Environmental Services

Engineering Services

#

Stormwater Report

Proposed Filling Station
"Route 66 Express Mart"
#249 West High Street
East Hampton, CT 06424

November 18, 2020

Prepared for:

Paula Free
249 West High Street
East Hampton, CT 06424

Prepared by:

CMG Environmental, Inc.
CMG ID 2017-194

67 Hall Road
Sturbridge, MA 01566
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STORMWATER MANAGEMENT NARRATIVE

This report provides engineering calculations and a summary of our technical evaluation of the proposed drainage and stormwater management improvements 249 West High Street in East Hampton, CT (the "Site").

Existing condition shows that the entire site drains to an off-site catch basin located at the intersection of West High St. (CT Route 66) and Middletown Ave. (CT Route 16).

Project Description

The Applicant, is proposing to renovate approximately 1,275 SF of existing first floor space into a convenience store and install two underground fuel storage tanks, four fueling islands and new filling station canopy. In conjunction with these improvements, the entire parking lot will be reconstructed with a proper accessible parking space, and landscaping.

Currently the site has no stormwater management system. The new parking lot will be constructed with deep sump hooded catchbasins to collect and direct runoff from paved areas to Hydroworks stormwater treatment unit. The storm sewer system has been designed in accordance with methods outlined in the CT DOT Drainage Manual. The system has also been designed to comply with the *Connecticut DEEP 2004 Connecticut Stormwater Quality Manual* by ensuring over 80 percent TSS removal. The project will result in a net reduction in impervious surface and therefore a reduction in peak rates of runoff without the need for a detention system.

Hydrologic Calculation Methodology

Hydrology

Computer Model: HydroCAD 10.0 © 1986-2015 Applied Microcomputer Systems, drainage modeling software;

Hydrologic Methodology: TR-20 & TR-55 Methodology is used in order to model the effects of the existing & proposed on-site stormwater systems. A minimum 6-minute time of concentration is assumed in the included calculations.

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Surface Runoff Conditions

Rainfall Intensity: USGS Type III Rainfall – East Hampton, CT
Point Precipitation Frequency Estimates

2-Year Storm = 3.38 in.
10-Year Storm = 5.20 in
25-Year Storm = 6.34 in.
100-Year Storm = 8.10 in.

Watershed Areas: Watershed areas are calculated using AutoCAD software based on the subcatchment areas delineated on the enclosed "Pre-Development Drainage Areas" Sheet D-1 and "Proposed Drainage Areas" Sheet D-2. The subcatchment areas shown, times of concentration and runoff coefficients are consistent with the Hydrologic Methodology discussed above.

Flood Plain

The Site is not located within a designated Special Flood Hazard Area zone as shown on Flood Insurance Rate Map (FIRM) Town of East Hampton, CT Community Panel Number 09007C0141G, Revise Date August 08, 2008.

Appendix A includes a copy of Site USGS Site Location Map, FEMA Flood Insurance Mapping.

Soils & Topography

In general, the entire site drains to a low point in the western part of the property. Topography is fairly flat with the eastern area sloping down towards Middletown Ave which slopes down to off-site catch basin located at the intersection of Middletown Ave and West High Street.

According to the Natural Resources Conservation Service's online mapping the Site's soil types are classified as:

- Udorthents-Urban Land Complex, 0-25% slopes (map unit 306). Site soils are categorized as Hydrologic Soil Group "B".

Soil Permeability (k):

NRCS data estimates soil permeability at 0.00 ~ 1.98 in / hour for these type of soils. This is consistent with a Rawls Rate k= 1.02 in/hour (Sandy Loam) based on a Hydrologic Soil Type "B".

CMG's hydrology calculations use a conservative approach and do not account for on-site infiltration.

Appendix B includes a copy of the NRCS soil descriptions and Rawls Table.

Pre-Development Conditions:

OUTFALL (1S) – Off-Site Catch Basin 1:

Stormwater runoff from the (**Subcatchment 2)** Site consists of 16,875 SF of impervious area and 29,664 SF of grassed area, drains to the west of the property and then through the grassed area to off-site catch basin 1, Stormwater runoff from (**Subcatchment 1**) consists of 16,801 SF of impervious area and 39,334 SF of grassed area, drains through Middletown Ave to off-site catch basin 1.

The "**Pre-Development Drainage Map**" **D-1** and calculations are included as **Appendix C.**

Proposed Drainage Improvements

The project Applicant is proposing to incorporate on-site stormwater design improvements to collect, treat all Site's stormwater runoff to the maximum extent practicable given existing site conditions.

The following design elements will be incorporated into the proposed development's storm water management system:

OUTFALL (1S) – Off-Site Catch Basin 1:

- **Four (4) new deep sump Catch Basins with hoods.**
- **Stormwater treatment unit:** CMG is proposing a new stormwater treatment unit that will treat Stormwater prior to discharge to offsite catch basin.
- **Plunge pool:** CMG is proposing a new plunge pool with an overflow to offsite catch basin 1 to mitigate flows from the development of the site.

CMG is providing "**Post-Development Drainage Map" D-2** along with our hydrologic calculations as **Appendix D** to document the proposed Site stormwater management improvements.

Conclusion:

Table No. 1 shows the proposed stormwater design improvements for the Site will reduce off-site runoff to the existing Outfall 1S during all design storm events.

Table No. 2 provides a summary of the Pre- and Post-Development drainage areas.

Table No. 3 demonstrates that the storm sewer system can convey the runoff from a 25 yr storm event without surcharging.

TABLE NO. 1

11/18/2020

STORMWATER RUNOFF PEAK FLOW SUMMARY
#249 W HIGH STREET
EAST HAMPTON, CT

Pre-Existing Site Development (Fig D1) Conditions					
		2-Year	10-Year	25-Year	100-Year
1S - OFF-SITE CATCH BASIN 1	*Peak Flow (cfs)*	*2.70*	*6.64*	*9.39*	*13.84*

Proposed - Site Development (Fig D2) Conditions					
1S - FARMINGTON AVE	*Peak Flow (cfs)*	*2.49*	*6.15*	*8.74*	*12.98*

TABLE NO. 2

DRAINAGE AREA CALCULATIONS
#249 W HIGH STREET
EAST HAMPTON, CT

PRE-DEVELOPMENT DRAINAGE AREAS (s.f.)

On-Site	Soil Type B				Watershed
Area	Impervious	Gravel	Grass/Ldscp	Woods	Total
1	16,801	0	39,334	9,286	65,421
2	16,875	0	29,664	6,739	53,278
					Total
	33,676	0	68,998	16,025	**118,699 s.f.**
				Total Site Area=	**2.72** Ac

Total Impervious= 33,676 s.f.
Total Open Space = 85,023 s.f.

POST-DEVELOPMENT DRAINAGE AREAS (s.f.)

On-Site	Soil Type B				Watershed
Area	Impervious	Gravel	Grass/Ldscp	Woods	Total
1A	8,642	0	39,473	9,349	57,464
1B	4,524	0	879	0	5,403
1C	1,523	0	971	0	2,494
1D	2,440	0	250	0	2,690
1E	8,885	0	21,992	6,735	37,612
1F	1,473	0	275	0	1,748
1G	2,220	0	9,068	0	11,288
					Total
	29,707	0	72,908	16,084	***118,699 s.f.***
				Total Site Area=	**2.72** Ac

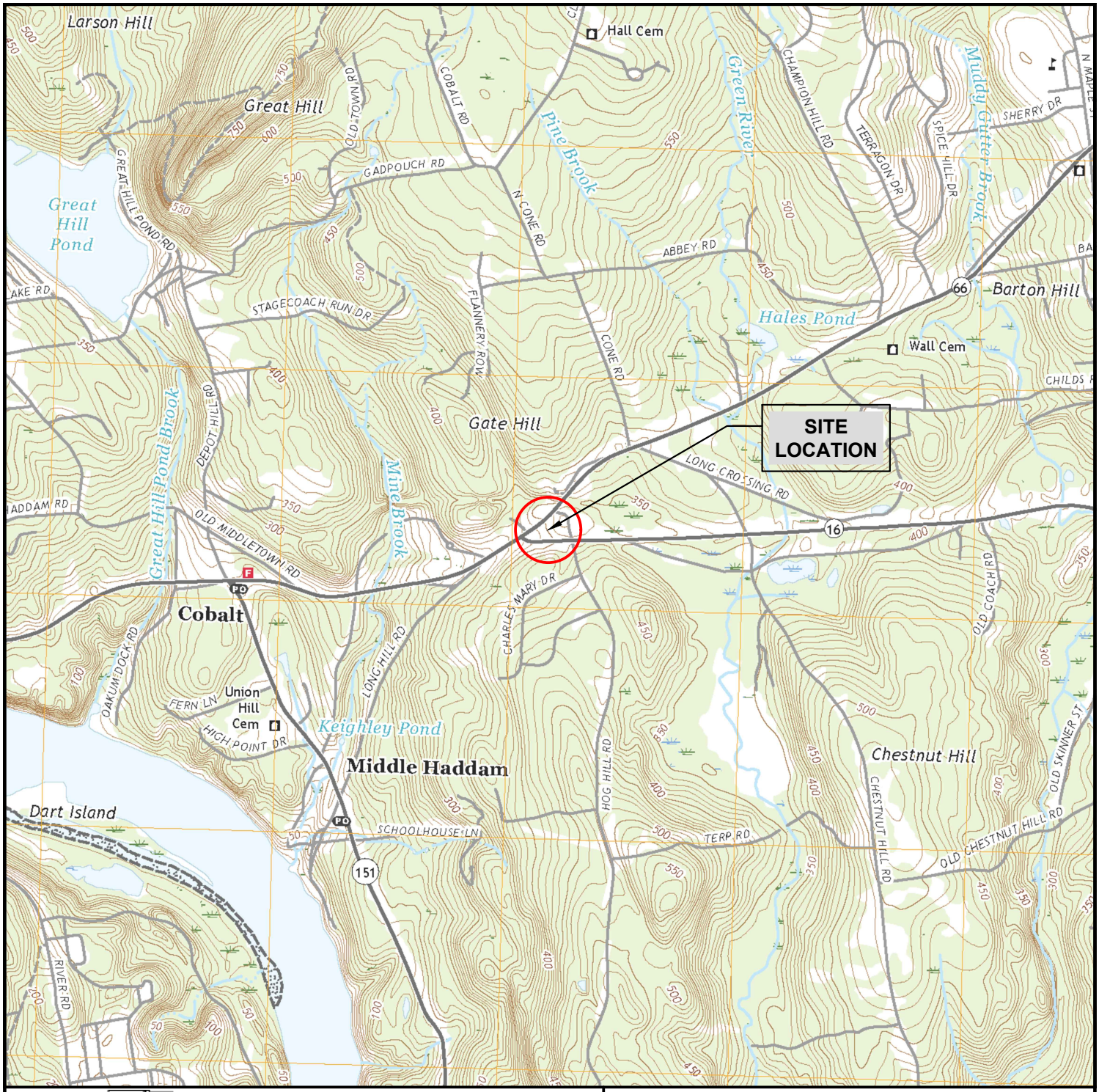
Total Impervious= 29,707 s.f.
Total Open Space = 88,992 s.f.

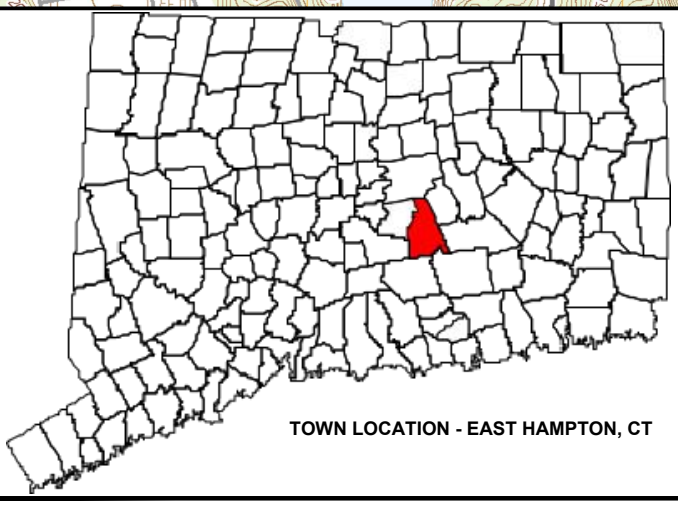
Note:

[1] All Drainage Areas are calculated using CAD Software based on Pre- & Post Development Drainage Plans prepared by CMG date 10/28/20

Appendix A

USGS Site Location Map
&
FEMA Flood Plain Mapping





TOWN LOCATION - EAST HAMPTON, CT

FIGURE 1: SITE LOCATION

249 W HIGH STREET
EAST HAMPTON, CT 06424
CMG ID 2017-194

SCALE 1:24,000

2000 FT 0 2000 FT

ENVIRONMENTAL SERVICES

CMG EST. 2002

ENGINEERING SERVICES

67 HALL ROAD. STURBRIDGE MA 01566

National Flood Hazard Layer FIRMette

FEMA

72°32'41"W 41°34'5"N

72°32'4"W 41°33'38"N

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

1:6,000

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
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 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

N

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 10/28/2020 at 2:19 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.

Appendix B

NCRS Soil Mapping

Soil Map—State of Connecticut

Map Scale: 1:5,790 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

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
Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Aug 30, 2019—Oct 15, 2019

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	3.3	1.9%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	6.3	3.6%
18	Catden and Freetown soils, 0 to 2 percent slopes	12.3	7.0%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	7.2	4.1%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	16.0	9.1%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	7.7	4.4%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	15.6	8.9%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	28.8	16.4%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	17.4	9.9%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	2.7	1.5%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	23.3	13.3%
306	Udorthents-Urban land complex	33.5	19.2%
308	Udorthents, smoothed	1.0	0.6%
Totals for Area of Interest		**175.0**	**100.0%**

State of Connecticut

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

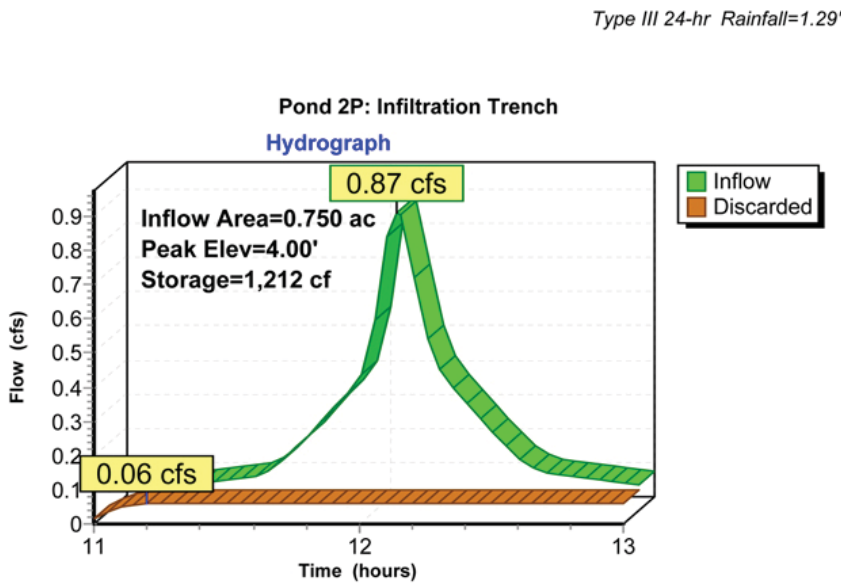


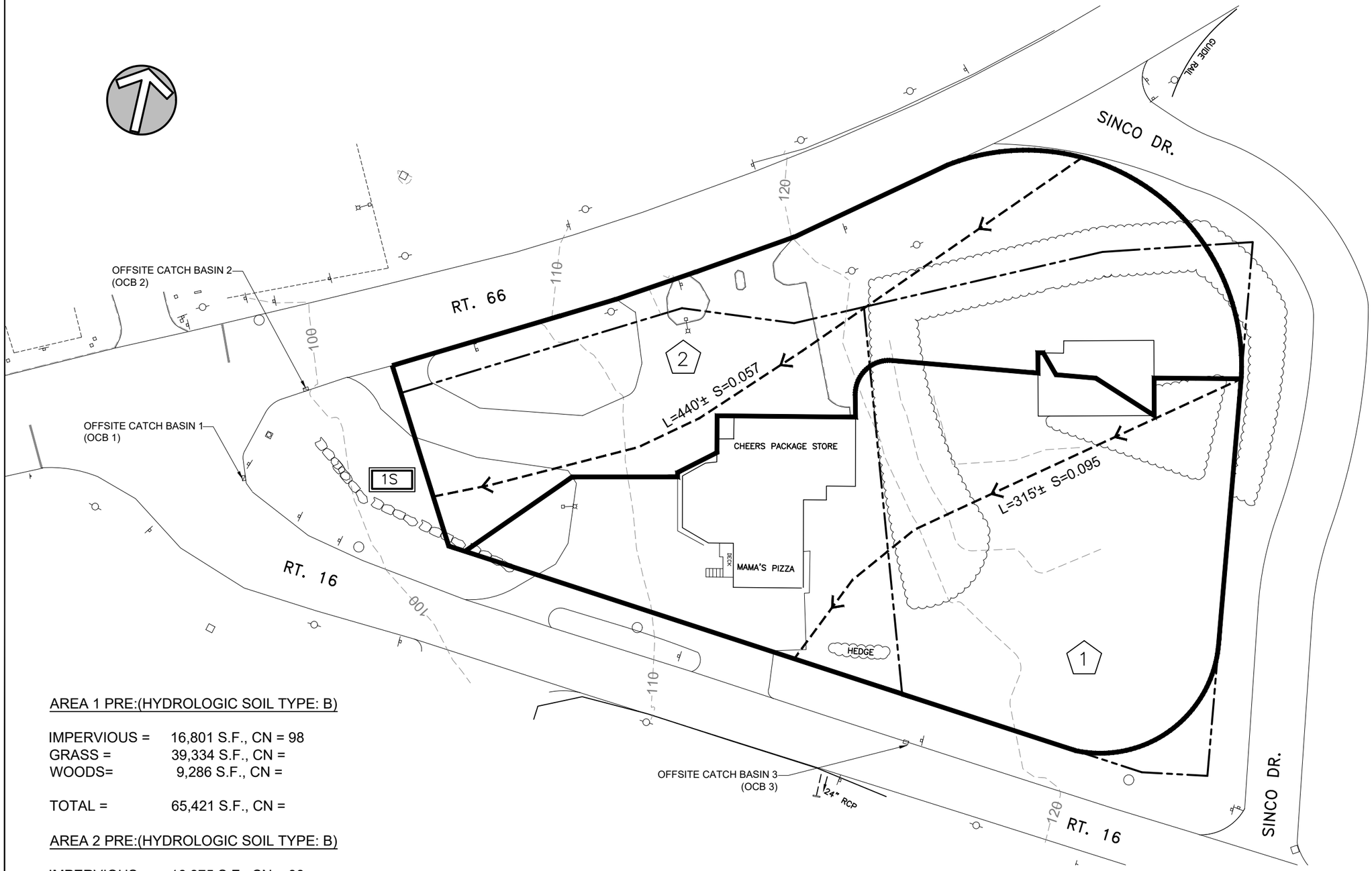
Table 2.3.3. 1982 Rawls Rates[18]

Texture Class	NRCS Hydrologic Soil Group (HSG)	Infiltration Rate Inches/Hour
Sand	A	8.27
Loamy Sand	A	2.41
Sandy Loam	B	1.02
Loam	B	0.52
Silt Loam	C	0.27
Sandy Clay Loam	C	0.17
Clay Loam	D	0.09
Silty Clay Loam	D	0.06
Sandy Clay	D	0.05
Silty Clay	D	0.04
Clay	D	0.02

[18] Rawls, Brakensiek and Saxton, 1982

Appendix C

Pre-Development Drainage Calculations



AREA 1 PRE:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 16,801 S.F., CN = 98
GRASS = 39,334 S.F., CN =
WOODS= 9,286 S.F., CN =

TOTAL = 65,421 S.F., CN =

AREA 2 PRE:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 16,875 S.F., CN = 98
GRASS = 29,664 S.F., CN = 61
WOODS= 6,739 S.F., CN = 55

TOTAL = 53,278 S.F., CN = 72

NO.	DATE	DESCRIPTION	BY	CK'D
		REVISIONS		

PROFESSIONAL SEAL

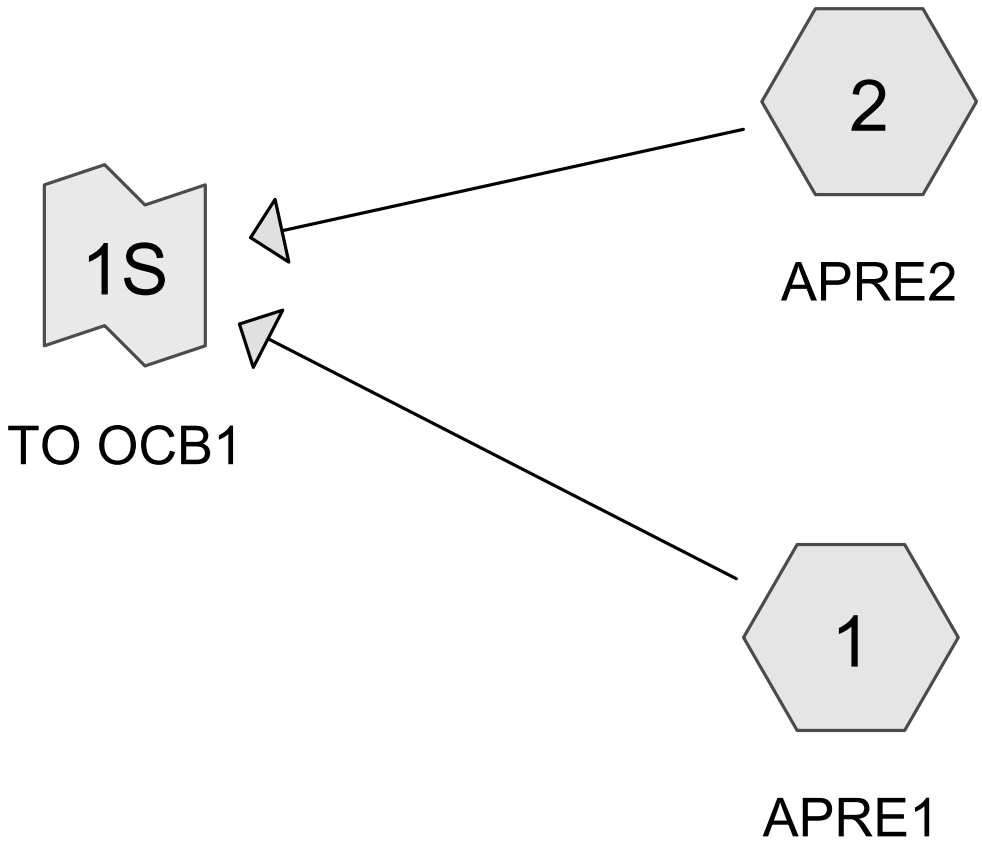
PROJECT:
NEW GASOLINE DISPENSER CANOPY AND
PARTIAL BUILDING INTERIOR REMODEL
ROUTE 66 EXPRESS MART
ROUTE 66 AT ROUTE 16, EAST HAMPTON, CT

PREPARED FOR:
PAULA FREE
249 WEST HIGH STREET
EAST HAMPTON, CT 06424

ENVIRONMENTAL SERVICES
ENGINEERING SERVICES
67 HALL ROAD
STURBRIDGE, MA 01560
PHONE: 774-241-0901
FAX: 774-241-0906

CMG EST. 2002

ISSUE DATE: 10/28/2020
DRAWN BY: SH | CHECKED BY: MS
SCALE: 1" = 60'
PROJECT NO.: 2017-194
SHEET NAME:
PRE-DEVELOPMENT
DRAINAGE MAP
SHEET NO.:
D - 1.0



Subcat Reach Pond Link

Routing Diagram for 2017-194_PRE_SH_10-26-2020
Prepared by {enter your company name here}, Printed 10/28/2020

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Storm	Type III 24-hr		Default	24.00	1	3.38	2
2	10-Year Storm	Type III 24-hr		Default	24.00	1	5.20	2
3	25-Year Storm	Type III 24-hr		Default	24.00	1	6.34	2
4	100-Year Storm	Type III 24-hr		Default	24.00	1	8.10	2

