Stormwater Management Report

Cosgray University Holdings, LLC
Cosgray Crossing
Dublin, Ohio

1/14/2026

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Appendices

1.0 Project Information

Cosgray Crossing is located in Dublin, Ohio. The project consists of nine mixed-use subareas containing both commercial and residential uses that vary between subareas.

The purpose of this memorandum is to provide preliminary stormwater calculations and assumptions utilized when determining feasibility of stormwater design of this project. A more detailed and defined stormwater report will be provided after each subarea is more solidified in its layout and use. This study will attempt to assume the most restrictive case for the development to account for any changes that may occur further into design, as described later in this report.

As a result of the changes in stormwater runoff due to the proposed development, a stormwater management system has been designed to control the site's stormwater flows. The proposed stormwater management system for this development will consist of interconnected wet detention basins and associated storm sewers and an outlet control structure. In cases where the shown proposed wet detention basins do not provide adequate stormwater management, the approximate additional volume needed in either additional wet detention area or underground detention systems will be displayed and reported. The system will meet the appropriate local and state requirements and will outlet to the South Fork Indian Run tributary stream located on the south property line. This watershed is ultimately tributary to the Scioto River.

A project location map, soils map and FEMA flood insurance rate map can be found in **Appendix A** of this report.

2.0 Pre-Developed Drainage Conditions

The existing topography of the site consists of almost entirely row crop conditions, with a small amount of wooded area on the south side of the site adjacent to the stream. Following the City of Dublin Master Drainage Plan, the site sits within two tributary subareas. These areas are defined as subareas 2430 and 2450. The City of Dublin Master Drainage Plan maps are located in Appendix B.

Table 2.0.1 – Pre-Developed Drainage Conditions

Tributary Area	Area (ac)	Tc (min)	CN
Ex. Site (2430)	11.74	21.0	81
Ex. Site (2450)	32.66	98.5	81

NOAA Rainfall data can be found in **Appendix A**, pre-developed runoff calculations using HydroCAD Version 10.00 by HydroCAD Software Solutions, LLC can be found in **Appendix B**, and a pre-developed tributary area map can be found in **Appendix E** of this report.

3.0 Post-Developed Drainage Conditions

The site will be modified as described above. As part of the development, a storm sewer system will collect on-site stormwater runoff and outlet into a proposed stormwater management system, which will be used for water quality and quantity treatment. The stormwater management system will provide storage for the 1–100-year storm events and will outlet to the stream located on the south property line, and an existing culvert that runs underneath the roundabout at Post Road and University Blvd. The post-developed runoff calculations can be found in Appendix C and the post-developed tributary map can be found in Appendix E.

Table 3.0.1- Post-Developed Drainage Conditions

Tributary Area	Area (ac)	Tc (min)	CN
Detained (2430)	11.74	10	95
Detained (2450)	32.66	10	94

3.1 General Stormwater Control Narrative

The critical storm event was calculated by comparing the pre-developed conditions to the post-developed conditions 1-year, 24-hour event using the SCS Type II distribution curve.

- Pre-Developed Runoff Volume = 111,731 cf
- Post-Developed Runoff Volume = 263,014 cf
- Percentage Increase = 135%
- Critical Storm = 25-Year Event

3.2 Stormwater Quality Control

The proposed development will disturb more than 1 acre of land and therefore is subject to the requirements set forth in Ohio EPA NPDES Permit No.:OHC000006.

Required WQv - 2430

WQv-req = RV * P * A /12

WQv-req = 0.82 * 0.90 * 14.32 /12 = 0.875 acre-feet = 38,129 cubic feet

Where:

WQv-req = minimum water quality volume required to be provided in acre-feet

Rv = volumetric runoff coefficient, 0.05 + 0.9 * I, where I = fraction of impervious surface

Where I = .085

P = 0.90 inches

A = disturbed area in acres

Required WQv - 2450

WQv-req = RV * P * A /12

WQv-req = 0.82 * 0.90 * 32.66 /12 = 1.996 acre-feet = 86,966 cubic feet

Where:

WQv-req = minimum water quality volume required to be provided in acre-feet

Rv = volumetric runoff coefficient, 0.05 + 0.9 * I, where I = fraction of impervious surface

Where I = 0.85

P = 0.90 inches

A = disturbed area in acres

Provided WQv

Water quality drawdown per the Ohio EPA NPDES Permit No.: OHCO000006 is provided for the 44.41 acre area tributary to the system. The water quality elevation in the 2430 subarea is approximately 941.82. The water quality elevation in the 2450 subarea is approximately 938.26. Per Table 4a of the permit, "Wet Extended Detention Basins" shall provide a drain time of 24-hours. An orifice at invert elevation at the normal pool of each subarea's outlet basin has been designed to provide the 24-hour required drawdown time. The orifice provides a WQv drawdown time of 24 hours. Additionally, the first half of the WQv shall not be released in the first one-third of the drain time. The water quality orifice provides an 8-hour one-half WQv drawdown time.

Calculations for Water Quality Volumes and Drawdown can be found in Appendix D.

3.3 Stormwater Quantity Control

Per the Dublin, Ohio Master Drainage Plan and Drainage Manual a 135% increase in runoff assigns the critical storm as the 25-year storm event. The post-developed release rates for storm events 1-25 will release at the pre-developed 1 year event. For every storm event thereafter (25-100 year event) the post-developed release rate will be released at the pre-developed rate.

The proposed storages for basins 1 and 2 to subarea 2430 did not meet the needed volumes for the system to perform within City of Dublin. After analysis of the system was completed, it was determined that an approximate 70,000 CF of storage is needed in addition to the storages shown on the current plan. This additional storage could be obtained by additional wet detention areas, or with underground detention areas provided during the construction of subareas A or B.

The proposed storages for basins 3 through 6 to subarea 2450 did not meet the needed volumes for the system to perform within City of Dublin. After analysis of the system was completed, it was determined that an approximate 74,000 CF of storage is needed in addition to the storages shown on the current plan. This additional storage could be obtained by additional wet detention areas, or with underground detention areas provided during the construction of subareas A or B.

Table 3.3.1 Proposed Outlet Structure

Invert	Description
Information to be provided following further design in future drainage reports	

Table 3.3.2 Subarea 2430 Release Rate Requirements

Tributary Subarea (2430)			
Storm Event	**Sub-Basin #2430 Allowable Release Rate (cfs/ac)**	**Proposed Site Release Rate per City of Dublin Master Plan (cfs)**	**Allowable Release Rate Using Critical Storm Method (cfs)**
(Acres)	142.9	11.74	
1-Year	0.4	4.696	4.696
2-Year	0.6	7.044	4.696
5-Year	0.7	8.218	4.696
10-Year	0.9	10.566	4.696
25-Year	1.1	12.914	4.696
50-Year	1.4	16.436	16.436
100-Year	1.6	18.784	18.784

Table 3.3.3 Subarea 2450 Release Rate Requirements

Tributary Subarea (2450)			
Storm Event	**Sub-Basin #2450 Allowable Release Rate (cfs/ac)**	**Proposed Site Release Rate per City of Dublin Master Plan (cfs)**	**Allowable Release Rate Using Critical Storm Method (cfs)**
(Acres)	41.0	31.62	
1-Year	0.01	0.3162	0.3162
2-Year	0.01	0.3162	0.3162
5-Year	0.01	0.3162	0.3162
10-Year	0.1	3.162	0.3162
25-Year	0.1	3.162	0.3162
50-Year	0.2	6.324	6.324
100-Year	0.3	9.486	9.486

Table 3.3.4 Site Stormwater Release Rate Summary – Subarea 2430

Storm Event	Site Allowable Release Rate (cfs)	Post-Developed Site Release Rate (cfs)*
1-Year	4.696	0.63
2-Year	4.696	1.54
5-Year	4.696	2.95
10-Year	4.696	3.75
25-Year	4.696	4.69
50-Year	16.436	9.96
100-Year	18.784	12.99

* Proposed release rates shown assume that the required storage volume is provided, as described in this section above.

Table 3.3.5 Site Stormwater Release Rate Summary – Subarea 2450

Storm Event	Site Allowable Release Rate (cfs)	Post-Developed Site Release Rate* (cfs)
1-Year	0.3162	0.21
2-Year	0.3162	0.23
5-Year	0.3162	0.23
10-Year	0.3162	0.28
25-Year	0.3162	0.31
50-Year	6.324	2.41
100-Year	9.486	4.75

*Proposed release rates shown assume that the required storage volume is provided, as described in this section above.

4.0 Summary and Conclusions

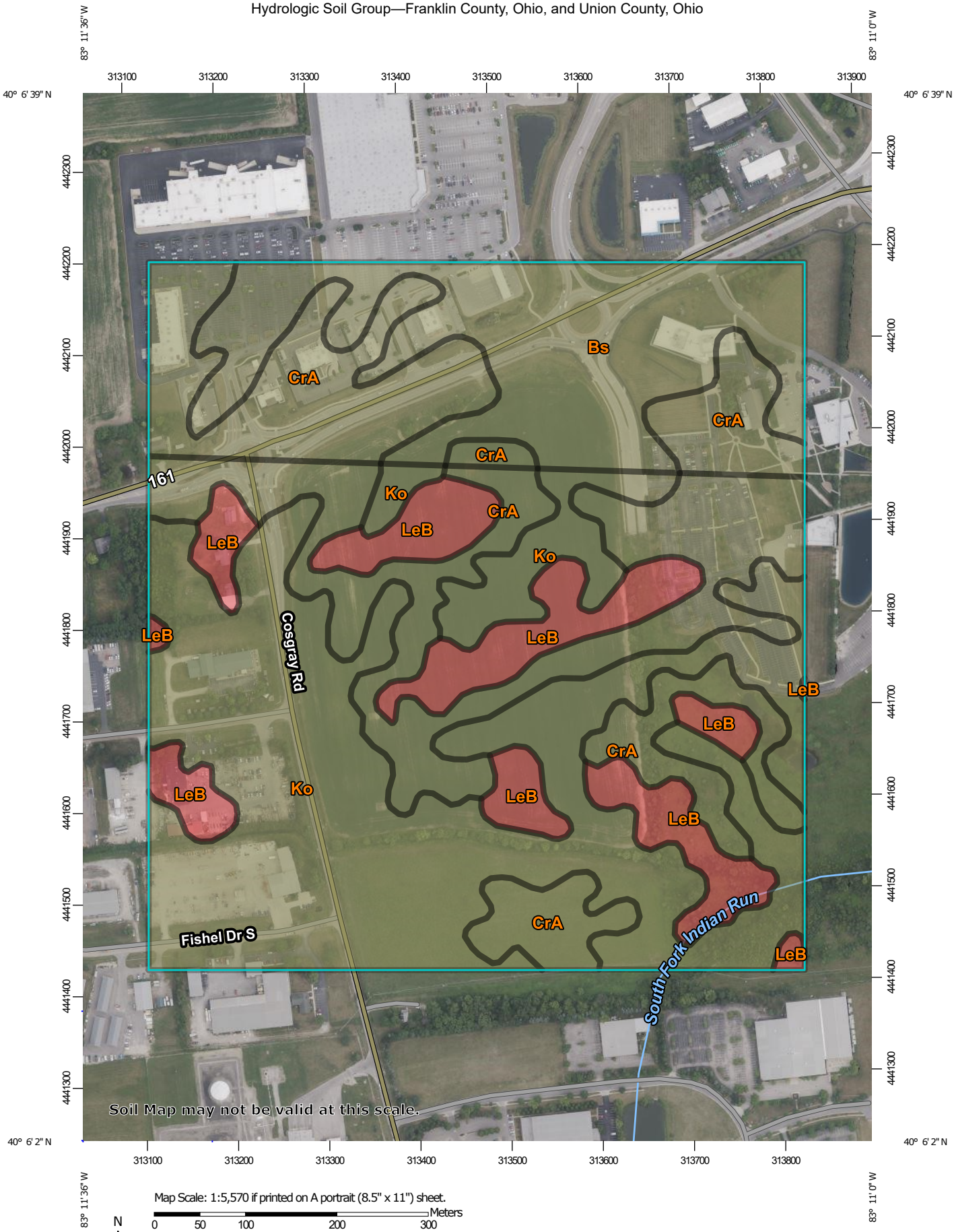
American Structurepoint has analyzed the pre-developed and post-developed conditions for all storm frequencies (1-100 year) to determine the allowable peak discharge rates and storage requirements, while taking into account water quality calculations. The stormwater management system and storm sewer systems have been designed to meet or exceed the detention requirements set forth by Dublin, Ohio and the Ohio EPA water quality requirements for large construction activities.

Accordingly, we believe the proposed improvements will not adversely affect this site, adjacent property owners, or Dublin, Ohio.

Appendix A

Project Site Data

Project Location Map



Map Scale: 1:5,570 if printed on A portrait (8.5" x 11") 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 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

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 1:15,800.

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: Franklin County, Ohio
Survey Area Data: Version 24, Aug 27, 2025

Soil Survey Area: Union County, Ohio
Survey Area Data: Version 24, Sep 8, 2025

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

MAP LEGEND

MAP INFORMATION

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	C/D	27.6	20.0%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	C/D	53.7	38.9%
LeB	Lewisburg-Crosby complex, 2 to 6 percent slopes	D	16.8	12.2%
Subtotals for Soil Survey Area			**98.1**	**71.1%**
Totals for Area of Interest			**137.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Bs	Brookston silty clay loam, fine texture, 0 to 2 percent slopes	C/D	23.0	16.7%
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	C/D	16.8	12.2%
Subtotals for Soil Survey Area			**39.8**	**28.9%**
Totals for Area of Interest			**137.9**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

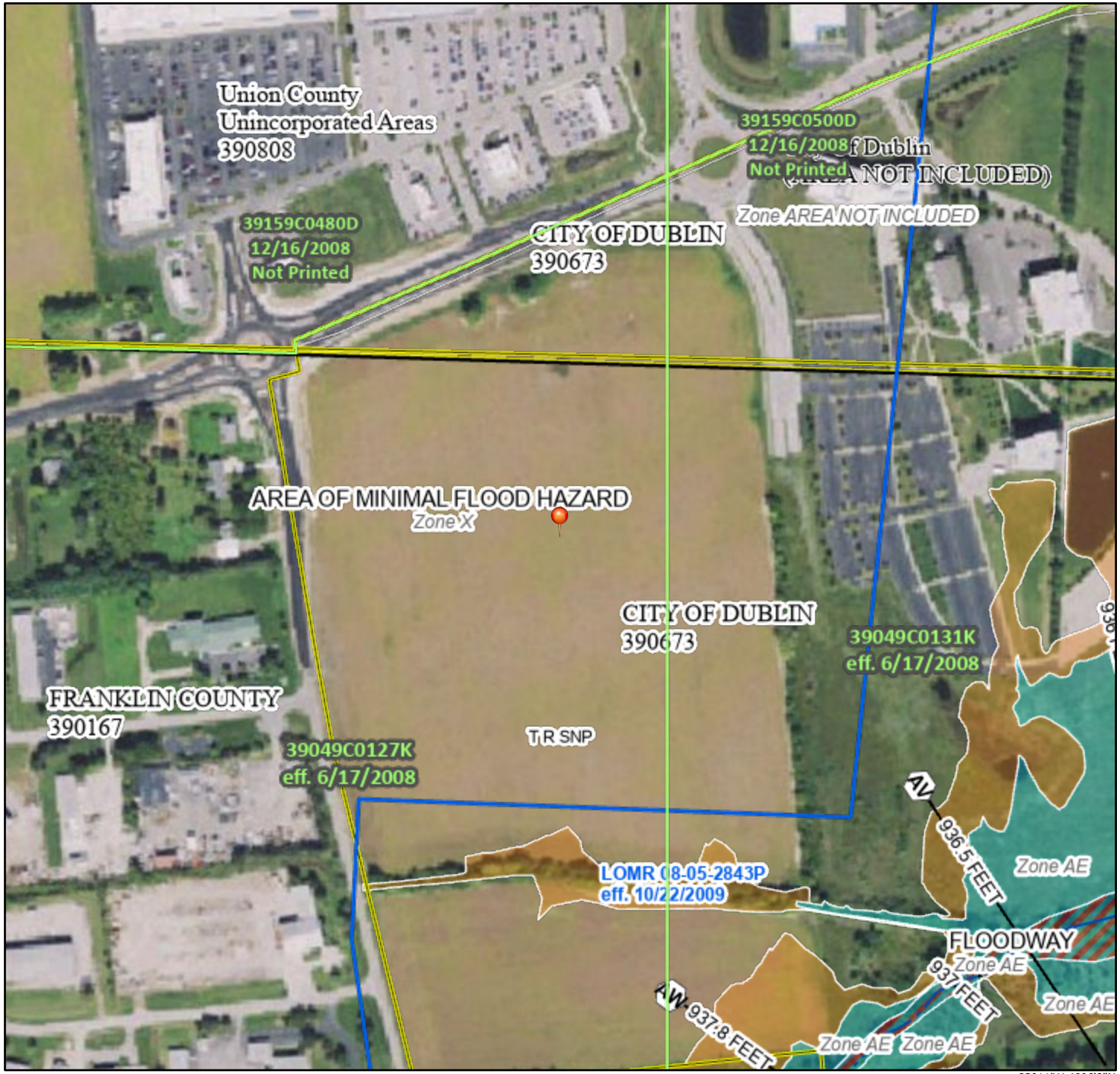
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

National Flood Hazard Layer FIRMette

FEMA

83°11'37"W 40°6'36"N



83°11'W 40°6'8"N

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

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- 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
- 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.

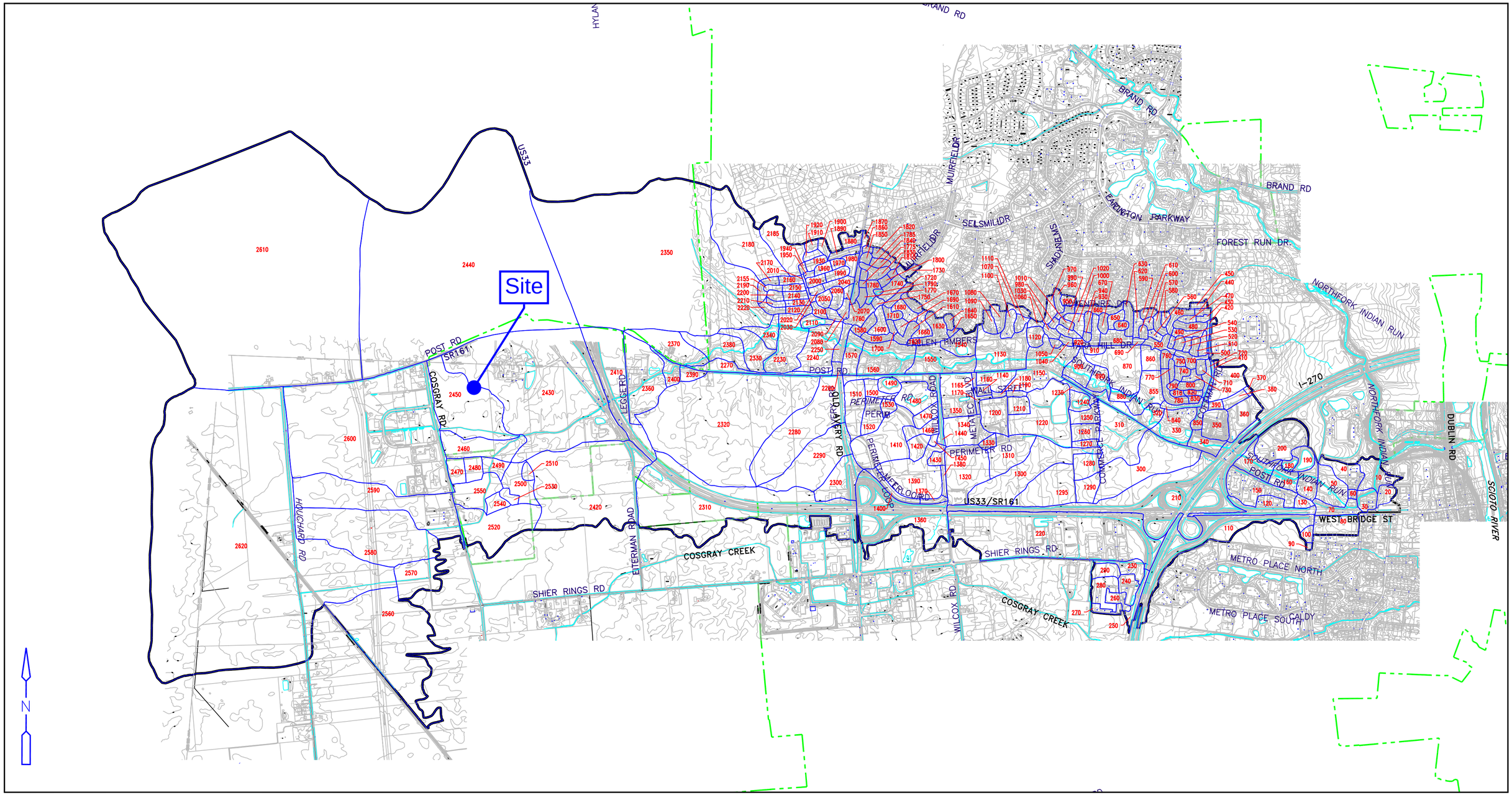
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/30/2025 at 7:44 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

Pre-Developed Calculations



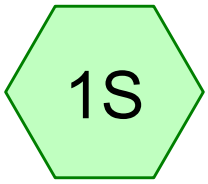
City of Dublin Stormwater Master Plan
South Fork Indian Run
Overall Watershed and Sub-Basins

1" = 1400'
700 0 1400

CDM Camp Dresser & McKee

Figure C-6

Pre-Dev



Pre-Dev Subarea 2430

Pre-Dev Subarea 2450

Subcat Reach Pond Link

Routing Diagram for Drainage Calcs
Prepared by American Structurepoint, Printed 12/30/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1 YR	Type II 24-hr		Default	24.00	1	2.20	2
2	2 YR	Type II 24-hr		Default	24.00	1	2.63	2
3	5 YR	Type II 24-hr		Default	24.00	1	3.24	2
4	10 YR	Type II 24-hr		Default	24.00	1	3.74	2
5	25 YR	Type II 24-hr		Default	24.00	1	4.44	2
6	50 YR	Type II 24-hr		Default	24.00	1	5.02	2
7	100 YR	Type II 24-hr		Default	24.00	1	5.63	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
43.360	81	Row crops, C&T, Good, HSG D (1S, 29S)
1.045	79	Woods/grass comb., Good, HSG D (29S)
44.405	**81**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
44.405	HSG D	1S, 29S
0.000	Other	
44.405		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	43.360	0.000	43.360	Row crops, C&T, Good	1S, 29S
0.000	0.000	0.000	1.045	0.000	1.045	Woods/grass comb., Good	29S
0.000	**0.000**	**0.000**	**44.405**	**0.000**	**44.405**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>0.73"
Flow Length=805' Tc=21.0 min CN=81 Runoff=8.85 cfs 0.714 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>0.71"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=8.16 cfs 1.932 af

Total Runoff Area = 44.405 ac Runoff Volume = 2.646 af Average Runoff Depth = 0.72"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

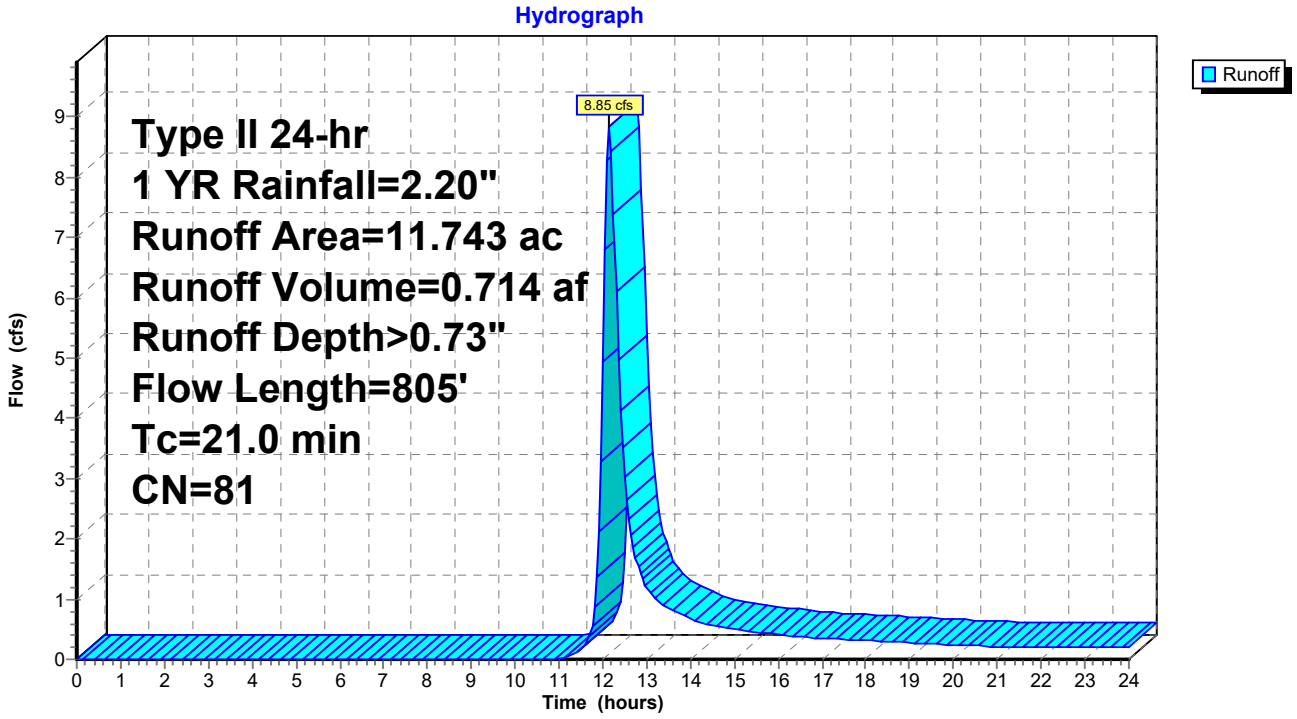
Runoff = 8.85 cfs @ 12.15 hrs, Volume= 0.714 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

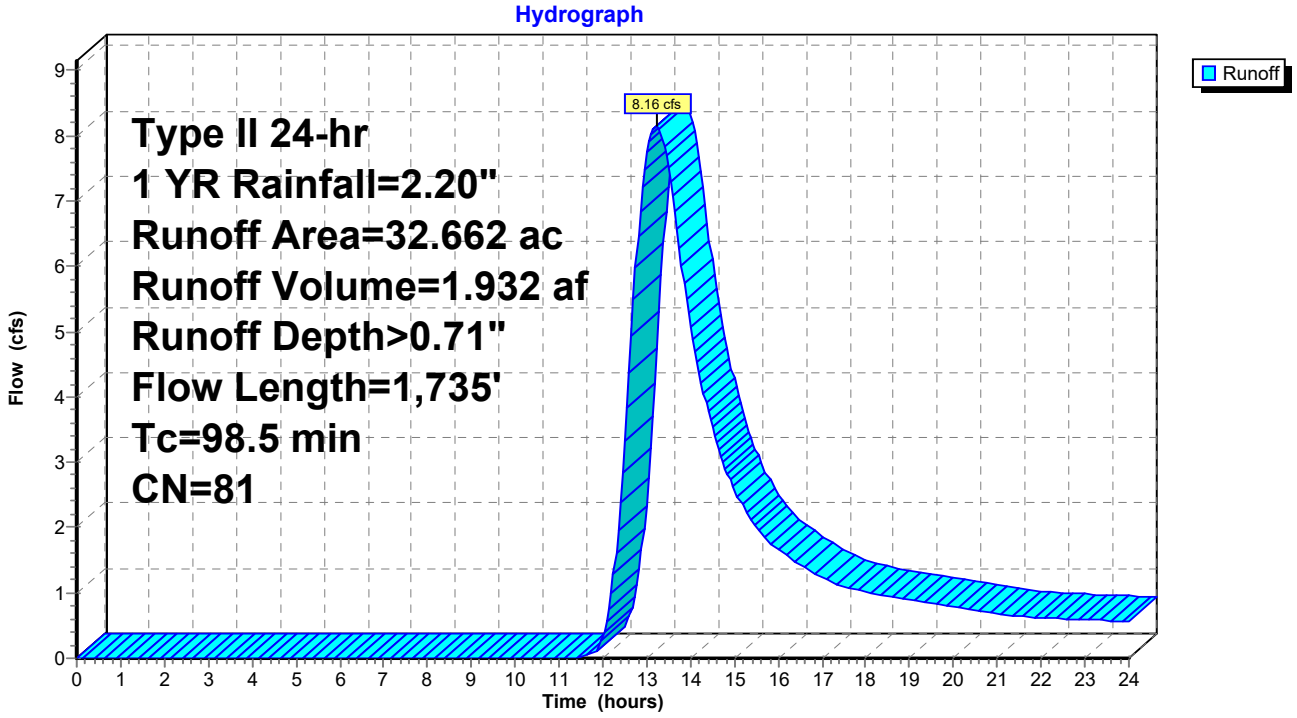
Runoff = 8.16 cfs @ 13.23 hrs, Volume= 1.932 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

Subcatchment 29S: Pre-Dev Subarea 2450



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>1.03"
Flow Length=805' Tc=21.0 min CN=81 Runoff=12.80 cfs 1.008 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>1.00"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=11.89 cfs 2.731 af

Total Runoff Area = 44.405 ac Runoff Volume = 3.739 af Average Runoff Depth = 1.01"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

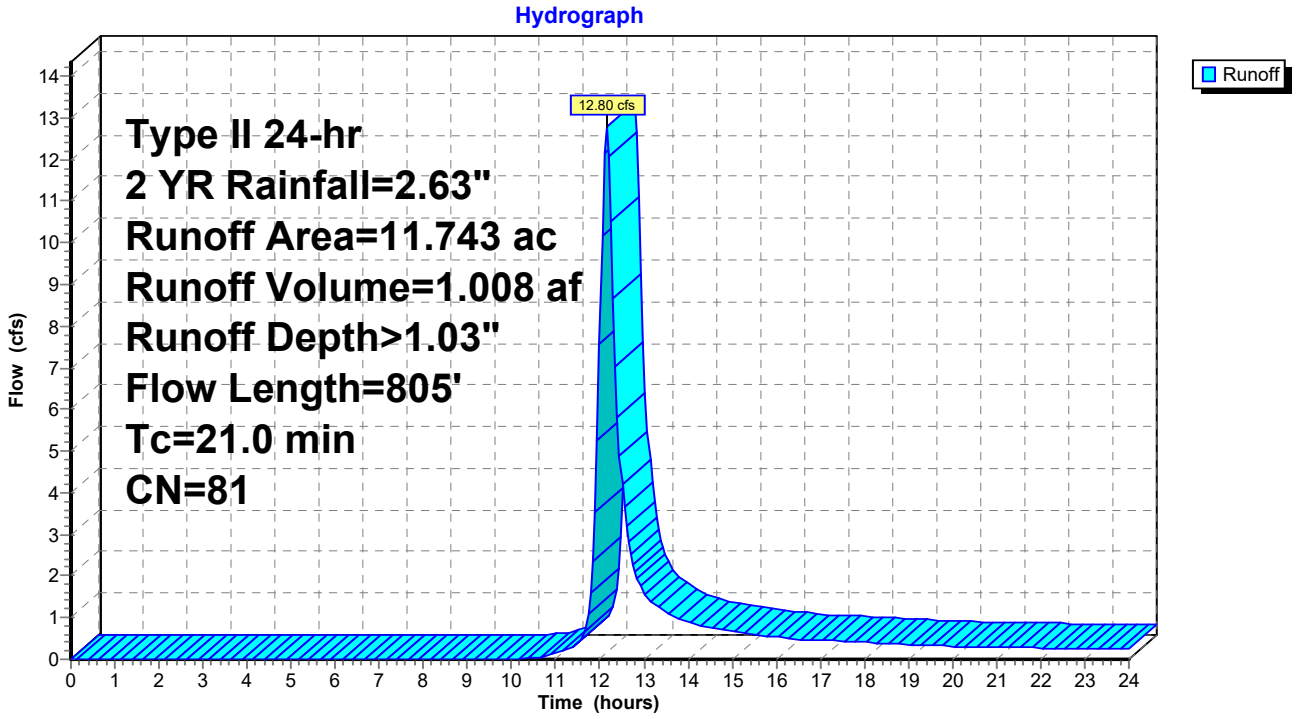
Runoff = 12.80 cfs @ 12.15 hrs, Volume= 1.008 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

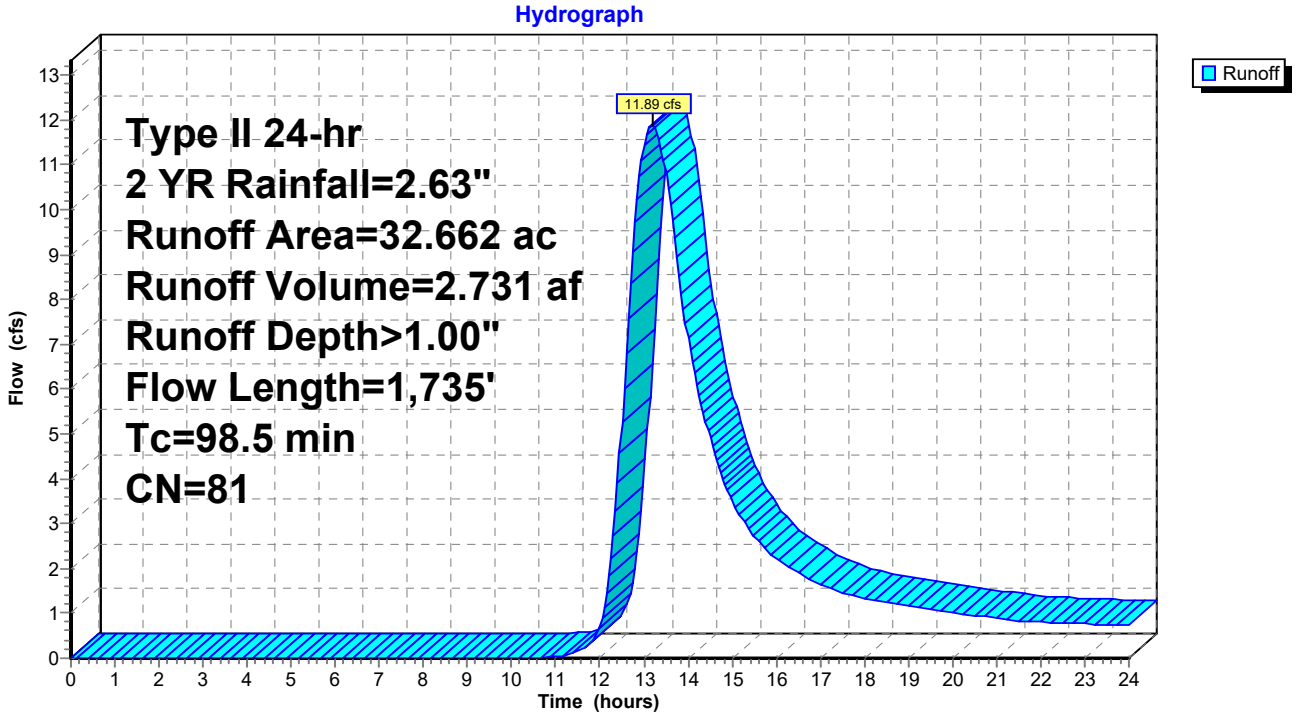
Runoff = 11.89 cfs @ 13.21 hrs, Volume= 2.731 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

Subcatchment 29S: Pre-Dev Subarea 2450



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>1.49"
Flow Length=805' Tc=21.0 min CN=81 Runoff=18.84 cfs 1.460 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>1.46"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=17.66 cfs 3.965 af

Total Runoff Area = 44.405 ac Runoff Volume = 5.425 af Average Runoff Depth = 1.47"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

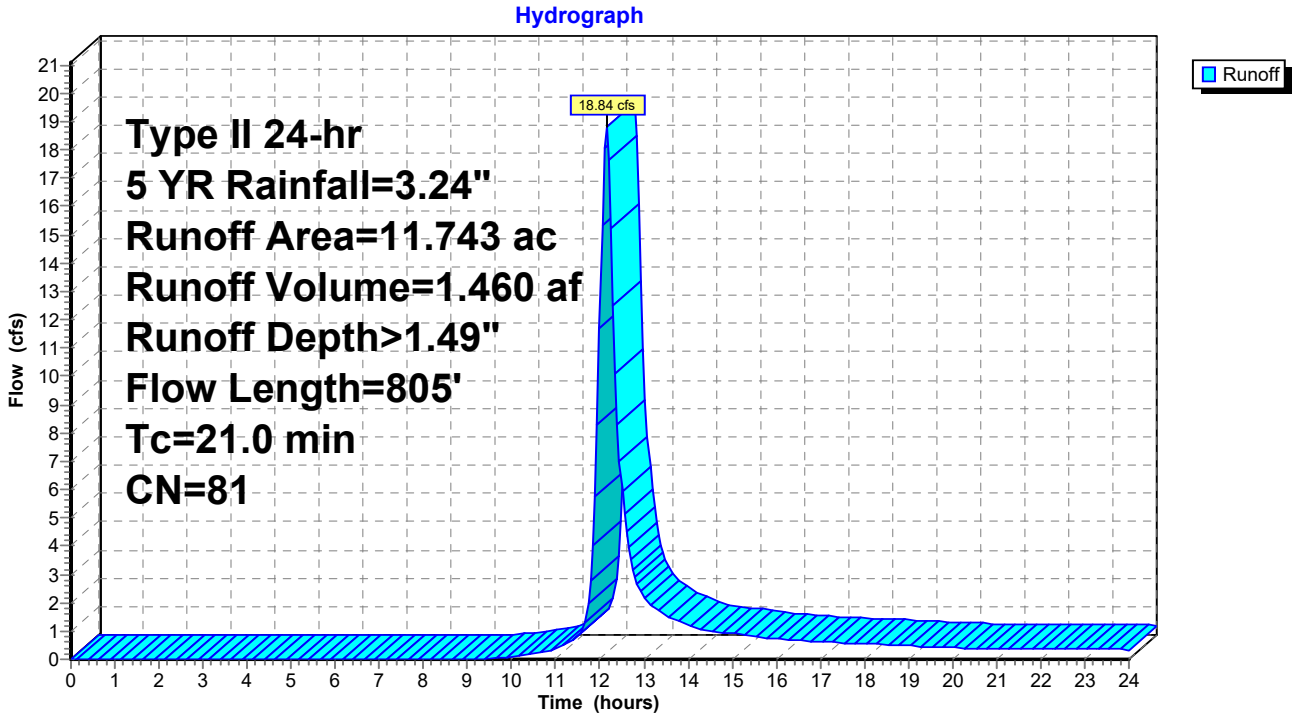
Runoff = 18.84 cfs @ 12.14 hrs, Volume= 1.460 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

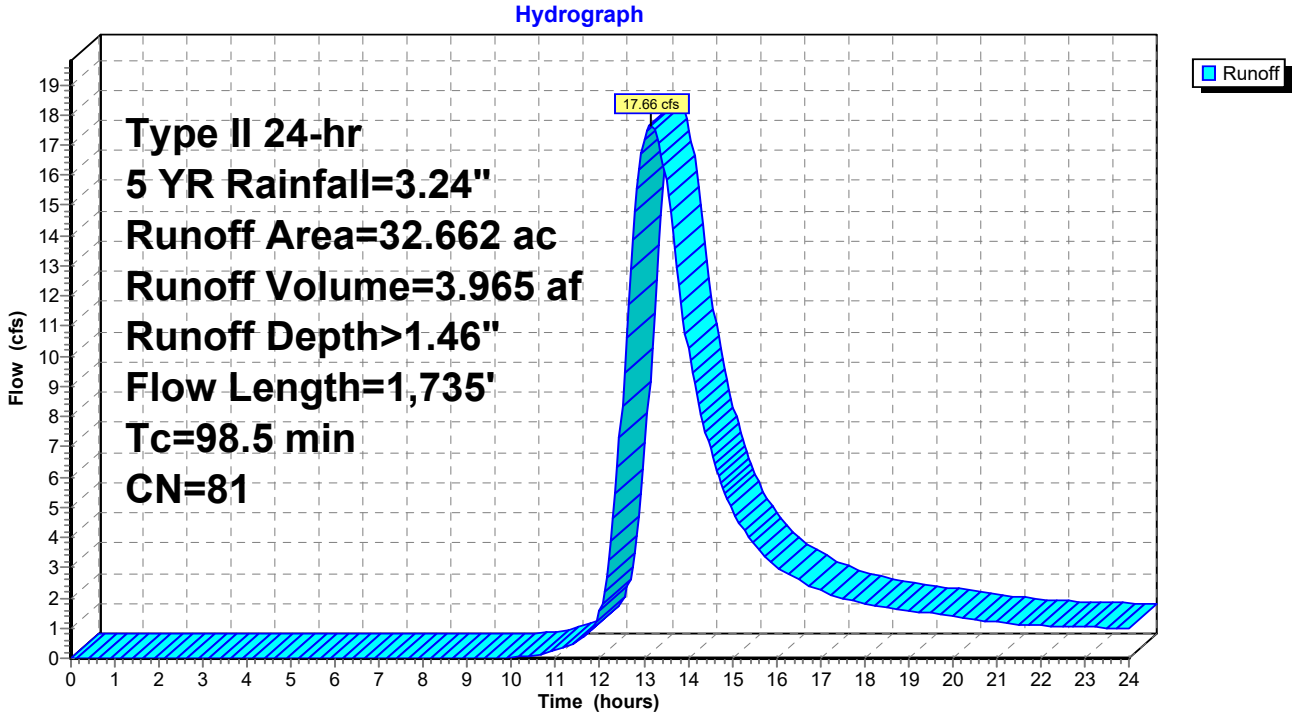
Runoff = 17.66 cfs @ 13.17 hrs, Volume= 3.965 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

Subcatchment 29S: Pre-Dev Subarea 2450



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>1.89"
Flow Length=805' Tc=21.0 min CN=81 Runoff=24.04 cfs 1.854 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>1.85"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=22.67 cfs 5.041 af

Total Runoff Area = 44.405 ac Runoff Volume = 6.895 af Average Runoff Depth = 1.86"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

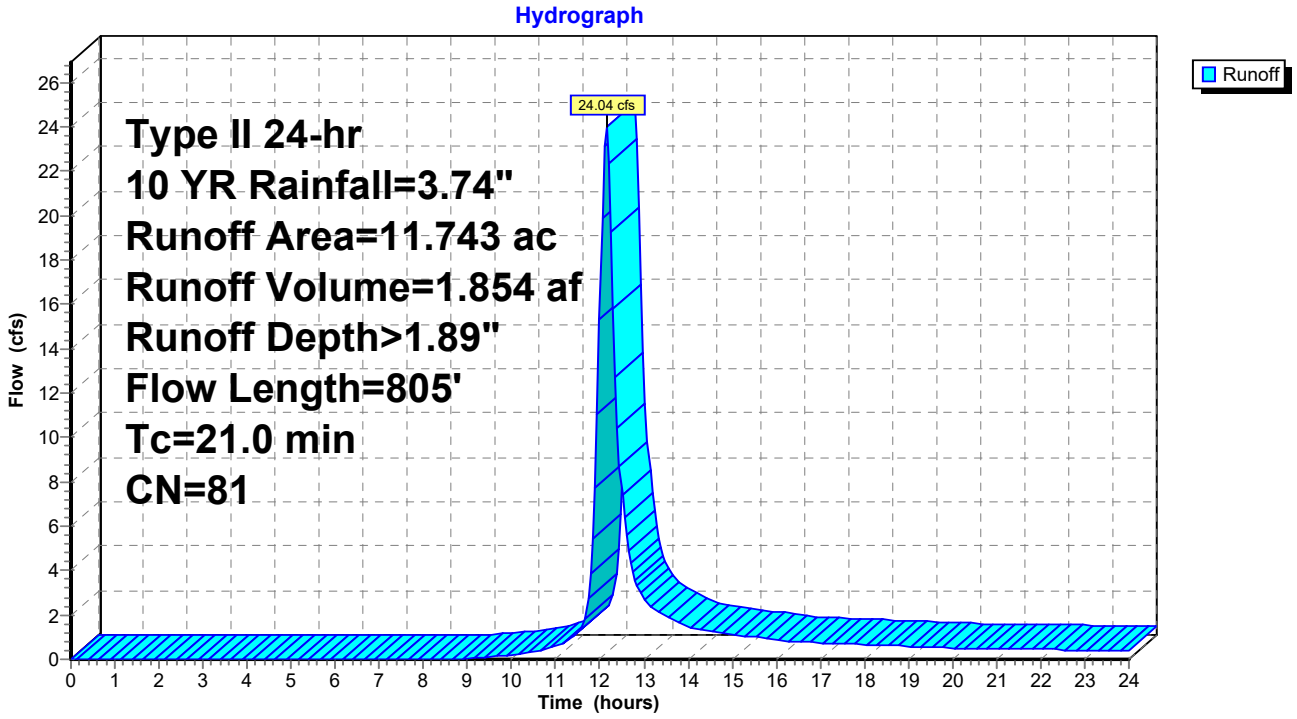
Runoff = 24.04 cfs @ 12.14 hrs, Volume= 1.854 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

