DRAINAGE ANALYSIS

for

Apartment Complex

Franklin Street

Worcester, Massachusetts

November 12, 2021

Revised Through January 7, 2022

COMMONWEALTH OF MASSACHUSETTS
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1-7-2022

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1.0
DRAINAGE NARRATIVE

1.0 NARRATIVE

1.1 INTRODUCTION

Revised Through January 7, 2022

On behalf of our client, GoVenture Capital Group, LLC., Hannigan Engineering, Inc. has prepared this Drainage Analysis and Report as part of the submittal package for Definitive Site Plan Approval from the City of Worcester. The proposed project is located on several parcels of land between Franklin, Artic and Plastic Streets consisting of approximately 4.00-acres of Developed land. It is the intent of the applicant to construct a single new mid-rise apartment building with a total of 421 dewlling units along with applicable parking and utility improvements.

The purpose of this analysis is to compare the pre-development and post-development peak flow rates to certain design points from the project. In particular, changes in peak rates of runoff generally associated with alterations of land use were studied. These alterations include land being transformed from areas of landscape (grass), woods, and brush to areas of grass, landscape, and impervious areas (rooftops, sidewalks and pavement). The effects of stormwater being re-directed to new areas as a result of the proposed construction and the associated drainage system were reviewed as well. For the purposes of this report, any developed areas which are not impervious will be considered to consist of lawn and landscape areas.

The U.S. Soil Conservation Sevice (SCS) methods were utilized for this analysis in order to establish land use and run-off characteristics in the determination of pre- and post-developement peak run-off rates. All proposed development areas and subsequent impacts on stormwater runoff relative to this development have been incorporated within this analysis and report.

In the area of the proposed development, many of the existing structures and areas of pavement and concrete will be removed in order to facilitate the construction of the new apartment building. This building will have an indoor parking garage along with additional surface parking areas for the tenants. As a result the project area will experience a net decrease in impervious areas due to the recosntruction of the property and redistribution of the impervious areas on the site. The project's drainage system will utilize a underground storage system to capture a portion of the runoff to aid in peak rate mitigation and provide additional recharge provisions. The proposed drainage system will also improve the water quality by providing TSS removal in compliance with the Stormwater Management Regulations.

1.2 METHOD OF ANALYSIS

The enclosed hydrologic calculations utilize the runoff estimating techniques developed by the USDA Soil Conservation Service (SCS). The following publications were used in the preparation of this report:

1. "Urban Hydrology for Small Watersheds"[1]
2. "National Engineering Handbook, Hydrology, Section 4" (NEH-4)[2]
3. "Handbook of Hydraulics" 6th ed. - E.F. Brater & H. Williams[3]
4. "Soil Survey Report for Northeastern Worcester County" 1985 ed. - USDA NRCS[4]

Using SCS publications and other texts on surface water hydrology, in conjunction with drainage software *HydroCAD* developed by Applied Microcomputer Systems[5], Hannigan Engineering, Inc. has calculated peak rates of runoff relative to the subject site for conditions prior to development as well as conditions upon the completion of construction. The drainage software program *HydroCAD* calculates peak rates of runoff similarly to the computer program known as *Computer*

Programs for Project Formulations-Hydrology, Technical Release Number 20 (TR-20), developed by SCS. This program and series of programs are the technical standard utilized by engineers, Planning Boards, Conservation Commission, and Municipal Agencies throughout the region and across the country for the evaluation of storm water conditions.
The analysis reviews certain parameters of sub-watersheds surrounding the subject site and how these parameters are affected by various rainfall conditions. These parameters include land cover and use, soil strata and permeability, and variations in slope. These parameters are used to develop rainfall runoff characteristics, which are used to analyze both pre and post development conditions within and surrounding the proposed construction activity. Some of these characteristics include times of concentration (Tc), peak rates of runoff, runoff volume, and the time the peak rate of runoff occurs within the particular storm event.

Times of concentration were computed by using the SCS "Upland Method" as described in the aforementioned National Engineering Handbook and were utilized for the analysis of the individual watersheds. The Upland Method computes the time of travel of storm waters over segments of the watershed depending upon land conditions, such as surface roughness, channel configuration, slope of land, and flow patterns. The addition of these travel times determines the individual watershed Time of Concentration. This method translates to more accurate Tc's than other more general methods.

1.3 SITE DESCRIPTION

The proposed site is approximately 4.0-acres and is comprised of several lots located along the southerly side of Franklin Street between Artic and Plastic Street in Worcester, Massachusetts. The topography of the land is generally flat in nature with little elevation relief through the property. Currently the project area is comprised of several older structures with many of them having been abandoned in recent years. Access to these building areas is provide paved driveways off of Artic Street and Plastics Street with other areas of concrete sidewalks associated with the previous uses. It is noted that much of the site is covered in gravel base which appears to be heavily degraded pavement with the base course still intact. The remaining areas are primarily overgrown brush and grass with little to no established woodland.

As part of the initial phase of construction, the existing structures within the property limits will be demolished. As part of the general site preparation, the existing pavement and concrete areas will be removed and disposed of off site and the existing utility connections such as sewer and water to the structures will be cut and capped at their respective mains.

Upon the completion initial demolition of the site, a single new high-rise apartment building will be constructed comprised of a total of x dwelling units. The building has been designed as a rectangular structure within the properties between Arctic and Plastic Street, with two center courtyard areas near the center of development, one being at grade and another on the 4th floor level. The building has been designed to incorporate a drive-in multi-level parking garage, which will be accessible via Franklin Street.

As previously stated, access to the proposed parking garage will be provided by a new curb cut along Franklin Street. This parking garage will provide 360 parking spaces to be shared between both the new building and the existing structures. This structure will also provide additional amenities including bicycle storage for the tenants. As part of the overall redevelopment of the area, the existing private portion of Arctic Street, south of the fire station, will reconstructed to bring the existing roadway into current City Standards, including upgrades to several utilities. To provide additional parking for the development, two abutting properties at #26 Arctic Street and #38 Arctic Street will be reconstructed to provide an additional 108 surface parking spaces as well as additional areas for landscaping. Additional project improvements include various utility improvements including drainage, sewage, water and telecommunications.

It is noted that the existing property is currently located within the treatment district of the Upper Blackstone Wastewater Treatment Plant (WWTP), with treatment and mitigation measures being required to maximum extent practicable. As the site sits now the surface runoff and santiary sewage is discharged to a combined sewer system located within Franklin Street. The sewage and surface drainage infrastructure, with mitigation measures, will be directed towards Franklin Street as part of this project. Additional provisions have been provided for water, natural gas, electric and telecommunications connections within the Franklin Street as well.

For the purpose of the analysis, certain design points were reviewed. The design points are where the pre-development drainage for the subcatchment areas of the watershed over the property are directed. The same design points have been utilized and reviewed for both pre- and post-development runoff conditions. The design points are the basis for the design of the proposed drainage infrastructure and stormwater detention structures depicted on the plans. The drainage from the site currently flows to one of five Design Points. Design Point #1 has been designated as a point in the gutter along Franklin Street west of the locus property. Design Point #2 has been designated as a combined sewer manhole located in Franklin Street. Design Point #3 is located at a catchbasin located on the abutting Fire Department Property. Design Point #4 is located at a low point on the abutting property to the south and Design Point #5 is located at a catchbasin located within Keyes Road.

1.4 SOIL CHARACTERISTICS

Soil types for this analysis were based upon review of soils information contained in the SCS publication *Interim Soil Report for Worcester County, Massachusetts – Northeastern Part.* The original mapping has been reestablished via the Web Soil Survey as part of the National Cooperative Soil Survey under the Natural Resource Conservation Service and its website (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx). This mapping is the basis for the soil type determinations for this analysis.

Soils within the subject watersheds are also hydrologically classified into different soil groups as defined by the Soil Conservation Service. The following table provides the SCS Hydrological Soil Group classification for each soil type. It is noted that the property contains exclusively Urban land which carries no designated for hydrological Soil Class. Further review of Surficical Geologic Map of the Worcester North Quandrangle, as issued by the USGS, shows this area being located within an outwash plain. These soil features are typically underlaid with coarse sand and gravel, thus typical of a Hydrological A soil. Further review of on site conditions by borings found that the underlying soil is tyupically sandy in nature consistent with the Type A Soil.

Soil Designation	Name	Hydrological Group
651	Urban Land	NA

1.5 RUNOFF CURVE NUMBERS

The SCS runoff curve numbers used in all watershed modeling contained in this report are based on the Hydrologic Soil Groups and land uses below:

Land Use	Hydrologic Soil Group	Curve #
Grass Cover (good)	A	39
Brush (poor)	A	48
Gravel Surface	A	96
Impervious Area	A	98

1.6 DESIGN CRITERIA

This drainage analysis was developed utilizing the Atlas-14 rainfall data specifically Type III, NRCC-D 24-hour storm for this region. The storm frequencies and the corresponding 24-hour rainfall amounts are as follows:

Storm Frequency (years)	Rainfall (inches)
2	3.13
10	4.68
25	5.88
100	8.34

1.7 THE PROPOSED DRAINAGE SYSTEM

As with any development, changes in land use such as the transformation of woodland areas to lawn, landscape and impervious areas can cause increased peak rates of runoff. On this particular project, the transformed areas consist of existing driveways and rooftops being converted to a similar impervious coverage, as well as alterations in land use from impervious areas to open lawn and landscaped areas. These increases in peak rates of runoff must be mitigated with an appropriately designed site including proper grading to direct stormwater flows to the storm drainage system.

As previously mentioned the site is located within the treatment district of the Upper Blackstone Wastewater Treatment Plant (WWTP), with treatment and mitigation measures being required to maximum extent practicable. As part of this project, it is the intent to extend the existing drainage trunkline within Arctic Street further south to capture runoff from the surrounding area. Currently the site's drainage system is non-functional and experiences significant ponding post-storm events due to unfunctional or obsolete catchbasins. The proposed redevelopment of the site will incorporate proper grading design and a series new deep-sump hooded catchbasins to capture the runoff, directing the stormwater through water quality devices to provide Total Suspended Solids (TSS) removal. Upon treatment, portions of the stormwater will be directed to the new trunkline, with the remaining flows being directed to an small underground storage system comprised of molded chambers set within a bed of crushed stone to provide mitigation of peak rates of runoff and provide additional recharge capacity. The proposed stormwater design is predicated on the fact that there will be a natural reduction in impervious area on the property which will lend itself to a reduction in rates and volume of runoff to the municipal system. As

part of this project, discharges from the project are directed to the combined system located within Franklin Street, as the site currently does. Additional provisions have been provided to account for the internal roof drain systems to direct runoff to several points within the drainage system as to not overwhelm the drainage lines during larger storm events.

The proposed underground stormwater system utilizes a Stormtech MC3500 underground storage systems to capture stormwater and provide peak rate mitigation. The system is comprised of a series of molded plastic arch-chambers set within a bed of crushed stone with a manifold to ensure even distrubtion of stormwater within the system. This sytem is designed to capture and hold (i.e. detain) stormwater runoff from the proposed development areas and to allow for the controlled release of stormwater from the site. The Stormtech sytem will discharge stormwater to an the aforementioned drainage line extension within Arctic Street.

The proposed catch basins on the project will contain a deep sump (48-inch below the level of the outlet pipe), along with a hood to contain the majority of the roadway debris and sediment within the basin itself. The catchbasins will then discharge directly to the drainage trunk lines and then to a Hydrowork Hydroguard water quality units. These units have been designated at DCB#5, and #2, as well as DMH#2 and will provide additional cleaning and TSS removal prior to discharge, it can be expected that the water quality units and deep-sump catchbasins will achieve the 80 percent TSS removal required. In addition to the treatment and migitation facilities, the project also results in a net decrease in impervious areas which lends itself to enhanced natrual recharge around the site.

1.8 CONCLUSIONS

As stated above, the design points have been established at five points on or near the property. Changes in land use are the predominant cause of increases in peak rate of runoff to design points. In this as case, much of the post-development runoff is directed towards the combined sewer sytem within Franklin Street which as been designted as Design Point #2. These improvements and drainage system components will provide treatement and mitigation of peak rates to the site. The results of the analysis are shown below.

Design Point		2-yr Storm	10-yr Storm	25-yr Storm	100-yr Storm
#1	Pre-	0.16	0.26	0.33	0.48
	Post-	0.16	0.26	0.33	0.48
#2	**Pre-**	**10.14**	**16.24**	**20.98**	**30.58**
	Post-	**9.56**	**15.62**	**20.47**	**30.53**
#3	Pre-	0.31	0.61	0.85	1.36
	Post-	0.24	0.44	0.60	0.94
#4	Pre-	1.22	2.51	3.58	5.83
	Post-	0.41	0.75	1.02	1.58
#5	Pre-	0.30	0.46	0.58	0.83
	Post-	0.00	0.00	0.01	0.07

All flows are in cubic feet per second.

As outline above, the post-development peak rates of runoff have been mitigated for all design points. This assures that no adverse impacts to abutting properties relative to increases in peak rates of runoff will occur due to the proposed development upon the completion of construction. The storm water management as outlined herein and as shown on the accompanying plans has the following positive values relative to storm water management:

A) Attenuation of the 2-, 10-, 25- and 100-year storm events has mitigated increases in peak rates of runoff, or has been justified herein.
B) On-site roadway and pavement areas are directed to standard catch basins with deep sumps for collection of debris and sediments prior to discharge.
C) The development adheres to the provisions of the Massachusetts Stormwater Management program with greater than 80% TSS removal.
D) The Stormwater Operation and Maintenance Plan (OMP) attached, has been prepared to ensure long-term function of the system, as designed

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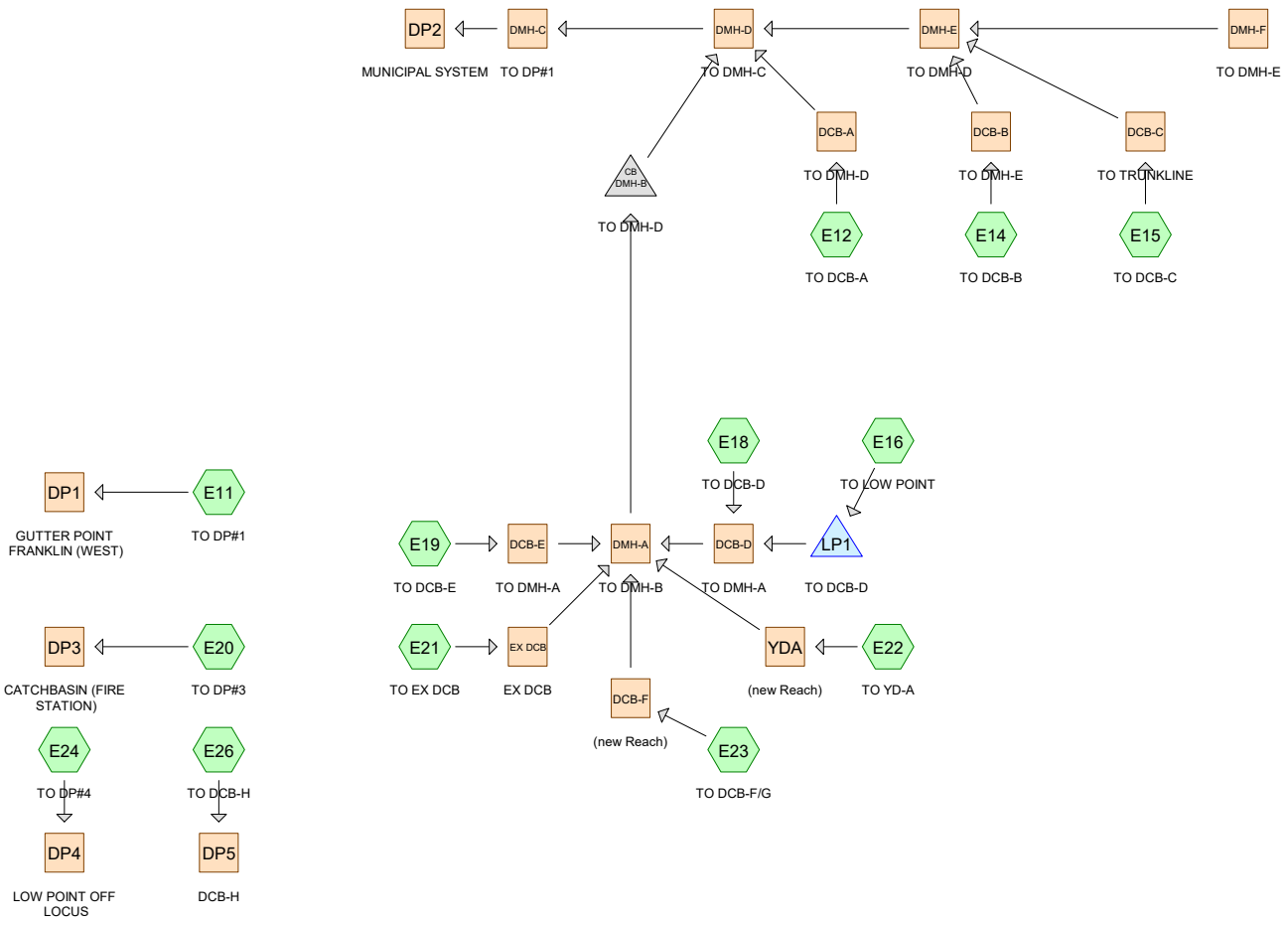
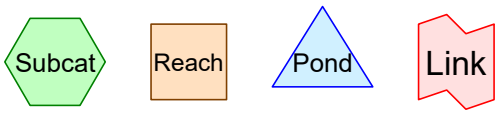
[1]"Urban Hydrology for Small Watersheds (Technical Release Number 55); Engineering Division, United States Dept. of Agriculture ,Soil Conservation Service (Jan. 1975)
[2]"National Engineering Handbook Section 4- Hydrology" ; United States Dept. of Agriculture, Soil Conservation Service (March 1985)
[3]"Handbook of Hydraulics" - 6th ed., E.F. Brater & H. Williams (1976)
[4]"Interim Soil Report for Southern Worcester County" 1995 ed., Published by the Southern Worcester County Conservation District, in cooperation with the United States Department of Agriculture, Natural Resources Conservation Service (1995)
[5] "HydroCAD" Drainage software developed by Applied Microcomputer, Page Hill Road, Chocorua, NH

2.0
HYDROLOGICAL CALCULATIONS

2.1
PRE-DEVELOPMENT CALCULATIONS





Routing Diagram for 3030-Pre

Prepared by HANNIGAN ENGINEERING, INC., Printed 11/15/2021

HydroCAD® 10.00-25 s/n 00840 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.708	39	>75% Grass cover, Good, HSG A (E11, E15, E16, E18, E19, E20, E21, E23, E24)
0.267	48	Brush, Poor, HSG A (E24)
0.807	96	Gravel surface, HSG A (E12, E14, E15, E16, E18, E22, E23, E26)
4.168	98	Paved parking, HSG A (E11, E12, E14, E15, E16, E18, E19, E20, E21, E22, E23, E24, E26)
5.950	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.950	HSG A	E11, E12, E14, E15, E16, E18, E19, E20, E21, E22, E23, E24, E26
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.950		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.708	0.000	0.000	0.000	0.000	0.708	>75% Grass cover, Good	E11, E15, E16, E18, E19, E20, E21, E23, E24
0.267	0.000	0.000	0.000	0.000	0.267	Brush, Poor	E24
0.807	0.000	0.000	0.000	0.000	0.807	Gravel surface	E12, E14, E15, E16, E18, E22, E23, E26
4.168	0.000	0.000	0.000	0.000	4.168	Paved parking	E11, E12, E14, E15, E16, E18, E19, E20, E21, E22, E23, E24, E26
5.950	**0.000**	**0.000**	**0.000**	**0.000**	**5.950**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	DCB-D	469.11	466.67	15.0	0.1627	0.011	12.0	0.0	0.0
2	DCB-E	467.63	466.57	12.0	0.0883	0.011	12.0	0.0	0.0
3	DMH-D	455.90	455.21	99.0	0.0070	0.011	36.0	0.0	0.0
4	DMH-E	456.57	455.90	121.0	0.0055	0.011	36.0	0.0	0.0
5	DMH-F	458.13	456.57	268.0	0.0058	0.011	36.0	0.0	0.0
6	DMH-B	456.80	455.90	45.0	0.0200	0.011	15.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=2.28"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.16 cfs 0.012 af

Subcatchment E12: TO DCB-A Runoff Area=11,373 sf 80.04% Impervious Runoff Depth=2.90"
Flow Length=209' Tc=10.9 min CN=98 Runoff=0.60 cfs 0.063 af

Subcatchment E14: TO DCB-B Runoff Area=11,310 sf 55.37% Impervious Runoff Depth=2.79"
Flow Length=171' Tc=8.1 min CN=97 Runoff=0.66 cfs 0.060 af

Subcatchment E15: TO DCB-C Runoff Area=8,235 sf 70.42% Impervious Runoff Depth=1.77"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=86 Runoff=0.35 cfs 0.028 af

Subcatchment E16: TO LOW POINT Runoff Area=33,282 sf 43.34% Impervious Runoff Depth=2.48"
Flow Length=183' Tc=5.0 min CN=94 Runoff=1.98 cfs 0.158 af

Subcatchment E18: TO DCB-D Runoff Area=69,813 sf 94.39% Impervious Runoff Depth=2.68"
Flow Length=305' Tc=7.0 min CN=96 Runoff=4.12 cfs 0.358 af

Subcatchment E19: TO DCB-E Runoff Area=4,127 sf 82.02% Impervious Runoff Depth=1.85"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=87 Runoff=0.19 cfs 0.015 af

Subcatchment E20: TO DP#3 Runoff Area=9,426 sf 68.08% Impervious Runoff Depth=1.28"
Flow Length=137' Tc=5.0 min CN=79 Runoff=0.31 cfs 0.023 af

Subcatchment E21: TO EX DCB Runoff Area=10,744 sf 29.99% Impervious Runoff Depth=0.29"
Flow Length=77' Slope=0.0200 '/' Tc=5.0 min CN=57 Runoff=0.03 cfs 0.006 af

Subcatchment E22: TO YD-A Runoff Area=13,343 sf 58.95% Impervious Runoff Depth=2.79"
Flow Length=125' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=0.85 cfs 0.071 af

Subcatchment E23: TO DCB-F/G Runoff Area=38,054 sf 78.48% Impervious Runoff Depth=1.77"
Flow Length=287' Tc=5.2 min CN=86 Runoff=1.69 cfs 0.129 af

Subcatchment E24: TO DP#4 Runoff Area=41,828 sf 59.67% Impervious Runoff Depth=1.16"
Flow Length=150' Slope=0.0050 '/' Tc=5.0 min CN=77 Runoff=1.22 cfs 0.093 af

Subcatchment E26: TO DCB-H Runoff Area=4,779 sf 37.39% Impervious Runoff Depth=2.79"
Flow Length=135' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.30 cfs 0.025 af

Reach DCB-A: TO DMH-D Inflow=0.60 cfs 0.063 af
Outflow=0.60 cfs 0.063 af

Reach DCB-B: TO DMH-E Inflow=0.66 cfs 0.060 af
Outflow=0.66 cfs 0.060 af

Reach DCB-C: TO TRUNKLINE Inflow=0.35 cfs 0.028 af
Outflow=0.35 cfs 0.028 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.41' Max Vel=19.73 fps Inflow=6.05 cfs 0.515 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=6.05 cfs 0.515 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.09' Max Vel=5.81 fps Inflow=0.19 cfs 0.015 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.19 cfs 0.015 af

Reach DCB-F: (new Reach) Inflow=1.69 cfs 0.129 af
Outflow=1.69 cfs 0.129 af

Reach DMH-A: TO DMH-B Inflow=8.75 cfs 0.735 af
Outflow=8.75 cfs 0.735 af

Reach DMH-C: TO DP#1 Inflow=10.14 cfs 0.887 af
Outflow=10.14 cfs 0.887 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=0.80' Max Vel=6.75 fps Inflow=10.23 cfs 0.887 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=10.14 cfs 0.887 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.27' Max Vel=3.13 fps Inflow=1.01 cfs 0.088 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=0.97 cfs 0.088 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.16 cfs 0.012 af
Outflow=0.16 cfs 0.012 af

Reach DP2: MUNICIPAL SYSTEM Inflow=10.14 cfs 0.887 af
Outflow=10.14 cfs 0.887 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.31 cfs 0.023 af
Outflow=0.31 cfs 0.023 af

Reach DP4: LOW POINT OFF LOCUS Inflow=1.22 cfs 0.093 af
Outflow=1.22 cfs 0.093 af

Reach DP5: DCB-H Inflow=0.30 cfs 0.025 af
Outflow=0.30 cfs 0.025 af

Reach EX DCB: EX DCB Inflow=0.03 cfs 0.006 af
Outflow=0.03 cfs 0.006 af

Reach YDA: (new Reach) Inflow=0.85 cfs 0.071 af
Outflow=0.85 cfs 0.071 af

Pond DMH-B: TO DMH-D Peak Elev=459.59' Inflow=8.75 cfs 0.735 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=8.75 cfs 0.735 af

Pond LP1: TO DCB-D Peak Elev=473.94' Storage=145 cf Inflow=1.98 cfs 0.158 af
Outflow=1.94 cfs 0.157 af

Total Runoff Area = 5.950 ac Runoff Volume = 1.042 af Average Runoff Depth = 2.10"
29.95% Pervious = 1.782 ac 70.05% Impervious = 4.168 ac

Summary for Subcatchment E11: TO DP#1

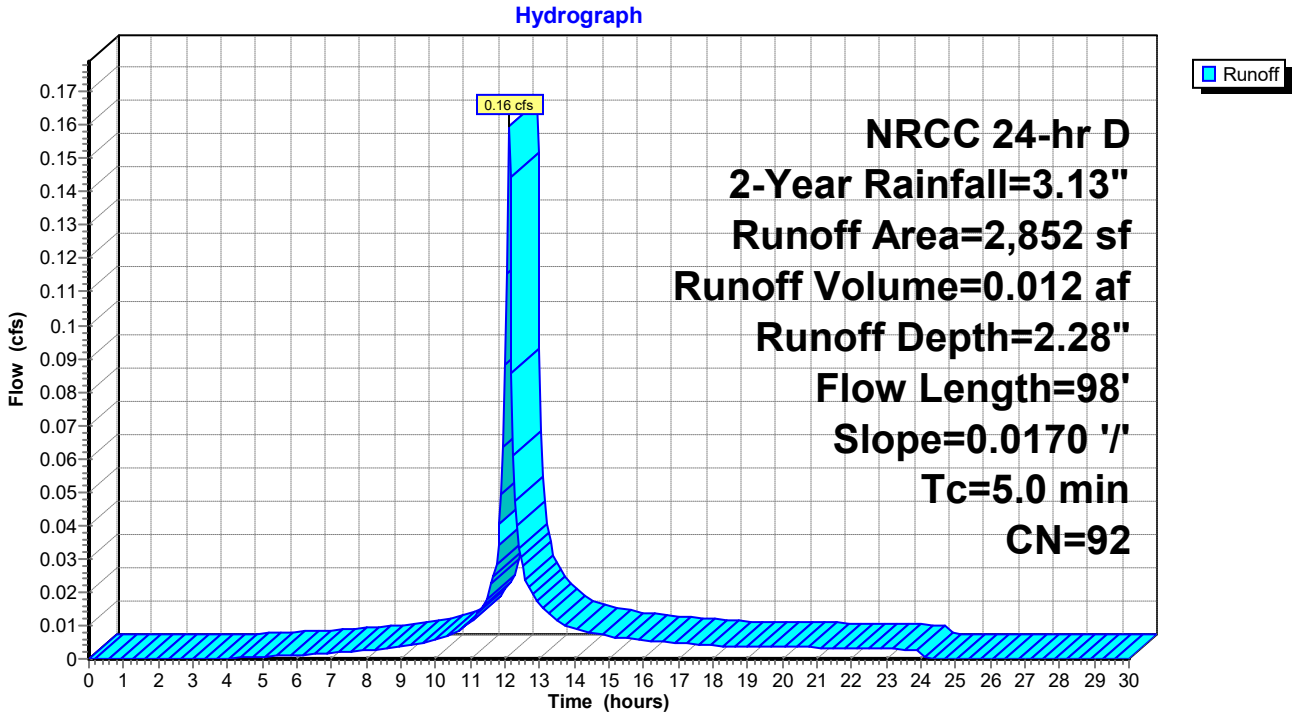
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E11: TO DP#1



Summary for Subcatchment E12: TO DCB-A

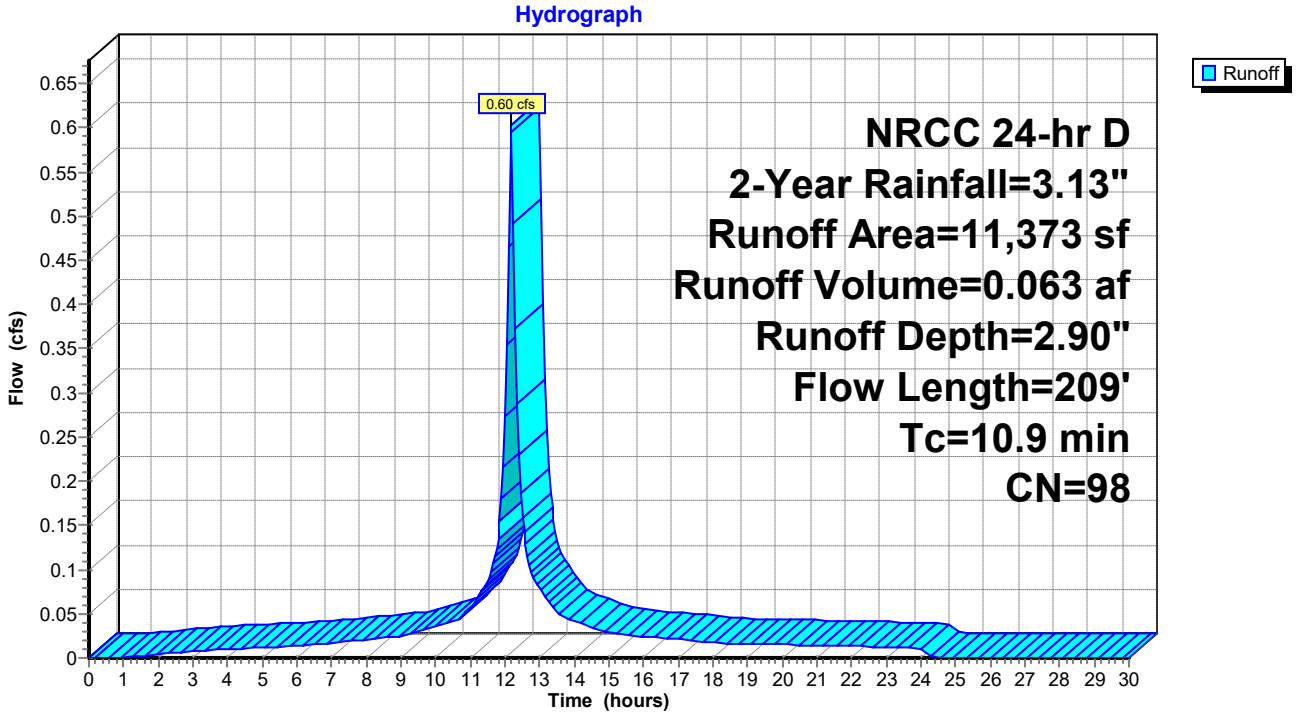
Runoff = 0.60 cfs @ 12.18 hrs, Volume= 0.063 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
9,103	98	Paved parking, HSG A
2,270	96	Gravel surface, HSG A
11,373	98	Weighted Average
2,270		19.96% Pervious Area
9,103		80.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	75	0.0120	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	9	0.0120	1.76		**Shallow Concentrated Flow, GRASS** Unpaved Kv= 16.1 fps
1.1	125	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.9	209	Total			

Subcatchment E12: TO DCB-A



Summary for Subcatchment E14: TO DCB-B

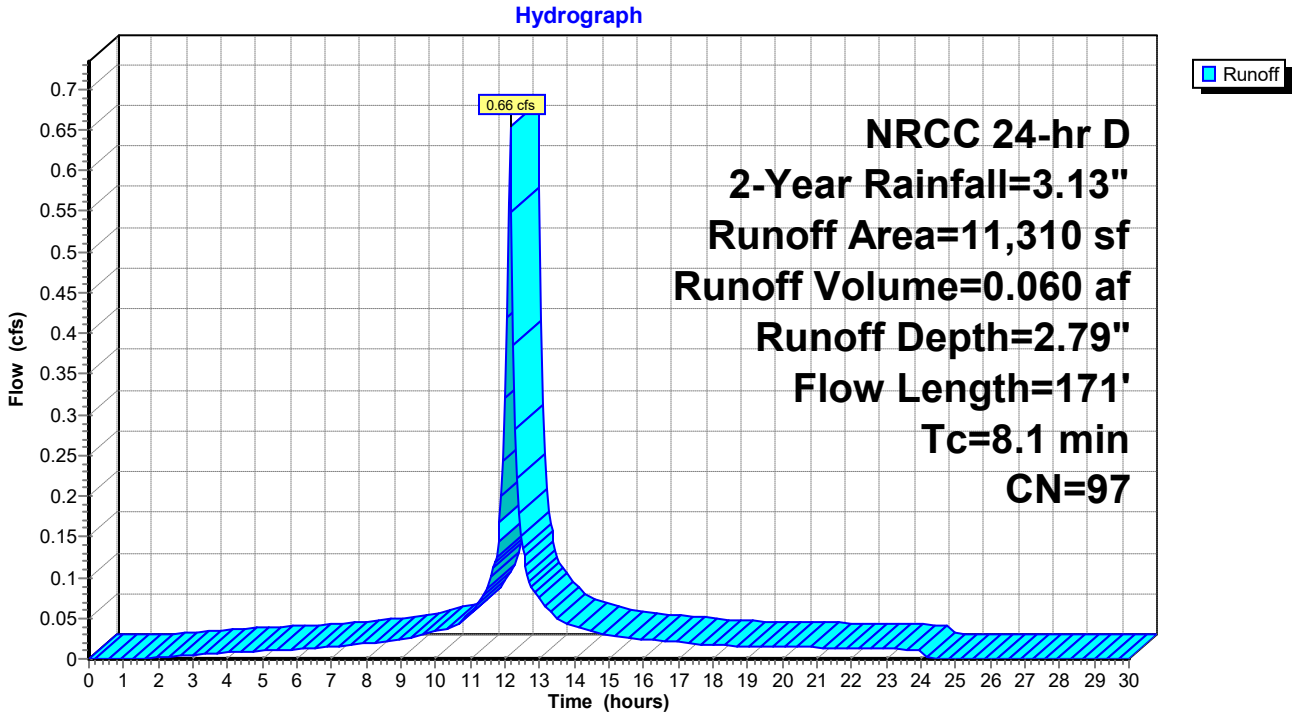
Runoff = 0.66 cfs @ 12.15 hrs, Volume= 0.060 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
6,262	98	Paved parking, HSG A
5,048	96	Gravel surface, HSG A
11,310	97	Weighted Average
5,048		44.63% Pervious Area
6,262		55.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.1	121	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	171	Total			

Subcatchment E14: TO DCB-B



Summary for Subcatchment E15: TO DCB-C

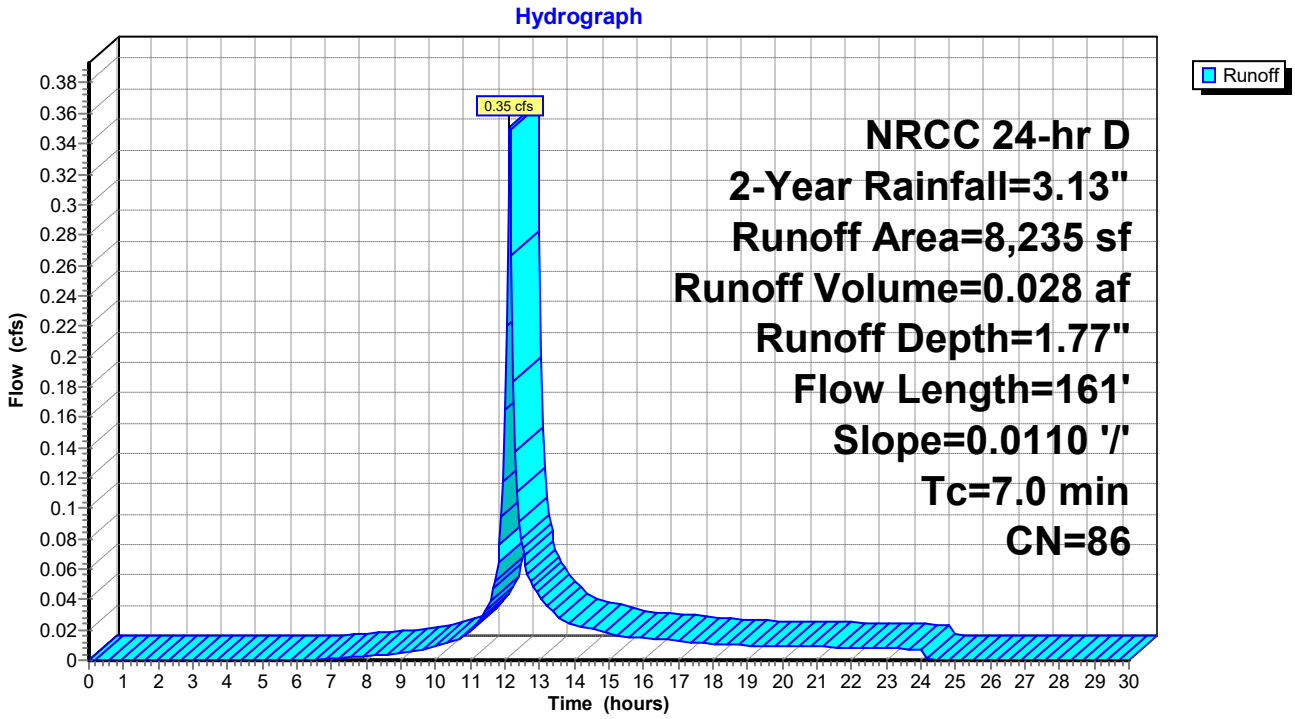
Runoff = 0.35 cfs @ 12.14 hrs, Volume= 0.028 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,643	39	>75% Grass cover, Good, HSG A
5,799	98	Paved parking, HSG A
793	96	Gravel surface, HSG A
8,235	86	Weighted Average
2,436		29.58% Pervious Area
5,799		70.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment E15: TO DCB-C



Summary for Subcatchment E16: TO LOW POINT

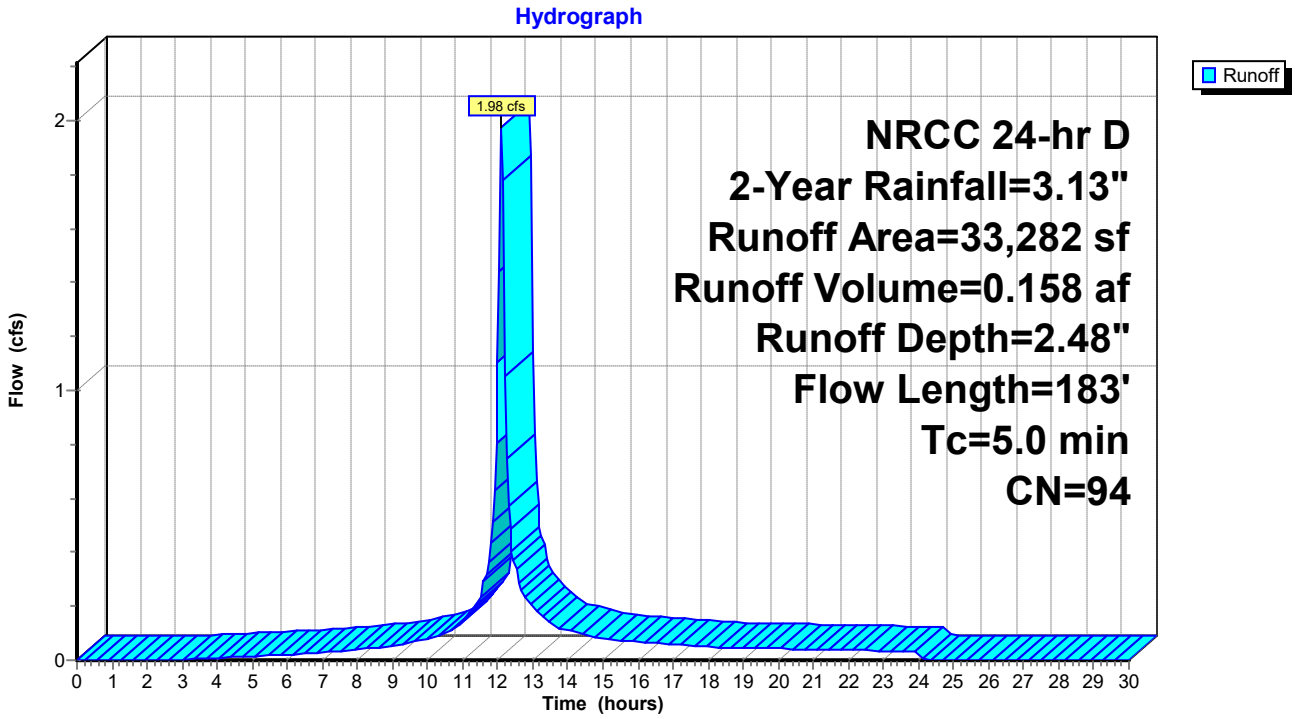
Runoff = 1.98 cfs @ 12.11 hrs, Volume= 0.158 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,882	39	>75% Grass cover, Good, HSG A
14,426	98	Paved parking, HSG A
16,974	96	Gravel surface, HSG A
33,282	94	Weighted Average
18,856		56.66% Pervious Area
14,426		43.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.9	29	0.0040	0.56		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
2.2	133	0.0040	1.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	183	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E16: TO LOW POINT



Summary for Subcatchment E18: TO DCB-D

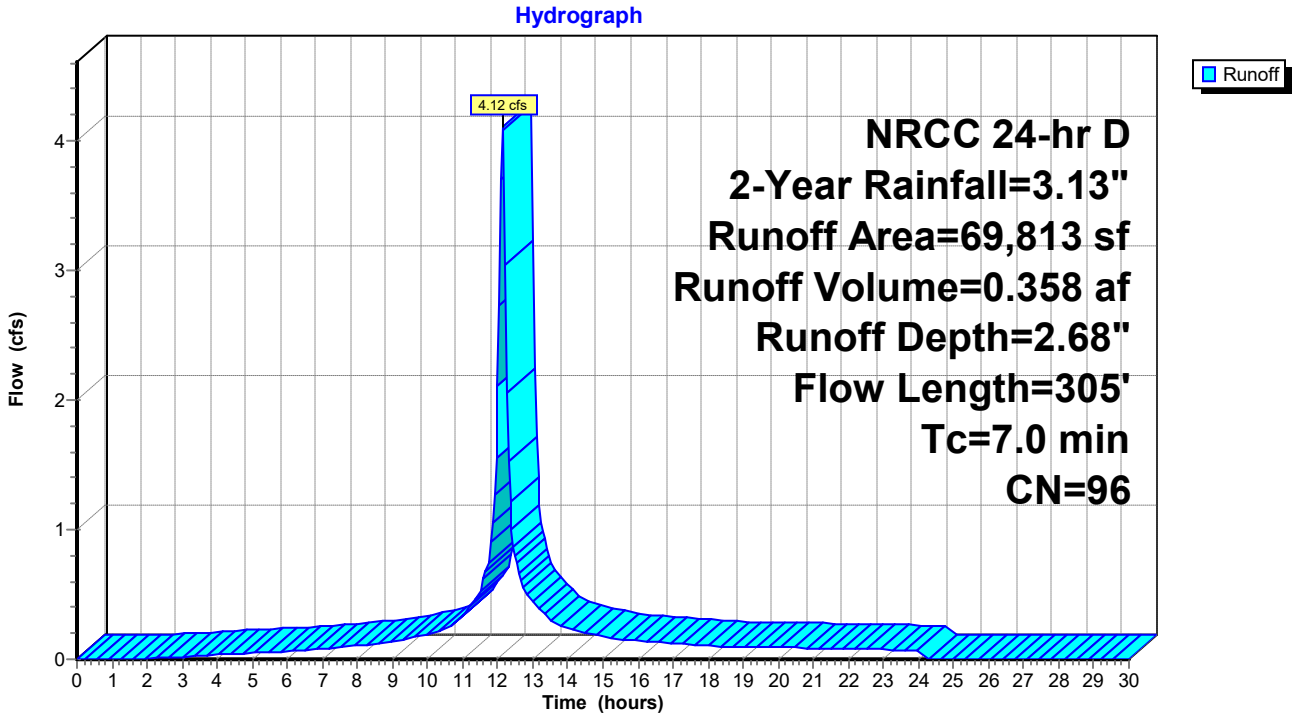
Runoff = 4.12 cfs @ 12.14 hrs, Volume= 0.358 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
2,530	39	>75% Grass cover, Good, HSG A
65,894	98	Paved parking, HSG A
1,389	96	Gravel surface, HSG A
69,813	96	Weighted Average
3,919		5.61% Pervious Area
65,894		94.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	23	0.0120	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.6	27	0.0090	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	107	0.0090	1.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	148	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	305	Total			

Subcatchment E18: TO DCB-D



Summary for Subcatchment E19: TO DCB-E

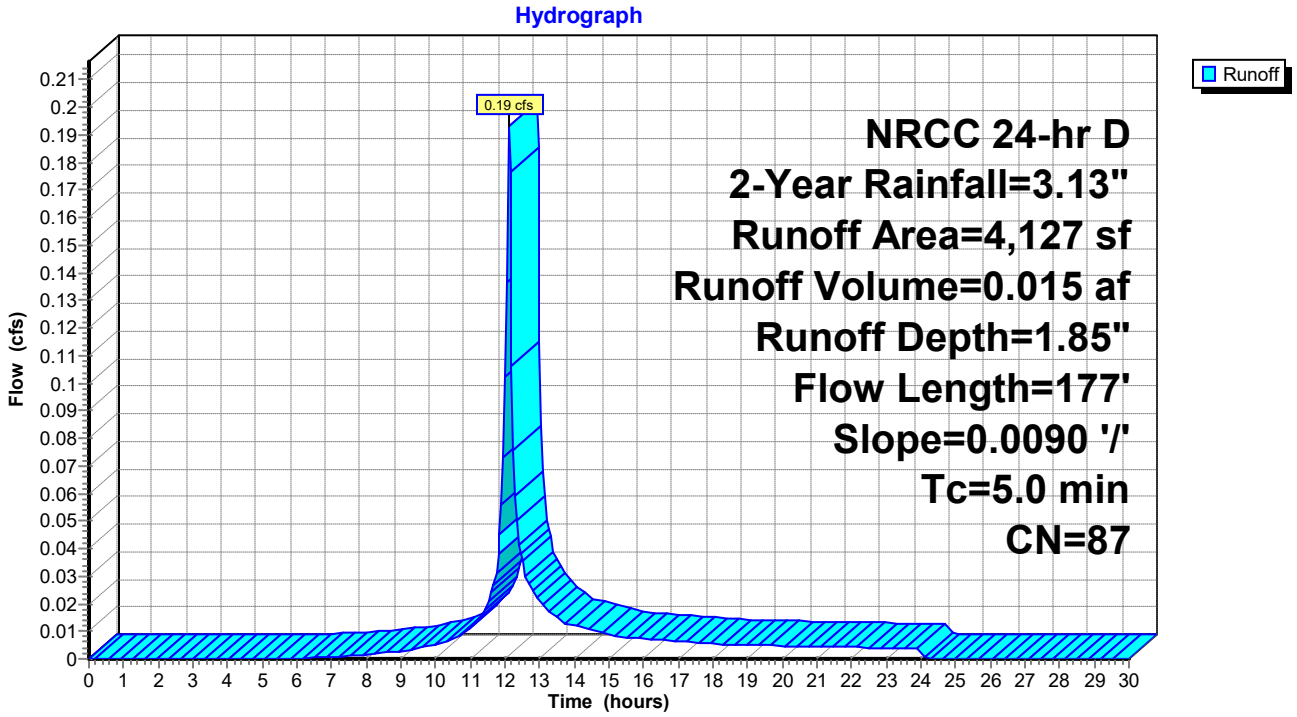
Runoff = 0.19 cfs @ 12.11 hrs, Volume= 0.015 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
742	39	>75% Grass cover, Good, HSG A
3,385	98	Paved parking, HSG A
4,127	87	Weighted Average
742		17.98% Pervious Area
3,385		82.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E19: TO DCB-E



Summary for Subcatchment E20: TO DP#3

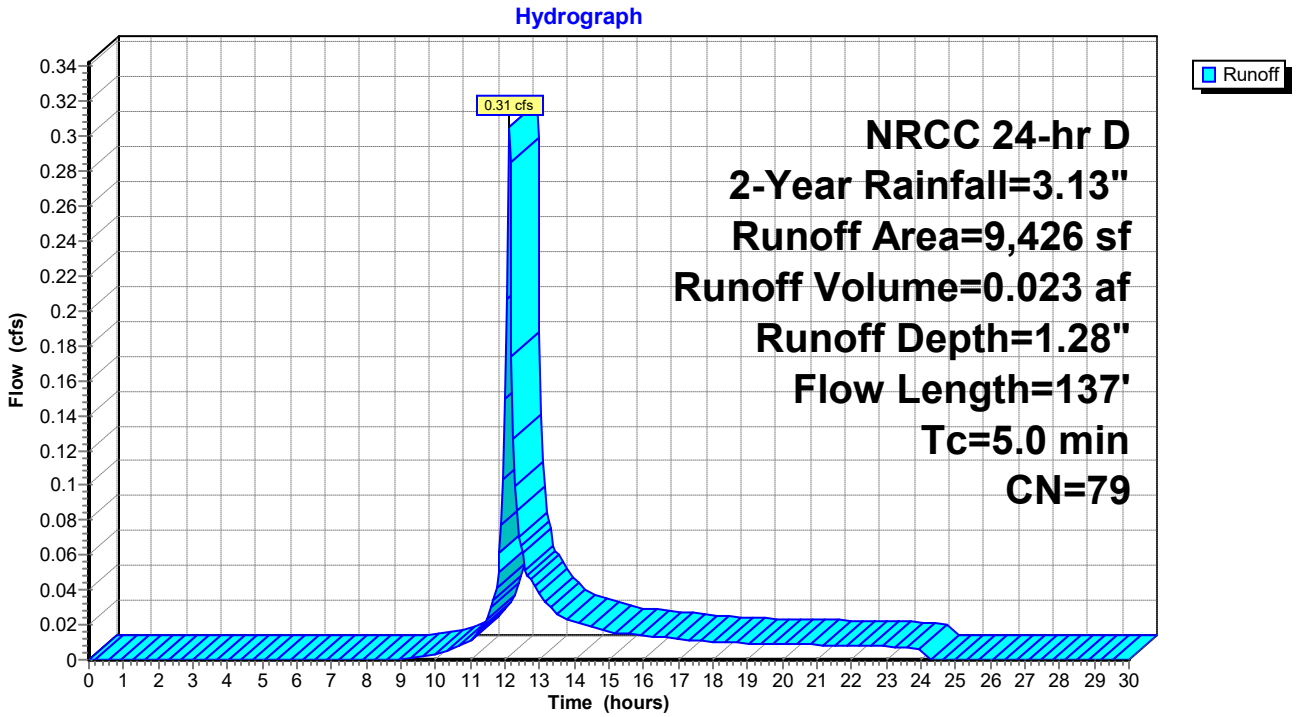
Runoff = 0.31 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
3,009	39	>75% Grass cover, Good, HSG A
6,417	98	Paved parking, HSG A
9,426	79	Weighted Average
3,009		31.92% Pervious Area
6,417		68.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0300	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	26	0.1300	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	6	0.0150	0.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	87	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	137	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E20: TO DP#3



Summary for Subcatchment E21: TO EX DCB

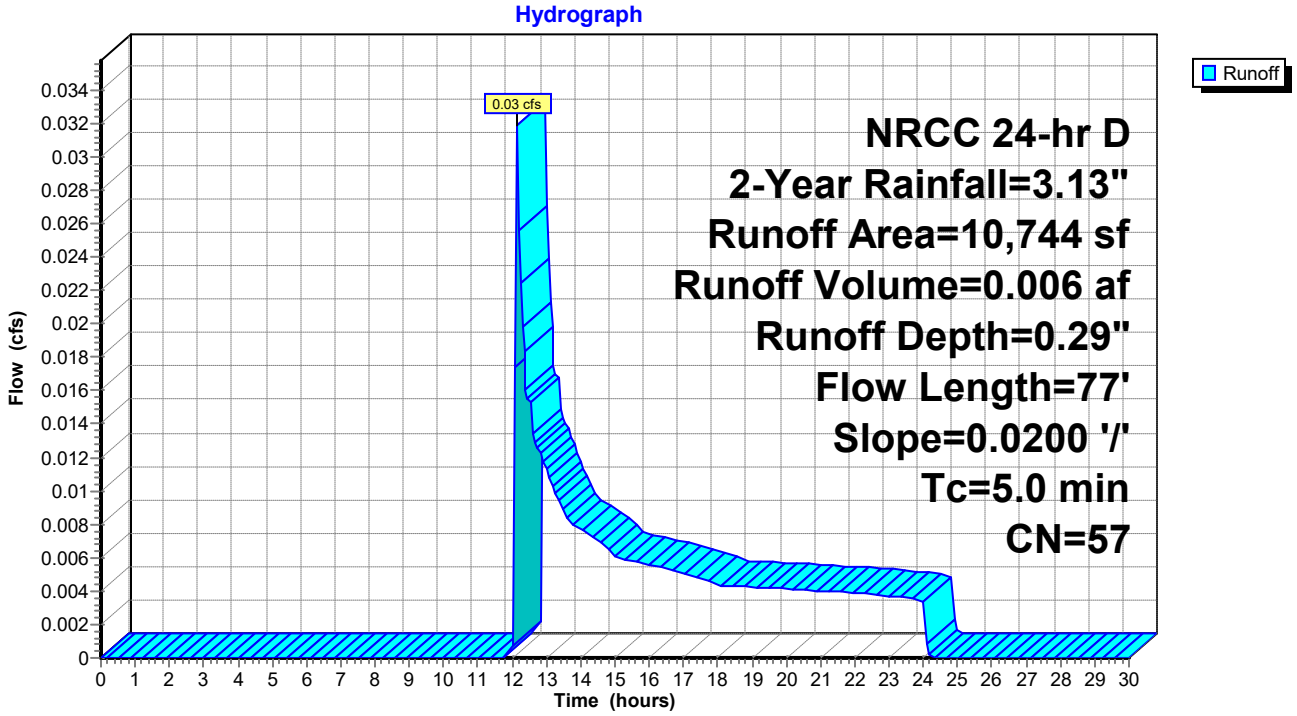
Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.006 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
7,522	39	>75% Grass cover, Good, HSG A
3,222	98	Paved parking, HSG A
10,744	57	Weighted Average
7,522		70.01% Pervious Area
3,222		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	43	0.0200	1.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	7	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	27	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.0	77	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E21: TO EX DCB



Summary for Subcatchment E22: TO YD-A

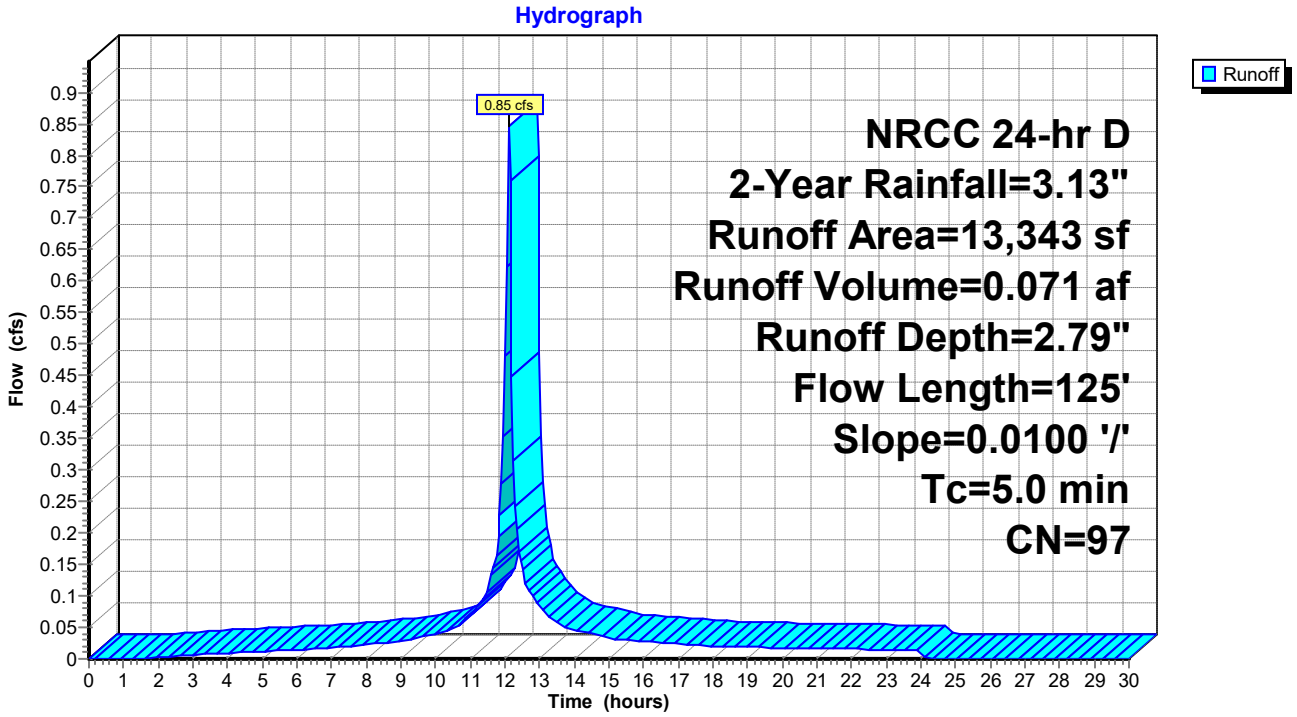
Runoff = 0.85 cfs @ 12.11 hrs, Volume= 0.071 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
7,866	98	Paved parking, HSG A
5,477	96	Gravel surface, HSG A
13,343	97	Weighted Average
5,477		41.05% Pervious Area
7,866		58.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
0.8	75	0.0100	1.61		**Shallow Concentrated Flow, GRAVEL** Unpaved Kv= 16.1 fps
1.7	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E22: TO YD-A



Summary for Subcatchment E23: TO DCB-F/G

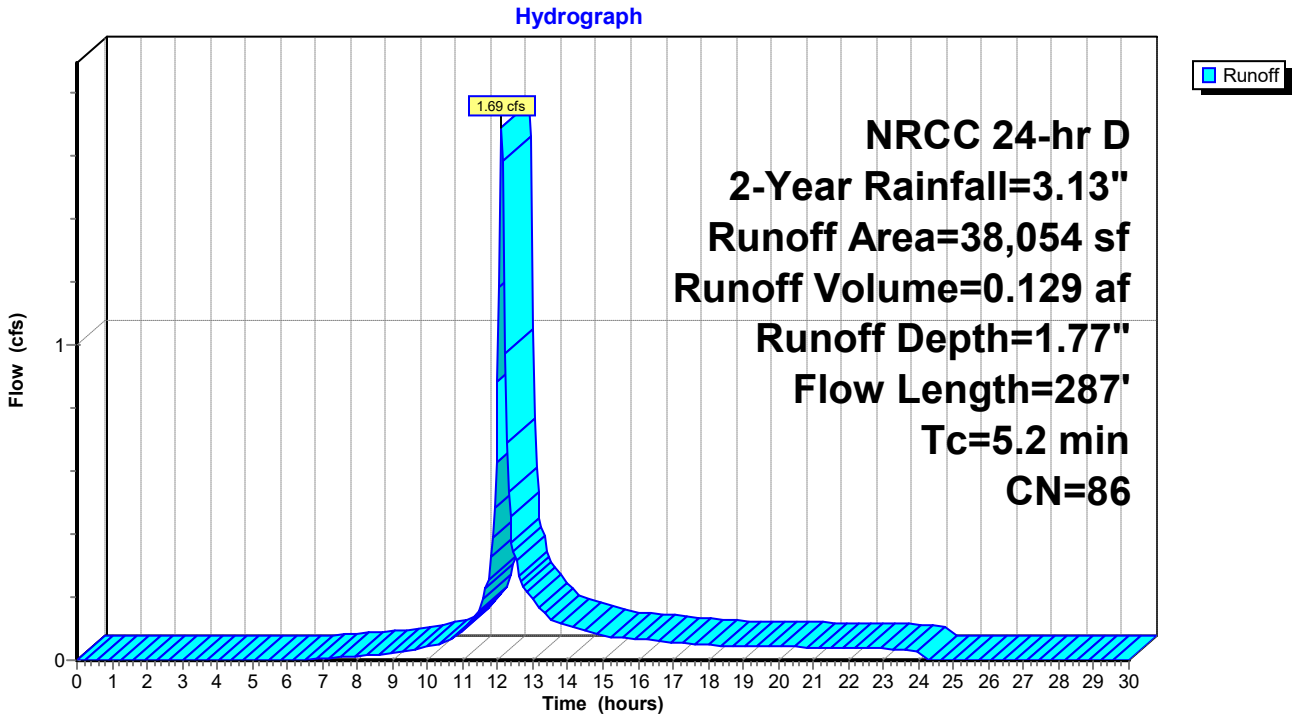
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.129 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
7,964	39	>75% Grass cover, Good, HSG A
29,865	98	Paved parking, HSG A
225	96	Gravel surface, HSG A
38,054	86	Weighted Average
8,189		21.52% Pervious Area
29,865		78.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.8	29	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.8	237	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	287	Total			

Subcatchment E23: TO DCB-F/G



Summary for Subcatchment E24: TO DP#4

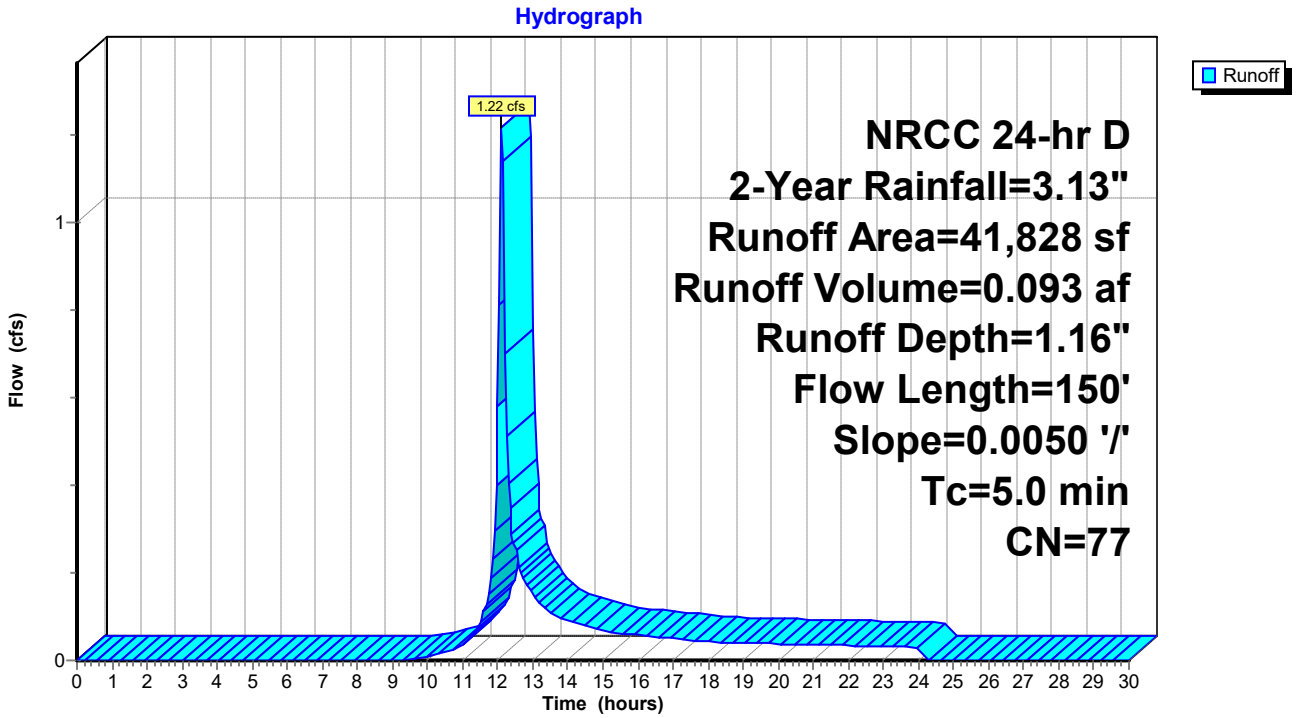
Runoff = 1.22 cfs @ 12.12 hrs, Volume= 0.093 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
5,248	39	>75% Grass cover, Good, HSG A
24,960	98	Paved parking, HSG A
11,620	48	Brush, Poor, HSG A
41,828	77	Weighted Average
16,868		40.33% Pervious Area
24,960		59.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.68		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	100	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO DP#4



Summary for Subcatchment E26: TO DCB-H

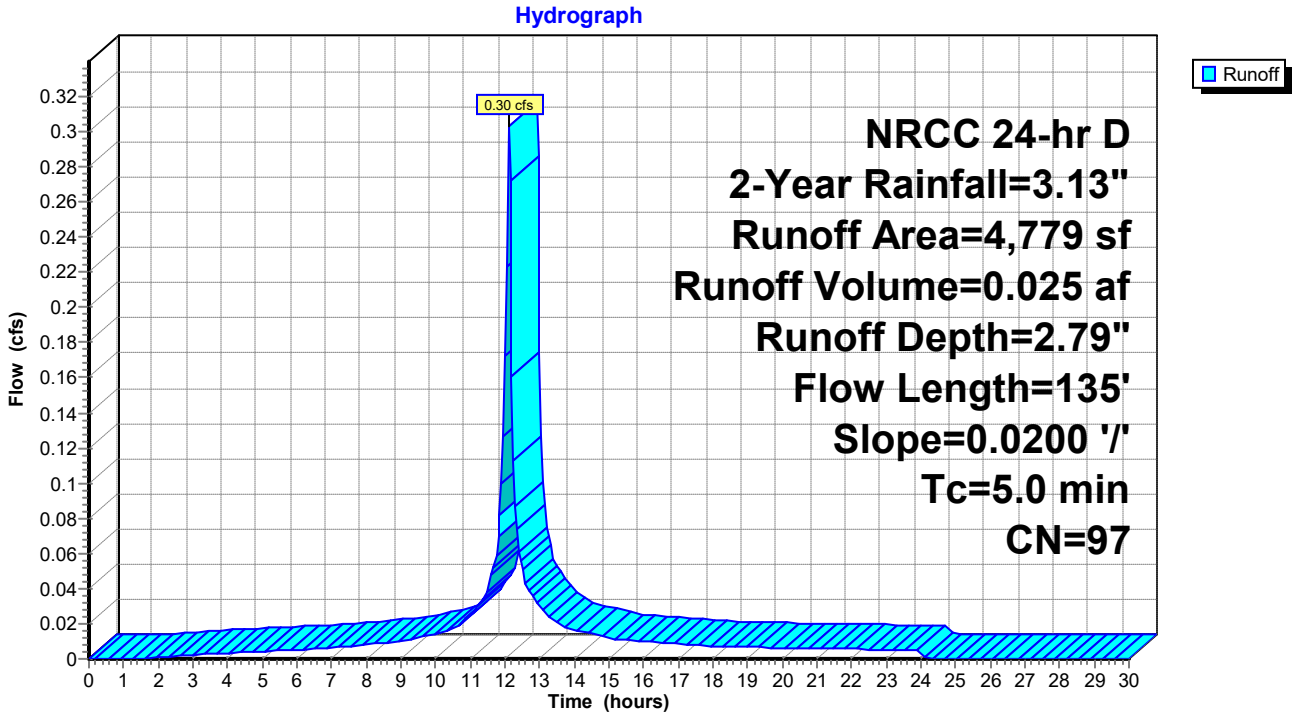
Runoff = 0.30 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,787	98	Paved parking, HSG A
2,992	96	Gravel surface, HSG A
4,779	97	Weighted Average
2,992		62.61% Pervious Area
1,787		37.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	85	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	135	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E26: TO DCB-H

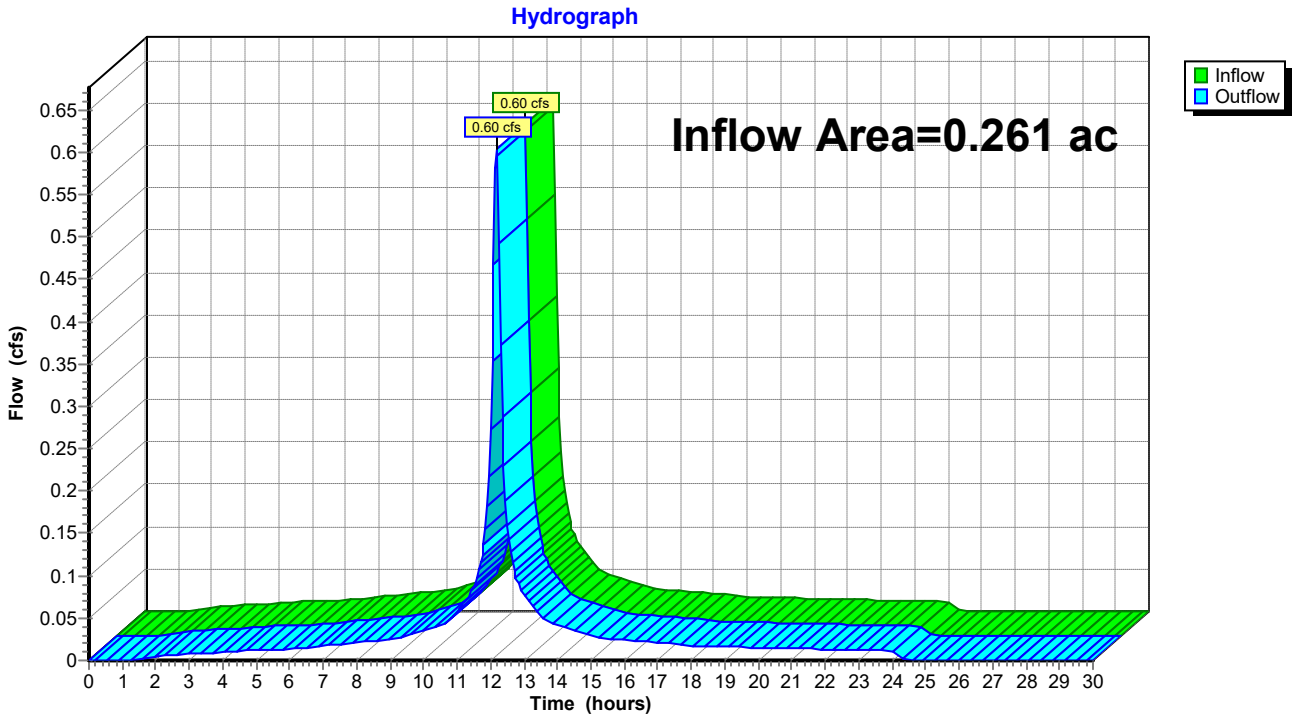


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.261 ac, 80.04% Impervious, Inflow Depth = 2.90" for 2-Year event
Inflow = 0.60 cfs @ 12.18 hrs, Volume= 0.063 af
Outflow = 0.60 cfs @ 12.18 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

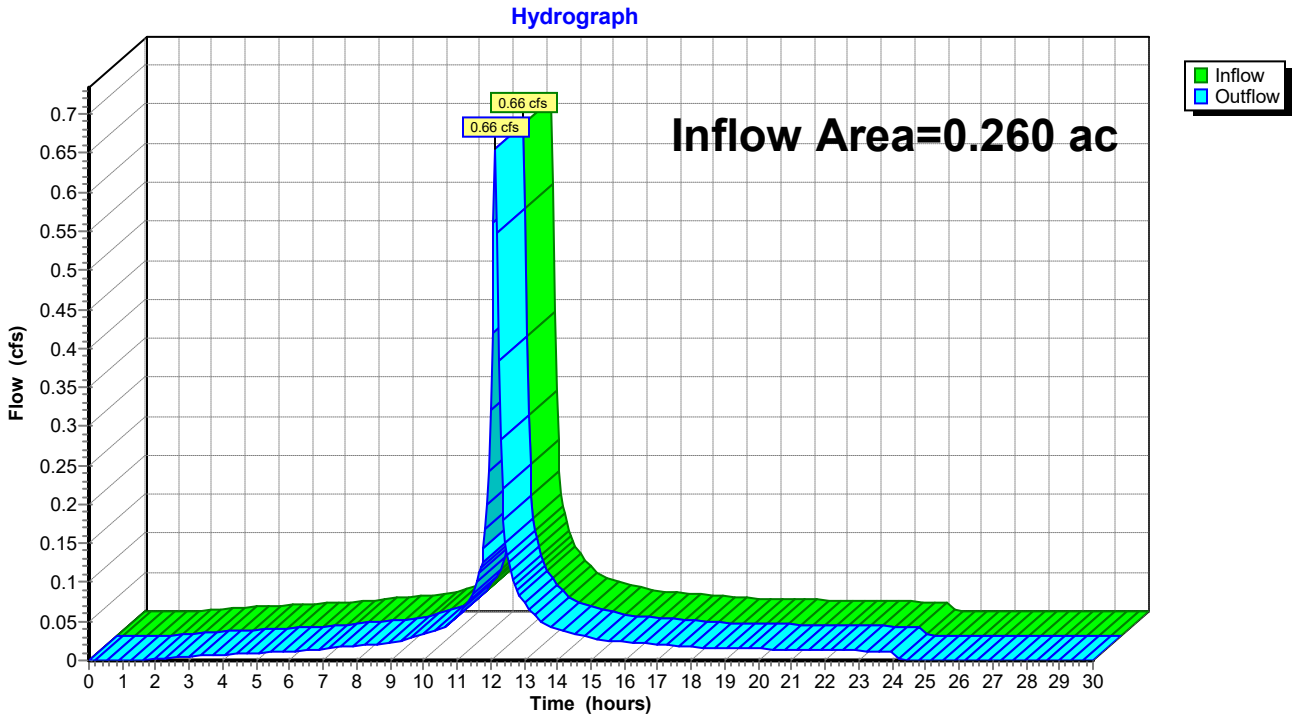


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.260 ac, 55.37% Impervious, Inflow Depth = 2.79" for 2-Year event
Inflow = 0.66 cfs @ 12.15 hrs, Volume= 0.060 af
Outflow = 0.66 cfs @ 12.15 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

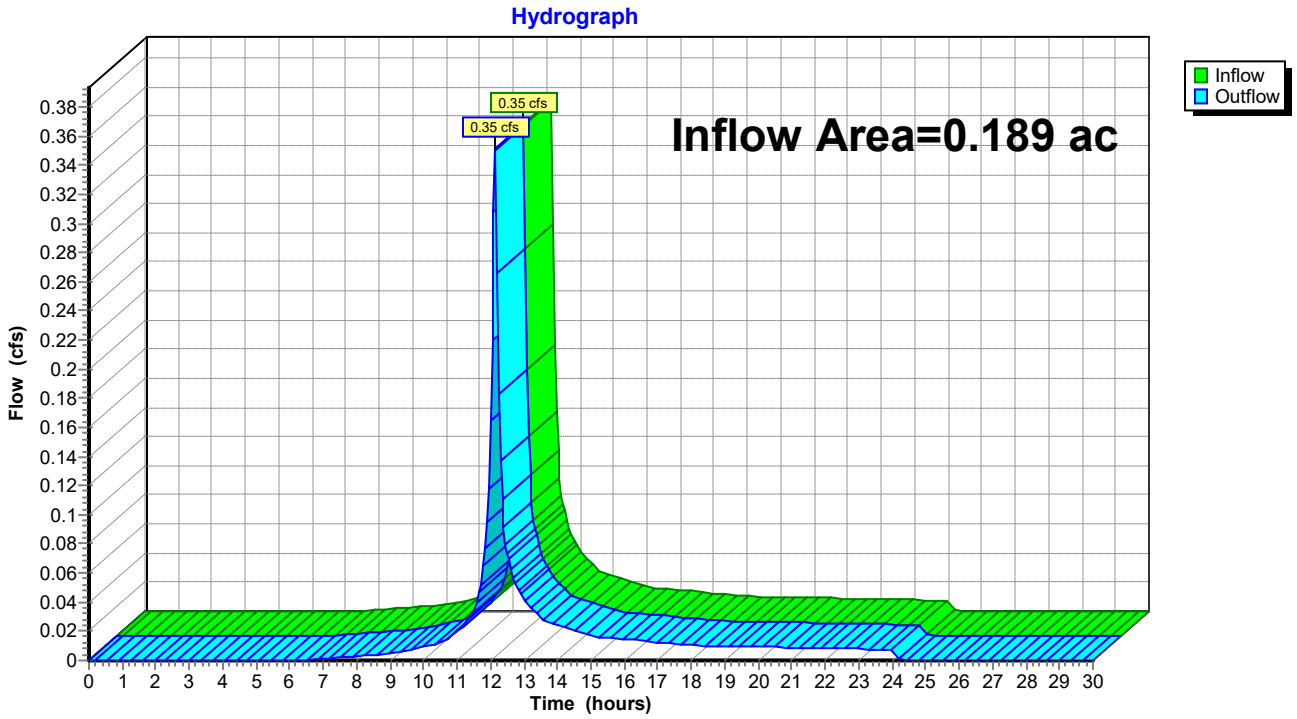


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.189 ac, 70.42% Impervious, Inflow Depth = 1.77" for 2-Year event
Inflow = 0.35 cfs @ 12.14 hrs, Volume= 0.028 af
Outflow = 0.35 cfs @ 12.14 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



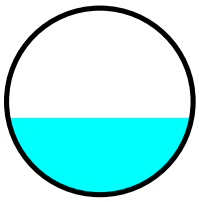
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 2.61" for 2-Year event
Inflow = 6.05 cfs @ 12.14 hrs, Volume= 0.515 af
Outflow = 6.05 cfs @ 12.14 hrs, Volume= 0.515 af, Atten= 0%, Lag= 0.0 min

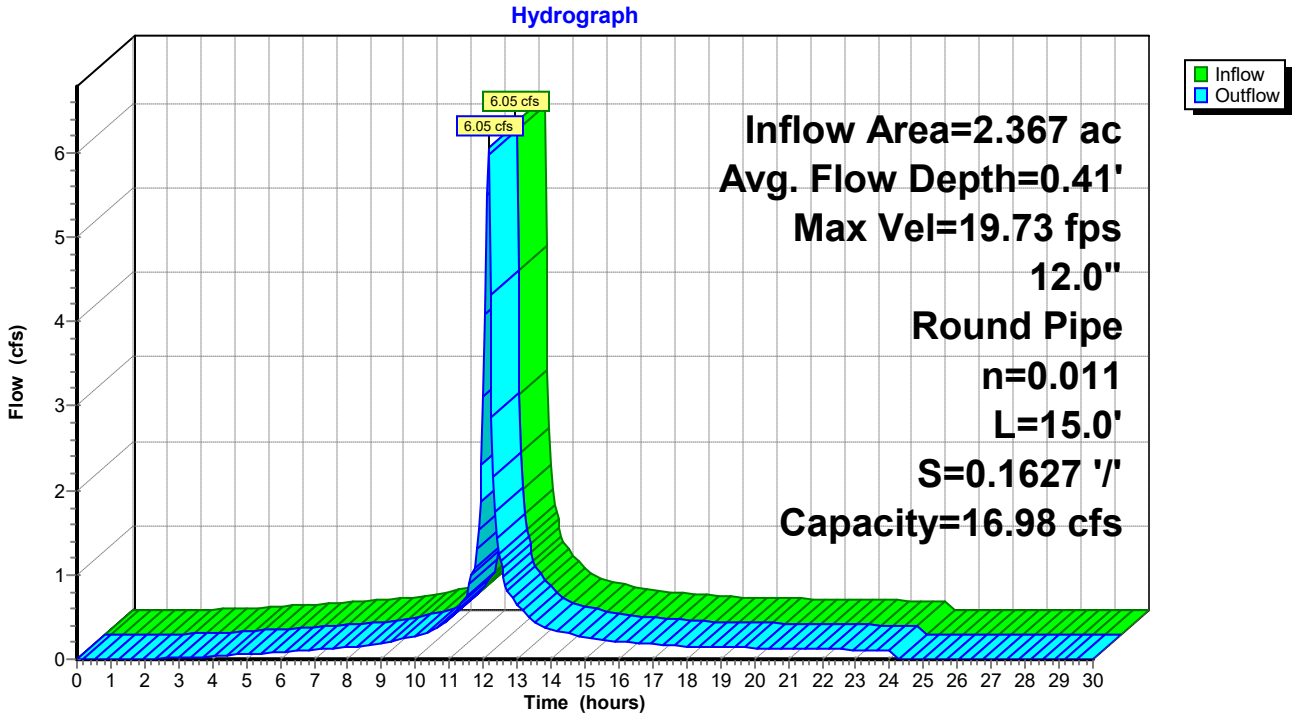
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 19.73 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 6.95 fps, Avg. Travel Time= 0.0 min

Peak Storage= 5 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.98 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.1627 '/'
Inlet Invert= 469.11', Outlet Invert= 466.67'



Reach DCB-D: TO DMH-A



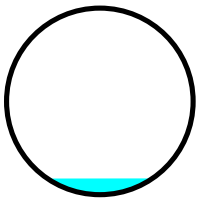
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.095 ac, 82.02% Impervious, Inflow Depth = 1.85" for 2-Year event
Inflow = 0.19 cfs @ 12.11 hrs, Volume= 0.015 af
Outflow = 0.19 cfs @ 12.12 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.1 min

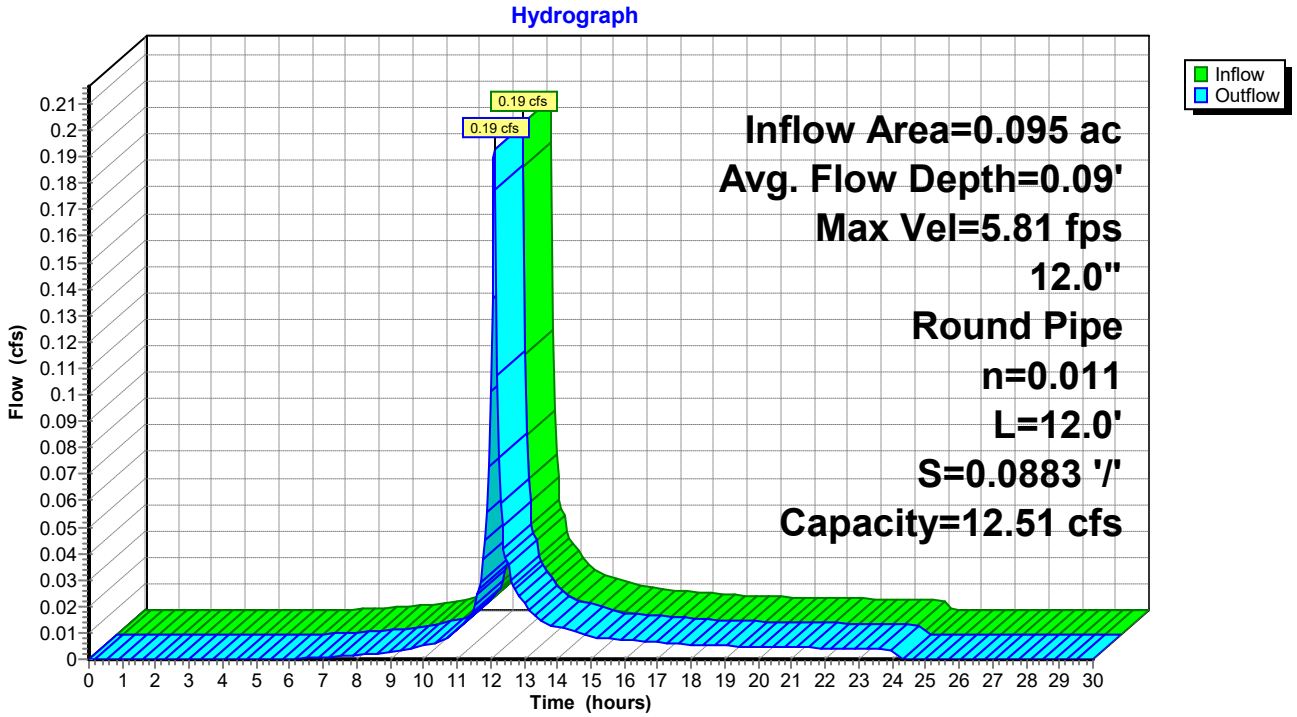
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.81 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A

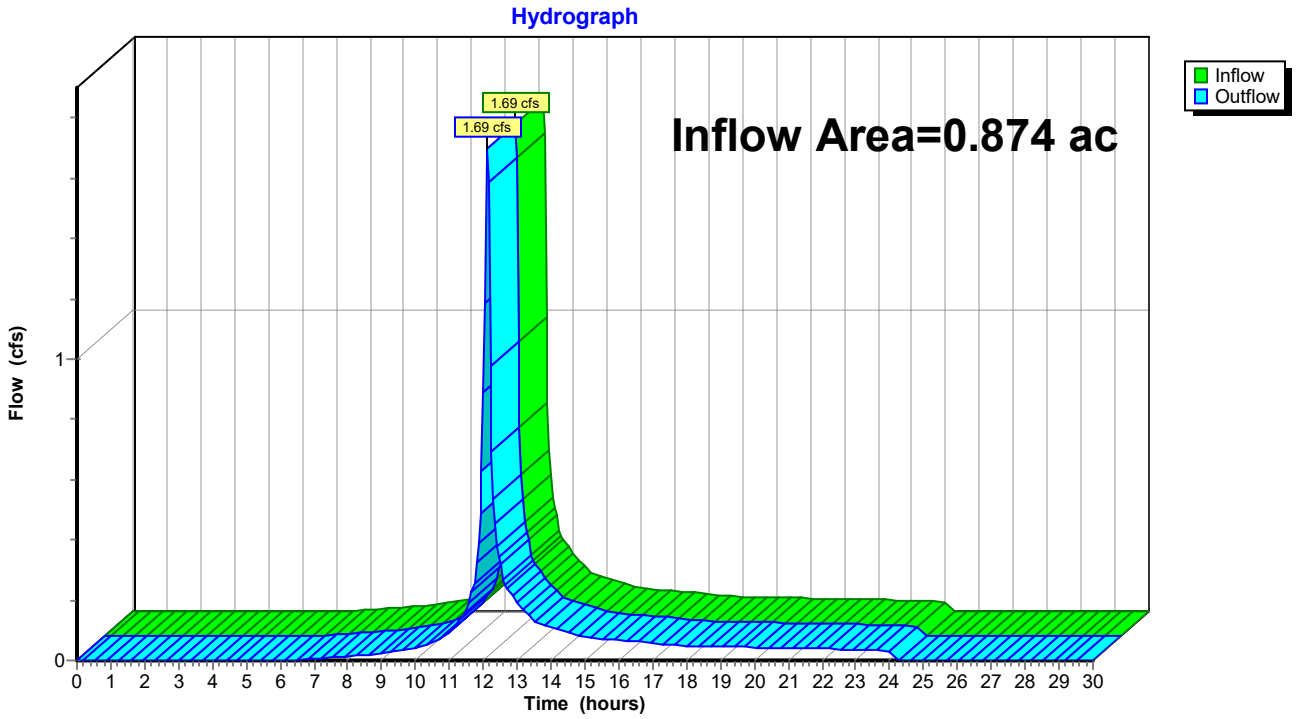


Summary for Reach DCB-F: (new Reach)

Inflow Area = 0.874 ac, 78.48% Impervious, Inflow Depth = 1.77" for 2-Year event
Inflow = 1.69 cfs @ 12.12 hrs, Volume= 0.129 af
Outflow = 1.69 cfs @ 12.12 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-F: (new Reach)

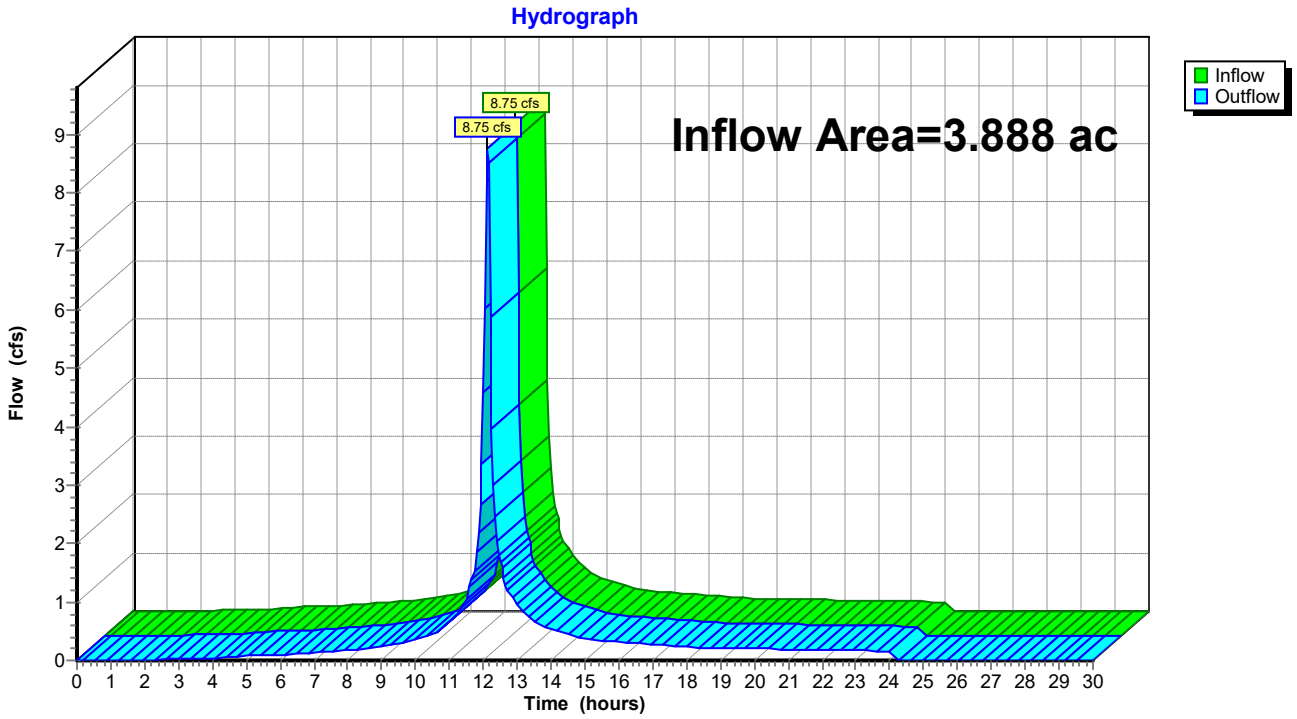


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 2.27" for 2-Year event
Inflow = 8.75 cfs @ 12.13 hrs, Volume= 0.735 af
Outflow = 8.75 cfs @ 12.13 hrs, Volume= 0.735 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

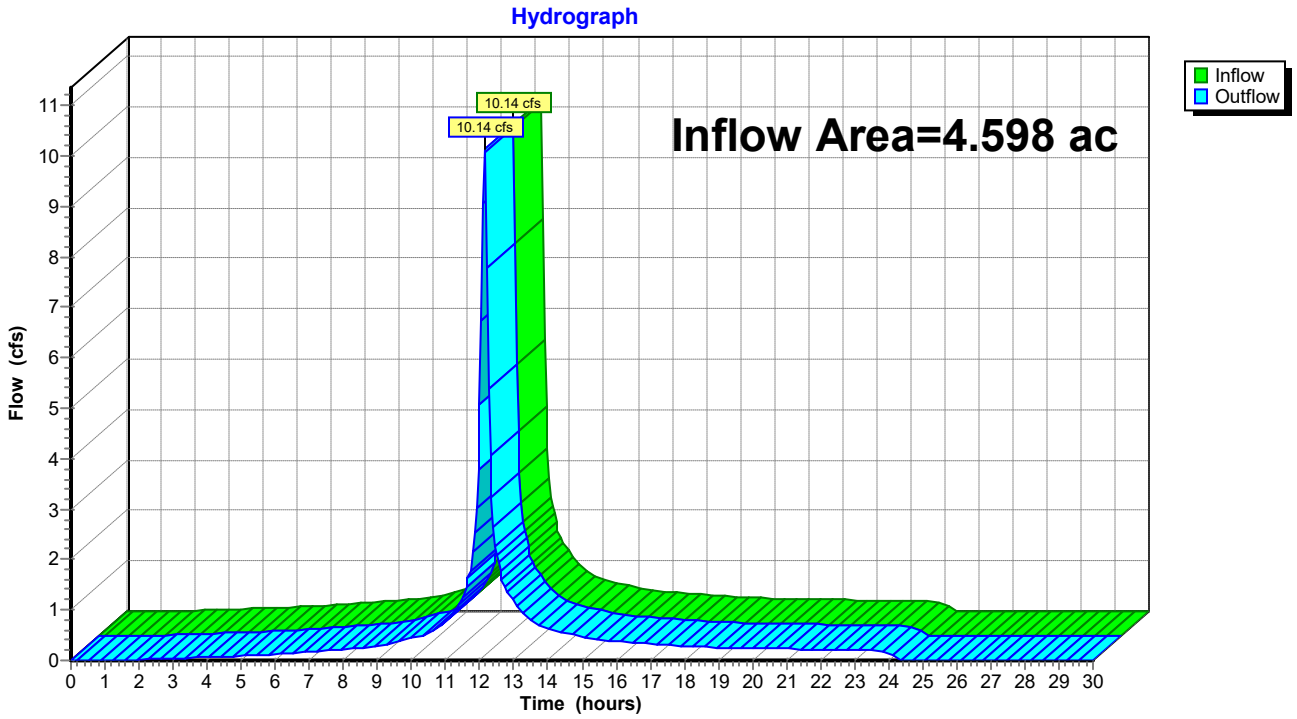


Summary for Reach DMH-C: TO DP#1

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 2.31" for 2-Year event
Inflow = 10.14 cfs @ 12.14 hrs, Volume= 0.887 af
Outflow = 10.14 cfs @ 12.14 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



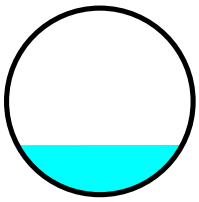
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 2.31" for 2-Year event
Inflow = 10.23 cfs @ 12.13 hrs, Volume= 0.887 af
Outflow = 10.14 cfs @ 12.14 hrs, Volume= 0.887 af, Atten= 1%, Lag= 0.4 min

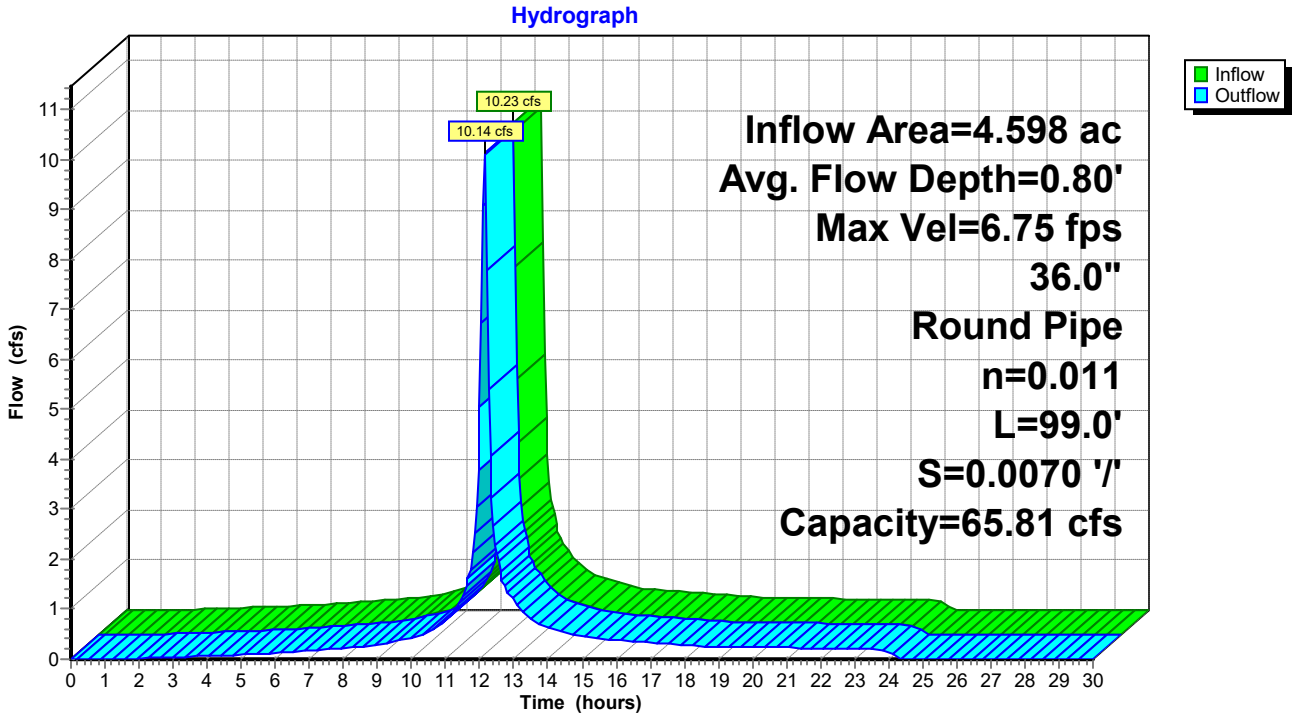
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.7 min

Peak Storage= 150 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



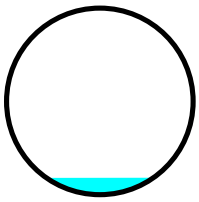
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.449 ac, 61.71% Impervious, Inflow Depth = 2.36" for 2-Year event
Inflow = 1.01 cfs @ 12.15 hrs, Volume= 0.088 af
Outflow = 0.97 cfs @ 12.16 hrs, Volume= 0.088 af, Atten= 4%, Lag= 0.9 min

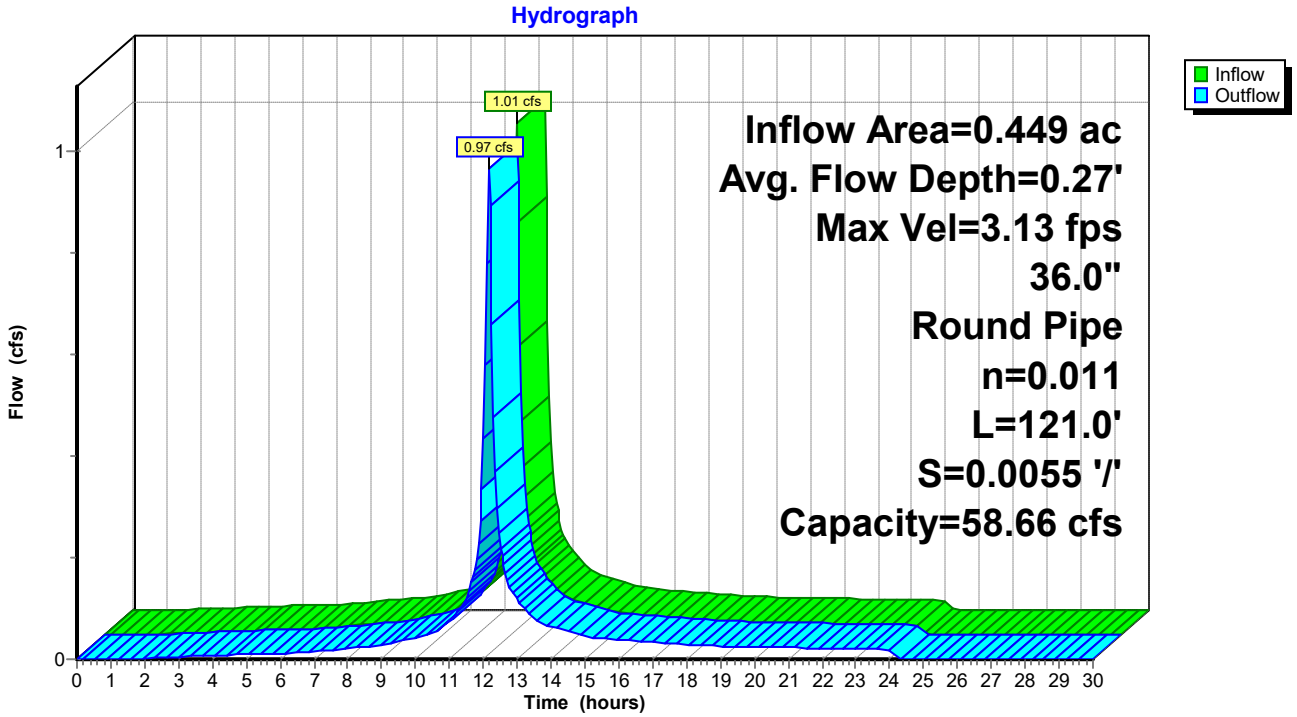
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 1.8 min

Peak Storage= 39 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.66 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 121.0' Slope= 0.0055 '/'
Inlet Invert= 456.57', Outlet Invert= 455.90'



Reach DMH-E: TO DMH-D



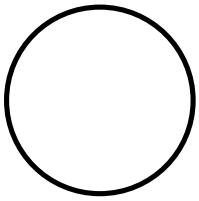
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

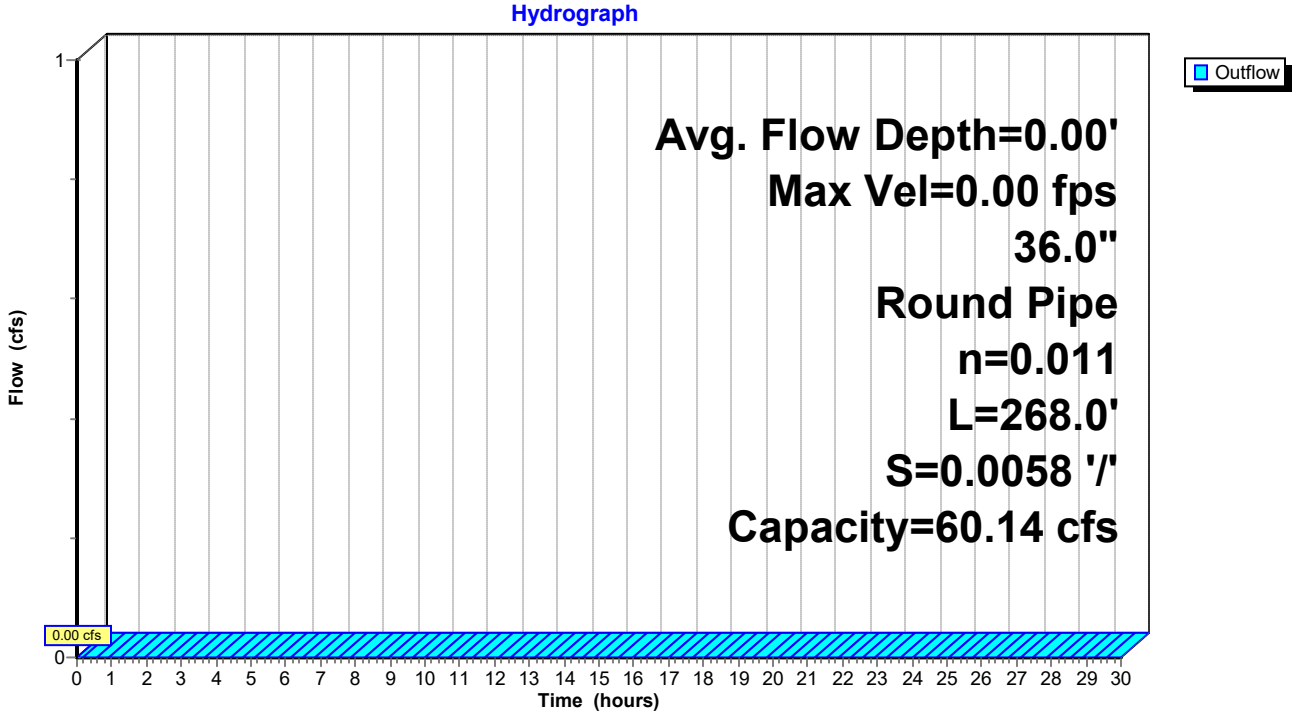
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E

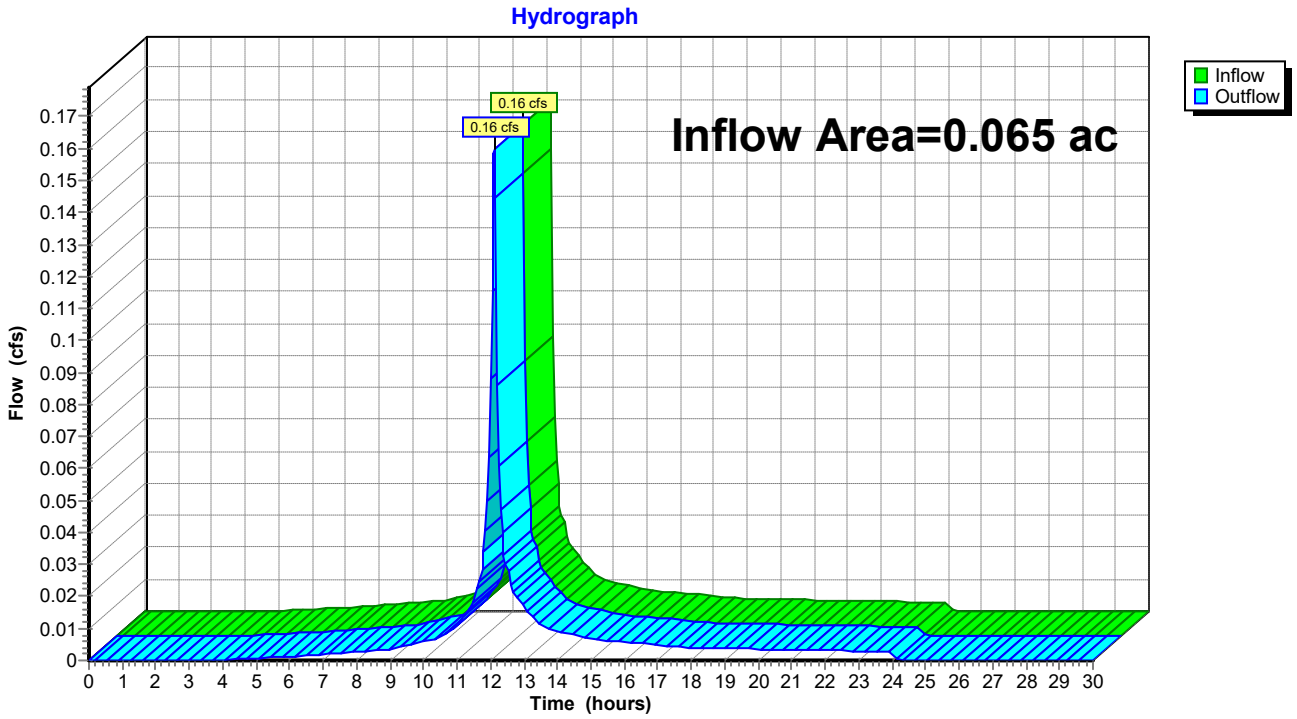


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

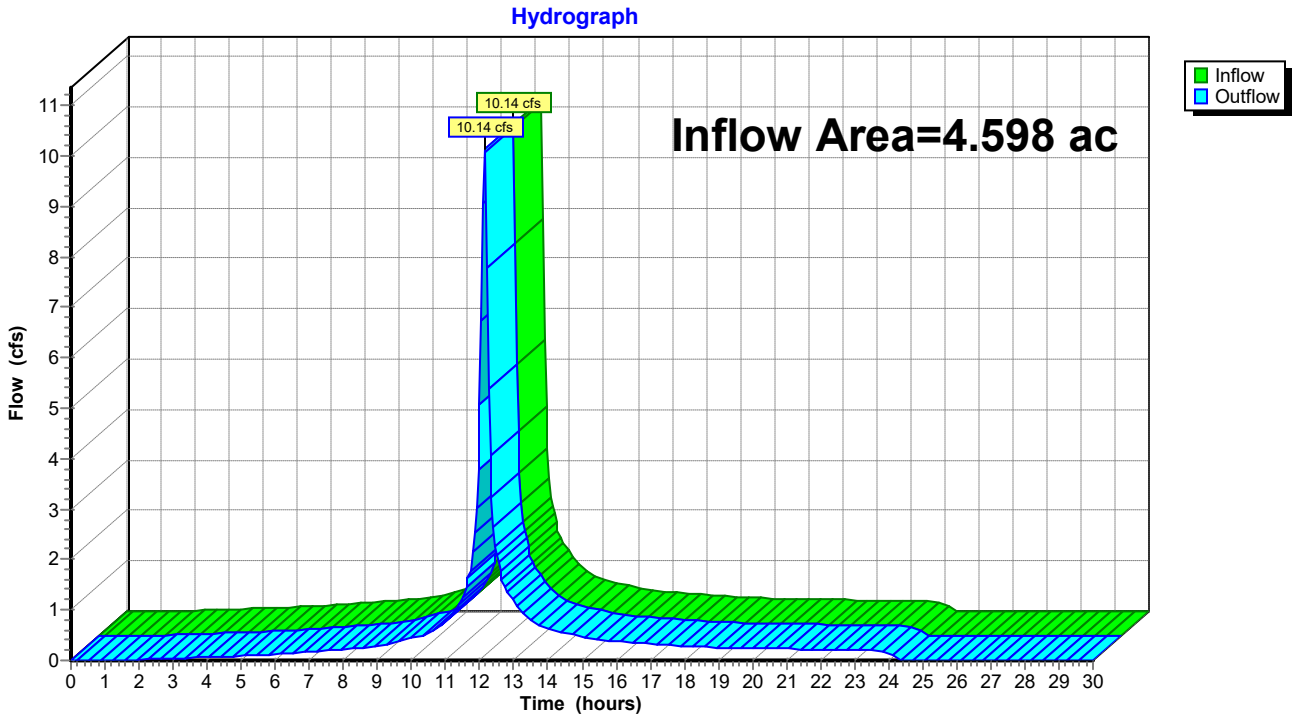


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 2.31" for 2-Year event
Inflow = 10.14 cfs @ 12.14 hrs, Volume= 0.887 af
Outflow = 10.14 cfs @ 12.14 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

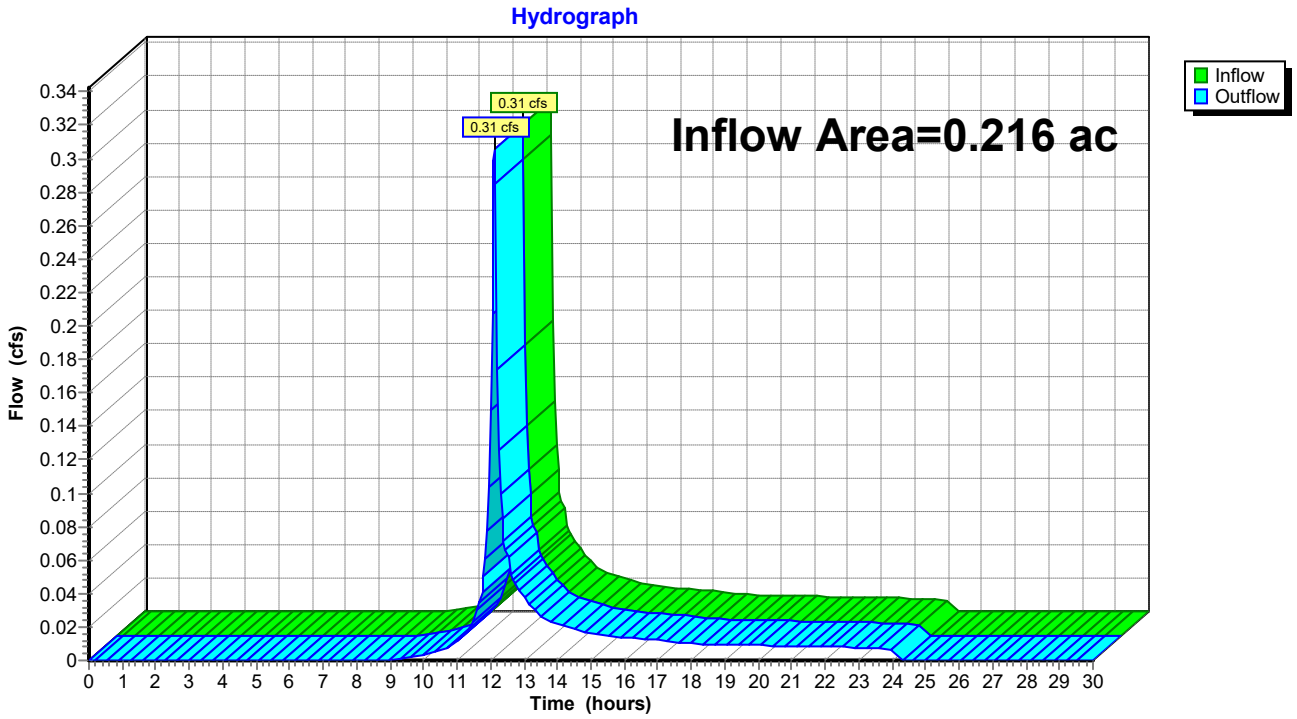


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.216 ac, 68.08% Impervious, Inflow Depth = 1.28" for 2-Year event
Inflow = 0.31 cfs @ 12.12 hrs, Volume= 0.023 af
Outflow = 0.31 cfs @ 12.12 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

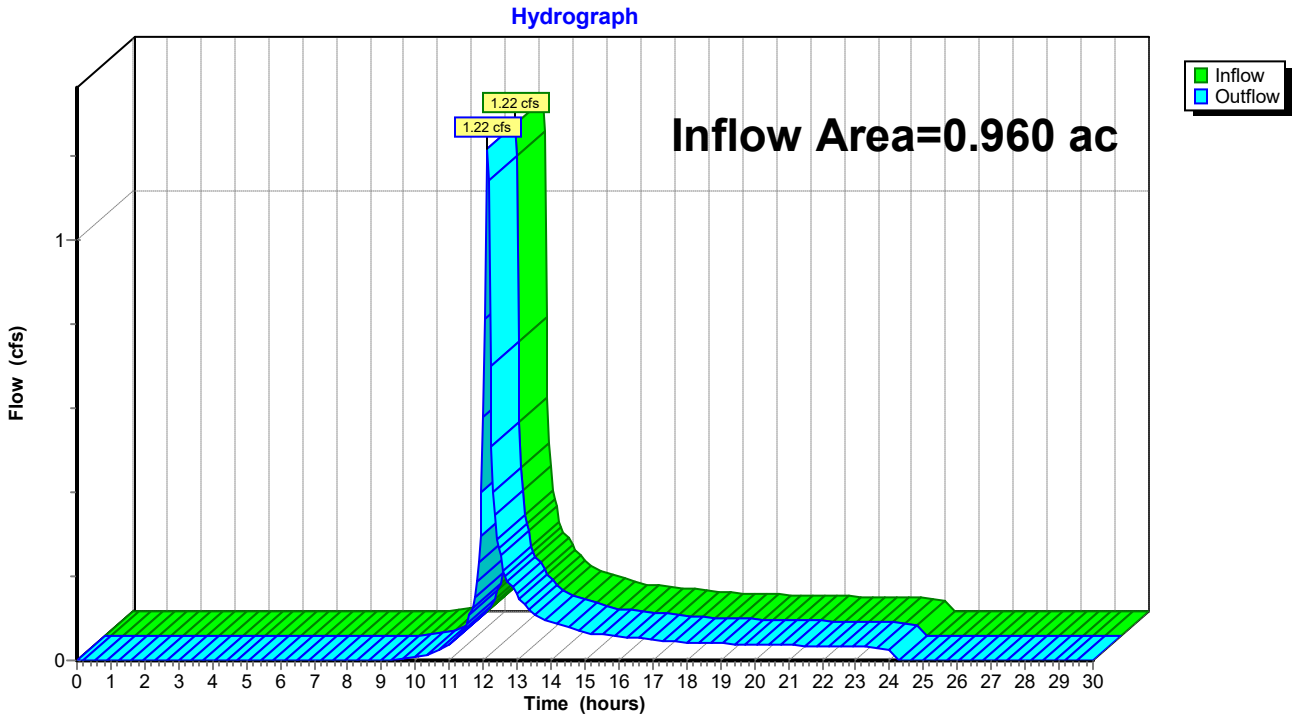


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.960 ac, 59.67% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 1.22 cfs @ 12.12 hrs, Volume= 0.093 af
Outflow = 1.22 cfs @ 12.12 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

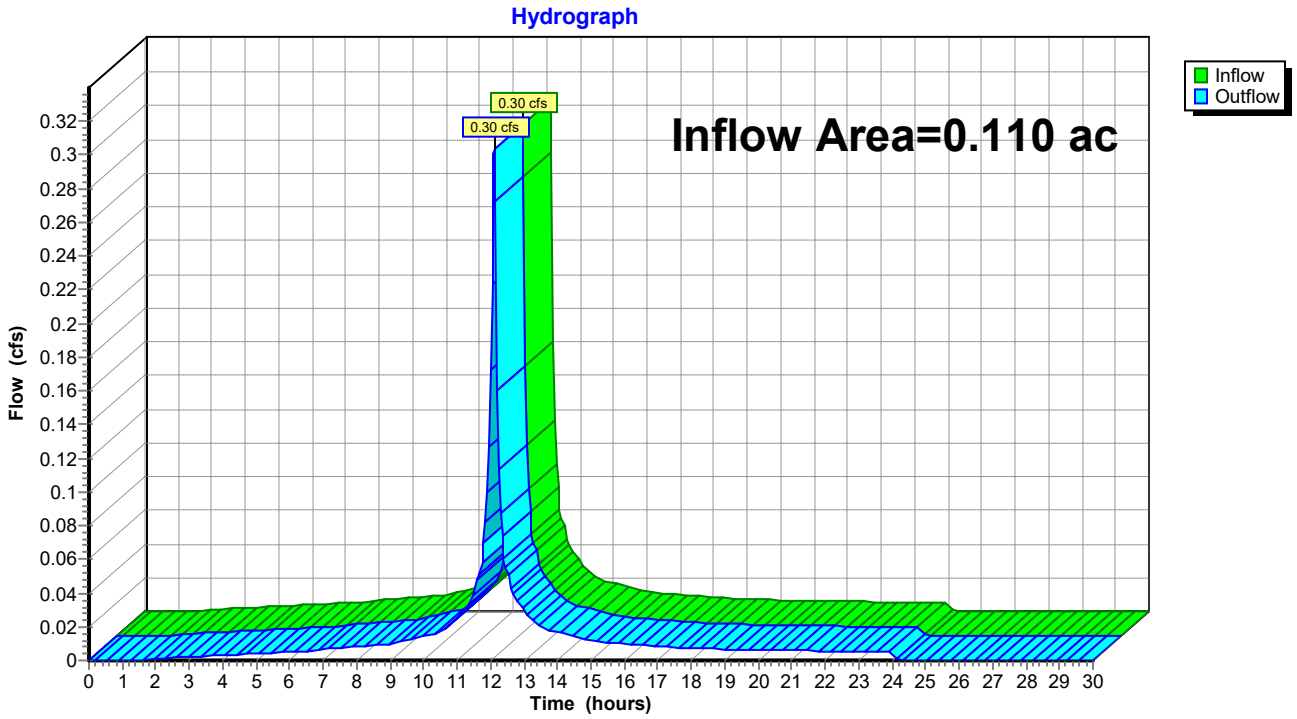


Summary for Reach DP5: DCB-H

Inflow Area = 0.110 ac, 37.39% Impervious, Inflow Depth = 2.79" for 2-Year event
Inflow = 0.30 cfs @ 12.11 hrs, Volume= 0.025 af
Outflow = 0.30 cfs @ 12.11 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H

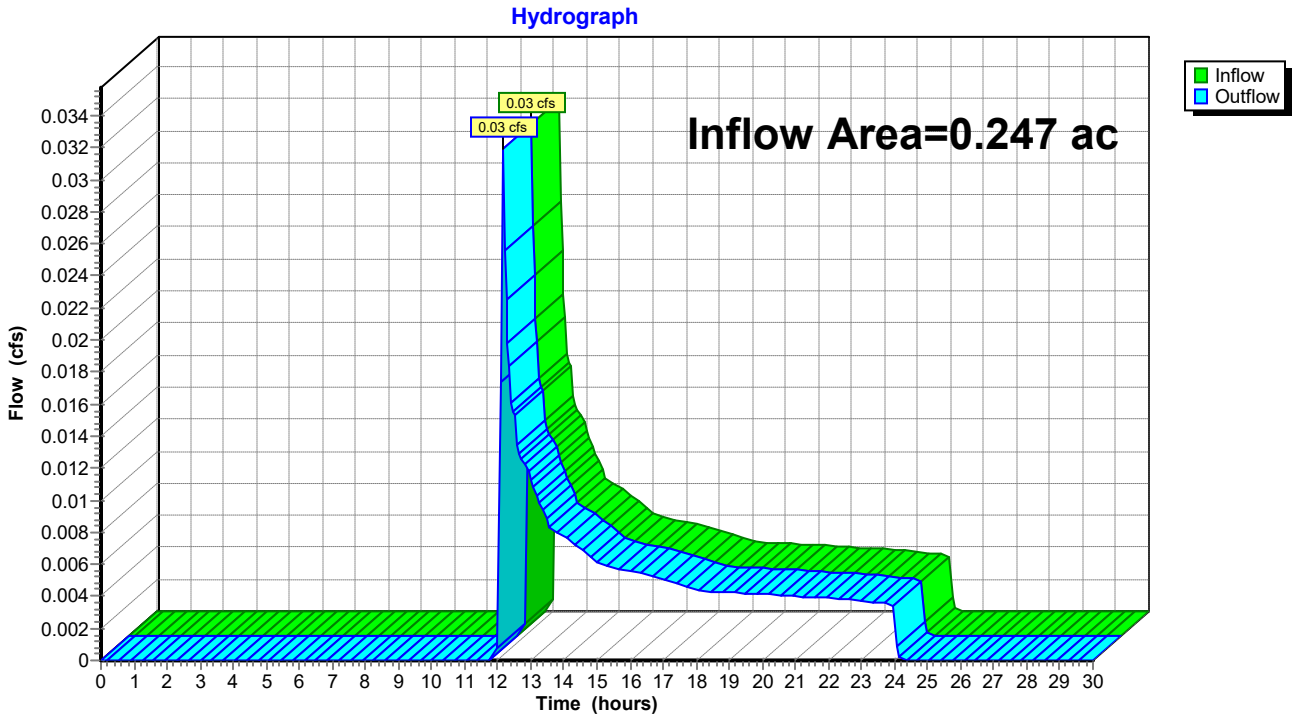


Summary for Reach EX DCB: EX DCB

Inflow Area = 0.247 ac, 29.99% Impervious, Inflow Depth = 0.29" for 2-Year event
Inflow = 0.03 cfs @ 12.16 hrs, Volume= 0.006 af
Outflow = 0.03 cfs @ 12.16 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach EX DCB: EX DCB

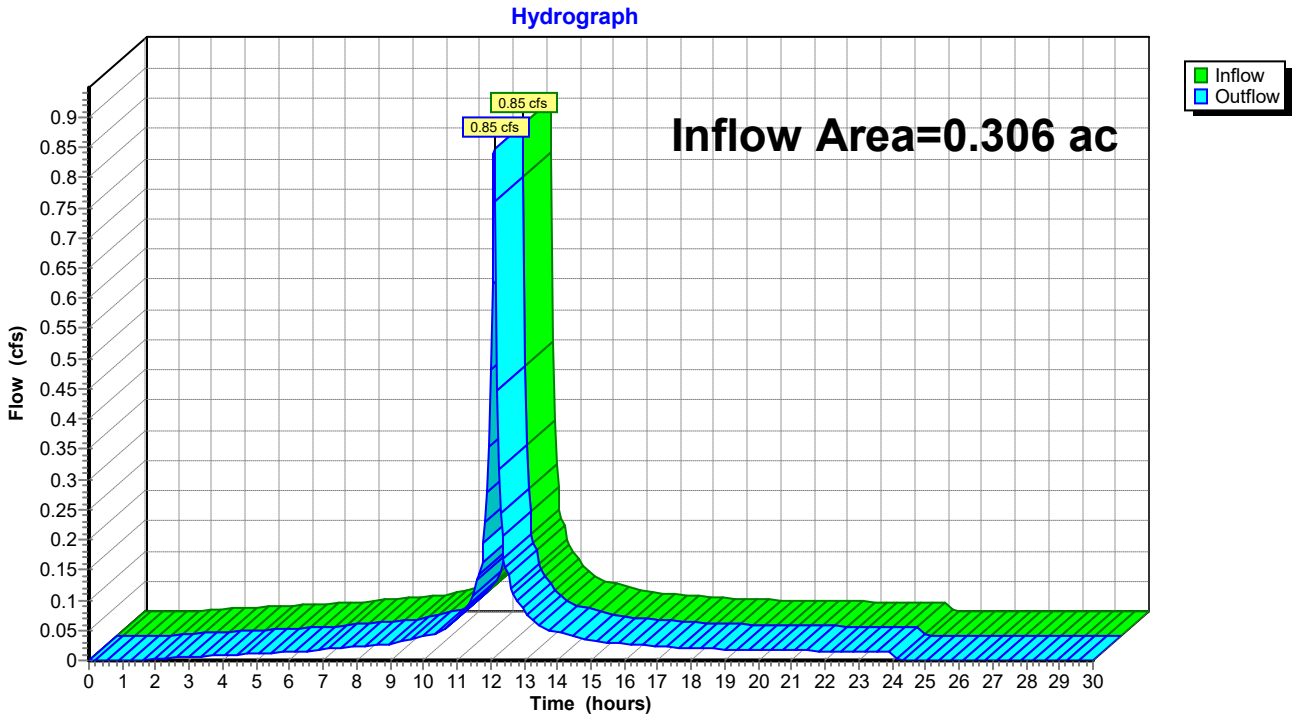


Summary for Reach YDA: (new Reach)

Inflow Area = 0.306 ac, 58.95% Impervious, Inflow Depth = 2.79" for 2-Year event
Inflow = 0.85 cfs @ 12.11 hrs, Volume= 0.071 af
Outflow = 0.85 cfs @ 12.11 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach YDA: (new Reach)



Summary for Pond DMH-B: TO DMH-D

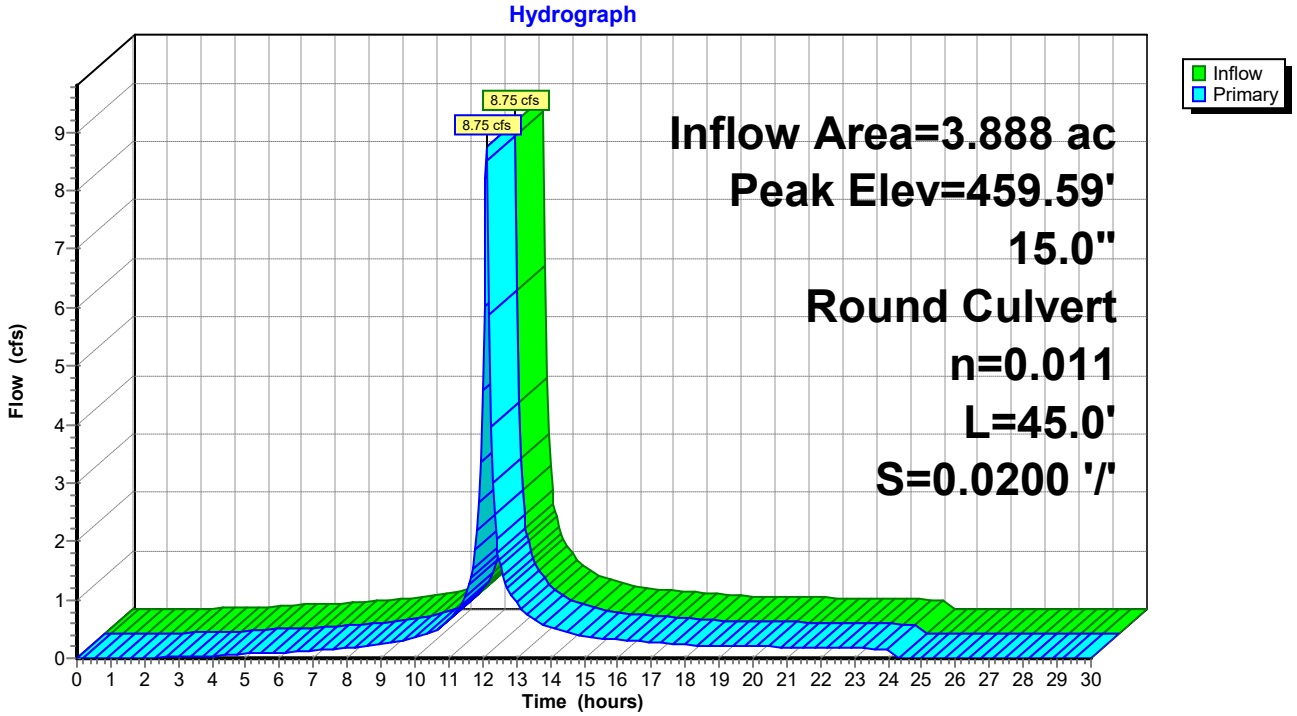
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 2.27" for 2-Year event
Inflow = 8.75 cfs @ 12.13 hrs, Volume= 0.735 af
Outflow = 8.75 cfs @ 12.13 hrs, Volume= 0.735 af, Atten= 0%, Lag= 0.0 min
Primary = 8.75 cfs @ 12.13 hrs, Volume= 0.735 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 459.59' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=8.40 cfs @ 12.13 hrs HW=459.44' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.40 cfs @ 6.84 fps)

Pond DMH-B: TO DMH-D



Summary for Pond LP1: TO DCB-D

Inflow Area = 0.764 ac, 43.34% Impervious, Inflow Depth = 2.48" for 2-Year event
Inflow = 1.98 cfs @ 12.11 hrs, Volume= 0.158 af
Outflow = 1.94 cfs @ 12.13 hrs, Volume= 0.157 af, Atten= 2%, Lag= 1.1 min
Primary = 1.94 cfs @ 12.13 hrs, Volume= 0.157 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 473.94' @ 12.13 hrs Surf.Area= 1,369 sf Storage= 145 cf

Plug-Flow detention time= 9.2 min calculated for 0.156 af (99% of inflow)
Center-of-Mass det. time= 5.2 min (803.9 - 798.7)

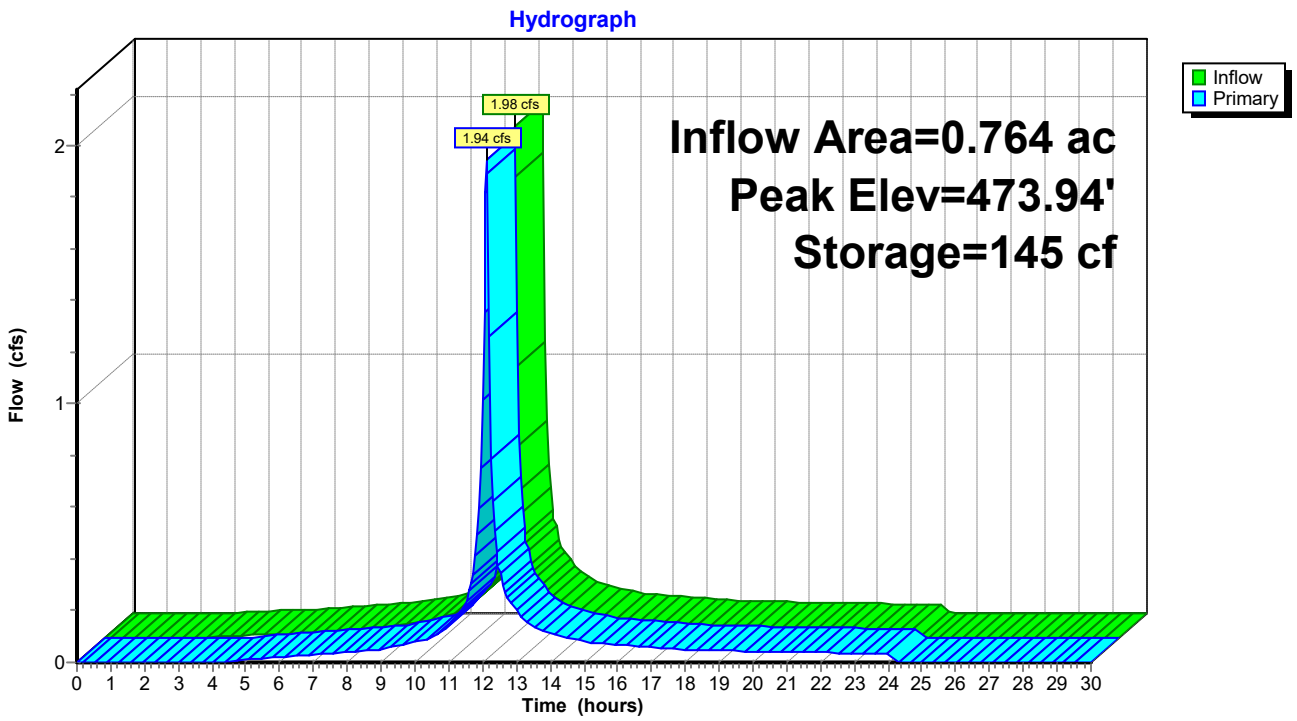
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
473.75	120	0	0
474.00	1,725	231	231

Device	Routing	Invert	Outlet Devices
#1	Primary	473.85'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.86 cfs @ 12.13 hrs HW=473.94' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.86 cfs @ 0.81 fps)

Pond LP1: TO DCB-D



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=3.78"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.26 cfs 0.021 af

Subcatchment E12: TO DCB-A Runoff Area=11,373 sf 80.04% Impervious Runoff Depth=4.44"
Flow Length=209' Tc=10.9 min CN=98 Runoff=0.91 cfs 0.097 af

Subcatchment E14: TO DCB-B Runoff Area=11,310 sf 55.37% Impervious Runoff Depth=4.33"
Flow Length=171' Tc=8.1 min CN=97 Runoff=0.99 cfs 0.094 af

Subcatchment E15: TO DCB-C Runoff Area=8,235 sf 70.42% Impervious Runoff Depth=3.17"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=86 Runoff=0.62 cfs 0.050 af

Subcatchment E16: TO LOW POINT Runoff Area=33,282 sf 43.34% Impervious Runoff Depth=3.99"
Flow Length=183' Tc=5.0 min CN=94 Runoff=3.09 cfs 0.254 af

Subcatchment E18: TO DCB-D Runoff Area=69,813 sf 94.39% Impervious Runoff Depth=4.21"
Flow Length=305' Tc=7.0 min CN=96 Runoff=6.30 cfs 0.563 af

Subcatchment E19: TO DCB-E Runoff Area=4,127 sf 82.02% Impervious Runoff Depth=3.27"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=87 Runoff=0.33 cfs 0.026 af

Subcatchment E20: TO DP#3 Runoff Area=9,426 sf 68.08% Impervious Runoff Depth=2.53"
Flow Length=137' Tc=5.0 min CN=79 Runoff=0.61 cfs 0.046 af

Subcatchment E21: TO EX DCB Runoff Area=10,744 sf 29.99% Impervious Runoff Depth=0.94"
Flow Length=77' Slope=0.0200 '/' Tc=5.0 min CN=57 Runoff=0.22 cfs 0.019 af

Subcatchment E22: TO YD-A Runoff Area=13,343 sf 58.95% Impervious Runoff Depth=4.33"
Flow Length=125' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=1.29 cfs 0.110 af

Subcatchment E23: TO DCB-F/G Runoff Area=38,054 sf 78.48% Impervious Runoff Depth=3.17"
Flow Length=287' Tc=5.2 min CN=86 Runoff=2.97 cfs 0.231 af

Subcatchment E24: TO DP#4 Runoff Area=41,828 sf 59.67% Impervious Runoff Depth=2.36"
Flow Length=150' Slope=0.0050 '/' Tc=5.0 min CN=77 Runoff=2.51 cfs 0.189 af

Subcatchment E26: TO DCB-H Runoff Area=4,779 sf 37.39% Impervious Runoff Depth=4.33"
Flow Length=135' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.46 cfs 0.040 af

Reach DCB-A: TO DMH-D Inflow=0.91 cfs 0.097 af
Outflow=0.91 cfs 0.097 af

Reach DCB-B: TO DMH-E Inflow=0.99 cfs 0.094 af
Outflow=0.99 cfs 0.094 af

Reach DCB-C: TO TRUNKLINE Inflow=0.62 cfs 0.050 af
Outflow=0.62 cfs 0.050 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.53' Max Vel=22.05 fps Inflow=9.33 cfs 0.816 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=9.33 cfs 0.816 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.11' Max Vel=6.85 fps Inflow=0.33 cfs 0.026 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.33 cfs 0.026 af

Reach DCB-F: (new Reach) Inflow=2.97 cfs 0.231 af
Outflow=2.97 cfs 0.231 af

Reach DMH-A: TO DMH-B Inflow=14.03 cfs 1.202 af
Outflow=14.03 cfs 1.202 af

Reach DMH-C: TO DP#1 Inflow=16.24 cfs 1.443 af
Outflow=16.24 cfs 1.443 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.02' Max Vel=7.70 fps Inflow=16.35 cfs 1.443 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=16.24 cfs 1.443 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.34' Max Vel=3.61 fps Inflow=1.61 cfs 0.144 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=1.55 cfs 0.144 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.26 cfs 0.021 af
Outflow=0.26 cfs 0.021 af

Reach DP2: MUNICIPAL SYSTEM Inflow=16.24 cfs 1.443 af
Outflow=16.24 cfs 1.443 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.61 cfs 0.046 af
Outflow=0.61 cfs 0.046 af

Reach DP4: LOW POINT OFF LOCUS Inflow=2.51 cfs 0.189 af
Outflow=2.51 cfs 0.189 af

Reach DP5: DCB-H Inflow=0.46 cfs 0.040 af
Outflow=0.46 cfs 0.040 af

Reach EX DCB: EX DCB Inflow=0.22 cfs 0.019 af
Outflow=0.22 cfs 0.019 af

Reach YDA: (new Reach) Inflow=1.29 cfs 0.110 af
Outflow=1.29 cfs 0.110 af

Pond DMH-B: TO DMH-D Peak Elev=462.99' Inflow=14.03 cfs 1.202 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=14.03 cfs 1.202 af

Pond LP1: TO DCB-D Peak Elev=473.98' Storage=193 cf Inflow=3.09 cfs 0.254 af
Outflow=3.04 cfs 0.253 af

Total Runoff Area = 5.950 ac Runoff Volume = 1.738 af Average Runoff Depth = 3.51"
29.95% Pervious = 1.782 ac 70.05% Impervious = 4.168 ac

Summary for Subcatchment E11: TO DP#1

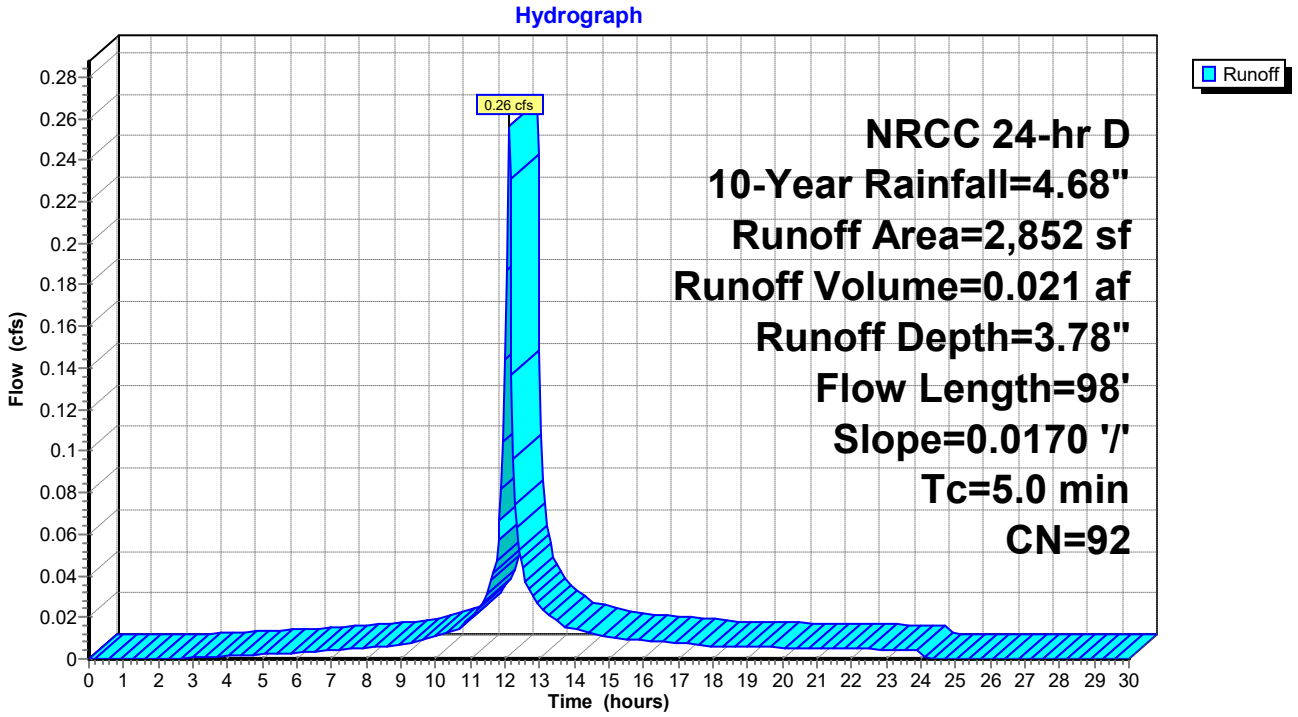
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E11: TO DP#1



Summary for Subcatchment E12: TO DCB-A

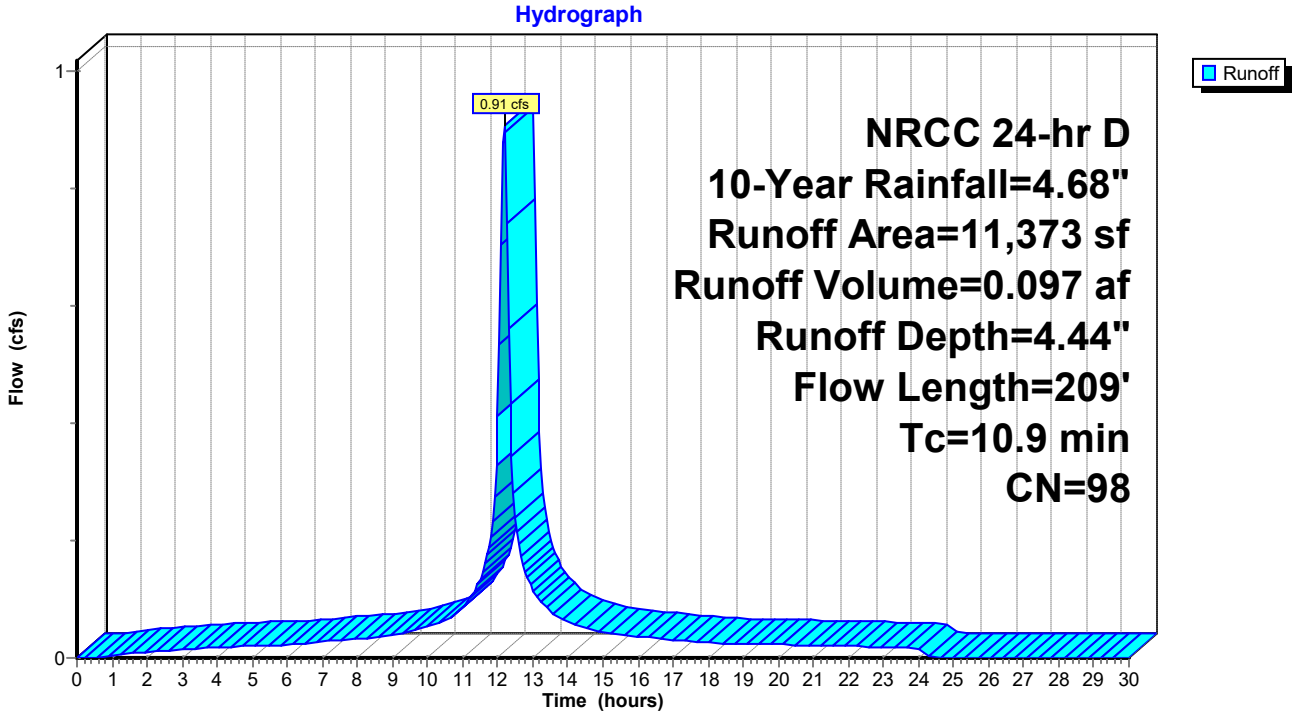
Runoff = 0.91 cfs @ 12.18 hrs, Volume= 0.097 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
9,103	98	Paved parking, HSG A
2,270	96	Gravel surface, HSG A
11,373	98	Weighted Average
2,270		19.96% Pervious Area
9,103		80.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	75	0.0120	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	9	0.0120	1.76		**Shallow Concentrated Flow, GRASS** Unpaved Kv= 16.1 fps
1.1	125	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.9	209	Total			

