STORMWATER REPORT
189-193 ADAMS STREET
NEWTON, MASSACHUSETTS

February 12, 2018

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INTRODUCTION

VTP Associates has performed a stormwater management analysis to evaluate the post-development impacts created by the proposed residential at #189-193 Adams Street in Newton, Massachusetts. . The project will include a new residence building with approximately 18 units, a new surface driveway with parking, landscaped areas, and an associated stormwater management system.

VTP Associates analyzed the hydrology for the drainage areas impacted by the proposed work utilizing the Soil Conservation Service's (SCS) Runoff Curve Number (CN) methodology. VTP Associates used the HydroCAD computer modeling system in conjunction with the SCS's methods to determine the peak rate of runoff for the 2, 10, and 100-year storm events.

VTP Associates proposes the use of best management practices (BMPs) as defined by the Massachusetts Department of Environmental Protection (MA DEP) for stormwater management onsite to protect downstream receiving waters from adverse water quality impacts due to stormwater runoff. Mitigating the rate and quality of stormwater runoff from the project site will also help to lessen the environmental impact of the proposed development.

METHODOLOGY

Hydrology and Hydraulics

VTP Associates analyzed the survey base plan and conducted a site visit to determine the existing drainage flow patterns onsite. The existing conditions survey, in conjunction with aerial photography, and site visits were used to determine existing surface coverage areas for the site. VTP Associates determined that a majority of the pre-developed surface cover for the study area is impervious cover. Initial soil research was determined using the Natural Resources Conservation Service (NRCS) soil survey maps for Middlesex County, Massachusetts via Web Soil Survey 1.1. According to the soil survey, the soil on the site consists of the following:

626B: Merrimac – Urban land complex

VTP Associates used a Hydrologic soil group 'A' for its drainage calculations. As per the Mass DEP Stormwater Hydrology Handbook for Conservation Commissions, VTP used a design infiltration rate of 7.0 in/hr for 'A' soils.

For each subcatchment area, VTP Associates determined drainage flow path lengths, surface cover type and slopes for sheet and shallow concentrated flow. The information was used to calculate the time of concentration (Tc) for each subcatchment areas. Where applicable, a minimum Tc of 5 minutes was used; the minimum value for highly developed, small catchment areas. SCS Runoff Curve Numbers were selected by using the cover type and hydrologic soil group of each area. The peak runoff rates for the 2, 10 and 100-year storm events were then determined by inputting the weighted CN, Tc, drainage areas, and drainage system information into the HydroCAD storm water modeling system computer program. The storm events were based on the 24-hour duration storm with a SCS Type III storm distribution curve.

Storm Event

VTP Associates used Massachusetts rainfall data maps from Technical Paper 40, Rainfall Frequency Atlas of the United States and the City of Newton's Requirements for On-Site Drainage to estimate the rainfall depth for the 2, 10 and 100-year storms. The rainfall depths for the 24-hour storm events used are as follows:

Storm Event	24-Hour Rainfall Depth (inches)
2-year	3.1
10-year	4.5
100-year	8.78

HYDROLOGICAL ANALYSIS

Pre-Development Conditions

The existing site consists of a two-half-story wood building, a detached on- story mason garage, a detached one-story wood garage, a two-story wood house, a surface driveway with parking. Approximately 15,730 square feet (81.3%) of the site is impervious cover. The site is bound by residential building to the southwest, northwest and southeast, and Adams Street to the northeast.

VTP Associates compiled the existing drainage areas from an existing conditions survey prepared by VTP Associates. Additionally, VTP Associates conducted site visits to evaluate the existing onsite drainage patterns and watershed divides from the existing conditions survey. At present, stormwater runoffs from the existing study area drain to Adams Street to the northeast (E1), to the northwest (E2) and southwest (E3) abutters. The pre-development drainage areas are shown on "Figure 1: Pre-Development Drainage Areas."

Post Development Conditions

The proposed project includes the construction of a new multi-family residence, consisting 18 units, on ground parking, walkways, landscaped areas, and associated drainage improvements. As a result, approximately 16,093 square feet (83.1%) of the site is impervious. The same overall area was analyzed for the proposed conditions as the pre-development conditions and is shown on "Figure 2: Post-Development Drainage Areas." Similar to pre-development conditions, the stormwater runoff flows in the same direction. The same design points were used as in the pre-development conditions.

The new residence will have approximately 7,180 square feet of impervious, or roof, and the driveway will be approximately 9,129 square feet. The roof runoff areas are separated into two drainage areas and discharge to a respective underground infiltration system. The roof runoff areas (PR1) and (PR2) will be collected by roof leaders and discharge into the onsite 8,000 gal. Tank (TNK) with a verflow into the infiltration system #1 (INF-1)). The driveway runoff (PD1) will be collected by a catch basin and discharge into onsite infiltration system #1 (INF-1). The driveway runoff (PD2) and (PD3) will be collected by two catch basins and discharge into onsite infiltration system #2 (INF-2). The runoff from (AD1) will be collected by an area drain and discharge into onsite infiltration system #2 (INF-2). The runoff from (AD2) and (AD3) will be collected by two area drains and discharge into onsite infiltration system #1 (INF-1) The intent of the proposed stormwater management systems are to infiltrate stormwater runoff of the proposed building and driveway/parking. The infiltration system was designed to control the 100-year storm with the addition of overflow to the infiltration systems and help mitigate proposed peak rates of runoff to less than existing conditions. The drainage areas can be seen on "Figure 2: Post-Development Drainage Areas."

VTP Associates analyzed the pre- and post-development site conditions to determine the peak rates of runoff at the design points. By incorporating the stormwater management features discussed above, the peak rates of runoff in the post-development condition is to be better than pre-development levels. Pre-development peak runoff rates vs. post-development peak runoff rates for the 2, 10, and 100-year storm events are presented in Table 1 below.

Table 1, Pre-development vs. Post-Development Peak Rate of Runoff

Design Point #1 – Adams Street (Northeast)

STORM EVENT (DESIGN POINT)	*PRE-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*POST-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*PRE-DEVELOPMENT VOLUME OF RUNOFF (AF)*	*POST-DEVELOPMENT VOLUME OF RUNOFF (AF)*
2-YEAR	0.43	0.00	0.032	0.000
10-YEAR	0.63	0.01	0.048	0.001
100-YEAR	1.25	0.08	0.098	0.005

Design Point #2 – Northwest Abutter

STORM EVENT (DESIGN POINT)	*PRE-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*POST-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*PRE-DEVELOPMENT VOLUME OF RUNOFF (AF)*	*POST-DEVELOPMENT VOLUME OF RUNOFF (AF)*
2-YEAR	0.42	0.00	0.029	0.000
10-YEAR	0.77	0.00	0.053	0.000
100-YEAR	1.92	0.00	0.135	0.000

Design Point #3 – Southwest Abutter

STORM EVENT (DESIGN POINT)	*PRE-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*POST-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*PRE-DEVELOPMENT VOLUME OF RUNOFF (AF)*	*POST-DEVELOPMENT VOLUME OF RUNOFF (AF)*
2-YEAR	0.07	0.00	0.005	0.000
10-YEAR	0.17	0.00	0.012	0.000
100-YEAR	0.57	0.00	0.039	0.000

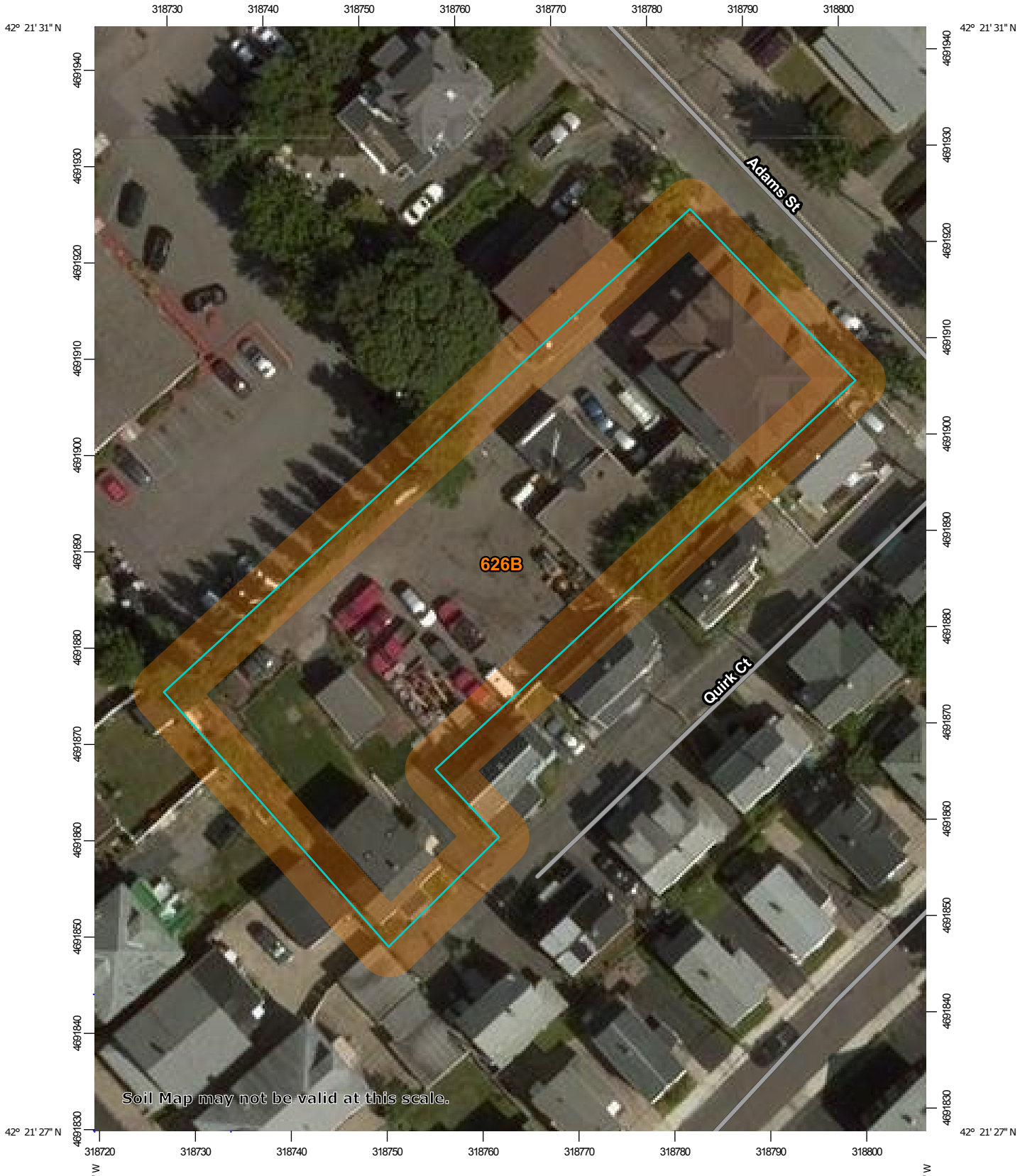
CONCLUSION

The post-development peak rate of runoff is expected to be less than or equal to pre-development levels for the 2, 10, and 100-year storm events. Although there is increased impervious coverage on the site as a result of the proposed redevelopment, the addition of the underground infiltration systems controls the post-development runoff to pre-development levels or better.

ENCLOSURES

NRCS Soil Map
Pre-Development Drainage Areas (Figure 1)
Post-Development Drainage Areas (Figure 2)
Pre & Post Development HydroCAD Calculations

Custom Soil Resource Report
Soil Map



Map Scale: 1:559 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 5 10 20 30

Feet: 0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N 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 1:25,000.

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: Middlesex County, Massachusetts
Survey Area Data: Version 17, Oct 6, 2017

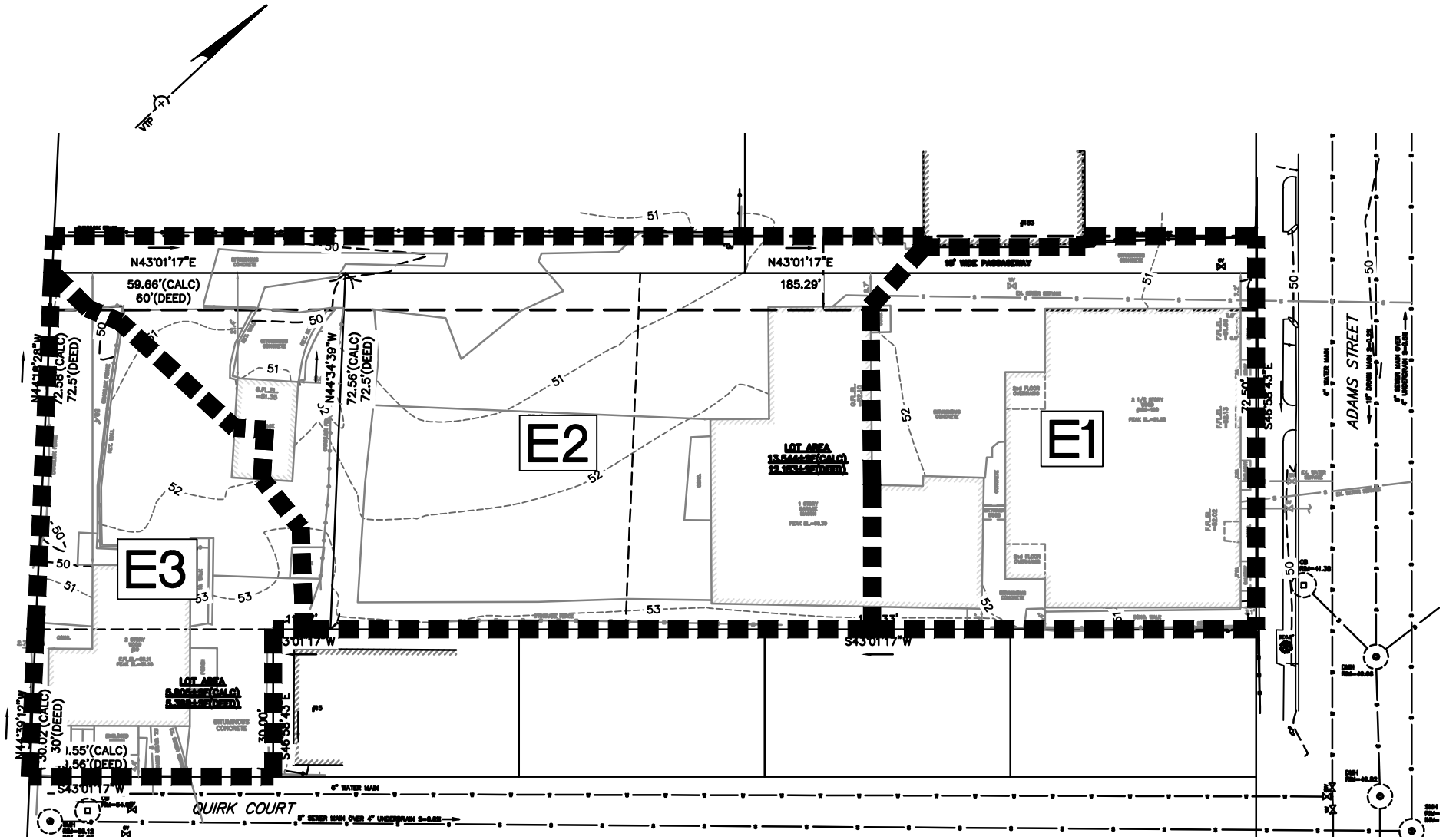
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

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.

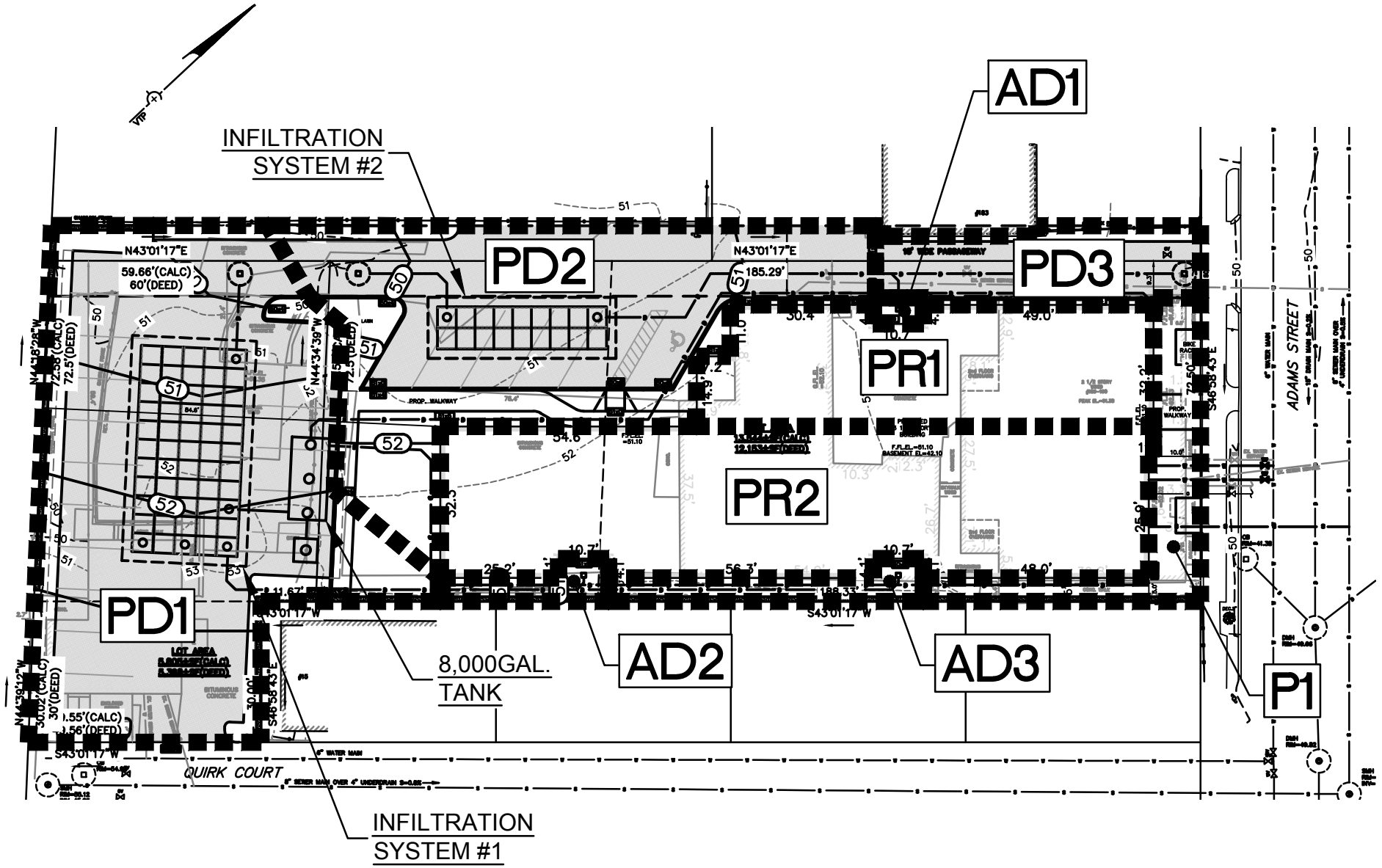
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.5	100.0%
Totals for Area of Interest		**0.5**	**100.0%**



SCALE: 1in.=30ft.
DATE: FEBRUARY 12, 2018

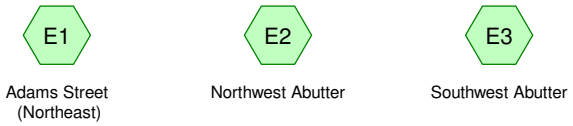
FIGURE 1:
PRE-DEVELOPMENT DRAINAGE AREAS
#189-193 ADAMS STREET
NEWTON, MA



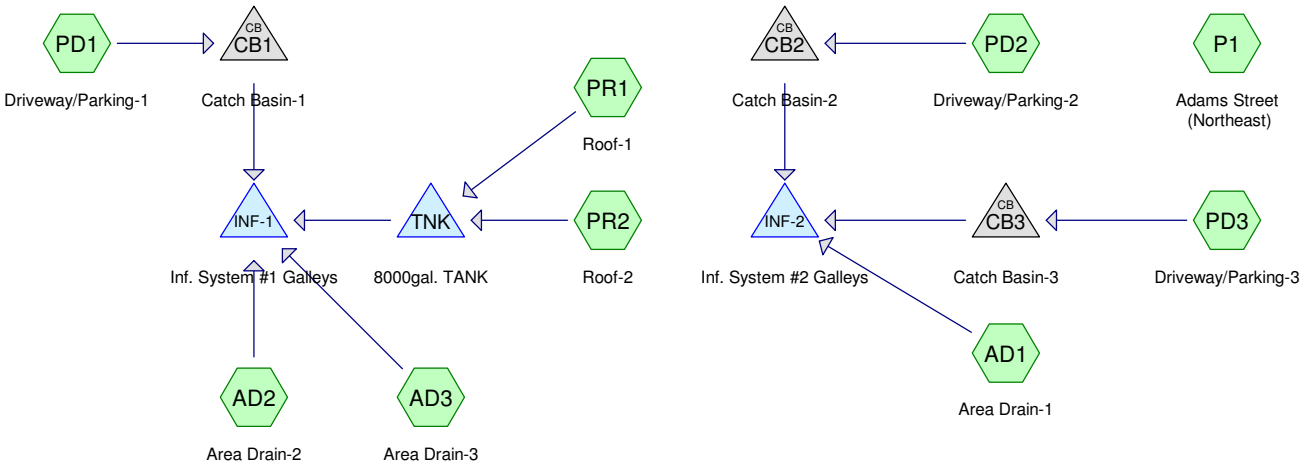
SCALE: 1in.=30ft.
DATE: FEBRUARY 12, 2018

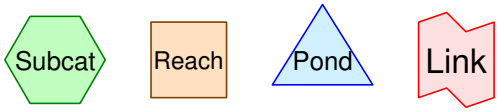
FIGURE 2:
POST-DEVELOPMENT DRAINAGE AREAS
#189-193 ADAMS STREET
NEWTON, MA

PRE-DEVELOPMENT CONDITIONS



POST-DEVELOPMENT CONDITIONS





Routing Diagram for 218100_189-193 Adams St Newton, MA
Prepared by VTP associates, inc., Printed 2/11/2018

Summary for Subcatchment AD1: Area Drain-1

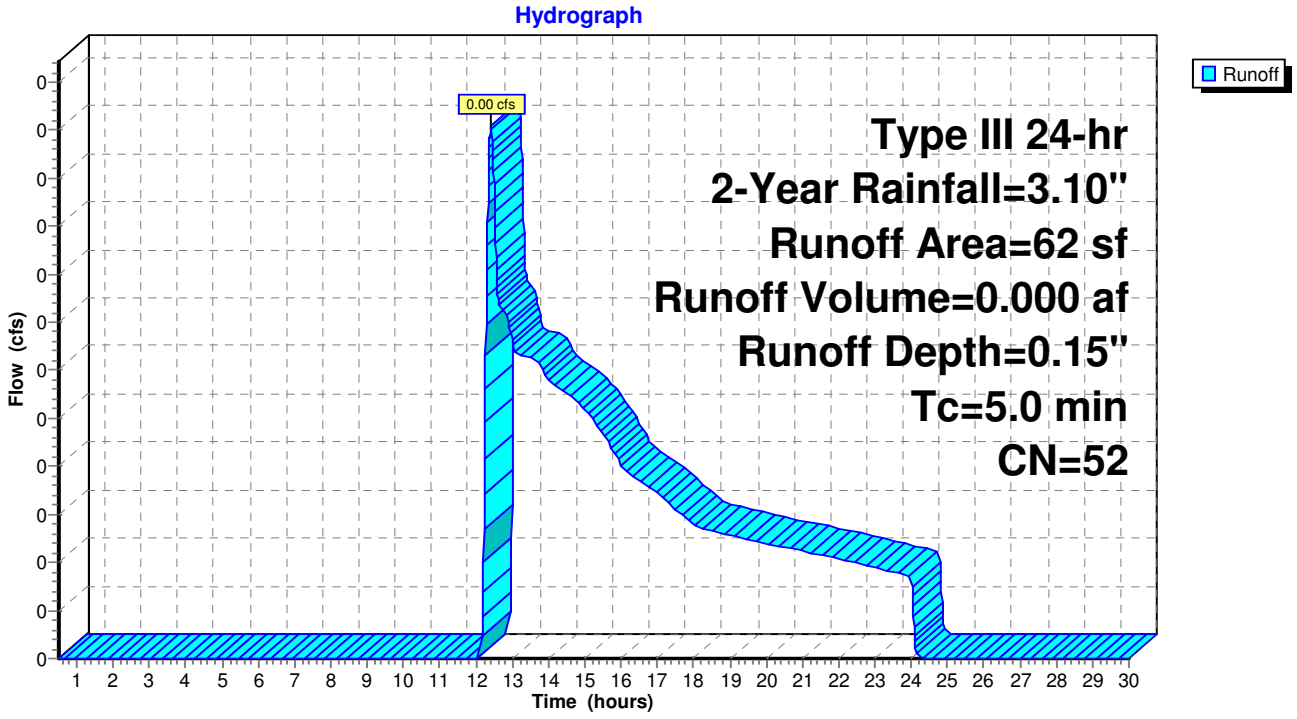
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 0.000 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	14	98	Ret. Wall
	48	39	>75% Grass cover, Good, HSG A
	62	52	Weighted Average
	48		77.42% Pervious Area
	14		22.58% Impervious Area

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

Subcatchment AD1: Area Drain-1



Summary for Subcatchment AD2: Area Drain-2

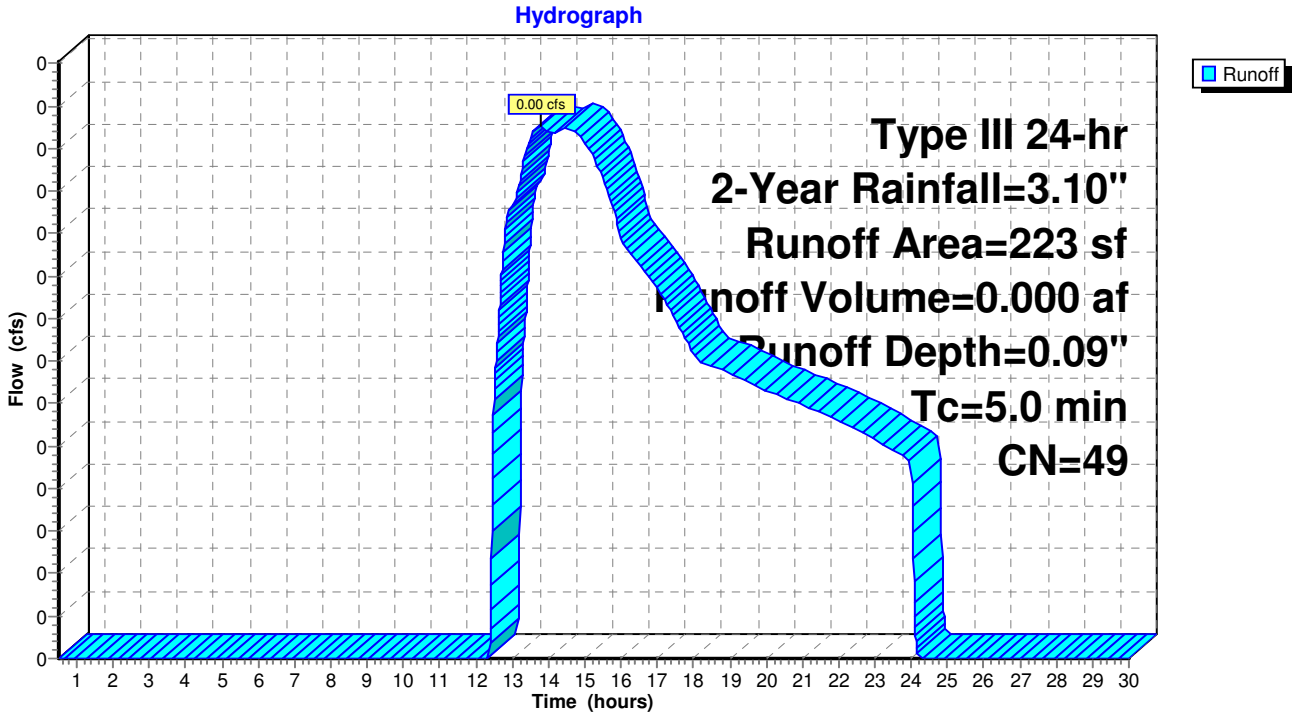
Runoff = 0.00 cfs @ 13.78 hrs, Volume= 0.000 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	36	98	Ret. Wall
	187	39	>75% Grass cover, Good, HSG A
	223	49	Weighted Average
	187		83.86% Pervious Area
	36		16.14% Impervious Area