Summary for Subcatchment 1: APRE1

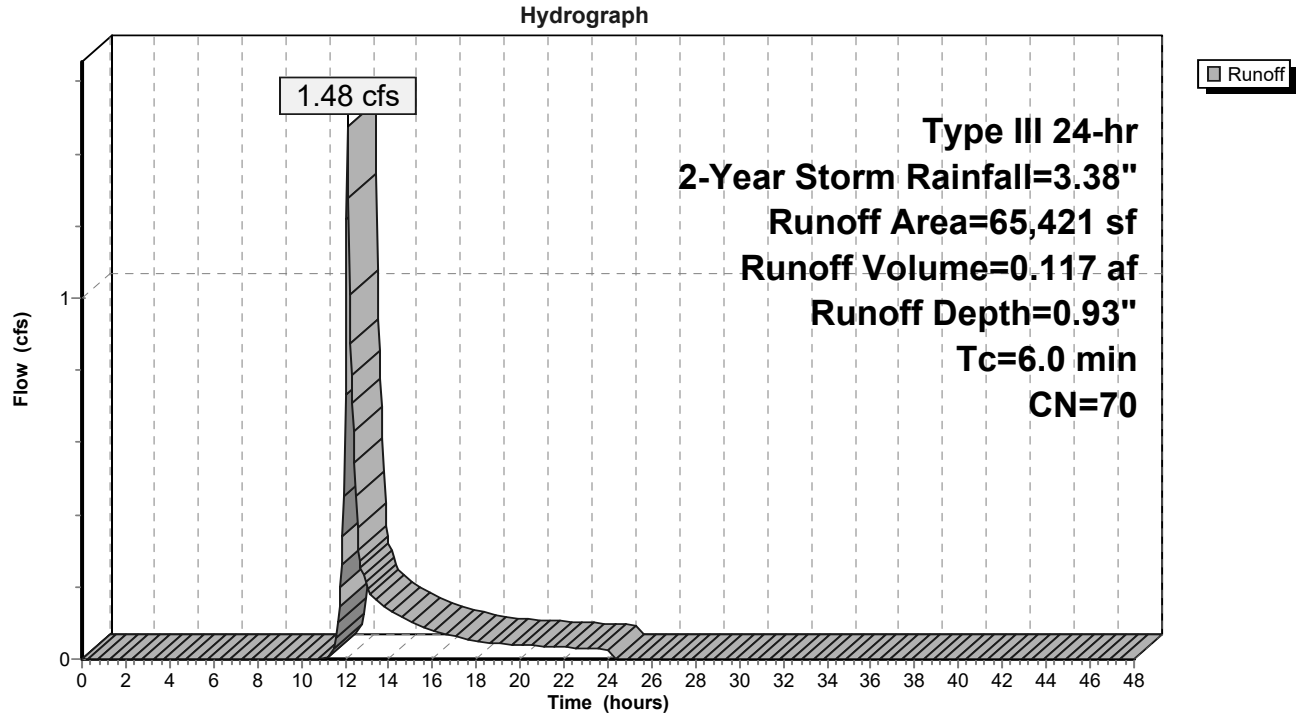
Runoff = 1.48 cfs @ 12.10 hrs, Volume= 0.117 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
16,801	98	Paved parking, HSG B
39,334	61	>75% Grass cover, Good, HSG B
9,286	55	Woods, Good, HSG B
65,421	70	Weighted Average
48,620		74.32% Pervious Area
16,801		25.68% Impervious Area

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

Subcatchment 1: APRE1



Summary for Subcatchment 2: APRE2

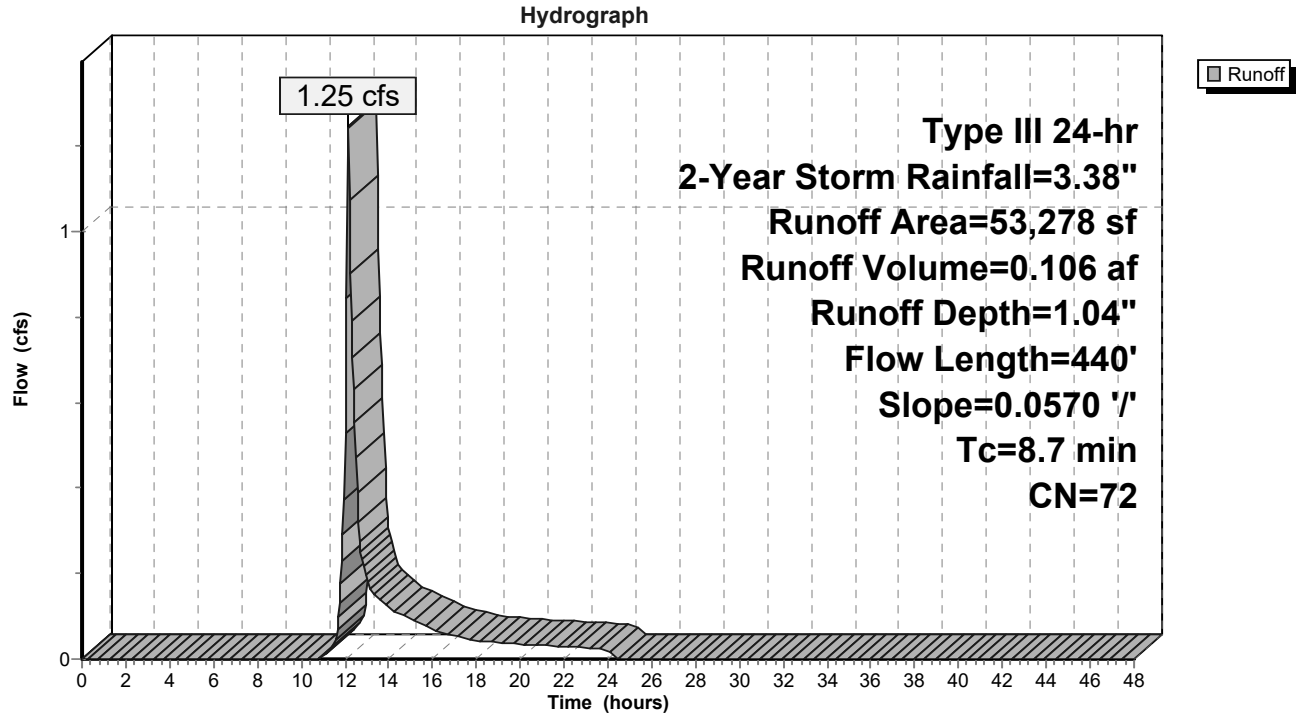
Runoff = 1.25 cfs @ 12.14 hrs, Volume= 0.106 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
16,875	98	Paved parking, HSG B
29,664	61	>75% Grass cover, Good, HSG B
6,739	55	Woods, Good, HSG B
53,278	72	Weighted Average
36,403		68.33% Pervious Area
16,875		31.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	440	0.0570	0.84		**Lag/CN Method, LAG/CN METHOD**

Subcatchment 2: APRE2

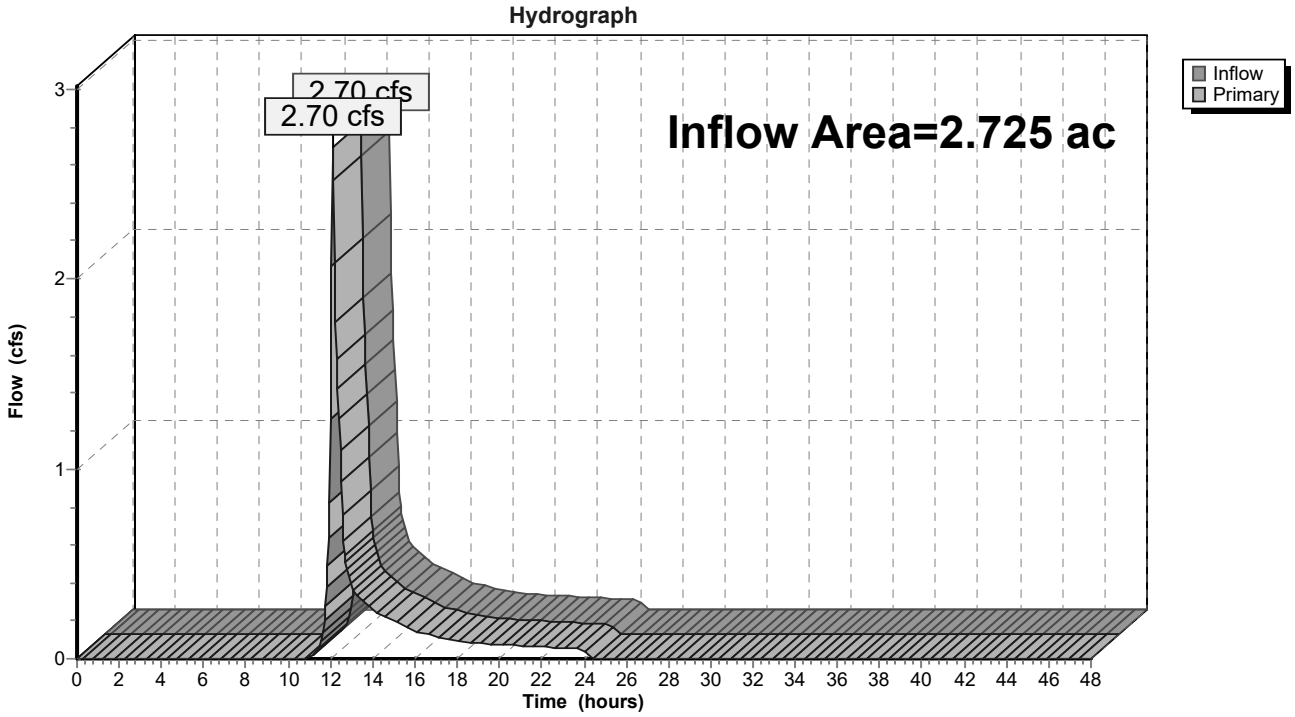


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 28.37% Impervious, Inflow Depth = 0.98" for 2-Year Storm event
Inflow = 2.70 cfs @ 12.12 hrs, Volume= 0.223 af
Primary = 2.70 cfs @ 12.12 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Summary for Subcatchment 1: APRE1

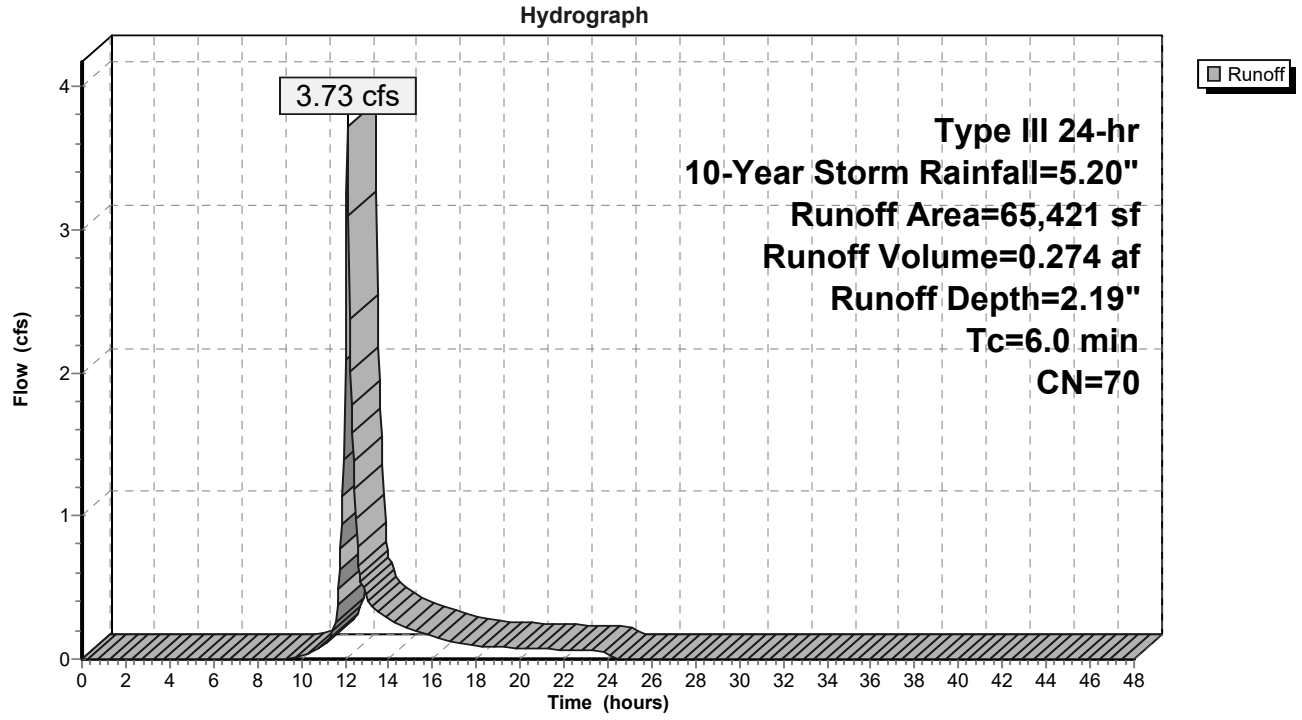
Runoff = 3.73 cfs @ 12.10 hrs, Volume= 0.274 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
16,801	98	Paved parking, HSG B
39,334	61	>75% Grass cover, Good, HSG B
9,286	55	Woods, Good, HSG B
65,421	70	Weighted Average
48,620		74.32% Pervious Area
16,801		25.68% Impervious Area

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

Subcatchment 1: APRE1



Summary for Subcatchment 2: APRE2

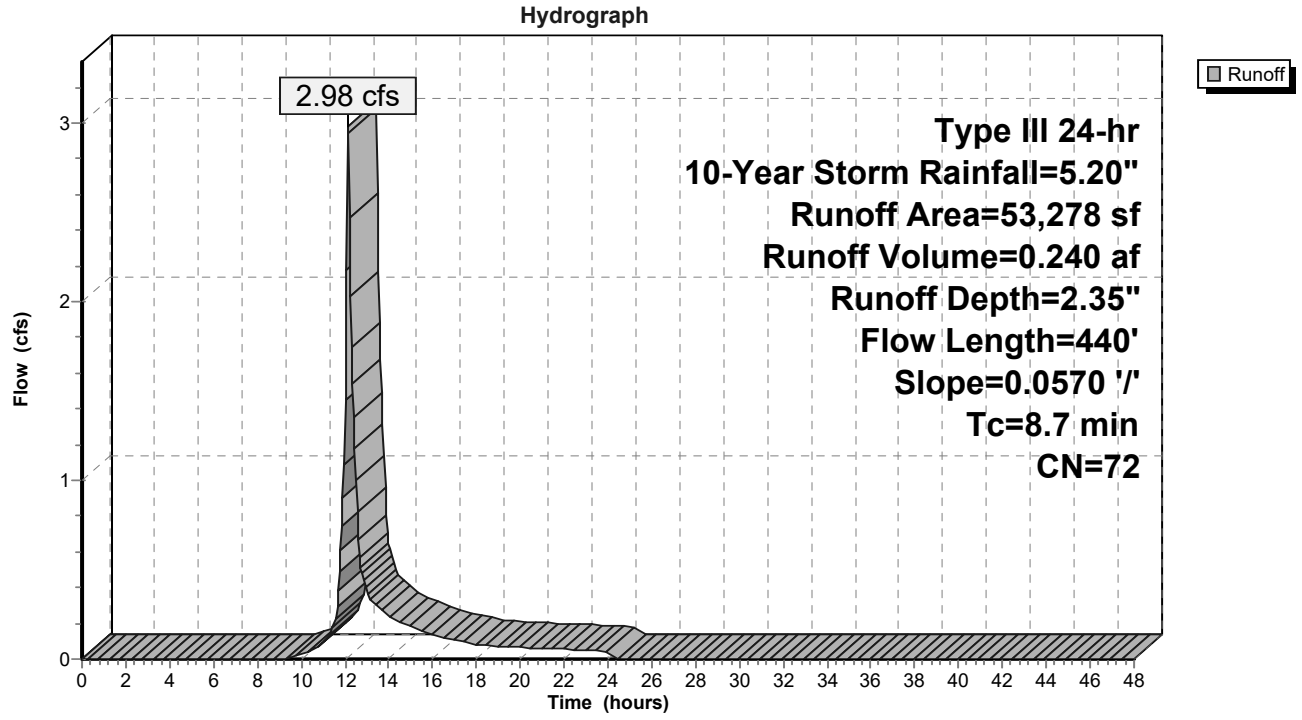
Runoff = 2.98 cfs @ 12.13 hrs, Volume= 0.240 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
16,875	98	Paved parking, HSG B
29,664	61	>75% Grass cover, Good, HSG B
6,739	55	Woods, Good, HSG B
53,278	72	Weighted Average
36,403		68.33% Pervious Area
16,875		31.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	440	0.0570	0.84		**Lag/CN Method, LAG/CN METHOD**

Subcatchment 2: APRE2

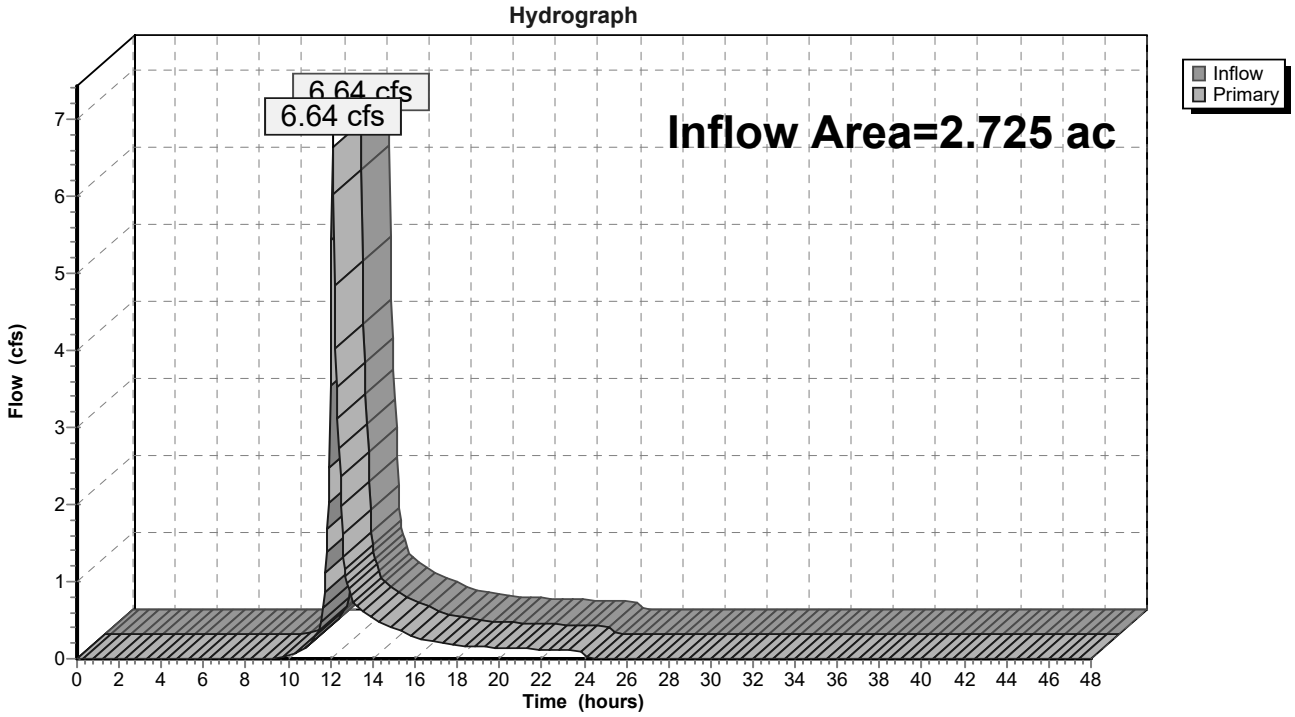


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 28.37% Impervious, Inflow Depth = 2.26" for 10-Year Storm event
Inflow = 6.64 cfs @ 12.11 hrs, Volume= 0.513 af
Primary = 6.64 cfs @ 12.11 hrs, Volume= 0.513 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Summary for Subcatchment 1: APRE1

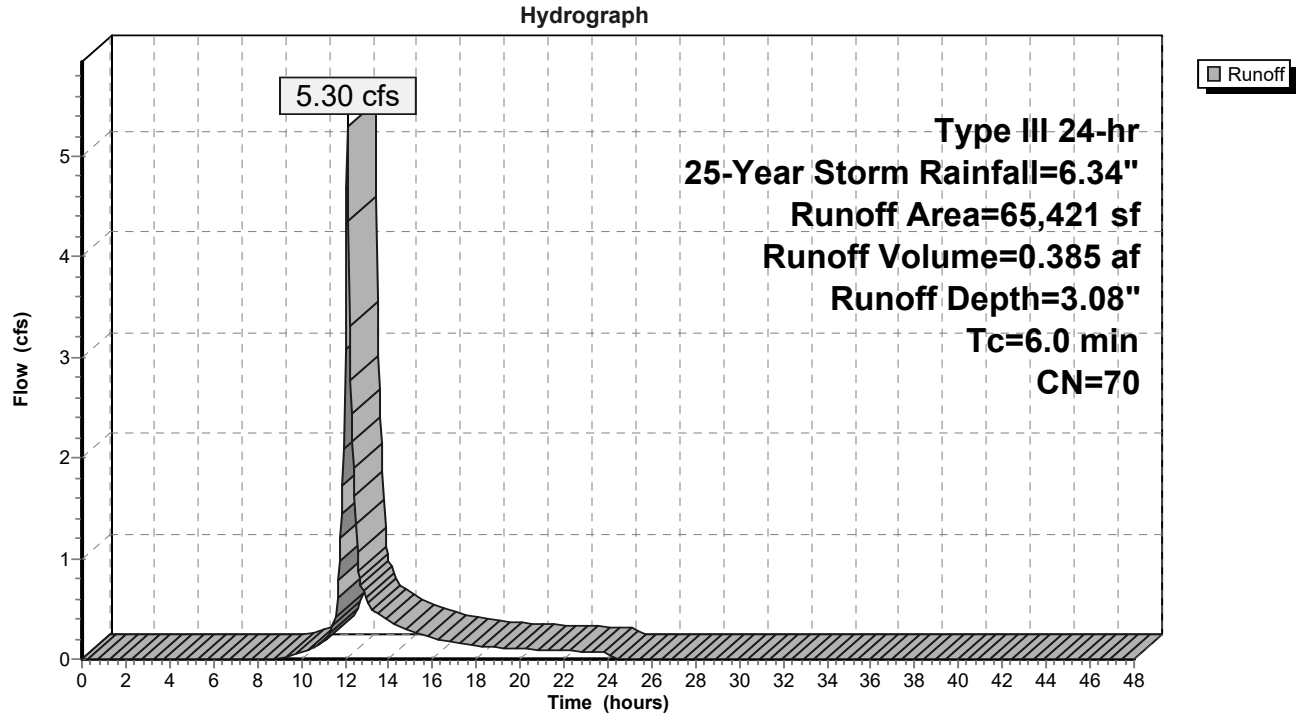
Runoff = 5.30 cfs @ 12.09 hrs, Volume= 0.385 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
16,801	98	Paved parking, HSG B
39,334	61	>75% Grass cover, Good, HSG B
9,286	55	Woods, Good, HSG B
65,421	70	Weighted Average
48,620		74.32% Pervious Area
16,801		25.68% Impervious Area

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

Subcatchment 1: APRE1



Summary for Subcatchment 2: APRE2

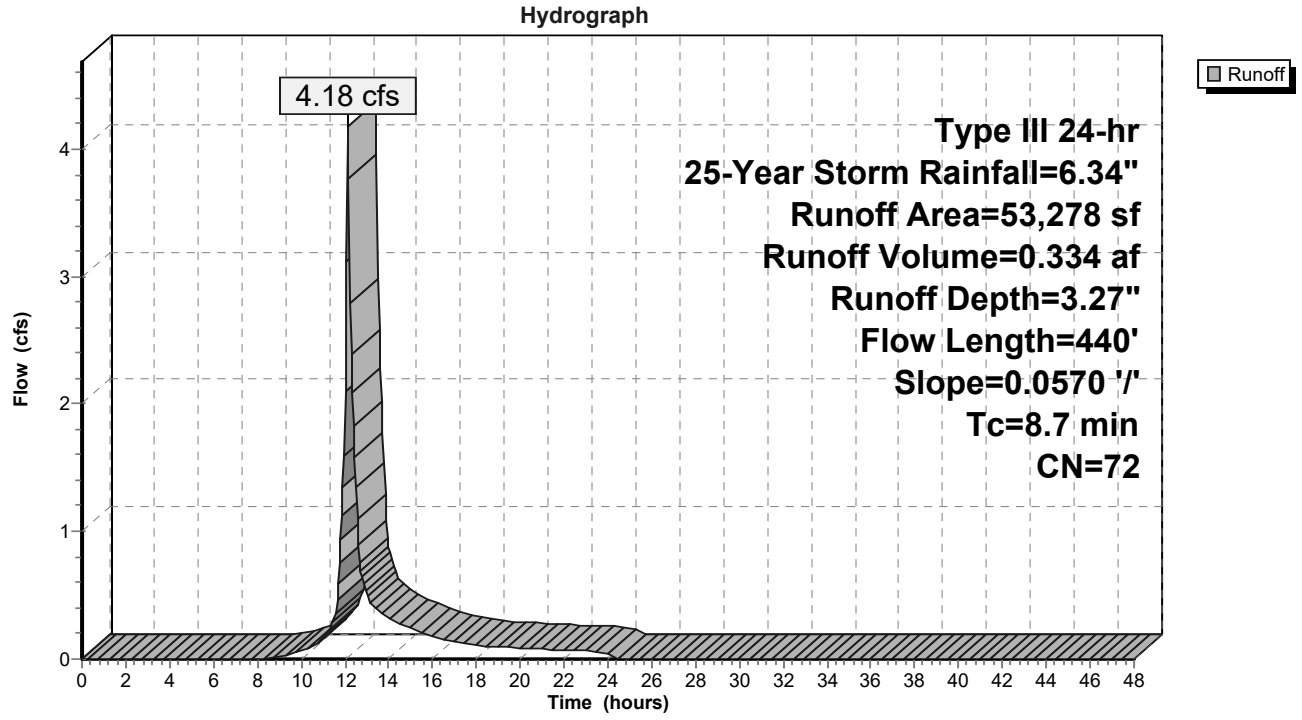
Runoff = 4.18 cfs @ 12.13 hrs, Volume= 0.334 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
16,875	98	Paved parking, HSG B
29,664	61	>75% Grass cover, Good, HSG B
6,739	55	Woods, Good, HSG B
53,278	72	Weighted Average
36,403		68.33% Pervious Area
16,875		31.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	440	0.0570	0.84		**Lag/CN Method, LAG/CN METHOD**

