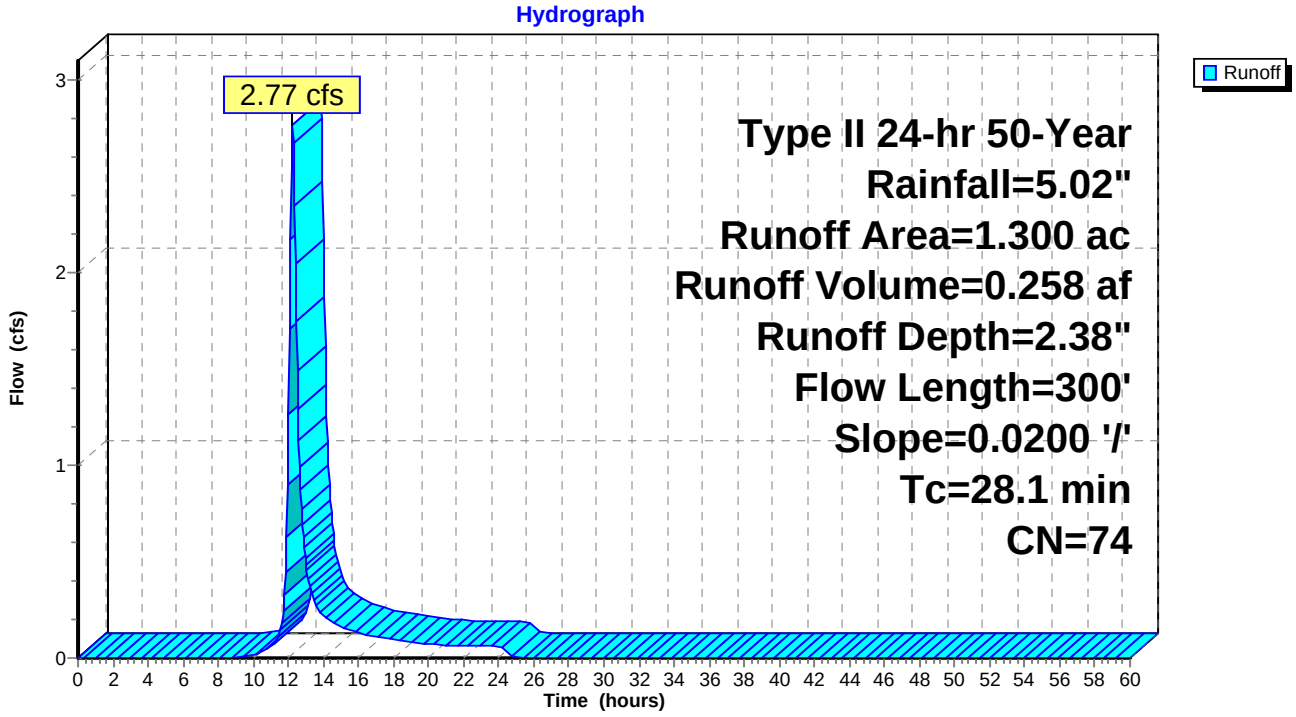
Runoff = 2.77 cfs @ 12.23 hrs, Volume= 0.258 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

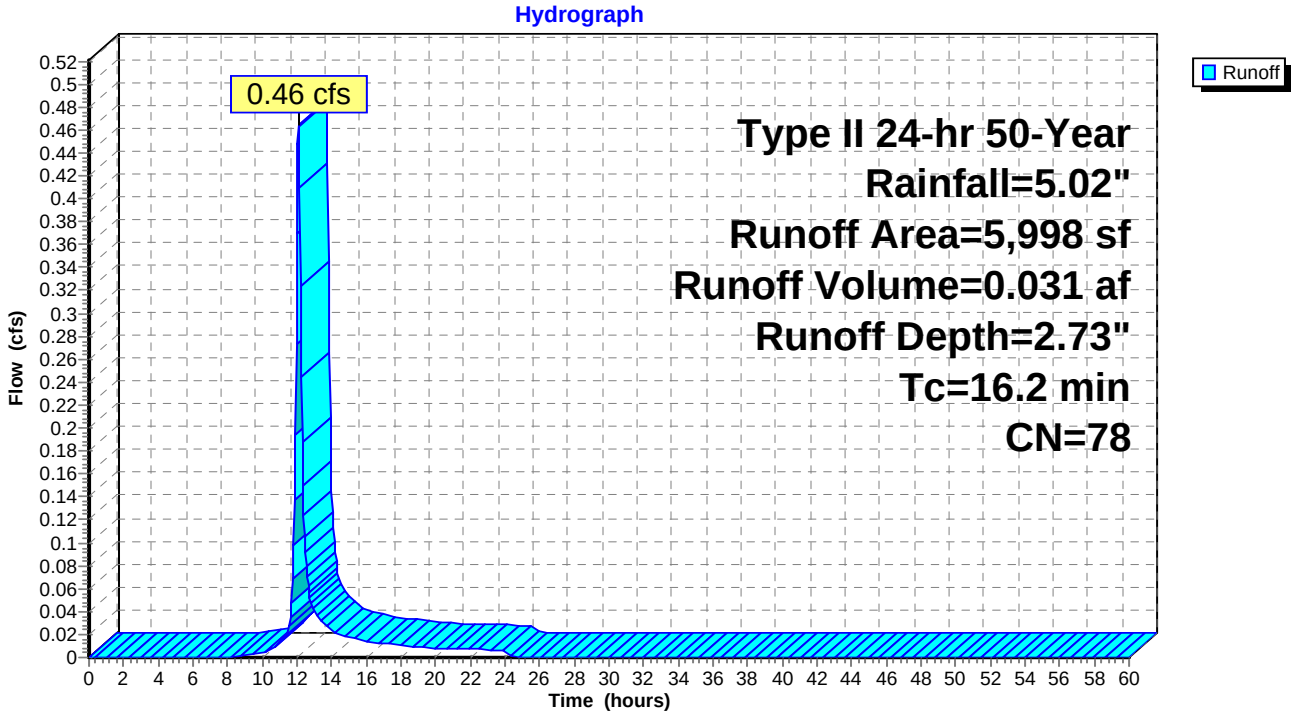
Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

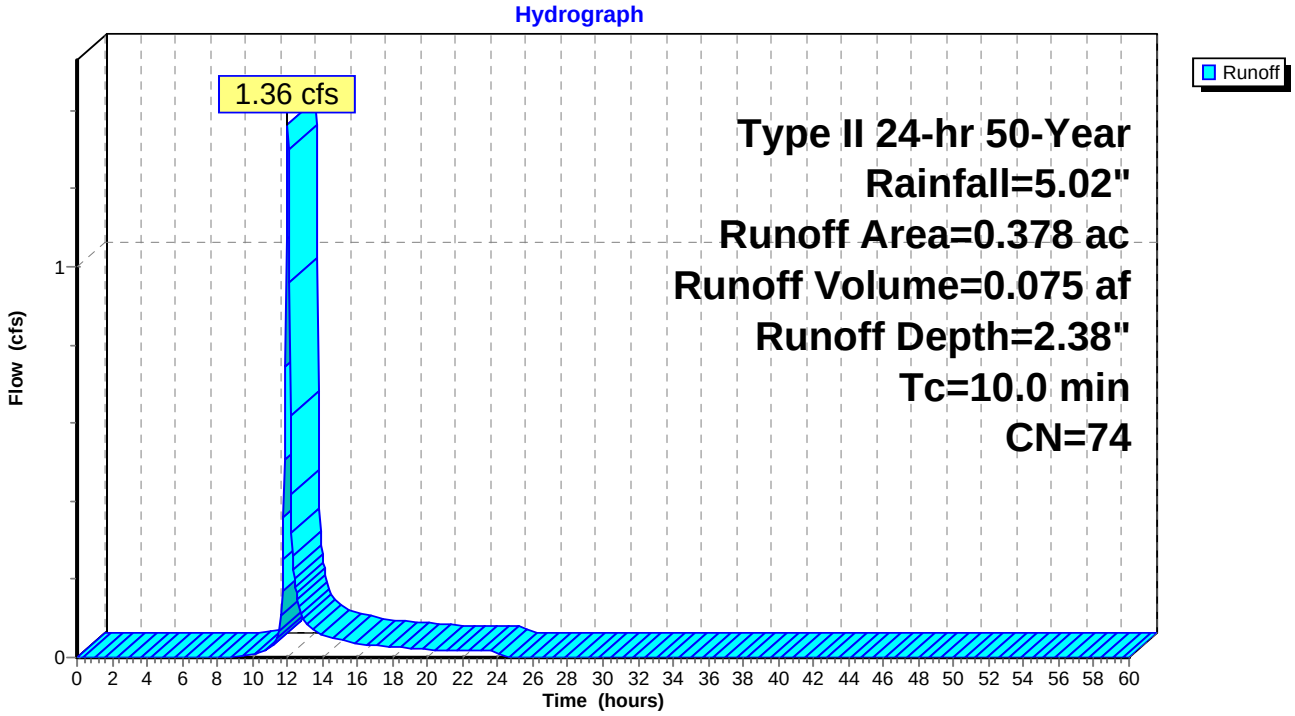
Runoff = 1.36 cfs @ 12.02 hrs, Volume= 0.075 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

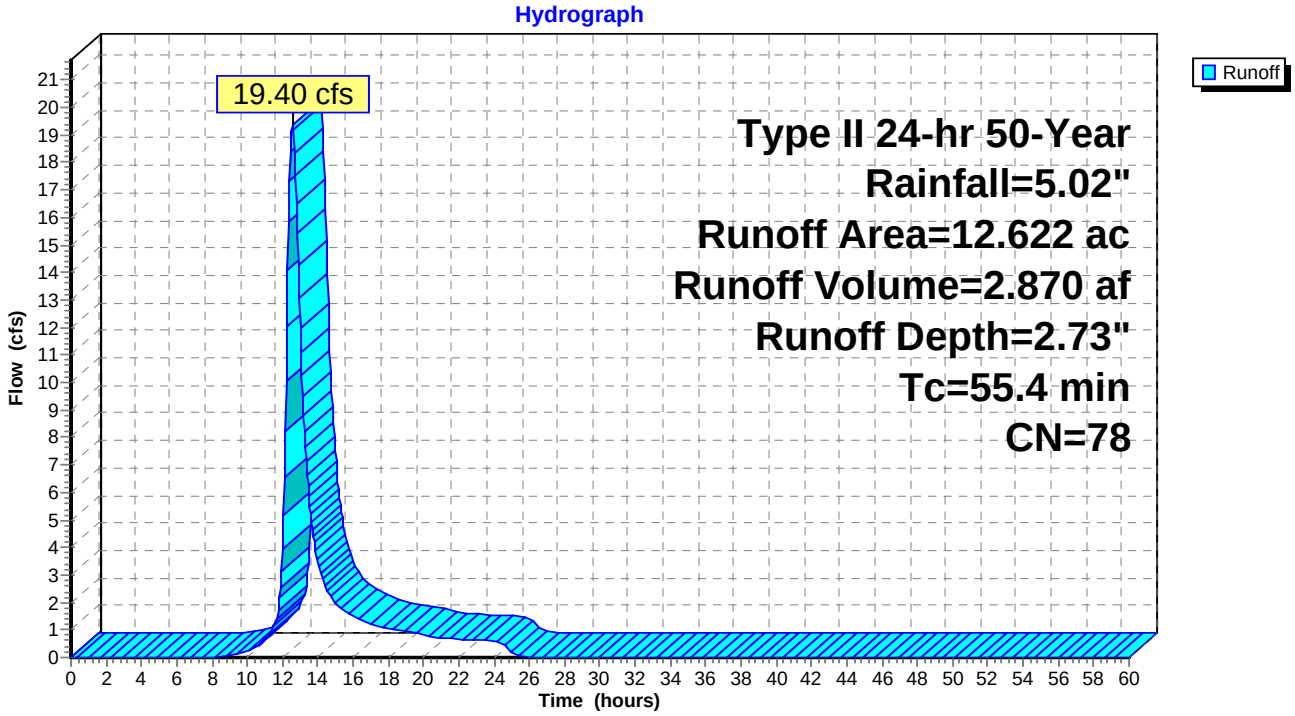
Runoff = 19.40 cfs @ 12.57 hrs, Volume= 2.870 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

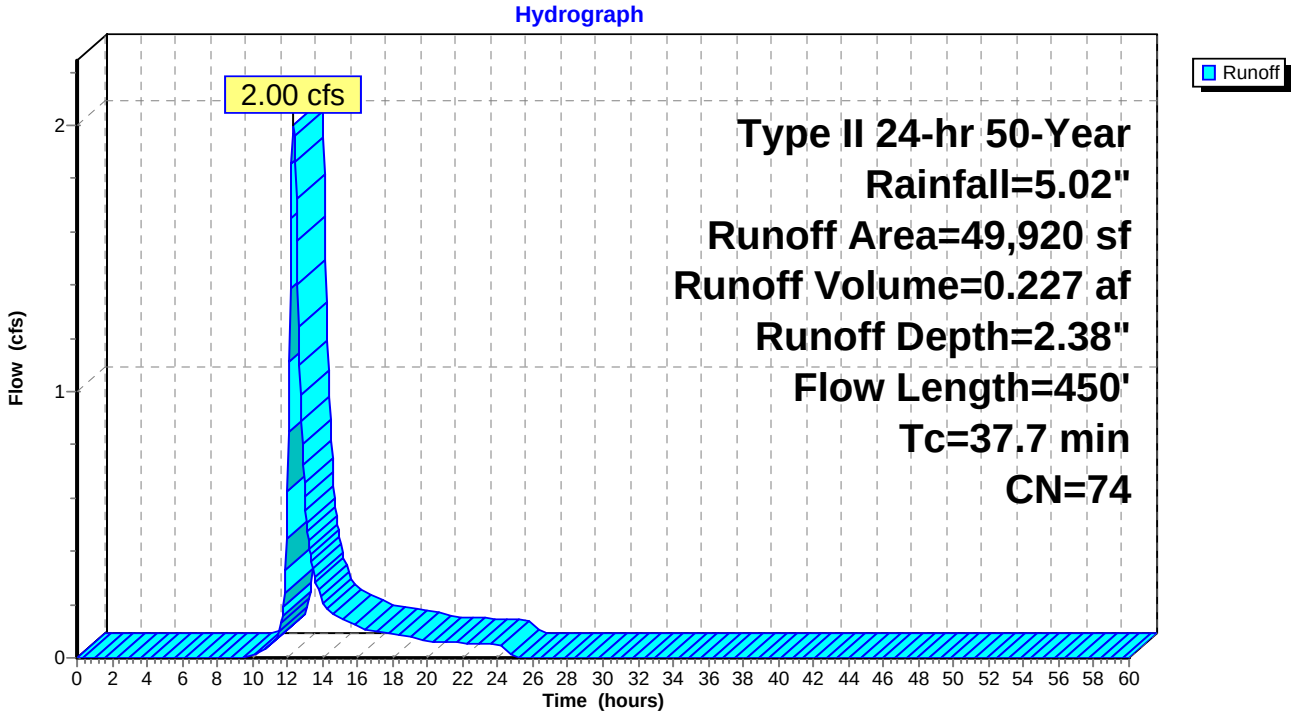
Runoff = 2.00 cfs @ 12.35 hrs, Volume= 0.227 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

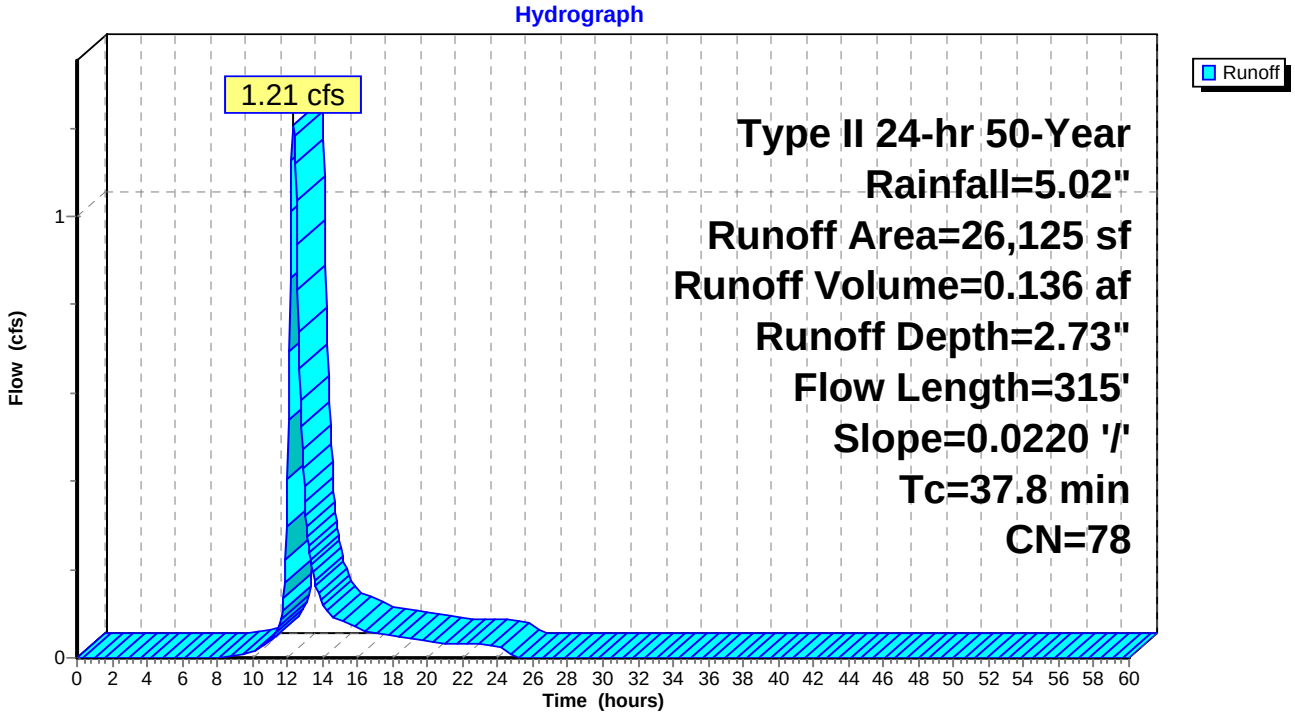
Runoff = 1.21 cfs @ 12.34 hrs, Volume= 0.136 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 2.78" for 50-Year event
Inflow = 19.93 cfs @ 12.53 hrs, Volume= 3.012 af
Outflow = 19.85 cfs @ 12.57 hrs, Volume= 3.441 af, Atten= 0%, Lag= 2.7 min
Primary = 19.85 cfs @ 12.57 hrs, Volume= 3.441 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.20' @ 12.57 hrs Surf.Area= 15,360 sf Storage= 4,851 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 38.0 min (904.0 - 865.9)

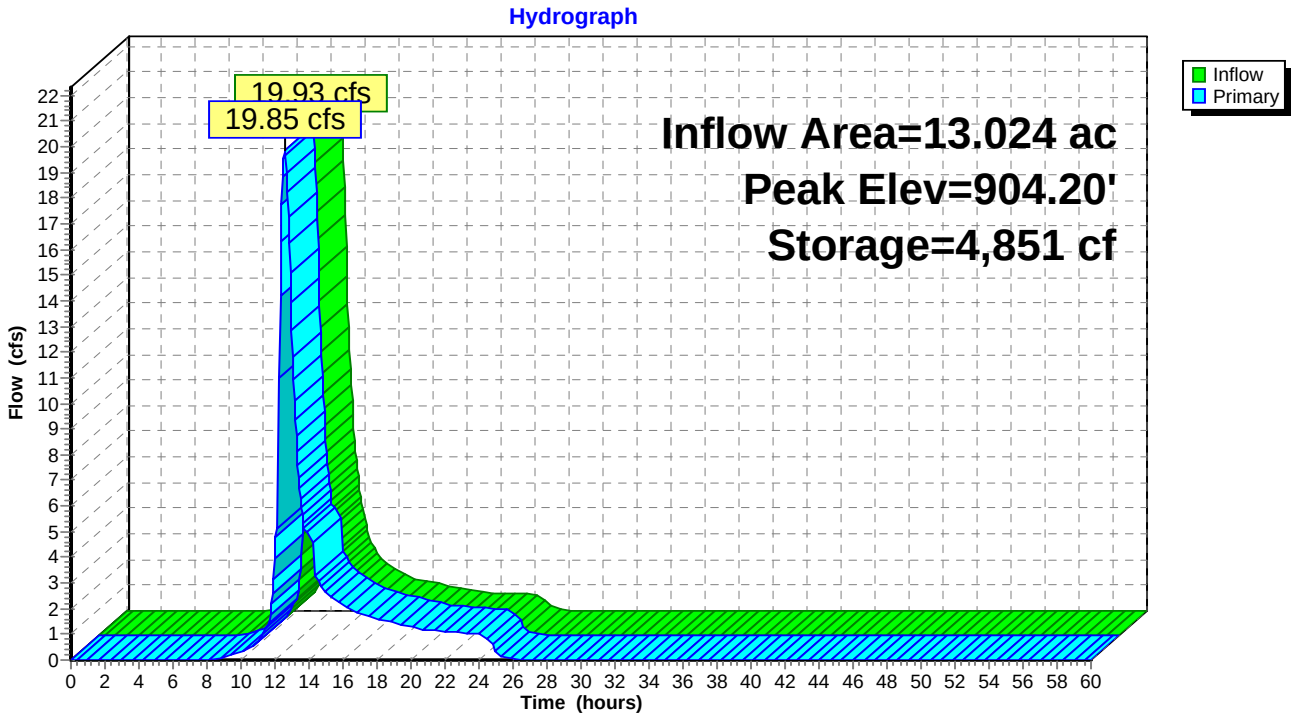
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=19.79 cfs @ 12.57 hrs HW=904.20' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.05 cfs @ 6.44 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 14.73 cfs @ 1.24 fps)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 2.47" for 50-Year event
Inflow = 1.77 cfs @ 12.03 hrs, Volume= 0.106 af
Outflow = 1.78 cfs @ 12.03 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.1 min
Primary = 1.78 cfs @ 12.03 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 900.53' @ 12.03 hrs Surf.Area= 4 sf Storage= 5 cf

Plug-Flow detention time= 0.0 min calculated for 0.106 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (836.4 - 836.4)

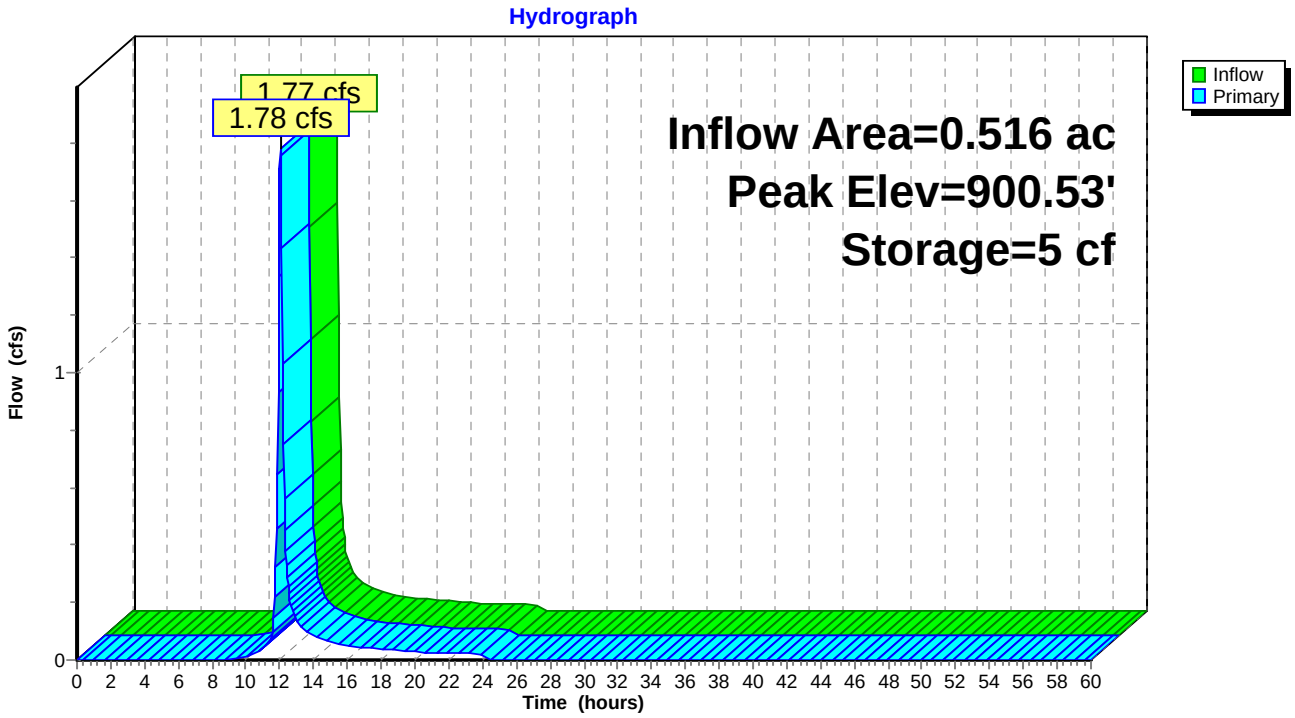
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.73 cfs @ 12.03 hrs HW=900.48' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 1.73 cfs @ 4.97 fps)

Pond 20P: Ex. # 9


Hydrograph
1.77 cfs
1.78 cfs
Inflow Area=0.516 ac
Peak Elev=900.53'
Storage=5 cf
Inflow
Primary
Flow (cfs)
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 22P: Ex. # 8

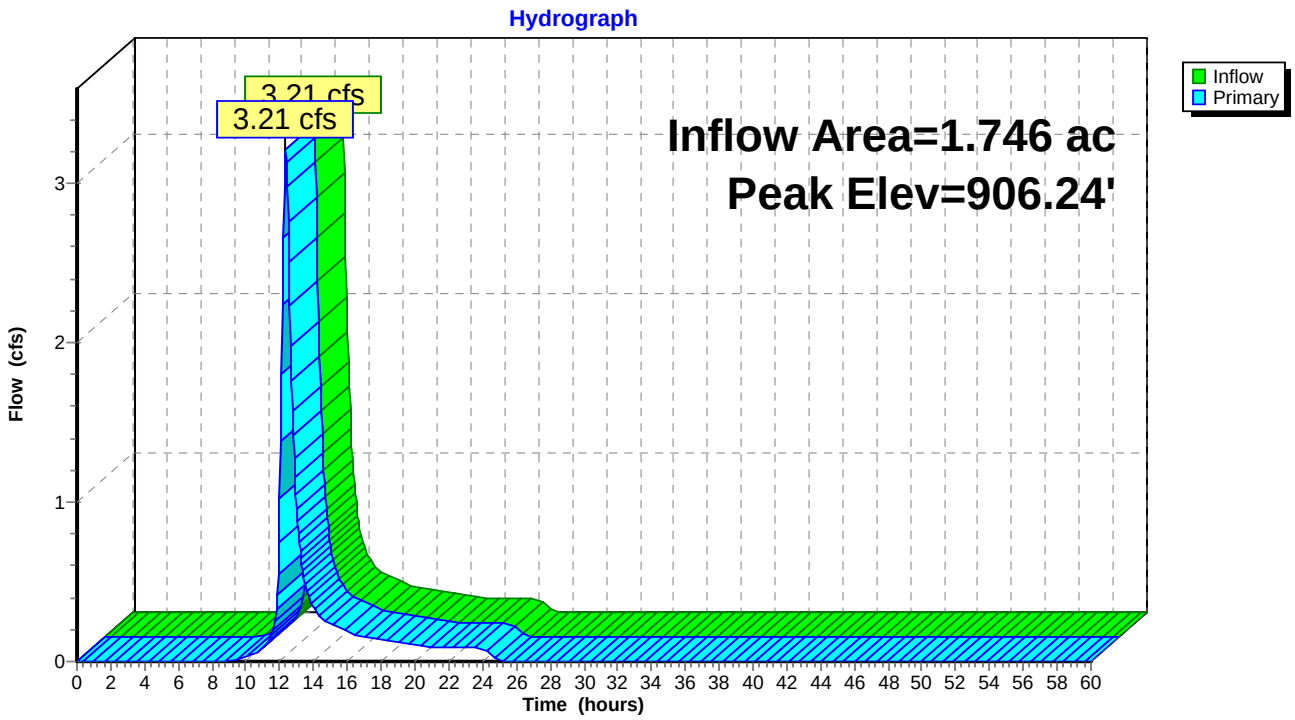
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	2.50"	for 50-Year event
Inflow =	3.21 cfs @	12.34 hrs,	Volume=	0.364 af	
Outflow =	3.21 cfs @	12.34 hrs,	Volume=	0.364 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.21 cfs @	12.34 hrs,	Volume=	0.364 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 906.24' @ 12.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=3.21 cfs @ 12.34 hrs HW=906.23' (Free Discharge)
└─**1=Pipe Leaving Structure** (Orifice Controls 3.21 cfs @ 9.18 fps)

Pond 22P: Ex. # 8



Summary for Subcatchment 1S: Site Pre to 10

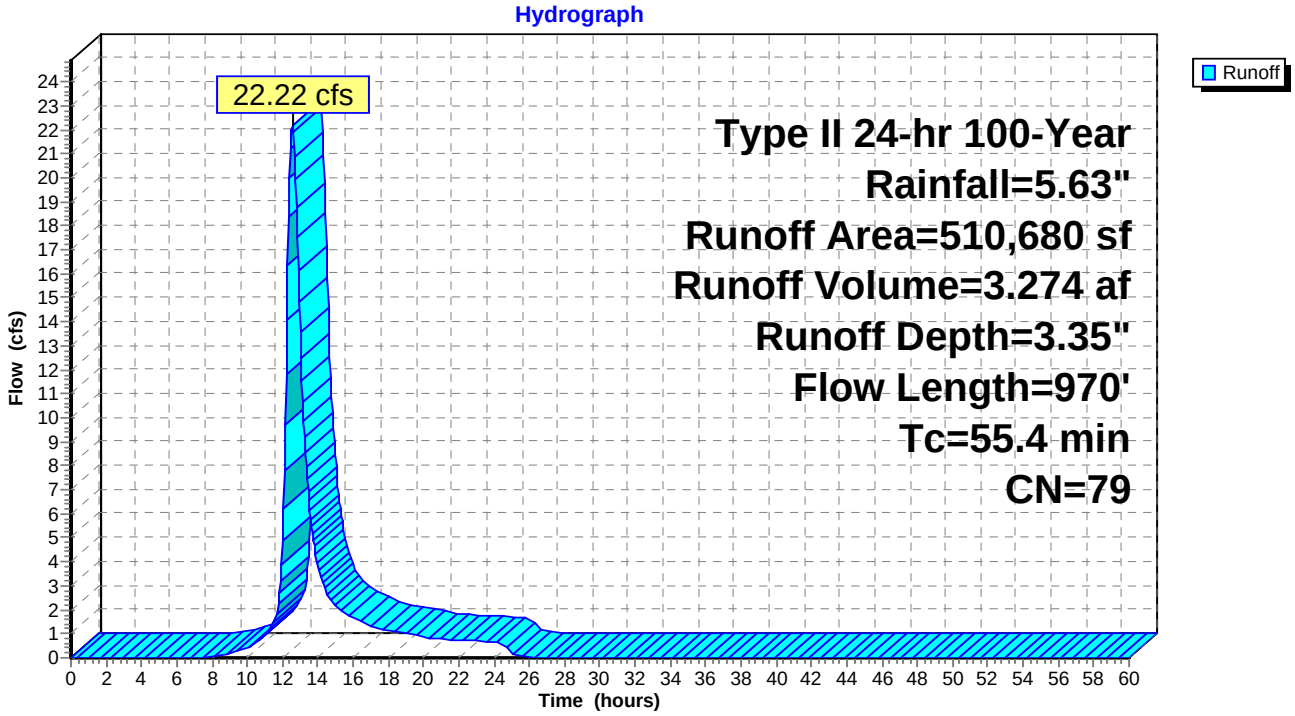
Runoff = 22.22 cfs @ 12.56 hrs, Volume= 3.274 af, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (sf)	CN	Description
*	510,680	79	Woods, Fair, HSG D (Assumed) - 950
	510,680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	100	0.0400	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 2.25"
21.6	870	0.0180	0.67		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
55.4	970	Total			

Subcatchment 1S: Site Pre to 10



Summary for Subcatchment 2S: Post Developed Overall

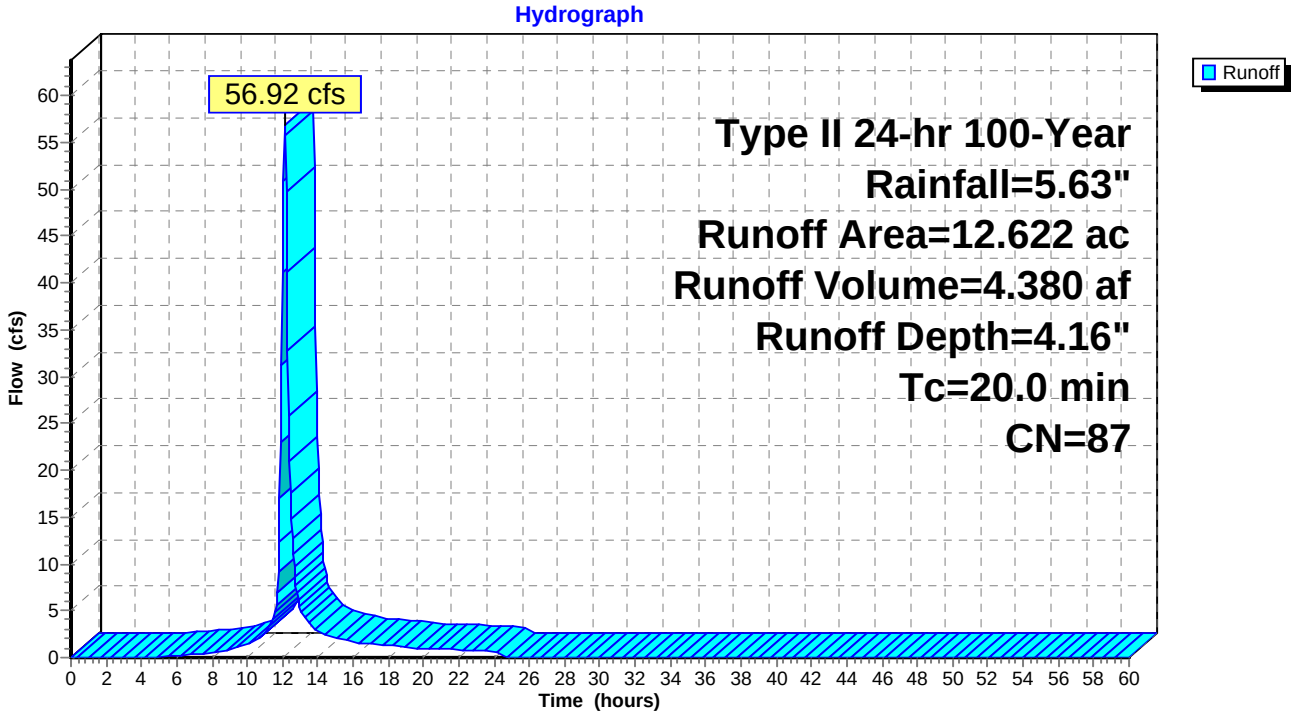
Runoff = 56.92 cfs @ 12.12 hrs, Volume= 4.380 af, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 17S: Dublin Schools On-Site Pre-10

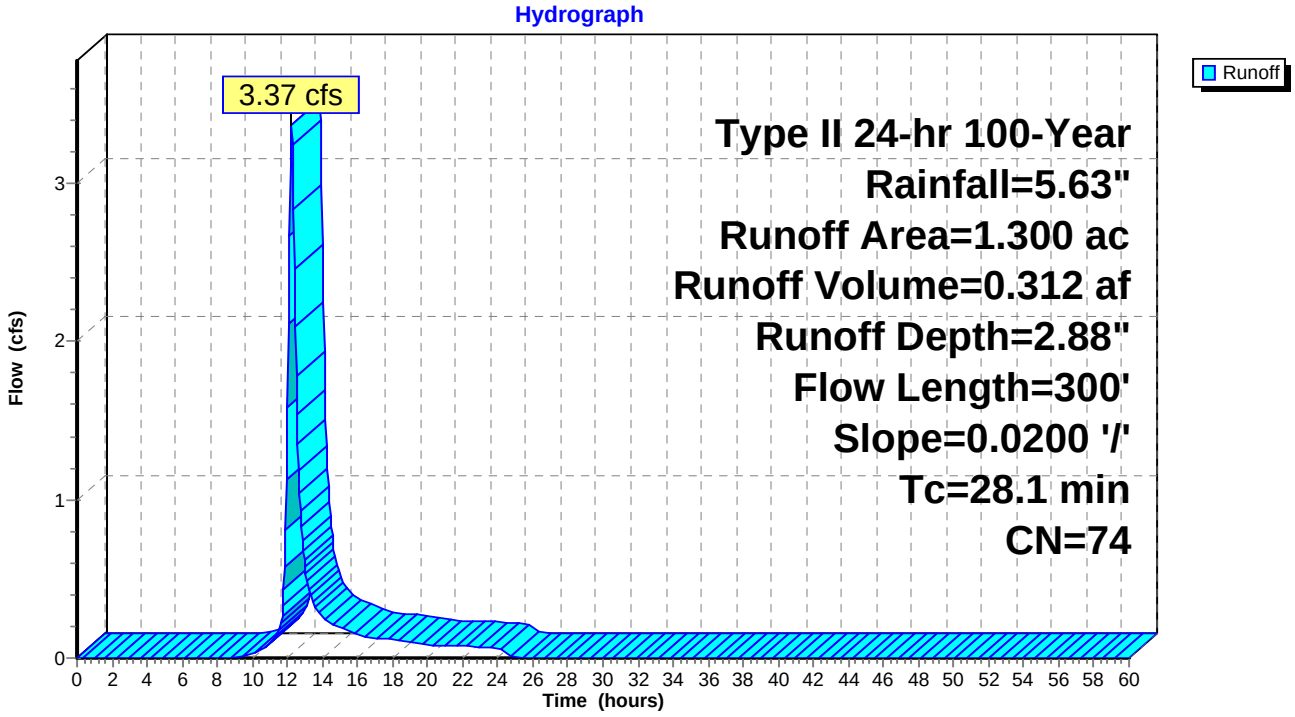
Runoff = 3.37 cfs @ 12.22 hrs, Volume= 0.312 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site Pre-10



Summary for Subcatchment 21S: Site Pre to 9

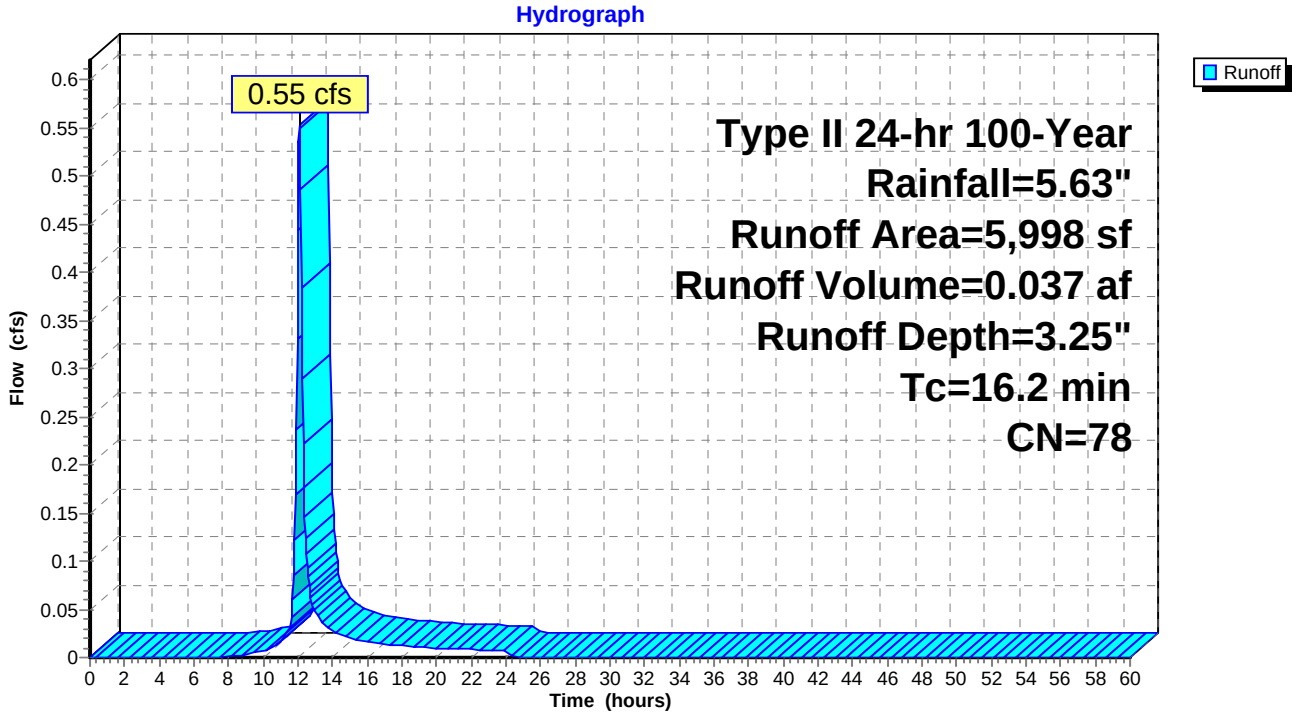
Runoff = 0.55 cfs @ 12.08 hrs, Volume= 0.037 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (sf)	CN	Description
*	5,998	78	Woods
	5,998		100.00% Pervious Area

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

Subcatchment 21S: Site Pre to 9



Summary for Subcatchment 22S: Dublin Schools Pre-9

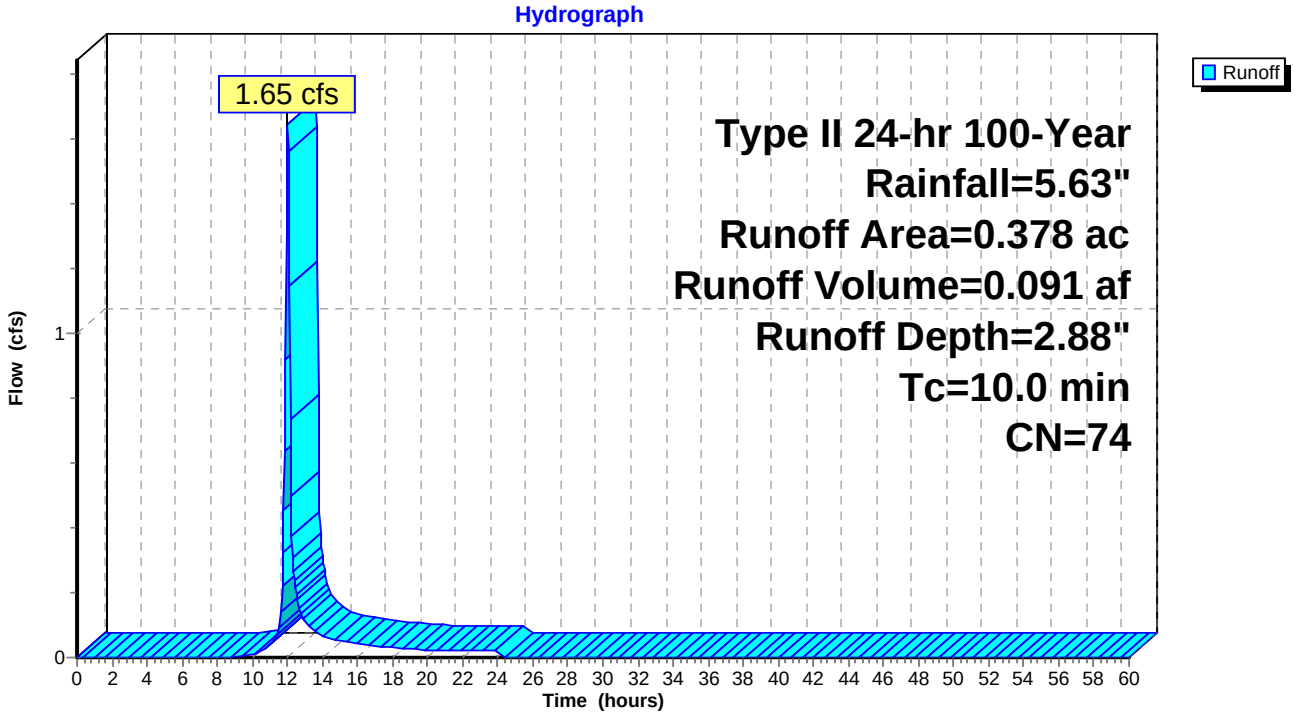
Runoff = 1.65 cfs @ 12.02 hrs, Volume= 0.091 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.378	74	Dublin Schools Lawn Area
	0.378		100.00% Pervious Area

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

Subcatchment 22S: Dublin Schools Pre-9



Summary for Subcatchment 23S: Pre-Developed Overall

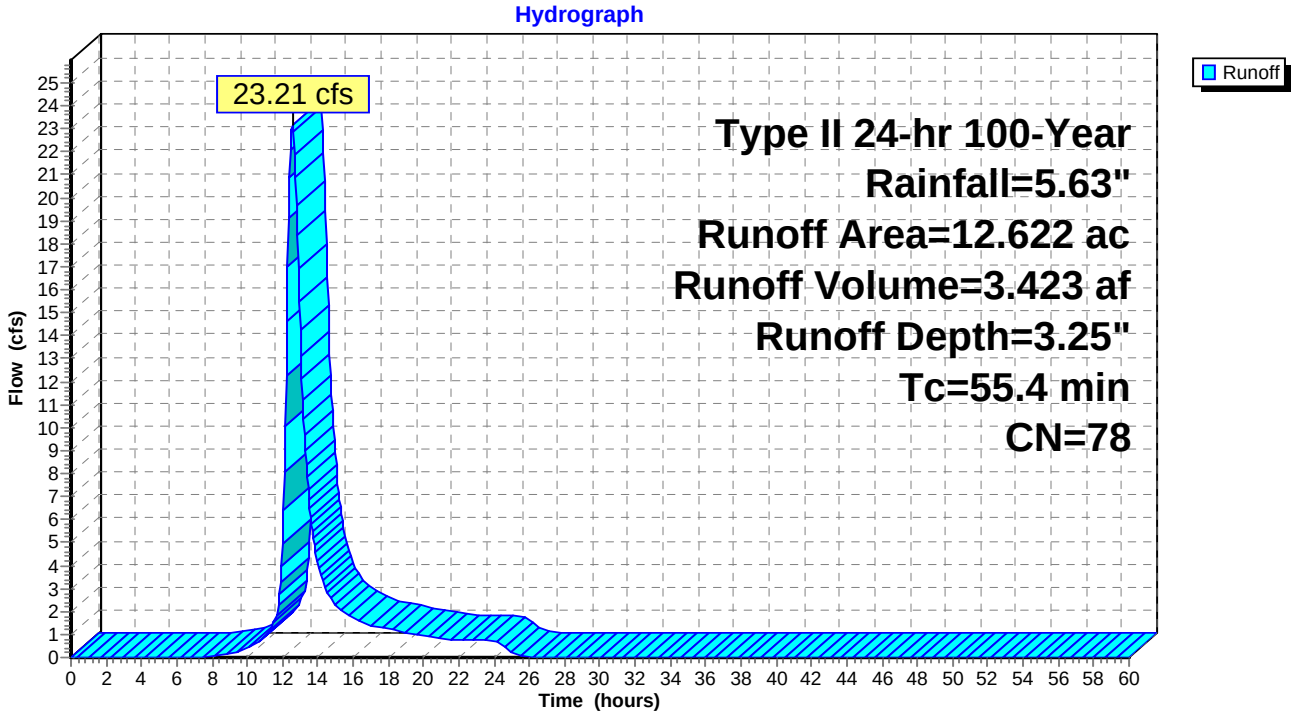
Runoff = 23.21 cfs @ 12.57 hrs, Volume= 3.423 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	12.622	78	Woods
	12.622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.4					**Direct Entry, Tc from 1S**

Subcatchment 23S: Pre-Developed Overall



Summary for Subcatchment 24S: Dublin Schools Pre-8

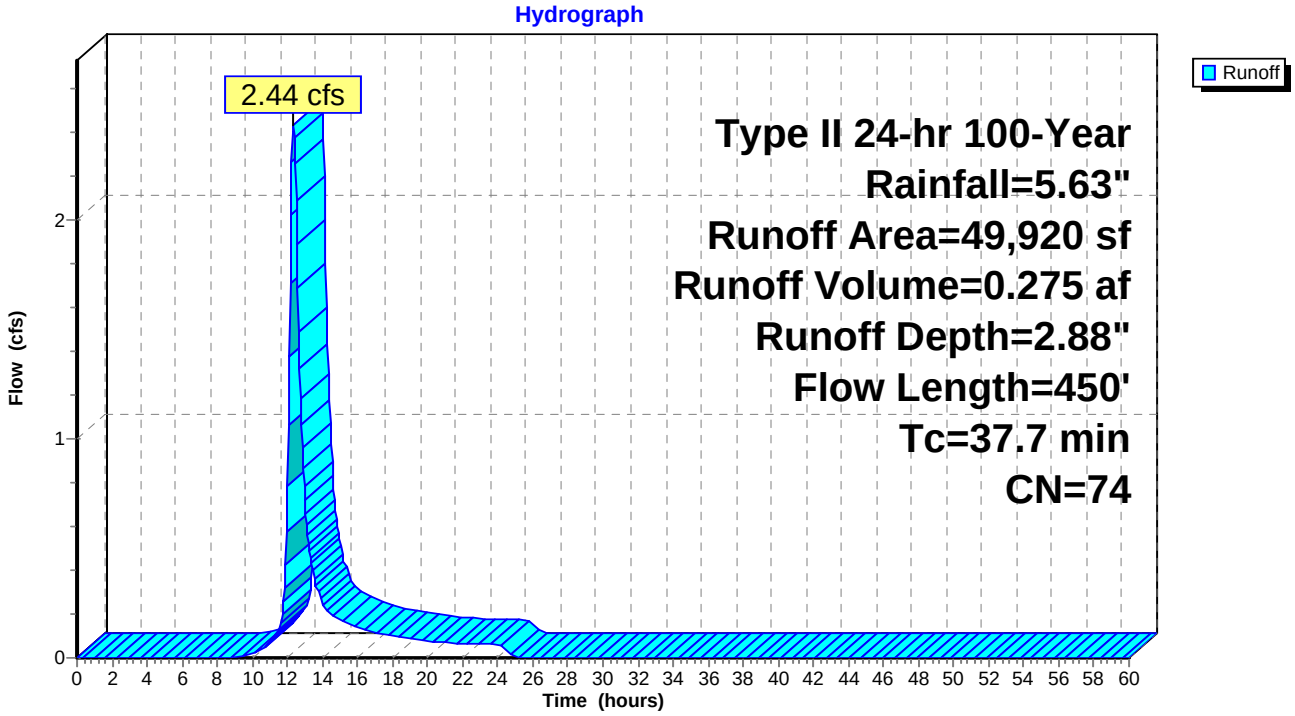
Runoff = 2.44 cfs @ 12.34 hrs, Volume= 0.275 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (sf)	CN	Description
*	49,920	74	Recreation Fields
	49,920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.1	300	0.0100	0.13		**Sheet Flow, Sheet across lawn/Rec Fields** Grass: Short n= 0.150 P2= 2.25"
0.6	150	0.0600	3.94		**Shallow Concentrated Flow, SCF Portion - Rec Fields** Unpaved Kv= 16.1 fps
37.7	450	Total			

Subcatchment 24S: Dublin Schools Pre-8



Summary for Subcatchment 25S: Site Pre to 8

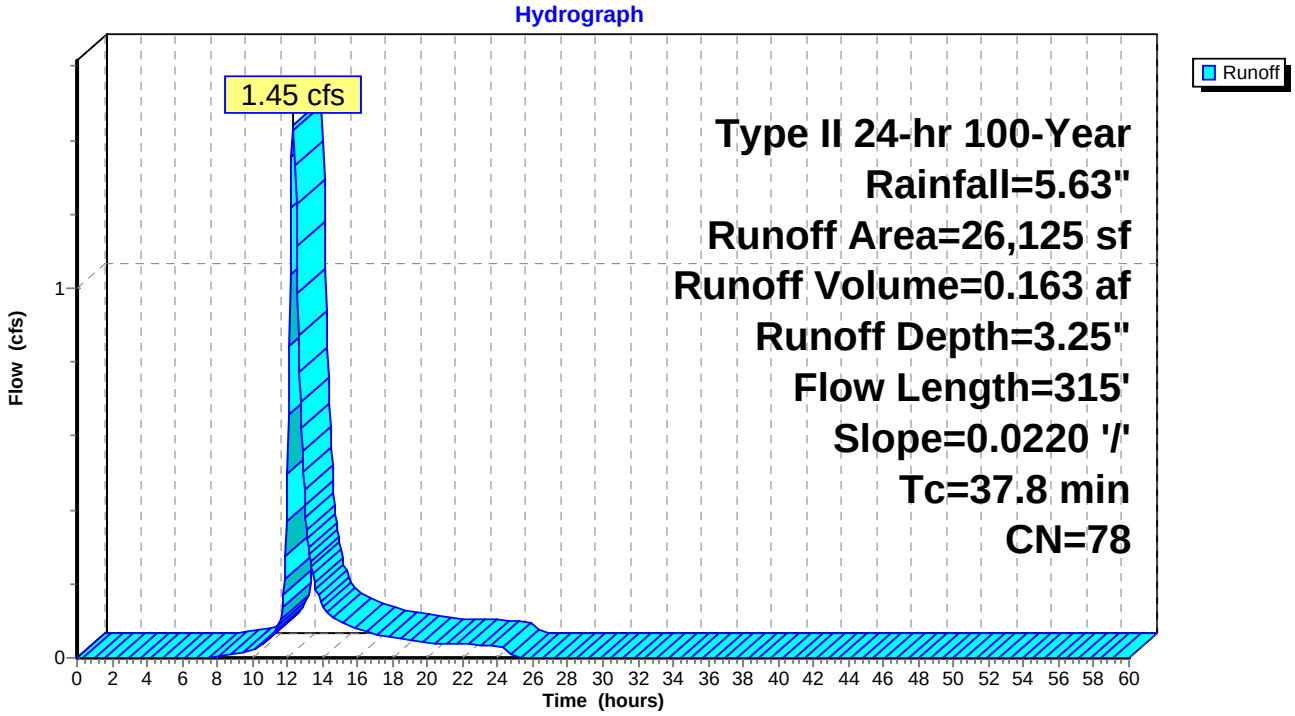
Runoff = 1.45 cfs @ 12.34 hrs, Volume= 0.163 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (sf)	CN	Description
*	26,125	78	Woods
	26,125		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	150	0.0220	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
3.7	165	0.0220	0.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
37.8	315	Total			

Subcatchment 25S: Site Pre to 8



Summary for Pond 16P: Ex. #10

Inflow Area = 13.024 ac, 0.00% Impervious, Inflow Depth = 3.30" for 100-Year event
Inflow = 23.82 cfs @ 12.52 hrs, Volume= 3.586 af
Outflow = 23.68 cfs @ 12.57 hrs, Volume= 4.057 af, Atten= 1%, Lag= 2.7 min
Primary = 23.68 cfs @ 12.57 hrs, Volume= 4.057 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.23' @ 12.57 hrs Surf.Area= 16,534 sf Storage= 5,360 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 37.2 min (898.1 - 860.9)

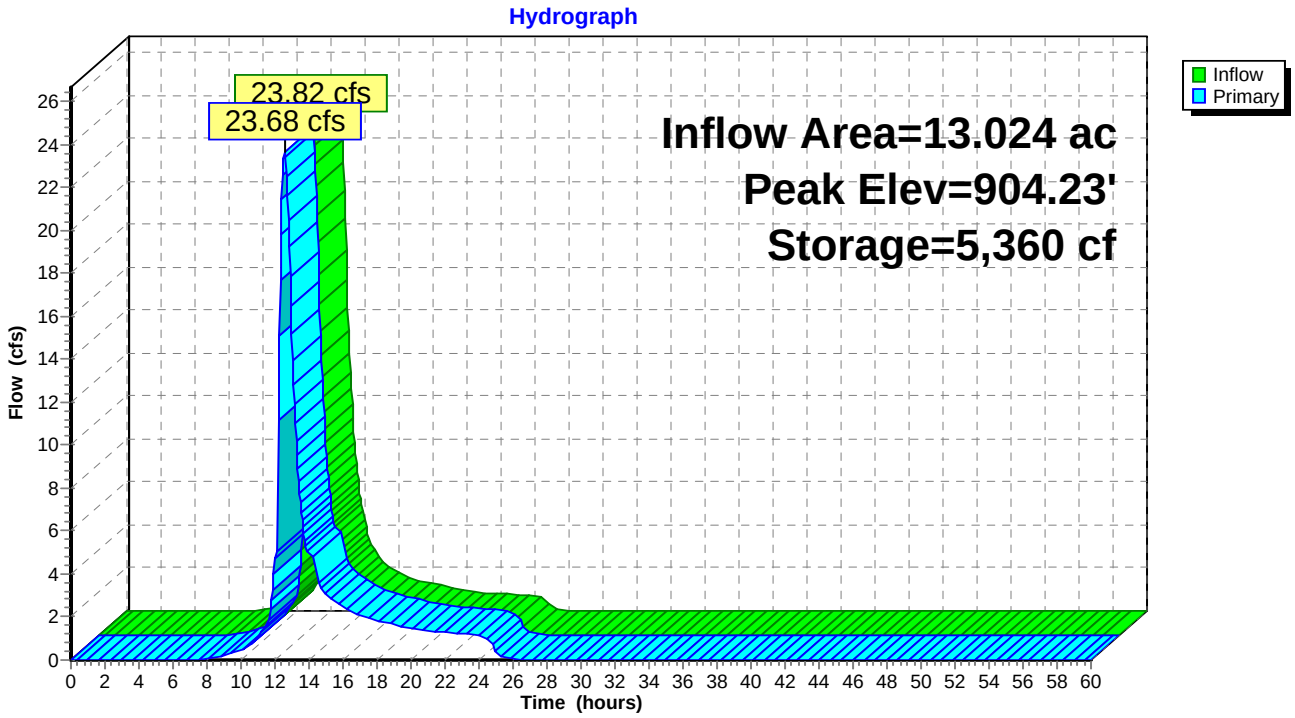
Volume	Invert	Avail.Storage	Storage Description
#1	903.20'	11,339 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.20	4	8.0	0	0	4
904.00	9,050	658.0	2,465	2,465	34,454
904.50	28,212	701.0	8,873	11,339	39,117

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=23.63 cfs @ 12.57 hrs HW=904.23' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.07 cfs @ 6.45 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 18.57 cfs @ 1.35 fps)

Pond 16P: Ex. #10



Summary for Pond 20P: Ex. # 9

Inflow Area = 0.516 ac, 0.00% Impervious, Inflow Depth = 2.98" for 100-Year event
Inflow = 2.14 cfs @ 12.03 hrs, Volume= 0.128 af
Outflow = 2.14 cfs @ 12.03 hrs, Volume= 0.128 af, Atten= 0%, Lag= 0.1 min
Primary = 2.14 cfs @ 12.03 hrs, Volume= 0.128 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 901.03' @ 12.03 hrs Surf.Area= 4 sf Storage= 7 cf

Plug-Flow detention time= 0.0 min calculated for 0.128 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (831.1 - 831.1)

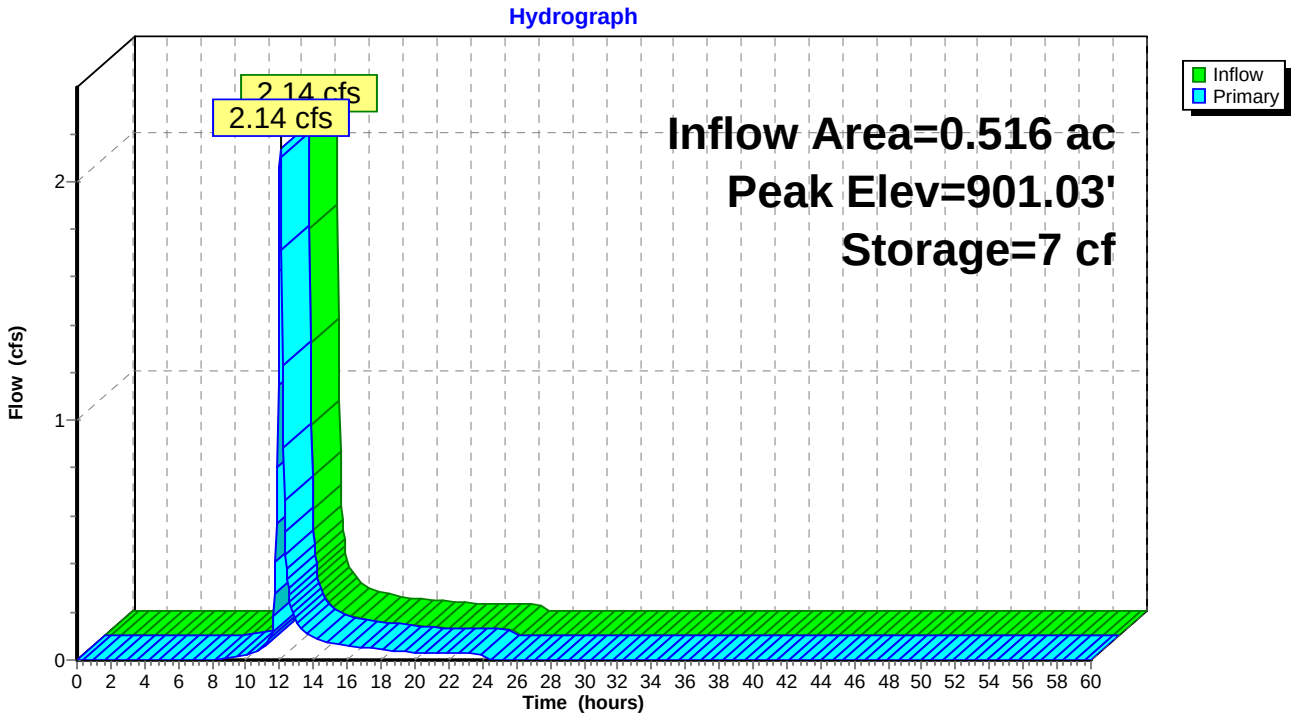
Volume	Invert	Avail.Storage	Storage Description
#1	899.19'	3,538 cf	**Ponding Area at West Basin (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.19	4	8.0	0	0	4
902.23	4	8.0	12	12	28
904.00	1,047	140.0	658	670	1,588
905.00	5,219	296.0	2,868	3,538	7,005

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=2.09 cfs @ 12.03 hrs HW=900.95' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 2.09 cfs @ 5.98 fps)

Pond 20P: Ex. # 9


Hydrograph
2.14 cfs
2.14 cfs
Inflow Area=0.516 ac
Peak Elev=901.03'
Storage=7 cf
Inflow
Primary
Flow (cfs)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 22P: Ex. # 8

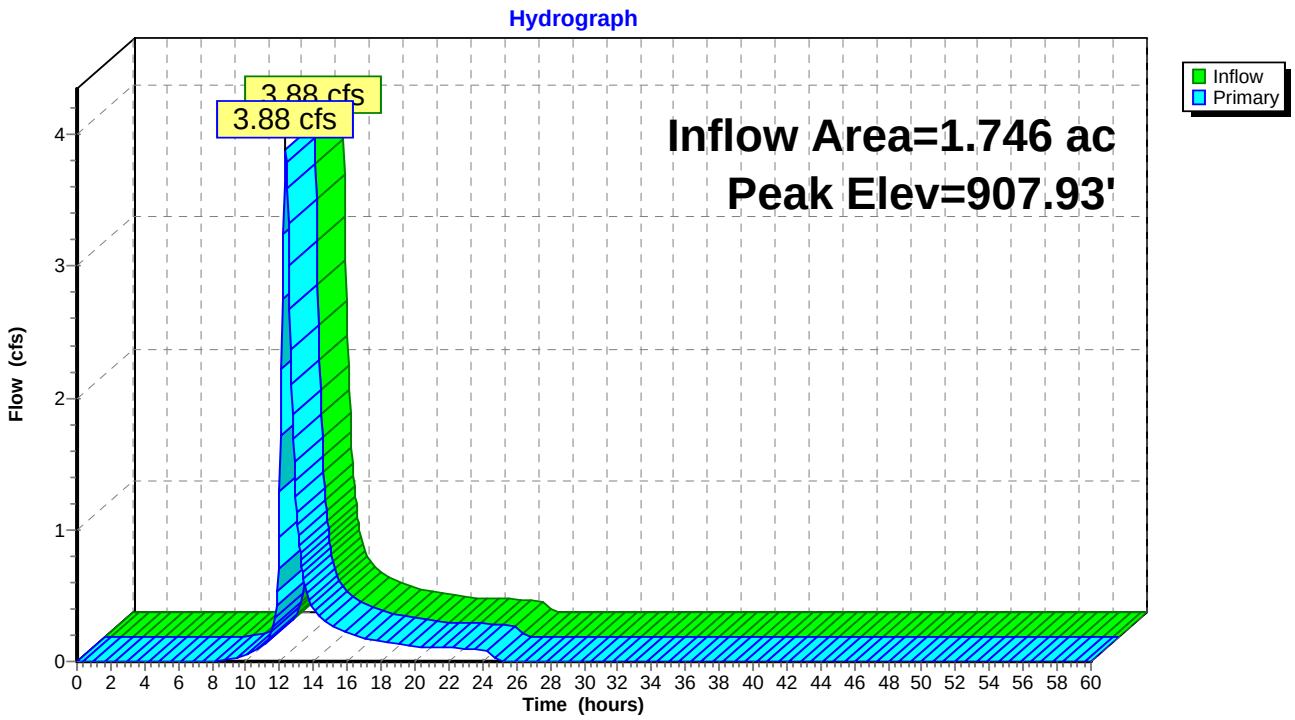
Inflow Area =	1.746 ac,	0.00% Impervious,	Inflow Depth =	3.01"	for 100-Year event
Inflow =	3.88 cfs @	12.34 hrs,	Volume=	0.437 af	
Outflow =	3.88 cfs @	12.34 hrs,	Volume=	0.437 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.88 cfs @	12.34 hrs,	Volume=	0.437 af	

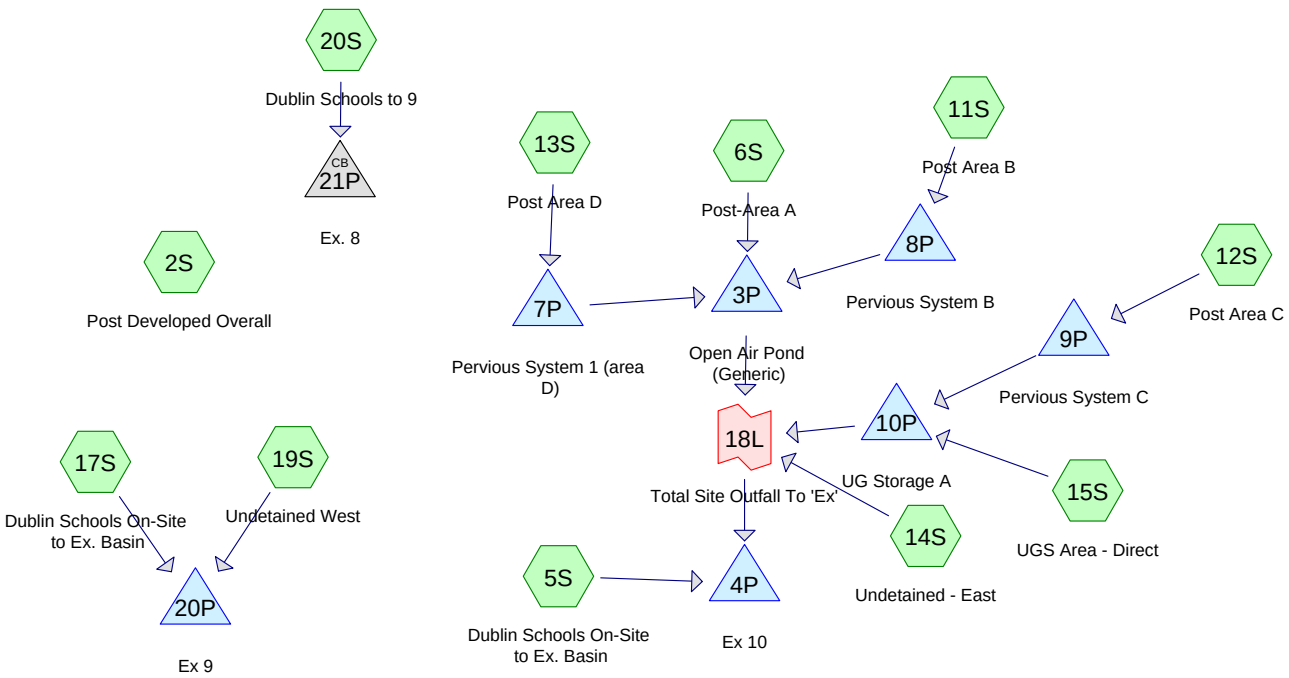
Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 907.93' @ 12.34 hrs

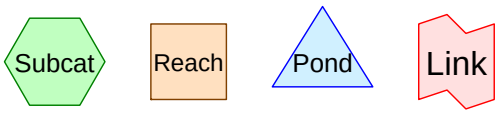
Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=3.87 cfs @ 12.34 hrs HW=907.90' (Free Discharge)
└**1=Pipe Leaving Structure** (Orifice Controls 3.87 cfs @ 11.09 fps)

Pond 22P: Ex. # 8







Drainage Diagram for FDP Calculations
Prepared by Microsoft, Printed 11/23/2015
HydroCAD® 9.10 s/n 05053 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 2S: Post Developed Overall

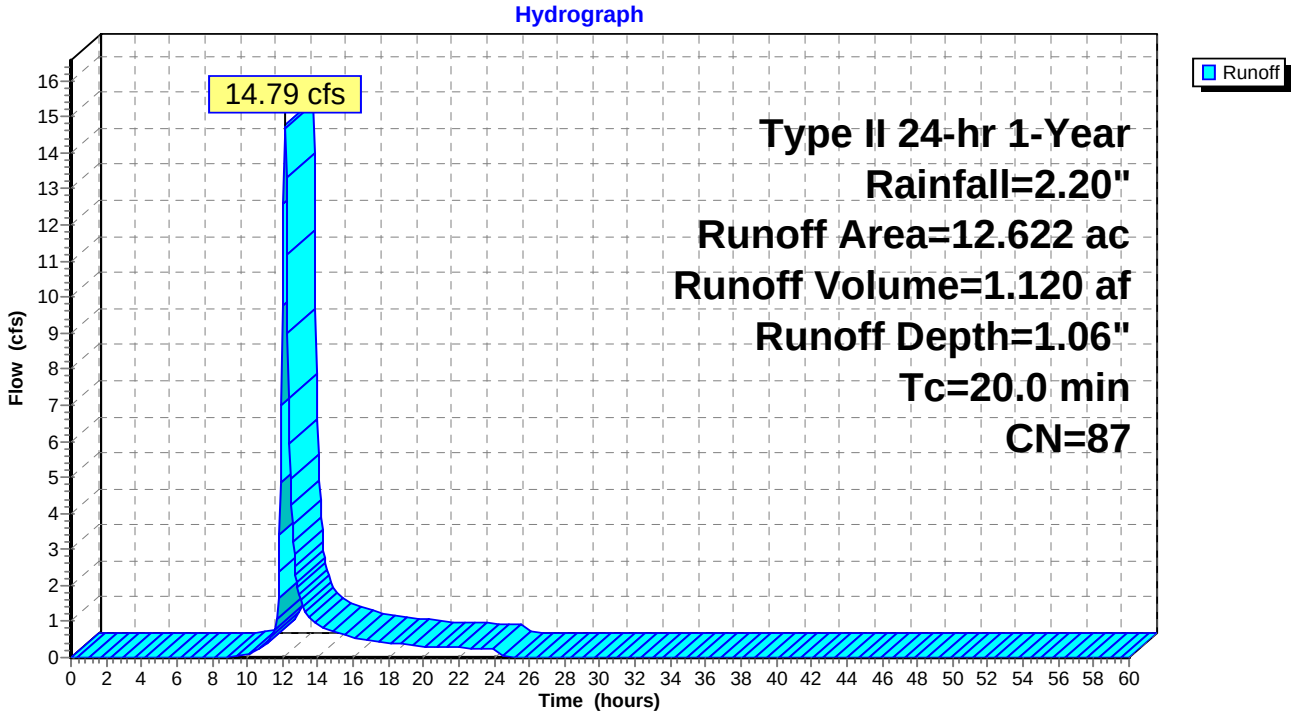
Runoff = 14.79 cfs @ 12.13 hrs, Volume= 1.120 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