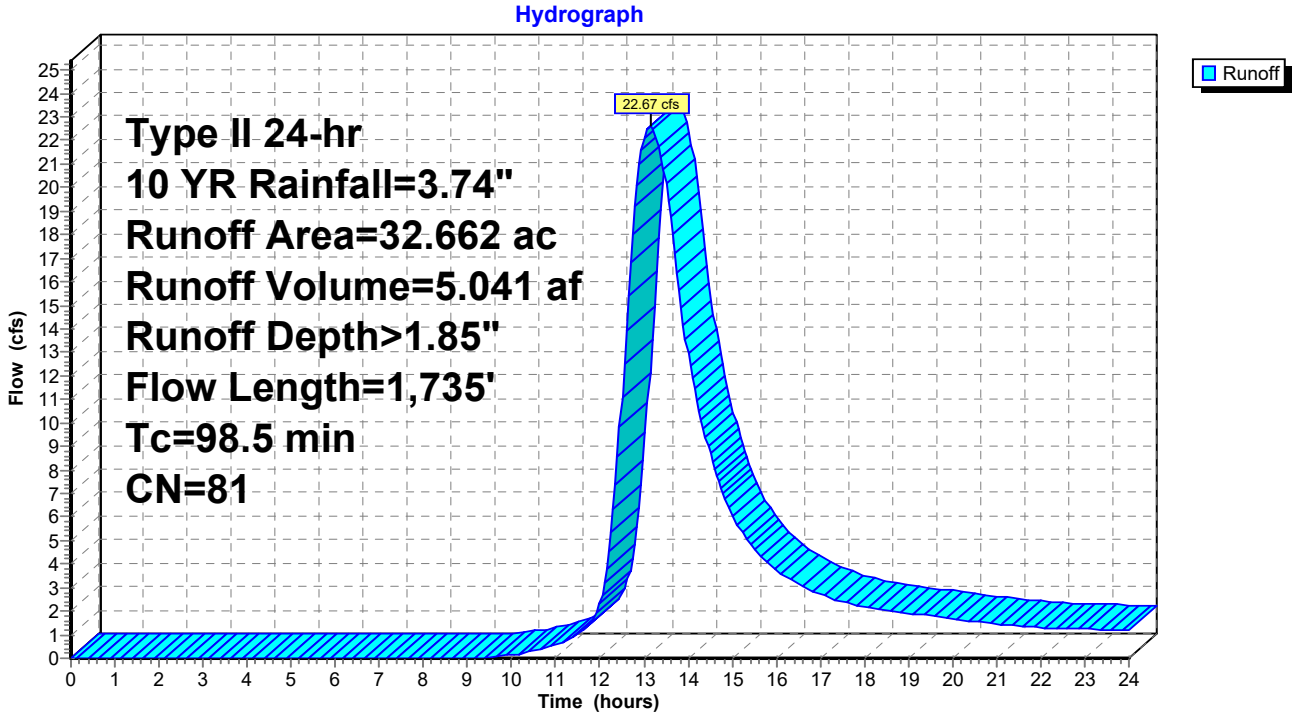
Runoff = 22.67 cfs @ 13.16 hrs, Volume= 5.041 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

Subcatchment 29S: Pre-Dev Subarea 2450



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>2.48"
Flow Length=805' Tc=21.0 min CN=81 Runoff=31.57 cfs 2.430 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>2.43"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=29.94 cfs 6.616 af

Total Runoff Area = 44.405 ac Runoff Volume = 9.046 af Average Runoff Depth = 2.44"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

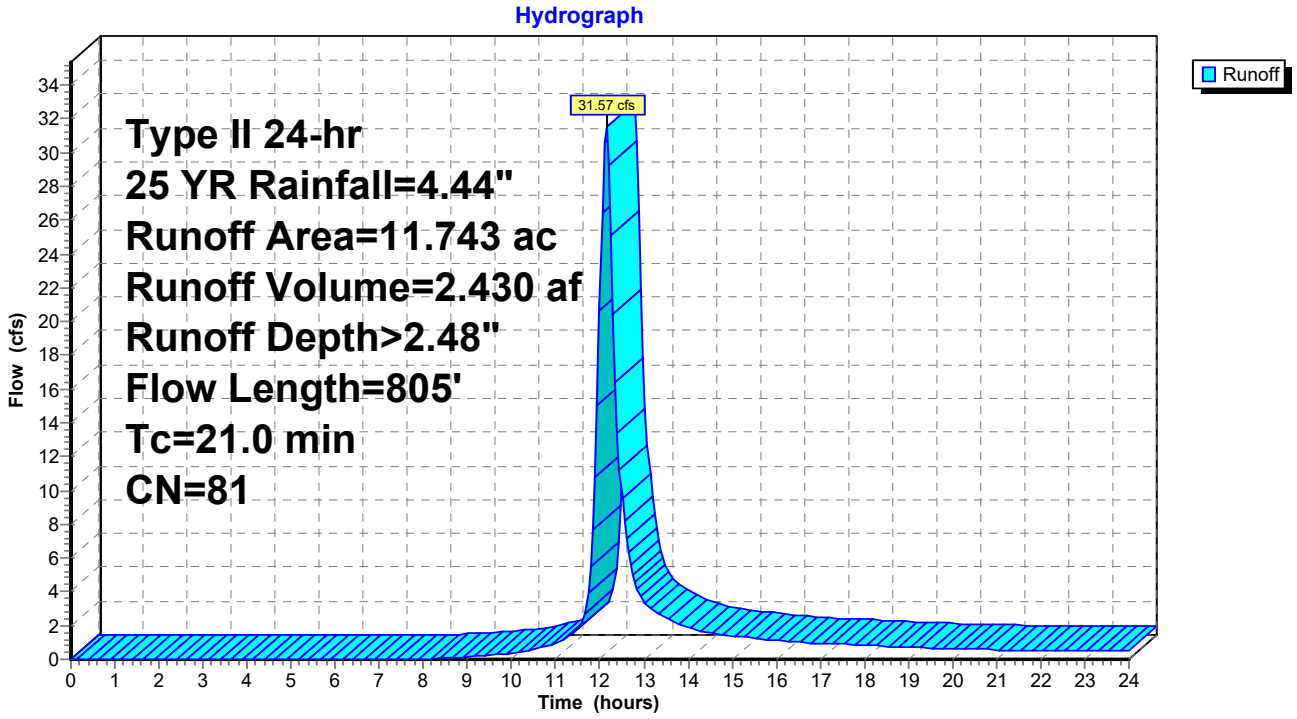
Runoff = 31.57 cfs @ 12.14 hrs, Volume= 2.430 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

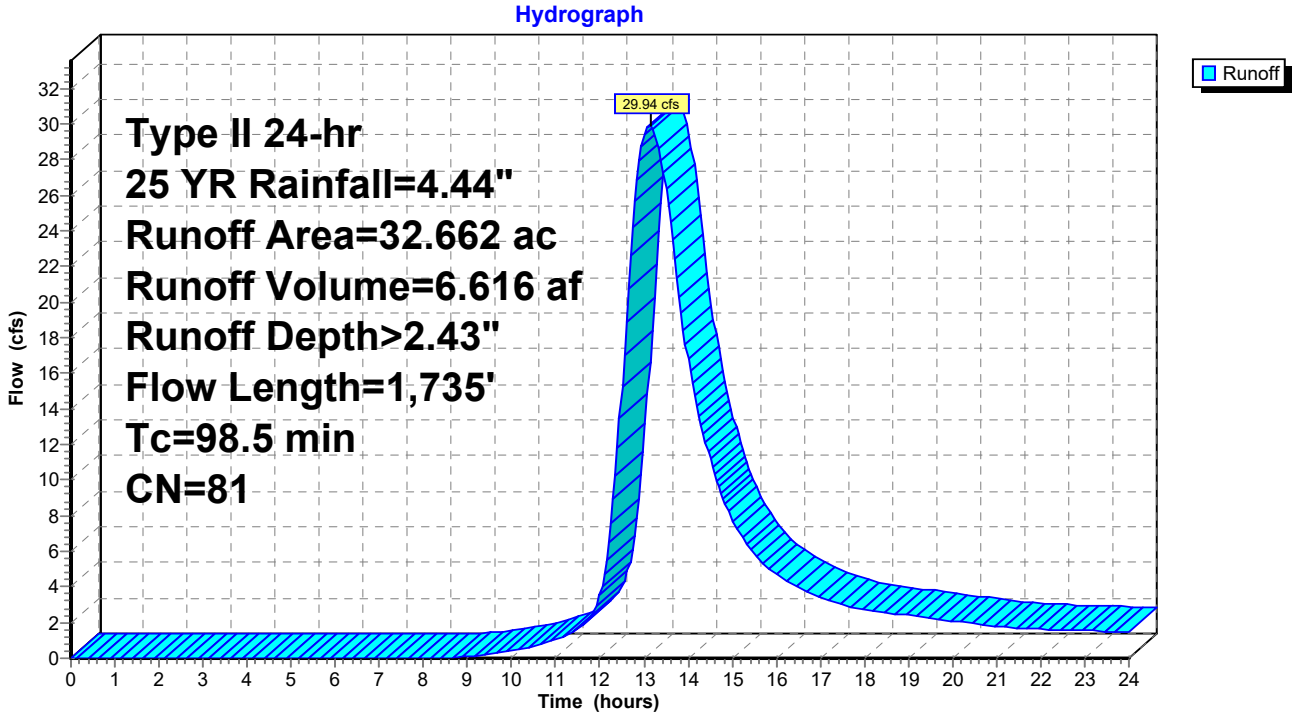
Runoff = 29.94 cfs @ 13.14 hrs, Volume= 6.616 af, Depth> 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

Subcatchment 29S: Pre-Dev Subarea 2450



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>2.99"
Flow Length=805' Tc=21.0 min CN=81 Runoff=37.94 cfs 2.924 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=36.13 cfs 7.967 af

Total Runoff Area = 44.405 ac Runoff Volume = 10.891 af Average Runoff Depth = 2.94"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

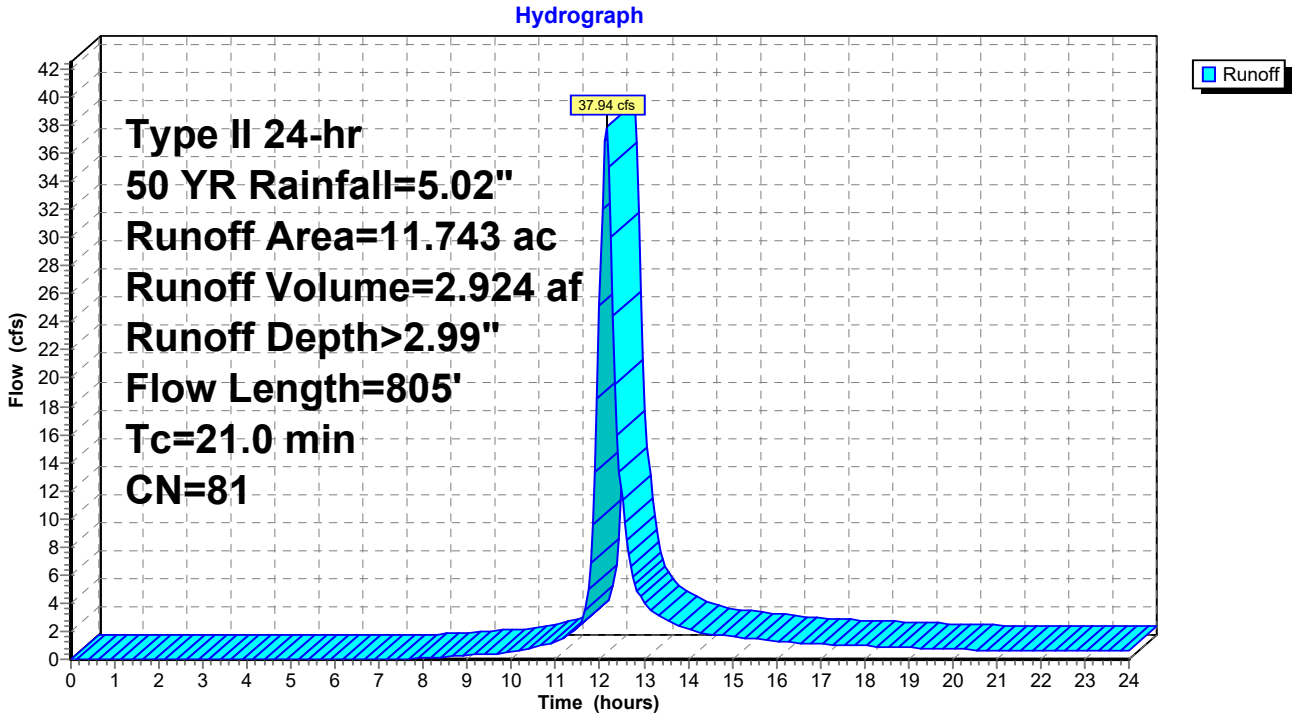
Runoff = 37.94 cfs @ 12.14 hrs, Volume= 2.924 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

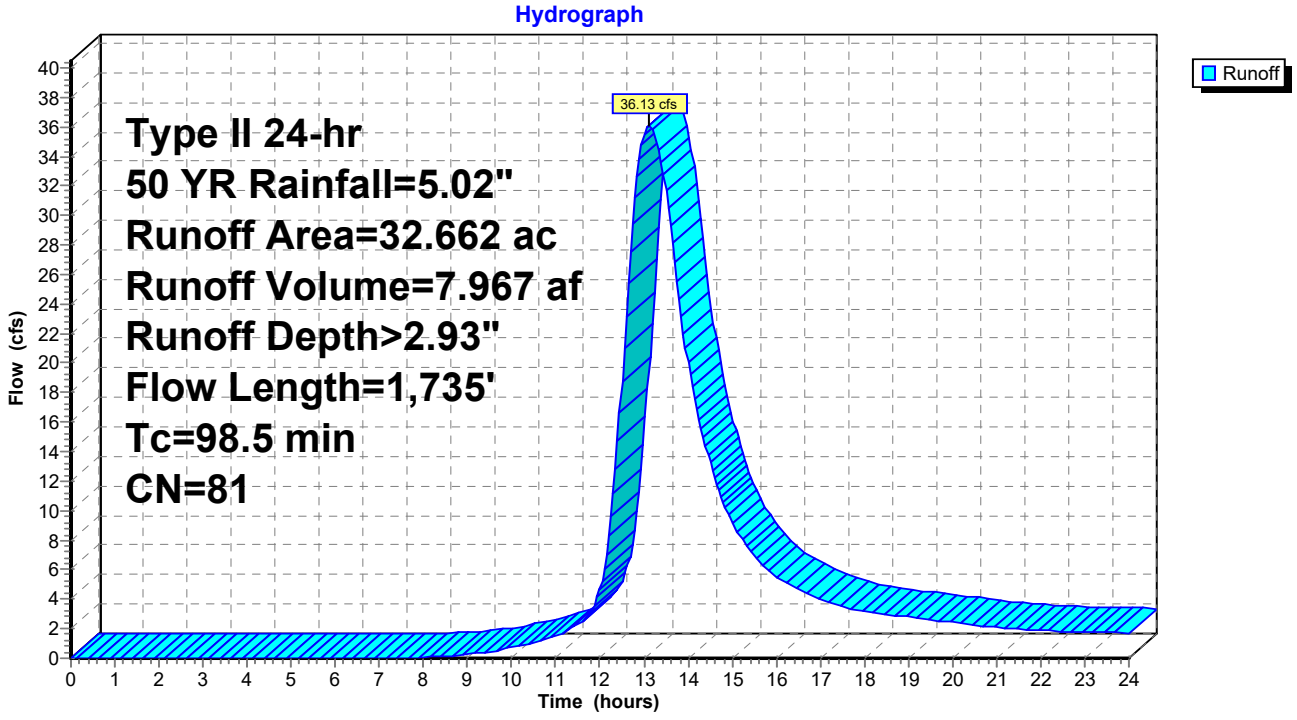
Runoff = 36.13 cfs @ 13.13 hrs, Volume= 7.967 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

Subcatchment 29S: Pre-Dev Subarea 2450



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-Dev Subarea 2430 Runoff Area=11.743 ac 0.00% Impervious Runoff Depth>3.53"
Flow Length=805' Tc=21.0 min CN=81 Runoff=44.72 cfs 3.456 af

Subcatchment29S: Pre-Dev Subarea 2450 Runoff Area=32.662 ac 0.00% Impervious Runoff Depth>3.46"
Flow Length=1,735' Tc=98.5 min CN=81 Runoff=42.75 cfs 9.421 af

Total Runoff Area = 44.405 ac Runoff Volume = 12.876 af Average Runoff Depth = 3.48"
100.00% Pervious = 44.405 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Dev Subarea 2430

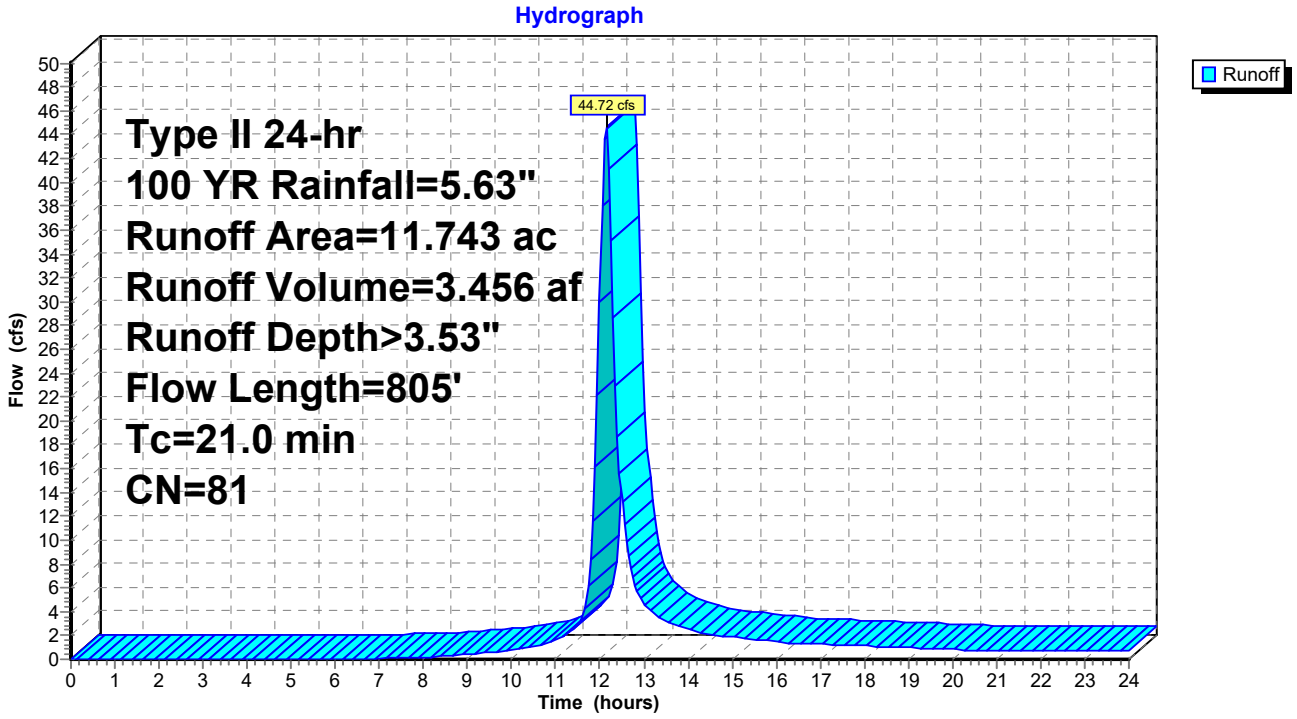
Runoff = 44.72 cfs @ 12.14 hrs, Volume= 3.456 af, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
11.743	81	Row crops, C&T, Good, HSG D
11.743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0249	0.32		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
15.8	705	0.0068	0.74		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
21.0	805	Total			

Subcatchment 1S: Pre-Dev Subarea 2430



Summary for Subcatchment 29S: Pre-Dev Subarea 2450

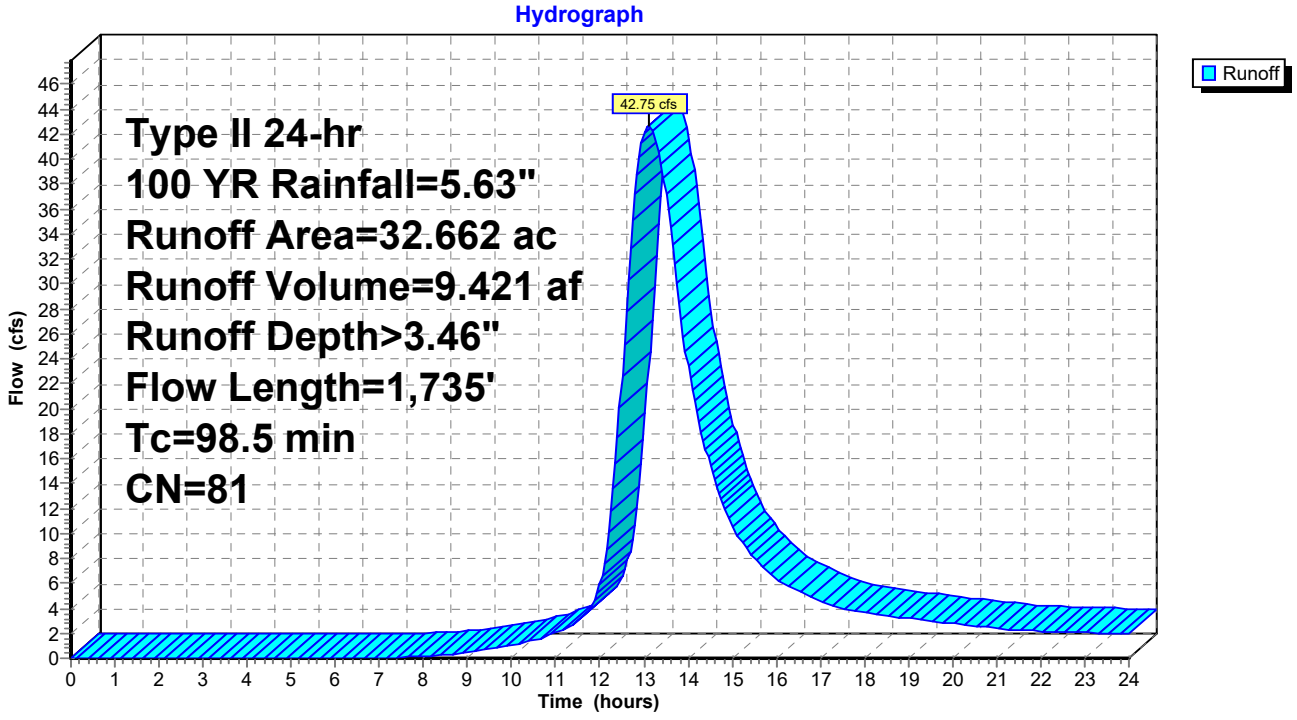
Runoff = 42.75 cfs @ 13.13 hrs, Volume= 9.421 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
31.617	81	Row crops, C&T, Good, HSG D
1.045	79	Woods/grass comb., Good, HSG D
32.662	81	Weighted Average
32.662		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.3	100	0.0001	0.04		**Sheet Flow, A-B** Cultivated: Residue<=20% n= 0.060 P2= 2.20"
51.2	1,635	0.0035	0.53		**Shallow Concentrated Flow, B-C** Cultivated Straight Rows Kv= 9.0 fps
98.5	1,735	Total			

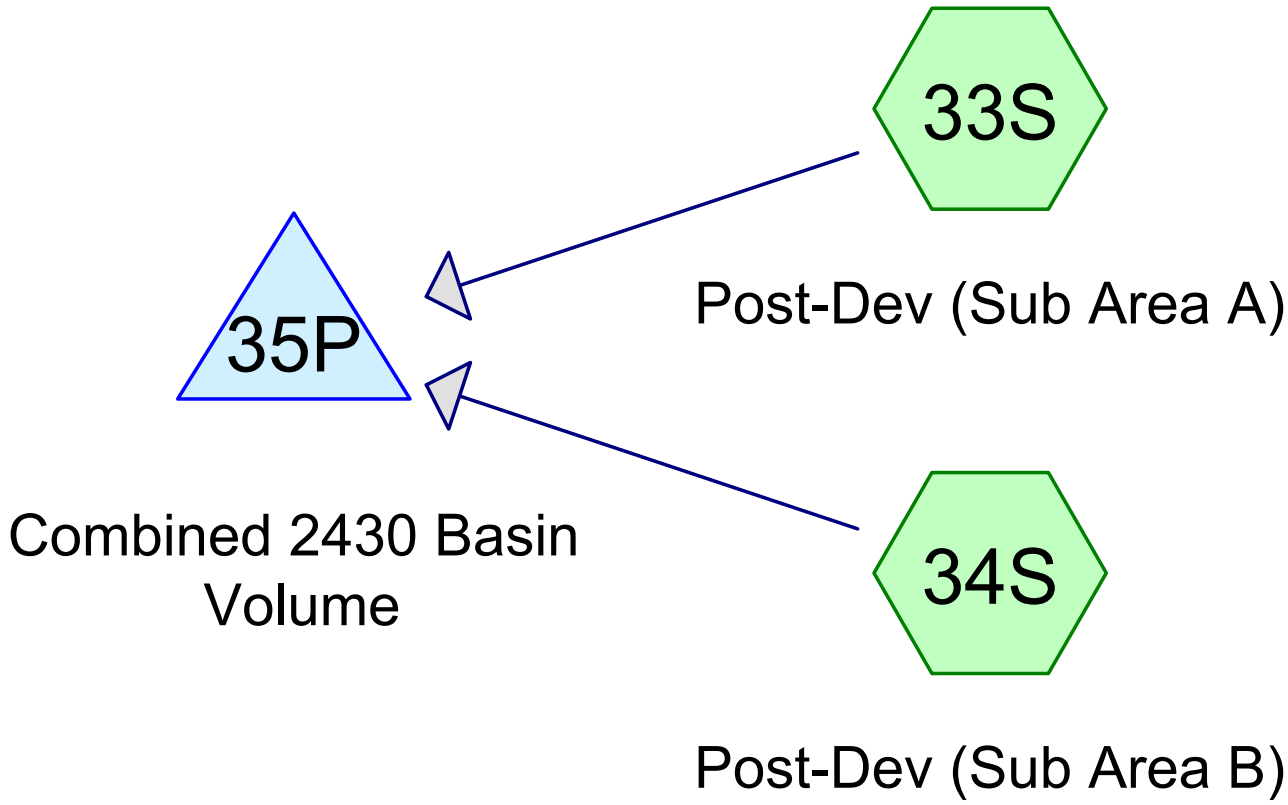
Subcatchment 29S: Pre-Dev Subarea 2450



Appendix C

Post-Developed Calculations

Note: Assumes that the volume required is provided



Subcat Reach Pond Link

Routing Diagram for Drainage Calcs
Prepared by American Structurepoint, Printed 1/14/2026

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1 YR	Type II 24-hr		Default	24.00	1	2.20	2
2	2 YR	Type II 24-hr		Default	24.00	1	2.63	2
3	5 YR	Type II 24-hr		Default	24.00	1	3.24	2
4	10 YR	Type II 24-hr		Default	24.00	1	3.74	2
5	25 YR	Type II 24-hr		Default	24.00	1	4.44	2
6	50 YR	Type II 24-hr		Default	24.00	1	5.02	2
7	100 YR	Type II 24-hr		Default	24.00	1	5.63	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.730	95	Urban commercial, 85% imp, HSG D (33S, 34S)
8.730	**95**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
8.730	HSG D	33S, 34S
0.000	Other	
8.730		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	8.730	0.000	8.730	Urban commercial, 85% imp	33S, 34S
0.000	**0.000**	**0.000**	**8.730**	**0.000**	**8.730**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	35P	939.10	938.96	111.0	0.0013	0.011	0.0	24.0	0.0	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=95 Runoff=14.98 cfs 0.862 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=95 Runoff=6.15 cfs 0.354 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=941.02' Storage=35,838 cf Inflow=21.12 cfs 1.216 af
Outflow=0.56 cfs 0.561 af

Total Runoff Area = 8.730 ac Runoff Volume = 1.216 af Average Runoff Depth = 1.67"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

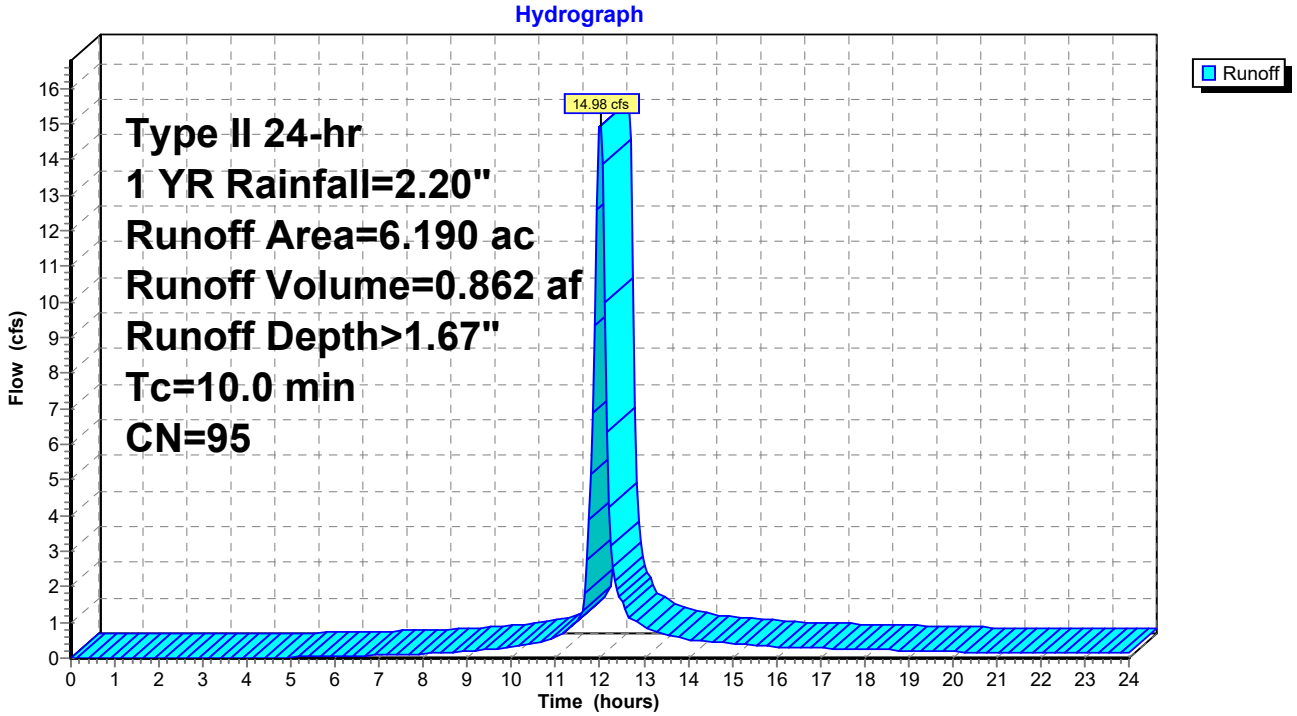
Runoff = 14.98 cfs @ 12.01 hrs, Volume= 0.862 af, Depth> 1.67"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

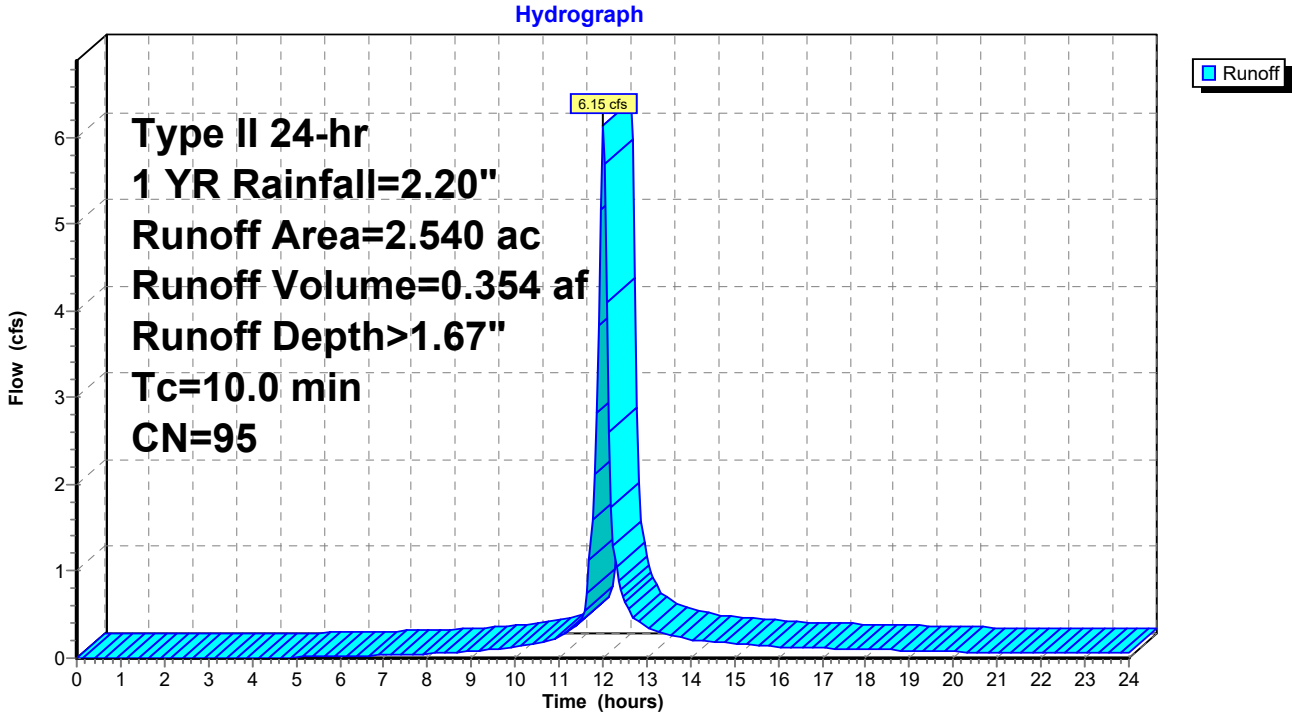
Runoff = 6.15 cfs @ 12.01 hrs, Volume= 0.354 af, Depth> 1.67"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 1.67" for 1 YR event
Inflow = 21.12 cfs @ 12.01 hrs, Volume= 1.216 af
Outflow = 0.56 cfs @ 15.11 hrs, Volume= 0.561 af, Atten= 97%, Lag= 186.3 min
Primary = 0.56 cfs @ 15.11 hrs, Volume= 0.561 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 941.02' @ 15.11 hrs Surf.Area= 20,613 sf Storage= 35,838 cf

Plug-Flow detention time= 375.6 min calculated for 0.560 af (46% of inflow)
Center-of-Mass det. time= 260.5 min (1,053.1 - 792.6)

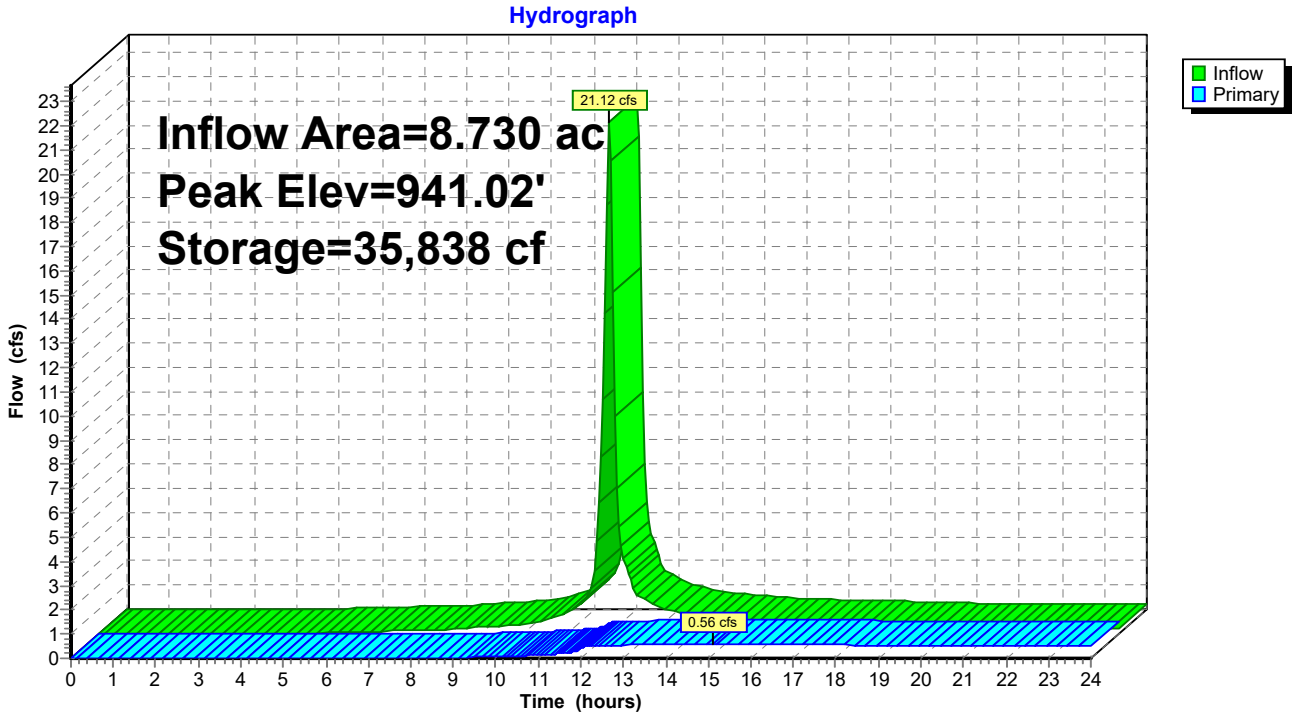
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

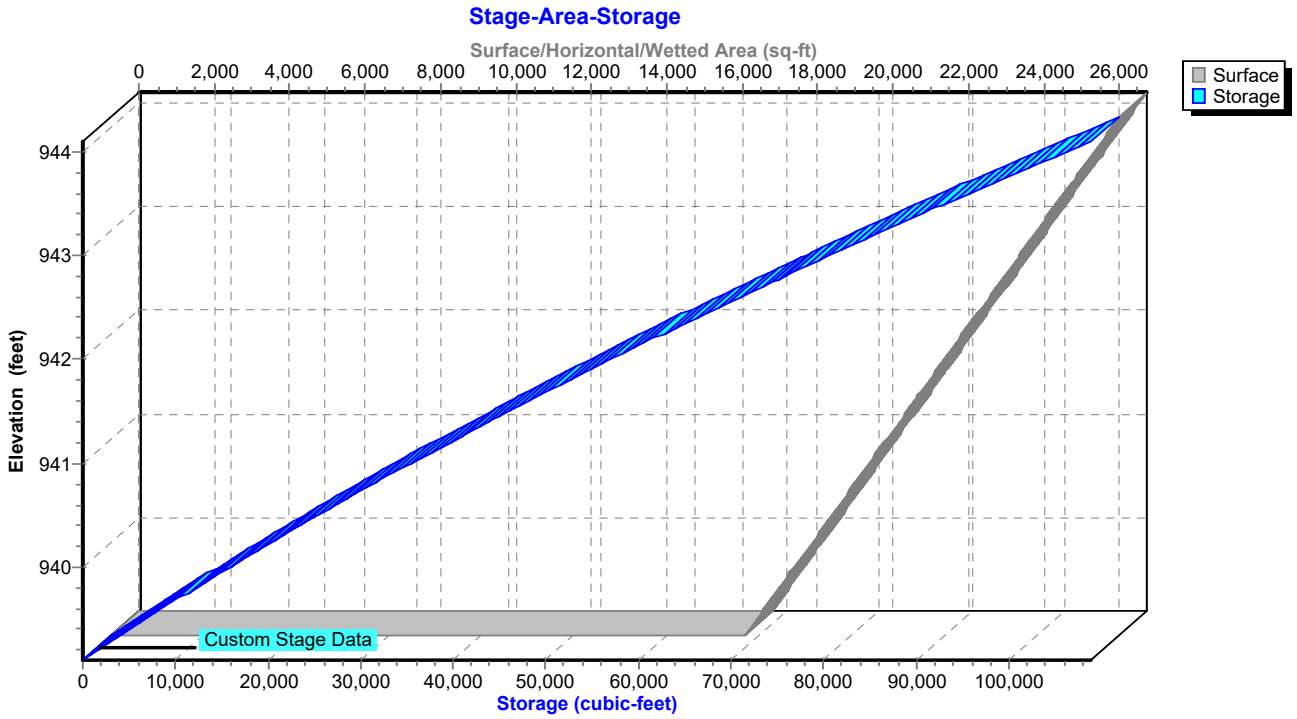
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.56 cfs @ 15.11 hrs HW=941.02' (Free Discharge)
└**1=Culvert** (Passes 0.56 cfs of 10.09 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.56 cfs @ 6.37 fps)
  ├**3=Stage 1 Window** (Controls 0.00 cfs)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>2.09"
Tc=10.0 min CN=95 Runoff=18.45 cfs 1.076 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>2.09"
Tc=10.0 min CN=95 Runoff=7.57 cfs 0.441 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=941.46' Storage=45,198 cf Inflow=26.02 cfs 1.517 af
Outflow=0.71 cfs 0.659 af

Total Runoff Area = 8.730 ac Runoff Volume = 1.517 af Average Runoff Depth = 2.09"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

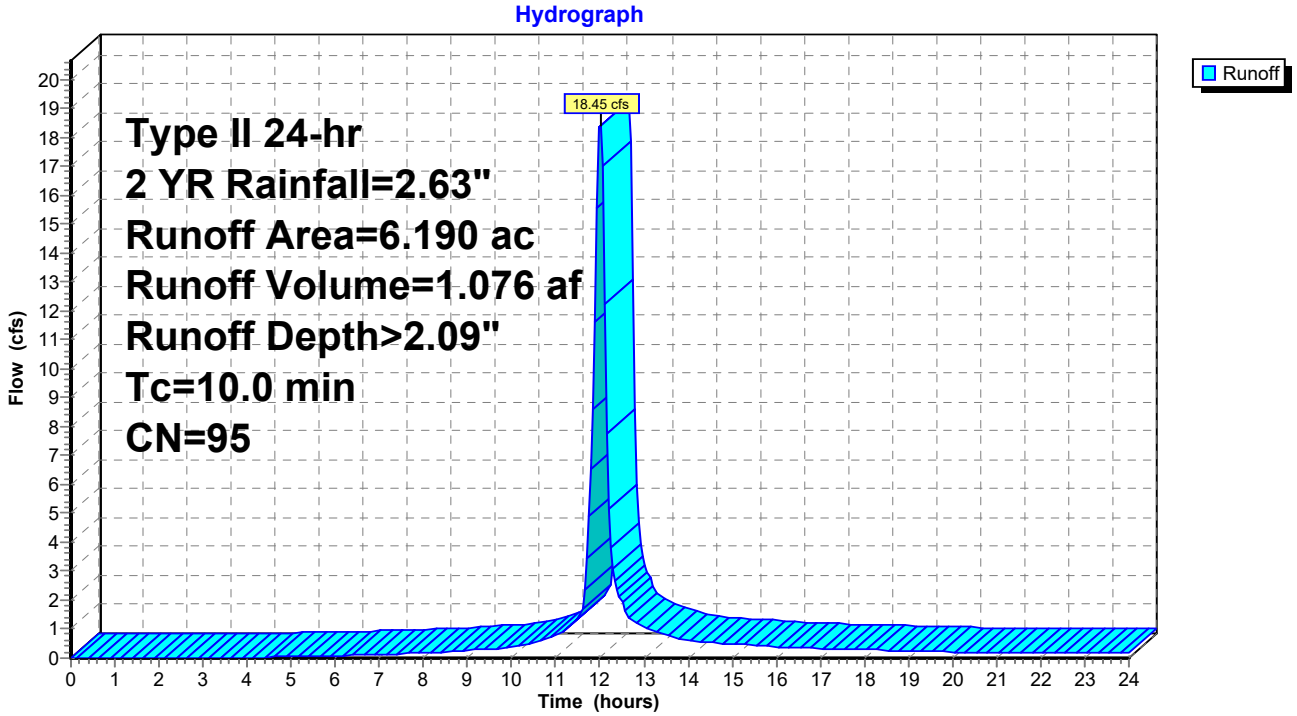
Runoff = 18.45 cfs @ 12.01 hrs, Volume= 1.076 af, Depth> 2.09"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