Subcatchment E12: TO DCB-A



Summary for Subcatchment E14: TO DCB-B

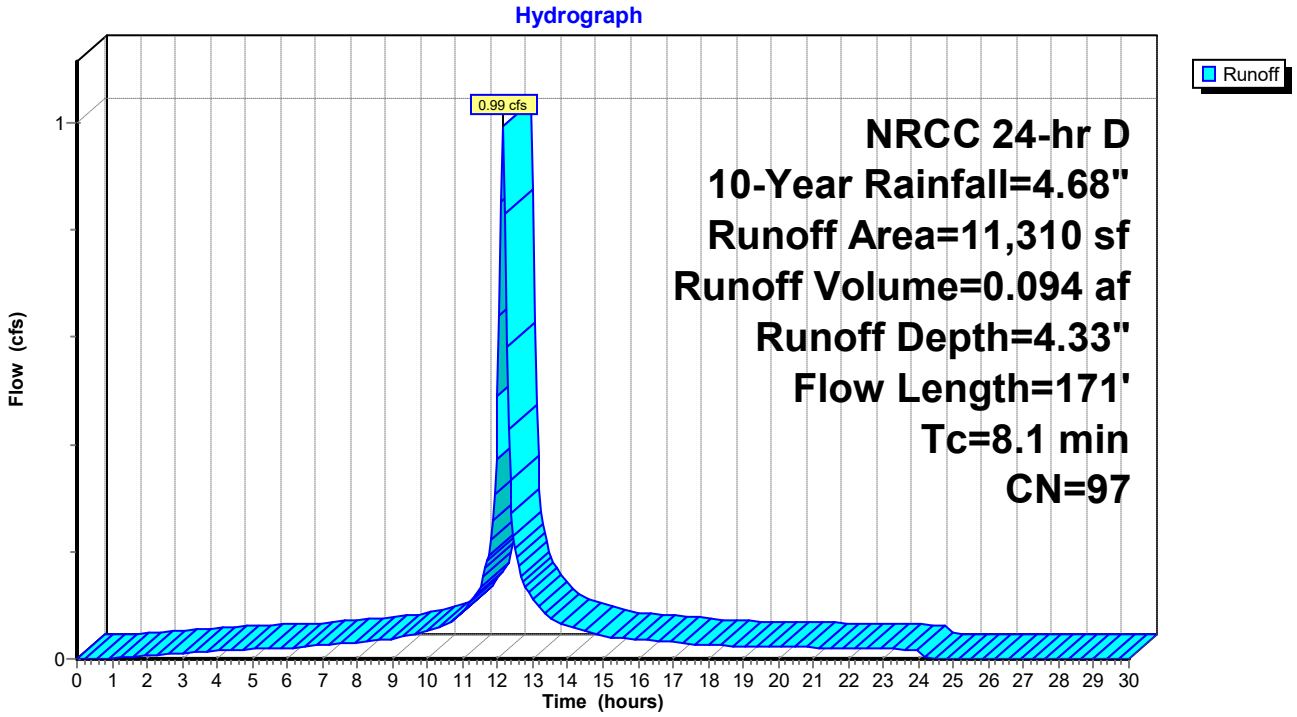
Runoff = 0.99 cfs @ 12.15 hrs, Volume= 0.094 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
6,262	98	Paved parking, HSG A
5,048	96	Gravel surface, HSG A
11,310	97	Weighted Average
5,048		44.63% Pervious Area
6,262		55.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.1	121	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	171	Total			

Subcatchment E14: TO DCB-B



Summary for Subcatchment E15: TO DCB-C

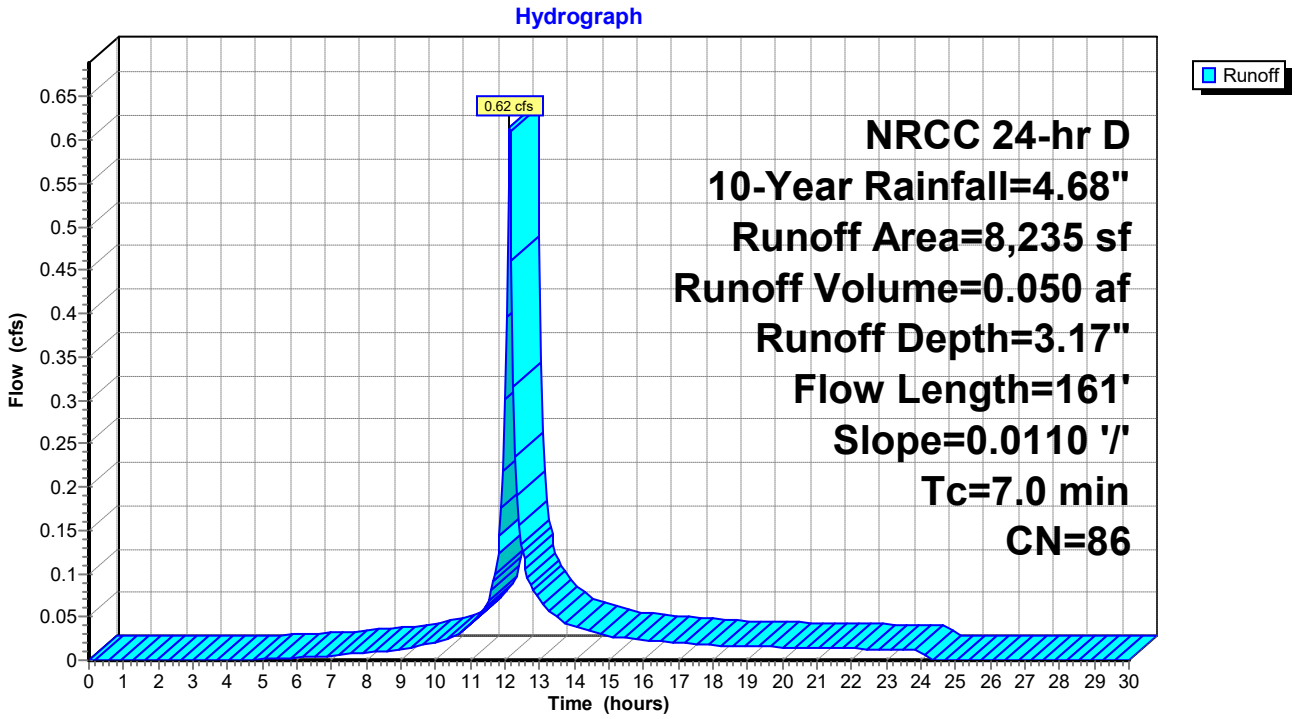
Runoff = 0.62 cfs @ 12.14 hrs, Volume= 0.050 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,643	39	>75% Grass cover, Good, HSG A
5,799	98	Paved parking, HSG A
793	96	Gravel surface, HSG A
8,235	86	Weighted Average
2,436		29.58% Pervious Area
5,799		70.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment E15: TO DCB-C



Summary for Subcatchment E16: TO LOW POINT

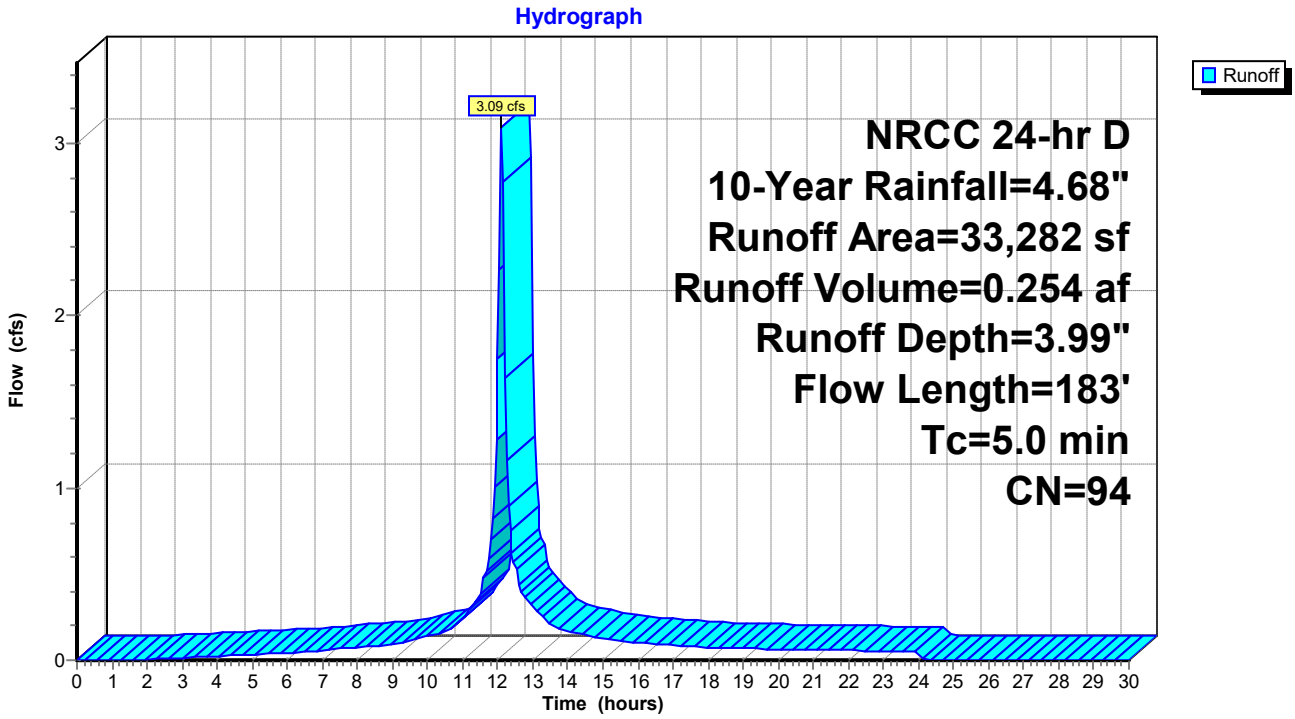
Runoff = 3.09 cfs @ 12.11 hrs, Volume= 0.254 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,882	39	>75% Grass cover, Good, HSG A
14,426	98	Paved parking, HSG A
16,974	96	Gravel surface, HSG A
33,282	94	Weighted Average
18,856		56.66% Pervious Area
14,426		43.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.9	29	0.0040	0.56		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
2.2	133	0.0040	1.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	183	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E16: TO LOW POINT



Summary for Subcatchment E18: TO DCB-D

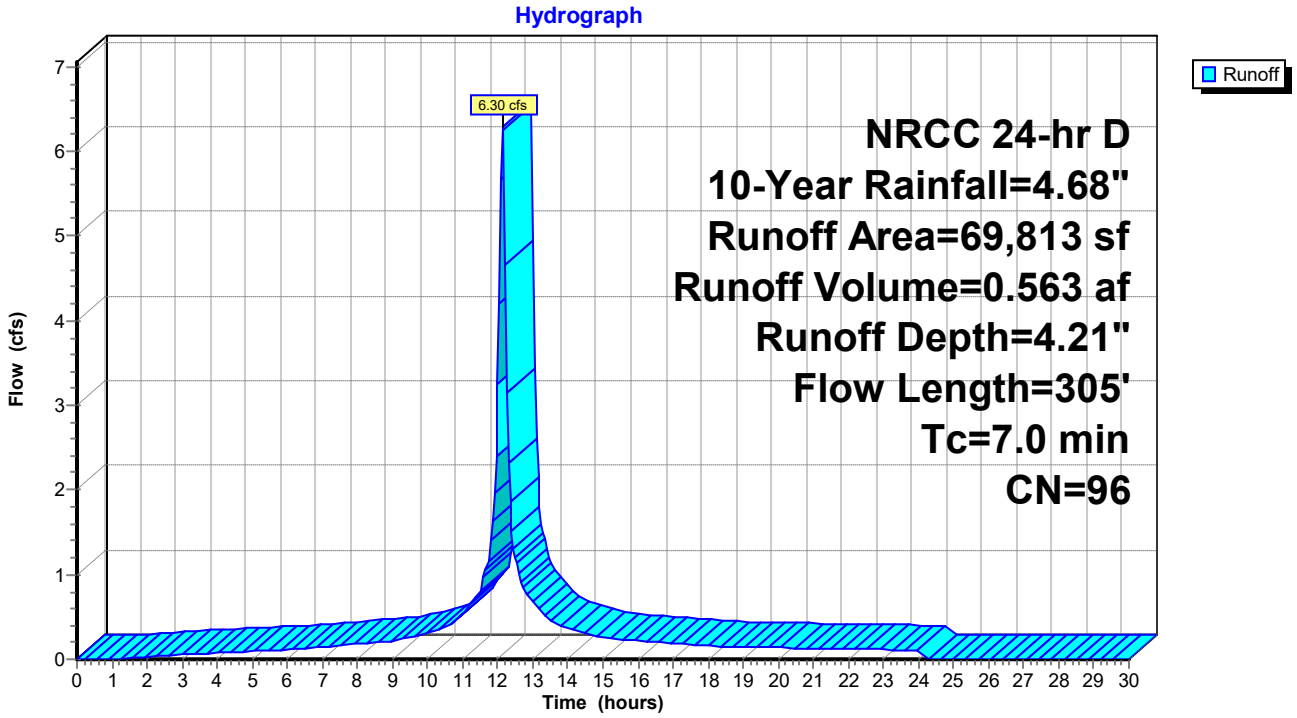
Runoff = 6.30 cfs @ 12.14 hrs, Volume= 0.563 af, Depth= 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
2,530	39	>75% Grass cover, Good, HSG A
65,894	98	Paved parking, HSG A
1,389	96	Gravel surface, HSG A
69,813	96	Weighted Average
3,919		5.61% Pervious Area
65,894		94.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	23	0.0120	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.6	27	0.0090	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	107	0.0090	1.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	148	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	305	Total			

Subcatchment E18: TO DCB-D



Summary for Subcatchment E19: TO DCB-E

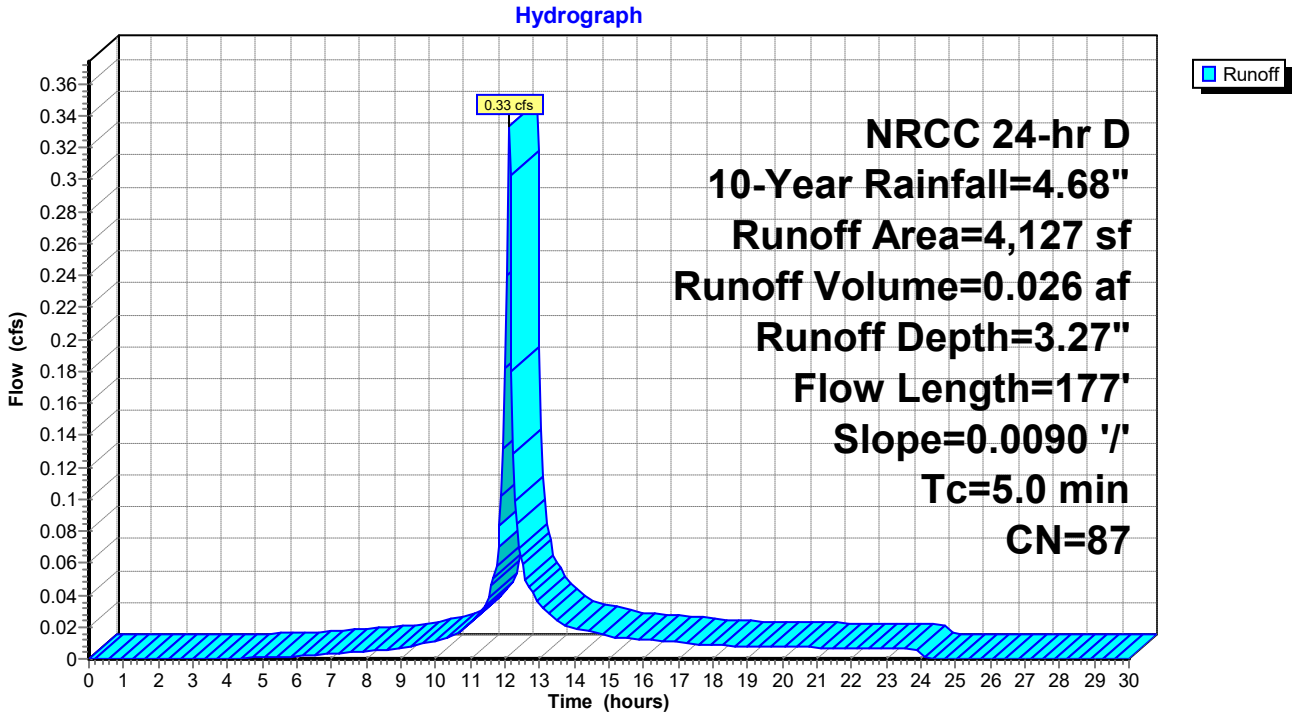
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.026 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
742	39	>75% Grass cover, Good, HSG A
3,385	98	Paved parking, HSG A
4,127	87	Weighted Average
742		17.98% Pervious Area
3,385		82.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E19: TO DCB-E



Summary for Subcatchment E20: TO DP#3

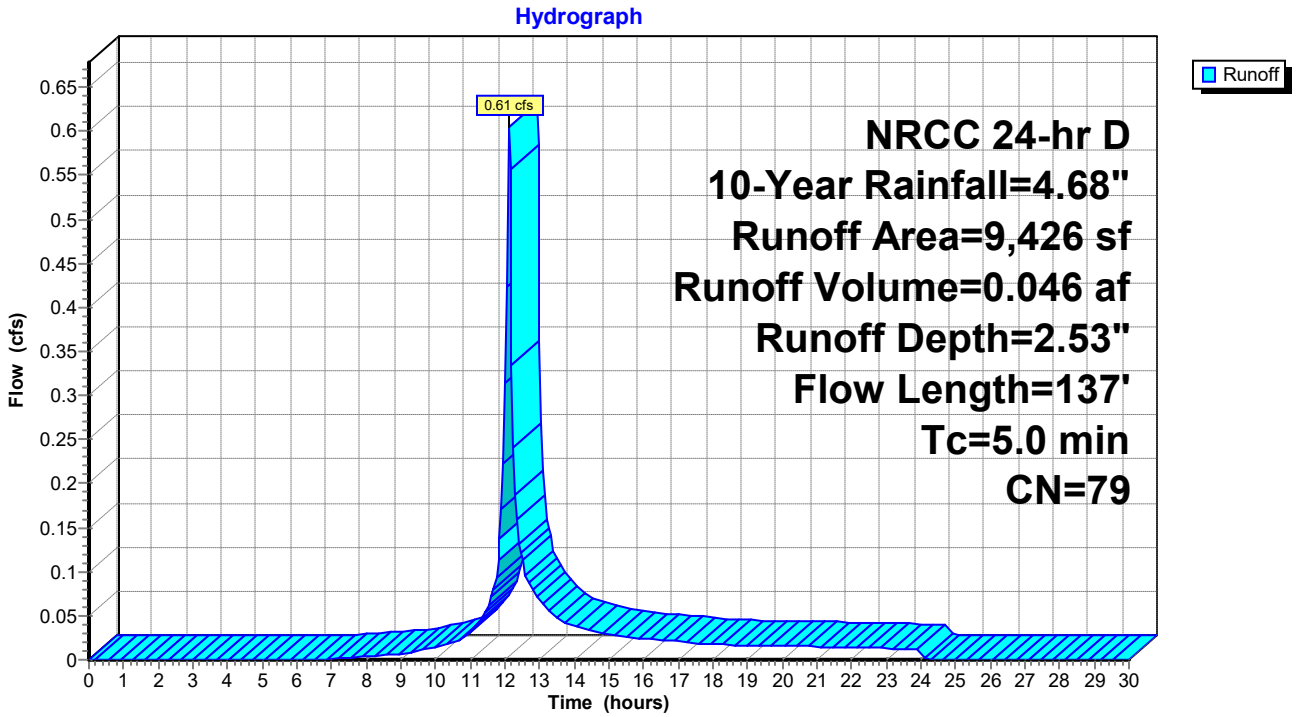
Runoff = 0.61 cfs @ 12.12 hrs, Volume= 0.046 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
3,009	39	>75% Grass cover, Good, HSG A
6,417	98	Paved parking, HSG A
9,426	79	Weighted Average
3,009		31.92% Pervious Area
6,417		68.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0300	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	26	0.1300	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	6	0.0150	0.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	87	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	137	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E20: TO DP#3



Summary for Subcatchment E21: TO EX DCB

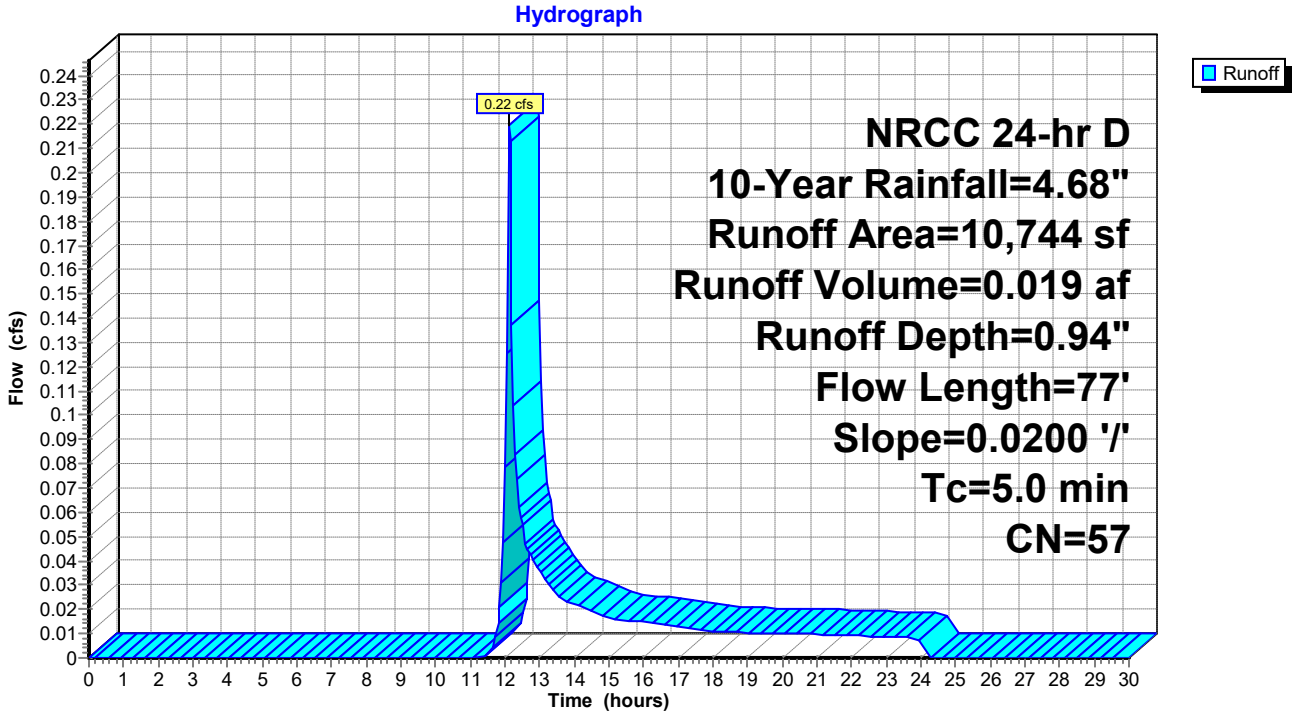
Runoff = 0.22 cfs @ 12.13 hrs, Volume= 0.019 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
7,522	39	>75% Grass cover, Good, HSG A
3,222	98	Paved parking, HSG A
10,744	57	Weighted Average
7,522		70.01% Pervious Area
3,222		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	43	0.0200	1.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	7	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	27	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.0	77	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E21: TO EX DCB



Summary for Subcatchment E22: TO YD-A

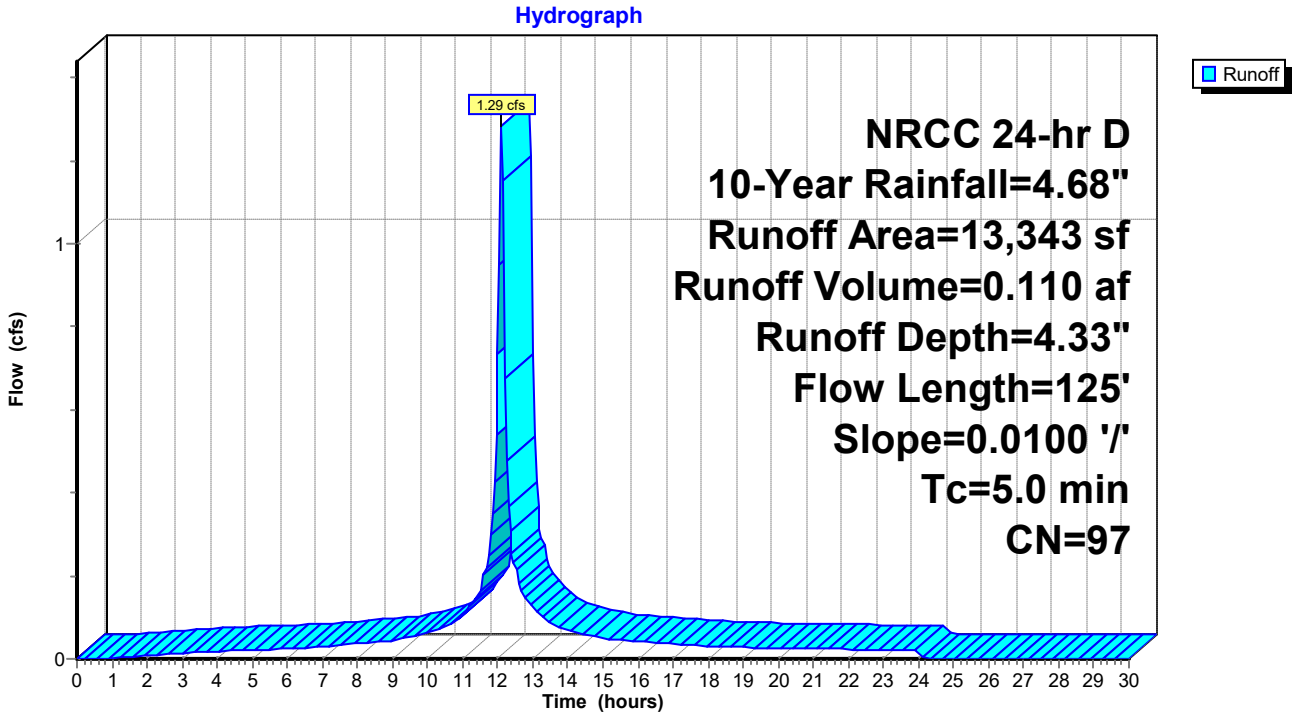
Runoff = 1.29 cfs @ 12.11 hrs, Volume= 0.110 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
7,866	98	Paved parking, HSG A
5,477	96	Gravel surface, HSG A
13,343	97	Weighted Average
5,477		41.05% Pervious Area
7,866		58.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
0.8	75	0.0100	1.61		**Shallow Concentrated Flow, GRAVEL** Unpaved Kv= 16.1 fps
1.7	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E22: TO YD-A



Summary for Subcatchment E23: TO DCB-F/G

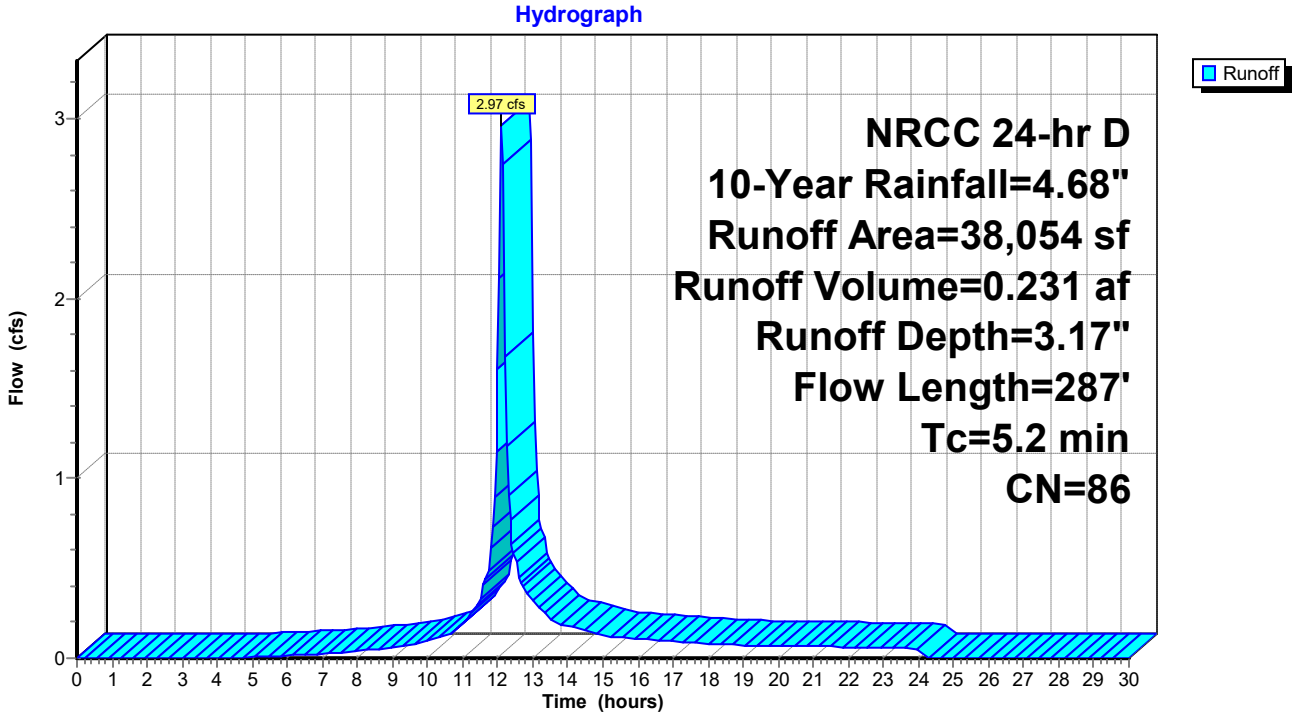
Runoff = 2.97 cfs @ 12.12 hrs, Volume= 0.231 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
7,964	39	>75% Grass cover, Good, HSG A
29,865	98	Paved parking, HSG A
225	96	Gravel surface, HSG A
38,054	86	Weighted Average
8,189		21.52% Pervious Area
29,865		78.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.8	29	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.8	237	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	287	Total			

Subcatchment E23: TO DCB-F/G



Summary for Subcatchment E24: TO DP#4

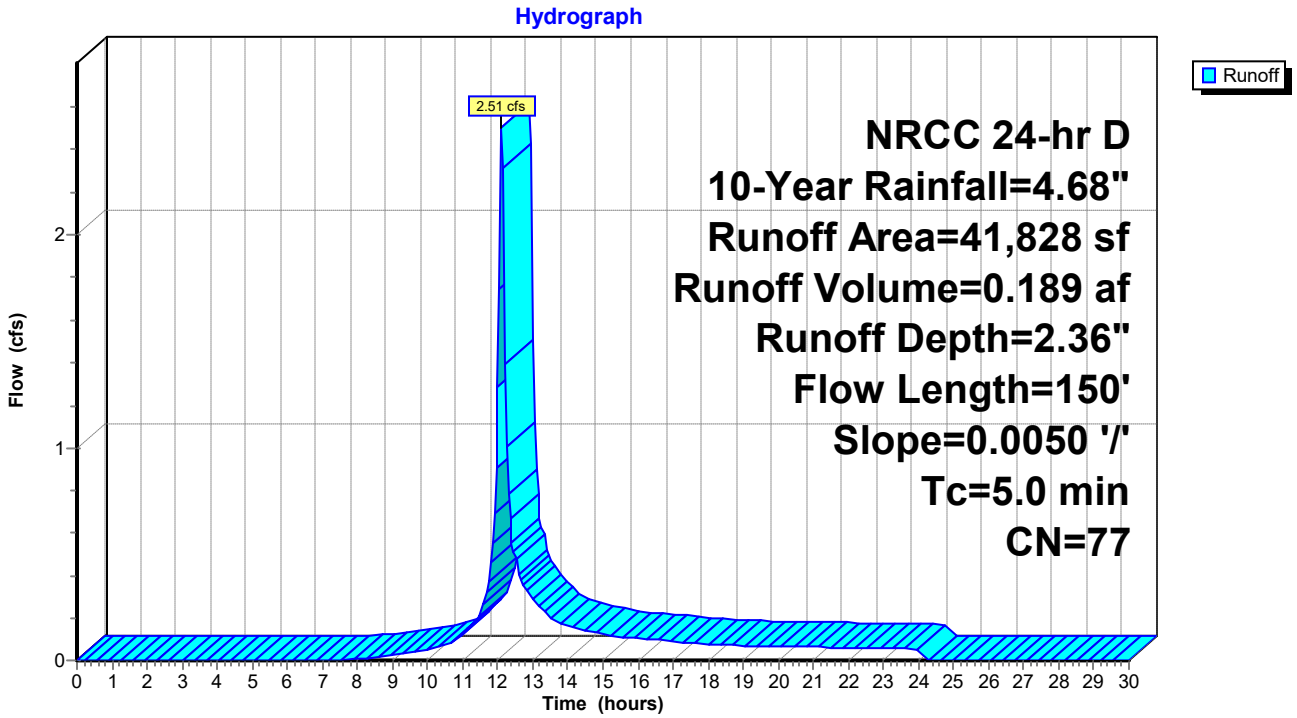
Runoff = 2.51 cfs @ 12.12 hrs, Volume= 0.189 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
5,248	39	>75% Grass cover, Good, HSG A
24,960	98	Paved parking, HSG A
11,620	48	Brush, Poor, HSG A
41,828	77	Weighted Average
16,868		40.33% Pervious Area
24,960		59.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.68		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	100	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO DP#4



Summary for Subcatchment E26: TO DCB-H

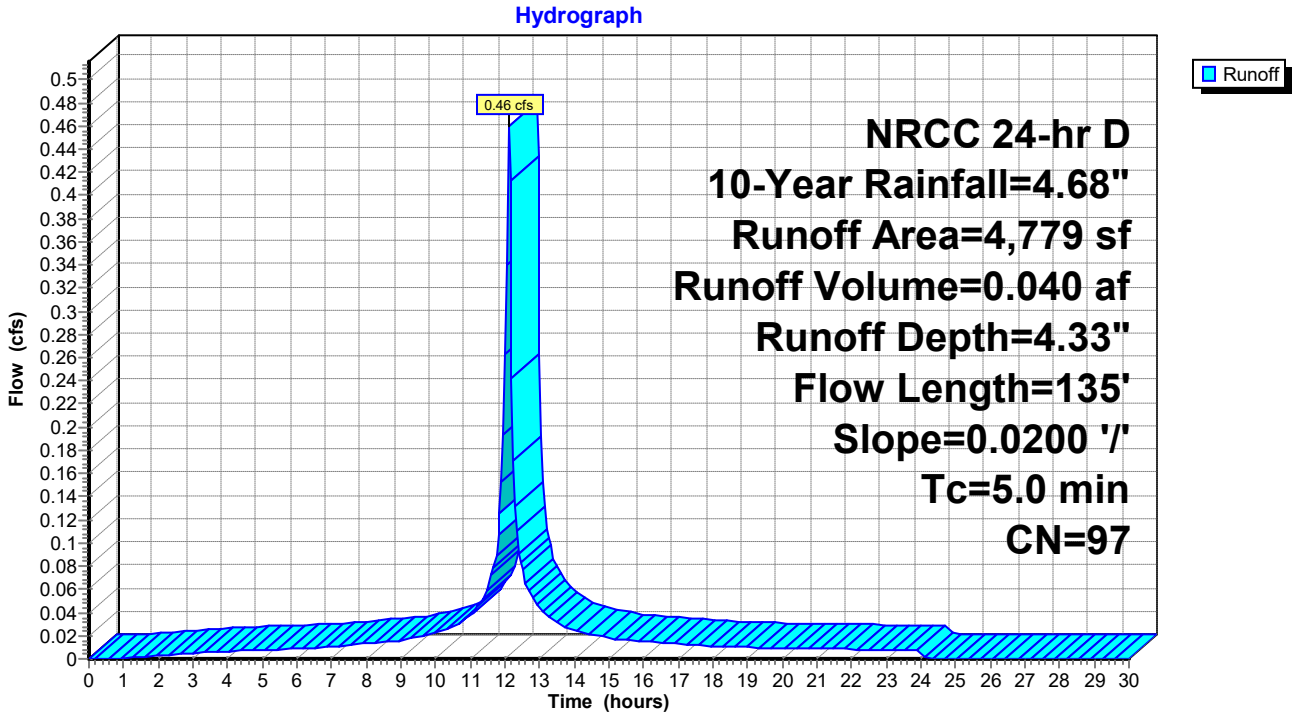
Runoff = 0.46 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,787	98	Paved parking, HSG A
2,992	96	Gravel surface, HSG A
4,779	97	Weighted Average
2,992		62.61% Pervious Area
1,787		37.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	85	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	135	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E26: TO DCB-H

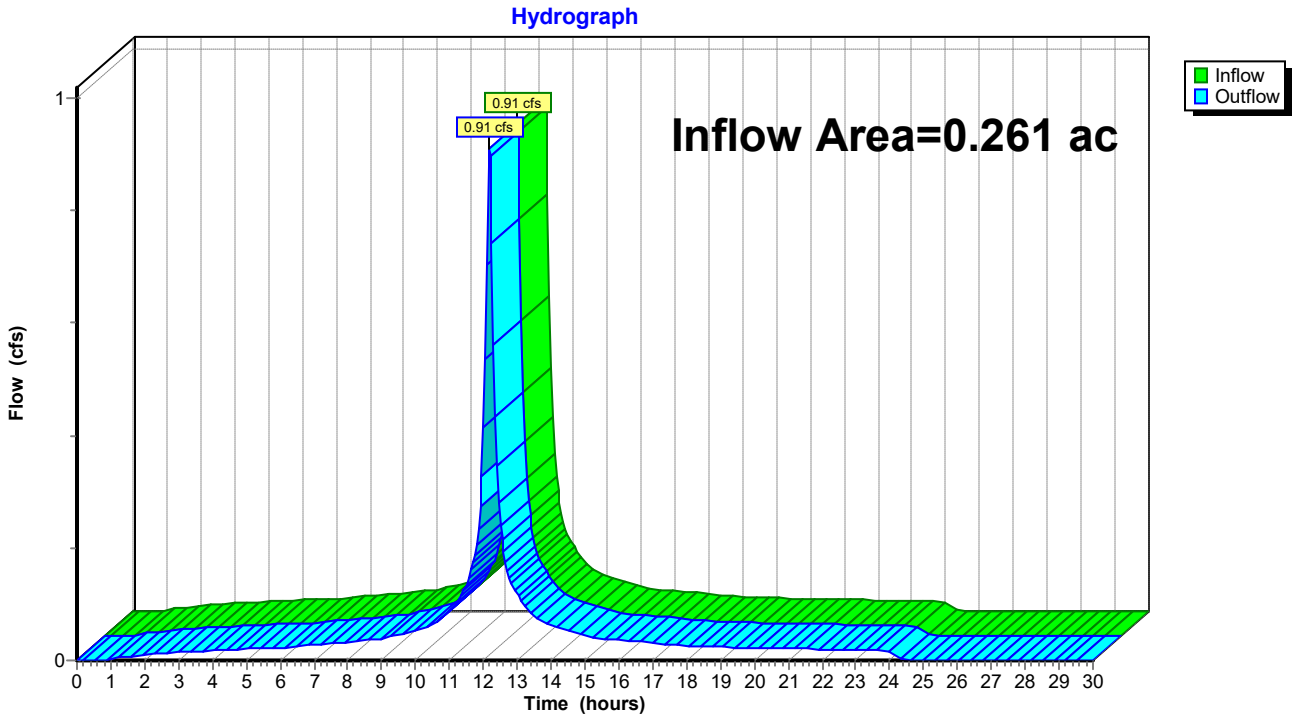


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.261 ac, 80.04% Impervious, Inflow Depth = 4.44" for 10-Year event
Inflow = 0.91 cfs @ 12.18 hrs, Volume= 0.097 af
Outflow = 0.91 cfs @ 12.18 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

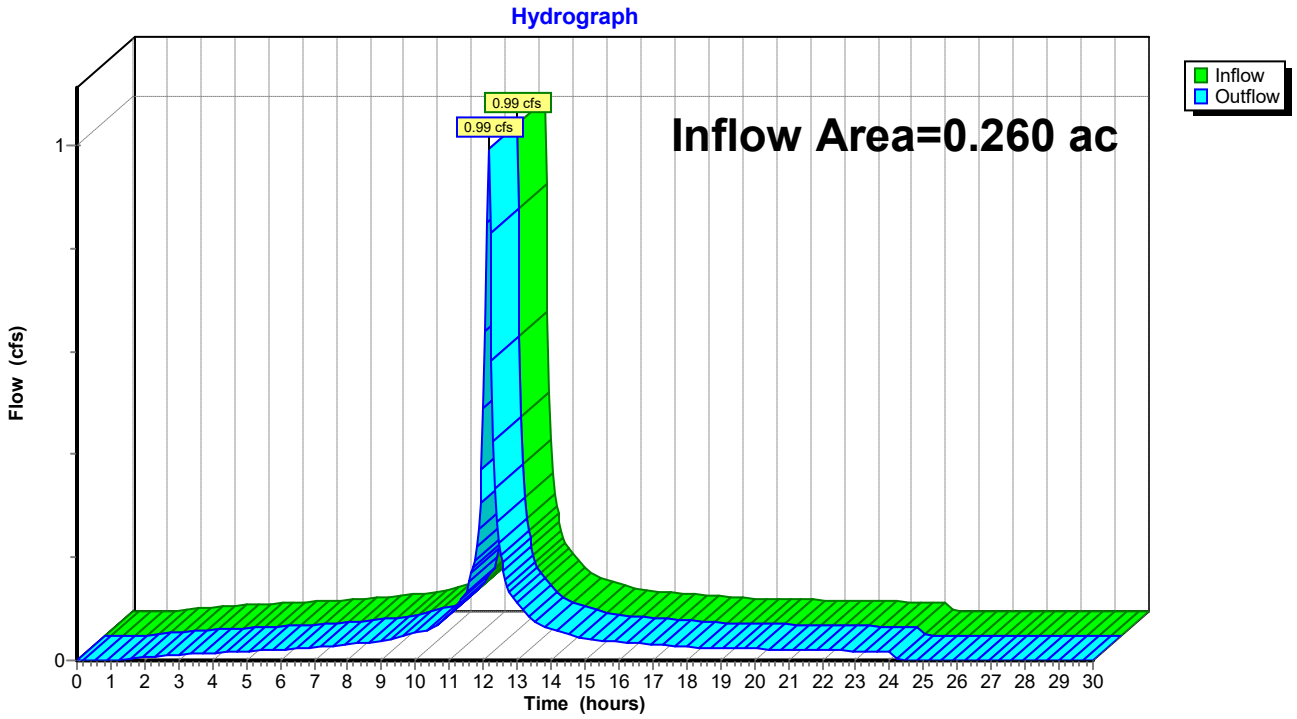


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.260 ac, 55.37% Impervious, Inflow Depth = 4.33" for 10-Year event
Inflow = 0.99 cfs @ 12.15 hrs, Volume= 0.094 af
Outflow = 0.99 cfs @ 12.15 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

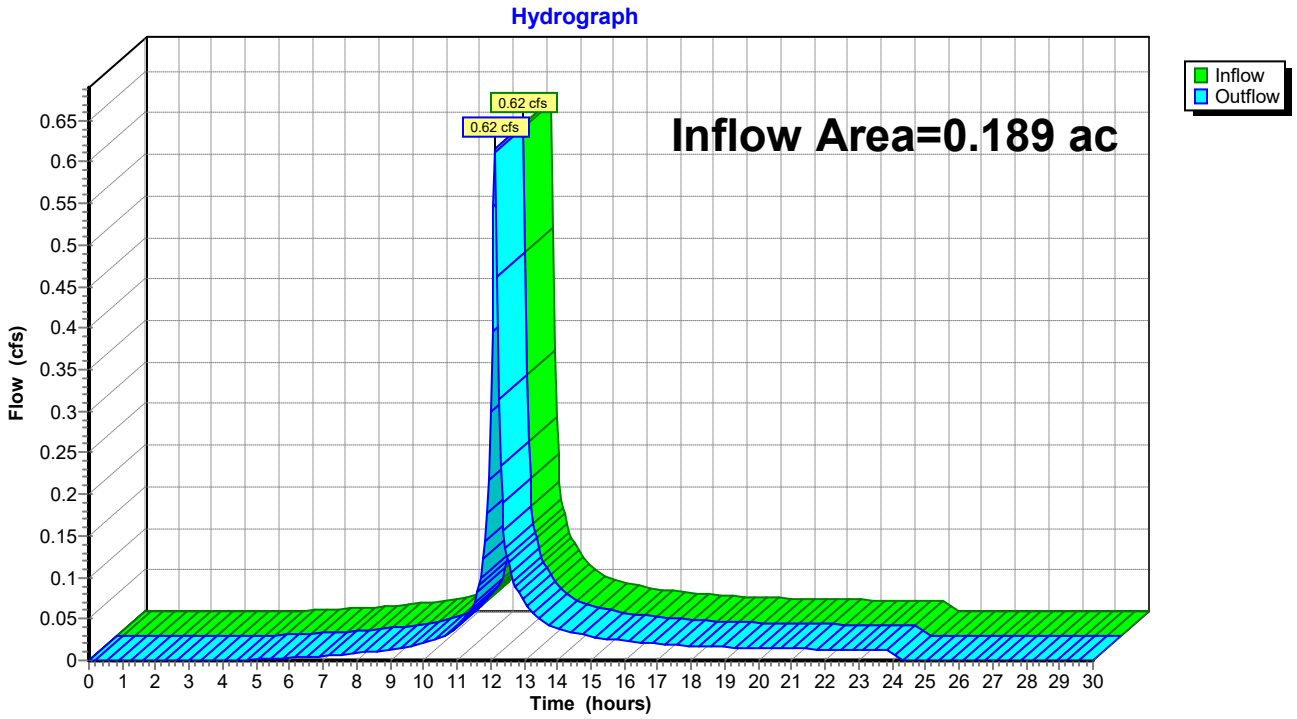


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.189 ac, 70.42% Impervious, Inflow Depth = 3.17" for 10-Year event
Inflow = 0.62 cfs @ 12.14 hrs, Volume= 0.050 af
Outflow = 0.62 cfs @ 12.14 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



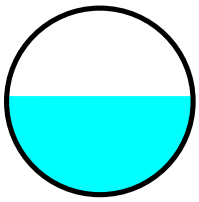
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 4.14" for 10-Year event
Inflow = 9.33 cfs @ 12.14 hrs, Volume= 0.816 af
Outflow = 9.33 cfs @ 12.14 hrs, Volume= 0.816 af, Atten= 0%, Lag= 0.0 min

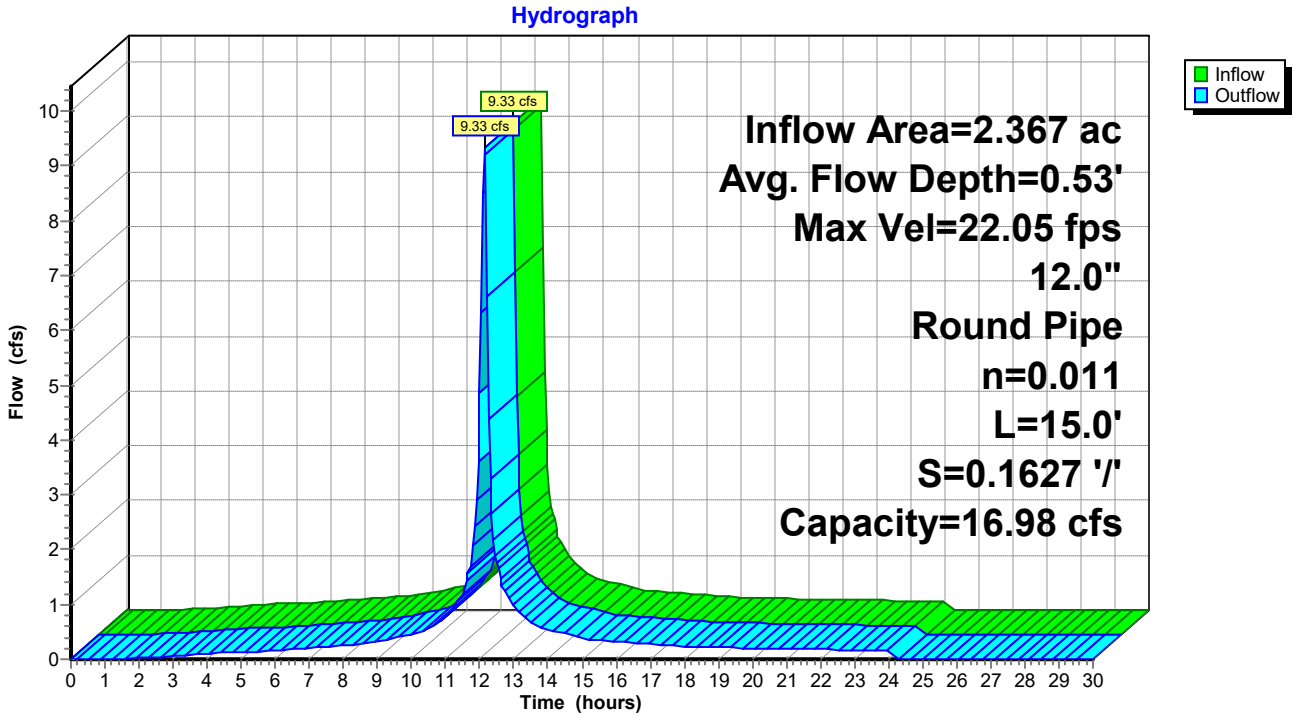
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 22.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 7.96 fps, Avg. Travel Time= 0.0 min

Peak Storage= 6 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.98 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.1627 '/'
Inlet Invert= 469.11', Outlet Invert= 466.67'



Reach DCB-D: TO DMH-A



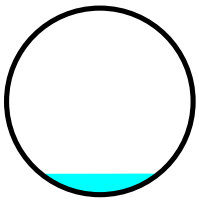
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.095 ac, 82.02% Impervious, Inflow Depth = 3.27" for 10-Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 0.026 af
Outflow = 0.33 cfs @ 12.11 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.1 min

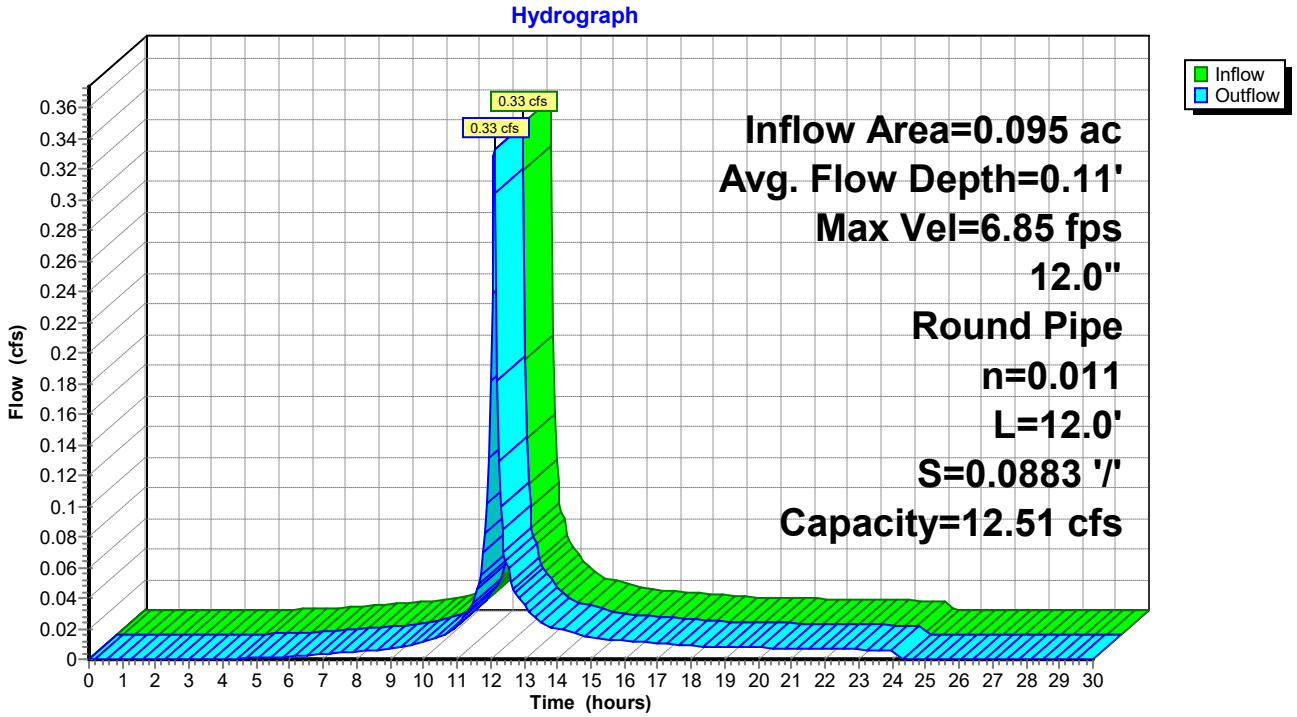
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.85 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A

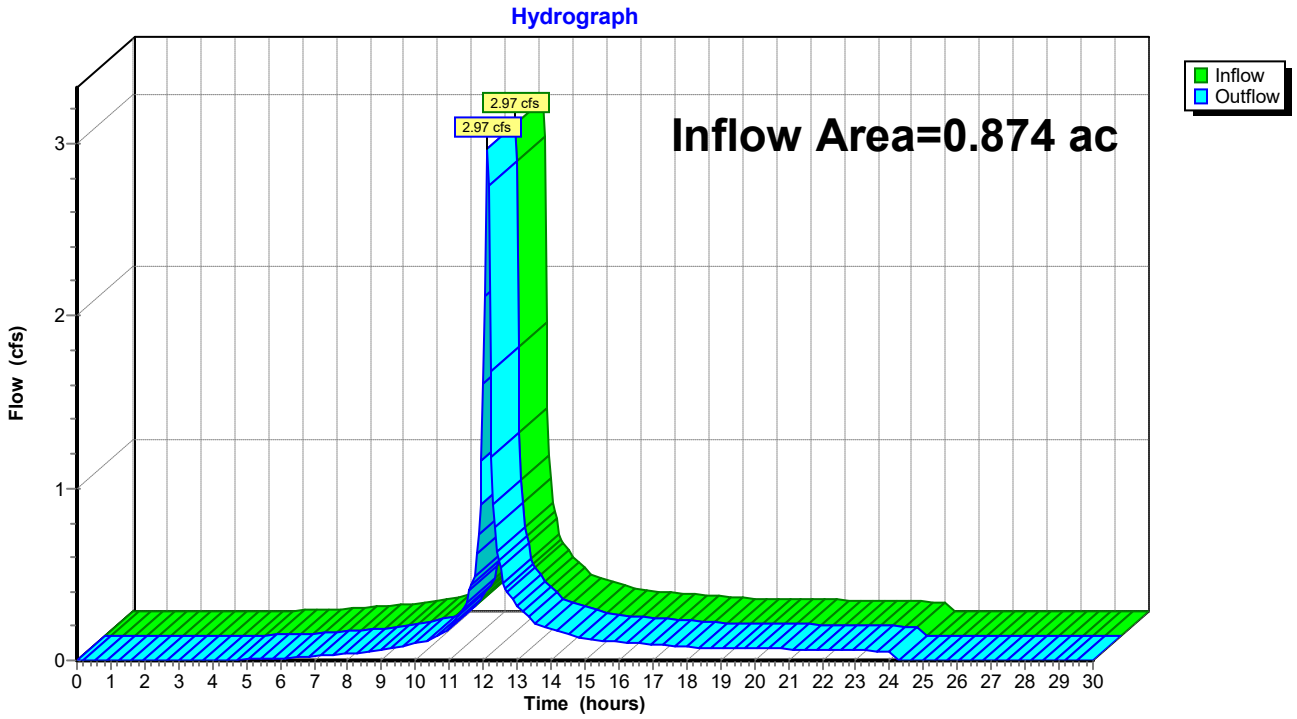


Summary for Reach DCB-F: (new Reach)

Inflow Area = 0.874 ac, 78.48% Impervious, Inflow Depth = 3.17" for 10-Year event
Inflow = 2.97 cfs @ 12.12 hrs, Volume= 0.231 af
Outflow = 2.97 cfs @ 12.12 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-F: (new Reach)

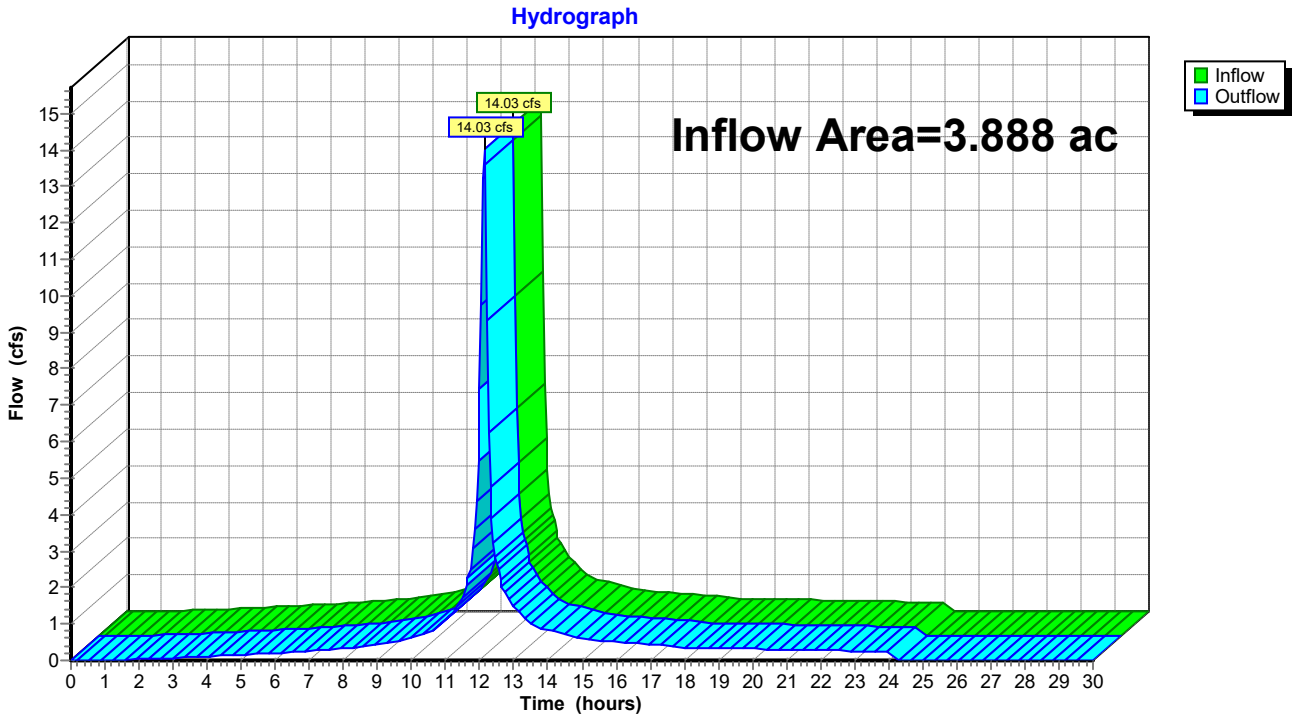


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 3.71" for 10-Year event
Inflow = 14.03 cfs @ 12.13 hrs, Volume= 1.202 af
Outflow = 14.03 cfs @ 12.13 hrs, Volume= 1.202 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

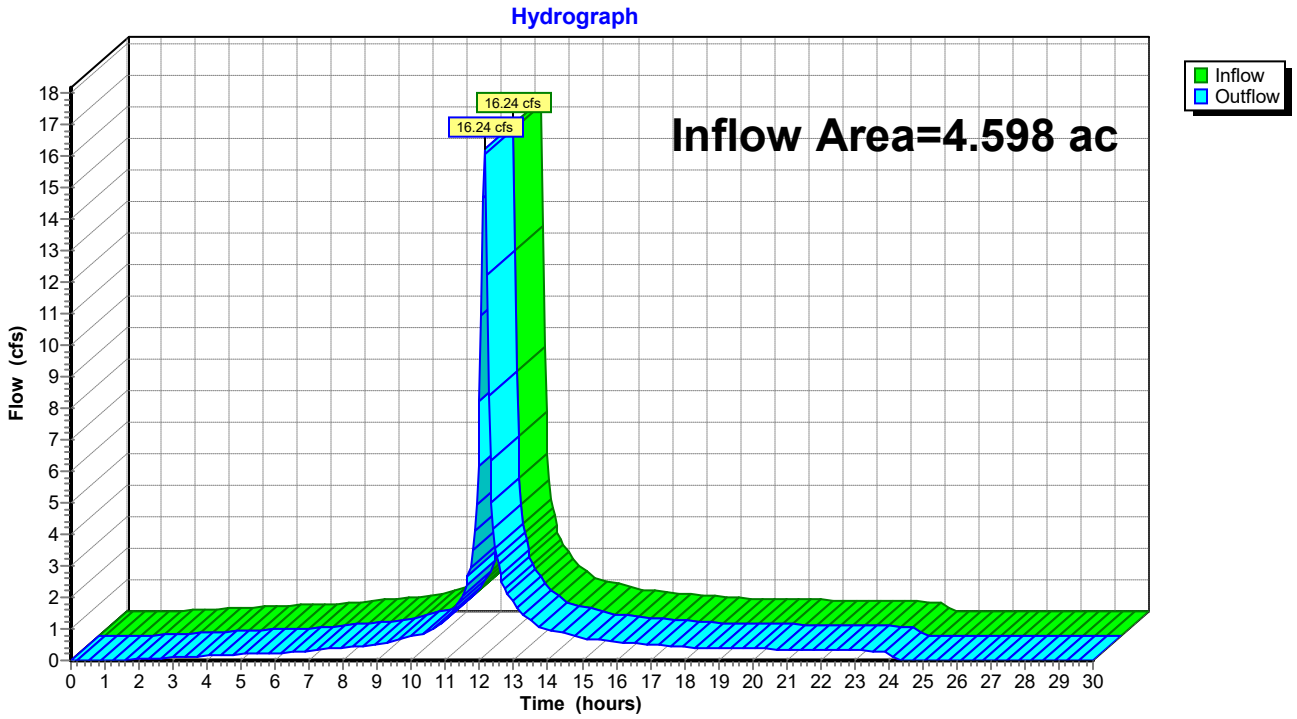


Summary for Reach DMH-C: TO DP#1

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 3.77" for 10-Year event
Inflow = 16.24 cfs @ 12.14 hrs, Volume= 1.443 af
Outflow = 16.24 cfs @ 12.14 hrs, Volume= 1.443 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



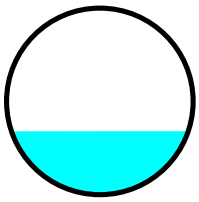
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 3.77" for 10-Year event
Inflow = 16.35 cfs @ 12.13 hrs, Volume= 1.443 af
Outflow = 16.24 cfs @ 12.14 hrs, Volume= 1.443 af, Atten= 1%, Lag= 0.3 min

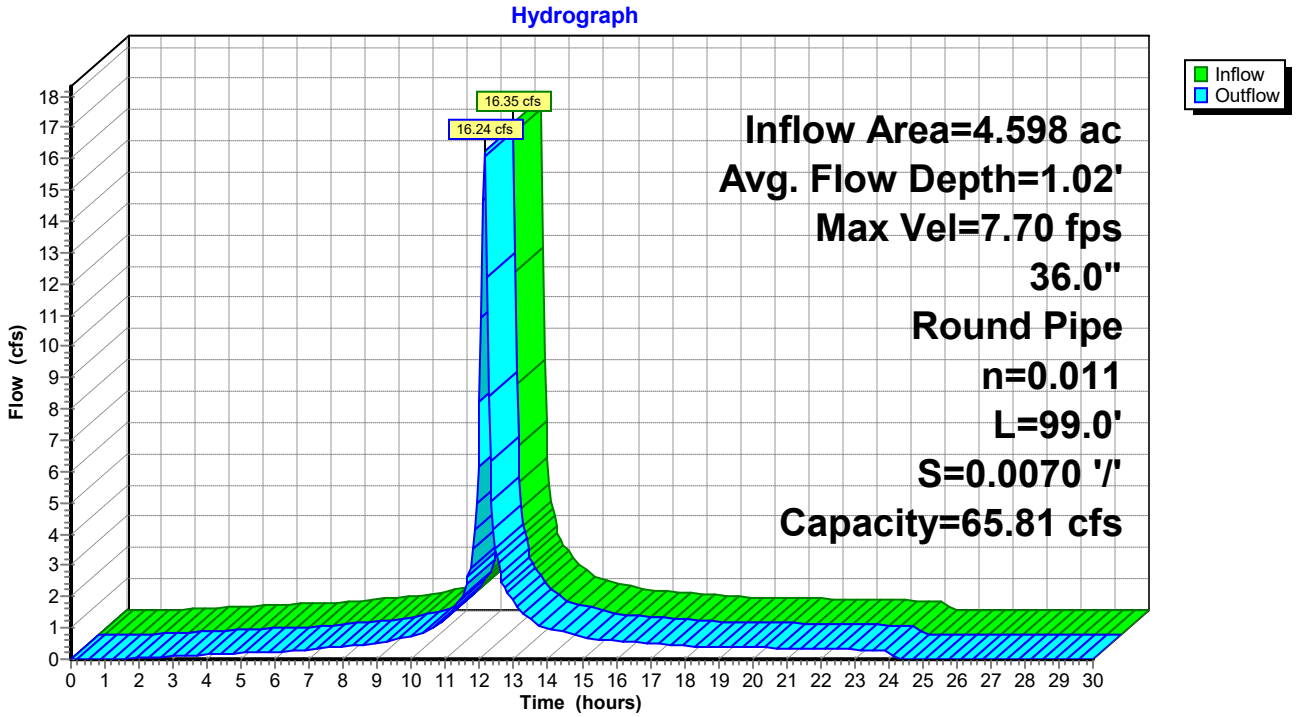
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.70 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.65 fps, Avg. Travel Time= 0.6 min

Peak Storage= 210 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



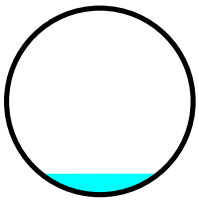
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.449 ac, 61.71% Impervious, Inflow Depth = 3.84" for 10-Year event
Inflow = 1.61 cfs @ 12.14 hrs, Volume= 0.144 af
Outflow = 1.55 cfs @ 12.16 hrs, Volume= 0.144 af, Atten= 3%, Lag= 0.8 min

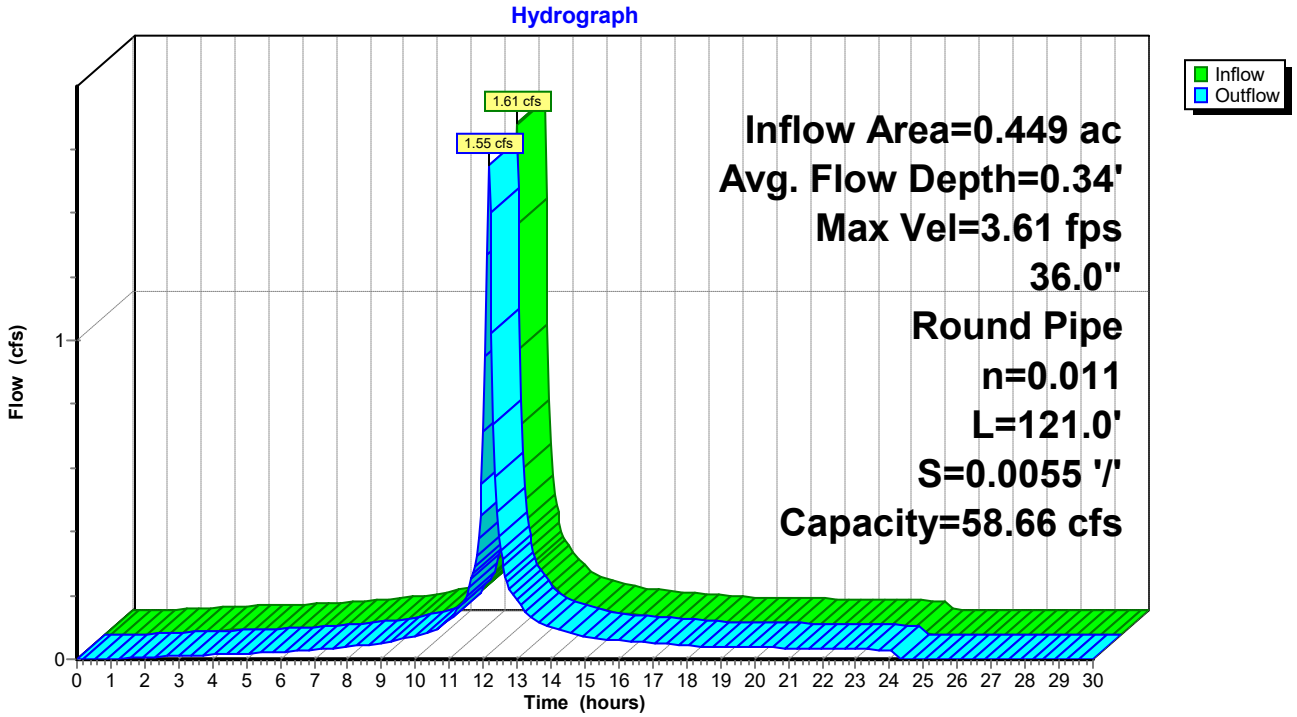
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.61 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 1.6 min

Peak Storage= 54 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.66 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 121.0' Slope= 0.0055 '/'
Inlet Invert= 456.57', Outlet Invert= 455.90'



Reach DMH-E: TO DMH-D



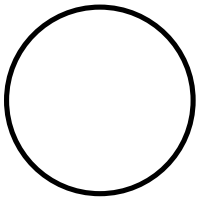
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

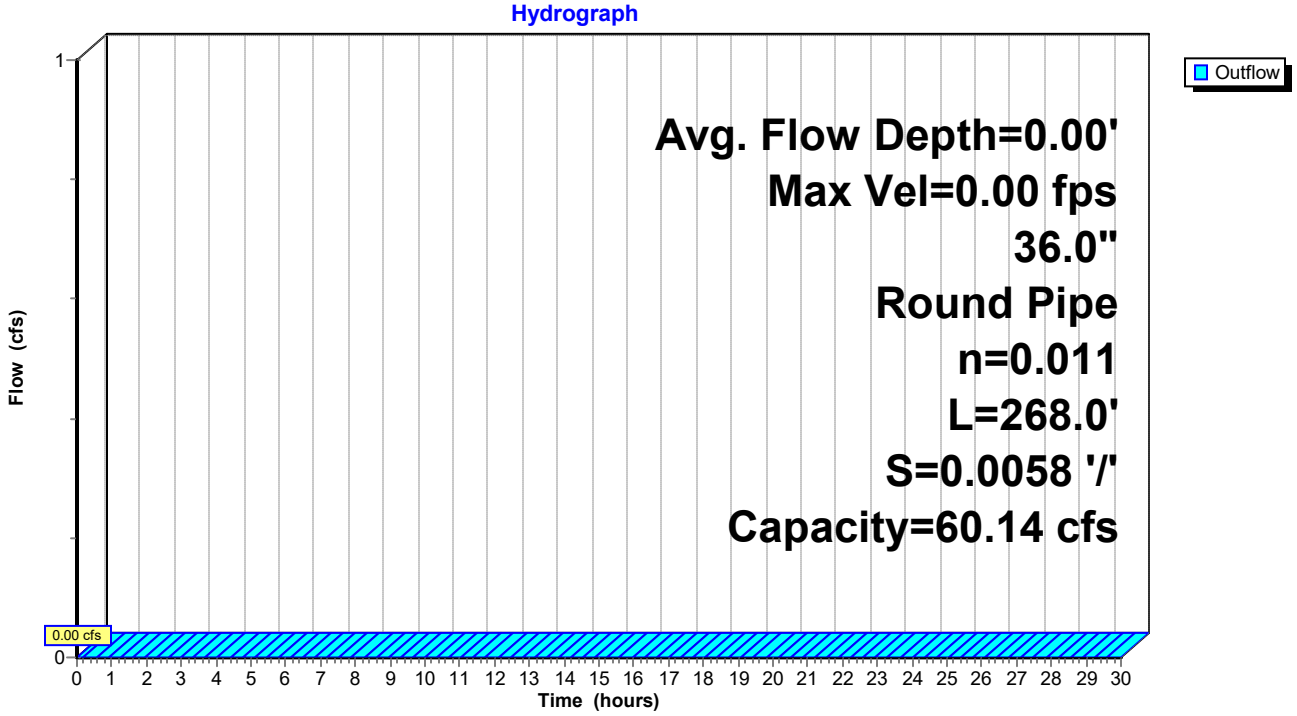
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E

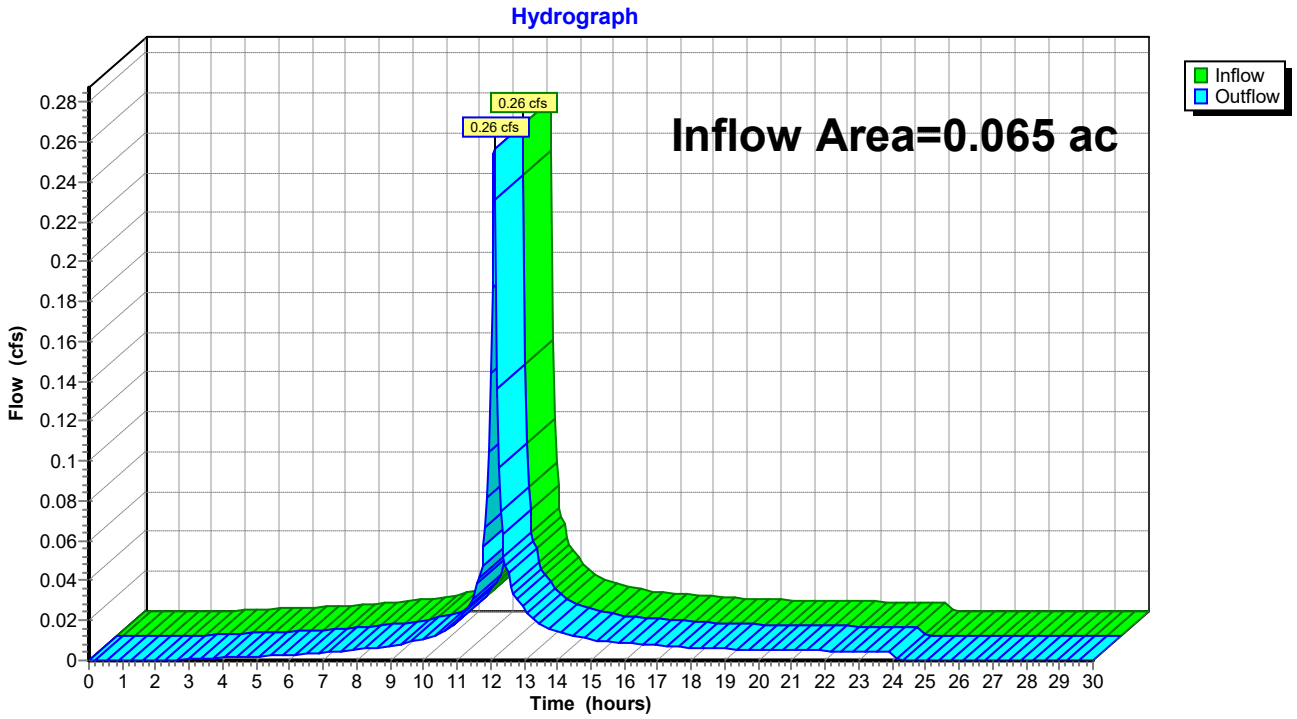


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af
Outflow = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

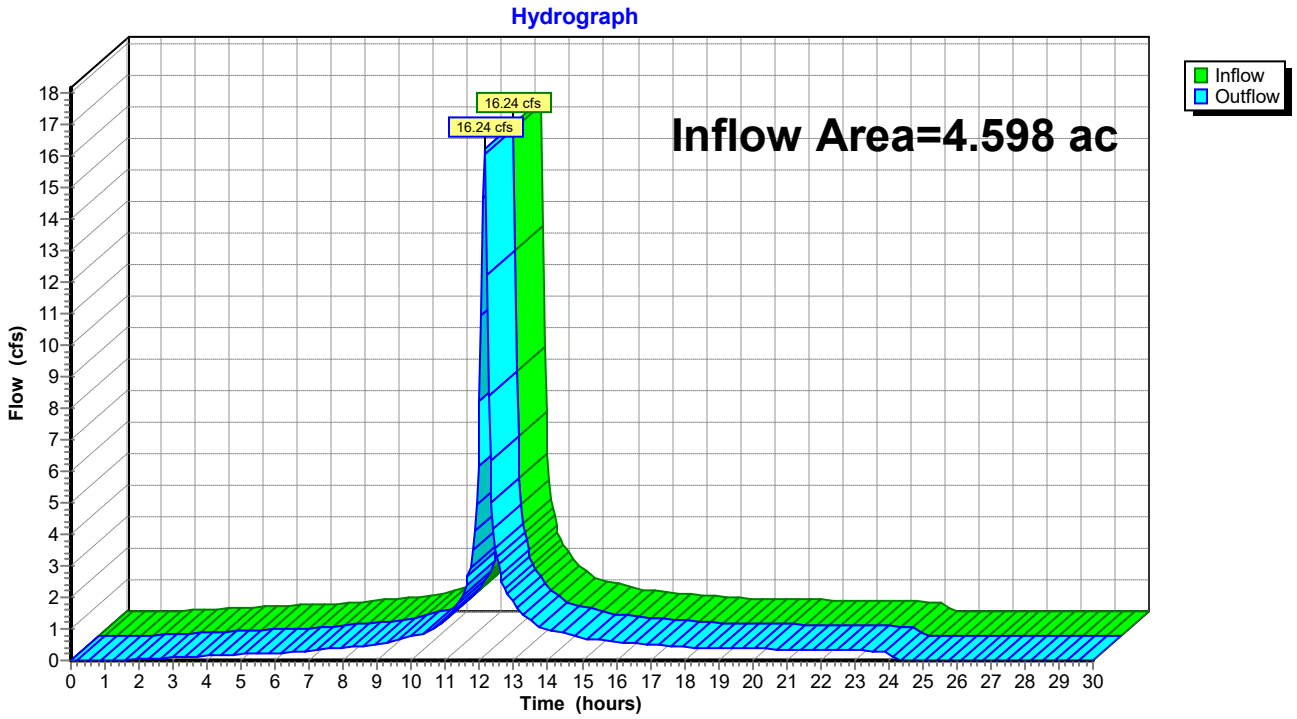


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 3.77" for 10-Year event
Inflow = 16.24 cfs @ 12.14 hrs, Volume= 1.443 af
Outflow = 16.24 cfs @ 12.14 hrs, Volume= 1.443 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

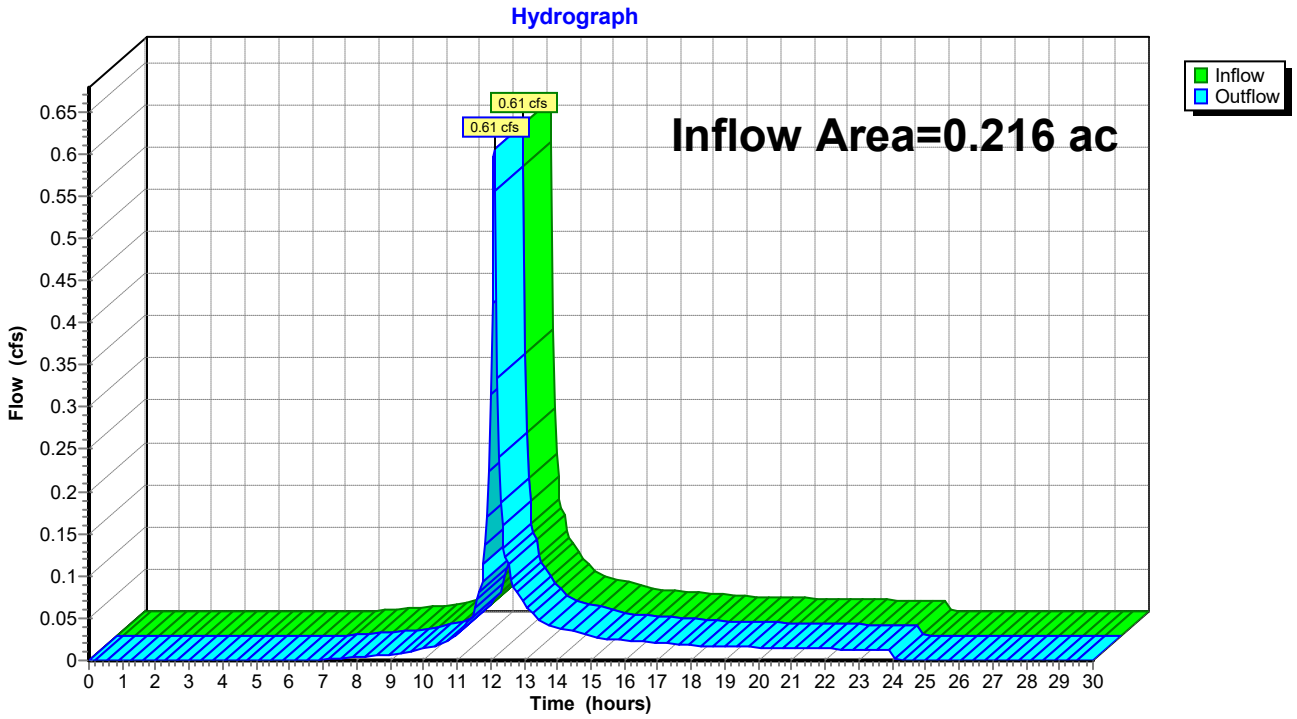


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.216 ac, 68.08% Impervious, Inflow Depth = 2.53" for 10-Year event
Inflow = 0.61 cfs @ 12.12 hrs, Volume= 0.046 af
Outflow = 0.61 cfs @ 12.12 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

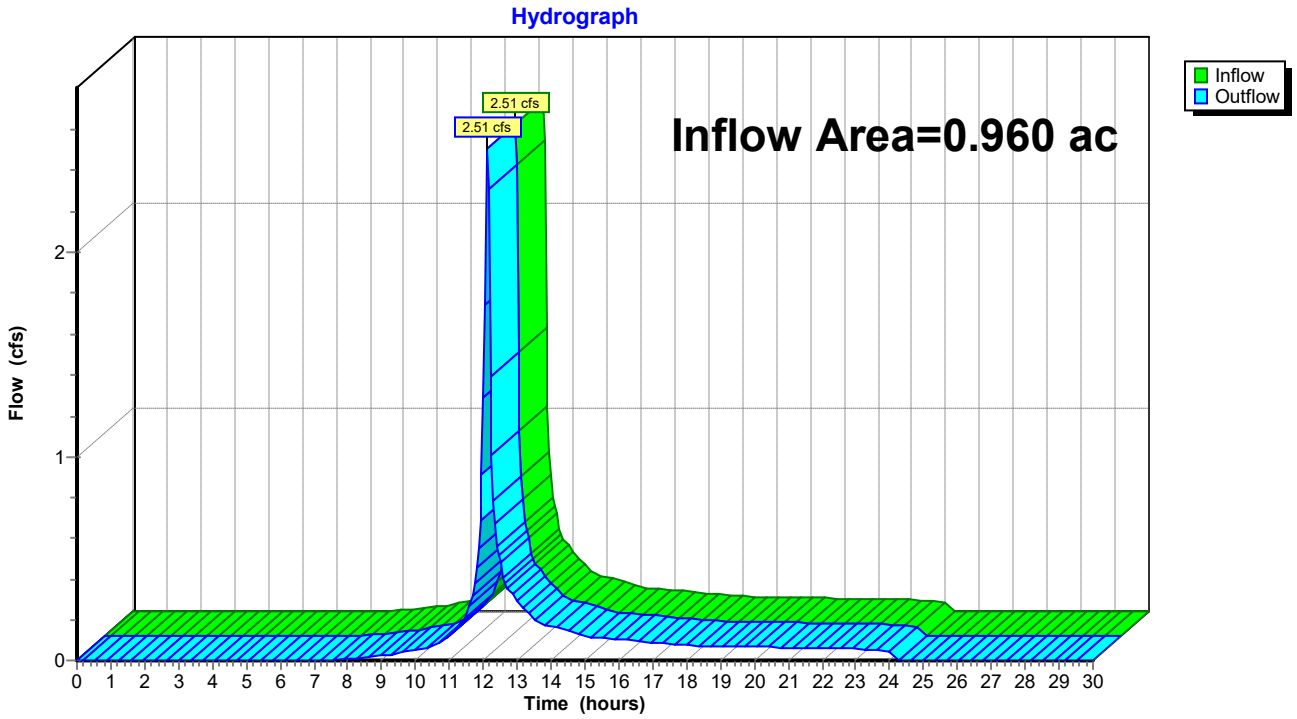


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.960 ac, 59.67% Impervious, Inflow Depth = 2.36" for 10-Year event
Inflow = 2.51 cfs @ 12.12 hrs, Volume= 0.189 af
Outflow = 2.51 cfs @ 12.12 hrs, Volume= 0.189 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

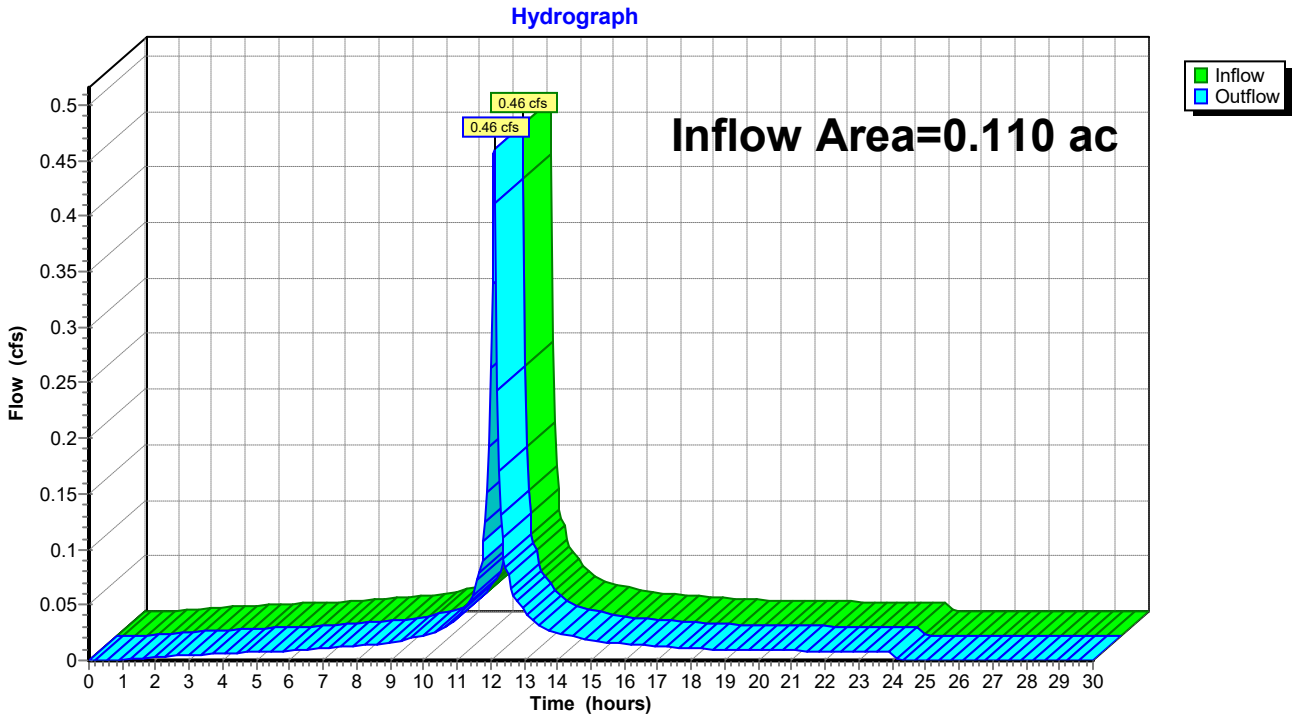


Summary for Reach DP5: DCB-H

Inflow Area = 0.110 ac, 37.39% Impervious, Inflow Depth = 4.33" for 10-Year event
Inflow = 0.46 cfs @ 12.11 hrs, Volume= 0.040 af
Outflow = 0.46 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H

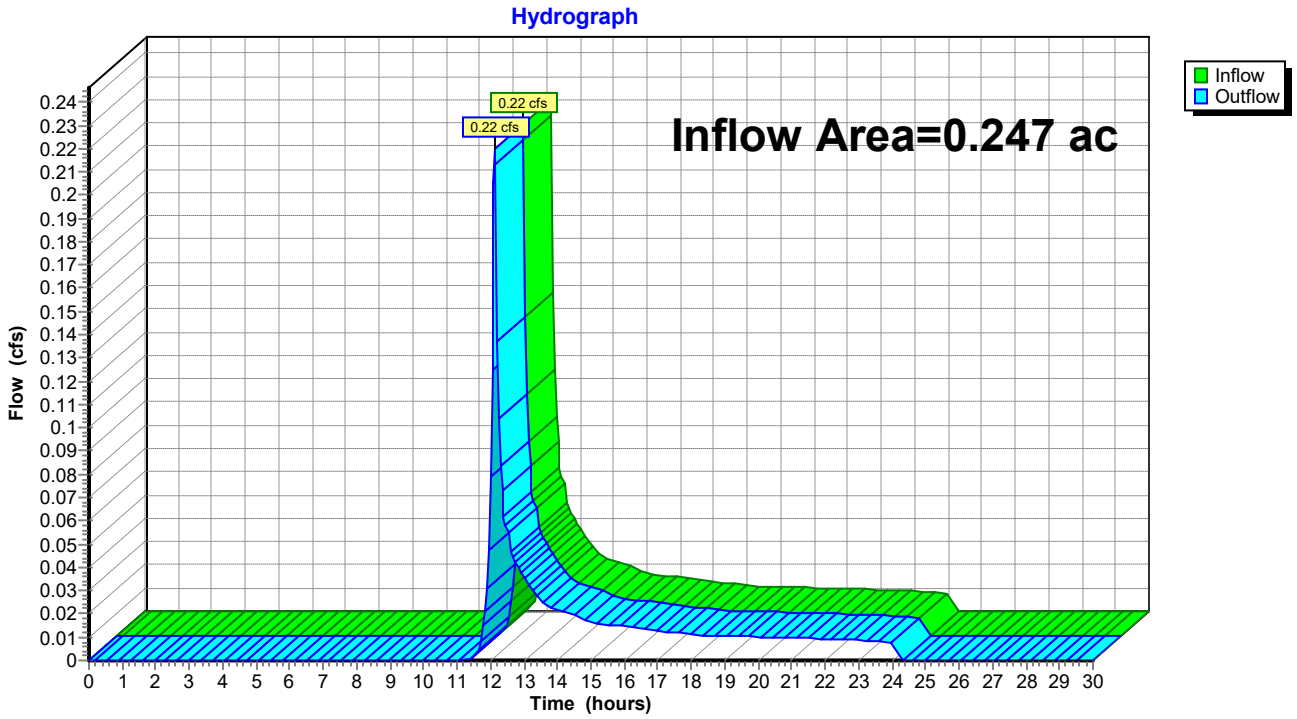


Summary for Reach EX DCB: EX DCB

Inflow Area = 0.247 ac, 29.99% Impervious, Inflow Depth = 0.94" for 10-Year event
Inflow = 0.22 cfs @ 12.13 hrs, Volume= 0.019 af
Outflow = 0.22 cfs @ 12.13 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach EX DCB: EX DCB

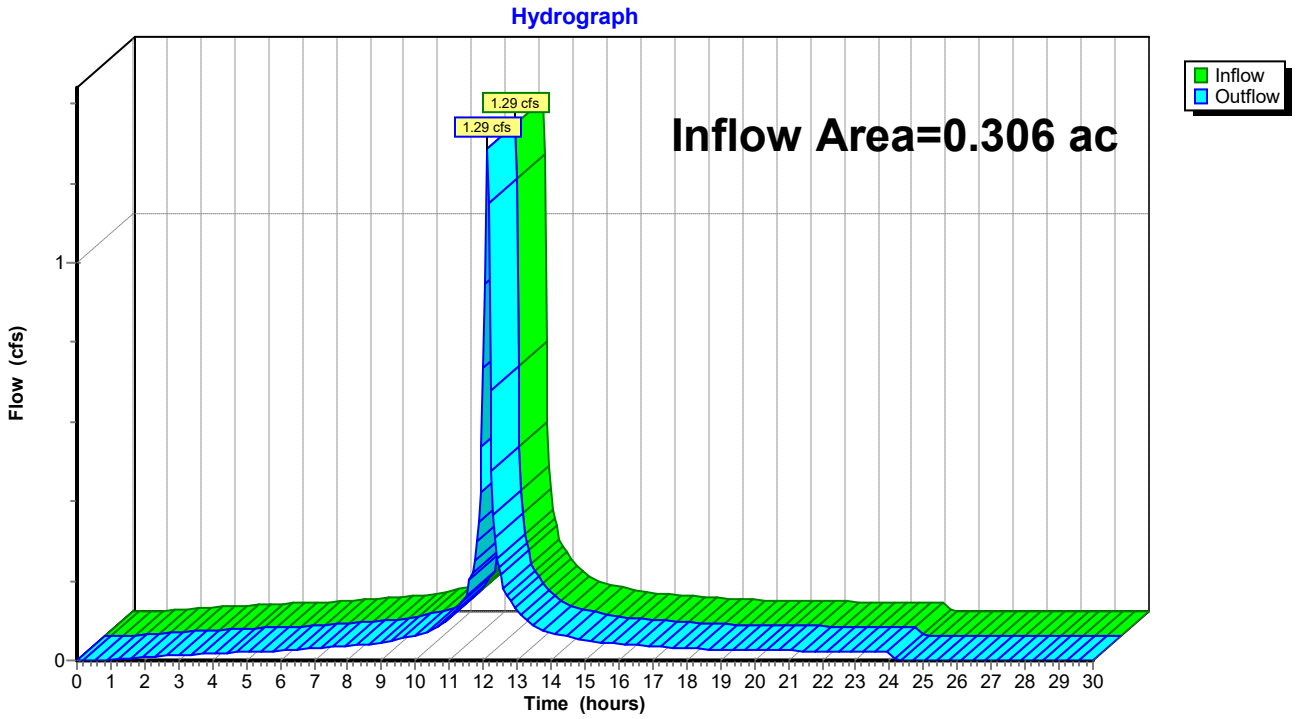


Summary for Reach YDA: (new Reach)

Inflow Area = 0.306 ac, 58.95% Impervious, Inflow Depth = 4.33" for 10-Year event
Inflow = 1.29 cfs @ 12.11 hrs, Volume= 0.110 af
Outflow = 1.29 cfs @ 12.11 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach YDA: (new Reach)



Summary for Pond DMH-B: TO DMH-D

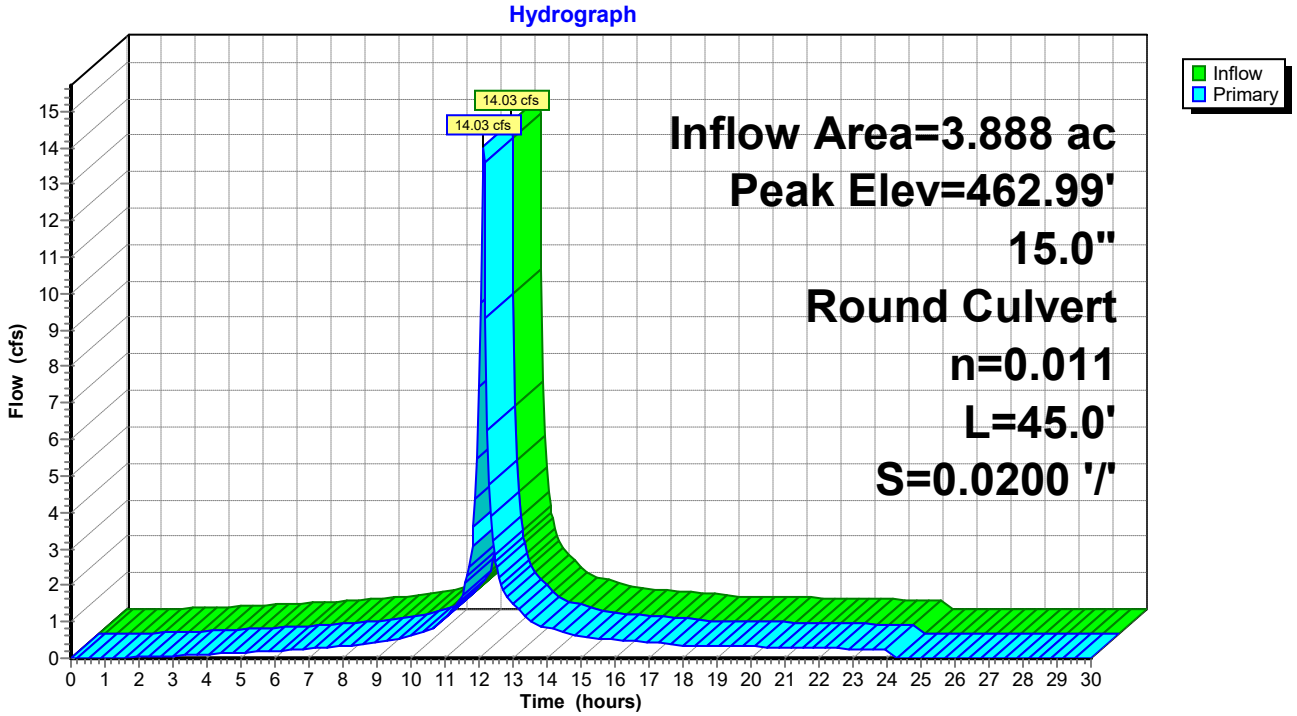
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 3.71" for 10-Year event
Inflow = 14.03 cfs @ 12.13 hrs, Volume= 1.202 af
Outflow = 14.03 cfs @ 12.13 hrs, Volume= 1.202 af, Atten= 0%, Lag= 0.0 min
Primary = 14.03 cfs @ 12.13 hrs, Volume= 1.202 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 462.99' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=13.45 cfs @ 12.13 hrs HW=462.61' (Free Discharge)
└**1=Culvert** (Inlet Controls 13.45 cfs @ 10.96 fps)

Pond DMH-B: TO DMH-D



Summary for Pond LP1: TO DCB-D

Inflow Area = 0.764 ac, 43.34% Impervious, Inflow Depth = 3.99" for 10-Year event
Inflow = 3.09 cfs @ 12.11 hrs, Volume= 0.254 af
Outflow = 3.04 cfs @ 12.13 hrs, Volume= 0.253 af, Atten= 2%, Lag= 1.1 min
Primary = 3.04 cfs @ 12.13 hrs, Volume= 0.253 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 473.98' @ 12.13 hrs Surf.Area= 1,580 sf Storage= 193 cf

Plug-Flow detention time= 6.5 min calculated for 0.253 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (786.7 - 782.9)

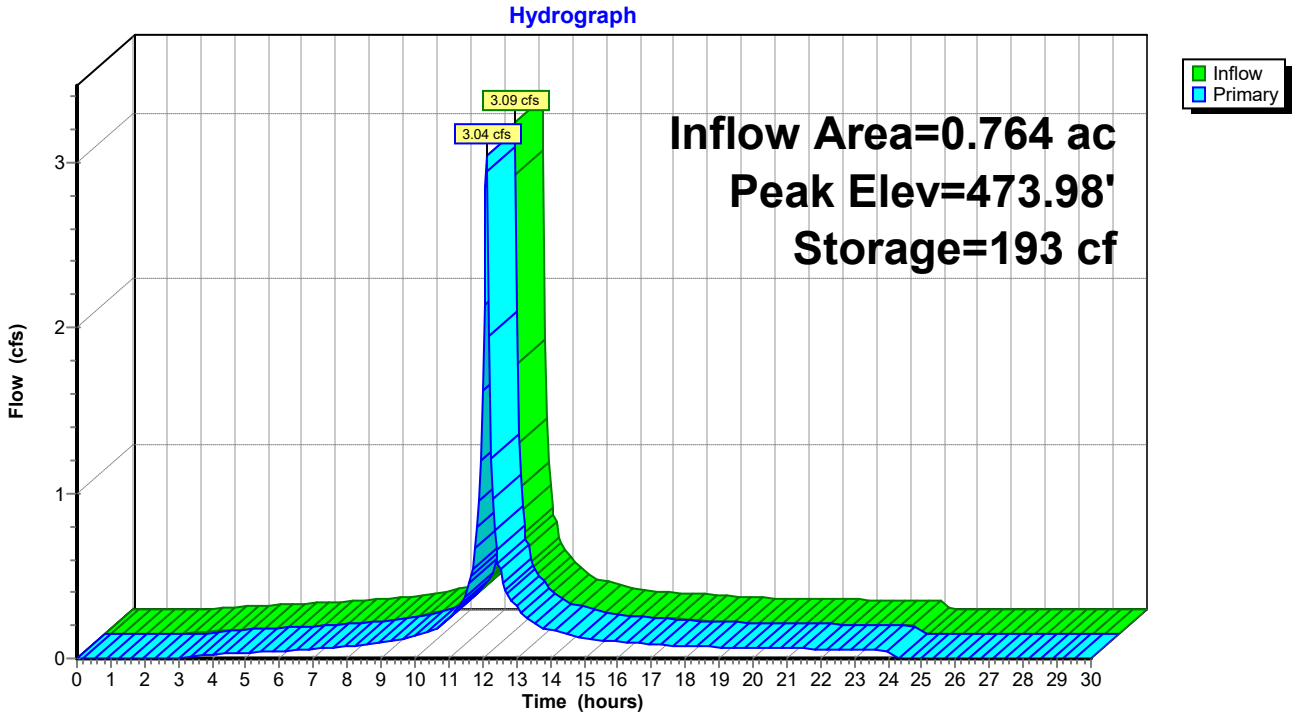
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
473.75	120	0	0
474.00	1,725	231	231

Device	Routing	Invert	Outlet Devices
#1	Primary	473.85'	**25.0' long x 25.0' 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=2.91 cfs @ 12.13 hrs HW=473.97' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.91 cfs @ 0.94 fps)

Pond LP1: TO DCB-D



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=4.95"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.33 cfs 0.027 af

Subcatchment E12: TO DCB-A Runoff Area=11,373 sf 80.04% Impervious Runoff Depth=5.64"
Flow Length=209' Tc=10.9 min CN=98 Runoff=1.14 cfs 0.123 af

Subcatchment E14: TO DCB-B Runoff Area=11,310 sf 55.37% Impervious Runoff Depth=5.52"
Flow Length=171' Tc=8.1 min CN=97 Runoff=1.26 cfs 0.120 af

Subcatchment E15: TO DCB-C Runoff Area=8,235 sf 70.42% Impervious Runoff Depth=4.30"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=86 Runoff=0.82 cfs 0.068 af

Subcatchment E16: TO LOW POINT Runoff Area=33,282 sf 43.34% Impervious Runoff Depth=5.18"
Flow Length=183' Tc=5.0 min CN=94 Runoff=3.95 cfs 0.330 af

Subcatchment E18: TO DCB-D Runoff Area=69,813 sf 94.39% Impervious Runoff Depth=5.41"
Flow Length=305' Tc=7.0 min CN=96 Runoff=7.98 cfs 0.722 af

Subcatchment E19: TO DCB-E Runoff Area=4,127 sf 82.02% Impervious Runoff Depth=4.40"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=87 Runoff=0.44 cfs 0.035 af

Subcatchment E20: TO DP#3 Runoff Area=9,426 sf 68.08% Impervious Runoff Depth=3.57"
Flow Length=137' Tc=5.0 min CN=79 Runoff=0.85 cfs 0.064 af

Subcatchment E21: TO EX DCB Runoff Area=10,744 sf 29.99% Impervious Runoff Depth=1.60"
Flow Length=77' Slope=0.0200 '/' Tc=5.0 min CN=57 Runoff=0.41 cfs 0.033 af

Subcatchment E22: TO YD-A Runoff Area=13,343 sf 58.95% Impervious Runoff Depth=5.52"
Flow Length=125' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=1.62 cfs 0.141 af

Subcatchment E23: TO DCB-F/G Runoff Area=38,054 sf 78.48% Impervious Runoff Depth=4.30"
Flow Length=287' Tc=5.2 min CN=86 Runoff=3.97 cfs 0.313 af

Subcatchment E24: TO DP#4 Runoff Area=41,828 sf 59.67% Impervious Runoff Depth=3.37"
Flow Length=150' Slope=0.0050 '/' Tc=5.0 min CN=77 Runoff=3.58 cfs 0.270 af

Subcatchment E26: TO DCB-H Runoff Area=4,779 sf 37.39% Impervious Runoff Depth=5.52"
Flow Length=135' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.58 cfs 0.051 af

Reach DCB-A: TO DMH-D Inflow=1.14 cfs 0.123 af
Outflow=1.14 cfs 0.123 af

Reach DCB-B: TO DMH-E Inflow=1.26 cfs 0.120 af
Outflow=1.26 cfs 0.120 af

Reach DCB-C: TO TRUNKLINE Inflow=0.82 cfs 0.068 af
Outflow=0.82 cfs 0.068 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.62' Max Vel=23.30 fps Inflow=11.85 cfs 1.051 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=11.84 cfs 1.051 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.13' Max Vel=7.46 fps Inflow=0.44 cfs 0.035 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.44 cfs 0.035 af

Reach DCB-F: (new Reach) Inflow=3.97 cfs 0.313 af
Outflow=3.97 cfs 0.313 af

Reach DMH-A: TO DMH-B Inflow=18.13 cfs 1.572 af
Outflow=18.13 cfs 1.572 af

Reach DMH-C: TO DP#1 Inflow=20.98 cfs 1.882 af
Outflow=20.98 cfs 1.882 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.17' Max Vel=8.26 fps Inflow=21.11 cfs 1.882 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=20.98 cfs 1.882 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.38' Max Vel=3.89 fps Inflow=2.07 cfs 0.187 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=2.01 cfs 0.187 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.33 cfs 0.027 af
Outflow=0.33 cfs 0.027 af

Reach DP2: MUNICIPAL SYSTEM Inflow=20.98 cfs 1.882 af
Outflow=20.98 cfs 1.882 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.85 cfs 0.064 af
Outflow=0.85 cfs 0.064 af

Reach DP4: LOW POINT OFF LOCUS Inflow=3.58 cfs 0.270 af
Outflow=3.58 cfs 0.270 af

Reach DP5: DCB-H Inflow=0.58 cfs 0.051 af
Outflow=0.58 cfs 0.051 af

Reach EX DCB: EX DCB Inflow=0.41 cfs 0.033 af
Outflow=0.41 cfs 0.033 af

Reach YDA: (new Reach) Inflow=1.62 cfs 0.141 af
Outflow=1.62 cfs 0.141 af

Pond DMH-B: TO DMH-D Peak Elev=466.72' Inflow=18.13 cfs 1.572 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=18.13 cfs 1.572 af

Pond LP1: TO DCB-D Peak Elev=474.00' Storage=230 cf Inflow=3.95 cfs 0.330 af
Outflow=3.88 cfs 0.329 af

Total Runoff Area = 5.950 ac Runoff Volume = 2.295 af Average Runoff Depth = 4.63"
29.95% Pervious = 1.782 ac 70.05% Impervious = 4.168 ac

Summary for Subcatchment E11: TO DP#1

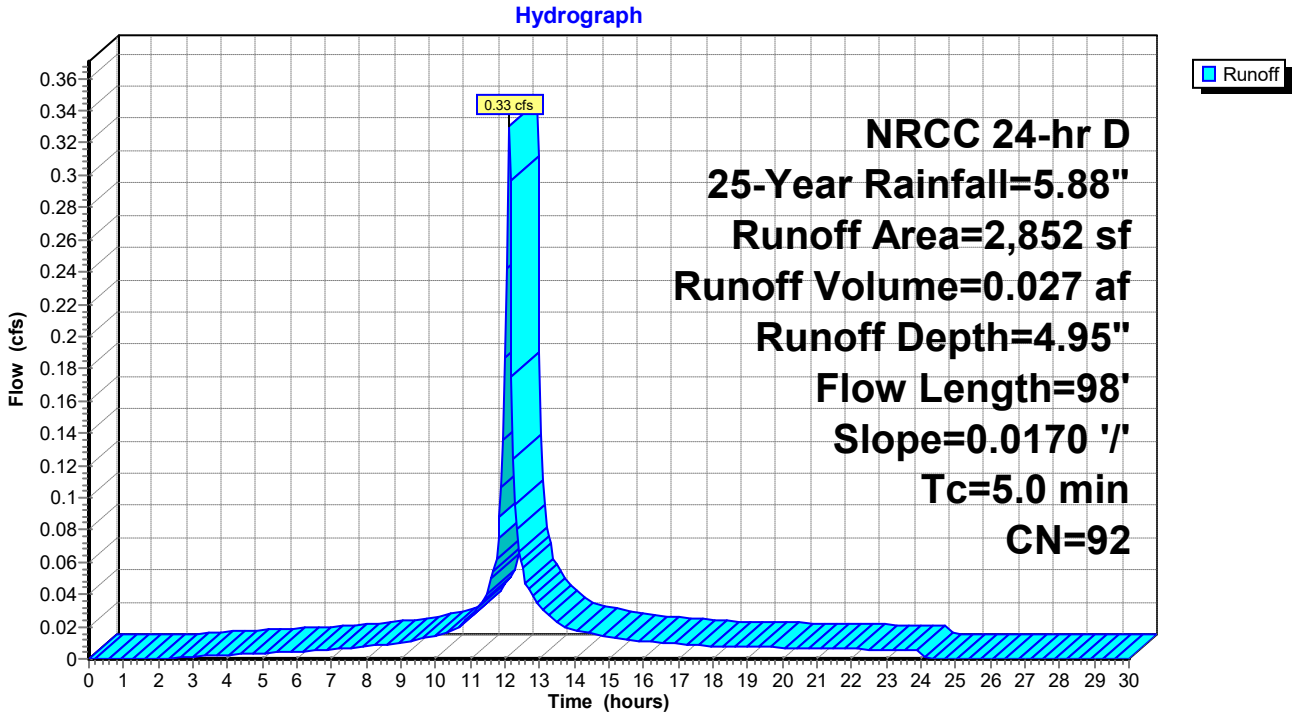
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E11: TO DP#1



Summary for Subcatchment E12: TO DCB-A

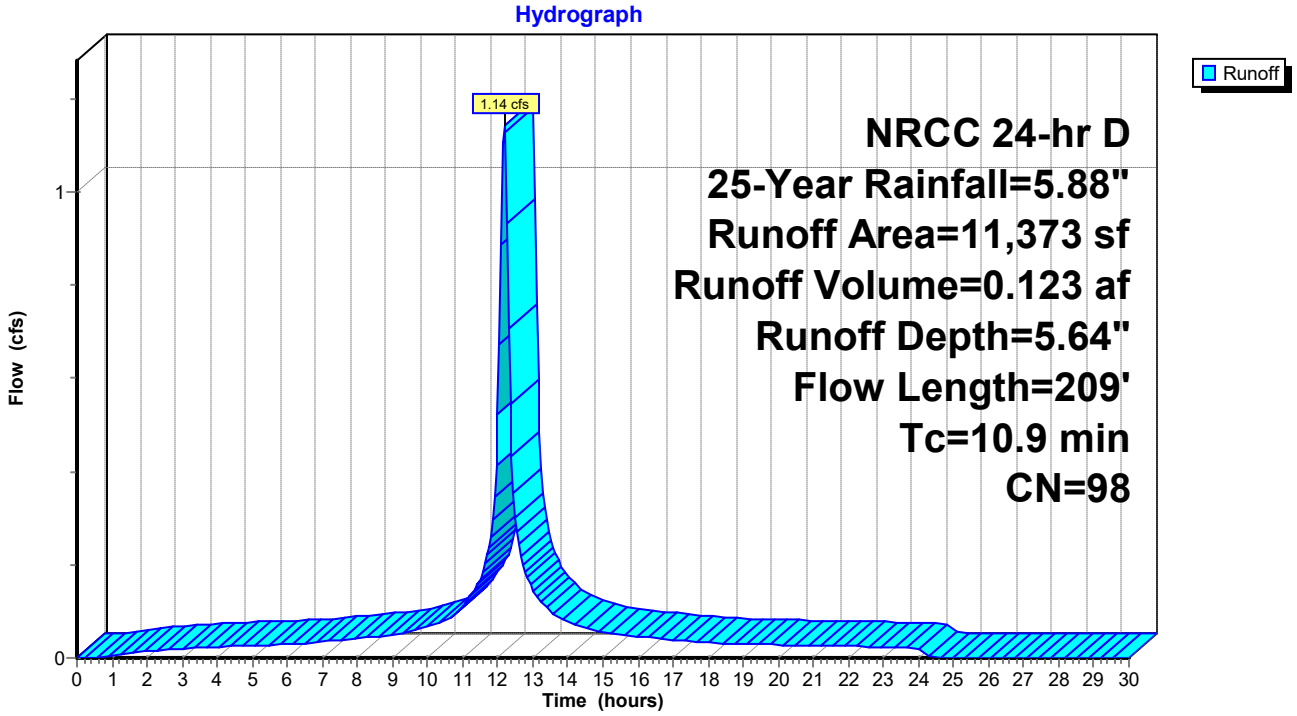
Runoff = 1.14 cfs @ 12.18 hrs, Volume= 0.123 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
9,103	98	Paved parking, HSG A
2,270	96	Gravel surface, HSG A
11,373	98	Weighted Average
2,270		19.96% Pervious Area
9,103		80.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	75	0.0120	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	9	0.0120	1.76		**Shallow Concentrated Flow, GRASS** Unpaved Kv= 16.1 fps
1.1	125	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.9	209	Total			

Subcatchment E12: TO DCB-A



Summary for Subcatchment E14: TO DCB-B

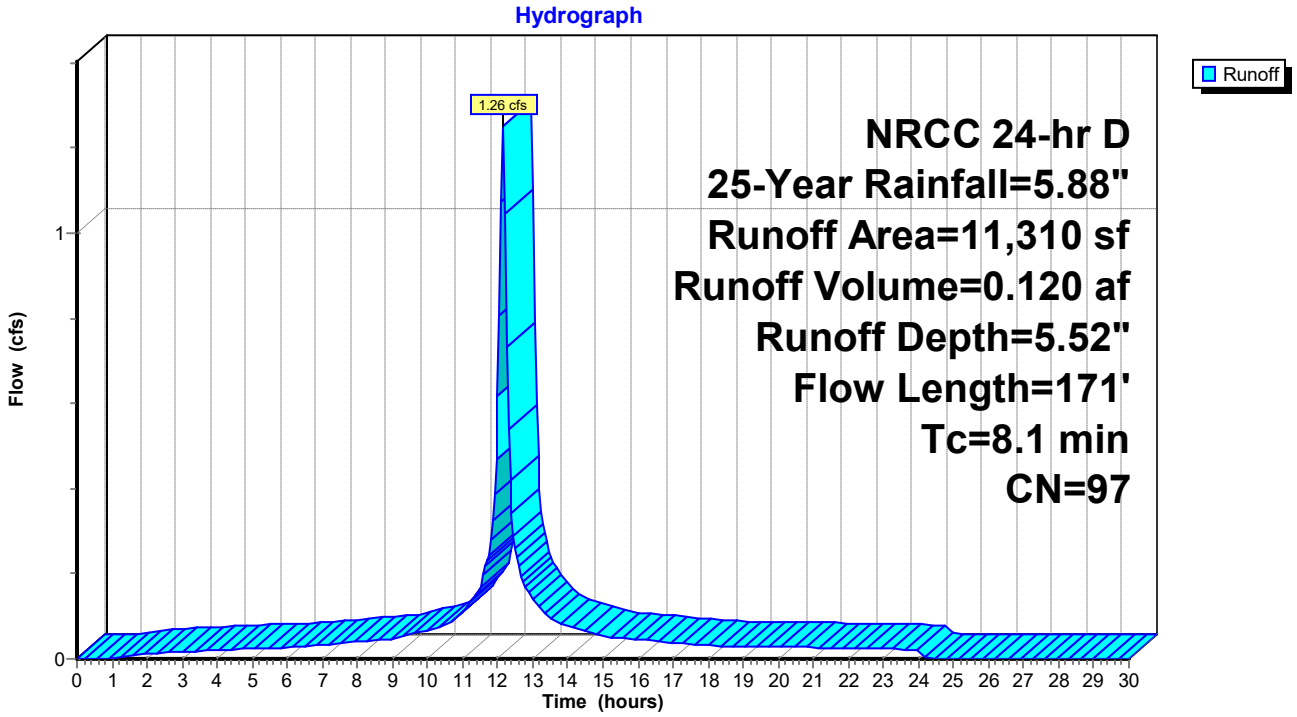
Runoff = 1.26 cfs @ 12.15 hrs, Volume= 0.120 af, Depth= 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
6,262	98	Paved parking, HSG A
5,048	96	Gravel surface, HSG A
11,310	97	Weighted Average
5,048		44.63% Pervious Area
6,262		55.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.1	121	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	171	Total			

Subcatchment E14: TO DCB-B



Summary for Subcatchment E15: TO DCB-C

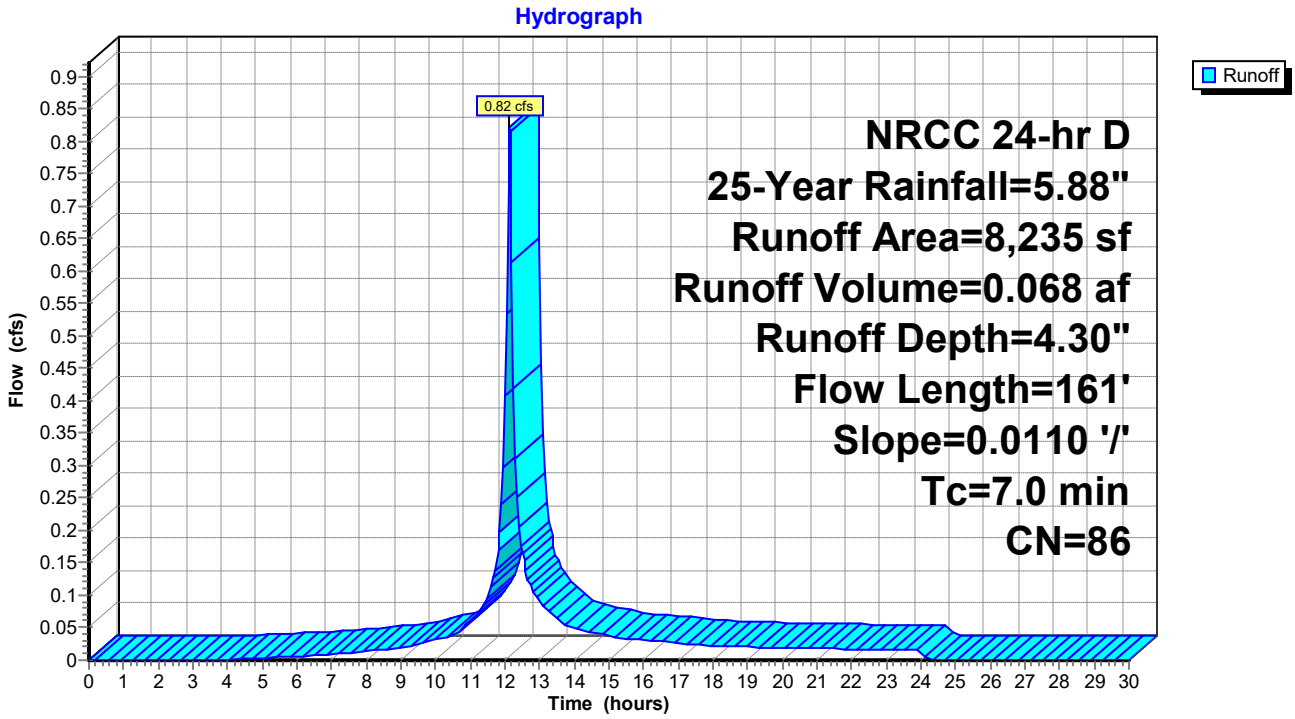
Runoff = 0.82 cfs @ 12.14 hrs, Volume= 0.068 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,643	39	>75% Grass cover, Good, HSG A
5,799	98	Paved parking, HSG A
793	96	Gravel surface, HSG A
8,235	86	Weighted Average
2,436		29.58% Pervious Area
5,799		70.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment E15: TO DCB-C



Summary for Subcatchment E16: TO LOW POINT

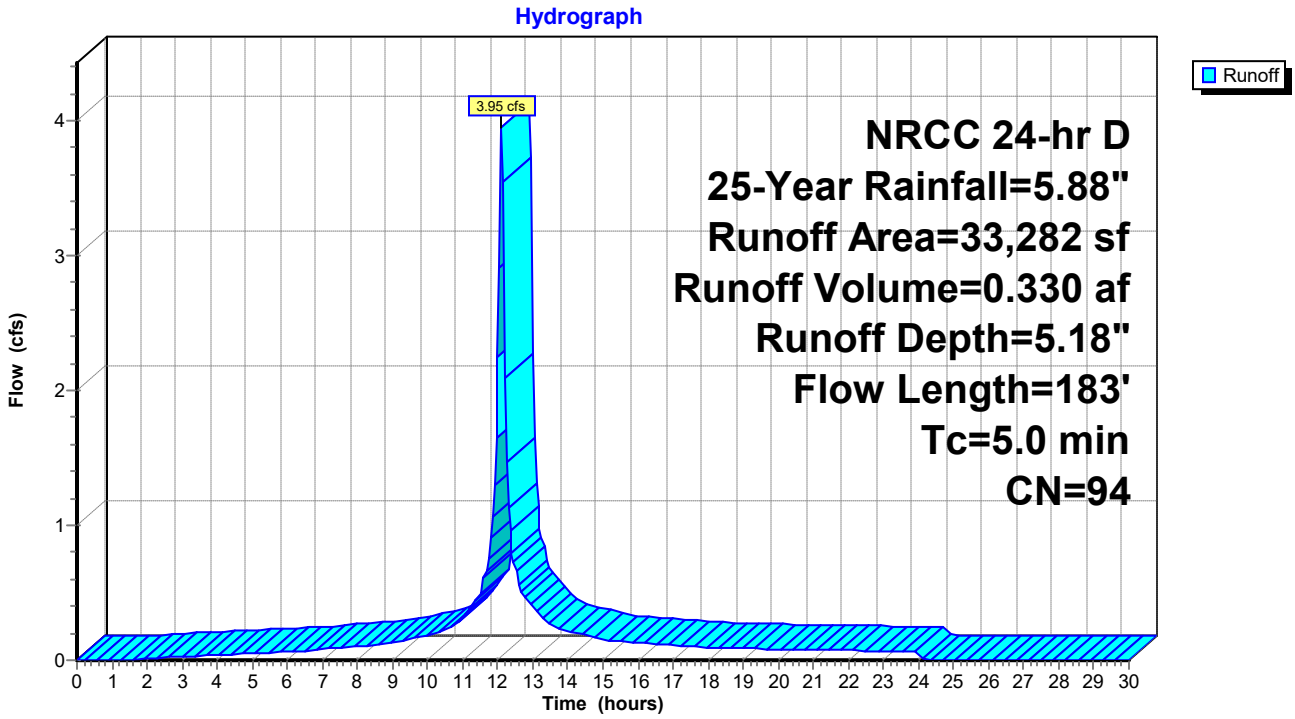
Runoff = 3.95 cfs @ 12.11 hrs, Volume= 0.330 af, Depth= 5.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,882	39	>75% Grass cover, Good, HSG A
14,426	98	Paved parking, HSG A
16,974	96	Gravel surface, HSG A
33,282	94	Weighted Average
18,856		56.66% Pervious Area
14,426		43.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.9	29	0.0040	0.56		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
2.2	133	0.0040	1.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	183	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E16: TO LOW POINT



Summary for Subcatchment E18: TO DCB-D

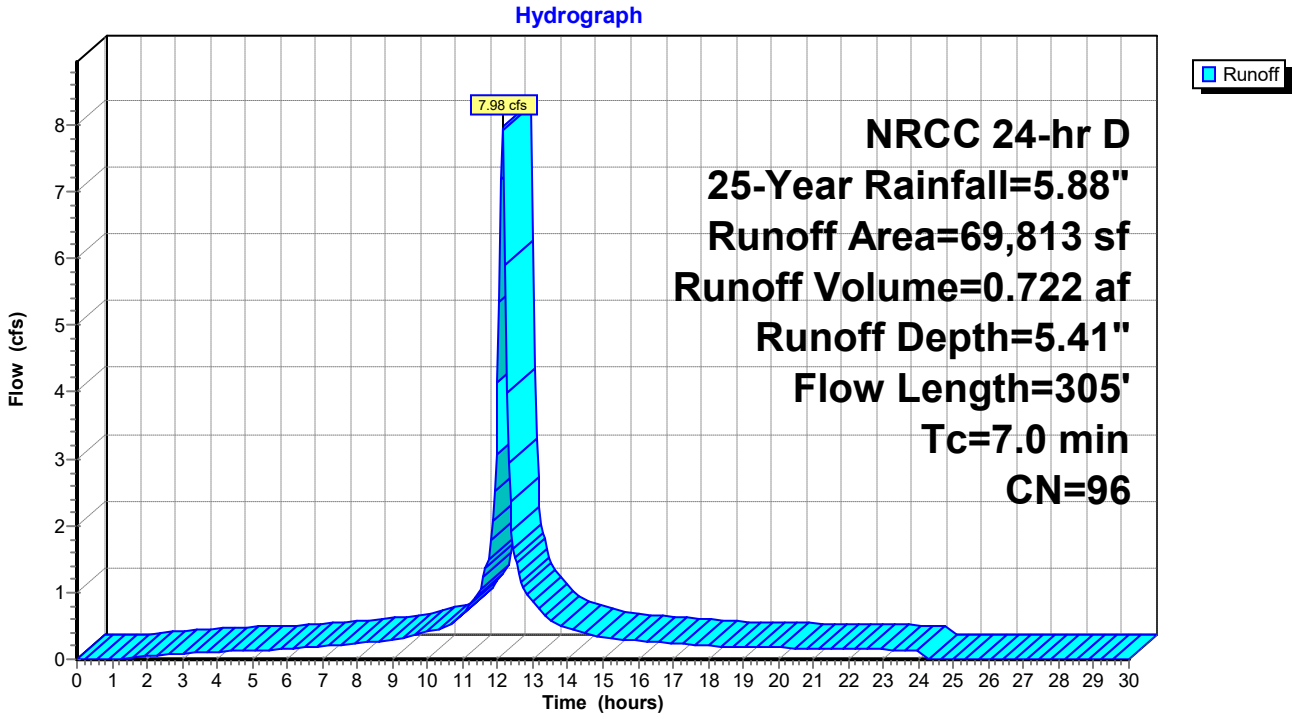
Runoff = 7.98 cfs @ 12.14 hrs, Volume= 0.722 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
2,530	39	>75% Grass cover, Good, HSG A
65,894	98	Paved parking, HSG A
1,389	96	Gravel surface, HSG A
69,813	96	Weighted Average
3,919		5.61% Pervious Area
65,894		94.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	23	0.0120	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.6	27	0.0090	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	107	0.0090	1.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	148	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	305	Total			

Subcatchment E18: TO DCB-D



Summary for Subcatchment E19: TO DCB-E

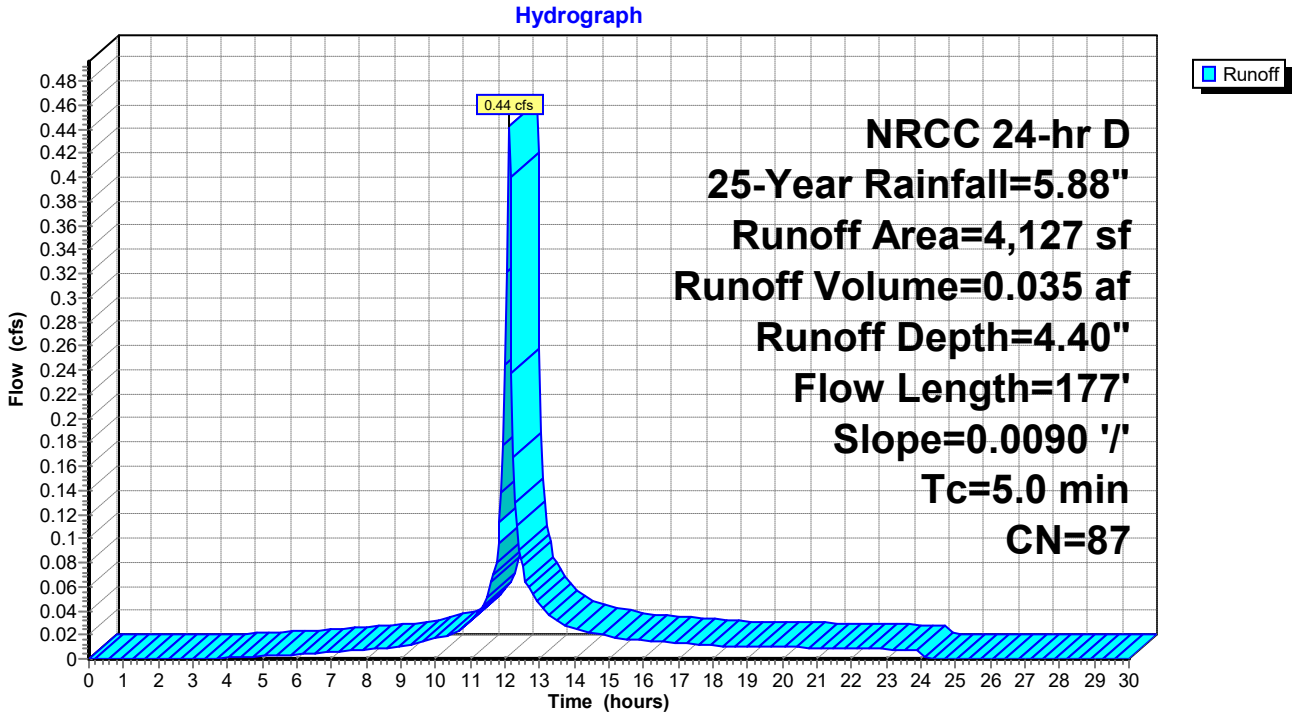
Runoff = 0.44 cfs @ 12.11 hrs, Volume= 0.035 af, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
742	39	>75% Grass cover, Good, HSG A
3,385	98	Paved parking, HSG A
4,127	87	Weighted Average
742		17.98% Pervious Area
3,385		82.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E19: TO DCB-E



Summary for Subcatchment E20: TO DP#3

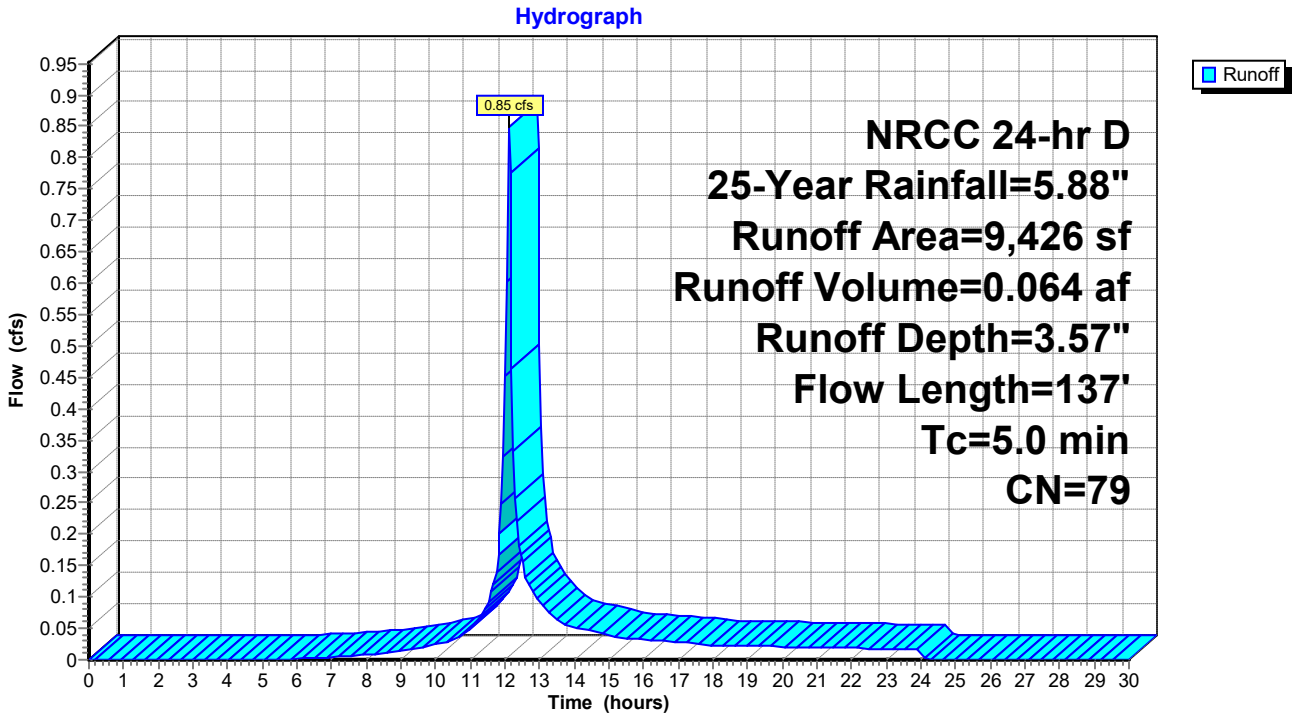
Runoff = 0.85 cfs @ 12.11 hrs, Volume= 0.064 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
3,009	39	>75% Grass cover, Good, HSG A
6,417	98	Paved parking, HSG A
9,426	79	Weighted Average
3,009		31.92% Pervious Area
6,417		68.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0300	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	26	0.1300	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	6	0.0150	0.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	87	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	137	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E20: TO DP#3



Summary for Subcatchment E21: TO EX DCB

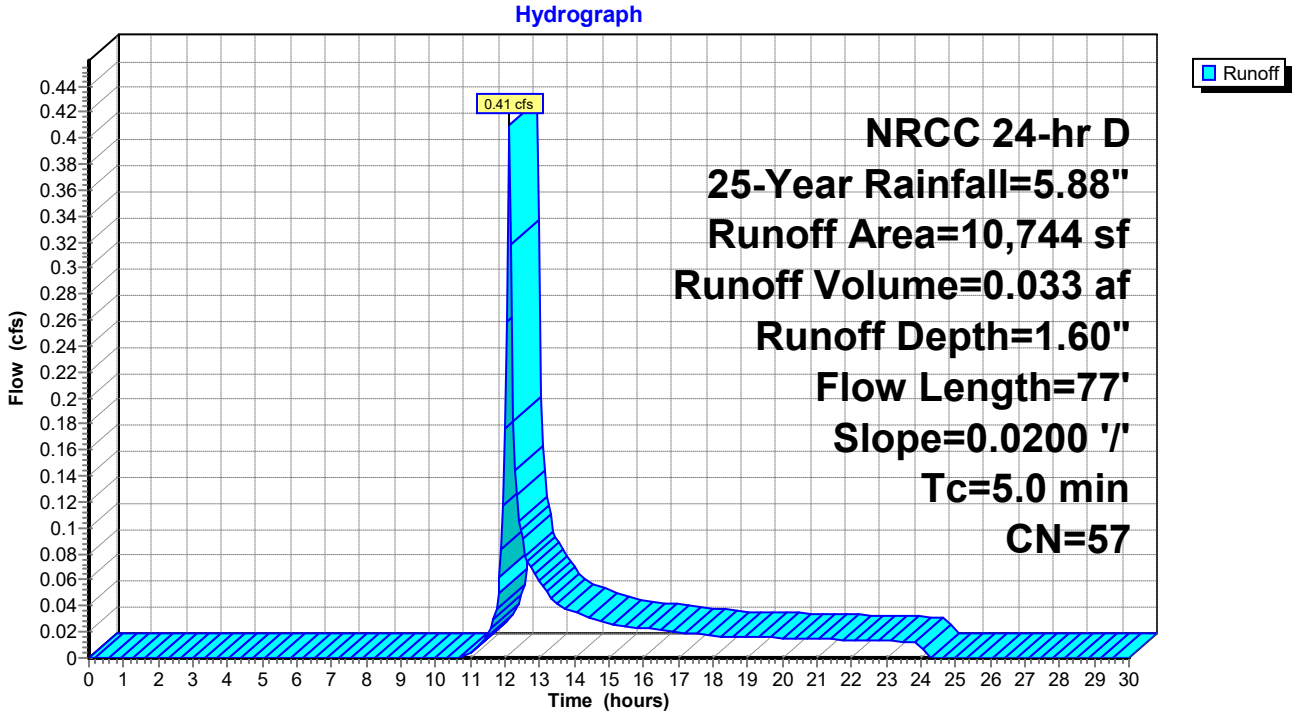
Runoff = 0.41 cfs @ 12.12 hrs, Volume= 0.033 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
7,522	39	>75% Grass cover, Good, HSG A
3,222	98	Paved parking, HSG A
10,744	57	Weighted Average
7,522		70.01% Pervious Area
3,222		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	43	0.0200	1.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	7	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	27	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.0	77	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E21: TO EX DCB



Summary for Subcatchment E22: TO YD-A

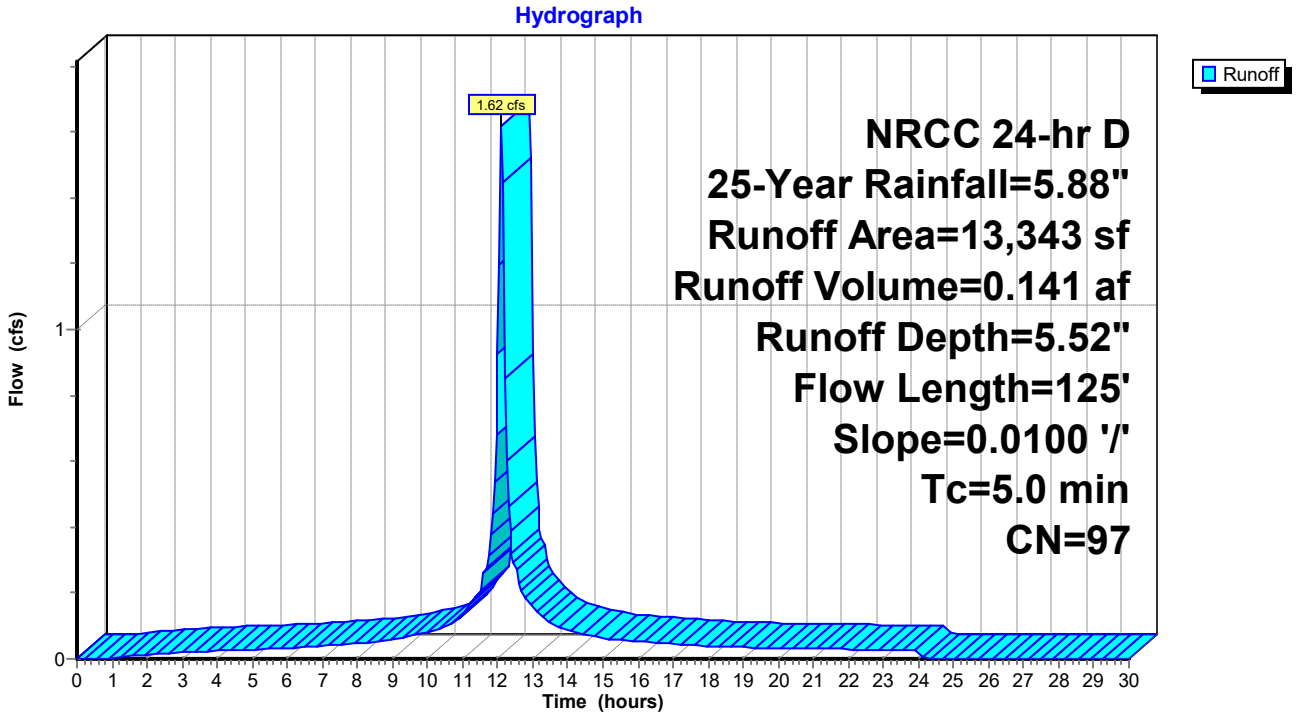
Runoff = 1.62 cfs @ 12.11 hrs, Volume= 0.141 af, Depth= 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
7,866	98	Paved parking, HSG A
5,477	96	Gravel surface, HSG A
13,343	97	Weighted Average
5,477		41.05% Pervious Area
7,866		58.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
0.8	75	0.0100	1.61		**Shallow Concentrated Flow, GRAVEL** Unpaved Kv= 16.1 fps
1.7	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E22: TO YD-A



Summary for Subcatchment E23: TO DCB-F/G

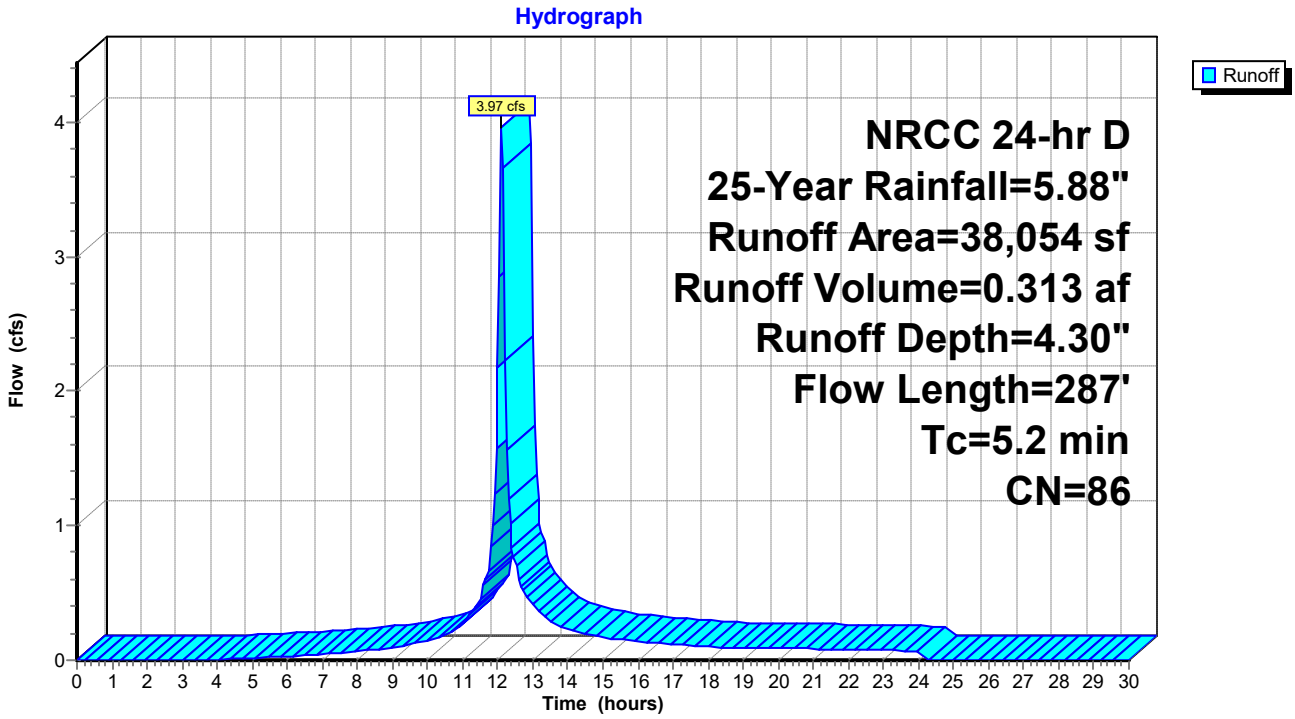
Runoff = 3.97 cfs @ 12.12 hrs, Volume= 0.313 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
7,964	39	>75% Grass cover, Good, HSG A
29,865	98	Paved parking, HSG A
225	96	Gravel surface, HSG A
38,054	86	Weighted Average
8,189		21.52% Pervious Area
29,865		78.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.8	29	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.8	237	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	287	Total			

Subcatchment E23: TO DCB-F/G



Summary for Subcatchment E24: TO DP#4

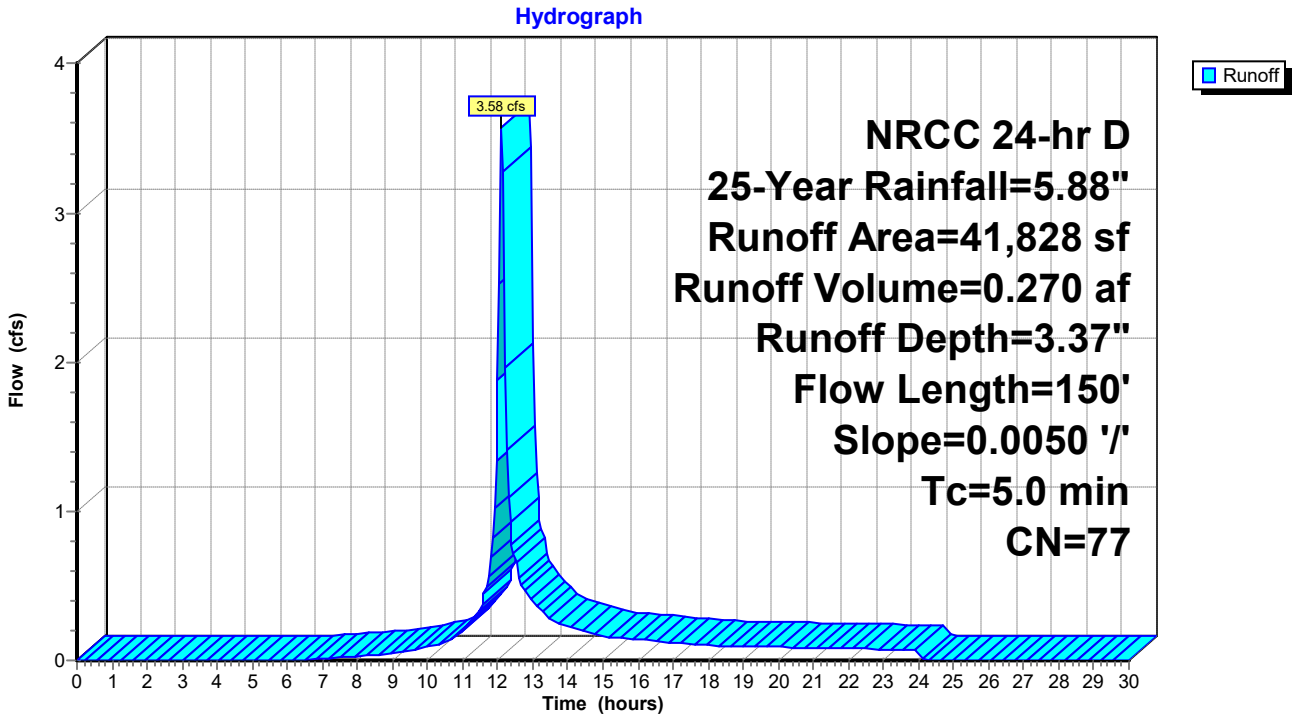
Runoff = 3.58 cfs @ 12.12 hrs, Volume= 0.270 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
5,248	39	>75% Grass cover, Good, HSG A
24,960	98	Paved parking, HSG A
11,620	48	Brush, Poor, HSG A
41,828	77	Weighted Average
16,868		40.33% Pervious Area
24,960		59.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.68		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	100	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO DP#4