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

Subcatchment AD2: Area Drain-2



Summary for Subcatchment AD3: Area Drain-3

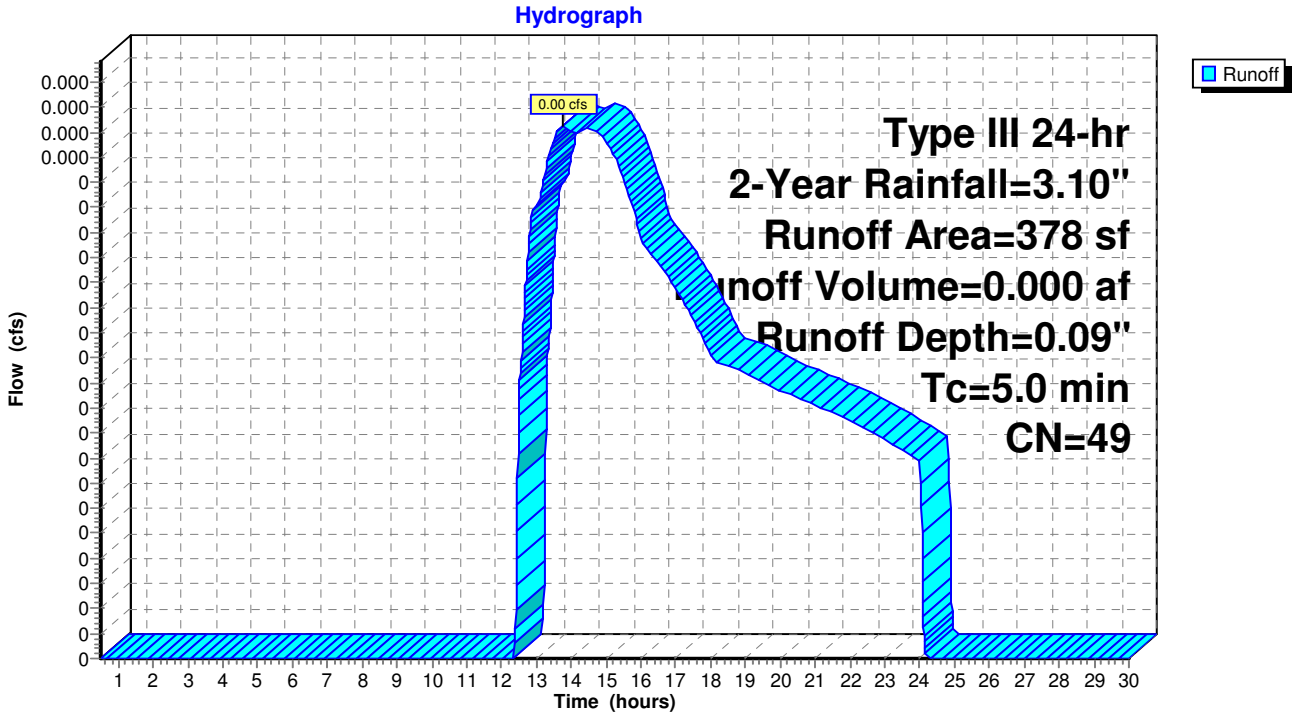
Runoff = 0.00 cfs @ 13.78 hrs, Volume= 0.000 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	67	98	Ret. Wall
	311	39	>75% Grass cover, Good, HSG A
	378	49	Weighted Average
	311		82.28% Pervious Area
	67		17.72% Impervious Area

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

Subcatchment AD3: Area Drain-3



Summary for Subcatchment E1: Adams Street (Northeast)

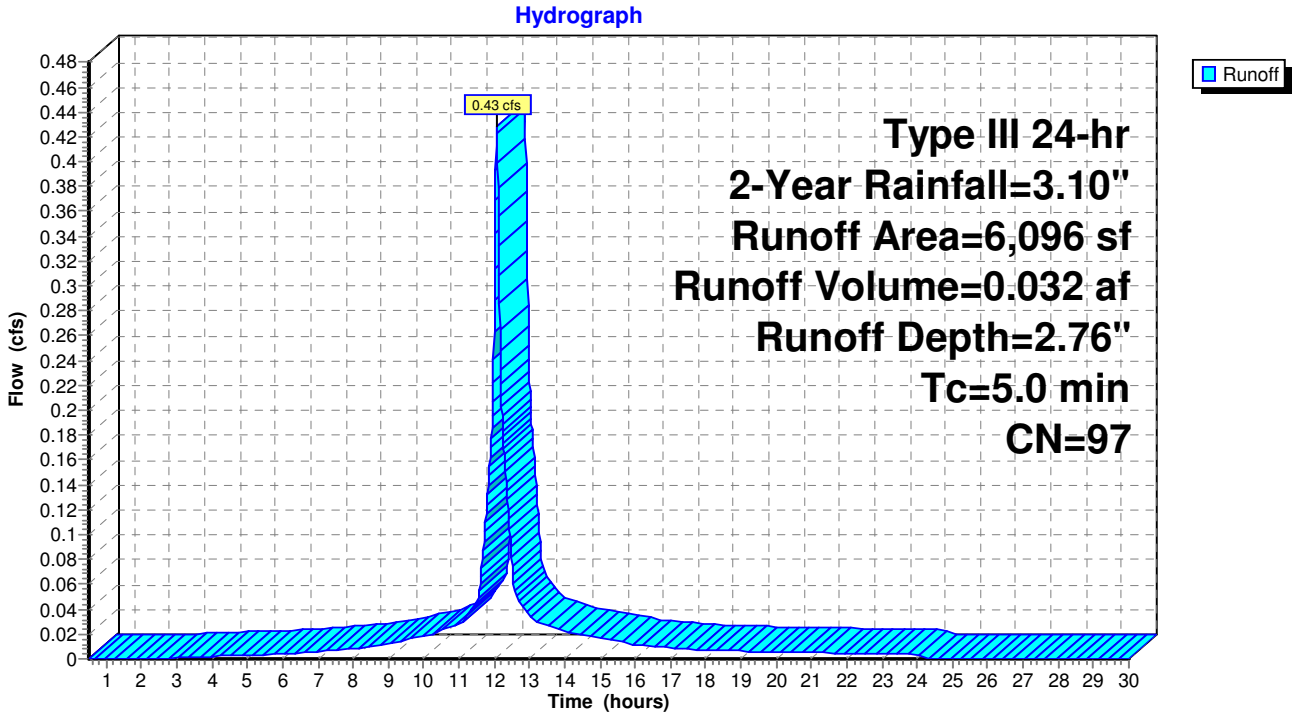
Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.032 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	581	98	Ex. Concrete Garage Roof (Portion)
*	2,760	98	Ex. Bldg. Roof
*	1,976	98	Paved Driveway (Portion)
*	571	98	Walks
*	71	98	Conc. pads
*	22	98	Ret. Wall
	115	39	>75% Grass cover, Good, HSG A
	6,096	97	Weighted Average
	115		1.89% Pervious Area
	5,981		98.11% Impervious Area

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

Subcatchment E1: Adams Street (Northeast)



Summary for Subcatchment E2: Northwest Abutter

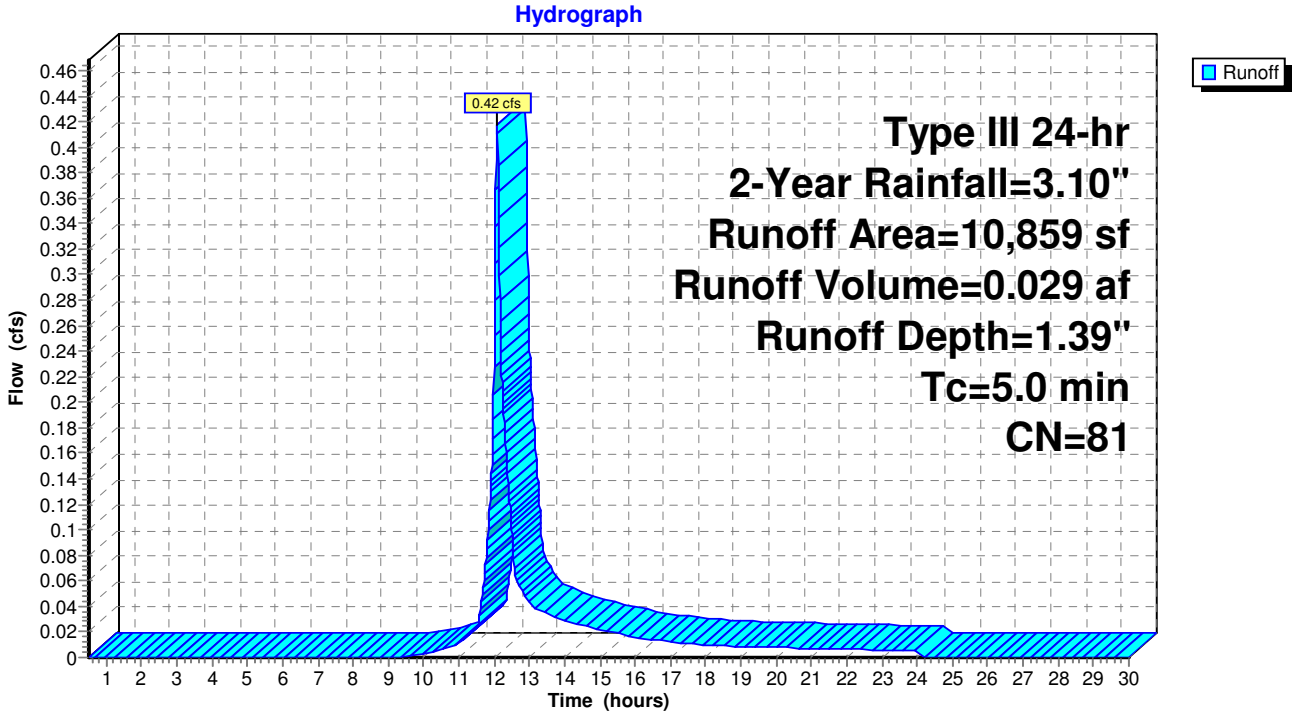
Runoff = 0.42 cfs @ 12.08 hrs, Volume= 0.029 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	1,717	98	Ex. Concrete Garage Roof (Portion)
*	187	98	Ex. Wood Garage Roof (Portion)
*	5,671	98	Paved Driveway (Portion)
*	107	98	Conc./brick pads
*	48	98	Ret. Wall
	3,129	39	>75% Grass cover, Good, HSG A
	10,859	81	Weighted Average
	3,129		28.81% Pervious Area
	7,730		71.19% Impervious Area

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

Subcatchment E2: Northwest Abutter



Summary for Subcatchment E3: Southwest Abutter

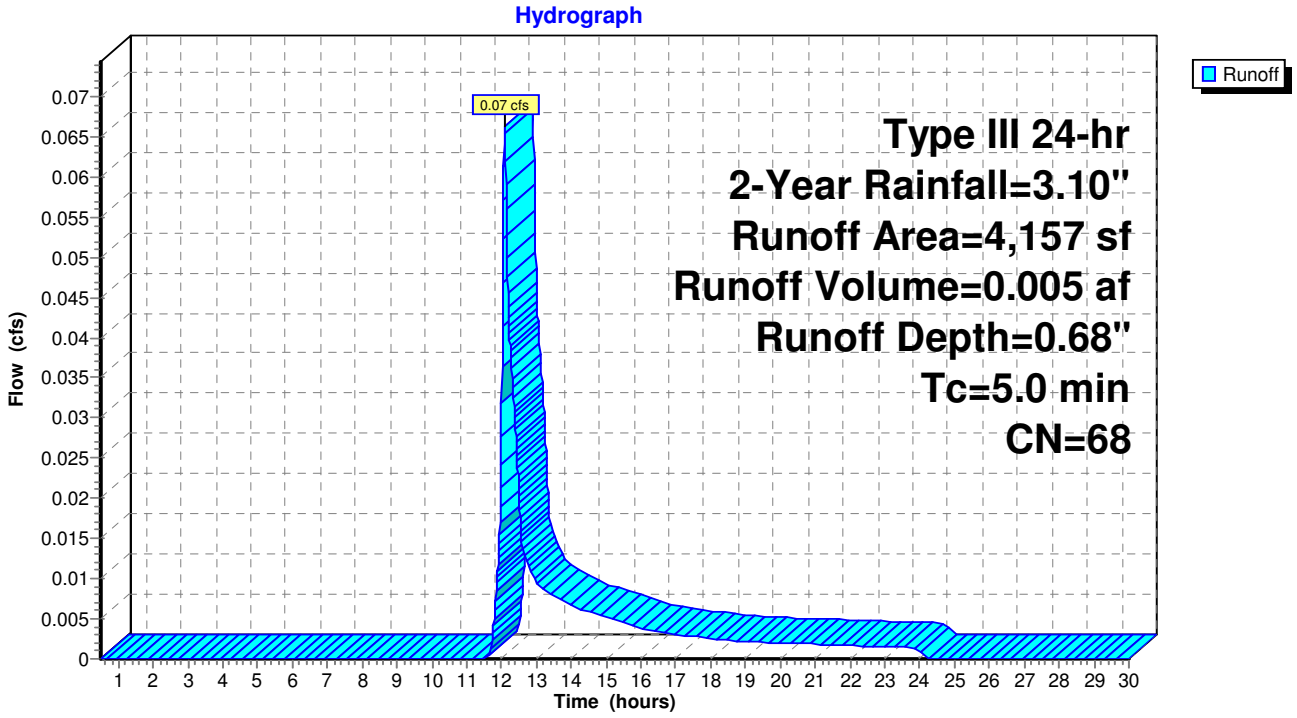
Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	887	98	Ex. House Roof
*	63	98	Ex. Wood Garage Roof (Portion)
*	621	98	Paved Driveway
*	354	98	Landing/Steps/Walks
*	63	98	Ret. Wall
*	34	98	Bulkhead
	2,135	39	>75% Grass cover, Good, HSG A
	4,157	68	Weighted Average
	2,135		51.36% Pervious Area
	2,022		48.64% Impervious Area

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

Subcatchment E3: Southwest Abutter



Summary for Subcatchment P1: Adams Street (Northeast)

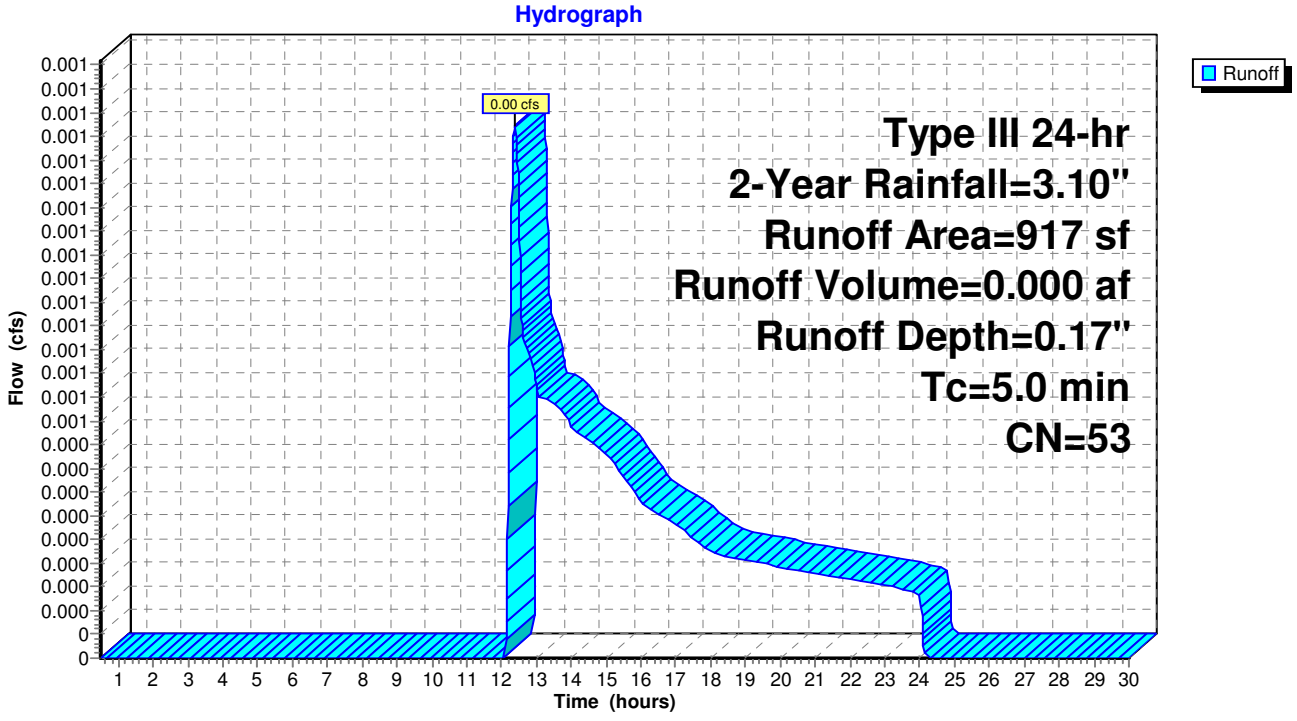
Runoff = 0.00 cfs @ 12.39 hrs, Volume= 0.000 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	154	98	Walks/Conc. Pads
*	59	98	Ret. Wall
	704	39	>75% Grass cover, Good, HSG A
	917	53	Weighted Average
	704		76.77% Pervious Area
	213		23.23% Impervious Area

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

Subcatchment P1: Adams Street (Northeast)



Summary for Subcatchment PD1: Driveway/Parking-1

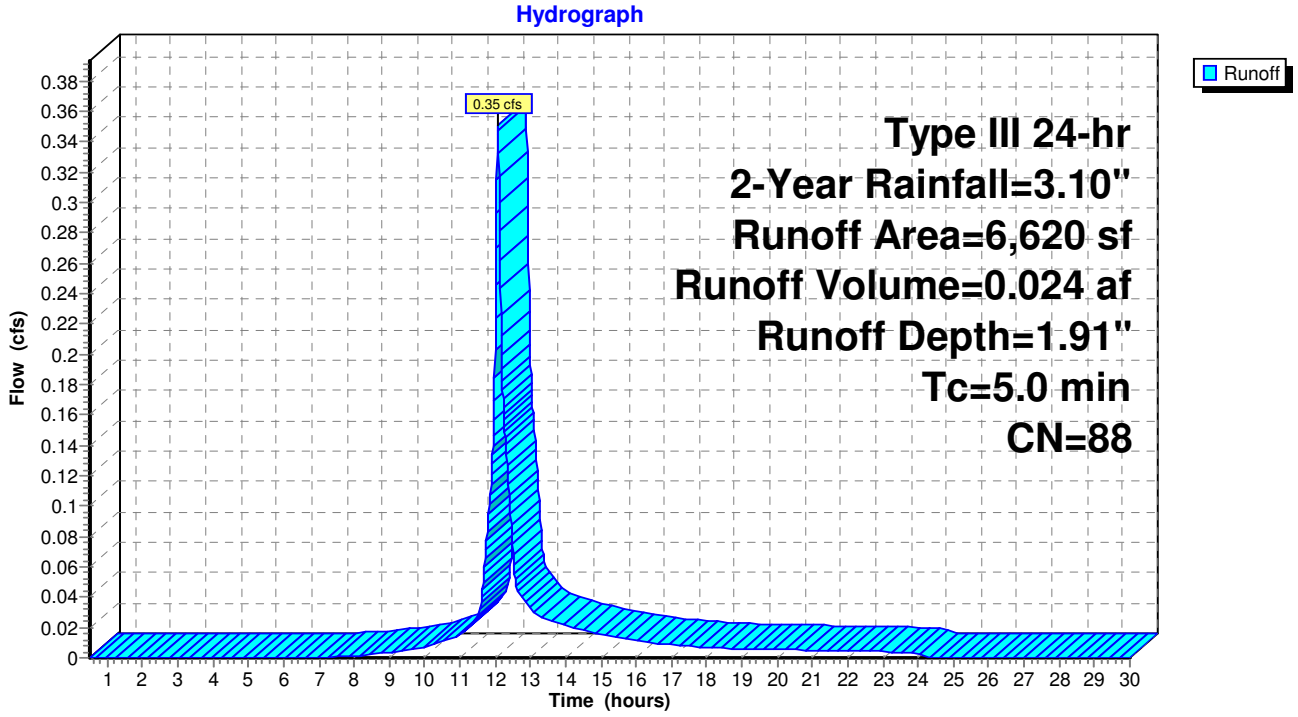
Runoff = 0.35 cfs @ 12.07 hrs, Volume= 0.024 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	5,232	98	Driveway/Parking Lot
*	22	98	Curbing
*	168	98	Ret. Walls
*	50	98	Walks
	1,148	39	>75% Grass cover, Good, HSG A
	6,620	88	Weighted Average
	1,148		17.34% Pervious Area
	5,472		82.66% Impervious Area

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

Subcatchment PD1: Driveway/Parking-1



Summary for Subcatchment PD2: Driveway/Parking-2

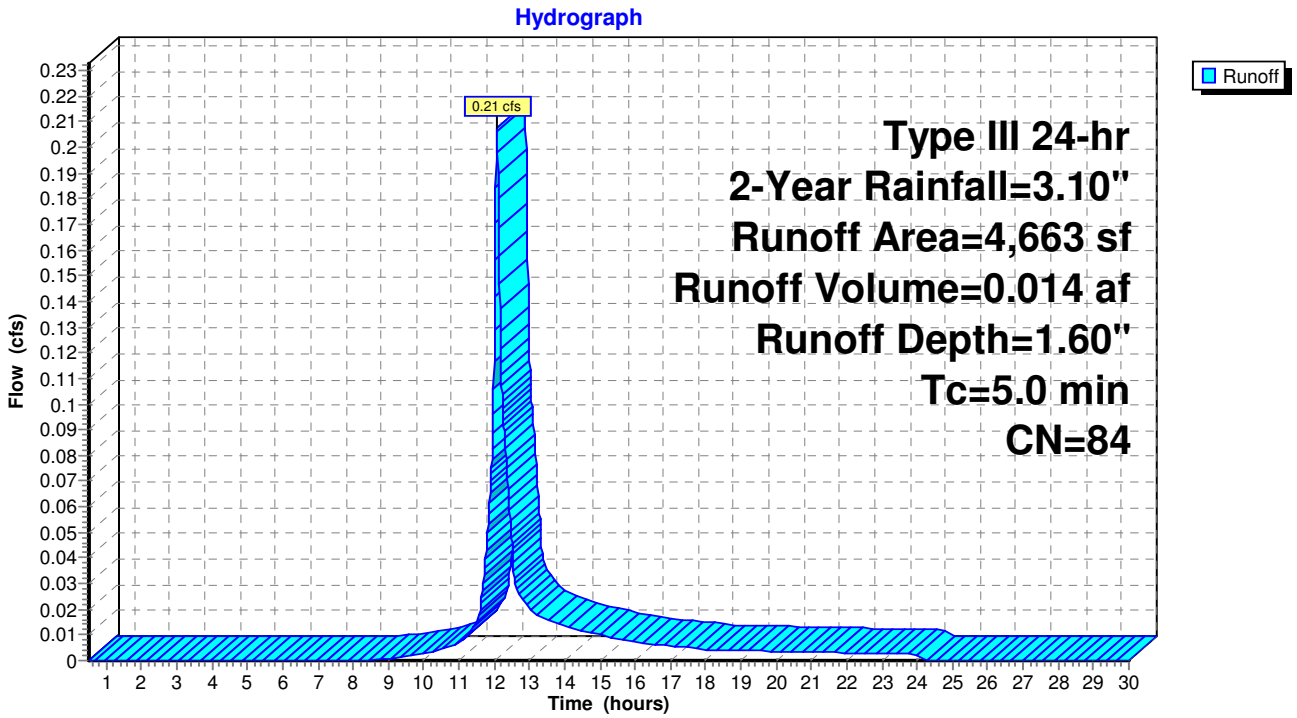
Runoff = 0.21 cfs @ 12.08 hrs, Volume= 0.014 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	3,066	98	Driveway/Parking Lot
*	82	98	Curbing
*	417	98	Walks
	1,098	39	>75% Grass cover, Good, HSG A
	4,663	84	Weighted Average
	1,098		23.55% Pervious Area
	3,565		76.45% Impervious Area

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

Subcatchment PD2: Driveway/Parking-2



Summary for Subcatchment PD3: Driveway/Parking-3

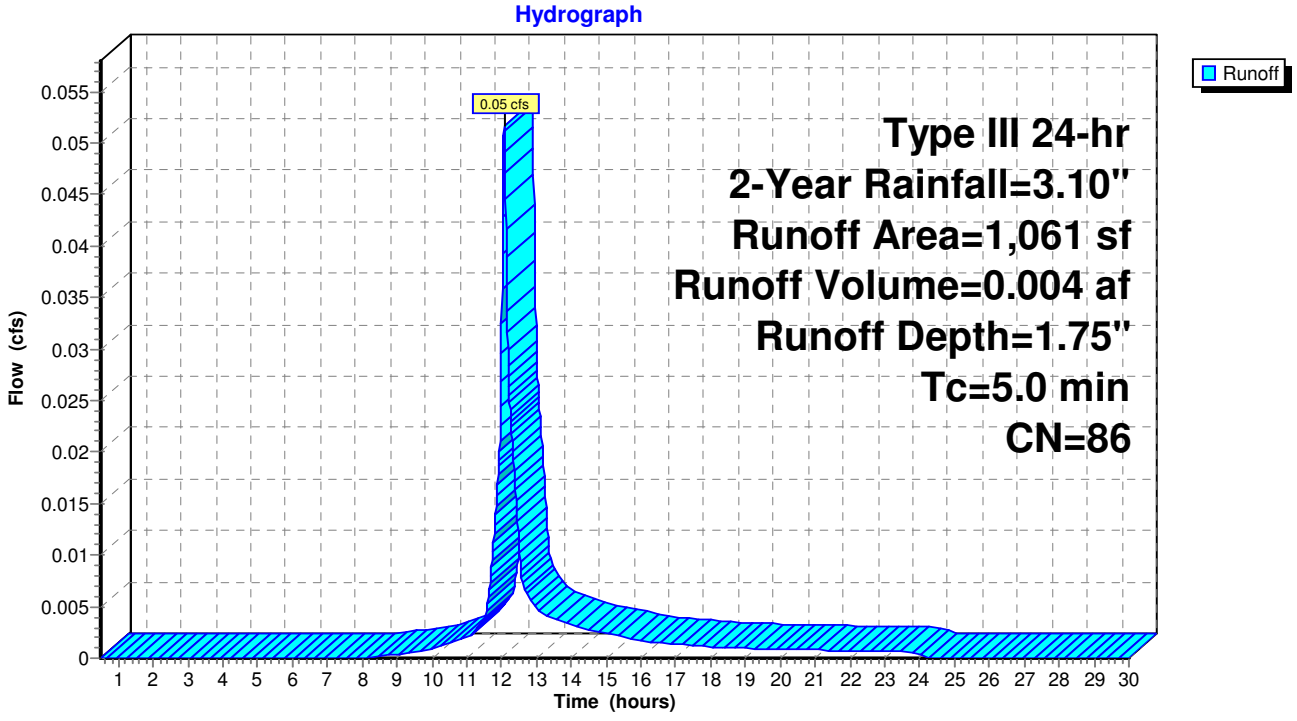
Runoff = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	831	98	Driveway
*	21	98	Curbing
	209	39	>75% Grass cover, Good, HSG A
	1,061	86	Weighted Average
	209		19.70% Pervious Area
	852		80.30% Impervious Area