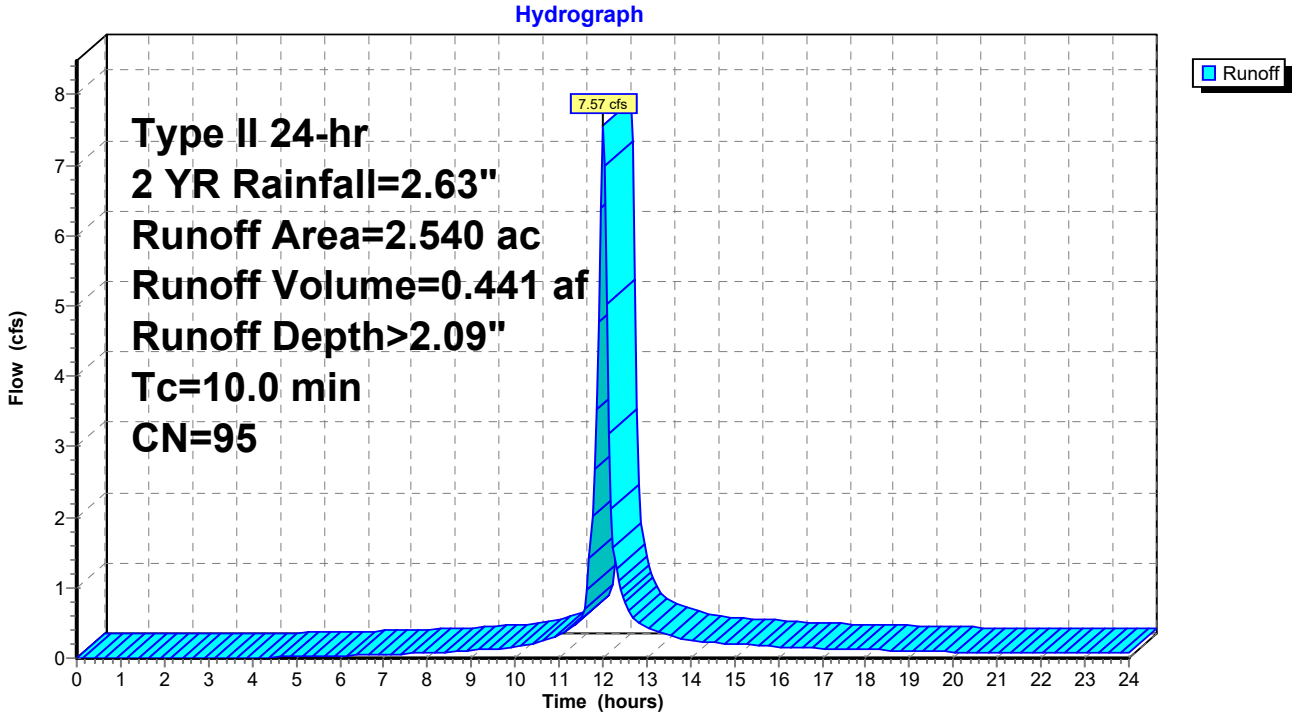
Runoff = 7.57 cfs @ 12.01 hrs, Volume= 0.441 af, Depth> 2.09"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 2.09" for 2 YR event
Inflow = 26.02 cfs @ 12.01 hrs, Volume= 1.517 af
Outflow = 0.71 cfs @ 14.91 hrs, Volume= 0.659 af, Atten= 97%, Lag= 174.1 min
Primary = 0.71 cfs @ 14.91 hrs, Volume= 0.659 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 941.46' @ 14.91 hrs Surf.Area= 21,495 sf Storage= 45,198 cf

Plug-Flow detention time= 376.9 min calculated for 0.659 af (43% of inflow)
Center-of-Mass det. time= 256.6 min (1,043.1 - 786.5)

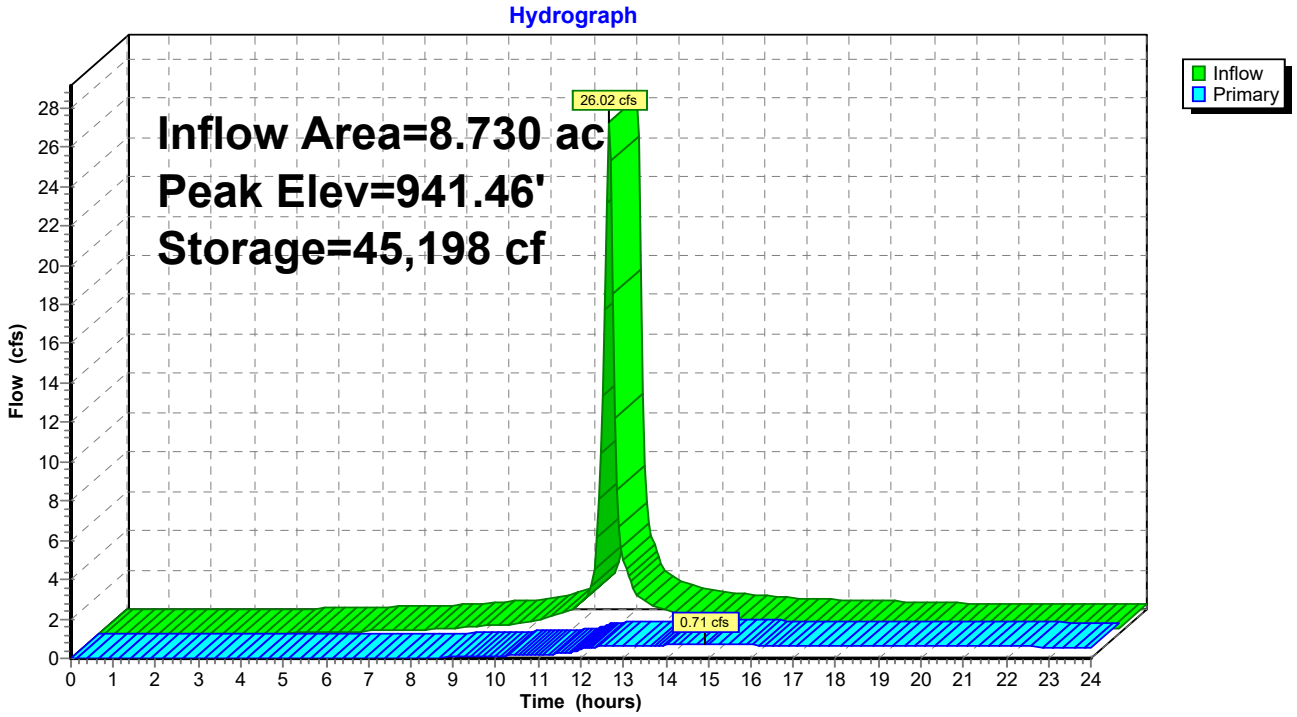
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

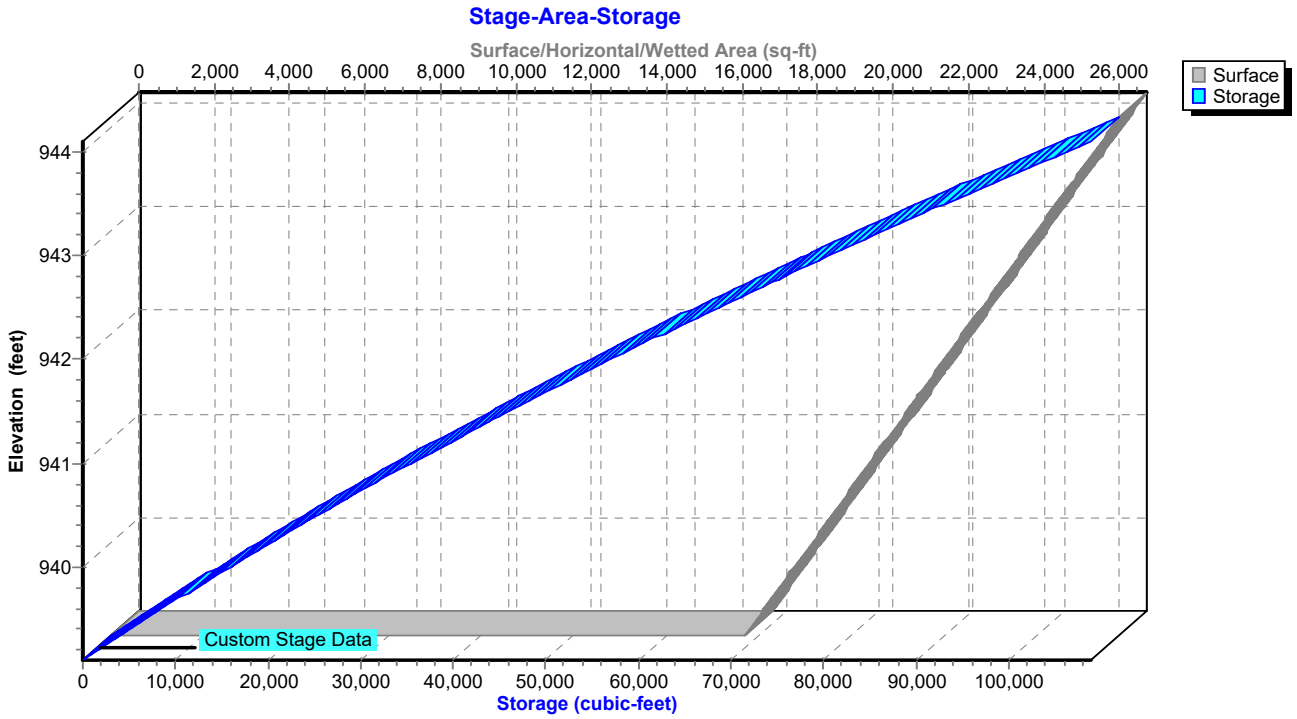
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.70 cfs @ 14.91 hrs HW=941.46' (Free Discharge)
└**1=Culvert** (Passes 0.70 cfs of 13.36 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.62 cfs @ 7.13 fps)
  ├**3=Stage 1 Window** (Orifice Controls 0.08 cfs @ 0.71 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=95 Runoff=23.35 cfs 1.382 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=95 Runoff=9.58 cfs 0.567 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=941.77' Storage=51,985 cf Inflow=32.93 cfs 1.949 af
Outflow=2.25 cfs 1.032 af

Total Runoff Area = 8.730 ac Runoff Volume = 1.949 af Average Runoff Depth = 2.68"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

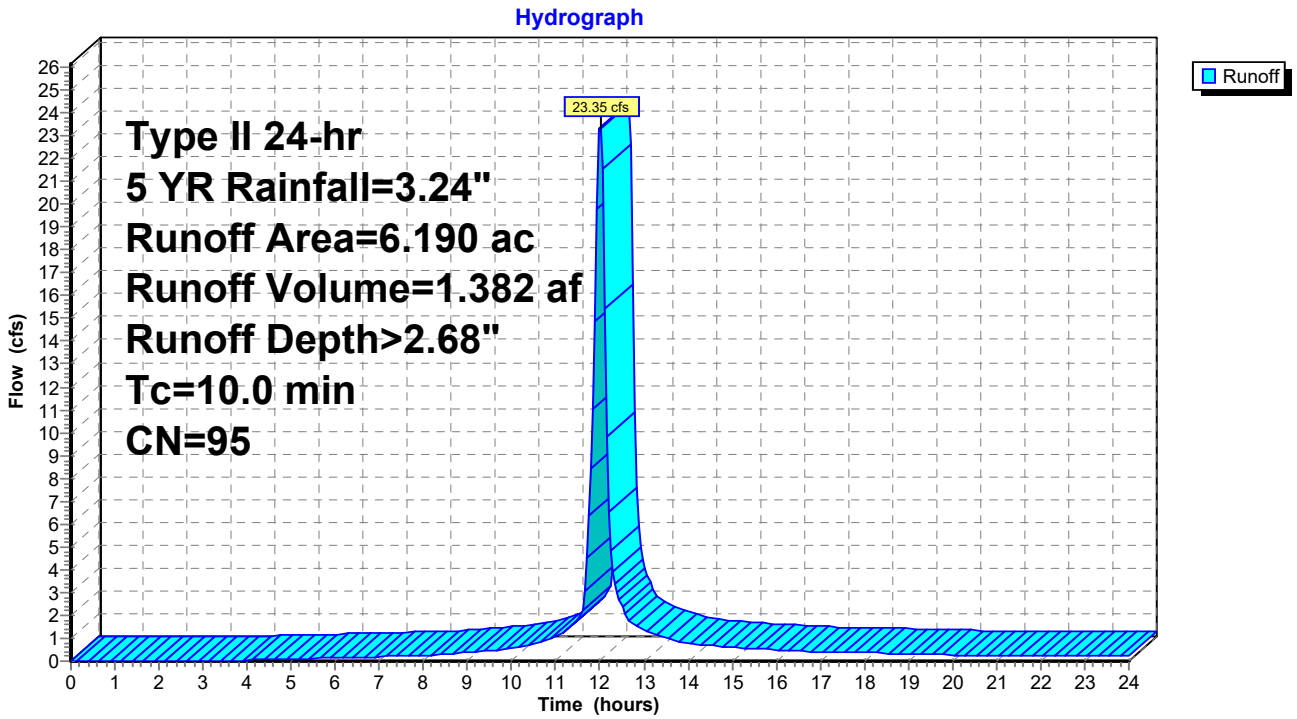
Runoff = 23.35 cfs @ 12.01 hrs, Volume= 1.382 af, Depth> 2.68"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

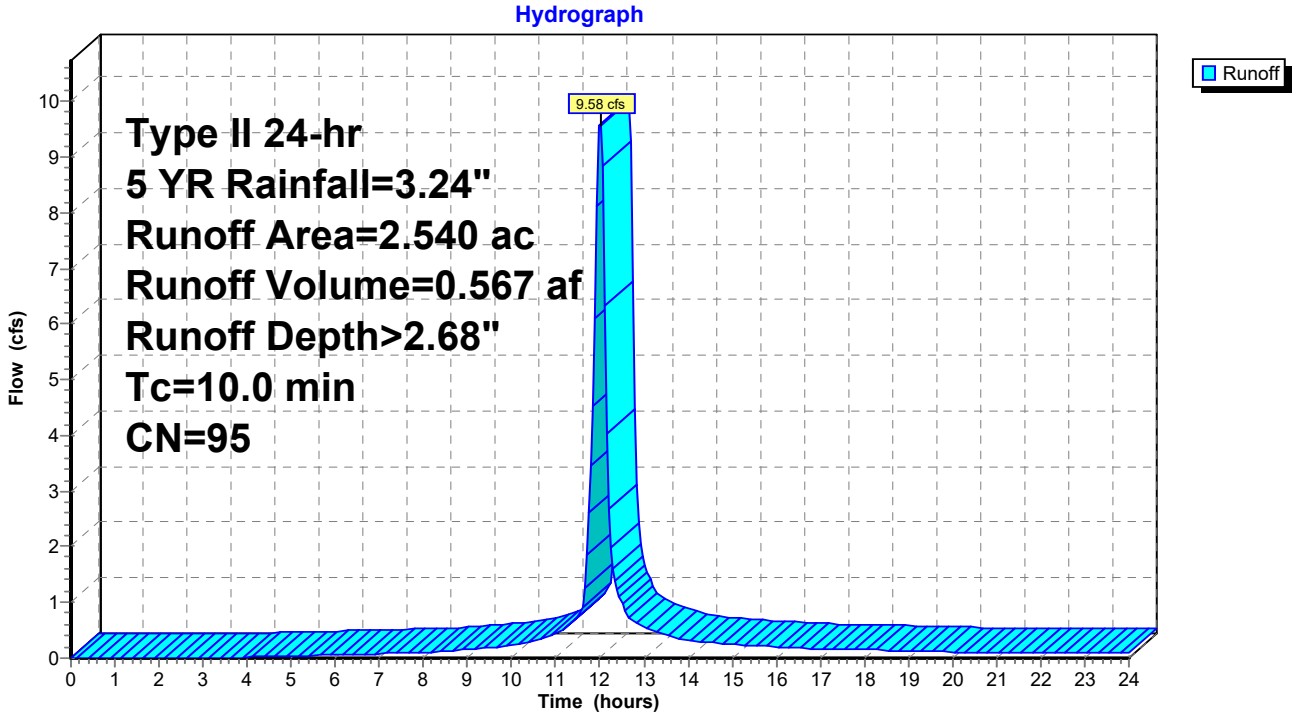
Runoff = 9.58 cfs @ 12.01 hrs, Volume= 0.567 af, Depth> 2.68"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 2.68" for 5 YR event
Inflow = 32.93 cfs @ 12.01 hrs, Volume= 1.949 af
Outflow = 2.25 cfs @ 12.77 hrs, Volume= 1.032 af, Atten= 93%, Lag= 45.8 min
Primary = 2.25 cfs @ 12.77 hrs, Volume= 1.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 941.77' @ 12.77 hrs Surf.Area= 22,112 sf Storage= 51,985 cf

Plug-Flow detention time= 297.6 min calculated for 1.032 af (53% of inflow)
Center-of-Mass det. time= 186.6 min (966.4 - 779.8)

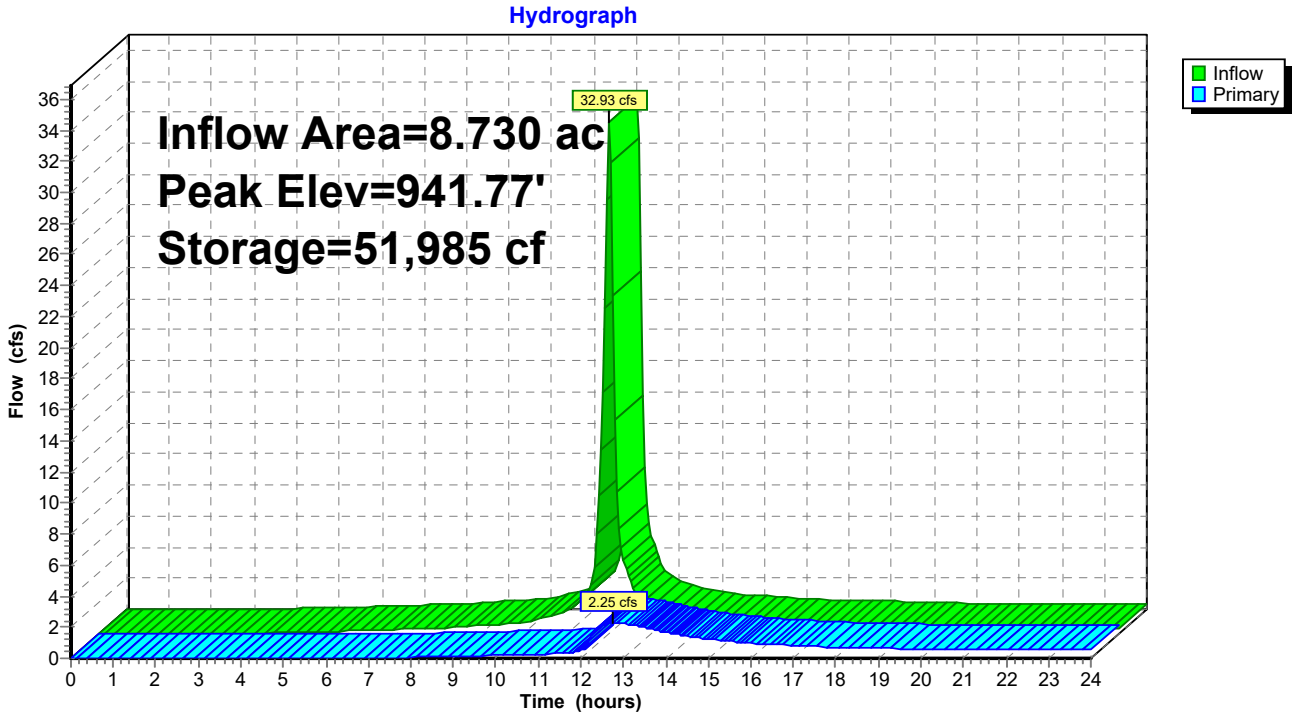
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

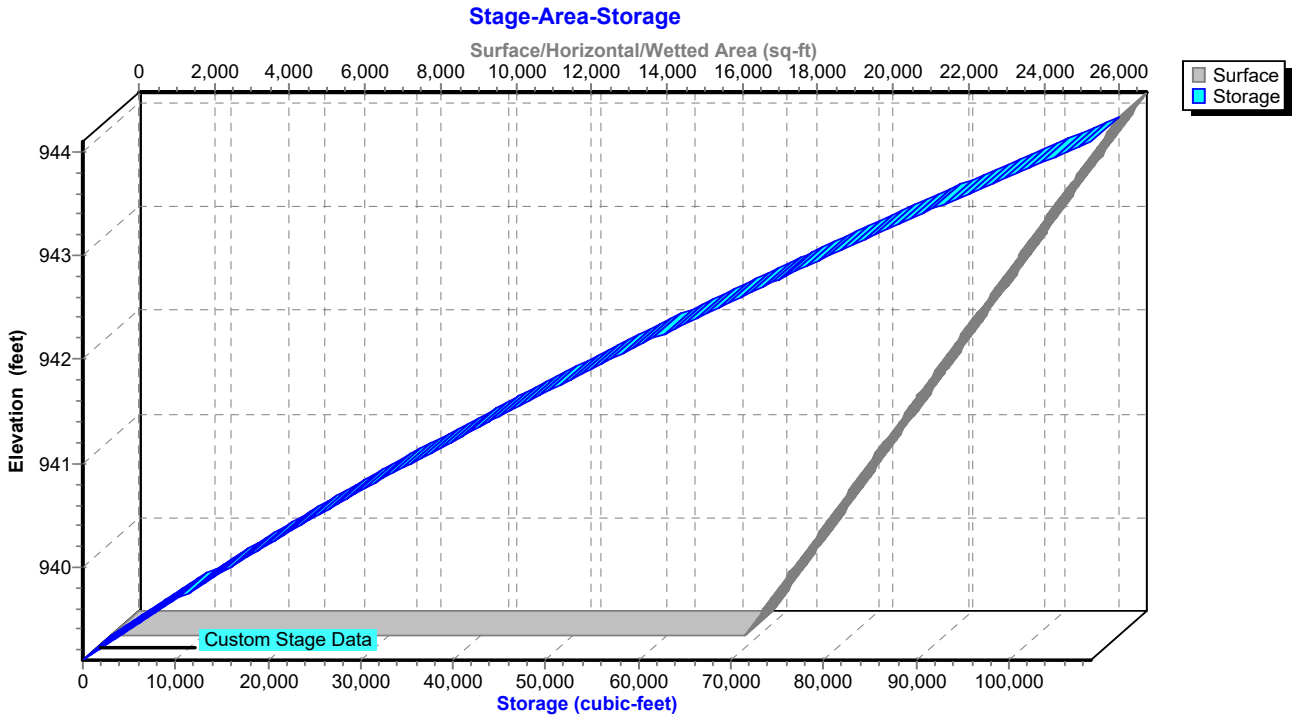
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.25 cfs @ 12.77 hrs HW=941.77' (Free Discharge)
└**1=Culvert** (Passes 2.25 cfs of 14.39 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.66 cfs @ 7.62 fps)
  ├**3=Stage 1 Window** (Orifice Controls 1.59 cfs @ 2.04 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>3.17"
Tc=10.0 min CN=95 Runoff=27.34 cfs 1.635 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>3.17"
Tc=10.0 min CN=95 Runoff=11.22 cfs 0.671 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=942.10' Storage=59,390 cf Inflow=38.55 cfs 2.306 af
Outflow=3.41 cfs 1.357 af

Total Runoff Area = 8.730 ac Runoff Volume = 2.306 af Average Runoff Depth = 3.17"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

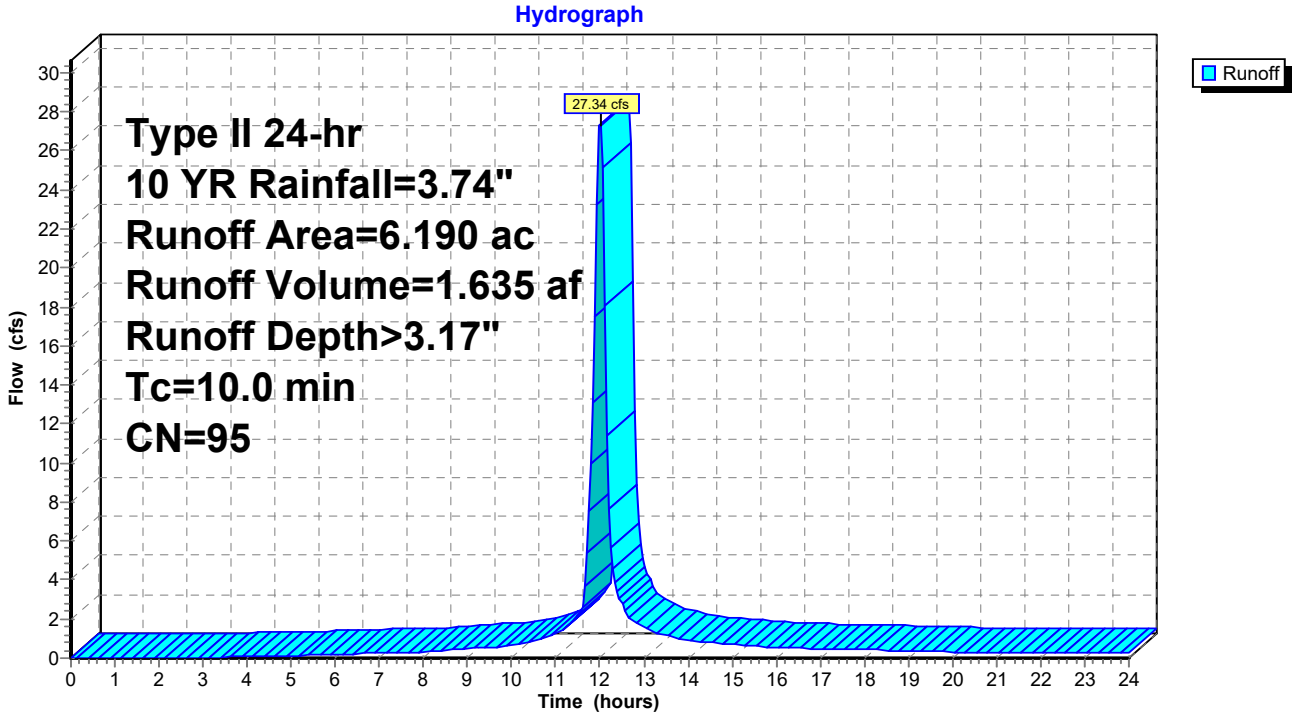
Runoff = 27.34 cfs @ 12.01 hrs, Volume= 1.635 af, Depth> 3.17"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

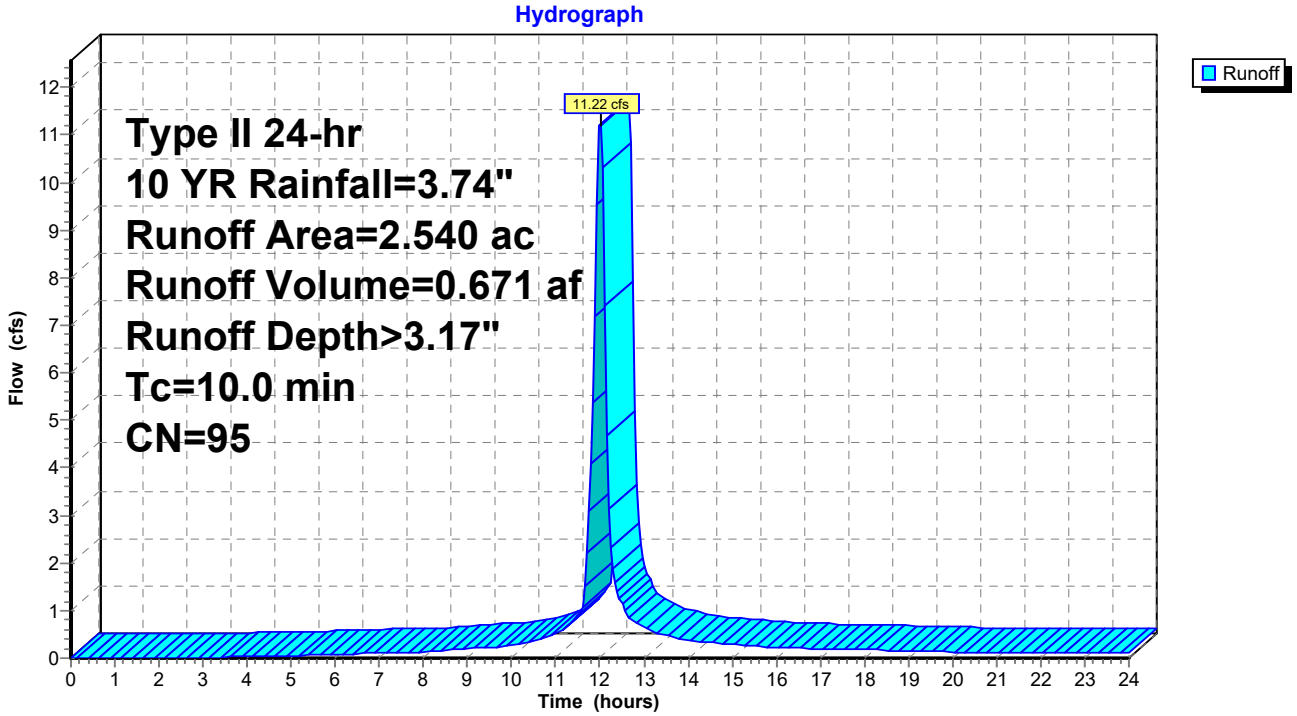
Runoff = 11.22 cfs @ 12.01 hrs, Volume= 0.671 af, Depth> 3.17"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 3.17" for 10 YR event
Inflow = 38.55 cfs @ 12.01 hrs, Volume= 2.306 af
Outflow = 3.41 cfs @ 12.57 hrs, Volume= 1.357 af, Atten= 91%, Lag= 33.8 min
Primary = 3.41 cfs @ 12.57 hrs, Volume= 1.357 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 942.10' @ 12.57 hrs Surf.Area= 22,766 sf Storage= 59,390 cf

Plug-Flow detention time= 263.0 min calculated for 1.357 af (59% of inflow)
Center-of-Mass det. time= 157.5 min (932.9 - 775.4)

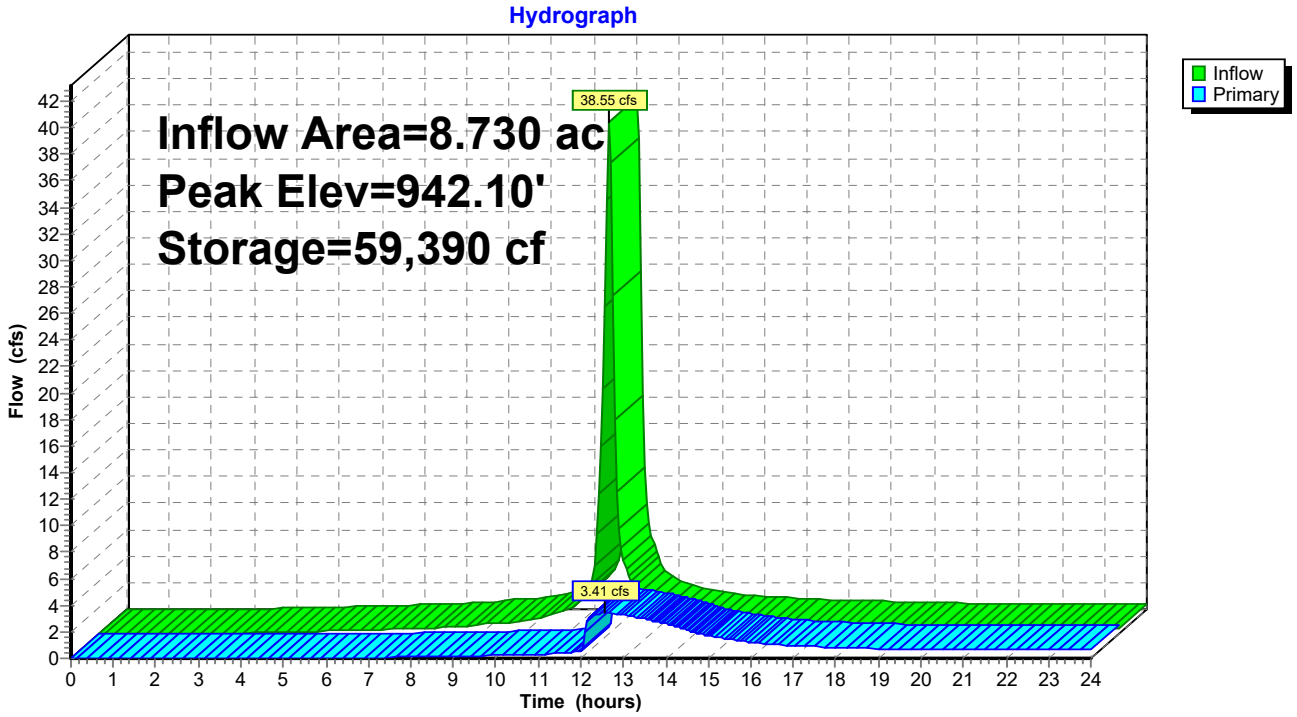
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

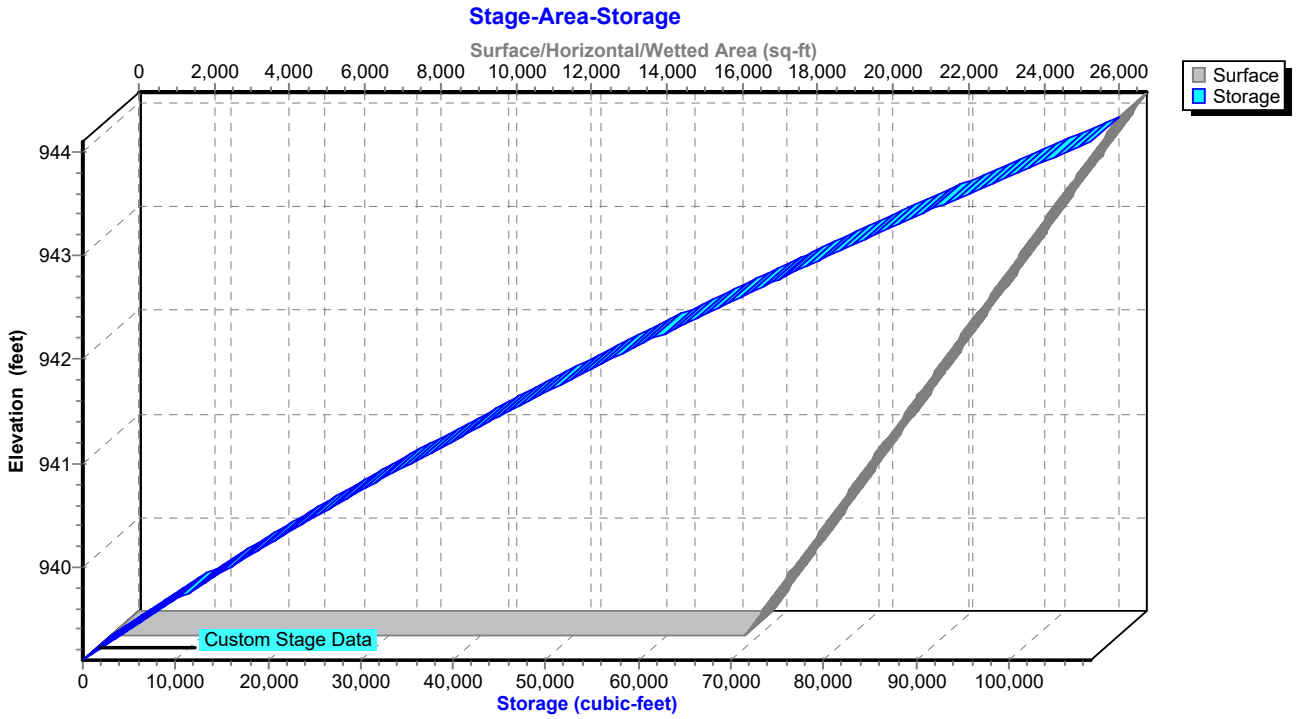
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.41 cfs @ 12.57 hrs HW=942.10' (Free Discharge)
└**1=Culvert** (Passes 3.41 cfs of 17.06 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.71 cfs @ 8.11 fps)
  ├**3=Stage 1 Window** (Orifice Controls 2.70 cfs @ 3.47 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>3.86"
Tc=10.0 min CN=95 Runoff=32.89 cfs 1.991 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>3.86"
Tc=10.0 min CN=95 Runoff=13.50 cfs 0.817 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=942.61' Storage=71,237 cf Inflow=46.38 cfs 2.808 af
Outflow=4.57 cfs 1.822 af

Total Runoff Area = 8.730 ac Runoff Volume = 2.808 af Average Runoff Depth = 3.86"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

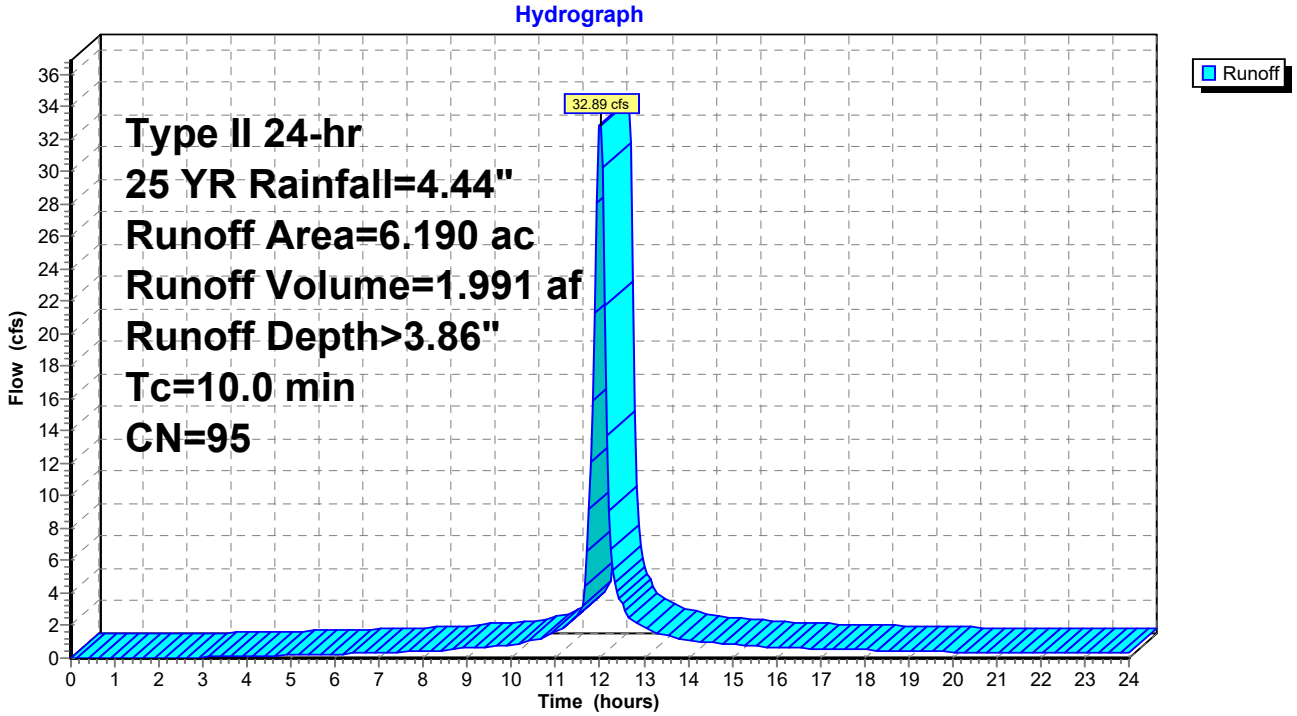
Runoff = 32.89 cfs @ 12.01 hrs, Volume= 1.991 af, Depth> 3.86"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

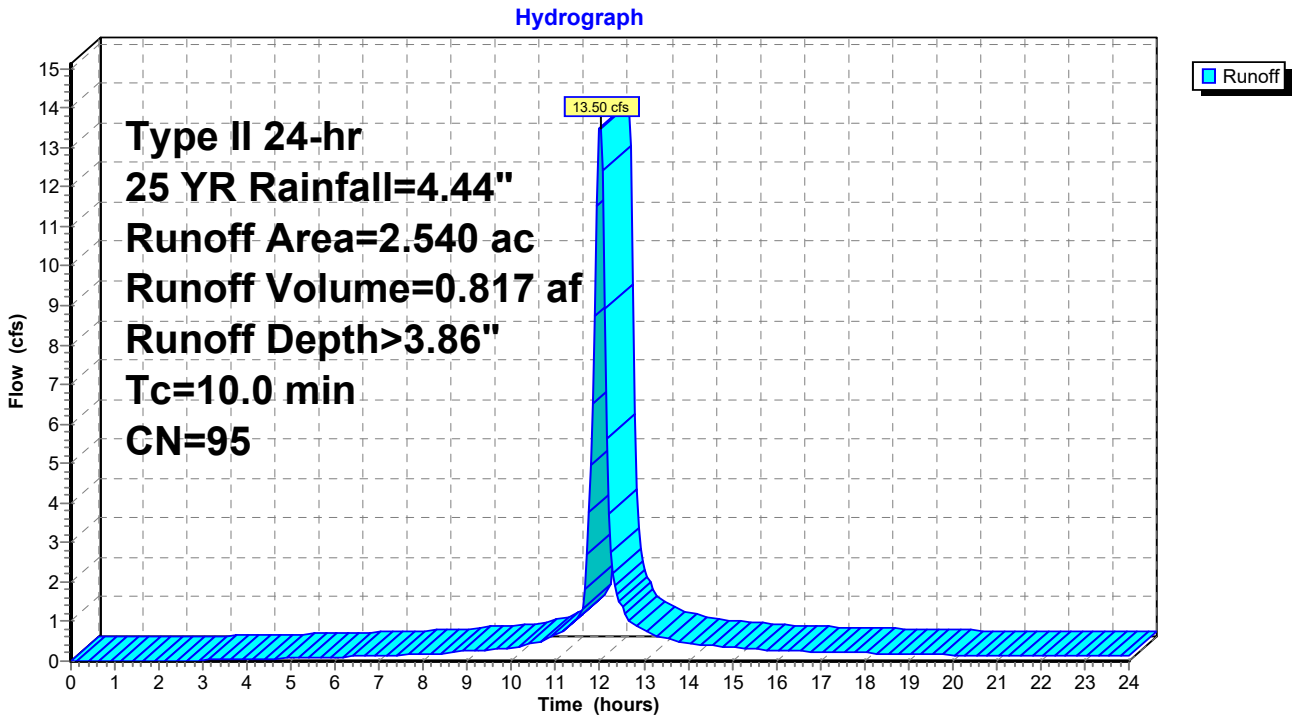
Runoff = 13.50 cfs @ 12.01 hrs, Volume= 0.817 af, Depth> 3.86"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 3.86" for 25 YR event
Inflow = 46.38 cfs @ 12.01 hrs, Volume= 2.808 af
Outflow = 4.57 cfs @ 12.51 hrs, Volume= 1.822 af, Atten= 90%, Lag= 30.4 min
Primary = 4.57 cfs @ 12.51 hrs, Volume= 1.822 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 942.61' @ 12.51 hrs Surf.Area= 23,776 sf Storage= 71,237 cf