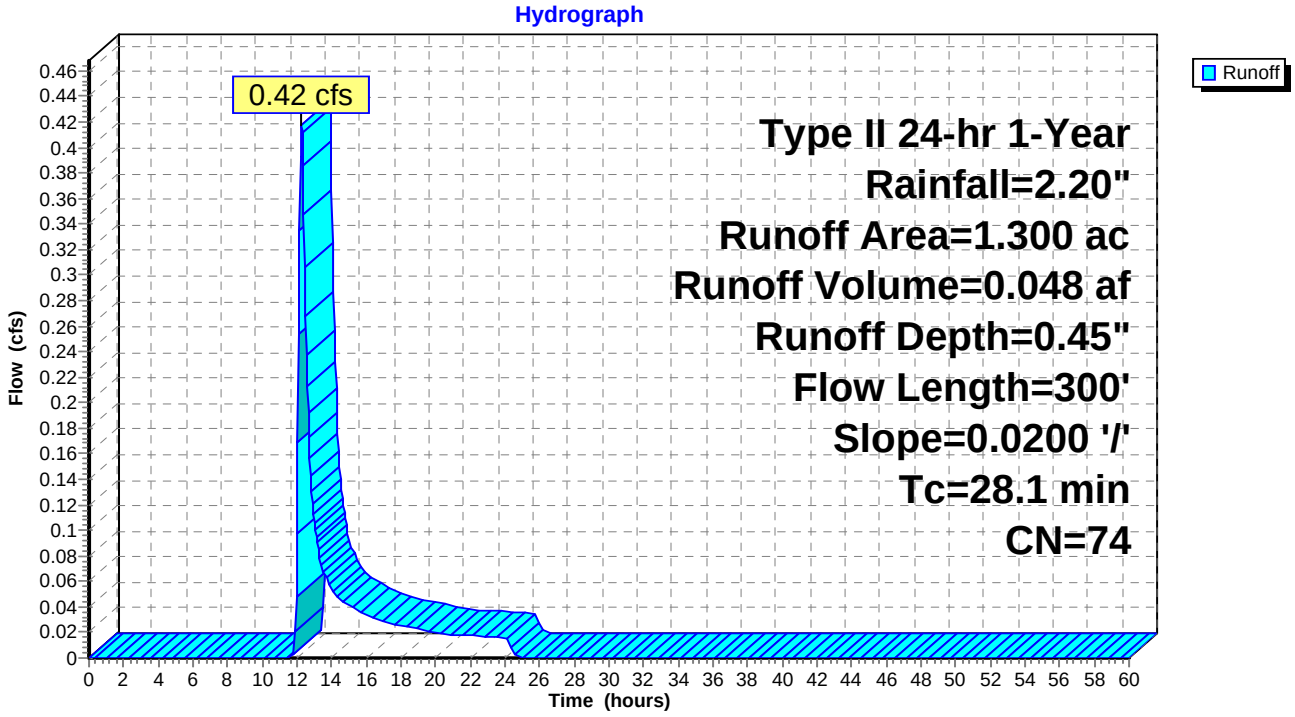
Runoff = 0.42 cfs @ 12.27 hrs, Volume= 0.048 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

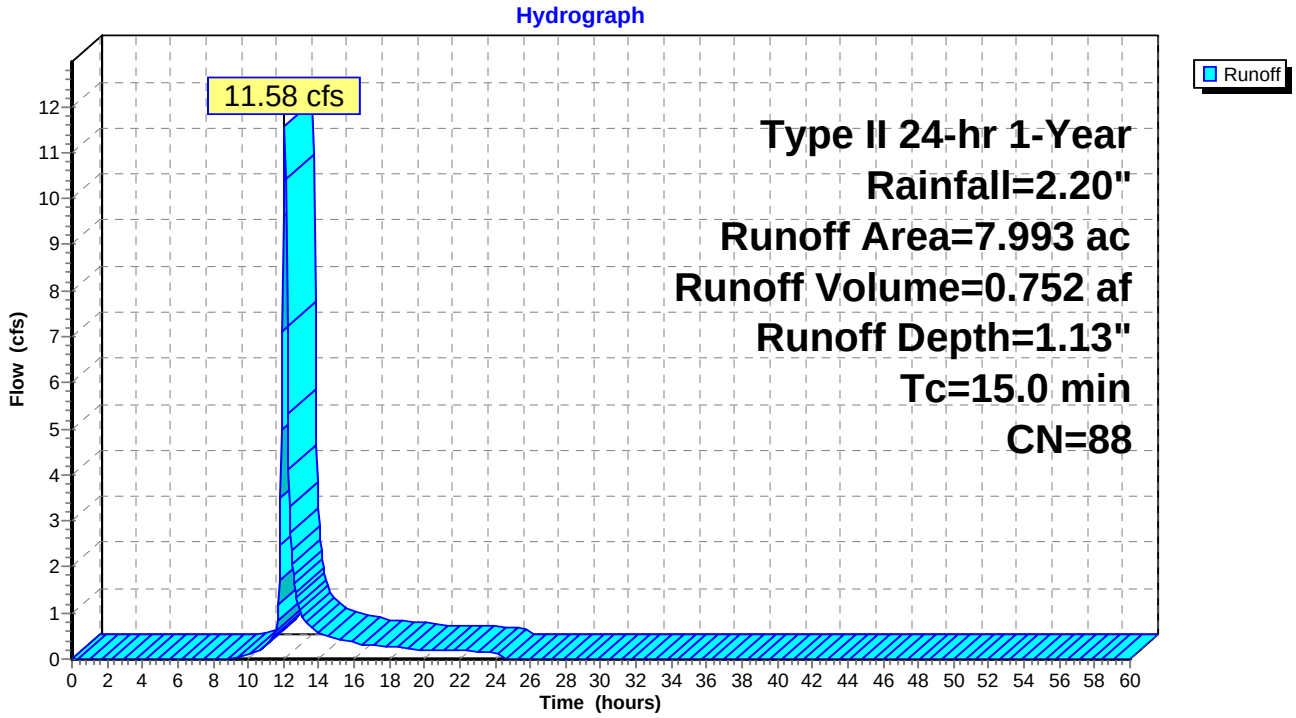
Runoff = 11.58 cfs @ 12.07 hrs, Volume= 0.752 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

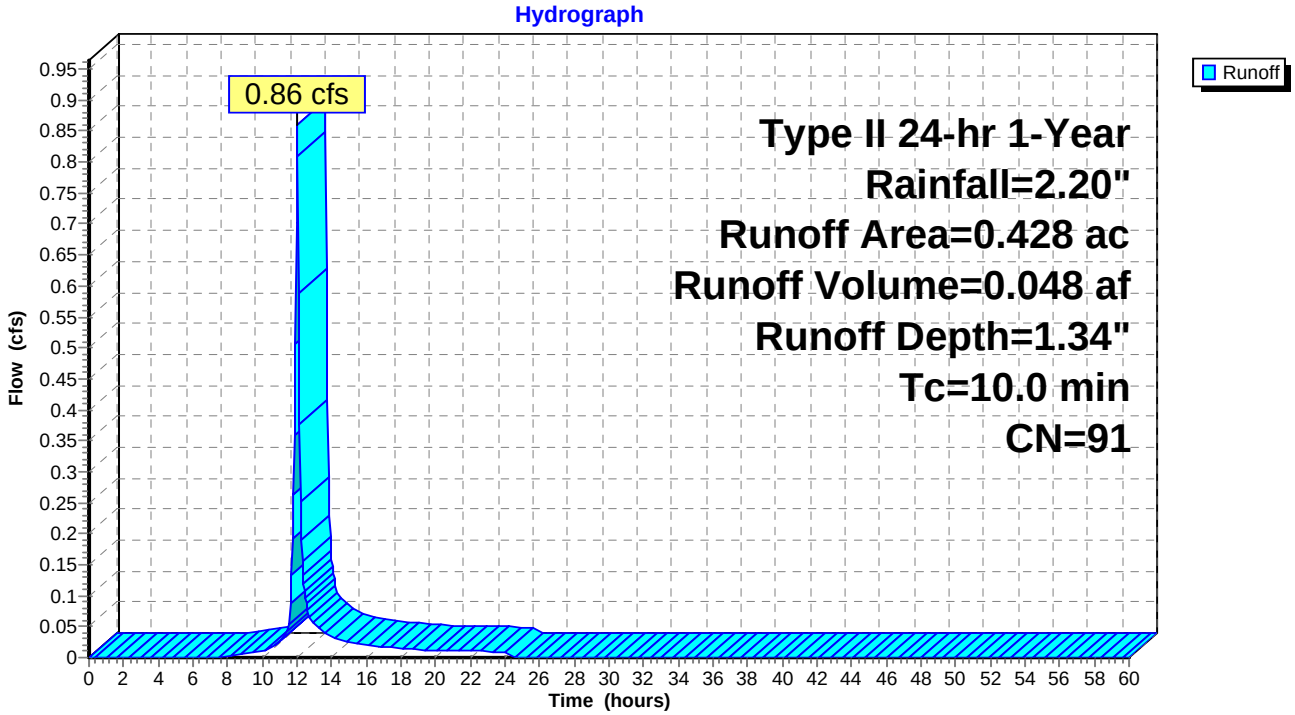
Runoff = 0.86 cfs @ 12.01 hrs, Volume= 0.048 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

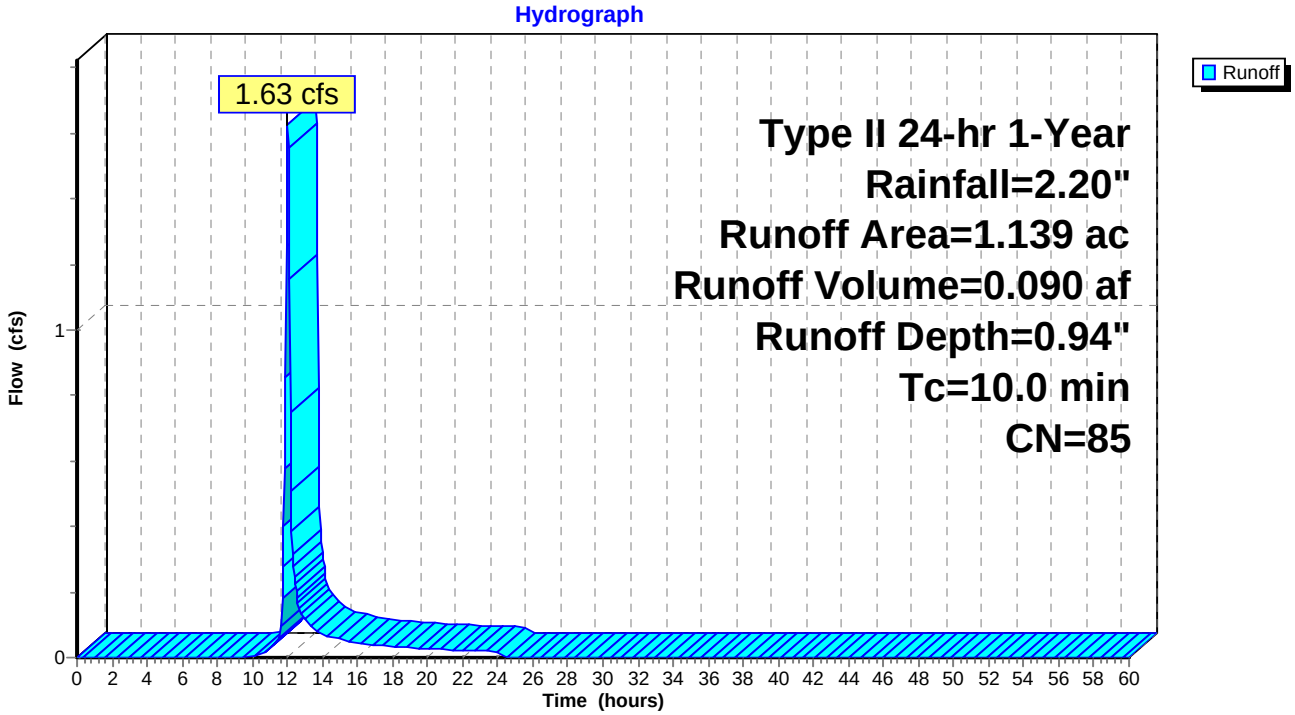
Runoff = 1.63 cfs @ 12.02 hrs, Volume= 0.090 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

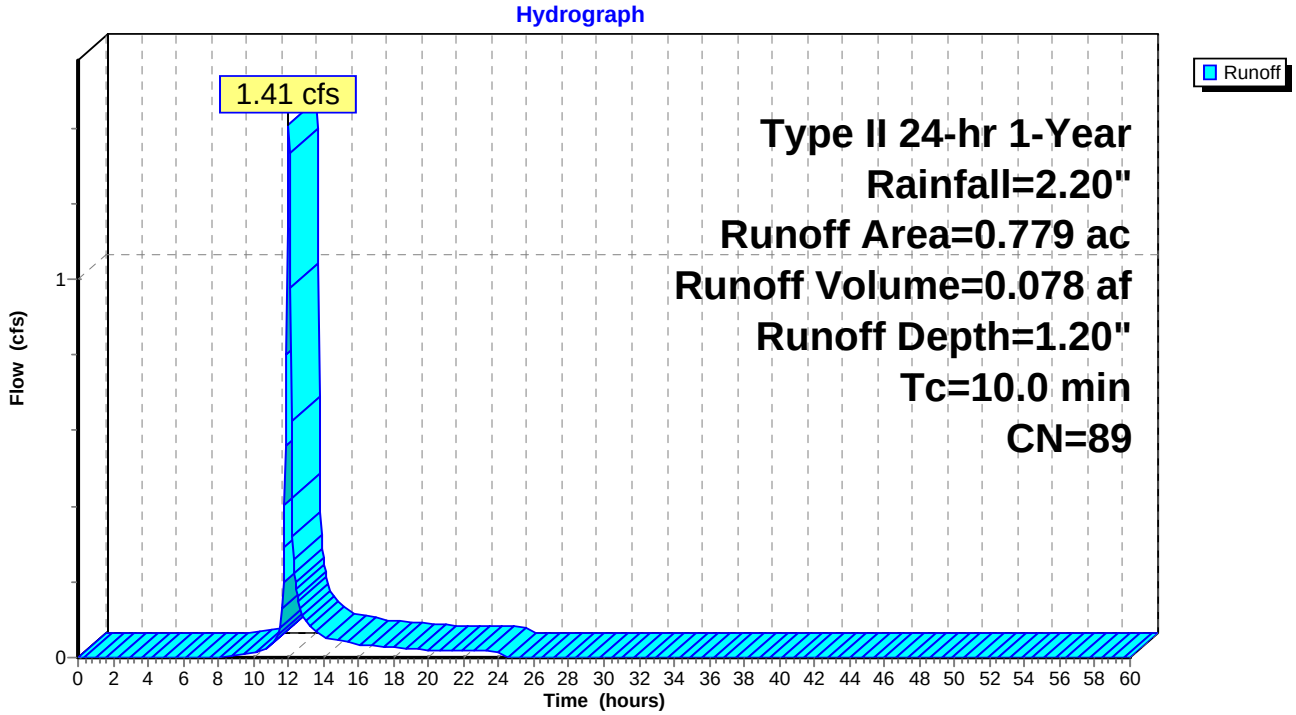
Runoff = 1.41 cfs @ 12.02 hrs, Volume= 0.078 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

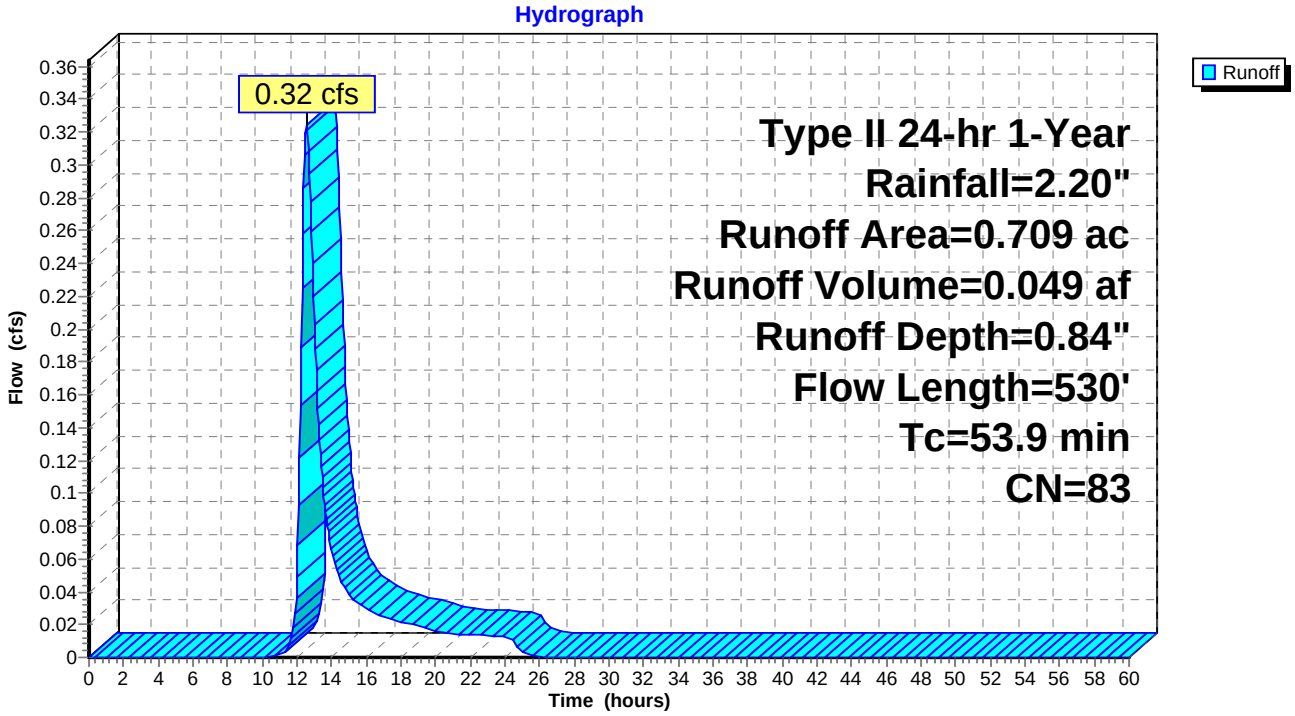
Runoff = 0.32 cfs @ 12.57 hrs, Volume= 0.049 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

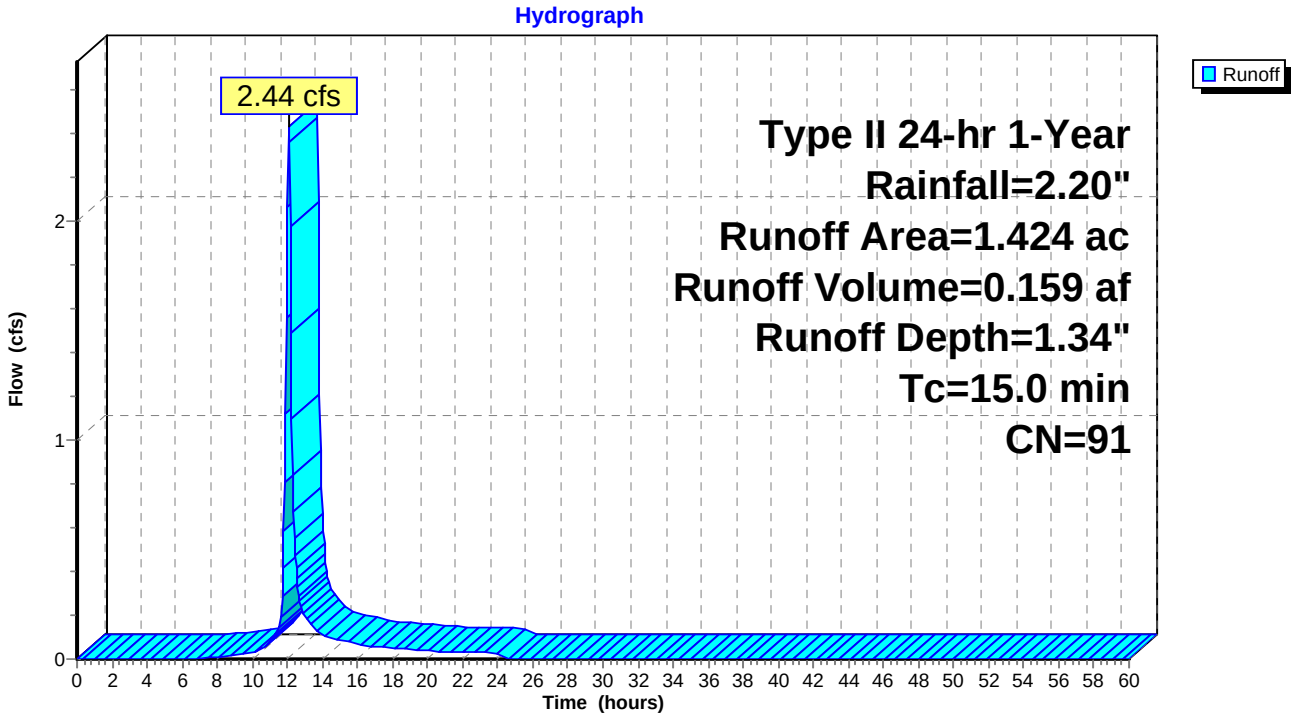
Runoff = 2.44 cfs @ 12.07 hrs, Volume= 0.159 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

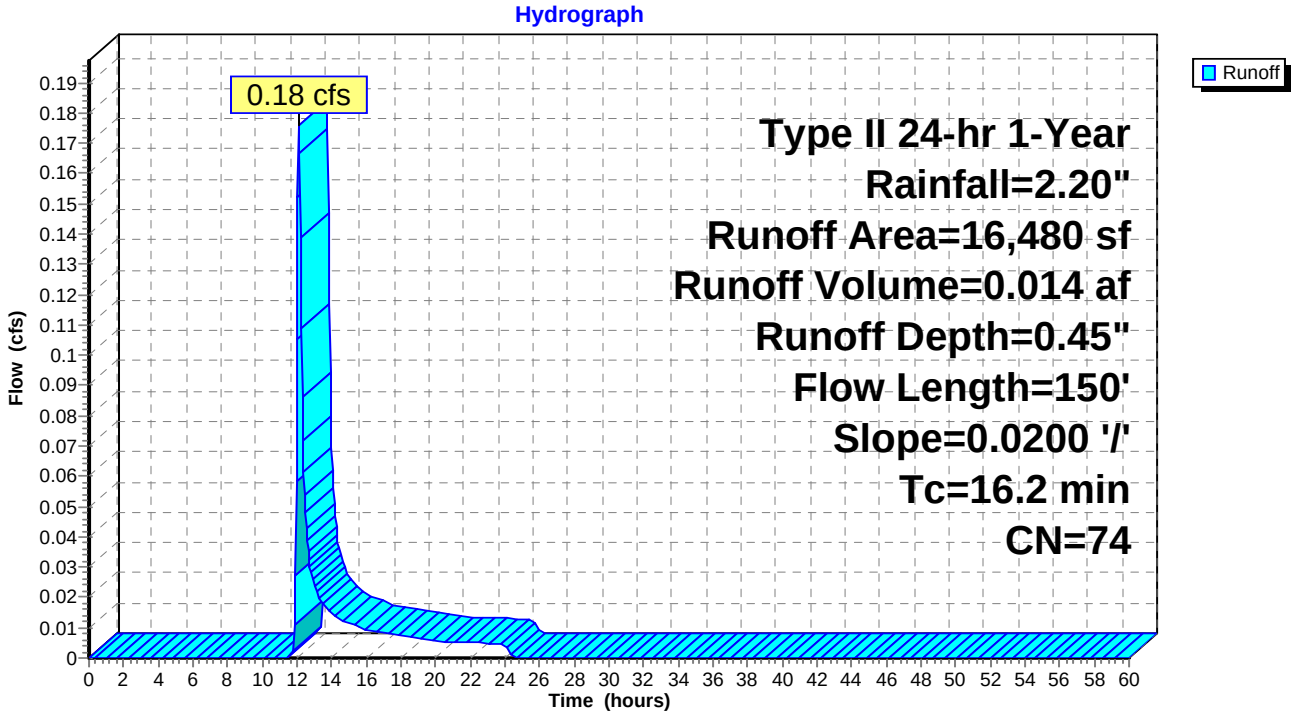
Runoff = 0.18 cfs @ 12.11 hrs, Volume= 0.014 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



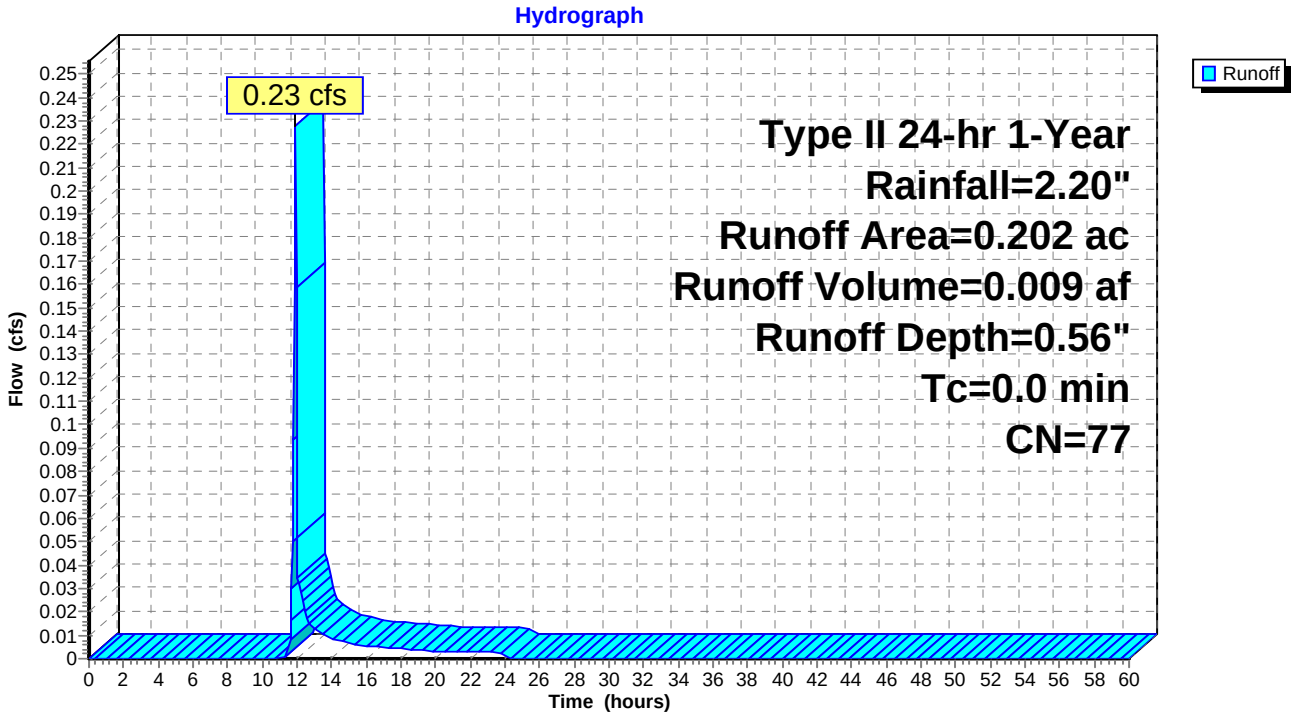
Summary for Subcatchment 19S: Undetained West

Runoff = 0.23 cfs @ 11.90 hrs, Volume= 0.009 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

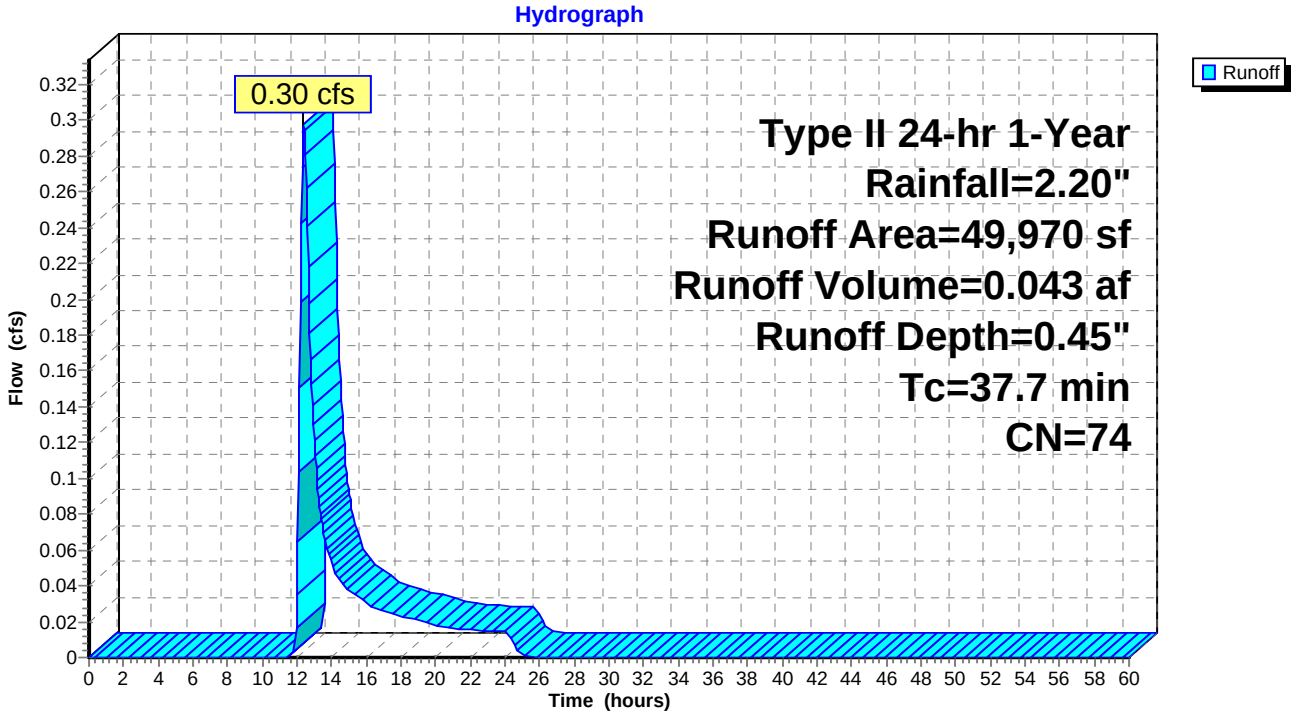
Runoff = 0.30 cfs @ 12.40 hrs, Volume= 0.043 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 1.13" for 1-Year event
Inflow = 12.25 cfs @ 12.08 hrs, Volume= 0.868 af
Outflow = 1.00 cfs @ 13.38 hrs, Volume= 0.864 af, Atten= 92%, Lag= 78.2 min
Primary = 1.00 cfs @ 13.38 hrs, Volume= 0.864 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 908.62' @ 13.38 hrs Surf.Area= 28,502 sf Storage= 41,623 cf (19,205 cf above start)

Plug-Flow detention time= 733.6 min calculated for 0.349 af (40% of inflow)
Center-of-Mass det. time= 282.9 min (1,129.2 - 846.4)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

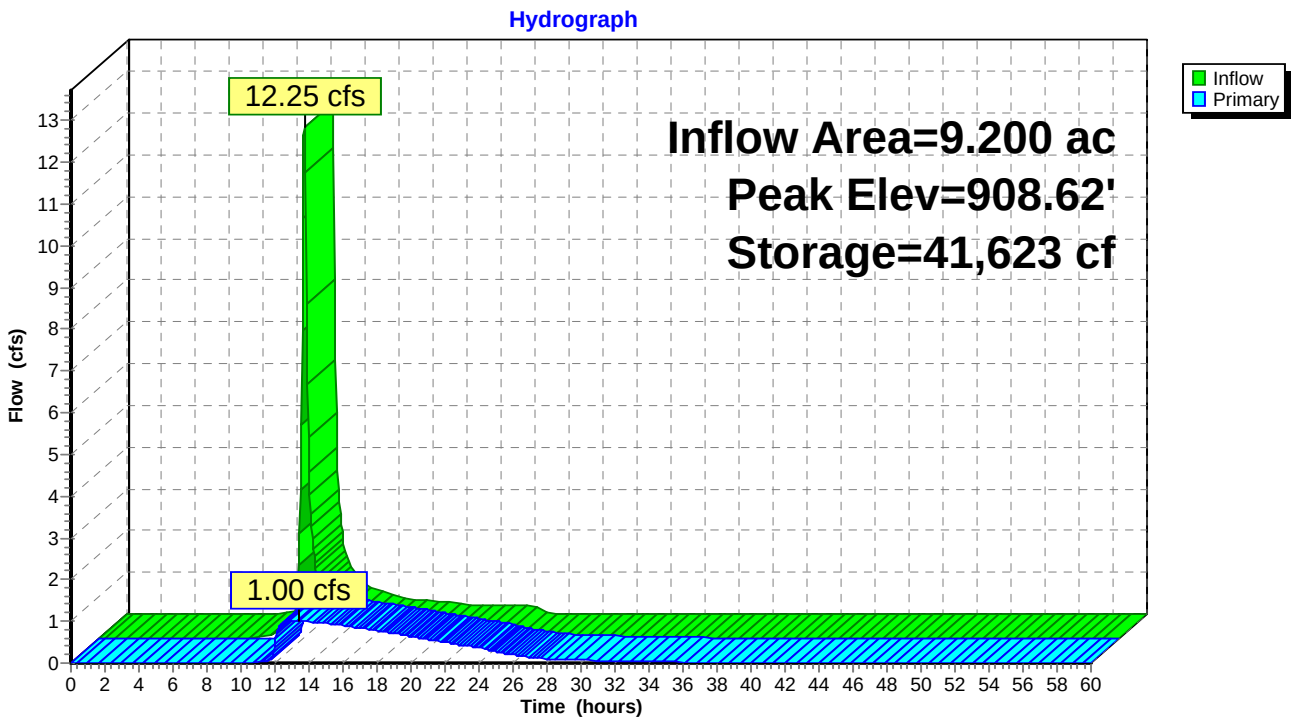
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.00 cfs @ 13.38 hrs HW=908.62' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.00 cfs @ 5.09 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 1.04" for 1-Year event
Inflow = 1.97 cfs @ 12.40 hrs, Volume= 1.194 af
Outflow = 1.97 cfs @ 12.40 hrs, Volume= 1.194 af, Atten= 0%, Lag= 0.0 min
Primary = 1.97 cfs @ 12.40 hrs, Volume= 1.194 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 899.67' @ 12.40 hrs Surf.Area= 4 sf Storage= 6 cf

Plug-Flow detention time= 0.2 min calculated for 1.194 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,083.4 - 1,083.3)

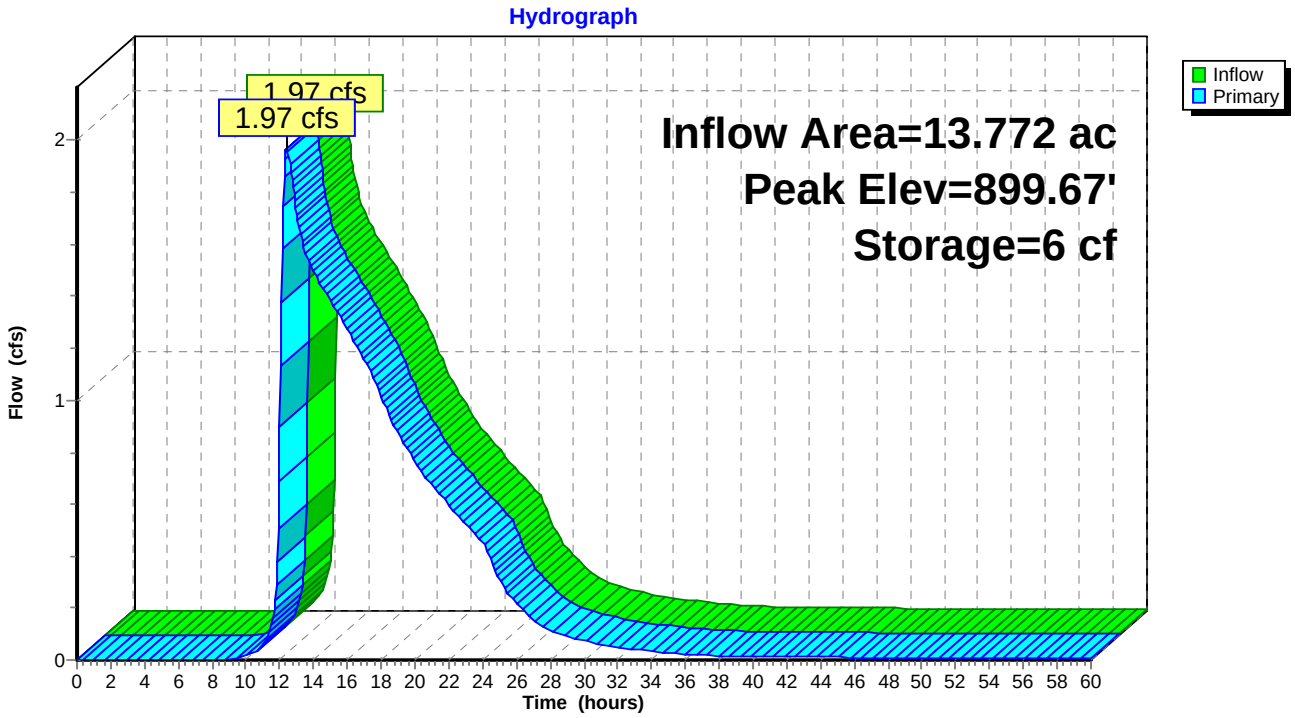
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.97 cfs @ 12.40 hrs HW=899.67' (Free Discharge)
└─**1=Existing 12" Storm** (Inlet Controls 1.97 cfs @ 2.77 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 4P: Ex 10


Hydrograph
1.97 cfs
1.97 cfs
Inflow Area=13.772 ac
Peak Elev=899.67'
Storage=6 cf
Inflow
Primary
Flow (cfs)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 1.20" for 1-Year event
Inflow = 1.41 cfs @ 12.02 hrs, Volume= 0.078 af
Outflow = 0.54 cfs @ 12.17 hrs, Volume= 0.069 af, Atten= 62%, Lag= 9.4 min
Primary = 0.54 cfs @ 12.17 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 911.08' @ 12.17 hrs Surf.Area= 1,938 sf Storage= 1,293 cf

Plug-Flow detention time= 134.6 min calculated for 0.069 af (88% of inflow)
Center-of-Mass det. time= 78.8 min (906.3 - 827.5)

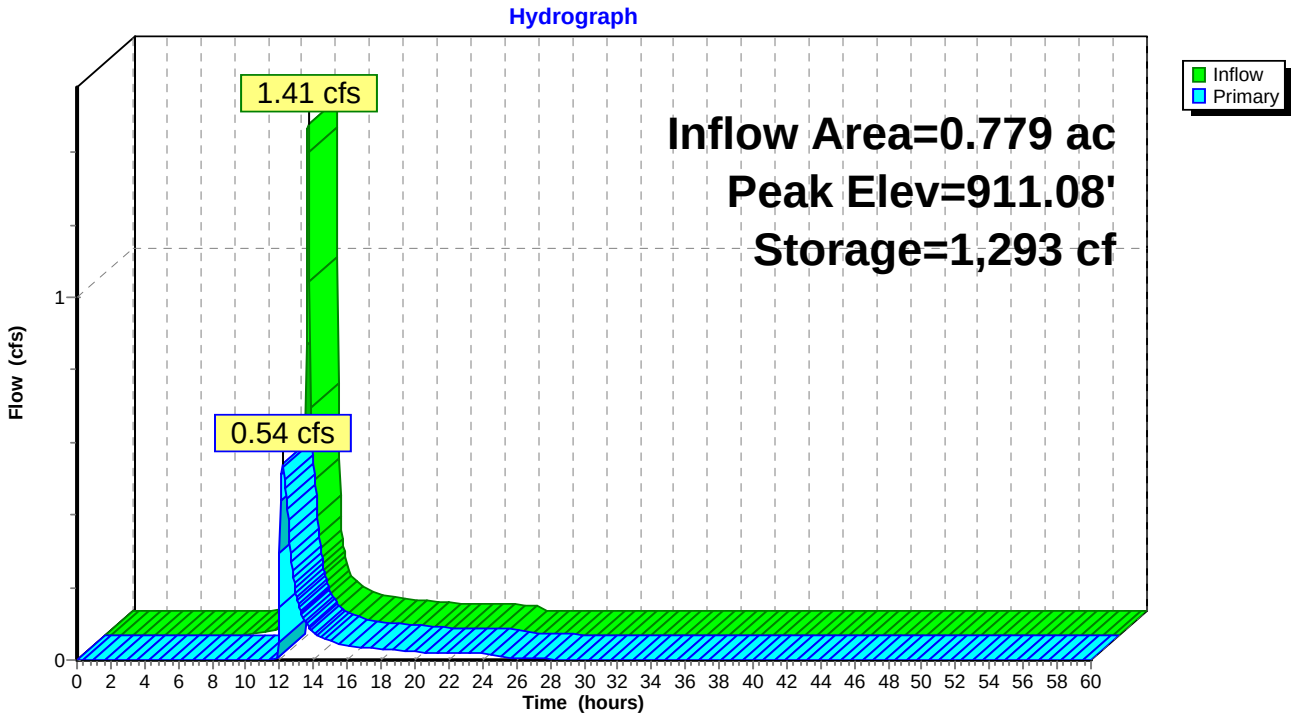
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.54 cfs @ 12.17 hrs HW=911.07' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.54 cfs @ 2.74 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 1.34" for 1-Year event
Inflow = 0.86 cfs @ 12.01 hrs, Volume= 0.048 af
Outflow = 0.24 cfs @ 12.22 hrs, Volume= 0.048 af, Atten= 72%, Lag= 12.2 min
Primary = 0.24 cfs @ 12.22 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 914.49' @ 12.22 hrs Surf.Area= 4,150 sf Storage= 807 cf

Plug-Flow detention time= 95.7 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 95.5 min (913.4 - 817.9)

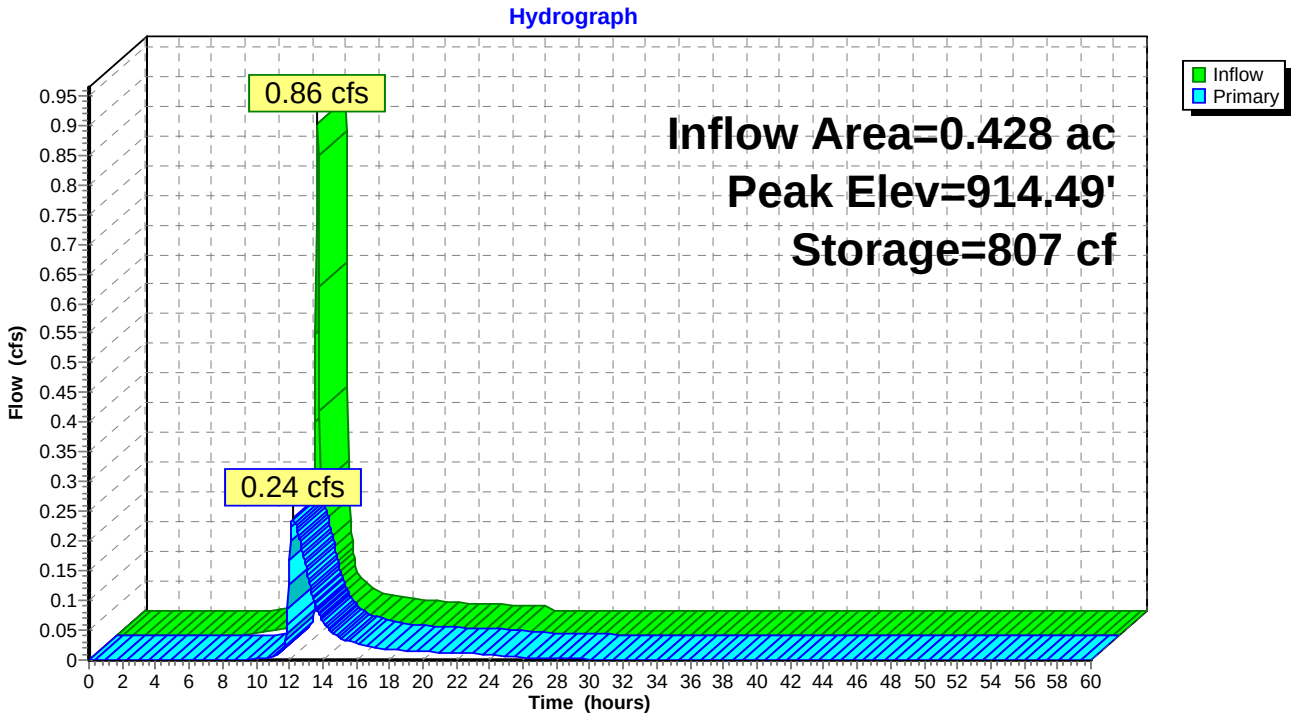
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.24 cfs @ 12.22 hrs HW=914.49' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.24 cfs @ 2.72 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 0.94" for 1-Year event
Inflow = 1.63 cfs @ 12.02 hrs, Volume= 0.090 af
Outflow = 0.16 cfs @ 12.62 hrs, Volume= 0.073 af, Atten= 90%, Lag= 35.9 min
Primary = 0.16 cfs @ 12.62 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 907.90' @ 12.62 hrs Surf.Area= 3,449 sf Storage= 1,849 cf

Plug-Flow detention time= 263.6 min calculated for 0.073 af (82% of inflow)
Center-of-Mass det. time= 185.7 min (1,030.2 - 844.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

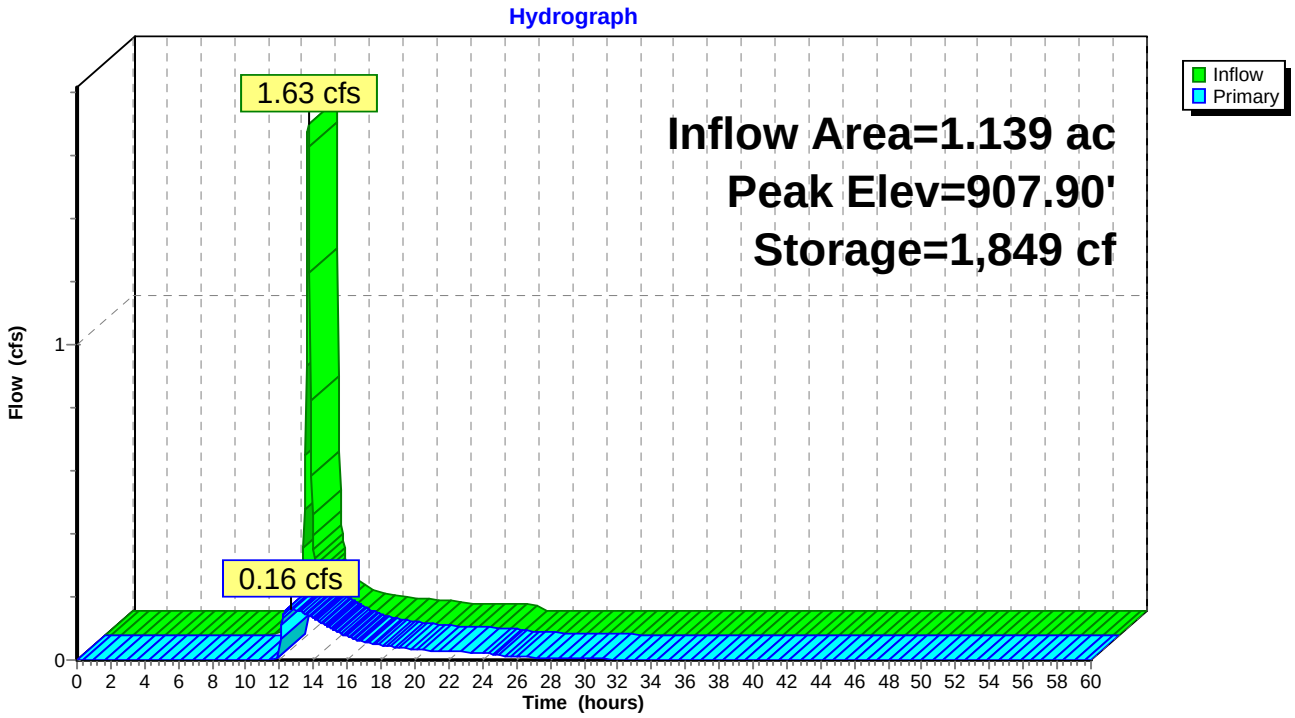
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=0.16 cfs @ 12.62 hrs HW=907.90' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.16 cfs @ 2.44 fps)
└─**2=2nd Stage Orifice** (Controls 0.00 cfs)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 1.09" for 1-Year event
Inflow = 2.52 cfs @ 12.07 hrs, Volume= 0.233 af
Outflow = 0.41 cfs @ 12.74 hrs, Volume= 0.232 af, Atten= 84%, Lag= 39.8 min
Primary = 0.41 cfs @ 12.74 hrs, Volume= 0.232 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 906.13' @ 12.74 hrs Surf.Area= 4,540 sf Storage= 3,233 cf

Plug-Flow detention time= 102.4 min calculated for 0.232 af (100% of inflow)
Center-of-Mass det. time= 101.1 min (989.3 - 888.2)

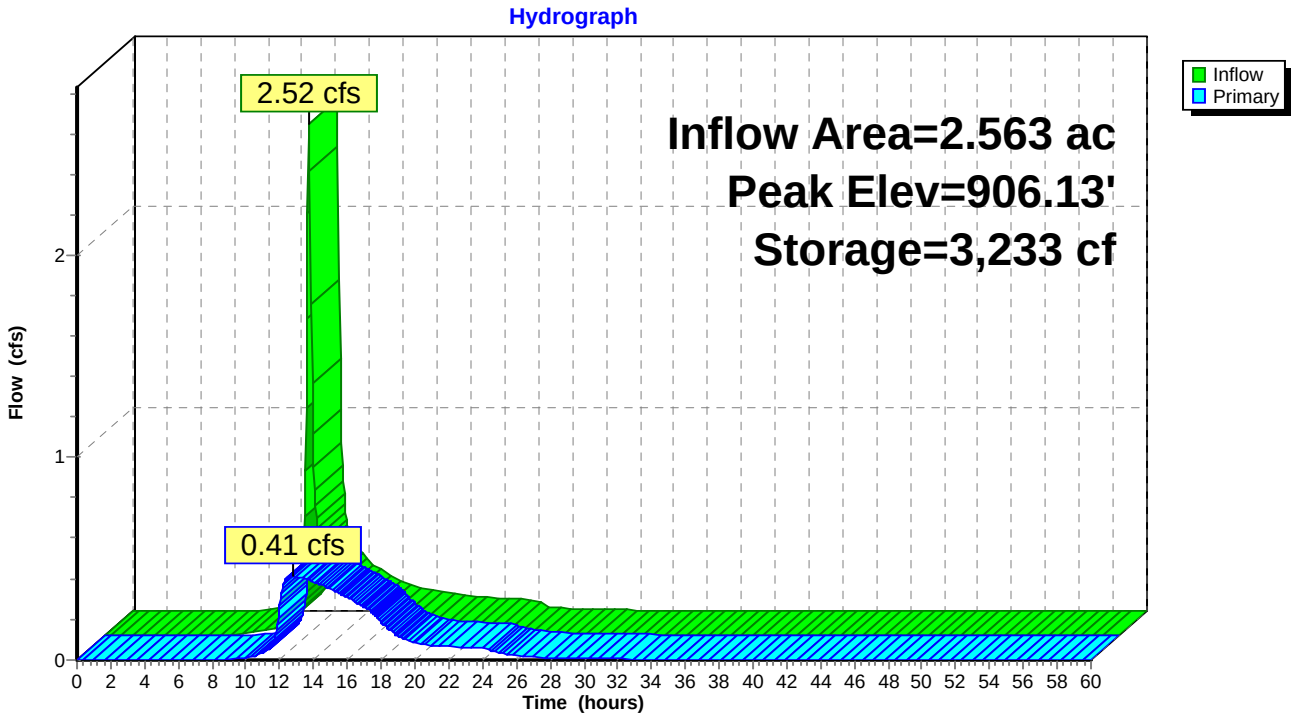
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=0.41 cfs @ 12.74 hrs HW=906.13' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.41 cfs @ 4.72 fps)
└─**2=2nd Stage Weir** (Controls 0.00 cfs)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 0.49" for 1-Year event
Inflow = 0.26 cfs @ 11.91 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 11.91 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.1 min
Primary = 0.26 cfs @ 11.91 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.36' @ 11.91 hrs Surf.Area= 4 sf Storage= 1 cf

Plug-Flow detention time= 0.2 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (885.7 - 885.6)

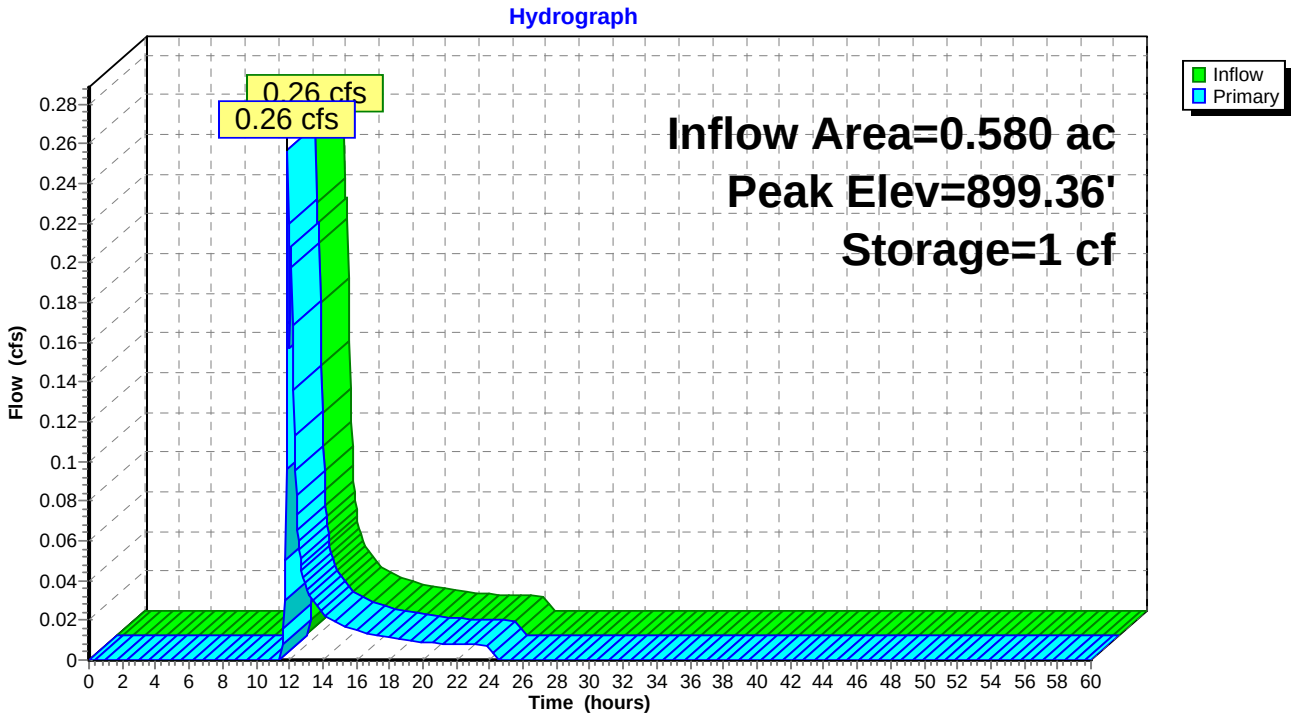
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.25 cfs @ 11.91 hrs HW=899.36' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.25 cfs @ 1.79 fps)

Pond 20P: Ex 9


Hydrograph
0.26 cfs
0.26 cfs
Inflow Area=0.580 ac
Peak Elev=899.36'
Storage=1 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 21P: Ex. 8

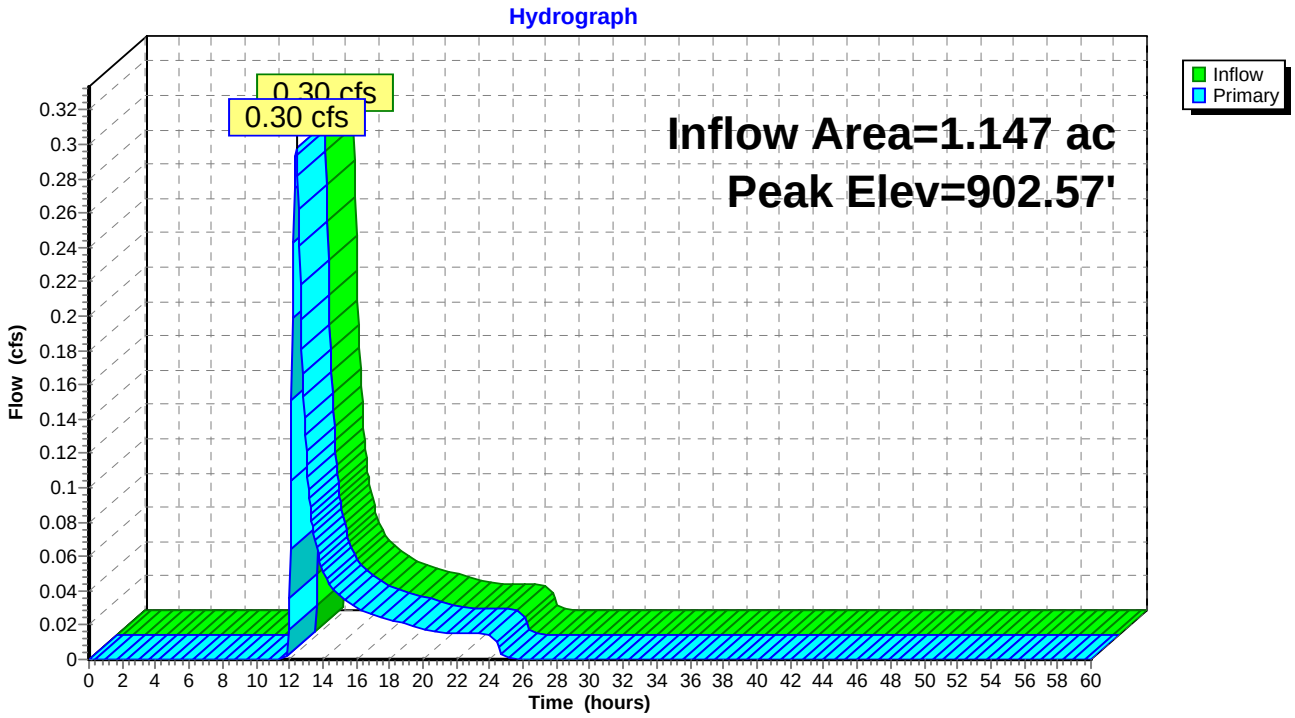
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	0.45"	for 1-Year event
Inflow =	0.30 cfs @	12.40 hrs,	Volume=	0.043 af	
Outflow =	0.30 cfs @	12.40 hrs,	Volume=	0.043 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.30 cfs @	12.40 hrs,	Volume=	0.043 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 902.57' @ 12.40 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.30 cfs @ 12.40 hrs HW=902.57' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.30 cfs @ 1.89 fps)

Pond 21P: Ex. 8

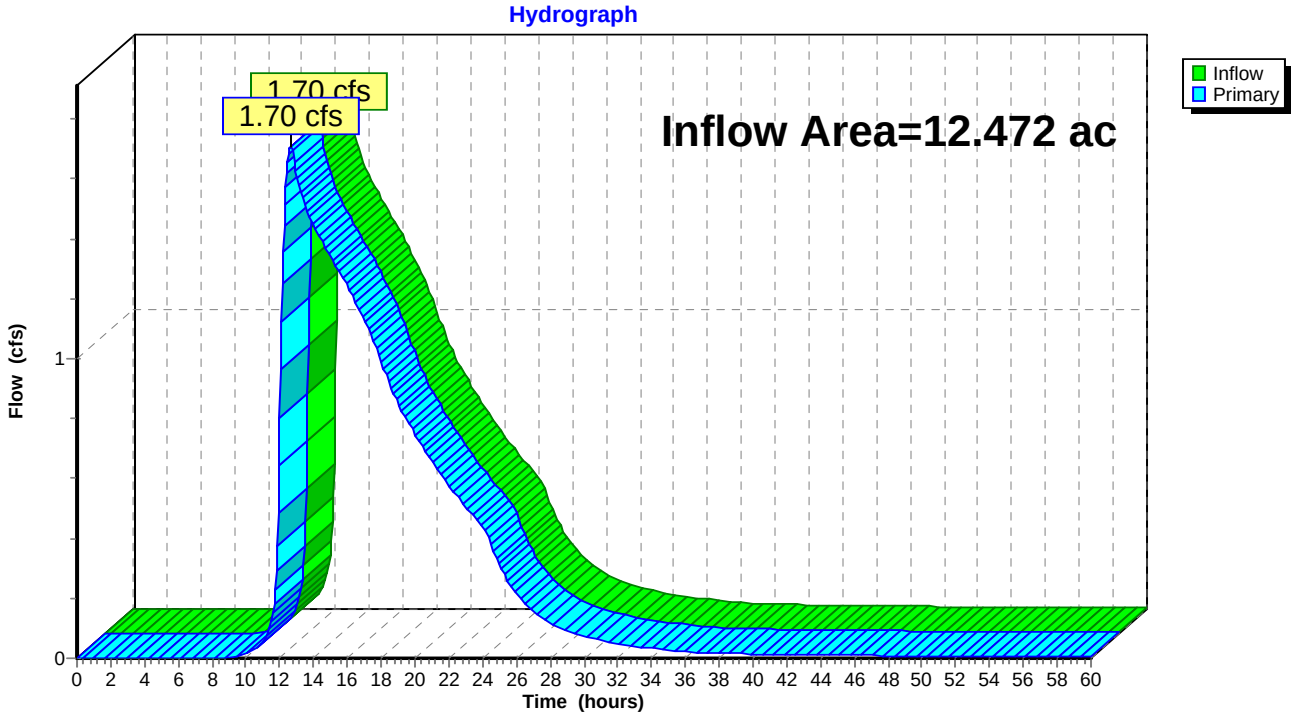


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 1.10" for 1-Year event
Inflow = 1.70 cfs @ 12.63 hrs, Volume= 1.146 af
Primary = 1.70 cfs @ 12.63 hrs, Volume= 1.146 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



Summary for Subcatchment 2S: Post Developed Overall

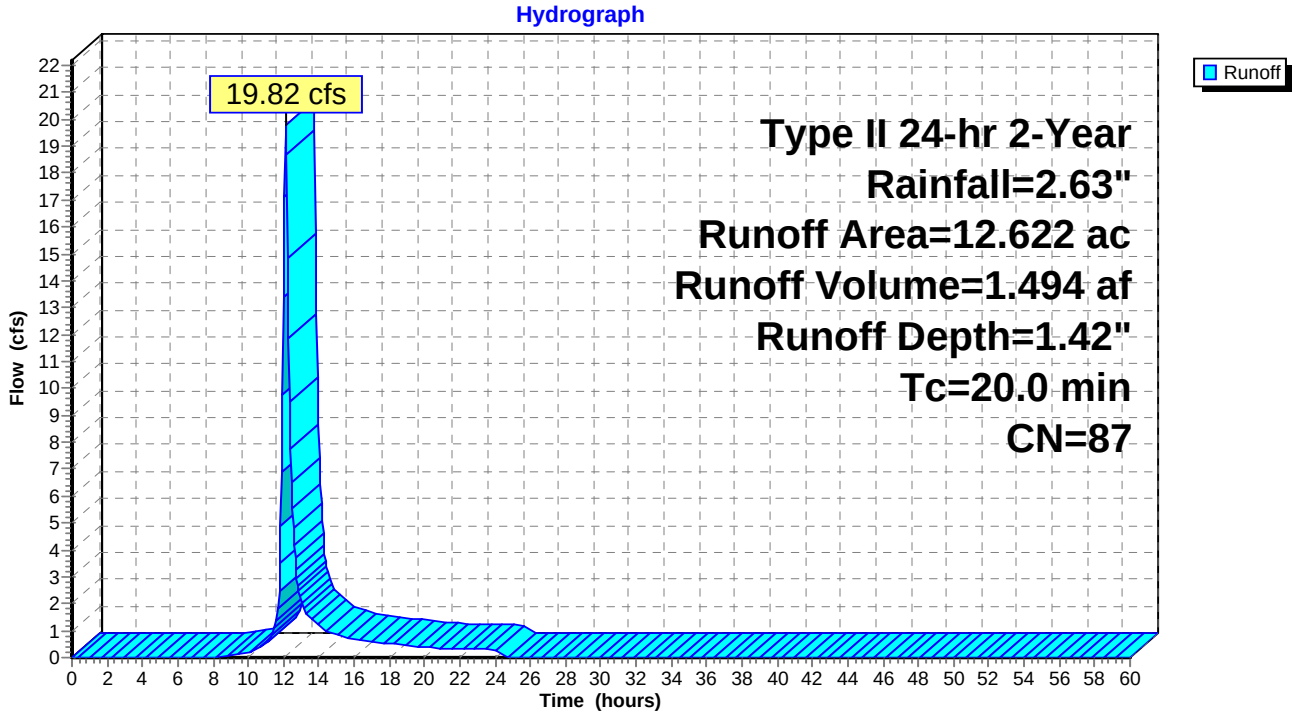
Runoff = 19.82 cfs @ 12.13 hrs, Volume= 1.494 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

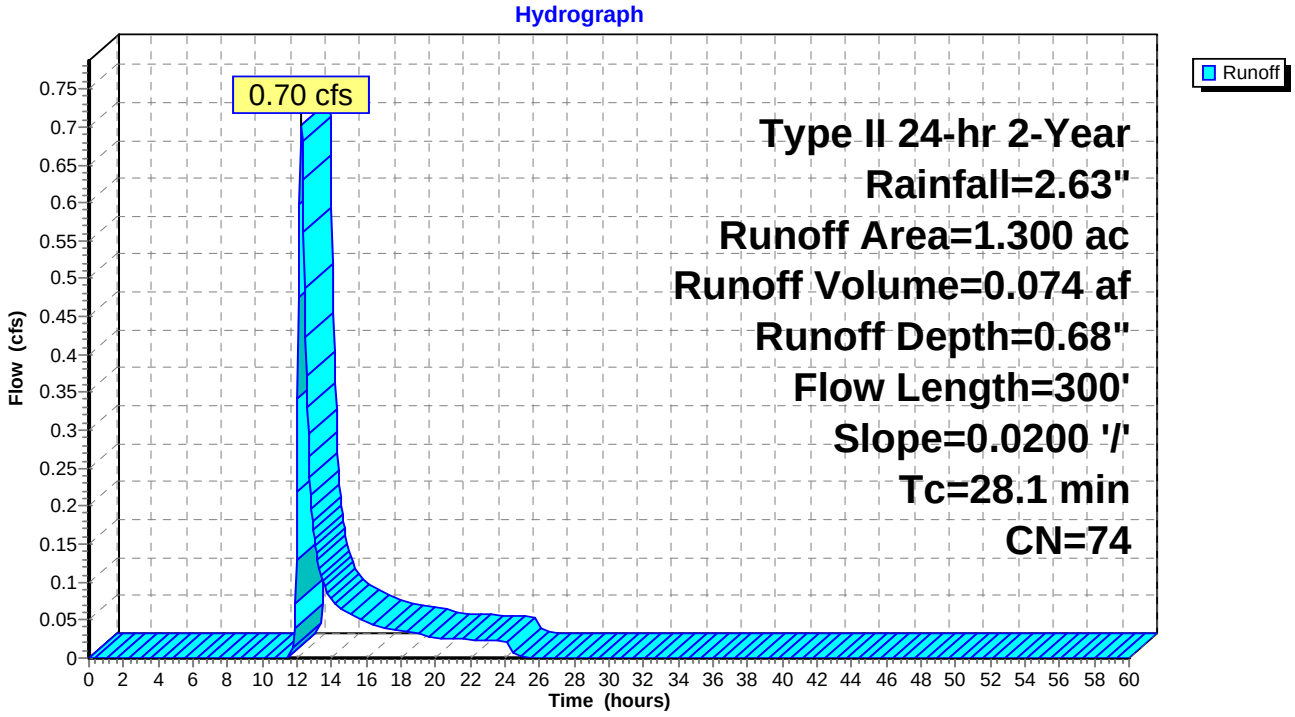
Runoff = 0.70 cfs @ 12.25 hrs, Volume= 0.074 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

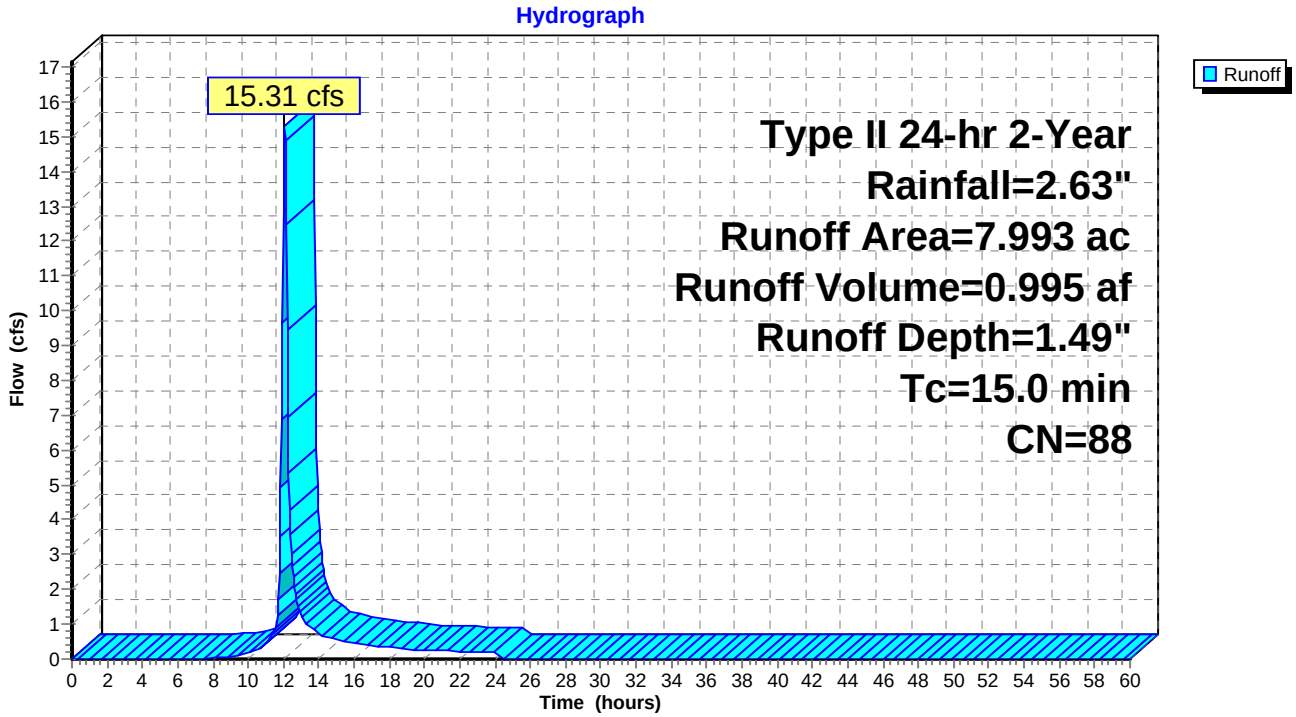
Runoff = 15.31 cfs @ 12.07 hrs, Volume= 0.995 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