Subcatchment 2: APRE2

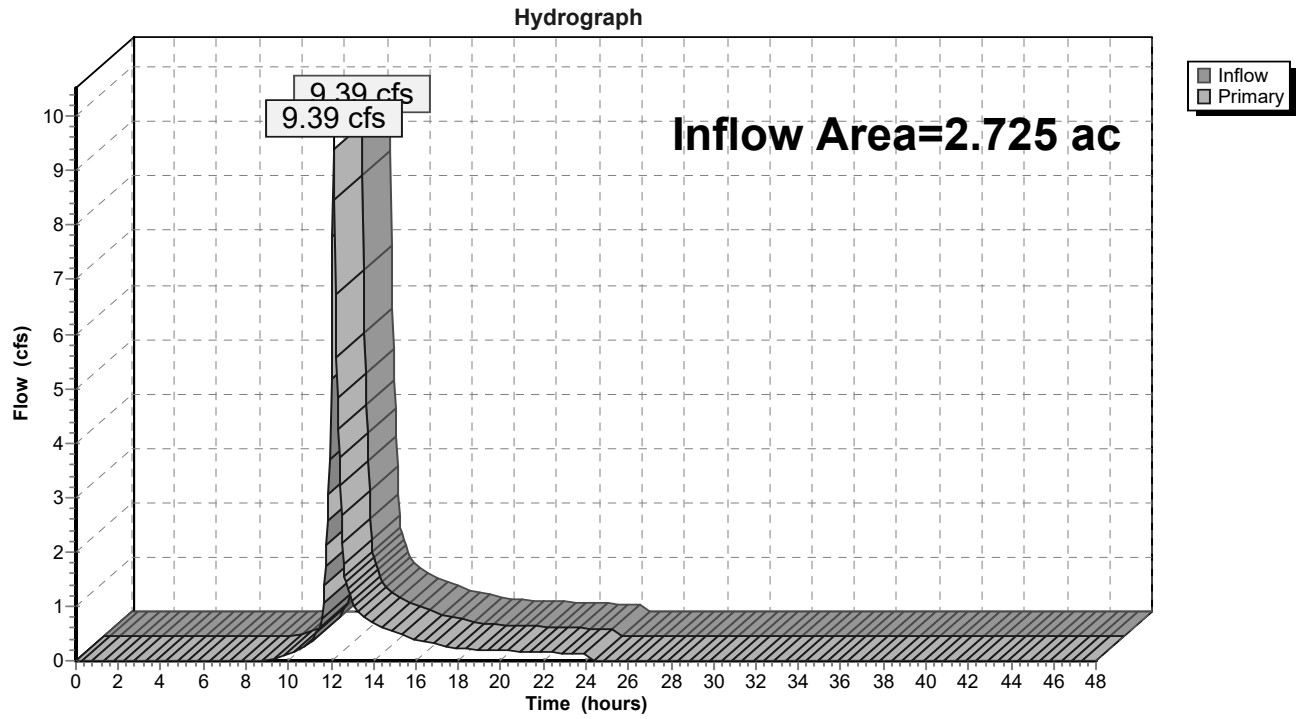


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 28.37% Impervious, Inflow Depth = 3.17" for 25-Year Storm event
Inflow = 9.39 cfs @ 12.11 hrs, Volume= 0.719 af
Primary = 9.39 cfs @ 12.11 hrs, Volume= 0.719 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Summary for Subcatchment 1: APRE1

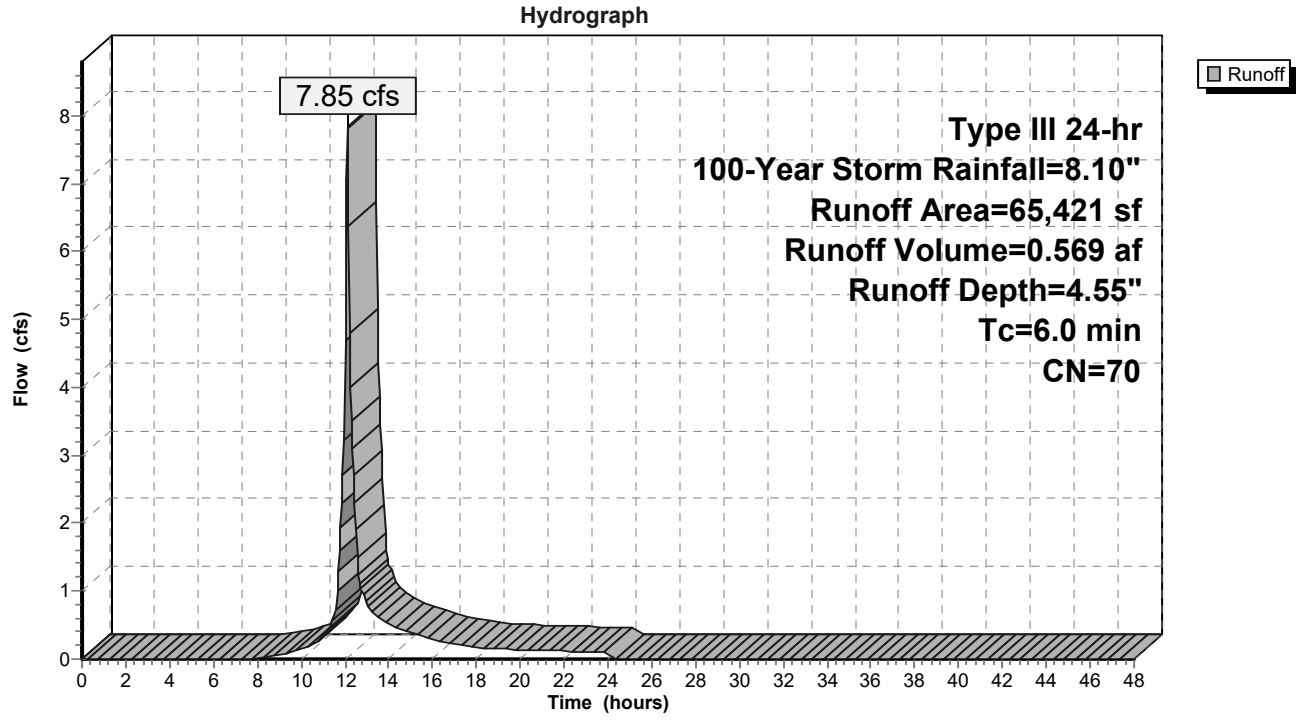
Runoff = 7.85 cfs @ 12.09 hrs, Volume= 0.569 af, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
16,801	98	Paved parking, HSG B
39,334	61	>75% Grass cover, Good, HSG B
9,286	55	Woods, Good, HSG B
65,421	70	Weighted Average
48,620		74.32% Pervious Area
16,801		25.68% Impervious Area

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

Subcatchment 1: APRE1



Summary for Subcatchment 2: APRE2

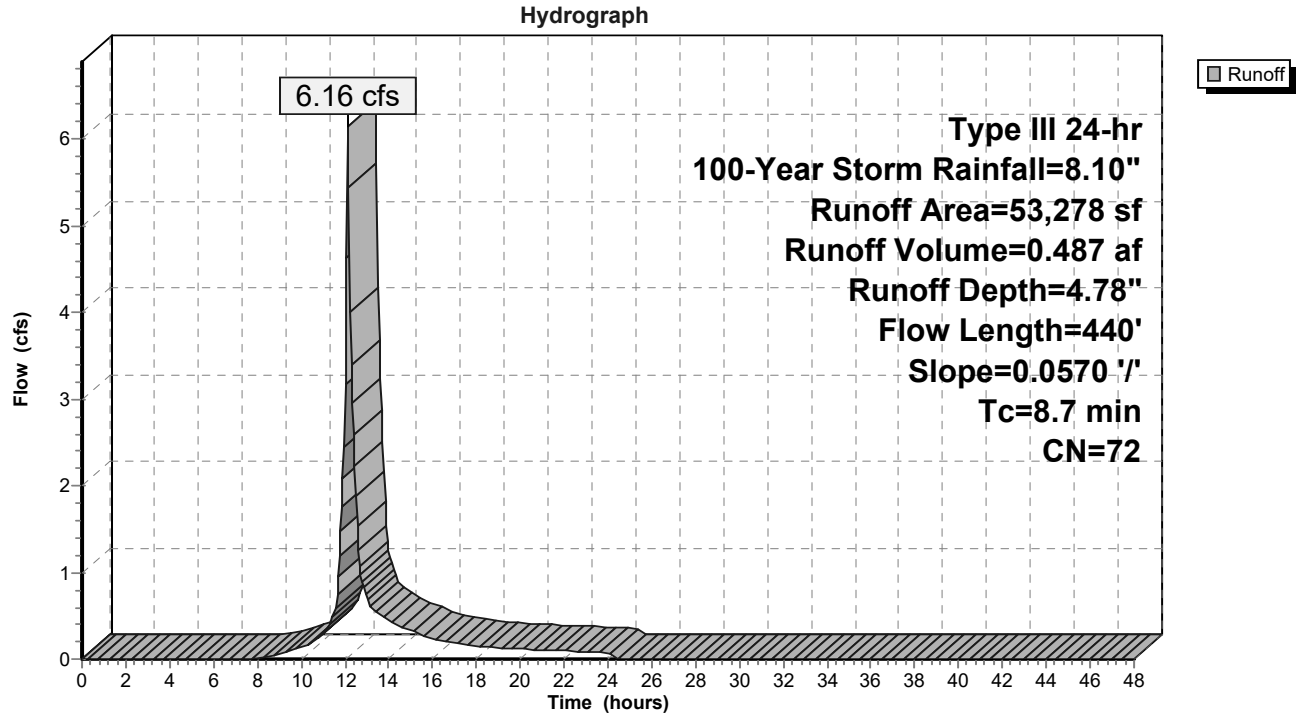
Runoff = 6.16 cfs @ 12.12 hrs, Volume= 0.487 af, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
16,875	98	Paved parking, HSG B
29,664	61	>75% Grass cover, Good, HSG B
6,739	55	Woods, Good, HSG B
53,278	72	Weighted Average
36,403		68.33% Pervious Area
16,875		31.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	440	0.0570	0.84		**Lag/CN Method, LAG/CN METHOD**

Subcatchment 2: APRE2

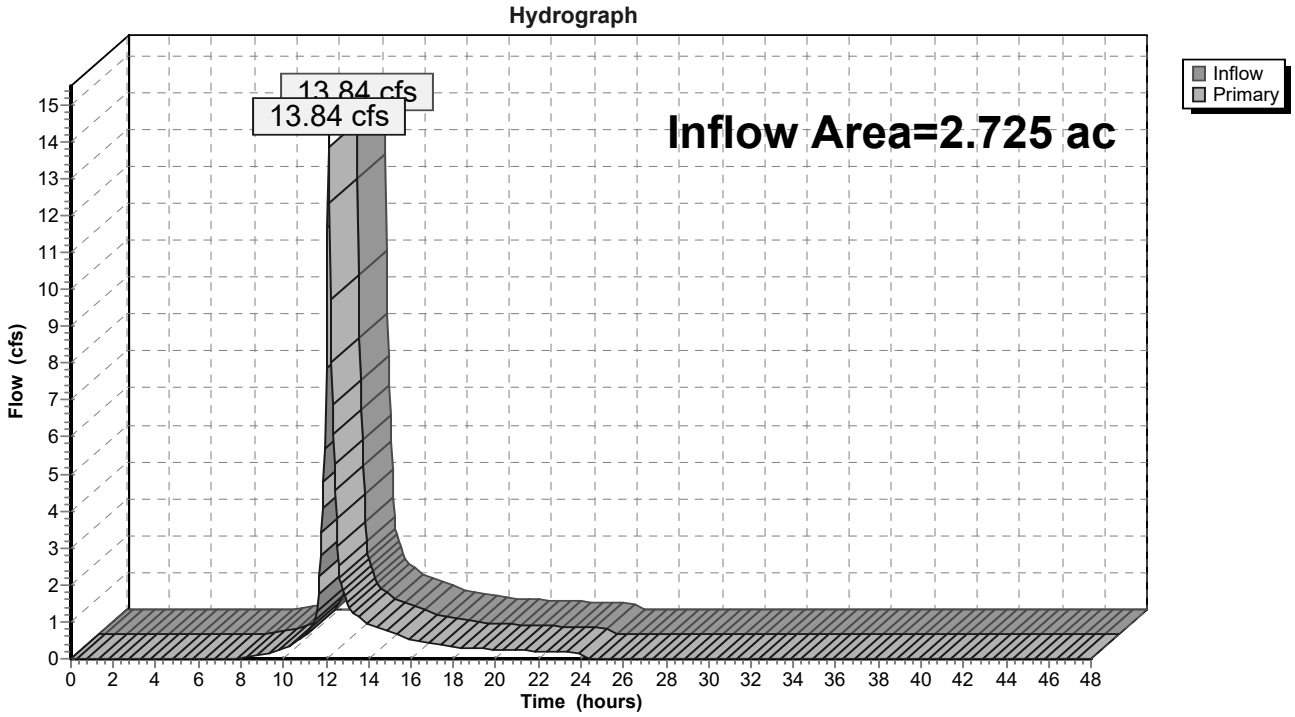


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 28.37% Impervious, Inflow Depth = 4.65" for 100-Year Storm event
Inflow = 13.84 cfs @ 12.10 hrs, Volume= 1.057 af
Primary = 13.84 cfs @ 12.10 hrs, Volume= 1.057 af, Atten= 0%, Lag= 0.0 min

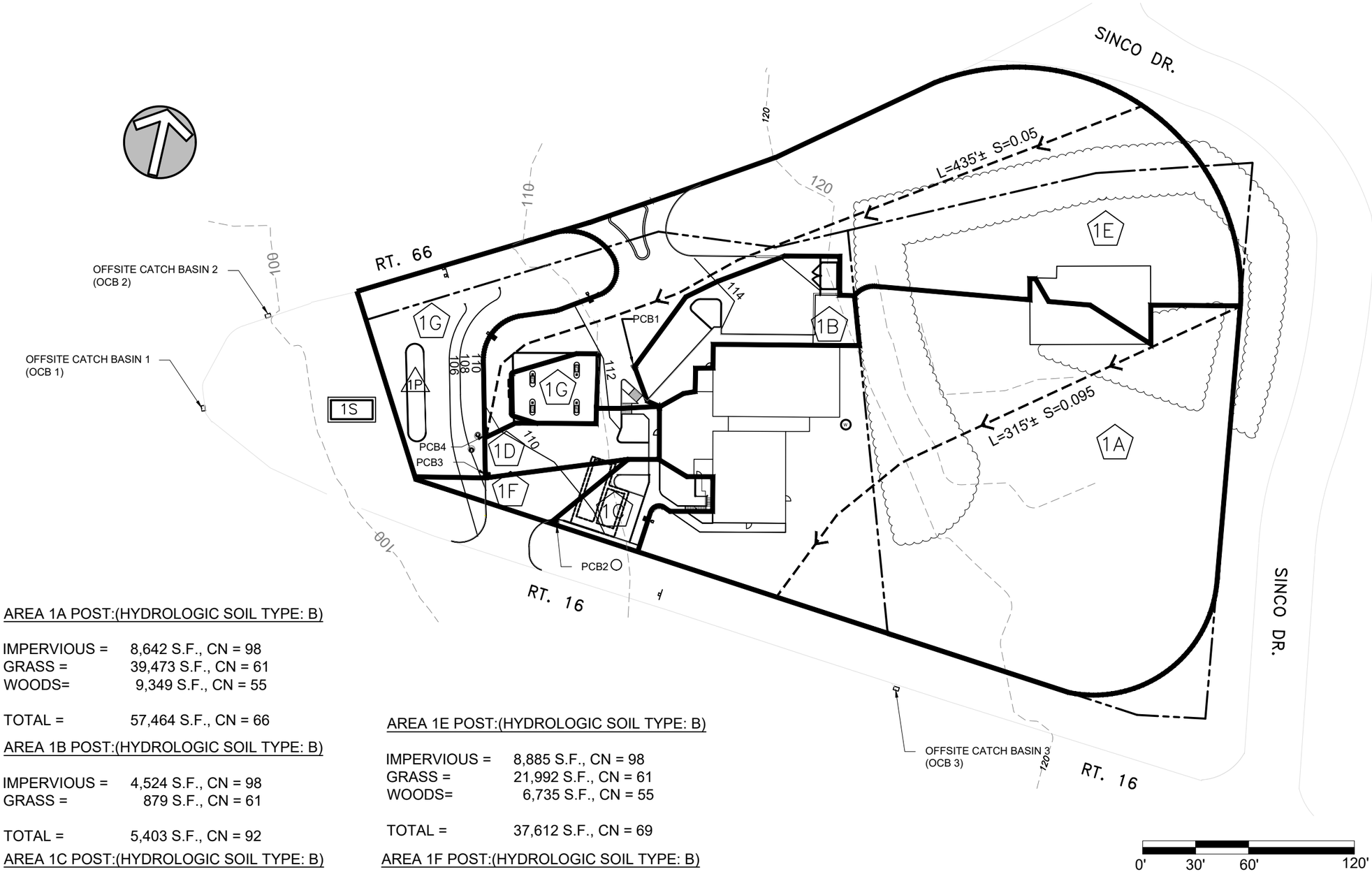
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Appendix D

Post-Development Drainage Calculations



AREA 1A POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 8,642 S.F., CN = 98
GRASS = 39,473 S.F., CN = 61
WOODS= 9,349 S.F., CN = 55

TOTAL = 57,464 S.F., CN = 66

AREA 1B POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 4,524 S.F., CN = 98
GRASS = 879 S.F., CN = 61

TOTAL = 5,403 S.F., CN = 92

AREA 1C POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 1,523S.F., CN = 98
GRASS = 971 S.F., CN = 61

TOTAL = 2,494 S.F., CN = 84

AREA 1D POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 2,440 S.F., CN = 98
GRASS= 250 S.F., CN = 61

TOTAL = 2,690 S.F., CN = 95

AREA 1E POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 8,885 S.F., CN = 98
GRASS = 21,992 S.F., CN = 61
WOODS= 6,735 S.F., CN = 55

TOTAL = 37,612 S.F., CN = 69

AREA 1F POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 1,473 S.F., CN = 98
GRASS = 275 S.F., CN = 61

TOTAL = 1,748 S.F., CN = 92

AREA 1G POST:(HYDROLOGIC SOIL TYPE: B)

IMPERVIOUS = 2,220 S.F., CN = 98
GRASS = 9,068 S.F., CN = 61

TOTAL = 11,288 S.F., CN = 68

REVISIONS

NO.	DATE	DESCRIPTION	BY	CK'D

PROFESSIONAL SEAL

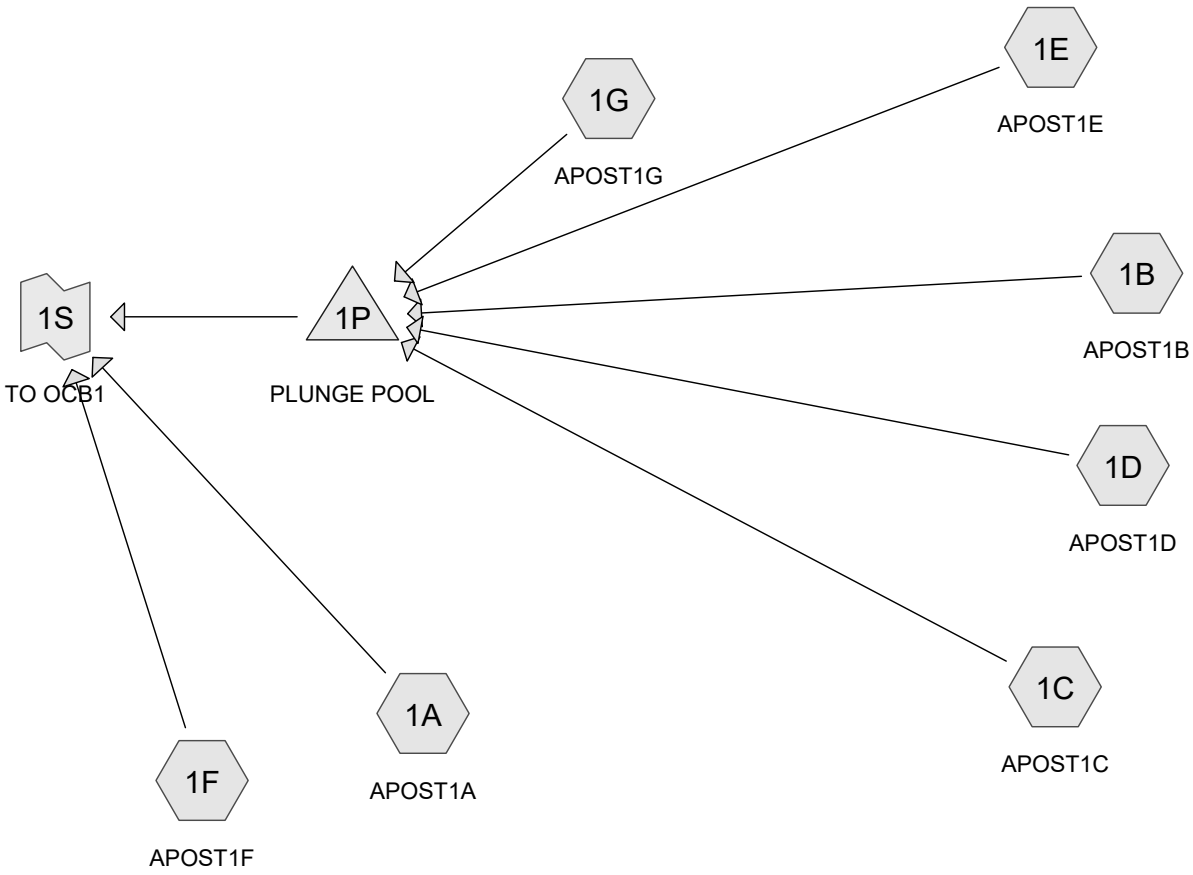
PROJECT: NEW GASOLINE DISPENSER CANOPY AND PARTIAL BUILDING INTERIOR REMODEL
ROUTE 66 EXPRESS MART
ROUTE 66 AT ROUTE 16, EAST HAMPTON, CT

PREPARED FOR: PAULA FREE
249 WEST HIGH STREET
EAST HAMPTON, CT 06424

ENVIRONMENTAL SERVICES
ENGINEERING SERVICES
67 HALL ROAD
STURBRIDGE, MA 01560
PHONE: 774-241-0901
FAX: 774-241-0906

CMG EST. 2002

ISSUE DATE: 10/28/2020
DRAWN BY: SH | CHECKED BY: MS
SCALE: 1" = 60'
PROJECT NO.: 2017-194
SHEET NAME: POST-DEVELOPMENT DRAINAGE MAP
SHEET NO.: D - 2.0



Subcat Reach Pond Link

Routing Diagram for 2017-194_POST_3_SH_DF_10-28-2020
Prepared by {enter your company name here}, Printed 11/18/2020

