STORMWATER MANAGEMENT REPORT

800 LONG RIDGE ROAD
STAMFORD, CONNECTICUT

Prepared by:

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STORMWATER MANAGEMENT REPORT

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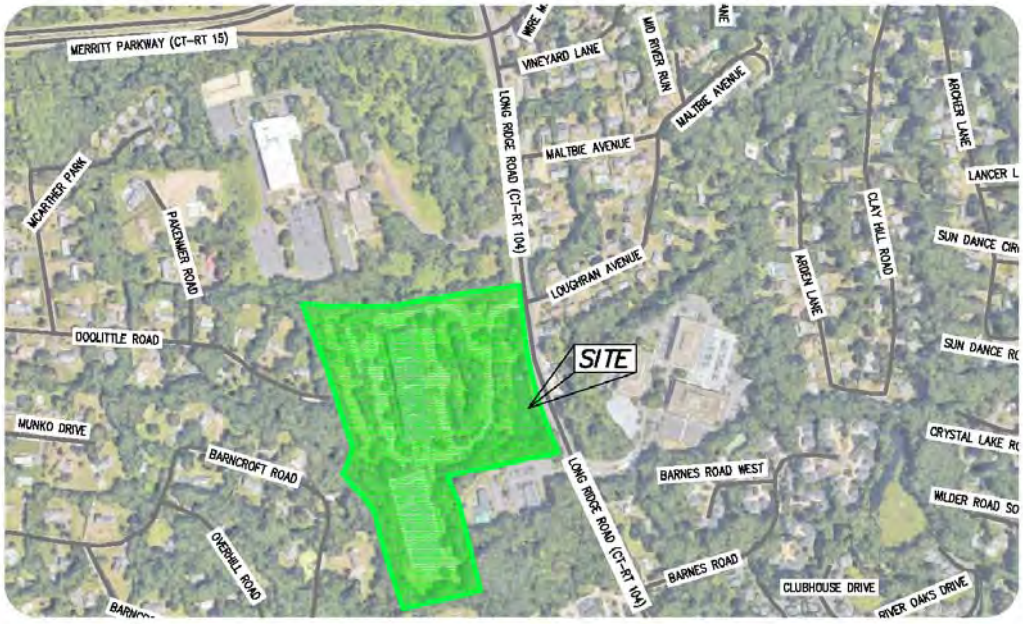
800 LONG RIDGE ROAD, STAMFORD



PROJECT SITE VICINITY MAP

ZONE: C-D (DESIGNED COMMERCIAL)

2. Project Introduction

Applications are being submitted to the City of Stamford's land use offices for proposed improvements to a 25.26-acre property located at 800 Long Ridge Road, in the Designed Commercial (C-D) Zoning District. The property is owned by, and being developed by, 800 Long Ridge, LLC, Stamford, CT. Included in the proposed development is the demolition of an existing 4-story office building and 2-level parking garage. The existing driveway, parking areas, and most of the walkways are slated to remain to serve the future buildings. Two proposed multi-family residential buildings will be constructed and will encompass approximately the same footprint as the existing buildings to be demolished.

The proposed project will utilize the existing curb cut on Long Ridge Road and tie into the existing public water supply and sanitary sewer systems that currently serve the site. Significant stormwater management improvements are proposed throughout the property as, currently, there is no existing treatment of stormwater beyond runoff conveyance and piping.

3. Existing Site Conditions

The property at 800 Long Ridge Road currently contains two existing structures: one 4-story office building and one 2-level parking garage. There is a surrounding network of existing parking areas, walkways, and access drives that serve the building. A majority of the site is developed and there is approximately 8.26 acres of impervious area on the 25.26-acre site (32.7% of total property area). There are several walking paths in the rear, westernmost, portion of the site.

The property generally slopes up from Long Ridge Road from east to west. A majority of the site, and a large amount of off-site area, drains to an existing pond on the property along Long Ridge Road. Above the site, there is approximately 82.2 acres of developed land that drains toward the site, entering an existing 60" culvert along the westerly property line. The culvert discharges to a channel, which briefly leaves the property before re-entering the site and entering into the existing pond. This pond discharges under Long Ridge Road through twin 24" culverts, ultimately draining to the Rippowam River that is just across the street to the east. There is a small area near the entrance to the 2-24" culverts that is within the 100-year flood plain as defined by the FEMA mapping for Stamford, CT. No work is proposed within the flood plain area. This discharge point shall be referenced throughout the report as Design Point 1 (DP-1).

Along the northern property line, 2.70 acres of the site is within a different catchment area that drains to a pair of 36" culverts that also discharge under Long Ridge Road and ultimately reach the Rippowam River. The majority of this drainage area is offsite to the north and consists of 501.9 acres of developed land. This area drains to an existing stream that cuts across the northeast corner of the site, under the existing driveway, before entering the 2-36" culverts. The point at which the 36" culverts leave the site is referenced in this report as Design Point 2 (DP-2). There is no work proposed within the small on-site area within Drainage Area 2 and, thus, the stormwater runoff to DP-2 is the same under existing and proposed conditions.

The existing storm drainage system on site consists mainly of catch basins, manholes, and piping. The site is served by public water supply, sanitary sewer, and gas in Long Ridge Road.

Pre- and post-development drainage area mapping for the analyzed design points is included in this report in Appendix A.

The project site is located within the middle subwatershed of the Rippowam River Subregional Drainage Basin. The Rippowam River watershed area is approximately 30.5 square miles in size. It is located within the Southwest Western Complex Regional Drainage Basin in the Southwest Coast Major Basin.

4. Proposed Site Conditions

Project Type & General Design Criteria

The current proposal is for the construction of two multi-family residential buildings, with a total footprint of approximately 151,000 SF, which closely mimics the footprint of the existing commercial building and parking structure. The existing access drive will be maintained, while the parking areas and sidewalks serving the proposed buildings will be removed and replaced to match the proposed building elevations and required parking configuration. The proposed improvements will take place on approximately 13.2 acres of the property, mainly within the area that is already developed. The existing impervious coverage on the site will increase by 25,075 SF from 359,806 SF under existing conditions to 384,881 SF under proposed conditions. Based upon the flowchart in "Stormwater Management Standards Applicability Flowchart", this project will disturb over ½ acre of land. Therefore, a "full" Stormwater Management Report, as defined on Page 25 of the City of Stamford Stormwater Drainage Manual (Drainage Manual), is required. The project must, and does, comply with Standards 1 through 5 of the Drainage Manual. In addition, because all of the existing impervious areas on the property is considered

DCIA (100%), the project will be required to hold and infiltrate the 50% of the required Water Quality Volume (WQV), as defined by the CT DEEP Stormwater Quality Manual.

Summary of Low Impact Design (LID) Site Constraints

The Drainage Manual highly encourages the use of Low Impact Design (LID) measures to retain, infiltrate, and treat the stormwater runoff from a project site. A project's ability to incorporate such LID measures is contingent upon existing site conditions and constraints but should be incorporated to the extent practicable to satisfy the conditions of the Drainage Manual. A map showing the site constraints and the proposed LID measures is included in Appendix M.

For the proposed re-development projects, the LID constraints are mainly due to existing development on the site such as buildings, parking areas and driveways, existing utility and storm drainage infrastructure, and previous re-grading of the site. The project site has a significant amount of impervious area and an extensive storm drainage system that consists mainly of catch basins, manholes, and piping to convey, but not treat, stormwater runoff. To the extent practicable, the proposed design incorporates LID measures to promote stormwater infiltration while also maintaining the use of as much of the existing infrastructure as possible. This limits overall land disturbance, disturbance of steep slopes, and product waste.

Summary of Proposed Stormwater Treatment Practices

Several stormwater management practices have been incorporated into the proposed project design to meet Standards 1 and 2 of the Design Manual. The proposed stormwater management system is designed to mitigate post development stormwater flow rates and runoff volume, as well as increase water quality, to the existing pond and down-gradient properties. Non-structural practices were incorporated into the design where possible and include limiting clearing/grading to the already developed area of the site to the extent practicable, limiting the disturbance of steep slopes, re-utilizing existing stormwater and utility infrastructure to reduce product waste, and preserving the natural areas on the site. The structural components of the stormwater management system include the installation of two (2) subsurface detention/infiltration chamber systems, one (1) infiltration/retention basin, and four (4) hydrodynamic separators for pre-treatment. Drainage area mapping showing the catchment areas to each of the stormwater management areas is included in this report in Appendix A and a detailed description of each system is below:

- **Subsurface Detention/Infiltration Chamber Systems**

  Due to topographic, on-site soil testing results and area constraints, subsurface detention/infiltration is proposed to treat the stormwater runoff from the south building (Buildings 3 and 4) for half of rooftop and all of the parking areas. Stormwater from this catchment area will be directed into two subsurface chamber systems prior to discharging to the on-site storm drainage system. Underground infiltration systems are considered a primary treatment measure by the CT DEEP and should be designed with additional pre-treatment measures, which are outlined further in this section.

  Infiltration System 1B1-P consists of 162 units of 36" tall Cultec R-360HD chambers. The Water Quality Volume (WQV) for the catchment area is retained in the first 10.2" of the chamber height, below the outlet invert. The chambers will infiltrate the WQV and drain completely between storm events. The additional 25.8" of storage above the outlet invert is utilized for detention and peak flow rate attenuation. Infiltration System 1B2 consists of 248 units of 48" tall Cultec R-902HD chambers. In this system, the first 12" are utilized for WQV storage/infiltration and the upper 36" for detention and peak flow rate reduction. Water Quality Volume calculations can be found in Appendix D of this report. For the HydroCAD models of existing and proposed conditions showing the peak flow rate calculations refer to Appendices C and D.

- **Infiltration Basin**

  One infiltration basin is proposed in the central area of the site. This basin is designed in accordance with the CT Stormwater Quality Manual and is intended to capture and infiltrate stormwater during and shortly after a storm event. It is designed to drain fully within 18 hours after a storm event (72 hours is maximum allowed) and not hold a permanent pool of water. The bottom of the infiltration basin will be surfaced and graded in accordance with the Stormwater Quality Manual and will incorporate vegetated cover to promote filtration and nutrient uptake.

  Rooftop and driveway runoff currently enters the existing storm drainage system and the on-site wet pond without pre-treatment. The proposed improvements include re-direction of a portion of this existing drainage piping into the proposed Infiltration Basin to provide retention, infiltration, and treatment prior to flowing to the existing pond and, ultimately, to the Rippowam River.

Infiltration Basin 1B3 retains runoff from the discharge of roof runoff from the southern half of the proposed northern building (building 2) and runoff from the adjacent driveway and parking areas.

The infiltration basin has been designed to retain and infiltrate 70% of the Water Quality Volume, as defined by the CT DEEP Stormwater Quality Manual, below the outlet invert. The outlet inverts are set 18" above the basin bottoms. Water Quality Volume and basin sizing calculations can be found in Appendix E of this report as well as a summary table showing that the proposed design exceeds the 50% WQV requirement in total. The basin has additional detention storage above the outlet invert elevation, which is included in the HydroCAD modeling for the site showing the reduction in peak flow rates from existing to proposed conditions. Refer to Appendix C and D for existing and proposed HydroCAD models for all required design storms.

- **Hydrodynamic Separators (Pre-Treatment)**

An essential component of an effective stormwater management system is pre-treatment of runoff prior to discharge to an infiltration or detention basin. The pre-treatment reduces the amount of total suspended solids, floatable, and oils/grease and allows the infiltration system to function at its highest capacity. There are four (4) hydrodynamic separators included in the project design as pre-treatment measures. They are incorporated in the drainage manholes/catch basins just upstream of Infiltration Chamber Systems 1B1P and 1B2, as well as upstream of Infiltration Basin 1B3 and for the undetained area of the property in the northern section of the site. The hydrodynamic separators are labeled as B1, B2 B3 and B4 on the site plans and details for each separator are included in the plan set as well.

The hydrodynamic separator units are designed to remove in excess of 80% of total suspended solids (TSS) and provide oil/grease separation to meet the standards of the CT DEEP Stormwater Quality Manual and the Drainage Manual. The design also allows for conveyance of the full 25-year storm event runoff without the need for a bypass system or off-line separator. There is currently no water quality treatment provided in the on-site storm drainage system. Sizing calculations for the hydrodynamic separators can be found in Appendix F of this report.

5. Compliance with Stormwater Management Standards

Standard I. Runoff and Pollutant Reduction

A. The stormwater treatment practices were designed to meet the retention and treatment requirements from the flow chart on Page 5 of the Stormwater Drainage Manual. This was achieved by dividing up the overall drainage area into subcatchment areas that are more easily treated by the various systems proposed throughout the site. The subsurface infiltration chambers and the infiltration basins were designed to retain and infiltrate in excess of 50% of the water quality volume. The hydrodynamic separators were included as pre-treatment to further enhance the water quality of the stormwater runoff. Soil mapping for the project site shows that the underlying soils in non-impervious areas are classified as a Type B Sandy Loam/Loam. Soil testing was completed on site to determine depths to groundwater and ledge as well as permeability rates of the on-site soils. These results have dictated the location of the proposed stormwater infiltration measures.

B. N/A

C. The proposed development has been primarily limited to the area already within the existing development. Care has been taken to minimize work outside of the currently developed areas to protect natural buffers, steep slopes, and landscaping. The limits of the construction area are noted on the plans and will be demarcated the field using silt fence and construction fencing. This will ensure that construction activities stay within the approved construction area. At the end of construction, all disturbed areas that are not paved will be seeded to re-establish a stable vegetated surface.

D. Noted. Every effort has been taken to comply with City of Stamford regulations and standards and City comments will be incorporated into the design as required throughout the review and approval process.

E. The proposed stormwater treatment practices, especially in a sequential treatment train as designed, provide in excess of the required 80% of TSS removal. The hydrodynamic separators provide additional storage for oils/grease and floatables. Additionally, the infiltration basin provides vegetated surfaces for nutrient removal and groundwater recharge.

F. The proposed design of the project minimizes the disturbance of existing natural features by limiting the construction disturbance mainly to the previously developed area. This minimizes compaction of natural soils outside of the development, protects natural buffers and landscaping, minimizes disturbance to existing steep slopes, and reduces the potential for erosion from the project site. Care shall be taken to leave existing pavement in place during construction until such time as it is to be replaced to minimize erodible soils within the construction area.

The proposed stormwater management system greatly enhances the stormwater treatment from the property. By installing the systems described above in accordance with City and CTDEEP standards and recommendations, water quality to the existing pond and down-gradient Rippowam River will be increased post-development.

Standard II. Peak Flow Control

A. Stream channel protection is intended to decrease impacts to down-gradient channel beds by increased urbanization upstream. Per the CT Stormwater Quality Manual, there are several limitations to achieving the stream channel protection standard of reducing the 2-year post-development runoff to less than 50% of the pre-development runoff. According to the manual, the stream channel protection criterion may not apply to sites that discharge to a large receiving water body and where the development area is less than 5% of the watershed area upstream. This is the case for the proposed project, where the site discharges across the street to the Rippowam River, which has an upstream watershed area of greater than 30.5 square miles (19,520 acres). The subject property contains 25.26 acres, roughly 0.13% of the watershed area. In this instance, erosion of down-gradient stream channels is not anticipated due to the proximity of the project site to the large river below and the relatively small size in comparison to the overall watershed.

B. Stormwater conveyance protection on the site is provided catch basins, drainage manholes, and piping (proposed and existing to remain as noted). The pipe sizes have been analyzed to convey the 25-year storm event as required by the City of Stamford Drainage Manual. The overall watershed was subdivided into catchment areas to determine the stormwater runoff to each catch basin. Inlet control capacity was also checked at each structure. The catch basin and pipe sizing calculations are in accordance with Section 4 of the Drainage Manual and are included in Appendix G of this report. Outlet protection in the form of a riprap energy dissipator is provided at the

discharge point into Infiltration Basins 1B3 per Section 4.7 of the Drainage Manual. For outlet protection calculations refer to Appendix H.

C. The post-development peak flow rates from the 1-, 2-, 5-, 10-, 25-, 50- and 100-year storm events are mitigated to under pre-development conditions at all design points.

The primary method of predicting the surface water runoff rates utilized in this report is a computer program entitled HydroCAD V10 Stormwater Modeling System. HydroCAD combines methodology of technical release No. 55 (TR-55) "Urban Hydrology for Small Watersheds" and technical release No. 20 (TR-20) "Project Formulation-Hydrology". Both TR-55 & TR-20 were originally developed by the USDA Soil Conservation Service (SCS).

The HydroCAD program forecasts the rate of surface water runoff based upon several factors, including information on land use, vegetation, watershed areas, soil types, time of concentration, rainfall data, storage volumes and hydraulic capacities of structures. The program predicts the amount of runoff as a function of time.

Rainfall events with recurrence frequency of 1-, 2-, 5-, 10-, 25-, 50- and 100 years were utilized as input data. NOAA's National Weather Service Center has developed storm events to model extreme precipitation data in New England. Precipitation data is taken from the latest NOAA Atlas 14 Point Precipitation Frequency Estimates and is included in this report in Appendix B.

Soil types in the watershed were determined from the USDA's NRCS Web Soil Survey as mentioned previously. The soil types and hydrologic group are included in Appendix I of this report.

Refer to Appendix C and D for existing and proposed HydroCAD model computations for all required design storms. The following peak flows were obtained from the hydrology analysis.

Table 1. Existing vs. Proposed Peak Flows (Design Point 1)

Return Period (Years)	Existing Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)	Change (cfs)	Percent Change (%)
1	21.15	19.72	-1.43	-6.8%
2	32.97	32.08	-0.89	-2.7%
5	49.31	48.83	-0.48	-1.0%
10	77.90	77.06	-0.84	-1.1%
25	132.15	131.78	-0.37	-0.3%
50	171.46	171.13	-0.33	-0.2%
100	210.04	209.48	-0.56	-0.3%

Table 2. Existing vs. Proposed Peak Flows (Design Point 2)

Return Period (Years)	Existing Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)	Change (cfs)	Percent Change (%)
1	0.64	0.64	0	0
2	1.32	1.32	0	0
5	2.74	2.74	0	0
10	4.10	4.10	0	0
25	6.15	6.15	0	0
50	7.79	7.79	0	0
100	9.60	9.60	0	0

D. The outlet structures from the proposed Infiltration Basin 1B3 has been designed to convey the 100-year storm event discharge without damage to down-gradient systems or properties.

E. Detention is proposed within the two subsurface detention/infiltration chamber systems (1B1P and 1B2) and within Infiltration Basin B3. The detention system design meets the requirements in Section 4 of the Drainage Manual. The setbacks, grading limits, and berm elevation are in accordance with the regulations. These detention systems discharge to an existing on-site wet pond that has twin 24" culverts that exit the site under Long Ridge Road. The existing pond and 24" culverts were included in the HydroCAD model to show the effect of the detention on the existing pond and to demonstrate adequate capacity of the 24" culverts under Long Ridge Road.

Standard III. Construction Erosion and Sediment Control

A. Soil erosion and sediment controls are measures that are used to reduce the amount of soil particles that are carried from a land area and deposited in receiving waters. Measures will be maintained during and after the construction activity, until final

stabilization of the soil is accomplished. Upon final stabilization of disturbed areas, all temporary soil erosion and sediment control measures will be removed.

The soil and erosion control plan has been developed in accordance with the CT DEEP 2002 Connecticut Guidelines for Soil and Erosion Control, the City of Stamford regulations, and the CT DEEP Stormwater Quality Manual. The proposal includes extensive soil and erosion control measures including both structural control practices and soil stabilization practices of temporary and permanent natures.

Structural control practices divert flows from exposed soils, store water flow, or otherwise limit runoff from exposed areas of the site. Examples of these practices that are incorporated into the Erosion & Sedimentation Control Plan (E&S Plan) for the site include stabilized construction entrances, silt fence, and material stockpiles. Haybales will be utilized around the proposed catch basins and along the toe of critical slopes.

An additional goal of the E&S plan is to maintain separation of clean runoff from runoff within the construction area using temporary diversions. These diversions prevent clean runoff from traveling through a disturbed area and mixing with runoff from the construction site and reduce the burden on the Temporary Sediment Traps as well as maintain the water quality of the off-site runoff.

Due to its size, the project will also register with CT DEEP to obtain a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

Standard IV. Operation and Maintenance

A. A Standard City of Stamford Drainage Maintenance Agreement shall be executed with the Environmental Protection Board. A draft agreement is included in this report in Appendix J.

B. The permitting plans include detailed descriptions of inspection and maintenance requirements both during and post-construction. These include inspection and maintenance of all components of the proposed stormwater management system including, but not limited to, catch basins and piping, hydrodynamic separators, and the infiltration basin. Additional information may be added to the construction plan set as required by the City during the review and approval process.

Standard V. Stormwater Management Report

A. This document and included appendices serve as the required Stormwater Management Report.

B. Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent or downstream properties or City-owned drainage facilities.

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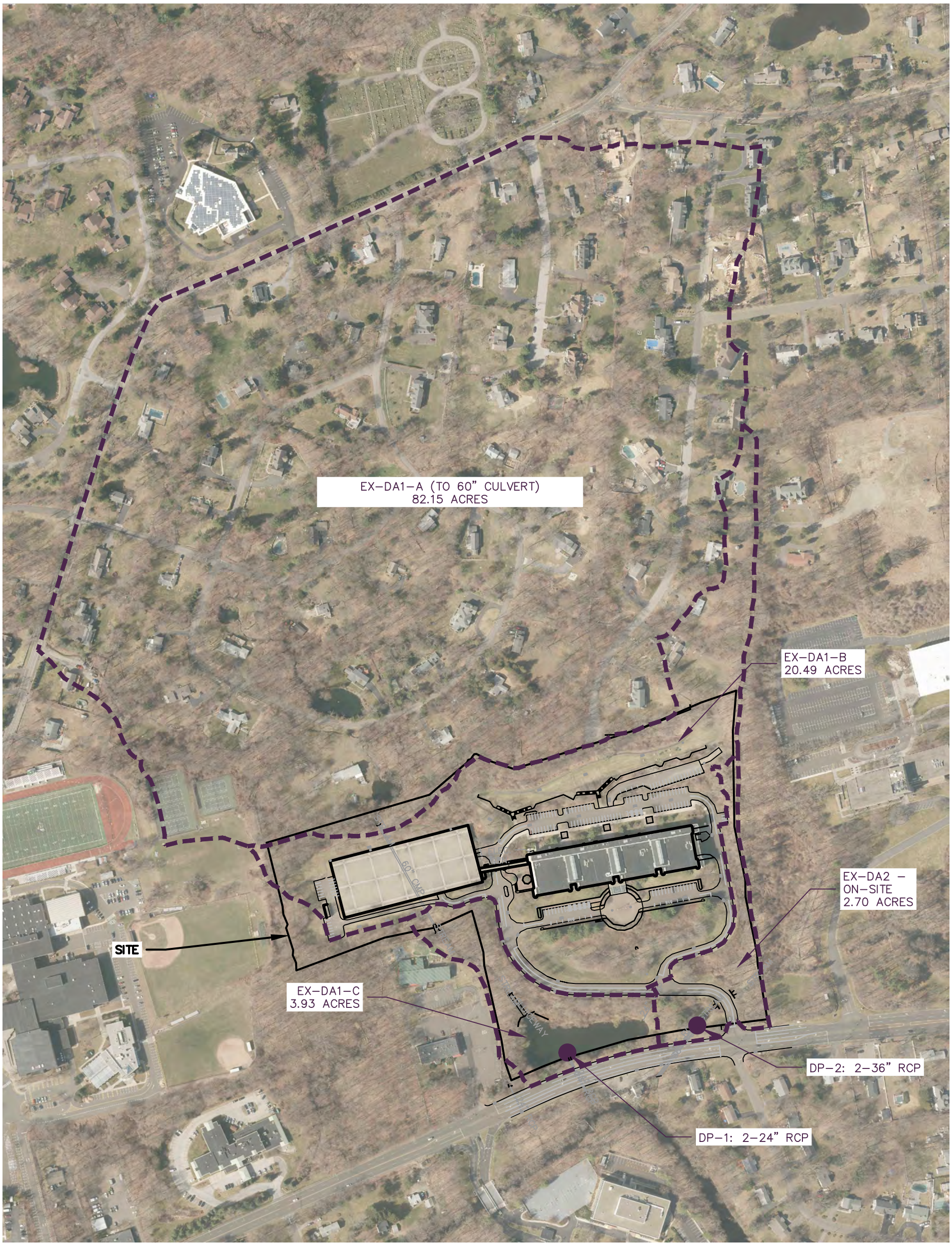
SECTION II

APPENDICES

Appendix A – Drainage Area Maps



NO.	REVISION	DATE

Previous Editions Obsolete

0 150 300

1 inch = 300 ft.

BUILDING AND LAND TECHNOLOGY
100 WASHINGTON BLVD.
SUITE 200
STAMFORD, CT 06902

EXISTING DRAINAGE BASIN AREA MAP

800 LONG RIDGE ROAD
STAMFORD CONNECTICUT

CIVIL 1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

DRAWN:	SQ
APPROVED:	CJ
SCALE:	1" = 300'
DATE:	29 SEP 23
PROJ. NO.:	4084
CADD FILE NAME:	4084 DAMAP
DRAWING NO.:	1 OF 1

NO.	REVISION	DATE
1	REVISED PER ENGINEERING	28 MAY 24

Previous Editions Obsolete

0 150 300

1 inch = 300 ft.

BUILDING AND LAND TECHNOLOGY
100 WASHINGTON BLVD.
SUITE 200
STAMFORD, CT 06902

PROPOSED DRAINAGE BASIN AREA MAP

800 LONG RIDGE ROAD
STAMFORD CONNECTICUT

CIVIL 1
CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

DRAWN: SQ APPROVED: CJ
SCALE: 1" = 300'
DATE: 29 SEP 23
PROJ. NO.: 4084
CADD FILE NAME: 4084 DAMAP
DRAWING NO.:

1 OF 1

Appendix B – NOAA Precipitation Data

NOAA Atlas 14, Volume 10, Version 3
Location name: Stamford, Connecticut, USA*
Latitude: 41.0967°, Longitude: -73.5665°
Elevation: 152 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.367** (0.279-0.470)	**0.426** (0.323-0.545)	**0.522** (0.394-0.670)	**0.602** (0.452-0.776)	**0.711** (0.520-0.945)	**0.794** (0.570-1.07)	**0.880** (0.615-1.22)	**0.973** (0.651-1.38)	**1.10** (0.712-1.60)	**1.21** (0.763-1.78)
10-min	**0.520** (0.395-0.665)	**0.603** (0.457-0.772)	**0.739** (0.559-0.949)	**0.852** (0.641-1.10)	**1.01** (0.736-1.34)	**1.12** (0.807-1.52)	**1.25** (0.871-1.73)	**1.38** (0.922-1.95)	**1.56** (1.01-2.27)	**1.71** (1.08-2.52)
15-min	**0.612** (0.464-0.783)	**0.710** (0.538-0.909)	**0.870** (0.658-1.12)	**1.00** (0.754-1.29)	**1.18** (0.866-1.58)	**1.32** (0.950-1.79)	**1.47** (1.02-2.03)	**1.62** (1.08-2.29)	**1.84** (1.19-2.67)	**2.01** (1.27-2.97)
30-min	**0.858** (0.651-1.10)	**0.995** (0.754-1.27)	**1.22** (0.922-1.56)	**1.41** (1.06-1.81)	**1.66** (1.21-2.21)	**1.86** (1.33-2.50)	**2.06** (1.44-2.85)	**2.27** (1.52-3.21)	**2.56** (1.66-3.72)	**2.80** (1.77-4.12)
60-min	**1.10** (0.837-1.41)	**1.28** (0.970-1.64)	**1.57** (1.19-2.02)	**1.81** (1.36-2.33)	**2.14** (1.56-2.84)	**2.39** (1.72-3.22)	**2.65** (1.85-3.66)	**2.92** (1.95-4.13)	**3.29** (2.13-4.78)	**3.58** (2.27-5.28)
2-hr	**1.42** (1.09-1.81)	**1.67** (1.28-2.12)	**2.07** (1.58-2.64)	**2.40** (1.82-3.08)	**2.86** (2.10-3.78)	**3.21** (2.32-4.30)	**3.57** (2.51-4.92)	**3.96** (2.66-5.56)	**4.50** (2.92-6.50)	**4.94** (3.14-7.25)
3-hr	**1.64** (1.26-2.08)	**1.94** (1.48-2.45)	**2.42** (1.84-3.07)	**2.81** (2.14-3.58)	**3.36** (2.48-4.43)	**3.77** (2.73-5.05)	**4.20** (2.97-5.78)	**4.68** (3.15-6.54)	**5.35** (3.48-7.69)	**5.90** (3.75-8.61)
6-hr	**2.08** (1.60-2.61)	**2.46** (1.90-3.10)	**3.10** (2.38-3.91)	**3.62** (2.77-4.58)	**4.34** (3.23-5.69)	**4.88** (3.56-6.50)	**5.45** (3.88-7.48)	**6.09** (4.12-8.48)	**7.02** (4.58-10.0)	**7.78** (4.96-11.3)
12-hr	**2.58** (2.00-3.22)	**3.07** (2.39-3.84)	**3.88** (3.01-4.86)	**4.55** (3.51-5.73)	**5.47** (4.10-7.13)	**6.16** (4.53-8.16)	**6.89** (4.94-9.41)	**7.73** (5.24-10.7)	**8.94** (5.85-12.7)	**9.95** (6.36-14.3)
24-hr	**3.04** (2.38-3.77)	**3.66** (2.86-4.54)	**4.67** (3.65-5.82)	**5.51** (4.28-6.89)	**6.67** (5.03-8.65)	**7.54** (5.58-9.94)	**8.46** (6.10-11.5)	**9.54** (6.50-13.1)	**11.1** (7.31-15.7)	**12.5** (8.01-17.9)
2-day	**3.41** (2.69-4.20)	**4.17** (3.29-5.14)	**5.41** (4.26-6.69)	**6.44** (5.04-8.00)	**7.86** (5.98-10.2)	**8.92** (6.66-11.7)	**10.1** (7.33-13.7)	**11.4** (7.81-15.6)	**13.5** (8.90-18.9)	**15.3** (9.85-21.7)
3-day	**3.69** (2.93-4.53)	**4.52** (3.58-5.56)	**5.89** (4.65-7.25)	**7.02** (5.51-8.68)	**8.57** (6.54-11.0)	**9.72** (7.28-12.7)	**11.0** (8.02-14.9)	**12.5** (8.55-17.0)	**14.8** (9.76-20.6)	**16.8** (10.8-23.7)
4-day	**3.96** (3.15-4.84)	**4.84** (3.84-5.92)	**6.27** (4.97-7.70)	**7.47** (5.88-9.21)	**9.11** (6.97-11.7)	**10.3** (7.75-13.5)	**11.6** (8.53-15.7)	**13.2** (9.08-17.9)	**15.7** (10.3-21.8)	**17.7** (11.4-25.0)
7-day	**4.73** (3.79-5.76)	**5.69** (4.55-6.94)	**7.26** (5.79-8.87)	**8.57** (6.79-10.5)	**10.4** (7.96-13.2)	**11.7** (8.81-15.2)	**13.1** (9.63-17.6)	**14.8** (10.2-20.0)	**17.4** (11.5-24.0)	**19.5** (12.6-27.4)
10-day	**5.49** (4.41-6.66)	**6.50** (5.22-7.89)	**8.16** (6.53-9.94)	**9.54** (7.59-11.7)	**11.4** (8.81-14.5)	**12.9** (9.70-16.6)	**14.4** (10.5-19.1)	**16.1** (11.1-21.6)	**18.7** (12.4-25.7)	**20.8** (13.5-29.1)
20-day	**7.74** (6.26-9.32)	**8.89** (7.18-10.7)	**10.8** (8.67-13.0)	**12.3** (9.86-15.0)	**14.5** (11.2-18.1)	**16.1** (12.2-20.4)	**17.8** (13.0-23.2)	**19.6** (13.6-26.0)	**22.0** (14.7-30.1)	**24.0** (15.6-33.3)
30-day	**9.58** (7.79-11.5)	**10.8** (8.79-13.0)	**12.9** (10.4-15.5)	**14.5** (11.7-17.6)	**16.9** (13.1-21.0)	**18.6** (14.1-23.5)	**20.4** (14.9-26.4)	**22.3** (15.5-29.5)	**24.7** (16.5-33.6)	**26.5** (17.3-36.7)
45-day	**11.8** (9.67-14.1)	**13.2** (10.8-15.8)	**15.4** (12.5-18.5)	**17.2** (13.9-20.7)	**19.8** (15.4-24.4)	**21.7** (16.5-27.2)	**23.6** (17.3-30.3)	**25.5** (17.9-33.6)	**27.9** (18.7-37.8)	**29.7** (19.4-40.9)
60-day	**13.7** (11.2-16.3)	**15.1** (12.4-18.1)	**17.5** (14.3-20.9)	**19.4** (15.8-23.3)	**22.1** (17.3-27.2)	**24.2** (18.4-30.2)	**26.3** (19.2-33.4)	**28.2** (19.8-37.0)	**30.6** (20.6-41.3)	**32.3** (21.1-44.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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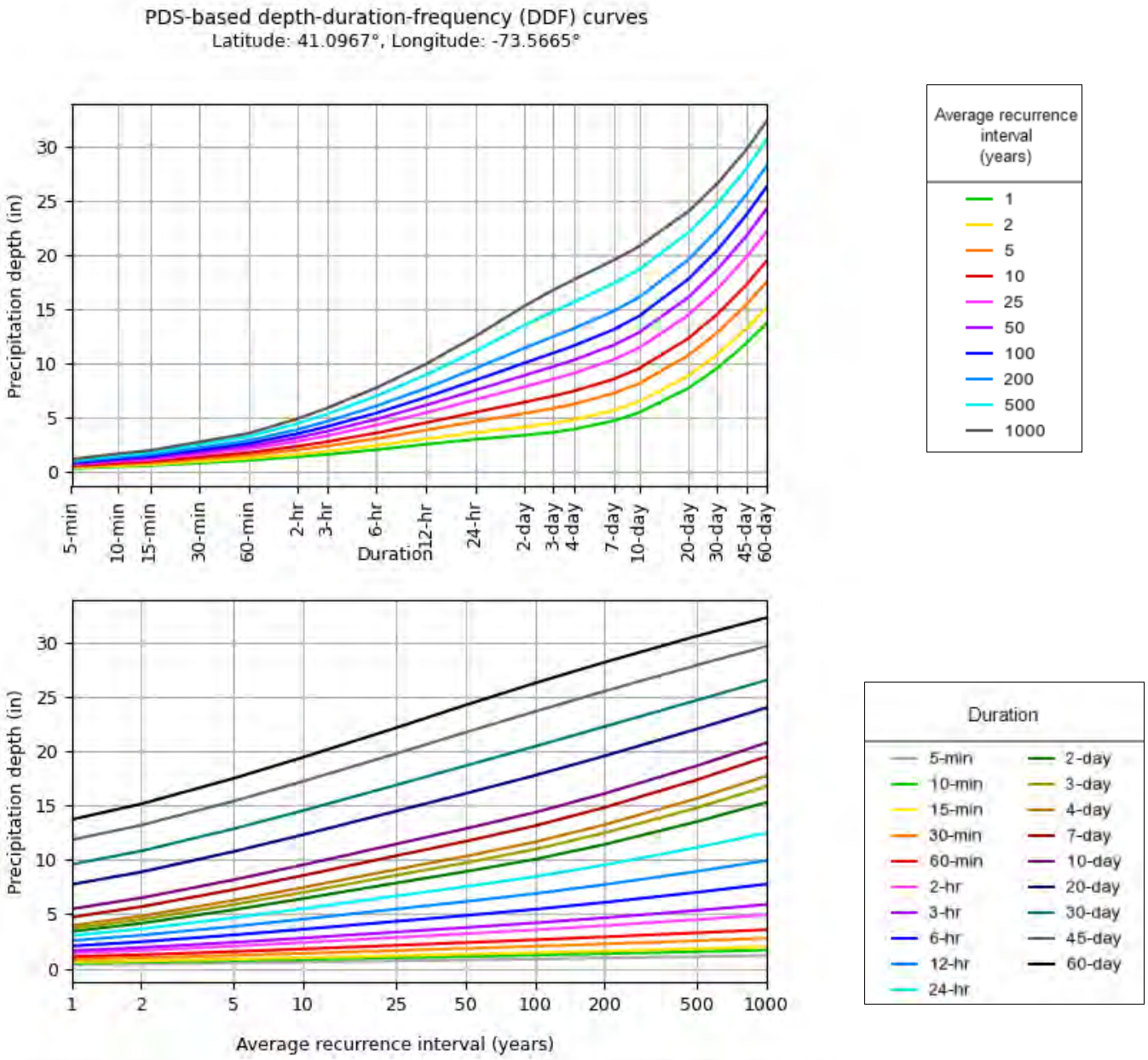
PF graphical



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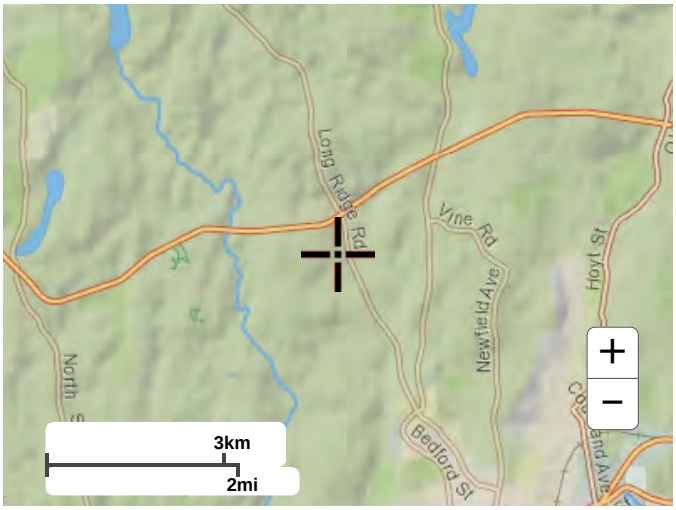
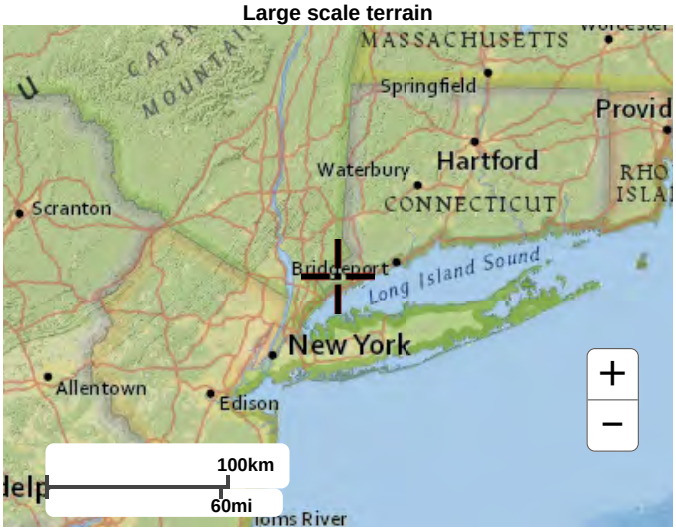
Maps & aerials

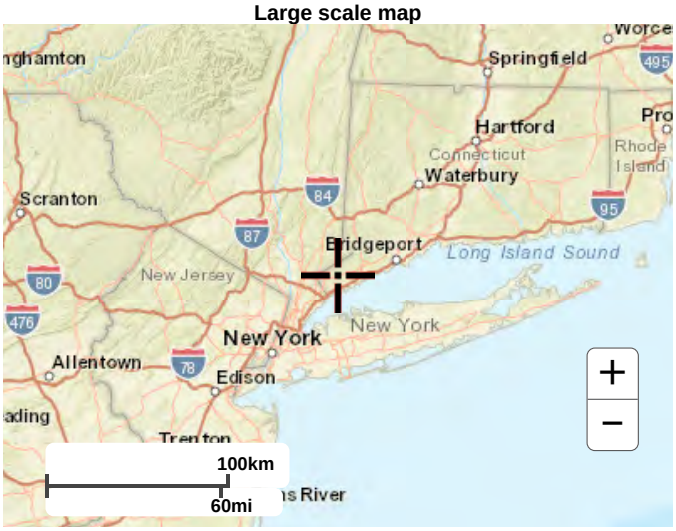
Small scale terrain



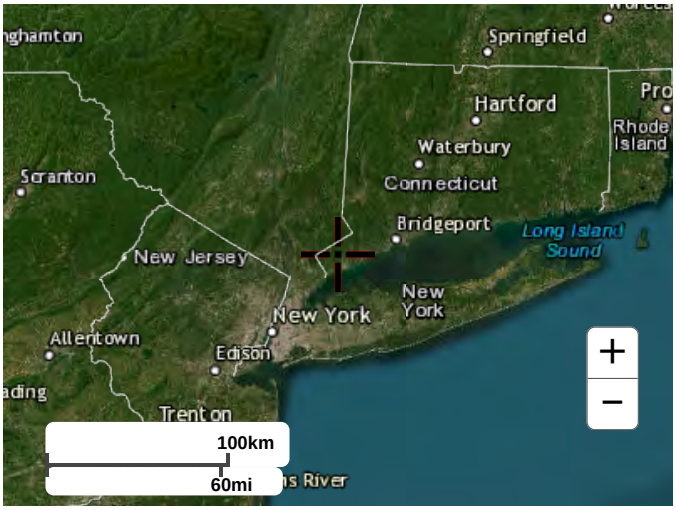
Large scale terrain



Large scale map



Large scale aerial



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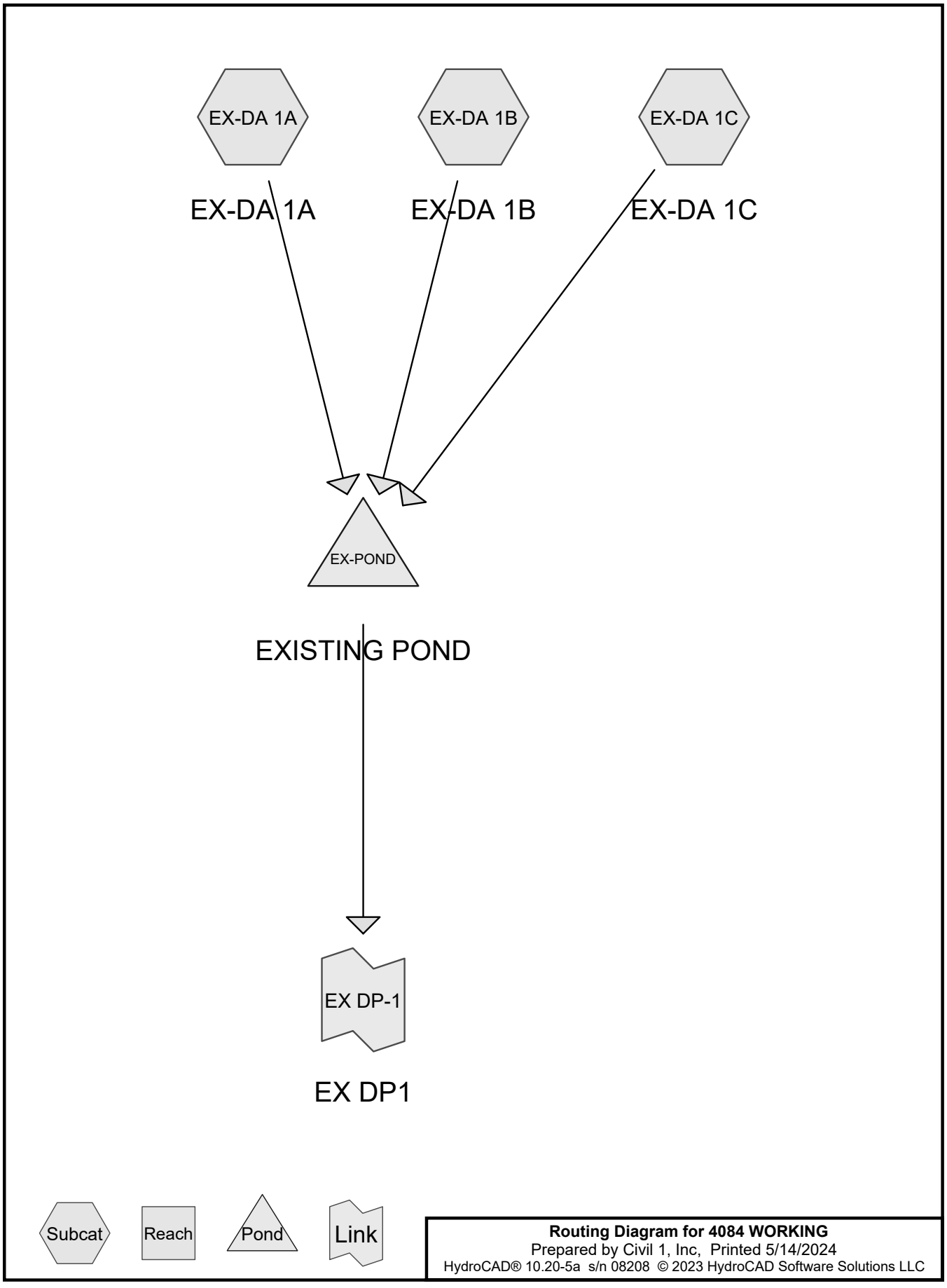
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Appendix C – Existing Conditions HydroCAD Routing



Routing Diagram for 4084 WORKING
Prepared by Civil 1, Inc, Printed 5/14/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
42.920	68	1 acre lots, 20% imp, HSG B (EX-DA 1A, EX-DA 1B)
27.890	79	1 acre lots, 20% imp, HSG C (EX-DA 1A, EX-DA 1B)
6.410	61	>75% Grass cover, Good, HSG B (EX-DA 1A, EX-DA 1B, EX-DA 1C)
0.270	74	>75% Grass cover, Good, HSG C (EX-DA 1A)
8.090	98	Paved parking, HSG B (EX-DA 1A, EX-DA 1B)
0.620	98	Paved parking, HSG C (EX-DA 1A)
0.900	98	Water Surface (EX-DA 1C)
18.020	55	Woods, Good, HSG B (EX-DA 1A, EX-DA 1B, EX-DA 1C)
1.450	70	Woods, Good, HSG C (EX-DA 1A)
106.570	**71**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
75.440	HSG B	EX-DA 1A, EX-DA 1B, EX-DA 1C
30.230	HSG C	EX-DA 1A, EX-DA 1B
0.000	HSG D	
0.900	Other	EX-DA 1C
106.570		**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	42.920	27.890	0.000	0.000	70.810	1 acre lots, 20% imp	EX-DA 1A, EX-DA 1B
0.000	6.410	0.270	0.000	0.000	6.680	>75% Grass cover, Good	EX-DA 1A, EX-DA 1B, EX-DA 1C
0.000	8.090	0.620	0.000	0.000	8.710	Paved parking	EX-DA 1A, EX-DA 1B
0.000	0.000	0.000	0.000	0.900	0.900	Water Surface	EX-DA 1C
0.000	18.020	1.450	0.000	0.000	19.470	Woods, Good	EX-DA 1A, EX-DA 1B, EX-DA 1C
0.000	**75.440**	**30.230**	**0.000**	**0.900**	**106.570**	**TOTAL AREA**	

Summary for Subcatchment EX-DA 1A: EX-DA 1A

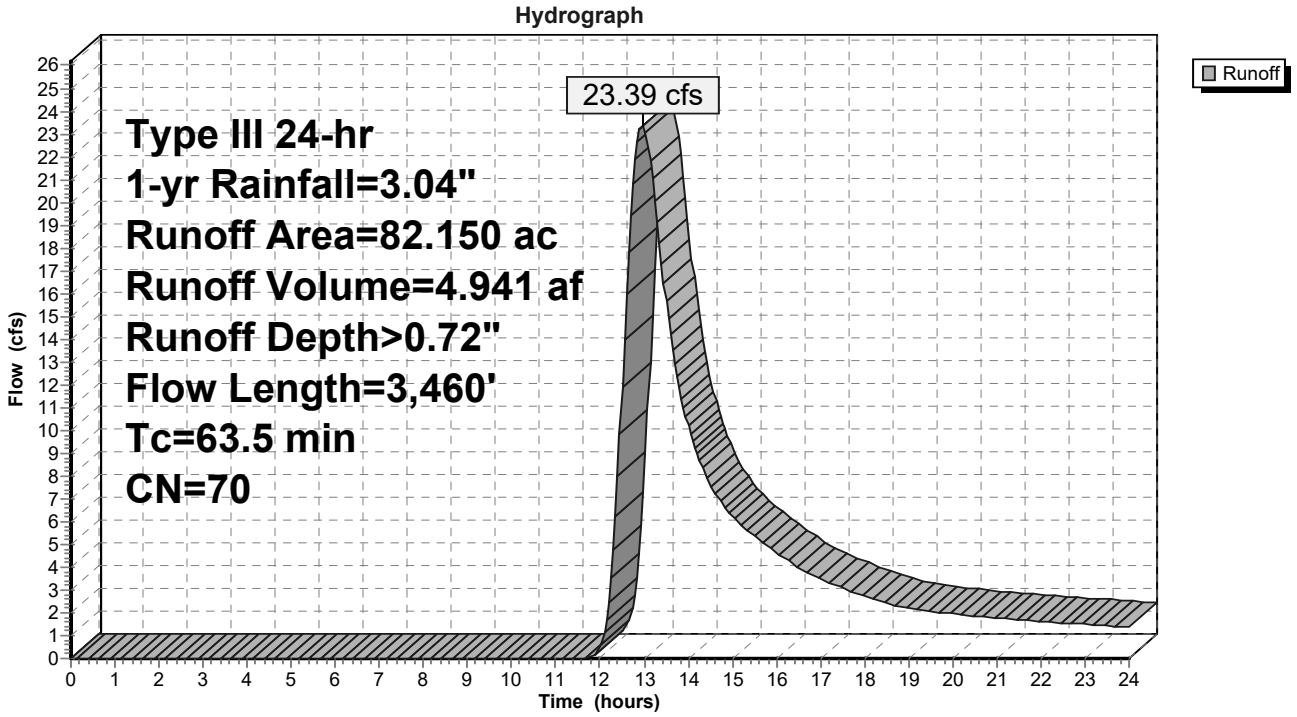
Runoff = 23.39 cfs @ 12.96 hrs, Volume= 4.941 af, Depth> 0.72"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

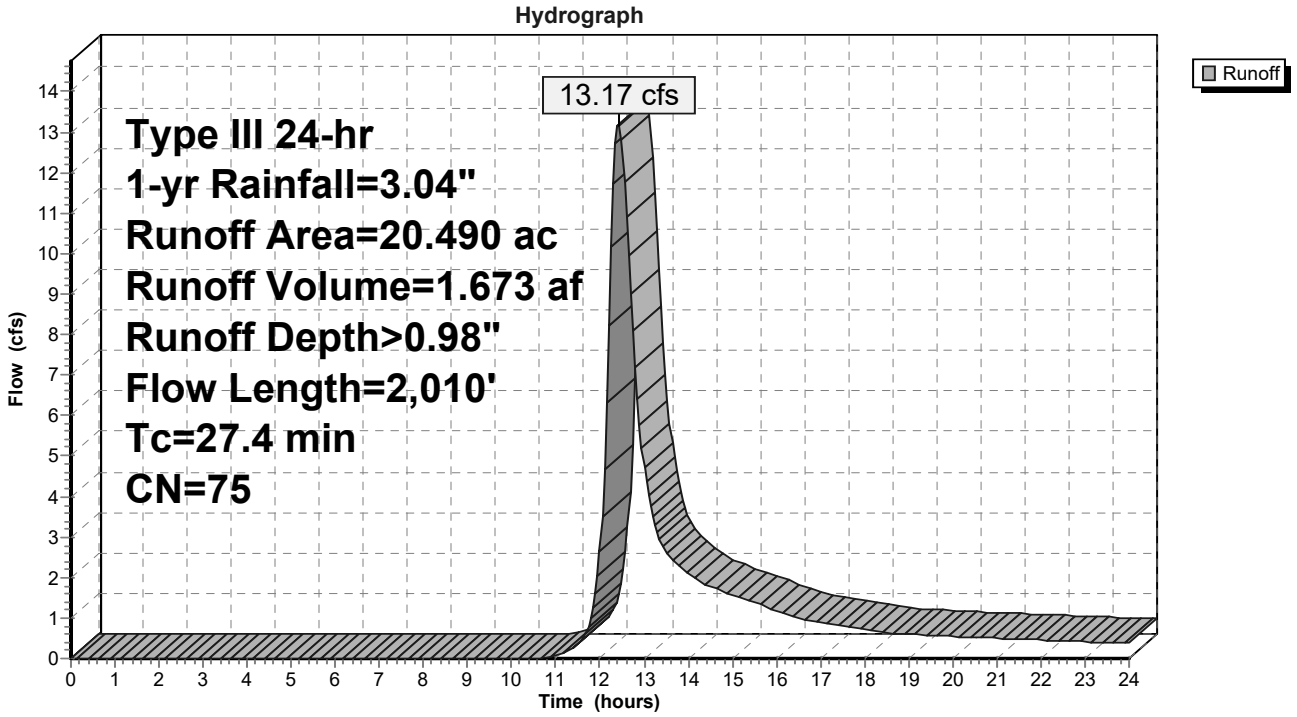
Runoff = 13.17 cfs @ 12.42 hrs, Volume= 1.673 af, Depth> 0.98"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

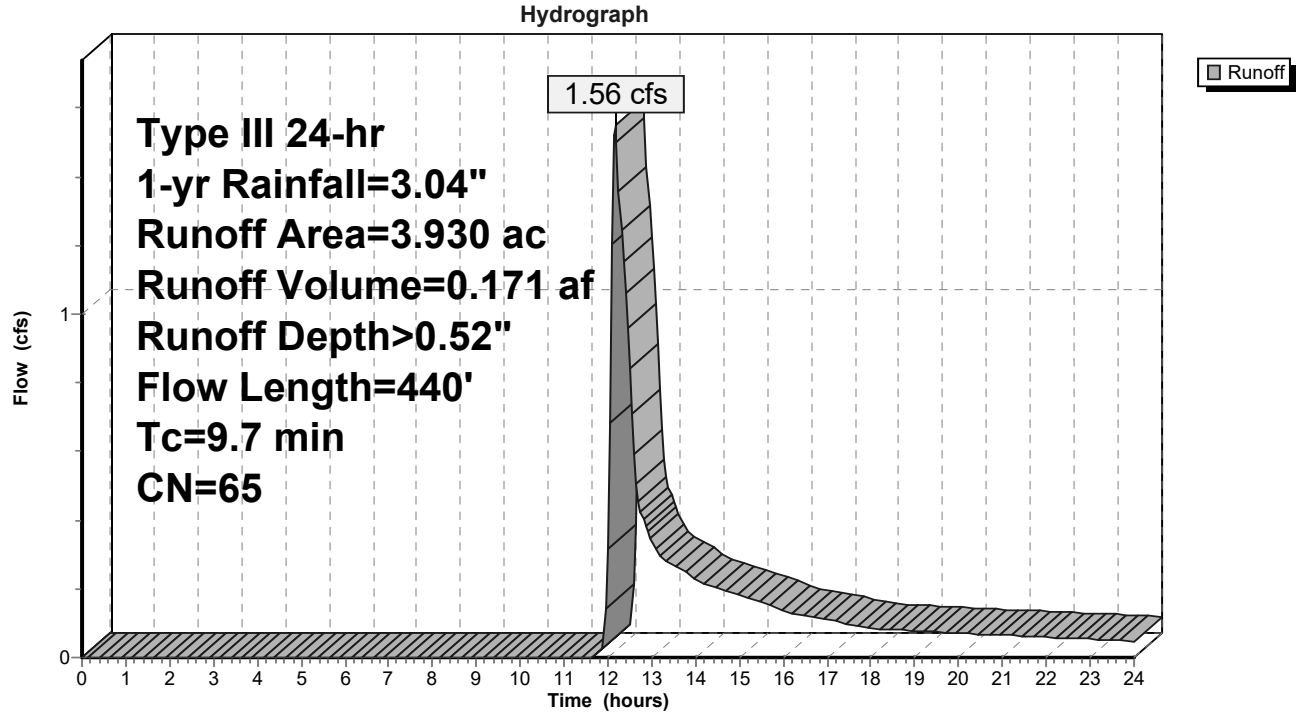
Runoff = 1.56 cfs @ 12.17 hrs, Volume= 0.171 af, Depth> 0.52"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 0.76" for 1-yr event
Inflow = 29.51 cfs @ 12.82 hrs, Volume= 6.785 af
Outflow = 21.15 cfs @ 13.37 hrs, Volume= 6.401 af, Atten= 28%, Lag= 32.7 min
Primary = 21.15 cfs @ 13.37 hrs, Volume= 6.401 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 73.30' @ 13.37 hrs Surf.Area= 0.994 ac Storage= 1.452 af

Plug-Flow detention time= 71.6 min calculated for 6.401 af (94% of inflow)
Center-of-Mass det. time= 44.1 min (954.6 - 910.5)

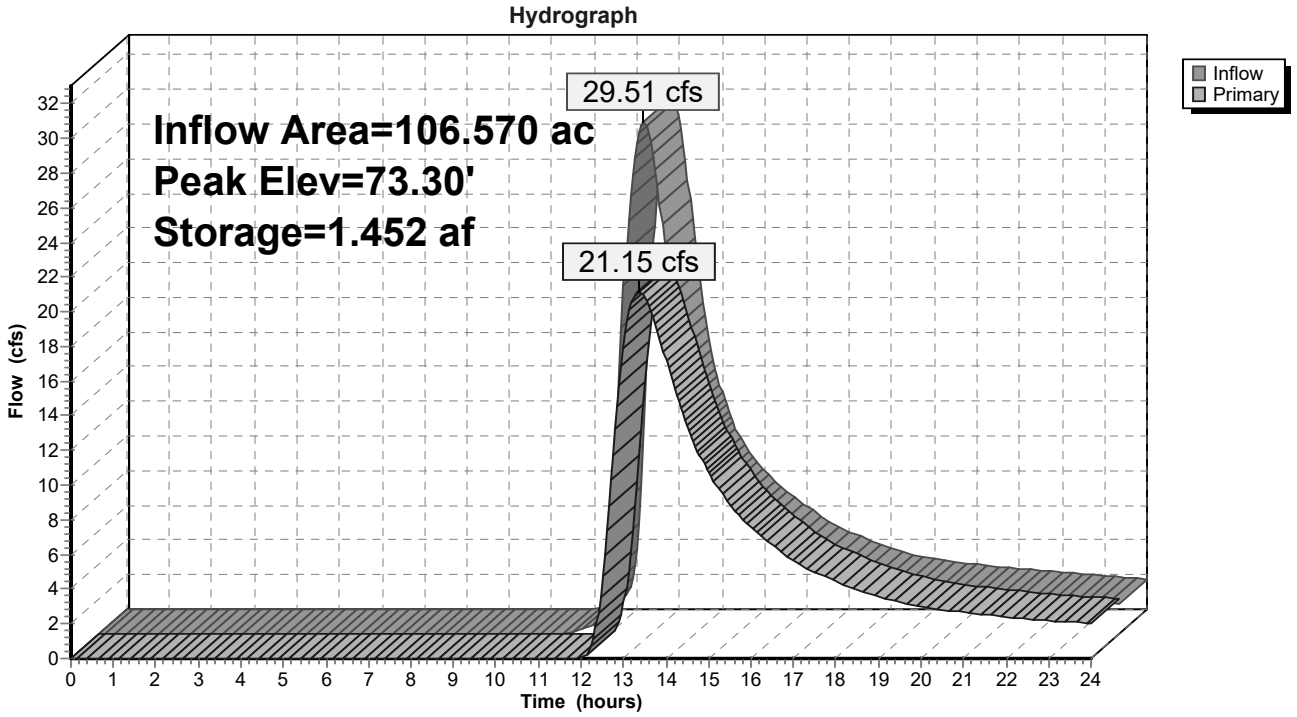
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.14 cfs @ 13.37 hrs HW=73.30' (Free Discharge)
- **1=Culvert** (Inlet Controls 21.14 cfs @ 4.17 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EX-POND: EXISTING POND

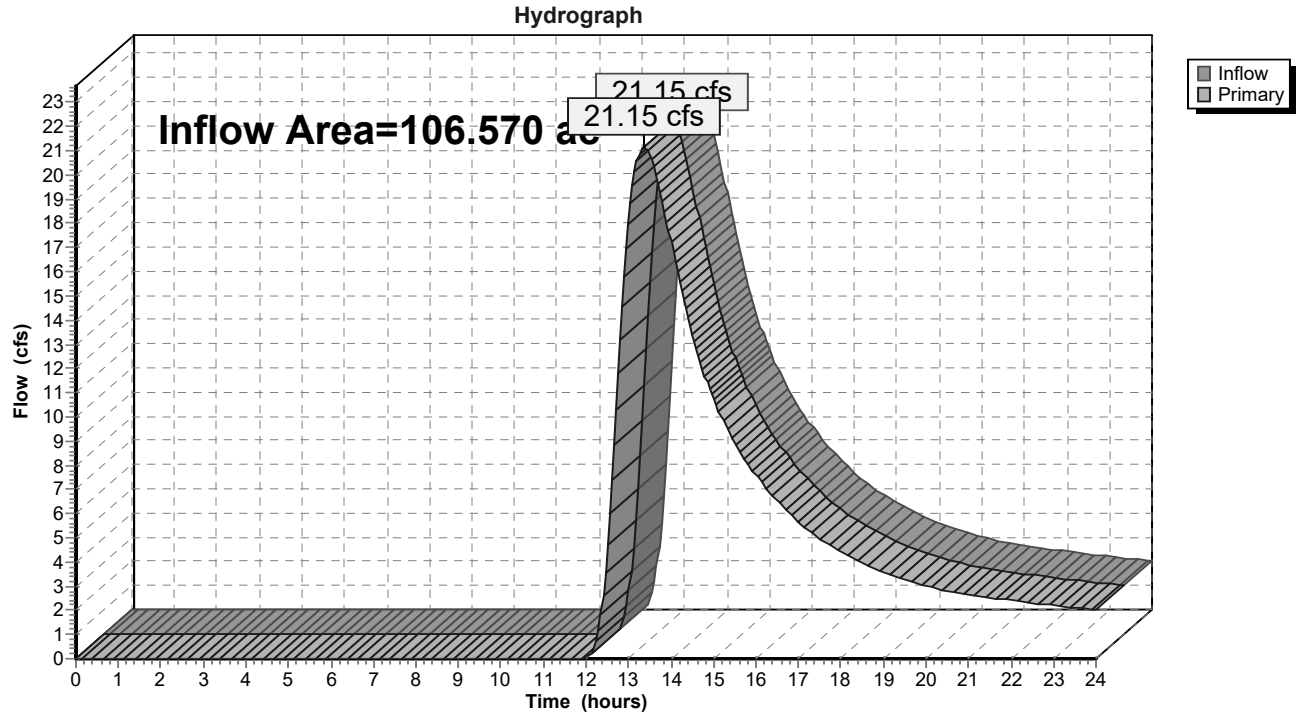


Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 0.72" for 1-yr event
Inflow = 21.15 cfs @ 13.37 hrs, Volume= 6.401 af
Primary = 21.15 cfs @ 13.37 hrs, Volume= 6.401 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1



Summary for Subcatchment EX-DA 1A: EX-DA 1A

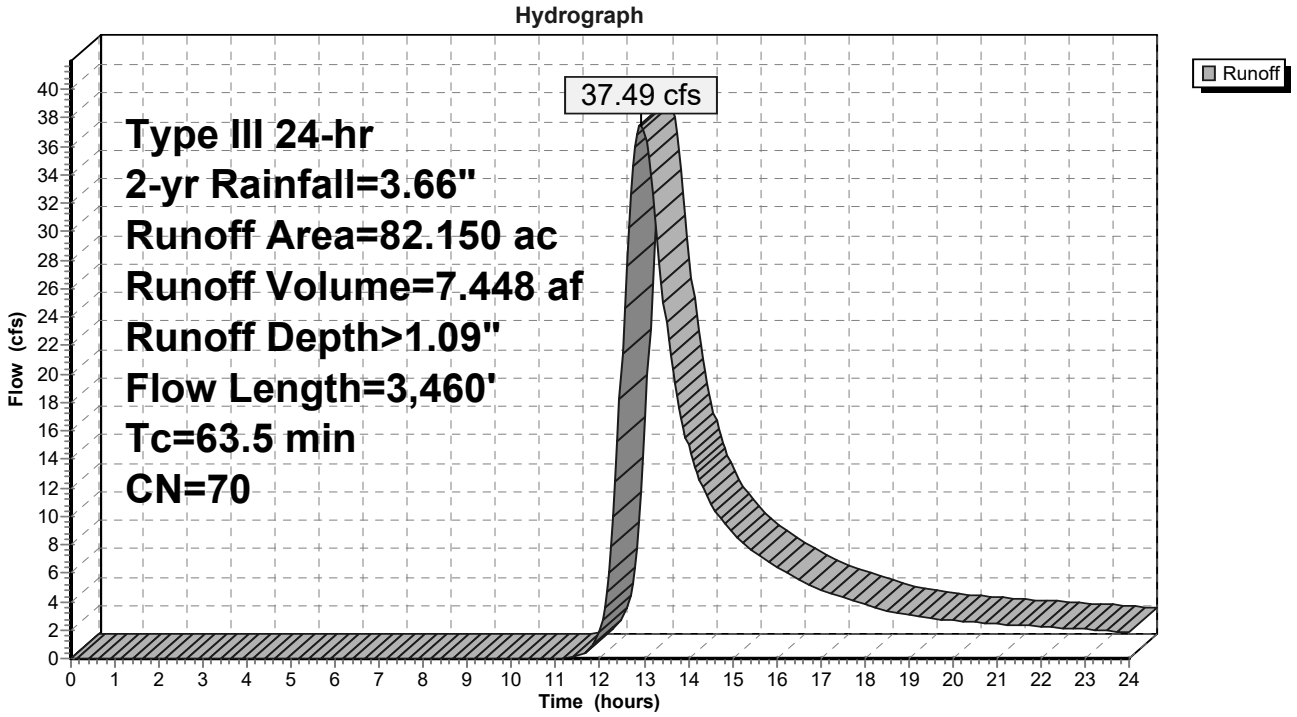
Runoff = 37.49 cfs @ 12.92 hrs, Volume= 7.448 af, Depth> 1.09"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

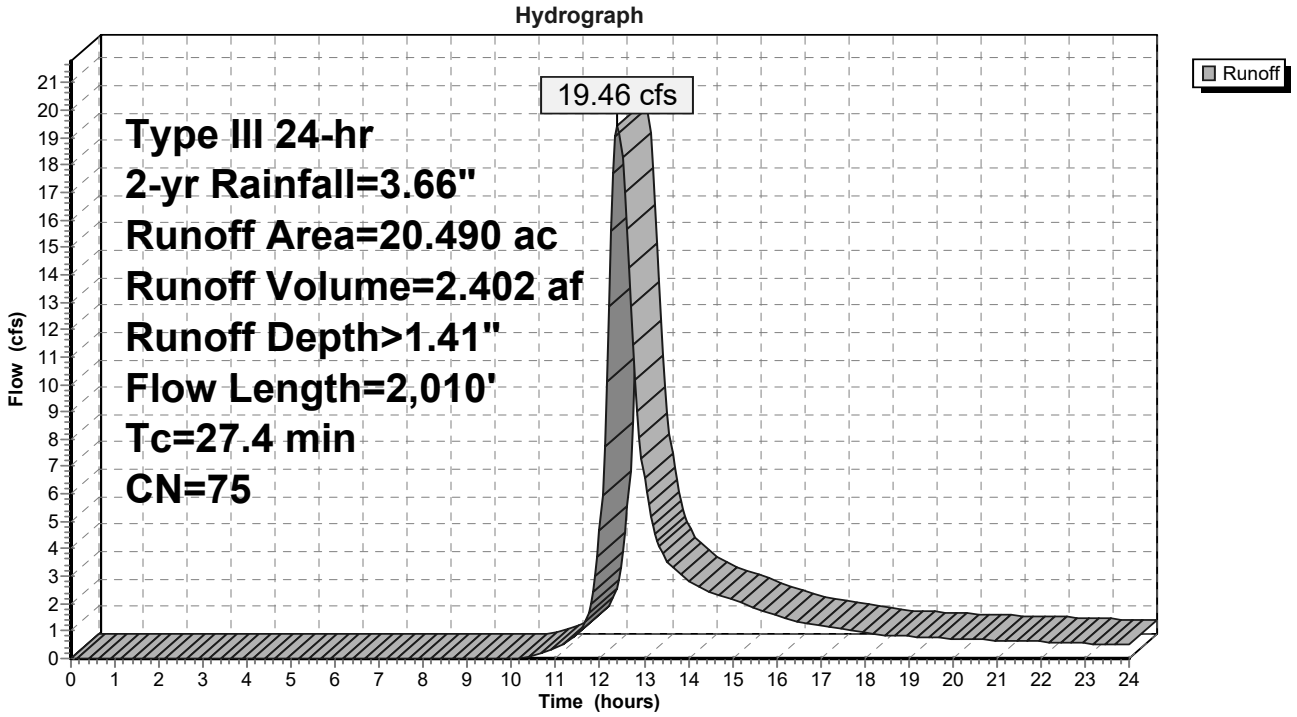
Runoff = 19.46 cfs @ 12.40 hrs, Volume= 2.402 af, Depth> 1.41"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

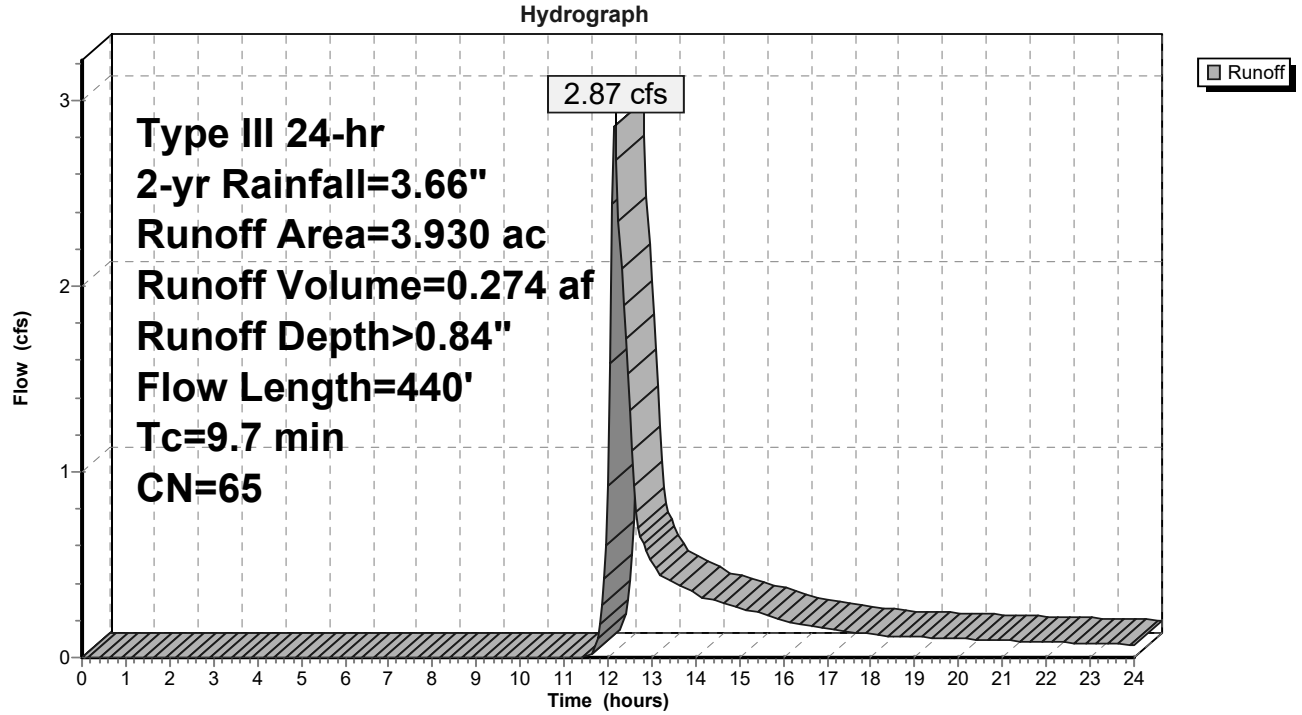
Runoff = 2.87 cfs @ 12.16 hrs, Volume= 0.274 af, Depth> 0.84"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 1.14" for 2-yr event
Inflow = 46.72 cfs @ 12.79 hrs, Volume= 10.124 af
Outflow = 32.97 cfs @ 13.33 hrs, Volume= 9.676 af, Atten= 29%, Lag= 32.8 min
Primary = 32.97 cfs @ 13.33 hrs, Volume= 9.676 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 73.99' @ 13.33 hrs Surf.Area= 1.020 ac Storage= 2.141 af

Plug-Flow detention time= 61.7 min calculated for 9.676 af (96% of inflow)
Center-of-Mass det. time= 39.6 min (938.1 - 898.5)

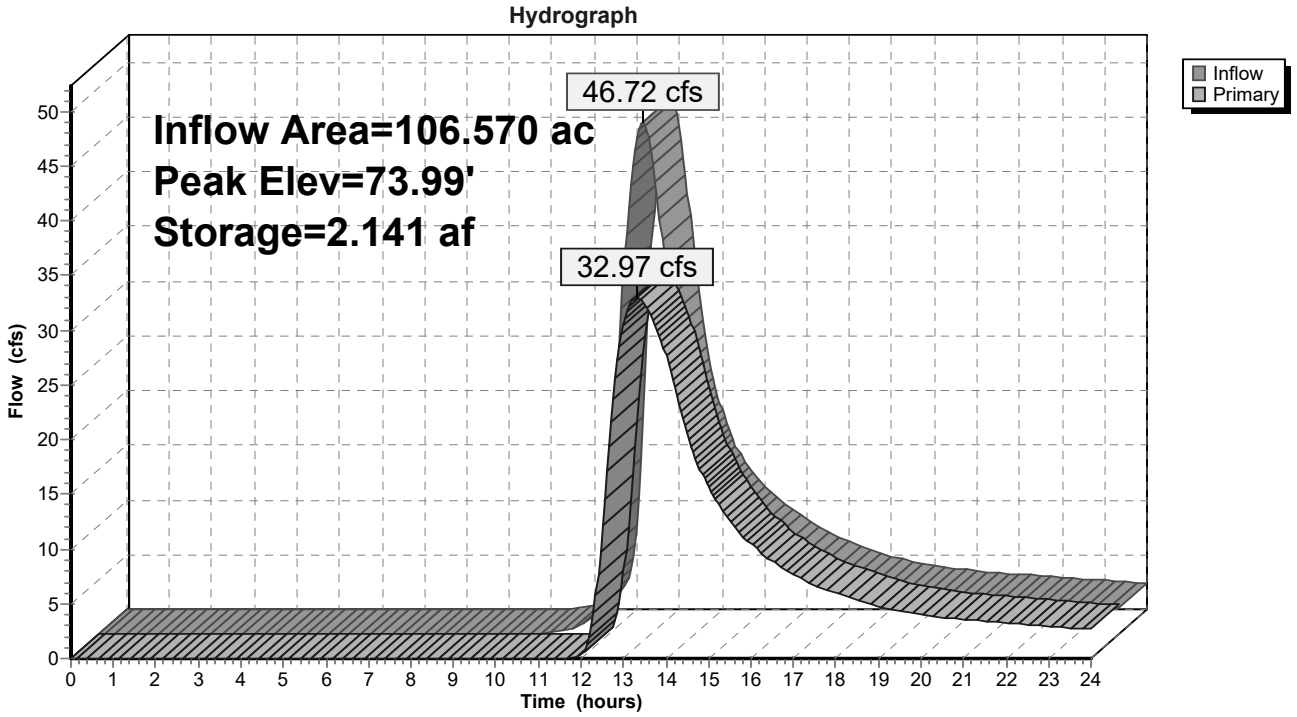
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=32.96 cfs @ 13.33 hrs HW=73.99' (Free Discharge)
- **1=Culvert** (Inlet Controls 32.96 cfs @ 5.25 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EX-POND: EXISTING POND

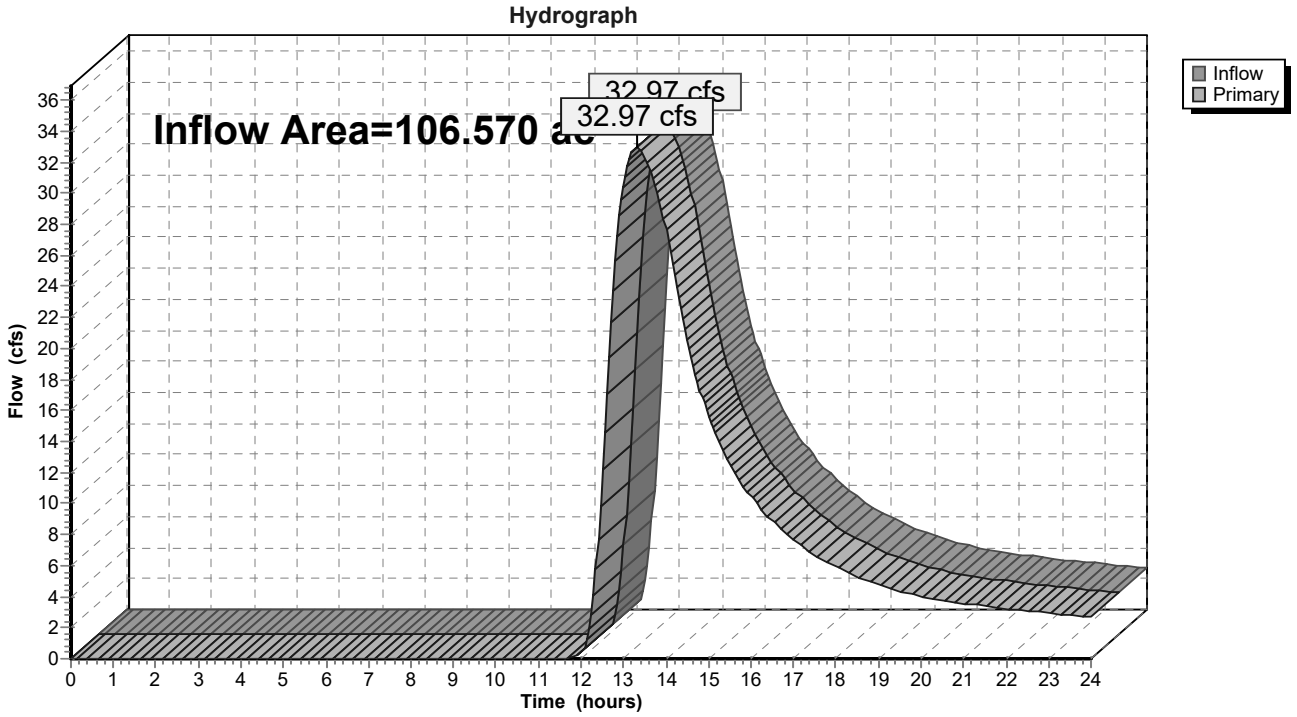


Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 1.09" for 2-yr event
Inflow = 32.97 cfs @ 13.33 hrs, Volume= 9.676 af
Primary = 32.97 cfs @ 13.33 hrs, Volume= 9.676 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1