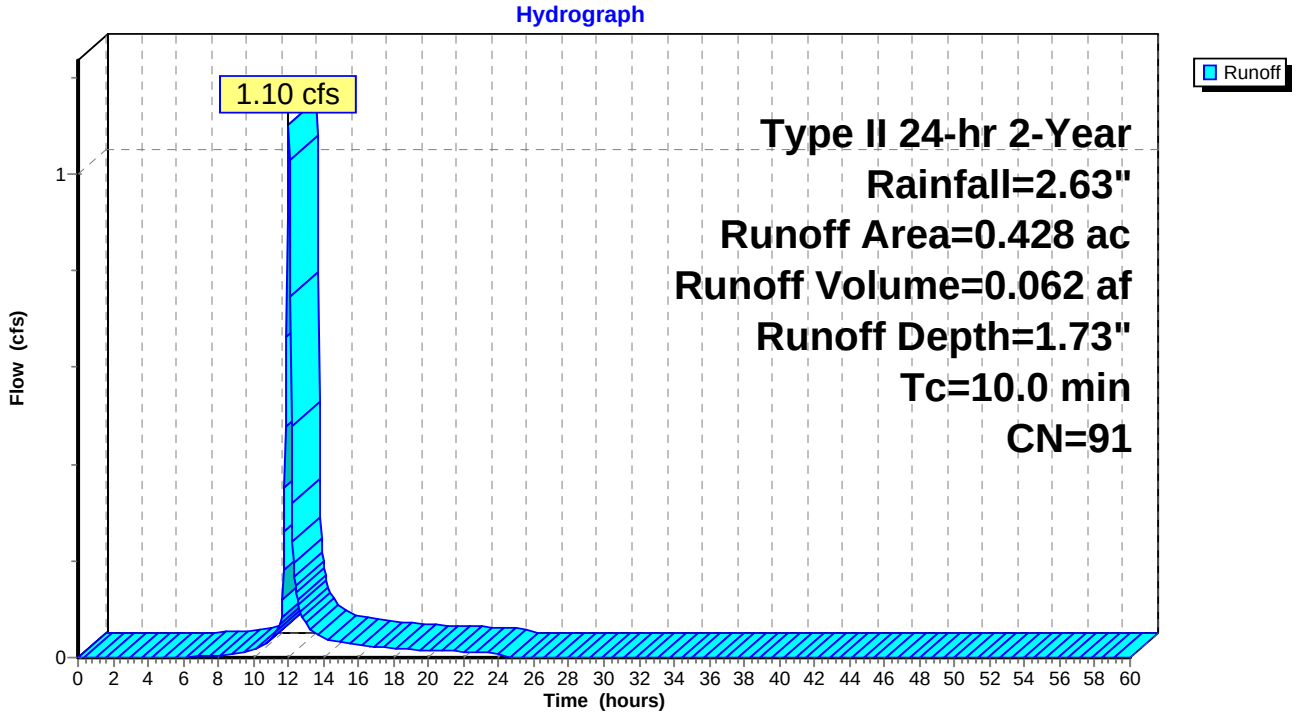
Runoff = 1.10 cfs @ 12.01 hrs, Volume= 0.062 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

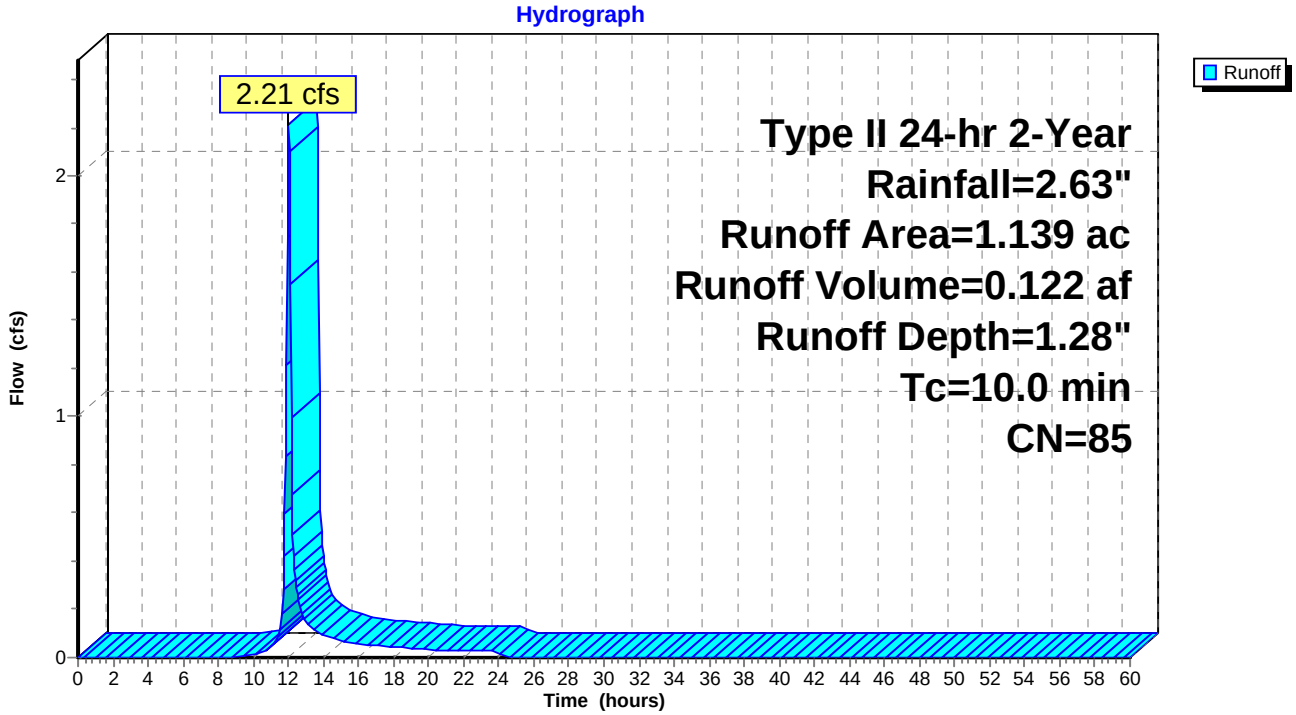
Runoff = 2.21 cfs @ 12.02 hrs, Volume= 0.122 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

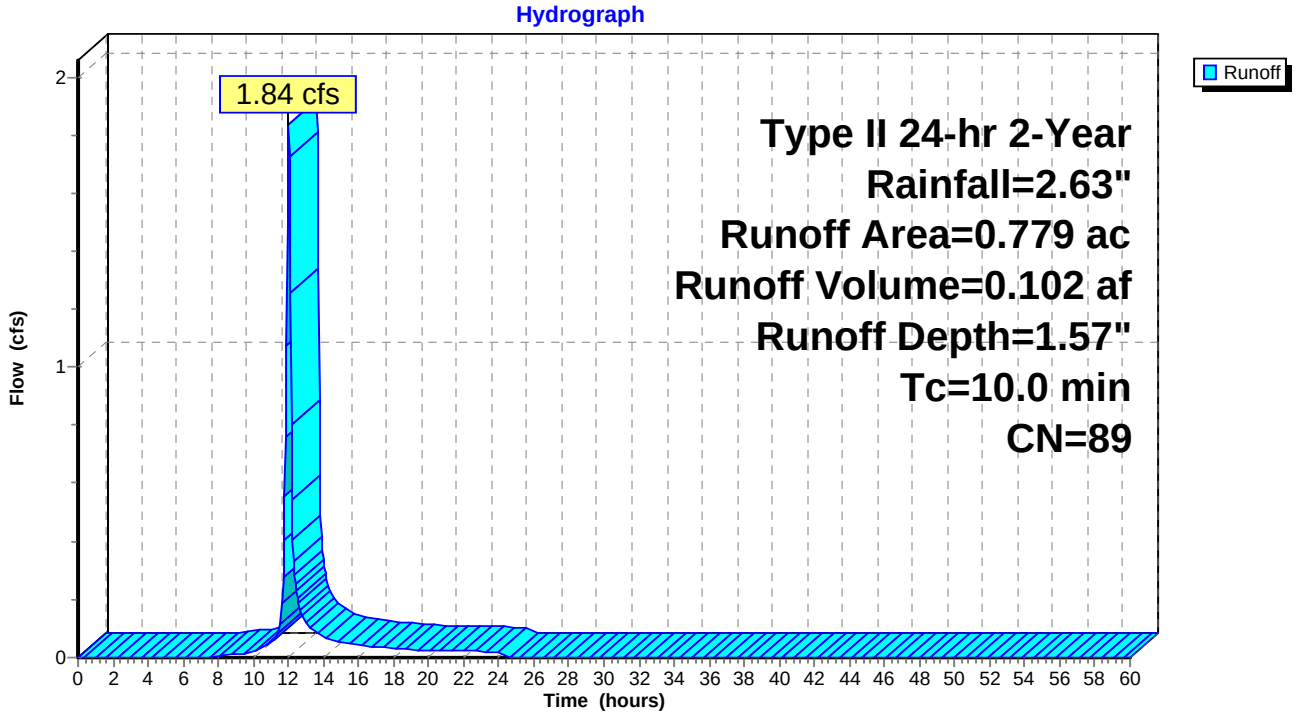
Runoff = 1.84 cfs @ 12.01 hrs, Volume= 0.102 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

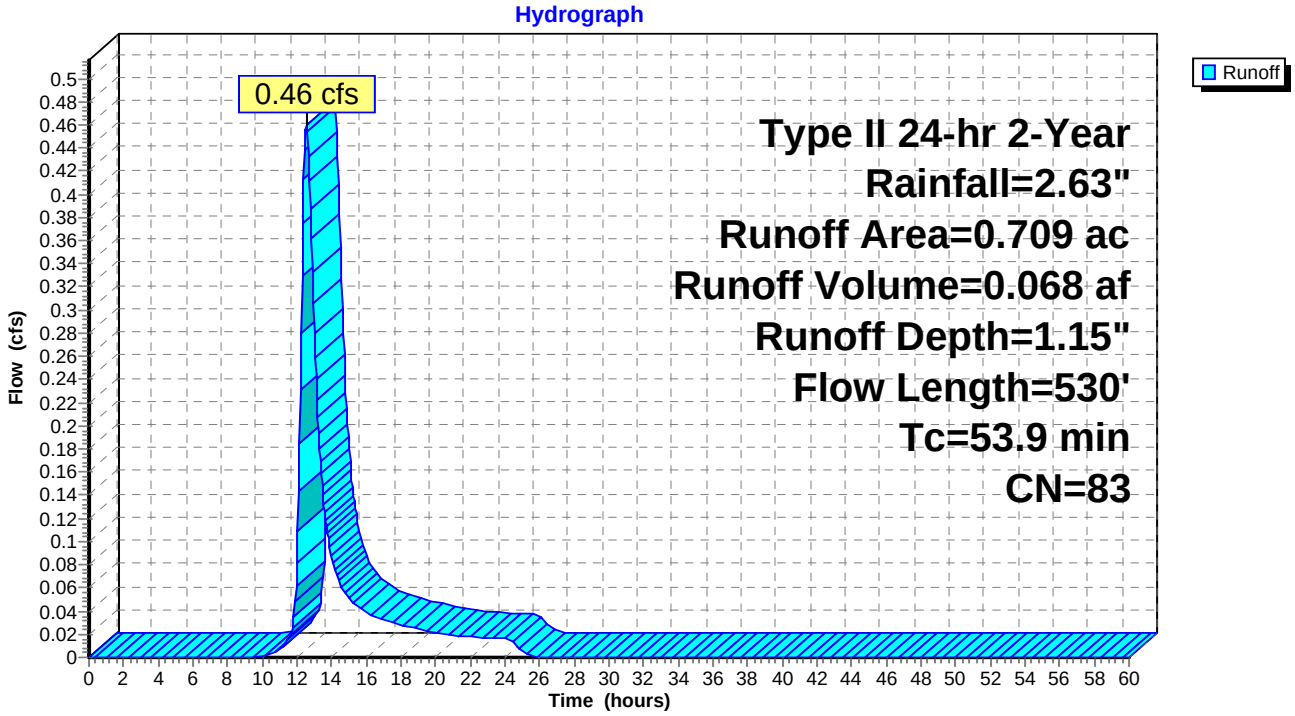
Runoff = 0.46 cfs @ 12.56 hrs, Volume= 0.068 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

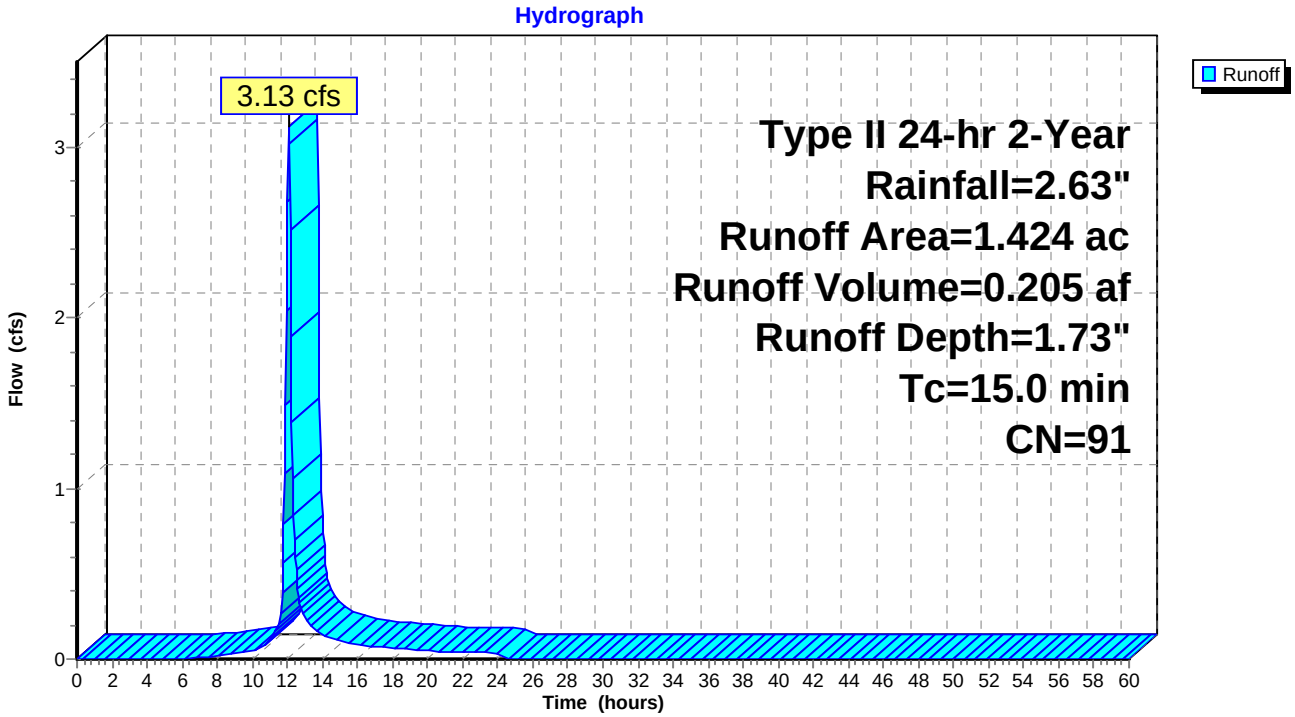
Runoff = 3.13 cfs @ 12.07 hrs, Volume= 0.205 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

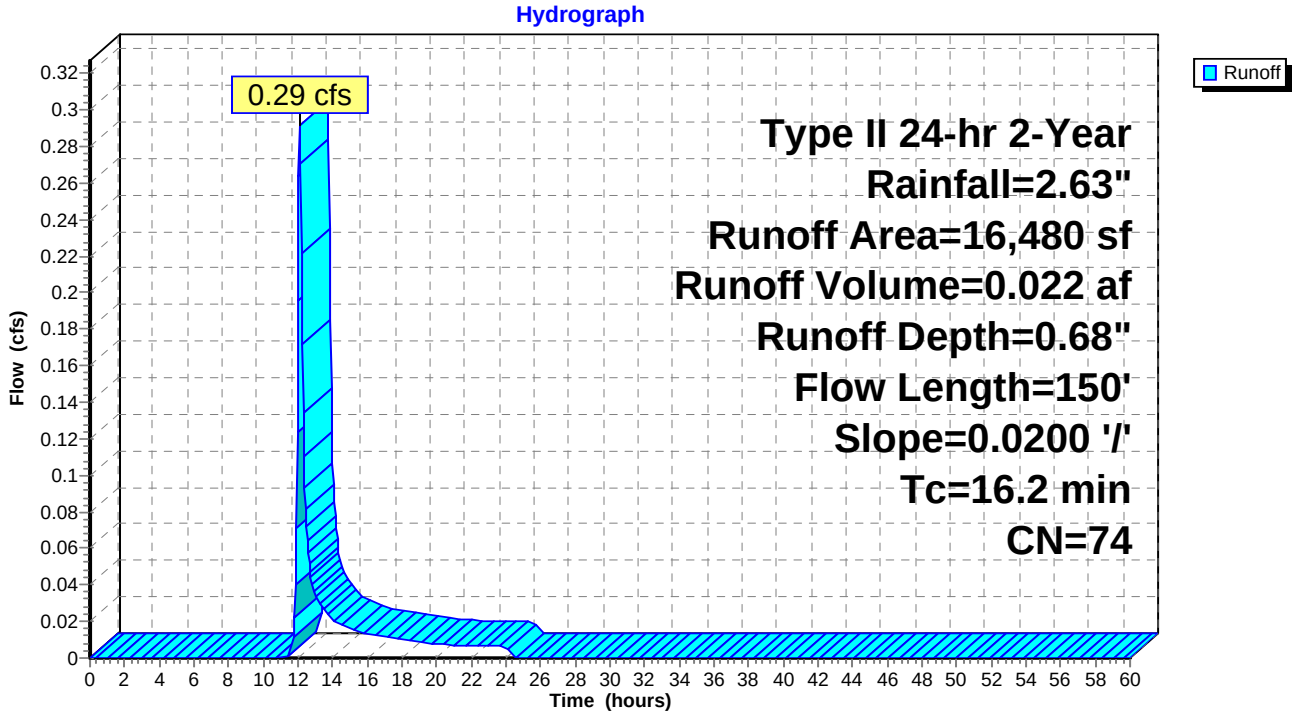
Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



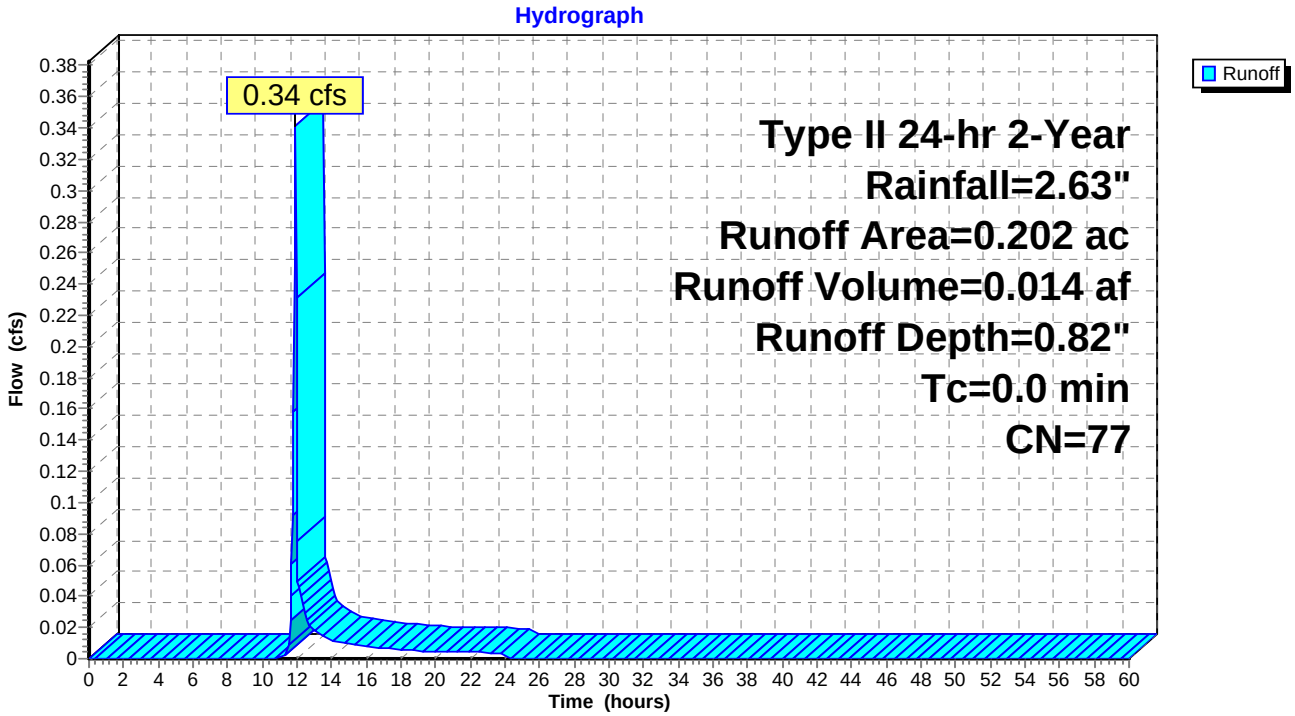
Summary for Subcatchment 19S: Undetained West

Runoff = 0.34 cfs @ 11.90 hrs, Volume= 0.014 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

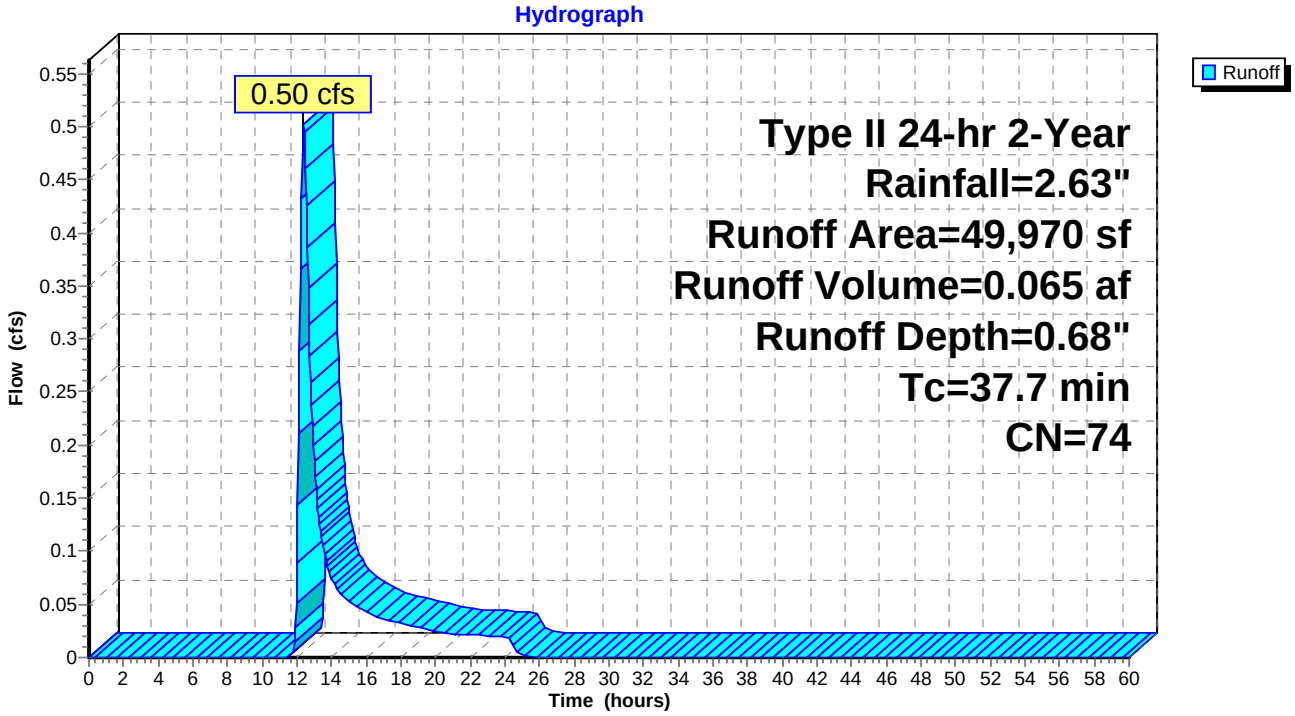
Runoff = 0.50 cfs @ 12.38 hrs, Volume= 0.065 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 1.50" for 2-Year event
Inflow = 16.23 cfs @ 12.07 hrs, Volume= 1.149 af
Outflow = 1.18 cfs @ 13.52 hrs, Volume= 1.144 af, Atten= 93%, Lag= 87.1 min
Primary = 1.18 cfs @ 13.52 hrs, Volume= 1.144 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 909.07' @ 13.52 hrs Surf.Area= 29,752 sf Storage= 49,114 cf (26,696 cf above start)

Plug-Flow detention time= 658.4 min calculated for 0.629 af (55% of inflow)
Center-of-Mass det. time= 313.0 min (1,150.3 - 837.3)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

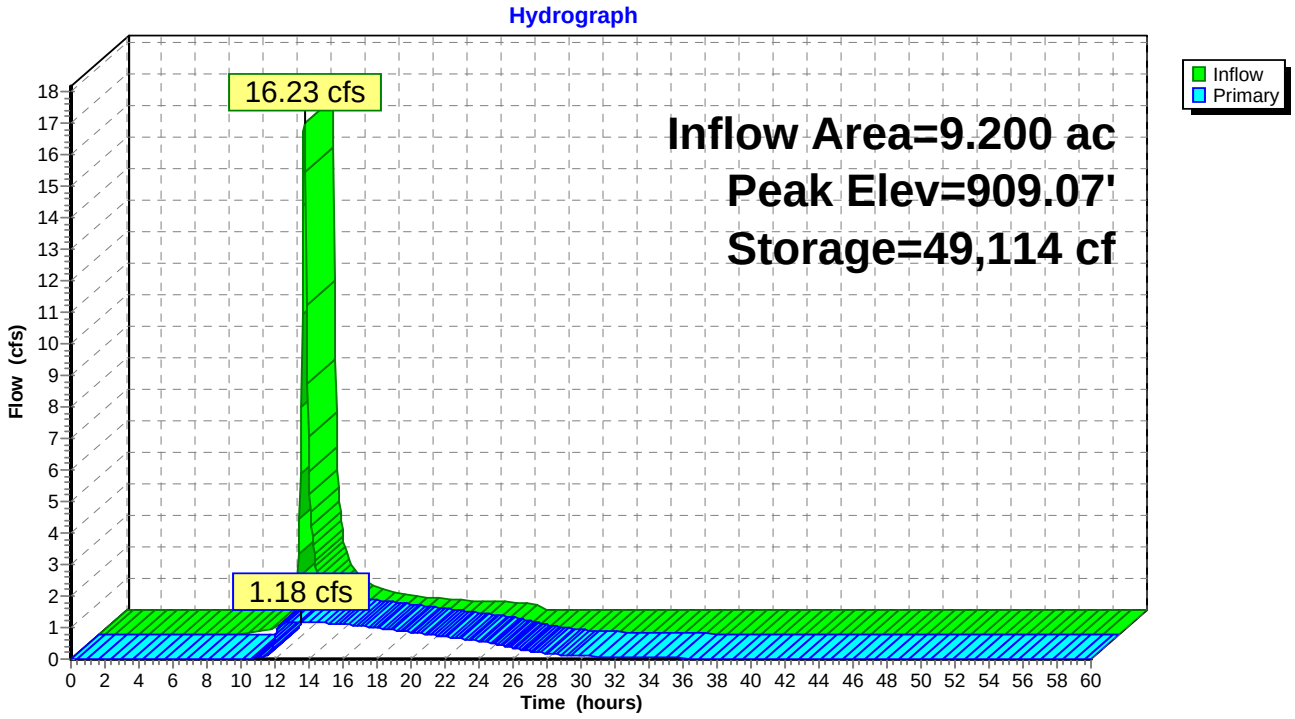
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.18 cfs @ 13.52 hrs HW=909.07' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.18 cfs @ 6.03 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 1.39" for 2-Year event
Inflow = 2.55 cfs @ 12.36 hrs, Volume= 1.597 af
Outflow = 2.55 cfs @ 12.36 hrs, Volume= 1.597 af, Atten= 0%, Lag= 0.0 min
Primary = 2.55 cfs @ 12.36 hrs, Volume= 1.597 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 899.90' @ 12.36 hrs Surf.Area= 4 sf Storage= 7 cf

Plug-Flow detention time= 0.1 min calculated for 1.596 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,097.0 - 1,097.0)

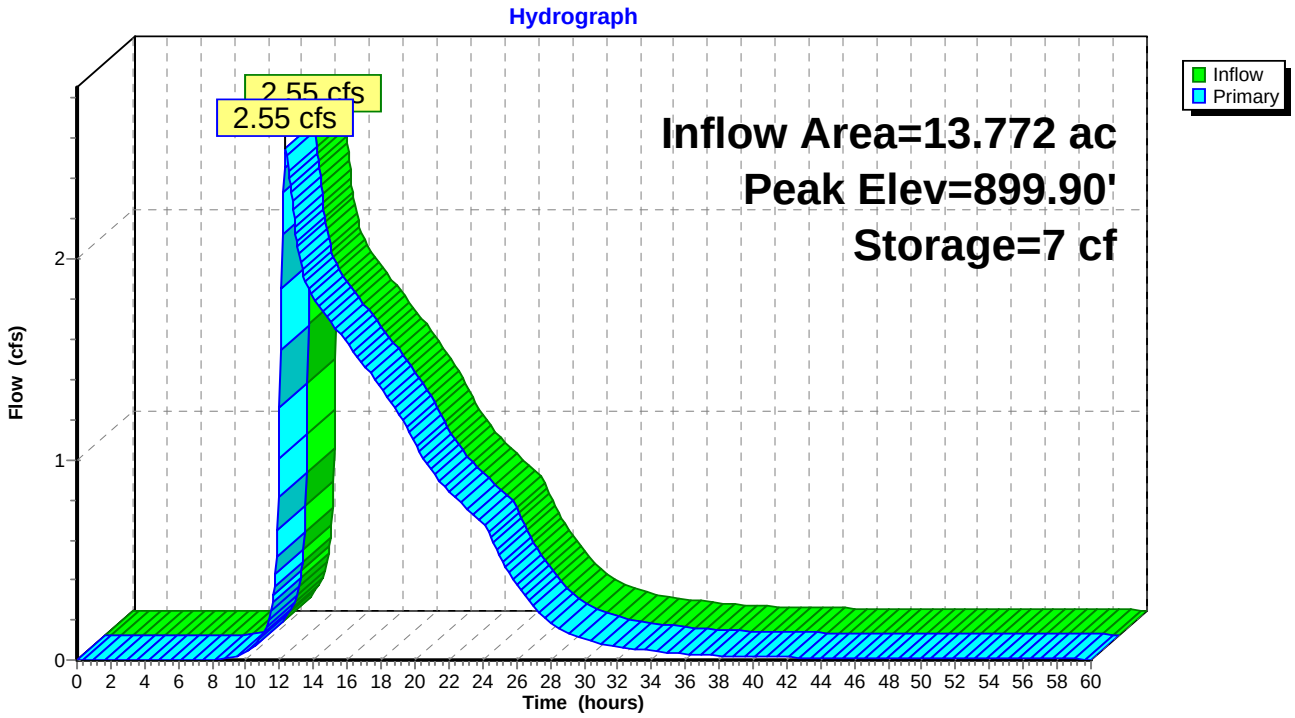
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.55 cfs @ 12.36 hrs HW=899.90' (Free Discharge)
└─**1=Existing 12" Storm** (Inlet Controls 2.55 cfs @ 3.24 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 4P: Ex 10


Hydrograph
2.55 cfs
2.55 cfs
Inflow Area=13.772 ac
Peak Elev=899.90'
Storage=7 cf
Inflow
Primary
Flow (cfs)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 1.57" for 2-Year event
Inflow = 1.84 cfs @ 12.01 hrs, Volume= 0.102 af
Outflow = 0.72 cfs @ 12.17 hrs, Volume= 0.093 af, Atten= 61%, Lag= 9.4 min
Primary = 0.72 cfs @ 12.17 hrs, Volume= 0.093 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 911.33' @ 12.17 hrs Surf.Area= 1,938 sf Storage= 1,667 cf

Plug-Flow detention time= 114.1 min calculated for 0.093 af (91% of inflow)
Center-of-Mass det. time= 69.2 min (889.0 - 819.8)

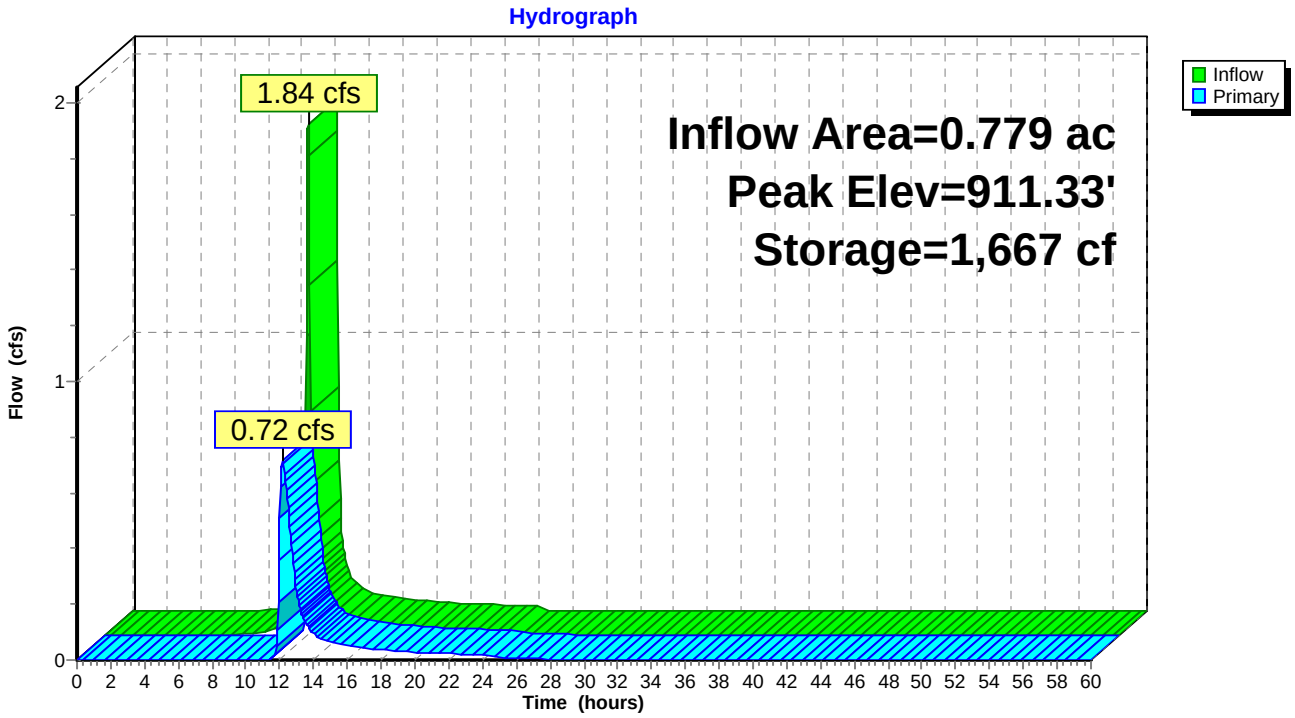
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.71 cfs @ 12.17 hrs HW=911.32' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.71 cfs @ 3.64 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 1.73" for 2-Year event
Inflow = 1.10 cfs @ 12.01 hrs, Volume= 0.062 af
Outflow = 0.29 cfs @ 12.22 hrs, Volume= 0.062 af, Atten= 74%, Lag= 12.6 min
Primary = 0.29 cfs @ 12.22 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 914.63' @ 12.22 hrs Surf.Area= 4,150 sf Storage= 1,048 cf

Plug-Flow detention time= 89.1 min calculated for 0.062 af (100% of inflow)
Center-of-Mass det. time= 88.9 min (899.6 - 810.7)

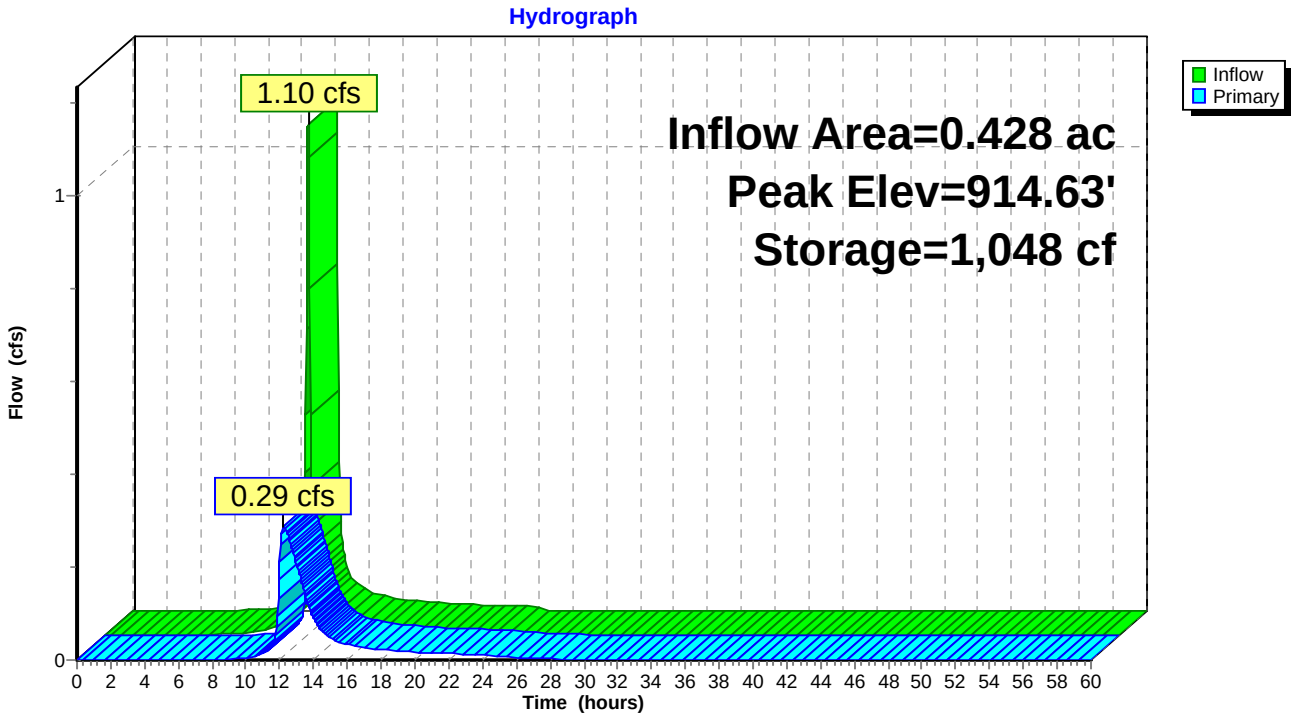
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.29 cfs @ 12.22 hrs HW=914.63' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.29 cfs @ 3.28 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 1.28" for 2-Year event
Inflow = 2.21 cfs @ 12.02 hrs, Volume= 0.122 af
Outflow = 0.23 cfs @ 12.57 hrs, Volume= 0.106 af, Atten= 90%, Lag= 33.3 min
Primary = 0.23 cfs @ 12.57 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 908.16' @ 12.57 hrs Surf.Area= 5,849 sf Storage= 2,572 cf

Plug-Flow detention time= 230.8 min calculated for 0.106 af (87% of inflow)
Center-of-Mass det. time= 168.9 min (1,004.6 - 835.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

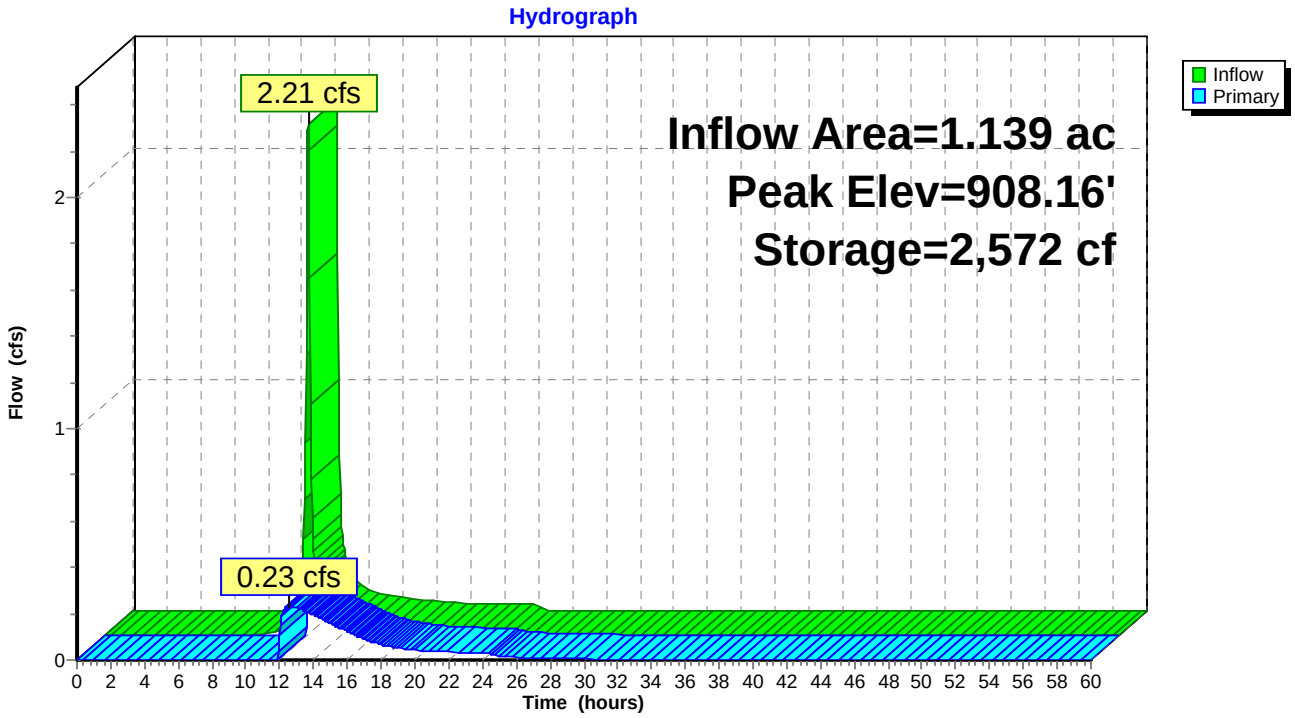
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=0.23 cfs @ 12.57 hrs HW=908.16' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.23 cfs @ 3.45 fps)
└─**2=2nd Stage Orifice** (Controls 0.00 cfs)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 1.46" for 2-Year event
Inflow = 3.30 cfs @ 12.07 hrs, Volume= 0.311 af
Outflow = 0.48 cfs @ 12.95 hrs, Volume= 0.311 af, Atten= 85%, Lag= 52.5 min
Primary = 0.48 cfs @ 12.95 hrs, Volume= 0.311 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 906.46' @ 12.95 hrs Surf.Area= 4,540 sf Storage= 4,430 cf

Plug-Flow detention time= 117.4 min calculated for 0.311 af (100% of inflow)
Center-of-Mass det. time= 116.4 min (996.0 - 879.6)

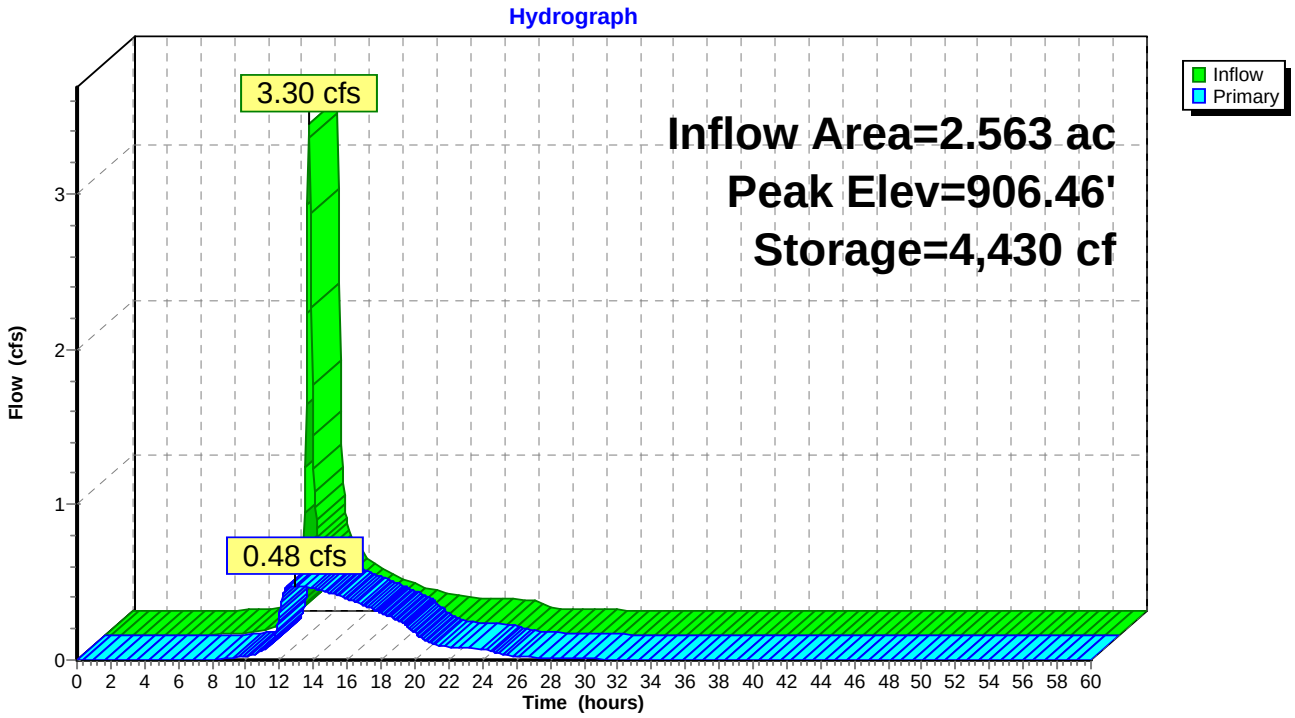
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=0.48 cfs @ 12.95 hrs HW=906.46' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.48 cfs @ 5.48 fps)
└─**2=2nd Stage Weir** (Controls 0.00 cfs)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 0.73" for 2-Year event
Inflow = 0.42 cfs @ 11.91 hrs, Volume= 0.035 af
Outflow = 0.42 cfs @ 11.91 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 11.91 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.45' @ 11.91 hrs Surf.Area= 4 sf Storage= 1 cf

Plug-Flow detention time= 0.2 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (871.7 - 871.5)

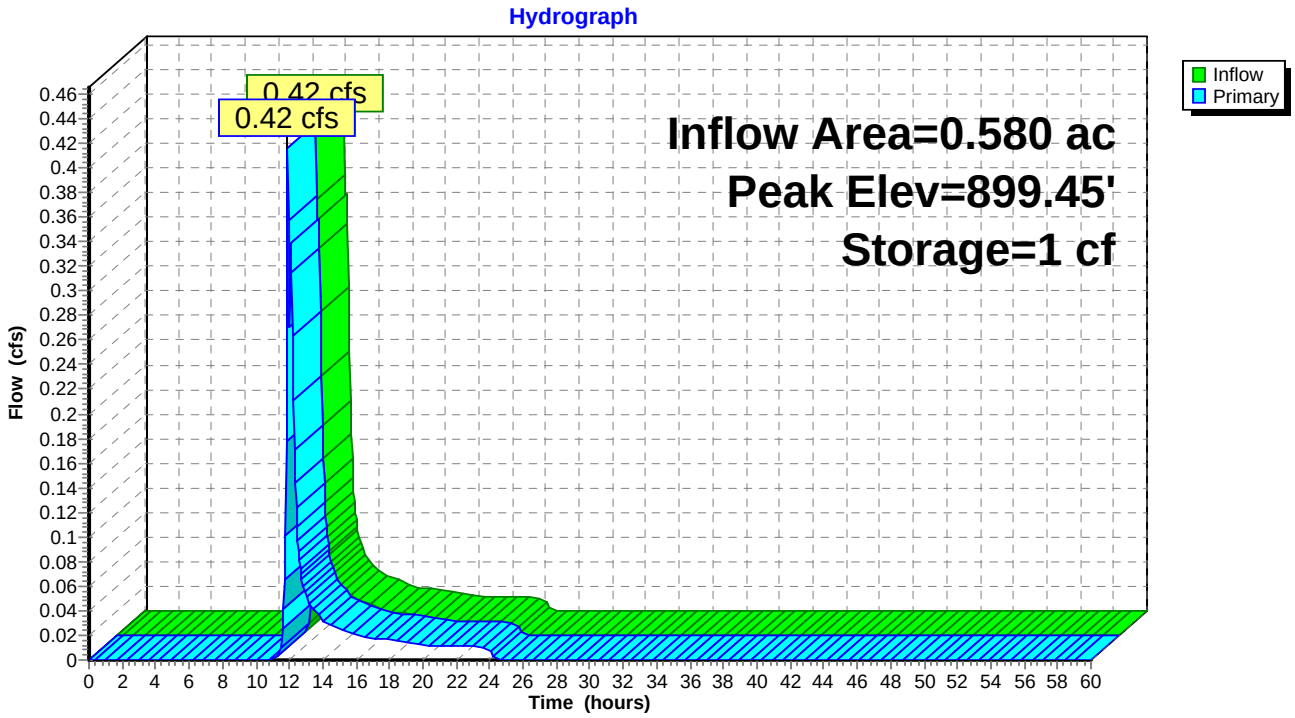
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.40 cfs @ 11.91 hrs HW=899.44' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.40 cfs @ 2.05 fps)

Pond 20P: Ex 9


Hydrograph
0.42 cfs
0.42 cfs
Inflow Area=0.580 ac
Peak Elev=899.45'
Storage=1 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 21P: Ex. 8

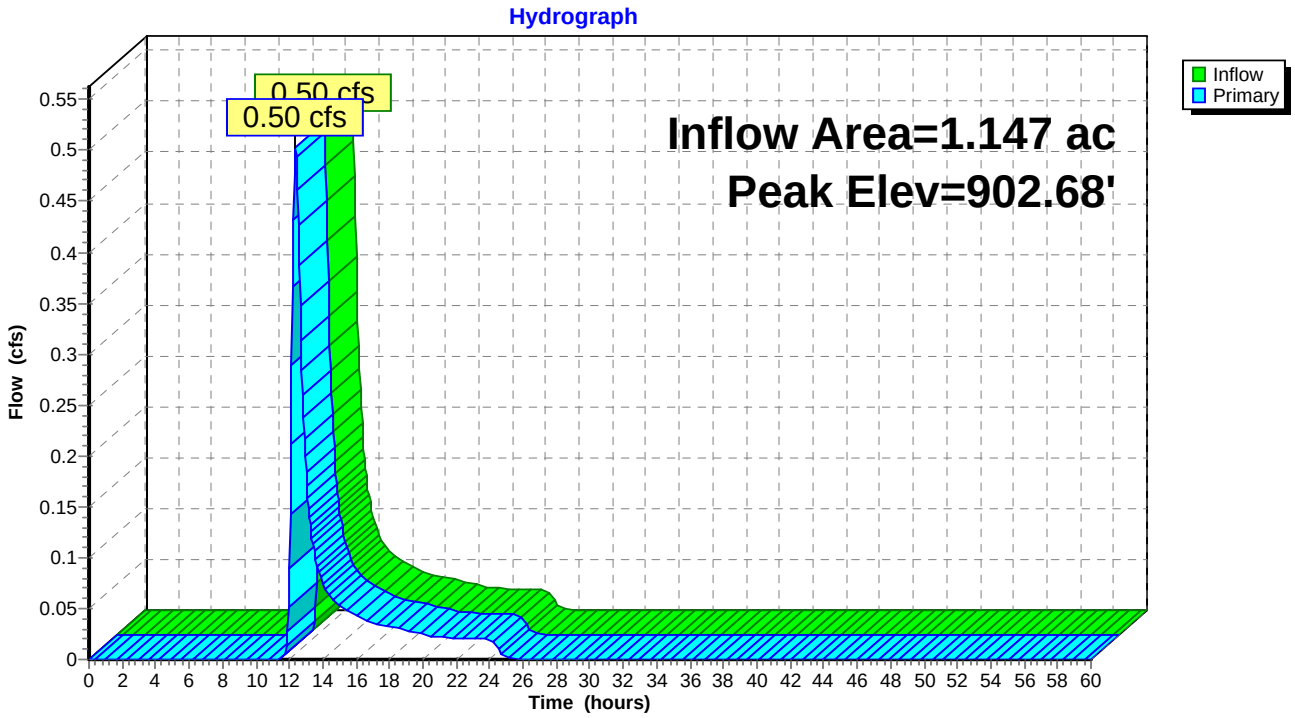
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	0.68"	for 2-Year event
Inflow =	0.50 cfs @	12.38 hrs,	Volume=	0.065 af	
Outflow =	0.50 cfs @	12.38 hrs,	Volume=	0.065 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.50 cfs @	12.38 hrs,	Volume=	0.065 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 902.68' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices	
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate**	C= 0.600

Primary OutFlow Max=0.50 cfs @ 12.38 hrs HW=902.67' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.50 cfs @ 2.19 fps)

Pond 21P: Ex. 8

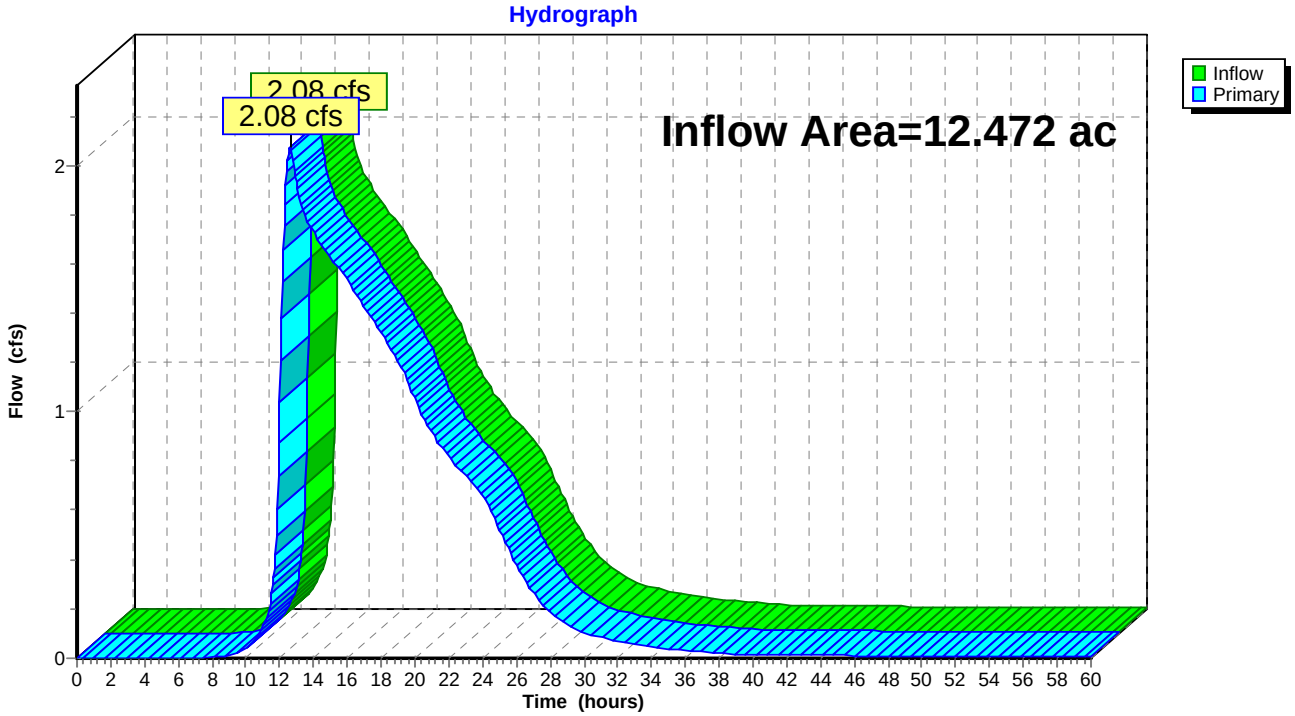


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 1.47" for 2-Year event
Inflow = 2.08 cfs @ 12.62 hrs, Volume= 1.523 af
Primary = 2.08 cfs @ 12.62 hrs, Volume= 1.523 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



Summary for Subcatchment 2S: Post Developed Overall

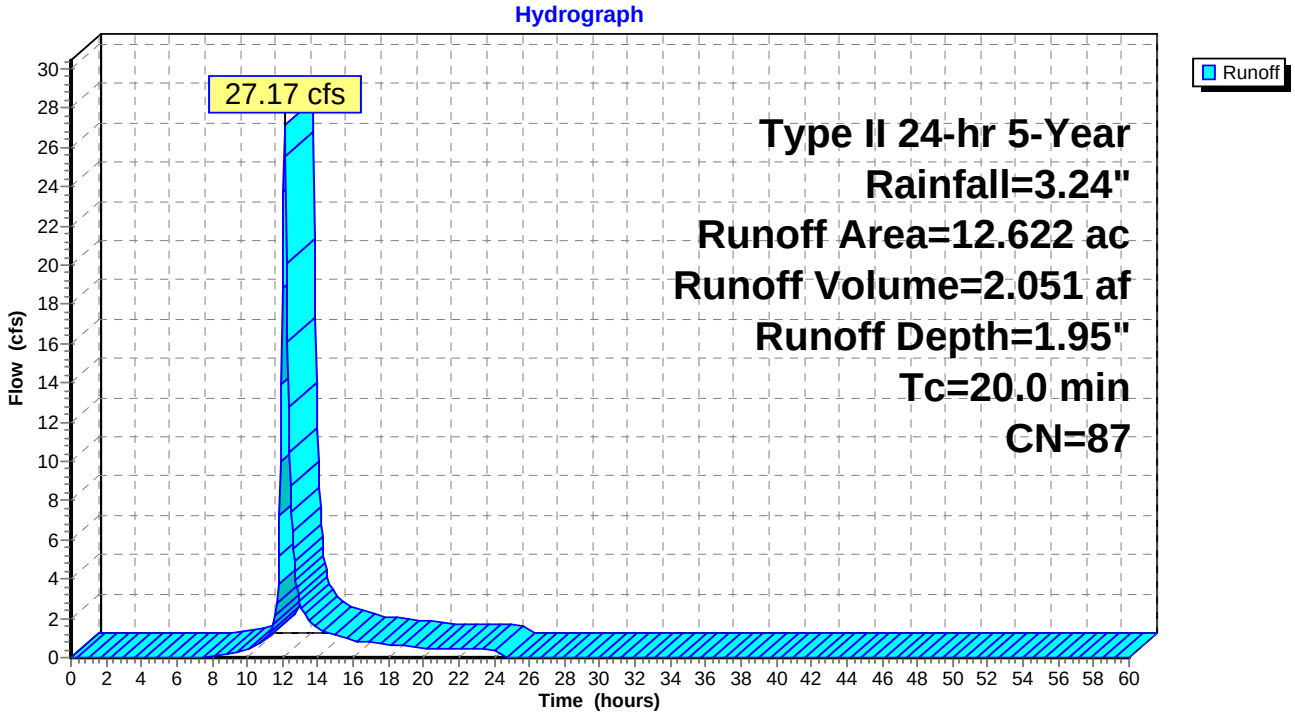
Runoff = 27.17 cfs @ 12.13 hrs, Volume= 2.051 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

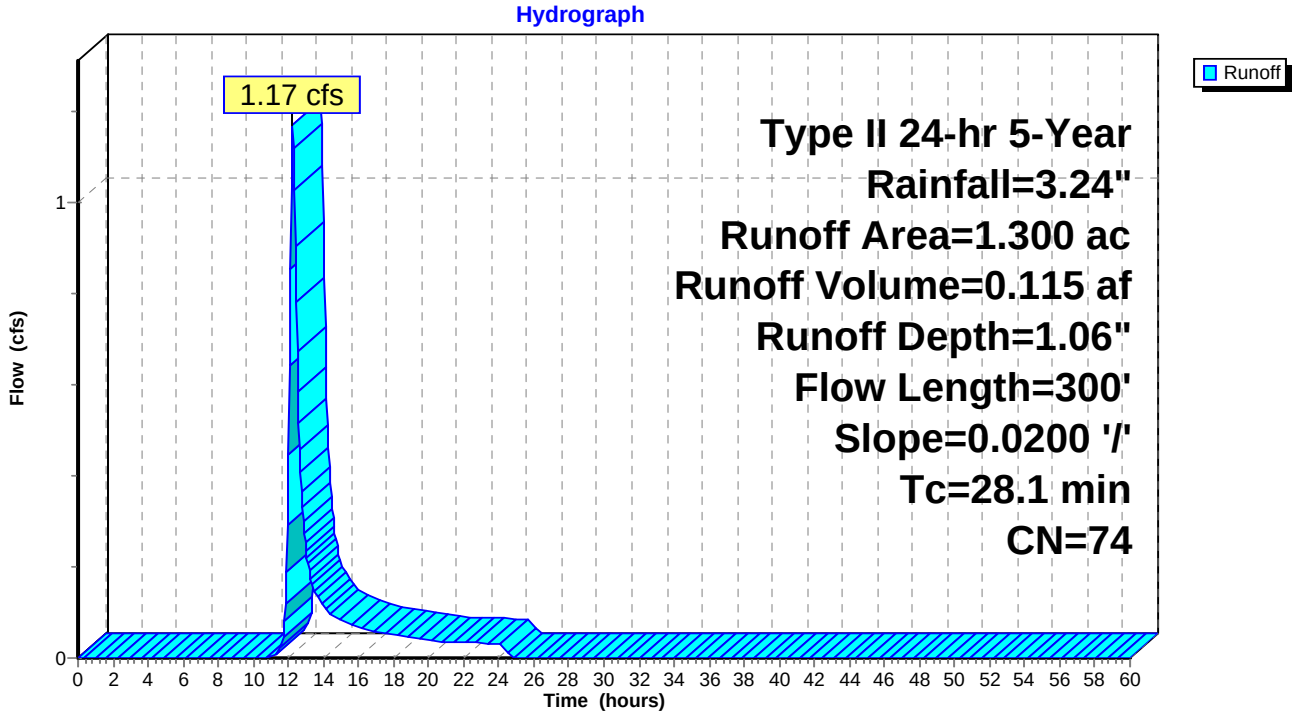
Runoff = 1.17 cfs @ 12.24 hrs, Volume= 0.115 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

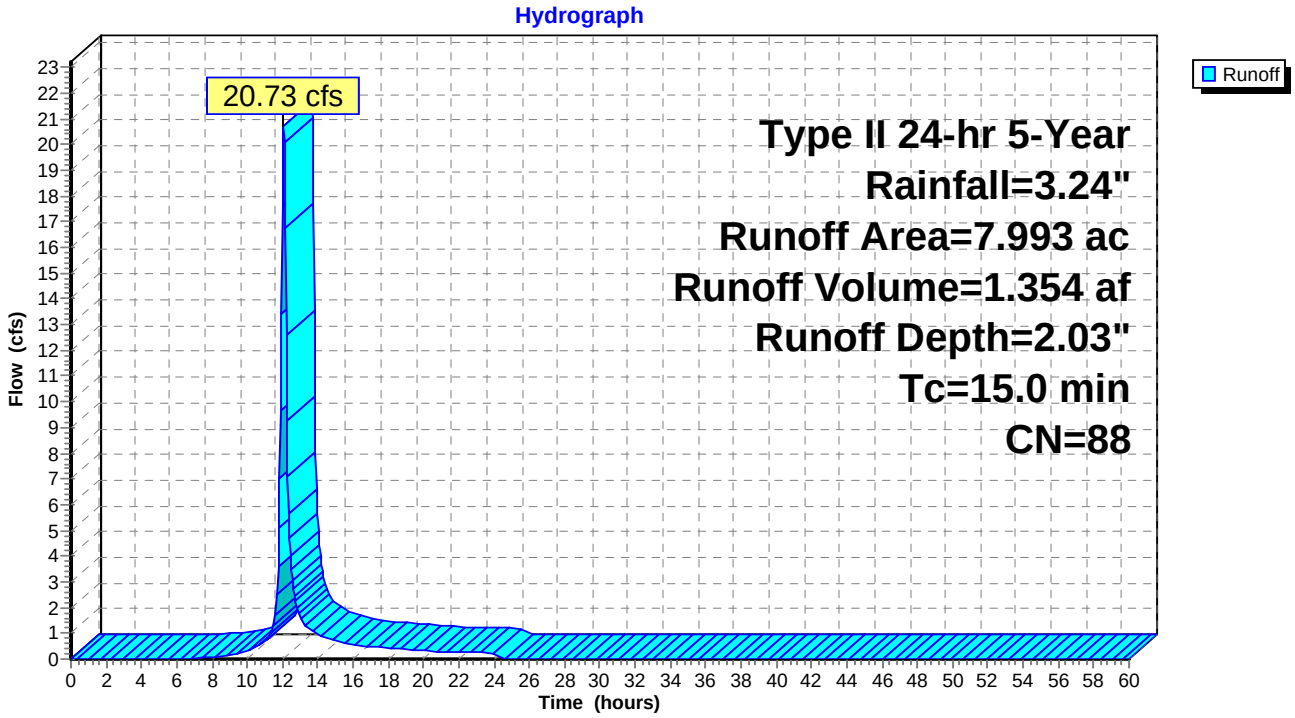
Runoff = 20.73 cfs @ 12.07 hrs, Volume= 1.354 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

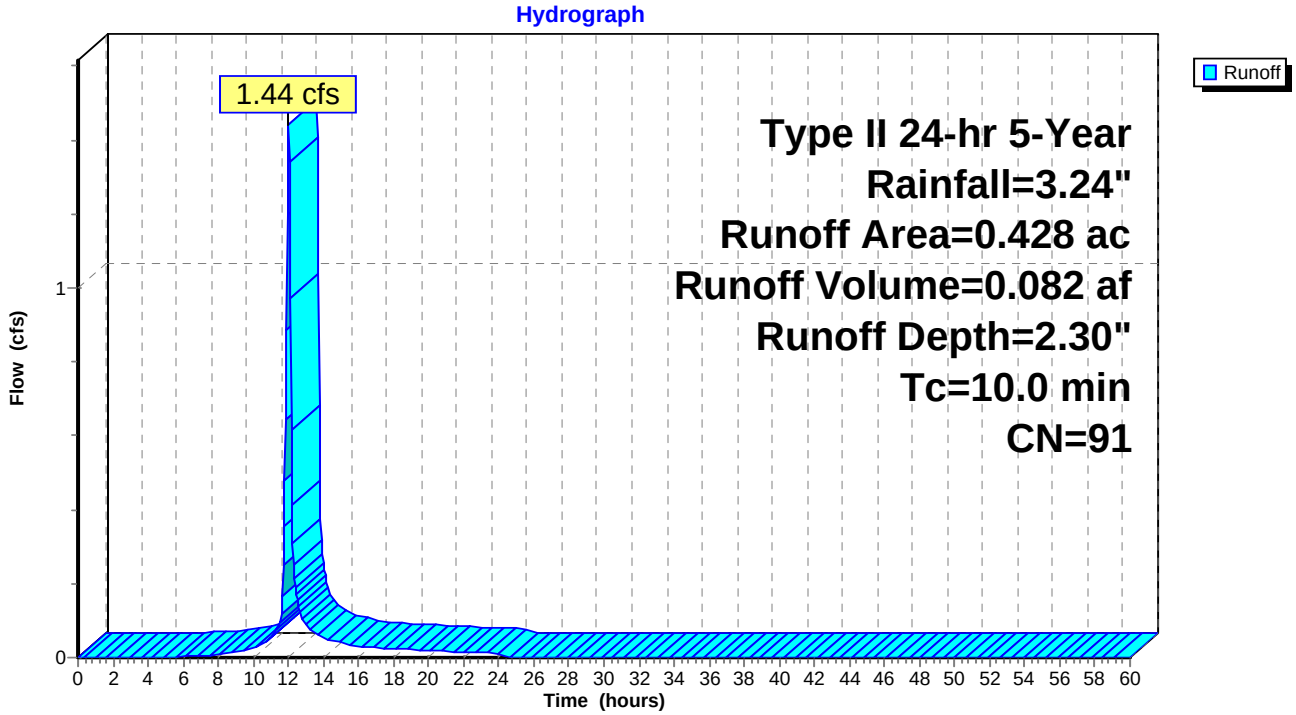
Runoff = 1.44 cfs @ 12.01 hrs, Volume= 0.082 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

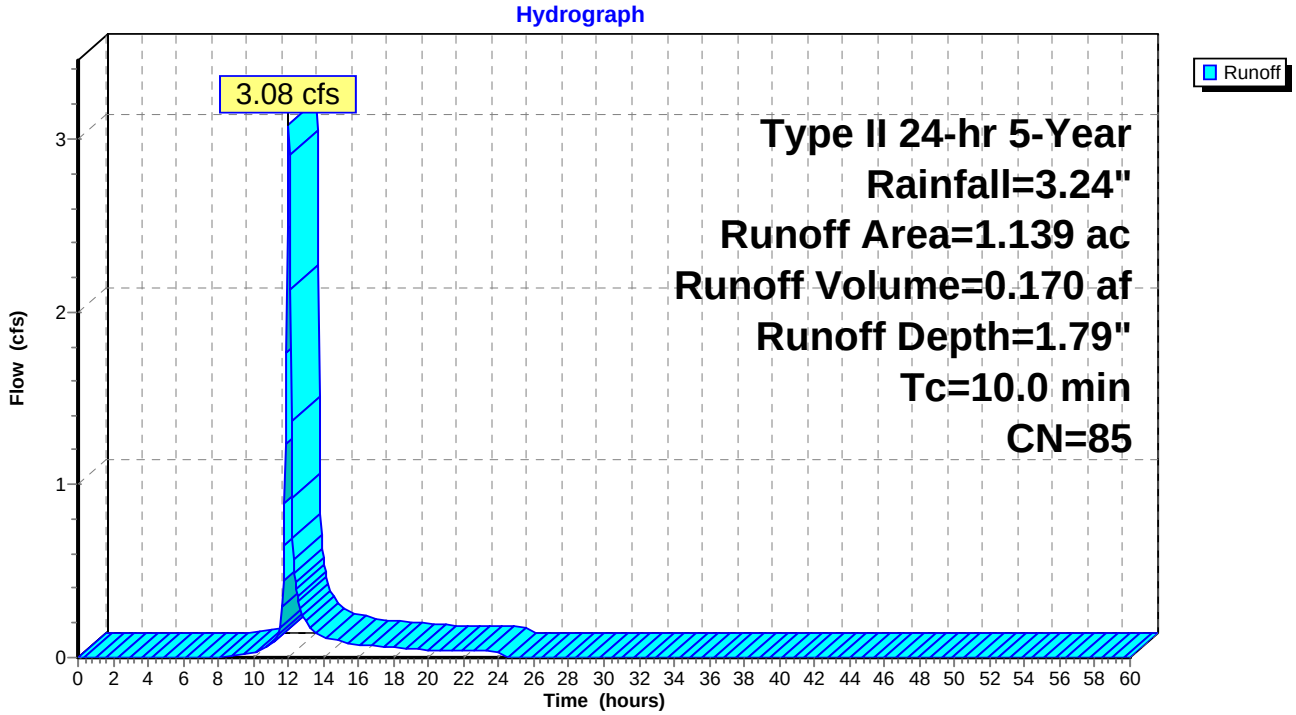
Runoff = 3.08 cfs @ 12.02 hrs, Volume= 0.170 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

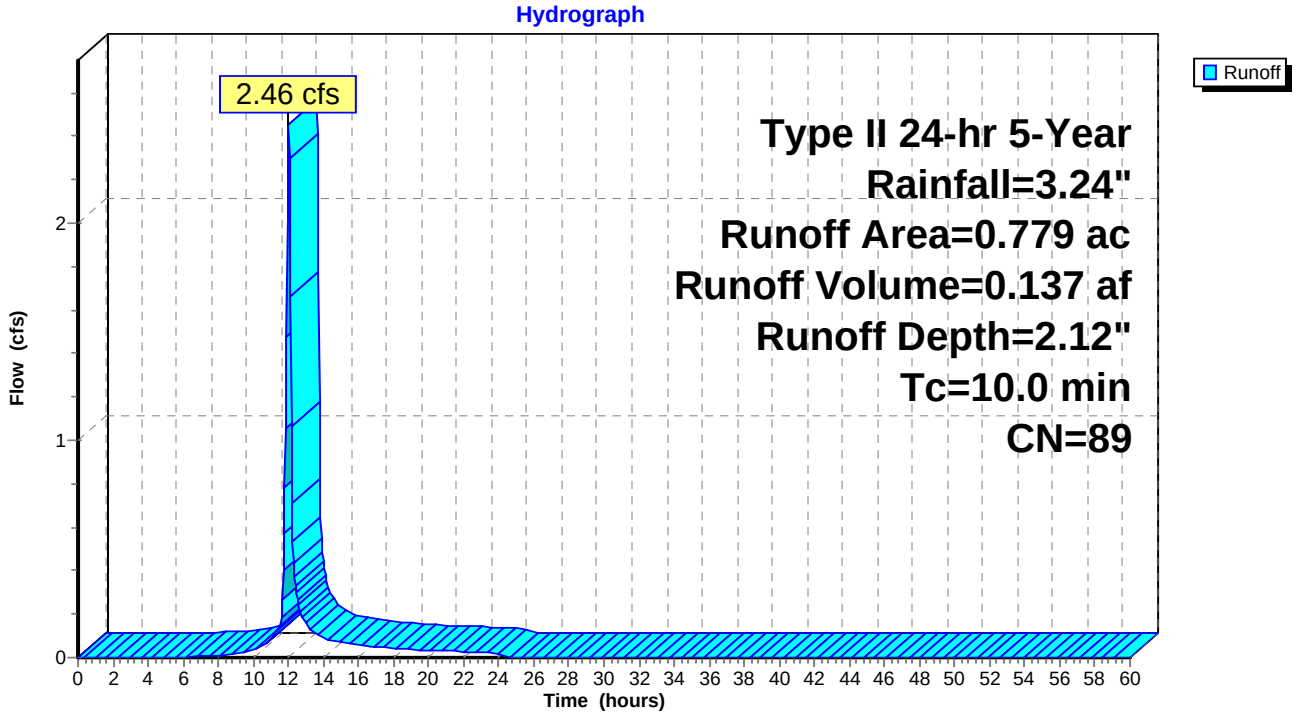
Runoff = 2.46 cfs @ 12.01 hrs, Volume= 0.137 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