Summary for Subcatchment 1A: APOST1A

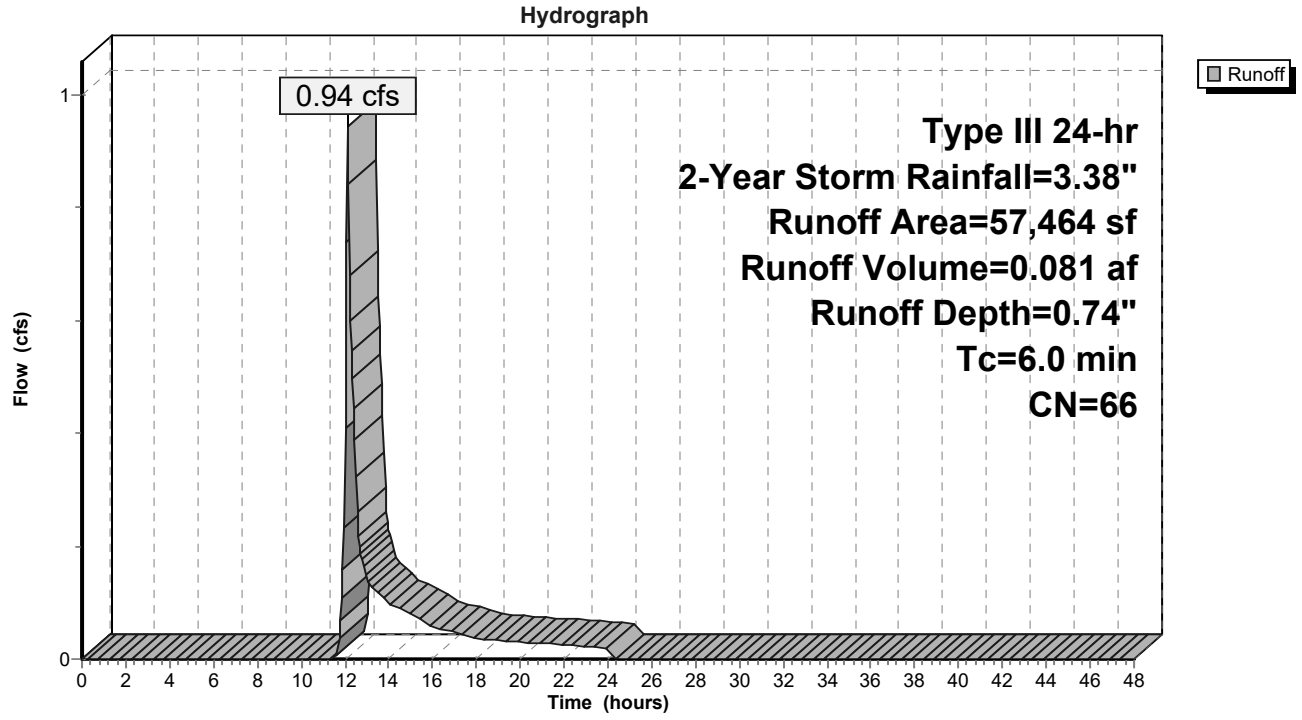
Runoff = 0.94 cfs @ 12.11 hrs, Volume= 0.081 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
8,642	98	Paved parking, HSG B
39,473	61	>75% Grass cover, Good, HSG B
9,349	55	Woods, Good, HSG B
57,464	66	Weighted Average
48,822		84.96% Pervious Area
8,642		15.04% Impervious Area

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

Subcatchment 1A: APOST1A



Summary for Subcatchment 1B: APOST1B

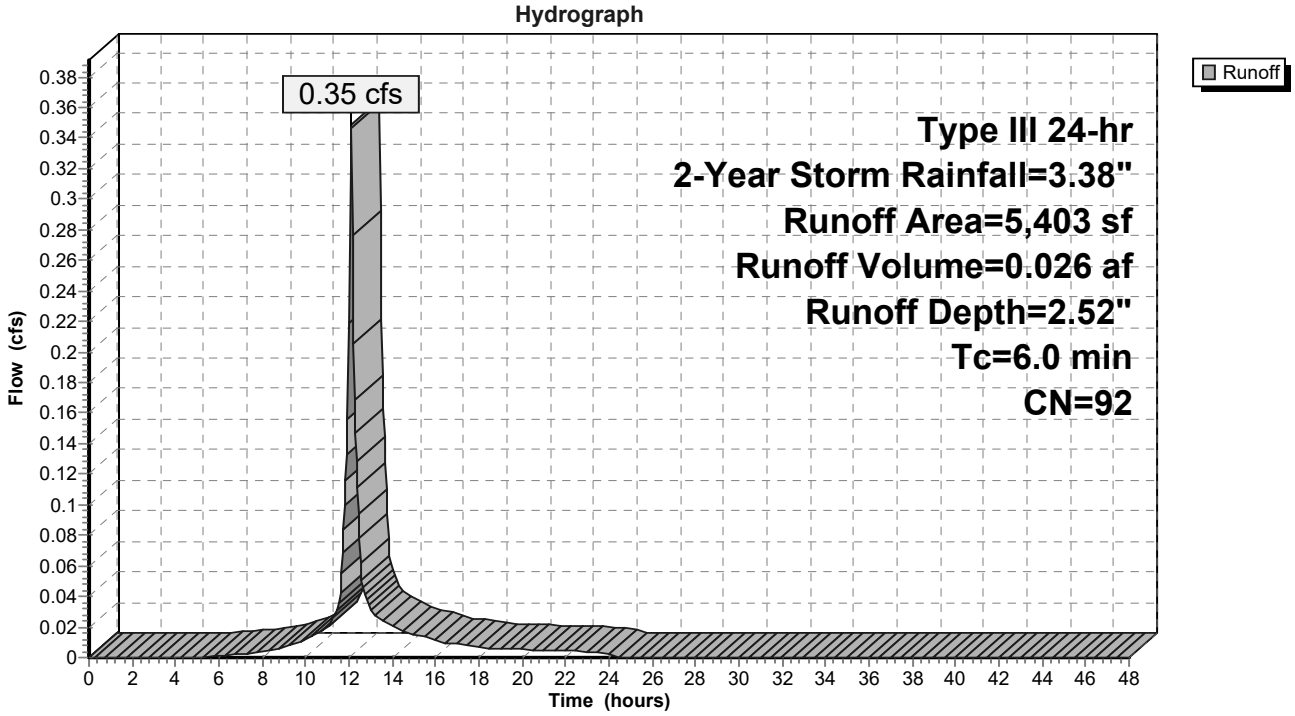
Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
4,524	98	Paved parking, HSG B
879	61	>75% Grass cover, Good, HSG B
5,403	92	Weighted Average
879		16.27% Pervious Area
4,524		83.73% Impervious Area

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

Subcatchment 1B: APOST1B



Summary for Subcatchment 1C: APOST1C

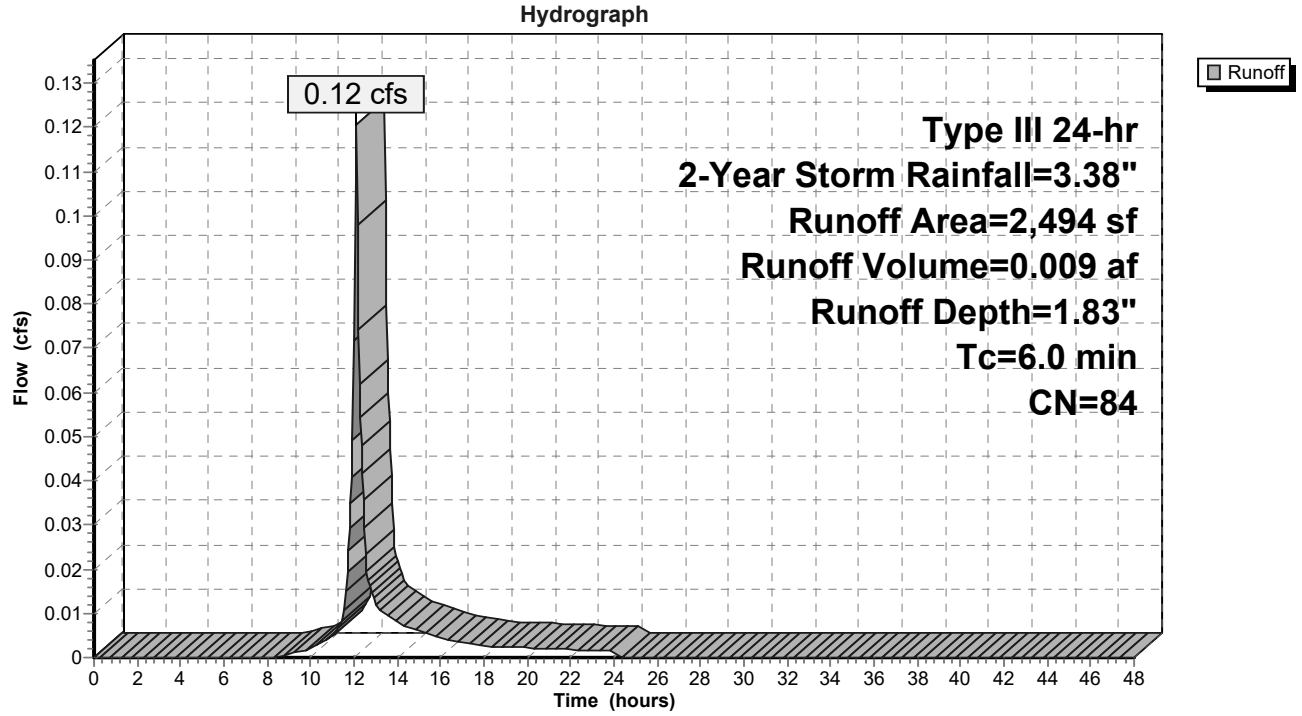
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
1,523	98	Paved parking, HSG B
971	61	>75% Grass cover, Good, HSG B
2,494	84	Weighted Average
971		38.93% Pervious Area
1,523		61.07% Impervious Area

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

Subcatchment 1C: APOST1C



Summary for Subcatchment 1D: APOST1D

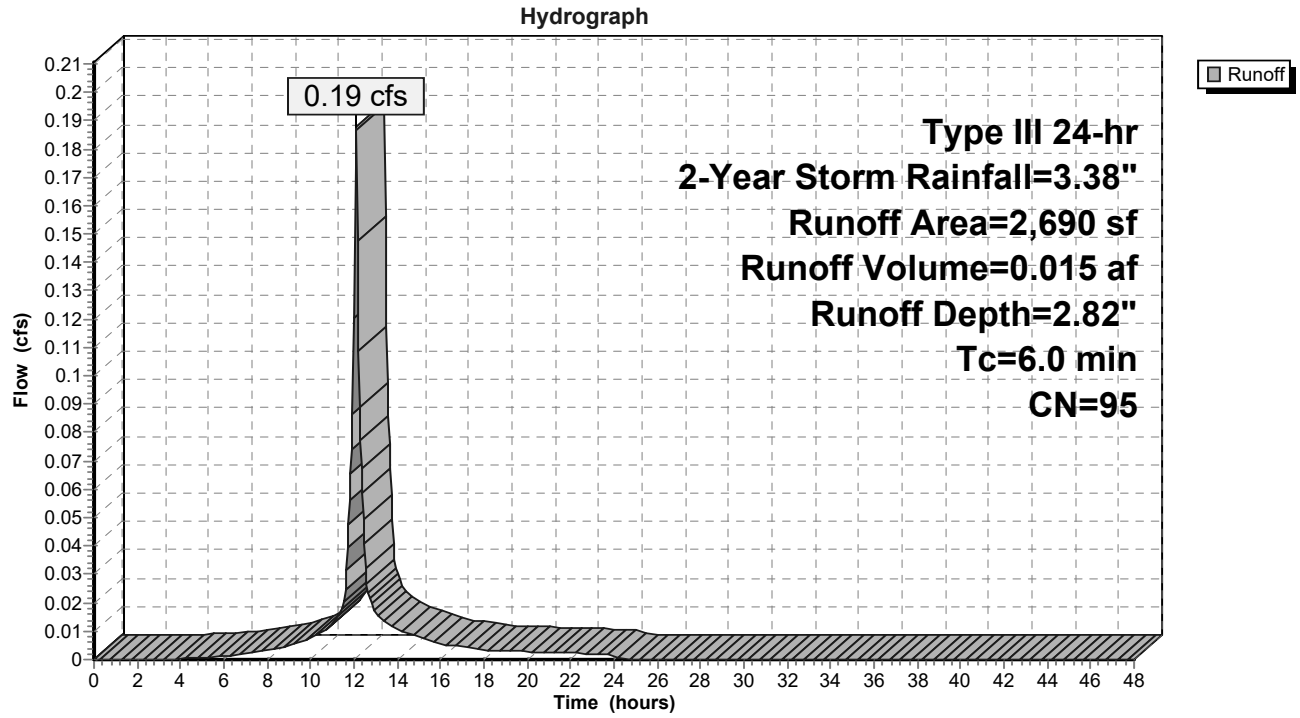
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
2,440	98	Paved parking, HSG B
250	61	>75% Grass cover, Good, HSG B
2,690	95	Weighted Average
250		9.29% Pervious Area
2,440		90.71% Impervious Area

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

Subcatchment 1D: APOST1D



Summary for Subcatchment 1E: APOST1E

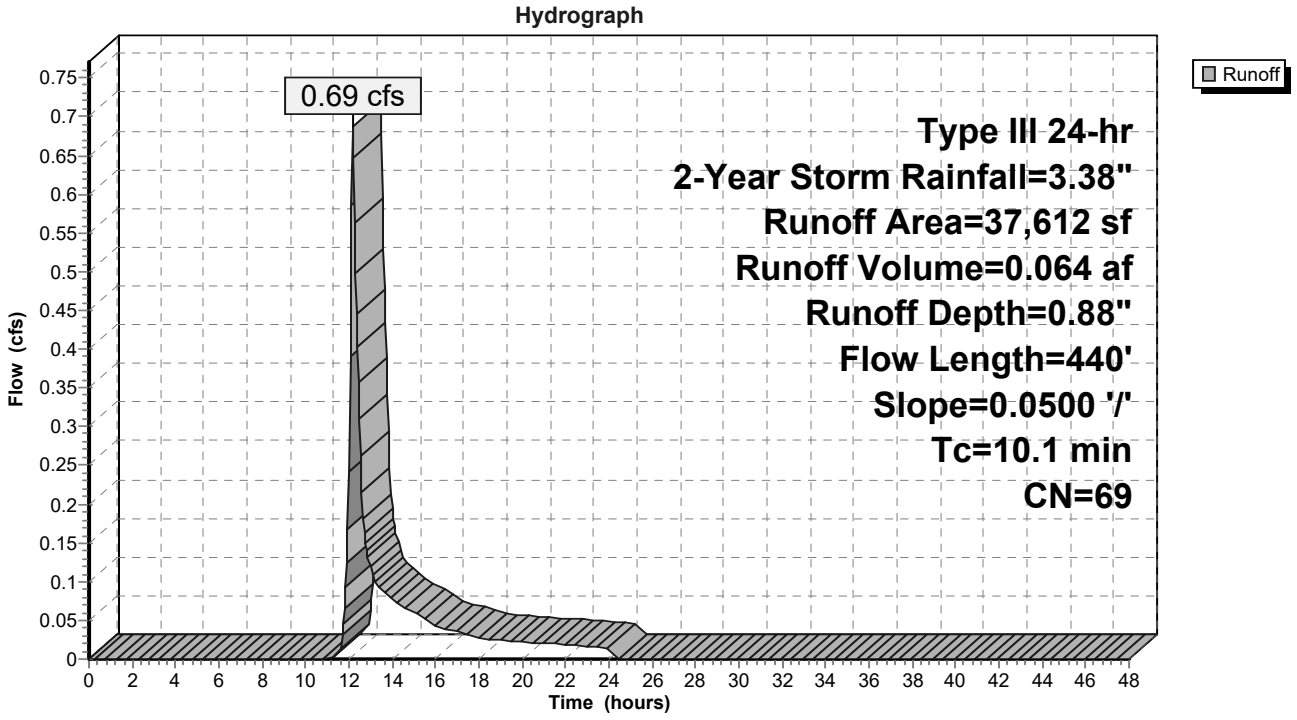
Runoff = 0.69 cfs @ 12.16 hrs, Volume= 0.064 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
8,885	98	Paved parking, HSG B
21,992	61	>75% Grass cover, Good, HSG B
6,735	55	Woods, Good, HSG B
37,612	69	Weighted Average
28,727		76.38% Pervious Area
8,885		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	440	0.0500	0.73		**Lag/CN Method, LAG/CN**

Subcatchment 1E: APOST1E



Summary for Subcatchment 1F: APOST1F

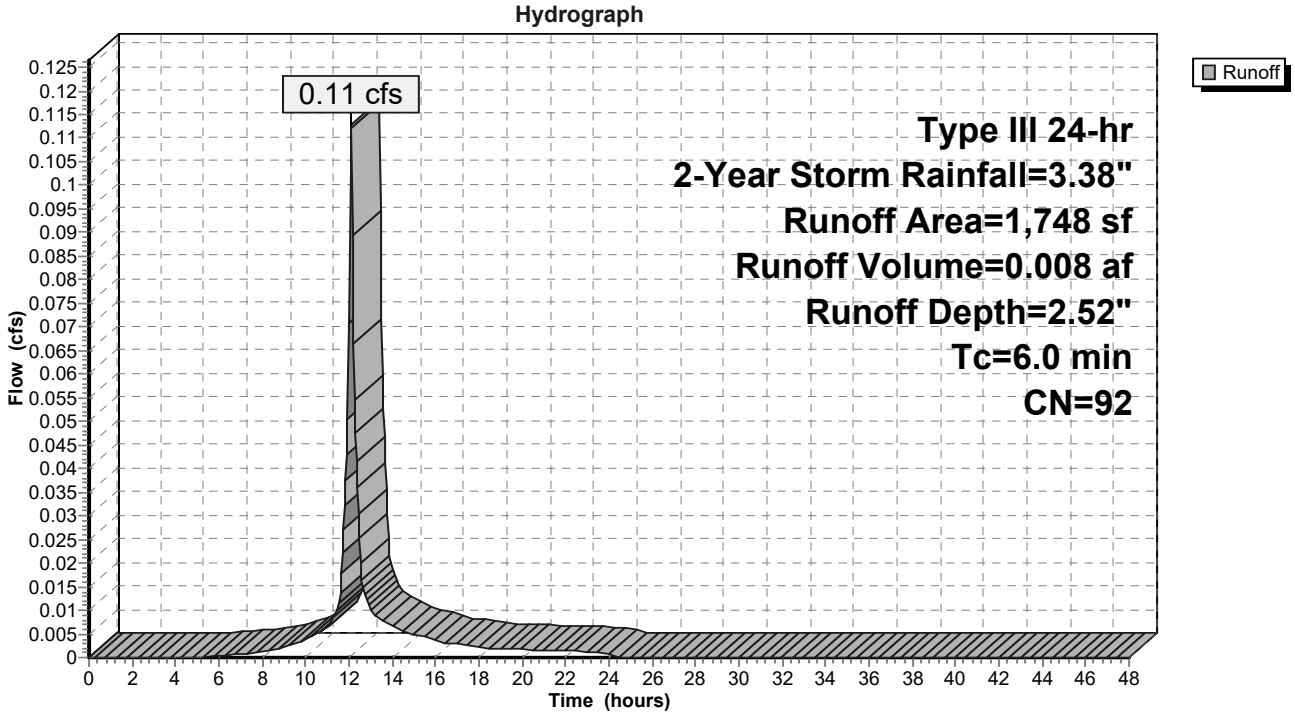
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
1,473	98	Paved parking, HSG B
275	61	>75% Grass cover, Good, HSG B
1,748	92	Weighted Average
275		15.73% Pervious Area
1,473		84.27% Impervious Area

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

Subcatchment 1F: APOST1F



Summary for Subcatchment 1G: APOST1G

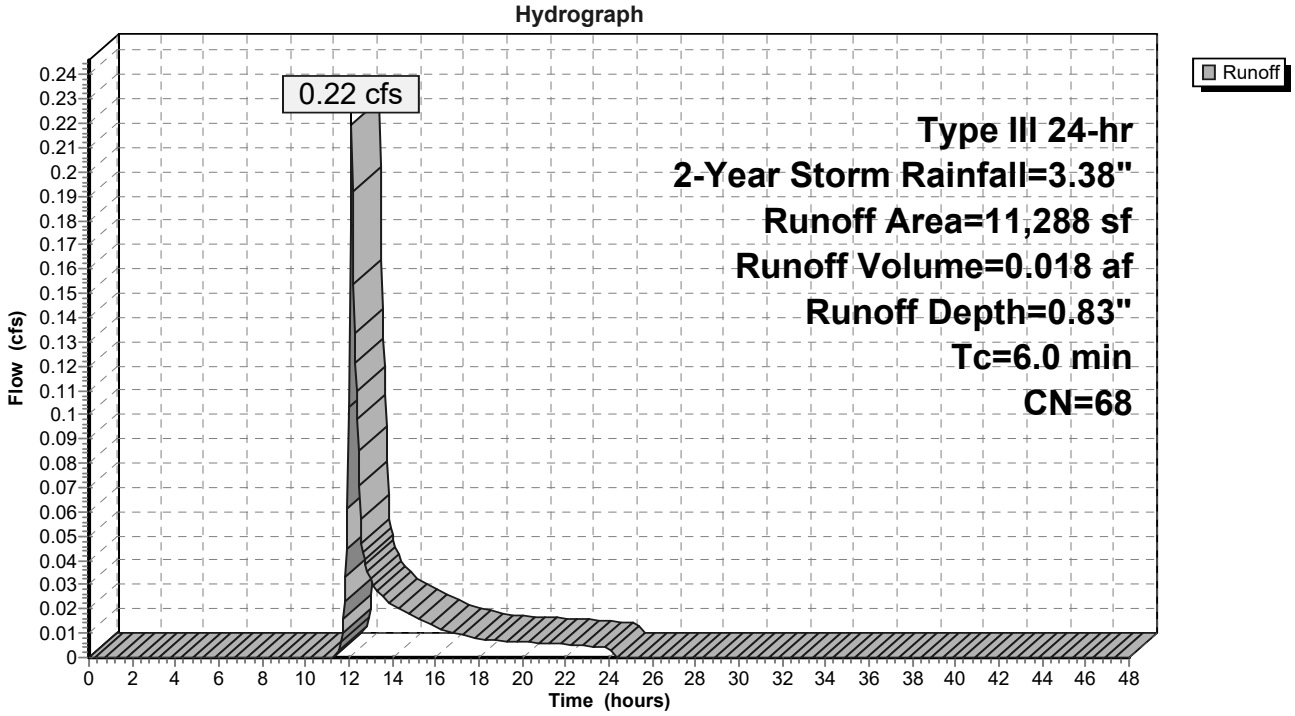
Runoff = 0.22 cfs @ 12.11 hrs, Volume= 0.018 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.38"

Area (sf)	CN	Description
2,220	98	Paved parking, HSG B
9,068	61	>75% Grass cover, Good, HSG B
11,288	68	Weighted Average
9,068		80.33% Pervious Area
2,220		19.67% Impervious Area

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

Subcatchment 1G: APOST1G



Summary for Pond 1P: PLUNGE POOL

Inflow Area = 1.366 ac, 32.93% Impervious, Inflow Depth = 1.15" for 2-Year Storm event
Inflow = 1.48 cfs @ 12.12 hrs, Volume= 0.131 af
Outflow = 1.43 cfs @ 12.13 hrs, Volume= 0.123 af, Atten= 3%, Lag= 0.7 min
Primary = 1.43 cfs @ 12.13 hrs, Volume= 0.123 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 103.64' @ 12.13 hrs Surf.Area= 532 sf Storage= 424 cf

Plug-Flow detention time= 50.0 min calculated for 0.123 af (94% of inflow)
Center-of-Mass det. time= 17.8 min (865.6 - 847.8)