Plug-Flow detention time= 242.5 min calculated for 1.822 af (65% of inflow)
Center-of-Mass det. time= 142.7 min (913.2 - 770.5)

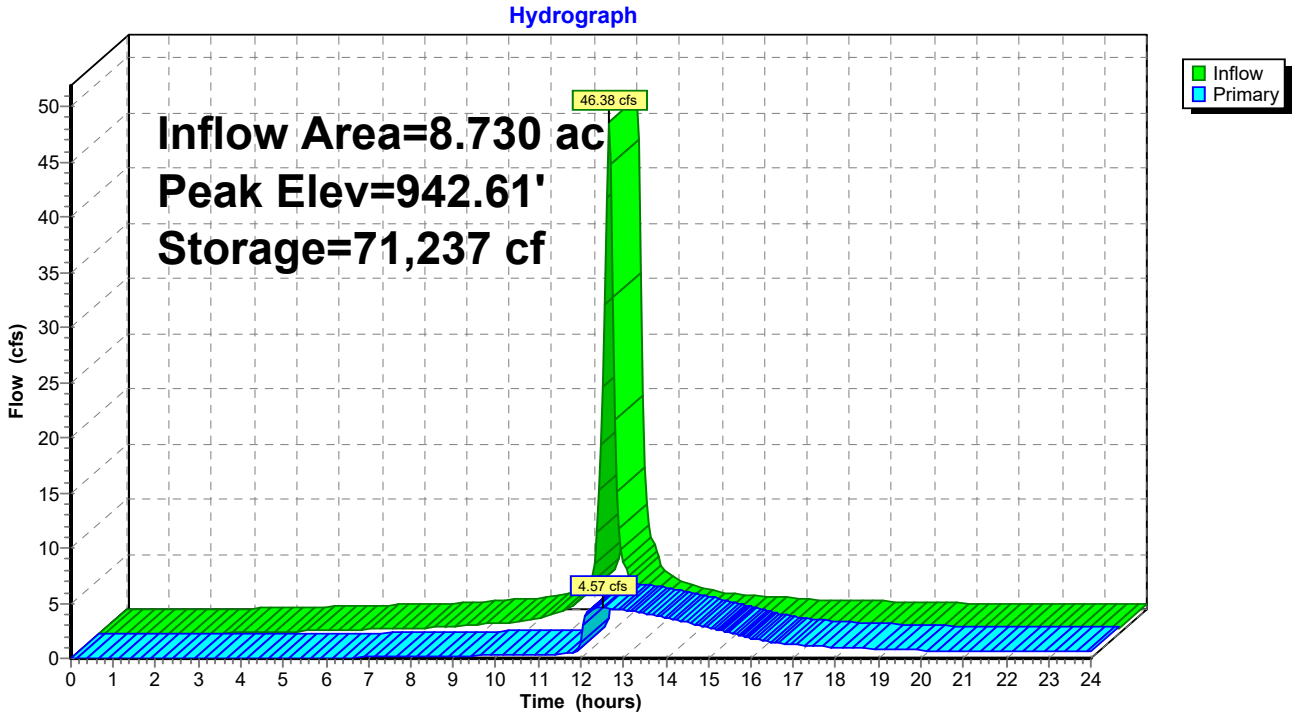
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

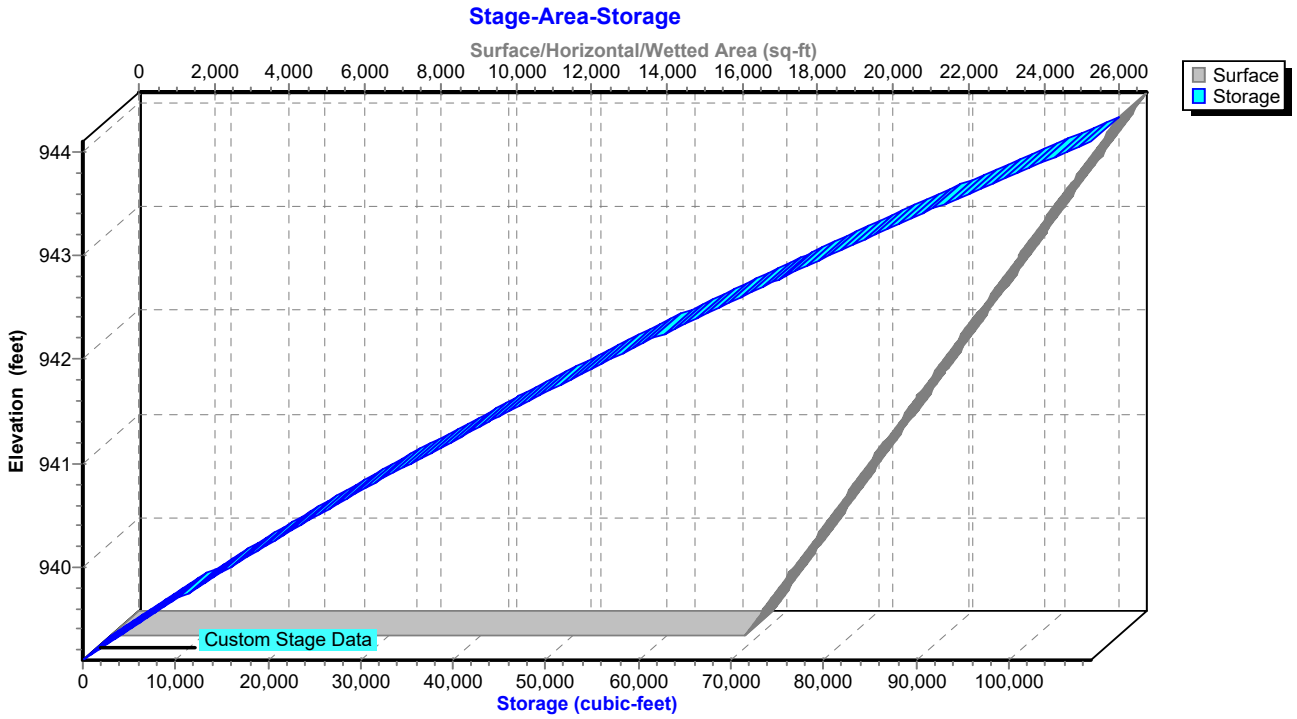
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.57 cfs @ 12.51 hrs HW=942.61' (Free Discharge)
└**1=Culvert** (Passes 4.57 cfs of 20.52 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.77 cfs @ 8.80 fps)
  ├**3=Stage 1 Window** (Orifice Controls 3.80 cfs @ 4.89 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>4.43"
Tc=10.0 min CN=95 Runoff=37.47 cfs 2.286 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>4.43"
Tc=10.0 min CN=95 Runoff=15.37 cfs 0.938 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=942.93' Storage=78,875 cf Inflow=52.84 cfs 3.224 af
Outflow=8.73 cfs 2.218 af

Total Runoff Area = 8.730 ac Runoff Volume = 3.224 af Average Runoff Depth = 4.43"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

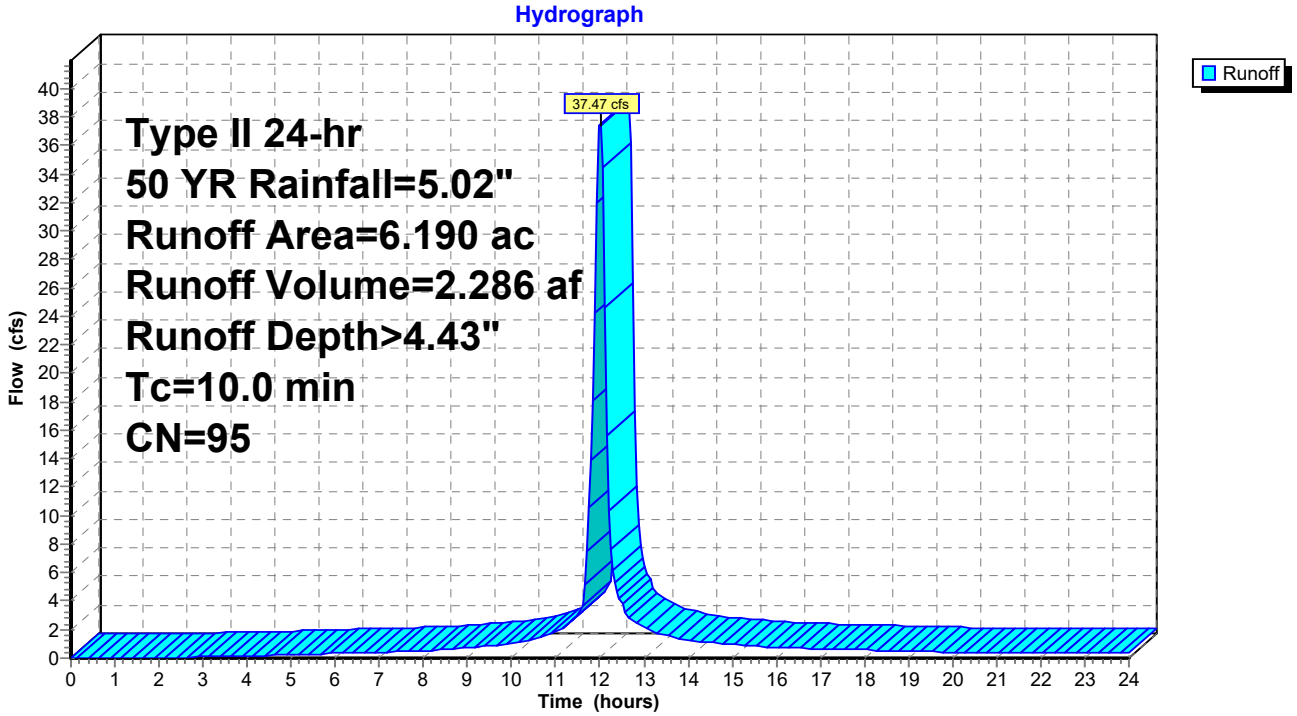
Runoff = 37.47 cfs @ 12.01 hrs, Volume= 2.286 af, Depth> 4.43"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

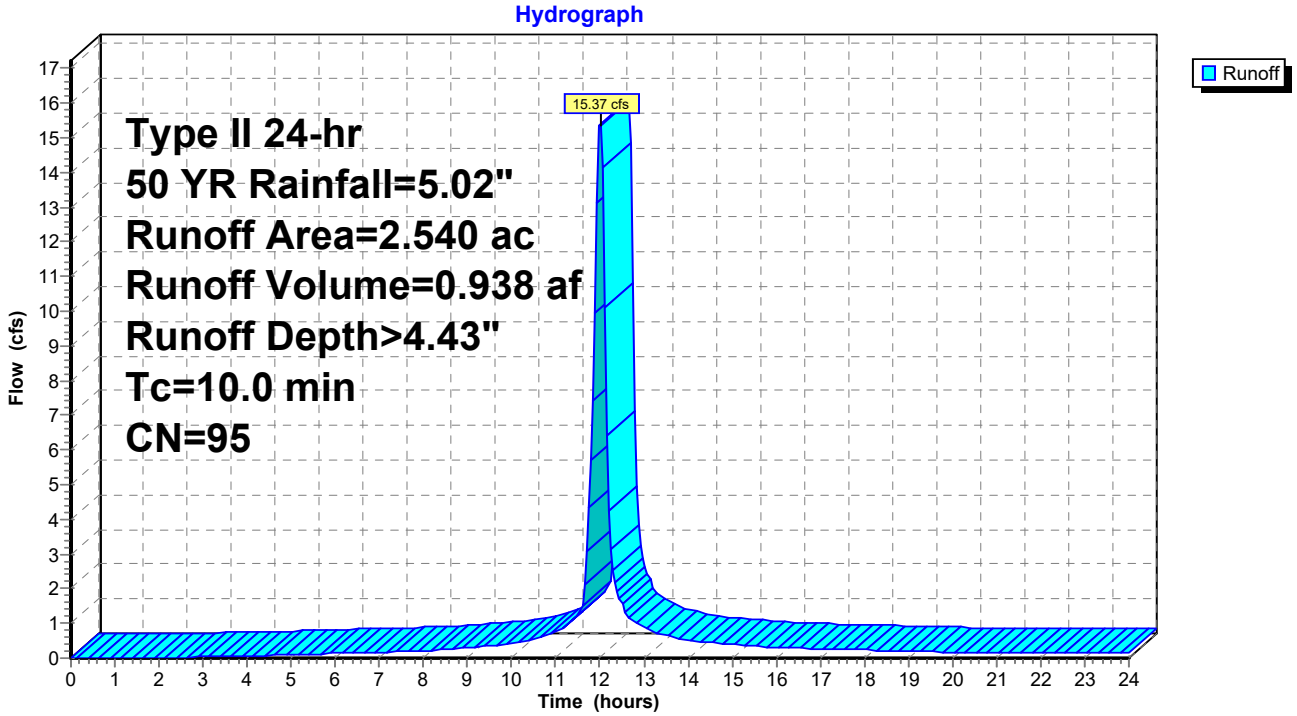
Runoff = 15.37 cfs @ 12.01 hrs, Volume= 0.938 af, Depth> 4.43"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 4.43" for 50 YR event
Inflow = 52.84 cfs @ 12.01 hrs, Volume= 3.224 af
Outflow = 8.73 cfs @ 12.31 hrs, Volume= 2.218 af, Atten= 83%, Lag= 18.0 min
Primary = 8.73 cfs @ 12.31 hrs, Volume= 2.218 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 942.93' @ 12.31 hrs Surf.Area= 24,405 sf Storage= 78,875 cf

Plug-Flow detention time= 228.0 min calculated for 2.218 af (69% of inflow)
Center-of-Mass det. time= 132.2 min (899.3 - 767.1)

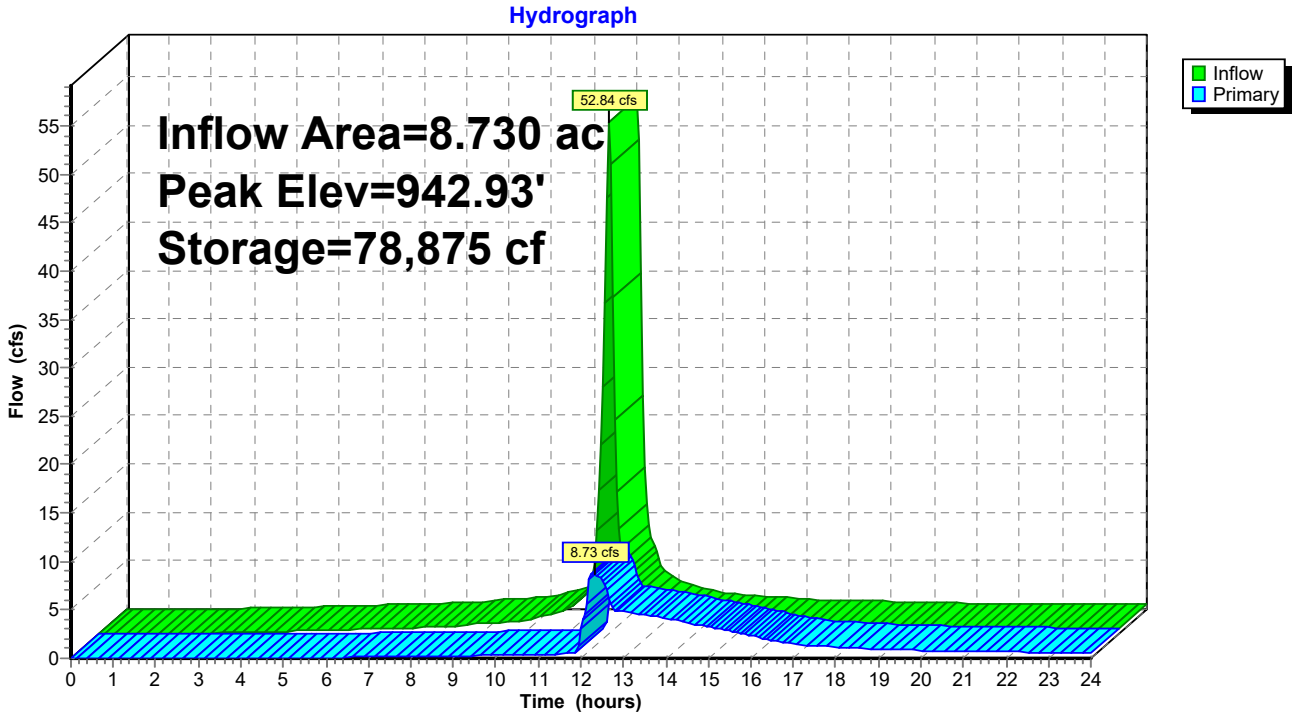
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

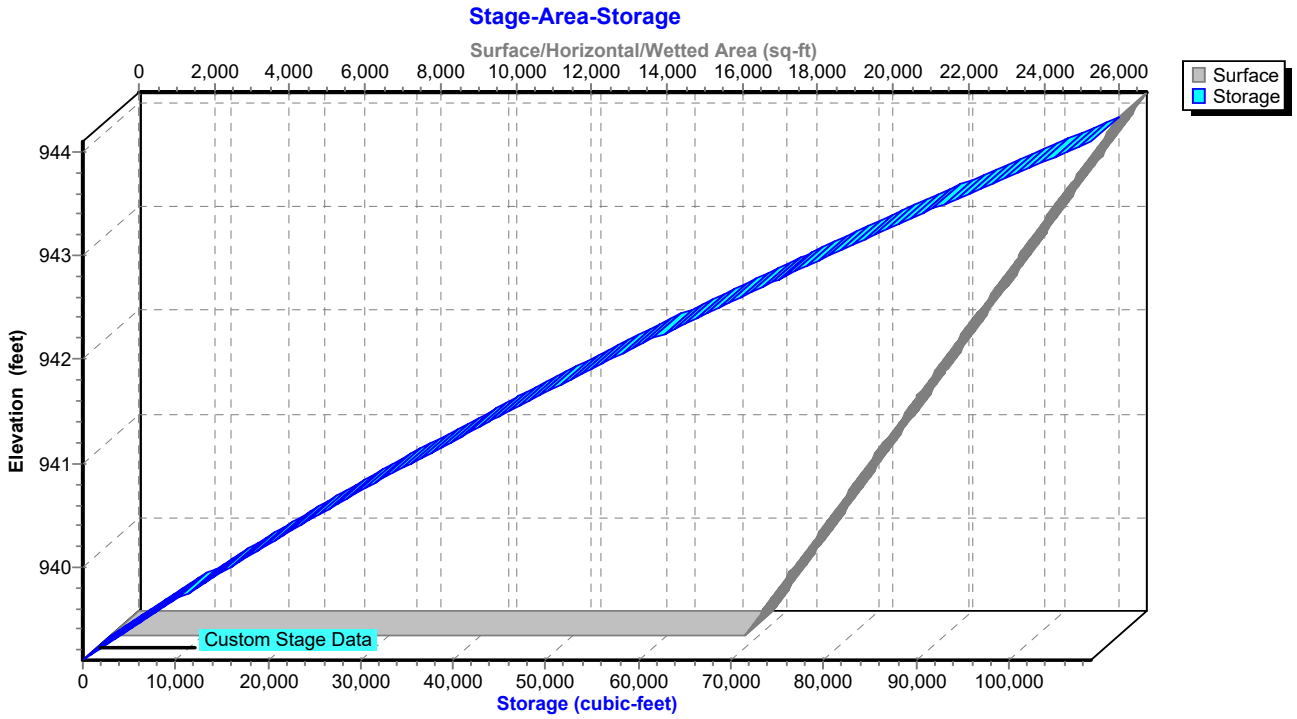
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.72 cfs @ 12.31 hrs HW=942.93' (Free Discharge)
└**1=Culvert** (Passes 8.72 cfs of 22.40 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.80 cfs @ 9.21 fps)
  ├**3=Stage 1 Window** (Orifice Controls 4.35 cfs @ 5.59 fps)
  └**4=Top of Casting** (Orifice Controls 3.57 cfs @ 1.90 fps)

Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: Post-Dev (Sub Area A) Runoff Area=6.190 ac 85.00% Impervious Runoff Depth>5.04"
Tc=10.0 min CN=95 Runoff=42.26 cfs 2.598 af

Subcatchment34S: Post-Dev (Sub Area B) Runoff Area=2.540 ac 85.00% Impervious Runoff Depth>5.04"
Tc=10.0 min CN=95 Runoff=17.34 cfs 1.066 af

Pond 35P: Combined 2430 Basin Volume Peak Elev=943.26' Storage=87,049 cf Inflow=59.61 cfs 3.664 af
Outflow=12.00 cfs 2.642 af

Total Runoff Area = 8.730 ac Runoff Volume = 3.664 af Average Runoff Depth = 5.04"
15.00% Pervious = 1.310 ac 85.00% Impervious = 7.420 ac

Summary for Subcatchment 33S: Post-Dev (Sub Area A)

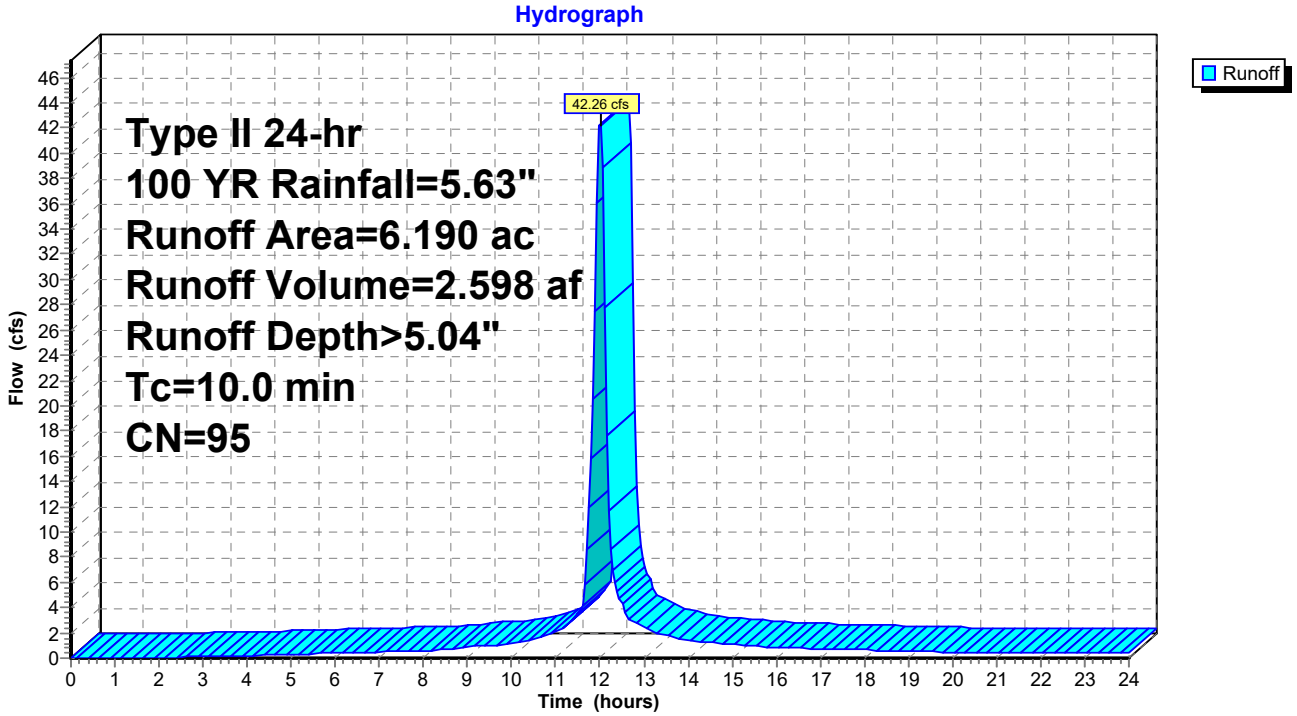
Runoff = 42.26 cfs @ 12.01 hrs, Volume= 2.598 af, Depth> 5.04"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
6.190	95	Urban commercial, 85% imp, HSG D
0.929		15.00% Pervious Area
5.261		85.00% Impervious Area

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

Subcatchment 33S: Post-Dev (Sub Area A)



Summary for Subcatchment 34S: Post-Dev (Sub Area B)

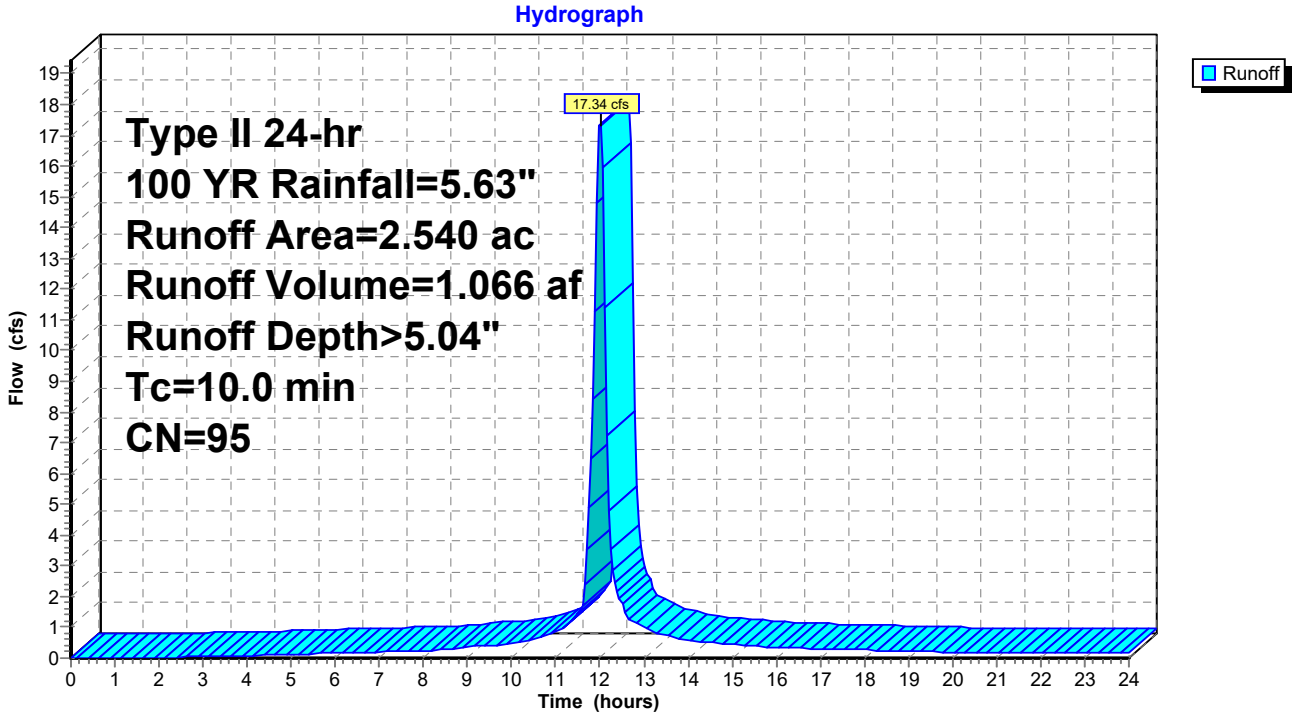
Runoff = 17.34 cfs @ 12.01 hrs, Volume= 1.066 af, Depth> 5.04"
Routed to Pond 35P : Combined 2430 Basin Volume

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
2.540	95	Urban commercial, 85% imp, HSG D
0.381		15.00% Pervious Area
2.159		85.00% Impervious Area

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

Subcatchment 34S: Post-Dev (Sub Area B)



Summary for Pond 35P: Combined 2430 Basin Volume

Inflow Area = 8.730 ac, 85.00% Impervious, Inflow Depth > 5.04" for 100 YR event
Inflow = 59.61 cfs @ 12.01 hrs, Volume= 3.664 af
Outflow = 12.00 cfs @ 12.26 hrs, Volume= 2.642 af, Atten= 80%, Lag= 15.2 min
Primary = 12.00 cfs @ 12.26 hrs, Volume= 2.642 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 943.26' @ 12.26 hrs Surf.Area= 25,060 sf Storage= 87,049 cf

Plug-Flow detention time= 214.0 min calculated for 2.642 af (72% of inflow)
Center-of-Mass det. time= 122.1 min (886.2 - 764.1)

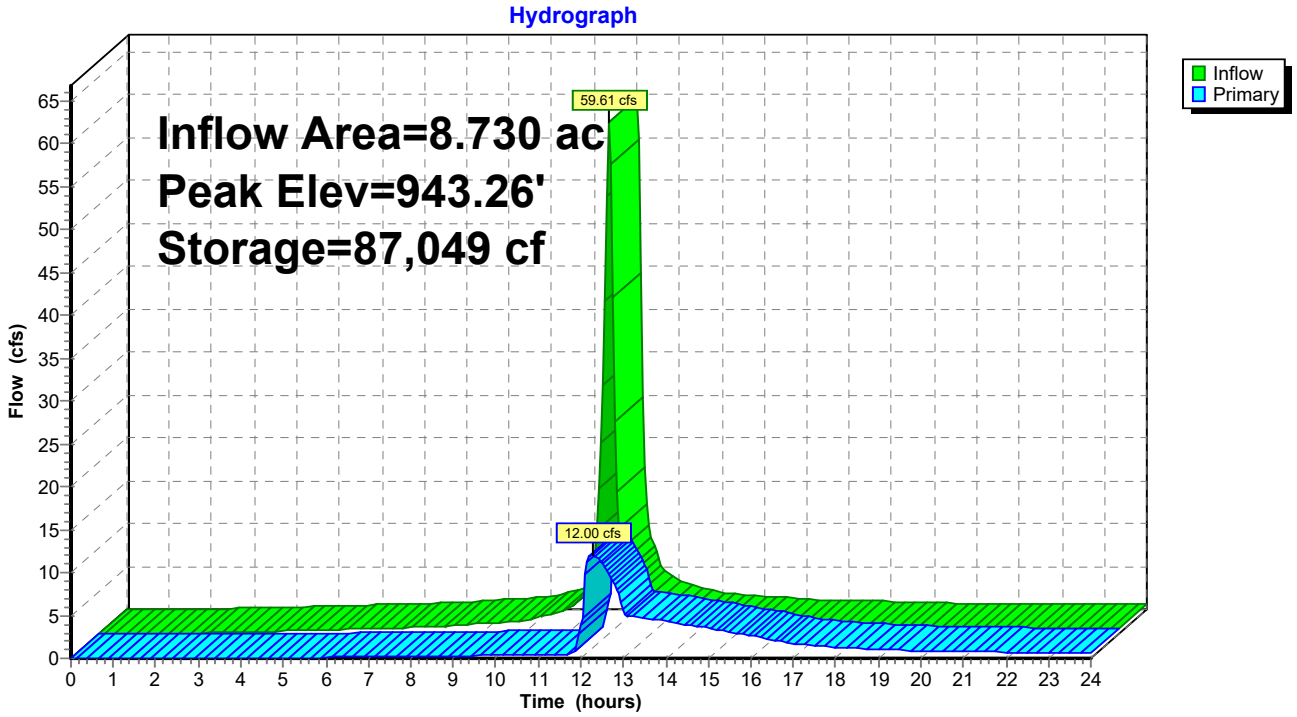
Volume	Invert	Avail.Storage	Storage Description
#1	939.10'	108,865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.10	16,815	0	0
944.10	26,731	108,865	108,865

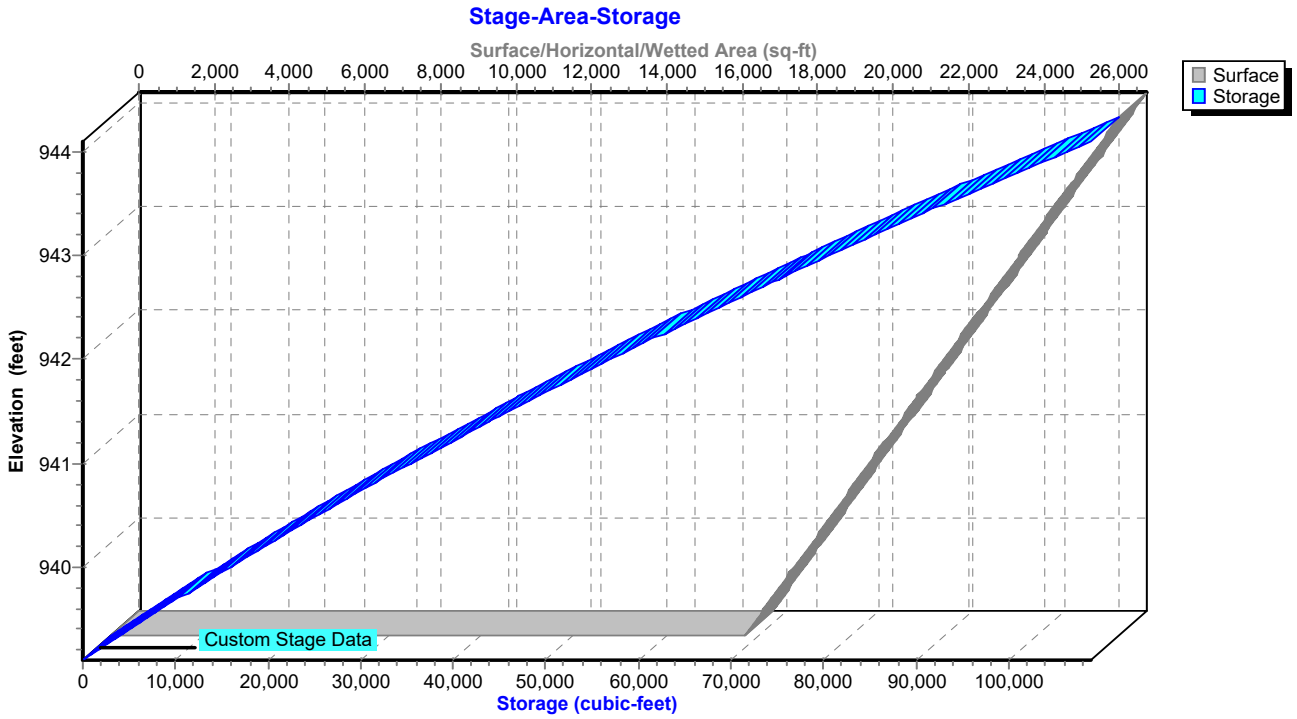
Device	Routing	Invert	Outlet Devices
#1	Primary	939.10'	**24.0" Round Culvert** L= 111.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 939.10' / 938.96' S= 0.0013 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	939.10'	**4.0" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.41'	**28.0" W x 4.0" H Vert. Stage 1 Window** C= 0.600 Limited to weir flow at low heads
#4	Device 1	942.77'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.98 cfs @ 12.26 hrs HW=943.26' (Free Discharge)
└**1=Culvert** (Passes 11.98 cfs of 24.20 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.84 cfs @ 9.62 fps)
  ├**3=Stage 1 Window** (Orifice Controls 4.85 cfs @ 6.24 fps)
  └**4=Top of Casting** (Orifice Controls 6.29 cfs @ 3.36 fps)

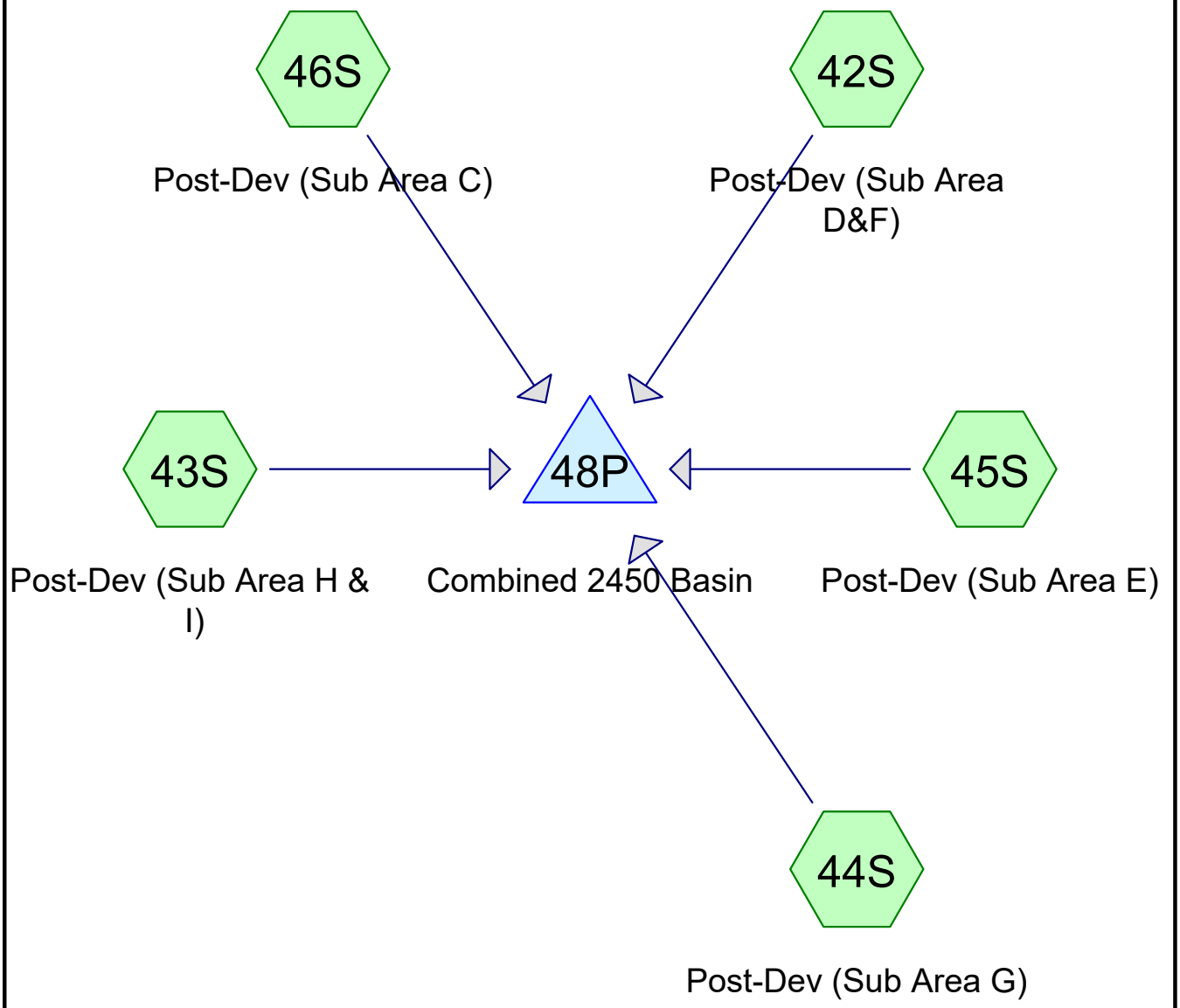
Pond 35P: Combined 2430 Basin Volume



Pond 35P: Combined 2430 Basin Volume



Note: Assumes that the volume required is provided



Subcat Reach Pond Link

Routing Diagram for Drainage Calcs
Prepared by American Structurepoint, Printed 1/14/2026

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1 YR	Type II 24-hr		Default	24.00	1	2.20	2
2	2 YR	Type II 24-hr		Default	24.00	1	2.63	2
3	5 YR	Type II 24-hr		Default	24.00	1	3.24	2
4	10 YR	Type II 24-hr		Default	24.00	1	3.74	2
5	25 YR	Type II 24-hr		Default	24.00	1	4.44	2
6	50 YR	Type II 24-hr		Default	24.00	1	5.02	2
7	100 YR	Type II 24-hr		Default	24.00	1	5.63	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
31.610	95	Urban commercial, 85% imp, HSG D (42S, 43S, 44S, 45S, 46S)
1.045	79	Woods/grass comb., Good, HSG D (43S)
32.655	**94**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
32.655	HSG D	42S, 43S, 44S, 45S, 46S
0.000	Other	
32.655		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	31.610	0.000	31.610	Urban commercial, 85% imp	42S, 43S, 44S, 45S, 46S
0.000	0.000	0.000	1.045	0.000	1.045	Woods/grass comb., Good	43S
0.000	**0.000**	**0.000**	**32.655**	**0.000**	**32.655**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	48P	937.00	936.89	100.0	0.0011	0.011	0.0	48.0	0.0	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=95 Runoff=29.47 cfs 1.696 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>1.41"
Tc=10.0 min CN=92 Runoff=12.49 cfs 0.696 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=95 Runoff=16.33 cfs 0.940 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=95 Runoff=5.40 cfs 0.311 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=95 Runoff=13.52 cfs 0.778 af

Pond 48P: Combined 2450 Basin Peak Elev=939.06' Storage=183,418 cf Inflow=77.21 cfs 4.421 af
Outflow=0.21 cfs 0.209 af

Total Runoff Area = 32.655 ac Runoff Volume = 4.421 af Average Runoff Depth = 1.62"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

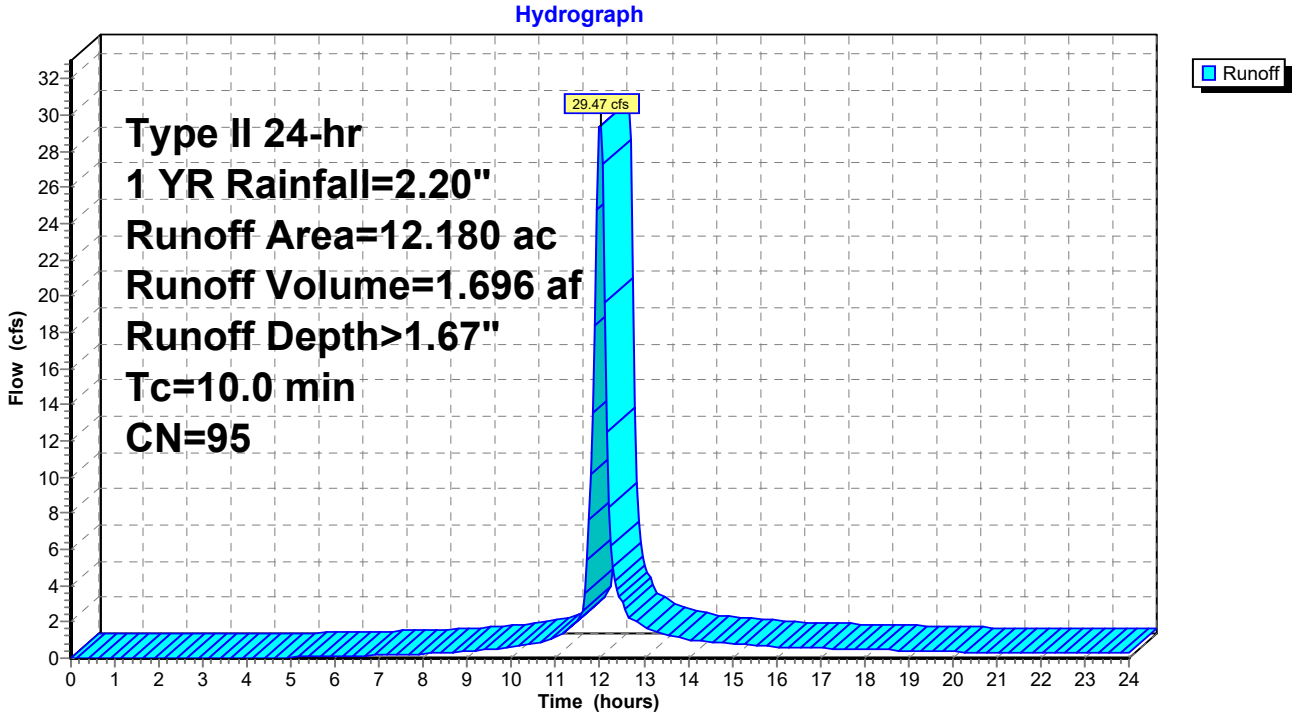
Runoff = 29.47 cfs @ 12.01 hrs, Volume= 1.696 af, Depth> 1.67"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