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

Subcatchment PD3: Driveway/Parking-3



Summary for Subcatchment PR1: Roof-1

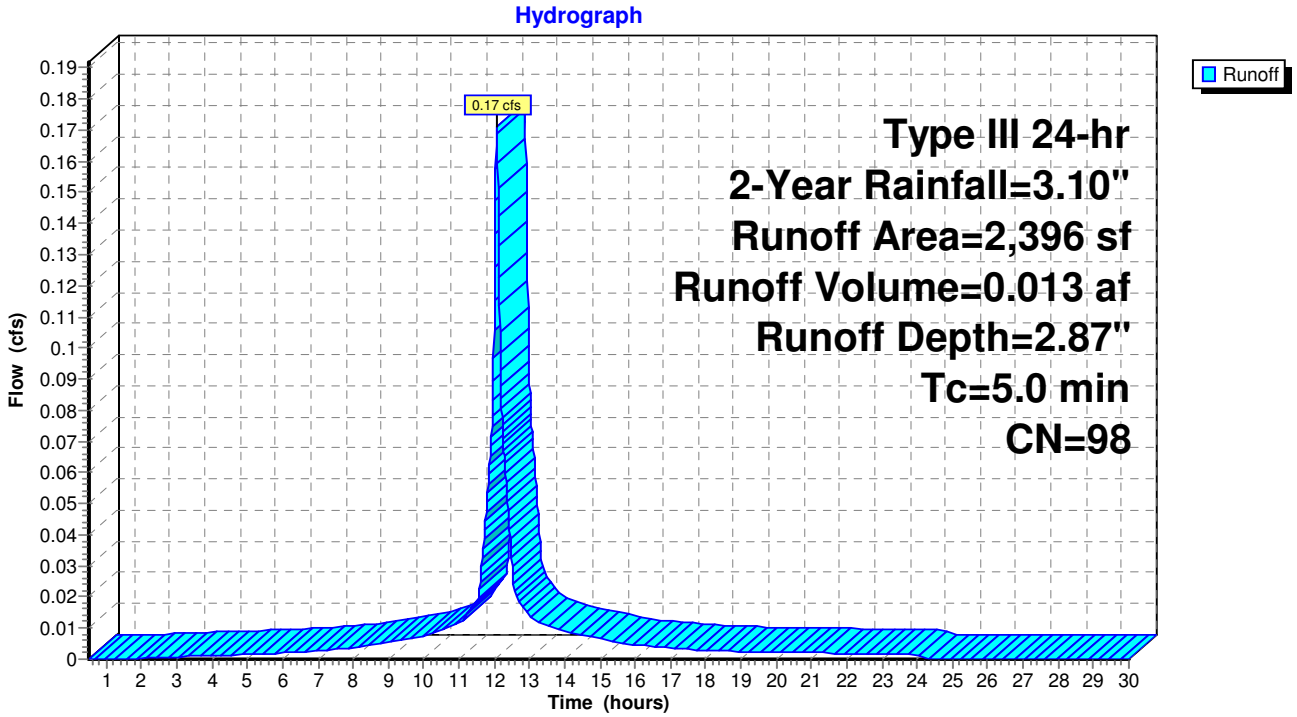
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	2,396	98	Prop. Roof-1
	2,396		100.00% Impervious Area

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

Subcatchment PR1: Roof-1



Summary for Subcatchment PR2: Roof-2

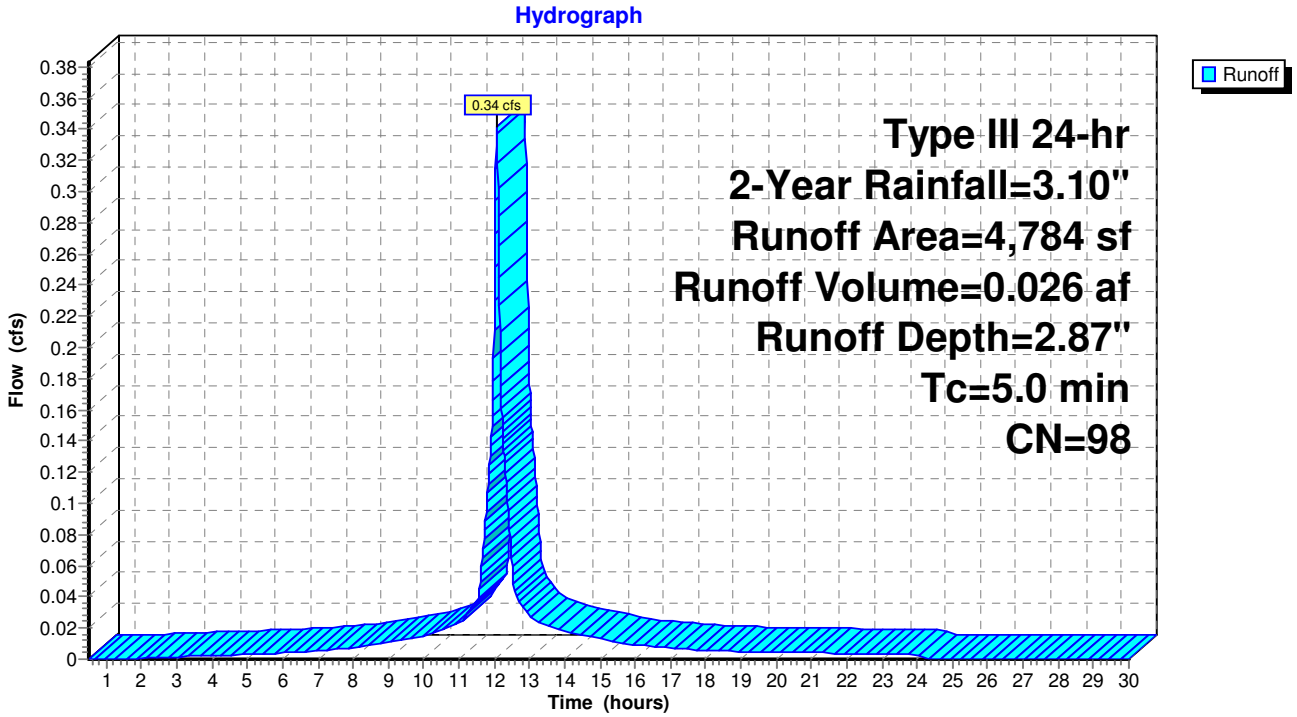
Runoff = 0.34 cfs @ 12.07 hrs, Volume= 0.026 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	4,784	98	Prop. Roof-2
	4,784		100.00% Impervious Area

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

Subcatchment PR2: Roof-2



Summary for Pond CB1: Catch Basin-1

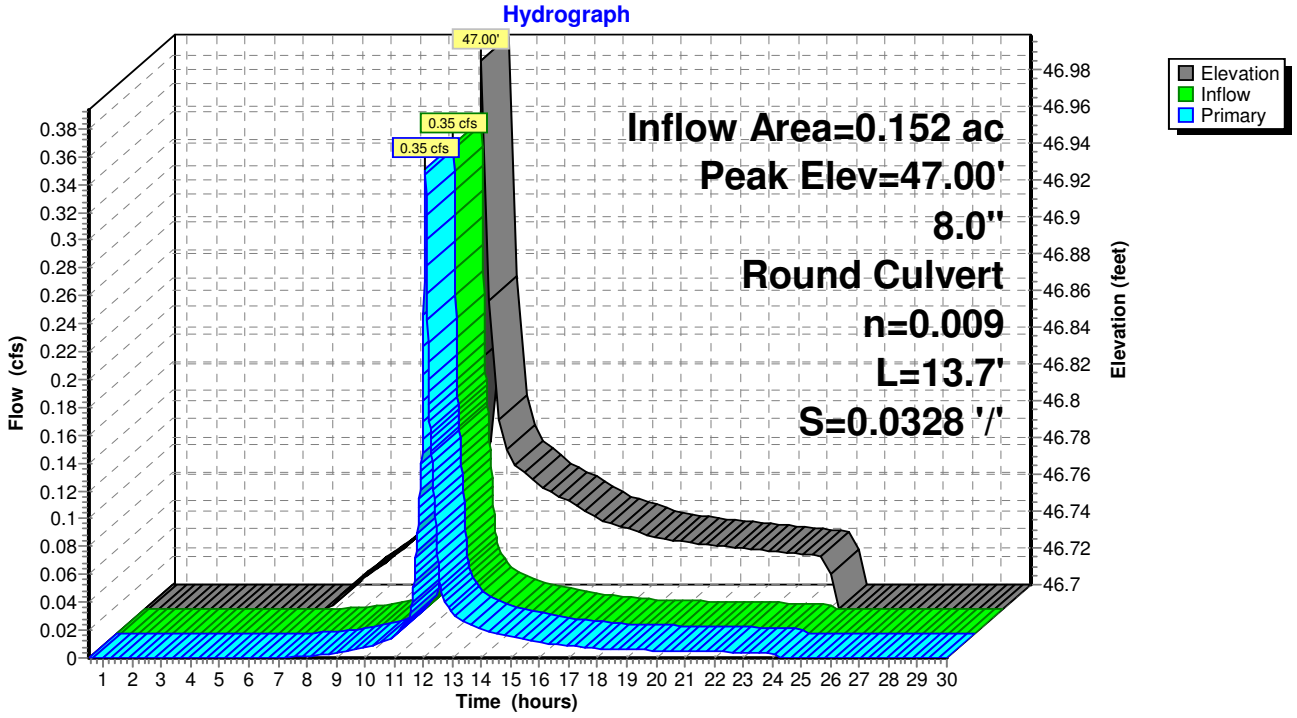
Inflow Area = 0.152 ac, 82.66% Impervious, Inflow Depth = 1.91" for 2-Year event
Inflow = 0.35 cfs @ 12.07 hrs, Volume= 0.024 af
Outflow = 0.35 cfs @ 12.07 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 12.07 hrs, Volume= 0.024 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.00' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.70'	**8.0" Round 8"CCP** L= 13.7' Ke= 0.200 Inlet / Outlet Invert= 46.70' / 46.25' S= 0.0328 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.35 cfs @ 12.07 hrs HW=47.00' TW=42.08' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.35 cfs @ 2.32 fps)

Pond CB1: Catch Basin-1



Summary for Pond CB2: Catch Basin-2

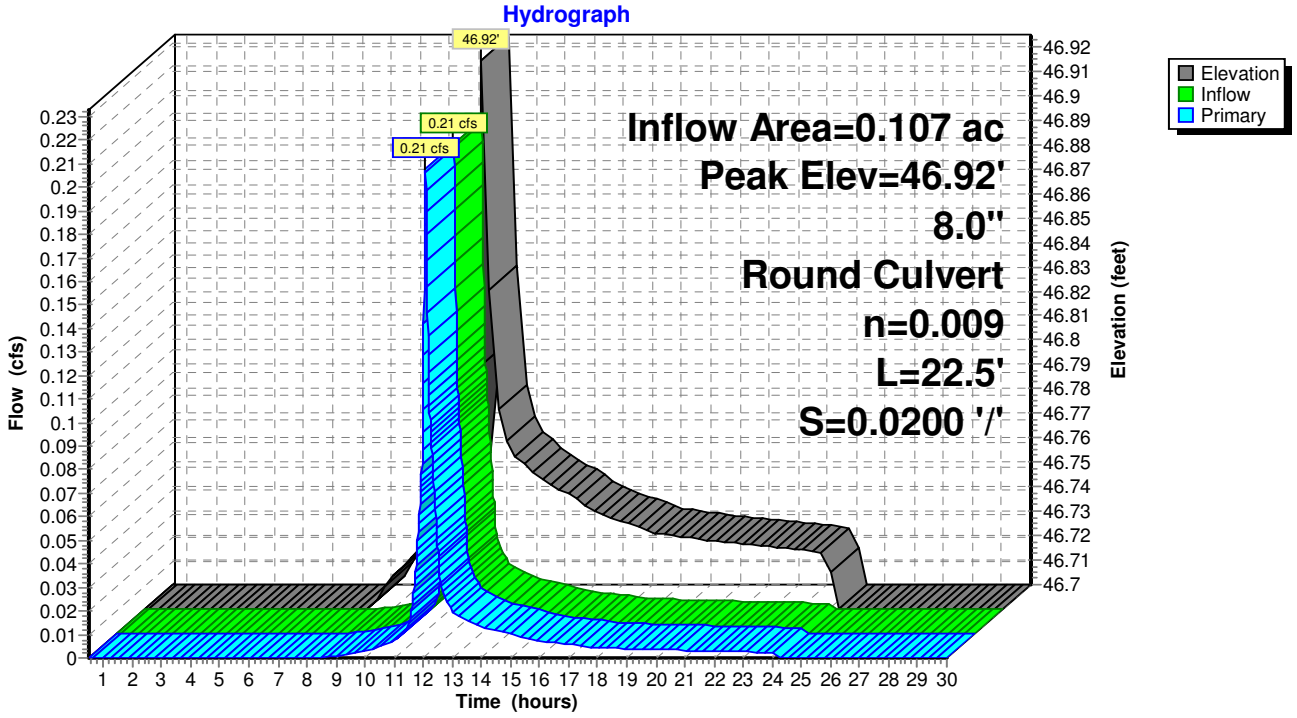
Inflow Area = 0.107 ac, 76.45% Impervious, Inflow Depth = 1.60" for 2-Year event
Inflow = 0.21 cfs @ 12.08 hrs, Volume= 0.014 af
Outflow = 0.21 cfs @ 12.08 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.08 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 46.92' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.70'	**8.0" Round 8"CCP** L= 22.5' Ke= 0.200 Inlet / Outlet Invert= 46.70' / 46.25' S= 0.0200 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.21 cfs @ 12.08 hrs HW=46.92' TW=42.27' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.21 cfs @ 2.01 fps)

Pond CB2: Catch Basin-2



Summary for Pond CB3: Catch Basin-3

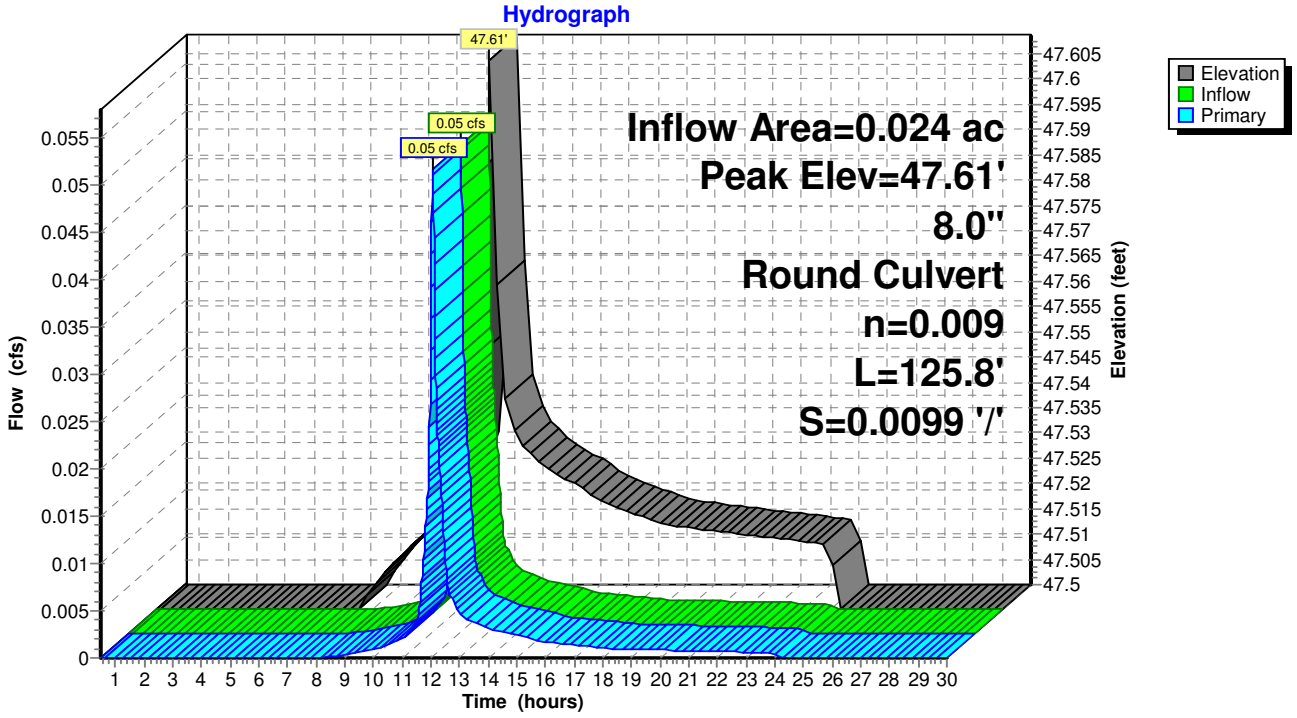
Inflow Area = 0.024 ac, 80.30% Impervious, Inflow Depth = 1.75" for 2-Year event
Inflow = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af
Outflow = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
Primary = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.61' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**8.0" Round 8"CCP** L= 125.8' Ke= 0.200 Inlet / Outlet Invert= 47.50' / 46.25' S= 0.0099 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.05 cfs @ 12.07 hrs HW=47.61' TW=42.26' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.05 cfs @ 1.40 fps)

Pond CB3: Catch Basin-3



Summary for Pond INF-1: Inf. System #1 Galleys

Inflow Area = 0.331 ac, 88.57% Impervious, Inflow Depth = 1.68" for 2-Year event
Inflow = 0.78 cfs @ 12.10 hrs, Volume= 0.046 af
Outflow = 0.21 cfs @ 12.07 hrs, Volume= 0.046 af, Atten= 74%, Lag= 0.0 min
Discarded = 0.21 cfs @ 12.07 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 42.75' @ 12.47 hrs Surf.Area= 0.029 ac Storage= 0.008 af

Plug-Flow detention time= 7.9 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 7.9 min (849.7 - 841.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	0.026 af	**26.50'W x 48.00'L x 5.25'H Field A** 0.153 af Overall - 0.079 af Embedded = 0.075 af x 35.0% Voids
#2A	43.00'	0.059 af	**Concrete Galley 4x4x4.25** x 55 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 5 Rows of 11 Chambers
		0.085 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.21 cfs @ 12.07 hrs HW=42.07' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Pond INF-1: Inf. System #1 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x4.25 (Concrete Galley, Shea LE-EGH, LE-CGH or equivalent)
Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf
Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf

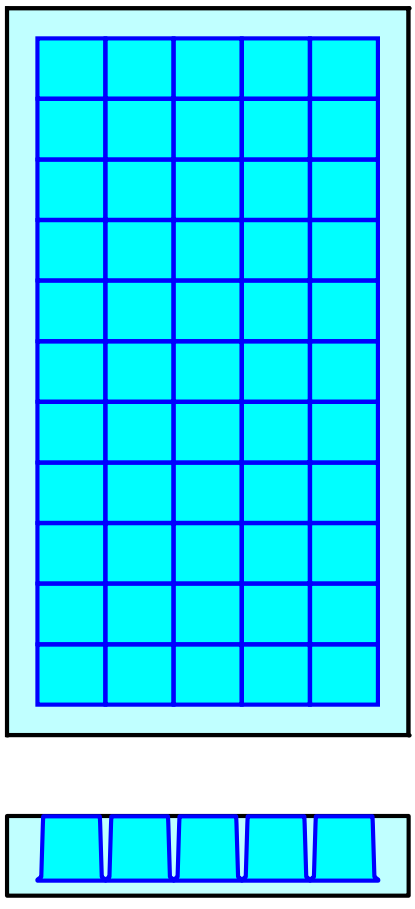
11 Chambers/Row x 4.00' Long = 44.00' Row Length +24.0" End Stone x 2 = 48.00' Base Length
5 Rows x 54.0" Wide + 24.0" Side Stone x 2 = 26.50' Base Width
12.0" Base + 51.0" Chamber Height = 5.25' Field Height

55 Chambers x 46.4 cf = 2,550.9 cf Chamber Storage
55 Chambers x 62.3 cf = 3,428.2 cf Displacement

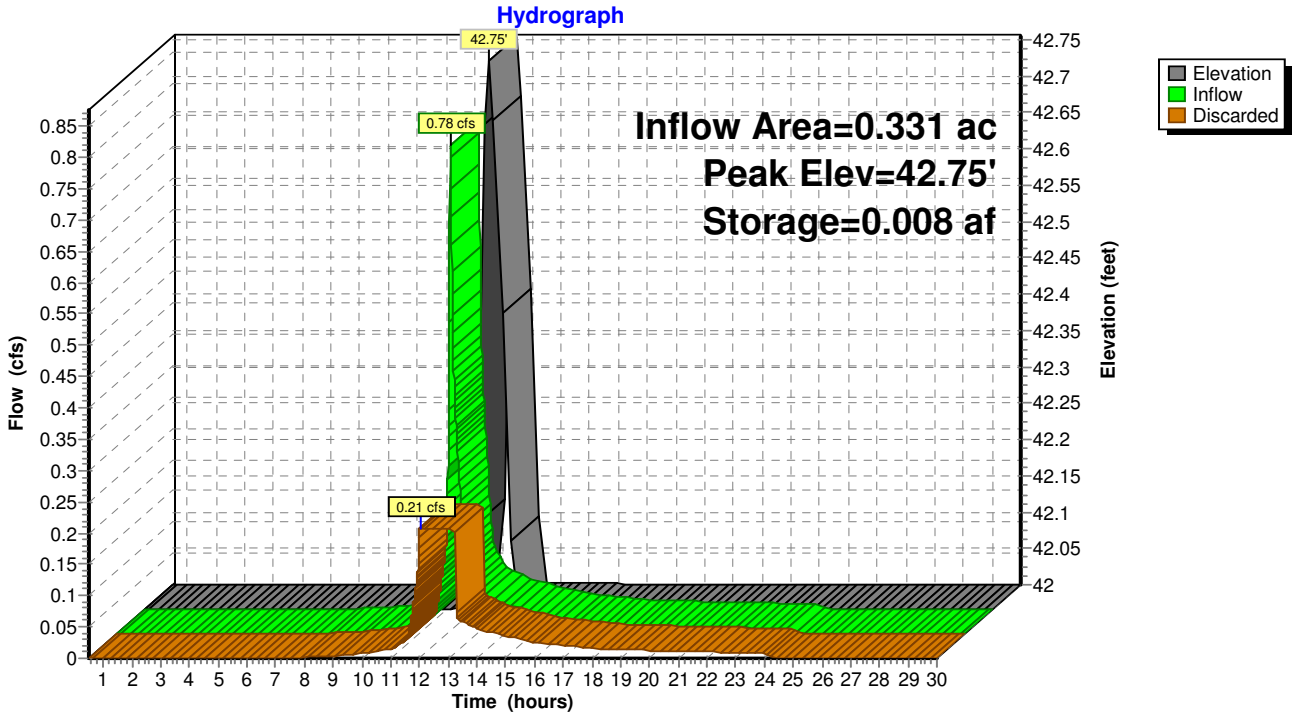
6,678.0 cf Field - 3,428.2 cf Chambers = 3,249.8 cf Stone x 35.0% Voids = 1,137.4 cf Stone Storage

Chamber Storage + Stone Storage = 3,688.4 cf = 0.085 af
Overall Storage Efficiency = 55.2%
Overall System Size = 48.00' x 26.50' x 5.25'

55 Chambers
247.3 cy Field
120.4 cy Stone



Pond INF-1: Inf. System #1 Galleys



Summary for Pond INF-2: Inf. System #2 Galleys

Inflow Area = 0.133 ac, 76.58% Impervious, Inflow Depth = 1.61" for 2-Year event
Inflow = 0.26 cfs @ 12.08 hrs, Volume= 0.018 af
Outflow = 0.08 cfs @ 12.00 hrs, Volume= 0.018 af, Atten= 68%, Lag= 0.0 min
Discarded = 0.08 cfs @ 12.00 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 42.65' @ 12.39 hrs Surf.Area= 0.012 ac Storage= 0.003 af

Plug-Flow detention time= 6.6 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 6.6 min (835.4 - 828.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	0.013 af	**13.00'W x 40.00'L x 5.25'H Field A** 0.063 af Overall - 0.026 af Embedded = 0.037 af x 35.0% Voids
#2A	43.00'	0.019 af	**Concrete Galley 4x4x4.25** x 18 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 2 Rows of 9 Chambers
		0.032 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 12.00 hrs HW=42.06' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond INF-2: Inf. System #2 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x4.25 (Concrete Galley, Shea LE-EGH, LE-CGH or equivalent)
Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf
Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf

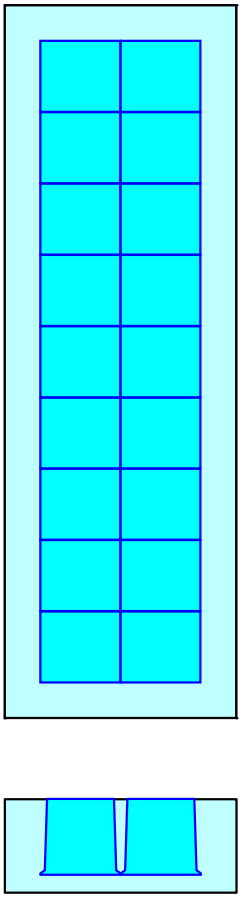
9 Chambers/Row x 4.00' Long = 36.00' Row Length +24.0" End Stone x 2 = 40.00' Base Length
2 Rows x 54.0" Wide + 24.0" Side Stone x 2 = 13.00' Base Width
12.0" Base + 51.0" Chamber Height = 5.25' Field Height

