



Memorandum

To: Christopher Hulk, PE
FieldTurf

Date: April 16, 2024

From: Steven J. Kochis, PE
VHB

Project #: 43380.00
Re: FieldTurf Athletic Field Drainage
Ayers Road & Nevers Road
South Windsor, Connecticut



Site & Project Description

South Windsor High School is located at 161 Nevers Road in South Windsor, Connecticut. The property contains the existing school buildings, associated parking and athletic fields. The project proposes a new synthetic turf field to replace an existing grass athletic field. The new field is proposed northwest of the existing field. VHB prepared an analysis of existing and proposed conditions drainage conditions.

NRCS Web Soil Survey lists the existing field as Udorthents-Urban Land Complex (Hydrologic Soil Group B) and a small portion as Enfield Silt Loam, 8-15% Slopes (Hydrologic Soil Group B) and Haven-Urban Land Complex, 0-8% Slopes (Hydrologic Soil Group B).

Per available FEMA Map No. 09003C0381F dated 09/26/2008, the site is located within Zone X – area of minimal flood hazard (no Special Flood Hazard Areas).

Existing Drainage Conditions

Under existing conditions, the project area was analyzed as two (2) drainage areas that outlet to two (2) design points. See Figure 1 – Existing Drainage Conditions.

Drainage Area E-1: This 6.0- acre catchment area consists of a portion of the South Windsor Parks and Recreation parking, an existing grassed field west of South Windsor Parks and Recreation Building, portions of the existing South Windsor High School Baseball Field and the existing South Windsor High School tennis courts. This area conveys stormwater runoff overland to the southern property line adjacent to the existing tennis courts (DP1) where it is captured and conveyed by both a 15" PVC pipe and a 12" PVC pipe.

Drainage Area E-2: This 2.3-acre catchment area consists of a portion of the South Windsor Parks and Recreation parking lot, the northern portion of the South Windsor High School Baseball Field and the grassed area adjacent to Ayers Road. Stormwater in this area is conveyed westerly overland to the western property line (DP2). There is no known drainage outlet from this area and it is anticipated that the area drains solely by infiltration or overflow into the road.

Proposed Drainage Conditions

A synthetic turf field is proposed, which will include no actual hardscape and a network of subsurface perforated drains within crushed stone. The proposed field area itself has been modelled as a stone reservoir for the subsurface stone with fallow underlying soil. An outlet control structure incorporating an above-ground inlet will allow volumetric storage of stormwater runoff to promote retention and infiltration for water quality. Peak rates of runoff are attenuated from proposed conditions down to pre-development levels. An infiltration rate of 7 inches per hour into the native soil has been used in the hydrologic model utilizing one-half of the lowest field-tested infiltration rate

as provided by FieldTurf for the area. It is also recommended that a wetland study be performed within the development area for the possible presence of wetlands.

Table 1 below displays the anticipated existing and proposed peak flows for the project area before and after site improvements including underdrainage.

Figure 2 illustrates the proposed "post construction conditions for the project area. As shown the project area was analyzed as three (3) catchment areas that outlet to two (2) design points.

Drainage Area P-1A: This 3.1-acre catchment area consists of the grassed area at the western property line and the parking lot in the eastern portion of the watershed. The area drains overland and via pipe to the southern proposed stormwater basin (Pond 1AP).

Drainage Area P-1B: This 2.4-acre catchment area consists of a portion of the proposed parking expansion and the proposed field. Stormwater flows over the field being collected by the fields underdrainage and then is conveyed into the proposed stormwater basin (Pond 1AP).

Drainage Area P-2A: This 1.5-acre catchment area consist of a portion of the existing and proposed parking area located along the road frontage as well as the grassed area proposed north of the field. Stormwater flows to a proposed stormwater basin (Pond 2AP) near the proposed turf field access road prior to being discharged to the northwest corner of the property (DP2). Pond 2AP has been designed, assuming the use of a 7 inch per hour infiltrated rate during storm events, to capture and infiltrate the full runoff volume of a 50-year rainfall event in order to protect the access road to the turf field.

Drainage Area P-2B: This 1.5-acre catchment area consist of a portion of the proposed grassed area and Ayers Road frontage. Stormwater generally flows towards Ayers Road prior to being discharged to the northwest corner of the property (DP2).

The table (Table 1) below presents a summary of the existing and proposed conditions peak discharge rates:

Design Point	2-year	10-year	25-year	50-year	100-year
<u>Design Point:</u>					
<u>DP1</u>					
Existing, cfs	5.8	14.9	21.1	25.9	31.3
Proposed,cfs	0.0	1.7	5.0	10.1	17.3
<u>Design Point:</u>					
<u>DP2</u>					
Existing, cfs	2.6	6.3	8.8	10.6	12.7
Proposed, cfs	2.1	4.8	6.5	7.8	9.3

Due to there being no known outlet at DP2, the table (Table 2) below presents a summary of the existing and proposed conditions runoff volumes reaching DP2 to ensure they are mitigated along with peak rates of runoff:

Design Point	2-year	10-year	25-year	50-year	100-year
<u>Design Point:</u>					
<u>DP2</u>					
Existing, af	0.20	0.46	0.64	0.77	0.93
Proposed, af	0.15	0.34	0.46	0.55	0.71

Water Quality

Retention and infiltration of the required water quality volume is provided within the proposed stormwater basins for tributary impervious areas. Computations for the required water quality volume are enclosed herewith.

Figures

Figure 1: Existing Conditions Drainage Areas

Figure 2: Proposed Conditions Drainage Areas

Attachments

Attachment 3: NOAA Precipitation Frequency

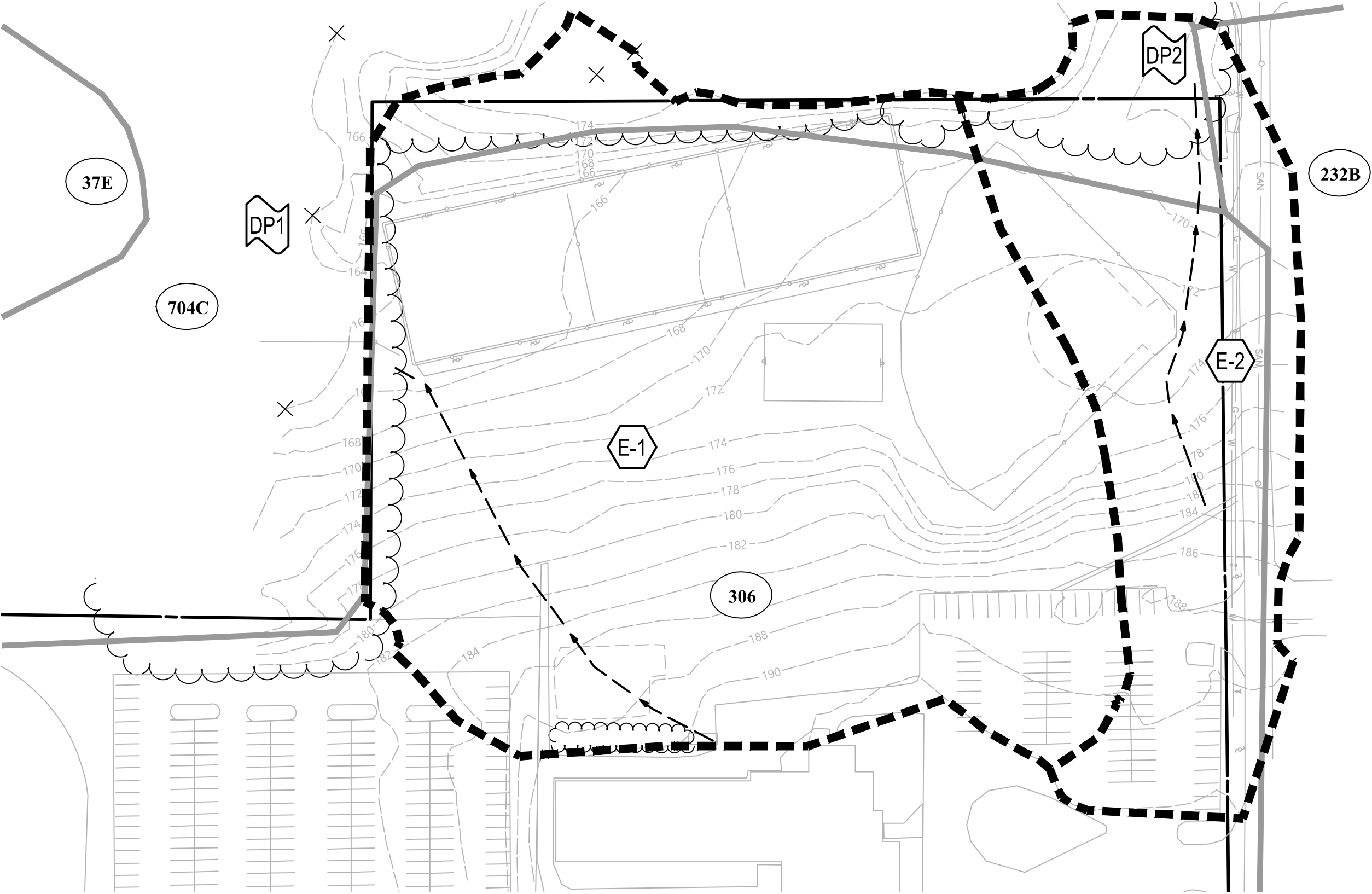
Attachment 4: NRCS Hydrologic Soil Group & Field-tested Infiltration Rates

Attachment 5: FEMA Flood Map

Attachment 6: Water Quality Volume Computations

Attachment 7: HydroCAD Existing Conditions

Attachment 8: HydroCAD Proposed Conditions



Legend

SYMBOLS

X DRAINAGE AREA DESIGNATION

DPX DESIGN POINT

LINETYPES

--- DRAINAGE AREA BOUNDARY

---> TIME OF CONCENTRATION FLOW LINE

— SOIL TYPE BOUNDARY

SCS SOIL CLASSIFICATIONS

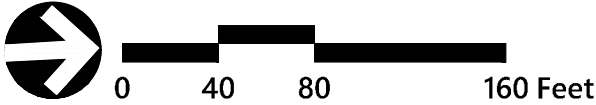
306 UDORTHENTS-URBAN LAND COMPLEX, HSG B

704C ENFIELD SILT LOAM, 8-15% SLOPES, HSG B

308 UDORTHENTS, SMOOTHED, HSG B

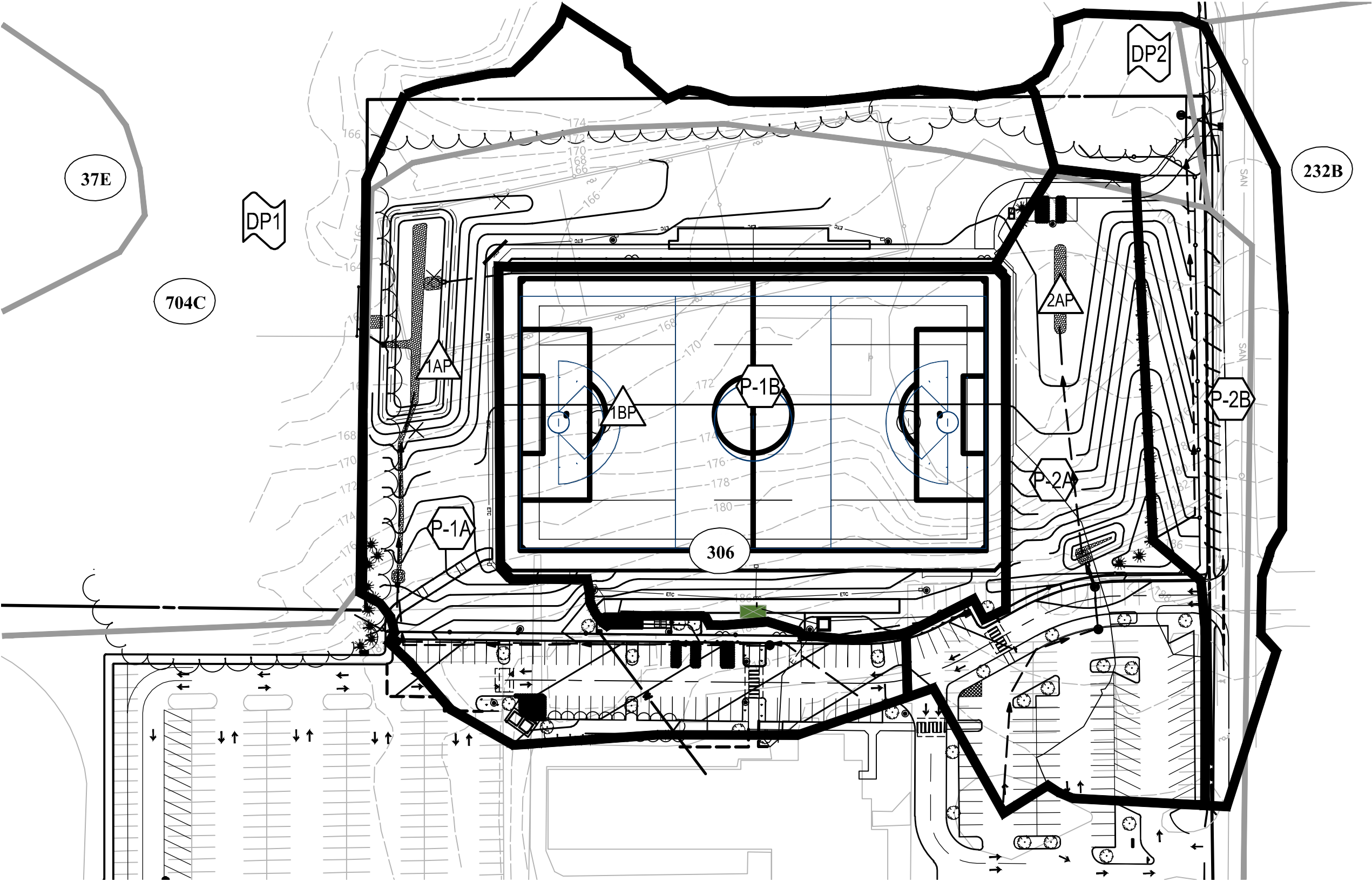
232B HAVEN-URBAN LAND COMPLEX, 0-8% SLOPES, HSG B

37E MANCHESTER GRAVELLY SANDY LOAM, 15-45% SLOPES, HSG B



Existing Drainage Conditions

Figure 1



Legend

SYMBOLS

X

DRAINAGE AREA DESIGNATION

XP

DRAINAGE POND

DPX

DESIGN POINT

LINETYPES

DRAINAGE AREA BOUNDARY

- - ->

TIME OF CONCENTRATION FLOW LINE

SOIL TYPE BOUNDARY

SCS SOIL CLASSIFICATIONS

306

UDORTHENTS-URBAN LAND COMPLEX, HSG B

704C

ENFIELD SILT LOAM, 8-15% SLOPES, HSG B

308

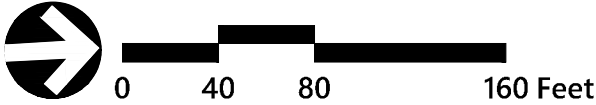
UDORTHENTS, SMOOTHED, HSG B

232B

HAVEN-URBAN LAND COMPLEX, 0-8% SLOPES, HSG B

37E

MANCHESTER GRAVELLY SANDY LOAM, 15-45% SLOPES, HSG B





NOAA Atlas 14, Volume 10, Version 3
Location name: South Windsor, Connecticut, USA*
Latitude: 41.842°, Longitude: -72.5545°
Elevation: 184 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.336 (0.259-0.435)	0.407 (0.314-0.527)	0.523 (0.402-0.681)	0.620 (0.474-0.811)	0.753 (0.558-1.03)	0.853 (0.621-1.19)	0.958 (0.678-1.39)	1.08 (0.723-1.60)	1.25 (0.806-1.92)	1.39 (0.877-2.17)
10-min	0.475 (0.367-0.616)	0.576 (0.444-0.747)	0.741 (0.569-0.964)	0.878 (0.671-1.15)	1.07 (0.791-1.46)	1.21 (0.878-1.69)	1.36 (0.960-1.97)	1.52 (1.02-2.26)	1.77 (1.14-2.71)	1.96 (1.24-3.08)
15-min	0.559 (0.432-0.724)	0.678 (0.523-0.879)	0.872 (0.670-1.13)	1.03 (0.789-1.35)	1.26 (0.930-1.72)	1.42 (1.03-1.99)	1.60 (1.13-2.32)	1.79 (1.20-2.66)	2.08 (1.34-3.19)	2.31 (1.46-3.62)
30-min	0.752 (0.580-0.973)	0.913 (0.704-1.18)	1.18 (0.904-1.53)	1.40 (1.07-1.83)	1.70 (1.26-2.32)	1.93 (1.40-2.69)	2.16 (1.53-3.14)	2.43 (1.63-3.61)	2.82 (1.82-4.33)	3.13 (1.98-4.92)
60-min	0.944 (0.728-1.22)	1.15 (0.885-1.49)	1.48 (1.14-1.93)	1.76 (1.35-2.30)	2.14 (1.59-2.93)	2.43 (1.77-3.40)	2.73 (1.94-3.97)	3.07 (2.06-4.56)	3.56 (2.30-5.47)	3.96 (2.51-6.21)
2-hr	1.22 (0.946-1.57)	1.48 (1.14-1.90)	1.89 (1.46-2.45)	2.24 (1.72-2.92)	2.72 (2.03-3.71)	3.07 (2.25-4.29)	3.45 (2.47-5.02)	3.90 (2.63-5.76)	4.58 (2.97-7.00)	5.15 (3.27-8.02)
3-hr	1.40 (1.09-1.80)	1.70 (1.32-2.18)	2.18 (1.69-2.81)	2.57 (1.98-3.34)	3.12 (2.34-4.25)	3.52 (2.59-4.91)	3.96 (2.85-5.76)	4.49 (3.03-6.61)	5.30 (3.45-8.08)	6.00 (3.82-9.31)
6-hr	1.76 (1.38-2.25)	2.14 (1.67-2.73)	2.75 (2.14-3.53)	3.26 (2.52-4.20)	3.96 (2.98-5.37)	4.47 (3.31-6.22)	5.04 (3.65-7.31)	5.74 (3.88-8.39)	6.82 (4.45-10.3)	7.76 (4.95-12.0)
12-hr	2.16 (1.70-2.74)	2.64 (2.07-3.36)	3.43 (2.69-4.38)	4.09 (3.18-5.24)	4.99 (3.78-6.74)	5.66 (4.21-7.82)	6.39 (4.65-9.22)	7.30 (4.96-10.6)	8.72 (5.70-13.1)	9.95 (6.37-15.2)
24-hr	2.52 (1.99-3.18)	3.13 (2.47-3.95)	4.12 (3.24-5.23)	4.95 (3.87-6.31)	6.09 (4.64-8.18)	6.92 (5.19-9.54)	7.84 (5.76-11.3)	9.01 (6.14-13.0)	10.9 (7.14-16.3)	12.5 (8.03-19.0)
2-day	2.83 (2.25-3.56)	3.57 (2.83-4.49)	4.77 (3.78-6.02)	5.77 (4.54-7.32)	7.14 (5.48-9.58)	8.14 (6.15-11.2)	9.26 (6.87-13.4)	10.7 (7.34-15.4)	13.1 (8.65-19.5)	15.3 (9.85-23.1)
3-day	3.08 (2.46-3.86)	3.89 (3.10-4.88)	5.21 (4.14-6.55)	6.30 (4.98-7.97)	7.81 (6.02-10.4)	8.90 (6.75-12.2)	10.1 (7.54-14.6)	11.8 (8.06-16.9)	14.5 (9.53-21.4)	16.9 (10.9-25.4)
4-day	3.31 (2.65-4.14)	4.17 (3.33-5.22)	5.58 (4.44-7.00)	6.74 (5.34-8.51)	8.35 (6.44-11.1)	9.51 (7.22-13.0)	10.8 (8.07-15.6)	12.6 (8.62-17.9)	15.4 (10.2-22.8)	18.0 (11.6-27.0)
7-day	3.94 (3.16-4.90)	4.91 (3.94-6.10)	6.49 (5.18-8.10)	7.80 (6.20-9.79)	9.60 (7.44-12.7)	10.9 (8.31-14.9)	12.4 (9.25-17.7)	14.3 (9.85-20.3)	17.5 (11.6-25.6)	20.3 (13.1-30.2)
10-day	4.57 (3.68-5.66)	5.59 (4.50-6.94)	7.27 (5.82-9.05)	8.66 (6.90-10.8)	10.6 (8.19-13.9)	12.0 (9.11-16.2)	13.5 (10.1-19.1)	15.5 (10.7-21.9)	18.7 (12.4-27.4)	21.5 (14.0-32.1)
20-day	6.57 (5.32-8.10)	7.66 (6.20-9.45)	9.44 (7.61-11.7)	10.9 (8.74-13.6)	12.9 (10.0-16.8)	14.4 (11.0-19.2)	16.1 (11.9-22.2)	18.0 (12.5-25.3)	21.0 (14.0-30.4)	23.5 (15.3-34.7)
30-day	8.29 (6.74-10.2)	9.40 (7.63-11.6)	11.2 (9.07-13.8)	12.7 (10.2-15.8)	14.8 (11.5-19.1)	16.4 (12.4-21.5)	18.0 (13.2-24.5)	19.8 (13.8-27.7)	22.5 (15.0-32.4)	24.6 (16.0-36.2)
45-day	10.4 (8.52-12.8)	11.6 (9.44-14.2)	13.5 (10.9-16.6)	15.0 (12.1-18.6)	17.2 (13.3-22.0)	18.8 (14.3-24.5)	20.5 (15.0-27.5)	22.1 (15.5-30.7)	24.4 (16.4-35.0)	26.1 (17.0-38.3)
60-day	12.3 (10.0-15.0)	13.4 (11.0-16.4)	15.4 (12.5-18.9)	17.0 (13.7-20.9)	19.2 (14.9-24.4)	20.9 (15.9-27.1)	22.6 (16.5-30.1)	24.2 (16.9-33.4)	26.1 (17.6-37.4)	27.5 (18.0-40.2)

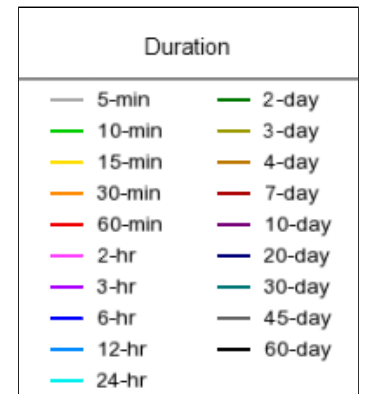
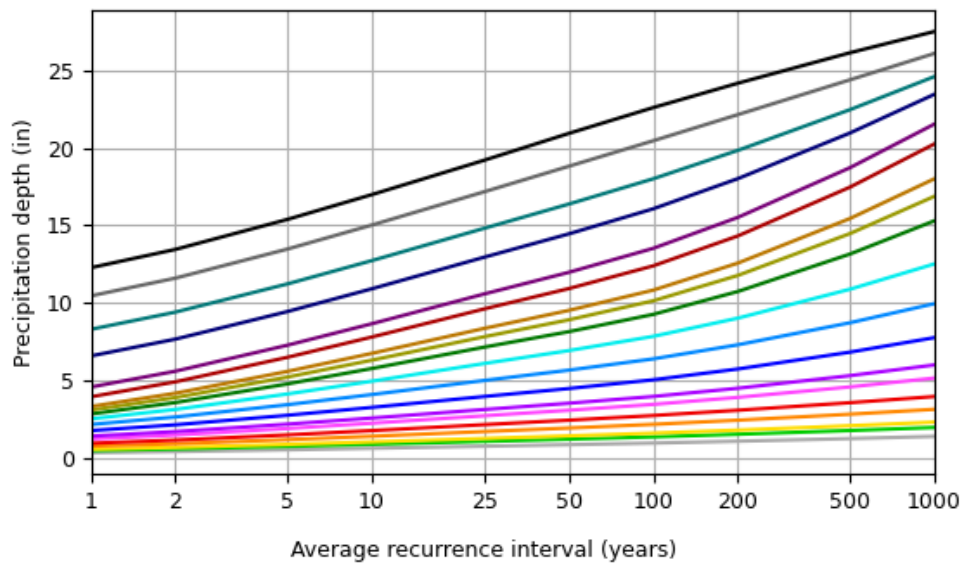
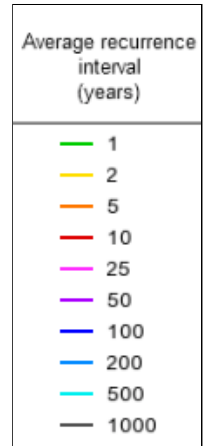
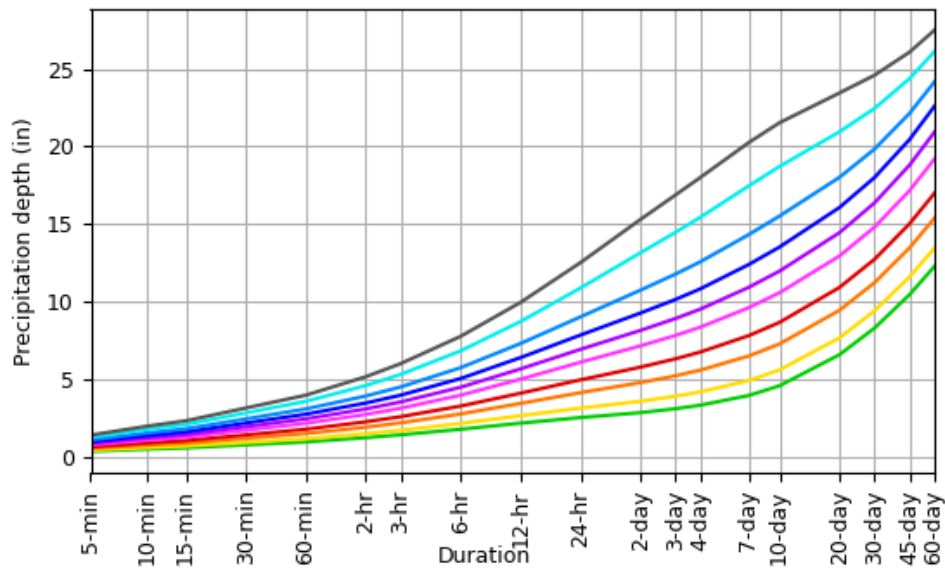
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

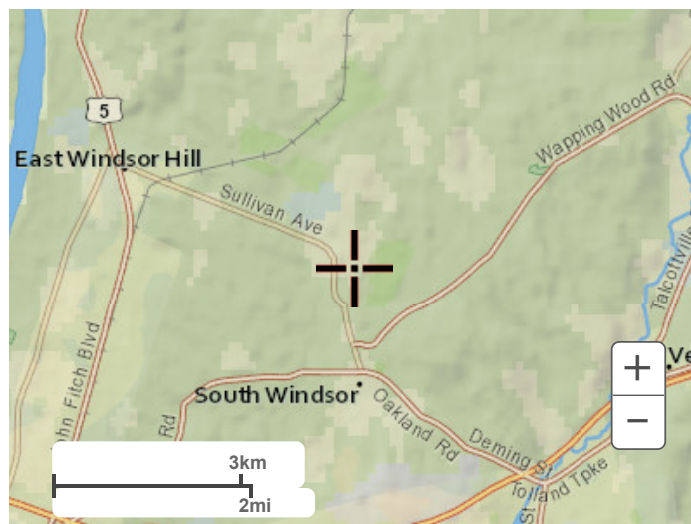
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PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.8420°, Longitude: -72.5545°

[Back to Top](#)**Maps & aerals****Small scale terrain**



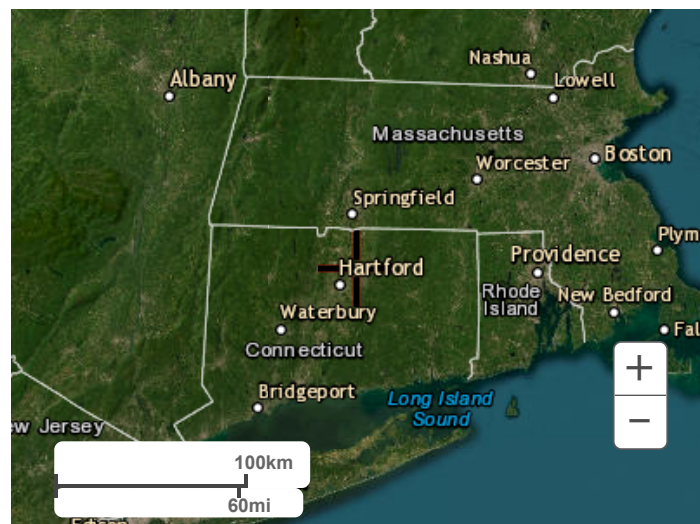
Large scale terrain



Large scale map



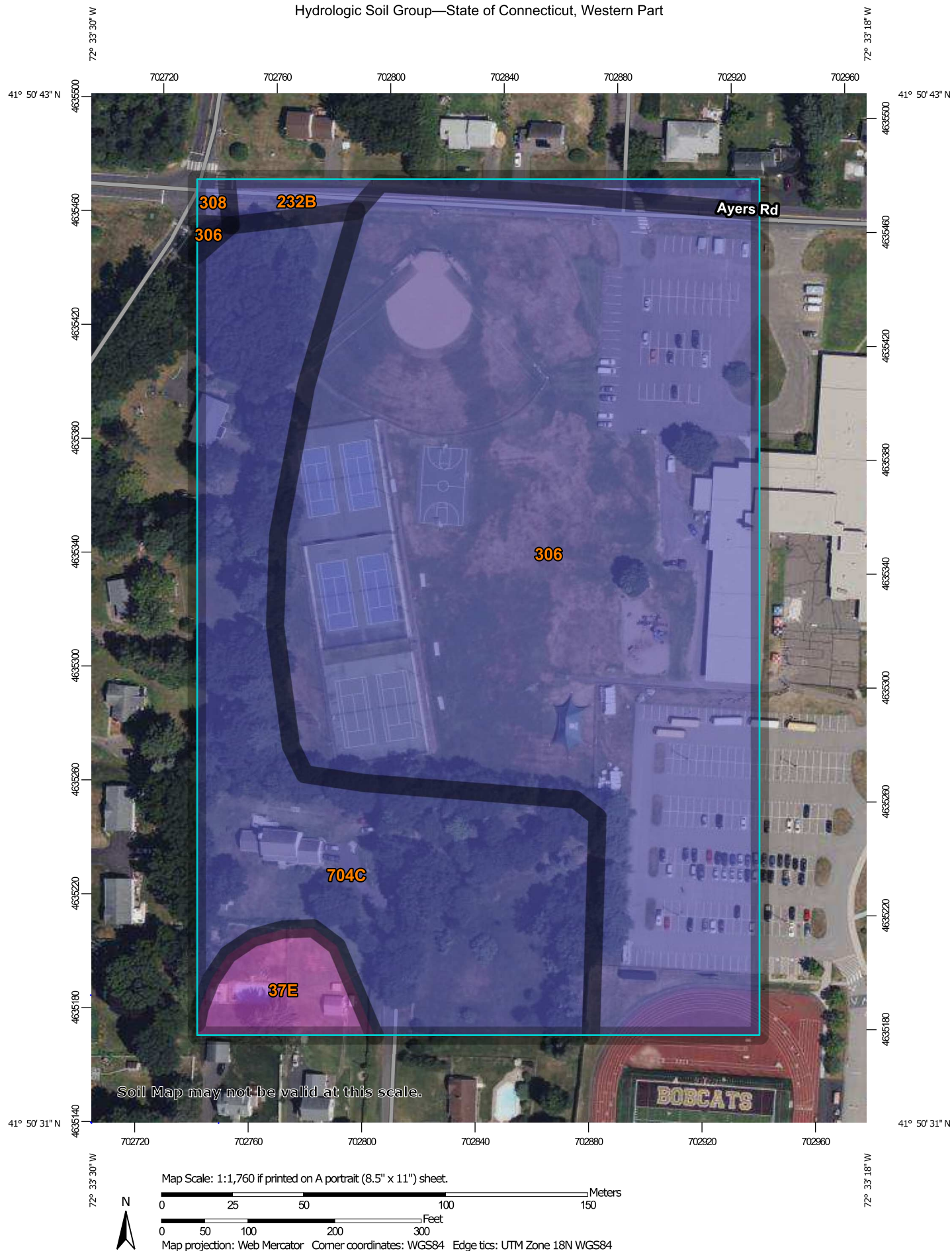
Large scale aerial



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1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov
[Disclaimer](#)

Hydrologic Soil Group—State of Connecticut, Western Part



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

A 

A/D 

B 

B/D 

C 

C/D 

D 

Not rated or not available 

Soil Rating Lines

A 

A/D 

B 

B/D 

C 

C/D 

D 

Not rated or not available 

Soil Rating Points

A 

A/D 

B 

B/D 

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

C 

C/D 

D 

Not rated or not available 

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
37E	Manchester gravelly sandy loam, 15 to 45 percent slopes	A	0.4	2.9%
232B	Haven-Urban land complex, 0 to 8 percent slopes	B	0.4	2.5%
306	Udorthents-Urban land complex	B	9.6	65.0%
308	Udorthents, smoothed	B	0.0	0.3%
704C	Enfield silt loam, 8 to 15 percent slopes	B	4.3	29.3%
Totals for Area of Interest			14.8	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

EXISTING CONDITIONS LEGEND

PROPERTY LINE	
TREE LINE	
CHAIN LINK FENCE	
EXISTING CONTOUR	
WATER LINE	
GAS LINE	
SEWER LINE	
UTILITY POLE	
TEST PIT	

EXISTING CONDITIONS NOTES

1. ALL INFORMATION SHOWN IS BASED ON AVAILABLE MAPPING AND SHOULD BE CONSIDERED APPROXIMATE.

REMOVALS LEGEND

	REMOVE AND DISPOSE OF SITE FEATURE
	ALTER EXISTING SITE FEATURE TO REMAIN
	STRIP TOPSOIL TO REMAIN ONSITE
	MILL EXISTING PAVEMENT AND STOCKPILE TO REUSE AS BASE MATERIAL ON SITE

NOTES:

ALL TOPSOIL TO BE REMAIN ON SITE.