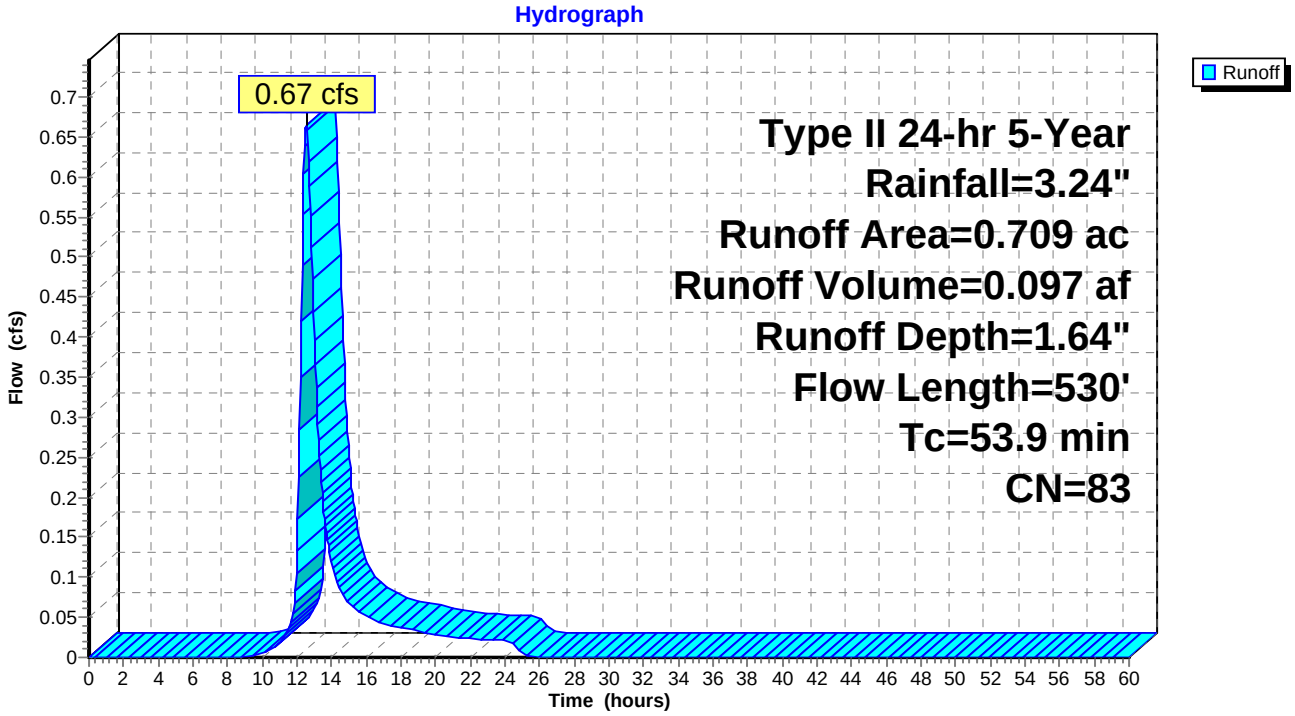
Runoff = 0.67 cfs @ 12.55 hrs, Volume= 0.097 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

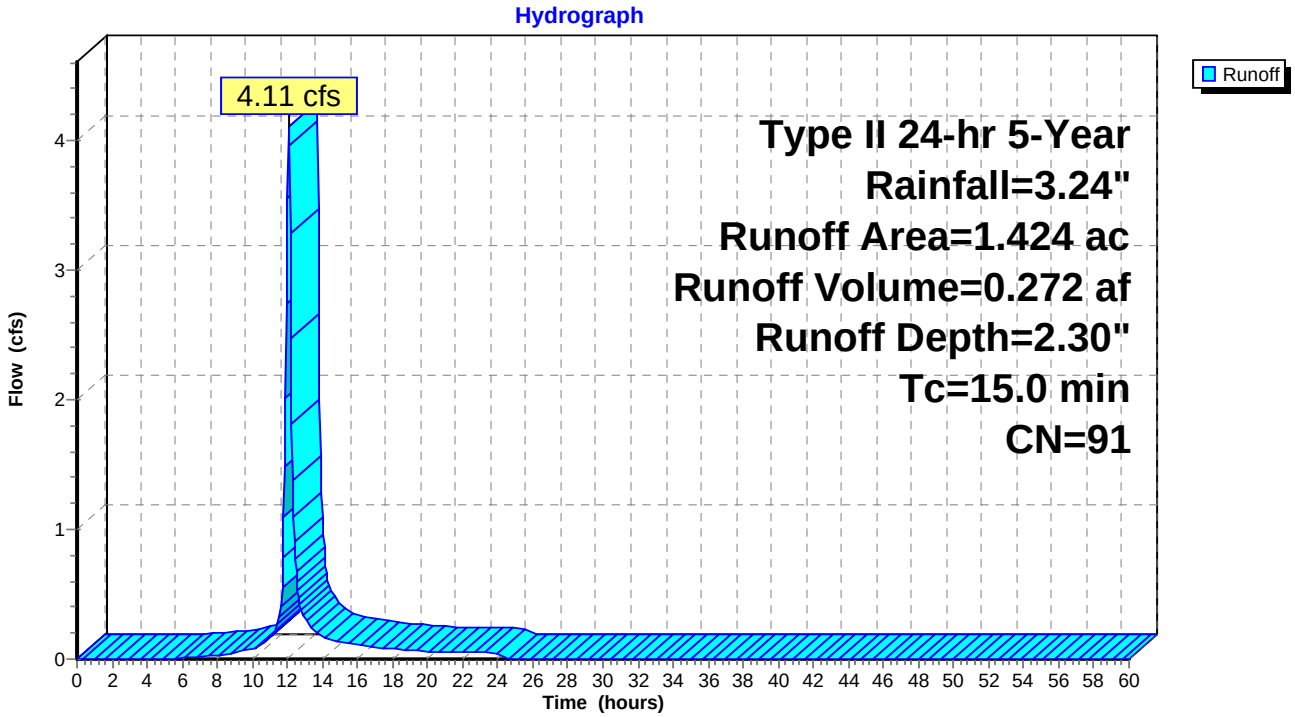
Runoff = 4.11 cfs @ 12.07 hrs, Volume= 0.272 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

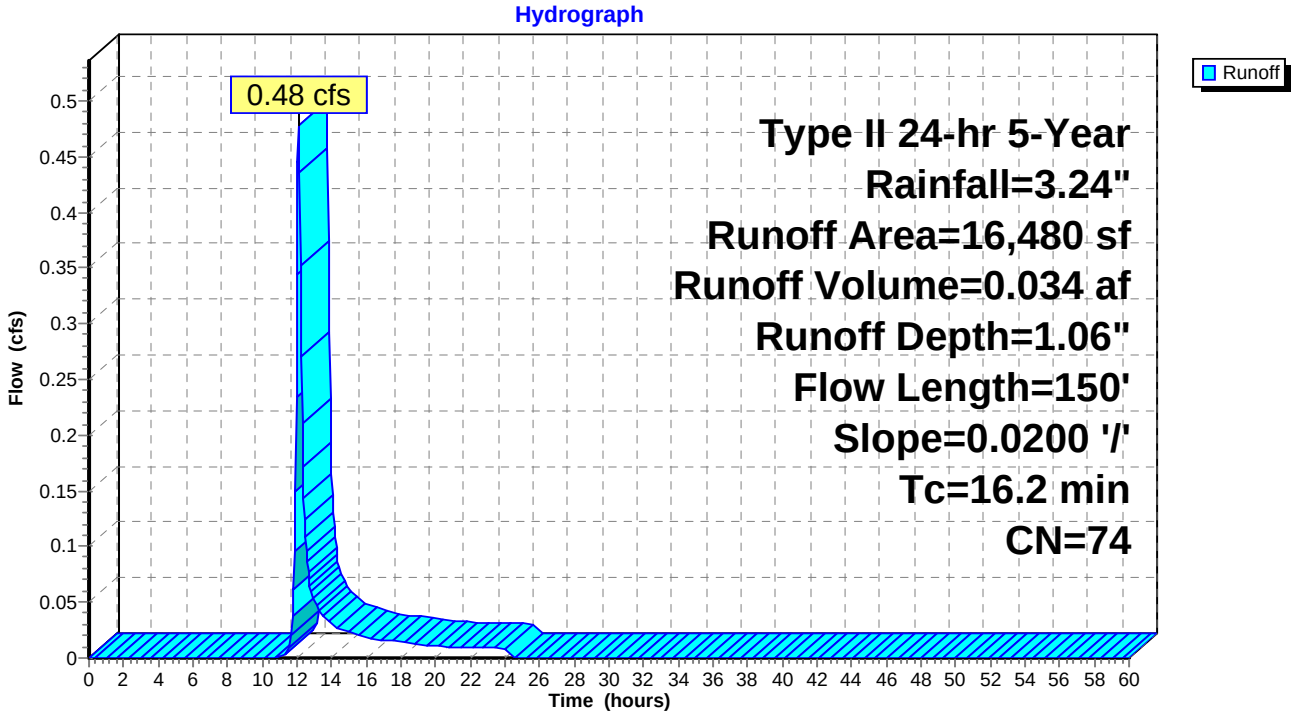
Runoff = 0.48 cfs @ 12.10 hrs, Volume= 0.034 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



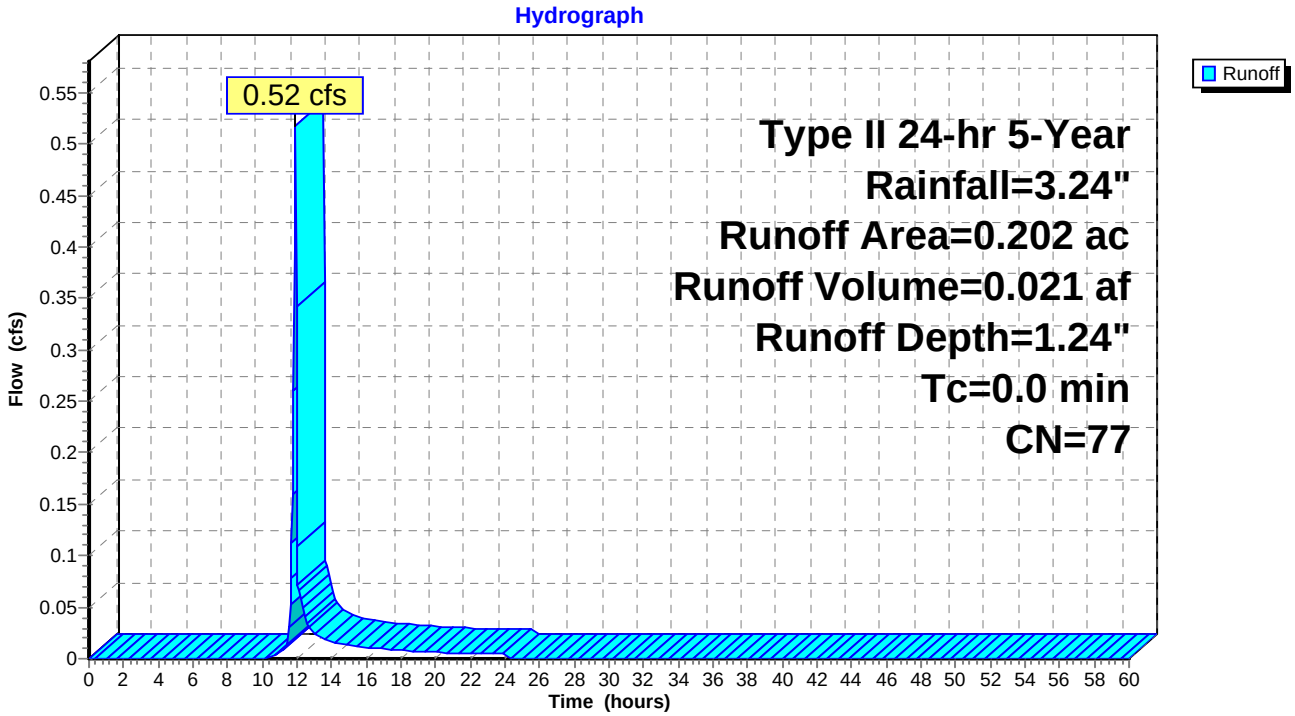
Summary for Subcatchment 19S: Undetained West

Runoff = 0.52 cfs @ 11.90 hrs, Volume= 0.021 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

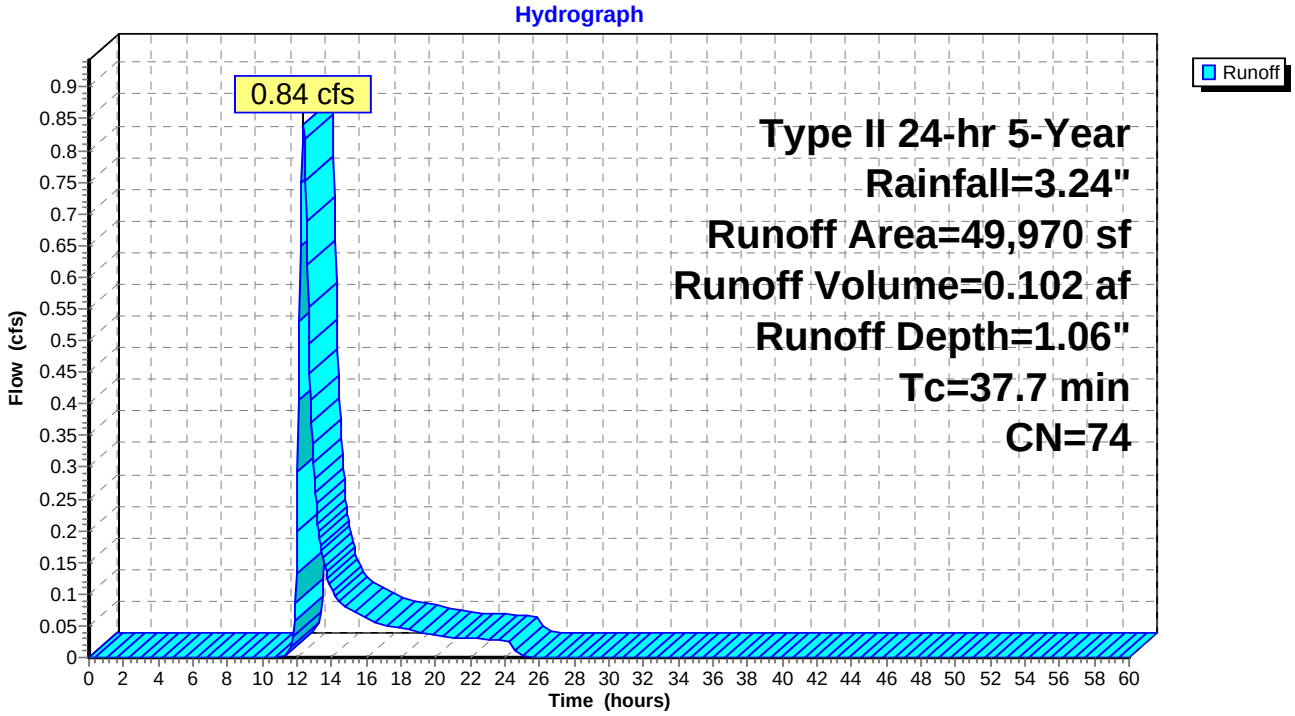
Runoff = 0.84 cfs @ 12.36 hrs, Volume= 0.102 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 2.04" for 5-Year event
Inflow = 21.90 cfs @ 12.07 hrs, Volume= 1.565 af
Outflow = 1.40 cfs @ 13.72 hrs, Volume= 1.559 af, Atten= 94%, Lag= 98.9 min
Primary = 1.40 cfs @ 13.72 hrs, Volume= 1.559 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 909.69' @ 13.72 hrs Surf.Area= 31,529 sf Storage= 60,484 cf (38,066 cf above start)

Plug-Flow detention time= 637.7 min calculated for 1.043 af (67% of inflow)
Center-of-Mass det. time= 359.7 min (1,187.5 - 827.8)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

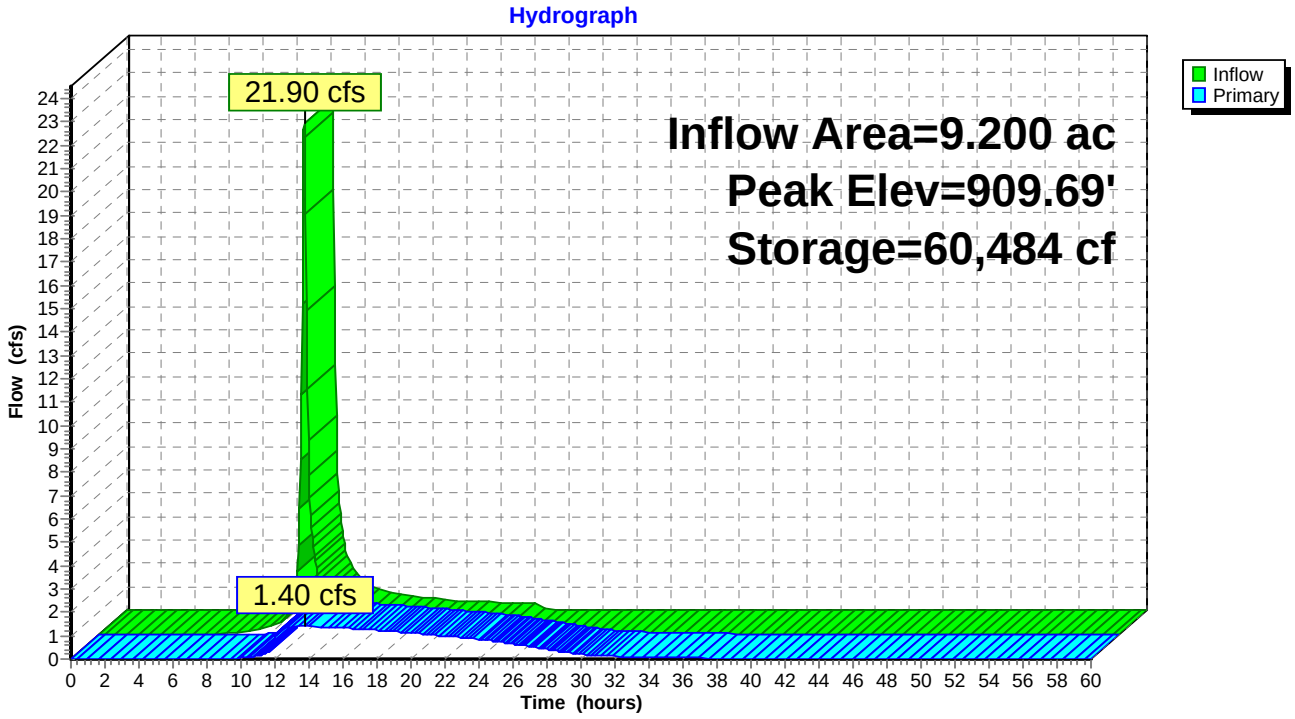
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.40 cfs @ 13.72 hrs HW=909.69' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.40 cfs @ 7.13 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 1.91" for 5-Year event
Inflow = 3.41 cfs @ 12.32 hrs, Volume= 2.197 af
Outflow = 3.40 cfs @ 12.33 hrs, Volume= 2.197 af, Atten= 0%, Lag= 0.0 min
Primary = 3.40 cfs @ 12.33 hrs, Volume= 2.197 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 900.36' @ 12.33 hrs Surf.Area= 4 sf Storage= 9 cf

Plug-Flow detention time= 0.2 min calculated for 2.197 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,123.4 - 1,123.3)

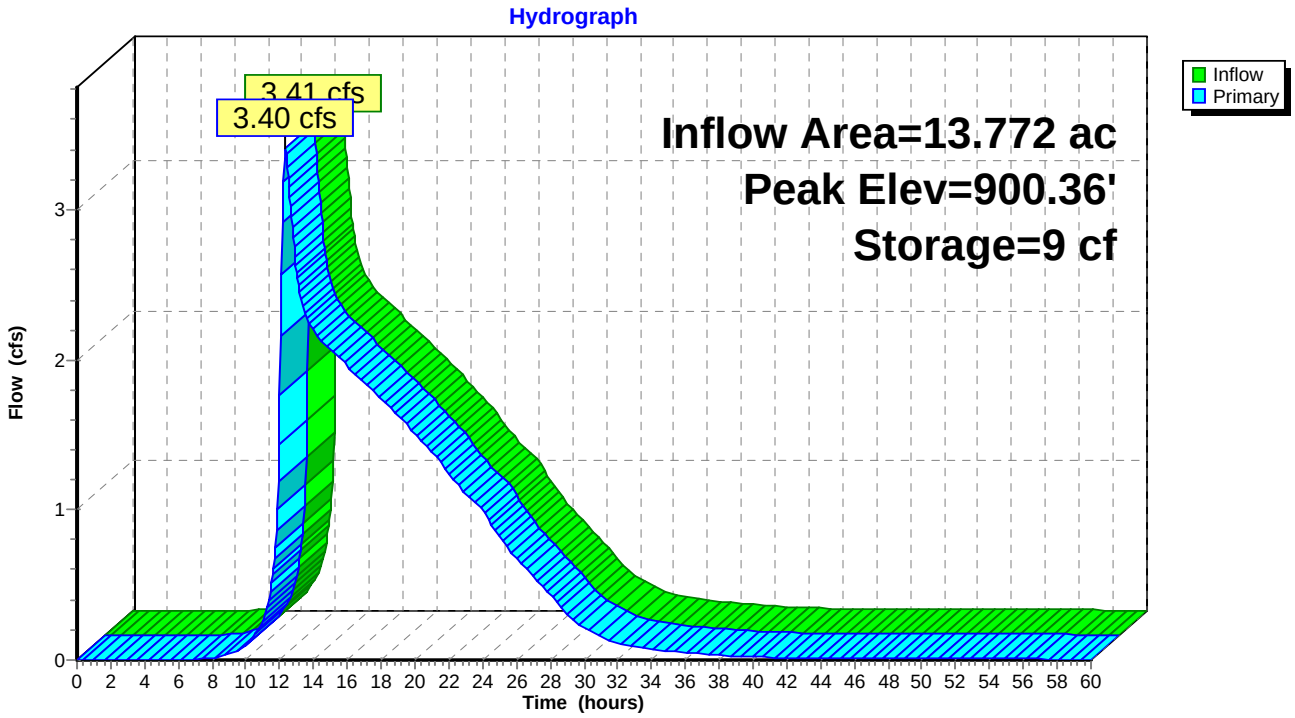
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.40 cfs @ 12.33 hrs HW=900.36' (Free Discharge)
└─**1=Existing 12" Storm** (Inlet Controls 3.40 cfs @ 4.32 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 4P: Ex 10


Hydrograph
3.41 cfs
3.40 cfs
Inflow Area=13.772 ac
Peak Elev=900.36'
Storage=9 cf
Inflow
Primary
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 2.12" for 5-Year event
Inflow = 2.46 cfs @ 12.01 hrs, Volume= 0.137 af
Outflow = 0.92 cfs @ 12.17 hrs, Volume= 0.129 af, Atten= 63%, Lag= 9.6 min
Primary = 0.92 cfs @ 12.17 hrs, Volume= 0.129 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 911.70' @ 12.17 hrs Surf.Area= 1,938 sf Storage= 2,211 cf

Plug-Flow detention time= 98.8 min calculated for 0.129 af (94% of inflow)
Center-of-Mass det. time= 62.6 min (873.8 - 811.2)

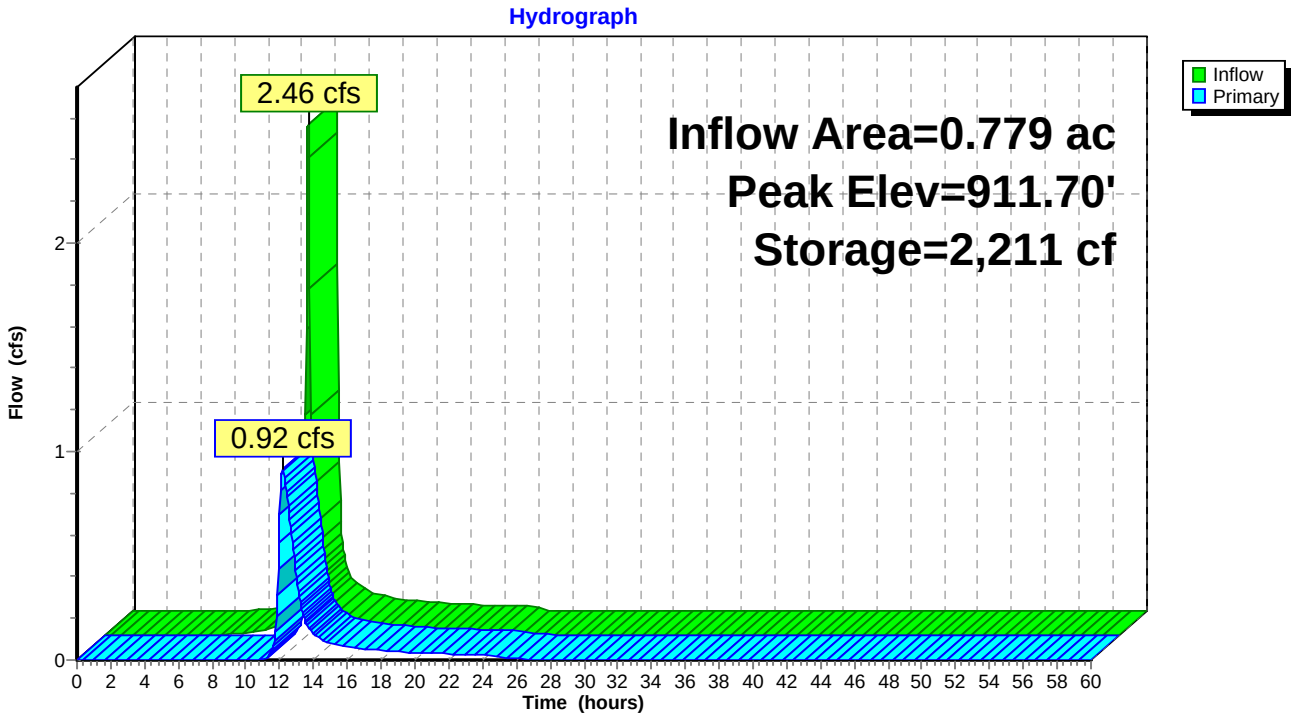
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.92 cfs @ 12.17 hrs HW=911.69' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.92 cfs @ 4.67 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 2.30" for 5-Year event
Inflow = 1.44 cfs @ 12.01 hrs, Volume= 0.082 af
Outflow = 0.35 cfs @ 12.23 hrs, Volume= 0.082 af, Atten= 76%, Lag= 13.4 min
Primary = 0.35 cfs @ 12.23 hrs, Volume= 0.082 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 914.84' @ 12.23 hrs Surf.Area= 4,150 sf Storage= 1,399 cf

Plug-Flow detention time= 84.4 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 84.2 min (886.8 - 802.6)

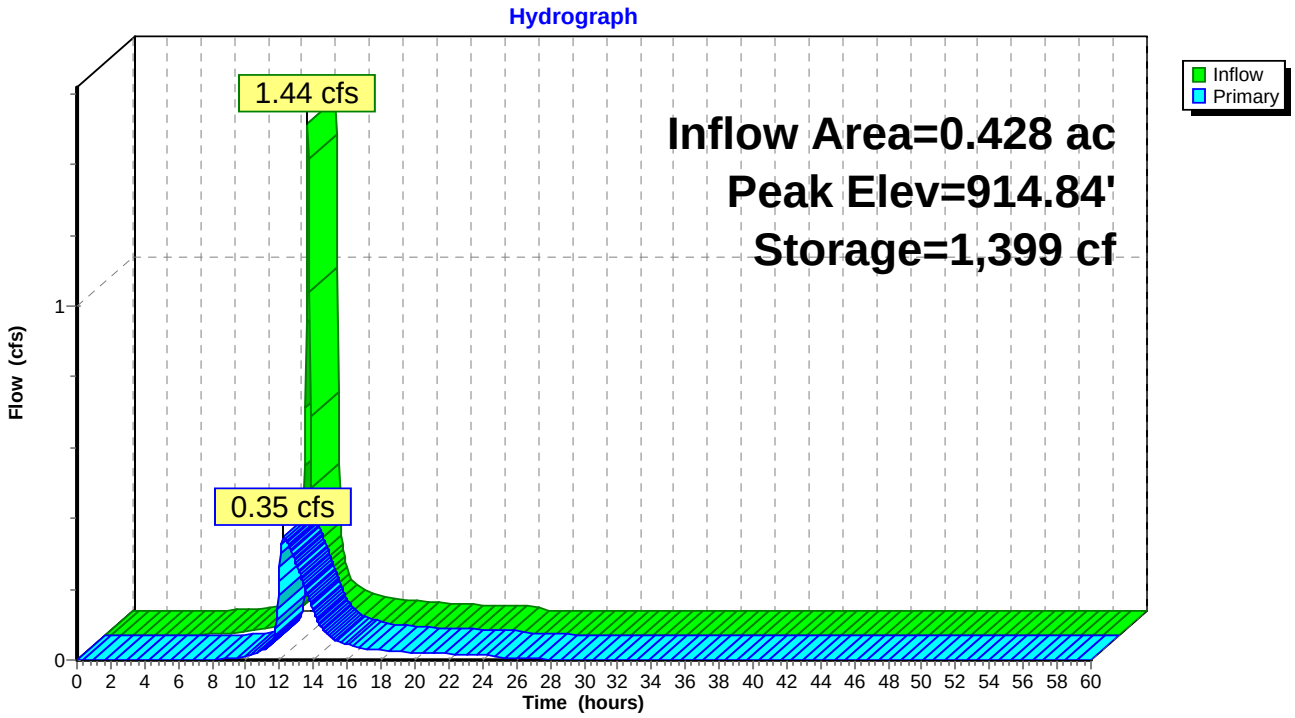
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.35 cfs @ 12.23 hrs HW=914.84' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.35 cfs @ 3.96 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 1.79" for 5-Year event
Inflow = 3.08 cfs @ 12.02 hrs, Volume= 0.170 af
Outflow = 0.31 cfs @ 12.57 hrs, Volume= 0.154 af, Atten= 90%, Lag= 33.2 min
Primary = 0.31 cfs @ 12.57 hrs, Volume= 0.154 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 908.58' @ 12.57 hrs Surf.Area= 5,849 sf Storage= 3,730 cf

Plug-Flow detention time= 214.6 min calculated for 0.154 af (90% of inflow)
Center-of-Mass det. time= 167.3 min (993.4 - 826.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

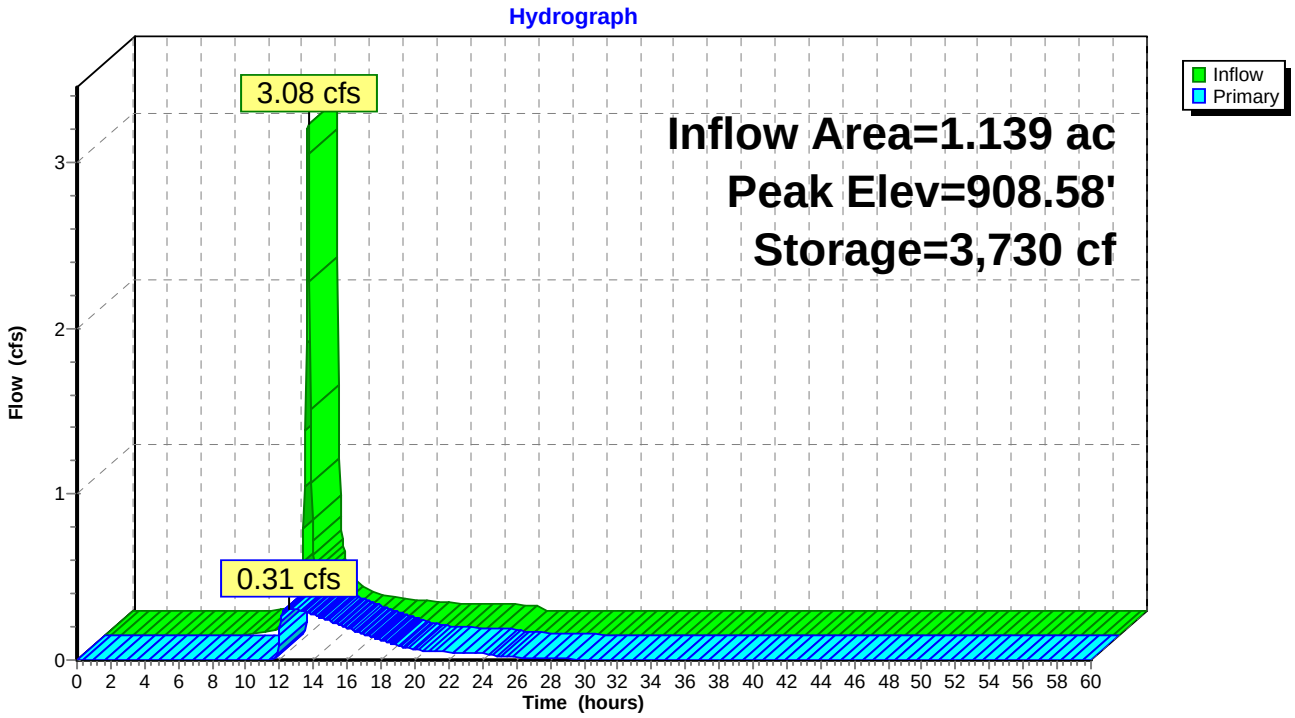
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=0.31 cfs @ 12.57 hrs HW=908.58' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.31 cfs @ 4.66 fps)
└─**2=2nd Stage Orifice** (Controls 0.00 cfs)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 2.00" for 5-Year event
Inflow = 4.36 cfs @ 12.07 hrs, Volume= 0.426 af
Outflow = 0.57 cfs @ 13.20 hrs, Volume= 0.426 af, Atten= 87%, Lag= 67.9 min
Primary = 0.57 cfs @ 13.20 hrs, Volume= 0.426 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 906.99' @ 13.20 hrs Surf.Area= 4,540 sf Storage= 6,207 cf

Plug-Flow detention time= 138.2 min calculated for 0.426 af (100% of inflow)
Center-of-Mass det. time= 137.4 min (1,011.9 - 874.4)

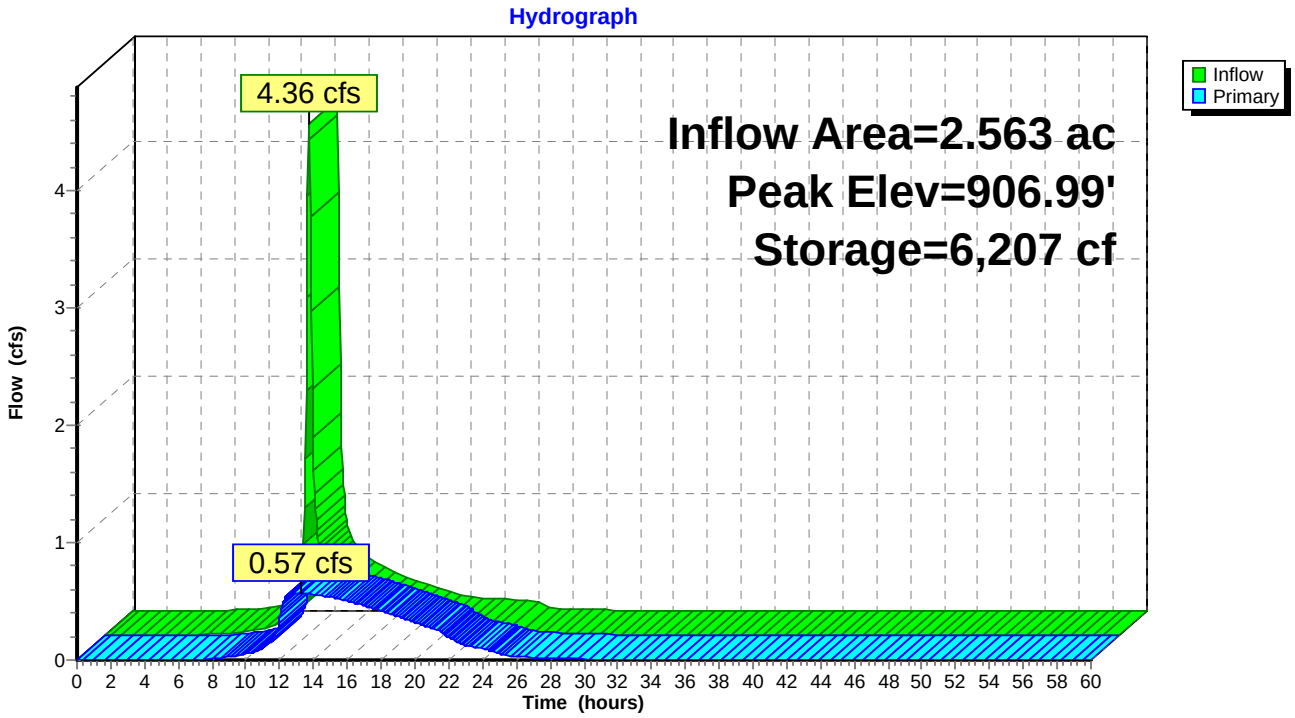
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=0.57 cfs @ 13.20 hrs HW=906.99' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.57 cfs @ 6.51 fps)
└─**2=2nd Stage Weir** (Controls 0.00 cfs)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 1.13" for 5-Year event
Inflow = 0.67 cfs @ 11.91 hrs, Volume= 0.054 af
Outflow = 0.67 cfs @ 11.91 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 11.91 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.58' @ 11.91 hrs Surf.Area= 4 sf Storage= 2 cf

Plug-Flow detention time= 0.1 min calculated for 0.054 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (858.1 - 857.9)

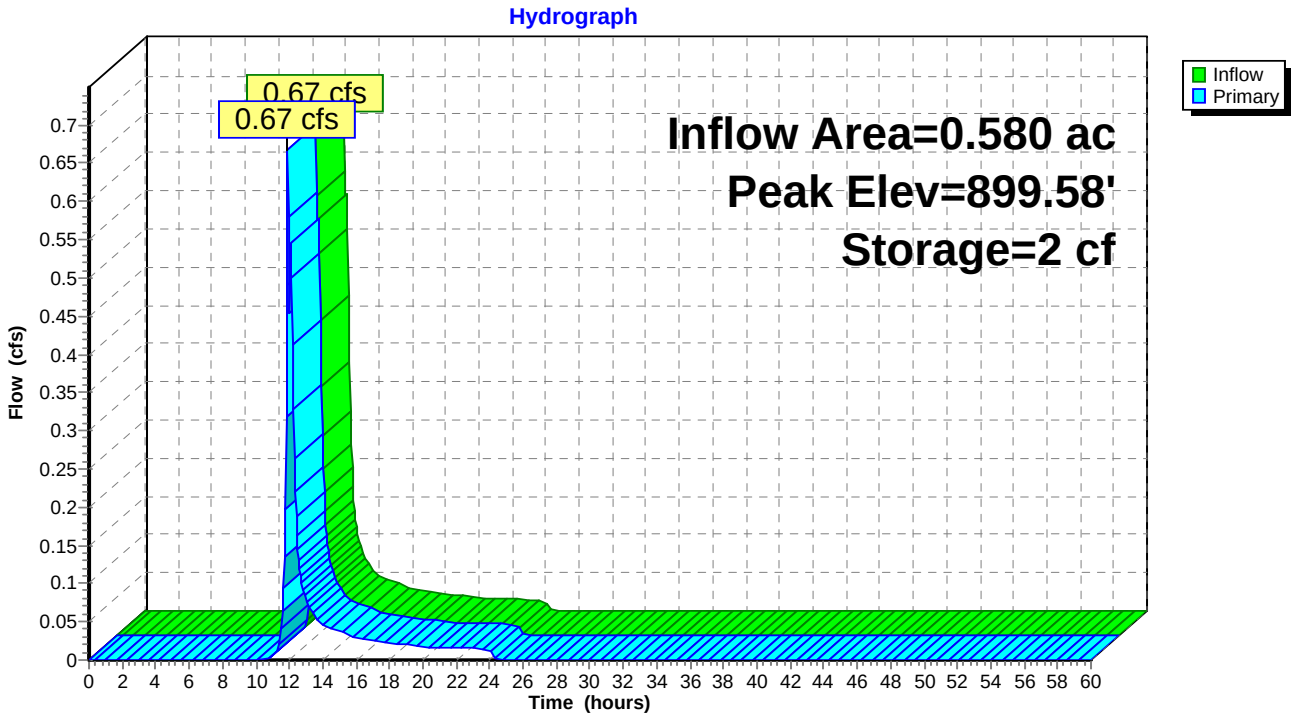
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.65 cfs @ 11.91 hrs HW=899.57' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.65 cfs @ 2.38 fps)

Pond 20P: Ex 9


Hydrograph
0.67 cfs
0.67 cfs
Inflow Area=0.580 ac
Peak Elev=899.58'
Storage=2 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 21P: Ex. 8

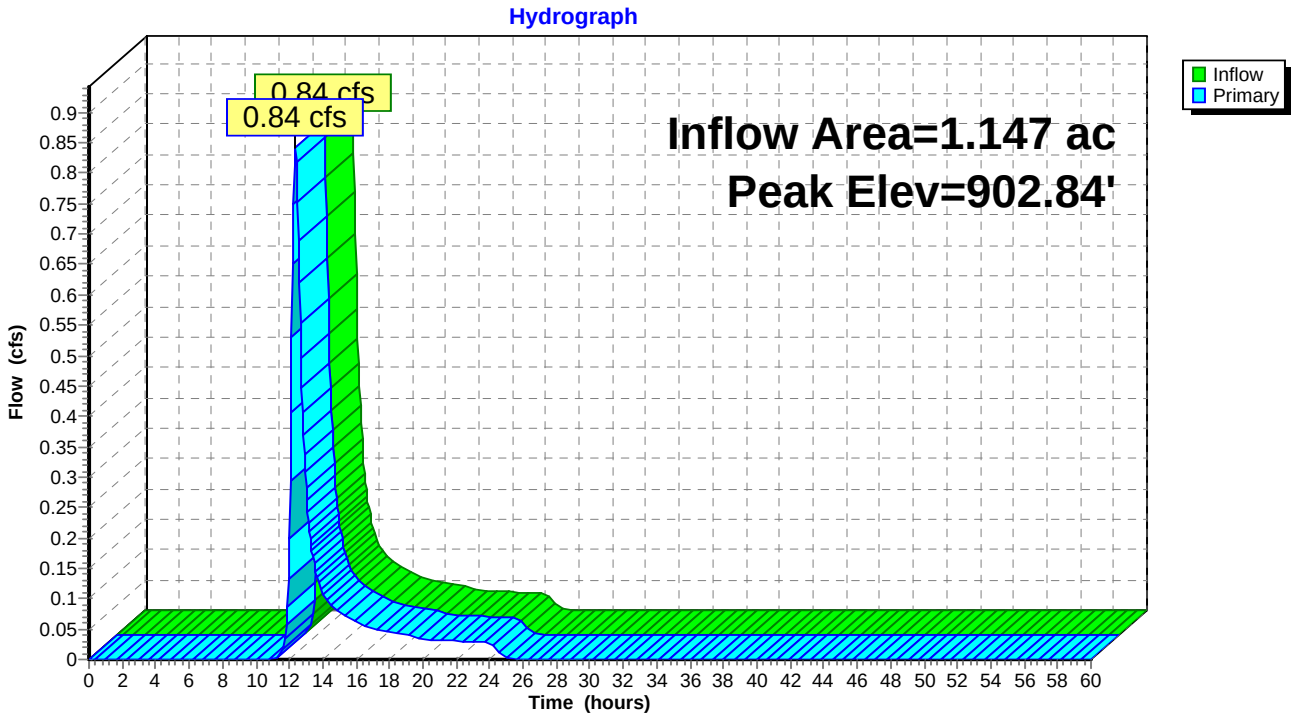
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	1.06"	for 5-Year event
Inflow =	0.84 cfs @	12.36 hrs,	Volume=	0.102 af	
Outflow =	0.84 cfs @	12.36 hrs,	Volume=	0.102 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.84 cfs @	12.36 hrs,	Volume=	0.102 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 902.84' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.84 cfs @ 12.36 hrs HW=902.84' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.84 cfs @ 2.60 fps)

Pond 21P: Ex. 8

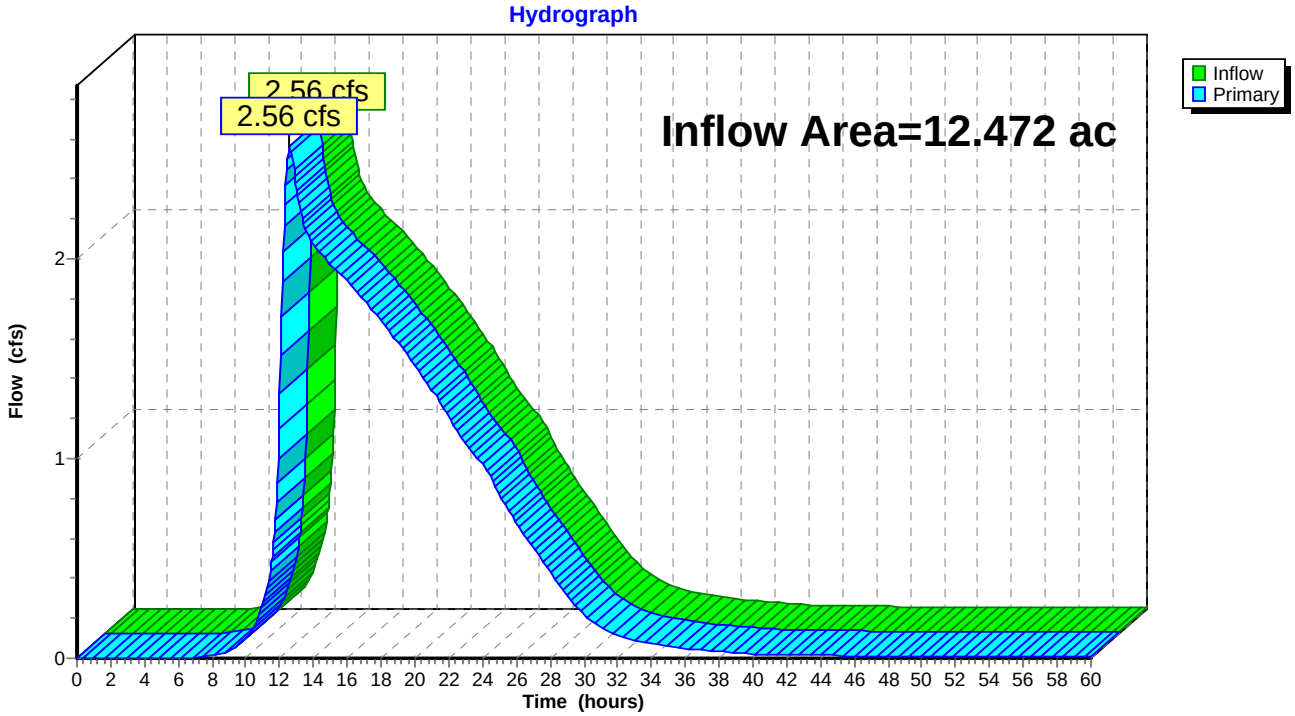


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 2.00" for 5-Year event
Inflow = 2.56 cfs @ 12.60 hrs, Volume= 2.082 af
Primary = 2.56 cfs @ 12.60 hrs, Volume= 2.082 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



Summary for Subcatchment 2S: Post Developed Overall

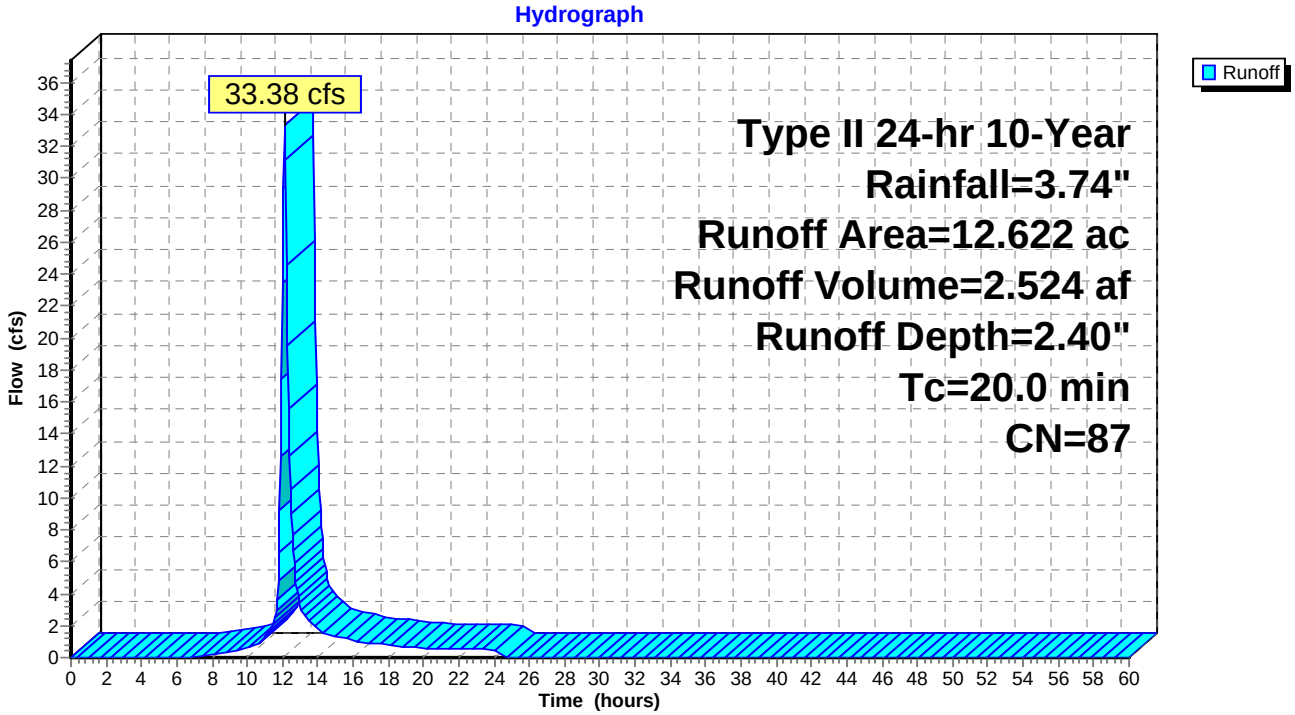
Runoff = 33.38 cfs @ 12.12 hrs, Volume= 2.524 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

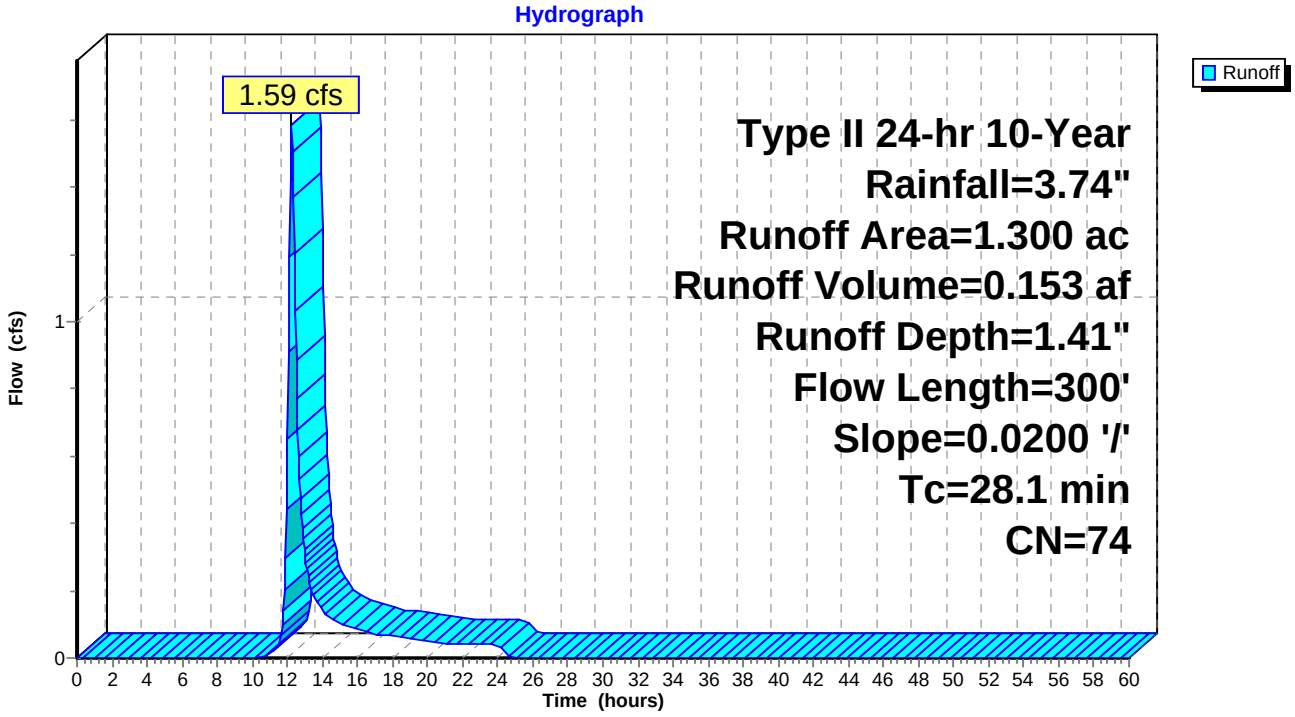
Runoff = 1.59 cfs @ 12.24 hrs, Volume= 0.153 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

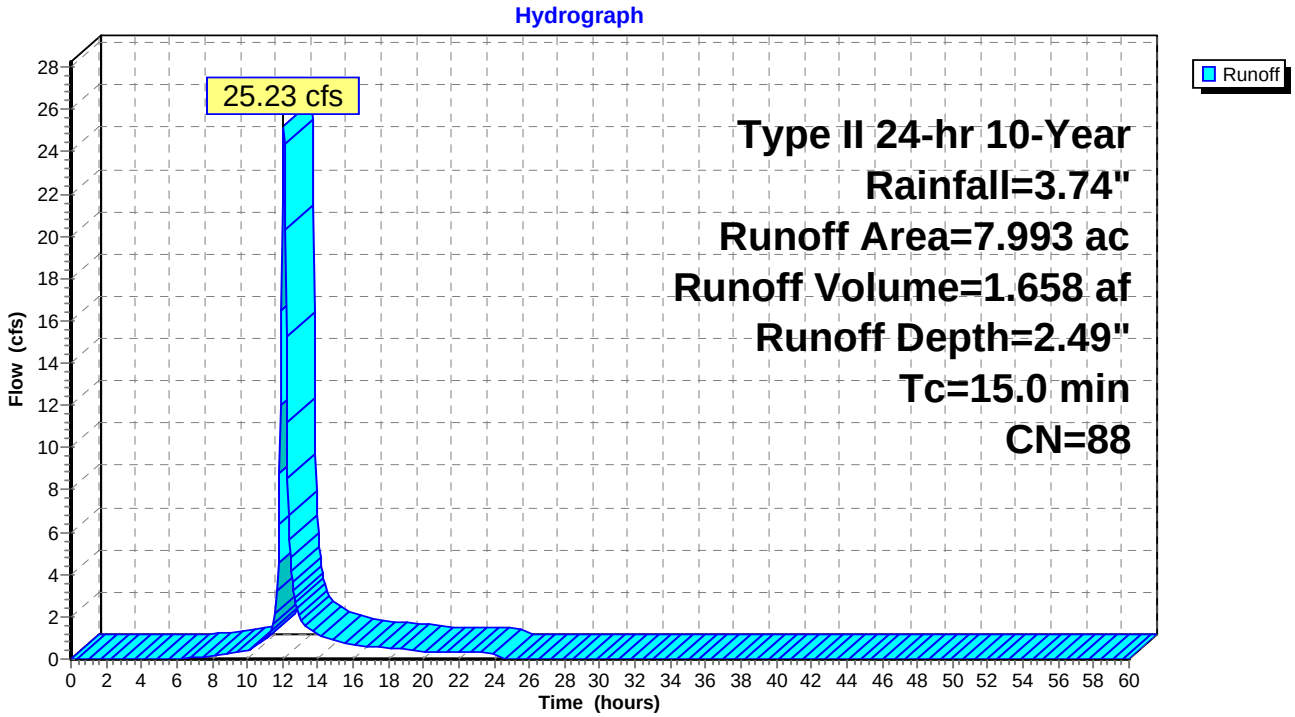
Runoff = 25.23 cfs @ 12.07 hrs, Volume= 1.658 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

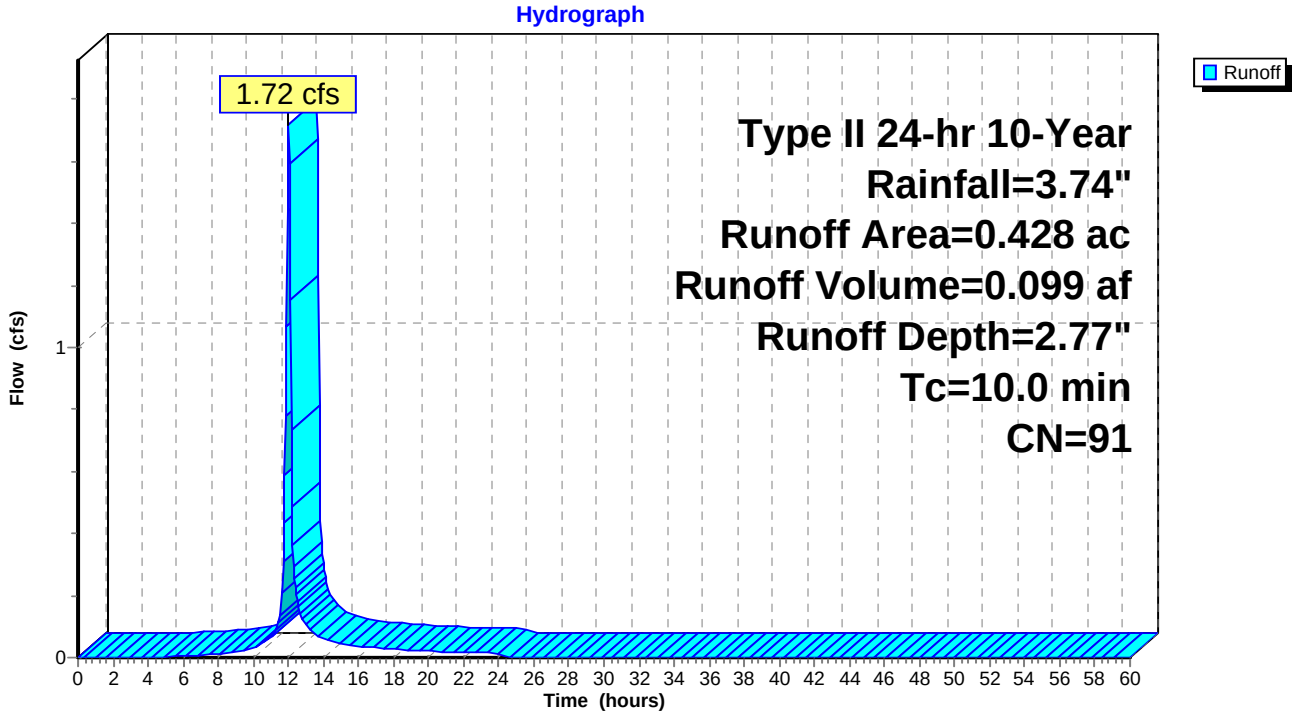
Runoff = 1.72 cfs @ 12.01 hrs, Volume= 0.099 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

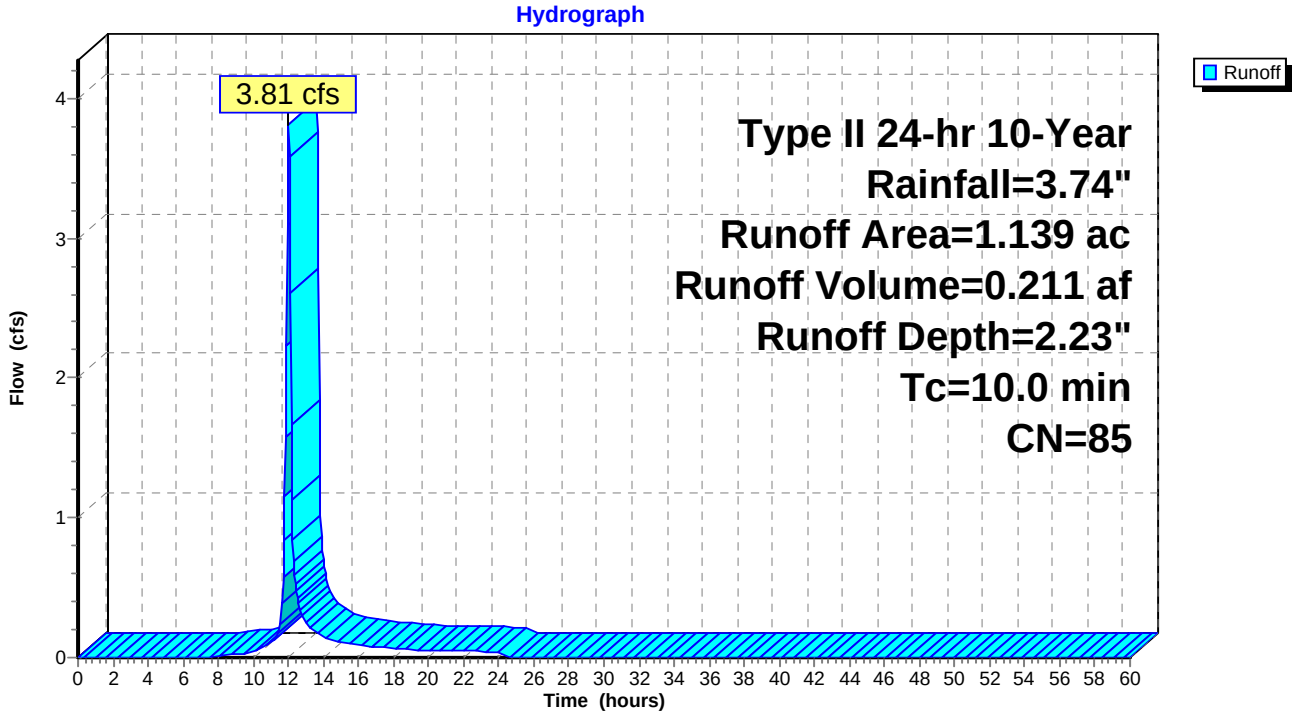
Runoff = 3.81 cfs @ 12.01 hrs, Volume= 0.211 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

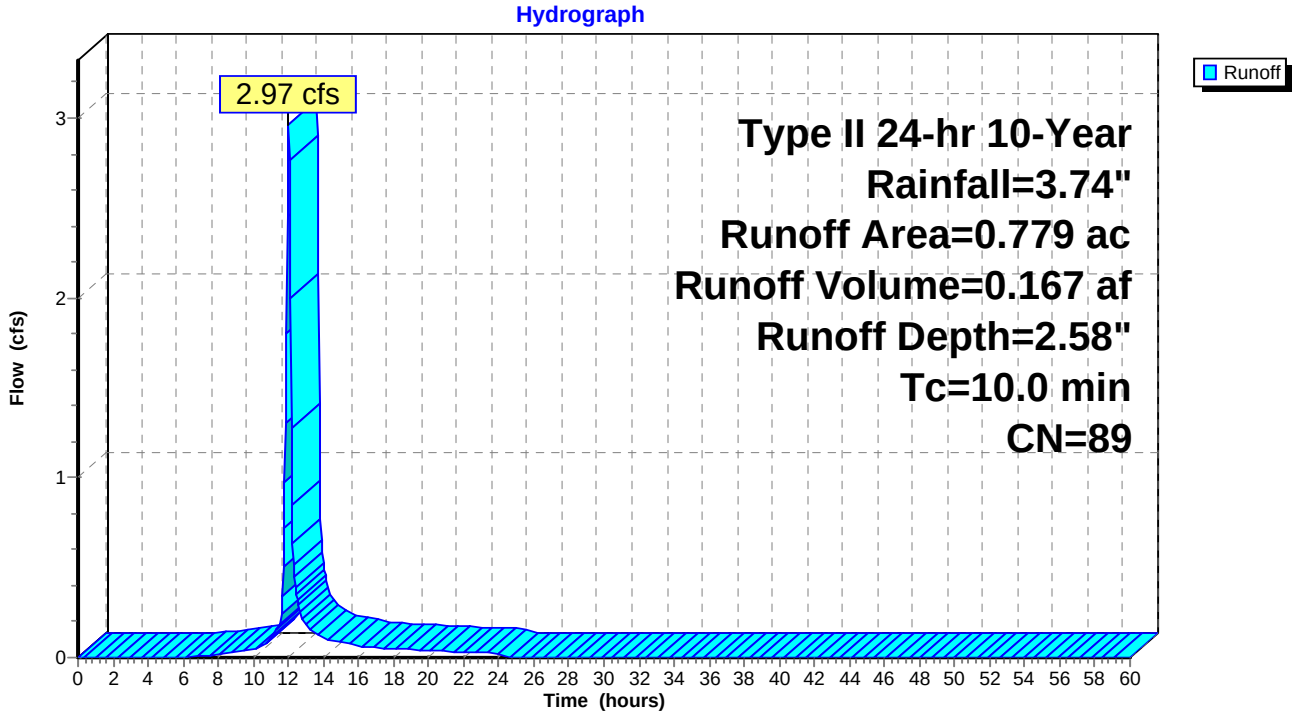
Runoff = 2.97 cfs @ 12.01 hrs, Volume= 0.167 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

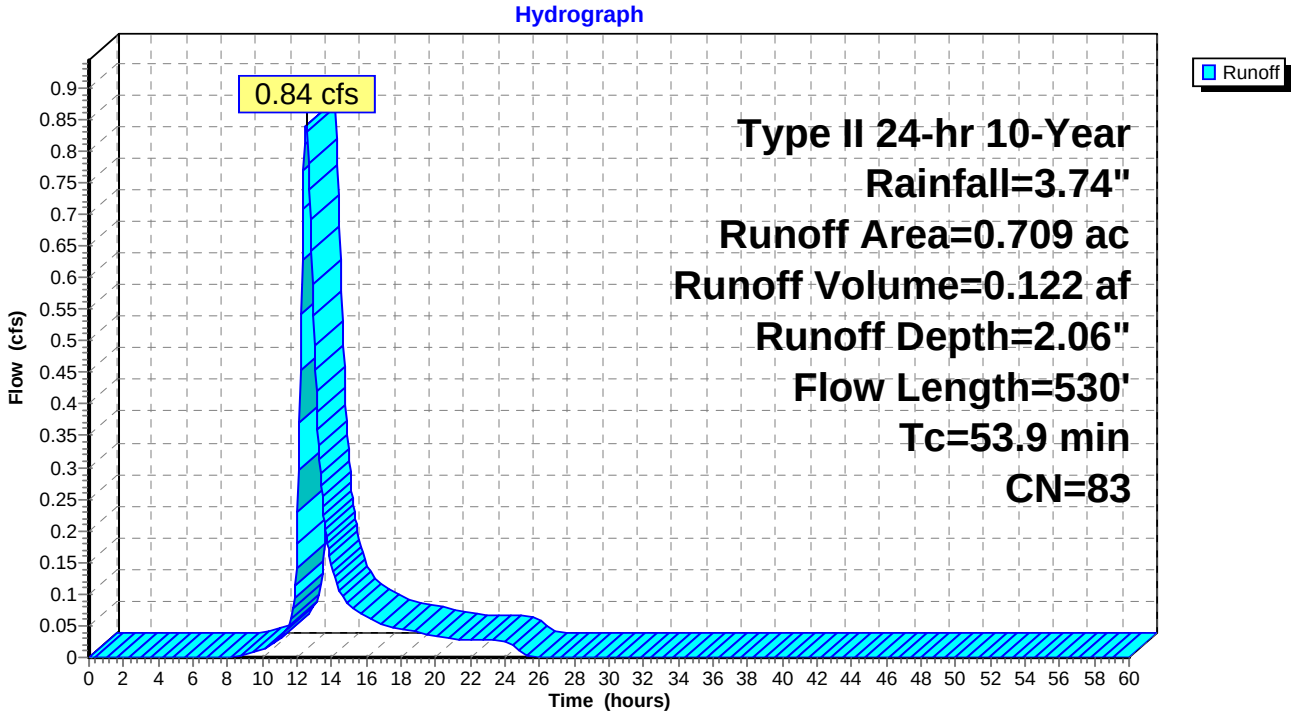
Runoff = 0.84 cfs @ 12.54 hrs, Volume= 0.122 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

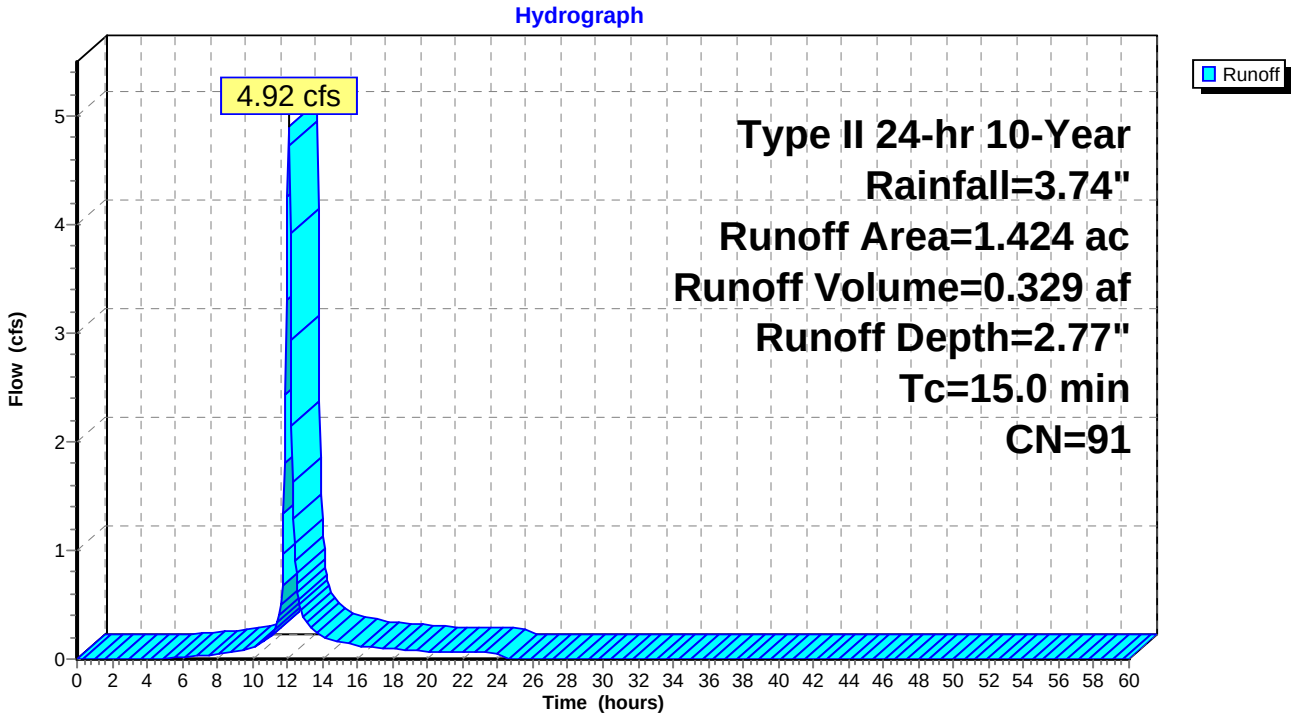
Runoff = 4.92 cfs @ 12.06 hrs, Volume= 0.329 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