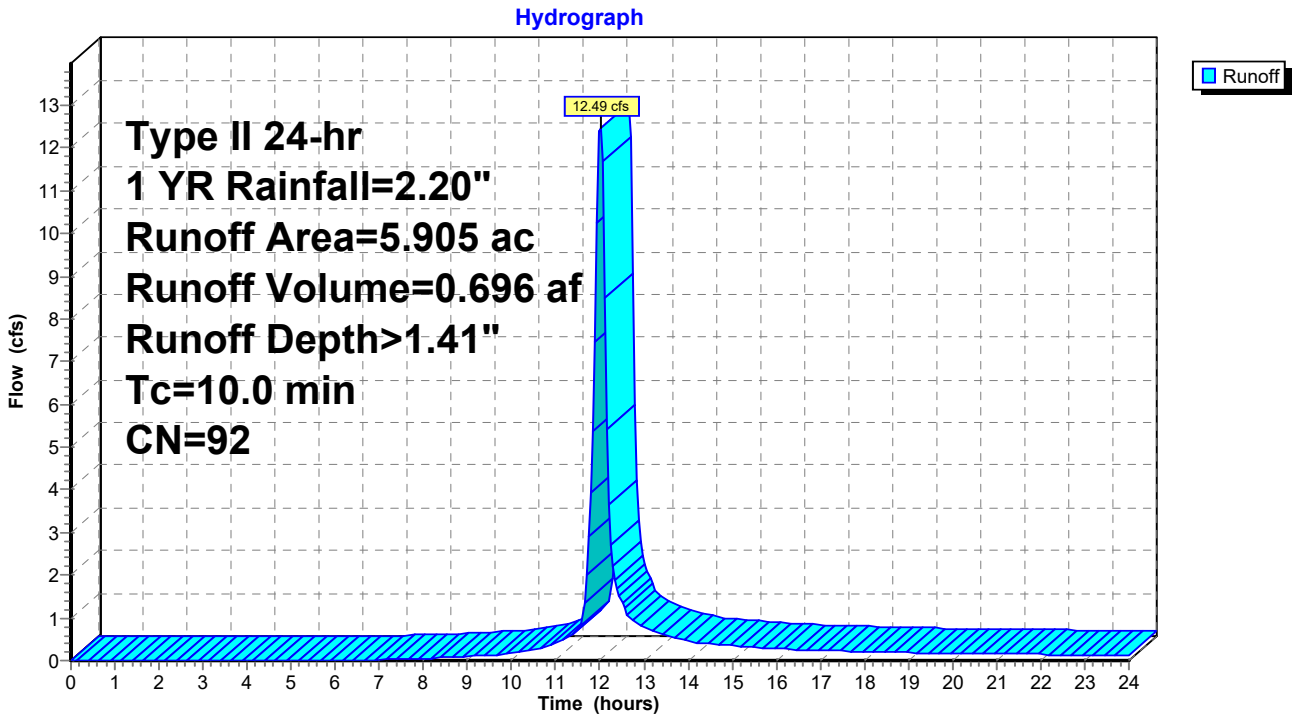
Runoff = 12.49 cfs @ 12.01 hrs, Volume= 0.696 af, Depth> 1.41"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

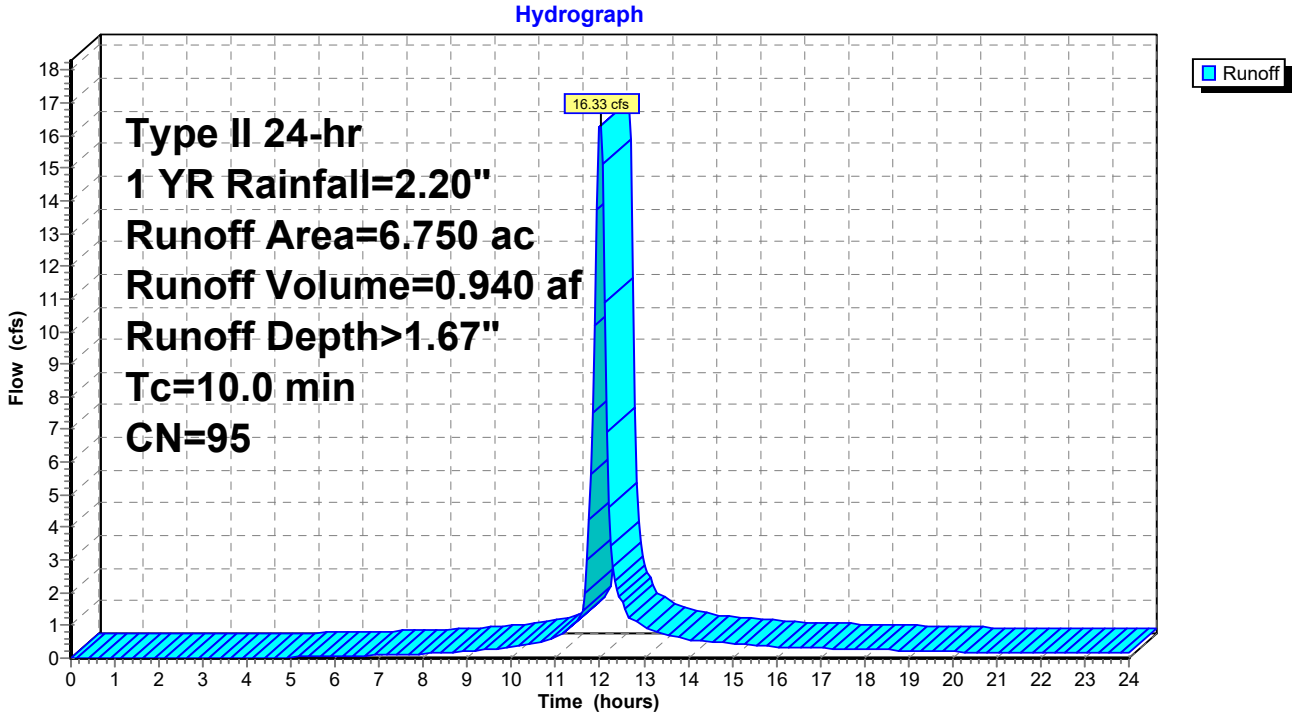
Runoff = 16.33 cfs @ 12.01 hrs, Volume= 0.940 af, Depth> 1.67"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

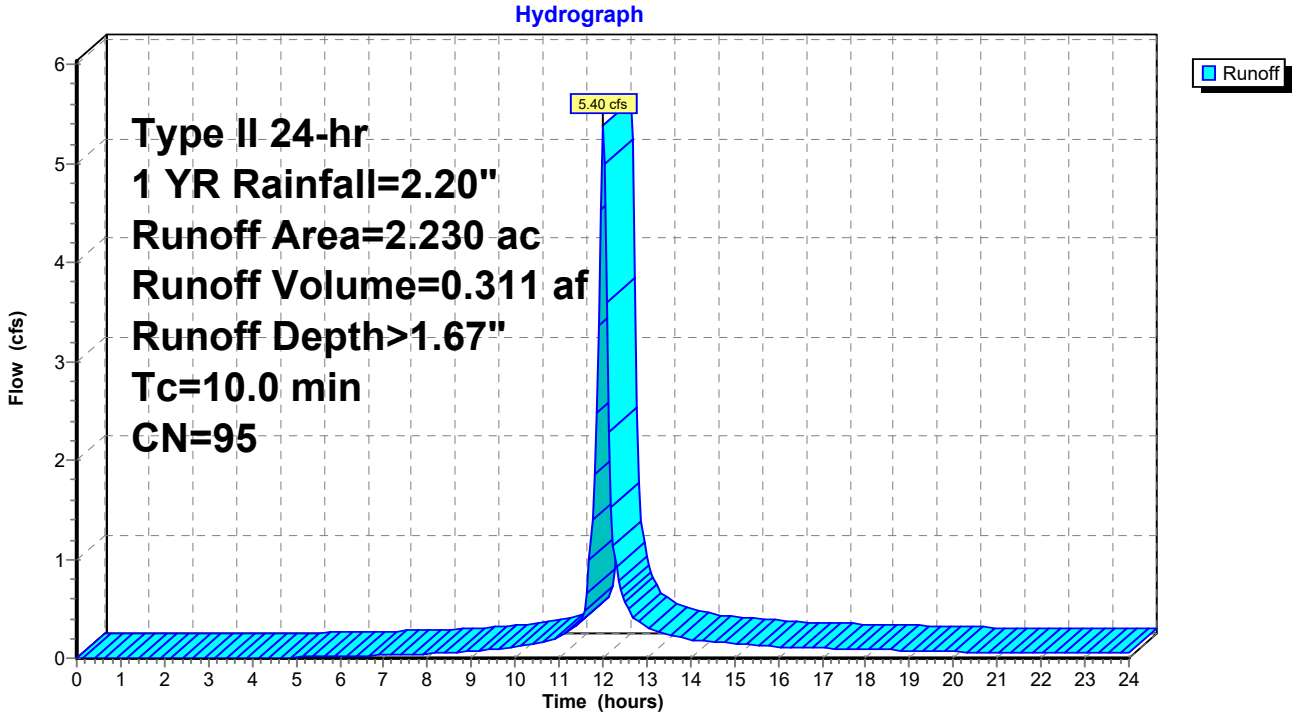
Runoff = 5.40 cfs @ 12.01 hrs, Volume= 0.311 af, Depth> 1.67"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

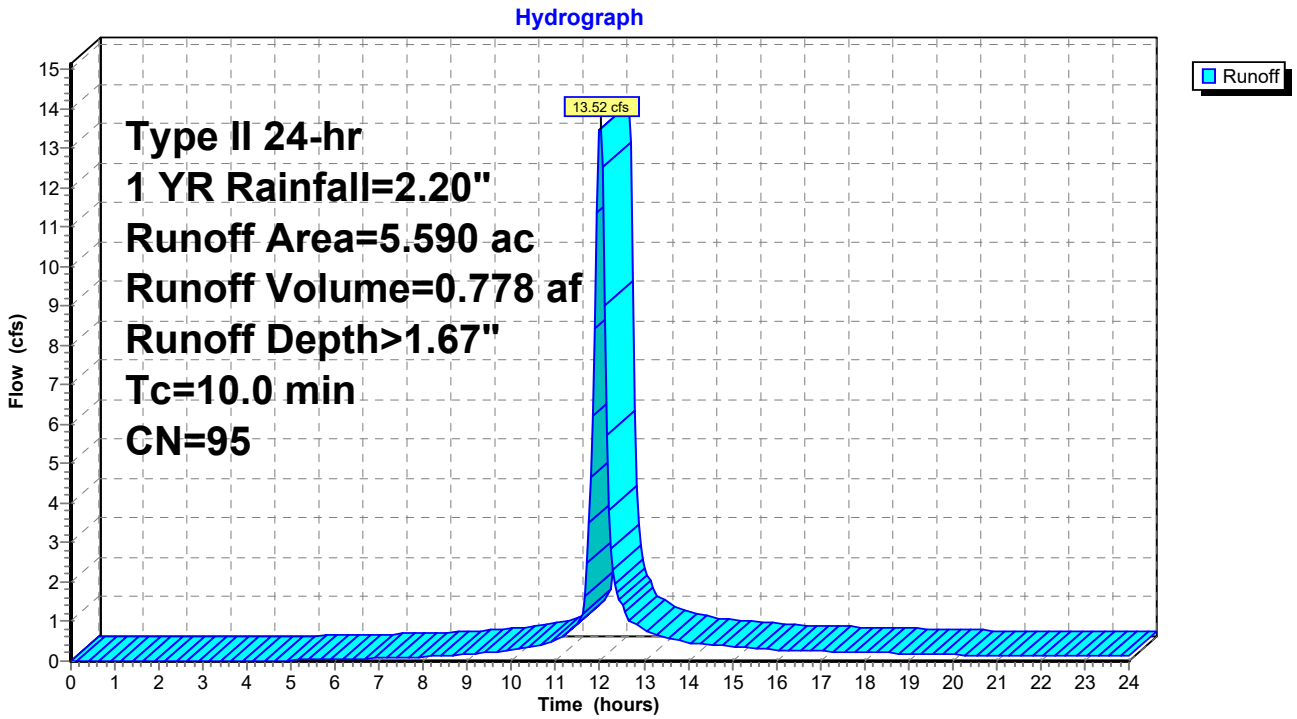
Runoff = 13.52 cfs @ 12.01 hrs, Volume= 0.778 af, Depth> 1.67"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 YR Rainfall=2.20"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 1.62" for 1 YR event
Inflow = 77.21 cfs @ 12.01 hrs, Volume= 4.421 af
Outflow = 0.21 cfs @ 24.00 hrs, Volume= 0.209 af, Atten= 100%, Lag= 719.4 min
Primary = 0.21 cfs @ 24.00 hrs, Volume= 0.209 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 939.06' @ 24.00 hrs Surf.Area= 98,496 sf Storage= 183,418 cf

Plug-Flow detention time= 576.7 min calculated for 0.209 af (5% of inflow)
Center-of-Mass det. time= 272.0 min (1,067.5 - 795.5)

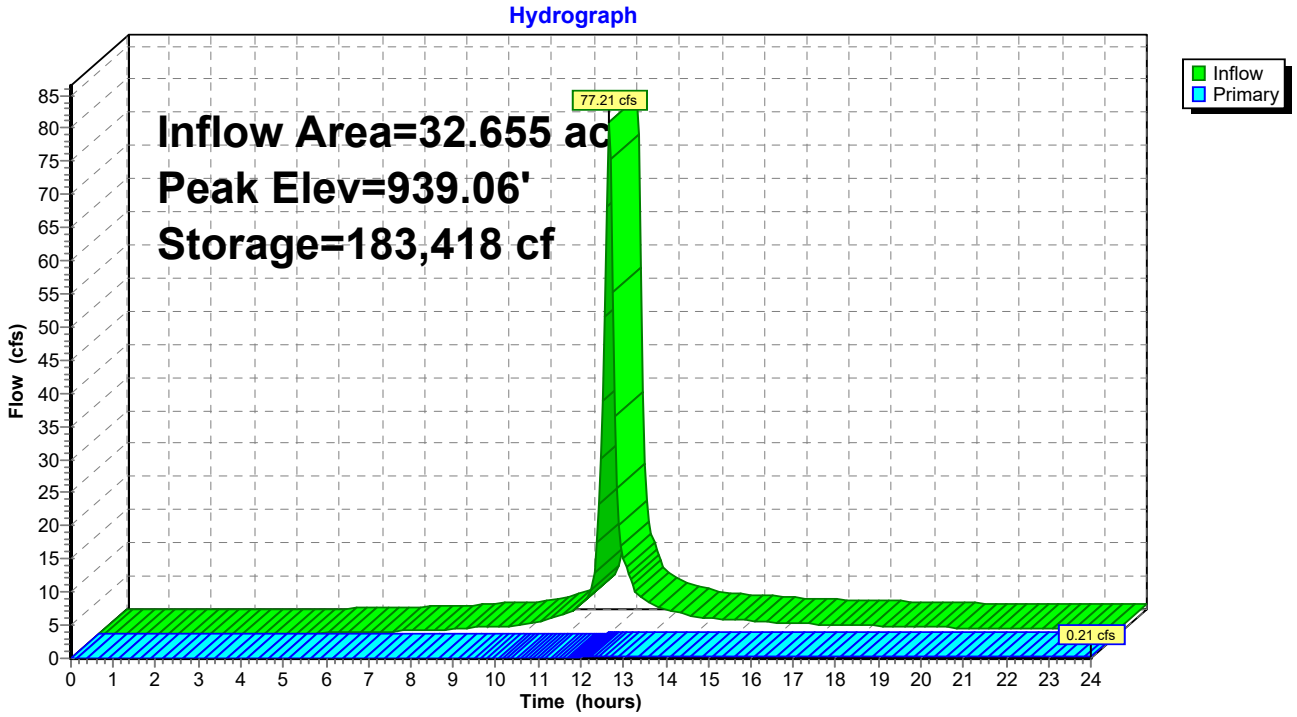
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

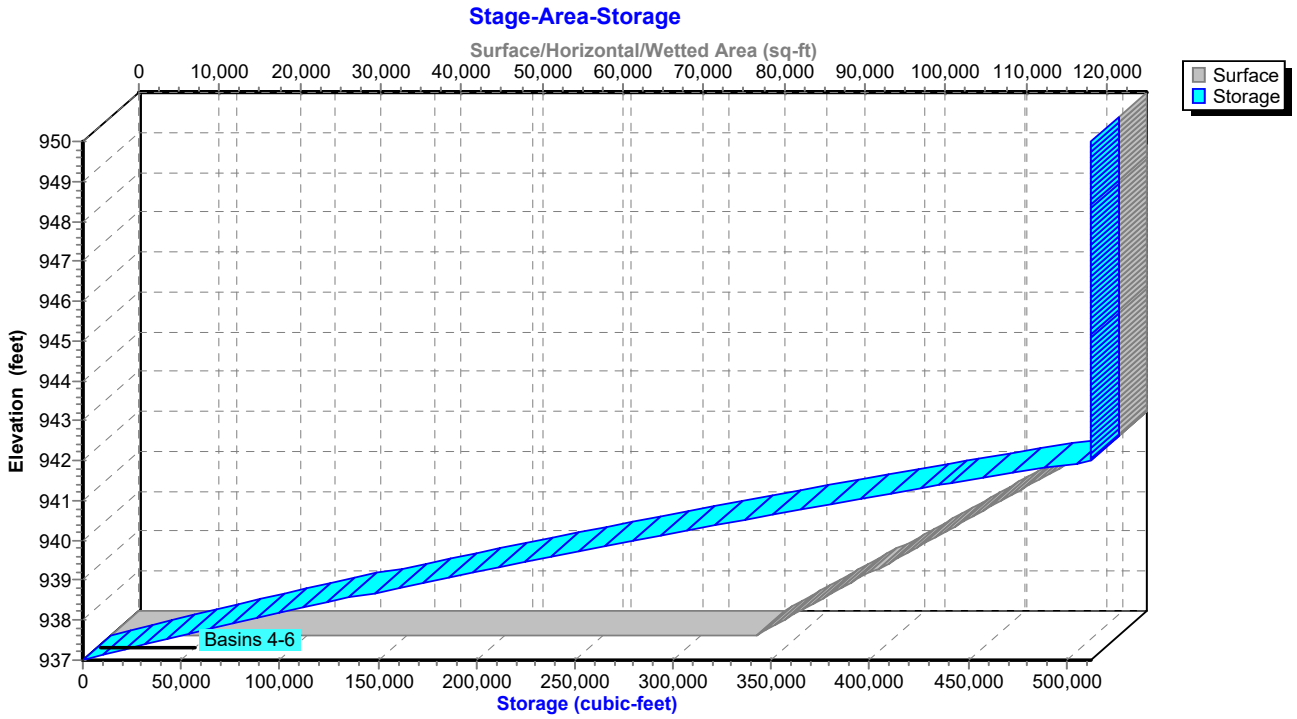
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.21 cfs @ 24.00 hrs HW=939.06' (Free Discharge)
└**1=Culvert** (Passes 0.21 cfs of 20.26 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.21 cfs @ 6.73 fps)
  ├**3=Window** (Controls 0.00 cfs)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>2.09"
Tc=10.0 min CN=95 Runoff=36.31 cfs 2.117 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>1.81"
Tc=10.0 min CN=92 Runoff=15.82 cfs 0.891 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>2.09"
Tc=10.0 min CN=95 Runoff=20.12 cfs 1.173 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>2.09"
Tc=10.0 min CN=95 Runoff=6.65 cfs 0.388 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>2.09"
Tc=10.0 min CN=95 Runoff=16.66 cfs 0.972 af

Pond 48P: Combined 2450 Basin Peak Elev=939.53' Storage=230,881 cf Inflow=95.55 cfs 5.540 af
Outflow=0.24 cfs 0.238 af

Total Runoff Area = 32.655 ac Runoff Volume = 5.540 af Average Runoff Depth = 2.04"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

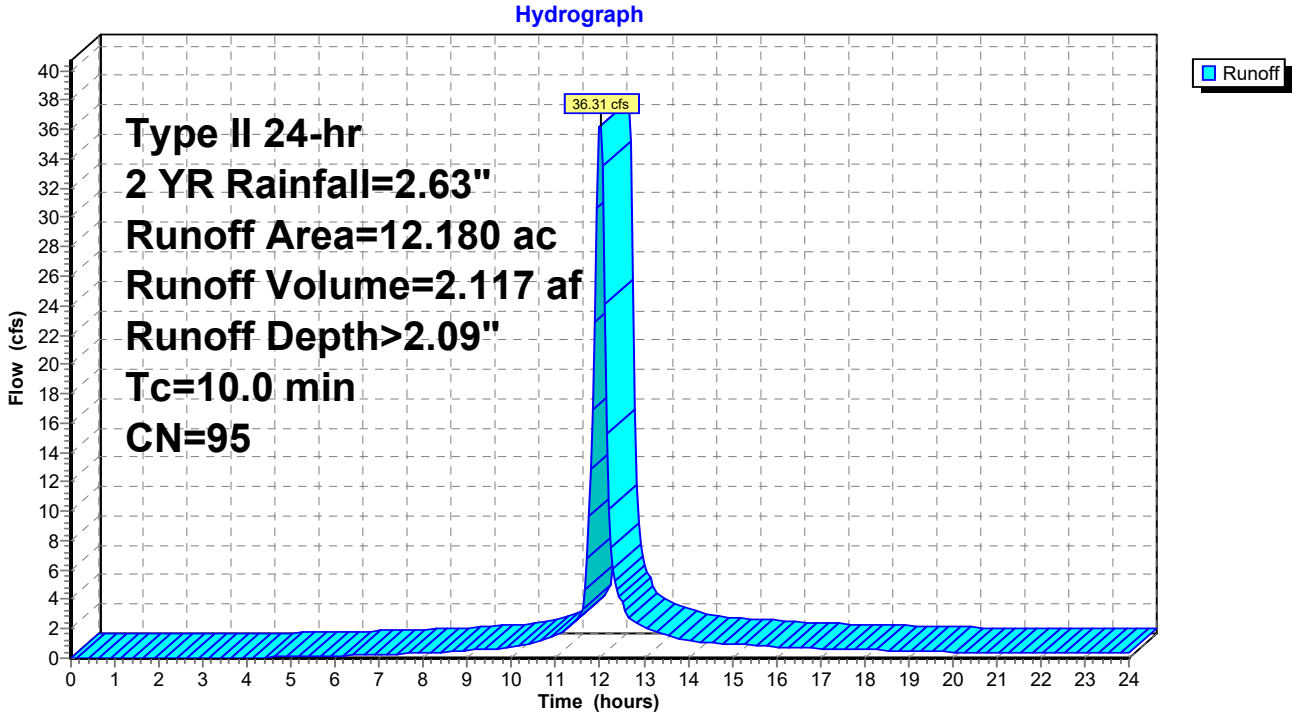
Runoff = 36.31 cfs @ 12.01 hrs, Volume= 2.117 af, Depth> 2.09"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

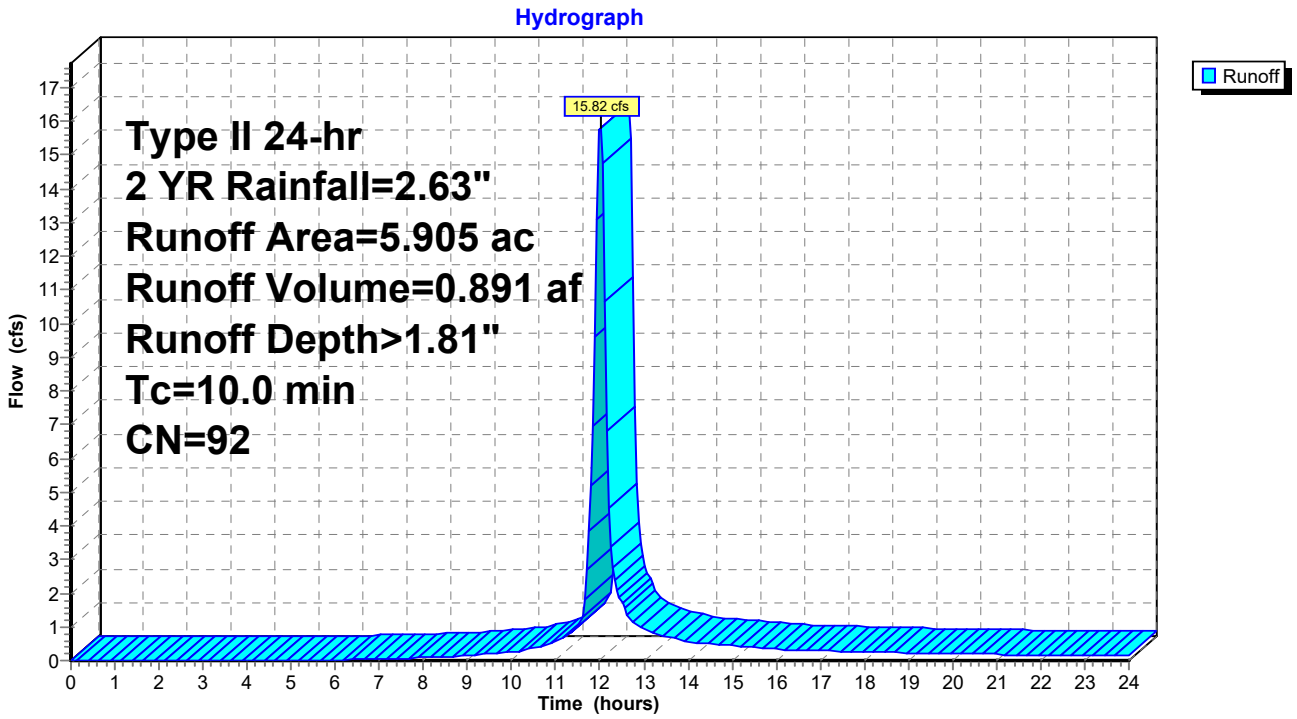
Runoff = 15.82 cfs @ 12.01 hrs, Volume= 0.891 af, Depth> 1.81"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

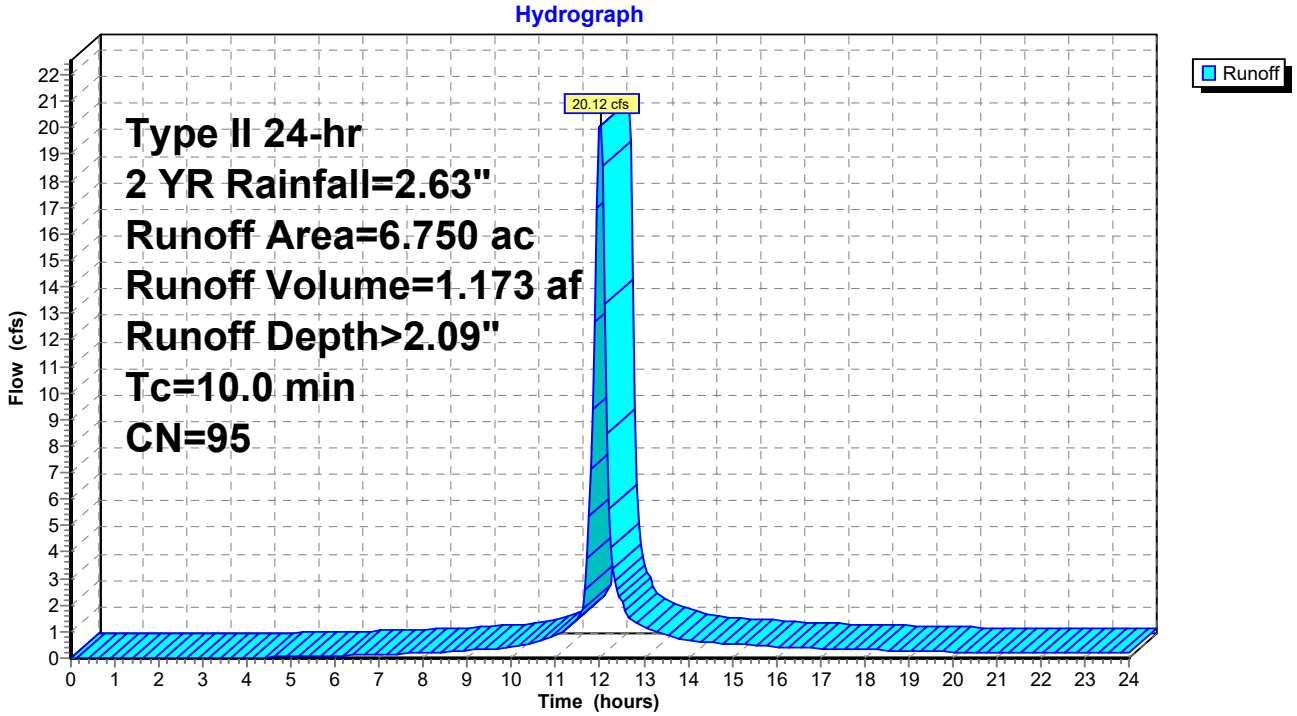
Runoff = 20.12 cfs @ 12.01 hrs, Volume= 1.173 af, Depth> 2.09"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

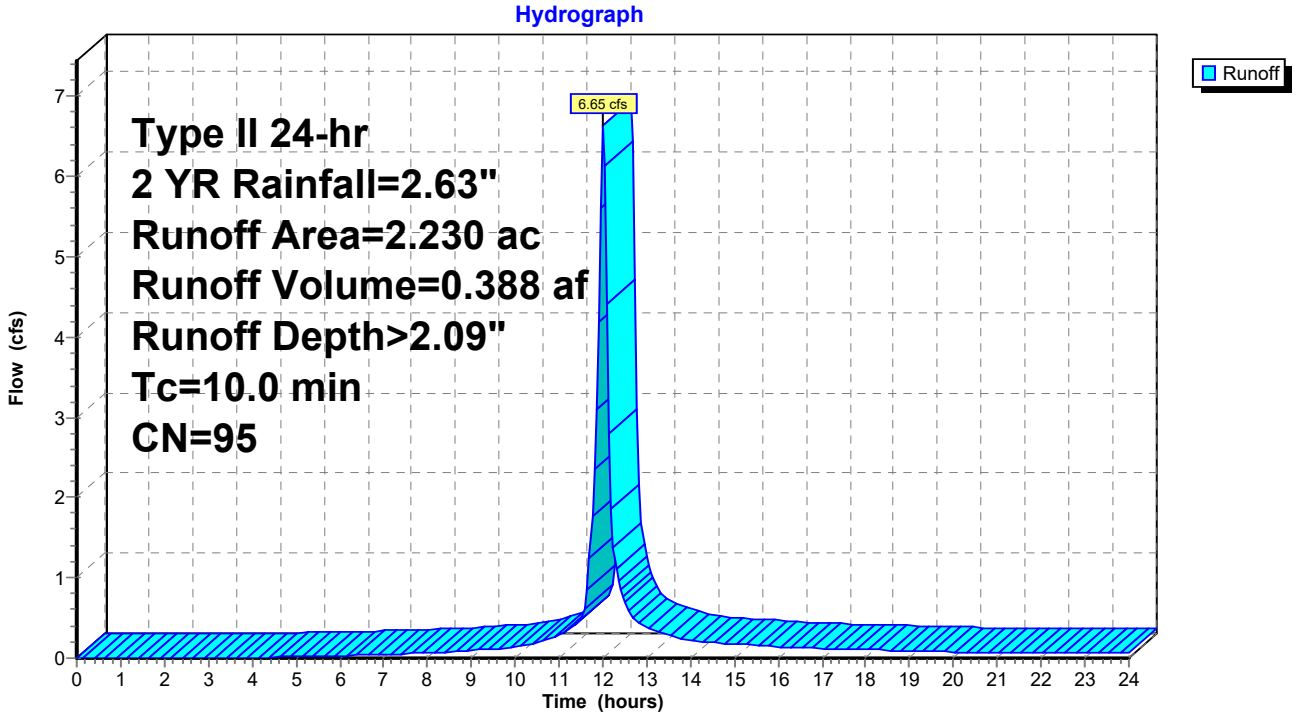
Runoff = 6.65 cfs @ 12.01 hrs, Volume= 0.388 af, Depth> 2.09"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

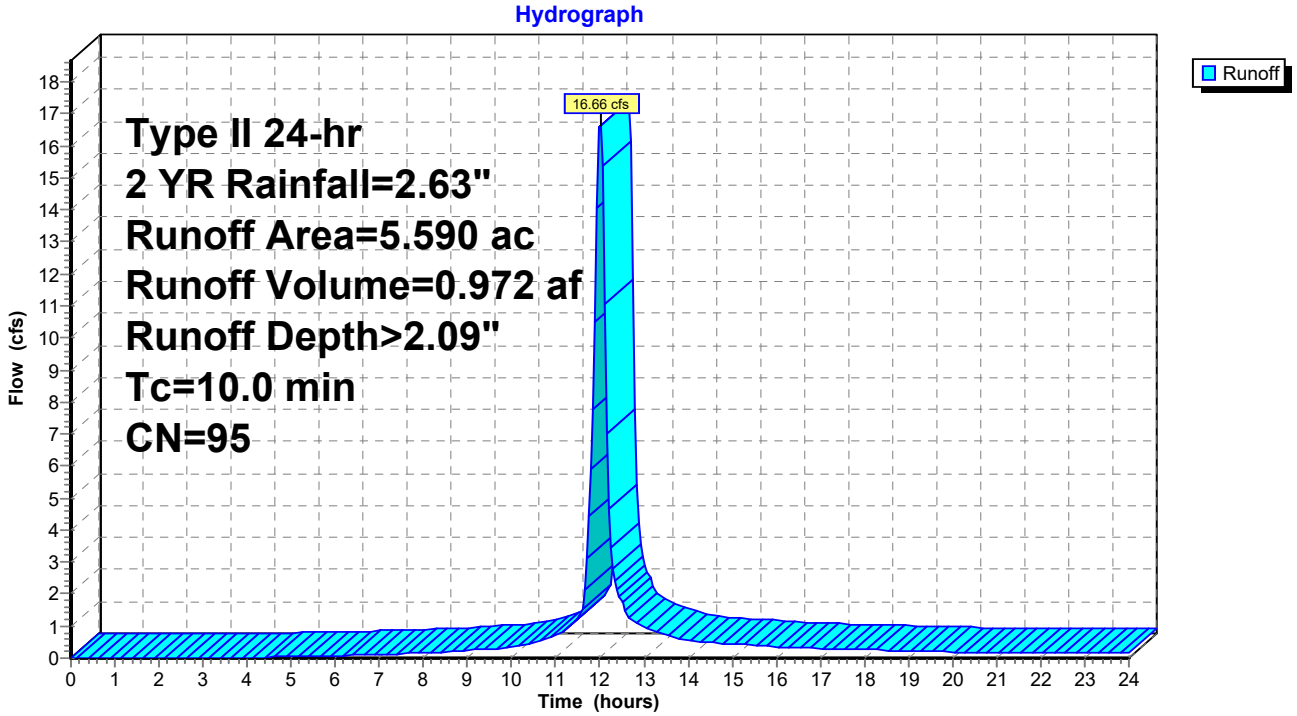
Runoff = 16.66 cfs @ 12.01 hrs, Volume= 0.972 af, Depth> 2.09"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YR Rainfall=2.63"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 2.04" for 2 YR event
Inflow = 95.55 cfs @ 12.01 hrs, Volume= 5.540 af
Outflow = 0.24 cfs @ 24.00 hrs, Volume= 0.238 af, Atten= 100%, Lag= 719.4 min
Primary = 0.24 cfs @ 24.00 hrs, Volume= 0.238 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 939.53' @ 24.00 hrs Surf.Area= 102,742 sf Storage= 230,881 cf

Plug-Flow detention time= 607.0 min calculated for 0.238 af (4% of inflow)
Center-of-Mass det. time= 269.2 min (1,058.5 - 789.4)

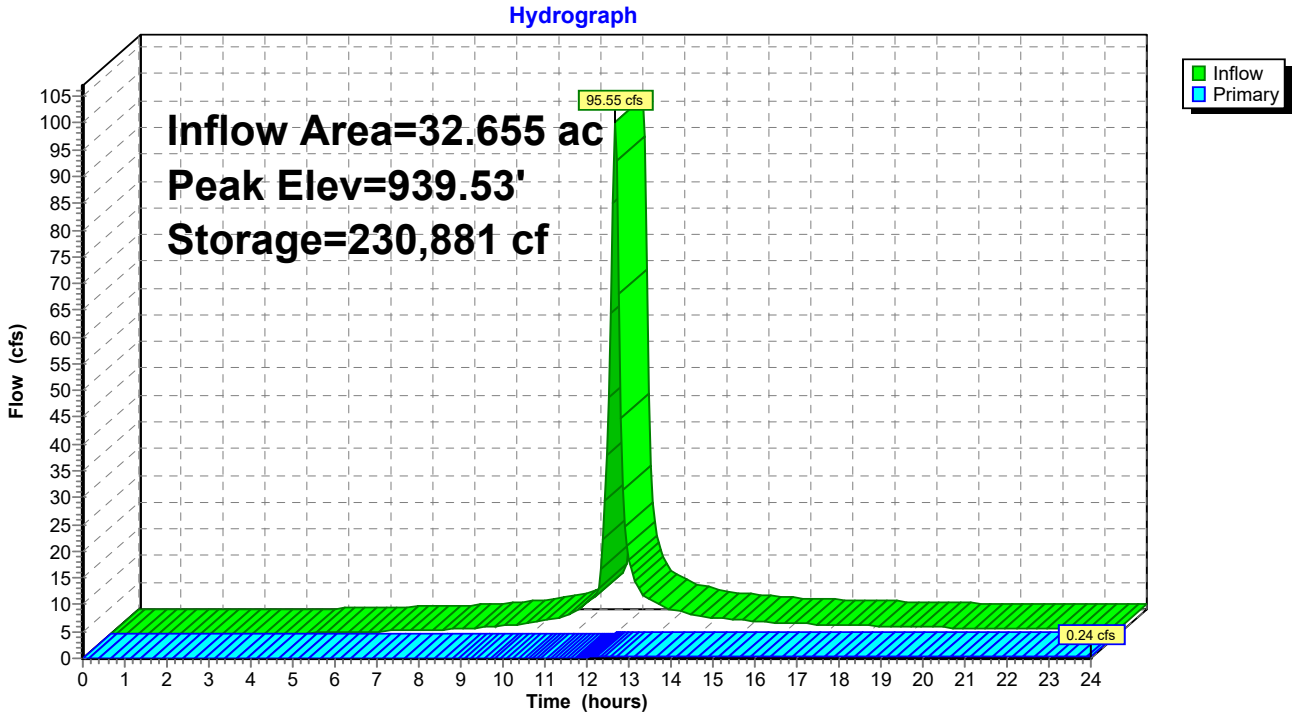
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

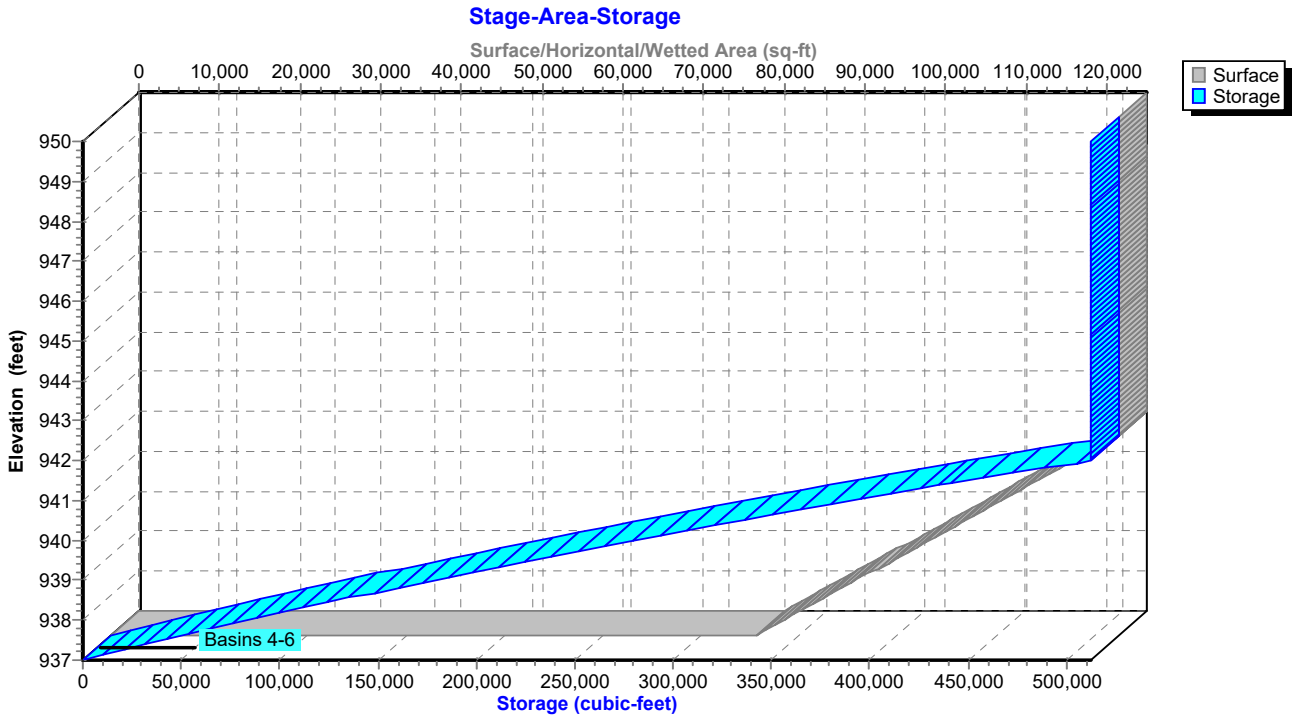
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.24 cfs @ 24.00 hrs HW=939.53' (Free Discharge)
└**1=Culvert** (Passes 0.24 cfs of 29.63 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.24 cfs @ 7.50 fps)
  ├**3=Window** (Controls 0.00 cfs)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=95 Runoff=45.94 cfs 2.720 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>2.38"
Tc=10.0 min CN=92 Runoff=20.55 cfs 1.173 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=95 Runoff=25.46 cfs 1.507 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=95 Runoff=8.41 cfs 0.498 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=95 Runoff=21.08 cfs 1.248 af

Pond 48P: Combined 2450 Basin Peak Elev=940.17' Storage=299,249 cf Inflow=121.44 cfs 7.146 af
Outflow=0.27 cfs 0.275 af

Total Runoff Area = 32.655 ac Runoff Volume = 7.146 af Average Runoff Depth = 2.63"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

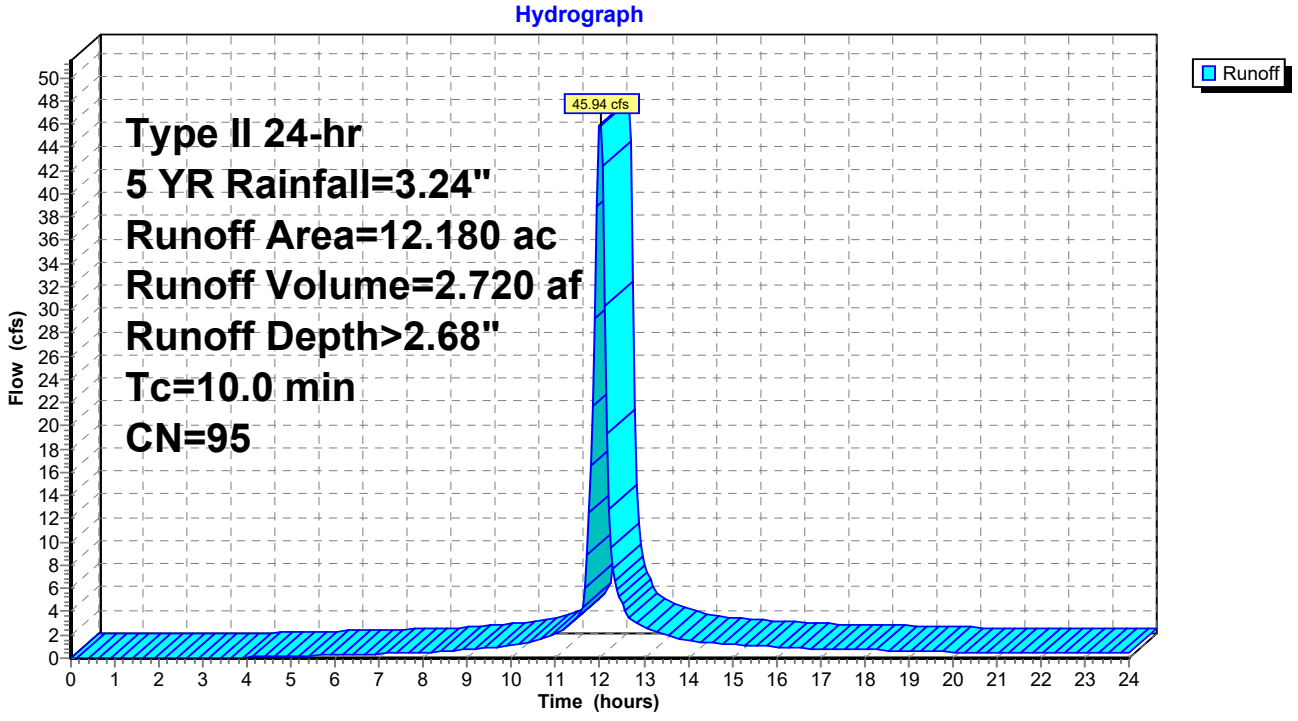
Runoff = 45.94 cfs @ 12.01 hrs, Volume= 2.720 af, Depth> 2.68"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