PERCOLATION TEST RESULTS:

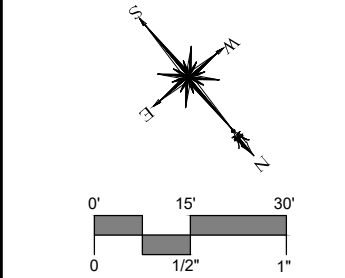
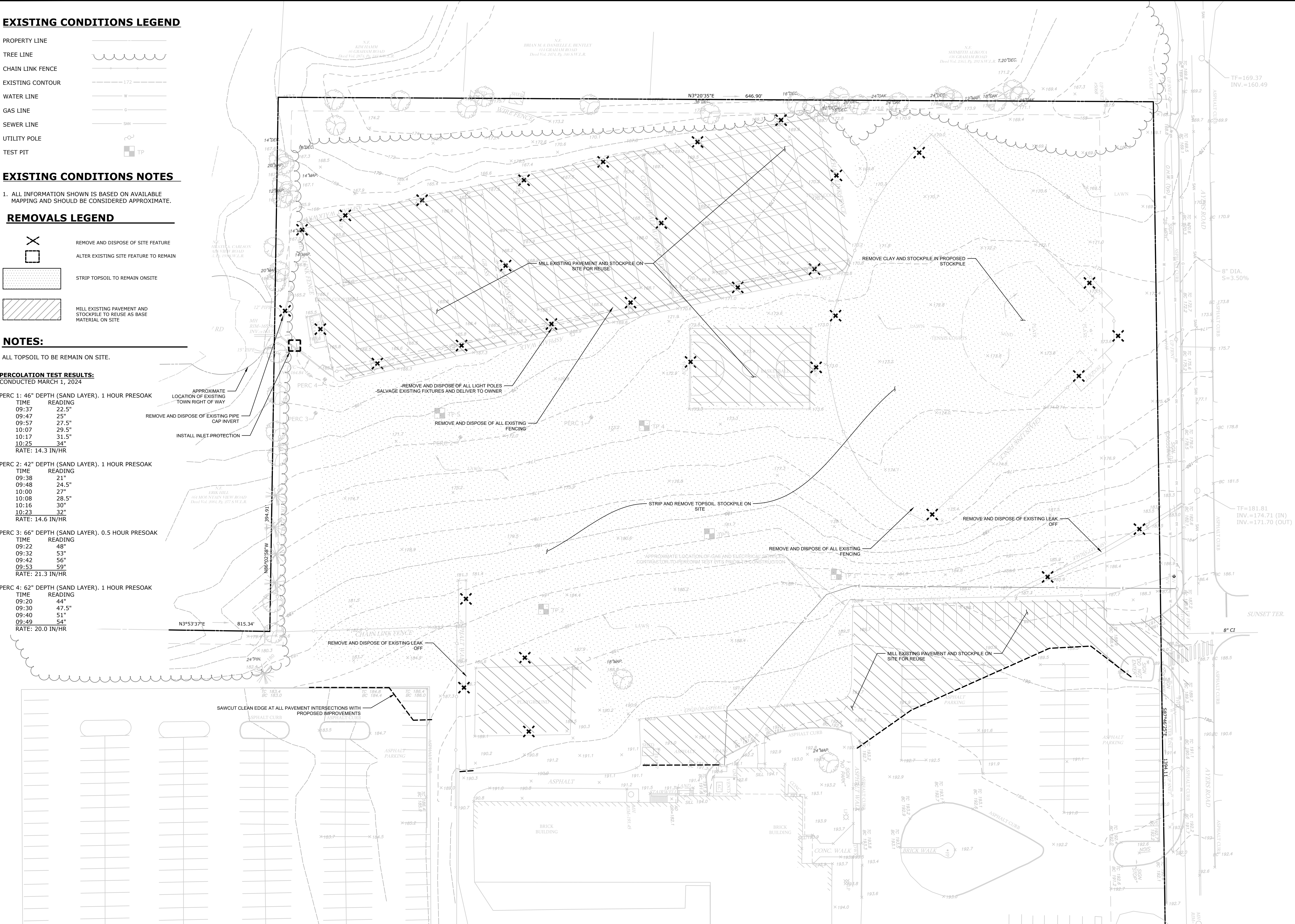
CONDUCTED MARCH 1, 2024

PERC 1: 46" DEPTH (SAND LAYER). 1 HOUR PRESOAK	
TIME	READING
09:37	22.5"
09:47	25"
09:57	27.5"
10:07	29.5"
10:17	31.5"
10:25	34"
RATE: 14.3 IN/HR	

PERC 2: 42" DEPTH (SAND LAYER). 1 HOUR PRESOAK	
TIME	READING
09:38	21"
09:48	24.5"
10:00	27"
10:08	28.5"
10:16	30"
10:23	32"
RATE: 14.6 IN/HR	

PERC 3: 66" DEPTH (SAND LAYER). 0.5 HOUR PRESOAK	
TIME	READING
09:22	48"
09:32	53"
09:42	56"
09:53	59"
RATE: 21.3 IN/HR	

PERC 4: 62" DEPTH (SAND LAYER). 1 HOUR PRESOAK	
TIME	READING
09:20	44"
09:30	47.5"
09:40	51"
09:49	54"
RATE: 20.0 IN/HR	



CEH Engineering & Consulting

CEH ENGINEERING AND CONSULTING
580 SHEPARD AVENUE
HAMDEN, CT 06514
chris.hulk@yahoo.com, 203-676-4445

FieldTurf
A Tarkett Sports Company

DESCRIPTION	DATE	BY
INVC SUBMISSION	12/29/2023	CEH
P2C SUBMISSION	1/22/2024	CEH
P & Z SUBMISSION	3/4/2024	CEH

SITE PLAN - EXISTING CONDITIONS AND REMOVALS

PROPOSED SYNTHETIC TURF FIELD AND TENNIS COURT DEVELOPMENT

SOUTH WINDSOR HIGH SCHOOL

AYERS ROAD AND NEVERS ROAD

SOUTH WINDSOR, CONNECTICUT

CEH	JDH
DESIGNED	DRAWN

SCALE: 1"=30'

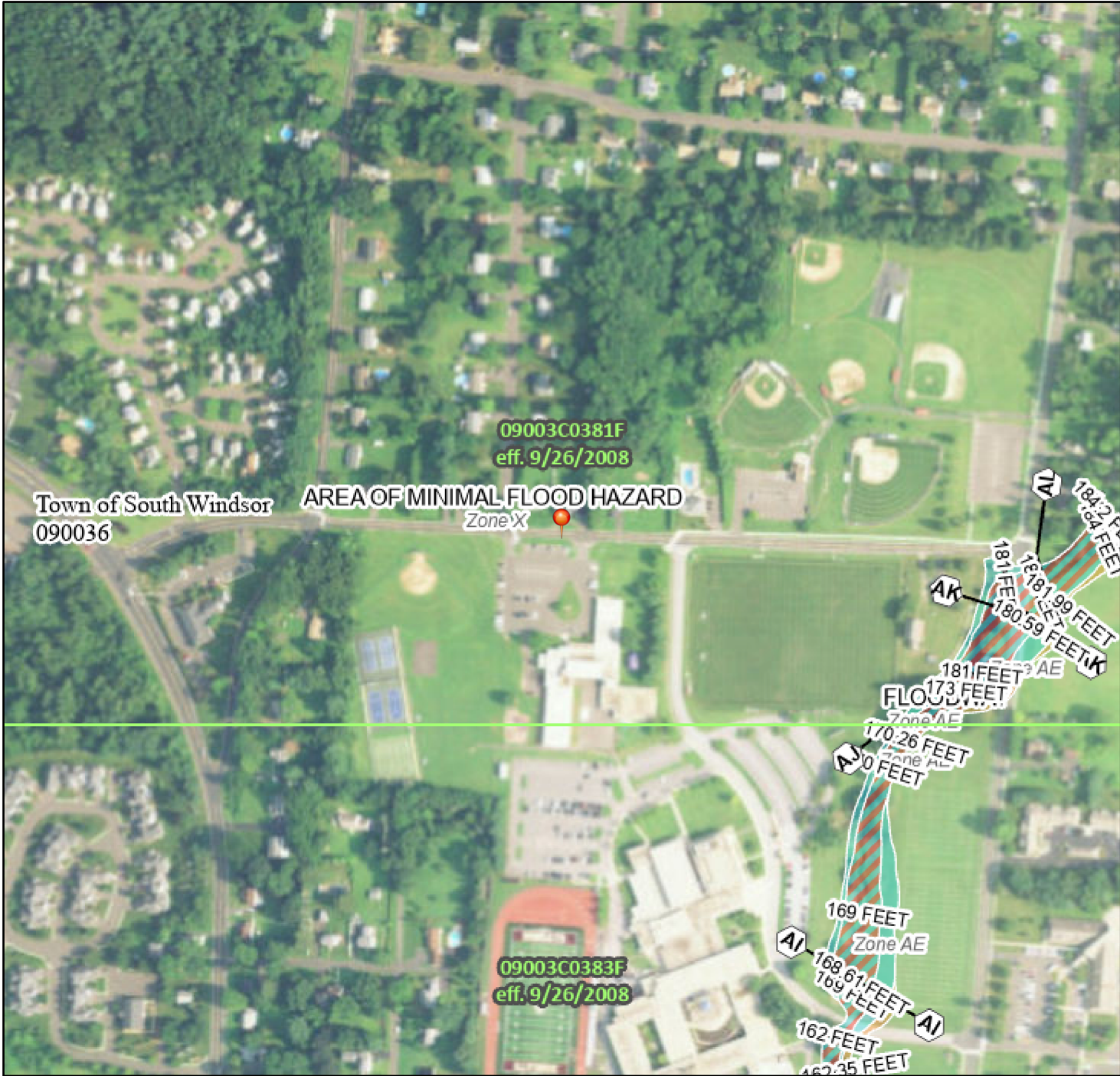
DATE: DECEMBER 15, 2023

SHEET: EX-1

National Flood Hazard Layer FIRMette



72°33'39"W 41°50'56"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/16/2023 at 2:45 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Water Quality Volume Calculations

Project: South Windsor High School Field By: AMK Date: 4/16/24
 Location: South Windsor, CT Checked: SJK Date: _____

Basin Name	1AP (PR-1A + PR-1B)	2AP (PR-2A)	
Rainfall, P	1.0 in.	1.0 in.	a
Area, A	5.52 ac	1.53 ac	b
Impervious Cover Area	0.9 ac	0.7 ac	c
% Impervious, I	16 %	44 %	
Volumetric Runoff Coeff., R	0.195	0.445	d
Water Quality Volume, WQV	0.090 ac-ft	0.057 ac-ft	e
	3,902 cf	2,475 cf	
WQV Provided	0.226 ac-ft	0.240 ac-ft	e
	9,835 cf	10,434 cf	f

^a First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

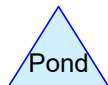
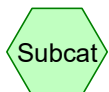
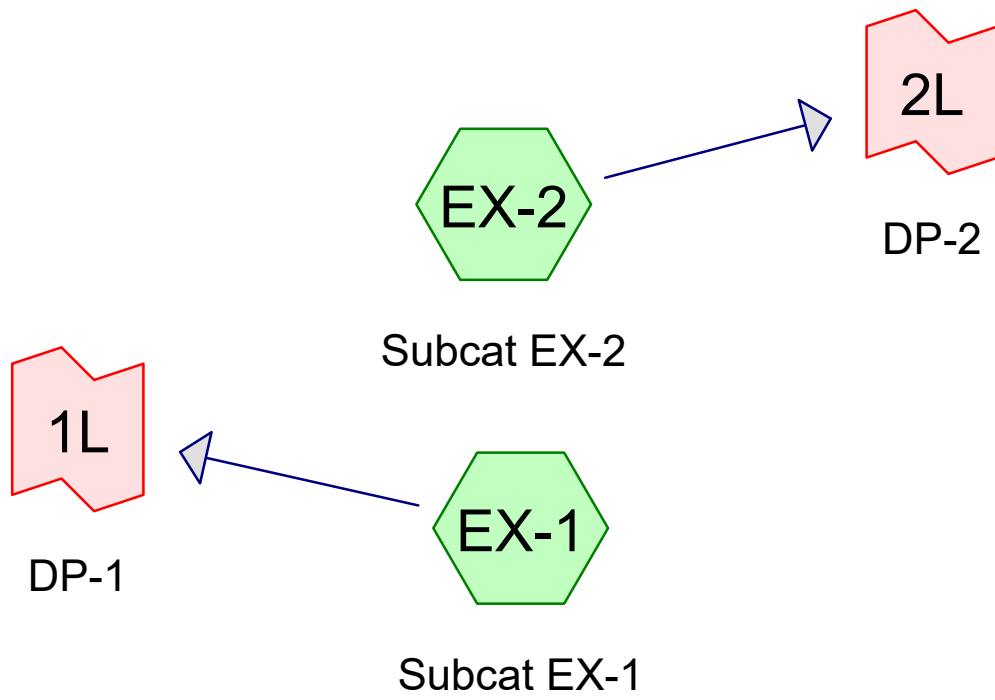
^b Area tributary to the stormwater management basin

^c Impervious cover area tributary to the stormwater management basin

^d $R=0.05+0.009*I$; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

^e $WQV=P*R*A/12$; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

^f Volumetric storage below outlet invert within proposed stormwater basin



Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	Type III 24-hr		Default	24.00	1	3.13	2
2	10 yr	Type III 24-hr		Default	24.00	1	4.95	2
3	25 yr	Type III 24-hr		Default	24.00	1	6.09	2
4	50 yr	Type III 24-hr		Default	24.00	1	6.92	2
5	100 yr	Type III 24-hr		Default	24.00	1	7.84	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.442	61	>75% Grass cover, Good, HSG B (EX-1, EX-2)
0.166	82	Dirt roads, HSG B (EX-1, EX-2)
2.649	98	Unconnected pavement, HSG B (EX-1, EX-2)
8.258	73	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.258	HSG B	EX-1, EX-2
0.000	HSG C	
0.000	HSG D	
0.000	Other	
8.258		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	5.442	0.000	0.000	0.000	5.442	>75% Grass cover, Good	EX-1, EX-2
0.000	0.166	0.000	0.000	0.000	0.166	Dirt roads	EX-1, EX-2
0.000	2.649	0.000	0.000	0.000	2.649	Unconnected pavement	EX-1, EX-2
0.000	8.258	0.000	0.000	0.000	8.258	TOTAL AREA	

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Subcat EX-1

Runoff Area=5.990 ac 31.02% Impervious Runoff Depth=0.94"
Flow Length=385' Tc=7.2 min CN=73 Runoff=5.84 cfs 0.468 af

SubcatchmentEX-2: Subcat EX-2

Runoff Area=2.268 ac 34.90% Impervious Runoff Depth=1.05"
Flow Length=310' Tc=6.4 min CN=75 Runoff=2.60 cfs 0.198 af

Link 1L: DP-1

Inflow=5.84 cfs 0.468 af
Primary=5.84 cfs 0.468 af

Link 2L: DP-2

Inflow=2.60 cfs 0.198 af
Primary=2.60 cfs 0.198 af

Total Runoff Area = 8.258 ac Runoff Volume = 0.666 af Average Runoff Depth = 0.97"
67.92% Pervious = 5.608 ac 32.08% Impervious = 2.649 ac

Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 5.84 cfs @ 12.12 hrs, Volume= 0.468 af, Depth= 0.94"
 Routed to Link 1L : DP-1

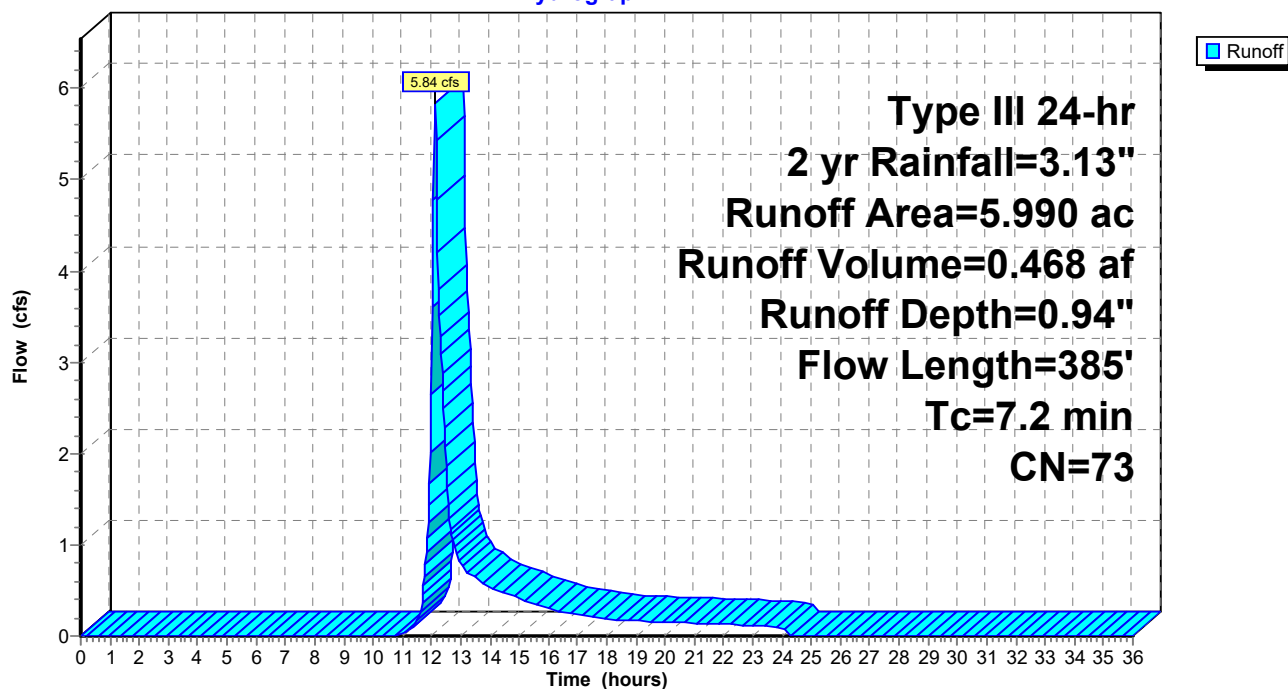
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 yr Rainfall=3.13"

Area (ac)	CN	Description
4.099	61	>75% Grass cover, Good, HSG B
0.033	82	Dirt roads, HSG B
1.858	98	Unconnected pavement, HSG B
5.990	73	Weighted Average
4.132		68.98% Pervious Area
1.858		31.02% Impervious Area
1.858		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
0.9	75	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.0	260	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	385	Total			

Subcatchment EX-1: Subcat EX-1

Hydrograph



Summary for Subcatchment EX-2: Subcat EX-2

Runoff = 2.60 cfs @ 12.10 hrs, Volume= 0.198 af, Depth= 1.05"
 Routed to Link 2L : DP-2

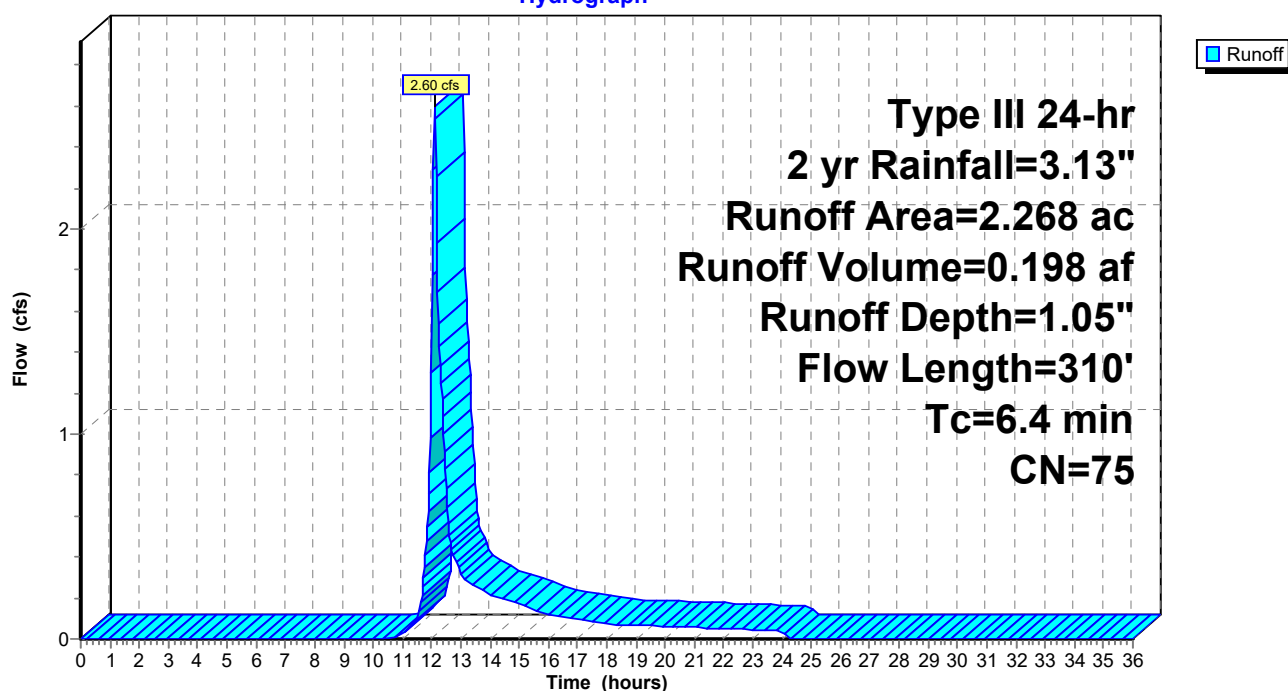
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 yr Rainfall=3.13"

Area (ac)	CN	Description
1.343	61	>75% Grass cover, Good, HSG B
0.133	82	Dirt roads, HSG B
0.791	98	Unconnected pavement, HSG B
2.268	75	Weighted Average
1.476		65.10% Pervious Area
0.791		34.90% Impervious Area
0.791		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1200	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.6	260	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	310	Total			

Subcatchment EX-2: Subcat EX-2

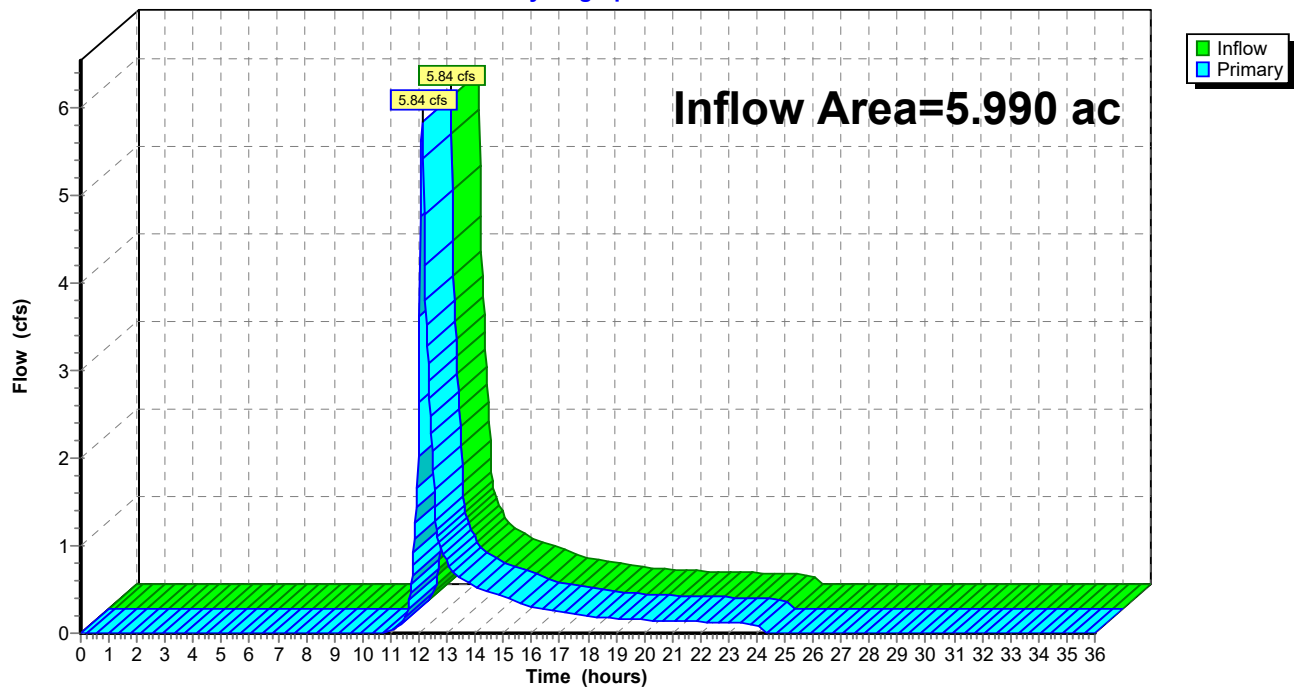
Hydrograph



Summary for Link 1L: DP-1

Inflow Area = 5.990 ac, 31.02% Impervious, Inflow Depth = 0.94" for 2 yr event
Inflow = 5.84 cfs @ 12.12 hrs, Volume= 0.468 af
Primary = 5.84 cfs @ 12.12 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min

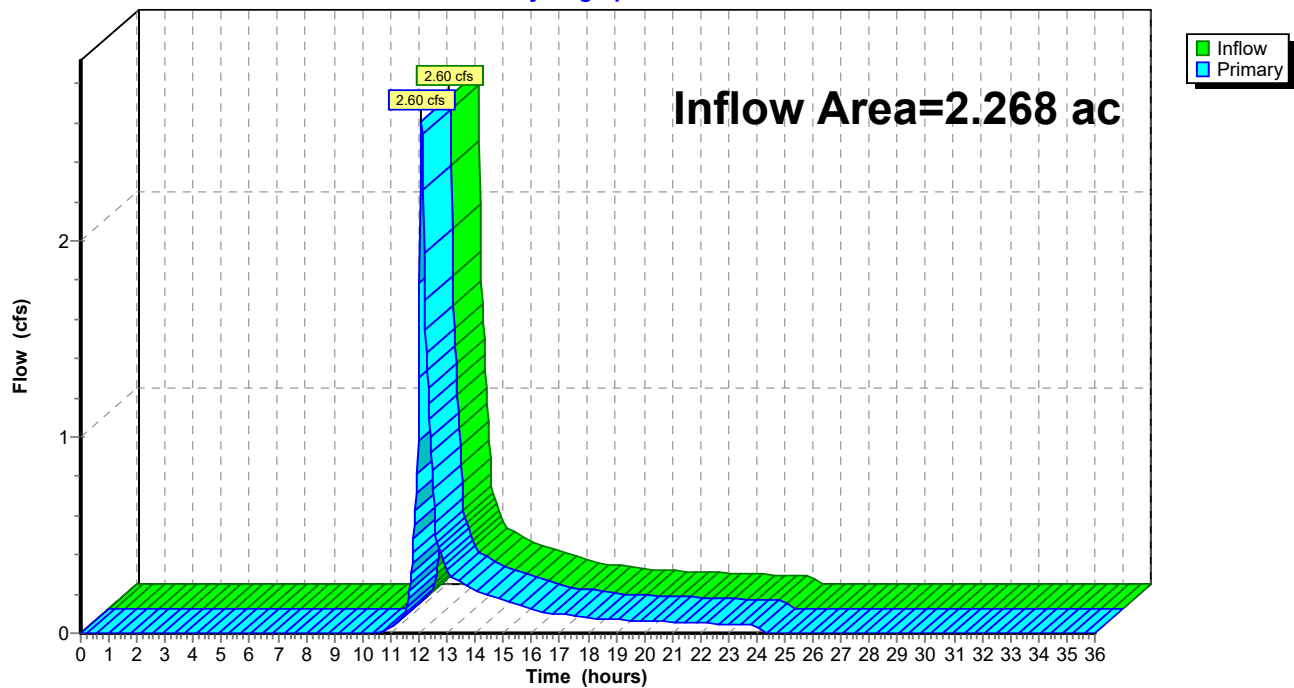
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 1L: DP-1**Hydrograph**

Summary for Link 2L: DP-2

Inflow Area = 2.268 ac, 34.90% Impervious, Inflow Depth = 1.05" for 2 yr event
Inflow = 2.60 cfs @ 12.10 hrs, Volume= 0.198 af
Primary = 2.60 cfs @ 12.10 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 2L: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Subcat EX-1

Runoff Area=5.990 ac 31.02% Impervious Runoff Depth=2.24"
Flow Length=385' Tc=7.2 min CN=73 Runoff=14.87 cfs 1.119 af

SubcatchmentEX-2: Subcat EX-2

Runoff Area=2.268 ac 34.90% Impervious Runoff Depth=2.41"
Flow Length=310' Tc=6.4 min CN=75 Runoff=6.27 cfs 0.455 af

Link 1L: DP-1

Inflow=14.87 cfs 1.119 af
Primary=14.87 cfs 1.119 af

Link 2L: DP-2

Inflow=6.27 cfs 0.455 af
Primary=6.27 cfs 0.455 af

Total Runoff Area = 8.258 ac Runoff Volume = 1.574 af Average Runoff Depth = 2.29"
67.92% Pervious = 5.608 ac 32.08% Impervious = 2.649 ac

Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 14.87 cfs @ 12.11 hrs, Volume= 1.119 af, Depth= 2.24"
 Routed to Link 1L : DP-1

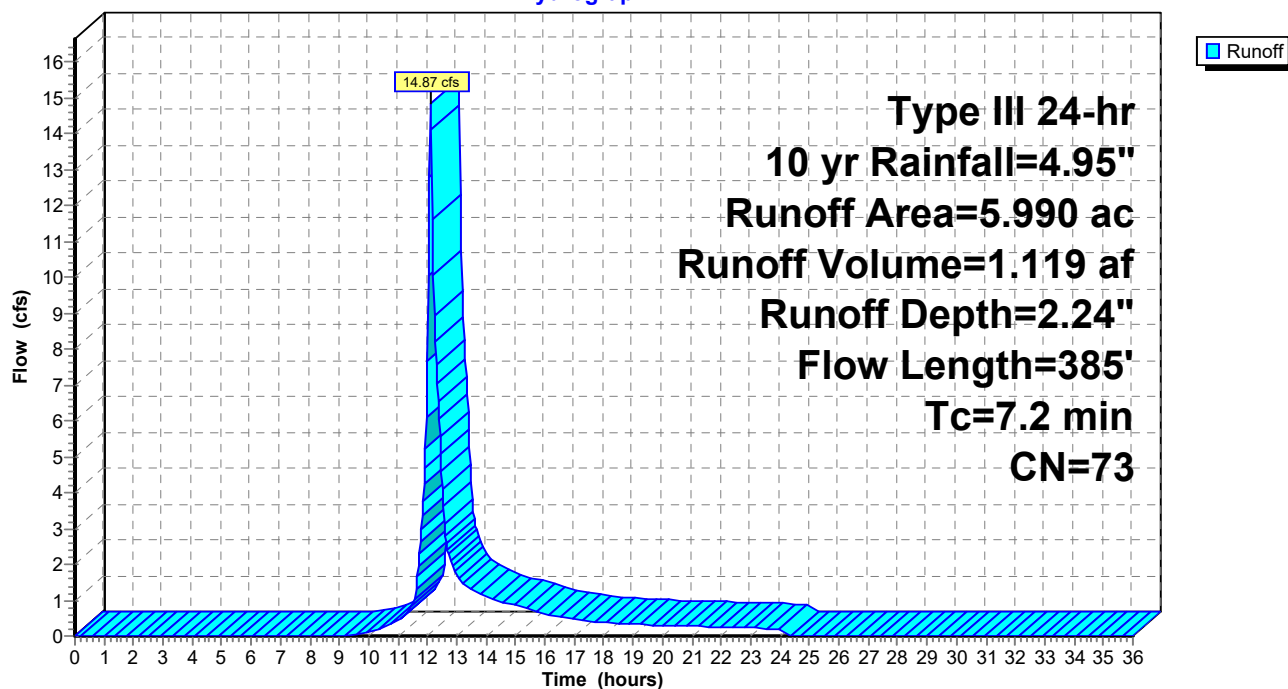
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 yr Rainfall=4.95"

Area (ac)	CN	Description
4.099	61	>75% Grass cover, Good, HSG B
0.033	82	Dirt roads, HSG B
1.858	98	Unconnected pavement, HSG B
5.990	73	Weighted Average
4.132		68.98% Pervious Area
1.858		31.02% Impervious Area
1.858		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
0.9	75	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.0	260	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	385	Total			

Subcatchment EX-1: Subcat EX-1

Hydrograph



Summary for Subcatchment EX-2: Subcat EX-2

Runoff = 6.27 cfs @ 12.10 hrs, Volume= 0.455 af, Depth= 2.41"
 Routed to Link 2L : DP-2

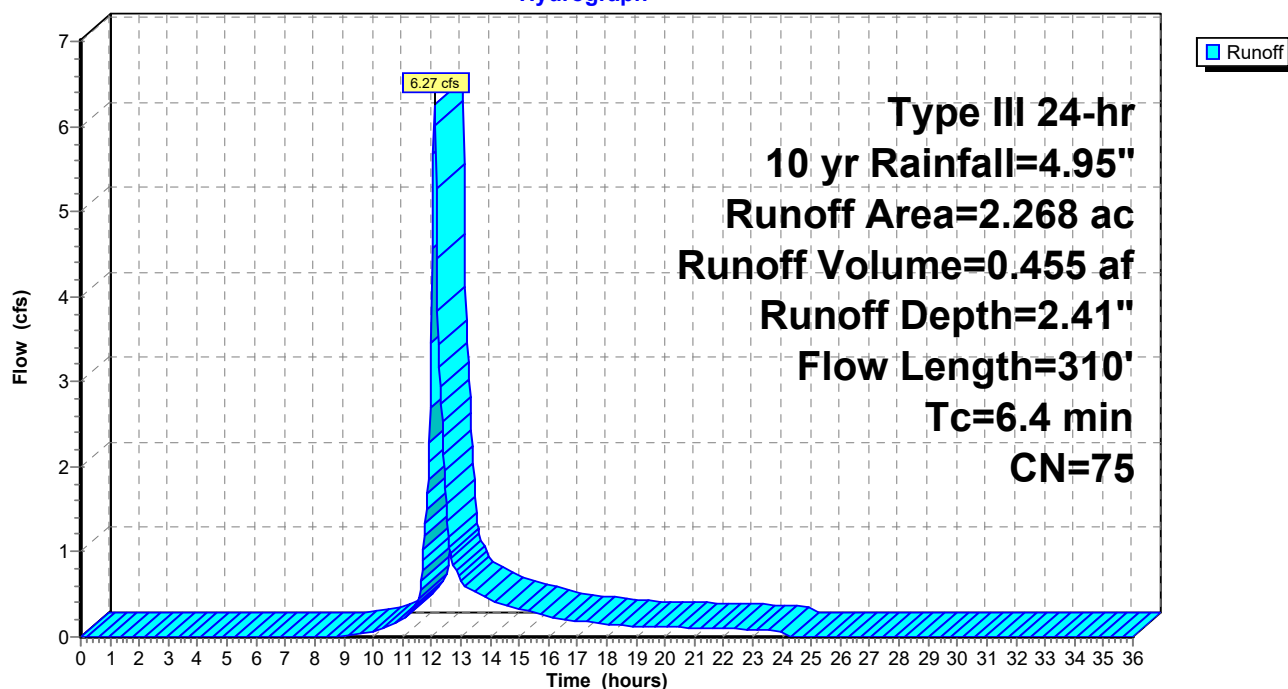
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 yr Rainfall=4.95"

Area (ac)	CN	Description
1.343	61	>75% Grass cover, Good, HSG B
0.133	82	Dirt roads, HSG B
0.791	98	Unconnected pavement, HSG B
2.268	75	Weighted Average
1.476		65.10% Pervious Area
0.791		34.90% Impervious Area
0.791		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1200	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.6	260	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	310	Total			

Subcatchment EX-2: Subcat EX-2

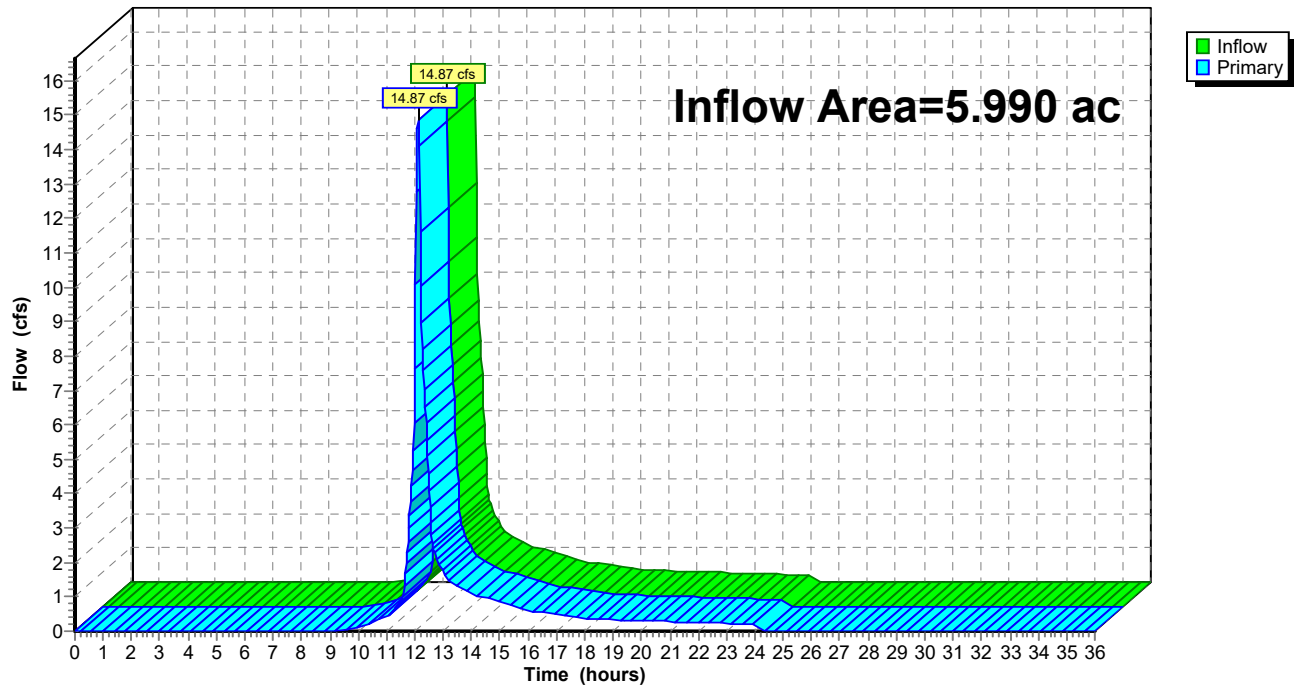
Hydrograph



Summary for Link 1L: DP-1

Inflow Area = 5.990 ac, 31.02% Impervious, Inflow Depth = 2.24" for 10 yr event
Inflow = 14.87 cfs @ 12.11 hrs, Volume= 1.119 af
Primary = 14.87 cfs @ 12.11 hrs, Volume= 1.119 af, Atten= 0%, Lag= 0.0 min