Summary for Subcatchment EX-DA 1A: EX-DA 1A

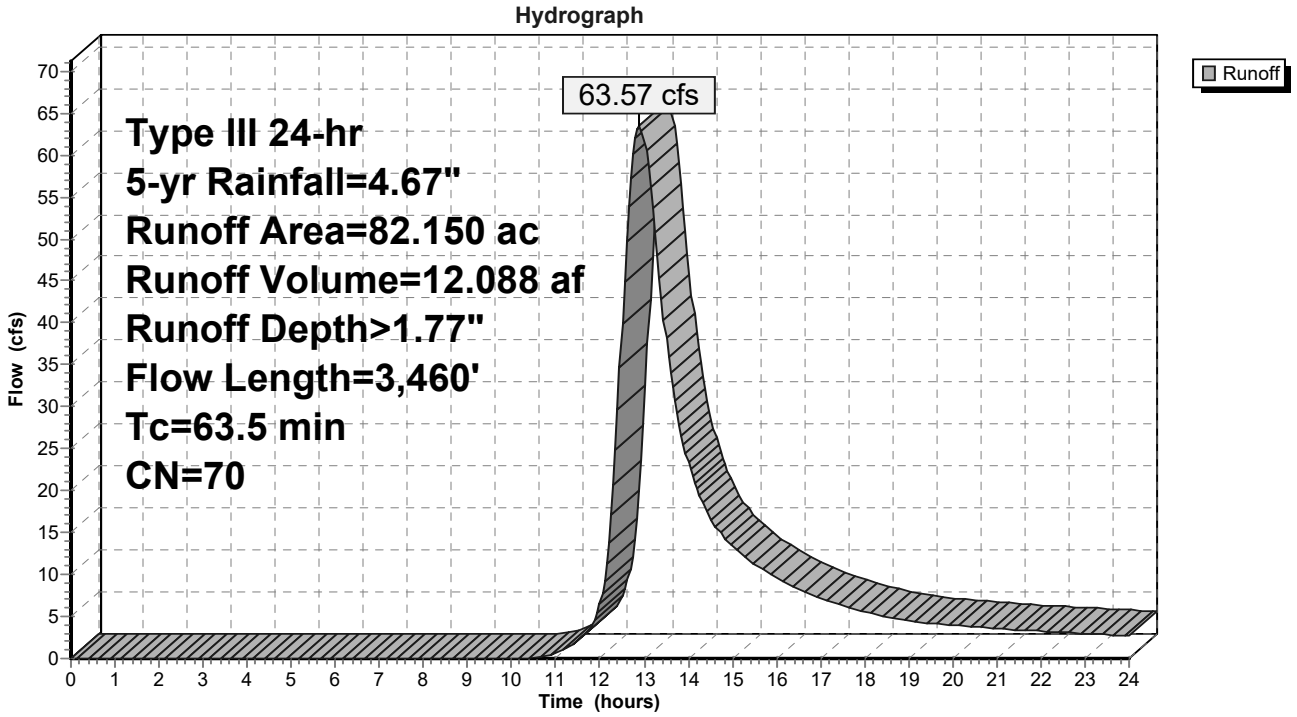
Runoff = 63.57 cfs @ 12.90 hrs, Volume= 12.088 af, Depth> 1.77"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

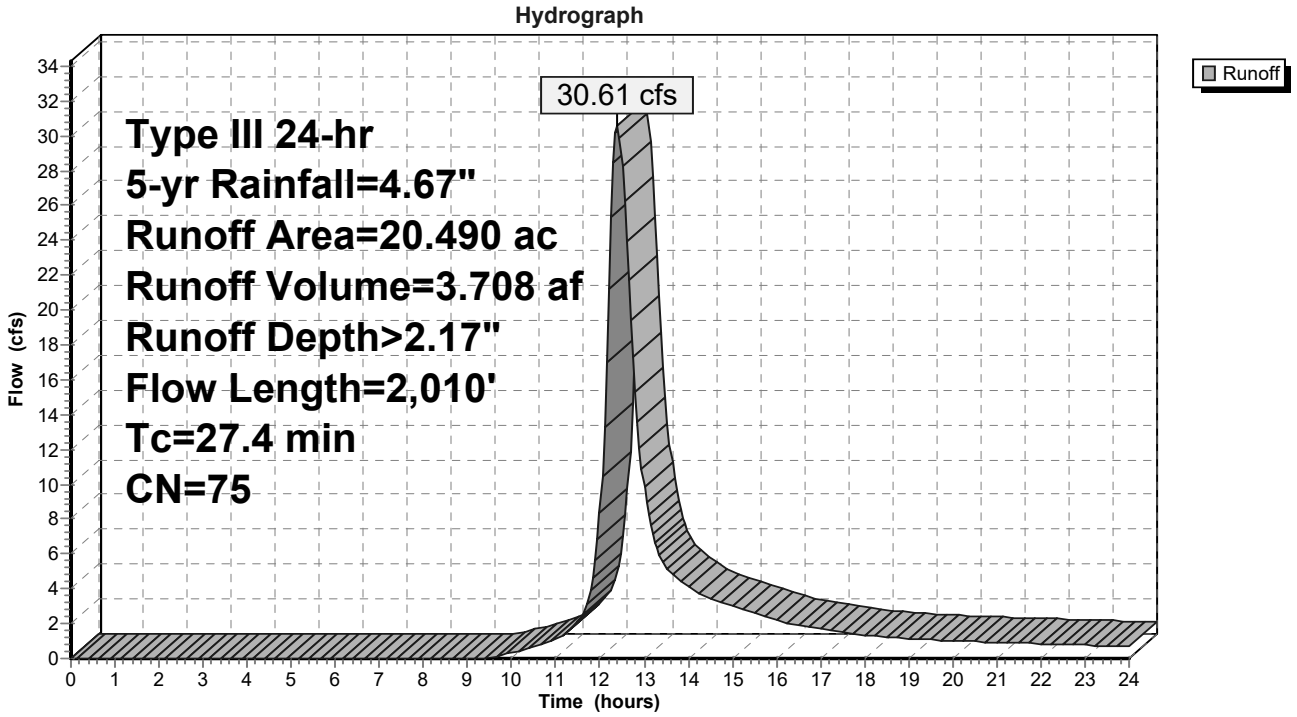
Runoff = 30.61 cfs @ 12.39 hrs, Volume= 3.708 af, Depth> 2.17"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

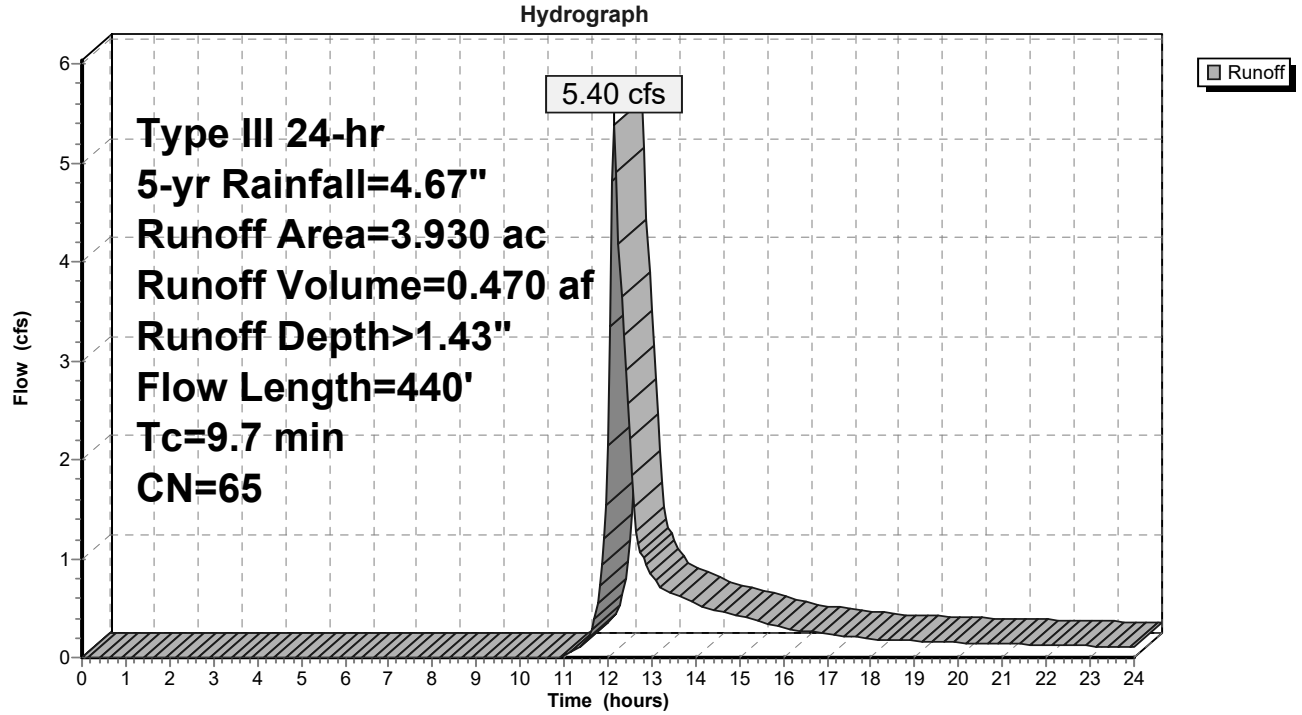
Runoff = 5.40 cfs @ 12.15 hrs, Volume= 0.470 af, Depth> 1.43"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 1.83" for 5-yr event
Inflow = 78.44 cfs @ 12.76 hrs, Volume= 16.265 af
Outflow = 49.31 cfs @ 13.40 hrs, Volume= 15.725 af, Atten= 37%, Lag= 38.1 min
Primary = 49.31 cfs @ 13.40 hrs, Volume= 15.725 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 75.46' @ 13.40 hrs Surf.Area= 1.235 ac Storage= 3.793 af

Plug-Flow detention time= 57.9 min calculated for 15.725 af (97% of inflow)
Center-of-Mass det. time= 40.7 min (925.8 - 885.1)

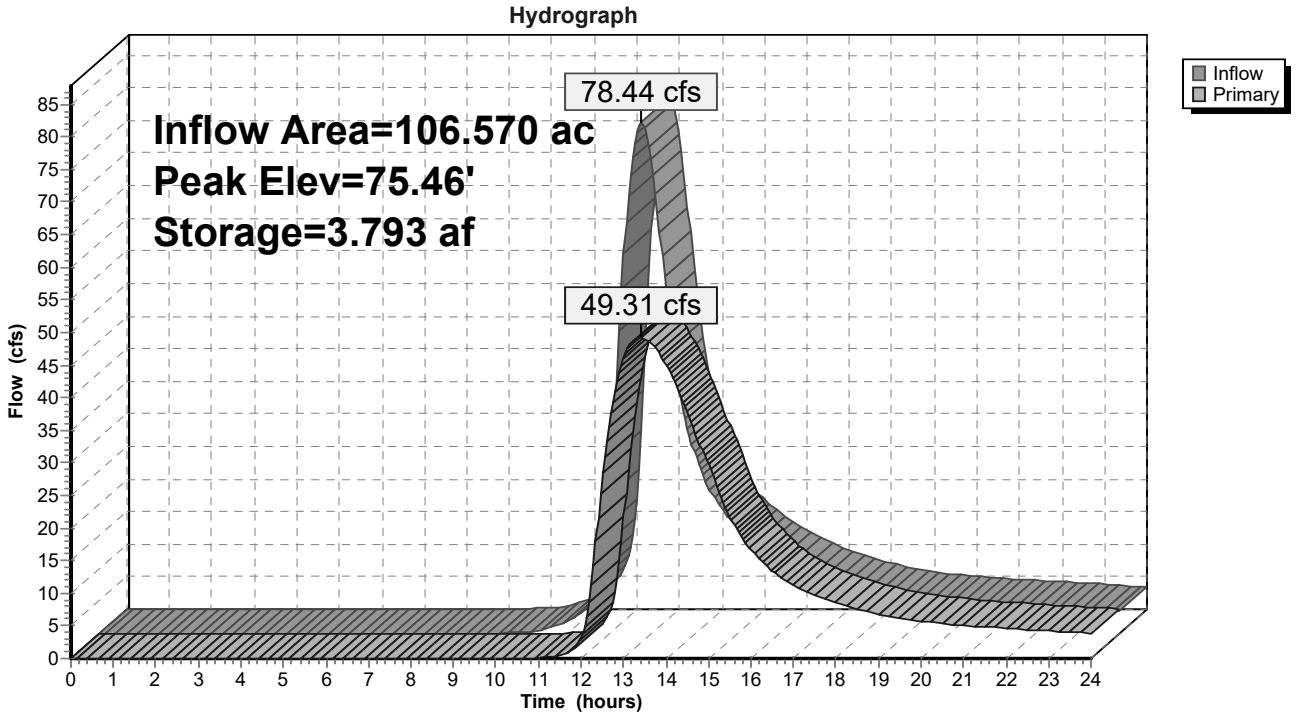
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=49.31 cfs @ 13.40 hrs HW=75.46' (Free Discharge)
- **1=Culvert** (Inlet Controls 49.31 cfs @ 7.85 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EX-POND: EXISTING POND

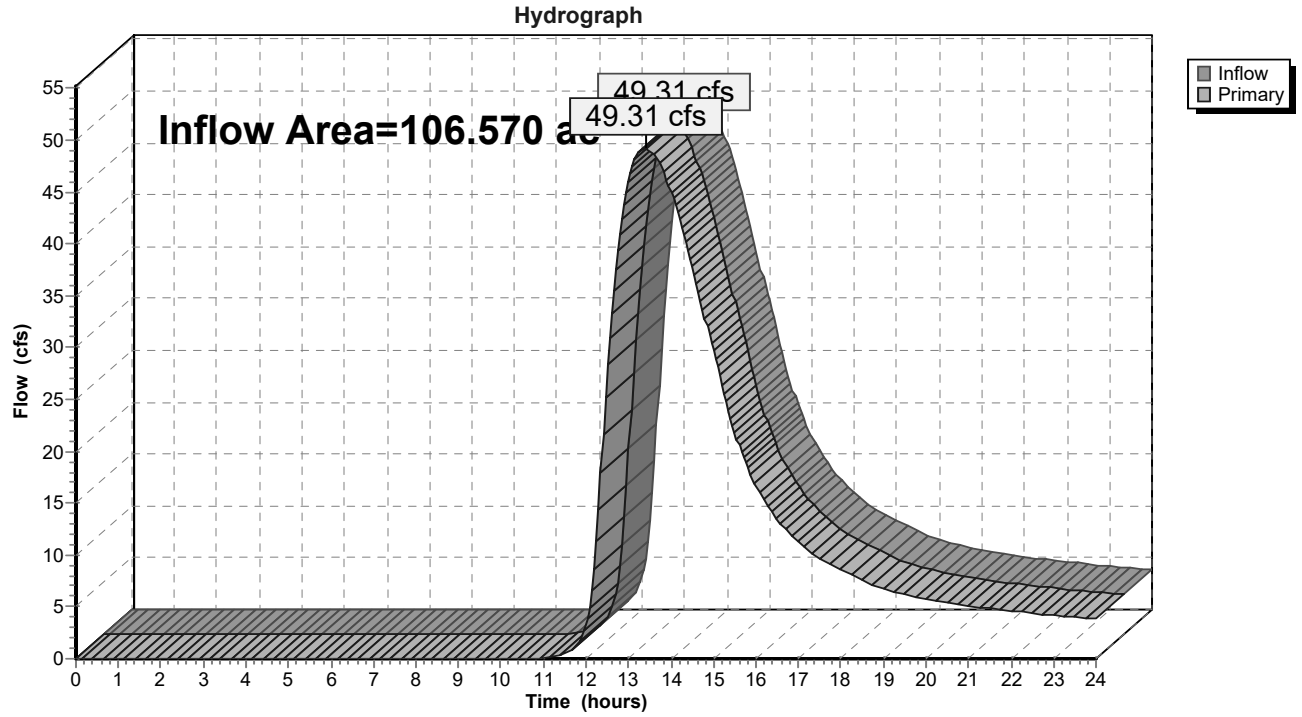


Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 1.77" for 5-yr event
Inflow = 49.31 cfs @ 13.40 hrs, Volume= 15.725 af
Primary = 49.31 cfs @ 13.40 hrs, Volume= 15.725 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1



Summary for Subcatchment EX-DA 1A: EX-DA 1A

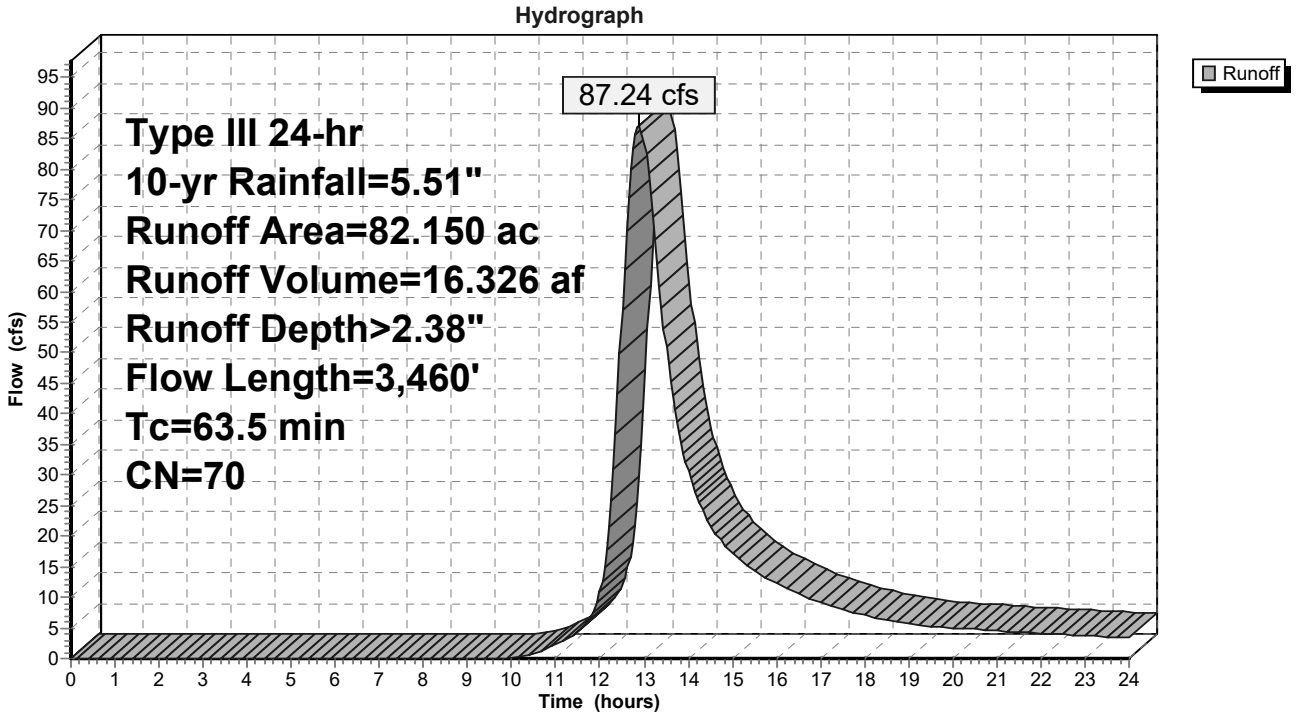
Runoff = 87.24 cfs @ 12.89 hrs, Volume= 16.326 af, Depth> 2.38"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

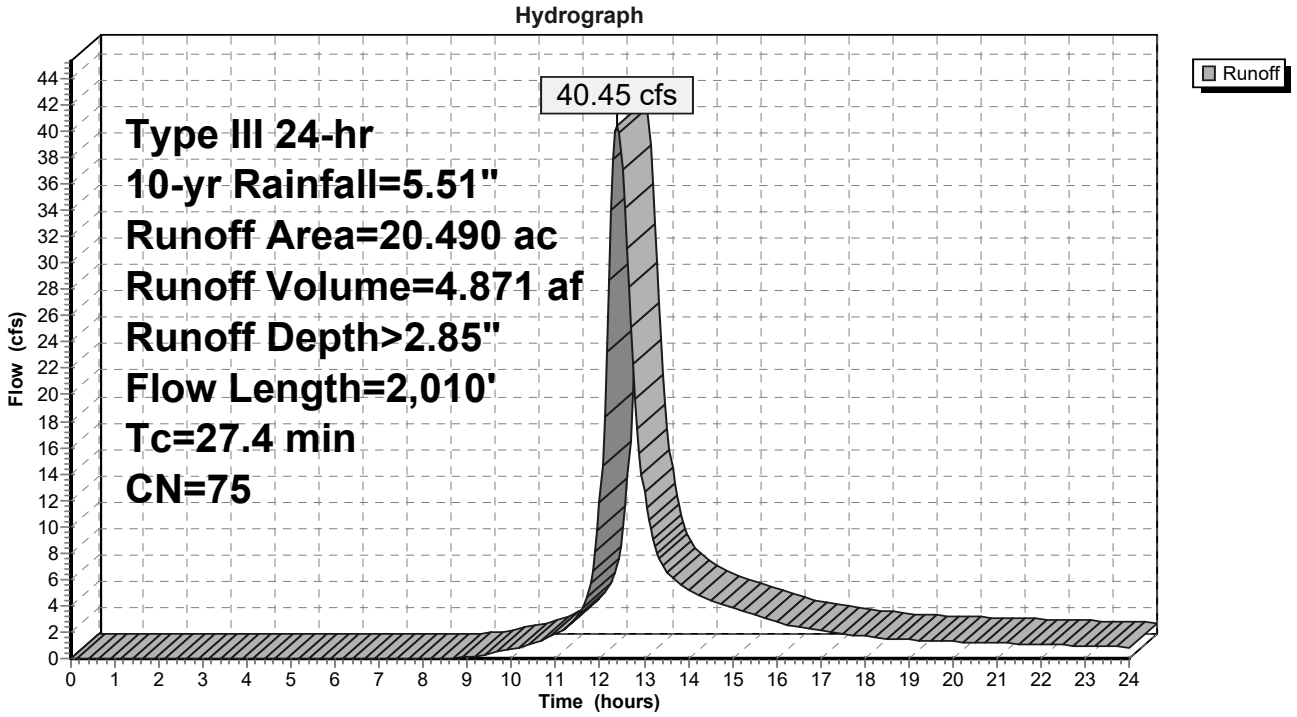
Runoff = 40.45 cfs @ 12.39 hrs, Volume= 4.871 af, Depth> 2.85"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

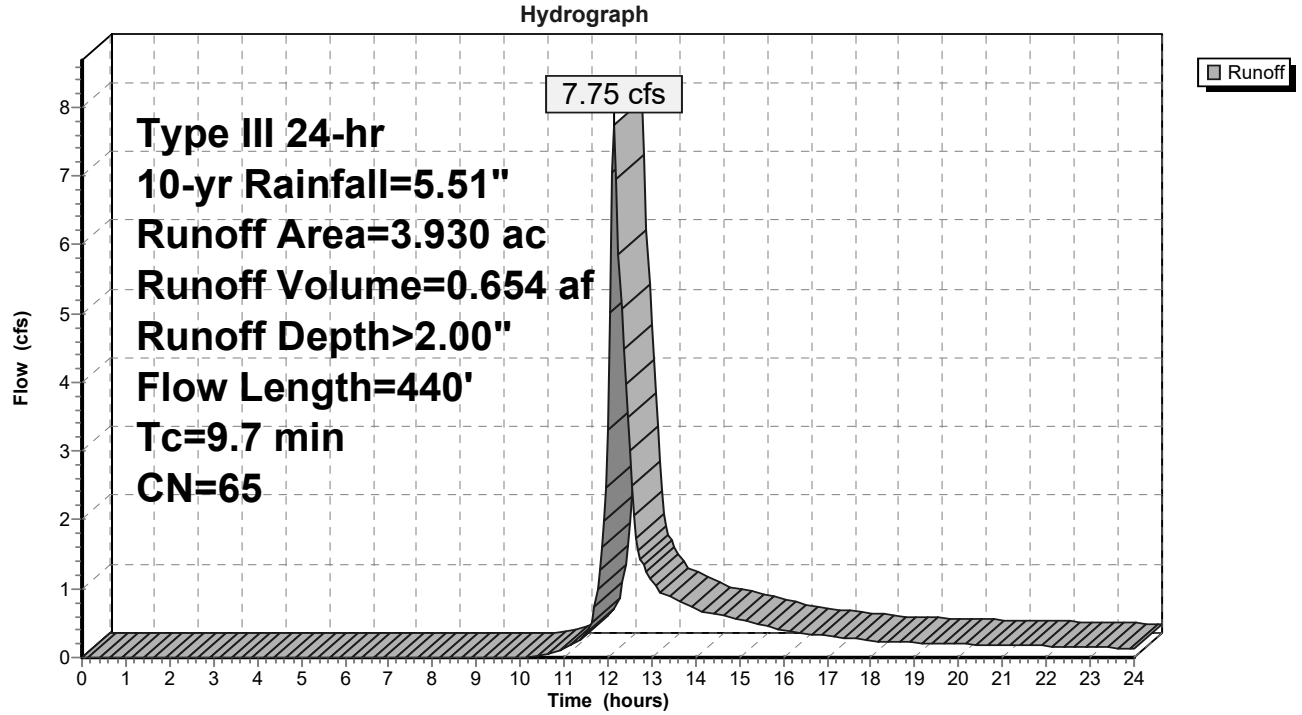
Runoff = 7.75 cfs @ 12.15 hrs, Volume= 0.654 af, Depth> 2.00"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 2.46" for 10-yr event
Inflow = 107.09 cfs @ 12.75 hrs, Volume= 21.852 af
Outflow = 77.90 cfs @ 13.25 hrs, Volume= 21.243 af, Atten= 27%, Lag= 29.9 min
Primary = 77.90 cfs @ 13.25 hrs, Volume= 21.243 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 76.42' @ 13.25 hrs Surf.Area= 1.408 ac Storage= 5.066 af

Plug-Flow detention time= 55.9 min calculated for 21.243 af (97% of inflow)
Center-of-Mass det. time= 41.2 min (918.2 - 877.0)

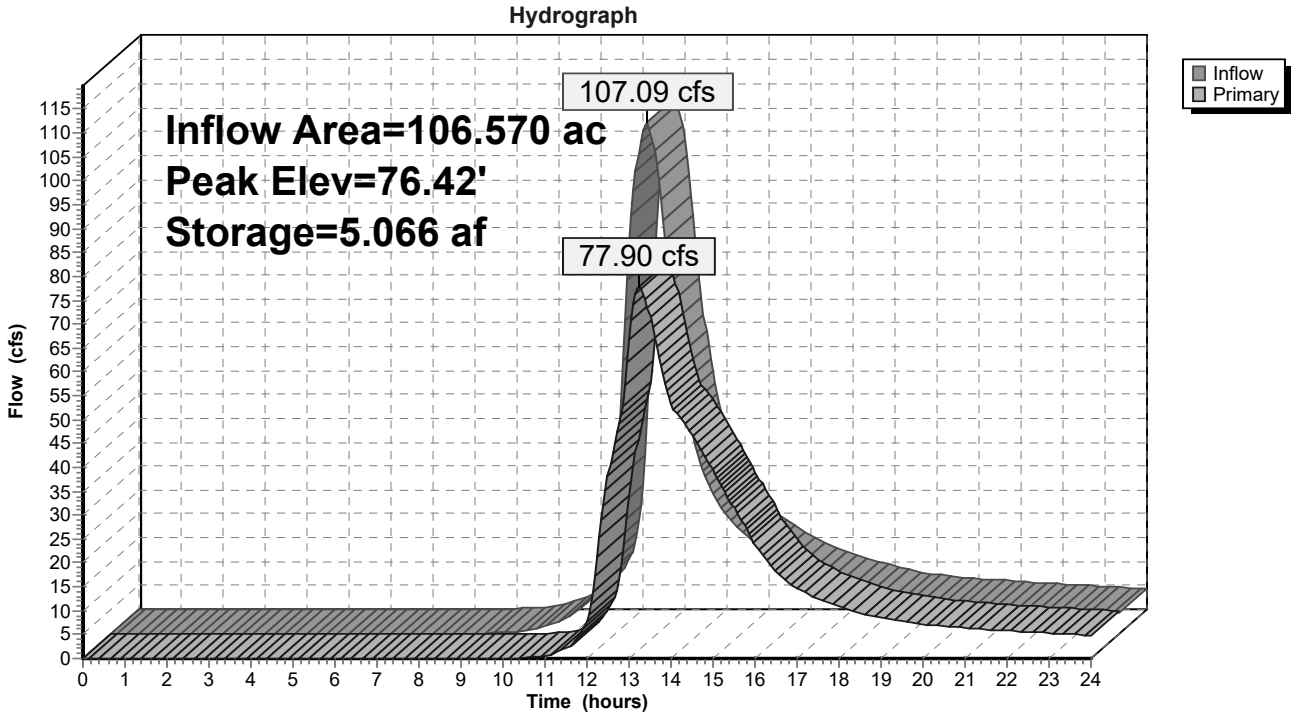
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=77.87 cfs @ 13.25 hrs HW=76.42' (Free Discharge)
- **1=Culvert** (Inlet Controls 57.60 cfs @ 9.17 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 20.28 cfs @ 2.14 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EX-POND: EXISTING POND

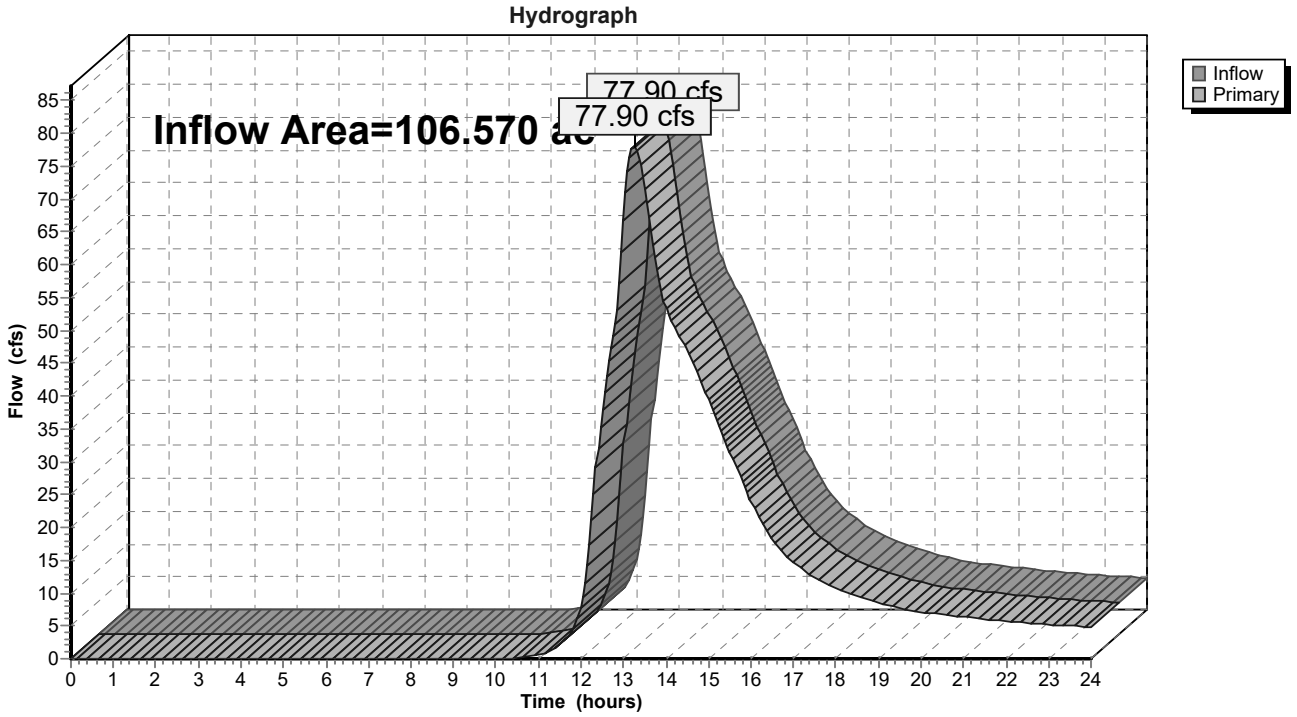


Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 2.39" for 10-yr event
Inflow = 77.90 cfs @ 13.25 hrs, Volume= 21.243 af
Primary = 77.90 cfs @ 13.25 hrs, Volume= 21.243 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1



Summary for Subcatchment EX-DA 1A: EX-DA 1A

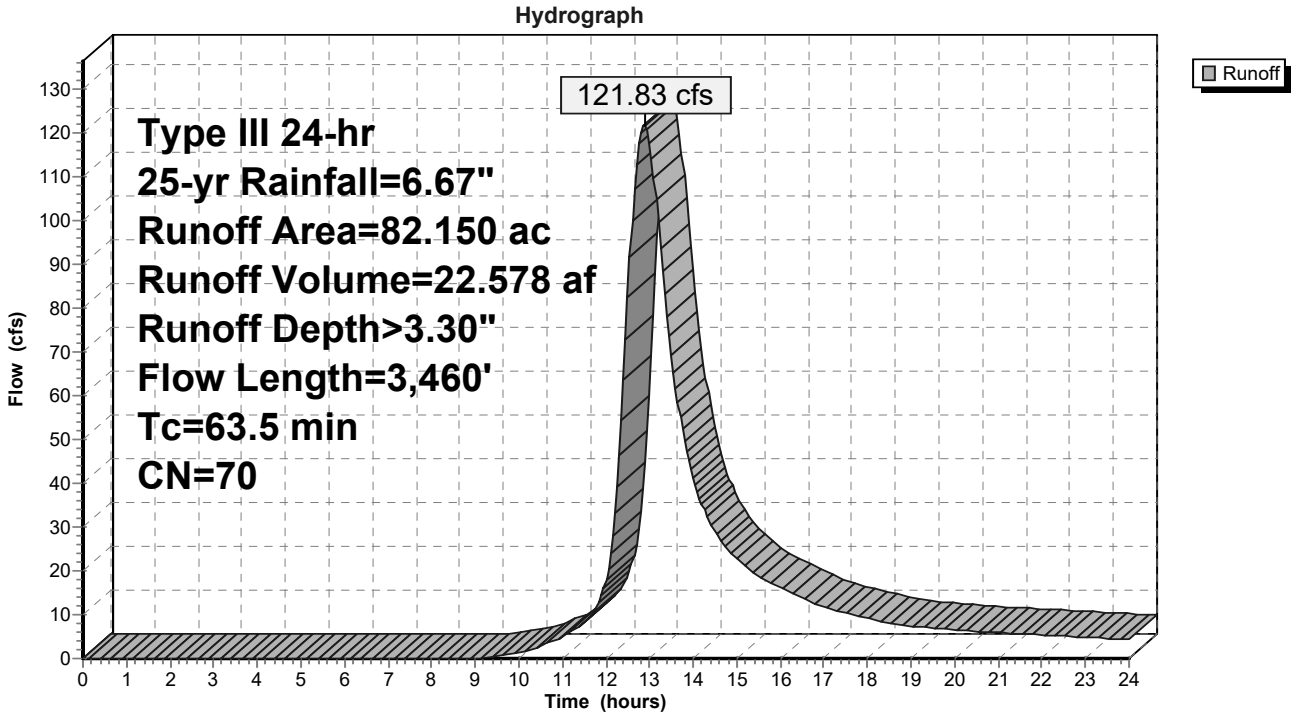
Runoff = 121.83 cfs @ 12.88 hrs, Volume= 22.578 af, Depth> 3.30"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

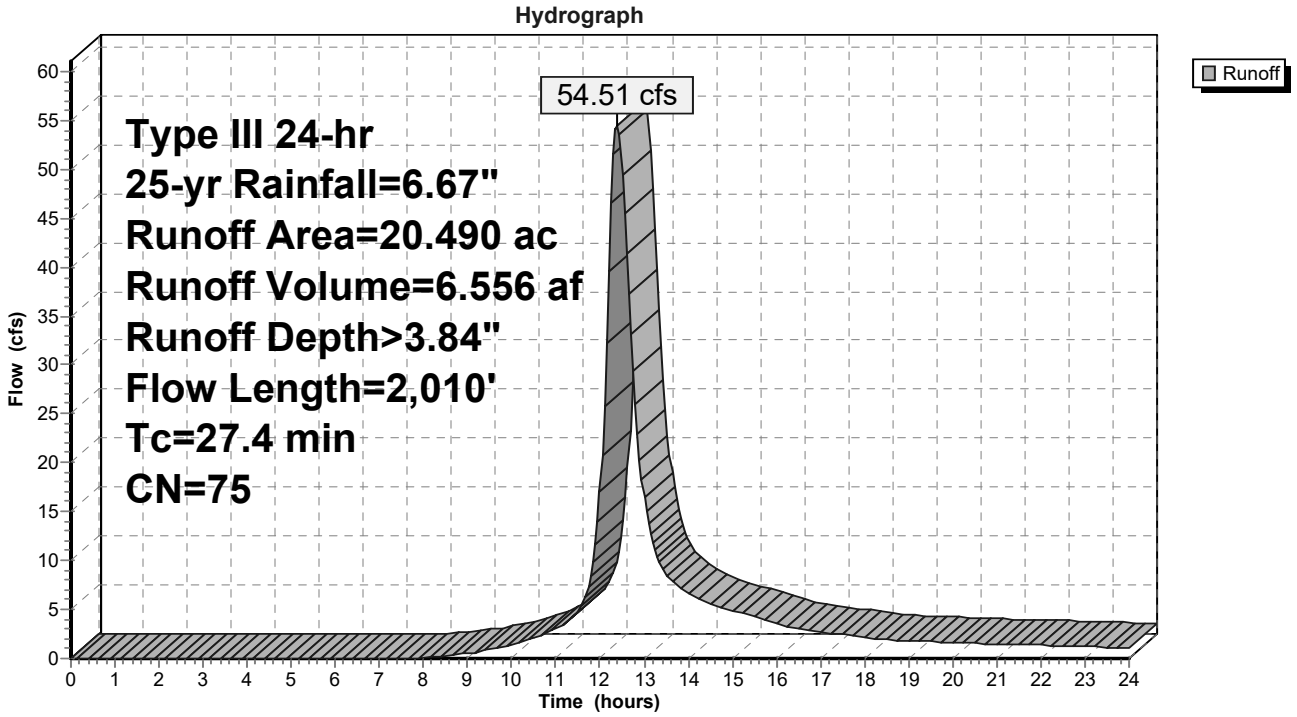
Runoff = 54.51 cfs @ 12.38 hrs, Volume= 6.556 af, Depth> 3.84"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

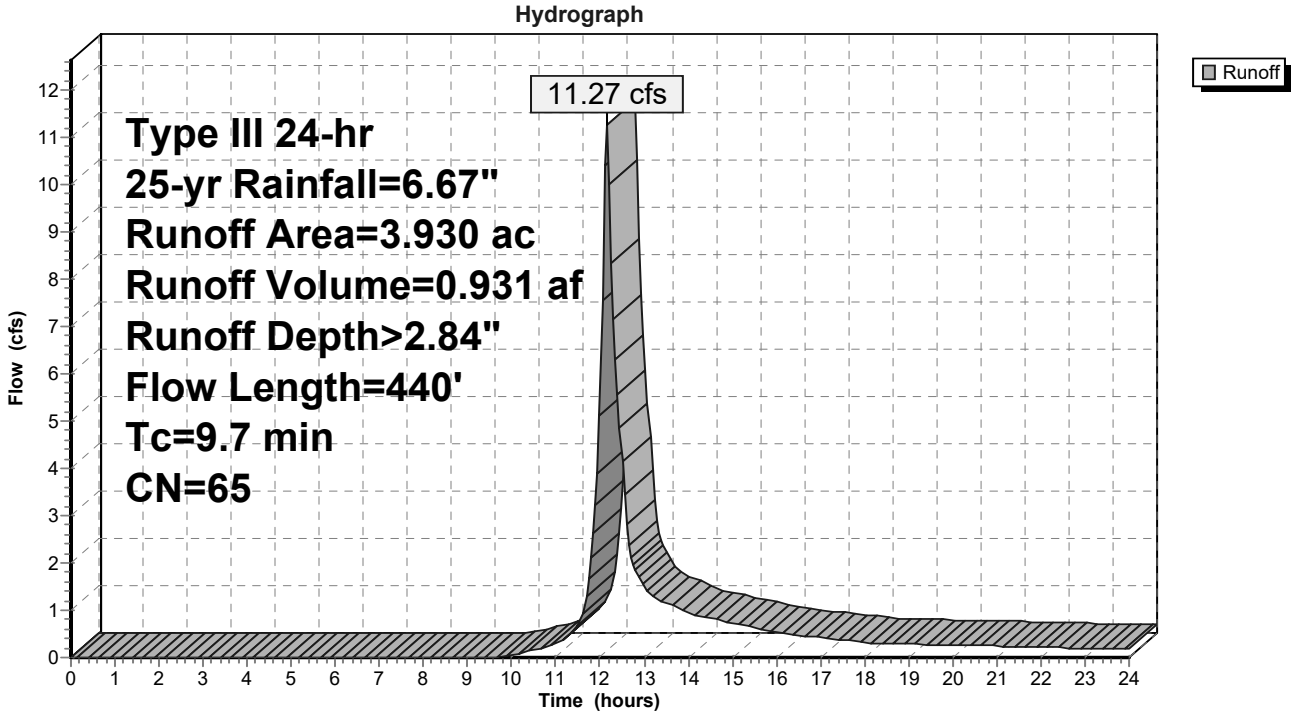
Runoff = 11.27 cfs @ 12.15 hrs, Volume= 0.931 af, Depth> 2.84"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 3.39" for 25-yr event
Inflow = 148.84 cfs @ 12.74 hrs, Volume= 30.066 af
Outflow = 132.15 cfs @ 13.04 hrs, Volume= 29.370 af, Atten= 11%, Lag= 17.6 min
Primary = 132.15 cfs @ 13.04 hrs, Volume= 29.370 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.03' @ 13.04 hrs Surf.Area= 1.538 ac Storage= 5.952 af

Plug-Flow detention time= 50.0 min calculated for 29.370 af (98% of inflow)
Center-of-Mass det. time= 37.6 min (905.9 - 868.3)

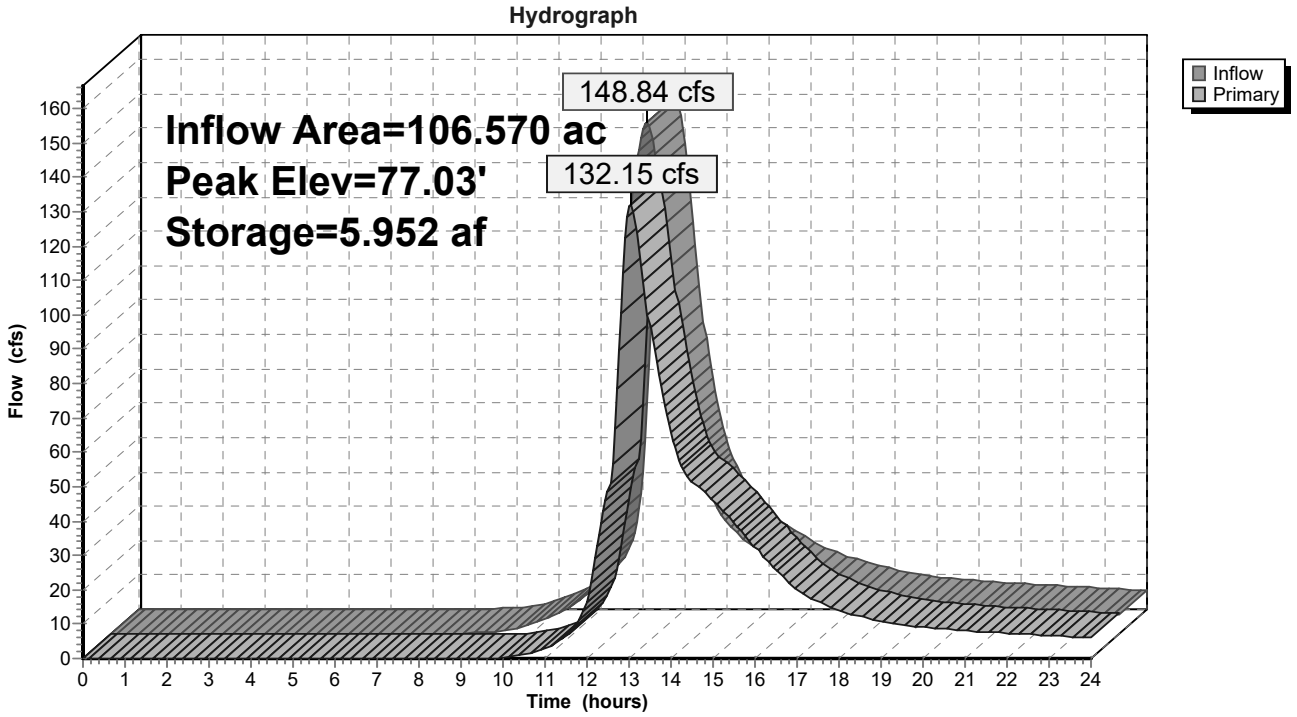
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=131.90 cfs @ 13.04 hrs HW=77.03' (Free Discharge)
- **1=Culvert** (Inlet Controls 62.19 cfs @ 9.90 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 57.82 cfs @ 2.87 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 11.89 cfs @ 1.40 fps)

Pond EX-POND: EXISTING POND

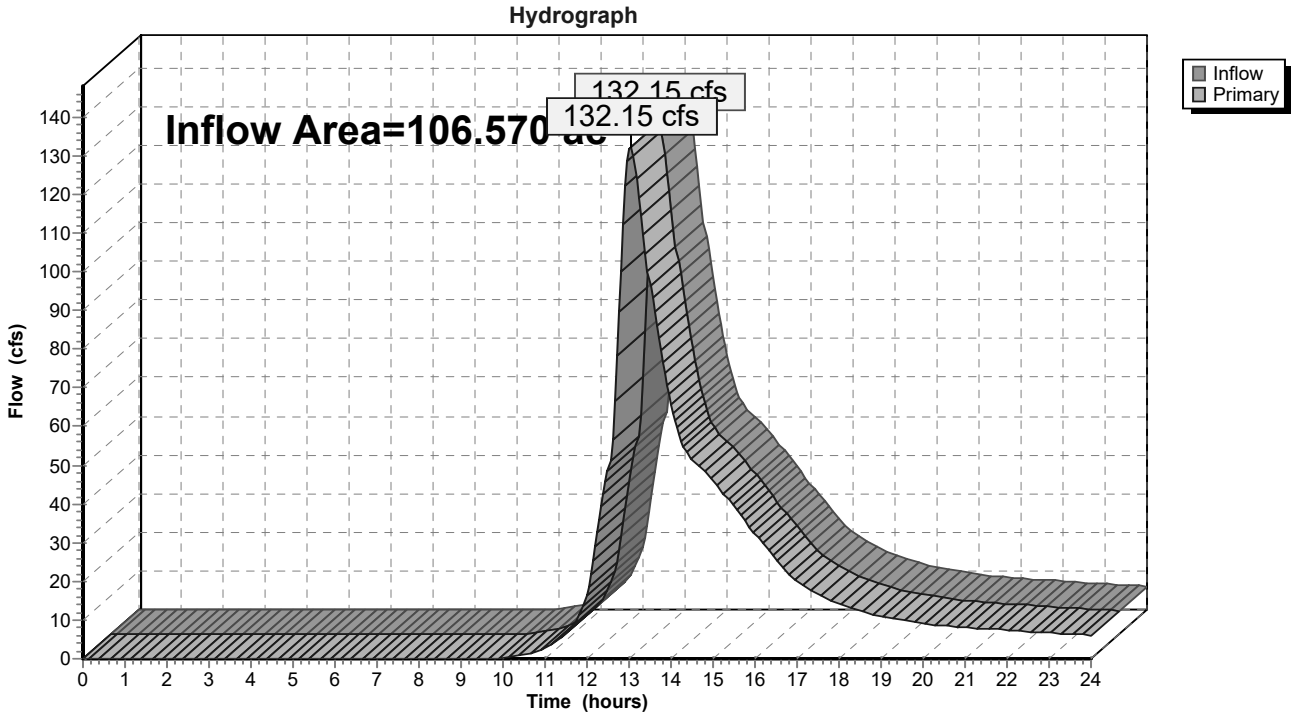


Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 3.31" for 25-yr event
Inflow = 132.15 cfs @ 13.04 hrs, Volume= 29.370 af
Primary = 132.15 cfs @ 13.04 hrs, Volume= 29.370 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1



Summary for Subcatchment EX-DA 1A: EX-DA 1A

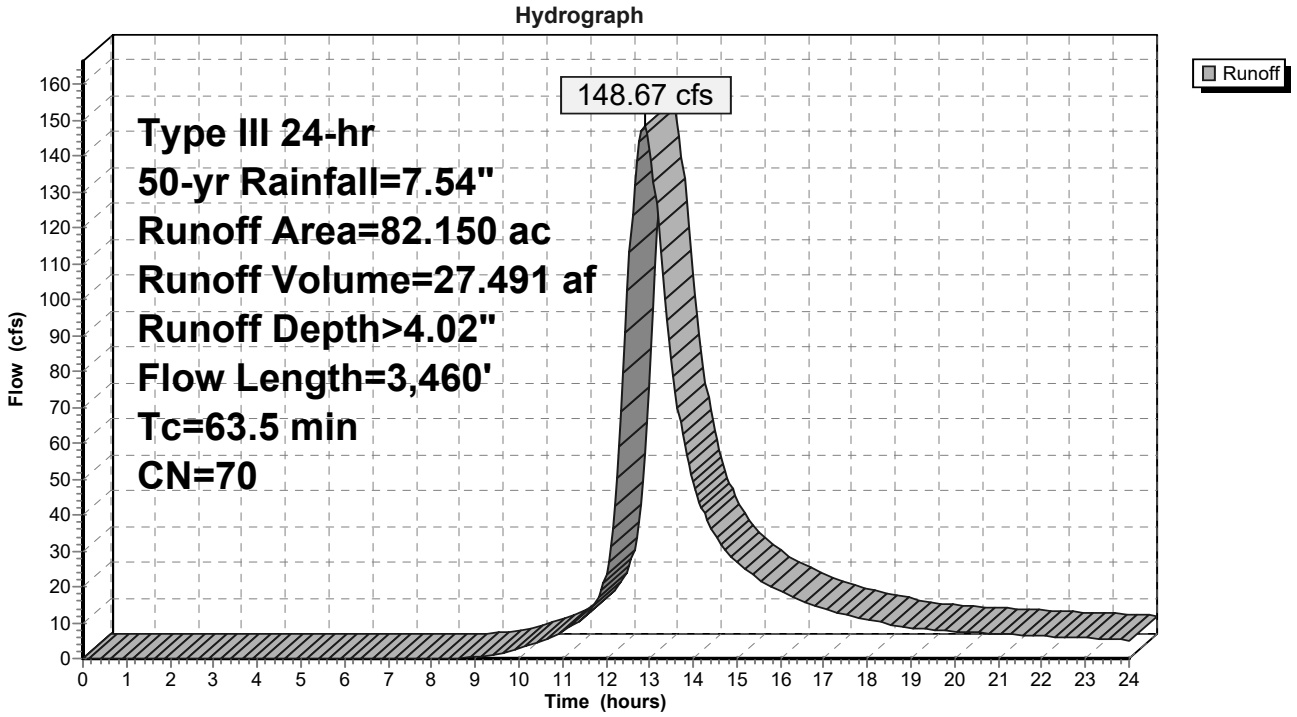
Runoff = 148.67 cfs @ 12.87 hrs, Volume= 27.491 af, Depth> 4.02"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

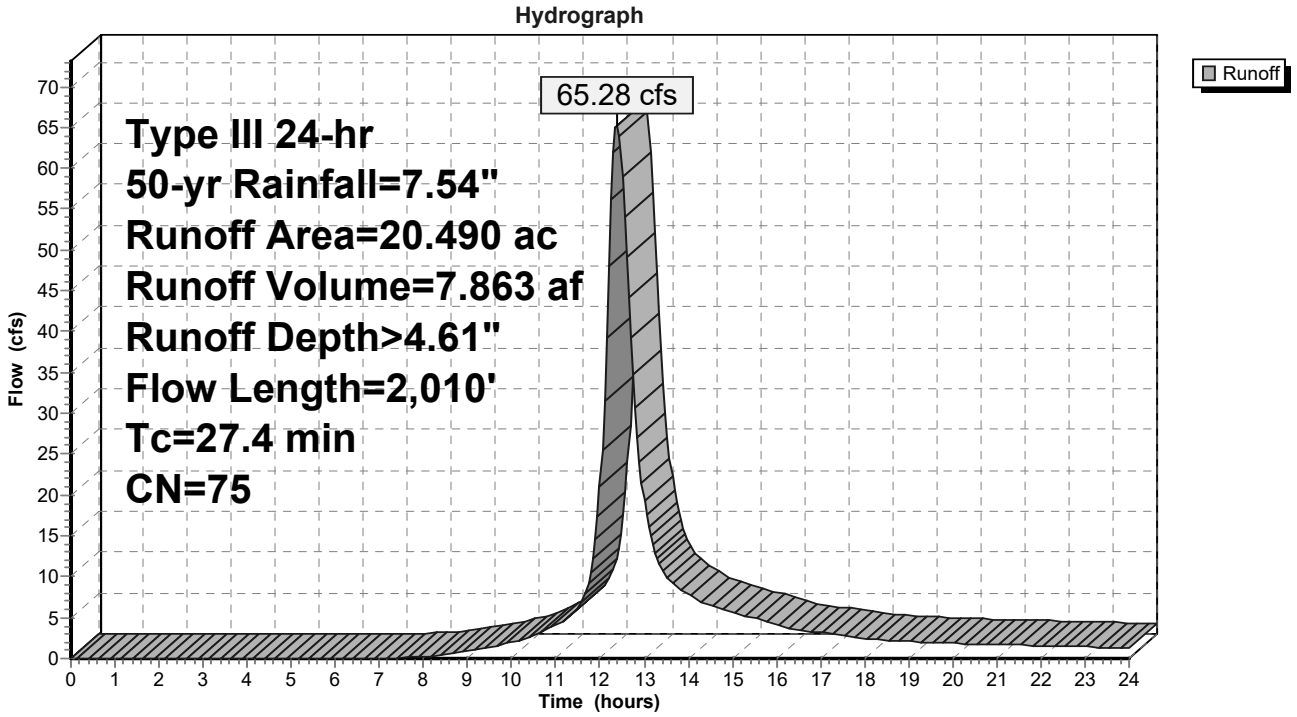
Runoff = 65.28 cfs @ 12.38 hrs, Volume= 7.863 af, Depth> 4.61"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

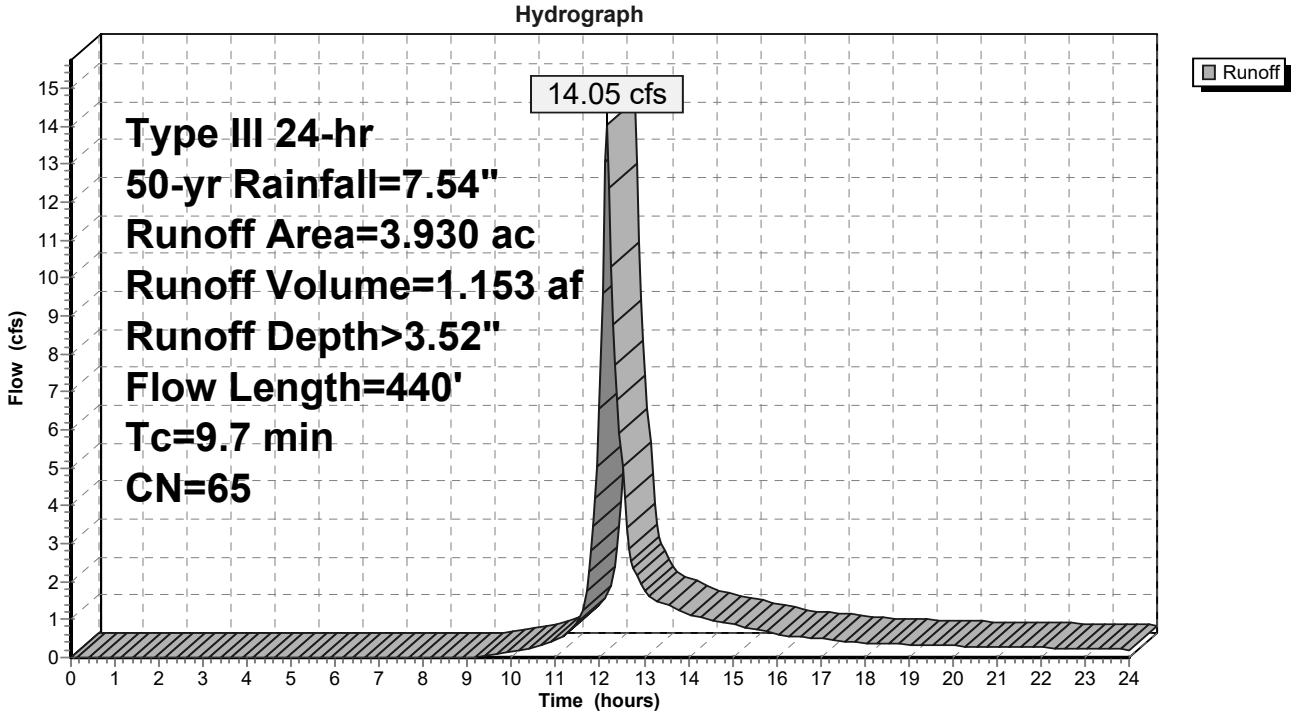
Runoff = 14.05 cfs @ 12.14 hrs, Volume= 1.153 af, Depth> 3.52"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 4.11" for 50-yr event
Inflow = 181.29 cfs @ 12.74 hrs, Volume= 36.507 af
Outflow = 171.46 cfs @ 12.94 hrs, Volume= 35.751 af, Atten= 5%, Lag= 11.8 min
Primary = 171.46 cfs @ 12.94 hrs, Volume= 35.751 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.26' @ 12.94 hrs Surf.Area= 1.590 ac Storage= 6.318 af

Plug-Flow detention time= 46.2 min calculated for 35.677 af (98% of inflow)
Center-of-Mass det. time= 35.0 min (898.0 - 863.0)

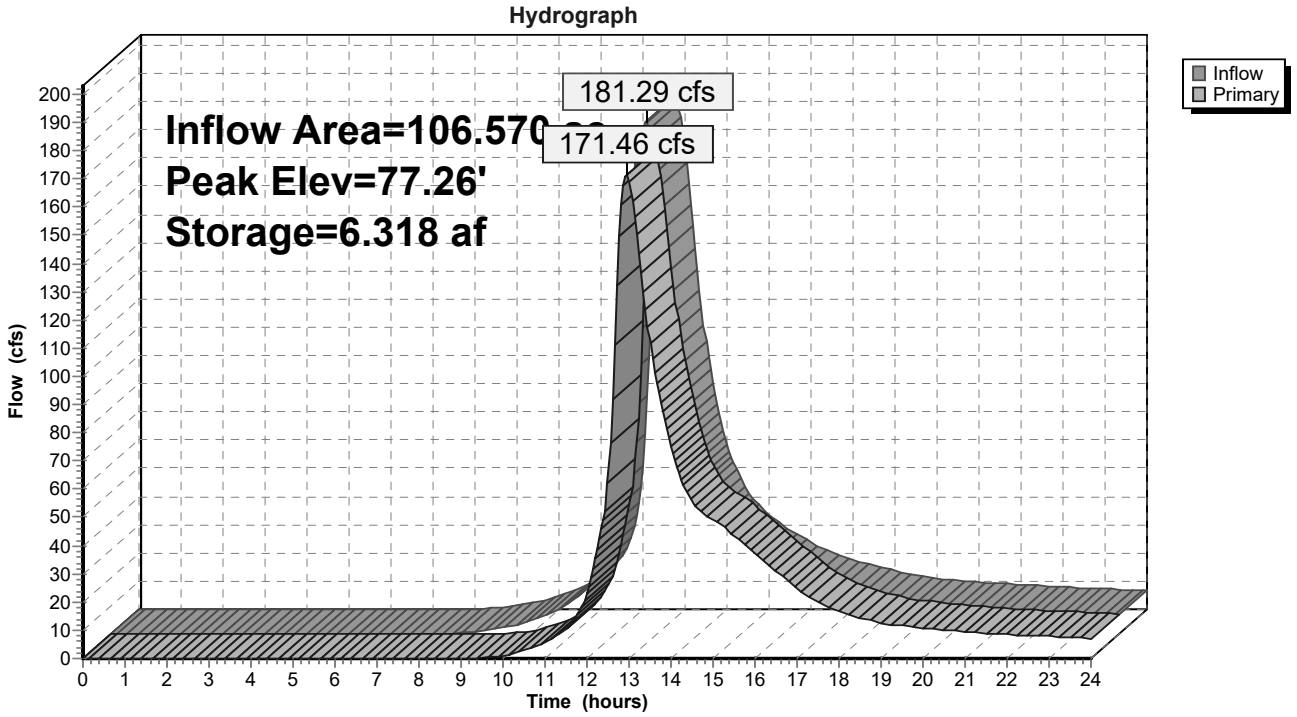
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=171.23 cfs @ 12.94 hrs HW=77.26' (Free Discharge)
- **1=Culvert** (Inlet Controls 63.88 cfs @ 10.17 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 76.72 cfs @ 3.08 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 30.62 cfs @ 1.91 fps)

Pond EX-POND: EXISTING POND

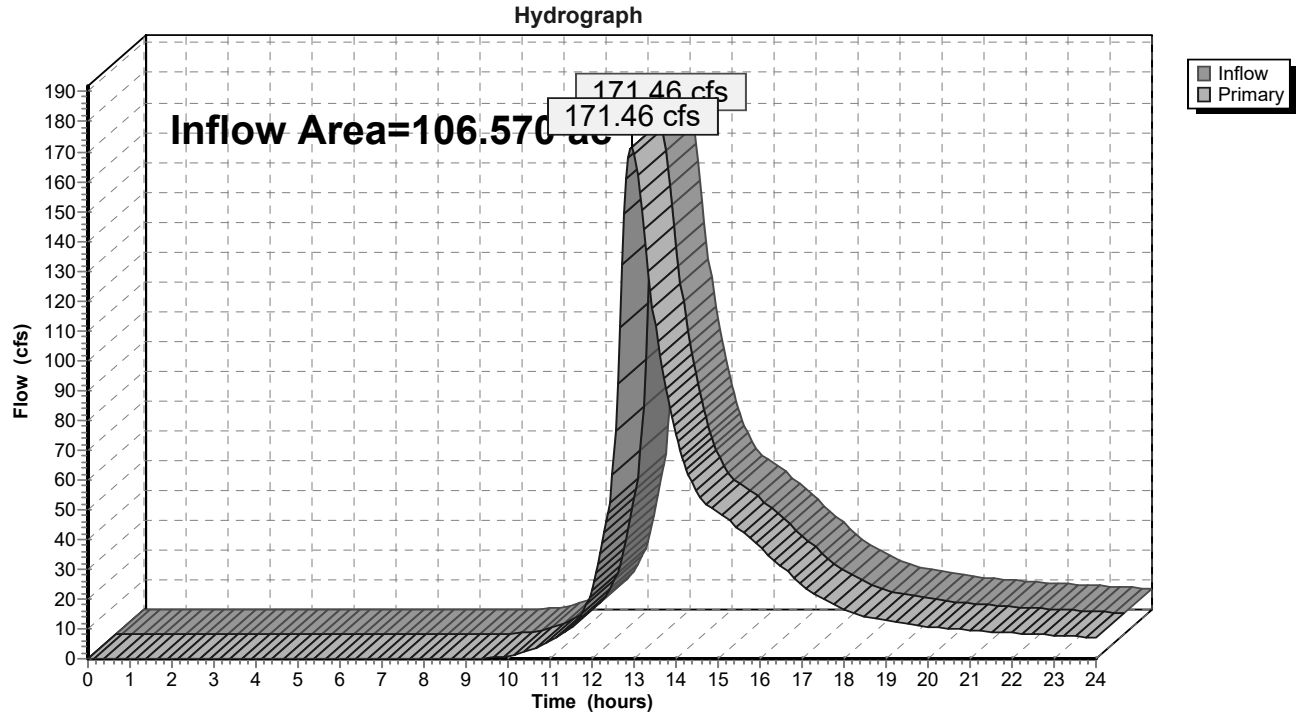


Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 4.03" for 50-yr event
Inflow = 171.46 cfs @ 12.94 hrs, Volume= 35.751 af
Primary = 171.46 cfs @ 12.94 hrs, Volume= 35.751 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1



Summary for Subcatchment EX-DA 1A: EX-DA 1A

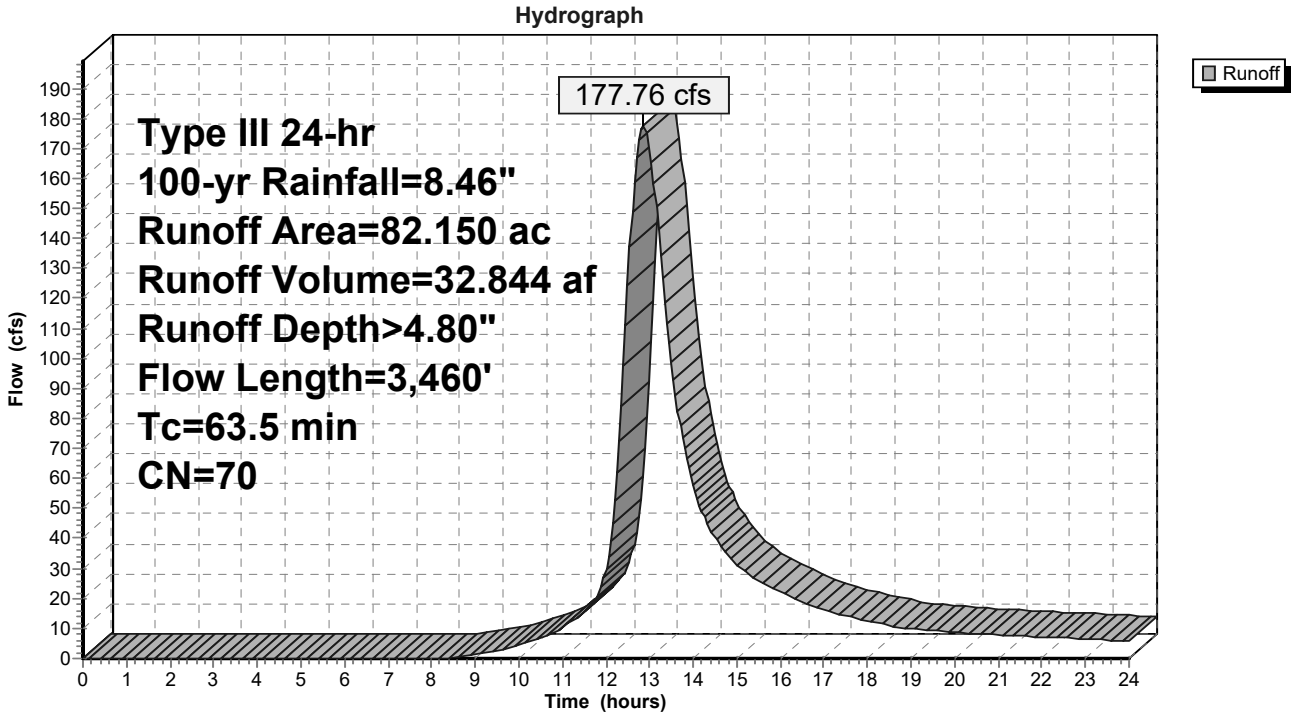
Runoff = 177.76 cfs @ 12.87 hrs, Volume= 32.844 af, Depth> 4.80"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment EX-DA 1A: EX-DA 1A



Summary for Subcatchment EX-DA 1B: EX-DA 1B

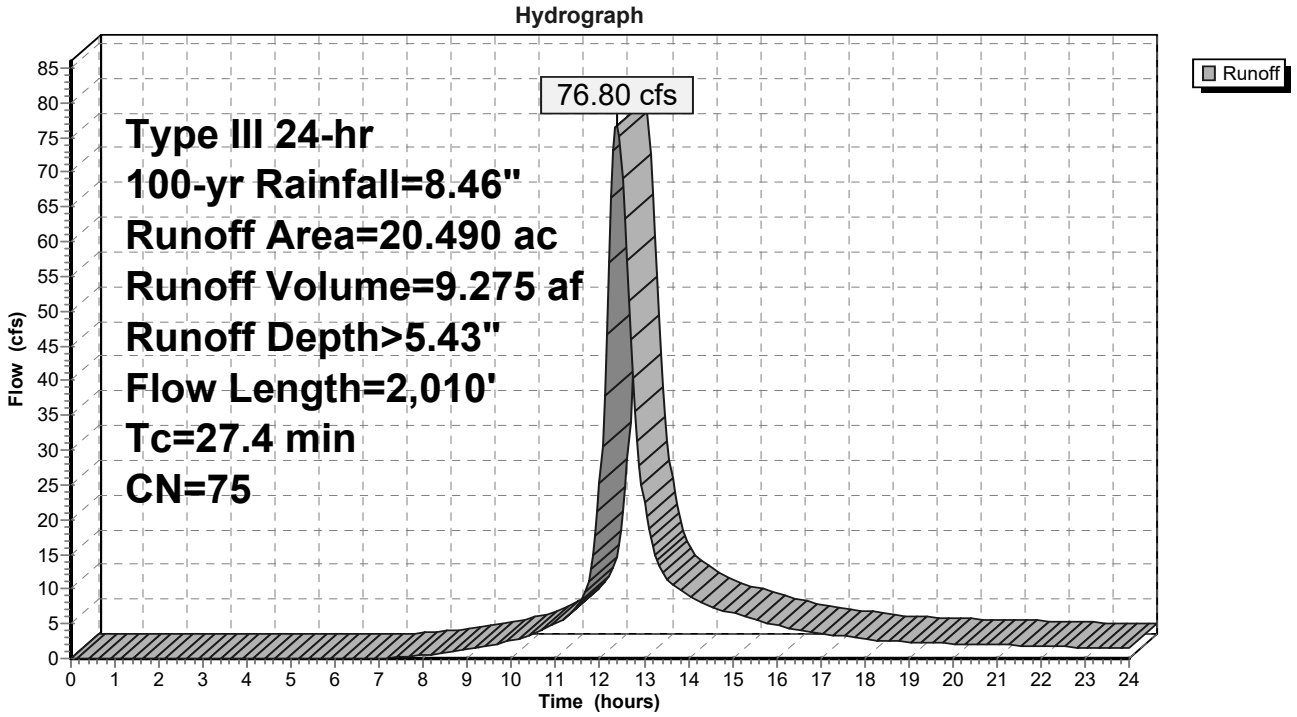
Runoff = 76.80 cfs @ 12.38 hrs, Volume= 9.275 af, Depth> 5.43"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
7.910	98	Paved parking, HSG B
3.650	55	Woods, Good, HSG B
5.940	61	>75% Grass cover, Good, HSG B
20.490	75	Weighted Average
11.982		58.48% Pervious Area
8.508		41.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment EX-DA 1B: EX-DA 1B



Summary for Subcatchment EX-DA 1C: EX-DA 1C

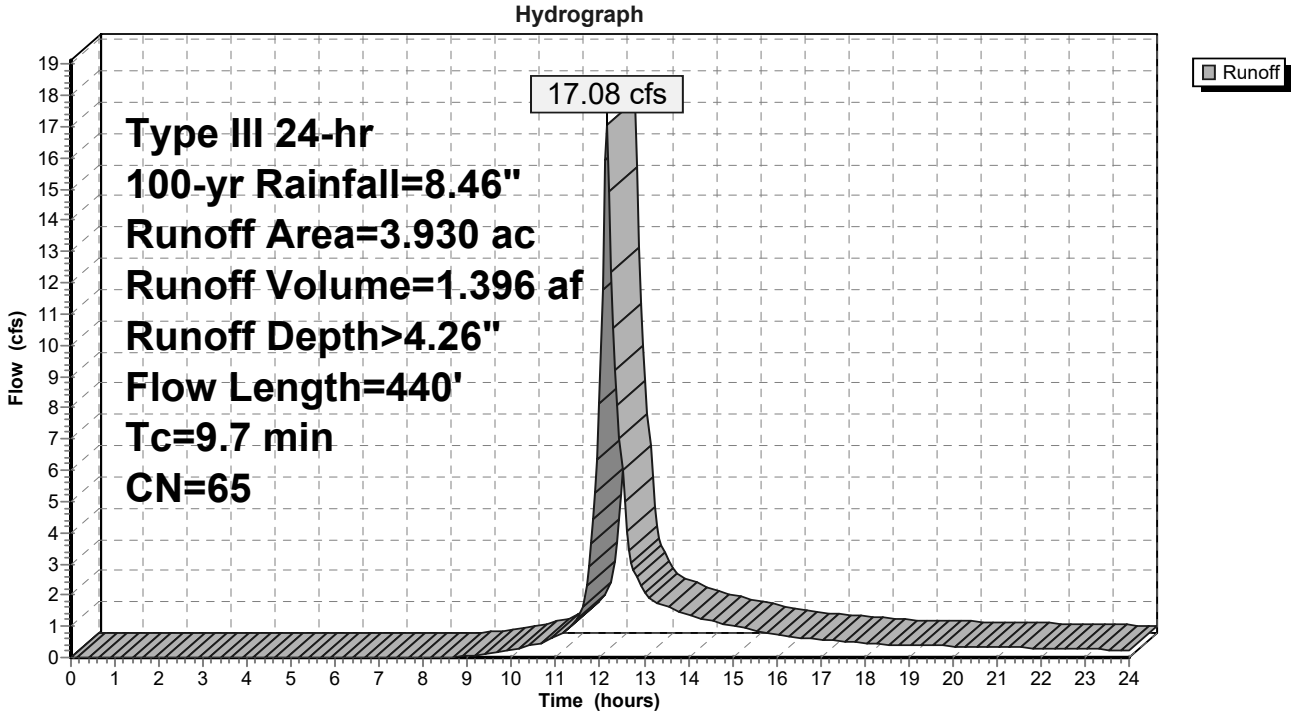
Runoff = 17.08 cfs @ 12.14 hrs, Volume= 1.396 af, Depth> 4.26"
Routed to Pond EX-POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment EX-DA 1C: EX-DA 1C



Summary for Pond EX-POND: EXISTING POND

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 4.90" for 100-yr event
Inflow = 216.30 cfs @ 12.74 hrs, Volume= 43.514 af
Outflow = 210.04 cfs @ 12.87 hrs, Volume= 42.699 af, Atten= 3%, Lag= 8.3 min
Primary = 210.04 cfs @ 12.87 hrs, Volume= 42.699 af
Routed to Link EX DP-1 : EX DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.46' @ 12.87 hrs Surf.Area= 1.634 ac Storage= 6.632 af

Plug-Flow detention time= 43.0 min calculated for 42.610 af (98% of inflow)
Center-of-Mass det. time= 32.7 min (891.0 - 858.3)

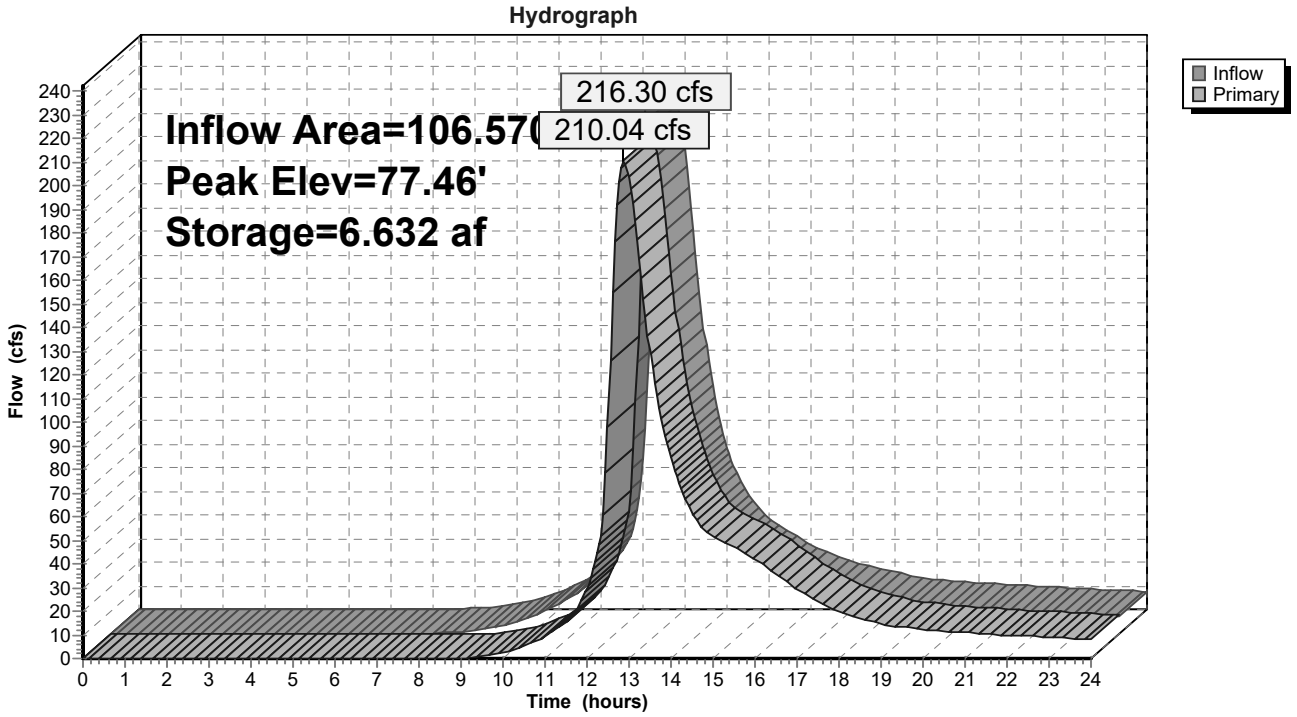
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=209.70 cfs @ 12.87 hrs HW=77.45' (Free Discharge)
- **1=Culvert** (Inlet Controls 65.27 cfs @ 10.39 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 94.48 cfs @ 3.24 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 49.95 cfs @ 2.21 fps)

Pond EX-POND: EXISTING POND

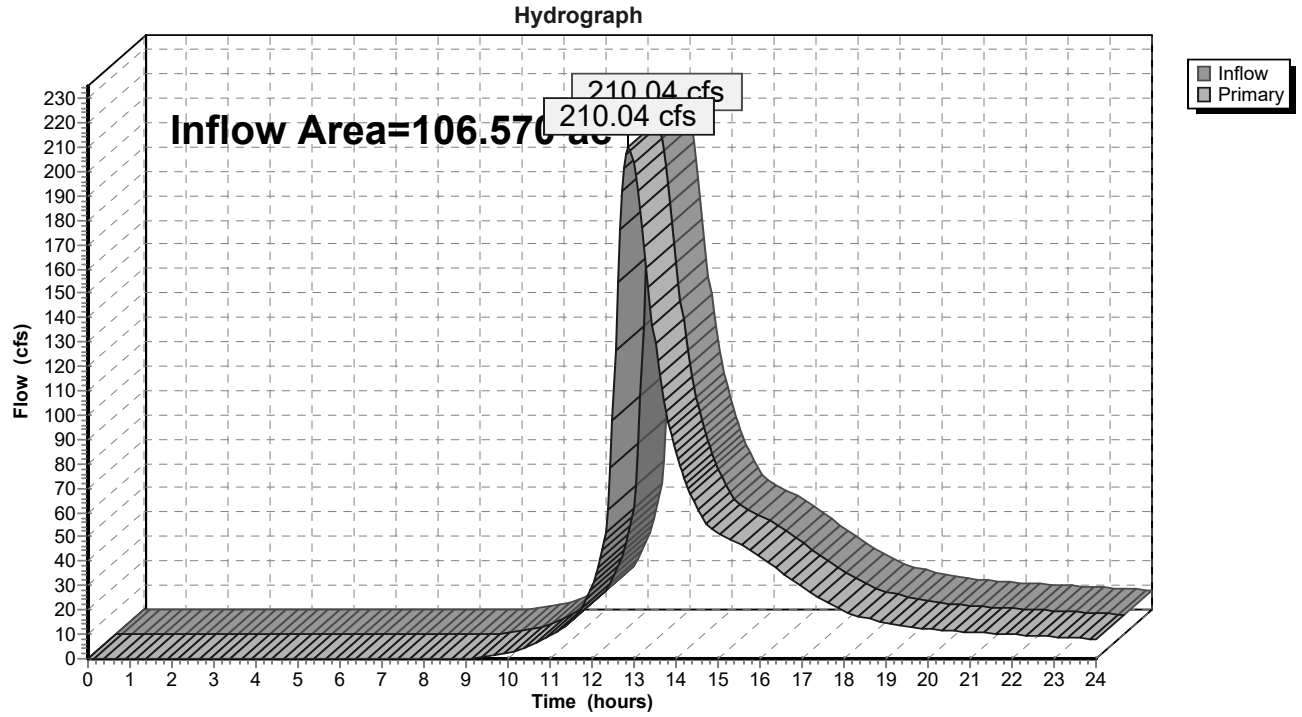


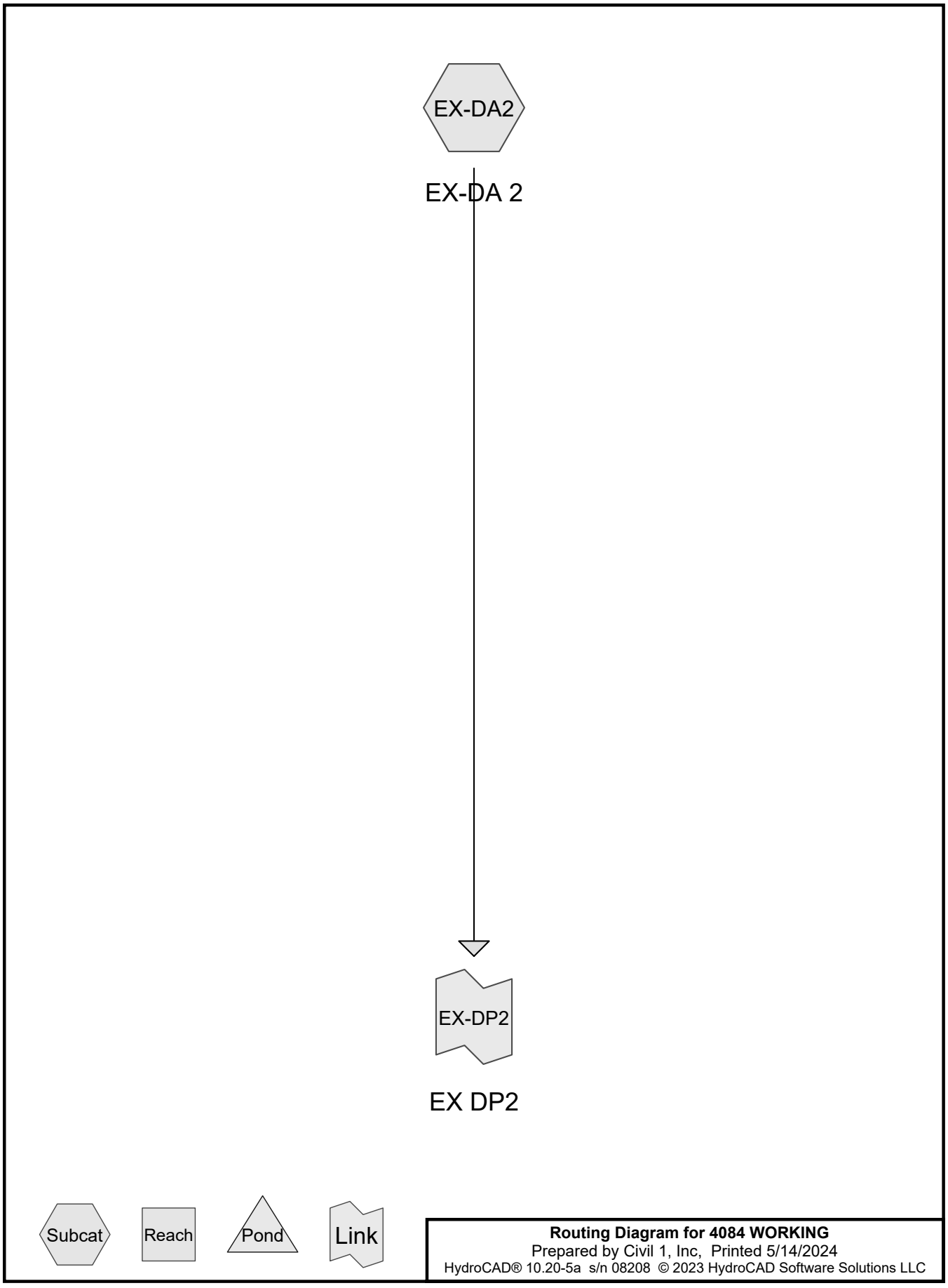
Summary for Link EX DP-1: EX DP1

Inflow Area = 106.570 ac, 22.31% Impervious, Inflow Depth > 4.81" for 100-yr event
Inflow = 210.04 cfs @ 12.87 hrs, Volume= 42.699 af
Primary = 210.04 cfs @ 12.87 hrs, Volume= 42.699 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX DP-1: EX DP1