18 Chambers x 46.4 cf = 834.9 cf Chamber Storage
18 Chambers x 62.3 cf = 1,122.0 cf Displacement

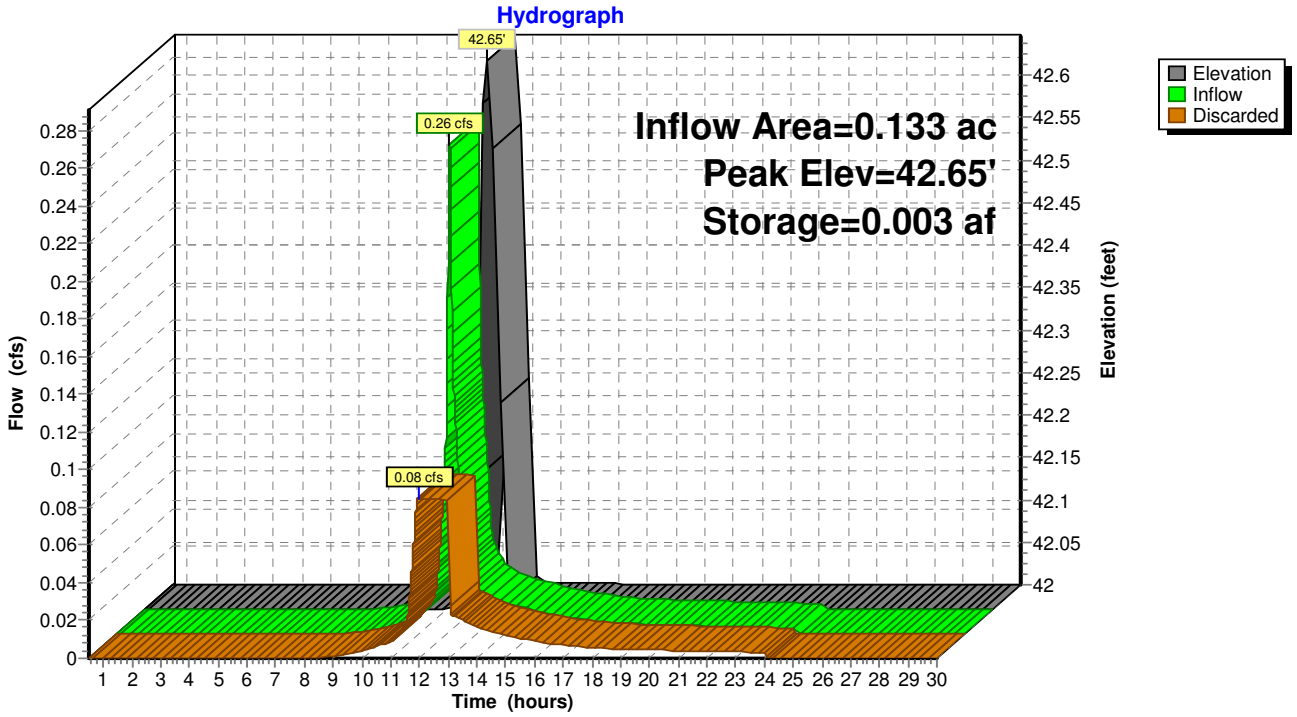
2,730.0 cf Field - 1,122.0 cf Chambers = 1,608.0 cf Stone x 35.0% Voids = 562.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,397.7 cf = 0.032 af
Overall Storage Efficiency = 51.2%
Overall System Size = 40.00' x 13.00' x 5.25'

18 Chambers
101.1 cy Field
59.6 cy Stone



Pond INF-2: Inf. System #2 Galleys



Summary for Pond TNK: 8000gal. TANK

Inflow Area = 0.165 ac,100.00% Impervious, Inflow Depth = 2.87" for 2-Year event
Inflow = 0.51 cfs @ 12.07 hrs, Volume= 0.039 af
Outflow = 0.46 cfs @ 12.11 hrs, Volume= 0.022 af, Atten= 11%, Lag= 2.4 min
Primary = 0.46 cfs @ 12.11 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.10' @ 12.11 hrs Surf.Area= 0.003 ac Storage= 0.018 af

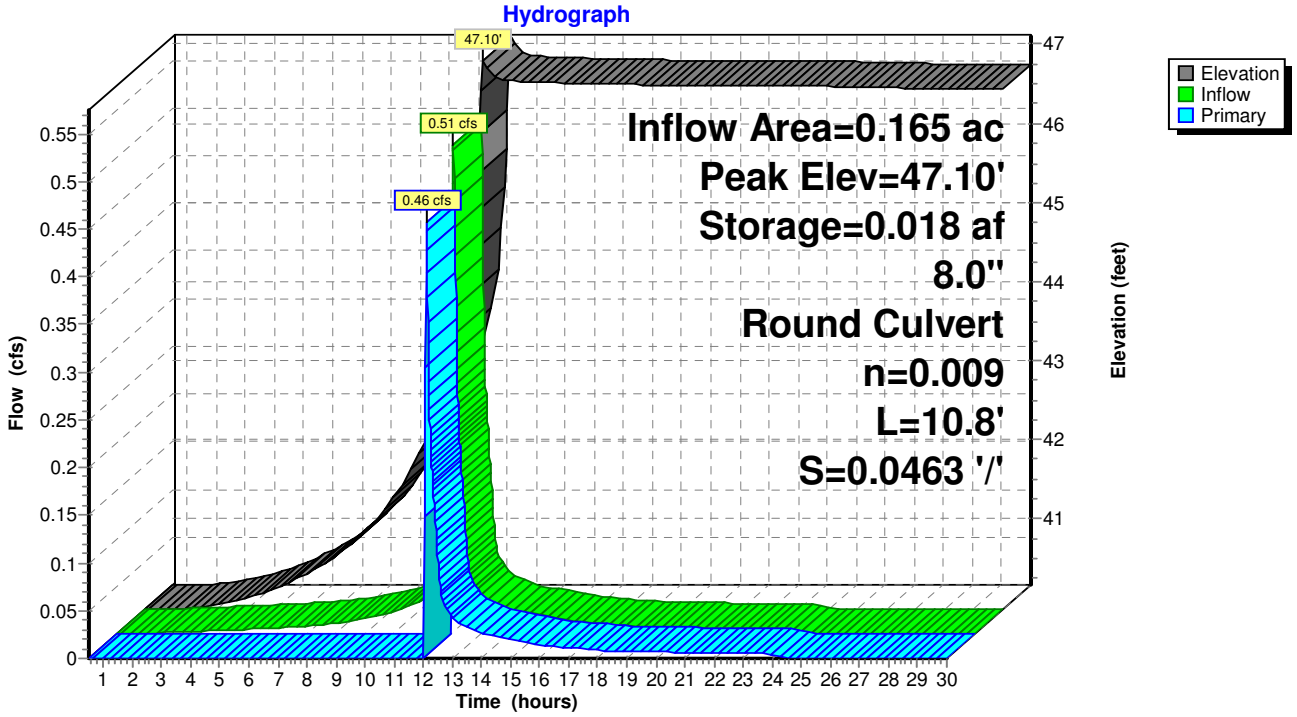
Plug-Flow detention time= 228.0 min calculated for 0.022 af (56% of inflow)
Center-of-Mass det. time= 113.8 min (869.9 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	0.028 af	**7.00'W x 16.50'L x 10.66'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	46.75'	**8.0" Round 8"CPP** L= 10.8' Ke= 0.200 Inlet / Outlet Invert= 46.75' / 46.25' S= 0.0463 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.46 cfs @ 12.11 hrs HW=47.10' TW=42.23' (Dynamic Tailwater)
↑—**1=8"CPP** (Inlet Controls 0.46 cfs @ 2.50 fps)

Pond TNK: 8000gal. TANK



Summary for Subcatchment AD1: Area Drain-1

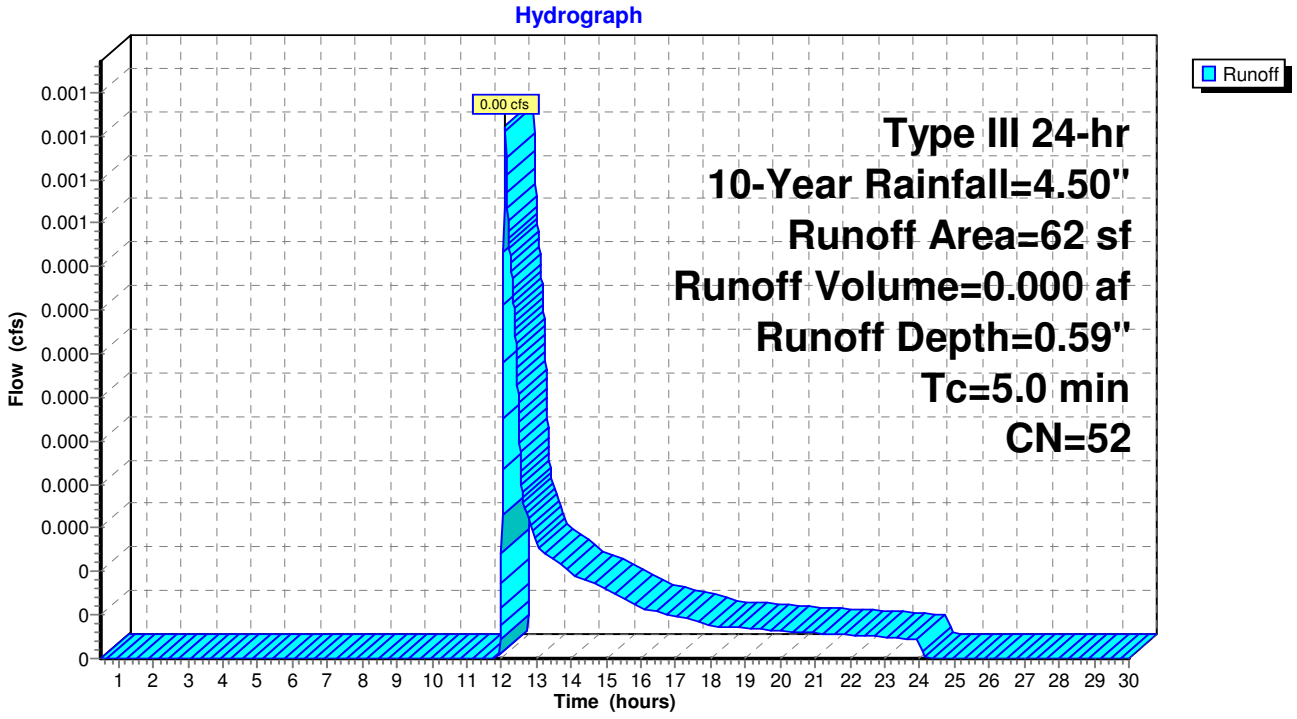
Runoff = 0.00 cfs @ 12.11 hrs, Volume= 0.000 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	14	98	Ret. Wall
	48	39	>75% Grass cover, Good, HSG A
	62	52	Weighted Average
	48		77.42% Pervious Area
	14		22.58% Impervious Area

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

Subcatchment AD1: Area Drain-1



Summary for Subcatchment AD2: Area Drain-2

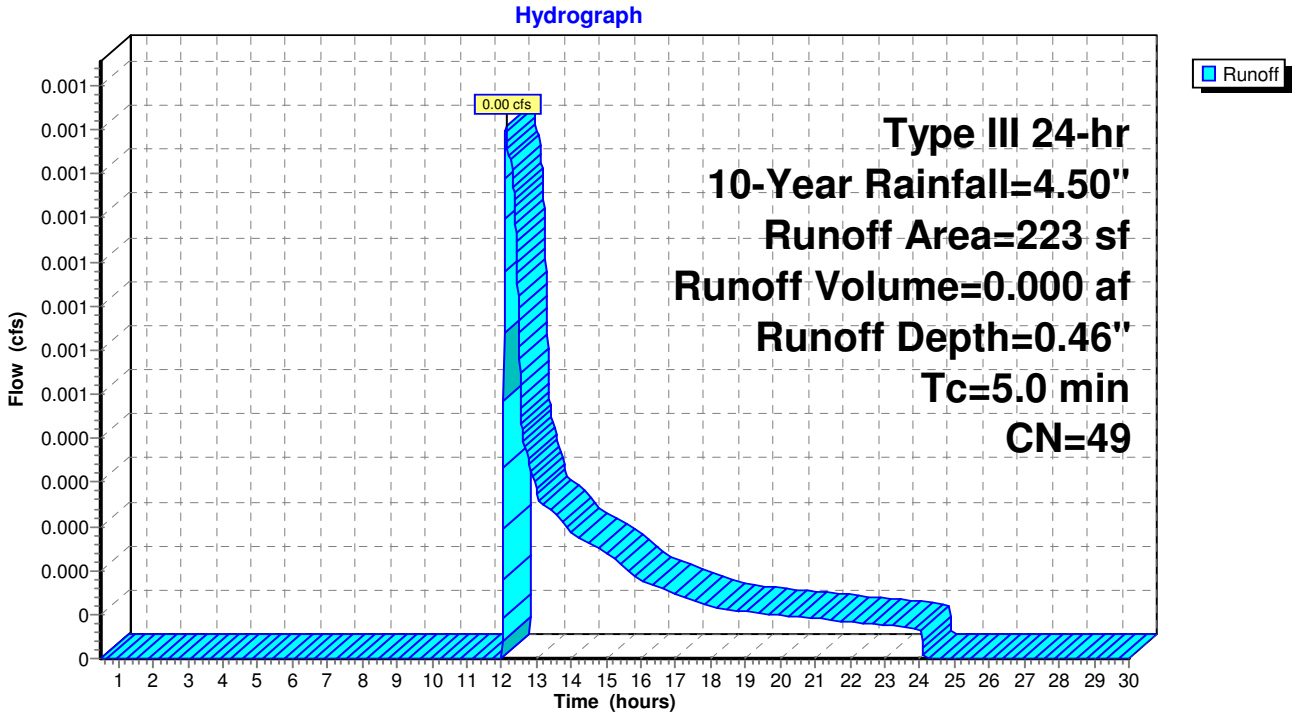
Runoff = 0.00 cfs @ 12.13 hrs, Volume= 0.000 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	36	98	Ret. Wall
	187	39	>75% Grass cover, Good, HSG A
	223	49	Weighted Average
	187		83.86% Pervious Area
	36		16.14% Impervious Area

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

Subcatchment AD2: Area Drain-2



Summary for Subcatchment AD3: Area Drain-3

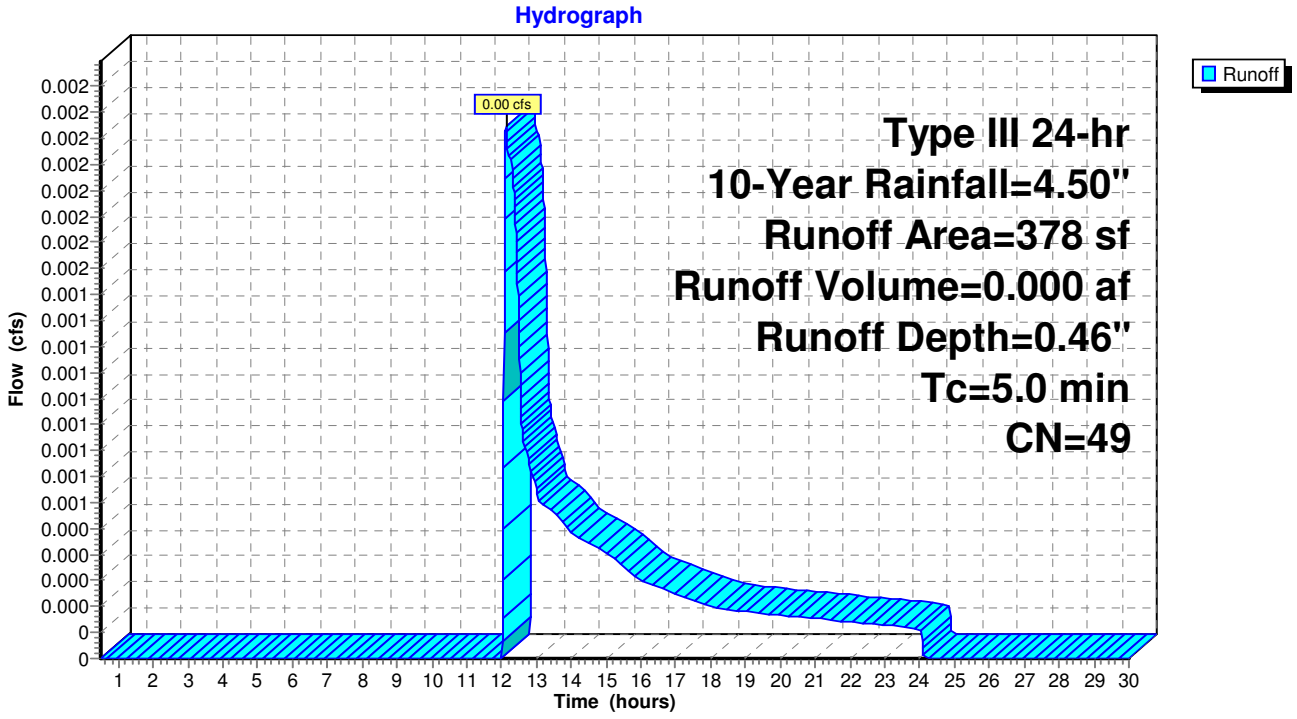
Runoff = 0.00 cfs @ 12.13 hrs, Volume= 0.000 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	67	98	Ret. Wall
	311	39	>75% Grass cover, Good, HSG A
	378	49	Weighted Average
	311		82.28% Pervious Area
	67		17.72% Impervious Area

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

Subcatchment AD3: Area Drain-3



Summary for Subcatchment E1: Adams Street (Northeast)

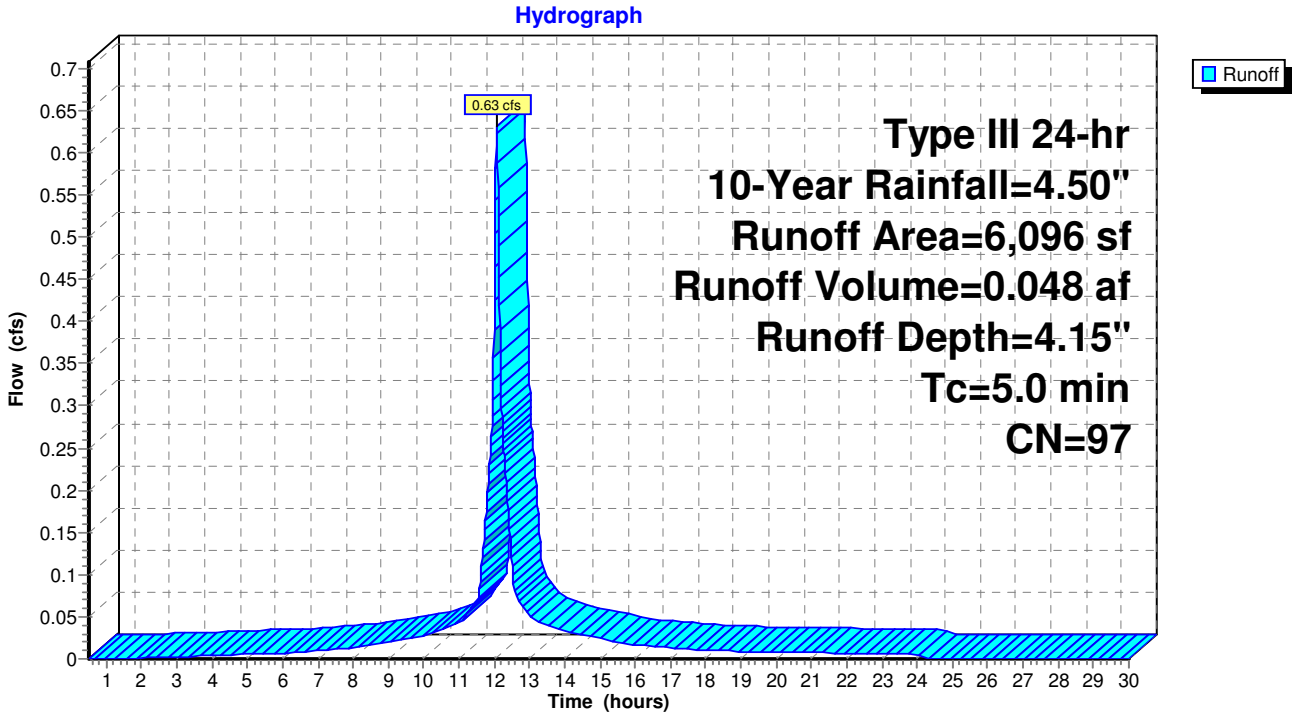
Runoff = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	581	98	Ex. Concrete Garage Roof (Portion)
*	2,760	98	Ex. Bldg. Roof
*	1,976	98	Paved Driveway (Portion)
*	571	98	Walks
*	71	98	Conc. pads
*	22	98	Ret. Wall
	115	39	>75% Grass cover, Good, HSG A
	6,096	97	Weighted Average
	115		1.89% Pervious Area
	5,981		98.11% Impervious Area

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

Subcatchment E1: Adams Street (Northeast)



Summary for Subcatchment E2: Northwest Abutter

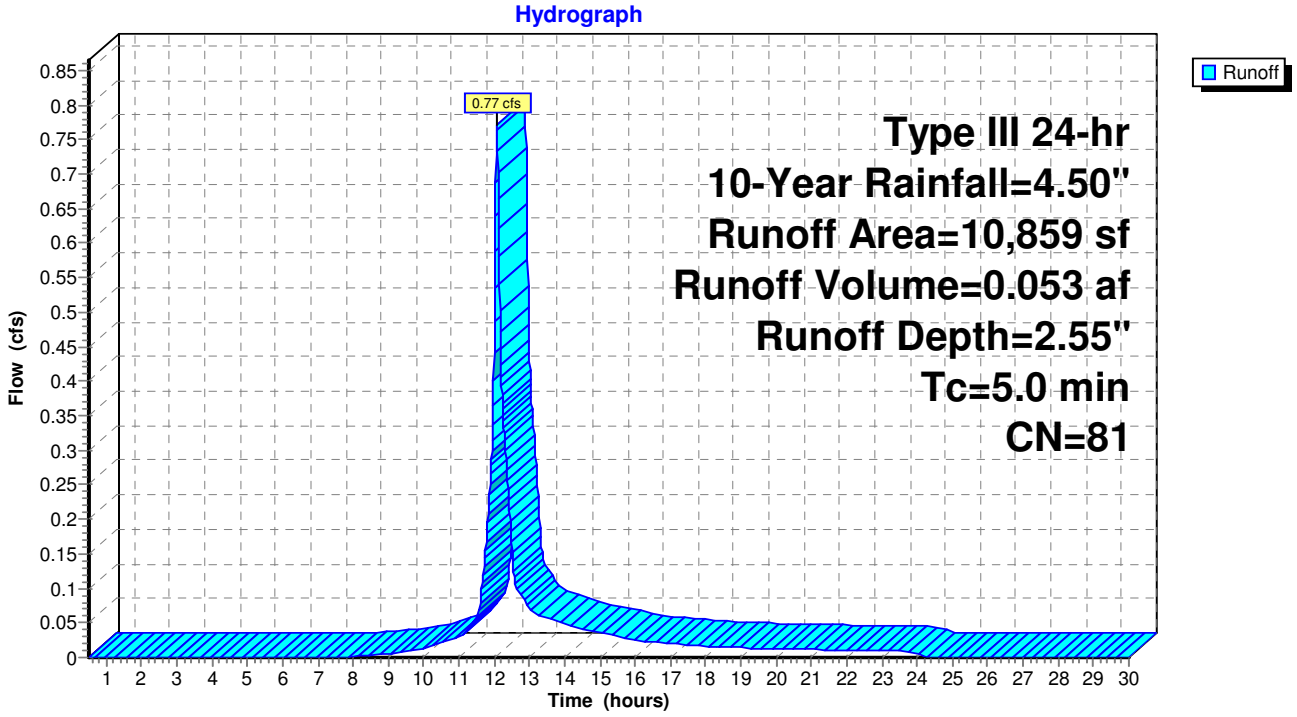
Runoff = 0.77 cfs @ 12.07 hrs, Volume= 0.053 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	1,717	98	Ex. Concrete Garage Roof (Portion)
*	187	98	Ex. Wood Garage Roof (Portion)
*	5,671	98	Paved Driveway (Portion)
*	107	98	Conc./brick pads
*	48	98	Ret. Wall
	3,129	39	>75% Grass cover, Good, HSG A
	10,859	81	Weighted Average
	3,129		28.81% Pervious Area
	7,730		71.19% Impervious Area

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

Subcatchment E2: Northwest Abutter



Summary for Subcatchment E3: Southwest Abutter

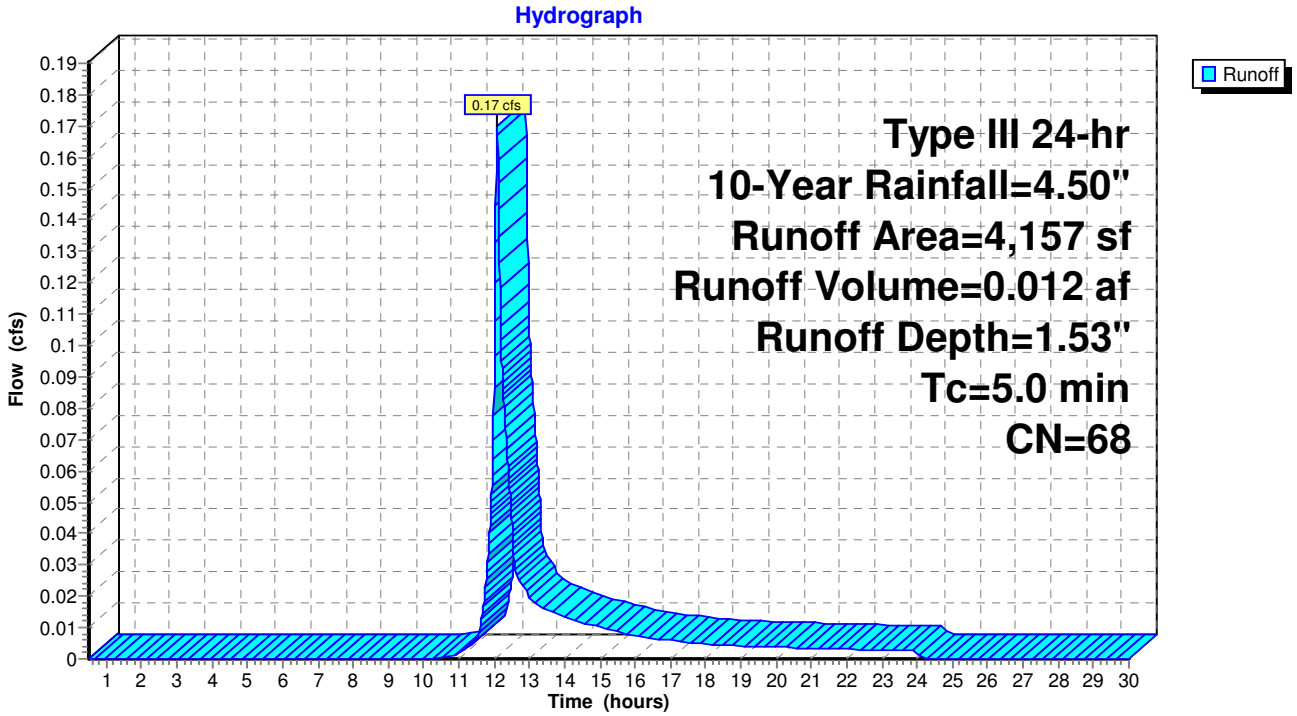
Runoff = 0.17 cfs @ 12.08 hrs, Volume= 0.012 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	887	98	Ex. House Roof
*	63	98	Ex. Wood Garage Roof (Portion)
*	621	98	Paved Driveway
*	354	98	Landing/Steps/Walks
*	63	98	Ret. Wall
*	34	98	Bulkhead
	2,135	39	>75% Grass cover, Good, HSG A
	4,157	68	Weighted Average
	2,135		51.36% Pervious Area
	2,022		48.64% Impervious Area

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

Subcatchment E3: Southwest Abutter



Summary for Subcatchment P1: Adams Street (Northeast)