Summary for Subcatchment E26: TO DCB-H

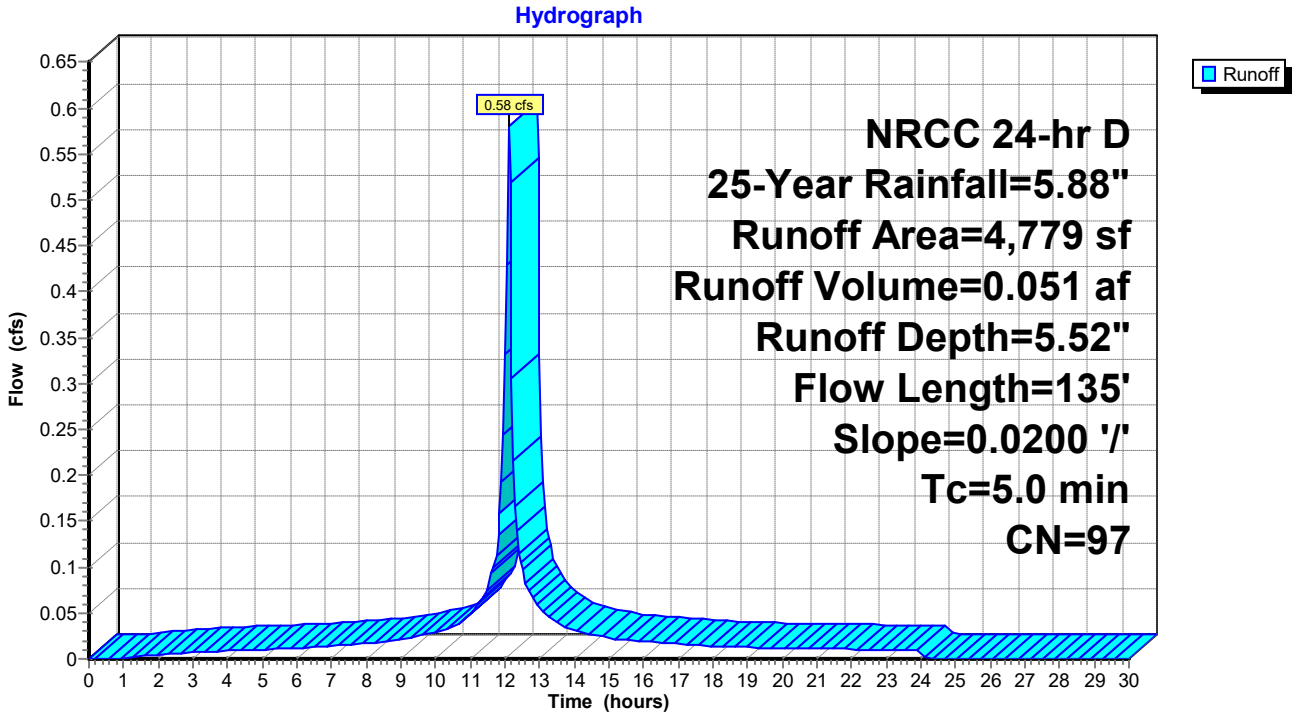
Runoff = 0.58 cfs @ 12.11 hrs, Volume= 0.051 af, Depth= 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,787	98	Paved parking, HSG A
2,992	96	Gravel surface, HSG A
4,779	97	Weighted Average
2,992		62.61% Pervious Area
1,787		37.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	85	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	135	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E26: TO DCB-H

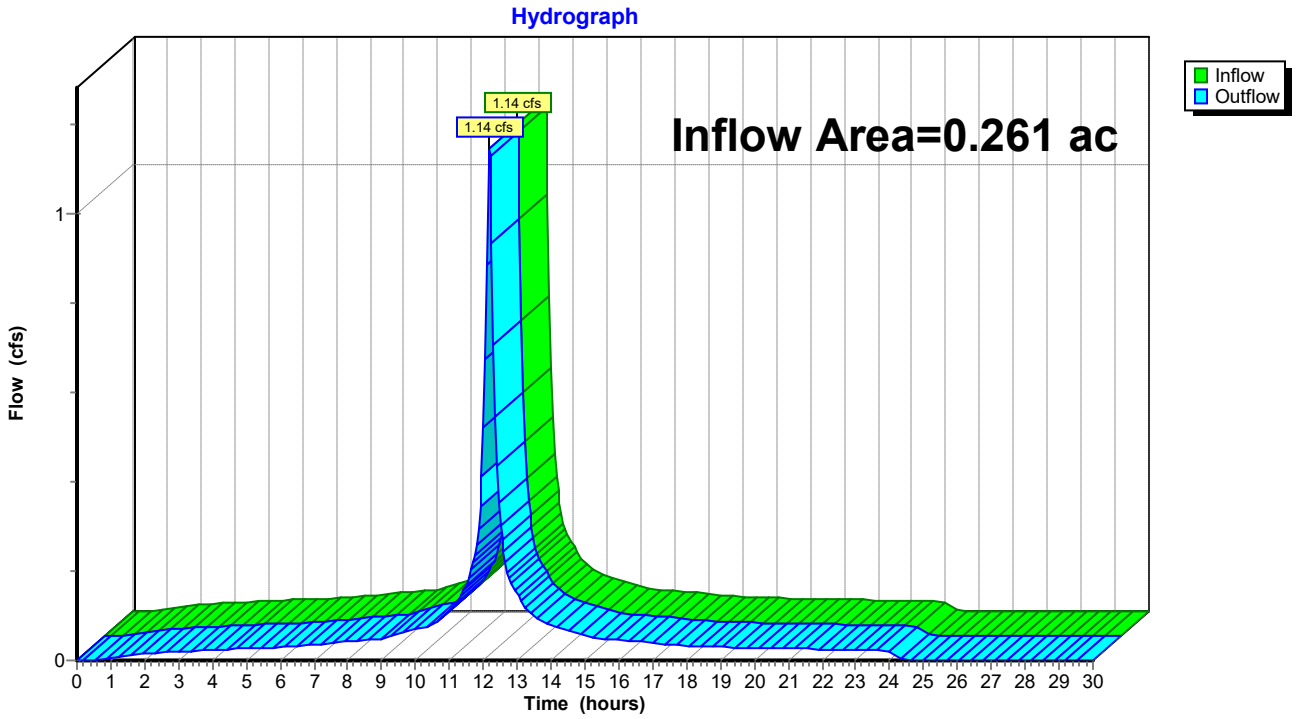


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.261 ac, 80.04% Impervious, Inflow Depth = 5.64" for 25-Year event
Inflow = 1.14 cfs @ 12.18 hrs, Volume= 0.123 af
Outflow = 1.14 cfs @ 12.18 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

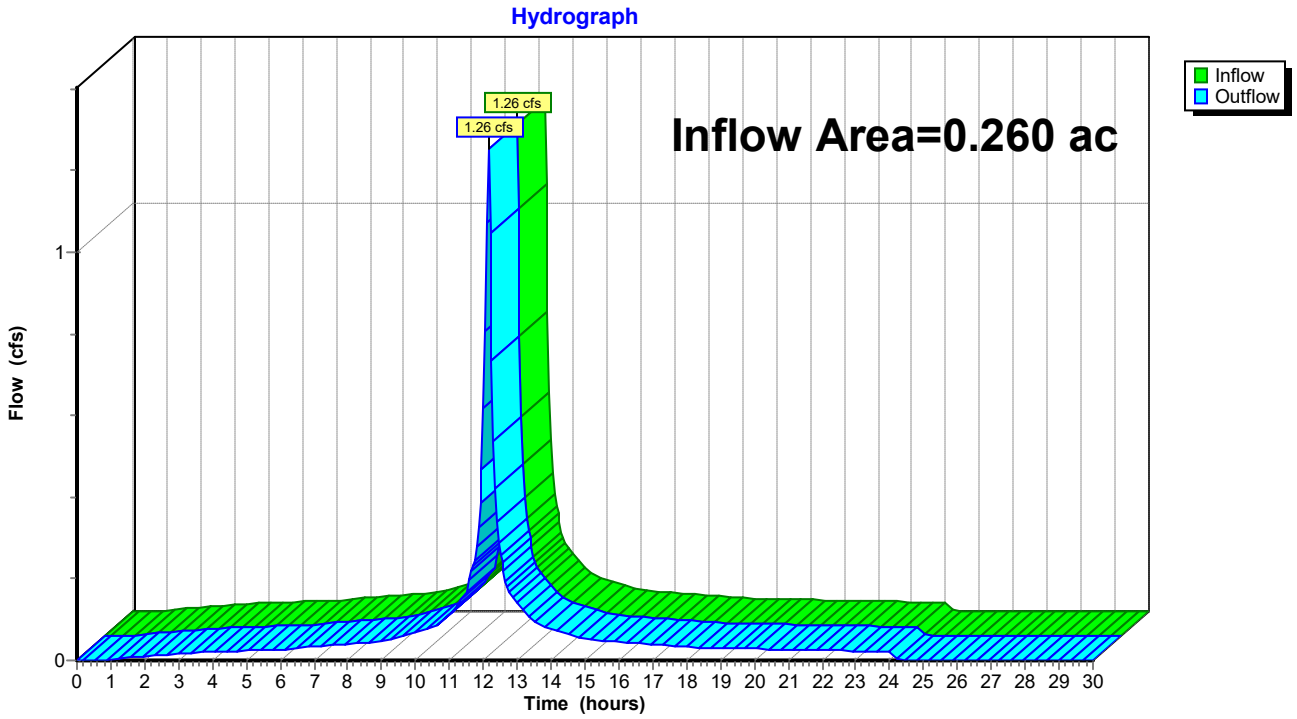


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.260 ac, 55.37% Impervious, Inflow Depth = 5.52" for 25-Year event
Inflow = 1.26 cfs @ 12.15 hrs, Volume= 0.120 af
Outflow = 1.26 cfs @ 12.15 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

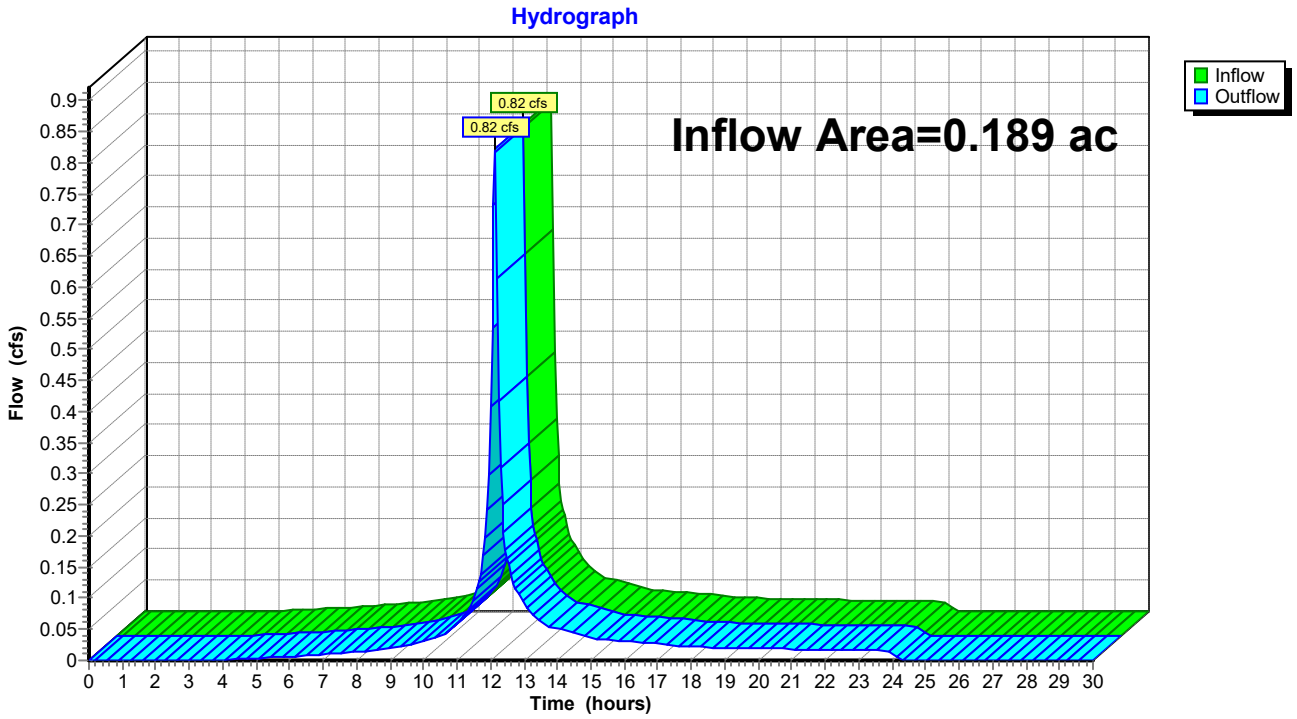


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.189 ac, 70.42% Impervious, Inflow Depth = 4.30" for 25-Year event
Inflow = 0.82 cfs @ 12.14 hrs, Volume= 0.068 af
Outflow = 0.82 cfs @ 12.14 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



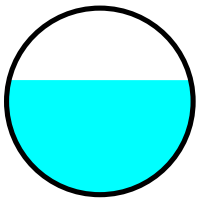
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 5.33" for 25-Year event
Inflow = 11.85 cfs @ 12.14 hrs, Volume= 1.051 af
Outflow = 11.84 cfs @ 12.14 hrs, Volume= 1.051 af, Atten= 0%, Lag= 0.0 min

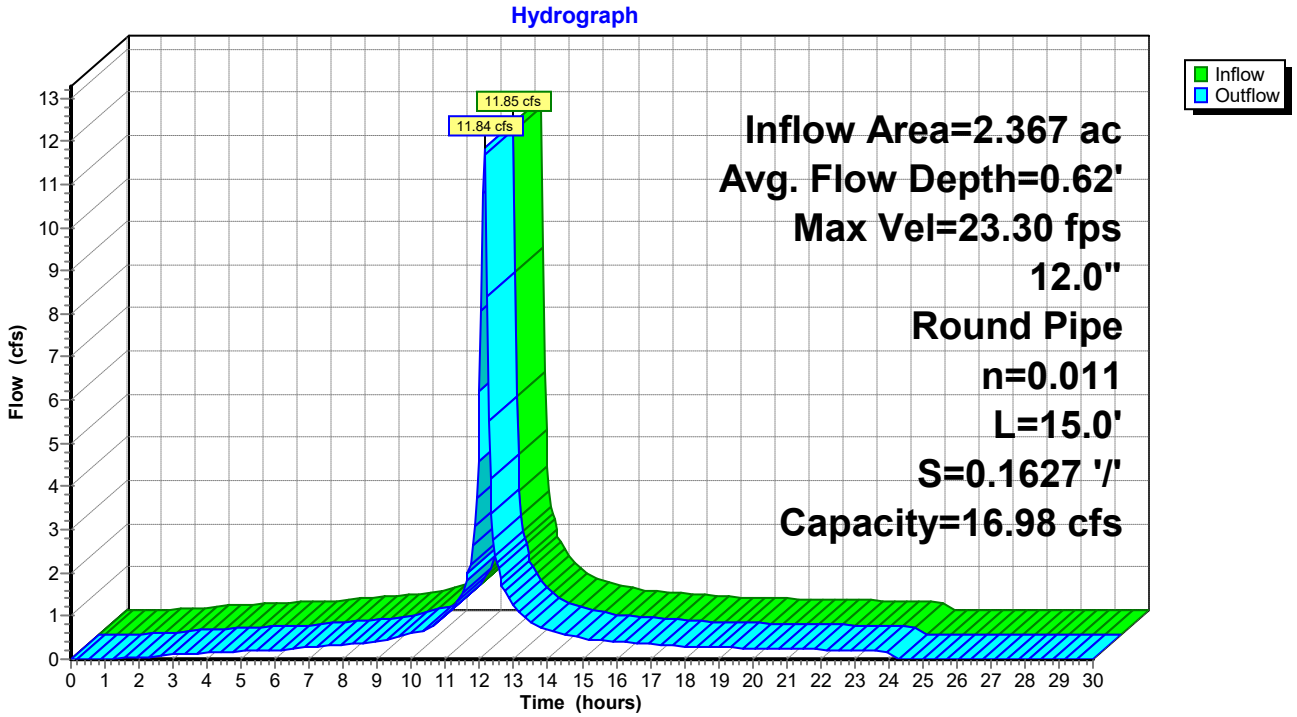
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 23.30 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 8.60 fps, Avg. Travel Time= 0.0 min

Peak Storage= 8 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.98 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.1627 '/'
Inlet Invert= 469.11', Outlet Invert= 466.67'



Reach DCB-D: TO DMH-A



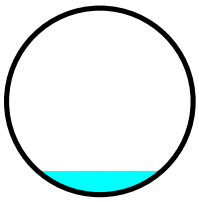
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.095 ac, 82.02% Impervious, Inflow Depth = 4.40" for 25-Year event
Inflow = 0.44 cfs @ 12.11 hrs, Volume= 0.035 af
Outflow = 0.44 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.1 min

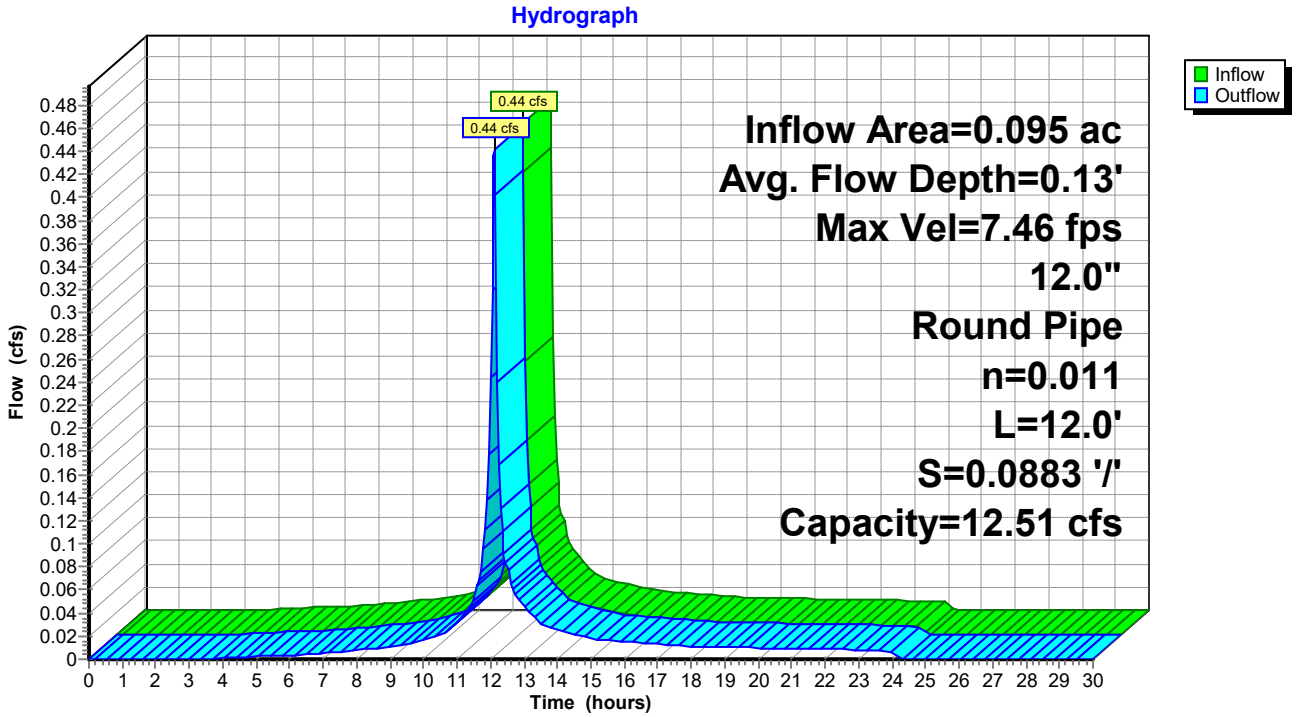
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.46 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.59 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A

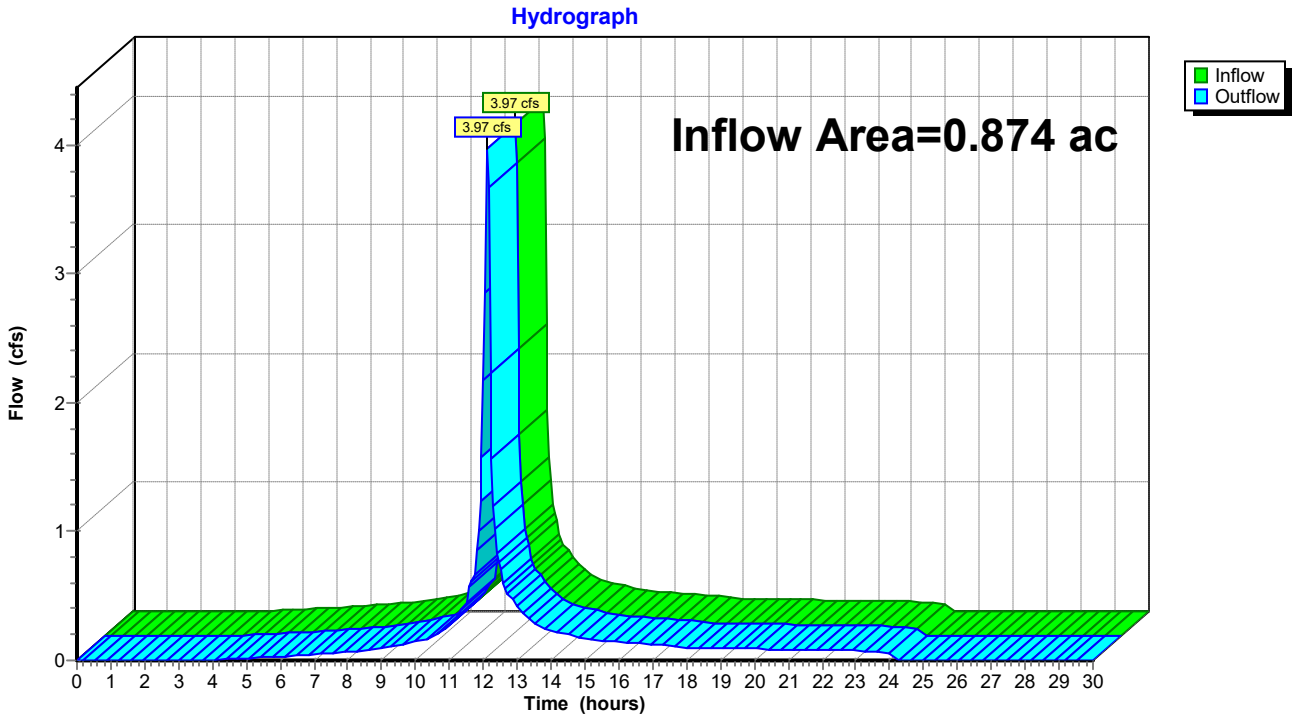


Summary for Reach DCB-F: (new Reach)

Inflow Area = 0.874 ac, 78.48% Impervious, Inflow Depth = 4.30" for 25-Year event
Inflow = 3.97 cfs @ 12.12 hrs, Volume= 0.313 af
Outflow = 3.97 cfs @ 12.12 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-F: (new Reach)

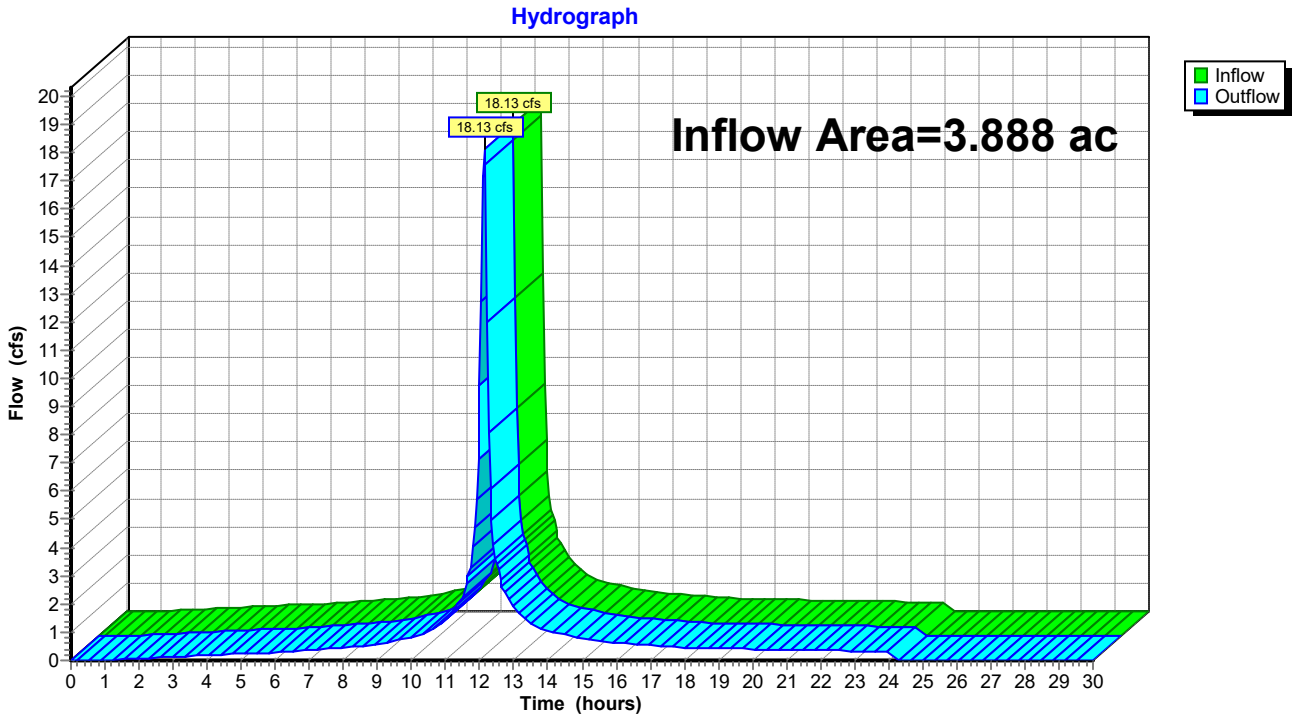


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 4.85" for 25-Year event
Inflow = 18.13 cfs @ 12.13 hrs, Volume= 1.572 af
Outflow = 18.13 cfs @ 12.13 hrs, Volume= 1.572 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

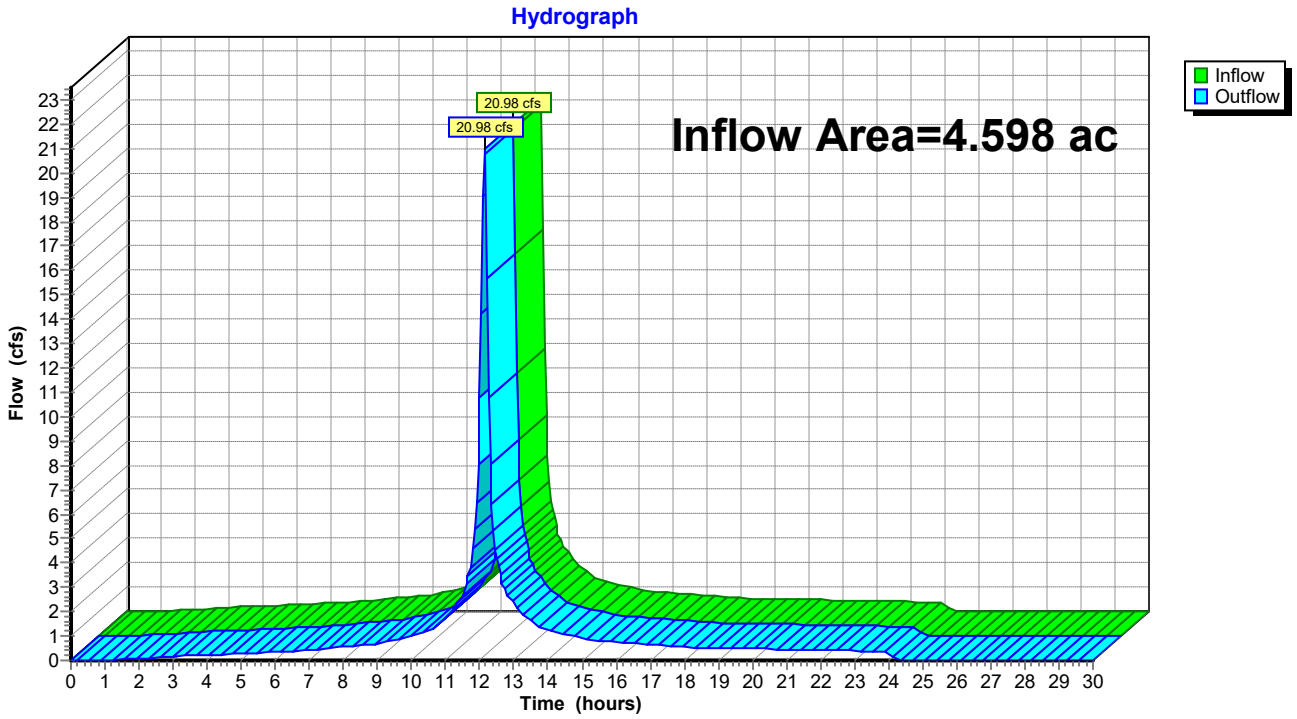


Summary for Reach DMH-C: TO DP#1

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 20.98 cfs @ 12.14 hrs, Volume= 1.882 af
Outflow = 20.98 cfs @ 12.14 hrs, Volume= 1.882 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



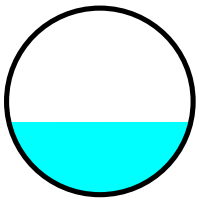
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 21.11 cfs @ 12.13 hrs, Volume= 1.882 af
Outflow = 20.98 cfs @ 12.14 hrs, Volume= 1.882 af, Atten= 1%, Lag= 0.3 min

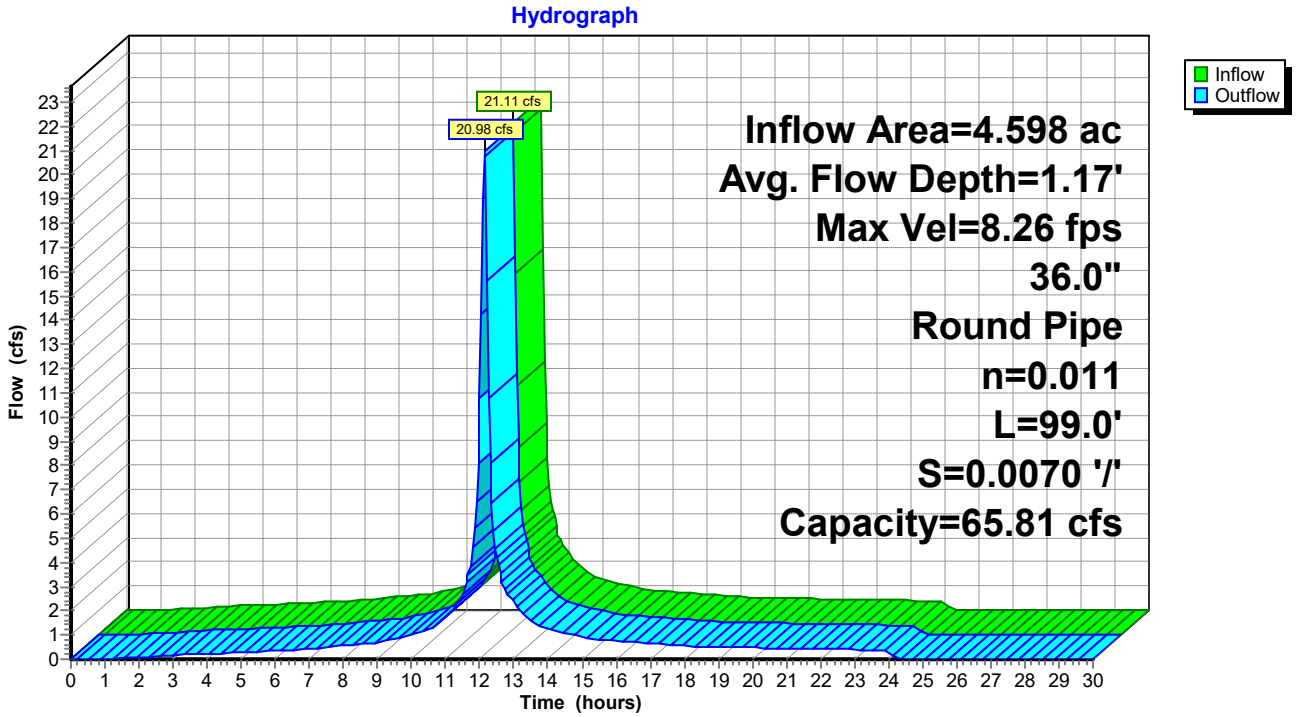
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.26 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.88 fps, Avg. Travel Time= 0.6 min

Peak Storage= 253 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.17'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



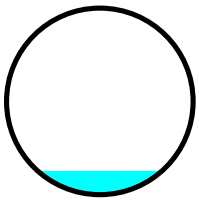
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.449 ac, 61.71% Impervious, Inflow Depth = 5.01" for 25-Year event
Inflow = 2.07 cfs @ 12.14 hrs, Volume= 0.187 af
Outflow = 2.01 cfs @ 12.16 hrs, Volume= 0.187 af, Atten= 3%, Lag= 0.7 min

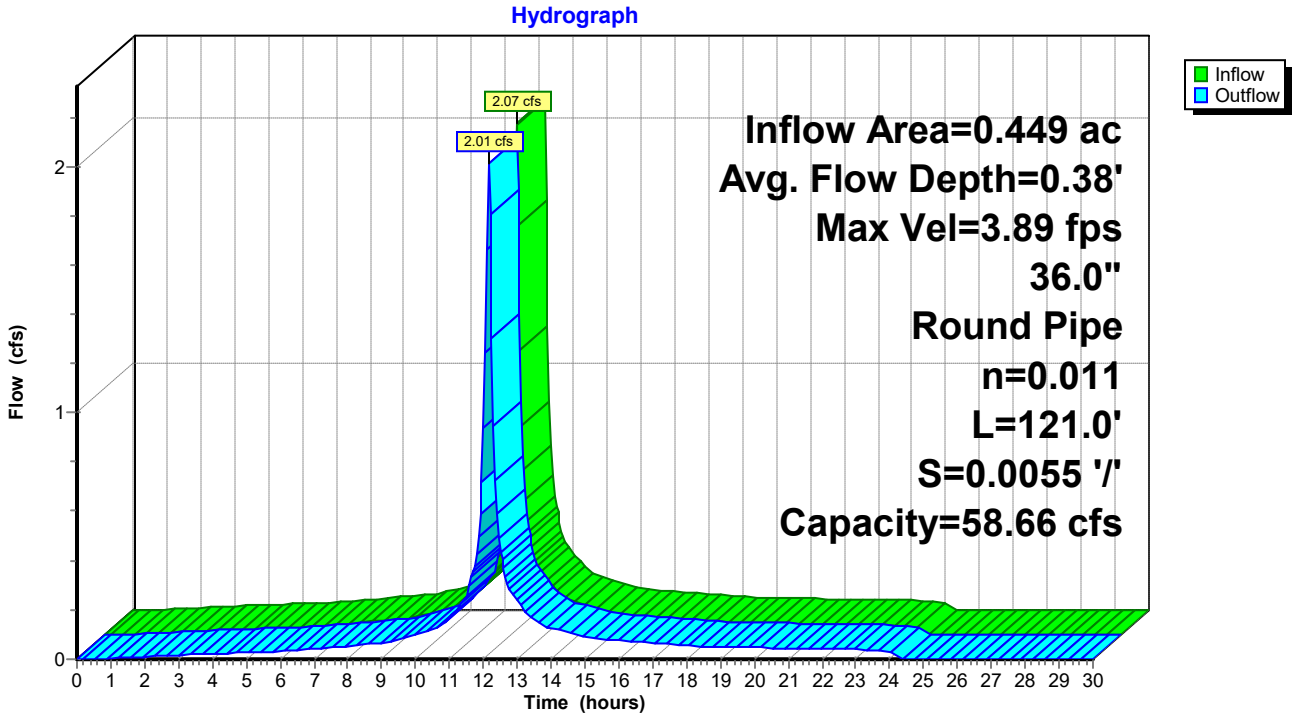
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 1.5 min

Peak Storage= 64 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.66 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 121.0' Slope= 0.0055 '/'
Inlet Invert= 456.57', Outlet Invert= 455.90'



Reach DMH-E: TO DMH-D



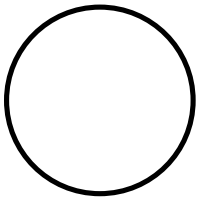
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

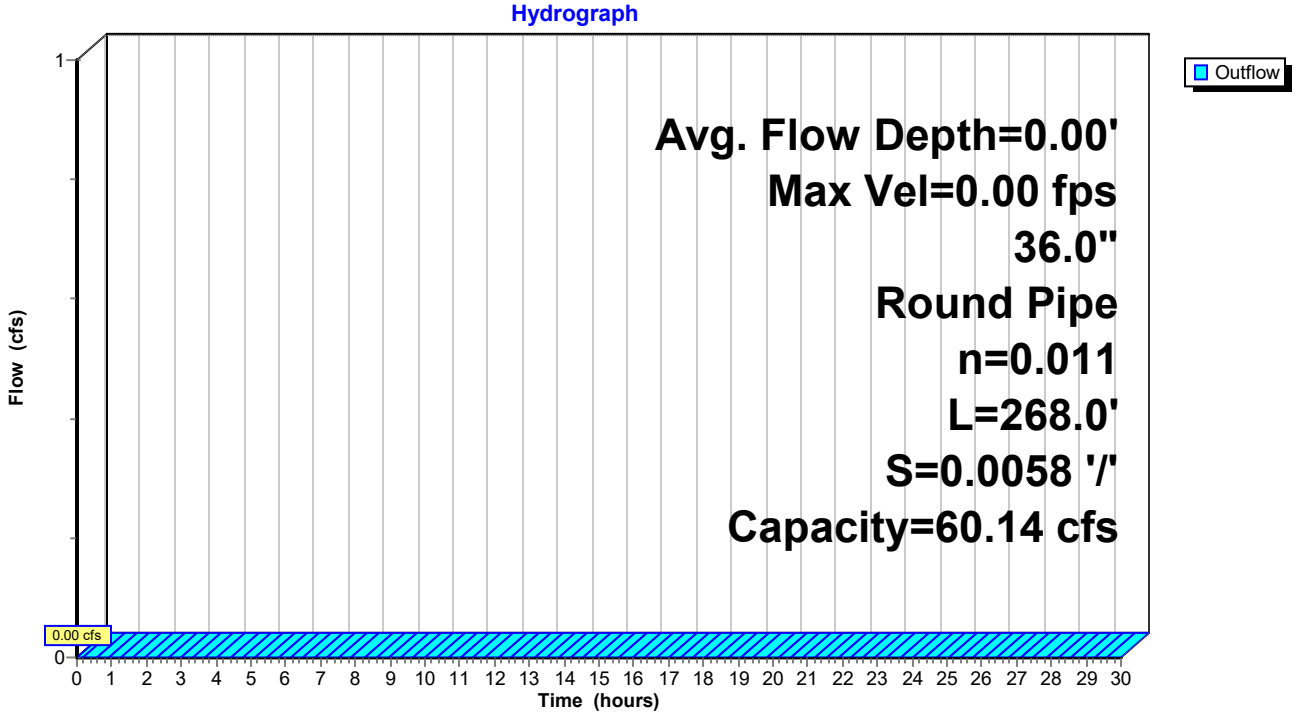
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E

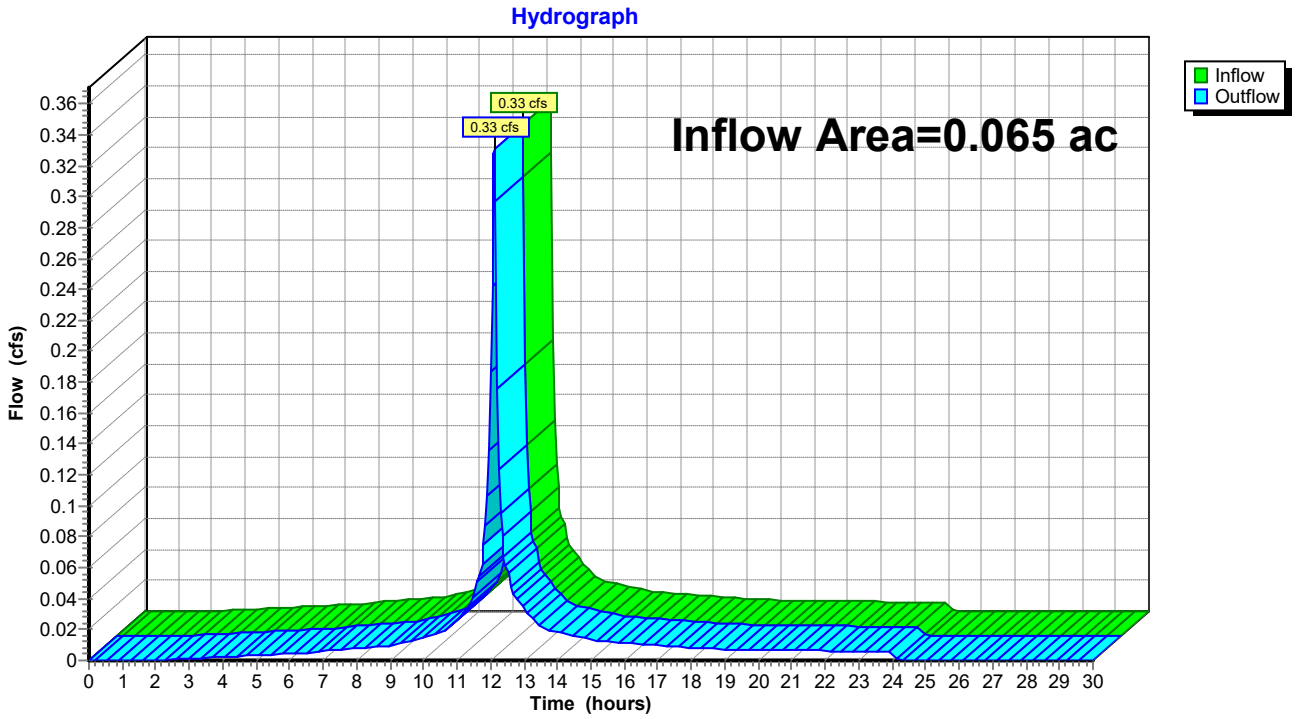


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 4.95" for 25-Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af
Outflow = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

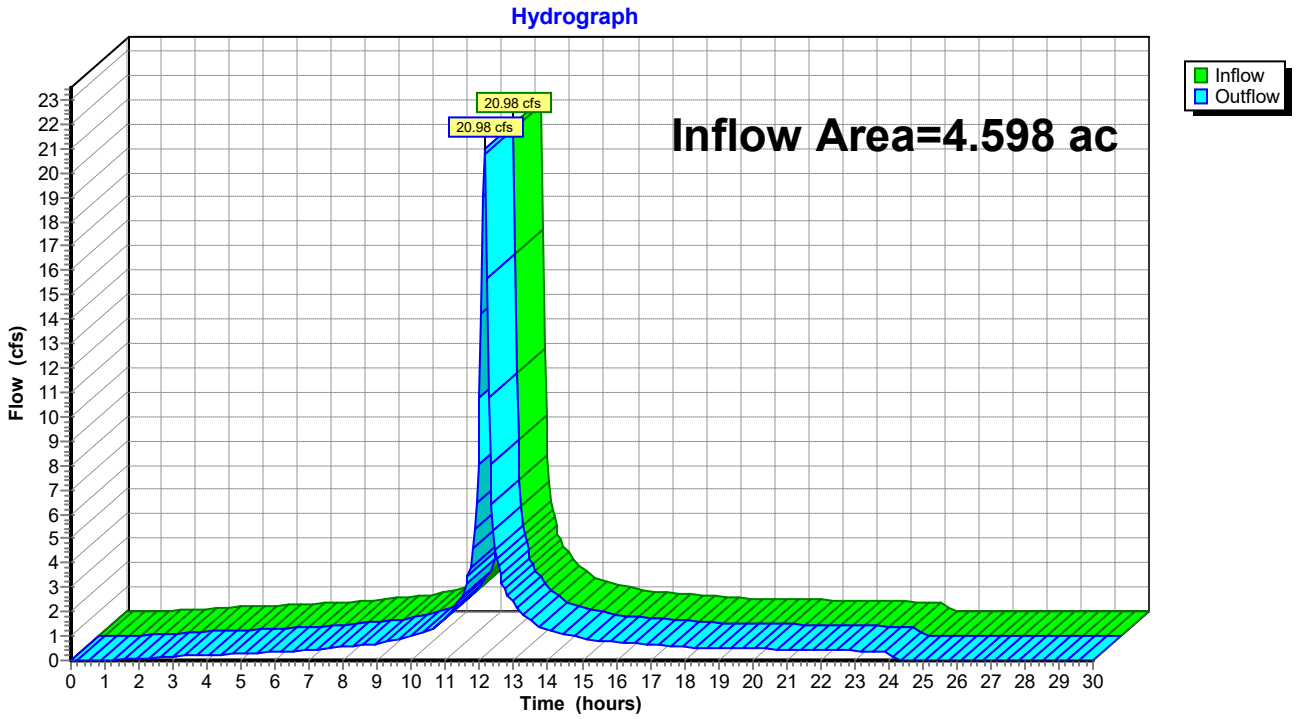


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 20.98 cfs @ 12.14 hrs, Volume= 1.882 af
Outflow = 20.98 cfs @ 12.14 hrs, Volume= 1.882 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

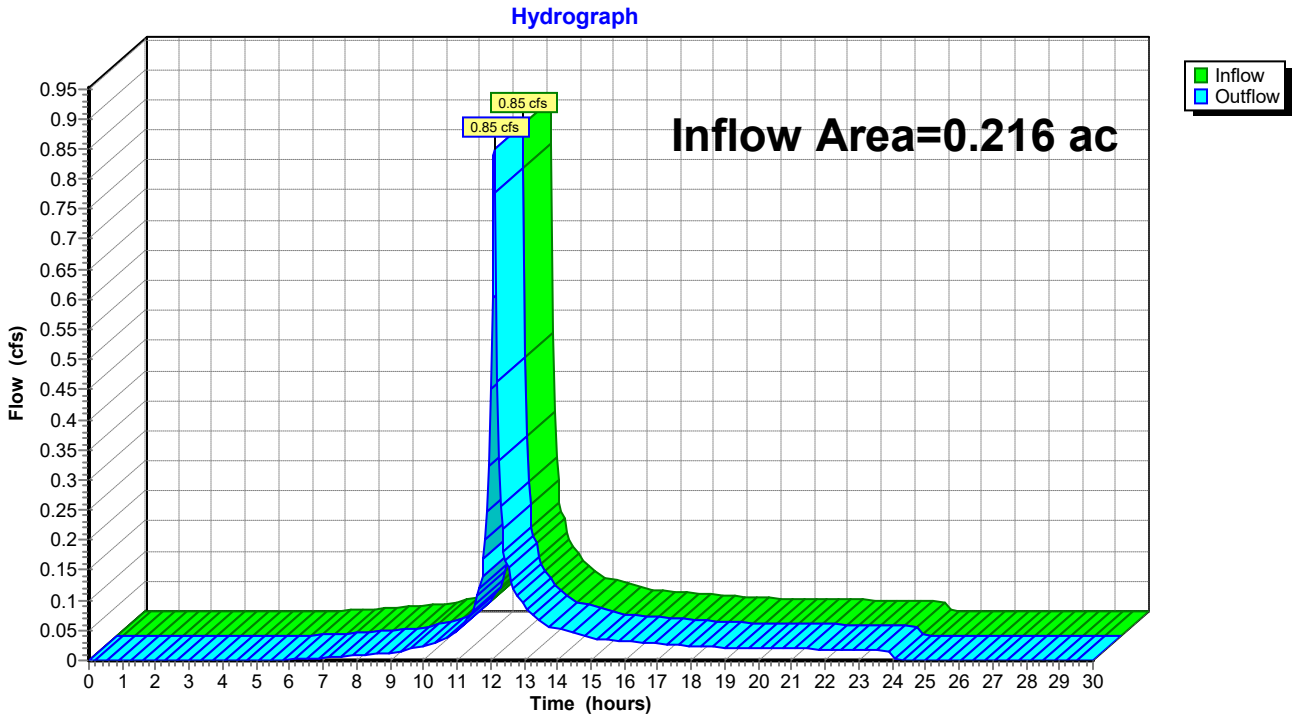


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.216 ac, 68.08% Impervious, Inflow Depth = 3.57" for 25-Year event
Inflow = 0.85 cfs @ 12.11 hrs, Volume= 0.064 af
Outflow = 0.85 cfs @ 12.11 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

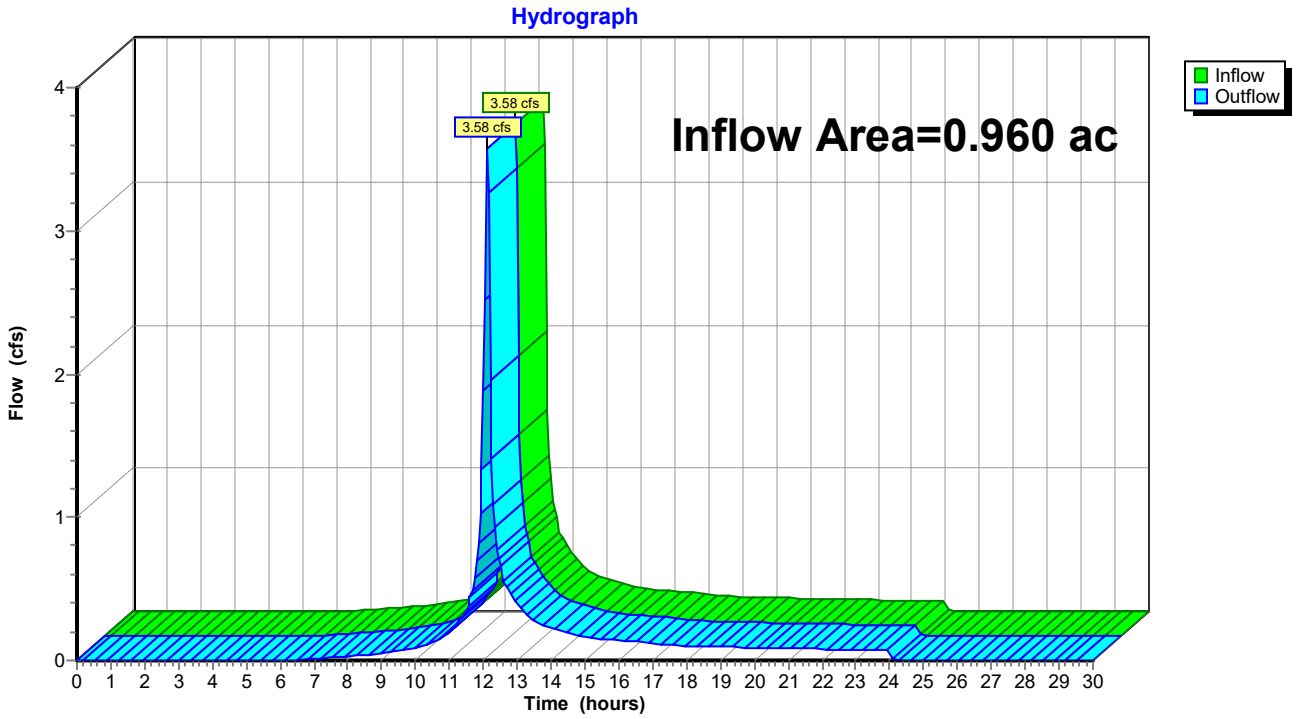


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.960 ac, 59.67% Impervious, Inflow Depth = 3.37" for 25-Year event
Inflow = 3.58 cfs @ 12.12 hrs, Volume= 0.270 af
Outflow = 3.58 cfs @ 12.12 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

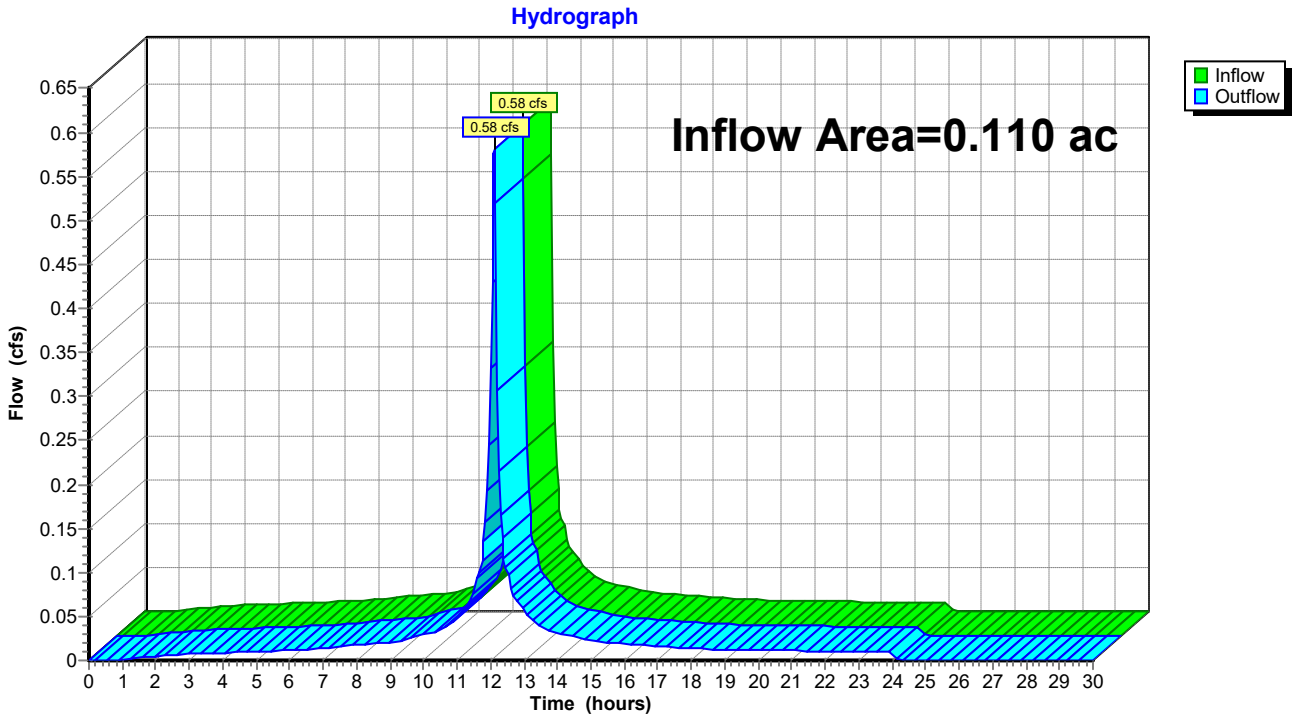


Summary for Reach DP5: DCB-H

Inflow Area = 0.110 ac, 37.39% Impervious, Inflow Depth = 5.52" for 25-Year event
Inflow = 0.58 cfs @ 12.11 hrs, Volume= 0.051 af
Outflow = 0.58 cfs @ 12.11 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H

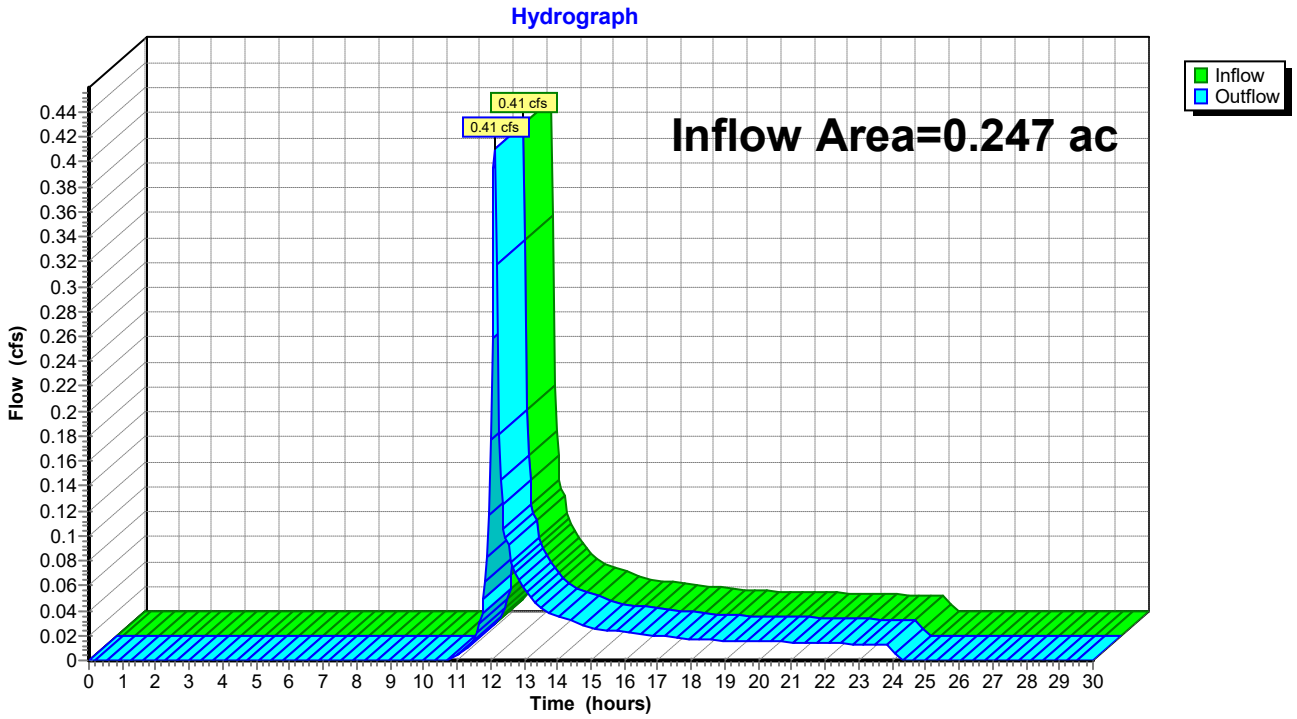


Summary for Reach EX DCB: EX DCB

Inflow Area = 0.247 ac, 29.99% Impervious, Inflow Depth = 1.60" for 25-Year event
Inflow = 0.41 cfs @ 12.12 hrs, Volume= 0.033 af
Outflow = 0.41 cfs @ 12.12 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach EX DCB: EX DCB

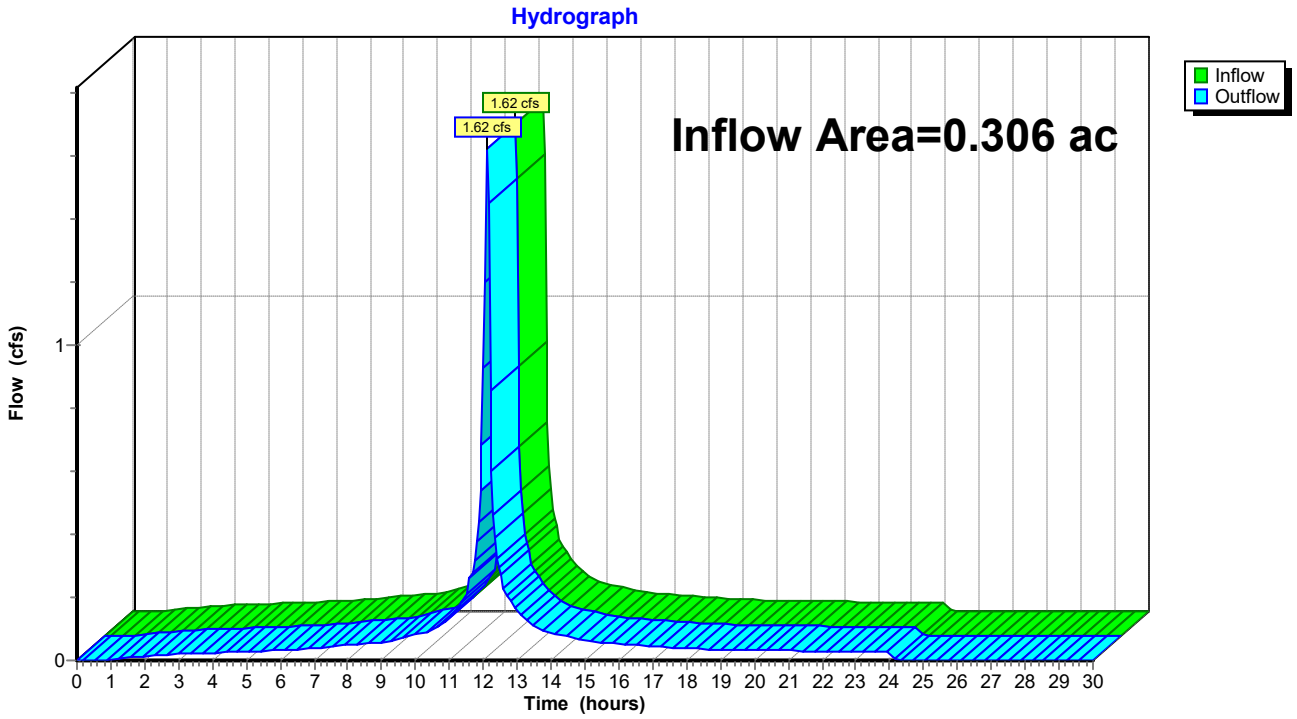


Summary for Reach YDA: (new Reach)

Inflow Area = 0.306 ac, 58.95% Impervious, Inflow Depth = 5.52" for 25-Year event
Inflow = 1.62 cfs @ 12.11 hrs, Volume= 0.141 af
Outflow = 1.62 cfs @ 12.11 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach YDA: (new Reach)



Summary for Pond DMH-B: TO DMH-D

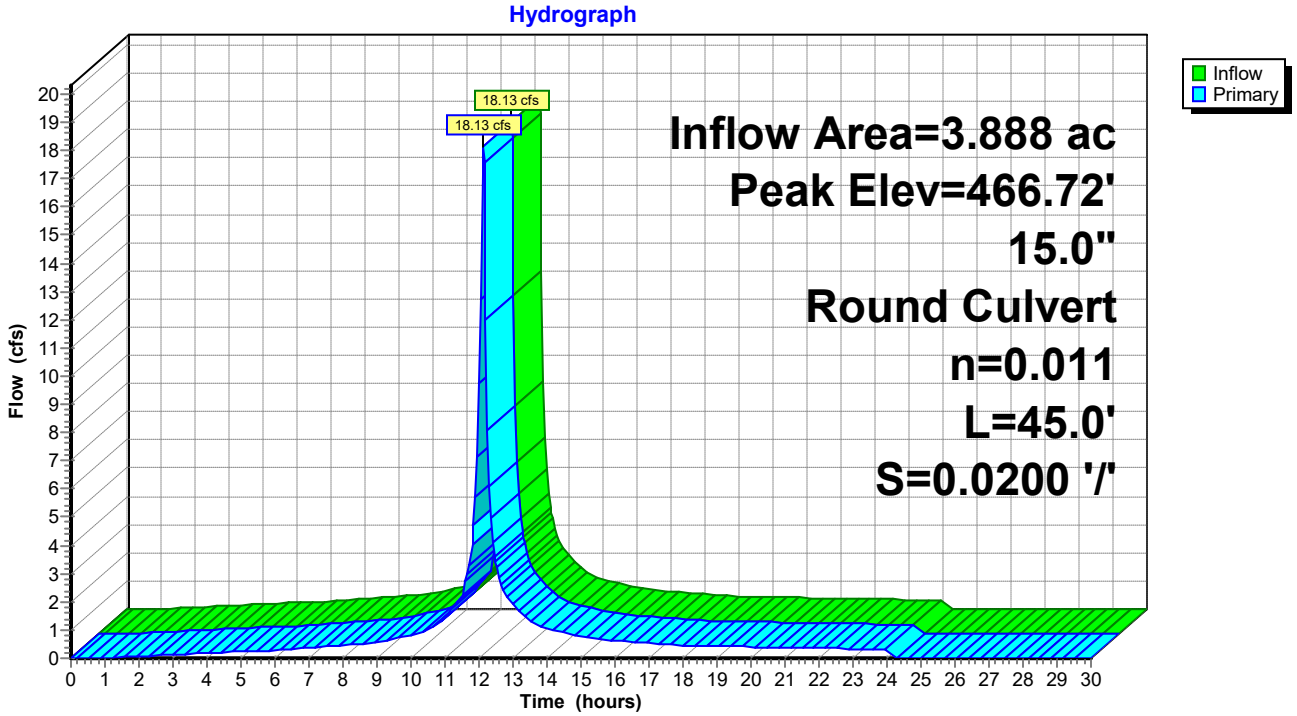
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 4.85" for 25-Year event
Inflow = 18.13 cfs @ 12.13 hrs, Volume= 1.572 af
Outflow = 18.13 cfs @ 12.13 hrs, Volume= 1.572 af, Atten= 0%, Lag= 0.0 min
Primary = 18.13 cfs @ 12.13 hrs, Volume= 1.572 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 466.72' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=17.39 cfs @ 12.13 hrs HW=466.09' (Free Discharge)
└**1=Culvert** (Inlet Controls 17.39 cfs @ 14.17 fps)

Pond DMH-B: TO DMH-D



Summary for Pond LP1: TO DCB-D

Inflow Area = 0.764 ac, 43.34% Impervious, Inflow Depth = 5.18" for 25-Year event
Inflow = 3.95 cfs @ 12.11 hrs, Volume= 0.330 af
Outflow = 3.88 cfs @ 12.13 hrs, Volume= 0.329 af, Atten= 2%, Lag= 1.1 min
Primary = 3.88 cfs @ 12.13 hrs, Volume= 0.329 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 474.00' @ 12.13 hrs Surf.Area= 1,724 sf Storage= 230 cf

Plug-Flow detention time= 5.4 min calculated for 0.329 af (100% of inflow)
Center-of-Mass det. time= 3.3 min (778.2 - 775.0)

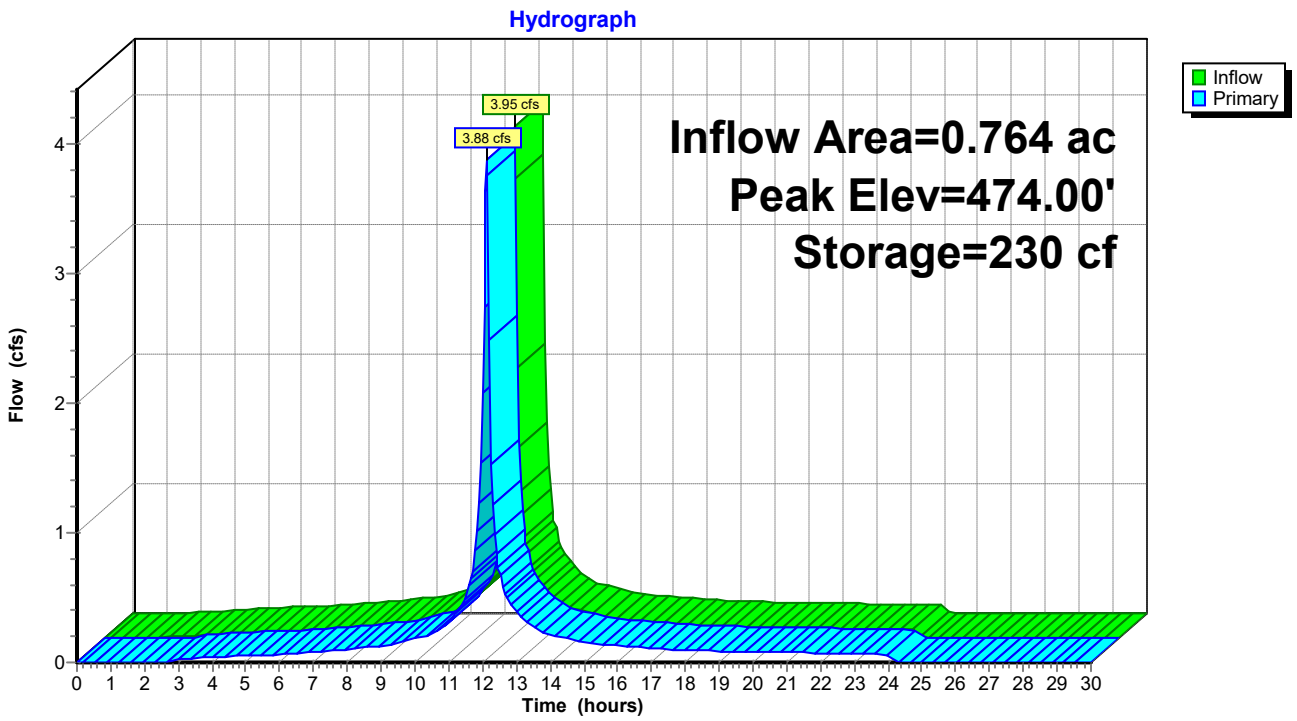
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
473.75	120	0	0
474.00	1,725	231	231

Device	Routing	Invert	Outlet Devices
#1	Primary	473.85'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.71 cfs @ 12.13 hrs HW=474.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.71 cfs @ 1.02 fps)

Pond LP1: TO DCB-D



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=7.38"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.48 cfs 0.040 af

Subcatchment E12: TO DCB-A Runoff Area=11,373 sf 80.04% Impervious Runoff Depth=8.10"
Flow Length=209' Tc=10.9 min CN=98 Runoff=1.63 cfs 0.176 af

Subcatchment E14: TO DCB-B Runoff Area=11,310 sf 55.37% Impervious Runoff Depth=7.98"
Flow Length=171' Tc=8.1 min CN=97 Runoff=1.79 cfs 0.173 af

Subcatchment E15: TO DCB-C Runoff Area=8,235 sf 70.42% Impervious Runoff Depth=6.66"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=86 Runoff=1.24 cfs 0.105 af

Subcatchment E16: TO LOW POINT Runoff Area=33,282 sf 43.34% Impervious Runoff Depth=7.62"
Flow Length=183' Tc=5.0 min CN=94 Runoff=5.69 cfs 0.485 af

Subcatchment E18: TO DCB-D Runoff Area=69,813 sf 94.39% Impervious Runoff Depth=7.86"
Flow Length=305' Tc=7.0 min CN=96 Runoff=11.40 cfs 1.050 af

Subcatchment E19: TO DCB-E Runoff Area=4,127 sf 82.02% Impervious Runoff Depth=6.78"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=87 Runoff=0.66 cfs 0.054 af

Subcatchment E20: TO DP#3 Runoff Area=9,426 sf 68.08% Impervious Runoff Depth=5.83"
Flow Length=137' Tc=5.0 min CN=79 Runoff=1.36 cfs 0.105 af

Subcatchment E21: TO EX DCB Runoff Area=10,744 sf 29.99% Impervious Runoff Depth=3.25"
Flow Length=77' Slope=0.0200 '/' Tc=5.0 min CN=57 Runoff=0.88 cfs 0.067 af

Subcatchment E22: TO YD-A Runoff Area=13,343 sf 58.95% Impervious Runoff Depth=7.98"
Flow Length=125' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=2.31 cfs 0.204 af

Subcatchment E23: TO DCB-F/G Runoff Area=38,054 sf 78.48% Impervious Runoff Depth=6.66"
Flow Length=287' Tc=5.2 min CN=86 Runoff=6.00 cfs 0.485 af

Subcatchment E24: TO DP#4 Runoff Area=41,828 sf 59.67% Impervious Runoff Depth=5.59"
Flow Length=150' Slope=0.0050 '/' Tc=5.0 min CN=77 Runoff=5.83 cfs 0.447 af

Subcatchment E26: TO DCB-H Runoff Area=4,779 sf 37.39% Impervious Runoff Depth=7.98"
Flow Length=135' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.83 cfs 0.073 af

Reach DCB-A: TO DMH-D Inflow=1.63 cfs 0.176 af
Outflow=1.63 cfs 0.176 af

Reach DCB-B: TO DMH-E Inflow=1.79 cfs 0.173 af
Outflow=1.79 cfs 0.173 af

Reach DCB-C: TO TRUNKLINE Inflow=1.24 cfs 0.105 af
Outflow=1.24 cfs 0.105 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.80' Max Vel=24.61 fps Inflow=16.71 cfs 1.534 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=16.71 cfs 1.534 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.16' Max Vel=8.43 fps Inflow=0.66 cfs 0.054 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.66 cfs 0.054 af

Reach DCB-F: (new Reach) Inflow=6.00 cfs 0.485 af
Outflow=6.00 cfs 0.485 af

Reach DMH-A: TO DMH-B Inflow=26.48 cfs 2.343 af
Outflow=26.48 cfs 2.343 af

Reach DMH-C: TO DP#1 Inflow=30.58 cfs 2.797 af
Outflow=30.58 cfs 2.797 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.44' Max Vel=9.10 fps Inflow=30.68 cfs 2.797 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=30.58 cfs 2.797 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.46' Max Vel=4.36 fps Inflow=3.03 cfs 0.278 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=2.95 cfs 0.278 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.48 cfs 0.040 af
Outflow=0.48 cfs 0.040 af

Reach DP2: MUNICIPAL SYSTEM Inflow=30.58 cfs 2.797 af
Outflow=30.58 cfs 2.797 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=1.36 cfs 0.105 af
Outflow=1.36 cfs 0.105 af

Reach DP4: LOW POINT OFF LOCUS Inflow=5.83 cfs 0.447 af
Outflow=5.83 cfs 0.447 af

Reach DP5: DCB-H Inflow=0.83 cfs 0.073 af
Outflow=0.83 cfs 0.073 af

Reach EX DCB: EX DCB Inflow=0.88 cfs 0.067 af
Outflow=0.88 cfs 0.067 af

Reach YDA: (new Reach) Inflow=2.31 cfs 0.204 af
Outflow=2.31 cfs 0.204 af

Pond DMH-B: TO DMH-D Peak Elev=477.32' Inflow=26.48 cfs 2.343 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=26.48 cfs 2.343 af

Pond LP1: TO DCB-D Peak Elev=474.05' Storage=231 cf Inflow=5.69 cfs 0.485 af
Outflow=5.87 cfs 0.484 af

Total Runoff Area = 5.950 ac Runoff Volume = 3.463 af Average Runoff Depth = 6.98"
29.95% Pervious = 1.782 ac 70.05% Impervious = 4.168 ac

Summary for Subcatchment E11: TO DP#1

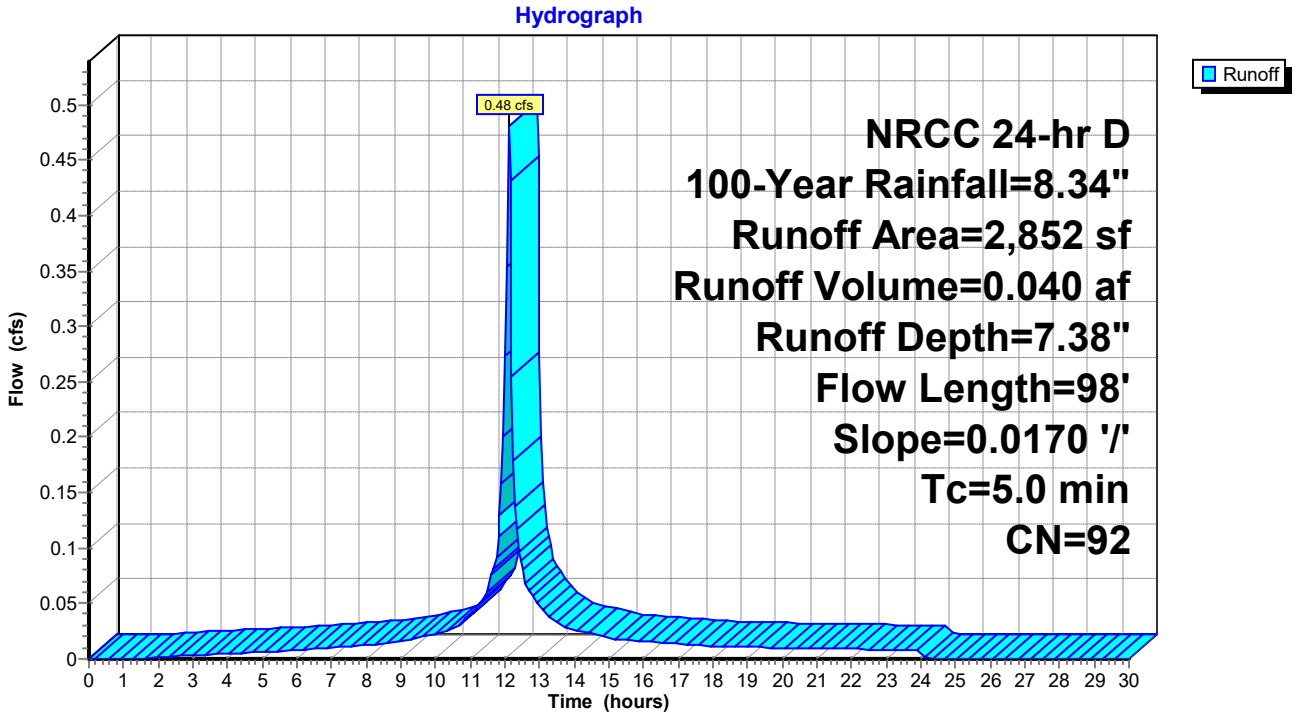
Runoff = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 7.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E11: TO DP#1



Summary for Subcatchment E12: TO DCB-A

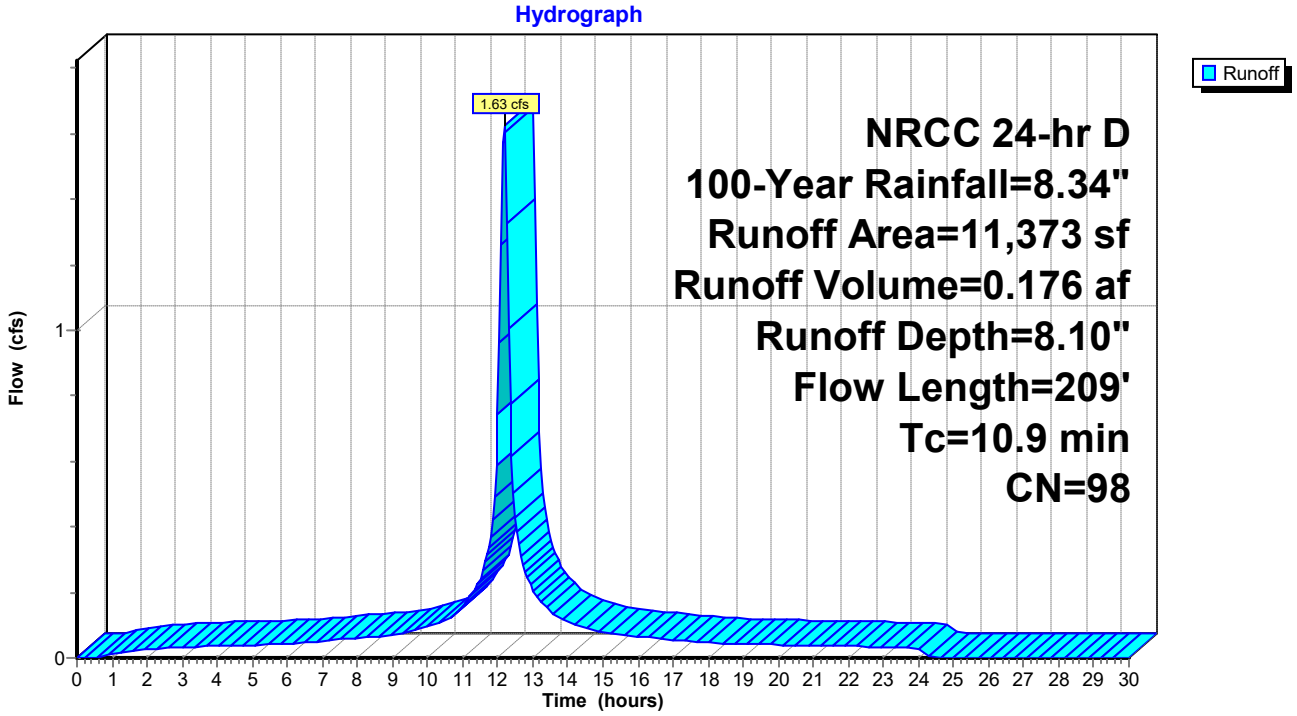
Runoff = 1.63 cfs @ 12.18 hrs, Volume= 0.176 af, Depth= 8.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
9,103	98	Paved parking, HSG A
2,270	96	Gravel surface, HSG A
11,373	98	Weighted Average
2,270		19.96% Pervious Area
9,103		80.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	75	0.0120	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	9	0.0120	1.76		**Shallow Concentrated Flow, GRASS** Unpaved Kv= 16.1 fps
1.1	125	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.9	209	Total			

Subcatchment E12: TO DCB-A



Summary for Subcatchment E14: TO DCB-B

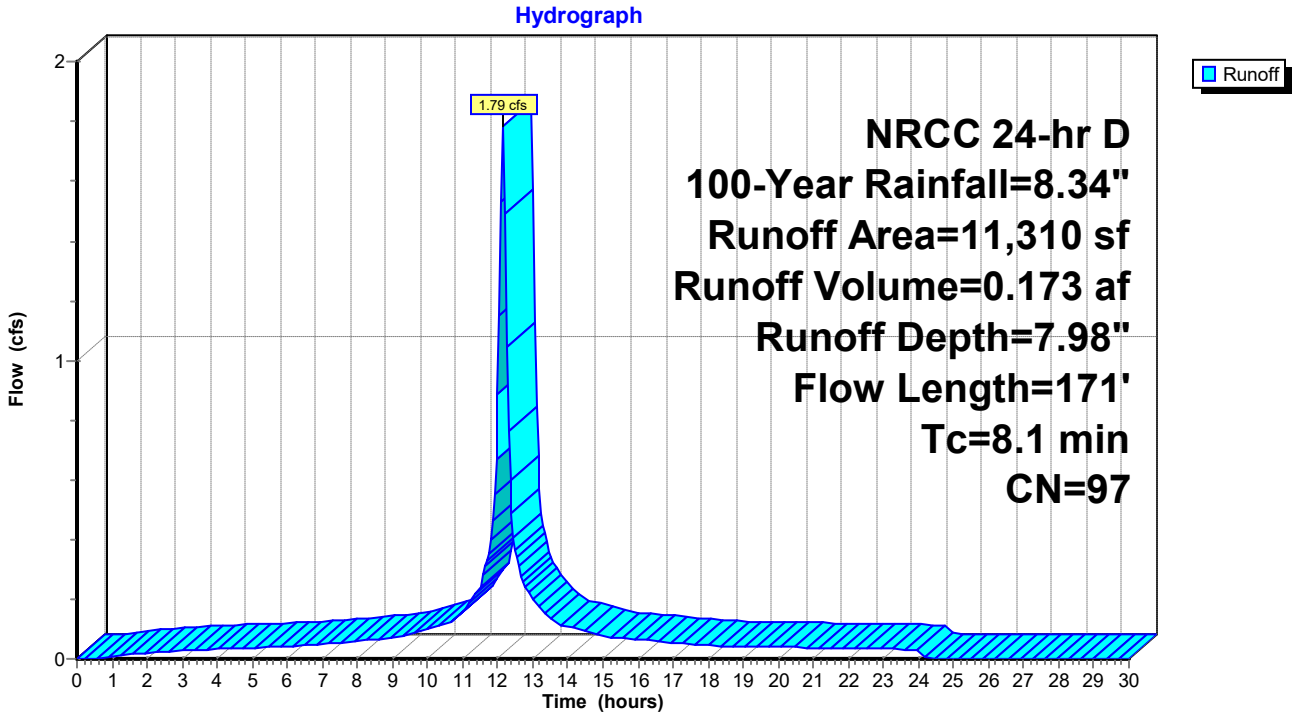
Runoff = 1.79 cfs @ 12.15 hrs, Volume= 0.173 af, Depth= 7.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
6,262	98	Paved parking, HSG A
5,048	96	Gravel surface, HSG A
11,310	97	Weighted Average
5,048		44.63% Pervious Area
6,262		55.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.1	121	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.1	171	Total			

Subcatchment E14: TO DCB-B



Summary for Subcatchment E15: TO DCB-C

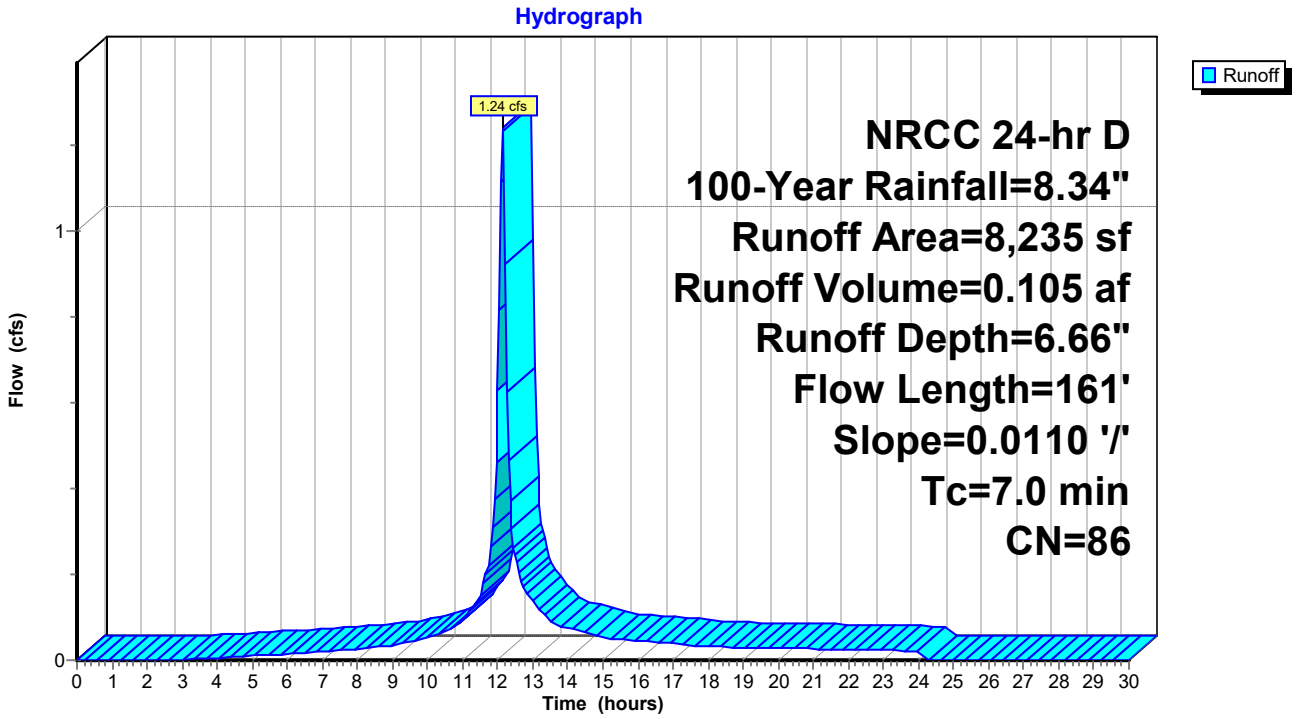
Runoff = 1.24 cfs @ 12.14 hrs, Volume= 0.105 af, Depth= 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,643	39	>75% Grass cover, Good, HSG A
5,799	98	Paved parking, HSG A
793	96	Gravel surface, HSG A
8,235	86	Weighted Average
2,436		29.58% Pervious Area
5,799		70.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment E15: TO DCB-C



Summary for Subcatchment E16: TO LOW POINT

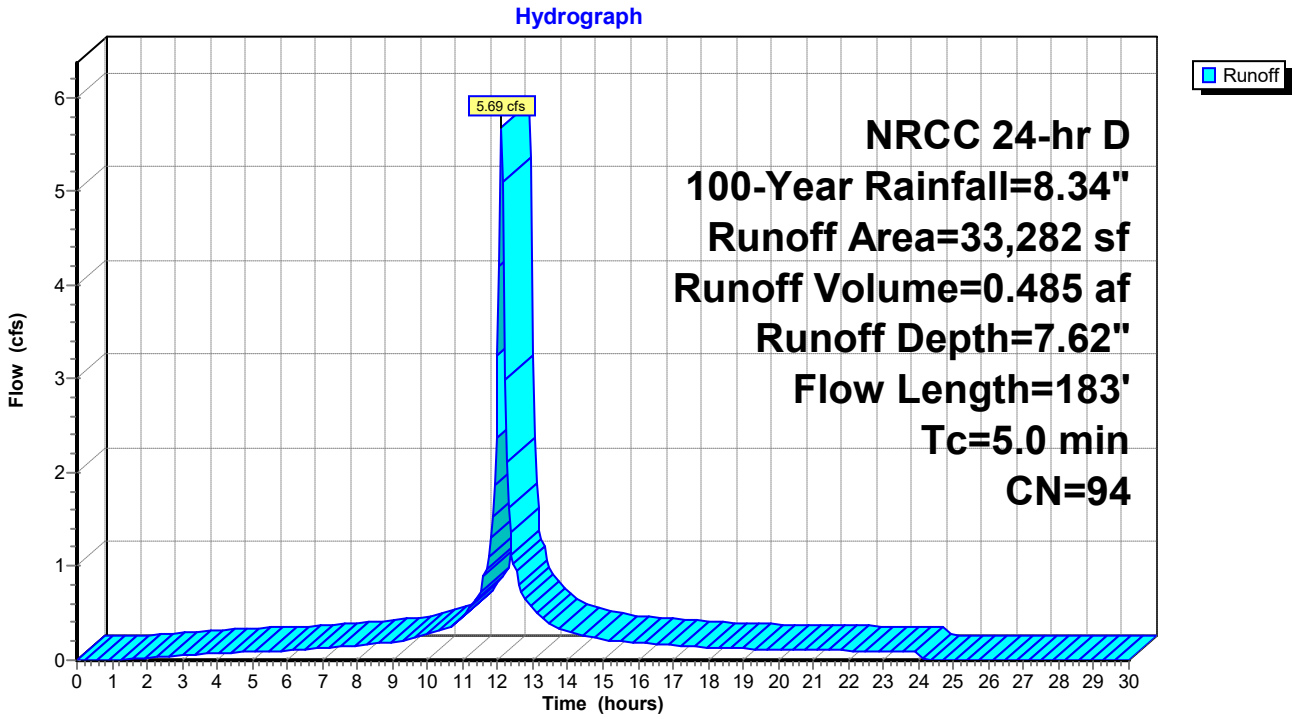
Runoff = 5.69 cfs @ 12.11 hrs, Volume= 0.485 af, Depth= 7.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,882	39	>75% Grass cover, Good, HSG A
14,426	98	Paved parking, HSG A
16,974	96	Gravel surface, HSG A
33,282	94	Weighted Average
18,856		56.66% Pervious Area
14,426		43.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.9	29	0.0040	0.56		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
2.2	133	0.0040	1.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	183	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E16: TO LOW POINT



Summary for Subcatchment E18: TO DCB-D

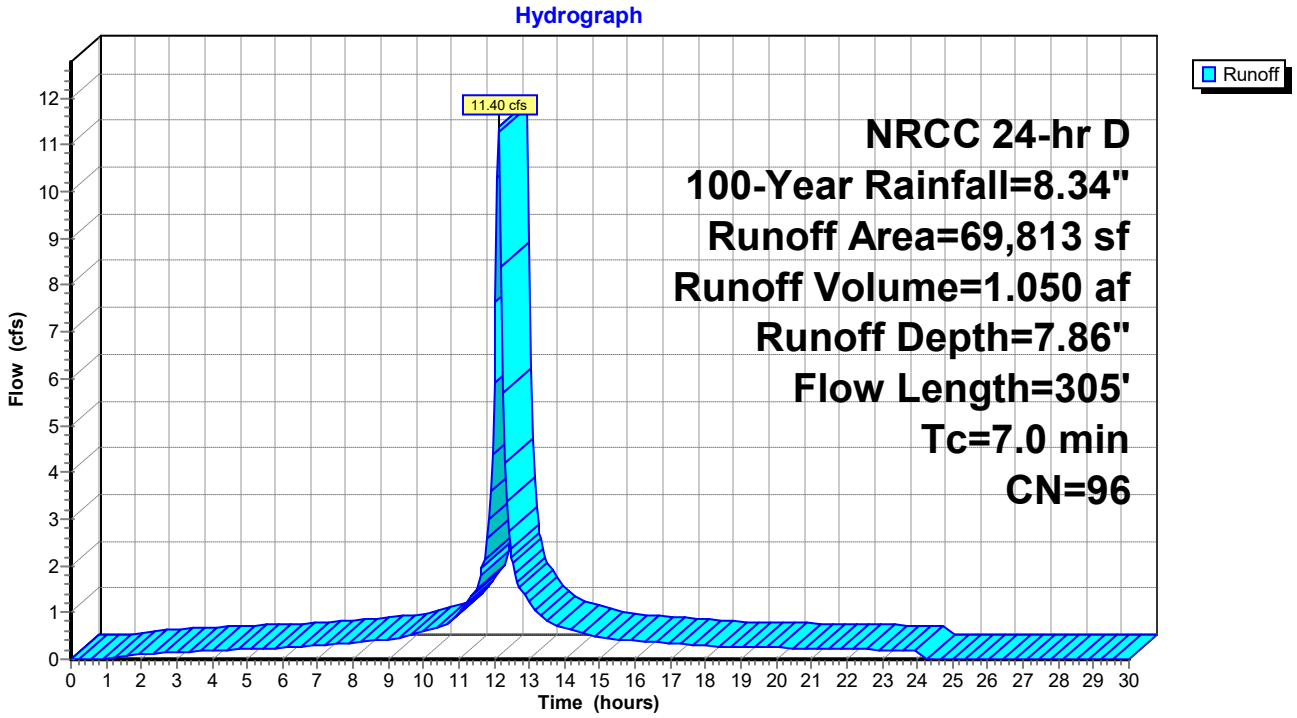
Runoff = 11.40 cfs @ 12.14 hrs, Volume= 1.050 af, Depth= 7.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
2,530	39	>75% Grass cover, Good, HSG A
65,894	98	Paved parking, HSG A
1,389	96	Gravel surface, HSG A
69,813	96	Weighted Average
3,919		5.61% Pervious Area
65,894		94.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	23	0.0120	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.6	27	0.0090	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	107	0.0090	1.53		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.4	148	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	305	Total			

Subcatchment E18: TO DCB-D



Summary for Subcatchment E19: TO DCB-E

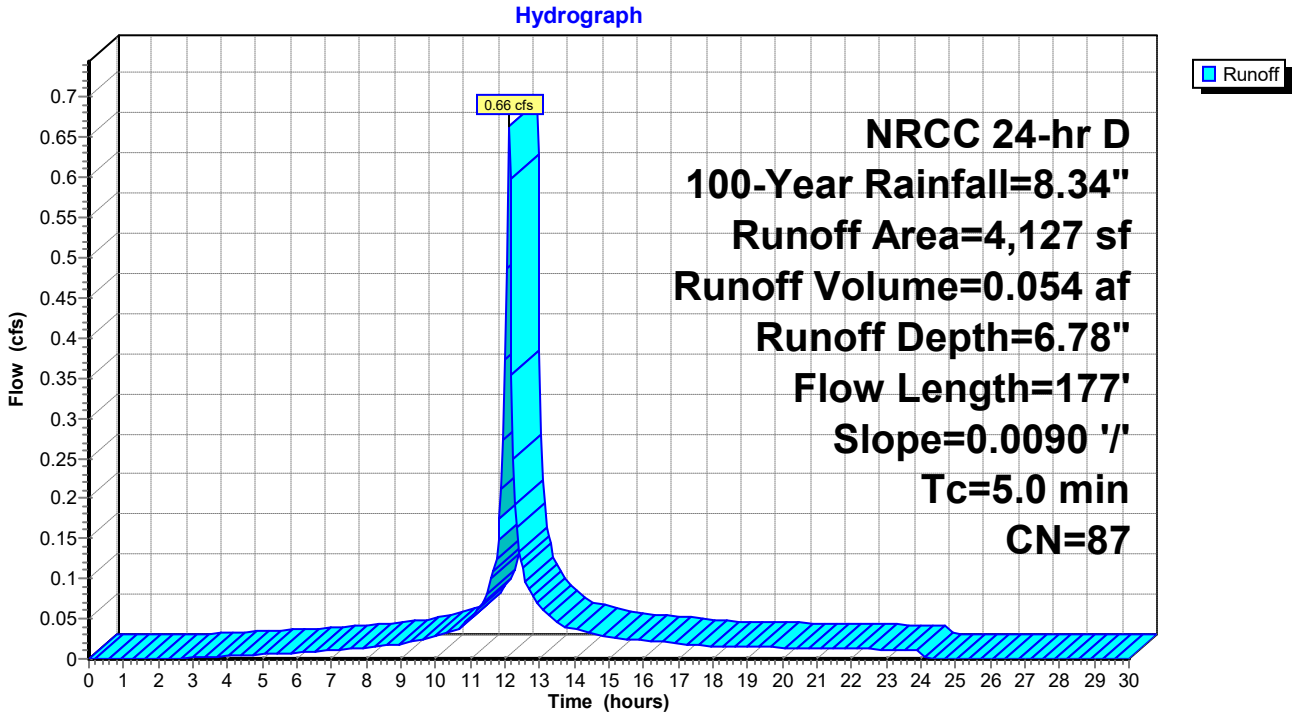
Runoff = 0.66 cfs @ 12.11 hrs, Volume= 0.054 af, Depth= 6.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
742	39	>75% Grass cover, Good, HSG A
3,385	98	Paved parking, HSG A
4,127	87	Weighted Average
742		17.98% Pervious Area
3,385		82.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E19: TO DCB-E



Summary for Subcatchment E20: TO DP#3

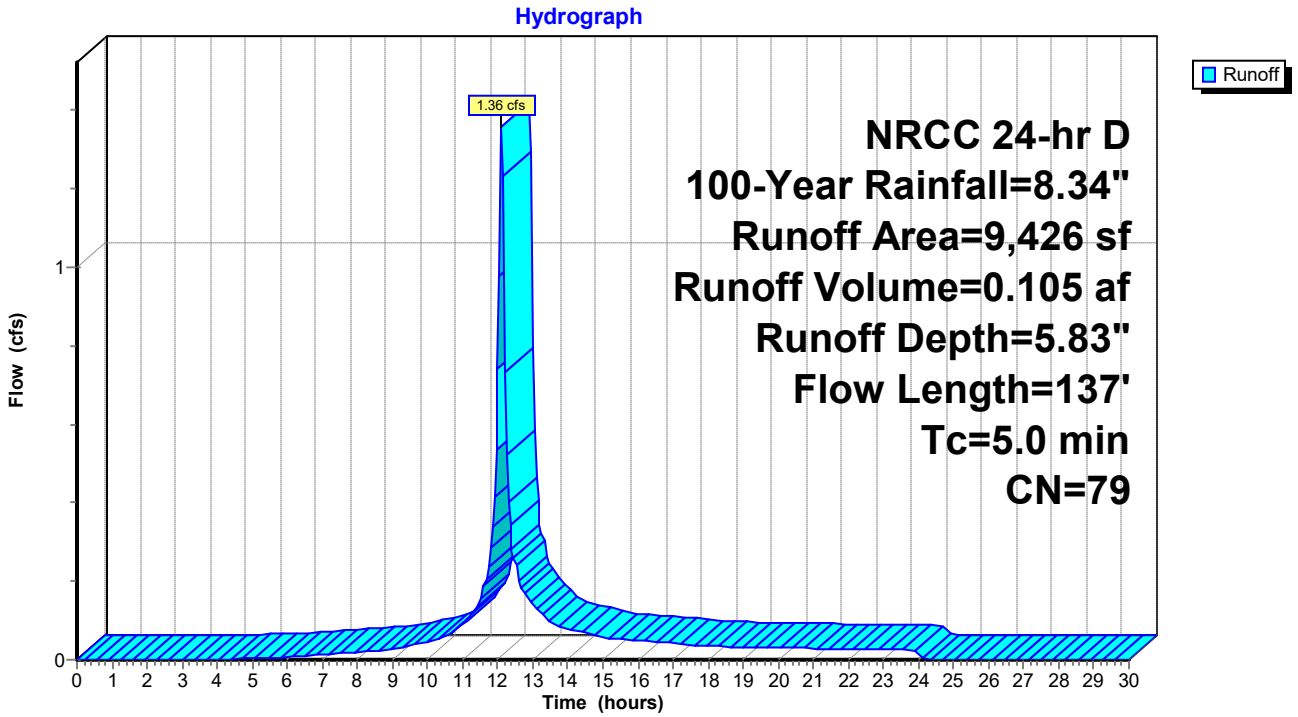
Runoff = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Depth= 5.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
3,009	39	>75% Grass cover, Good, HSG A
6,417	98	Paved parking, HSG A
9,426	79	Weighted Average
3,009		31.92% Pervious Area
6,417		68.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0300	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	26	0.1300	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	6	0.0150	0.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	87	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	137	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E20: TO DP#3



Summary for Subcatchment E21: TO EX DCB

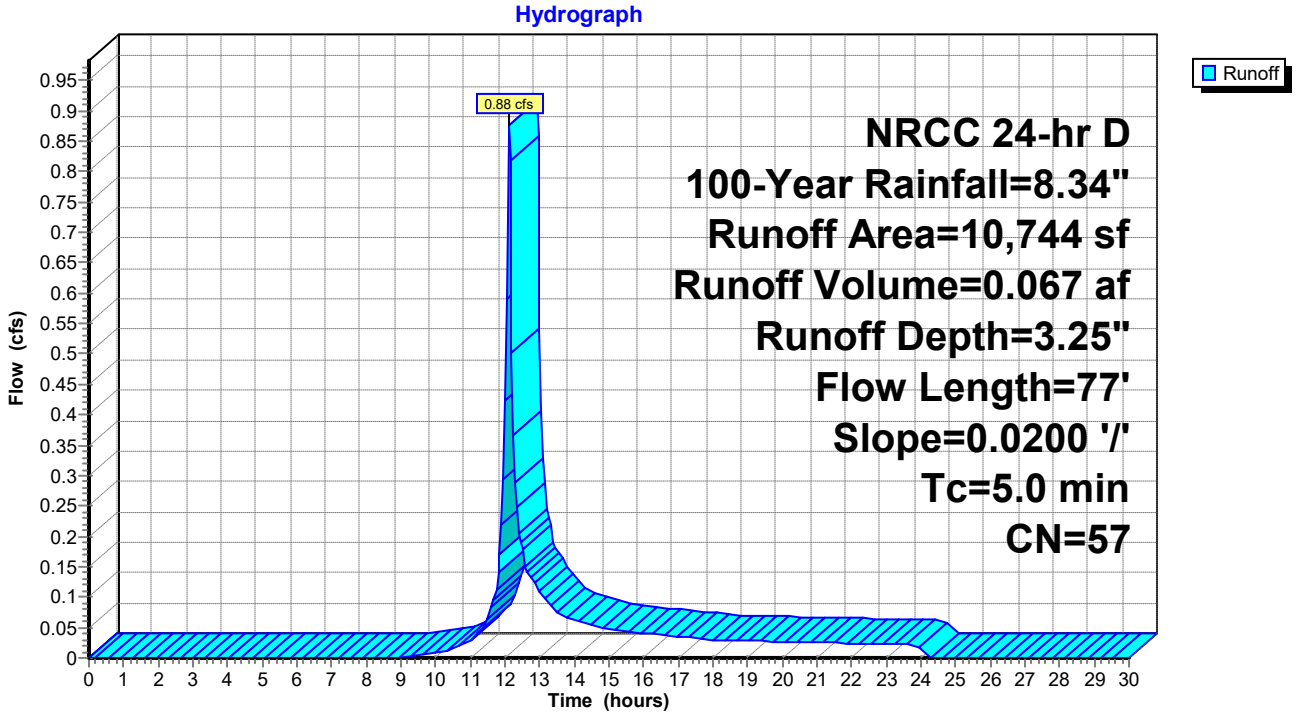
Runoff = 0.88 cfs @ 12.12 hrs, Volume= 0.067 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
7,522	39	>75% Grass cover, Good, HSG A
3,222	98	Paved parking, HSG A
10,744	57	Weighted Average
7,522		70.01% Pervious Area
3,222		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	43	0.0200	1.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	7	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	27	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.0	77	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E21: TO EX DCB



Summary for Subcatchment E22: TO YD-A

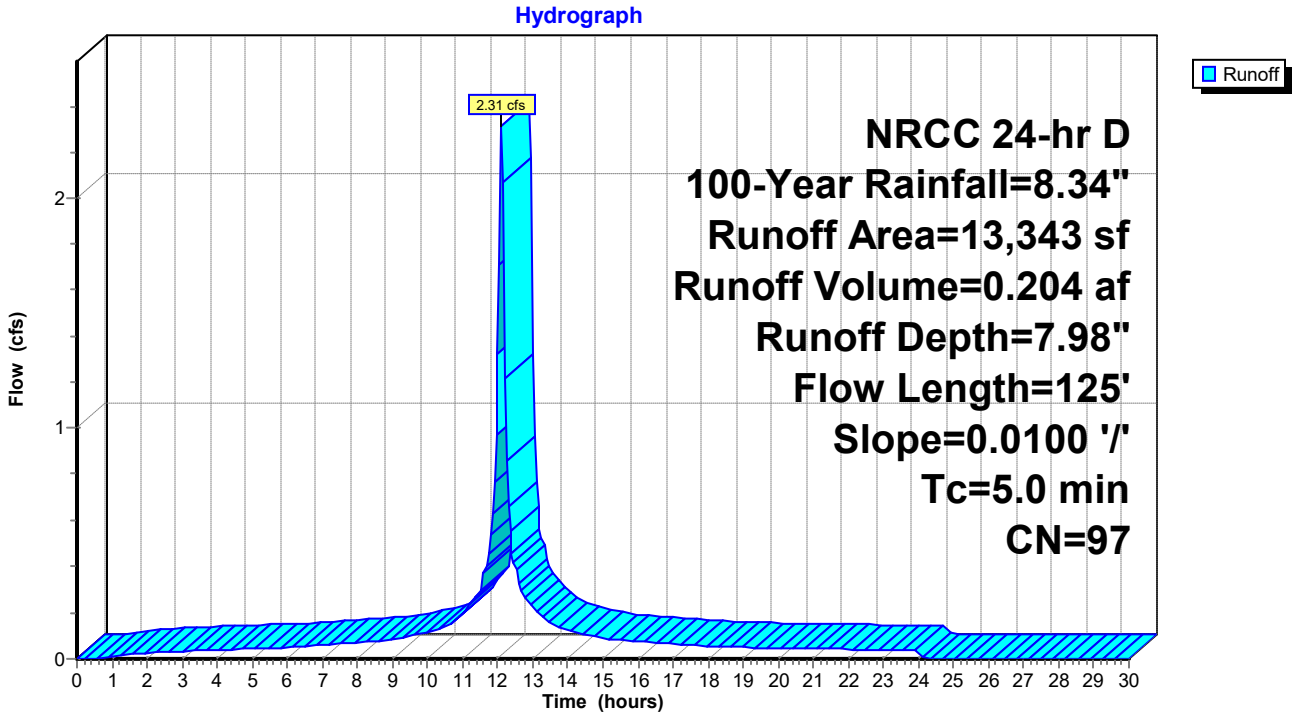
Runoff = 2.31 cfs @ 12.11 hrs, Volume= 0.204 af, Depth= 7.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
7,866	98	Paved parking, HSG A
5,477	96	Gravel surface, HSG A
13,343	97	Weighted Average
5,477		41.05% Pervious Area
7,866		58.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow, GRAVEL** Smooth surfaces n= 0.011 P2= 3.13"
0.8	75	0.0100	1.61		**Shallow Concentrated Flow, GRAVEL** Unpaved Kv= 16.1 fps
1.7	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E22: TO YD-A



Summary for Subcatchment E23: TO DCB-F/G

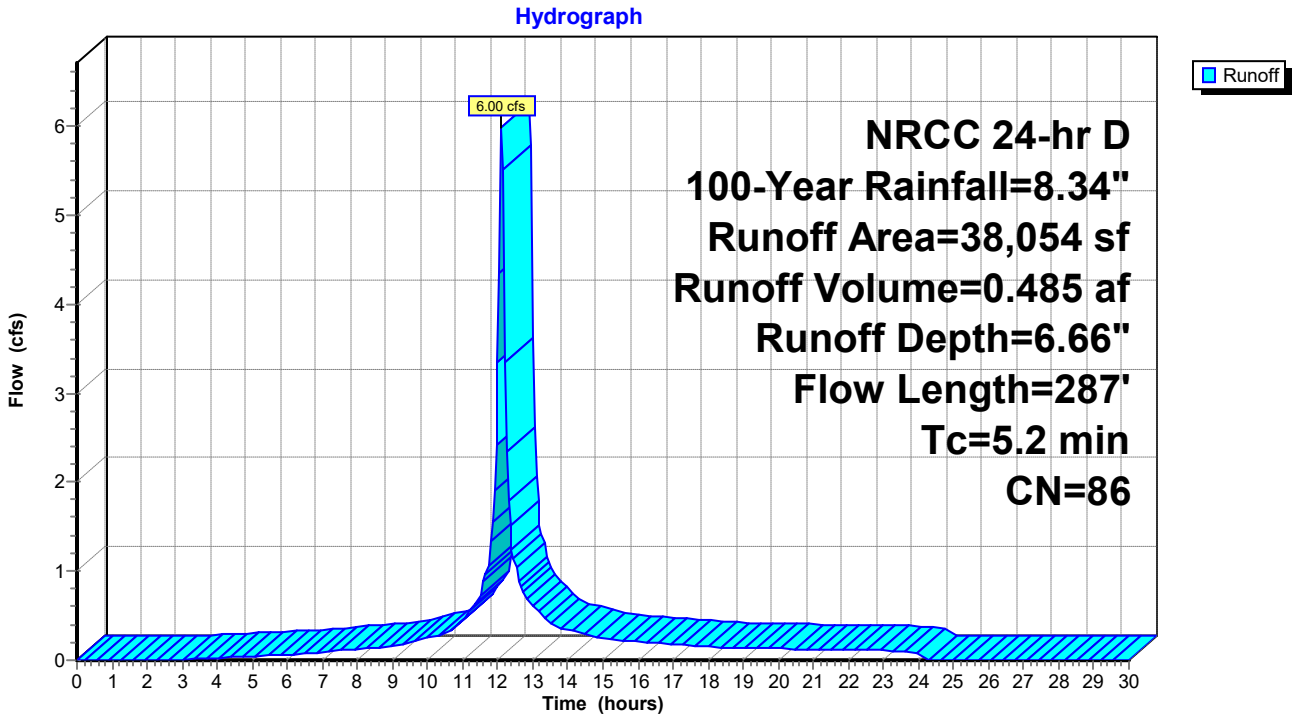
Runoff = 6.00 cfs @ 12.11 hrs, Volume= 0.485 af, Depth= 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
7,964	39	>75% Grass cover, Good, HSG A
29,865	98	Paved parking, HSG A
225	96	Gravel surface, HSG A
38,054	86	Weighted Average
8,189		21.52% Pervious Area
29,865		78.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	21	0.0800	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.8	29	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.8	237	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	287	Total			

Subcatchment E23: TO DCB-F/G



Summary for Subcatchment E24: TO DP#4

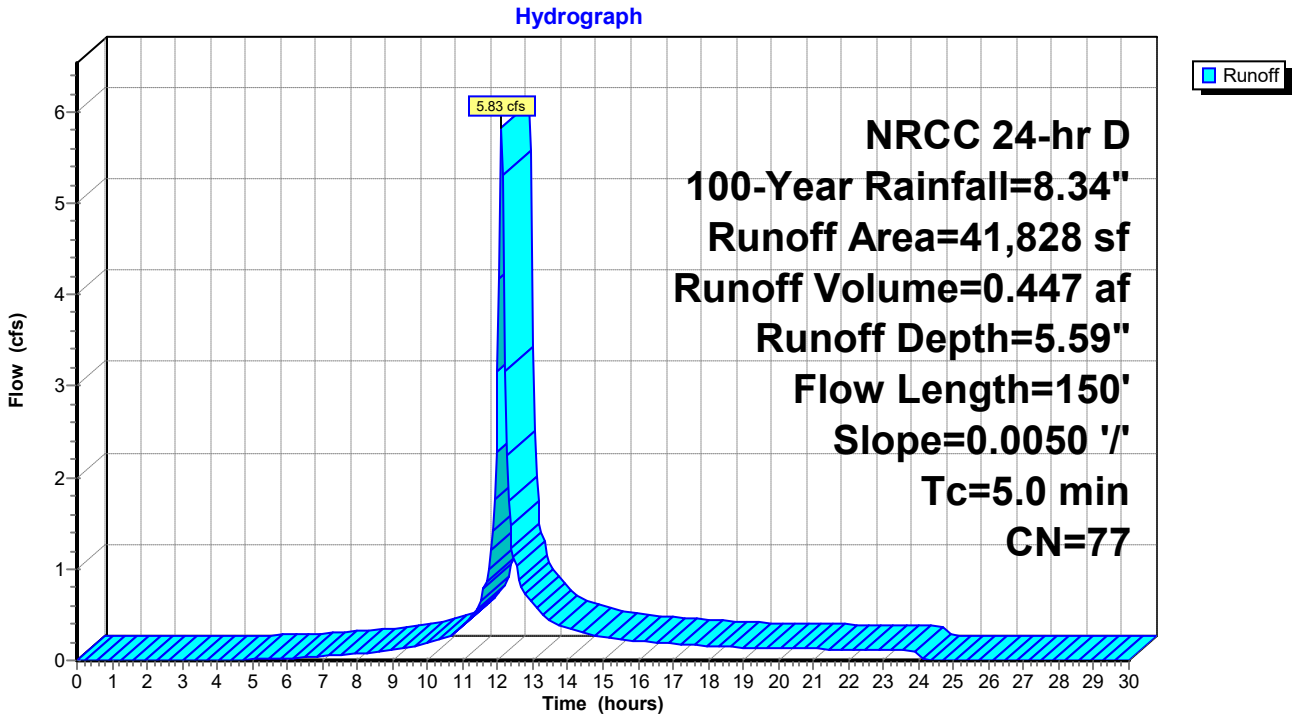
Runoff = 5.83 cfs @ 12.11 hrs, Volume= 0.447 af, Depth= 5.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
5,248	39	>75% Grass cover, Good, HSG A
24,960	98	Paved parking, HSG A
11,620	48	Brush, Poor, HSG A
41,828	77	Weighted Average
16,868		40.33% Pervious Area
24,960		59.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.68		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.2	100	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO DP#4



Summary for Subcatchment E26: TO DCB-H

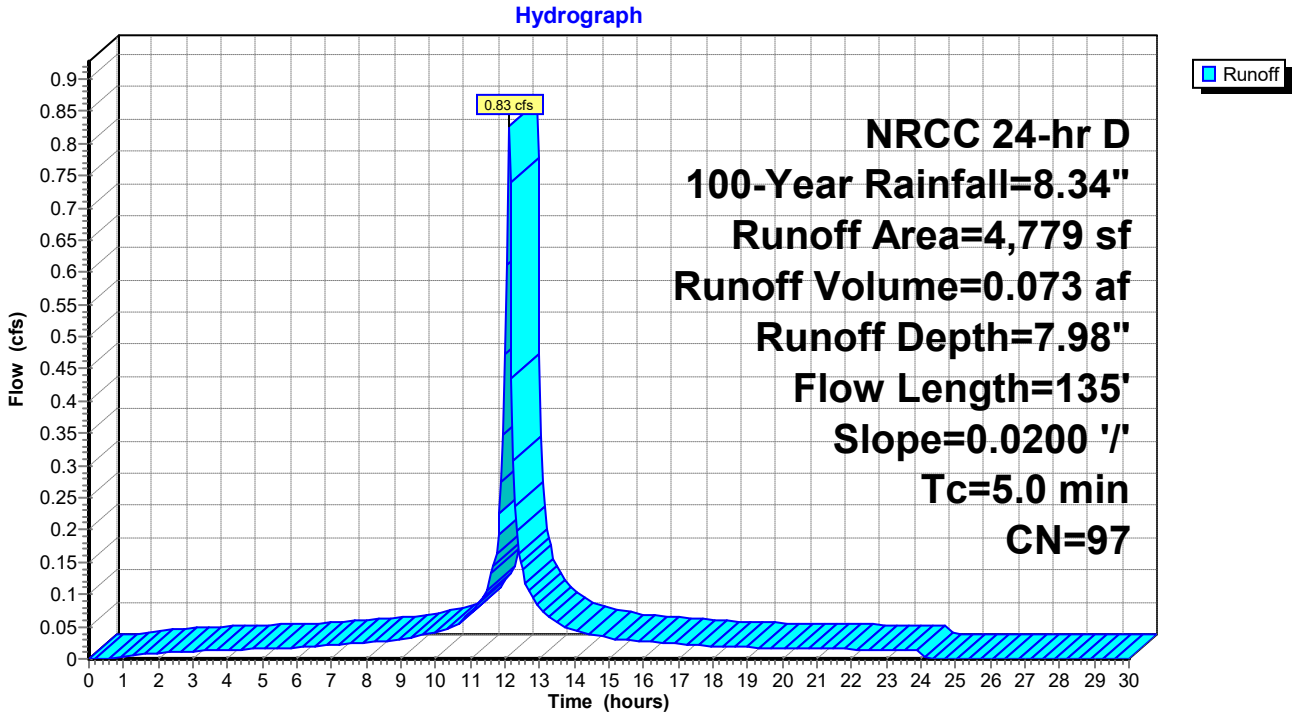
Runoff = 0.83 cfs @ 12.11 hrs, Volume= 0.073 af, Depth= 7.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,787	98	Paved parking, HSG A
2,992	96	Gravel surface, HSG A
4,779	97	Weighted Average
2,992		62.61% Pervious Area
1,787		37.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	85	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	135	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E26: TO DCB-H

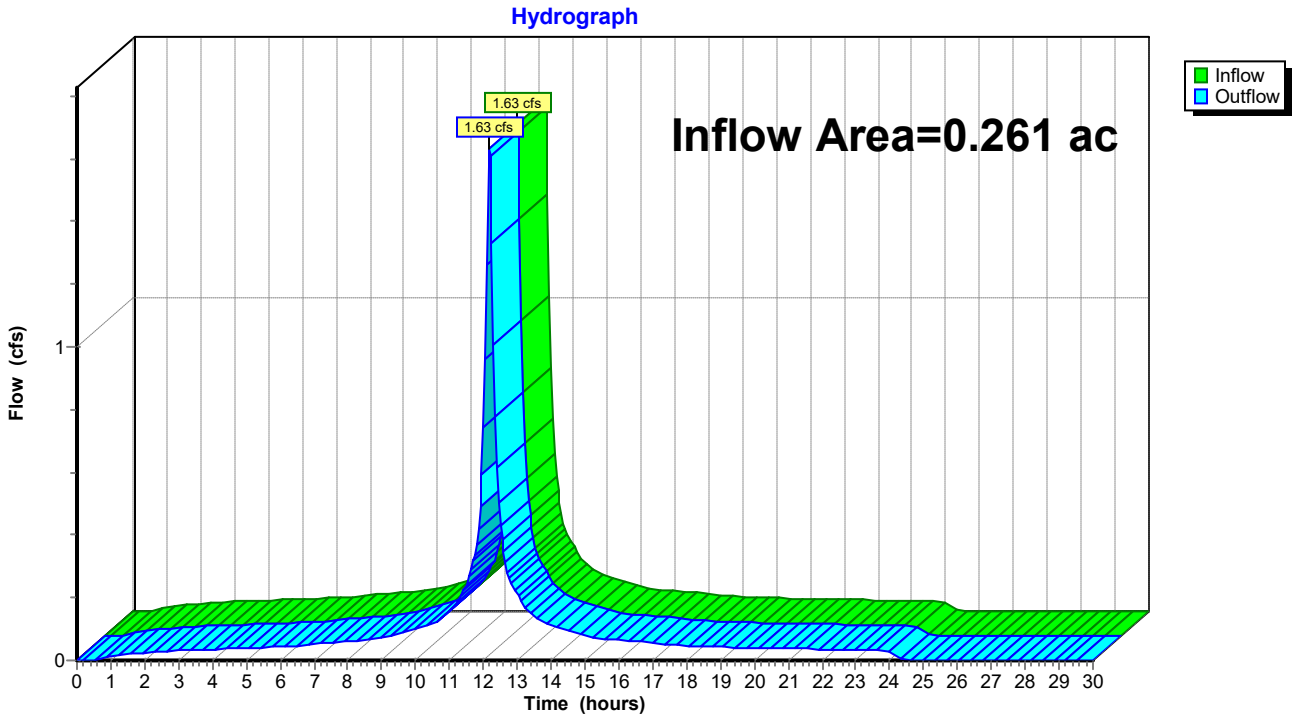


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.261 ac, 80.04% Impervious, Inflow Depth = 8.10" for 100-Year event
Inflow = 1.63 cfs @ 12.18 hrs, Volume= 0.176 af
Outflow = 1.63 cfs @ 12.18 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

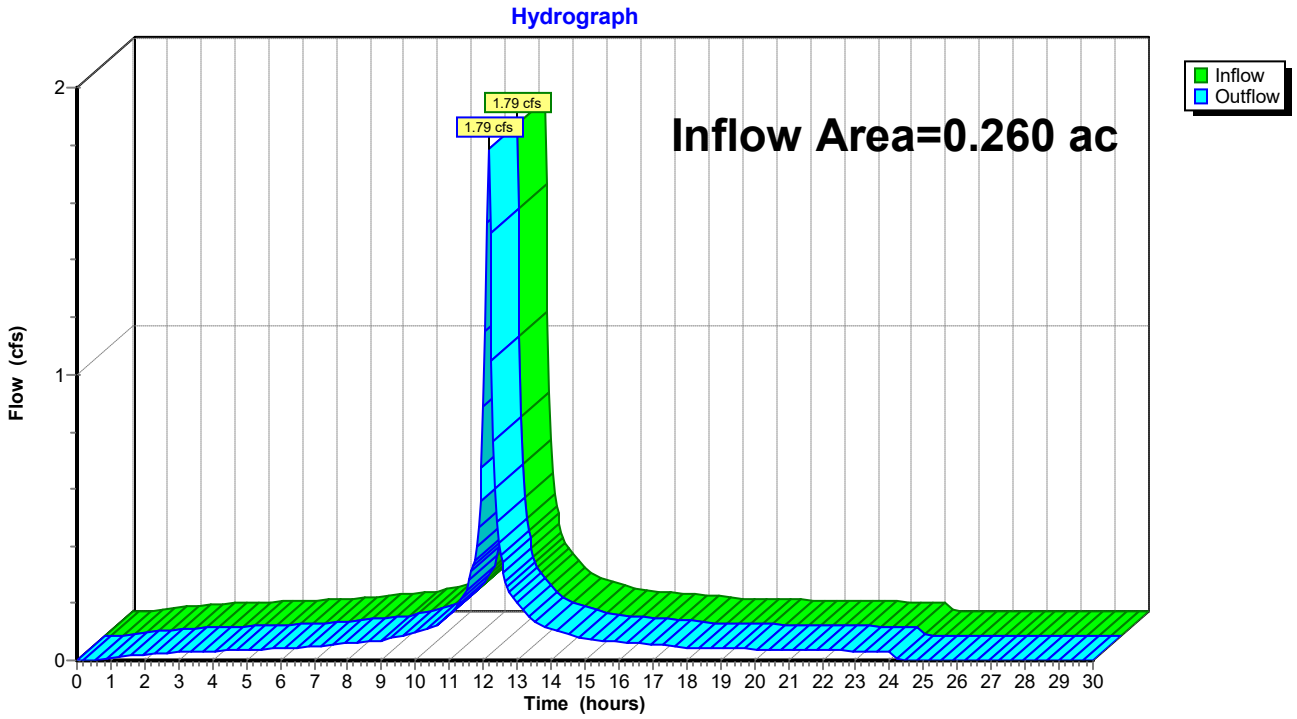


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.260 ac, 55.37% Impervious, Inflow Depth = 7.98" for 100-Year event
Inflow = 1.79 cfs @ 12.15 hrs, Volume= 0.173 af
Outflow = 1.79 cfs @ 12.15 hrs, Volume= 0.173 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

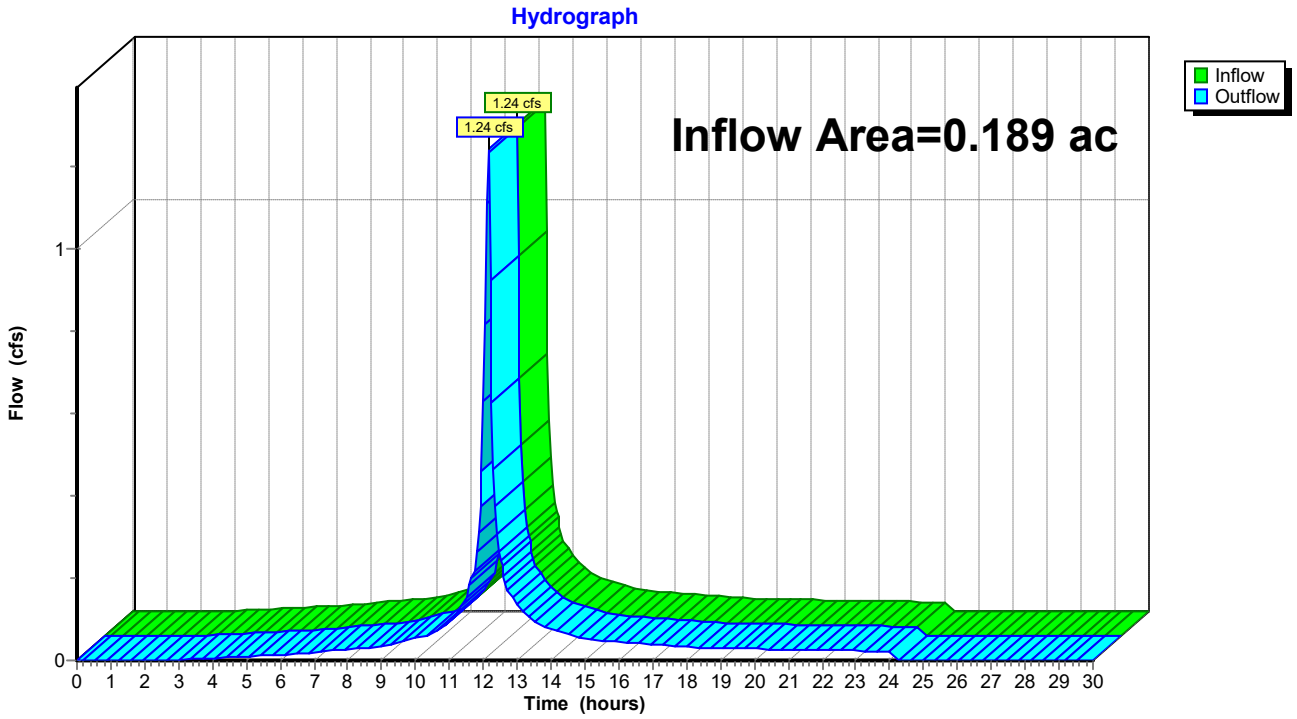


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.189 ac, 70.42% Impervious, Inflow Depth = 6.66" for 100-Year event
Inflow = 1.24 cfs @ 12.14 hrs, Volume= 0.105 af
Outflow = 1.24 cfs @ 12.14 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



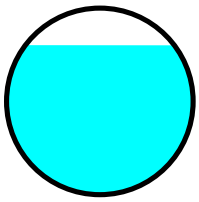
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 7.78" for 100-Year event
Inflow = 16.71 cfs @ 12.13 hrs, Volume= 1.534 af
Outflow = 16.71 cfs @ 12.13 hrs, Volume= 1.534 af, Atten= 0%, Lag= 0.0 min

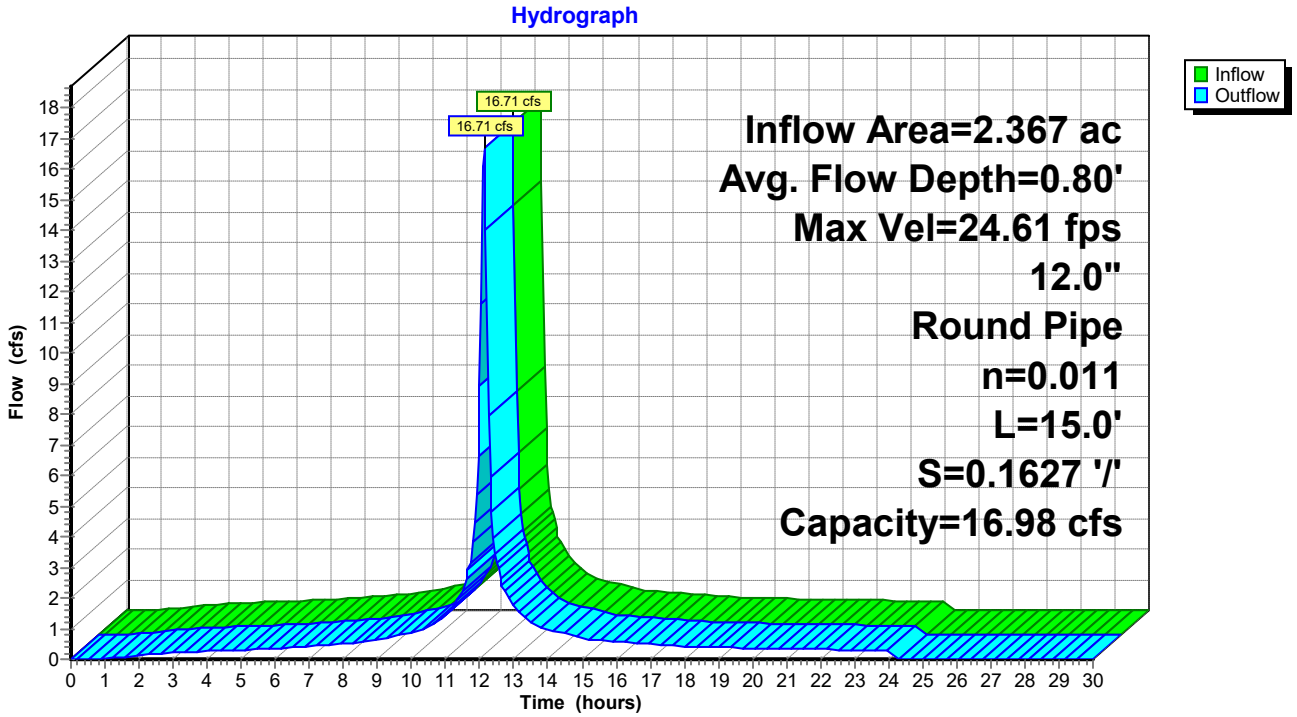
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 24.61 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.64 fps, Avg. Travel Time= 0.0 min

Peak Storage= 10 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.98 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.1627 '/'
Inlet Invert= 469.11', Outlet Invert= 466.67'



Reach DCB-D: TO DMH-A



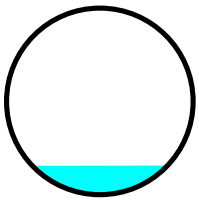
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.095 ac, 82.02% Impervious, Inflow Depth = 6.78" for 100-Year event
Inflow = 0.66 cfs @ 12.11 hrs, Volume= 0.054 af
Outflow = 0.66 cfs @ 12.11 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

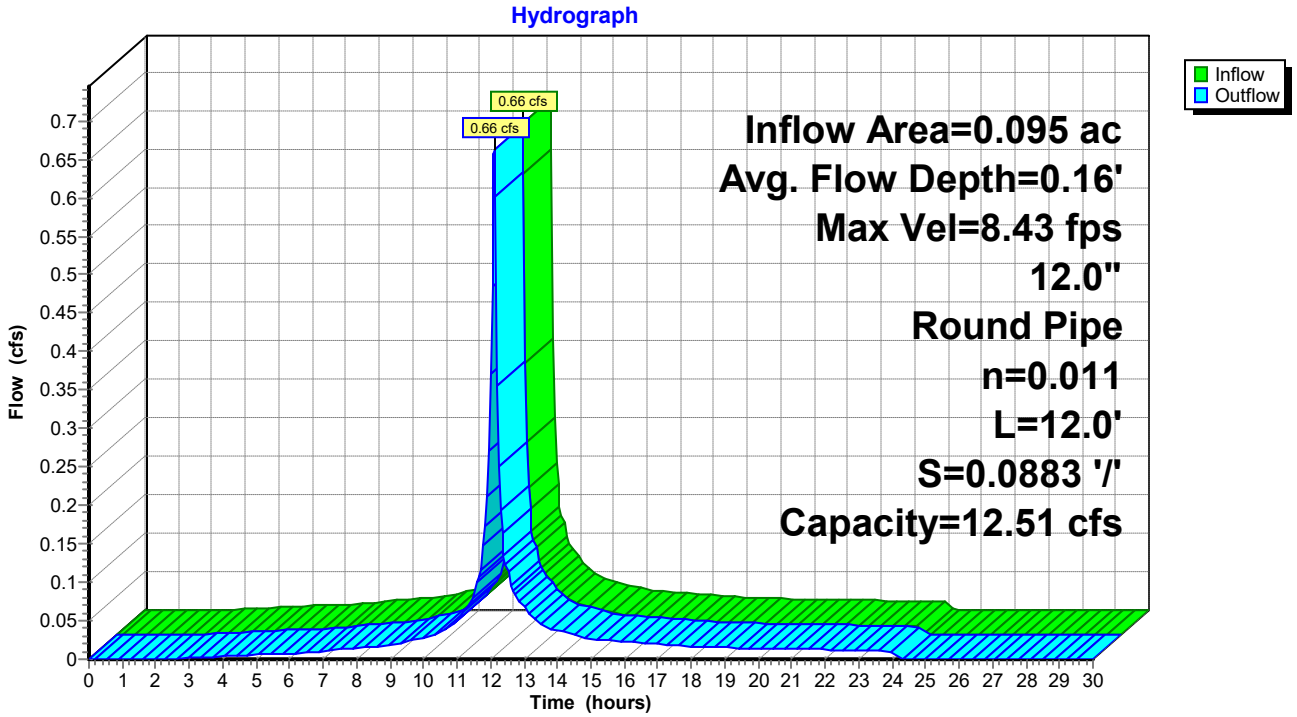
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.43 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.91 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A

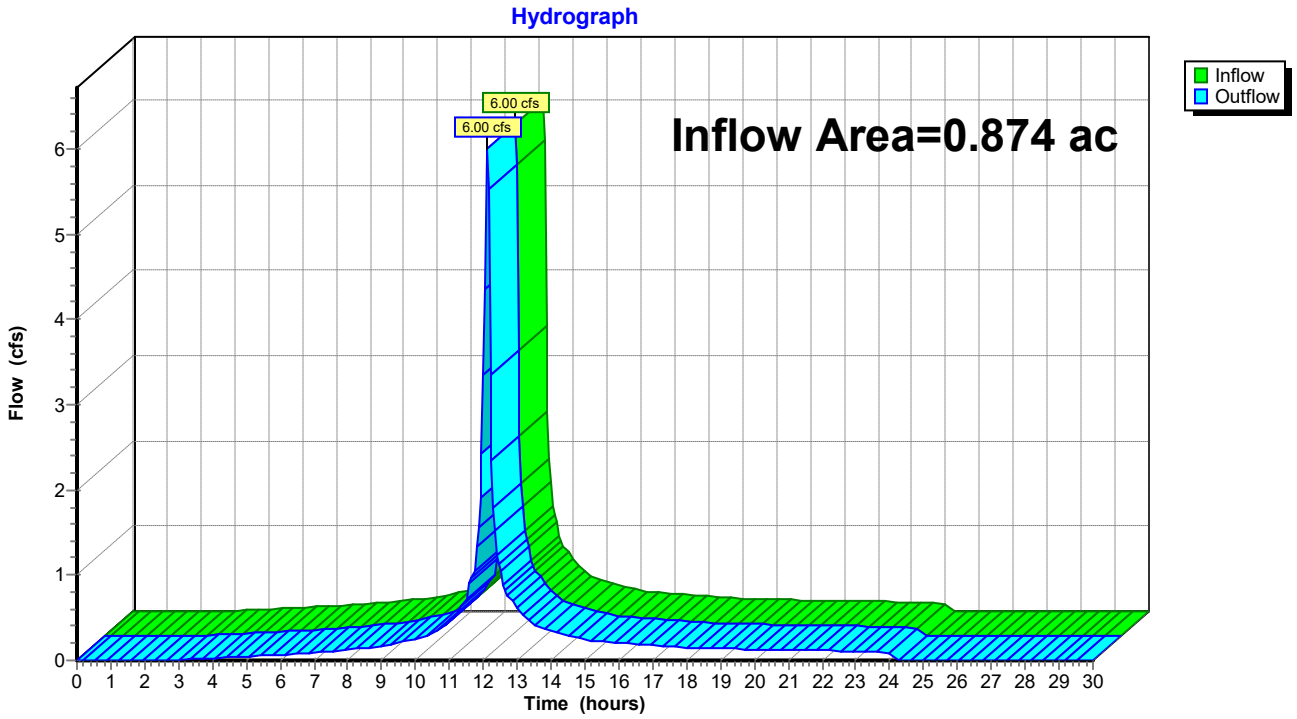


Summary for Reach DCB-F: (new Reach)

Inflow Area = 0.874 ac, 78.48% Impervious, Inflow Depth = 6.66" for 100-Year event
Inflow = 6.00 cfs @ 12.11 hrs, Volume= 0.485 af
Outflow = 6.00 cfs @ 12.11 hrs, Volume= 0.485 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-F: (new Reach)

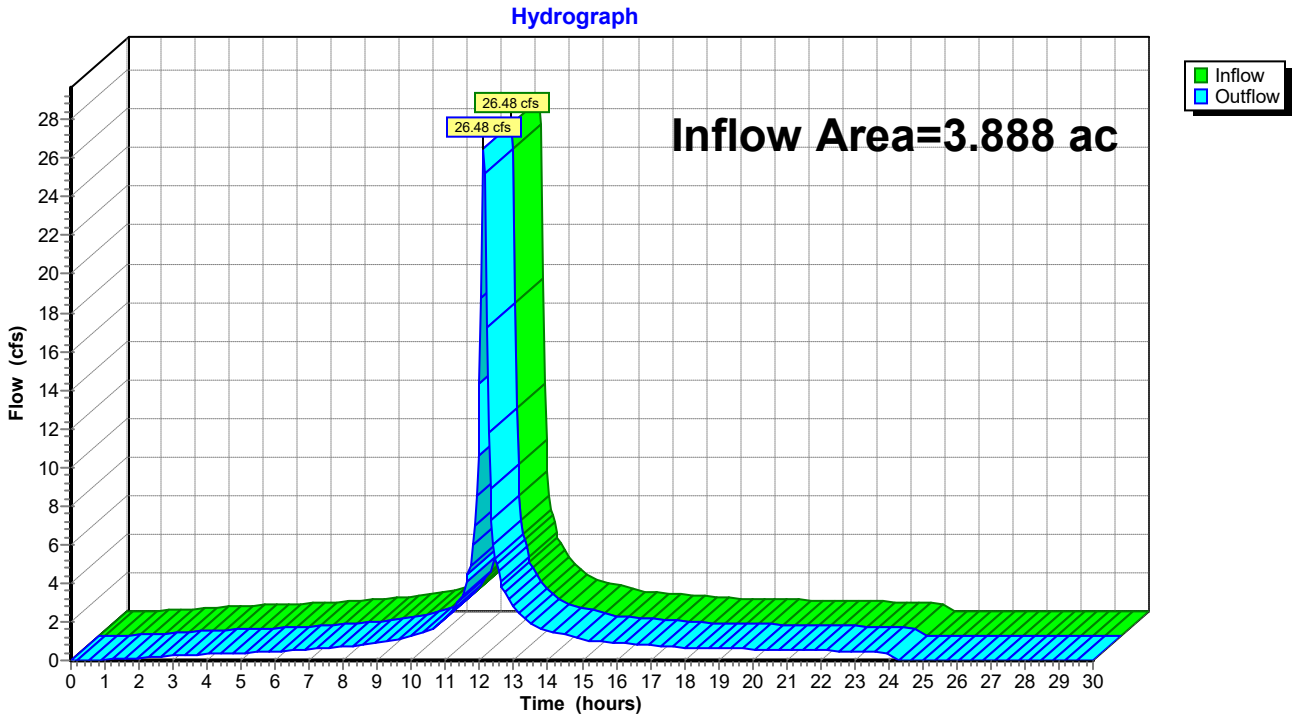


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 7.23" for 100-Year event
Inflow = 26.48 cfs @ 12.12 hrs, Volume= 2.343 af
Outflow = 26.48 cfs @ 12.12 hrs, Volume= 2.343 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

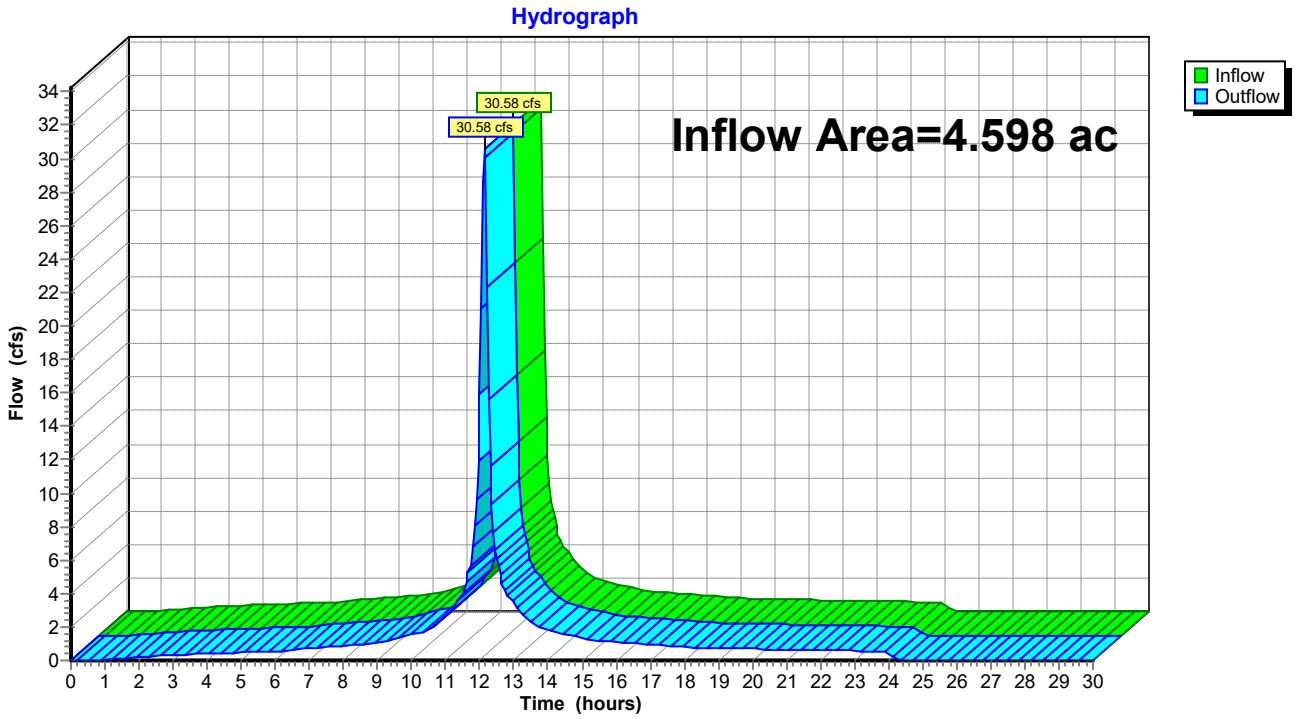


Summary for Reach DMH-C: TO DP#1

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 30.58 cfs @ 12.13 hrs, Volume= 2.797 af
Outflow = 30.58 cfs @ 12.13 hrs, Volume= 2.797 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



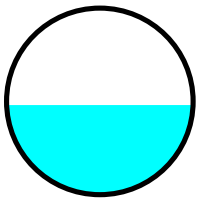
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 30.68 cfs @ 12.13 hrs, Volume= 2.797 af
Outflow = 30.58 cfs @ 12.13 hrs, Volume= 2.797 af, Atten= 0%, Lag= 0.4 min