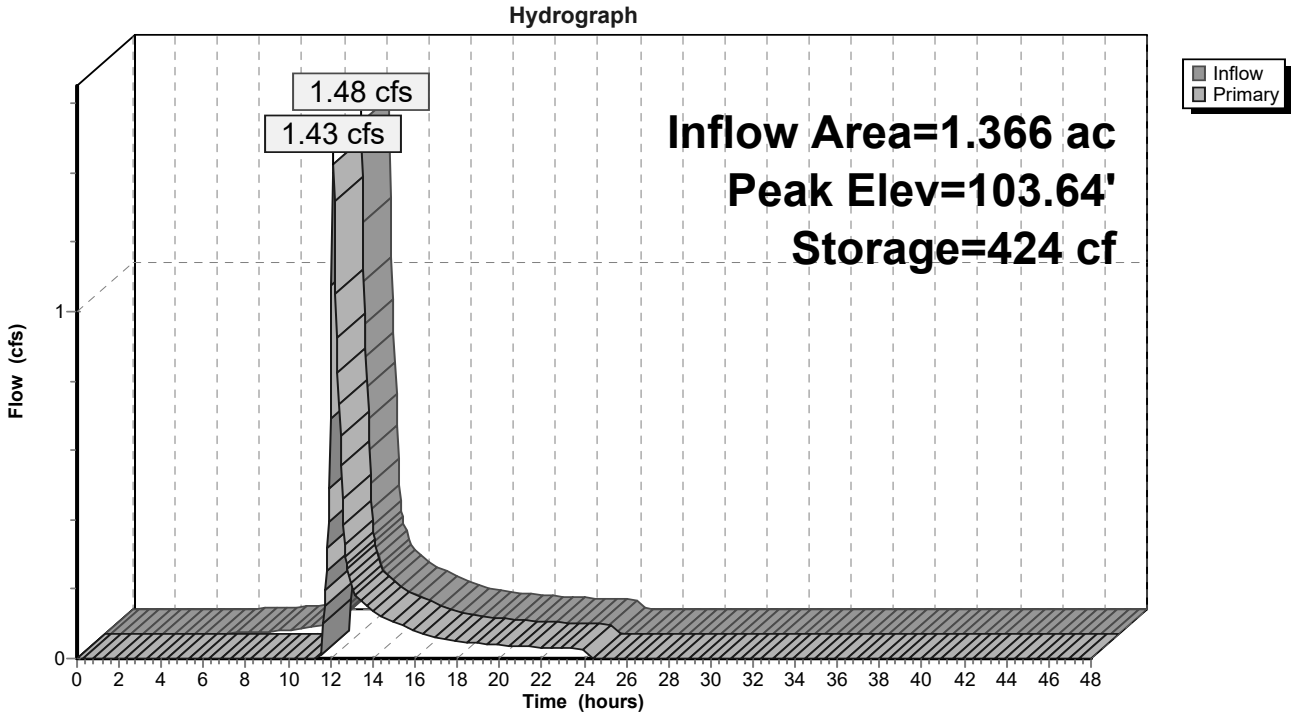
Volume	Invert	Avail.Storage	Storage Description
#1	102.50'	615 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.50	194	103.0	0	0	194
103.50	532	122.0	349	349	552
104.00	532	122.0	266	615	613

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	**10.0' long x 45.0' 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

Primary OutFlow Max=1.40 cfs @ 12.13 hrs HW=103.64' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 1.00 fps)

Pond 1P: PLUNGE POOL

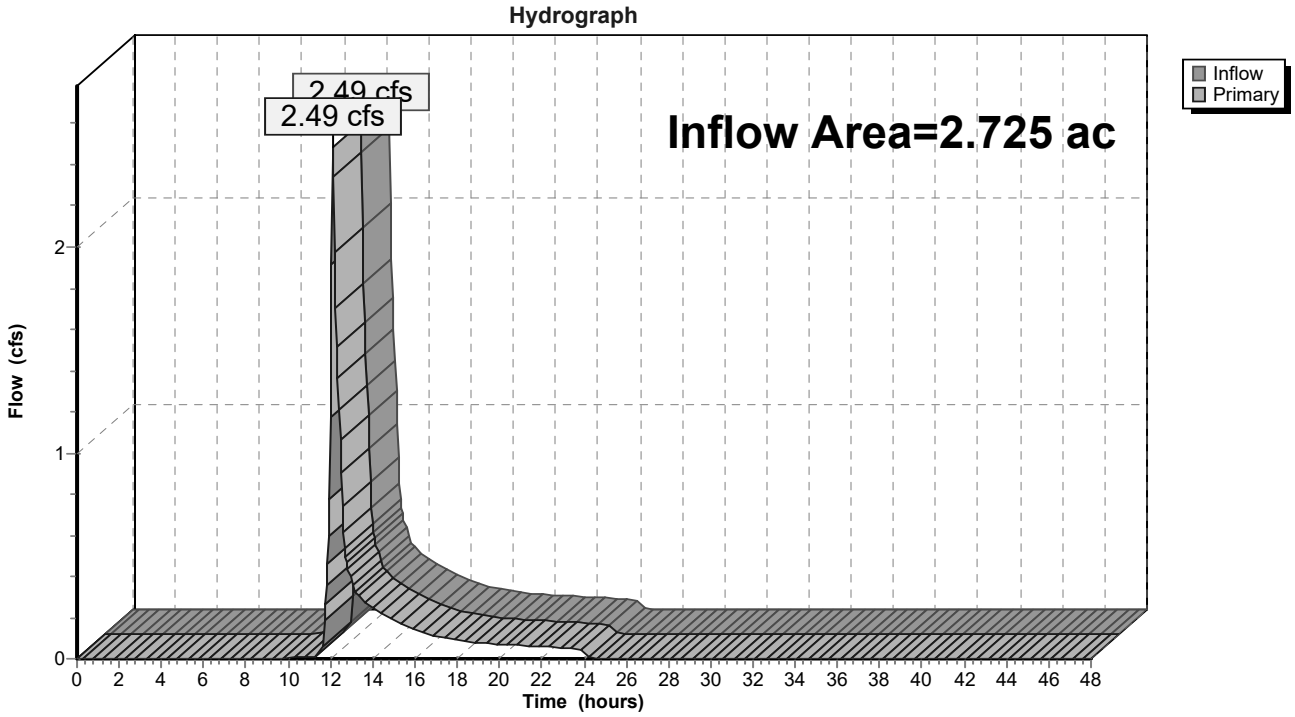


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 25.03% Impervious, Inflow Depth = 0.93" for 2-Year Storm event
Inflow = 2.49 cfs @ 12.12 hrs, Volume= 0.212 af
Primary = 2.49 cfs @ 12.12 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Summary for Subcatchment 1A: APOST1A

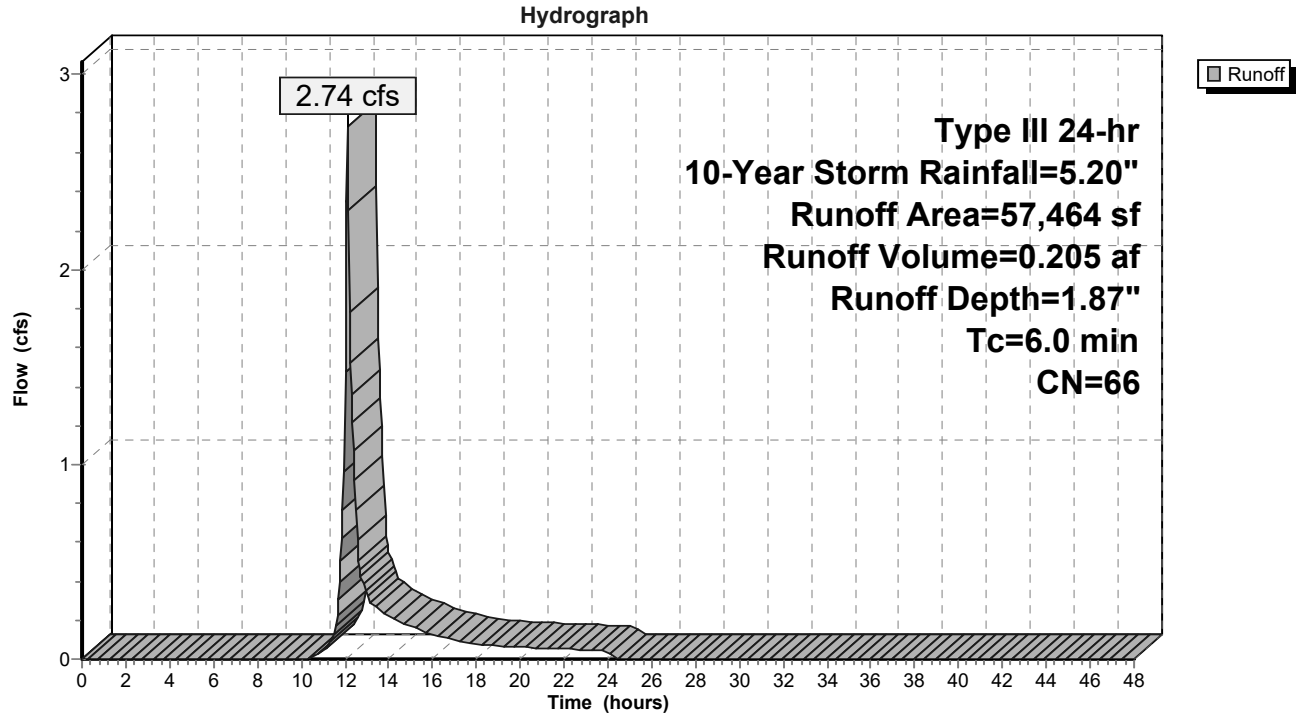
Runoff = 2.74 cfs @ 12.10 hrs, Volume= 0.205 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
8,642	98	Paved parking, HSG B
39,473	61	>75% Grass cover, Good, HSG B
9,349	55	Woods, Good, HSG B
57,464	66	Weighted Average
48,822		84.96% Pervious Area
8,642		15.04% Impervious Area

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

Subcatchment 1A: APOST1A



Summary for Subcatchment 1B: APOST1B

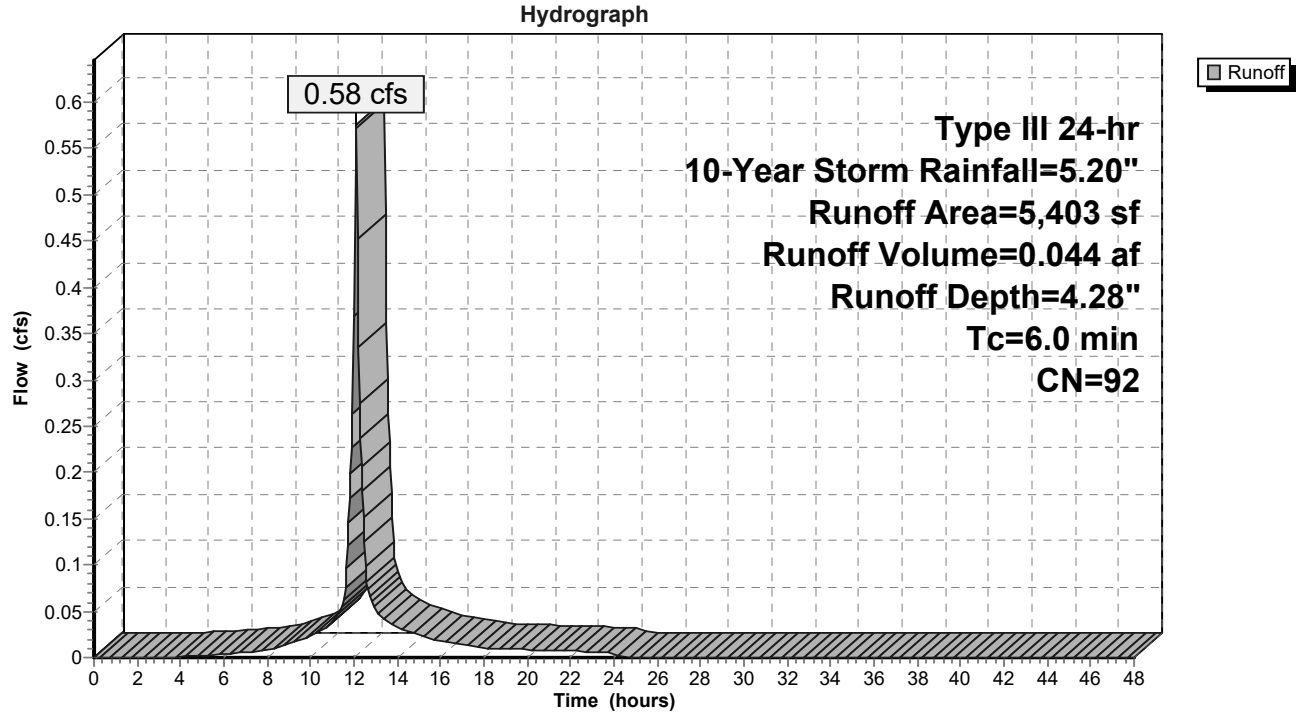
Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.044 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
4,524	98	Paved parking, HSG B
879	61	>75% Grass cover, Good, HSG B
5,403	92	Weighted Average
879		16.27% Pervious Area
4,524		83.73% Impervious Area

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

Subcatchment 1B: APOST1B



Summary for Subcatchment 1C: APOST1C

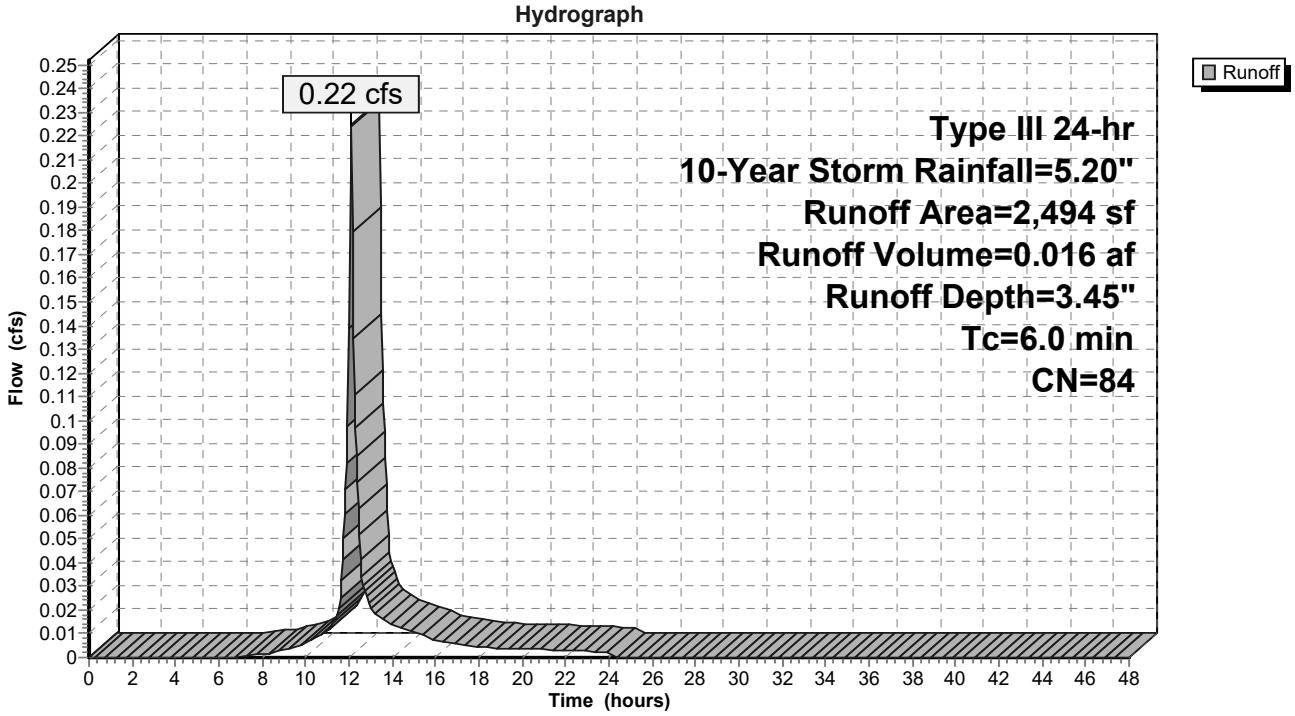
Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
1,523	98	Paved parking, HSG B
971	61	>75% Grass cover, Good, HSG B
2,494	84	Weighted Average
971		38.93% Pervious Area
1,523		61.07% Impervious Area

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

Subcatchment 1C: APOST1C



Summary for Subcatchment 1D: APOST1D

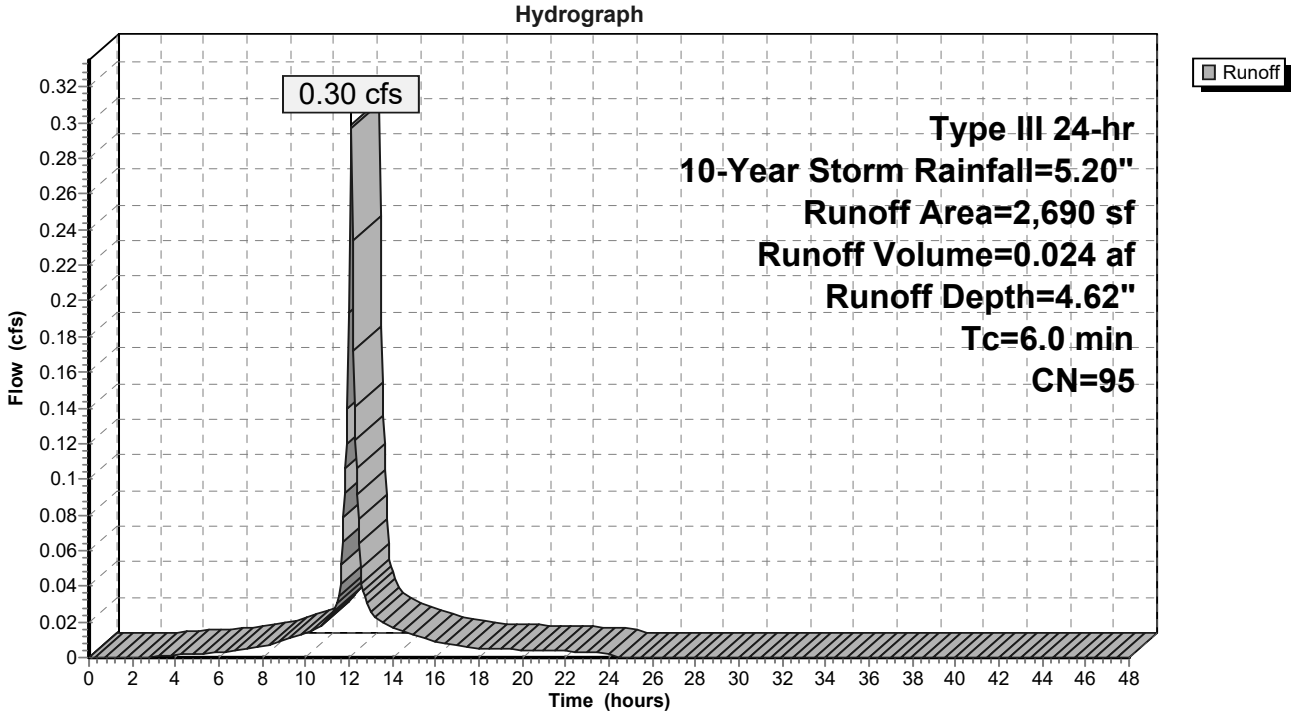
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
2,440	98	Paved parking, HSG B
250	61	>75% Grass cover, Good, HSG B
2,690	95	Weighted Average
250		9.29% Pervious Area
2,440		90.71% Impervious Area

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

Subcatchment 1D: APOST1D



Summary for Subcatchment 1E: APOST1E

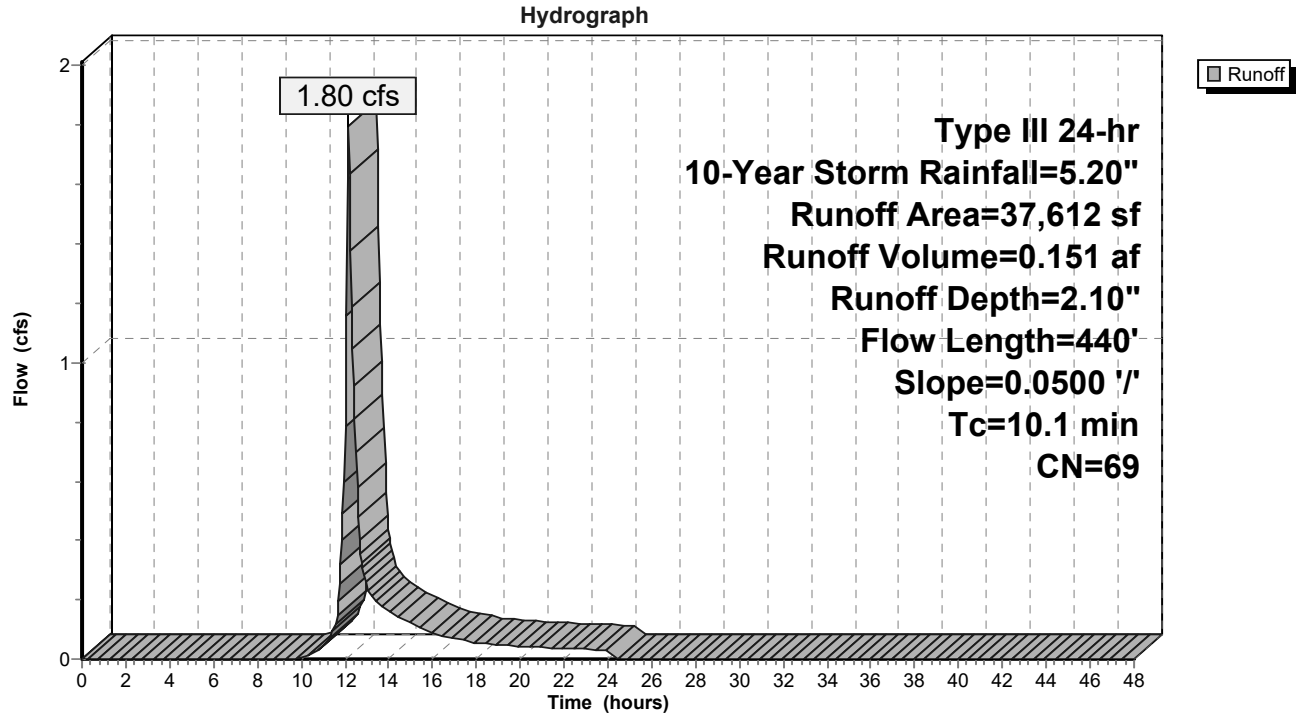
Runoff = 1.80 cfs @ 12.15 hrs, Volume= 0.151 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
8,885	98	Paved parking, HSG B
21,992	61	>75% Grass cover, Good, HSG B
6,735	55	Woods, Good, HSG B
37,612	69	Weighted Average
28,727		76.38% Pervious Area
8,885		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	440	0.0500	0.73		**Lag/CN Method, LAG/CN**

Subcatchment 1E: APOST1E



Summary for Subcatchment 1F: APOST1F

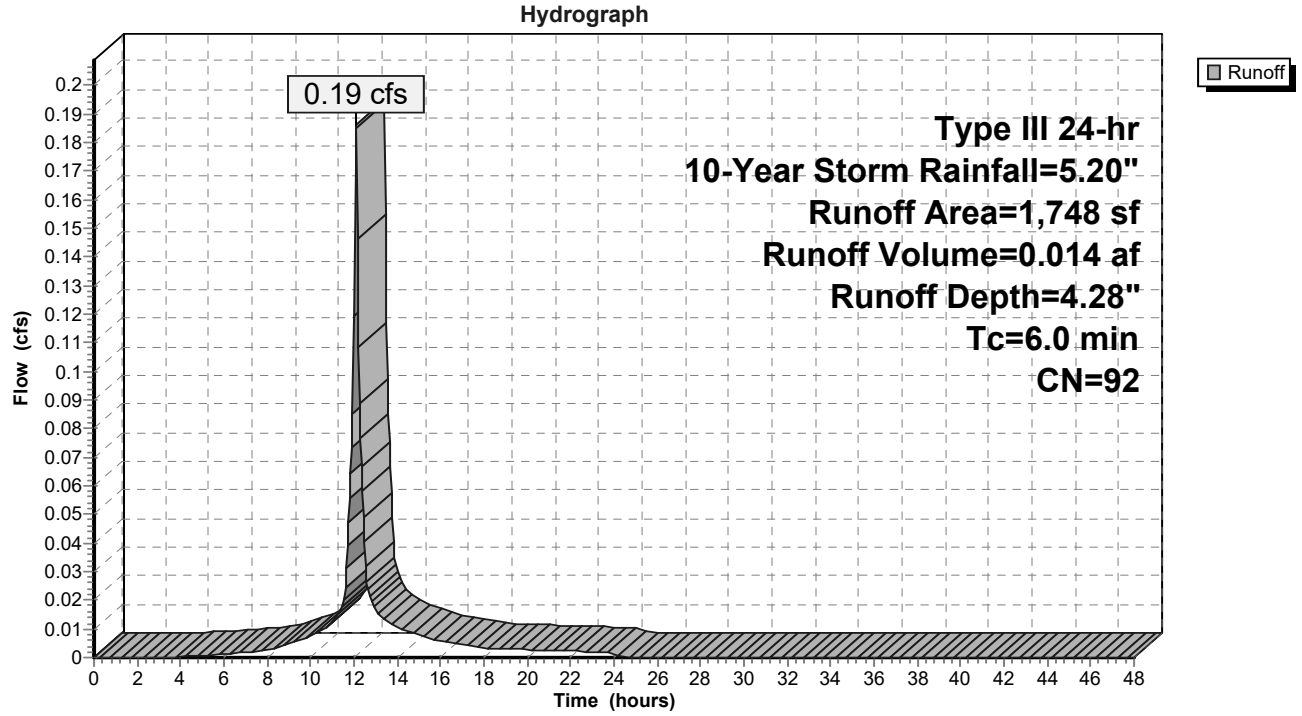
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
1,473	98	Paved parking, HSG B
275	61	>75% Grass cover, Good, HSG B
1,748	92	Weighted Average
275		15.73% Pervious Area
1,473		84.27% Impervious Area