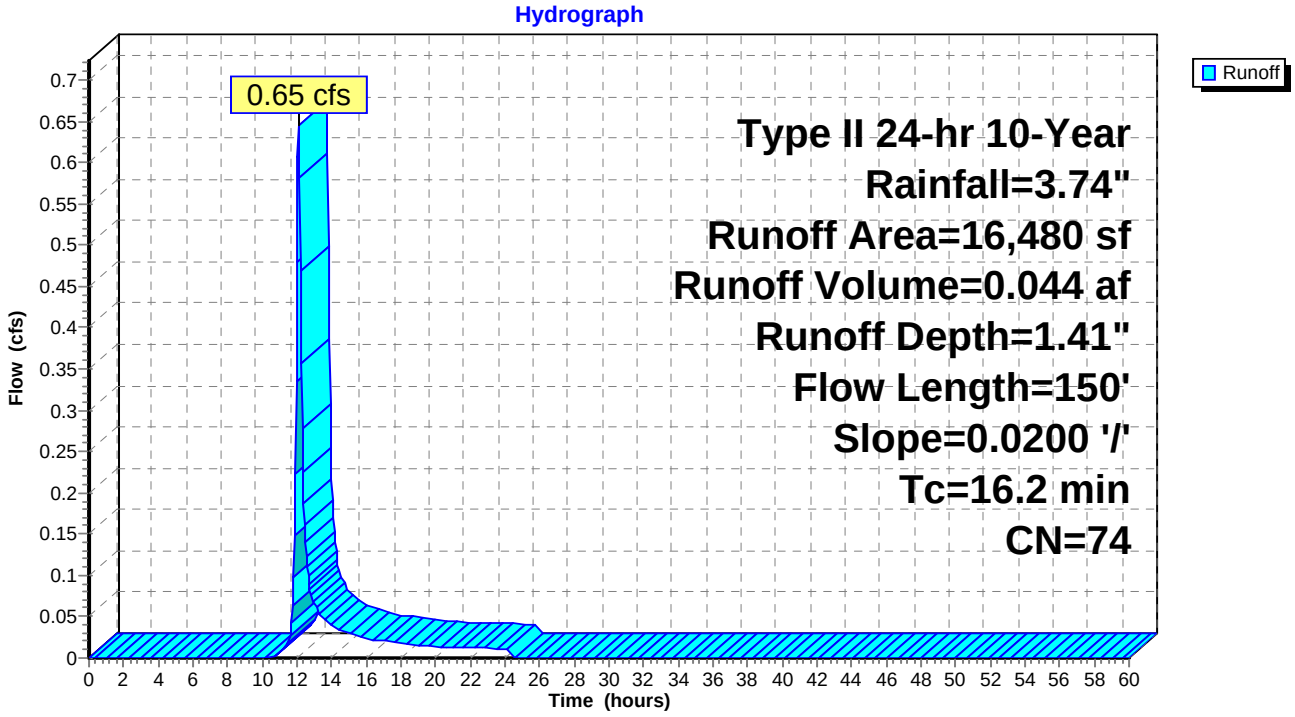
Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.044 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



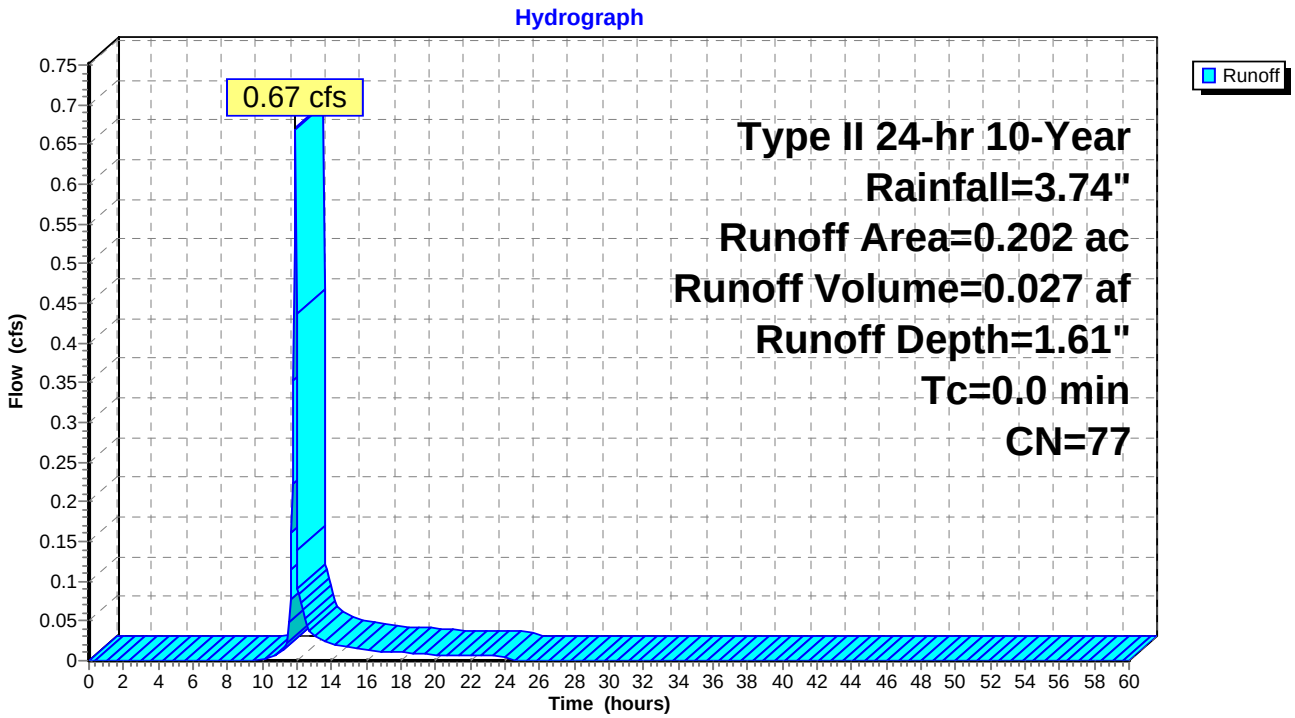
Summary for Subcatchment 19S: Undetained West

Runoff = 0.67 cfs @ 11.89 hrs, Volume= 0.027 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

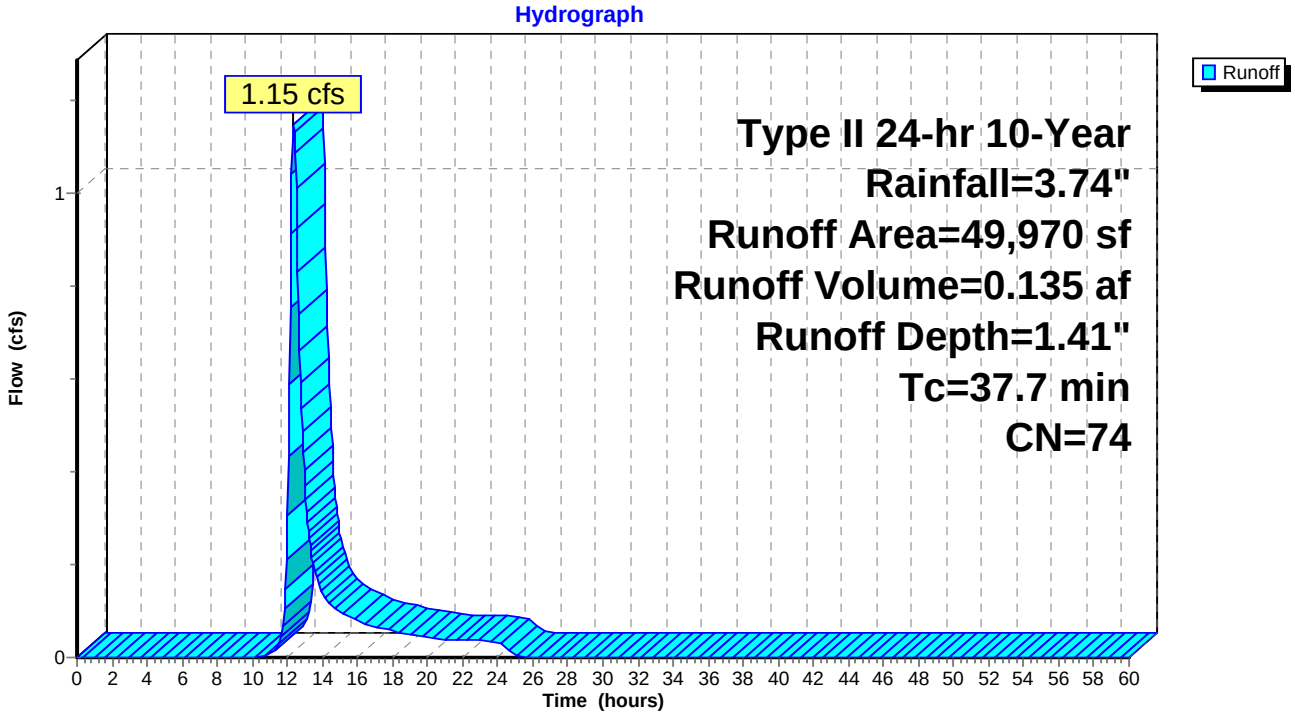
Runoff = 1.15 cfs @ 12.36 hrs, Volume= 0.135 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 2.50" for 10-Year event
Inflow = 26.56 cfs @ 12.07 hrs, Volume= 1.915 af
Outflow = 1.55 cfs @ 13.87 hrs, Volume= 1.909 af, Atten= 94%, Lag= 108.2 min
Primary = 1.55 cfs @ 13.87 hrs, Volume= 1.909 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 910.18' @ 13.87 hrs Surf.Area= 33,160 sf Storage= 70,264 cf (47,846 cf above start)

Plug-Flow detention time= 645.4 min calculated for 1.394 af (73% of inflow)
Center-of-Mass det. time= 398.1 min (1,219.8 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

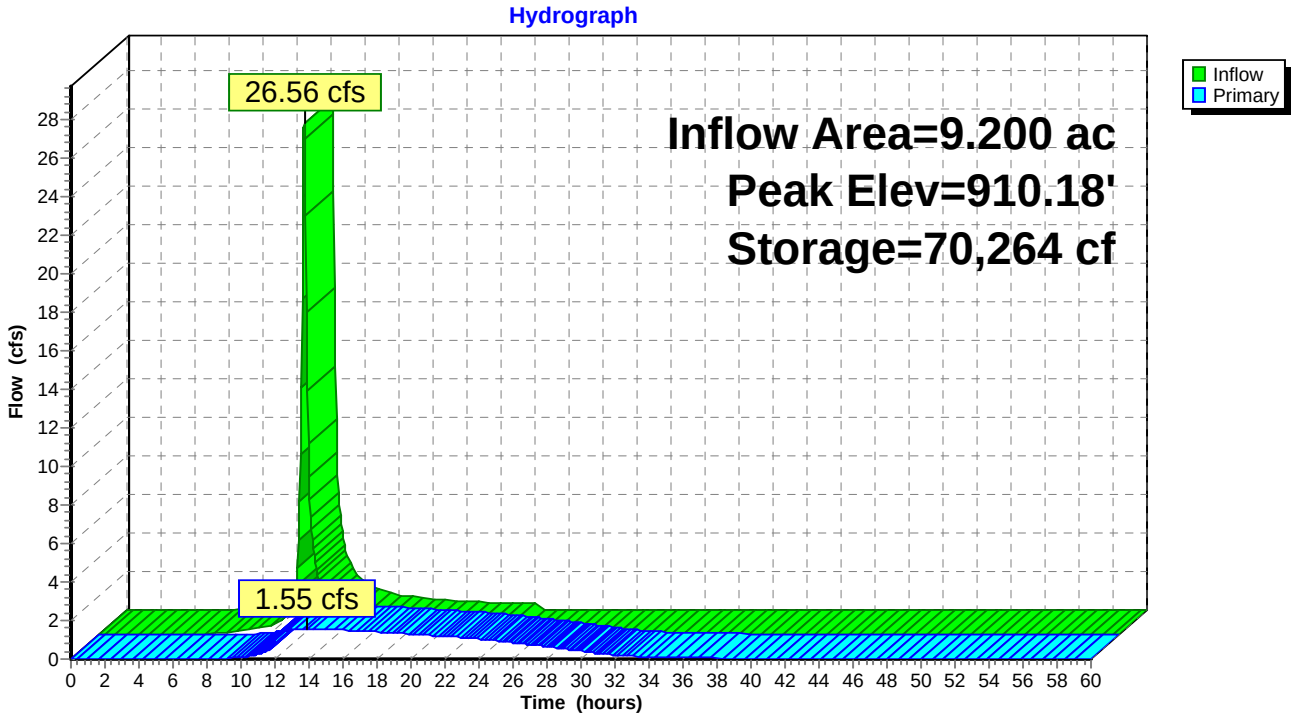
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.55 cfs @ 13.87 hrs HW=910.18' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.55 cfs @ 7.89 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 2.36" for 10-Year event
Inflow = 4.13 cfs @ 12.31 hrs, Volume= 2.707 af
Outflow = 4.10 cfs @ 12.34 hrs, Volume= 2.706 af, Atten= 1%, Lag= 1.8 min
Primary = 4.10 cfs @ 12.34 hrs, Volume= 2.706 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 901.58' @ 12.34 hrs Surf.Area= 83 sf Storage= 23 cf

Plug-Flow detention time= 0.3 min calculated for 2.706 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,146.8 - 1,146.7)

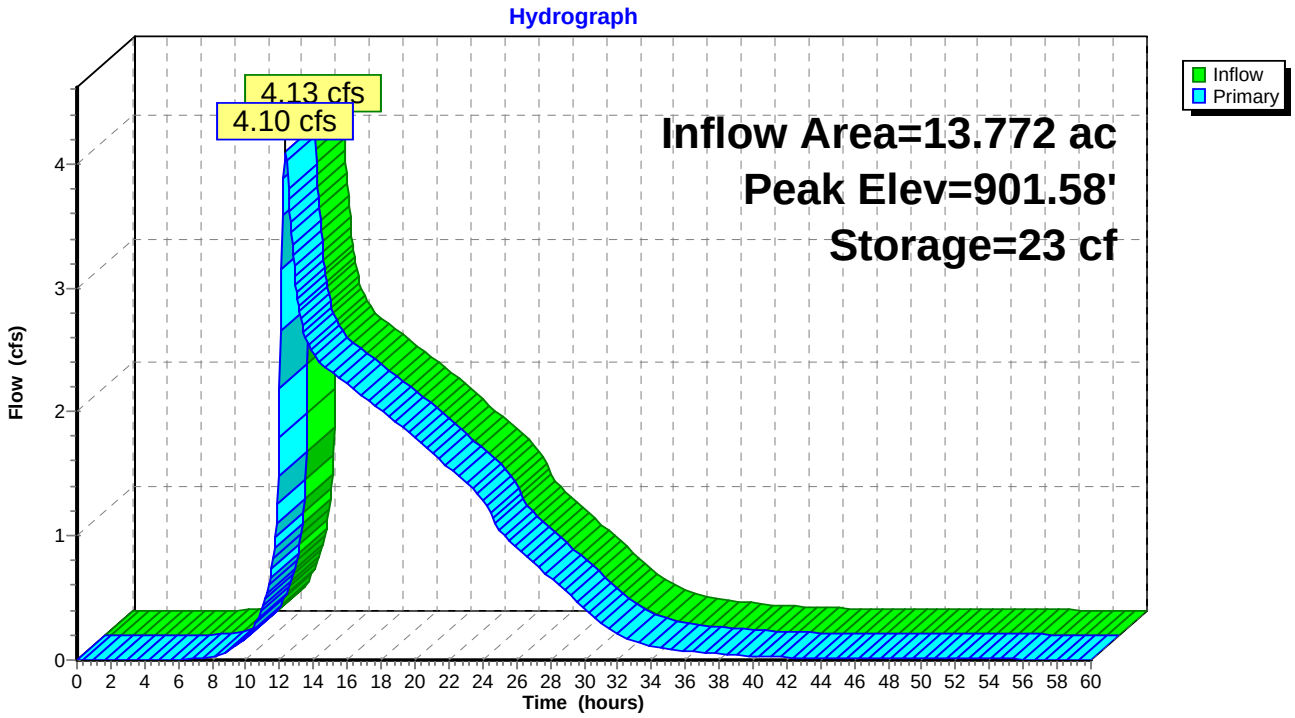
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.10 cfs @ 12.34 hrs HW=901.57' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 4.10 cfs @ 5.22 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 4P: Ex 10


Hydrograph
4.13 cfs
4.10 cfs
Inflow Area=13.772 ac
Peak Elev=901.58'
Storage=23 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 2.58" for 10-Year event
Inflow = 2.97 cfs @ 12.01 hrs, Volume= 0.167 af
Outflow = 1.06 cfs @ 12.18 hrs, Volume= 0.159 af, Atten= 64%, Lag= 9.9 min
Primary = 1.06 cfs @ 12.18 hrs, Volume= 0.159 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 912.01' @ 12.18 hrs Surf.Area= 1,938 sf Storage= 2,647 cf

Plug-Flow detention time= 90.4 min calculated for 0.159 af (95% of inflow)
Center-of-Mass det. time= 59.6 min (865.2 - 805.6)

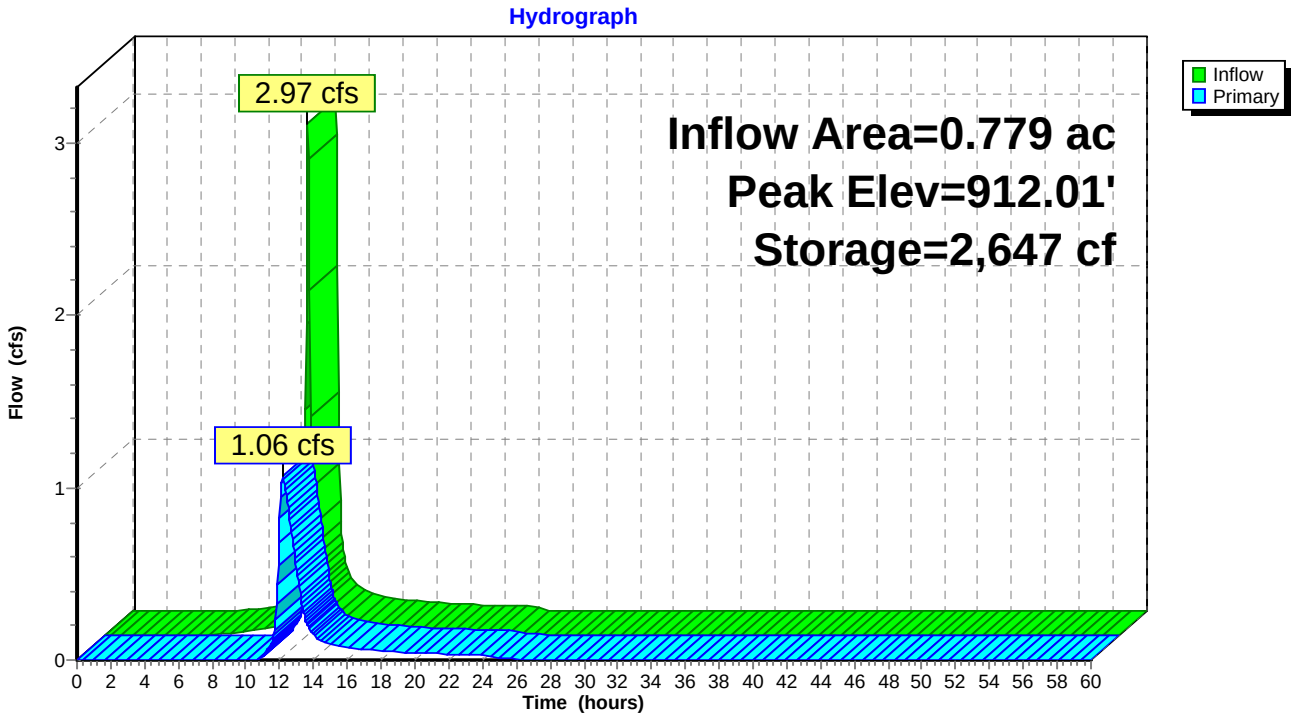
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.06 cfs @ 12.18 hrs HW=912.01' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.06 cfs @ 5.40 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 2.77" for 10-Year event
Inflow = 1.72 cfs @ 12.01 hrs, Volume= 0.099 af
Outflow = 0.39 cfs @ 12.25 hrs, Volume= 0.099 af, Atten= 77%, Lag= 14.1 min
Primary = 0.39 cfs @ 12.25 hrs, Volume= 0.099 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 915.02' @ 12.25 hrs Surf.Area= 4,150 sf Storage= 1,695 cf

Plug-Flow detention time= 82.5 min calculated for 0.099 af (100% of inflow)
Center-of-Mass det. time= 82.3 min (879.6 - 797.3)

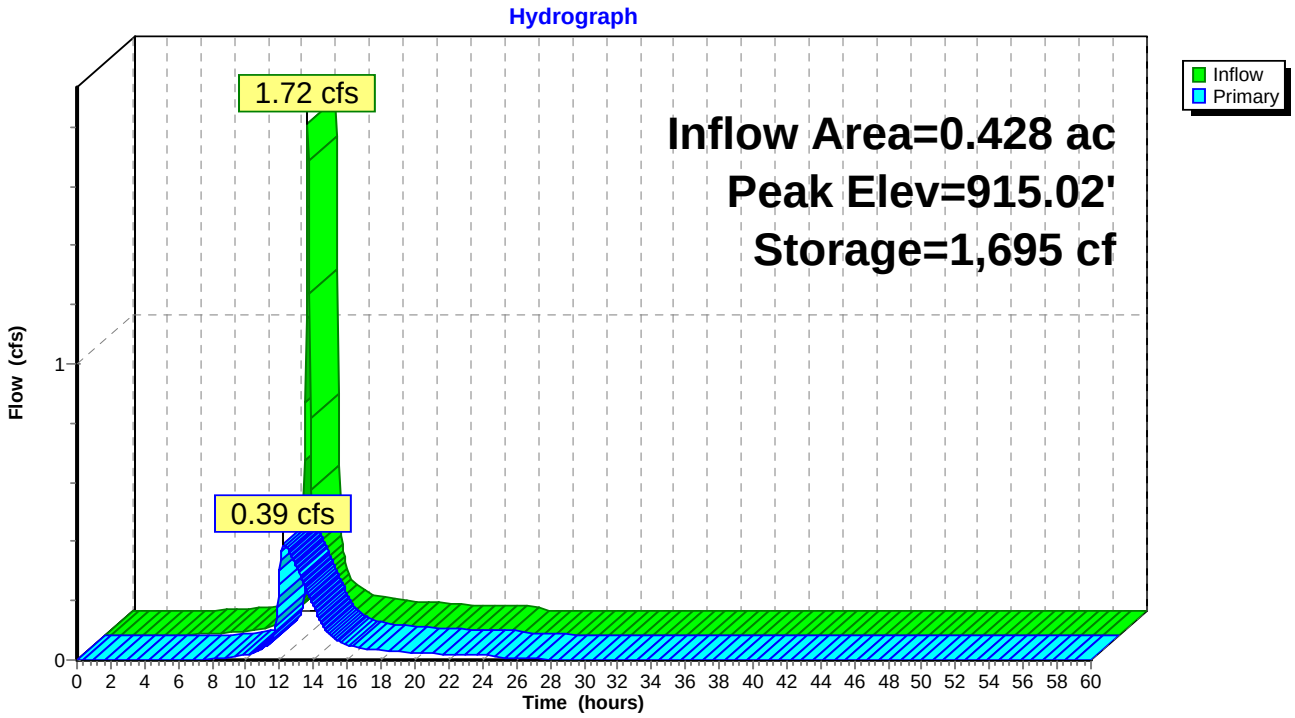
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.39 cfs @ 12.25 hrs HW=915.02' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.39 cfs @ 4.45 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 2.23" for 10-Year event
Inflow = 3.81 cfs @ 12.01 hrs, Volume= 0.211 af
Outflow = 0.37 cfs @ 12.57 hrs, Volume= 0.195 af, Atten= 90%, Lag= 33.6 min
Primary = 0.37 cfs @ 12.57 hrs, Volume= 0.195 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 908.98' @ 12.57 hrs Surf.Area= 5,849 sf Storage= 4,749 cf

Plug-Flow detention time= 212.2 min calculated for 0.195 af (92% of inflow)
Center-of-Mass det. time= 172.8 min (992.7 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

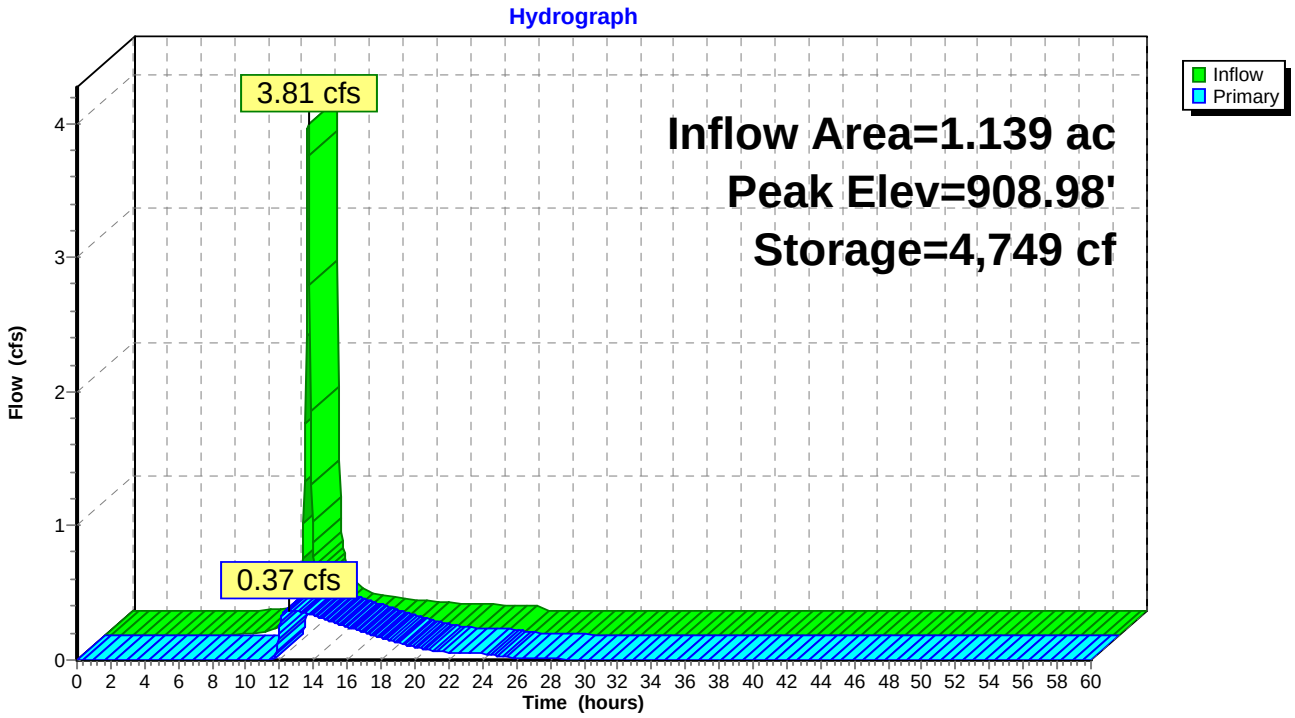
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=0.37 cfs @ 12.57 hrs HW=908.98' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.37 cfs @ 5.56 fps)
└─**2=2nd Stage Orifice** (Controls 0.00 cfs)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 2.45" for 10-Year event
Inflow = 5.22 cfs @ 12.07 hrs, Volume= 0.524 af
Outflow = 0.64 cfs @ 13.36 hrs, Volume= 0.524 af, Atten= 88%, Lag= 77.8 min
Primary = 0.64 cfs @ 13.36 hrs, Volume= 0.524 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 907.50' @ 13.36 hrs Surf.Area= 4,540 sf Storage= 7,712 cf

Plug-Flow detention time= 153.6 min calculated for 0.524 af (100% of inflow)
Center-of-Mass det. time= 153.0 min (1,026.1 - 873.1)

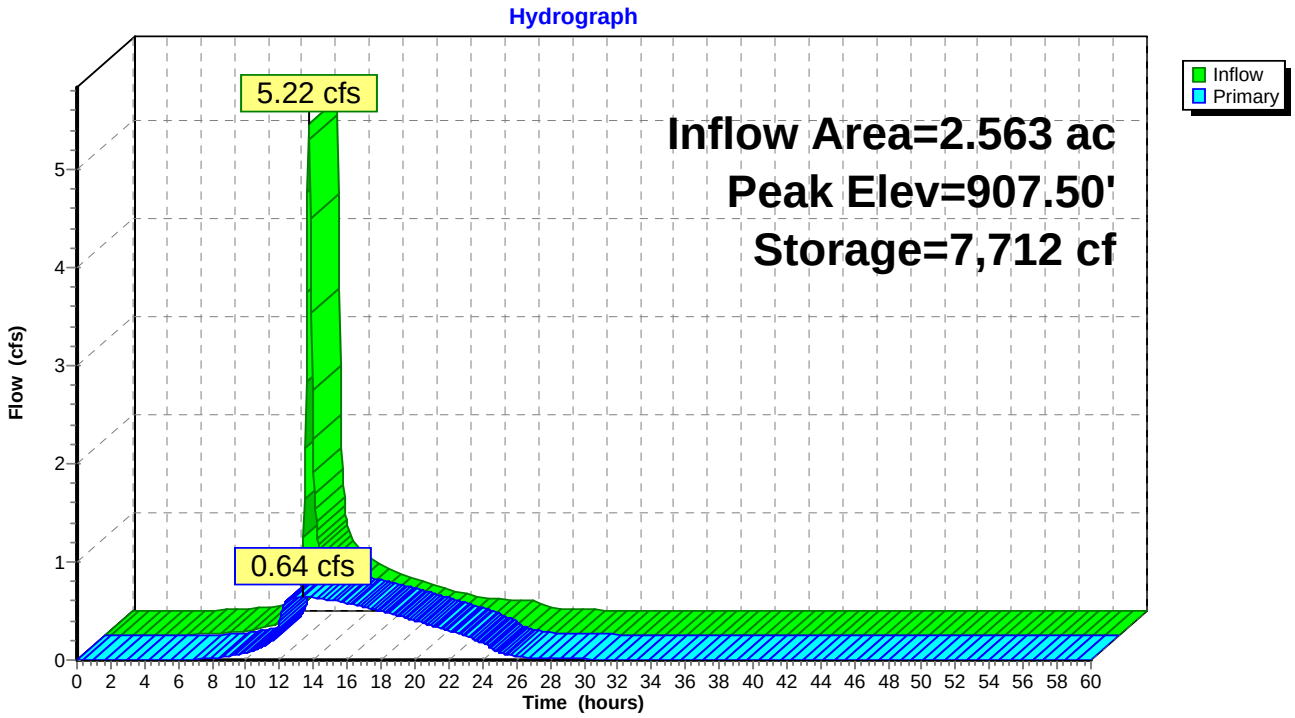
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=0.64 cfs @ 13.36 hrs HW=907.50' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.64 cfs @ 7.35 fps)
└─**2=2nd Stage Weir** (Controls 0.00 cfs)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 1.48" for 10-Year event
Inflow = 0.89 cfs @ 11.91 hrs, Volume= 0.072 af
Outflow = 0.89 cfs @ 11.91 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.89 cfs @ 11.91 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.69' @ 11.91 hrs Surf.Area= 4 sf Storage= 2 cf

Plug-Flow detention time= 0.1 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (849.9 - 849.8)

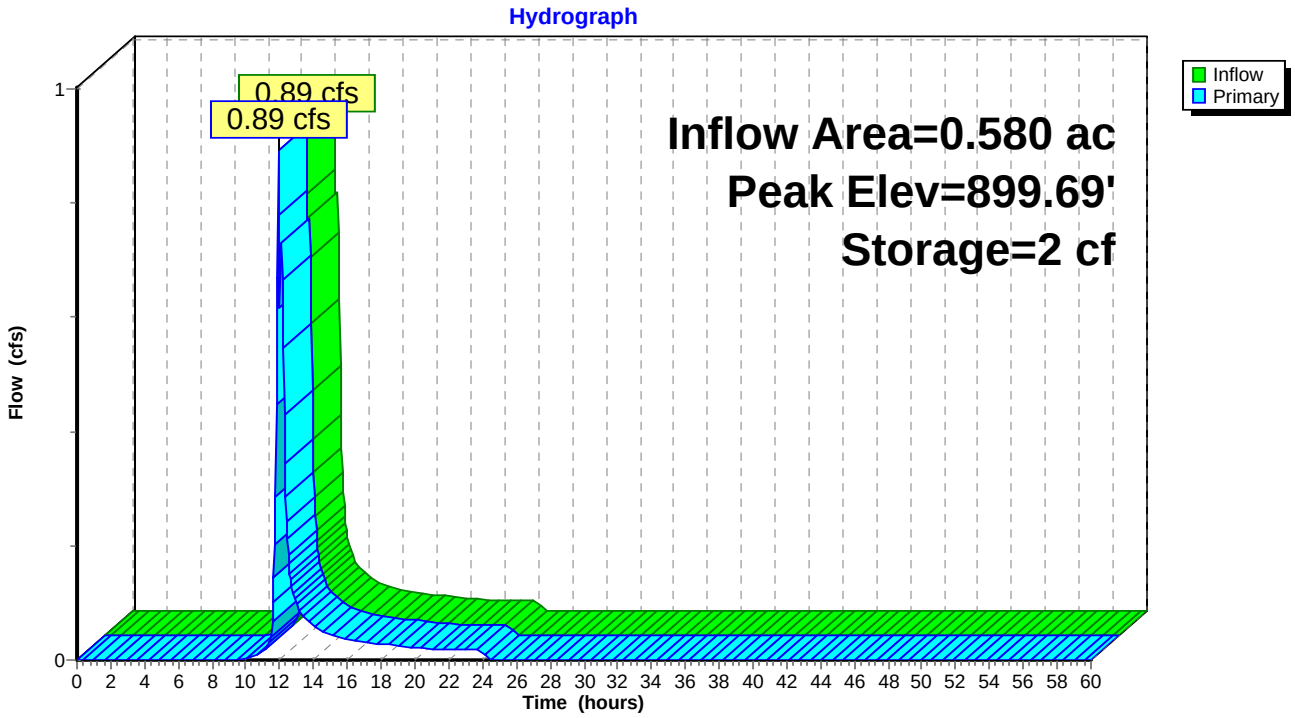
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=0.87 cfs @ 11.91 hrs HW=899.68' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 0.87 cfs @ 2.64 fps)

Pond 20P: Ex 9


Hydrograph
0.89 cfs
0.89 cfs
Inflow Area=0.580 ac
Peak Elev=899.69'
Storage=2 cf
Inflow
Primary
Flow (cfs)
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 21P: Ex. 8

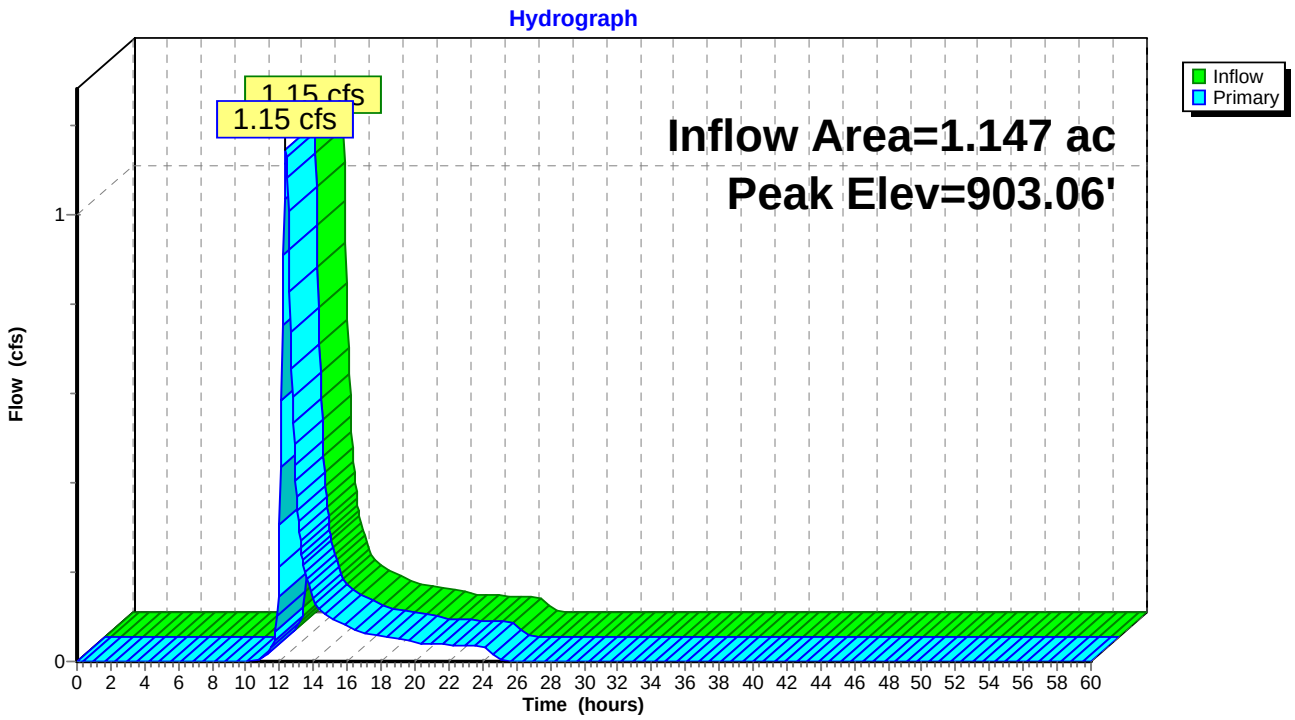
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	1.41"	for 10-Year event
Inflow =	1.15 cfs @	12.36 hrs,	Volume=	0.135 af	
Outflow =	1.15 cfs @	12.36 hrs,	Volume=	0.135 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.15 cfs @	12.36 hrs,	Volume=	0.135 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 903.06' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.14 cfs @ 12.36 hrs HW=903.06' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.14 cfs @ 3.28 fps)

Pond 21P: Ex. 8

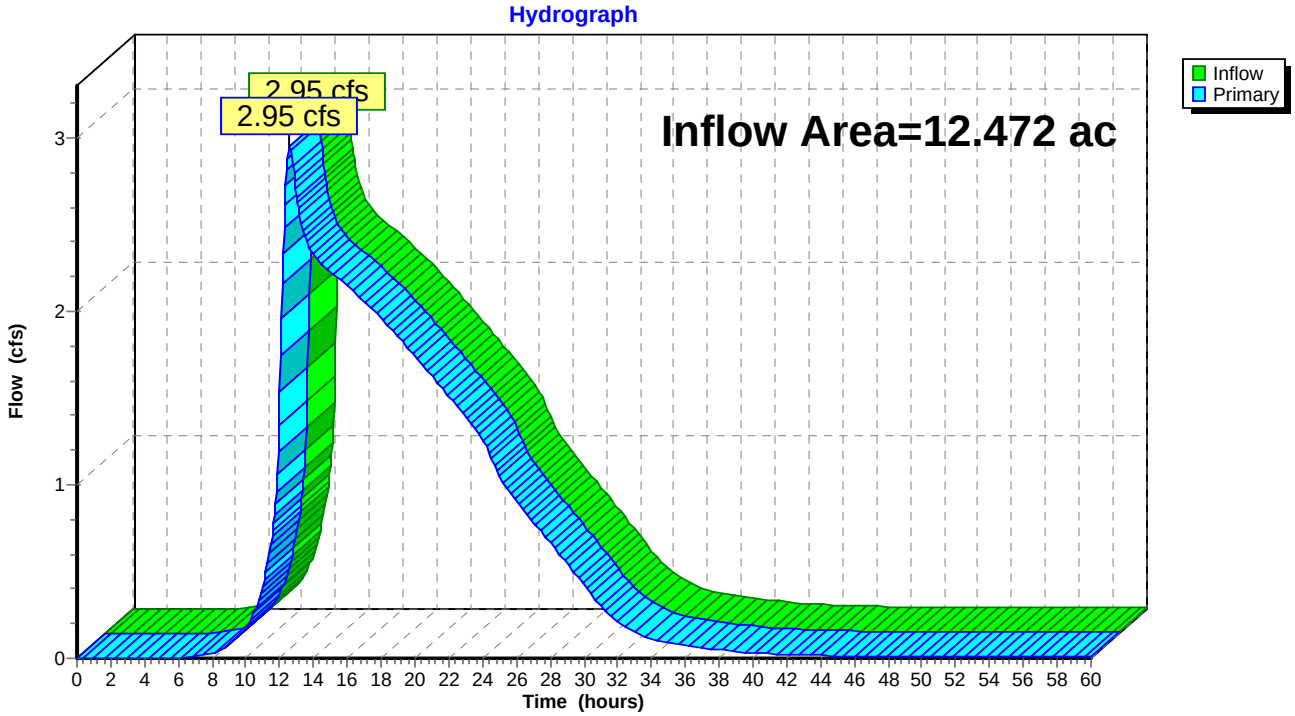


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 2.46" for 10-Year event
Inflow = 2.95 cfs @ 12.59 hrs, Volume= 2.554 af
Primary = 2.95 cfs @ 12.59 hrs, Volume= 2.554 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



Summary for Subcatchment 2S: Post Developed Overall

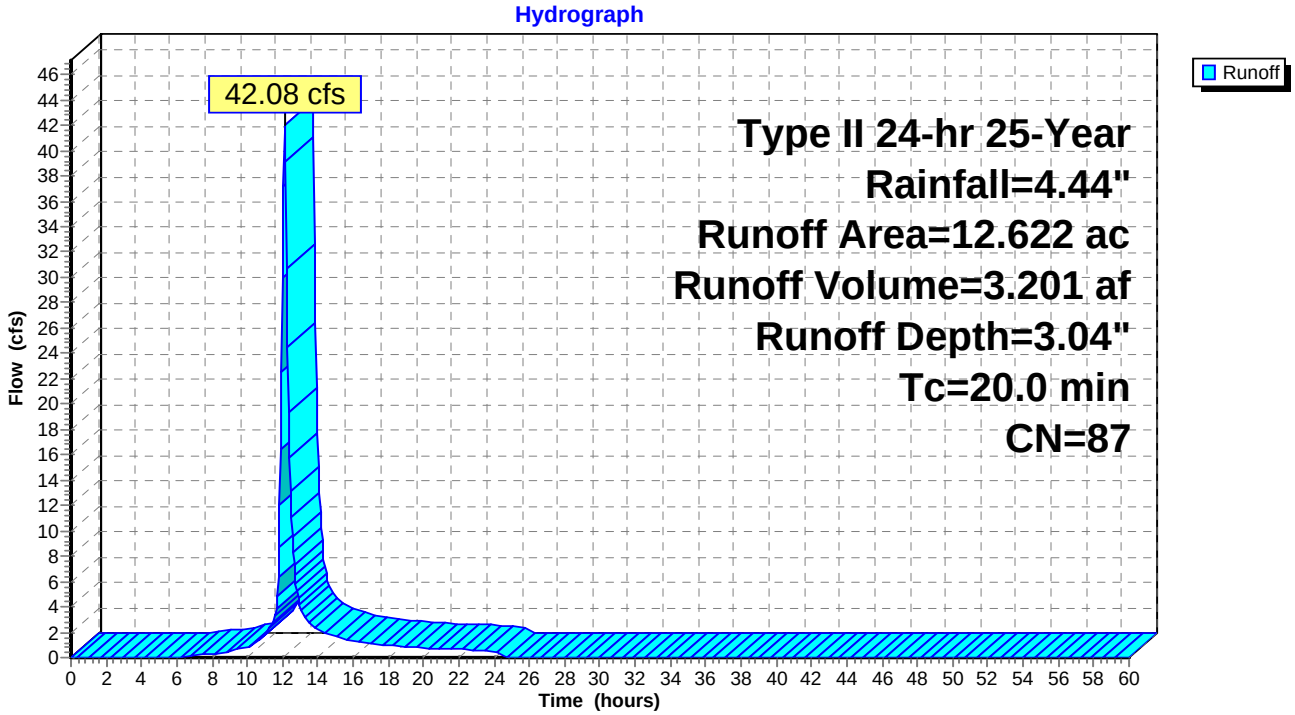
Runoff = 42.08 cfs @ 12.12 hrs, Volume= 3.201 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

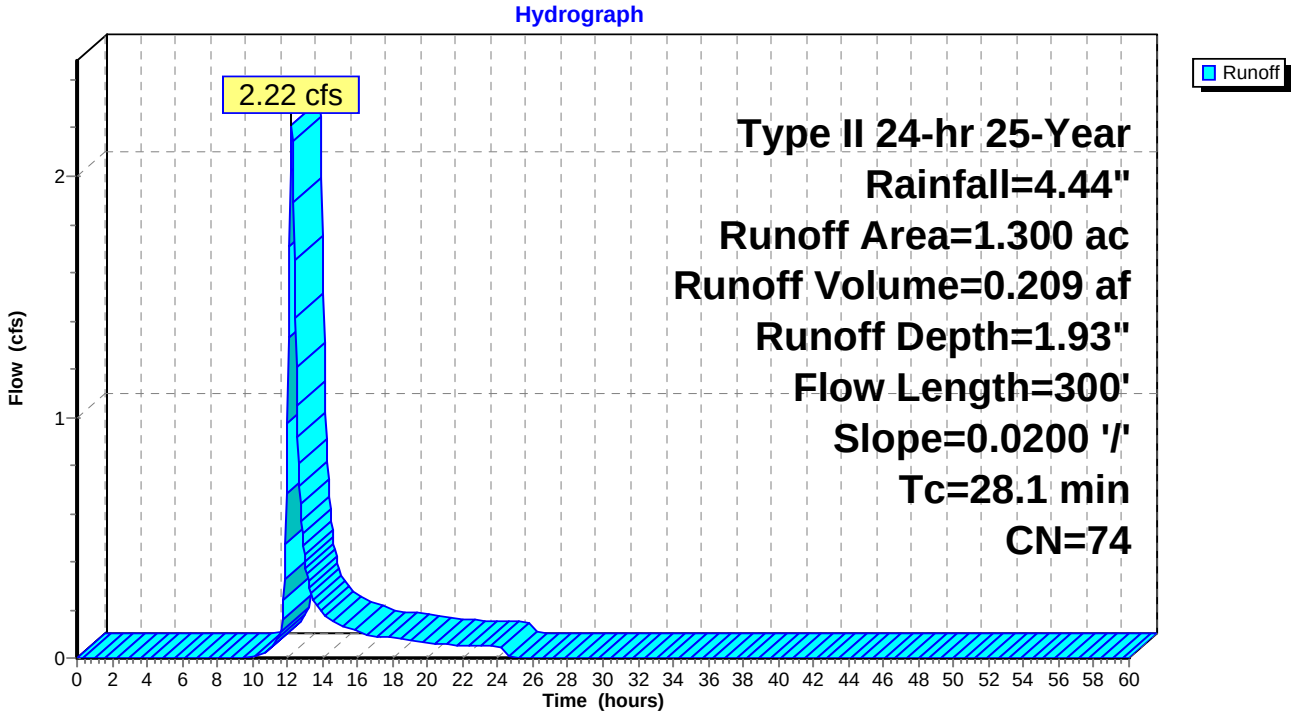
Runoff = 2.22 cfs @ 12.23 hrs, Volume= 0.209 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

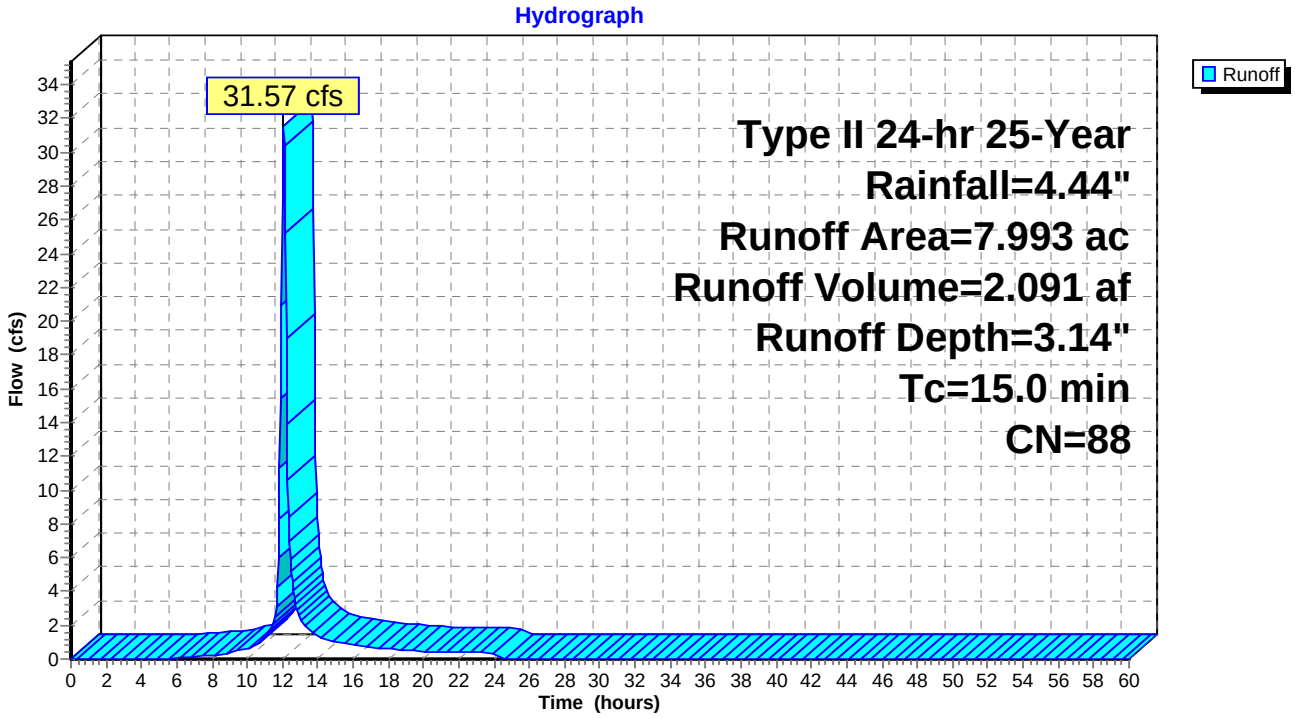
Runoff = 31.57 cfs @ 12.07 hrs, Volume= 2.091 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

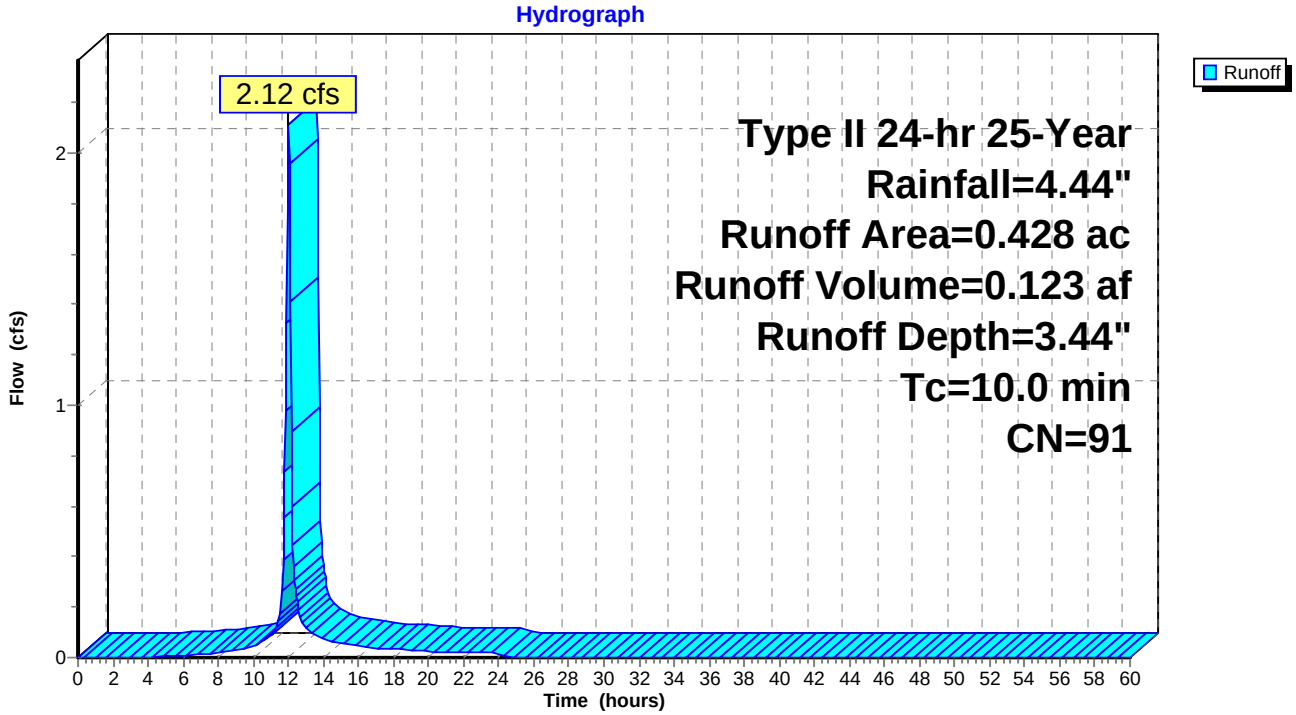
Runoff = 2.12 cfs @ 12.01 hrs, Volume= 0.123 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

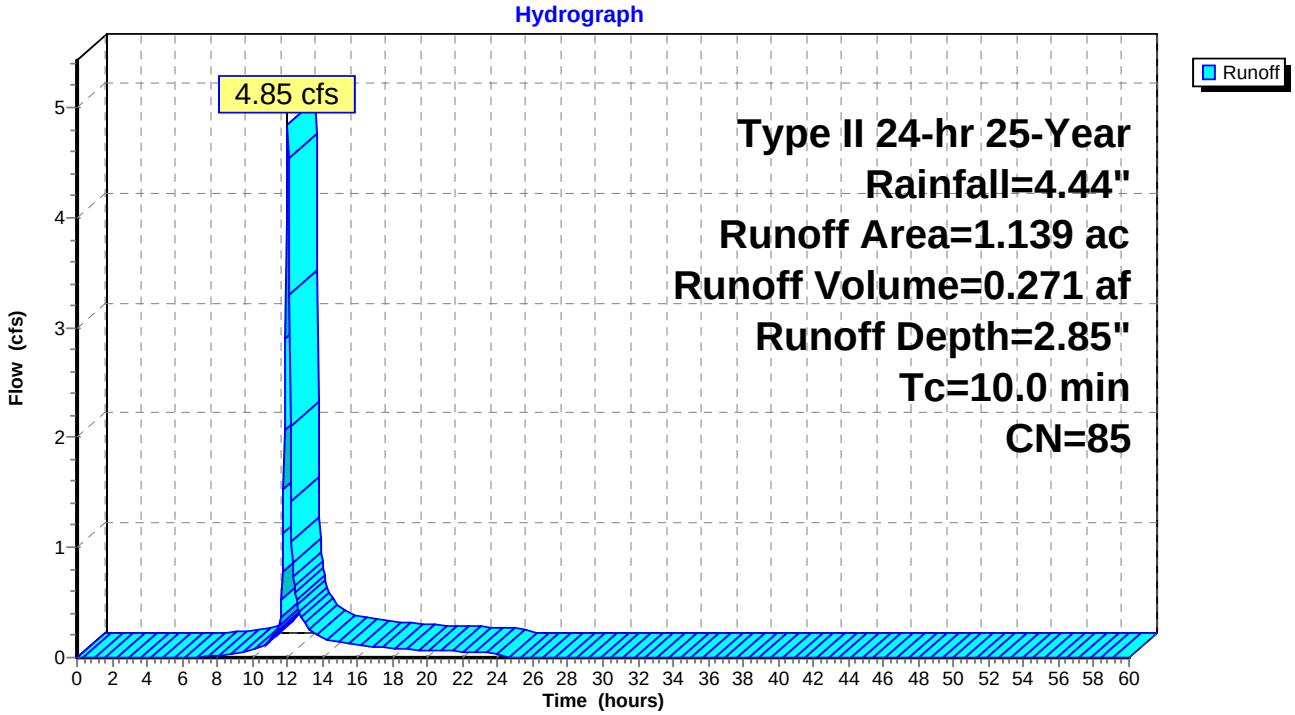
Runoff = 4.85 cfs @ 12.01 hrs, Volume= 0.271 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

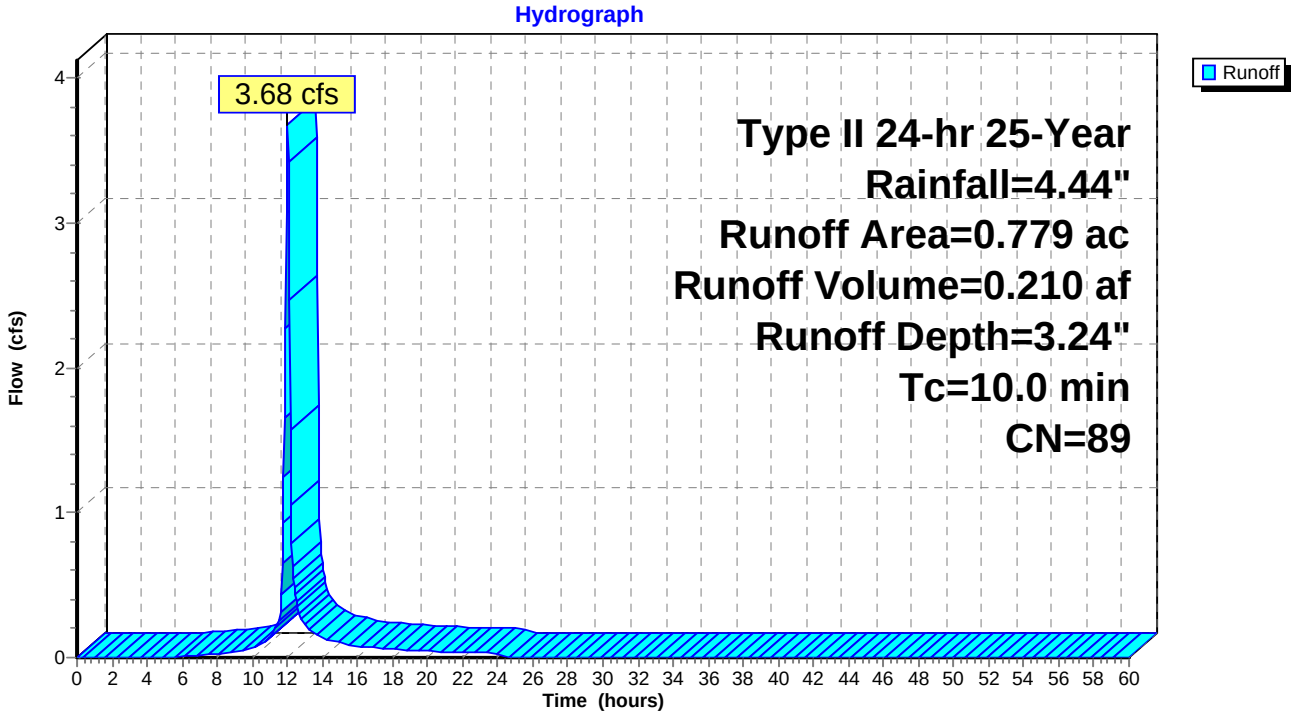
Runoff = 3.68 cfs @ 12.01 hrs, Volume= 0.210 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

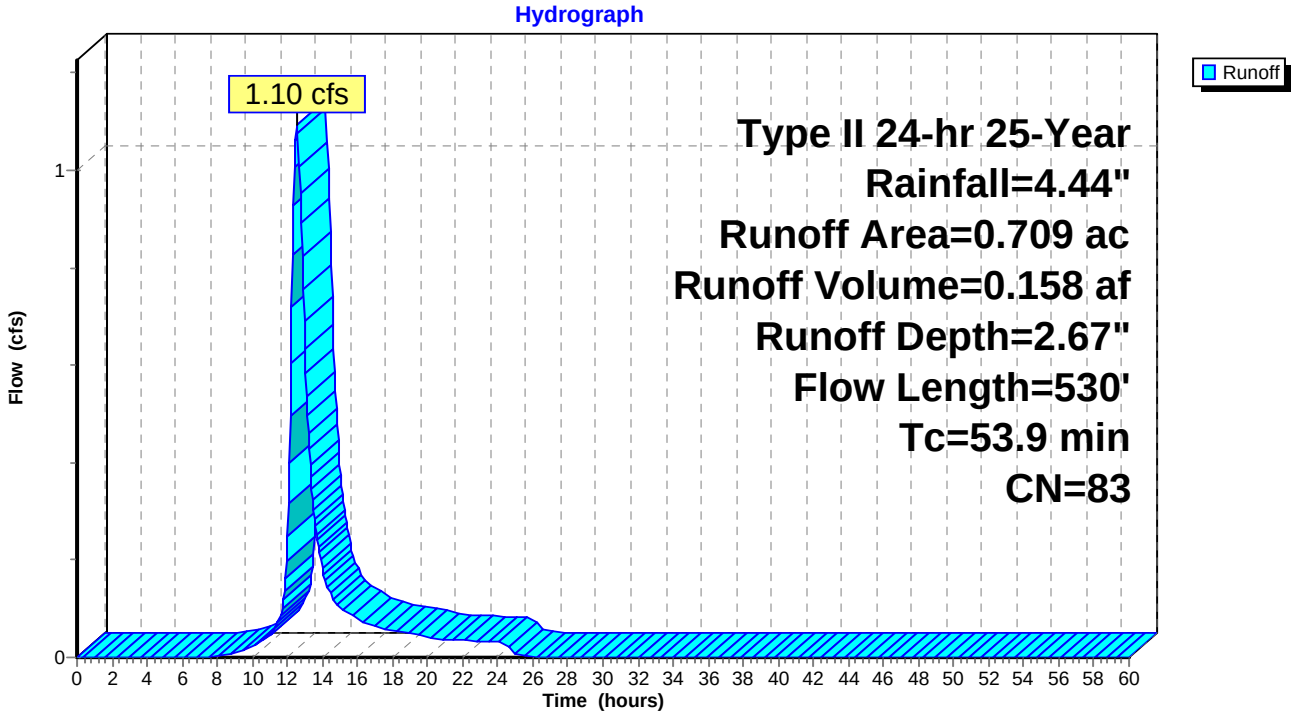
Runoff = 1.10 cfs @ 12.54 hrs, Volume= 0.158 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

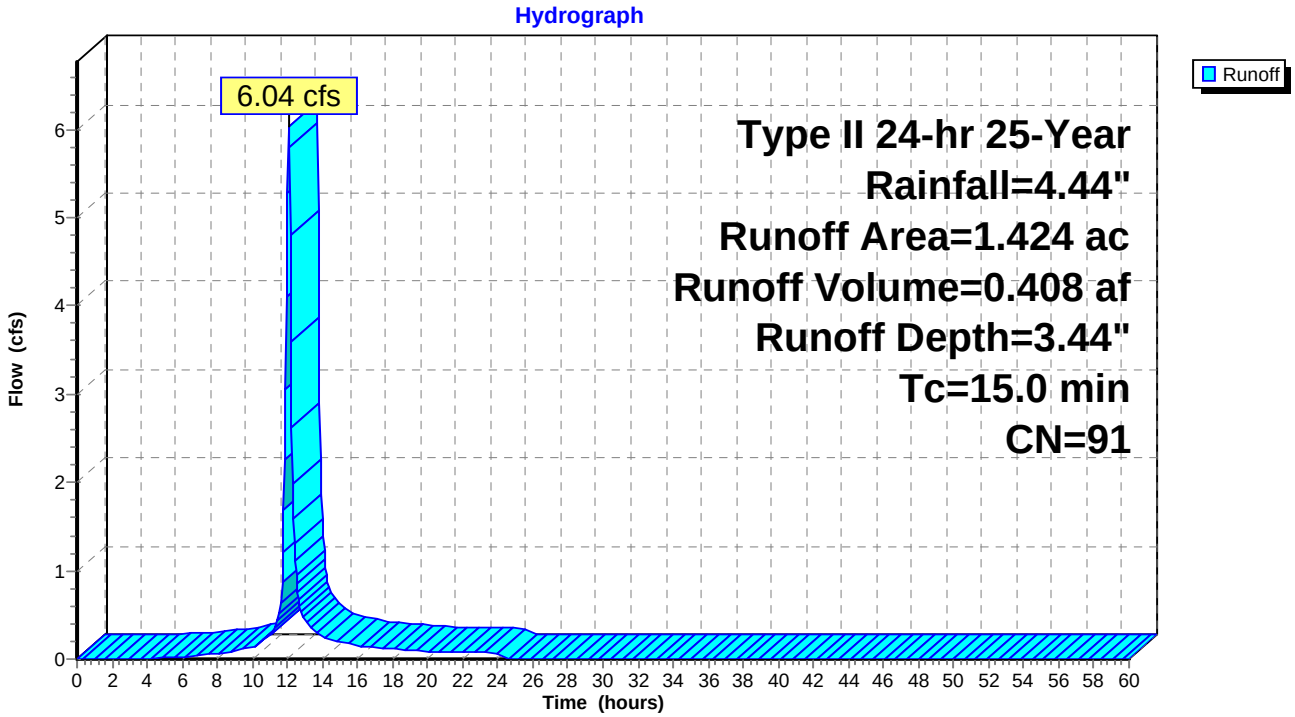
Runoff = 6.04 cfs @ 12.06 hrs, Volume= 0.408 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

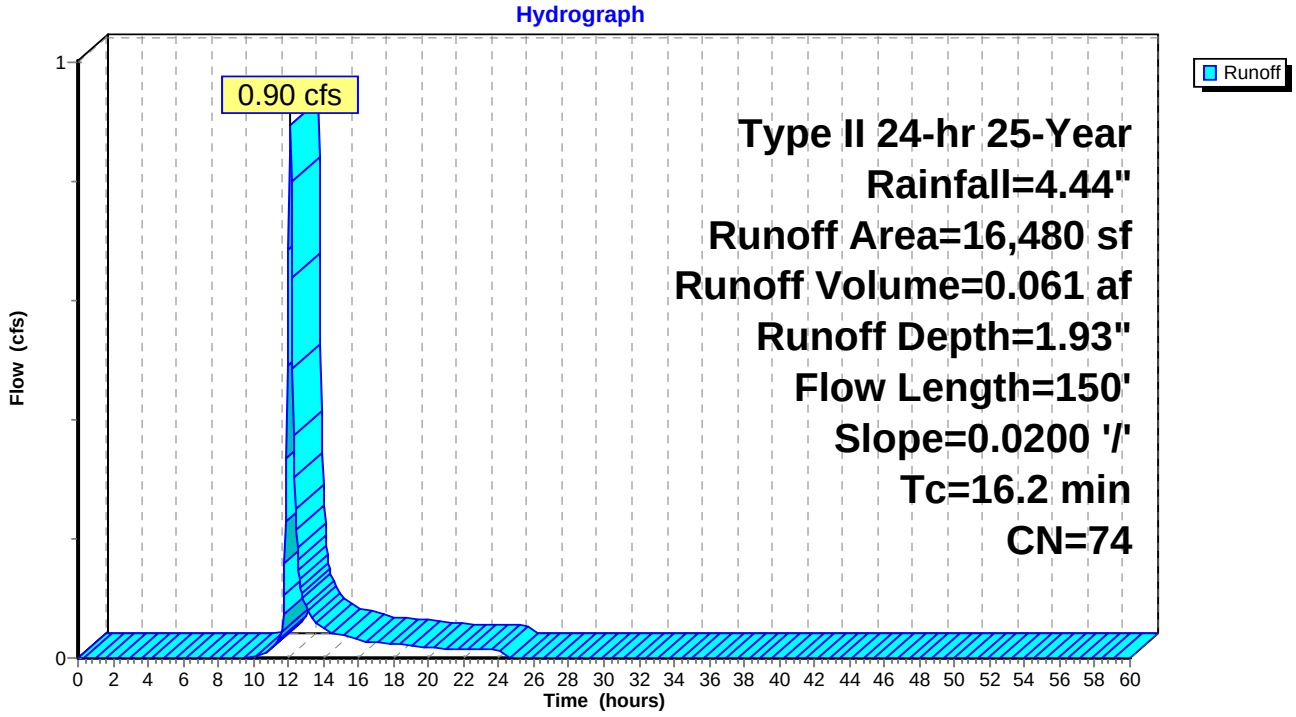
Runoff = 0.90 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



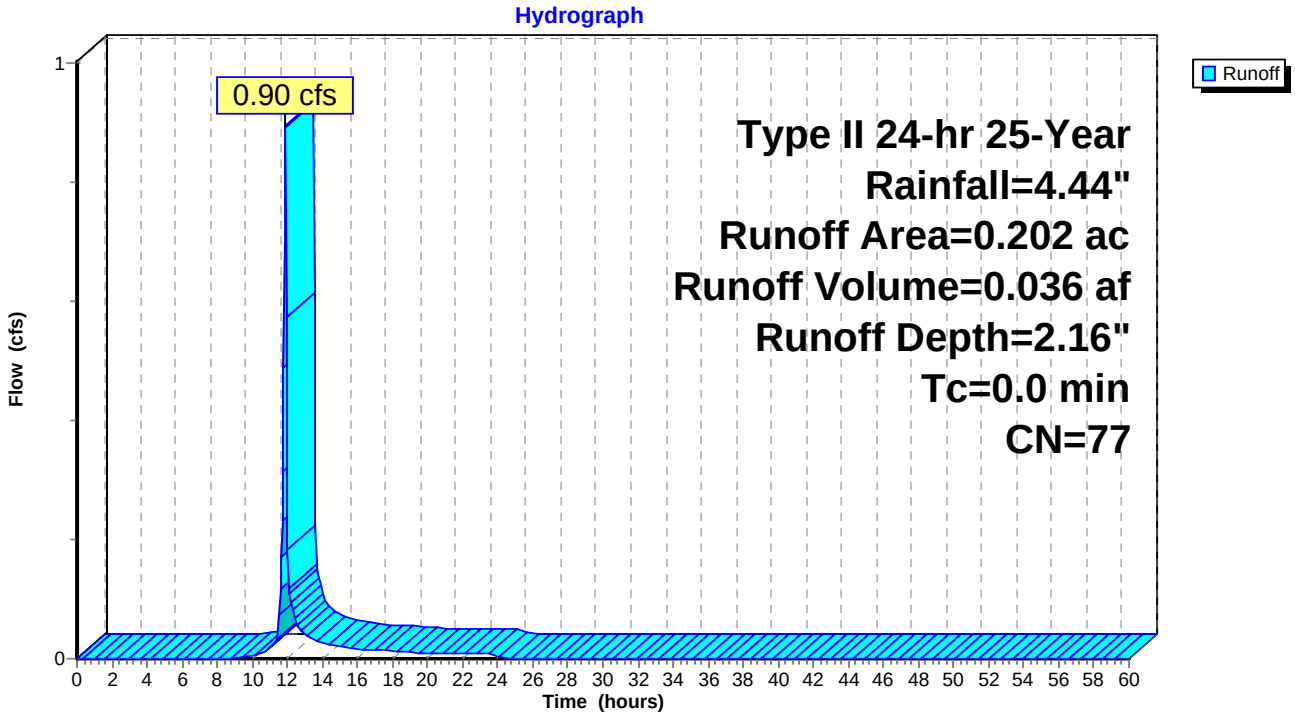
Summary for Subcatchment 19S: Undetained West

Runoff = 0.90 cfs @ 11.89 hrs, Volume= 0.036 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