Routing Diagram for 4084 WORKING
Prepared by Civil 1, Inc, Printed 5/14/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.660	61	>75% Grass cover, Good, HSG B (EX-DA2)
0.350	98	Paved parking, HSG B (EX-DA2)
1.690	55	Woods, Good, HSG B (EX-DA2)
2.700	**62**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.700	HSG B	EX-DA2
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.700		**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	0.660	0.000	0.000	0.000	0.660	>75% Grass cover, Good	EX-DA2
0.000	0.350	0.000	0.000	0.000	0.350	Paved parking	EX-DA2
0.000	1.690	0.000	0.000	0.000	1.690	Woods, Good	EX-DA2
0.000	**2.700**	**0.000**	**0.000**	**0.000**	**2.700**	**TOTAL AREA**	

Summary for Subcatchment EX-DA2: EX-DA 2

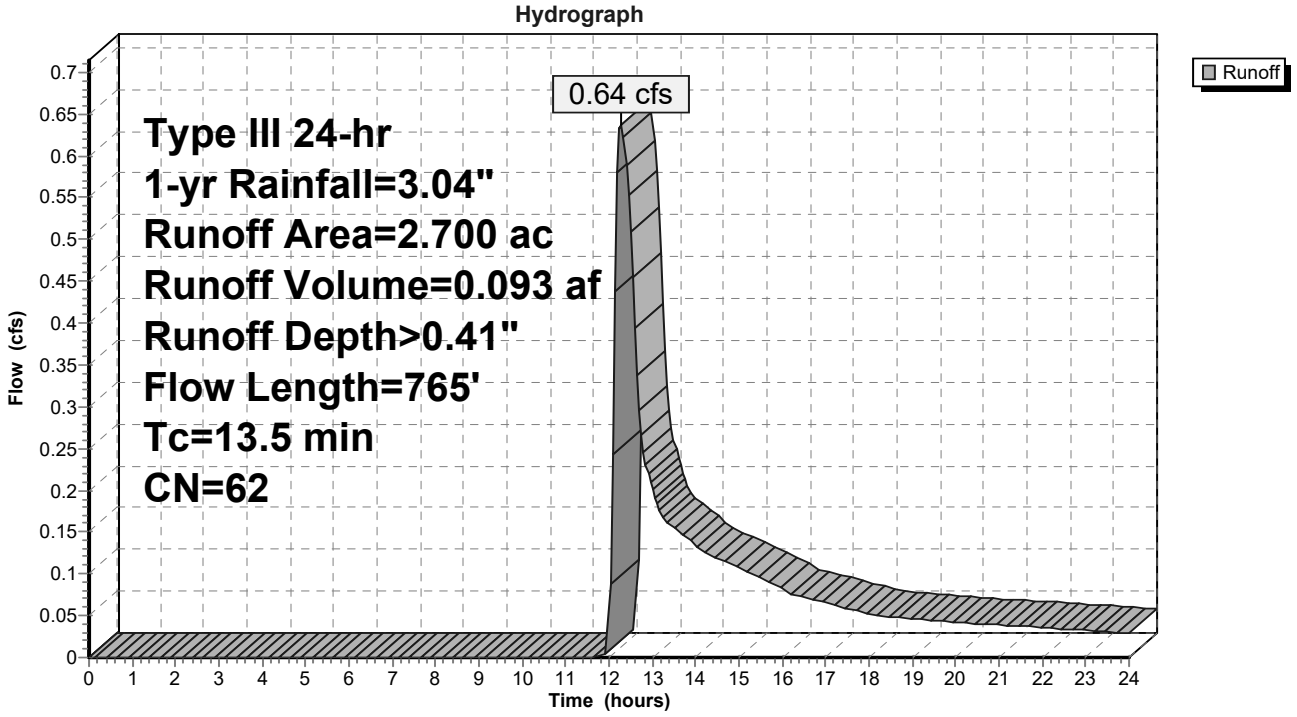
Runoff = 0.64 cfs @ 12.27 hrs, Volume= 0.093 af, Depth> 0.41"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

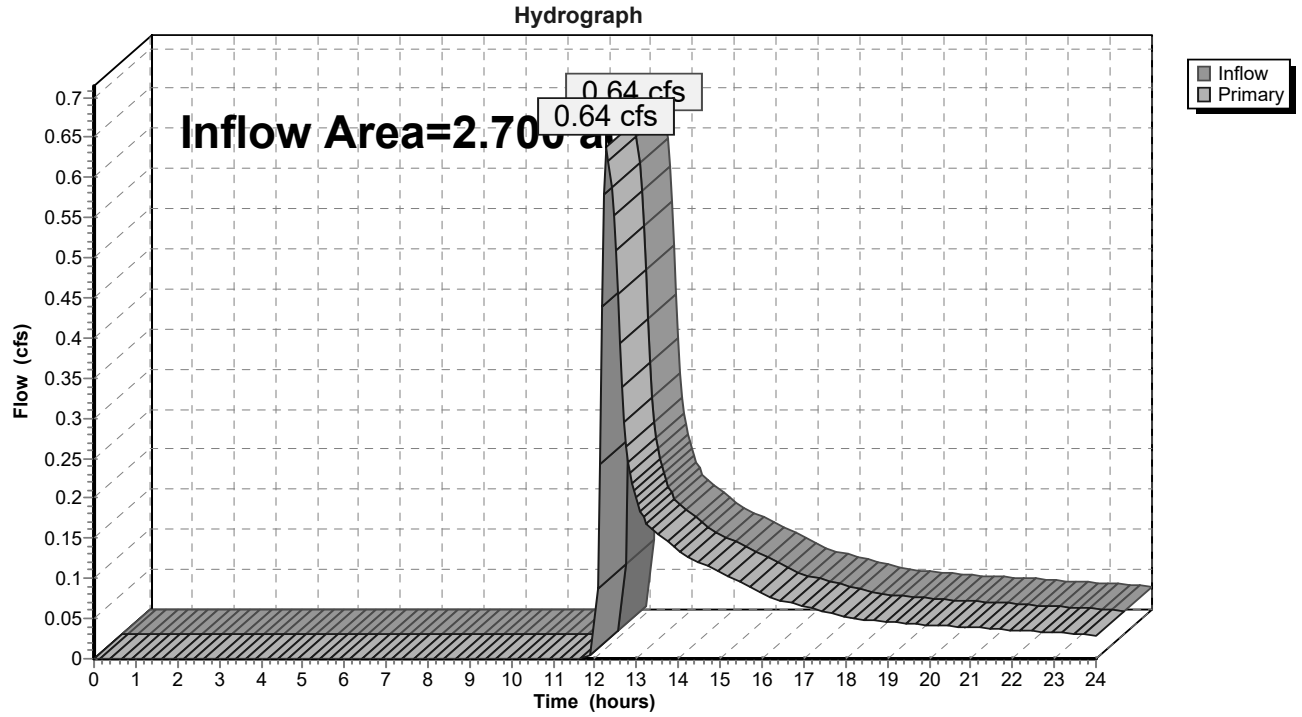


Summary for Link EX-DP2: EX DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 0.41" for 1-yr event
Inflow = 0.64 cfs @ 12.27 hrs, Volume= 0.093 af
Primary = 0.64 cfs @ 12.27 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Summary for Subcatchment EX-DA2: EX-DA 2

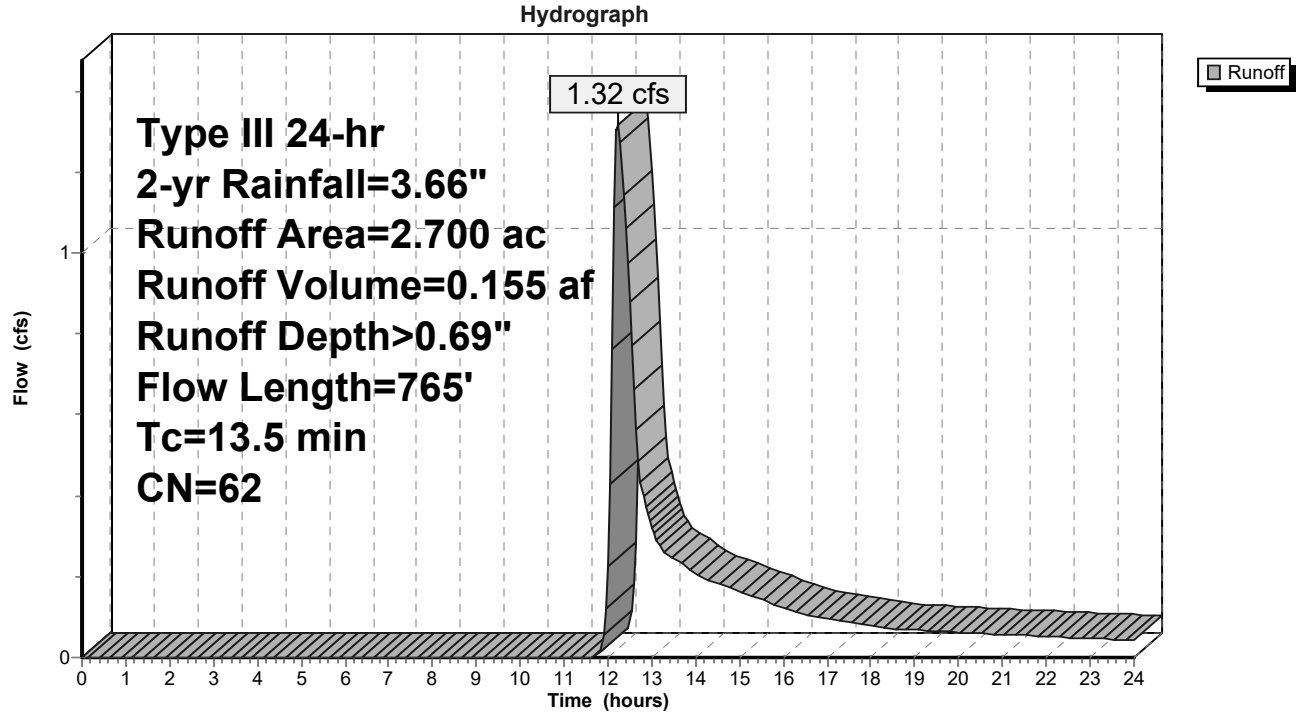
Runoff = 1.32 cfs @ 12.23 hrs, Volume= 0.155 af, Depth> 0.69"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

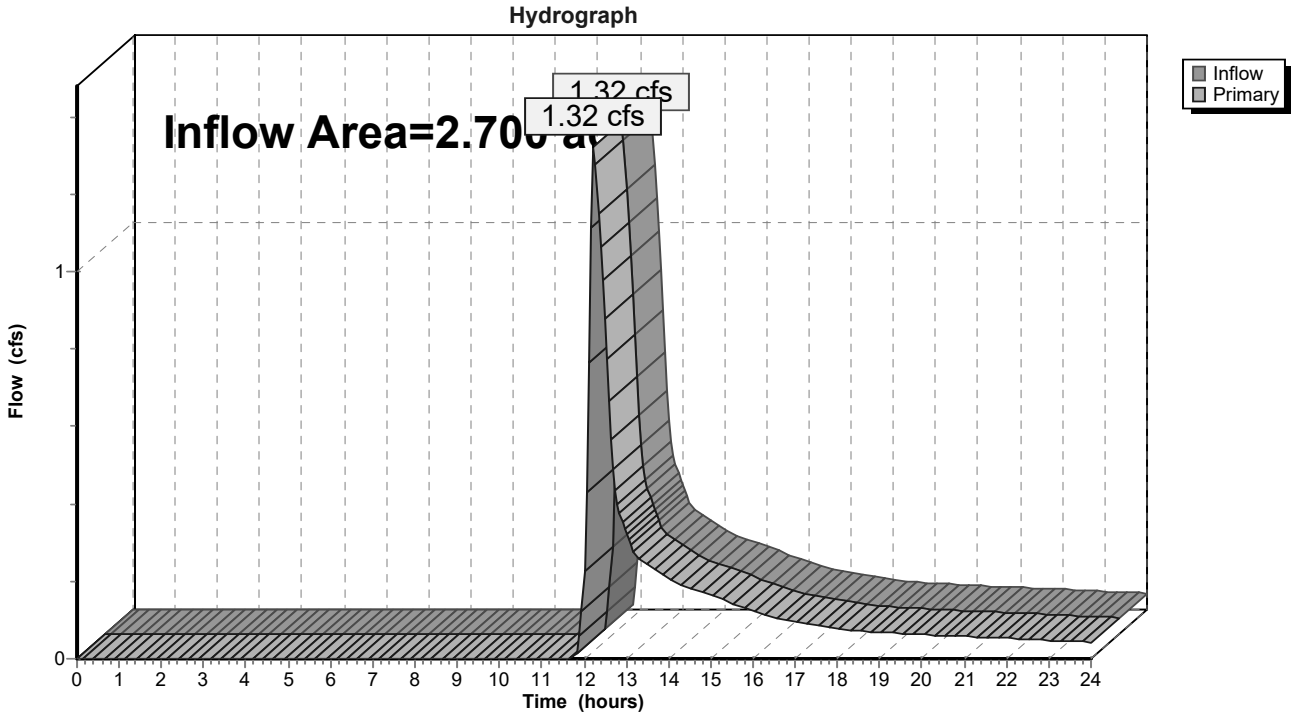


Summary for Link EX-DP2: EX DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 0.69" for 2-yr event
Inflow = 1.32 cfs @ 12.23 hrs, Volume= 0.155 af
Primary = 1.32 cfs @ 12.23 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Summary for Subcatchment EX-DA2: EX-DA 2

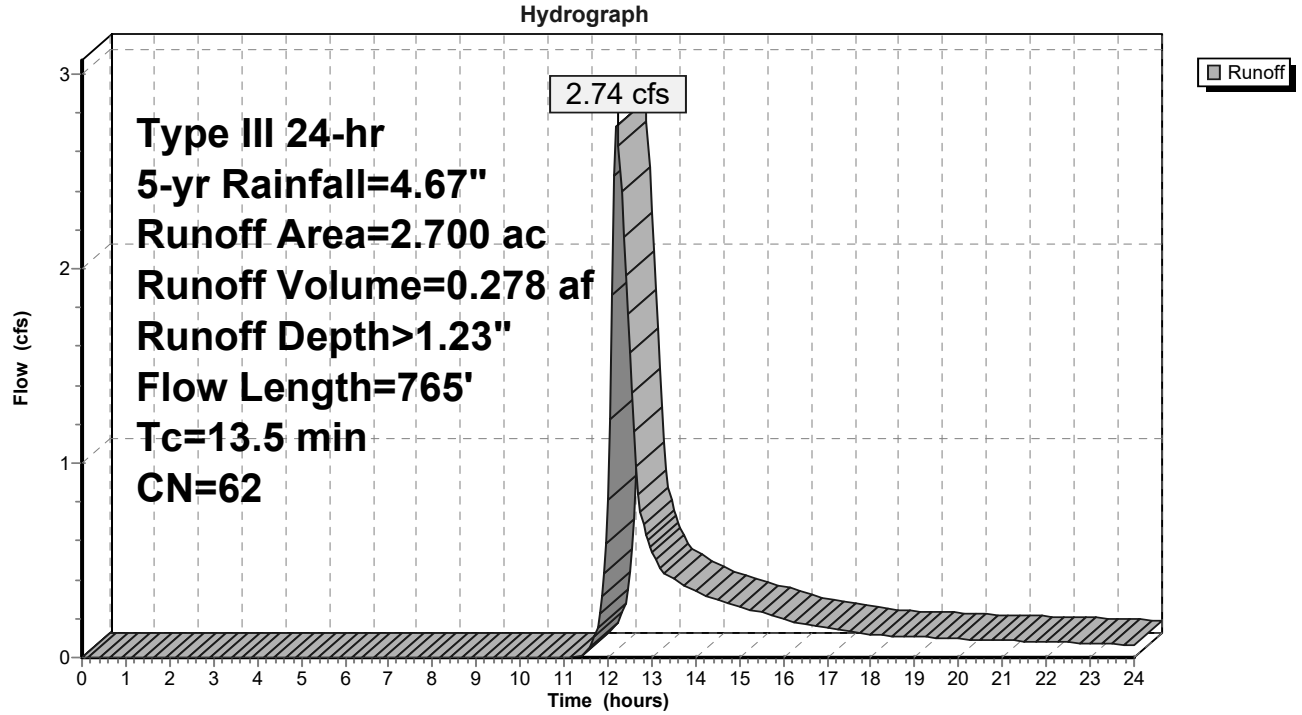
Runoff = 2.74 cfs @ 12.21 hrs, Volume= 0.278 af, Depth> 1.23"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

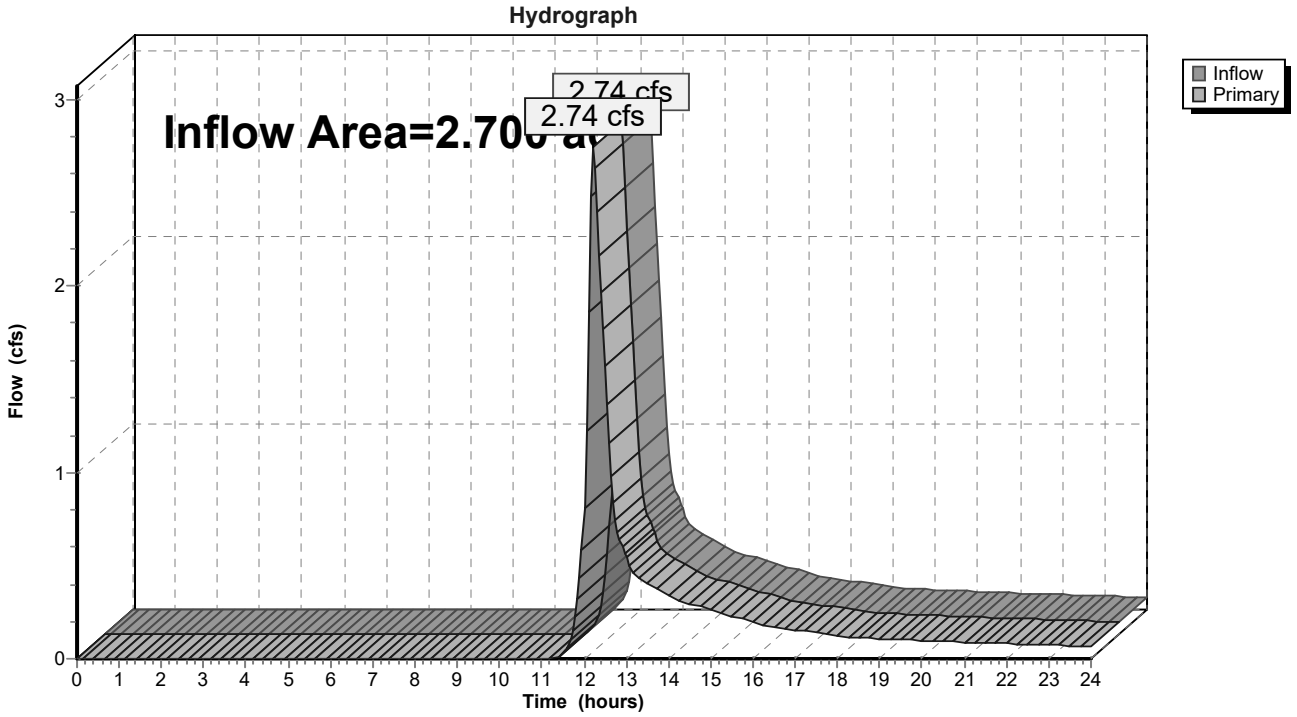


Summary for Link EX-DP2: EX DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 1.23" for 5-yr event
Inflow = 2.74 cfs @ 12.21 hrs, Volume= 0.278 af
Primary = 2.74 cfs @ 12.21 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Summary for Subcatchment EX-DA2: EX-DA 2

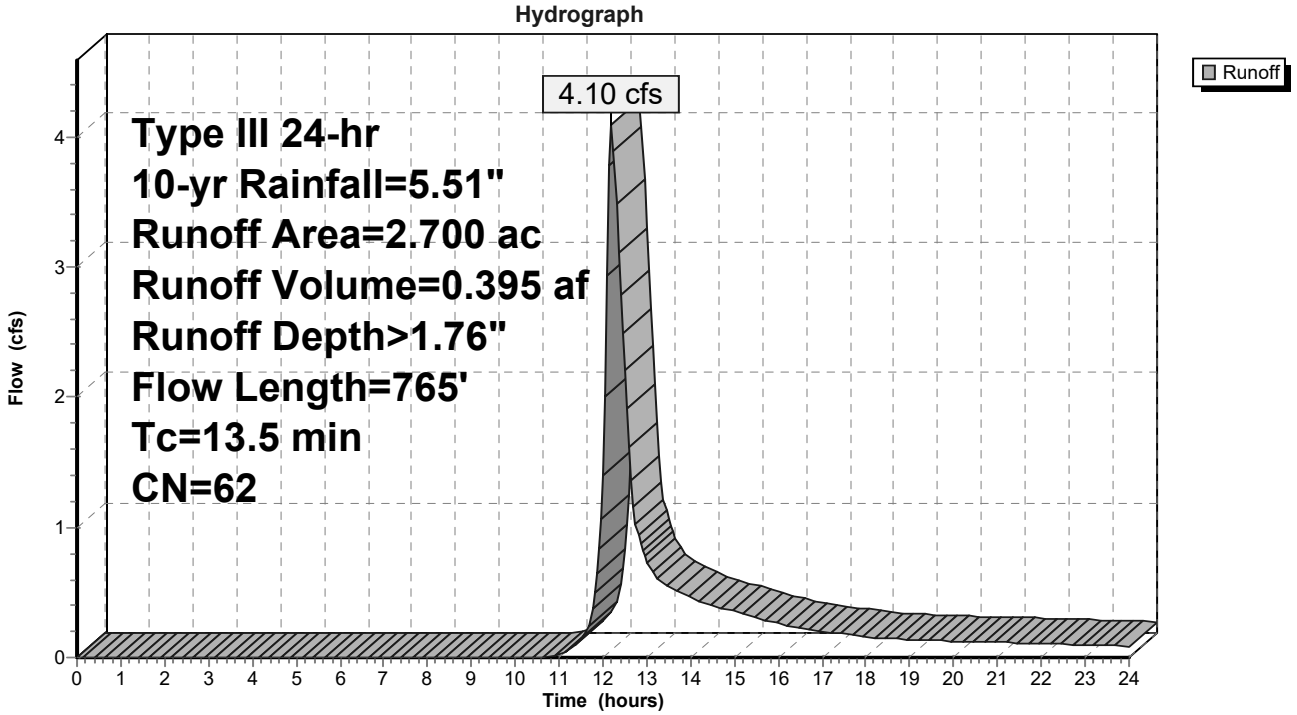
Runoff = 4.10 cfs @ 12.20 hrs, Volume= 0.395 af, Depth> 1.76"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

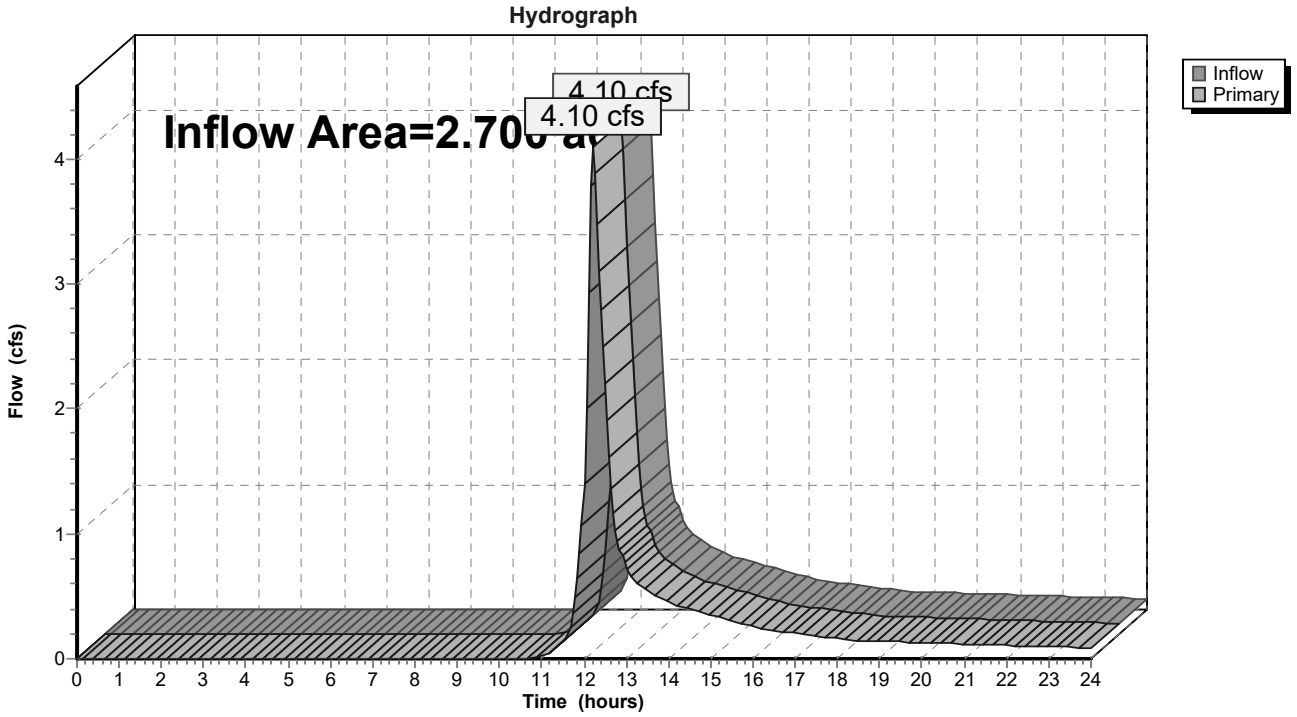


Summary for Link EX-DP2: EX DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 1.76" for 10-yr event
Inflow = 4.10 cfs @ 12.20 hrs, Volume= 0.395 af
Primary = 4.10 cfs @ 12.20 hrs, Volume= 0.395 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Summary for Subcatchment EX-DA2: EX-DA 2

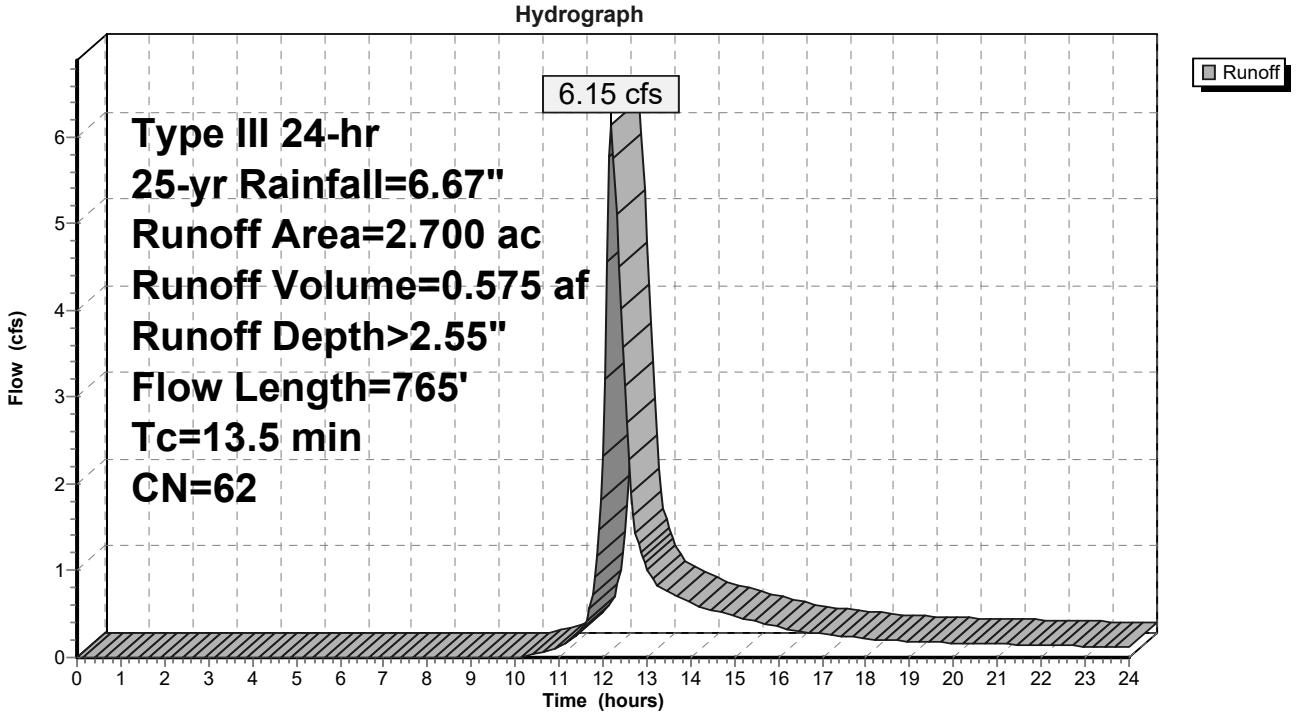
Runoff = 6.15 cfs @ 12.20 hrs, Volume= 0.575 af, Depth> 2.55"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

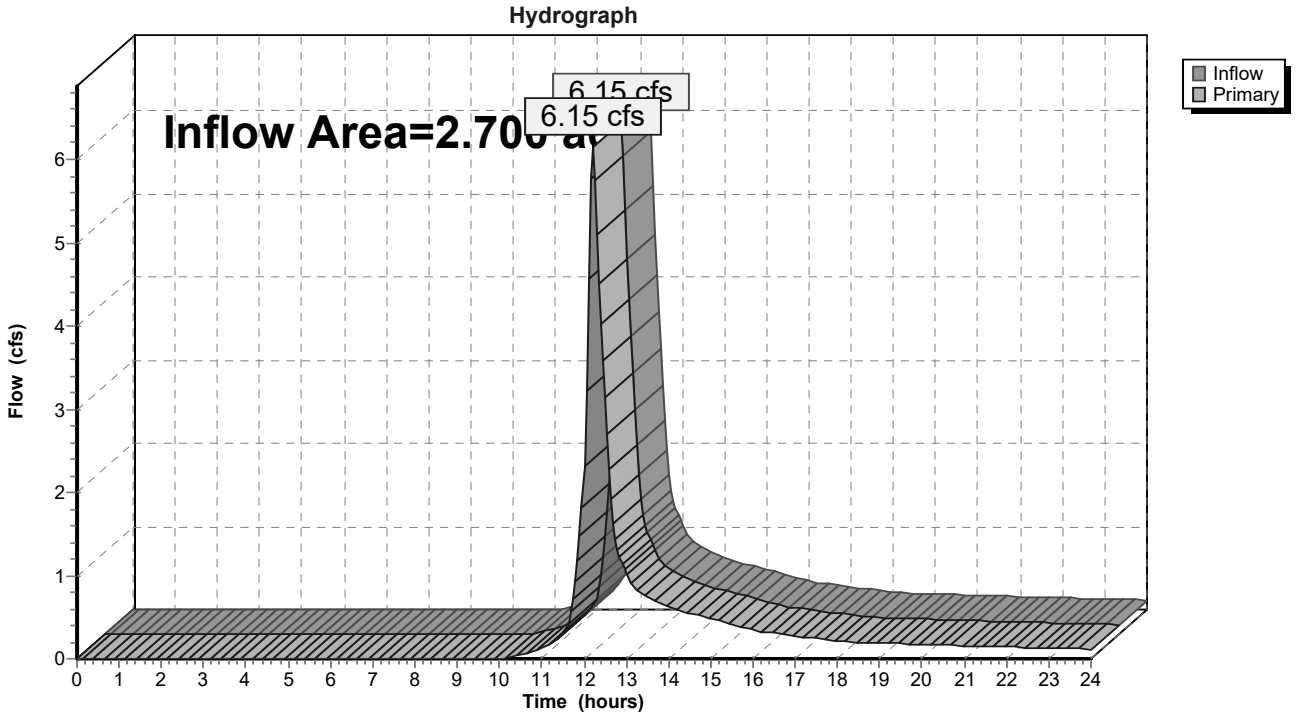


Summary for Link EX-DP2: EX DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 2.55" for 25-yr event
Inflow = 6.15 cfs @ 12.20 hrs, Volume= 0.575 af
Primary = 6.15 cfs @ 12.20 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Summary for Subcatchment EX-DA2: EX-DA 2

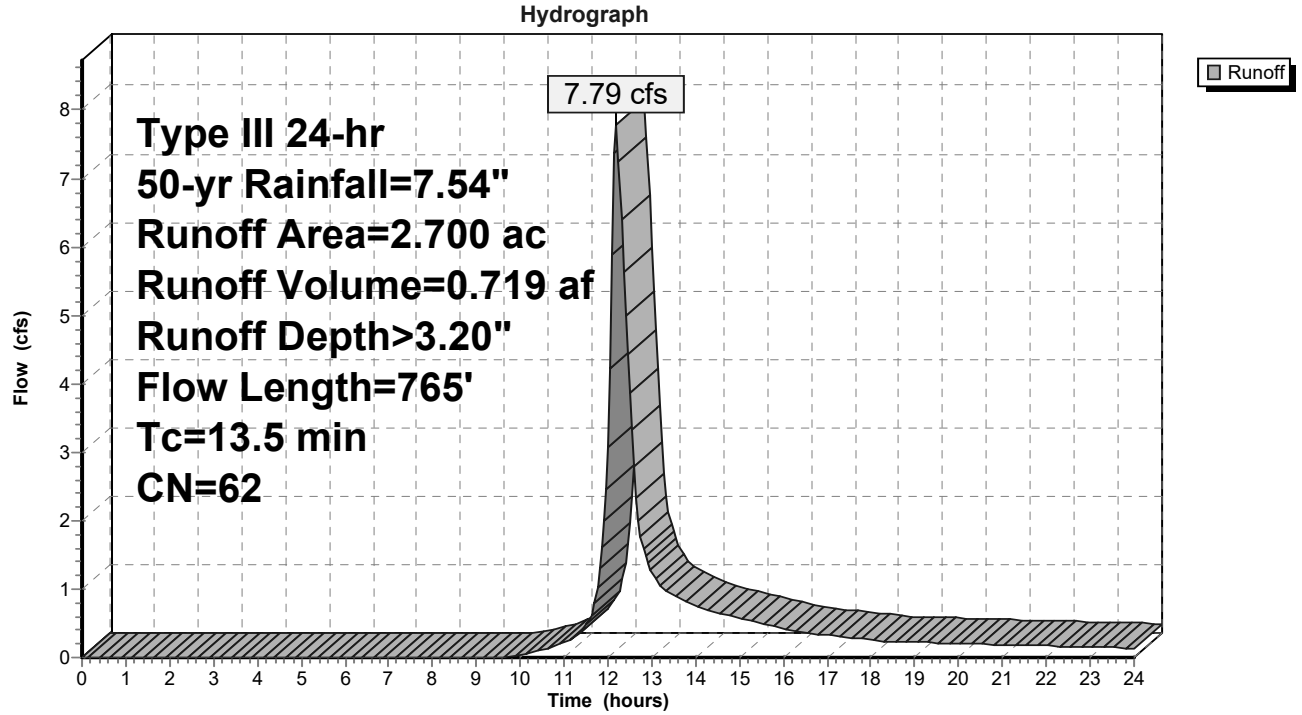
Runoff = 7.79 cfs @ 12.20 hrs, Volume= 0.719 af, Depth> 3.20"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

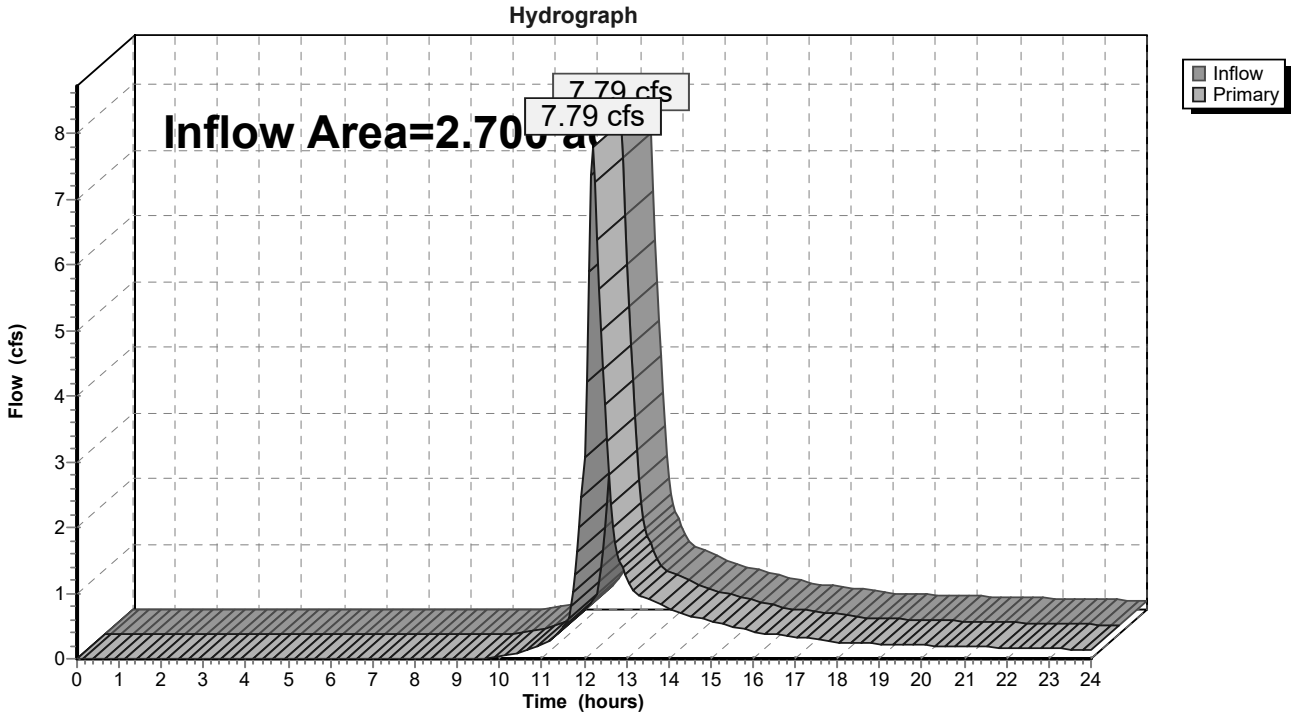


Summary for Link EX-DP2: EX DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 3.20" for 50-yr event
Inflow = 7.79 cfs @ 12.20 hrs, Volume= 0.719 af
Primary = 7.79 cfs @ 12.20 hrs, Volume= 0.719 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Summary for Subcatchment EX-DA2: EX-DA 2

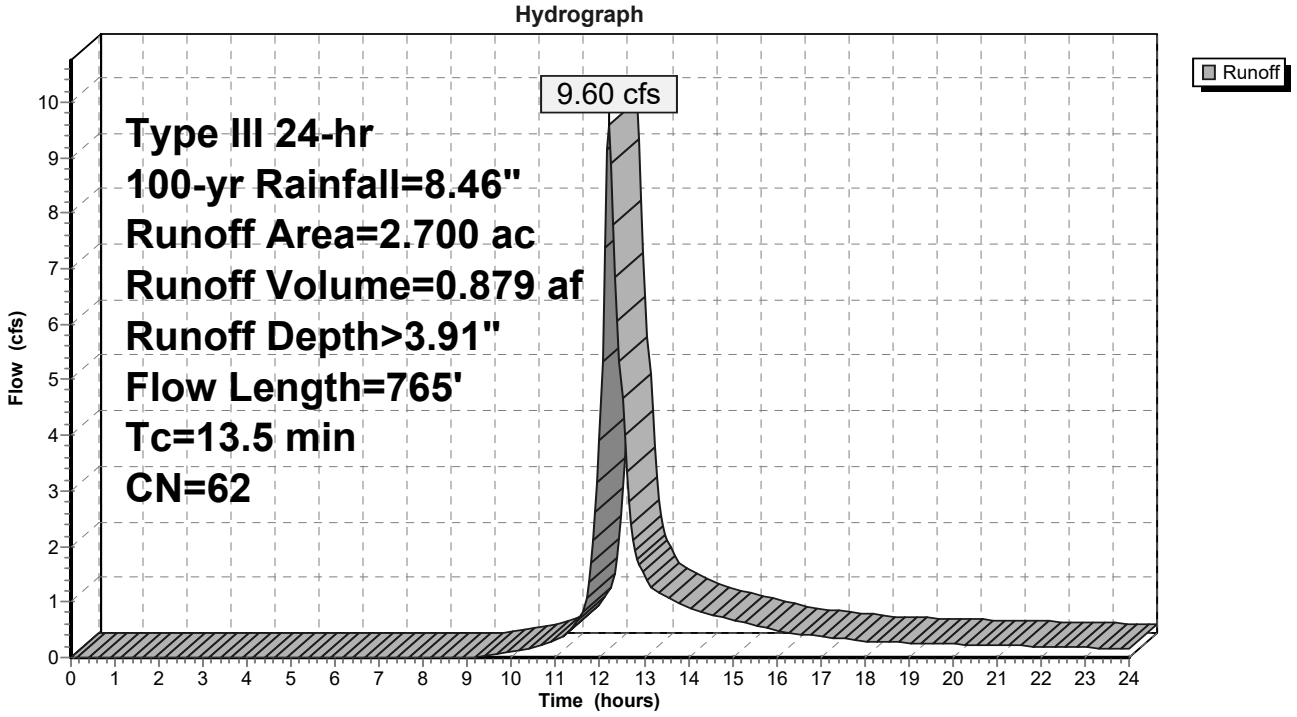
Runoff = 9.60 cfs @ 12.19 hrs, Volume= 0.879 af, Depth> 3.91"
Routed to Link EX-DP2 : EX DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment EX-DA2: EX-DA 2

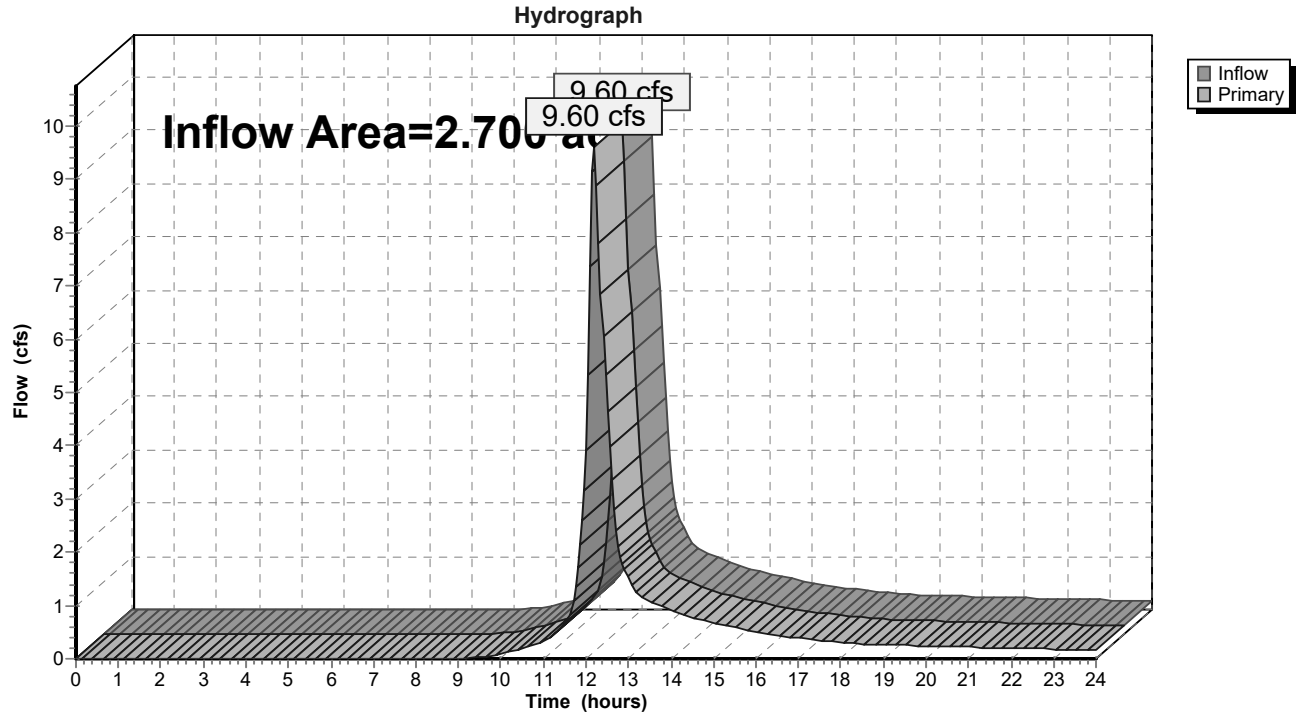


Summary for Link EX-DP2: EX DP2

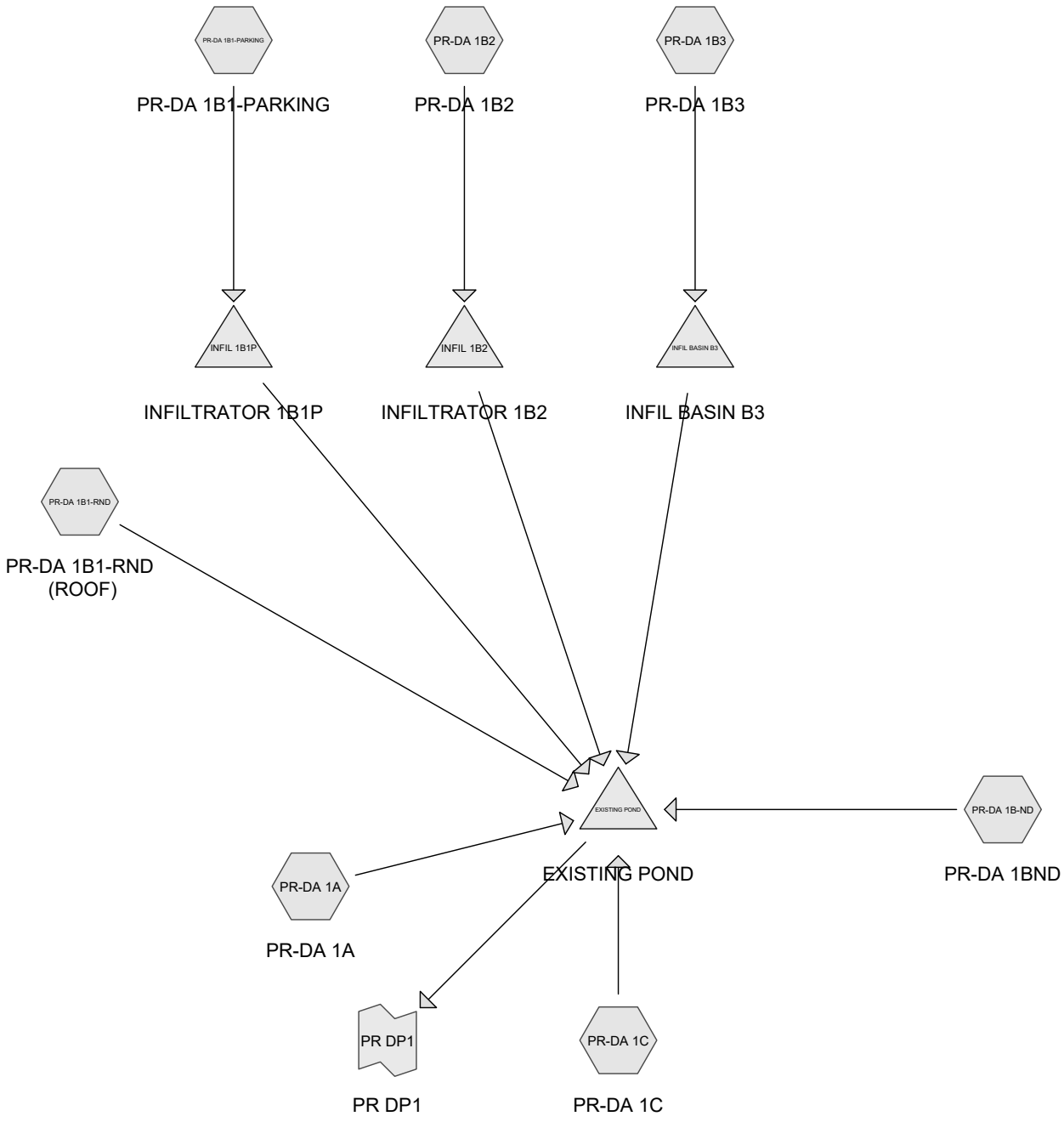
Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 3.91" for 100-yr event
Inflow = 9.60 cfs @ 12.19 hrs, Volume= 0.879 af
Primary = 9.60 cfs @ 12.19 hrs, Volume= 0.879 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link EX-DP2: EX DP2



Appendix D – Proposed Conditions HydroCAD Routing



Subcat Reach Pond Link

Routing Diagram for 4084 WORKING
Prepared by Civil 1, Inc, Printed 5/14/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
42.920	68	1 acre lots, 20% imp, HSG B (PR-DA 1A, PR-DA 1B-ND)
27.890	79	1 acre lots, 20% imp, HSG C (PR-DA 1A, PR-DA 1B-ND)
6.660	61	>75% Grass cover, Good, HSG B (PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B2, PR-DA 1B3, PR-DA 1C)
0.270	74	>75% Grass cover, Good, HSG C (PR-DA 1A)
6.020	98	Paved parking, HSG B (PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B2, PR-DA 1B3)
0.620	98	Paved parking, HSG C (PR-DA 1A)
2.630	98	Roofs, HSG B (PR-DA 1B-ND, PR-DA 1B1-RND, PR-DA 1B3)
0.900	98	Water Surface (PR-DA 1C)
17.587	55	Woods, Good, HSG B (PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B2, PR-DA 1B3, PR-DA 1C)
1.450	70	Woods, Good, HSG C (PR-DA 1A)
106.947	**71**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
75.817	HSG B	PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B1-RND, PR-DA 1B2, PR-DA 1B3, PR-DA 1C
30.230	HSG C	PR-DA 1A, PR-DA 1B-ND
0.000	HSG D	
0.900	Other	PR-DA 1C
106.947		**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	42.920	27.890	0.000	0.000	70.810	1 acre lots, 20% imp	PR-DA 1A, PR-DA 1B-ND
0.000	6.660	0.270	0.000	0.000	6.930	>75% Grass cover, Good	PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B2, PR-DA 1B3, PR-DA 1C
0.000	6.020	0.620	0.000	0.000	6.640	Paved parking	PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B2, PR-DA 1B3
0.000	2.630	0.000	0.000	0.000	2.630	Roofs	PR-DA 1B-ND, PR-DA 1B1-RND, PR-DA 1B3
0.000	0.000	0.000	0.000	0.900	0.900	Water Surface	PR-DA 1C
0.000	17.587	1.450	0.000	0.000	19.037	Woods, Good	PR-DA 1A, PR-DA 1B-ND, PR-DA 1B1-PARKING, PR-DA 1B2, PR-DA

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**75.817**	**30.230**	**0.000**	**0.900**	**106.947**	**TOTAL AREA**	

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

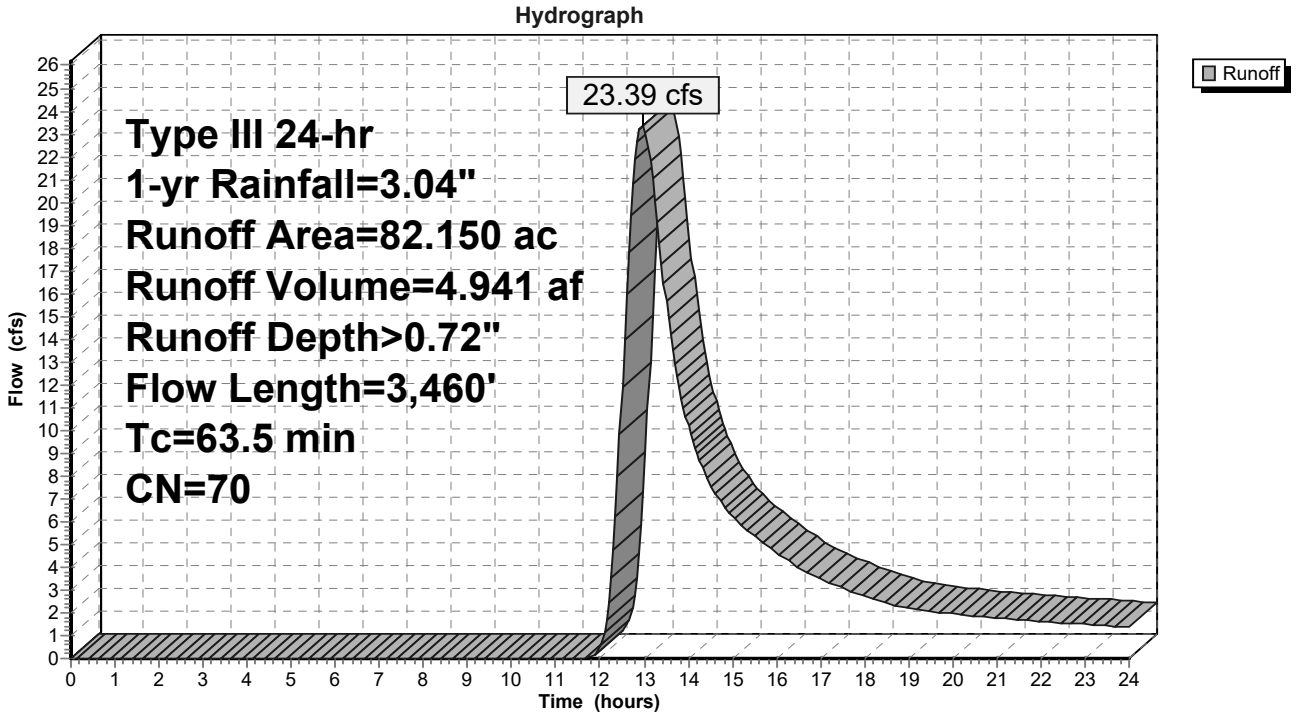
Runoff = 23.39 cfs @ 12.96 hrs, Volume= 4.941 af, Depth> 0.72"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

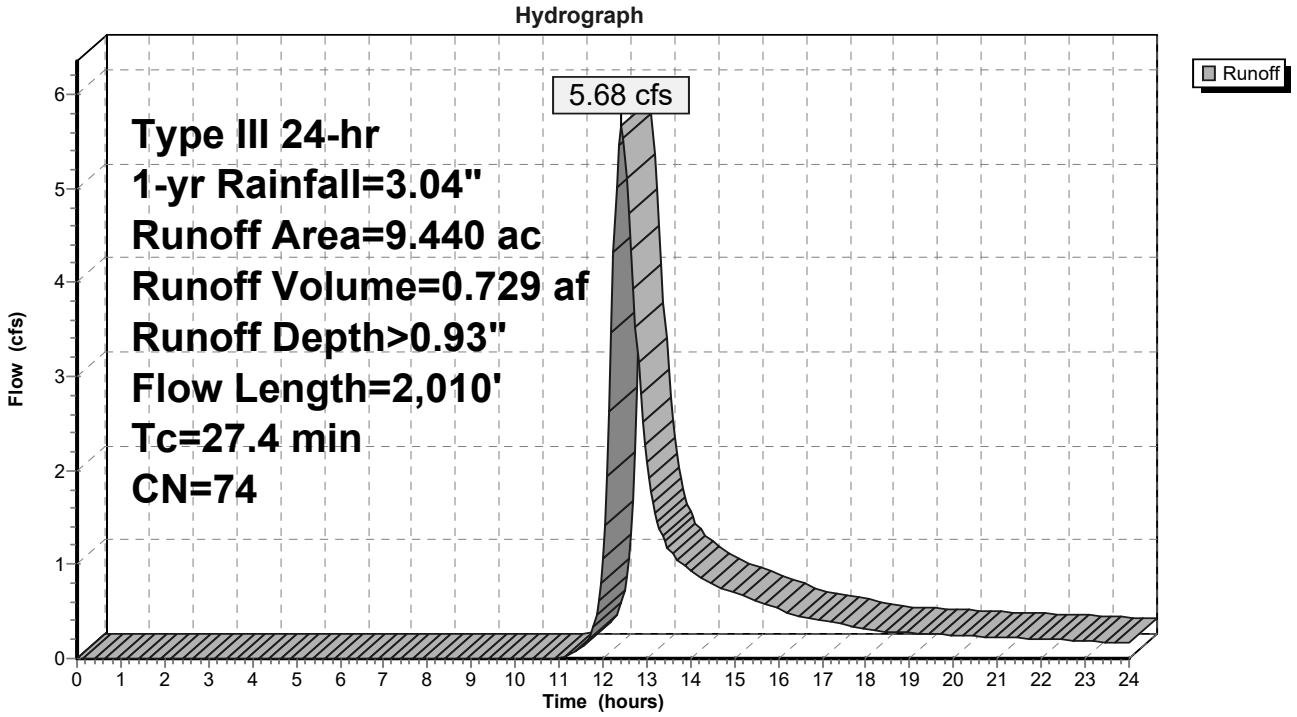
Runoff = 5.68 cfs @ 12.42 hrs, Volume= 0.729 af, Depth> 0.93"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

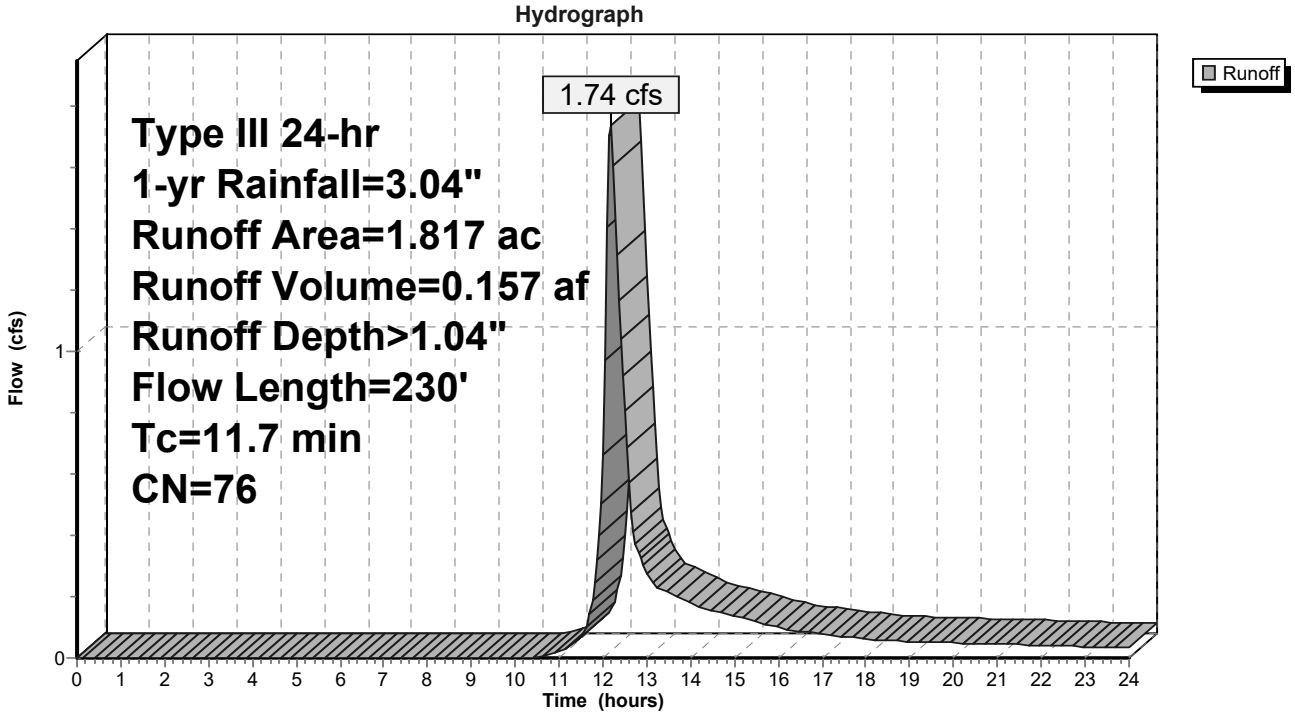
Runoff = 1.74 cfs @ 12.17 hrs, Volume= 0.157 af, Depth> 1.04"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

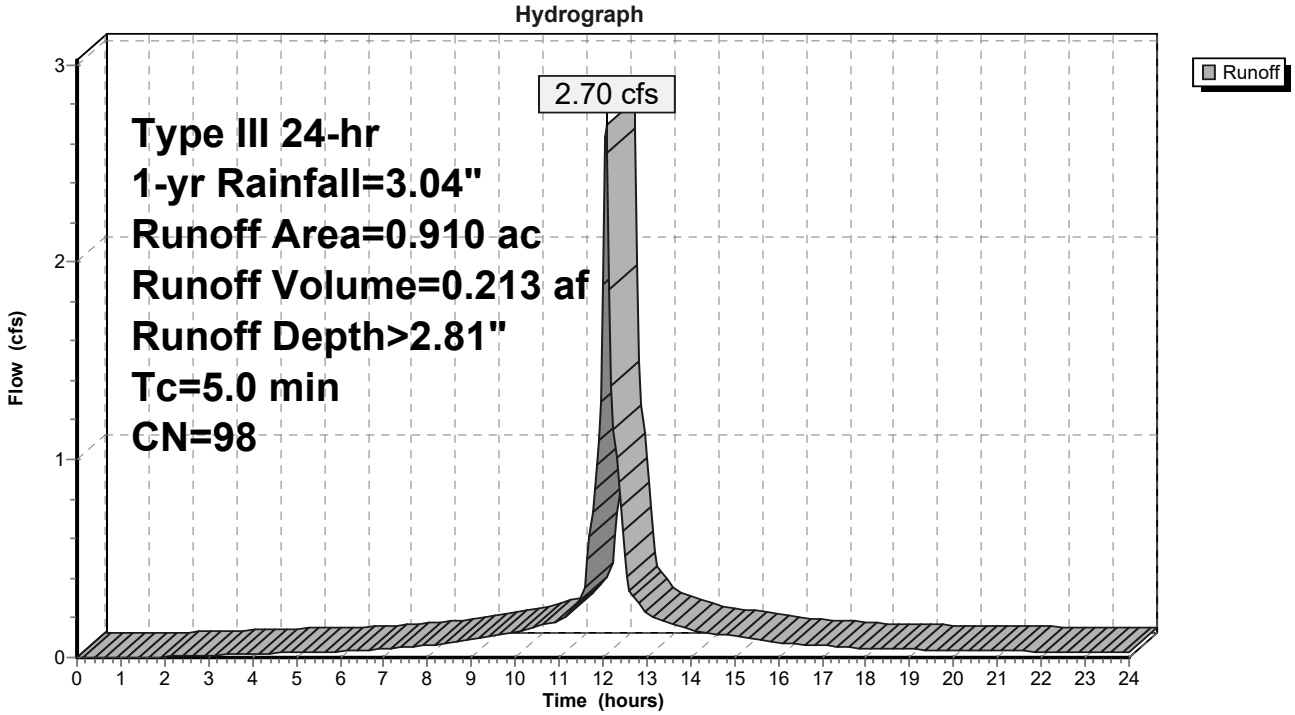
Runoff = 2.70 cfs @ 12.07 hrs, Volume= 0.213 af, Depth> 2.81"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

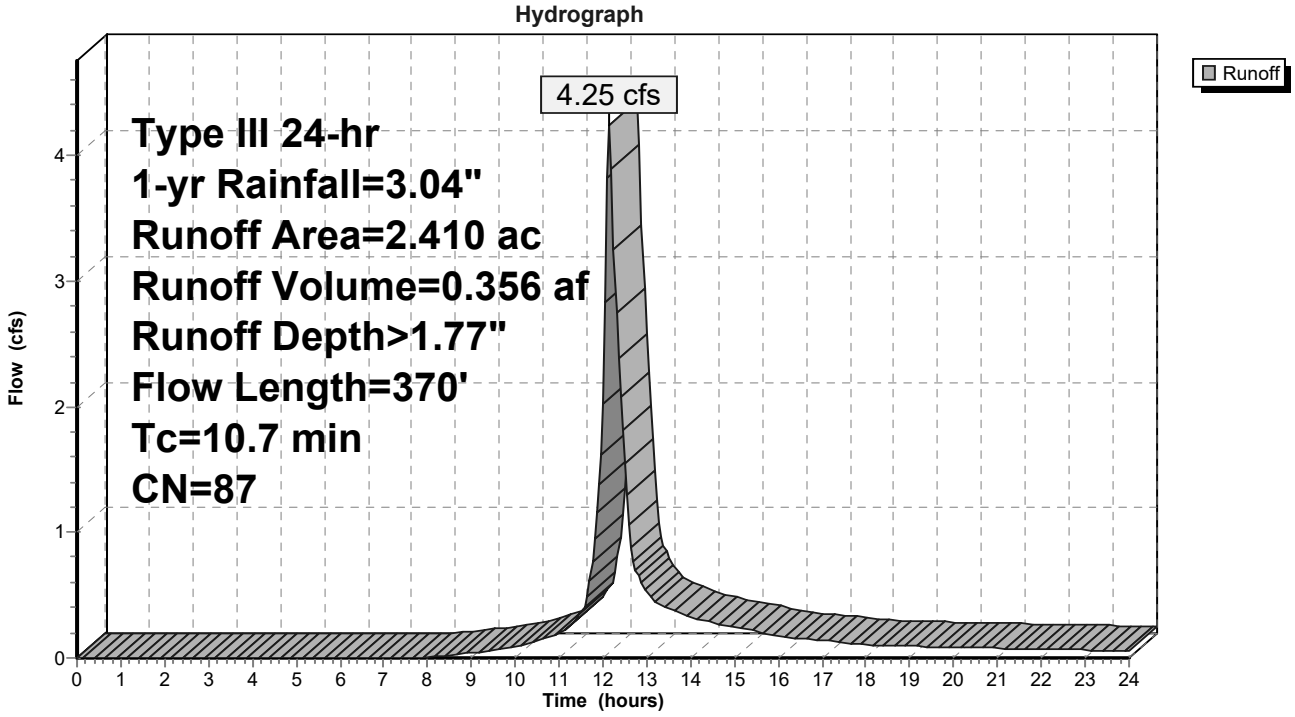
Runoff = 4.25 cfs @ 12.15 hrs, Volume= 0.356 af, Depth> 1.77"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

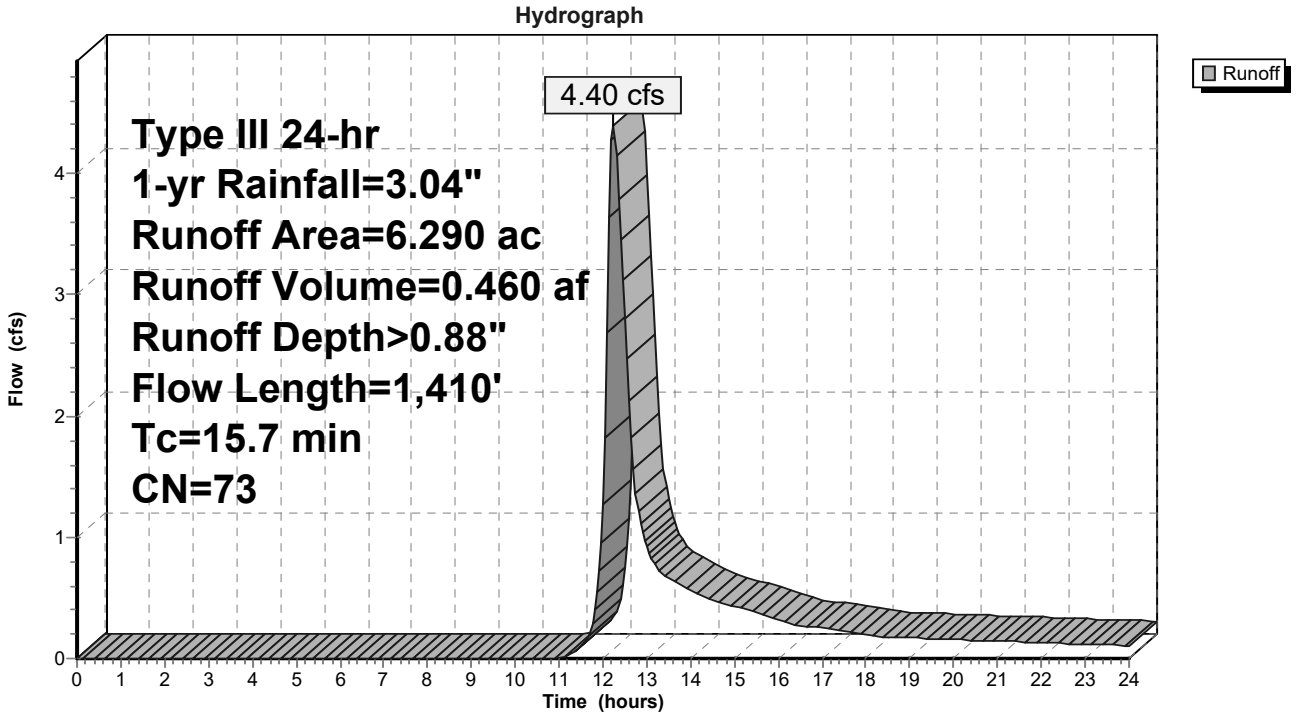
Runoff = 4.40 cfs @ 12.24 hrs, Volume= 0.460 af, Depth> 0.88"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

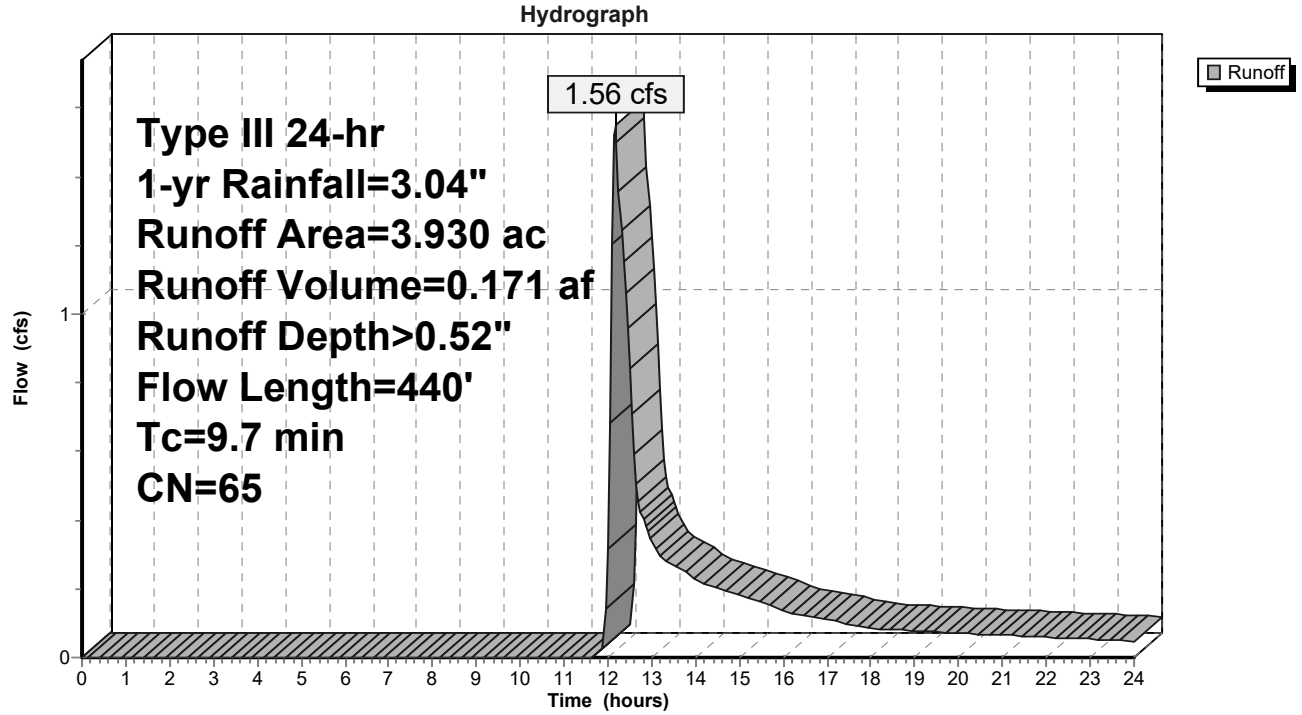
Runoff = 1.56 cfs @ 12.17 hrs, Volume= 0.171 af, Depth> 0.52"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 0.74" for 1-yr event
Inflow = 28.01 cfs @ 12.90 hrs, Volume= 6.624 af
Outflow = 19.72 cfs @ 13.44 hrs, Volume= 6.236 af, Atten= 30%, Lag= 32.0 min
Primary = 19.72 cfs @ 13.44 hrs, Volume= 6.236 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 73.24' @ 13.44 hrs Surf.Area= 0.991 ac Storage= 1.386 af

Plug-Flow detention time= 73.6 min calculated for 6.223 af (94% of inflow)
Center-of-Mass det. time= 45.7 min (961.6 - 915.9)

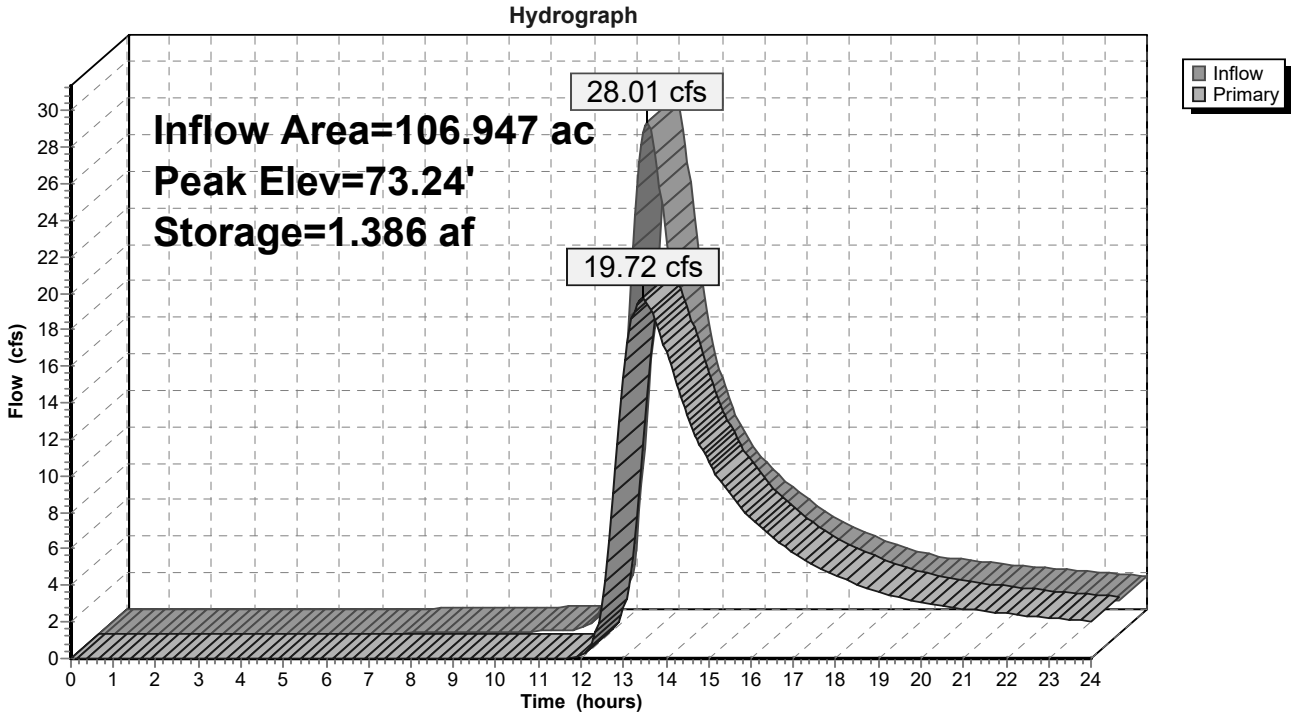
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=19.71 cfs @ 13.44 hrs HW=73.24' (Free Discharge)
- **1=Culvert** (Inlet Controls 19.71 cfs @ 4.08 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 1.04" for 1-yr event
Inflow = 1.74 cfs @ 12.17 hrs, Volume= 0.157 af
Outflow = 0.17 cfs @ 14.11 hrs, Volume= 0.075 af, Atten= 90%, Lag= 115.9 min
Primary = 0.17 cfs @ 14.11 hrs, Volume= 0.075 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.29' @ 14.11 hrs Surf.Area= 0.085 ac Storage= 0.090 af

Plug-Flow detention time= 293.0 min calculated for 0.075 af (47% of inflow)
Center-of-Mass det. time= 163.3 min (1,025.7 - 862.4)