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

Subcatchment 1F: APOST1F



Summary for Subcatchment 1G: APOST1G

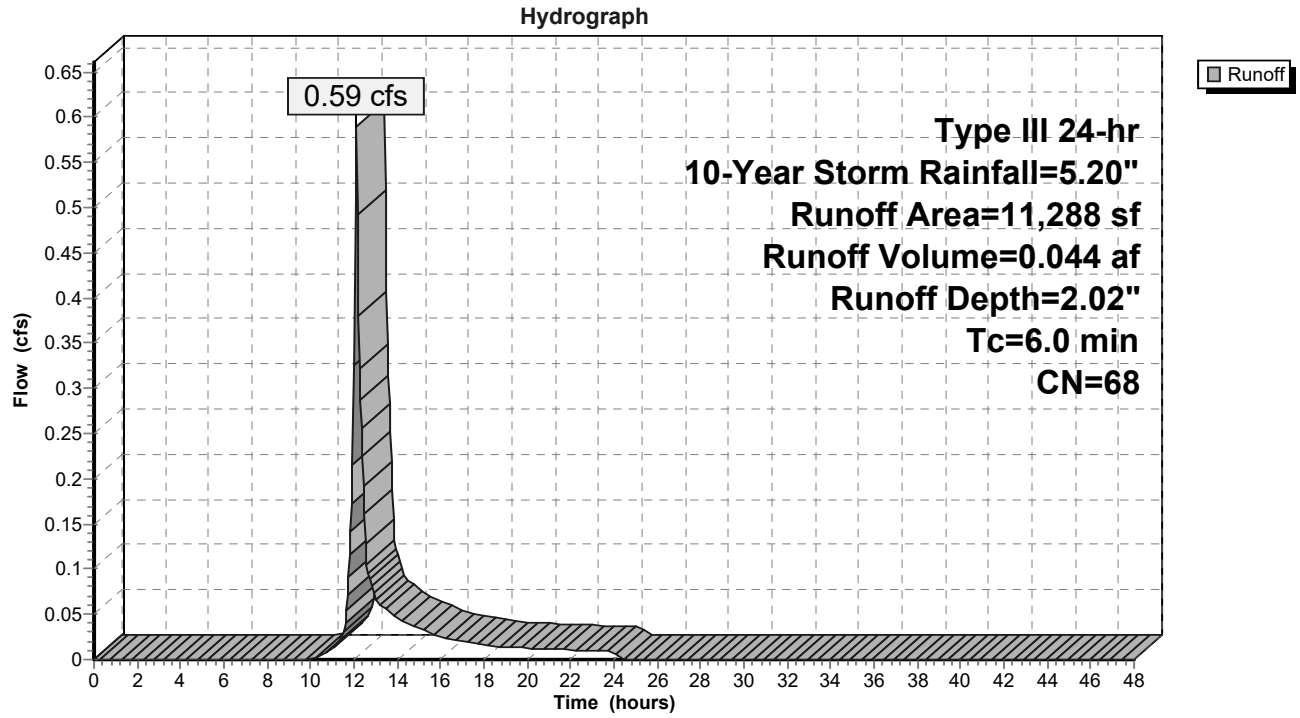
Runoff = 0.59 cfs @ 12.10 hrs, Volume= 0.044 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
2,220	98	Paved parking, HSG B
9,068	61	>75% Grass cover, Good, HSG B
11,288	68	Weighted Average
9,068		80.33% Pervious Area
2,220		19.67% Impervious Area

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

Subcatchment 1G: APOST1G



Summary for Pond 1P: PLUNGE POOL

Inflow Area = 1.366 ac, 32.93% Impervious, Inflow Depth = 2.46" for 10-Year Storm event
Inflow = 3.33 cfs @ 12.12 hrs, Volume= 0.280 af
Outflow = 3.27 cfs @ 12.12 hrs, Volume= 0.272 af, Atten= 2%, Lag= 0.4 min
Primary = 3.27 cfs @ 12.12 hrs, Volume= 0.272 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 103.75' @ 12.12 hrs Surf.Area= 532 sf Storage= 480 cf

Plug-Flow detention time= 27.4 min calculated for 0.272 af (97% of inflow)
Center-of-Mass det. time= 11.0 min (841.8 - 830.8)

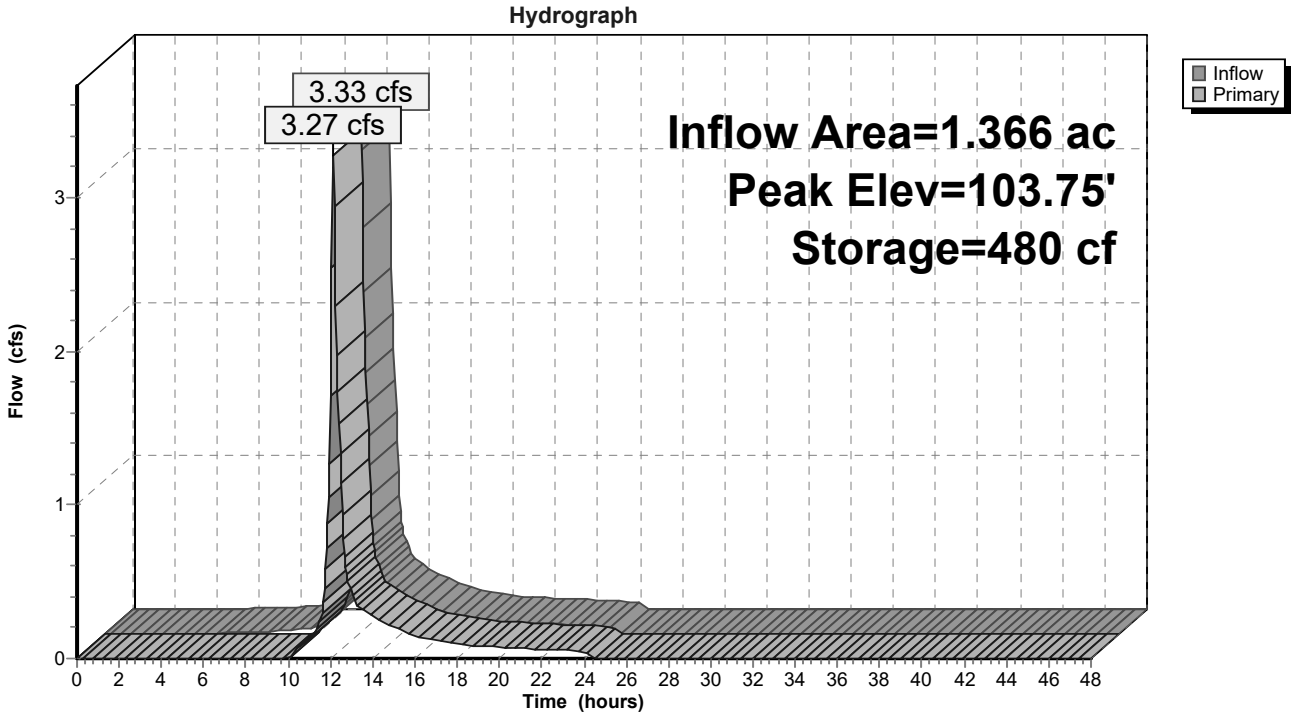
Volume	Invert	Avail.Storage	Storage Description
#1	102.50'	615 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.50	194	103.0	0	0	194
103.50	532	122.0	349	349	552
104.00	532	122.0	266	615	613

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	**10.0' long x 45.0' 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

Primary OutFlow Max=3.19 cfs @ 12.12 hrs HW=103.74' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 3.19 cfs @ 1.32 fps)

Pond 1P: PLUNGE POOL

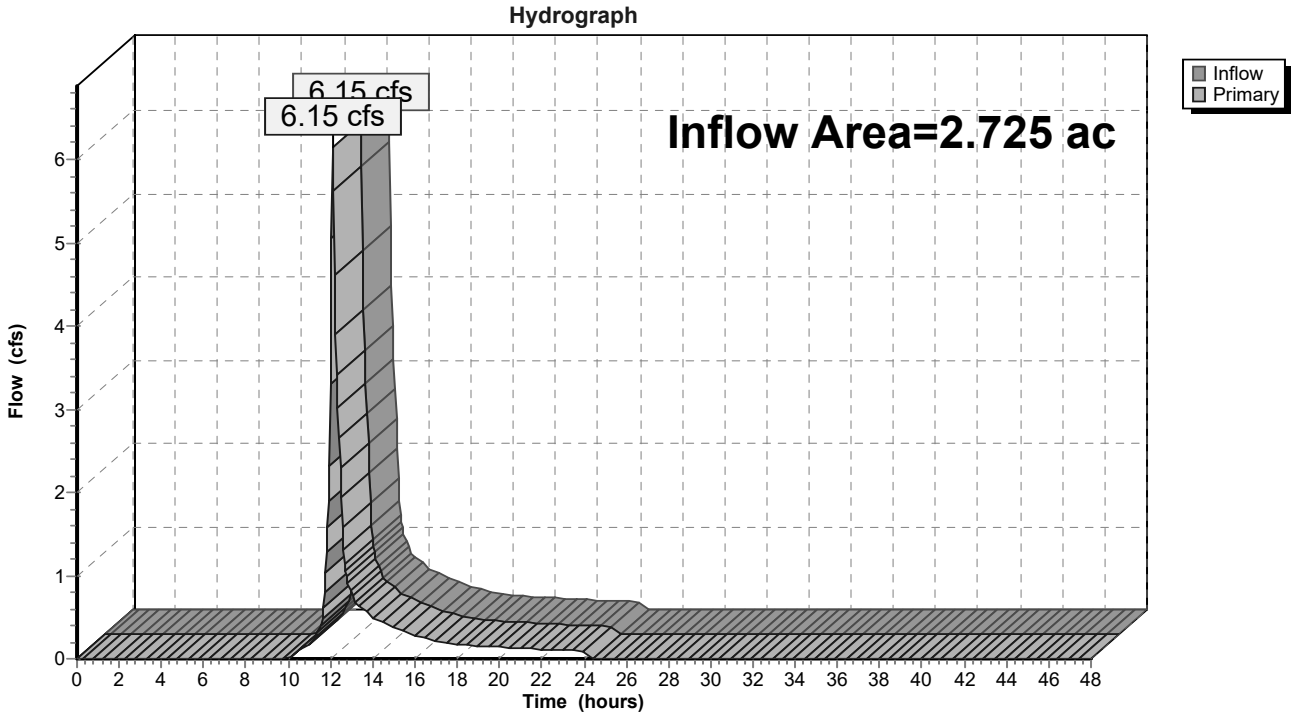


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 25.03% Impervious, Inflow Depth = 2.16" for 10-Year Storm event
Inflow = 6.15 cfs @ 12.11 hrs, Volume= 0.491 af
Primary = 6.15 cfs @ 12.11 hrs, Volume= 0.491 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Summary for Subcatchment 1A: APOST1A

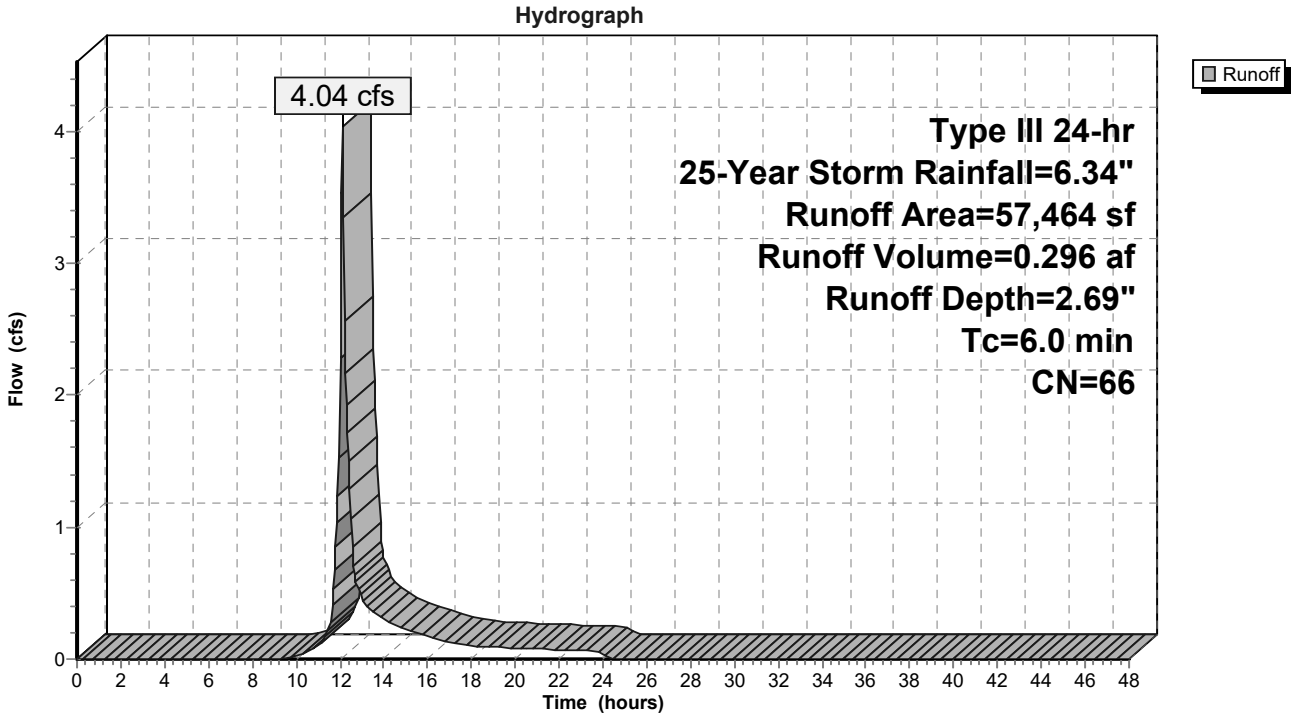
Runoff = 4.04 cfs @ 12.10 hrs, Volume= 0.296 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
8,642	98	Paved parking, HSG B
39,473	61	>75% Grass cover, Good, HSG B
9,349	55	Woods, Good, HSG B
57,464	66	Weighted Average
48,822		84.96% Pervious Area
8,642		15.04% Impervious Area

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

Subcatchment 1A: APOST1A



Summary for Subcatchment 1B: APOST1B

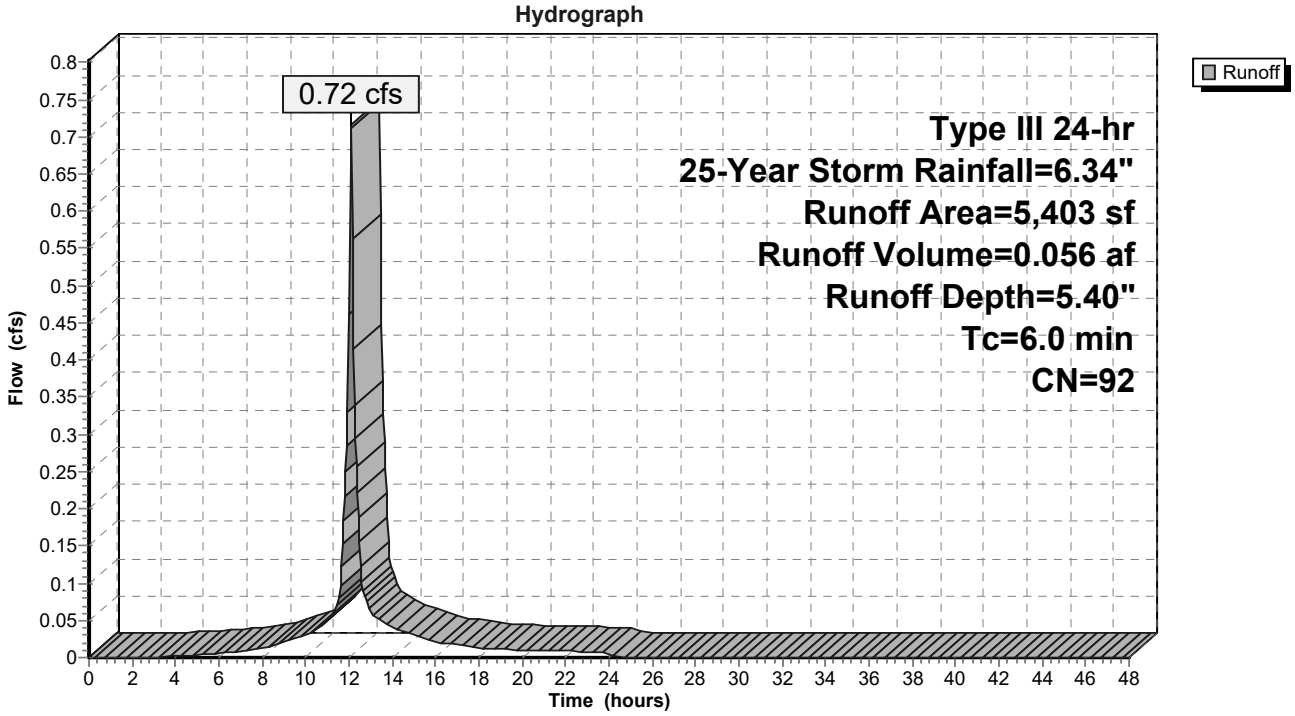
Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 5.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
4,524	98	Paved parking, HSG B
879	61	>75% Grass cover, Good, HSG B
5,403	92	Weighted Average
879		16.27% Pervious Area
4,524		83.73% Impervious Area

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

Subcatchment 1B: APOST1B



Summary for Subcatchment 1C: APOST1C

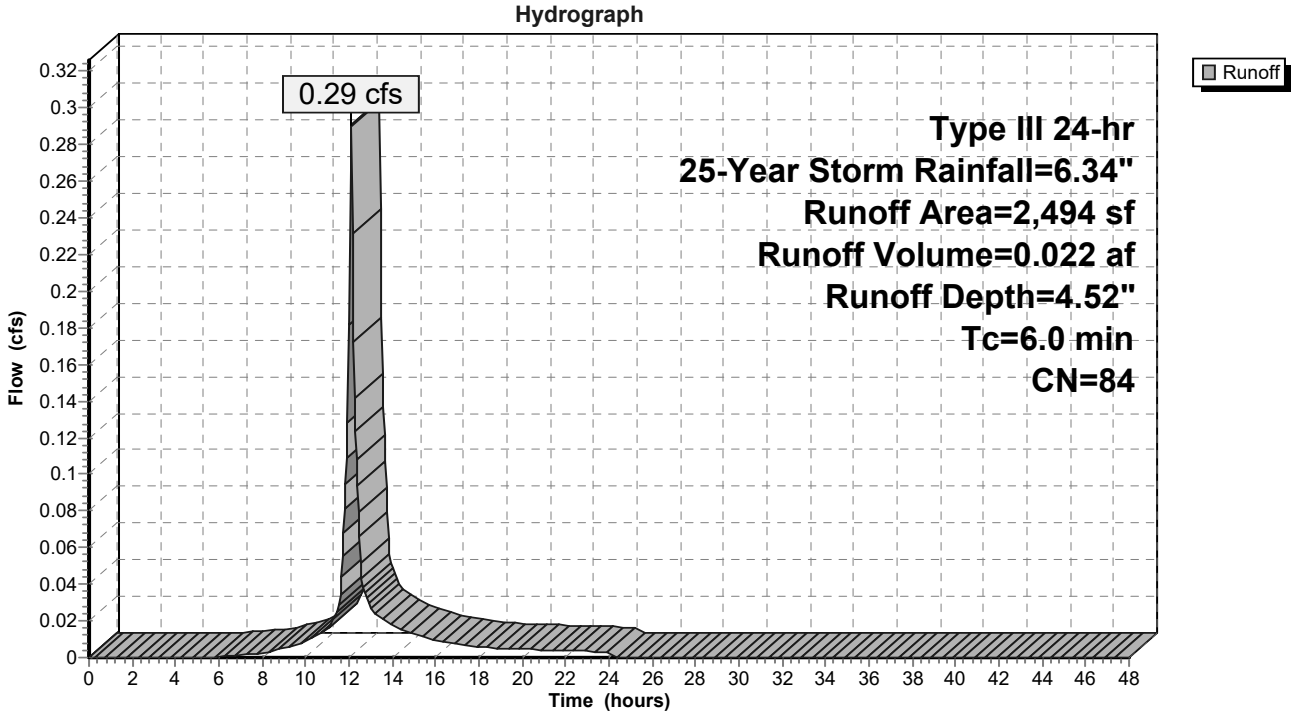
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
1,523	98	Paved parking, HSG B
971	61	>75% Grass cover, Good, HSG B
2,494	84	Weighted Average
971		38.93% Pervious Area
1,523		61.07% Impervious Area

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

Subcatchment 1C: APOST1C



Summary for Subcatchment 1D: APOST1D

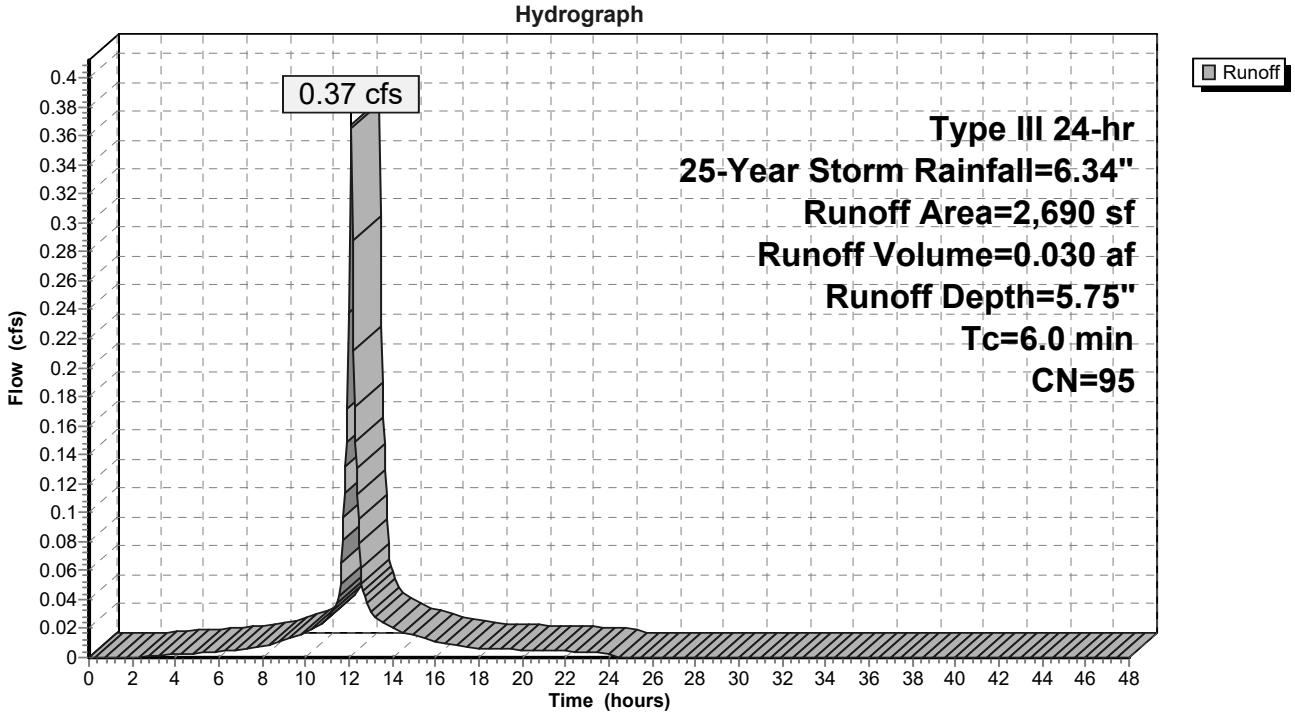
Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.030 af, Depth= 5.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
2,440	98	Paved parking, HSG B
250	61	>75% Grass cover, Good, HSG B
2,690	95	Weighted Average
250		9.29% Pervious Area
2,440		90.71% Impervious Area