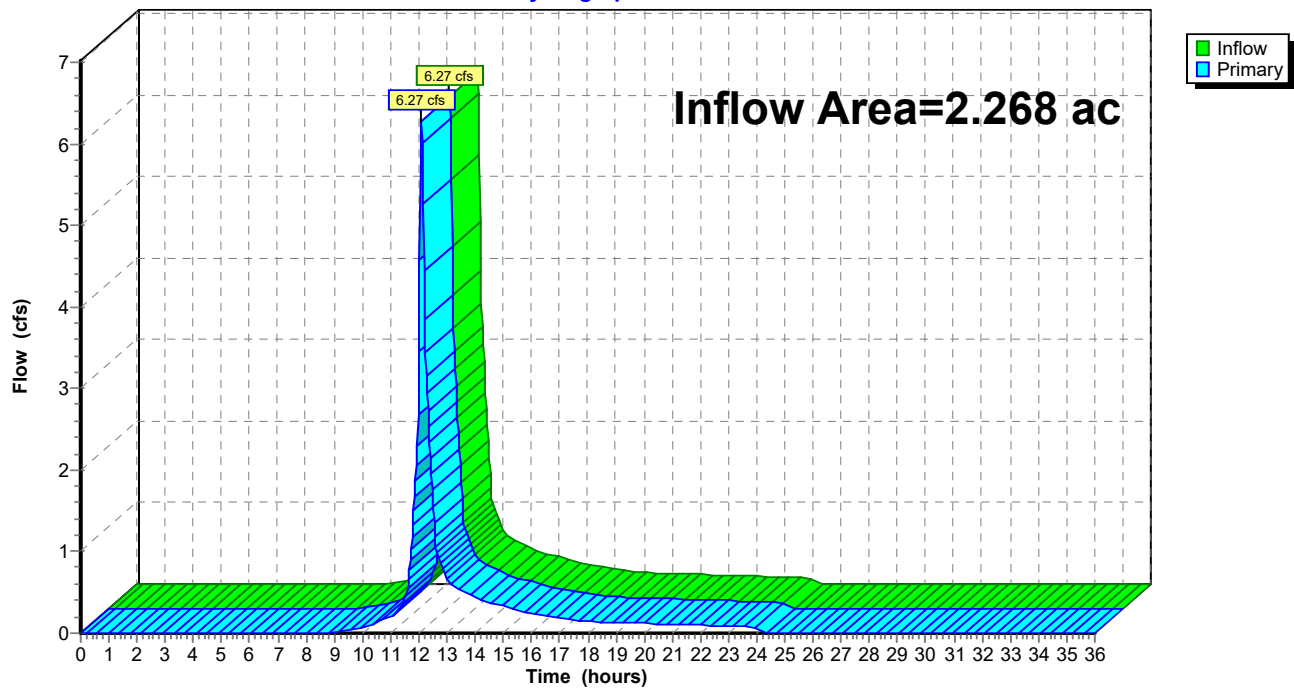
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 1L: DP-1**Hydrograph**

Summary for Link 2L: DP-2

Inflow Area = 2.268 ac, 34.90% Impervious, Inflow Depth = 2.41" for 10 yr event
Inflow = 6.27 cfs @ 12.10 hrs, Volume= 0.455 af
Primary = 6.27 cfs @ 12.10 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 2L: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Subcat EX-1

Runoff Area=5.990 ac 31.02% Impervious Runoff Depth=3.16"
Flow Length=385' Tc=7.2 min CN=73 Runoff=21.14 cfs 1.579 af

SubcatchmentEX-2: Subcat EX-2

Runoff Area=2.268 ac 34.90% Impervious Runoff Depth=3.36"
Flow Length=310' Tc=6.4 min CN=75 Runoff=8.77 cfs 0.635 af

Link 1L: DP-1

Inflow=21.14 cfs 1.579 af
Primary=21.14 cfs 1.579 af

Link 2L: DP-2

Inflow=8.77 cfs 0.635 af
Primary=8.77 cfs 0.635 af

Total Runoff Area = 8.258 ac Runoff Volume = 2.214 af Average Runoff Depth = 3.22"
67.92% Pervious = 5.608 ac 32.08% Impervious = 2.649 ac

Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 21.14 cfs @ 12.11 hrs, Volume= 1.579 af, Depth= 3.16"
 Routed to Link 1L : DP-1

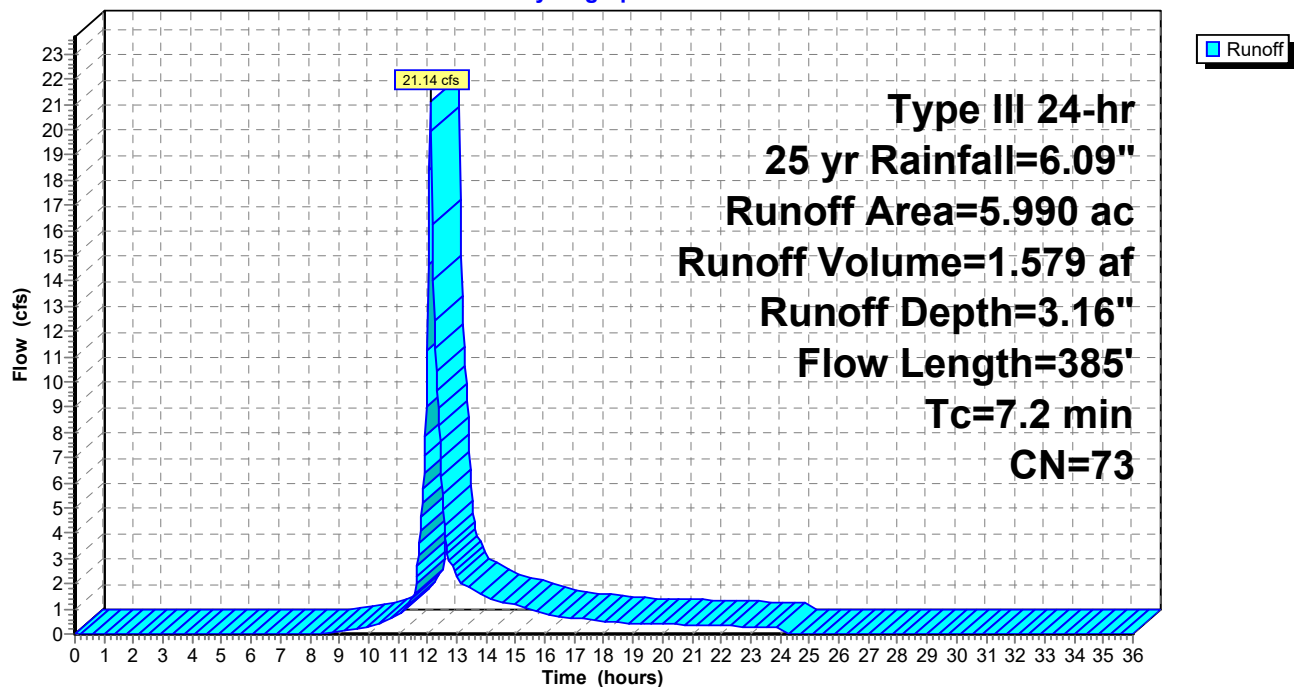
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25 yr Rainfall=6.09"

Area (ac)	CN	Description
4.099	61	>75% Grass cover, Good, HSG B
0.033	82	Dirt roads, HSG B
1.858	98	Unconnected pavement, HSG B
5.990	73	Weighted Average
4.132		68.98% Pervious Area
1.858		31.02% Impervious Area
1.858		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
0.9	75	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.0	260	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	385	Total			

Subcatchment EX-1: Subcat EX-1

Hydrograph



Summary for Subcatchment EX-2: Subcat EX-2

Runoff = 8.77 cfs @ 12.09 hrs, Volume= 0.635 af, Depth= 3.36"
 Routed to Link 2L : DP-2

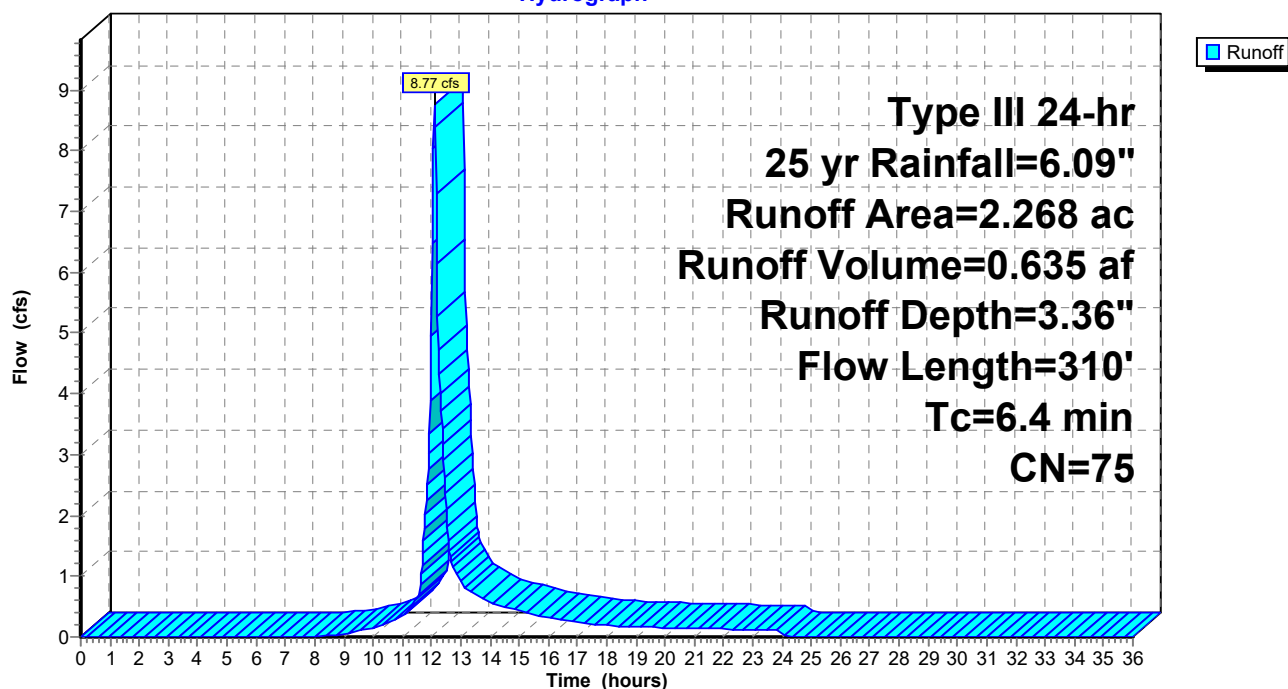
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25 yr Rainfall=6.09"

Area (ac)	CN	Description
1.343	61	>75% Grass cover, Good, HSG B
0.133	82	Dirt roads, HSG B
0.791	98	Unconnected pavement, HSG B
2.268	75	Weighted Average
1.476		65.10% Pervious Area
0.791		34.90% Impervious Area
0.791		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1200	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.6	260	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	310	Total			

Subcatchment EX-2: Subcat EX-2

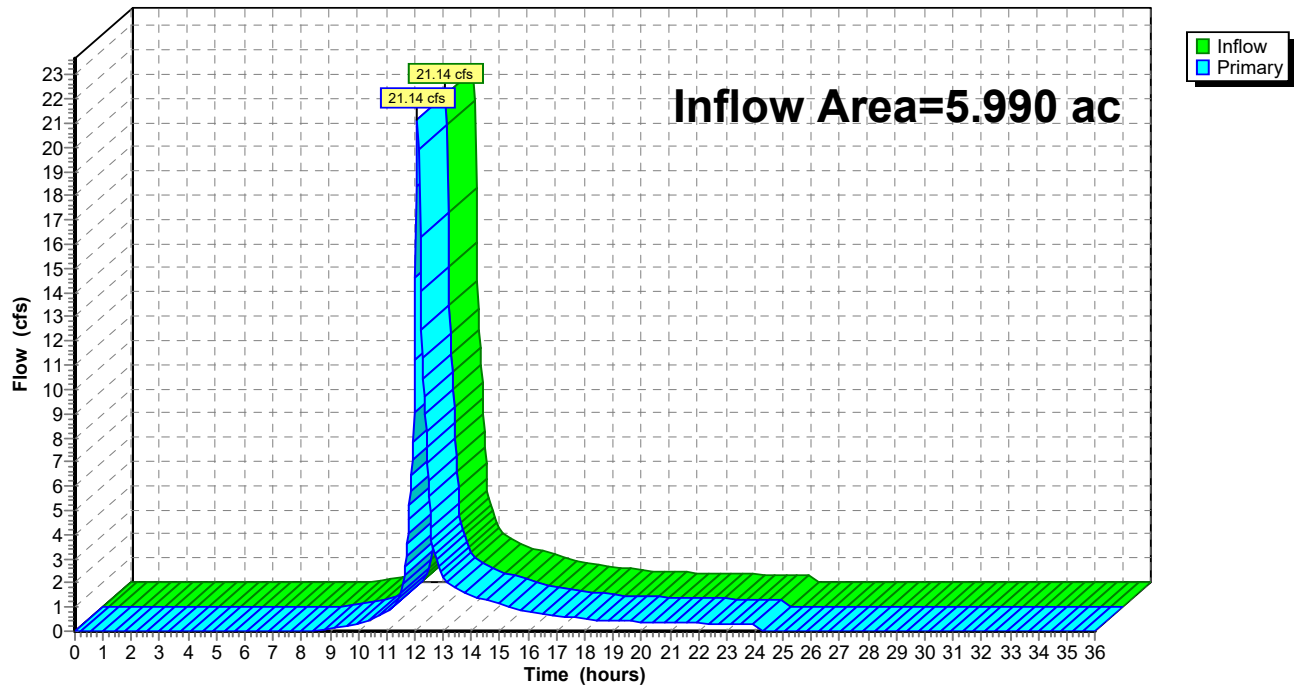
Hydrograph



Summary for Link 1L: DP-1

Inflow Area = 5.990 ac, 31.02% Impervious, Inflow Depth = 3.16" for 25 yr event
Inflow = 21.14 cfs @ 12.11 hrs, Volume= 1.579 af
Primary = 21.14 cfs @ 12.11 hrs, Volume= 1.579 af, Atten= 0%, Lag= 0.0 min

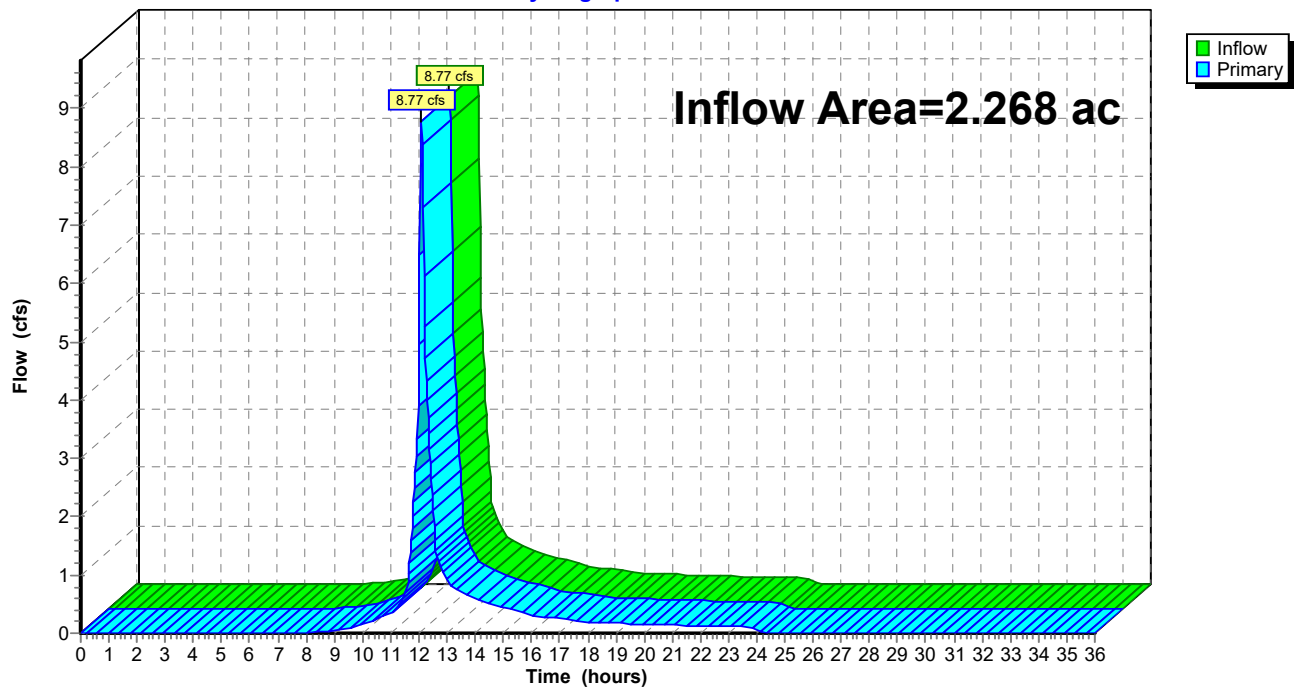
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 1L: DP-1**Hydrograph**

Summary for Link 2L: DP-2

Inflow Area = 2.268 ac, 34.90% Impervious, Inflow Depth = 3.36" for 25 yr event
Inflow = 8.77 cfs @ 12.09 hrs, Volume= 0.635 af
Primary = 8.77 cfs @ 12.09 hrs, Volume= 0.635 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 2L: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Subcat EX-1

Runoff Area=5.990 ac 31.02% Impervious Runoff Depth=3.87"
Flow Length=385' Tc=7.2 min CN=73 Runoff=25.93 cfs 1.930 af

SubcatchmentEX-2: Subcat EX-2

Runoff Area=2.268 ac 34.90% Impervious Runoff Depth=4.08"
Flow Length=310' Tc=6.4 min CN=75 Runoff=10.64 cfs 0.771 af

Link 1L: DP-1

Inflow=25.93 cfs 1.930 af
Primary=25.93 cfs 1.930 af

Link 2L: DP-2

Inflow=10.64 cfs 0.771 af
Primary=10.64 cfs 0.771 af

Total Runoff Area = 8.258 ac Runoff Volume = 2.701 af Average Runoff Depth = 3.92"
67.92% Pervious = 5.608 ac 32.08% Impervious = 2.649 ac

Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 25.93 cfs @ 12.10 hrs, Volume= 1.930 af, Depth= 3.87"
 Routed to Link 1L : DP-1

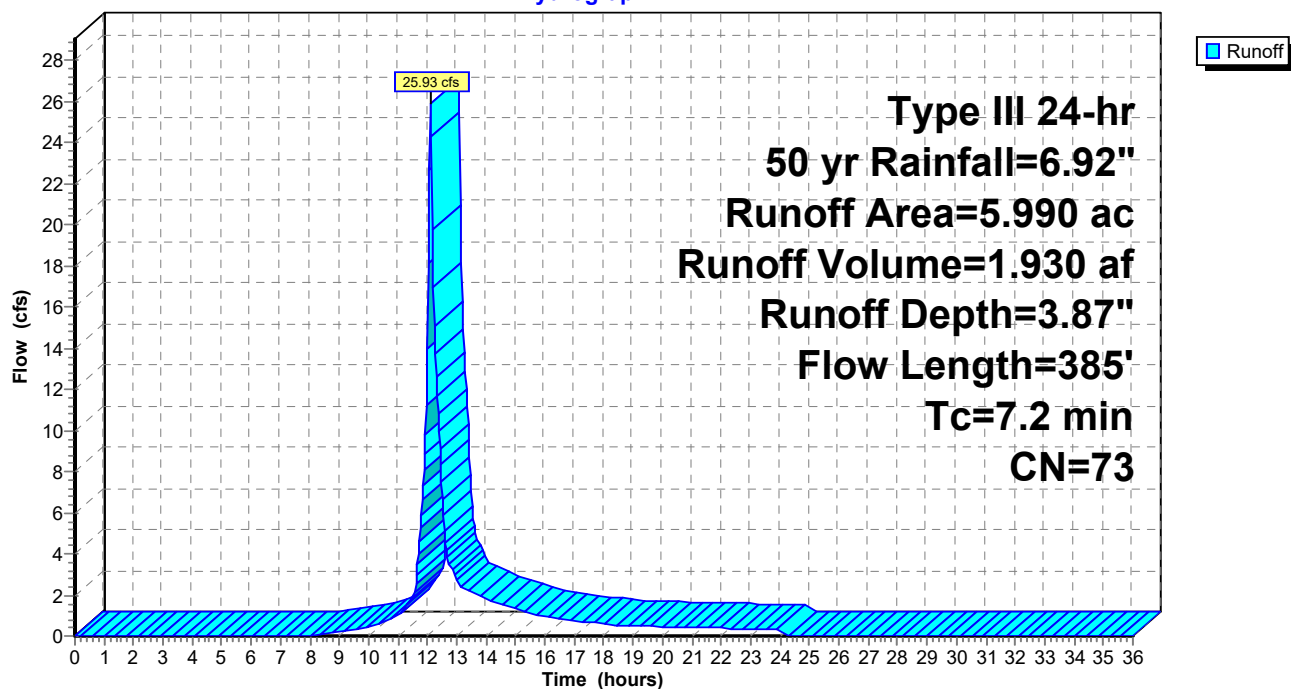
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 50 yr Rainfall=6.92"

Area (ac)	CN	Description
4.099	61	>75% Grass cover, Good, HSG B
0.033	82	Dirt roads, HSG B
1.858	98	Unconnected pavement, HSG B
5.990	73	Weighted Average
4.132		68.98% Pervious Area
1.858		31.02% Impervious Area
1.858		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
0.9	75	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.0	260	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	385	Total			

Subcatchment EX-1: Subcat EX-1

Hydrograph



Summary for Subcatchment EX-2: Subcat EX-2

Runoff = 10.64 cfs @ 12.09 hrs, Volume= 0.771 af, Depth= 4.08"
 Routed to Link 2L : DP-2

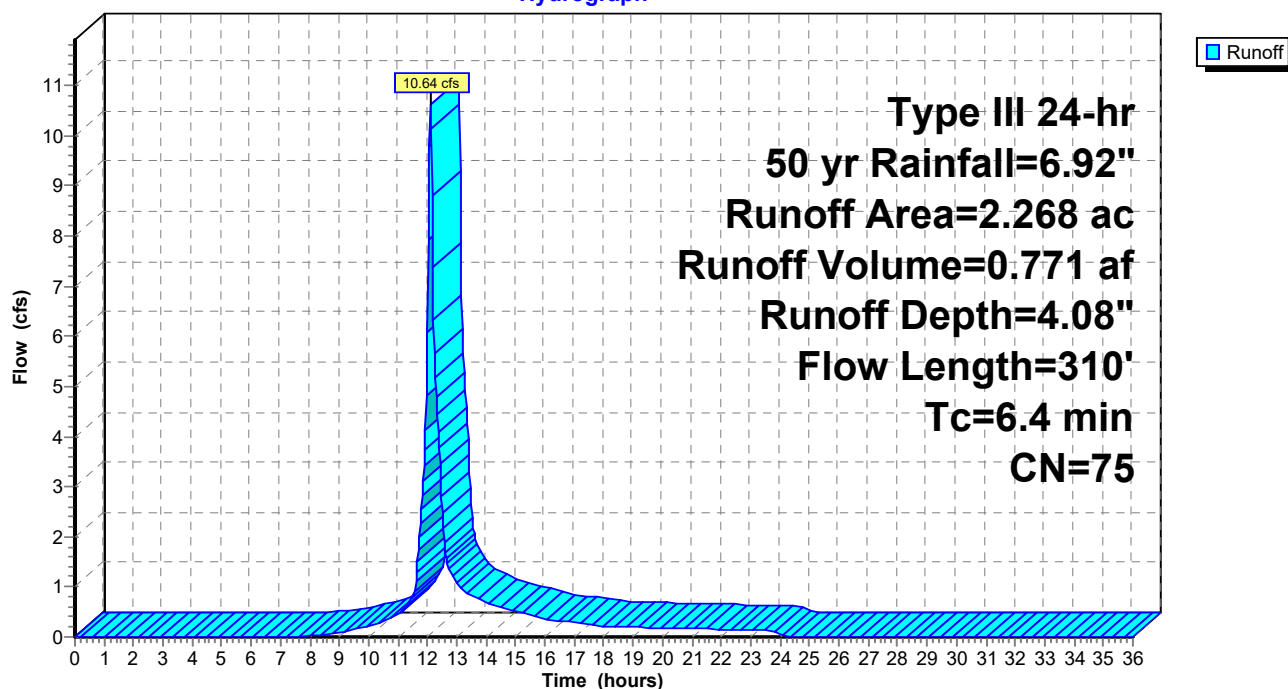
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 50 yr Rainfall=6.92"

Area (ac)	CN	Description
1.343	61	>75% Grass cover, Good, HSG B
0.133	82	Dirt roads, HSG B
0.791	98	Unconnected pavement, HSG B
2.268	75	Weighted Average
1.476		65.10% Pervious Area
0.791		34.90% Impervious Area
0.791		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1200	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.6	260	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	310	Total			

Subcatchment EX-2: Subcat EX-2

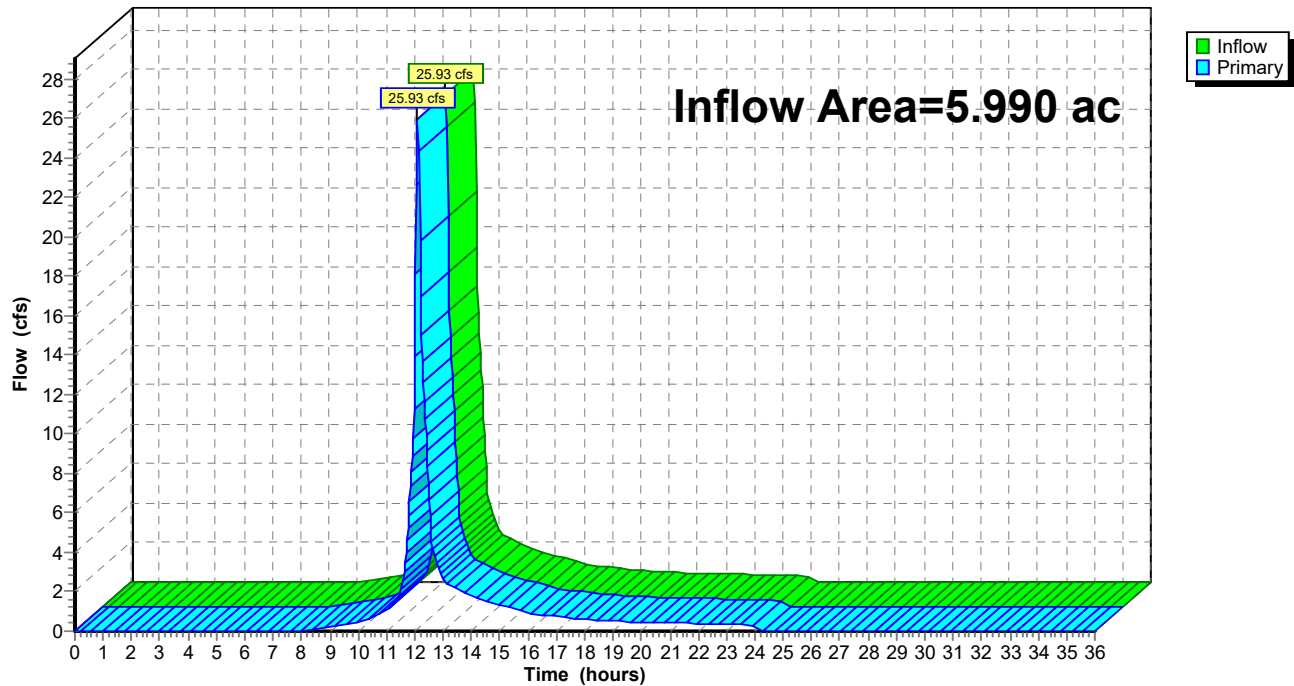
Hydrograph



Summary for Link 1L: DP-1

Inflow Area = 5.990 ac, 31.02% Impervious, Inflow Depth = 3.87" for 50 yr event
Inflow = 25.93 cfs @ 12.10 hrs, Volume= 1.930 af
Primary = 25.93 cfs @ 12.10 hrs, Volume= 1.930 af, Atten= 0%, Lag= 0.0 min

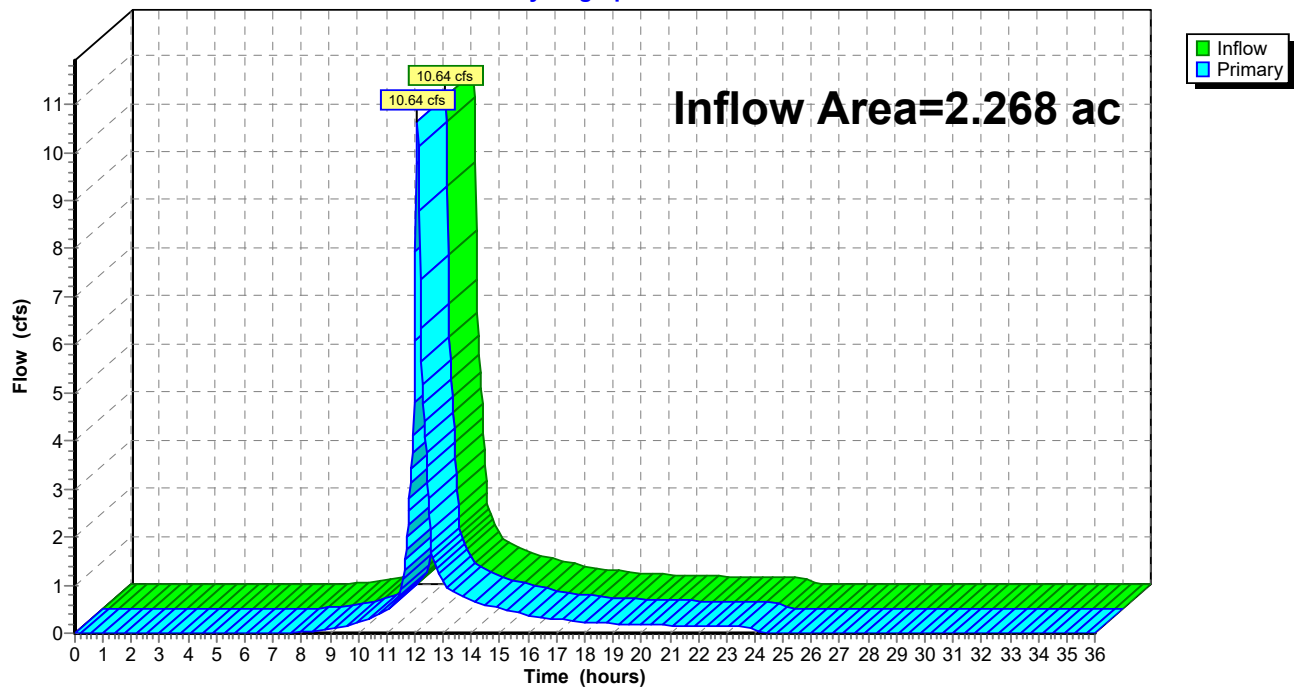
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 1L: DP-1**Hydrograph**

Summary for Link 2L: DP-2

Inflow Area = 2.268 ac, 34.90% Impervious, Inflow Depth = 4.08" for 50 yr event
Inflow = 10.64 cfs @ 12.09 hrs, Volume= 0.771 af
Primary = 10.64 cfs @ 12.09 hrs, Volume= 0.771 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 2L: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Subcat EX-1

Runoff Area=5.990 ac 31.02% Impervious Runoff Depth=4.67"
Flow Length=385' Tc=7.2 min CN=73 Runoff=31.27 cfs 2.330 af

SubcatchmentEX-2: Subcat EX-2

Runoff Area=2.268 ac 34.90% Impervious Runoff Depth=4.90"
Flow Length=310' Tc=6.4 min CN=75 Runoff=12.74 cfs 0.925 af

Link 1L: DP-1

Inflow=31.27 cfs 2.330 af
Primary=31.27 cfs 2.330 af

Link 2L: DP-2

Inflow=12.74 cfs 0.925 af
Primary=12.74 cfs 0.925 af

Total Runoff Area = 8.258 ac Runoff Volume = 3.256 af Average Runoff Depth = 4.73"
67.92% Pervious = 5.608 ac 32.08% Impervious = 2.649 ac

Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 31.27 cfs @ 12.10 hrs, Volume= 2.330 af, Depth= 4.67"
 Routed to Link 1L : DP-1

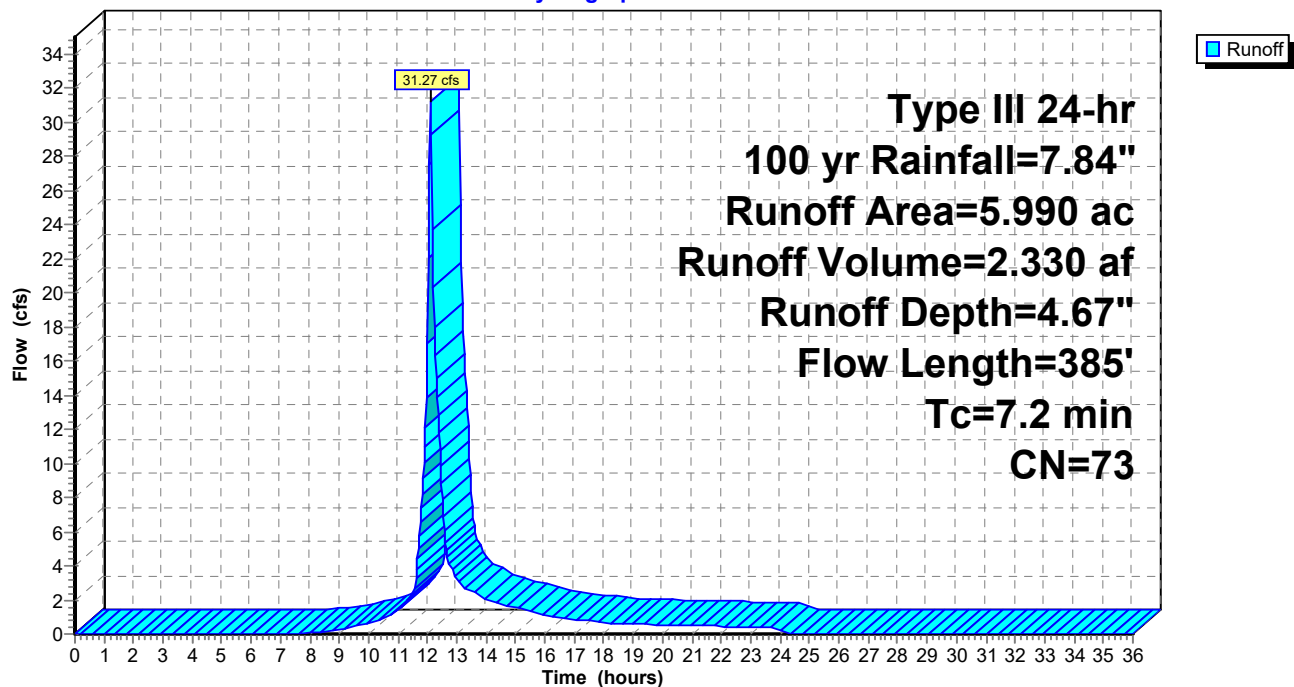
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100 yr Rainfall=7.84"

Area (ac)	CN	Description
4.099	61	>75% Grass cover, Good, HSG B
0.033	82	Dirt roads, HSG B
1.858	98	Unconnected pavement, HSG B
5.990	73	Weighted Average
4.132		68.98% Pervious Area
1.858		31.02% Impervious Area
1.858		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
0.9	75	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.0	260	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.2	385	Total			

Subcatchment EX-1: Subcat EX-1

Hydrograph



Summary for Subcatchment EX-2: Subcat EX-2

Runoff = 12.74 cfs @ 12.09 hrs, Volume= 0.925 af, Depth= 4.90"
 Routed to Link 2L : DP-2

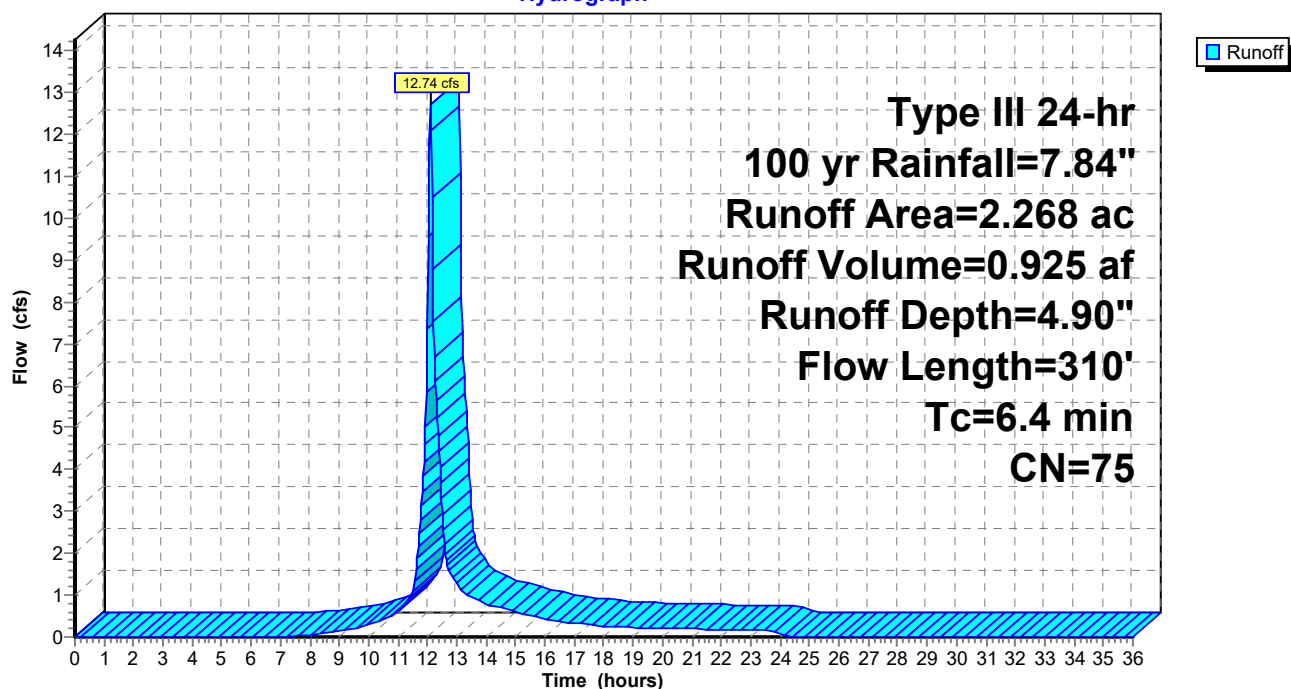
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100 yr Rainfall=7.84"