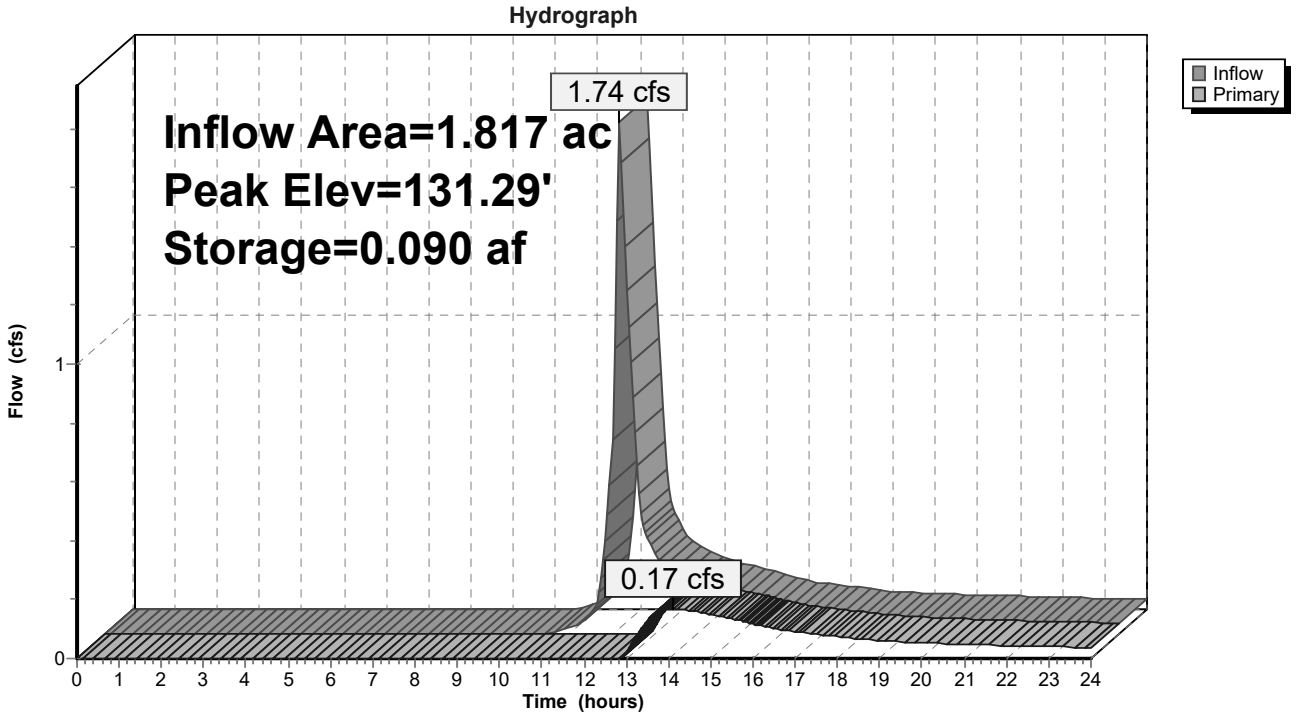
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.17 cfs @ 14.11 hrs HW=131.29' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.17 cfs @ 1.47 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 1.77" for 1-yr event
Inflow = 4.25 cfs @ 12.15 hrs, Volume= 0.356 af
Outflow = 0.42 cfs @ 13.32 hrs, Volume= 0.173 af, Atten= 90%, Lag= 70.3 min
Primary = 0.42 cfs @ 13.32 hrs, Volume= 0.173 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 124.32' @ 13.32 hrs Surf.Area= 0.160 ac Storage= 0.209 af

Plug-Flow detention time= 272.6 min calculated for 0.172 af (48% of inflow)
Center-of-Mass det. time= 158.9 min (983.1 - 824.3)

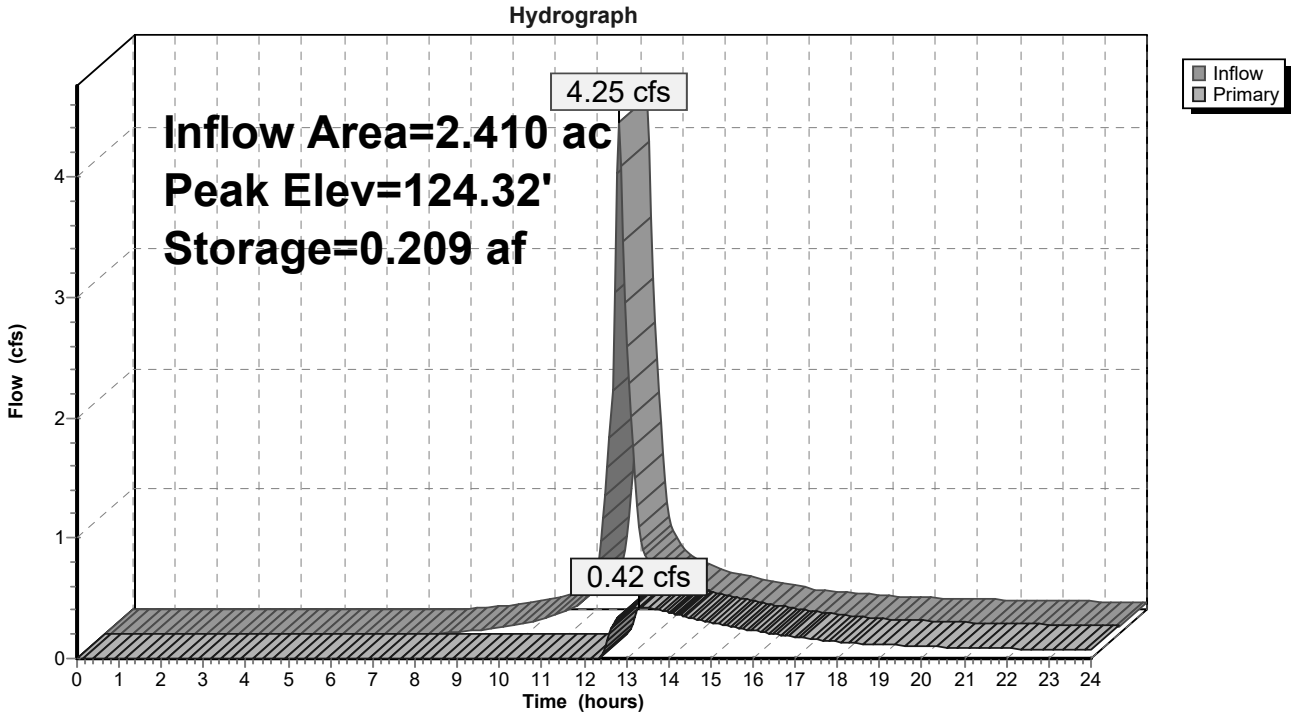
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.42 cfs @ 13.32 hrs HW=124.32' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.42 cfs @ 1.93 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 0.88" for 1-yr event
Inflow = 4.40 cfs @ 12.24 hrs, Volume= 0.460 af
Outflow = 1.37 cfs @ 12.75 hrs, Volume= 0.323 af, Atten= 69%, Lag= 30.6 min
Primary = 1.37 cfs @ 12.75 hrs, Volume= 0.323 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 101.48' @ 12.75 hrs Surf.Area= 4,558 sf Storage= 7,518 cf

Plug-Flow detention time= 183.3 min calculated for 0.323 af (70% of inflow)
Center-of-Mass det. time= 79.7 min (955.2 - 875.5)

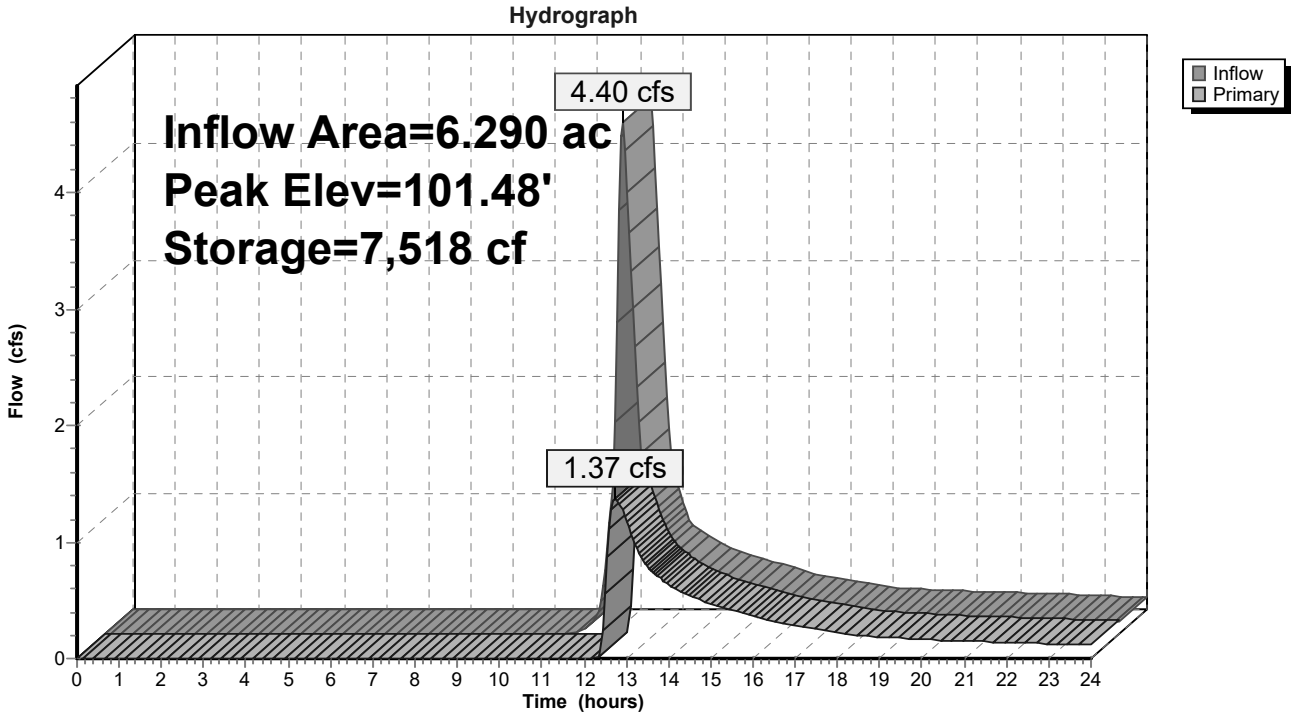
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.37 cfs @ 12.75 hrs HW=101.48' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.37 cfs @ 2.36 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond INFIL BASIN B3: INFIL BASIN B3

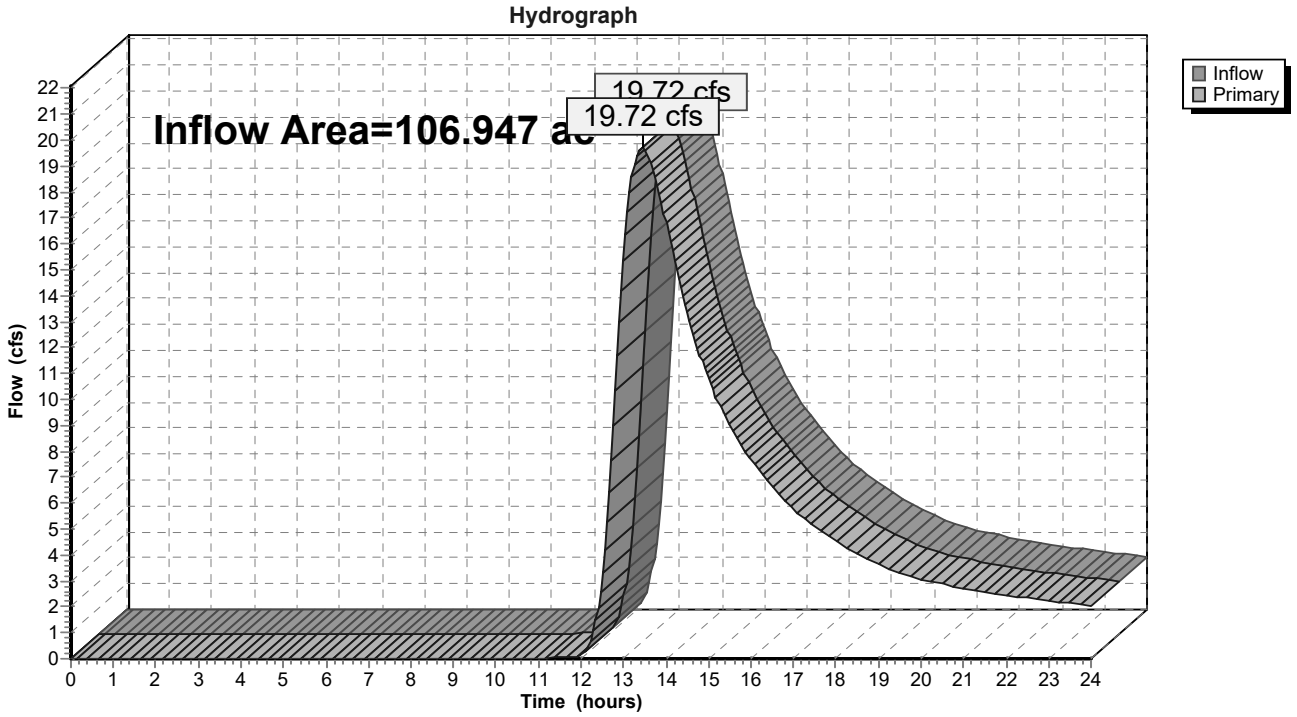


Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 0.70" for 1-yr event
Inflow = 19.72 cfs @ 13.44 hrs, Volume= 6.236 af
Primary = 19.72 cfs @ 13.44 hrs, Volume= 6.236 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1



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

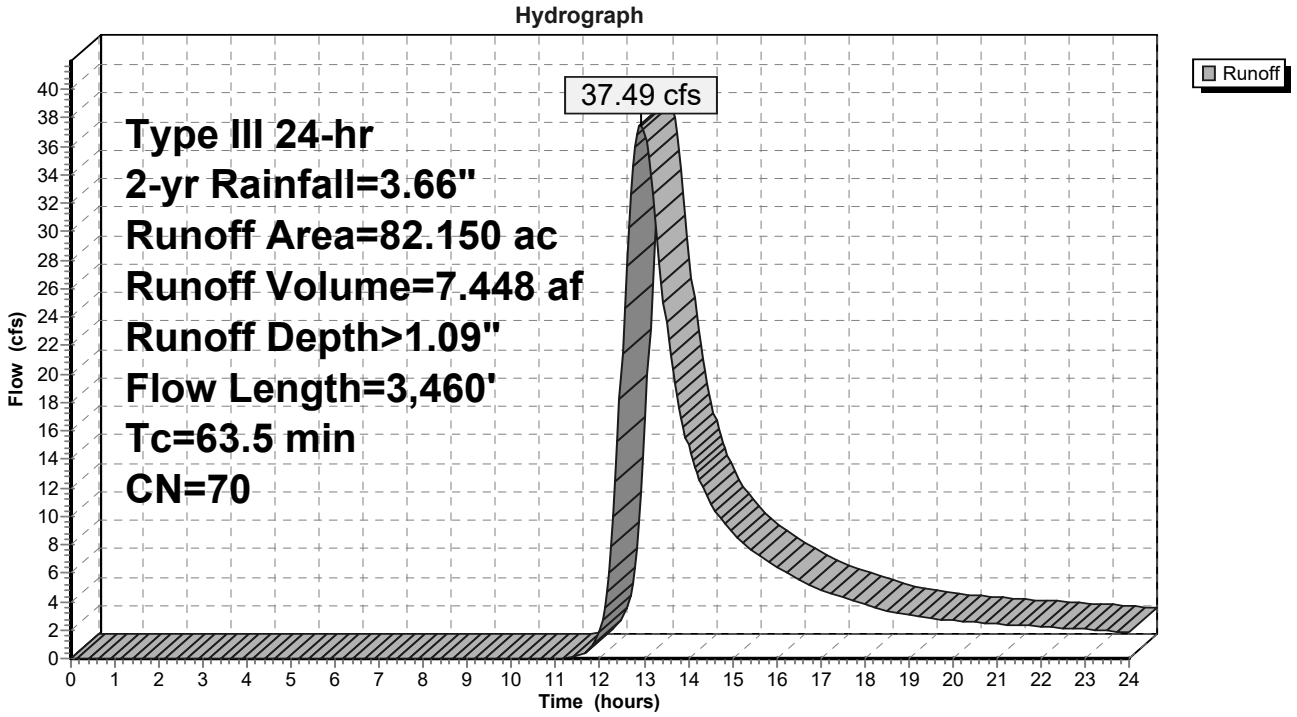
Runoff = 37.49 cfs @ 12.92 hrs, Volume= 7.448 af, Depth> 1.09"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

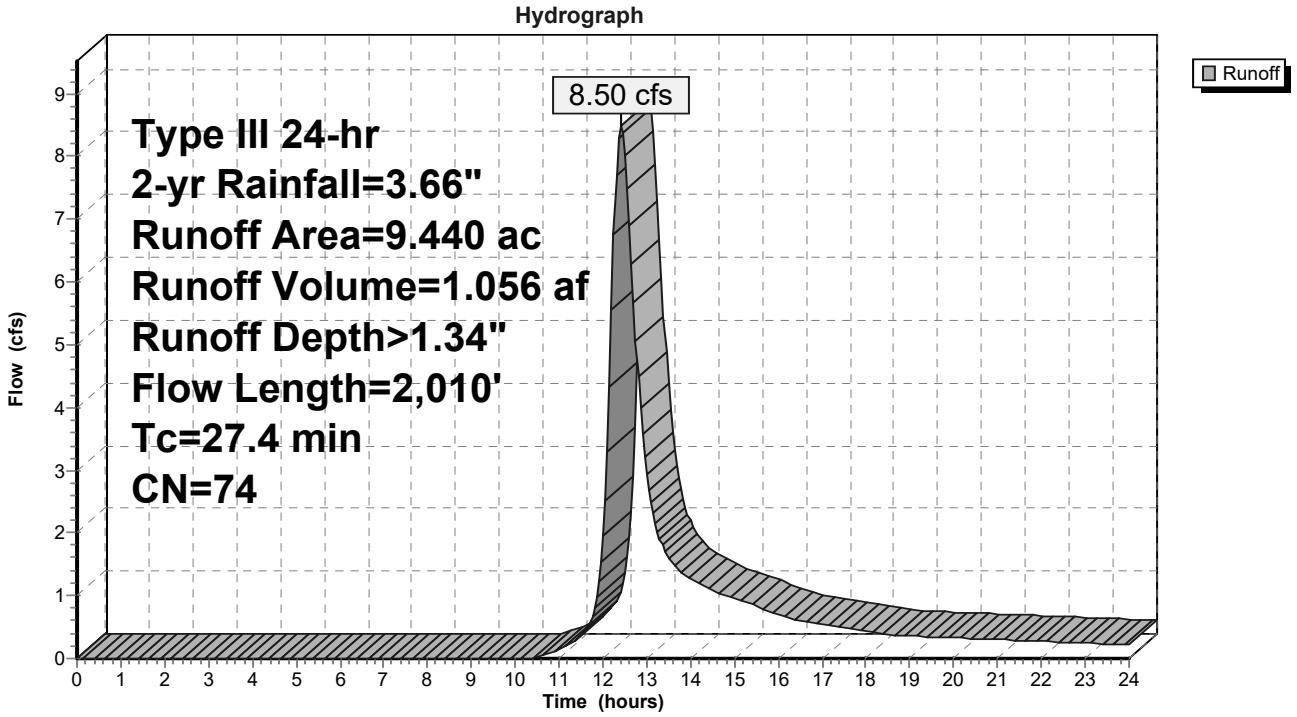
Runoff = 8.50 cfs @ 12.41 hrs, Volume= 1.056 af, Depth> 1.34"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

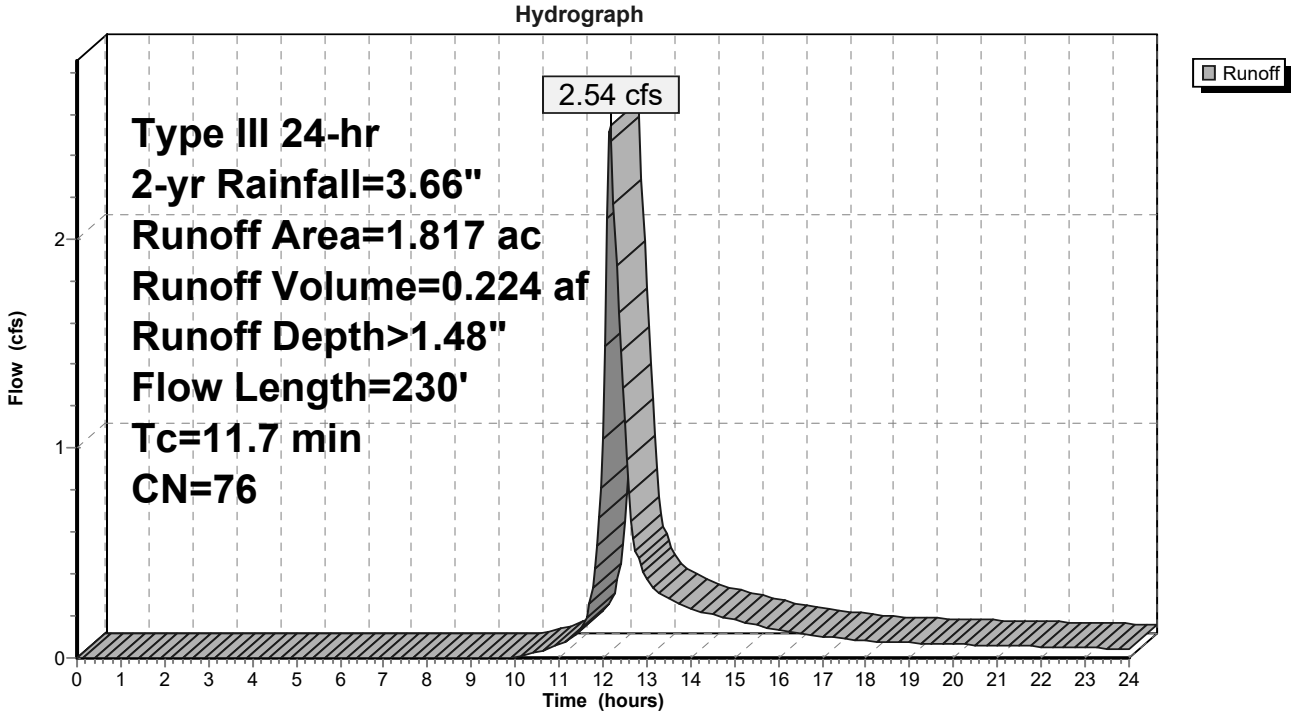
Runoff = 2.54 cfs @ 12.17 hrs, Volume= 0.224 af, Depth> 1.48"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

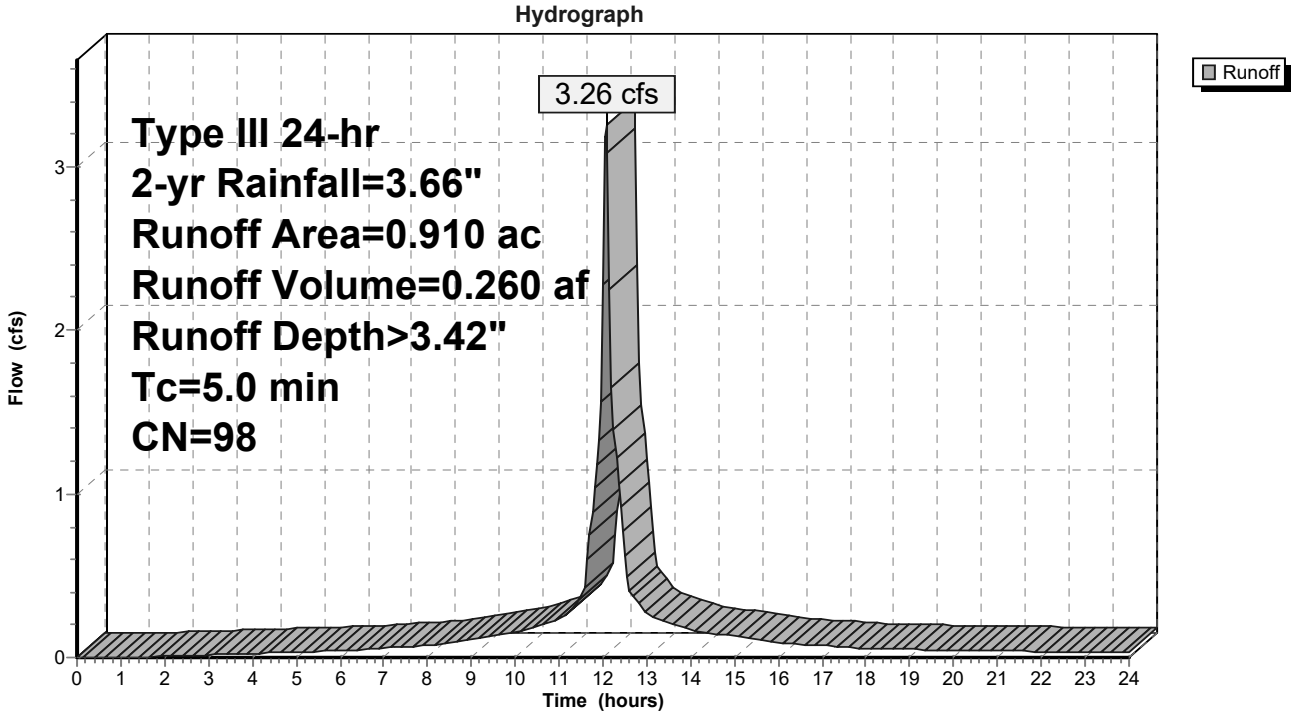
Runoff = 3.26 cfs @ 12.07 hrs, Volume= 0.260 af, Depth> 3.42"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

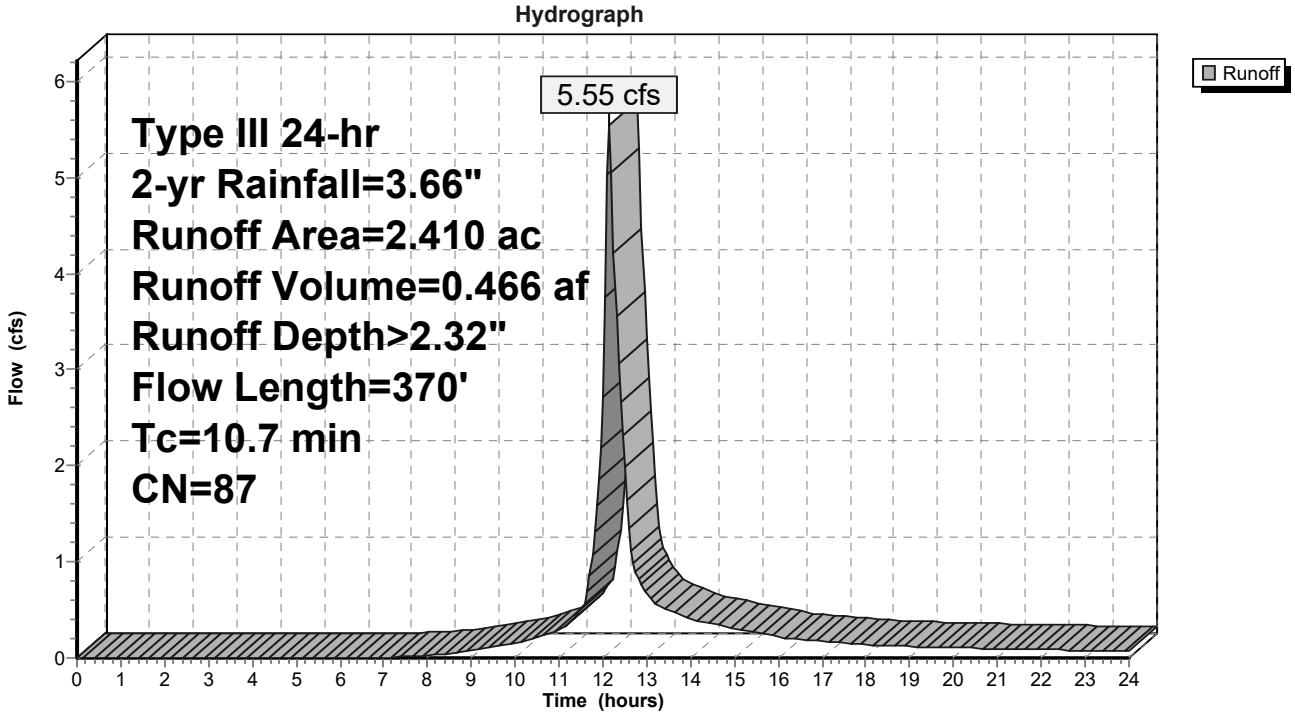
Runoff = 5.55 cfs @ 12.15 hrs, Volume= 0.466 af, Depth> 2.32"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

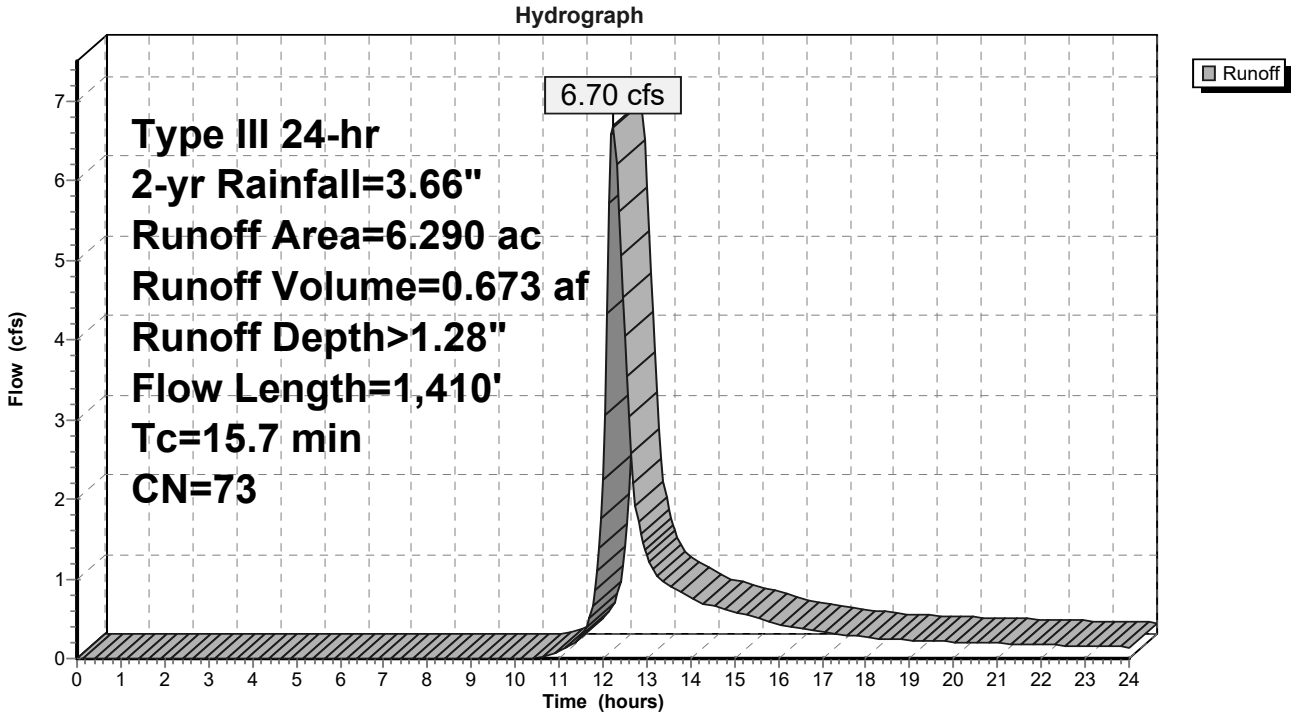
Runoff = 6.70 cfs @ 12.23 hrs, Volume= 0.673 af, Depth> 1.28"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

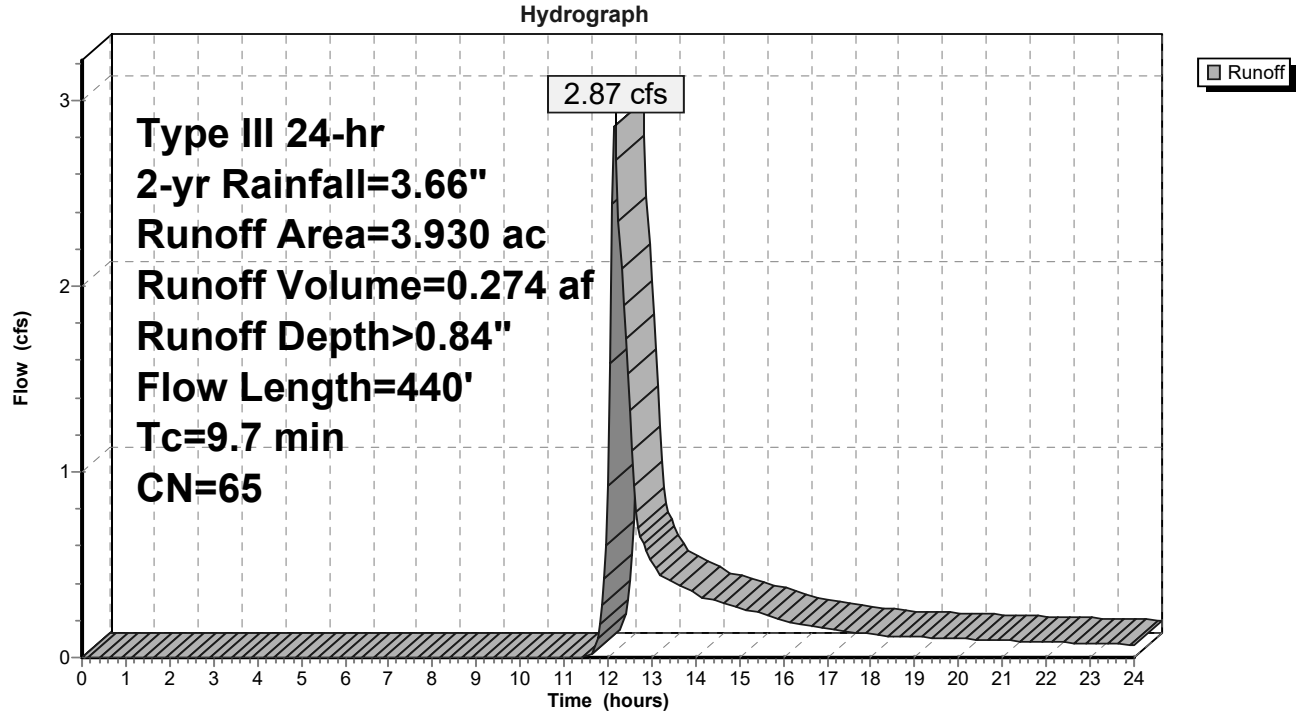
Runoff = 2.87 cfs @ 12.16 hrs, Volume= 0.274 af, Depth> 0.84"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 1.12" for 2-yr event
Inflow = 45.78 cfs @ 12.85 hrs, Volume= 9.993 af
Outflow = 32.08 cfs @ 13.37 hrs, Volume= 9.541 af, Atten= 30%, Lag= 31.4 min
Primary = 32.08 cfs @ 13.37 hrs, Volume= 9.541 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 73.92' @ 13.37 hrs Surf.Area= 1.017 ac Storage= 2.077 af

Plug-Flow detention time= 62.7 min calculated for 9.541 af (95% of inflow)
Center-of-Mass det. time= 40.4 min (942.3 - 901.9)

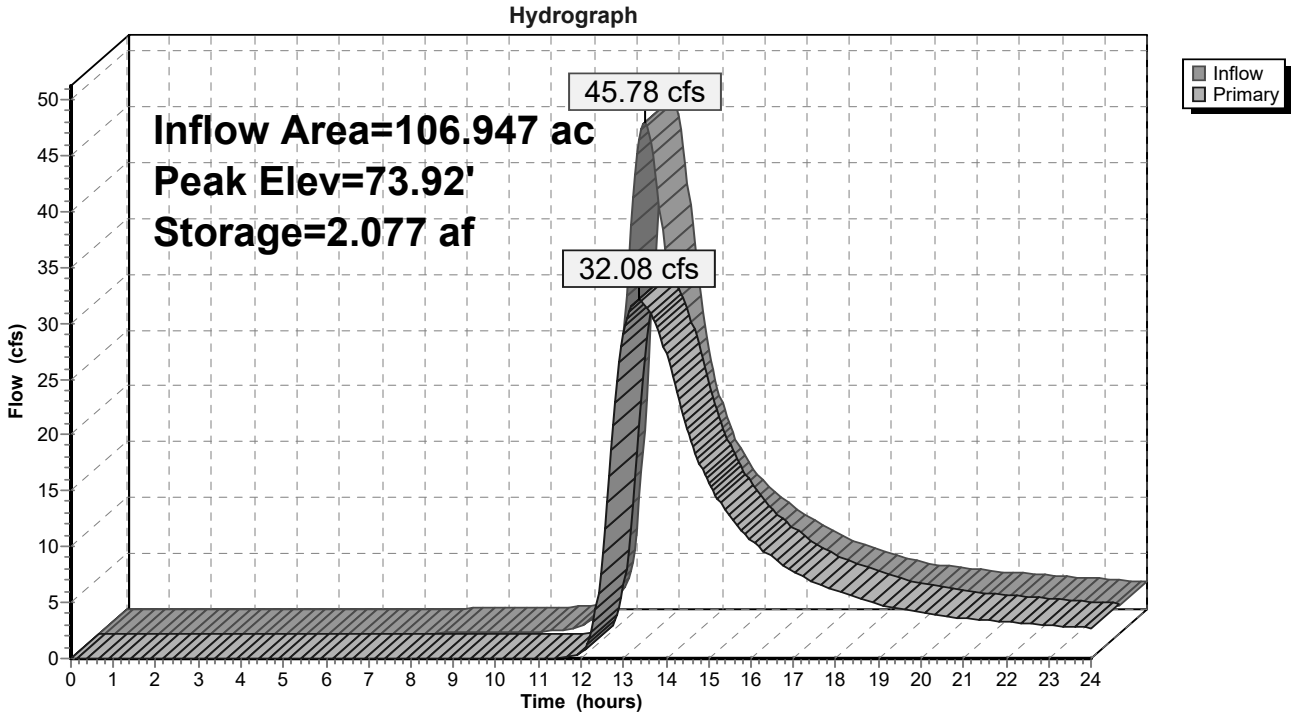
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=32.07 cfs @ 13.37 hrs HW=73.92' (Free Discharge)
- **1=Culvert** (Inlet Controls 32.07 cfs @ 5.10 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 1.48" for 2-yr event
Inflow = 2.54 cfs @ 12.17 hrs, Volume= 0.224 af
Outflow = 0.57 cfs @ 12.70 hrs, Volume= 0.140 af, Atten= 77%, Lag= 31.9 min
Primary = 0.57 cfs @ 12.70 hrs, Volume= 0.140 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.45' @ 12.70 hrs Surf.Area= 0.085 ac Storage= 0.101 af

Plug-Flow detention time= 210.3 min calculated for 0.140 af (63% of inflow)
Center-of-Mass det. time= 99.5 min (951.3 - 851.8)

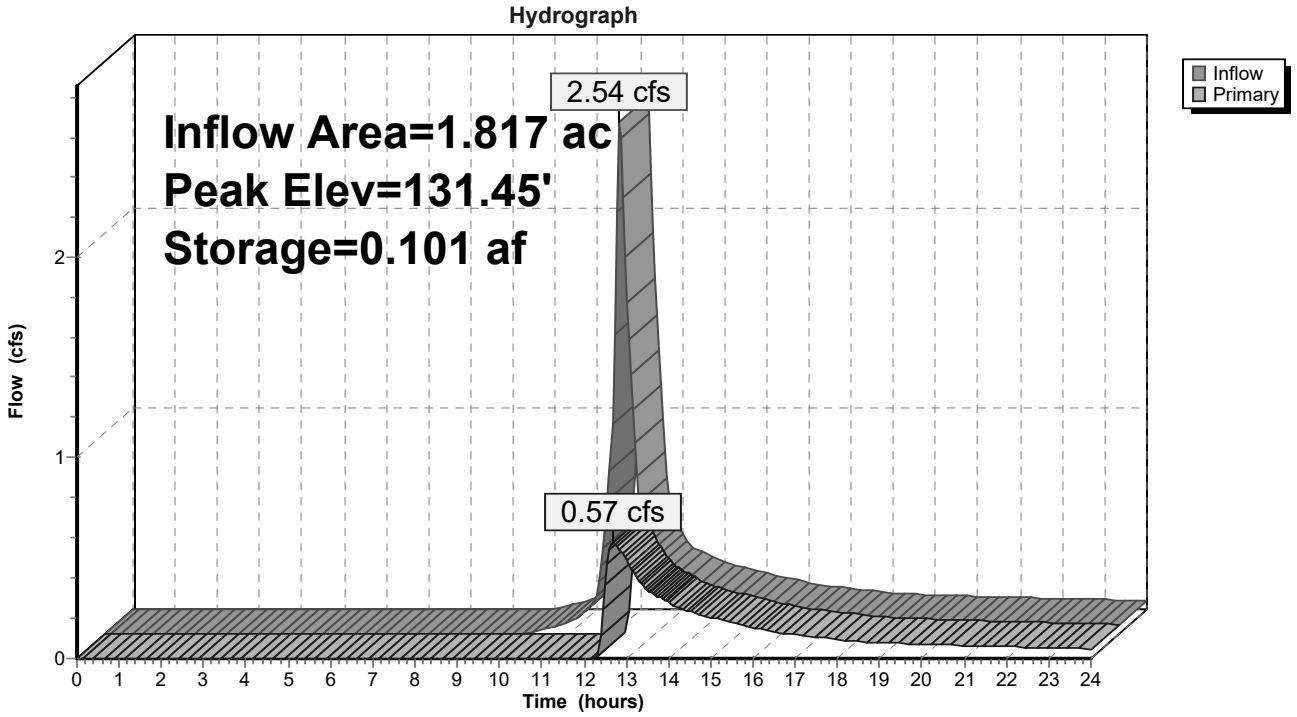
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.57 cfs @ 12.70 hrs HW=131.45' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.57 cfs @ 2.02 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 2.32" for 2-yr event
Inflow = 5.55 cfs @ 12.15 hrs, Volume= 0.466 af
Outflow = 1.23 cfs @ 12.63 hrs, Volume= 0.282 af, Atten= 78%, Lag= 28.6 min
Primary = 1.23 cfs @ 12.63 hrs, Volume= 0.282 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 124.58' @ 12.63 hrs Surf.Area= 0.160 ac Storage= 0.243 af

Plug-Flow detention time= 218.0 min calculated for 0.281 af (60% of inflow)
Center-of-Mass det. time= 115.1 min (931.7 - 816.6)

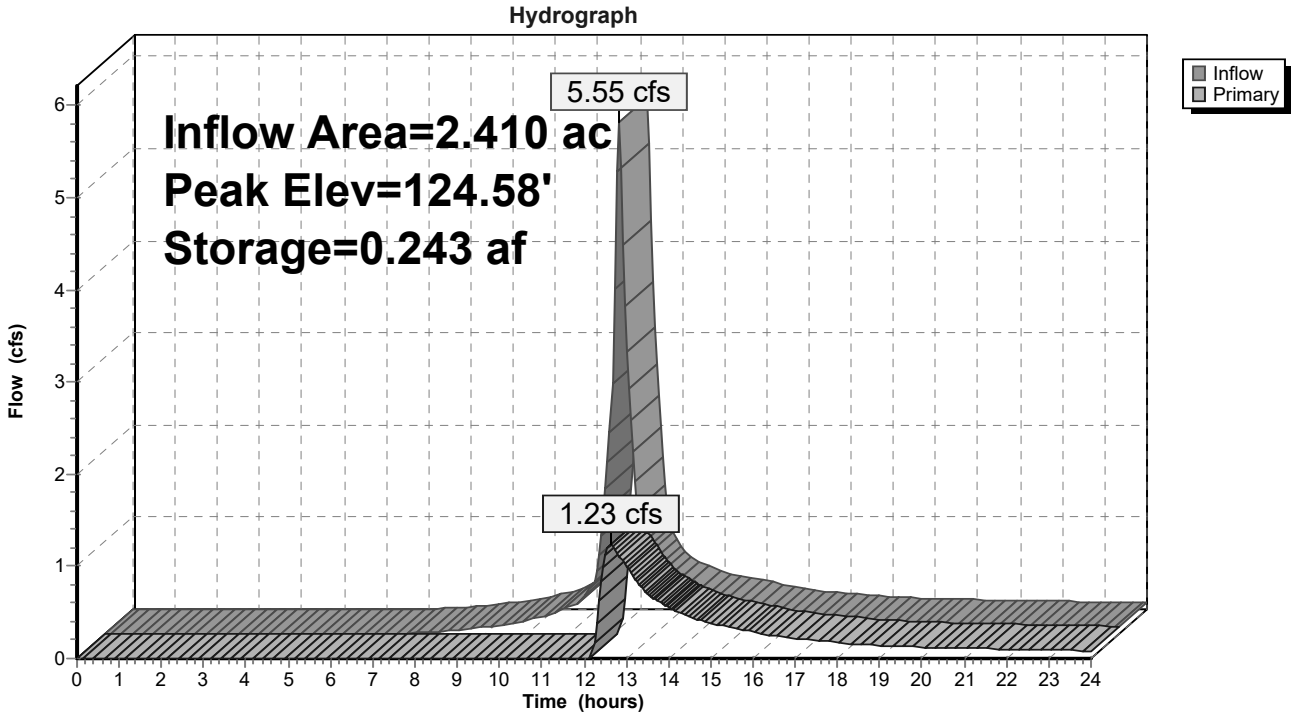
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.23 cfs @ 12.63 hrs HW=124.58' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.23 cfs @ 2.59 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 1.28" for 2-yr event
Inflow = 6.70 cfs @ 12.23 hrs, Volume= 0.673 af
Outflow = 3.66 cfs @ 12.54 hrs, Volume= 0.534 af, Atten= 45%, Lag= 18.5 min
Primary = 3.66 cfs @ 12.54 hrs, Volume= 0.534 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 101.81' @ 12.54 hrs Surf.Area= 4,832 sf Storage= 9,064 cf

Plug-Flow detention time= 133.8 min calculated for 0.532 af (79% of inflow)
Center-of-Mass det. time= 52.9 min (916.8 - 863.8)

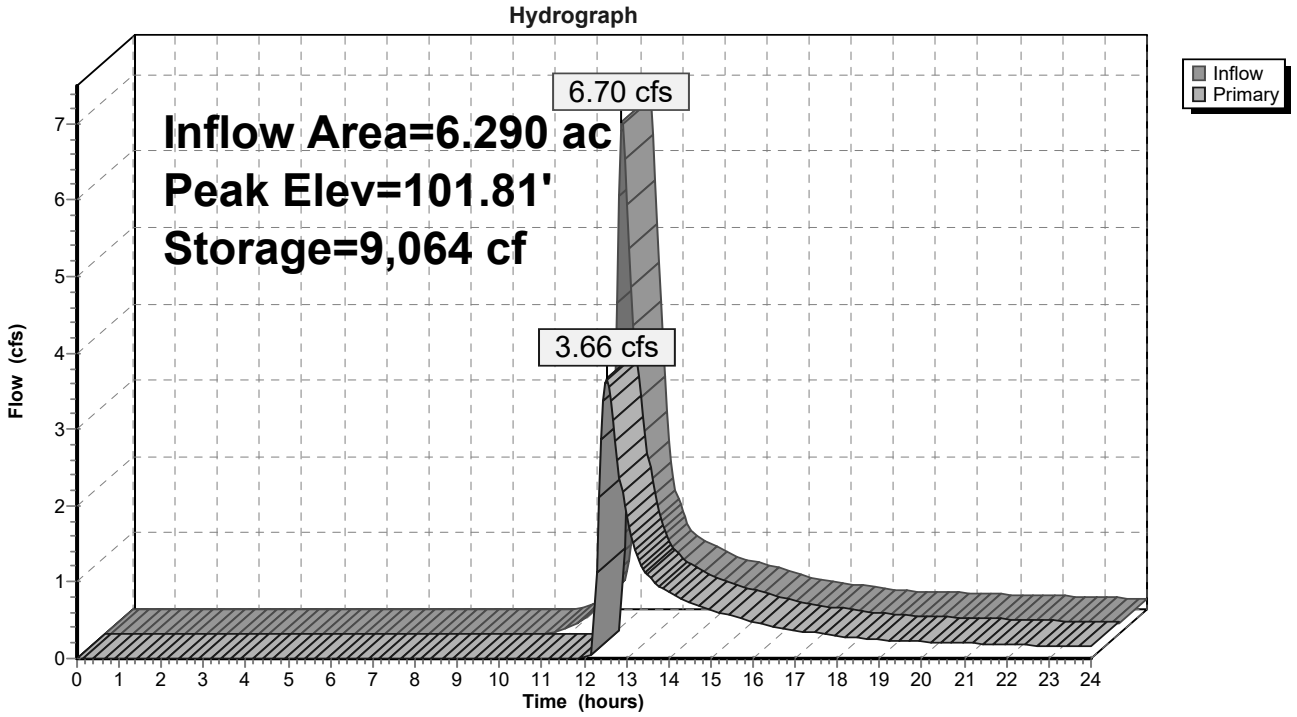
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=3.65 cfs @ 12.54 hrs HW=101.81' (Free Discharge)
1=Culvert (Inlet Controls 3.65 cfs @ 3.06 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond INFIL BASIN B3: INFIL BASIN B3

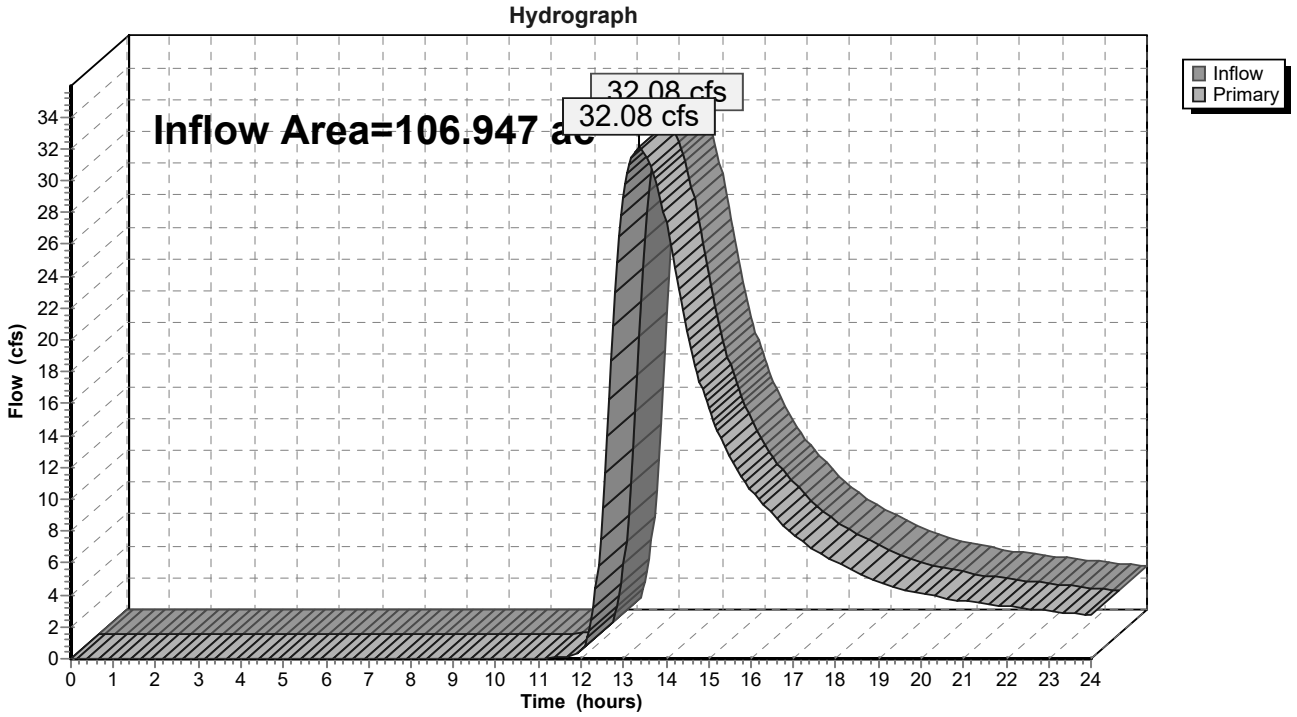


Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 1.07" for 2-yr event
Inflow = 32.08 cfs @ 13.37 hrs, Volume= 9.541 af
Primary = 32.08 cfs @ 13.37 hrs, Volume= 9.541 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1



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

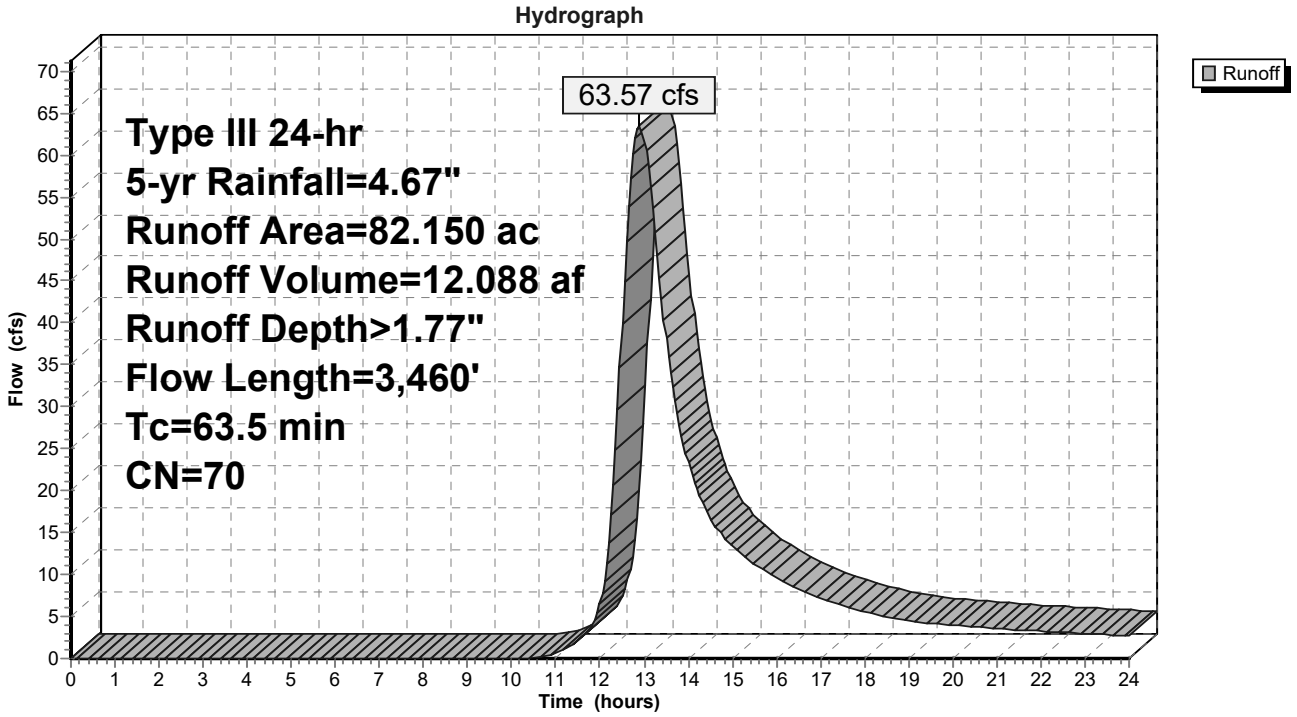
Runoff = 63.57 cfs @ 12.90 hrs, Volume= 12.088 af, Depth> 1.77"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

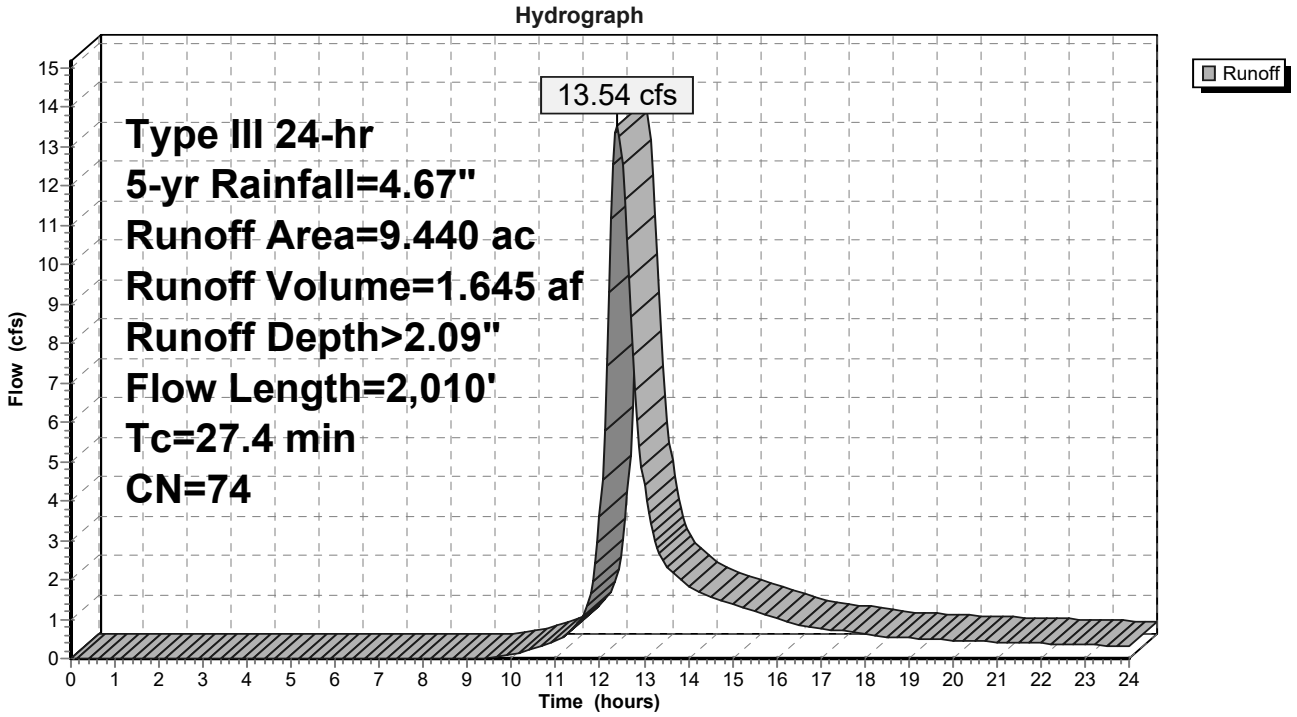
Runoff = 13.54 cfs @ 12.40 hrs, Volume= 1.645 af, Depth> 2.09"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

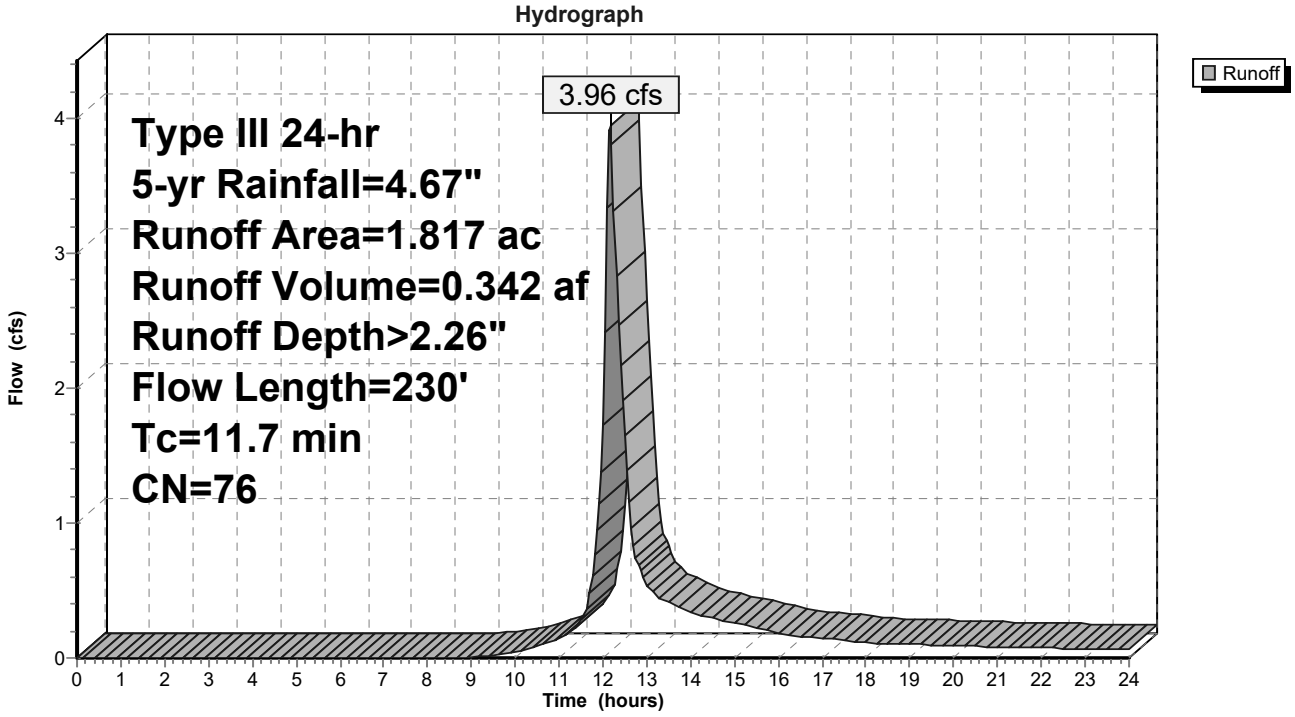
Runoff = 3.96 cfs @ 12.17 hrs, Volume= 0.342 af, Depth> 2.26"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

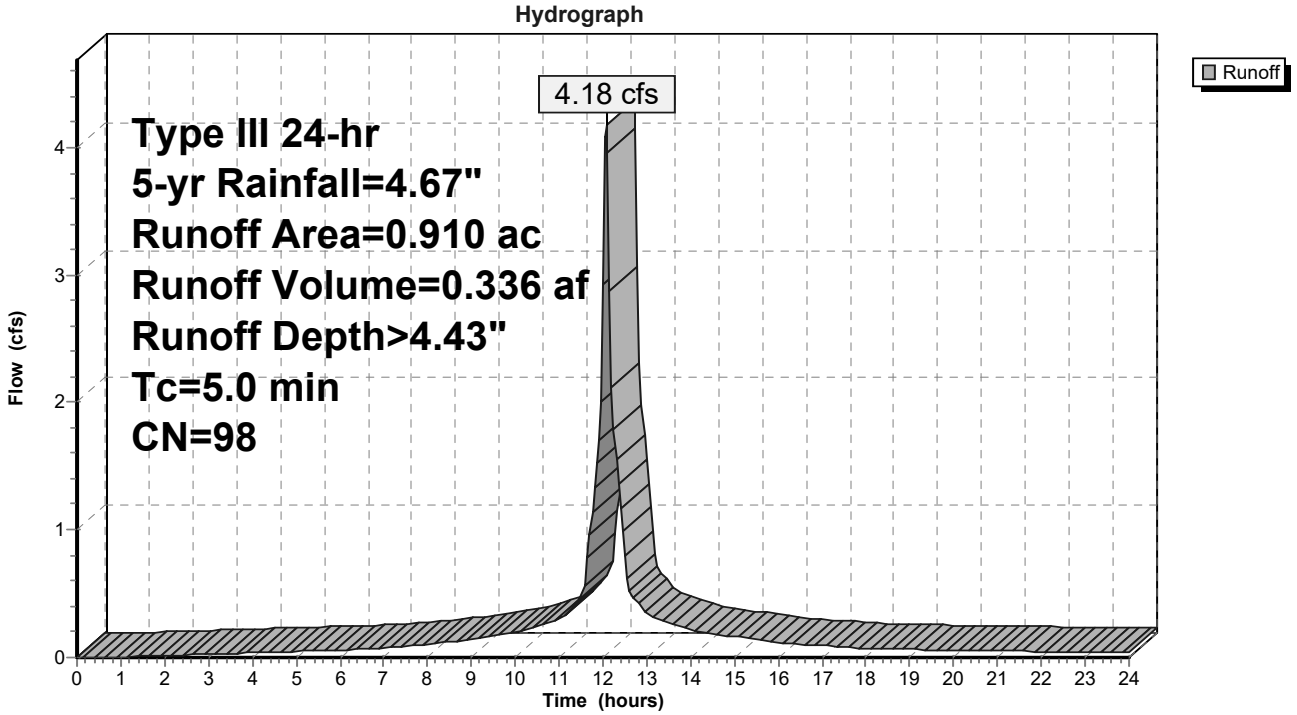
Runoff = 4.18 cfs @ 12.07 hrs, Volume= 0.336 af, Depth> 4.43"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

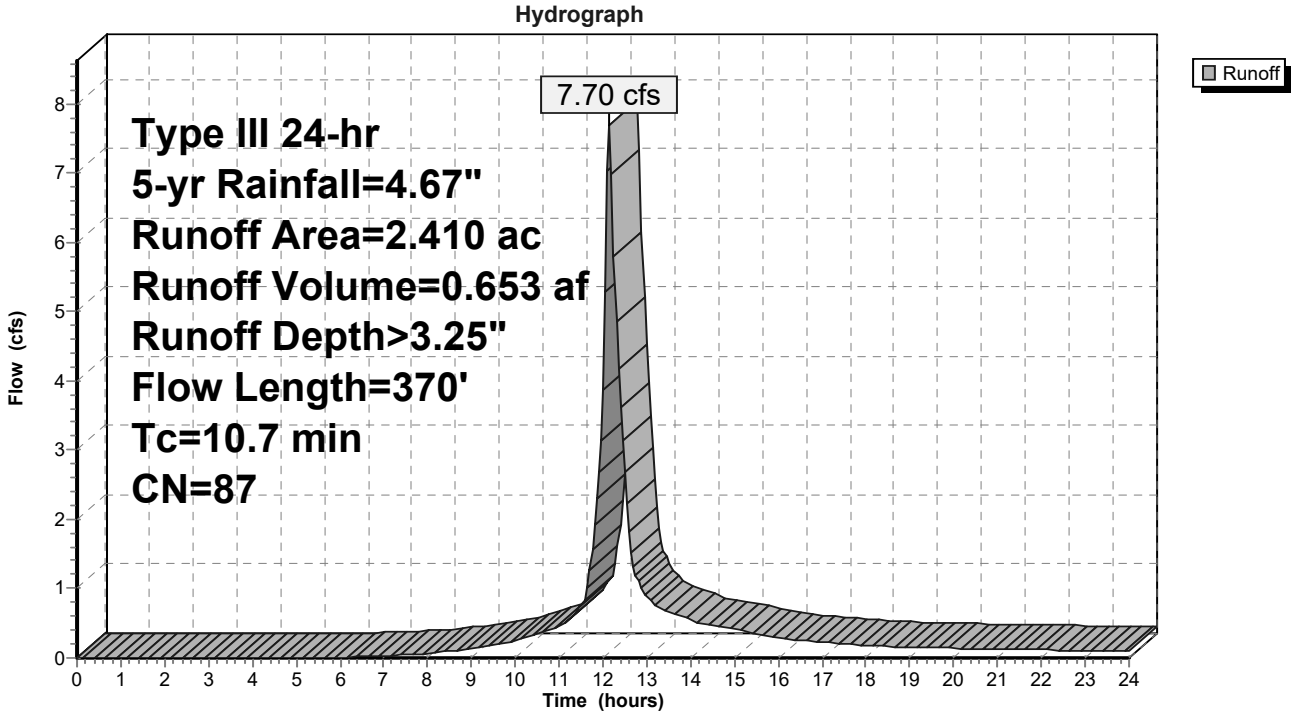
Runoff = 7.70 cfs @ 12.15 hrs, Volume= 0.653 af, Depth> 3.25"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

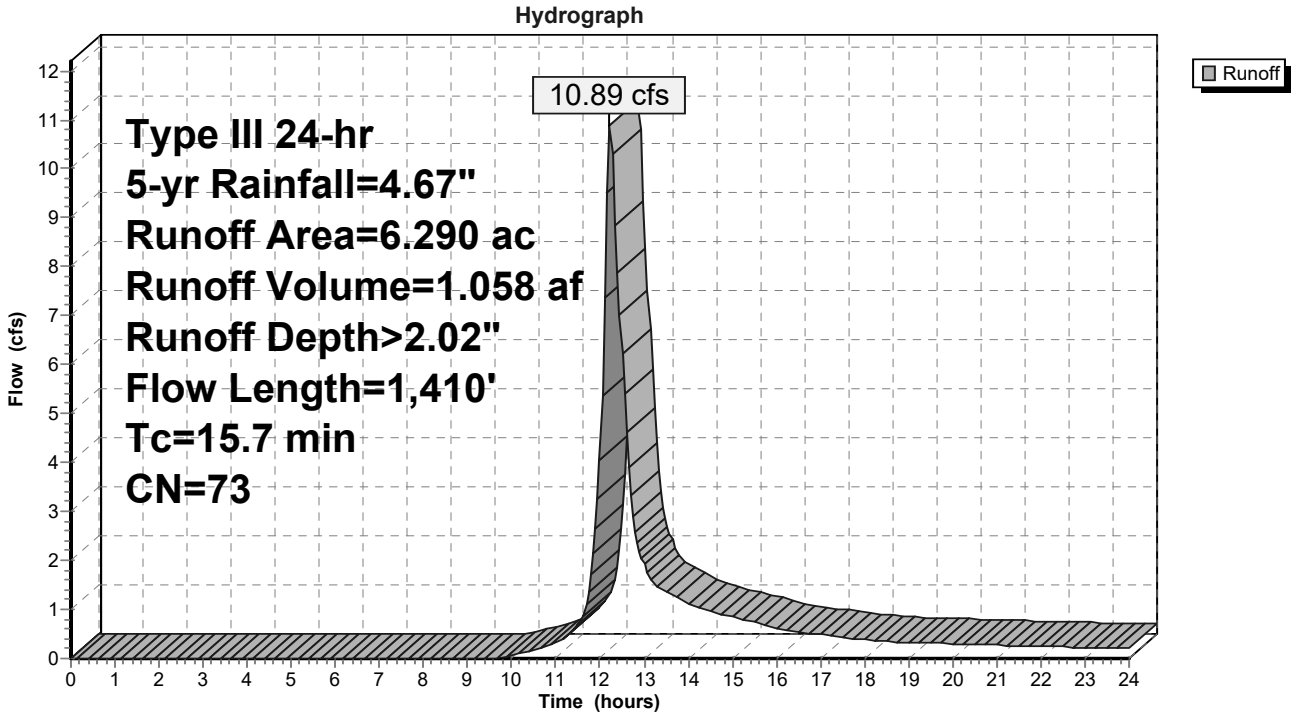
Runoff = 10.89 cfs @ 12.22 hrs, Volume= 1.058 af, Depth> 2.02"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

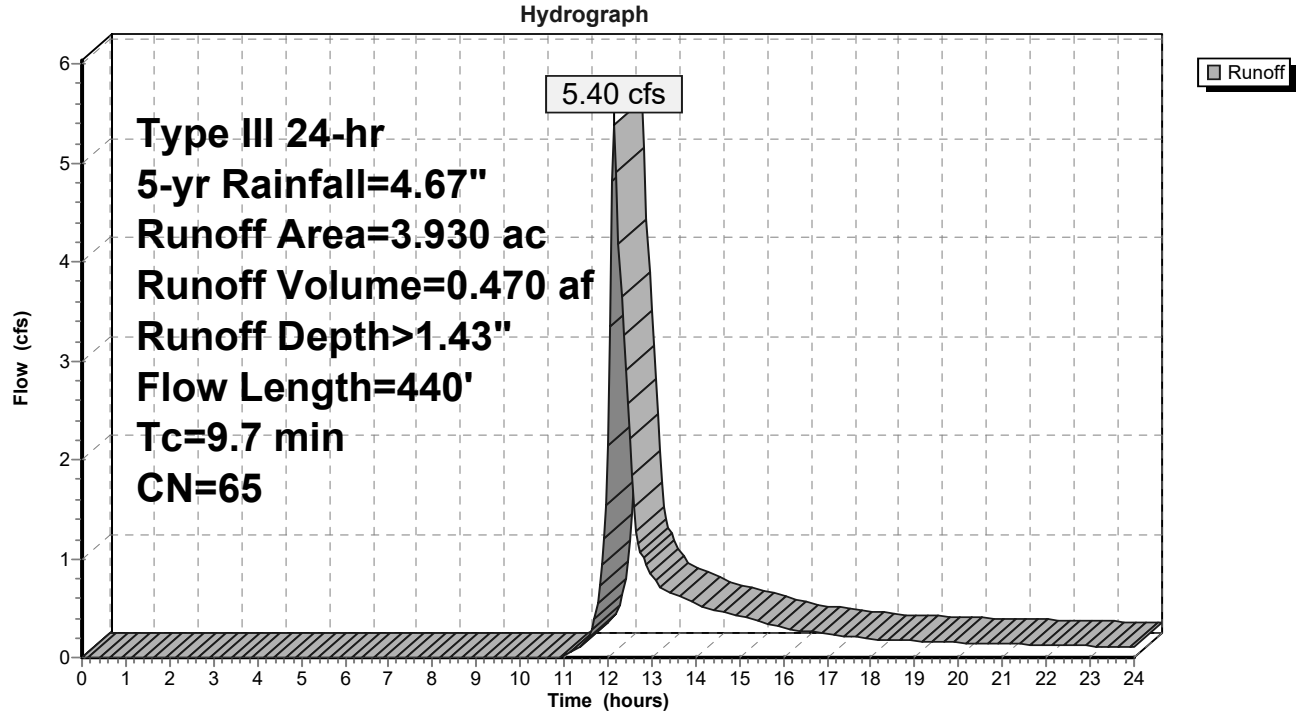
Runoff = 5.40 cfs @ 12.15 hrs, Volume= 0.470 af, Depth> 1.43"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 1.82" for 5-yr event
Inflow = 77.62 cfs @ 12.79 hrs, Volume= 16.178 af
Outflow = 48.83 cfs @ 13.42 hrs, Volume= 15.634 af, Atten= 37%, Lag= 37.5 min
Primary = 48.83 cfs @ 13.42 hrs, Volume= 15.634 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 75.40' @ 13.42 hrs Surf.Area= 1.227 ac Storage= 3.729 af

Plug-Flow detention time= 58.0 min calculated for 15.602 af (96% of inflow)
Center-of-Mass det. time= 41.0 min (928.0 - 887.1)

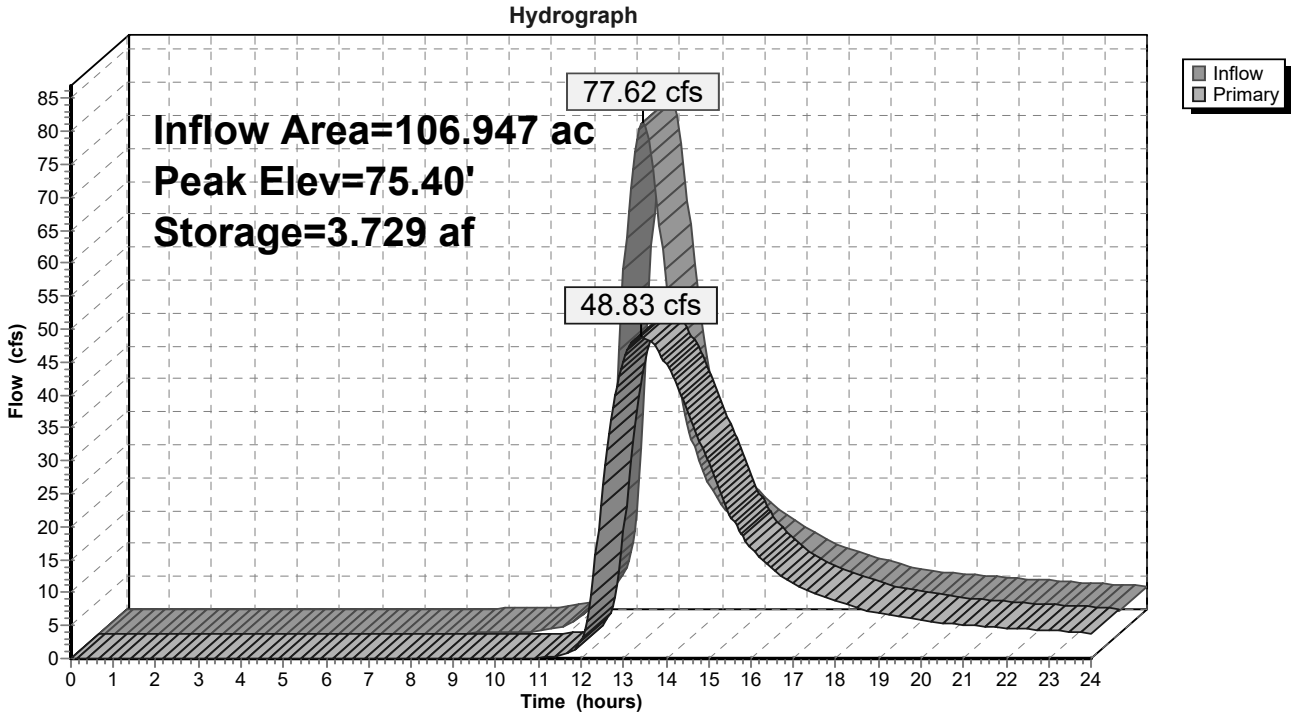
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.82 cfs @ 13.42 hrs HW=75.40' (Free Discharge)
- **1=Culvert** (Inlet Controls 48.82 cfs @ 7.77 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 2.26" for 5-yr event
Inflow = 3.96 cfs @ 12.17 hrs, Volume= 0.342 af
Outflow = 1.99 cfs @ 12.44 hrs, Volume= 0.258 af, Atten= 50%, Lag= 16.3 min
Primary = 1.99 cfs @ 12.44 hrs, Volume= 0.258 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.79' @ 12.44 hrs Surf.Area= 0.085 ac Storage= 0.123 af

Plug-Flow detention time= 149.5 min calculated for 0.257 af (75% of inflow)
Center-of-Mass det. time= 62.4 min (901.9 - 839.5)

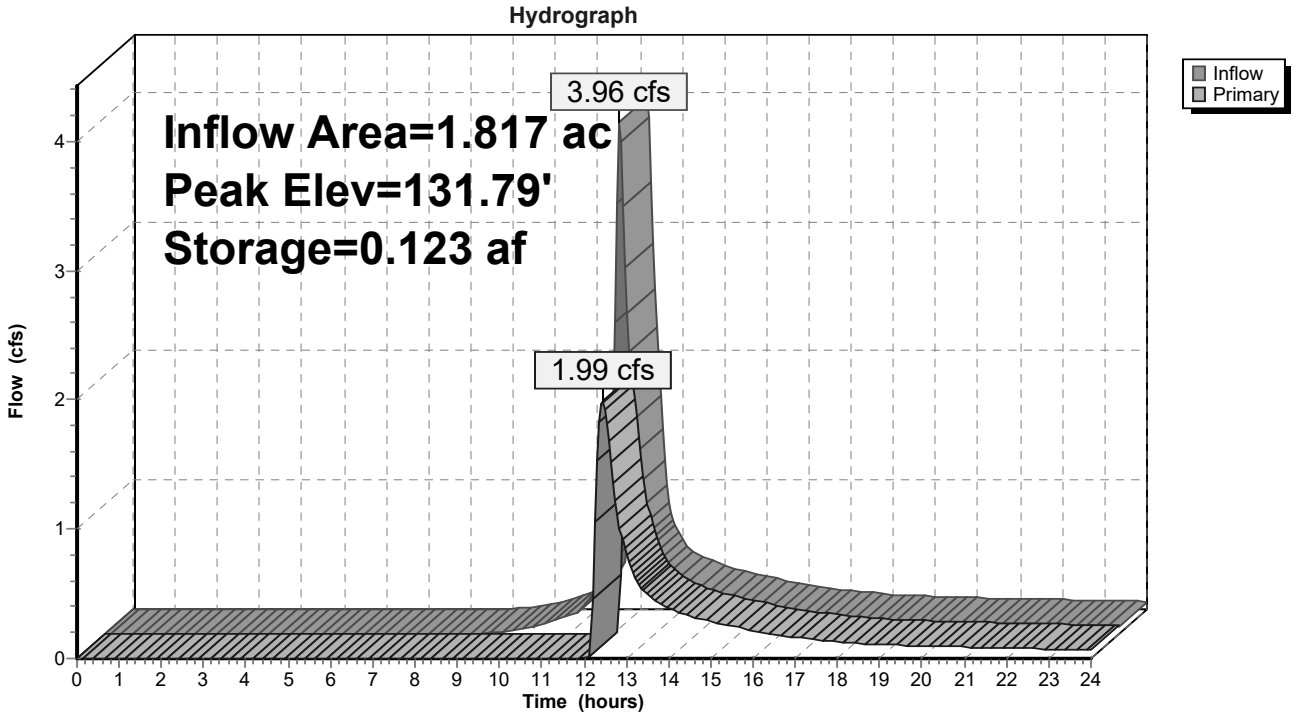
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.98 cfs @ 12.44 hrs HW=131.79' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.98 cfs @ 2.83 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 3.25" for 5-yr event
Inflow = 7.70 cfs @ 12.15 hrs, Volume= 0.653 af
Outflow = 2.77 cfs @ 12.49 hrs, Volume= 0.466 af, Atten= 64%, Lag= 20.5 min
Primary = 2.77 cfs @ 12.49 hrs, Volume= 0.466 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 125.04' @ 12.49 hrs Surf.Area= 0.160 ac Storage= 0.301 af