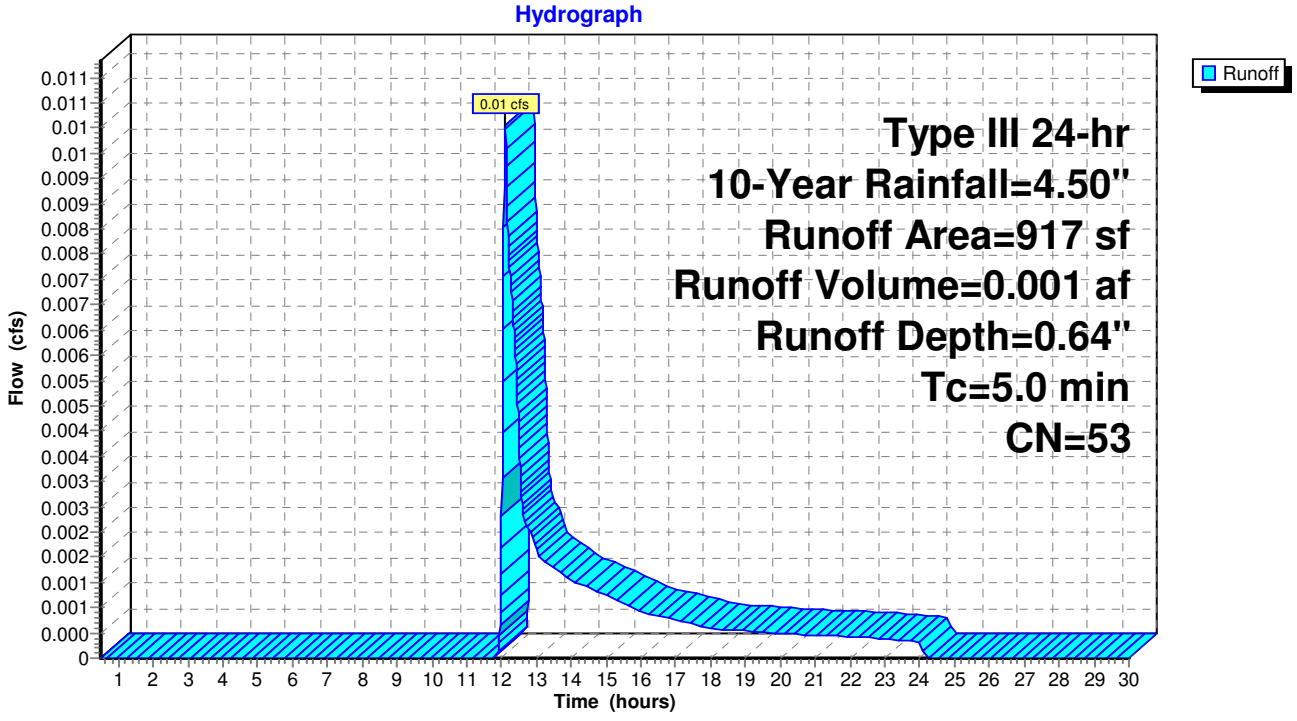
Runoff = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	154	98	Walks/Conc. Pads
*	59	98	Ret. Wall
	704	39	>75% Grass cover, Good, HSG A
	917	53	Weighted Average
	704		76.77% Pervious Area
	213		23.23% Impervious Area

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

Subcatchment P1: Adams Street (Northeast)



Summary for Subcatchment PD1: Driveway/Parking-1

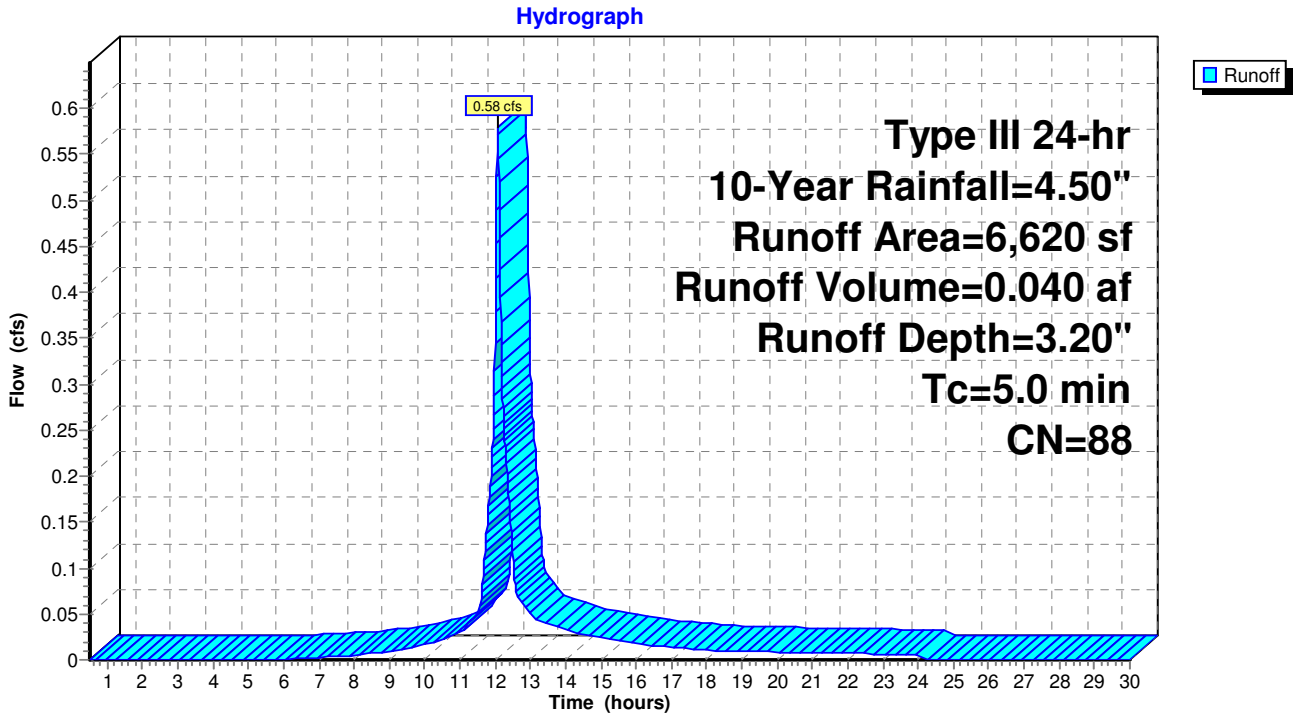
Runoff = 0.58 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	5,232	98	Driveway/Parking Lot
*	22	98	Curbing
*	168	98	Ret. Walls
*	50	98	Walks
	1,148	39	>75% Grass cover, Good, HSG A
	6,620	88	Weighted Average
	1,148		17.34% Pervious Area
	5,472		82.66% Impervious Area

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

Subcatchment PD1: Driveway/Parking-1



Summary for Subcatchment PD2: Driveway/Parking-2

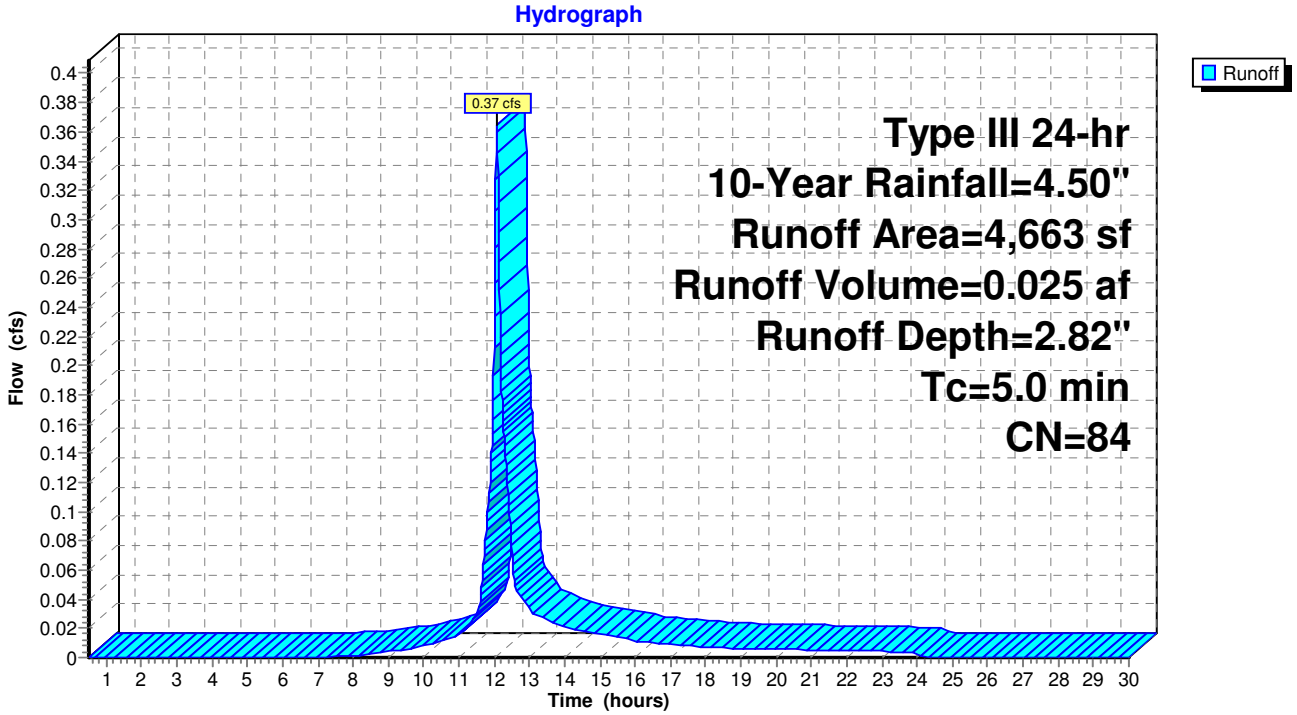
Runoff = 0.37 cfs @ 12.07 hrs, Volume= 0.025 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	3,066	98	Driveway/Parking Lot
*	82	98	Curbing
*	417	98	Walks
	1,098	39	>75% Grass cover, Good, HSG A
	4,663	84	Weighted Average
	1,098		23.55% Pervious Area
	3,565		76.45% Impervious Area

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

Subcatchment PD2: Driveway/Parking-2



Summary for Subcatchment PD3: Driveway/Parking-3

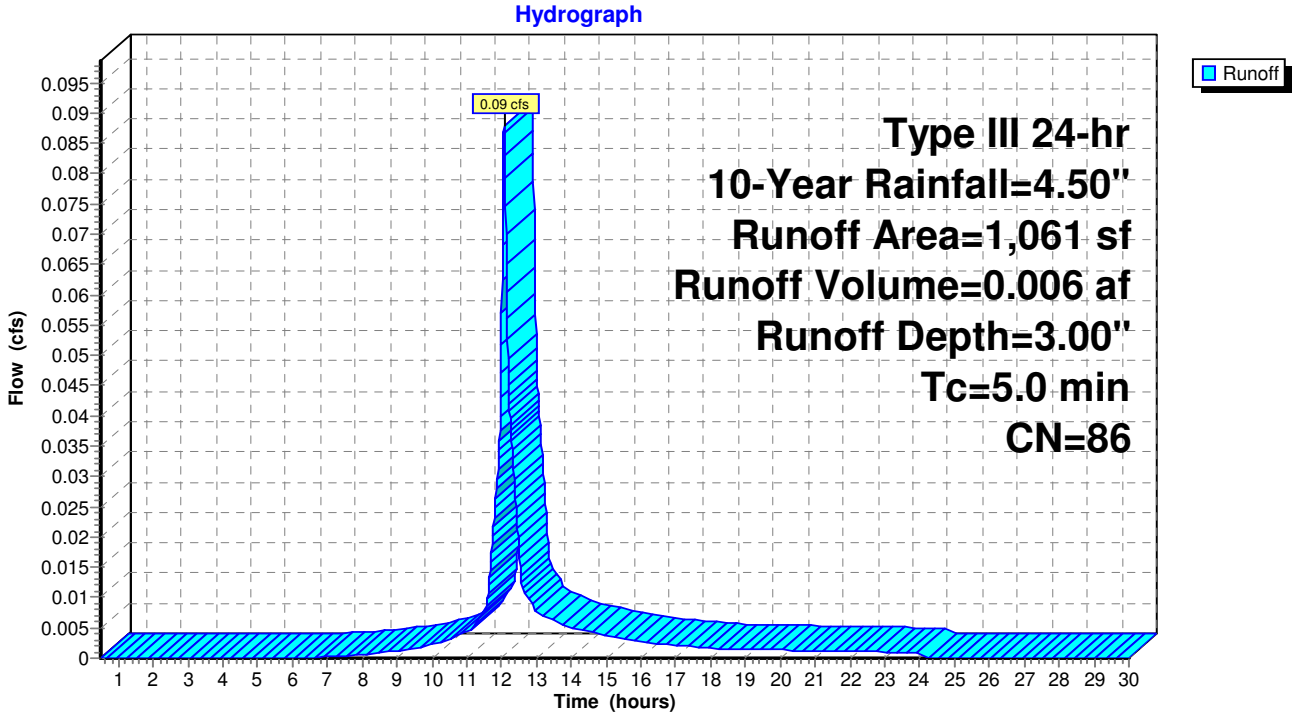
Runoff = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	831	98	Driveway
*	21	98	Curbing
	209	39	>75% Grass cover, Good, HSG A
	1,061	86	Weighted Average
	209		19.70% Pervious Area
	852		80.30% Impervious Area

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

Subcatchment PD3: Driveway/Parking-3



Summary for Subcatchment PR1: Roof-1

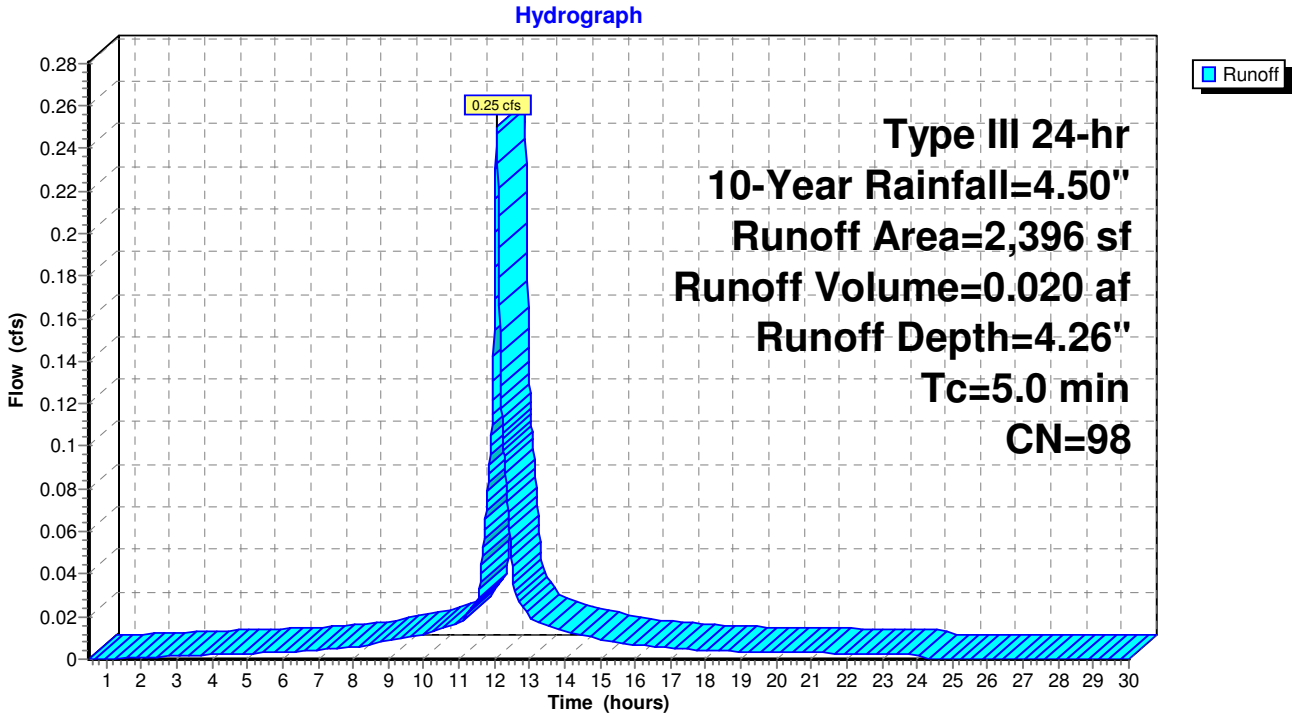
Runoff = 0.25 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	2,396	98	Prop. Roof-1
	2,396		100.00% Impervious Area

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

Subcatchment PR1: Roof-1



Summary for Subcatchment PR2: Roof-2

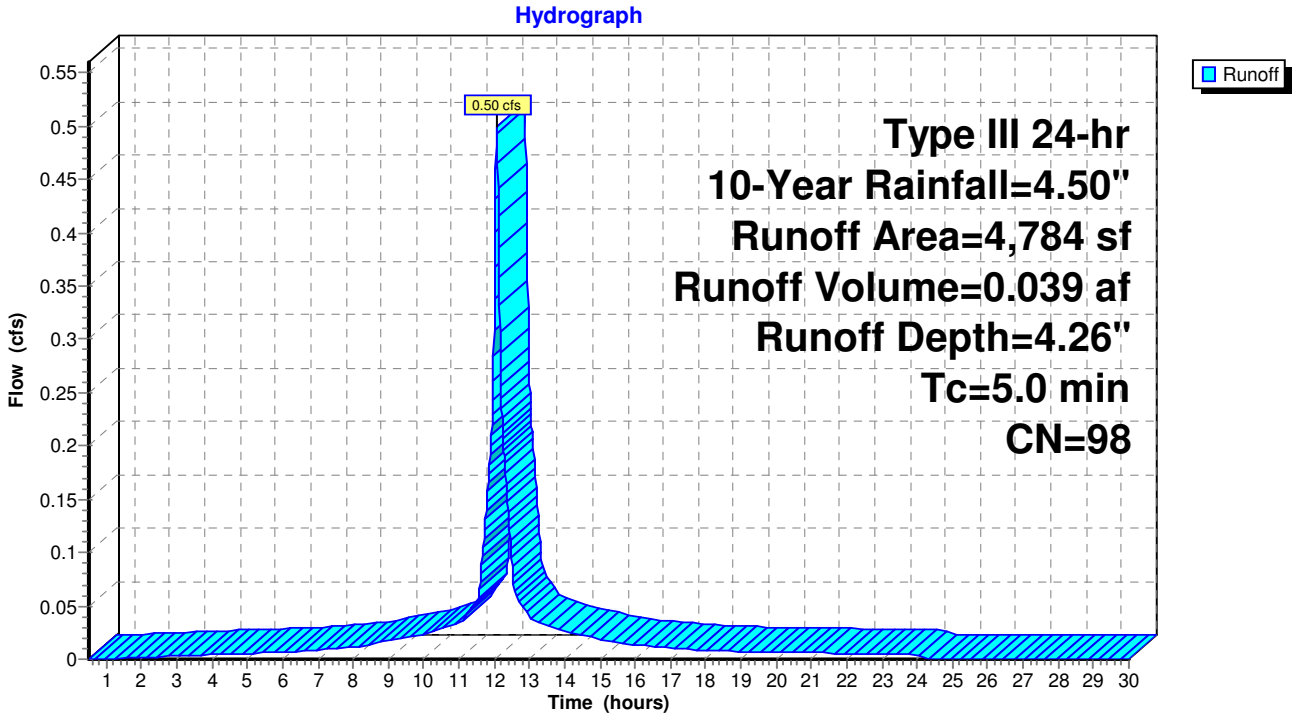
Runoff = 0.50 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	4,784	98	Prop. Roof-2
	4,784		100.00% Impervious Area

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

Subcatchment PR2: Roof-2



Summary for Pond CB1: Catch Basin-1

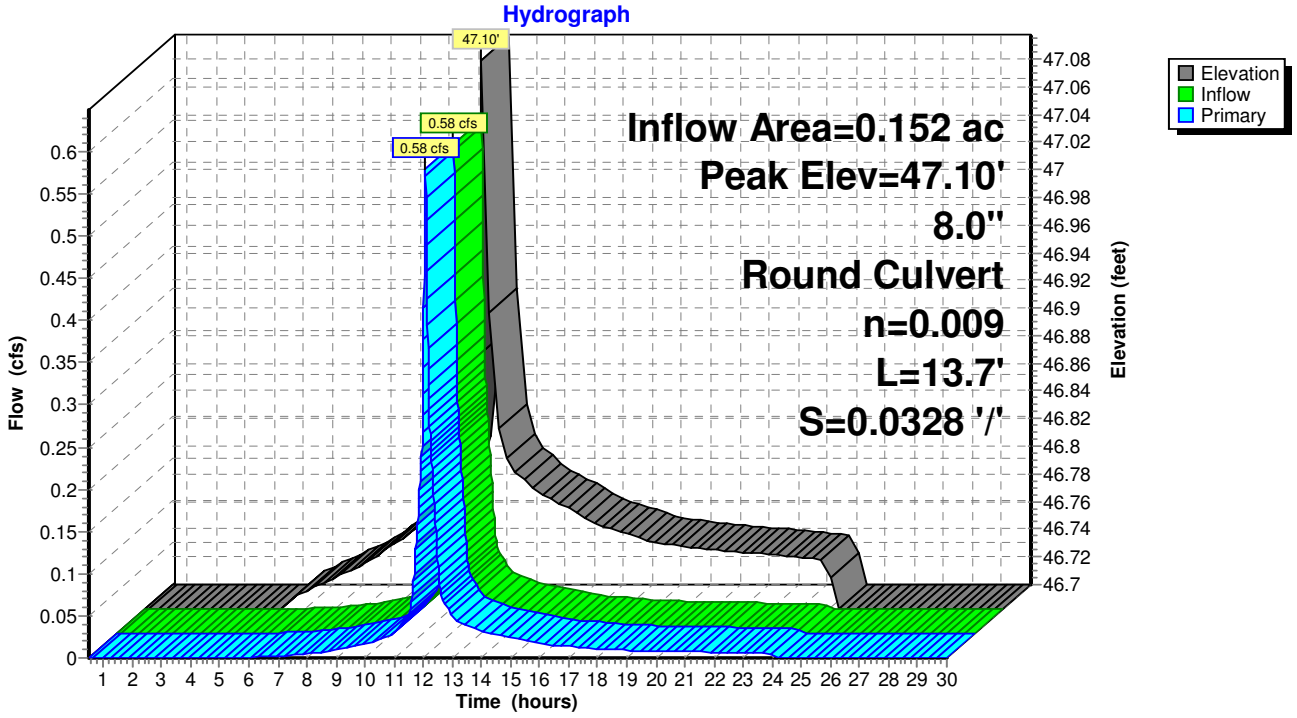
Inflow Area = 0.152 ac, 82.66% Impervious, Inflow Depth = 3.20" for 10-Year event
Inflow = 0.58 cfs @ 12.07 hrs, Volume= 0.040 af
Outflow = 0.58 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Primary = 0.58 cfs @ 12.07 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.10' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.70'	**8.0" Round 8"CCP** L= 13.7' Ke= 0.200 Inlet / Outlet Invert= 46.70' / 46.25' S= 0.0328 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.58 cfs @ 12.07 hrs HW=47.10' TW=43.04' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.58 cfs @ 2.68 fps)

Pond CB1: Catch Basin-1



Summary for Pond CB2: Catch Basin-2

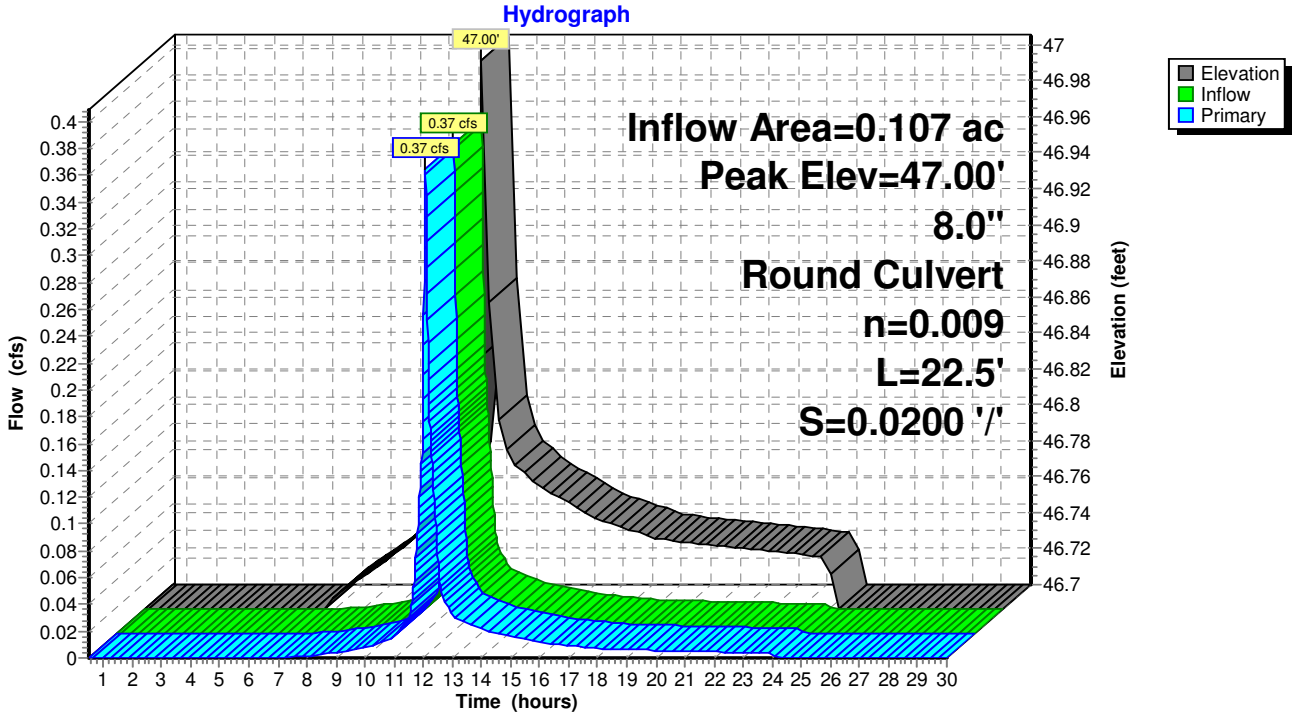
Inflow Area = 0.107 ac, 76.45% Impervious, Inflow Depth = 2.82" for 10-Year event
Inflow = 0.37 cfs @ 12.07 hrs, Volume= 0.025 af
Outflow = 0.37 cfs @ 12.07 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.07 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.00' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.70'	**8.0" Round 8"CCP** L= 22.5' Ke= 0.200 Inlet / Outlet Invert= 46.70' / 46.25' S= 0.0200 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.36 cfs @ 12.07 hrs HW=47.00' TW=42.83' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.36 cfs @ 2.35 fps)