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

Subcatchment 1D: APOST1D



Summary for Subcatchment 1E: APOST1E

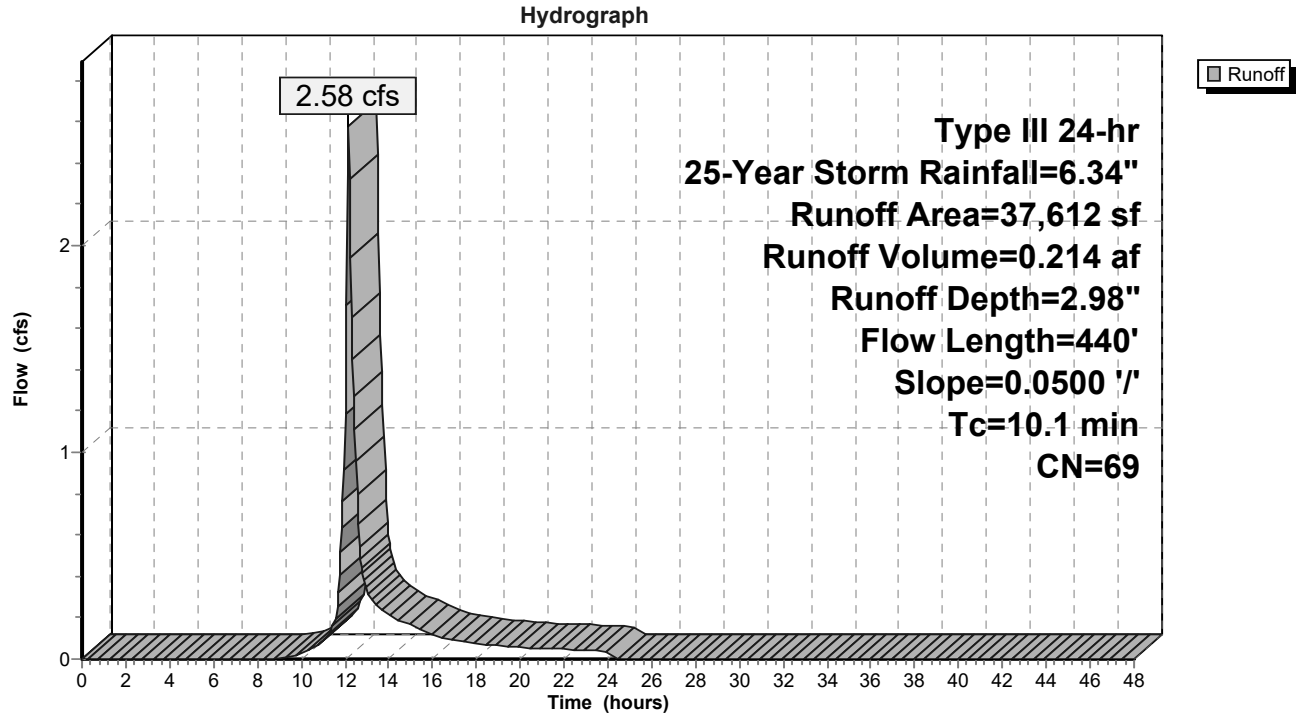
Runoff = 2.58 cfs @ 12.15 hrs, Volume= 0.214 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
8,885	98	Paved parking, HSG B
21,992	61	>75% Grass cover, Good, HSG B
6,735	55	Woods, Good, HSG B
37,612	69	Weighted Average
28,727		76.38% Pervious Area
8,885		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	440	0.0500	0.73		**Lag/CN Method, LAG/CN**

Subcatchment 1E: APOST1E



Summary for Subcatchment 1F: APOST1F

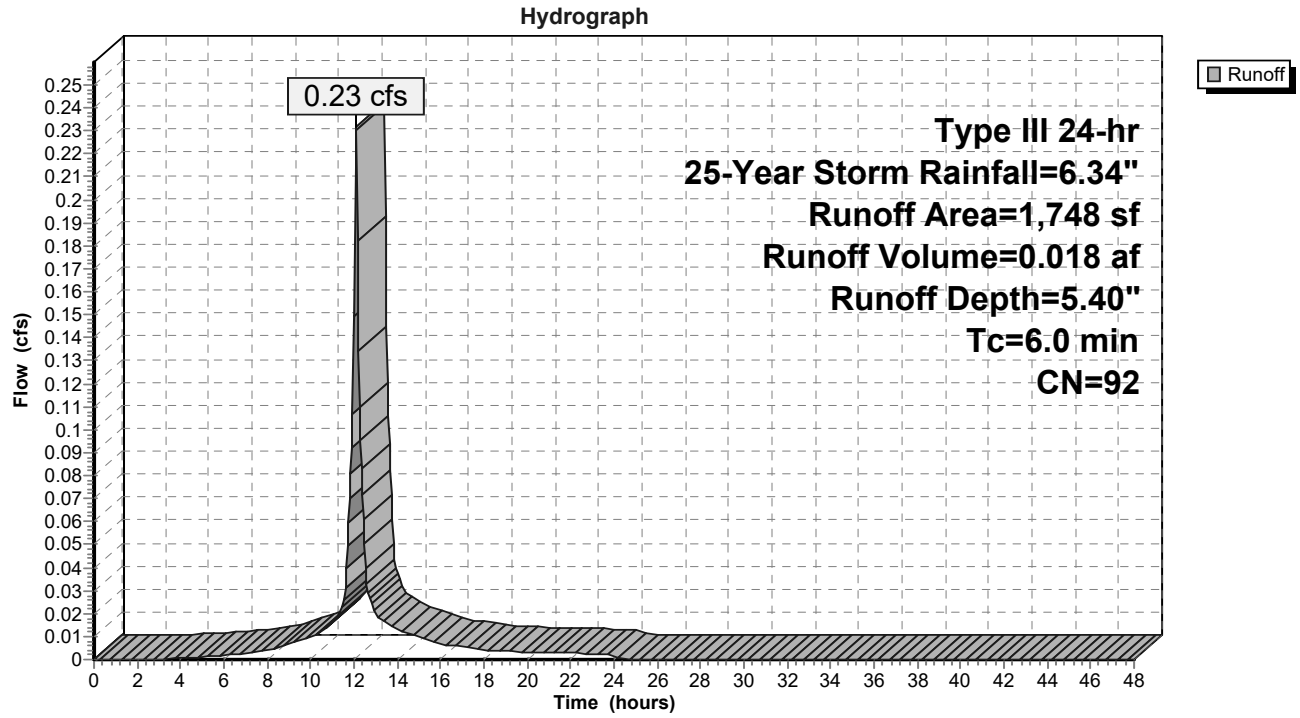
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af, Depth= 5.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
1,473	98	Paved parking, HSG B
275	61	>75% Grass cover, Good, HSG B
1,748	92	Weighted Average
275		15.73% Pervious Area
1,473		84.27% Impervious Area

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

Subcatchment 1F: APOST1F



Summary for Subcatchment 1G: APOST1G

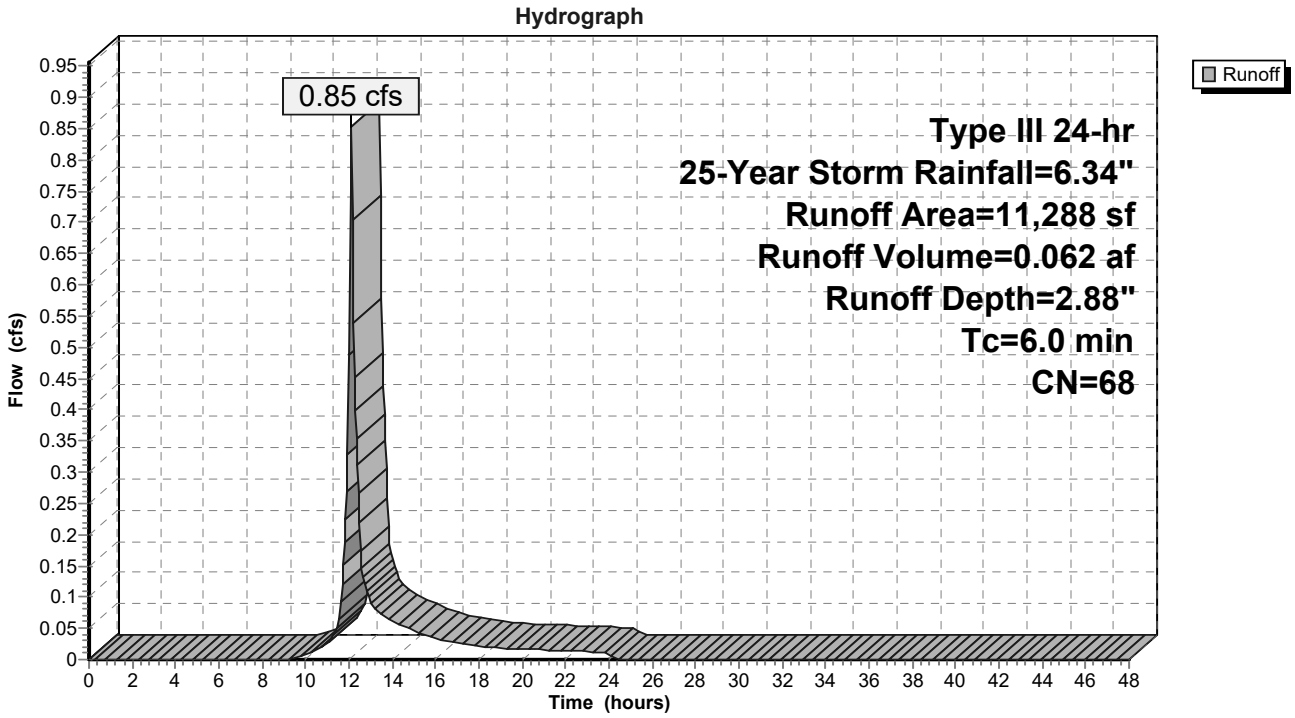
Runoff = 0.85 cfs @ 12.10 hrs, Volume= 0.062 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=6.34"

Area (sf)	CN	Description
2,220	98	Paved parking, HSG B
9,068	61	>75% Grass cover, Good, HSG B
11,288	68	Weighted Average
9,068		80.33% Pervious Area
2,220		19.67% Impervious Area

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

Subcatchment 1G: APOST1G



Summary for Pond 1P: PLUNGE POOL

Inflow Area = 1.366 ac, 32.93% Impervious, Inflow Depth = 3.37" for 25-Year Storm event
Inflow = 4.62 cfs @ 12.12 hrs, Volume= 0.384 af
Outflow = 4.54 cfs @ 12.12 hrs, Volume= 0.376 af, Atten= 2%, Lag= 0.4 min
Primary = 4.54 cfs @ 12.12 hrs, Volume= 0.376 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 103.81' @ 12.12 hrs Surf.Area= 532 sf Storage= 512 cf

Plug-Flow detention time= 21.3 min calculated for 0.376 af (98% of inflow)
Center-of-Mass det. time= 9.1 min (832.5 - 823.4)

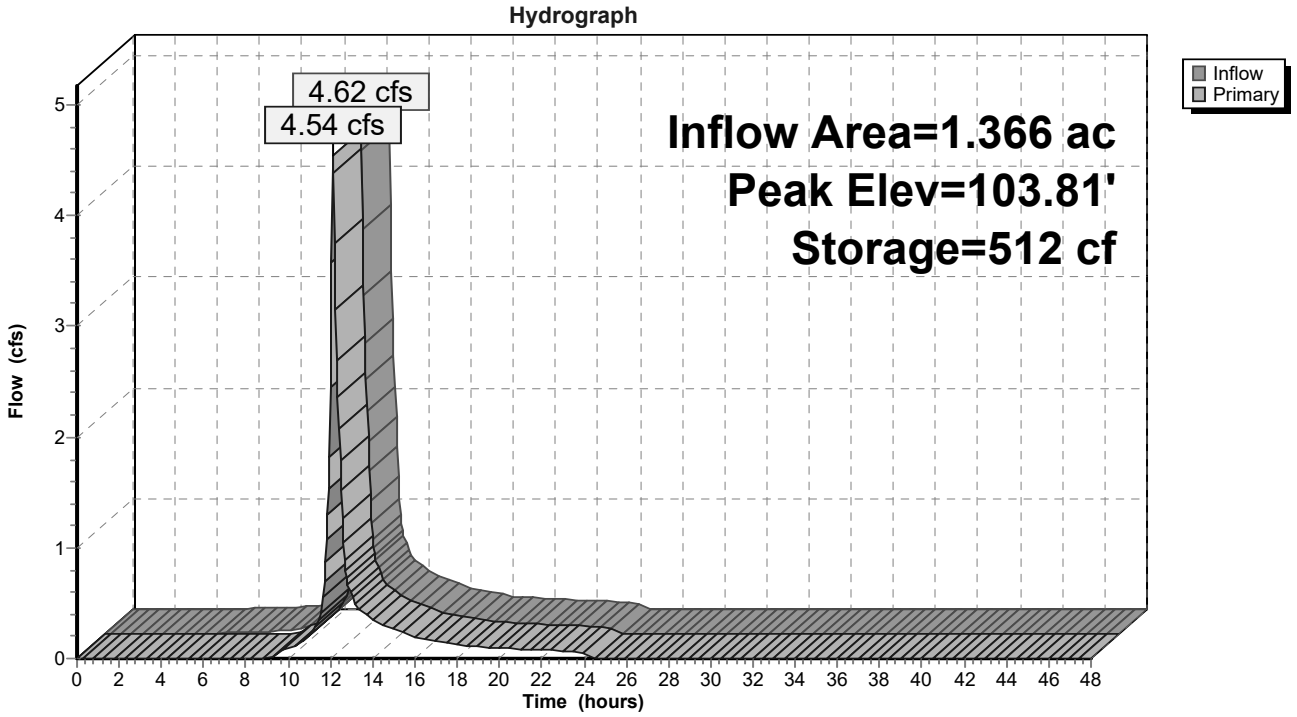
Volume	Invert	Avail.Storage	Storage Description
#1	102.50'	615 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.50	194	103.0	0	0	194
103.50	532	122.0	349	349	552
104.00	532	122.0	266	615	613

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	**10.0' long x 45.0' 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

Primary OutFlow Max=4.42 cfs @ 12.12 hrs HW=103.80' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 4.42 cfs @ 1.47 fps)

Pond 1P: PLUNGE POOL

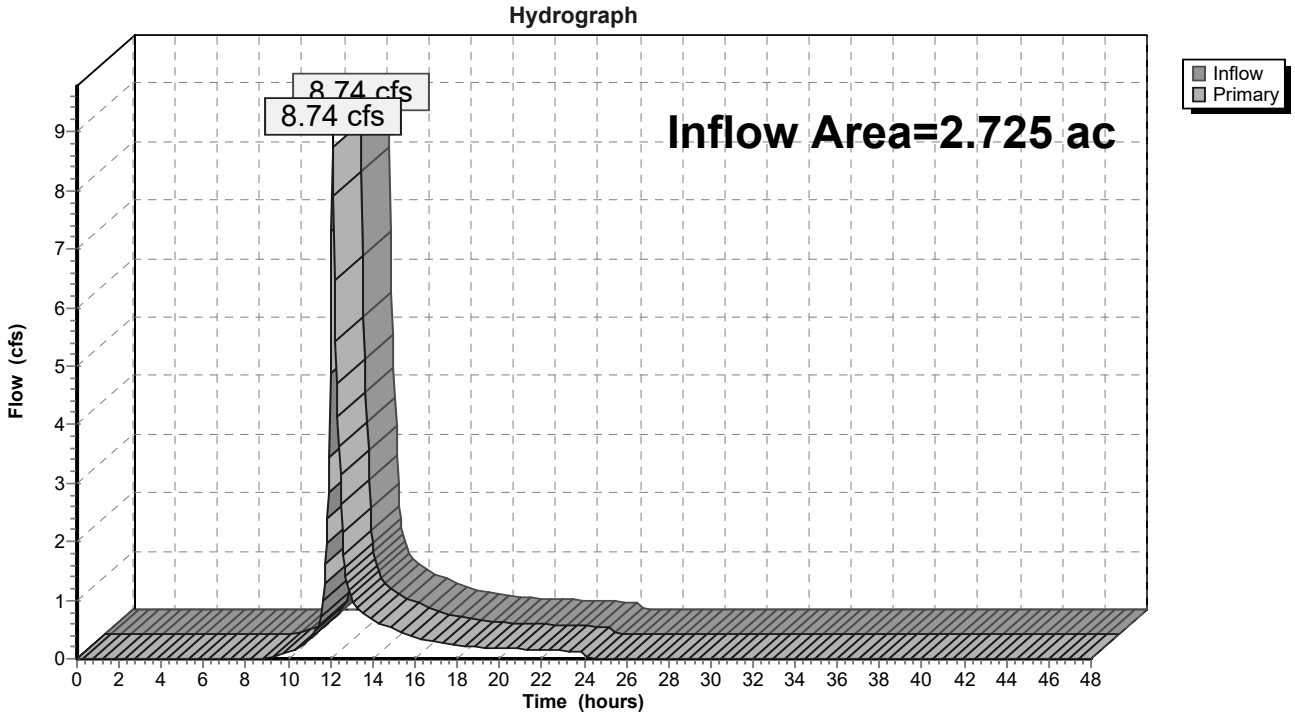


Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 25.03% Impervious, Inflow Depth = 3.04" for 25-Year Storm event
Inflow = 8.74 cfs @ 12.11 hrs, Volume= 0.690 af
Primary = 8.74 cfs @ 12.11 hrs, Volume= 0.690 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1



Summary for Subcatchment 1A: APOST1A

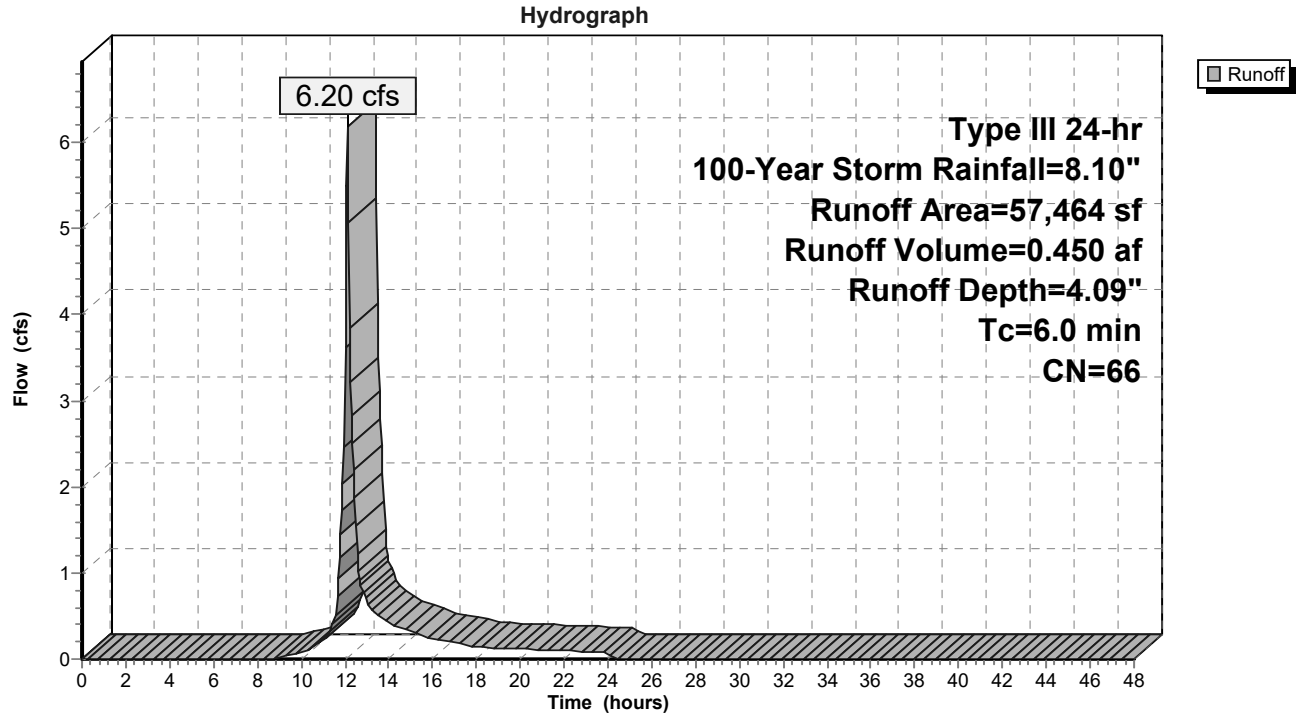
Runoff = 6.20 cfs @ 12.09 hrs, Volume= 0.450 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
8,642	98	Paved parking, HSG B
39,473	61	>75% Grass cover, Good, HSG B
9,349	55	Woods, Good, HSG B
57,464	66	Weighted Average
48,822		84.96% Pervious Area
8,642		15.04% Impervious Area

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

Subcatchment 1A: APOST1A



Summary for Subcatchment 1B: APOST1B

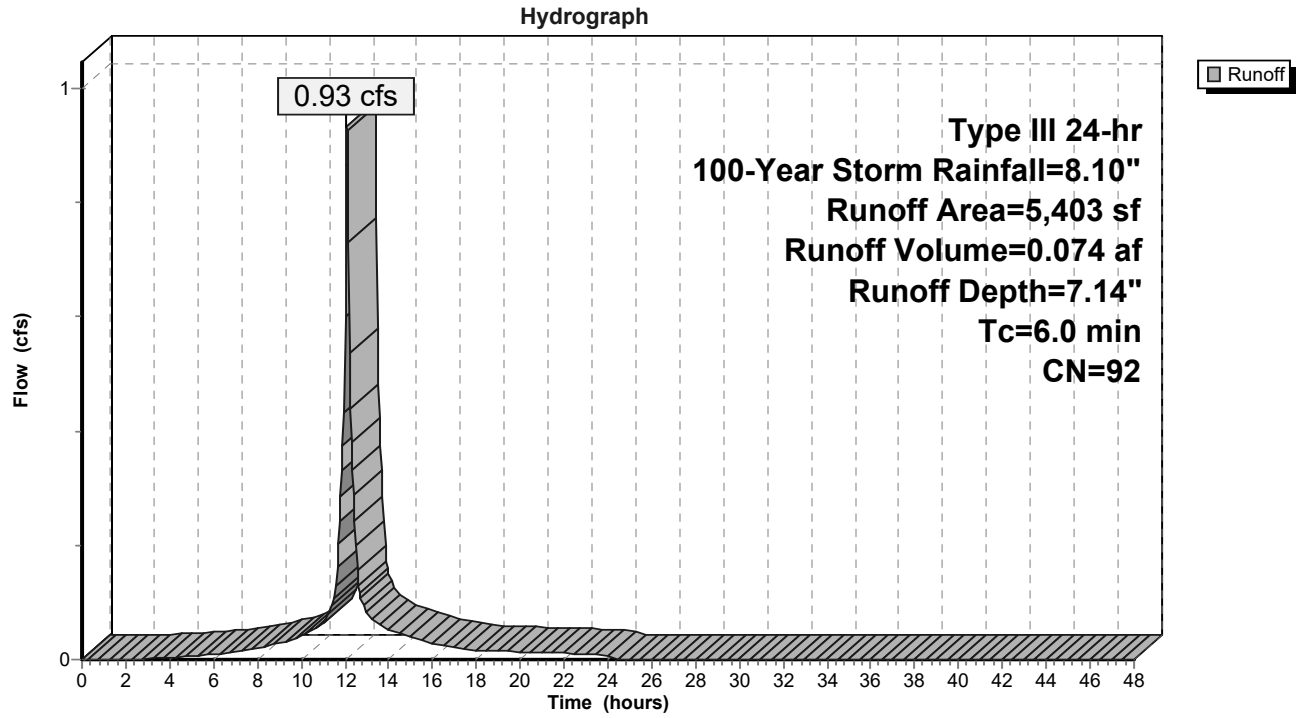
Runoff = 0.93 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 7.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
4,524	98	Paved parking, HSG B
879	61	>75% Grass cover, Good, HSG B
5,403	92	Weighted Average
879		16.27% Pervious Area
4,524		83.73% Impervious Area

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

Subcatchment 1B: APOST1B



Summary for Subcatchment 1C: APOST1C

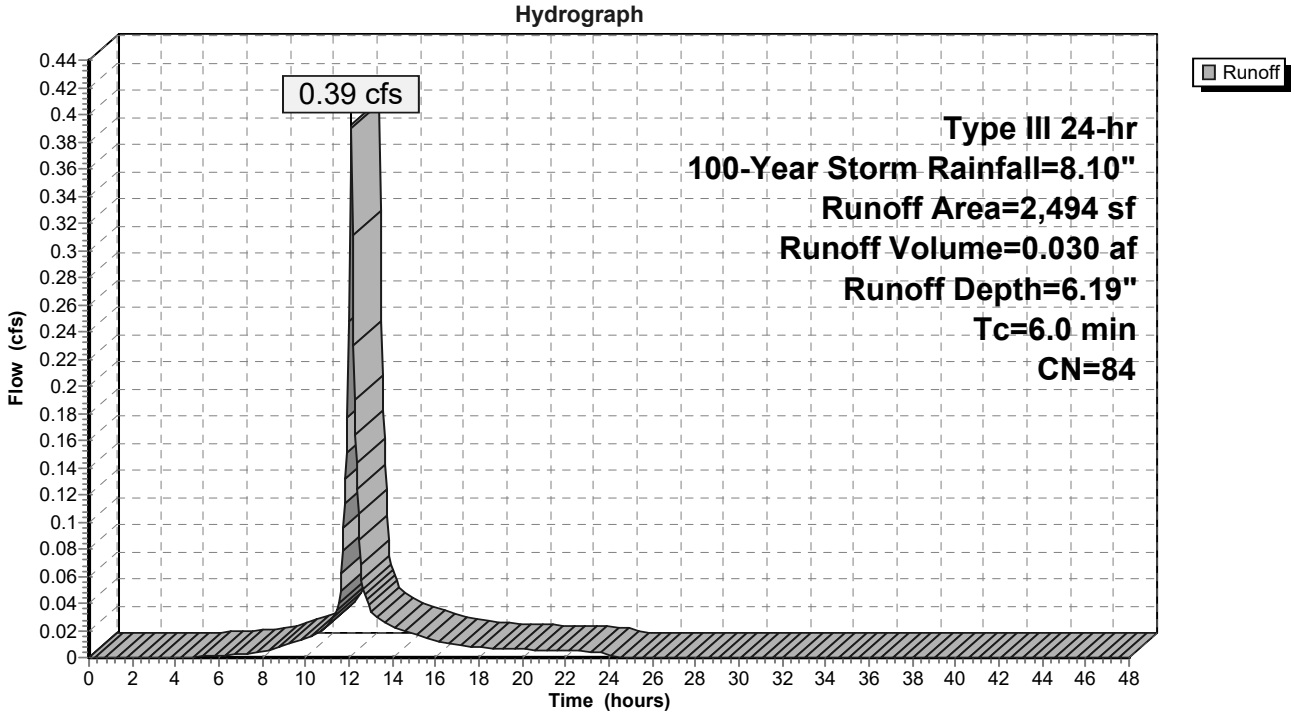
Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af, Depth= 6.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
1,523	98	Paved parking, HSG B
971	61	>75% Grass cover, Good, HSG B
2,494	84	Weighted Average
971		38.93% Pervious Area
1,523		61.07% Impervious Area