Plug-Flow detention time= 175.7 min calculated for 0.465 af (71% of inflow)
Center-of-Mass det. time= 86.5 min (893.6 - 807.1)

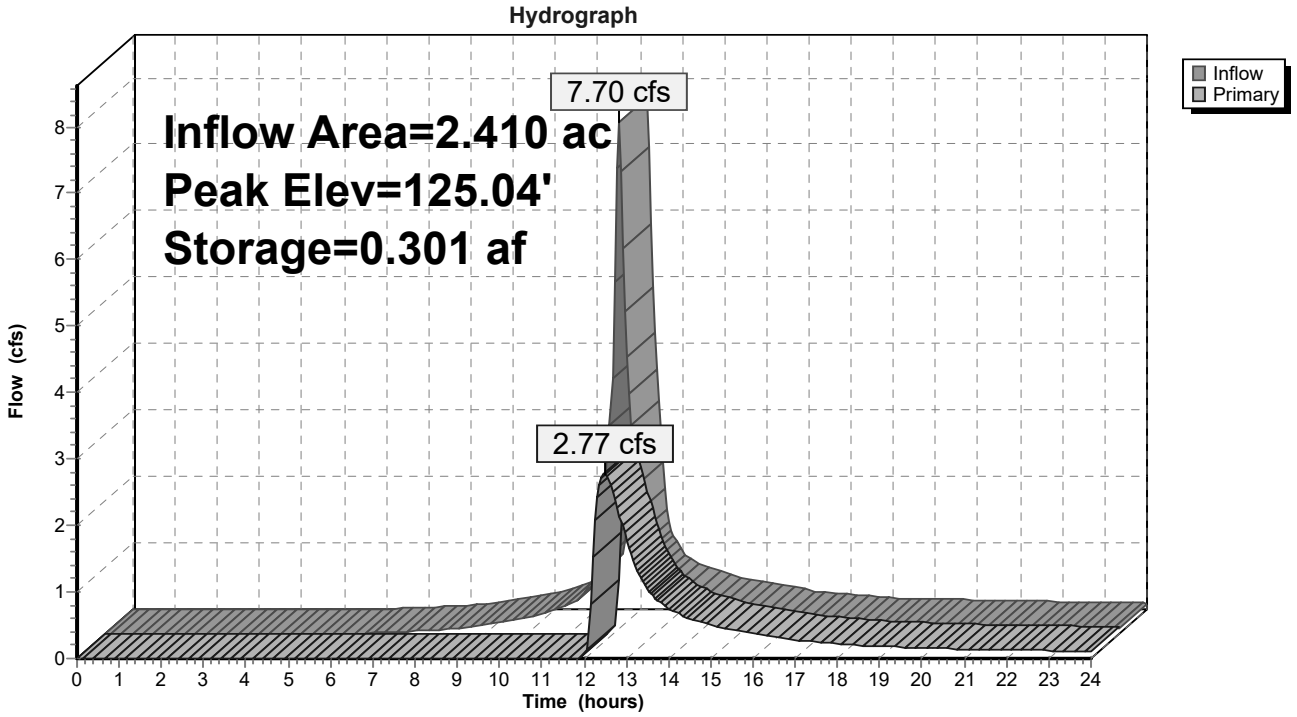
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.77 cfs @ 12.49 hrs HW=125.04' (Free Discharge)
1=Orifice/Grate (Orifice Controls 2.77 cfs @ 3.53 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 2.02" for 5-yr event
Inflow = 10.89 cfs @ 12.22 hrs, Volume= 1.058 af
Outflow = 8.00 cfs @ 12.40 hrs, Volume= 0.916 af, Atten= 27%, Lag= 10.5 min
Primary = 8.00 cfs @ 12.40 hrs, Volume= 0.916 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 102.26' @ 12.40 hrs Surf.Area= 5,215 sf Storage= 11,340 cf

Plug-Flow detention time= 95.4 min calculated for 0.914 af (86% of inflow)
Center-of-Mass det. time= 36.2 min (886.6 - 850.5)

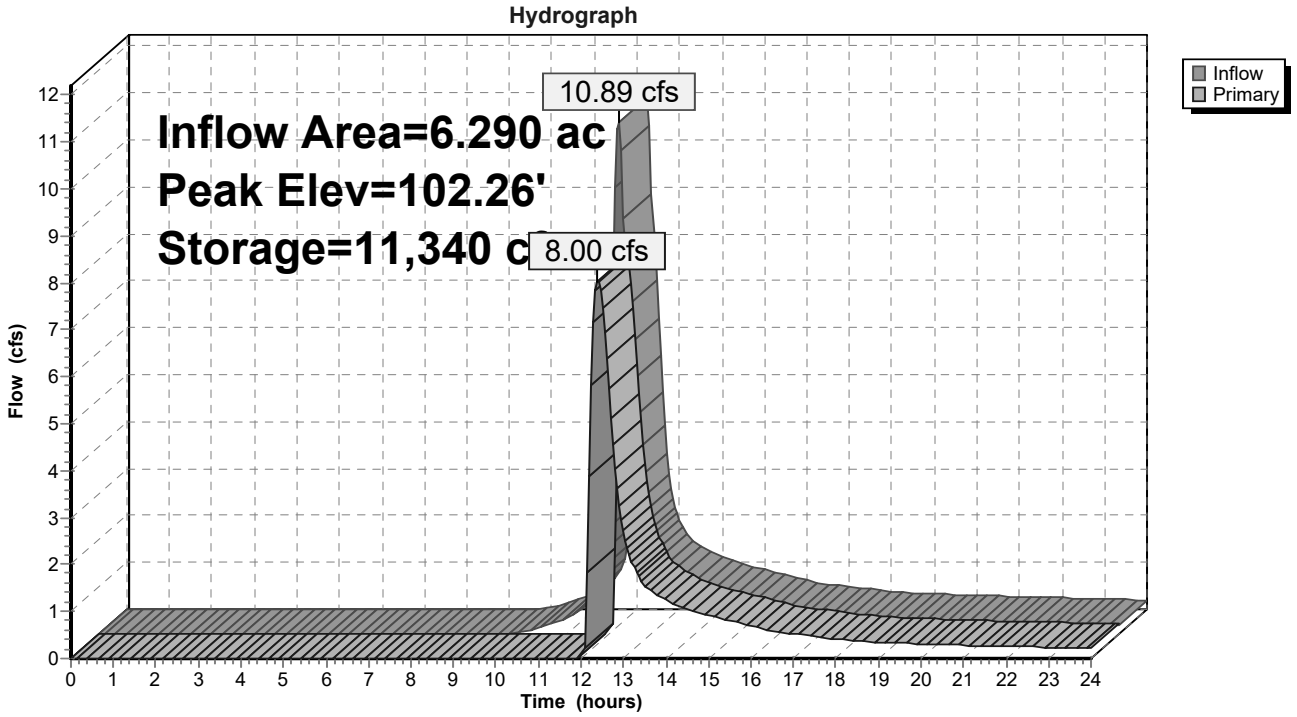
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.00 cfs @ 12.40 hrs HW=102.26' (Free Discharge)
1=Culvert (Inlet Controls 8.00 cfs @ 3.83 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond INFIL BASIN B3: INFIL BASIN B3

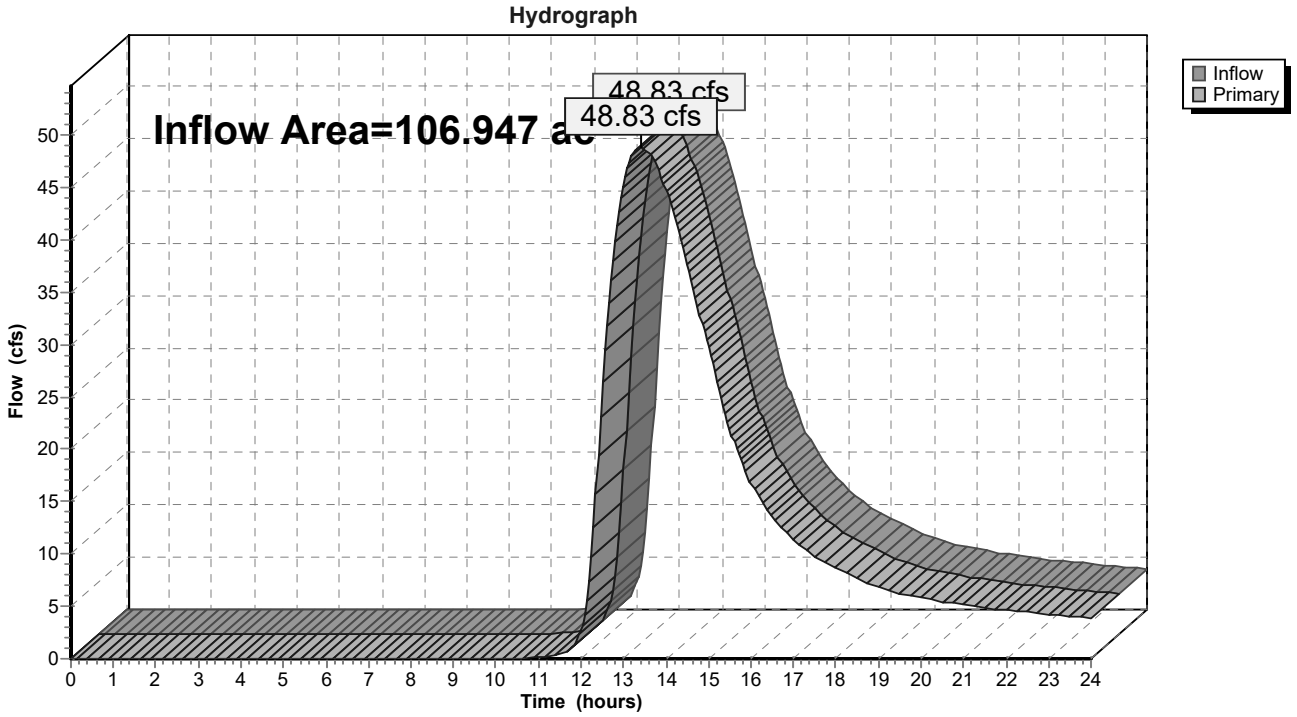


Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 1.75" for 5-yr event
Inflow = 48.83 cfs @ 13.42 hrs, Volume= 15.634 af
Primary = 48.83 cfs @ 13.42 hrs, Volume= 15.634 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1



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

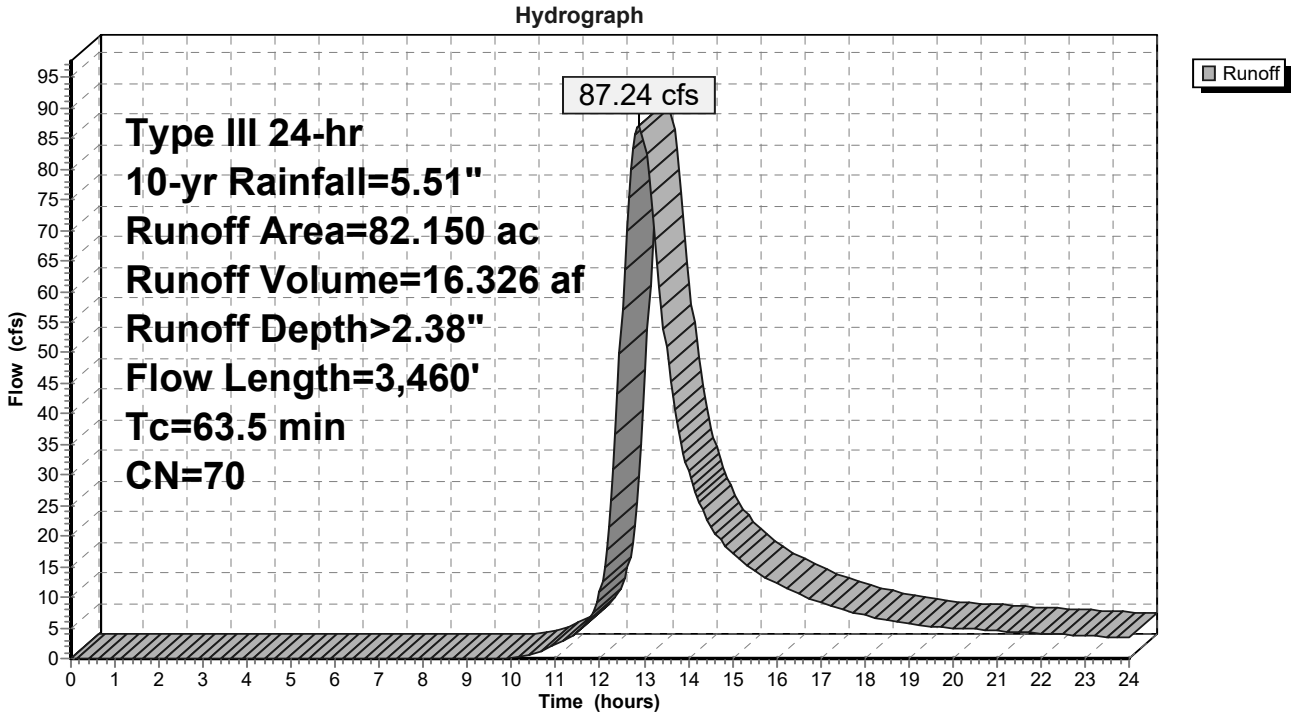
Runoff = 87.24 cfs @ 12.89 hrs, Volume= 16.326 af, Depth> 2.38"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

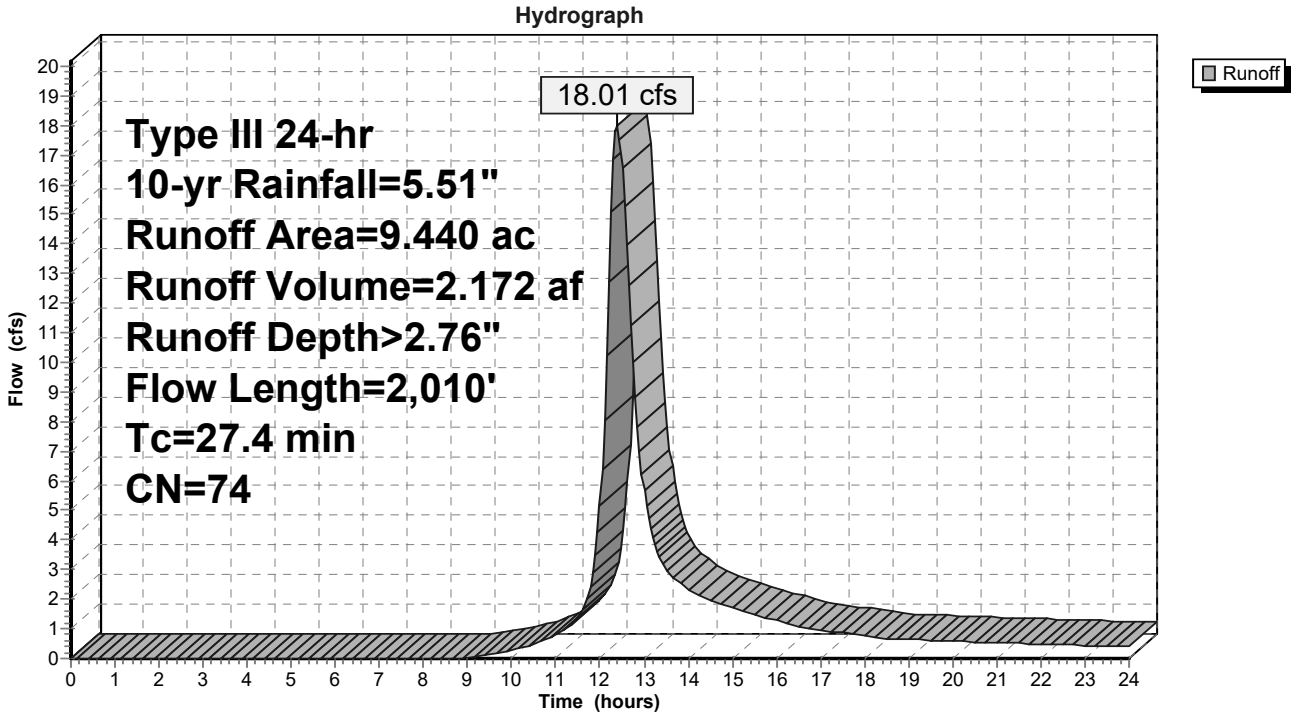
Runoff = 18.01 cfs @ 12.39 hrs, Volume= 2.172 af, Depth> 2.76"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

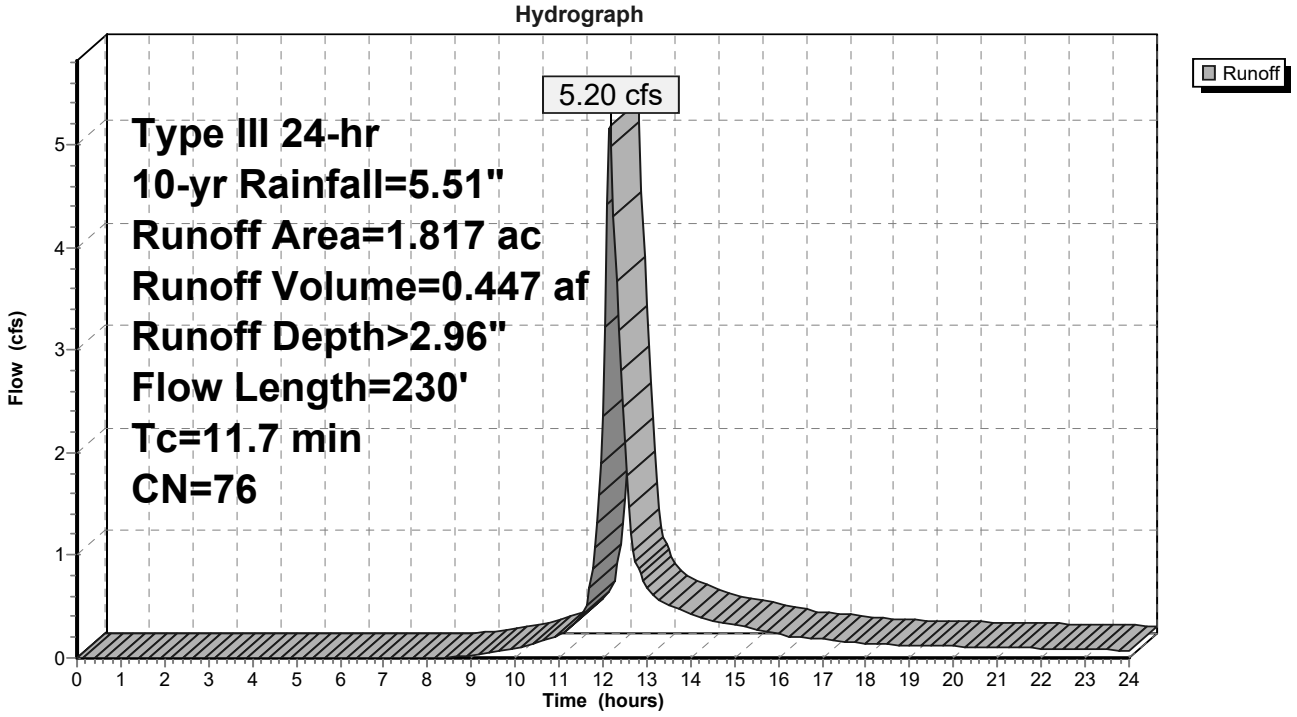
Runoff = 5.20 cfs @ 12.17 hrs, Volume= 0.447 af, Depth> 2.96"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

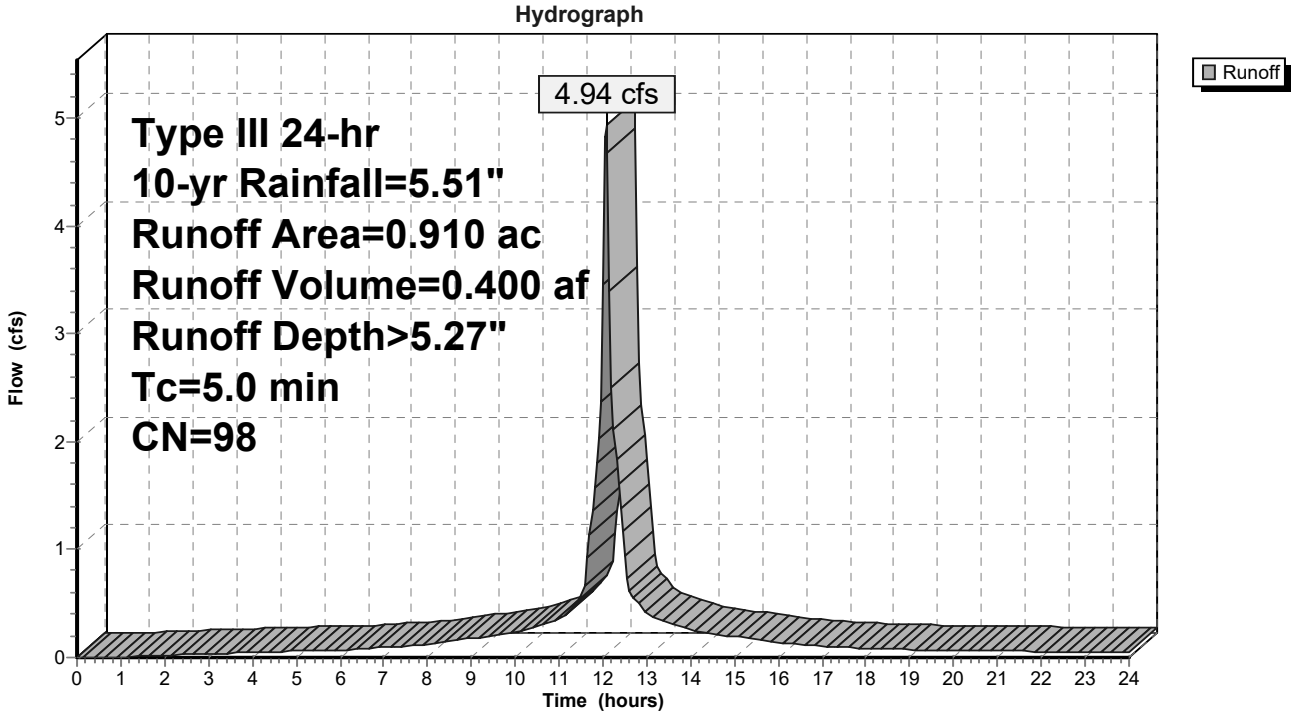
Runoff = 4.94 cfs @ 12.07 hrs, Volume= 0.400 af, Depth> 5.27"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

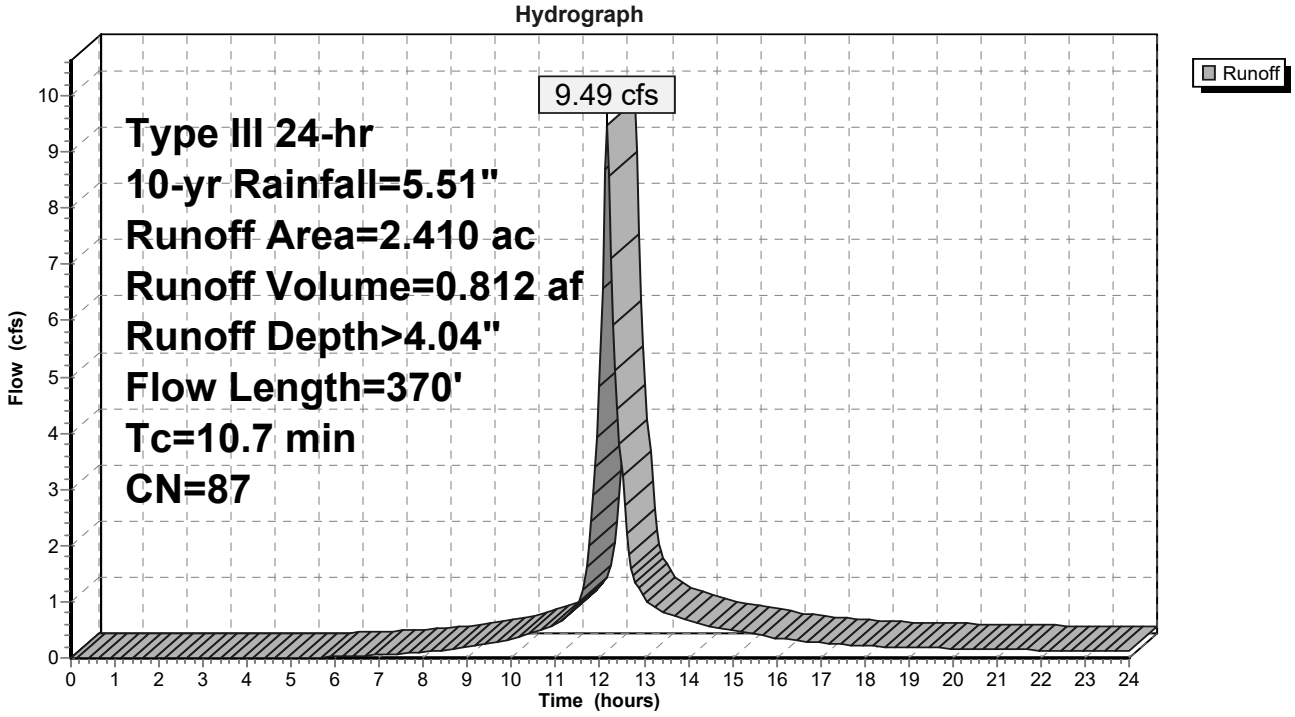
Runoff = 9.49 cfs @ 12.15 hrs, Volume= 0.812 af, Depth> 4.04"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

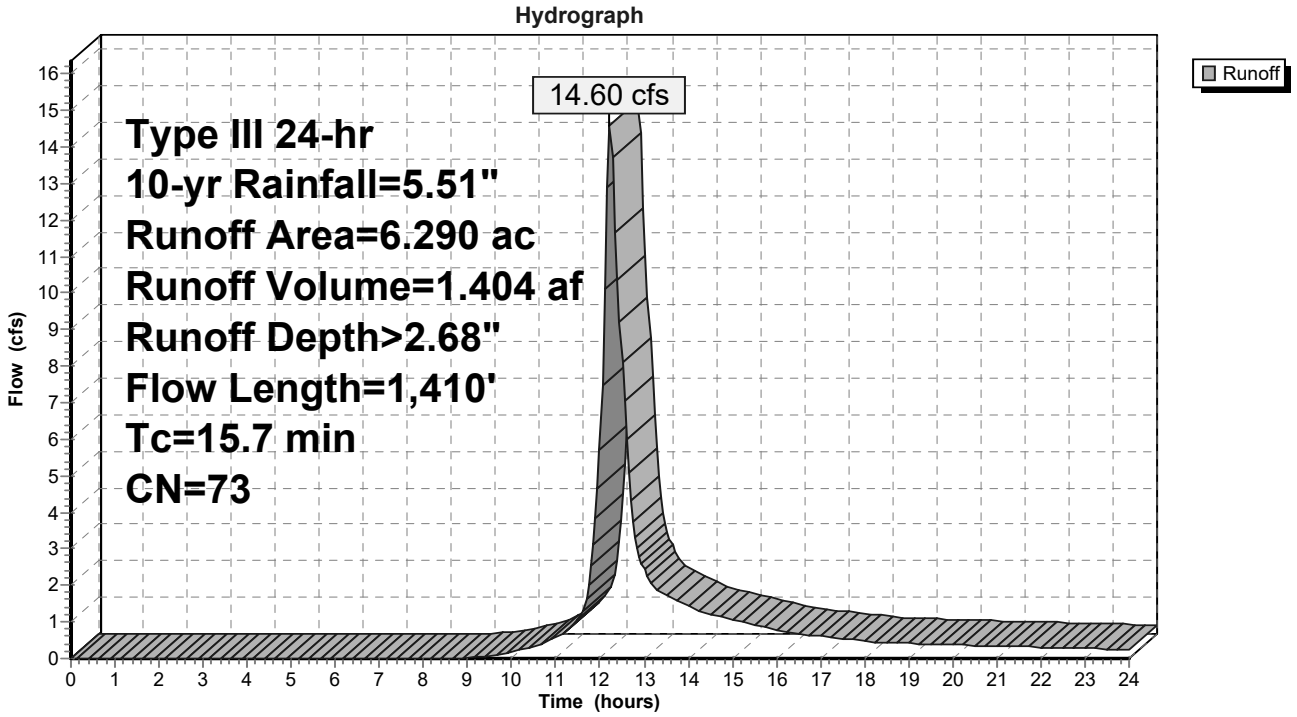
Runoff = 14.60 cfs @ 12.22 hrs, Volume= 1.404 af, Depth> 2.68"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

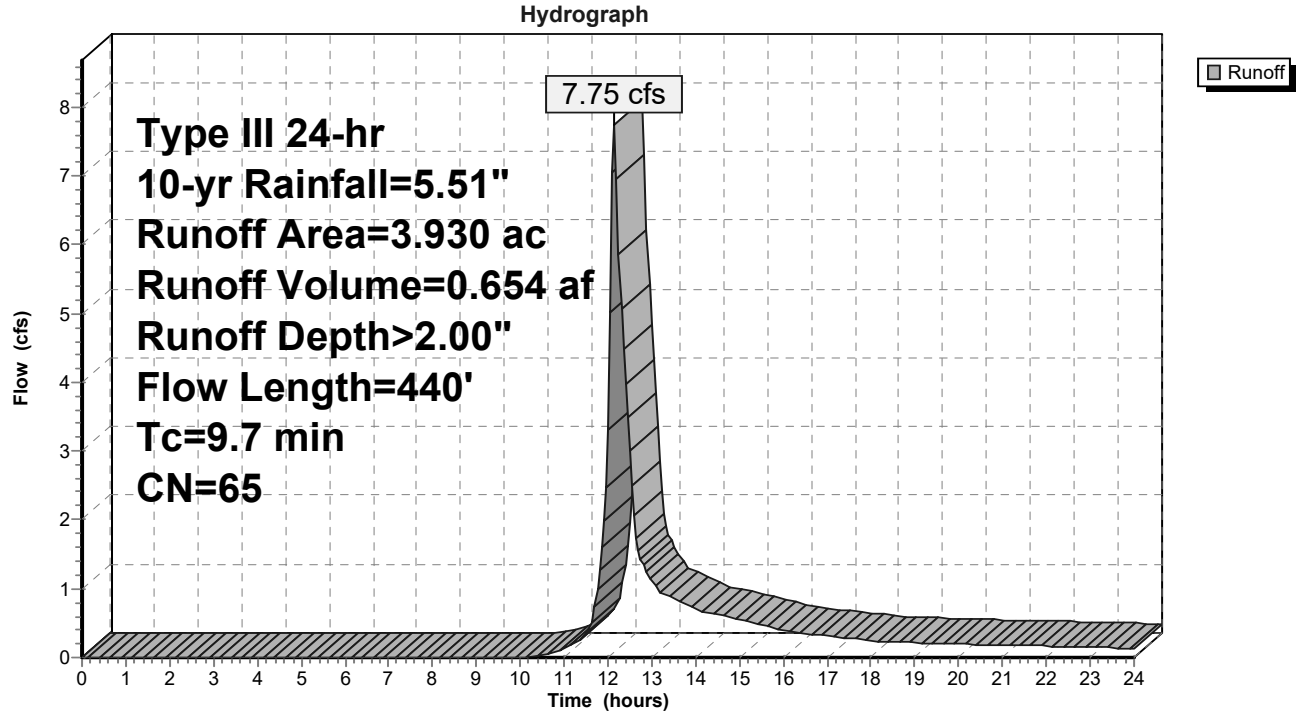
Runoff = 7.75 cfs @ 12.15 hrs, Volume= 0.654 af, Depth> 2.00"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 2.45" for 10-yr event
Inflow = 106.15 cfs @ 12.77 hrs, Volume= 21.797 af
Outflow = 77.06 cfs @ 13.27 hrs, Volume= 21.184 af, Atten= 27%, Lag= 29.7 min
Primary = 77.06 cfs @ 13.27 hrs, Volume= 21.184 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 76.41' @ 13.27 hrs Surf.Area= 1.405 ac Storage= 5.044 af

Plug-Flow detention time= 56.1 min calculated for 21.184 af (97% of inflow)
Center-of-Mass det. time= 41.5 min (920.0 - 878.4)

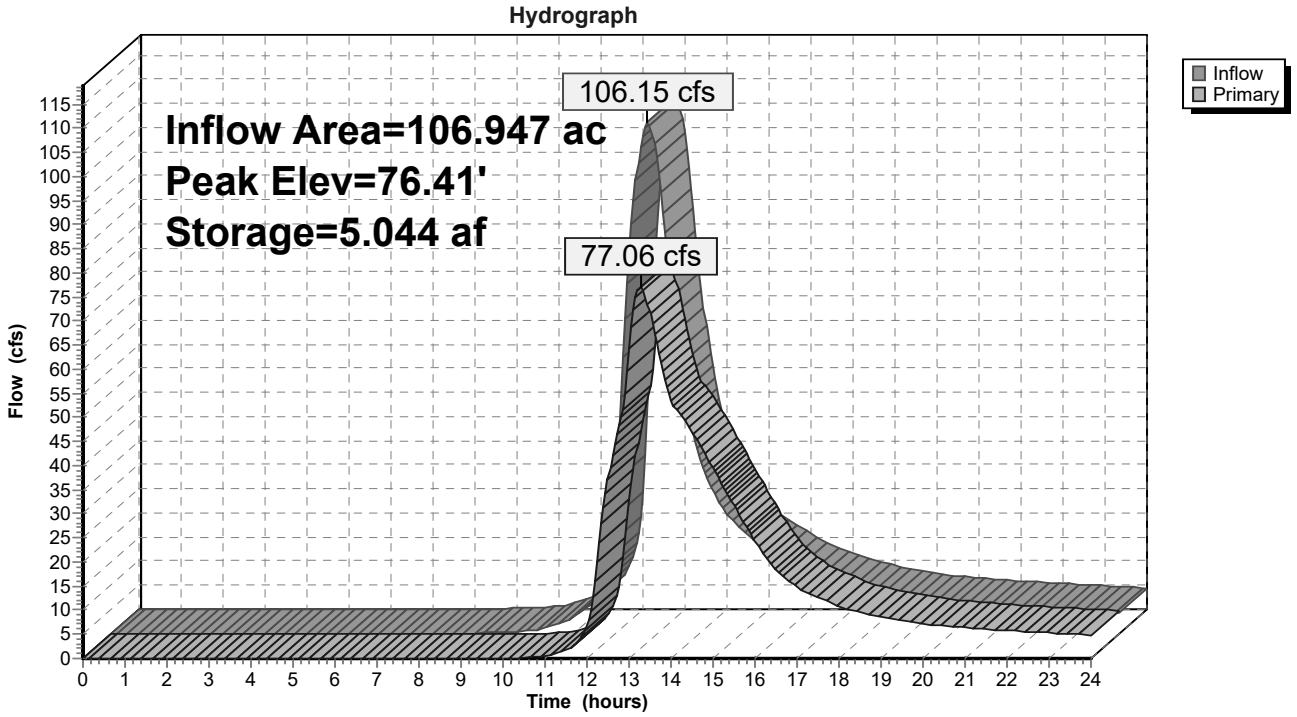
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=76.96 cfs @ 13.27 hrs HW=76.41' (Free Discharge)
- **1=Culvert** (Inlet Controls 57.46 cfs @ 9.15 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 19.49 cfs @ 2.12 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 2.96" for 10-yr event
Inflow = 5.20 cfs @ 12.17 hrs, Volume= 0.447 af
Outflow = 3.35 cfs @ 12.34 hrs, Volume= 0.362 af, Atten= 35%, Lag= 10.3 min
Primary = 3.35 cfs @ 12.34 hrs, Volume= 0.362 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.06' @ 12.34 hrs Surf.Area= 0.085 ac Storage= 0.140 af

Plug-Flow detention time= 123.8 min calculated for 0.361 af (81% of inflow)
Center-of-Mass det. time= 49.7 min (881.5 - 831.8)

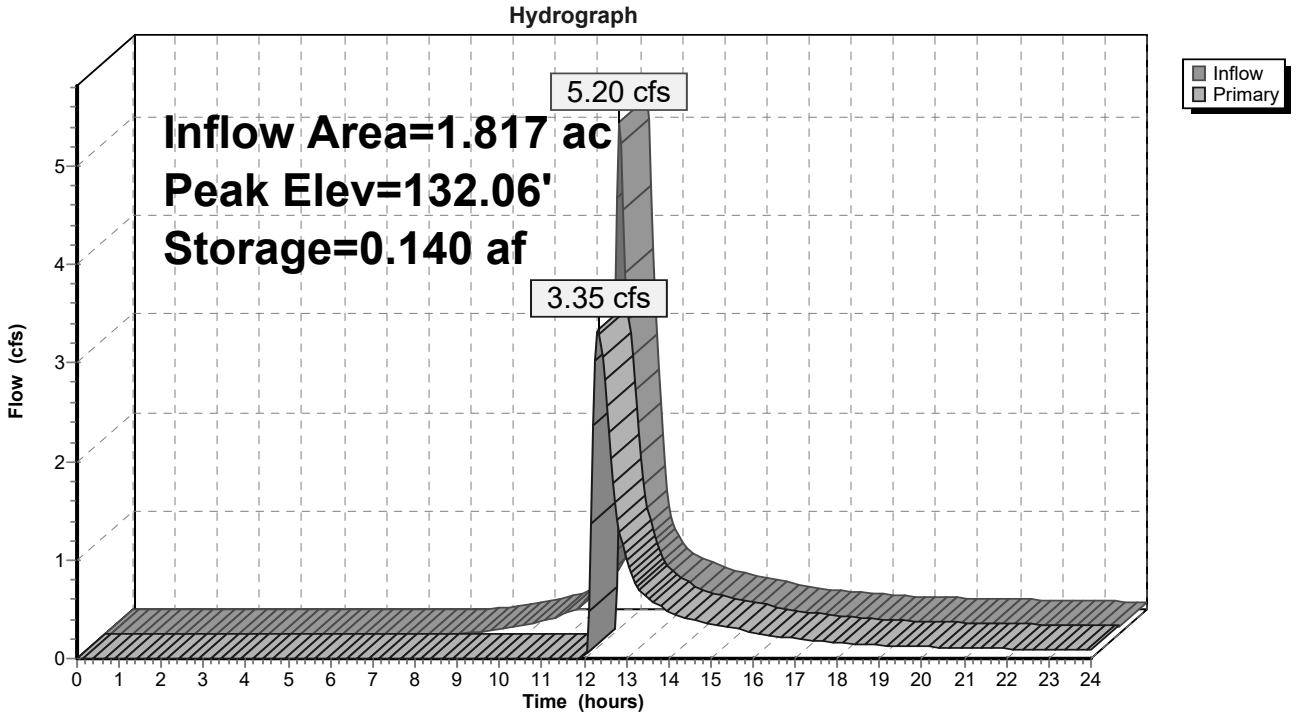
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.34 cfs @ 12.34 hrs HW=132.05' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 3.34 cfs @ 3.33 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 4.04" for 10-yr event
Inflow = 9.49 cfs @ 12.15 hrs, Volume= 0.812 af
Outflow = 3.74 cfs @ 12.46 hrs, Volume= 0.623 af, Atten= 61%, Lag= 18.6 min
Primary = 3.74 cfs @ 12.46 hrs, Volume= 0.623 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 125.48' @ 12.46 hrs Surf.Area= 0.160 ac Storage= 0.356 af

Plug-Flow detention time= 157.5 min calculated for 0.621 af (77% of inflow)
Center-of-Mass det. time= 77.3 min (878.4 - 801.0)

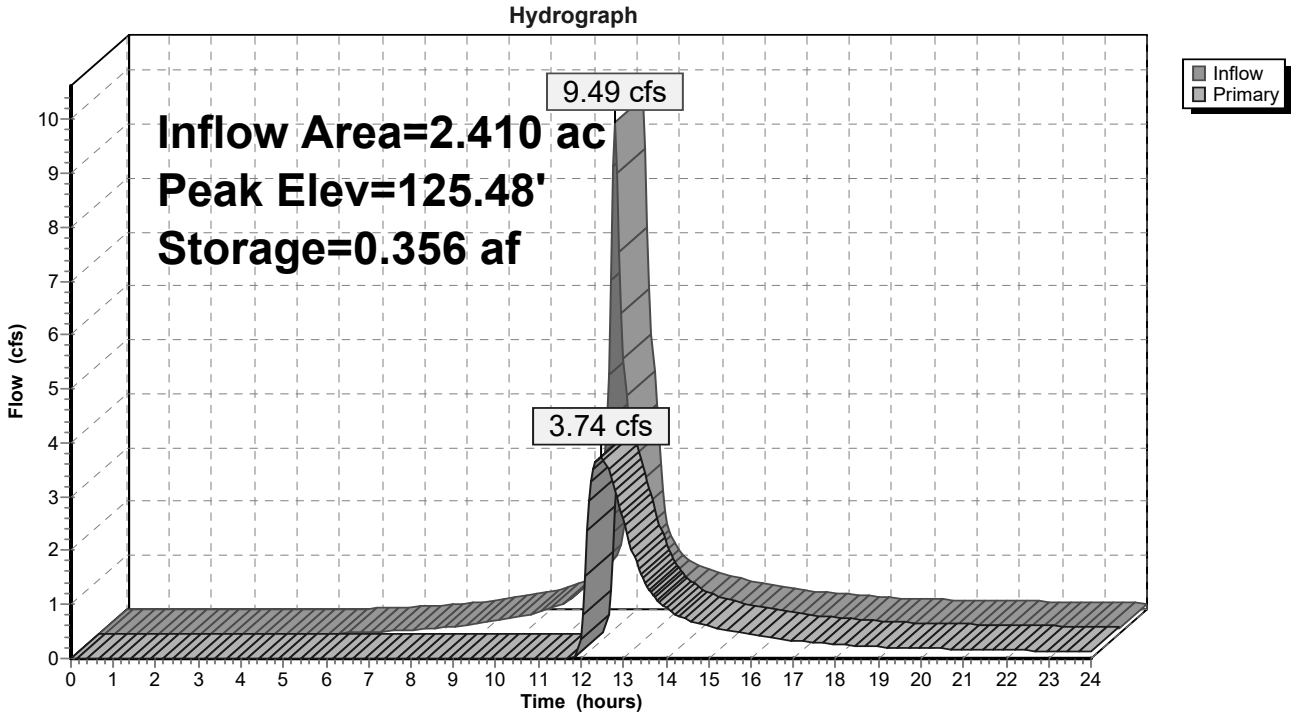
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.74 cfs @ 12.46 hrs HW=125.48' (Free Discharge)
1=Orifice/Grate (Orifice Controls 3.74 cfs @ 4.76 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 2.68" for 10-yr event
Inflow = 14.60 cfs @ 12.22 hrs, Volume= 1.404 af
Outflow = 11.62 cfs @ 12.36 hrs, Volume= 1.260 af, Atten= 20%, Lag= 8.1 min
Primary = 11.62 cfs @ 12.36 hrs, Volume= 1.260 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 102.60' @ 12.36 hrs Surf.Area= 5,507 sf Storage= 13,153 cf

Plug-Flow detention time= 78.5 min calculated for 1.257 af (90% of inflow)
Center-of-Mass det. time= 30.3 min (872.6 - 842.3)

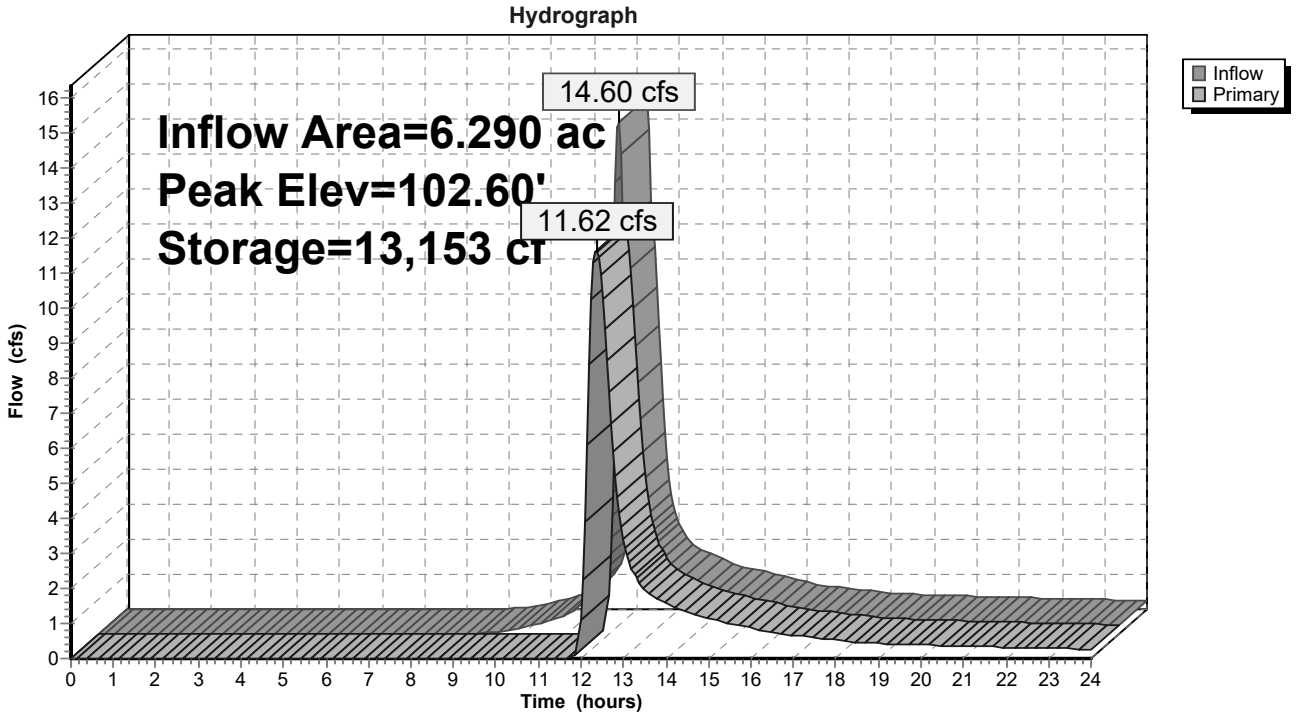
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=11.59 cfs @ 12.36 hrs HW=102.60' (Free Discharge)
1=Culvert (Inlet Controls 11.59 cfs @ 4.30 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond INFIL BASIN B3: INFIL BASIN B3

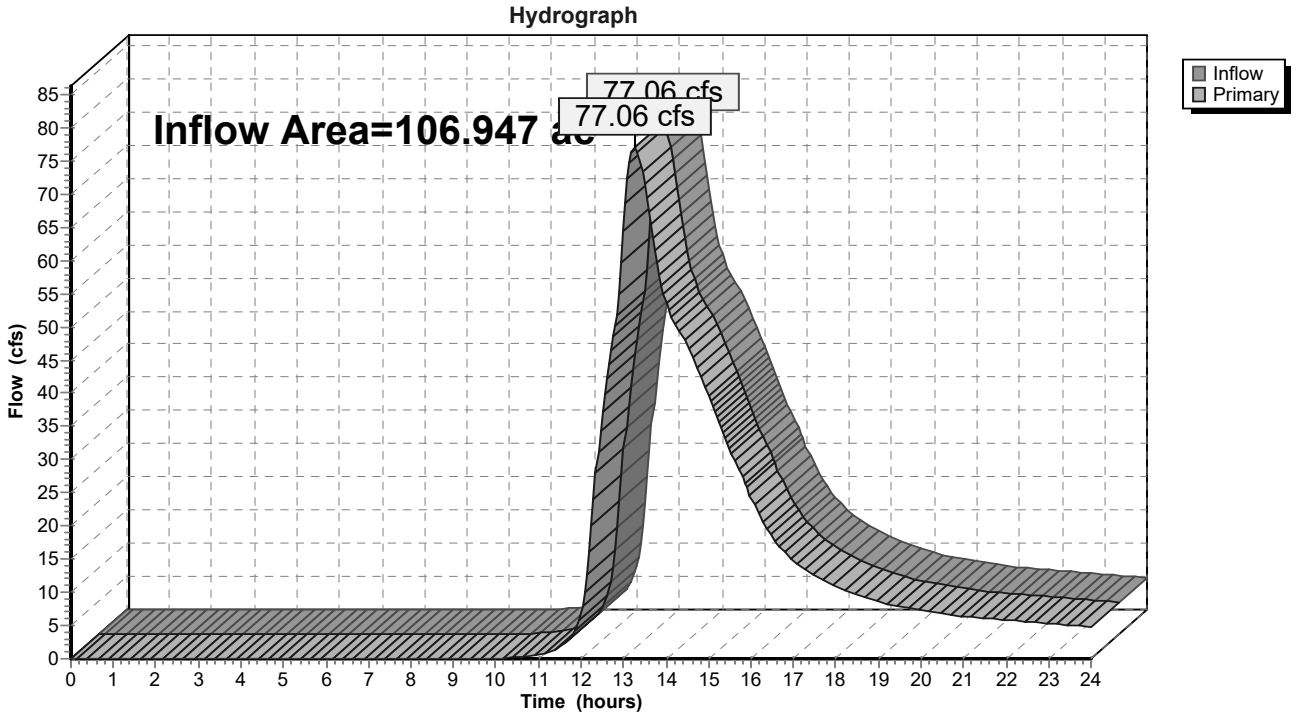


Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 2.38" for 10-yr event
Inflow = 77.06 cfs @ 13.27 hrs, Volume= 21.184 af
Primary = 77.06 cfs @ 13.27 hrs, Volume= 21.184 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1



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

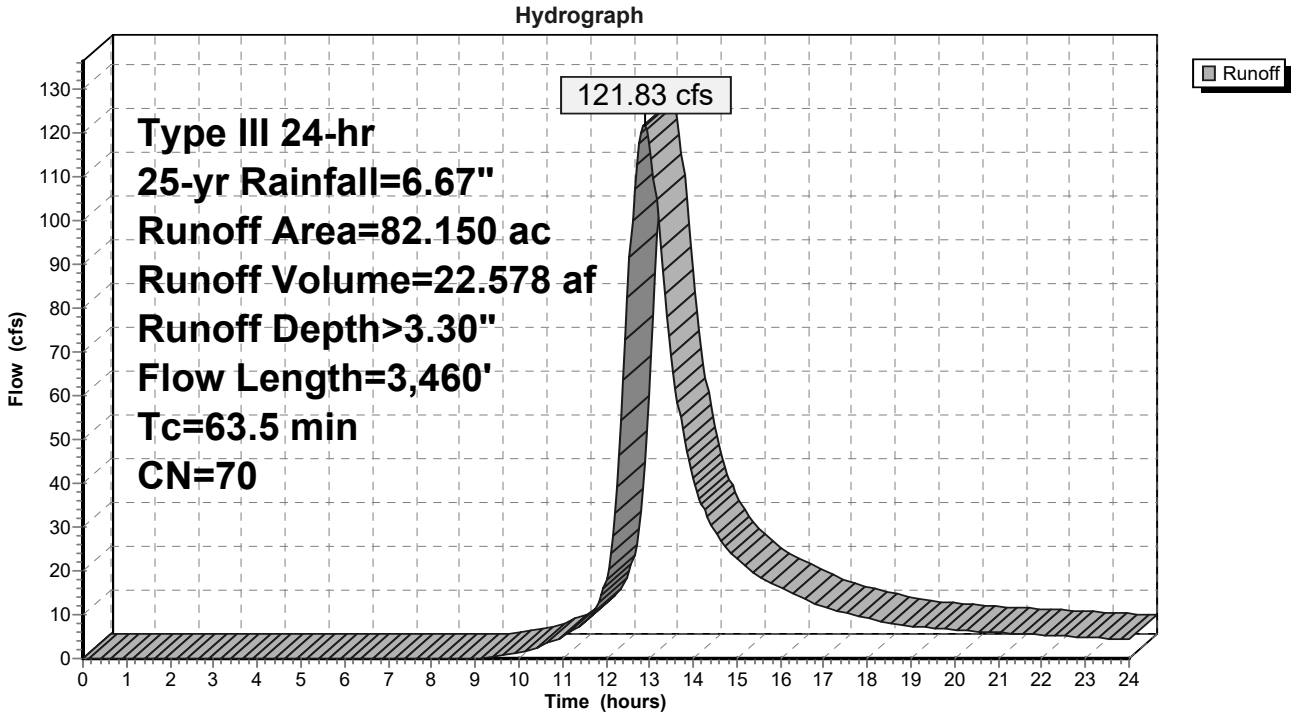
Runoff = 121.83 cfs @ 12.88 hrs, Volume= 22.578 af, Depth> 3.30"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

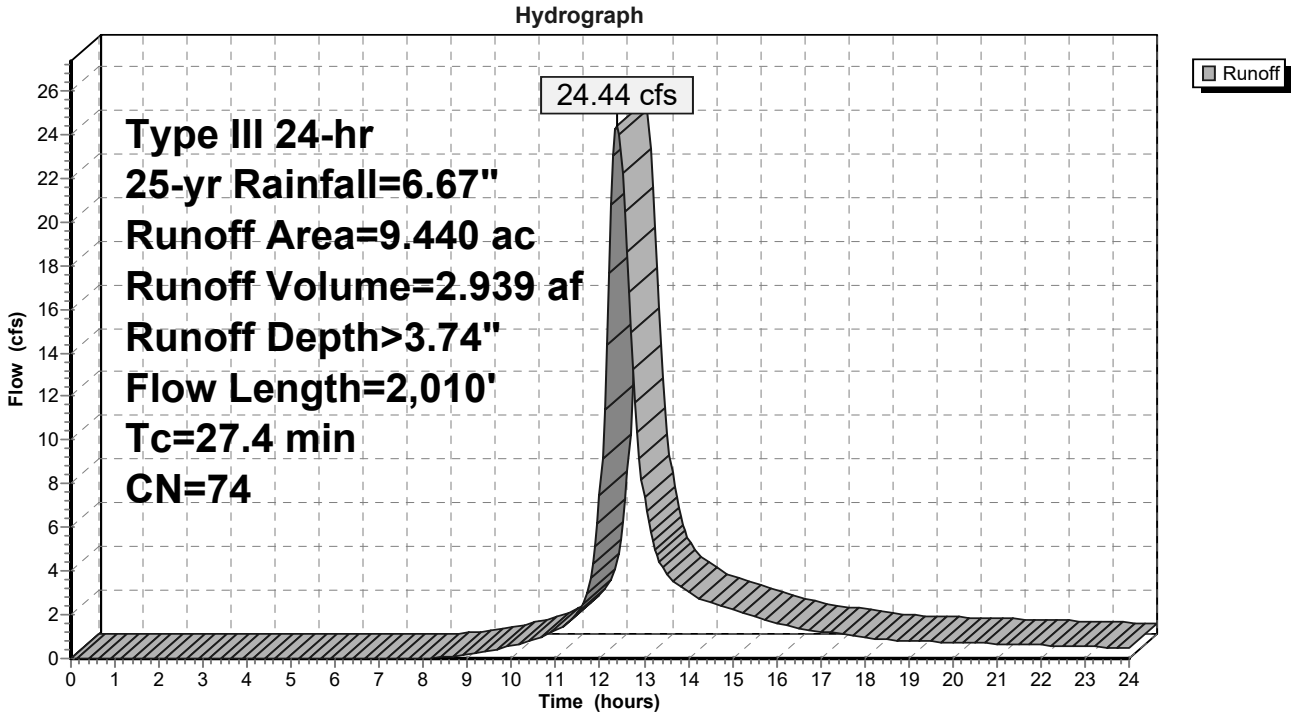
Runoff = 24.44 cfs @ 12.38 hrs, Volume= 2.939 af, Depth> 3.74"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

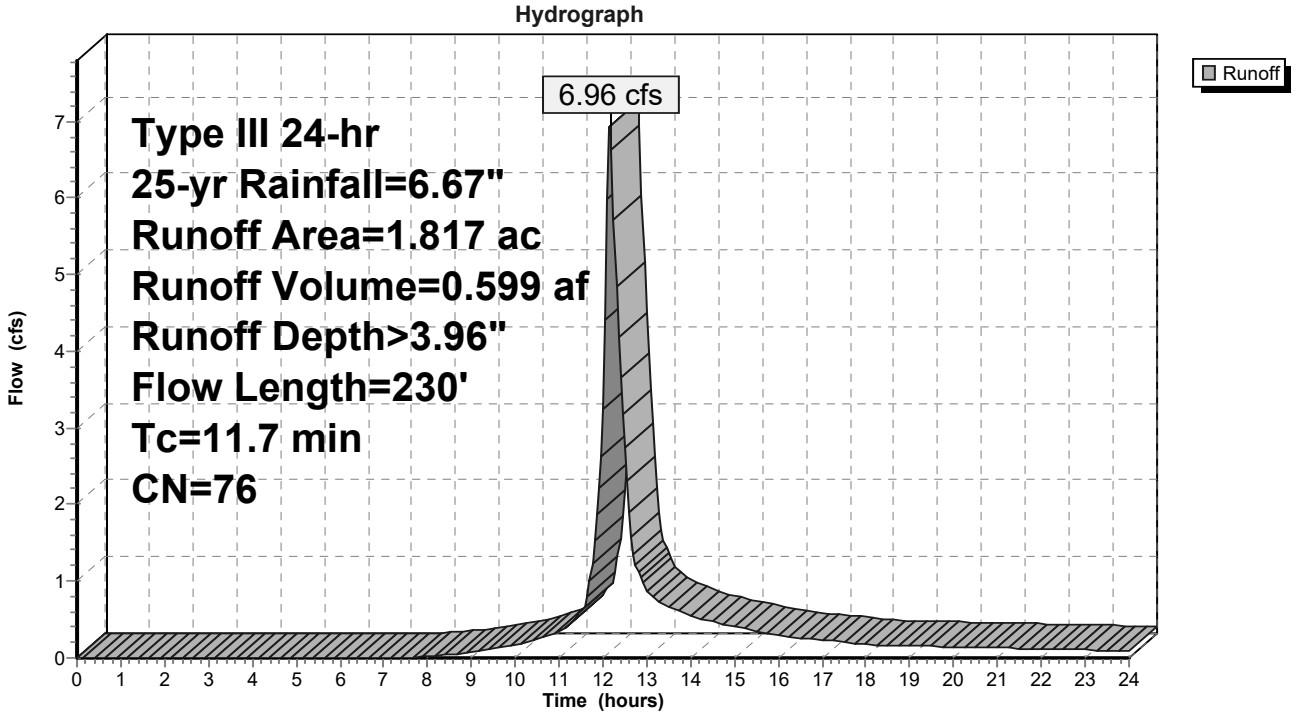
Runoff = 6.96 cfs @ 12.16 hrs, Volume= 0.599 af, Depth> 3.96"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

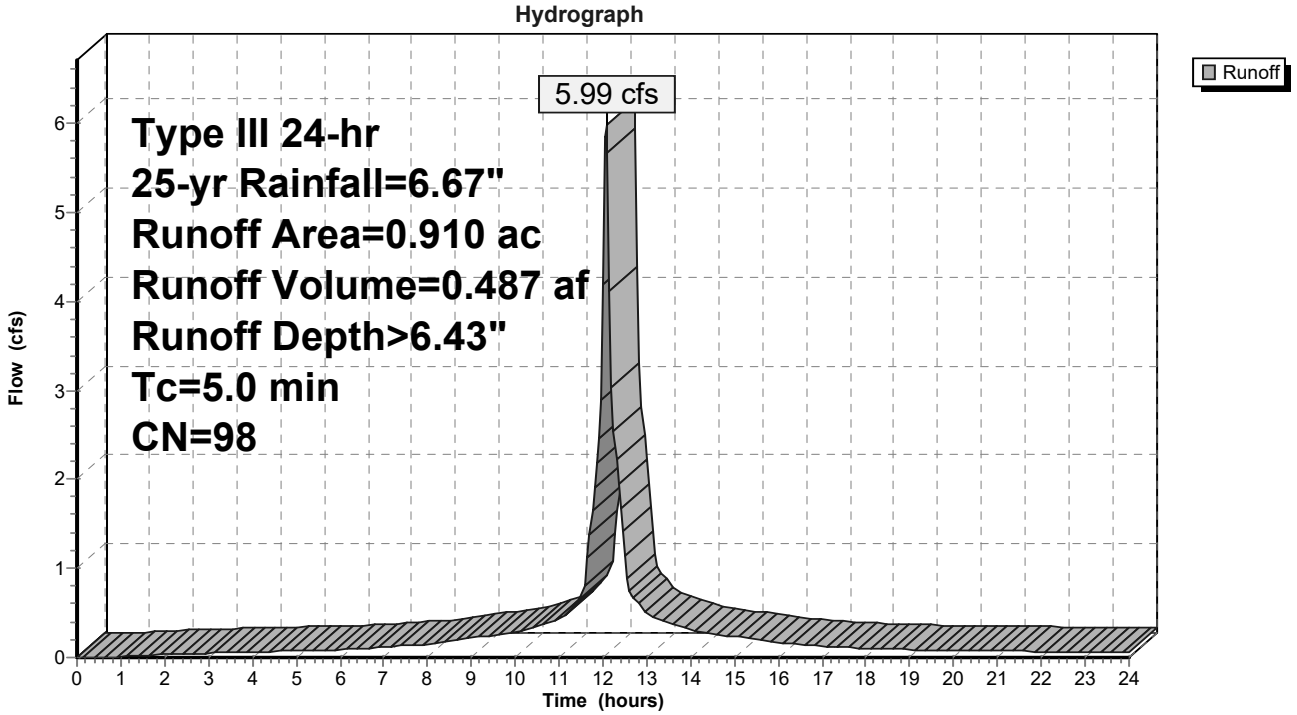
Runoff = 5.99 cfs @ 12.07 hrs, Volume= 0.487 af, Depth> 6.43"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

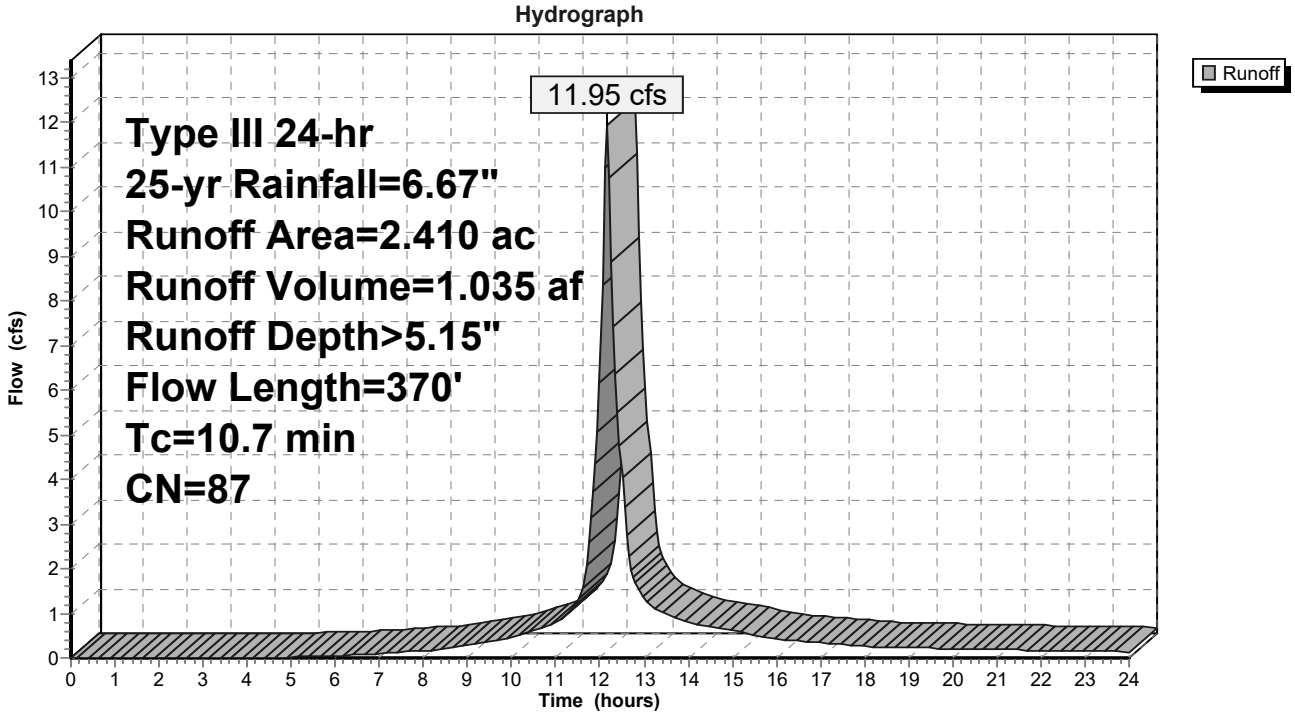
Runoff = 11.95 cfs @ 12.15 hrs, Volume= 1.035 af, Depth> 5.15"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

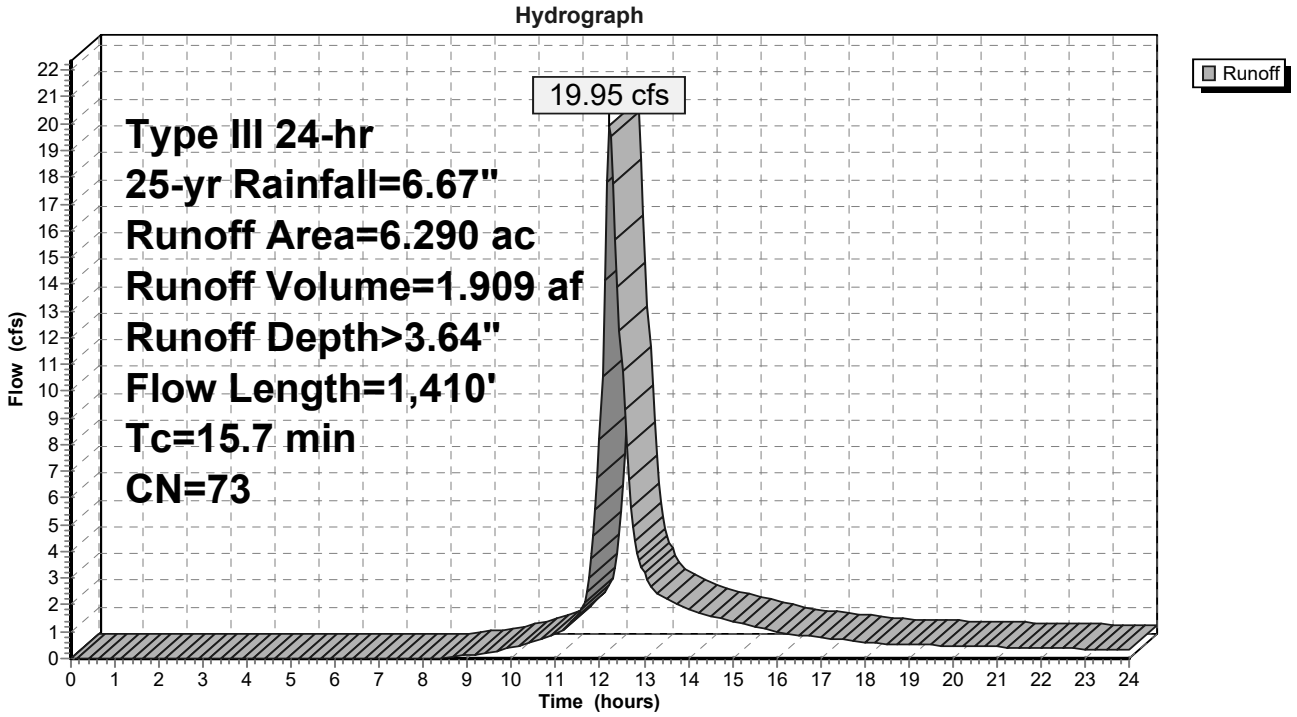
Runoff = 19.95 cfs @ 12.22 hrs, Volume= 1.909 af, Depth> 3.64"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

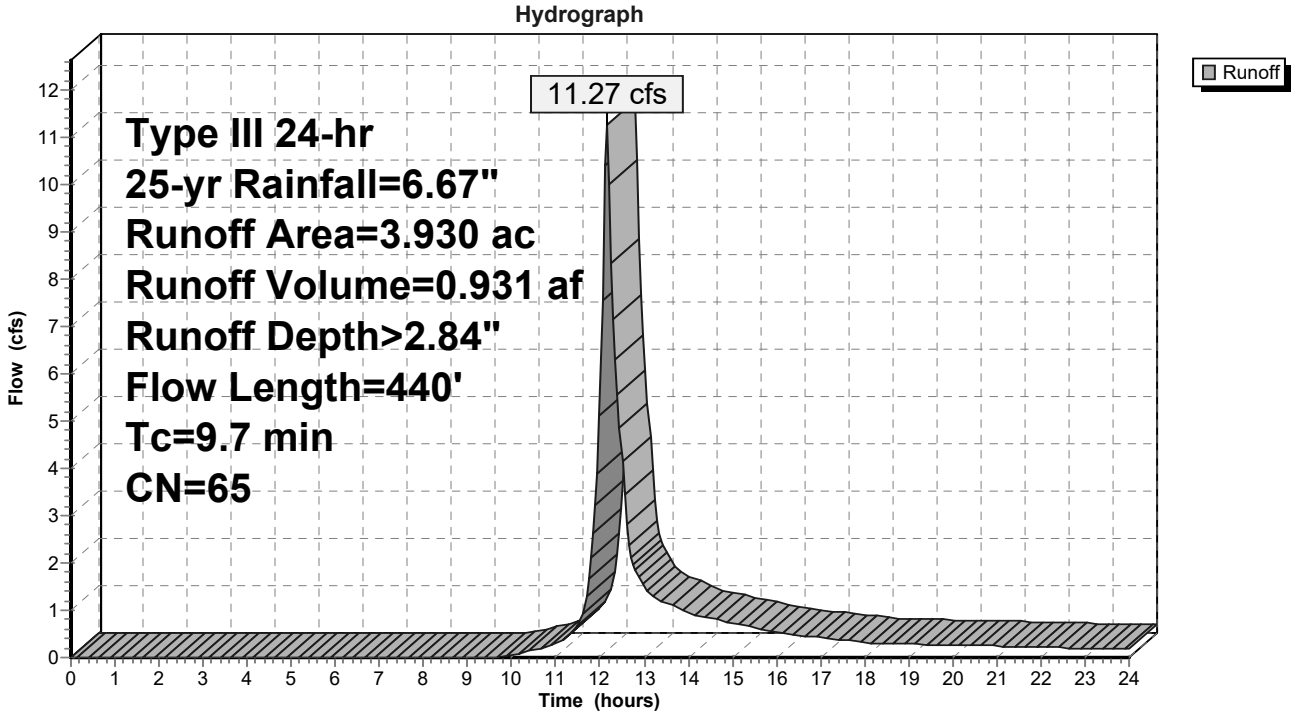
Runoff = 11.27 cfs @ 12.15 hrs, Volume= 0.931 af, Depth> 2.84"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 3.37" for 25-yr event
Inflow = 147.68 cfs @ 12.76 hrs, Volume= 30.053 af
Outflow = 131.78 cfs @ 13.05 hrs, Volume= 29.354 af, Atten= 11%, Lag= 17.4 min
Primary = 131.78 cfs @ 13.05 hrs, Volume= 29.354 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.02' @ 13.05 hrs Surf.Area= 1.537 ac Storage= 5.948 af

Plug-Flow detention time= 50.1 min calculated for 29.293 af (97% of inflow)
Center-of-Mass det. time= 37.8 min (907.3 - 869.5)

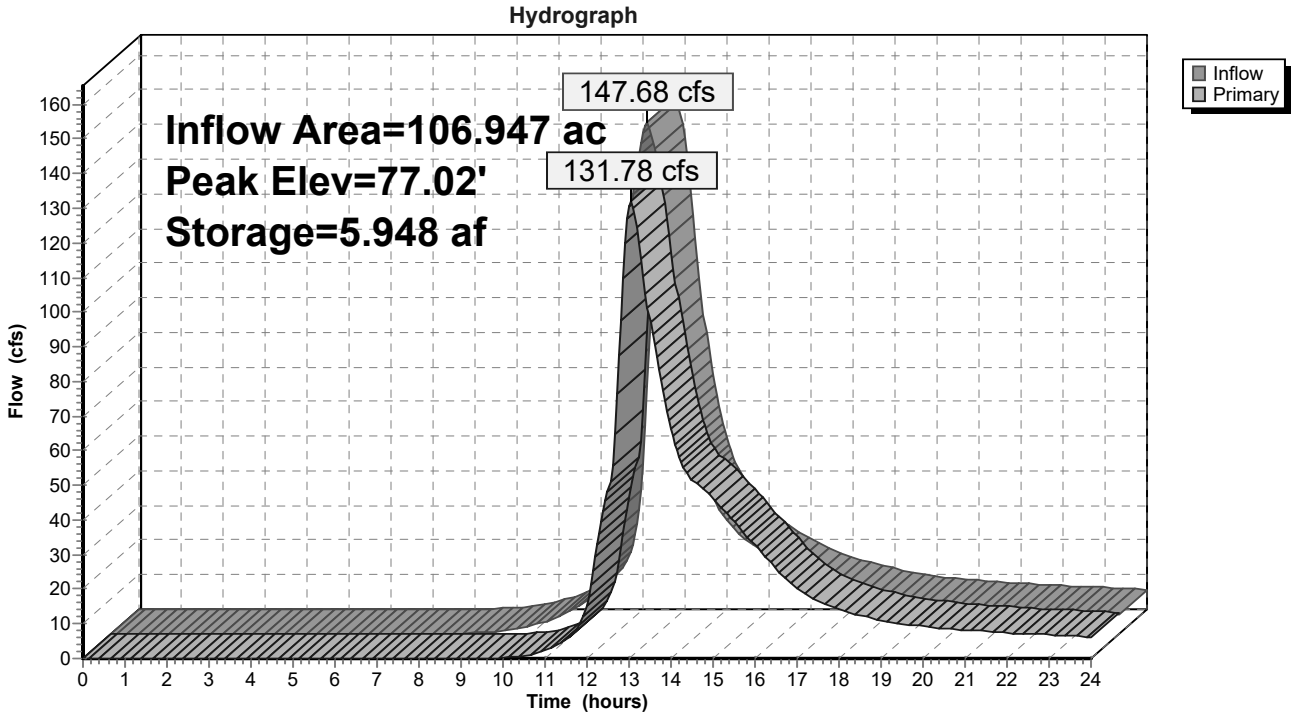
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=131.71 cfs @ 13.05 hrs HW=77.02' (Free Discharge)
- **1=Culvert** (Inlet Controls 62.18 cfs @ 9.90 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 57.72 cfs @ 2.86 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 11.81 cfs @ 1.40 fps)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 3.96" for 25-yr event
Inflow = 6.96 cfs @ 12.16 hrs, Volume= 0.599 af
Outflow = 4.98 cfs @ 12.30 hrs, Volume= 0.512 af, Atten= 28%, Lag= 8.0 min
Primary = 4.98 cfs @ 12.30 hrs, Volume= 0.512 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.44' @ 12.30 hrs Surf.Area= 0.085 ac Storage= 0.163 af

Plug-Flow detention time= 103.5 min calculated for 0.512 af (86% of inflow)
Center-of-Mass det. time= 41.3 min (864.8 - 823.5)

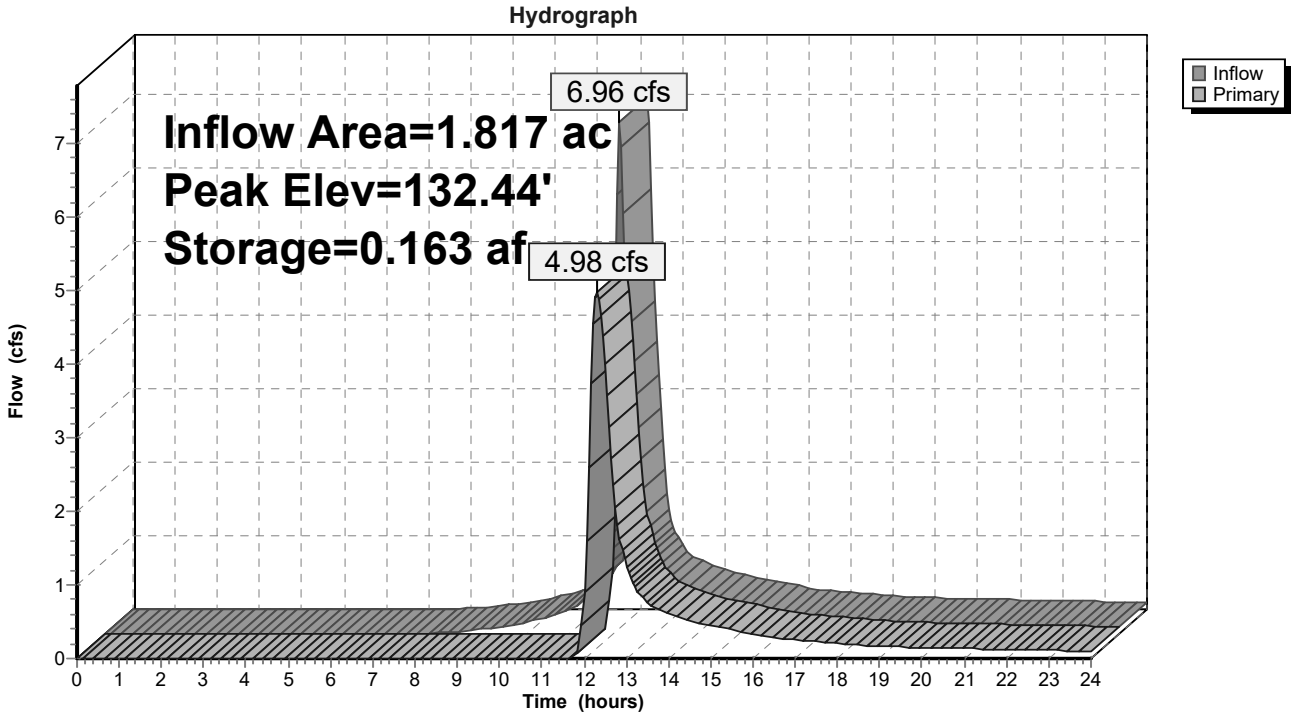
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.98 cfs @ 12.30 hrs HW=132.43' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 4.98 cfs @ 4.06 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 5.15" for 25-yr event
Inflow = 11.95 cfs @ 12.15 hrs, Volume= 1.035 af
Outflow = 4.83 cfs @ 12.45 hrs, Volume= 0.843 af, Atten= 60%, Lag= 17.9 min
Primary = 4.83 cfs @ 12.45 hrs, Volume= 0.843 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 126.13' @ 12.45 hrs Surf.Area= 0.160 ac Storage= 0.431 af

Plug-Flow detention time= 142.2 min calculated for 0.841 af (81% of inflow)
Center-of-Mass det. time= 71.9 min (866.3 - 794.4)

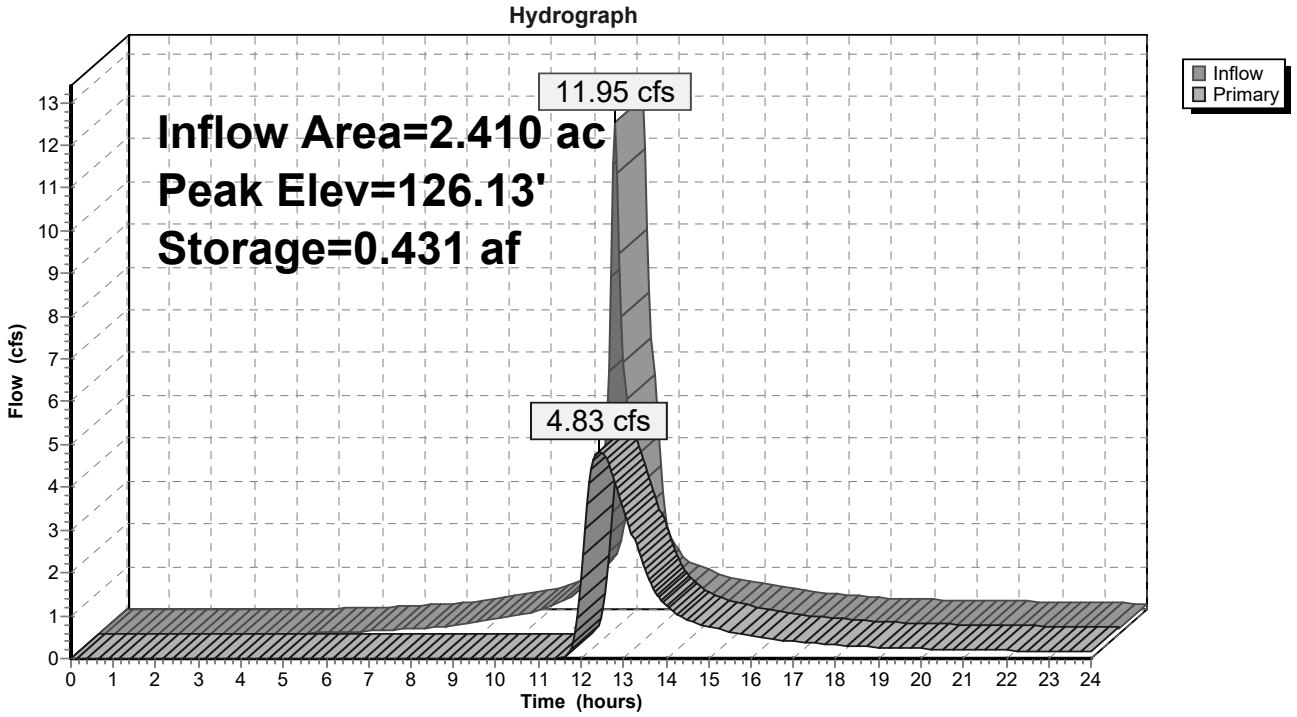
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.83 cfs @ 12.45 hrs HW=126.13' (Free Discharge)
1=Orifice/Grate (Orifice Controls 4.83 cfs @ 6.15 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 3.64" for 25-yr event
Inflow = 19.95 cfs @ 12.22 hrs, Volume= 1.909 af
Outflow = 15.60 cfs @ 12.36 hrs, Volume= 1.762 af, Atten= 22%, Lag= 8.3 min
Primary = 15.60 cfs @ 12.36 hrs, Volume= 1.762 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 103.06' @ 12.36 hrs Surf.Area= 5,918 sf Storage= 15,792 cf