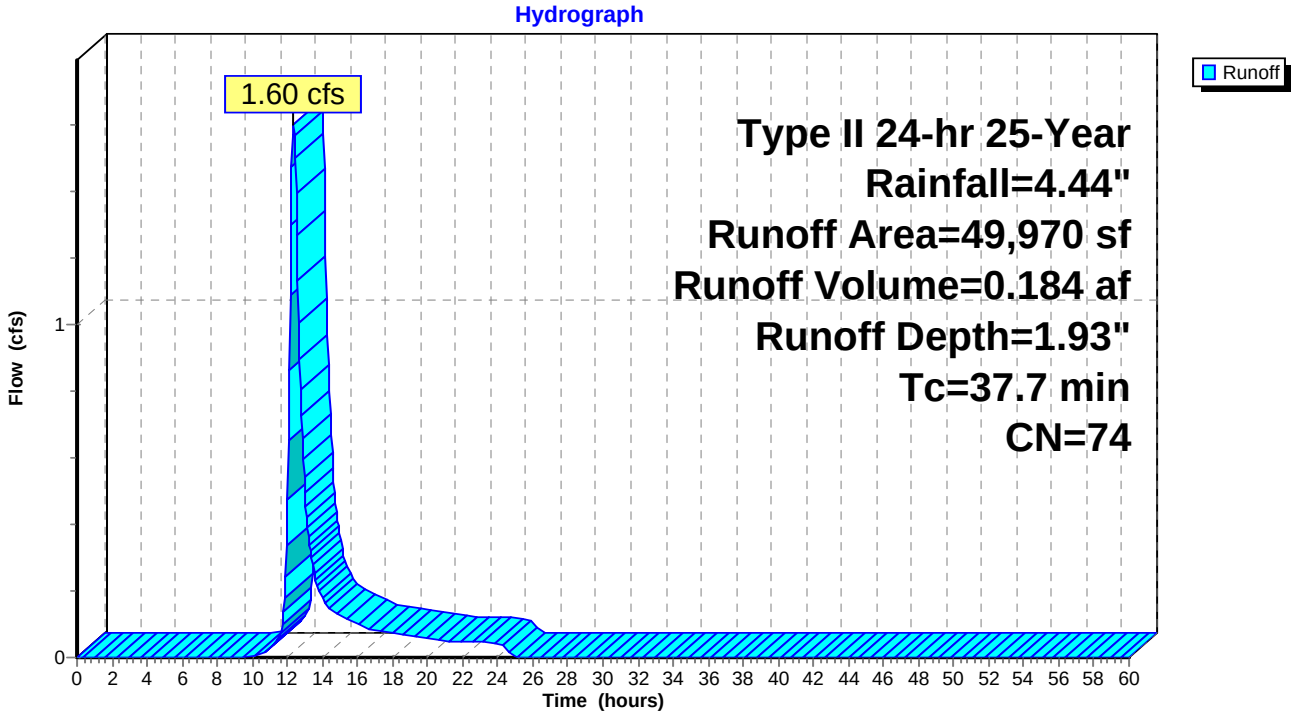
Runoff = 1.60 cfs @ 12.35 hrs, Volume= 0.184 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 3.15" for 25-Year event
Inflow = 33.11 cfs @ 12.07 hrs, Volume= 2.415 af
Outflow = 1.73 cfs @ 14.07 hrs, Volume= 2.408 af, Atten= 95%, Lag= 120.2 min
Primary = 1.73 cfs @ 14.07 hrs, Volume= 2.408 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 910.83' @ 14.07 hrs Surf.Area= 35,793 sf Storage= 84,503 cf (62,085 cf above start)

Plug-Flow detention time= 666.2 min calculated for 1.892 af (78% of inflow)
Center-of-Mass det. time= 451.1 min (1,265.9 - 814.8)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

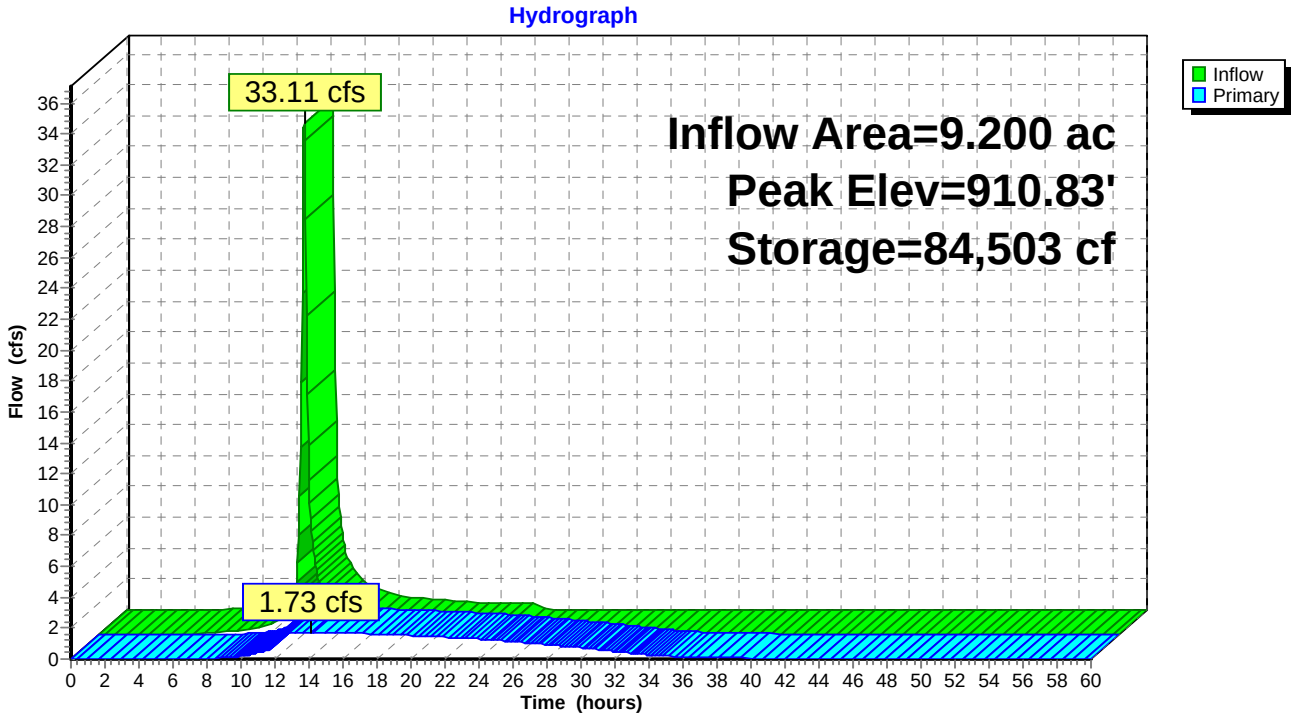
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.73 cfs @ 14.07 hrs HW=910.83' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.73 cfs @ 8.79 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 3.00" for 25-Year event
Inflow = 6.21 cfs @ 12.41 hrs, Volume= 3.437 af
Outflow = 4.73 cfs @ 12.72 hrs, Volume= 3.428 af, Atten= 24%, Lag= 18.3 min
Primary = 4.73 cfs @ 12.72 hrs, Volume= 3.428 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 903.25' @ 12.72 hrs Surf.Area= 3,434 sf Storage= 1,872 cf

Plug-Flow detention time= 6.6 min calculated for 3.425 af (100% of inflow)
Center-of-Mass det. time= 1.5 min (1,175.3 - 1,173.7)

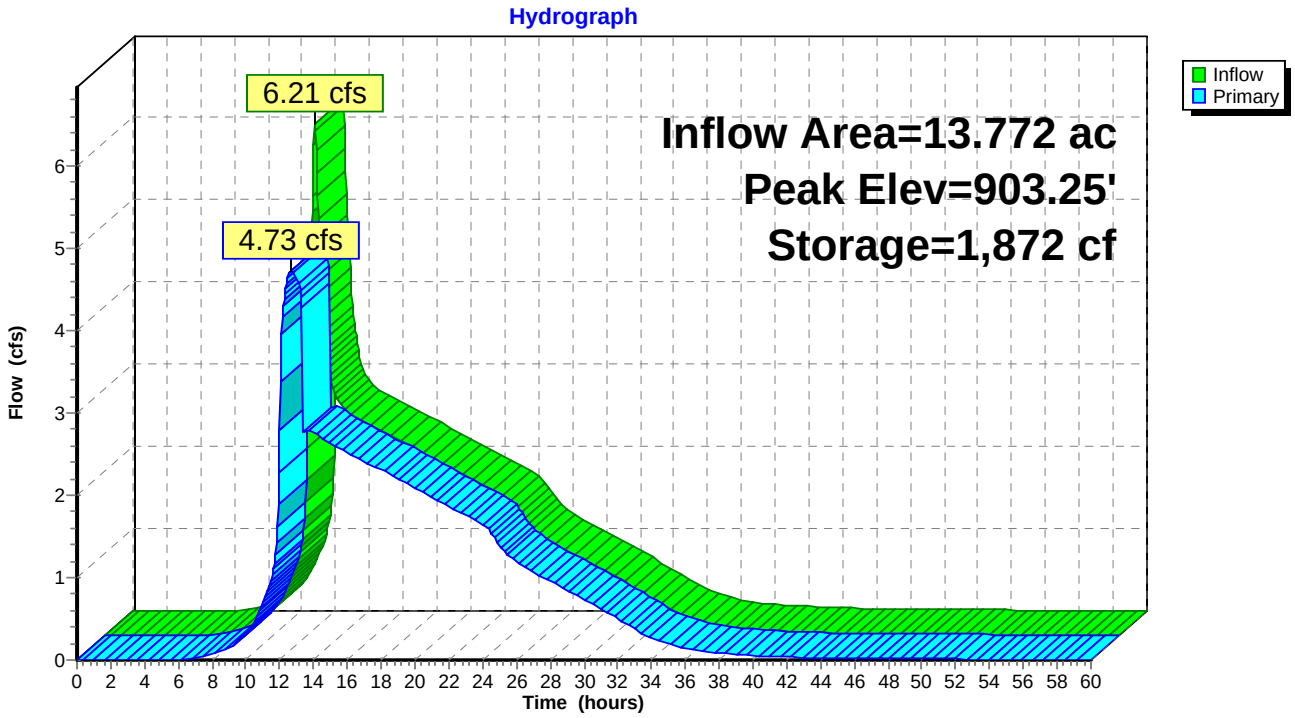
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.73 cfs @ 12.72 hrs HW=903.25' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 4.73 cfs @ 6.03 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Controls 0.00 cfs)

Pond 4P: Ex 10


Hydrograph
6.21 cfs
4.73 cfs
Inflow Area=13.772 ac
Peak Elev=903.25'
Storage=1,872 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 3.24" for 25-Year event
Inflow = 3.68 cfs @ 12.01 hrs, Volume= 0.210 af
Outflow = 1.25 cfs @ 12.18 hrs, Volume= 0.201 af, Atten= 66%, Lag= 10.3 min
Primary = 1.25 cfs @ 12.18 hrs, Volume= 0.201 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 912.51' @ 12.18 hrs Surf.Area= 1,938 sf Storage= 3,264 cf

Plug-Flow detention time= 81.2 min calculated for 0.201 af (96% of inflow)
Center-of-Mass det. time= 57.0 min (856.2 - 799.2)

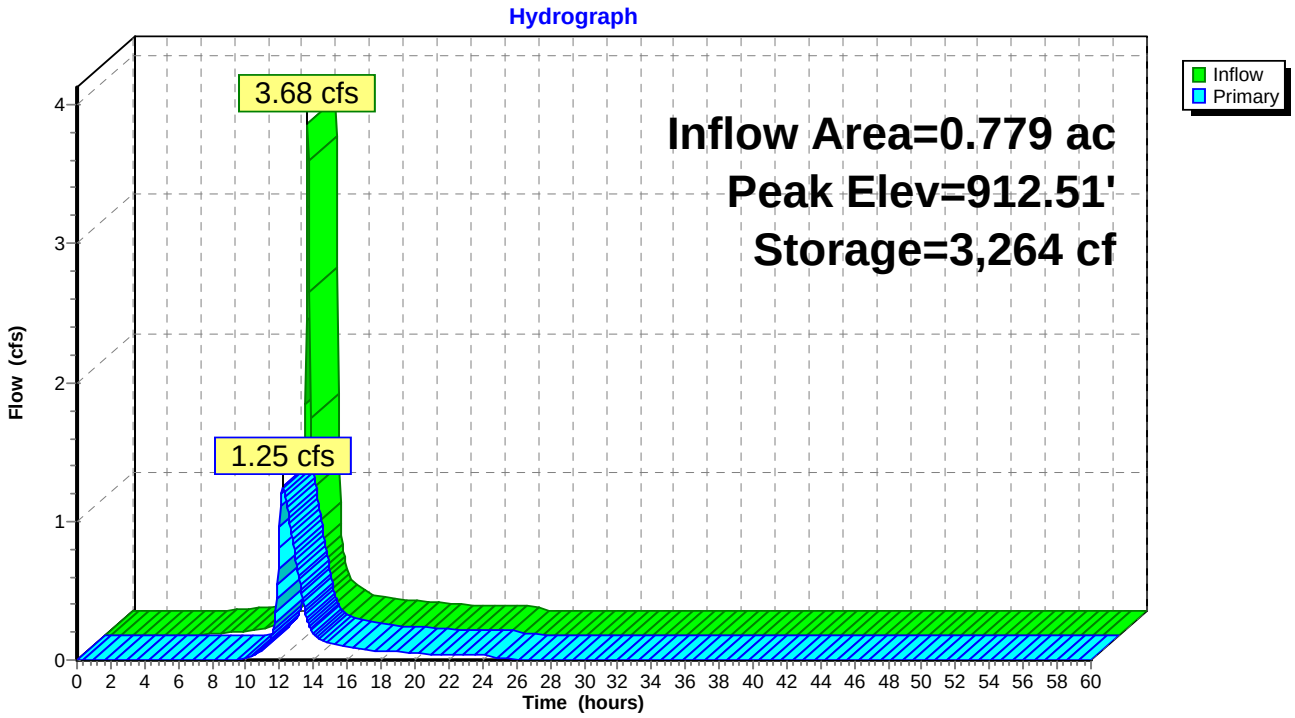
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.25 cfs @ 12.18 hrs HW=912.50' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.25 cfs @ 6.37 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 3.44" for 25-Year event
Inflow = 2.12 cfs @ 12.01 hrs, Volume= 0.123 af
Outflow = 0.44 cfs @ 12.26 hrs, Volume= 0.123 af, Atten= 79%, Lag= 14.9 min
Primary = 0.44 cfs @ 12.26 hrs, Volume= 0.123 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 915.28' @ 12.26 hrs Surf.Area= 4,150 sf Storage= 2,117 cf

Plug-Flow detention time= 81.3 min calculated for 0.123 af (100% of inflow)
Center-of-Mass det. time= 81.1 min (872.3 - 791.3)

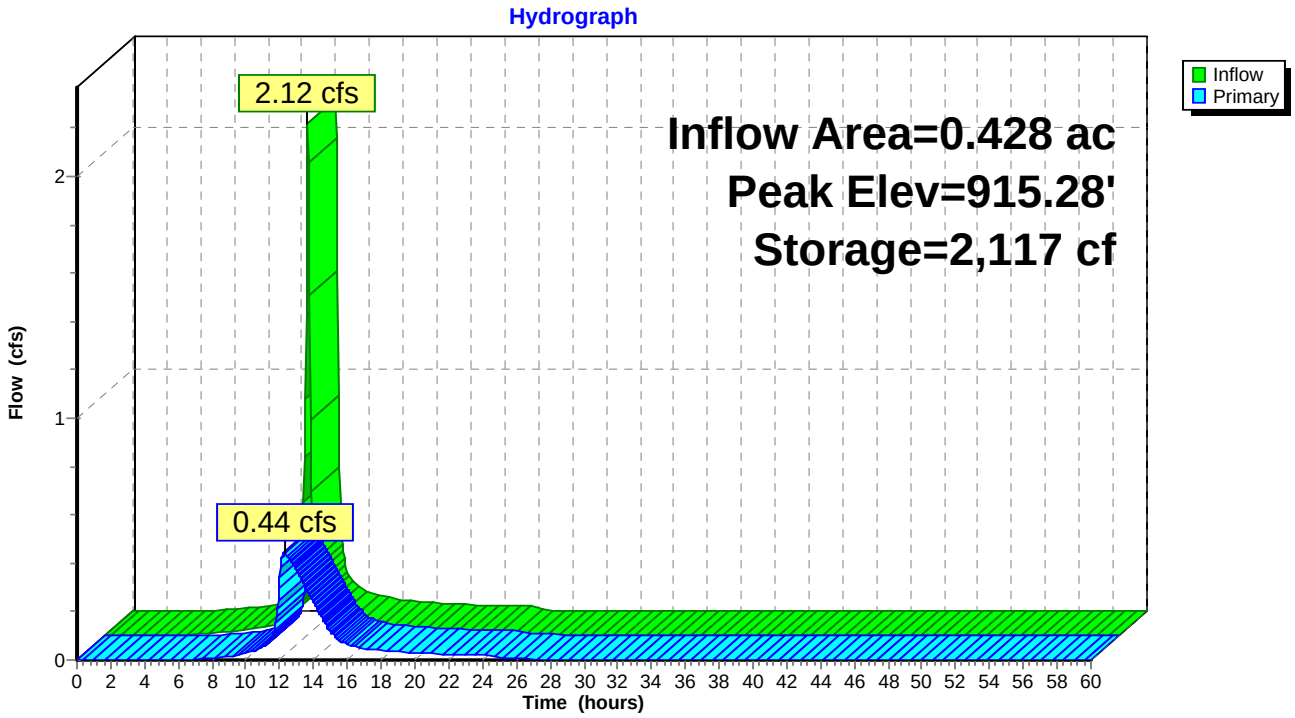
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.44 cfs @ 12.26 hrs HW=915.27' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.44 cfs @ 5.07 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 2.85" for 25-Year event
Inflow = 4.85 cfs @ 12.01 hrs, Volume= 0.271 af
Outflow = 1.46 cfs @ 12.21 hrs, Volume= 0.255 af, Atten= 70%, Lag= 11.8 min
Primary = 1.46 cfs @ 12.21 hrs, Volume= 0.255 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 909.30' @ 12.21 hrs Surf.Area= 5,849 sf Storage= 5,502 cf

Plug-Flow detention time= 187.1 min calculated for 0.255 af (94% of inflow)
Center-of-Mass det. time= 153.6 min (966.5 - 812.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

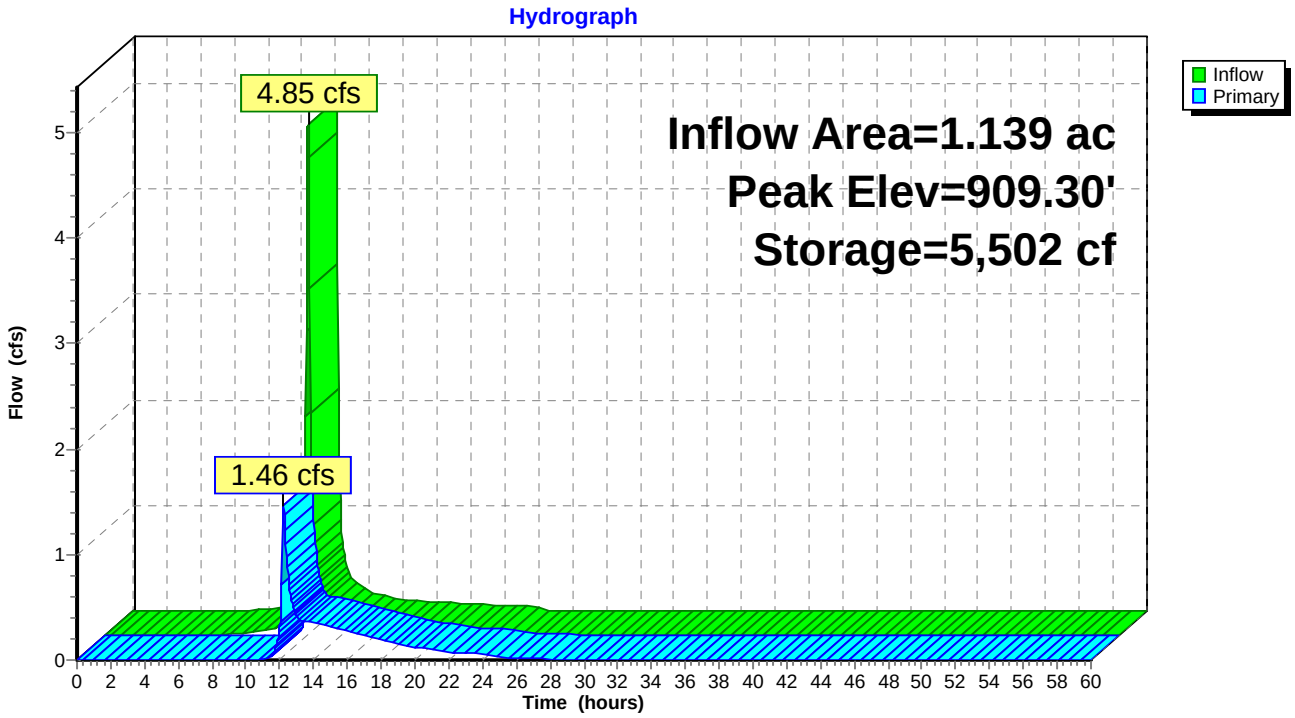
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=1.44 cfs @ 12.21 hrs HW=909.29' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.41 cfs @ 6.18 fps)
└─**2=2nd Stage Orifice** (Orifice Controls 1.02 cfs @ 1.74 fps)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 3.10" for 25-Year event
Inflow = 6.53 cfs @ 12.09 hrs, Volume= 0.663 af
Outflow = 2.02 cfs @ 12.45 hrs, Volume= 0.663 af, Atten= 69%, Lag= 21.9 min
Primary = 2.02 cfs @ 12.45 hrs, Volume= 0.663 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 908.34' @ 12.45 hrs Surf.Area= 4,540 sf Storage= 9,455 cf

Plug-Flow detention time= 151.2 min calculated for 0.663 af (100% of inflow)
Center-of-Mass det. time= 150.7 min (1,012.2 - 861.5)

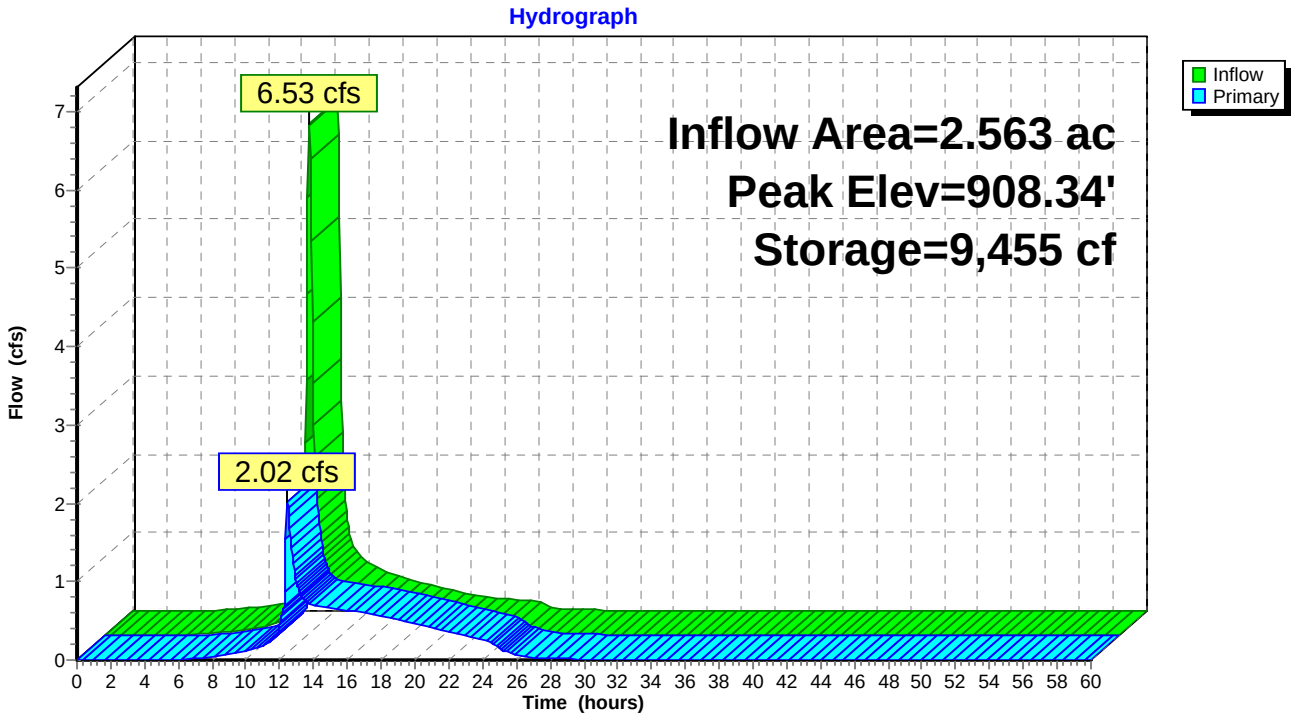
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=2.02 cfs @ 12.45 hrs HW=908.34' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.75 cfs @ 8.58 fps)
└─**2=2nd Stage Weir** (Orifice Controls 1.27 cfs @ 1.87 fps)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 2.01" for 25-Year event
Inflow = 1.23 cfs @ 11.91 hrs, Volume= 0.097 af
Outflow = 1.23 cfs @ 11.91 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.1 min
Primary = 1.23 cfs @ 11.91 hrs, Volume= 0.097 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 899.94' @ 11.91 hrs Surf.Area= 4 sf Storage= 3 cf

Plug-Flow detention time= 0.1 min calculated for 0.097 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (841.1 - 841.0)

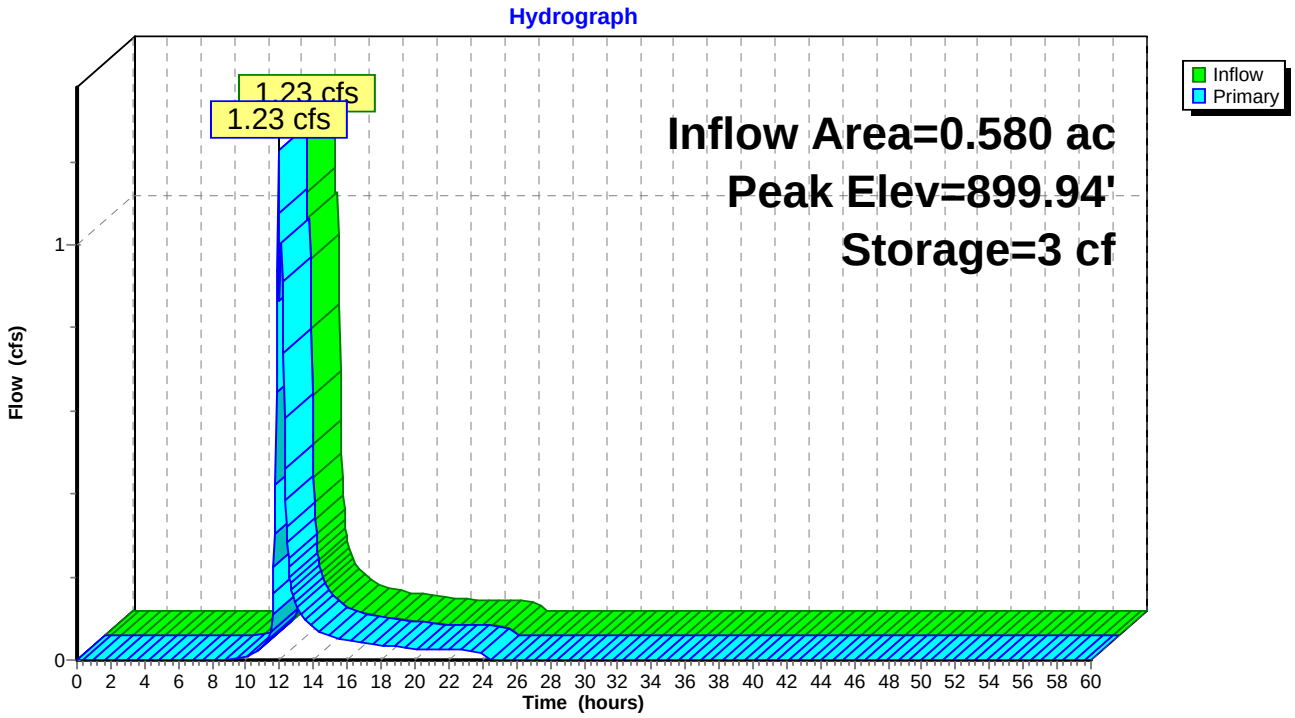
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.20 cfs @ 11.91 hrs HW=899.92' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 1.20 cfs @ 3.43 fps)

Pond 20P: Ex 9


Hydrograph
1.23 cfs
1.23 cfs
Inflow Area=0.580 ac
Peak Elev=899.94'
Storage=3 cf
Inflow
Primary
Flow (cfs)
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 21P: Ex. 8

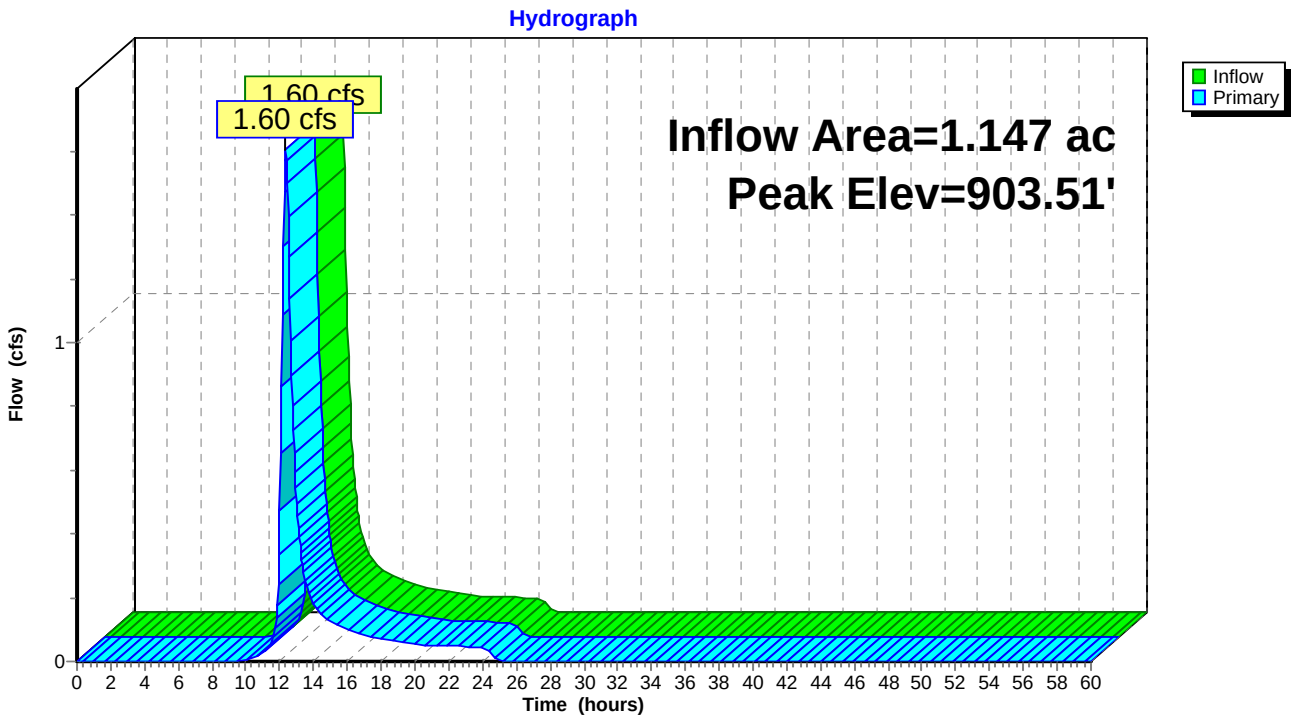
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	1.93"	for 25-Year event
Inflow =	1.60 cfs @	12.35 hrs,	Volume=	0.184 af	
Outflow =	1.60 cfs @	12.35 hrs,	Volume=	0.184 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.60 cfs @	12.35 hrs,	Volume=	0.184 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 903.51' @ 12.35 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.60 cfs @ 12.35 hrs HW=903.50' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.60 cfs @ 4.60 fps)

Pond 21P: Ex. 8

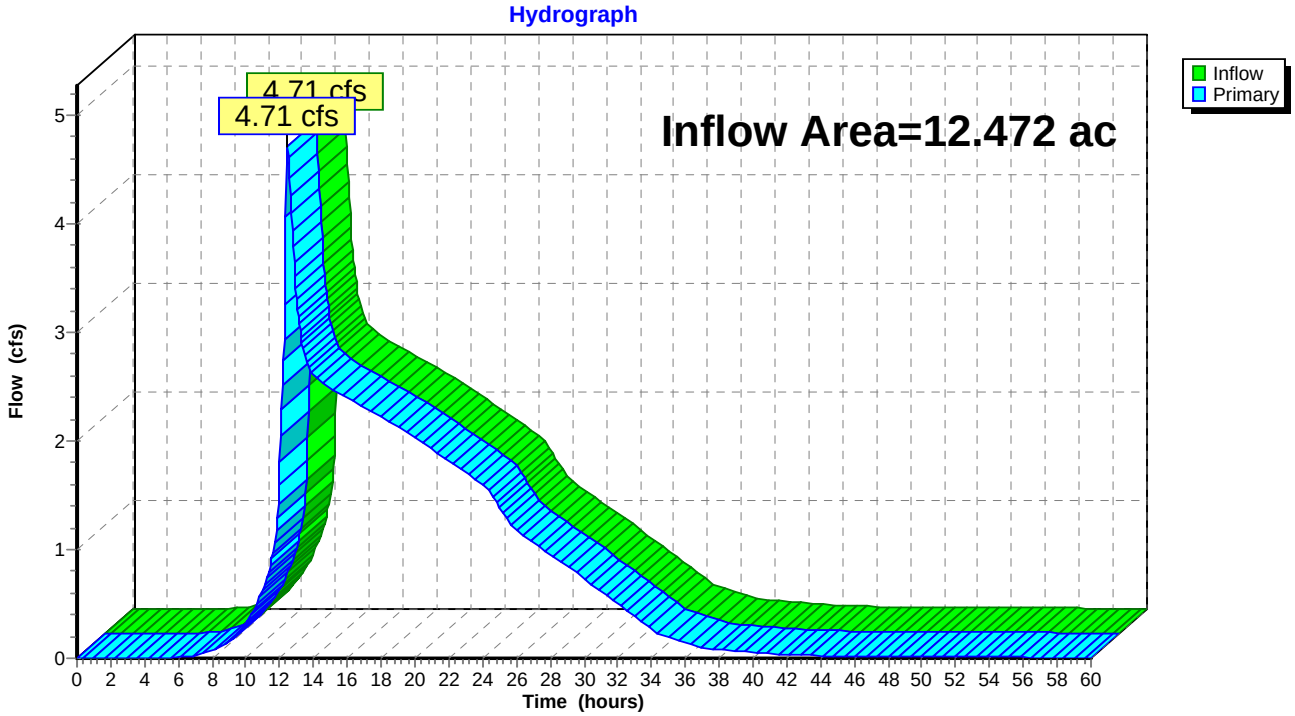


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 3.11" for 25-Year event
Inflow = 4.71 cfs @ 12.47 hrs, Volume= 3.229 af
Primary = 4.71 cfs @ 12.47 hrs, Volume= 3.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



Summary for Subcatchment 2S: Post Developed Overall

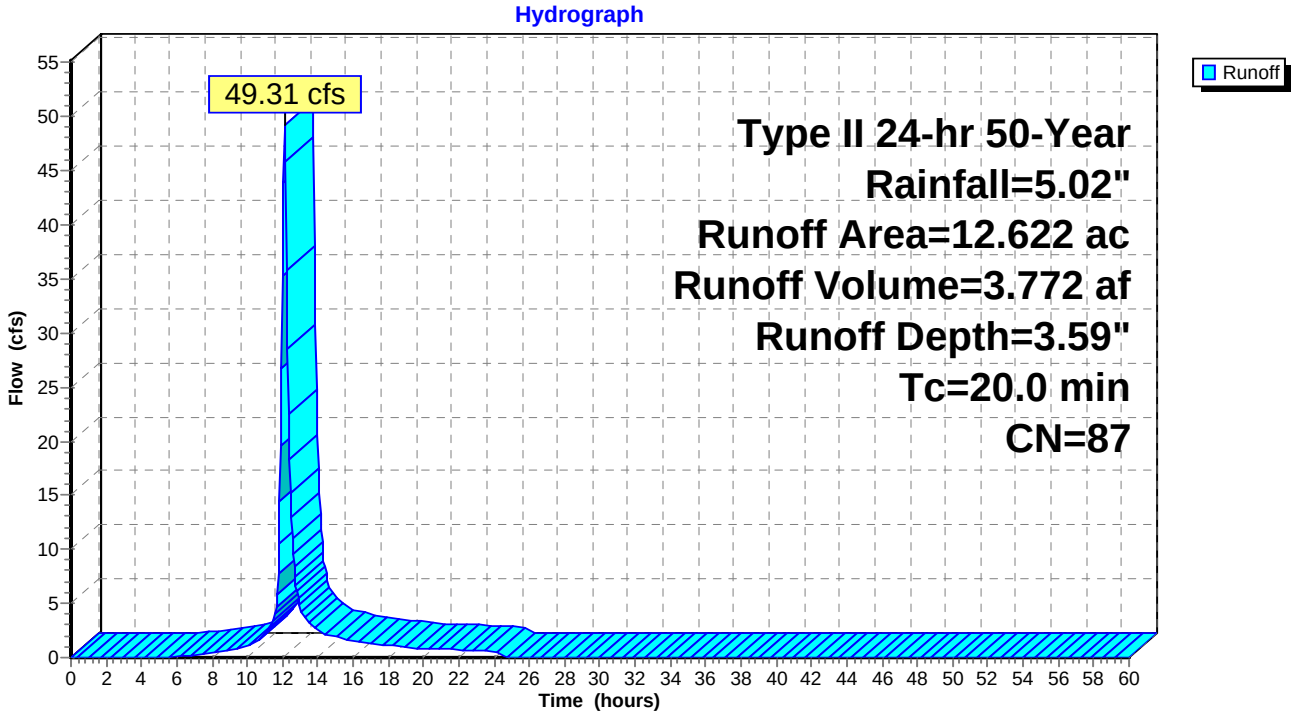
Runoff = 49.31 cfs @ 12.12 hrs, Volume= 3.772 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

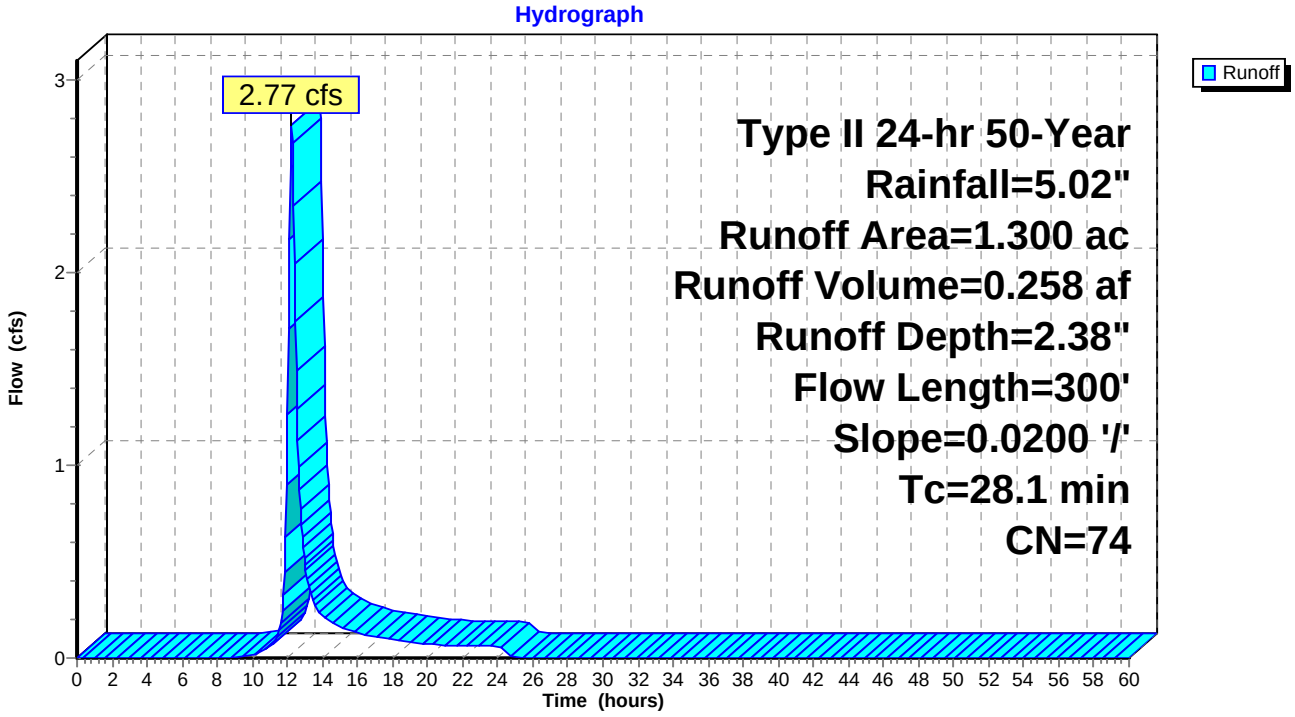
Runoff = 2.77 cfs @ 12.23 hrs, Volume= 0.258 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

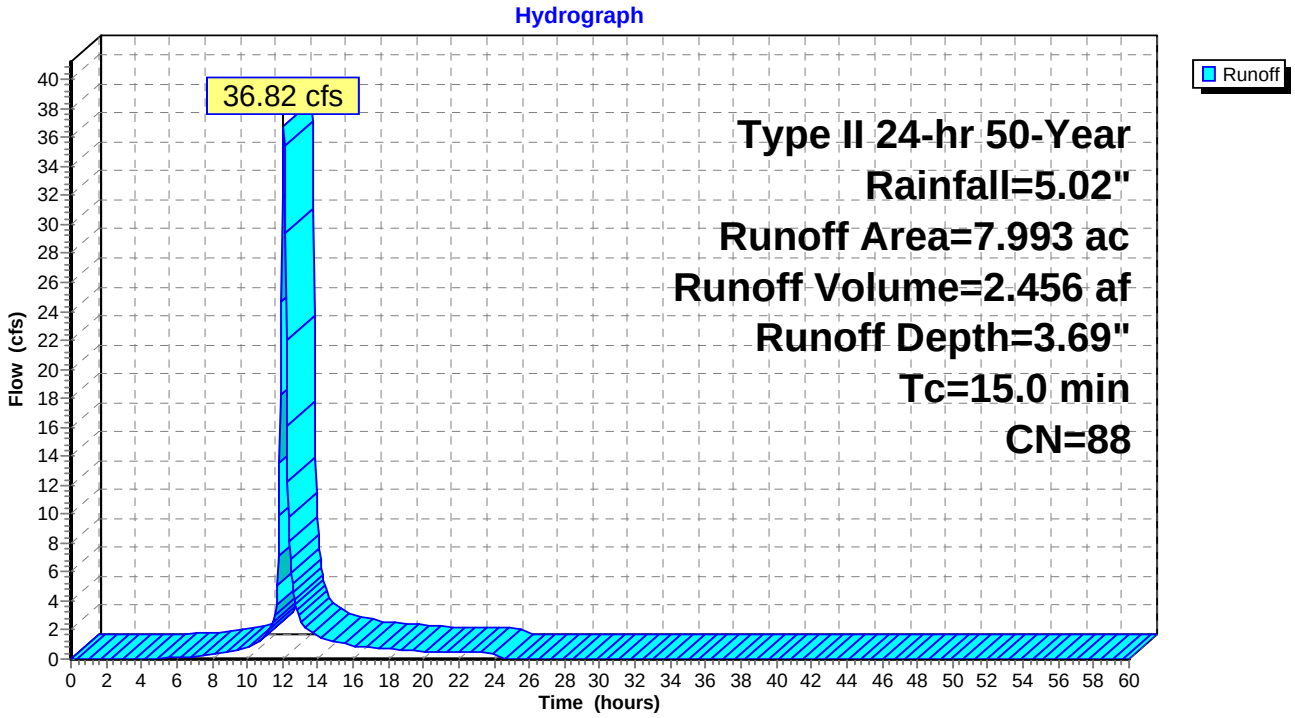
Runoff = 36.82 cfs @ 12.07 hrs, Volume= 2.456 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

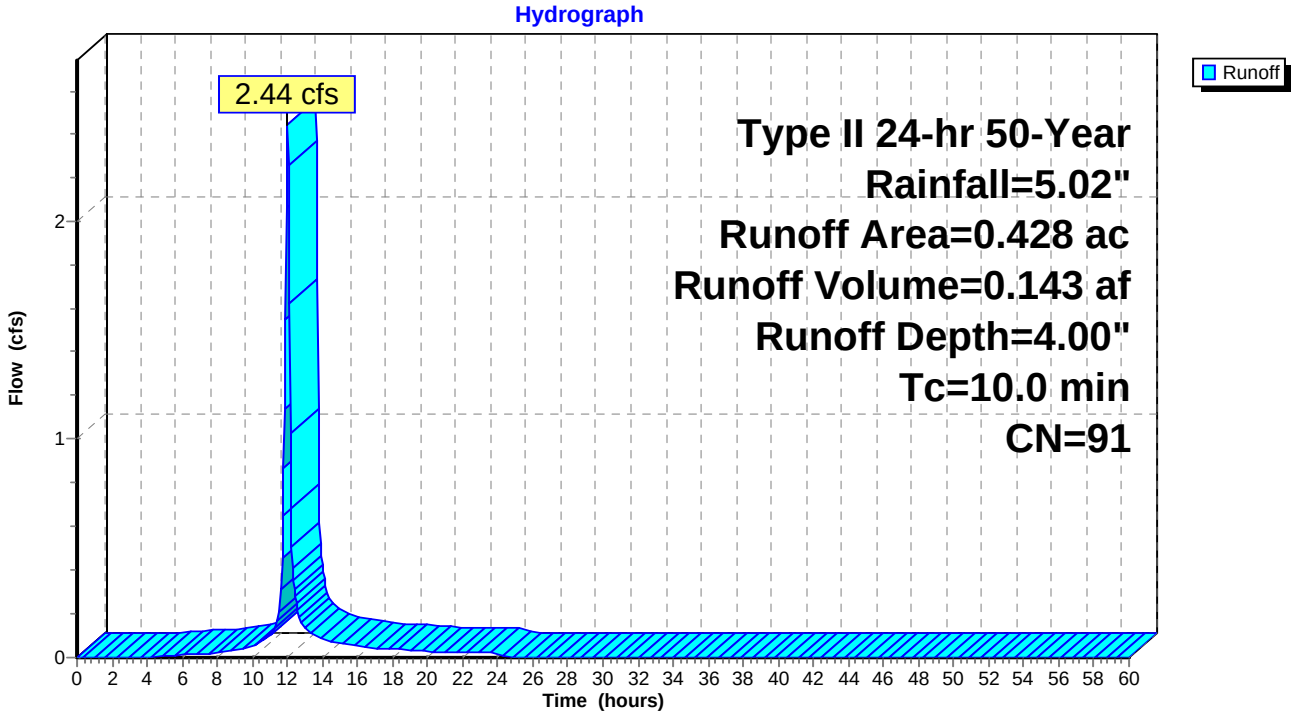
Runoff = 2.44 cfs @ 12.01 hrs, Volume= 0.143 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

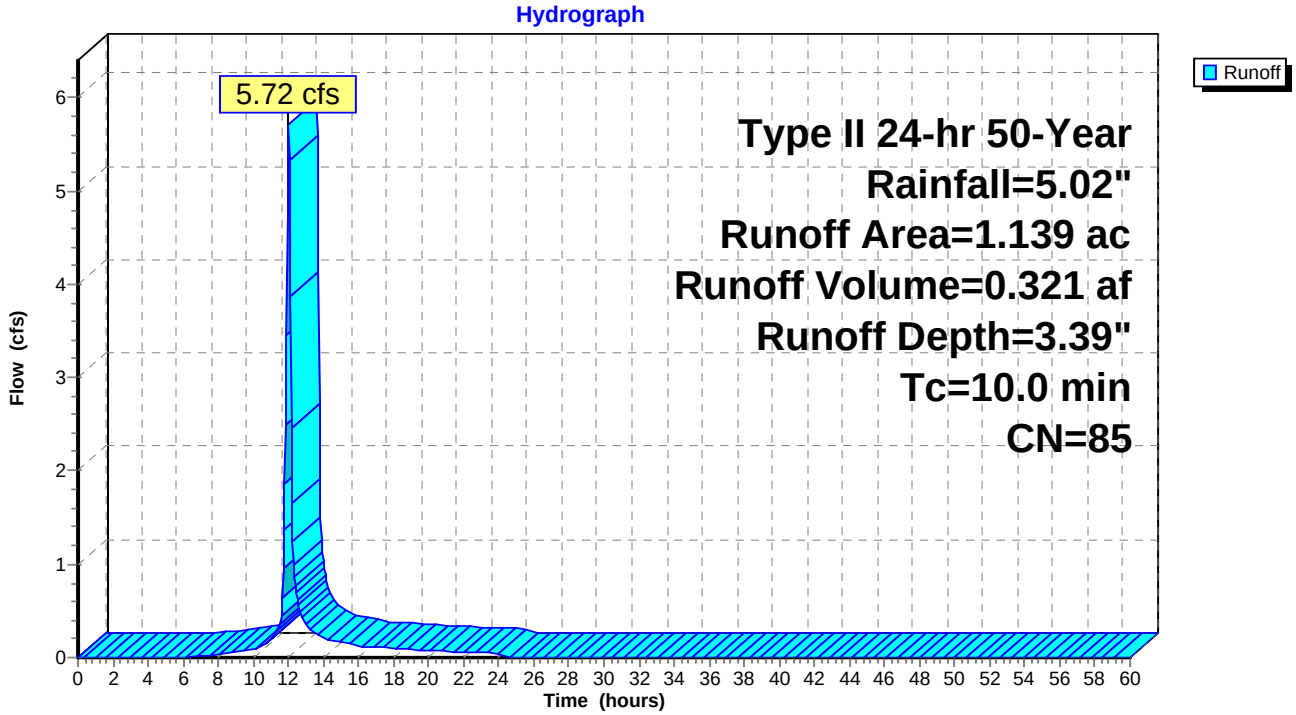
Runoff = 5.72 cfs @ 12.01 hrs, Volume= 0.321 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

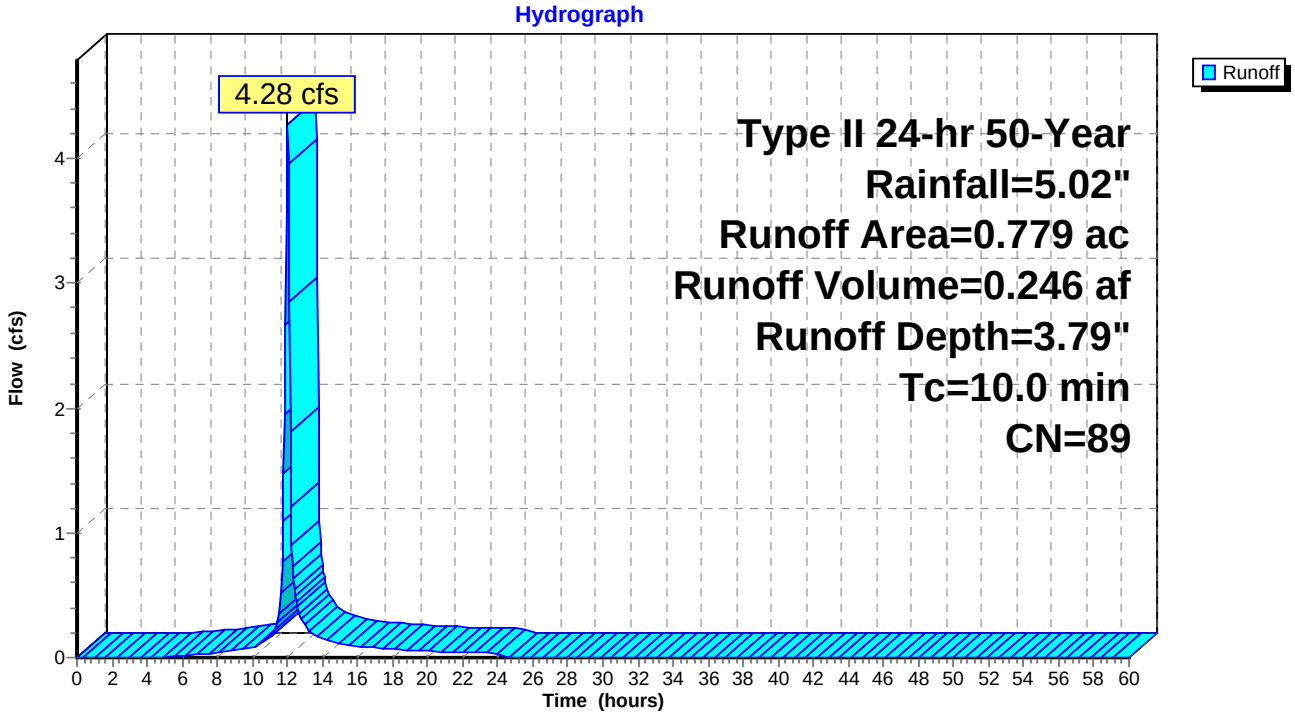
Runoff = 4.28 cfs @ 12.01 hrs, Volume= 0.246 af, Depth= 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

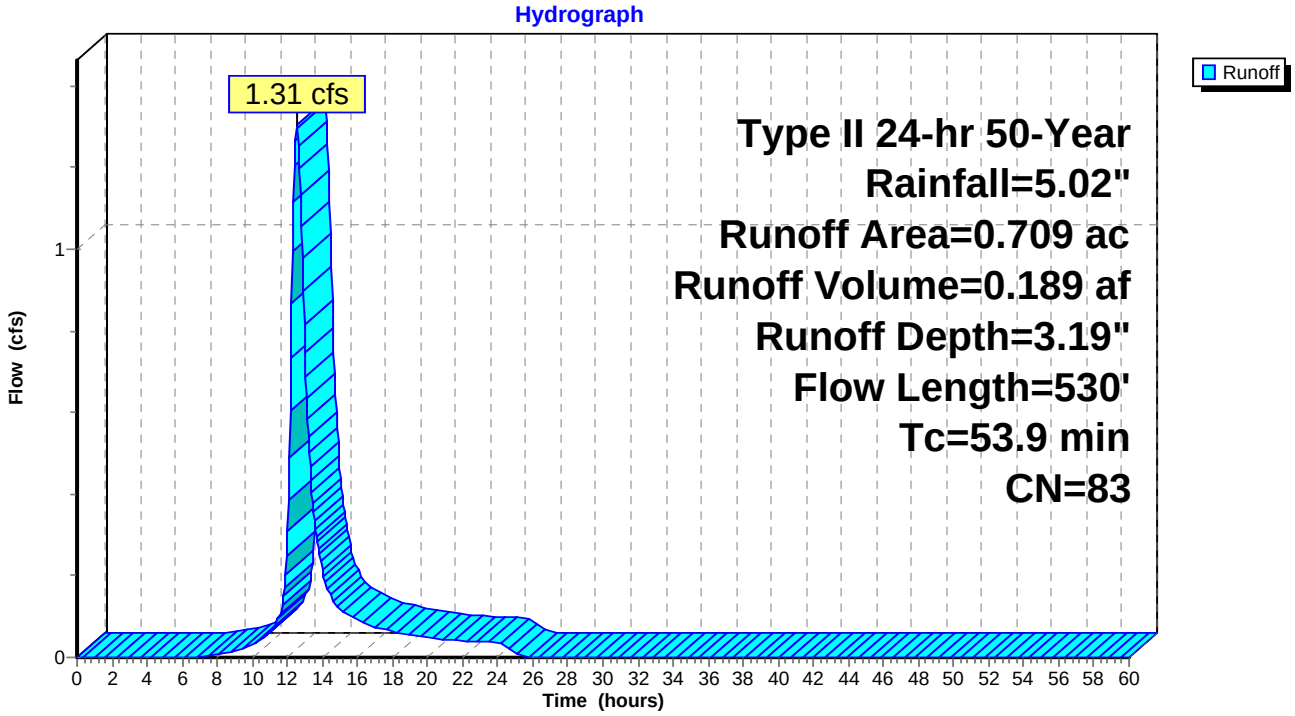
Runoff = 1.31 cfs @ 12.53 hrs, Volume= 0.189 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

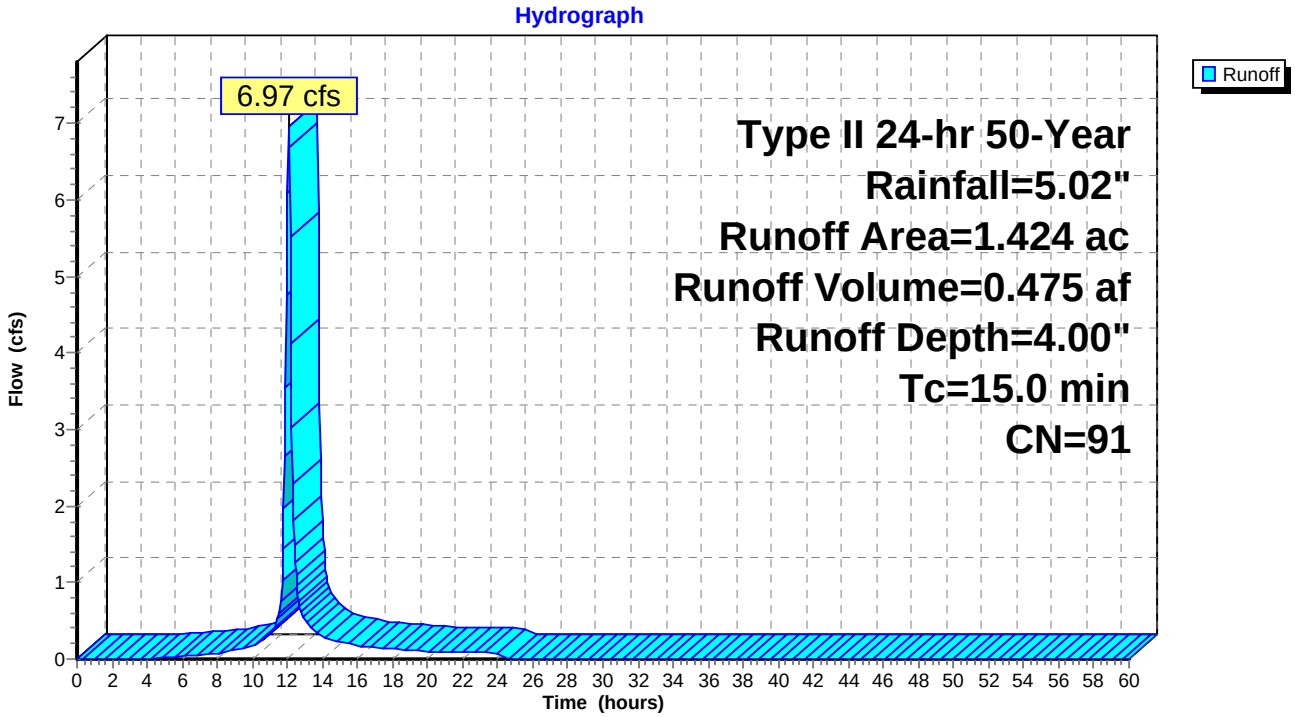
Runoff = 6.97 cfs @ 12.06 hrs, Volume= 0.475 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

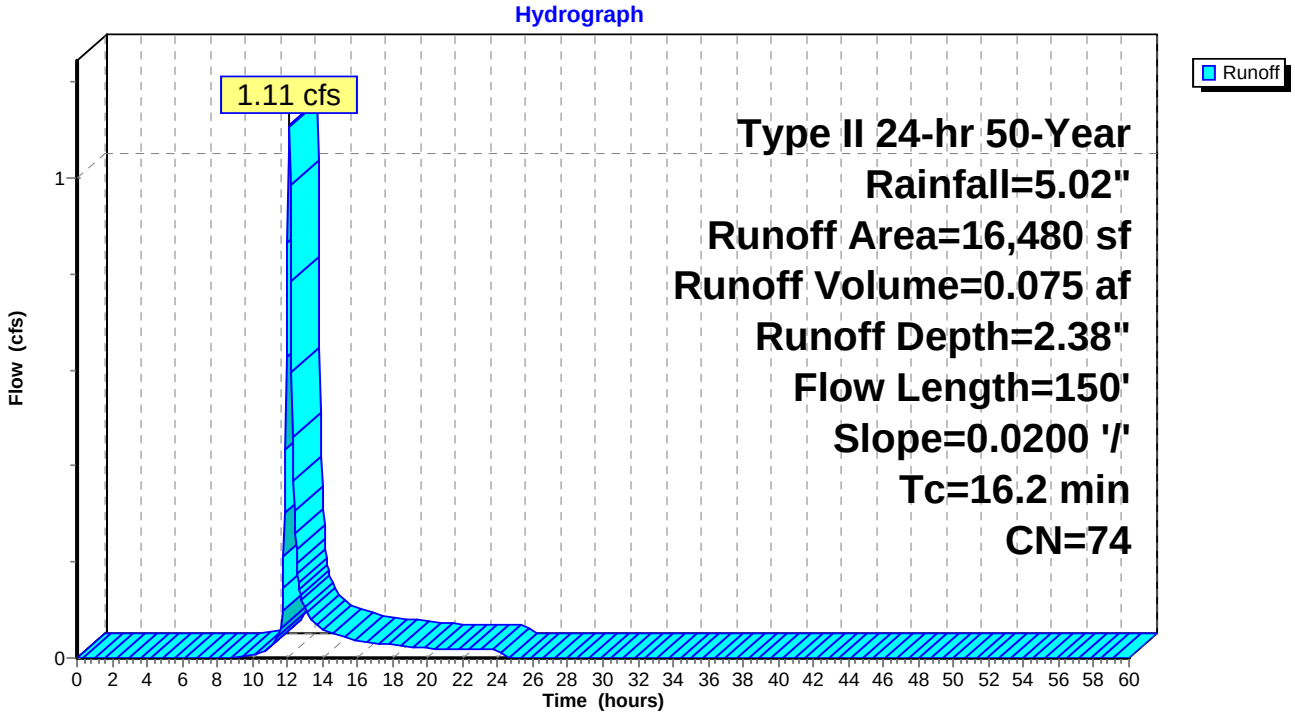
Runoff = 1.11 cfs @ 12.09 hrs, Volume= 0.075 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



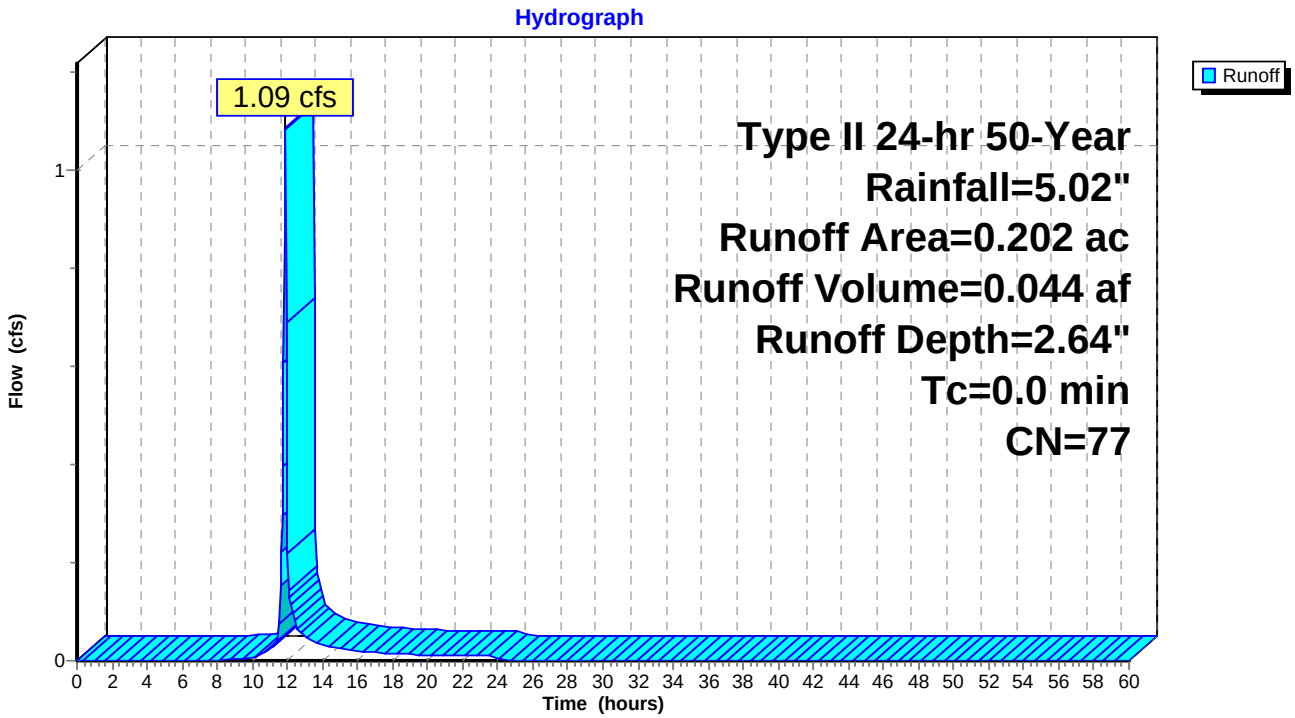
Summary for Subcatchment 19S: Undetained West

Runoff = 1.09 cfs @ 11.89 hrs, Volume= 0.044 af, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

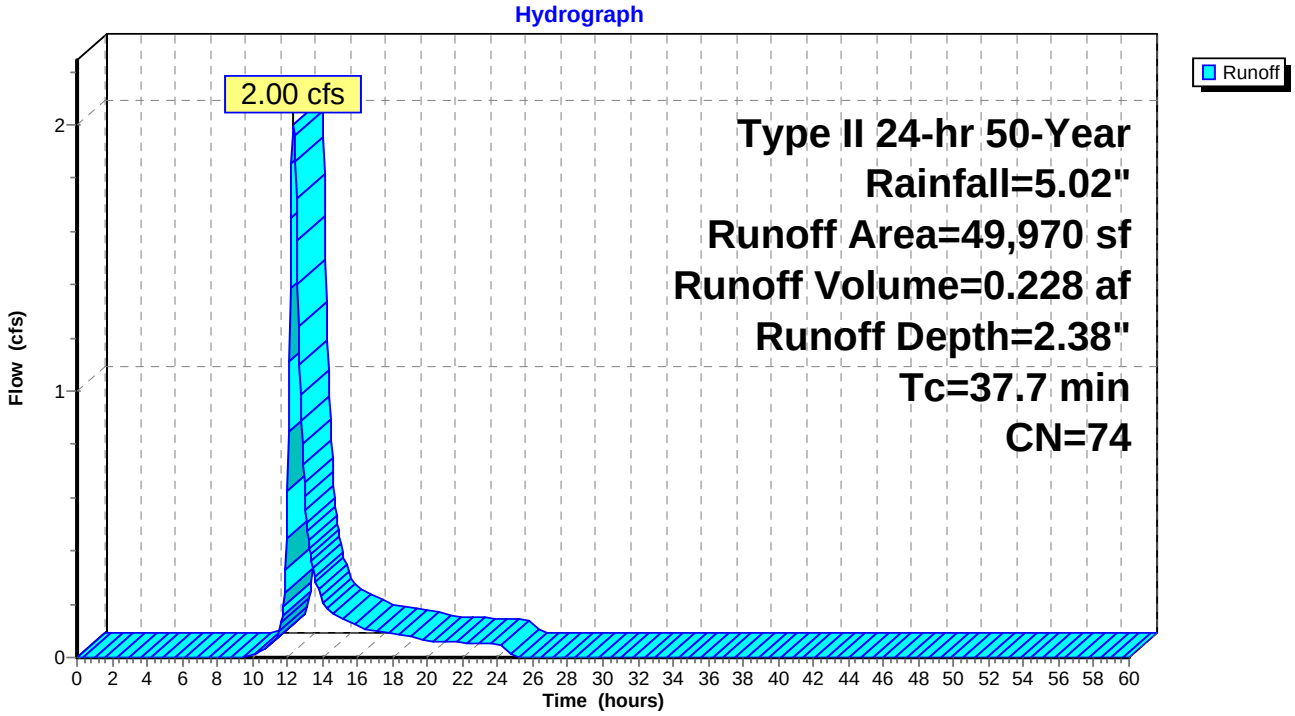
Runoff = 2.00 cfs @ 12.35 hrs, Volume= 0.228 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 3.70" for 50-Year event
Inflow = 38.53 cfs @ 12.07 hrs, Volume= 2.836 af
Outflow = 3.52 cfs @ 13.16 hrs, Volume= 2.828 af, Atten= 91%, Lag= 65.4 min
Primary = 3.52 cfs @ 13.16 hrs, Volume= 2.828 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 911.13' @ 13.16 hrs Surf.Area= 36,970 sf Storage= 91,616 cf (69,198 cf above start)

Plug-Flow detention time= 631.9 min calculated for 2.312 af (82% of inflow)
Center-of-Mass det. time= 443.0 min (1,253.2 - 810.2)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

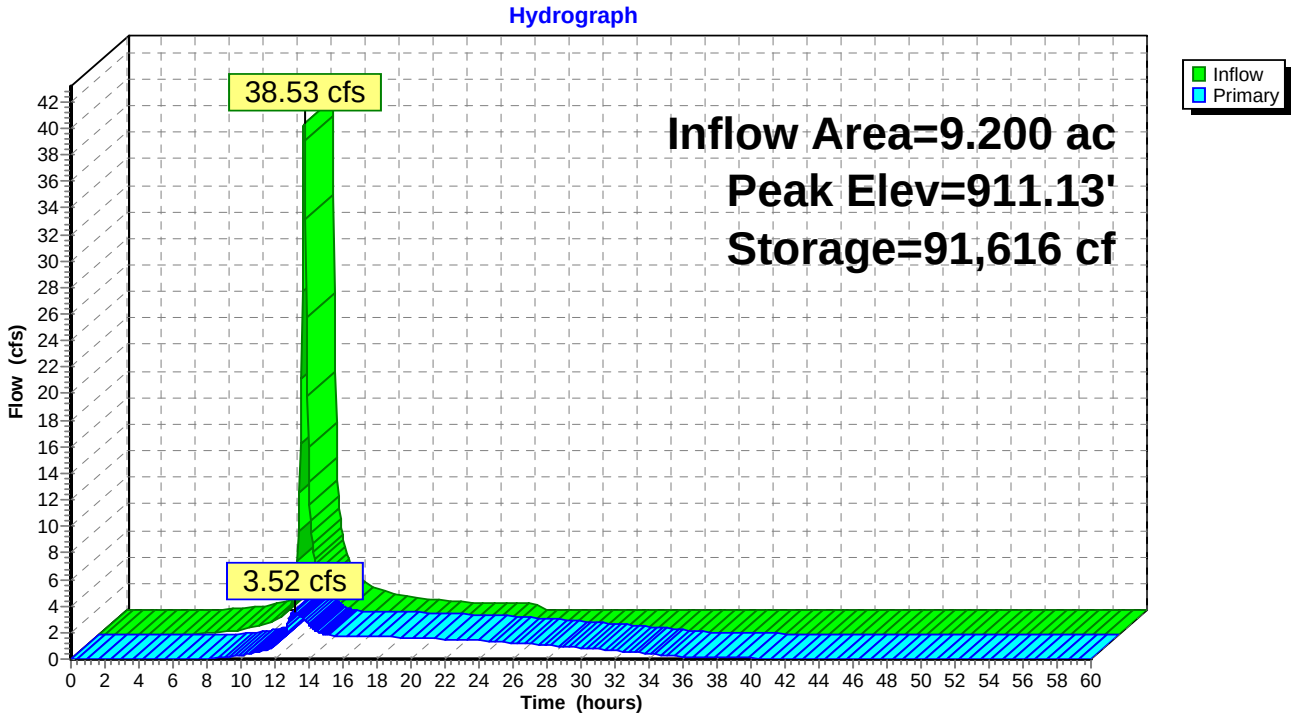
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.40 cfs @ 13.16 hrs HW=911.13' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.80 cfs @ 9.17 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 1.60 cfs @ 0.84 fps)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 3.53" for 50-Year event
Inflow = 9.47 cfs @ 12.29 hrs, Volume= 4.055 af
Outflow = 5.59 cfs @ 13.10 hrs, Volume= 4.074 af, Atten= 41%, Lag= 48.4 min
Primary = 5.59 cfs @ 13.10 hrs, Volume= 4.074 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.02' @ 13.10 hrs Surf.Area= 10,022 sf Storage= 6,909 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.3 min (1,162.2 - 1,158.9)