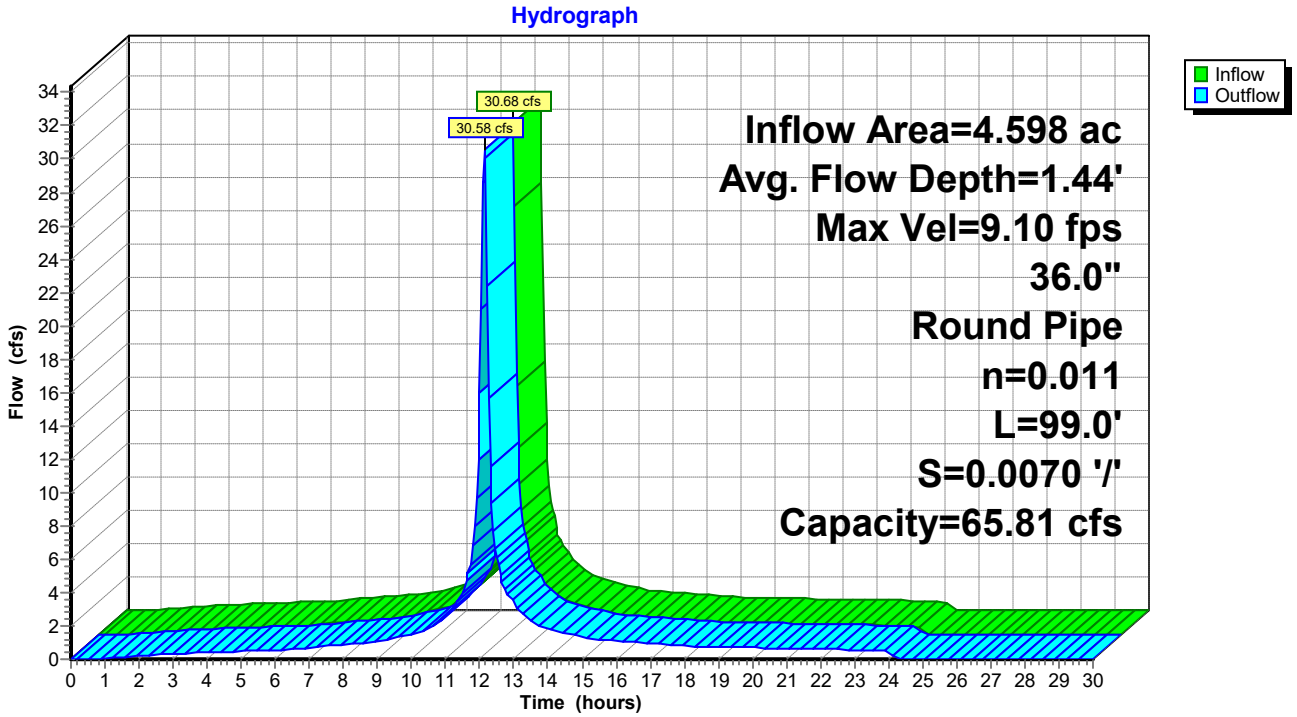
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.10 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.26 fps, Avg. Travel Time= 0.5 min

Peak Storage= 333 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



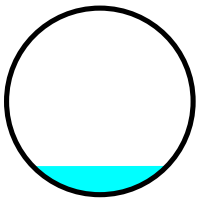
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.449 ac, 61.71% Impervious, Inflow Depth = 7.42" for 100-Year event
Inflow = 3.03 cfs @ 12.14 hrs, Volume= 0.278 af
Outflow = 2.95 cfs @ 12.15 hrs, Volume= 0.278 af, Atten= 3%, Lag= 0.6 min

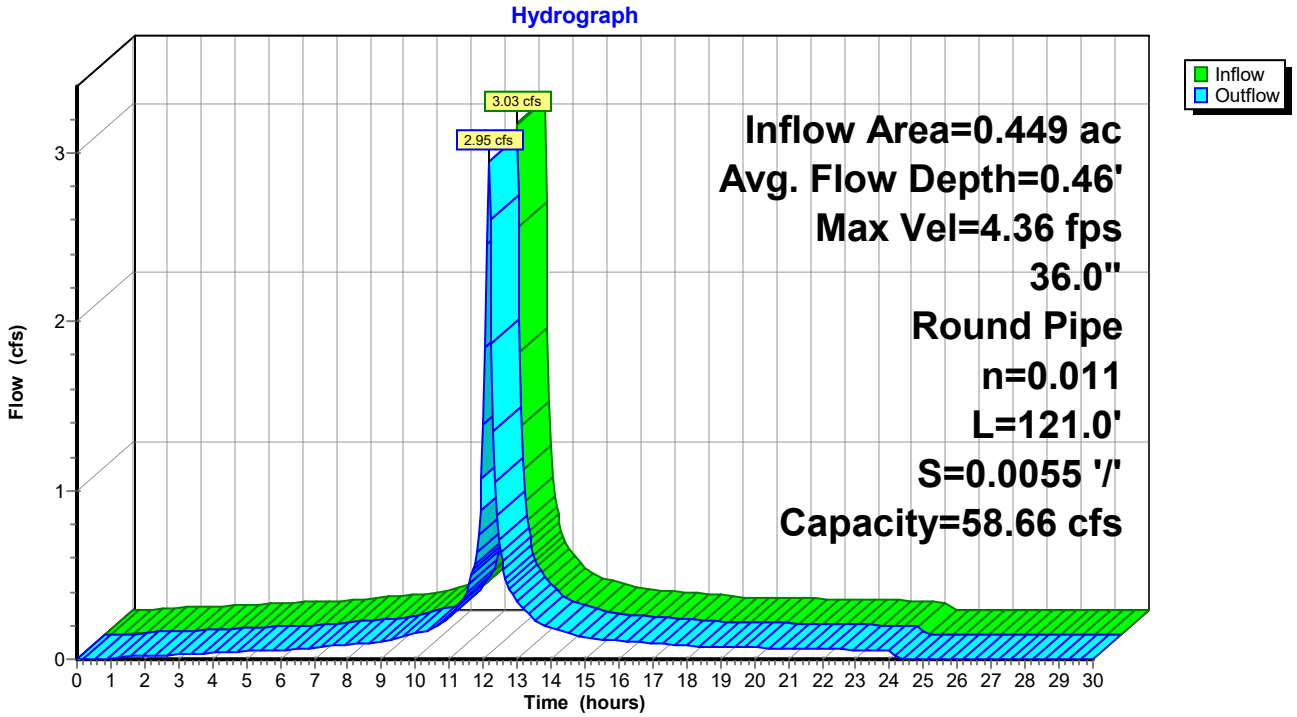
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.36 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 1.3 min

Peak Storage= 84 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.66 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 121.0' Slope= 0.0055 '/'
Inlet Invert= 456.57', Outlet Invert= 455.90'



Reach DMH-E: TO DMH-D



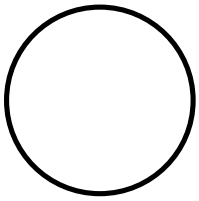
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

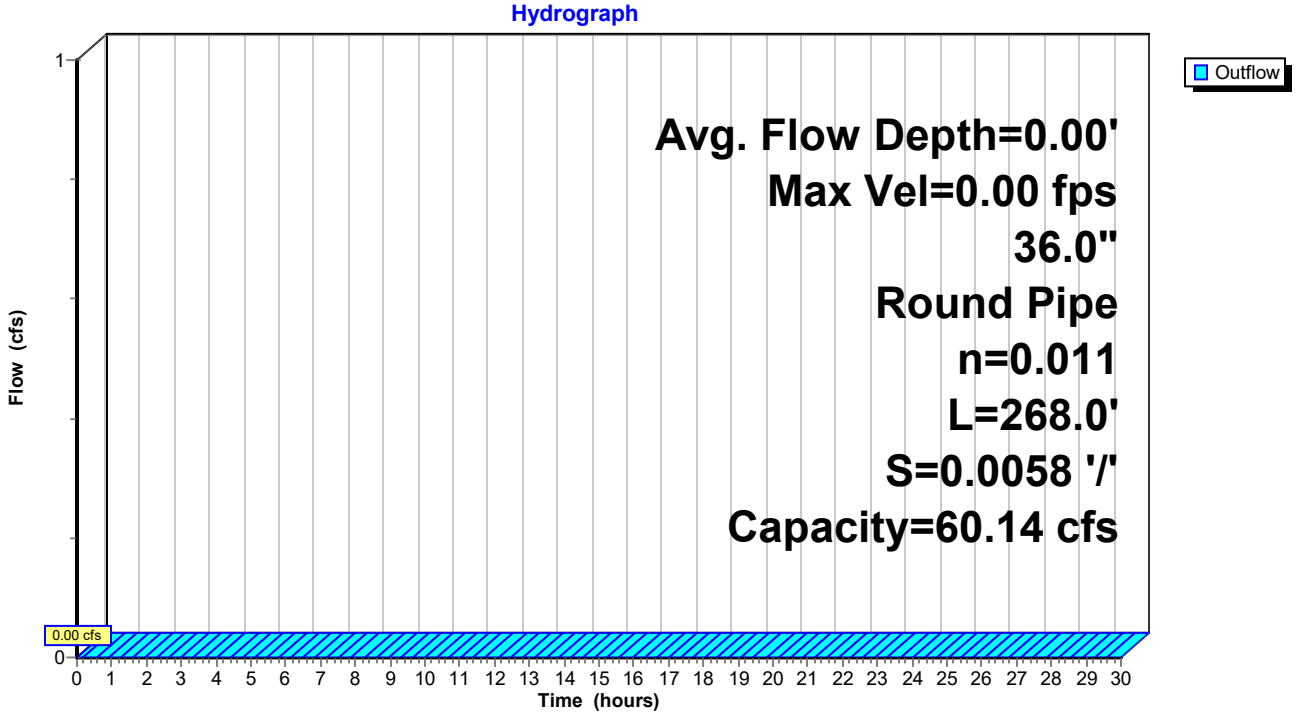
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E

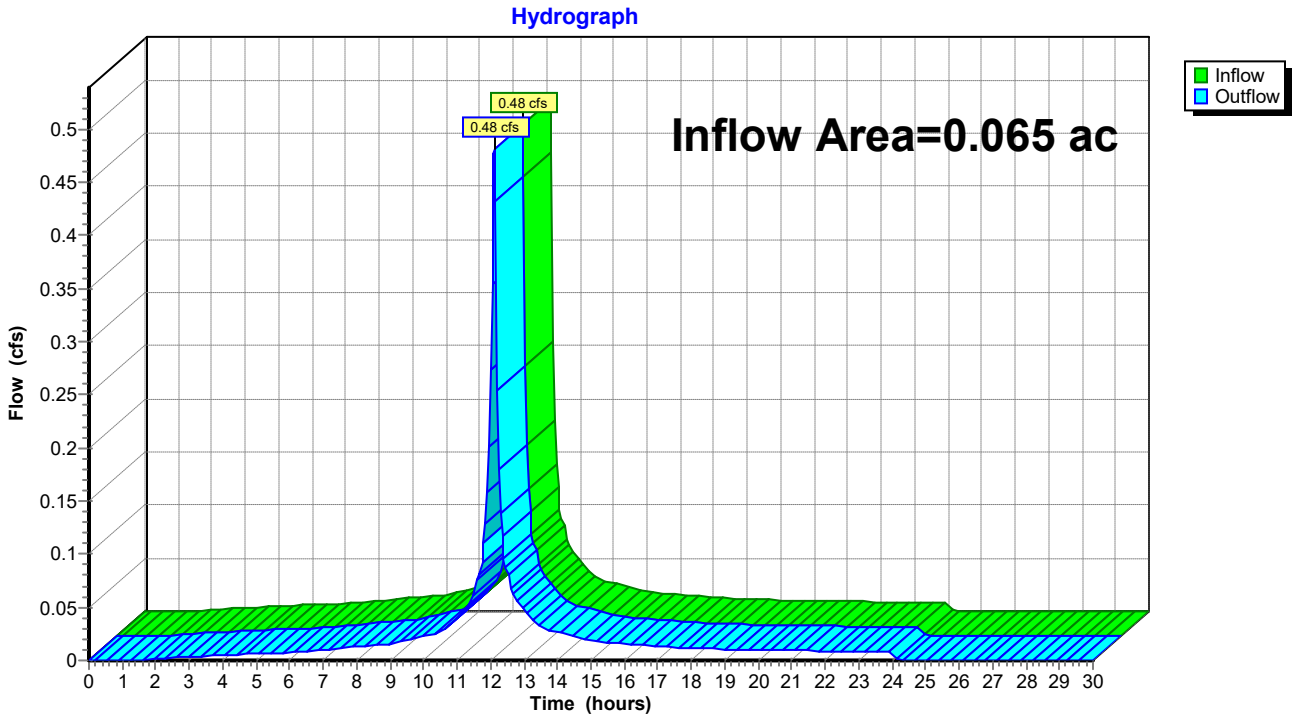


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 7.38" for 100-Year event
Inflow = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af
Outflow = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

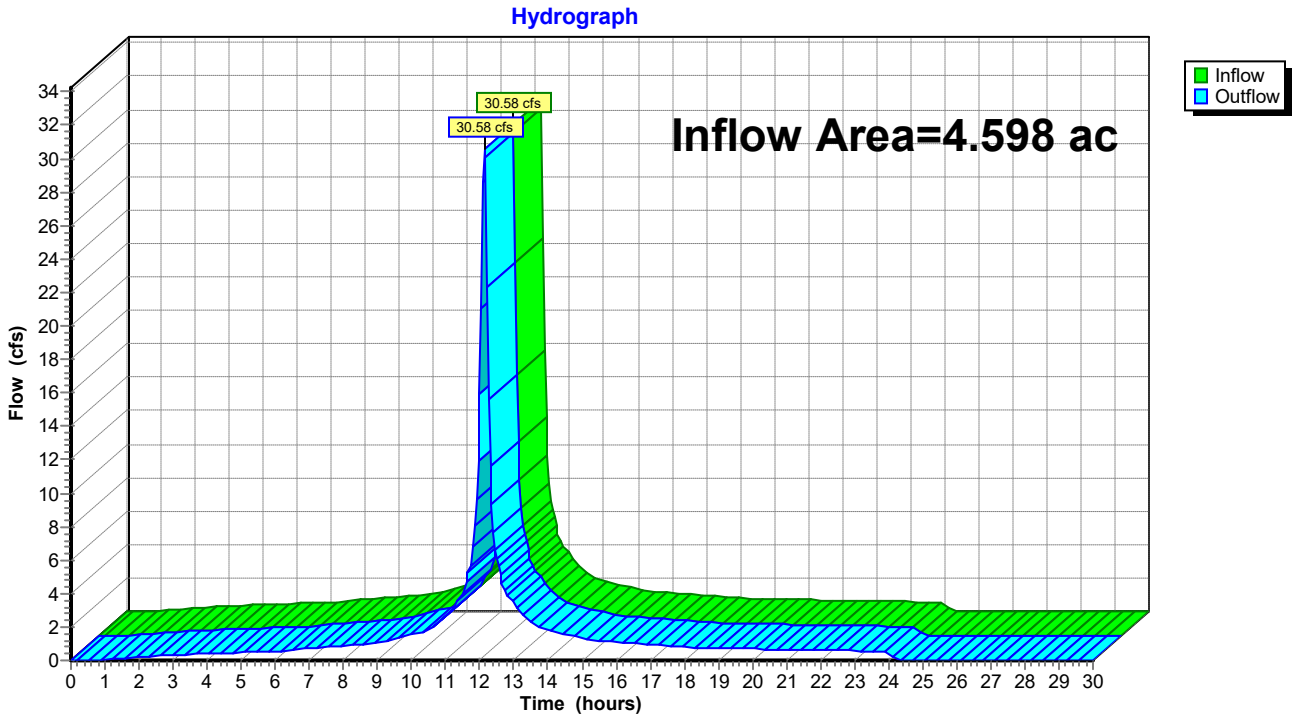


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 30.58 cfs @ 12.13 hrs, Volume= 2.797 af
Outflow = 30.58 cfs @ 12.13 hrs, Volume= 2.797 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

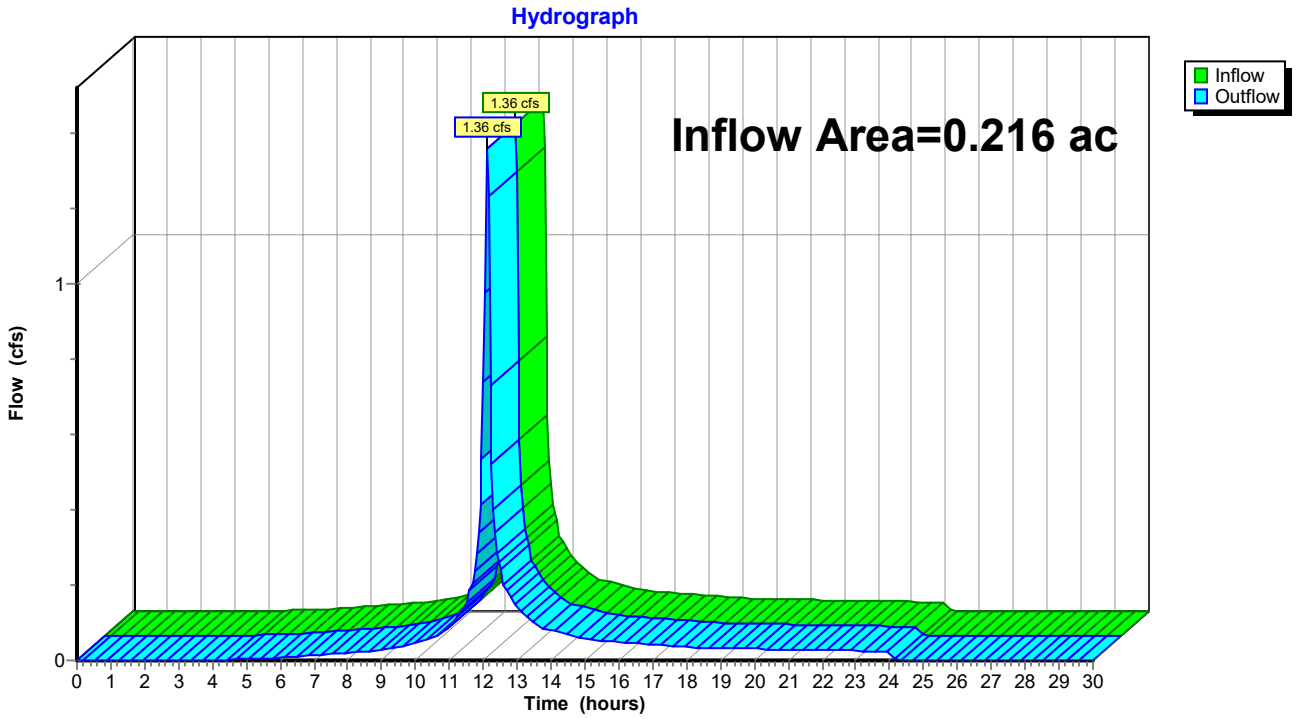


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.216 ac, 68.08% Impervious, Inflow Depth = 5.83" for 100-Year event
Inflow = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af
Outflow = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

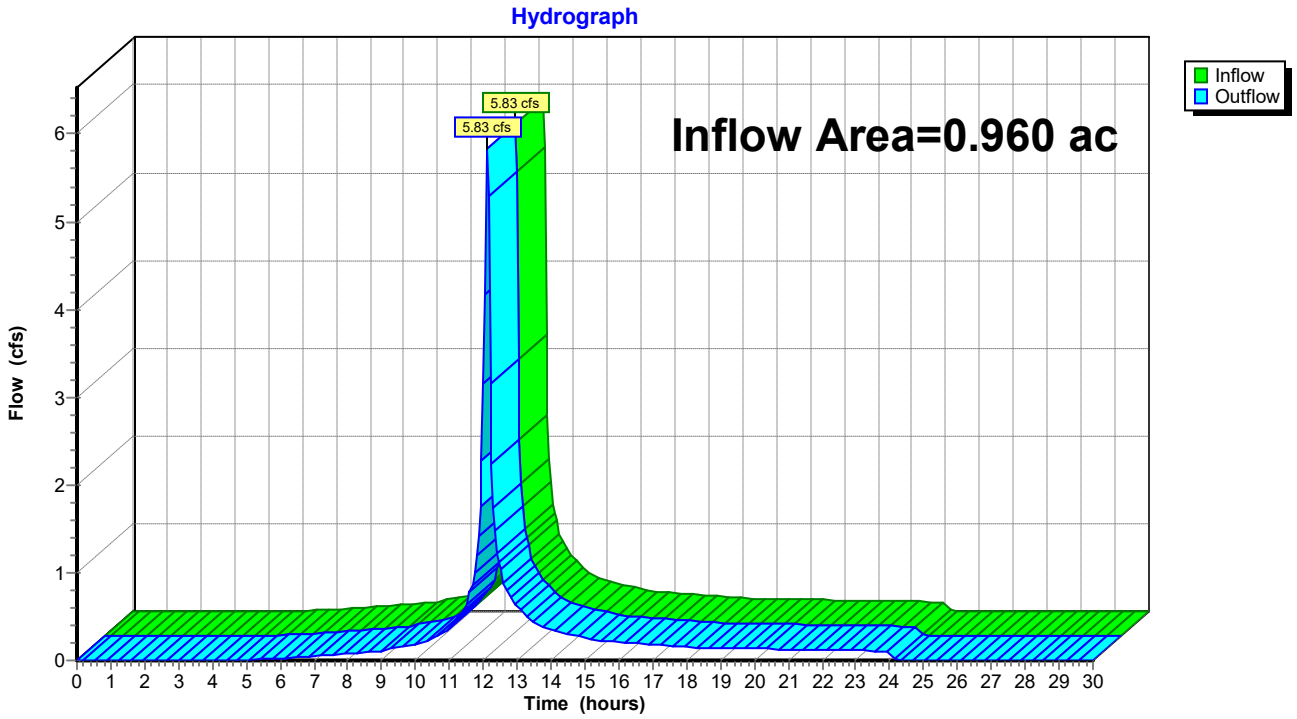


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.960 ac, 59.67% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 5.83 cfs @ 12.11 hrs, Volume= 0.447 af
Outflow = 5.83 cfs @ 12.11 hrs, Volume= 0.447 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

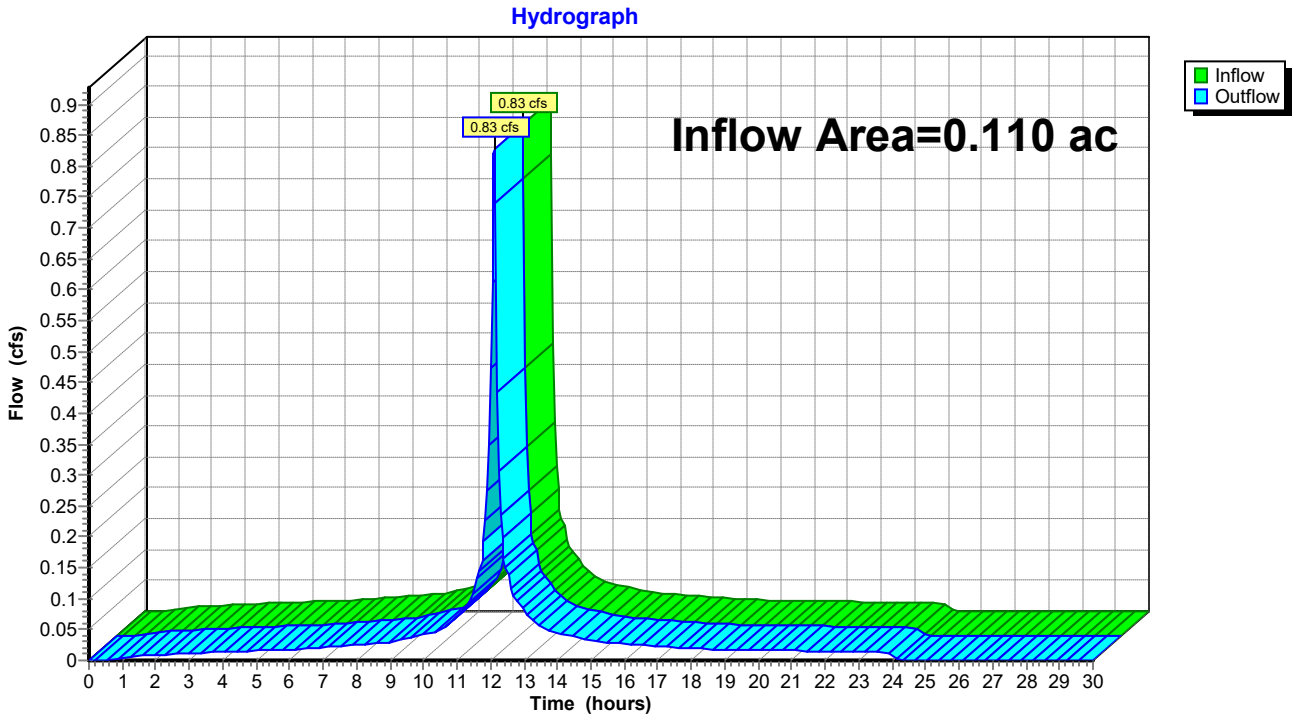


Summary for Reach DP5: DCB-H

Inflow Area = 0.110 ac, 37.39% Impervious, Inflow Depth = 7.98" for 100-Year event
Inflow = 0.83 cfs @ 12.11 hrs, Volume= 0.073 af
Outflow = 0.83 cfs @ 12.11 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H

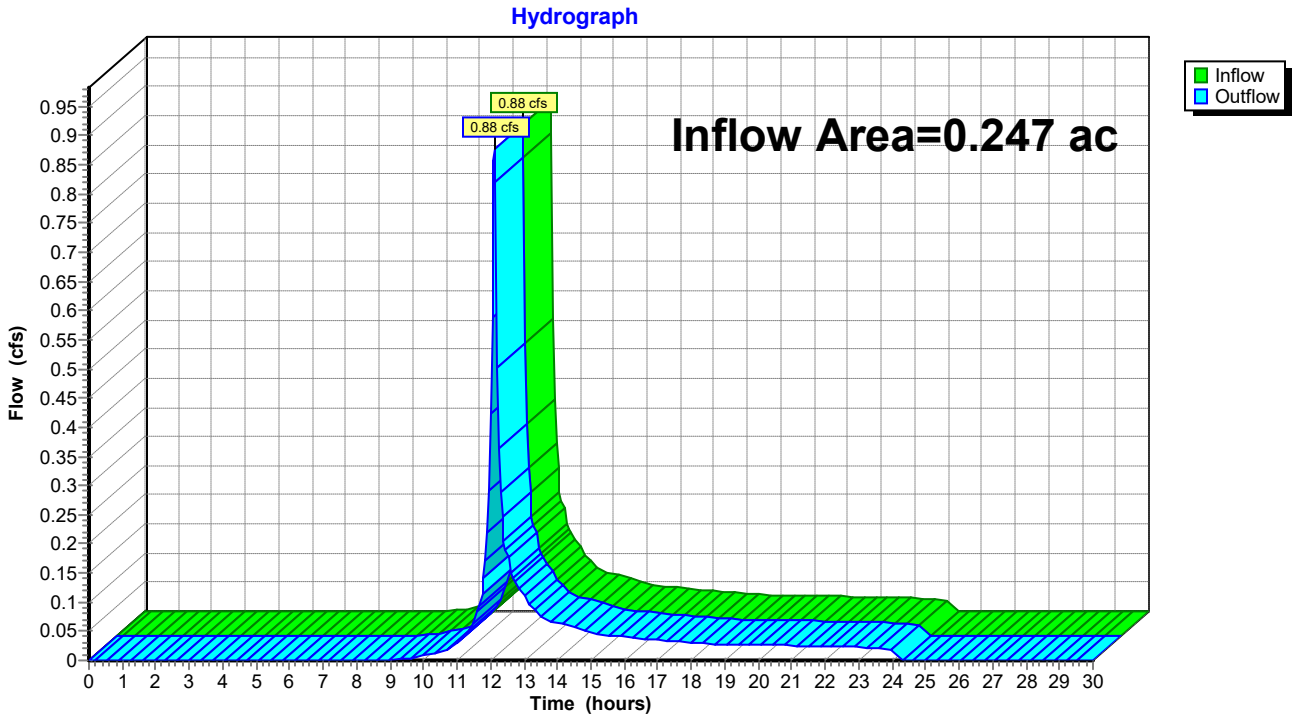


Summary for Reach EX DCB: EX DCB

Inflow Area = 0.247 ac, 29.99% Impervious, Inflow Depth = 3.25" for 100-Year event
Inflow = 0.88 cfs @ 12.12 hrs, Volume= 0.067 af
Outflow = 0.88 cfs @ 12.12 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach EX DCB: EX DCB

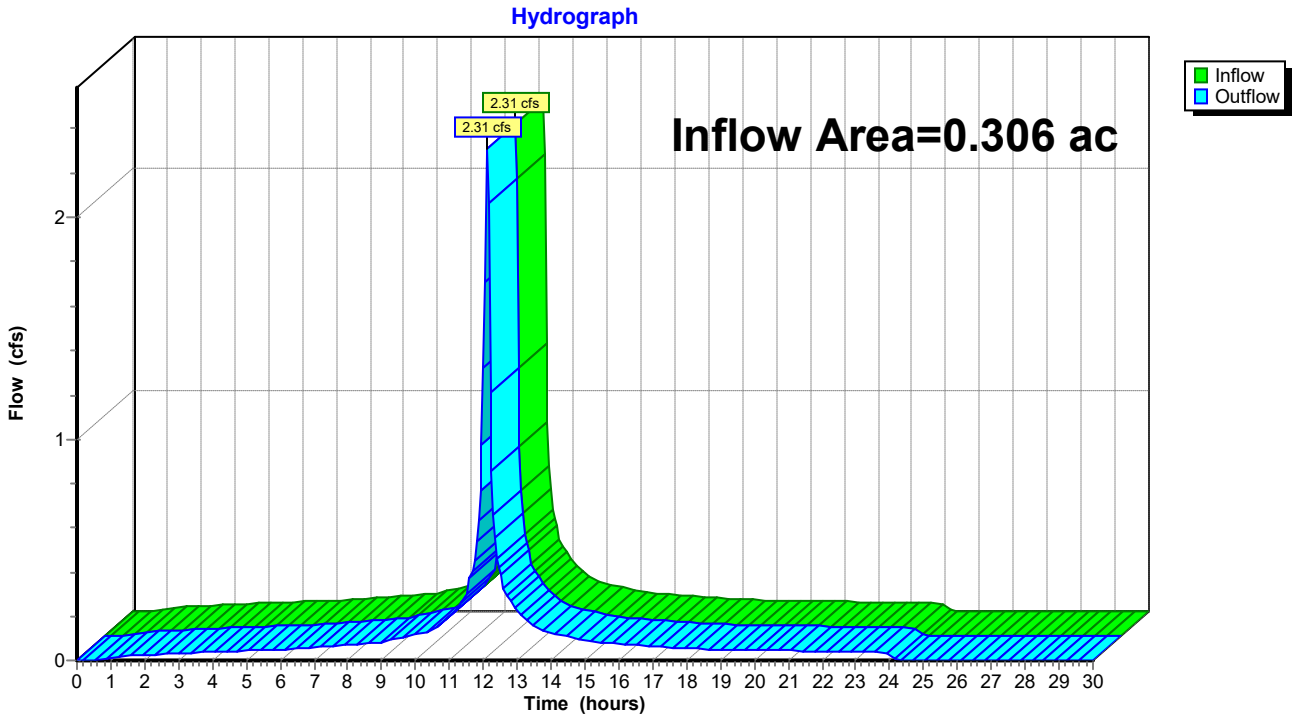


Summary for Reach YDA: (new Reach)

Inflow Area = 0.306 ac, 58.95% Impervious, Inflow Depth = 7.98" for 100-Year event
Inflow = 2.31 cfs @ 12.11 hrs, Volume= 0.204 af
Outflow = 2.31 cfs @ 12.11 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach YDA: (new Reach)



Summary for Pond DMH-B: TO DMH-D

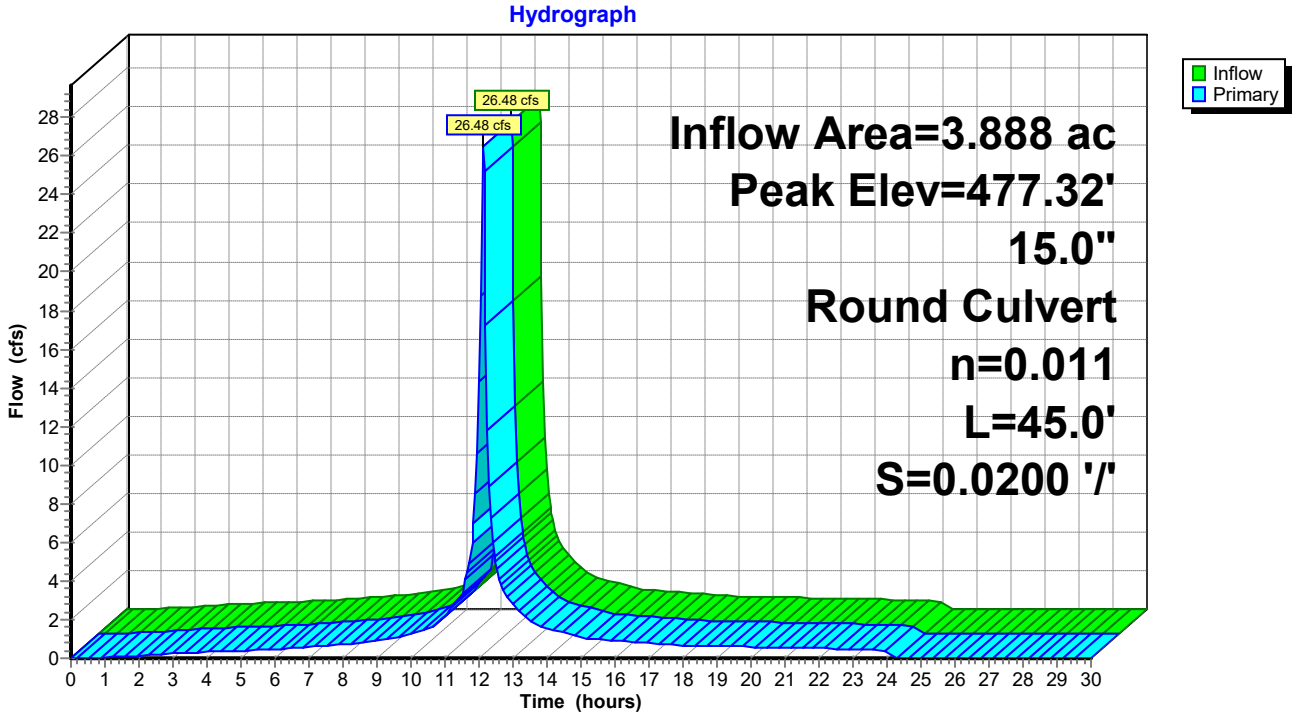
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 7.23" for 100-Year event
Inflow = 26.48 cfs @ 12.12 hrs, Volume= 2.343 af
Outflow = 26.48 cfs @ 12.12 hrs, Volume= 2.343 af, Atten= 0%, Lag= 0.0 min
Primary = 26.48 cfs @ 12.12 hrs, Volume= 2.343 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 477.32' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=25.55 cfs @ 12.12 hrs HW=476.12' (Free Discharge)
└**1=Culvert** (Inlet Controls 25.55 cfs @ 20.82 fps)

Pond DMH-B: TO DMH-D



Summary for Pond LP1: TO DCB-D

Inflow Area = 0.764 ac, 43.34% Impervious, Inflow Depth = 7.62" for 100-Year event
Inflow = 5.69 cfs @ 12.11 hrs, Volume= 0.485 af
Outflow = 5.87 cfs @ 12.11 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min
Primary = 5.87 cfs @ 12.11 hrs, Volume= 0.484 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 474.05' @ 12.11 hrs Surf.Area= 1,725 sf Storage= 231 cf

Plug-Flow detention time= 4.0 min calculated for 0.483 af (100% of inflow)
Center-of-Mass det. time= 2.6 min (766.9 - 764.3)

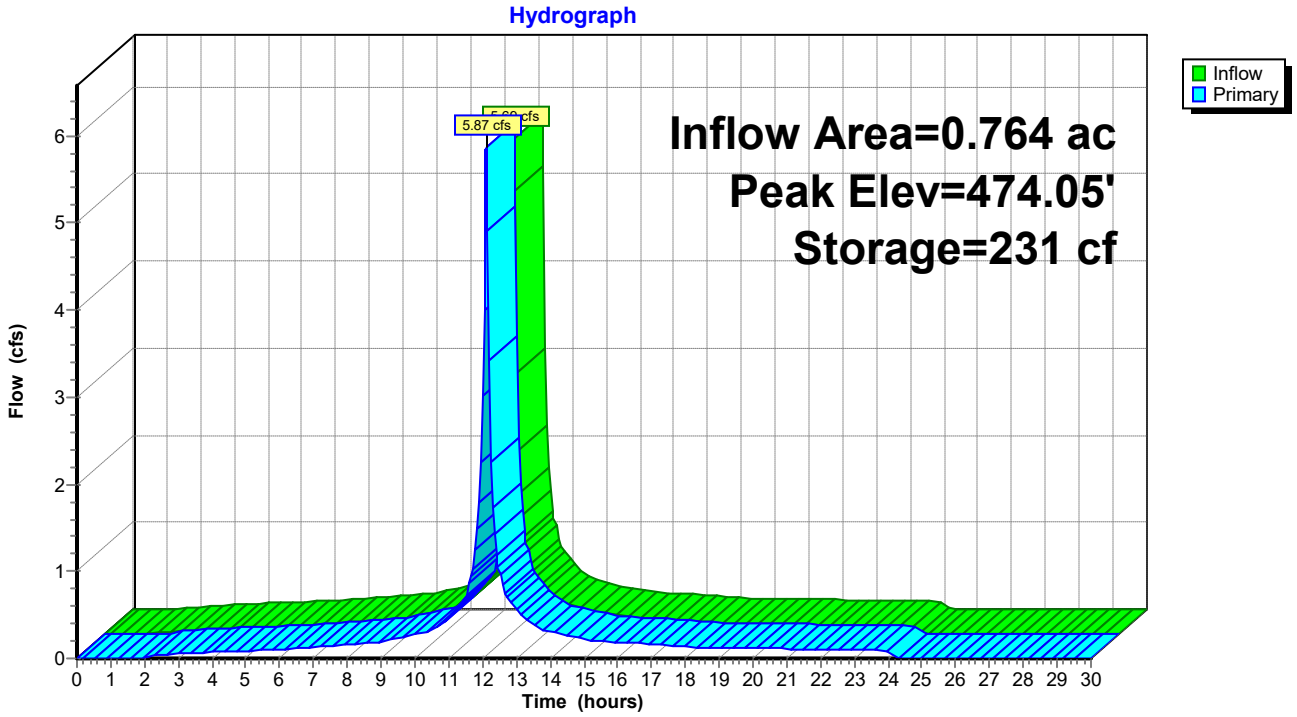
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
473.75	120	0	0
474.00	1,725	231	231

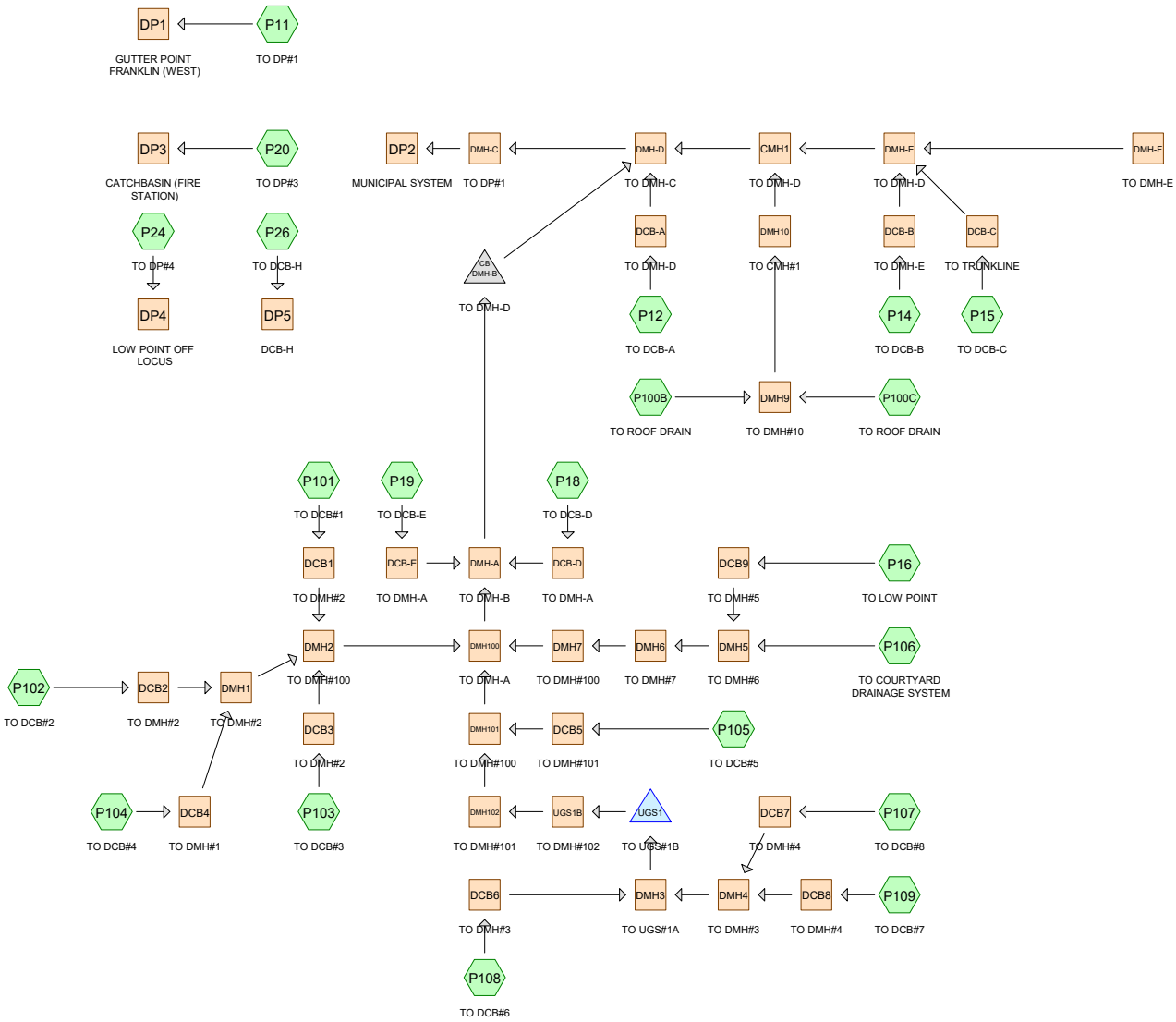
Device	Routing	Invert	Outlet Devices
#1	Primary	473.85'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.68 cfs @ 12.11 hrs HW=474.04' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.68 cfs @ 1.18 fps)

Pond LP1: TO DCB-D



2.2
POST DEVELOPMENT CALCULATIONS



Subcat Reach Pond Link

Routing Diagram for 3030-Post-R1
Prepared by HANNIGAN ENGINEERING, INC., Printed 1/7/2022
HydroCAD® 10.00-25 s/n 00840 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.160	39	>75% Grass cover, Good, HSG A (P101, P102, P103, P104, P105, P106, P107, P108, P109, P11, P12, P14, P15, P16, P18, P19, P20, P24, P26)
0.059	96	Gravel surface, HSG A (P15, P16)
4.732	98	Paved parking, HSG A (P100B, P100C, P101, P102, P103, P104, P105, P106, P107, P108, P109, P11, P12, P14, P15, P16, P18, P19, P20, P24)
5.951	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.951	HSG A	P100B, P100C, P101, P102, P103, P104, P105, P106, P107, P108, P109, P11, P12, P14, P15, P16, P18, P19, P20, P24, P26
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.951		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.160	0.000	0.000	0.000	0.000	1.160	>75% Grass cover, Good	P101, P102, P103, P104, P105, P106, P107, P108, P109, P11, P12, P14, P15, P16, P18, P19, P20, P24, P26
0.059	0.000	0.000	0.000	0.000	0.059	Gravel surface	P15, P16
4.732	0.000	0.000	0.000	0.000	4.732	Paved parking	P100B, P100C, P101, P102, P103, P104, P105, P106, P107, P108, P109, P11, P12, P14, P15, P16, P18, P19, P20, P24

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
5.951	**0.000**	**0.000**	**0.000**	**0.000**	**5.951**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CMH1	456.47	455.90	105.0	0.0054	0.011	36.0	0.0	0.0
2	DCB-D	466.75	466.00	15.0	0.0500	0.011	12.0	0.0	0.0
3	DCB-E	467.63	466.57	12.0	0.0883	0.011	12.0	0.0	0.0
4	DCB1	469.10	467.00	80.0	0.0263	0.013	12.0	0.0	0.0
5	DCB2	469.10	467.60	71.0	0.0211	0.013	12.0	0.0	0.0
6	DCB3	469.10	468.90	10.0	0.0200	0.013	12.0	0.0	0.0
7	DCB4	468.50	467.60	90.0	0.0100	0.013	12.0	0.0	0.0
8	DCB5	468.30	468.00	25.0	0.0120	0.011	12.0	0.0	0.0
9	DCB6	469.50	468.50	98.0	0.0102	0.013	12.0	0.0	0.0
10	DCB7	470.00	469.00	105.0	0.0095	0.013	12.0	0.0	0.0
11	DCB8	469.90	469.00	58.0	0.0155	0.013	12.0	0.0	0.0
12	DCB9	471.00	470.50	71.0	0.0070	0.012	10.0	0.0	0.0
13	DMH-D	455.90	455.21	99.0	0.0070	0.011	36.0	0.0	0.0
14	DMH-E	456.57	456.47	18.0	0.0056	0.011	36.0	0.0	0.0
15	DMH-F	458.13	456.57	268.0	0.0058	0.011	36.0	0.0	0.0
16	DMH1	467.50	467.00	50.0	0.0100	0.013	12.0	0.0	0.0
17	DMH10	458.10	457.90	20.0	0.0100	0.011	24.0	0.0	0.0
18	DMH100	466.10	464.80	87.0	0.0149	0.011	15.0	0.0	0.0
19	DMH101	467.10	466.20	75.0	0.0120	0.011	12.0	0.0	0.0
20	DMH102	467.60	467.20	25.0	0.0160	0.011	12.0	0.0	0.0
21	DMH2	466.75	466.20	44.0	0.0125	0.011	12.0	0.0	0.0
22	DMH3	468.25	468.00	5.0	0.0500	0.013	12.0	0.0	0.0
23	DMH4	468.90	468.50	24.0	0.0167	0.013	12.0	0.0	0.0
24	DMH5	470.30	469.40	100.0	0.0090	0.013	12.0	0.0	0.0
25	DMH6	469.30	468.50	42.0	0.0190	0.013	12.0	0.0	0.0
26	DMH7	468.40	466.20	105.0	0.0210	0.012	12.0	0.0	0.0
27	DMH9	459.70	458.20	209.0	0.0072	0.012	24.0	0.0	0.0
28	UGS1B	469.50	467.70	160.0	0.0113	0.011	12.0	0.0	0.0
29	DMH-B	456.80	455.90	45.0	0.0200	0.011	15.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P100B: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=2.90"
Tc=5.0 min CN=98 Runoff=3.13 cfs 0.270 af

Subcatchment P100C: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=2.90"
Tc=5.0 min CN=98 Runoff=3.13 cfs 0.270 af

Subcatchment P101: TO DCB#1 Runoff Area=5,154 sf 82.42% Impervious Runoff Depth=1.93"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=88 Runoff=0.25 cfs 0.019 af

Subcatchment P102: TO DCB#2 Runoff Area=3,847 sf 96.05% Impervious Runoff Depth=2.68"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=96 Runoff=0.24 cfs 0.020 af

Subcatchment P103: TO DCB#3 Runoff Area=6,905 sf 92.22% Impervious Runoff Depth=2.38"
Flow Length=70' Slope=0.0150 '/' Tc=5.0 min CN=93 Runoff=0.40 cfs 0.031 af

Subcatchment P104: TO DCB#4 Runoff Area=2,032 sf 78.10% Impervious Runoff Depth=1.70"
Flow Length=65' Slope=0.0300 '/' Tc=5.0 min CN=85 Runoff=0.09 cfs 0.007 af

Subcatchment P105: TO DCB#5 Runoff Area=17,091 sf 83.45% Impervious Runoff Depth=1.93"
Flow Length=242' Tc=5.0 min CN=88 Runoff=0.83 cfs 0.063 af

Subcatchment P106: TO COURTYARD Runoff Area=23,395 sf 27.09% Impervious Runoff Depth=0.23"
Flow Length=88' Slope=0.0200 '/' Tc=8.0 min CN=55 Runoff=0.03 cfs 0.010 af

Subcatchment P107: TO DCB#8 Runoff Area=14,595 sf 56.05% Impervious Runoff Depth=0.89"
Flow Length=132' Tc=7.8 min CN=72 Runoff=0.29 cfs 0.025 af

Subcatchment P108: TO DCB#6 Runoff Area=7,999 sf 87.34% Impervious Runoff Depth=2.19"
Flow Length=125' Slope=0.0125 '/' Tc=5.0 min CN=91 Runoff=0.43 cfs 0.034 af

Subcatchment P109: TO DCB#7 Runoff Area=6,226 sf 85.54% Impervious Runoff Depth=2.02"
Flow Length=99' Tc=5.0 min CN=89 Runoff=0.31 cfs 0.024 af

Subcatchment P11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=2.28"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.16 cfs 0.012 af

Subcatchment P12: TO DCB-A Runoff Area=6,513 sf 85.11% Impervious Runoff Depth=2.02"
Flow Length=147' Tc=5.0 min CN=89 Runoff=0.33 cfs 0.025 af

Subcatchment P14: TO DCB-B Runoff Area=5,805 sf 89.51% Impervious Runoff Depth=2.28"
Flow Length=169' Tc=5.0 min CN=92 Runoff=0.33 cfs 0.025 af

Subcatchment P15: TO DCB-C Runoff Area=7,907 sf 68.45% Impervious Runoff Depth=1.70"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=85 Runoff=0.32 cfs 0.026 af

Subcatchment P16: TO LOW POINT Runoff Area=14,911 sf 51.34% Impervious Runoff Depth=1.10"
Flow Length=223' Slope=0.0100 '/' Tc=5.0 min CN=76 Runoff=0.41 cfs 0.031 af

Subcatchment P18: TO DCB-D Runoff Area=10,359 sf 73.15% Impervious Runoff Depth=1.48"
Flow Length=222' Tc=5.0 min CN=82 Runoff=0.39 cfs 0.029 af

Subcatchment P19: TO DCB-E Runoff Area=6,699 sf 83.83% Impervious Runoff Depth=1.93"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=88 Runoff=0.33 cfs 0.025 af

Subcatchment P20: TO DP#3 Runoff Area=6,101 sf 75.40% Impervious Runoff Depth=1.55"
Flow Length=101' Tc=5.0 min CN=83 Runoff=0.24 cfs 0.018 af

Subcatchment P24: TO DP#4 Runoff Area=10,319 sf 74.63% Impervious Runoff Depth=1.55"
Flow Length=133' Tc=5.0 min CN=83 Runoff=0.41 cfs 0.031 af

Subcatchment P26: TO DCB-H Runoff Area=3,256 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=135' Slope=0.0200 '/' Tc=8.3 min CN=39 Runoff=0.00 cfs 0.000 af

Reach CMH1: TO DMH-D Avg. Flow Depth=0.69' Max Vel=5.45 fps Inflow=6.67 cfs 0.590 af
36.0" Round Pipe n=0.011 L=105.0' S=0.0054 '/' Capacity=58.08 cfs Outflow=6.57 cfs 0.590 af

Reach DCB-A: TO DMH-D Inflow=0.33 cfs 0.025 af
Outflow=0.33 cfs 0.025 af

Reach DCB-B: TO DMH-E Inflow=0.33 cfs 0.025 af
Outflow=0.33 cfs 0.025 af

Reach DCB-C: TO TRUNKLINE Inflow=0.32 cfs 0.026 af
Outflow=0.32 cfs 0.026 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.14' Max Vel=5.87 fps Inflow=0.39 cfs 0.029 af
12.0" Round Pipe n=0.011 L=15.0' S=0.0500 '/' Capacity=9.42 cfs Outflow=0.39 cfs 0.029 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.11' Max Vel=6.80 fps Inflow=0.33 cfs 0.025 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.33 cfs 0.025 af

Reach DCB1: TO DMH#2 Avg. Flow Depth=0.14' Max Vel=3.63 fps Inflow=0.25 cfs 0.019 af
12.0" Round Pipe n=0.013 L=80.0' S=0.0263 '/' Capacity=5.77 cfs Outflow=0.25 cfs 0.019 af

Reach DCB2: TO DMH#2 Avg. Flow Depth=0.15' Max Vel=3.32 fps Inflow=0.24 cfs 0.020 af
12.0" Round Pipe n=0.013 L=71.0' S=0.0211 '/' Capacity=5.18 cfs Outflow=0.23 cfs 0.020 af

Reach DCB3: TO DMH#2 Avg. Flow Depth=0.19' Max Vel=3.81 fps Inflow=0.40 cfs 0.031 af
12.0" Round Pipe n=0.013 L=10.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=0.40 cfs 0.031 af

Reach DCB4: TO DMH#1 Avg. Flow Depth=0.11' Max Vel=1.89 fps Inflow=0.09 cfs 0.007 af
12.0" Round Pipe n=0.013 L=90.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.08 cfs 0.007 af

Reach DCB5: TO DMH#101 Avg. Flow Depth=0.29' Max Vel=4.42 fps Inflow=0.83 cfs 0.063 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=0.82 cfs 0.063 af

Reach DCB6: TO DMH#3 Avg. Flow Depth=0.23' Max Vel=3.05 fps Inflow=0.43 cfs 0.034 af
12.0" Round Pipe n=0.013 L=98.0' S=0.0102 '/' Capacity=3.60 cfs Outflow=0.42 cfs 0.034 af

Reach DCB7: TO DMH#4 Avg. Flow Depth=0.19' Max Vel=2.65 fps Inflow=0.29 cfs 0.025 af
12.0" Round Pipe n=0.013 L=105.0' S=0.0095 '/' Capacity=3.48 cfs Outflow=0.27 cfs 0.025 af

Reach DCB8: TO DMH#4 Avg. Flow Depth=0.18' Max Vel=3.23 fps Inflow=0.31 cfs 0.024 af
12.0" Round Pipe n=0.013 L=58.0' S=0.0155 '/' Capacity=4.44 cfs Outflow=0.31 cfs 0.024 af

Reach DCB9: TO DMH#5 Avg. Flow Depth=0.26' Max Vel=2.85 fps Inflow=0.41 cfs 0.031 af
10.0" Round Pipe n=0.012 L=71.0' S=0.0070 '/' Capacity=1.99 cfs Outflow=0.40 cfs 0.031 af

Reach DMH-A: TO DMH-B Inflow=2.79 cfs 0.236 af
Outflow=2.79 cfs 0.236 af

Reach DMH-C: TO DP#1 Inflow=9.56 cfs 0.851 af
Outflow=9.56 cfs 0.851 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=0.78' Max Vel=6.65 fps Inflow=9.67 cfs 0.851 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=9.56 cfs 0.851 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.22' Max Vel=2.72 fps Inflow=0.64 cfs 0.051 af
36.0" Round Pipe n=0.011 L=18.0' S=0.0056 '/' Capacity=58.75 cfs Outflow=0.64 cfs 0.051 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DMH1: TO DMH#2 Avg. Flow Depth=0.20' Max Vel=2.79 fps Inflow=0.32 cfs 0.026 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.31 cfs 0.026 af

Reach DMH10: TO CMH#1 Avg. Flow Depth=0.65' Max Vel=6.84 fps Inflow=6.04 cfs 0.539 af
24.0" Round Pipe n=0.011 L=20.0' S=0.0100 '/' Capacity=26.74 cfs Outflow=6.03 cfs 0.539 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.41' Max Vel=6.14 fps Inflow=2.11 cfs 0.182 af
15.0" Round Pipe n=0.011 L=87.0' S=0.0149 '/' Capacity=9.33 cfs Outflow=2.09 cfs 0.182 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.29' Max Vel=4.39 fps Inflow=0.82 cfs 0.063 af
12.0" Round Pipe n=0.011 L=75.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=0.82 cfs 0.063 af

Reach DMH102: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0160 '/' Capacity=5.33 cfs Outflow=0.00 cfs 0.000 af

Reach DMH2: TO DMH#100 Avg. Flow Depth=0.31' Max Vel=4.65 fps Inflow=0.95 cfs 0.077 af
12.0" Round Pipe n=0.011 L=44.0' S=0.0125 '/' Capacity=4.71 cfs Outflow=0.94 cfs 0.077 af

Reach DMH3: TO UGS#1A Avg. Flow Depth=0.24' Max Vel=6.87 fps Inflow=0.97 cfs 0.082 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=0.97 cfs 0.082 af

Reach DMH4: TO DMH#3 Avg. Flow Depth=0.24' Max Vel=3.97 fps Inflow=0.56 cfs 0.049 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0167 '/' Capacity=4.60 cfs Outflow=0.56 cfs 0.049 af

Reach DMH5: TO DMH#6 Avg. Flow Depth=0.24' Max Vel=2.91 fps Inflow=0.41 cfs 0.042 af
12.0" Round Pipe n=0.013 L=100.0' S=0.0090 '/' Capacity=3.38 cfs Outflow=0.40 cfs 0.042 af

Reach DMH6: TO DMH#7 Avg. Flow Depth=0.19' Max Vel=3.76 fps Inflow=0.40 cfs 0.042 af
12.0" Round Pipe n=0.013 L=42.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=0.39 cfs 0.042 af

Reach DMH7: TO DMH#100 Avg. Flow Depth=0.18' Max Vel=4.09 fps Inflow=0.39 cfs 0.042 af
12.0" Round Pipe n=0.012 L=105.0' S=0.0210 '/' Capacity=5.59 cfs Outflow=0.38 cfs 0.042 af

Reach DMH9: TO DMH#10 Avg. Flow Depth=0.74' Max Vel=5.70 fps Inflow=6.27 cfs 0.539 af
24.0" Round Pipe n=0.012 L=209.0' S=0.0072 '/' Capacity=20.76 cfs Outflow=6.04 cfs 0.539 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.16 cfs 0.012 af
Outflow=0.16 cfs 0.012 af

Reach DP2: MUNICIPAL SYSTEM Inflow=9.56 cfs 0.851 af
Outflow=9.56 cfs 0.851 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.24 cfs 0.018 af
Outflow=0.24 cfs 0.018 af

Reach DP4: LOW POINT OFF LOCUS Inflow=0.41 cfs 0.031 af
Outflow=0.41 cfs 0.031 af

Reach DP5: DCB-H Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach UGS1B: TO DMH#102 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=160.0' S=0.0113 '/' Capacity=4.47 cfs Outflow=0.00 cfs 0.000 af

Pond DMH-B: TO DMH-D Peak Elev=457.65' Inflow=2.79 cfs 0.236 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=2.79 cfs 0.236 af

Pond UGS1: TO UGS#1B Peak Elev=467.48' Storage=0.020 af Inflow=0.97 cfs 0.082 af
Discarded=0.15 cfs 0.082 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.082 af

Total Runoff Area = 5.951 ac Runoff Volume = 0.995 af Average Runoff Depth = 2.01"
20.49% Pervious = 1.219 ac 79.51% Impervious = 4.732 ac

Summary for Subcatchment P100B: TO ROOF DRAIN

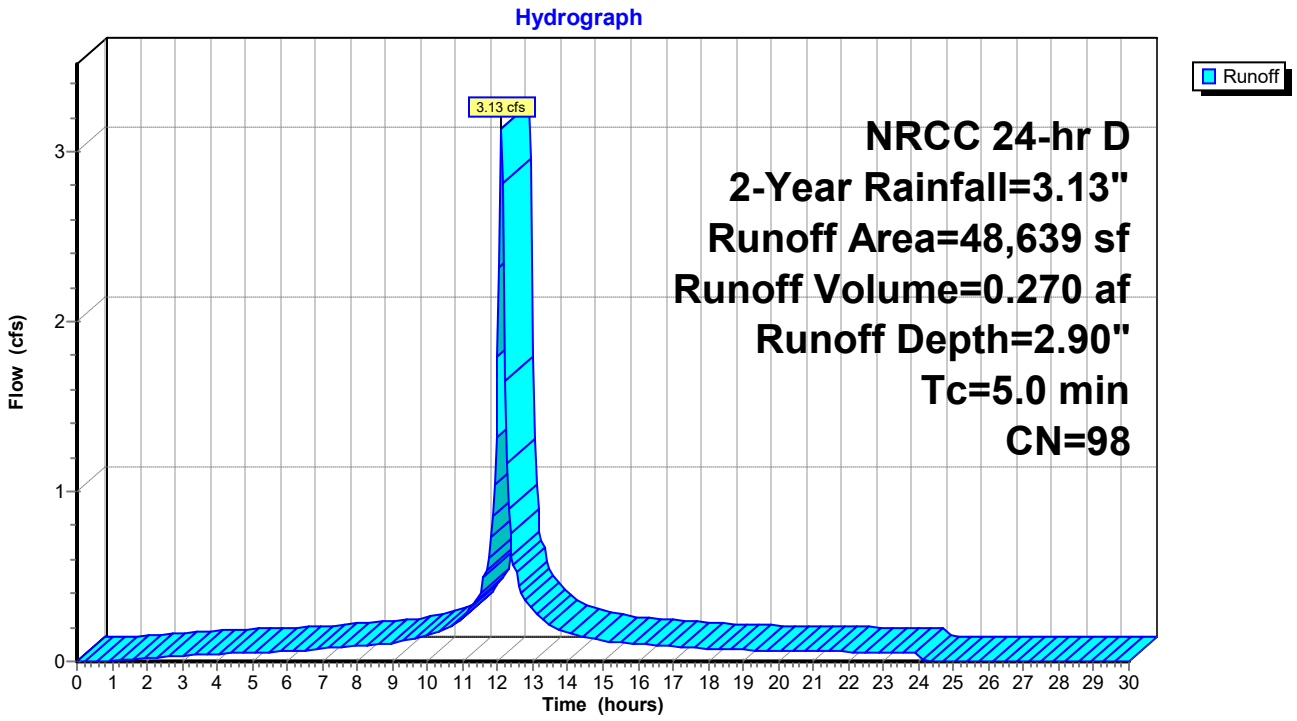
Runoff = 3.13 cfs @ 12.11 hrs, Volume= 0.270 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100B: TO ROOF DRAIN



Summary for Subcatchment P100C: TO ROOF DRAIN

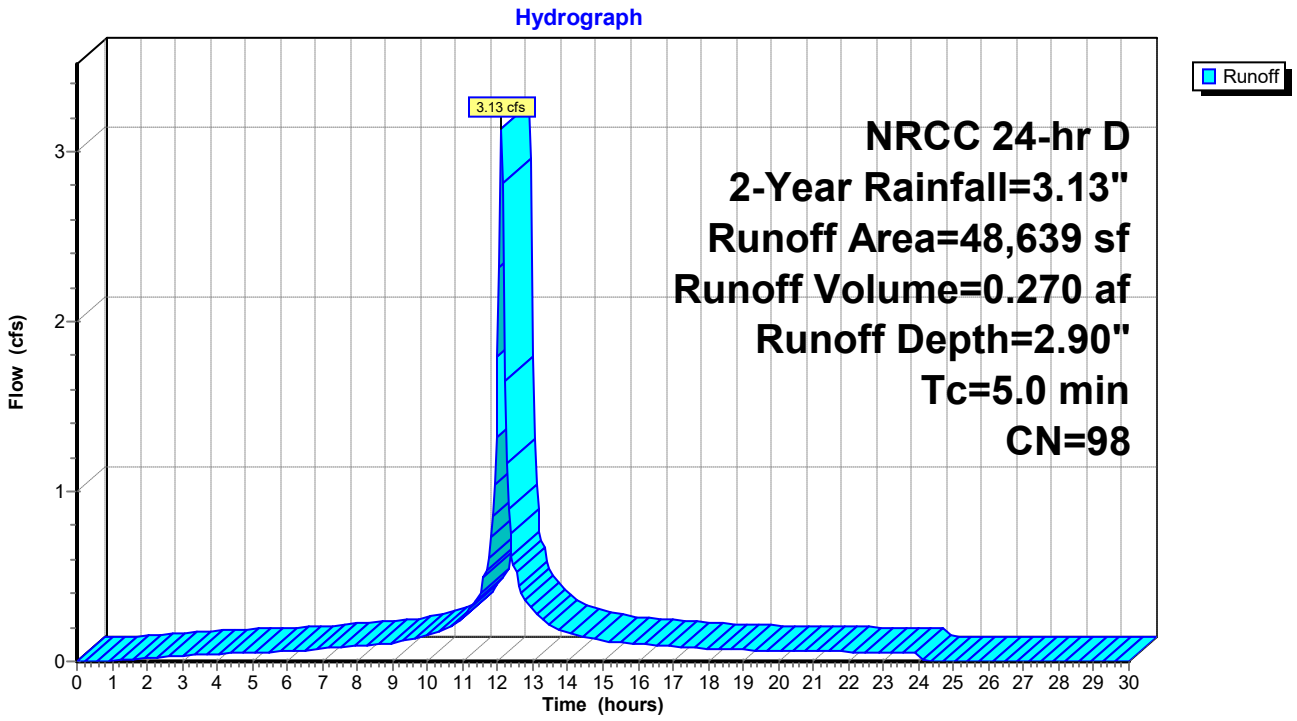
Runoff = 3.13 cfs @ 12.11 hrs, Volume= 0.270 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100C: TO ROOF DRAIN



Summary for Subcatchment P101: TO DCB#1

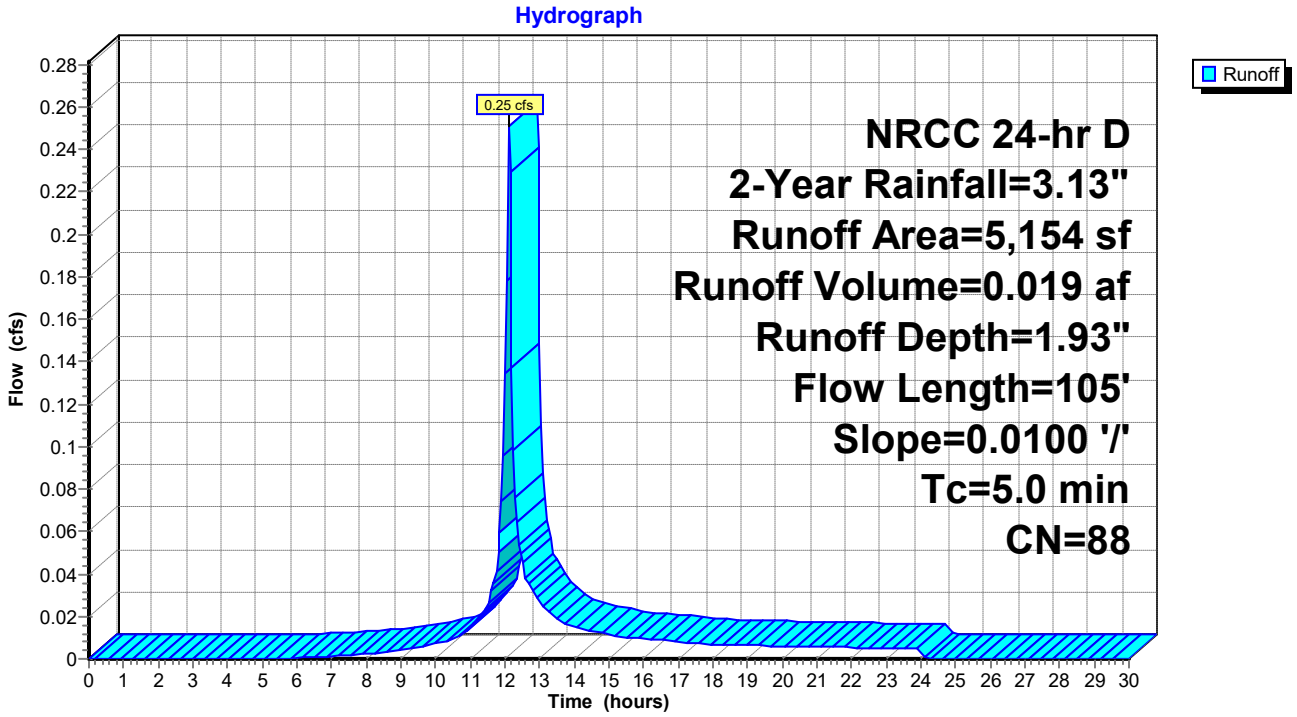
Runoff = 0.25 cfs @ 12.11 hrs, Volume= 0.019 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
906	39	>75% Grass cover, Good, HSG A
4,248	98	Paved parking, HSG A
5,154	88	Weighted Average
906		17.58% Pervious Area
4,248		82.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	55	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	105	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P101: TO DCB#1



Summary for Subcatchment P102: TO DCB#2

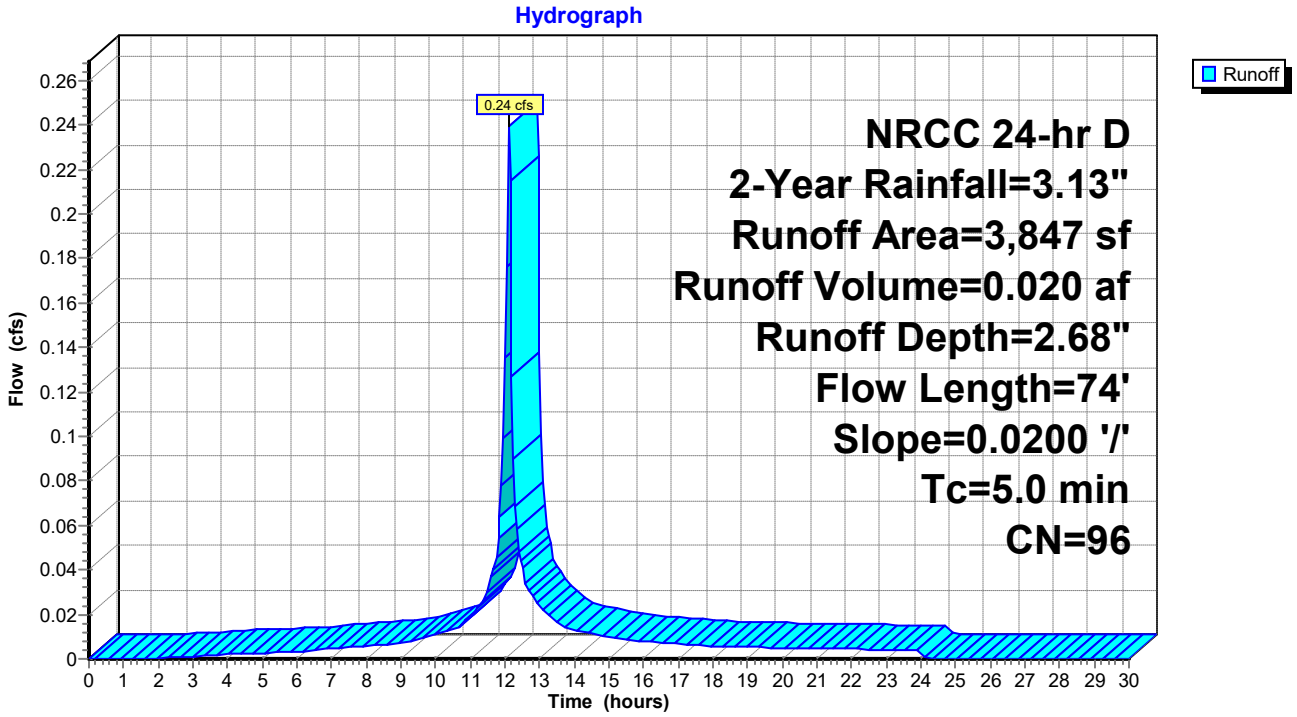
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 0.020 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
152	39	>75% Grass cover, Good, HSG A
3,695	98	Paved parking, HSG A
3,847	96	Weighted Average
152		3.95% Pervious Area
3,695		96.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	74	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P102: TO DCB#2



Summary for Subcatchment P103: TO DCB#3

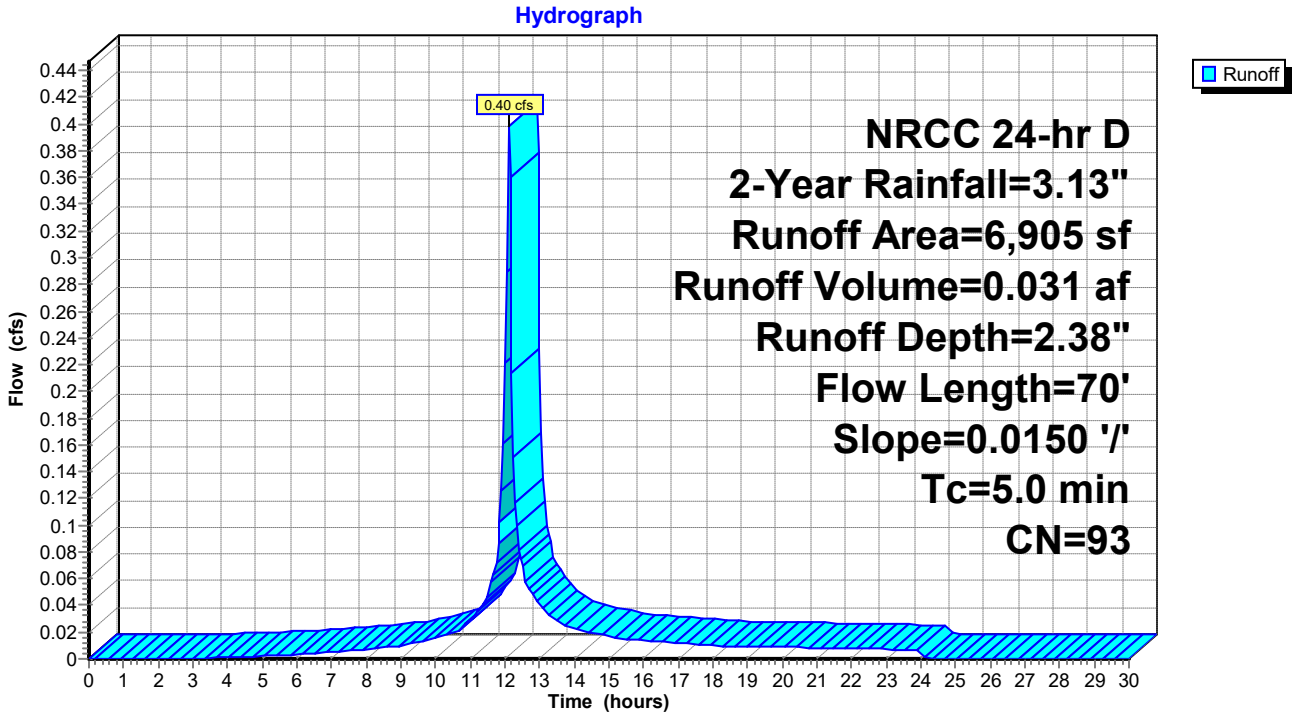
Runoff = 0.40 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
537	39	>75% Grass cover, Good, HSG A
6,368	98	Paved parking, HSG A
6,905	93	Weighted Average
537		7.78% Pervious Area
6,368		92.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	20	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	70	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P103: TO DCB#3



Summary for Subcatchment P104: TO DCB#4

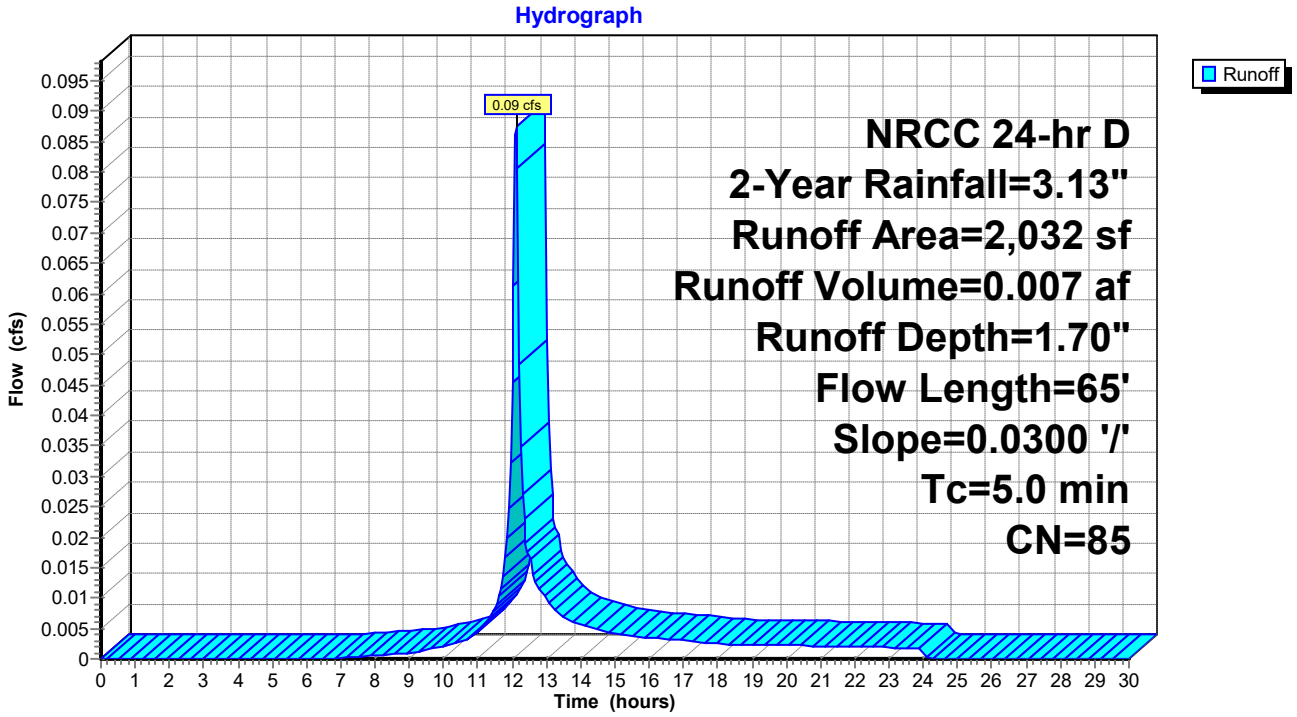
Runoff = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
445	39	>75% Grass cover, Good, HSG A
1,587	98	Paved parking, HSG A
2,032	85	Weighted Average
445		21.90% Pervious Area
1,587		78.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	15	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	65	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P104: TO DCB#4



Summary for Subcatchment P105: TO DCB#5

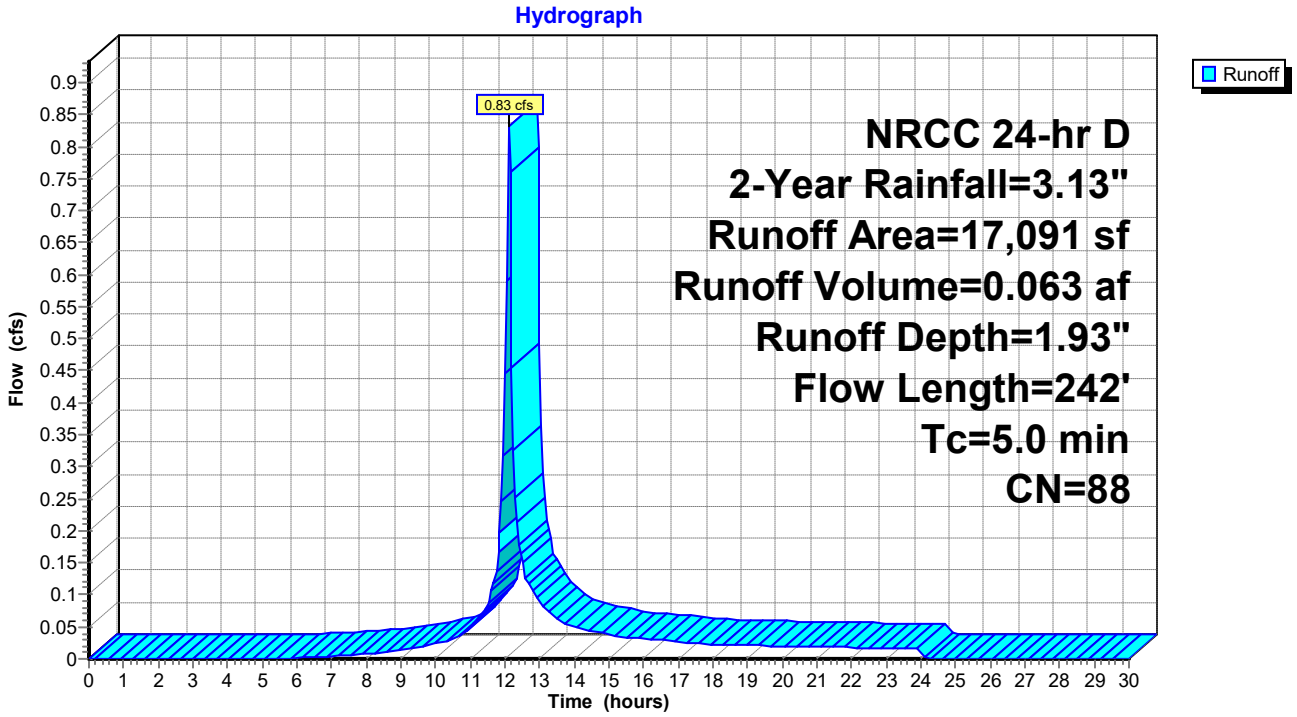
Runoff = 0.83 cfs @ 12.11 hrs, Volume= 0.063 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
2,829	39	>75% Grass cover, Good, HSG A
14,262	98	Paved parking, HSG A
17,091	88	Weighted Average
2,829		16.55% Pervious Area
14,262		83.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	192	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	242	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P105: TO DCB#5



Summary for Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM

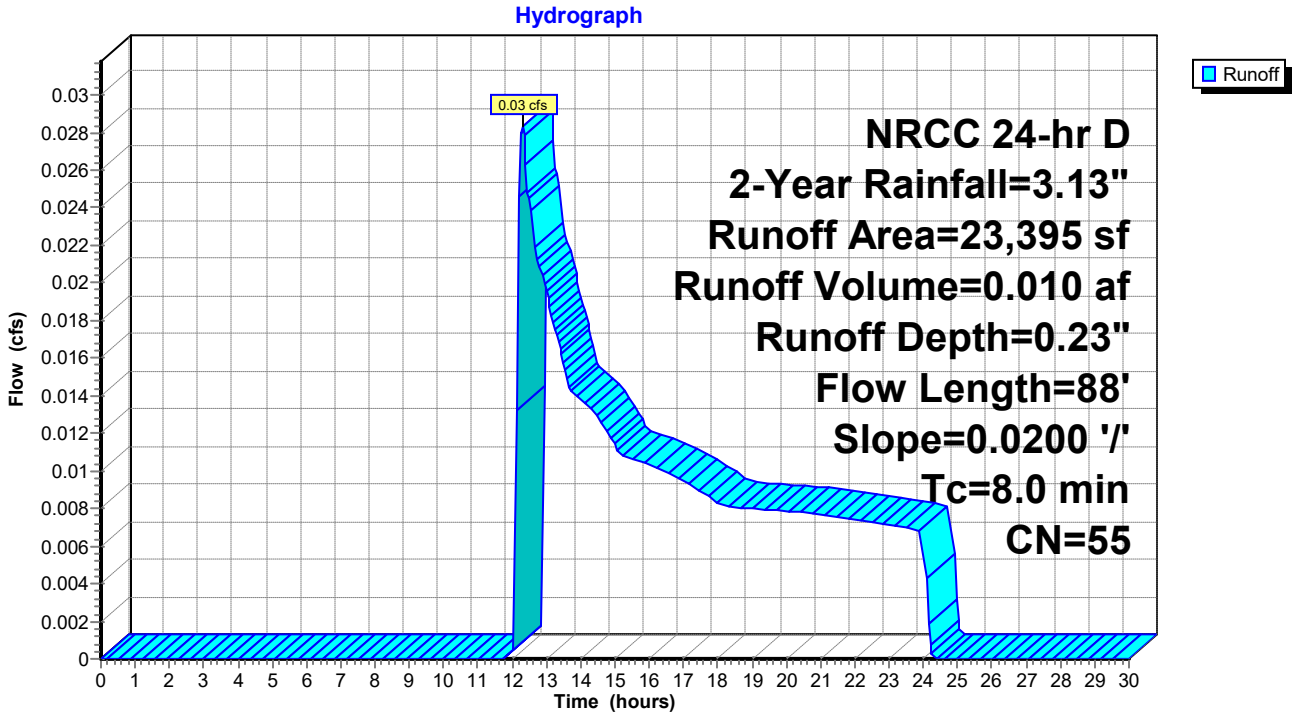
Runoff = 0.03 cfs @ 12.30 hrs, Volume= 0.010 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
17,058	39	>75% Grass cover, Good, HSG A
6,337	98	Paved parking, HSG A
23,395	55	Weighted Average
17,058		72.91% Pervious Area
6,337		27.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	13	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.0	88	Total			

Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM



Summary for Subcatchment P107: TO DCB#8

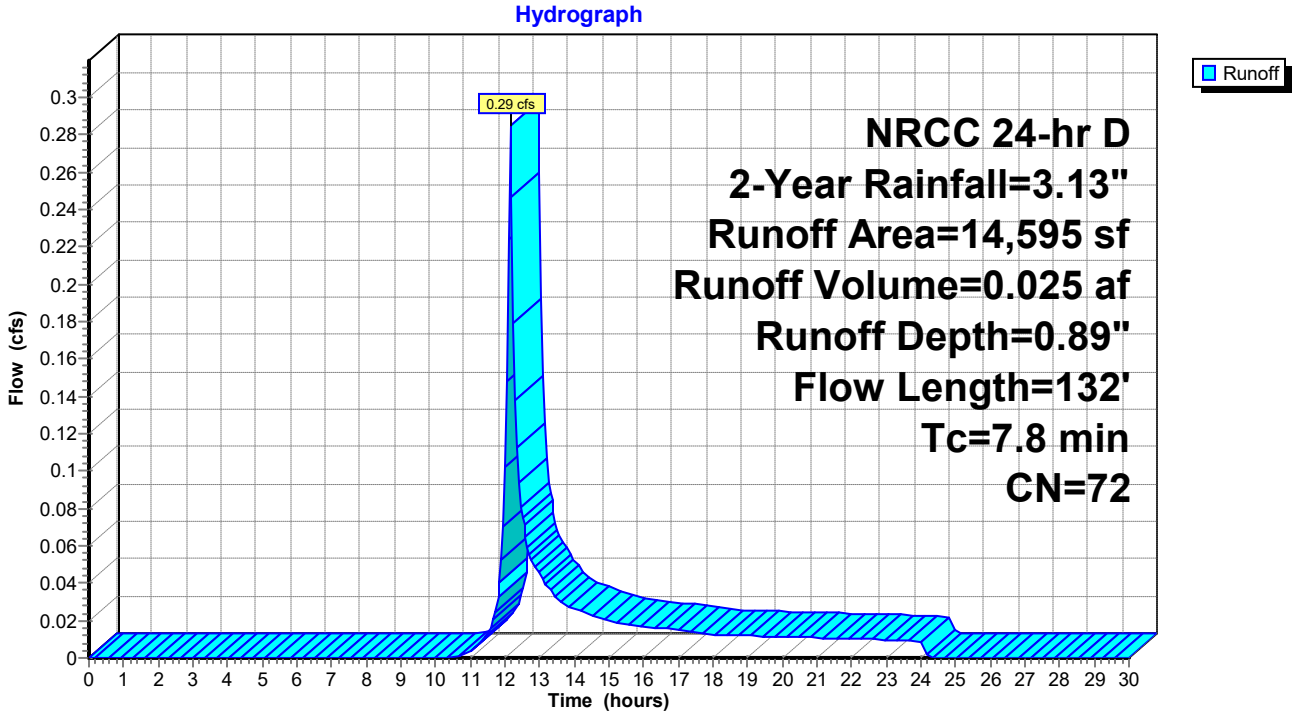
Runoff = 0.29 cfs @ 12.16 hrs, Volume= 0.025 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
6,415	39	>75% Grass cover, Good, HSG A
8,180	98	Paved parking, HSG A
14,595	72	Weighted Average
6,415		43.95% Pervious Area
8,180		56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	23	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
5.9	52	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	57	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.8	132	Total			

Subcatchment P107: TO DCB#8



Summary for Subcatchment P108: TO DCB#6

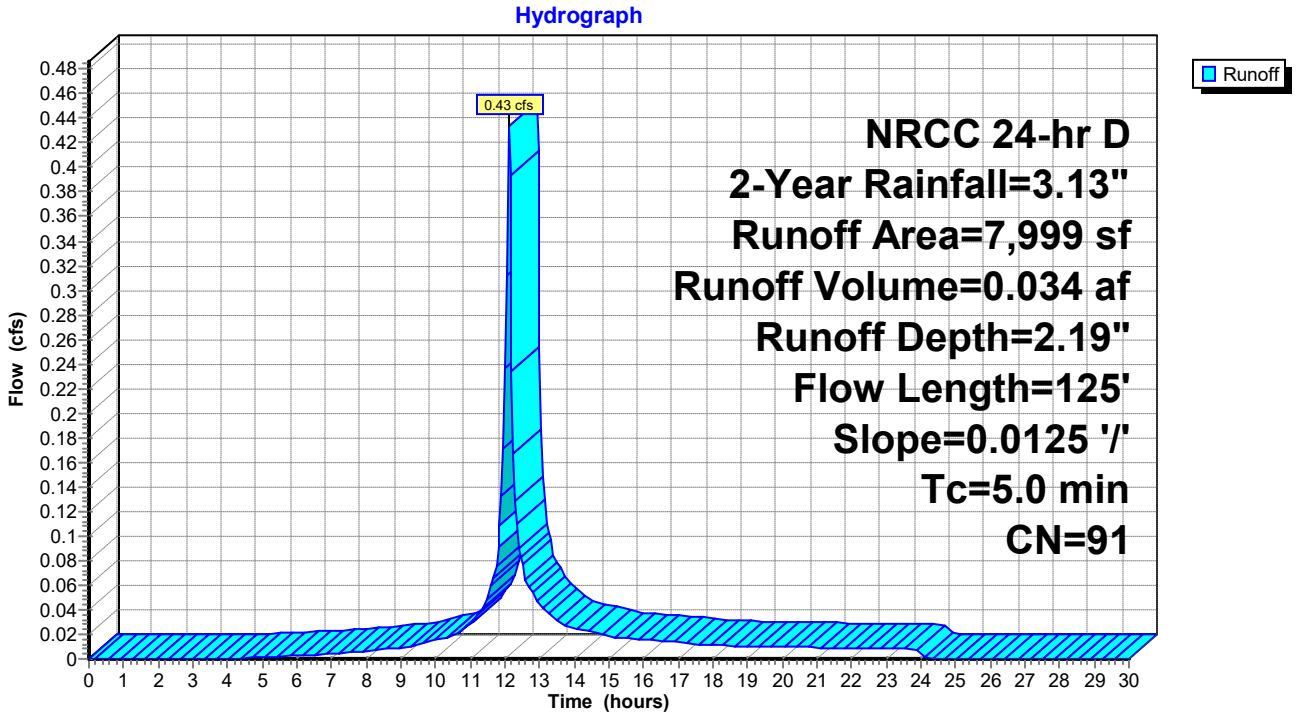
Runoff = 0.43 cfs @ 12.11 hrs, Volume= 0.034 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,013	39	>75% Grass cover, Good, HSG A
6,986	98	Paved parking, HSG A
7,999	91	Weighted Average
1,013		12.66% Pervious Area
6,986		87.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	75	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#6



Summary for Subcatchment P109: TO DCB#7

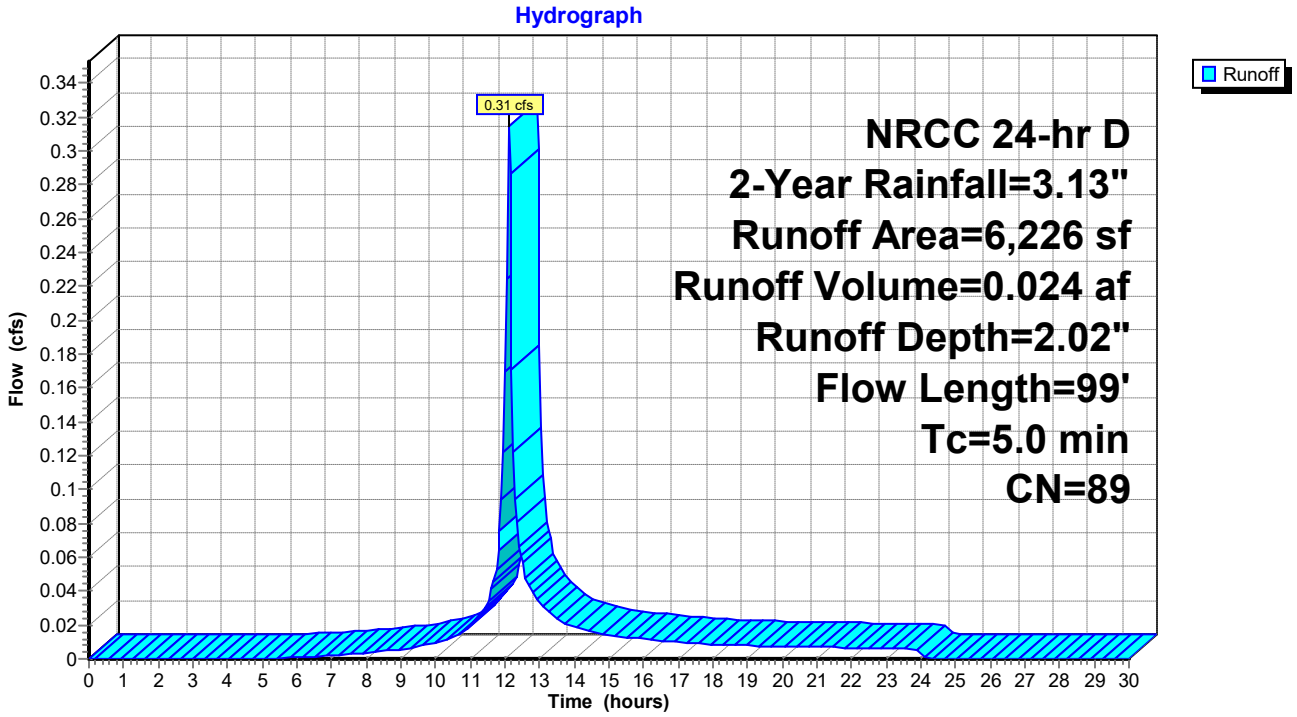
Runoff = 0.31 cfs @ 12.11 hrs, Volume= 0.024 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
900	39	>75% Grass cover, Good, HSG A
5,326	98	Paved parking, HSG A
6,226	89	Weighted Average
900		14.46% Pervious Area
5,326		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.4	49	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	99	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P109: TO DCB#7



Summary for Subcatchment P11: TO DP#1

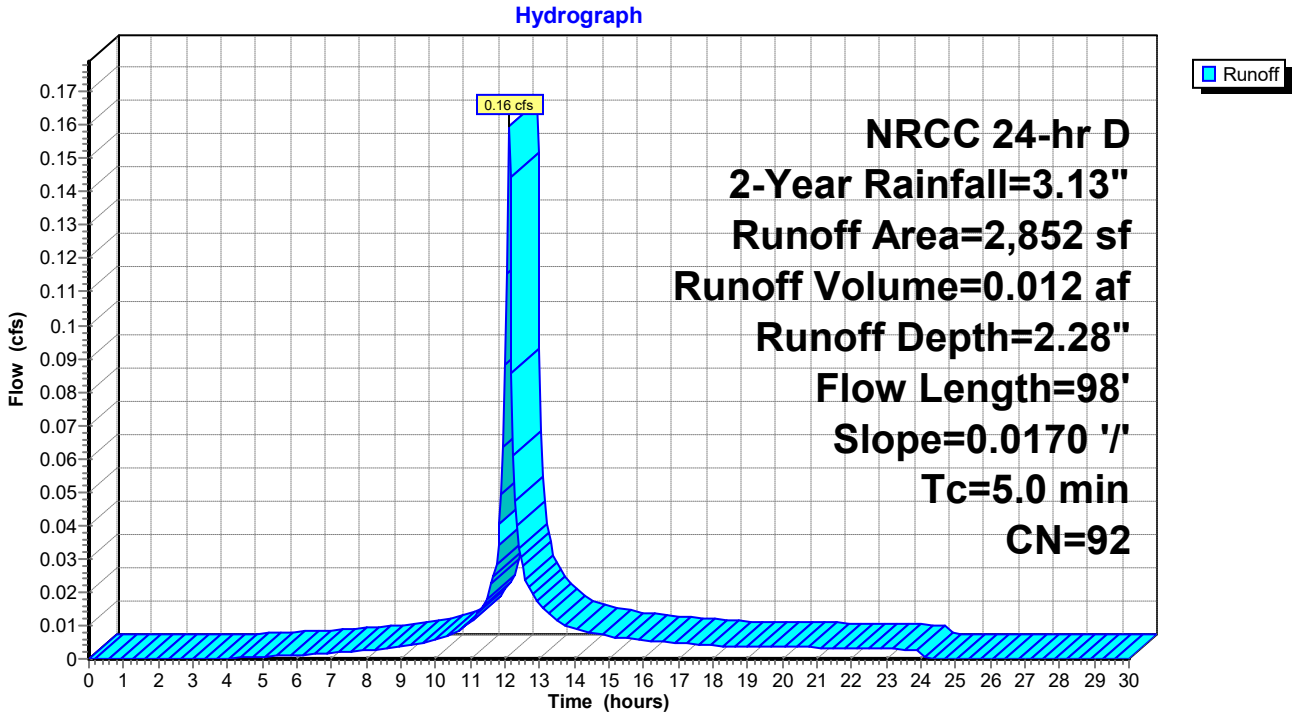
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P11: TO DP#1



Summary for Subcatchment P12: TO DCB-A

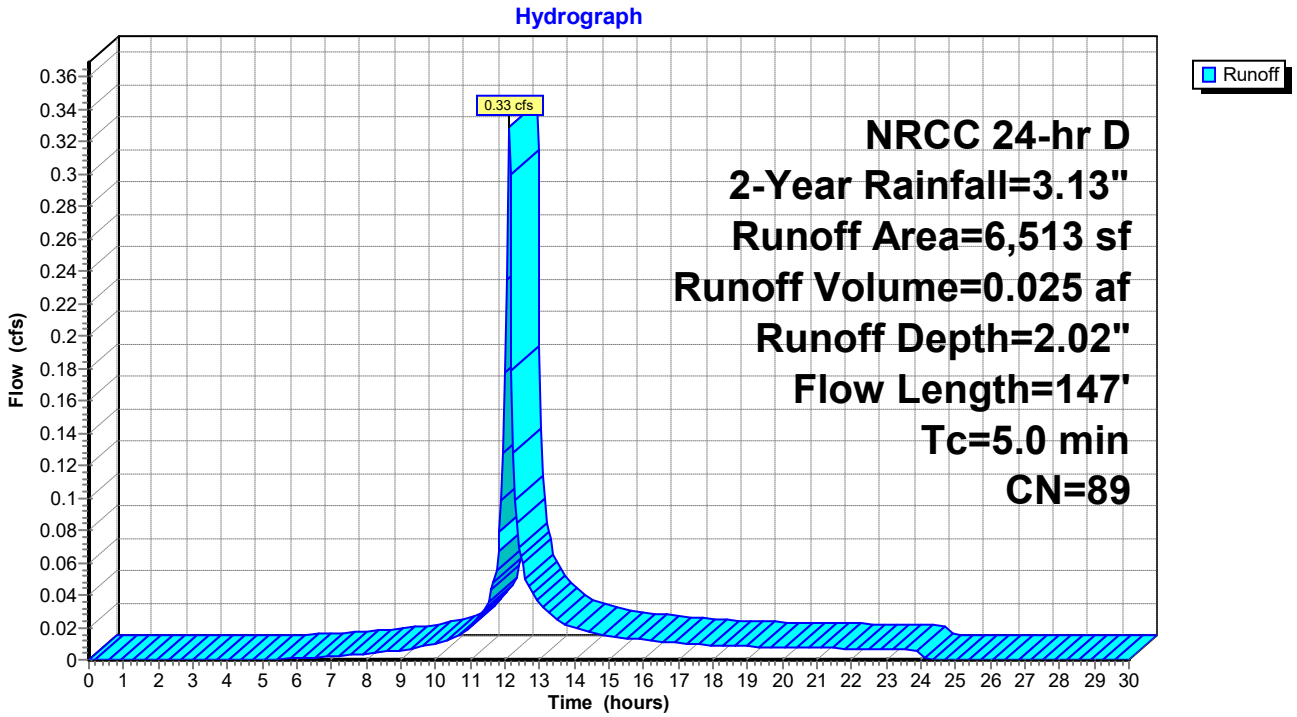
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
970	39	>75% Grass cover, Good, HSG A
5,543	98	Paved parking, HSG A
6,513	89	Weighted Average
970		14.89% Pervious Area
5,543		85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	8	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	35	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	97	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	147	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P12: TO DCB-A



Summary for Subcatchment P14: TO DCB-B

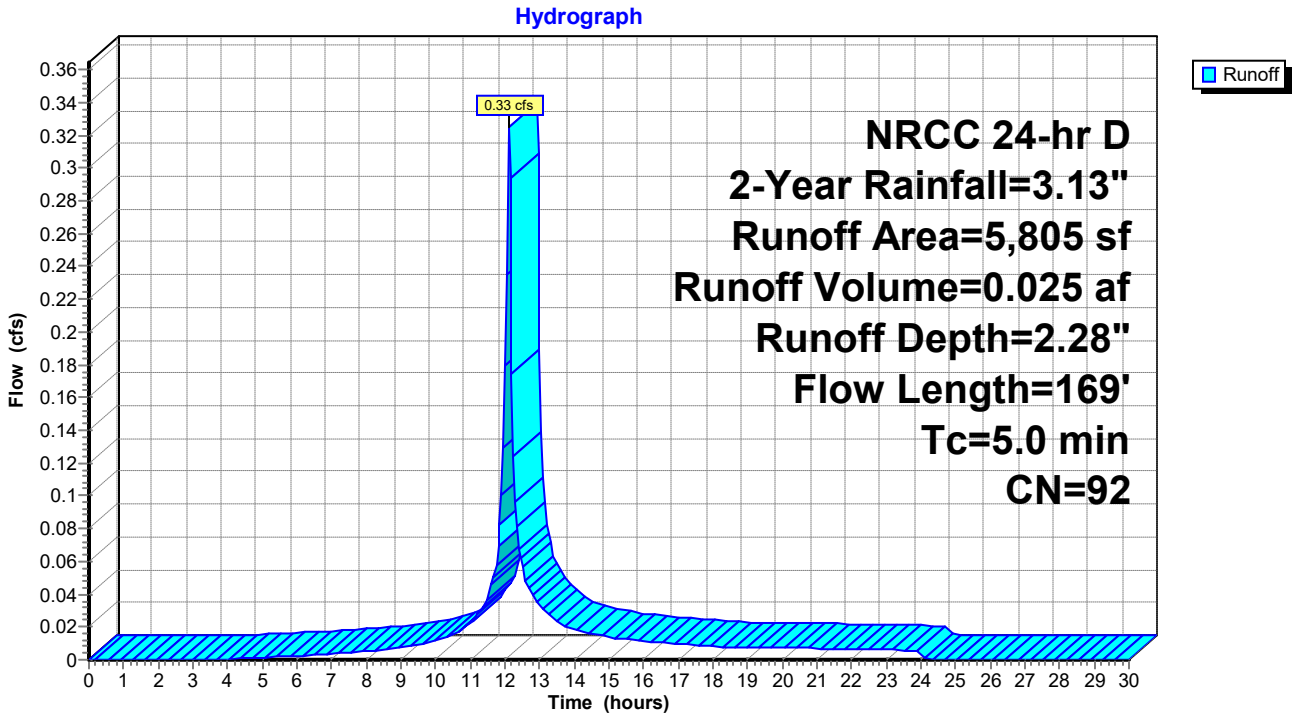
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
609	39	>75% Grass cover, Good, HSG A
5,196	98	Paved parking, HSG A
5,805	92	Weighted Average
609		10.49% Pervious Area
5,196		89.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	10	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	33	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	119	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P14: TO DCB-B



Summary for Subcatchment P15: TO DCB-C

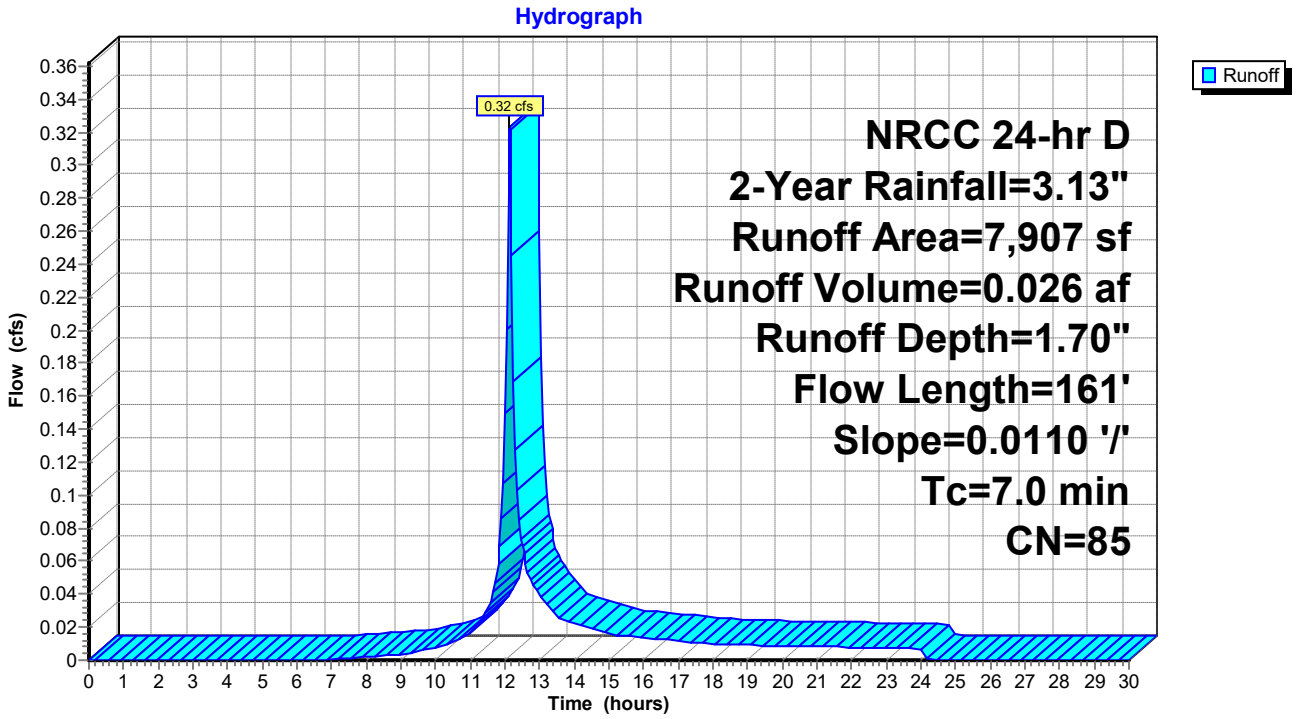
Runoff = 0.32 cfs @ 12.14 hrs, Volume= 0.026 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,765	39	>75% Grass cover, Good, HSG A
5,412	98	Paved parking, HSG A
730	96	Gravel surface, HSG A
7,907	85	Weighted Average
2,495		31.55% Pervious Area
5,412		68.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment P15: TO DCB-C



Summary for Subcatchment P16: TO LOW POINT

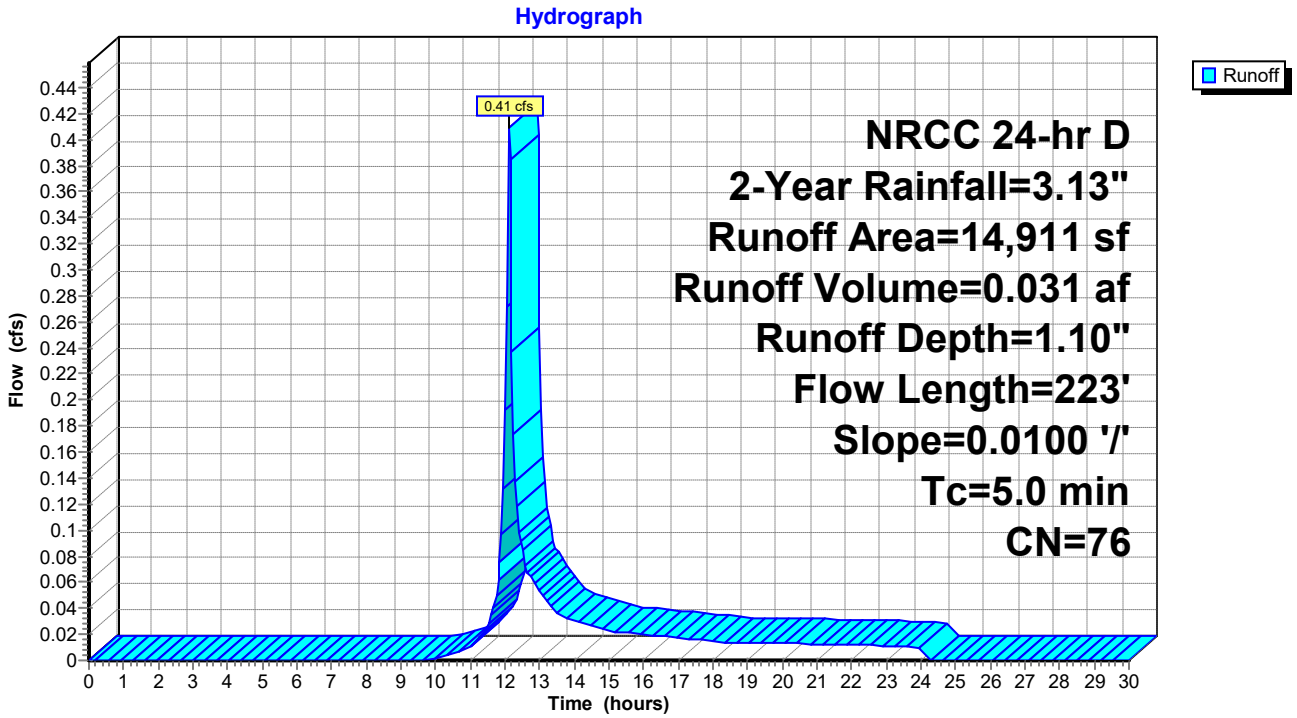
Runoff = 0.41 cfs @ 12.12 hrs, Volume= 0.031 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
5,411	39	>75% Grass cover, Good, HSG A
7,655	98	Paved parking, HSG A
1,845	96	Gravel surface, HSG A
14,911	76	Weighted Average
7,256		48.66% Pervious Area
7,655		51.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.8	173	0.0100	1.61		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
2.7	223	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P16: TO LOW POINT



Summary for Subcatchment P18: TO DCB-D

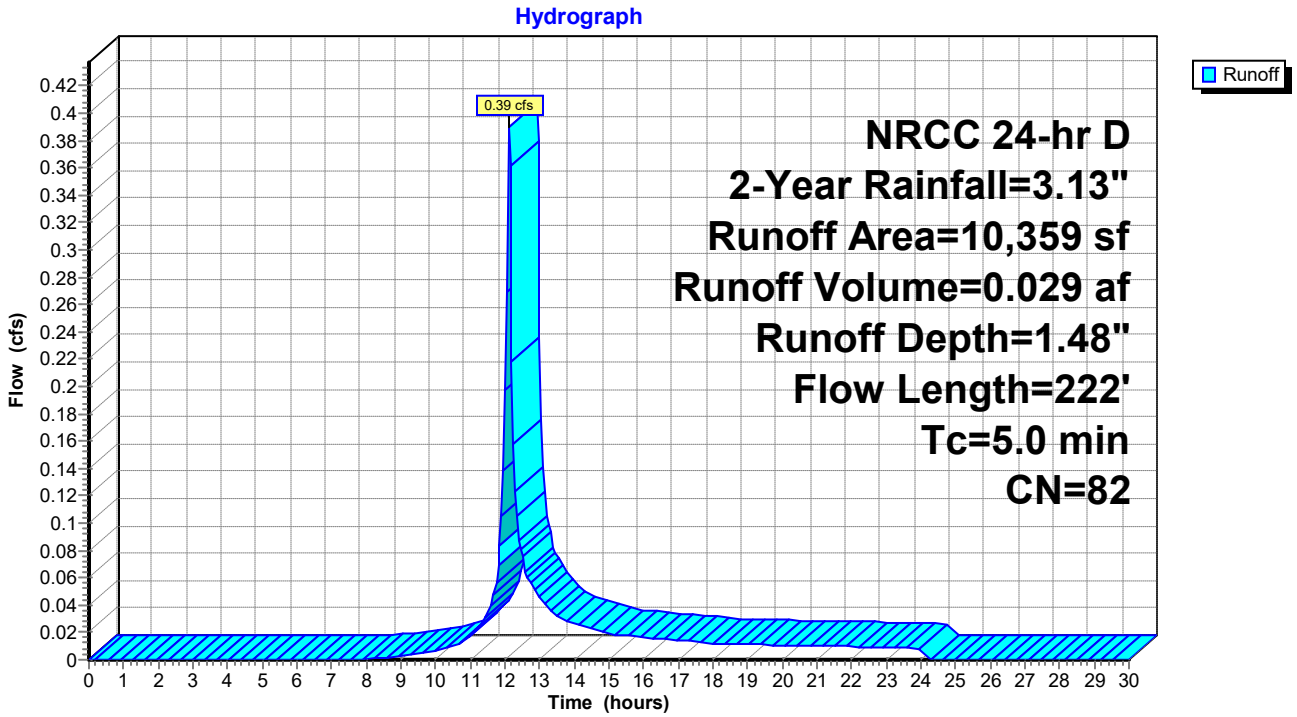
Runoff = 0.39 cfs @ 12.12 hrs, Volume= 0.029 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
2,781	39	>75% Grass cover, Good, HSG A
7,578	98	Paved parking, HSG A
10,359	82	Weighted Average
2,781		26.85% Pervious Area
7,578		73.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	9	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	9	0.0150	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	32	0.0075	0.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	172	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	222	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P18: TO DCB-D



Summary for Subcatchment P19: TO DCB-E

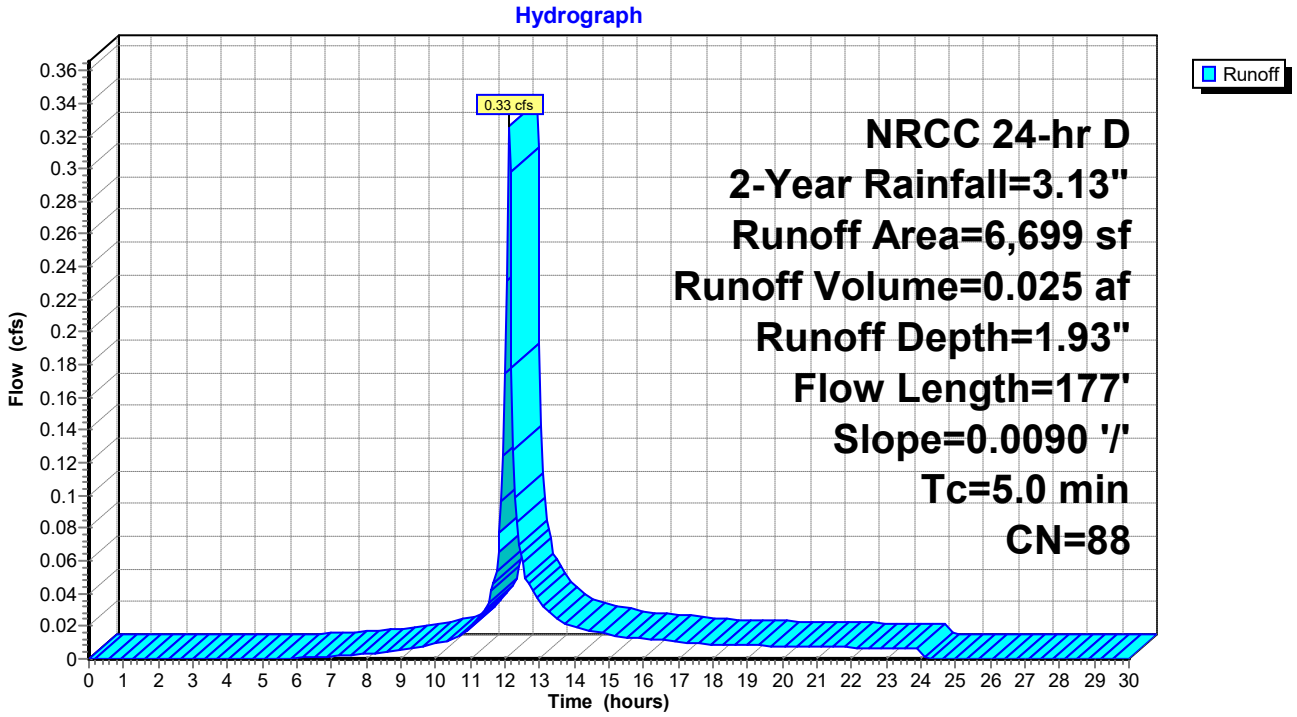
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,083	39	>75% Grass cover, Good, HSG A
5,616	98	Paved parking, HSG A
6,699	88	Weighted Average
1,083		16.17% Pervious Area
5,616		83.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P19: TO DCB-E



Summary for Subcatchment P20: TO DP#3

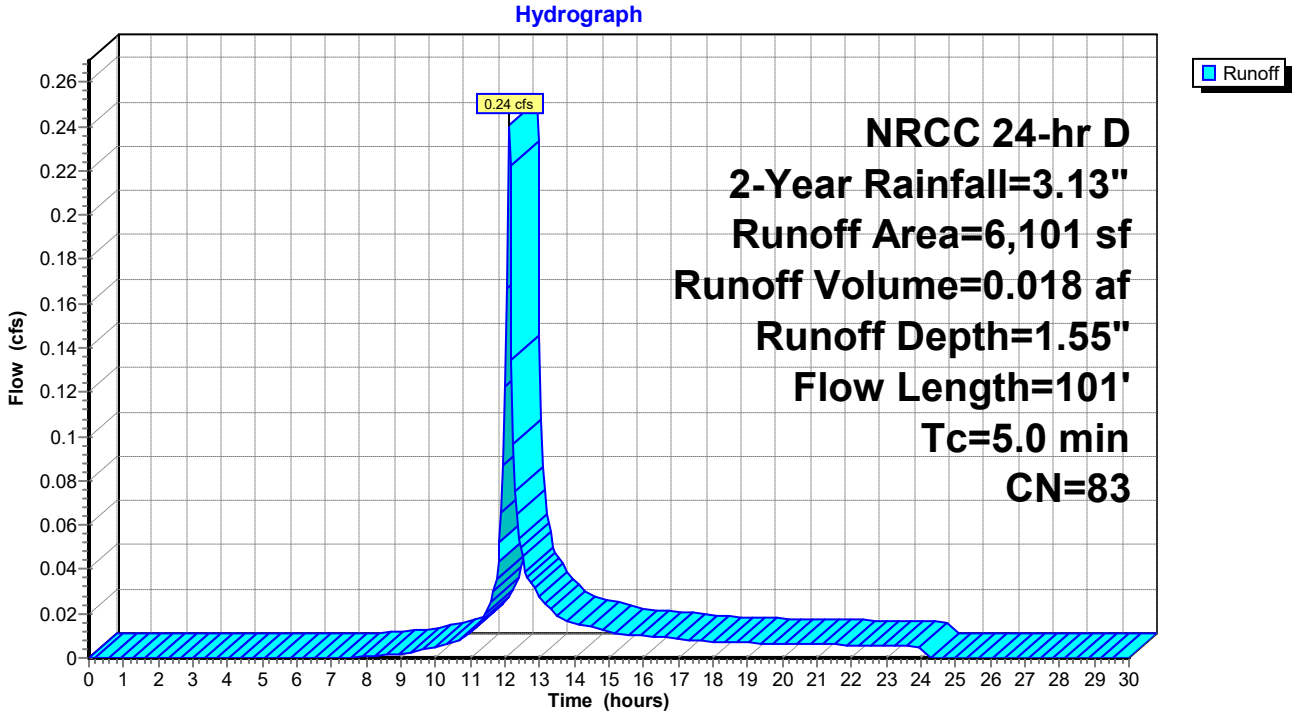
Runoff = 0.24 cfs @ 12.12 hrs, Volume= 0.018 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,501	39	>75% Grass cover, Good, HSG A
4,600	98	Paved parking, HSG A
6,101	83	Weighted Average
1,501		24.60% Pervious Area
4,600		75.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	9	0.0250	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	41	0.0150	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P20: TO DP#3



Summary for Subcatchment P24: TO DP#4

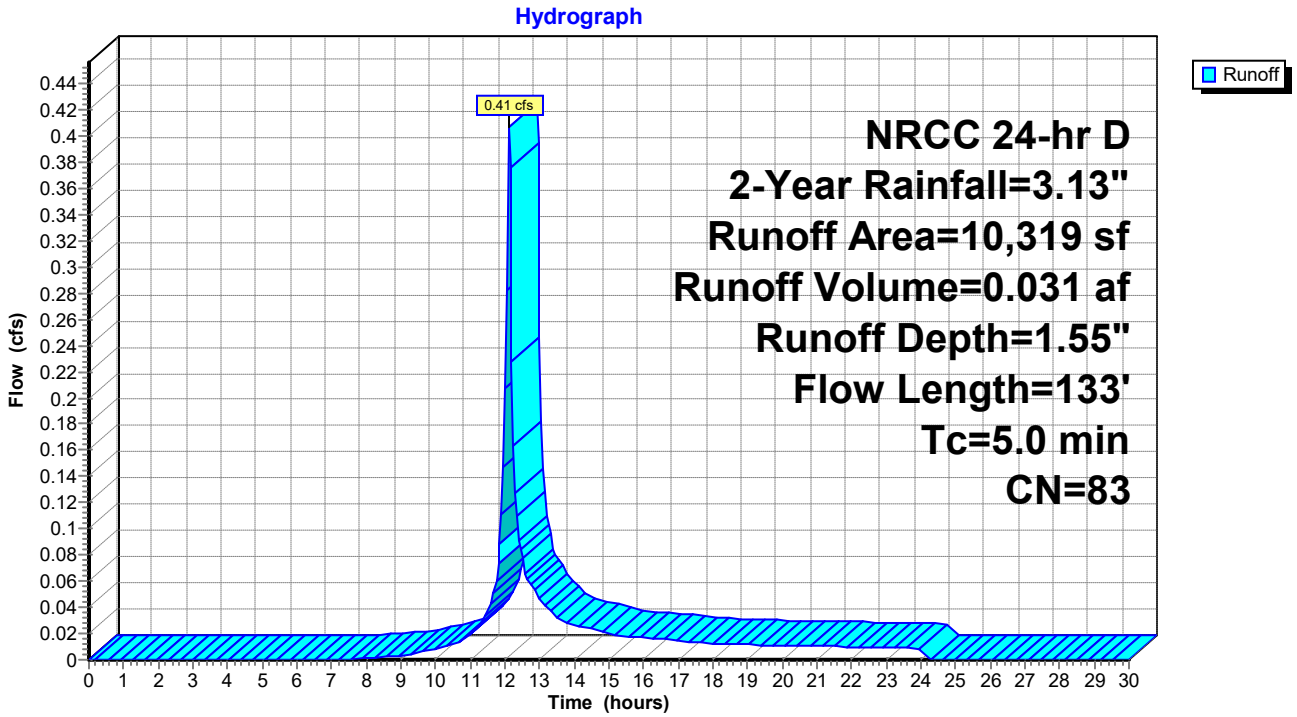
Runoff = 0.41 cfs @ 12.12 hrs, Volume= 0.031 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
2,618	39	>75% Grass cover, Good, HSG A
7,701	98	Paved parking, HSG A
10,319	83	Weighted Average
2,618		25.37% Pervious Area
7,701		74.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	35	0.0600	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	10	0.3000	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0100	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.4	83	0.0100	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
4.8	133	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DP#4



Summary for Subcatchment P26: TO DCB-H

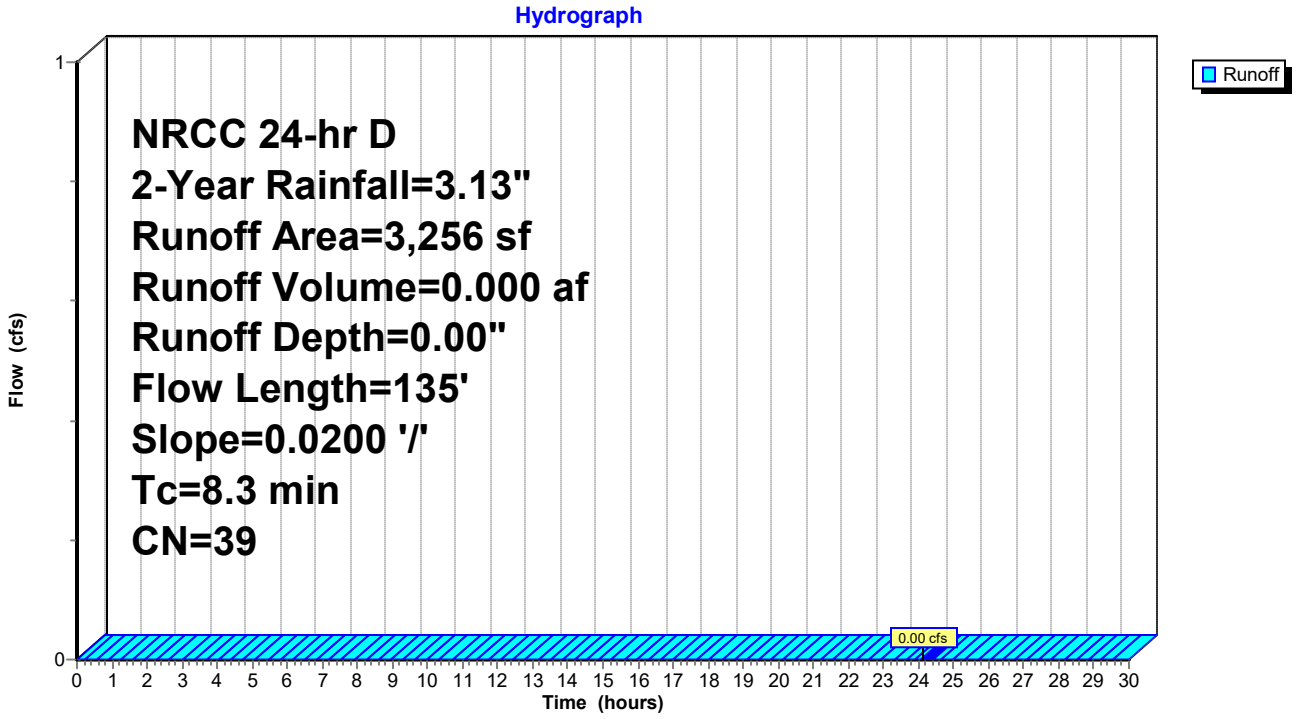
Runoff = 0.00 cfs @ 24.10 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
3,256	39	>75% Grass cover, Good, HSG A
3,256		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.3	135	Total			

Subcatchment P26: TO DCB-H



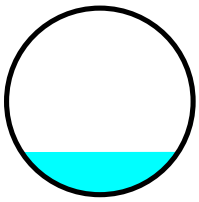
Summary for Reach CMH1: TO DMH-D

Inflow Area = 2.548 ac, 97.20% Impervious, Inflow Depth = 2.78" for 2-Year event
Inflow = 6.67 cfs @ 12.13 hrs, Volume= 0.590 af
Outflow = 6.57 cfs @ 12.14 hrs, Volume= 0.590 af, Atten= 1%, Lag= 0.4 min

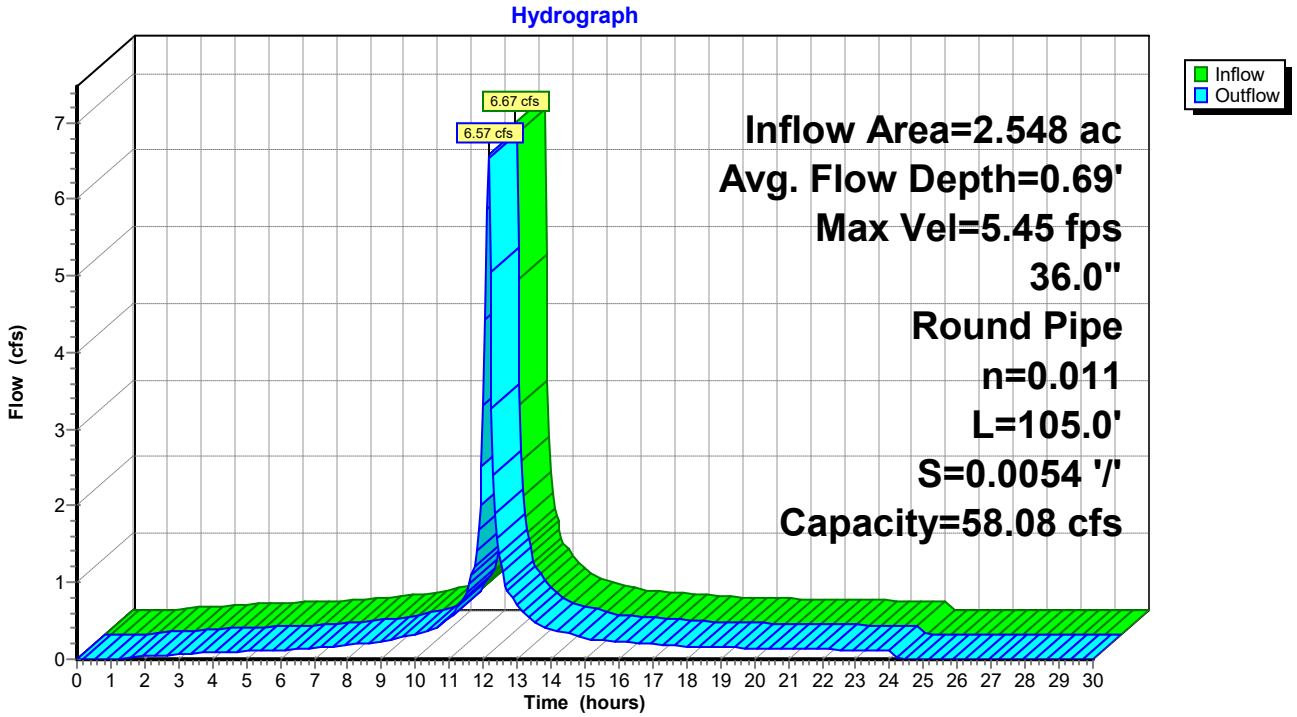
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.45 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 0.9 min

Peak Storage= 128 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.08 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 105.0' Slope= 0.0054 '/'
Inlet Invert= 456.47', Outlet Invert= 455.90'



Reach CMH1: TO DMH-D

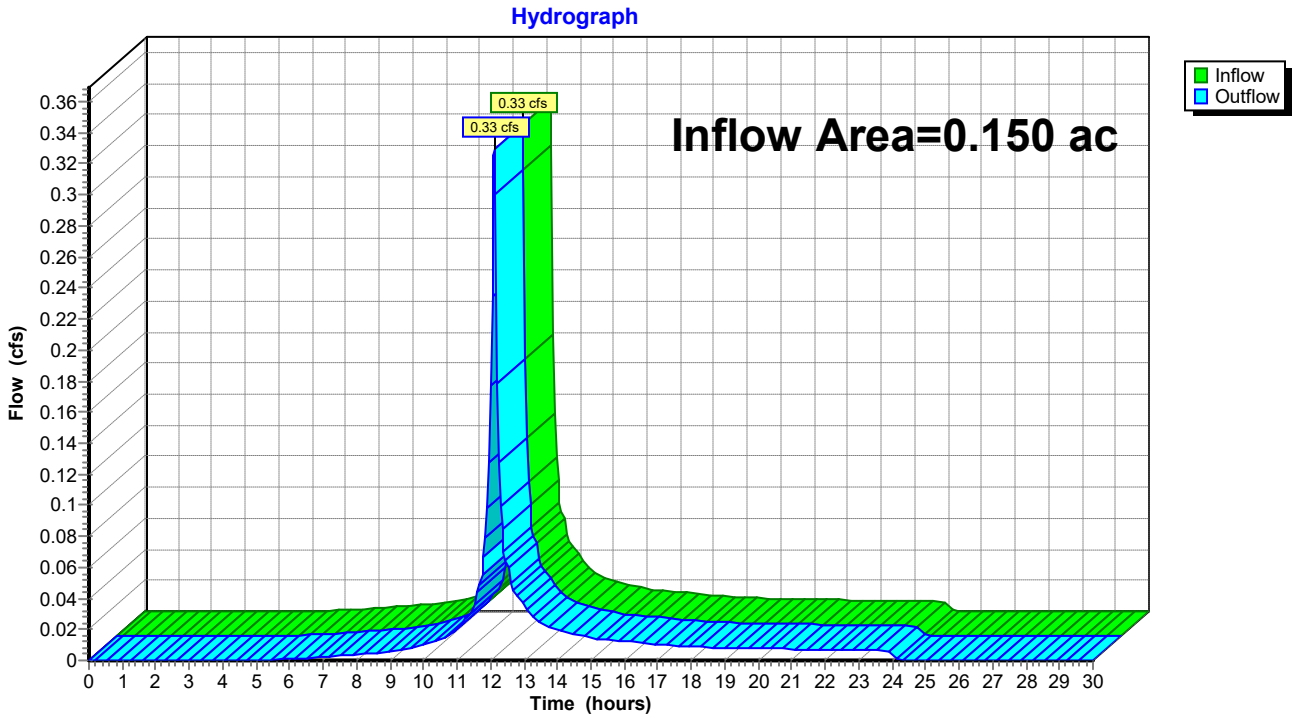


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.150 ac, 85.11% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af
Outflow = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

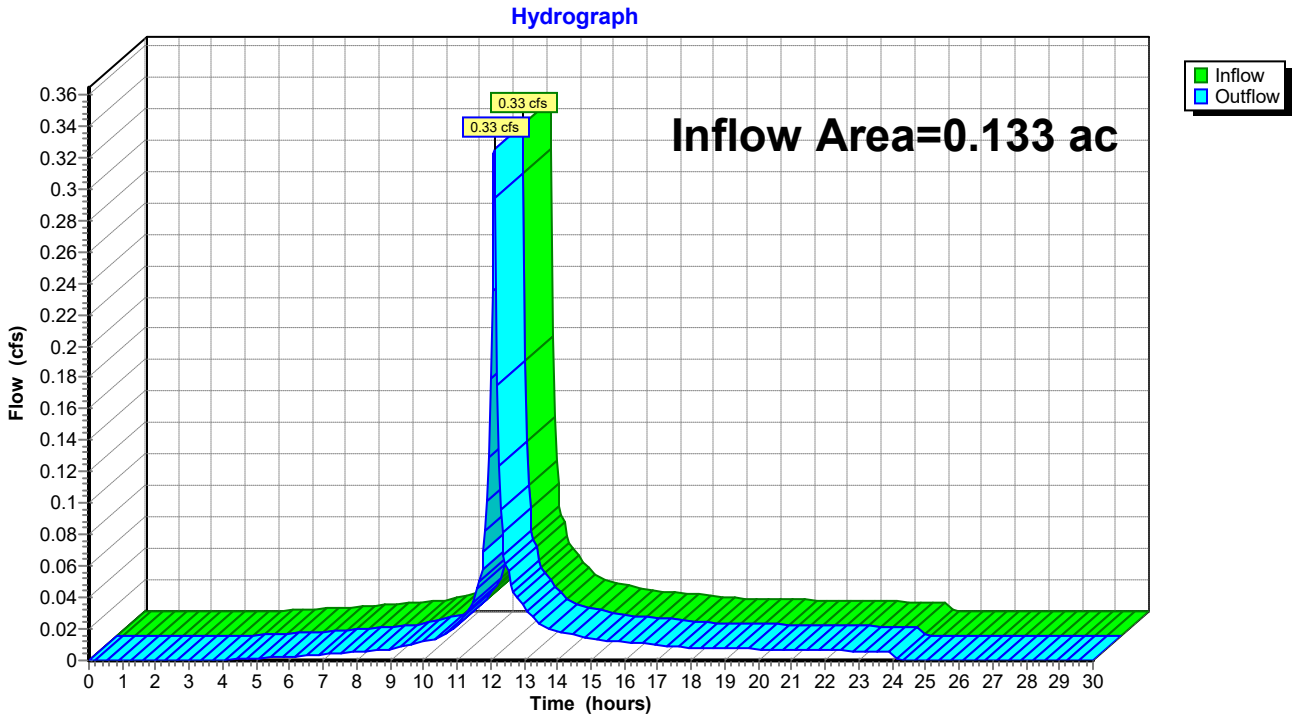


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.133 ac, 89.51% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af
Outflow = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

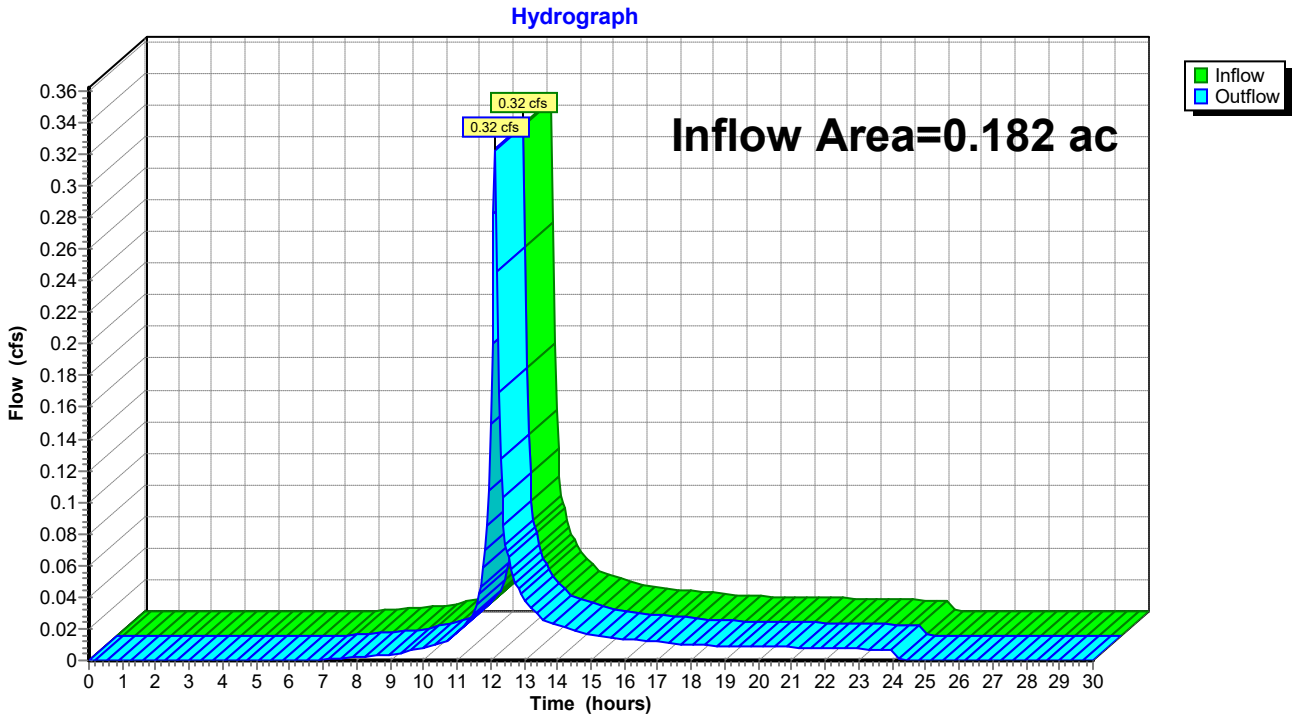


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.182 ac, 68.45% Impervious, Inflow Depth = 1.70" for 2-Year event
Inflow = 0.32 cfs @ 12.14 hrs, Volume= 0.026 af
Outflow = 0.32 cfs @ 12.14 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



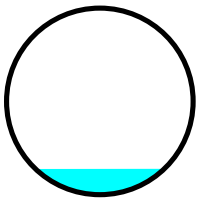
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 0.238 ac, 73.15% Impervious, Inflow Depth = 1.48" for 2-Year event
Inflow = 0.39 cfs @ 12.12 hrs, Volume= 0.029 af
Outflow = 0.39 cfs @ 12.12 hrs, Volume= 0.029 af, Atten= 1%, Lag= 0.1 min

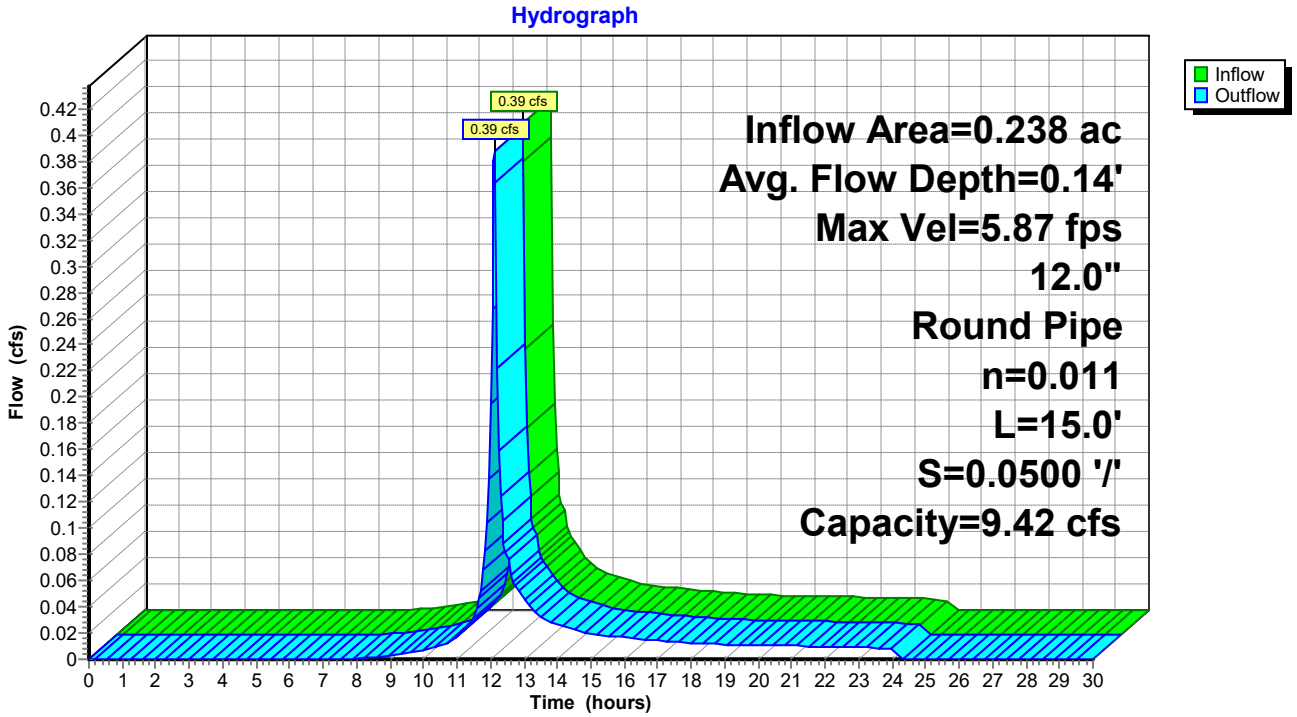
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.87 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.20 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.42 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.0500 '/'
Inlet Invert= 466.75', Outlet Invert= 466.00'



Reach DCB-D: TO DMH-A



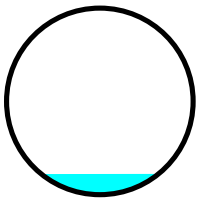
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.154 ac, 83.83% Impervious, Inflow Depth = 1.93" for 2-Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 0.025 af
Outflow = 0.33 cfs @ 12.12 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.1 min

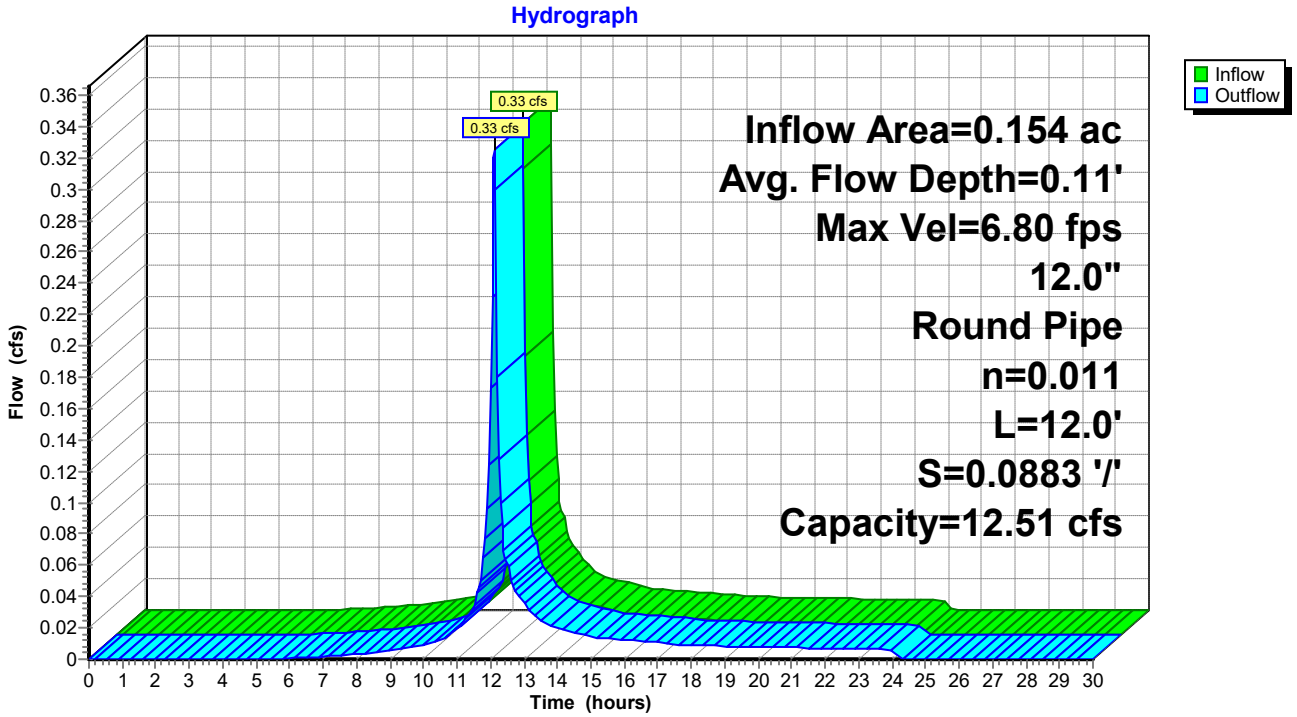
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.80 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.44 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A