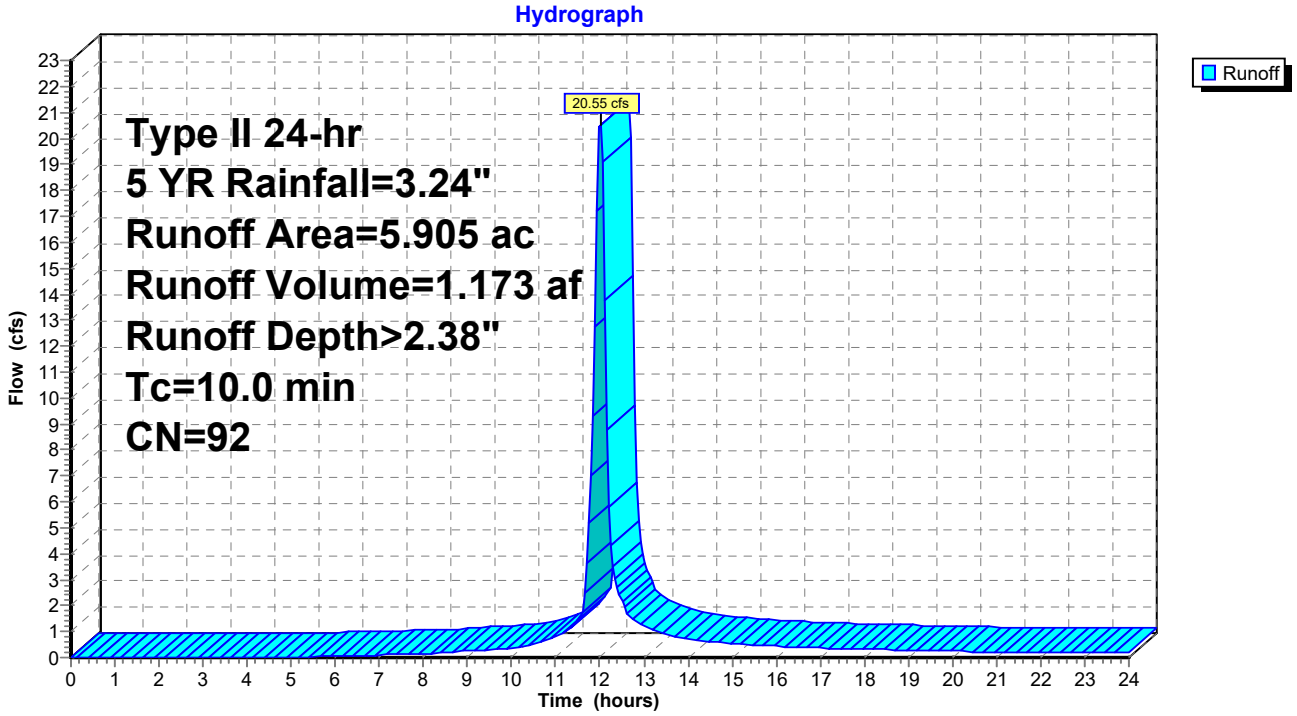
Runoff = 20.55 cfs @ 12.01 hrs, Volume= 1.173 af, Depth> 2.38"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

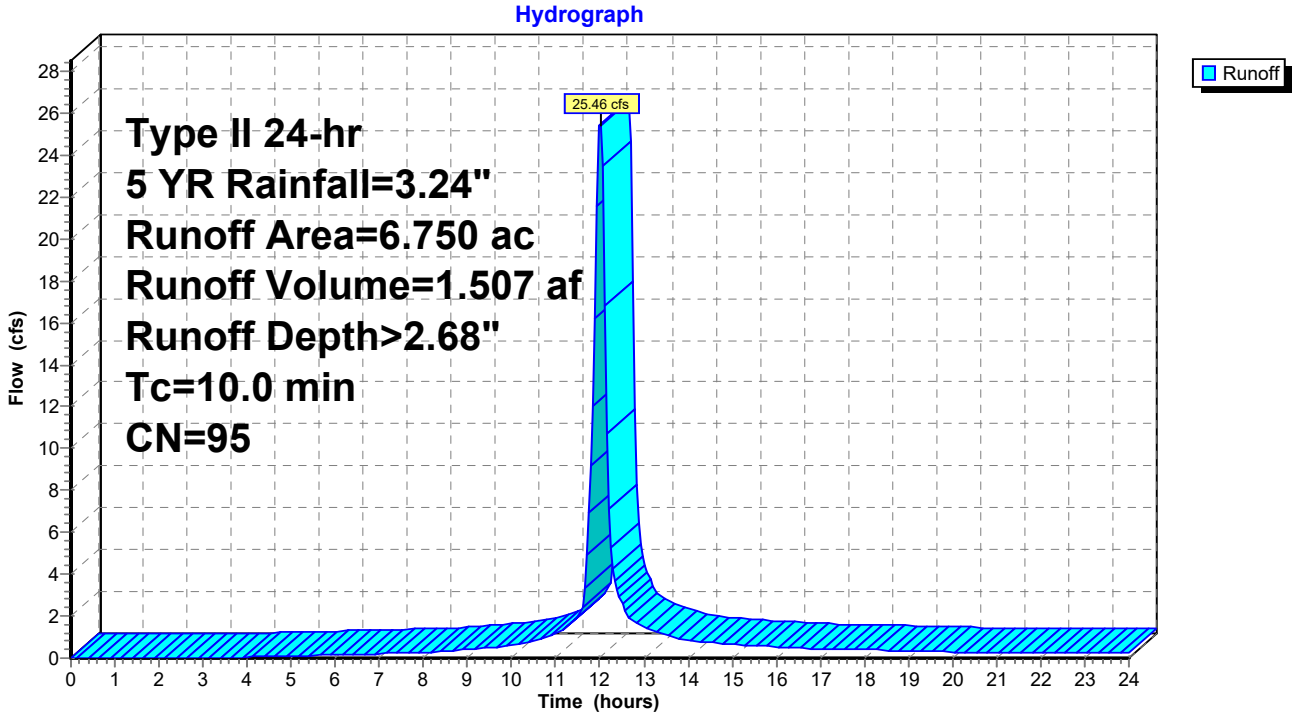
Runoff = 25.46 cfs @ 12.01 hrs, Volume= 1.507 af, Depth> 2.68"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

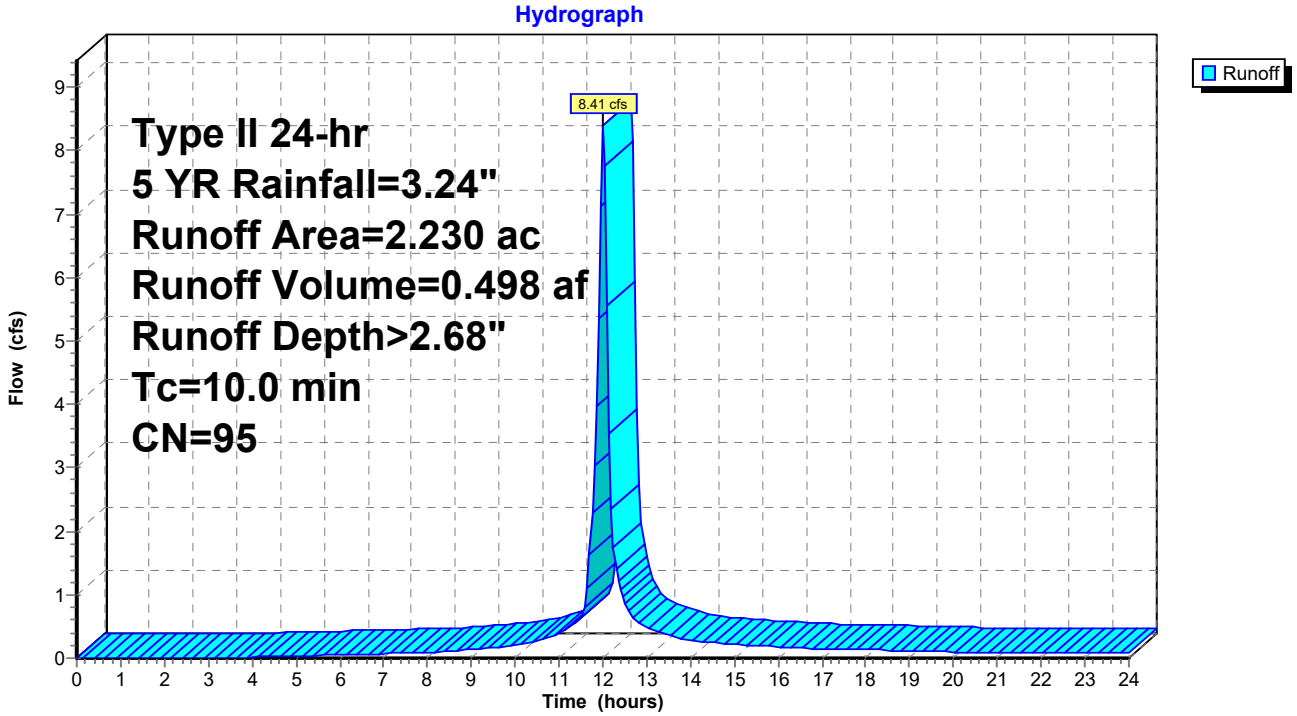
Runoff = 8.41 cfs @ 12.01 hrs, Volume= 0.498 af, Depth> 2.68"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

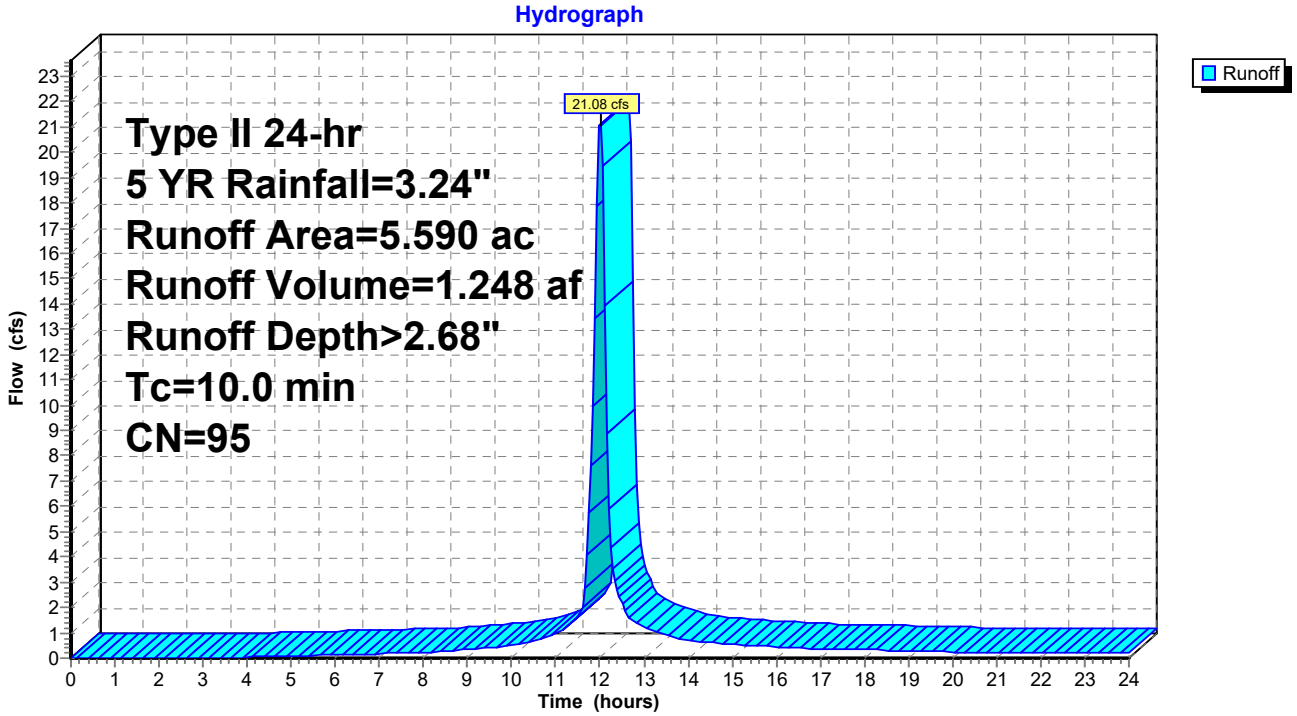
Runoff = 21.08 cfs @ 12.01 hrs, Volume= 1.248 af, Depth> 2.68"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 5 YR Rainfall=3.24"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 2.63" for 5 YR event
Inflow = 121.44 cfs @ 12.01 hrs, Volume= 7.146 af
Outflow = 0.27 cfs @ 24.00 hrs, Volume= 0.275 af, Atten= 100%, Lag= 719.5 min
Primary = 0.27 cfs @ 24.00 hrs, Volume= 0.275 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 940.17' @ 24.00 hrs Surf.Area= 108,566 sf Storage= 299,249 cf

Plug-Flow detention time= 641.8 min calculated for 0.275 af (4% of inflow)
Center-of-Mass det. time= 264.6 min (1,047.2 - 782.6)

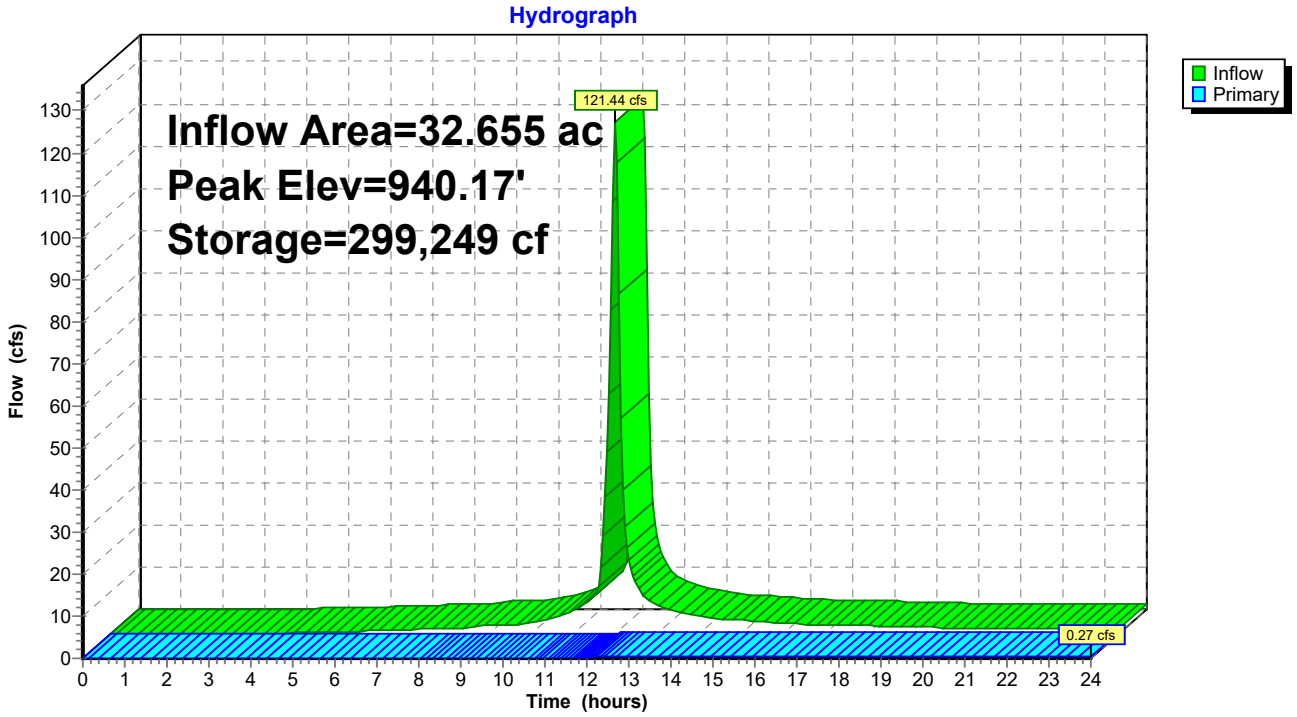
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

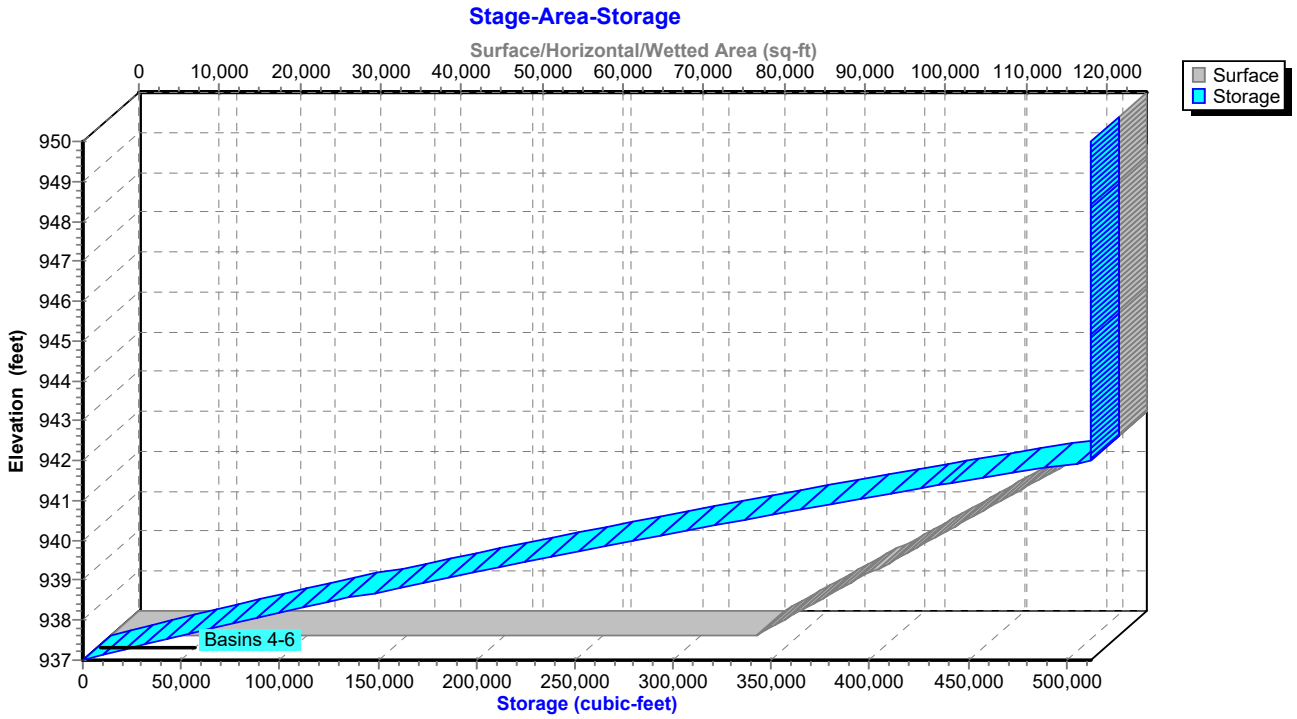
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.27 cfs @ 24.00 hrs HW=940.17' (Free Discharge)
└**1=Culvert** (Passes 0.27 cfs of 44.20 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.27 cfs @ 8.44 fps)
  ├**3=Window** (Controls 0.00 cfs)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>3.17"
Tc=10.0 min CN=95 Runoff=53.79 cfs 3.217 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>2.86"
Tc=10.0 min CN=92 Runoff=24.42 cfs 1.408 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>3.17"
Tc=10.0 min CN=95 Runoff=29.81 cfs 1.783 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>3.17"
Tc=10.0 min CN=95 Runoff=9.85 cfs 0.589 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>3.17"
Tc=10.0 min CN=95 Runoff=24.69 cfs 1.477 af

Pond 48P: Combined 2450 Basin Peak Elev=940.68' Storage=355,893 cf Inflow=142.55 cfs 8.474 af
Outflow=0.29 cfs 0.302 af

Total Runoff Area = 32.655 ac Runoff Volume = 8.474 af Average Runoff Depth = 3.11"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

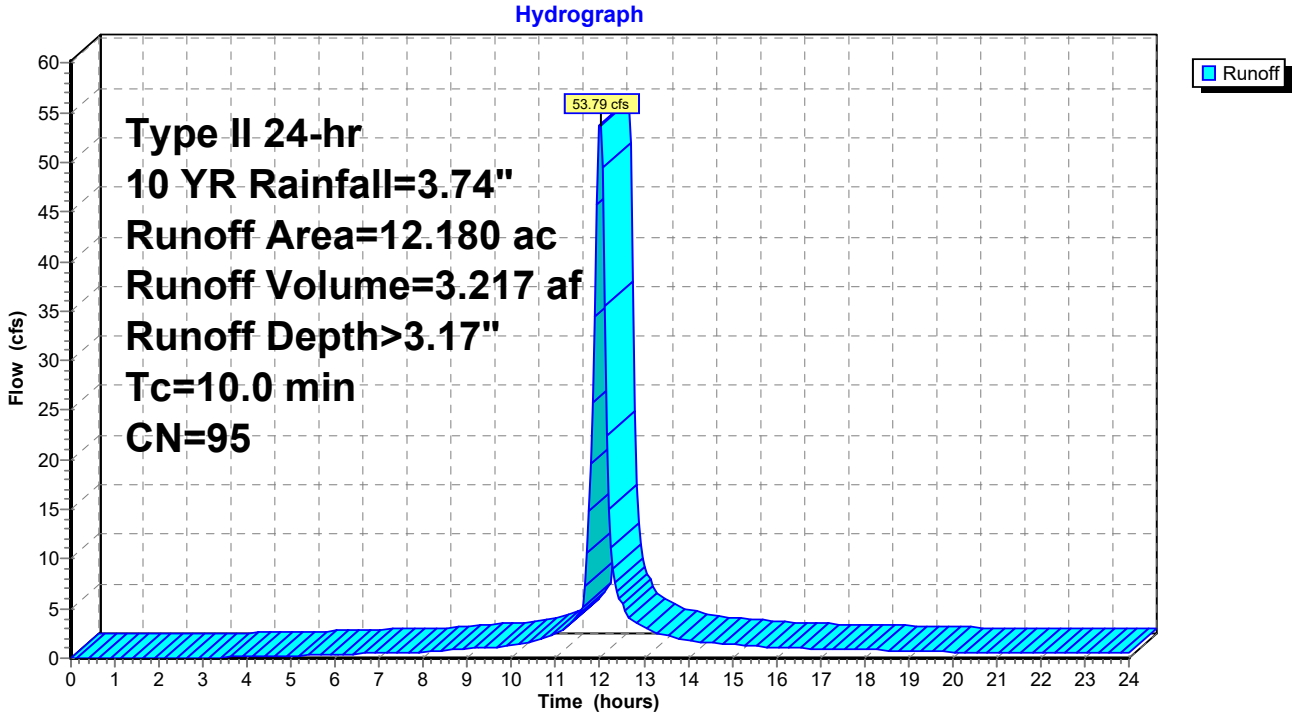
Runoff = 53.79 cfs @ 12.01 hrs, Volume= 3.217 af, Depth> 3.17"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

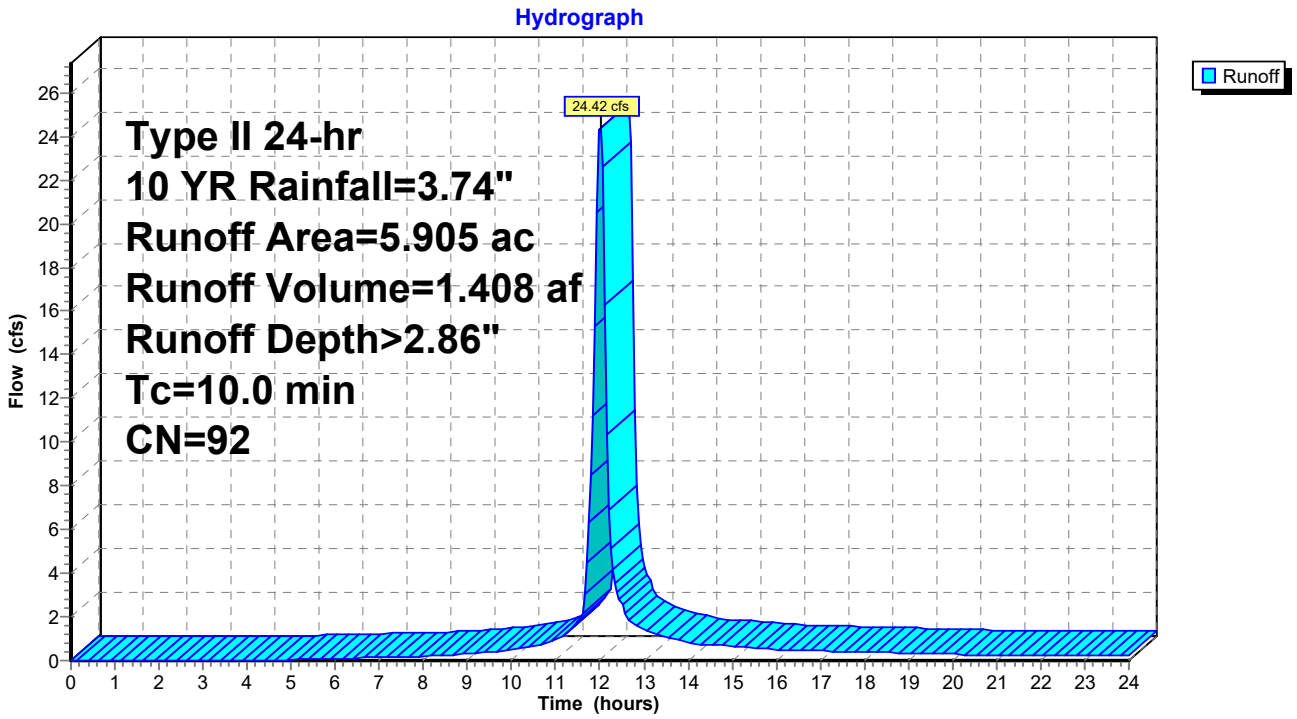
Runoff = 24.42 cfs @ 12.01 hrs, Volume= 1.408 af, Depth> 2.86"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

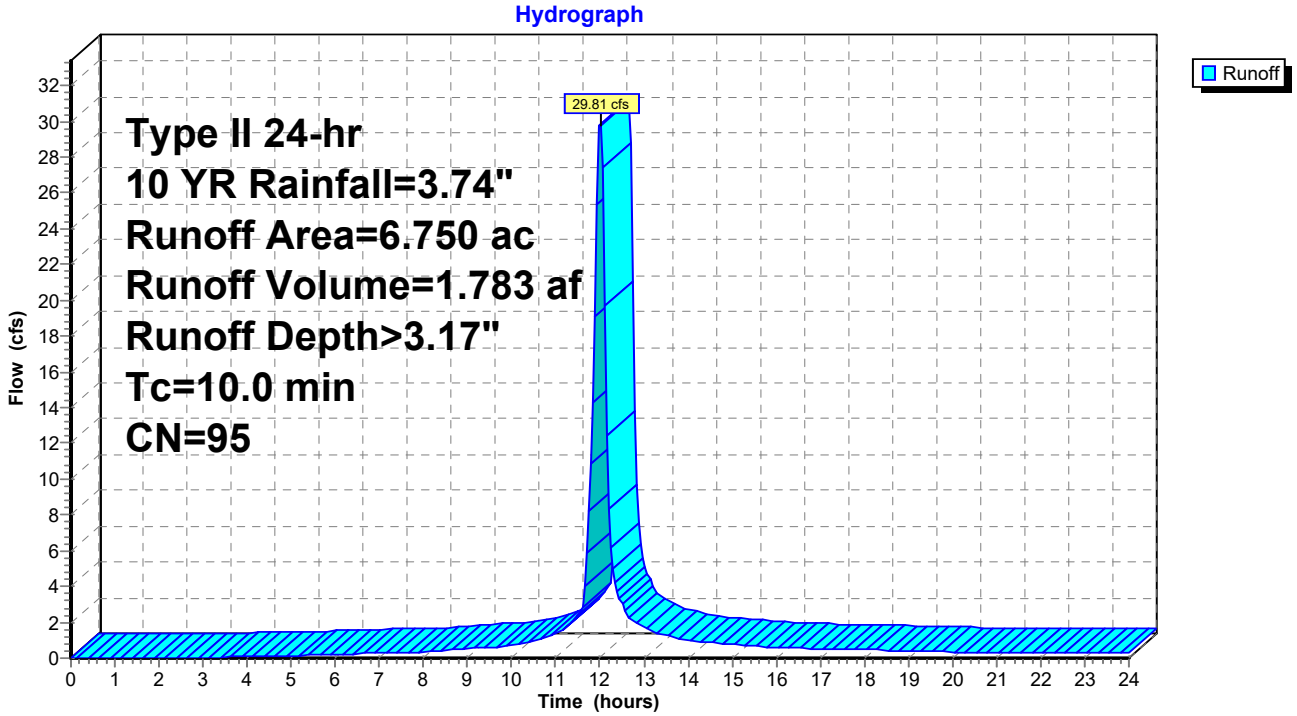
Runoff = 29.81 cfs @ 12.01 hrs, Volume= 1.783 af, Depth> 3.17"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

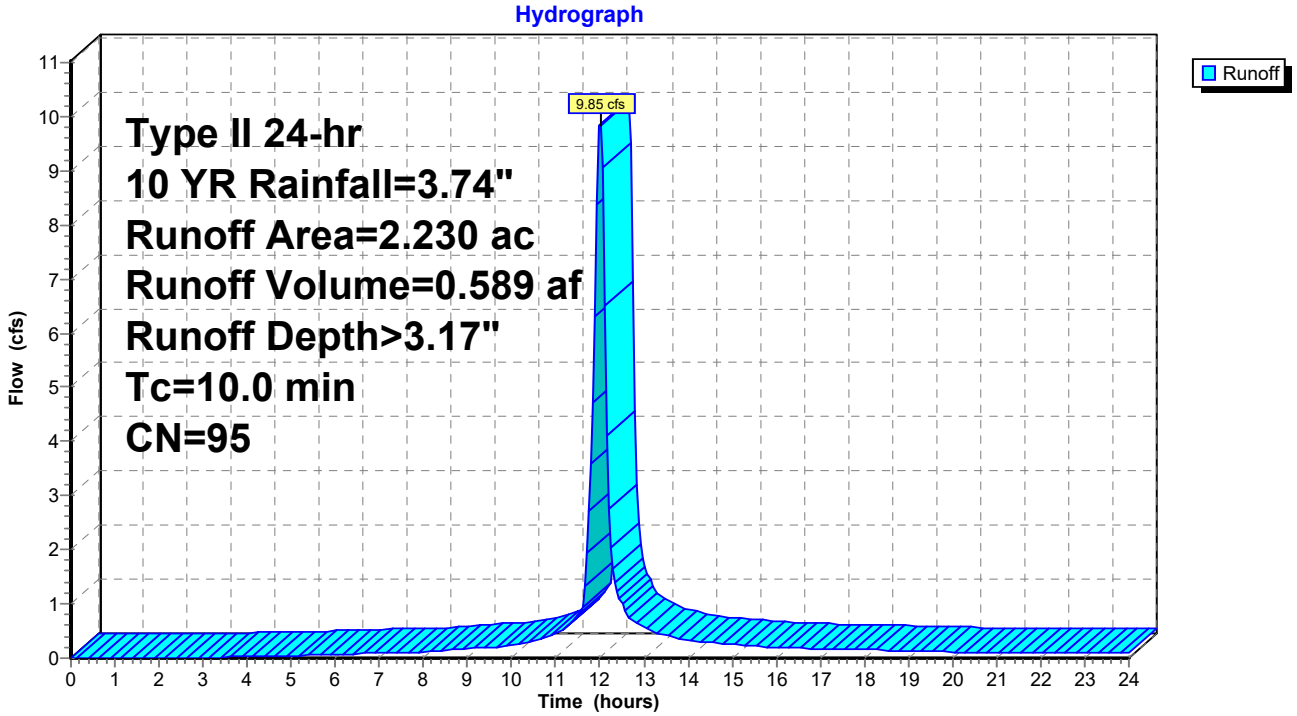
Runoff = 9.85 cfs @ 12.01 hrs, Volume= 0.589 af, Depth> 3.17"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

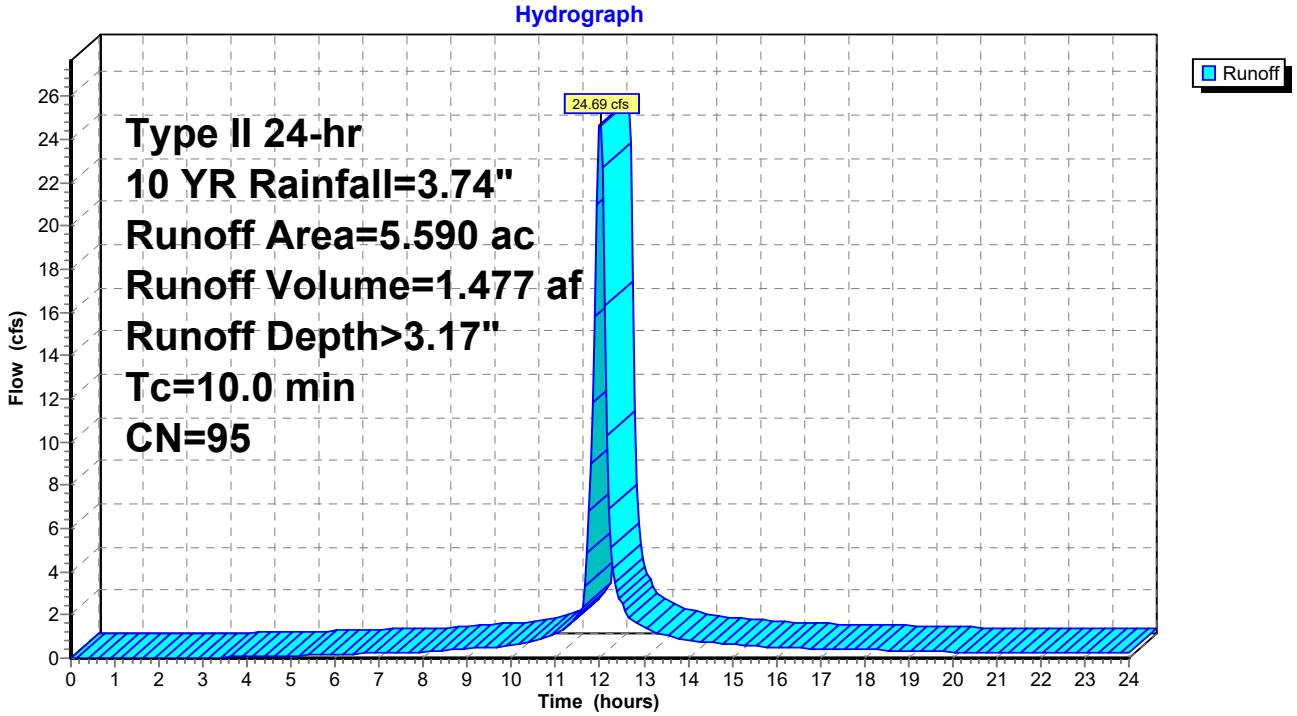
Runoff = 24.69 cfs @ 12.01 hrs, Volume= 1.477 af, Depth> 3.17"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YR Rainfall=3.74"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 3.11" for 10 YR event
Inflow = 142.55 cfs @ 12.01 hrs, Volume= 8.474 af
Outflow = 0.29 cfs @ 24.00 hrs, Volume= 0.302 af, Atten= 100%, Lag= 719.5 min
Primary = 0.29 cfs @ 24.00 hrs, Volume= 0.302 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 940.68' @ 24.00 hrs Surf.Area= 113,164 sf Storage= 355,893 cf

Plug-Flow detention time= 663.8 min calculated for 0.302 af (4% of inflow)
Center-of-Mass det. time= 260.9 min (1,039.0 - 778.1)

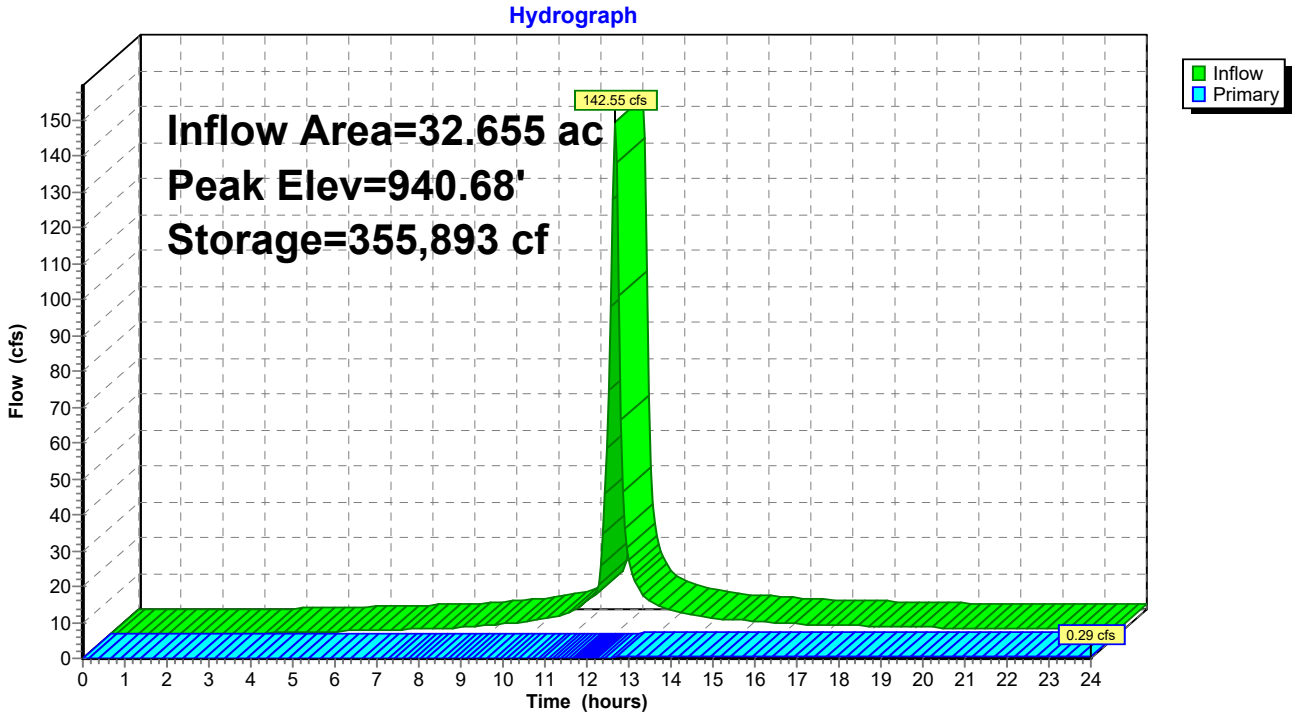
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

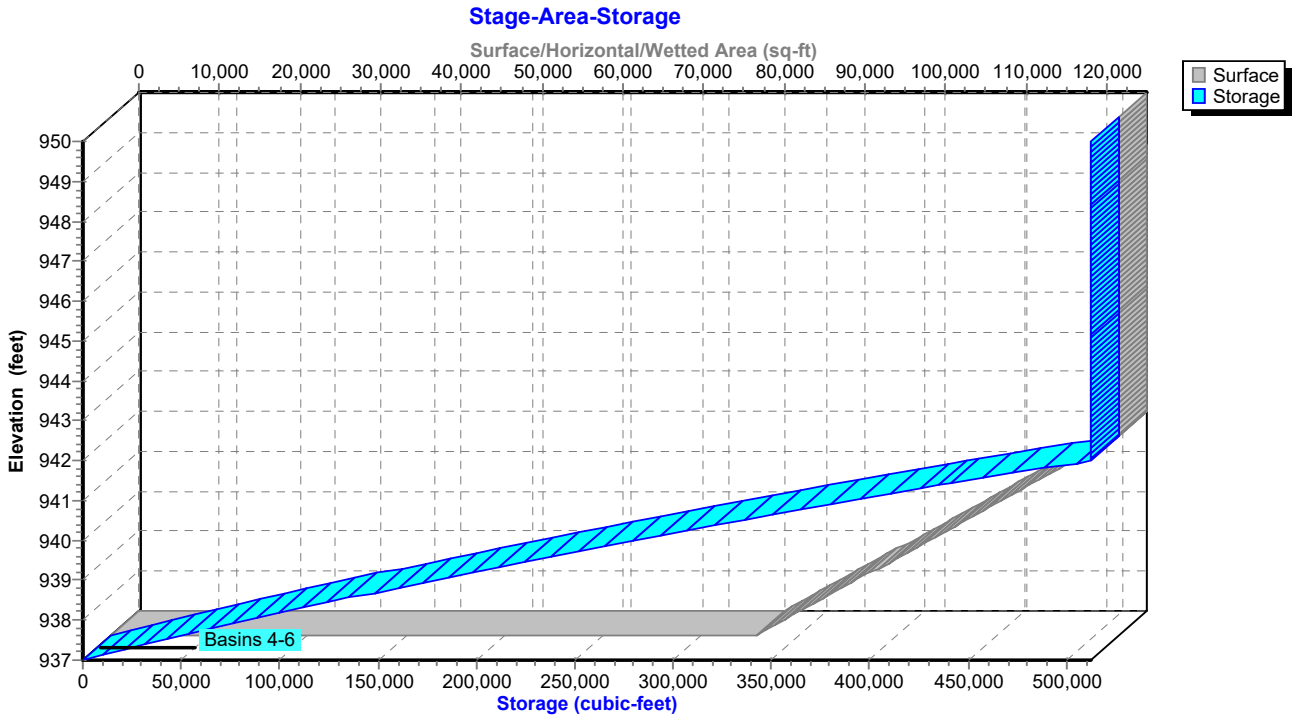
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.29 cfs @ 24.00 hrs HW=940.68' (Free Discharge)
└**1=Culvert** (Passes 0.29 cfs of 56.51 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.29 cfs @ 9.12 fps)
  ├**3=Window** (Controls 0.00 cfs)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>3.86"
Tc=10.0 min CN=95 Runoff=64.71 cfs 3.917 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>3.54"
Tc=10.0 min CN=92 Runoff=29.81 cfs 1.741 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>3.86"
Tc=10.0 min CN=95 Runoff=35.86 cfs 2.171 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>3.86"
Tc=10.0 min CN=95 Runoff=11.85 cfs 0.717 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>3.86"
Tc=10.0 min CN=95 Runoff=29.70 cfs 1.798 af

Pond 48P: Combined 2450 Basin Peak Elev=941.37' Storage=435,806 cf Inflow=171.93 cfs 10.343 af
Outflow=0.32 cfs 0.336 af

Total Runoff Area = 32.655 ac Runoff Volume = 10.343 af Average Runoff Depth = 3.80"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