Plug-Flow detention time= 64.6 min calculated for 1.758 af (92% of inflow)
Center-of-Mass det. time= 26.4 min (859.9 - 833.5)

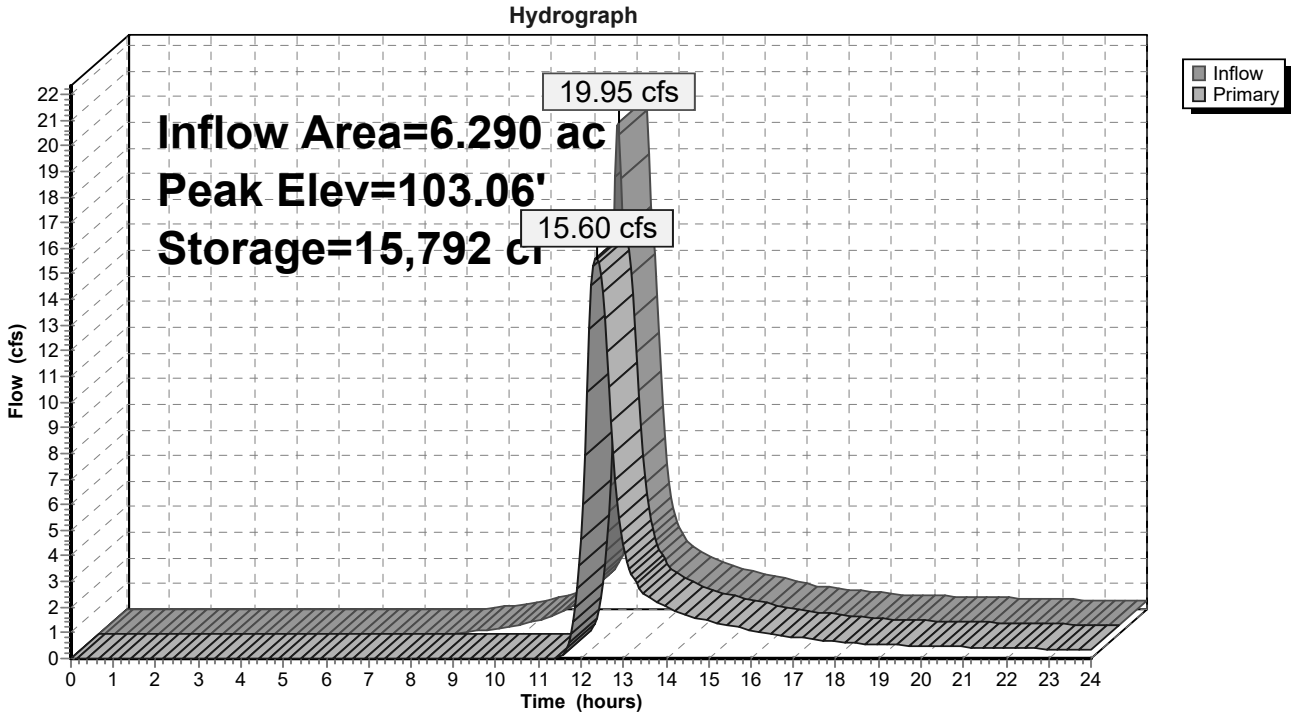
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=15.57 cfs @ 12.36 hrs HW=103.06' (Free Discharge)
1=Culvert (Inlet Controls 15.57 cfs @ 4.96 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond INFIL BASIN B3: INFIL BASIN B3

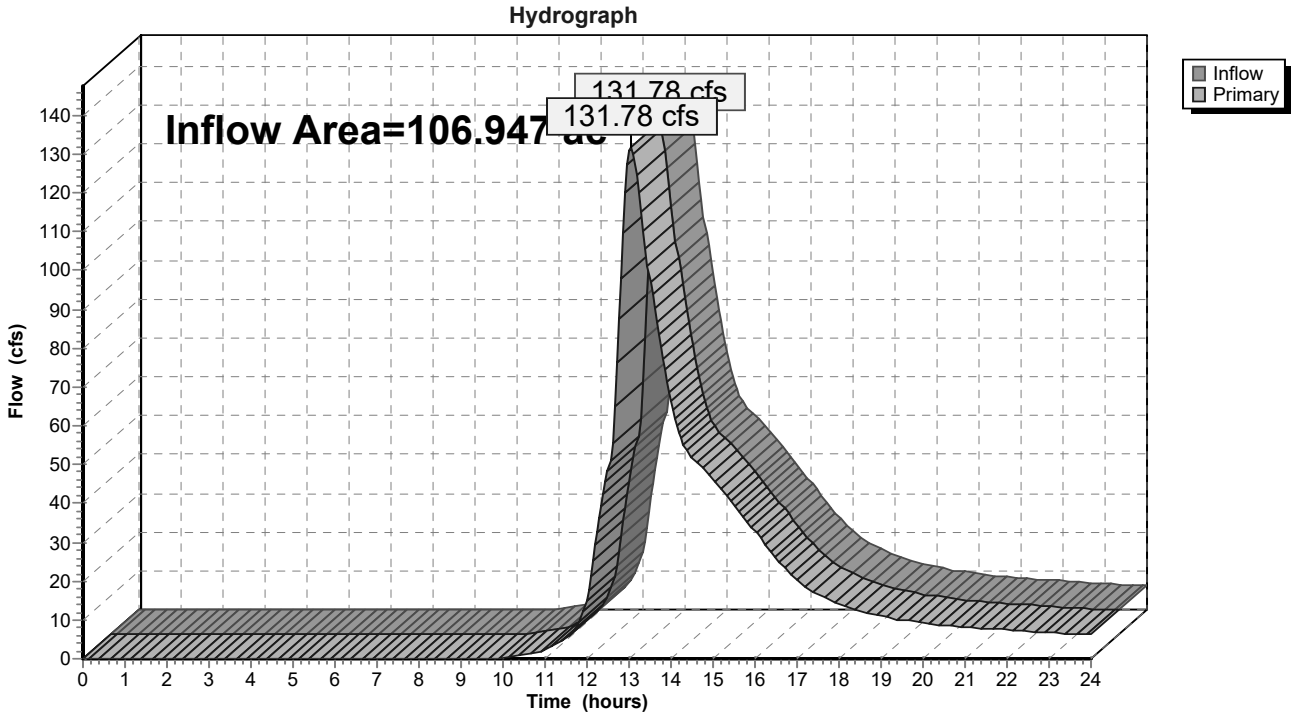


Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 3.29" for 25-yr event
Inflow = 131.78 cfs @ 13.05 hrs, Volume= 29.354 af
Primary = 131.78 cfs @ 13.05 hrs, Volume= 29.354 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1



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

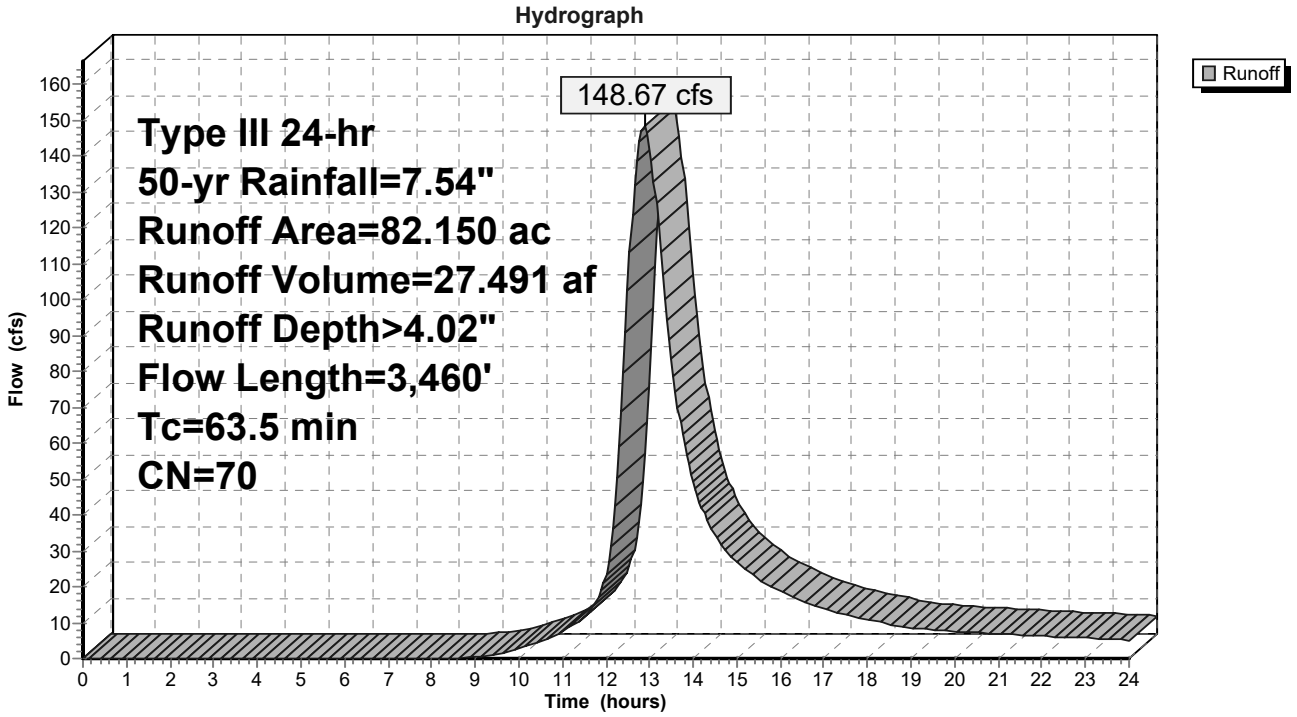
Runoff = 148.67 cfs @ 12.87 hrs, Volume= 27.491 af, Depth> 4.02"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

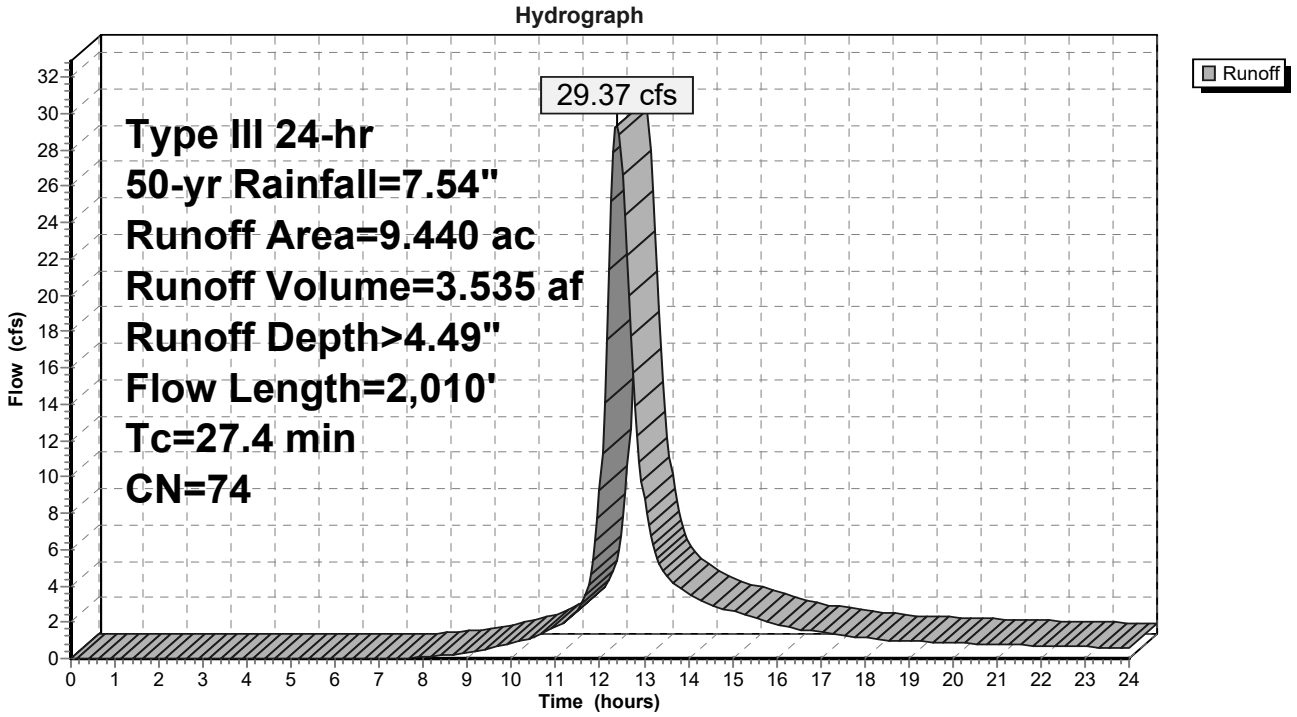
Runoff = 29.37 cfs @ 12.38 hrs, Volume= 3.535 af, Depth> 4.49"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

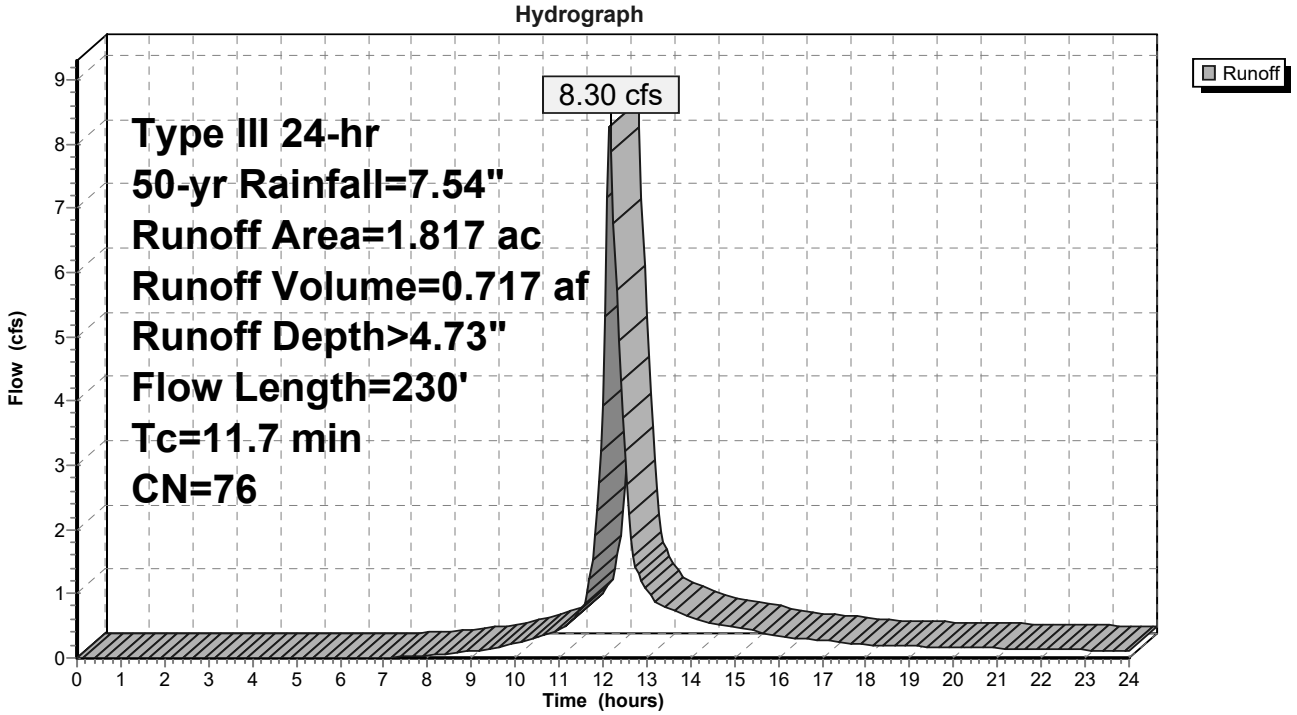
Runoff = 8.30 cfs @ 12.16 hrs, Volume= 0.717 af, Depth> 4.73"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

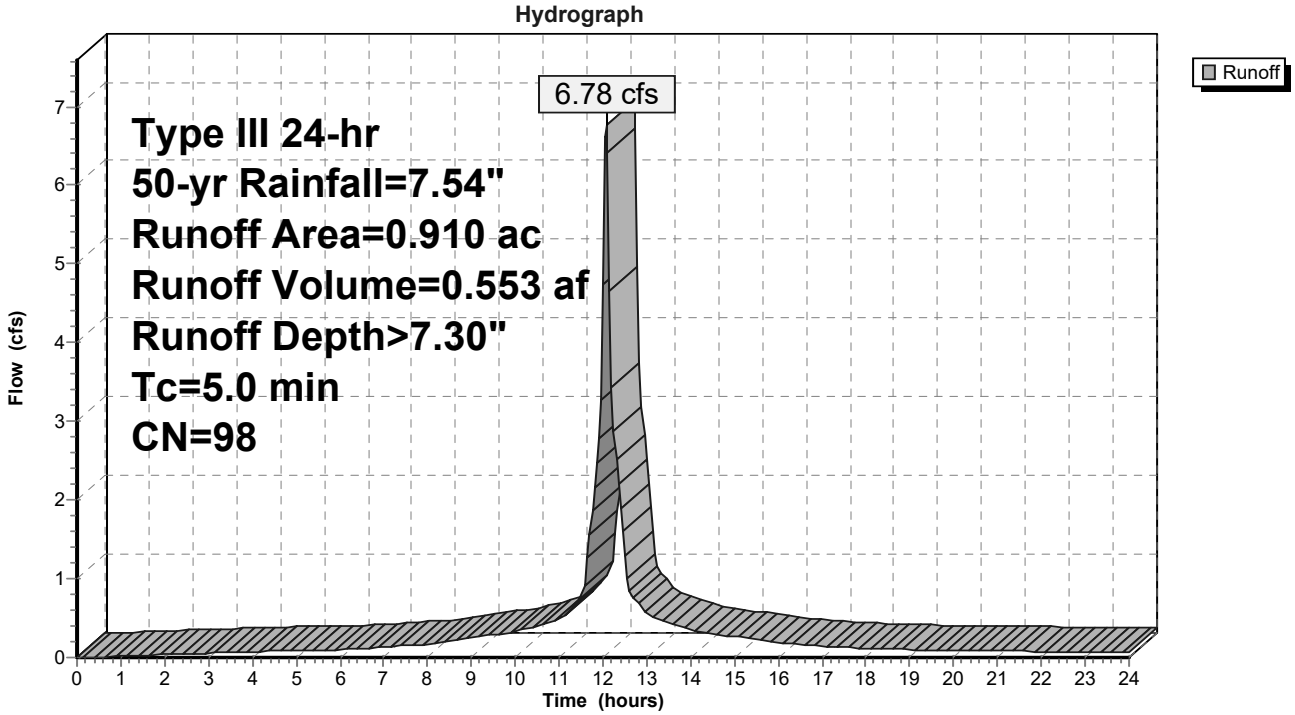
Runoff = 6.78 cfs @ 12.07 hrs, Volume= 0.553 af, Depth> 7.30"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

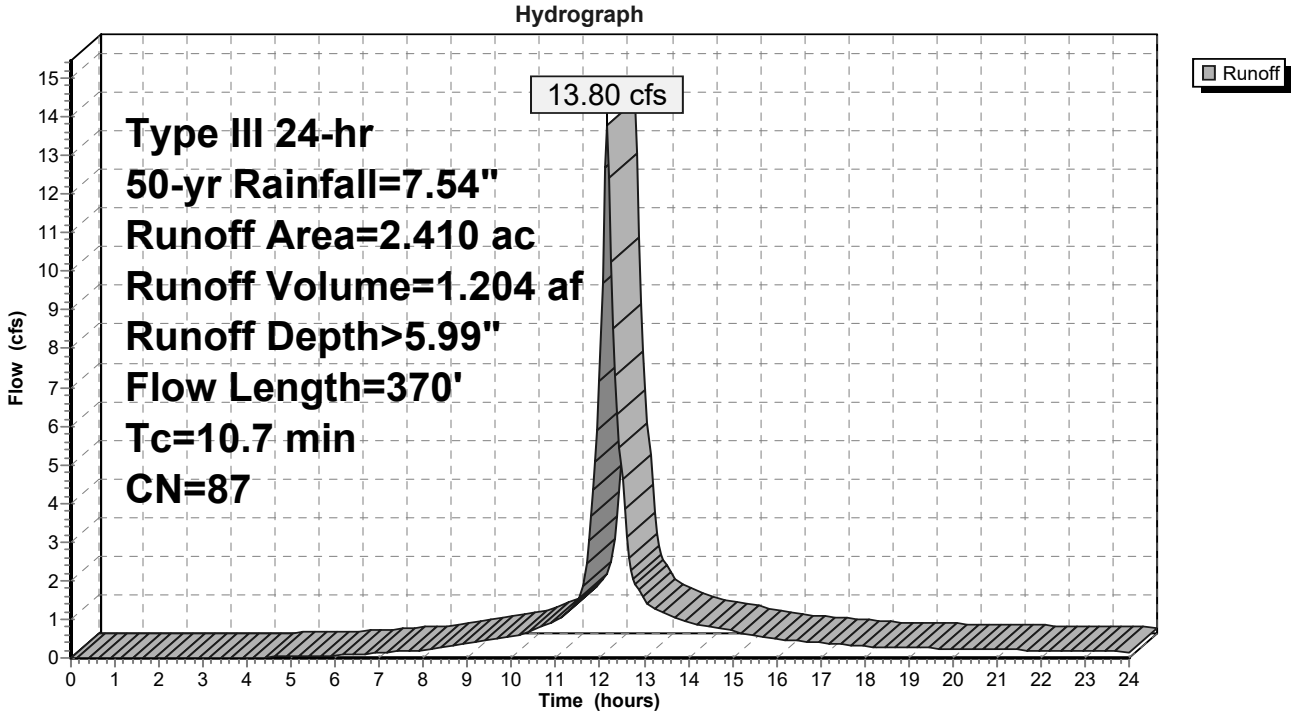
Runoff = 13.80 cfs @ 12.15 hrs, Volume= 1.204 af, Depth> 5.99"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

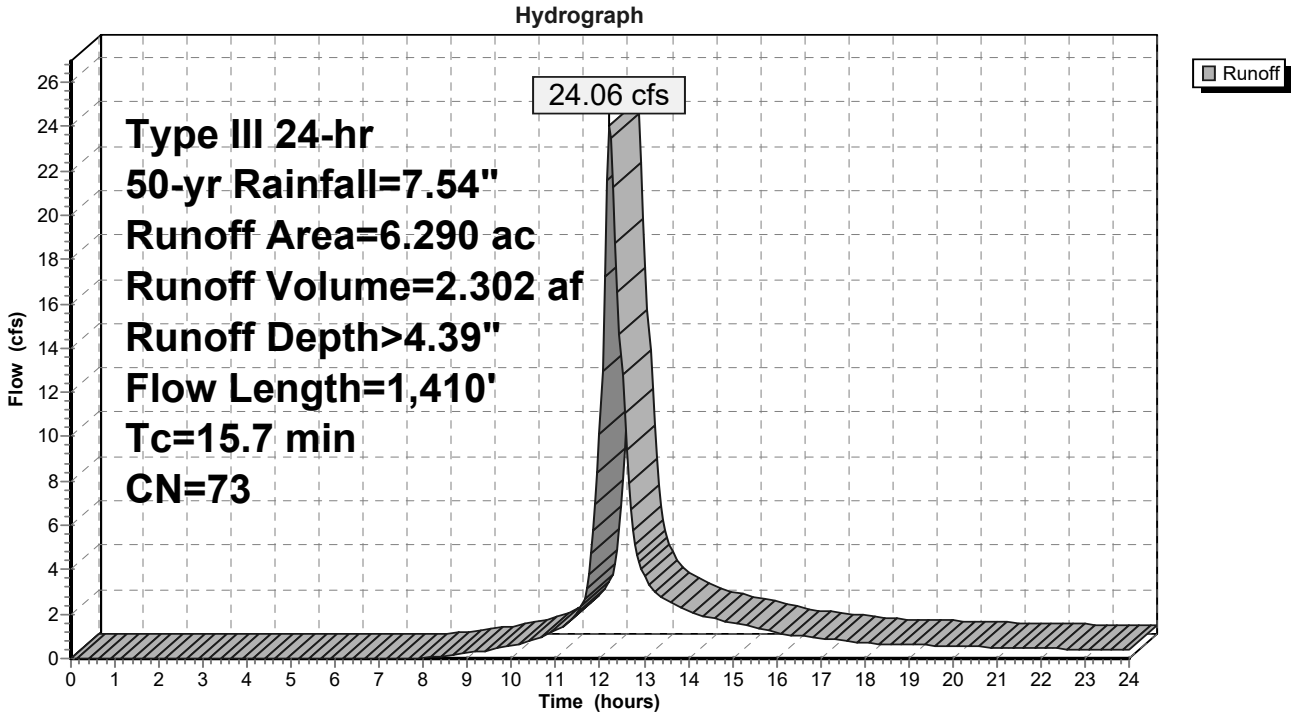
Runoff = 24.06 cfs @ 12.22 hrs, Volume= 2.302 af, Depth> 4.39"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

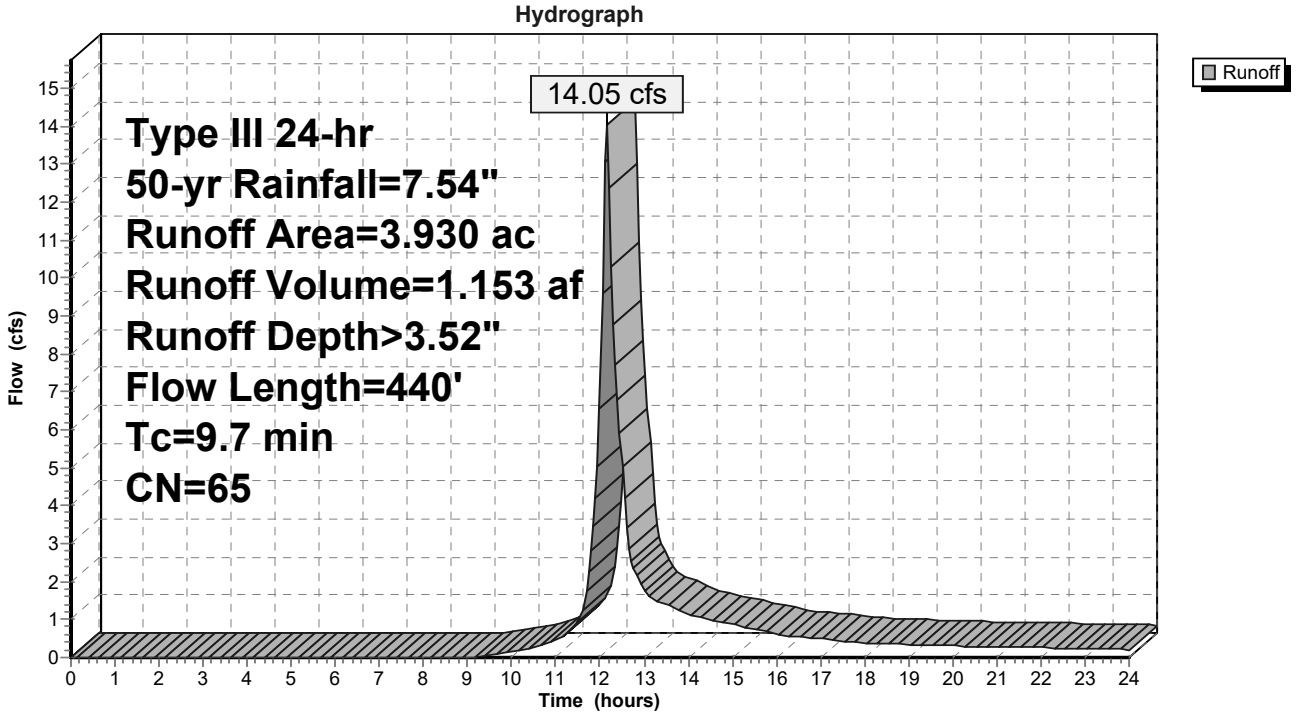
Runoff = 14.05 cfs @ 12.14 hrs, Volume= 1.153 af, Depth> 3.52"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 4.10" for 50-yr event
Inflow = 180.41 cfs @ 12.75 hrs, Volume= 36.524 af
Outflow = 171.13 cfs @ 12.94 hrs, Volume= 35.766 af, Atten= 5%, Lag= 11.8 min
Primary = 171.13 cfs @ 12.94 hrs, Volume= 35.766 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.26' @ 12.94 hrs Surf.Area= 1.590 ac Storage= 6.315 af

Plug-Flow detention time= 46.3 min calculated for 35.766 af (98% of inflow)
Center-of-Mass det. time= 35.2 min (899.3 - 864.1)

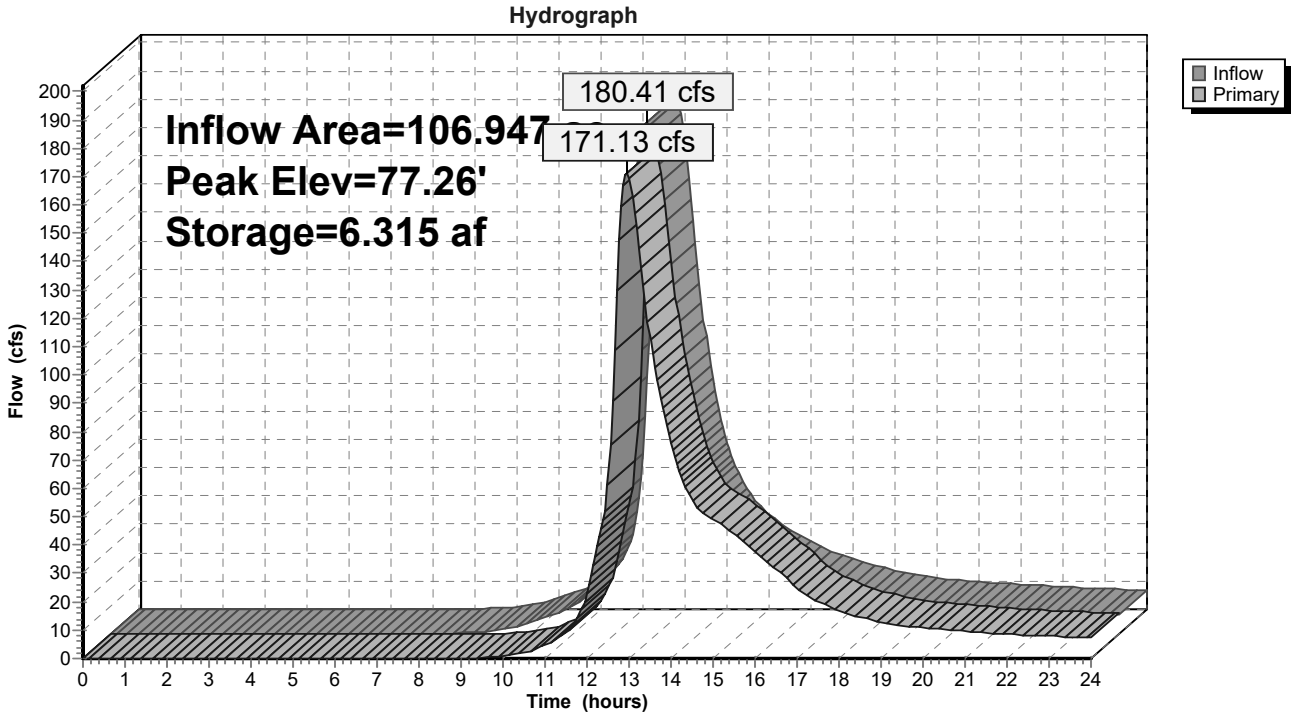
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=171.01 cfs @ 12.94 hrs HW=77.26' (Free Discharge)
- **1=Culvert** (Inlet Controls 63.88 cfs @ 10.17 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 76.62 cfs @ 3.08 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 30.51 cfs @ 1.91 fps)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 4.73" for 50-yr event
Inflow = 8.30 cfs @ 12.16 hrs, Volume= 0.717 af
Outflow = 5.97 cfs @ 12.29 hrs, Volume= 0.629 af, Atten= 28%, Lag= 7.8 min
Primary = 5.97 cfs @ 12.29 hrs, Volume= 0.629 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.75' @ 12.29 hrs Surf.Area= 0.085 ac Storage= 0.180 af

Plug-Flow detention time= 92.6 min calculated for 0.628 af (88% of inflow)
Center-of-Mass det. time= 38.0 min (856.4 - 818.4)

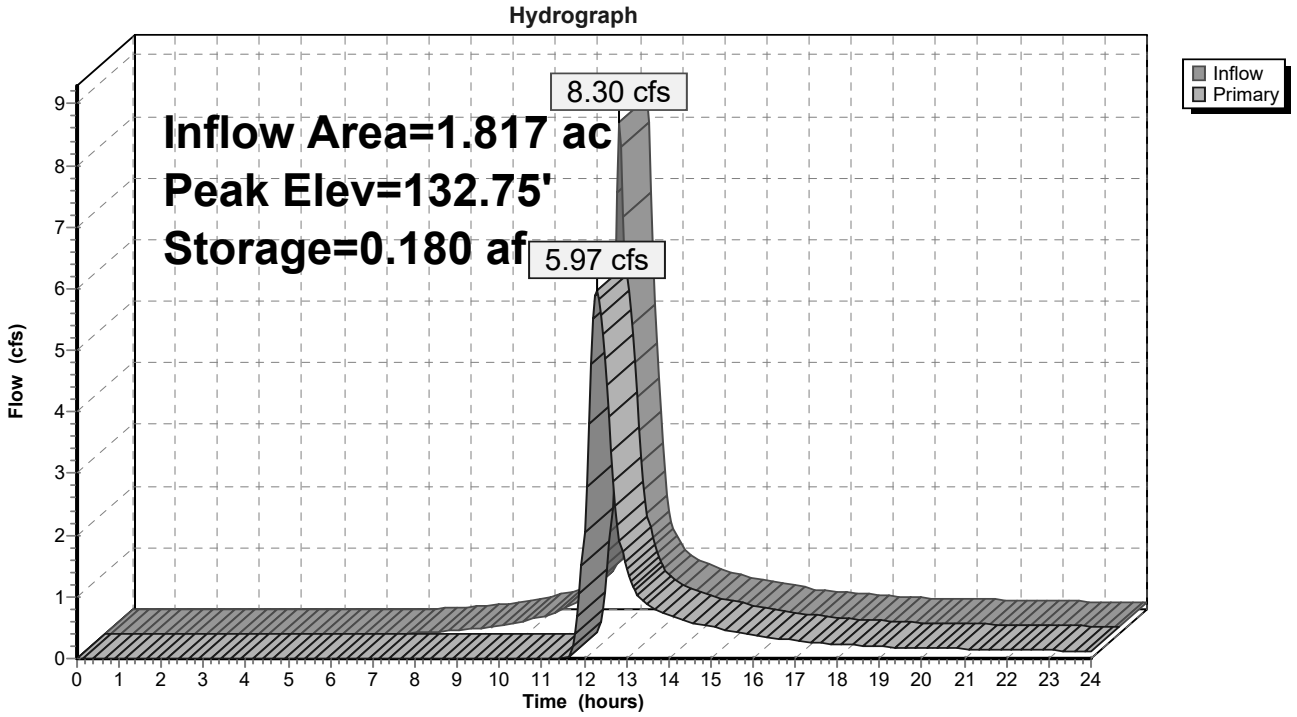
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.96 cfs @ 12.29 hrs HW=132.74' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 5.96 cfs @ 4.85 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 5.99" for 50-yr event
Inflow = 13.80 cfs @ 12.15 hrs, Volume= 1.204 af
Outflow = 5.56 cfs @ 12.44 hrs, Volume= 1.010 af, Atten= 60%, Lag= 17.9 min
Primary = 5.56 cfs @ 12.44 hrs, Volume= 1.010 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 126.67' @ 12.44 hrs Surf.Area= 0.160 ac Storage= 0.484 af

Plug-Flow detention time= 135.0 min calculated for 1.010 af (84% of inflow)
Center-of-Mass det. time= 69.7 min (860.0 - 790.3)

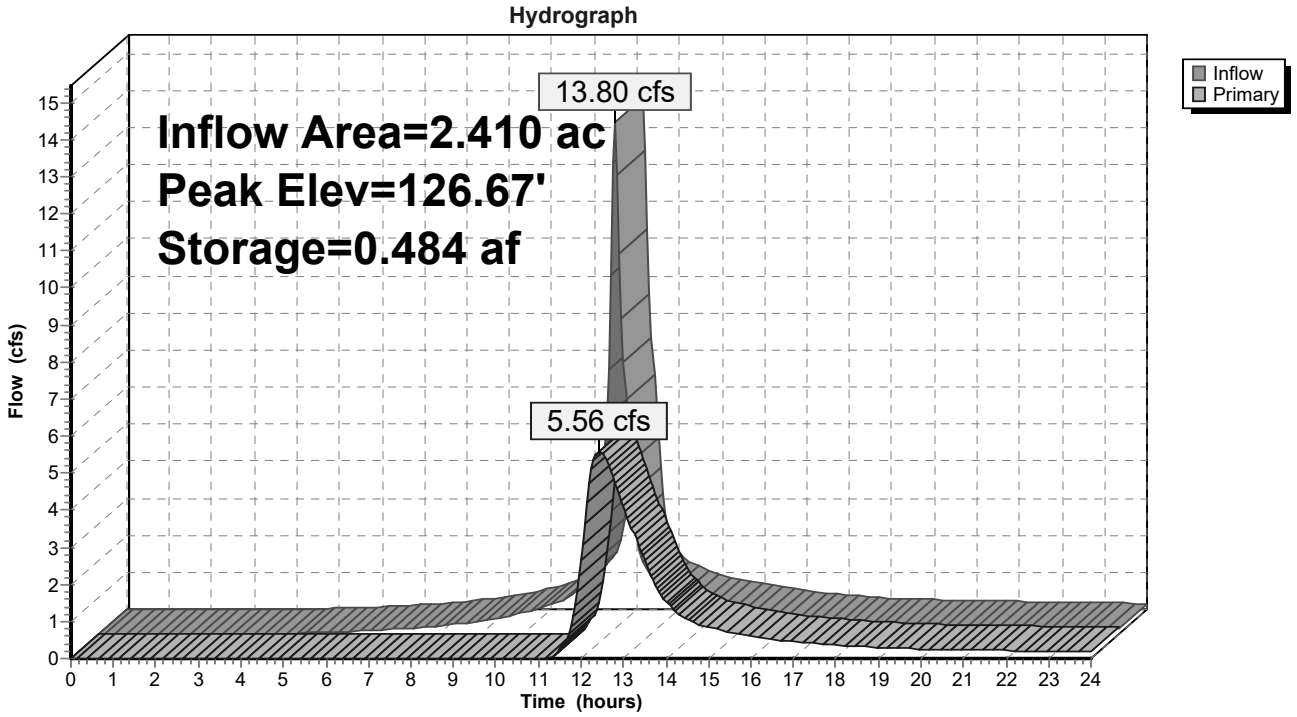
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.56 cfs @ 12.44 hrs HW=126.66' (Free Discharge)
1=Orifice/Grate (Orifice Controls 5.56 cfs @ 7.08 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 4.39" for 50-yr event
Inflow = 24.06 cfs @ 12.22 hrs, Volume= 2.302 af
Outflow = 18.18 cfs @ 12.37 hrs, Volume= 2.153 af, Atten= 24%, Lag= 8.9 min
Primary = 18.18 cfs @ 12.37 hrs, Volume= 2.153 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 103.44' @ 12.37 hrs Surf.Area= 6,269 sf Storage= 18,112 cf

Plug-Flow detention time= 58.3 min calculated for 2.153 af (94% of inflow)
Center-of-Mass det. time= 24.8 min (853.0 - 828.2)

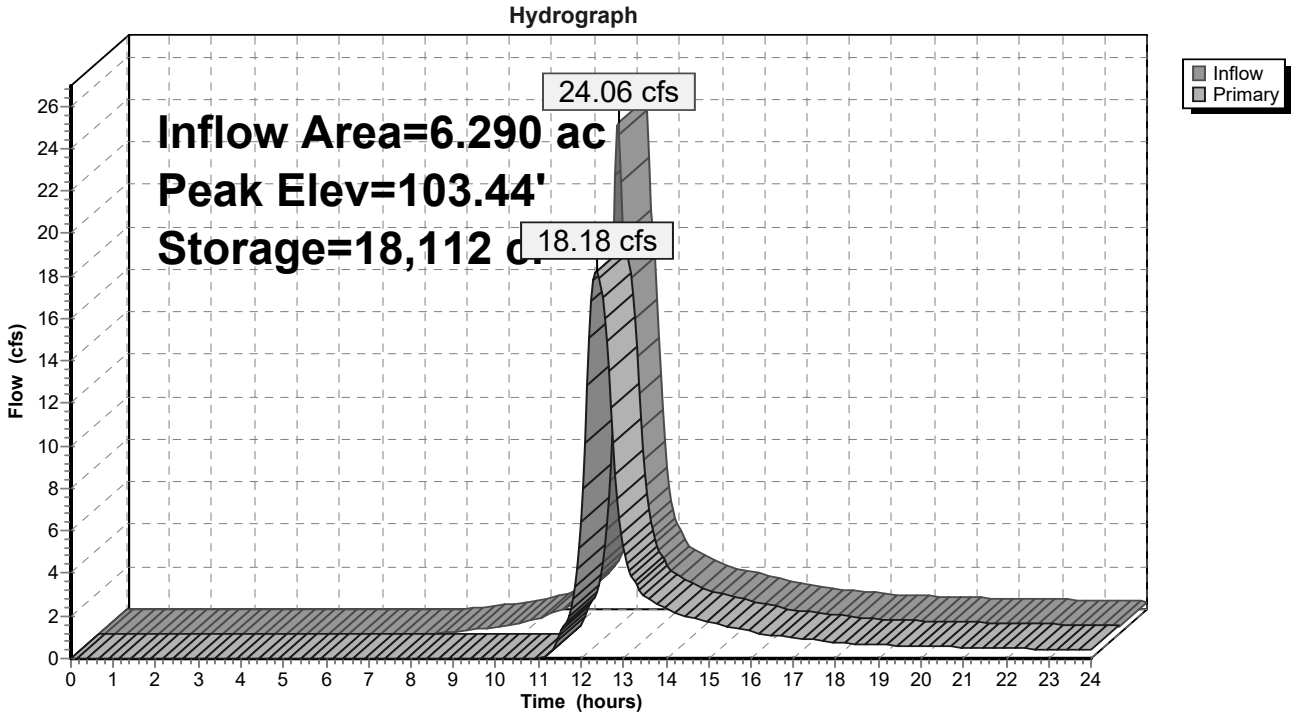
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=18.13 cfs @ 12.37 hrs HW=103.44' (Free Discharge)
1=Culvert (Inlet Controls 18.13 cfs @ 5.77 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond INFIL BASIN B3: INFIL BASIN B3

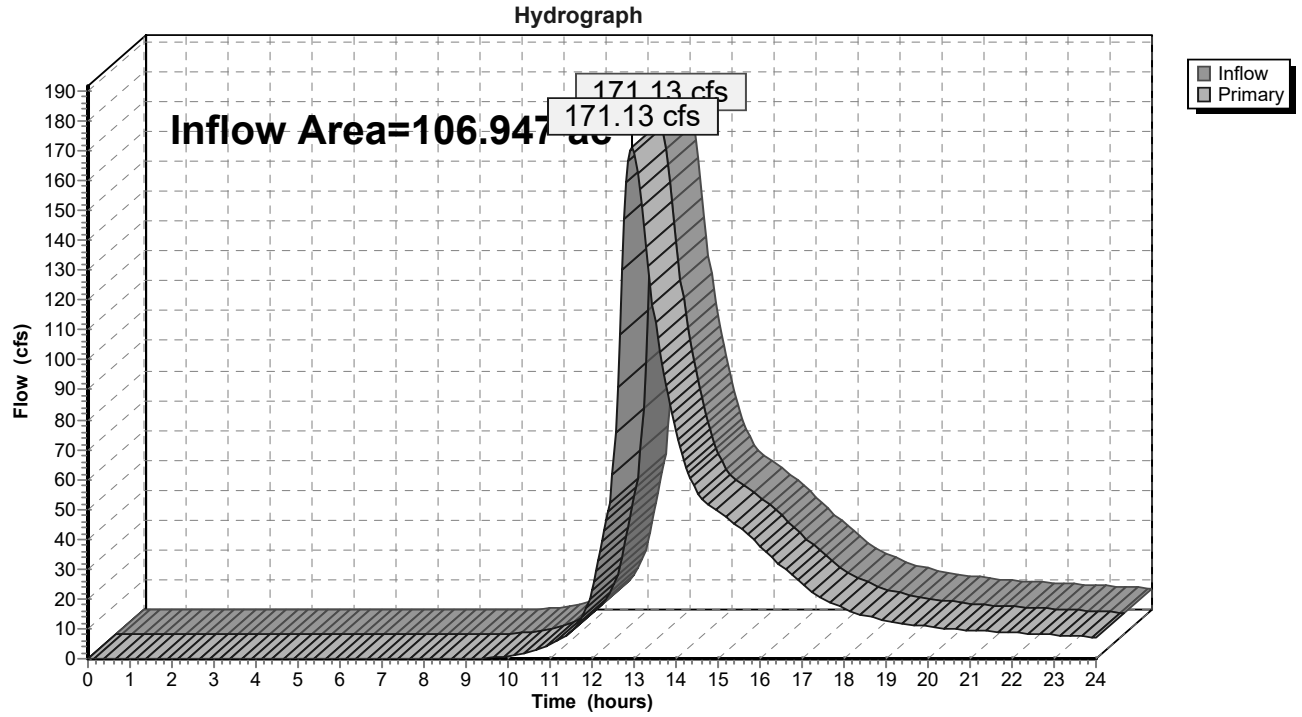


Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 4.01" for 50-yr event
Inflow = 171.13 cfs @ 12.94 hrs, Volume= 35.766 af
Primary = 171.13 cfs @ 12.94 hrs, Volume= 35.766 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1



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

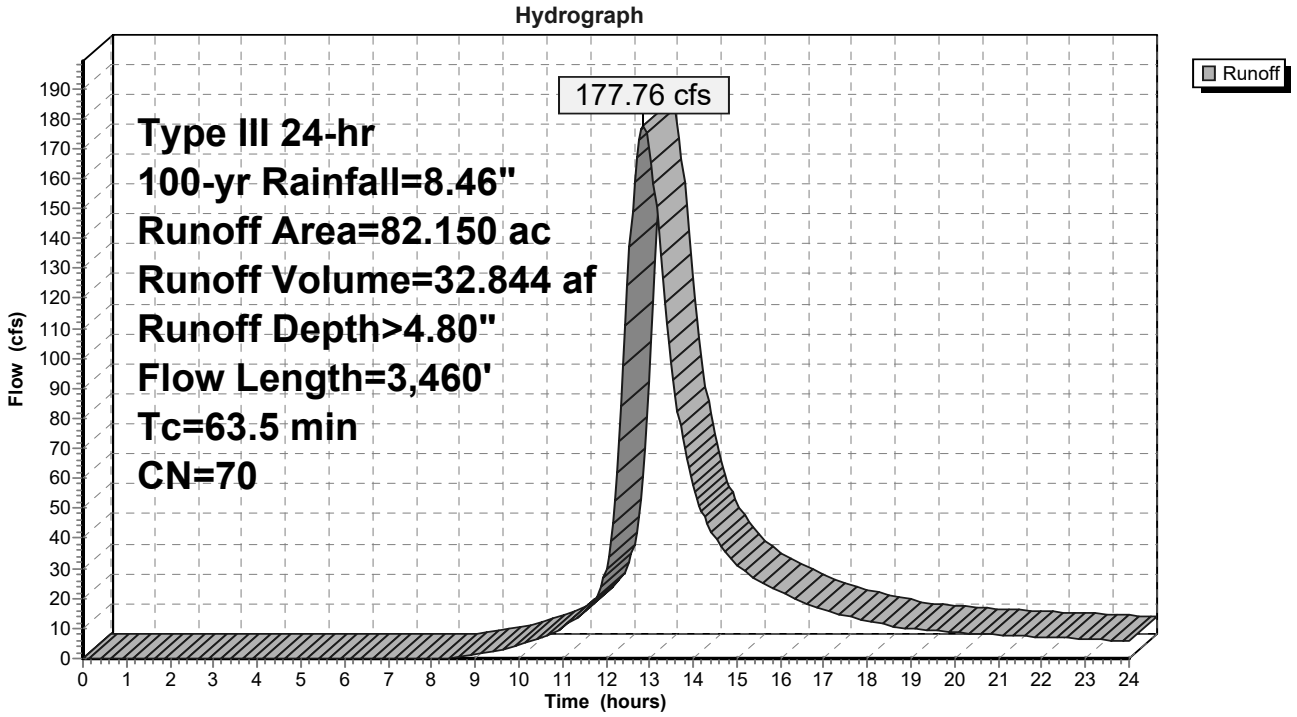
Runoff = 177.76 cfs @ 12.87 hrs, Volume= 32.844 af, Depth> 4.80"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
40.280	68	1 acre lots, 20% imp, HSG B
27.540	79	1 acre lots, 20% imp, HSG C
0.180	98	Paved parking, HSG B
11.690	55	Woods, Good, HSG B
0.120	61	>75% Grass cover, Good, HSG B
0.620	98	Paved parking, HSG C
1.450	70	Woods, Good, HSG C
0.270	74	>75% Grass cover, Good, HSG C
82.150	70	Weighted Average
67.786		82.51% Pervious Area
14.364		17.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.3	200	0.0100	0.07		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	130	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Concentrated Forest** Woodland Kv= 5.0 fps
3.4	630	0.0230	3.08		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
4.6	2,300	0.0510	8.39	83.90	**Channel Flow, Channel Flow Wooded** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
63.5	3,460	Total			

Subcatchment PR-DA 1A: PR-DA 1A



Summary for Subcatchment PR-DA 1B-ND: PR-DA 1BND

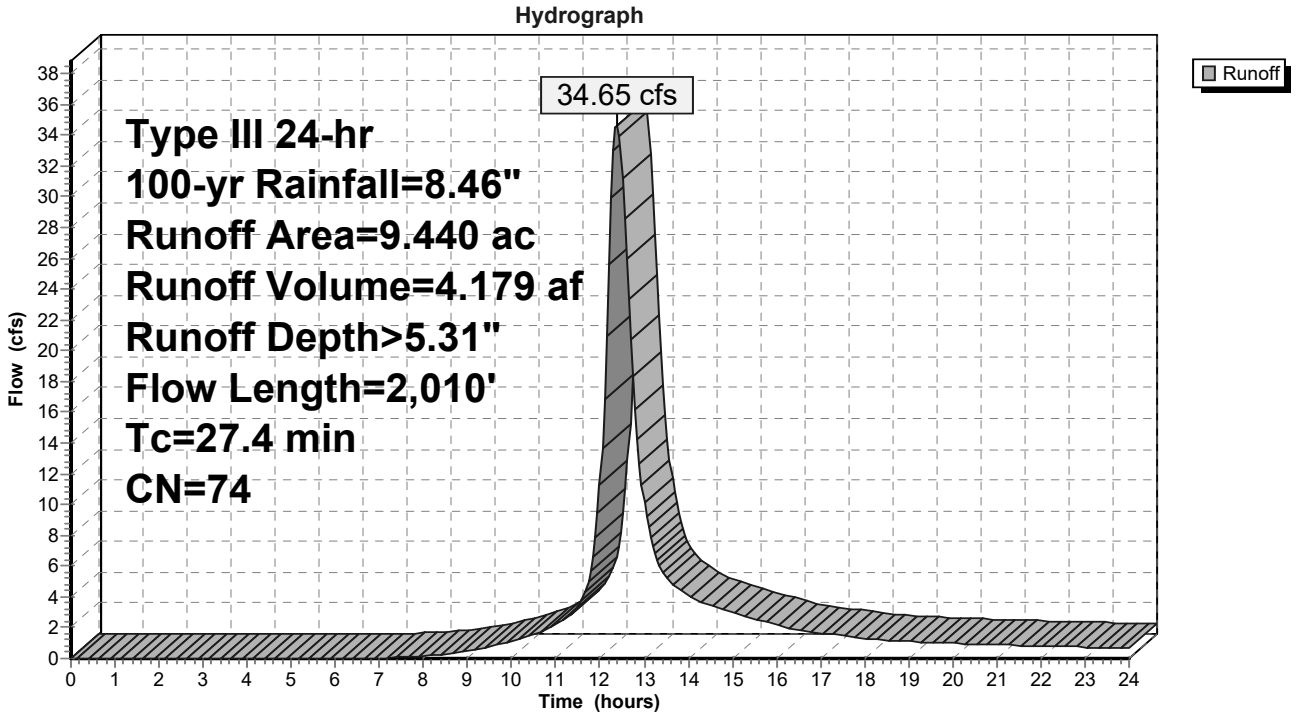
Runoff = 34.65 cfs @ 12.38 hrs, Volume= 4.179 af, Depth> 5.31"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
2.640	68	1 acre lots, 20% imp, HSG B
0.350	79	1 acre lots, 20% imp, HSG C
0.860	98	Roofs, HSG B
1.890	98	Paved parking, HSG B
1.010	55	Woods, Good, HSG B
2.690	61	>75% Grass cover, Good, HSG B
9.440	74	Weighted Average
6.092		64.53% Pervious Area
3.348		35.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	150	0.0400	0.11		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	950	0.0660	4.14		**Shallow Concentrated Flow, Shallow Concentrated Woods** Unpaved Kv= 16.1 fps
1.1	910	0.0660	14.15	44.44	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
27.4	2,010	Total			

Subcatchment PR-DA 1B-ND: PR-DA 1BND



Summary for Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING

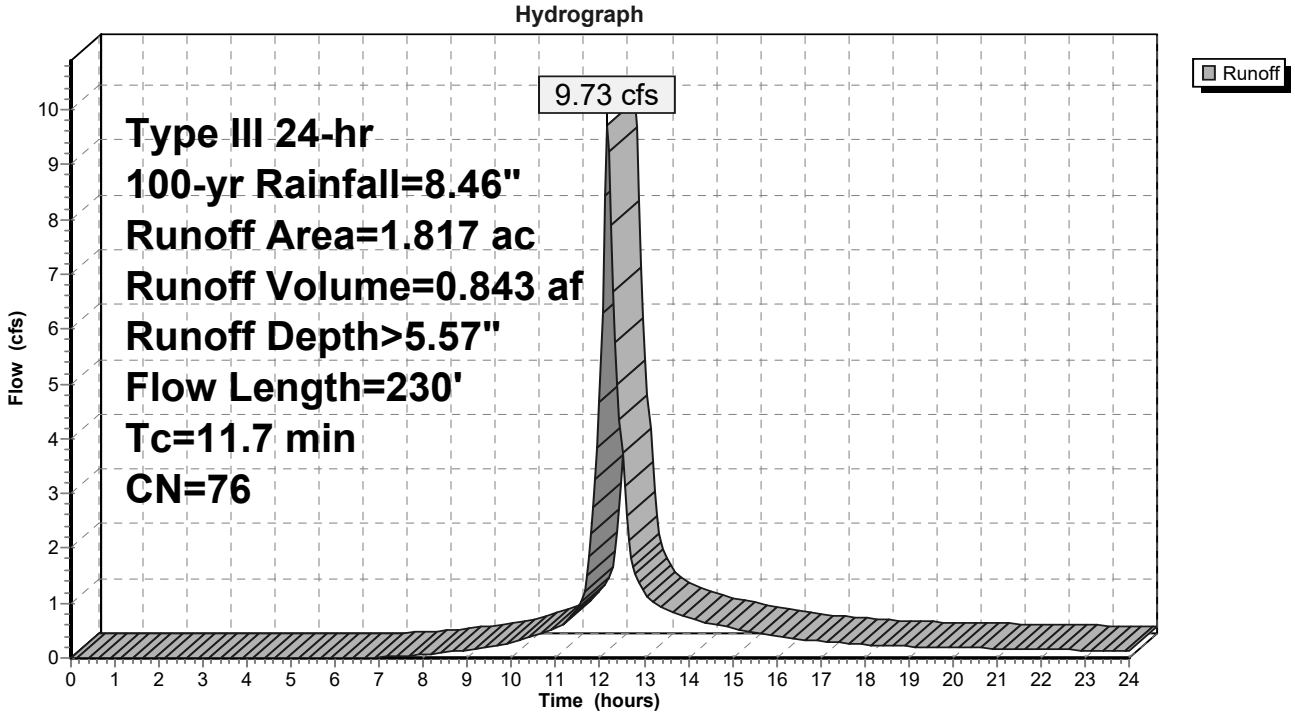
Runoff = 9.73 cfs @ 12.16 hrs, Volume= 0.843 af, Depth> 5.57"
Routed to Pond INFIL 1B1P : INFILTRATOR 1B1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
0.850	98	Paved parking, HSG B
0.697	55	Woods, Good, HSG B
0.270	61	>75% Grass cover, Good, HSG B
1.817	76	Weighted Average
0.967		53.22% Pervious Area
0.850		46.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	150	0.2300	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
11.7	230	Total			

Subcatchment PR-DA 1B1-PARKING: PR-DA 1B1-PARKING



Summary for Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)

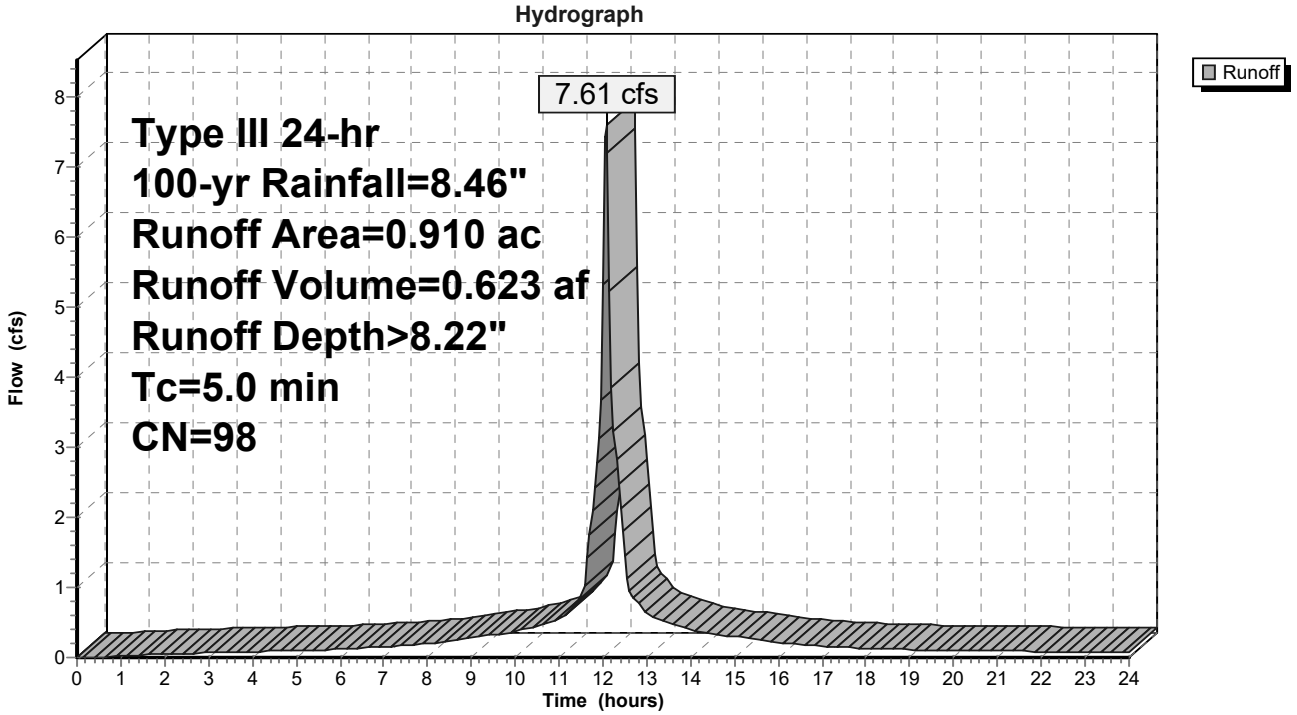
Runoff = 7.61 cfs @ 12.07 hrs, Volume= 0.623 af, Depth> 8.22"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
0.910	98	Roofs, HSG B
0.910		100.00% Impervious Area

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

Subcatchment PR-DA 1B1-RND: PR-DA 1B1-RND (ROOF)



Summary for Subcatchment PR-DA 1B2: PR-DA 1B2

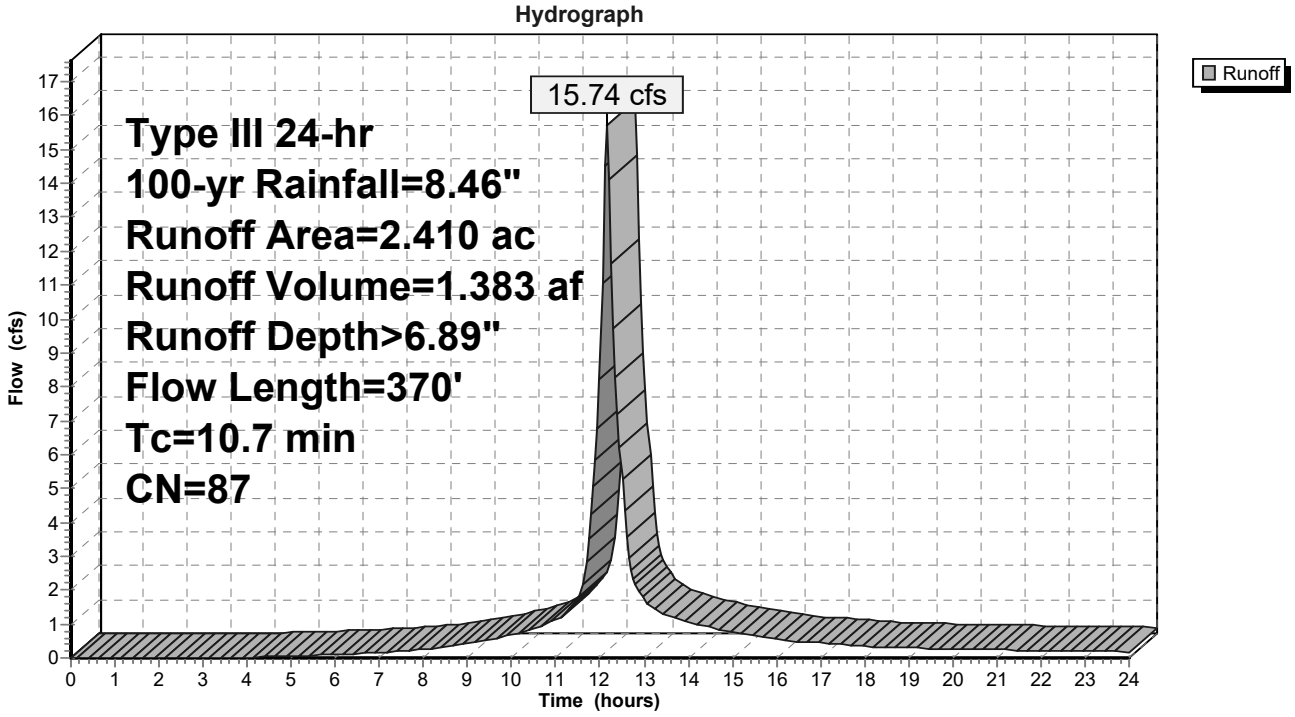
Runoff = 15.74 cfs @ 12.15 hrs, Volume= 1.383 af, Depth> 6.89"
Routed to Pond INFIL 1B2 : INFILTRATOR 1B2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
1.760	98	Paved parking, HSG B
0.310	55	Woods, Good, HSG B
0.340	61	>75% Grass cover, Good, HSG B
2.410	87	Weighted Average
0.650		26.97% Pervious Area
1.760		73.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	70	0.0850	0.13		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.7	300	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Paved** Paved Kv= 20.3 fps
10.7	370	Total			

Subcatchment PR-DA 1B2: PR-DA 1B2



Summary for Subcatchment PR-DA 1B3: PR-DA 1B3

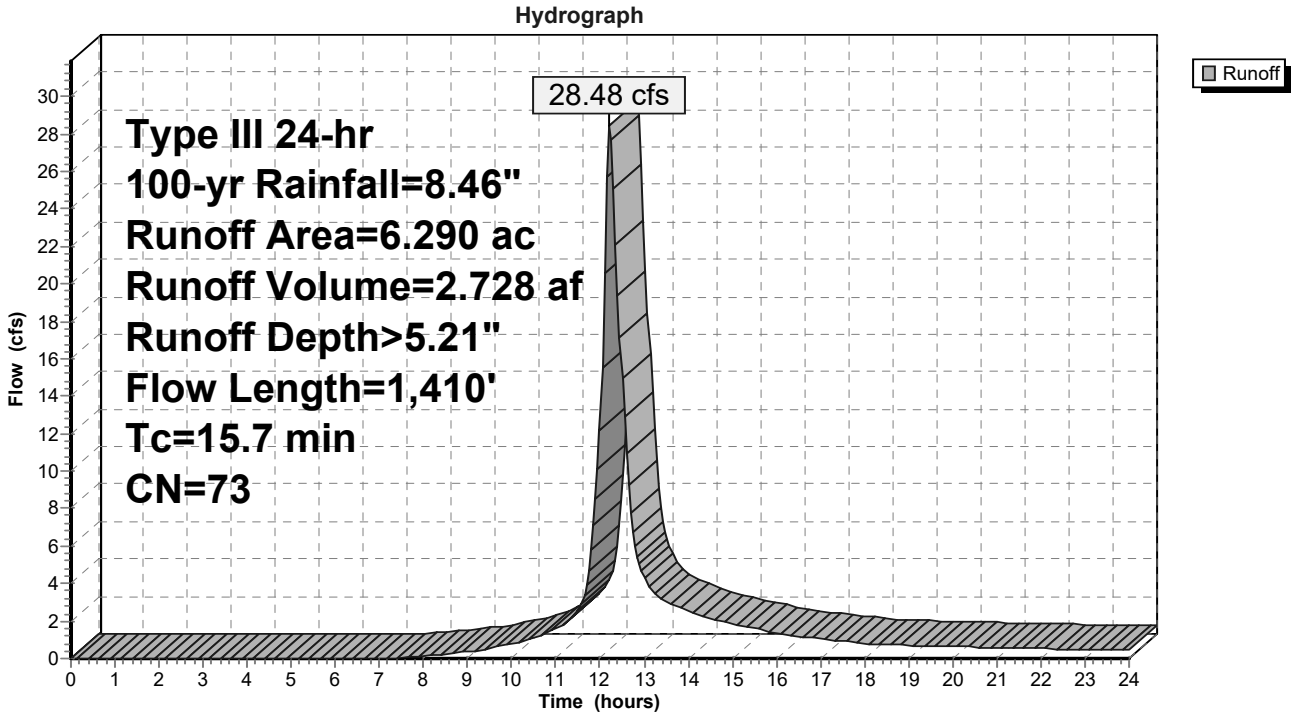
Runoff = 28.48 cfs @ 12.22 hrs, Volume= 2.728 af, Depth> 5.21"
Routed to Pond INFIL BASIN B3 : INFIL BASIN B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
0.860	98	Roofs, HSG B
1.340	98	Paved parking, HSG B
1.200	55	Woods, Good, HSG B
2.890	61	>75% Grass cover, Good, HSG B
6.290	73	Weighted Average
4.090		65.02% Pervious Area
2.200		34.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	150	0.0200	0.18		**Sheet Flow, Sheet Flow Grass** Grass: Short n= 0.150 P2= 3.20"
0.7	90	0.0200	2.28		**Shallow Concentrated Flow, Shallow Concentrated Grass** Unpaved Kv= 16.1 fps
1.4	1,170	0.0600	13.49	42.37	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.017 Concrete sewer w/manholes & inlets
15.7	1,410	Total			

Subcatchment PR-DA 1B3: PR-DA 1B3



Summary for Subcatchment PR-DA 1C: PR-DA 1C

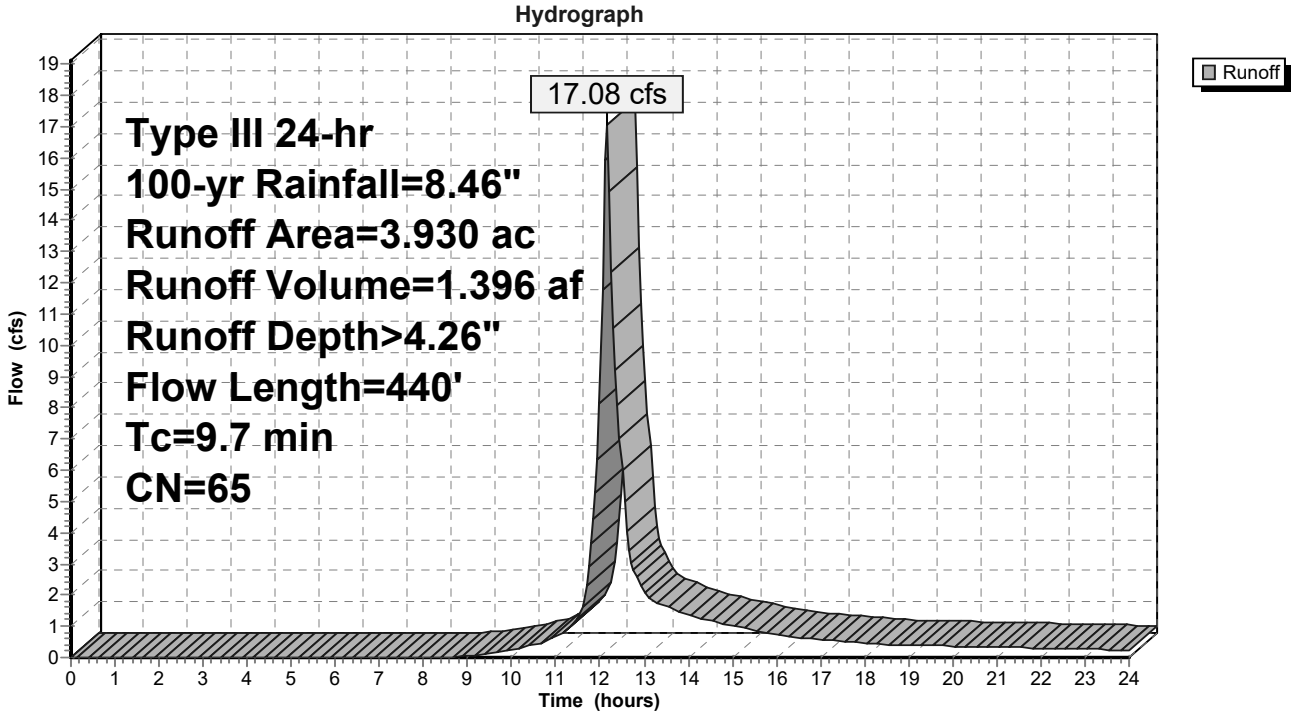
Runoff = 17.08 cfs @ 12.14 hrs, Volume= 1.396 af, Depth> 4.26"
Routed to Pond EXISTING POND : EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

	Area (ac)	CN	Description
*	0.900	98	Water Surface
	2.680	55	Woods, Good, HSG B
	0.350	61	>75% Grass cover, Good, HSG B
	3.930	65	Weighted Average
	3.030		77.10% Pervious Area
	0.900		22.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	90	0.1833	0.18		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	140	0.1290	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.3	210	0.0660	12.73	127.25	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
9.7	440	Total			

Subcatchment PR-DA 1C: PR-DA 1C



Summary for Pond EXISTING POND: EXISTING POND

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 4.89" for 100-yr event
Inflow = 215.65 cfs @ 12.74 hrs, Volume= 43.563 af
Outflow = 209.48 cfs @ 12.88 hrs, Volume= 42.744 af, Atten= 3%, Lag= 8.3 min
Primary = 209.48 cfs @ 12.88 hrs, Volume= 42.744 af
Routed to Link PR DP1 : PR DP1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.45' @ 12.88 hrs Surf.Area= 1.633 ac Storage= 6.628 af

Plug-Flow detention time= 43.0 min calculated for 42.655 af (98% of inflow)
Center-of-Mass det. time= 32.8 min (892.1 - 859.3)

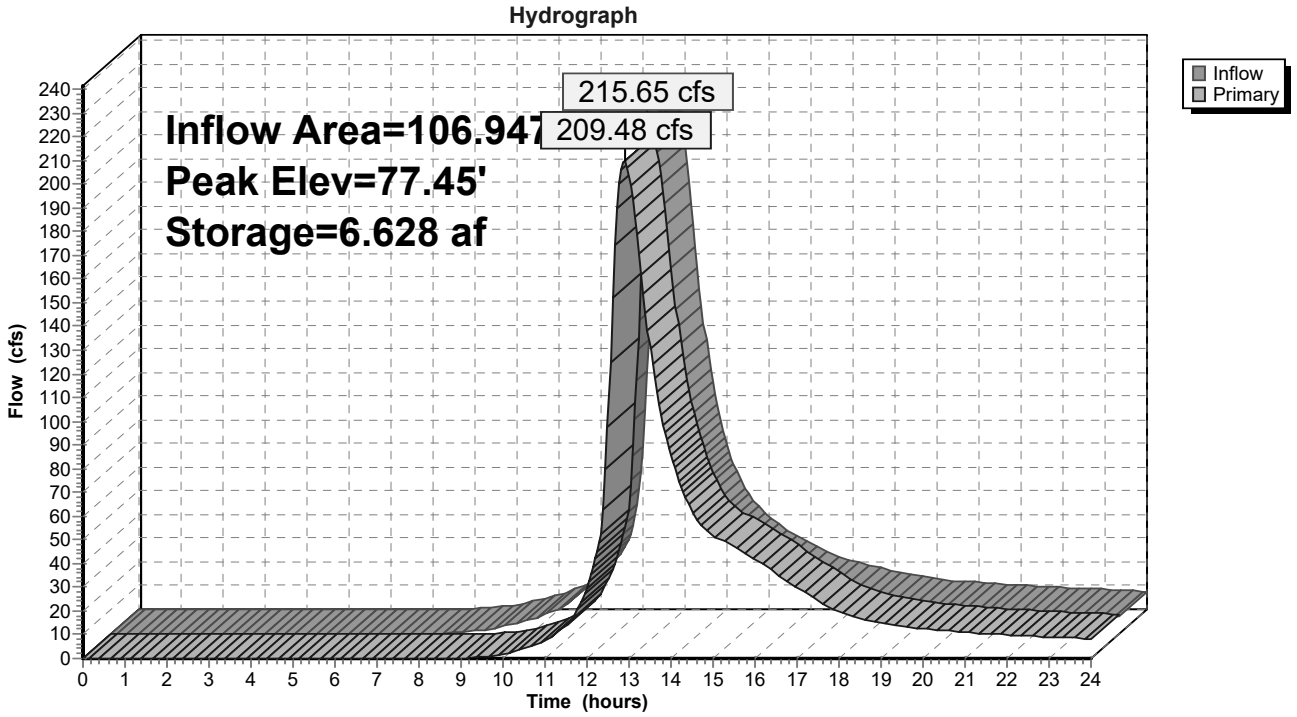
Volume	Invert	Avail.Storage	Storage Description
#1	71.80'	7.556 af	**Existing Pond (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
71.80	0.938	1,000.1	0.000	0.000	0.938
74.00	1.020	1,016.0	2.153	2.153	1.016
76.00	1.320	1,692.0	2.334	4.487	4.360
78.00	1.760	1,652.0	3.069	7.556	4.617

Device	Routing	Invert	Outlet Devices
#1	Primary	71.80'	**24.0" Round Culvert X 2.00** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 71.80' / 70.00' S= 0.0180 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	75.75'	**12.0' long + 3.0 '/' SideZ x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#3	Primary	76.75'	**30.0' long + 3.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=209.21 cfs @ 12.88 hrs HW=77.45' (Free Discharge)
- **1=Culvert** (Inlet Controls 65.25 cfs @ 10.38 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 94.25 cfs @ 3.24 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 49.71 cfs @ 2.21 fps)

Pond EXISTING POND: EXISTING POND



Summary for Pond INFIL 1B1P: INFILTRATOR 1B1P

Inflow Area = 1.817 ac, 46.78% Impervious, Inflow Depth > 5.57" for 100-yr event
Inflow = 9.73 cfs @ 12.16 hrs, Volume= 0.843 af
Outflow = 6.98 cfs @ 12.29 hrs, Volume= 0.755 af, Atten= 28%, Lag= 7.8 min
Primary = 6.98 cfs @ 12.29 hrs, Volume= 0.755 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.12' @ 12.29 hrs Surf.Area= 0.085 ac Storage= 0.197 af

Plug-Flow detention time= 85.0 min calculated for 0.755 af (90% of inflow)
Center-of-Mass det. time= 35.7 min (849.5 - 813.8)

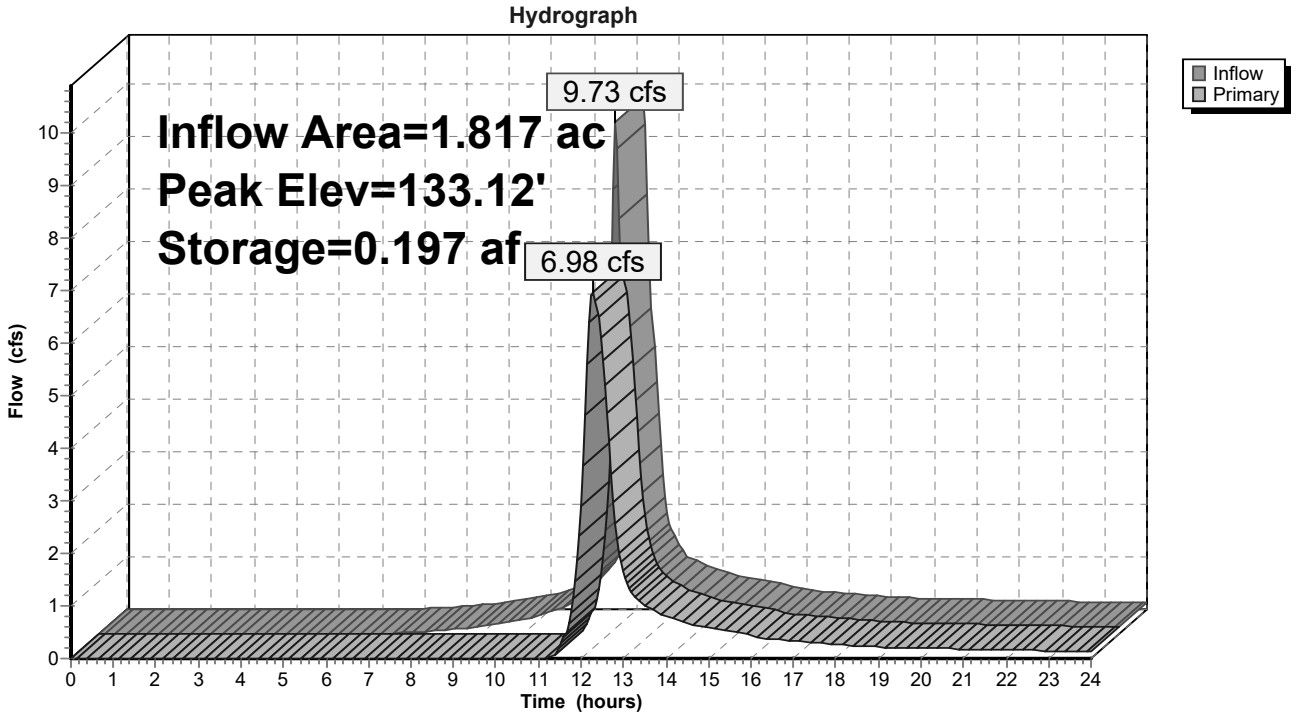
Volume	Invert	Avail.Storage	Storage Description
#1A	129.75'	0.098 af	**35.75'W x 103.50'L x 4.50'H Field A** 0.382 af Overall - 0.138 af Embedded = 0.244 af x 40.0% Voids
#2A	130.25'	0.138 af	**Cultec R-360HD** x 162 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 162 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		0.236 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	131.10'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.96 cfs @ 12.29 hrs HW=133.11' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 6.96 cfs @ 5.68 fps)