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

Subcatchment 1C: APOST1C



Summary for Subcatchment 1D: APOST1D

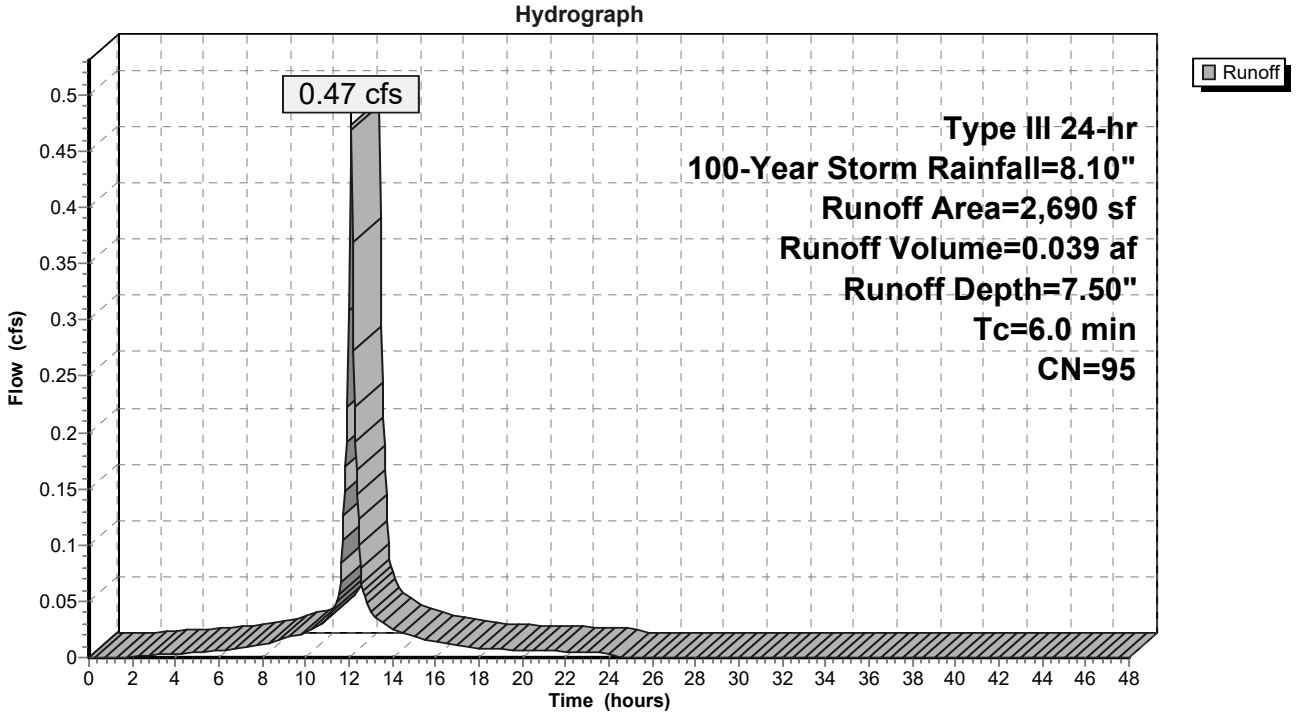
Runoff = 0.47 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 7.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
2,440	98	Paved parking, HSG B
250	61	>75% Grass cover, Good, HSG B
2,690	95	Weighted Average
250		9.29% Pervious Area
2,440		90.71% Impervious Area

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

Subcatchment 1D: APOST1D



Summary for Subcatchment 1E: APOST1E

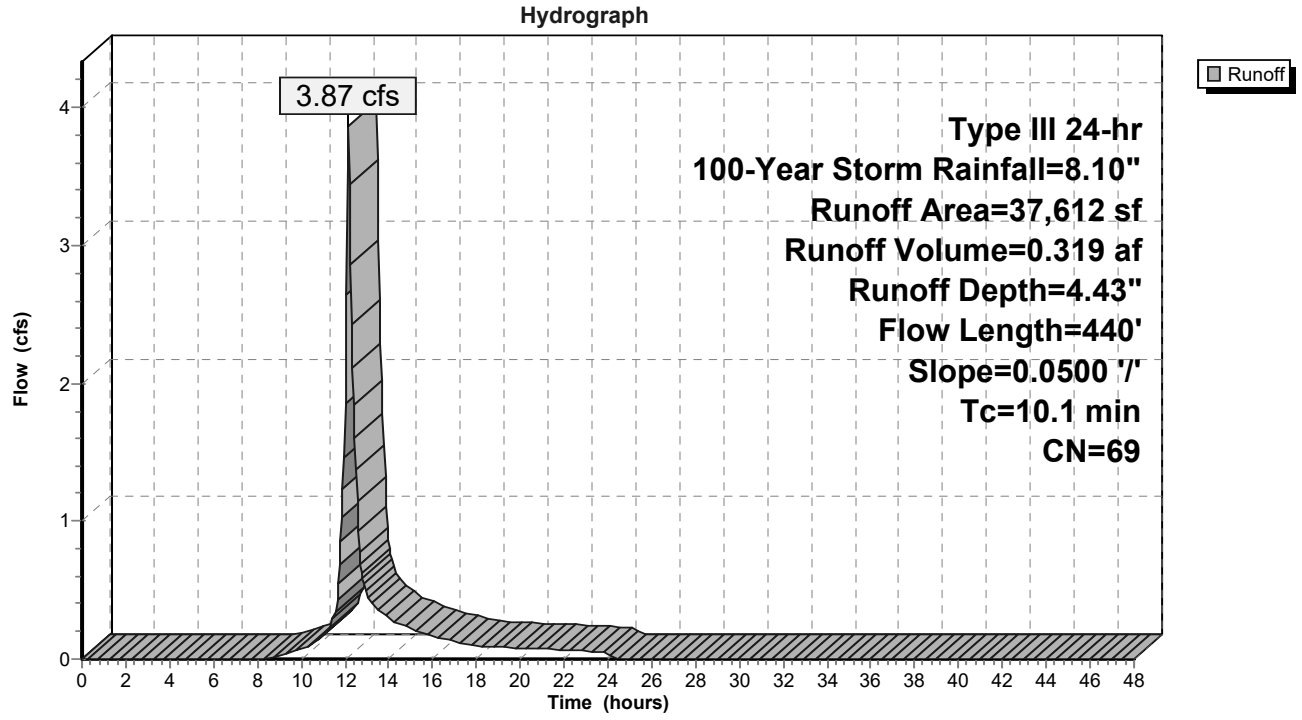
Runoff = 3.87 cfs @ 12.15 hrs, Volume= 0.319 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
8,885	98	Paved parking, HSG B
21,992	61	>75% Grass cover, Good, HSG B
6,735	55	Woods, Good, HSG B
37,612	69	Weighted Average
28,727		76.38% Pervious Area
8,885		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	440	0.0500	0.73		**Lag/CN Method, LAG/CN**

Subcatchment 1E: APOST1E



Summary for Subcatchment 1F: APOST1F

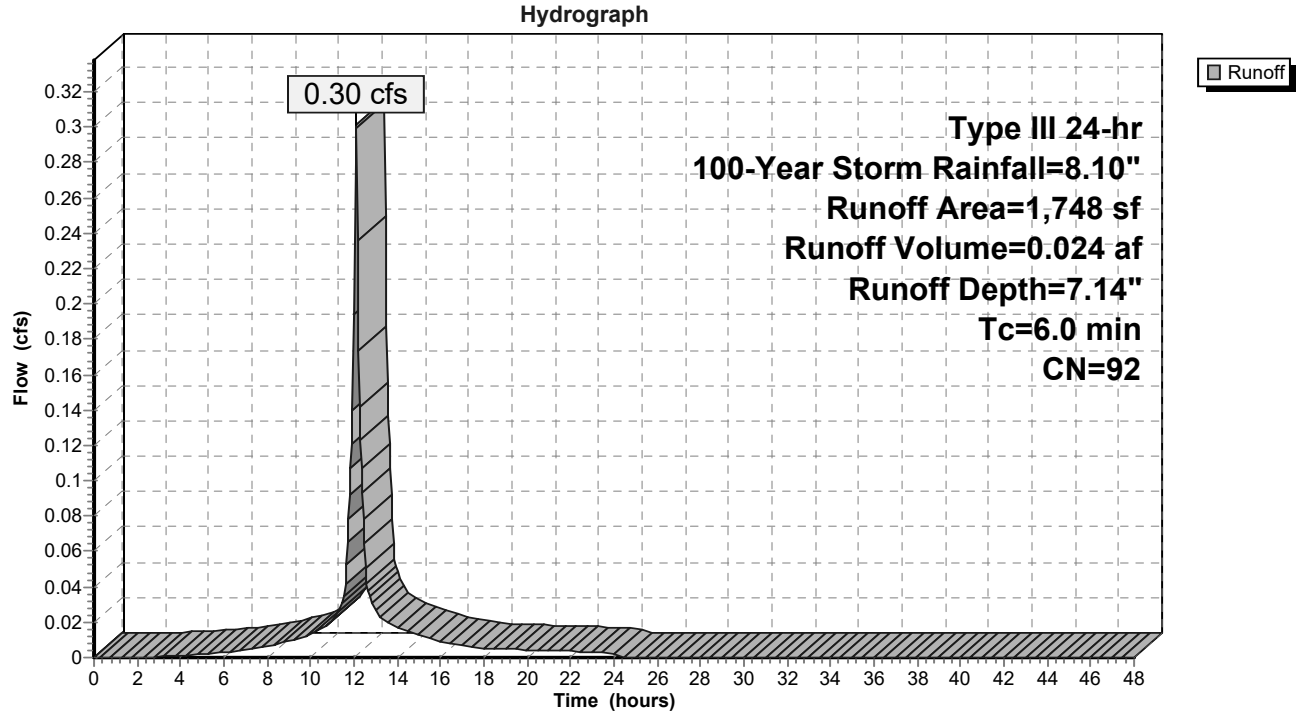
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 7.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
1,473	98	Paved parking, HSG B
275	61	>75% Grass cover, Good, HSG B
1,748	92	Weighted Average
275		15.73% Pervious Area
1,473		84.27% Impervious Area

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

Subcatchment 1F: APOST1F



Summary for Subcatchment 1G: APOST1G

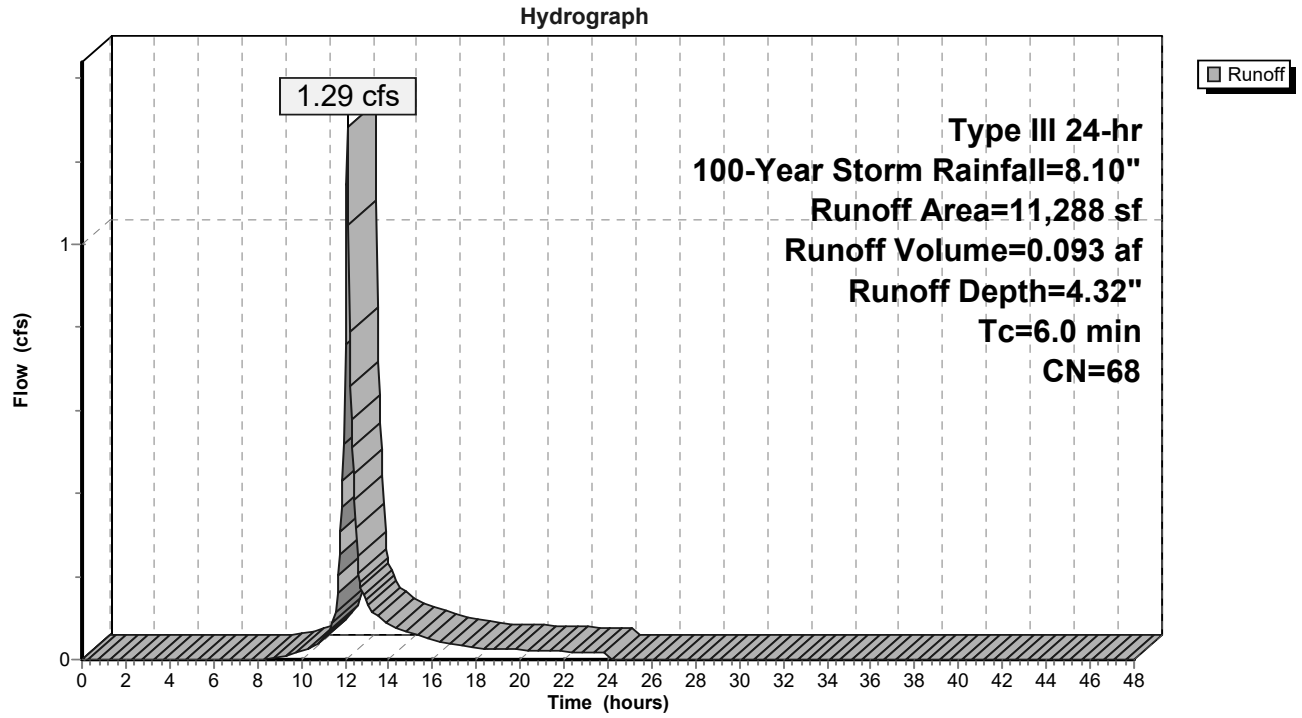
Runoff = 1.29 cfs @ 12.09 hrs, Volume= 0.093 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=8.10"

Area (sf)	CN	Description
2,220	98	Paved parking, HSG B
9,068	61	>75% Grass cover, Good, HSG B
11,288	68	Weighted Average
9,068		80.33% Pervious Area
2,220		19.67% Impervious Area

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

Subcatchment 1G: APOST1G



Summary for Pond 1P: PLUNGE POOL

Inflow Area = 1.366 ac, 32.93% Impervious, Inflow Depth = 4.87" for 100-Year Storm event
Inflow = 6.69 cfs @ 12.11 hrs, Volume= 0.554 af
Outflow = 6.59 cfs @ 12.12 hrs, Volume= 0.546 af, Atten= 2%, Lag= 0.3 min
Primary = 6.59 cfs @ 12.12 hrs, Volume= 0.546 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 103.89' @ 12.12 hrs Surf.Area= 532 sf Storage= 557 cf

Plug-Flow detention time= 15.8 min calculated for 0.546 af (98% of inflow)
Center-of-Mass det. time= 7.3 min (821.9 - 814.6)

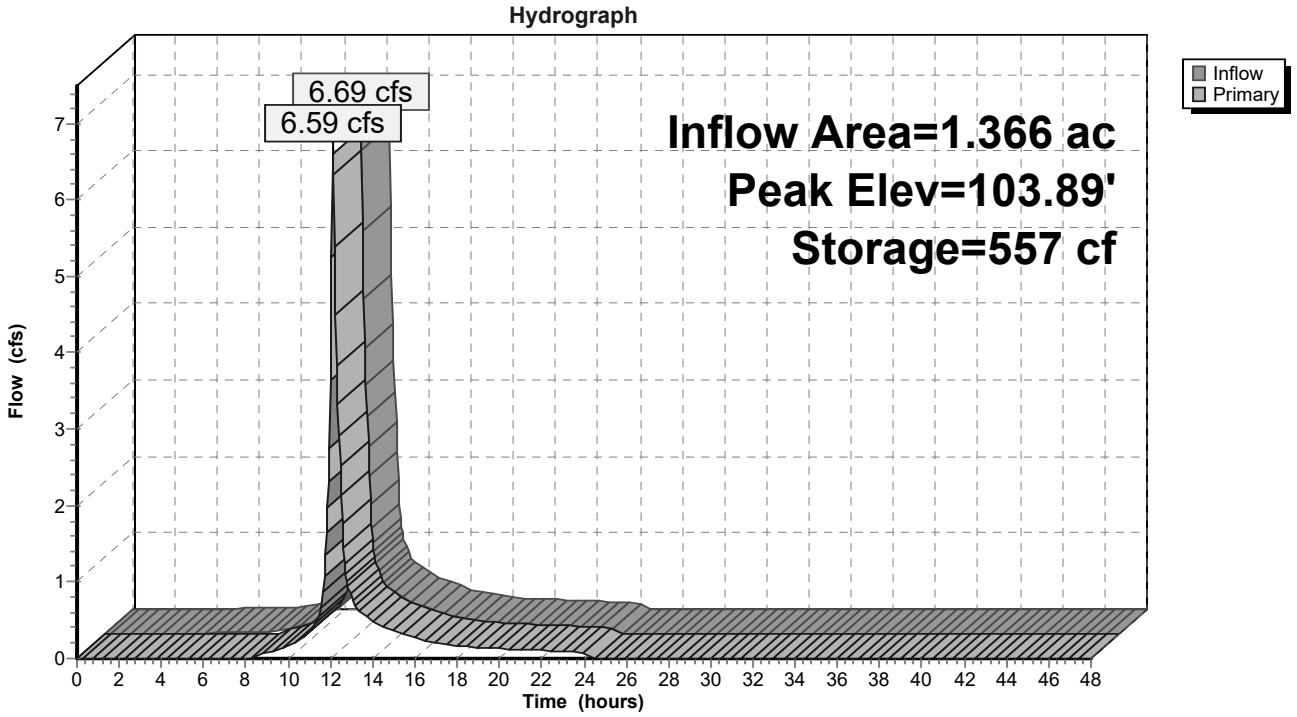
Volume	Invert	Avail.Storage	Storage Description
#1	102.50'	615 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.50	194	103.0	0	0	194
103.50	532	122.0	349	349	552
104.00	532	122.0	266	615	613

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	**10.0' long x 45.0' 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

Primary OutFlow Max=6.42 cfs @ 12.12 hrs HW=103.88' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 6.42 cfs @ 1.67 fps)

Pond 1P: PLUNGE POOL



Summary for Link 1S: TO OCB1

Inflow Area = 2.725 ac, 25.03% Impervious, Inflow Depth = 4.49" for 100-Year Storm event
Inflow = 12.98 cfs @ 12.10 hrs, Volume= 1.020 af
Primary = 12.98 cfs @ 12.10 hrs, Volume= 1.020 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1S: TO OCB1

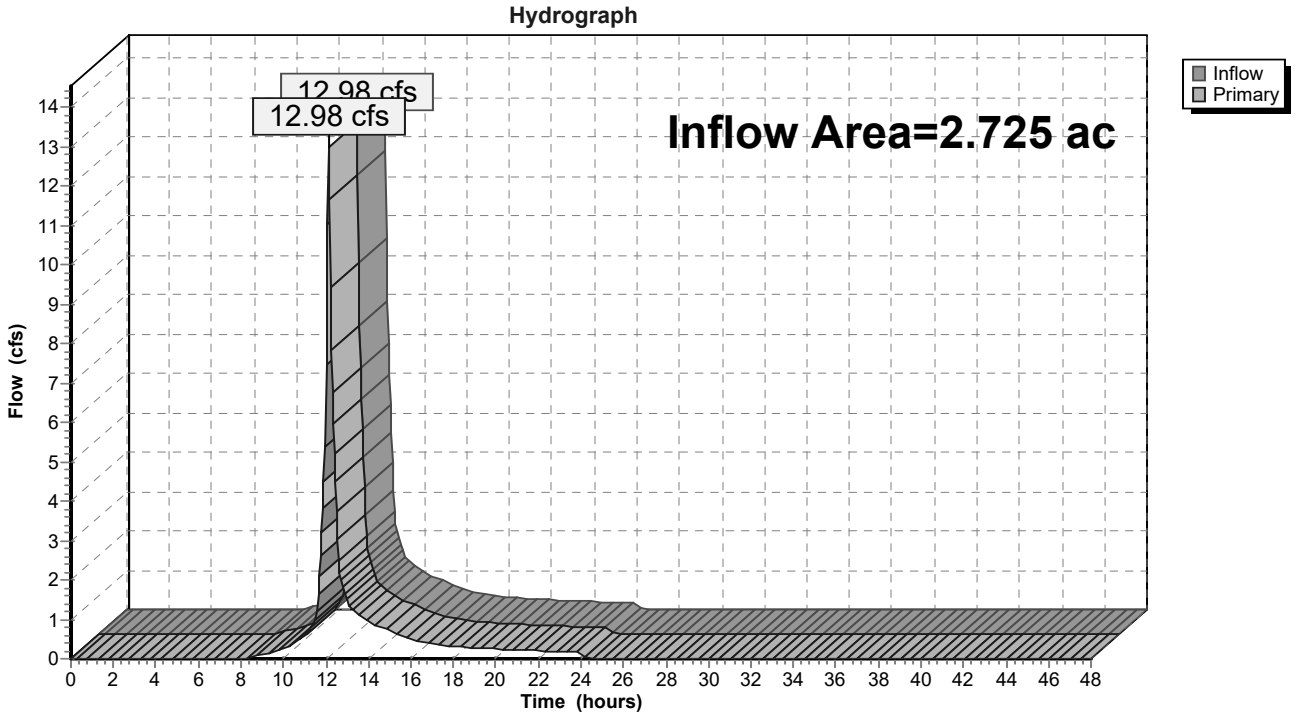


Table No. 3
RATIONAL METHOD PIPE DESIGN WORKSHEET
CHEERS
PROPOSED FILLING STATION / CONVENIENCE STORE
EAST HAMPTON, CT

LOCATION	PIPE SEGMENT From	To	INCREMENTAL AREA DESIGNATION	A (Acres)	Total A	C	C*A	Sum (C*A)	FLOW TIME (min.) To Inlet	In Chan.	Tot.	25-Yr I (in/hr)	25-Yr Q (cfs)	DESIGN CONDITIONS Pipe Diam (in.)	Length (ft)	Slope (%)	Q-full (cfs)	V-Full (fps)	Design (25-Yr) Depth Peak (in.)	V-Peak (fps)	Inverts Up	Down	Remarks
In-Site Catch Basins:																							
	PCB-1	PCB-2		0.124		0.83	**0.10**		6		6	6.3	**0.65**	12	96	0.026	**5.76**	7.34	1.4	0.83	107.63	105.13	PCB-1 Rim =112.13
	PCB-2	PCB-3		0.057		0.66	**0.04**	**0.14**	6		6	6.3	**0.89**	12	46	0.008	**3.29**	4.19	3.2	1.13	105.13	104.74	PCB-2 Rim =108.63
	PCB-3	PCB-4		0.062		0.88	**0.05**	**0.20**	6		6	6.3	**1.23**	12	21	0.010	**3.57**	4.55	4.1	1.57	104.30	104.09	PCB-3 Rim=107.80
	PCB-4	HG-4		0.863		0.38	**0.33**	**0.53**	6		6	6.3	**3.32**	12	6	0.025	**5.65**	7.19	7.1	4.23	103.59	103.44	PCB-4 Rim=109.60

Notes:

1) Runoff Coefficient C-Values used; Impervious(Pavement) C=0.95 Grass/OpenSpace C=0.21, Mannings "n", RCP n=0.013
2) Rainfall Intensity I (in/hr) values taken from NOAA Precipitation Frequency Data Server.
3) Six (6) minute minimum flow time used for minimum time of concentration (Tc) to CB inlet to system
4) Standard Grate Capacity= 0.95 cfs est.

Drainage Structure	Contributing Area Impervious	Grass/Lawn	Total s.f.	Ac.	Runoff Coefficient C
PCB-1	4,524	879	5,403	0.124	0.83
PCB-2	1,523	971	2,494	0.057	0.66
PCB-3	2,440	250	2,690	0.062	0.88
PCB-4	8,885	28,727	37,612	0.863	0.38