Area (ac)	CN	Description
1.343	61	>75% Grass cover, Good, HSG B
0.133	82	Dirt roads, HSG B
0.791	98	Unconnected pavement, HSG B
2.268	75	Weighted Average
1.476		65.10% Pervious Area
0.791		34.90% Impervious Area
0.791		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1200	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.6	260	0.0300	1.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	310	Total			

Subcatchment EX-2: Subcat EX-2

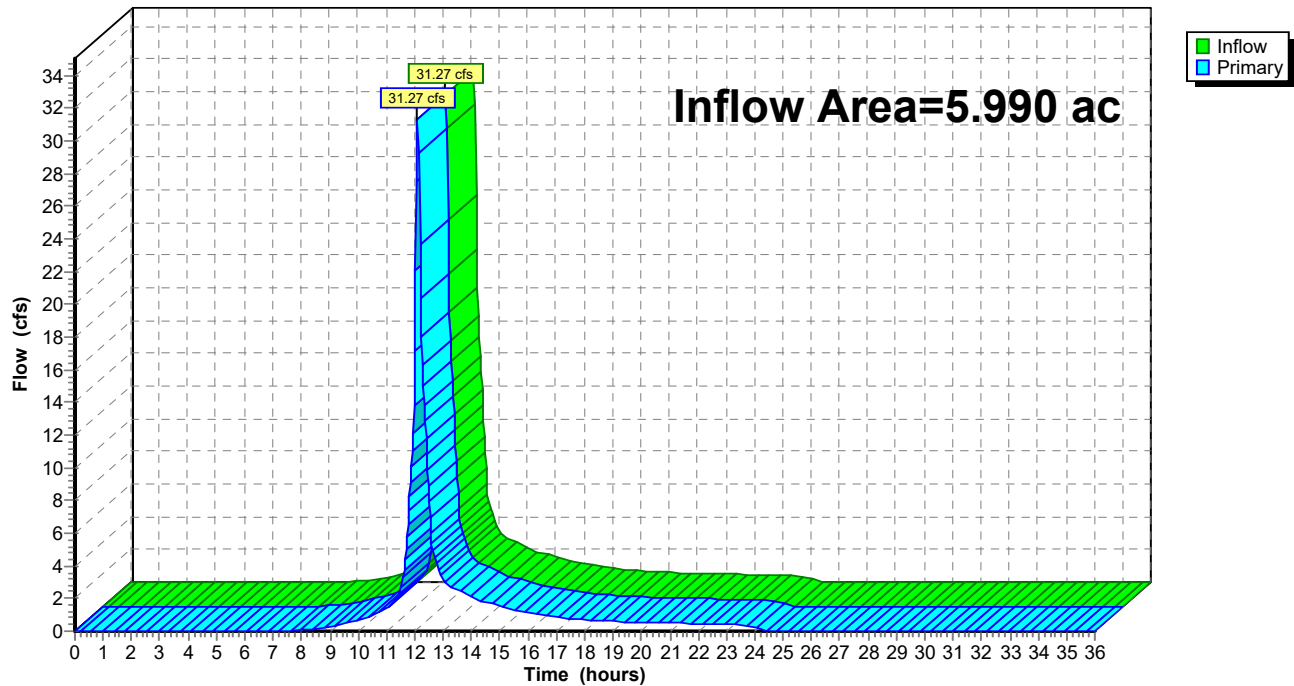
Hydrograph



Summary for Link 1L: DP-1

Inflow Area = 5.990 ac, 31.02% Impervious, Inflow Depth = 4.67" for 100 yr event
Inflow = 31.27 cfs @ 12.10 hrs, Volume= 2.330 af
Primary = 31.27 cfs @ 12.10 hrs, Volume= 2.330 af, Atten= 0%, Lag= 0.0 min

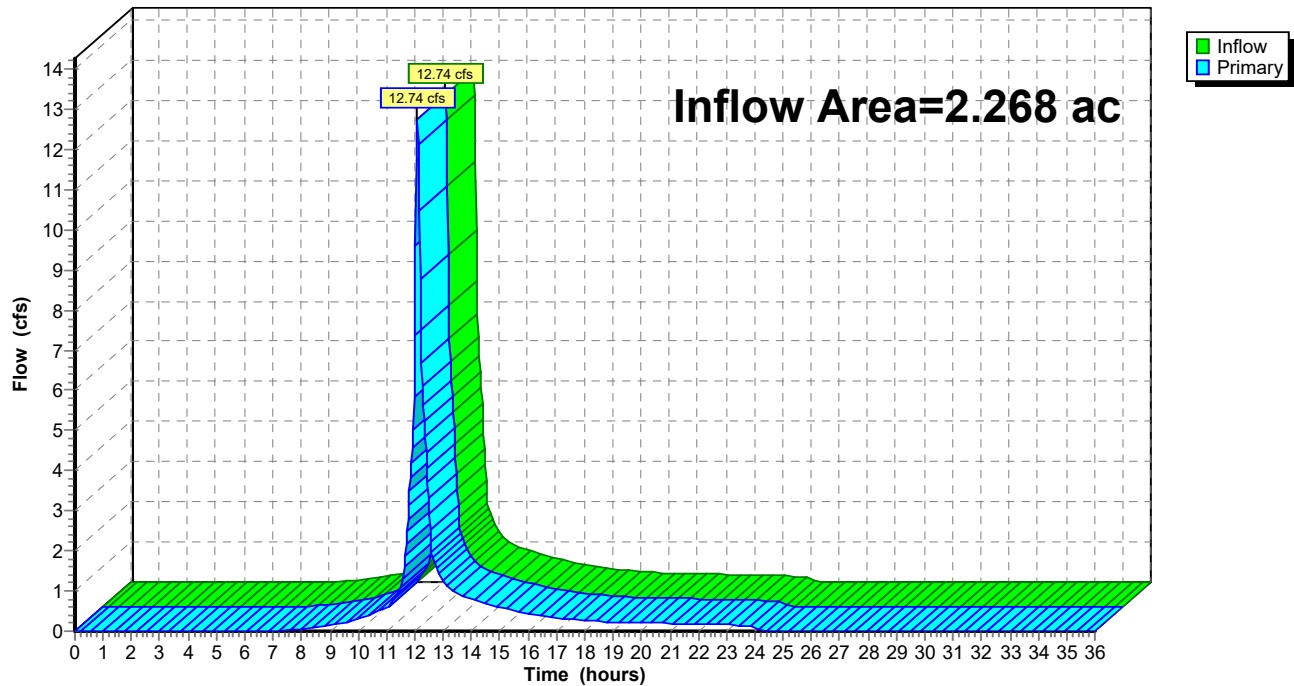
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

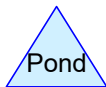
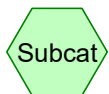
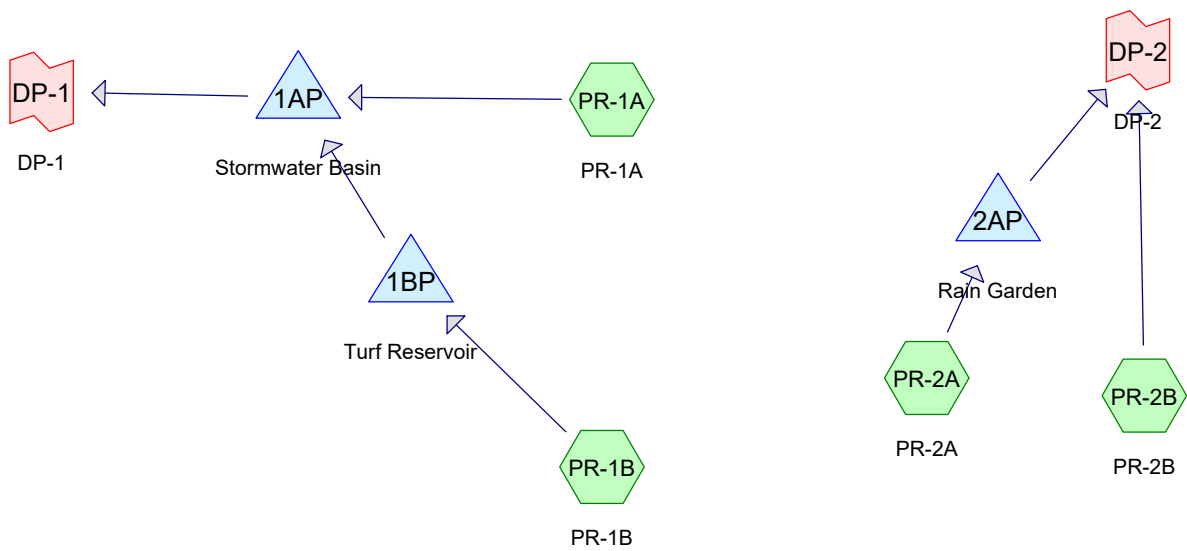
Link 1L: DP-1**Hydrograph**

Summary for Link 2L: DP-2

Inflow Area = 2.268 ac, 34.90% Impervious, Inflow Depth = 4.90" for 100 yr event
Inflow = 12.74 cfs @ 12.09 hrs, Volume= 0.925 af
Primary = 12.74 cfs @ 12.09 hrs, Volume= 0.925 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link 2L: DP-2**Hydrograph**



Routing Diagram for 43380-PR DR 2024-04-16

Prepared by VHB, Inc, Printed 4/17/2024

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	Type III 24-hr		Default	24.00	1	3.13	2
2	10 yr	Type III 24-hr		Default	24.00	1	4.95	2
3	25 yr	Type III 24-hr		Default	24.00	1	6.09	2
4	50 yr	Type III 24-hr		Default	24.00	1	6.92	2
5	100 yr	Type III 24-hr		Default	24.00	1	7.84	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.998	61	>75% Grass cover, Good, HSG B (PR-1A, PR-1B, PR-2A, PR-2B)
2.157	86	Fallow, bare soil, HSG B (PR-1B)
0.169	96	Gravel surface, HSG B (PR-1A, PR-1B, PR-2A)
0.102	98	Roofs, HSG B (PR-1A)
2.131	98	Unconnected pavement, HSG B (PR-1A, PR-1B, PR-2A, PR-2B)
8.557	78	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	PR-1A, PR-1B, PR-2A, PR-2B
8.557	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
8.557		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	3.998	0.000	0.000	0.000	3.998	>75% Grass cover, Good	PR-1A, PR-1B, PR-2A, PR-2B
0.000	2.157	0.000	0.000	0.000	2.157	Fallow, bare soil	PR-1B
0.000	0.169	0.000	0.000	0.000	0.169	Gravel surface	PR-1A, PR-1B, PR-2A
0.000	0.102	0.000	0.000	0.000	0.102	Roofs	PR-1A
0.000	2.131	0.000	0.000	0.000	2.131	Unconnected pavement	PR-1A, PR-1B, PR-2A, PR-2B
0.000	8.557	0.000	0.000	0.000	8.557	TOTAL AREA	

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR-1A: PR-1A Runoff Area=134,799 sf 25.74% Impervious Runoff Depth=0.65"
 Flow Length=560' Tc=5.0 min UI Adjusted CN=67 Runoff=2.01 cfs 0.168 af

SubcatchmentPR-1B: PR-1B Runoff Area=105,533 sf 3.78% Impervious Runoff Depth=1.77"
 Tc=5.0 min CN=86 Runoff=5.17 cfs 0.358 af

SubcatchmentPR-2A: PR-2A Runoff Area=66,700 sf 43.93% Impervious Runoff Depth=1.22"
 Flow Length=410' Tc=5.0 min CN=78 Runoff=2.20 cfs 0.156 af

SubcatchmentPR-2B: PR-2B Runoff Area=65,700 sf 44.60% Impervious Runoff Depth=1.22"
 Flow Length=370' Tc=5.6 min CN=78 Runoff=2.13 cfs 0.154 af

Pond 1AP: Stormwater Basin Peak Elev=163.22' Storage=6,702 cf Inflow=2.01 cfs 0.168 af
 Discarded=0.01 cfs 0.028 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.028 af

Pond 1BP: Turf Reservoir Peak Elev=172.73' Storage=8,530 cf Inflow=5.17 cfs 0.358 af
 Discarded=0.22 cfs 0.358 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.358 af

Pond 2AP: Rain Garden Peak Elev=169.72' Storage=1,791 cf Inflow=2.20 cfs 0.156 af
 Discarded=0.46 cfs 0.156 af Primary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.156 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af

Link DP-2: DP-2 Inflow=2.13 cfs 0.154 af
 Primary=2.13 cfs 0.154 af

Total Runoff Area = 8.557 ac Runoff Volume = 0.836 af Average Runoff Depth = 1.17"
73.90% Pervious = 6.324 ac 26.10% Impervious = 2.233 ac

Summary for Subcatchment PR-1A: PR-1A

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 0.168 af, Depth= 0.65"
 Routed to Pond 1AP : Stormwater Basin

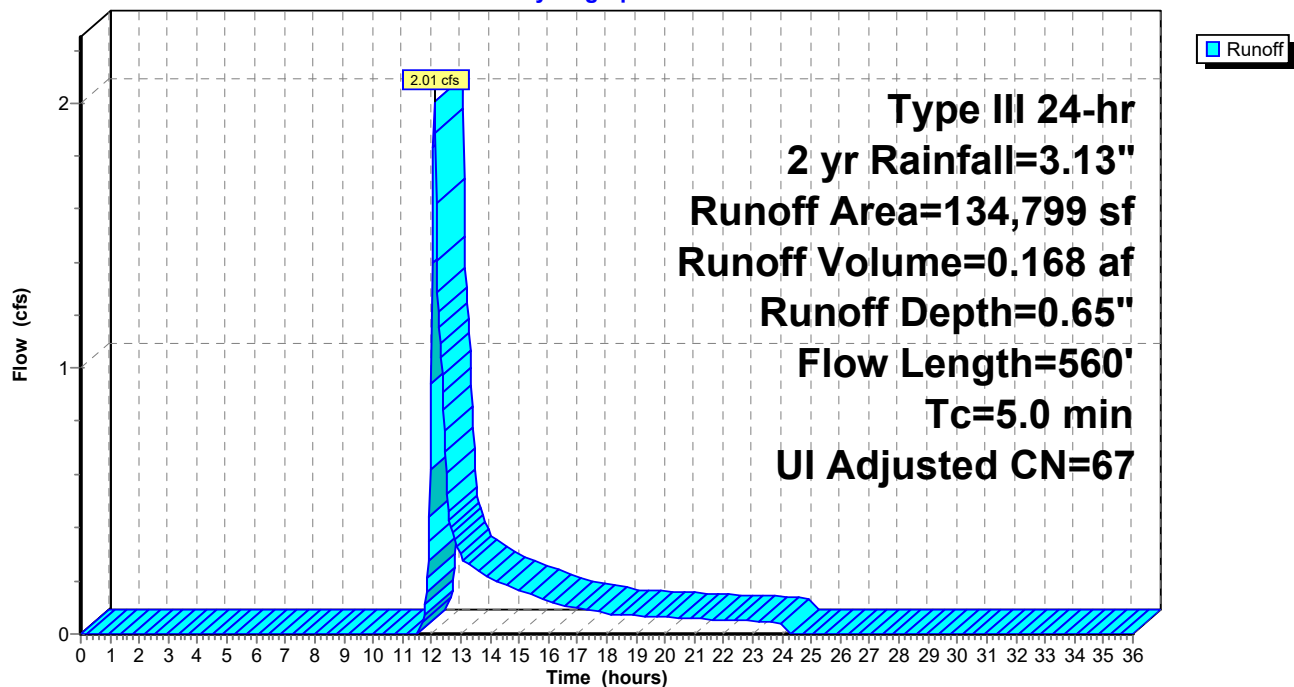
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 yr Rainfall=3.13"

Area (sf)	CN	Adj	Description
30,254	98		Unconnected pavement, HSG B
947	96		Gravel surface, HSG B
99,160	61		>75% Grass cover, Good, HSG B
4,438	98		Roofs, HSG B
134,799	71	67	Weighted Average, UI Adjusted
100,107			74.26% Pervious Area
34,692			25.74% Impervious Area
30,254			87.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
2.0	360		3.00		Direct Entry, pipe flow
1.3	150	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.9	560	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-1A: PR-1A

Hydrograph



Summary for Subcatchment PR-1B: PR-1B

Runoff = 5.17 cfs @ 12.08 hrs, Volume= 0.358 af, Depth= 1.77"
 Routed to Pond 1BP : Turf Reservoir

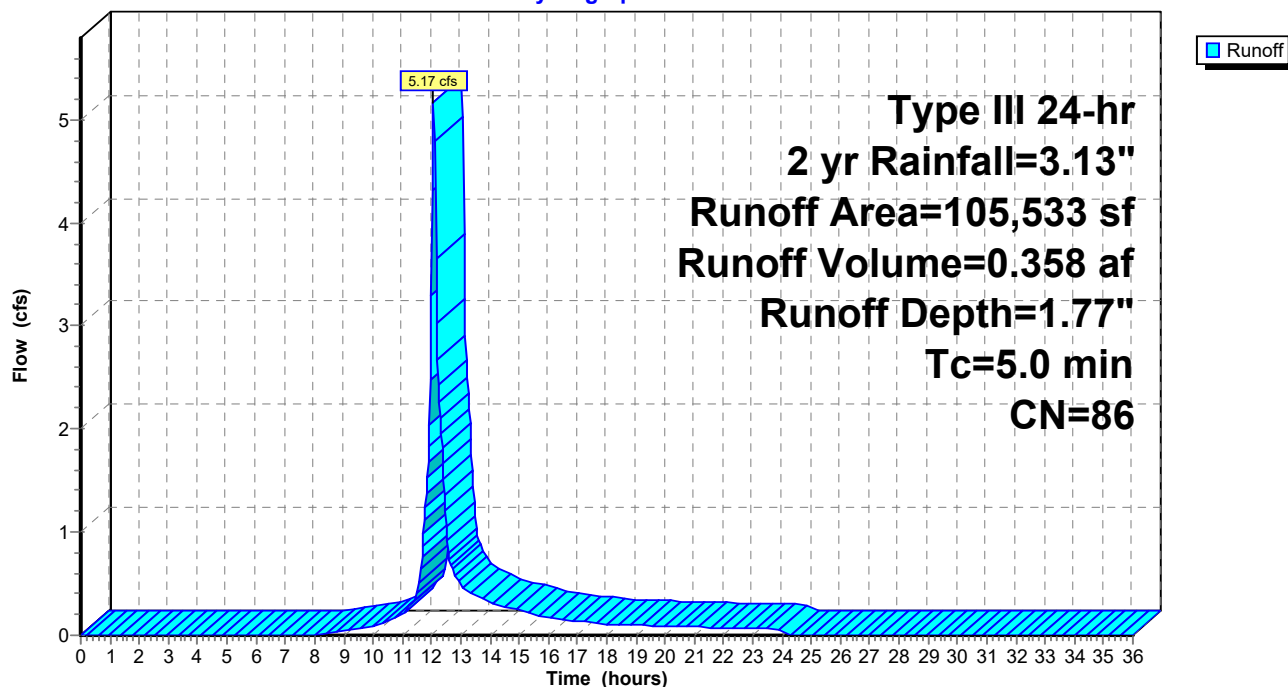
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 yr Rainfall=3.13"

Area (sf)	CN	Description
3,984	98	Unconnected pavement, HSG B
4,917	96	Gravel surface, HSG B
93,955	86	Fallow, bare soil, HSG B
2,677	61	>75% Grass cover, Good, HSG B
105,533	86	Weighted Average
101,549		96.22% Pervious Area
3,984		3.78% Impervious Area
3,984		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					Direct Entry,
1.0	0				Total, Increased to minimum Tc = 5.0 min

Subcatchment PR-1B: PR-1B

Hydrograph



Summary for Subcatchment PR-2A: PR-2A

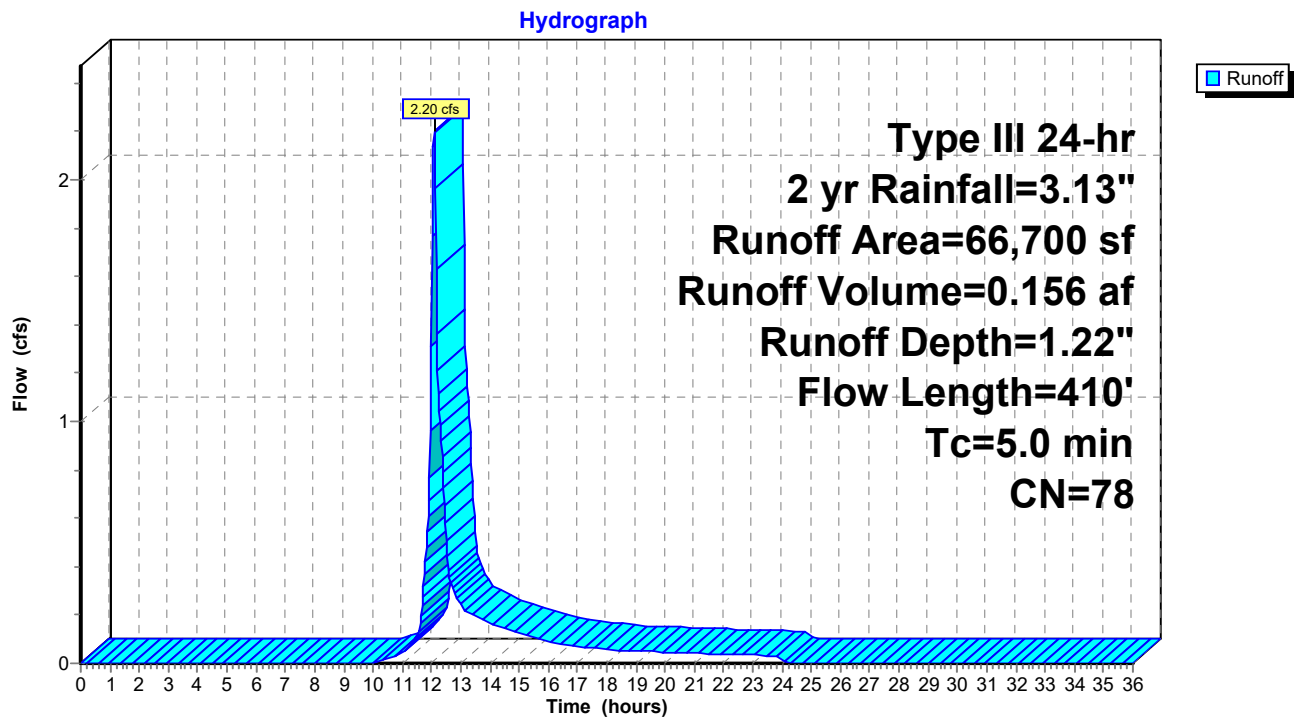
Runoff = 2.20 cfs @ 12.08 hrs, Volume= 0.156 af, Depth= 1.22"
 Routed to Pond 2AP : Rain Garden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 yr Rainfall=3.13"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
35,900	61	>75% Grass cover, Good, HSG B
1,500	96	Gravel surface, HSG B
66,700	78	Weighted Average
37,400		56.07% Pervious Area
29,300		43.93% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
0.7	130	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	50		3.00		Direct Entry, pipe flow
1.5	180	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	410	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

Runoff = 2.13 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 1.22"
 Routed to Link DP-2 : DP-2

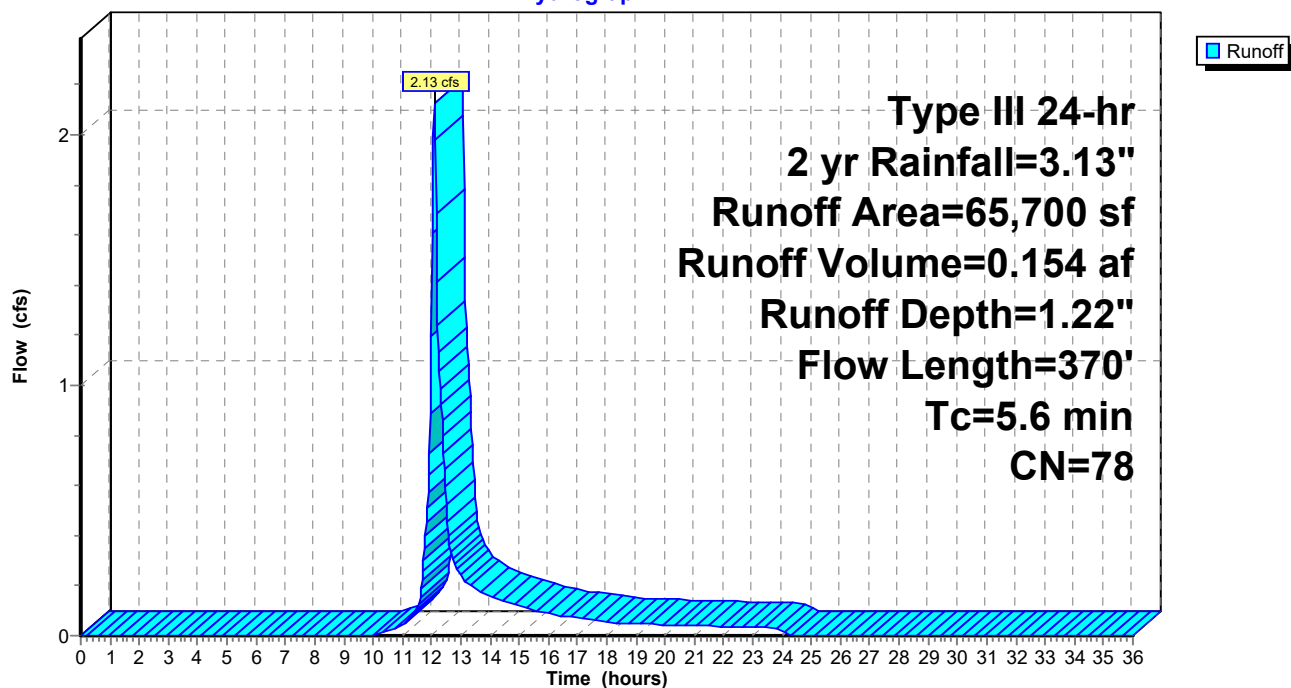
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 yr Rainfall=3.13"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
36,400	61	>75% Grass cover, Good, HSG B
65,700	78	Weighted Average
36,400		55.40% Pervious Area
29,300		44.60% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2200	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.4	320	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.6	370	Total			

Subcatchment PR-2B: PR-2B

Hydrograph



Summary for Pond 1AP: Stormwater Basin

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 0.36" for 2 yr event
 Inflow = 2.01 cfs @ 12.09 hrs, Volume= 0.168 af
 Outflow = 0.01 cfs @ 24.09 hrs, Volume= 0.028 af, Atten= 99%, Lag= 719.8 min
 Discarded = 0.01 cfs @ 24.09 hrs, Volume= 0.028 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 163.22' @ 24.09 hrs Surf.Area= 6,193 sf Storage= 6,702 cf

Plug-Flow detention time= 724.4 min calculated for 0.028 af (17% of inflow)
 Center-of-Mass det. time= 559.4 min (1,447.5 - 888.1)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	28,990 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	4,840	0	0
163.00	5,940	5,390	5,390
164.00	7,110	6,525	11,915
165.00	8,320	7,715	19,630
166.00	10,400	9,360	28,990

Device	Routing	Invert	Outlet Devices
#1	Primary	165.00'	10.0' 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
#2	Discarded	162.00'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'
#3	Primary	163.70'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

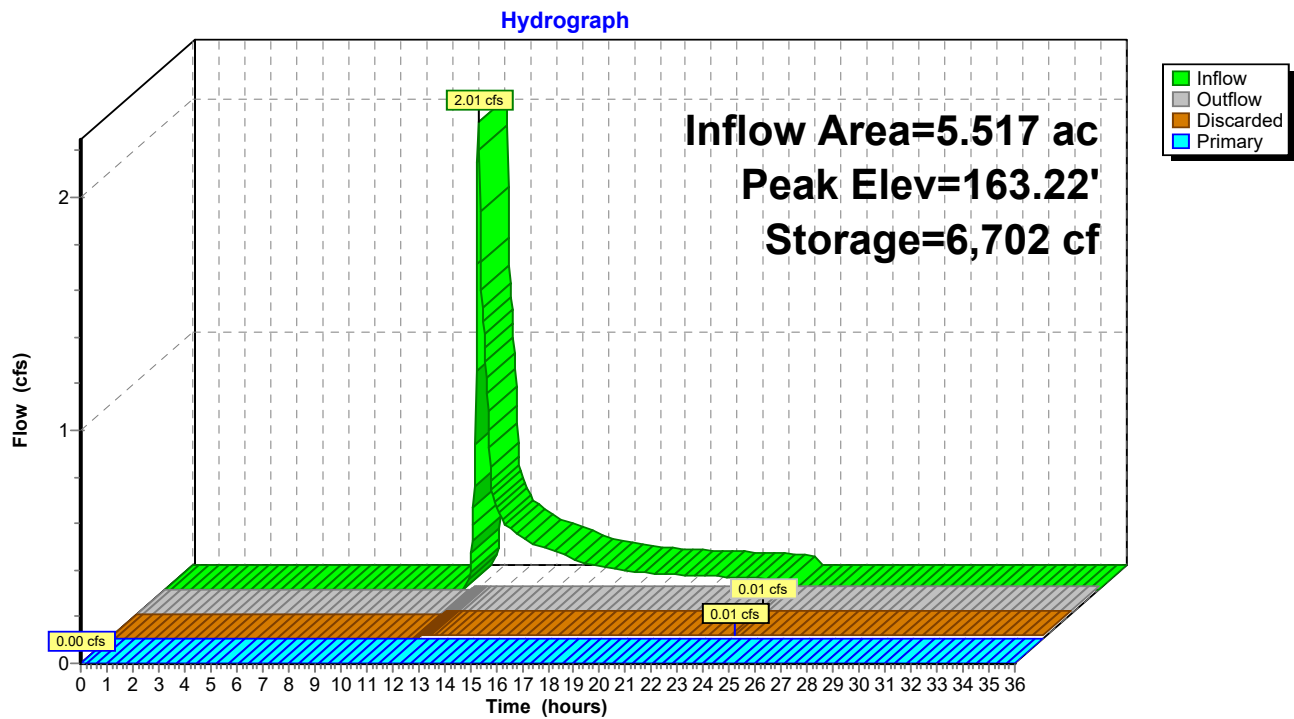
Discarded OutFlow Max=0.01 cfs @ 24.09 hrs HW=163.22' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)

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

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 1AP: Stormwater Basin

Summary for Pond 1BP: Turf Reservoir

Inflow Area = 2.423 ac, 3.78% Impervious, Inflow Depth = 1.77" for 2 yr event
 Inflow = 5.17 cfs @ 12.08 hrs, Volume= 0.358 af
 Outflow = 0.22 cfs @ 15.40 hrs, Volume= 0.358 af, Atten= 96%, Lag= 199.4 min
 Discarded = 0.22 cfs @ 15.40 hrs, Volume= 0.358 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1AP : Stormwater Basin

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 172.73' @ 15.40 hrs Surf.Area= 93,140 sf Storage= 8,530 cf

Plug-Flow detention time= 399.6 min calculated for 0.358 af (100% of inflow)
 Center-of-Mass det. time= 399.7 min (1,222.2 - 822.6)

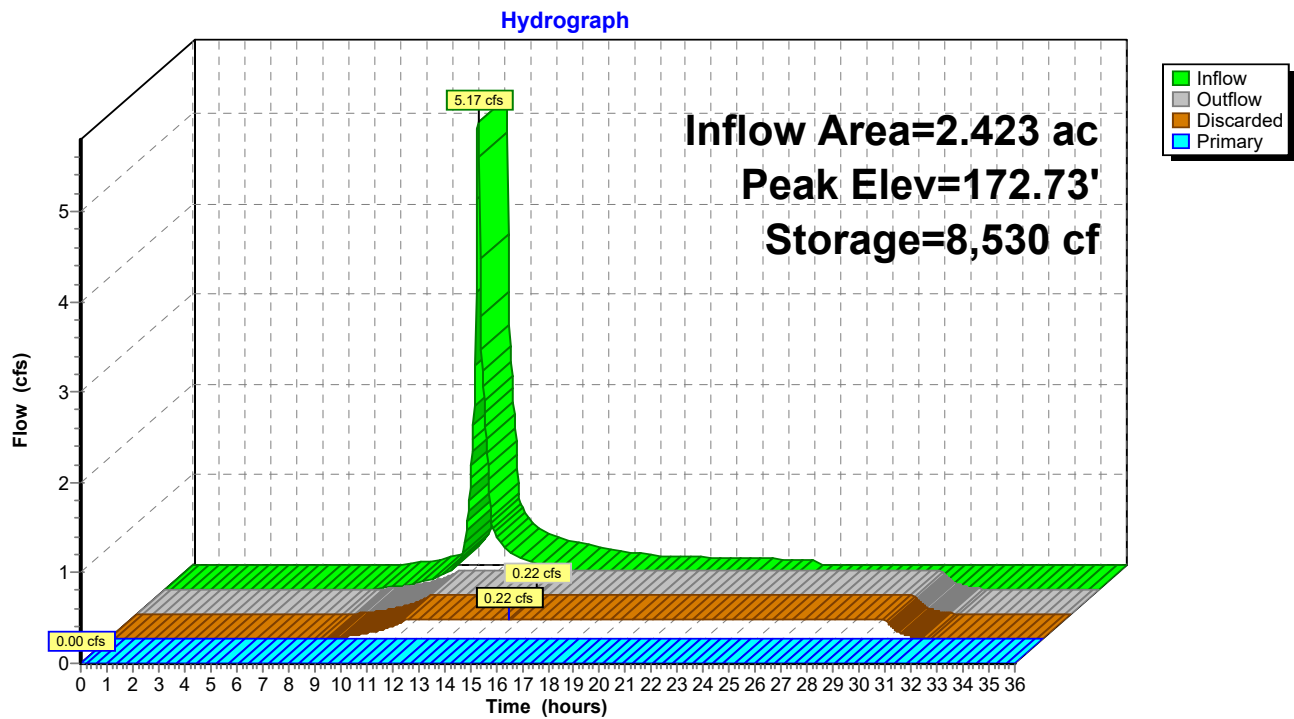
Volume	Invert	Avail.Storage	Storage Description
#1	172.50'	37,256 cf	Custom Stage Data (Irregular) Listed below (Recalc) 93,140 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.50	93,140	746.0	0	0	93,140
173.00	93,140	746.0	46,570	46,570	93,513
173.50	93,140	746.0	46,570	93,140	93,886

Device	Routing	Invert	Outlet Devices
#1	Primary	172.75'	746.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	172.50'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 15.40 hrs HW=172.73' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=172.50' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1BP: Turf Reservoir

Summary for Pond 2AP: Rain Garden

Inflow Area = 1.531 ac, 43.93% Impervious, Inflow Depth = 1.22" for 2 yr event
 Inflow = 2.20 cfs @ 12.08 hrs, Volume= 0.156 af
 Outflow = 0.46 cfs @ 12.53 hrs, Volume= 0.156 af, Atten= 79%, Lag= 27.2 min
 Discarded = 0.46 cfs @ 12.53 hrs, Volume= 0.156 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 169.72' @ 12.53 hrs Surf.Area= 2,780 sf Storage= 1,791 cf