Pond INFIL 1B1P: INFILTRATOR 1B1P



Summary for Pond INFIL 1B2: INFILTRATOR 1B2

Inflow Area = 2.410 ac, 73.03% Impervious, Inflow Depth > 6.89" for 100-yr event
Inflow = 15.74 cfs @ 12.15 hrs, Volume= 1.383 af
Outflow = 6.44 cfs @ 12.44 hrs, Volume= 1.188 af, Atten= 59%, Lag= 17.5 min
Primary = 6.44 cfs @ 12.44 hrs, Volume= 1.188 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 127.40' @ 12.44 hrs Surf.Area= 0.160 ac Storage= 0.535 af

Plug-Flow detention time= 127.2 min calculated for 1.186 af (86% of inflow)
Center-of-Mass det. time= 67.7 min (854.3 - 786.6)

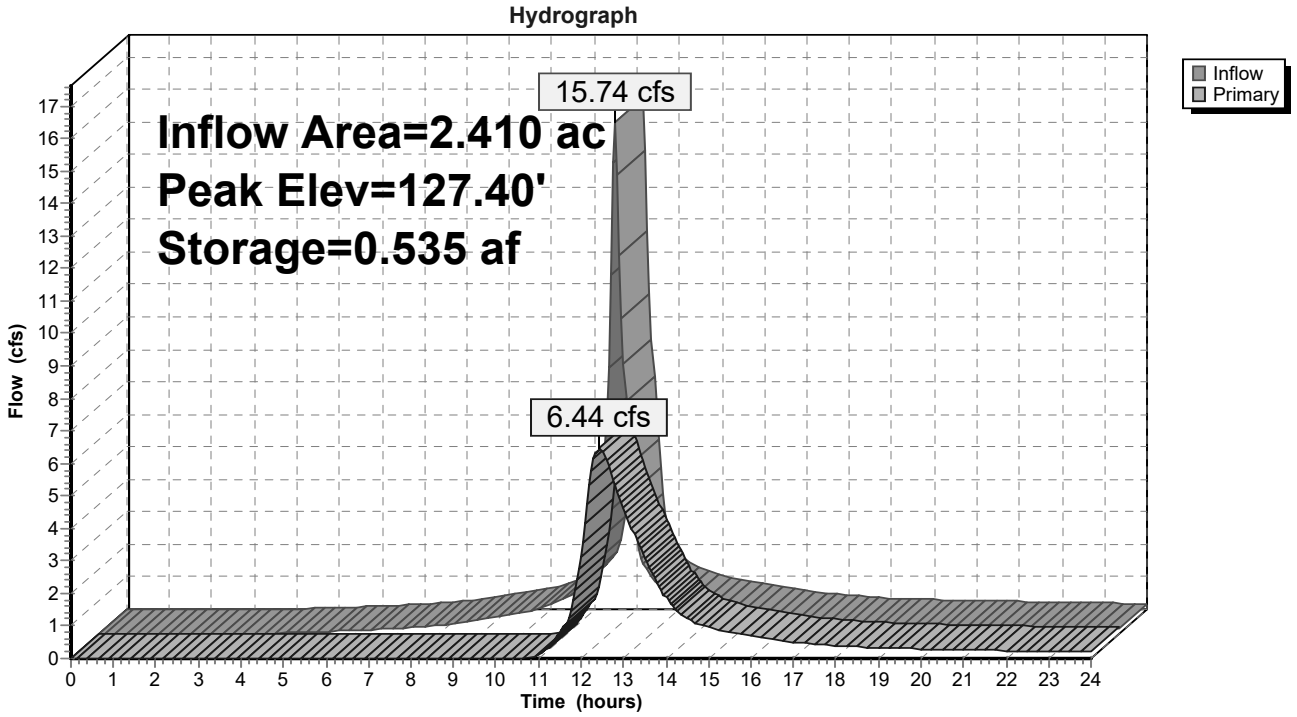
Volume	Invert	Avail.Storage	Storage Description
#1A	122.50'	0.236 af	**30.25'W x 230.37'L x 6.00'H Field A** 0.960 af Overall - 0.369 af Embedded = 0.591 af x 40.0% Voids
#2A	123.00'	0.369 af	**Cultec R-902HD** x 248 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 248 Chambers in 4 Rows Cap Storage= 2.8 cf x 2 x 4 rows = 22.1 cf
		0.605 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.44 cfs @ 12.44 hrs HW=127.40' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 6.44 cfs @ 8.20 fps)

Pond INFIL 1B2: INFILTRATOR 1B2



Summary for Pond INFIL BASIN B3: INFIL BASIN B3

Inflow Area = 6.290 ac, 34.98% Impervious, Inflow Depth > 5.21" for 100-yr event
Inflow = 28.48 cfs @ 12.22 hrs, Volume= 2.728 af
Outflow = 23.32 cfs @ 12.34 hrs, Volume= 2.578 af, Atten= 18%, Lag= 7.3 min
Primary = 23.32 cfs @ 12.34 hrs, Volume= 2.578 af
Routed to Pond EXISTING POND : EXISTING POND

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 103.73' @ 12.34 hrs Surf.Area= 6,541 sf Storage= 19,964 cf

Plug-Flow detention time= 52.4 min calculated for 2.573 af (94% of inflow)
Center-of-Mass det. time= 23.4 min (846.8 - 823.4)

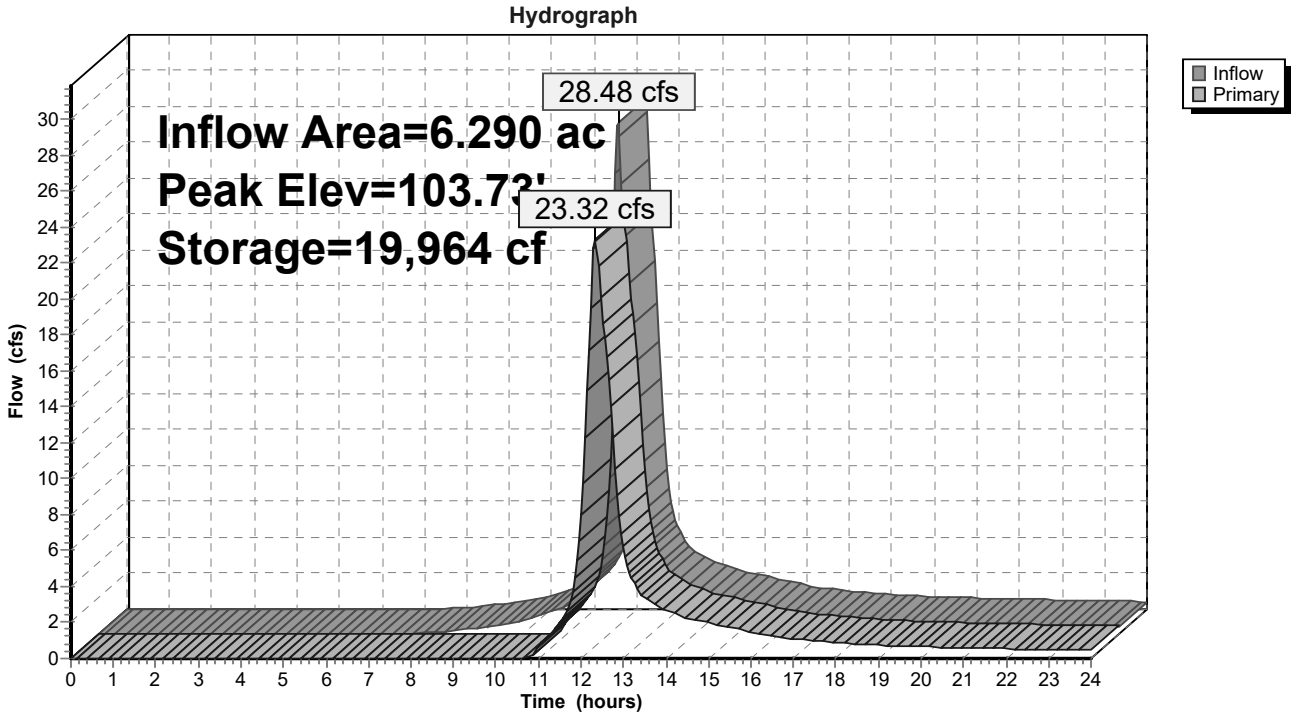
Volume	Invert	Avail.Storage	Storage Description
#1	99.50'	25,262 cf	**Infiltration Basin B3 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
99.50	3,074	220.0	0	0	3,074
100.00	3,428	230.0	1,625	1,625	3,449
102.00	4,993	269.0	8,372	9,997	5,076
104.00	6,798	305.0	11,745	21,741	6,818
104.50	7,285	315.0	3,520	25,262	7,335

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	103.50'	**12.0' long + 3.0 '/' SideZ x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=23.12 cfs @ 12.34 hrs HW=103.73' (Free Discharge)
1=Culvert (Inlet Controls 19.88 cfs @ 6.33 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 3.24 cfs @ 1.13 fps)

Pond INFIL BASIN B3: INFIL BASIN B3

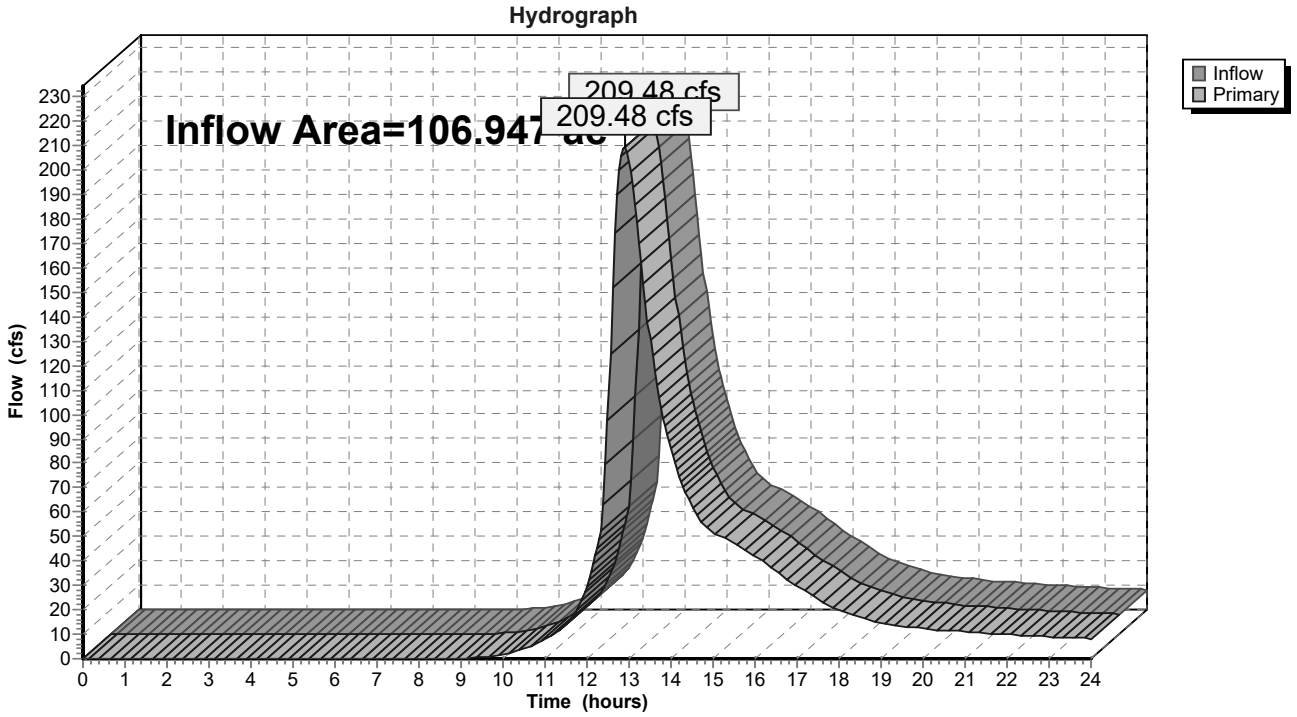


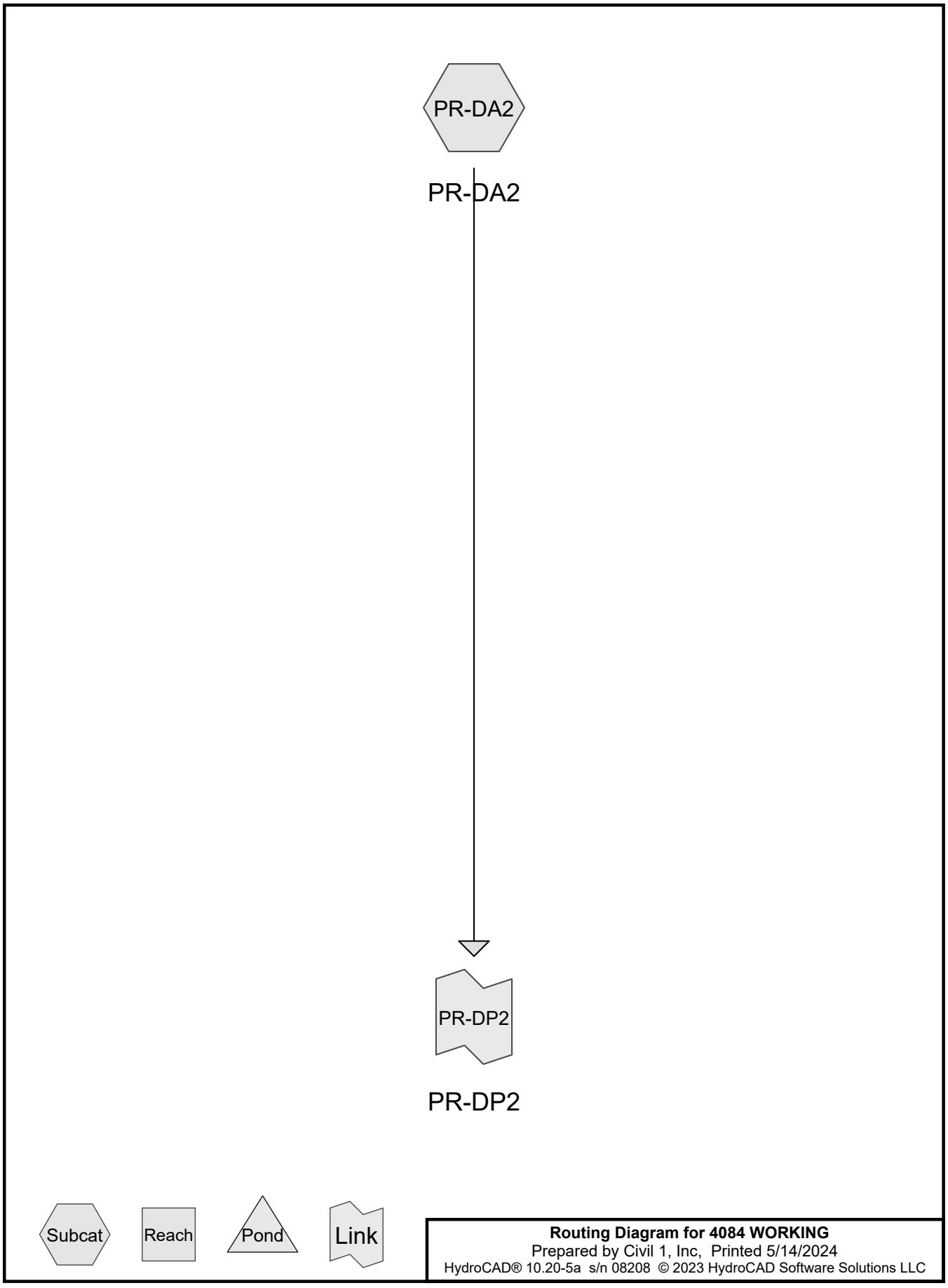
Summary for Link PR DP1: PR DP1

Inflow Area = 106.947 ac, 22.75% Impervious, Inflow Depth > 4.80" for 100-yr event
Inflow = 209.48 cfs @ 12.88 hrs, Volume= 42.744 af
Primary = 209.48 cfs @ 12.88 hrs, Volume= 42.744 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR DP1: PR DP1





Routing Diagram for 4084 WORKING
Prepared by Civil 1, Inc, Printed 5/14/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.660	61	>75% Grass cover, Good, HSG B (PR-DA2)
0.350	98	Paved parking, HSG B (PR-DA2)
1.690	55	Woods, Good, HSG B (PR-DA2)
2.700	**62**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.700	HSG B	PR-DA2
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.700		**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	0.660	0.000	0.000	0.000	0.660	>75% Grass cover, Good	PR-DA2
0.000	0.350	0.000	0.000	0.000	0.350	Paved parking	PR-DA2
0.000	1.690	0.000	0.000	0.000	1.690	Woods, Good	PR-DA2
0.000	**2.700**	**0.000**	**0.000**	**0.000**	**2.700**	**TOTAL AREA**	

Summary for Subcatchment PR-DA2: PR-DA2

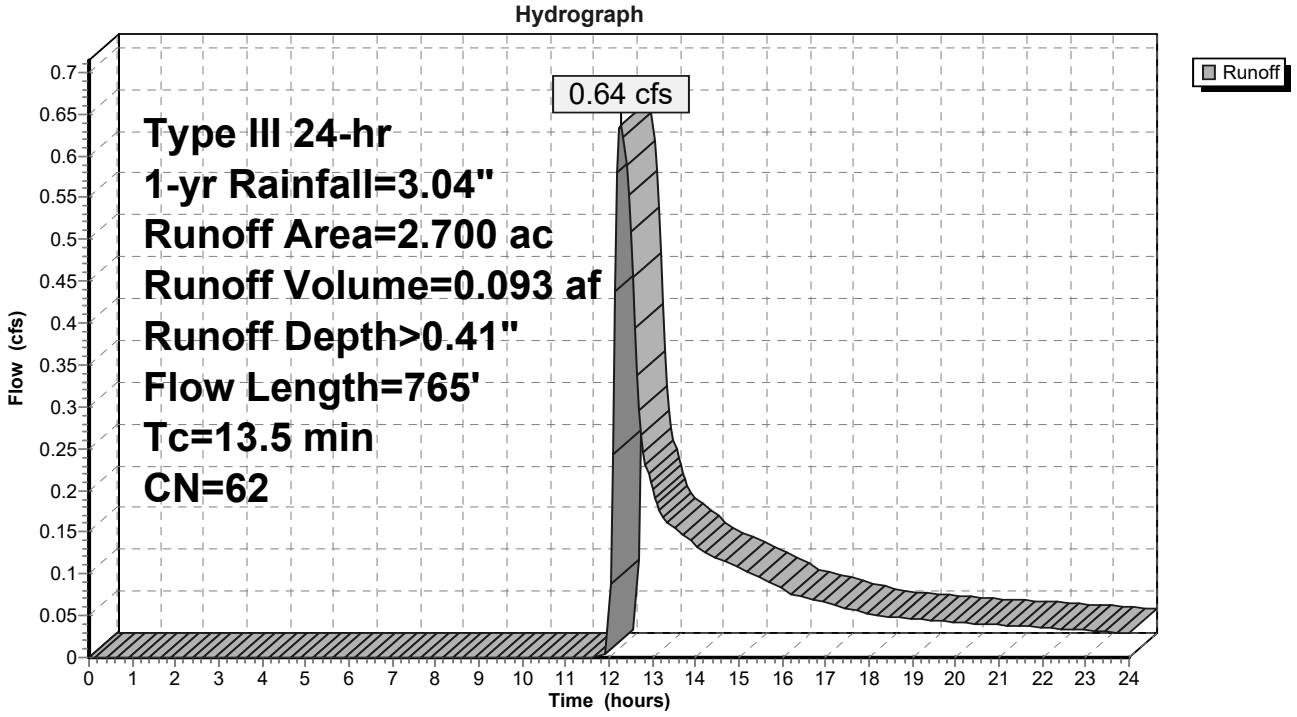
Runoff = 0.64 cfs @ 12.27 hrs, Volume= 0.093 af, Depth> 0.41"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=3.04"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

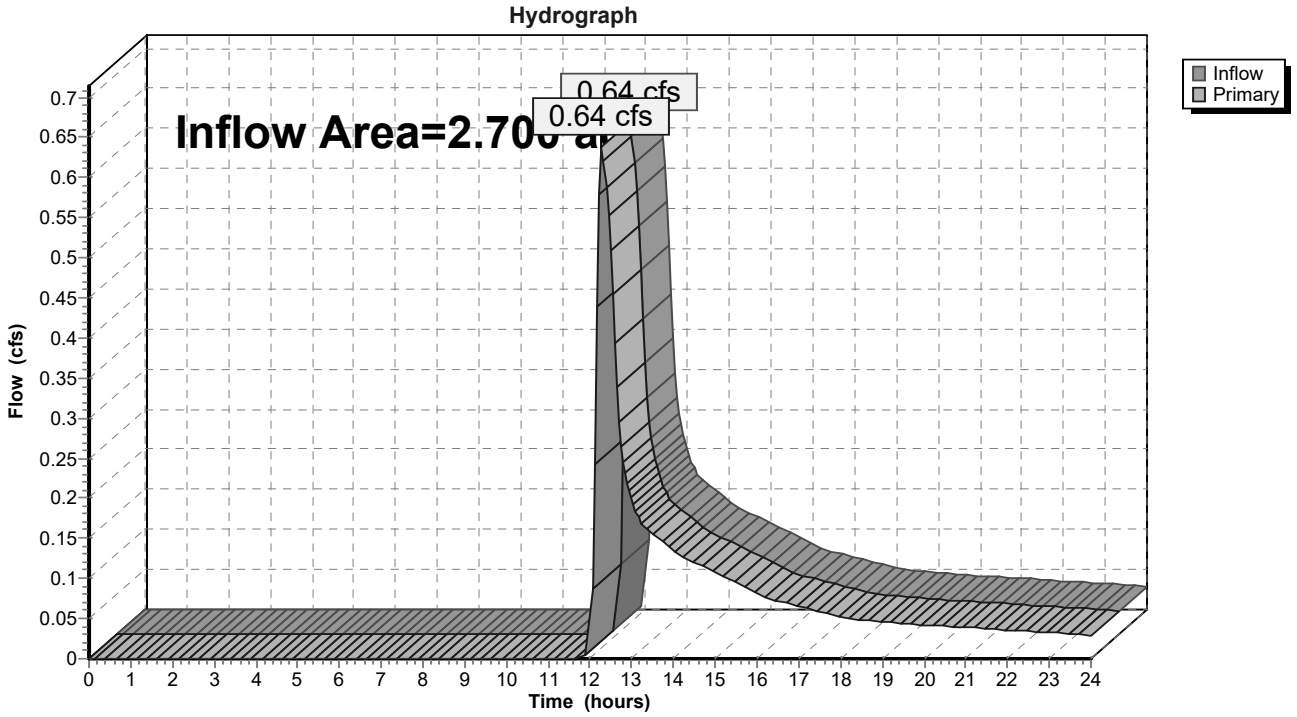


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 0.41" for 1-yr event
Inflow = 0.64 cfs @ 12.27 hrs, Volume= 0.093 af
Primary = 0.64 cfs @ 12.27 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Summary for Subcatchment PR-DA2: PR-DA2

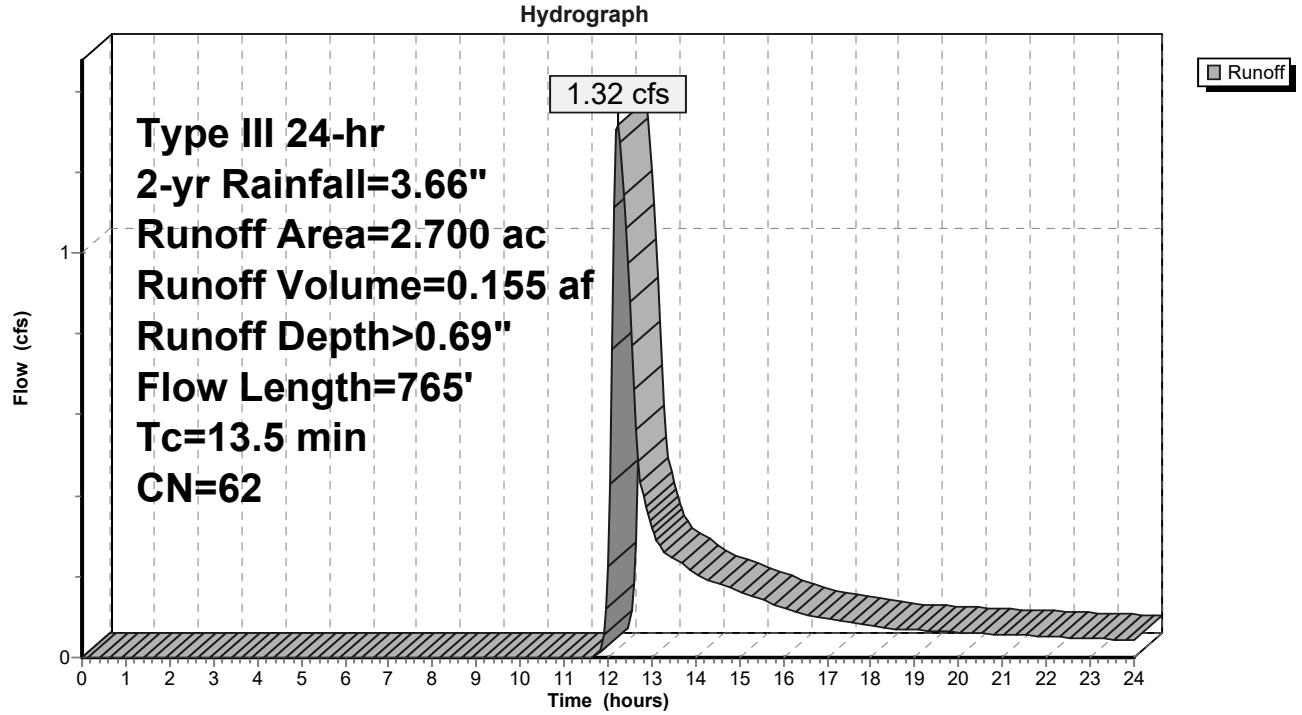
Runoff = 1.32 cfs @ 12.23 hrs, Volume= 0.155 af, Depth> 0.69"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.66"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

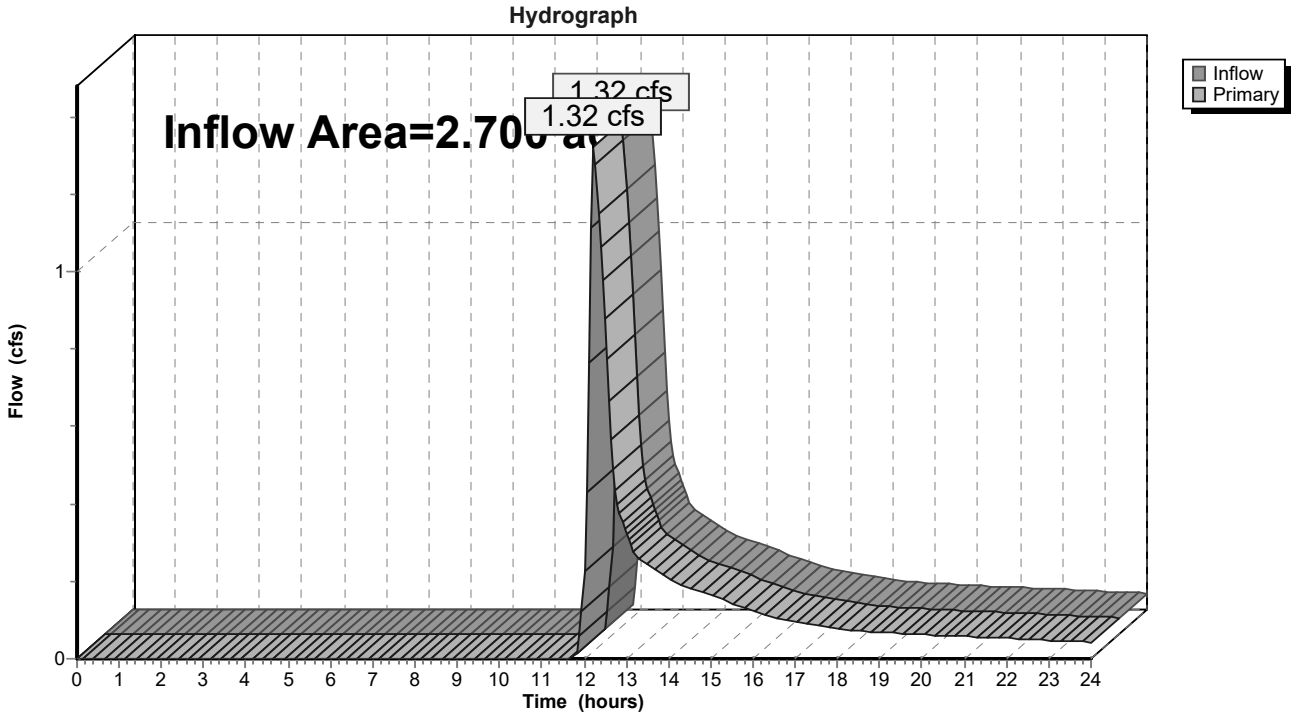


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 0.69" for 2-yr event
Inflow = 1.32 cfs @ 12.23 hrs, Volume= 0.155 af
Primary = 1.32 cfs @ 12.23 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Summary for Subcatchment PR-DA2: PR-DA2

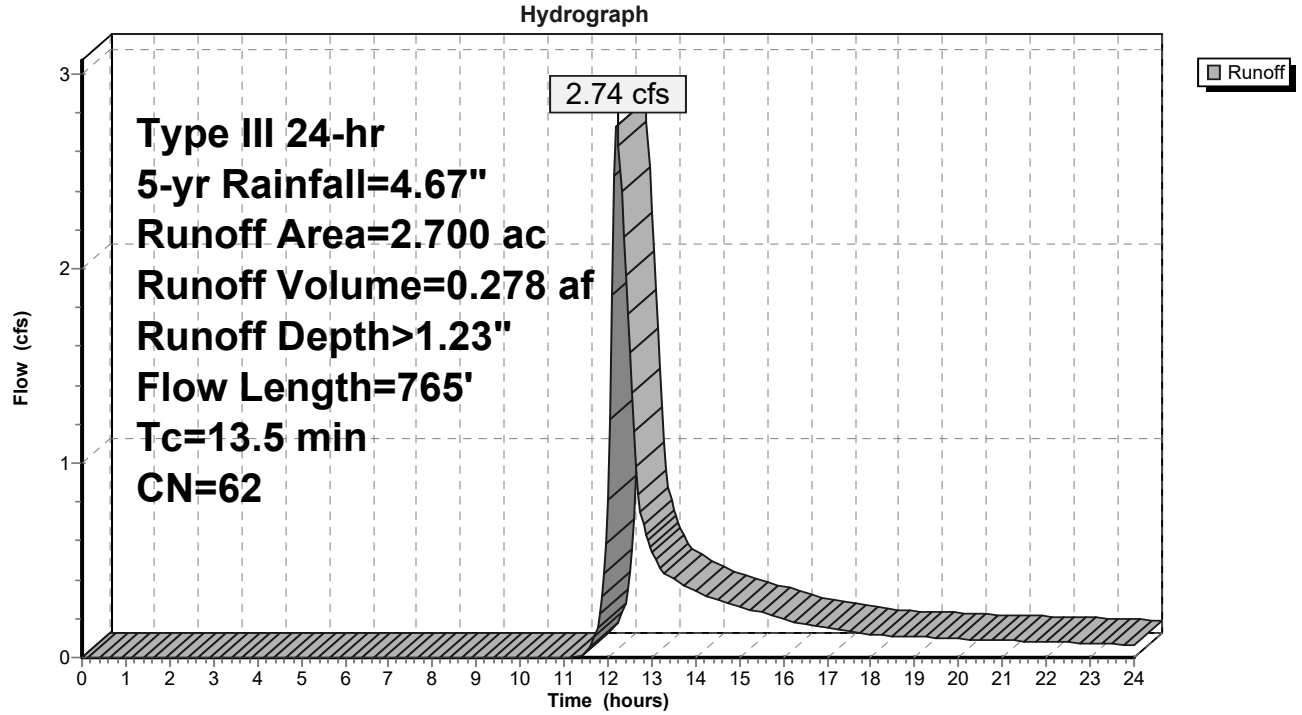
Runoff = 2.74 cfs @ 12.21 hrs, Volume= 0.278 af, Depth> 1.23"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.67"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

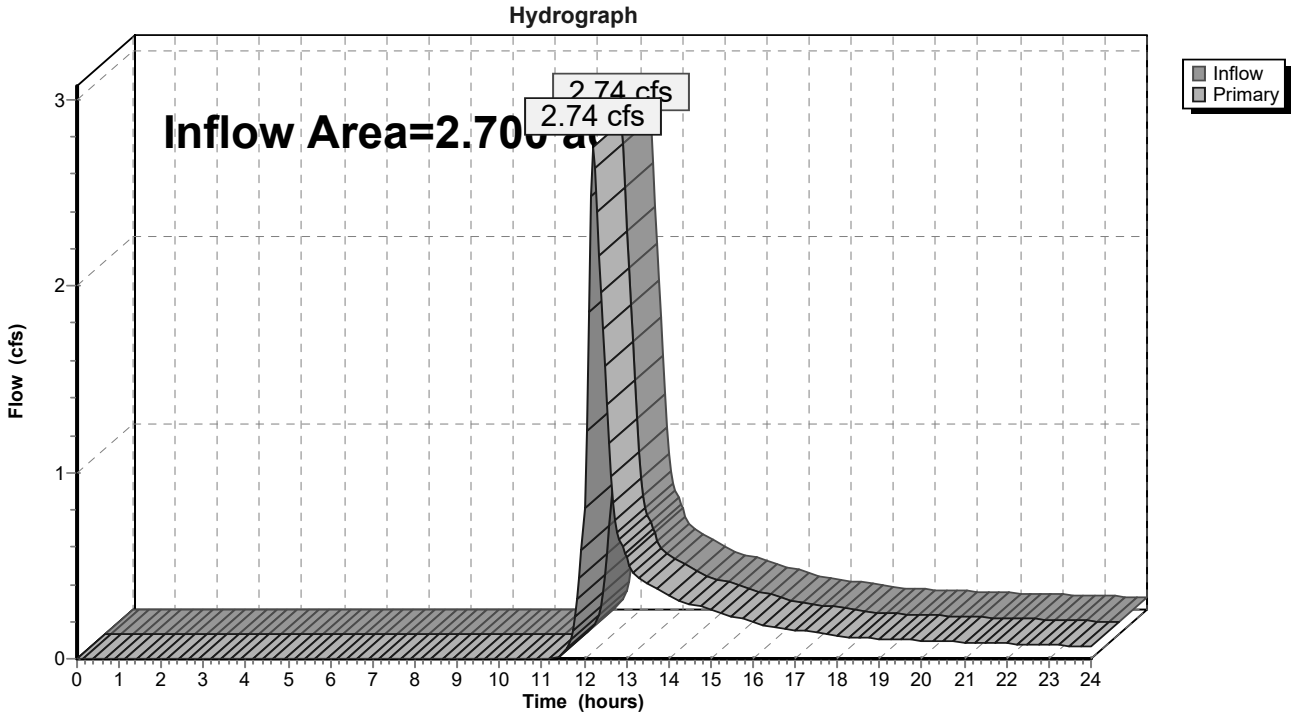


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 1.23" for 5-yr event
Inflow = 2.74 cfs @ 12.21 hrs, Volume= 0.278 af
Primary = 2.74 cfs @ 12.21 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Summary for Subcatchment PR-DA2: PR-DA2

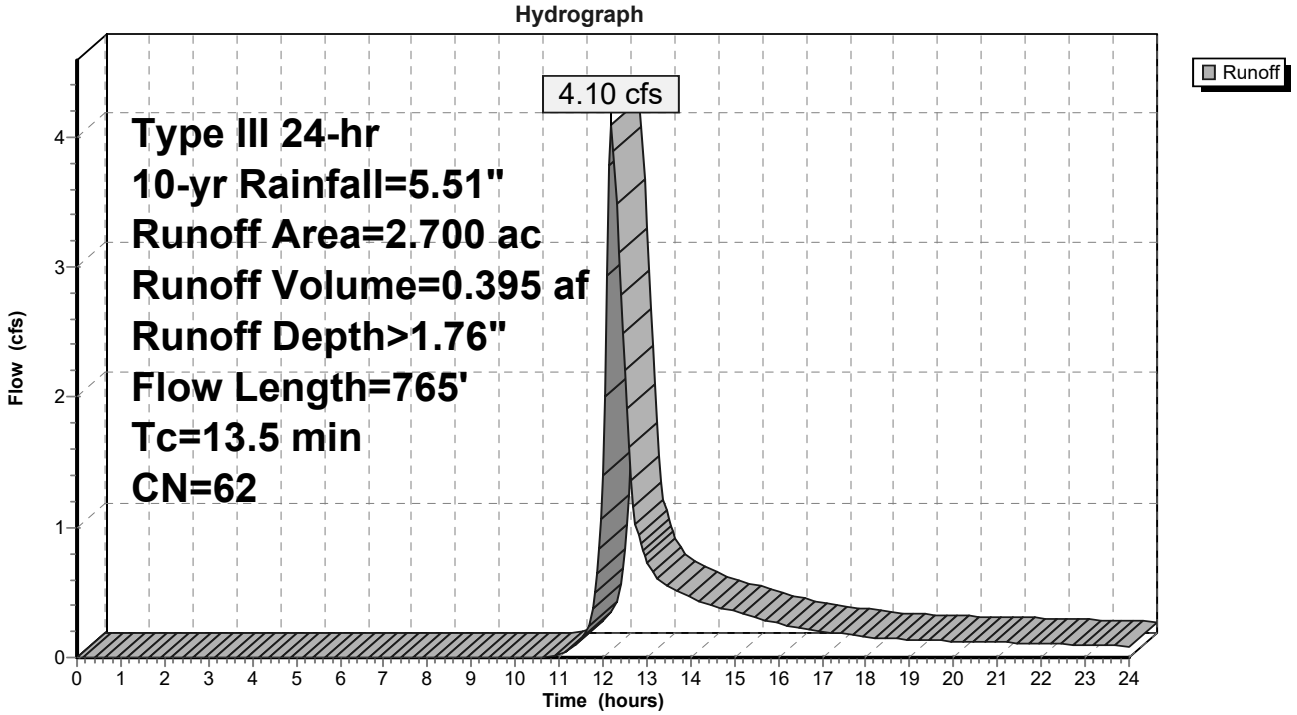
Runoff = 4.10 cfs @ 12.20 hrs, Volume= 0.395 af, Depth> 1.76"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.51"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

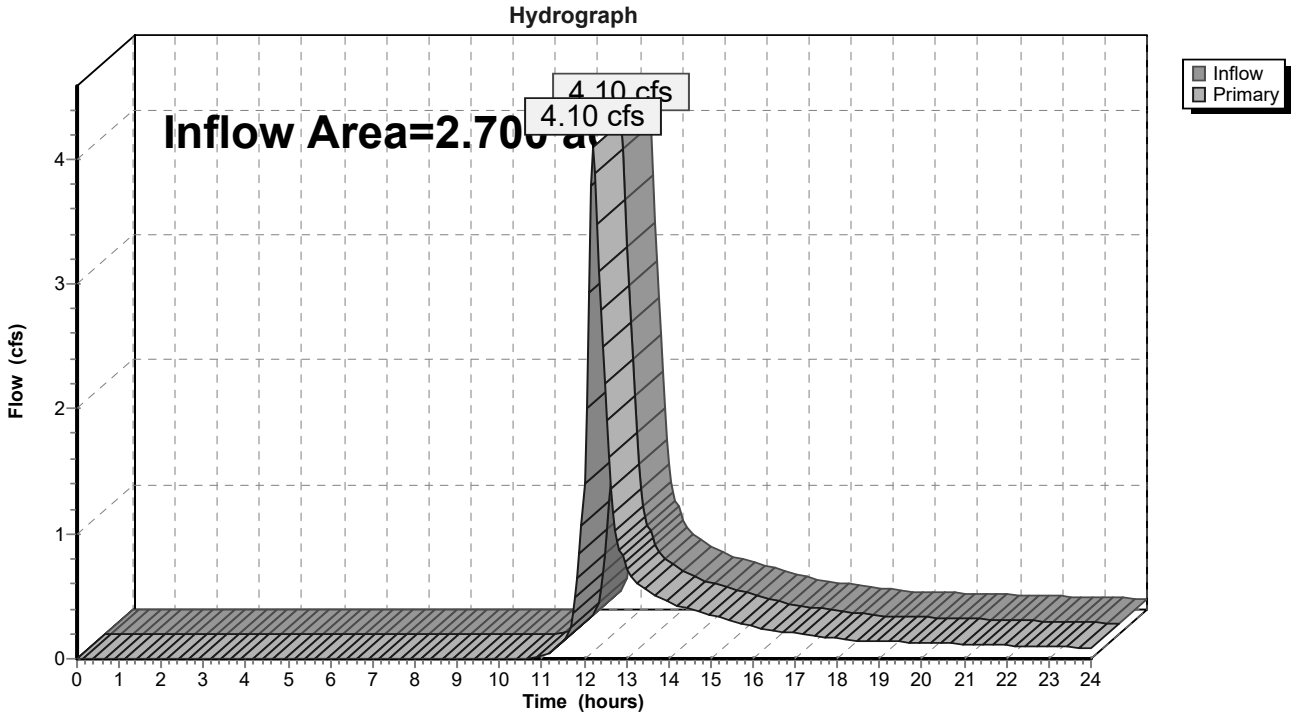


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 1.76" for 10-yr event
Inflow = 4.10 cfs @ 12.20 hrs, Volume= 0.395 af
Primary = 4.10 cfs @ 12.20 hrs, Volume= 0.395 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Summary for Subcatchment PR-DA2: PR-DA2

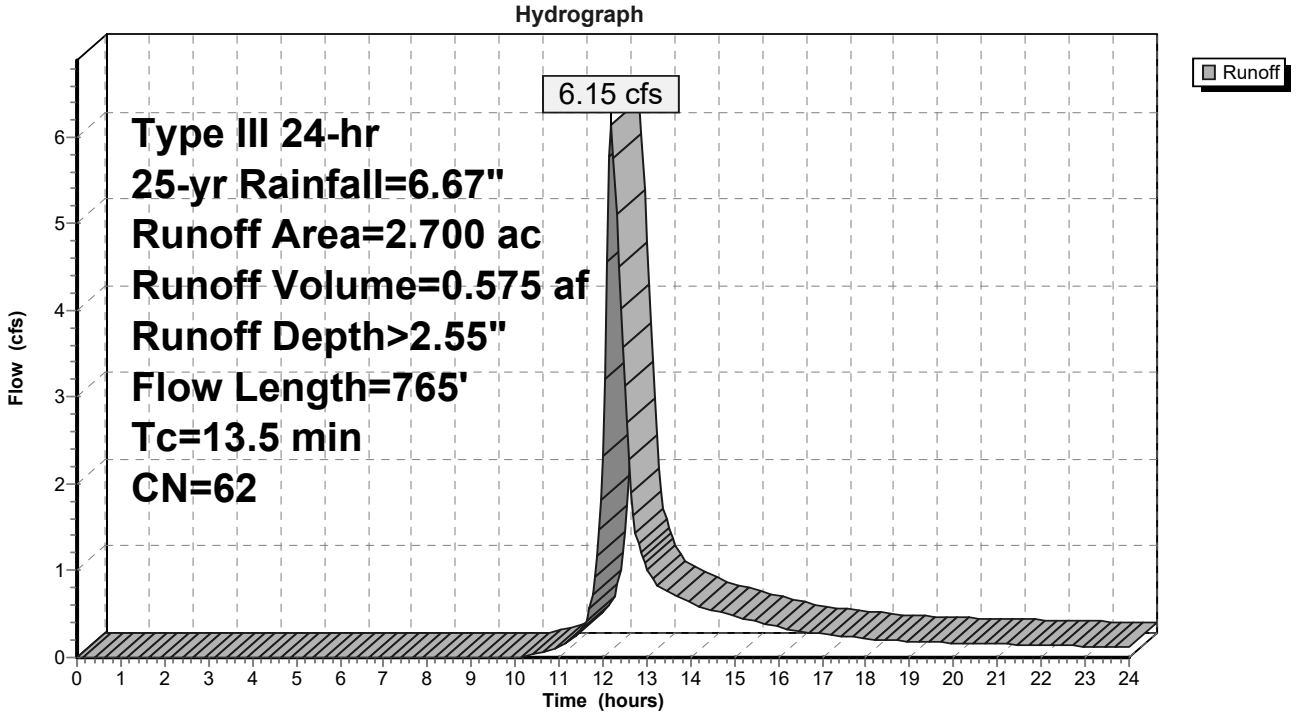
Runoff = 6.15 cfs @ 12.20 hrs, Volume= 0.575 af, Depth> 2.55"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.67"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

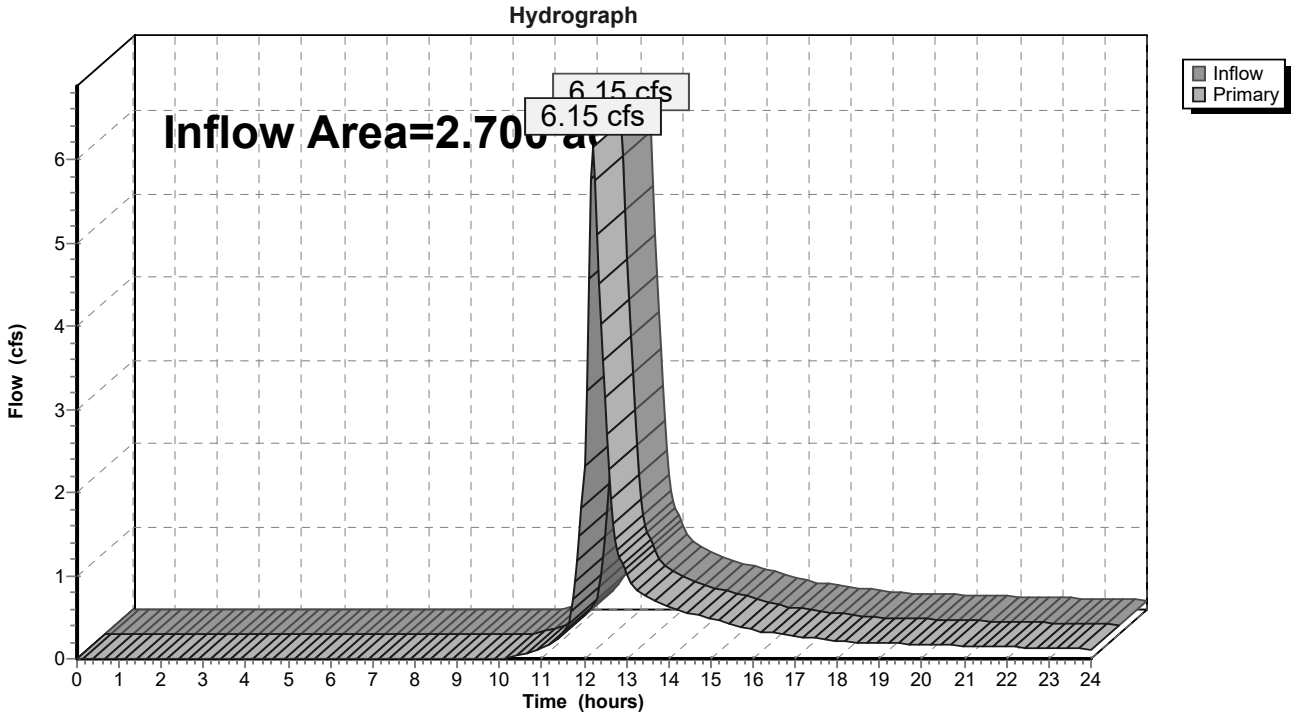


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 2.55" for 25-yr event
Inflow = 6.15 cfs @ 12.20 hrs, Volume= 0.575 af
Primary = 6.15 cfs @ 12.20 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Summary for Subcatchment PR-DA2: PR-DA2

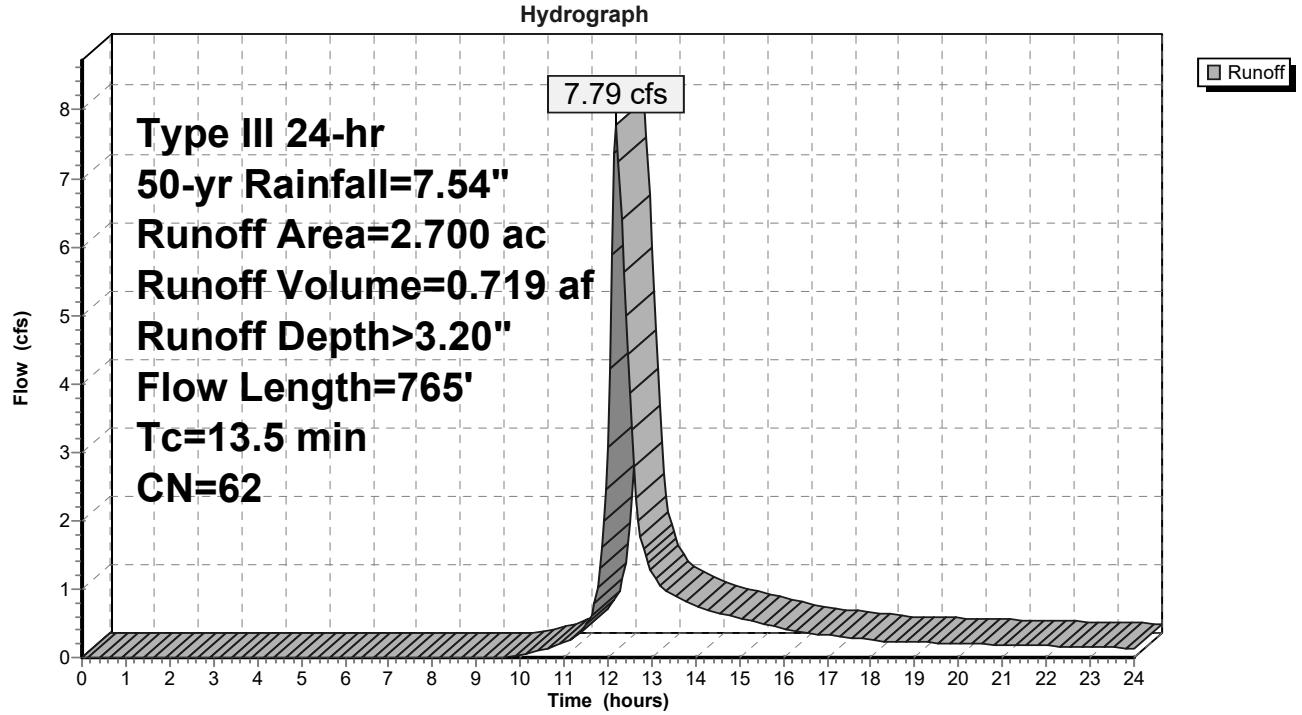
Runoff = 7.79 cfs @ 12.20 hrs, Volume= 0.719 af, Depth> 3.20"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.54"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

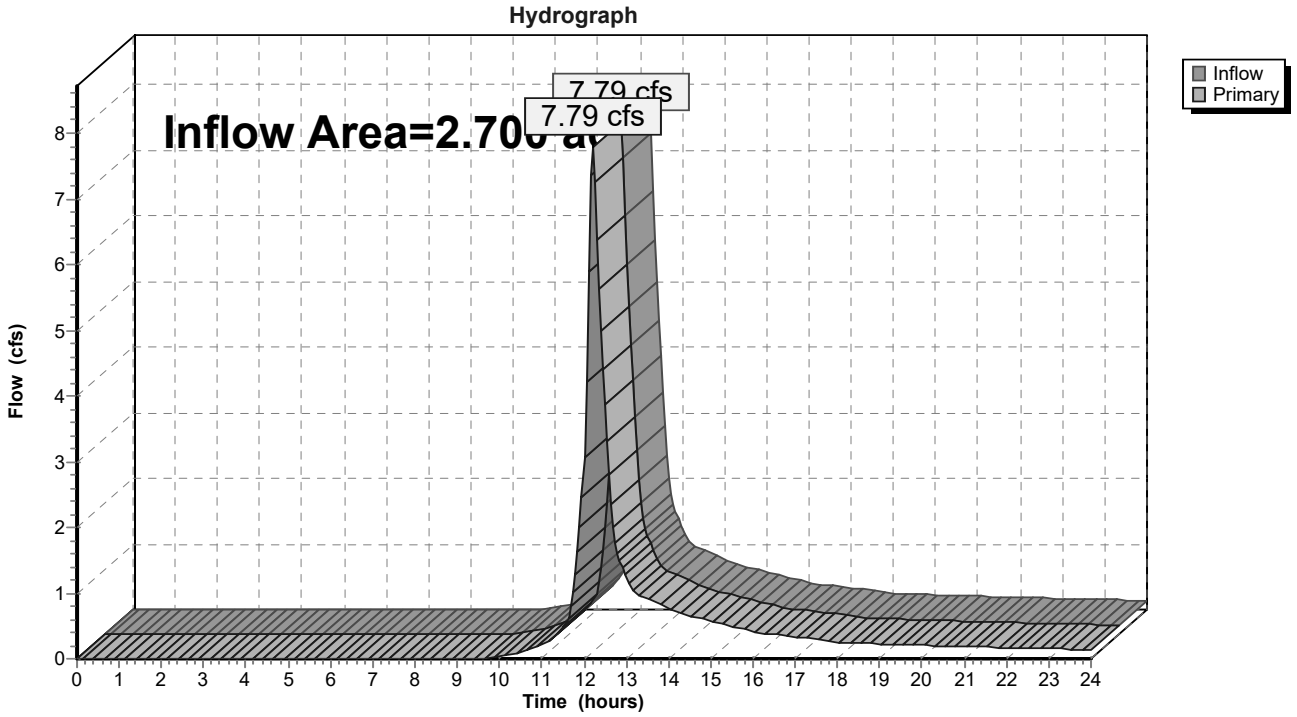


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 3.20" for 50-yr event
Inflow = 7.79 cfs @ 12.20 hrs, Volume= 0.719 af
Primary = 7.79 cfs @ 12.20 hrs, Volume= 0.719 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Summary for Subcatchment PR-DA2: PR-DA2

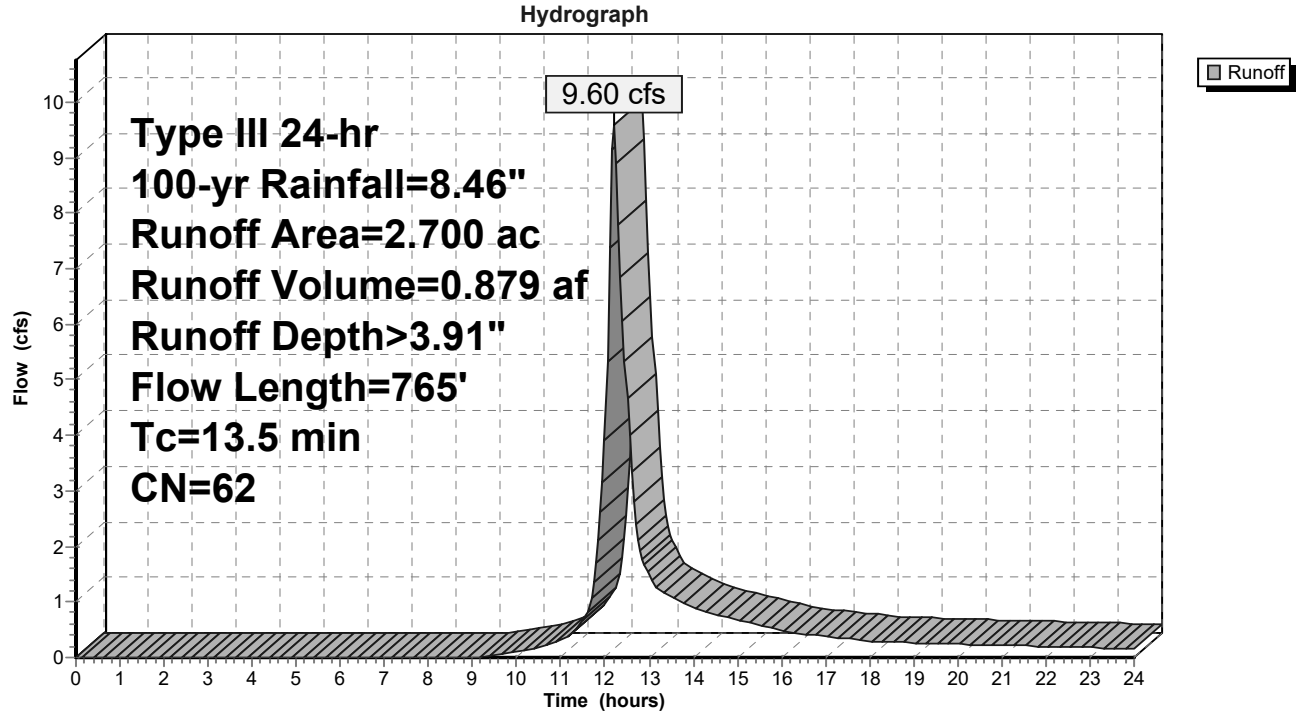
Runoff = 9.60 cfs @ 12.19 hrs, Volume= 0.879 af, Depth> 3.91"
Routed to Link PR-DP2 : PR-DP2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.46"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
1.690	55	Woods, Good, HSG B
0.660	61	>75% Grass cover, Good, HSG B
2.700	62	Weighted Average
2.350		87.04% Pervious Area
0.350		12.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.2600	0.22		**Sheet Flow, Sheet Flow Woods** Woods: Light underbrush n= 0.400 P2= 3.20"
5.7	620	0.1300	1.80		**Shallow Concentrated Flow, Shallow Concentrated Woods** Woodland Kv= 5.0 fps
0.1	45	0.0100	6.75	67.55	**Channel Flow, Stream Channel** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
13.5	765	Total			

Subcatchment PR-DA2: PR-DA2

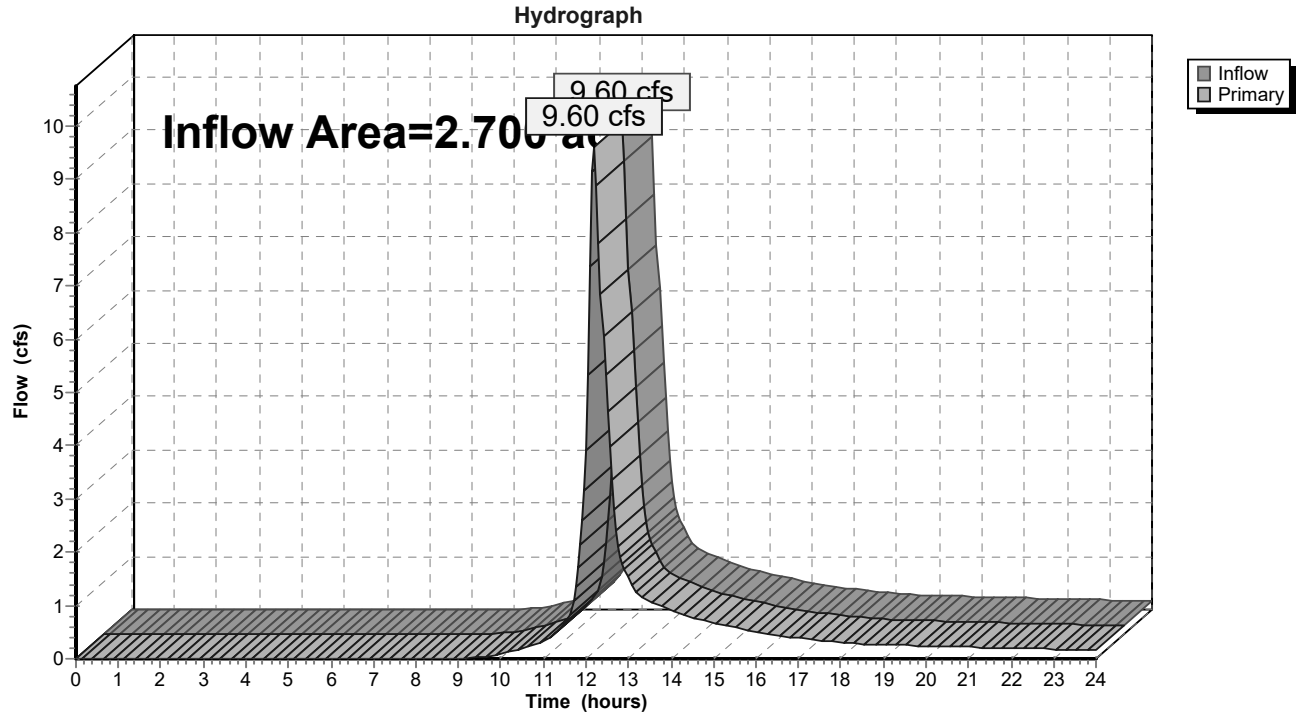


Summary for Link PR-DP2: PR-DP2

Inflow Area = 2.700 ac, 12.96% Impervious, Inflow Depth > 3.91" for 100-yr event
Inflow = 9.60 cfs @ 12.19 hrs, Volume= 0.879 af
Primary = 9.60 cfs @ 12.19 hrs, Volume= 0.879 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link PR-DP2: PR-DP2



Appendix E – Water Quality Calculations

WATER QUALITY VOLUME SUMMARY
800 LONG RIDGE ROAD
STAMFORD, CT

Proposed Drainage Area	Required Water Quality Volume (CF)	Provided Water Quality Volume (CF)
1B1-RND	3,138	0
1B1-P	3,107	3,354
1B2	6,176	7,035
1B3	8,329	5,842
1BND	10,698	0
TOTAL	**31,448**	**16,231**
		51.6% OF REQUIRED IS PROVIDED

Note: For all proposed drainage areas, the Water Quality Flows are also being treated with hydrodynamic separators. See Appendix F of the Stormwater Management Report.

WATER QUALITY CALCULATIONS
800 Long Ridge Road
Stamford, CT

BLT Apartment Buildings
Storm Drainage - PRDA-1B1RND - Roof Only

Job No	4084	
Designed by	SQ	
Sheet No.	1 of 1	
Date	9/27/2023	REV 5/7/24

Storm Water Quality Calculations - WQV - Water Quality Volume
As defined in Chapter 7 of the "2004 CT Stormwater Quality Manual"

WQV= Water Quality Volume

$$WQV = \frac{(1")(R)(A)}{12\ IN/FT.}$$

Area= Total inflowing drainage area on and off site entering stormwater quality system as Acres
Note: See drainage area map(s)

Drainage Area in Acres Entering System:
A= 0.910 Acres

Percent of Impervious Cover Inflowing Drainage Area:

$$I = \frac{0.910}{0.910} \times 100 = 100.00\ \%\ \text{of Impervious Area}$$

Volumetric Runoff Coefficient:
R= 0.05 + 0.009(I) = 0.9500 Coefficient

Water Quality Volume:

$$\text{Required WQV} = \frac{1xRxA}{12} = 0.0720\ \text{Acre Feet} = 3{,}138\ \text{cubic feet}$$

Provided WQV= = 0.0000 Acre Feet
0 cubic feet Closed Detention System

Storm Water Quality Calculations - WQF - Water Quality Flow
As defined in Connecticut Stormwater Design Manual

$$Q = \frac{WQV(\text{acre-feet})x12}{\text{Drainage Area}}$$

Q = Runoff Depth (Inches)

WQV (ACRE FEET) = 0.0720 Acre Feet

Drainage Area = Total inflowing drainage area on and off site entering stormwater quality system (Acres)

Drainage Area = 0.9100 Acres

Q = 0.9500 Inches

NRCS Runoff Curve Number:

$$CN = \frac{1000}{10+5P+10Q-10(Q^2+1.25QP)^{1/2}}$$

CN = 99.57

Ia = 200/CN-2

Ia = 0.0086

P = 1 Inch

$$\frac{Ia}{P} = 0.0086$$

Time of Concentration = 10.0 minutes = 0.167 hours (minimum recommended)
Therefore, q_u = 550 cfs/sq mi/inch runoff (From Exhibit 4-III in TR-55)

Compute Water Quality Flow:

A = Drain Area Miles^2 = 0.00142 sq mi

WQF=(q_u)(A)(Q) = 0.74 cfs

WATER QUALITY CALCULATIONS
800 Long Ridge Road
Stamford, CT

BLT Apartment Buildings
Storm Drainage - PRDA-1B1P - Parking Area

Job No	4084	
Designed by	SQ	
Sheet No.	1 of 1	
Date	9/27/2023	REV 5/7/24

Storm Water Quality Calculations - WQV - Water Quality Volume
As defined in Chapter 7 of the "2004 CT Stormwater Quality Manual"

WQV= Water Quality Volume

$$WQV = \frac{(1")(R)(A)}{12\ IN/FT.}$$

Area= Total inflowing drainage area on and off site entering stormwater quality system as Acres
Note: See drainage area map(s)

Drainage Area in Acres Entering System:
A= 1.820 Acres

Percent of Impervious Cover Inflowing Drainage Area:

$$I = \frac{0.850}{1.820} \times 100 = 46.70\ \%\ \text{of Impervious Area}$$

Volumetric Runoff Coefficient:
R= 0.05 + 0.009(I) = 0.4703 Coefficient

Water Quality Volume:

$$\text{Required WQV} = \frac{1xRxA}{12} = \boxed{0.0713\ \text{Acre Feet}} = 3{,}107\ \text{cubic feet}$$

$$\text{Provided WQV} = \boxed{0.0770\ \text{Acre Feet}} = 3{,}354\ \text{cubic feet}$$

Storm Water Quality Calculations - WQF - Water Quality Flow
As defined in Connecticut Stormwater Design Manual

$$Q = \frac{WQV(\text{acre-feet})x12}{\text{Drainage Area}}$$

Q = Runoff Depth (Inches)

WQV (ACRE FEET) = 0.0713 Acre Feet

Drainage Area = Total inflowing drainage area on and off site entering stormwater quality system (Acres)

Drainage Area = 1.8200 Acres

Q = 0.4703 Inches

NRCS Runoff Curve Number:

$$CN = \frac{1000}{10+5P+10Q-10(Q^2+1.25QP)^{1/2}}$$

CN = 93.39

Ia = 200/CN-2

Ia = 0.1416

P = 1 Inch

$$\frac{Ia}{P} = 0.1416$$

Time of Concentration = 11.7 minutes = 0.195 hours
Therefore, q_u = 550 cfs/sq mi/inch runoff (From Exhibit 4-III in TR-55)

Compute Water Quality Flow:

A = Drain Area Miles^2 = 0.00284 sq mi

WQF=(q_u)(A)(Q) = 0.74 cfs

Drain Time - Infiltration Bed 1B1P
Depth of WQV stored = 131.1 - 129.75 = 1.35'
Field Measured Infiltration Rate = 40 minutes per inch x 1.5 safety factor = 60 minutes per inch design rate
1.35' x 12"/foot = 16.2 inches
16.2 inches x 60 minutes per inch infitlrator rate = 972 minutes/60 minutes per hour = **16.2 hour drain time**

WATER QUALITY CALCULATIONS
800 Long Ridge Road
Stamford, CT

BLT Apartment Buildings
Storm Drainage - PRDA-1B2

Job No	4084
Designed by	SQ
Sheet No.	1 of 1
Date	9/27/2023 Rev 5-14-23

Storm Water Quality Calculations - WQV - Water Quality Volume
As defined in Chapter 7 of the "2004 CT Stormwater Quality Manual"

WQV= Water Quality Volume

$$WQV = \frac{(1")(R)(A)}{12\ IN/FT.}$$

Area= Total inflowing drainage area on and off site entering stormwater quality system as Acres
Note: See drainage area map(s)

Drainage Area in Acres Entering System:
A= 2.350 Acres

Rational Method Coefficient:
C = 0.98

Percent of Impervious Cover Inflowing Drainage Area:

$$I = \frac{1.760}{2.350} \times 100 = 74.89\ \%\ \text{of Impervious Area}$$

Volumetric Runoff Coefficient:
R= 0.05 + 0.009(I) = 0.7240 Coefficient

Water Quality Volume:

$$\text{Required WQV} = \frac{1xRxA}{12} = 0.1418\ \text{Acre Feet} = 6{,}176\ \text{cubic feet}$$

Provided WQV= = 0.1620 Acre Feet = 7,035 cubic feet

Storm Water Quality Calculations - WQF - Water Quality Flow
As defined in Connecticut Stormwater Design Manual

$$Q = \frac{WQV(acre\text{-}feet)x12}{Drainage\ Area}$$

Q = Runoff Depth (Inches)

WQV (ACRE FEET) = 0.1418 Acre Feet

Drainage Area = Total inflowing drainage area on and off site entering stormwater quality system (Acres)

Drainage Area = 2.3500 Acres

Q = 0.7240 Inches

NRCS Runoff Curve Number:

$$CN = \frac{1000}{10+5P+10Q-10(Q^2+1.25QP)^{1/2}}$$

CN = 97.23

Ia = 200/CN-2

Ia = 0.0570

P = 1 Inch

$$\frac{Ia}{P} = 0.0570$$

Time of Concentration = 10.7 minutes = 0.1 hours
Therefore, q_u = 650 cfs/sq mi/inch runoff (From Exhibit 4-III in TR-55)

Compute Water Quality Flow:

A = Drain Area Miles^2 = 0.00367 sq mi

WQF=(q_u)(A)(Q) = 1.73 cfs

Drain Time - Infiltration Bed 1B2
Depth of WQV stored = 124.0 - 122.5 = 1.5'
Field Measured Infiltration Rate = 10 minutes per inch x 1.5 safety factor = 15 minutes per inch design rate
1.5' x 12"/foot = 18 inches
18 inches x 15 minutes per inch infitlrator rate = 270 minutes/60 minutes per hour = **4.5 hour drain time**

WATER QUALITY CALCULATIONS
800 Long Ridge Road
Stamford, CT

BLT Apartment Buildings
Storm Drainage - PRDA-1B3

Job No 4084
Designed by SQ
Sheet No. 1 of 1
Date 9/27/2023 Rev 5/7/24

Storm Water Quality Calculations - WQV - Water Quality Volume
As defined in Chapter 7 of the "2004 CT Stormwater Quality Manual"

WQV= Water Quality Volume

$$WQV = \frac{(1")(R)(A)}{12\ IN/FT.}$$

Area= Total inflowing drainage area on and off site entering stormwater quality system as Acres
Note: See drainage area map(s)

Drainage Area in Acres Entering System:
A= 6.290 Acres

Percent of Impervious Cover Inflowing Drainage Area:

$$I = \frac{2.200}{6.290} \times 100 = 34.98\ \%\ \text{of Impervious Area}$$

Volumetric Runoff Coefficient:
R= 0.05 + 0.009(I) = 0.3648 Coefficient

Water Quality Volume:

$$\text{Required WQV} = \frac{1xRxA}{12} = 0.1912\ \text{Acre Feet} = 8{,}329\ \text{cubic feet}$$

Provided WQV= 0.1240 Acre Feet = 5,842 cubic feet

Storm Water Quality Calculations - WQF - Water Quality Flow
As defined in Connecticut Stormwater Design Manual

$$Q = \frac{WQV(\text{acre-feet})x12}{\text{Drainage Area}}$$

Q = Runoff Depth (Inches)

WQV (ACRE FEET) = 0.1912 Acre Feet

Drainage Area = Total inflowing drainage area on and off site entering stormwater quality system (Acres)

Drainage Area = 6.2900 Acres

Q = 0.3648 Inches

NRCS Runoff Curve Number:

$$CN = \frac{1000}{10+5P+10Q-10(Q^2+1.25QP)^{1/2}}$$

CN = 91.13

Ia = 200/CN-2

Ia = 0.1946

P = 1 Inch

$$\frac{Ia}{P} = 0.1946$$

Time of Concentration = 15.7 minutes = 0.262 hours
Therefore, q_u = 475 cfs/sq mi/inch runoff (From Exhibit 4-III in TR-55)

Compute Water Quality Flow:

A = Drain Area Miles^2 = 0.00983 sq mi

WQF=(q_u)(A)(Q) = 1.70 cfs

Drain Time - Infiltration Basin 1B3
Depth of WQV stored = 101.0 - 99.5 = 1.5'
Field Measured Infiltration Rate = 40 minutes per inch x 1.5 safety factor = 60 minutes per inch design rate
1.5' x 12"/foot = 18 inches
18 inches x 60 minutes per inch infitlrator rate = 1,080 minutes/60 minutes per hour = **18 hour drain time**

WATER QUALITY CALCULATIONS
800 Long Ridge Road
Stamford, CT

BLT Apartment Buildings
Storm Drainage - PRDA-1BND

Job No 4084
Designed by SQ
Sheet No. 1 of 1
Date 9/27/2023 Rev 5/7/24

Storm Water Quality Calculations - WQV - Water Quality Volume
As defined in Chapter 7 of the "2004 CT Stormwater Quality Manual"

WQV= Water Quality Volume

$$WQV = \frac{(1")(R)(A)}{12\ IN/FT.}$$

Area= Total inflowing drainage area on and off site entering stormwater quality system as Acres
Note: See drainage area map(s)

Drainage Area in Acres Entering System:
A= 9.440 Acres

Percent of Impervious Cover Inflowing Drainage Area:

$$I = \frac{2.750}{9.440} \times 100 = 29.13\ \%\ \text{of Impervious Area}$$

Volumetric Runoff Coefficient:
R= 0.05 + 0.009(I) = 0.3122 Coefficient

Water Quality Volume:

$$\text{Required WQV} = \frac{1xRxA}{12} = 0.2456\ \text{Acre Feet} = 10{,}698\ \text{cubic feet}$$

Provided WQV= 0.0000 Acre Feet = 0 cubic feet (Not Detained)

Storm Water Quality Calculations - WQF - Water Quality Flow
As defined in Connecticut Stormwater Design Manual

$$Q = \frac{WQV(\text{acre-feet})x12}{\text{Drainage Area}}$$

Q = Runoff Depth (Inches)

WQV (ACRE FEET) = 0.2456 Acre Feet

Drainage Area = Total inflowing drainage area on and off site entering stormwater quality system (Acres)

Drainage Area = 9.4400 Acres

Q = 0.3122 Inches

NRCS Runoff Curve Number:

$$CN = \frac{1000}{10+5P+10Q-10(Q^2+1.25QP)^{1/2}}$$

CN = 89.78

Ia = 200/CN-2

Ia = 0.2277

P = 1 Inch

$$\frac{Ia}{P} = 0.2277$$

Time of Concentration = 27.4 minutes = 0.46 hours
Therefore, q_u = 375 cfs/sq mi/inch runoff (From Exhibit 4-III in TR-55)

Compute Water Quality Flow:

A = Drain Area Miles^2 = 0.01475 sq mi

WQF=(q_u)(A)(Q) = 1.73 cfs

Appendix F – Hydrodynamic Separator Sizing Calculations

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

B1

CDS 2015-4

Project Information					
Project Name	800 Long Ridge Road			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Stamford

Contact Information			
First Name	Emily	**Last Name**	Jones
Company	Civil 1	**Phone #**	203-266-0778
Email	emily@civil1.com		

Design Criteria					
Site Designation	B1			**Sizing Method**	Net Annual
Screening Required?	No	**Drainage Area (ac)**	1.80	**Peak Flow (cfs)**	5.12
Groundwater Depth (ft)	10 - 15	**Pipe Invert Depth (ft)**	5 - 10	**Bedrock Depth (ft)**	10 - 15
Multiple Inlets?	No	**Grate Inlet Required?**	Yes	**Pipe Size (in)**	15.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A	**180° between inlet and outlet?**	No
Runoff Coefficient	0.56	**Rainfall Station**	34 - Birdgeport Airport, CT	**TC (Min)**	12

Treatment Selection					
Treatment Unit	CDS	**System Model**	2015-4		
Target Removal	80%	**Particle Size Distribution (PSD)**	125	**Predicted Net Annual Removal**	86.98%

CONTECH ENGINEERED SOLUTIONS

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

B1

CDS 2015-4

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.0200	9.71%	9.71%	9.71%	0.0202	0.0202	2.89%	100.00%	9.71%
0.0400	9.68%	19.39%	9.68%	0.0403	0.0403	5.76%	100.00%	9.68%
0.0600	9.81%	29.20%	9.81%	0.0605	0.0605	8.64%	99.68%	9.78%
0.0800	7.67%	36.87%	7.67%	0.0806	0.0806	11.51%	99.11%	7.60%
0.1000	8.04%	44.91%	8.04%	0.1008	0.1008	14.40%	98.53%	7.92%
0.1200	5.44%	50.35%	5.44%	0.1210	0.1210	17.29%	97.95%	5.33%
0.1400	4.65%	55.00%	4.65%	0.1411	0.1411	20.16%	97.38%	4.53%
0.1600	5.49%	60.49%	5.49%	0.1613	0.1613	23.04%	96.80%	5.31%
0.1800	3.45%	63.94%	3.45%	0.1814	0.1814	25.91%	96.23%	3.32%
0.2000	4.08%	68.02%	4.08%	0.2016	0.2016	28.80%	95.65%	3.90%
0.2500	6.51%	74.53%	6.51%	0.2520	0.2520	36.00%	94.21%	6.13%
0.3000	5.47%	80.00%	5.47%	0.3024	0.3024	43.20%	92.77%	5.07%
0.3500	4.02%	84.02%	4.02%	0.3528	0.3528	50.40%	91.32%	3.67%
0.4000	1.98%	86.00%	1.98%	0.4032	0.4032	57.60%	89.88%	1.78%
0.4500	2.13%	88.13%	2.13%	0.4536	0.4536	64.80%	88.44%	1.88%
0.5000	2.03%	90.16%	2.03%	0.5040	0.5040	72.00%	87.00%	1.77%
0.7500	5.11%	95.27%	4.73%	0.7560	0.7000	100.00%	75.37%	3.85%
1.0000	2.48%	97.75%	1.72%	1.0080	0.7000	100.00%	56.53%	1.40%
1.5000	1.76%	99.51%	0.81%	1.5120	0.7000	100.00%	37.69%	0.66%
2.0000	0.48%	99.99%	0.17%	2.0160	0.7000	100.00%	28.26%	0.14%
								93.43%
							Removal Efficiency Adjustment[2] =	6.45%
							Predicted % Annual Rainfall Treated =	91.14%
							Predicted Net Annual Load Removal Efficiency =	86.98%
1 - Based on 10 years of hourly precipitation data from NCDC station 806, Bridgeport WSO ARPT, Fairfield County, CT								
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.								