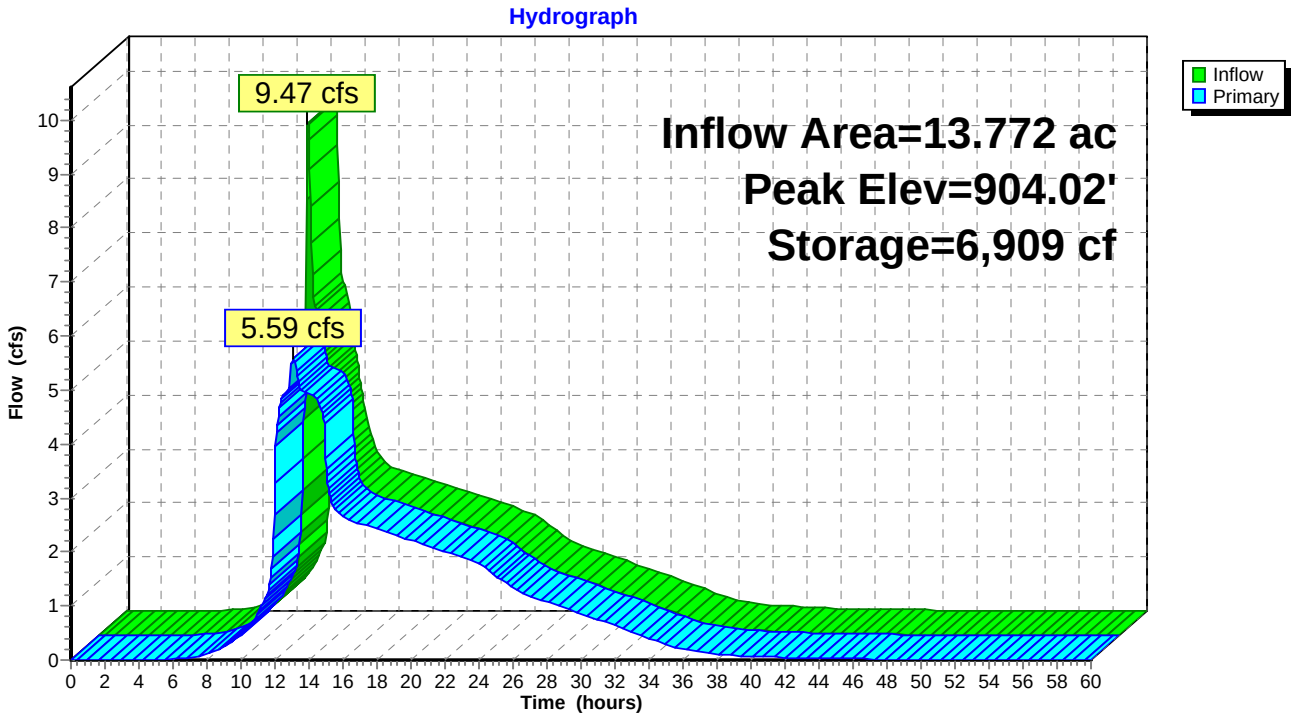
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.58 cfs @ 13.10 hrs HW=904.02' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.00 cfs @ 6.36 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 0.59 cfs @ 0.42 fps)

Pond 4P: Ex 10


Hydrograph
9.47 cfs
5.59 cfs
Inflow Area=13.772 ac
Peak Elev=904.02'
Storage=6,909 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 3.79" for 50-Year event
Inflow = 4.28 cfs @ 12.01 hrs, Volume= 0.246 af
Outflow = 1.43 cfs @ 12.18 hrs, Volume= 0.237 af, Atten= 66%, Lag= 10.5 min
Primary = 1.43 cfs @ 12.18 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 913.05' @ 12.18 hrs Surf.Area= 1,938 sf Storage= 3,772 cf

Plug-Flow detention time= 76.4 min calculated for 0.237 af (96% of inflow)
Center-of-Mass det. time= 55.5 min (850.2 - 794.8)

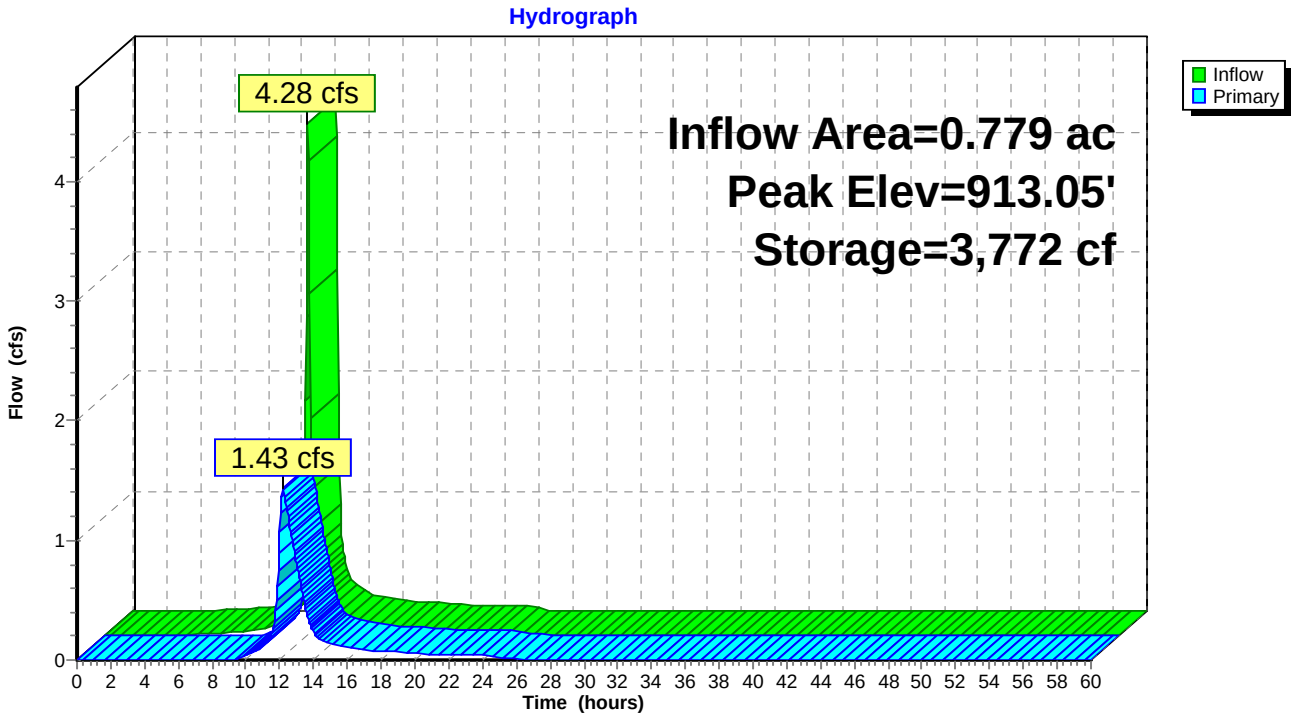
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.43 cfs @ 12.18 hrs HW=913.04' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.43 cfs @ 7.29 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 4.00" for 50-Year event
Inflow = 2.44 cfs @ 12.01 hrs, Volume= 0.143 af
Outflow = 0.48 cfs @ 12.27 hrs, Volume= 0.143 af, Atten= 80%, Lag= 15.5 min
Primary = 0.48 cfs @ 12.27 hrs, Volume= 0.143 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 915.49' @ 12.27 hrs Surf.Area= 4,150 sf Storage= 2,473 cf

Plug-Flow detention time= 79.9 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 80.9 min (868.1 - 787.1)

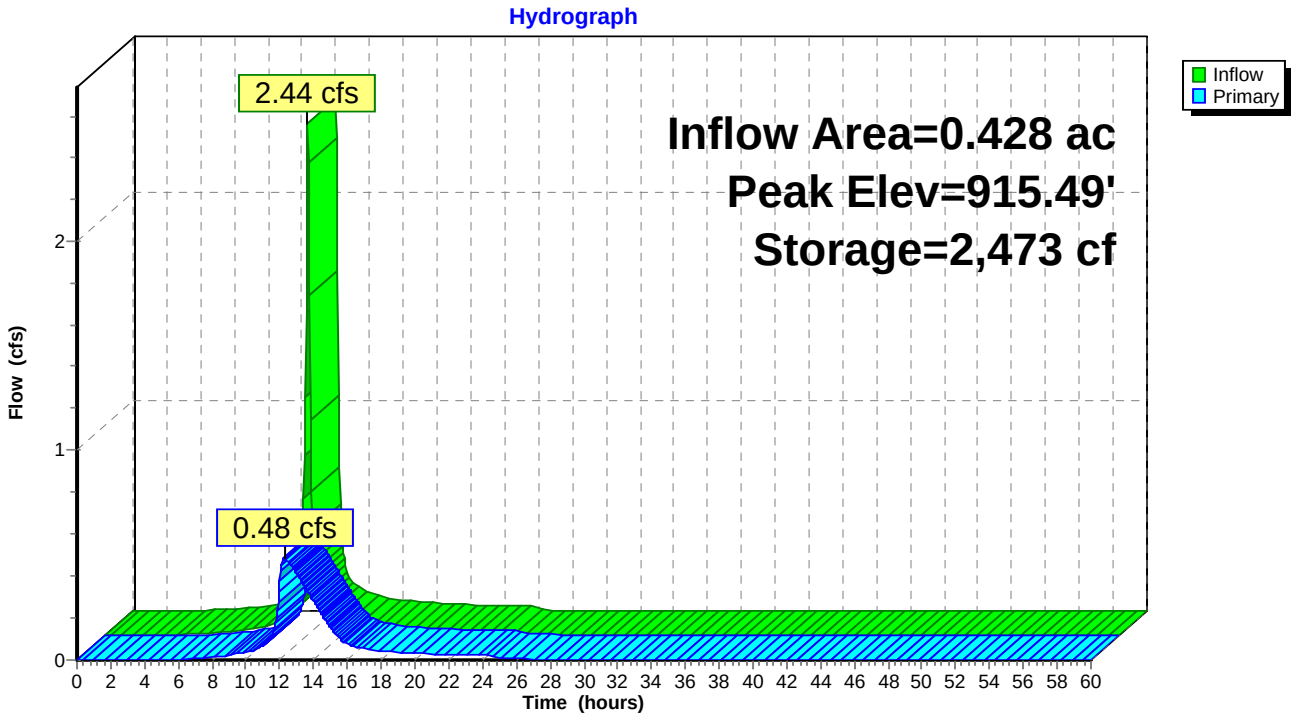
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.48 cfs @ 12.27 hrs HW=915.49' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.48 cfs @ 5.54 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 3.39" for 50-Year event
Inflow = 5.72 cfs @ 12.01 hrs, Volume= 0.321 af
Outflow = 2.77 cfs @ 12.15 hrs, Volume= 0.305 af, Atten= 52%, Lag= 8.3 min
Primary = 2.77 cfs @ 12.15 hrs, Volume= 0.305 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 909.51' @ 12.15 hrs Surf.Area= 5,849 sf Storage= 5,964 cf

Plug-Flow detention time= 168.8 min calculated for 0.305 af (95% of inflow)
Center-of-Mass det. time= 139.9 min (947.9 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

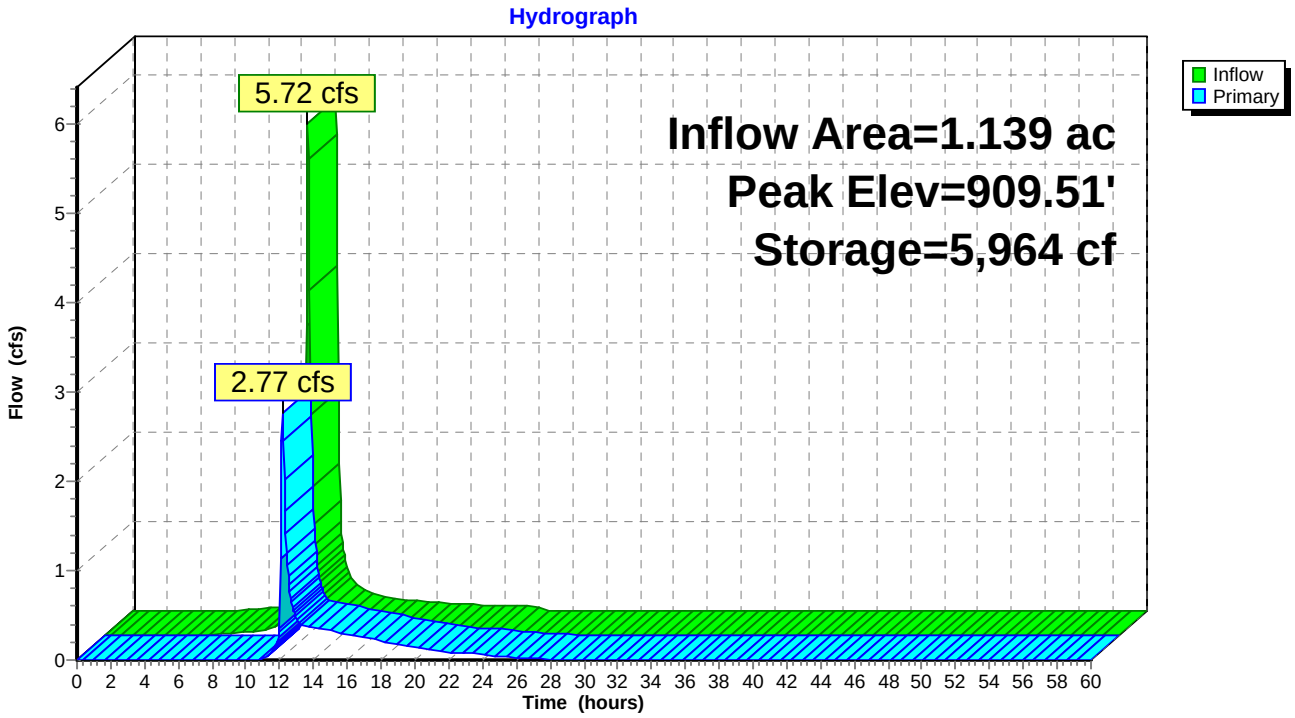
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=2.77 cfs @ 12.15 hrs HW=909.51' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.44 cfs @ 6.57 fps)
└─**2=2nd Stage Orifice** (Orifice Controls 2.33 cfs @ 2.33 fps)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 3.65" for 50-Year event
Inflow = 9.14 cfs @ 12.10 hrs, Volume= 0.780 af
Outflow = 4.19 cfs @ 12.30 hrs, Volume= 0.780 af, Atten= 54%, Lag= 11.6 min
Primary = 4.19 cfs @ 12.30 hrs, Volume= 0.780 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 908.76' @ 12.30 hrs Surf.Area= 4,540 sf Storage= 10,215 cf

Plug-Flow detention time= 138.5 min calculated for 0.779 af (100% of inflow)
Center-of-Mass det. time= 138.3 min (991.1 - 852.9)

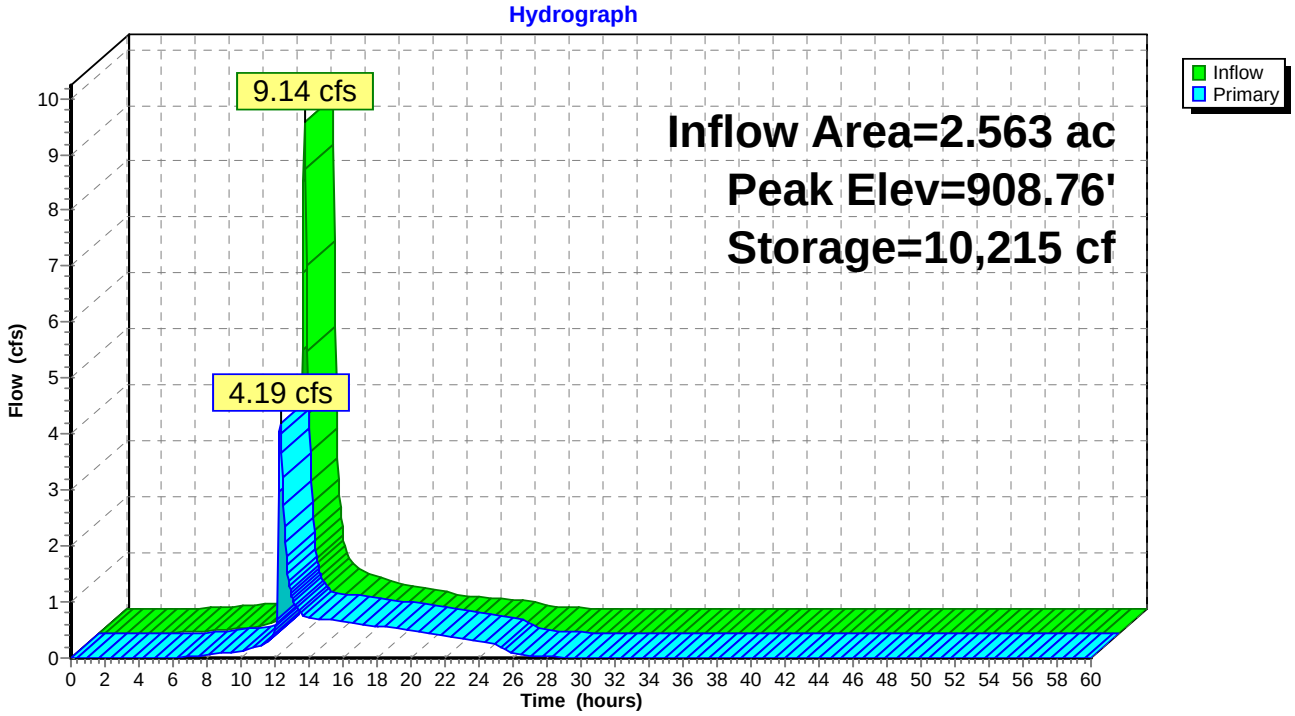
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=4.18 cfs @ 12.30 hrs HW=908.75' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.80 cfs @ 9.12 fps)
└─**2=2nd Stage Weir** (Orifice Controls 3.38 cfs @ 3.38 fps)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 2.47" for 50-Year event
Inflow = 1.52 cfs @ 11.91 hrs, Volume= 0.119 af
Outflow = 1.51 cfs @ 11.91 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.1 min
Primary = 1.51 cfs @ 11.91 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 900.22' @ 11.91 hrs Surf.Area= 4 sf Storage= 5 cf

Plug-Flow detention time= 0.1 min calculated for 0.119 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (835.1 - 835.0)

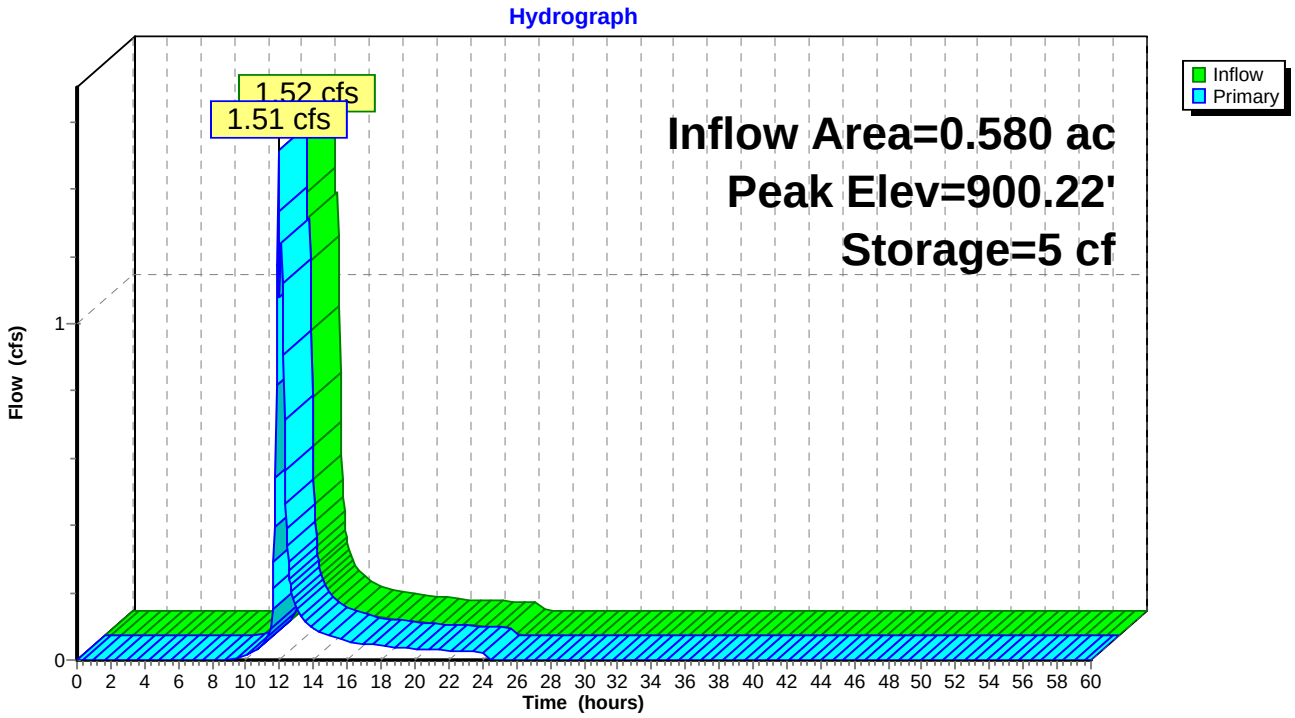
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.48 cfs @ 11.91 hrs HW=900.19' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 1.48 cfs @ 4.24 fps)

Pond 20P: Ex 9


Hydrograph
1.52 cfs
1.51 cfs
Inflow Area=0.580 ac
Peak Elev=900.22'
Storage=5 cf
Inflow
Primary
Flow (cfs)
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)

Summary for Pond 21P: Ex. 8

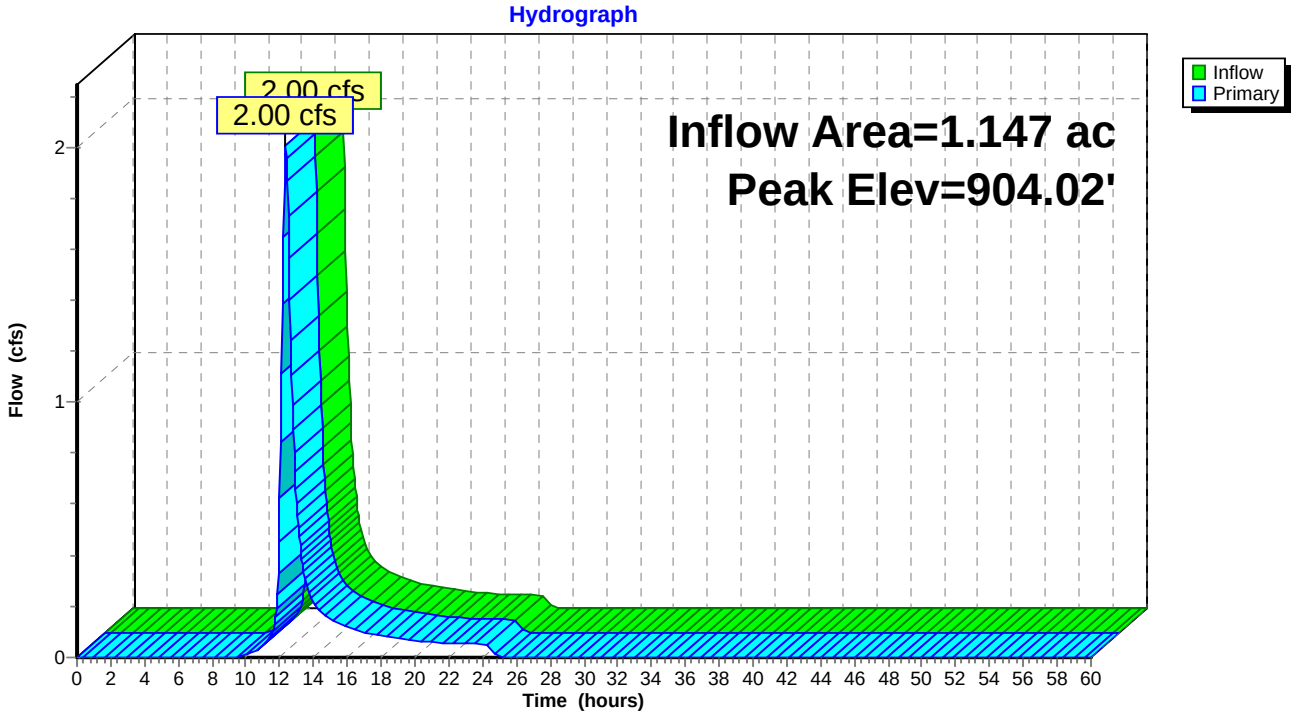
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	2.38"	for 50-Year event
Inflow =	2.00 cfs @	12.35 hrs,	Volume=	0.228 af	
Outflow =	2.00 cfs @	12.35 hrs,	Volume=	0.228 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.00 cfs @	12.35 hrs,	Volume=	0.228 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 904.02' @ 12.35 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.00 cfs @ 12.35 hrs HW=904.01' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 2.00 cfs @ 5.73 fps)

Pond 21P: Ex. 8

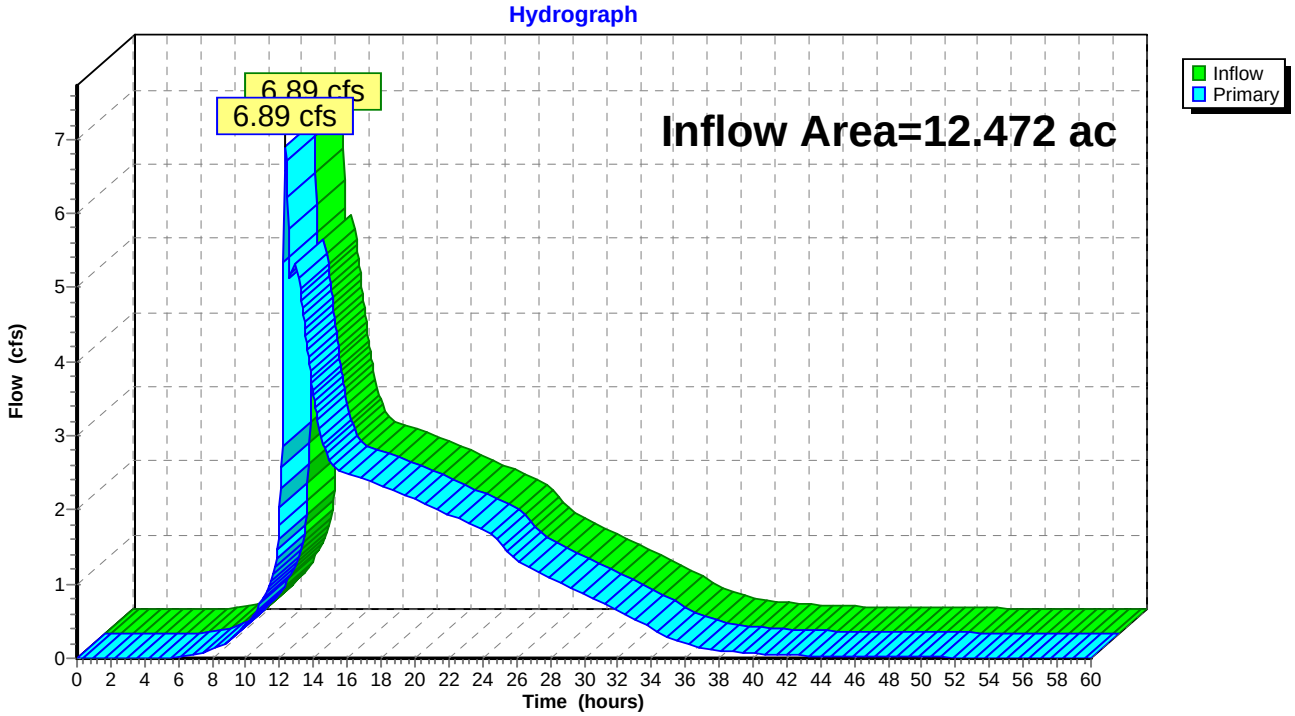


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 3.65" for 50-Year event
Inflow = 6.89 cfs @ 12.32 hrs, Volume= 3.797 af
Primary = 6.89 cfs @ 12.32 hrs, Volume= 3.797 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



Summary for Subcatchment 2S: Post Developed Overall

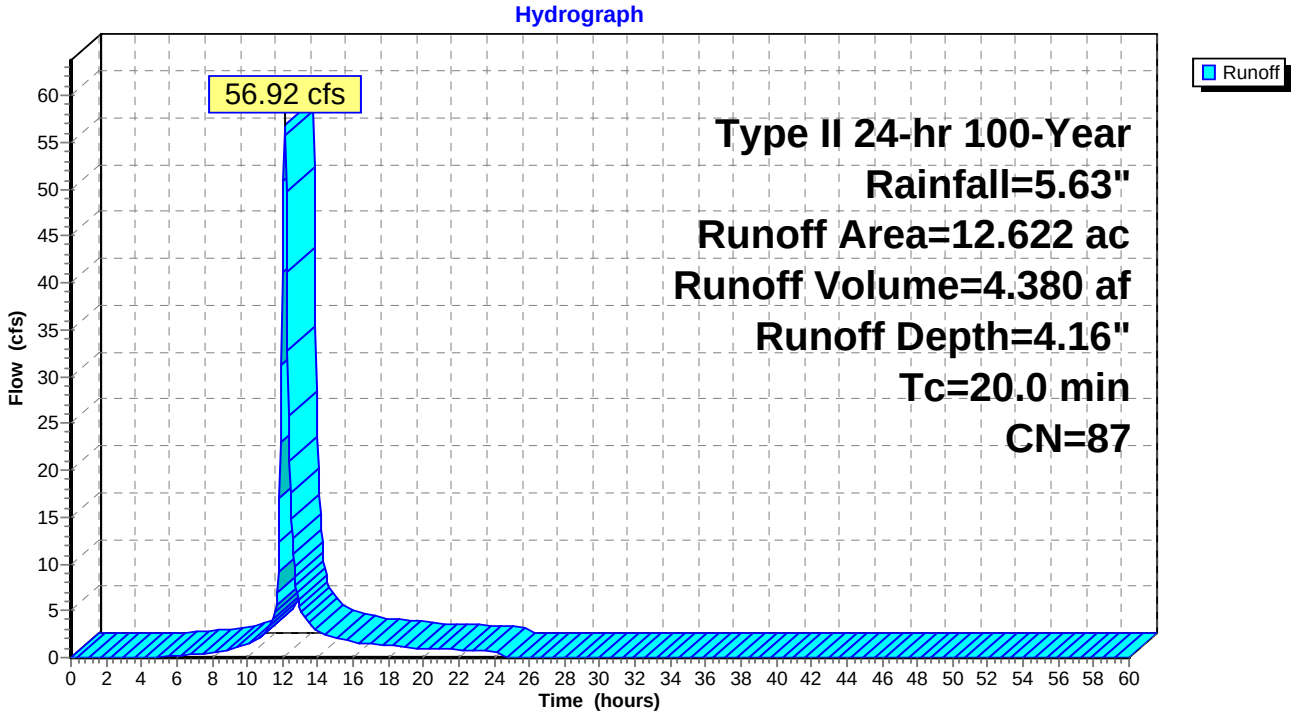
Runoff = 56.92 cfs @ 12.12 hrs, Volume= 4.380 af, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	6.893	98	Impervious Area (assumed)
*	5.458	74	Pervious/Open Area (assumed)
*	0.271	78	Pervious pavement
	12.622	87	Weighted Average
	5.729		45.39% Pervious Area
	6.893		54.61% Impervious Area

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

Subcatchment 2S: Post Developed Overall



Summary for Subcatchment 5S: Dublin Schools On-Site to Ex. Basin

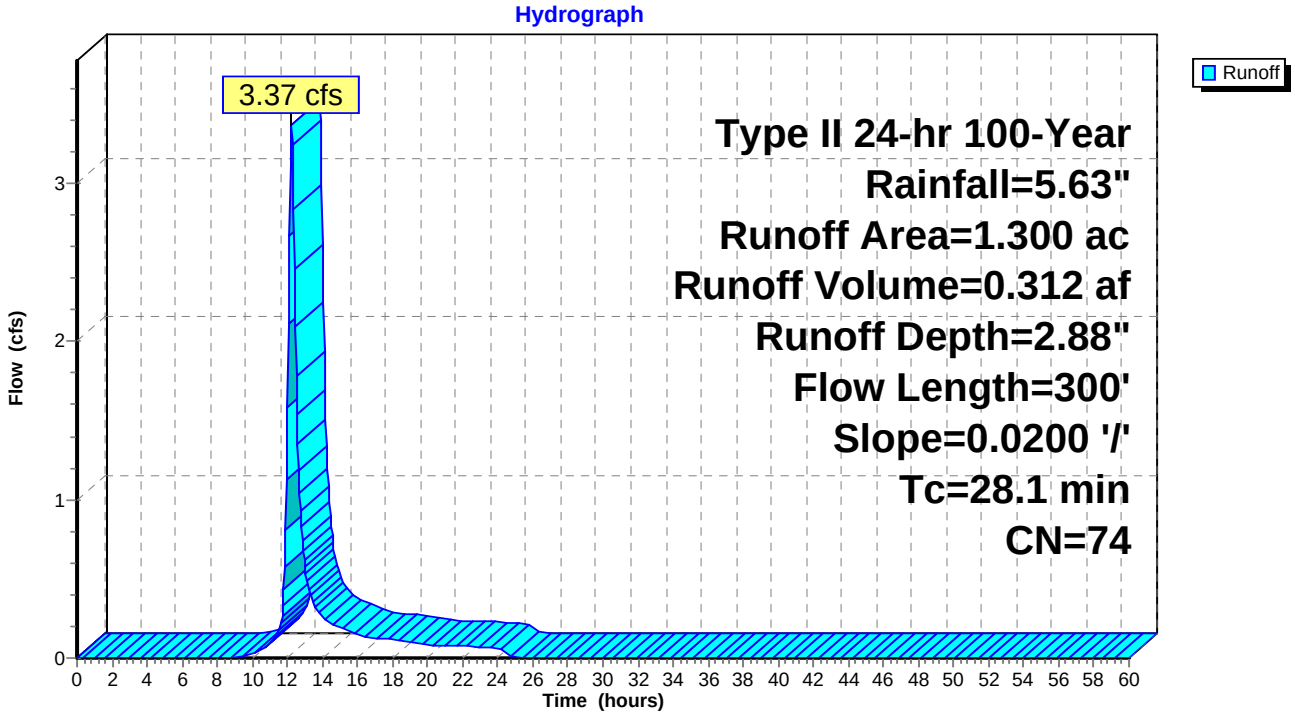
Runoff = 3.37 cfs @ 12.22 hrs, Volume= 0.312 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (ac)	CN	Description
1.300	74	>75% Grass cover, Good, HSG C
1.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	300	0.0200	0.18		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 5S: Dublin Schools On-Site to Ex. Basin



Summary for Subcatchment 6S: Post-Area A

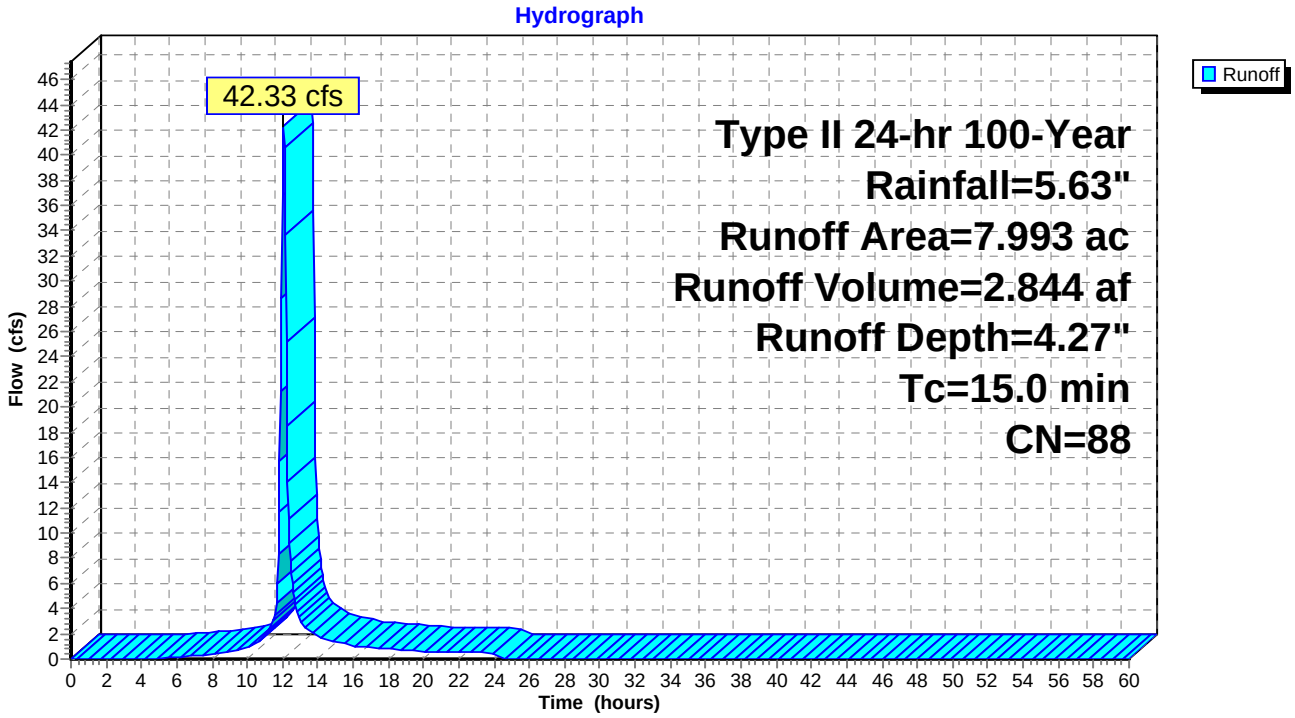
Runoff = 42.33 cfs @ 12.06 hrs, Volume= 2.844 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	4.525	98	Impervous Area
*	3.468	74	Lawn/Landscape Area
	7.993	88	Weighted Average
	3.468		43.39% Pervious Area
	4.525		56.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, ToC Direct Estimate**

Subcatchment 6S: Post-Area A



Summary for Subcatchment 11S: Post Area B

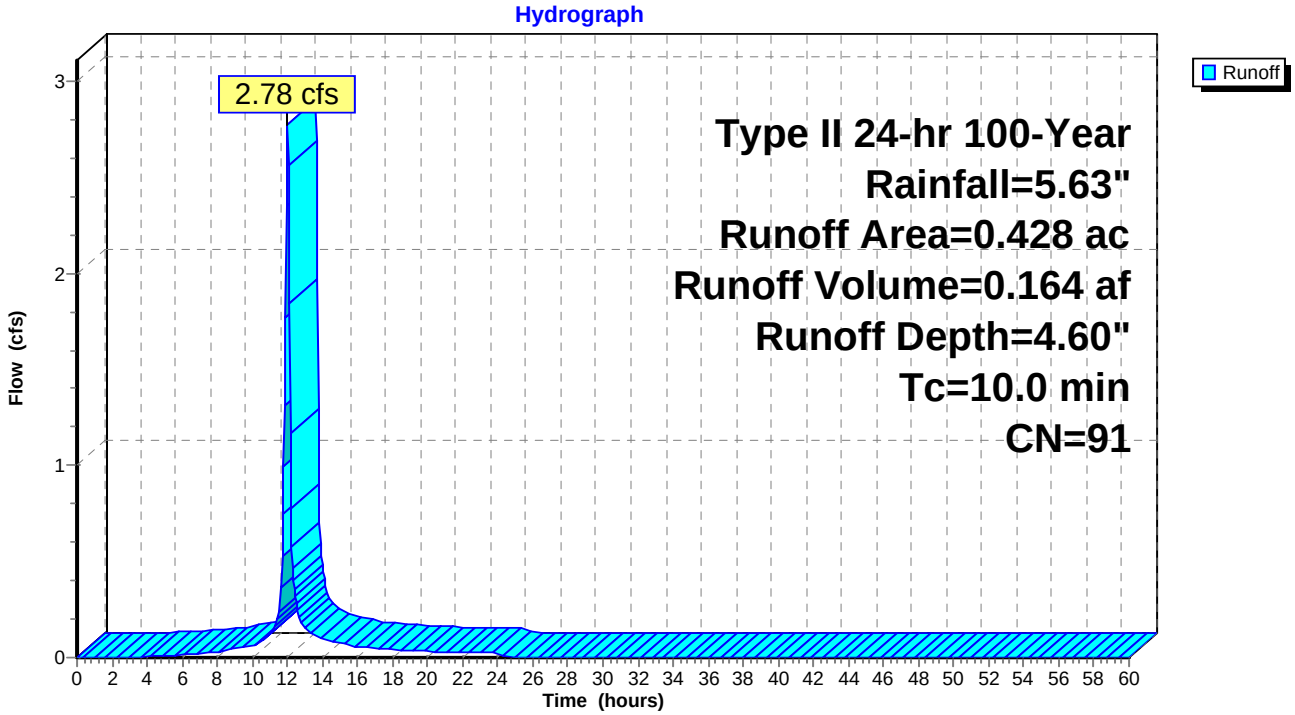
Runoff = 2.78 cfs @ 12.01 hrs, Volume= 0.164 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.094	78	Pervious Pavement
*	0.038	74	Lawn/Landscape Area
*	0.296	98	Impervious Area
	0.428	91	Weighted Average
	0.132		30.84% Pervious Area
	0.296		69.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct Entry - Estimated Tc (min)**

Subcatchment 11S: Post Area B



Summary for Subcatchment 12S: Post Area C

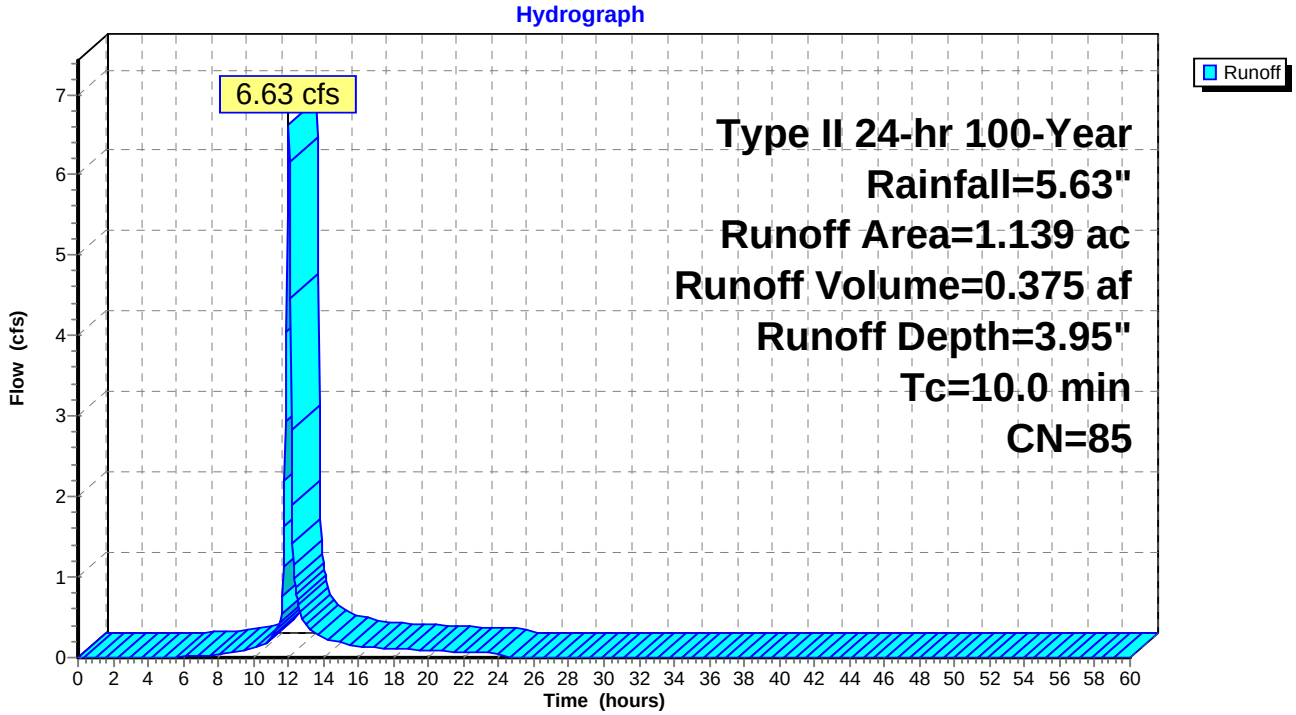
Runoff = 6.63 cfs @ 12.01 hrs, Volume= 0.375 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.095	78	Pervious Pavement
*	0.537	74	Lawn/Landscape Area
*	0.507	98	Impervious Area
	1.139	85	Weighted Average
	0.632		55.49% Pervious Area
	0.507		44.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Est. Tc at minimum**

Subcatchment 12S: Post Area C



Summary for Subcatchment 13S: Post Area D

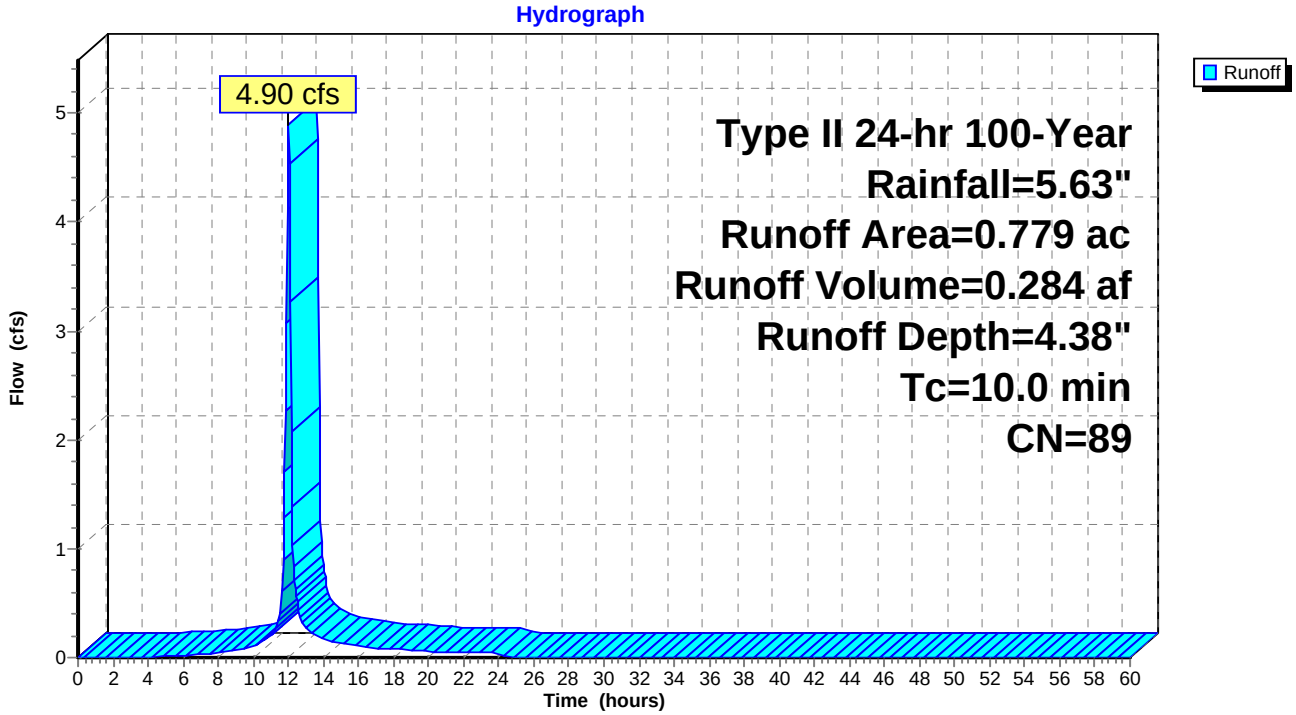
Runoff = 4.90 cfs @ 12.01 hrs, Volume= 0.284 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.082	78	Pervious Pavers
*	0.227	74	Lawn/Landscape Area
*	0.470	98	Impervious Area
	0.779	89	Weighted Average
	0.309		39.67% Pervious Area
	0.470		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Tc Estimated at Minimum**

Subcatchment 13S: Post Area D



Summary for Subcatchment 14S: Undetained - East

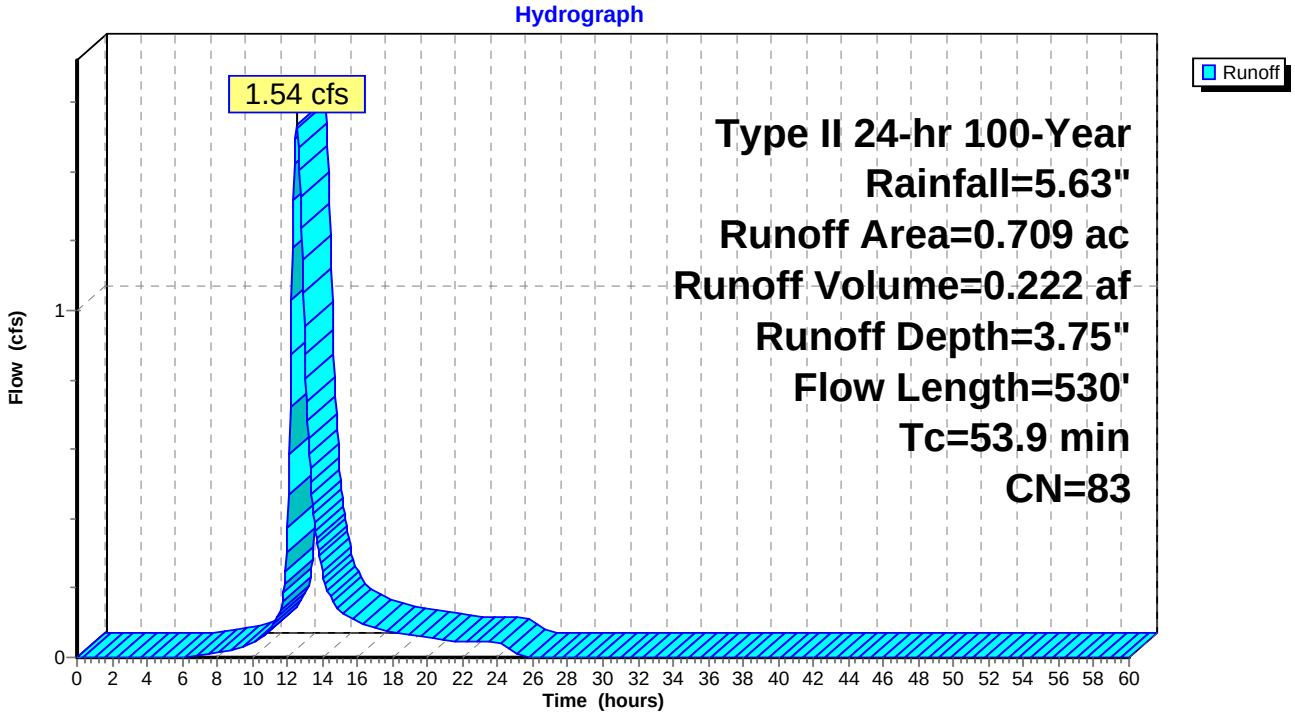
Runoff = 1.54 cfs @ 12.53 hrs, Volume= 0.222 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.210	98	Impervious
*	0.499	76	Wooded/Lawn Composite
	0.709	83	Weighted Average
	0.499		70.38% Pervious Area
	0.210		29.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.25"
7.2	380	0.0310	0.88		**Shallow Concentrated Flow, Shallow Conc. Flow** Woodland Kv= 5.0 fps
53.9	530	Total			

Subcatchment 14S: Undetained - East



Summary for Subcatchment 15S: UGS Area - Direct

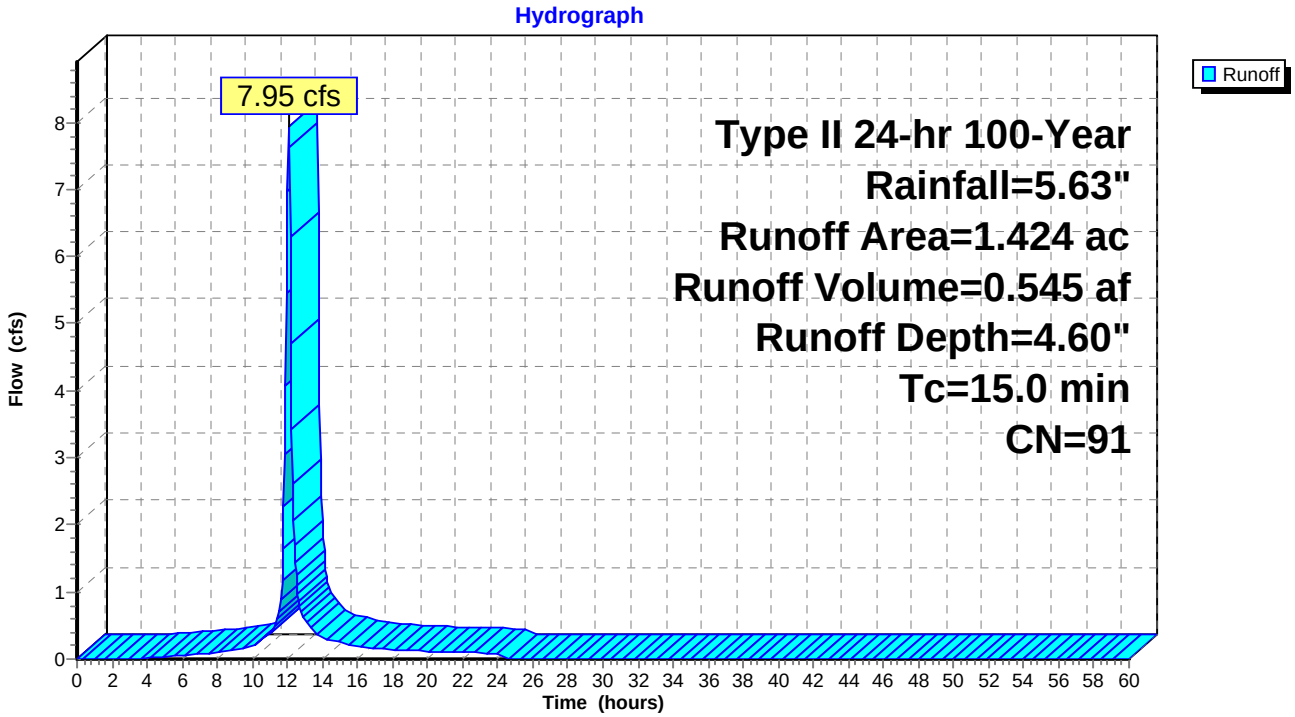
Runoff = 7.95 cfs @ 12.06 hrs, Volume= 0.545 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.400	74	Lawn/Landscape Area
*	1.024	98	Impervious Area
	1.424	91	Weighted Average
	0.400		28.09% Pervious Area
	1.024		71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Est. Tc**

Subcatchment 15S: UGS Area - Direct



Summary for Subcatchment 17S: Dublin Schools On-Site to Ex. Basin

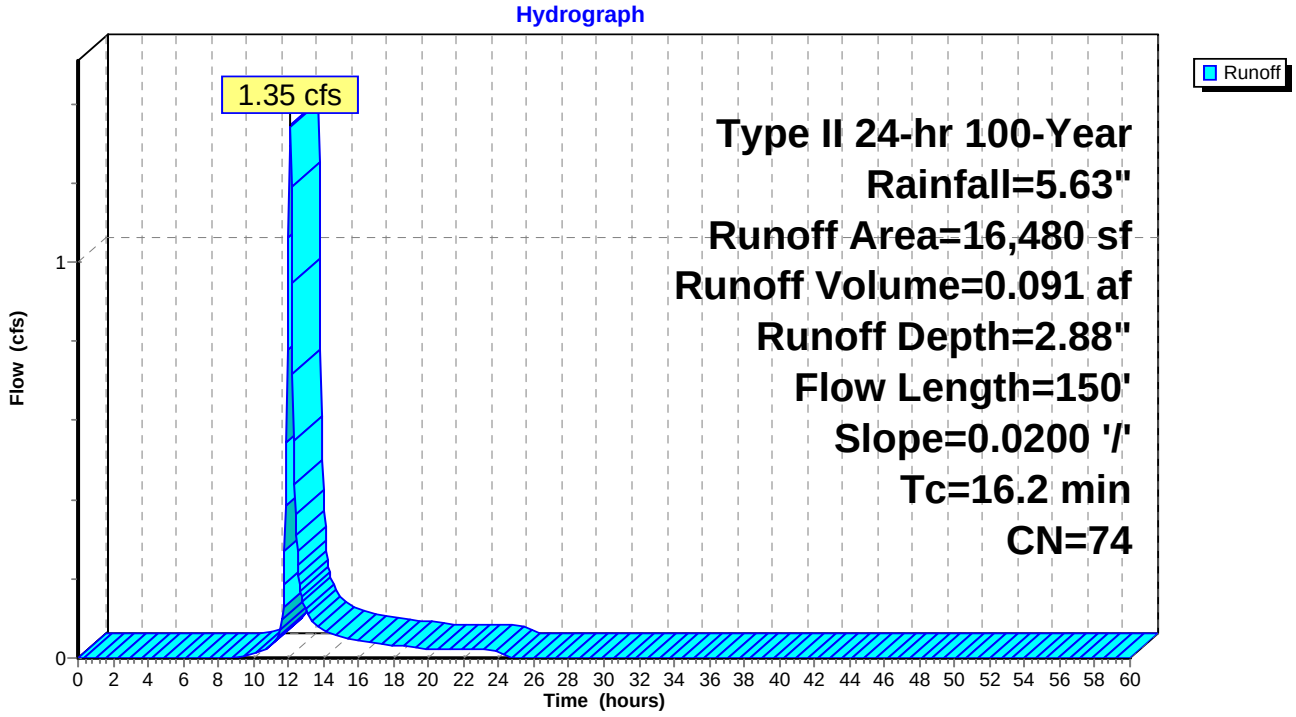
Runoff = 1.35 cfs @ 12.09 hrs, Volume= 0.091 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (sf)	CN	Description
16,480	74	>75% Grass cover, Good, HSG C
16,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	150	0.0200	0.15		**Sheet Flow, Sheet flow to inlet** Grass: Short n= 0.150 P2= 2.25"

Subcatchment 17S: Dublin Schools On-Site to Ex. Basin



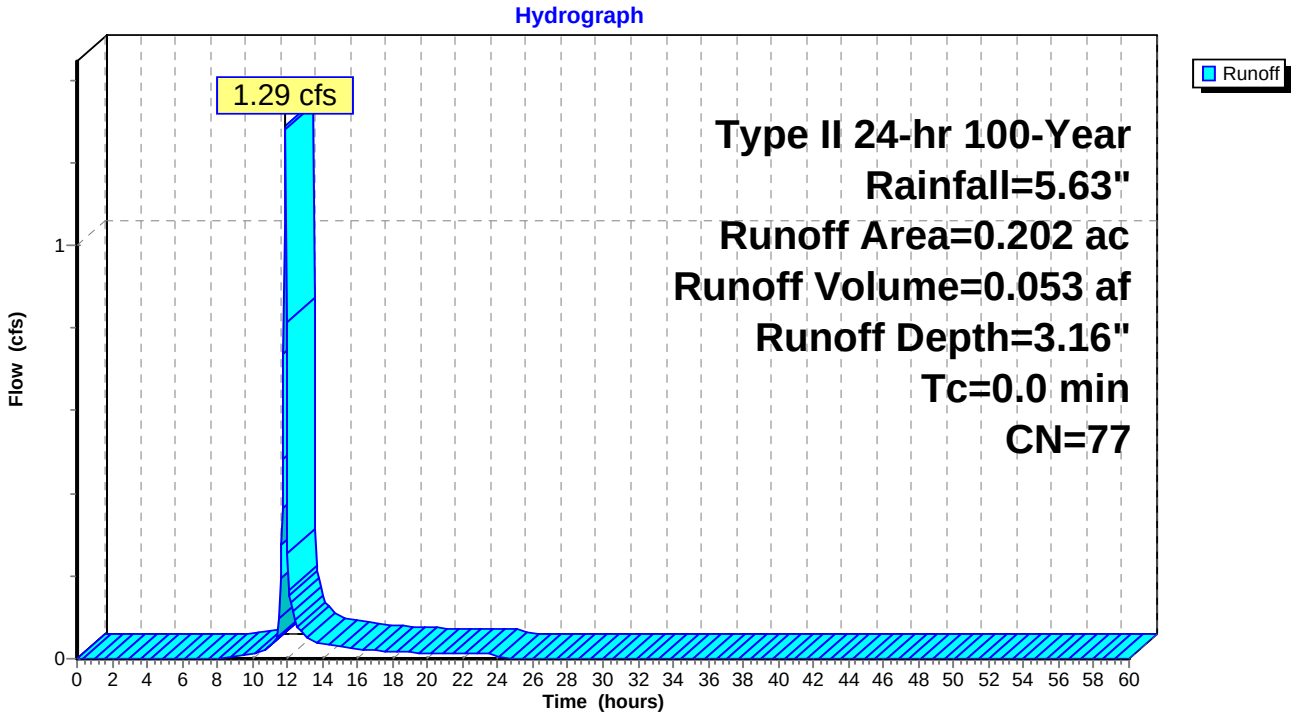
Summary for Subcatchment 19S: Undetained West

Runoff = 1.29 cfs @ 11.89 hrs, Volume= 0.053 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.174	74	Lawn/Landscape
*	0.028	98	Impervious Area
	0.202	77	Weighted Average
	0.174		86.14% Pervious Area
	0.028		13.86% Impervious Area

Subcatchment 19S: Undetained West



Summary for Subcatchment 20S: Dublin Schools to 9

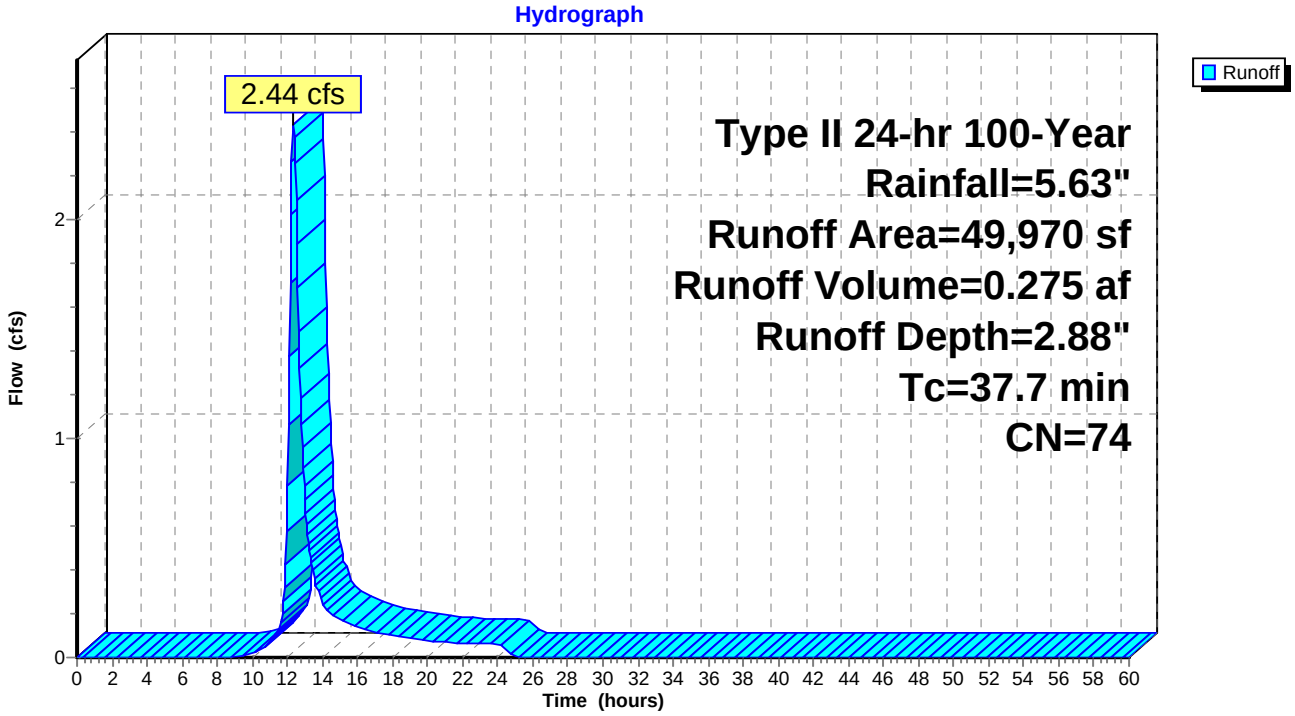
Runoff = 2.44 cfs @ 12.34 hrs, Volume= 0.275 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

	Area (sf)	CN	Description
*	49,970	74	Lawn/rec Fields - Schools Site
	49,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.7					**Direct Entry, See Pre- Calcs**

Subcatchment 20S: Dublin Schools to 9



Summary for Pond 3P: Open Air Pond (Generic)

Inflow Area = 9.200 ac, 57.51% Impervious, Inflow Depth = 4.28" for 100-Year event
Inflow = 44.24 cfs @ 12.07 hrs, Volume= 3.284 af
Outflow = 7.14 cfs @ 12.60 hrs, Volume= 3.275 af, Atten= 84%, Lag= 31.8 min
Primary = 7.14 cfs @ 12.60 hrs, Volume= 3.275 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Starting Elev= 907.25' Surf.Area= 24,155 sf Storage= 22,418 cf
Peak Elev= 911.28' @ 12.60 hrs Surf.Area= 37,520 sf Storage= 95,350 cf (72,932 cf above start)

Plug-Flow detention time= 568.8 min calculated for 2.760 af (84% of inflow)
Center-of-Mass det. time= 405.2 min (1,211.2 - 806.0)

Volume	Invert	Avail.Storage	Storage Description
#1	907.00'	94,833 cf	**Open Air Pond (Irregular)**Listed below (Recalc)
#2	900.00'	16,932 cf	**Forebay Below NWL (Irregular)**Listed below (Recalc)
#3	902.00'	2,661 cf	**Settling Bay below WSL (Irregular)**Listed below (Recalc)
		114,427 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
907.00	10,883	491.0	0	0	10,883
908.00	14,416	530.0	12,608	12,608	14,093
909.00	17,131	561.0	15,754	28,362	16,839
910.00	20,002	592.0	18,548	46,910	19,741
911.00	24,072	673.0	22,006	68,916	27,919
912.00	27,808	728.0	25,918	94,833	34,091

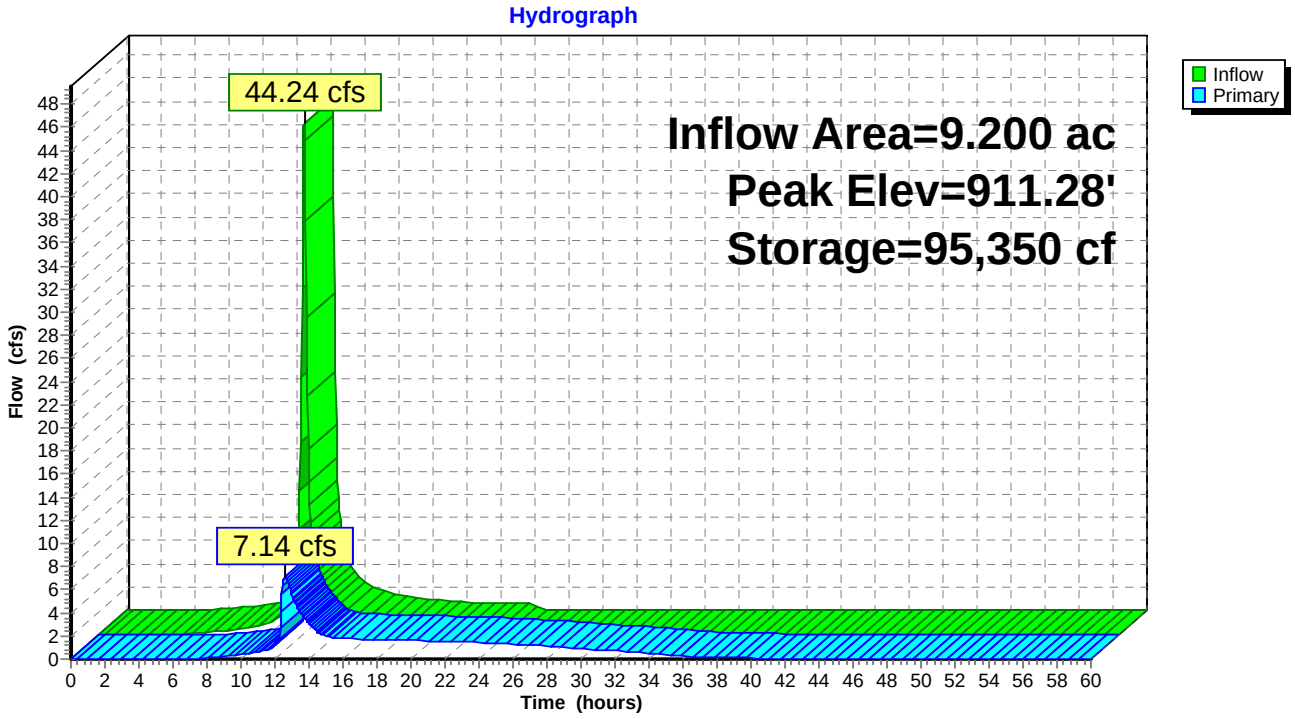
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
900.00	470	94.0	0	0	470
901.00	791	119.0	624	624	907
902.00	1,176	138.0	977	1,601	1,316
903.00	1,618	156.0	1,391	2,992	1,762
904.00	2,117	176.0	1,862	4,854	2,316
905.00	2,672	195.0	2,389	7,243	2,907
906.00	3,285	213.0	2,973	10,216	3,526
907.00	10,883	491.0	6,716	16,932	19,104

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
902.00	59	43.0	0	0	59
903.00	260	90.0	148	148	561
904.00	595	133.0	416	564	1,332
905.00	1,043	160.0	809	1,372	1,978
906.00	1,552	179.0	1,289	2,661	2,518

Device	Routing	Invert	Outlet Devices
#1	Primary	907.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	911.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.12 cfs @ 12.60 hrs HW=911.28' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.84 cfs @ 9.36 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 5.29 cfs @ 1.27 fps)

Pond 3P: Open Air Pond (Generic)



Summary for Pond 4P: Ex 10

Inflow Area = 13.772 ac, 51.06% Impervious, Inflow Depth > 4.11" for 100-Year event
Inflow = 14.49 cfs @ 12.42 hrs, Volume= 4.713 af
Outflow = 14.05 cfs @ 12.51 hrs, Volume= 4.699 af, Atten= 3%, Lag= 5.0 min
Primary = 14.05 cfs @ 12.51 hrs, Volume= 4.699 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 904.14' @ 12.51 hrs Surf.Area= 10,022 sf Storage= 8,078 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.5 min (1,130.2 - 1,124.7)

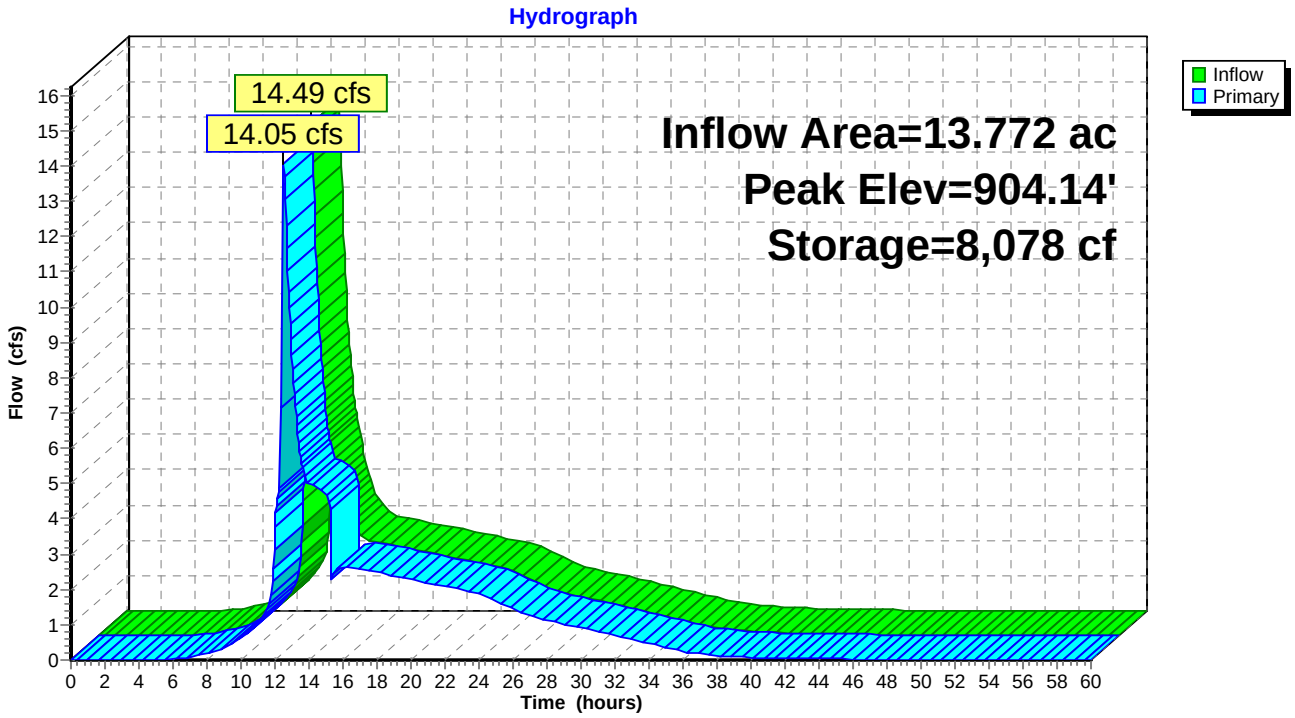
Volume	Invert	Avail.Storage	Storage Description
#1	898.19'	9,184 cf	**Existing Storm Structure Basin area (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
898.19	4	8.0	0	0	4
901.29	4	8.0	12	12	29
903.00	1,979	215.0	1,181	1,193	3,707
904.00	10,022	657.0	5,485	6,678	34,381
904.25	10,022	657.0	2,506	9,184	34,546