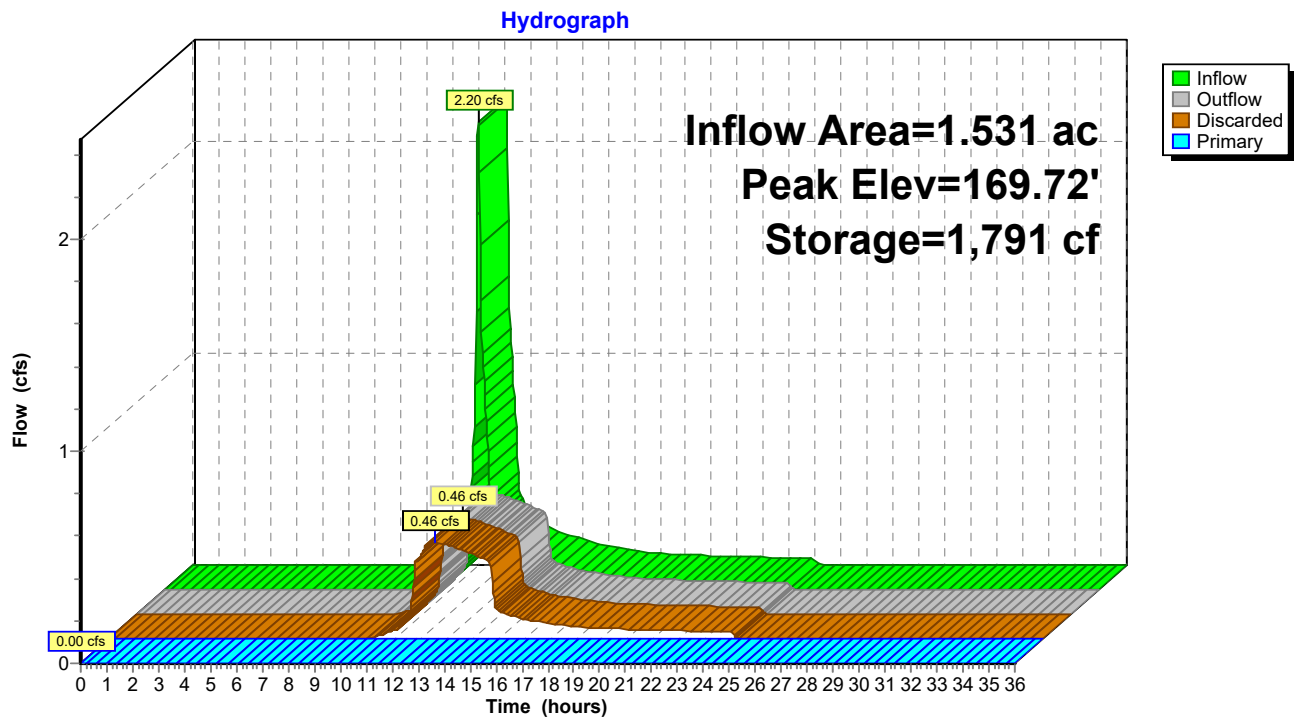
Plug-Flow detention time= 27.8 min calculated for 0.156 af (100% of inflow)
 Center-of-Mass det. time= 27.8 min (877.3 - 849.5)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	15,808 cf	20.00'W x 110.00'L x 4.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	7.000 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 5.00'
#2	Primary	172.00'	40.0' long + 20.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.46 cfs @ 12.53 hrs HW=169.72' (Free Discharge)
 ↑1=Exfiltration (Controls 0.46 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 2AP: Rain Garden

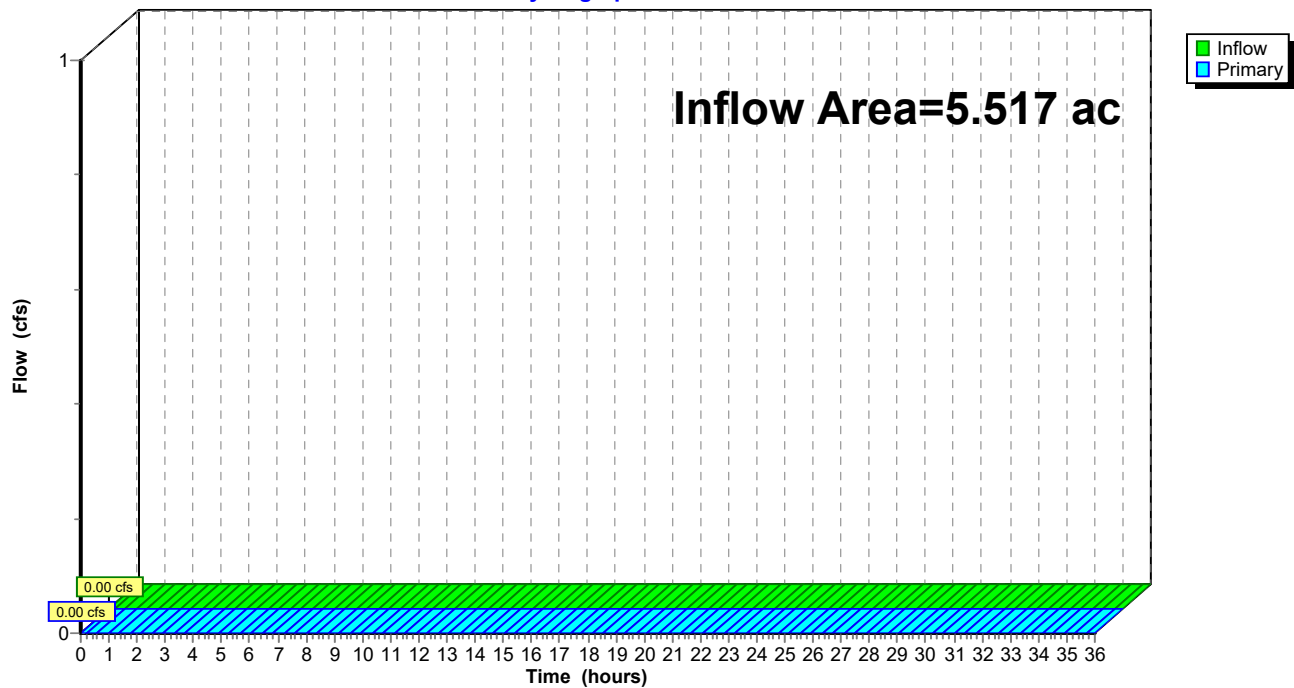
Summary for Link DP-1: DP-1

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-1: DP-1

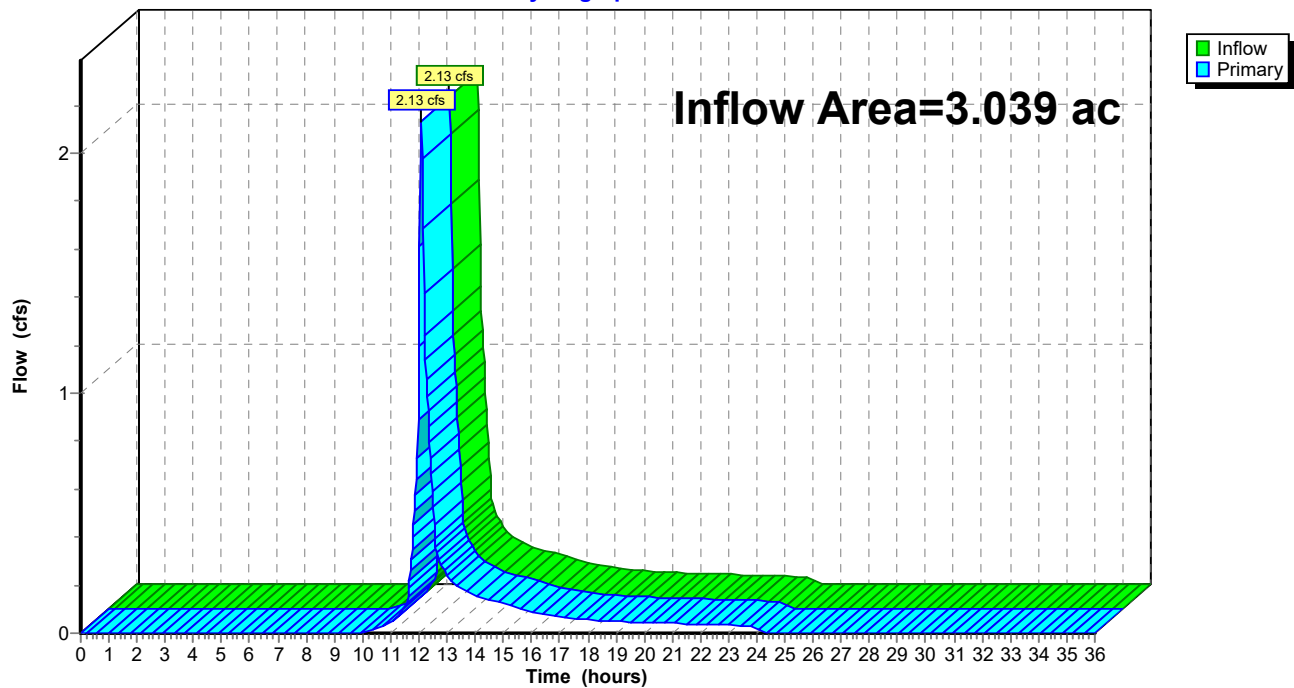
Hydrograph



Summary for Link DP-2: DP-2

Inflow Area = 3.039 ac, 44.26% Impervious, Inflow Depth = 0.61" for 2 yr event
Inflow = 2.13 cfs @ 12.09 hrs, Volume= 0.154 af
Primary = 2.13 cfs @ 12.09 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-2: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR-1A: PR-1A Runoff Area=134,799 sf 25.74% Impervious Runoff Depth=1.77"
 Flow Length=560' Tc=5.0 min UI Adjusted CN=67 Runoff=6.36 cfs 0.456 af

SubcatchmentPR-1B: PR-1B Runoff Area=105,533 sf 3.78% Impervious Runoff Depth=3.42"
 Tc=5.0 min CN=86 Runoff=9.87 cfs 0.691 af

SubcatchmentPR-2A: PR-2A Runoff Area=66,700 sf 43.93% Impervious Runoff Depth=2.67"
 Flow Length=410' Tc=5.0 min CN=78 Runoff=4.92 cfs 0.341 af

SubcatchmentPR-2B: PR-2B Runoff Area=65,700 sf 44.60% Impervious Runoff Depth=2.67"
 Flow Length=370' Tc=5.6 min CN=78 Runoff=4.76 cfs 0.336 af

Pond 1AP: Stormwater Basin Peak Elev=164.34' Storage=14,405 cf Inflow=9.70 cfs 0.699 af
 Discarded=0.02 cfs 0.033 af Primary=1.73 cfs 0.446 af Outflow=1.74 cfs 0.479 af

Pond 1BP: Turf Reservoir Peak Elev=172.77' Storage=10,083 cf Inflow=9.87 cfs 0.691 af
 Discarded=0.22 cfs 0.447 af Primary=5.64 cfs 0.243 af Outflow=5.86 cfs 0.691 af

Pond 2AP: Rain Garden Peak Elev=170.81' Storage=5,316 cf Inflow=4.92 cfs 0.341 af
 Discarded=0.62 cfs 0.341 af Primary=0.00 cfs 0.000 af Outflow=0.62 cfs 0.341 af

Link DP-1: DP-1 Inflow=1.73 cfs 0.446 af
 Primary=1.73 cfs 0.446 af

Link DP-2: DP-2 Inflow=4.76 cfs 0.336 af
 Primary=4.76 cfs 0.336 af

Total Runoff Area = 8.557 ac Runoff Volume = 1.823 af Average Runoff Depth = 2.56"
73.90% Pervious = 6.324 ac 26.10% Impervious = 2.233 ac

Summary for Subcatchment PR-1A: PR-1A

Runoff = 6.36 cfs @ 12.08 hrs, Volume= 0.456 af, Depth= 1.77"
 Routed to Pond 1AP : Stormwater Basin

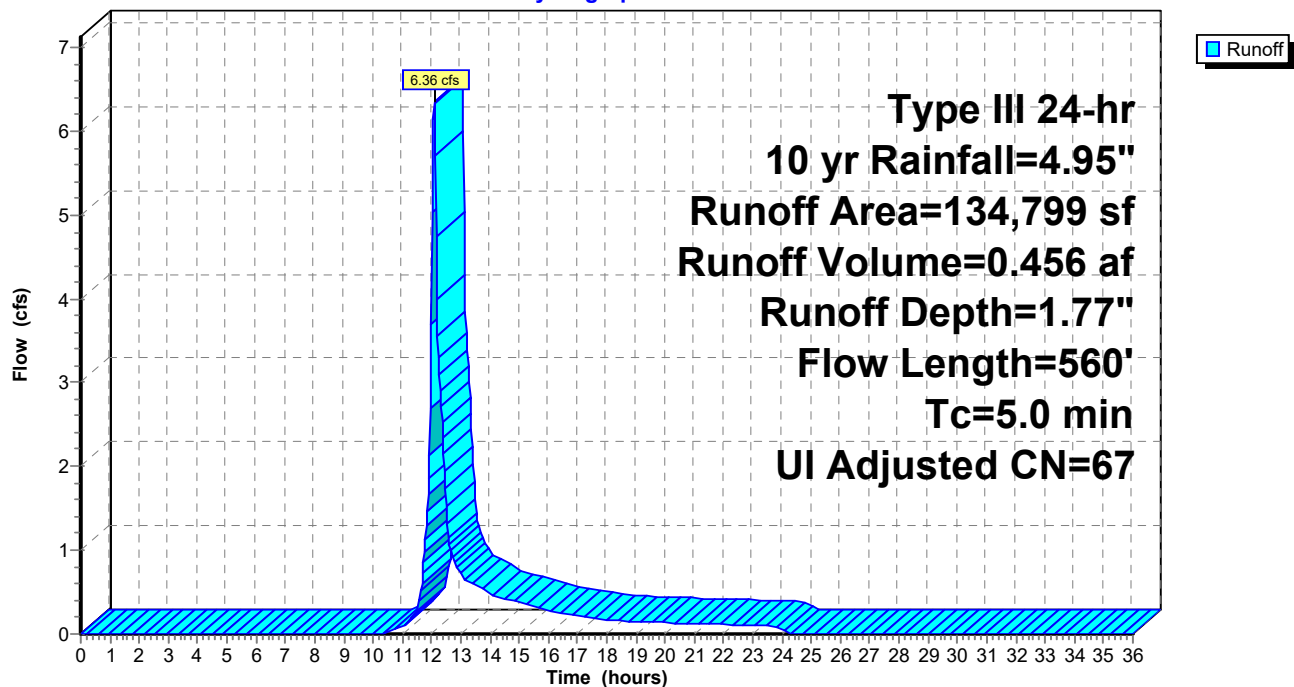
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 yr Rainfall=4.95"

Area (sf)	CN	Adj	Description
30,254	98		Unconnected pavement, HSG B
947	96		Gravel surface, HSG B
99,160	61		>75% Grass cover, Good, HSG B
4,438	98		Roofs, HSG B
134,799	71	67	Weighted Average, UI Adjusted
100,107			74.26% Pervious Area
34,692			25.74% Impervious Area
30,254			87.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
2.0	360		3.00		Direct Entry, pipe flow
1.3	150	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.9	560	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-1A: PR-1A

Hydrograph



Summary for Subcatchment PR-1B: PR-1B

Runoff = 9.87 cfs @ 12.07 hrs, Volume= 0.691 af, Depth= 3.42"
 Routed to Pond 1BP : Turf Reservoir

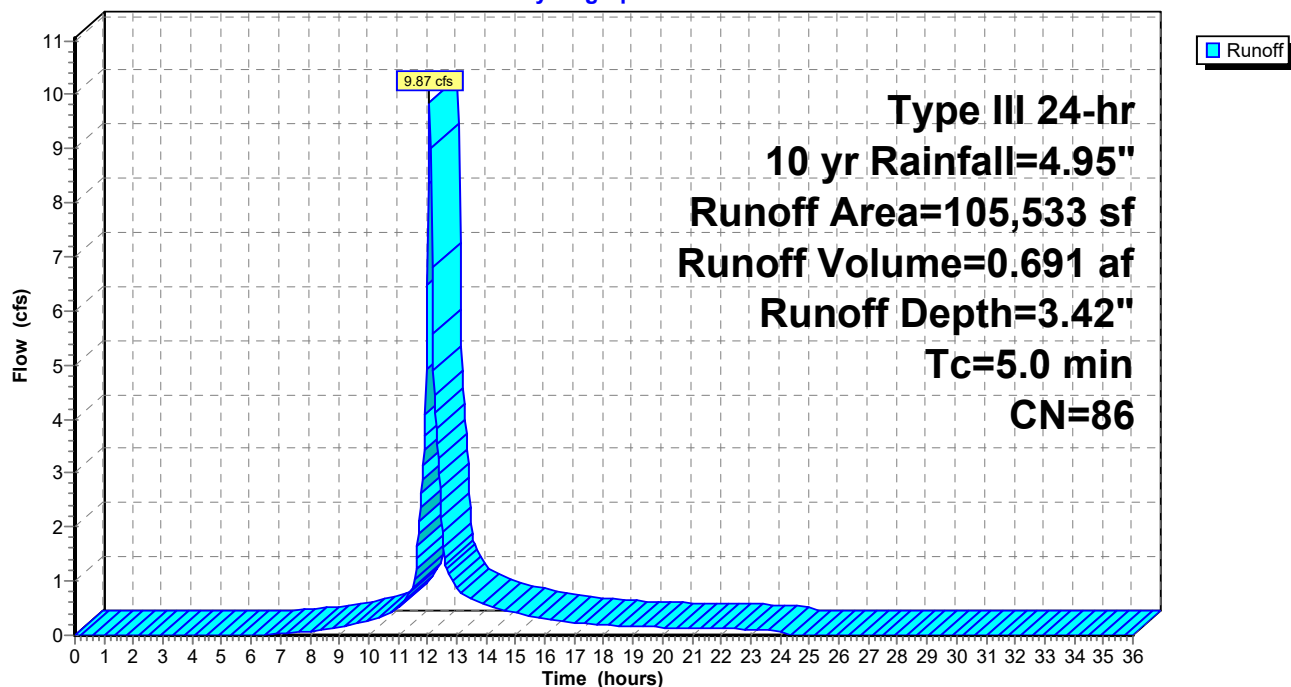
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 yr Rainfall=4.95"

Area (sf)	CN	Description
3,984	98	Unconnected pavement, HSG B
4,917	96	Gravel surface, HSG B
93,955	86	Fallow, bare soil, HSG B
2,677	61	>75% Grass cover, Good, HSG B
105,533	86	Weighted Average
101,549		96.22% Pervious Area
3,984		3.78% Impervious Area
3,984		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					Direct Entry,
1.0	0				Total, Increased to minimum Tc = 5.0 min

Subcatchment PR-1B: PR-1B

Hydrograph



Summary for Subcatchment PR-2A: PR-2A

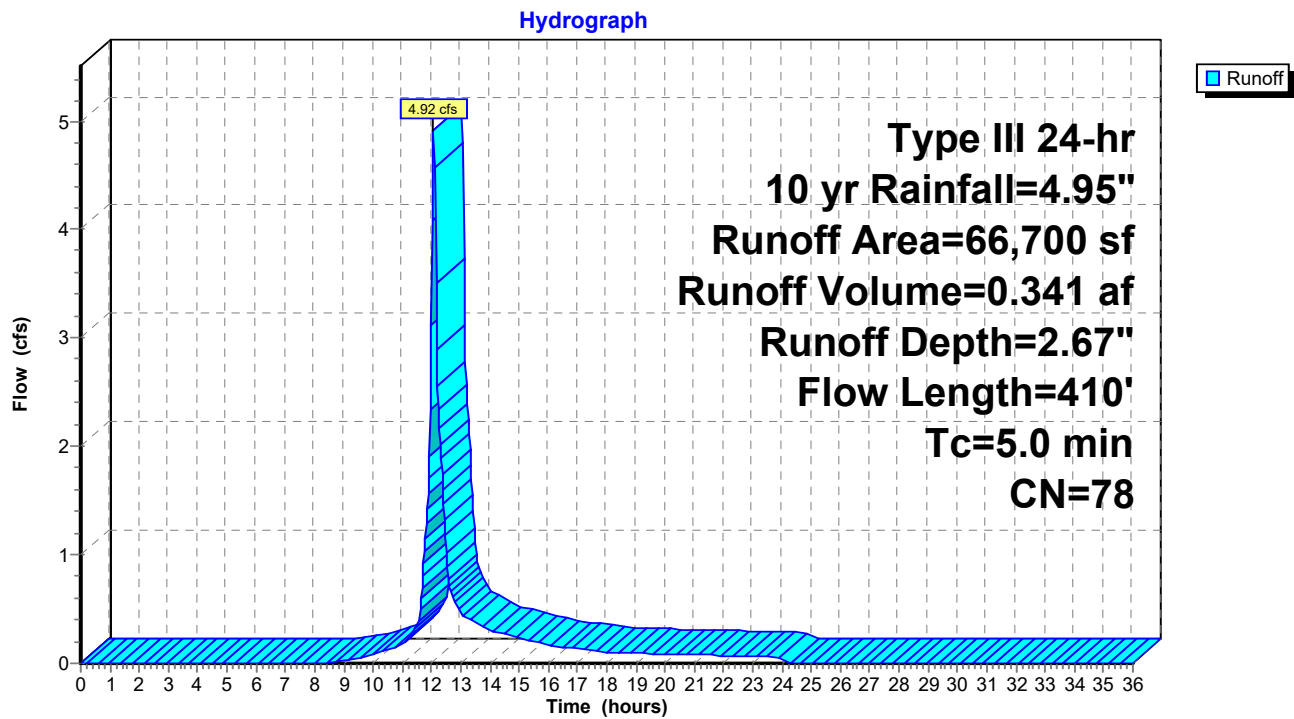
Runoff = 4.92 cfs @ 12.08 hrs, Volume= 0.341 af, Depth= 2.67"
 Routed to Pond 2AP : Rain Garden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 yr Rainfall=4.95"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
35,900	61	>75% Grass cover, Good, HSG B
1,500	96	Gravel surface, HSG B
66,700	78	Weighted Average
37,400		56.07% Pervious Area
29,300		43.93% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
0.7	130	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	50		3.00		Direct Entry, pipe flow
1.5	180	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	410	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

Runoff = 4.76 cfs @ 12.09 hrs, Volume= 0.336 af, Depth= 2.67"
 Routed to Link DP-2 : DP-2

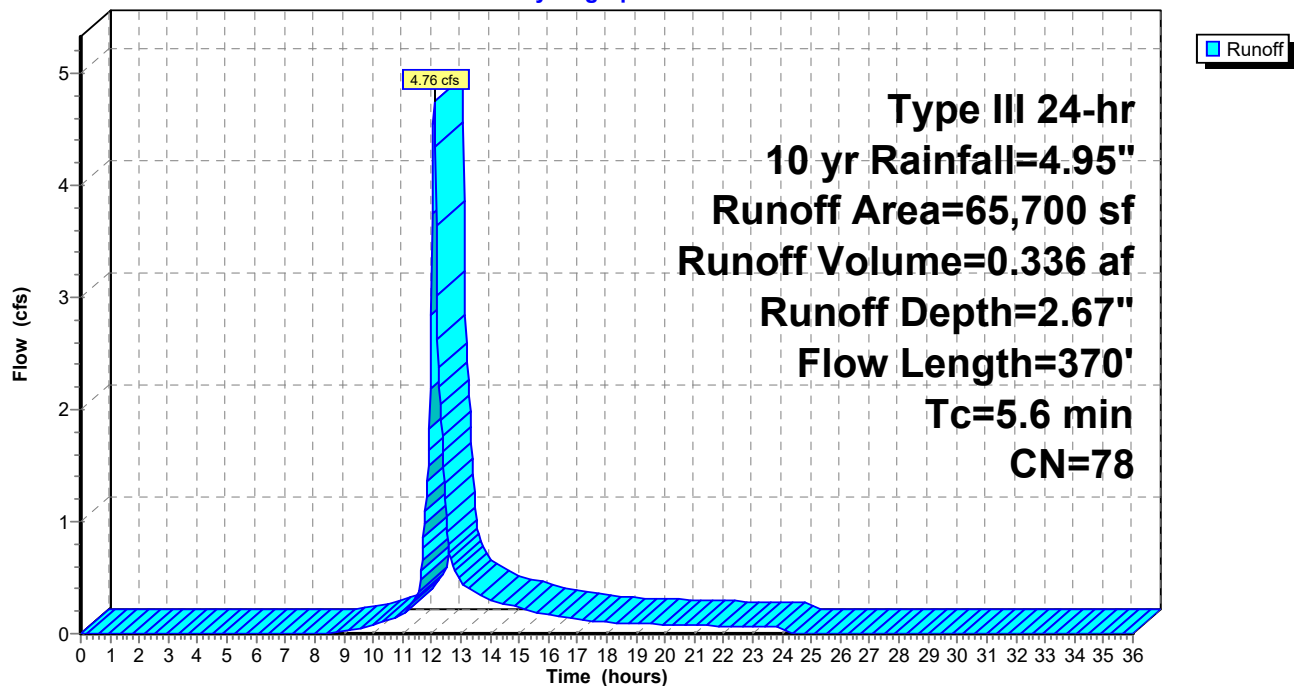
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 yr Rainfall=4.95"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
36,400	61	>75% Grass cover, Good, HSG B
65,700	78	Weighted Average
36,400		55.40% Pervious Area
29,300		44.60% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2200	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.4	320	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.6	370	Total			

Subcatchment PR-2B: PR-2B

Hydrograph



Summary for Pond 1AP: Stormwater Basin

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 1.52" for 10 yr event
 Inflow = 9.70 cfs @ 12.17 hrs, Volume= 0.699 af
 Outflow = 1.74 cfs @ 12.82 hrs, Volume= 0.479 af, Atten= 82%, Lag= 39.1 min
 Discarded = 0.02 cfs @ 12.82 hrs, Volume= 0.033 af
 Primary = 1.73 cfs @ 12.82 hrs, Volume= 0.446 af
 Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 164.34' @ 12.82 hrs Surf.Area= 7,522 sf Storage= 14,405 cf

Plug-Flow detention time= 220.1 min calculated for 0.479 af (69% of inflow)
 Center-of-Mass det. time= 136.4 min (965.6 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	28,990 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	4,840	0	0
163.00	5,940	5,390	5,390
164.00	7,110	6,525	11,915
165.00	8,320	7,715	19,630
166.00	10,400	9,360	28,990

Device	Routing	Invert	Outlet Devices
#1	Primary	165.00'	10.0' 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
#2	Discarded	162.00'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'
#3	Primary	163.70'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

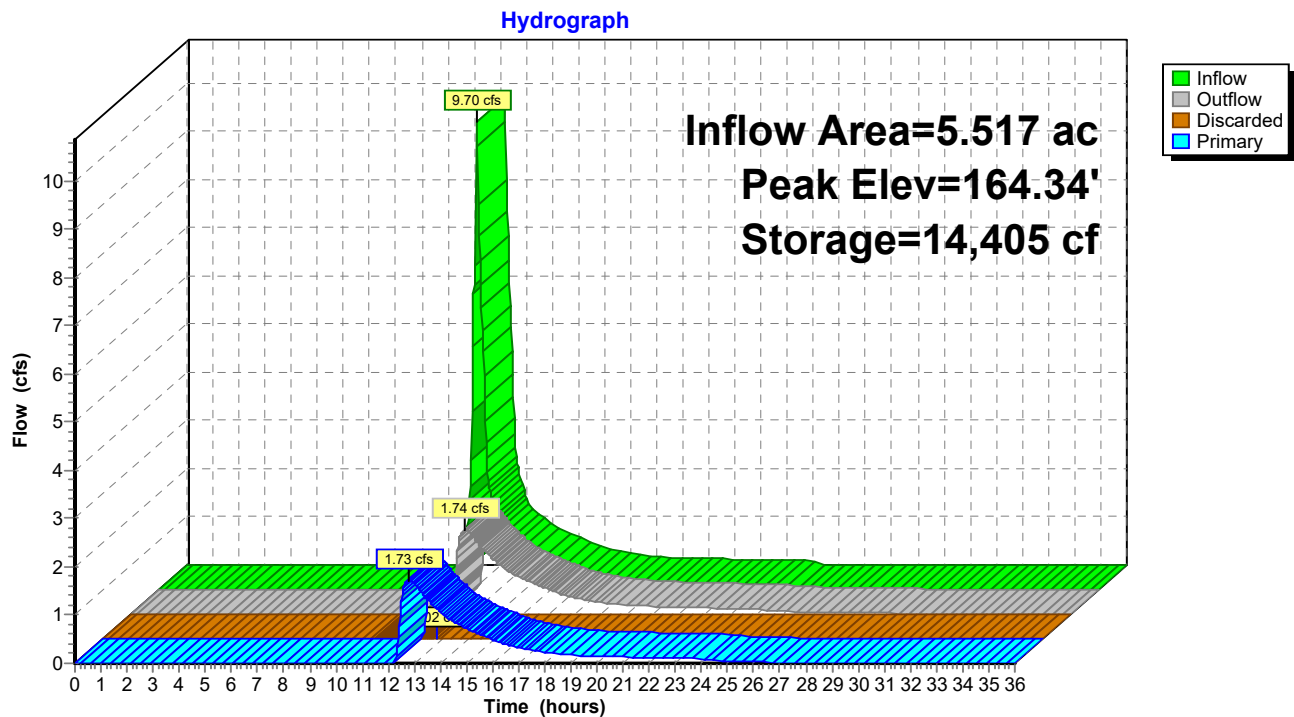
Discarded OutFlow Max=0.02 cfs @ 12.82 hrs HW=164.34' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=1.72 cfs @ 12.82 hrs HW=164.34' (Free Discharge)

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

↑ **3=Orifice/Grate** (Orifice Controls 1.72 cfs @ 2.72 fps)

Pond 1AP: Stormwater Basin

Summary for Pond 1BP: Turf Reservoir

Inflow Area = 2.423 ac, 3.78% Impervious, Inflow Depth = 3.42" for 10 yr event
 Inflow = 9.87 cfs @ 12.07 hrs, Volume= 0.691 af
 Outflow = 5.86 cfs @ 12.18 hrs, Volume= 0.691 af, Atten= 41%, Lag= 6.7 min
 Discarded = 0.22 cfs @ 12.18 hrs, Volume= 0.447 af
 Primary = 5.64 cfs @ 12.18 hrs, Volume= 0.243 af
 Routed to Pond 1AP : Stormwater Basin

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 172.77' @ 12.18 hrs Surf.Area= 93,140 sf Storage= 10,083 cf

Plug-Flow detention time= 294.6 min calculated for 0.690 af (100% of inflow)
 Center-of-Mass det. time= 294.9 min (1,098.8 - 803.9)

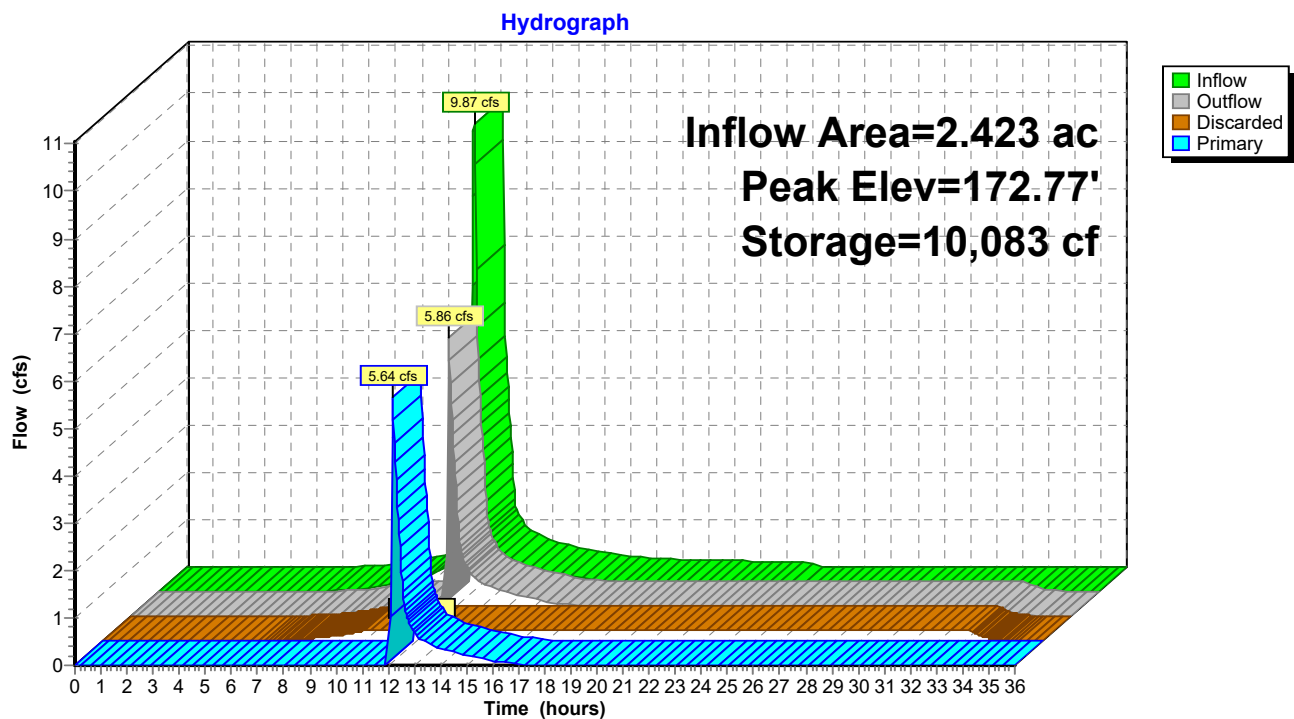
Volume	Invert	Avail.Storage	Storage Description
#1	172.50'	37,256 cf	Custom Stage Data (Irregular) Listed below (Recalc) 93,140 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.50	93,140	746.0	0	0	93,140
173.00	93,140	746.0	46,570	46,570	93,513
173.50	93,140	746.0	46,570	93,140	93,886

Device	Routing	Invert	Outlet Devices
#1	Primary	172.75'	746.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	172.50'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 12.18 hrs HW=172.77' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=5.54 cfs @ 12.18 hrs HW=172.77' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 5.54 cfs @ 0.36 fps)

Pond 1BP: Turf Reservoir

Summary for Pond 2AP: Rain Garden

Inflow Area = 1.531 ac, 43.93% Impervious, Inflow Depth = 2.67" for 10 yr event
 Inflow = 4.92 cfs @ 12.08 hrs, Volume= 0.341 af
 Outflow = 0.62 cfs @ 12.71 hrs, Volume= 0.341 af, Atten= 87%, Lag= 38.3 min
 Discarded = 0.62 cfs @ 12.71 hrs, Volume= 0.341 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 170.81' @ 12.71 hrs Surf.Area= 3,726 sf Storage= 5,316 cf

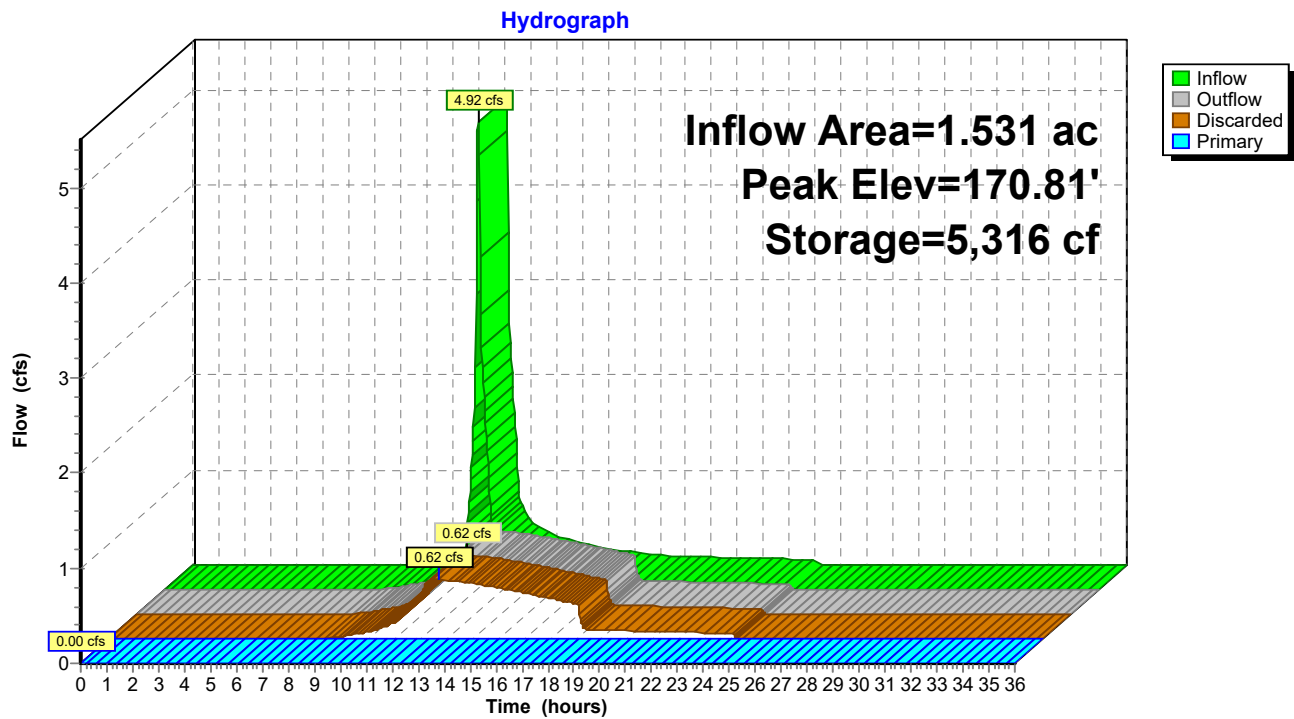
Plug-Flow detention time= 77.2 min calculated for 0.340 af (100% of inflow)
 Center-of-Mass det. time= 77.2 min (903.8 - 826.6)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	15,808 cf	20.00'W x 110.00'L x 4.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	7.000 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 5.00'
#2	Primary	172.00'	40.0' long + 20.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.62 cfs @ 12.71 hrs HW=170.81' (Free Discharge)
 ↑1=Exfiltration (Controls 0.62 cfs)