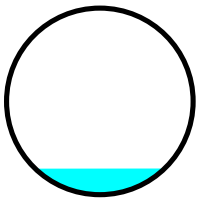
Summary for Reach DCB1: TO DMH#2

Inflow Area = 0.118 ac, 82.42% Impervious, Inflow Depth = 1.93" for 2-Year event
Inflow = 0.25 cfs @ 12.11 hrs, Volume= 0.019 af
Outflow = 0.25 cfs @ 12.13 hrs, Volume= 0.019 af, Atten= 2%, Lag= 0.8 min

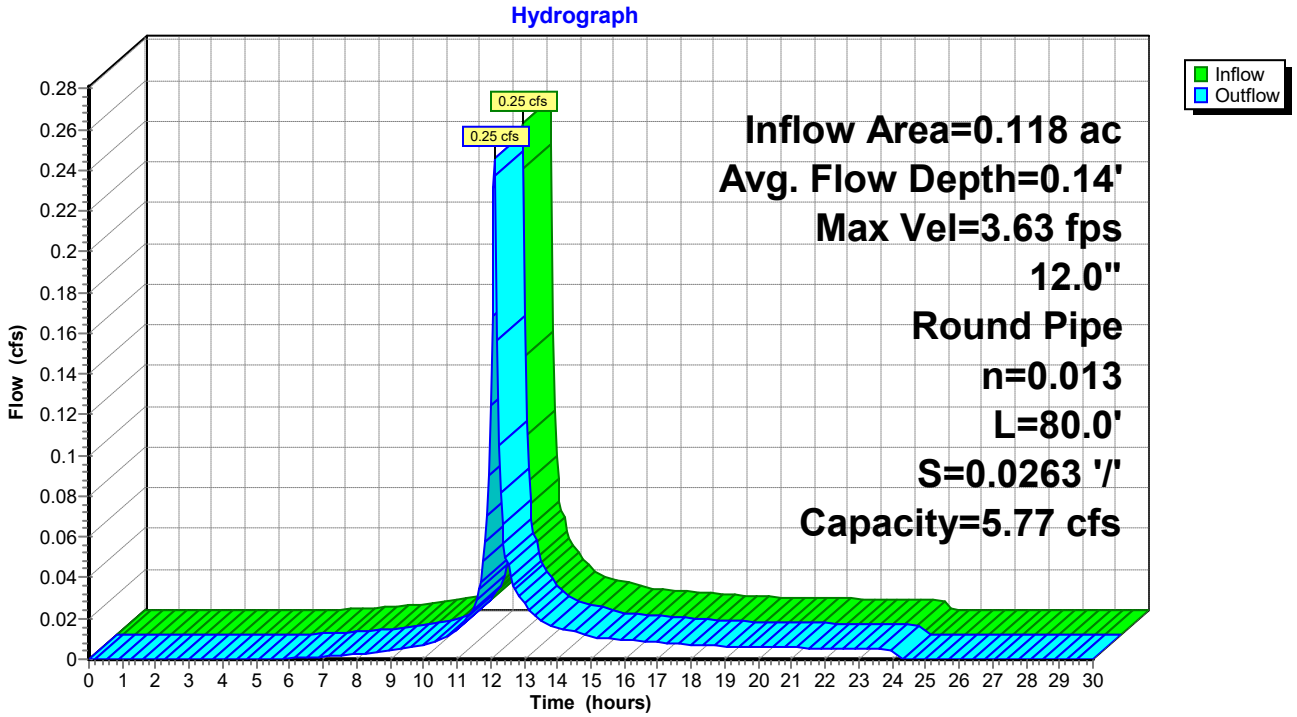
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.63 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.0 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.77 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 80.0' Slope= 0.0263 '/'
Inlet Invert= 469.10', Outlet Invert= 467.00'



Reach DCB1: TO DMH#2



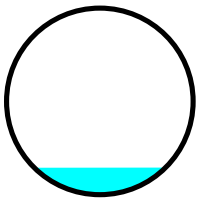
Summary for Reach DCB2: TO DMH#2

Inflow Area = 0.088 ac, 96.05% Impervious, Inflow Depth = 2.68" for 2-Year event
Inflow = 0.24 cfs @ 12.11 hrs, Volume= 0.020 af
Outflow = 0.23 cfs @ 12.13 hrs, Volume= 0.020 af, Atten= 2%, Lag= 0.8 min

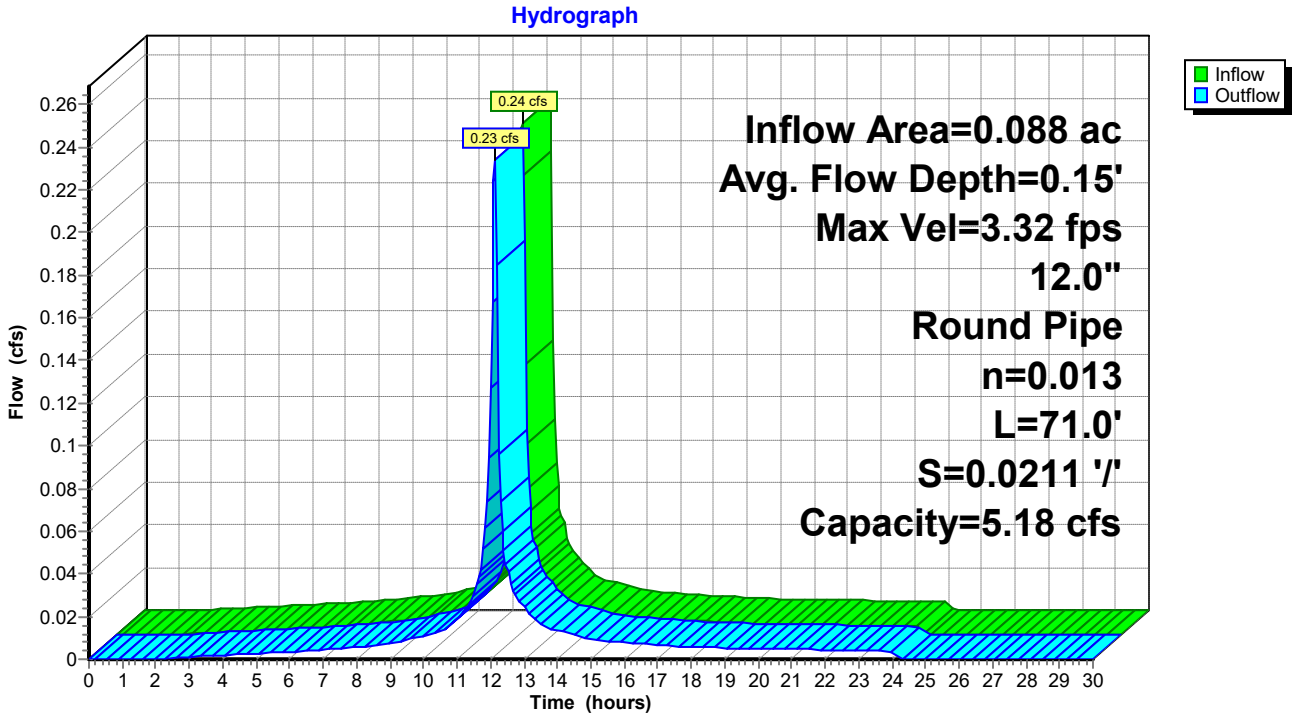
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.0 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.18 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 71.0' Slope= 0.0211 '/'
Inlet Invert= 469.10', Outlet Invert= 467.60'



Reach DCB2: TO DMH#2



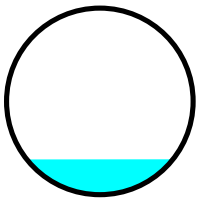
Summary for Reach DCB3: TO DMH#2

Inflow Area = 0.159 ac, 92.22% Impervious, Inflow Depth = 2.38" for 2-Year event
Inflow = 0.40 cfs @ 12.11 hrs, Volume= 0.031 af
Outflow = 0.40 cfs @ 12.11 hrs, Volume= 0.031 af, Atten= 1%, Lag= 0.1 min

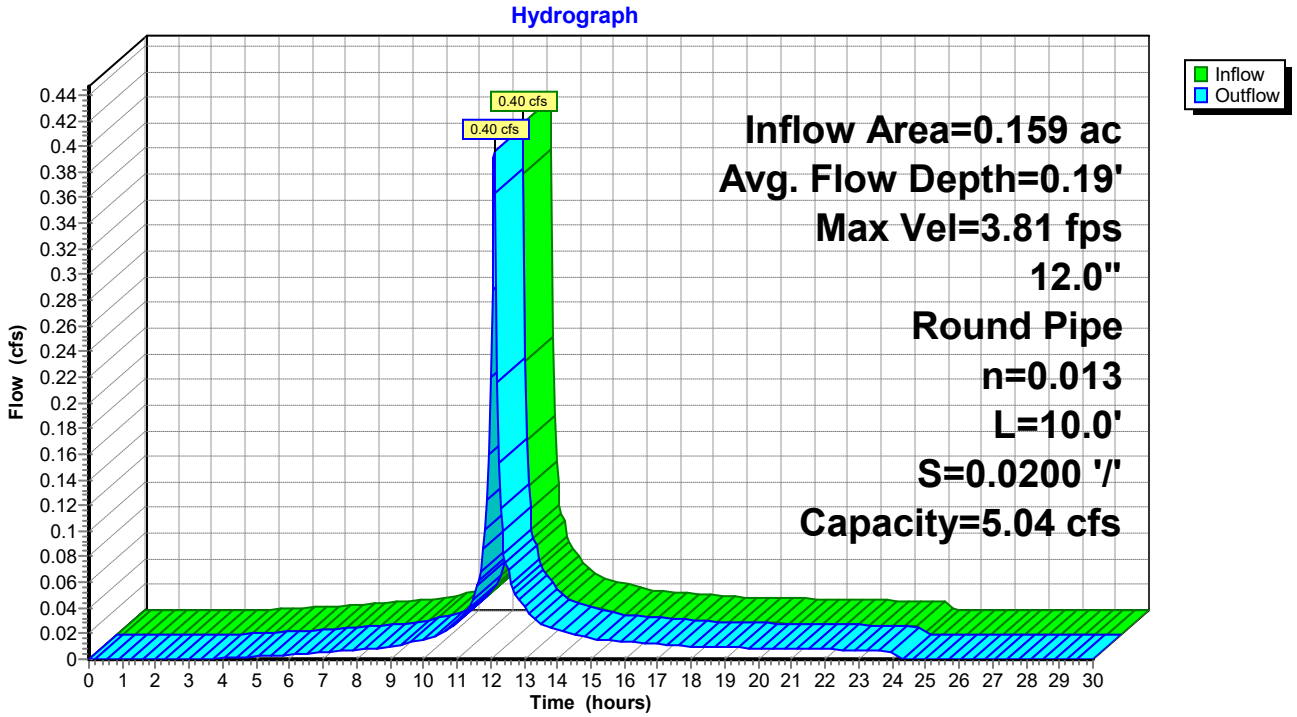
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.81 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 469.10', Outlet Invert= 468.90'



Reach DCB3: TO DMH#2



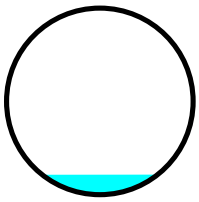
Summary for Reach DCB4: TO DMH#1

Inflow Area = 0.047 ac, 78.10% Impervious, Inflow Depth = 1.70" for 2-Year event
Inflow = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af
Outflow = 0.08 cfs @ 12.14 hrs, Volume= 0.007 af, Atten= 4%, Lag= 1.5 min

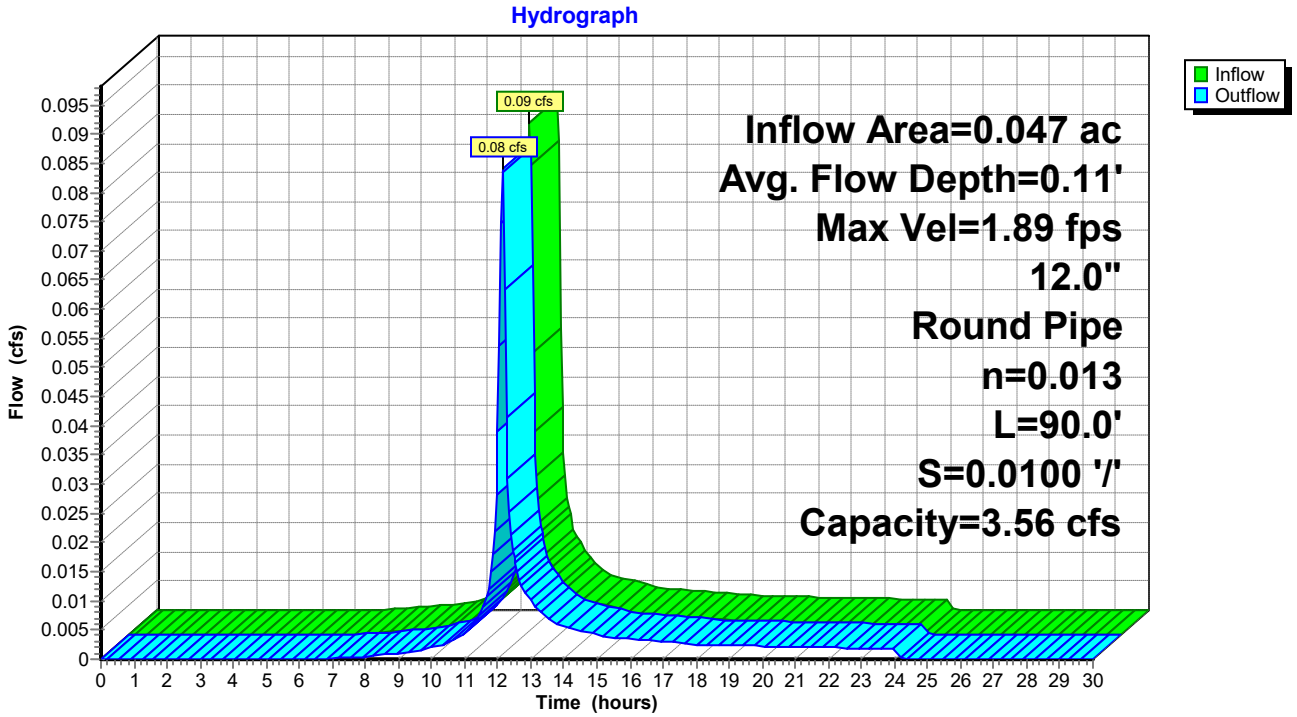
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 2.2 min

Peak Storage= 4 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 90.0' Slope= 0.0100 '/'
Inlet Invert= 468.50', Outlet Invert= 467.60'



Reach DCB4: TO DMH#1



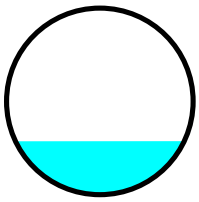
Summary for Reach DCB5: TO DMH#101

Inflow Area = 0.392 ac, 83.45% Impervious, Inflow Depth = 1.93" for 2-Year event
Inflow = 0.83 cfs @ 12.11 hrs, Volume= 0.063 af
Outflow = 0.82 cfs @ 12.12 hrs, Volume= 0.063 af, Atten= 1%, Lag= 0.2 min

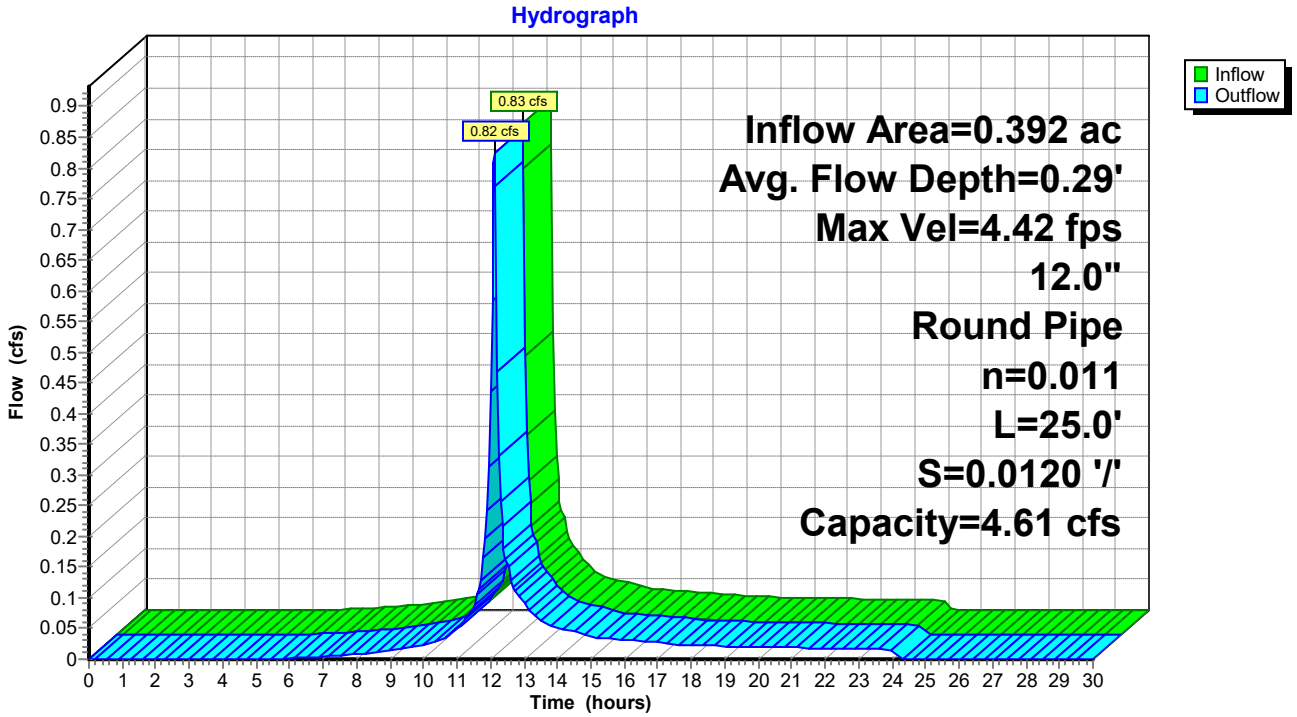
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.3 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0120 '/'
Inlet Invert= 468.30', Outlet Invert= 468.00'



Reach DCB5: TO DMH#101



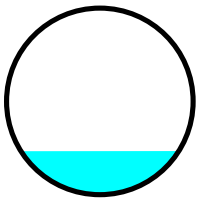
Summary for Reach DCB6: TO DMH#3

Inflow Area = 0.184 ac, 87.34% Impervious, Inflow Depth = 2.19" for 2-Year event
Inflow = 0.43 cfs @ 12.11 hrs, Volume= 0.034 af
Outflow = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af, Atten= 3%, Lag= 1.1 min

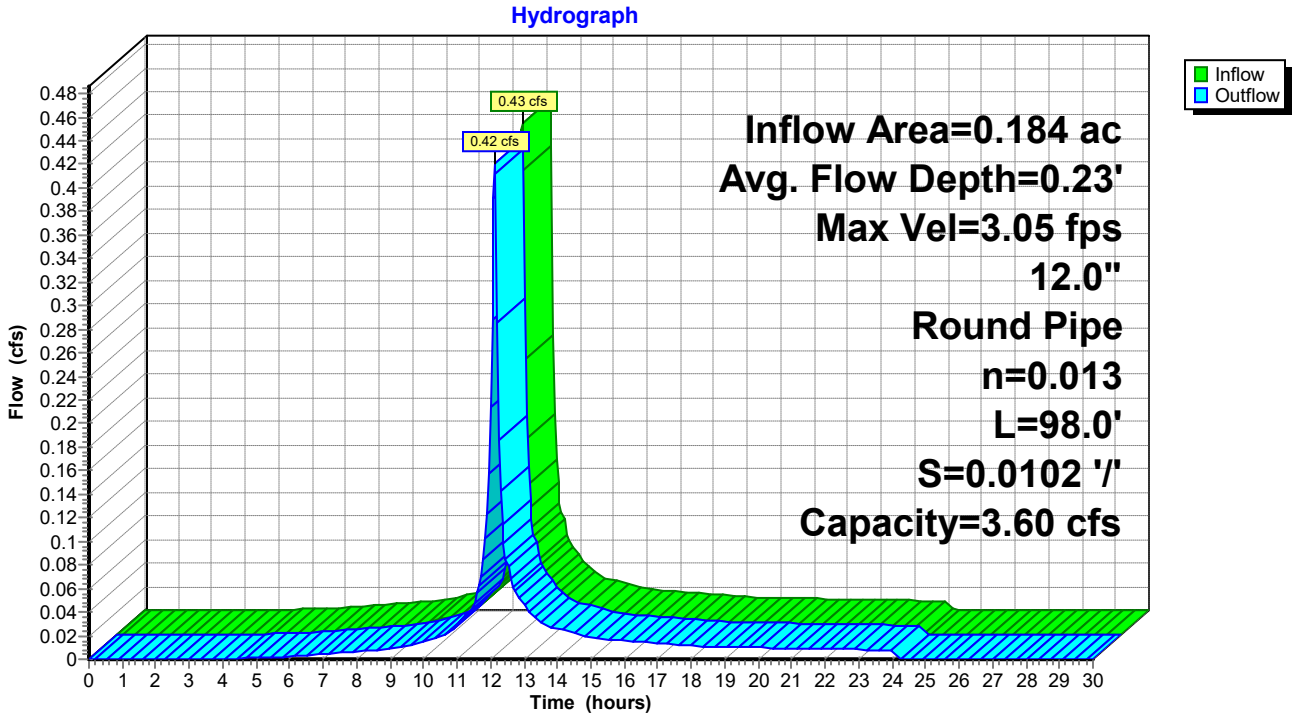
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.05 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 1.5 min

Peak Storage= 14 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 469.50', Outlet Invert= 468.50'



Reach DCB6: TO DMH#3



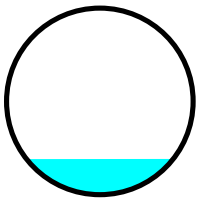
Summary for Reach DCB7: TO DMH#4

Inflow Area = 0.335 ac, 56.05% Impervious, Inflow Depth = 0.89" for 2-Year event
Inflow = 0.29 cfs @ 12.16 hrs, Volume= 0.025 af
Outflow = 0.27 cfs @ 12.18 hrs, Volume= 0.025 af, Atten= 5%, Lag= 1.2 min

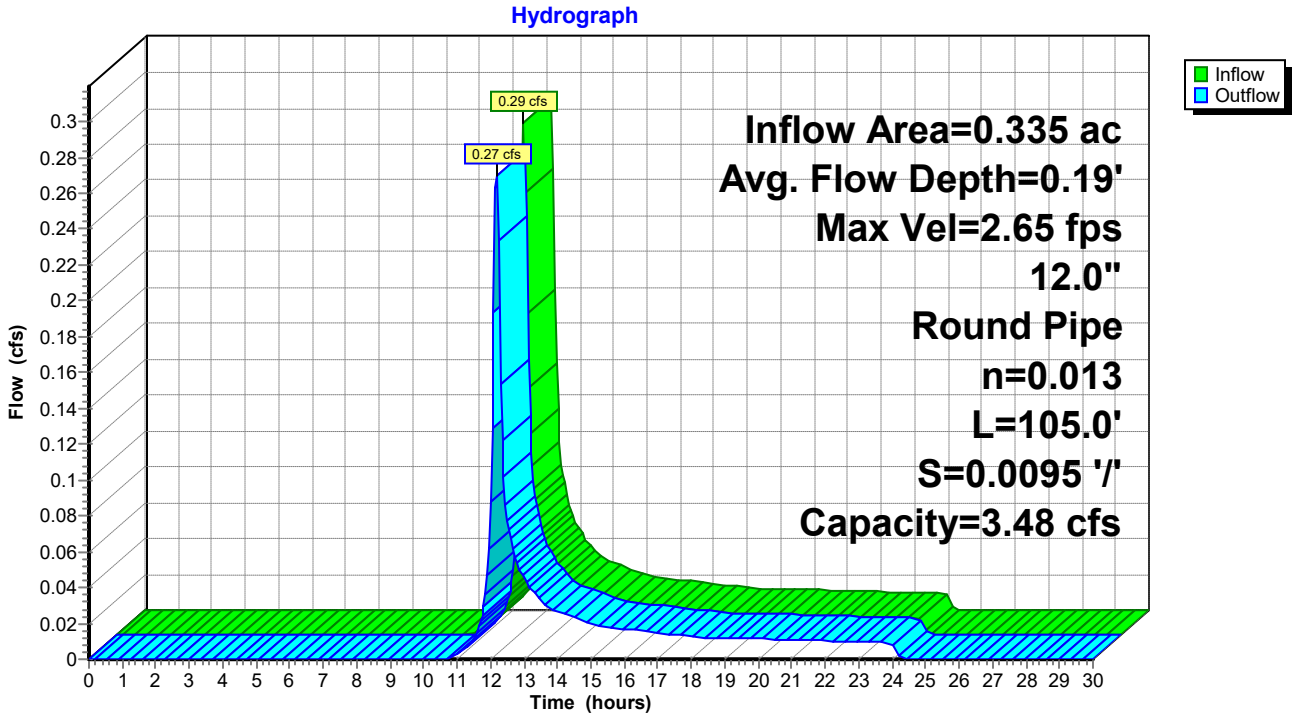
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.65 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.48 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 105.0' Slope= 0.0095 '/'
Inlet Invert= 470.00', Outlet Invert= 469.00'



Reach DCB7: TO DMH#4



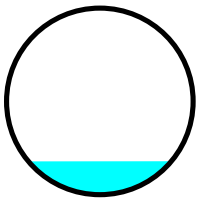
Summary for Reach DCB8: TO DMH#4

Inflow Area = 0.143 ac, 85.54% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 0.31 cfs @ 12.11 hrs, Volume= 0.024 af
Outflow = 0.31 cfs @ 12.13 hrs, Volume= 0.024 af, Atten= 2%, Lag= 0.7 min

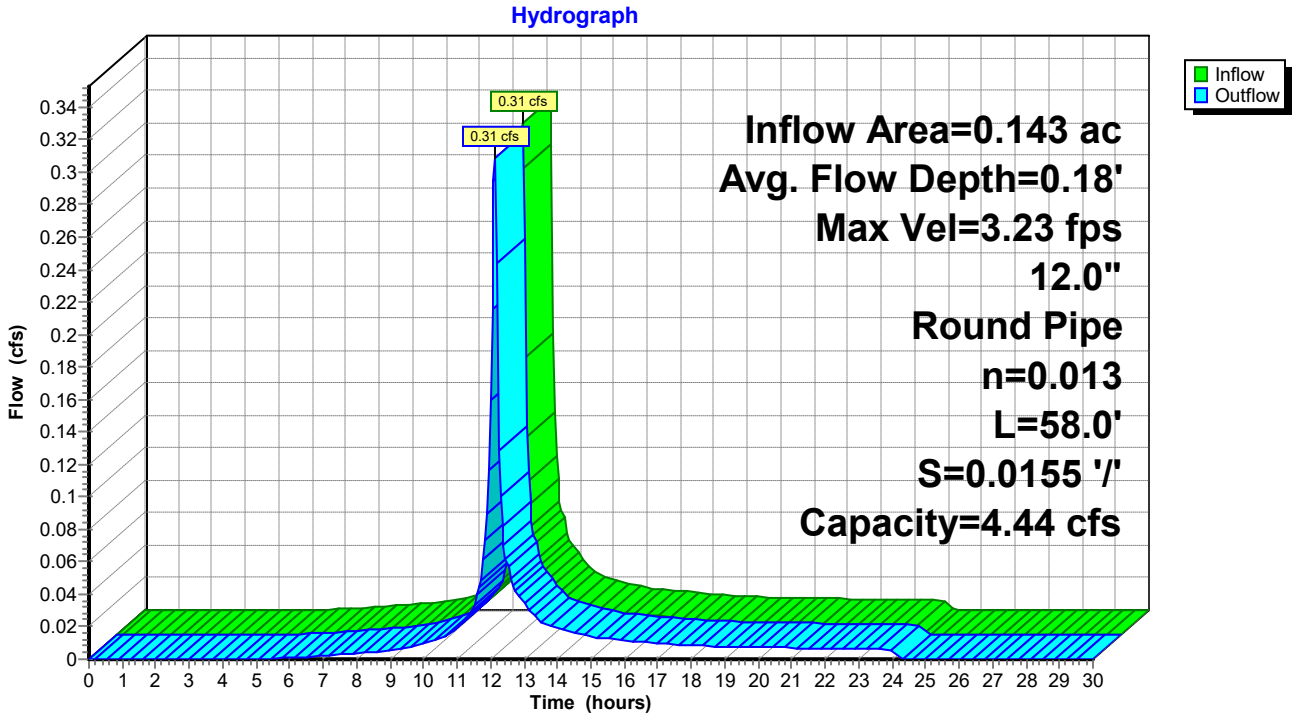
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.8 min

Peak Storage= 6 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 58.0' Slope= 0.0155 '/'
Inlet Invert= 469.90', Outlet Invert= 469.00'



Reach DCB8: TO DMH#4



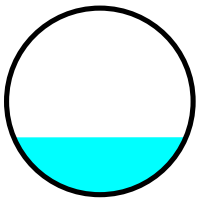
Summary for Reach DCB9: TO DMH#5

Inflow Area = 0.342 ac, 51.34% Impervious, Inflow Depth = 1.10" for 2-Year event
Inflow = 0.41 cfs @ 12.12 hrs, Volume= 0.031 af
Outflow = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Atten= 2%, Lag= 0.9 min

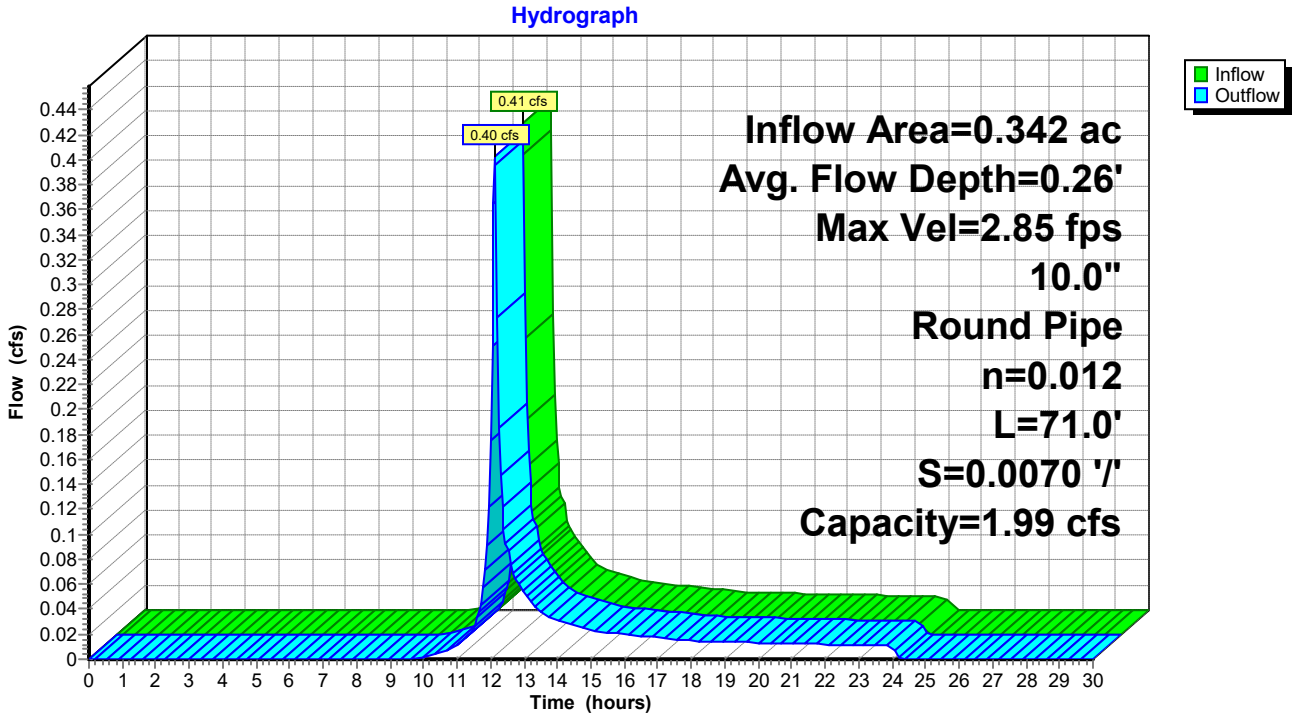
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.85 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 1.0 min

Peak Storage= 10 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 1.99 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 71.0' Slope= 0.0070 '/'
Inlet Invert= 471.00', Outlet Invert= 470.50'



Reach DCB9: TO DMH#5

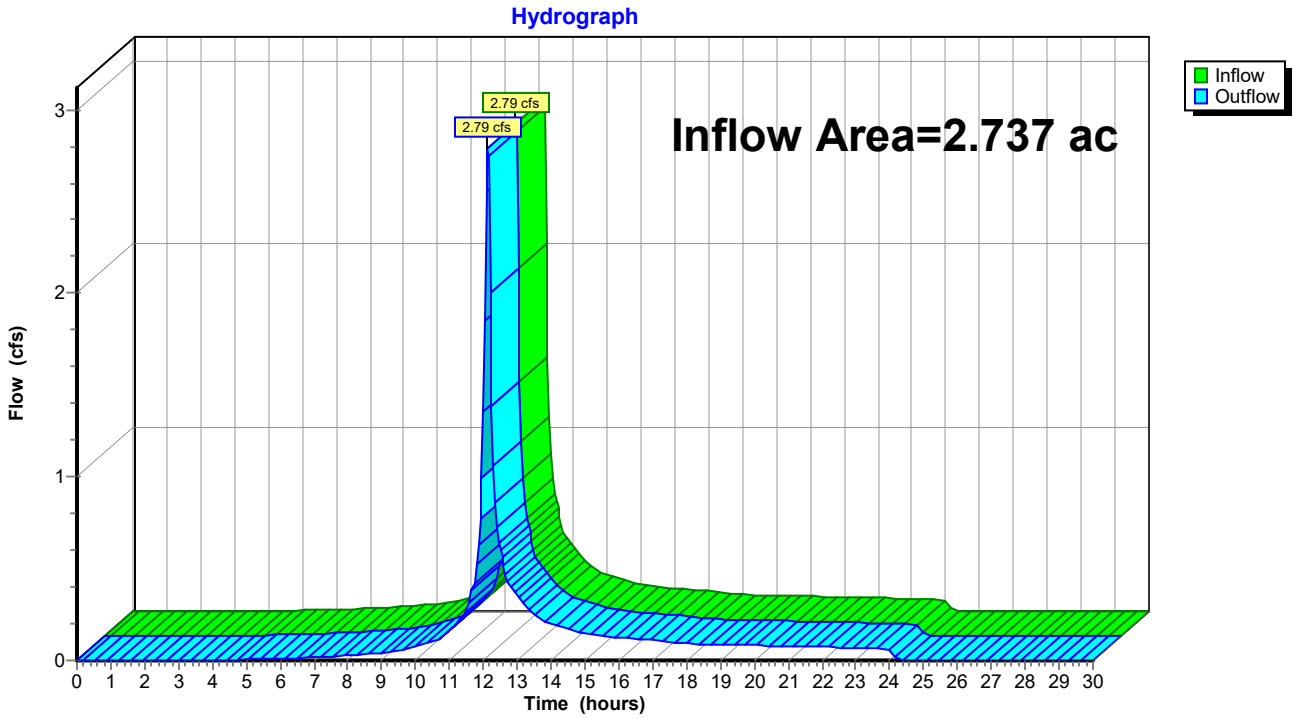


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 1.03" for 2-Year event
Inflow = 2.79 cfs @ 12.14 hrs, Volume= 0.236 af
Outflow = 2.79 cfs @ 12.14 hrs, Volume= 0.236 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

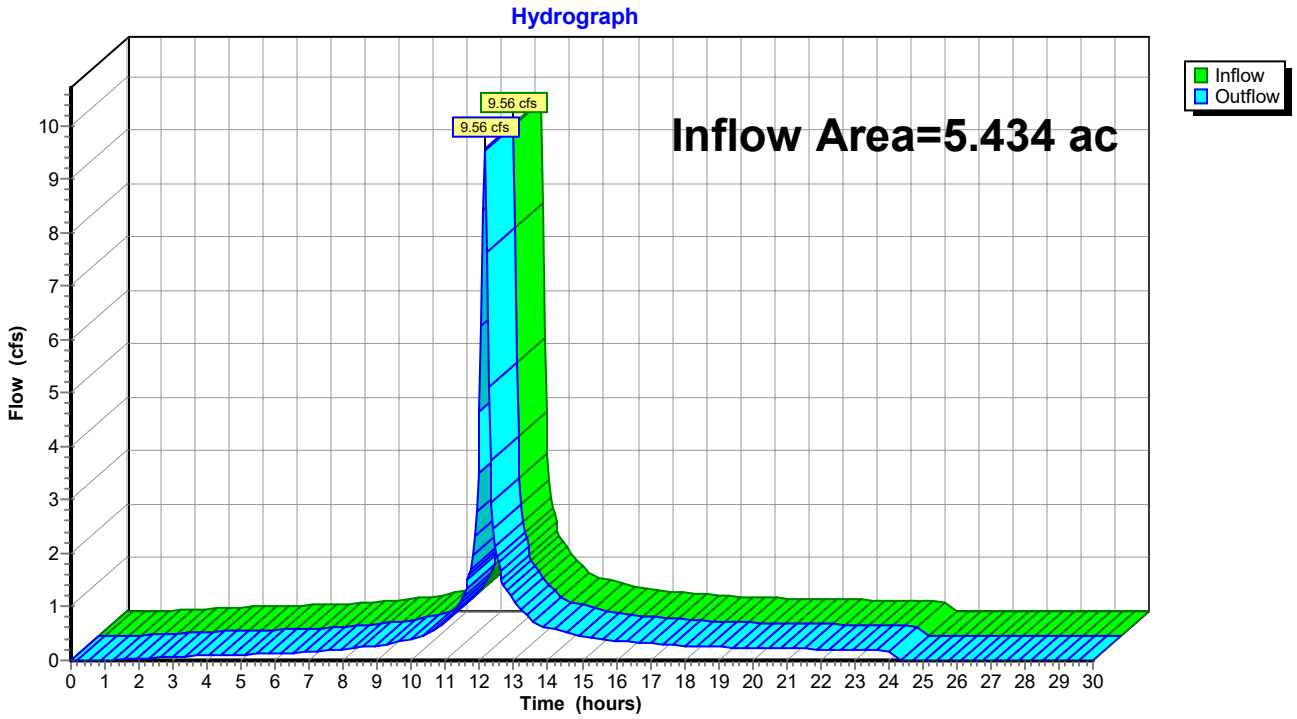


Summary for Reach DMH-C: TO DP#1

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 1.88" for 2-Year event
Inflow = 9.56 cfs @ 12.14 hrs, Volume= 0.851 af
Outflow = 9.56 cfs @ 12.14 hrs, Volume= 0.851 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



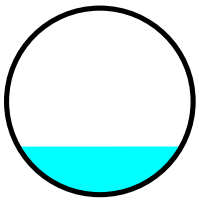
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 1.88" for 2-Year event
Inflow = 9.67 cfs @ 12.14 hrs, Volume= 0.851 af
Outflow = 9.56 cfs @ 12.14 hrs, Volume= 0.851 af, Atten= 1%, Lag= 0.3 min

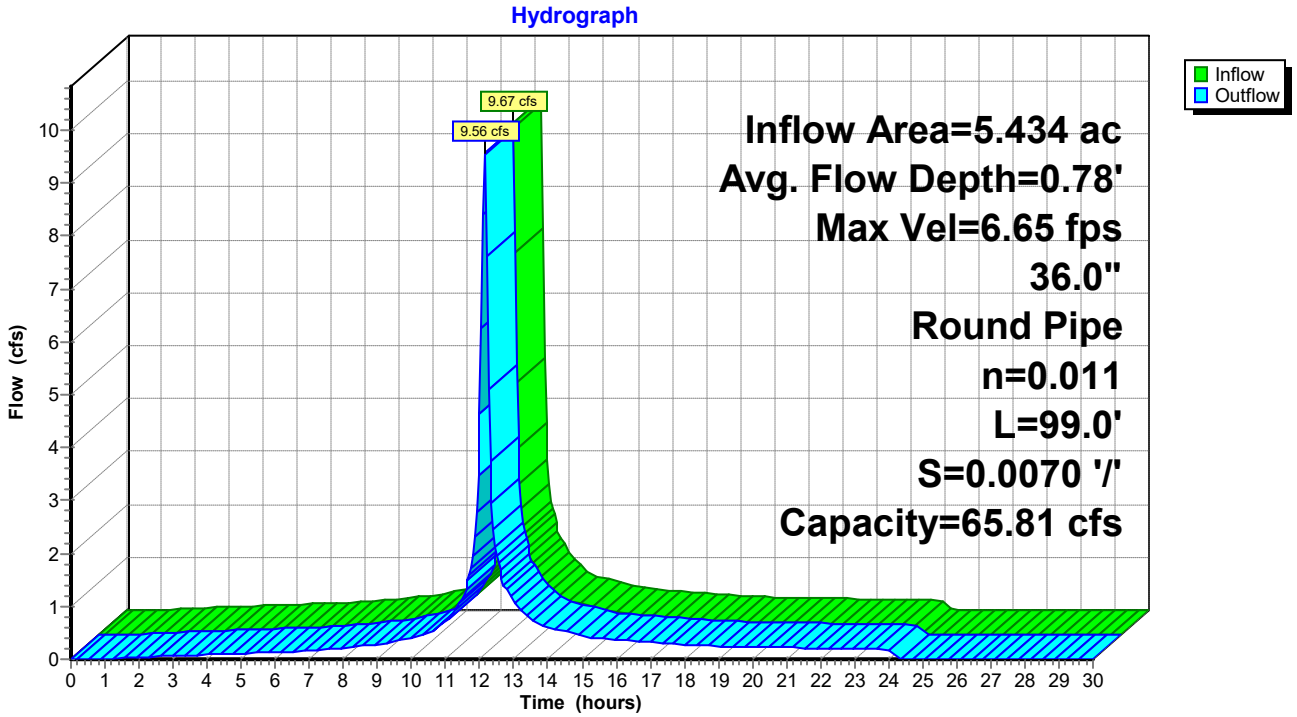
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.7 min

Peak Storage= 144 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



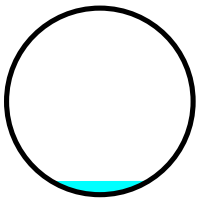
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.315 ac, 77.36% Impervious, Inflow Depth = 1.95" for 2-Year event
Inflow = 0.64 cfs @ 12.13 hrs, Volume= 0.051 af
Outflow = 0.64 cfs @ 12.13 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.2 min

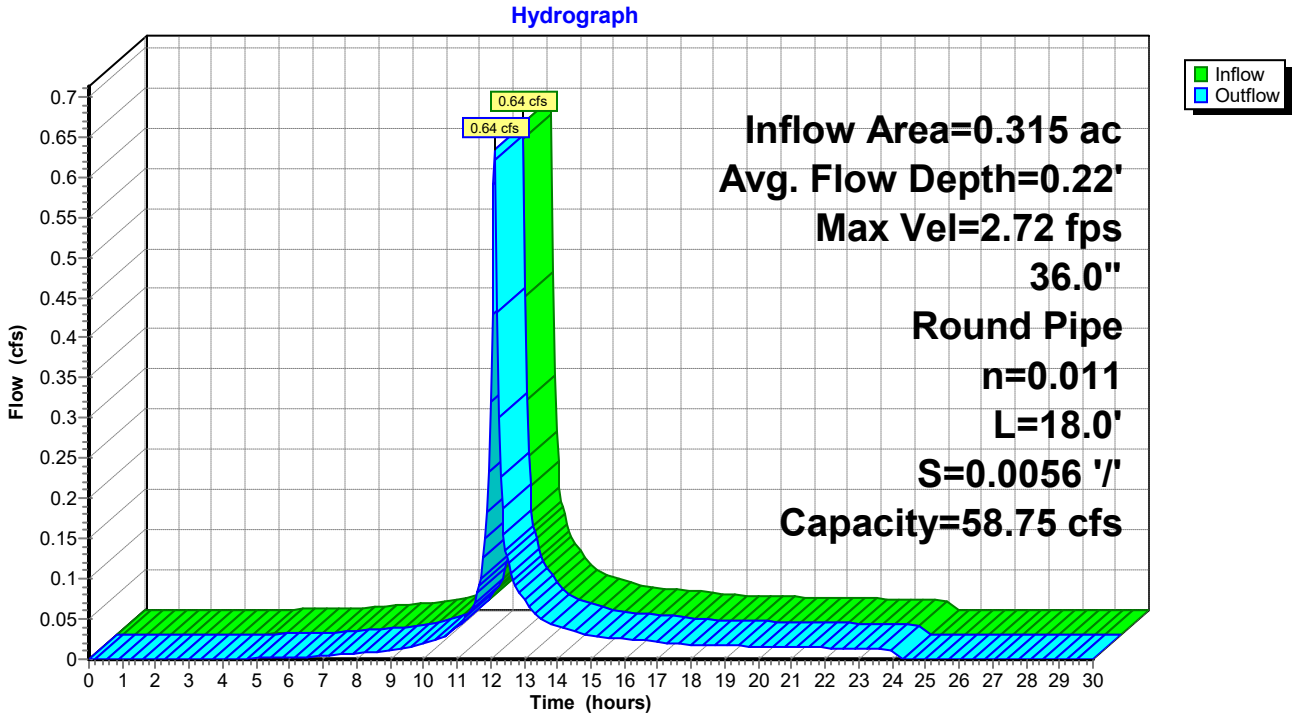
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.72 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.75 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 18.0' Slope= 0.0056 '/'
Inlet Invert= 456.57', Outlet Invert= 456.47'



Reach DMH-E: TO DMH-D



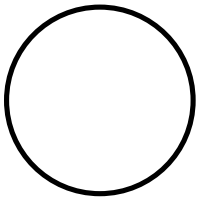
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

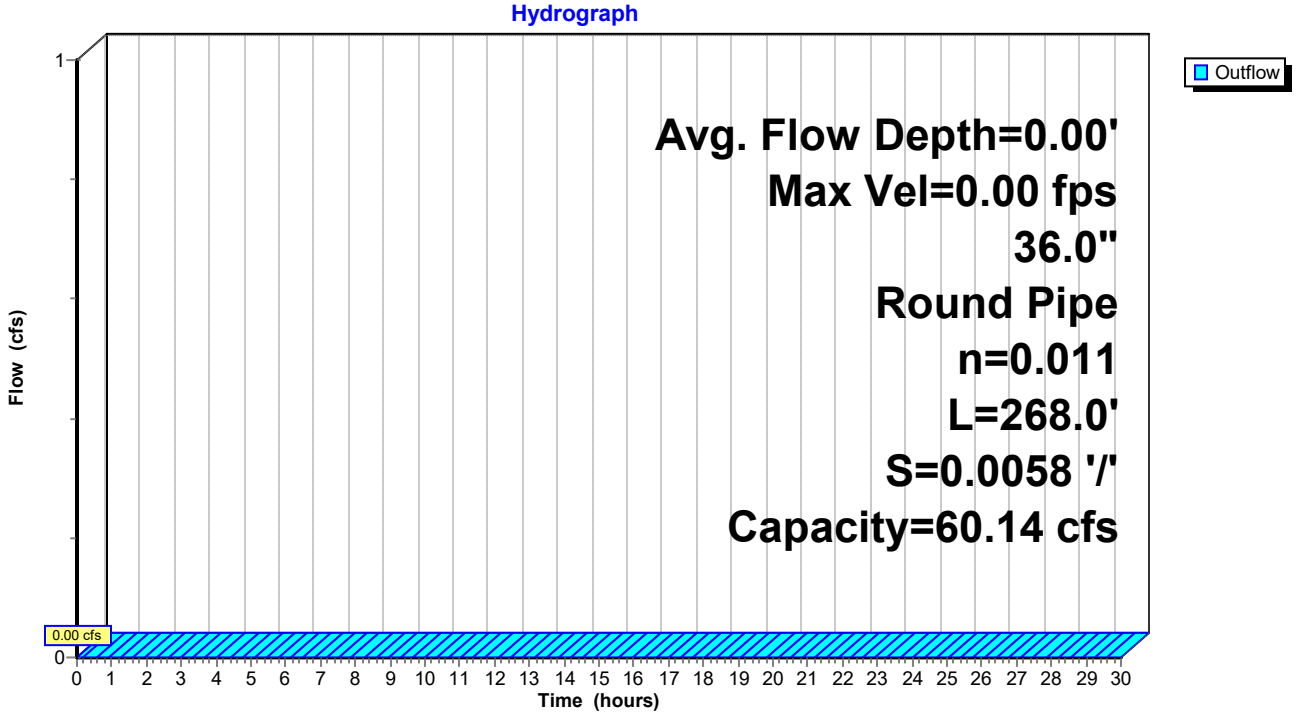
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E



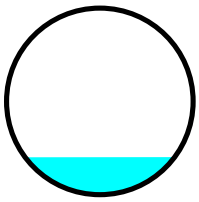
Summary for Reach DMH1: TO DMH#2

Inflow Area = 0.135 ac, 89.85% Impervious, Inflow Depth = 2.34" for 2-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af
Outflow = 0.31 cfs @ 12.14 hrs, Volume= 0.026 af, Atten= 1%, Lag= 0.5 min

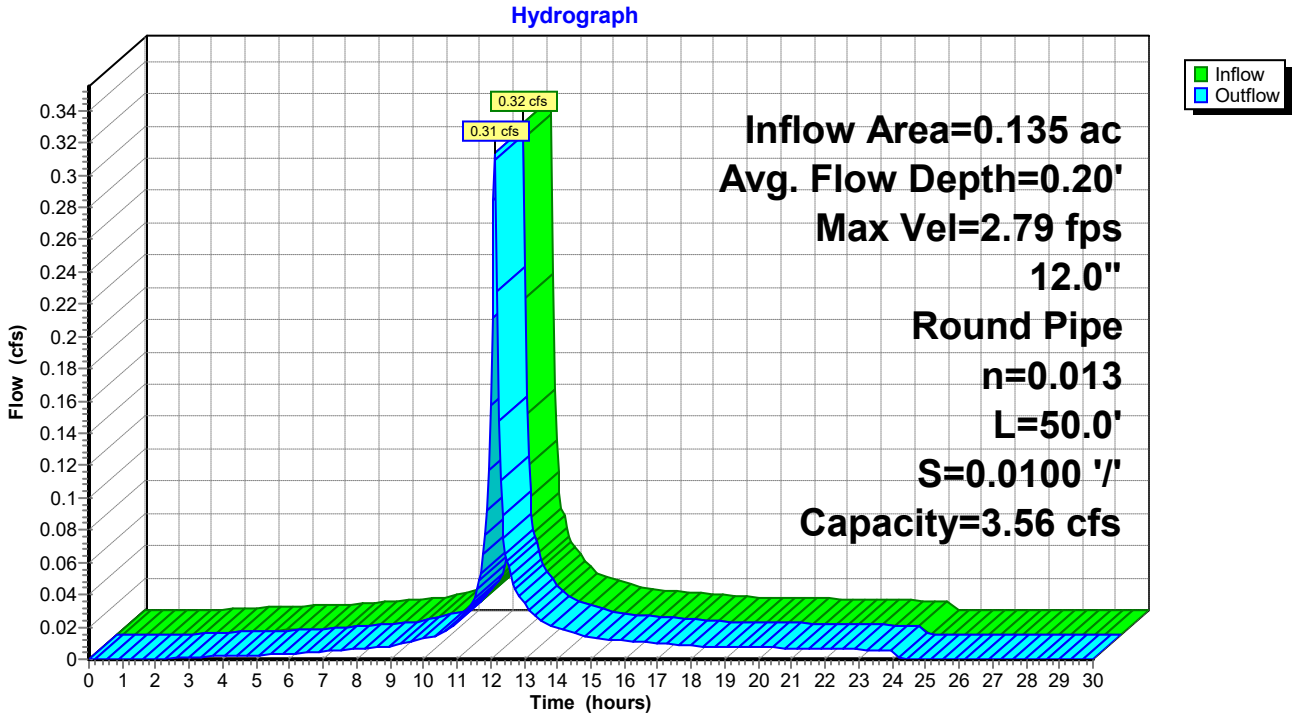
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 0.9 min

Peak Storage= 6 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DMH1: TO DMH#2



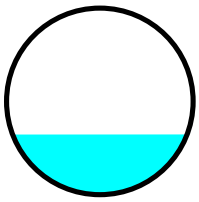
Summary for Reach DMH10: TO CMH#1

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 2.90" for 2-Year event
Inflow = 6.04 cfs @ 12.13 hrs, Volume= 0.539 af
Outflow = 6.03 cfs @ 12.13 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.1 min

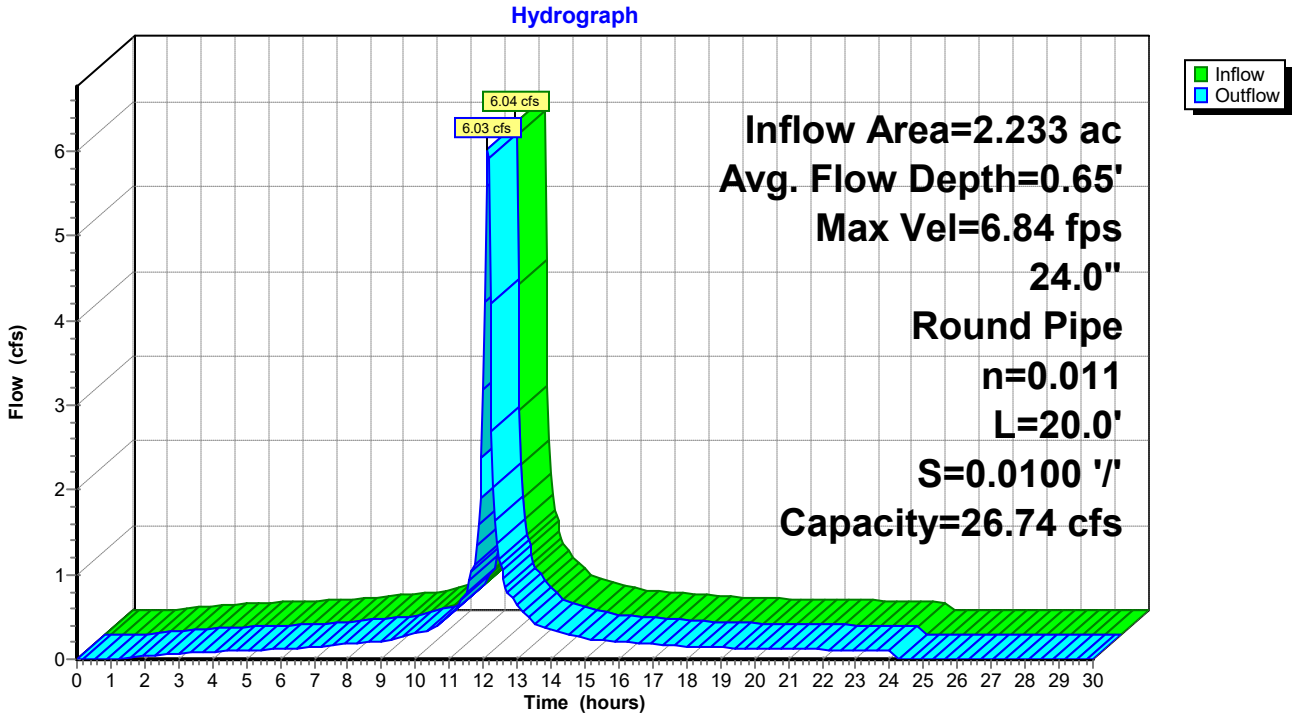
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.84 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 0.1 min

Peak Storage= 18 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 26.74 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0100 '/'
Inlet Invert= 458.10', Outlet Invert= 457.90'



Reach DMH10: TO CMH#1



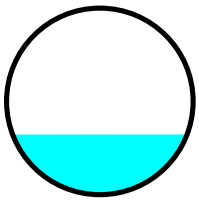
Summary for Reach DMH100: TO DMH-A

Inflow Area = 2.345 ac, 63.28% Impervious, Inflow Depth = 0.93" for 2-Year event
Inflow = 2.11 cfs @ 12.14 hrs, Volume= 0.182 af
Outflow = 2.09 cfs @ 12.14 hrs, Volume= 0.182 af, Atten= 1%, Lag= 0.3 min

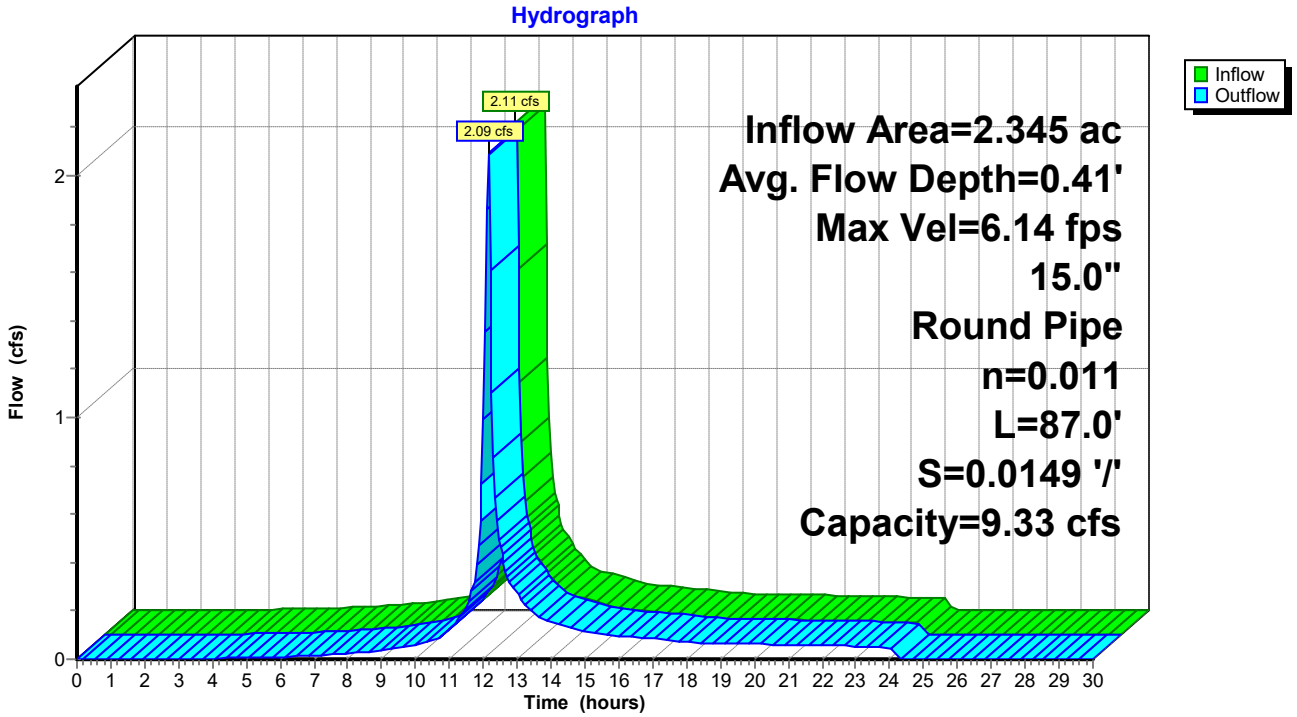
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.14 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 0.7 min

Peak Storage= 30 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 87.0' Slope= 0.0149 '/'
Inlet Invert= 466.10', Outlet Invert= 464.80'



Reach DMH100: TO DMH-A



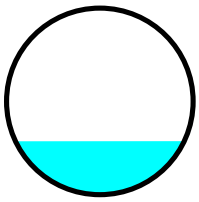
Summary for Reach DMH101: TO DMH#100

Inflow Area = 1.054 ac, 75.70% Impervious, Inflow Depth = 0.72" for 2-Year event
Inflow = 0.82 cfs @ 12.12 hrs, Volume= 0.063 af
Outflow = 0.82 cfs @ 12.13 hrs, Volume= 0.063 af, Atten= 1%, Lag= 0.6 min

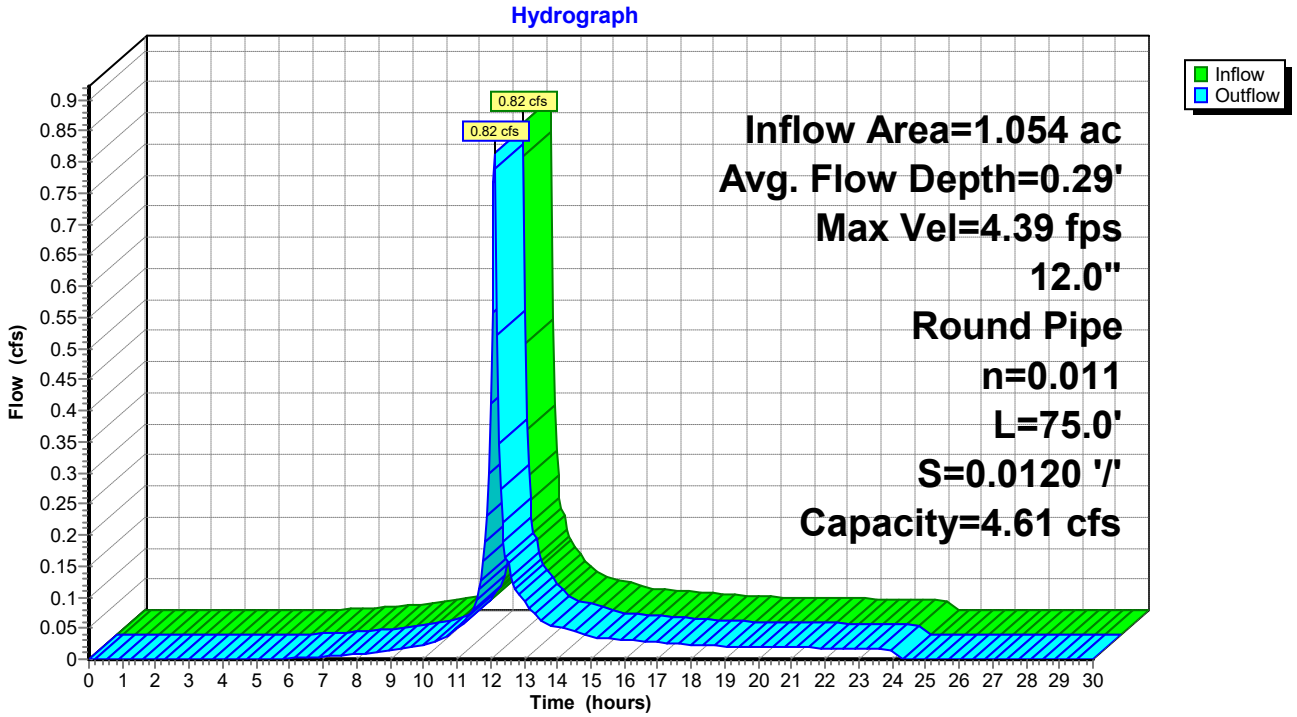
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.39 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.8 min

Peak Storage= 14 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 75.0' Slope= 0.0120 '/'
Inlet Invert= 467.10', Outlet Invert= 466.20'



Reach DMH101: TO DMH#100



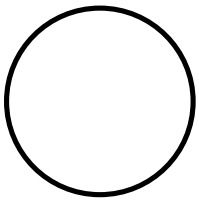
Summary for Reach DMH102: TO DMH#101

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

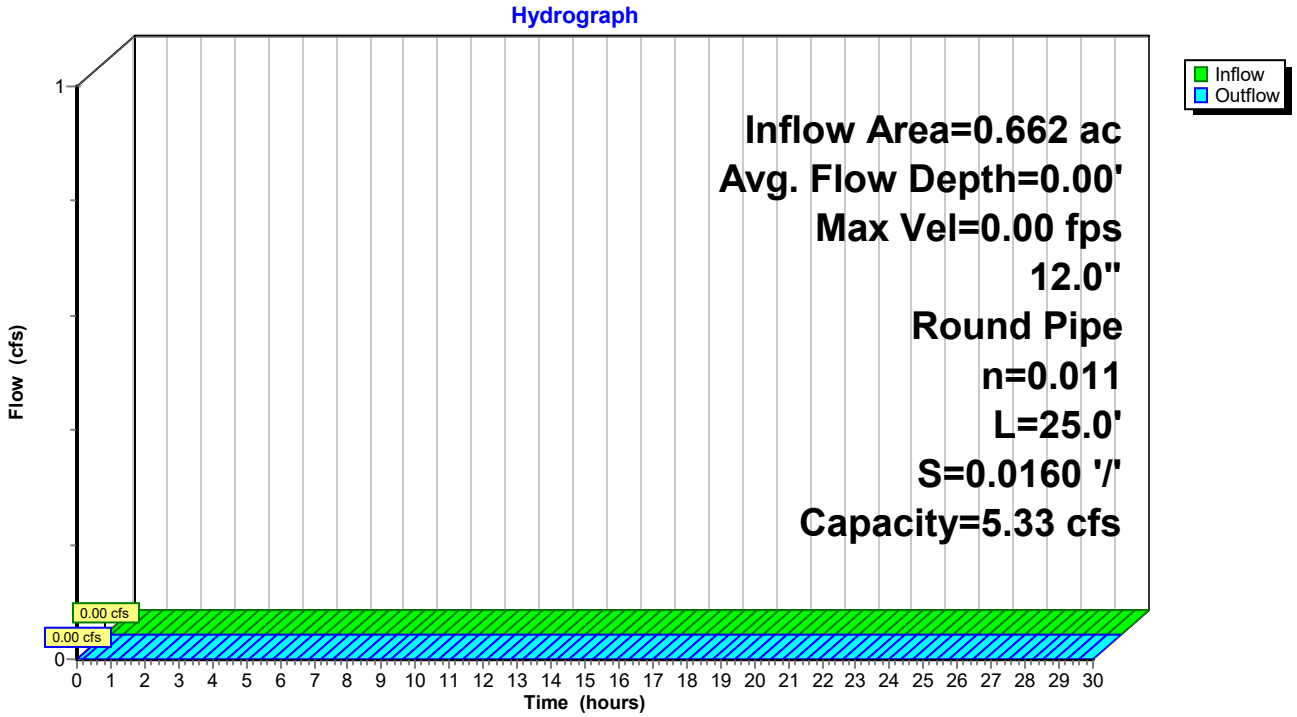
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.33 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0160 '/'
Inlet Invert= 467.60', Outlet Invert= 467.20'



Reach DMH102: TO DMH#101



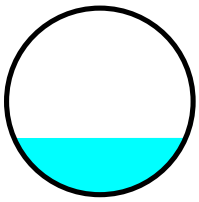
Summary for Reach DMH2: TO DMH#100

Inflow Area = 0.412 ac, 88.63% Impervious, Inflow Depth = 2.24" for 2-Year event
Inflow = 0.95 cfs @ 12.13 hrs, Volume= 0.077 af
Outflow = 0.94 cfs @ 12.13 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.3 min

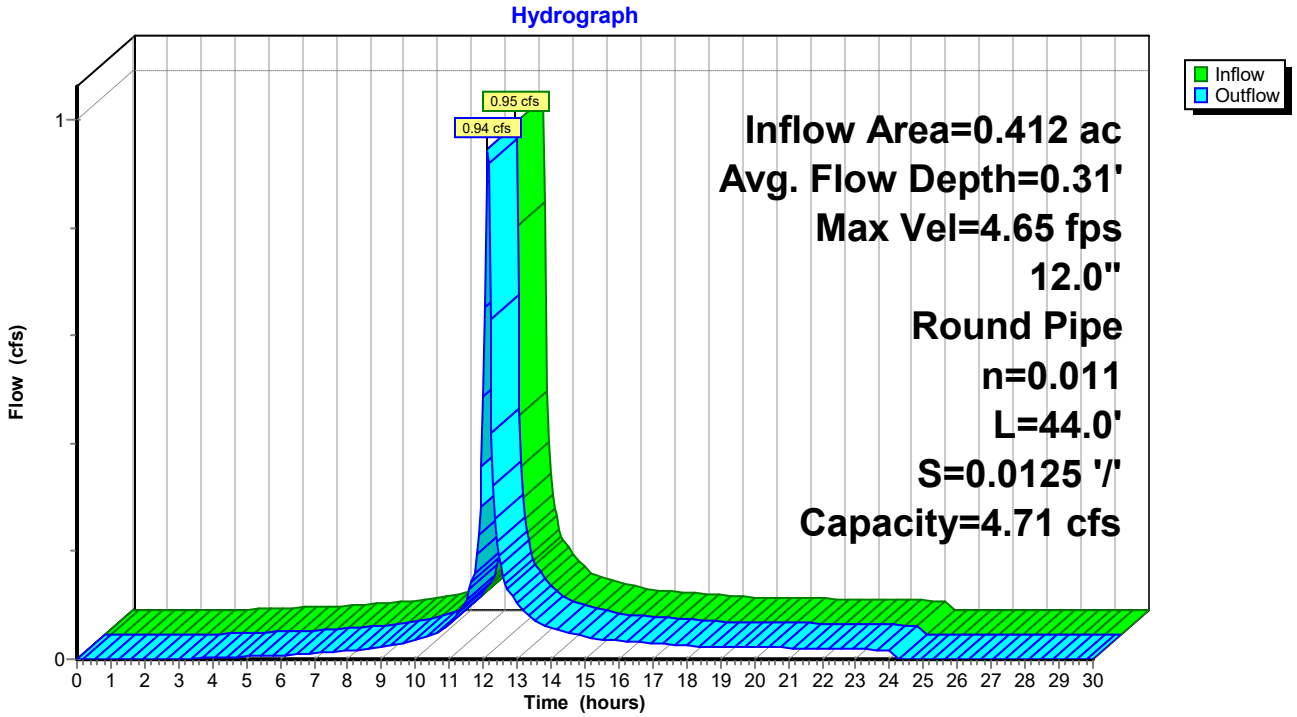
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.5 min

Peak Storage= 9 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.71 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 44.0' Slope= 0.0125 '/'
Inlet Invert= 466.75', Outlet Invert= 466.20'



Reach DMH2: TO DMH#100



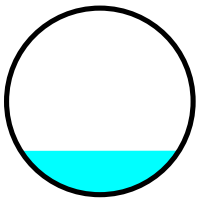
Summary for Reach DMH3: TO UGS#1A

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 1.49" for 2-Year event
Inflow = 0.97 cfs @ 12.14 hrs, Volume= 0.082 af
Outflow = 0.97 cfs @ 12.14 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

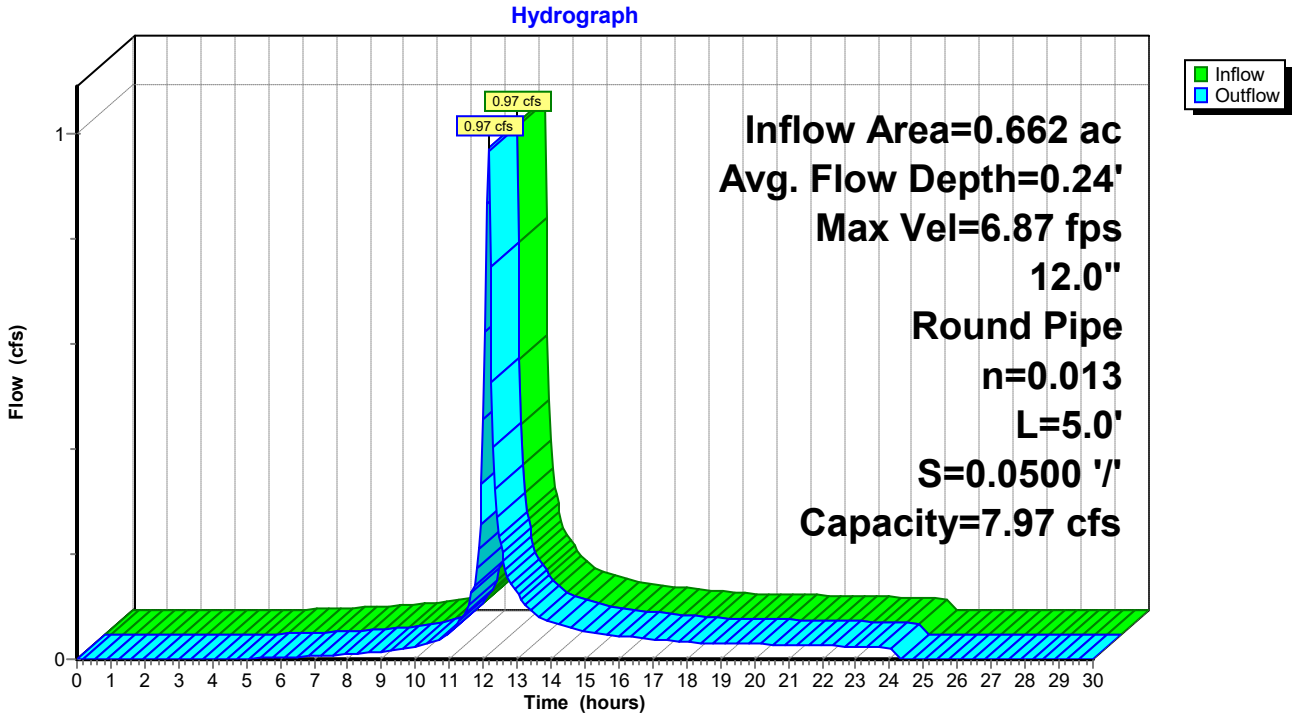
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.87 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.97 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 468.25', Outlet Invert= 468.00'



Reach DMH3: TO UGS#1A



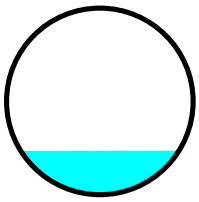
Summary for Reach DMH4: TO DMH#3

Inflow Area = 0.478 ac, 64.87% Impervious, Inflow Depth = 1.22" for 2-Year event
Inflow = 0.56 cfs @ 12.15 hrs, Volume= 0.049 af
Outflow = 0.56 cfs @ 12.15 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.1 min

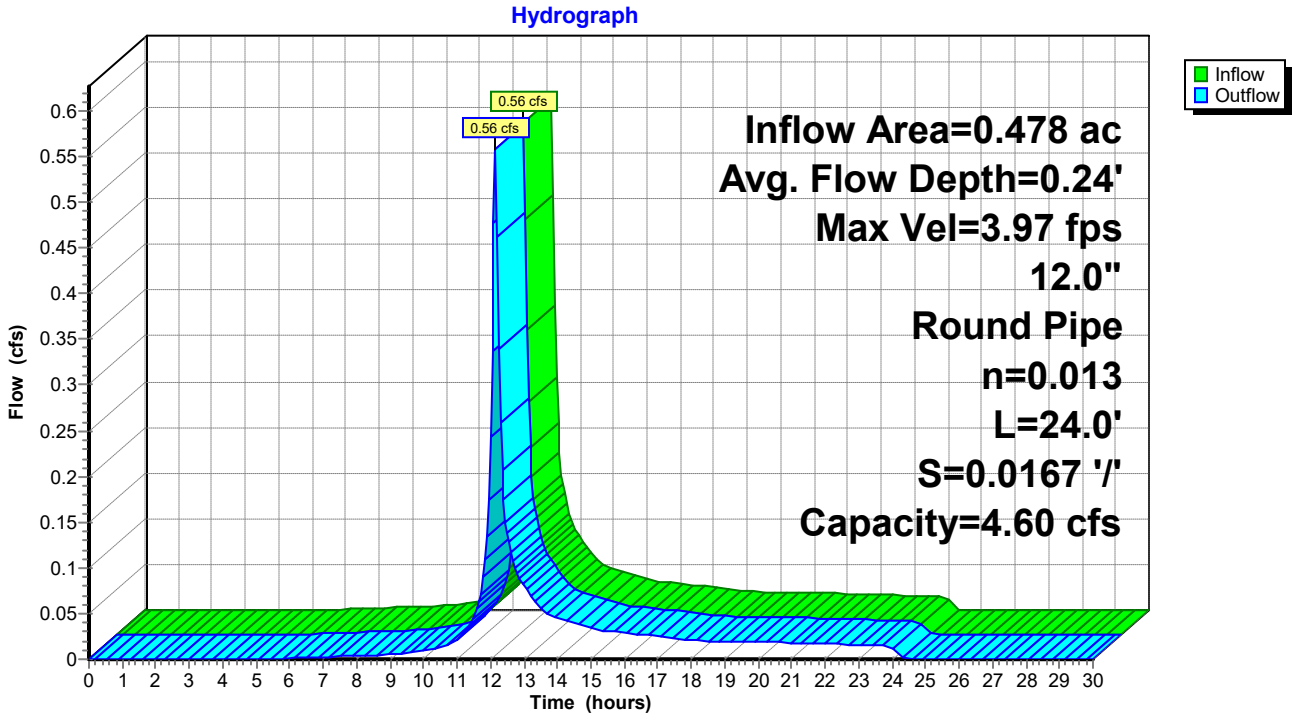
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 0.3 min

Peak Storage= 3 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0167 '/'
Inlet Invert= 468.90', Outlet Invert= 468.50'



Reach DMH4: TO DMH#3



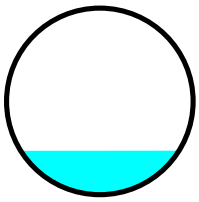
Summary for Reach DMH5: TO DMH#6

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 0.57" for 2-Year event
Inflow = 0.41 cfs @ 12.14 hrs, Volume= 0.042 af
Outflow = 0.40 cfs @ 12.15 hrs, Volume= 0.042 af, Atten= 3%, Lag= 0.8 min

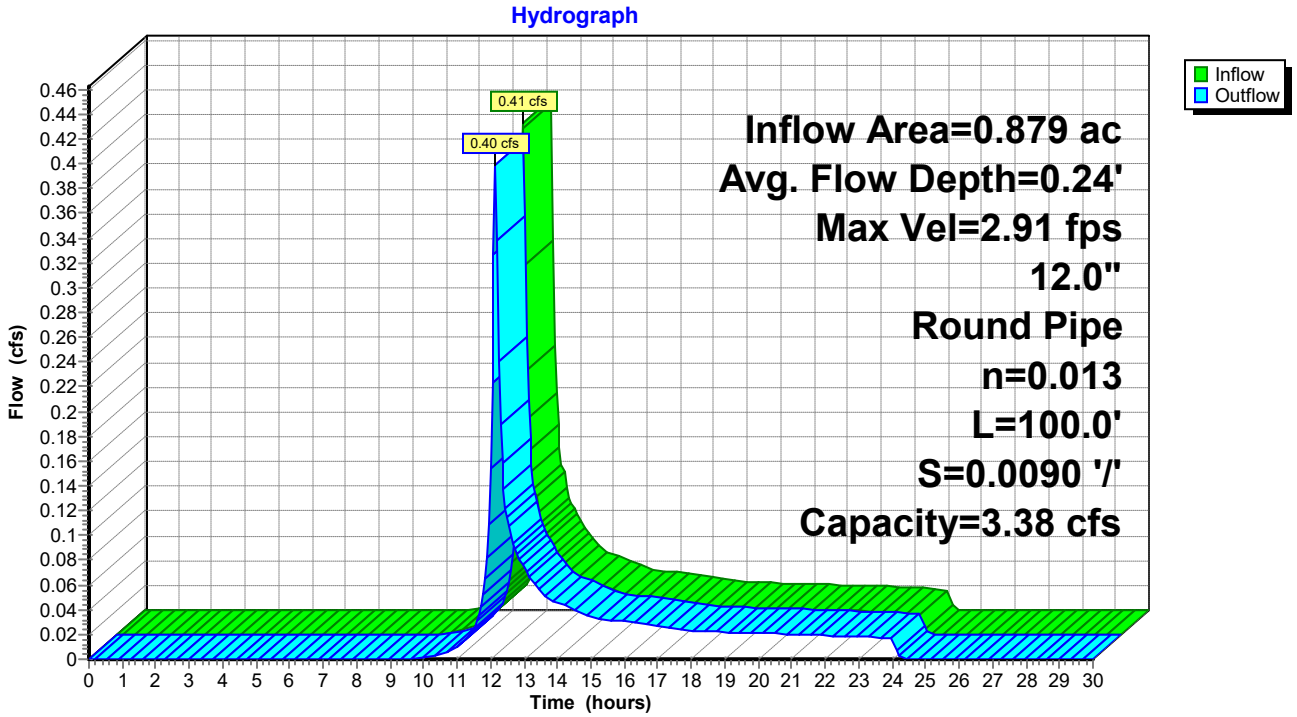
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 1.3 min

Peak Storage= 14 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.38 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 100.0' Slope= 0.0090 '/'
Inlet Invert= 470.30', Outlet Invert= 469.40'



Reach DMH5: TO DMH#6



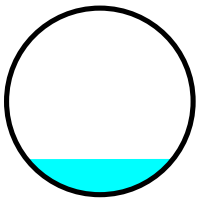
Summary for Reach DMH6: TO DMH#7

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 0.57" for 2-Year event
Inflow = 0.40 cfs @ 12.15 hrs, Volume= 0.042 af
Outflow = 0.39 cfs @ 12.16 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.3 min

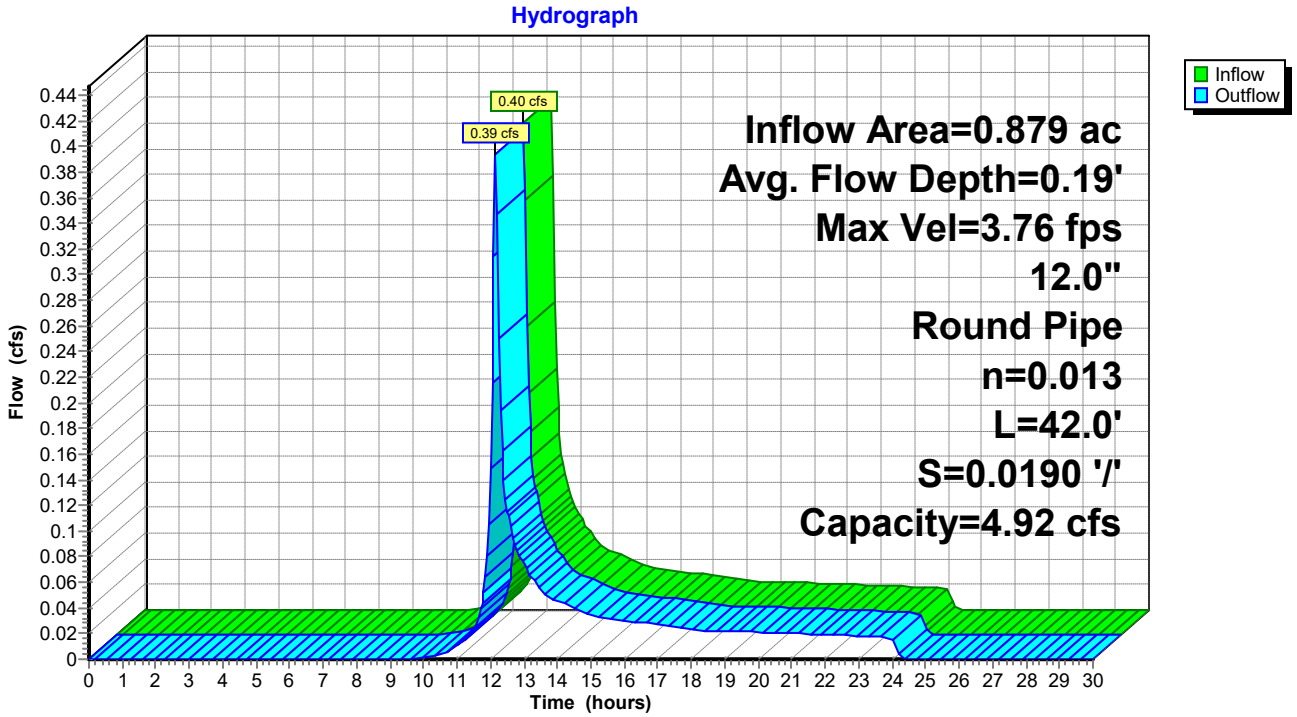
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.4 min

Peak Storage= 4 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.92 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 42.0' Slope= 0.0190 '/'
Inlet Invert= 469.30', Outlet Invert= 468.50'



Reach DMH6: TO DMH#7



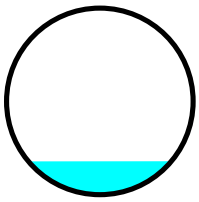
Summary for Reach DMH7: TO DMH#100

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 0.57" for 2-Year event
Inflow = 0.39 cfs @ 12.16 hrs, Volume= 0.042 af
Outflow = 0.38 cfs @ 12.17 hrs, Volume= 0.042 af, Atten= 3%, Lag= 0.7 min

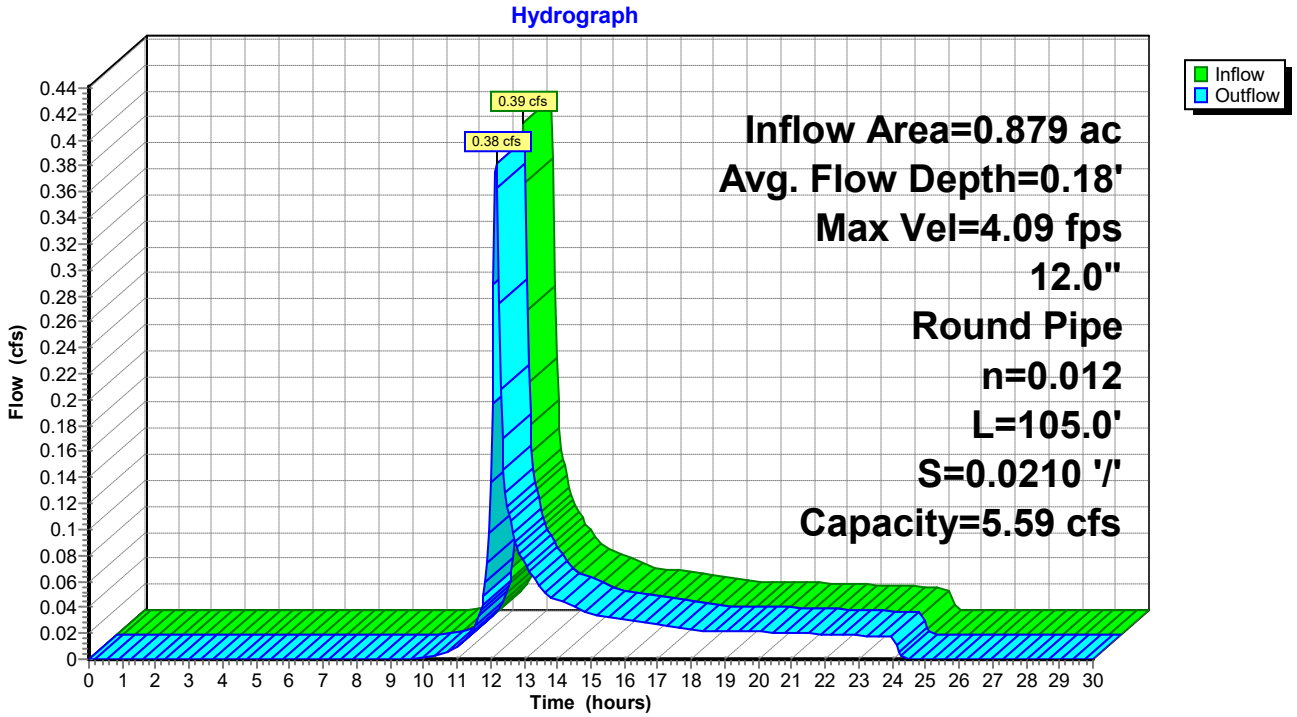
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.09 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 1.0 min

Peak Storage= 10 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.59 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 105.0' Slope= 0.0210 '/'
Inlet Invert= 468.40', Outlet Invert= 466.20'



Reach DMH7: TO DMH#100



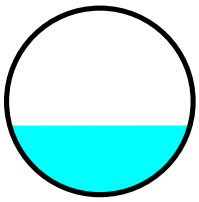
Summary for Reach DMH9: TO DMH#10

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 2.90" for 2-Year event
Inflow = 6.27 cfs @ 12.11 hrs, Volume= 0.539 af
Outflow = 6.04 cfs @ 12.13 hrs, Volume= 0.539 af, Atten= 4%, Lag= 1.2 min

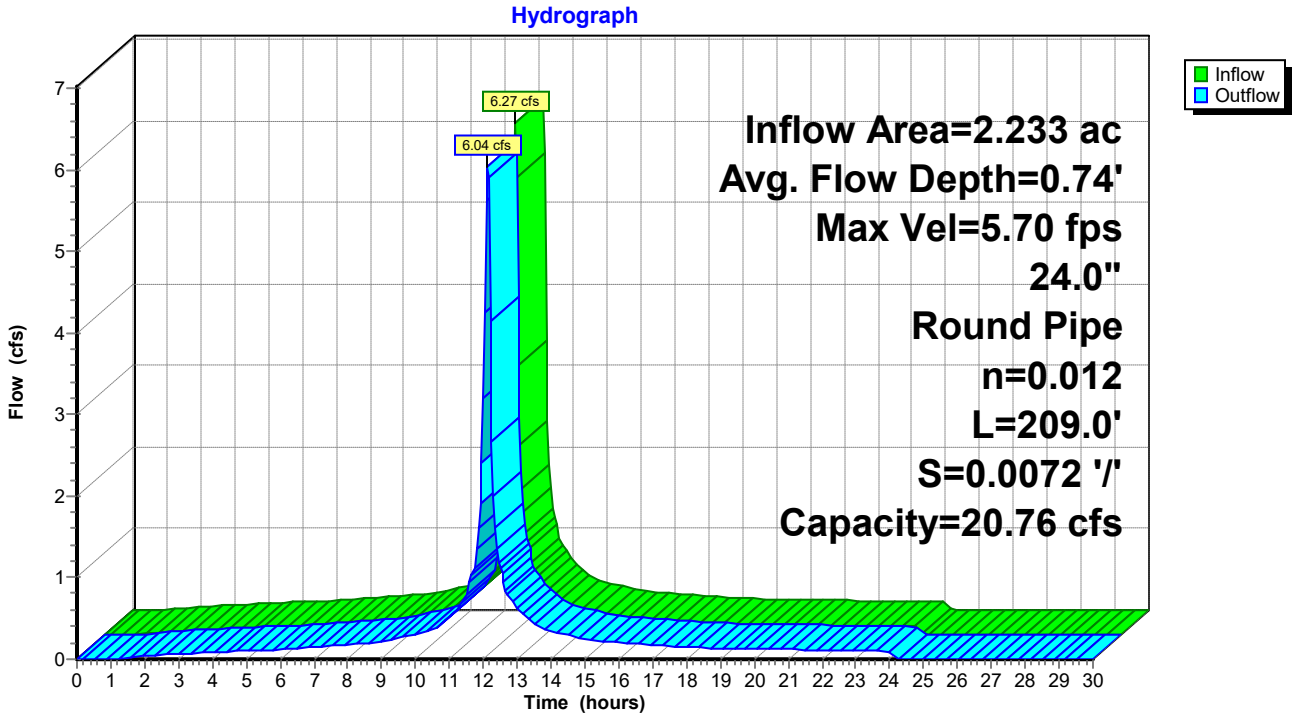
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.70 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.03 fps, Avg. Travel Time= 1.7 min

Peak Storage= 222 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 20.76 cfs

24.0" Round Pipe
n= 0.012 Steel, smooth
Length= 209.0' Slope= 0.0072 '/'
Inlet Invert= 459.70', Outlet Invert= 458.20'



Reach DMH9: TO DMH#10

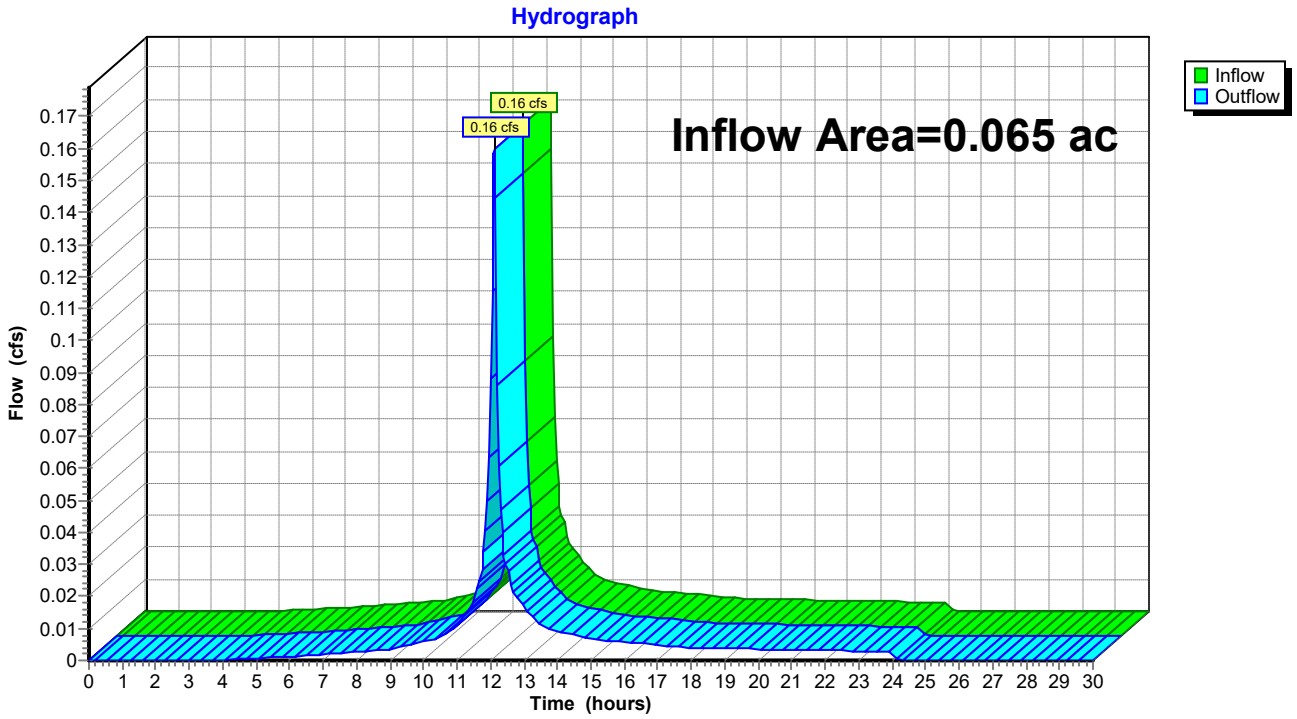


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

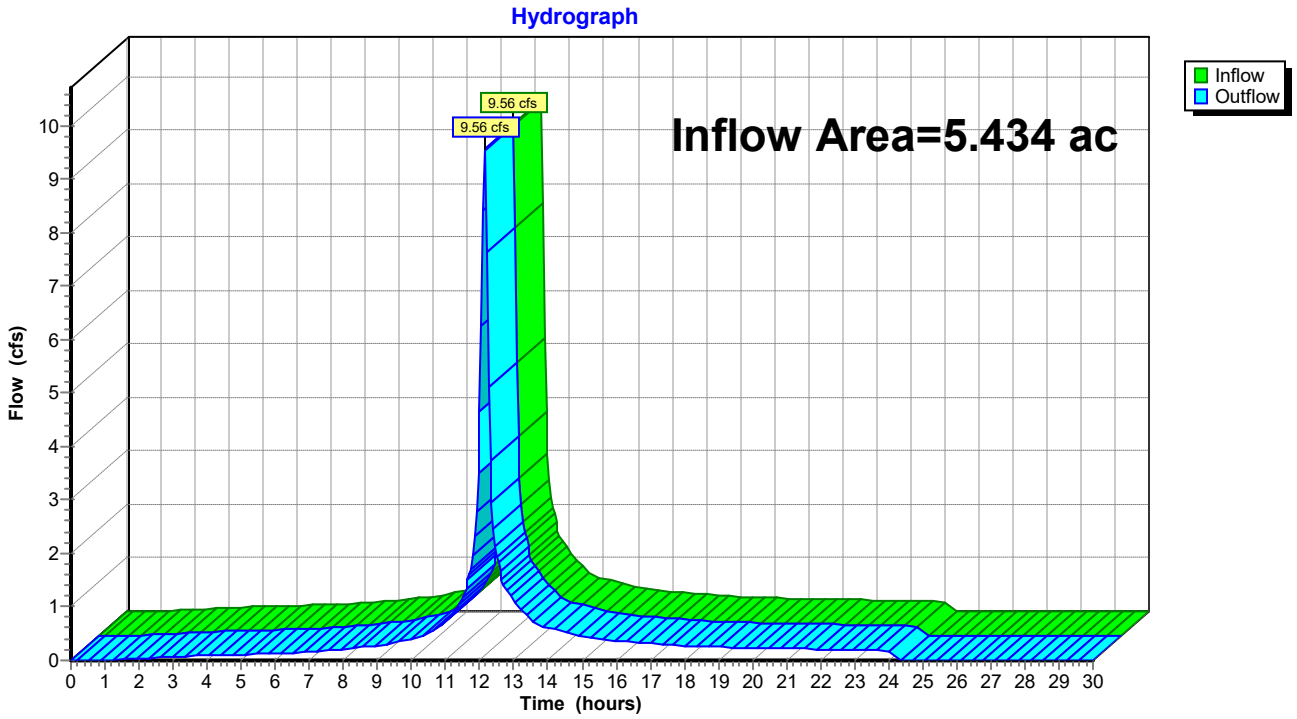


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 1.88" for 2-Year event
Inflow = 9.56 cfs @ 12.14 hrs, Volume= 0.851 af
Outflow = 9.56 cfs @ 12.14 hrs, Volume= 0.851 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

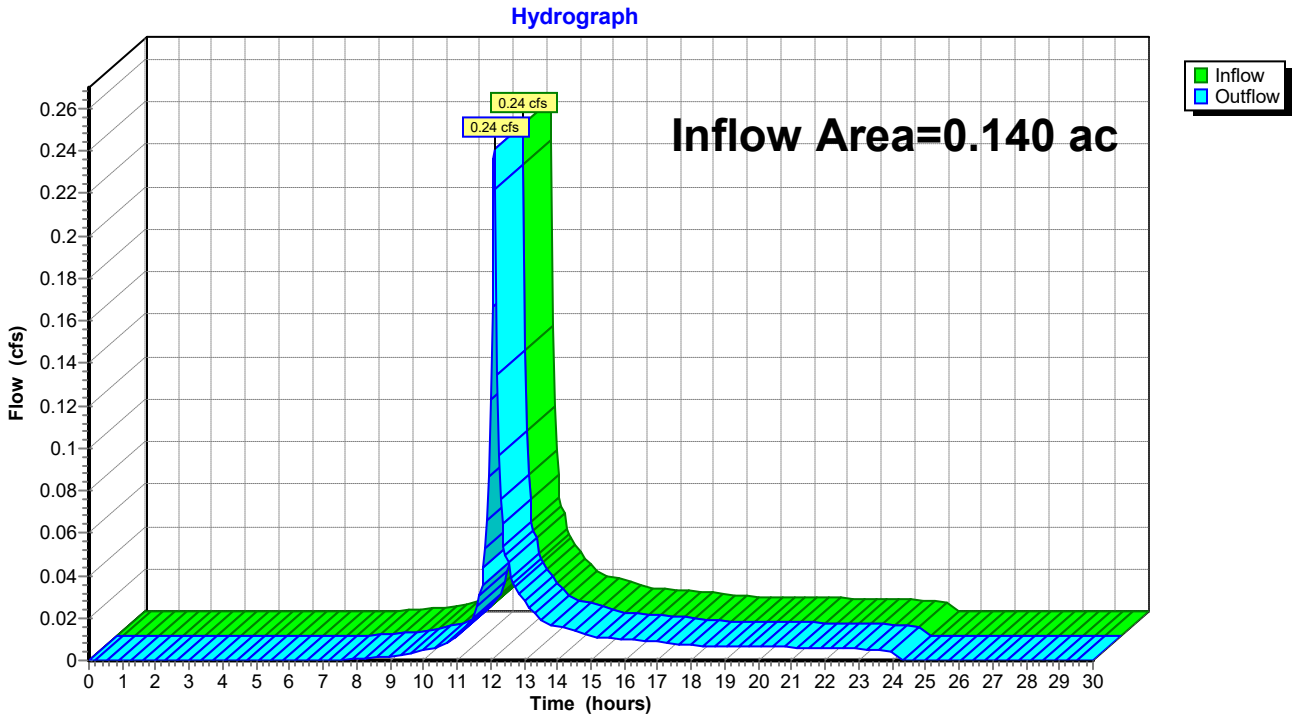


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.140 ac, 75.40% Impervious, Inflow Depth = 1.55" for 2-Year event
Inflow = 0.24 cfs @ 12.12 hrs, Volume= 0.018 af
Outflow = 0.24 cfs @ 12.12 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

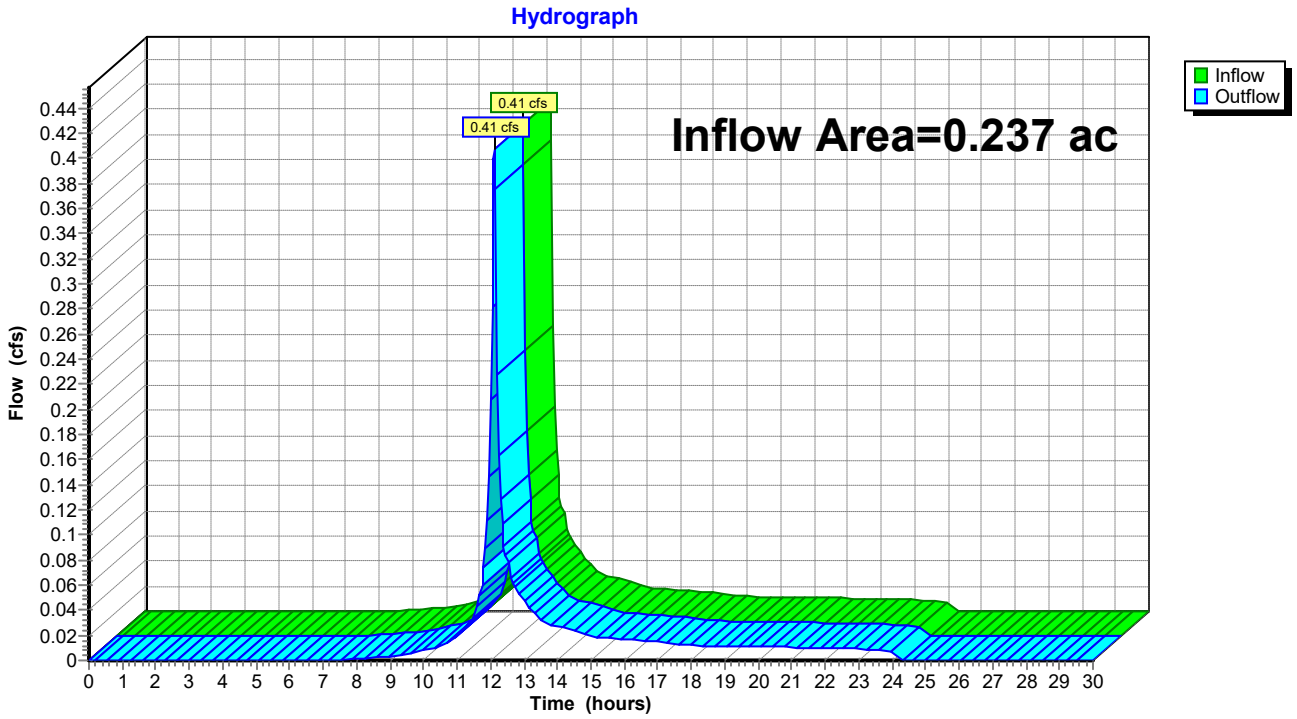


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.237 ac, 74.63% Impervious, Inflow Depth = 1.55" for 2-Year event
Inflow = 0.41 cfs @ 12.12 hrs, Volume= 0.031 af
Outflow = 0.41 cfs @ 12.12 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

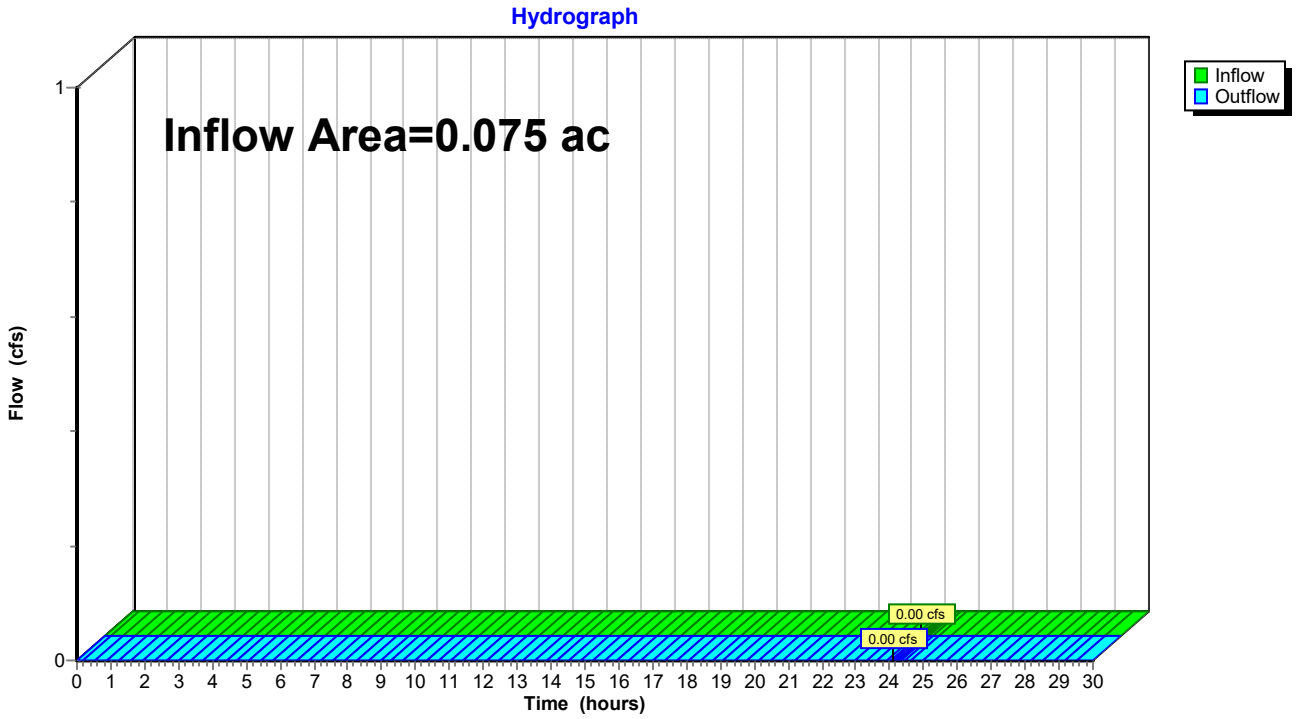


Summary for Reach DP5: DCB-H

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H



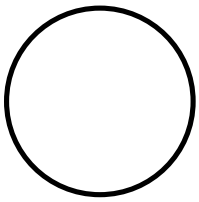
Summary for Reach UGS1B: TO DMH#102

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

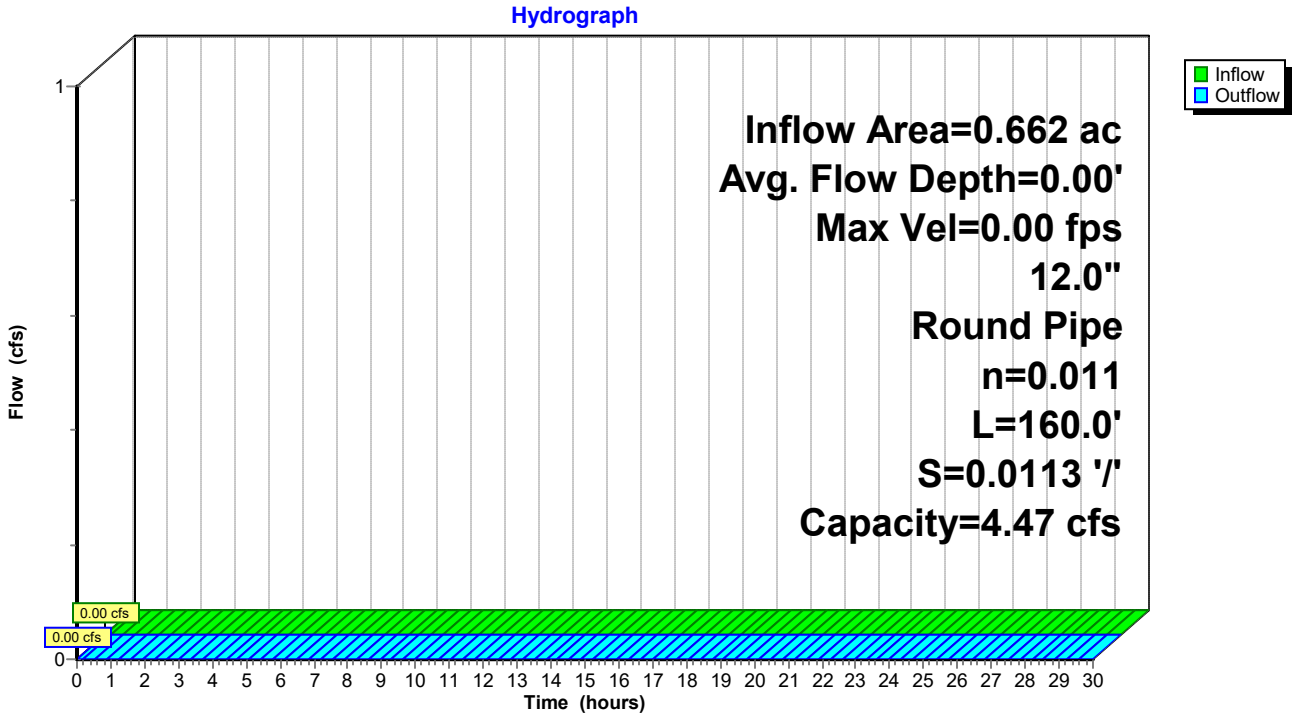
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.47 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 160.0' Slope= 0.0113 '/'
Inlet Invert= 469.50', Outlet Invert= 467.70'



Reach UGS1B: TO DMH#102



Summary for Pond DMH-B: TO DMH-D

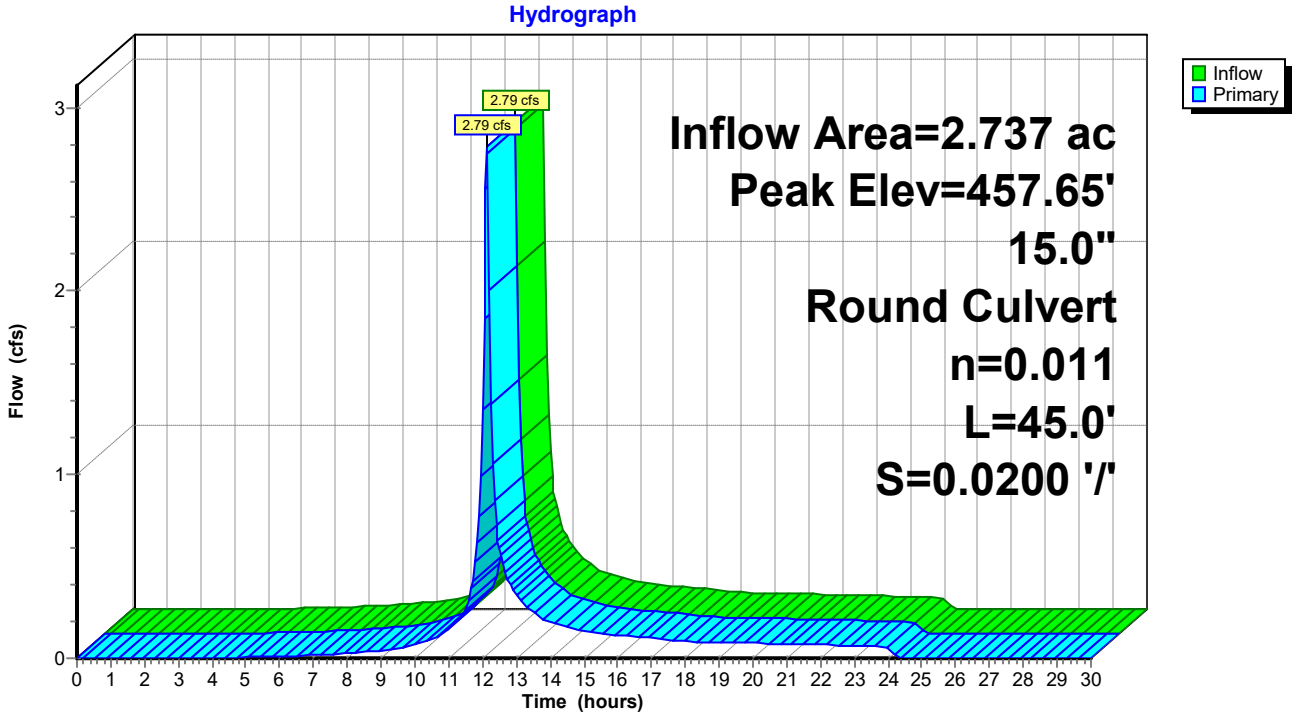
Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 1.03" for 2-Year event
Inflow = 2.79 cfs @ 12.14 hrs, Volume= 0.236 af
Outflow = 2.79 cfs @ 12.14 hrs, Volume= 0.236 af, Atten= 0%, Lag= 0.0 min
Primary = 2.79 cfs @ 12.14 hrs, Volume= 0.236 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 457.65' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=2.69 cfs @ 12.14 hrs HW=457.63' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.69 cfs @ 3.10 fps)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO UGS#1B

Inflow Area =	0.662 ac, 71.10% Impervious, Inflow Depth = 1.49" for 2-Year event				
Inflow =	0.97 cfs @	12.14 hrs,	Volume=	0.082 af	
Outflow =	0.15 cfs @	12.75 hrs,	Volume=	0.082 af,	Atten= 84%, Lag= 36.7 min
Discarded =	0.15 cfs @	12.75 hrs,	Volume=	0.082 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 467.48' @ 12.75 hrs Surf.Area= 0.056 ac Storage= 0.020 af

Plug-Flow detention time= 39.5 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 39.4 min (889.6 - 850.2)

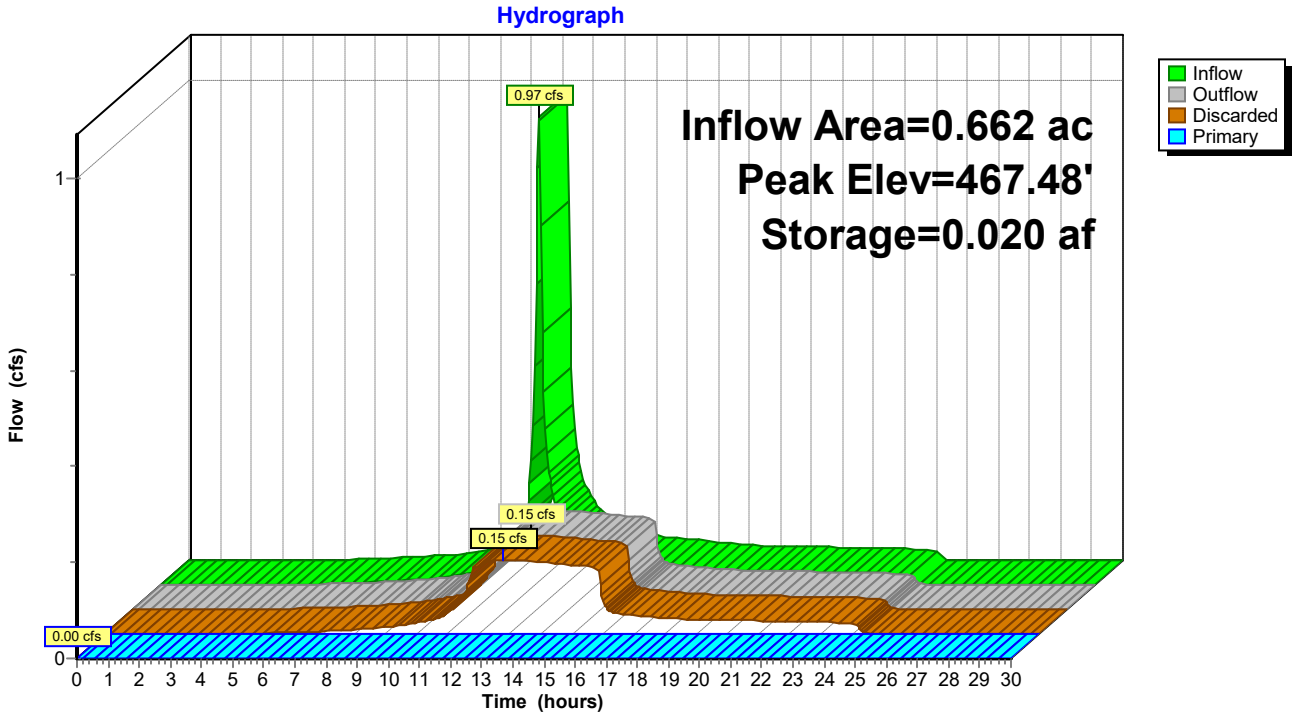
Volume	Invert	Avail.Storage	Storage Description
#1	466.70'	0.083 af	**36.00'W x 68.00'L x 6.00'H Prismatoid** 0.337 af Overall - 0.129 af Embedded = 0.208 af x 40.0% Voids
#2	467.40'	0.129 af	**ADS_StormTech MC-3500 c +Cap** x 49 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 49 Chambers in 7 Rows Cap Storage= +15.6 cf x 2 x 7 rows = 218.4 cf
		0.212 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	466.70'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'
#2	Primary	469.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.15 cfs @ 12.75 hrs HW=467.48' (Free Discharge)
└─**1=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=466.70' (Free Discharge)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond UGS1: TO UGS#1B



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P100B: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=4.44"
Tc=5.0 min CN=98 Runoff=4.72 cfs 0.413 af

Subcatchment P100C: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=4.44"
Tc=5.0 min CN=98 Runoff=4.72 cfs 0.413 af

Subcatchment P101: TO DCB#1 Runoff Area=5,154 sf 82.42% Impervious Runoff Depth=3.37"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=88 Runoff=0.43 cfs 0.033 af

Subcatchment P102: TO DCB#2 Runoff Area=3,847 sf 96.05% Impervious Runoff Depth=4.21"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=96 Runoff=0.37 cfs 0.031 af

Subcatchment P103: TO DCB#3 Runoff Area=6,905 sf 92.22% Impervious Runoff Depth=3.88"
Flow Length=70' Slope=0.0150 '/' Tc=5.0 min CN=93 Runoff=0.63 cfs 0.051 af

Subcatchment P104: TO DCB#4 Runoff Area=2,032 sf 78.10% Impervious Runoff Depth=3.07"
Flow Length=65' Slope=0.0300 '/' Tc=5.0 min CN=85 Runoff=0.16 cfs 0.012 af

Subcatchment P105: TO DCB#5 Runoff Area=17,091 sf 83.45% Impervious Runoff Depth=3.37"
Flow Length=242' Tc=5.0 min CN=88 Runoff=1.42 cfs 0.110 af

Subcatchment P106: TO COURTYARD Runoff Area=23,395 sf 27.09% Impervious Runoff Depth=0.83"
Flow Length=88' Slope=0.0200 '/' Tc=8.0 min CN=55 Runoff=0.35 cfs 0.037 af

Subcatchment P107: TO DCB#8 Runoff Area=14,595 sf 56.05% Impervious Runoff Depth=1.95"
Flow Length=132' Tc=7.8 min CN=72 Runoff=0.66 cfs 0.055 af

Subcatchment P108: TO DCB#6 Runoff Area=7,999 sf 87.34% Impervious Runoff Depth=3.67"
Flow Length=125' Slope=0.0125 '/' Tc=5.0 min CN=91 Runoff=0.71 cfs 0.056 af

Subcatchment P109: TO DCB#7 Runoff Area=6,226 sf 85.54% Impervious Runoff Depth=3.47"
Flow Length=99' Tc=5.0 min CN=89 Runoff=0.53 cfs 0.041 af

Subcatchment P11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=3.78"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.26 cfs 0.021 af

Subcatchment P12: TO DCB-A Runoff Area=6,513 sf 85.11% Impervious Runoff Depth=3.47"
Flow Length=147' Tc=5.0 min CN=89 Runoff=0.55 cfs 0.043 af

Subcatchment P14: TO DCB-B Runoff Area=5,805 sf 89.51% Impervious Runoff Depth=3.78"
Flow Length=169' Tc=5.0 min CN=92 Runoff=0.52 cfs 0.042 af

Subcatchment P15: TO DCB-C Runoff Area=7,907 sf 68.45% Impervious Runoff Depth=3.07"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=85 Runoff=0.58 cfs 0.046 af

Subcatchment P16: TO LOW POINT Runoff Area=14,911 sf 51.34% Impervious Runoff Depth=2.27"
Flow Length=223' Slope=0.0100 '/' Tc=5.0 min CN=76 Runoff=0.86 cfs 0.065 af

Subcatchment P18: TO DCB-D Runoff Area=10,359 sf 73.15% Impervious Runoff Depth=2.79"
Flow Length=222' Tc=5.0 min CN=82 Runoff=0.73 cfs 0.055 af

Subcatchment P19: TO DCB-E Runoff Area=6,699 sf 83.83% Impervious Runoff Depth=3.37"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=88 Runoff=0.56 cfs 0.043 af

Subcatchment P20: TO DP#3 Runoff Area=6,101 sf 75.40% Impervious Runoff Depth=2.89"
Flow Length=101' Tc=5.0 min CN=83 Runoff=0.44 cfs 0.034 af

Subcatchment P24: TO DP#4 Runoff Area=10,319 sf 74.63% Impervious Runoff Depth=2.89"
Flow Length=133' Tc=5.0 min CN=83 Runoff=0.75 cfs 0.057 af

Subcatchment P26: TO DCB-H Runoff Area=3,256 sf 0.00% Impervious Runoff Depth=0.14"
Flow Length=135' Slope=0.0200 '/' Tc=8.3 min CN=39 Runoff=0.00 cfs 0.001 af

Reach CMH1: TO DMH-D Avg. Flow Depth=0.85' Max Vel=6.16 fps Inflow=10.19 cfs 0.915 af
36.0" Round Pipe n=0.011 L=105.0' S=0.0054 '/' Capacity=58.08 cfs Outflow=10.07 cfs 0.915 af

Reach DCB-A: TO DMH-D Inflow=0.55 cfs 0.043 af
Outflow=0.55 cfs 0.043 af

Reach DCB-B: TO DMH-E Inflow=0.52 cfs 0.042 af
Outflow=0.52 cfs 0.042 af

Reach DCB-C: TO TRUNKLINE Inflow=0.58 cfs 0.046 af
Outflow=0.58 cfs 0.046 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.19' Max Vel=7.08 fps Inflow=0.73 cfs 0.055 af
12.0" Round Pipe n=0.011 L=15.0' S=0.0500 '/' Capacity=9.42 cfs Outflow=0.73 cfs 0.055 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.14' Max Vel=7.98 fps Inflow=0.56 cfs 0.043 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.55 cfs 0.043 af

Reach DCB1: TO DMH#2 Avg. Flow Depth=0.18' Max Vel=4.25 fps Inflow=0.43 cfs 0.033 af
12.0" Round Pipe n=0.013 L=80.0' S=0.0263 '/' Capacity=5.77 cfs Outflow=0.42 cfs 0.033 af

Reach DCB2: TO DMH#2 Avg. Flow Depth=0.18' Max Vel=3.77 fps Inflow=0.37 cfs 0.031 af
12.0" Round Pipe n=0.013 L=71.0' S=0.0211 '/' Capacity=5.18 cfs Outflow=0.35 cfs 0.031 af

Reach DCB3: TO DMH#2 Avg. Flow Depth=0.24' Max Vel=4.37 fps Inflow=0.63 cfs 0.051 af
12.0" Round Pipe n=0.013 L=10.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=0.63 cfs 0.051 af

Reach DCB4: TO DMH#1 Avg. Flow Depth=0.14' Max Vel=2.24 fps Inflow=0.16 cfs 0.012 af
12.0" Round Pipe n=0.013 L=90.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.15 cfs 0.012 af

Reach DCB5: TO DMH#101 Avg. Flow Depth=0.38' Max Vel=5.14 fps Inflow=1.42 cfs 0.110 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=1.40 cfs 0.110 af

Reach DCB6: TO DMH#3 Avg. Flow Depth=0.30' Max Vel=3.51 fps Inflow=0.71 cfs 0.056 af
12.0" Round Pipe n=0.013 L=98.0' S=0.0102 '/' Capacity=3.60 cfs Outflow=0.69 cfs 0.056 af

Reach DCB7: TO DMH#4 Avg. Flow Depth=0.29' Max Vel=3.40 fps Inflow=0.66 cfs 0.055 af
12.0" Round Pipe n=0.013 L=105.0' S=0.0095 '/' Capacity=3.48 cfs Outflow=0.64 cfs 0.055 af

Reach DCB8: TO DMH#4 Avg. Flow Depth=0.23' Max Vel=3.76 fps Inflow=0.53 cfs 0.041 af
12.0" Round Pipe n=0.013 L=58.0' S=0.0155 '/' Capacity=4.44 cfs Outflow=0.51 cfs 0.041 af

Reach DCB9: TO DMH#5 Avg. Flow Depth=0.38' Max Vel=3.48 fps Inflow=0.86 cfs 0.065 af
10.0" Round Pipe n=0.012 L=71.0' S=0.0070 '/' Capacity=1.99 cfs Outflow=0.85 cfs 0.065 af

Reach DMH-A: TO DMH-B Inflow=5.18 cfs 0.438 af
Outflow=5.18 cfs 0.438 af

Reach DMH-C: TO DP#1 Inflow=15.62 cfs 1.396 af
Outflow=15.62 cfs 1.396 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.00' Max Vel=7.63 fps Inflow=15.77 cfs 1.396 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=15.62 cfs 1.396 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.28' Max Vel=3.19 fps Inflow=1.08 cfs 0.088 af
36.0" Round Pipe n=0.011 L=18.0' S=0.0056 '/' Capacity=58.75 cfs Outflow=1.08 cfs 0.088 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DMH1: TO DMH#2 Avg. Flow Depth=0.26' Max Vel=3.19 fps Inflow=0.51 cfs 0.043 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.50 cfs 0.043 af

Reach DMH10: TO CMH#1 Avg. Flow Depth=0.81' Max Vel=7.65 fps Inflow=9.13 cfs 0.827 af
24.0" Round Pipe n=0.011 L=20.0' S=0.0100 '/' Capacity=26.74 cfs Outflow=9.11 cfs 0.827 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.57' Max Vel=7.28 fps Inflow=3.97 cfs 0.339 af
15.0" Round Pipe n=0.011 L=87.0' S=0.0149 '/' Capacity=9.33 cfs Outflow=3.94 cfs 0.339 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.38' Max Vel=5.10 fps Inflow=1.40 cfs 0.110 af
12.0" Round Pipe n=0.011 L=75.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=1.39 cfs 0.110 af

Reach DMH102: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0160 '/' Capacity=5.33 cfs Outflow=0.00 cfs 0.000 af

Reach DMH2: TO DMH#100 Avg. Flow Depth=0.39' Max Vel=5.31 fps Inflow=1.53 cfs 0.127 af
12.0" Round Pipe n=0.011 L=44.0' S=0.0125 '/' Capacity=4.71 cfs Outflow=1.53 cfs 0.127 af

Reach DMH3: TO UGS#1A Avg. Flow Depth=0.32' Max Vel=8.18 fps Inflow=1.80 cfs 0.152 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=1.80 cfs 0.152 af

Reach DMH4: TO DMH#3 Avg. Flow Depth=0.34' Max Vel=4.84 fps Inflow=1.13 cfs 0.096 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0167 '/' Capacity=4.60 cfs Outflow=1.12 cfs 0.096 af

Reach DMH5: TO DMH#6 Avg. Flow Depth=0.41' Max Vel=3.91 fps Inflow=1.18 cfs 0.102 af
12.0" Round Pipe n=0.013 L=100.0' S=0.0090 '/' Capacity=3.38 cfs Outflow=1.15 cfs 0.102 af

Reach DMH6: TO DMH#7 Avg. Flow Depth=0.33' Max Vel=5.10 fps Inflow=1.15 cfs 0.102 af
12.0" Round Pipe n=0.013 L=42.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=1.14 cfs 0.102 af

Reach DMH7: TO DMH#100 Avg. Flow Depth=0.31' Max Vel=5.57 fps Inflow=1.14 cfs 0.102 af
12.0" Round Pipe n=0.012 L=105.0' S=0.0210 '/' Capacity=5.59 cfs Outflow=1.11 cfs 0.102 af

Reach DMH9: TO DMH#10 Avg. Flow Depth=0.93' Max Vel=6.37 fps Inflow=9.44 cfs 0.827 af
24.0" Round Pipe n=0.012 L=209.0' S=0.0072 '/' Capacity=20.76 cfs Outflow=9.13 cfs 0.827 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.26 cfs 0.021 af
Outflow=0.26 cfs 0.021 af

Reach DP2: MUNICIPAL SYSTEM Inflow=15.62 cfs 1.396 af
Outflow=15.62 cfs 1.396 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.44 cfs 0.034 af
Outflow=0.44 cfs 0.034 af

Reach DP4: LOW POINT OFF LOCUS Inflow=0.75 cfs 0.057 af
Outflow=0.75 cfs 0.057 af

Reach DP5: DCB-H Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Reach UGS1B: TO DMH#102 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=160.0' S=0.0113 '/' Capacity=4.47 cfs Outflow=0.00 cfs 0.000 af

Pond DMH-B: TO DMH-D Peak Elev=458.19' Inflow=5.18 cfs 0.438 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=5.18 cfs 0.438 af

Pond UGS1: TO UGS#1B Peak Elev=468.09' Storage=0.051 af Inflow=1.80 cfs 0.152 af
Discarded=0.16 cfs 0.152 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.152 af

Total Runoff Area = 5.951 ac Runoff Volume = 1.661 af Average Runoff Depth = 3.35"
20.49% Pervious = 1.219 ac 79.51% Impervious = 4.732 ac

Summary for Subcatchment P100B: TO ROOF DRAIN

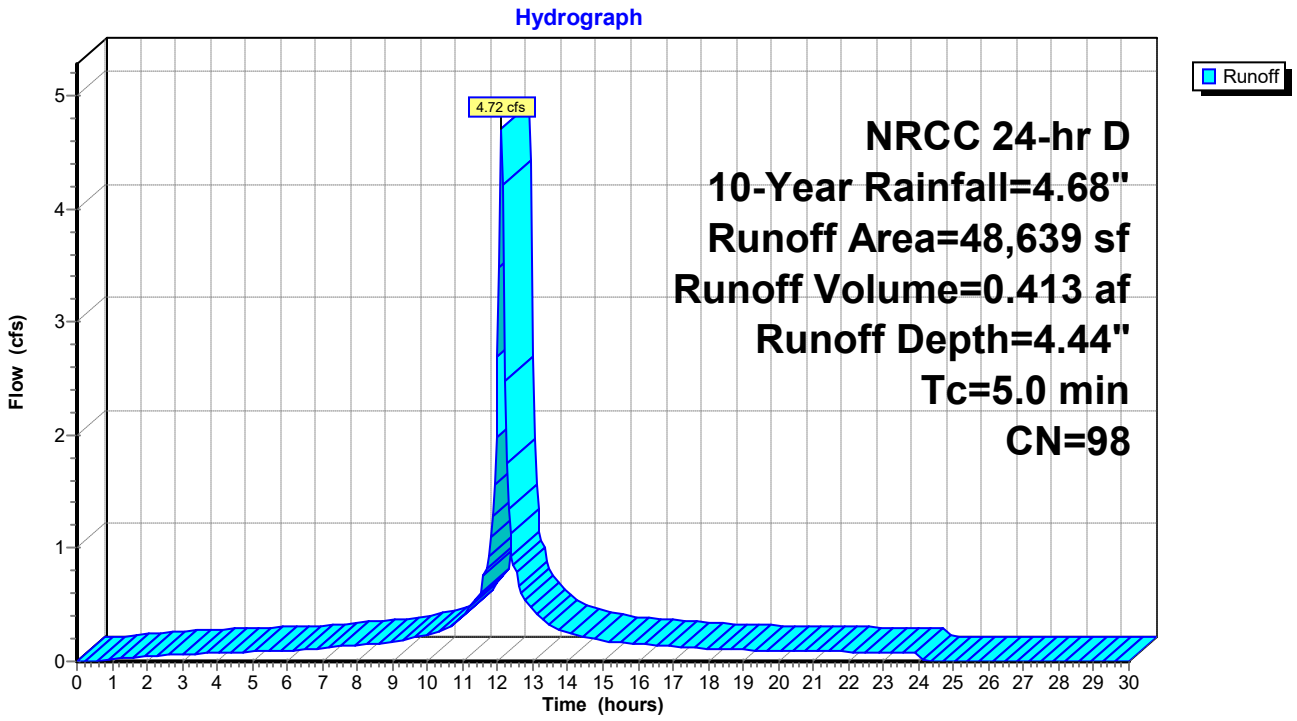
Runoff = 4.72 cfs @ 12.11 hrs, Volume= 0.413 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100B: TO ROOF DRAIN



Summary for Subcatchment P100C: TO ROOF DRAIN

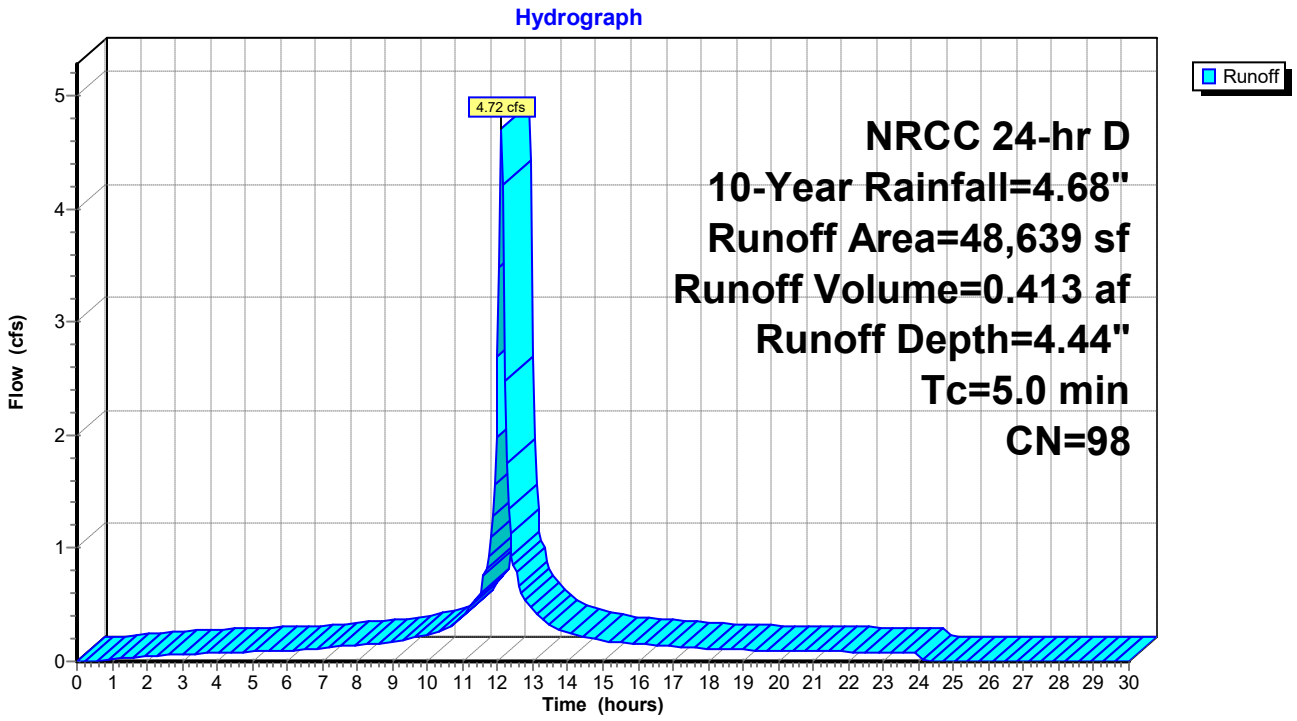
Runoff = 4.72 cfs @ 12.11 hrs, Volume= 0.413 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100C: TO ROOF DRAIN



Summary for Subcatchment P101: TO DCB#1

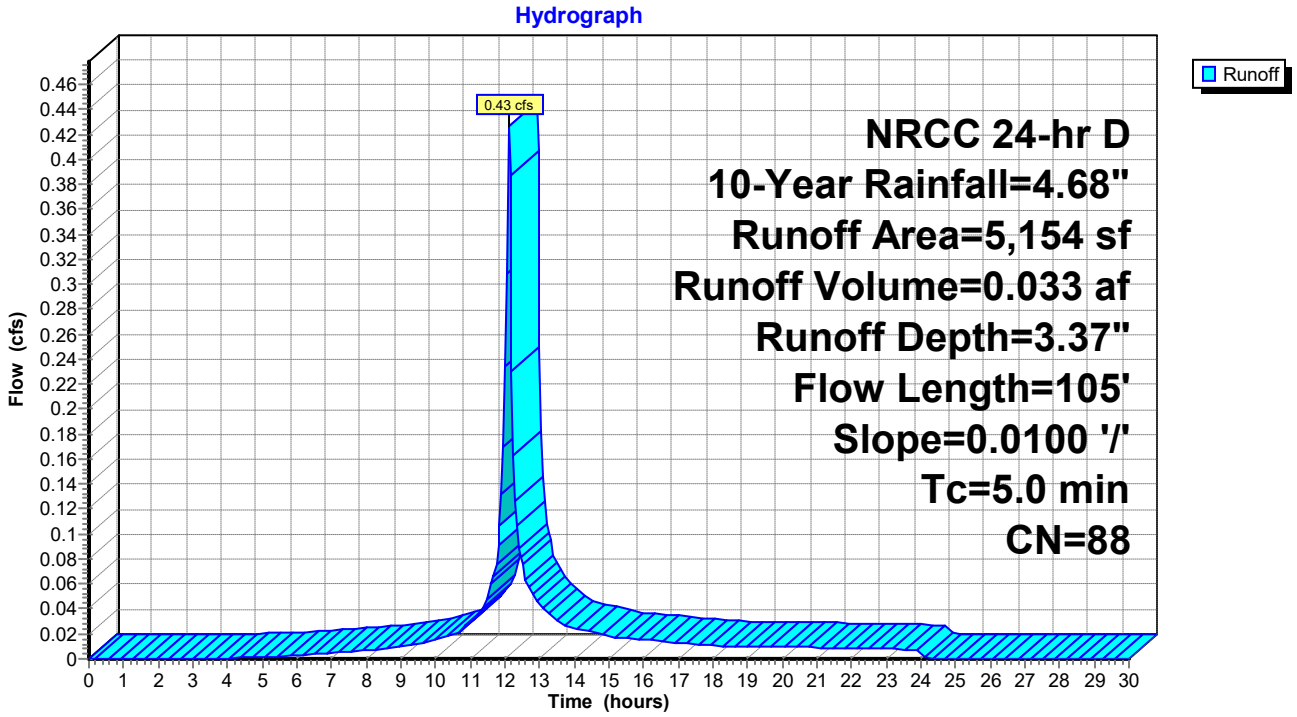
Runoff = 0.43 cfs @ 12.11 hrs, Volume= 0.033 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
906	39	>75% Grass cover, Good, HSG A
4,248	98	Paved parking, HSG A
5,154	88	Weighted Average
906		17.58% Pervious Area
4,248		82.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	55	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	105	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P101: TO DCB#1



Summary for Subcatchment P102: TO DCB#2

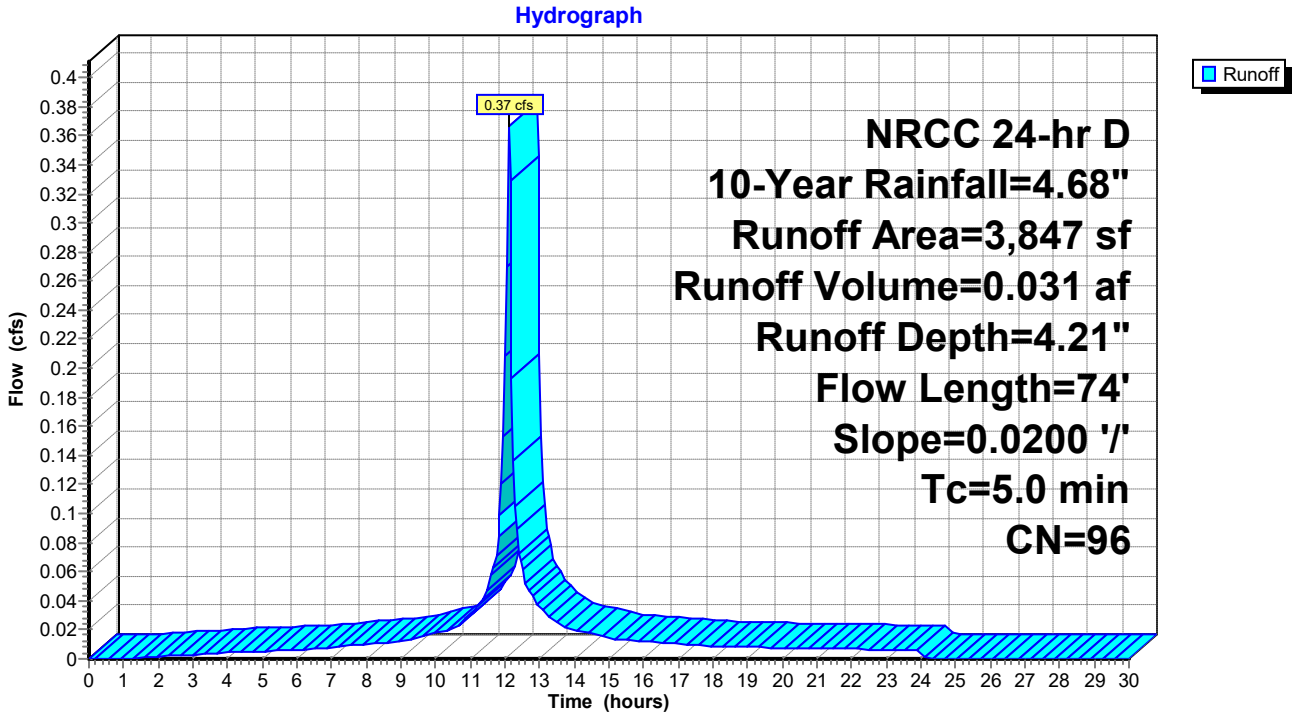
Runoff = 0.37 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
152	39	>75% Grass cover, Good, HSG A
3,695	98	Paved parking, HSG A
3,847	96	Weighted Average
152		3.95% Pervious Area
3,695		96.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	74	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P102: TO DCB#2



Summary for Subcatchment P103: TO DCB#3

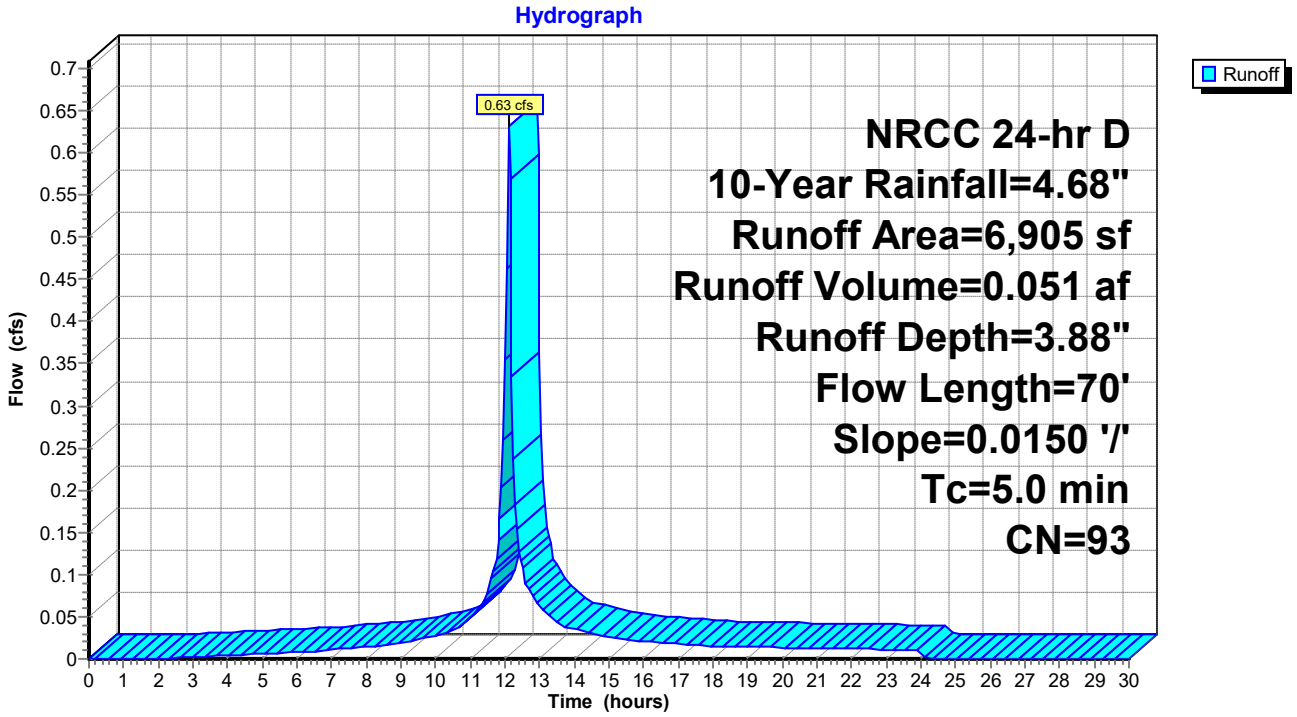
Runoff = 0.63 cfs @ 12.11 hrs, Volume= 0.051 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
537	39	>75% Grass cover, Good, HSG A
6,368	98	Paved parking, HSG A
6,905	93	Weighted Average
537		7.78% Pervious Area
6,368		92.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	20	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	70	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P103: TO DCB#3