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

B2

CDS 2015-4

Project Information					
Project Name	800 Long Ridge Road			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Stamford

Contact Information			
First Name	Emily	**Last Name**	Jones
Company	Civil 1	**Phone #**	203-266-0778
Email	emily@civil1.com		

Design Criteria					
Site Designation	B2			**Sizing Method**	Net Annual
Screening Required?	No	**Drainage Area (ac)**	1.20	**Peak Flow (cfs)**	3.82
Groundwater Depth (ft)	10 - 15	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	10 - 15
Multiple Inlets?	No	**Grate Inlet Required?**	Yes	**Pipe Size (in)**	15.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A	**180° between inlet and outlet?**	No
Runoff Coefficient	0.60	**Rainfall Station**	34 - Birdgeport Airport, CT	**TC (Min)**	11

Treatment Selection					
Treatment Unit	CDS	**System Model**	2015-4		
Target Removal	80%	**Particle Size Distribution (PSD)**	125	**Predicted Net Annual Removal**	89.47%

CONTECH ENGINEERED SOLUTIONS

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

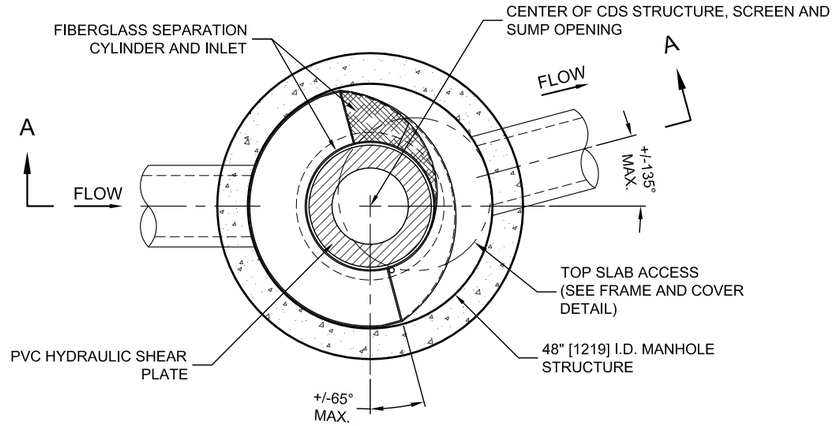
B2

CDS 2015-4

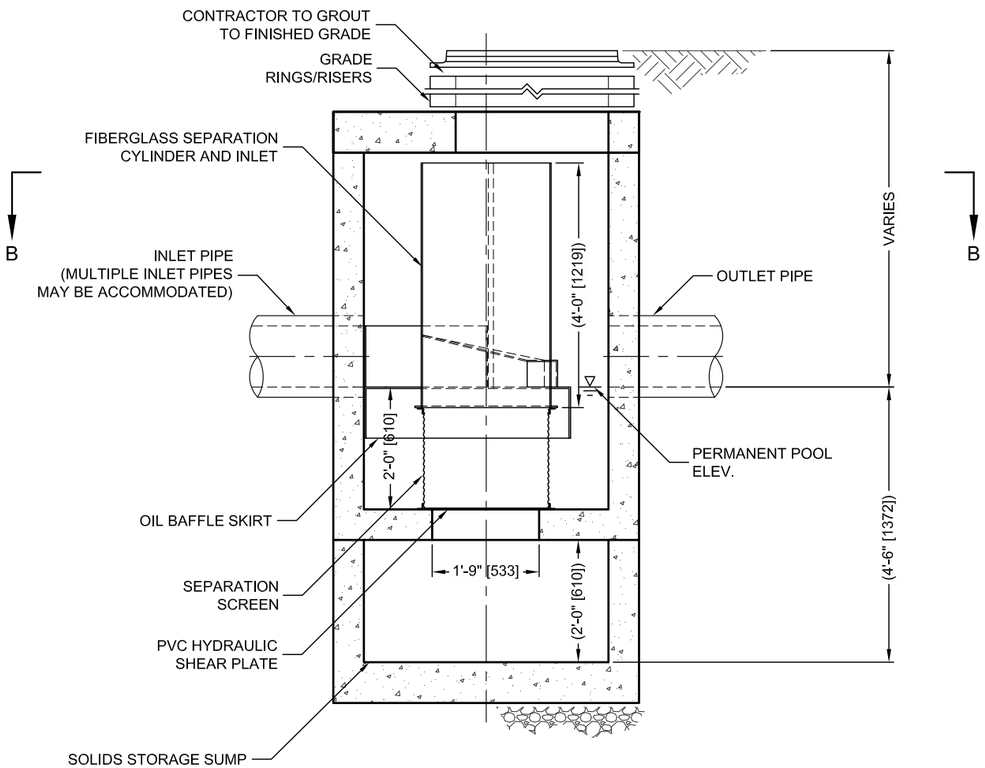
CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.0200	9.71%	9.71%	9.71%	0.0144	0.0144	2.06%	100.00%	9.71%
0.0400	9.68%	19.39%	9.68%	0.0288	0.0288	4.11%	100.00%	9.68%
0.0600	9.81%	29.20%	9.81%	0.0432	0.0432	6.17%	100.00%	9.81%
0.0800	7.67%	36.87%	7.67%	0.0576	0.0576	8.23%	99.76%	7.65%
0.1000	8.04%	44.91%	8.04%	0.0720	0.0720	10.29%	99.35%	7.99%
0.1200	5.44%	50.35%	5.44%	0.0864	0.0864	12.34%	98.94%	5.38%
0.1400	4.65%	55.00%	4.65%	0.1008	0.1008	14.40%	98.53%	4.58%
0.1600	5.49%	60.49%	5.49%	0.1152	0.1152	16.46%	98.12%	5.39%
0.1800	3.45%	63.94%	3.45%	0.1296	0.1296	18.51%	97.71%	3.37%
0.2000	4.08%	68.02%	4.08%	0.1440	0.1440	20.57%	97.29%	3.97%
0.2500	6.51%	74.53%	6.51%	0.1800	0.1800	25.71%	96.27%	6.27%
0.3000	5.47%	80.00%	5.47%	0.2160	0.2160	30.86%	95.23%	5.21%
0.3500	4.02%	84.02%	4.02%	0.2520	0.2520	36.00%	94.21%	3.79%
0.4000	1.98%	86.00%	1.98%	0.2880	0.2880	41.14%	93.18%	1.84%
0.4500	2.13%	88.13%	2.13%	0.3240	0.3240	46.29%	92.15%	1.96%
0.5000	2.03%	90.16%	2.03%	0.3600	0.3600	51.43%	91.12%	1.85%
0.7500	5.11%	95.27%	5.11%	0.5400	0.5400	77.14%	85.97%	4.39%
1.0000	2.48%	97.75%	2.41%	0.7200	0.7000	100.00%	79.14%	1.96%
1.5000	1.76%	99.51%	1.14%	1.0800	0.7000	100.00%	52.76%	0.93%
2.0000	0.48%	99.99%	0.23%	1.4400	0.7000	100.00%	39.57%	0.19%
								95.92%
							Removal Efficiency Adjustment[2] =	6.45%
							Predicted % Annual Rainfall Treated =	92.60%
							Predicted Net Annual Load Removal Efficiency =	89.47%

1 - Based on 10 years of hourly precipitation data from NCDC station 806, Bridgeport WSO ARPT, Fairfield County, CT

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW B-B
N.T.S.



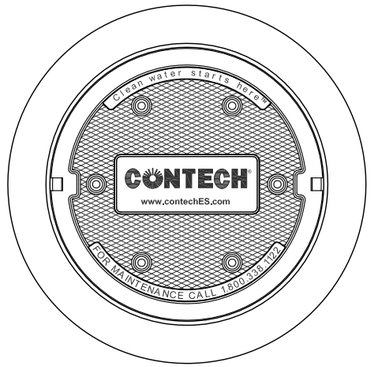
ELEVATION A-A
N.T.S.

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 6,581,782; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

CDS2015-4-C DESIGN NOTES

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C INLINE CDS STANDARD DETAIL

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

B3

CDS 2020-5

Project Information					
Project Name	800 Long Ridge Road			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Stamford

Contact Information			
First Name	Emily	**Last Name**	Jones
Company	Civil 1	**Phone #**	203-266-0778
Email	emily@civil1.com		

Design Criteria					
Site Designation	B3			**Sizing Method**	Net Annual
Screening Required?	No	**Drainage Area (ac)**	5.50	**Peak Flow (cfs)**	19.28
Groundwater Depth (ft)	10 - 15	**Pipe Invert Depth (ft)**	5 - 10	**Bedrock Depth (ft)**	10 - 15
Multiple Inlets?	No	**Grate Inlet Required?**	No	**Pipe Size (in)**	24.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A	**180° between inlet and outlet?**	No
Runoff Coefficient	0.53	**Rainfall Station**	34 - Birdgeport Airport, CT	**TC (Min)**	15

Treatment Selection					
Treatment Unit	CDS	**System Model**	2020-5		
Target Removal	80%	**Particle Size Distribution (PSD)**	125	**Predicted Net Annual Removal**	80.45%

CONTECH ENGINEERED SOLUTIONS

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

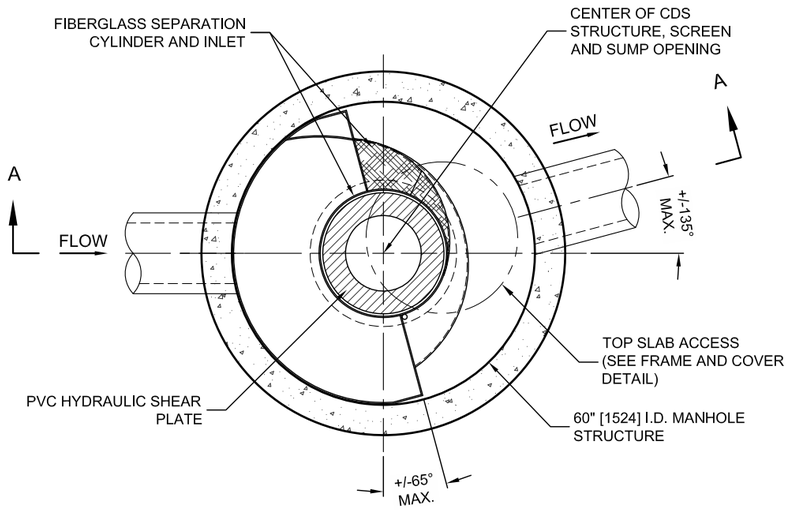
B3

CDS 2020-5

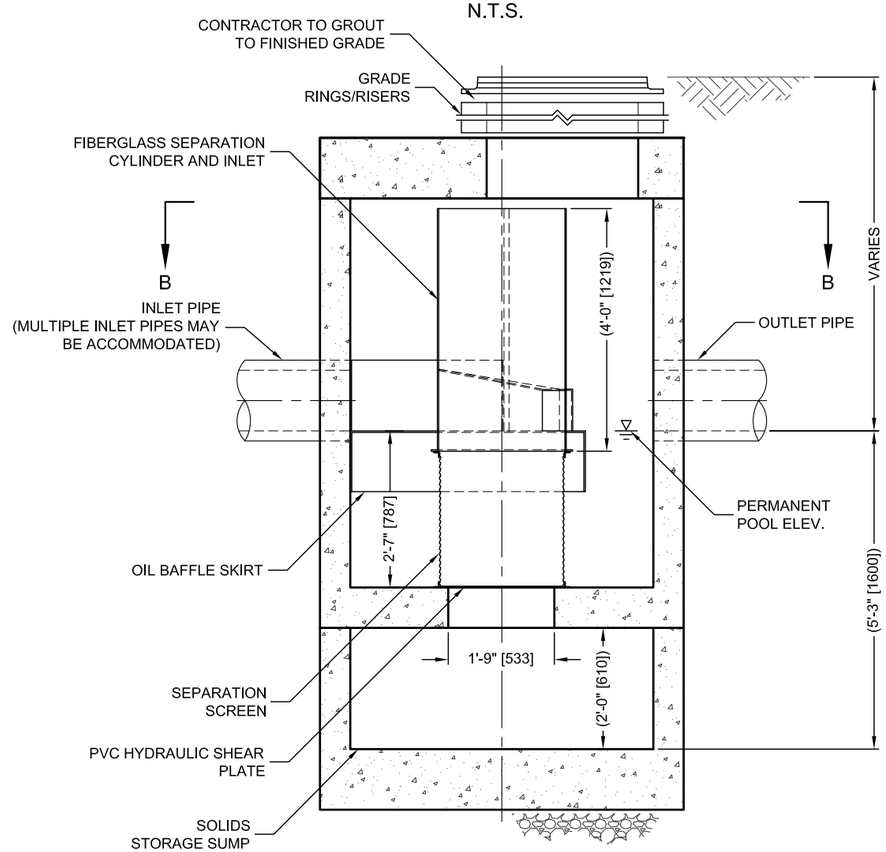
CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.0200	9.71%	9.71%	9.71%	0.0583	0.0583	5.30%	100.00%	9.71%
0.0400	9.68%	19.39%	9.68%	0.1166	0.1166	10.60%	99.29%	9.61%
0.0600	9.81%	29.20%	9.81%	0.1749	0.1749	15.90%	98.23%	9.64%
0.0800	7.67%	36.87%	7.67%	0.2332	0.2332	21.20%	97.17%	7.45%
0.1000	8.04%	44.91%	8.04%	0.2915	0.2915	26.50%	96.11%	7.73%
0.1200	5.44%	50.35%	5.44%	0.3498	0.3498	31.80%	95.05%	5.17%
0.1400	4.65%	55.00%	4.65%	0.4081	0.4081	37.10%	93.99%	4.37%
0.1600	5.49%	60.49%	5.49%	0.4664	0.4664	42.40%	92.93%	5.10%
0.1800	3.45%	63.94%	3.45%	0.5247	0.5247	47.70%	91.87%	3.17%
0.2000	4.08%	68.02%	4.08%	0.5830	0.5830	53.00%	90.80%	3.70%
0.2500	6.51%	74.53%	6.51%	0.7288	0.7288	66.25%	88.15%	5.74%
0.3000	5.47%	80.00%	5.47%	0.8745	0.8745	79.50%	85.50%	4.68%
0.3500	4.02%	84.02%	4.02%	1.0203	1.0203	92.75%	82.85%	3.33%
0.4000	1.98%	86.00%	1.87%	1.1660	1.1000	100.00%	76.79%	1.52%
0.4500	2.13%	88.13%	1.79%	1.3118	1.1000	100.00%	68.26%	1.45%
0.5000	2.03%	90.16%	1.53%	1.4575	1.1000	100.00%	61.43%	1.25%
0.7500	5.11%	95.27%	2.57%	2.1863	1.1000	100.00%	40.96%	2.09%
1.0000	2.48%	97.75%	0.94%	2.9150	1.1000	100.00%	30.72%	0.76%
1.5000	1.76%	99.51%	0.44%	4.3725	1.1000	100.00%	20.48%	0.36%
2.0000	0.48%	99.99%	0.09%	5.8300	1.1000	100.00%	15.36%	0.07%
								86.90%
							Removal Efficiency Adjustment[2] =	6.45%
							Predicted % Annual Rainfall Treated =	86.80%
							Predicted Net Annual Load Removal Efficiency =	80.45%

1 - Based on 10 years of hourly precipitation data from NCDC station 806, Bridgeport WSO ARPT, Fairfield County, CT

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW B-B
N.T.S.

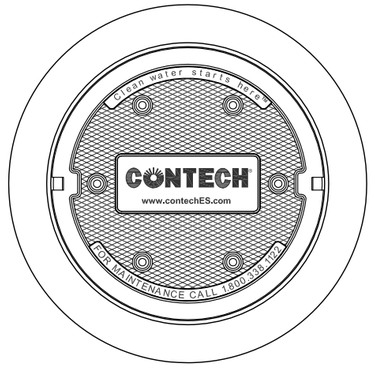


ELEVATION A-A
N.T.S.

CDS2020-5-C DESIGN NOTES

THE STANDARD CDS2020-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
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800-338-1122 513-645-7000 513-645-7993 FAX

CDS2020-5-C
INLINE CDS
STANDARD DETAIL

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

B4

CDS 2025-5

Project Information					
Project Name	800 Long Ridge Road			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Stamford

Contact Information			
First Name	Emily	**Last Name**	Jones
Company	Civil 1	**Phone #**	203-266-0778
Email	emily@civil1.com		

Design Criteria					
Site Designation	B4			**Sizing Method**	Net Annual
Screening Required?	No	**Drainage Area (ac)**	7.40	**Peak Flow (cfs)**	18.21
Groundwater Depth (ft)	10 - 15	**Pipe Invert Depth (ft)**	5 - 10	**Bedrock Depth (ft)**	10 - 15
Multiple Inlets?	No	**Grate Inlet Required?**	No	**Pipe Size (in)**	24.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A	**180° between inlet and outlet?**	No
Runoff Coefficient	0.48	**Rainfall Station**	34 - Birdgeport Airport, CT	**TC (Min)**	27

Treatment Selection					
Treatment Unit	CDS	**System Model**	2025-5		
Target Removal	80%	**Particle Size Distribution (PSD)**	125	**Predicted Net Annual Removal**	82.70%

Hydrodynamic Separation Product Calculator

800 Long Ridge Road

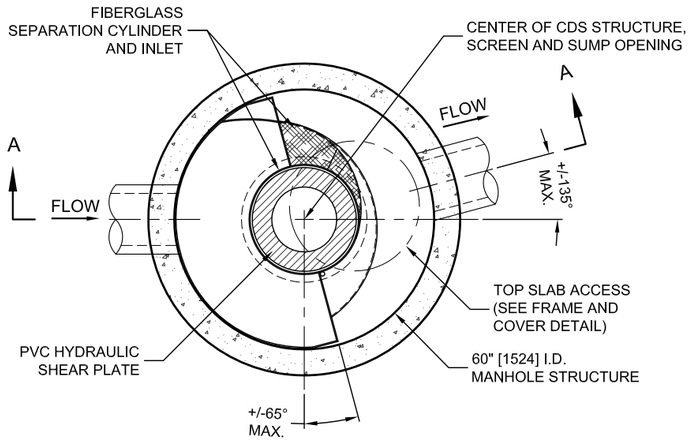
B4

CDS 2025-5

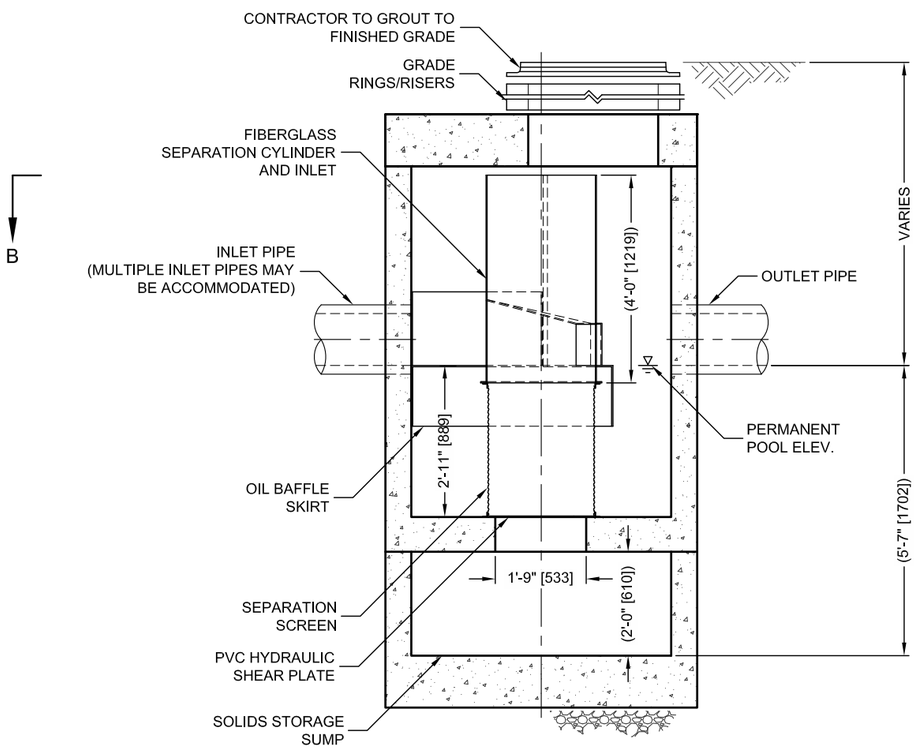
CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.0200	9.71%	9.71%	9.71%	0.0710	0.0710	4.44%	100.00%	9.71%
0.0400	9.68%	19.39%	9.68%	0.1421	0.1421	8.88%	99.63%	9.64%
0.0600	9.81%	29.20%	9.81%	0.2131	0.2131	13.32%	98.74%	9.69%
0.0800	7.67%	36.87%	7.67%	0.2842	0.2842	17.76%	97.86%	7.51%
0.1000	8.04%	44.91%	8.04%	0.3552	0.3552	22.20%	96.97%	7.80%
0.1200	5.44%	50.35%	5.44%	0.4262	0.4262	26.64%	96.08%	5.23%
0.1400	4.65%	55.00%	4.65%	0.4973	0.4973	31.08%	95.19%	4.43%
0.1600	5.49%	60.49%	5.49%	0.5683	0.5683	35.52%	94.30%	5.18%
0.1800	3.45%	63.94%	3.45%	0.6394	0.6394	39.96%	93.41%	3.22%
0.2000	4.08%	68.02%	4.08%	0.7104	0.7104	44.40%	92.53%	3.78%
0.2500	6.51%	74.53%	6.51%	0.8880	0.8880	55.50%	90.30%	5.88%
0.3000	5.47%	80.00%	5.47%	1.0656	1.0656	66.60%	88.08%	4.82%
0.3500	4.02%	84.02%	4.02%	1.2432	1.2432	77.70%	85.86%	3.45%
0.4000	1.98%	86.00%	1.98%	1.4208	1.4208	88.80%	83.64%	1.66%
0.4500	2.13%	88.13%	2.13%	1.5984	1.5984	99.90%	81.42%	1.73%
0.5000	2.03%	90.16%	1.83%	1.7760	1.6000	100.00%	73.33%	1.49%
0.7500	5.11%	95.27%	3.07%	2.6640	1.6000	100.00%	48.89%	2.50%
1.0000	2.48%	97.75%	1.12%	3.5520	1.6000	100.00%	36.67%	0.91%
1.5000	1.76%	99.51%	0.53%	5.3280	1.6000	100.00%	24.44%	0.43%
2.0000	0.48%	99.99%	0.11%	7.1040	1.6000	100.00%	18.33%	0.09%
								89.15%
							Removal Efficiency Adjustment[2] =	6.45%
							Predicted % Annual Rainfall Treated =	88.34%
							Predicted Net Annual Load Removal Efficiency =	82.70%

1 - Based on 10 years of hourly precipitation data from NCDC station 806, Bridgeport WSO ARPT, Fairfield County, CT

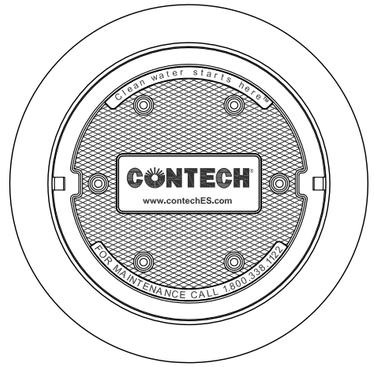
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

CDS2025-5-C DESIGN NOTES

THE STANDARD CDS2025-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2025-5-C
INLINE CDS
STANDARD DETAIL

SECTION (_____)
STORM WATER TREATMENT DEVICE

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of the CDS® by Contech Engineered Solutions LLC, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2 The Contractor shall furnish all labor, equipment and materials necessary to install the storm water treatment device(s) (SWTD) and appurtenances specified in the Drawings and these specifications.

1.3 The manufacturer of the SWTD shall be one that is regularly engaged in the engineering design and production of systems deployed for the treatment of storm water runoff for at least five (5) years and which have a history of successful production, acceptable to the Engineer. In accordance with the Drawings, the SWTD(s) shall be a CDS® device manufactured by:

Contech Engineered Solutions LLC
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

1.4 Related Sections

1.4.1 Section 02240: Dewatering
1.4.2 Section 02260: Excavation Support and Protection
1.4.3 Section 02315: Excavation and Fill
1.4.4 Section 02340: Soil Stabilization

1.5 All components shall be subject to inspection by the engineer at the place of manufacture and/or installation. All components are subject to being rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair where final acceptance of the component is contingent on the discretion of the Engineer.

1.6 The manufacturer shall guarantee the SWTD components against all manufacturer originated defects in materials or workmanship for a period of twelve (12) months from the date the components are delivered to the owner for installation. The manufacturer shall upon its determination repair, correct or replace any manufacturer originated defects advised in writing to the manufacturer within the referenced warranty period. The use of SWTD components shall be limited to the application for which it was specifically designed.

1.7 The SWTD manufacturer shall submit to the Engineer of Record a “Manufacturer’s Performance Certification” certifying that each SWTD is capable of achieving the specified removal efficiencies listed in these specifications. The certification shall be supported by independent third-party research

1.8 No product substitutions shall be accepted unless submitted 10 days prior to project bid date, or as directed by the Engineer of Record. Submissions for substitutions require review and approval by the Engineer of Record, for hydraulic performance, impact to project designs, equivalent treatment performance, and any required project plan and report (hydrology/hydraulic, water quality, stormwater pollution) modifications that would be required by the approving jurisdictions/agencies. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.

2.0 MATERIALS

2.1 Housing unit of stormwater treatment device shall be constructed of pre-cast or cast-in-place concrete, no exceptions. Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:

- 2.1.1 Concrete shall achieve a minimum 28-day compressive strength of 4,000 pounds per square-inch (psi);
- 2.1.2 Unless otherwise noted, the precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
- 2.1.3 Cement shall be Type III Portland Cement conforming to ASTM C 150;
- 2.1.4 Aggregates shall conform to ASTM C 33;
- 2.1.5 Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 185, or A 497.
- 2.1.6 Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.
- 2.1.7 Shipping of components shall not be initiated until a minimum compressive strength of 4,000 psi is attained or five (5) calendar days after fabrication has expired, whichever occurs first.

2.2 Internal Components and appurtenances shall conform to the following:

- 2.2.1 Screen and support structure shall be manufactured of Type 316 and 316L stainless steel conforming to ASTM F 1267-01;
- 2.2.2 Hardware shall be manufactured of Type 316 stainless steel conforming to ASTM A 320;
- 2.2.3 Fiberglass components shall conform to applicable sections of ASTM D-4097
- 2.2.4 Access system(s) conform to the following:
- 2.2.5 Manhole castings shall be designed to withstand AASHTO H-20 loadings and manufactured of cast-iron conforming to ASTM A 48 Class 30.

3.0 PERFORMANCE

3.1 The SWTD shall be sized to either achieve an 80 percent average annual reduction in the total suspended solid load with a particle size distribution having a mean particle size (d_{50}) of 125 microns unless otherwise stated.

3.2 The SWTD shall be capable of capturing and retaining 100 percent of pollutants greater than or equal to 2.4 millimeters (mm) regardless of the pollutant's specific gravity (i.e.: floatable and neutrally buoyant materials) for flows up to the device's rated-treatment capacity. The SWTD shall be designed to retain all previously captured pollutants addressed by this

subsection under all flow conditions. The SWTD shall be capable of capturing and retaining total petroleum hydrocarbons. The SWTD shall be capable of achieving a removal efficiency of 92 and 78 percent when the device is operating at 25 and 50 percent of its rated-treatment capacity. These removal efficiencies shall be based on independent third-party research for influent oil concentrations representative of storm water runoff (20 ± 5 mg/L). The SWTD shall be greater than 99 percent effective in controlling dry-weather accidental oil spills.

3.3 The SWTD shall be designed with a sump chamber for the storage of captured sediments and other negatively buoyant pollutants in between maintenance cycles. The minimum storage capacity provided by the sump chamber shall be in accordance with the volume listed in Table 1. The boundaries of the sump chamber shall be limited to that which do not degrade the SWTD's treatment efficiency as captured pollutants accumulate. The sump chamber shall be separate from the treatment processing portion(s) of the SWTD to minimize the probability of fine particle re-suspension. In order to not restrict the Owner's ability to maintain the SWTD, the minimum dimension providing access from the ground surface to the sump chamber shall be 16 inches in diameter.

3.4 The SWTD shall be designed to capture and retain Total Petroleum Hydrocarbons generated by wet-weather flow and dry-weather gross spills and have a capacity listed in Table 1 of the required unit.

3.5 The SWTD shall convey the flow from the peak storm event of the drainage network, in accordance with required hydraulic upstream conditions as defined by the Engineer. If a substitute SWTD is proposed, supporting documentation shall be submitted that demonstrates equal or better upstream hydraulic conditions compared to that specified herein. This documentation shall be signed and sealed by a Professional Engineer registered in the State of the work. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.6 The SWTD shall have completed field tested following TARP Tier II protocol requirements

4.0 EXECUTION

4.1 The contractor shall exercise care in the storage and handling of the SWTD components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be borne by the contractor.

4.2 The SWTD shall be installed in accordance with the manufacturer's recommendations and related sections of the contract documents. The manufacturer shall provide the contractor installation instructions and offer on-site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.

4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

4.4 The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

TABLE 1
Storm Water Treatment Device
Storage Capacities

CDS Model	Minimum Sump Storage Capacity $(yd^3)/(m^3)$	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-4	0.9(0.7)	61(232)
CDS2015-5	1.5(1.1)	83(313)
CDS2020-5	1.5(1.1)	99(376)
CDS2025-5	1.5(1.1)	116(439)
CDS3020-6	2.1 (1.6)	184(696)
CDS3025-6	2.1(1.6)	210(795)
CDS3030-6	2.1 (1.6)	236(895)
CDS3035-6	2.1 (1.6)	263(994)
CDS3535-7	2.9(2.2)	377(1426)
CDS4030-8	5.6(4.3)	426(1612)
CDS4040-8	5.6 (4.3)	520(1970)
CDS4045-8	5.6 (4.3)	568(2149)
CDS5640-10	8.7(6.7)	758(2869)
CDS5653-10	8.7(6.7)	965(3652)
CDS5668-10	8.7(6.7)	1172(4435)
CDS5678-10	8.7(6.7)	1309(4956)
CDS7070-DV	3.6(2.8)	914 (3459)
CDS10060-DV	5.0 (3.8)	792 (2997)
CDS10080-DV	5.0 (3.8)	1057 (4000)
CDS100100-DV	5.0 (3.8)	1320 (4996)

END OF SECTION

Appendix G – Rational Method Sizing for Storm Drainage

WATERSHED AREAS
800 LONG RIDGE ROAD
STAMFORD, CT

Drainage Area	Impervious (0.9)	Grass (0.3)	Wooded (0.2)	Total Area (Ac.)	Average C	Sum of AxC	Tc
STDA-1	0.454	0.000	0.000	0.454	0.900	0.409	5.00
STDA-2	0.454	0.000	0.000	0.454	0.900	0.409	5.00
STDA-3	0.454	0.000	0.000	0.454	0.900	0.409	5.00
STDA-4	0.454	0.000	0.000	0.454	0.900	0.409	5.00
STDA-5	0.464	0.189	0.335	0.988	0.548	0.541	12.00
STDA-6	0.399	0.176	0.252	0.827	0.559	0.462	5.00
STDA-7A	0.142	0.111	0.185	0.437	0.452	0.198	5.00
STDA-7	0.147	0.061	0.000	0.208	0.724	0.151	5.00
STDA-8	0.408	0.018	0.000	0.426	0.874	0.373	5.00
STDA-9	0.147	0.061	0.000	0.207	0.725	0.150	14.00
STDA-10	0.672	0.175	0.000	0.847	0.776	0.657	5.00
STDA-11	0.216	1.105	1.012	2.333	0.312	0.728	5.00
STDA-12	0.052	0.009	0.000	0.061	0.815	0.050	5.00
STDA-13	0.112	0.146	0.000	0.258	0.560	0.145	5.00
STDA-15	0.064	0.003	0.000	0.067	0.873	0.059	5.00
STDA-16	0.269	0.415	0.000	0.684	0.536	0.367	5.00
STDA-17	0.048	0.185	0.000	0.233	0.423	0.098	5.00
STDA-18	0.100	0.014	0.000	0.114	0.828	0.095	5.00
STDA-19	0.153	0.154	0.000	0.306	0.599	0.183	5.00
STDA-20	0.280	0.637	0.000	0.917	0.483	0.443	5.00
STDA-21	0.036	3.651	0.000	3.688	0.306	1.128	26.00
STDA-22	0.130	0.032	0.160	0.322	0.493	0.159	5.00
STDA-23	0.117	0.114	0.000	0.230	0.604	0.139	5.00
STDA-24	0.037	0.000	0.000	0.037	0.900	0.033	5.00
STDA-25	0.668	0.157	0.000	0.826	0.786	0.649	5.00
STDA-26	0.295	0.314	0.000	0.609	0.591	0.360	5.00
STDA-27	0.056	0.070	0.000	0.125	0.567	0.071	5.00
STDA-28	0.084	0.000	0.000	0.084	0.900	0.076	5.00
STDA-29	0.059	0.017	0.000	0.075	0.767	0.058	5.00
STDA-30	0.445	0.000	0.000	0.445	0.900	0.401	5.00
STDA-31	0.445	0.000	0.000	0.445	0.900	0.401	5.00

STORM SEWER SYSTEM DESIGN
800 LONG RIDGE ROAD
STAMFORD, CT
25 Year Design Storm

LINE	SEGMENT	TIME TO	TIME IN	ACCUM.	RUNOFF	AREA	SUM OF	ACCUM.	RAINFALL	SYSTEM	PIPE	PIPE (ft)	SLOPE	Vfull	Qfull	N'	CAPACITY	HW/D
SEGMENT	TYPE	INLET	PIPE	TIME	COEFF "C	(acres)	AxC	AxC	I	Q (cfs)	SIZE (in)	LENGTH	(ft/ft)	(fps)	(cfs)		CHECK	
ROOF TO	I	5.00	0.31	5.00	0.20	0.00												
INFIL (TYP BLDG. N)					0.30	0.00												
(STDA 1)					0.90	0.45												
							0.41	0.41	6.70	2.74	12	100	0.0100	5.36	4.21	0.0110	WITHIN CAPACITY	1.60
CB 2 TO	I	12.00	0.44	12.00	0.20	0.34												
HDS-B-1					0.30	0.19												
(STDA 5)					0.90	0.46												
							0.54	0.54	5.10	2.76	15	143	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.80
CB 3 TO	I	9.00	0.28	9.00	0.20	0.25												
HDS-B1					0.30	0.18												
(STDA 6)					0.90	0.40												
							0.46	0.46	5.70	2.63	15	91	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.75
HDS-B1	C	0.00	0.02	12.44	0.20	0.00												
INF. 1B1-P					0.30	0.00												
(NO STDA)					0.90	0.00												
							0.00	1.00	5.10	5.12	15	5	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	1.20
CB 4 TO	I	11.00	0.12	11.00	0.20	0.18												
DMH1					0.30	0.11												
(STDA 7A)					0.90	0.14												
							0.20	0.20	5.30	1.05	15	70	0.0250	9.84	12.07	0.0110	WITHIN CAPACITY	<0.5
DMH1	C	5.00	0.14	11.12	0.20	0.00												
CB 5					0.30	0.00												
(NO STDA)					0.90	0.00												
							0.00	0.20	5.30	1.05	15	90	0.0310	10.95	13.44	0.0110	WITHIN CAPACITY	<0.5
CB 5 (HDS B2) TO	C	5.00	0.01	11.26	0.20	0.00												
INFIL 1B2					0.30	0.06												
(STDA 7)					0.90	0.15												
							0.15	0.72	5.30	3.82	15	5	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	1.00
CB 6 TO	I	5.00	0.80	5.00	0.20	0.00												
CB 5					0.30	0.02												
(STDA 8)					0.90	0.41												
							0.37	0.37	6.70	2.50	15	260	0.0075	5.39	6.61	0.0110	WITHIN CAPACITY	0.85
ROOF TO	I	5.00	0.18	5.00	0.20	0.00												
INFIL					0.30	0.00												
(STDA 0)					0.90	0.40												
							0.36	0.36	6.70	2.41	12	50	0.0100	4.54	3.56	0.0130	WITHIN CAPACITY	1.20

STORM SEWER SYSTEM DESIGN
800 LONG RIDGE ROAD
STAMFORD, CT
25 Year Design Storm

LINE SEGMENT	SEGMENT TYPE	TIME TO INLET	TIME IN PIPE	ACCUM. TIME	RUNOFF COEFF "C	AREA (acres)	SUM OF AxC	ACCUM. AxC	RAINFALL I	SYSTEM Q (cfs)	PIPE SIZE (in)	PIPE (ft) LENGTH	SLOPE (ft/ft)	Vfull (fps)	Qfull (cfs)	N'	CAPACITY CHECK	HW/D
EX CB 7 TO	I	5.00	0.77	5.00	0.20	0.00												
EX CB-8					0.30	0.06												
(STDA 9)					0.90	0.15												
							0.15	0.15	6.70	1.01	12	152	0.0053	3.30	2.59	0.0130	WITHIN CAPACITY	0.65
EX CB 8 TO	C	5.00	0.07	5.77	0.20	0.00												
CB-9					0.30	0.17												
(STDA 10)					0.90	0.67												
							0.66	0.81	6.70	8.01	15	62	0.0540	14.46	17.74	0.0110	WITHIN CAPACITY	2.40
CB 9 TO	C	14.00	0.17	14.00	0.20	1.01												
DMH-11					0.30	1.10												
(STDA 11)					0.90	0.22												
							0.73	1.54	4.80	9.97	15	156	0.0620	15.49	19.01	0.0110	WITHIN CAPACITY	2.50
CB 10 TO	I	5.00	0.02	5.00	0.20	0.00												
DMH-11					0.30	0.01												
(STDA 12)					0.90	0.05												
							0.05	0.05	6.70	0.33	15	7	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	<0.5
CB 11 TO	I	5.00	0.02	5.00	0.20	0.00												
DMH-11					0.30	0.15												
(STDA 13)					0.90	0.11												
							0.14	0.14	6.70	3.57	15	7	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	0.80
DMH-11	C	5.00	0.29	14.17	0.20	0.00												
DMH-13					0.30	0.00												
(NO STDA)					0.90	0.00												
							0.00	1.73	4.80	10.91	15	170	0.0250	9.84	12.07	0.0110	WITHIN CAPACITY	2.50
CB 13 TO	I	5.00	0.01	5.00	0.20	0.00												
EX-DMH-13					0.30	0.00												
(STDA 15)					0.90	0.06												
							0.06	0.06	6.70	0.39	12	15	0.2530	22.82	17.92	0.0130	WITHIN CAPACITY	<0.5
CB 14	I	5.00	0.02	5.00	0.20	0.00												
DMH-14					0.30	0.41												
(STDA 16)					0.90	0.27												
							0.37	0.37	6.70	2.46	12	8	0.0300	7.86	6.17	0.0130	WITHIN CAPACITY	1.10
DMH-14	C	5.00	0.12	5.02	0.20	0.00												
EX CB-15					0.30	0.00												
(STDA 30)					0.90	0.45												
							0.40	0.77	6.70	5.14	15	65	0.0300	9.12	11.19	0.0130	WITHIN CAPACITY	1.40

STORM SEWER SYSTEM DESIGN
800 LONG RIDGE ROAD
STAMFORD, CT
25 Year Design Storm

LINE SEGMENT	SEGMENT TYPE	TIME TO INLET	TIME IN PIPE	ACCUM. TIME	RUNOFF COEFF "C	AREA (acres)	SUM OF AxC	ACCUM. AxC	RAINFALL I	SYSTEM Q (cfs)	PIPE SIZE (in)	PIPE (ft) LENGTH	SLOPE (ft/ft)	Vfull (fps)	Qfull (cfs)	N'	CAPACITY CHECK	HW/D
EX CB-15	C	5.00	0.04	5.14	0.20	0.00												
EX-DMH-13					0.30	0.18												
(STDA 17)					0.90	0.05												
							0.10	0.87	6.70	5.80	15	28	0.0400	10.53	12.92	0.0130	WITHIN CAPACITY	1.80
EX-DMH-13	C	5.00	0.25	14.46	0.20	0.00												
EX CB16					0.30	0.00												
(STDA 0)					0.90	0.00												
							0.00	2.65	4.80	12.74	24	216	0.0400	14.40	45.24	0.0130	WITHIN CAPACITY	1.10
EX CB 16 TO	C	5.00	0.06	14.71	0.20	0.00												
HDO-B3-CB 17					0.30	0.01												
(STDA 18)					0.90	0.10												
							0.09	2.75	4.80	18.40	24	25	0.0100	7.20	22.62	0.0130	WITHIN CAPACITY	1.40
HDO-B3 CB 17	C	5.00	0.05	14.76	0.20	0.00												
BASIN 1B3					0.30	0.15												
(STDA 19)					0.90	0.15												
							0.18	2.93	4.80	19.28	24	55	0.0750	19.72	61.95	0.0130	WITHIN CAPACITY	1.50
CB 18	I	5.00	0.30	5.00	0.20	0.00												
DMH-18					0.30	0.64												
(STDA 20)					0.90	0.28												
							0.44	0.44	6.70	2.97	15	111	0.0100	6.22	7.63	0.0110	WITHIN CAPACITY	1.00
DMH-18	C	5.00	0.27	5.30	0.20	0.00												
EX YD-19					0.30	0.00												
(STDA 31)					0.90	0.45												
							0.40	0.84	6.70	5.65	18	110	0.0135	6.91	12.20	0.0130	WITHIN CAPACITY	1.10
EX YD-19	C	26.00	0.09	26.00	0.20	0.00												
EX CB 21					0.30	3.65												
(STDA 21)					0.90	0.04												
							1.13	1.97	3.70	9.89	24	126	0.1000	22.77	71.54	0.0130	WITHIN CAPACITY	0.75
EX CB 20	I	5.00	0.07	5.00	0.20	0.16												
EX CB 21					0.30	0.03												
(STDA 22)					0.90	0.13												
							0.16	0.16	6.70	1.07	12	20	0.0100	4.54	3.56	0.0130	WITHIN CAPACITY	0.65
EX CB 21	C	5.00	0.29	26.09	0.20	0.00												
EX CB 23					0.30	0.11												
(STDA 23)					0.90	0.12												
							0.14	2.27	3.70	11.00	24	126	0.0100	7.20	22.62	0.0130	WITHIN CAPACITY	0.90

STORM SEWER SYSTEM DESIGN
800 LONG RIDGE ROAD
STAMFORD, CT
25 Year Design Storm

LINE	SEGMENT	TIME TO	TIME IN	ACCUM.	RUNOFF	AREA	SUM OF	ACCUM.	RAINFALL	SYSTEM	PIPE	PIPE (ft)	SLOPE	Vfull	Qfull	N'	CAPACITY	HW/D
SEGMENT	TYPE	INLET	PIPE	TIME	COEFF "C	(acres)	AxC	AxC	I	Q (cfs)	SIZE (in)	LENGTH	(ft/ft)	(fps)	(cfs)		CHECK	
EX CB 22	I	5.00	0.02	5.00	0.20	0.00												
EX CB 23					0.30	0.00												
(STDA 24)					0.90	0.04												
							0.03	0.03	6.70	0.22	12	15	0.0800	12.83	10.08	0.0130	WITHIN CAPACITY	<0.5
EX CB 23	C	5.00	0.06	26.38	0.20	0.00												
EX CB 25					0.30	0.16												
(STDA 25)					0.90	0.67												
							0.65	2.95	3.70	16.12	24	72	0.0670	18.64	58.56	0.0130	WITHIN CAPACITY	1.20
CB 24	I	5.00	0.03	5.00	0.20	0.00												
EX CB 25					0.30	0.31												
(STDA 26)					0.90	0.30												
							0.36	0.36	6.70	2.41	15	32	0.1500	20.39	25.02	0.0130	WITHIN CAPACITY	0.70
CB 25	C	5.00	0.11	26.45	0.20	0.00												
EX CB 26					0.30	0.07												
(STDA 27)					0.90	0.06												
							0.07	3.38	3.70	17.71	24	170	0.1350	26.46	83.12	0.0130	WITHIN CAPACITY	1.20
CB 27	I	5.00	0.02	5.00	0.20	0.00												
EX CB 26					0.30	0.00												
(STDA 28)					0.90	0.08												
							0.08	0.08	6.70	0.51	12	15	0.0700	12.00	9.43	0.0130	WITHIN CAPACITY	<0.5
CB 26	C	5.00	0.03	26.56	0.20	0.00												
HDS-B4					0.30	0.02												
(STDA 29)					0.90	0.06												
							0.06	3.52	3.70	18.21	24	25	0.0220	12.62	39.66	0.0110	WITHIN CAPACITY	1.30
HDS B4	C	5.00	0.07	26.59	0.20	0.00												
EX- CB					0.30	0.00												
(STDA 0)					0.90	0.00												
							0.00	3.52	3.70	18.21	24	112	0.0920	25.81	81.09	0.0110	WITHIN CAPACITY	1.30

Appendix H – Outlet Protection Calculations

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Sep 28 2023

Circular Culvert

Invert Elev Dn (ft)	=	100.00
Pipe Length (ft)	=	60.00
Slope (%)	=	7.50
Invert Elev Up (ft)	=	104.50
Rise (in)	=	24.0
Shape	=	Circular
Span (in)	=	24.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Culvert
Culvert Entrance	=	Rough tapered inlet throat
Coeff. K,M,c,Y,k	=	0.519, 0.64, 0.021, 0.9, 0.5

Embankment

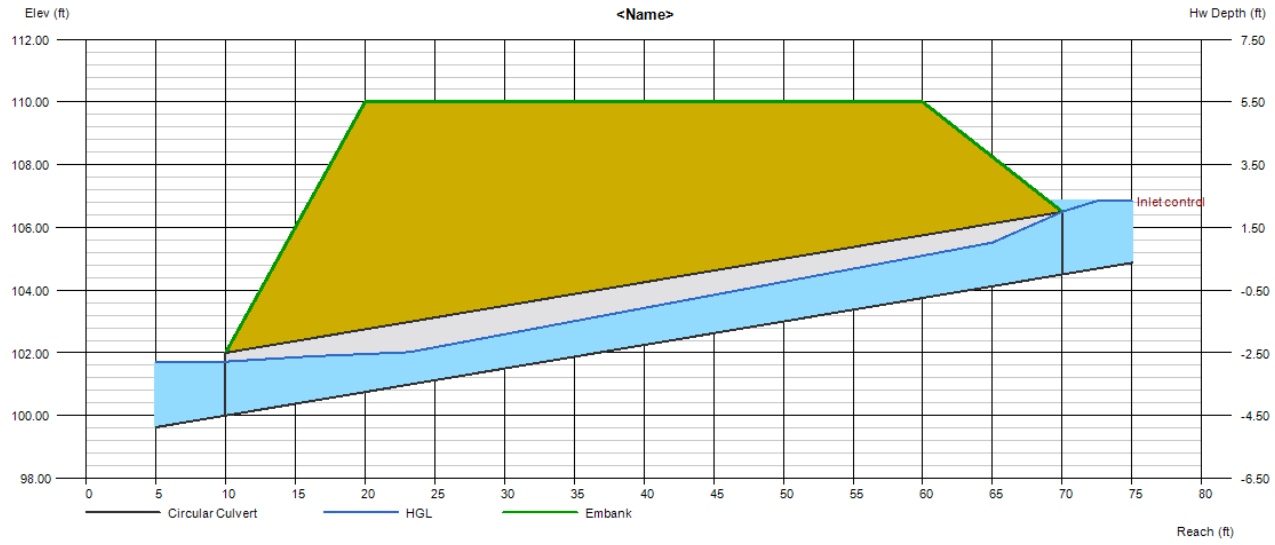
Top Elevation (ft)	=	110.00
Top Width (ft)	=	40.00
Crest Width (ft)	=	50.00

Calculations

Qmin (cfs)	=	15.90
Qmax (cfs)	=	15.90
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	15.90
Qpipe (cfs)	=	15.90
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	5.54
Veloc Up (ft/s)	=	6.58
HGL Dn (ft)	=	101.72
HGL Up (ft)	=	105.94
Hw Elev (ft)	=	106.85
Hw/D (ft)	=	1.17
Flow Regime	=	Inlet Control



OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	*10*	*10*		*USE*						
5.5	12	11								
6		12	*12*			*MINIMUM*				
7		14	13	**12**						
8			15	13						
8.5			16	14				*LENGTH*		
9				14						
10				15	*14*					
11				16	15					
12				17	15	*14*			*OUTLINED*	
13				18	16	15				
14					17	15	*14*			
16		*USE*			18	16	15	*14*		
18						18	16	15		
20						19	17	16		
22						20	18	16		
24							19	17	*16*	
26							20	18	17	*16*
28			*PREFORMED*				21	19	17	16
30							21	19	18	17
32							22	20	18	17
35								21	19	18
40								23	21	19
45								25	23	21
48					*SCOUR*			26	24	22
50									24	22
55									26	23
60									27	25
63									28	26
65										26
75							*HOLE*			29
80										30

Table 11-13.1 - Length - L_a (feet)
Type B or C Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

25 YR DESIGN Q = 19.20 CFS

OUTLET PROTECTION
OUTLET VELOCITY > 14 feet/sec or Length of Apron exceeds limits shown on Tables 11-12.1 and 11-13.1

Preformed Scour Hole										
(See Figure 11-15)	PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
Type 1										
B	5	6	8	10	13	15	18	20	23	25
C	6	8	9	12	15	18	21	24	27	30
d	Depends on riprap type(see Figure 11-15)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = 0.5\ S_p$	0.5	0.625	0.75	1	1.25	1.5	1.75	2	2.25	2.5
Type 2										
B	8	10	12	16	20	24	28	32	36	40
C	9	11	14	18	23	27	32	36	41	45
d	Depends on riprap size (see Figure 11-15)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = S_p$	1.0	1.3	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0

Table 11-14.1 - Dimensions of Preformed Scour Hole (Feet)

VELOCITY = 19.72 FT/SEC
USE STANDARD RIP-RAP

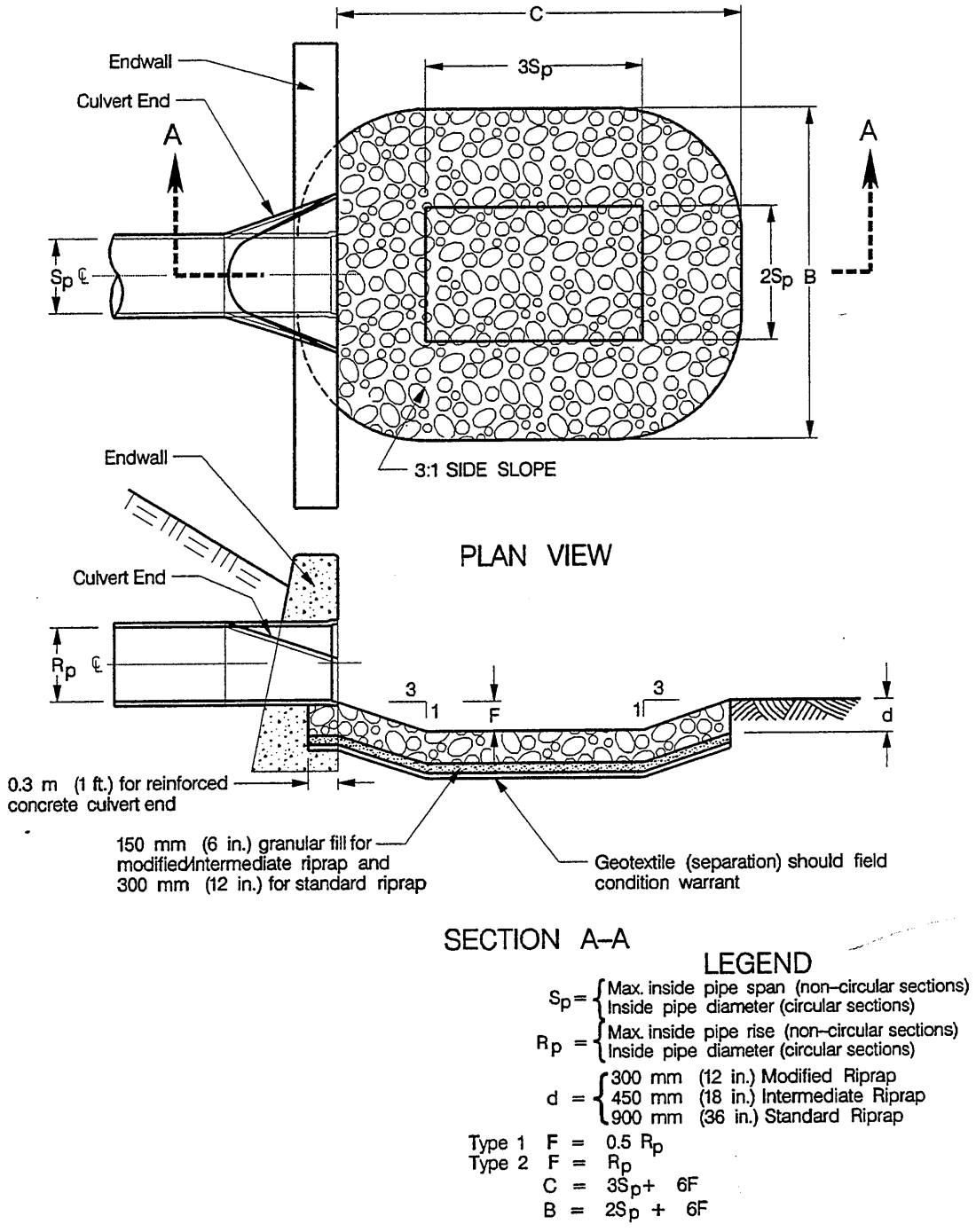


Figure 8-11 Preformed Scour Hole Type 1 and Type 2

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Sep 28 2023

Circular Culvert

Invert Elev Dn (ft)	=	92.00
Pipe Length (ft)	=	82.00
Slope (%)	=	4.90
Invert Elev Up (ft)	=	96.02
Rise (in)	=	24.0
Shape	=	Circular
Span (in)	=	24.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Culvert
Culvert Entrance	=	Rough tapered inlet throat
Coeff. K,M,c,Y,k	=	0.519, 0.64, 0.021, 0.9, 0.5

Embankment

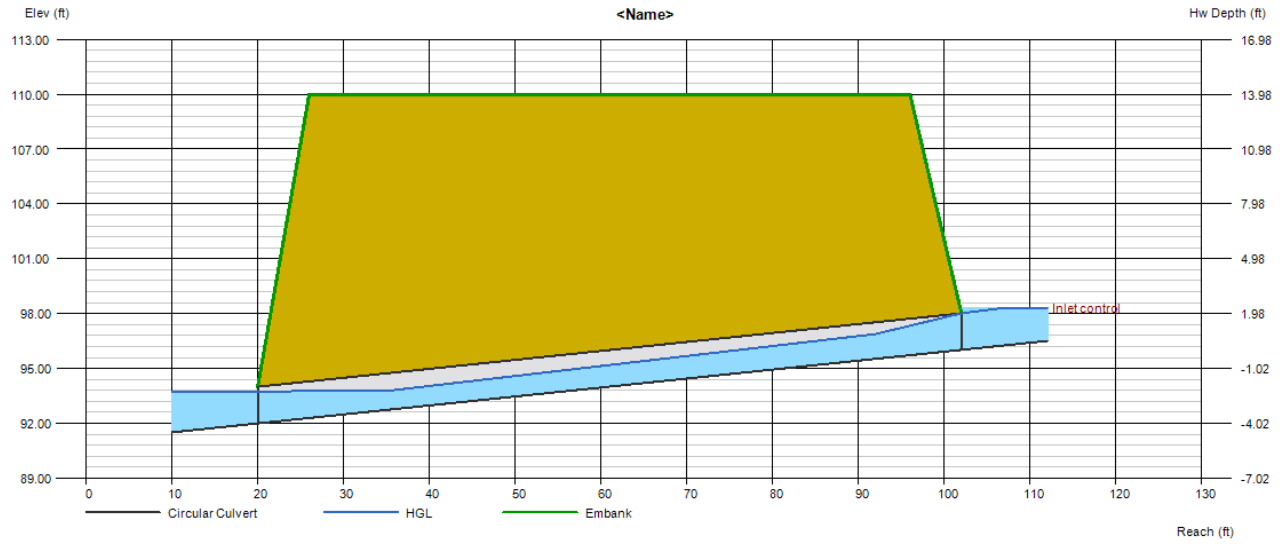
Top Elevation (ft)	=	110.00
Top Width (ft)	=	70.00
Crest Width (ft)	=	50.00

Calculations

Qmin (cfs)	=	15.40
Qmax (cfs)	=	15.40
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	15.40
Qpipe (cfs)	=	15.40
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	5.39
Veloc Up (ft/s)	=	6.49
HGL Dn (ft)	=	93.71
HGL Up (ft)	=	97.43
Hw Elev (ft)	=	98.32
Hw/D (ft)	=	1.15
Flow Regime	=	Inlet Control



Appendix I – USDA Soils Mapping

Soil Map—State of Connecticut
(800 Long Ridge Road)

Map Scale: 1:2,830 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
29B	Agawam fine sandy loam, 3 to 8 percent slopes	0.1	0.5%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	0.2	0.7%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	0.2	0.7%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	1.7	7.1%
238C	Hinckley-Urban land complex, 3 to 15 percent slopes	0.0	0.2%
273E	Urban land-Charlton-Chatfield complex, rocky, 15 to 45 percent slopes	5.2	21.1%
306	Udorthents-Urban land complex	16.5	66.8%
W	Water	0.7	3.0%
Totals for Area of Interest		**24.7**	**100.0%**

Appendix J – Draft Standard City of Stamford Drainage Maintenance Agreement

Block _____ .

AGREEMENT COVENANT

AGREEMENT made this____ day of_____by and between _____of_____in the City of Stamford, County of Fairfield and State of Connecticut (hereinafter referred to as "Owner"); and the **CITY OF STAMFORD**, a municipal corporation lying within the County of Fairfield and State of Connecticut, acting herein by its duly authorized Mayor, David R. Martin (hereinafter referred to as the "CITY"), the **ENVIRONMENTAL PROTECTION BOARD OF THE CITY OF STAMFORD**, acting herein by its duly authorized Chairman, Gary H. Stone (hereinafter referred to as the "EPB").

WITNESSETH

WHEREAS, OWNER has commenced the planning and construction of a new _____on land owned by it and as more particularly described on Schedule "A" annexed hereto and made of part hereof (hereinafter referred to as the "Property"); and

WHEREAS, certain drainage facilities ("Drainage Facilities"), including but not limited to_____as more particularly described on Schedule "B" attached (the "Construction Plans") shall be installed in connection with the aforesaid construction and in accordance with the Construction Plans and _____Permit No._____issued by the_____Board of the City of Stamford (_____) issued

therefore, ("Permit") and;

WHEREAS, OWNER, the CITY and EPB share a joint concern that the Drainage Facilities be maintained in a functioning condition so as to avoid pollution of surface and groundwaters, flooding and/or improper drainage.

NOW, THEREFORE, in consideration of ten dollars and other good and valuable consideration receipt of which is hereby acknowledged by the OWNER, it is hereby agreed as follows:

1) OWNER shall clean the drainage facilities or cause such facilities to be cleaned by periodic removal of accumulated sediment and debris in a good and workman-like manner, at least two (2) times during every twelve (12) month period, which times shall be in the period between April and June and between October and December and more often as the City may determine to be necessary.

2) OWNER shall sweep, or cause to be swept, garage facilities, driveways and roadway surfaces located on the Property at least once per calendar quarter.

3) OWNER shall utilize only sand or calcium chloride in connection with the de-icing of areas within the Property meaning and intending that road salt (Sodium Chloride) shall not be used for said purpose.

4) OWNER shall repair or replace any defects or defective drainage

facilities so as to maintain the drainage facilities, at all times, in a fully functional capacity.

5) OWNER shall file as-built drainage plans with the EPB immediately upon the completion of work. Said plans shall be prepared by a professional engineer/surveyor registered in the State of Connecticut.

6) OWNER grants the CITY and/or EPB, its agents, and employees, the right to enter the Property at all reasonable times upon twenty-four (24) hours notice to the OWNER for the purpose of inspecting the Property to determine if OWNER is complying with the requirements hereunder. A representative of the Owner shall have the right to accompany the City and/or EPB on their inspection of the Property.

7) If, after an inspection is made pursuant to Paragraph Six (6) hereof, the CITY and/or EPB determines that the owner has failed to comply with the aforesaid undertakings, then the CITY and/or EPB shall give written notice of said determination to the then OWNER of the Property which notice shall also specify the said failure. Said notice shall be sent by registered or certified mail to the last known address of said Owner. If the Owner disputes the claim, he shall give written notice thereof to City and/or EPB within ten (10) days of receipt of said notice, and the EPB shall hold a hearing as promptly as possible to decide the merits of the disputed claim. If the claim is not disputed within

said ten (10) days, the OWNER shall have thirty (30) days from the receipt of said notice to correct said failure, unless it is impossible to cure said defect within said time, in which case, the necessary repairs shall be immediately commenced and diligently pursued to completion within a reasonable time.

8) If the said failure is not remedied within the time frame herein stated, the CITY and/or EPB may proceed to cure the same and charge the actual cost thereof to the OWNER of the Property.

9) OWNER agrees to reimburse the CITY and/or EPB for reasonable legal fees and court costs if it becomes necessary for the CITY and/or EPB to sue for reimbursement of sums expended by the CITY and/or EPB in performance of OWNER'S obligation.

10) OWNER agrees and covenants to indemnify and save harmless the CITY and the EPB against any and all claims, suits, actions or judgments arising out of the delay in the performance of any of their obligations pursuant to this Agreement.

11) OWNER agrees that this covenant and restriction shall apply to and run with the land. It shall be binding on all future owners, administrators, executors, successors and assigns.

12) The OWNER hereby represents to the CITY and EPB that he/she is the owner, in fee simple, of all of the property described in "Schedule A" attached hereto and made a part hereof.

13) OWNER agrees that this Agreement and restrictive covenant upon execution of the same, shall be recorded on the land records at the OWNER'S expense at the time that a permit is issued for the Property herein and while the OWNER is in title.

14) OWNER agrees not to assert the invalidity of this document.

15) OWNER agrees that nothing herein shall be construed to be a limitation upon the right of the EPB to assert and enforce any rights it may have under federal, state or City statute, ordinance or regulation.

16) This agreement shall be governed by the laws of the State of Connecticut.

IN WITNESS WHEREOF, the said parties hereto have hereunto set their hands and seals, the day and year first above written.

WITNESSED:

_____

_____

THE CITY OF STAMFORD

BY: _____

David R. Martin
Its duly authorized Mayor

(ACKNOWLEDGEMENT ON THE FOLLOWING PAGE)

_____ **THE ENVIRONMENTAL PROTECTION BOARD**

_____ BY: _____

Gary H. Stone
Its duly authorized Chairman

_____ **OWNER**

_____ BY: _____

_____ **OWNER**

_____ BY: _____

_____

STATE OF CONNECTICUT}
} ss: STAMFORD Date: _____
COUNTY OF FAIRFIELD }

Personally appeared David R. Martin, Mayor of the City of Stamford, signer and sealer of the foregoing instrument, and acknowledged the same to be his free act and deed and the free act and deed of said City, before me.

_____
Commissioner of the Superior Court
or Notary Public

STATE OF CONNECTICUT}
} ss: STAMFORD Date: _____
COUNTY OF FAIRFIELD }

Personally appeared Gary H. Stone, Chairman of the Environmental Protection Board of the City of Stamford, signer and sealer of the foregoing instrument, and acknowledged the same to be his free act and deed and the free act and deed of said Commission, before me.

_____
Commissioner of the Superior Court
or Notary Public

STATE OF CONNECTICUT }
} ss: STAMFORD Date: _____
COUNTY OF FAIRFIELD }

Personally appeared _____, signer and sealer of the foregoing instrument, and acknowledge the same to be_____free act and deed, before me.

_____
Commissioner of the Superior Court
or Notary Public

Appendix K – DCIA Tracking Worksheet

Directly Connected Impervious Area Tracking Worksheet
City of Stamford Drainage Manual

Note to user: complete all cells of this color *only*

Part 1: General Information

Project Name	800 Long Ridge Road
Project Address	800 Long Ridge Road, Stamford, CT
Project Applicant	Building & Land Technology
Date of Submittal	10/03/2023 - REVISED 5-28-24
Tax Account Number	

Part 2: Project Details

1. What type of development is this? (choose from dropdown)	Redevelopment	
2. What is the total area of the project site?	1,100,532	ft^2
3. What is the total area of land disturbance for this project?	574,239	ft^2
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No	
5. What is the current ***DCIA*** for the site?	359,806	ft^2
6. Will the proposed development increase ***DCIA*** (without consideration of proposed stormwater management)? (Yes/No)	Yes	
7. What is the proposed-development ***total impervious area*** for the site?	384,881	ft^2

Part 3: Water Quality Target Total

Does Standard 1 apply based on information above?	Yes	
Water Quality Volume (WQV)	31,448	ft^3
Standard 1 requirement	Retain 50% WQV On-Site	
Required treatment/retention volume	15,724	ft^3
Provided treatment/retention volume for proposed development	16,231	ft^3

Part 4: Proposed DCIA Tracking

Pre-development ***total impervious area***	359,806	ft^2
Current ***DCIA***	359,806	ft^2
Proposed-development ***total impervious area***	384,881	ft^2
Proposed-development ***DCIA*** (after stormwater management)	174,676	ft^2
Net change in ***DCIA*** from pre-development to proposed-development	-185,130	ft^2

Part 5: Post-Development (As-Built Certified) DCIA Tracking

Post-development (per as-built) ***total impervious area***		ft^2
Post-development (per as-built) ***DCIA*** (after stormwater management)		ft^2
Net change in ***DCIA*** from pre-development to post-development		ft^2

Certification Statement

I hereby certify that the information contained in this worksheet is true and correct.

Engineer's Signature _____ Date 5/28/24 Engineer's Seal _____

Appendix L - Checklist for Stormwater Management Report & Plan

City of Stamford
Engineering Bureau
888 Washington Boulevard, 7th Floor Stamford, CT 06901
Phone 203-977-4189

Checklist for Stormwater Management Report

I. Project Report

A. Applicant / Site Information

X	Applicant name, legal address, contact information (email & phone)
X	Engineers name, legal address, contact information (email & phone)
X	Site address and legal description
X	Current / proposed zoning and land use
X	Site vicinity map (8.5" x 11")

B. Project Description and Purpose

X	Project description including proposed project elements and anticipated construction schedule

C. Existing Conditions Description

X	Site area, ground cover, vegetation, features (roads, buildings, utilities, etc.)
X	Site topography, slopes, drainage patterns, conveyances systems (swales, storm drains, etc.), stormwater discharge locations
X	Receiving waterbody information including stormwater impairments and TMDL information (See the most recent State of Connecticut Integrated Water Quality Report)
X	Site soils information including soil types, hydrologic soil group, bedrock / outcroppings, groundwater elevation, significant geologic features
X	Provide NRCS Soils Mapping
X	Resource protection areas (wetlands, streams, lakes, etc.), buffers, floodplains, floodways

D. Summary of Applicable General Design Criteria

X	Methodology, design storm frequency
X	Hydrologic design criteria
X	Hydraulic design criteria
X	Flood hazard areas

	Applying under "Lite" Stormwater Management: Skip to Section I (Refer to Flow Chart on page vii of the City of Stamford Stormwater Drainage Manual)

E. Project Type in Accordance with Standard 1 Definitions

X	Area of disturbance, receiving waterbody classification (High Quality, Tidal Wetlands, Direct Waterfront)
X	Project type (development, redevelopment, linear development)
X	Pollutant reduction standard per flowchart Section 2.4

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F. Summary of LID Site Constraints

X	Description of sensitive areas for protection
X	Mature tree inventory, which shall include 8-inch (dbh) diameter trees or greater
X	Steep slopes
	Ledge and bedrock depth
	Seasonal high groundwater elevation
	Pollutant hotspots
X	Summary of infiltration rates

G. Summary of Proposed Stormwater Treatment Practices

X	Proposed LID controls (i.e. minimize impervious, minimize DCIA, minimize disturbance, increase time of concentrations, other LID controls and strategies)
X	Location, size, types
X	Design criteria and references
X	Stormwater treatment practice, drainage area characteristics / details

H. Summary of Compliance with Standards 1

X	Required pollutant reduction criteria
X	Provided pollutant reduction (WQV) by stormwater treatment practice
X	Summary of compliance with Standard 1

I. Summary of Compliance with Standards 2, 3, and 4

X	Description of proposed stormwater management system
X	Pre-development site hydrology with delineation of each watershed area and sub-basin
X	Post-development site hydrology with delineation of each watershed area and sub-basin
X	Comparison table of pre- and post-development hydrology, peak flow, volume, and percent difference
X	Summary table of watershed areas and sub-basin areas, time of concentration and runoff coefficients
X	Summary table demonstrating the 2-year, 24-hour post development peak flow rate is less than or equal to the lowest of either: - The pre-development 1-year, 24-hour storm peak flow rate - 50 percent of the pre-development 2-year, 24-hour storm peak flow rate
X	Conveyance protection, emergency outlet sizing
	Hydraulic grade line summary and tail water elevation used in analysis
X	Construction erosion and sediment control description, Standard 3
X	Operation and Maintenance, maintenance tasks and schedule on construction plans per Standard 4

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J. Summary of Compliance with Applicable Drainage Facility Design Requirements

X	Description of applicable design requirements and compliance
X	Description of proposed drainage facilities and compliance

K. Stormwater Management Report

X	Signed and stamped by professional engineer licensed in the State of Connecticut
X	Drainage impact statement in accordance with Standard 5B.

II. Supporting Calculations (as appendix to Project Report)

	Applying under "Lite" Stormwater Management: Skip to Section N

L. Water Quality Volume / Water Quality Flow Calculations

X	Calculations demonstrating the total Water Quality Volume generated by the post-development site and the required retention/treatment volume per Standard 1 in cubic feet.
X	Calculations demonstrating the total Water Quality Volume retained/treated by each stormwater treatment practice and the total Water Quality Volume generated by the post-development contributing drainage area to each stormwater treatment practice

M. Stormwater Treatment Practice Sizing Calculations

X	Calculations demonstrating how each stormwater treatment practice has been designed and sized in accordance with the Structural Stormwater BMP Design references in Appendix B. Calculations will vary by stormwater treatment practice, but a minimum, applicants shall provide calculations in accordance with design criteria from the Connecticut Stormwater Quality Manual.

N. Hydrologic and Hydraulic Design Calculations

X	Stream channel protection, Standard 2A
X	Conveyance protection, Standard 2B
X	Peak flow control (1-year, 2-year, 5-year, 10-year, 25-year, and 50-year storms), Standard 2C
X	Inlet analysis
	Gutter flow (Site by site basis as requested by Engineering Bureau)
X	Storm sewers and culverts (velocities, capacity, hydraulics)
	Hydraulic grade line required when pipe is flowing at full capacity o Provide existing and proposed summary table o Provide existing and proposed mapping, label structures
X	Detention facilities (outlet structure, stage/storage, freeboard)
X	Emergency outlet sizing, safely pass the 100 year storm, Standard 2D
X	Outlet protection calculations, based on conveyance protection (i.e. riprap, energy dissipater)

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O. Hydrologic and Hydraulic Model, Existing and Proposed

X	Drainage routing diagram
X	Summary
X	Storage pond input

P. Downstream analysis (Site by site basis as required by the Engineering Bureau)

	Downstream analysis, Standard 2E

III. Supporting Mapping (as appendix to Project Report)

Q. Pre-Development Drainage Basin Area Mapping

X	11" x 17" or 8.5" x 11" sheet size
X	Topography, drainage patterns, drainage area boundaries and sub basins, flow paths, times of concentration
X	Locations of existing stormwater discharges
X	Perennial and intermittent streams, wetlands, and floodplain / floodways
X	NRCS soil types, locations, boring locations, infiltration testing locations
X	Vegetation and groundcover
X	Existing roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, decks and other structures
X	Location, size, type of existing structural stormwater controls, facilities and conveyance systems

R. Post-Development Drainage Basin Area Mapping

X	11" x 17" or 8.5" x 11" sheet size
X	Topography, drainage patterns, drainage area boundaries and sub basins, flow paths, times of concentration
X	Locations of proposed stormwater discharges
X	Perennial and intermittent streams, wetlands, and floodplain / floodways
X	NRCS soil types, locations, boring locations, infiltration testing locations
X	Vegetation, ground cover and proposed limits of clearing/disturbance
X	Proposed, roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, decks and other structures
X	Location, size, type of proposed structural stormwater controls, facilities and conveyance systems

IV. DCIA Tracking Worksheet (as appendix to Project Report)

X	DCIA Tracking Worksheet (Use form found in Appendix E)

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V. Proposed LID Review Map

	Applying under "Lite" Stormwater Management - Proposed LID Review Map NOT required.

A. General

X	Site address
X	Applicant name, legal address, contact information
X	Engineers name, address, contact information
X	North arrow, bar scale, horizontal and vertical datum
X	Drawing scale shall be set at 1"=20' or 1"=40' when possible
X	Signed and stamped by a Licensed Professional Engineer in the State of Connecticut
X	11" x 17" or 24" x 36" sheet size unless otherwise approved
X	Existing and proposed contours based on NAVD 88 at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent
X	Locations of existing stormwater discharges
X	Roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, and decks and other structures
X	Location, size, ownership of stormwater conveyance systems (swales, pipes, etc.)

B. LID Constraints:

	Boring / test pit locations
	Infiltration testing locations and results
X	Vegetation and proposed limits of clearing / disturbance
X	NRCS soils mapping
X	Steep slopes
X	Surface waters / Perennial and intermittent streams
X	Resource protection areas and buffers, wetlands, floodplain / floodways
	Existing vegetation and mature trees, which shall include 8-inch (dbh) diameter trees or greater
	Poor soils (HSG C & D)
	Shallow bedrock / ledge
	Seasonal high groundwater elevation
	Other site constraints (e.g. brownfield caps)

C. Proposed Stormwater Treatment Measures:

X	Location, size, type, limits, and WQV provided by each proposed stormwater treatment practices
X	Drainage area to each proposed stormwater treatment practice (total area, impervious area, WQV)

D. Site Summary Table:

X	Total site area, disturbed area, pre- and post-development impervious areas
X	Required pollutant reduction volume (retention or detention)
X	Provided pollutant reduction volume (retention or detention)

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Checklist for Stormwater Management Plan / Construction Plans

A. General

X	Site orientation, address and legal description
X	Applicant name, legal address, contact information
X	Engineers name, address, contact information
X	North arrow, bar scale, horizontal and vertical datum
X	Drawing scale shall be set at 1"=20' or 1"=40' when possible
X	Stamped by a Licensed Professional Engineer in the State of Connecticut
X	24" x 36" sheet size unless otherwise approved

B. Site Development Plans

X	City of Stamford Standard Notes
X	As required by the Drainage Maintenance Agreement, provide a written narrative describing the nature of the proposed development activity and the program for operation and maintenance of drainage facilities and control measures throughout the life of the project.
X	Existing and proposed contours based on NAVD 88 at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent
X	All required spot elevations to clearly depict positive pitch
X	Top and bottom elevation of all walls
X	Roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, and decks and other structures
X	All utilities and easements
X	Location, size, maintenance access, type of proposed structural stormwater controls and facilities with elevations and inverts
X	Location, size, maintenance access, type of proposed non-structural stormwater controls and facilities with elevations and inverts
X	Location, size, type of proposed stormwater infrastructure, inlets, manholes, infiltration and detentions systems, control structures with elevations and inverts
X	Location, size, ownership of stormwater conveyance systems (swales, pipes, etc.) with elevations and inverts
X	Identify roof leaders, curtain drains and foundation drains with elevations and inverts
X	Proposed water quality treatment systems, size and model type
X	Final stabilization measures which may include slope stabilization

C. Erosion and Sedimentation Control Plan

X	Phasing and schedule
X	Construction access and staging and stock pile areas
X	Operation and maintenance of erosion and sedimentation controls
X	Tree protection
X	Downstream protection such as location of silt fencing
X	Limit of disturbance
X	Construction fencing

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D. Construction Details

X	Standard City of Stamford details
X	Infiltration system details
X	Control structure details
X	Water quality treatment details
	Infiltration testing results

Checklist for Certificate of Occupancy

	Final Improvement Location Survey
	Stormwater Management Certification Form
	Final DCIA Tracking Worksheet
	Standard City of Stamford Drainage Maintenance Agreement (Agreement Covenant)

Other Certifications at the discretion of the Engineering Bureau and/or EPB

	Wall Certification
	Landscape Certification
	Landscape Maintenance Agreement
	Waiver Covering Storm Sewer Connection
	Waiver Covering Granite Block, Depressed Curb, and Driveway Aprons
	Flood Certification

Appendix M – LID Review Map

LEGEND

PROPERTY LINE

BUILD–TO LINE

PROPOSED EDGE OF PAVEMENT

EXISTING EDGE OF PAVEMENT TO REMAIN

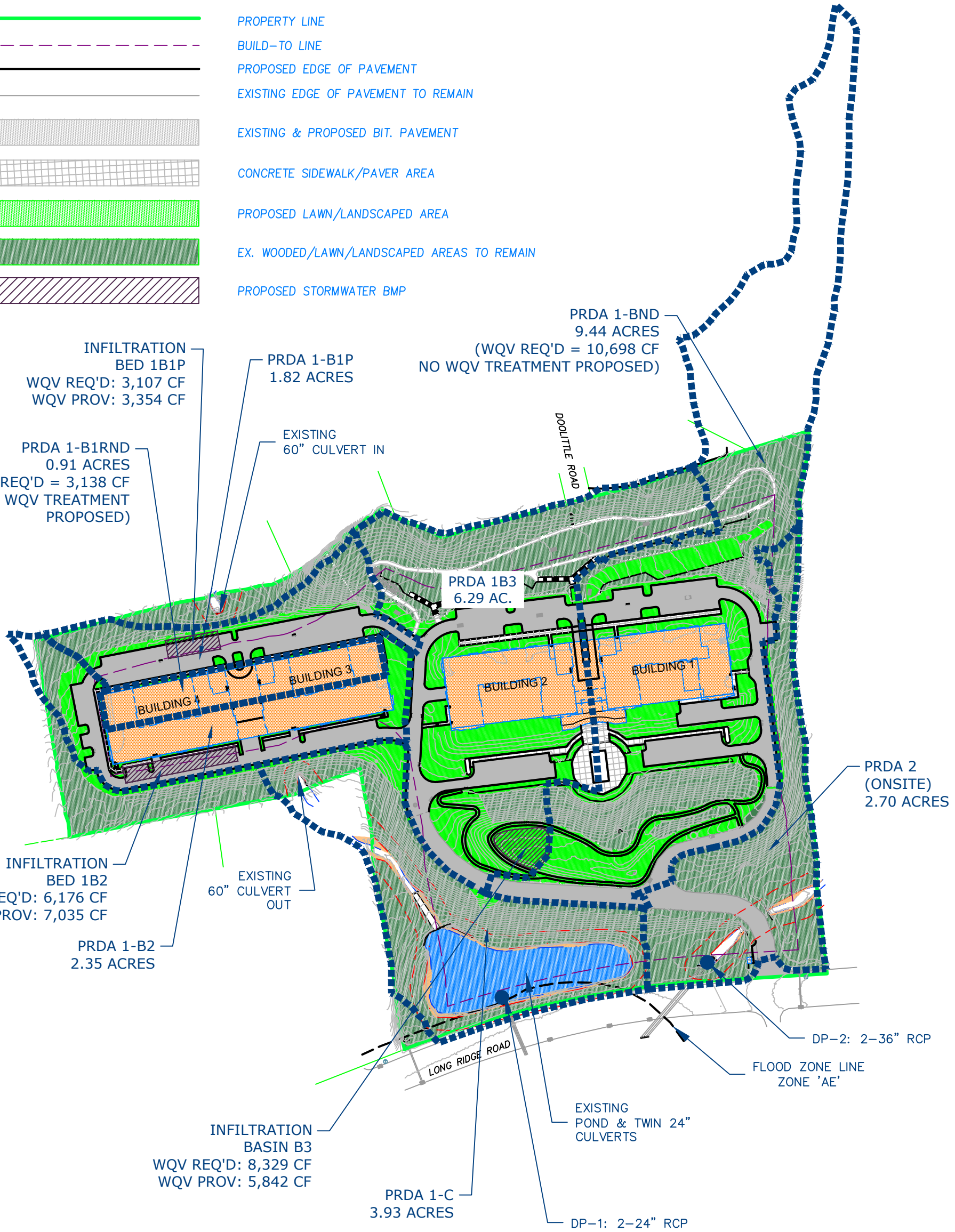
EXISTING & PROPOSED BIT. PAVEMENT

CONCRETE SIDEWALK/PAVER AREA

PROPOSED LAWN/LANDSCAPED AREA

EX. WOODED/LAWN/LANDSCAPED AREAS TO REMAIN

PROPOSED STORMWATER BMP



WQV SUMMARY

TOTAL WQV REQ'D: 31,448 CF

TOTAL WQV PROV: 16,231 CF (51.6% OF REQU'D)

NO.	REVISION	DATE
1	REVISED PER ENGINEER REVIEW	14 MAY 24

Previous Editions Obsolete

0 150 300

1 inch = 200 ft.

LID REVIEW MAP

CIVIL 1

CORNERSTONE PROFESSIONAL PARK, SUITE D-101
43 SHERMAN HILL ROAD
WOODBURY (203) 266-0778 CONNECTICUT

BUILDING AND LAND TECHNOLOGY
100 WASHINGTON BLVD.
SUITE 200
STAMFORD, CT 06902

800 LONG RIDGE ROAD

STAMFORD CONNECTICUT

STATE OF CONNECTICUT · CURTIS C. JONES · No. 17201 · LICENSED PROFESSIONAL ENGINEER

DRAWN:	BB
APPROVED:	CJ
SCALE:	1" = 200'
DATE:	03 OCT 23
PROJ. NO.:	4084
CADD FILE NAME:	4084_LID MAP 5-14-24
DRAWING NO.:	1 OF 1