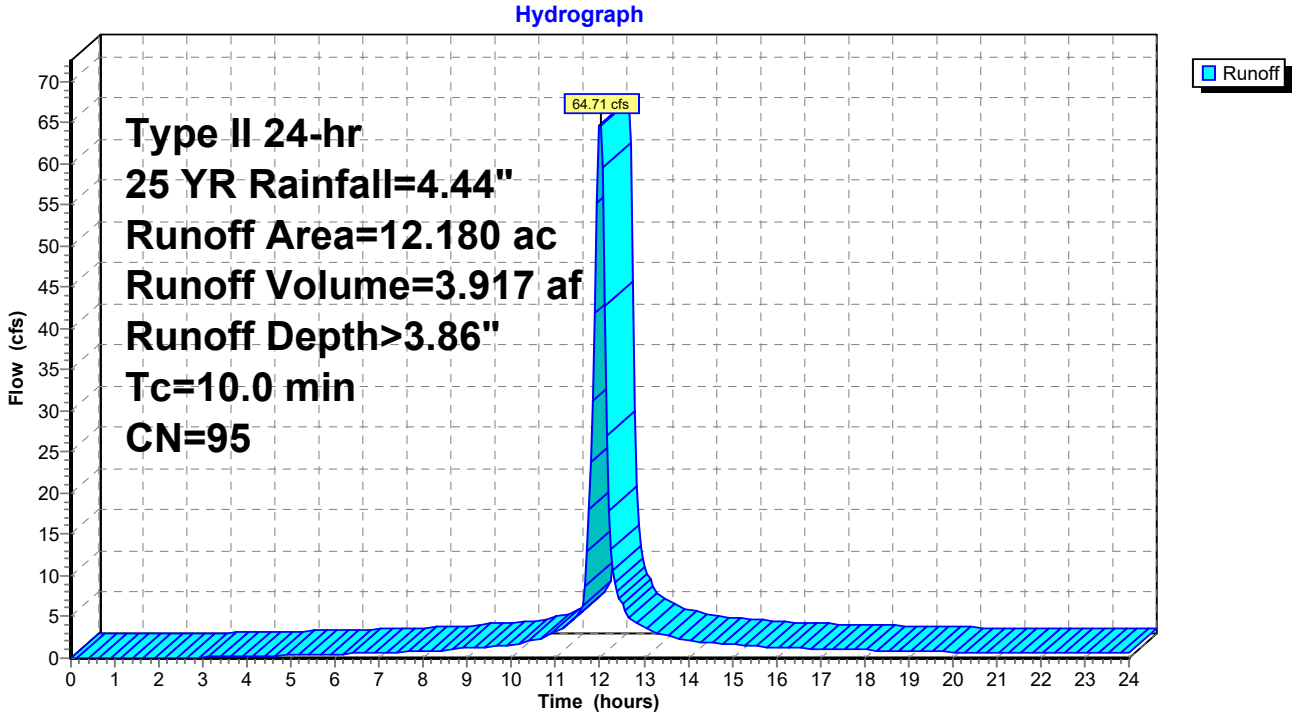
Runoff = 64.71 cfs @ 12.01 hrs, Volume= 3.917 af, Depth> 3.86"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

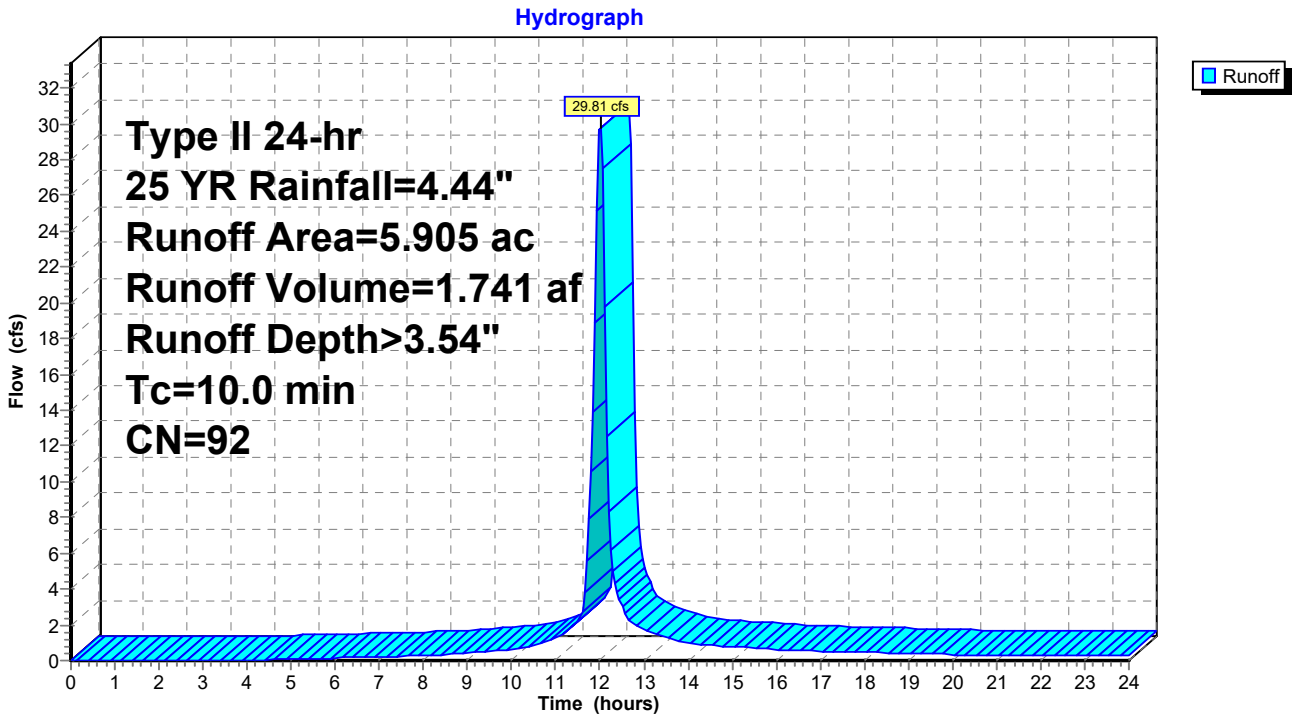
Runoff = 29.81 cfs @ 12.01 hrs, Volume= 1.741 af, Depth> 3.54"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

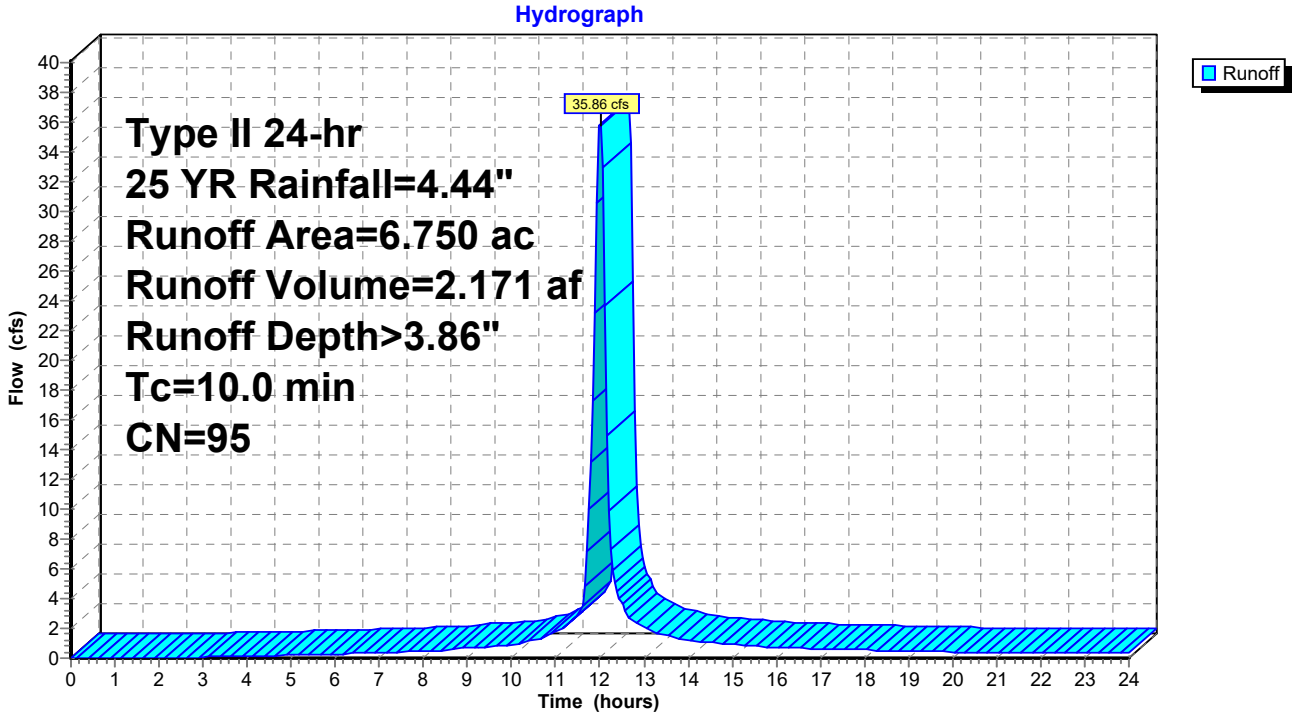
Runoff = 35.86 cfs @ 12.01 hrs, Volume= 2.171 af, Depth> 3.86"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

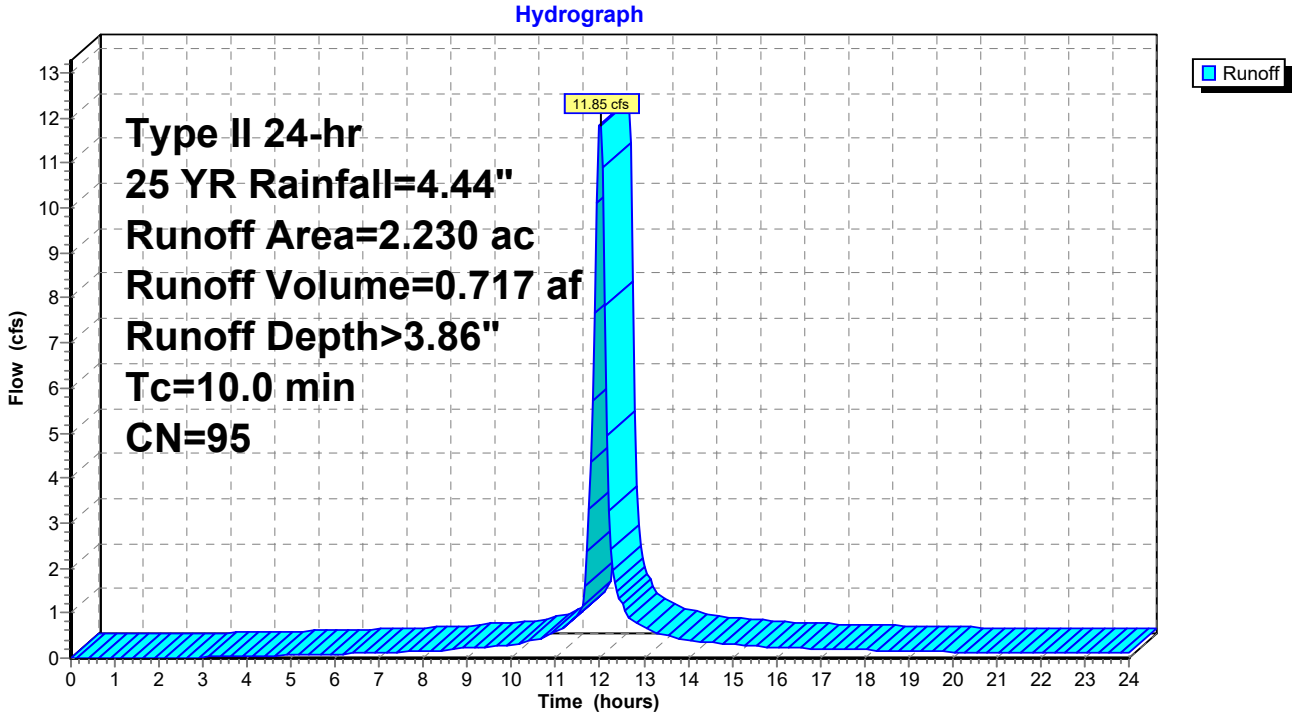
Runoff = 11.85 cfs @ 12.01 hrs, Volume= 0.717 af, Depth> 3.86"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

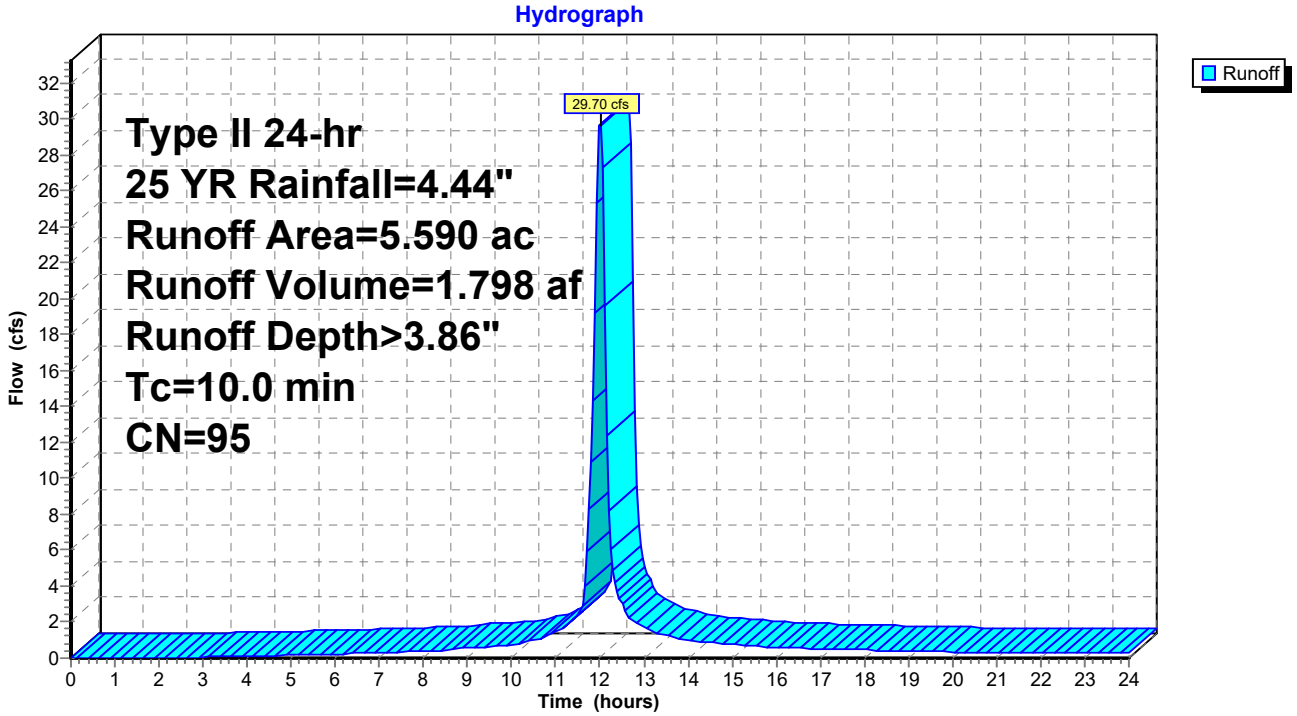
Runoff = 29.70 cfs @ 12.01 hrs, Volume= 1.798 af, Depth> 3.86"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=4.44"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 3.80" for 25 YR event
Inflow = 171.93 cfs @ 12.01 hrs, Volume= 10.343 af
Outflow = 0.32 cfs @ 24.00 hrs, Volume= 0.336 af, Atten= 100%, Lag= 719.5 min
Primary = 0.32 cfs @ 24.00 hrs, Volume= 0.336 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 941.37' @ 24.00 hrs Surf.Area= 119,350 sf Storage= 435,806 cf

Plug-Flow detention time= 688.1 min calculated for 0.336 af (3% of inflow)
Center-of-Mass det. time= 256.0 min (1,029.0 - 773.1)

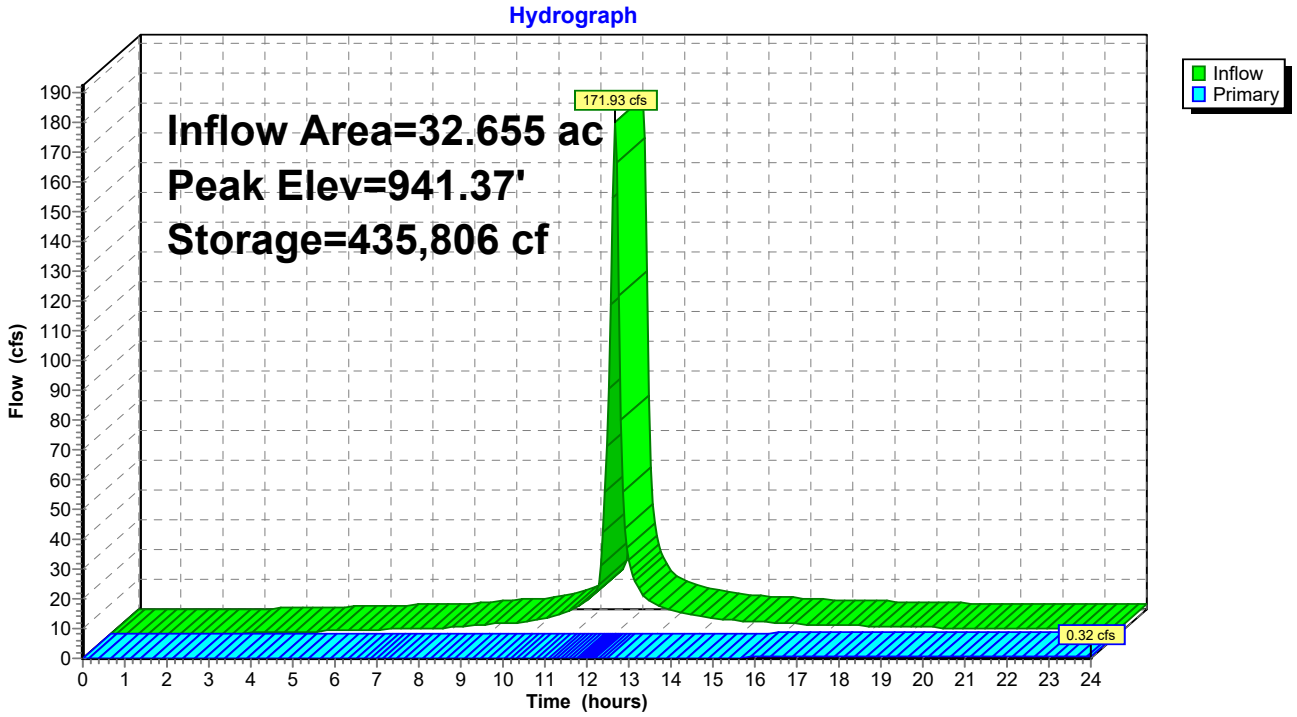
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

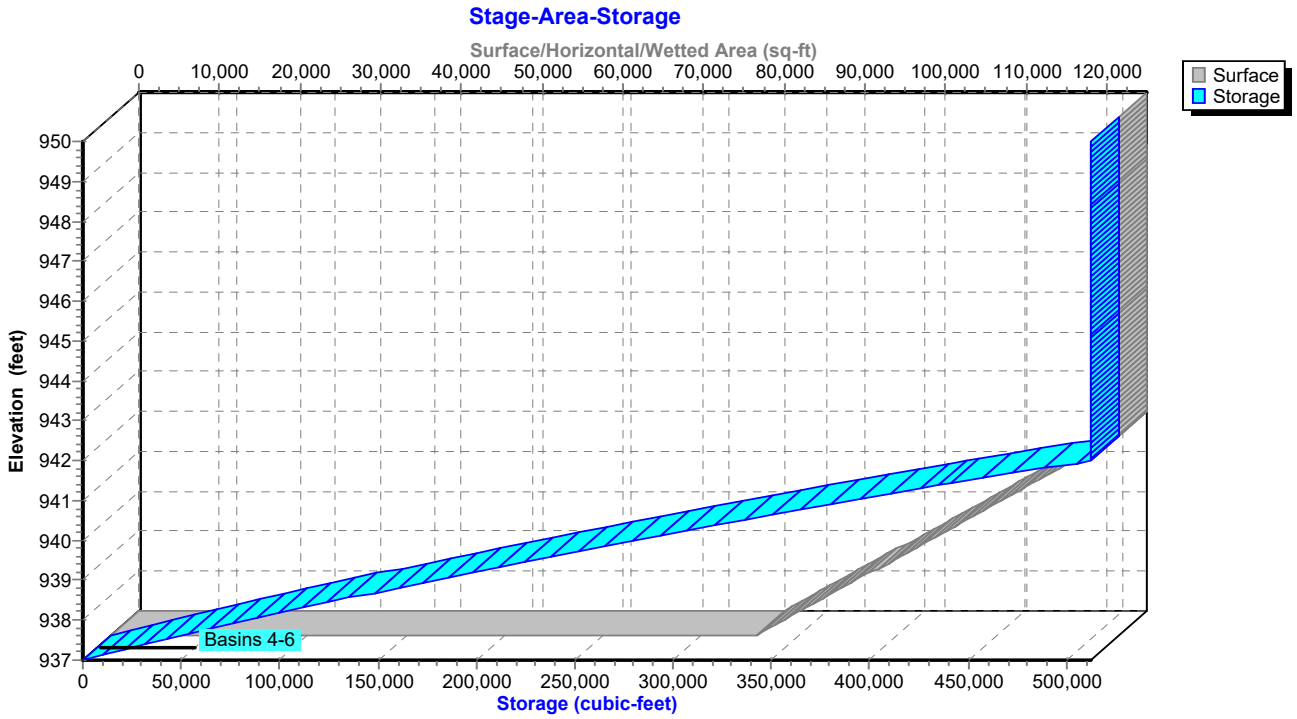
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 24.00 hrs HW=941.37' (Free Discharge)
└**1=Culvert** (Passes 0.32 cfs of 72.89 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.31 cfs @ 9.95 fps)
  ├**3=Window** (Orifice Controls 0.00 cfs @ 0.15 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>4.43"
Tc=10.0 min CN=95 Runoff=73.72 cfs 4.499 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>4.10"
Tc=10.0 min CN=92 Runoff=34.25 cfs 2.018 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>4.43"
Tc=10.0 min CN=95 Runoff=40.86 cfs 2.493 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>4.43"
Tc=10.0 min CN=95 Runoff=13.50 cfs 0.824 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>4.43"
Tc=10.0 min CN=95 Runoff=33.83 cfs 2.065 af

Pond 48P: Combined 2450 Basin Peak Elev=941.54' Storage=456,412 cf Inflow=196.16 cfs 11.899 af
Outflow=2.41 cfs 1.490 af

Total Runoff Area = 32.655 ac Runoff Volume = 11.899 af Average Runoff Depth = 4.37"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

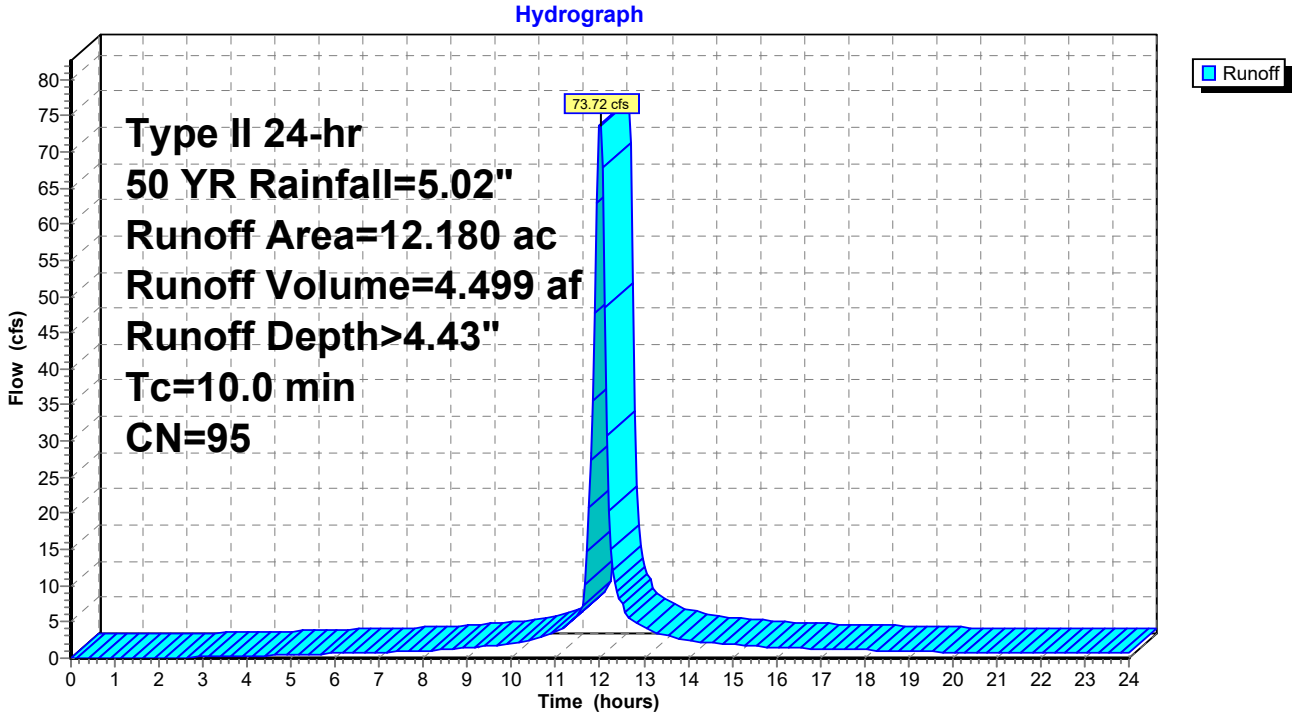
Runoff = 73.72 cfs @ 12.01 hrs, Volume= 4.499 af, Depth> 4.43"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

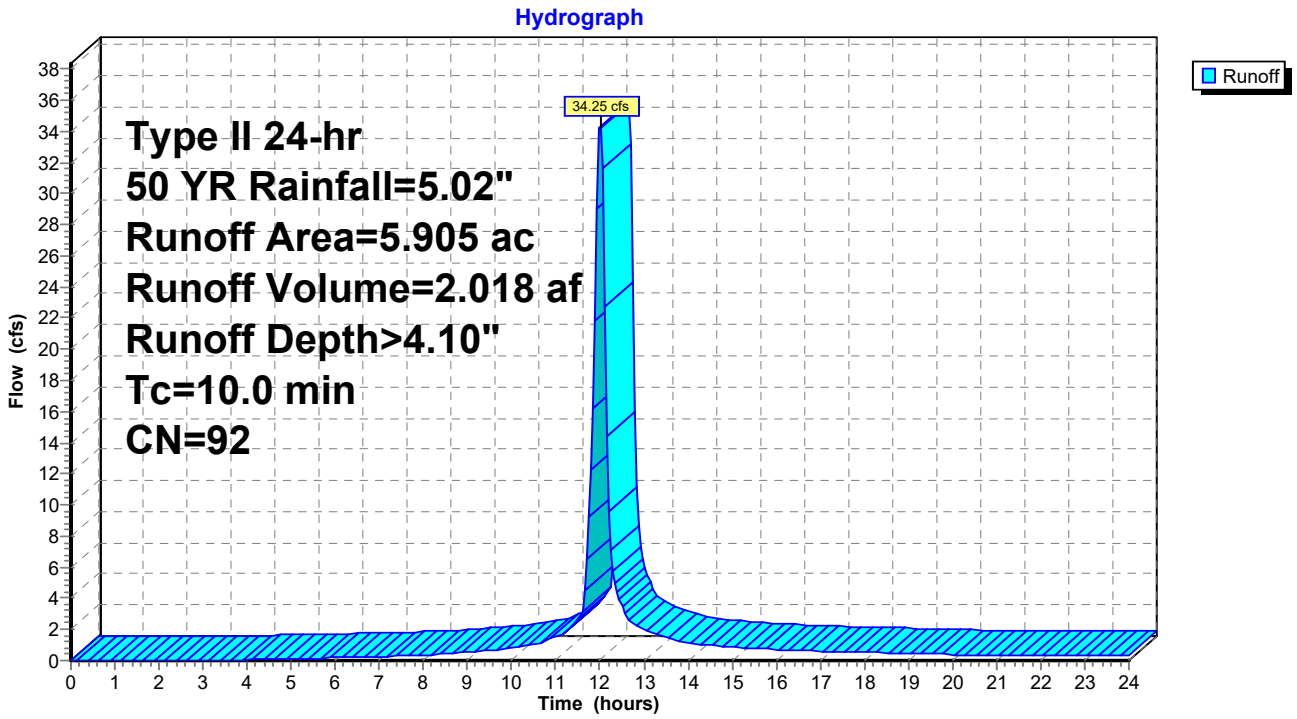
Runoff = 34.25 cfs @ 12.01 hrs, Volume= 2.018 af, Depth> 4.10"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

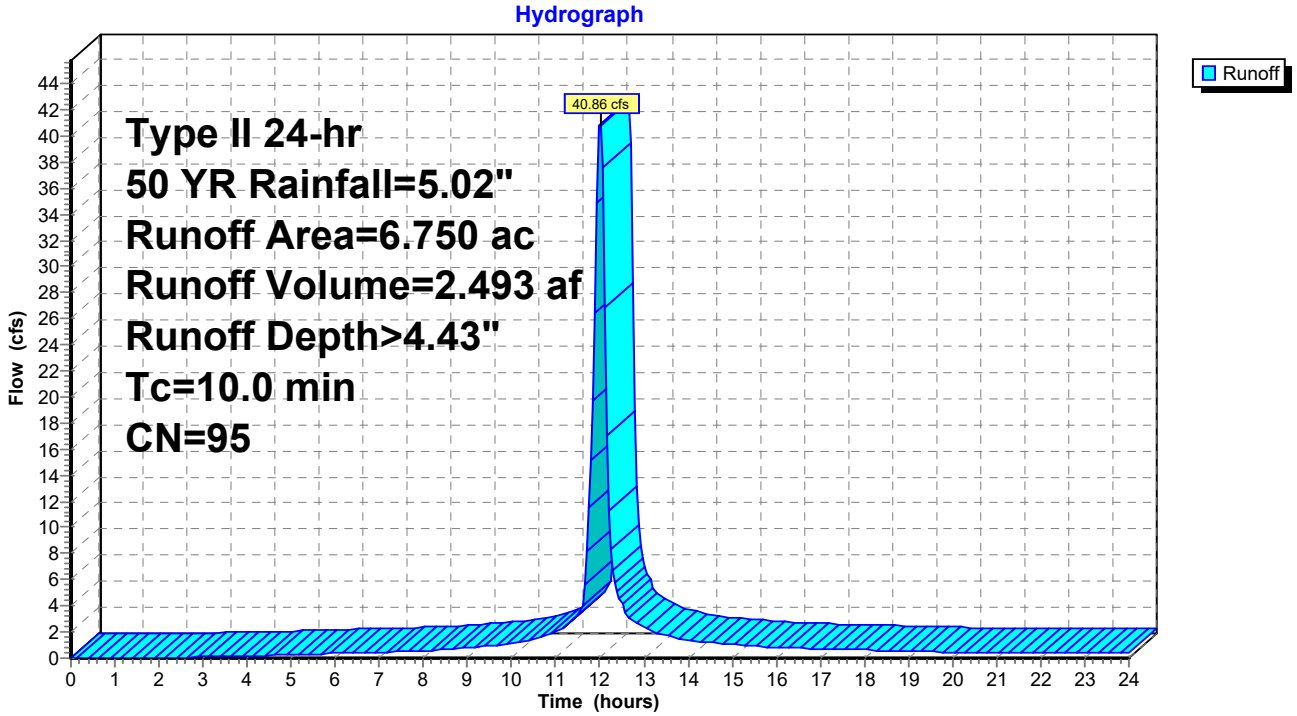
Runoff = 40.86 cfs @ 12.01 hrs, Volume= 2.493 af, Depth> 4.43"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

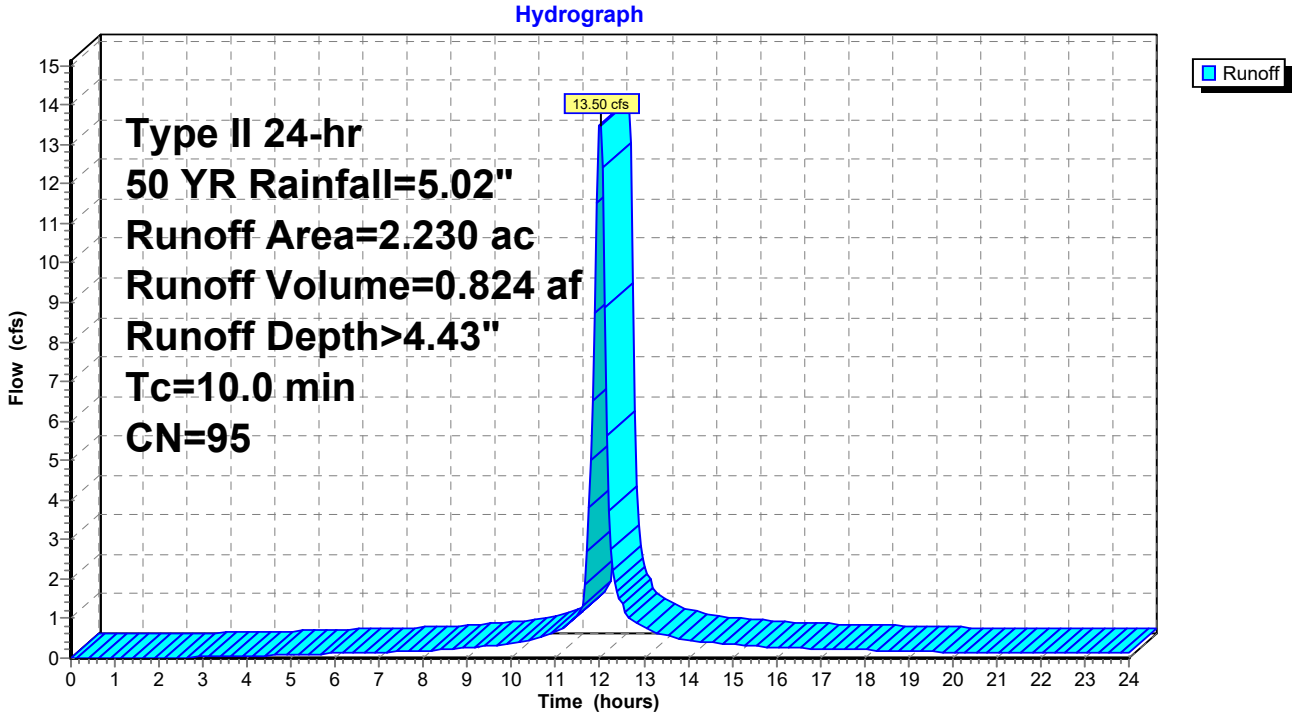
Runoff = 13.50 cfs @ 12.01 hrs, Volume= 0.824 af, Depth> 4.43"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

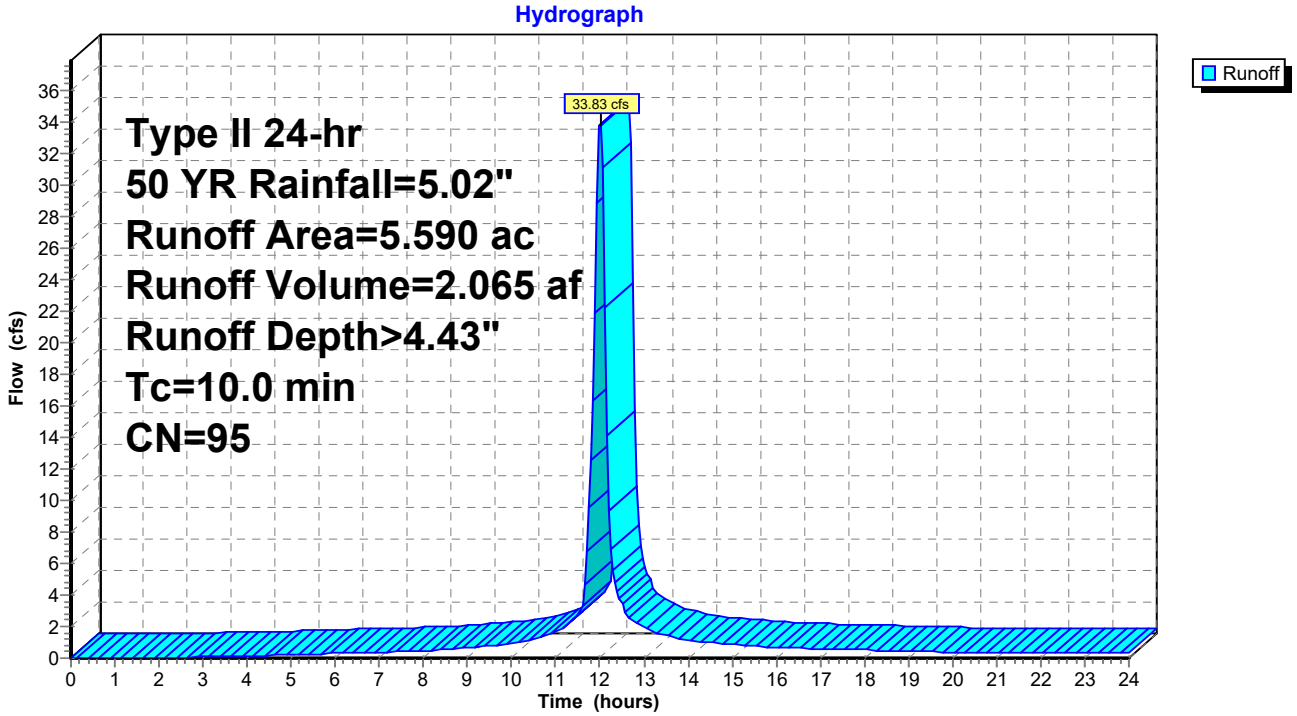
Runoff = 33.83 cfs @ 12.01 hrs, Volume= 2.065 af, Depth> 4.43"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 YR Rainfall=5.02"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 4.37" for 50 YR event
Inflow = 196.16 cfs @ 12.01 hrs, Volume= 11.899 af
Outflow = 2.41 cfs @ 19.44 hrs, Volume= 1.490 af, Atten= 99%, Lag= 445.9 min
Primary = 2.41 cfs @ 19.44 hrs, Volume= 1.490 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 941.54' @ 19.44 hrs Surf.Area= 120,894 sf Storage= 456,412 cf

Plug-Flow detention time= 678.7 min calculated for 1.487 af (12% of inflow)
Center-of-Mass det. time= 401.2 min (1,170.8 - 769.6)

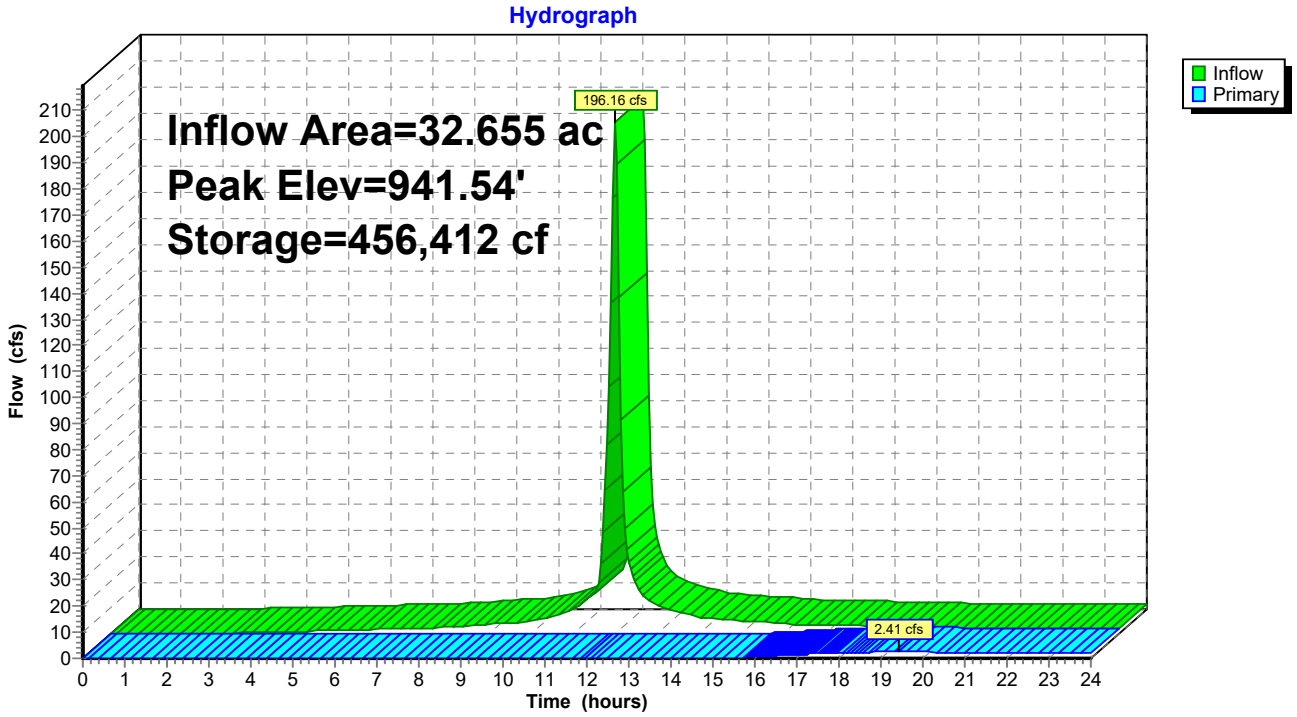
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

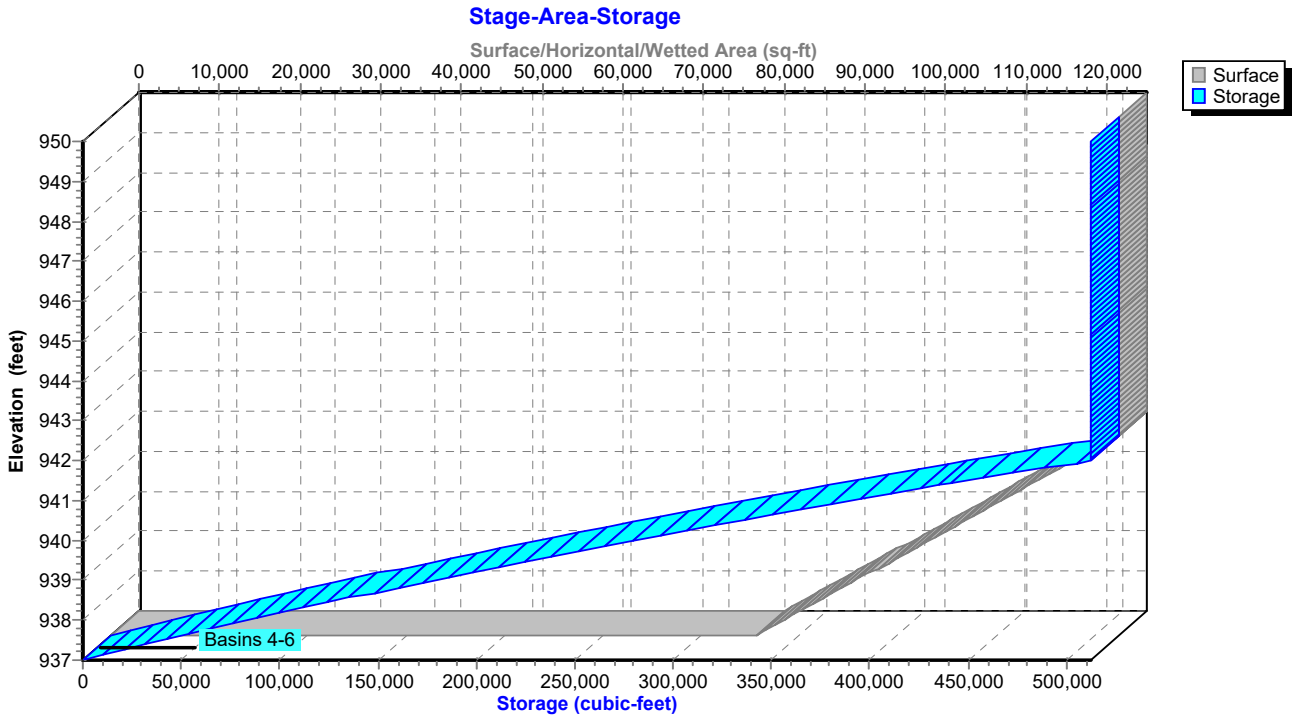
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.41 cfs @ 19.44 hrs HW=941.54' (Free Discharge)
└**1=Culvert** (Passes 2.41 cfs of 76.72 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.32 cfs @ 10.15 fps)
  ├**3=Window** (Orifice Controls 2.09 cfs @ 1.34 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment42S: Post-Dev (Sub Area Runoff Area=12.180 ac 85.00% Impervious Runoff Depth>5.04"
Tc=10.0 min CN=95 Runoff=83.16 cfs 5.112 af