Summary for Subcatchment P104: TO DCB#4

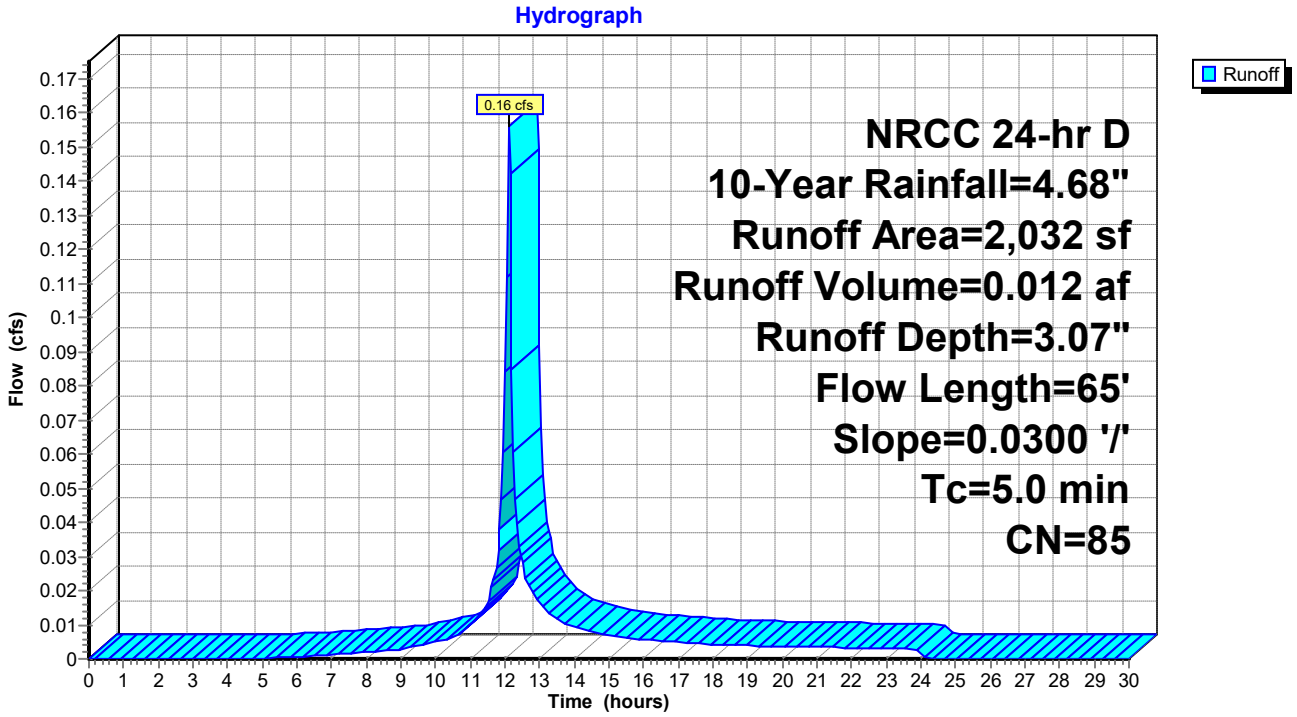
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
445	39	>75% Grass cover, Good, HSG A
1,587	98	Paved parking, HSG A
2,032	85	Weighted Average
445		21.90% Pervious Area
1,587		78.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	15	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	65	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P104: TO DCB#4



Summary for Subcatchment P105: TO DCB#5

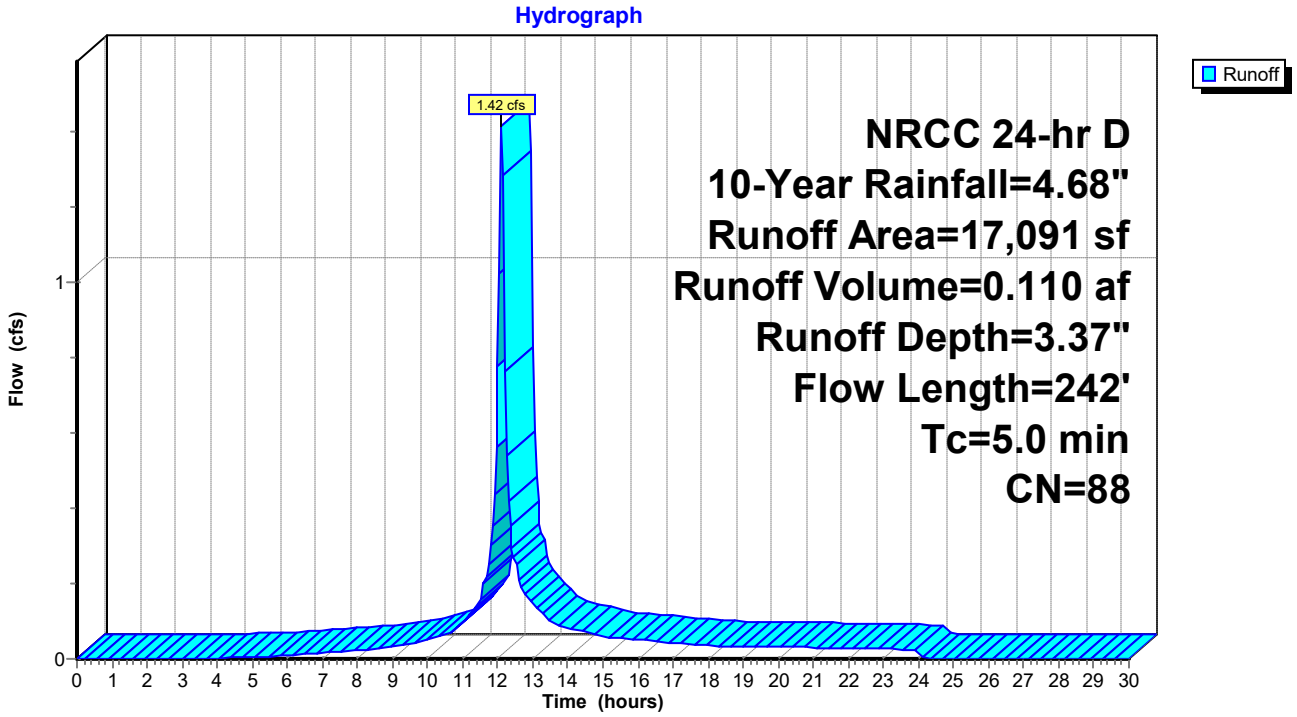
Runoff = 1.42 cfs @ 12.11 hrs, Volume= 0.110 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
2,829	39	>75% Grass cover, Good, HSG A
14,262	98	Paved parking, HSG A
17,091	88	Weighted Average
2,829		16.55% Pervious Area
14,262		83.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	192	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	242	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P105: TO DCB#5



Summary for Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM

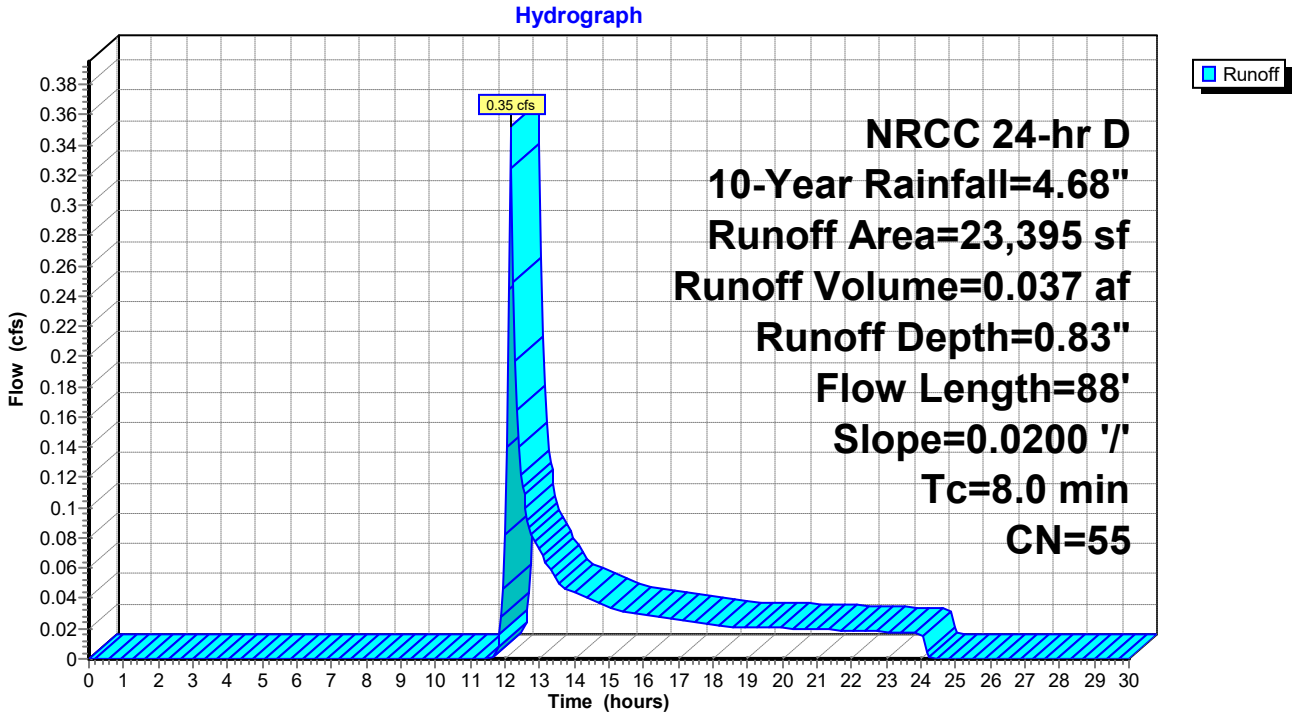
Runoff = 0.35 cfs @ 12.17 hrs, Volume= 0.037 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
17,058	39	>75% Grass cover, Good, HSG A
6,337	98	Paved parking, HSG A
23,395	55	Weighted Average
17,058		72.91% Pervious Area
6,337		27.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	13	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.0	88	Total			

Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM



Summary for Subcatchment P107: TO DCB#8

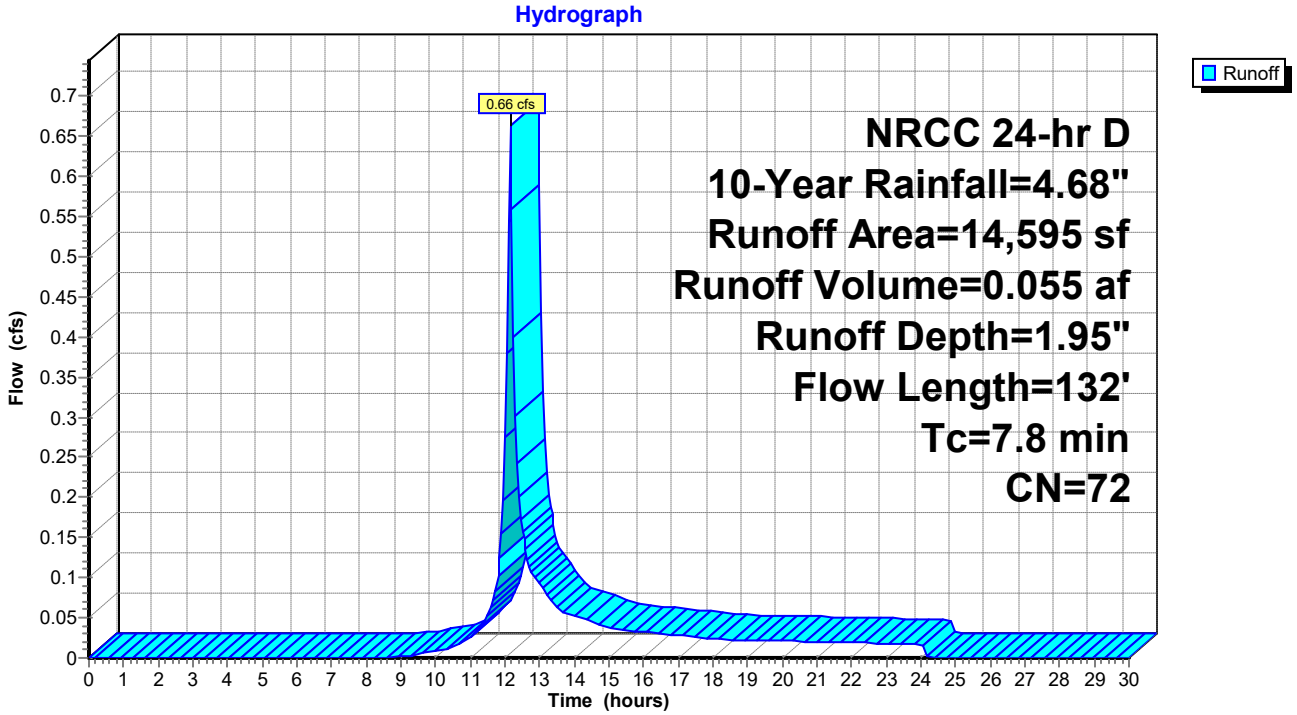
Runoff = 0.66 cfs @ 12.15 hrs, Volume= 0.055 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
6,415	39	>75% Grass cover, Good, HSG A
8,180	98	Paved parking, HSG A
14,595	72	Weighted Average
6,415		43.95% Pervious Area
8,180		56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	23	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
5.9	52	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	57	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.8	132	Total			

Subcatchment P107: TO DCB#8



Summary for Subcatchment P108: TO DCB#6

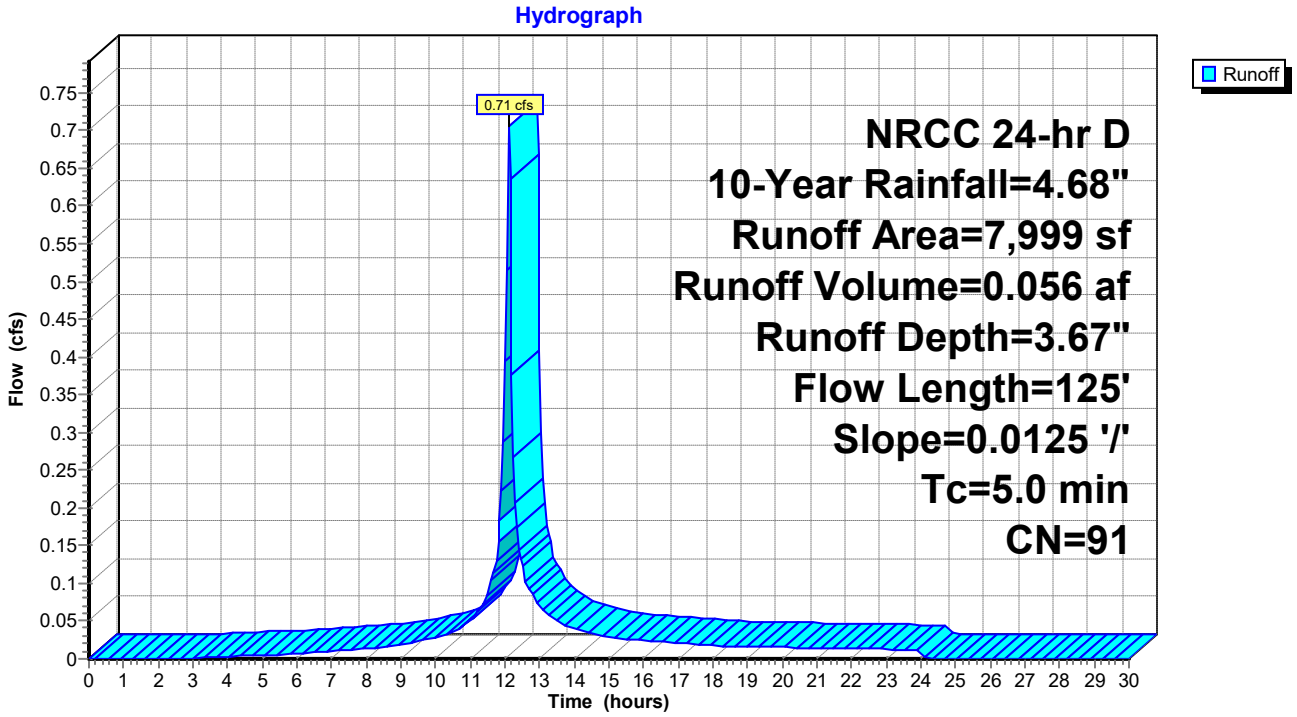
Runoff = 0.71 cfs @ 12.11 hrs, Volume= 0.056 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,013	39	>75% Grass cover, Good, HSG A
6,986	98	Paved parking, HSG A
7,999	91	Weighted Average
1,013		12.66% Pervious Area
6,986		87.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	75	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#6



Summary for Subcatchment P109: TO DCB#7

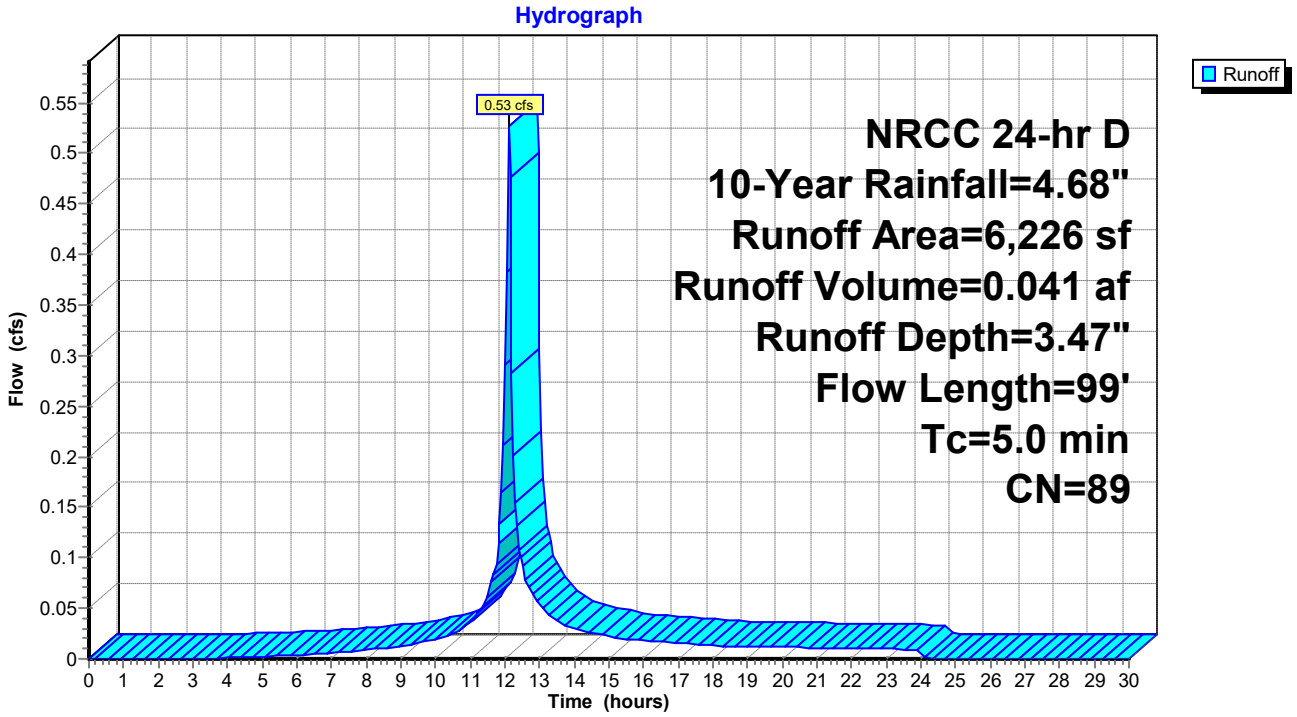
Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
900	39	>75% Grass cover, Good, HSG A
5,326	98	Paved parking, HSG A
6,226	89	Weighted Average
900		14.46% Pervious Area
5,326		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.4	49	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	99	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P109: TO DCB#7



Summary for Subcatchment P11: TO DP#1

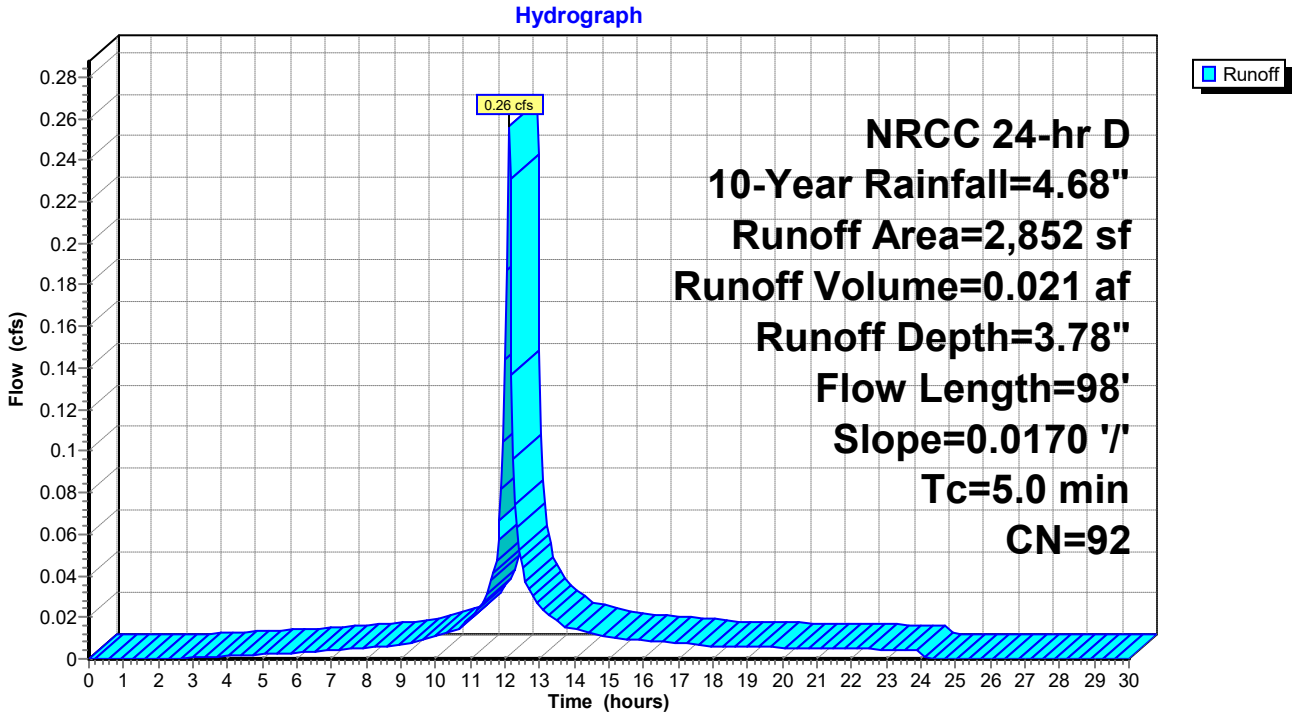
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P11: TO DP#1



Summary for Subcatchment P12: TO DCB-A

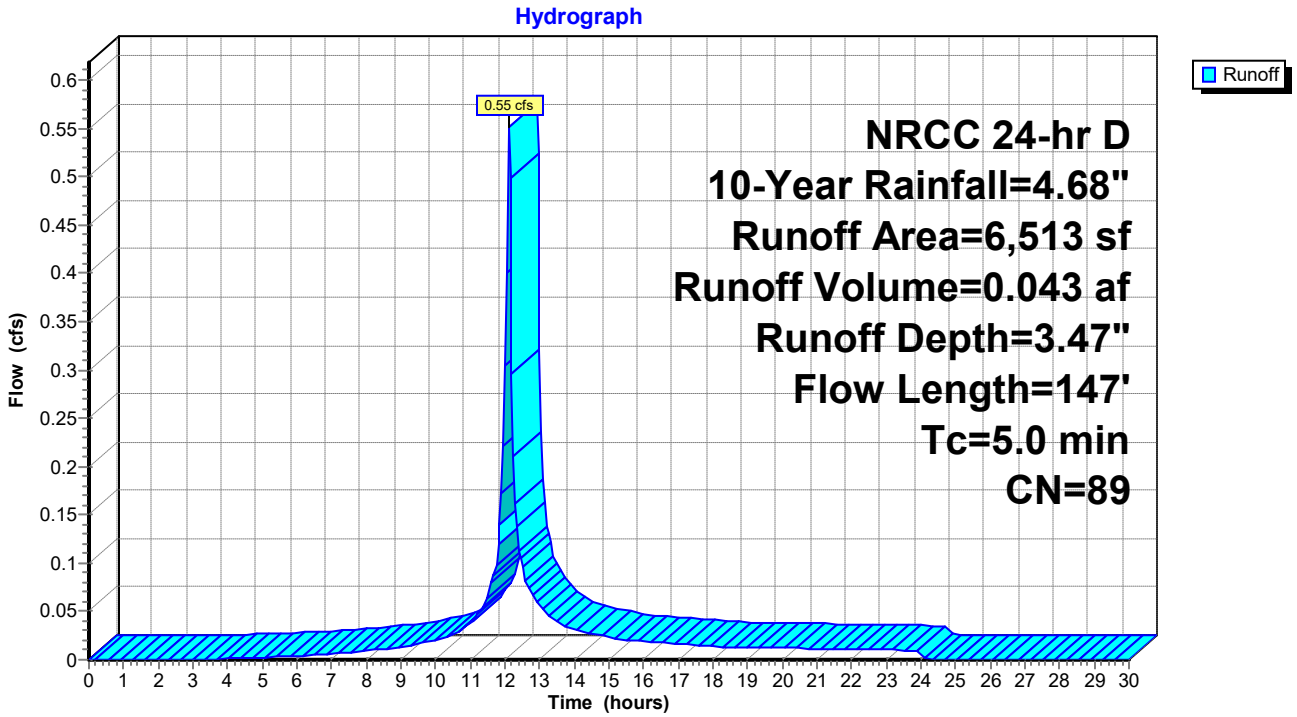
Runoff = 0.55 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
970	39	>75% Grass cover, Good, HSG A
5,543	98	Paved parking, HSG A
6,513	89	Weighted Average
970		14.89% Pervious Area
5,543		85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	8	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	35	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	97	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	147	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P12: TO DCB-A



Summary for Subcatchment P14: TO DCB-B

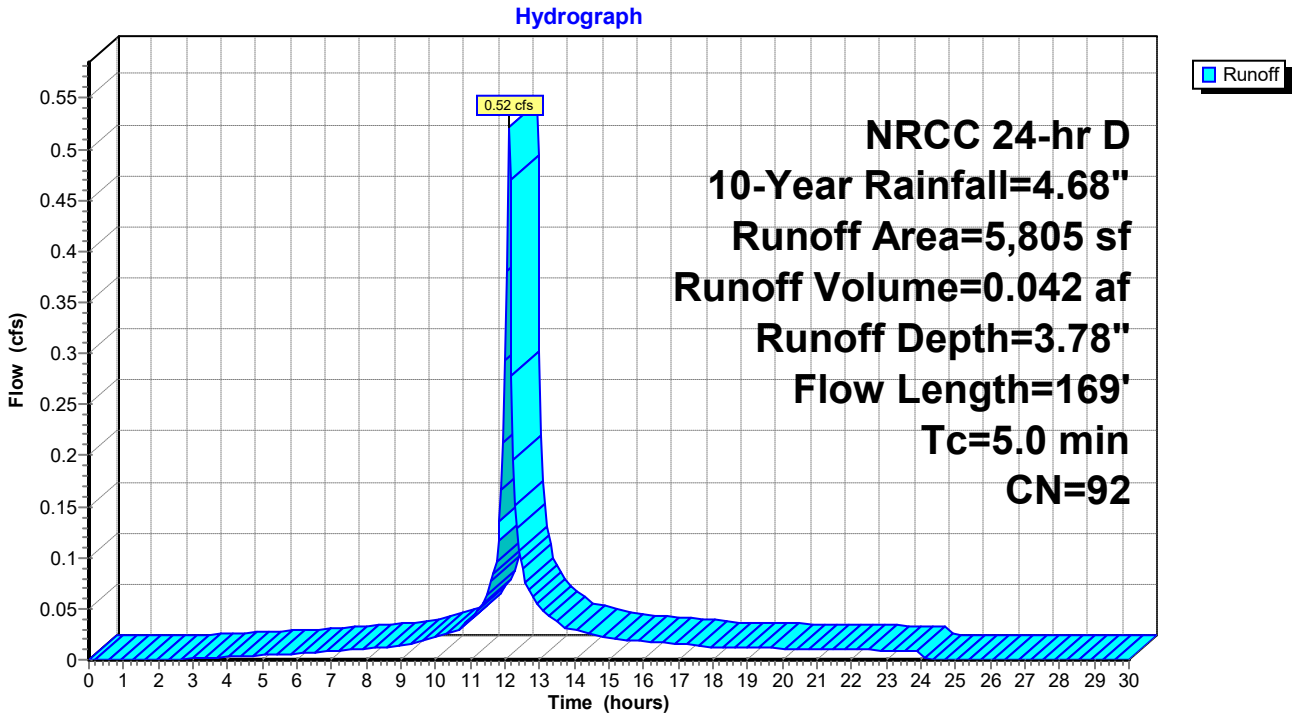
Runoff = 0.52 cfs @ 12.11 hrs, Volume= 0.042 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
609	39	>75% Grass cover, Good, HSG A
5,196	98	Paved parking, HSG A
5,805	92	Weighted Average
609		10.49% Pervious Area
5,196		89.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	10	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	33	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	119	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P14: TO DCB-B



Summary for Subcatchment P15: TO DCB-C

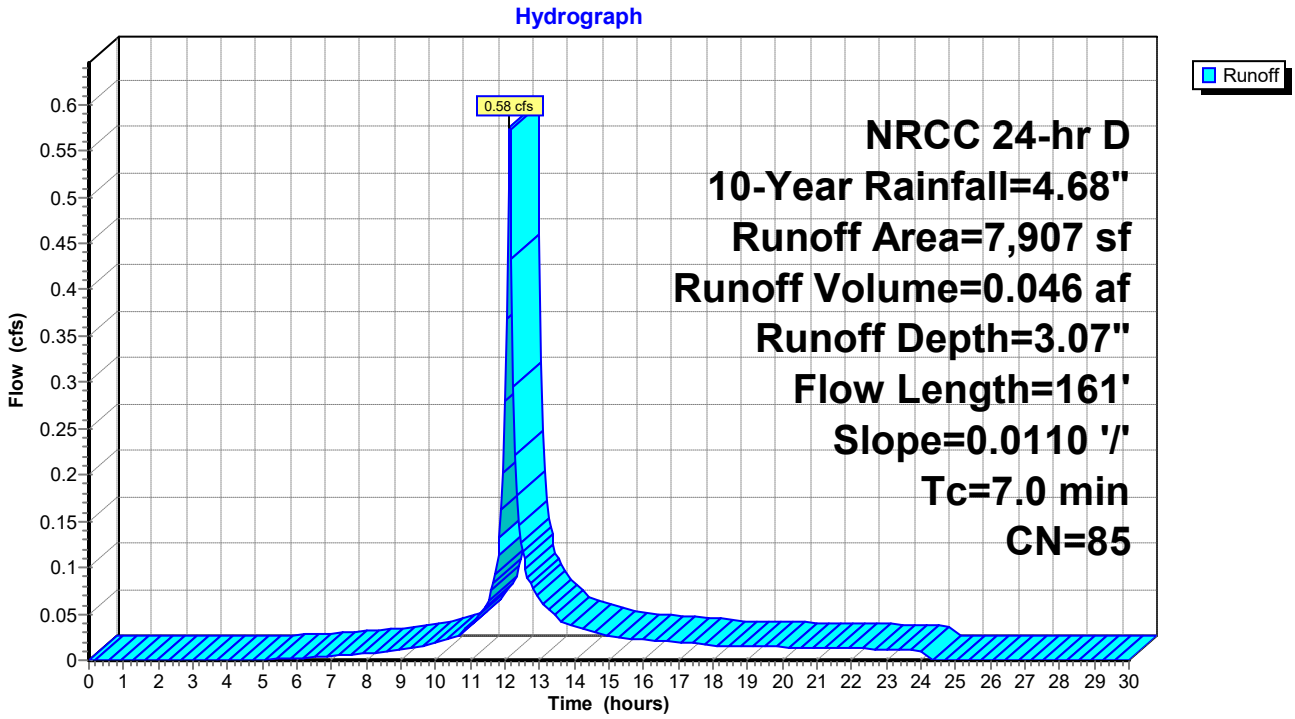
Runoff = 0.58 cfs @ 12.14 hrs, Volume= 0.046 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,765	39	>75% Grass cover, Good, HSG A
5,412	98	Paved parking, HSG A
730	96	Gravel surface, HSG A
7,907	85	Weighted Average
2,495		31.55% Pervious Area
5,412		68.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment P15: TO DCB-C



Summary for Subcatchment P16: TO LOW POINT

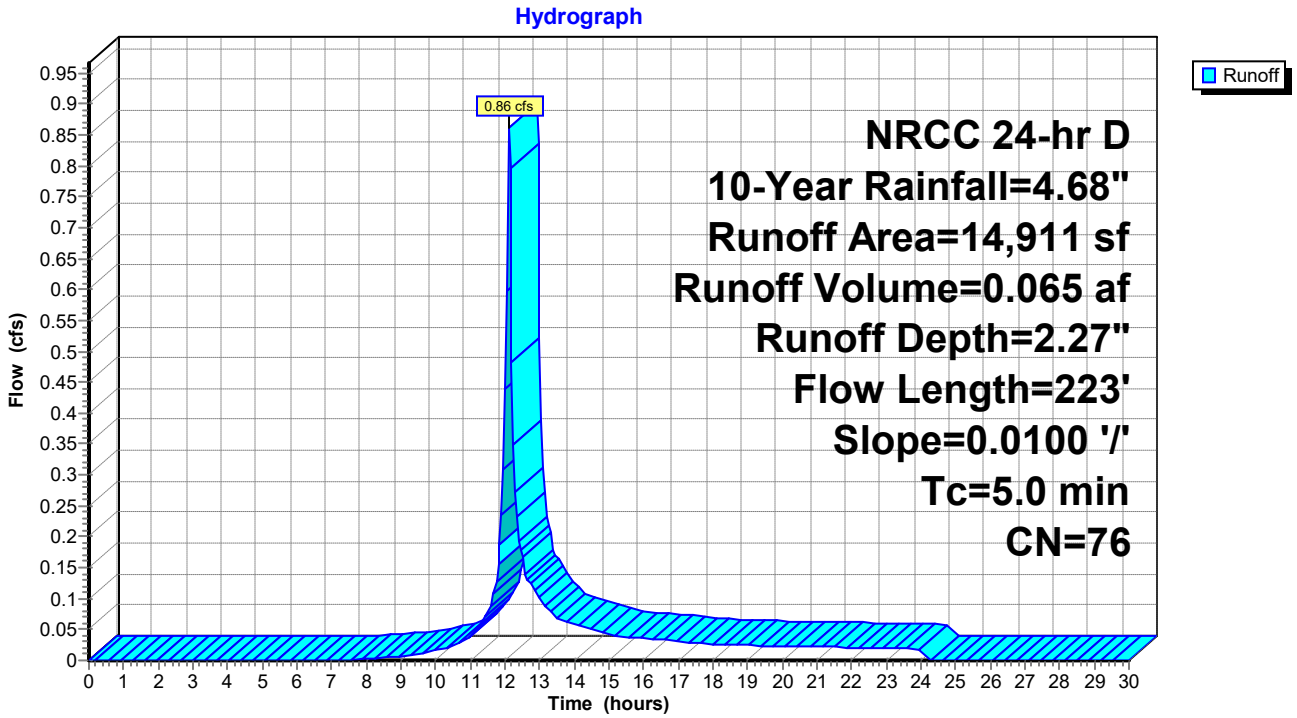
Runoff = 0.86 cfs @ 12.12 hrs, Volume= 0.065 af, Depth= 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
5,411	39	>75% Grass cover, Good, HSG A
7,655	98	Paved parking, HSG A
1,845	96	Gravel surface, HSG A
14,911	76	Weighted Average
7,256		48.66% Pervious Area
7,655		51.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.8	173	0.0100	1.61		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
2.7	223	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P16: TO LOW POINT



Summary for Subcatchment P18: TO DCB-D

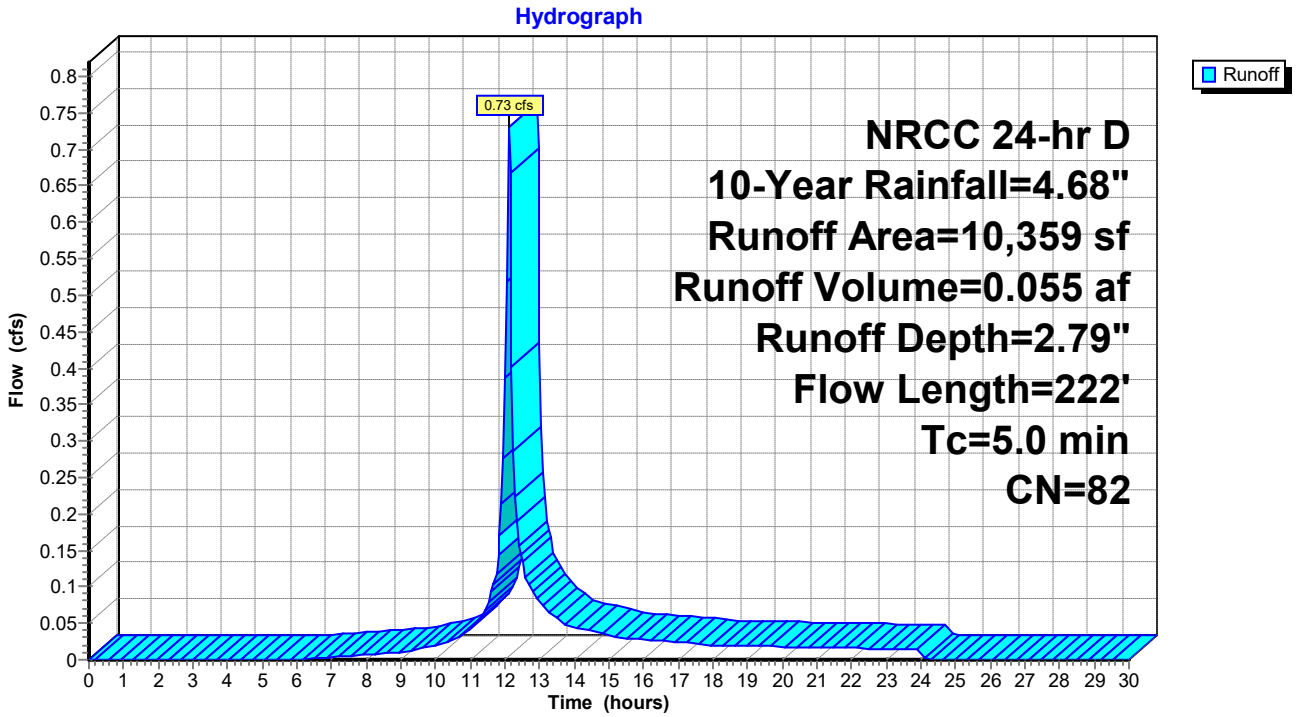
Runoff = 0.73 cfs @ 12.11 hrs, Volume= 0.055 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
2,781	39	>75% Grass cover, Good, HSG A
7,578	98	Paved parking, HSG A
10,359	82	Weighted Average
2,781		26.85% Pervious Area
7,578		73.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	9	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	9	0.0150	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	32	0.0075	0.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	172	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	222	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P18: TO DCB-D



Summary for Subcatchment P19: TO DCB-E

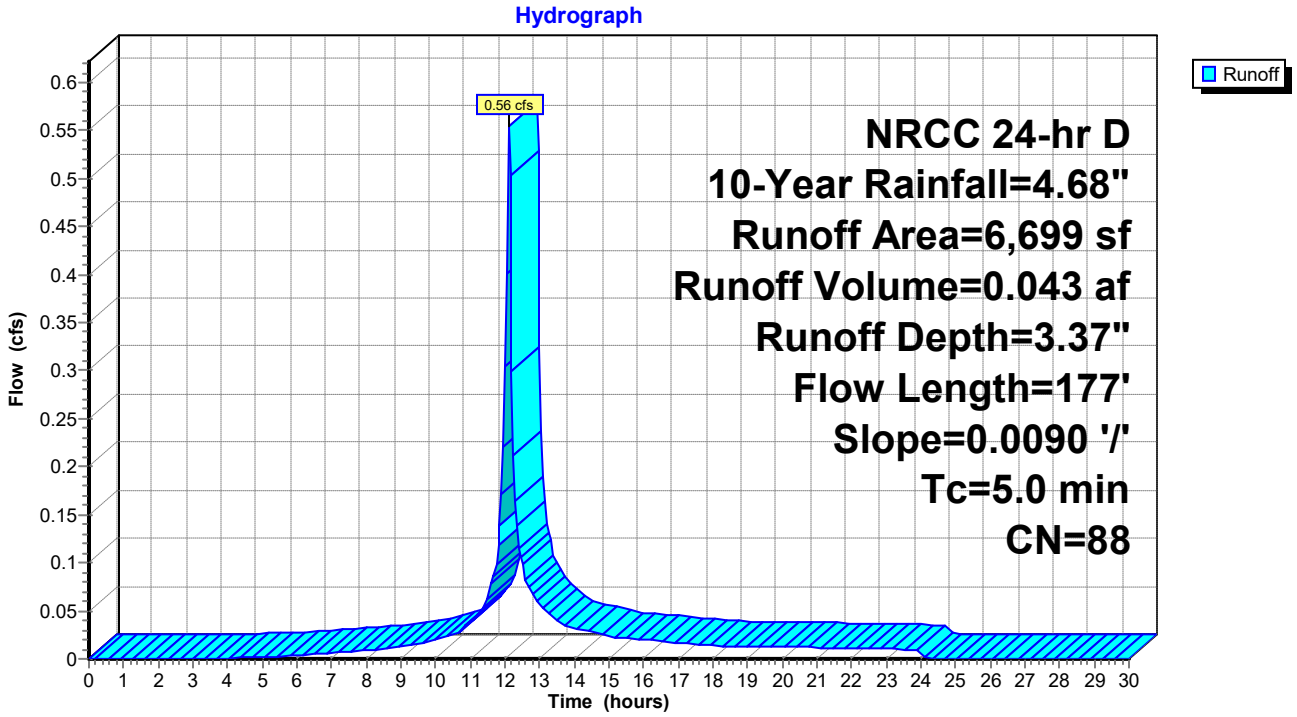
Runoff = 0.56 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,083	39	>75% Grass cover, Good, HSG A
5,616	98	Paved parking, HSG A
6,699	88	Weighted Average
1,083		16.17% Pervious Area
5,616		83.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P19: TO DCB-E



Summary for Subcatchment P20: TO DP#3

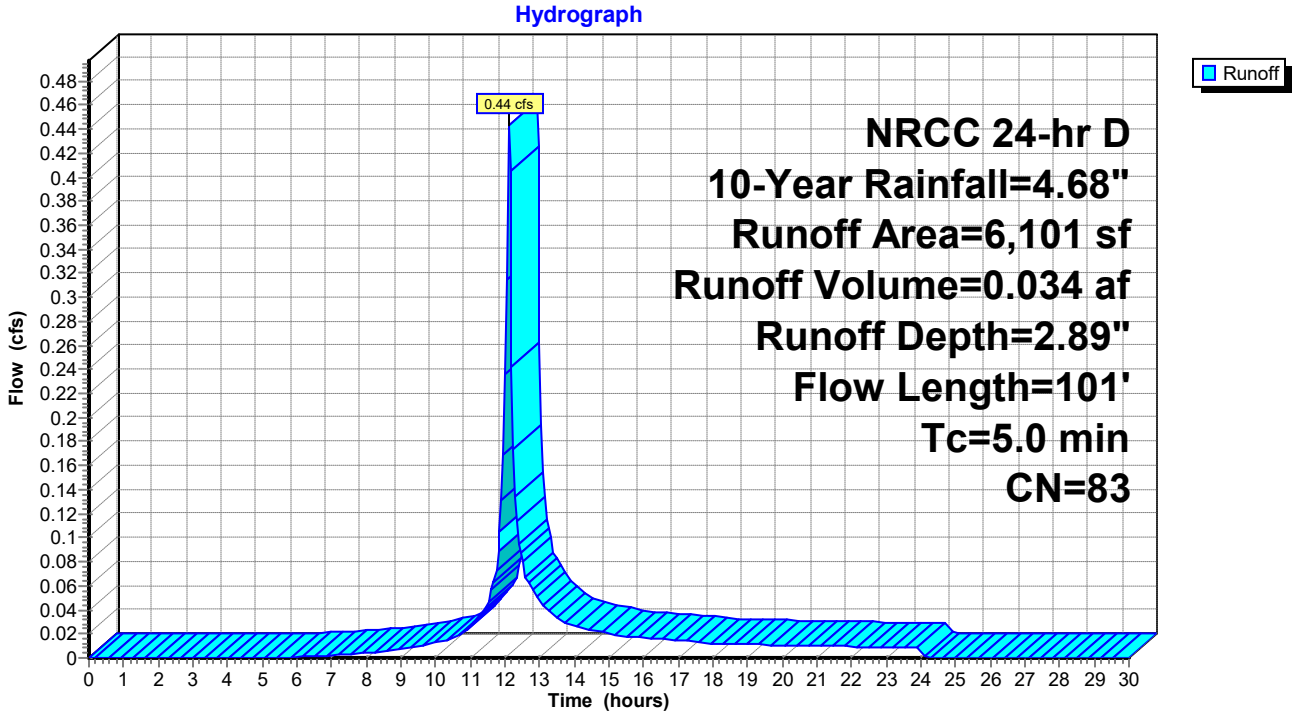
Runoff = 0.44 cfs @ 12.11 hrs, Volume= 0.034 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
1,501	39	>75% Grass cover, Good, HSG A
4,600	98	Paved parking, HSG A
6,101	83	Weighted Average
1,501		24.60% Pervious Area
4,600		75.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	9	0.0250	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	41	0.0150	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P20: TO DP#3



Summary for Subcatchment P24: TO DP#4

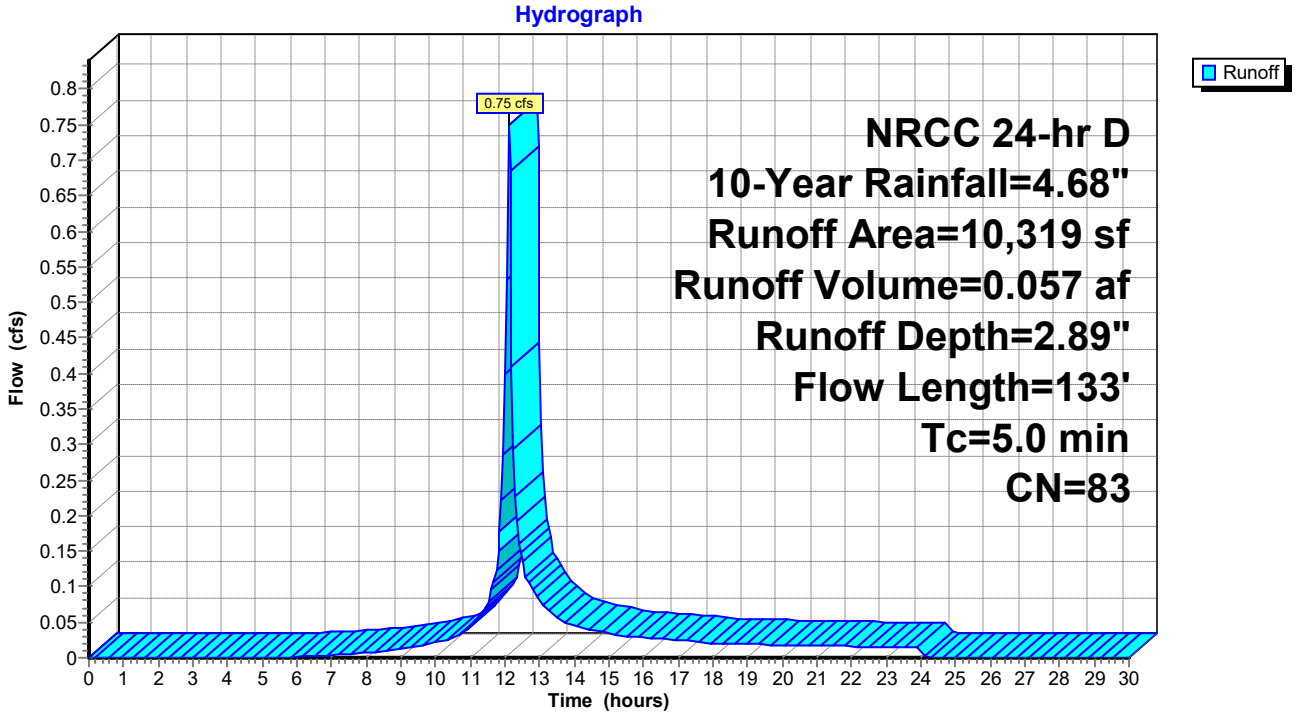
Runoff = 0.75 cfs @ 12.11 hrs, Volume= 0.057 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
2,618	39	>75% Grass cover, Good, HSG A
7,701	98	Paved parking, HSG A
10,319	83	Weighted Average
2,618		25.37% Pervious Area
7,701		74.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	35	0.0600	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	10	0.3000	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0100	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.4	83	0.0100	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
4.8	133	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DP#4



Summary for Subcatchment P26: TO DCB-H

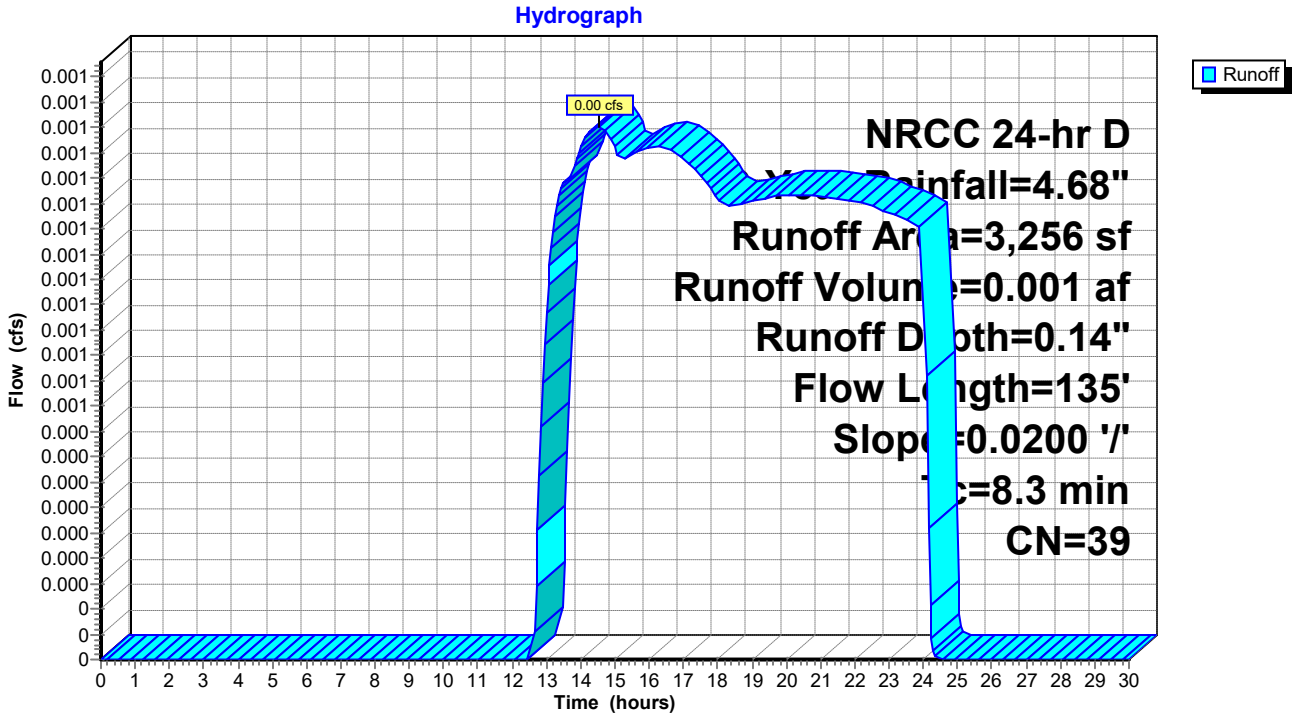
Runoff = 0.00 cfs @ 14.53 hrs, Volume= 0.001 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
3,256	39	>75% Grass cover, Good, HSG A
3,256		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.3	135	Total			

Subcatchment P26: TO DCB-H



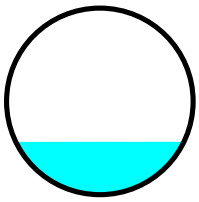
Summary for Reach CMH1: TO DMH-D

Inflow Area = 2.548 ac, 97.20% Impervious, Inflow Depth = 4.31" for 10-Year event
Inflow = 10.19 cfs @ 12.13 hrs, Volume= 0.915 af
Outflow = 10.07 cfs @ 12.14 hrs, Volume= 0.915 af, Atten= 1%, Lag= 0.4 min

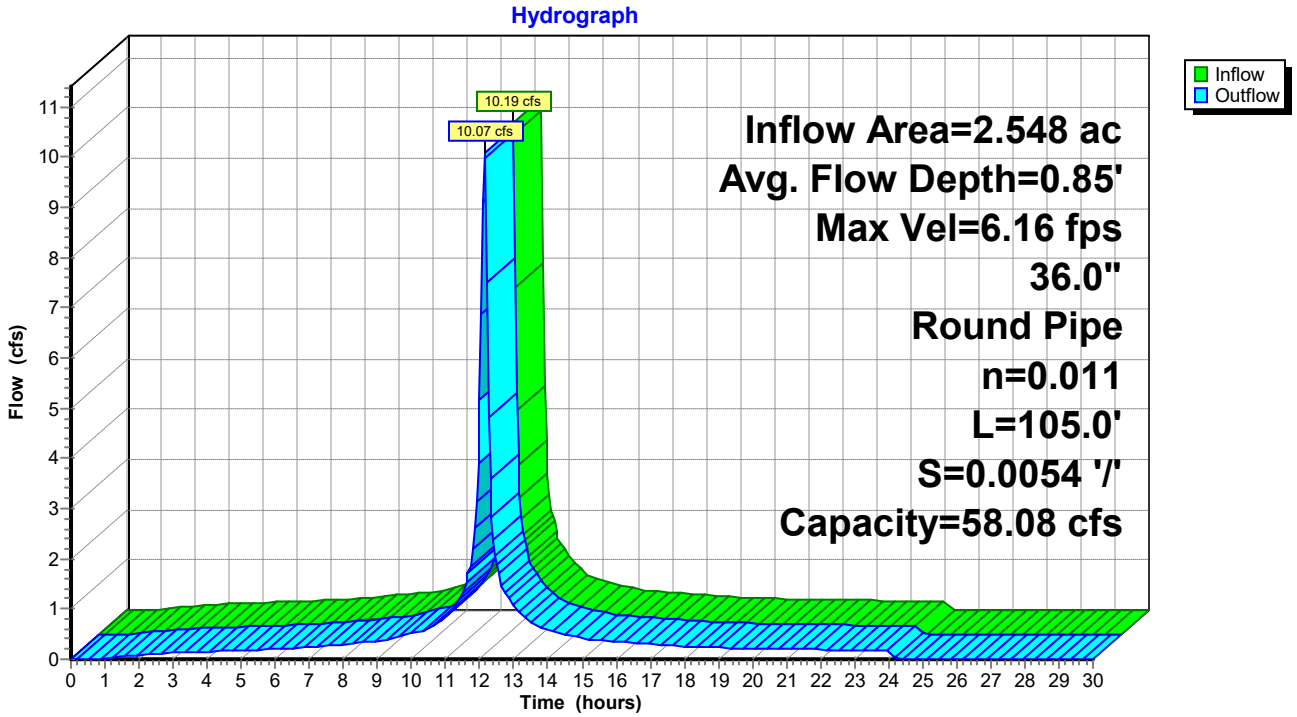
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.16 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.8 min

Peak Storage= 173 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.08 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 105.0' Slope= 0.0054 '/'
Inlet Invert= 456.47', Outlet Invert= 455.90'



Reach CMH1: TO DMH-D

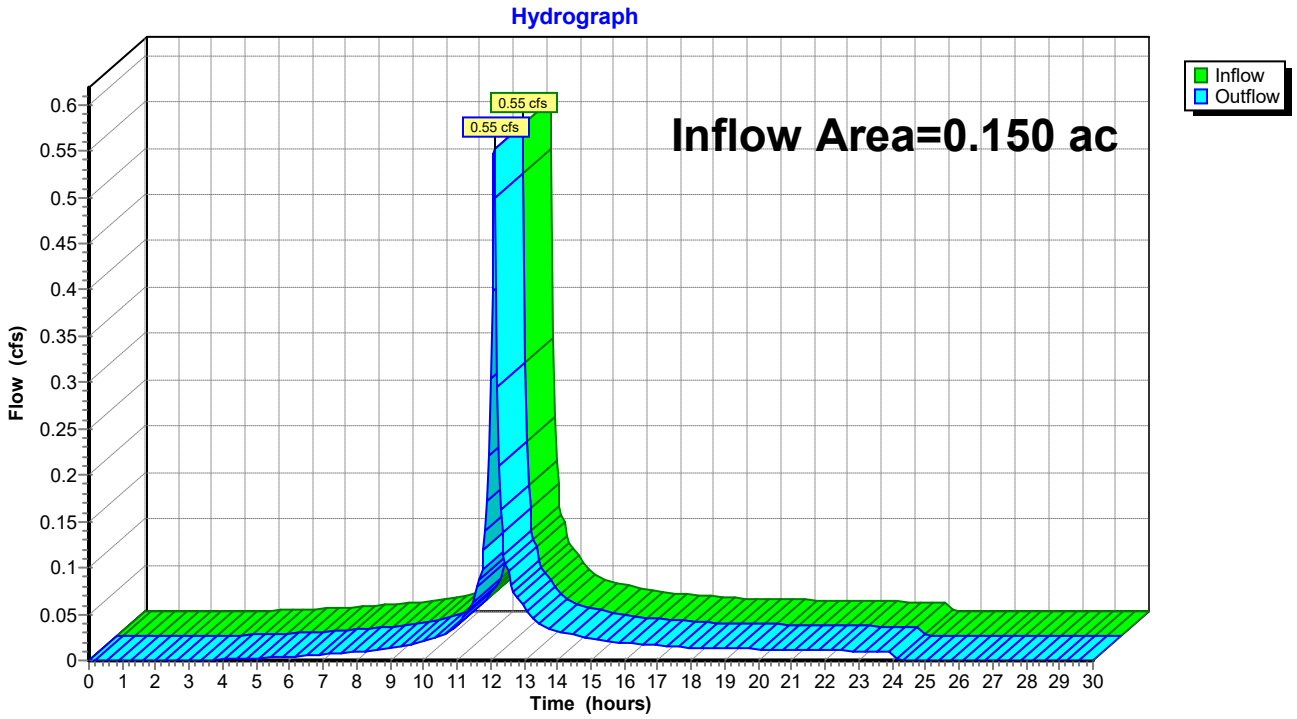


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.150 ac, 85.11% Impervious, Inflow Depth = 3.47" for 10-Year event
Inflow = 0.55 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.55 cfs @ 12.11 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

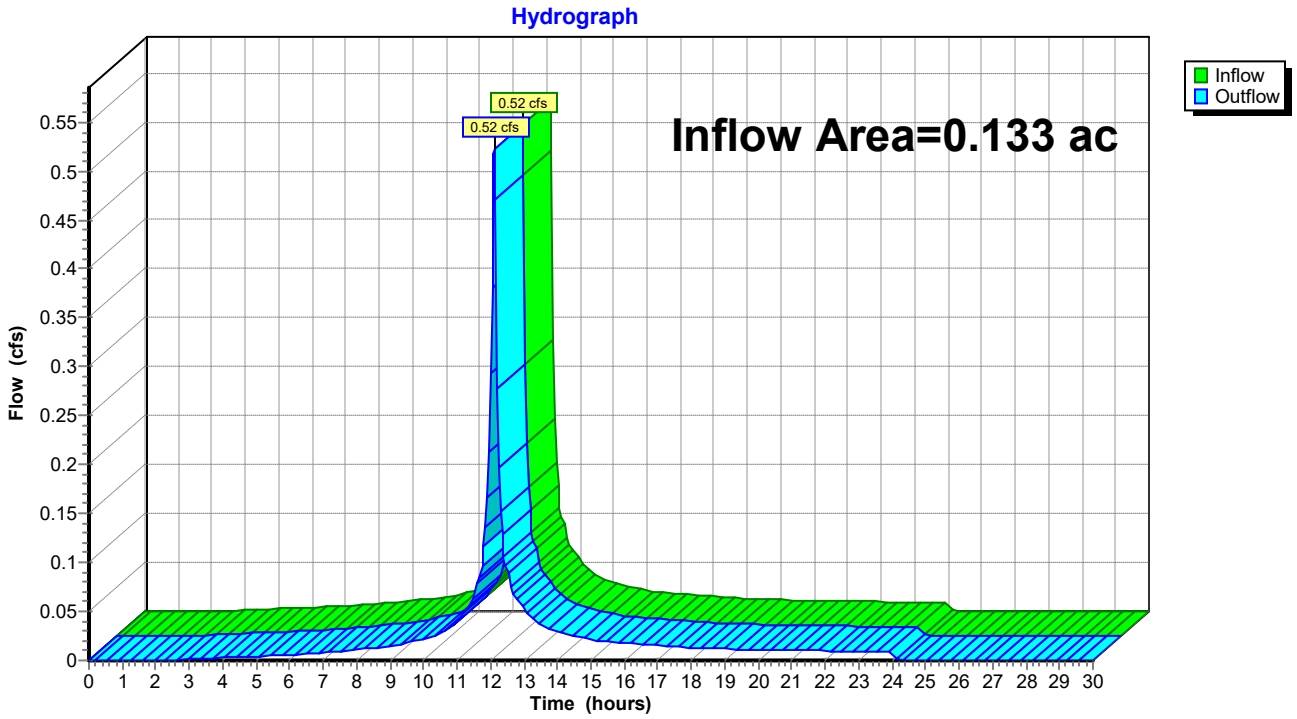


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.133 ac, 89.51% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 0.52 cfs @ 12.11 hrs, Volume= 0.042 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

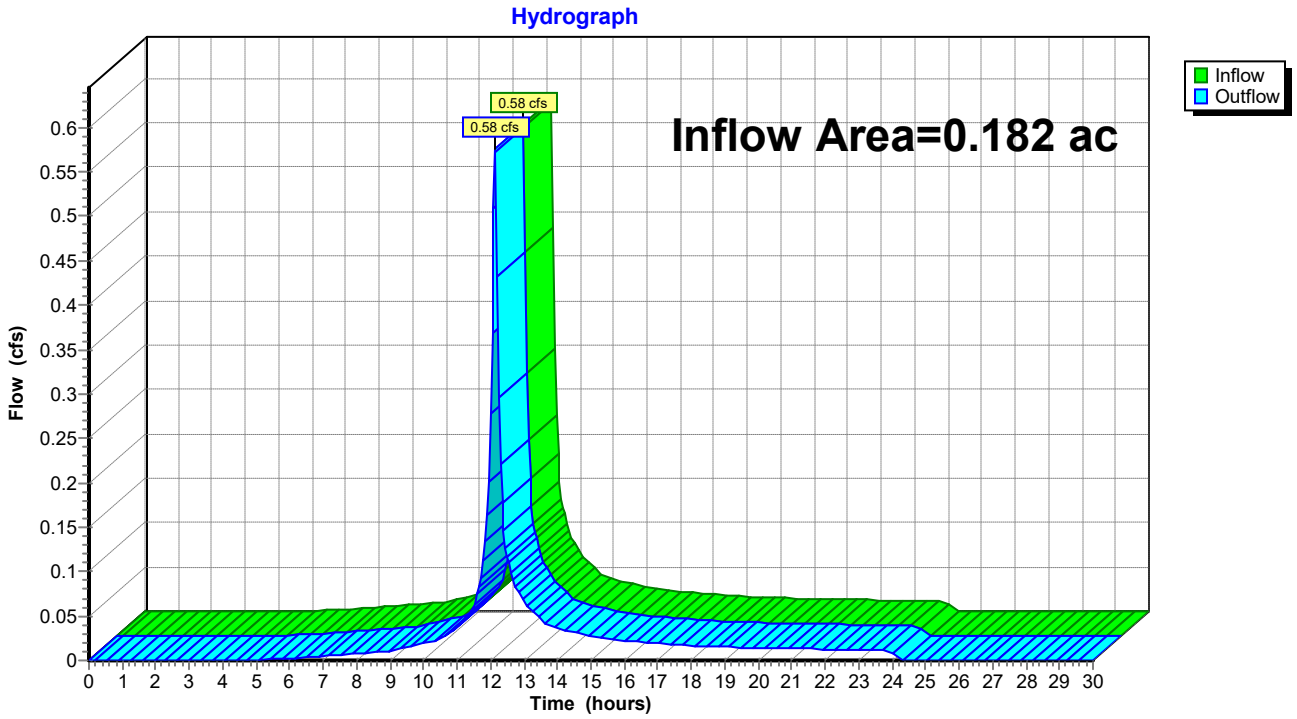


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.182 ac, 68.45% Impervious, Inflow Depth = 3.07" for 10-Year event
Inflow = 0.58 cfs @ 12.14 hrs, Volume= 0.046 af
Outflow = 0.58 cfs @ 12.14 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



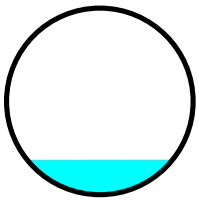
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 0.238 ac, 73.15% Impervious, Inflow Depth = 2.79" for 10-Year event
Inflow = 0.73 cfs @ 12.11 hrs, Volume= 0.055 af
Outflow = 0.73 cfs @ 12.12 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.1 min

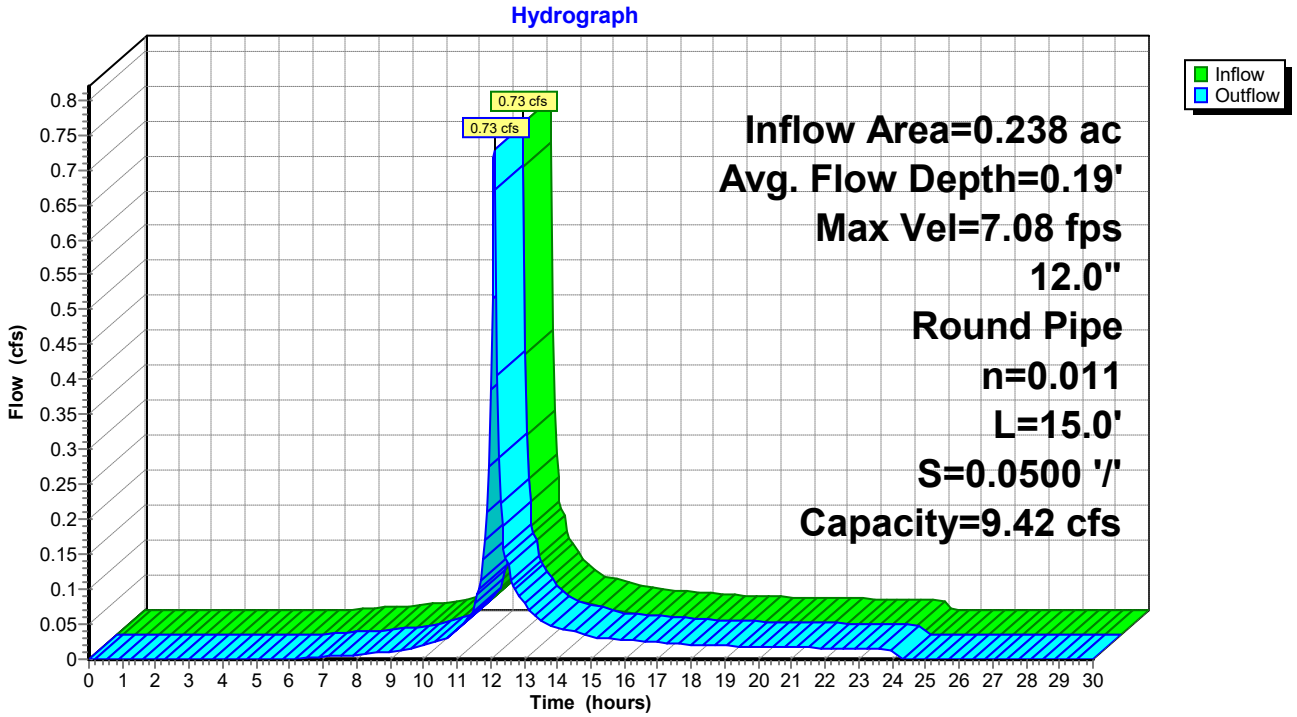
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.08 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.52 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.42 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.0500 '/'
Inlet Invert= 466.75', Outlet Invert= 466.00'



Reach DCB-D: TO DMH-A



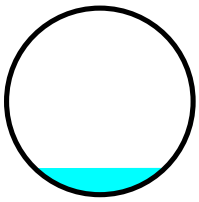
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.154 ac, 83.83% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 0.56 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.55 cfs @ 12.11 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.1 min

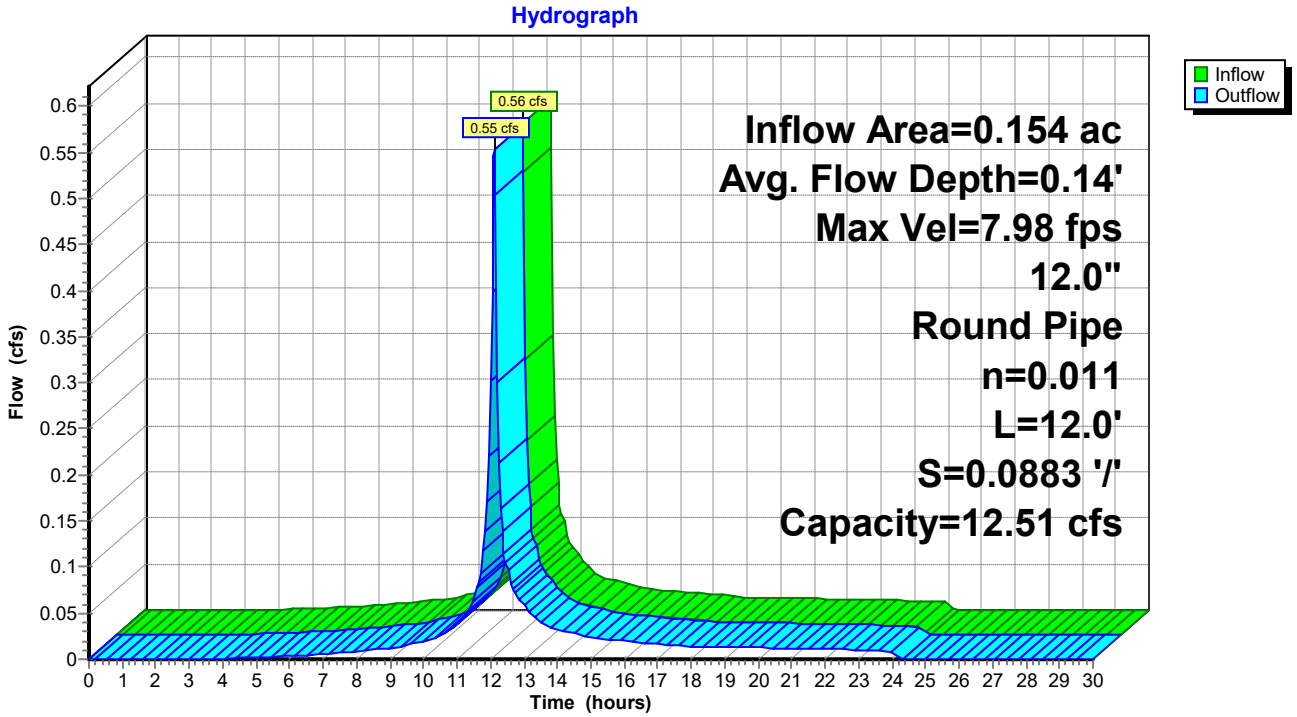
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.98 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A



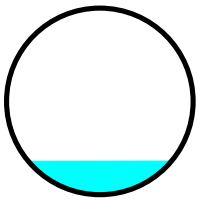
Summary for Reach DCB1: TO DMH#2

Inflow Area = 0.118 ac, 82.42% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 0.43 cfs @ 12.11 hrs, Volume= 0.033 af
Outflow = 0.42 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 2%, Lag= 0.7 min

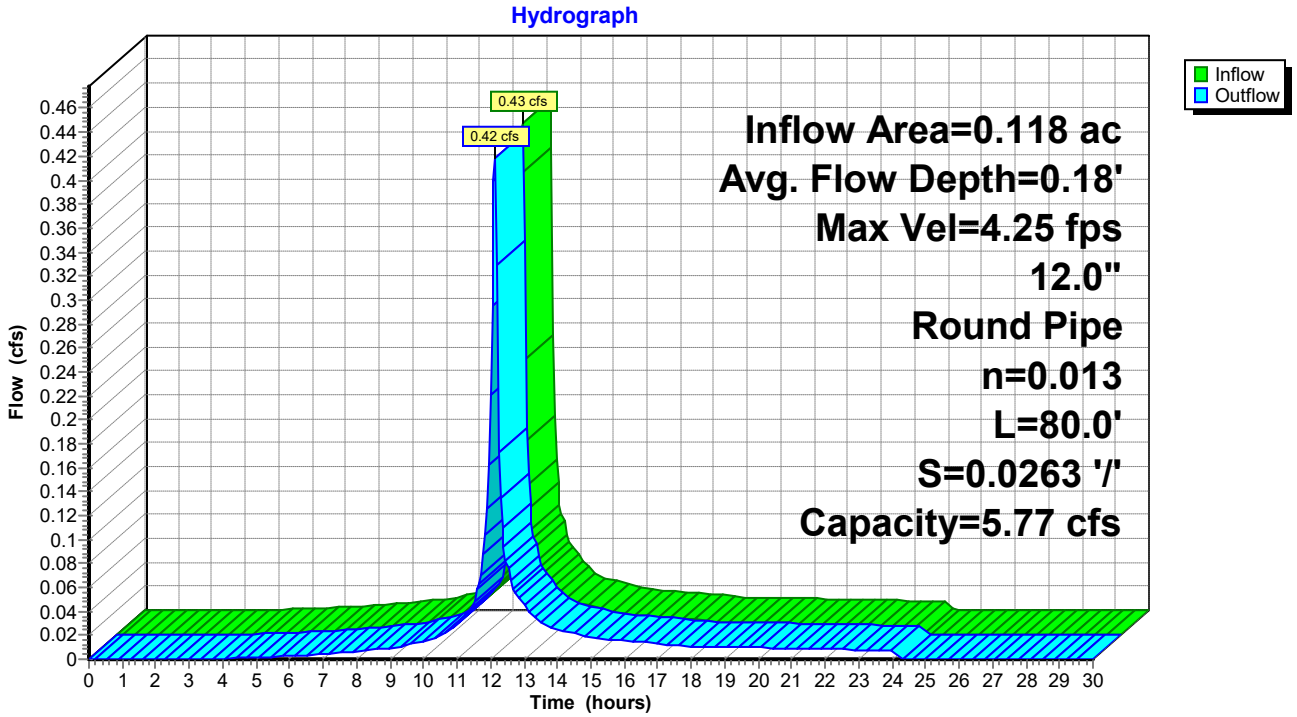
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.25 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 0.9 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.77 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 80.0' Slope= 0.0263 '/'
Inlet Invert= 469.10', Outlet Invert= 467.00'



Reach DCB1: TO DMH#2



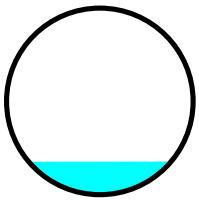
Summary for Reach DCB2: TO DMH#2

Inflow Area = 0.088 ac, 96.05% Impervious, Inflow Depth = 4.21" for 10-Year event
Inflow = 0.37 cfs @ 12.11 hrs, Volume= 0.031 af
Outflow = 0.35 cfs @ 12.12 hrs, Volume= 0.031 af, Atten= 3%, Lag= 0.7 min

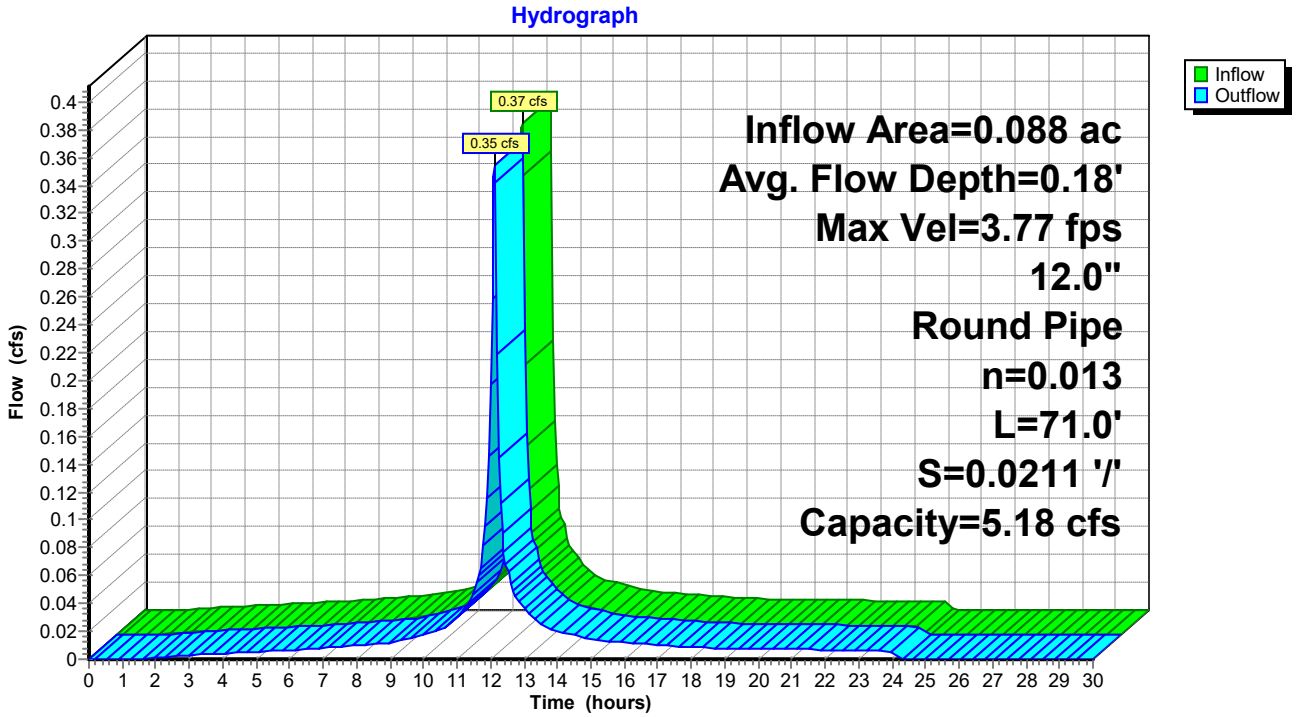
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.77 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 0.9 min

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.18 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 71.0' Slope= 0.0211 '/'
Inlet Invert= 469.10', Outlet Invert= 467.60'



Reach DCB2: TO DMH#2



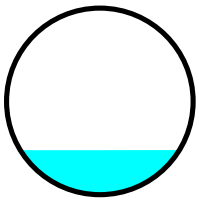
Summary for Reach DCB3: TO DMH#2

Inflow Area = 0.159 ac, 92.22% Impervious, Inflow Depth = 3.88" for 10-Year event
Inflow = 0.63 cfs @ 12.11 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.11 hrs, Volume= 0.051 af, Atten= 1%, Lag= 0.1 min

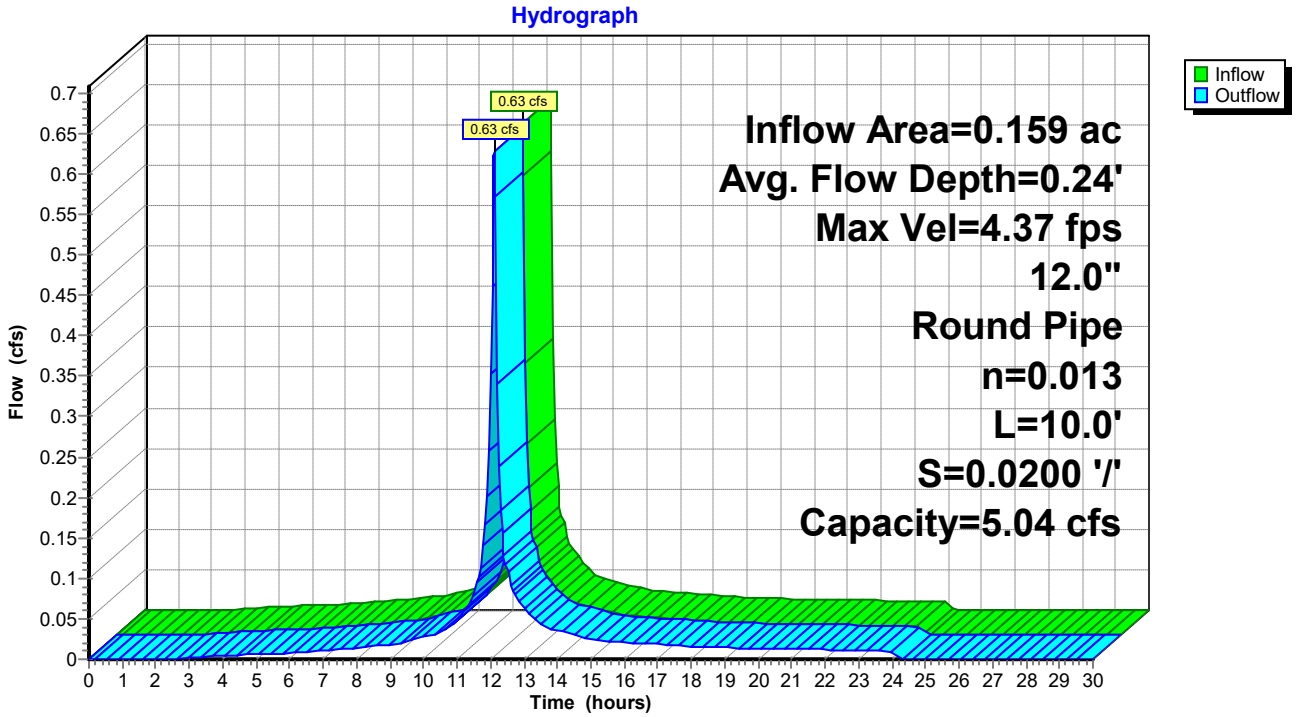
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.37 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 469.10', Outlet Invert= 468.90'



Reach DCB3: TO DMH#2



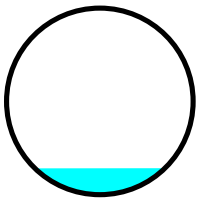
Summary for Reach DCB4: TO DMH#1

Inflow Area = 0.047 ac, 78.10% Impervious, Inflow Depth = 3.07" for 10-Year event
Inflow = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.14 hrs, Volume= 0.012 af, Atten= 4%, Lag= 1.3 min

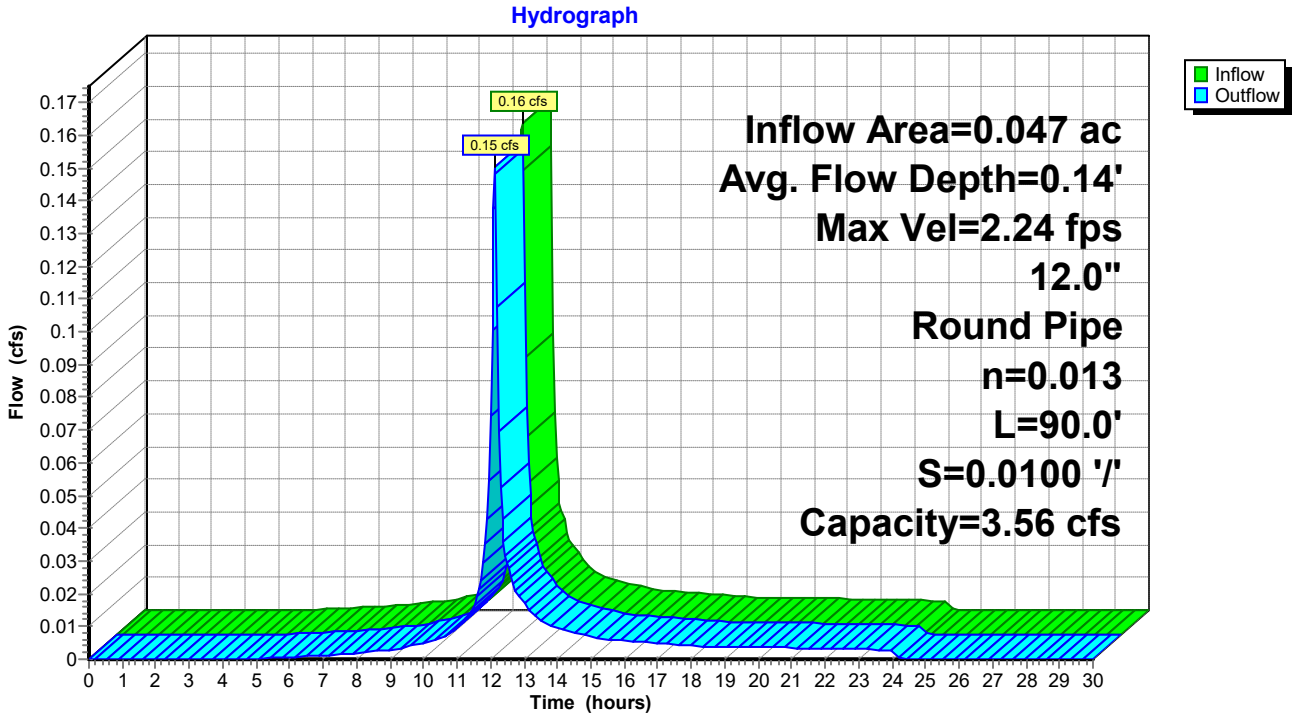
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 1.9 min

Peak Storage= 6 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 90.0' Slope= 0.0100 '/'
Inlet Invert= 468.50', Outlet Invert= 467.60'



Reach DCB4: TO DMH#1



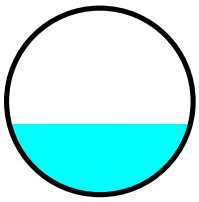
Summary for Reach DCB5: TO DMH#101

Inflow Area = 0.392 ac, 83.45% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 1.42 cfs @ 12.11 hrs, Volume= 0.110 af
Outflow = 1.40 cfs @ 12.12 hrs, Volume= 0.110 af, Atten= 1%, Lag= 0.2 min

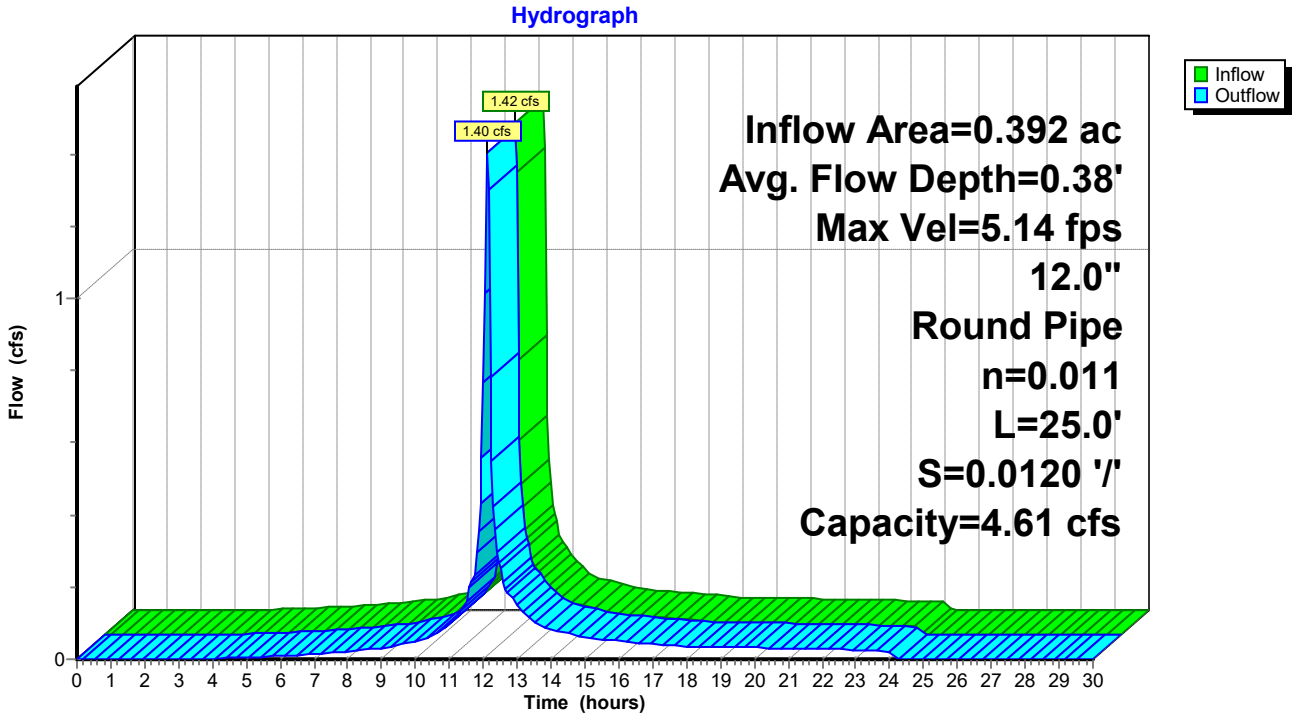
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.14 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0120 '/'
Inlet Invert= 468.30', Outlet Invert= 468.00'



Reach DCB5: TO DMH#101



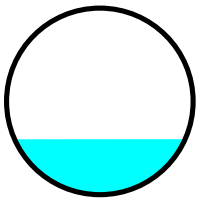
Summary for Reach DCB6: TO DMH#3

Inflow Area = 0.184 ac, 87.34% Impervious, Inflow Depth = 3.67" for 10-Year event
Inflow = 0.71 cfs @ 12.11 hrs, Volume= 0.056 af
Outflow = 0.69 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 3%, Lag= 1.0 min

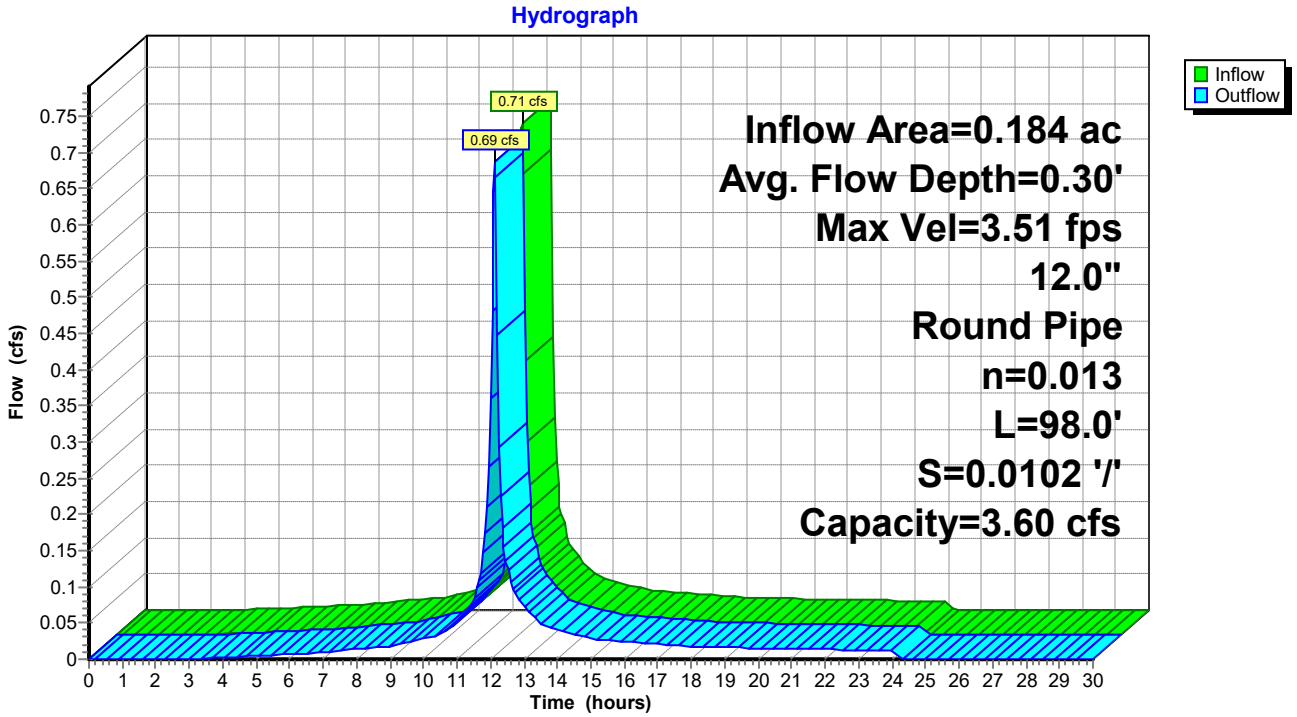
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.51 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 1.3 min

Peak Storage= 19 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 469.50', Outlet Invert= 468.50'



Reach DCB6: TO DMH#3



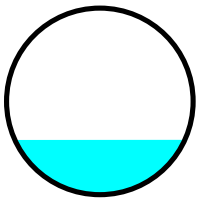
Summary for Reach DCB7: TO DMH#4

Inflow Area = 0.335 ac, 56.05% Impervious, Inflow Depth = 1.95" for 10-Year event
Inflow = 0.66 cfs @ 12.15 hrs, Volume= 0.055 af
Outflow = 0.64 cfs @ 12.17 hrs, Volume= 0.055 af, Atten= 4%, Lag= 0.8 min

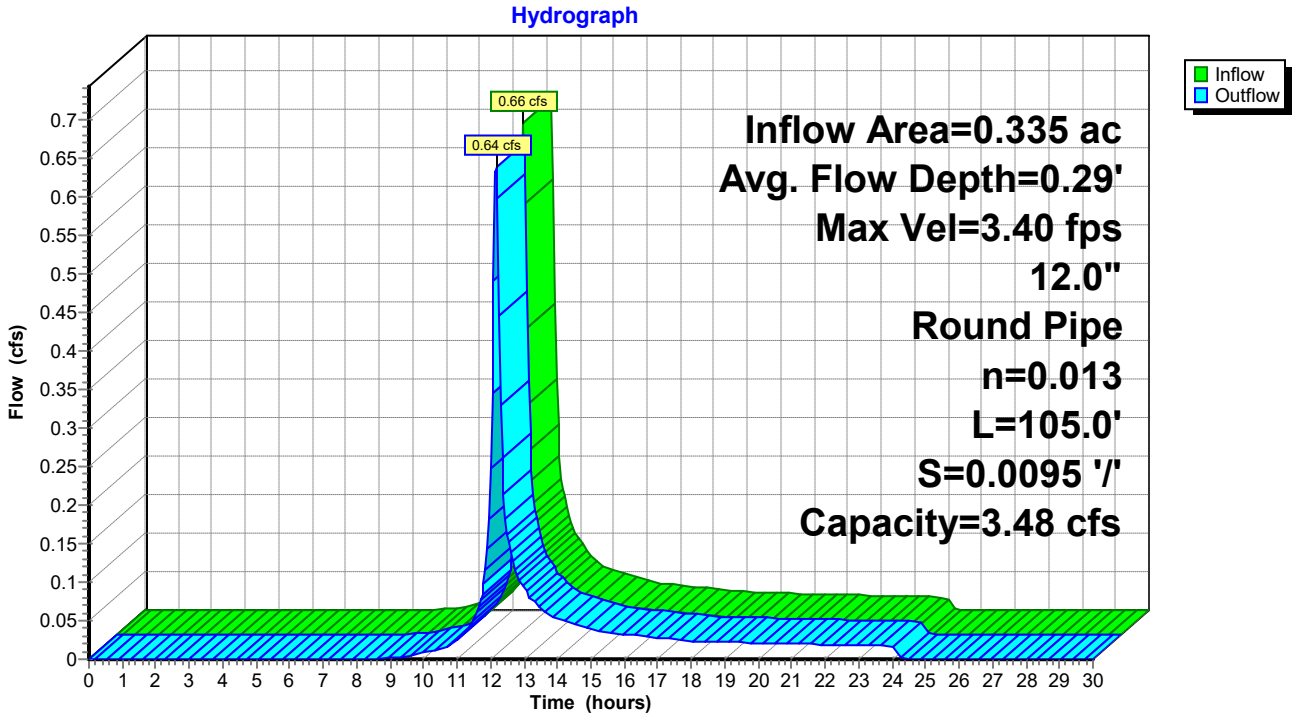
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.40 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.3 min

Peak Storage= 20 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.48 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 105.0' Slope= 0.0095 '/'
Inlet Invert= 470.00', Outlet Invert= 469.00'



Reach DCB7: TO DMH#4



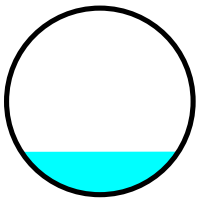
Summary for Reach DCB8: TO DMH#4

Inflow Area = 0.143 ac, 85.54% Impervious, Inflow Depth = 3.47" for 10-Year event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af
Outflow = 0.51 cfs @ 12.12 hrs, Volume= 0.041 af, Atten= 3%, Lag= 0.6 min

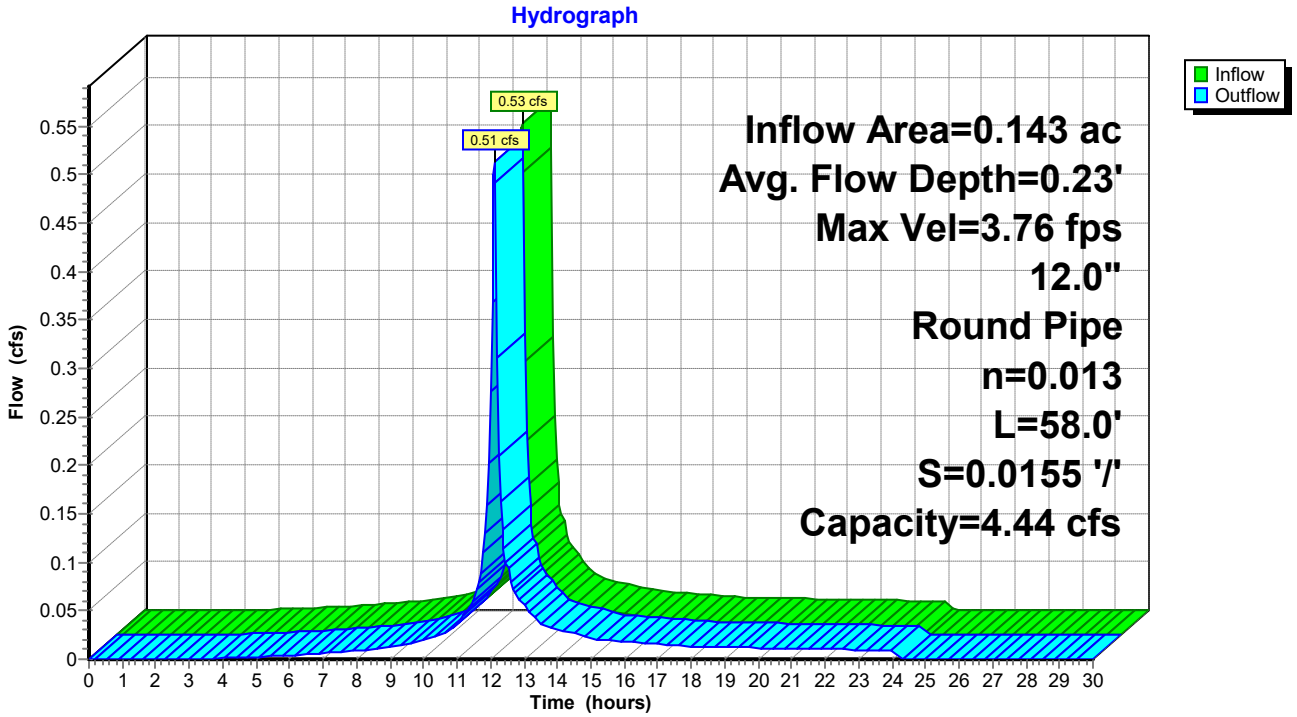
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 0.7 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 58.0' Slope= 0.0155 '/'
Inlet Invert= 469.90', Outlet Invert= 469.00'



Reach DCB8: TO DMH#4



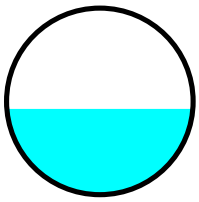
Summary for Reach DCB9: TO DMH#5

Inflow Area = 0.342 ac, 51.34% Impervious, Inflow Depth = 2.27" for 10-Year event
Inflow = 0.86 cfs @ 12.12 hrs, Volume= 0.065 af
Outflow = 0.85 cfs @ 12.13 hrs, Volume= 0.065 af, Atten= 2%, Lag= 0.8 min

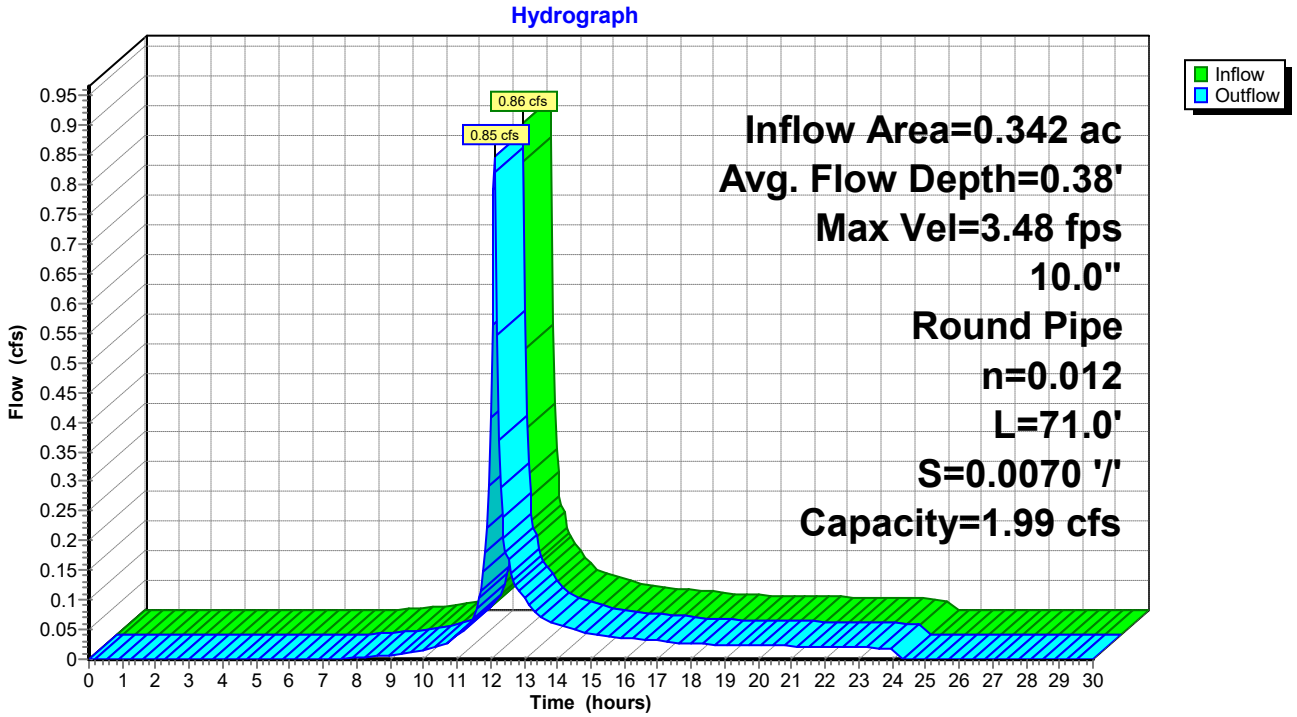
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.48 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 0.9 min

Peak Storage= 17 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 1.99 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 71.0' Slope= 0.0070 '/'
Inlet Invert= 471.00', Outlet Invert= 470.50'



Reach DCB9: TO DMH#5

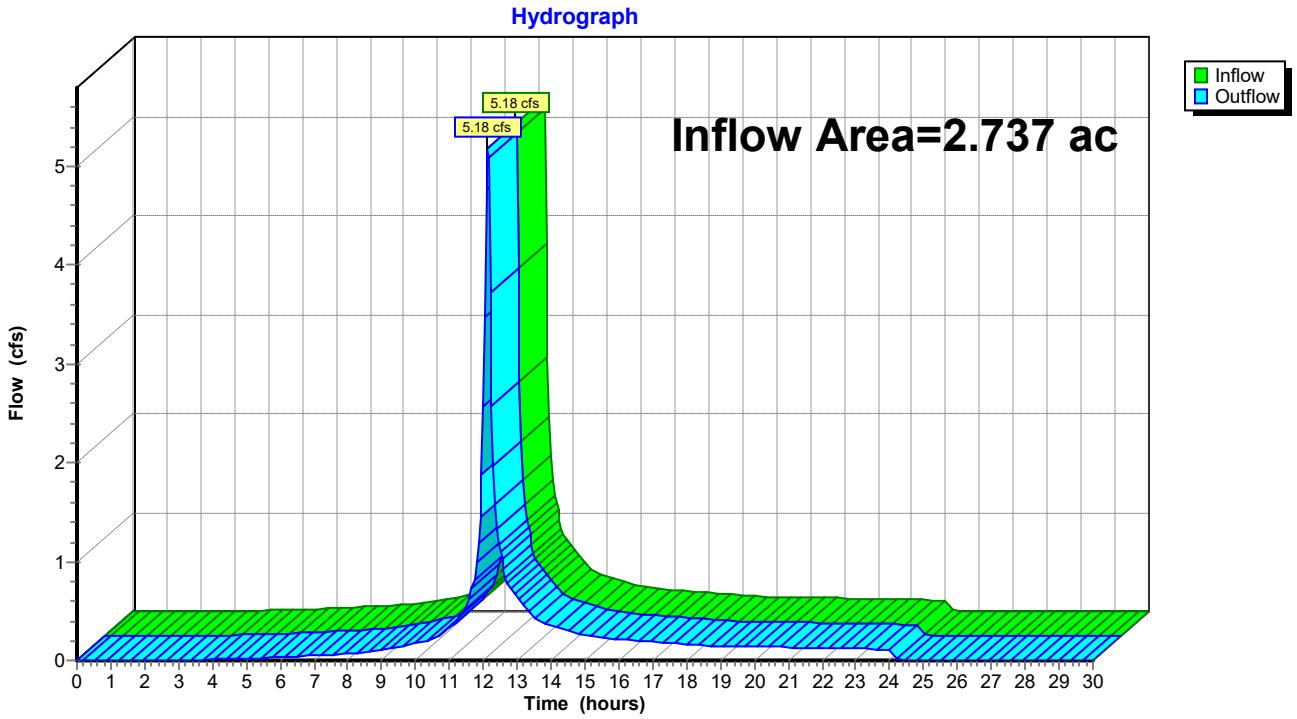


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 1.92" for 10-Year event
Inflow = 5.18 cfs @ 12.13 hrs, Volume= 0.438 af
Outflow = 5.18 cfs @ 12.13 hrs, Volume= 0.438 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

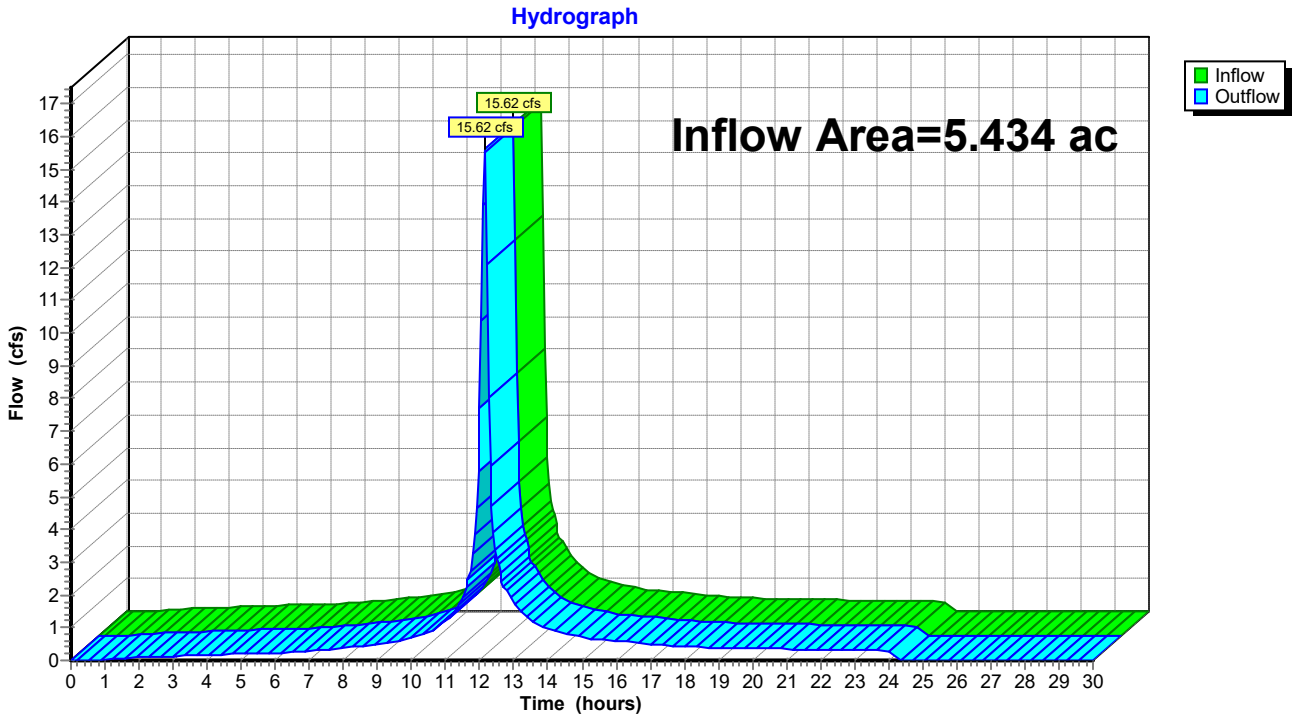


Summary for Reach DMH-C: TO DP#1

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 3.08" for 10-Year event
Inflow = 15.62 cfs @ 12.14 hrs, Volume= 1.396 af
Outflow = 15.62 cfs @ 12.14 hrs, Volume= 1.396 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



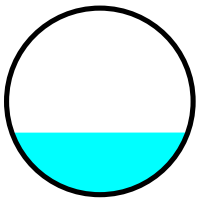
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 3.08" for 10-Year event
Inflow = 15.77 cfs @ 12.14 hrs, Volume= 1.396 af
Outflow = 15.62 cfs @ 12.14 hrs, Volume= 1.396 af, Atten= 1%, Lag= 0.3 min

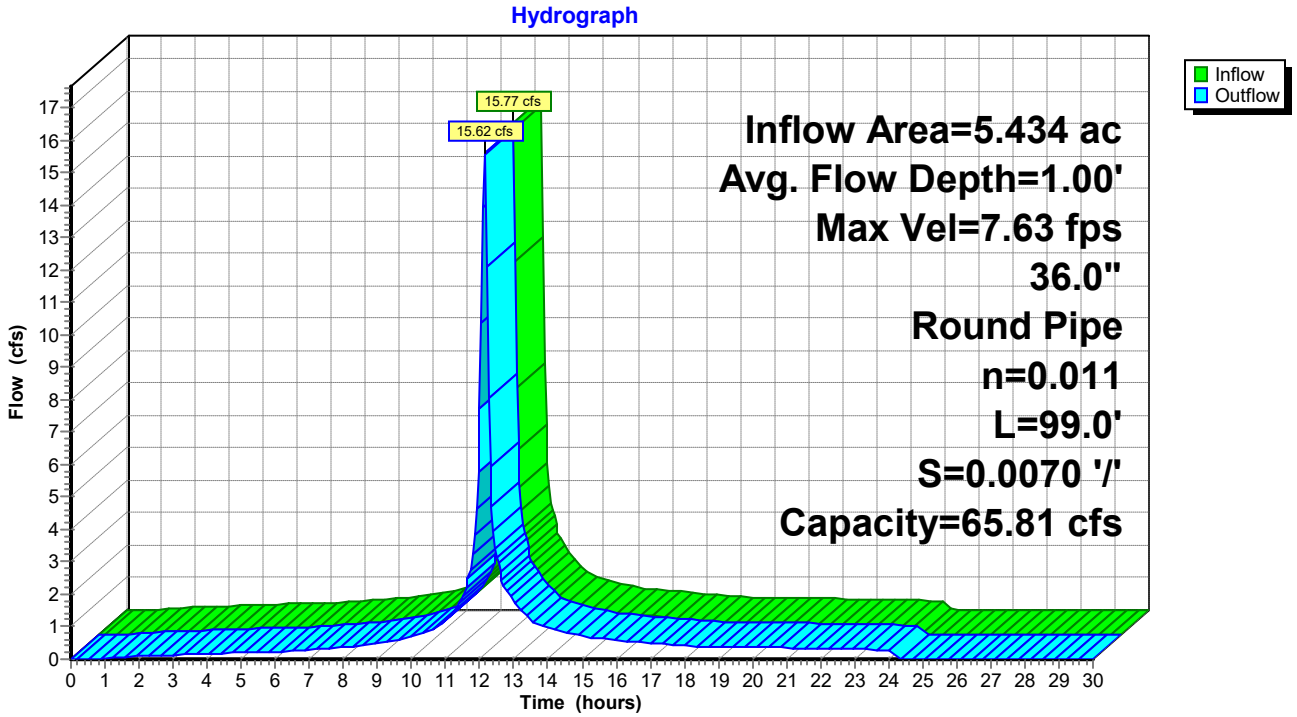
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.63 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.65 fps, Avg. Travel Time= 0.6 min

Peak Storage= 204 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



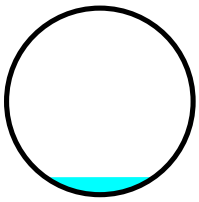
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.315 ac, 77.36% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 1.08 cfs @ 12.13 hrs, Volume= 0.088 af
Outflow = 1.08 cfs @ 12.13 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.2 min

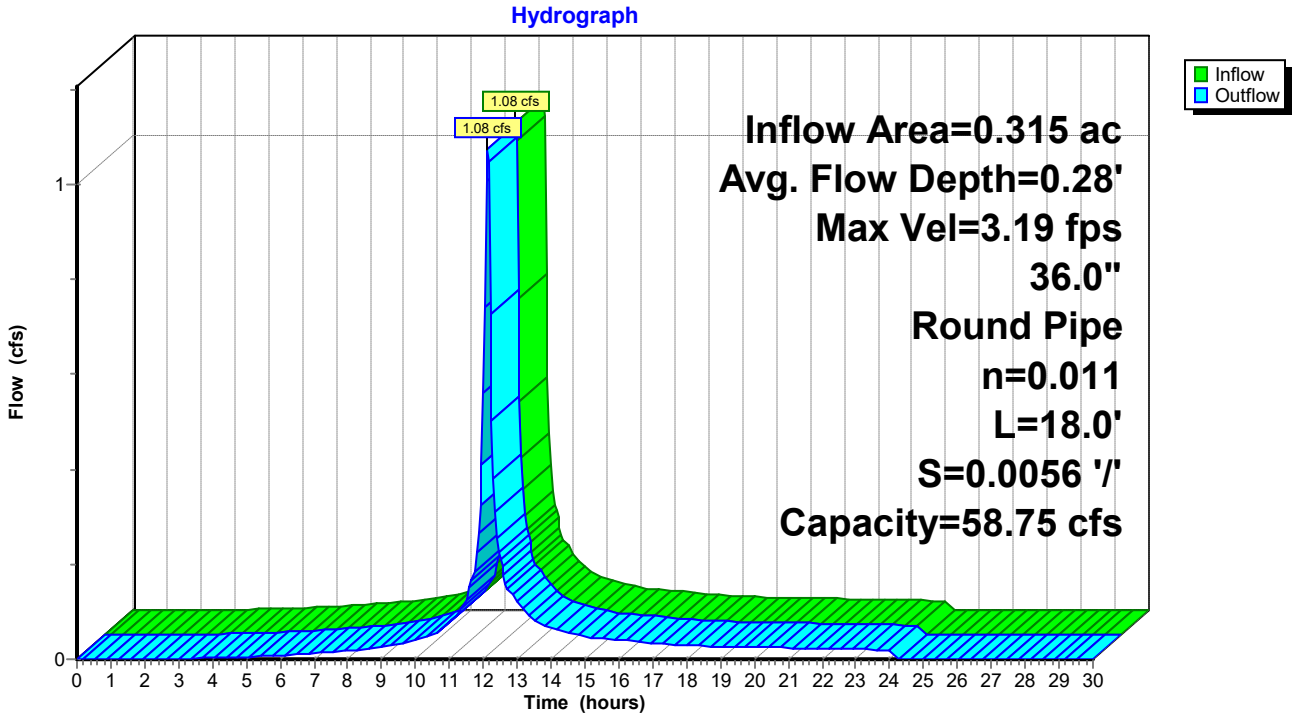
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 0.3 min

Peak Storage= 6 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.75 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 18.0' Slope= 0.0056 '/'
Inlet Invert= 456.57', Outlet Invert= 456.47'



Reach DMH-E: TO DMH-D



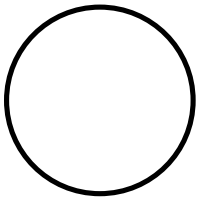
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

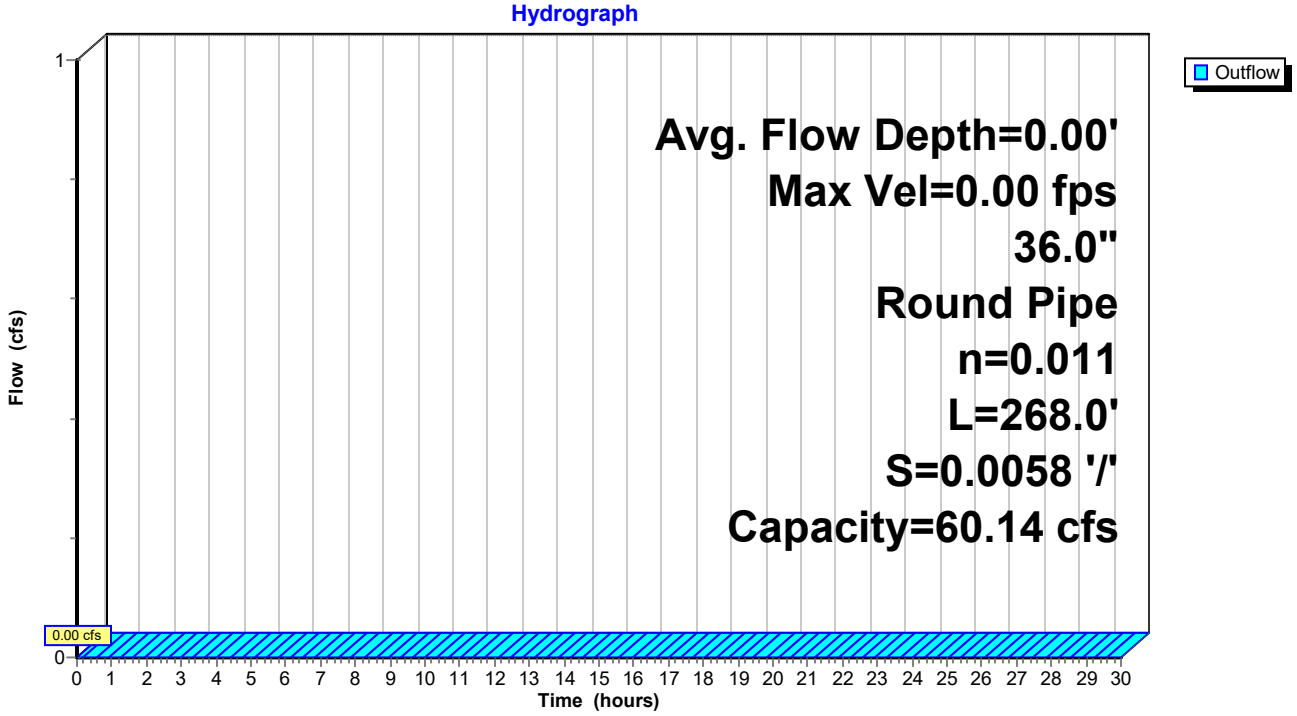
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E



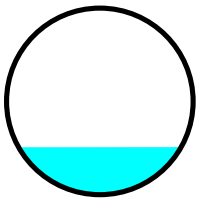
Summary for Reach DMH1: TO DMH#2

Inflow Area = 0.135 ac, 89.85% Impervious, Inflow Depth = 3.82" for 10-Year event
Inflow = 0.51 cfs @ 12.13 hrs, Volume= 0.043 af
Outflow = 0.50 cfs @ 12.13 hrs, Volume= 0.043 af, Atten= 1%, Lag= 0.4 min

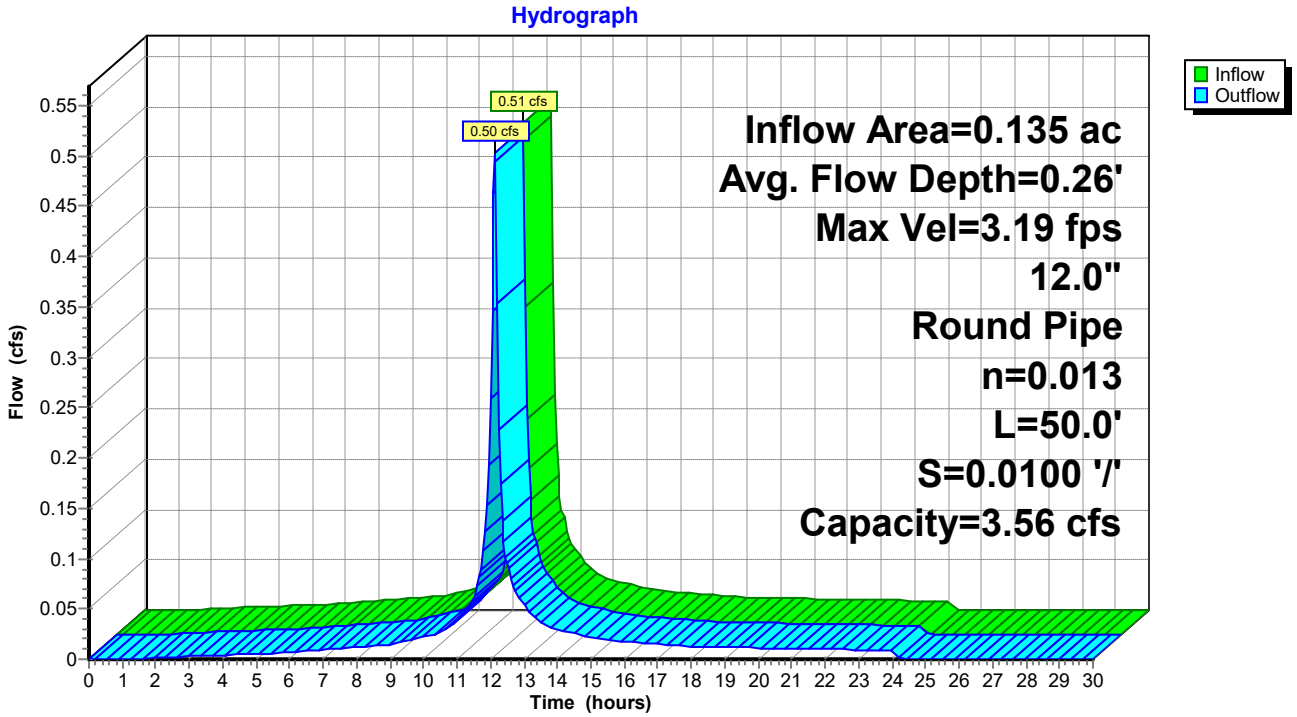
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DMH1: TO DMH#2



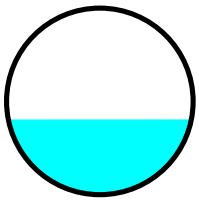
Summary for Reach DMH10: TO CMH#1

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 4.44" for 10-Year event
Inflow = 9.13 cfs @ 12.13 hrs, Volume= 0.827 af
Outflow = 9.11 cfs @ 12.13 hrs, Volume= 0.827 af, Atten= 0%, Lag= 0.1 min

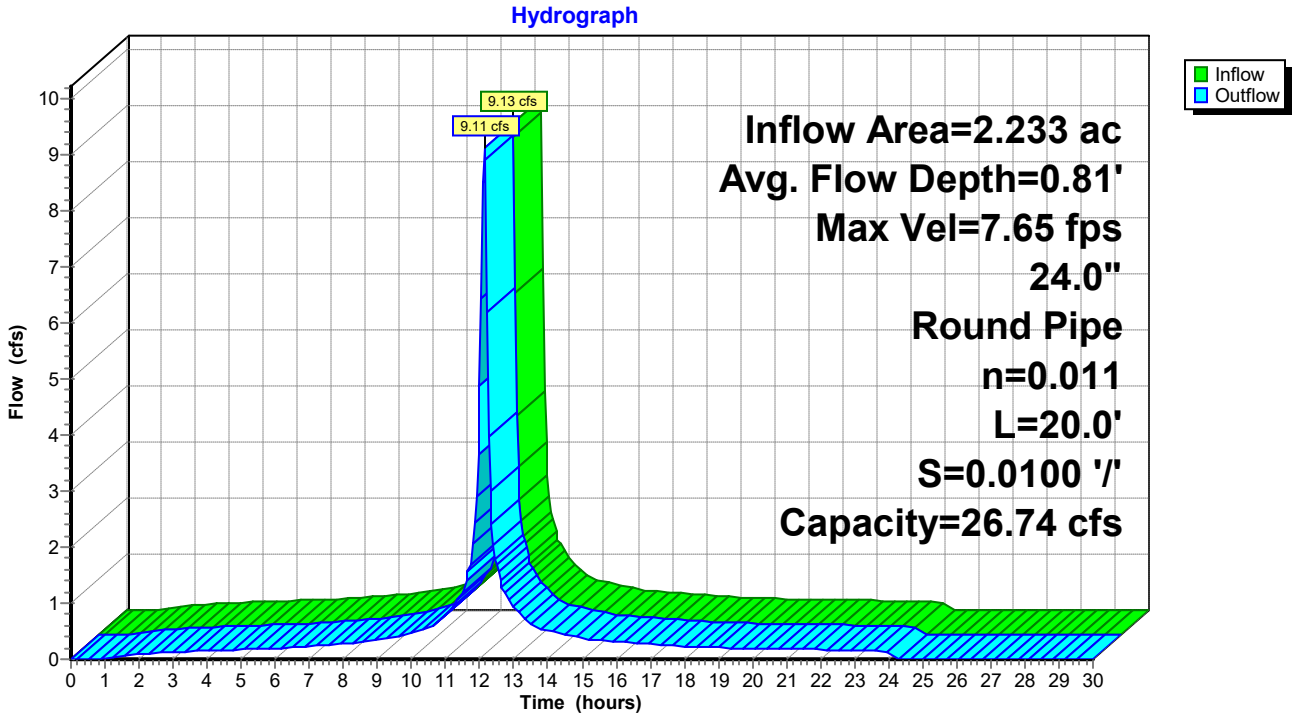
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.76 fps, Avg. Travel Time= 0.1 min

Peak Storage= 24 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 26.74 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0100 '/'
Inlet Invert= 458.10', Outlet Invert= 457.90'



Reach DMH10: TO CMH#1



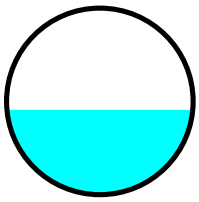
Summary for Reach DMH100: TO DMH-A

Inflow Area = 2.345 ac, 63.28% Impervious, Inflow Depth = 1.74" for 10-Year event
Inflow = 3.97 cfs @ 12.14 hrs, Volume= 0.339 af
Outflow = 3.94 cfs @ 12.14 hrs, Volume= 0.339 af, Atten= 1%, Lag= 0.3 min

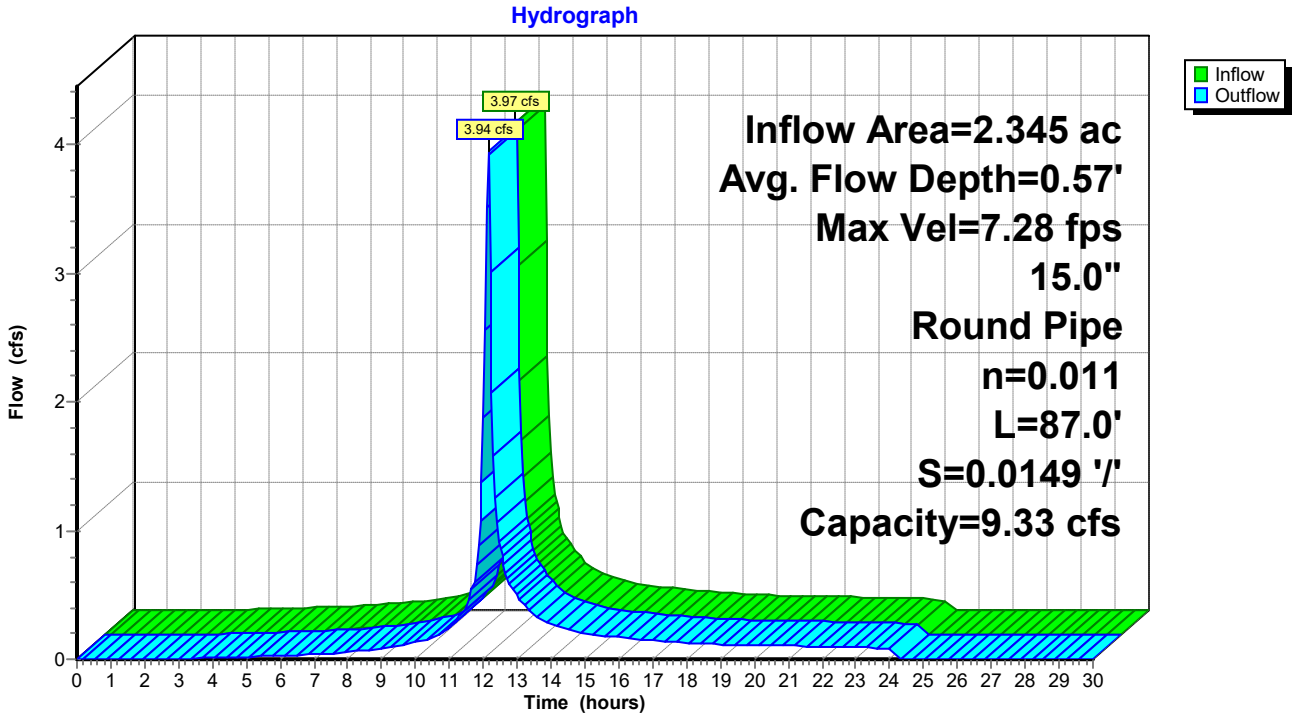
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.28 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.47 fps, Avg. Travel Time= 0.6 min

Peak Storage= 47 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 87.0' Slope= 0.0149 '/'
Inlet Invert= 466.10', Outlet Invert= 464.80'



Reach DMH100: TO DMH-A



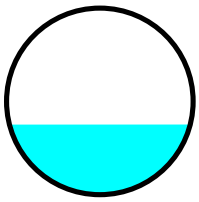
Summary for Reach DMH101: TO DMH#100

Inflow Area = 1.054 ac, 75.70% Impervious, Inflow Depth = 1.25" for 10-Year event
Inflow = 1.40 cfs @ 12.12 hrs, Volume= 0.110 af
Outflow = 1.39 cfs @ 12.13 hrs, Volume= 0.110 af, Atten= 1%, Lag= 0.6 min

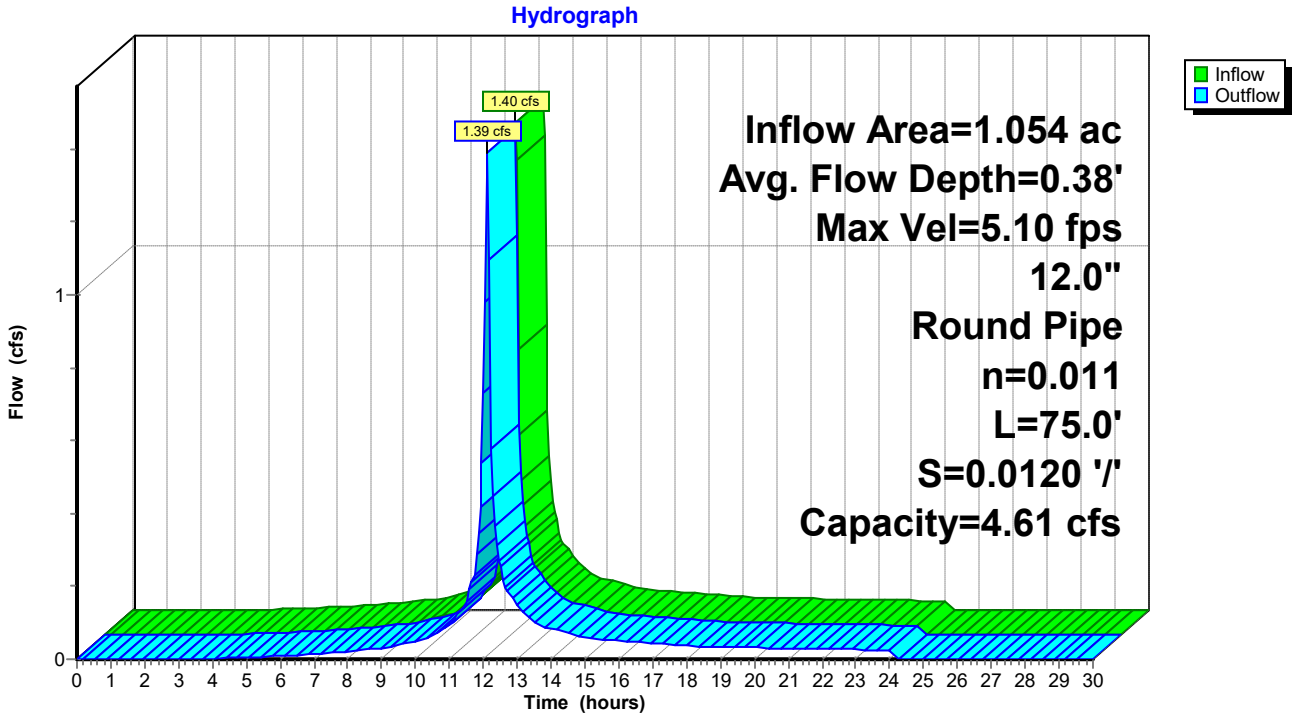
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.7 min

Peak Storage= 20 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 75.0' Slope= 0.0120 '/'
Inlet Invert= 467.10', Outlet Invert= 466.20'



Reach DMH101: TO DMH#100



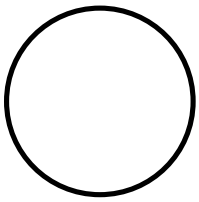
Summary for Reach DMH102: TO DMH#101

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

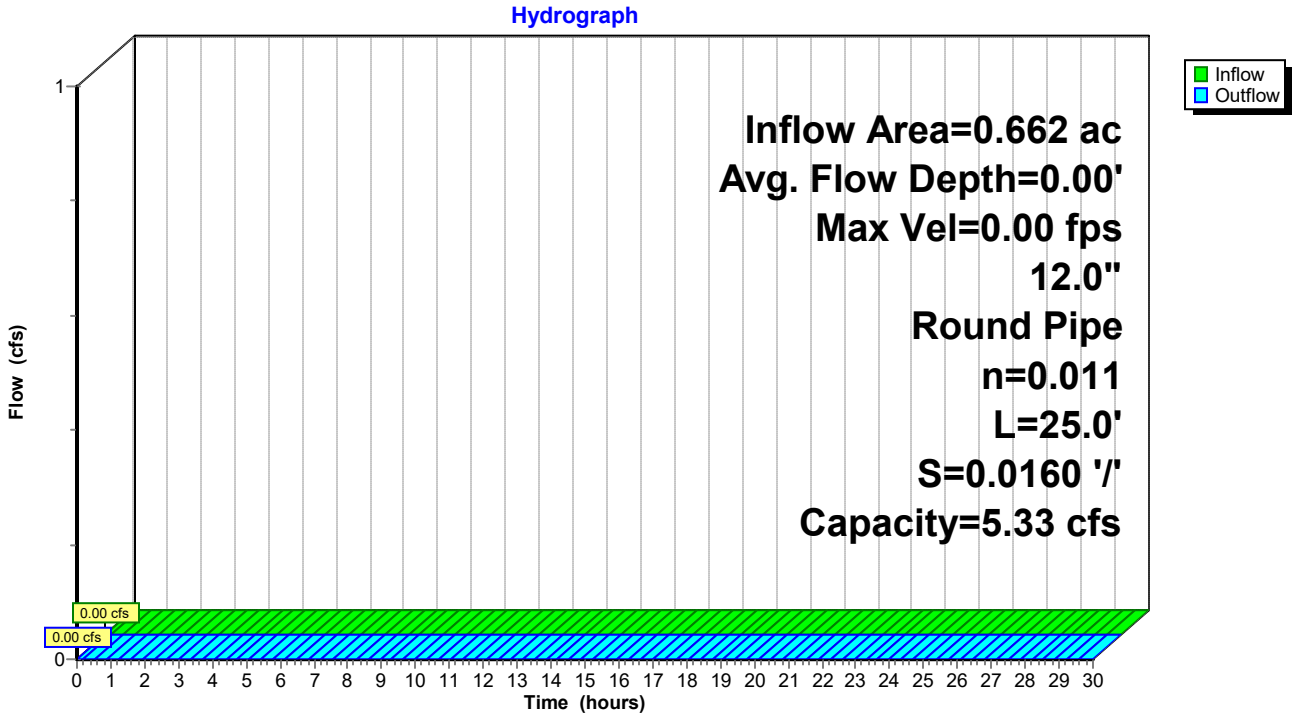
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.33 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0160 '/'
Inlet Invert= 467.60', Outlet Invert= 467.20'



Reach DMH102: TO DMH#101



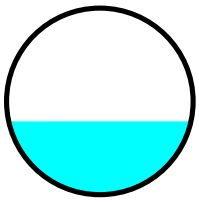
Summary for Reach DMH2: TO DMH#100

Inflow Area = 0.412 ac, 88.63% Impervious, Inflow Depth = 3.71" for 10-Year event
Inflow = 1.53 cfs @ 12.12 hrs, Volume= 0.127 af
Outflow = 1.53 cfs @ 12.13 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.3 min

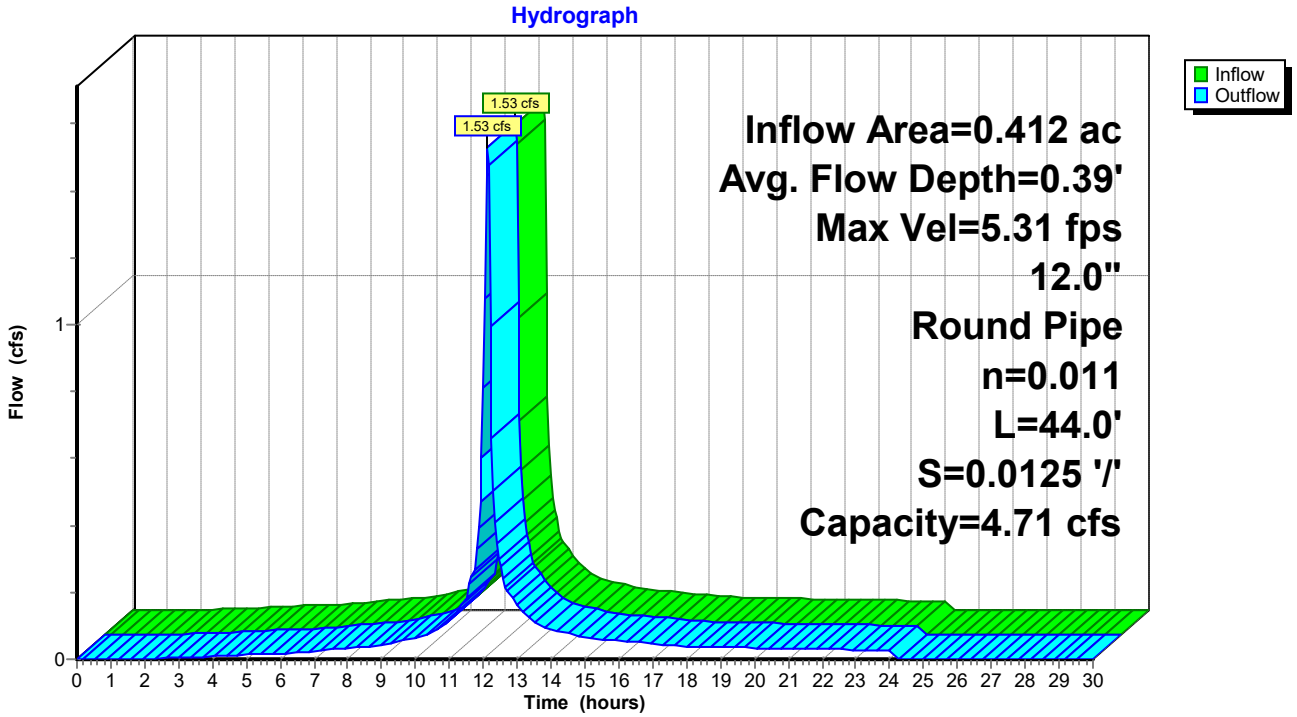
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.31 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 0.4 min

Peak Storage= 13 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.71 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 44.0' Slope= 0.0125 '/'
Inlet Invert= 466.75', Outlet Invert= 466.20'



Reach DMH2: TO DMH#100



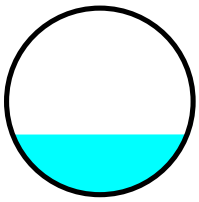
Summary for Reach DMH3: TO UGS#1A

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 2.76" for 10-Year event
Inflow = 1.80 cfs @ 12.14 hrs, Volume= 0.152 af
Outflow = 1.80 cfs @ 12.14 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min

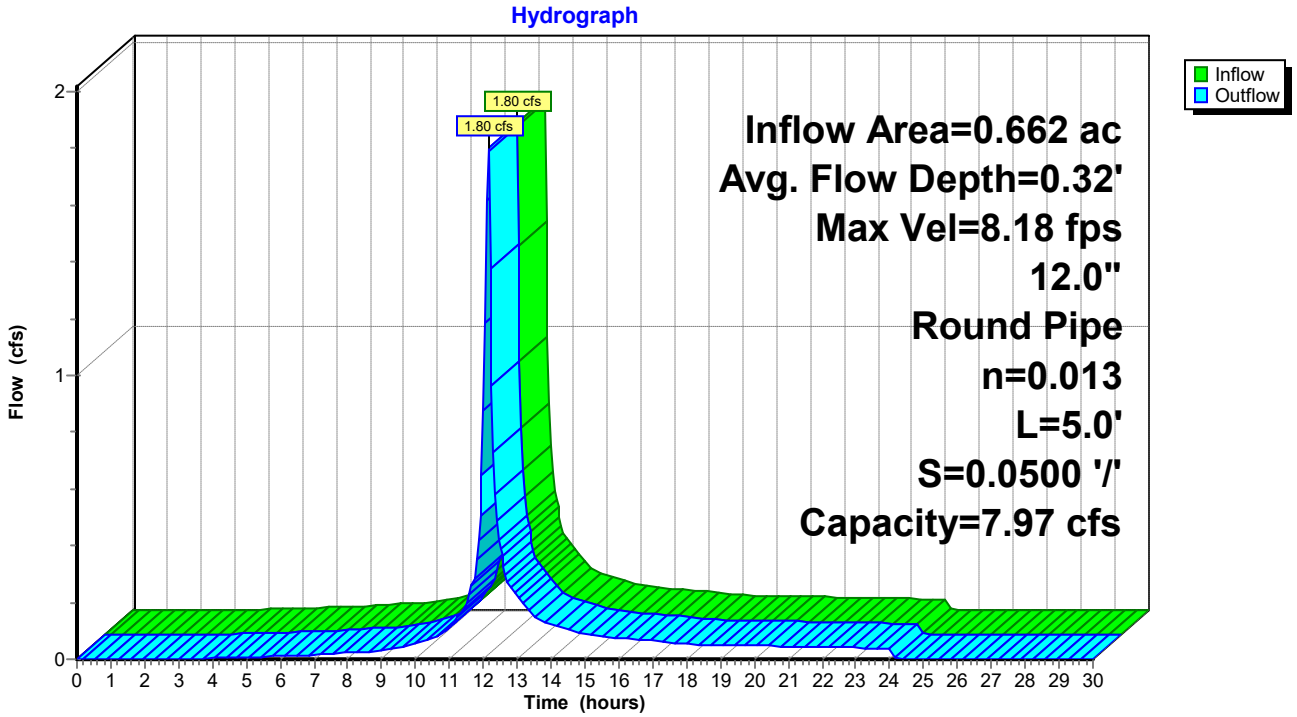
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.18 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.97 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 468.25', Outlet Invert= 468.00'