Device	Routing	Invert	Outlet Devices
#1	Primary	898.82'	**12.0" Round Existing 12" Storm** L= 326.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 898.82' / 895.52' S= 0.0101 '/' Cc= 0.900 n= 0.013
#2	Primary	904.00'	**60.0' long x 0.5' breadth Flood Routing of Inlet to downstream/Hard Road** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=13.75 cfs @ 12.51 hrs HW=904.14' (Free Discharge)
└─**1=Existing 12" Storm** (Barrel Controls 5.04 cfs @ 6.41 fps)
└─**2=Flood Routing of Inlet to downstream/Hard Road** (Weir Controls 8.71 cfs @ 1.04 fps)

Pond 4P: Ex 10


Hydrograph
14.49 cfs
14.05 cfs
Inflow Area=13.772 ac
Peak Elev=904.14'
Storage=8,078 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 7P: Pervious System 1 (area D)

Inflow Area = 0.779 ac, 60.33% Impervious, Inflow Depth = 4.38" for 100-Year event
Inflow = 4.90 cfs @ 12.01 hrs, Volume= 0.284 af
Outflow = 1.63 cfs @ 12.18 hrs, Volume= 0.275 af, Atten= 67%, Lag= 10.5 min
Primary = 1.63 cfs @ 12.18 hrs, Volume= 0.275 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 913.73' @ 12.18 hrs Surf.Area= 1,938 sf Storage= 4,300 cf

Plug-Flow detention time= 72.4 min calculated for 0.275 af (97% of inflow)
Center-of-Mass det. time= 54.0 min (844.8 - 790.8)

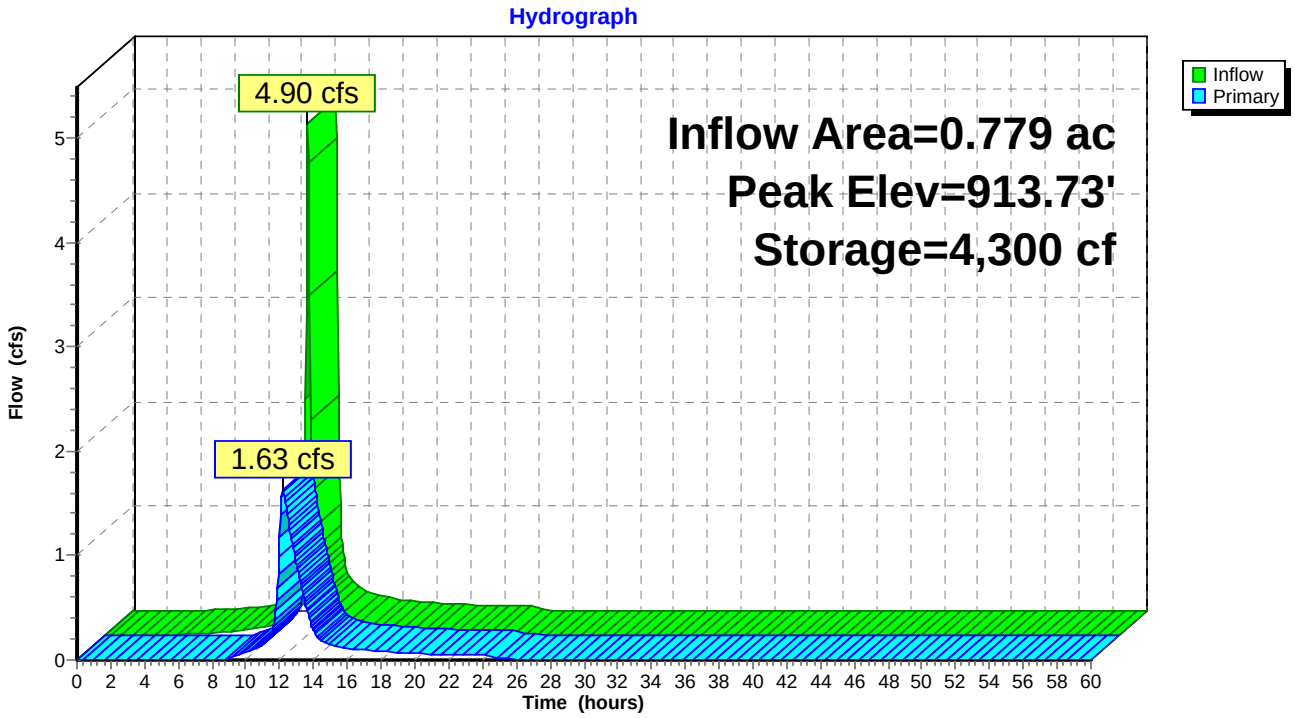
Volume	Invert	Avail.Storage	Storage Description
#1A	910.00'	2,551 cf	**15.75'W x 123.04'L x 4.50'H Field A** 8,720 cf Overall - 2,343 cf Embedded = 6,378 cf x 40.0% Voids
#2A	910.50'	2,343 cf	**StormTech SC-740** x 51 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		4,894 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	910.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.63 cfs @ 12.18 hrs HW=913.72' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.63 cfs @ 8.30 fps)

Pond 7P: Pervious System 1 (area D)



Summary for Pond 8P: Pervious System B

Inflow Area = 0.428 ac, 69.16% Impervious, Inflow Depth = 4.60" for 100-Year event
Inflow = 2.78 cfs @ 12.01 hrs, Volume= 0.164 af
Outflow = 0.52 cfs @ 12.27 hrs, Volume= 0.164 af, Atten= 81%, Lag= 16.0 min
Primary = 0.52 cfs @ 12.27 hrs, Volume= 0.164 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 915.72' @ 12.27 hrs Surf.Area= 4,150 sf Storage= 2,852 cf

Plug-Flow detention time= 80.3 min calculated for 0.164 af (100% of inflow)
Center-of-Mass det. time= 81.3 min (864.7 - 783.4)

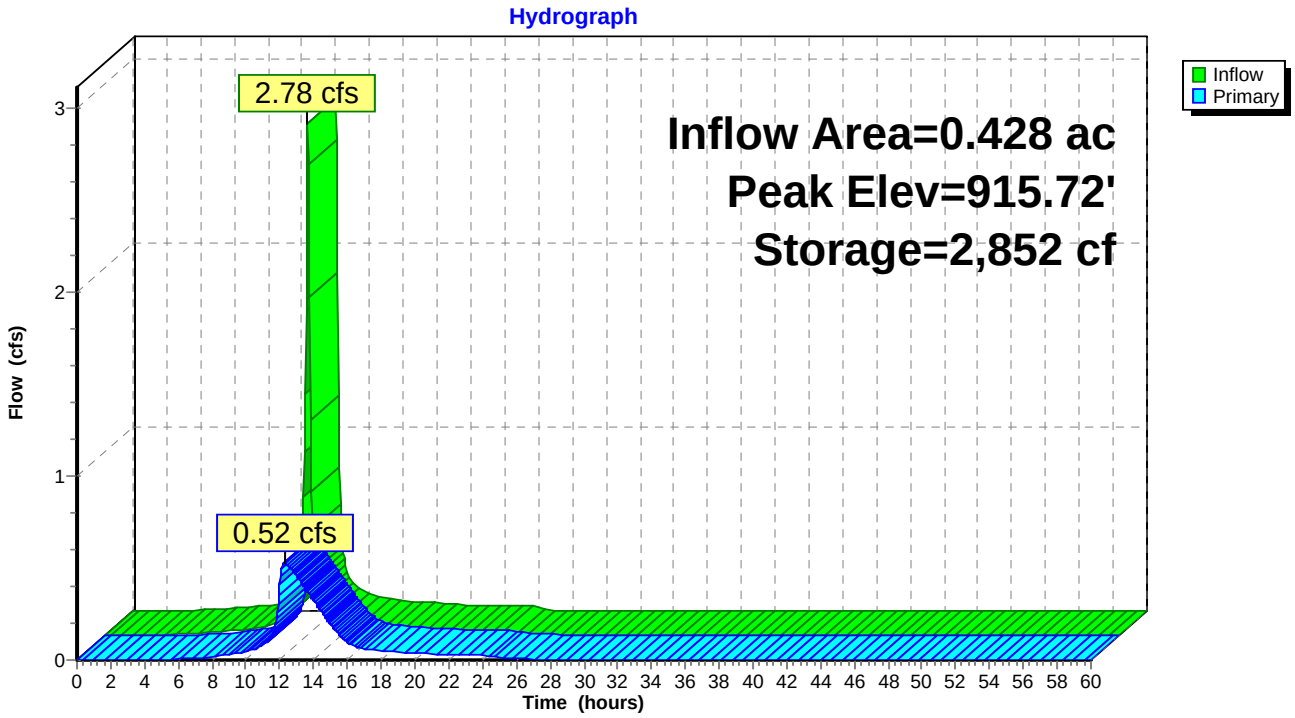
Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	4,980 cf	**Pervious Paver Storage (Irregular)** Listed below (Recalc) 12,450 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
914.00	4,150	288.0	0	0	4,150
915.00	4,150	288.0	4,150	4,150	4,438
916.00	4,150	288.0	4,150	8,300	4,726
917.00	4,150	288.0	4,150	12,450	5,014

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.52 cfs @ 12.27 hrs HW=915.72' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.52 cfs @ 5.99 fps)

Pond 8P: Pervious System B



Summary for Pond 9P: Pervious System C

Inflow Area = 1.139 ac, 44.51% Impervious, Inflow Depth = 3.95" for 100-Year event
Inflow = 6.63 cfs @ 12.01 hrs, Volume= 0.375 af
Outflow = 3.86 cfs @ 12.12 hrs, Volume= 0.359 af, Atten= 42%, Lag= 6.7 min
Primary = 3.86 cfs @ 12.12 hrs, Volume= 0.359 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 909.76' @ 12.12 hrs Surf.Area= 5,849 sf Storage= 6,433 cf

Plug-Flow detention time= 153.0 min calculated for 0.359 af (96% of inflow)
Center-of-Mass det. time= 129.3 min (932.9 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	907.00'	2,547 cf	**58.50'W x 58.96'L x 3.13'H Field A** 10,779 cf Overall - 4,410 cf Embedded = 6,368 cf x 40.0% Voids
#2A	907.50'	4,410 cf	**StormTech SC-740** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3	908.00'	29 cf	**Pervious Stone Storage (Prismatic)** Listed below (Recalc) 7,200 cf Overall x 0.4% Voids
		6,986 cf	Total Available Storage

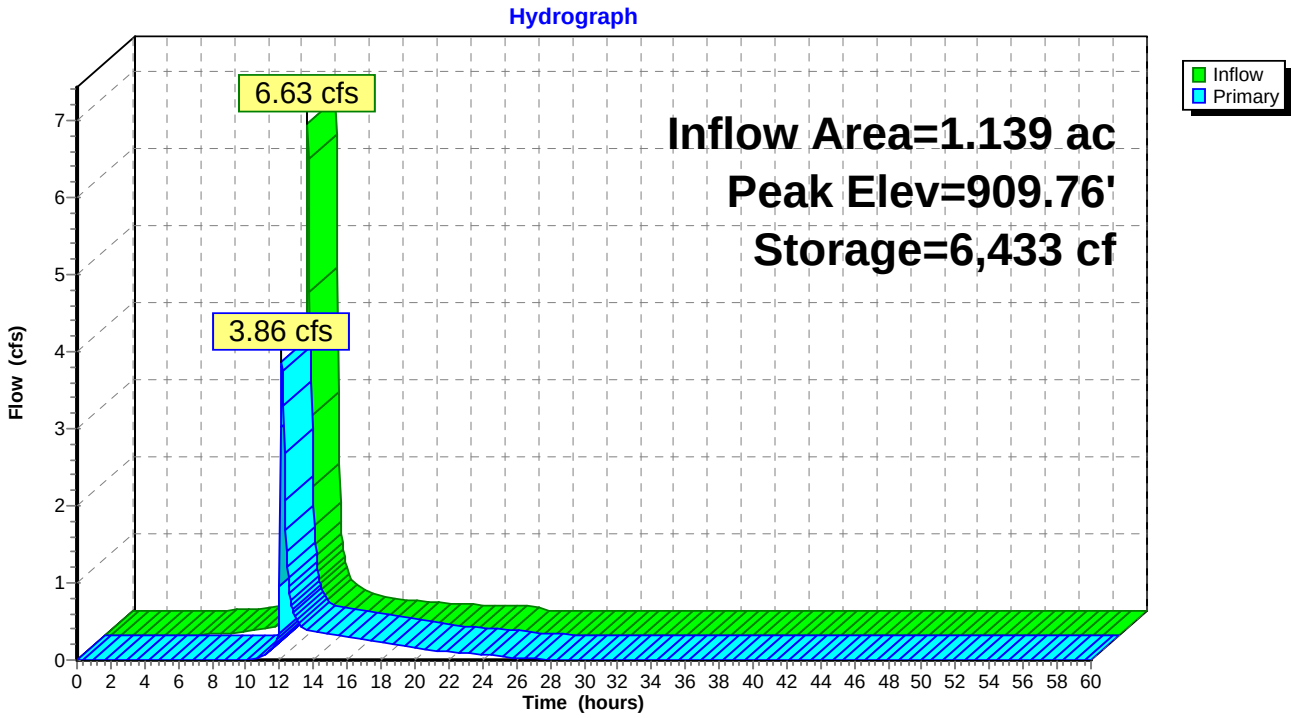
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
908.00	2,400	0	0
909.00	2,400	2,400	2,400
910.00	2,400	2,400	4,800
911.00	2,400	2,400	7,200

Device	Routing	Invert	Outlet Devices
#1	Primary	907.50'	**3.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	909.00'	**24.0" W x 6.0" H Vert. 2nd Stage Orifice** C= 0.600

Primary OutFlow Max=3.76 cfs @ 12.12 hrs HW=909.73' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.46 cfs @ 6.95 fps)
└─**2=2nd Stage Orifice** (Orifice Controls 3.30 cfs @ 3.30 fps)

Pond 9P: Pervious System C



Summary for Pond 10P: UG Storage A

Inflow Area = 2.563 ac, 59.73% Impervious, Inflow Depth = 4.23" for 100-Year event
Inflow = 11.45 cfs @ 12.09 hrs, Volume= 0.904 af
Outflow = 6.00 cfs @ 12.26 hrs, Volume= 0.904 af, Atten= 48%, Lag= 10.3 min
Primary = 6.00 cfs @ 12.26 hrs, Volume= 0.904 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 909.39' @ 12.26 hrs Surf.Area= 4,540 sf Storage= 11,370 cf

Plug-Flow detention time= 128.7 min calculated for 0.904 af (100% of inflow)
Center-of-Mass det. time= 128.3 min (973.9 - 845.6)

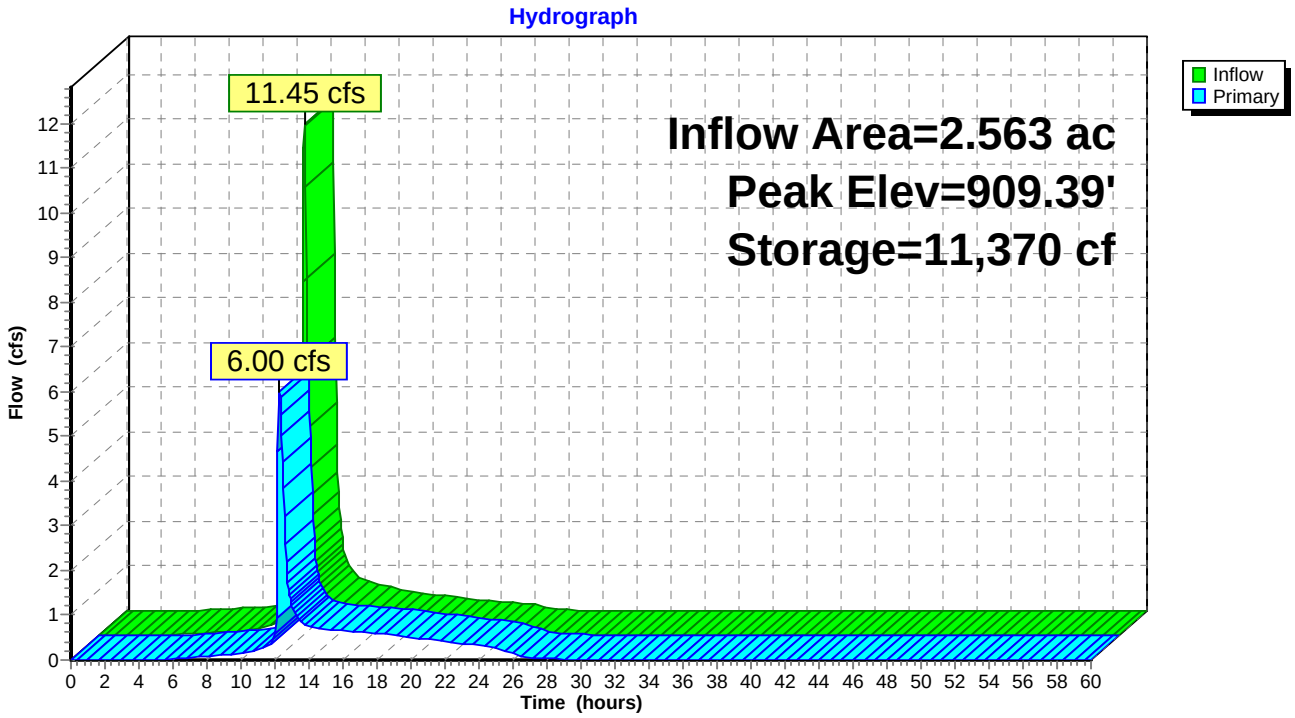
Volume	Invert	Avail.Storage	Storage Description
#1A	905.00'	1,964 cf	**15.75'W x 94.56'L x 4.50'H Field A** 6,702 cf Overall - 1,792 cf Embedded = 4,910 cf x 40.0% Voids
#2A	905.50'	1,792 cf	**StormTech SC-740** x 39 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
#3B	905.00'	3,947 cf	**30.00'W x 101.68'L x 4.50'H Field B** 13,727 cf Overall - 3,859 cf Embedded = 9,868 cf x 40.0% Voids
#4B	905.50'	3,859 cf	**StormTech SC-740** x 84 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		11,562 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	905.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	908.00'	**24.0" W x 6.0" H Vert. 2nd Stage Weir** C= 0.600

Primary OutFlow Max=5.97 cfs @ 12.26 hrs HW=909.38' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.86 cfs @ 9.88 fps)
└─**2=2nd Stage Weir** (Orifice Controls 5.11 cfs @ 5.11 fps)

Pond 10P: UG Storage A



Summary for Pond 20P: Ex 9

Inflow Area = 0.580 ac, 4.82% Impervious, Inflow Depth = 2.97" for 100-Year event
Inflow = 1.83 cfs @ 11.91 hrs, Volume= 0.144 af
Outflow = 1.82 cfs @ 11.91 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.1 min
Primary = 1.82 cfs @ 11.91 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 900.59' @ 11.91 hrs Surf.Area= 4 sf Storage= 6 cf

Plug-Flow detention time= 0.1 min calculated for 0.144 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (829.9 - 829.8)

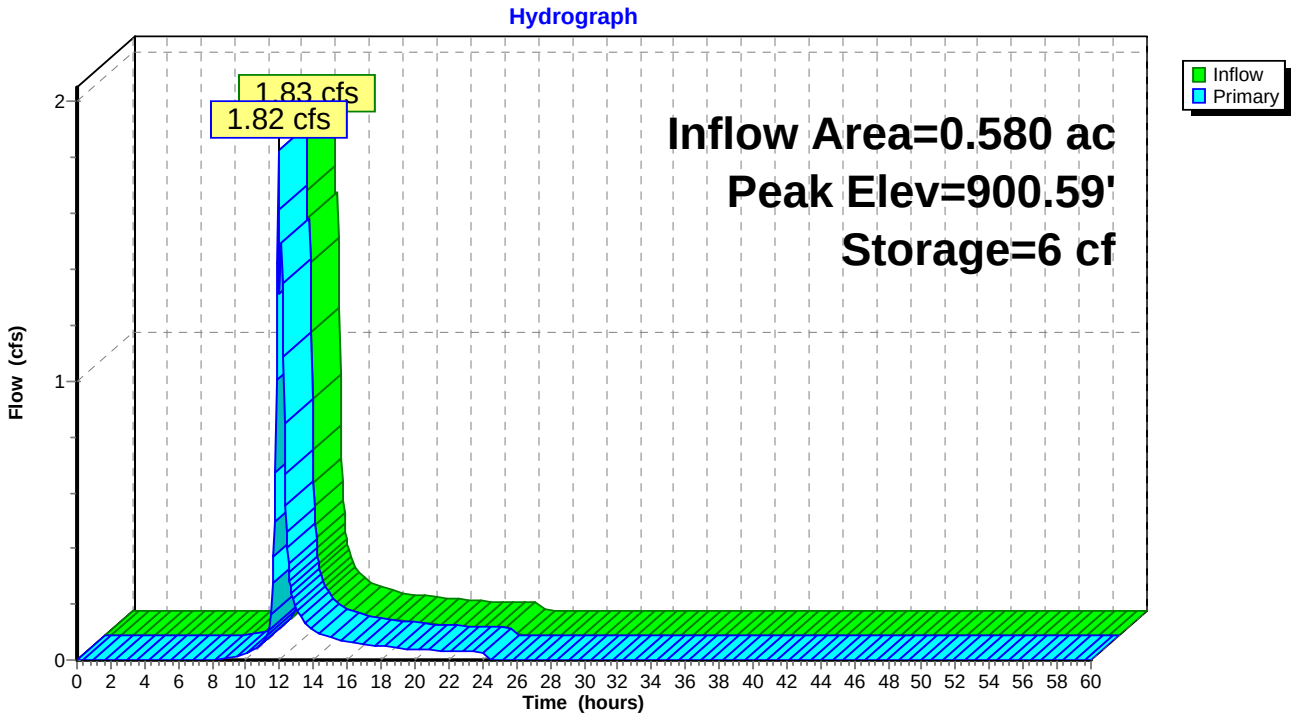
Volume	Invert	Avail.Storage	Storage Description
#1	899.08'	3,539 cf	**Ponding Area at Inlet (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.08	4	8.0	0	0	4
902.23	4	8.0	13	13	29
904.00	1,047	140.0	658	671	1,589
905.00	5,219	296.0	2,868	3,539	7,006

Device	Routing	Invert	Outlet Devices
#1	Primary	899.08'	**8.0" Vert. 8" Pipe Leaving Structure** C= 0.600

Primary OutFlow Max=1.79 cfs @ 11.91 hrs HW=900.54' (Free Discharge)
└─**1=8" Pipe Leaving Structure** (Orifice Controls 1.79 cfs @ 5.11 fps)

Pond 20P: Ex 9


Hydrograph
1.83 cfs
1.82 cfs
Inflow Area=0.580 ac
Peak Elev=900.59'
Storage=6 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60

Summary for Pond 21P: Ex. 8

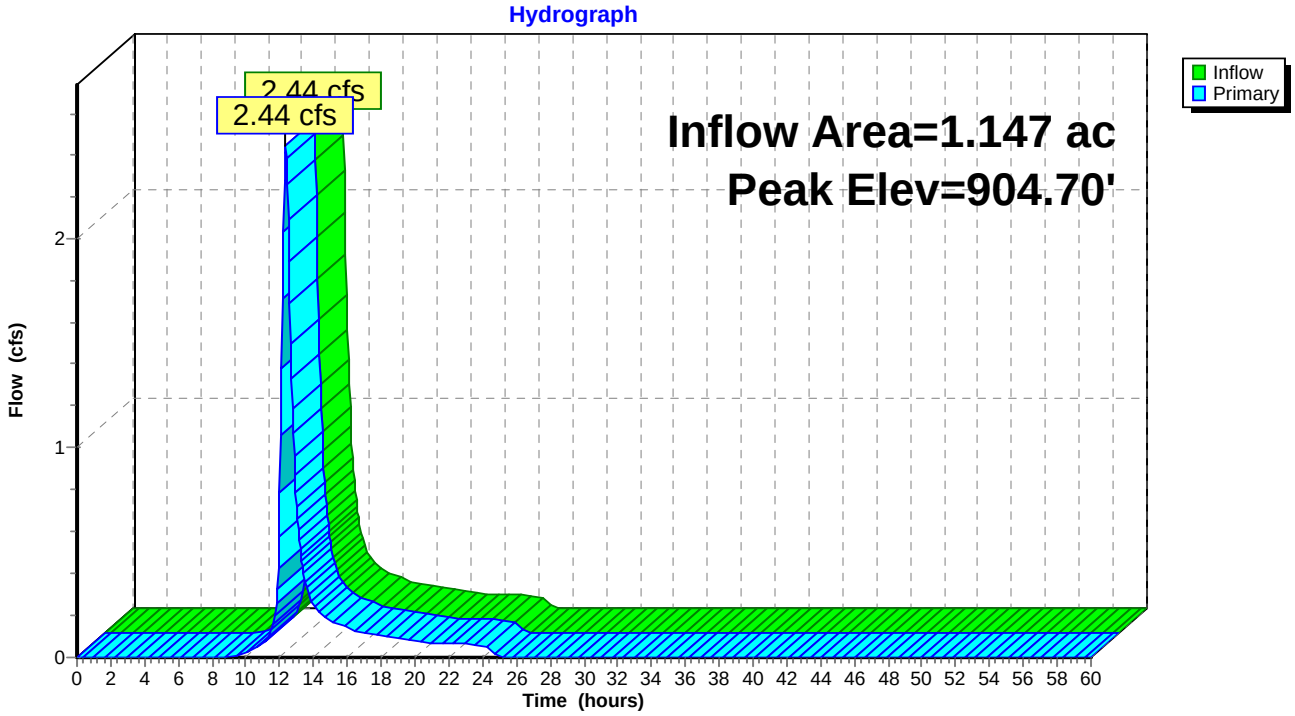
Inflow Area =	1.147 ac,	0.00% Impervious,	Inflow Depth =	2.88"	for 100-Year event
Inflow =	2.44 cfs @	12.34 hrs,	Volume=	0.275 af	
Outflow =	2.44 cfs @	12.34 hrs,	Volume=	0.275 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.44 cfs @	12.34 hrs,	Volume=	0.275 af	

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 904.70' @ 12.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	902.26'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.43 cfs @ 12.34 hrs HW=904.69' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 2.43 cfs @ 6.97 fps)

Pond 21P: Ex. 8

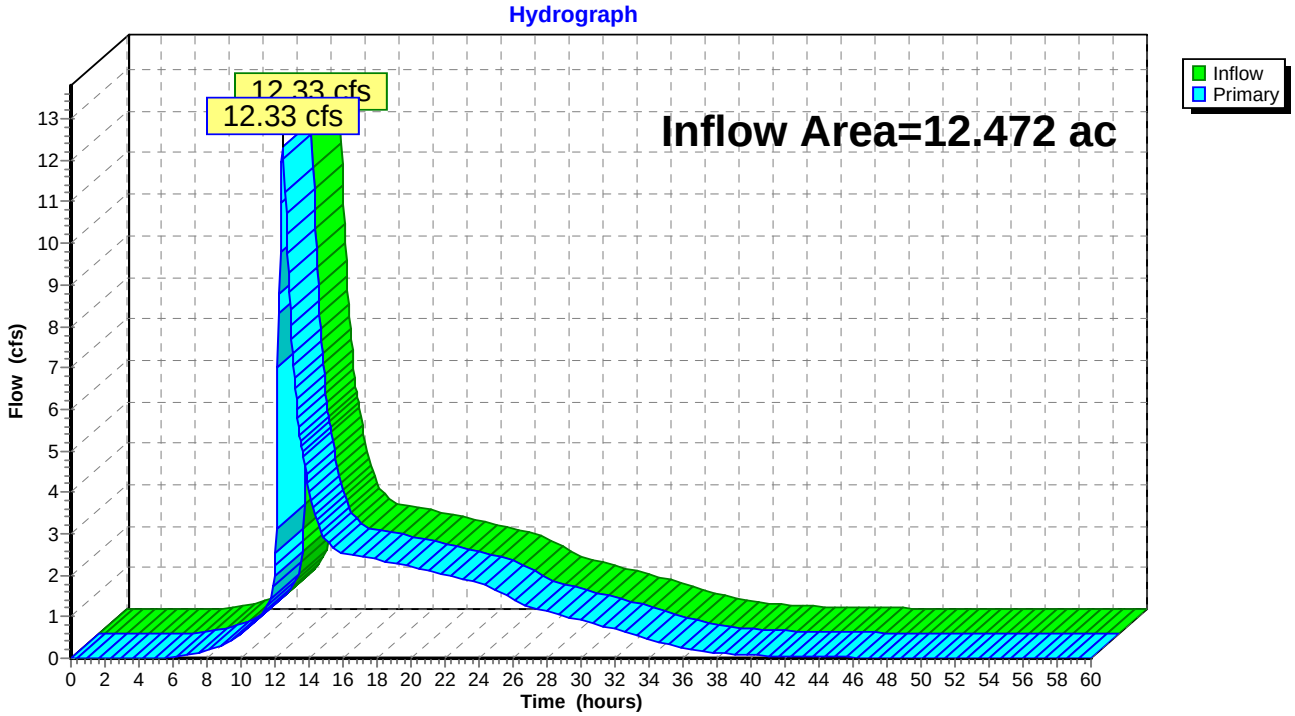


Summary for Link 18L: Total Site Outfall To 'Ex'

Inflow Area = 12.472 ac, 56.38% Impervious, Inflow Depth > 4.23" for 100-Year event
Inflow = 12.33 cfs @ 12.47 hrs, Volume= 4.401 af
Primary = 12.33 cfs @ 12.47 hrs, Volume= 4.401 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs

Link 18L: Total Site Outfall To 'Ex'



APPENDIX B

WATER QUALITY CALCULATION

WATER QUALITY CALCULATIONS

E. P. FERRIS and ASSOCIATES INC.
880 King Avenue
Columbus, Ohio 43212
614-299-2999
614-299-2992 (Fax)

Hawthorne Commons
Dublin, Ohio

Prepared | Sean Gillilan, P.E.

Date: 11/23/2015

Project: 1087.001

Water Quality Calculation - Per Ohio EPA requirements

WQv = C x P x (A/12)

C - See Table 1 or calculate using formula
P - precepitation depth (usually 0.75)
A - Area draining to BMP in Acres

Table 1 C Values:	
Industrial/Commercial	0.8
High Density residential (>8dw/ac)	0.5
Medium Density res. (4 to 8 dw/ac)	0.4
Low Density res (<4 dw/ac)	0.3
Open Space and Recreation Area	0.2

Formula:
$C=0.858i^3 - 0.78i^2 + 0.774i + 0.04$

Value for 'i': 0.9

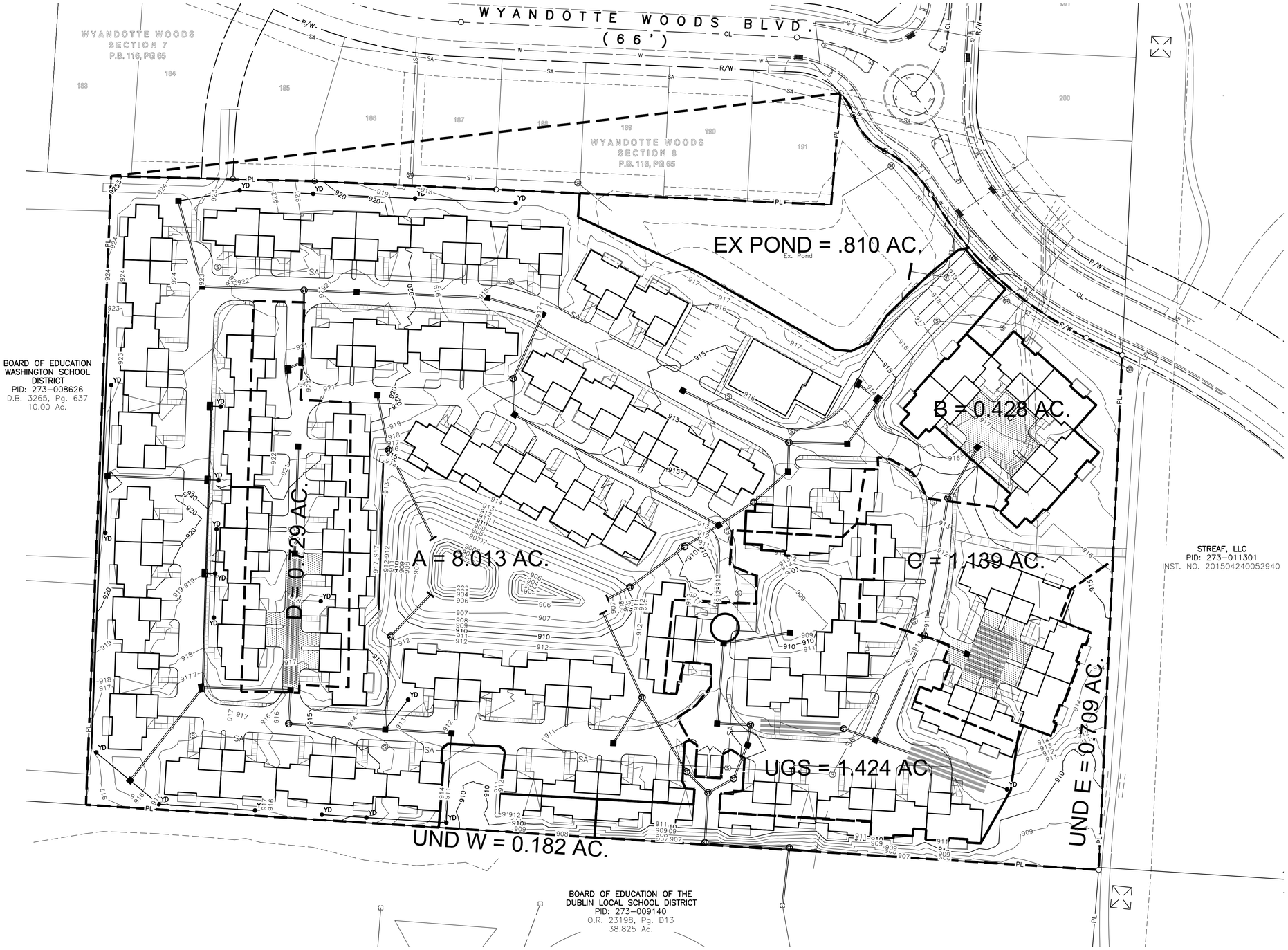
C = 0.730282

Total Site Disturbed/Tributary Area 12.6 acres.
Pervious Paver tributary area: 1.6 acres

C:	0.5	
P:	0.75	0.75 is OEPA REQUIRED for treatment of disturbed area
A:	11	Acres
	479160	Sq-Ft
WQv:	0.34375	acre-ft
	14974	cubic feet
	2995	cubic feet of sediment volume
WQv Total:	17969	cubic feet
	0.4125	acre-ft

APPENDIX C

TRIBUTARY MAP(S)



LEGEND

- Ex. Fire Hydrant
- Ex. Pull Box
- Ex. Tree
- Ex. Catch Basin
- Ex. Sanitary Manhole
- Ex. Storm Manhole
- Ex. Storm Curb Inlet
- Ex. Utility Pole
- Ex. Light Pole
- Ex. Gas Service Valve
- Ex. Underground Tele. Pedestal
- Ex. Water Service Valve
- Ex. Sign
- X — Ex. Fence
- W — Ex. Water Line
- WS — Ex. Water Service
- UGT — Ex. Underground Telephone
- G — Ex. Gas
- ST — Ex. Storm
- SA — Ex Sanitary
- UGE — Ex. Underground Electric
- OHE — Ex. Overhead Electric
- Prop. Catch Basin
- Prop. Curb Inlet
- Prop. Storm Manhole
- Prop. Storm Sewer
- DS — Prop. Downspout Line
- SA — Prop. Sanitary
- SS — Prop. Sanitary Srvc.
- Prop. Sanitary Manhole
- W — Prop. Water
- WS — Prop. Water Srvc.
- FS — Prop. Fire Main
- G — Prop. Gas
- E — Prop. Underground Electric
- T — Prop. Underground Telephone
- Prop. Tree Protection Fencing
- Prop. Pervious Pavement (See Details)
- Prop. Heavy Duty Asphalt Pavement (See Details)
- Prop. Concrete Walk/Drive (See Details)
- Prop. Fire Hydrant
- Prop. Water Valve
- Prop. Light Pole
- CO — Prop. Clean-out
- YD — Prop. Yard Drain
- DND — Do Not Disturb
- Proposed Flood Route
- Proposed Drainage Flow Directional Arrow
- Prop. Construction Limits
- Prop. Ponding Limits
- Ex. Easement
- Prop. Easement

NOTE: (TBR) Shall mean to be removed.

0 25 50 100

REVISIONS	DATE	BY	CHK.

E. P. FERRIS AND ASSOCIATES INC
Consulting Civil Engineers and Surveyors

CONTACT:
880 KING AVENUE
COLUMBUS, OHIO 43212
(614) 299-2999
(614) 299-2992 (Fax)
www.EPFERRIS.com

CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

HAWTHORN COMMONS

TREPLUS COMMUNITIES

JOB NO.	1087.001
DESIGNED BY:	MJO
DRAWN BY:	CLP
CHECKED BY:	SWG
APPROVED BY:	———
DATE:	11/18/15

POST-DEVELOPED TRIBUTARY MAP

SCALE: 1" = 50'

SHEET NO.	OF
1	1

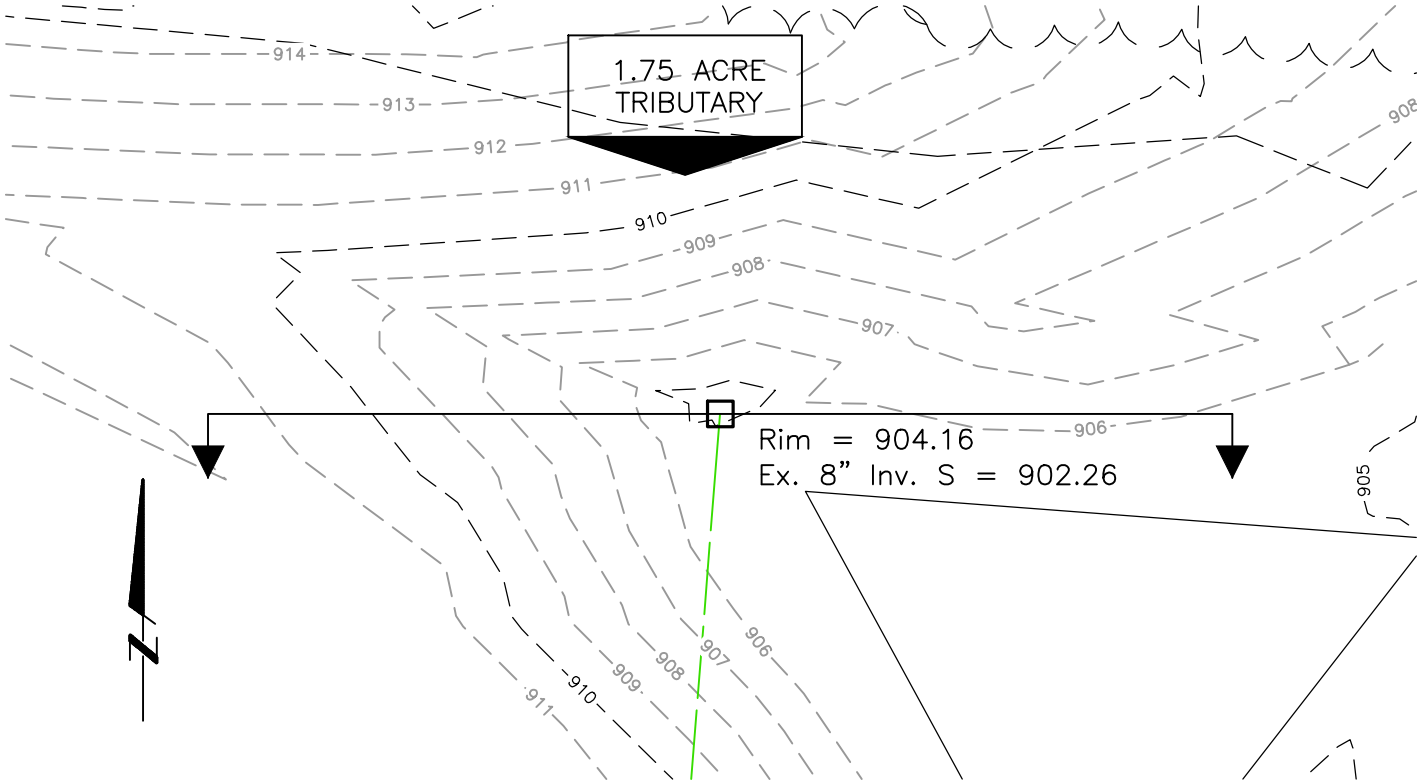
M:\1087001_HawthornGroveDublin\DWG\Final Development Plan\FDP_Grading.dwg ~POST TRIB LAST EDITED BYcpost ON 11/20/15

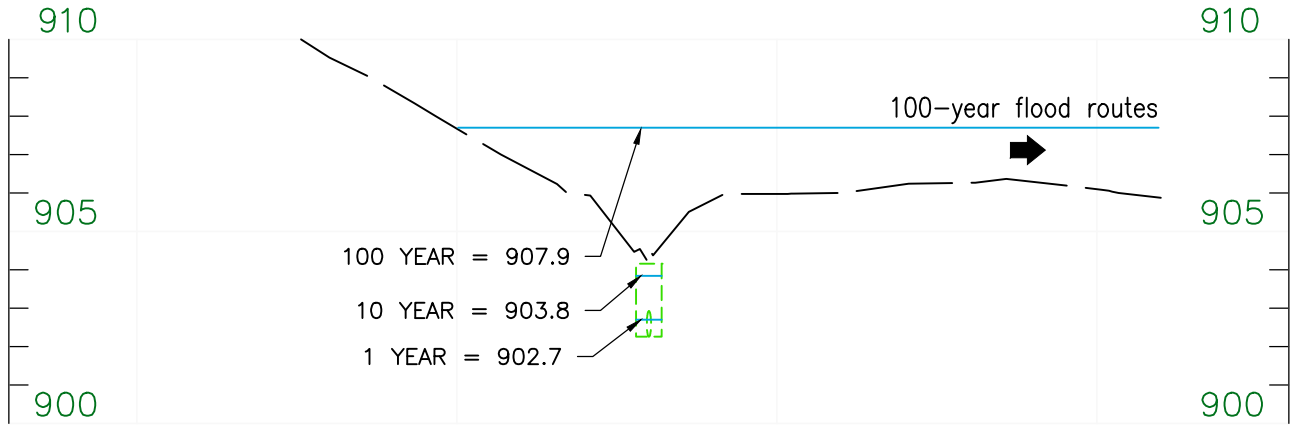
E.P. FERRIS & ASSOCIATES INC

APPENDIX D

OFFSITE PONDING AREA EXHIBITS

STRUCTURE EX8
PRE-DEVELOPED EXHIBIT





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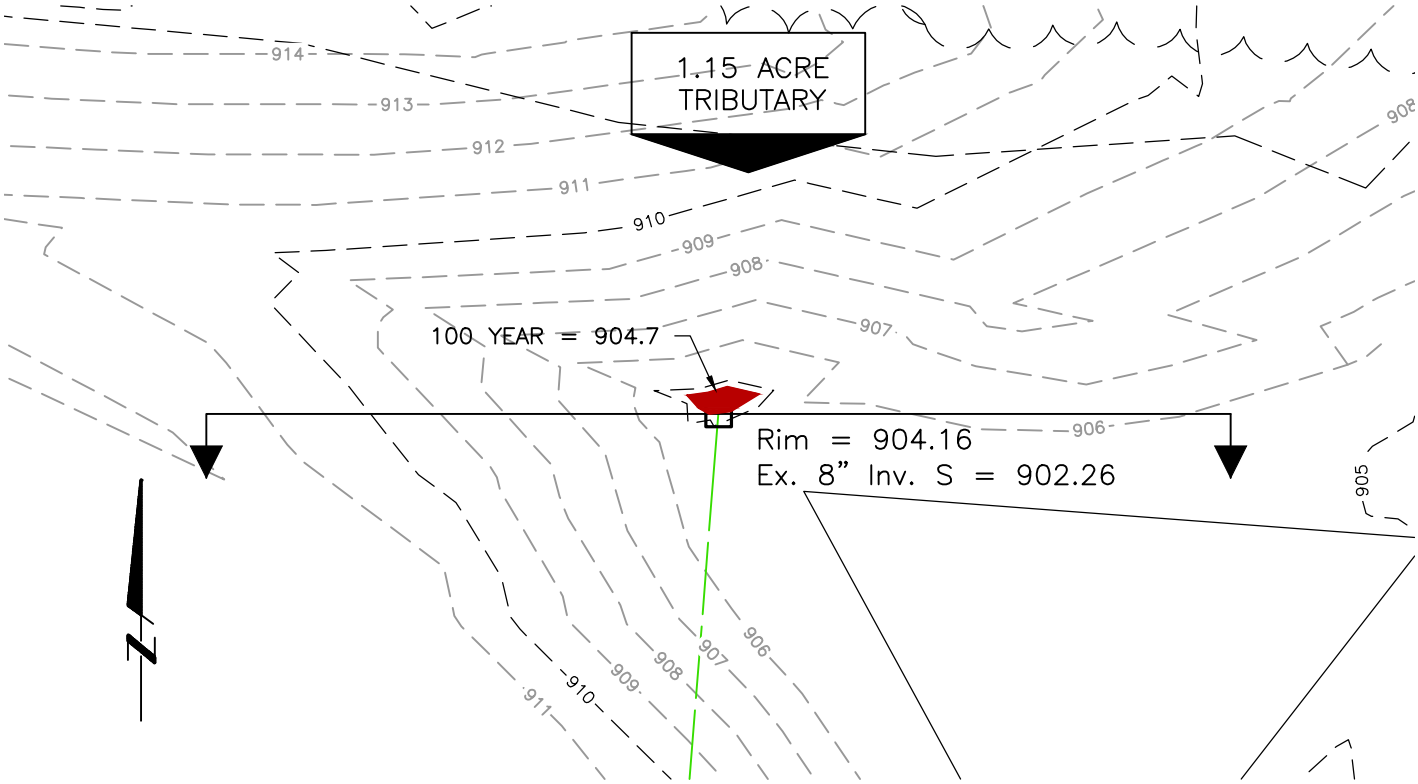
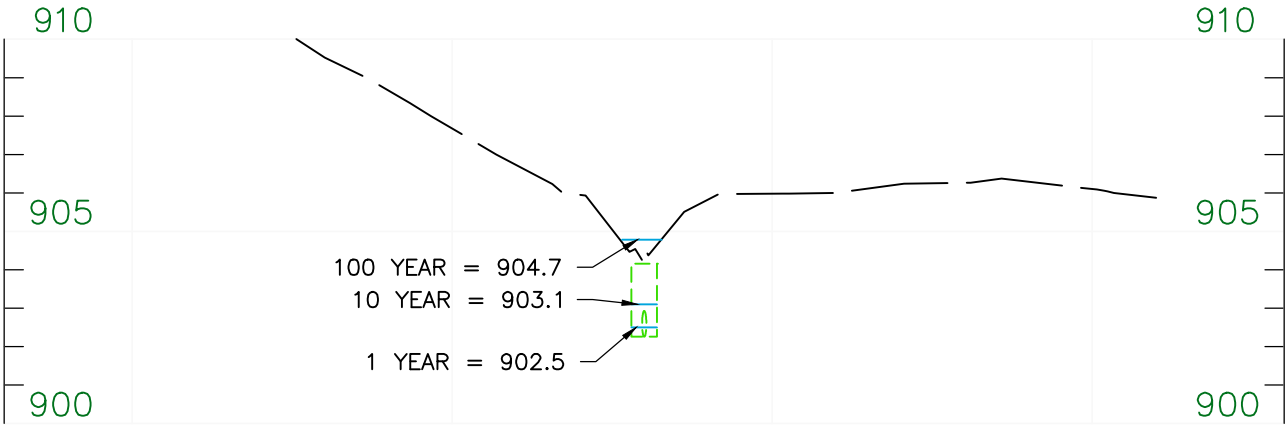
COLUMBUS, OHIO 43212
(614) 299-2999
(614) 299-2992 (Fax)
www.EPFERRIS.com

DRWN BY CLP **CHK BY** SWG **DATE** 11-23-15

1087.001

STRUCTURE EX8
POST-DEVELOPED EXHIBIT





E. P. FERRIS AND ASSOCIATES INC

Consulting Civil Engineers and Surveyors

CONTACT:

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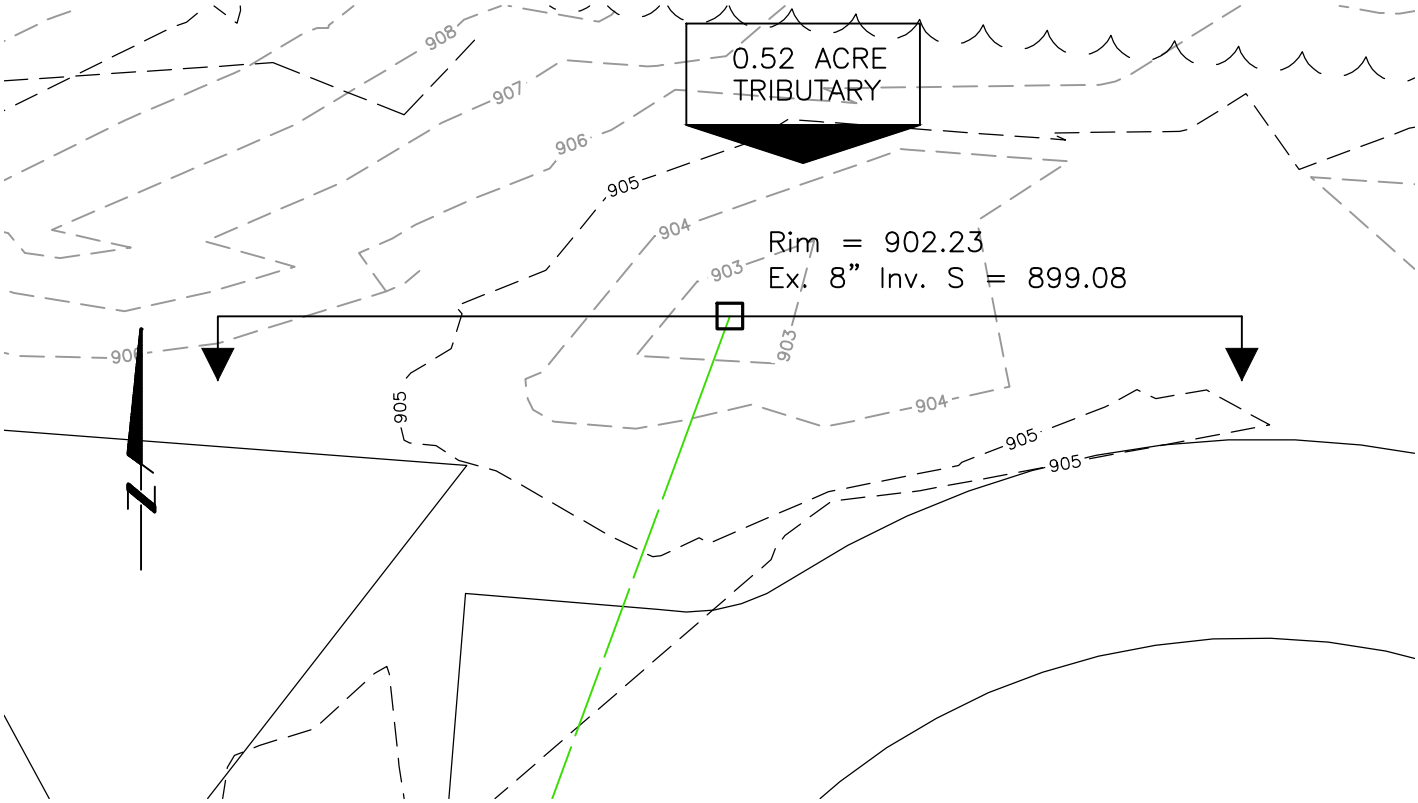
1087.001

STRUCTURE EX9
PRE-DEVELOPED EXHIBIT



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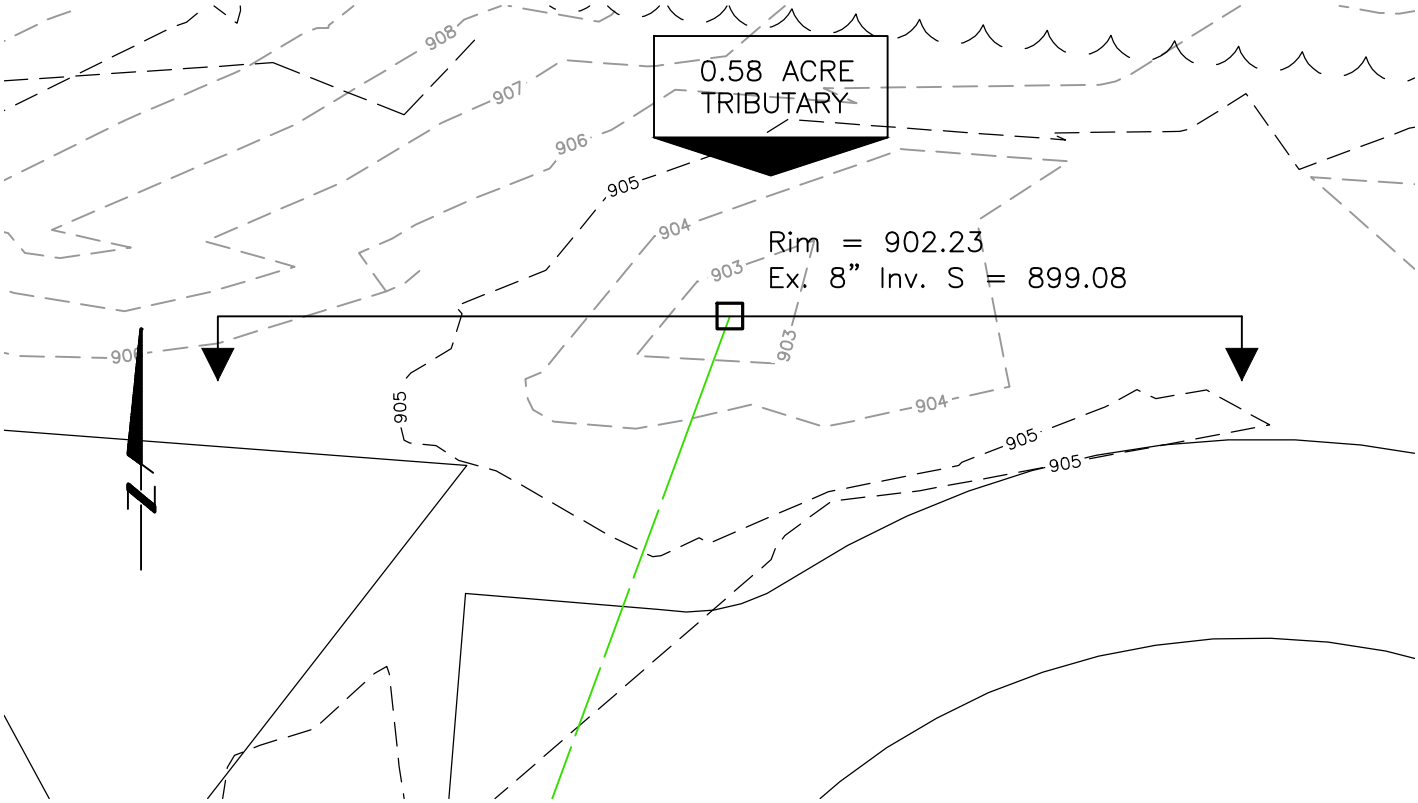
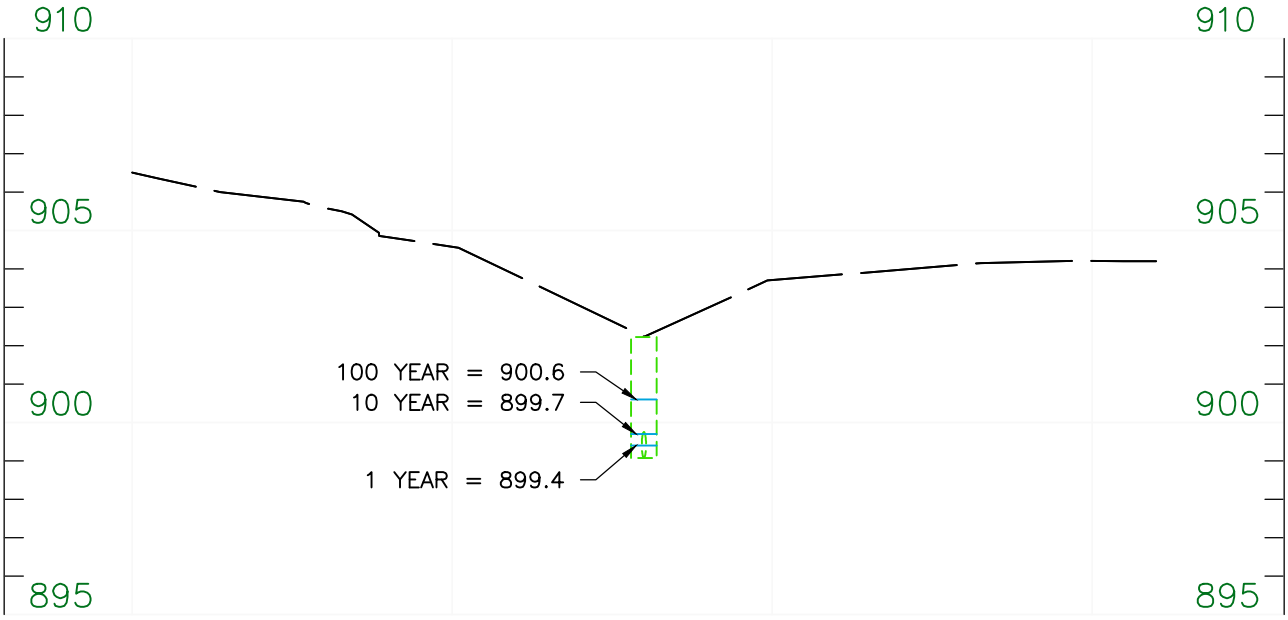
STRUCTURE EX9
POST-DEVELOPED EXHIBIT





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STRUCTURE EX10
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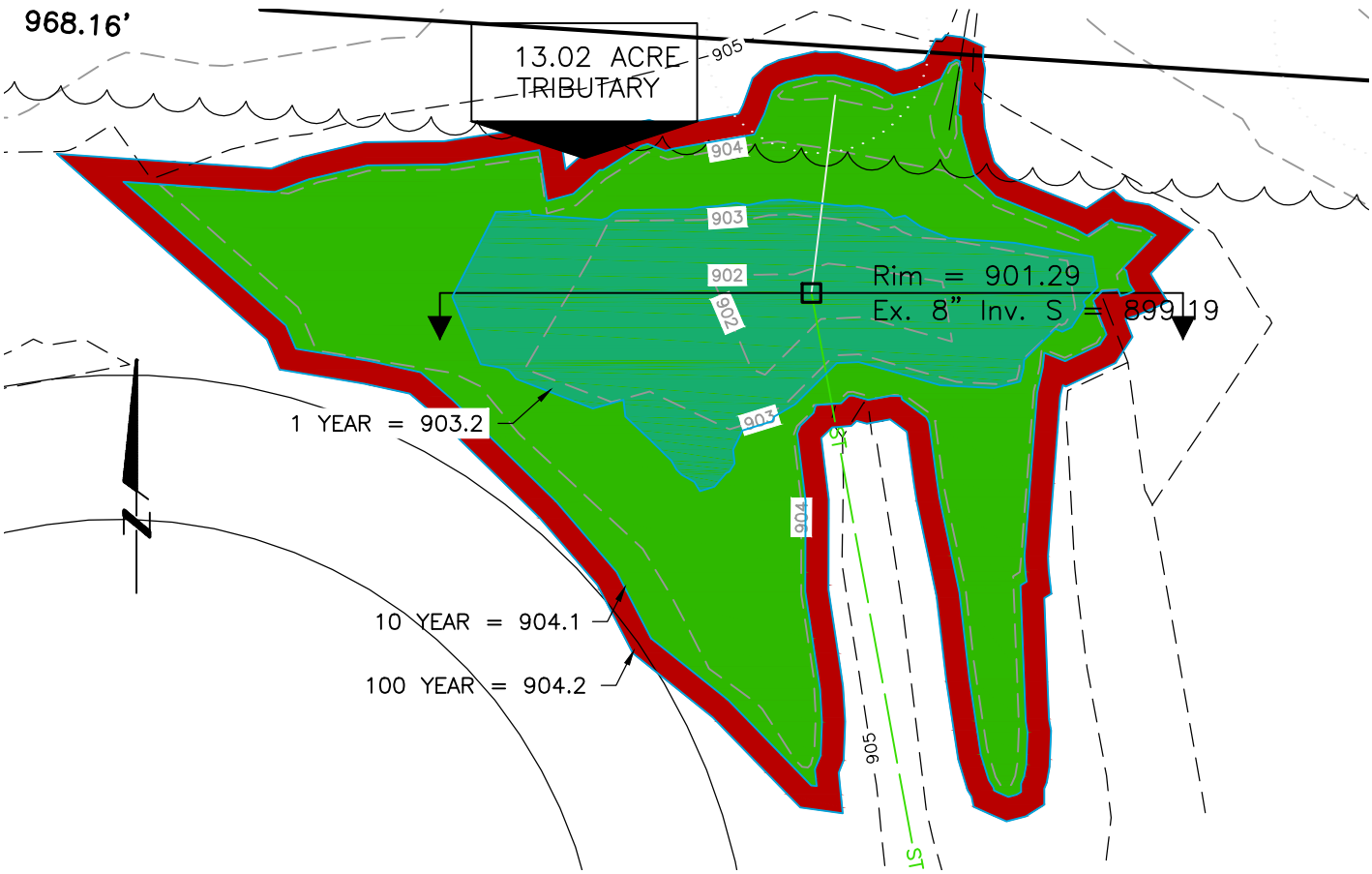

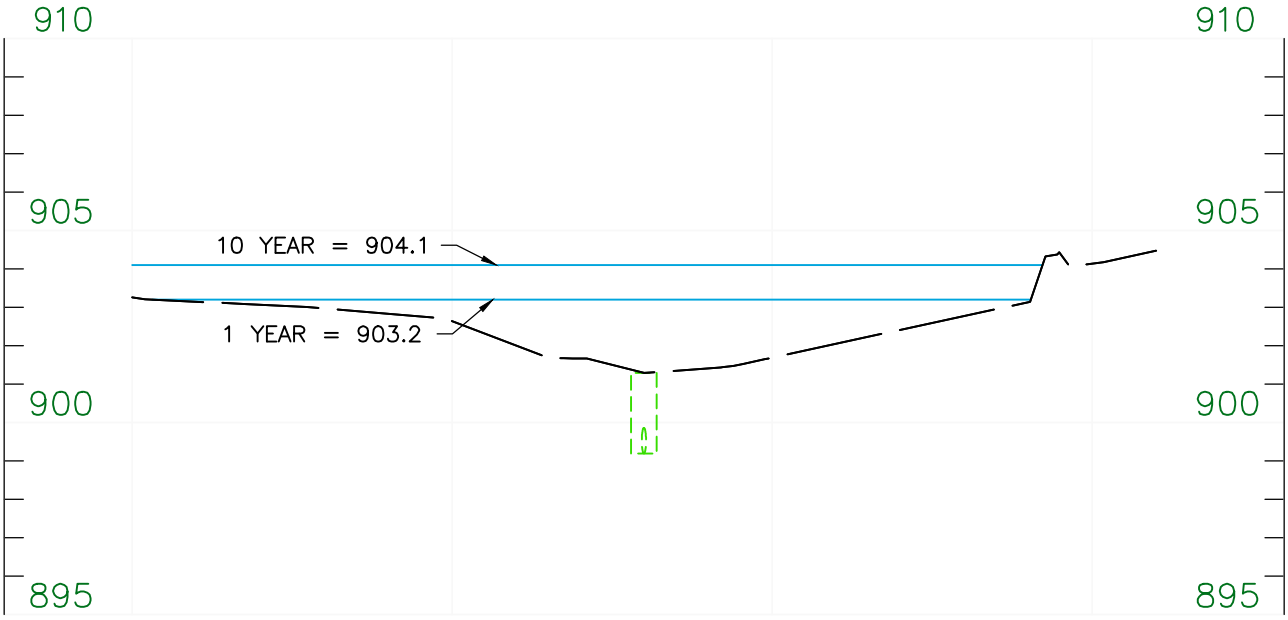

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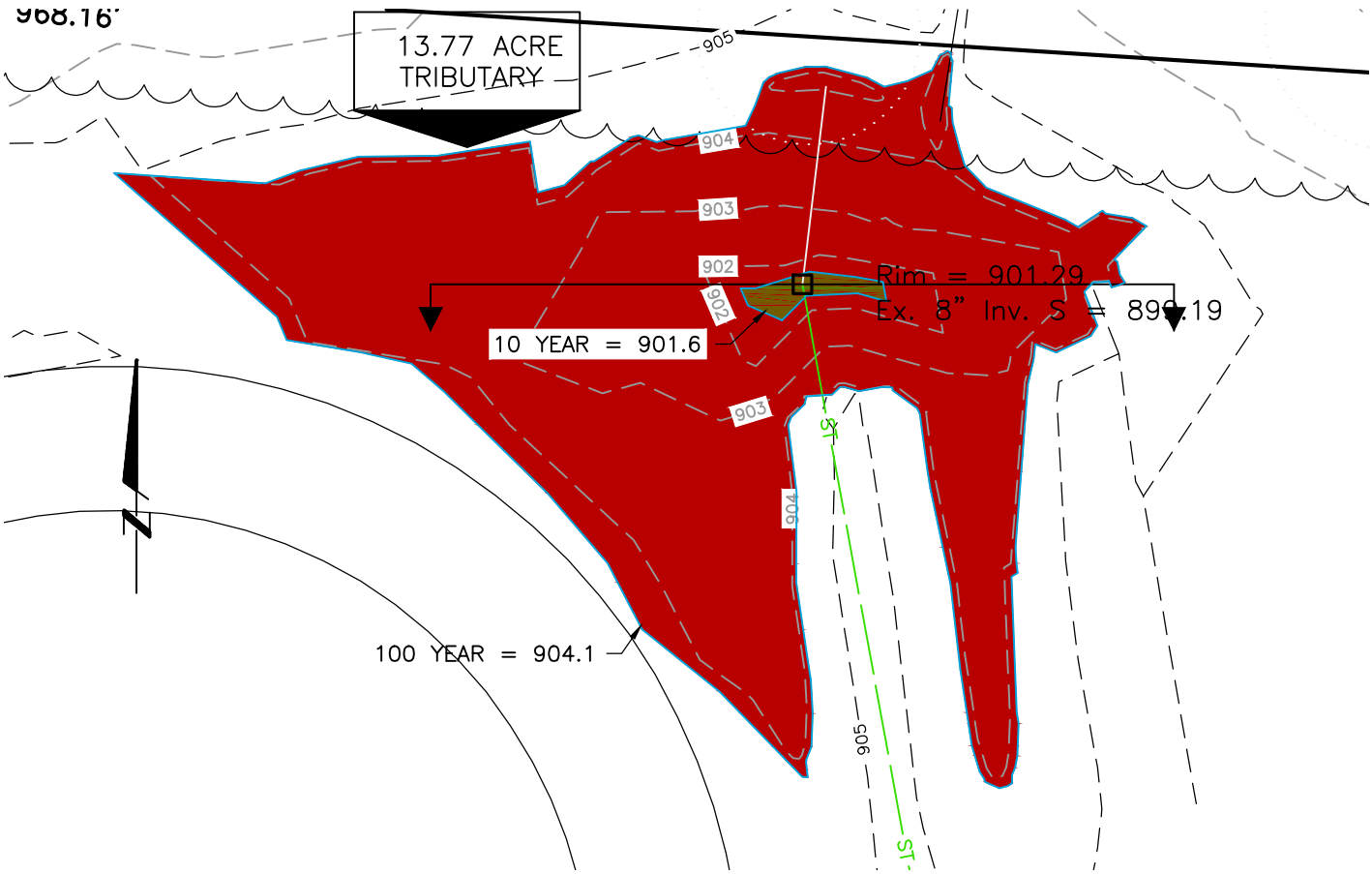

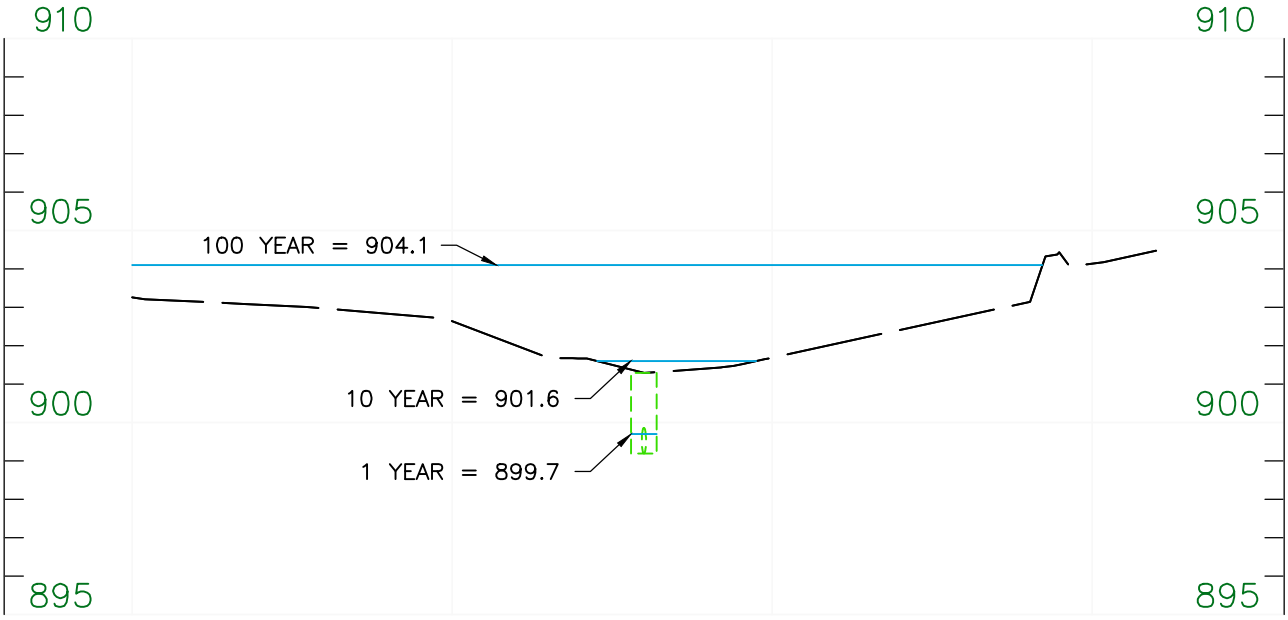

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