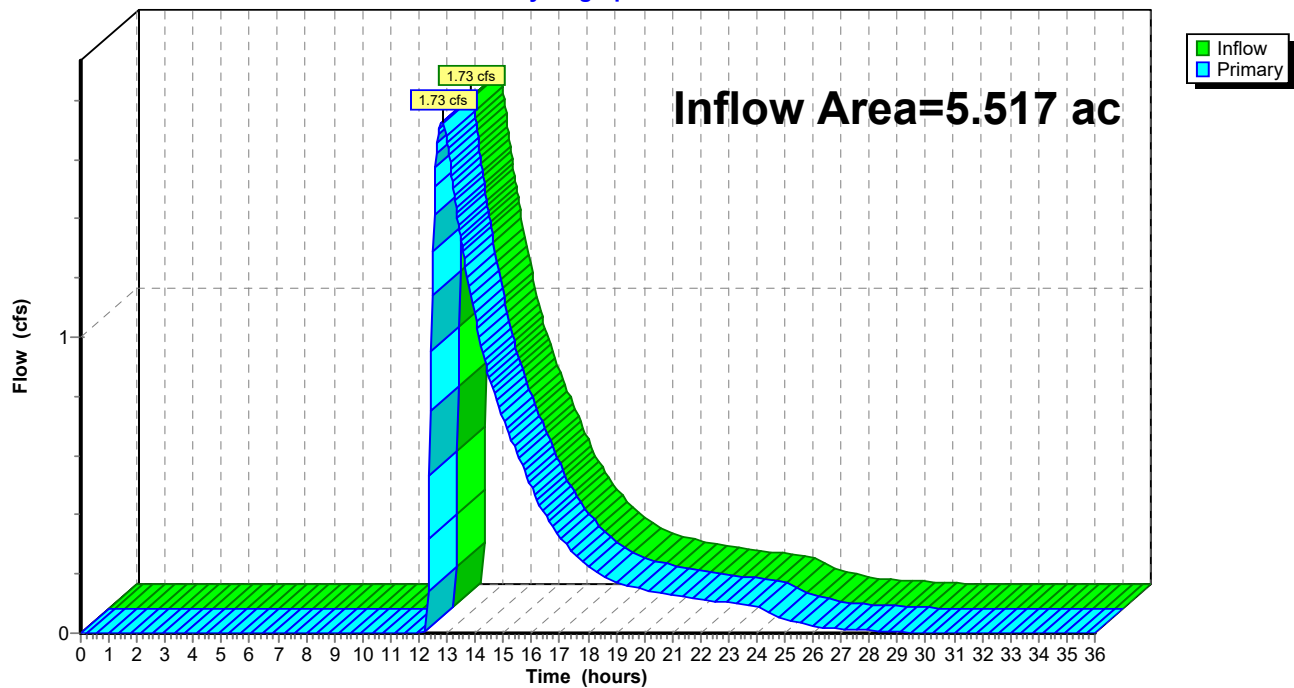
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 2AP: Rain Garden

Summary for Link DP-1: DP-1

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 0.97" for 10 yr event
Inflow = 1.73 cfs @ 12.82 hrs, Volume= 0.446 af
Primary = 1.73 cfs @ 12.82 hrs, Volume= 0.446 af, Atten= 0%, Lag= 0.0 min

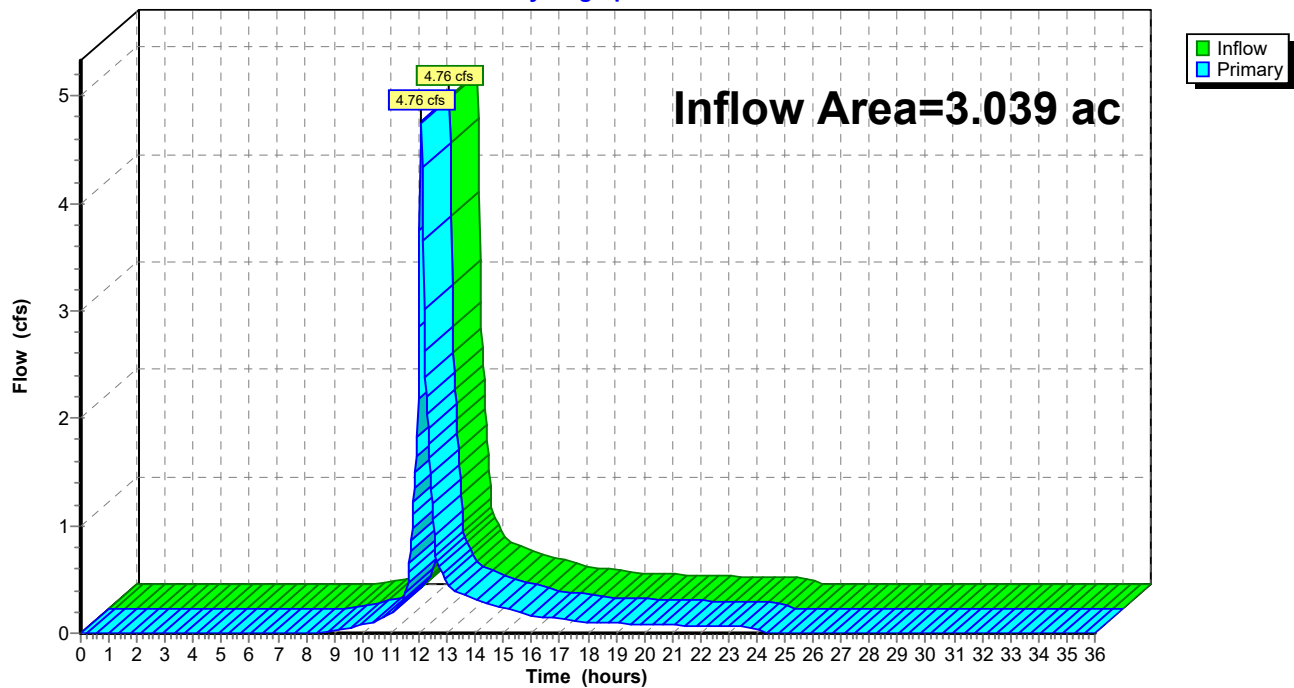
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-1: DP-1**Hydrograph**

Summary for Link DP-2: DP-2

Inflow Area = 3.039 ac, 44.26% Impervious, Inflow Depth = 1.32" for 10 yr event
Inflow = 4.76 cfs @ 12.09 hrs, Volume= 0.336 af
Primary = 4.76 cfs @ 12.09 hrs, Volume= 0.336 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-2: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR-1A: PR-1ARunoff Area=134,799 sf 25.74% Impervious Runoff Depth=2.60"
Flow Length=560' Tc=5.0 min UI Adjusted CN=67 Runoff=9.56 cfs 0.670 af**SubcatchmentPR-1B: PR-1B**Runoff Area=105,533 sf 3.78% Impervious Runoff Depth=4.50"
Tc=5.0 min CN=86 Runoff=12.82 cfs 0.908 af**SubcatchmentPR-2A: PR-2A**Runoff Area=66,700 sf 43.93% Impervious Runoff Depth=3.66"
Flow Length=410' Tc=5.0 min CN=78 Runoff=6.75 cfs 0.467 af**SubcatchmentPR-2B: PR-2B**Runoff Area=65,700 sf 44.60% Impervious Runoff Depth=3.66"
Flow Length=370' Tc=5.6 min CN=78 Runoff=6.51 cfs 0.460 af**Pond 1AP: Stormwater Basin**Peak Elev=165.02' Storage=19,780 cf Inflow=21.37 cfs 1.098 af
Discarded=0.02 cfs 0.034 af Primary=5.00 cfs 0.843 af Outflow=5.02 cfs 0.877 af**Pond 1BP: Turf Reservoir**Peak Elev=172.78' Storage=10,589 cf Inflow=12.82 cfs 0.908 af
Discarded=0.22 cfs 0.479 af Primary=12.07 cfs 0.428 af Outflow=12.29 cfs 0.907 af**Pond 2AP: Rain Garden**Peak Elev=171.45' Storage=7,915 cf Inflow=6.75 cfs 0.467 af
Discarded=0.73 cfs 0.467 af Primary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.467 af**Link DP-1: DP-1**Inflow=5.00 cfs 0.843 af
Primary=5.00 cfs 0.843 af**Link DP-2: DP-2**Inflow=6.51 cfs 0.460 af
Primary=6.51 cfs 0.460 af**Total Runoff Area = 8.557 ac Runoff Volume = 2.504 af Average Runoff Depth = 3.51"**
73.90% Pervious = 6.324 ac 26.10% Impervious = 2.233 ac

Summary for Subcatchment PR-1A: PR-1A

Runoff = 9.56 cfs @ 12.08 hrs, Volume= 0.670 af, Depth= 2.60"
 Routed to Pond 1AP : Stormwater Basin

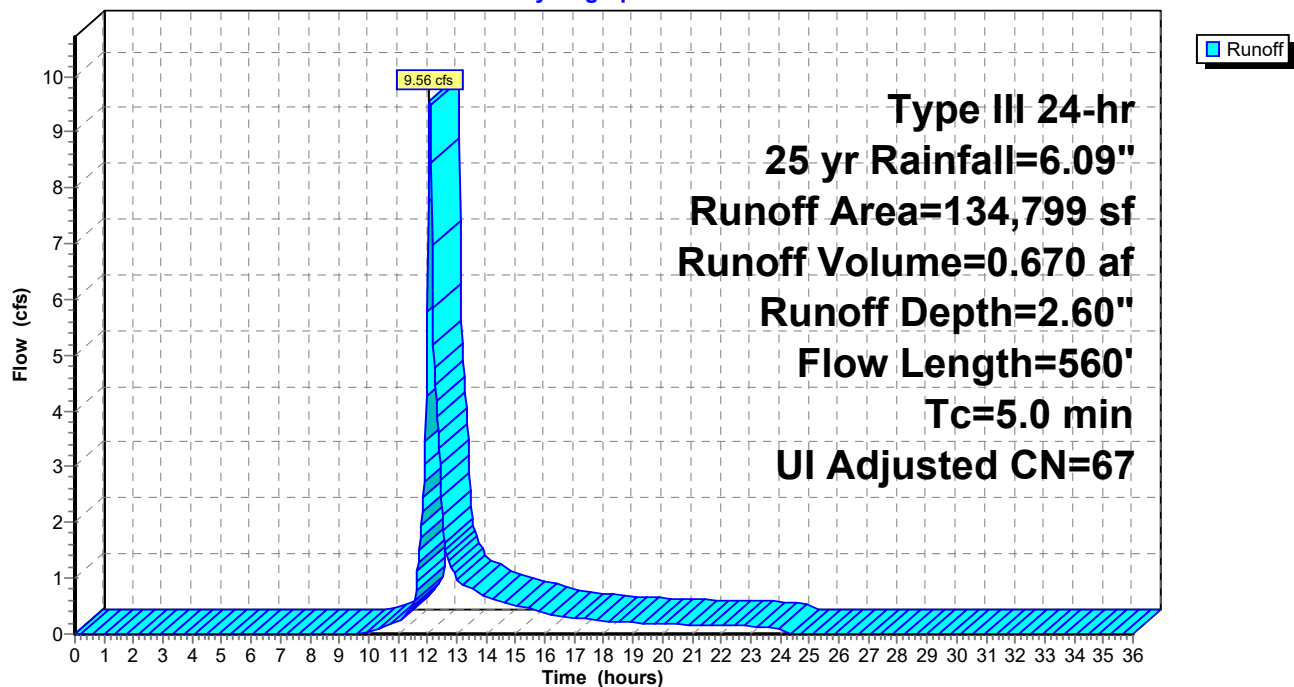
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25 yr Rainfall=6.09"

Area (sf)	CN	Adj	Description
30,254	98		Unconnected pavement, HSG B
947	96		Gravel surface, HSG B
99,160	61		>75% Grass cover, Good, HSG B
4,438	98		Roofs, HSG B
134,799	71	67	Weighted Average, UI Adjusted
100,107			74.26% Pervious Area
34,692			25.74% Impervious Area
30,254			87.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
2.0	360		3.00		Direct Entry, pipe flow
1.3	150	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.9	560	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-1A: PR-1A

Hydrograph



Summary for Subcatchment PR-1B: PR-1B

Runoff = 12.82 cfs @ 12.07 hrs, Volume= 0.908 af, Depth= 4.50"
 Routed to Pond 1BP : Turf Reservoir

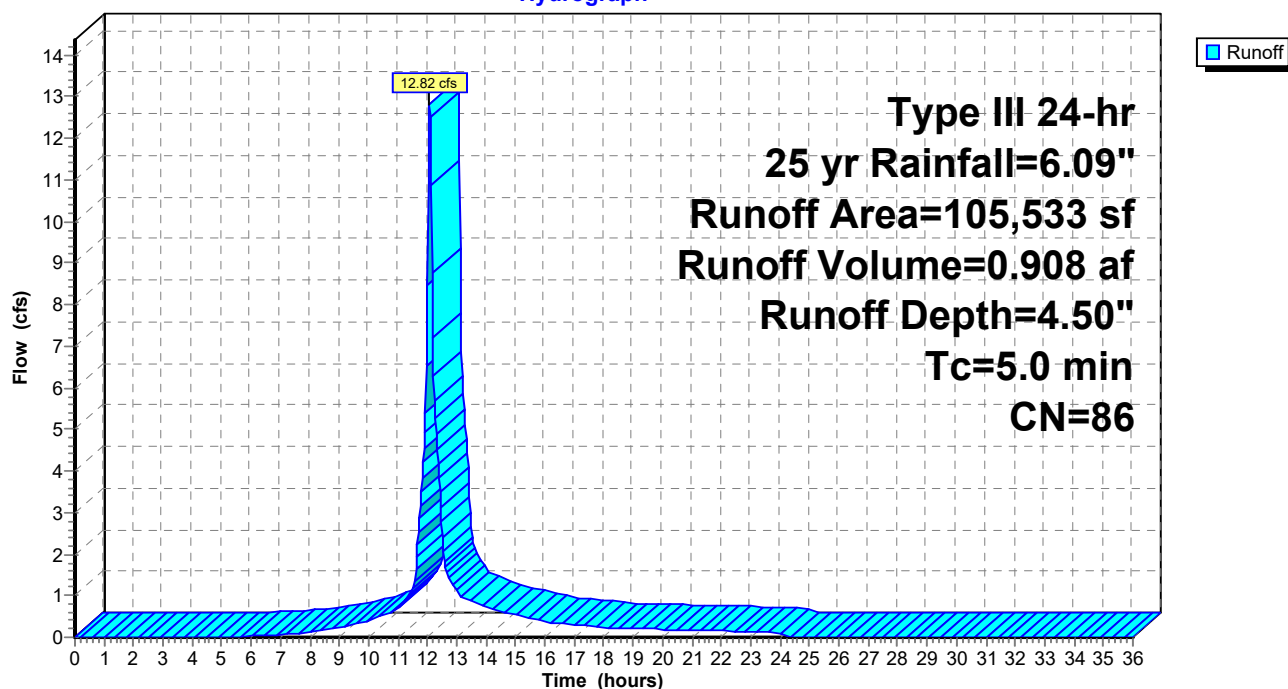
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25 yr Rainfall=6.09"

Area (sf)	CN	Description
3,984	98	Unconnected pavement, HSG B
4,917	96	Gravel surface, HSG B
93,955	86	Fallow, bare soil, HSG B
2,677	61	>75% Grass cover, Good, HSG B
105,533	86	Weighted Average
101,549		96.22% Pervious Area
3,984		3.78% Impervious Area
3,984		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					Direct Entry,
1.0	0				Total, Increased to minimum Tc = 5.0 min

Subcatchment PR-1B: PR-1B

Hydrograph



Summary for Subcatchment PR-2A: PR-2A

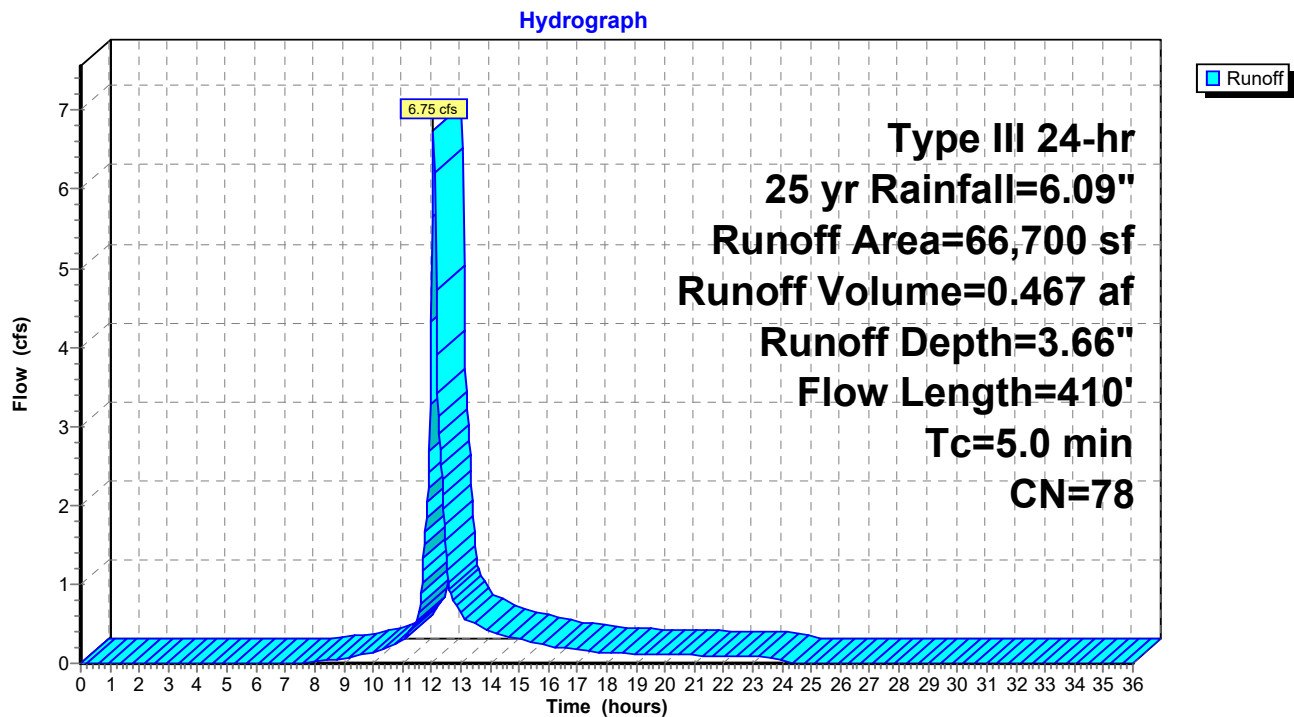
Runoff = 6.75 cfs @ 12.07 hrs, Volume= 0.467 af, Depth= 3.66"
 Routed to Pond 2AP : Rain Garden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25 yr Rainfall=6.09"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
35,900	61	>75% Grass cover, Good, HSG B
1,500	96	Gravel surface, HSG B
66,700	78	Weighted Average
37,400		56.07% Pervious Area
29,300		43.93% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
0.7	130	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	50		3.00		Direct Entry, pipe flow
1.5	180	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	410	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

Runoff = 6.51 cfs @ 12.08 hrs, Volume= 0.460 af, Depth= 3.66"
 Routed to Link DP-2 : DP-2

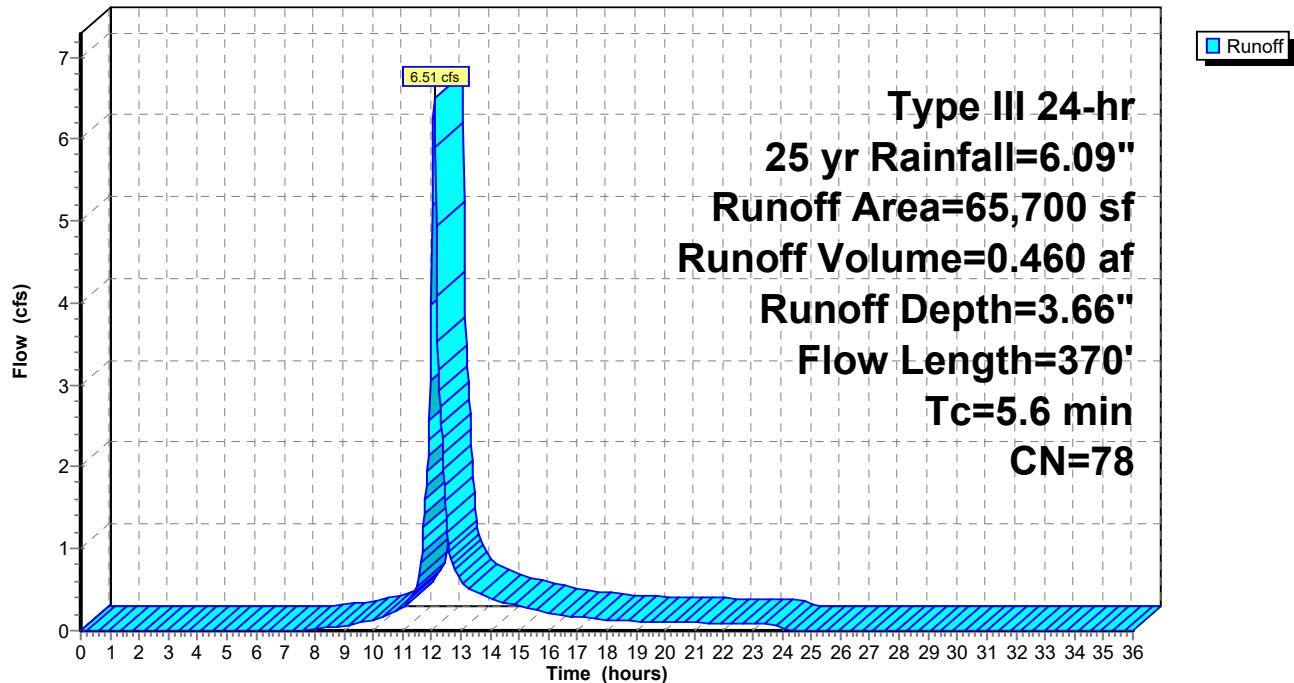
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 25 yr Rainfall=6.09"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
36,400	61	>75% Grass cover, Good, HSG B
65,700	78	Weighted Average
36,400		55.40% Pervious Area
29,300		44.60% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2200	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.4	320	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.6	370	Total			

Subcatchment PR-2B: PR-2B

Hydrograph



Summary for Pond 1AP: Stormwater Basin

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 2.39" for 25 yr event
 Inflow = 21.37 cfs @ 12.10 hrs, Volume= 1.098 af
 Outflow = 5.02 cfs @ 12.50 hrs, Volume= 0.877 af, Atten= 77%, Lag= 24.0 min
 Discarded = 0.02 cfs @ 12.50 hrs, Volume= 0.034 af
 Primary = 5.00 cfs @ 12.50 hrs, Volume= 0.843 af
 Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 165.02' @ 12.50 hrs Surf.Area= 8,357 sf Storage= 19,780 cf

Plug-Flow detention time= 152.7 min calculated for 0.877 af (80% of inflow)
 Center-of-Mass det. time= 89.1 min (906.5 - 817.3)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	28,990 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	4,840	0	0
163.00	5,940	5,390	5,390
164.00	7,110	6,525	11,915
165.00	8,320	7,715	19,630
166.00	10,400	9,360	28,990

Device	Routing	Invert	Outlet Devices
#1	Primary	165.00'	10.0' 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
#2	Discarded	162.00'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'
#3	Primary	163.70'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

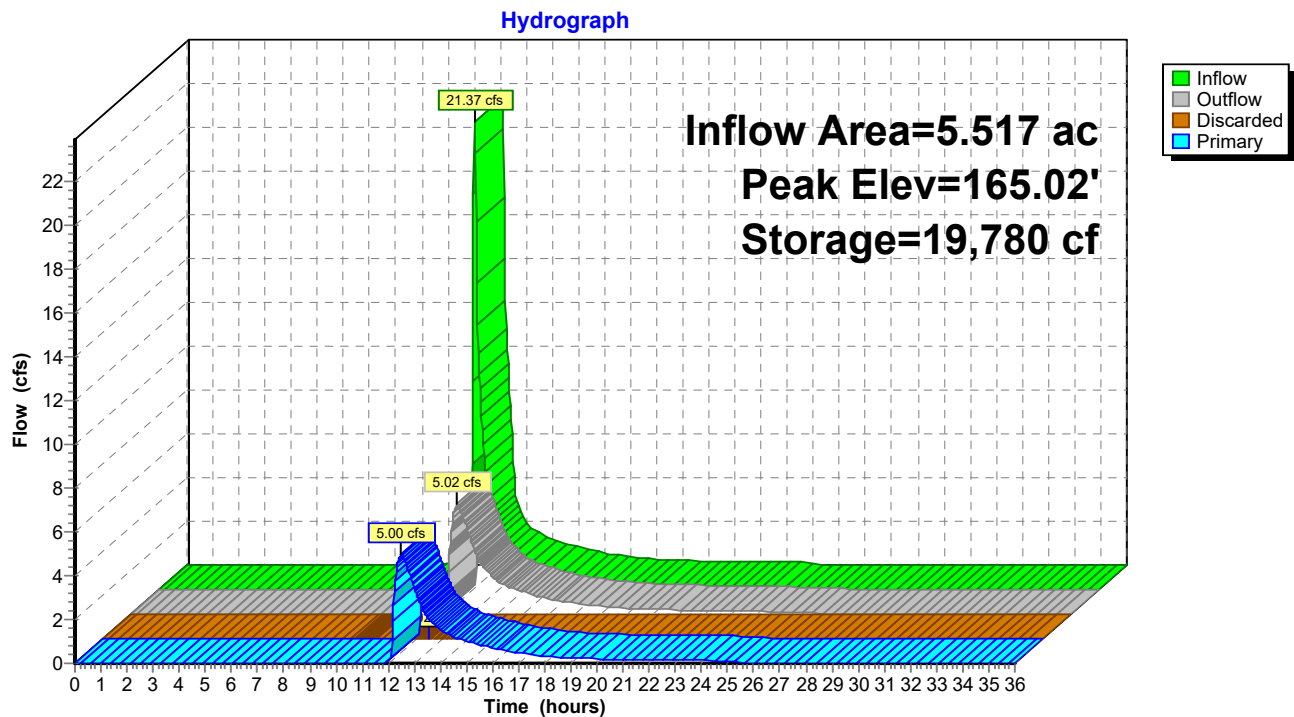
Discarded OutFlow Max=0.02 cfs @ 12.50 hrs HW=165.02' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=4.97 cfs @ 12.50 hrs HW=165.02' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir**(Weir Controls 0.05 cfs @ 0.30 fps)

↑ **3=Orifice/Grate** (Orifice Controls 4.92 cfs @ 4.01 fps)

Pond 1AP: Stormwater Basin

Summary for Pond 1BP: Turf Reservoir

Inflow Area = 2.423 ac, 3.78% Impervious, Inflow Depth = 4.50" for 25 yr event
 Inflow = 12.82 cfs @ 12.07 hrs, Volume= 0.908 af
 Outflow = 12.29 cfs @ 12.10 hrs, Volume= 0.907 af, Atten= 4%, Lag= 1.8 min
 Discarded = 0.22 cfs @ 12.10 hrs, Volume= 0.479 af
 Primary = 12.07 cfs @ 12.10 hrs, Volume= 0.428 af
 Routed to Pond 1AP : Stormwater Basin

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 172.78' @ 12.10 hrs Surf.Area= 93,140 sf Storage= 10,589 cf

Plug-Flow detention time= 244.7 min calculated for 0.907 af (100% of inflow)
 Center-of-Mass det. time= 244.9 min (1,041.1 - 796.2)

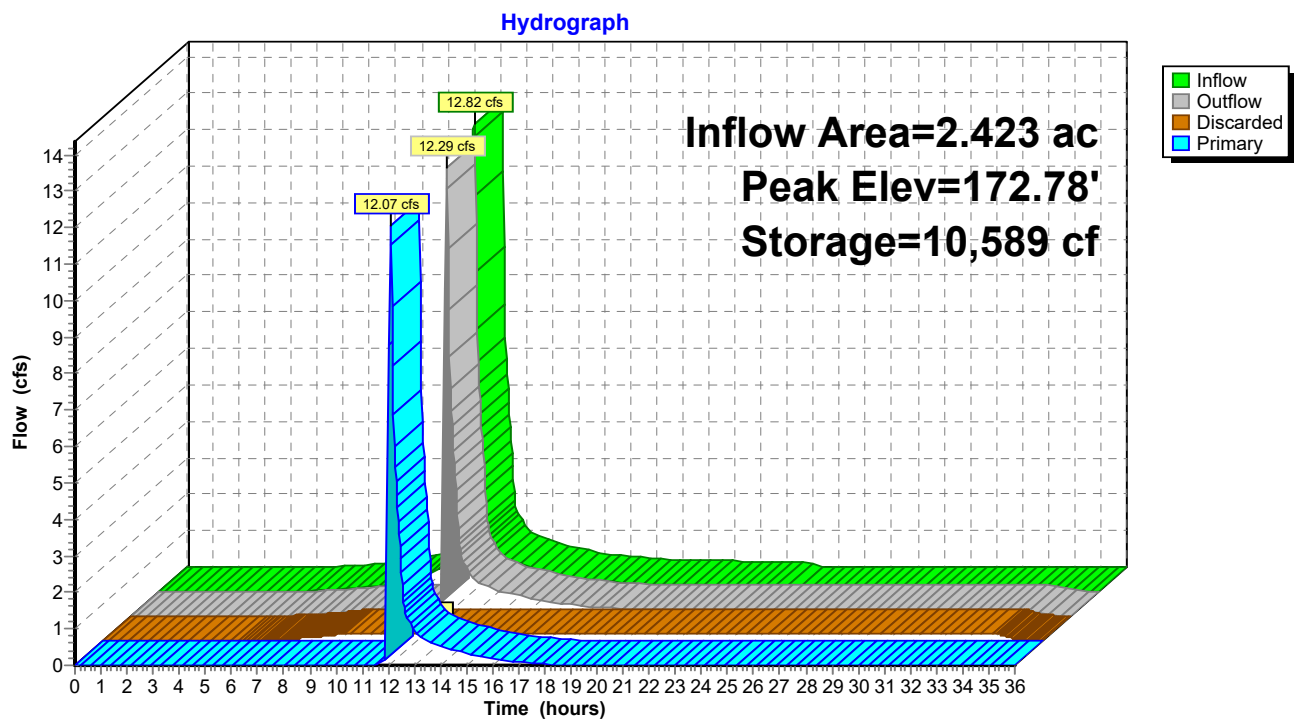
Volume	Invert	Avail.Storage	Storage Description
#1	172.50'	37,256 cf	Custom Stage Data (Irregular) Listed below (Recalc) 93,140 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.50	93,140	746.0	0	0	93,140
173.00	93,140	746.0	46,570	46,570	93,513
173.50	93,140	746.0	46,570	93,140	93,886

Device	Routing	Invert	Outlet Devices
#1	Primary	172.75'	746.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	172.50'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 12.10 hrs HW=172.78' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=11.59 cfs @ 12.10 hrs HW=172.78' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 11.59 cfs @ 0.46 fps)

Pond 1BP: Turf Reservoir

Summary for Pond 2AP: Rain Garden

Inflow Area = 1.531 ac, 43.93% Impervious, Inflow Depth = 3.66" for 25 yr event
 Inflow = 6.75 cfs @ 12.07 hrs, Volume= 0.467 af
 Outflow = 0.73 cfs @ 12.85 hrs, Volume= 0.467 af, Atten= 89%, Lag= 46.4 min
 Discarded = 0.73 cfs @ 12.85 hrs, Volume= 0.467 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 171.45' @ 12.85 hrs Surf.Area= 4,329 sf Storage= 7,915 cf

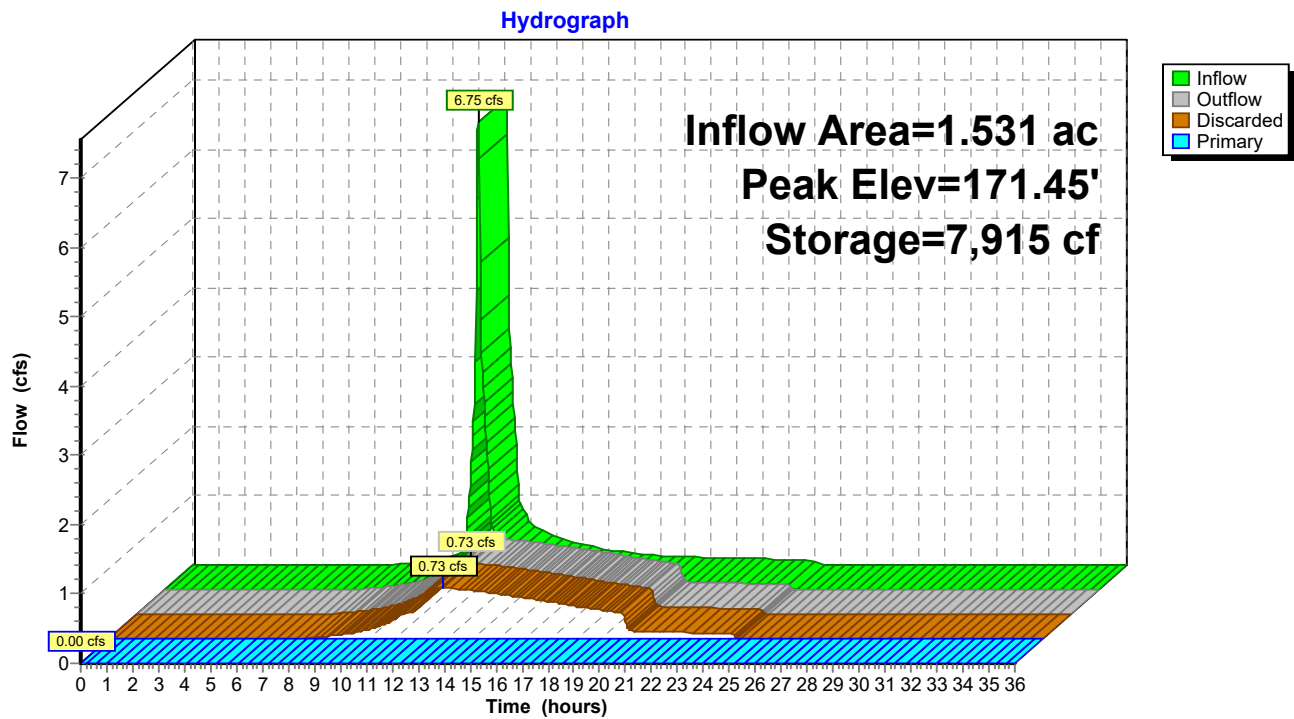
Plug-Flow detention time= 105.0 min calculated for 0.466 af (100% of inflow)
 Center-of-Mass det. time= 104.9 min (922.5 - 817.6)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	15,808 cf	20.00'W x 110.00'L x 4.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	7.000 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 5.00'
#2	Primary	172.00'	40.0' long + 20.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.73 cfs @ 12.85 hrs HW=171.45' (Free Discharge)
 ↑1=Exfiltration (Controls 0.73 cfs)