Reach DMH3: TO UGS#1A



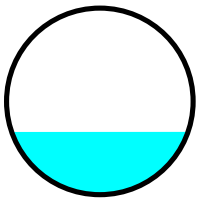
Summary for Reach DMH4: TO DMH#3

Inflow Area = 0.478 ac, 64.87% Impervious, Inflow Depth = 2.41" for 10-Year event
Inflow = 1.13 cfs @ 12.14 hrs, Volume= 0.096 af
Outflow = 1.12 cfs @ 12.15 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.1 min

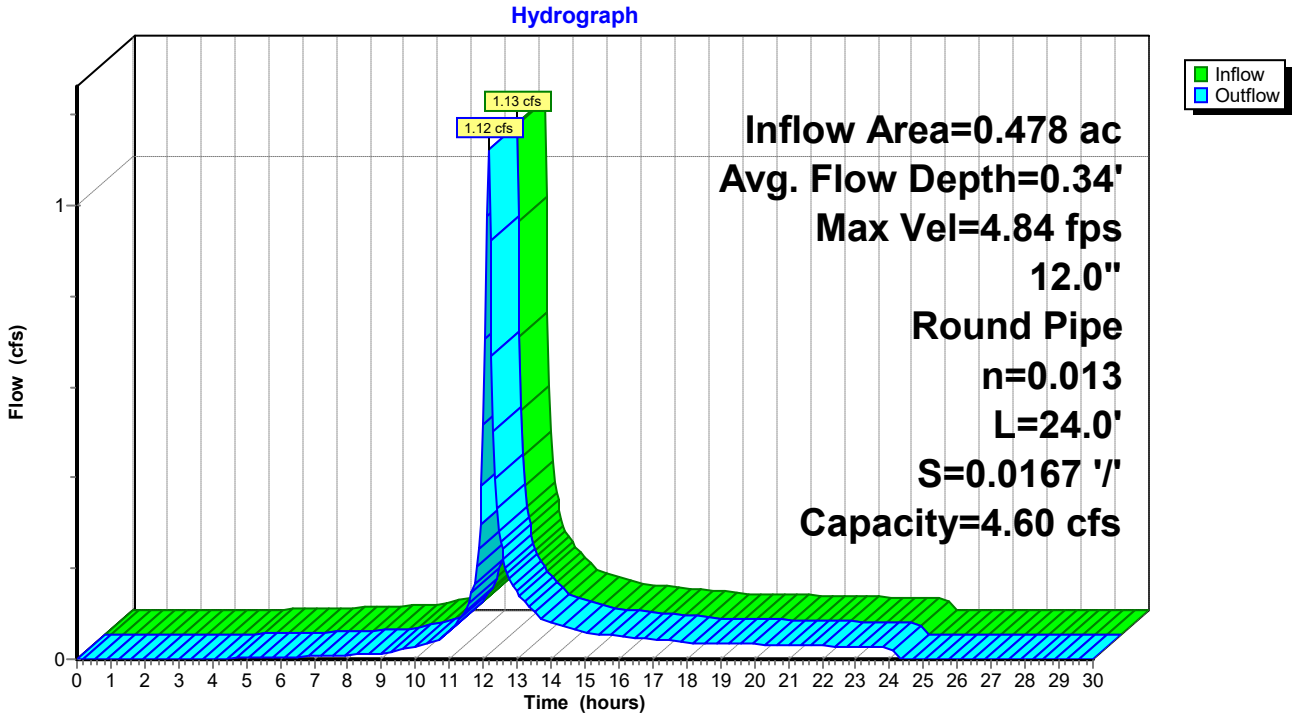
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 0.2 min

Peak Storage= 6 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0167 '/'
Inlet Invert= 468.90', Outlet Invert= 468.50'



Reach DMH4: TO DMH#3



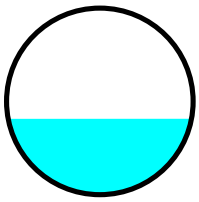
Summary for Reach DMH5: TO DMH#6

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 1.39" for 10-Year event
Inflow = 1.18 cfs @ 12.14 hrs, Volume= 0.102 af
Outflow = 1.15 cfs @ 12.15 hrs, Volume= 0.102 af, Atten= 2%, Lag= 0.6 min

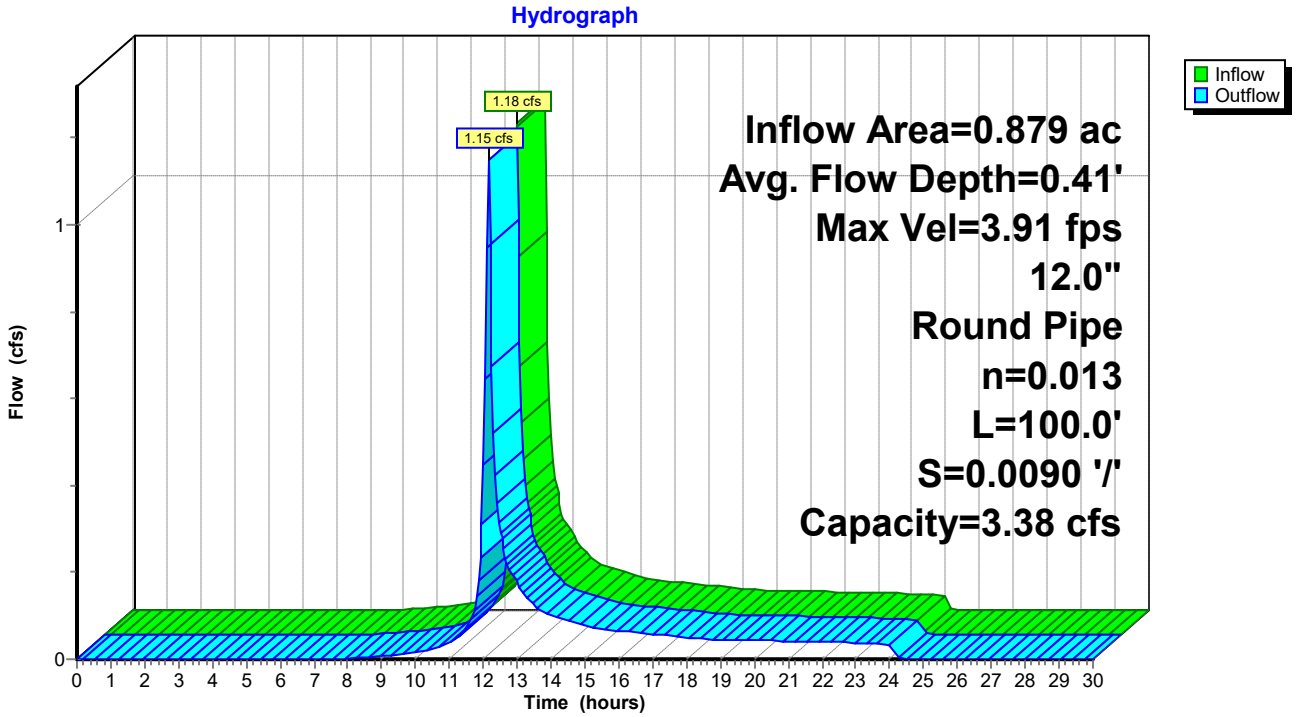
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 1.1 min

Peak Storage= 30 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.38 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 100.0' Slope= 0.0090 '/'
Inlet Invert= 470.30', Outlet Invert= 469.40'



Reach DMH5: TO DMH#6



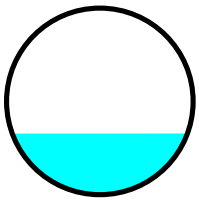
Summary for Reach DMH6: TO DMH#7

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 1.39" for 10-Year event
Inflow = 1.15 cfs @ 12.15 hrs, Volume= 0.102 af
Outflow = 1.14 cfs @ 12.15 hrs, Volume= 0.102 af, Atten= 1%, Lag= 0.2 min

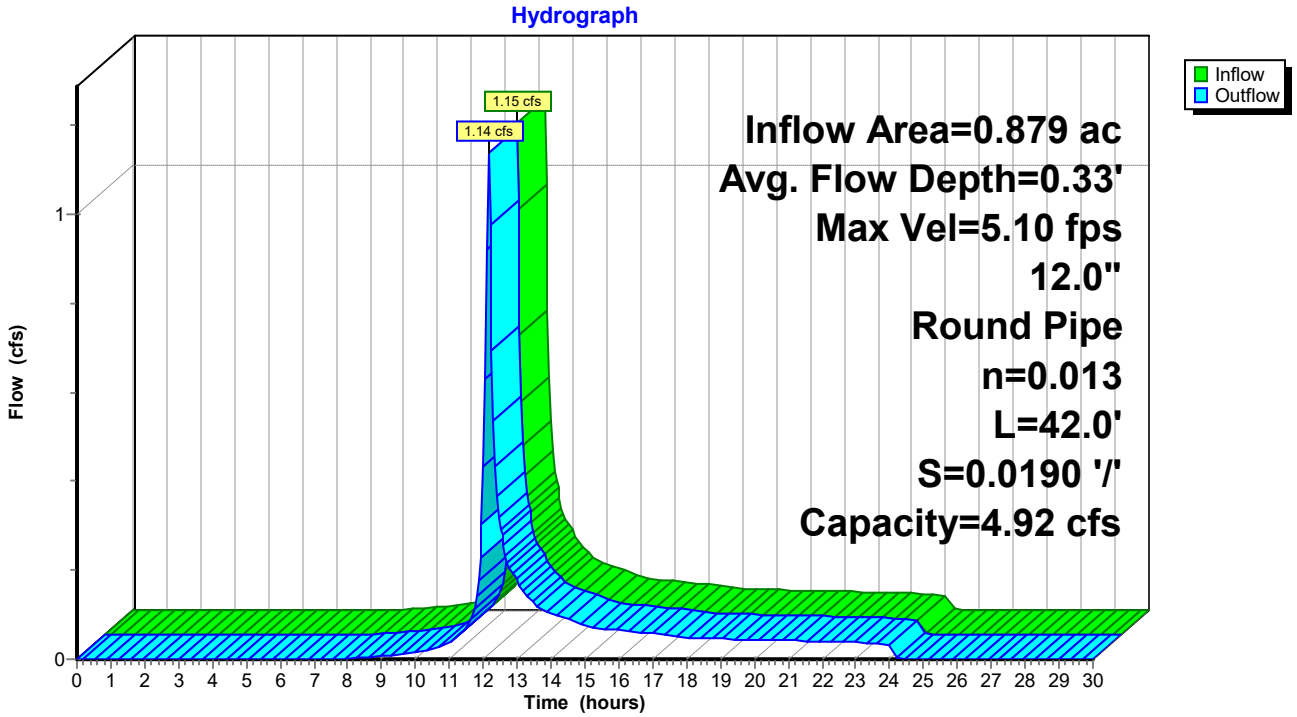
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.92 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 42.0' Slope= 0.0190 '/'
Inlet Invert= 469.30', Outlet Invert= 468.50'



Reach DMH6: TO DMH#7



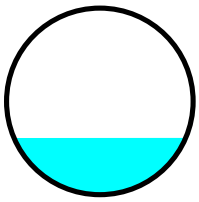
Summary for Reach DMH7: TO DMH#100

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 1.39" for 10-Year event
Inflow = 1.14 cfs @ 12.15 hrs, Volume= 0.102 af
Outflow = 1.11 cfs @ 12.16 hrs, Volume= 0.102 af, Atten= 2%, Lag= 0.5 min

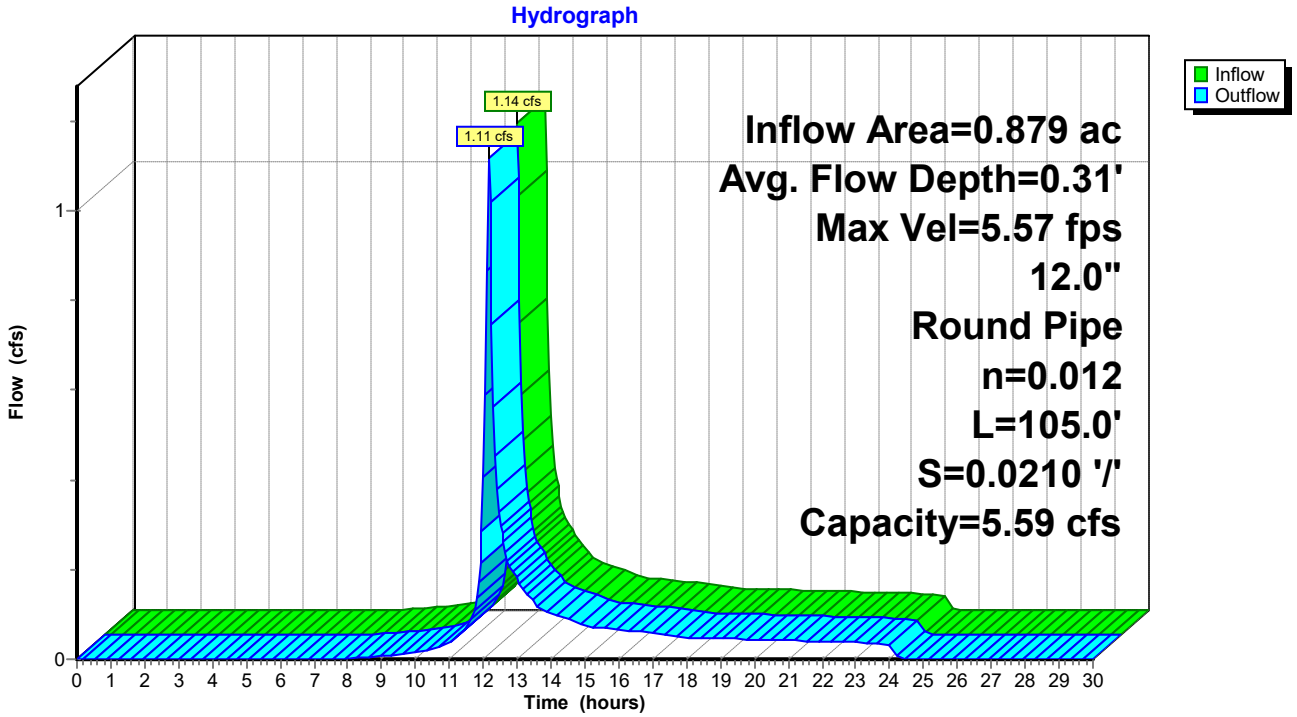
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.57 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.8 min

Peak Storage= 21 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.59 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 105.0' Slope= 0.0210 '/'
Inlet Invert= 468.40', Outlet Invert= 466.20'



Reach DMH7: TO DMH#100



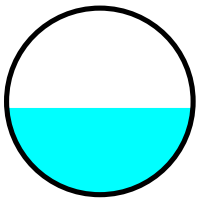
Summary for Reach DMH9: TO DMH#10

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 4.44" for 10-Year event
Inflow = 9.44 cfs @ 12.11 hrs, Volume= 0.827 af
Outflow = 9.13 cfs @ 12.13 hrs, Volume= 0.827 af, Atten= 3%, Lag= 1.1 min

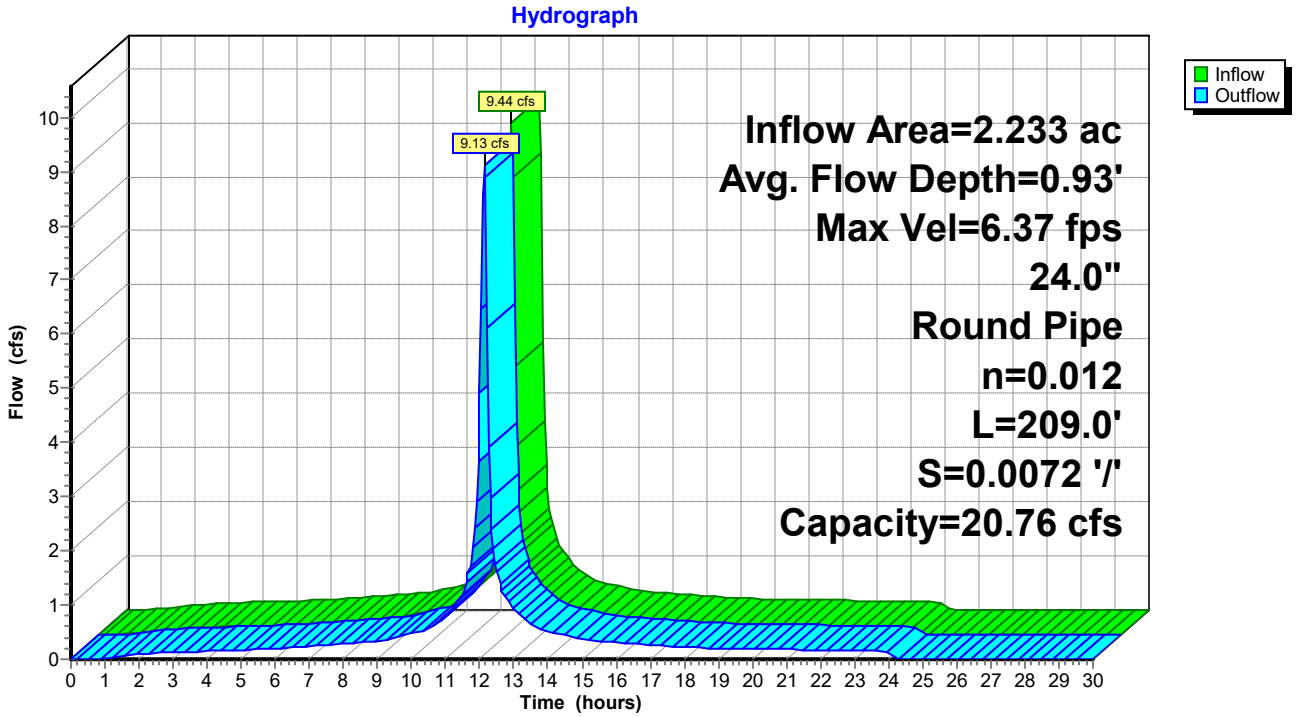
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.37 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 1.5 min

Peak Storage= 300 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 20.76 cfs

24.0" Round Pipe
n= 0.012 Steel, smooth
Length= 209.0' Slope= 0.0072 '/'
Inlet Invert= 459.70', Outlet Invert= 458.20'



Reach DMH9: TO DMH#10

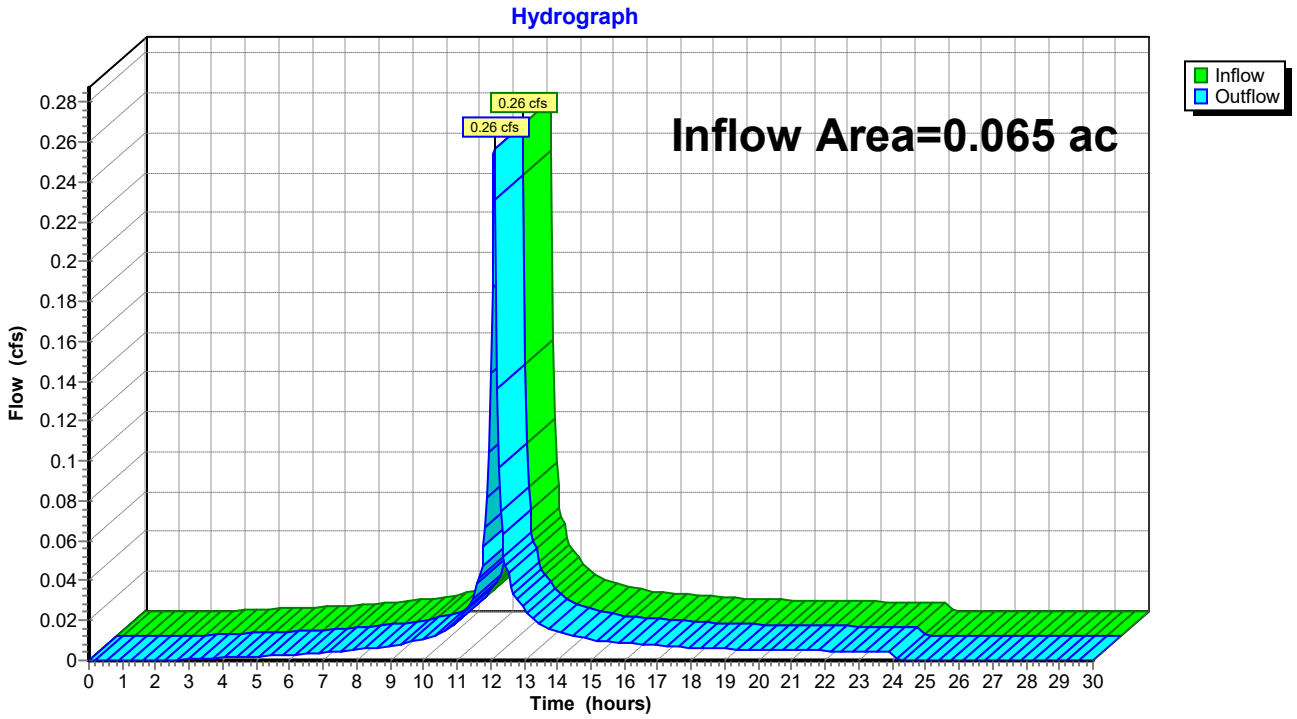


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af
Outflow = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

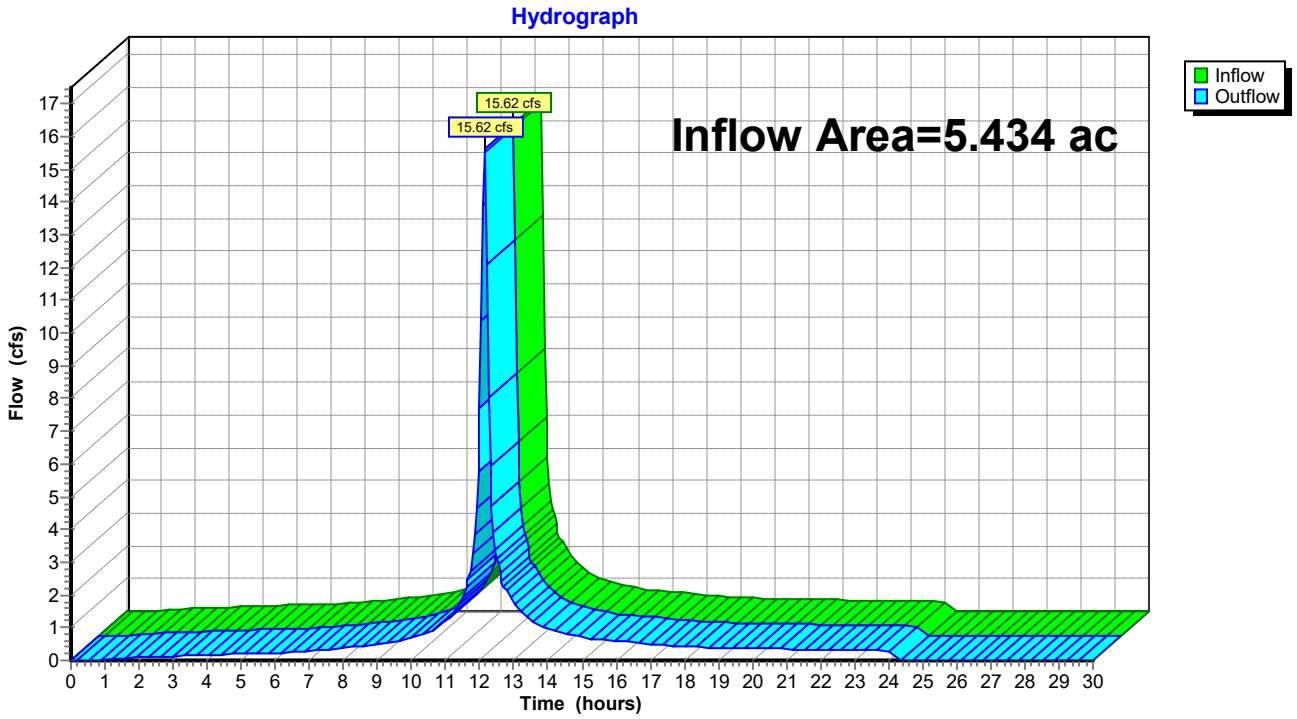


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 3.08" for 10-Year event
Inflow = 15.62 cfs @ 12.14 hrs, Volume= 1.396 af
Outflow = 15.62 cfs @ 12.14 hrs, Volume= 1.396 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

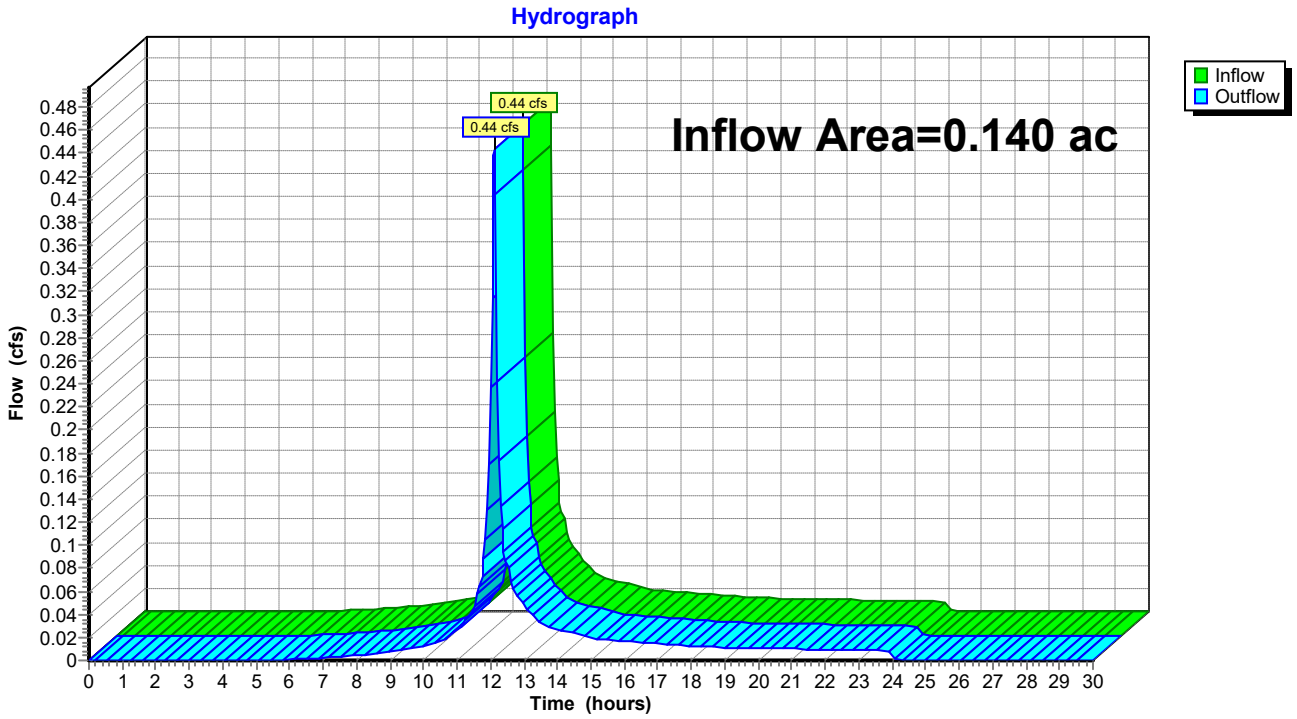


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.140 ac, 75.40% Impervious, Inflow Depth = 2.89" for 10-Year event
Inflow = 0.44 cfs @ 12.11 hrs, Volume= 0.034 af
Outflow = 0.44 cfs @ 12.11 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

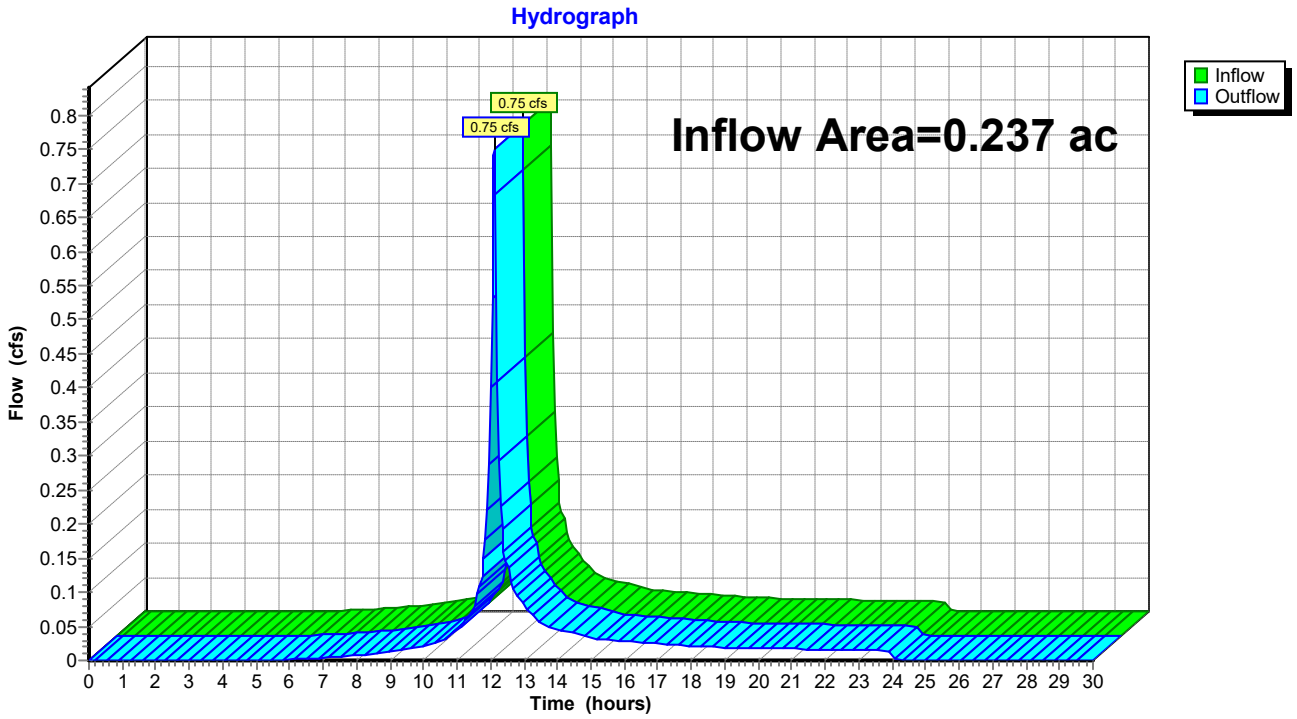


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.237 ac, 74.63% Impervious, Inflow Depth = 2.89" for 10-Year event
Inflow = 0.75 cfs @ 12.11 hrs, Volume= 0.057 af
Outflow = 0.75 cfs @ 12.11 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

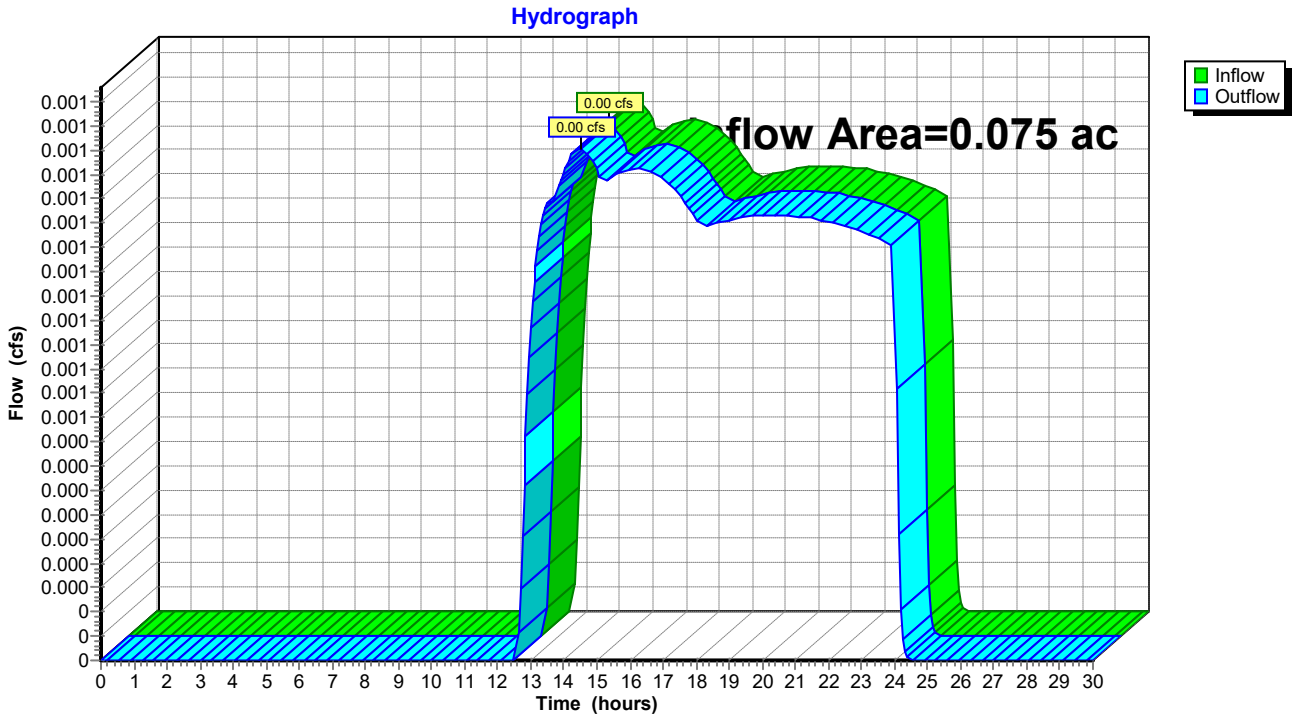


Summary for Reach DP5: DCB-H

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event
Inflow = 0.00 cfs @ 14.53 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 14.53 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H



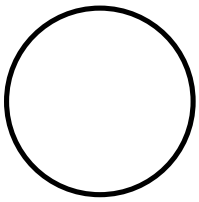
Summary for Reach UGS1B: TO DMH#102

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

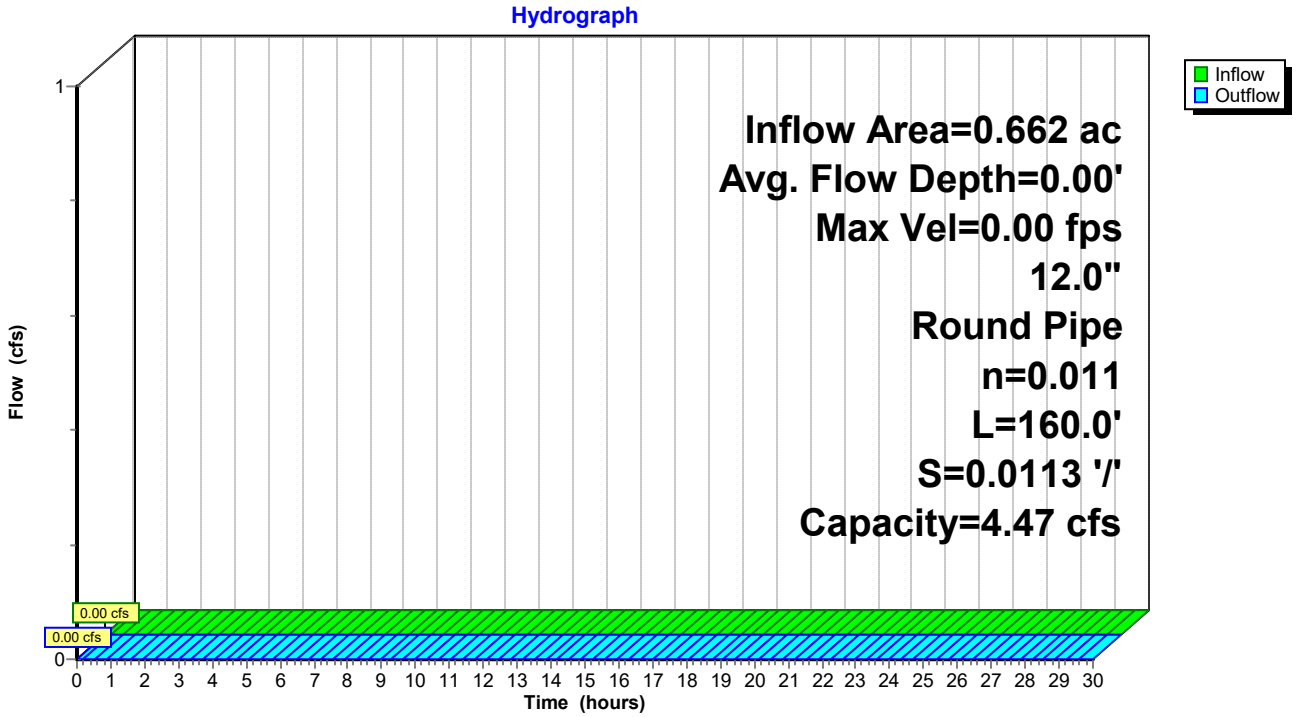
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.47 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 160.0' Slope= 0.0113 '/'
Inlet Invert= 469.50', Outlet Invert= 467.70'



Reach UGS1B: TO DMH#102



Summary for Pond DMH-B: TO DMH-D

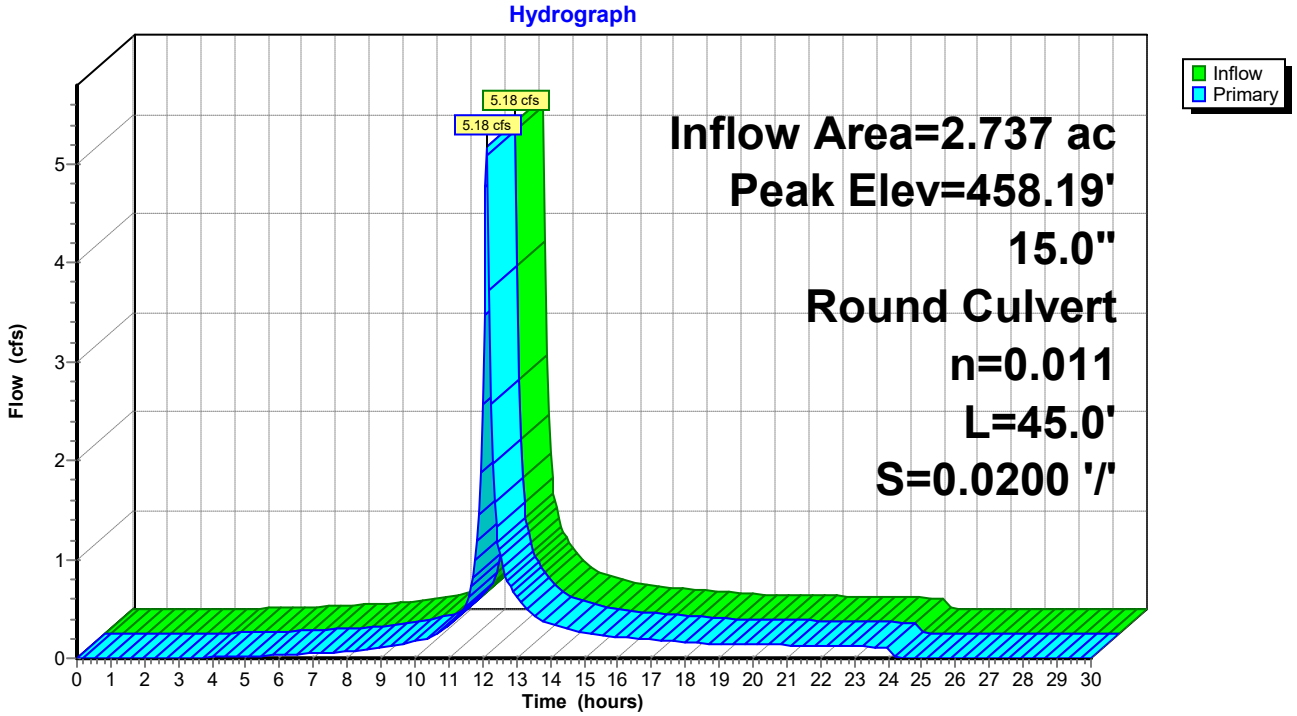
Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 1.92" for 10-Year event
Inflow = 5.18 cfs @ 12.13 hrs, Volume= 0.438 af
Outflow = 5.18 cfs @ 12.13 hrs, Volume= 0.438 af, Atten= 0%, Lag= 0.0 min
Primary = 5.18 cfs @ 12.13 hrs, Volume= 0.438 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 458.19' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=5.00 cfs @ 12.13 hrs HW=458.14' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.00 cfs @ 4.07 fps)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO UGS#1B

Inflow Area =	0.662 ac, 71.10% Impervious, Inflow Depth = 2.76" for 10-Year event				
Inflow =	1.80 cfs @	12.14 hrs,	Volume=	0.152 af	
Outflow =	0.16 cfs @	13.40 hrs,	Volume=	0.152 af,	Atten= 91%, Lag= 75.6 min
Discarded =	0.16 cfs @	13.40 hrs,	Volume=	0.152 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 468.09' @ 13.40 hrs Surf.Area= 0.056 ac Storage= 0.051 af

Plug-Flow detention time= 111.5 min calculated for 0.152 af (100% of inflow)
Center-of-Mass det. time= 111.4 min (943.1 - 831.7)

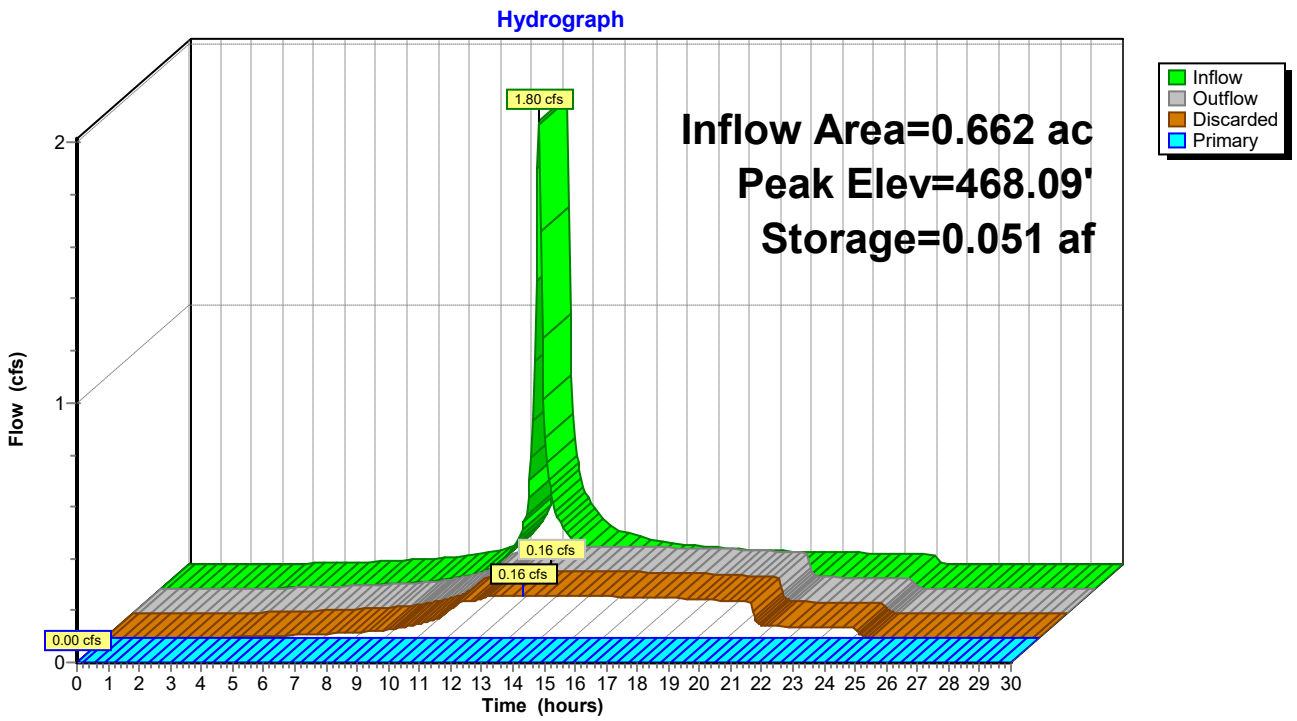
Volume	Invert	Avail.Storage	Storage Description
#1	466.70'	0.083 af	**36.00'W x 68.00'L x 6.00'H Prismatoid** 0.337 af Overall - 0.129 af Embedded = 0.208 af x 40.0% Voids
#2	467.40'	0.129 af	**ADS_StormTech MC-3500 c +Cap** x 49 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 49 Chambers in 7 Rows Cap Storage= +15.6 cf x 2 x 7 rows = 218.4 cf
		0.212 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	466.70'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'
#2	Primary	469.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.16 cfs @ 13.40 hrs HW=468.09' (Free Discharge)
└─**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=466.70' (Free Discharge)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond UGS1: TO UGS#1B



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P100B: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=5.64"
Tc=5.0 min CN=98 Runoff=5.94 cfs 0.525 af

Subcatchment P100C: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=5.64"
Tc=5.0 min CN=98 Runoff=5.94 cfs 0.525 af

Subcatchment P101: TO DCB#1 Runoff Area=5,154 sf 82.42% Impervious Runoff Depth=4.51"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=88 Runoff=0.56 cfs 0.044 af

Subcatchment P102: TO DCB#2 Runoff Area=3,847 sf 96.05% Impervious Runoff Depth=5.41"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=96 Runoff=0.46 cfs 0.040 af

Subcatchment P103: TO DCB#3 Runoff Area=6,905 sf 92.22% Impervious Runoff Depth=5.06"
Flow Length=70' Slope=0.0150 '/' Tc=5.0 min CN=93 Runoff=0.81 cfs 0.067 af

Subcatchment P104: TO DCB#4 Runoff Area=2,032 sf 78.10% Impervious Runoff Depth=4.19"
Flow Length=65' Slope=0.0300 '/' Tc=5.0 min CN=85 Runoff=0.21 cfs 0.016 af

Subcatchment P105: TO DCB#5 Runoff Area=17,091 sf 83.45% Impervious Runoff Depth=4.51"
Flow Length=242' Tc=5.0 min CN=88 Runoff=1.87 cfs 0.147 af

Subcatchment P106: TO COURTYARD Runoff Area=23,395 sf 27.09% Impervious Runoff Depth=1.45"
Flow Length=88' Slope=0.0200 '/' Tc=8.0 min CN=55 Runoff=0.71 cfs 0.065 af

Subcatchment P107: TO DCB#8 Runoff Area=14,595 sf 56.05% Impervious Runoff Depth=2.90"
Flow Length=132' Tc=7.8 min CN=72 Runoff=0.99 cfs 0.081 af

Subcatchment P108: TO DCB#6 Runoff Area=7,999 sf 87.34% Impervious Runoff Depth=4.84"
Flow Length=125' Slope=0.0125 '/' Tc=5.0 min CN=91 Runoff=0.92 cfs 0.074 af

Subcatchment P109: TO DCB#7 Runoff Area=6,226 sf 85.54% Impervious Runoff Depth=4.62"
Flow Length=99' Tc=5.0 min CN=89 Runoff=0.69 cfs 0.055 af

Subcatchment P11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=4.95"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.33 cfs 0.027 af

Subcatchment P12: TO DCB-A Runoff Area=6,513 sf 85.11% Impervious Runoff Depth=4.62"
Flow Length=147' Tc=5.0 min CN=89 Runoff=0.72 cfs 0.058 af

Subcatchment P14: TO DCB-B Runoff Area=5,805 sf 89.51% Impervious Runoff Depth=4.95"
Flow Length=169' Tc=5.0 min CN=92 Runoff=0.67 cfs 0.055 af

Subcatchment P15: TO DCB-C Runoff Area=7,907 sf 68.45% Impervious Runoff Depth=4.19"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=85 Runoff=0.77 cfs 0.063 af

Subcatchment P16: TO LOW POINT Runoff Area=14,911 sf 51.34% Impervious Runoff Depth=3.28"
Flow Length=223' Slope=0.0100 '/' Tc=5.0 min CN=76 Runoff=1.24 cfs 0.093 af

Subcatchment P18: TO DCB-D Runoff Area=10,359 sf 73.15% Impervious Runoff Depth=3.88"
Flow Length=222' Tc=5.0 min CN=82 Runoff=1.00 cfs 0.077 af

Subcatchment P19: TO DCB-E Runoff Area=6,699 sf 83.83% Impervious Runoff Depth=4.51"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=88 Runoff=0.73 cfs 0.058 af

Subcatchment P20: TO DP#3 Runoff Area=6,101 sf 75.40% Impervious Runoff Depth=3.98"
Flow Length=101' Tc=5.0 min CN=83 Runoff=0.60 cfs 0.046 af

Subcatchment P24: TO DP#4 Runoff Area=10,319 sf 74.63% Impervious Runoff Depth=3.98"
Flow Length=133' Tc=5.0 min CN=83 Runoff=1.02 cfs 0.079 af

Subcatchment P26: TO DCB-H Runoff Area=3,256 sf 0.00% Impervious Runoff Depth=0.41"
Flow Length=135' Slope=0.0200 '/' Tc=8.3 min CN=39 Runoff=0.01 cfs 0.003 af

Reach CMH1: TO DMH-D Avg. Flow Depth=0.96' Max Vel=6.58 fps Inflow=12.91 cfs 1.168 af
36.0" Round Pipe n=0.011 L=105.0' S=0.0054 '/' Capacity=58.08 cfs Outflow=12.77 cfs 1.168 af

Reach DCB-A: TO DMH-D Inflow=0.72 cfs 0.058 af
Outflow=0.72 cfs 0.058 af

Reach DCB-B: TO DMH-E Inflow=0.67 cfs 0.055 af
Outflow=0.67 cfs 0.055 af

Reach DCB-C: TO TRUNKLINE Inflow=0.77 cfs 0.063 af
Outflow=0.77 cfs 0.063 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.22' Max Vel=7.77 fps Inflow=1.00 cfs 0.077 af
12.0" Round Pipe n=0.011 L=15.0' S=0.0500 '/' Capacity=9.42 cfs Outflow=1.00 cfs 0.077 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.16' Max Vel=8.67 fps Inflow=0.73 cfs 0.058 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=0.73 cfs 0.058 af

Reach DCB1: TO DMH#2 Avg. Flow Depth=0.21' Max Vel=4.62 fps Inflow=0.56 cfs 0.044 af
12.0" Round Pipe n=0.013 L=80.0' S=0.0263 '/' Capacity=5.77 cfs Outflow=0.55 cfs 0.044 af

Reach DCB2: TO DMH#2 Avg. Flow Depth=0.20' Max Vel=4.05 fps Inflow=0.46 cfs 0.040 af
12.0" Round Pipe n=0.013 L=71.0' S=0.0211 '/' Capacity=5.18 cfs Outflow=0.45 cfs 0.040 af

Reach DCB3: TO DMH#2 Avg. Flow Depth=0.27' Max Vel=4.69 fps Inflow=0.81 cfs 0.067 af
12.0" Round Pipe n=0.013 L=10.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=0.81 cfs 0.067 af

Reach DCB4: TO DMH#1 Avg. Flow Depth=0.16' Max Vel=2.45 fps Inflow=0.21 cfs 0.016 af
12.0" Round Pipe n=0.013 L=90.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.20 cfs 0.016 af

Reach DCB5: TO DMH#101 Avg. Flow Depth=0.44' Max Vel=5.54 fps Inflow=1.87 cfs 0.147 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=1.85 cfs 0.147 af

Reach DCB6: TO DMH#3 Avg. Flow Depth=0.34' Max Vel=3.78 fps Inflow=0.92 cfs 0.074 af
12.0" Round Pipe n=0.013 L=98.0' S=0.0102 '/' Capacity=3.60 cfs Outflow=0.89 cfs 0.074 af

Reach DCB7: TO DMH#4 Avg. Flow Depth=0.36' Max Vel=3.81 fps Inflow=0.99 cfs 0.081 af
12.0" Round Pipe n=0.013 L=105.0' S=0.0095 '/' Capacity=3.48 cfs Outflow=0.96 cfs 0.081 af

Reach DCB8: TO DMH#4 Avg. Flow Depth=0.27' Max Vel=4.07 fps Inflow=0.69 cfs 0.055 af
12.0" Round Pipe n=0.013 L=58.0' S=0.0155 '/' Capacity=4.44 cfs Outflow=0.67 cfs 0.055 af

Reach DCB9: TO DMH#5 Avg. Flow Depth=0.47' Max Vel=3.81 fps Inflow=1.24 cfs 0.093 af
10.0" Round Pipe n=0.012 L=71.0' S=0.0070 '/' Capacity=1.99 cfs Outflow=1.22 cfs 0.093 af

Reach DMH-A: TO DMH-B Inflow=7.17 cfs 0.608 af
Outflow=7.17 cfs 0.608 af

Reach DMH-C: TO DP#1 Inflow=20.46 cfs 1.834 af
Outflow=20.46 cfs 1.834 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.15' Max Vel=8.22 fps Inflow=20.64 cfs 1.834 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=20.46 cfs 1.834 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.32' Max Vel=3.46 fps Inflow=1.42 cfs 0.118 af
36.0" Round Pipe n=0.011 L=18.0' S=0.0056 '/' Capacity=58.75 cfs Outflow=1.42 cfs 0.118 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DMH1: TO DMH#2 Avg. Flow Depth=0.29' Max Vel=3.43 fps Inflow=0.66 cfs 0.056 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.65 cfs 0.056 af

Reach DMH10: TO CMH#1 Avg. Flow Depth=0.92' Max Vel=8.13 fps Inflow=11.51 cfs 1.050 af
24.0" Round Pipe n=0.011 L=20.0' S=0.0100 '/' Capacity=26.74 cfs Outflow=11.49 cfs 1.050 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.69' Max Vel=7.92 fps Inflow=5.55 cfs 0.473 af
15.0" Round Pipe n=0.011 L=87.0' S=0.0149 '/' Capacity=9.33 cfs Outflow=5.51 cfs 0.473 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.44' Max Vel=5.50 fps Inflow=1.85 cfs 0.147 af
12.0" Round Pipe n=0.011 L=75.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=1.81 cfs 0.147 af

Reach DMH102: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0160 '/' Capacity=5.33 cfs Outflow=0.00 cfs 0.000 af

Reach DMH2: TO DMH#100 Avg. Flow Depth=0.46' Max Vel=5.69 fps Inflow=1.98 cfs 0.167 af
12.0" Round Pipe n=0.011 L=44.0' S=0.0125 '/' Capacity=4.71 cfs Outflow=1.99 cfs 0.167 af

Reach DMH3: TO UGS#1A Avg. Flow Depth=0.38' Max Vel=8.93 fps Inflow=2.47 cfs 0.210 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=2.47 cfs 0.210 af

Reach DMH4: TO DMH#3 Avg. Flow Depth=0.41' Max Vel=5.33 fps Inflow=1.60 cfs 0.136 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0167 '/' Capacity=4.60 cfs Outflow=1.59 cfs 0.136 af

Reach DMH5: TO DMH#6 Avg. Flow Depth=0.54' Max Vel=4.43 fps Inflow=1.90 cfs 0.158 af
12.0" Round Pipe n=0.013 L=100.0' S=0.0090 '/' Capacity=3.38 cfs Outflow=1.86 cfs 0.158 af

Reach DMH6: TO DMH#7 Avg. Flow Depth=0.43' Max Vel=5.83 fps Inflow=1.86 cfs 0.158 af
12.0" Round Pipe n=0.013 L=42.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=1.85 cfs 0.158 af

Reach DMH7: TO DMH#100 Avg. Flow Depth=0.40' Max Vel=6.38 fps Inflow=1.85 cfs 0.158 af
12.0" Round Pipe n=0.012 L=105.0' S=0.0210 '/' Capacity=5.59 cfs Outflow=1.81 cfs 0.158 af

Reach DMH9: TO DMH#10 Avg. Flow Depth=1.07' Max Vel=6.75 fps Inflow=11.89 cfs 1.050 af
24.0" Round Pipe n=0.012 L=209.0' S=0.0072 '/' Capacity=20.76 cfs Outflow=11.51 cfs 1.050 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.33 cfs 0.027 af
Outflow=0.33 cfs 0.027 af

Reach DP2: MUNICIPAL SYSTEM Inflow=20.46 cfs 1.834 af
Outflow=20.46 cfs 1.834 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.60 cfs 0.046 af
Outflow=0.60 cfs 0.046 af

Reach DP4: LOW POINT OFF LOCUS Inflow=1.02 cfs 0.079 af
Outflow=1.02 cfs 0.079 af

Reach DP5: DCB-H Inflow=0.01 cfs 0.003 af
Outflow=0.01 cfs 0.003 af

Reach UGS1B: TO DMH#102 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=160.0' S=0.0113 '/' Capacity=4.47 cfs Outflow=0.00 cfs 0.000 af

Pond DMH-B: TO DMH-D Peak Elev=458.89' Inflow=7.17 cfs 0.608 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=7.17 cfs 0.608 af

Pond UGS1: TO UGS#1B Peak Elev=468.68' Storage=0.081 af Inflow=2.47 cfs 0.210 af
Discarded=0.18 cfs 0.210 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.210 af

Total Runoff Area = 5.951 ac Runoff Volume = 2.198 af Average Runoff Depth = 4.43"
20.49% Pervious = 1.219 ac 79.51% Impervious = 4.732 ac

Summary for Subcatchment P100B: TO ROOF DRAIN

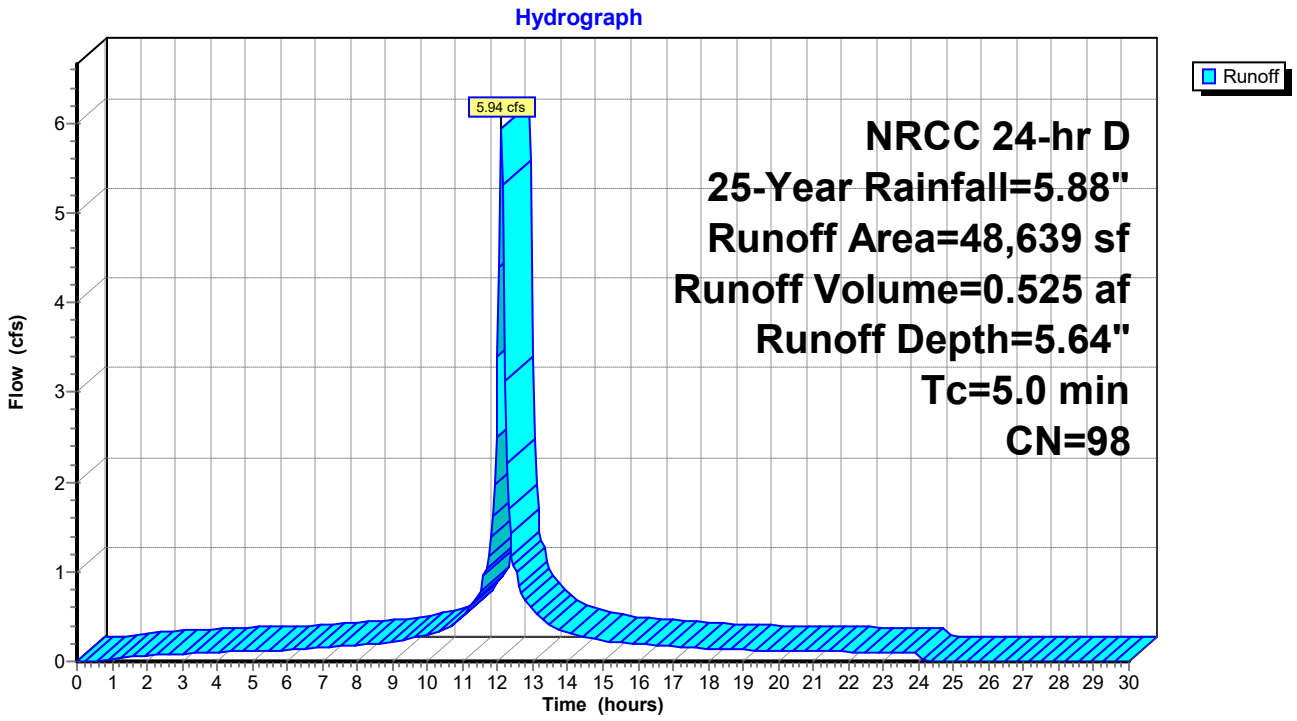
Runoff = 5.94 cfs @ 12.11 hrs, Volume= 0.525 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100B: TO ROOF DRAIN



Summary for Subcatchment P100C: TO ROOF DRAIN

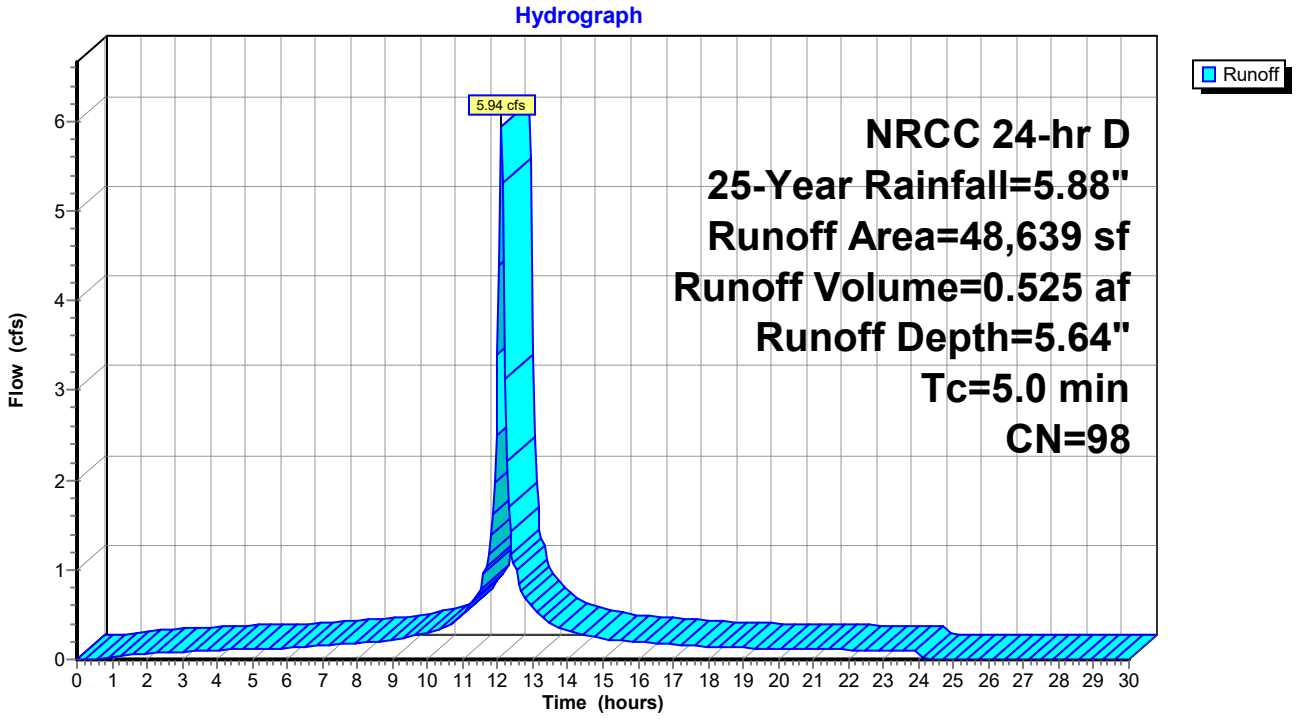
Runoff = 5.94 cfs @ 12.11 hrs, Volume= 0.525 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100C: TO ROOF DRAIN



Summary for Subcatchment P101: TO DCB#1

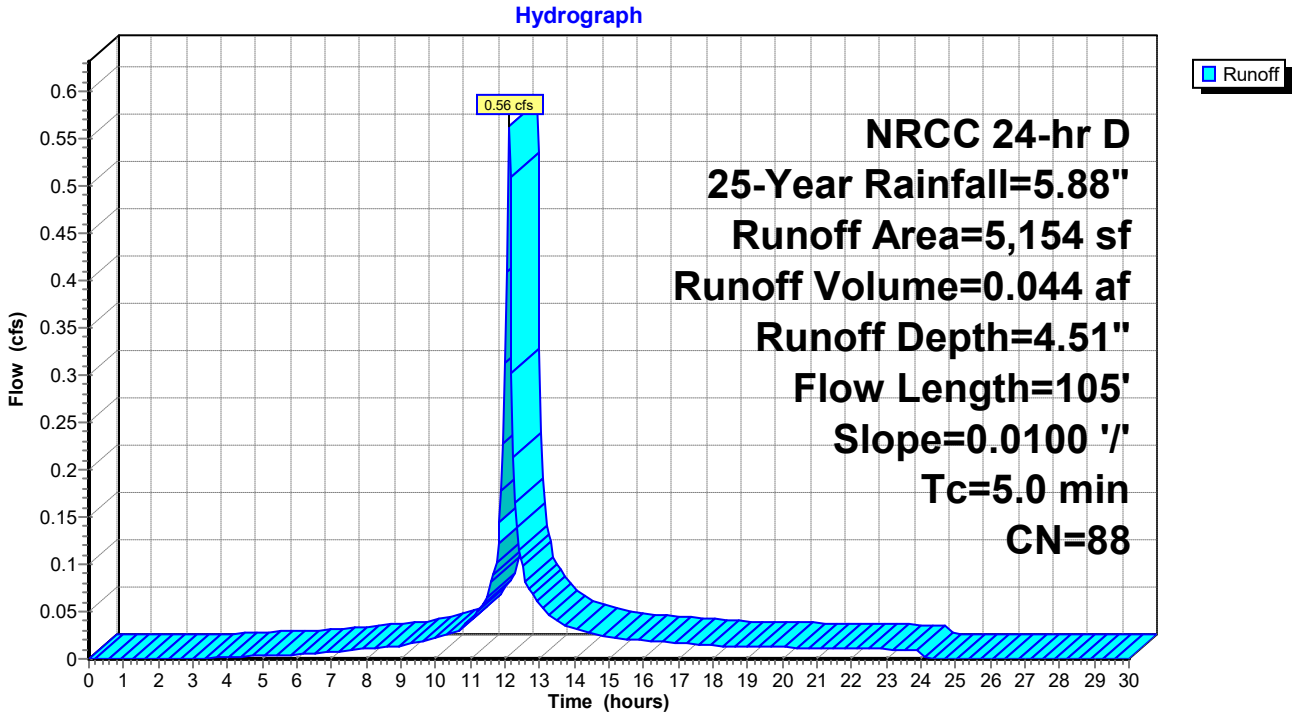
Runoff = 0.56 cfs @ 12.11 hrs, Volume= 0.044 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
906	39	>75% Grass cover, Good, HSG A
4,248	98	Paved parking, HSG A
5,154	88	Weighted Average
906		17.58% Pervious Area
4,248		82.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	55	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	105	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P101: TO DCB#1



Summary for Subcatchment P102: TO DCB#2

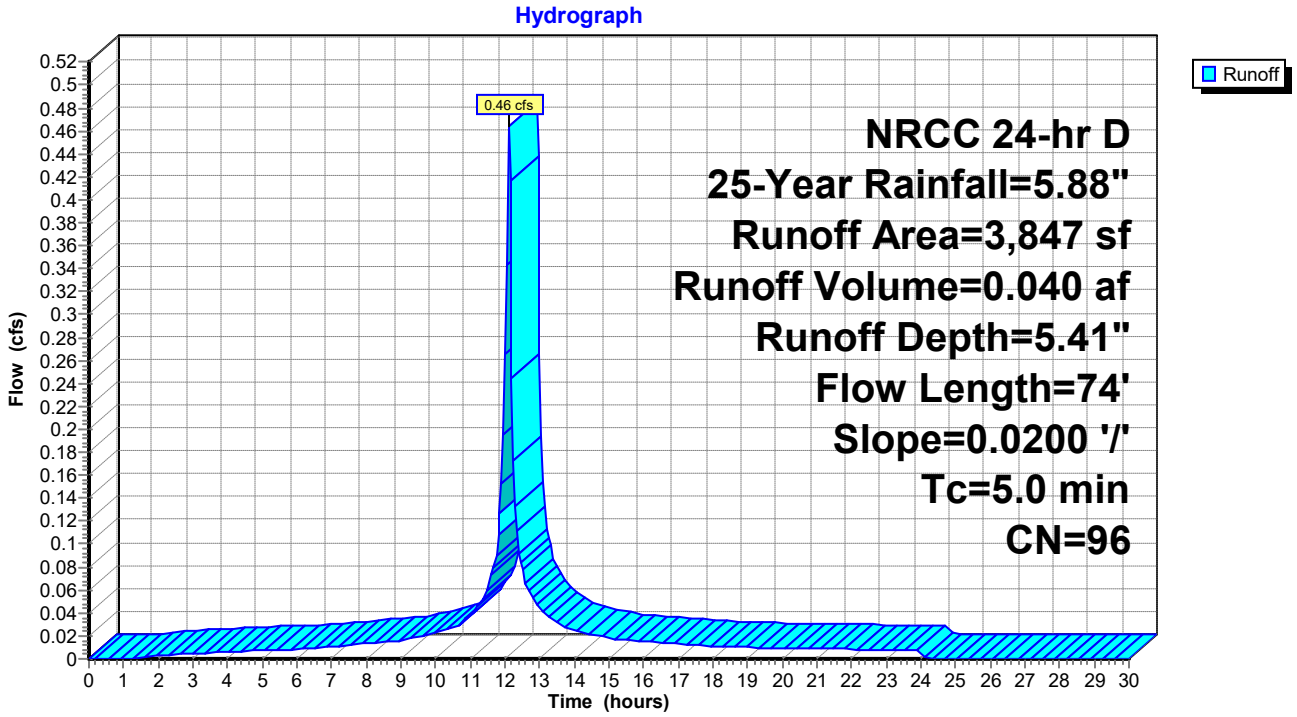
Runoff = 0.46 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
152	39	>75% Grass cover, Good, HSG A
3,695	98	Paved parking, HSG A
3,847	96	Weighted Average
152		3.95% Pervious Area
3,695		96.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	74	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P102: TO DCB#2



Summary for Subcatchment P103: TO DCB#3

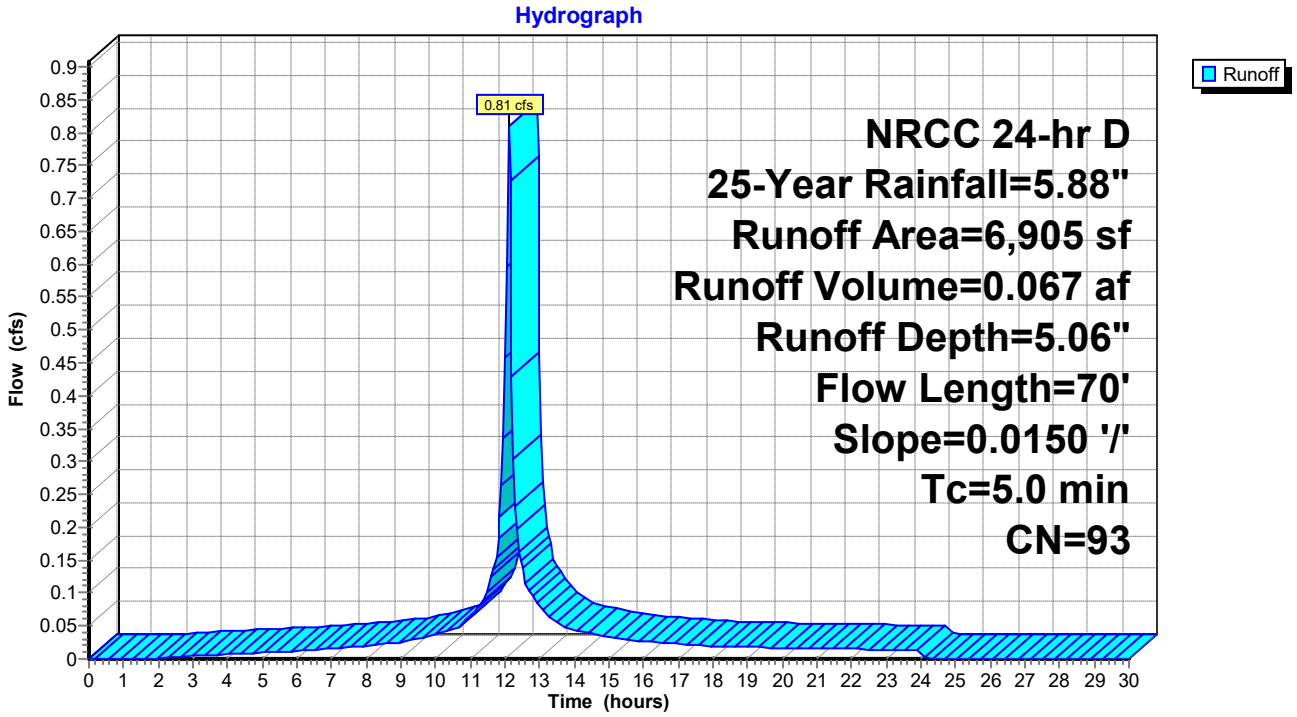
Runoff = 0.81 cfs @ 12.11 hrs, Volume= 0.067 af, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
537	39	>75% Grass cover, Good, HSG A
6,368	98	Paved parking, HSG A
6,905	93	Weighted Average
537		7.78% Pervious Area
6,368		92.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	20	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	70	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P103: TO DCB#3



Summary for Subcatchment P104: TO DCB#4

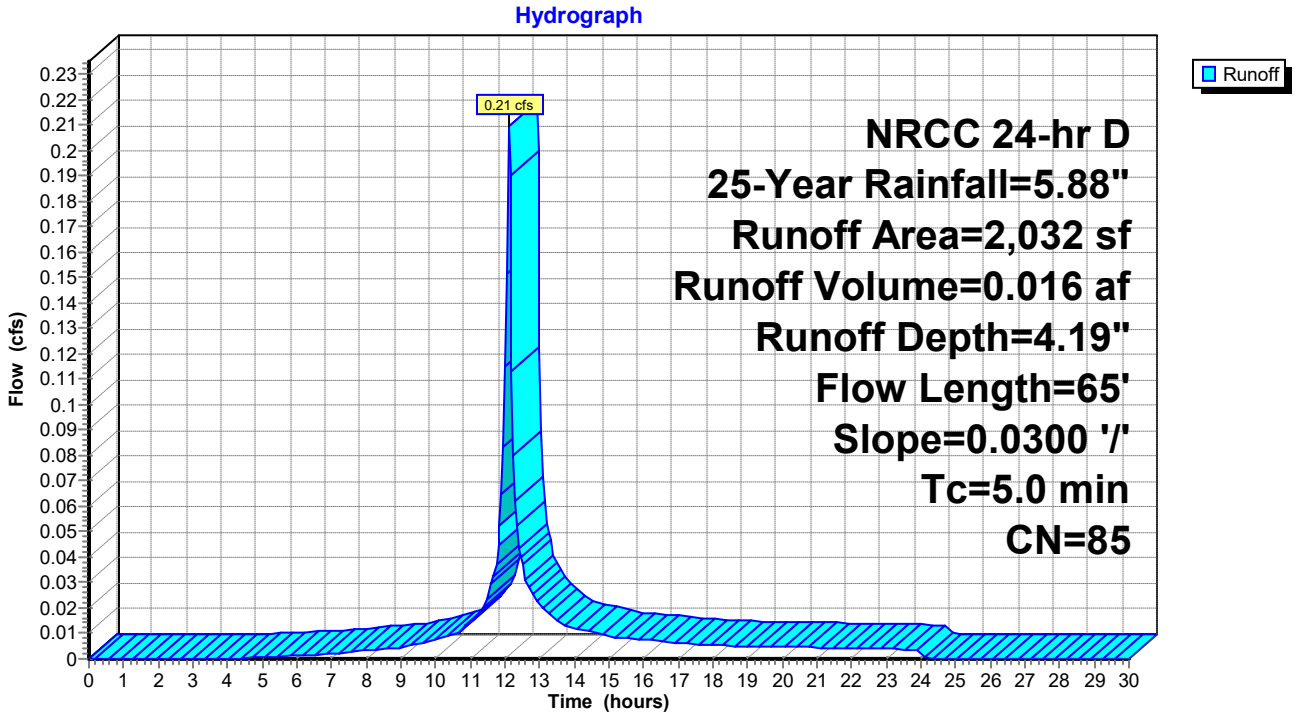
Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
445	39	>75% Grass cover, Good, HSG A
1,587	98	Paved parking, HSG A
2,032	85	Weighted Average
445		21.90% Pervious Area
1,587		78.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	15	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	65	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P104: TO DCB#4



Summary for Subcatchment P105: TO DCB#5

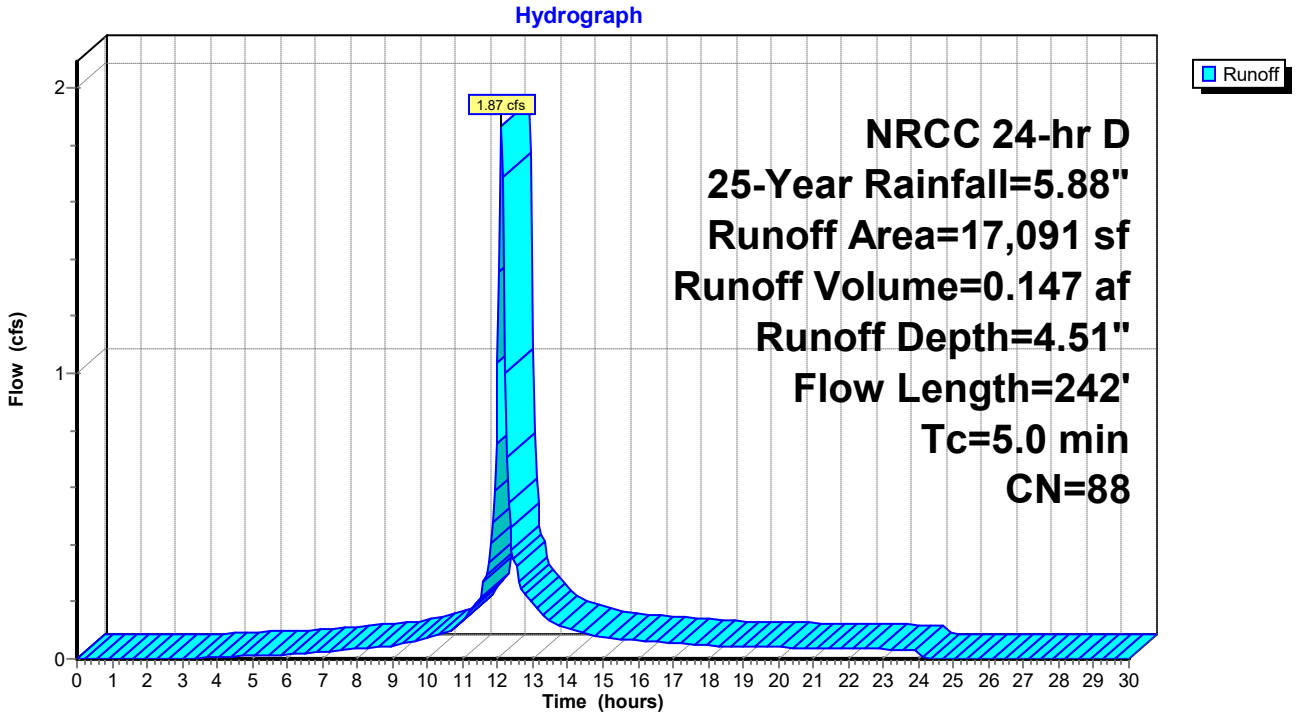
Runoff = 1.87 cfs @ 12.11 hrs, Volume= 0.147 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
2,829	39	>75% Grass cover, Good, HSG A
14,262	98	Paved parking, HSG A
17,091	88	Weighted Average
2,829		16.55% Pervious Area
14,262		83.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	192	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	242	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P105: TO DCB#5



Summary for Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM

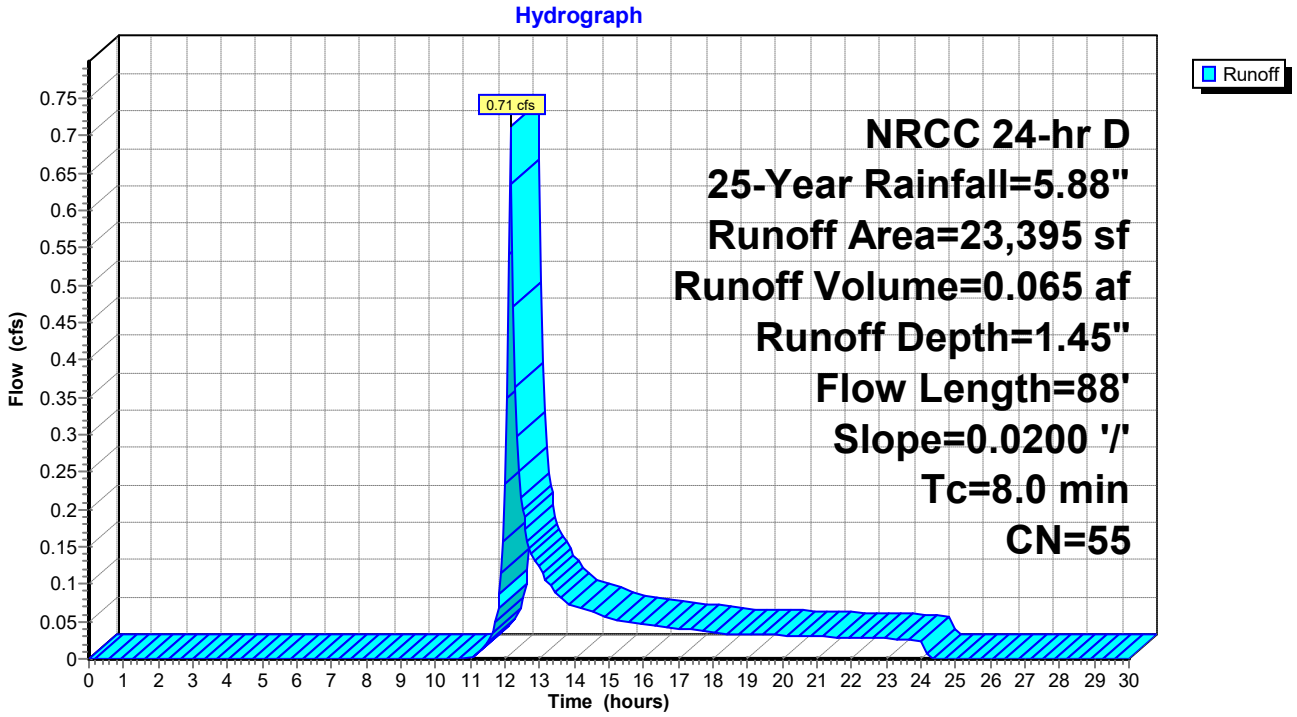
Runoff = 0.71 cfs @ 12.16 hrs, Volume= 0.065 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
17,058	39	>75% Grass cover, Good, HSG A
6,337	98	Paved parking, HSG A
23,395	55	Weighted Average
17,058		72.91% Pervious Area
6,337		27.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	13	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.0	88	Total			

Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM



Summary for Subcatchment P107: TO DCB#8

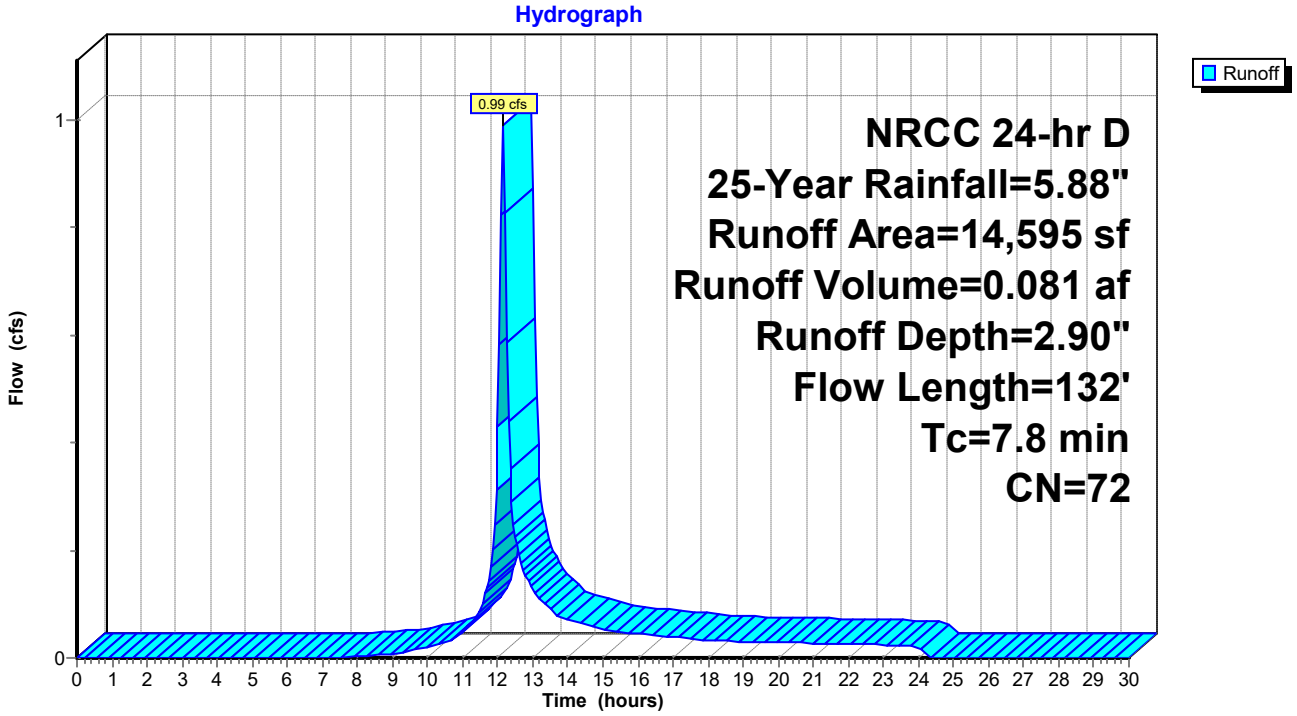
Runoff = 0.99 cfs @ 12.15 hrs, Volume= 0.081 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
6,415	39	>75% Grass cover, Good, HSG A
8,180	98	Paved parking, HSG A
14,595	72	Weighted Average
6,415		43.95% Pervious Area
8,180		56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	23	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
5.9	52	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	57	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.8	132	Total			

Subcatchment P107: TO DCB#8



Summary for Subcatchment P108: TO DCB#6

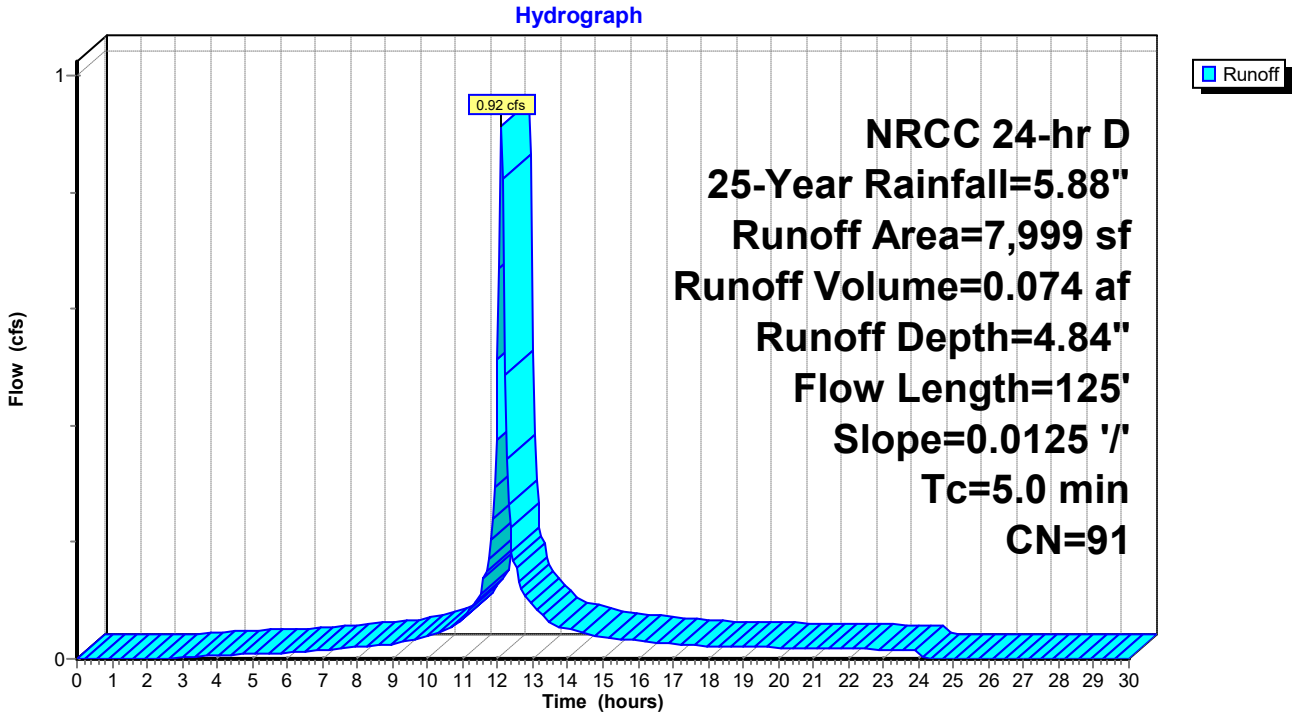
Runoff = 0.92 cfs @ 12.11 hrs, Volume= 0.074 af, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,013	39	>75% Grass cover, Good, HSG A
6,986	98	Paved parking, HSG A
7,999	91	Weighted Average
1,013		12.66% Pervious Area
6,986		87.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	75	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#6



Summary for Subcatchment P109: TO DCB#7

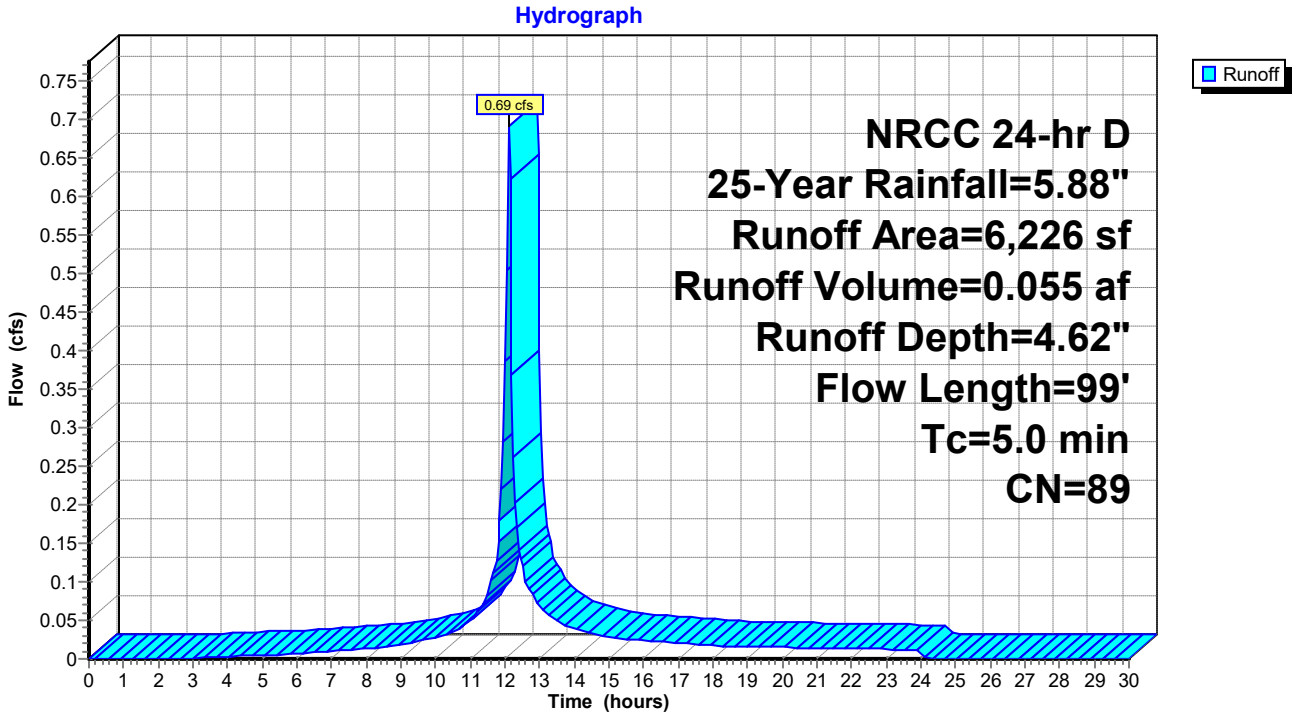
Runoff = 0.69 cfs @ 12.11 hrs, Volume= 0.055 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
900	39	>75% Grass cover, Good, HSG A
5,326	98	Paved parking, HSG A
6,226	89	Weighted Average
900		14.46% Pervious Area
5,326		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.4	49	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	99	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P109: TO DCB#7



Summary for Subcatchment P11: TO DP#1

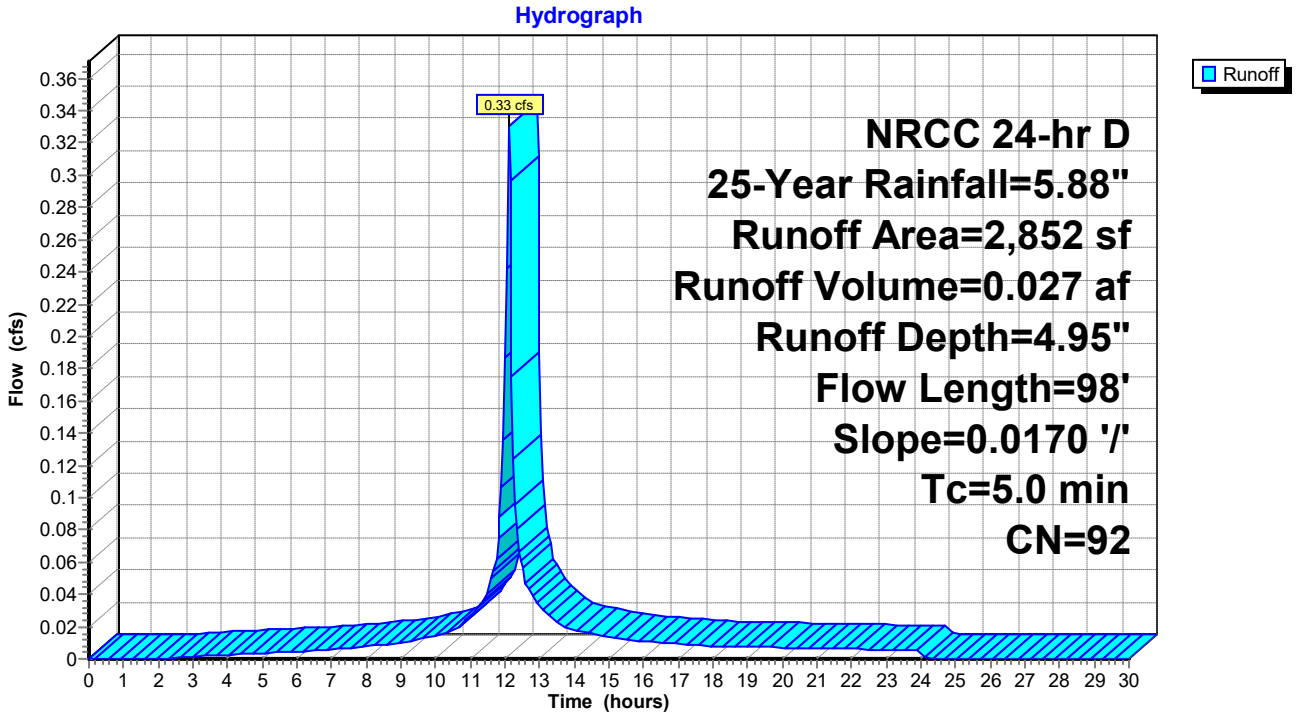
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P11: TO DP#1



Summary for Subcatchment P12: TO DCB-A

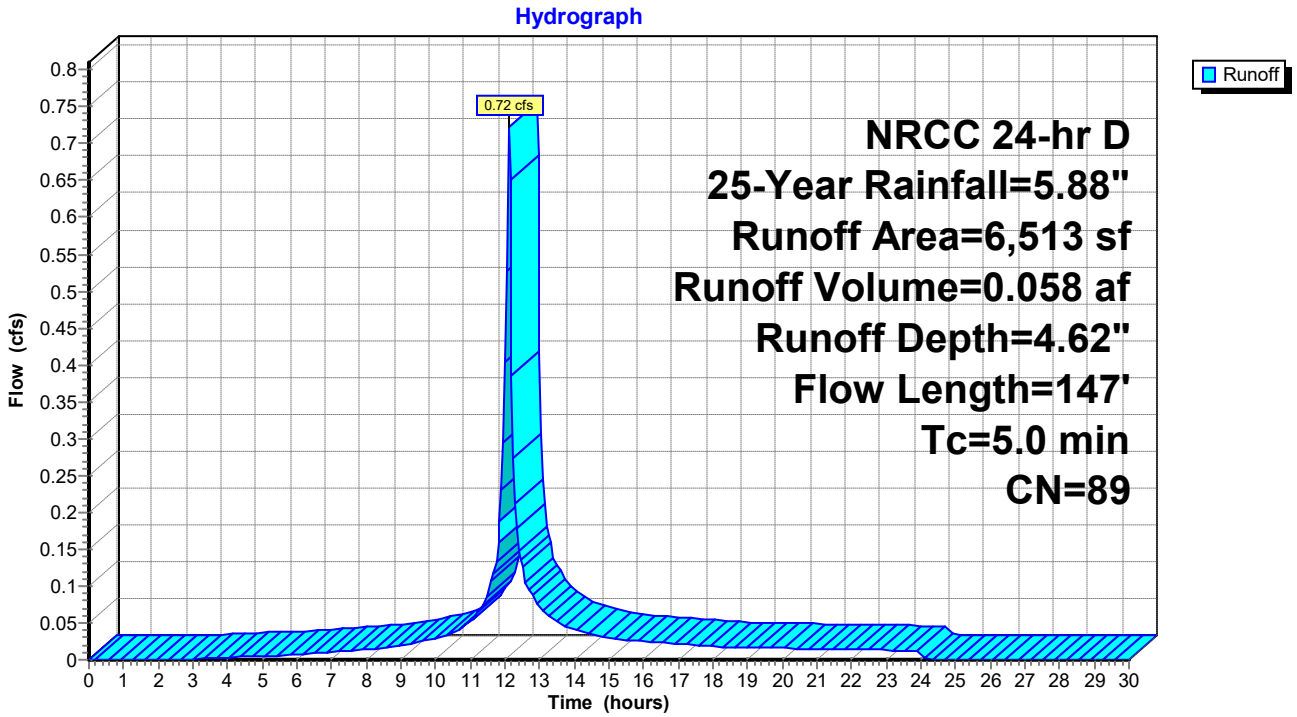
Runoff = 0.72 cfs @ 12.11 hrs, Volume= 0.058 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
970	39	>75% Grass cover, Good, HSG A
5,543	98	Paved parking, HSG A
6,513	89	Weighted Average
970		14.89% Pervious Area
5,543		85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	8	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	35	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	97	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	147	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P12: TO DCB-A



Summary for Subcatchment P14: TO DCB-B

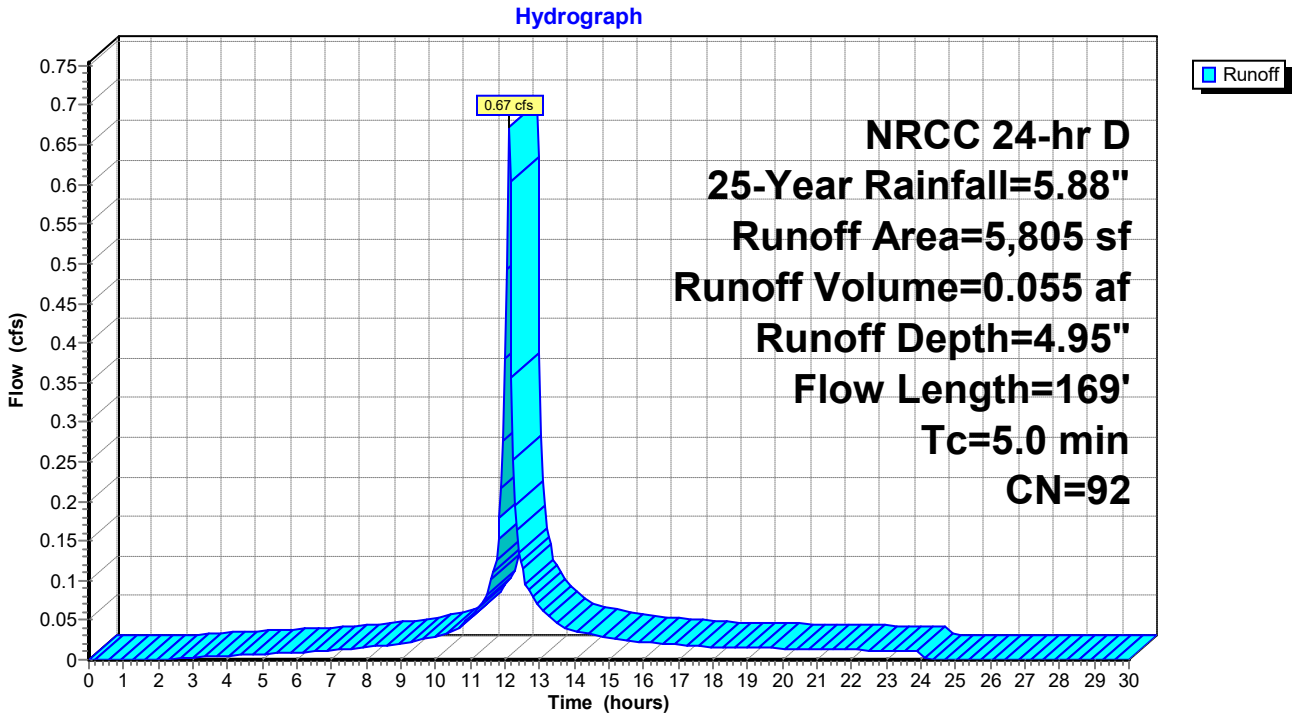
Runoff = 0.67 cfs @ 12.11 hrs, Volume= 0.055 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
609	39	>75% Grass cover, Good, HSG A
5,196	98	Paved parking, HSG A
5,805	92	Weighted Average
609		10.49% Pervious Area
5,196		89.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	10	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	33	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	119	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P14: TO DCB-B



Summary for Subcatchment P15: TO DCB-C

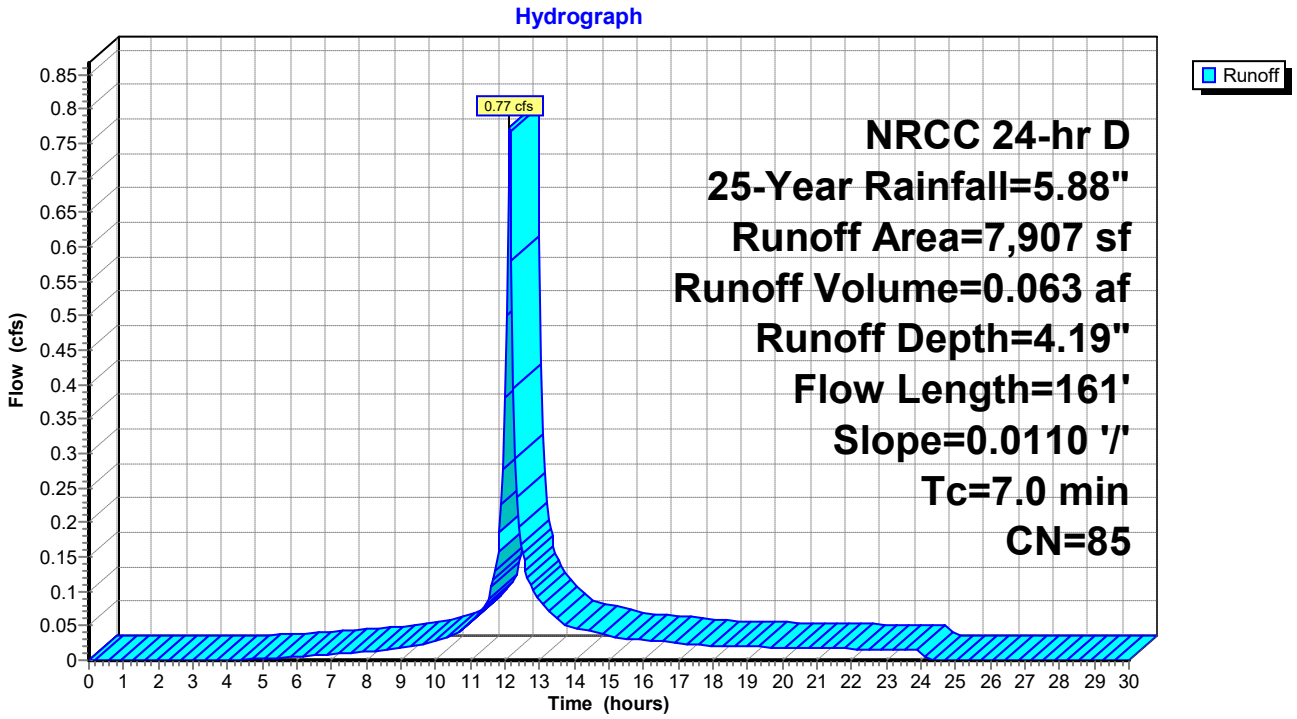
Runoff = 0.77 cfs @ 12.14 hrs, Volume= 0.063 af, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,765	39	>75% Grass cover, Good, HSG A
5,412	98	Paved parking, HSG A
730	96	Gravel surface, HSG A
7,907	85	Weighted Average
2,495		31.55% Pervious Area
5,412		68.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment P15: TO DCB-C



Summary for Subcatchment P16: TO LOW POINT

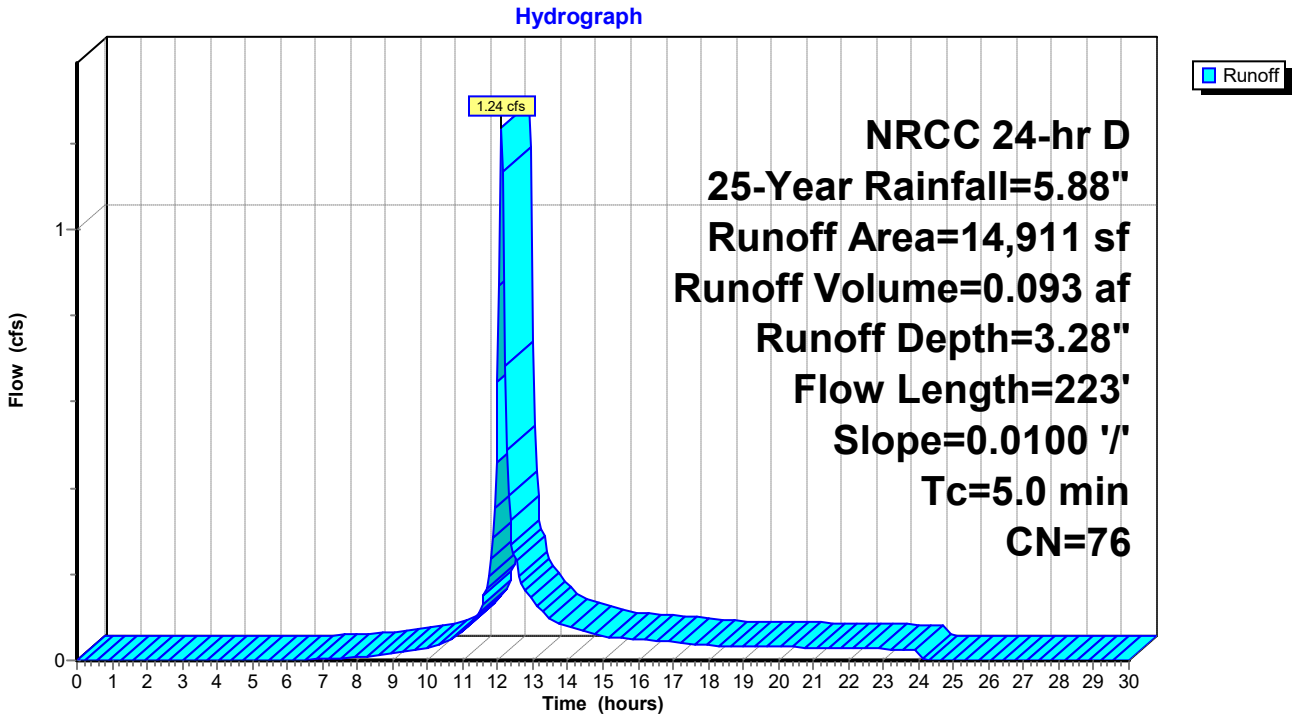
Runoff = 1.24 cfs @ 12.12 hrs, Volume= 0.093 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
5,411	39	>75% Grass cover, Good, HSG A
7,655	98	Paved parking, HSG A
1,845	96	Gravel surface, HSG A
14,911	76	Weighted Average
7,256		48.66% Pervious Area
7,655		51.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.8	173	0.0100	1.61		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
2.7	223	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P16: TO LOW POINT



Summary for Subcatchment P18: TO DCB-D

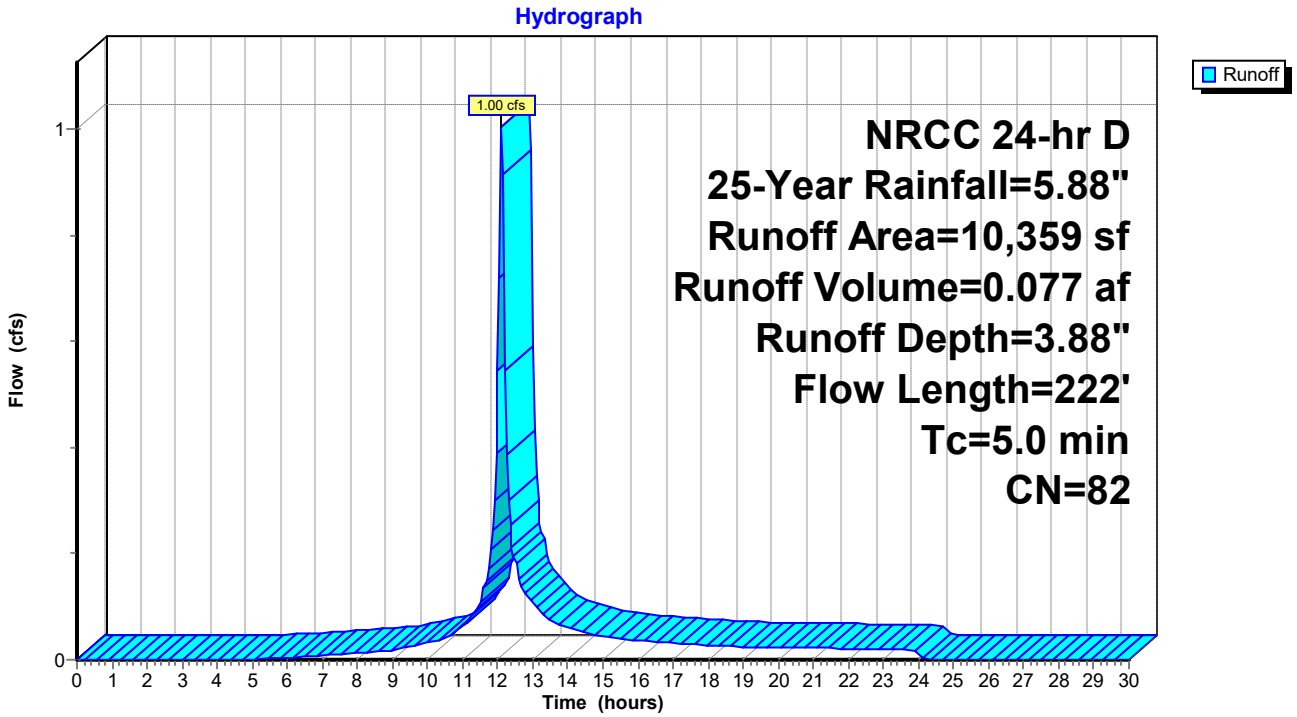
Runoff = 1.00 cfs @ 12.11 hrs, Volume= 0.077 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
2,781	39	>75% Grass cover, Good, HSG A
7,578	98	Paved parking, HSG A
10,359	82	Weighted Average
2,781		26.85% Pervious Area
7,578		73.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	9	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	9	0.0150	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	32	0.0075	0.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	172	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	222	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P18: TO DCB-D



Summary for Subcatchment P19: TO DCB-E

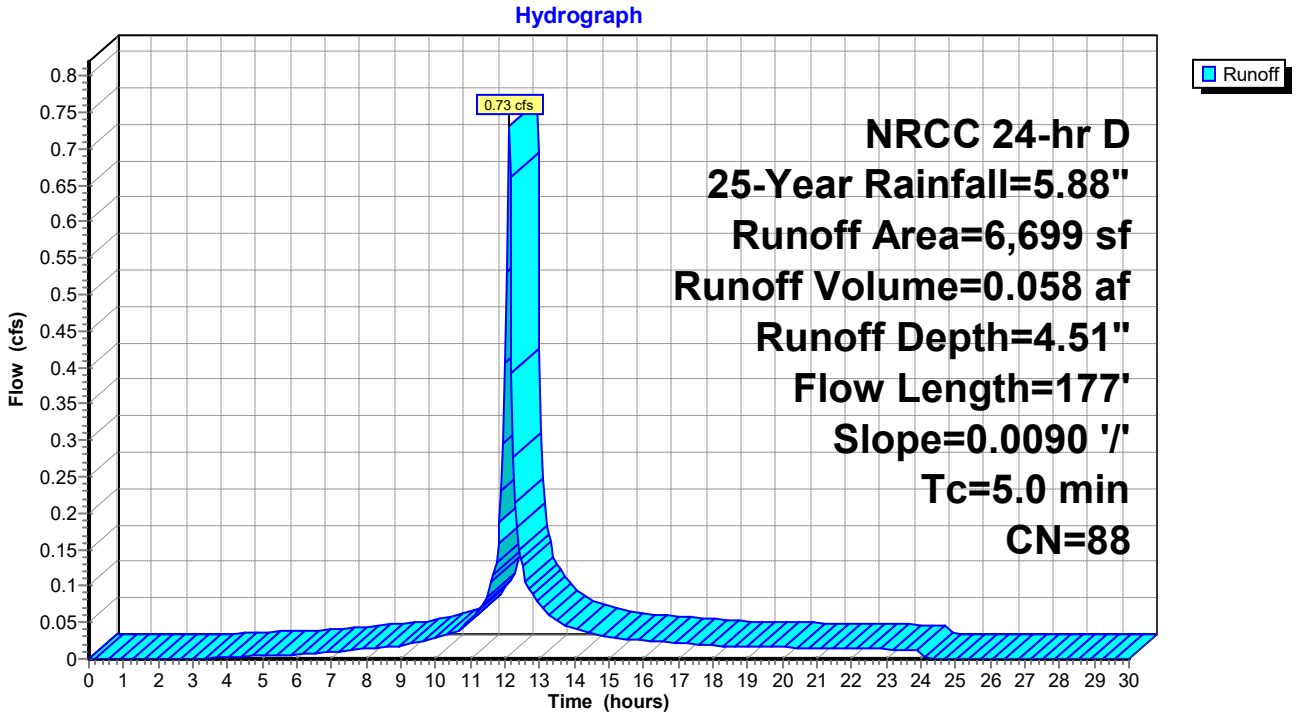
Runoff = 0.73 cfs @ 12.11 hrs, Volume= 0.058 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,083	39	>75% Grass cover, Good, HSG A
5,616	98	Paved parking, HSG A
6,699	88	Weighted Average
1,083		16.17% Pervious Area
5,616		83.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P19: TO DCB-E



Summary for Subcatchment P20: TO DP#3

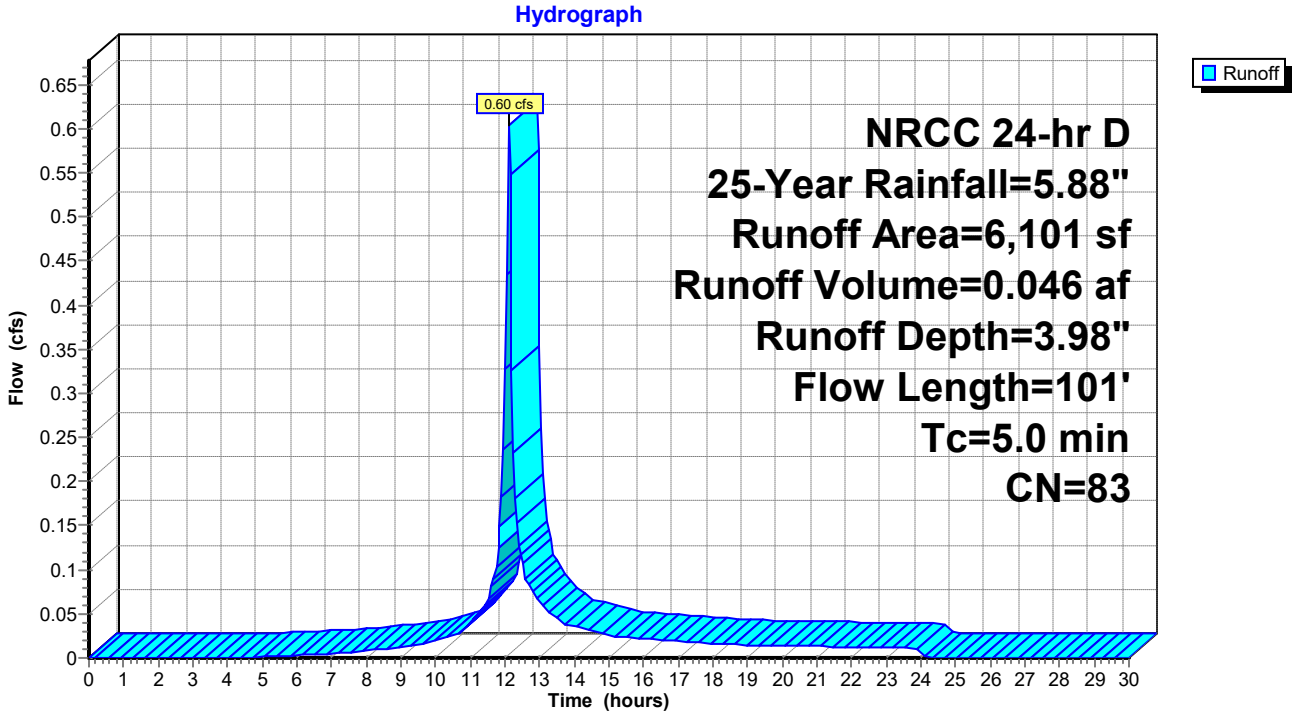
Runoff = 0.60 cfs @ 12.11 hrs, Volume= 0.046 af, Depth= 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
1,501	39	>75% Grass cover, Good, HSG A
4,600	98	Paved parking, HSG A
6,101	83	Weighted Average
1,501		24.60% Pervious Area
4,600		75.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	9	0.0250	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	41	0.0150	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P20: TO DP#3



Summary for Subcatchment P24: TO DP#4

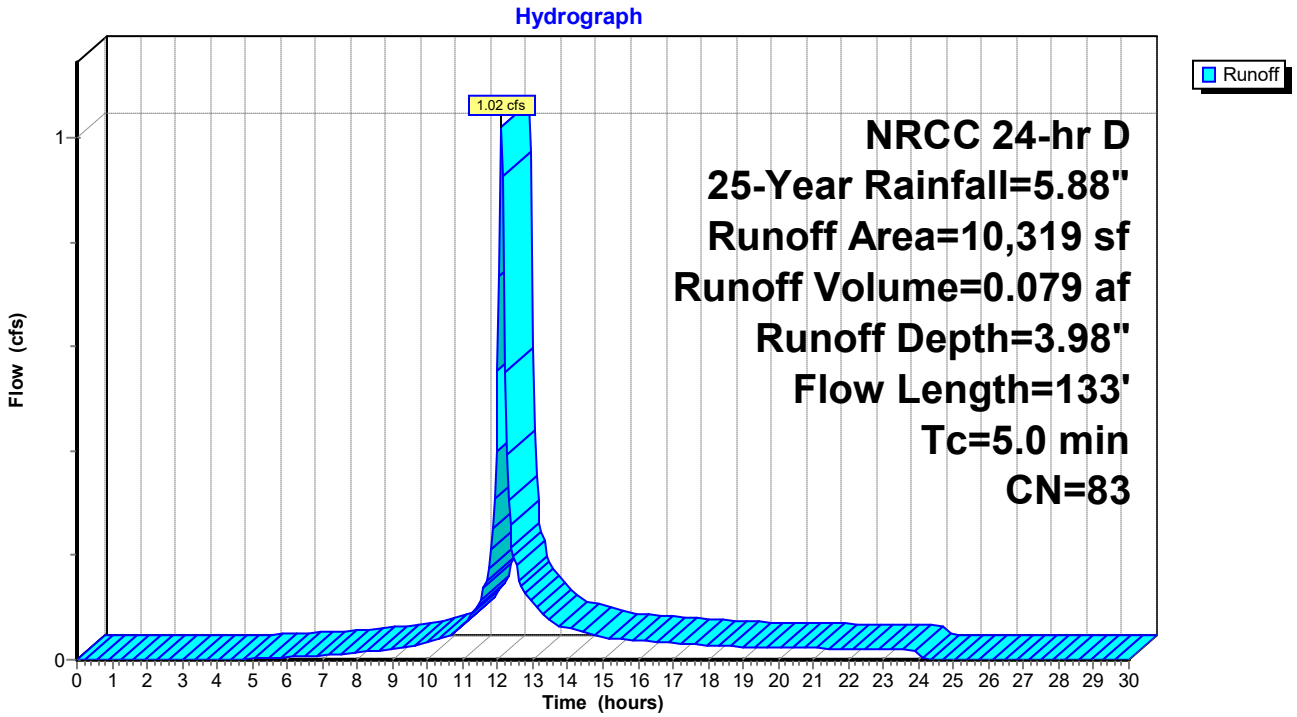
Runoff = 1.02 cfs @ 12.11 hrs, Volume= 0.079 af, Depth= 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
2,618	39	>75% Grass cover, Good, HSG A
7,701	98	Paved parking, HSG A
10,319	83	Weighted Average
2,618		25.37% Pervious Area
7,701		74.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	35	0.0600	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	10	0.3000	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0100	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.4	83	0.0100	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
4.8	133	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DP#4



Summary for Subcatchment P26: TO DCB-H

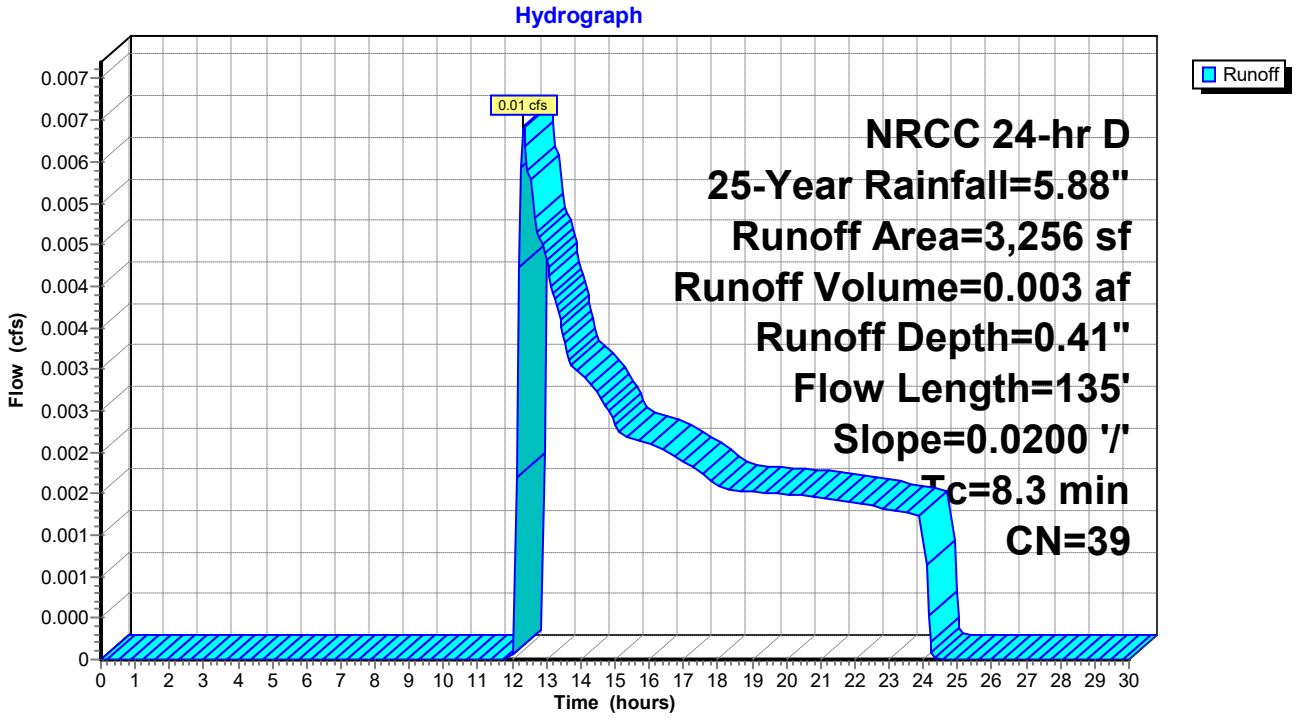
Runoff = 0.01 cfs @ 12.34 hrs, Volume= 0.003 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
3,256	39	>75% Grass cover, Good, HSG A
3,256		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.3	135	Total			

Subcatchment P26: TO DCB-H



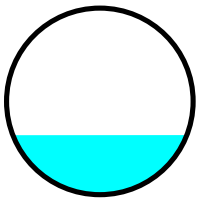
Summary for Reach CMH1: TO DMH-D

Inflow Area = 2.548 ac, 97.20% Impervious, Inflow Depth = 5.50" for 25-Year event
Inflow = 12.91 cfs @ 12.13 hrs, Volume= 1.168 af
Outflow = 12.77 cfs @ 12.14 hrs, Volume= 1.168 af, Atten= 1%, Lag= 0.4 min

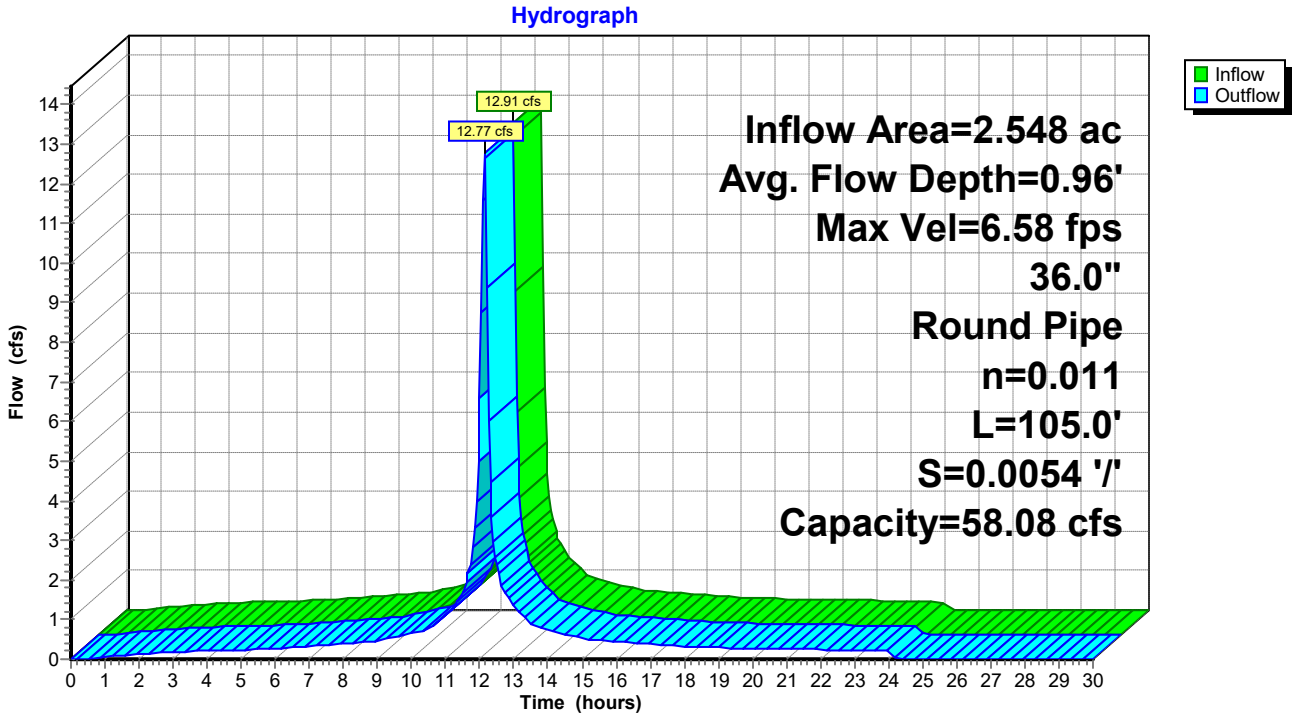
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.58 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.33 fps, Avg. Travel Time= 0.8 min

Peak Storage= 205 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.96'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.08 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 105.0' Slope= 0.0054 '/'
Inlet Invert= 456.47', Outlet Invert= 455.90'



Reach CMH1: TO DMH-D

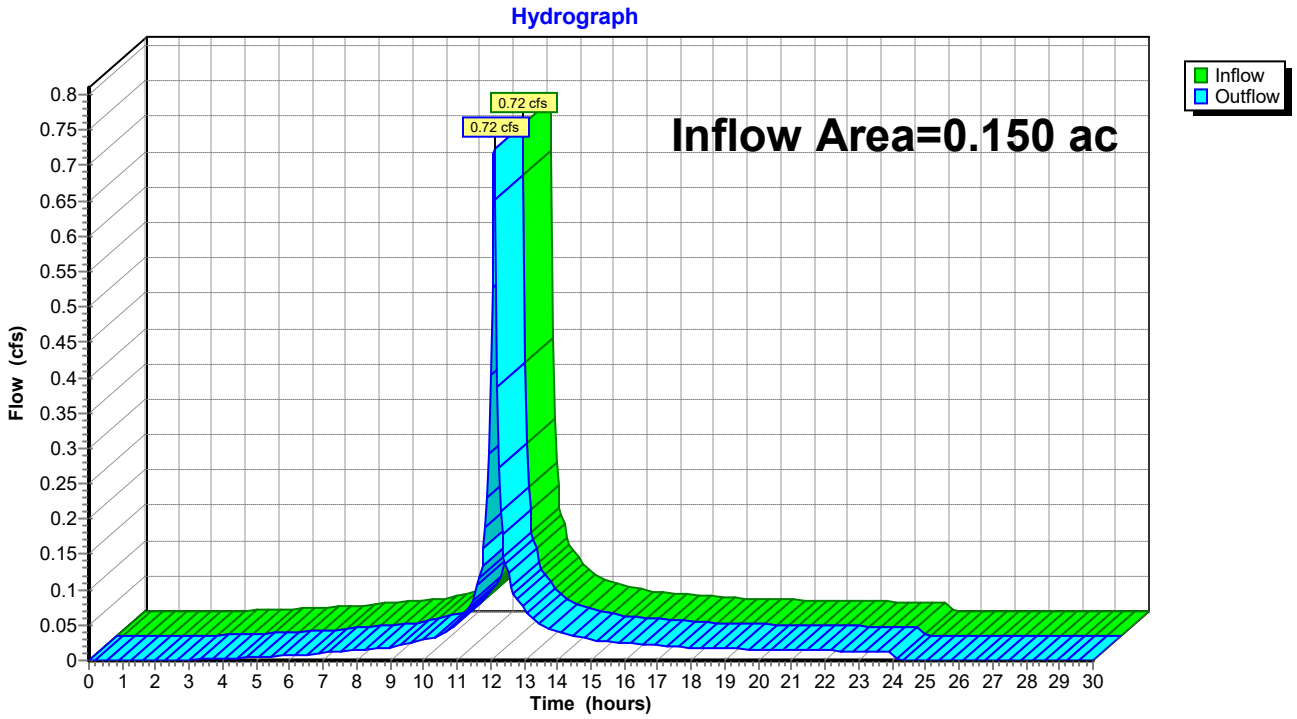


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.150 ac, 85.11% Impervious, Inflow Depth = 4.62" for 25-Year event
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 0.058 af
Outflow = 0.72 cfs @ 12.11 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

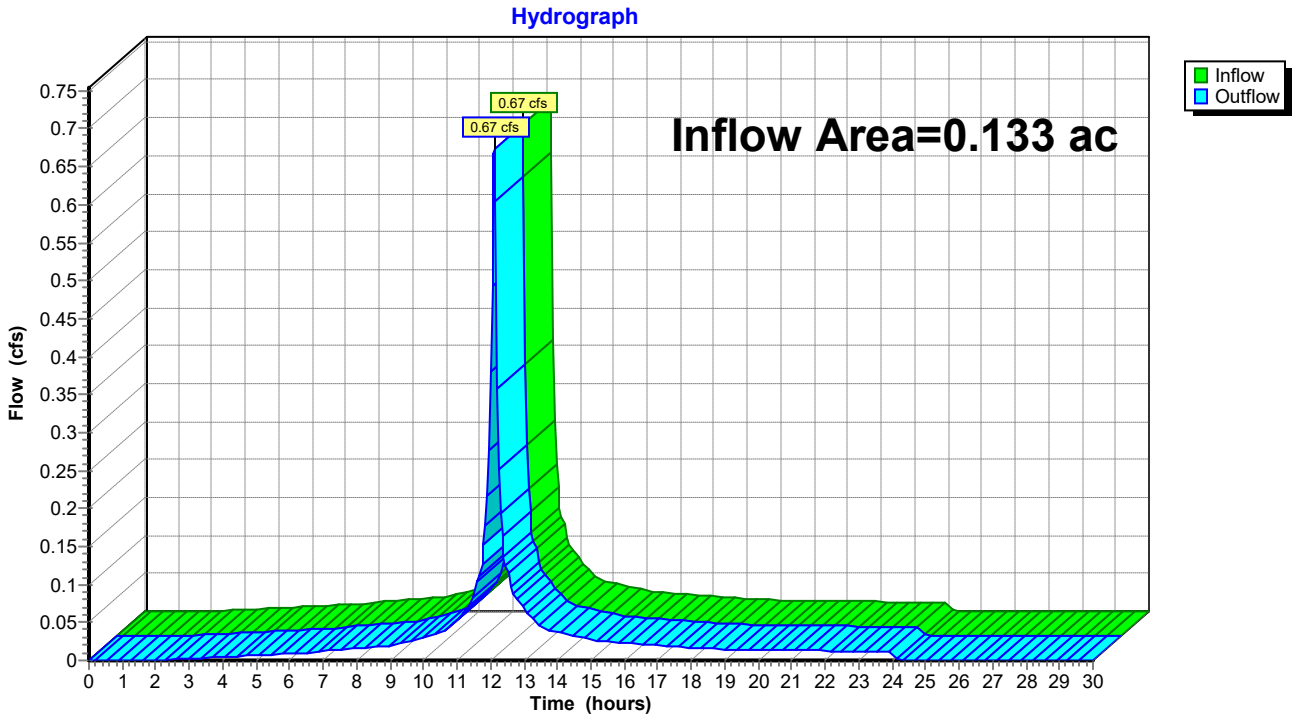


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.133 ac, 89.51% Impervious, Inflow Depth = 4.95" for 25-Year event
Inflow = 0.67 cfs @ 12.11 hrs, Volume= 0.055 af
Outflow = 0.67 cfs @ 12.11 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

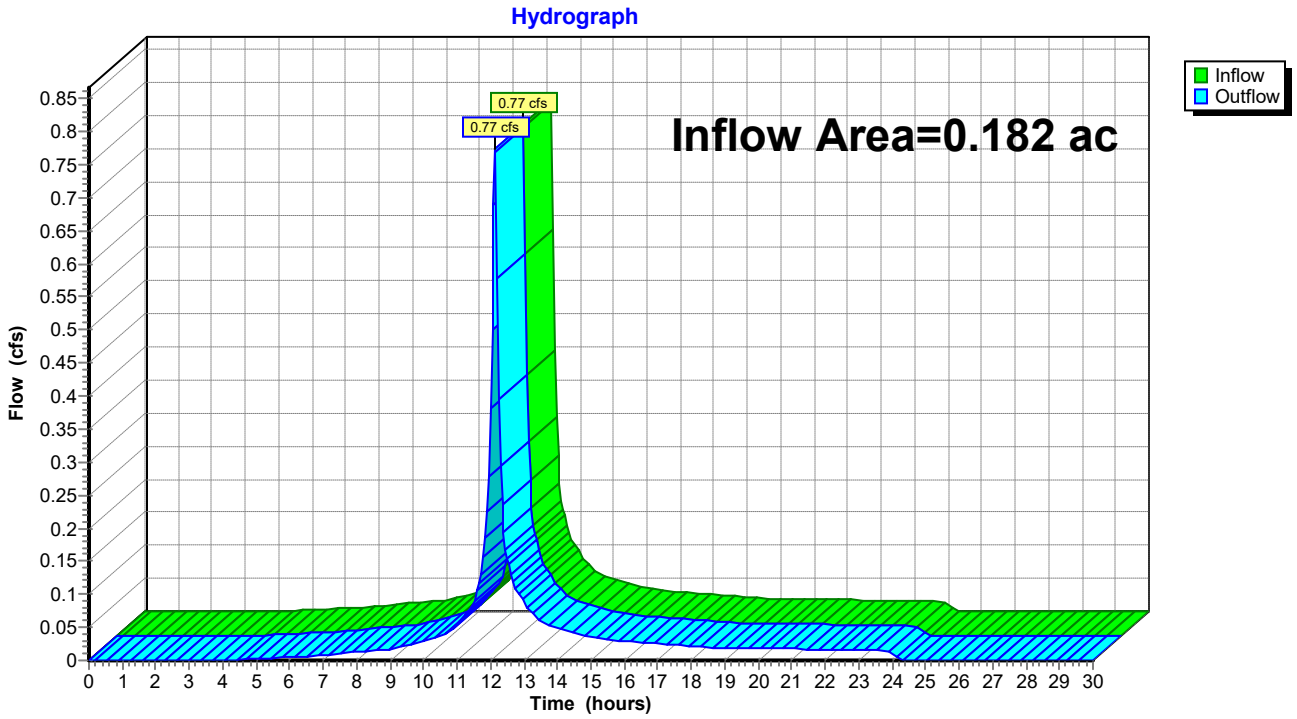


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.182 ac, 68.45% Impervious, Inflow Depth = 4.19" for 25-Year event
Inflow = 0.77 cfs @ 12.14 hrs, Volume= 0.063 af
Outflow = 0.77 cfs @ 12.14 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



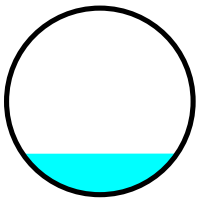
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 0.238 ac, 73.15% Impervious, Inflow Depth = 3.88" for 25-Year event
Inflow = 1.00 cfs @ 12.11 hrs, Volume= 0.077 af
Outflow = 1.00 cfs @ 12.12 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.1 min

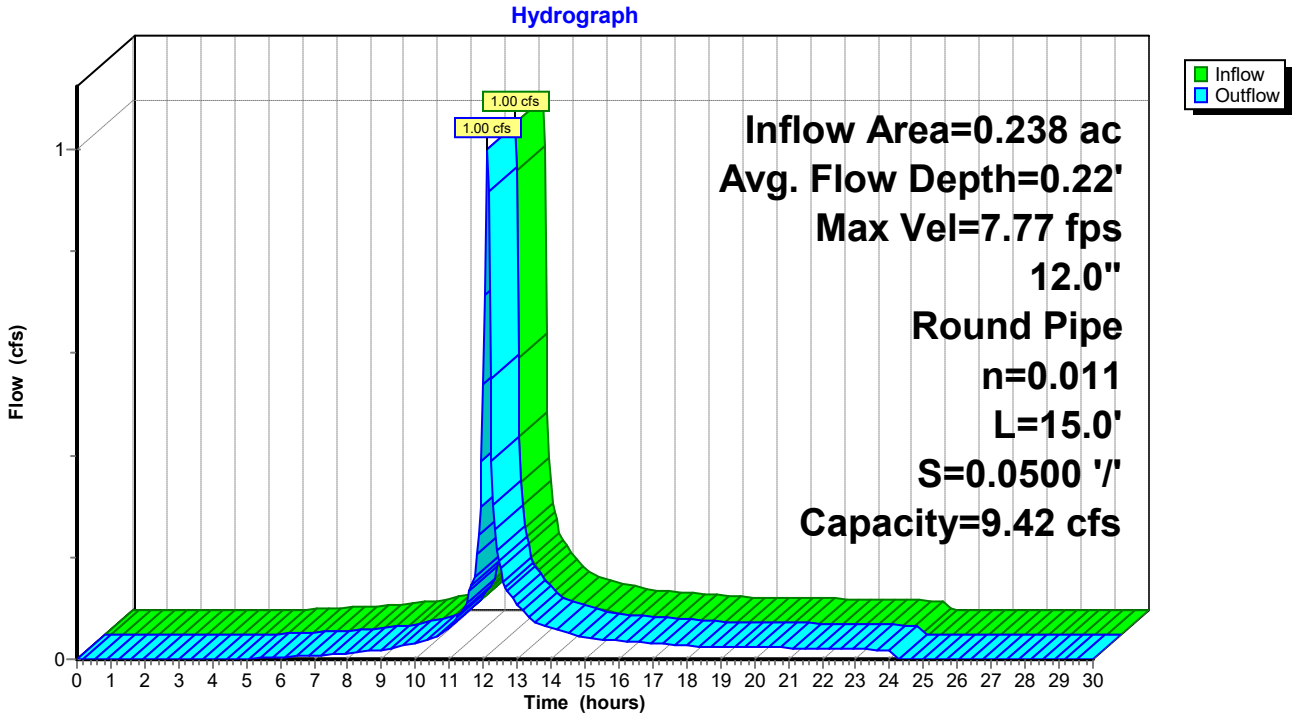
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.77 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.72 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.42 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.0500 '/'
Inlet Invert= 466.75', Outlet Invert= 466.00'



Reach DCB-D: TO DMH-A



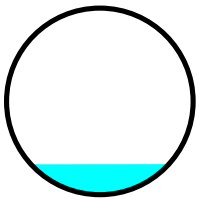
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.154 ac, 83.83% Impervious, Inflow Depth = 4.51" for 25-Year event
Inflow = 0.73 cfs @ 12.11 hrs, Volume= 0.058 af
Outflow = 0.73 cfs @ 12.11 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

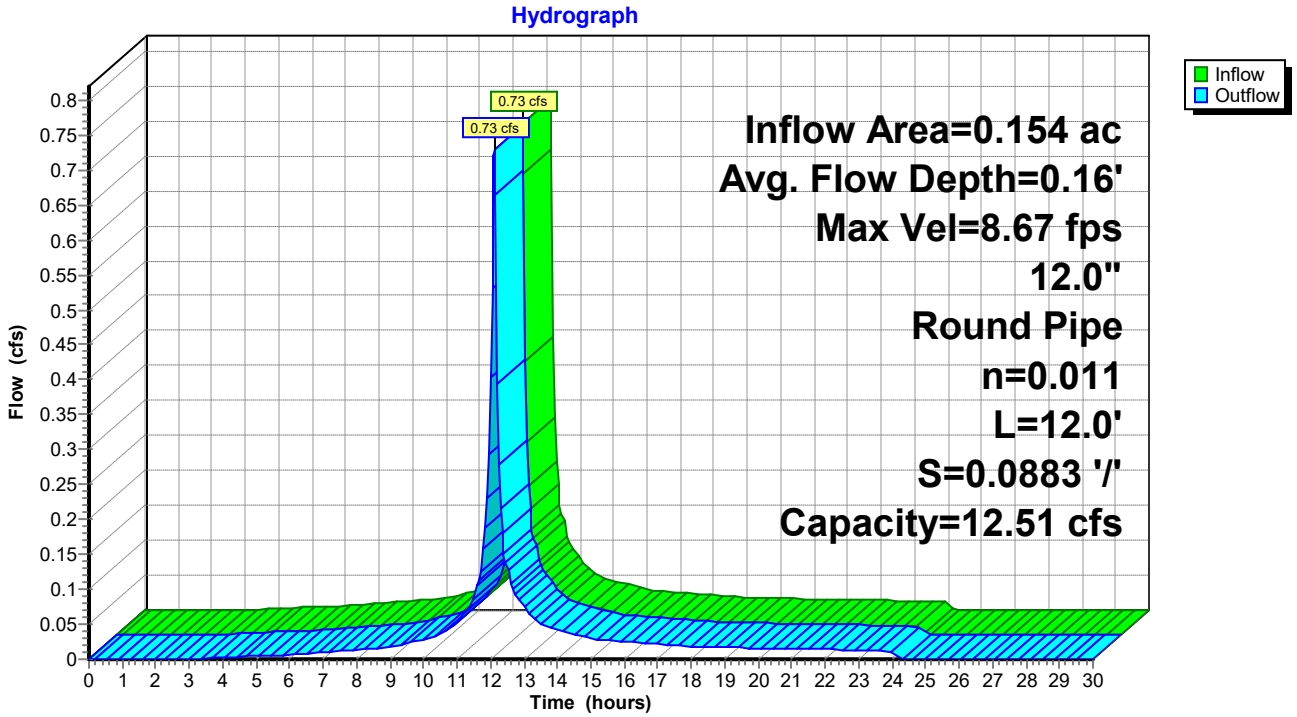
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.67 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.00 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A