Pond CB2: Catch Basin-2



Summary for Pond CB3: Catch Basin-3

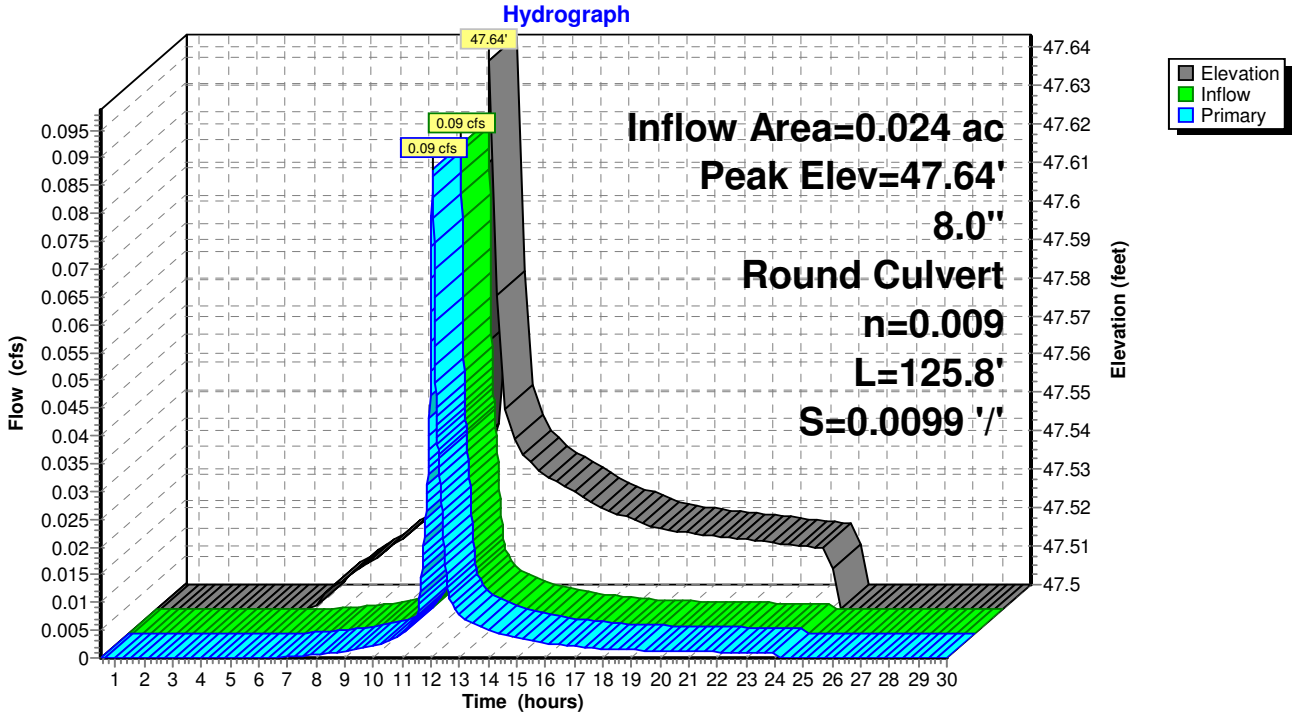
Inflow Area = 0.024 ac, 80.30% Impervious, Inflow Depth = 3.00" for 10-Year event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af
Outflow = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
Primary = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.64' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**8.0" Round 8"CCP** L= 125.8' Ke= 0.200 Inlet / Outlet Invert= 47.50' / 46.25' S= 0.0099 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.09 cfs @ 12.07 hrs HW=47.64' TW=42.82' (Dynamic Tailwater)
└**1=8"CCP** (Inlet Controls 0.09 cfs @ 1.61 fps)

Pond CB3: Catch Basin-3



Summary for Pond INF-1: Inf. System #1 Galleys

Inflow Area = 0.331 ac, 88.57% Impervious, Inflow Depth = 2.98" for 10-Year event
Inflow = 1.32 cfs @ 12.08 hrs, Volume= 0.082 af
Outflow = 0.21 cfs @ 11.82 hrs, Volume= 0.082 af, Atten= 84%, Lag= 0.0 min
Discarded = 0.21 cfs @ 11.82 hrs, Volume= 0.082 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 43.81' @ 12.56 hrs Surf.Area= 0.029 ac Storage= 0.026 af

Plug-Flow detention time= 36.7 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 36.7 min (855.6 - 818.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	0.026 af	**26.50'W x 48.00'L x 5.25'H Field A** 0.153 af Overall - 0.079 af Embedded = 0.075 af x 35.0% Voids
#2A	43.00'	0.059 af	**Concrete Galley 4x4x4.25** x 55 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 5 Rows of 11 Chambers
		0.085 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.21 cfs @ 11.82 hrs HW=42.06' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Pond INF-1: Inf. System #1 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x4.25 (Concrete Galley, Shea LE-EGH, LE-CGH or equivalent)
Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf
Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf

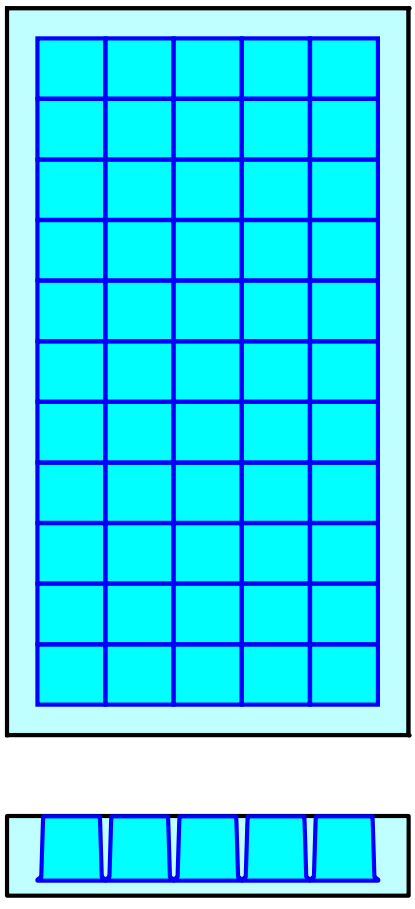
11 Chambers/Row x 4.00' Long = 44.00' Row Length +24.0" End Stone x 2 = 48.00' Base Length
5 Rows x 54.0" Wide + 24.0" Side Stone x 2 = 26.50' Base Width
12.0" Base + 51.0" Chamber Height = 5.25' Field Height

55 Chambers x 46.4 cf = 2,550.9 cf Chamber Storage
55 Chambers x 62.3 cf = 3,428.2 cf Displacement

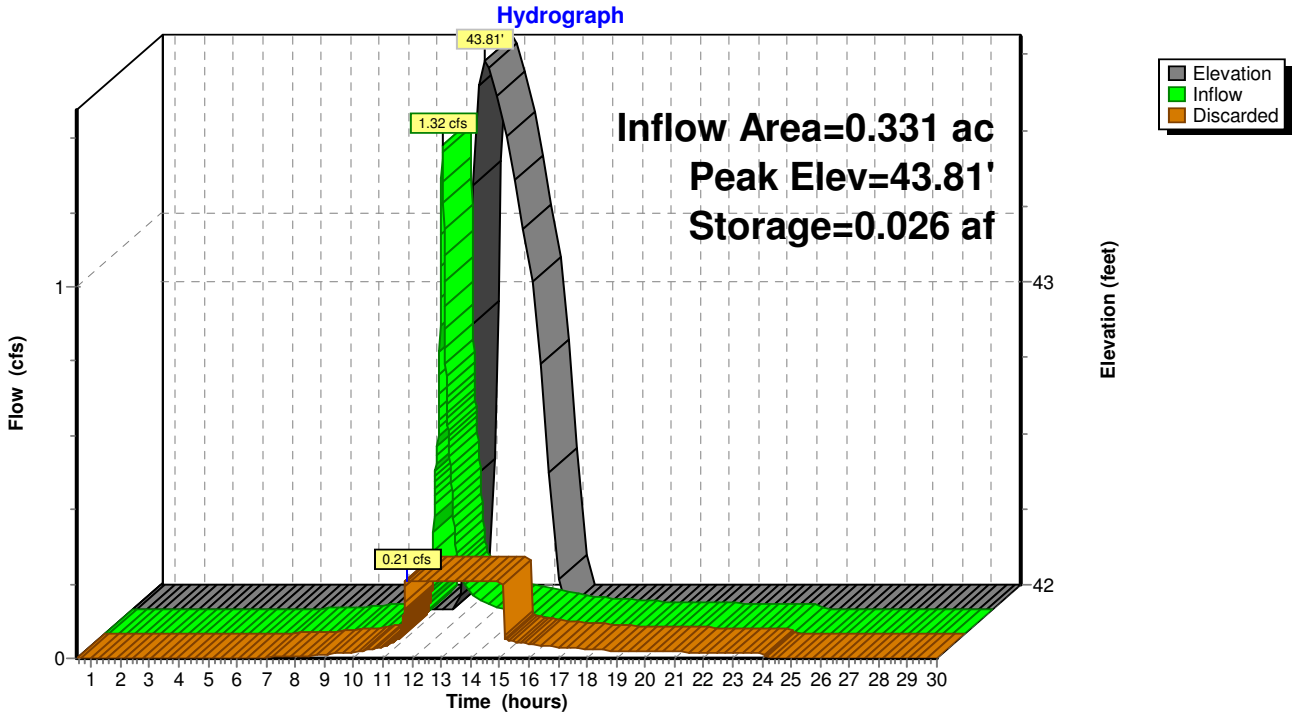
6,678.0 cf Field - 3,428.2 cf Chambers = 3,249.8 cf Stone x 35.0% Voids = 1,137.4 cf Stone Storage

Chamber Storage + Stone Storage = 3,688.4 cf = 0.085 af
Overall Storage Efficiency = 55.2%
Overall System Size = 48.00' x 26.50' x 5.25'

55 Chambers
247.3 cy Field
120.4 cy Stone



Pond INF-1: Inf. System #1 Galleys



Summary for Pond INF-2: Inf. System #2 Galleys

Inflow Area = 0.133 ac, 76.58% Impervious, Inflow Depth = 2.83" for 10-Year event
Inflow = 0.45 cfs @ 12.07 hrs, Volume= 0.031 af
Outflow = 0.08 cfs @ 11.82 hrs, Volume= 0.031 af, Atten= 81%, Lag= 0.0 min
Discarded = 0.08 cfs @ 11.82 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 43.54' @ 12.52 hrs Surf.Area= 0.012 ac Storage= 0.008 af

Plug-Flow detention time= 23.9 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 23.9 min (836.8 - 812.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	0.013 af	**13.00'W x 40.00'L x 5.25'H Field A** 0.063 af Overall - 0.026 af Embedded = 0.037 af x 35.0% Voids
#2A	43.00'	0.019 af	**Concrete Galley 4x4x4.25** x 18 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 2 Rows of 9 Chambers
		0.032 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 11.82 hrs HW=42.06' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond INF-2: Inf. System #2 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x4.25 (Concrete Galley, Shea LE-EGH, LE-CGH or equivalent)
Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf
Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf

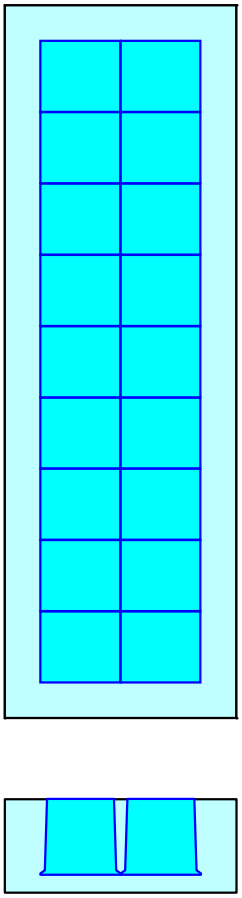
9 Chambers/Row x 4.00' Long = 36.00' Row Length +24.0" End Stone x 2 = 40.00' Base Length
2 Rows x 54.0" Wide + 24.0" Side Stone x 2 = 13.00' Base Width
12.0" Base + 51.0" Chamber Height = 5.25' Field Height

18 Chambers x 46.4 cf = 834.9 cf Chamber Storage
18 Chambers x 62.3 cf = 1,122.0 cf Displacement

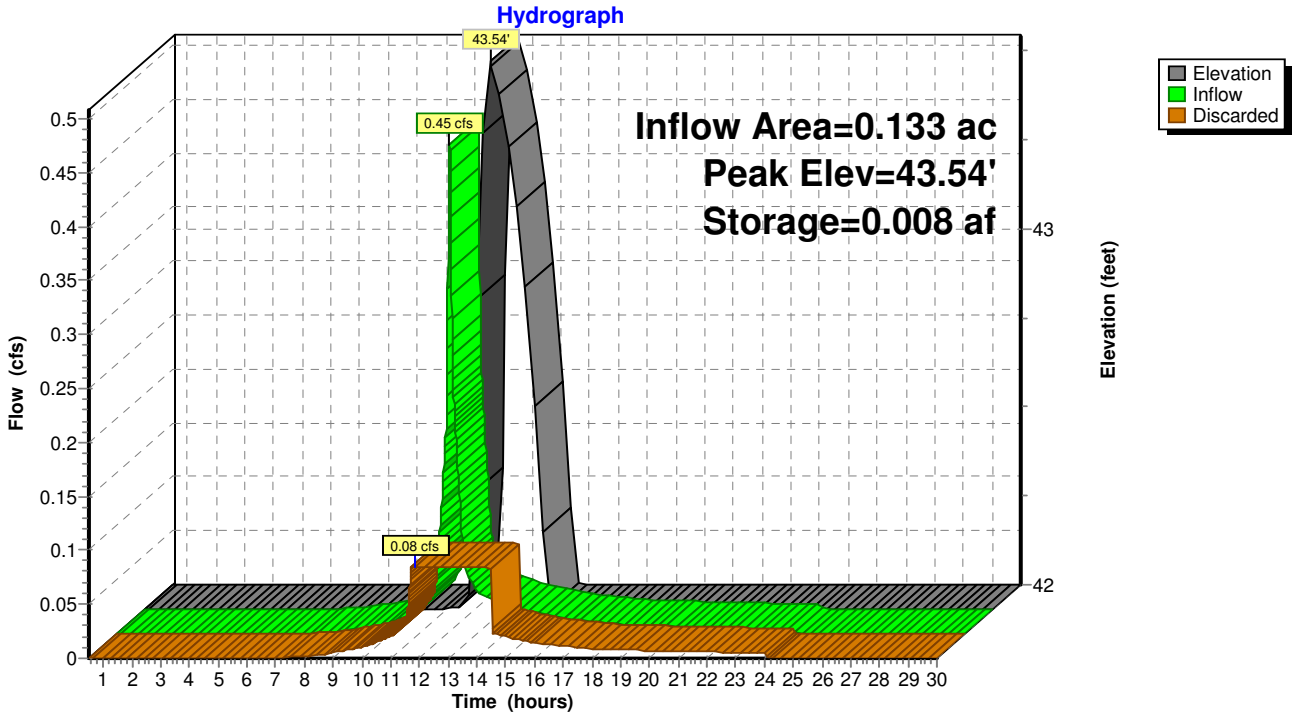
2,730.0 cf Field - 1,122.0 cf Chambers = 1,608.0 cf Stone x 35.0% Voids = 562.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,397.7 cf = 0.032 af
Overall Storage Efficiency = 51.2%
Overall System Size = 40.00' x 13.00' x 5.25'

18 Chambers
101.1 cy Field
59.6 cy Stone



Pond INF-2: Inf. System #2 Galleys



Summary for Pond TNK: 8000gal. TANK

Inflow Area = 0.165 ac,100.00% Impervious, Inflow Depth = 4.26" for 10-Year event
Inflow = 0.75 cfs @ 12.07 hrs, Volume= 0.059 af
Outflow = 0.74 cfs @ 12.08 hrs, Volume= 0.041 af, Atten= 1%, Lag= 0.7 min
Primary = 0.74 cfs @ 12.08 hrs, Volume= 0.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.21' @ 12.08 hrs Surf.Area= 0.003 ac Storage= 0.019 af

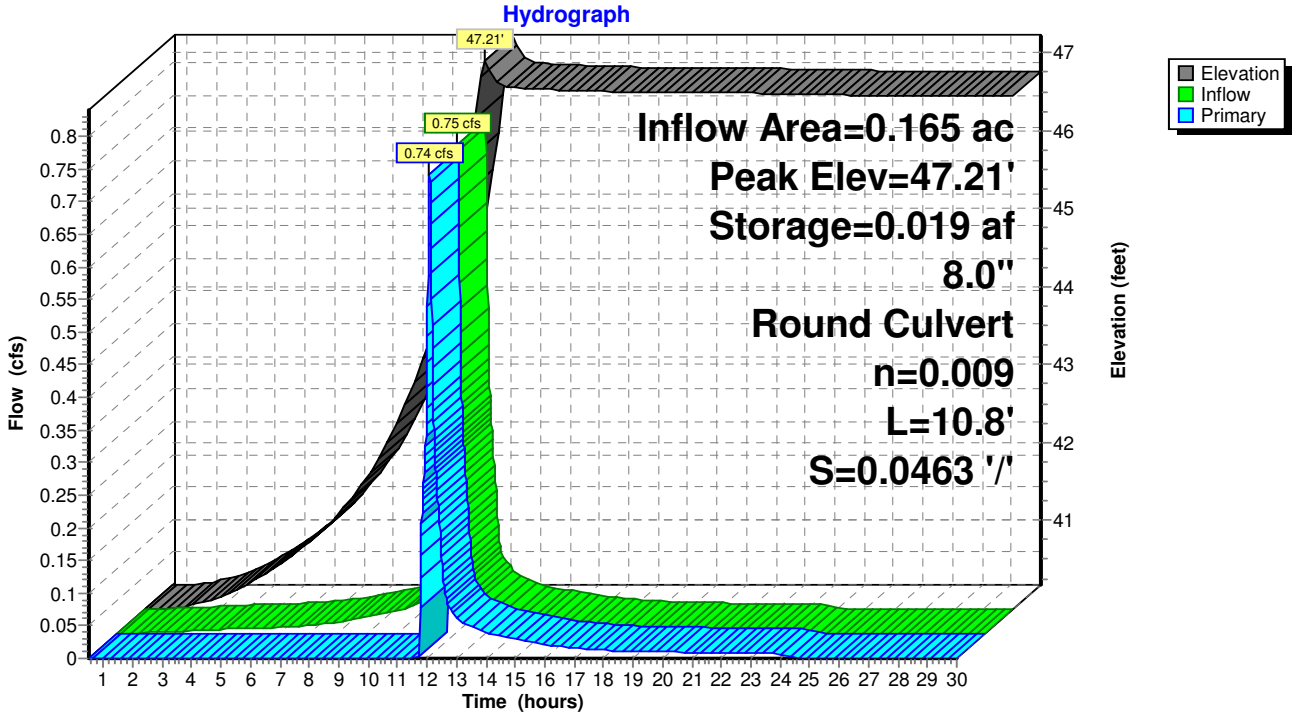
Plug-Flow detention time= 180.7 min calculated for 0.041 af (70% of inflow)
Center-of-Mass det. time= 86.3 min (835.2 - 748.9)

Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	0.028 af	**7.00'W x 16.50'L x 10.66'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	46.75'	**8.0" Round 8"CPP** L= 10.8' Ke= 0.200 Inlet / Outlet Invert= 46.75' / 46.25' S= 0.0463 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.74 cfs @ 12.08 hrs HW=47.21' TW=43.09' (Dynamic Tailwater)
↑—**1=8"CPP** (Inlet Controls 0.74 cfs @ 2.88 fps)

Pond TNK: 8000gal. TANK



Summary for Subcatchment AD1: Area Drain-1

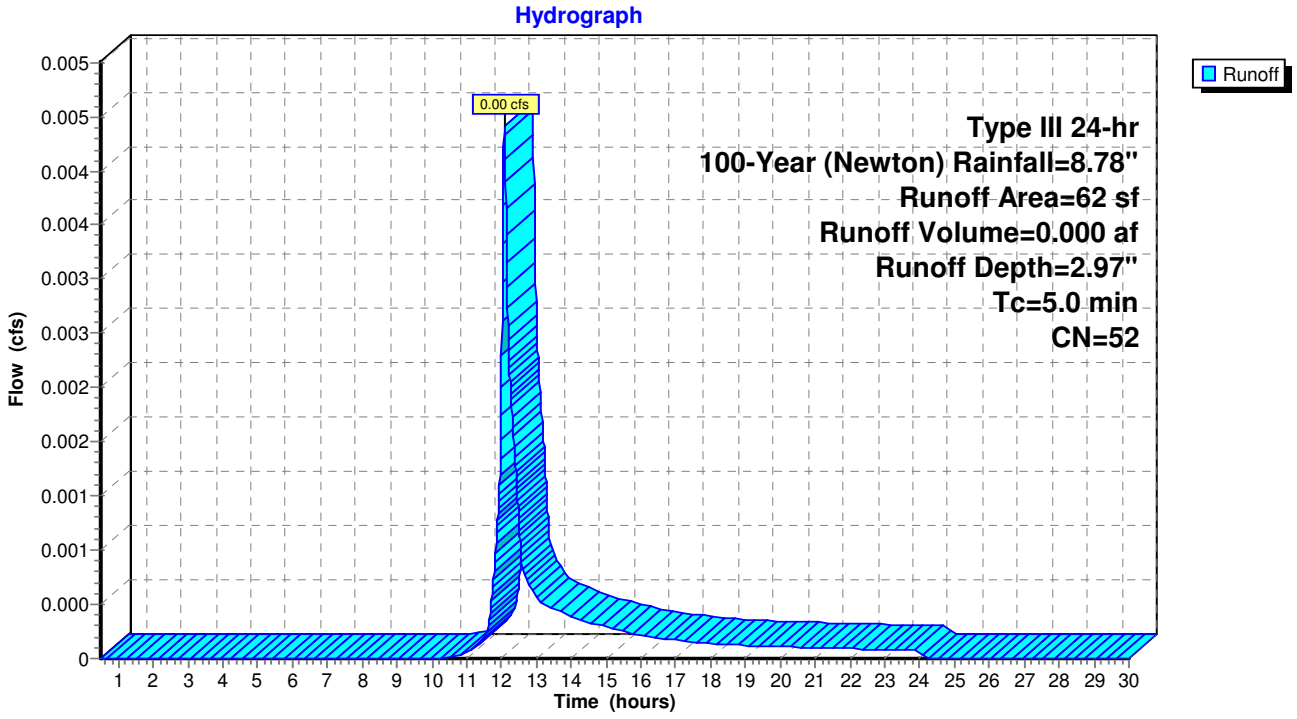
Runoff = 0.00 cfs @ 12.08 hrs, Volume= 0.000 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	14	98	Ret. Wall
	48	39	>75% Grass cover, Good, HSG A
	62	52	Weighted Average
	48		77.42% Pervious Area
	14		22.58% Impervious Area

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

Subcatchment AD1: Area Drain-1



Summary for Subcatchment AD2: Area Drain-2

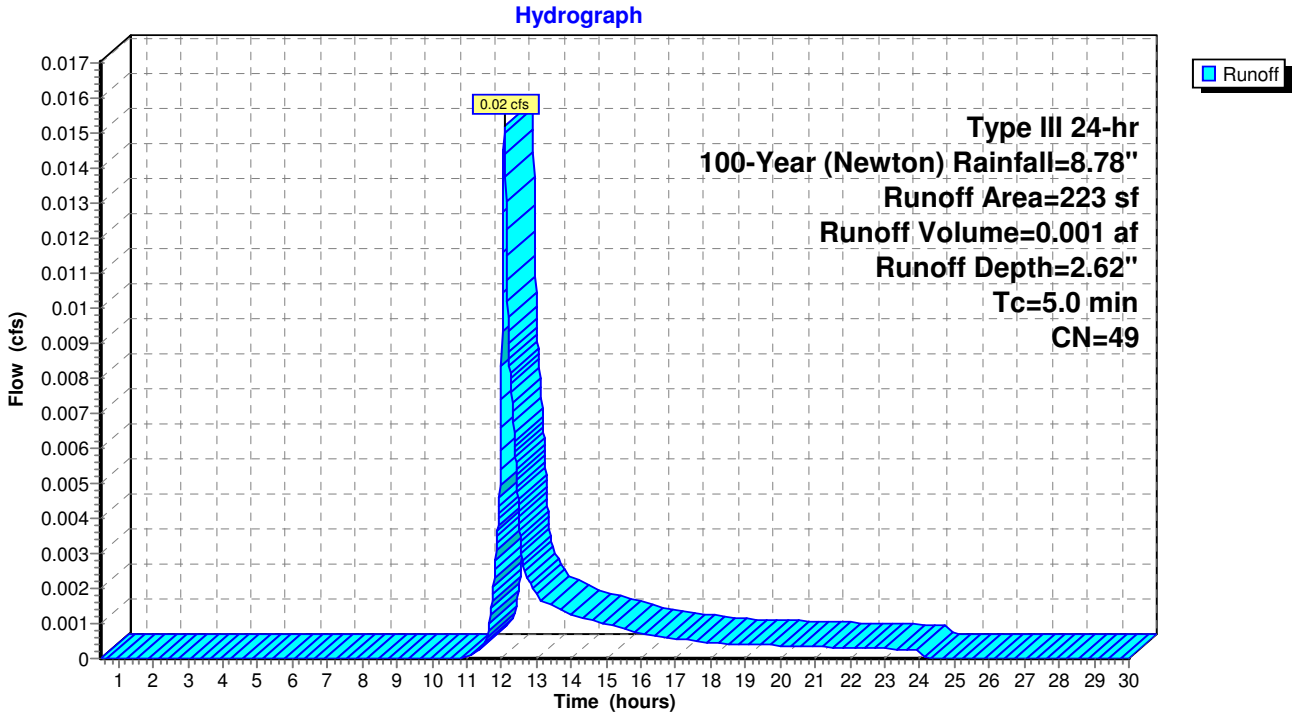
Runoff = 0.02 cfs @ 12.08 hrs, Volume= 0.001 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	36	98	Ret. Wall
	187	39	>75% Grass cover, Good, HSG A
	223	49	Weighted Average
	187		83.86% Pervious Area
	36		16.14% Impervious Area

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

Subcatchment AD2: Area Drain-2



Summary for Subcatchment AD3: Area Drain-3

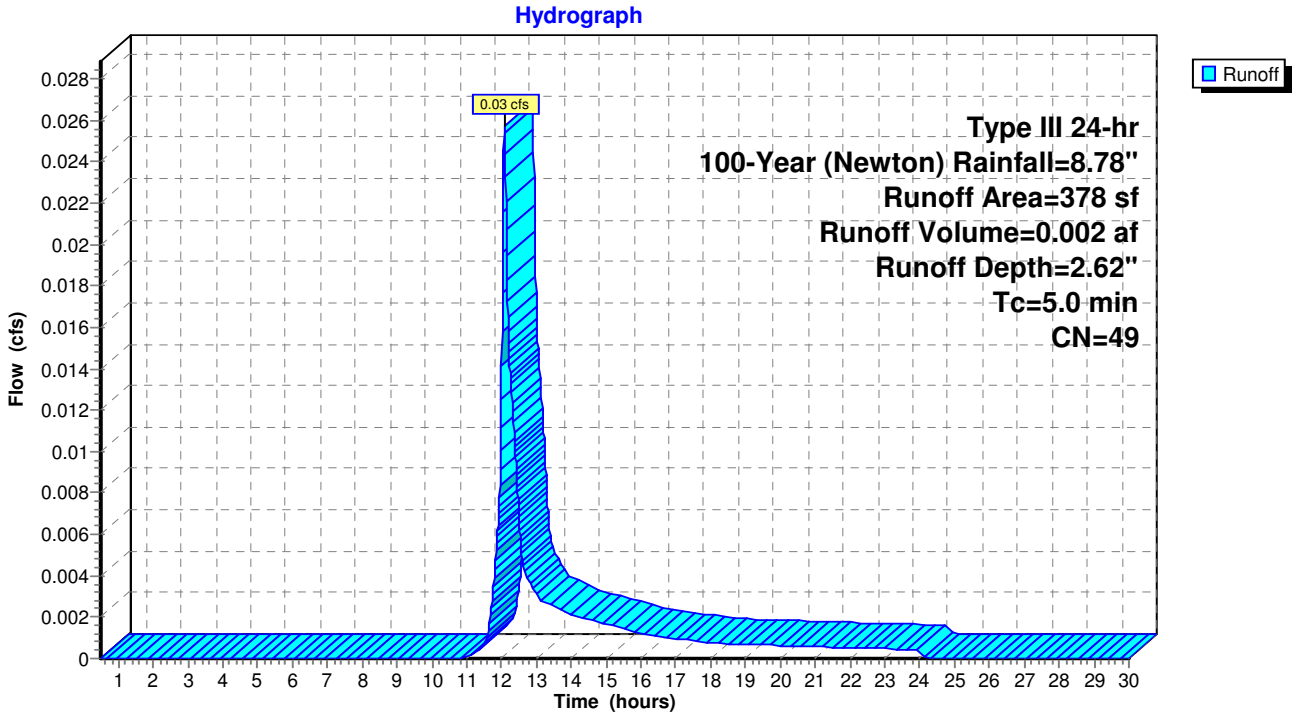
Runoff = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	67	98	Ret. Wall
	311	39	>75% Grass cover, Good, HSG A
	378	49	Weighted Average
	311		82.28% Pervious Area
	67		17.72% Impervious Area