Subcatchment43S: Post-Dev (Sub Area H Runoff Area=5.905 ac 69.96% Impervious Runoff Depth>4.70"
Tc=10.0 min CN=92 Runoff=38.91 cfs 2.312 af

Subcatchment44S: Post-Dev (Sub Area G) Runoff Area=6.750 ac 85.00% Impervious Runoff Depth>5.04"
Tc=10.0 min CN=95 Runoff=46.09 cfs 2.833 af

Subcatchment45S: Post-Dev (Sub Area E) Runoff Area=2.230 ac 85.00% Impervious Runoff Depth>5.04"
Tc=10.0 min CN=95 Runoff=15.23 cfs 0.936 af

Subcatchment46S: Post-Dev (Sub Area C) Runoff Area=5.590 ac 85.00% Impervious Runoff Depth>5.04"
Tc=10.0 min CN=95 Runoff=38.17 cfs 2.346 af

Pond 48P: Combined 2450 Basin Peak Elev=941.66' Storage=470,093 cf Inflow=221.55 cfs 13.538 af
Outflow=4.75 cfs 3.084 af

Total Runoff Area = 32.655 ac Runoff Volume = 13.538 af Average Runoff Depth = 4.98"
17.72% Pervious = 5.786 ac 82.28% Impervious = 26.869 ac

Summary for Subcatchment 42S: Post-Dev (Sub Area D&F)

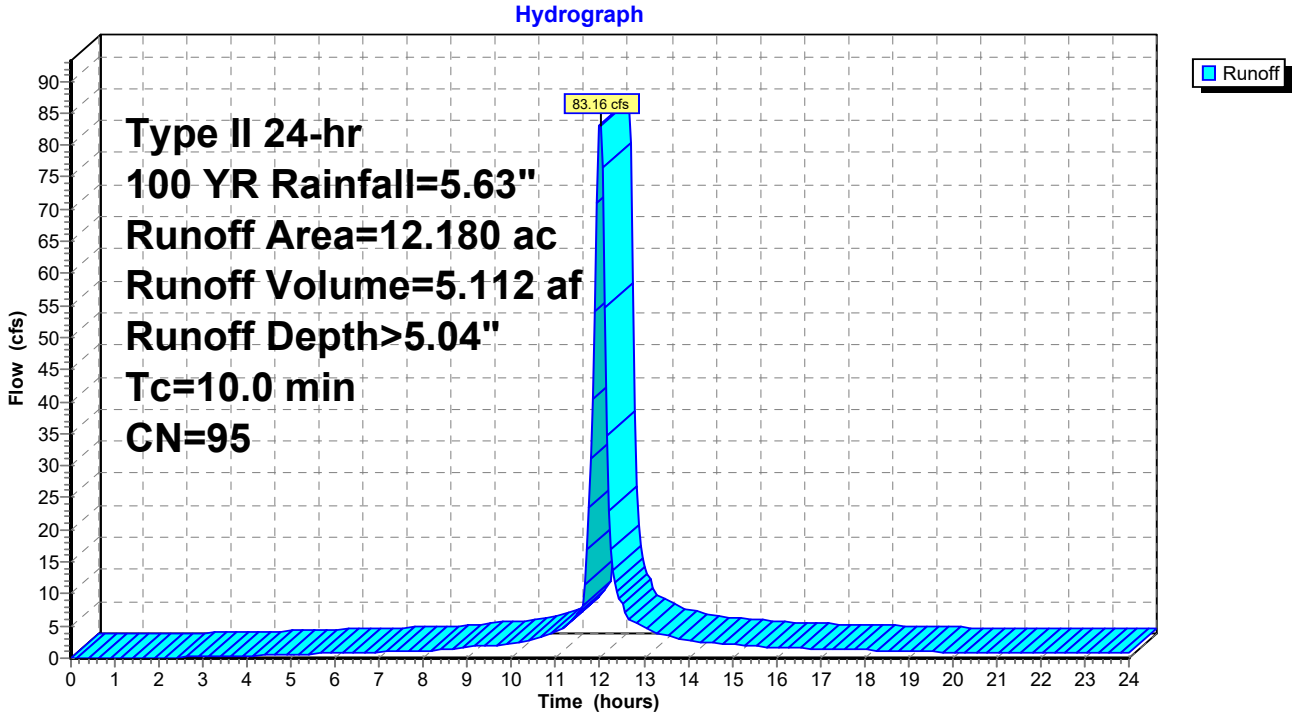
Runoff = 83.16 cfs @ 12.01 hrs, Volume= 5.112 af, Depth> 5.04"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
6.490	95	Urban commercial, 85% imp, HSG D
5.690	95	Urban commercial, 85% imp, HSG D
12.180	95	Weighted Average
1.827		15.00% Pervious Area
10.353		85.00% Impervious Area

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

Subcatchment 42S: Post-Dev (Sub Area D&F)



Summary for Subcatchment 43S: Post-Dev (Sub Area H & I)

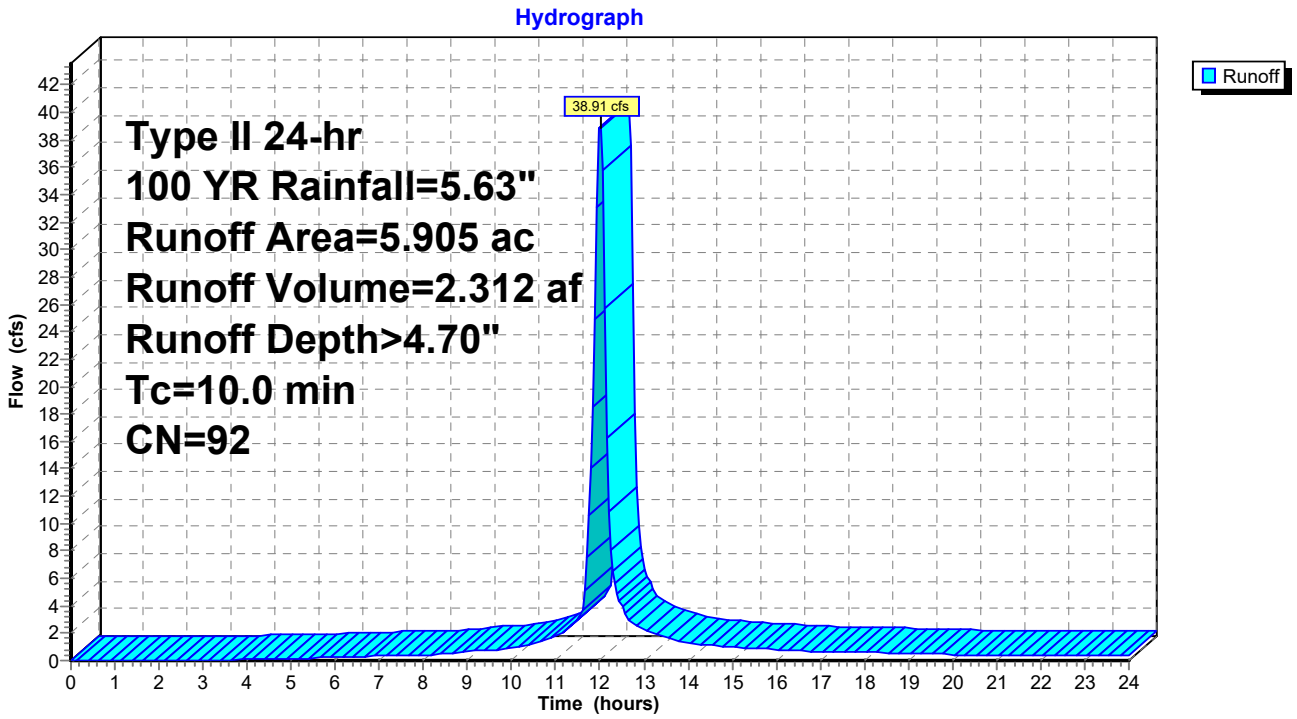
Runoff = 38.91 cfs @ 12.01 hrs, Volume= 2.312 af, Depth> 4.70"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
2.630	95	Urban commercial, 85% imp, HSG D
1.045	79	Woods/grass comb., Good, HSG D
5.905	92	Weighted Average
1.774		30.04% Pervious Area
4.131		69.96% Impervious Area

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

Subcatchment 43S: Post-Dev (Sub Area H & I)



Summary for Subcatchment 44S: Post-Dev (Sub Area G)

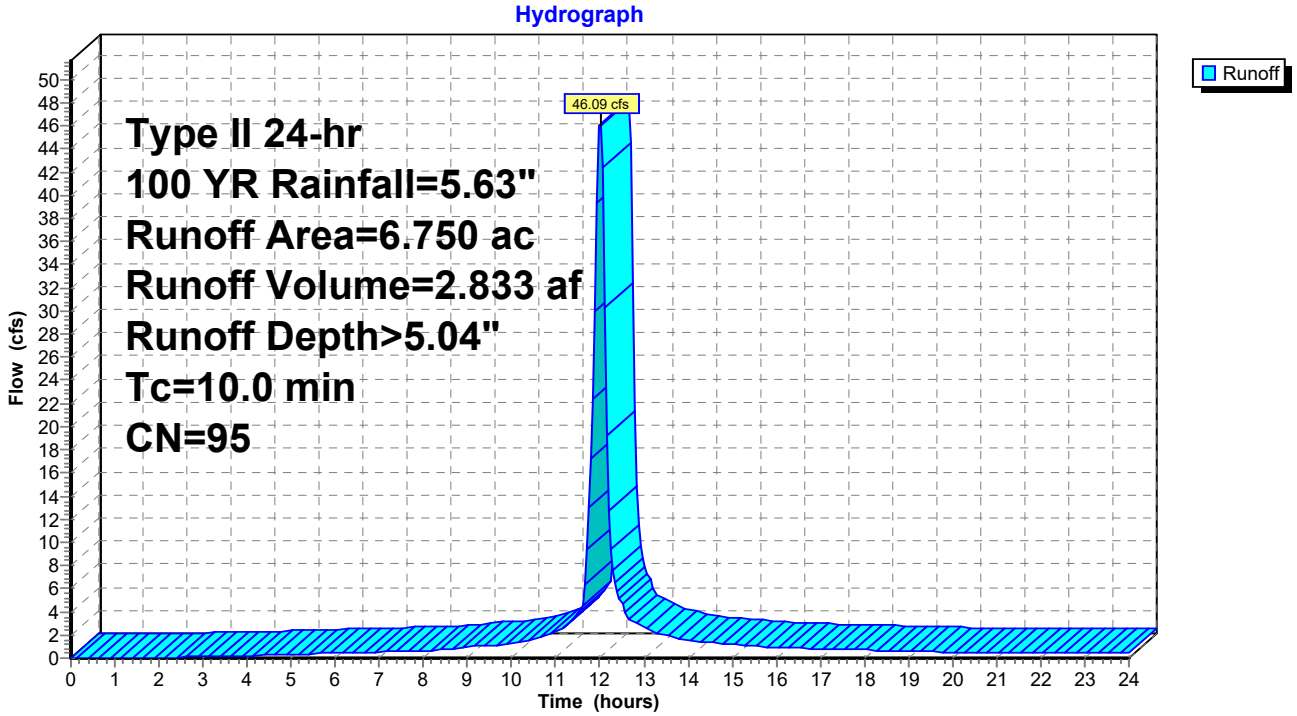
Runoff = 46.09 cfs @ 12.01 hrs, Volume= 2.833 af, Depth> 5.04"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
6.750	95	Urban commercial, 85% imp, HSG D
1.012		15.00% Pervious Area
5.737		85.00% Impervious Area

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

Subcatchment 44S: Post-Dev (Sub Area G)



Summary for Subcatchment 45S: Post-Dev (Sub Area E)

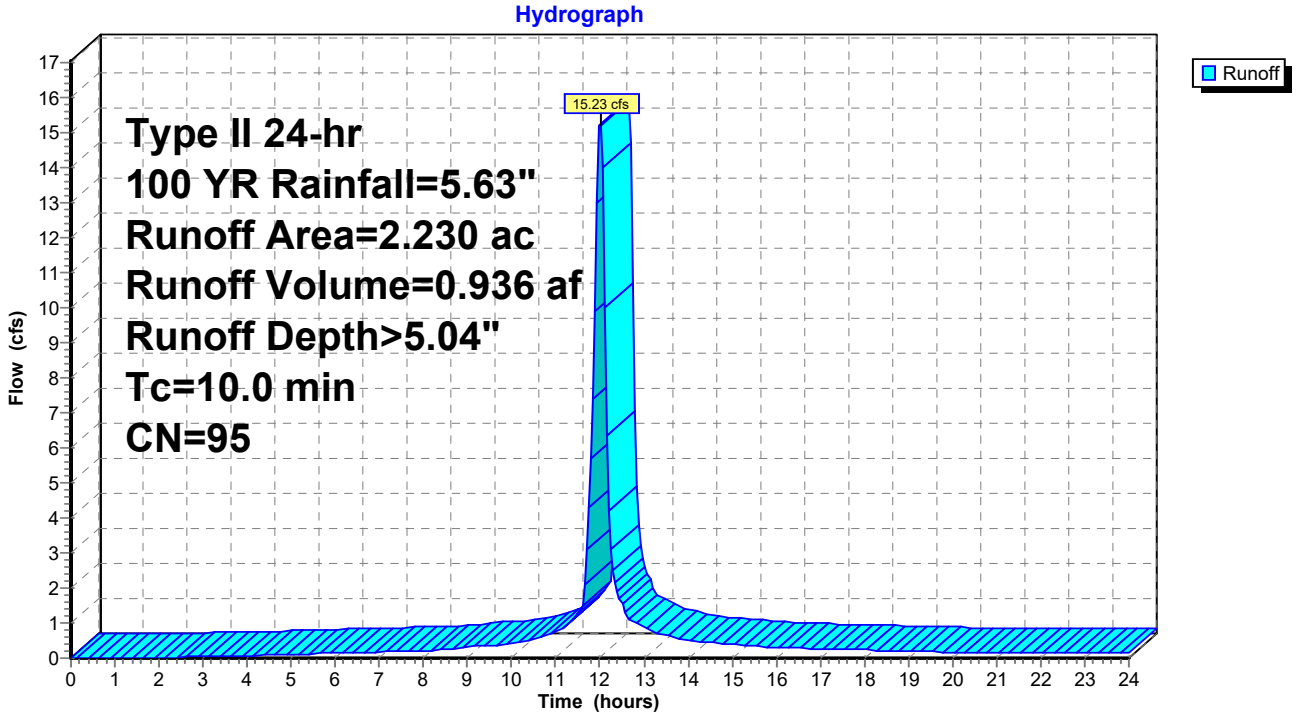
Runoff = 15.23 cfs @ 12.01 hrs, Volume= 0.936 af, Depth> 5.04"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
2.230	95	Urban commercial, 85% imp, HSG D
0.335		15.00% Pervious Area
1.895		85.00% Impervious Area

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

Subcatchment 45S: Post-Dev (Sub Area E)



Summary for Subcatchment 46S: Post-Dev (Sub Area C)

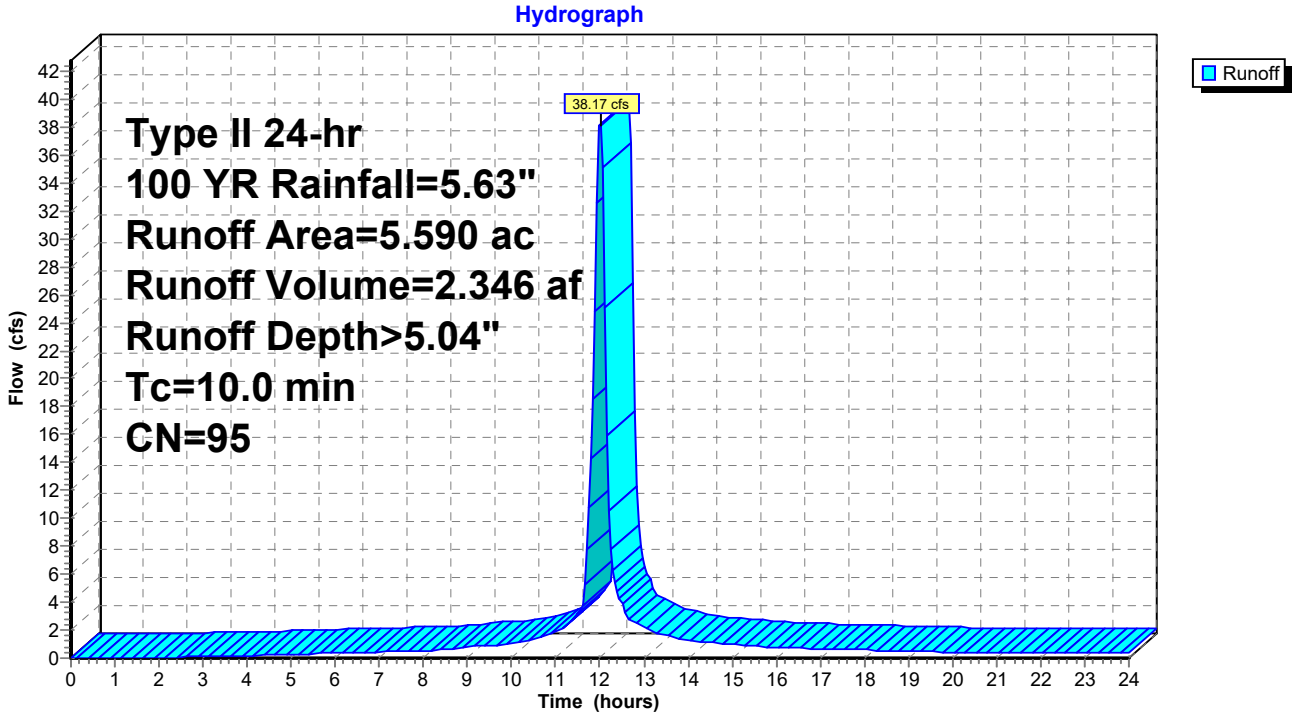
Runoff = 38.17 cfs @ 12.01 hrs, Volume= 2.346 af, Depth> 5.04"
Routed to Pond 48P : Combined 2450 Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=5.63"

Area (ac)	CN	Description
5.590	95	Urban commercial, 85% imp, HSG D
0.838		15.00% Pervious Area
4.751		85.00% Impervious Area

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

Subcatchment 46S: Post-Dev (Sub Area C)



Summary for Pond 48P: Combined 2450 Basin

Inflow Area = 32.655 ac, 82.28% Impervious, Inflow Depth > 4.98" for 100 YR event
Inflow = 221.55 cfs @ 12.01 hrs, Volume= 13.538 af
Outflow = 4.75 cfs @ 15.73 hrs, Volume= 3.084 af, Atten= 98%, Lag= 223.5 min
Primary = 4.75 cfs @ 15.73 hrs, Volume= 3.084 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 941.66' @ 15.73 hrs Surf.Area= 121,908 sf Storage= 470,093 cf

Plug-Flow detention time= 513.2 min calculated for 3.077 af (23% of inflow)
Center-of-Mass det. time= 314.6 min (1,081.1 - 766.5)

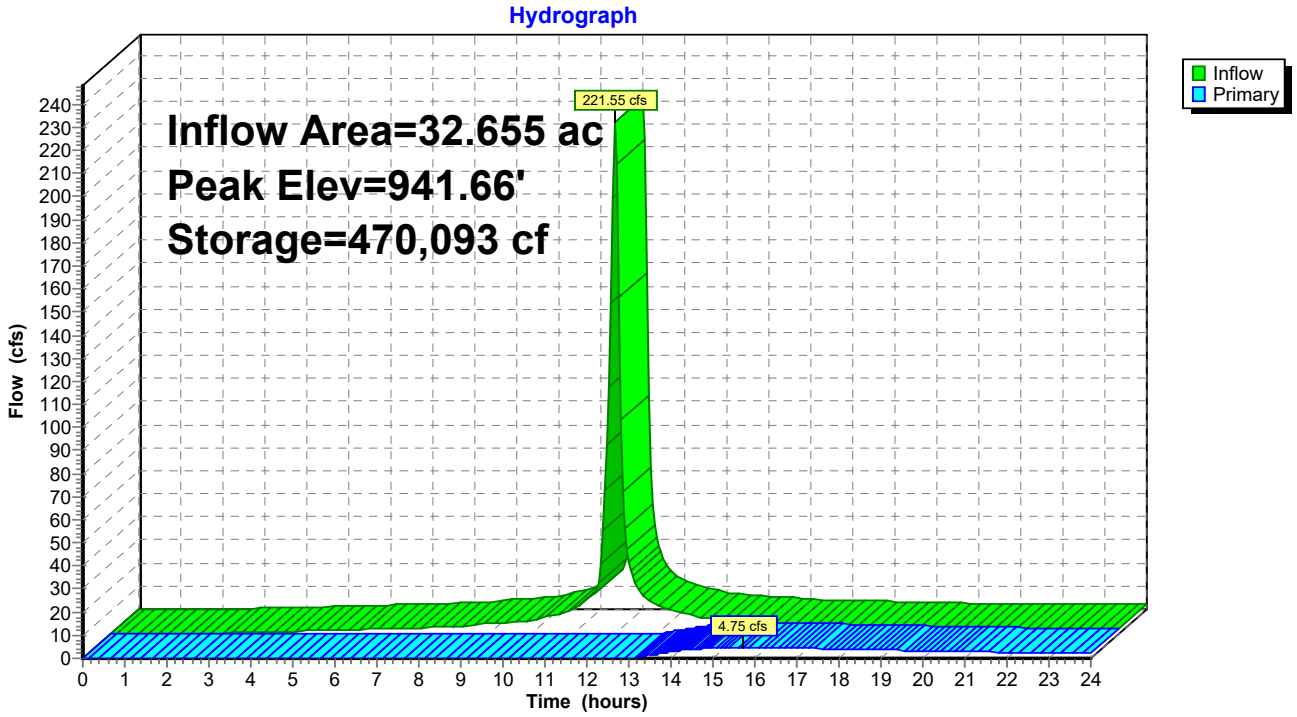
Volume	Invert	Avail.Storage	Storage Description
#1	937.00'	512,500 cf	**Basins 4-6 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
937.00	80,000	0	0
942.00	125,000	512,500	512,500

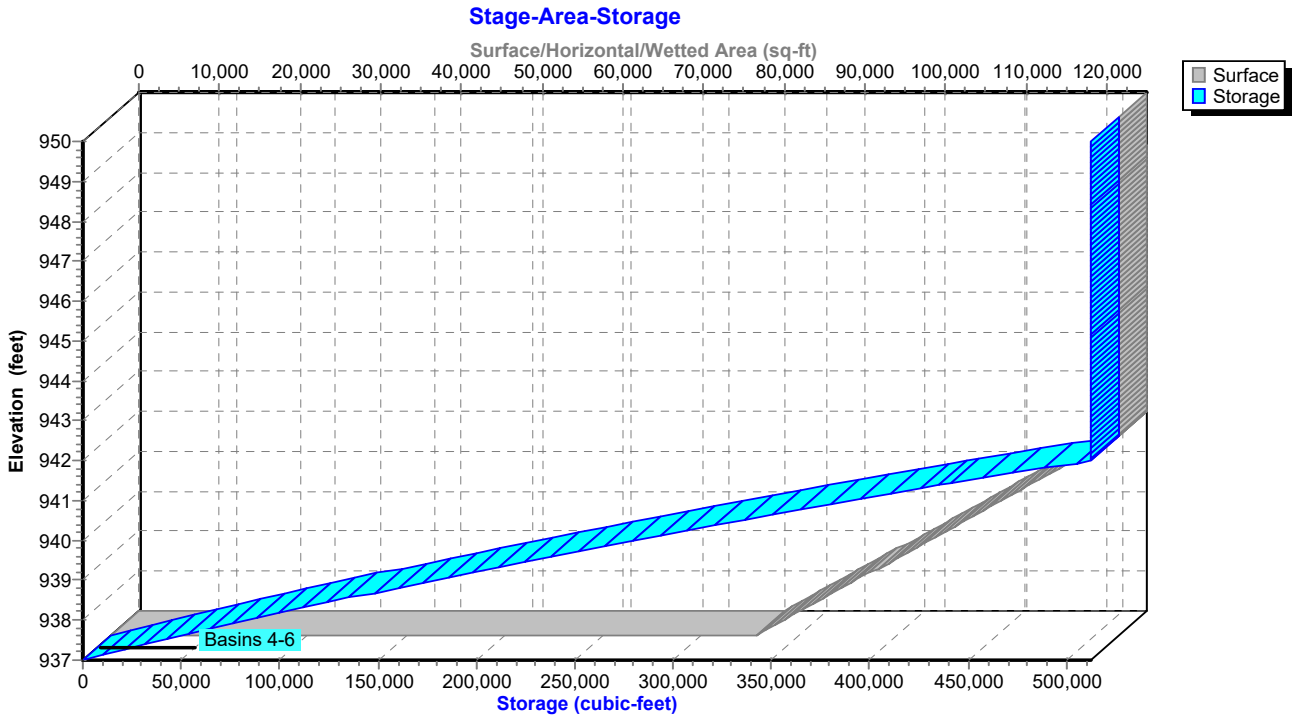
Device	Routing	Invert	Outlet Devices
#1	Primary	937.00'	**48.0" Round Culvert** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 937.00' / 936.89' S= 0.0011 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 12.57 sf
#2	Device 1	937.00'	**2.4" Vert. WQ Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	941.37'	**36.0" W x 12.0" H Vert. Window X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	950.00'	**1.5" x 5.0" Horiz. Top of Casting X 9.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.75 cfs @ 15.73 hrs HW=941.66' (Free Discharge)
└**1=Culvert** (Passes 4.75 cfs of 79.12 cfs potential flow)
  ├**2=WQ Orifice** (Orifice Controls 0.32 cfs @ 10.28 fps)
  ├**3=Window** (Orifice Controls 4.43 cfs @ 1.72 fps)
  └**4=Top of Casting** (Controls 0.00 cfs)

Pond 48P: Combined 2450 Basin



Pond 48P: Combined 2450 Basin



Appendix D

Water Quality Calculations

Wet Extended Detention Basin WQv Compliance Tool

version 3.2 2020-07-07

Project Summary

Project Name:	Cosgray Crossing - Subarea 2430				
Subwatershed ID/Label:					
Submitted by:					
Date:					
Subwatershed Drainage Area, A_{total} =	14.32	acres	=	623,779	ft2
Subwatershed Impervious Area, A_{imp} =	12.17	acres	=	530,212	ft2
Imperviousness fraction, i =	0.85			85	%
Water Quality Volume, WQv =	38,129	ft^3	=	0.88	ac-ft

Step 1 - Soil Suitability

Soil Series: | HSG:

Step 2 - Wet ED Basin Volume Requirements

Extended Detention Volume, EDv =	38129	ft^3
Minimum Sediment Storage Volume, $V_{sediment}$ =	7626	ft^3
Minimum Permanent Pool Volume, PPv =	45754	ft^3

Step 3 - Basin Stage-Storage Relationship

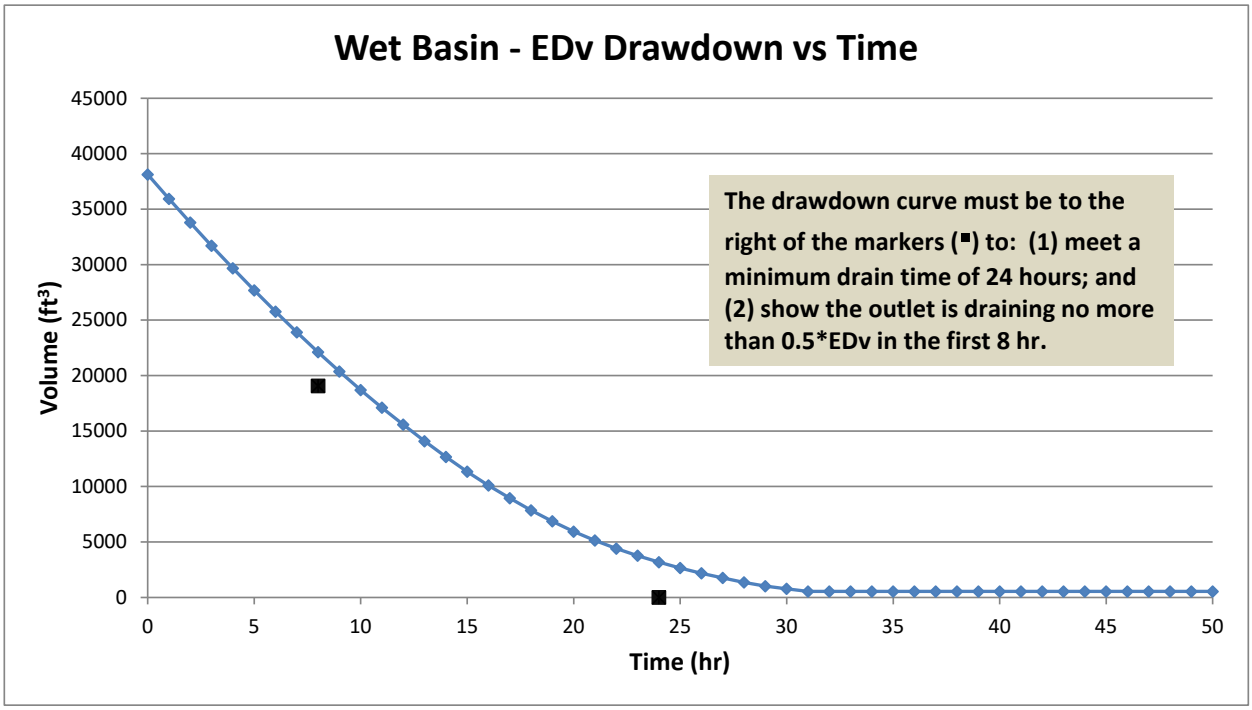
	Elevation ft	Area ft^2		Incremental Volume ft^3	Cumulative Volume ft^3
Bottom of Permanent Micropool =	939.10	10967			
	944.10	41381		122,752	122,752

Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	939.10				
Elevation of Top of EDv =	941.41				
Secondary Outlet Invert Elevation =	941.41				OKAY
WQ Treatment Volume Provided, $V_{treatment}$ =	37,740	ft^3			
Treatment Vol Provided Relative to EDv, $V_{treatment}/EDv$ =	0.99		=	99%	NOT MET
Permanent Pool Volume Provided, PPv =	0	ft^3			
Ratio PPv Provided to PPv Required =	0.00		=	0%	NOT MET

Step 5 - Outlet (Orifice) Sizing

Maximum Hydraulic Head, Hmax =	2.31	ft			
Orifice Coefficient, C =	0.6				
Target (Minimum) Draw-down Time, T_d =	24	hr			
Target Average Discharge, Q_{avg} =	0.44	cfs			
Average Hydraulic Head, H_{avg} =	1.15	ft			
Estimated Orifice Area, $A_{orifice}$ =	12.28	in^2	=	0.085	ft^2
Estimated Orifice Diameter, $D_{orifice}$ =	3.95	in	=	0.33	ft
Design Orifice Diameter, $D_{orifice}$ =	4.00	in	=	0.33	ft
Design Orifice Area, $A_{orifice}$ =	12.49	in^2	=	0.087	ft^2
Time to Completely Drain EDv, T_d =	>72	hr	must be ≥ 24 hr		OKAY
Volume Drained in First 8 hr =	16,024	ft^3			
% of EDv =	42.0	%	must be ≤ 50%		OKAY



Wet Extended Detention Basin WQv Compliance Tool

version 3.2 2020-07-07

Project Summary

Project Name: Cosgray Crossing Subarea 2450
Subwatershed ID/Label:
Submitted by:
Date:

Subwatershed Drainage Area, A_{total} =	32.66	acres	=	1,422,757	ft2
Subwatershed Impervious Area, A_{imp} =	27.76	acres	=	1,209,343	ft2
Imperviousness fraction, i =	0.85			85	%
Water Quality Volume, WQv =	86,966	ft^3	=	2.00	ac-ft

Step 1 - Soil Suitability

Soil Series: HSG:

Step 2 - Wet ED Basin Volume Requirements

Extended Detention Volume, EDv =	86966	ft^3
Minimum Sediment Storage Volume, $V_{sediment}$ =	17393	ft^3
Minimum Permanent Pool Volume, PPv =	104359	ft^3

Step 3 - Basin Stage-Storage Relationship

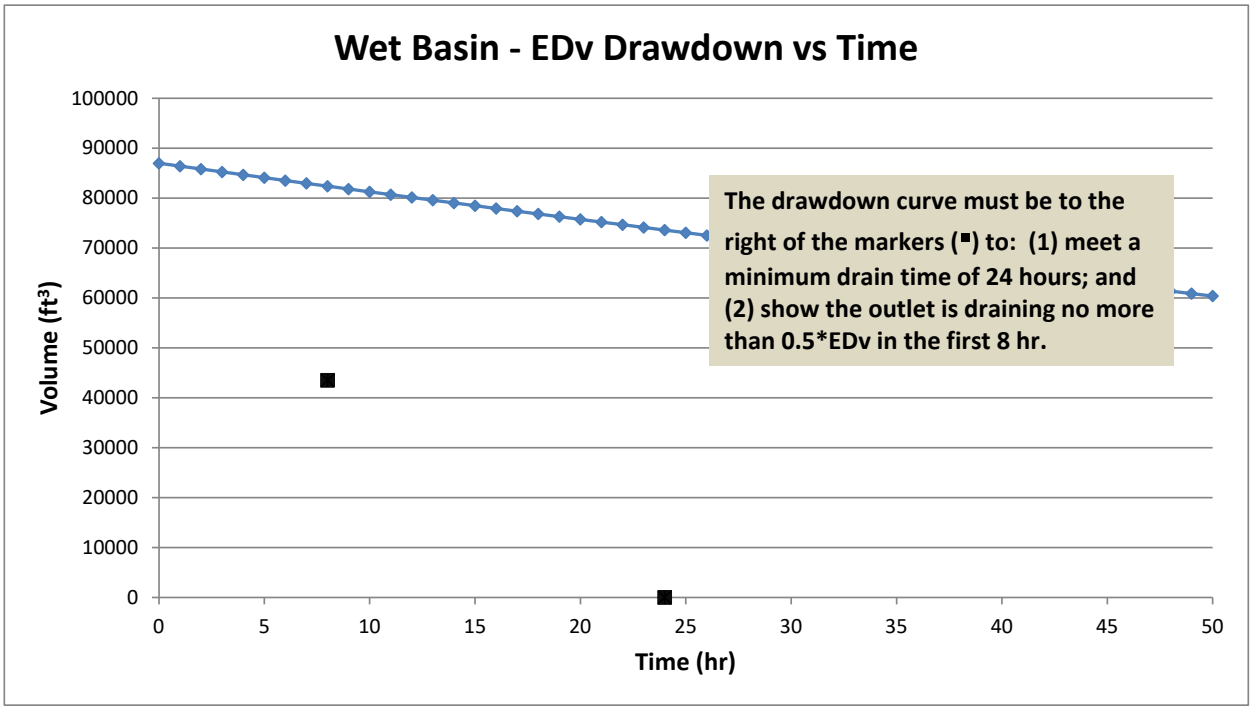
	Elevation ft	Area ft^2		Incremental Volume ft^3	Cumulative Volume ft^3
Bottom of Permanent Micropool =	937.00	63911			
	938.00	72481		68,151	68,151
	939.00	81374		76,885	145,036
	940.00	91523		86,399	231,435
	941.00	101942		96,686	328,120
	942.00	109911		105,902	434,022

Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	937.00				
Elevation of Top of EDv =	938.26				
Secondary Outlet Invert Elevation =	938.26				OKAY
WQ Treatment Volume Provided, $V_{treatment}$ =	87,290	ft^3			
Treatment Vol Provided Relative to EDv, $V_{treatment}/EDv$ =	1.00		=	100%	OKAY
Permanent Pool Volume Provided, PPv =	0	ft^3			
Ratio PPv Provided to PPv Required =	0.00		=	0%	NOT MET

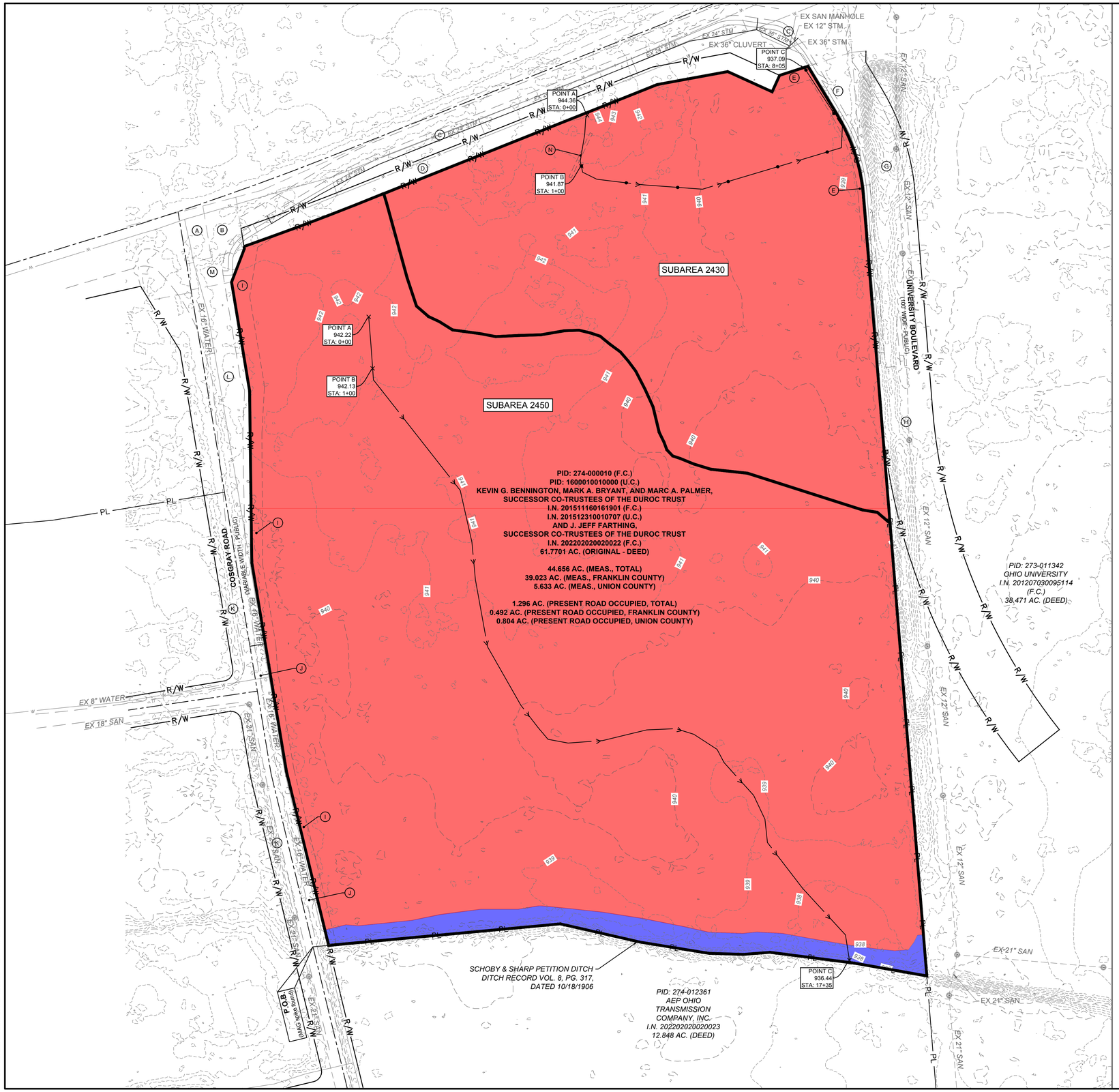
Step 5 - Outlet (Orifice) Sizing

Maximum Hydraulic Head, Hmax =	1.26	ft			
Orifice Coefficient, C =	0.6				
Target (Minimum) Draw-down Time, T_d =	24	hr			
Target Average Discharge, Q_{avg} =	1.01	cfs			
Average Hydraulic Head, H_{avg} =	0.63	ft			
Estimated Orifice Area, $A_{orifice}$ =	37.93	in^2	=	0.263	ft^2
Estimated Orifice Diameter, $D_{orifice}$ =	6.95	in	=	0.58	ft
Design Orifice Diameter, $D_{orifice}$ =	2.40	in	=	0.20	ft
Design Orifice Area, $A_{orifice}$ =	4.49	in^2	=	0.031	ft^2
Time to Completely Drain EDv, T_d =	>72	hr	must be ≥ 24 hr		OKAY
Volume Drained in First 8 hr =	4,589	ft^3			
% of EDv =	5.3	%	must be ≤ 50%		OKAY



Appendix E

Tributary Maps



SITE LEGEND

- PL — PROPERTY LINE
- R/W — RIGHT-OF-WAY
- ROW CROP
- WOODS / GRASS COMBINATION

AMERICAN STRUCTUREPOINT INC.
2550 Corporate Exchange Dr. Ste 300 | Columbus, Ohio 43231
TEL 614.901.2235 | FAX 614.901.2236
www.structurepoint.com

PRE-DEVELOPED TRIBUTARY MAP FOR COSGRAY CROSSING

CITY OF DUBLIN, COUNTY, STATE

REVISIONS	DATE	SHEET NO.	DESCRIPTION

APPROVAL PENDING NOT FOR CONSTRUCTION

IN SUBMITTING BIDS IN RELIANCE ON THESE PLANS THE CONTRACTOR ASSUMES ALL RISKS OF ADDITIONAL COSTS OF REVISIONS DUE TO REQUIREMENTS OF THE OWNER OR GOVERNMENTAL AUTHORITIES AND MATERIAL REVISIONS IN THE COURSE OF COMPLETING THE FINAL DESIGN.

DATE:	12/30/2025
DRAWN BY:	MTR
CHECKED BY:	JRP
JOB NUMBER:	2024.00364

PRE

HORZ 1"=100' 0 100 200

PLOT SCALE: 1:1 EDIT DATE: 12/23/25 - 12:17 PM EDITED BY: MROCHE DRAWING FILE: O:\2024\00364\D DRAWINGS\CIVIL\EXHIBITS\DRAINAGE EXHIBITS\PRE-DEVELOPED TRIBUTARY MAP.DWG

SITE LEGEND

- PL — PROPERTY LINE
- R/W — RIGHT-OF-WAY
- DEVELOPED ~85% IMPERVIOUS AREA
- WOODS / GRASS COMBINATION

HORZ 1"=100' 0 100 200

AMERICAN STRUCTUREPOINT INC.
2550 Corporate Exchange Dr. Ste 300 | Columbus, Ohio 43231
TEL 614.901.2235 | FAX 614.901.2236
www.structurepoint.com

POST-DEVELOPED TRIBUTARY MAP
FOR
COSGRAY CROSSING
CITY OF DUBLIN, COUNTY, STATE

REVISIONS	DATE	SHEET NO.	DESCRIPTION

APPROVAL PENDING NOT FOR CONSTRUCTION
IN SUBMITTING BIDS IN RELIANCE ON THESE PLANS THE CONTRACTOR ASSUMES ALL RISKS OF ADDITIONAL COSTS OF REVISIONS DUE TO REQUIREMENTS OF THE OWNER OR GOVERNMENTAL AUTHORITIES AND MATERIAL REVISIONS IN THE COURSE OF COMPLETING THE FINAL DESIGN.

DATE:	12/30/2025
DRAWN BY:	MTR
CHECKED BY:	JRP
JOB NUMBER:	2024.00364

POST

PLOT SCALE: 1:1 EDIT DATE: 12/30/25 - 3:04 PM EDITED BY: MROCHE DRAWING FILE: O:\2024\00364\D. DRAWINGS\CIVIL\EXHIBITS\DRAINAGE EXHIBITS\POST-DEVELOPED TRIBUTARY MAP.DWG