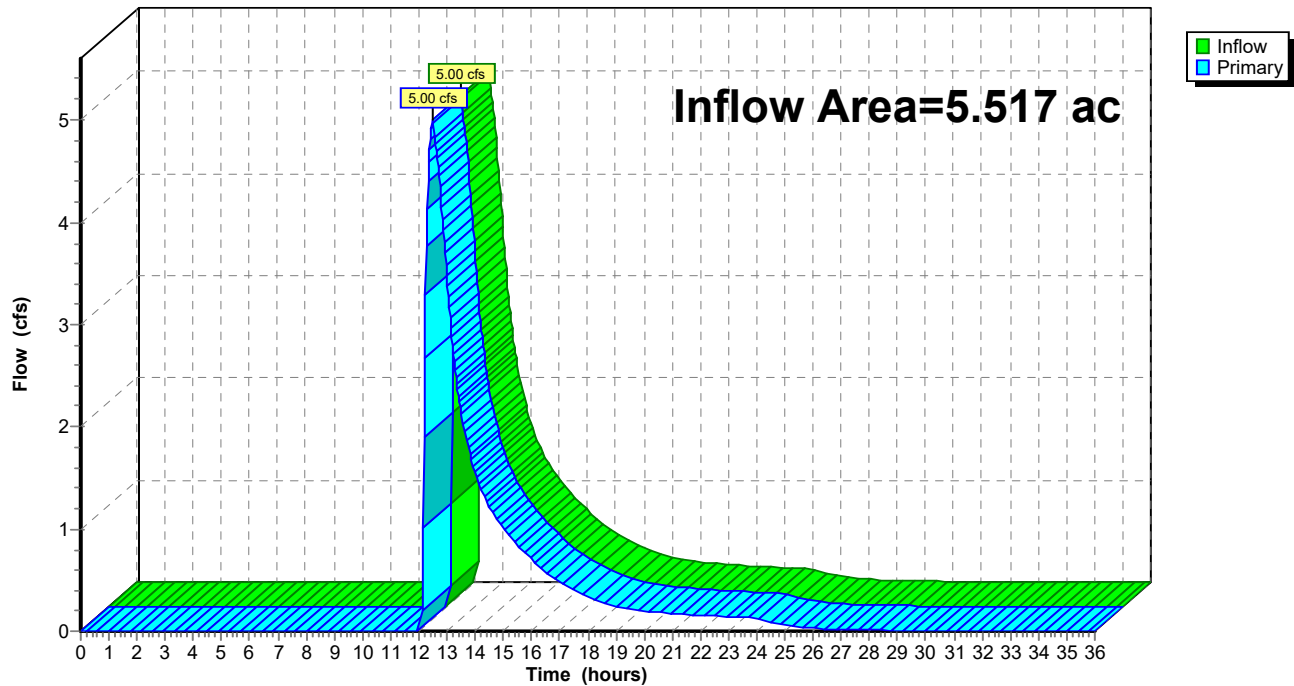
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 2AP: Rain Garden

Summary for Link DP-1: DP-1

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 1.83" for 25 yr event
Inflow = 5.00 cfs @ 12.50 hrs, Volume= 0.843 af
Primary = 5.00 cfs @ 12.50 hrs, Volume= 0.843 af, Atten= 0%, Lag= 0.0 min

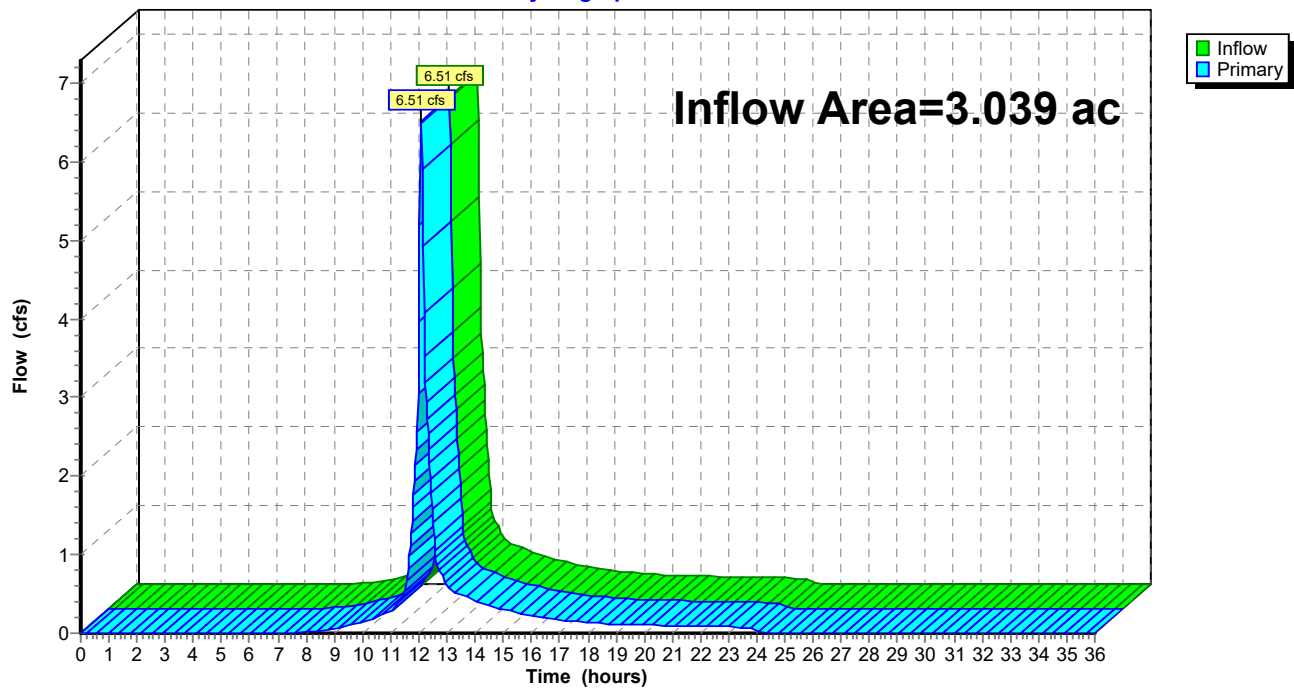
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-1: DP-1**Hydrograph**

Summary for Link DP-2: DP-2

Inflow Area = 3.039 ac, 44.26% Impervious, Inflow Depth = 1.82" for 25 yr event
Inflow = 6.51 cfs @ 12.08 hrs, Volume= 0.460 af
Primary = 6.51 cfs @ 12.08 hrs, Volume= 0.460 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-2: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR-1A: PR-1A Runoff Area=134,799 sf 25.74% Impervious Runoff Depth=3.24"
 Flow Length=560' Tc=5.0 min UI Adjusted CN=67 Runoff=12.02 cfs 0.836 af

SubcatchmentPR-1B: PR-1B Runoff Area=105,533 sf 3.78% Impervious Runoff Depth=5.29"
 Tc=5.0 min CN=86 Runoff=14.97 cfs 1.068 af

SubcatchmentPR-2A: PR-2A Runoff Area=66,700 sf 43.93% Impervious Runoff Depth=4.40"
 Flow Length=410' Tc=5.0 min CN=78 Runoff=8.10 cfs 0.562 af

SubcatchmentPR-2B: PR-2B Runoff Area=65,700 sf 44.60% Impervious Runoff Depth=4.40"
 Flow Length=370' Tc=5.6 min CN=78 Runoff=7.81 cfs 0.553 af

Pond 1AP: Stormwater Basin Peak Elev=165.31' Storage=22,315 cf Inflow=26.23 cfs 1.406 af
 Discarded=0.02 cfs 0.035 af Primary=10.08 cfs 1.150 af Outflow=10.10 cfs 1.185 af

Pond 1BP: Turf Reservoir Peak Elev=172.79' Storage=10,745 cf Inflow=14.97 cfs 1.068 af
 Discarded=0.22 cfs 0.497 af Primary=14.31 cfs 0.570 af Outflow=14.52 cfs 1.067 af

Pond 2AP: Rain Garden Peak Elev=171.90' Storage=9,949 cf Inflow=8.10 cfs 0.562 af
 Discarded=0.80 cfs 0.562 af Primary=0.00 cfs 0.000 af Outflow=0.80 cfs 0.562 af

Link DP-1: DP-1 Inflow=10.08 cfs 1.150 af
 Primary=10.08 cfs 1.150 af

Link DP-2: DP-2 Inflow=7.81 cfs 0.553 af
 Primary=7.81 cfs 0.553 af

Total Runoff Area = 8.557 ac Runoff Volume = 3.019 af Average Runoff Depth = 4.23"
73.90% Pervious = 6.324 ac 26.10% Impervious = 2.233 ac

Summary for Subcatchment PR-1A: PR-1A

Runoff = 12.02 cfs @ 12.08 hrs, Volume= 0.836 af, Depth= 3.24"
 Routed to Pond 1AP : Stormwater Basin

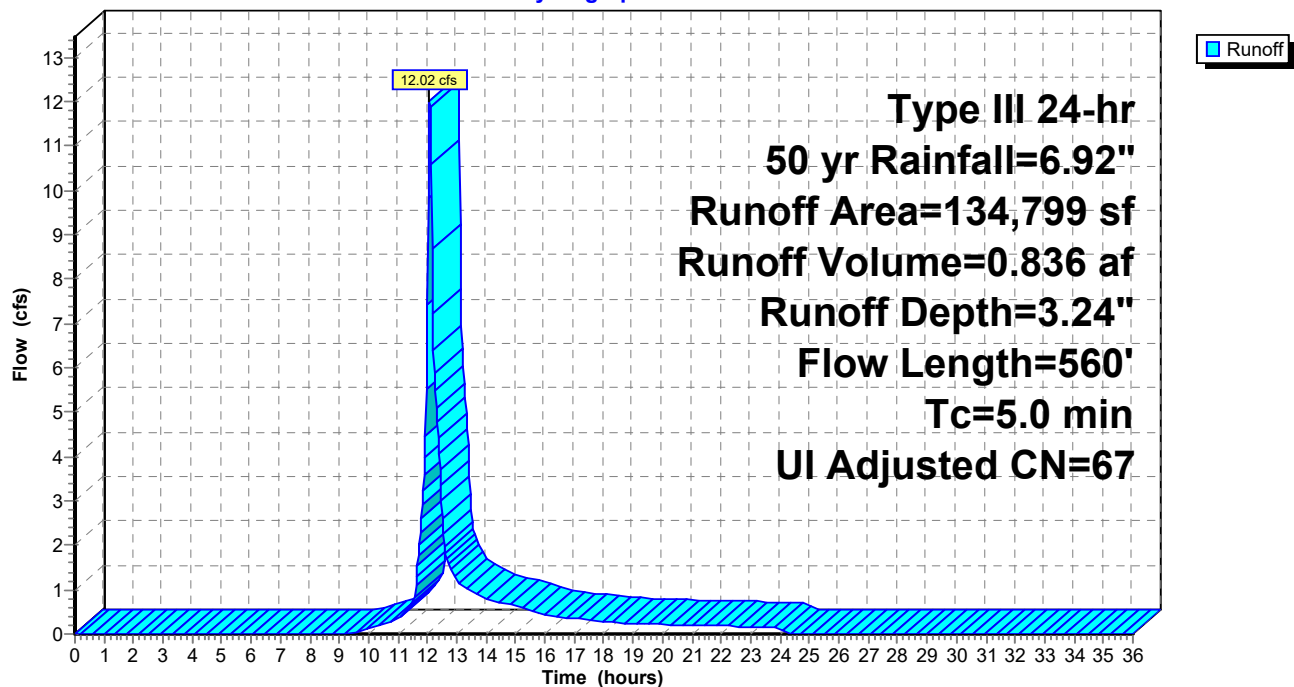
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 50 yr Rainfall=6.92"

Area (sf)	CN	Adj	Description
30,254	98		Unconnected pavement, HSG B
947	96		Gravel surface, HSG B
99,160	61		>75% Grass cover, Good, HSG B
4,438	98		Roofs, HSG B
134,799	71	67	Weighted Average, UI Adjusted
100,107			74.26% Pervious Area
34,692			25.74% Impervious Area
30,254			87.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
2.0	360		3.00		Direct Entry, pipe flow
1.3	150	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.9	560	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-1A: PR-1A

Hydrograph



Summary for Subcatchment PR-1B: PR-1B

Runoff = 14.97 cfs @ 12.07 hrs, Volume= 1.068 af, Depth= 5.29"
 Routed to Pond 1BP : Turf Reservoir

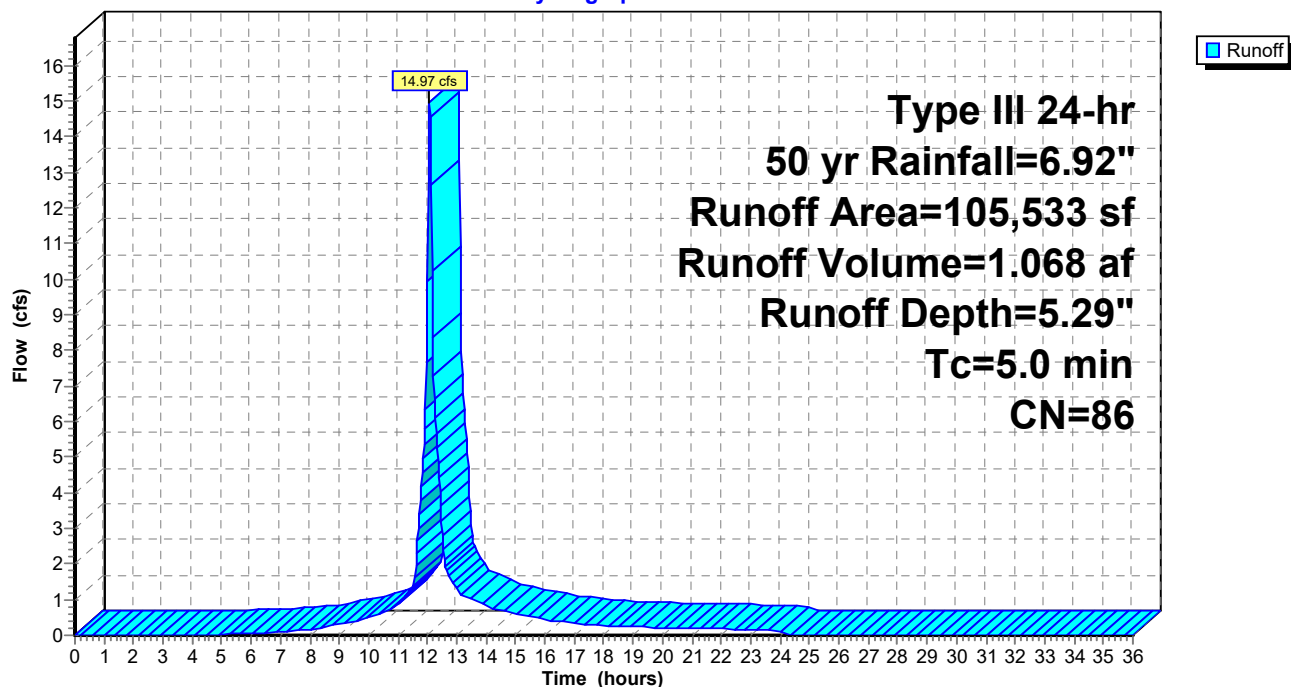
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 50 yr Rainfall=6.92"

Area (sf)	CN	Description
3,984	98	Unconnected pavement, HSG B
4,917	96	Gravel surface, HSG B
93,955	86	Fallow, bare soil, HSG B
2,677	61	>75% Grass cover, Good, HSG B
105,533	86	Weighted Average
101,549		96.22% Pervious Area
3,984		3.78% Impervious Area
3,984		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					Direct Entry,
1.0	0				Total, Increased to minimum Tc = 5.0 min

Subcatchment PR-1B: PR-1B

Hydrograph



Summary for Subcatchment PR-2A: PR-2A

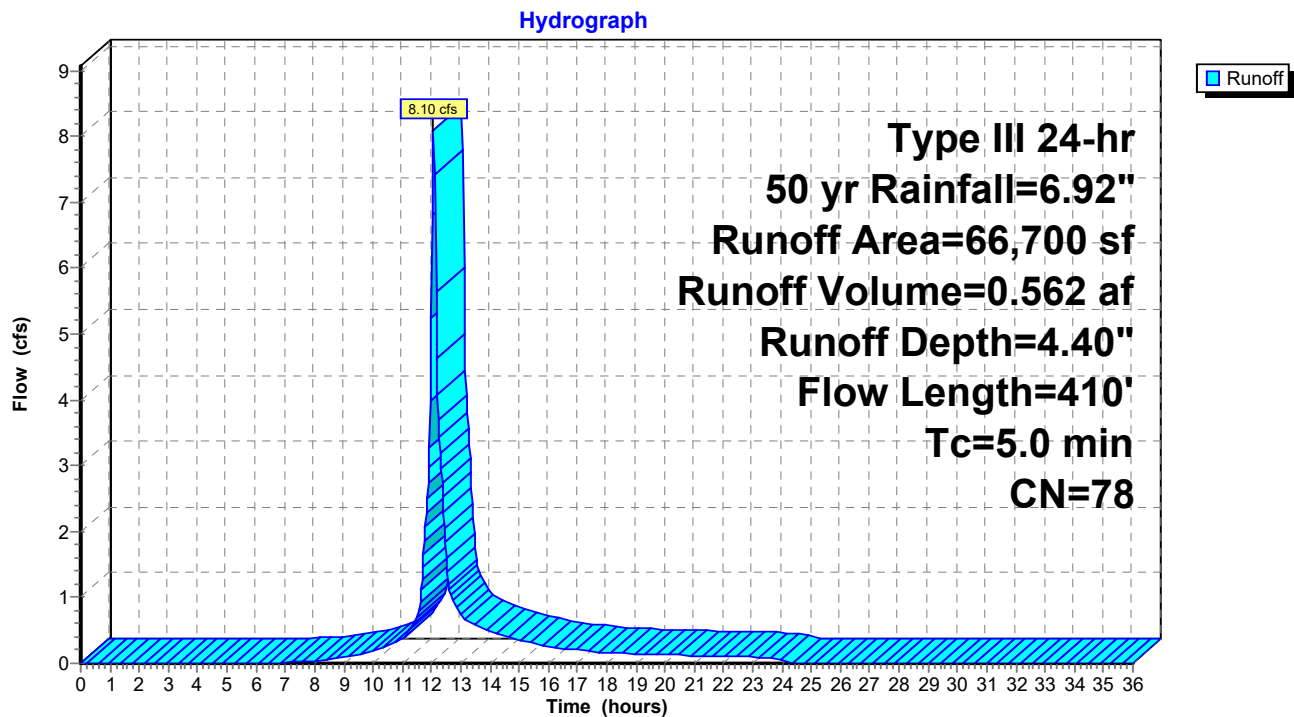
Runoff = 8.10 cfs @ 12.07 hrs, Volume= 0.562 af, Depth= 4.40"
 Routed to Pond 2AP : Rain Garden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 50 yr Rainfall=6.92"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
35,900	61	>75% Grass cover, Good, HSG B
1,500	96	Gravel surface, HSG B
66,700	78	Weighted Average
37,400		56.07% Pervious Area
29,300		43.93% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
0.7	130	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	50		3.00		Direct Entry, pipe flow
1.5	180	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	410	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

Runoff = 7.81 cfs @ 12.08 hrs, Volume= 0.553 af, Depth= 4.40"
 Routed to Link DP-2 : DP-2

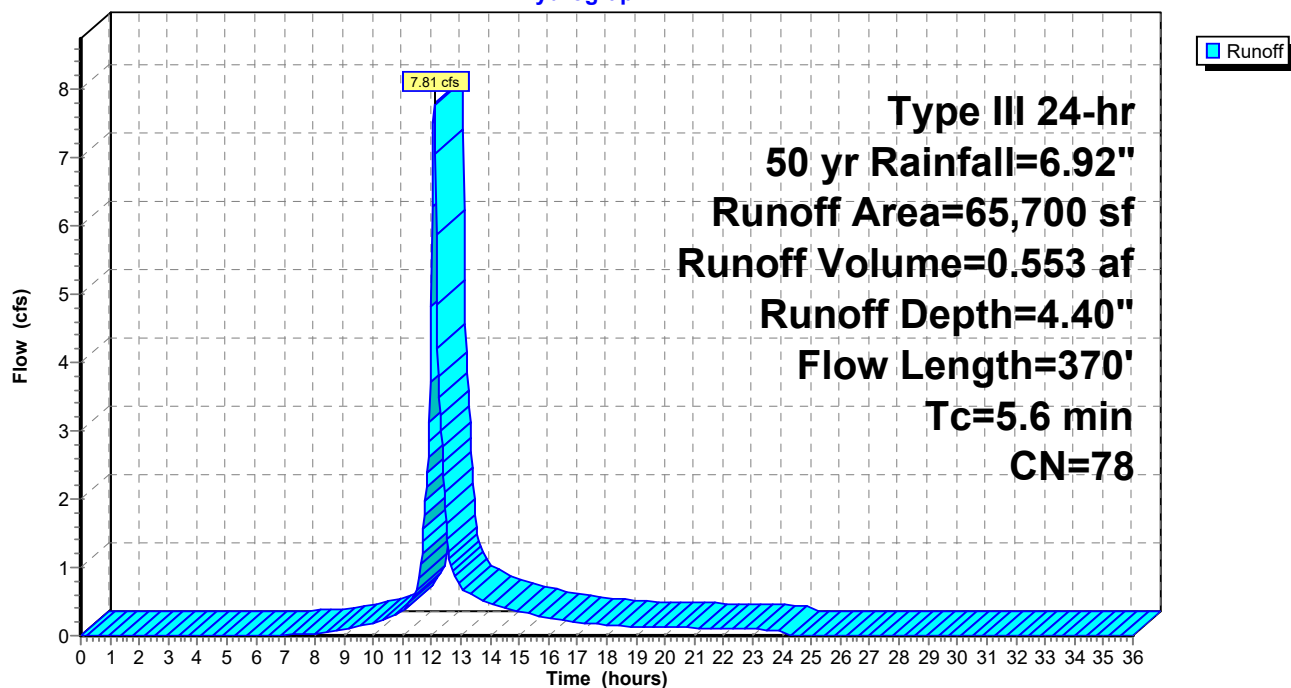
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 50 yr Rainfall=6.92"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
36,400	61	>75% Grass cover, Good, HSG B
65,700	78	Weighted Average
36,400		55.40% Pervious Area
29,300		44.60% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2200	0.38		Sheet Flow, Grass: Short n= 0.150 P2= 3.13"
3.4	320	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.6	370	Total			

Subcatchment PR-2B: PR-2B

Hydrograph



Summary for Pond 1AP: Stormwater Basin

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 3.06" for 50 yr event
 Inflow = 26.23 cfs @ 12.09 hrs, Volume= 1.406 af
 Outflow = 10.10 cfs @ 12.33 hrs, Volume= 1.185 af, Atten= 62%, Lag= 14.9 min
 Discarded = 0.02 cfs @ 12.33 hrs, Volume= 0.035 af
 Primary = 10.08 cfs @ 12.33 hrs, Volume= 1.150 af
 Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 165.31' @ 12.33 hrs Surf.Area= 8,966 sf Storage= 22,315 cf

Plug-Flow detention time= 127.7 min calculated for 1.184 af (84% of inflow)
 Center-of-Mass det. time= 72.9 min (885.2 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	28,990 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	4,840	0	0
163.00	5,940	5,390	5,390
164.00	7,110	6,525	11,915
165.00	8,320	7,715	19,630
166.00	10,400	9,360	28,990

Device	Routing	Invert	Outlet Devices
#1	Primary	165.00'	10.0' 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
#2	Discarded	162.00'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'
#3	Primary	163.70'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

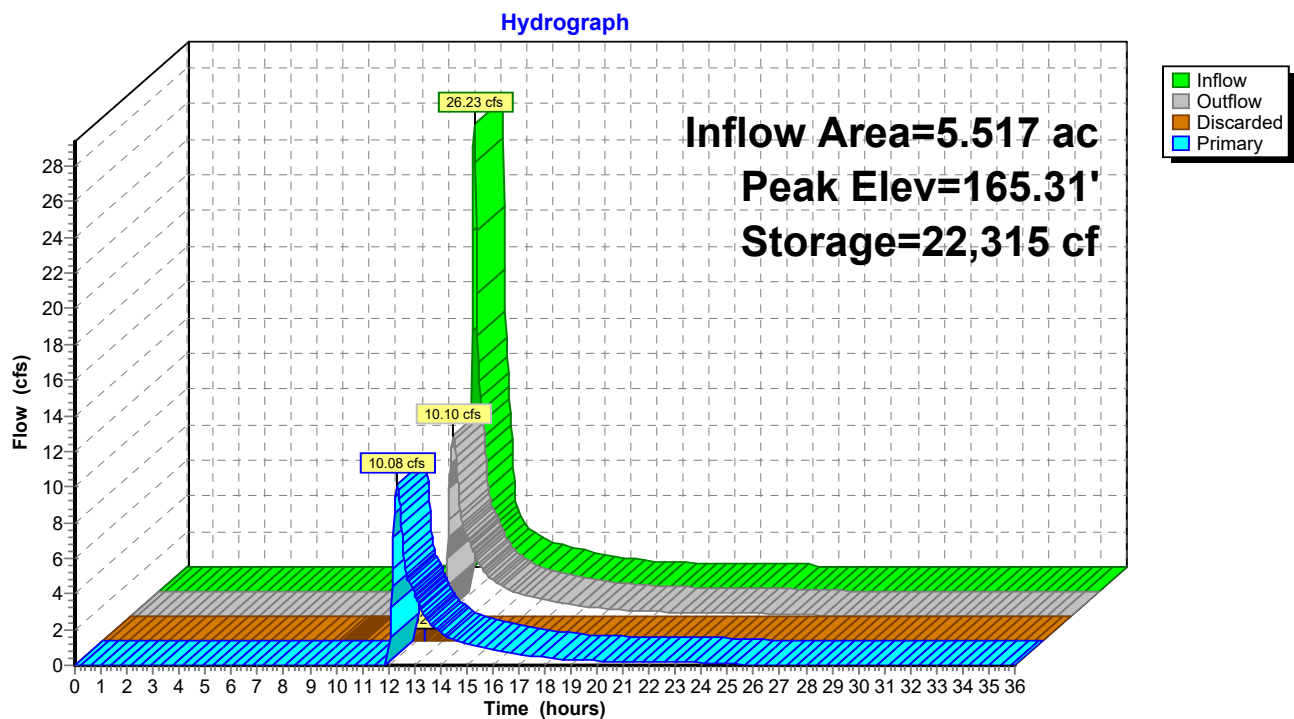
Discarded OutFlow Max=0.02 cfs @ 12.33 hrs HW=165.31' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=10.06 cfs @ 12.33 hrs HW=165.31' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir**(Weir Controls 4.19 cfs @ 1.35 fps)

↑ **3=Orifice/Grate** (Orifice Controls 5.86 cfs @ 4.78 fps)

Pond 1AP: Stormwater Basin

Summary for Pond 1BP: Turf Reservoir

Inflow Area = 2.423 ac, 3.78% Impervious, Inflow Depth = 5.29" for 50 yr event
 Inflow = 14.97 cfs @ 12.07 hrs, Volume= 1.068 af
 Outflow = 14.52 cfs @ 12.09 hrs, Volume= 1.067 af, Atten= 3%, Lag= 1.2 min
 Discarded = 0.22 cfs @ 12.09 hrs, Volume= 0.497 af
 Primary = 14.31 cfs @ 12.09 hrs, Volume= 0.570 af
 Routed to Pond 1AP : Stormwater Basin

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 172.79' @ 12.09 hrs Surf.Area= 93,140 sf Storage= 10,745 cf

Plug-Flow detention time= 218.0 min calculated for 1.066 af (100% of inflow)
 Center-of-Mass det. time= 218.0 min (1,009.8 - 791.7)

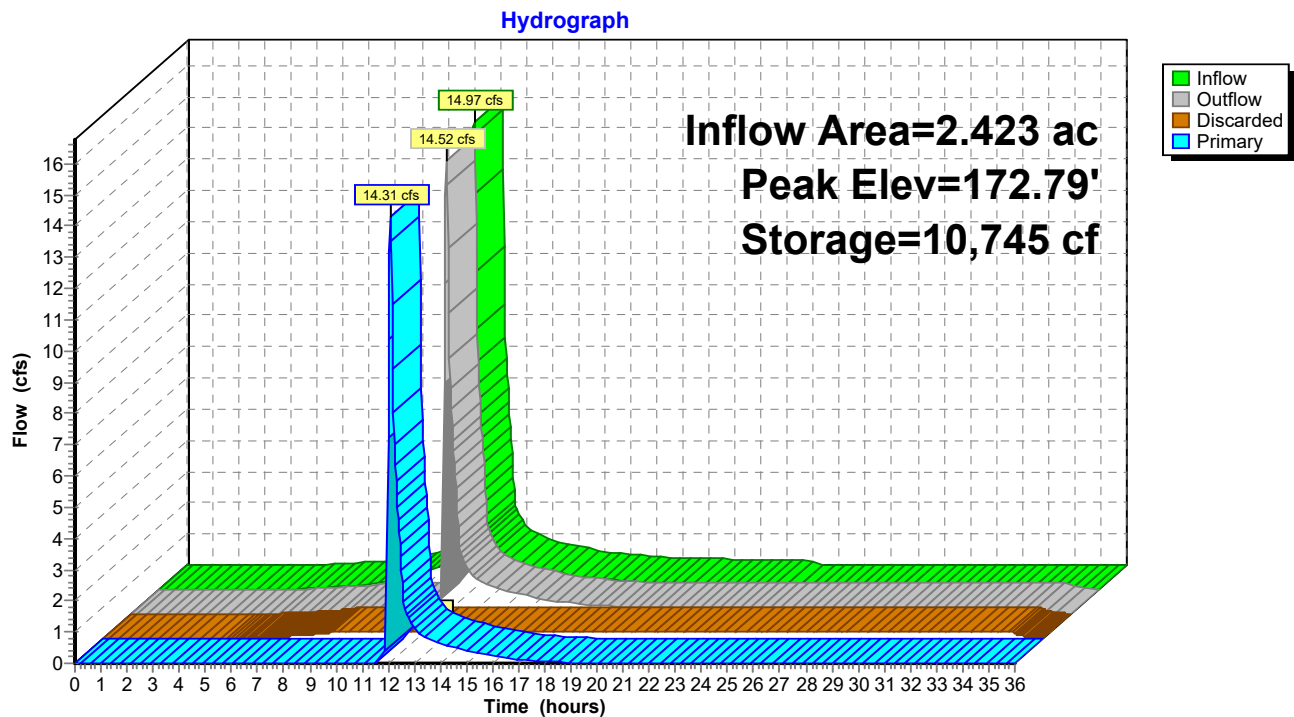
Volume	Invert	Avail.Storage	Storage Description
#1	172.50'	37,256 cf	Custom Stage Data (Irregular) Listed below (Recalc) 93,140 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.50	93,140	746.0	0	0	93,140
173.00	93,140	746.0	46,570	46,570	93,513
173.50	93,140	746.0	46,570	93,140	93,886

Device	Routing	Invert	Outlet Devices
#1	Primary	172.75'	746.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	172.50'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 12.09 hrs HW=172.79' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=14.17 cfs @ 12.09 hrs HW=172.79' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 14.17 cfs @ 0.50 fps)

Pond 1BP: Turf Reservoir

Summary for Pond 2AP: Rain Garden

Inflow Area = 1.531 ac, 43.93% Impervious, Inflow Depth = 4.40" for 50 yr event
 Inflow = 8.10 cfs @ 12.07 hrs, Volume= 0.562 af
 Outflow = 0.80 cfs @ 12.91 hrs, Volume= 0.562 af, Atten= 90%, Lag= 50.2 min
 Discarded = 0.80 cfs @ 12.91 hrs, Volume= 0.562 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 171.90' @ 12.91 hrs Surf.Area= 4,764 sf Storage= 9,949 cf

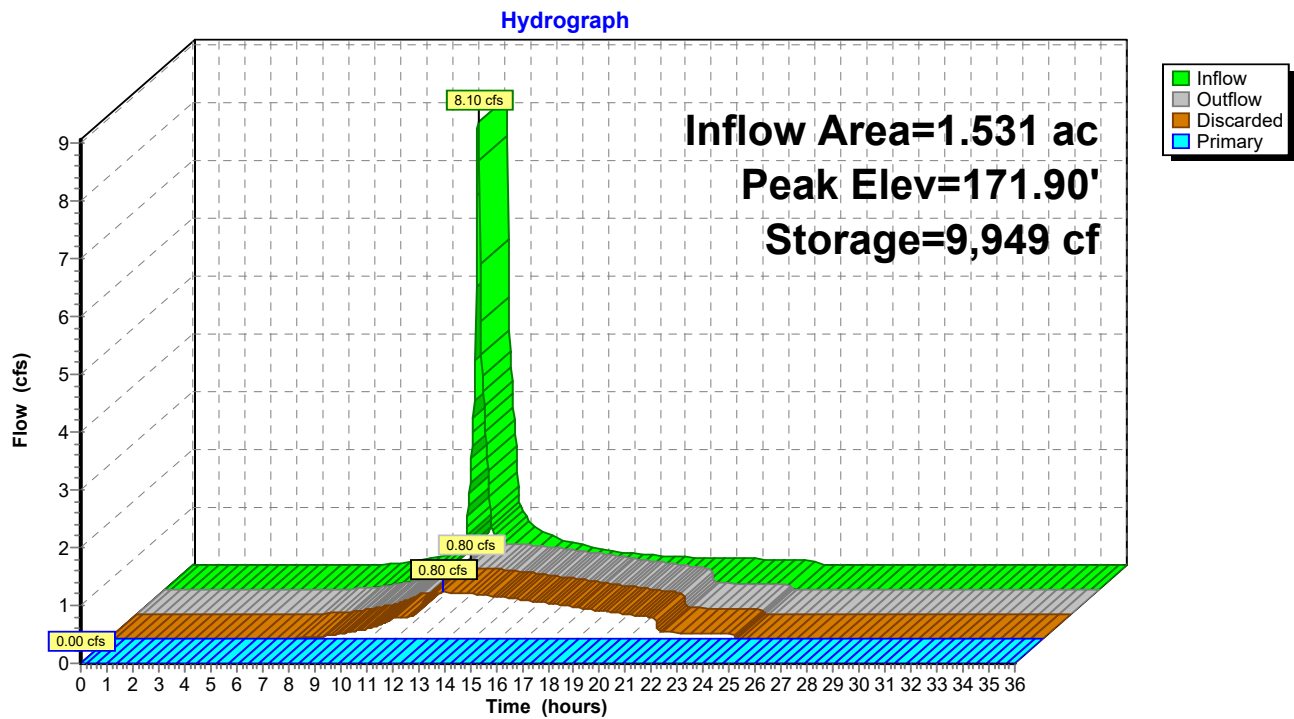
Plug-Flow detention time= 123.6 min calculated for 0.561 af (100% of inflow)
 Center-of-Mass det. time= 123.5 min (935.8 - 812.3)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	15,808 cf	20.00'W x 110.00'L x 4.00'H Prismatic Z=3.0

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	7.000 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 5.00'
#2	Primary	172.00'	40.0' long + 20.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.80 cfs @ 12.91 hrs HW=171.90' (Free Discharge)
 ↑1=Exfiltration (Controls 0.80 cfs)

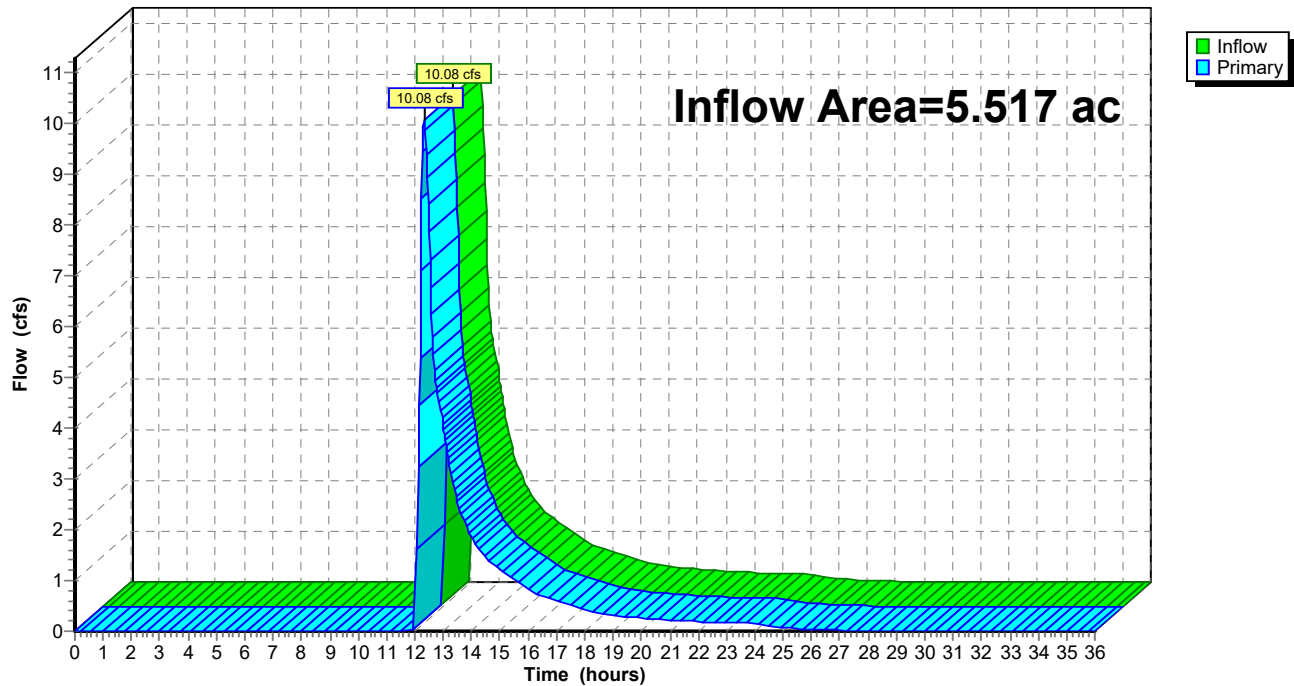
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 2AP: Rain Garden