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

Subcatchment AD3: Area Drain-3



Summary for Subcatchment E1: Adams Street (Northeast)

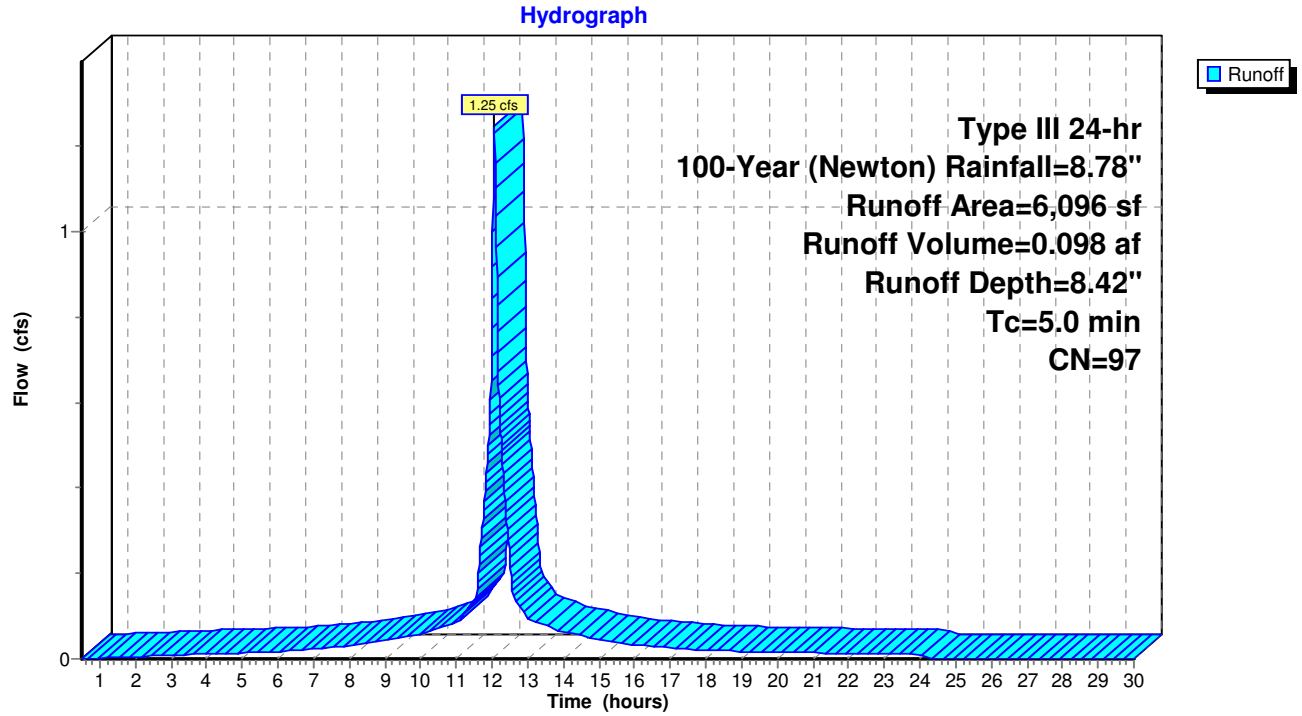
Runoff = 1.25 cfs @ 12.07 hrs, Volume= 0.098 af, Depth= 8.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	581	98	Ex. Concrete Garage Roof (Portion)
*	2,760	98	Ex. Bldg. Roof
*	1,976	98	Paved Driveway (Portion)
*	571	98	Walks
*	71	98	Conc. pads
*	22	98	Ret. Wall
	115	39	>75% Grass cover, Good, HSG A
	6,096	97	Weighted Average
	115		1.89% Pervious Area
	5,981		98.11% Impervious Area

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

Subcatchment E1: Adams Street (Northeast)



Summary for Subcatchment E2: Northwest Abutter

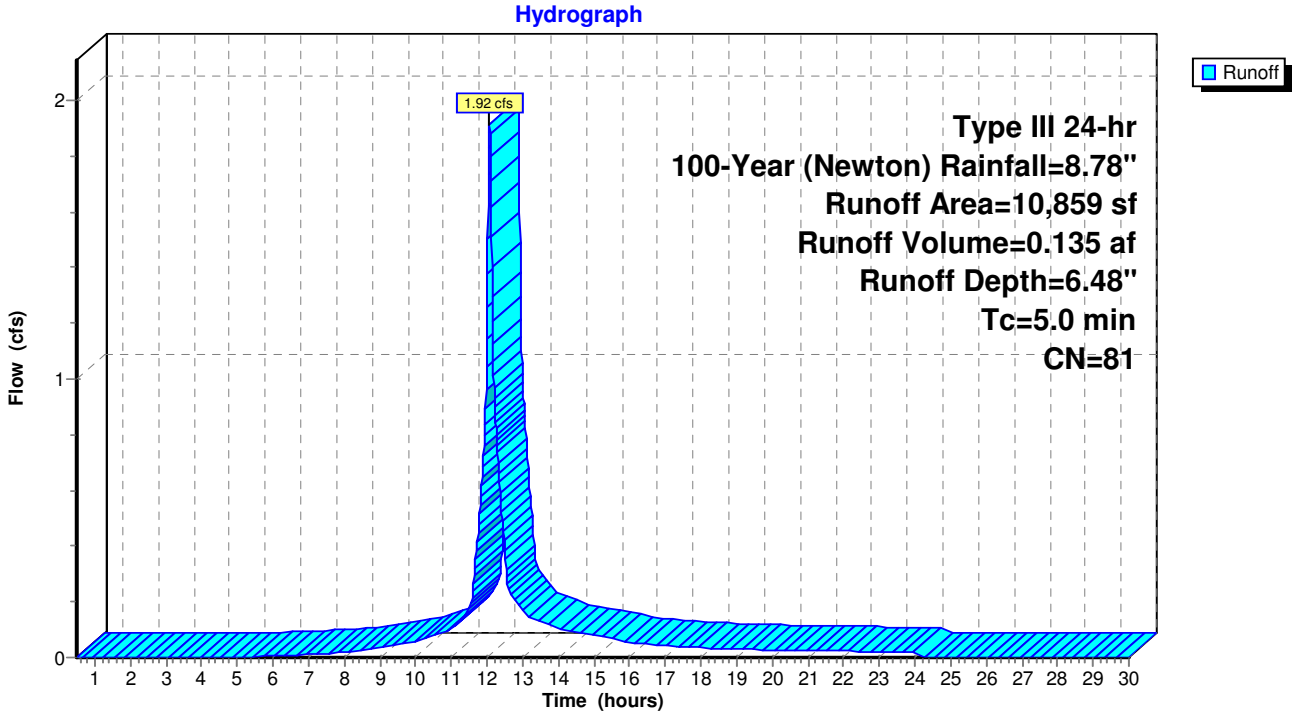
Runoff = 1.92 cfs @ 12.07 hrs, Volume= 0.135 af, Depth= 6.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	1,717	98	Ex. Concrete Garage Roof (Portion)
*	187	98	Ex. Wood Garage Roof (Portion)
*	5,671	98	Paved Driveway (Portion)
*	107	98	Conc./brick pads
*	48	98	Ret. Wall
	3,129	39	>75% Grass cover, Good, HSG A
	10,859	81	Weighted Average
	3,129		28.81% Pervious Area
	7,730		71.19% Impervious Area

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

Subcatchment E2: Northwest Abutter



Summary for Subcatchment E3: Southwest Abutter

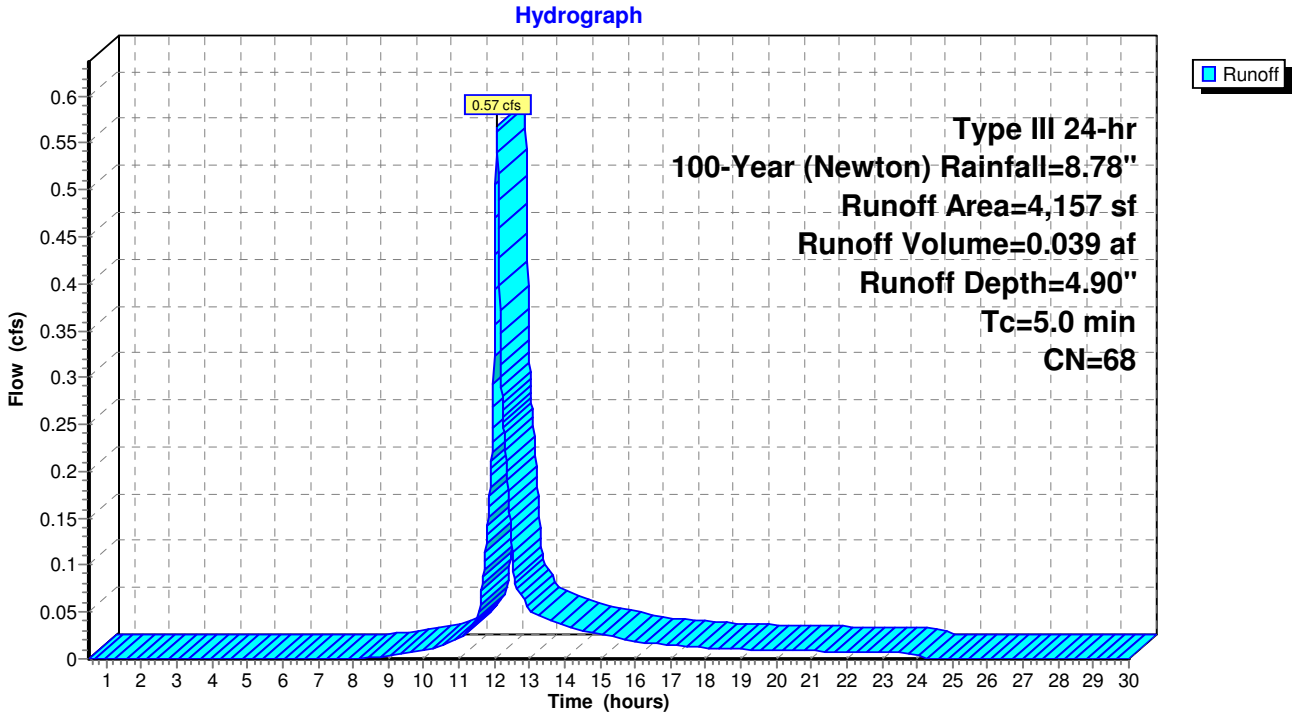
Runoff = 0.57 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	887	98	Ex. House Roof
*	63	98	Ex. Wood Garage Roof (Portion)
*	621	98	Paved Driveway
*	354	98	Landing/Steps/Walks
*	63	98	Ret. Wall
*	34	98	Bulkhead
	2,135	39	>75% Grass cover, Good, HSG A
	4,157	68	Weighted Average
	2,135		51.36% Pervious Area
	2,022		48.64% Impervious Area

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

Subcatchment E3: Southwest Abutter



Summary for Subcatchment P1: Adams Street (Northeast)

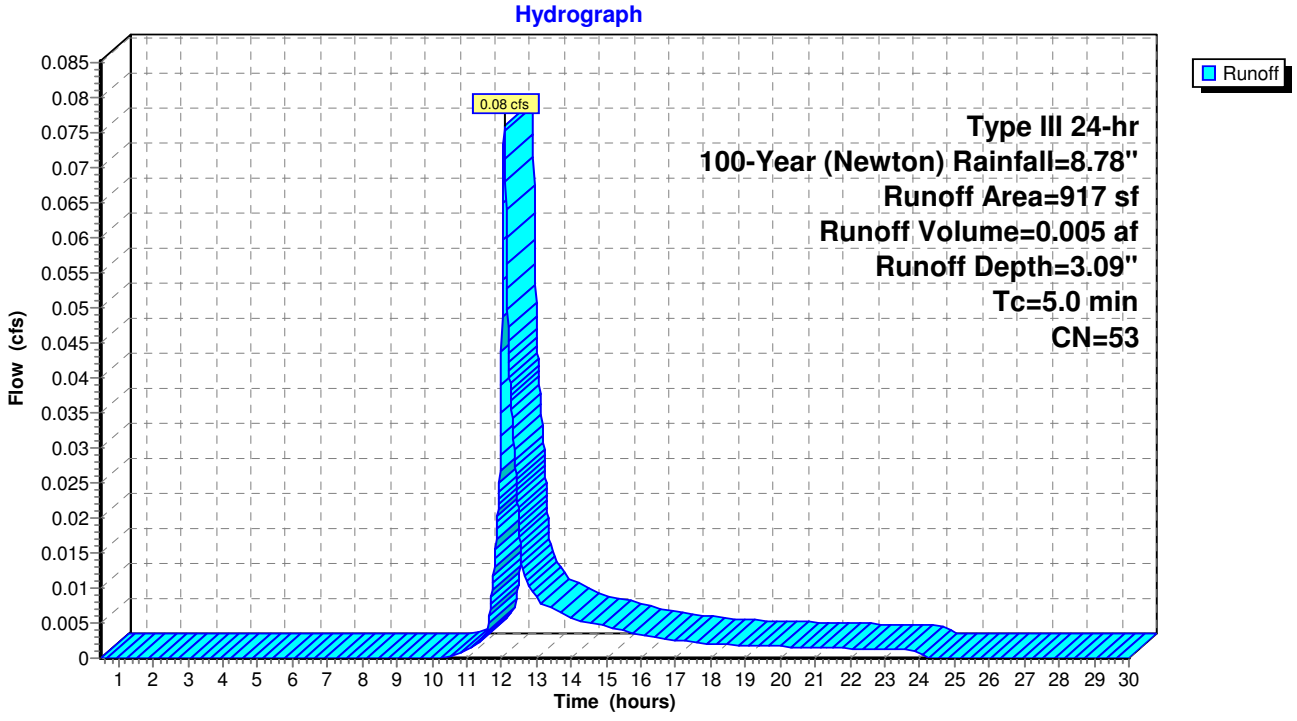
Runoff = 0.08 cfs @ 12.08 hrs, Volume= 0.005 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	154	98	Walks/Conc. Pads
*	59	98	Ret. Wall
	704	39	>75% Grass cover, Good, HSG A
	917	53	Weighted Average
	704		76.77% Pervious Area
	213		23.23% Impervious Area

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

Subcatchment P1: Adams Street (Northeast)



Summary for Subcatchment PD1: Driveway/Parking-1

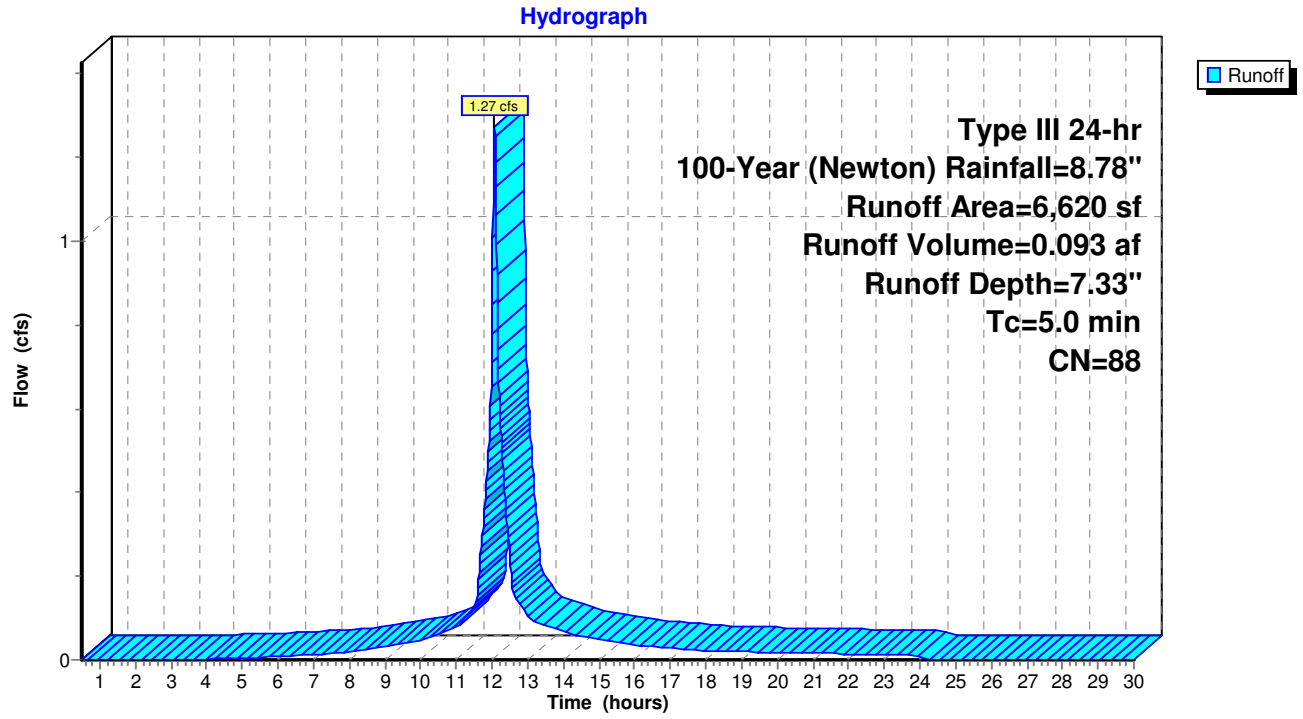
Runoff = 1.27 cfs @ 12.07 hrs, Volume= 0.093 af, Depth= 7.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	5,232	98	Driveway/Parking Lot
*	22	98	Curbing
*	168	98	Ret. Walls
*	50	98	Walks
	1,148	39	>75% Grass cover, Good, HSG A
	6,620	88	Weighted Average
	1,148		17.34% Pervious Area
	5,472		82.66% Impervious Area

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

Subcatchment PD1: Driveway/Parking-1



Summary for Subcatchment PD2: Driveway/Parking-2

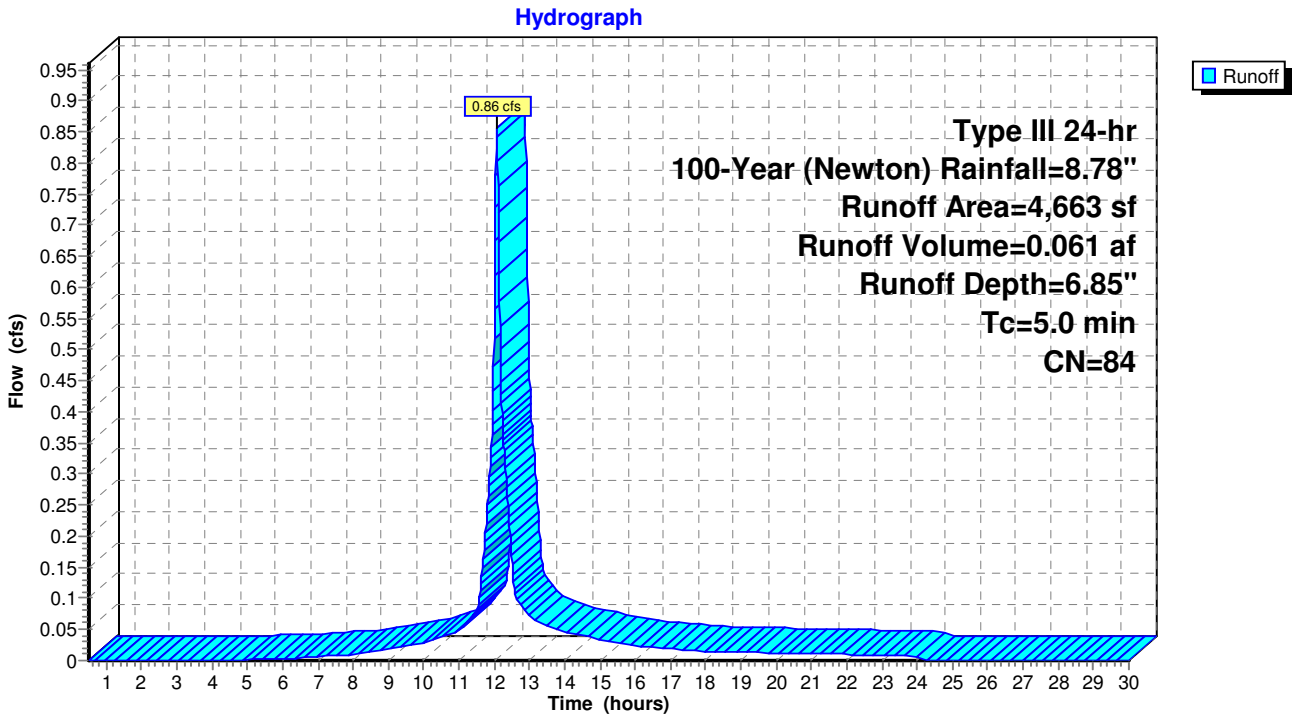
Runoff = 0.86 cfs @ 12.07 hrs, Volume= 0.061 af, Depth= 6.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	3,066	98	Driveway/Parking Lot
*	82	98	Curbing
*	417	98	Walks
	1,098	39	>75% Grass cover, Good, HSG A
	4,663	84	Weighted Average
	1,098		23.55% Pervious Area
	3,565		76.45% Impervious Area

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

Subcatchment PD2: Driveway/Parking-2



Summary for Subcatchment PD3: Driveway/Parking-3

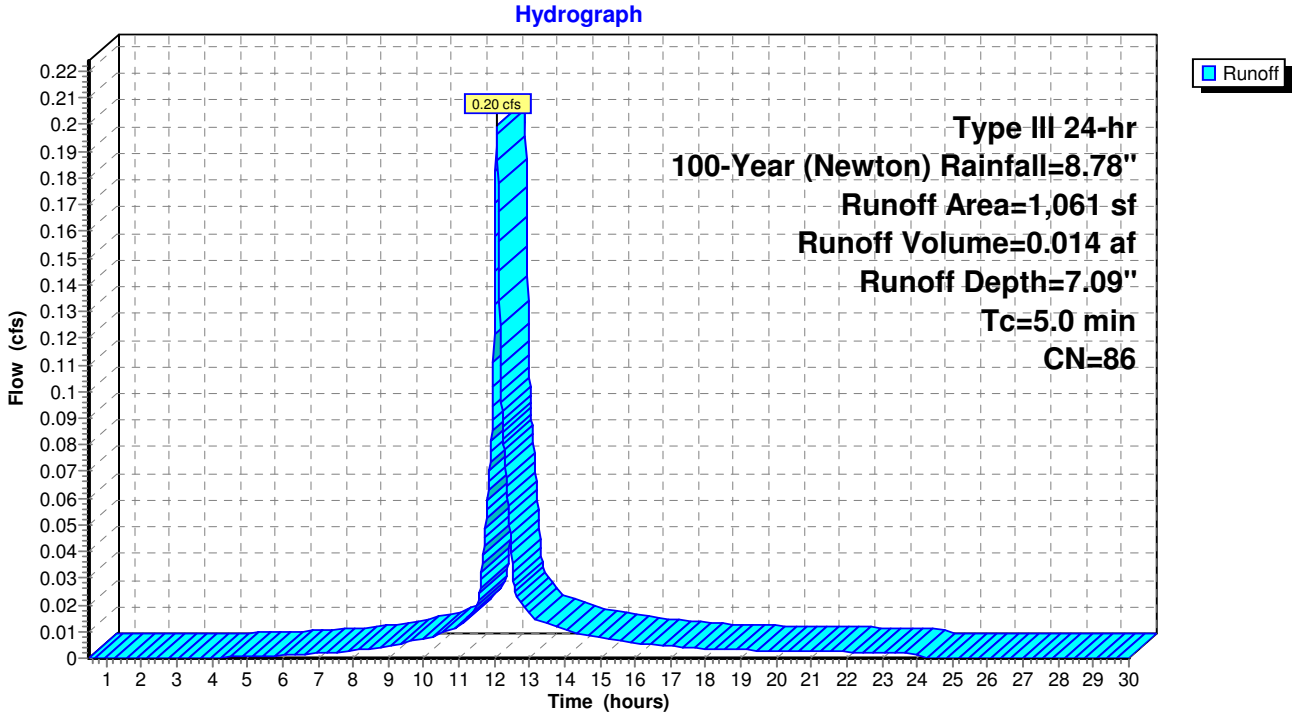
Runoff = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 7.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	831	98	Driveway
*	21	98	Curbing
	209	39	>75% Grass cover, Good, HSG A
	1,061	86	Weighted Average
	209		19.70% Pervious Area
	852		80.30% Impervious Area

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

Subcatchment PD3: Driveway/Parking-3



Summary for Subcatchment PR1: Roof-1

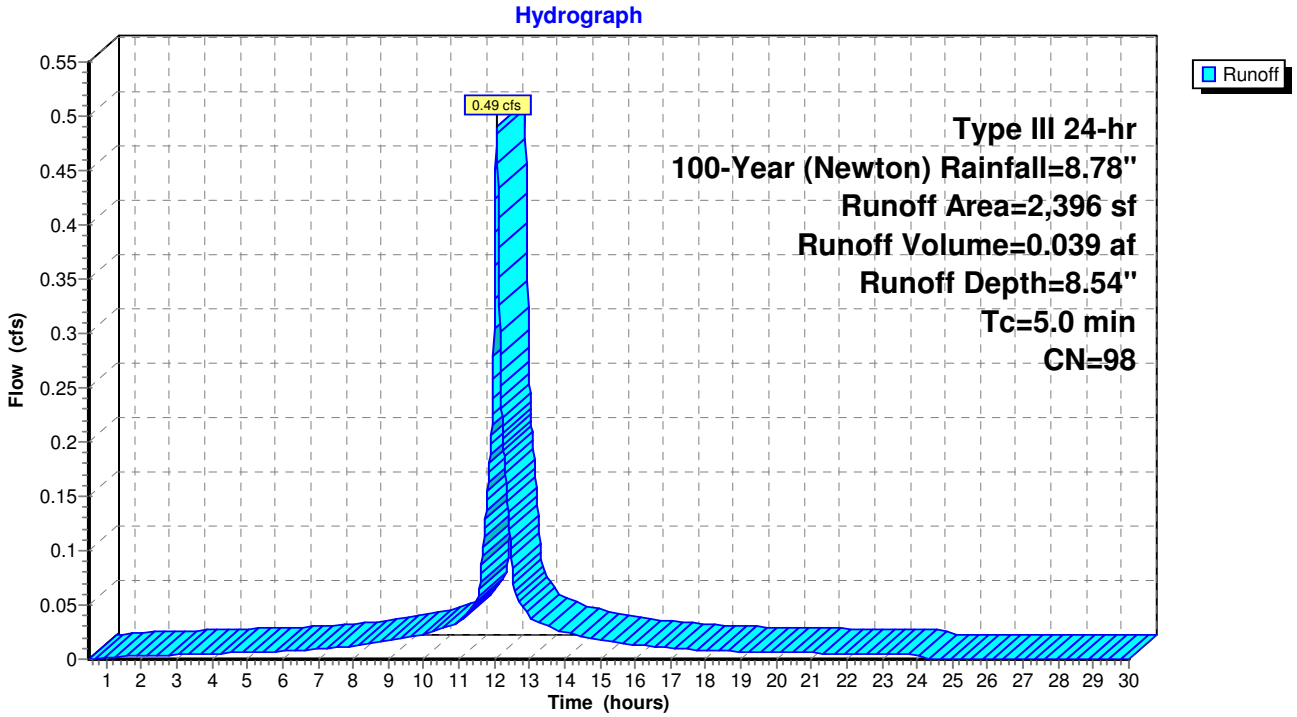
Runoff = 0.49 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	2,396	98	Prop. Roof-1
	2,396		100.00% Impervious Area

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

Subcatchment PR1: Roof-1



Summary for Subcatchment PR2: Roof-2

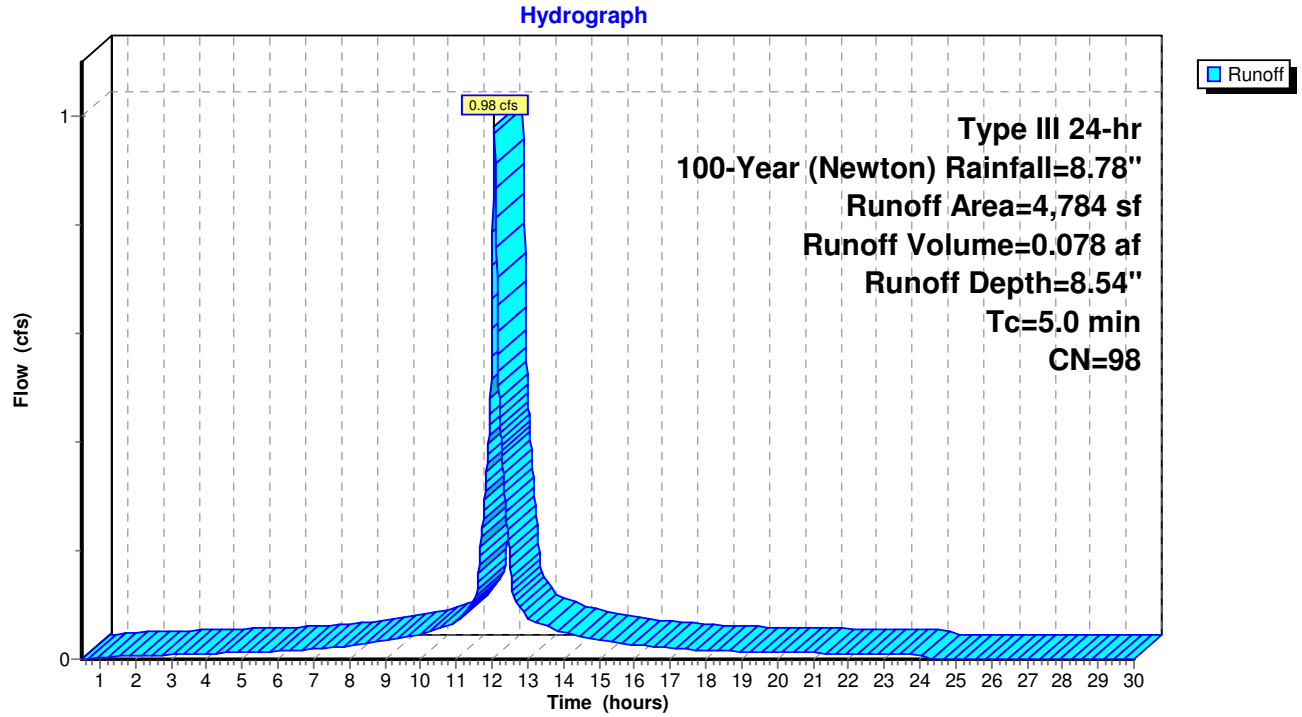
Runoff = 0.98 cfs @ 12.07 hrs, Volume= 0.078 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	4,784	98	Prop. Roof-2
	4,784		100.00% Impervious Area

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

Subcatchment PR2: Roof-2



Summary for Pond CB1: Catch Basin-1

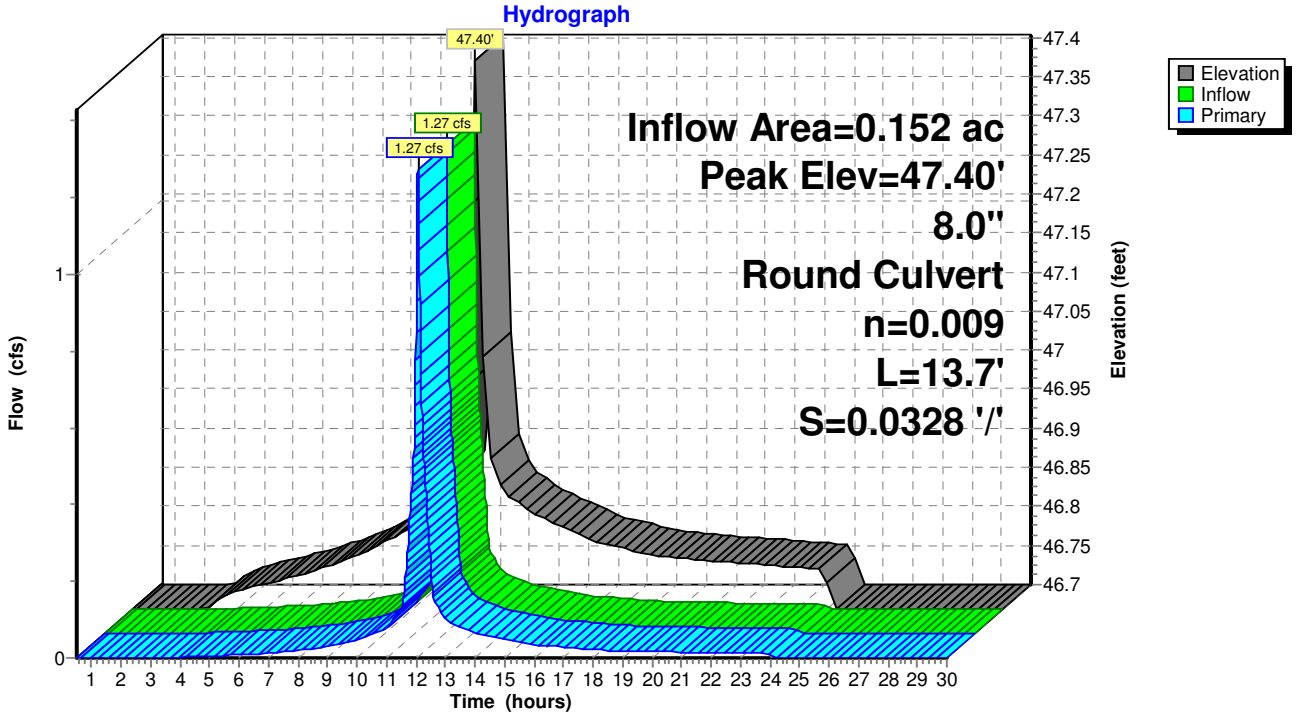
Inflow Area = 0.152 ac, 82.66% Impervious, Inflow Depth = 7.33" for 100-Year (Newton) event
Inflow = 1.27 cfs @ 12.07 hrs, Volume= 0.093 af
Outflow = 1.27 cfs @ 12.07 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.07 hrs, Volume= 0.093 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.40' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.70'	**8.0" Round 8"CCP** L= 13.7' Ke= 0.200 Inlet / Outlet Invert= 46.70' / 46.25' S= 0.0328 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.27 cfs @ 12.07 hrs HW=47.40' TW=44.32' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 1.27 cfs @ 3.65 fps)

Pond CB1: Catch Basin-1



Summary for Pond CB2: Catch Basin-2

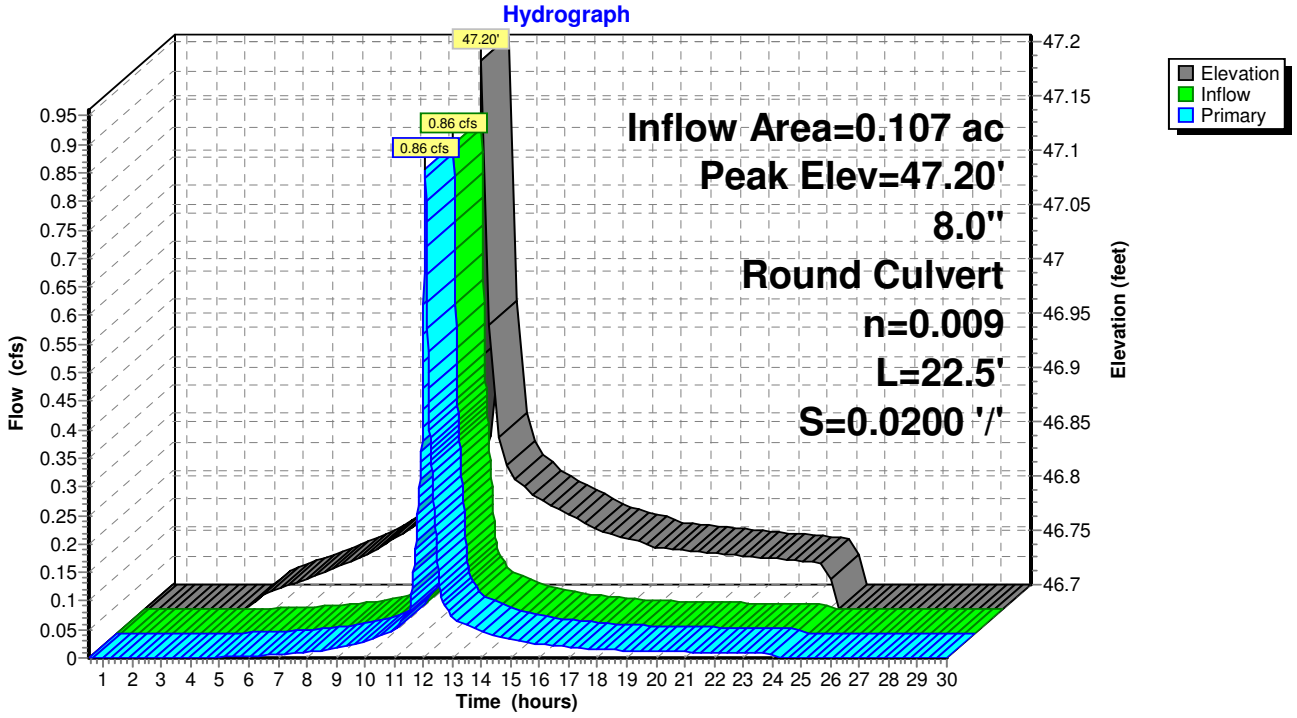
Inflow Area = 0.107 ac, 76.45% Impervious, Inflow Depth = 6.85" for 100-Year (Newton) event
Inflow = 0.86 cfs @ 12.07 hrs, Volume= 0.061 af
Outflow = 0.86 cfs @ 12.07 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.07 hrs, Volume= 0.061 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.20' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.70'	**8.0" Round 8"CCP** L= 22.5' Ke= 0.200 Inlet / Outlet Invert= 46.70' / 46.25' S= 0.0200 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.86 cfs @ 12.07 hrs HW=47.20' TW=44.26' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.86 cfs @ 3.02 fps)

Pond CB2: Catch Basin-2



Summary for Pond CB3: Catch Basin-3

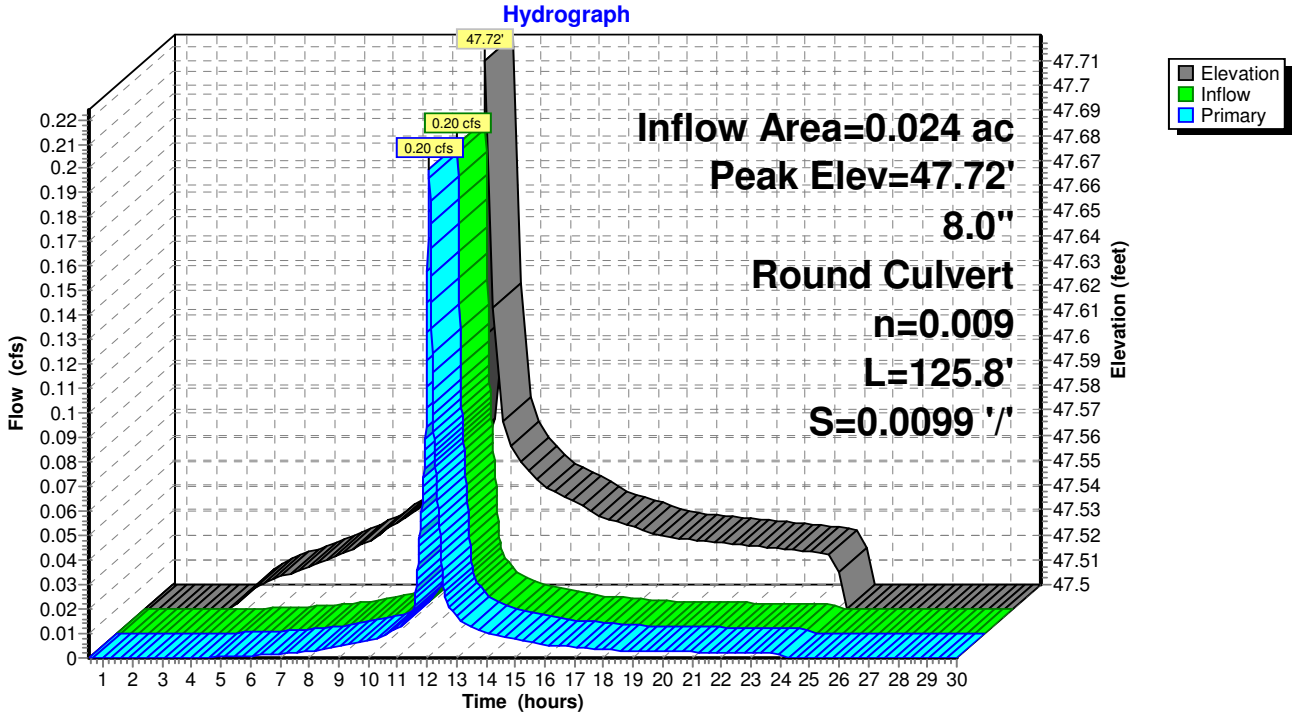
Inflow Area = 0.024 ac, 80.30% Impervious, Inflow Depth = 7.09" for 100-Year (Newton) event
Inflow = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af
Outflow = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.72' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**8.0" Round 8"CCP** L= 125.8' Ke= 0.200 Inlet / Outlet Invert= 47.50' / 46.25' S= 0.0099 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.20 cfs @ 12.07 hrs HW=47.72' TW=44.25' (Dynamic Tailwater)
↳**1=8"CCP** (Inlet Controls 0.20 cfs @ 1.99 fps)

Pond CB3: Catch Basin-3



Summary for Pond INF-1: Inf. System #1 Galleys

Inflow Area = 0.331 ac, 88.57% Impervious, Inflow Depth = 7.10" for 100-Year (Newton) event
Inflow = 2.73 cfs @ 12.08 hrs, Volume= 0.196 af
Outflow = 0.21 cfs @ 11.38 hrs, Volume= 0.196 af, Atten= 92%, Lag= 0.0 min
Discarded = 0.21 cfs @ 11.38 hrs, Volume= 0.196 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 46.57' @ 13.11 hrs Surf.Area= 0.029 ac Storage= 0.079 af

Plug-Flow detention time= 134.9 min calculated for 0.196 af (100% of inflow)
Center-of-Mass det. time= 134.9 min (925.8 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	0.026 af	**26.50'W x 48.00'L x 5.25'H Field A** 0.153 af Overall - 0.079 af Embedded = 0.075 af x 35.0% Voids
#2A	43.00'	0.059 af	**Concrete Galley 4x4x4.25** x 55 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 5 Rows of 11 Chambers
		0.085 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.21 cfs @ 11.38 hrs HW=42.06' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Pond INF-1: Inf. System #1 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x4.25 (Concrete Galley, Shea LE-EGH, LE-CGH or equivalent)
Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf
Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf

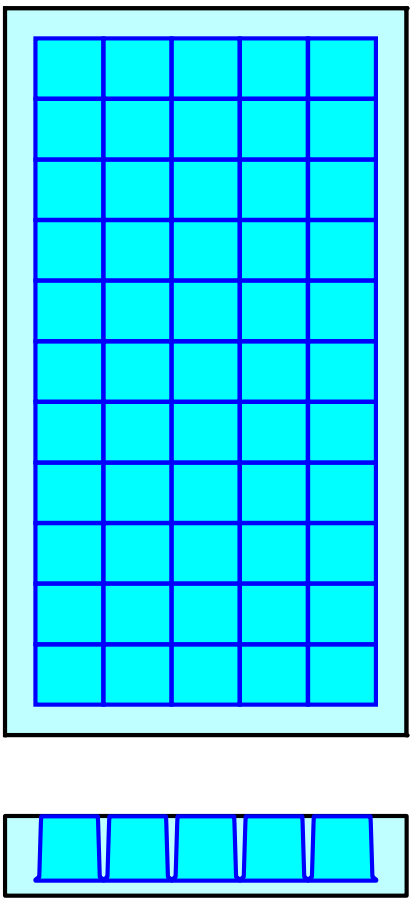
11 Chambers/Row x 4.00' Long = 44.00' Row Length +24.0" End Stone x 2 = 48.00' Base Length
5 Rows x 54.0" Wide + 24.0" Side Stone x 2 = 26.50' Base Width
12.0" Base + 51.0" Chamber Height = 5.25' Field Height

55 Chambers x 46.4 cf = 2,550.9 cf Chamber Storage
55 Chambers x 62.3 cf = 3,428.2 cf Displacement

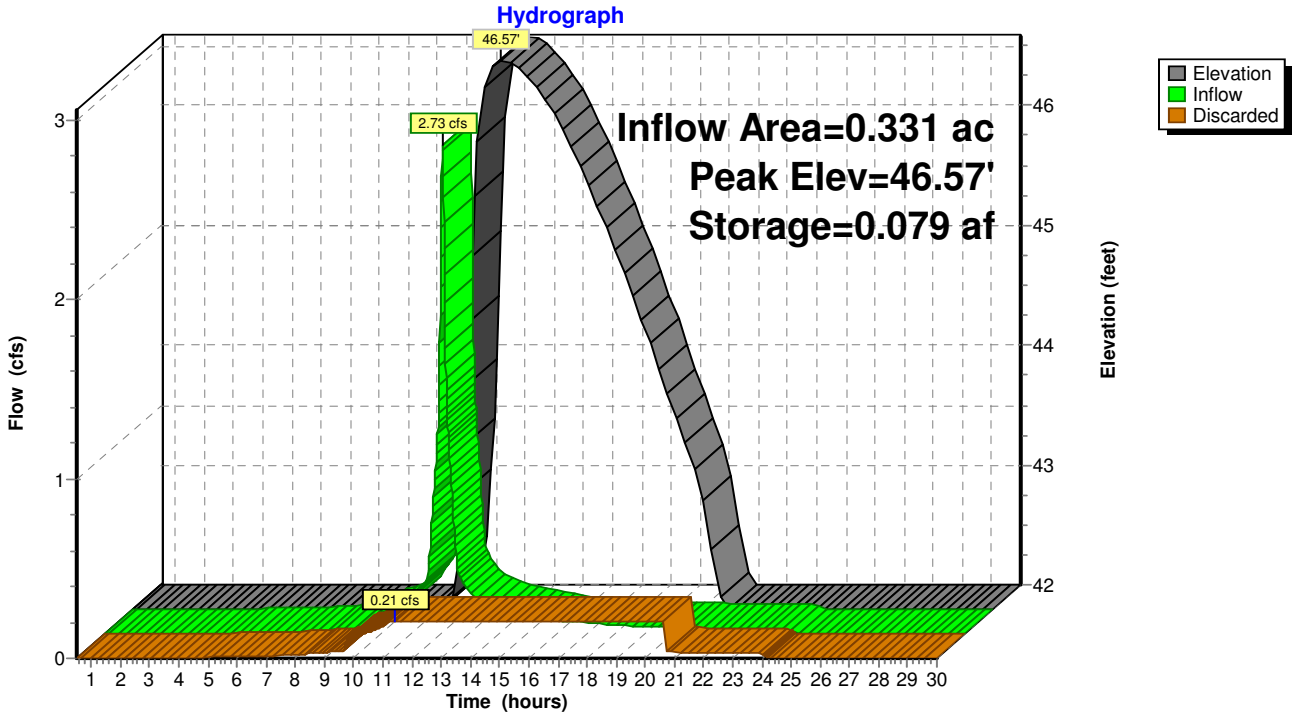
6,678.0 cf Field - 3,428.2 cf Chambers = 3,249.8 cf Stone x 35.0% Voids = 1,137.4 cf Stone Storage

Chamber Storage + Stone Storage = 3,688.4 cf = 0.085 af
Overall Storage Efficiency = 55.2%
Overall System Size = 48.00' x 26.50' x 5.25'

55 Chambers
247.3 cy Field
120.4 cy Stone



Pond INF-1: Inf. System #1 Galleys



Summary for Pond INF-2: Inf. System #2 Galleys

Inflow Area = 0.133 ac, 76.58% Impervious, Inflow Depth = 6.85" for 100-Year (Newton) event
Inflow = 1.06 cfs @ 12.07 hrs, Volume= 0.076 af
Outflow = 0.08 cfs @ 11.52 hrs, Volume= 0.076 af, Atten= 92%, Lag= 0.0 min
Discarded = 0.08 cfs @ 11.52 hrs, Volume= 0.076 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 46.46' @ 13.05 hrs Surf.Area= 0.012 ac Storage= 0.029 af

Plug-Flow detention time= 117.0 min calculated for 0.076 af (100% of inflow)
Center-of-Mass det. time= 116.9 min (905.2 - 788.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	0.013 af	**13.00'W x 40.00'L x 5.25'H Field A** 0.063 af Overall - 0.026 af Embedded = 0.037 af x 35.0% Voids
#2A	43.00'	0.019 af	**Concrete Galley 4x4x4.25** x 18 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 2 Rows of 9 Chambers
		0.032 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 11.52 hrs HW=42.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Pond INF-2: Inf. System #2 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x4.25 (Concrete Galley, Shea LE-EGH, LE-CGH or equivalent)
Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf
Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf

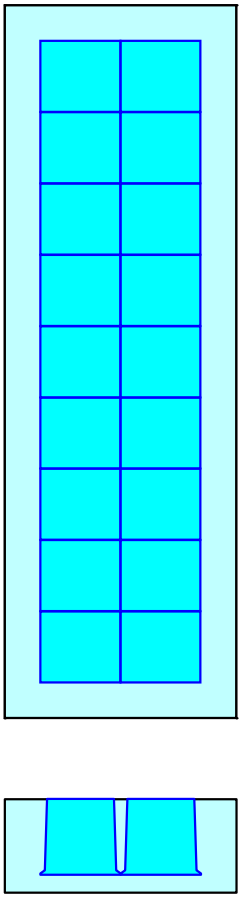
9 Chambers/Row x 4.00' Long = 36.00' Row Length +24.0" End Stone x 2 = 40.00' Base Length
2 Rows x 54.0" Wide + 24.0" Side Stone x 2 = 13.00' Base Width
12.0" Base + 51.0" Chamber Height = 5.25' Field Height

18 Chambers x 46.4 cf = 834.9 cf Chamber Storage
18 Chambers x 62.3 cf = 1,122.0 cf Displacement

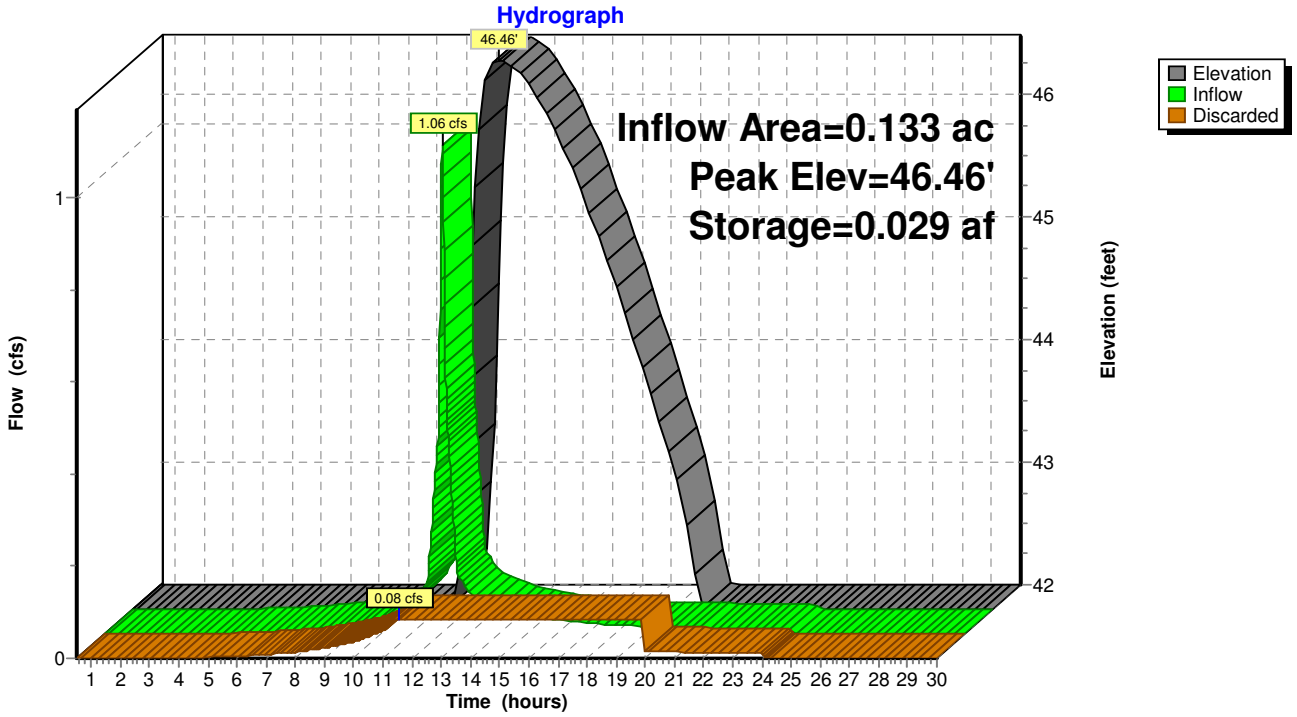
2,730.0 cf Field - 1,122.0 cf Chambers = 1,608.0 cf Stone x 35.0% Voids = 562.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,397.7 cf = 0.032 af
Overall Storage Efficiency = 51.2%
Overall System Size = 40.00' x 13.00' x 5.25'

18 Chambers
101.1 cy Field
59.6 cy Stone



Pond INF-2: Inf. System #2 Galleys



Summary for Pond TNK: 8000gal. TANK

Inflow Area = 0.165 ac,100.00% Impervious, Inflow Depth = 8.54" for 100-Year (Newton) event
Inflow = 1.47 cfs @ 12.07 hrs, Volume= 0.117 af
Outflow = 1.43 cfs @ 12.09 hrs, Volume= 0.100 af, Atten= 3%, Lag= 1.1 min
Primary = 1.43 cfs @ 12.09 hrs, Volume= 0.100 af

Routing by Dyn-Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.010 hrs
Peak Elev= 47.55' @ 12.09 hrs Surf.Area= 0.003 ac Storage= 0.020 af

Plug-Flow detention time= 126.8 min calculated for 0.100 af (85% of inflow)
Center-of-Mass det. time= 61.2 min (800.4 - 739.2)

Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	0.028 af	**7.00'W x 16.50'L x 10.66'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	46.75'	**8.0" Round 8"CPP** L= 10.8' Ke= 0.200 Inlet / Outlet Invert= 46.75' / 46.25' S= 0.0463 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.43 cfs @ 12.09 hrs HW=47.55' TW=44.50' (Dynamic Tailwater)
↑**1=8"CPP** (Inlet Controls 1.43 cfs @ 4.09 fps)

Pond TNK: 8000gal. TANK