Summary for Link DP-1: DP-1

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 2.50" for 50 yr event
Inflow = 10.08 cfs @ 12.33 hrs, Volume= 1.150 af
Primary = 10.08 cfs @ 12.33 hrs, Volume= 1.150 af, Atten= 0%, Lag= 0.0 min

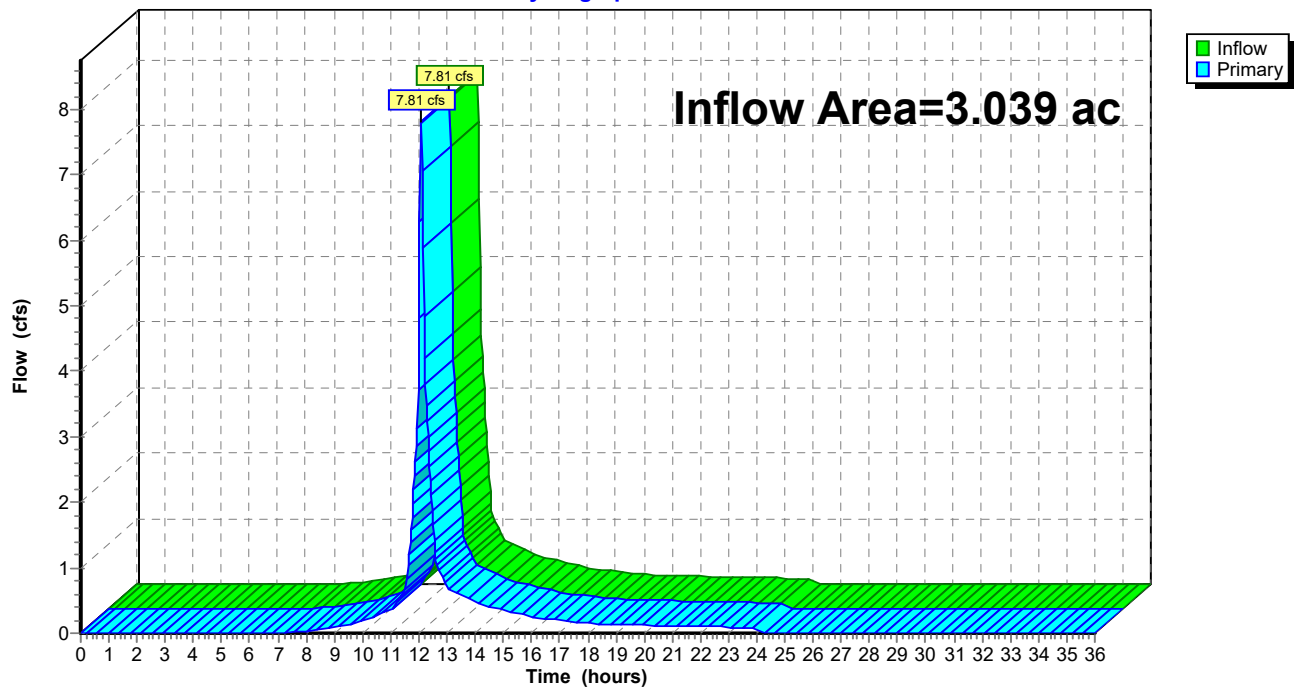
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-1: DP-1**Hydrograph**

Summary for Link DP-2: DP-2

Inflow Area = 3.039 ac, 44.26% Impervious, Inflow Depth = 2.18" for 50 yr event
Inflow = 7.81 cfs @ 12.08 hrs, Volume= 0.553 af
Primary = 7.81 cfs @ 12.08 hrs, Volume= 0.553 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-2: DP-2**Hydrograph**

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR-1A: PR-1A Runoff Area=134,799 sf 25.74% Impervious Runoff Depth=3.99"
 Flow Length=560' Tc=5.0 min UI Adjusted CN=67 Runoff=14.84 cfs 1.029 af

SubcatchmentPR-1B: PR-1B Runoff Area=105,533 sf 3.78% Impervious Runoff Depth=6.18"
 Tc=5.0 min CN=86 Runoff=17.34 cfs 1.247 af

SubcatchmentPR-2A: PR-2A Runoff Area=66,700 sf 43.93% Impervious Runoff Depth=5.24"
 Flow Length=410' Tc=5.0 min CN=78 Runoff=9.60 cfs 0.669 af

SubcatchmentPR-2B: PR-2B Runoff Area=65,700 sf 44.60% Impervious Runoff Depth=5.24"
 Flow Length=370' Tc=5.6 min CN=78 Runoff=9.25 cfs 0.659 af

Pond 1AP: Stormwater Basin Peak Elev=165.55' Storage=24,518 cf Inflow=31.42 cfs 1.761 af
 Discarded=0.02 cfs 0.036 af Primary=17.34 cfs 1.504 af Outflow=17.37 cfs 1.540 af

Pond 1BP: Turf Reservoir Peak Elev=172.79' Storage=10,900 cf Inflow=17.34 cfs 1.247 af
 Discarded=0.22 cfs 0.513 af Primary=16.70 cfs 0.732 af Outflow=16.92 cfs 1.245 af

Pond 2AP: Rain Garden Peak Elev=172.07' Storage=10,781 cf Inflow=9.60 cfs 0.669 af
 Discarded=0.83 cfs 0.623 af Primary=2.13 cfs 0.046 af Outflow=2.97 cfs 0.669 af

Link DP-1: DP-1 Inflow=17.34 cfs 1.504 af
 Primary=17.34 cfs 1.504 af

Link DP-2: DP-2 Inflow=9.25 cfs 0.705 af
 Primary=9.25 cfs 0.705 af

Total Runoff Area = 8.557 ac Runoff Volume = 3.604 af Average Runoff Depth = 5.05"
73.90% Pervious = 6.324 ac 26.10% Impervious = 2.233 ac

Summary for Subcatchment PR-1A: PR-1A

Runoff = 14.84 cfs @ 12.08 hrs, Volume= 1.029 af, Depth= 3.99"
 Routed to Pond 1AP : Stormwater Basin

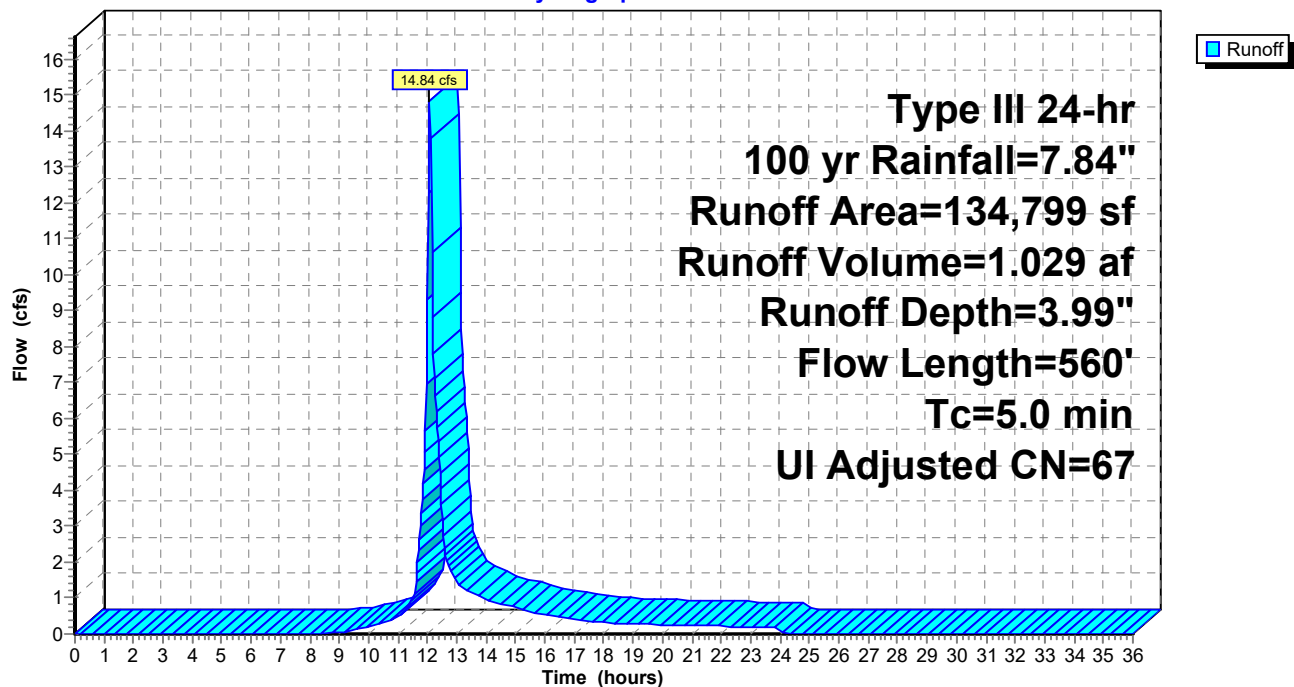
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100 yr Rainfall=7.84"

Area (sf)	CN	Adj	Description
30,254	98		Unconnected pavement, HSG B
947	96		Gravel surface, HSG B
99,160	61		>75% Grass cover, Good, HSG B
4,438	98		Roofs, HSG B
134,799	71	67	Weighted Average, UI Adjusted
100,107			74.26% Pervious Area
34,692			25.74% Impervious Area
30,254			87.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
2.0	360		3.00		Direct Entry, pipe flow
1.3	150	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.9	560	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-1A: PR-1A

Hydrograph



Summary for Subcatchment PR-1B: PR-1B

Runoff = 17.34 cfs @ 12.07 hrs, Volume= 1.247 af, Depth= 6.18"
 Routed to Pond 1BP : Turf Reservoir

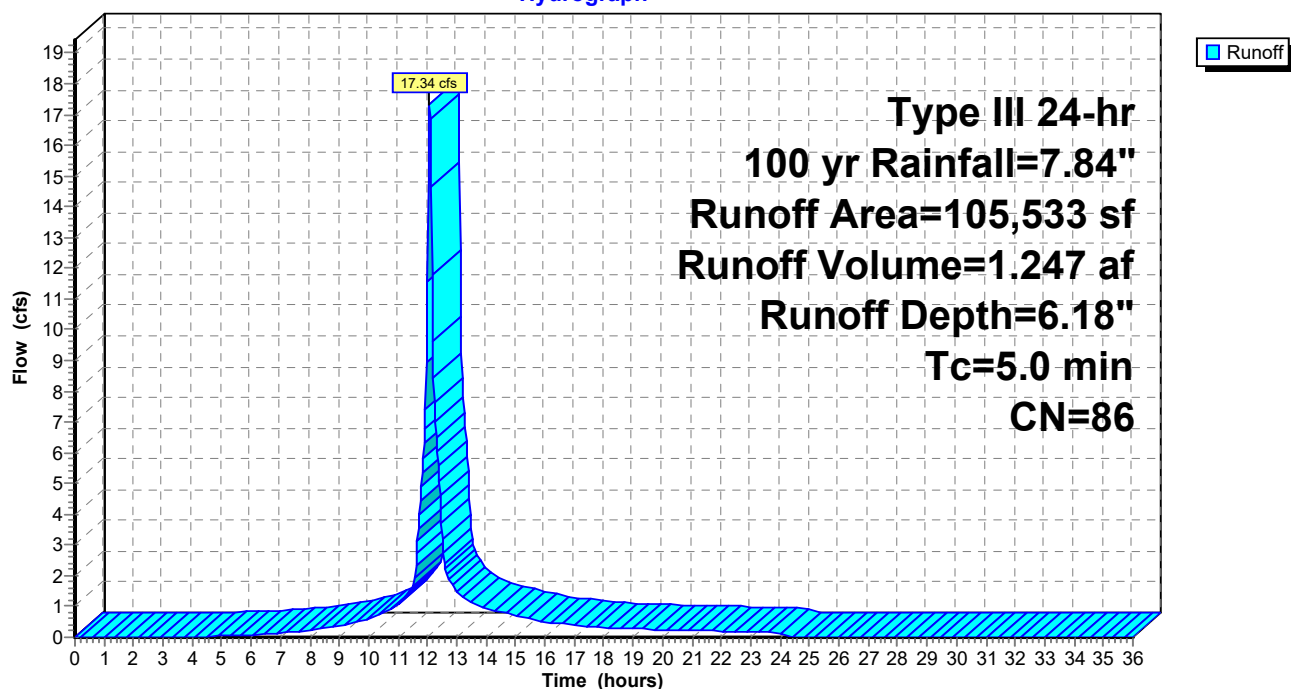
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100 yr Rainfall=7.84"

Area (sf)	CN	Description
3,984	98	Unconnected pavement, HSG B
4,917	96	Gravel surface, HSG B
93,955	86	Fallow, bare soil, HSG B
2,677	61	>75% Grass cover, Good, HSG B
105,533	86	Weighted Average
101,549		96.22% Pervious Area
3,984		3.78% Impervious Area
3,984		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					Direct Entry,
1.0	0				Total, Increased to minimum Tc = 5.0 min

Subcatchment PR-1B: PR-1B

Hydrograph



Summary for Subcatchment PR-2A: PR-2A

Runoff = 9.60 cfs @ 12.07 hrs, Volume= 0.669 af, Depth= 5.24"
 Routed to Pond 2AP : Rain Garden

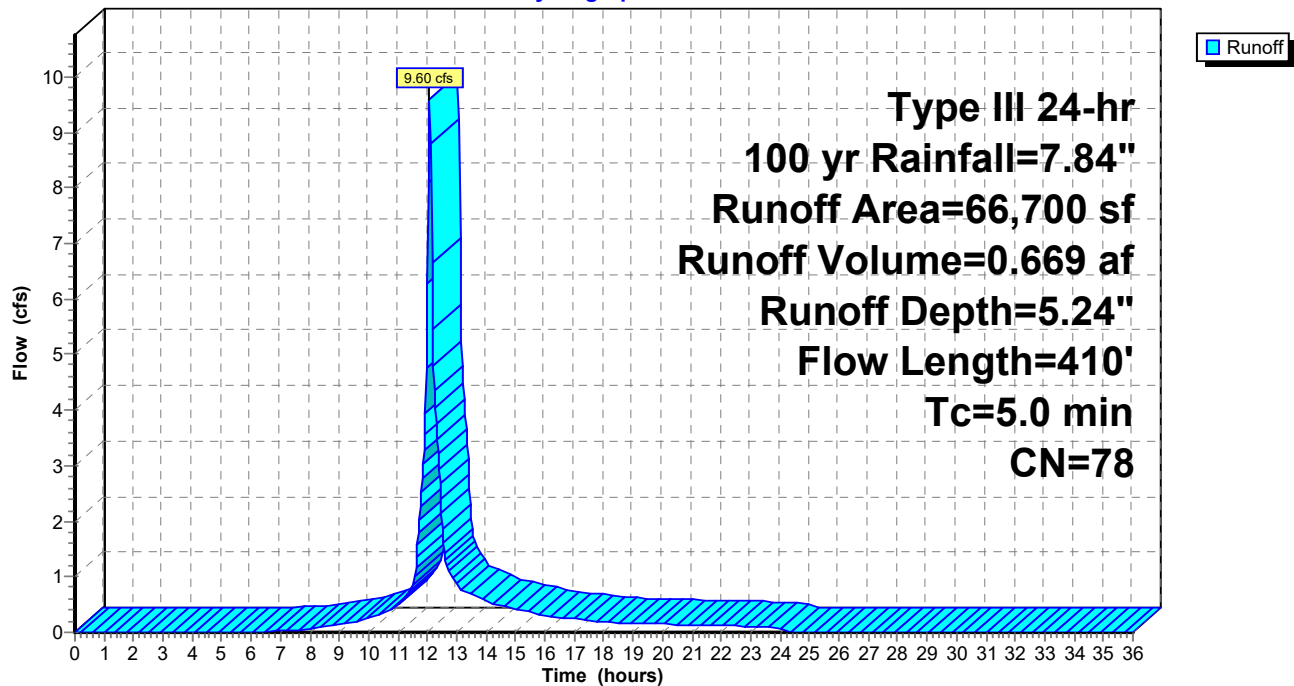
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100 yr Rainfall=7.84"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
35,900	61	>75% Grass cover, Good, HSG B
1,500	96	Gravel surface, HSG B
66,700	78	Weighted Average
37,400		56.07% Pervious Area
29,300		43.93% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.13"
0.7	130	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	50		3.00		Direct Entry, pipe flow
1.5	180	0.0800	1.98		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.1	410	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PR-2A: PR-2A

Hydrograph



Summary for Subcatchment PR-2B: PR-2B

Runoff = 9.25 cfs @ 12.08 hrs, Volume= 0.659 af, Depth= 5.24"
 Routed to Link DP-2 : DP-2

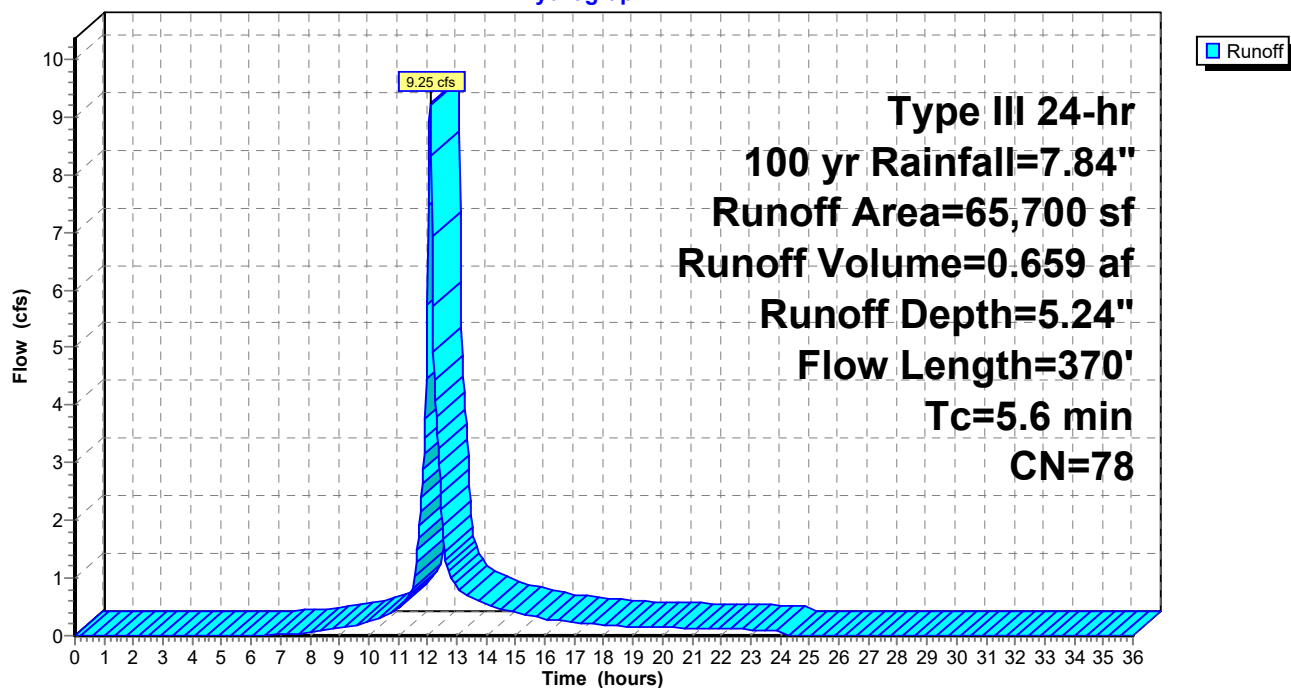
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Type III 24-hr 100 yr Rainfall=7.84"

Area (sf)	CN	Description
29,300	98	Unconnected pavement, HSG B
36,400	61	>75% Grass cover, Good, HSG B
65,700	78	Weighted Average
36,400		55.40% Pervious Area
29,300		44.60% Impervious Area
29,300		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2200	0.38		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.13"
3.4	320	0.0500	1.57		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
5.6	370	Total			

Subcatchment PR-2B: PR-2B

Hydrograph



Summary for Pond 1AP: Stormwater Basin

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 3.83" for 100 yr event
 Inflow = 31.42 cfs @ 12.09 hrs, Volume= 1.761 af
 Outflow = 17.37 cfs @ 12.21 hrs, Volume= 1.540 af, Atten= 45%, Lag= 7.5 min
 Discarded = 0.02 cfs @ 12.21 hrs, Volume= 0.036 af
 Primary = 17.34 cfs @ 12.21 hrs, Volume= 1.504 af
 Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 165.55' @ 12.21 hrs Surf.Area= 9,463 sf Storage= 24,518 cf

Plug-Flow detention time= 109.4 min calculated for 1.539 af (87% of inflow)
 Center-of-Mass det. time= 61.5 min (870.2 - 808.7)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	28,990 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.00	4,840	0	0
163.00	5,940	5,390	5,390
164.00	7,110	6,525	11,915
165.00	8,320	7,715	19,630
166.00	10,400	9,360	28,990

Device	Routing	Invert	Outlet Devices
#1	Primary	165.00'	10.0' 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
#2	Discarded	162.00'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'
#3	Primary	163.70'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

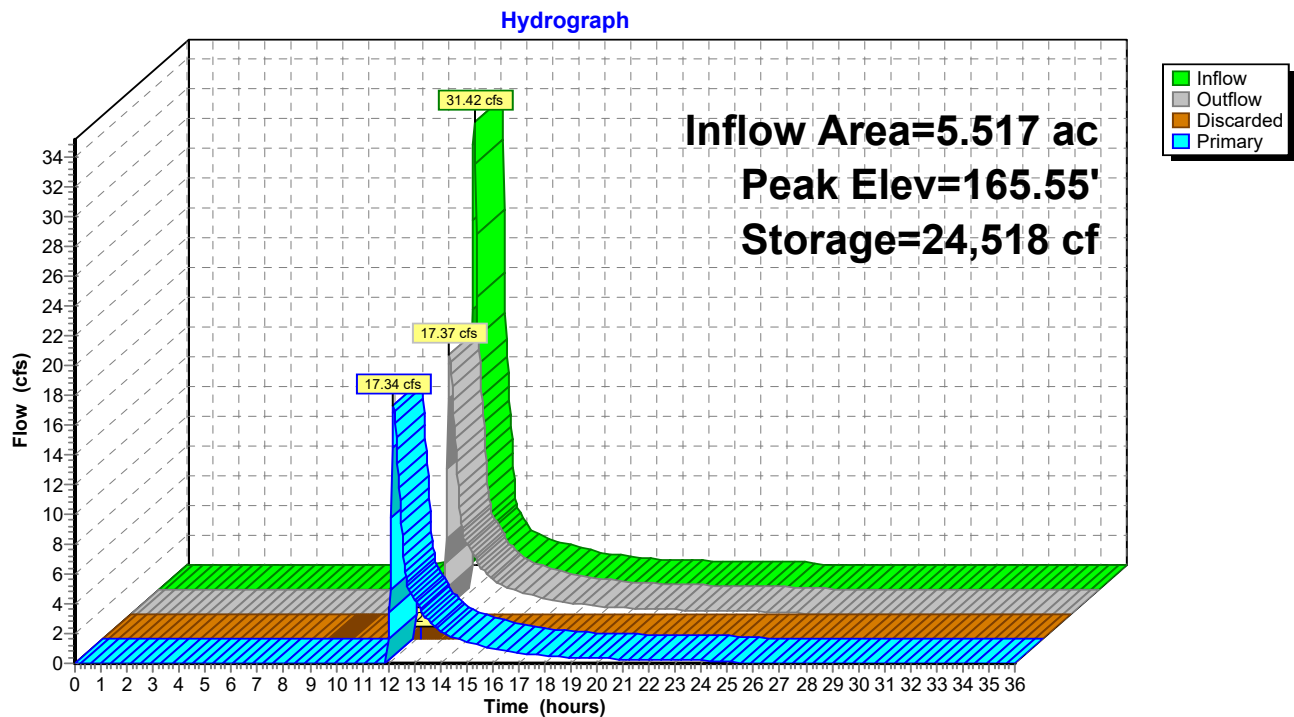
Discarded OutFlow Max=0.02 cfs @ 12.21 hrs HW=165.55' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=17.33 cfs @ 12.21 hrs HW=165.55' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir**(Weir Controls 10.79 cfs @ 1.96 fps)

↑ **3=Orifice/Grate** (Orifice Controls 6.54 cfs @ 5.33 fps)

Pond 1AP: Stormwater Basin

Summary for Pond 1BP: Turf Reservoir

Inflow Area = 2.423 ac, 3.78% Impervious, Inflow Depth = 6.18" for 100 yr event
 Inflow = 17.34 cfs @ 12.07 hrs, Volume= 1.247 af
 Outflow = 16.92 cfs @ 12.09 hrs, Volume= 1.245 af, Atten= 2%, Lag= 1.2 min
 Discarded = 0.22 cfs @ 12.09 hrs, Volume= 0.513 af
 Primary = 16.70 cfs @ 12.09 hrs, Volume= 0.732 af
 Routed to Pond 1AP : Stormwater Basin

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 172.79' @ 12.09 hrs Surf.Area= 93,140 sf Storage= 10,900 cf

Plug-Flow detention time= 193.9 min calculated for 1.244 af (100% of inflow)
 Center-of-Mass det. time= 193.5 min (981.0 - 787.5)

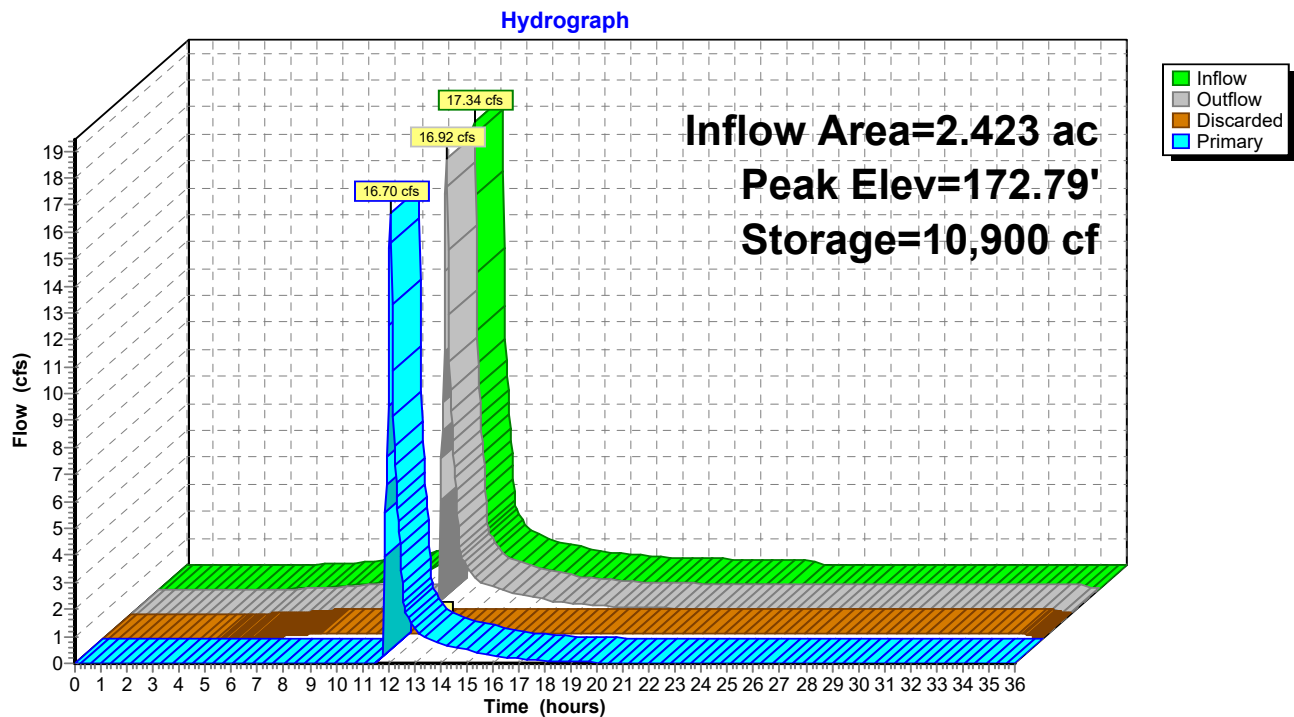
Volume	Invert	Avail.Storage	Storage Description
#1	172.50'	37,256 cf	Custom Stage Data (Irregular) Listed below (Recalc) 93,140 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
172.50	93,140	746.0	0	0	93,140
173.00	93,140	746.0	46,570	46,570	93,513
173.50	93,140	746.0	46,570	93,140	93,886

Device	Routing	Invert	Outlet Devices
#1	Primary	172.75'	746.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	172.50'	0.100 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 12.09 hrs HW=172.79' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=16.58 cfs @ 12.09 hrs HW=172.79' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 16.58 cfs @ 0.52 fps)

Pond 1BP: Turf Reservoir

Summary for Pond 2AP: Rain Garden

Inflow Area = 1.531 ac, 43.93% Impervious, Inflow Depth = 5.24" for 100 yr event
 Inflow = 9.60 cfs @ 12.07 hrs, Volume= 0.669 af
 Outflow = 2.97 cfs @ 12.39 hrs, Volume= 0.669 af, Atten= 69%, Lag= 19.3 min
 Discarded = 0.83 cfs @ 12.39 hrs, Volume= 0.623 af
 Primary = 2.13 cfs @ 12.39 hrs, Volume= 0.046 af
 Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
 Peak Elev= 172.07' @ 12.39 hrs Surf.Area= 4,935 sf Storage= 10,781 cf

Plug-Flow detention time= 121.1 min calculated for 0.668 af (100% of inflow)
 Center-of-Mass det. time= 121.0 min (928.3 - 807.3)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	15,808 cf	20.00'W x 110.00'L x 4.00'H Prismatic Z=3.0

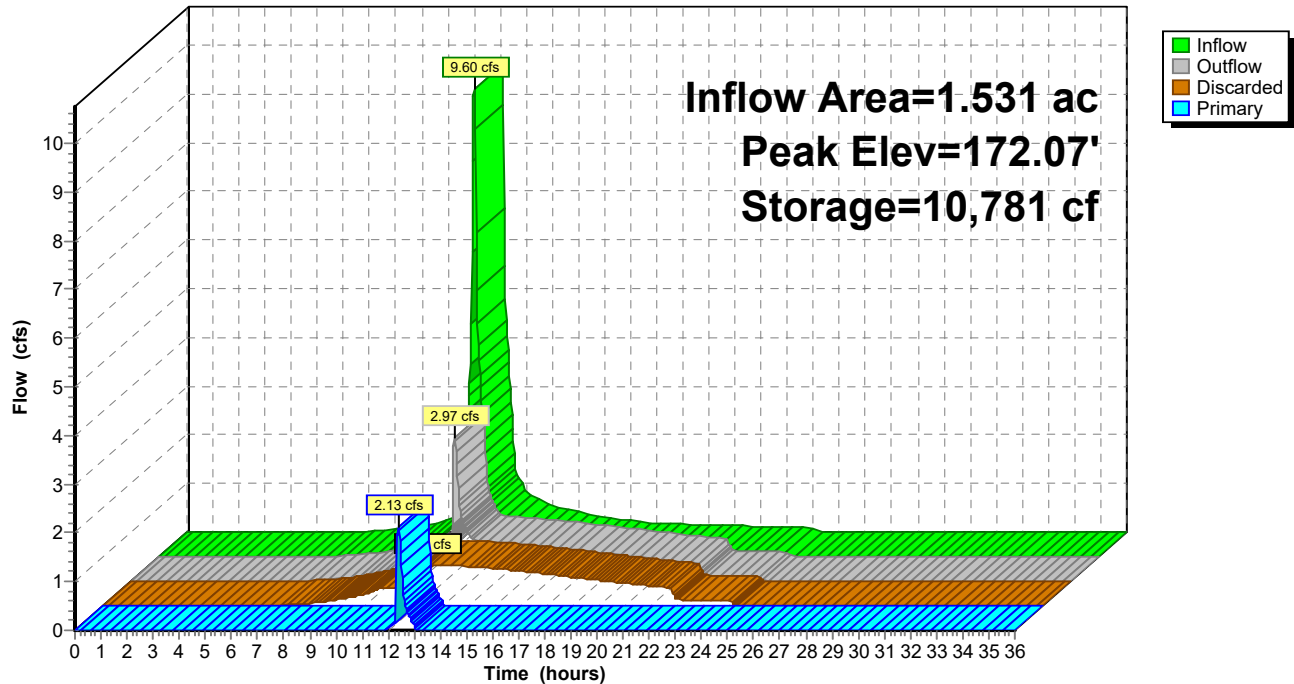
Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	7.000 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 5.00'
#2	Primary	172.00'	40.0' long + 20.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.83 cfs @ 12.39 hrs HW=172.07' (Free Discharge)
 ↳1=Exfiltration (Controls 0.83 cfs)

Primary OutFlow Max=2.06 cfs @ 12.39 hrs HW=172.07' (Free Discharge)
 ↳2=Broad-Crested Rectangular Weir(Weir Controls 2.06 cfs @ 0.71 fps)

Pond 2AP: Rain Garden

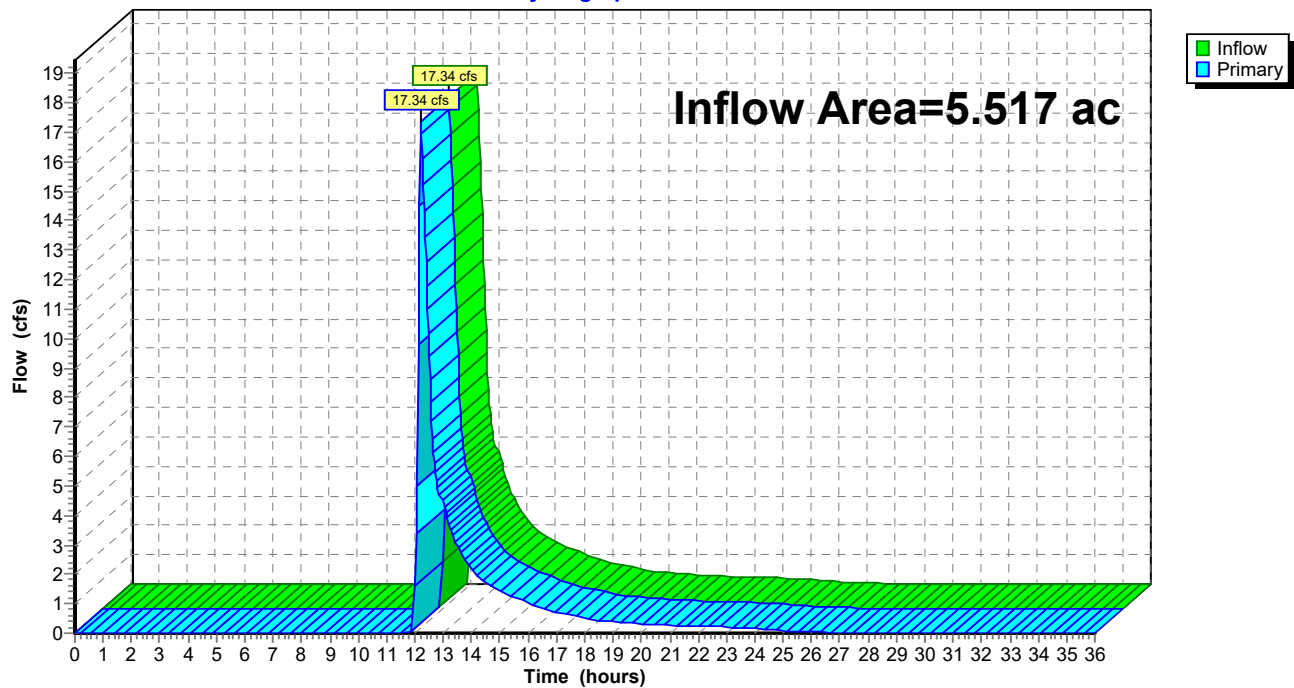
Hydrograph



Summary for Link DP-1: DP-1

Inflow Area = 5.517 ac, 16.09% Impervious, Inflow Depth = 3.27" for 100 yr event
Inflow = 17.34 cfs @ 12.21 hrs, Volume= 1.504 af
Primary = 17.34 cfs @ 12.21 hrs, Volume= 1.504 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-1: DP-1**Hydrograph**

Summary for Link DP-2: DP-2

Inflow Area = 3.039 ac, 44.26% Impervious, Inflow Depth = 2.78" for 100 yr event
Inflow = 9.25 cfs @ 12.08 hrs, Volume= 0.705 af
Primary = 9.25 cfs @ 12.08 hrs, Volume= 0.705 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs

Link DP-2: DP-2**Hydrograph**