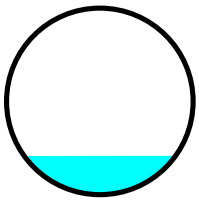
Summary for Reach DCB1: TO DMH#2

Inflow Area = 0.118 ac, 82.42% Impervious, Inflow Depth = 4.51" for 25-Year event
Inflow = 0.56 cfs @ 12.11 hrs, Volume= 0.044 af
Outflow = 0.55 cfs @ 12.12 hrs, Volume= 0.044 af, Atten= 3%, Lag= 0.7 min

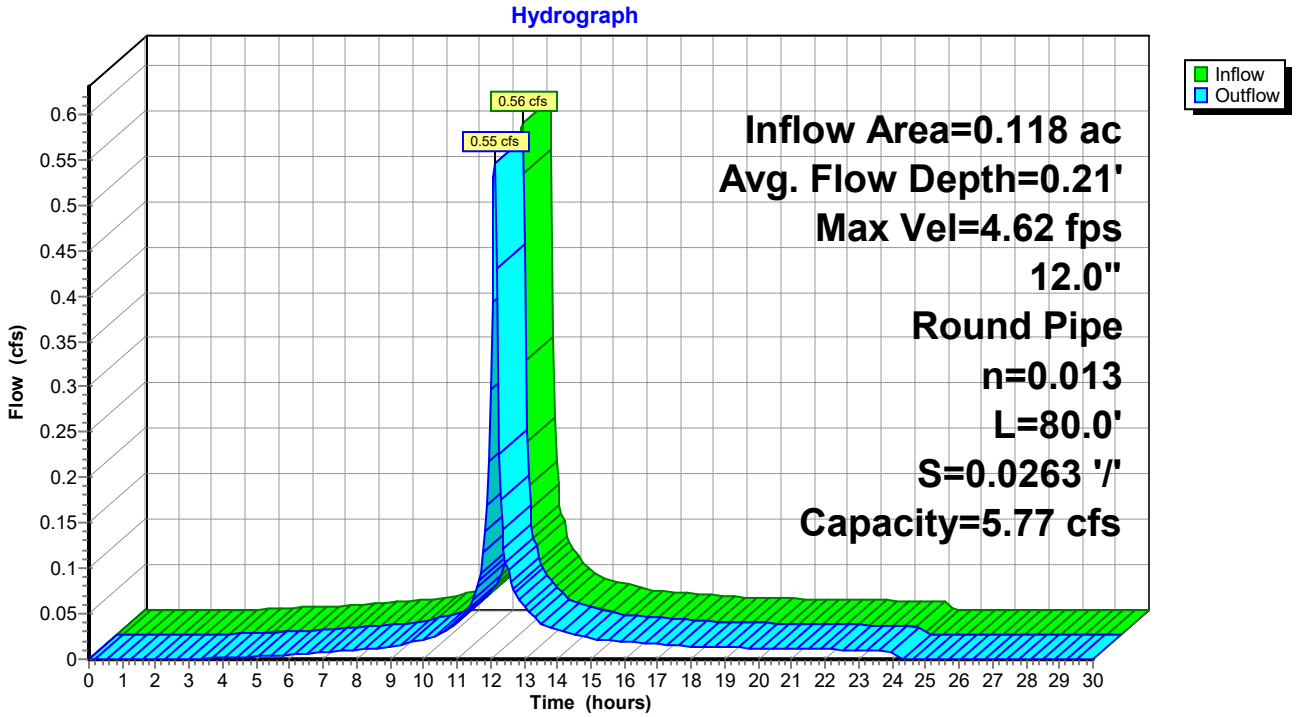
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.62 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.8 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.77 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 80.0' Slope= 0.0263 '/'
Inlet Invert= 469.10', Outlet Invert= 467.00'



Reach DCB1: TO DMH#2



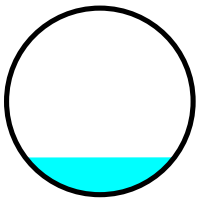
Summary for Reach DCB2: TO DMH#2

Inflow Area = 0.088 ac, 96.05% Impervious, Inflow Depth = 5.41" for 25-Year event
Inflow = 0.46 cfs @ 12.11 hrs, Volume= 0.040 af
Outflow = 0.45 cfs @ 12.12 hrs, Volume= 0.040 af, Atten= 3%, Lag= 0.6 min

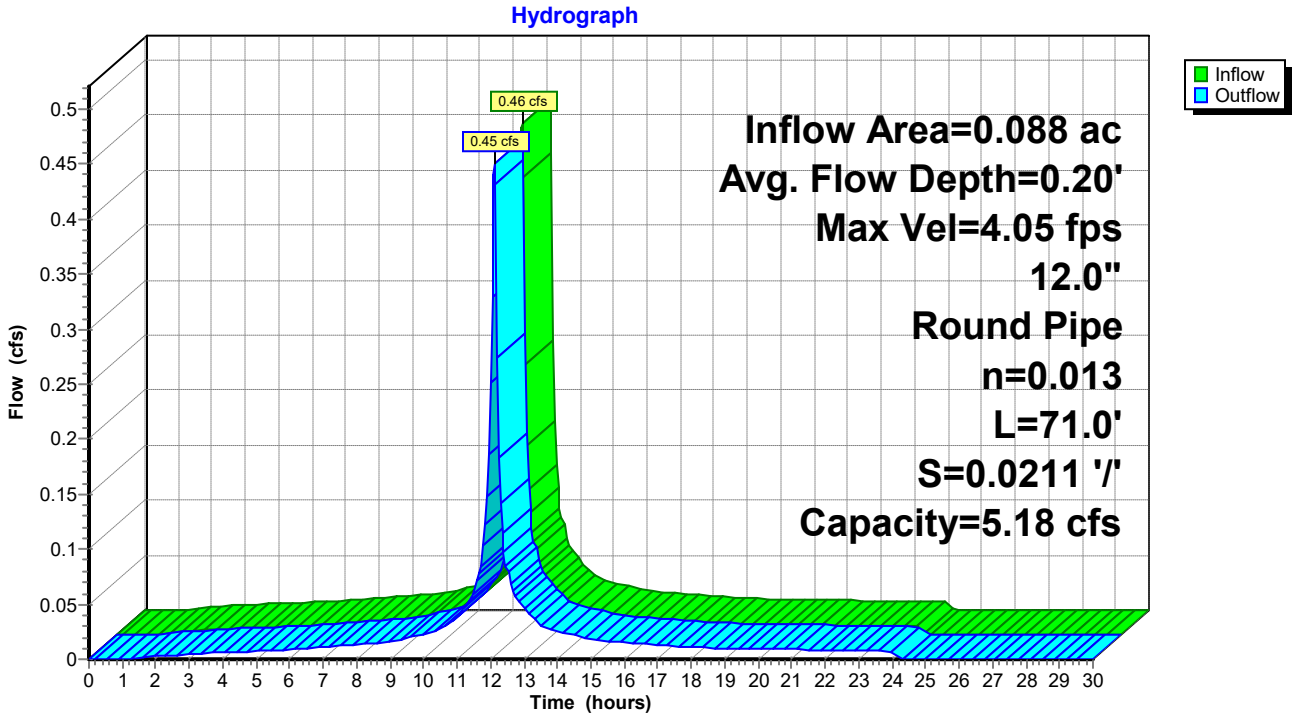
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.18 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 71.0' Slope= 0.0211 '/'
Inlet Invert= 469.10', Outlet Invert= 467.60'



Reach DCB2: TO DMH#2



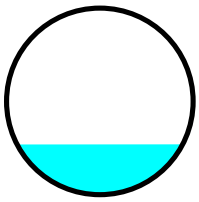
Summary for Reach DCB3: TO DMH#2

Inflow Area = 0.159 ac, 92.22% Impervious, Inflow Depth = 5.06" for 25-Year event
Inflow = 0.81 cfs @ 12.11 hrs, Volume= 0.067 af
Outflow = 0.81 cfs @ 12.11 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.1 min

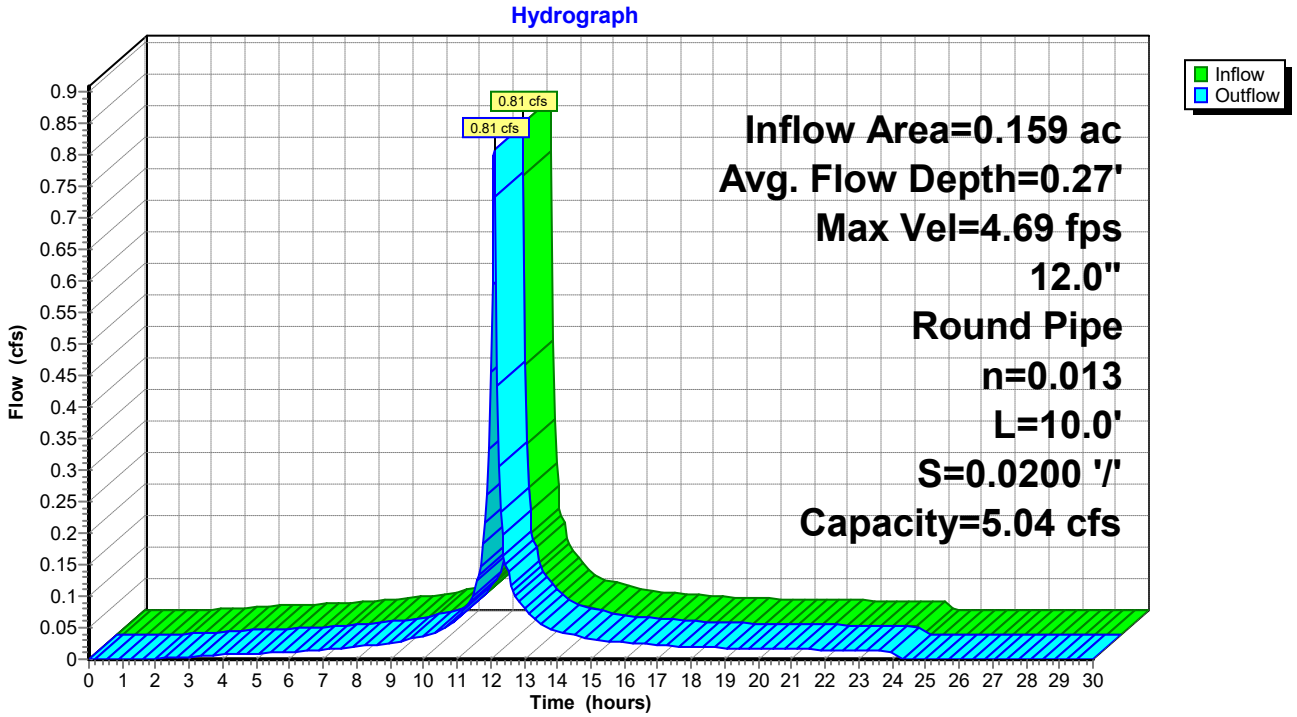
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.69 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 469.10', Outlet Invert= 468.90'



Reach DCB3: TO DMH#2



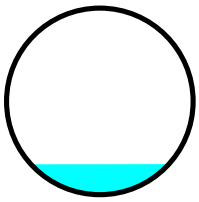
Summary for Reach DCB4: TO DMH#1

Inflow Area = 0.047 ac, 78.10% Impervious, Inflow Depth = 4.19" for 25-Year event
Inflow = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af
Outflow = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af, Atten= 3%, Lag= 1.2 min

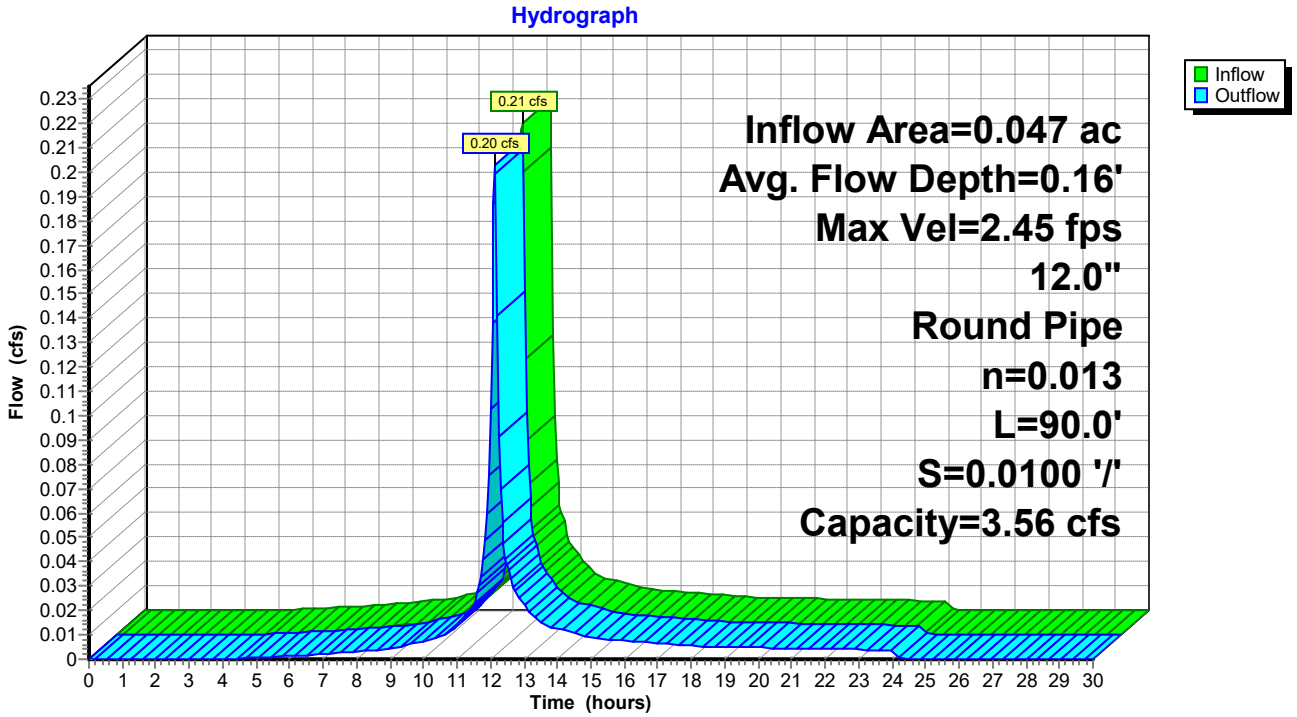
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 1.7 min

Peak Storage= 8 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 90.0' Slope= 0.0100 '/'
Inlet Invert= 468.50', Outlet Invert= 467.60'



Reach DCB4: TO DMH#1



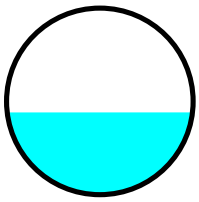
Summary for Reach DCB5: TO DMH#101

Inflow Area = 0.392 ac, 83.45% Impervious, Inflow Depth = 4.51" for 25-Year event
Inflow = 1.87 cfs @ 12.11 hrs, Volume= 0.147 af
Outflow = 1.85 cfs @ 12.12 hrs, Volume= 0.147 af, Atten= 1%, Lag= 0.2 min

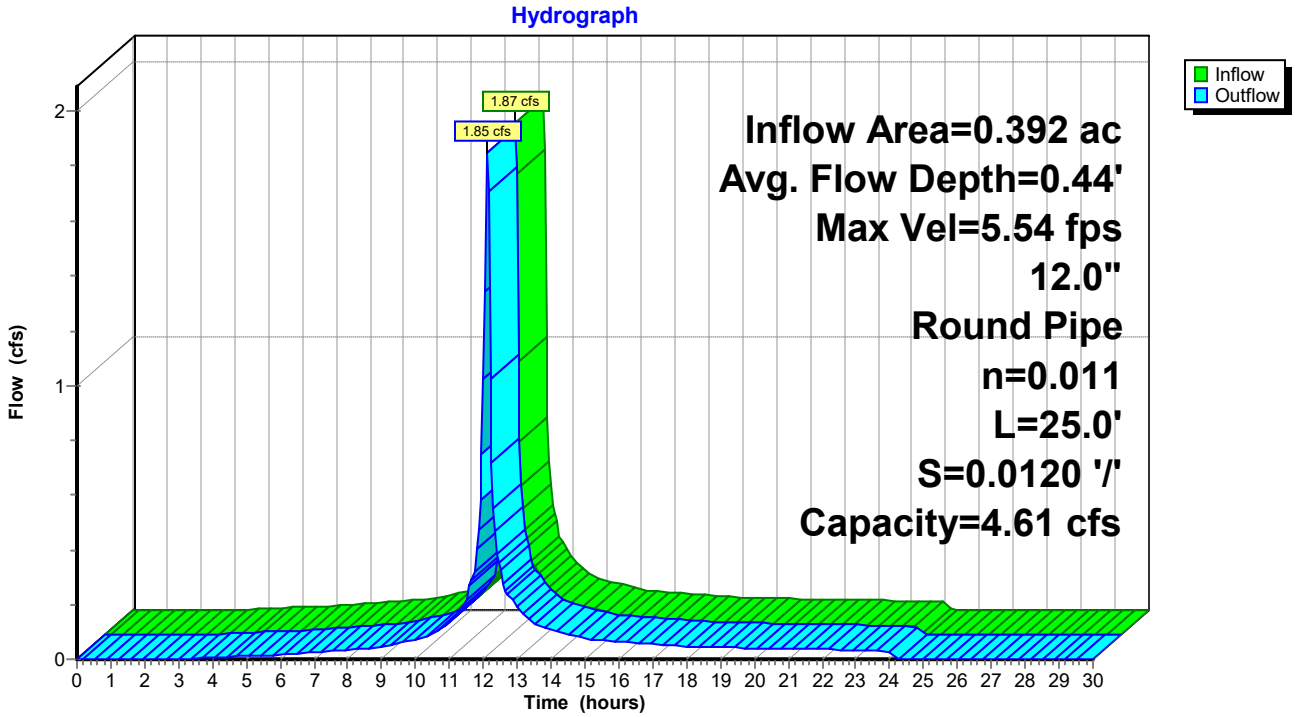
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.54 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0120 '/'
Inlet Invert= 468.30', Outlet Invert= 468.00'



Reach DCB5: TO DMH#101



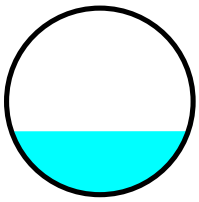
Summary for Reach DCB6: TO DMH#3

Inflow Area = 0.184 ac, 87.34% Impervious, Inflow Depth = 4.84" for 25-Year event
Inflow = 0.92 cfs @ 12.11 hrs, Volume= 0.074 af
Outflow = 0.89 cfs @ 12.13 hrs, Volume= 0.074 af, Atten= 3%, Lag= 1.0 min

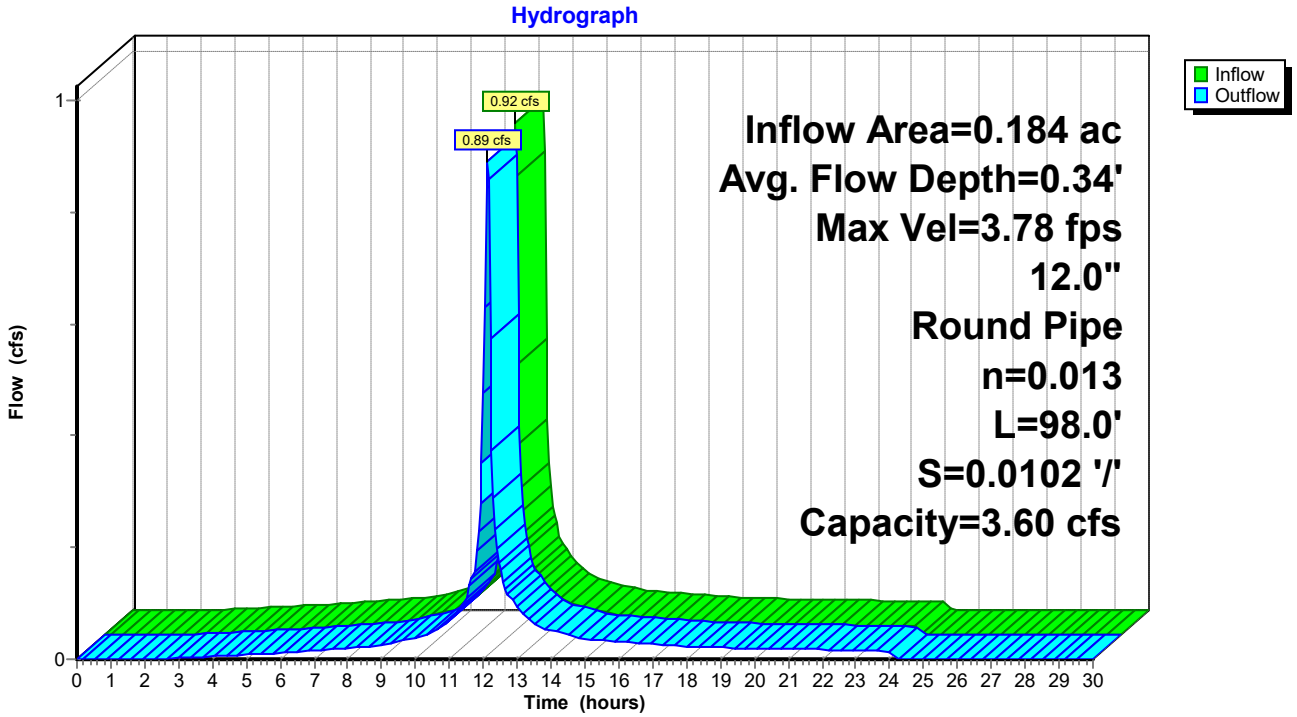
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.78 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 1.2 min

Peak Storage= 23 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 469.50', Outlet Invert= 468.50'



Reach DCB6: TO DMH#3



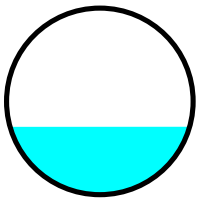
Summary for Reach DCB7: TO DMH#4

Inflow Area = 0.335 ac, 56.05% Impervious, Inflow Depth = 2.90" for 25-Year event
Inflow = 0.99 cfs @ 12.15 hrs, Volume= 0.081 af
Outflow = 0.96 cfs @ 12.16 hrs, Volume= 0.081 af, Atten= 3%, Lag= 0.7 min

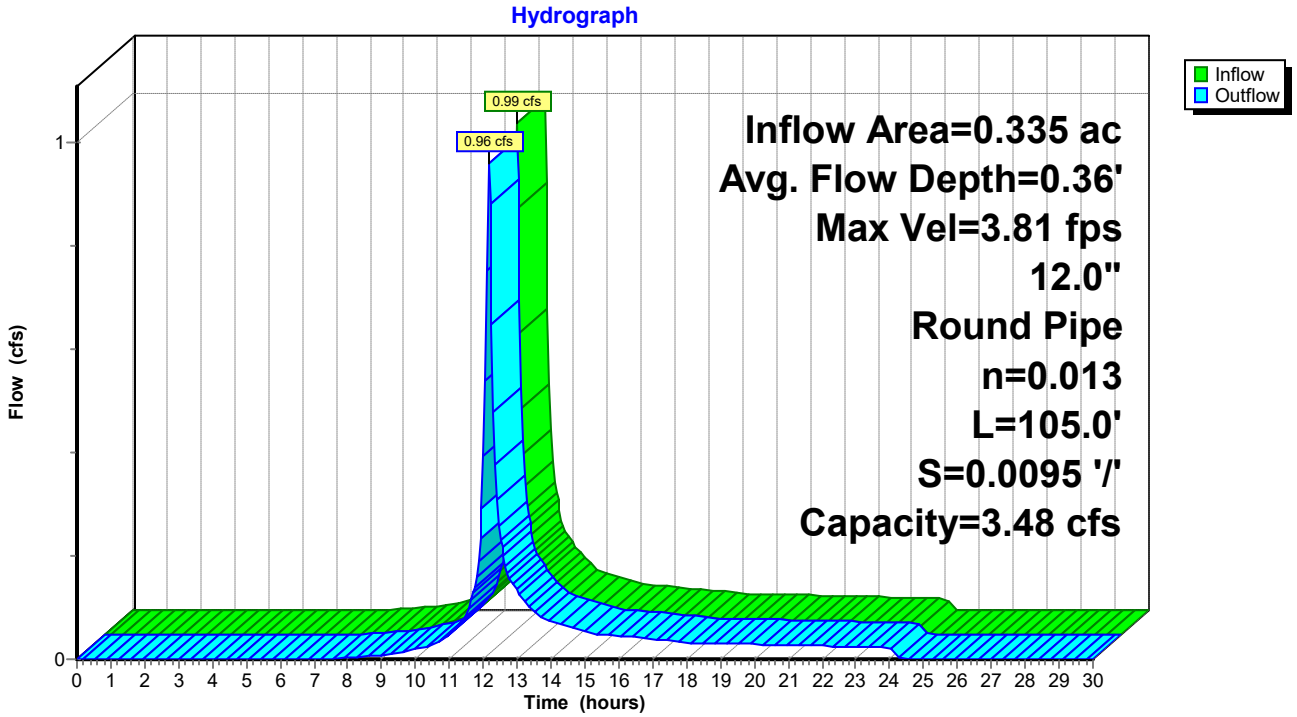
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.81 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 1.2 min

Peak Storage= 27 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.48 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 105.0' Slope= 0.0095 '/'
Inlet Invert= 470.00', Outlet Invert= 469.00'



Reach DCB7: TO DMH#4



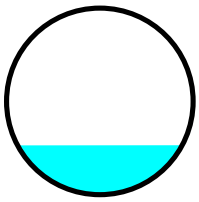
Summary for Reach DCB8: TO DMH#4

Inflow Area = 0.143 ac, 85.54% Impervious, Inflow Depth = 4.62" for 25-Year event
Inflow = 0.69 cfs @ 12.11 hrs, Volume= 0.055 af
Outflow = 0.67 cfs @ 12.12 hrs, Volume= 0.055 af, Atten= 3%, Lag= 0.5 min

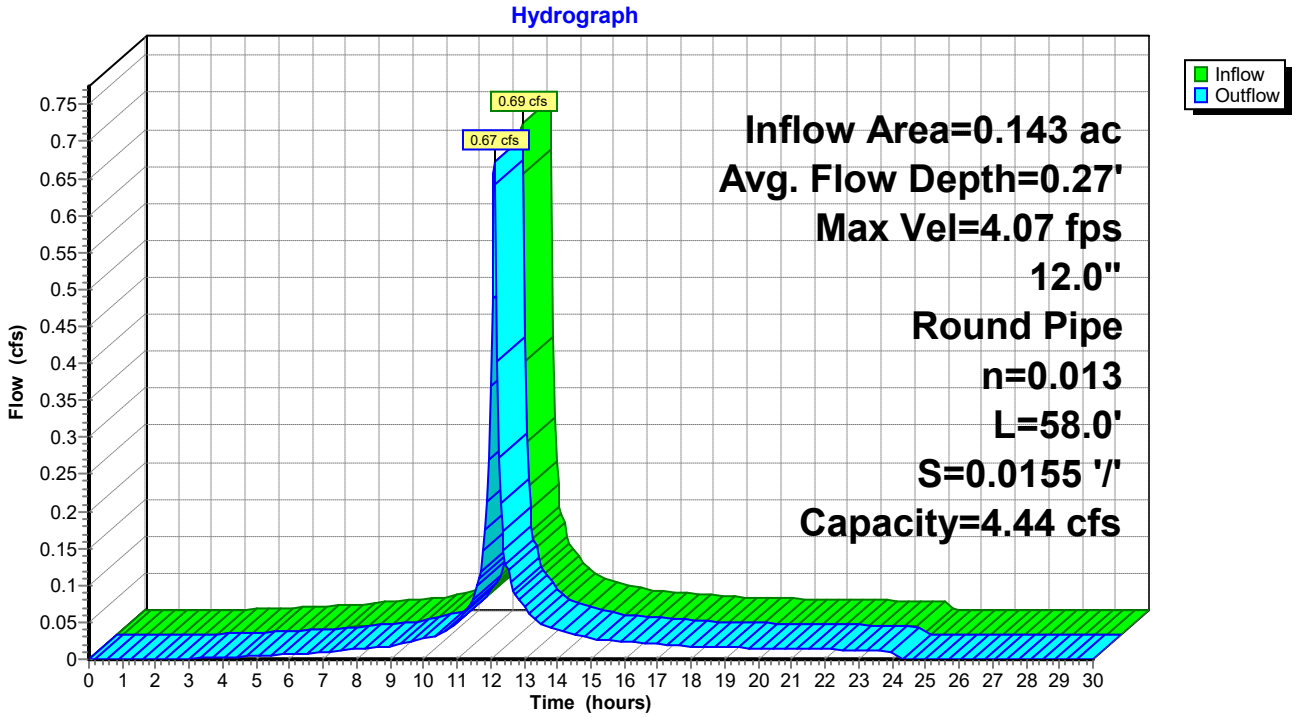
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 0.7 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 58.0' Slope= 0.0155 '/'
Inlet Invert= 469.90', Outlet Invert= 469.00'



Reach DCB8: TO DMH#4



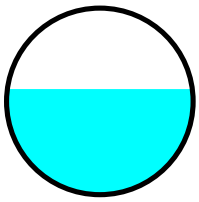
Summary for Reach DCB9: TO DMH#5

Inflow Area = 0.342 ac, 51.34% Impervious, Inflow Depth = 3.28" for 25-Year event
Inflow = 1.24 cfs @ 12.12 hrs, Volume= 0.093 af
Outflow = 1.22 cfs @ 12.13 hrs, Volume= 0.093 af, Atten= 2%, Lag= 0.8 min

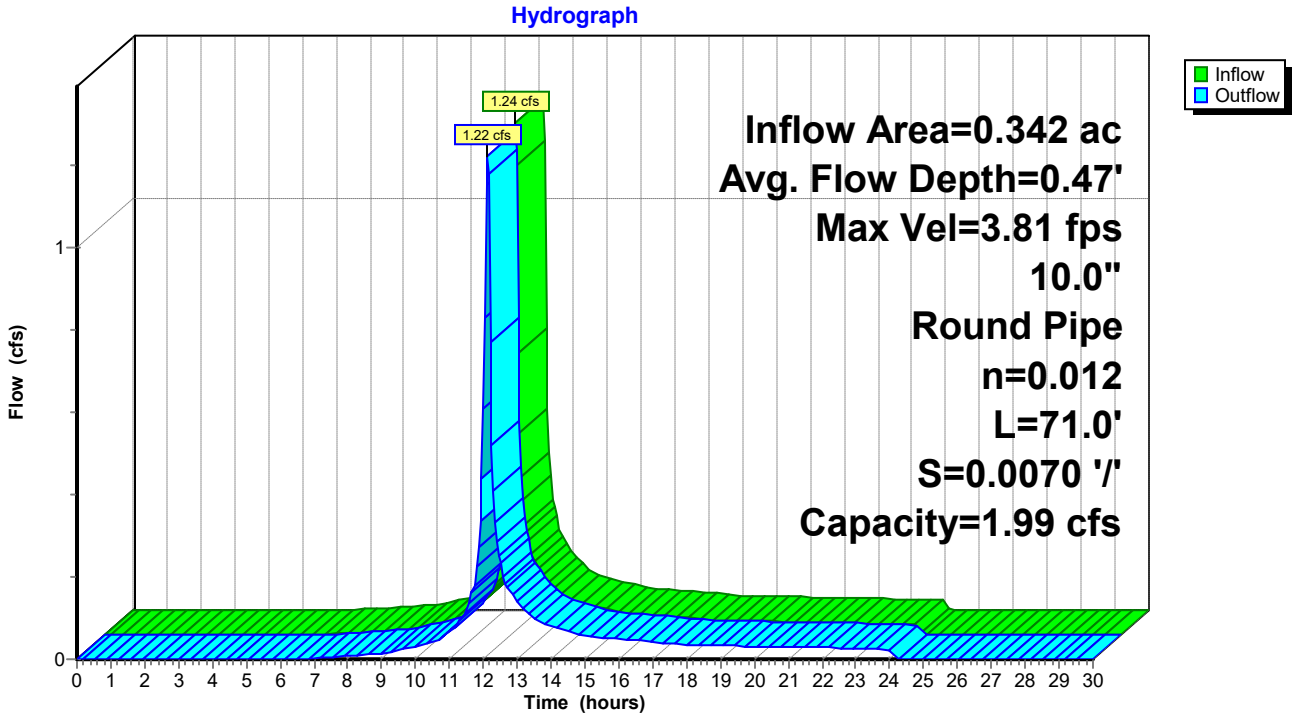
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.81 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 23 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 1.99 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 71.0' Slope= 0.0070 '/'
Inlet Invert= 471.00', Outlet Invert= 470.50'



Reach DCB9: TO DMH#5

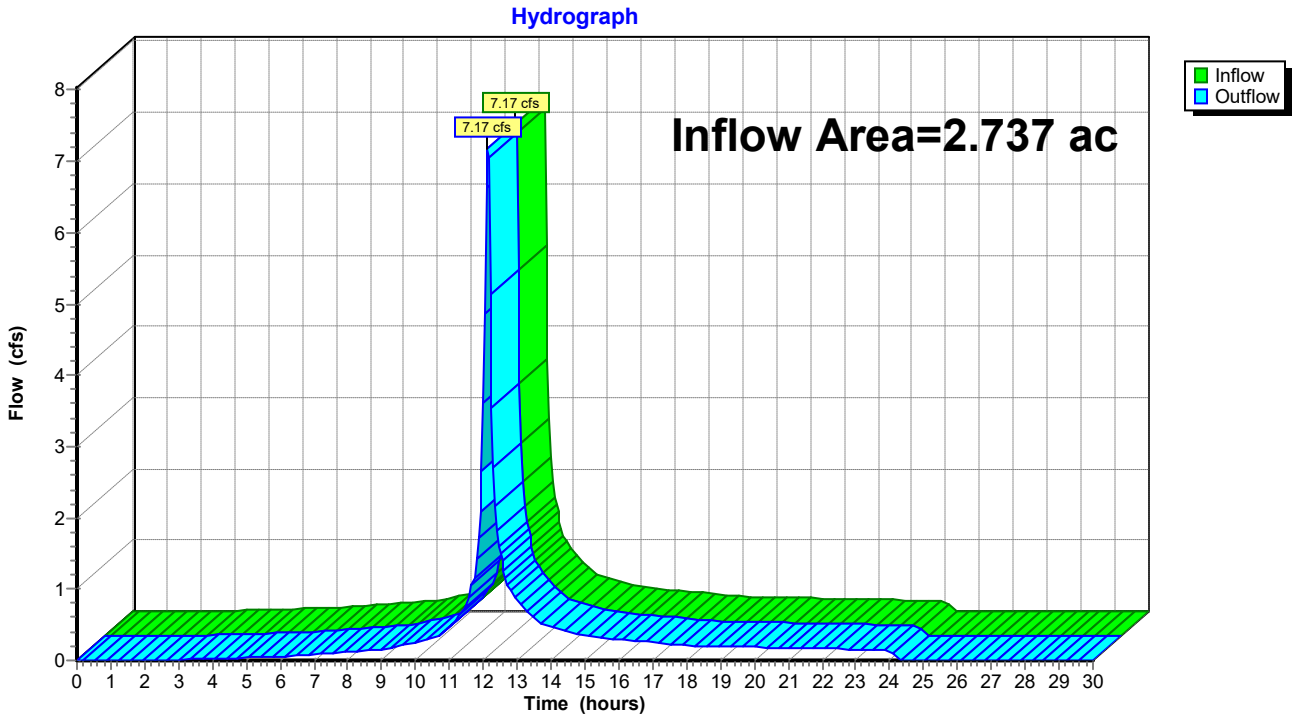


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 2.67" for 25-Year event
Inflow = 7.17 cfs @ 12.13 hrs, Volume= 0.608 af
Outflow = 7.17 cfs @ 12.13 hrs, Volume= 0.608 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

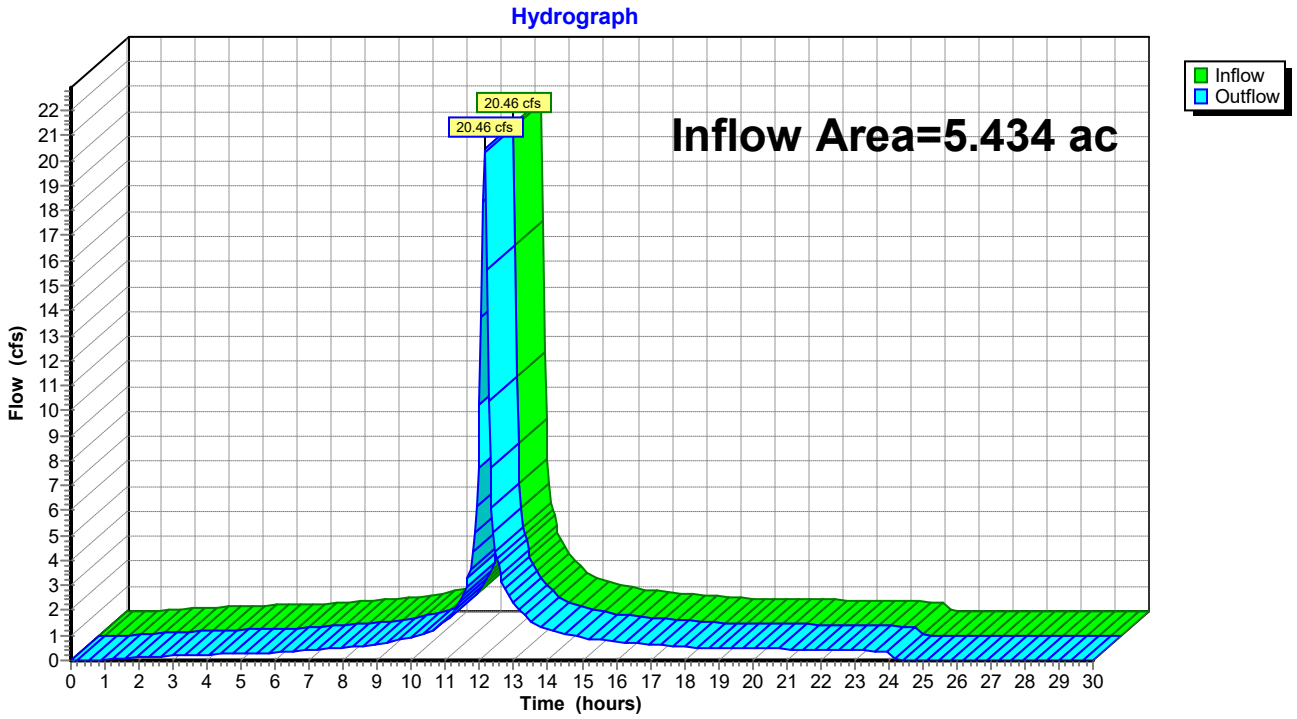


Summary for Reach DMH-C: TO DP#1

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 4.05" for 25-Year event
Inflow = 20.46 cfs @ 12.14 hrs, Volume= 1.834 af
Outflow = 20.46 cfs @ 12.14 hrs, Volume= 1.834 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



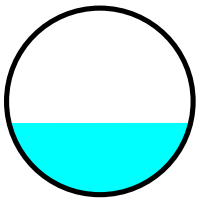
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 4.05" for 25-Year event
Inflow = 20.64 cfs @ 12.14 hrs, Volume= 1.834 af
Outflow = 20.46 cfs @ 12.14 hrs, Volume= 1.834 af, Atten= 1%, Lag= 0.3 min

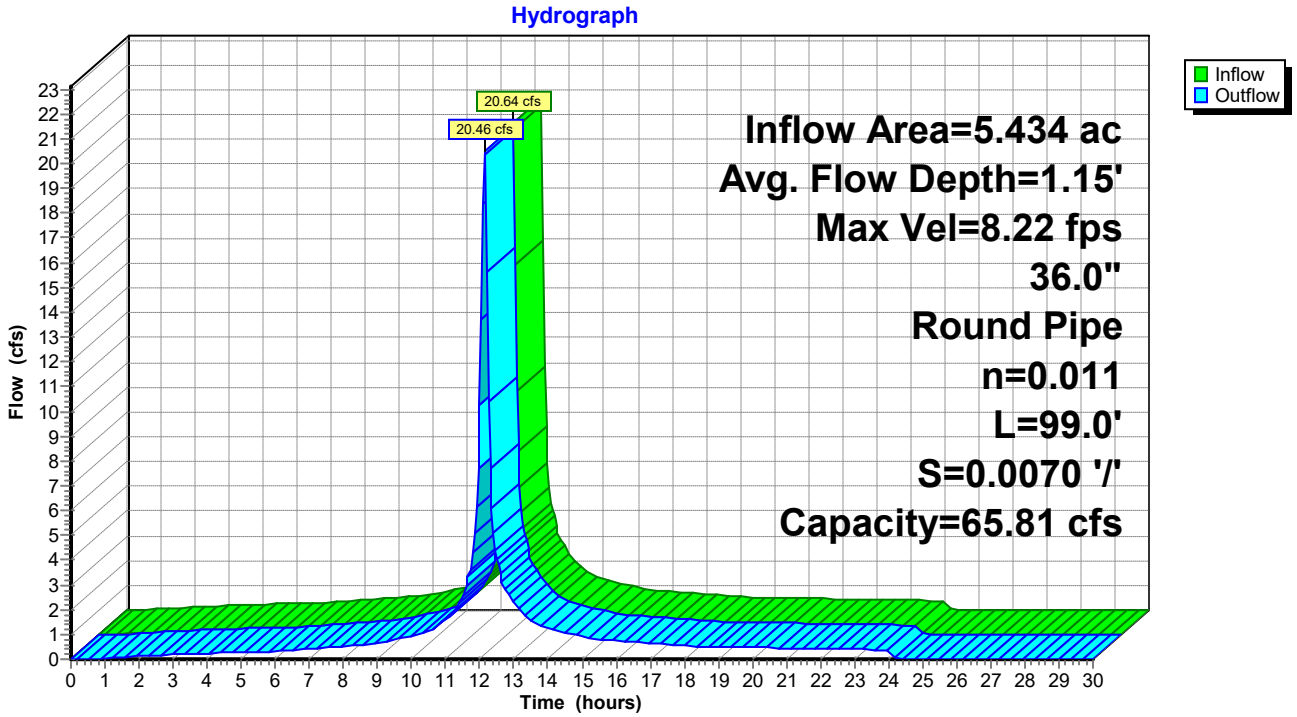
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.22 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.87 fps, Avg. Travel Time= 0.6 min

Peak Storage= 248 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



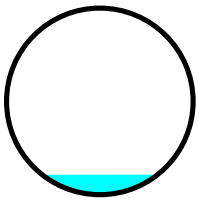
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.315 ac, 77.36% Impervious, Inflow Depth = 4.51" for 25-Year event
Inflow = 1.42 cfs @ 12.13 hrs, Volume= 0.118 af
Outflow = 1.42 cfs @ 12.13 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.2 min

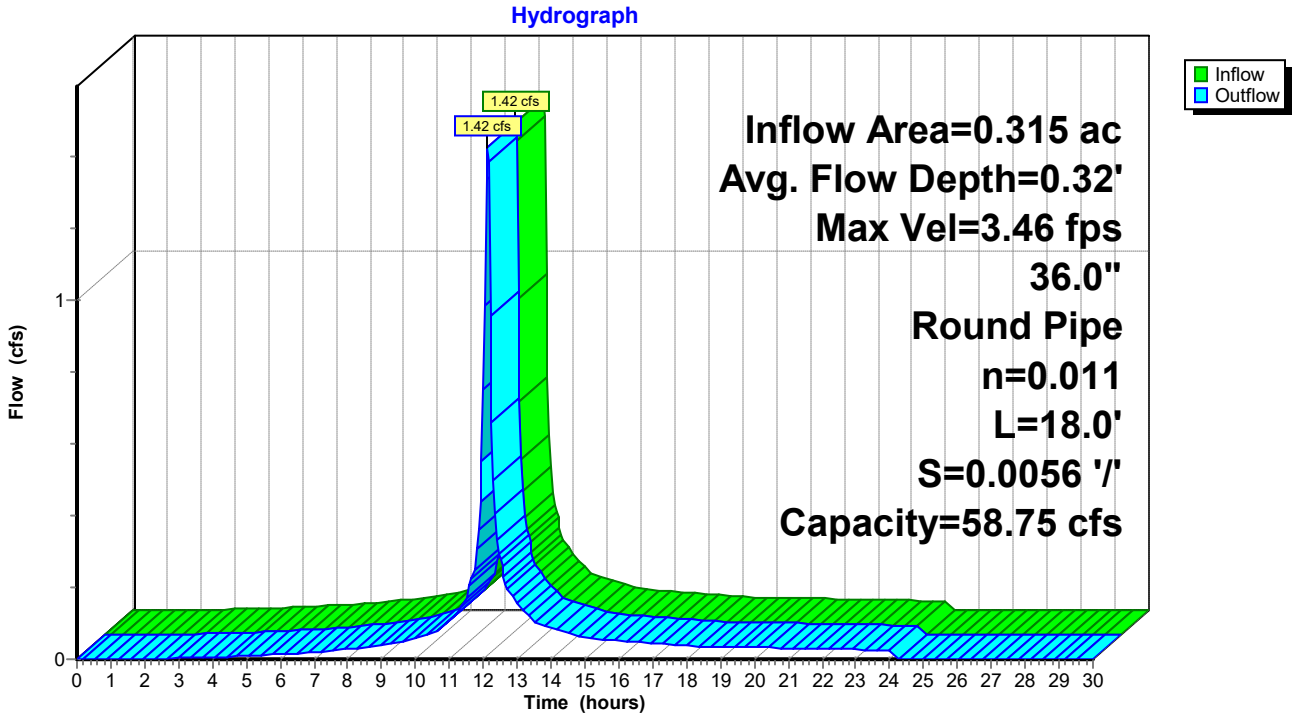
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.75 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 18.0' Slope= 0.0056 '/'
Inlet Invert= 456.57', Outlet Invert= 456.47'



Reach DMH-E: TO DMH-D



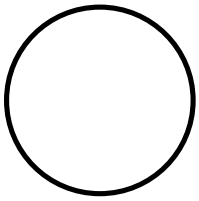
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

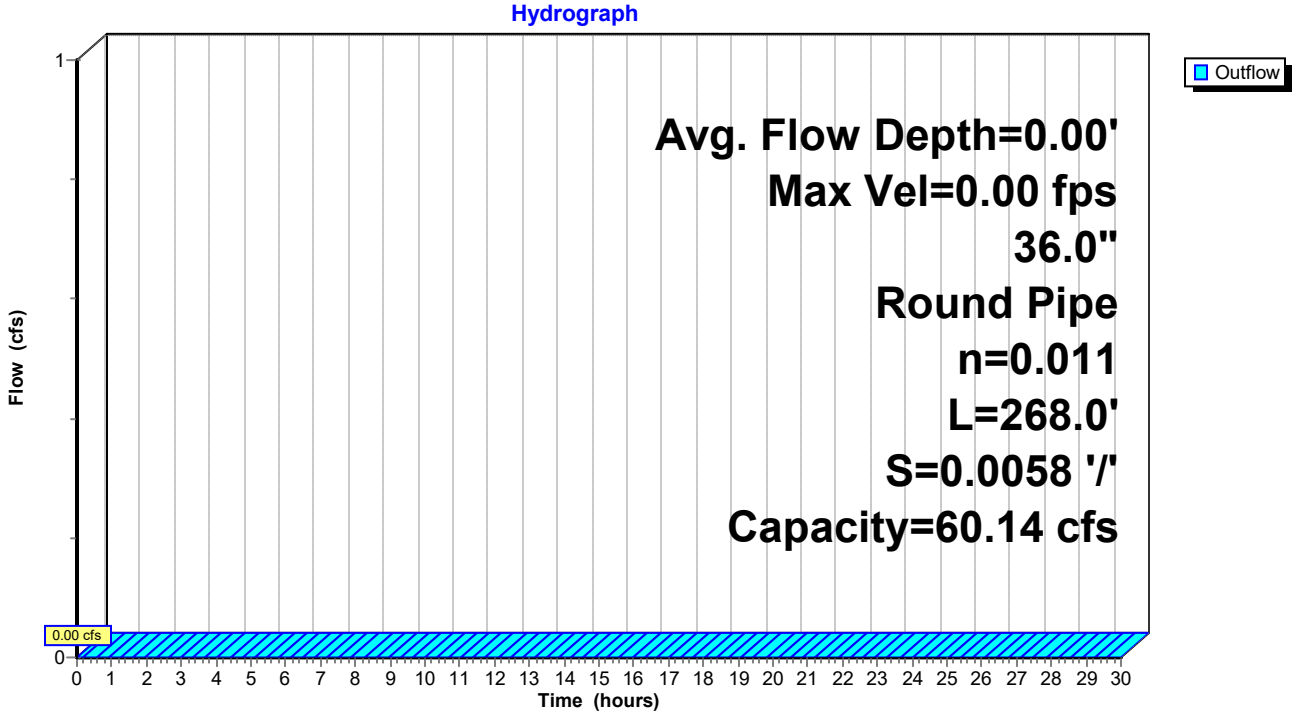
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E



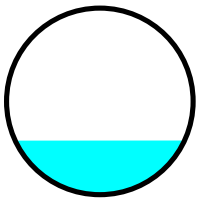
Summary for Reach DMH1: TO DMH#2

Inflow Area = 0.135 ac, 89.85% Impervious, Inflow Depth = 4.99" for 25-Year event
Inflow = 0.66 cfs @ 12.13 hrs, Volume= 0.056 af
Outflow = 0.65 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 1%, Lag= 0.4 min

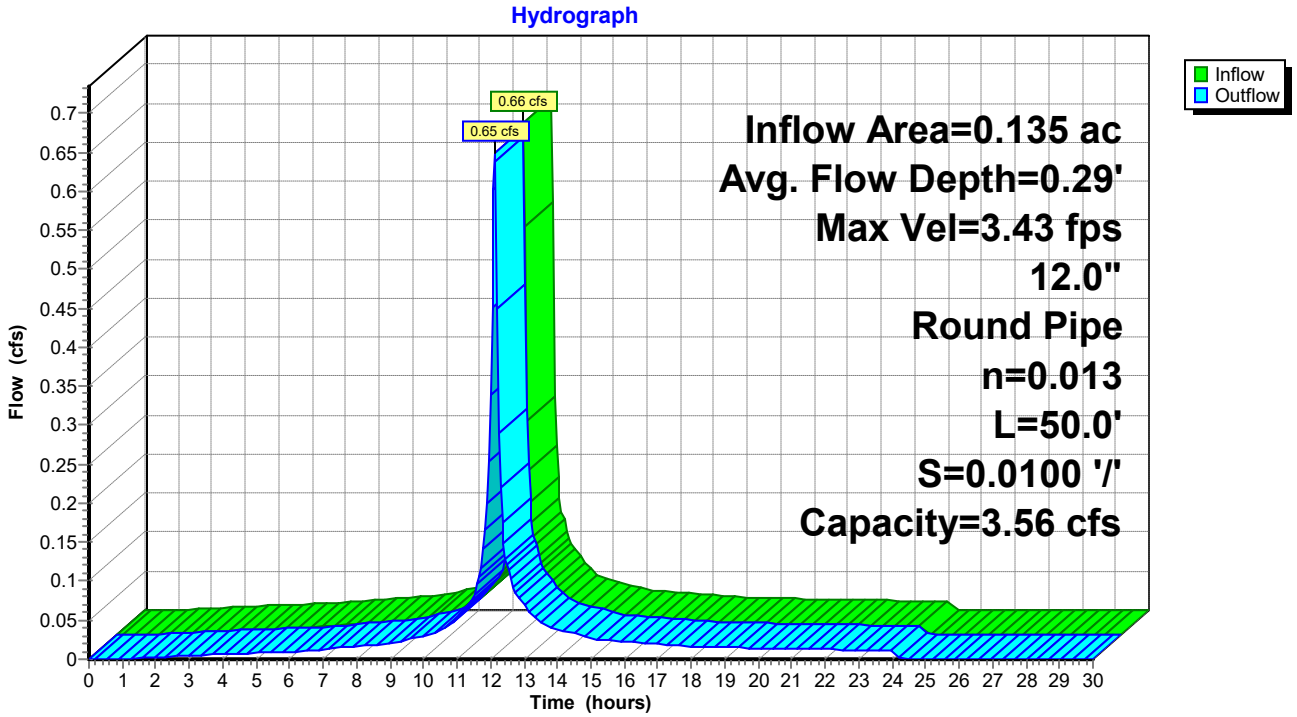
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.43 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.7 min

Peak Storage= 10 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DMH1: TO DMH#2



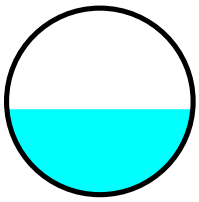
Summary for Reach DMH10: TO CMH#1

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 5.64" for 25-Year event
Inflow = 11.51 cfs @ 12.13 hrs, Volume= 1.050 af
Outflow = 11.49 cfs @ 12.13 hrs, Volume= 1.050 af, Atten= 0%, Lag= 0.1 min

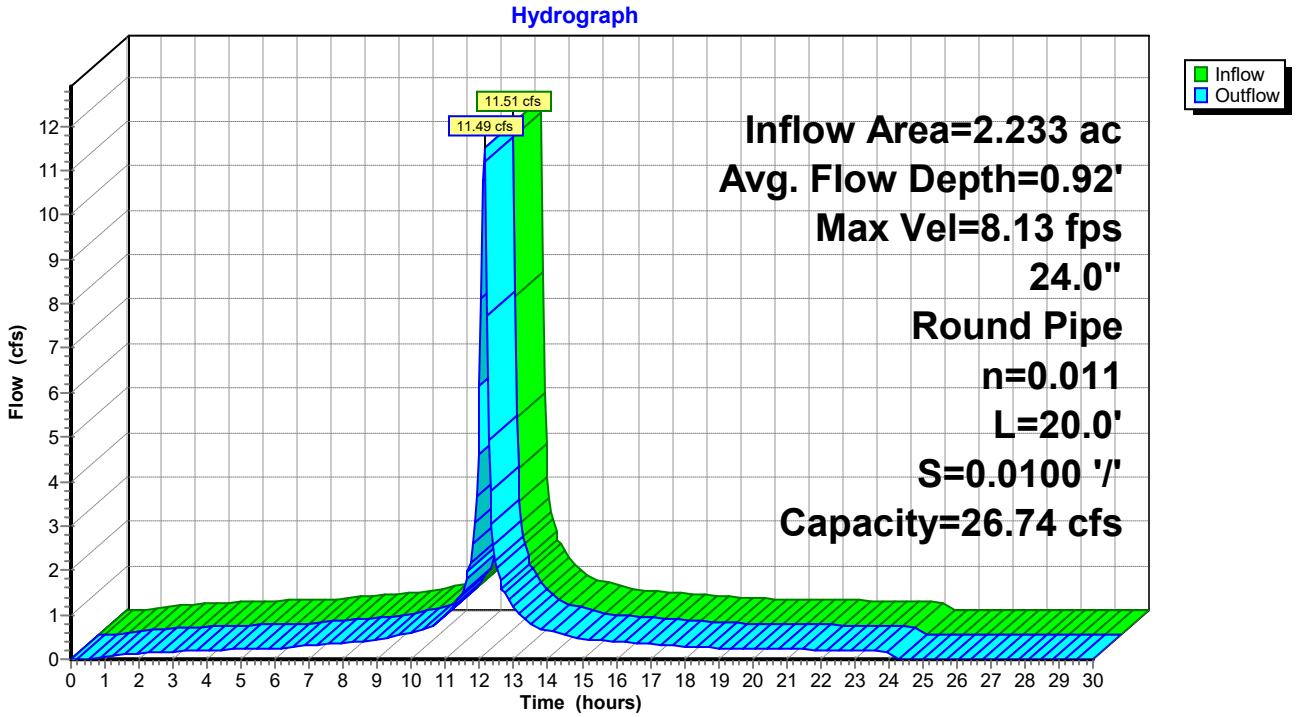
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.13 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.96 fps, Avg. Travel Time= 0.1 min

Peak Storage= 28 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 26.74 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0100 '/'
Inlet Invert= 458.10', Outlet Invert= 457.90'



Reach DMH10: TO CMH#1



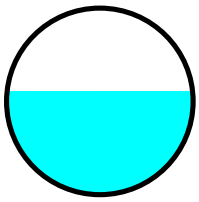
Summary for Reach DMH100: TO DMH-A

Inflow Area = 2.345 ac, 63.28% Impervious, Inflow Depth = 2.42" for 25-Year event
Inflow = 5.55 cfs @ 12.14 hrs, Volume= 0.473 af
Outflow = 5.51 cfs @ 12.14 hrs, Volume= 0.473 af, Atten= 1%, Lag= 0.3 min

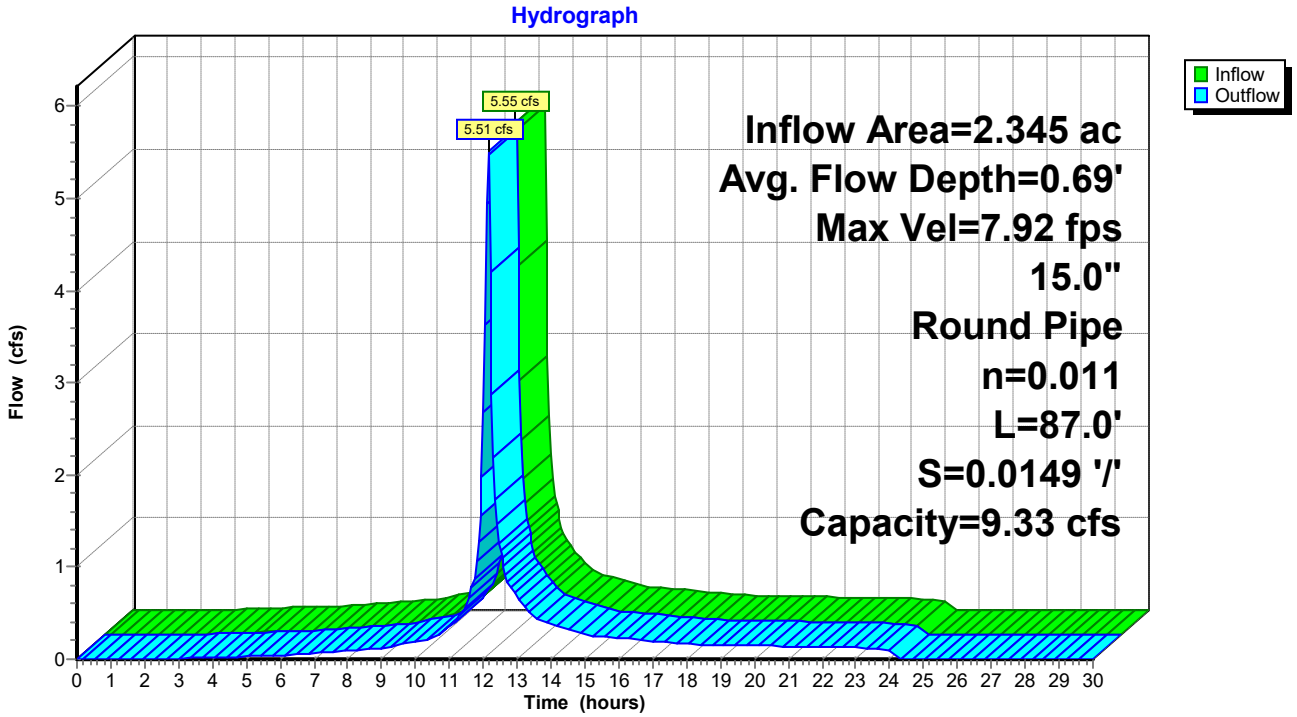
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.92 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.72 fps, Avg. Travel Time= 0.5 min

Peak Storage= 61 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 87.0' Slope= 0.0149 '/'
Inlet Invert= 466.10', Outlet Invert= 464.80'



Reach DMH100: TO DMH-A



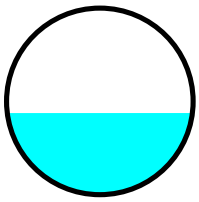
Summary for Reach DMH101: TO DMH#100

Inflow Area = 1.054 ac, 75.70% Impervious, Inflow Depth = 1.68" for 25-Year event
Inflow = 1.85 cfs @ 12.12 hrs, Volume= 0.147 af
Outflow = 1.81 cfs @ 12.12 hrs, Volume= 0.147 af, Atten= 2%, Lag= 0.6 min

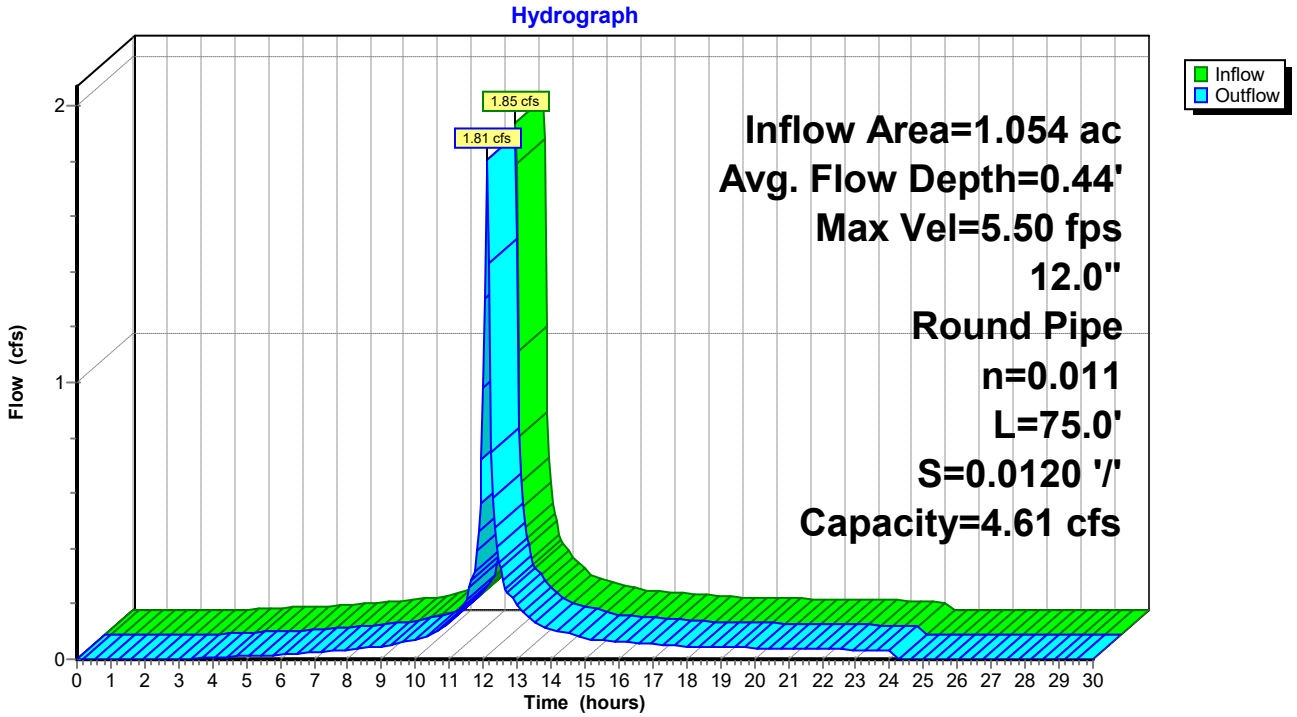
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.50 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 0.6 min

Peak Storage= 25 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 75.0' Slope= 0.0120 '/'
Inlet Invert= 467.10', Outlet Invert= 466.20'



Reach DMH101: TO DMH#100



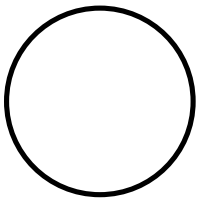
Summary for Reach DMH102: TO DMH#101

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.00" for 25-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

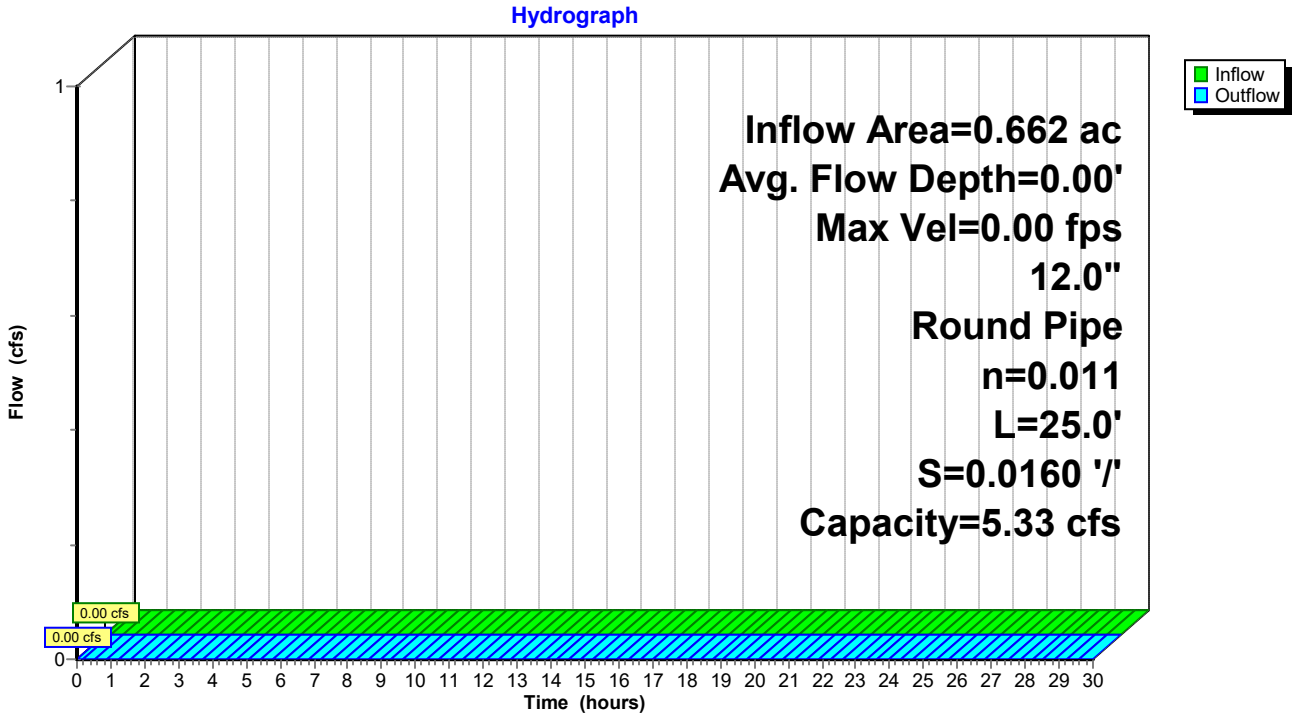
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.33 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0160 '/'
Inlet Invert= 467.60', Outlet Invert= 467.20'



Reach DMH102: TO DMH#101



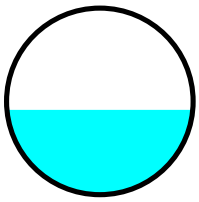
Summary for Reach DMH2: TO DMH#100

Inflow Area = 0.412 ac, 88.63% Impervious, Inflow Depth = 4.88" for 25-Year event
Inflow = 1.98 cfs @ 12.12 hrs, Volume= 0.167 af
Outflow = 1.99 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.3 min

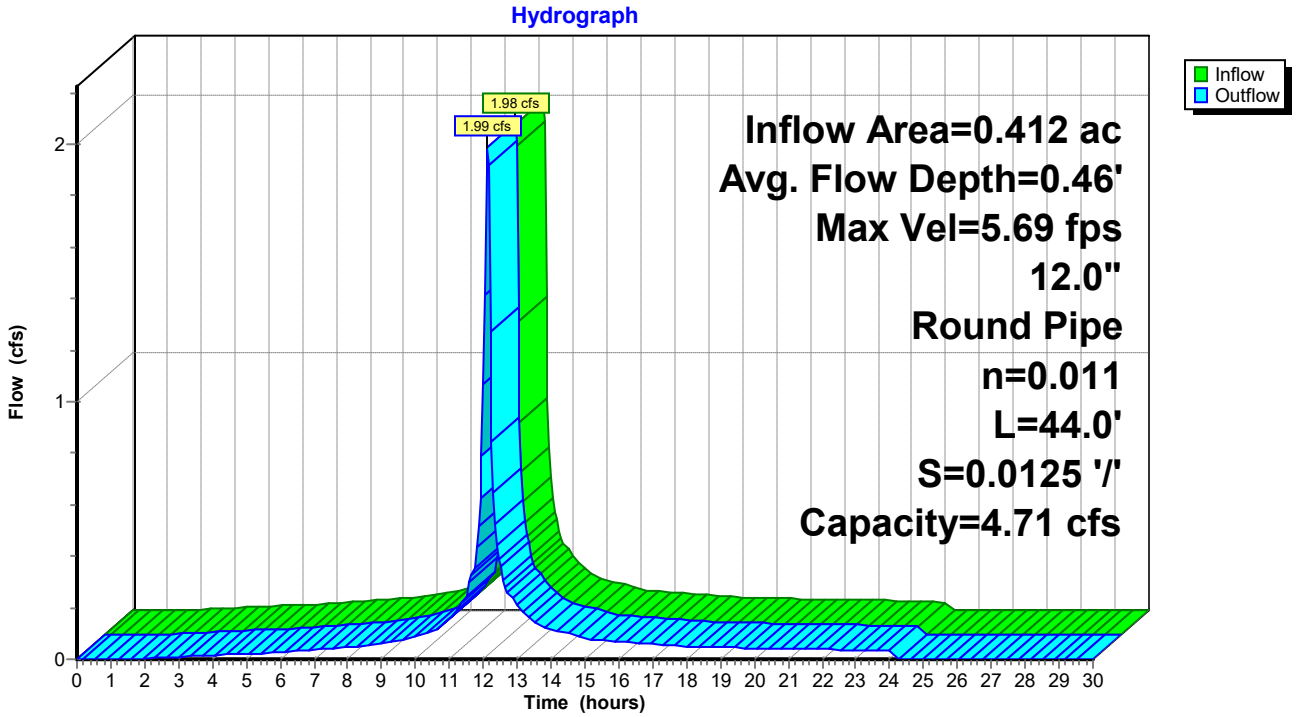
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.69 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 0.4 min

Peak Storage= 15 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.71 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 44.0' Slope= 0.0125 '/'
Inlet Invert= 466.75', Outlet Invert= 466.20'



Reach DMH2: TO DMH#100



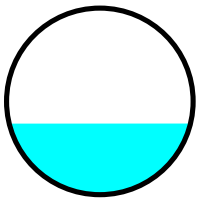
Summary for Reach DMH3: TO UGS#1A

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 3.81" for 25-Year event
Inflow = 2.47 cfs @ 12.14 hrs, Volume= 0.210 af
Outflow = 2.47 cfs @ 12.14 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min

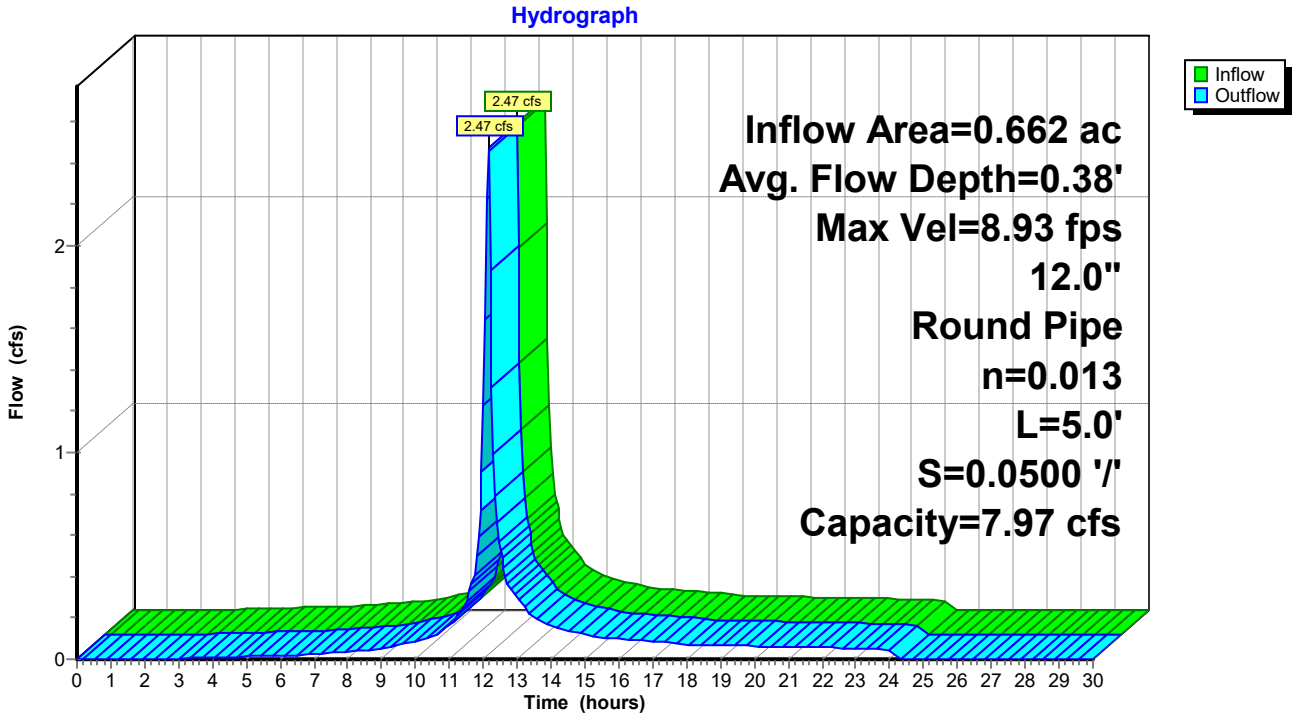
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.93 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.09 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.97 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 468.25', Outlet Invert= 468.00'



Reach DMH3: TO UGS#1A



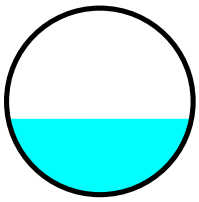
Summary for Reach DMH4: TO DMH#3

Inflow Area = 0.478 ac, 64.87% Impervious, Inflow Depth = 3.41" for 25-Year event
Inflow = 1.60 cfs @ 12.14 hrs, Volume= 0.136 af
Outflow = 1.59 cfs @ 12.15 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.1 min

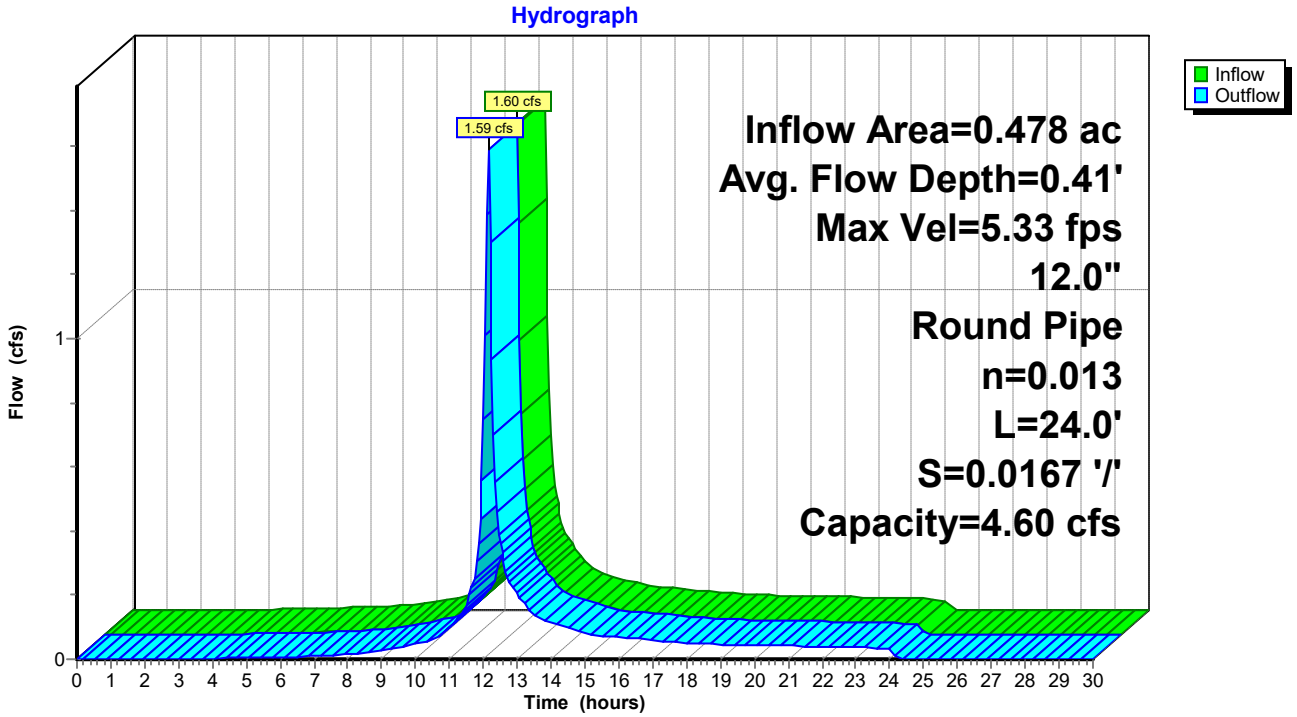
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.33 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0167 '/'
Inlet Invert= 468.90', Outlet Invert= 468.50'



Reach DMH4: TO DMH#3



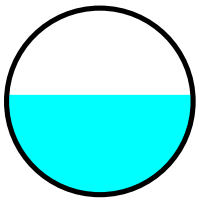
Summary for Reach DMH5: TO DMH#6

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 2.16" for 25-Year event
Inflow = 1.90 cfs @ 12.14 hrs, Volume= 0.158 af
Outflow = 1.86 cfs @ 12.15 hrs, Volume= 0.158 af, Atten= 2%, Lag= 0.5 min

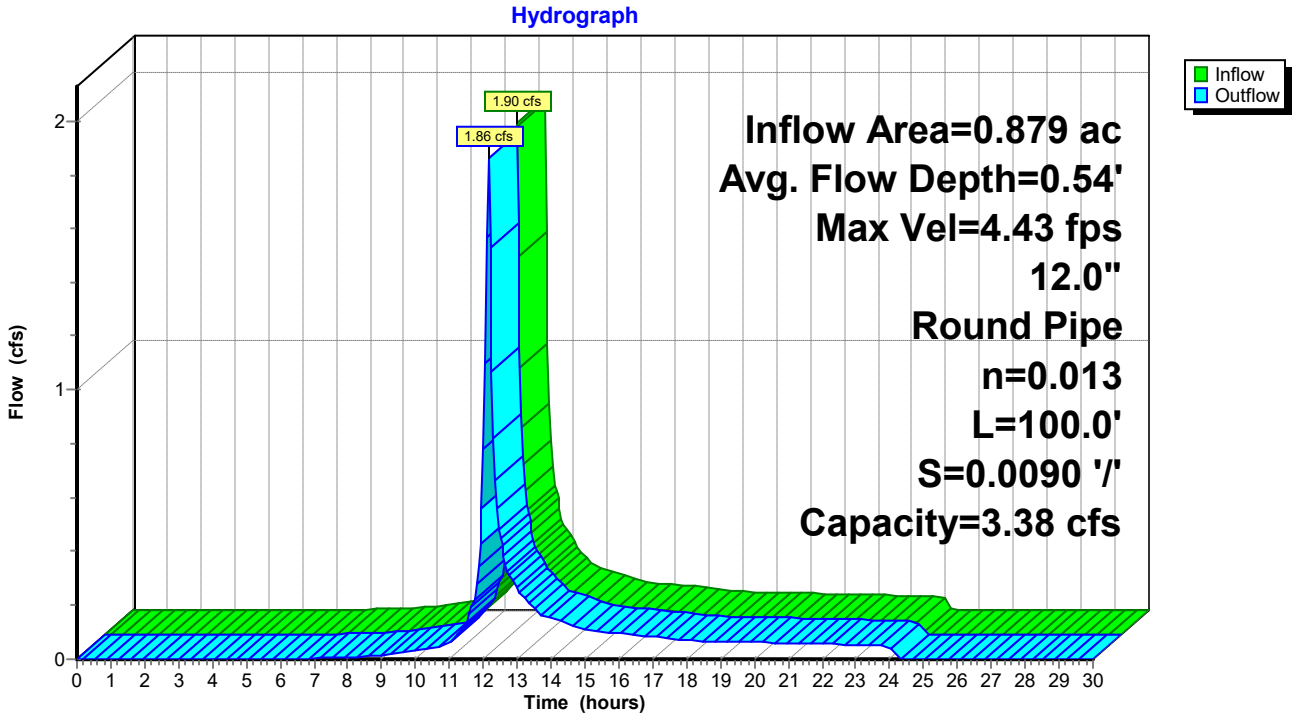
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.43 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 1.0 min

Peak Storage= 43 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.38 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 100.0' Slope= 0.0090 '/'
Inlet Invert= 470.30', Outlet Invert= 469.40'



Reach DMH5: TO DMH#6



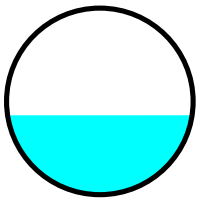
Summary for Reach DMH6: TO DMH#7

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 2.16" for 25-Year event
Inflow = 1.86 cfs @ 12.15 hrs, Volume= 0.158 af
Outflow = 1.85 cfs @ 12.15 hrs, Volume= 0.158 af, Atten= 1%, Lag= 0.2 min

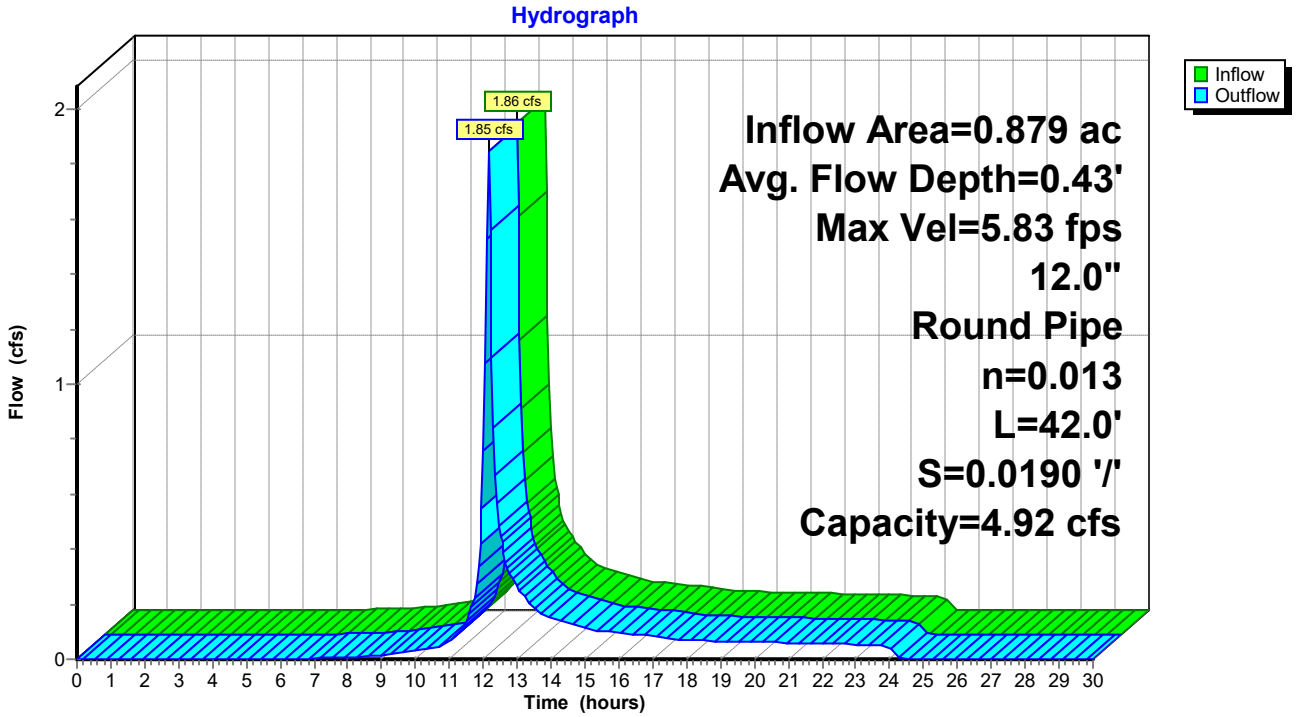
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.18 fps, Avg. Travel Time= 0.3 min

Peak Storage= 13 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.92 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 42.0' Slope= 0.0190 '/'
Inlet Invert= 469.30', Outlet Invert= 468.50'



Reach DMH6: TO DMH#7



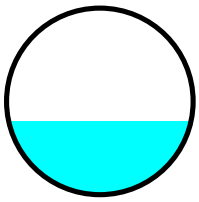
Summary for Reach DMH7: TO DMH#100

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 2.16" for 25-Year event
Inflow = 1.85 cfs @ 12.15 hrs, Volume= 0.158 af
Outflow = 1.81 cfs @ 12.16 hrs, Volume= 0.158 af, Atten= 2%, Lag= 0.4 min

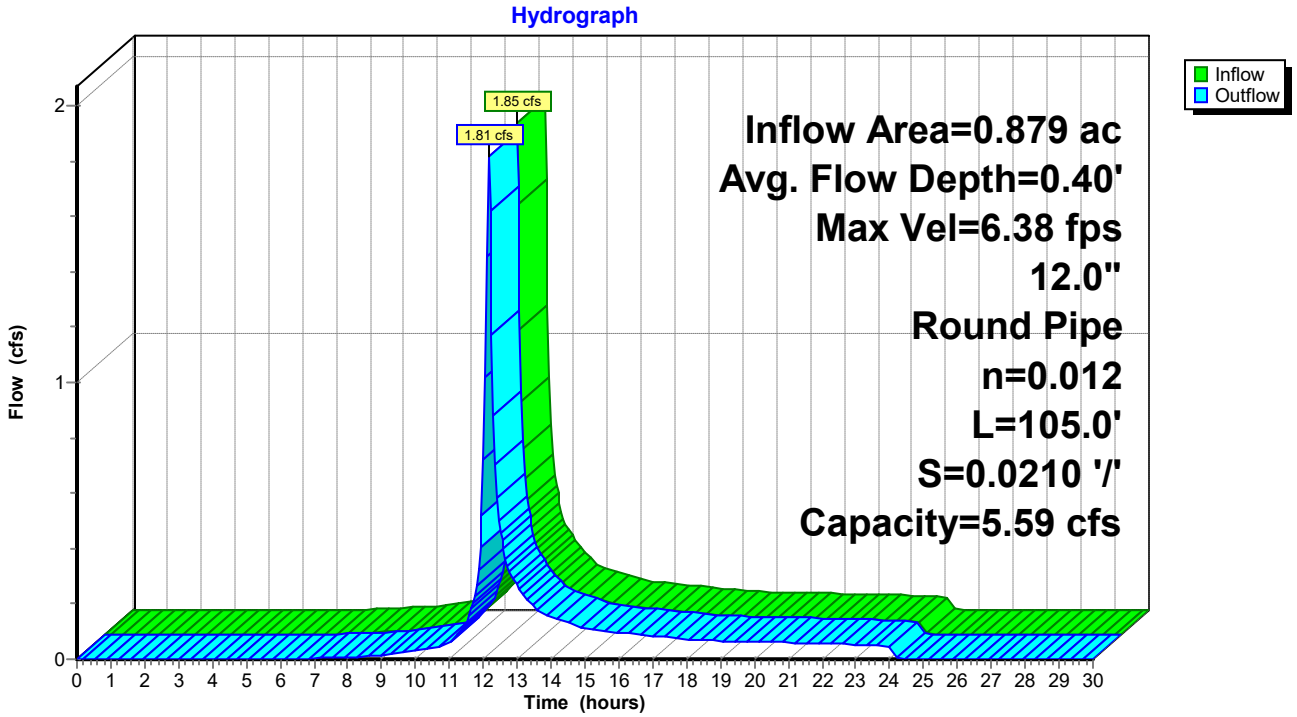
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.38 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.38 fps, Avg. Travel Time= 0.7 min

Peak Storage= 30 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.59 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 105.0' Slope= 0.0210 '/'
Inlet Invert= 468.40', Outlet Invert= 466.20'



Reach DMH7: TO DMH#100



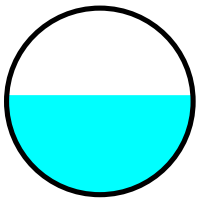
Summary for Reach DMH9: TO DMH#10

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 5.64" for 25-Year event
Inflow = 11.89 cfs @ 12.11 hrs, Volume= 1.050 af
Outflow = 11.51 cfs @ 12.13 hrs, Volume= 1.050 af, Atten= 3%, Lag= 1.1 min

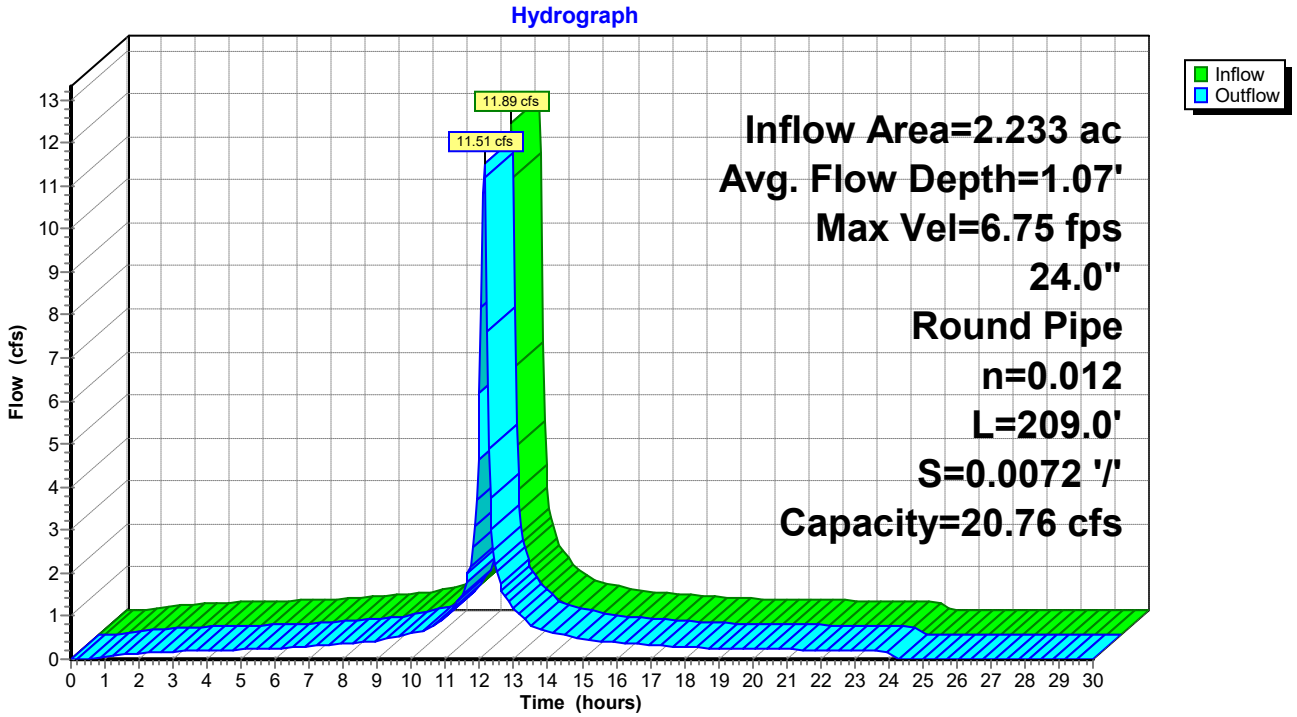
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.75 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.48 fps, Avg. Travel Time= 1.4 min

Peak Storage= 357 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.07'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 20.76 cfs

24.0" Round Pipe
n= 0.012 Steel, smooth
Length= 209.0' Slope= 0.0072 '/'
Inlet Invert= 459.70', Outlet Invert= 458.20'



Reach DMH9: TO DMH#10

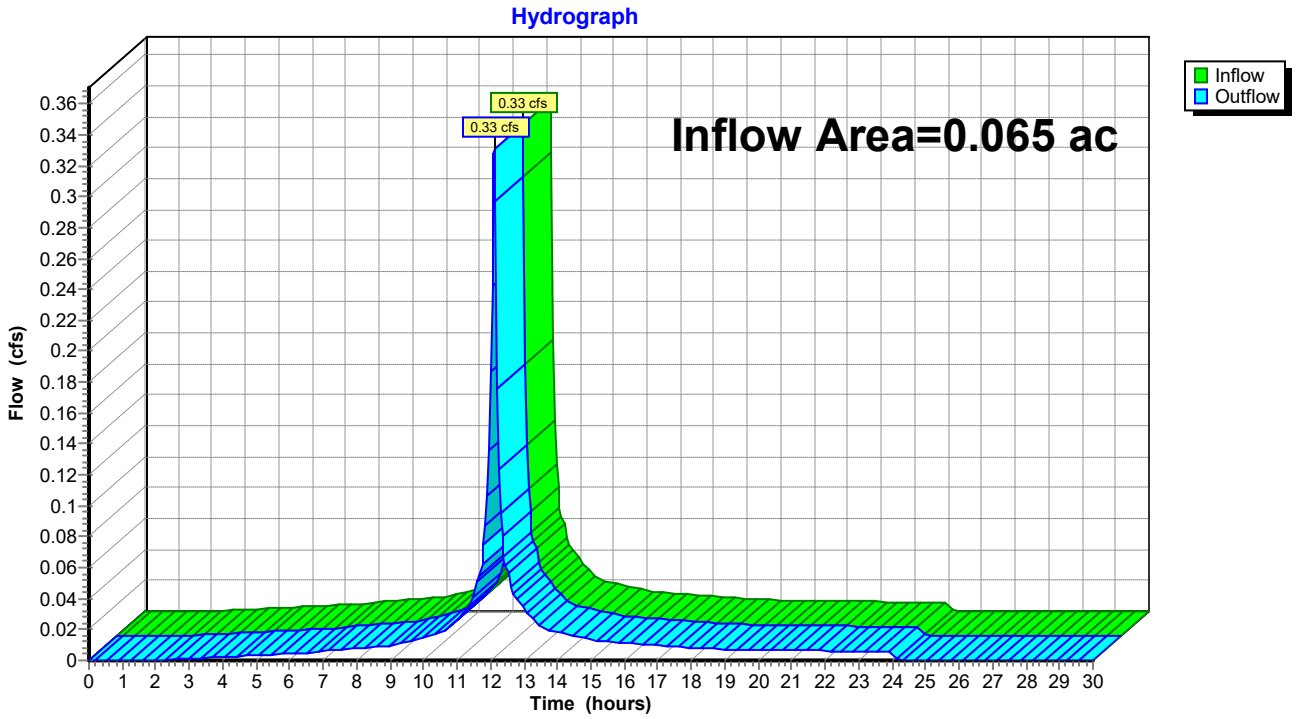


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 4.95" for 25-Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af
Outflow = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

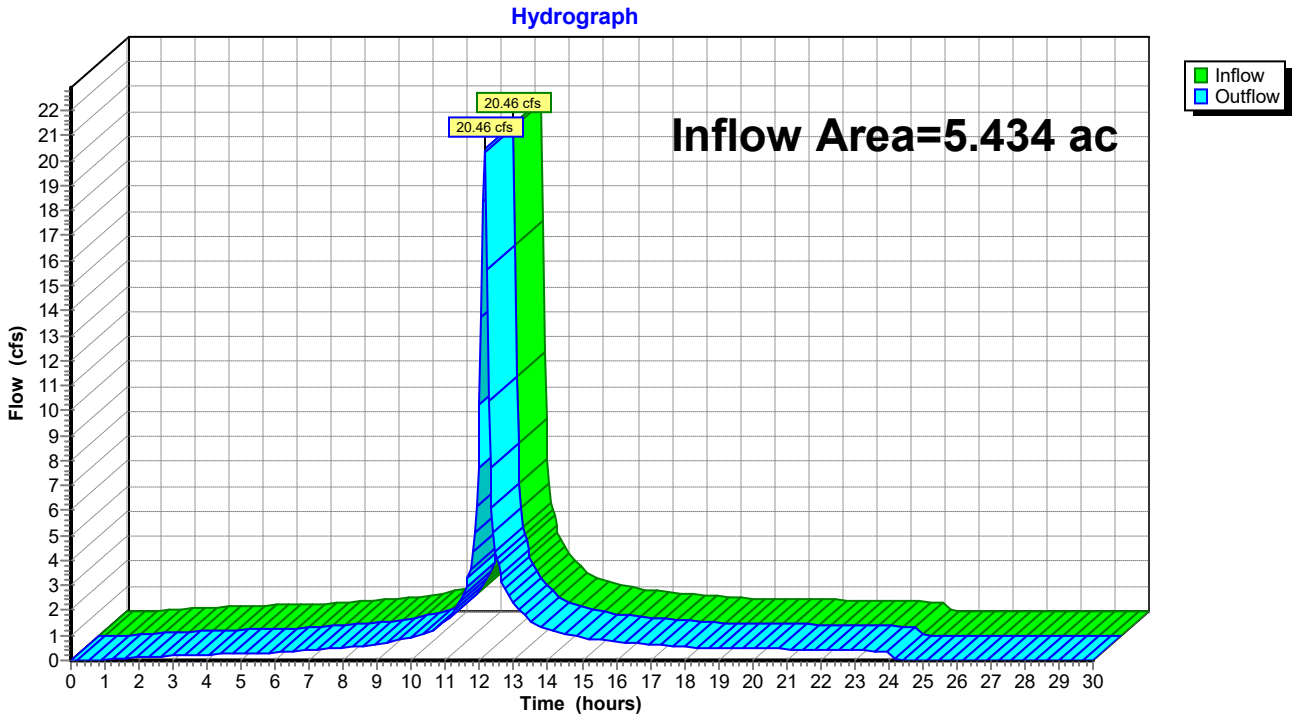


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 4.05" for 25-Year event
Inflow = 20.46 cfs @ 12.14 hrs, Volume= 1.834 af
Outflow = 20.46 cfs @ 12.14 hrs, Volume= 1.834 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

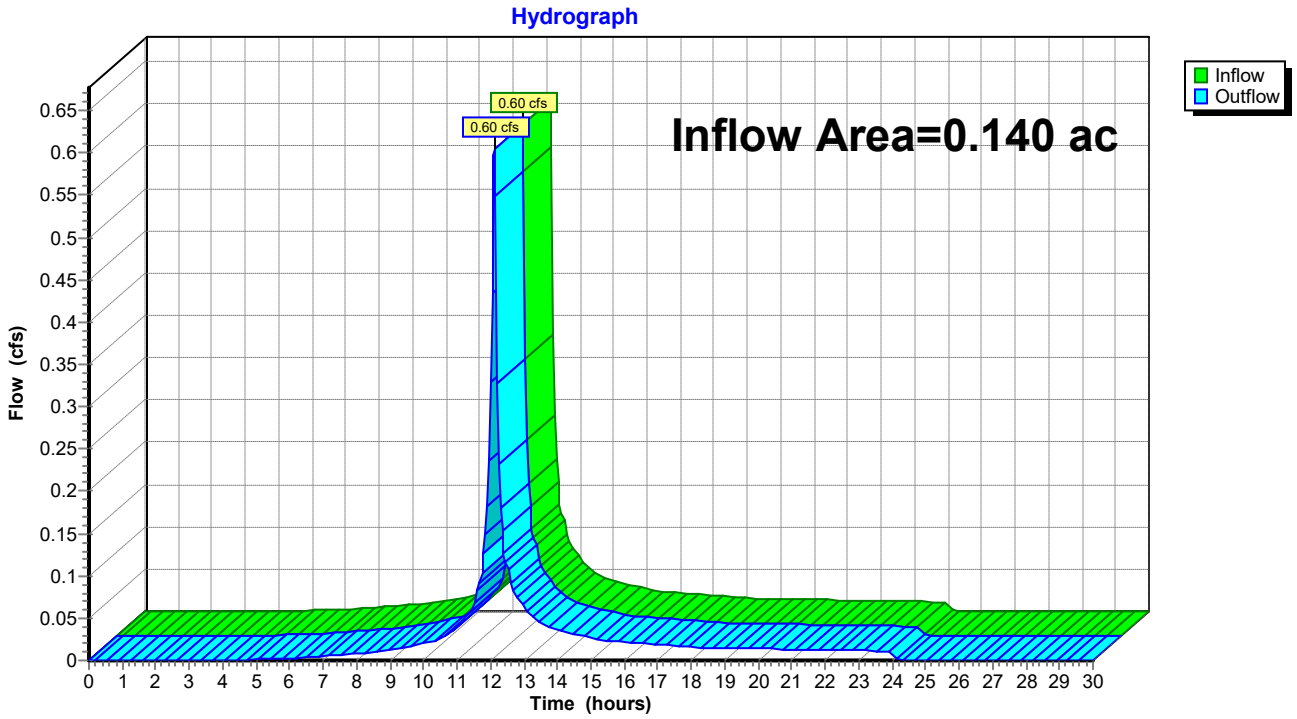


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.140 ac, 75.40% Impervious, Inflow Depth = 3.98" for 25-Year event
Inflow = 0.60 cfs @ 12.11 hrs, Volume= 0.046 af
Outflow = 0.60 cfs @ 12.11 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

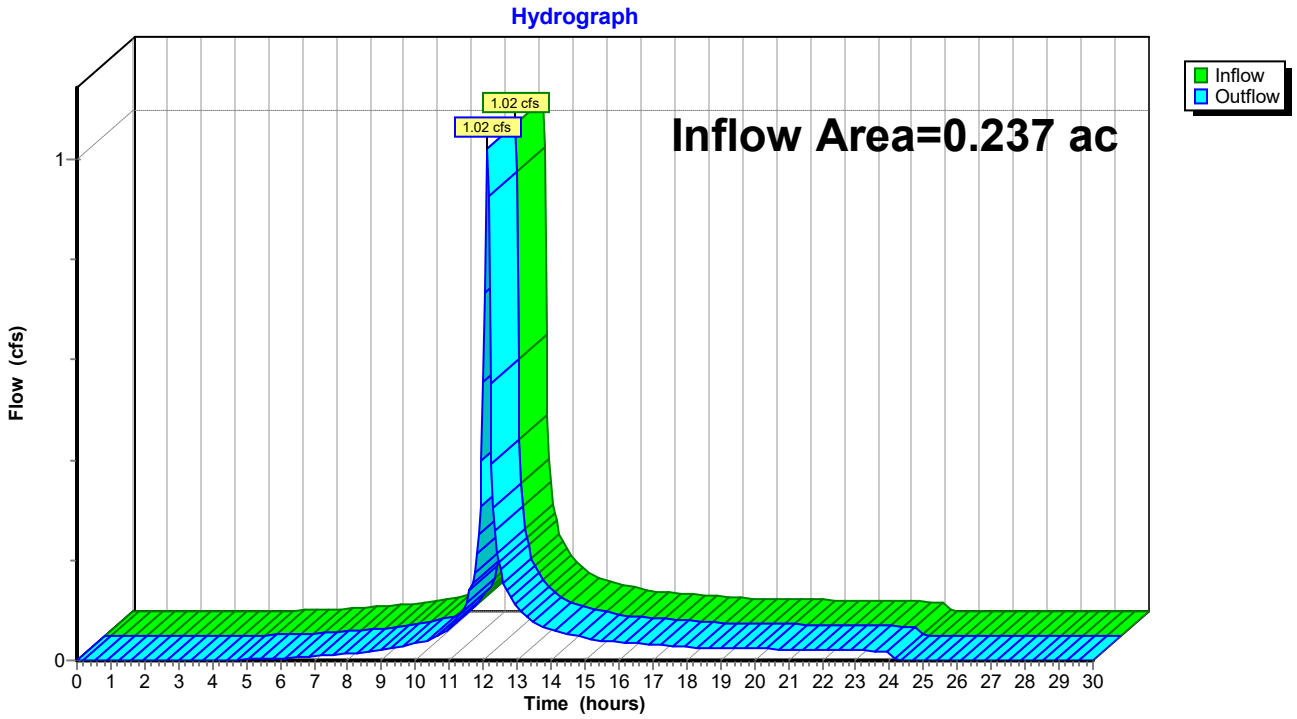


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.237 ac, 74.63% Impervious, Inflow Depth = 3.98" for 25-Year event
Inflow = 1.02 cfs @ 12.11 hrs, Volume= 0.079 af
Outflow = 1.02 cfs @ 12.11 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

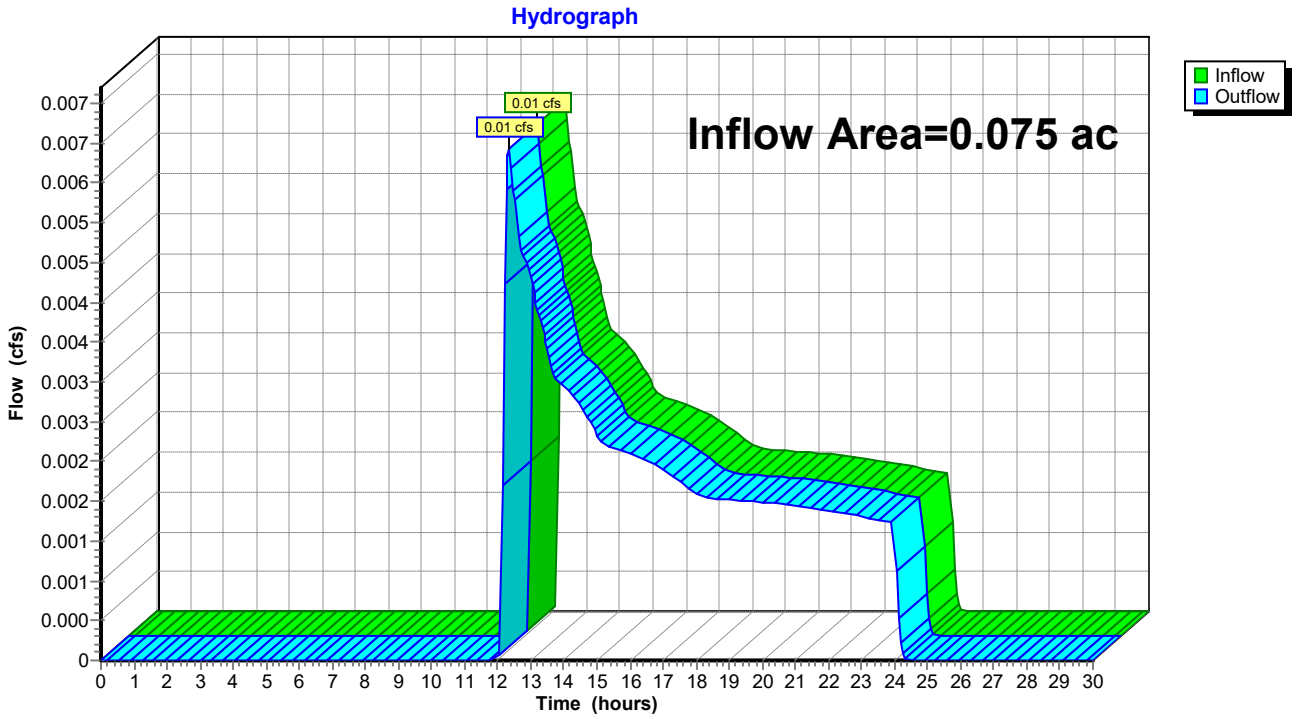


Summary for Reach DP5: DCB-H

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth = 0.41" for 25-Year event
Inflow = 0.01 cfs @ 12.34 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 12.34 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H



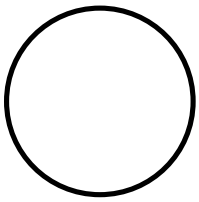
Summary for Reach UGS1B: TO DMH#102

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.00" for 25-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

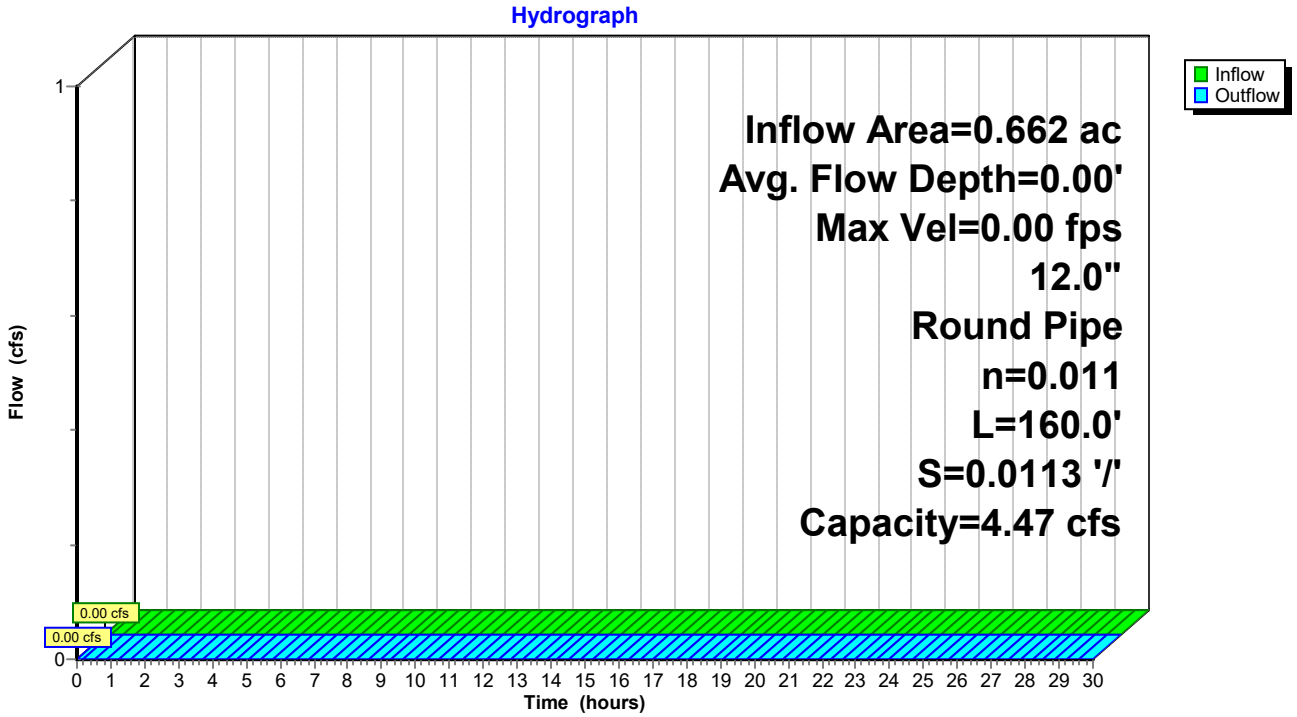
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.47 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 160.0' Slope= 0.0113 '/'
Inlet Invert= 469.50', Outlet Invert= 467.70'



Reach UGS1B: TO DMH#102



Summary for Pond DMH-B: TO DMH-D

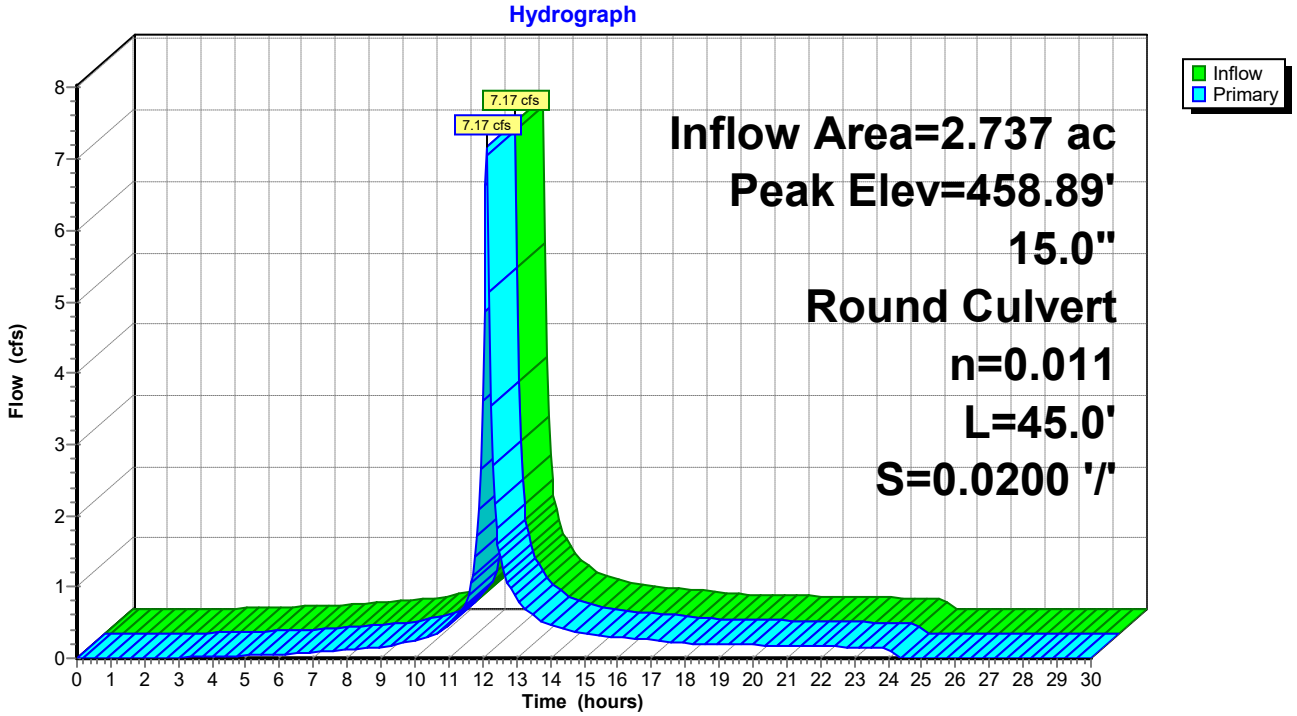
Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 2.67" for 25-Year event
Inflow = 7.17 cfs @ 12.13 hrs, Volume= 0.608 af
Outflow = 7.17 cfs @ 12.13 hrs, Volume= 0.608 af, Atten= 0%, Lag= 0.0 min
Primary = 7.17 cfs @ 12.13 hrs, Volume= 0.608 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 458.89' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=6.92 cfs @ 12.13 hrs HW=458.80' (Free Discharge)
└**1=Culvert** (Inlet Controls 6.92 cfs @ 5.64 fps)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO UGS#1B

Inflow Area =	0.662 ac, 71.10% Impervious, Inflow Depth = 3.81" for 25-Year event				
Inflow =	2.47 cfs @	12.14 hrs,	Volume=	0.210 af	
Outflow =	0.18 cfs @	13.72 hrs,	Volume=	0.210 af,	Atten= 93%, Lag= 94.9 min
Discarded =	0.18 cfs @	13.72 hrs,	Volume=	0.210 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 468.68' @ 13.72 hrs Surf.Area= 0.056 ac Storage= 0.081 af

Plug-Flow detention time= 184.0 min calculated for 0.210 af (100% of inflow)
Center-of-Mass det. time= 183.8 min (1,005.7 - 821.9)

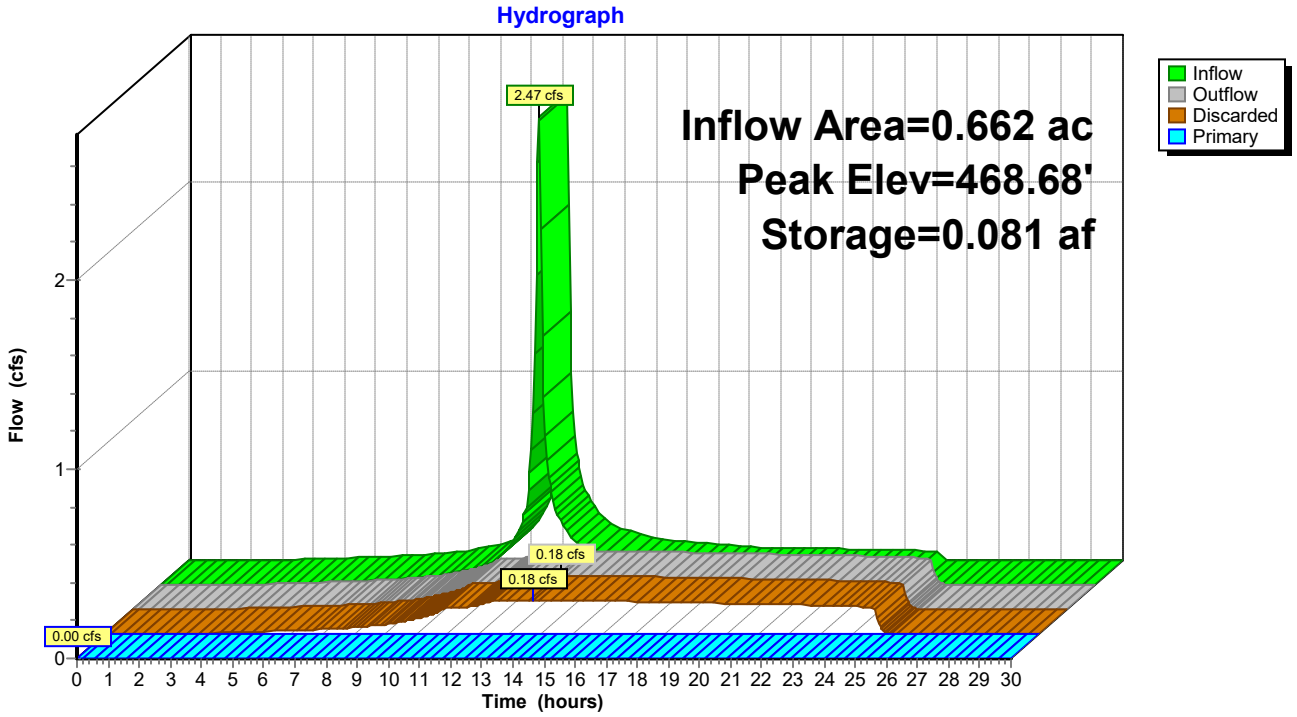
Volume	Invert	Avail.Storage	Storage Description
#1	466.70'	0.083 af	**36.00'W x 68.00'L x 6.00'H Prismatoid** 0.337 af Overall - 0.129 af Embedded = 0.208 af x 40.0% Voids
#2	467.40'	0.129 af	**ADS_StormTech MC-3500 c +Cap** x 49 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 49 Chambers in 7 Rows Cap Storage= +15.6 cf x 2 x 7 rows = 218.4 cf
		0.212 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	466.70'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'
#2	Primary	469.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.18 cfs @ 13.72 hrs HW=468.68' (Free Discharge)
└─**1=Exfiltration** (Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=466.70' (Free Discharge)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond UGS1: TO UGS#1B



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P100B: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=8.10"
Tc=5.0 min CN=98 Runoff=8.45 cfs 0.754 af

Subcatchment P100C: TO ROOF DRAIN Runoff Area=48,639 sf 100.00% Impervious Runoff Depth=8.10"
Tc=5.0 min CN=98 Runoff=8.45 cfs 0.754 af

Subcatchment P101: TO DCB#1 Runoff Area=5,154 sf 82.42% Impervious Runoff Depth=6.90"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=88 Runoff=0.84 cfs 0.068 af

Subcatchment P102: TO DCB#2 Runoff Area=3,847 sf 96.05% Impervious Runoff Depth=7.86"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=96 Runoff=0.66 cfs 0.058 af

Subcatchment P103: TO DCB#3 Runoff Area=6,905 sf 92.22% Impervious Runoff Depth=7.50"
Flow Length=70' Slope=0.0150 '/' Tc=5.0 min CN=93 Runoff=1.17 cfs 0.099 af

Subcatchment P104: TO DCB#4 Runoff Area=2,032 sf 78.10% Impervious Runoff Depth=6.54"
Flow Length=65' Slope=0.0300 '/' Tc=5.0 min CN=85 Runoff=0.32 cfs 0.025 af

Subcatchment P105: TO DCB#5 Runoff Area=17,091 sf 83.45% Impervious Runoff Depth=6.90"
Flow Length=242' Tc=5.0 min CN=88 Runoff=2.78 cfs 0.226 af

Subcatchment P106: TO COURTYARD Runoff Area=23,395 sf 27.09% Impervious Runoff Depth=3.02"
Flow Length=88' Slope=0.0200 '/' Tc=8.0 min CN=55 Runoff=1.61 cfs 0.135 af

Subcatchment P107: TO DCB#8 Runoff Area=14,595 sf 56.05% Impervious Runoff Depth=4.99"
Flow Length=132' Tc=7.8 min CN=72 Runoff=1.70 cfs 0.139 af

Subcatchment P108: TO DCB#6 Runoff Area=7,999 sf 87.34% Impervious Runoff Depth=7.26"
Flow Length=125' Slope=0.0125 '/' Tc=5.0 min CN=91 Runoff=1.34 cfs 0.111 af

Subcatchment P109: TO DCB#7 Runoff Area=6,226 sf 85.54% Impervious Runoff Depth=7.02"
Flow Length=99' Tc=5.0 min CN=89 Runoff=1.02 cfs 0.084 af

Subcatchment P11: TO DP#1 Runoff Area=2,852 sf 89.73% Impervious Runoff Depth=7.38"
Flow Length=98' Slope=0.0170 '/' Tc=5.0 min CN=92 Runoff=0.48 cfs 0.040 af

Subcatchment P12: TO DCB-A Runoff Area=6,513 sf 85.11% Impervious Runoff Depth=7.02"
Flow Length=147' Tc=5.0 min CN=89 Runoff=1.07 cfs 0.087 af

Subcatchment P14: TO DCB-B Runoff Area=5,805 sf 89.51% Impervious Runoff Depth=7.38"
Flow Length=169' Tc=5.0 min CN=92 Runoff=0.98 cfs 0.082 af

Subcatchment P15: TO DCB-C Runoff Area=7,907 sf 68.45% Impervious Runoff Depth=6.54"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=85 Runoff=1.18 cfs 0.099 af

Subcatchment P16: TO LOW POINT Runoff Area=14,911 sf 51.34% Impervious Runoff Depth=5.47"
Flow Length=223' Slope=0.0100 '/' Tc=5.0 min CN=76 Runoff=2.04 cfs 0.156 af

Subcatchment P18: TO DCB-D Runoff Area=10,359 sf 73.15% Impervious Runoff Depth=6.18"
Flow Length=222' Tc=5.0 min CN=82 Runoff=1.57 cfs 0.123 af

Subcatchment P19: TO DCB-E Runoff Area=6,699 sf 83.83% Impervious Runoff Depth=6.90"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=88 Runoff=1.09 cfs 0.088 af

Subcatchment P20: TO DP#3 Runoff Area=6,101 sf 75.40% Impervious Runoff Depth=6.30"
Flow Length=101' Tc=5.0 min CN=83 Runoff=0.94 cfs 0.074 af

Subcatchment P24: TO DP#4 Runoff Area=10,319 sf 74.63% Impervious Runoff Depth=6.30"
Flow Length=133' Tc=5.0 min CN=83 Runoff=1.58 cfs 0.124 af

Subcatchment P26: TO DCB-H Runoff Area=3,256 sf 0.00% Impervious Runoff Depth=1.30"
Flow Length=135' Slope=0.0200 '/' Tc=8.3 min CN=39 Runoff=0.07 cfs 0.008 af

Reach CMH1: TO DMH-D Avg. Flow Depth=1.16' Max Vel=7.26 fps Inflow=18.48 cfs 1.688 af
36.0" Round Pipe n=0.011 L=105.0' S=0.0054 '/' Capacity=58.08 cfs Outflow=18.31 cfs 1.688 af

Reach DCB-A: TO DMH-D Inflow=1.07 cfs 0.087 af
Outflow=1.07 cfs 0.087 af

Reach DCB-B: TO DMH-E Inflow=0.98 cfs 0.082 af
Outflow=0.98 cfs 0.082 af

Reach DCB-C: TO TRUNKLINE Inflow=1.18 cfs 0.099 af
Outflow=1.18 cfs 0.099 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.28' Max Vel=8.85 fps Inflow=1.57 cfs 0.123 af
12.0" Round Pipe n=0.011 L=15.0' S=0.0500 '/' Capacity=9.42 cfs Outflow=1.56 cfs 0.123 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.20' Max Vel=9.75 fps Inflow=1.09 cfs 0.088 af
12.0" Round Pipe n=0.011 L=12.0' S=0.0883 '/' Capacity=12.51 cfs Outflow=1.09 cfs 0.088 af

Reach DCB1: TO DMH#2 Avg. Flow Depth=0.26' Max Vel=5.19 fps Inflow=0.84 cfs 0.068 af
12.0" Round Pipe n=0.013 L=80.0' S=0.0263 '/' Capacity=5.77 cfs Outflow=0.82 cfs 0.068 af

Reach DCB2: TO DMH#2 Avg. Flow Depth=0.24' Max Vel=4.49 fps Inflow=0.66 cfs 0.058 af
12.0" Round Pipe n=0.013 L=71.0' S=0.0211 '/' Capacity=5.18 cfs Outflow=0.64 cfs 0.058 af

Reach DCB3: TO DMH#2 Avg. Flow Depth=0.33' Max Vel=5.21 fps Inflow=1.17 cfs 0.099 af
12.0" Round Pipe n=0.013 L=10.0' S=0.0200 '/' Capacity=5.04 cfs Outflow=1.17 cfs 0.099 af

Reach DCB4: TO DMH#1 Avg. Flow Depth=0.20' Max Vel=2.77 fps Inflow=0.32 cfs 0.025 af
12.0" Round Pipe n=0.013 L=90.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.31 cfs 0.025 af

Reach DCB5: TO DMH#101 Avg. Flow Depth=0.56' Max Vel=6.12 fps Inflow=2.78 cfs 0.226 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=2.76 cfs 0.226 af

Reach DCB6: TO DMH#3 Avg. Flow Depth=0.42' Max Vel=4.20 fps Inflow=1.34 cfs 0.111 af
12.0" Round Pipe n=0.013 L=98.0' S=0.0102 '/' Capacity=3.60 cfs Outflow=1.30 cfs 0.111 af

Reach DCB7: TO DMH#4 Avg. Flow Depth=0.49' Max Vel=4.39 fps Inflow=1.70 cfs 0.139 af
12.0" Round Pipe n=0.013 L=105.0' S=0.0095 '/' Capacity=3.48 cfs Outflow=1.65 cfs 0.139 af

Reach DCB8: TO DMH#4 Avg. Flow Depth=0.32' Max Vel=4.56 fps Inflow=1.02 cfs 0.084 af
12.0" Round Pipe n=0.013 L=58.0' S=0.0155 '/' Capacity=4.44 cfs Outflow=1.00 cfs 0.084 af

Reach DCB9: TO DMH#5 Avg. Flow Depth=0.68' Max Vel=4.16 fps Inflow=2.04 cfs 0.156 af
10.0" Round Pipe n=0.012 L=71.0' S=0.0070 '/' Capacity=1.99 cfs Outflow=2.00 cfs 0.156 af

Reach DMH-A: TO DMH-B Inflow=11.40 cfs 1.004 af
Outflow=11.40 cfs 1.004 af

Reach DMH-C: TO DP#1 Inflow=30.51 cfs 2.779 af
Outflow=30.51 cfs 2.779 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.44' Max Vel=9.13 fps Inflow=30.73 cfs 2.779 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=30.51 cfs 2.779 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.39' Max Vel=3.90 fps Inflow=2.12 cfs 0.181 af
36.0" Round Pipe n=0.011 L=18.0' S=0.0056 '/' Capacity=58.75 cfs Outflow=2.12 cfs 0.181 af

Reach DMH-F: TO DMH-E Avg. Flow Depth=0.00' Max Vel=0.00 fps
36.0" Round Pipe n=0.011 L=268.0' S=0.0058 '/' Capacity=60.14 cfs Outflow=0.00 cfs 0.000 af

Reach DMH1: TO DMH#2 Avg. Flow Depth=0.36' Max Vel=3.82 fps Inflow=0.95 cfs 0.083 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.95 cfs 0.083 af

Reach DMH10: TO CMH#1 Avg. Flow Depth=1.13' Max Vel=8.88 fps Inflow=16.38 cfs 1.507 af
24.0" Round Pipe n=0.011 L=20.0' S=0.0100 '/' Capacity=26.74 cfs Outflow=16.36 cfs 1.507 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.98' Max Vel=8.65 fps Inflow=8.92 cfs 0.793 af
15.0" Round Pipe n=0.011 L=87.0' S=0.0149 '/' Capacity=9.33 cfs Outflow=8.86 cfs 0.793 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.55' Max Vel=6.09 fps Inflow=2.76 cfs 0.251 af
12.0" Round Pipe n=0.011 L=75.0' S=0.0120 '/' Capacity=4.61 cfs Outflow=2.70 cfs 0.251 af

Reach DMH102: TO DMH#101 Avg. Flow Depth=0.15' Max Vel=3.44 fps Inflow=0.24 cfs 0.025 af
12.0" Round Pipe n=0.011 L=25.0' S=0.0160 '/' Capacity=5.33 cfs Outflow=0.24 cfs 0.025 af

Reach DMH2: TO DMH#100 Avg. Flow Depth=0.57' Max Vel=6.26 fps Inflow=2.90 cfs 0.250 af
12.0" Round Pipe n=0.011 L=44.0' S=0.0125 '/' Capacity=4.71 cfs Outflow=2.91 cfs 0.250 af

Reach DMH3: TO UGS#1A Avg. Flow Depth=0.49' Max Vel=10.05 fps Inflow=3.88 cfs 0.334 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=3.88 cfs 0.334 af

Reach DMH4: TO DMH#3 Avg. Flow Depth=0.54' Max Vel=6.03 fps Inflow=2.60 cfs 0.223 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0167 '/' Capacity=4.60 cfs Outflow=2.60 cfs 0.223 af

Reach DMH5: TO DMH#6 Avg. Flow Depth=0.87' Max Vel=4.88 fps Inflow=3.56 cfs 0.291 af
12.0" Round Pipe n=0.013 L=100.0' S=0.0090 '/' Capacity=3.38 cfs Outflow=3.48 cfs 0.291 af

Reach DMH6: TO DMH#7 Avg. Flow Depth=0.62' Max Vel=6.79 fps Inflow=3.48 cfs 0.291 af
12.0" Round Pipe n=0.013 L=42.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=3.46 cfs 0.291 af

Reach DMH7: TO DMH#100 Avg. Flow Depth=0.57' Max Vel=7.49 fps Inflow=3.46 cfs 0.291 af
12.0" Round Pipe n=0.012 L=105.0' S=0.0210 '/' Capacity=5.59 cfs Outflow=3.41 cfs 0.291 af

Reach DMH9: TO DMH#10 Avg. Flow Depth=1.34' Max Vel=7.30 fps Inflow=16.89 cfs 1.507 af
24.0" Round Pipe n=0.012 L=209.0' S=0.0072 '/' Capacity=20.76 cfs Outflow=16.38 cfs 1.507 af

Reach DP1: GUTTER POINT FRANKLIN (WEST) Inflow=0.48 cfs 0.040 af
Outflow=0.48 cfs 0.040 af

Reach DP2: MUNICIPAL SYSTEM Inflow=30.51 cfs 2.779 af
Outflow=30.51 cfs 2.779 af

Reach DP3: CATCHBASIN (FIRE STATION) Inflow=0.94 cfs 0.074 af
Outflow=0.94 cfs 0.074 af

Reach DP4: LOW POINT OFF LOCUS Inflow=1.58 cfs 0.124 af
Outflow=1.58 cfs 0.124 af

Reach DP5: DCB-H Inflow=0.07 cfs 0.008 af
Outflow=0.07 cfs 0.008 af

Reach UGS1B: TO DMH#102 Avg. Flow Depth=0.16' Max Vel=3.04 fps Inflow=0.24 cfs 0.025 af
12.0" Round Pipe n=0.011 L=160.0' S=0.0113 '/' Capacity=4.47 cfs Outflow=0.24 cfs 0.025 af

Pond DMH-B: TO DMH-D Peak Elev=461.12' Inflow=11.40 cfs 1.004 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=11.40 cfs 1.004 af

Pond UGS1: TO UGS#1B Peak Elev=469.84' Storage=0.133 af Inflow=3.88 cfs 0.334 af
Discarded=0.20 cfs 0.309 af Primary=0.24 cfs 0.025 af Outflow=0.44 cfs 0.334 af

Total Runoff Area = 5.951 ac Runoff Volume = 3.334 af Average Runoff Depth = 6.72"
20.49% Pervious = 1.219 ac 79.51% Impervious = 4.732 ac

Summary for Subcatchment P100B: TO ROOF DRAIN

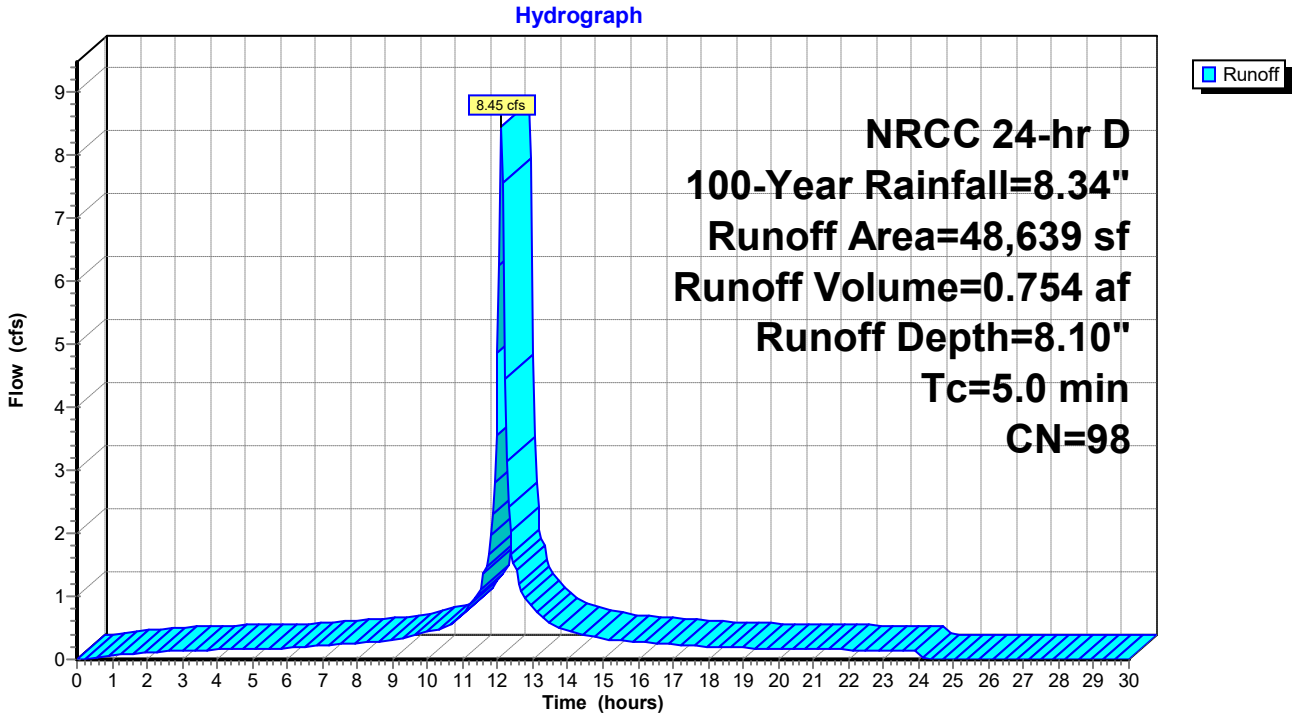
Runoff = 8.45 cfs @ 12.11 hrs, Volume= 0.754 af, Depth= 8.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100B: TO ROOF DRAIN



Summary for Subcatchment P100C: TO ROOF DRAIN

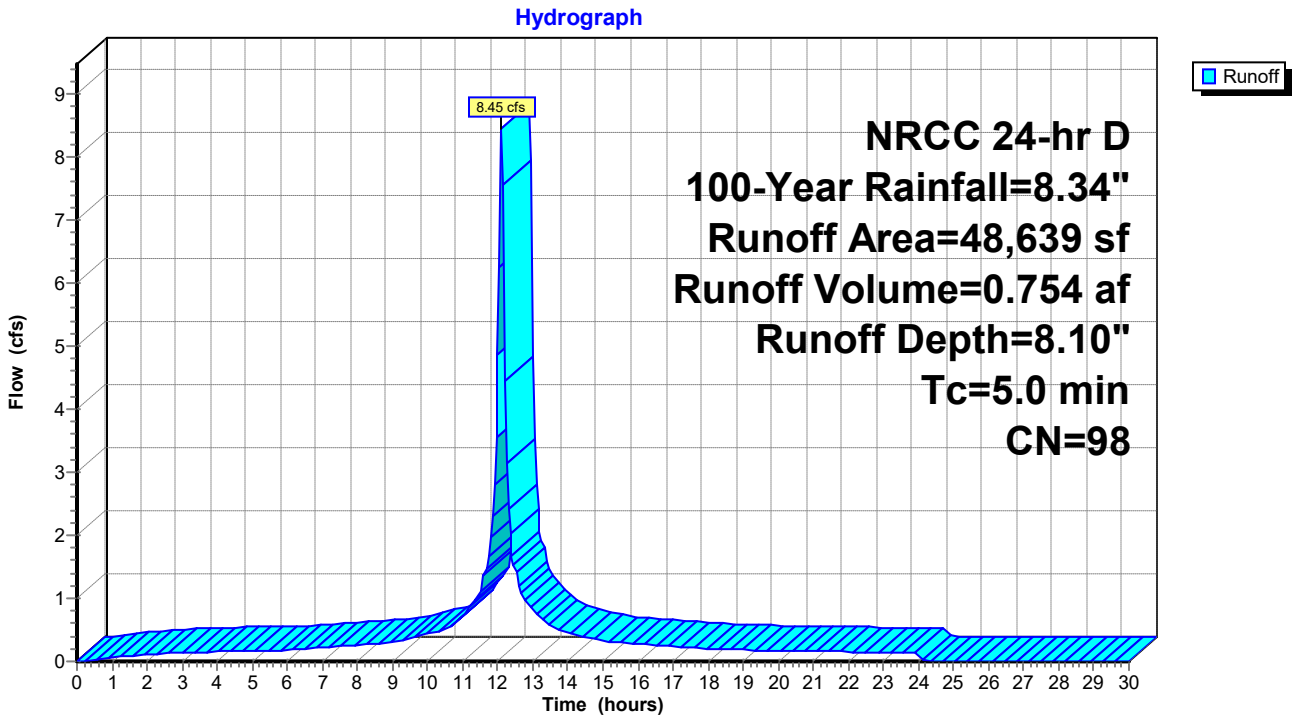
Runoff = 8.45 cfs @ 12.11 hrs, Volume= 0.754 af, Depth= 8.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
48,639	98	Paved parking, HSG A
48,639		100.00% Impervious Area

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

Subcatchment P100C: TO ROOF DRAIN



Summary for Subcatchment P101: TO DCB#1

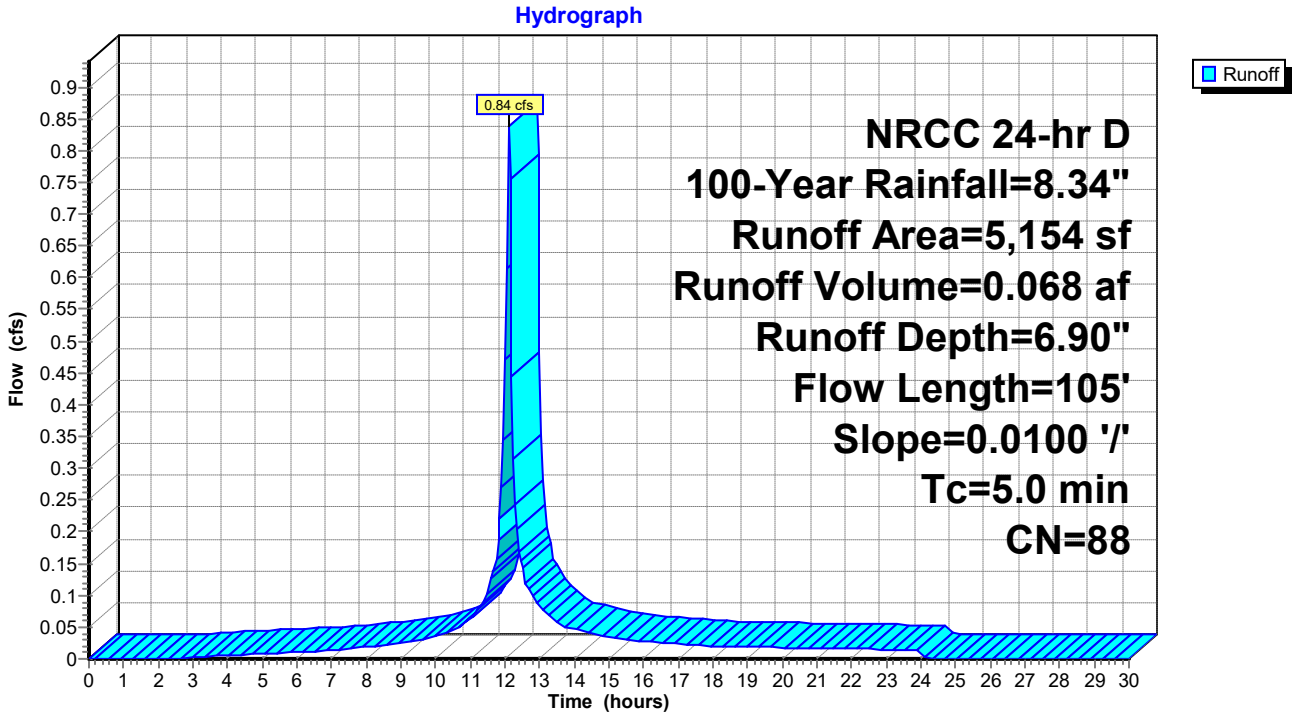
Runoff = 0.84 cfs @ 12.11 hrs, Volume= 0.068 af, Depth= 6.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
906	39	>75% Grass cover, Good, HSG A
4,248	98	Paved parking, HSG A
5,154	88	Weighted Average
906		17.58% Pervious Area
4,248		82.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	55	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	105	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P101: TO DCB#1



Summary for Subcatchment P102: TO DCB#2

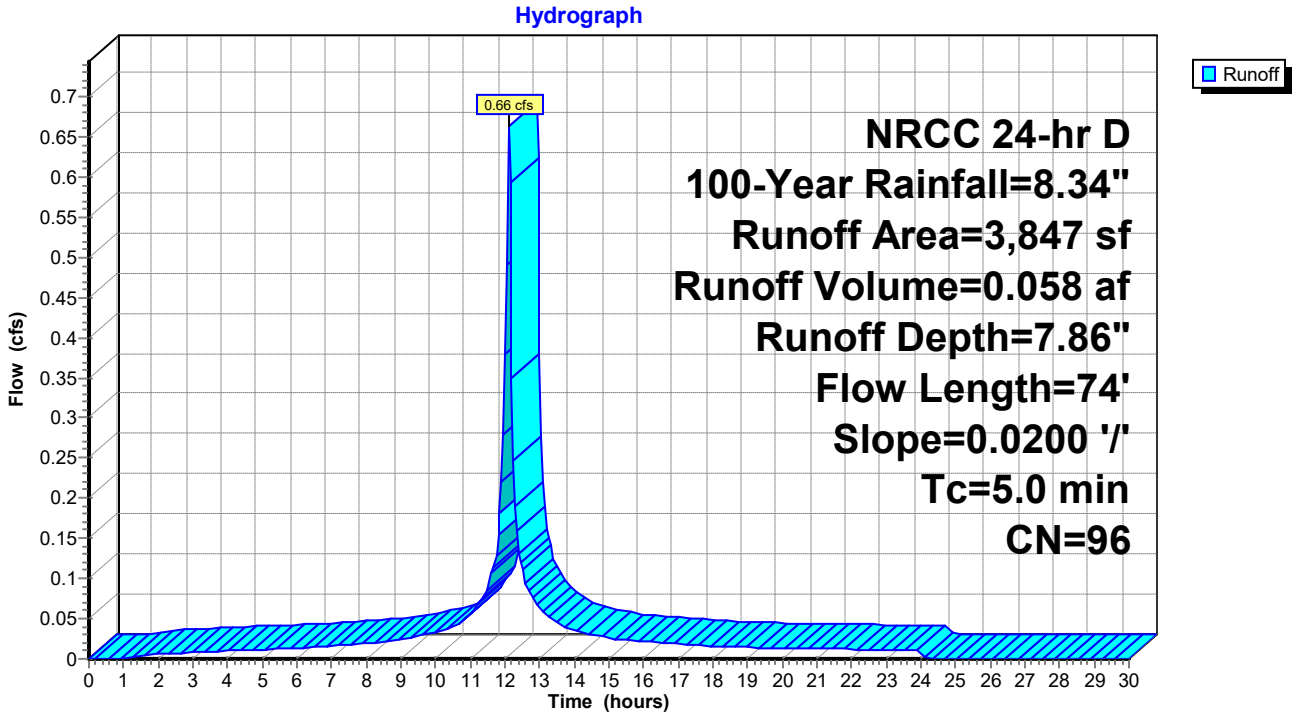
Runoff = 0.66 cfs @ 12.11 hrs, Volume= 0.058 af, Depth= 7.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
152	39	>75% Grass cover, Good, HSG A
3,695	98	Paved parking, HSG A
3,847	96	Weighted Average
152		3.95% Pervious Area
3,695		96.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	74	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P102: TO DCB#2



Summary for Subcatchment P103: TO DCB#3

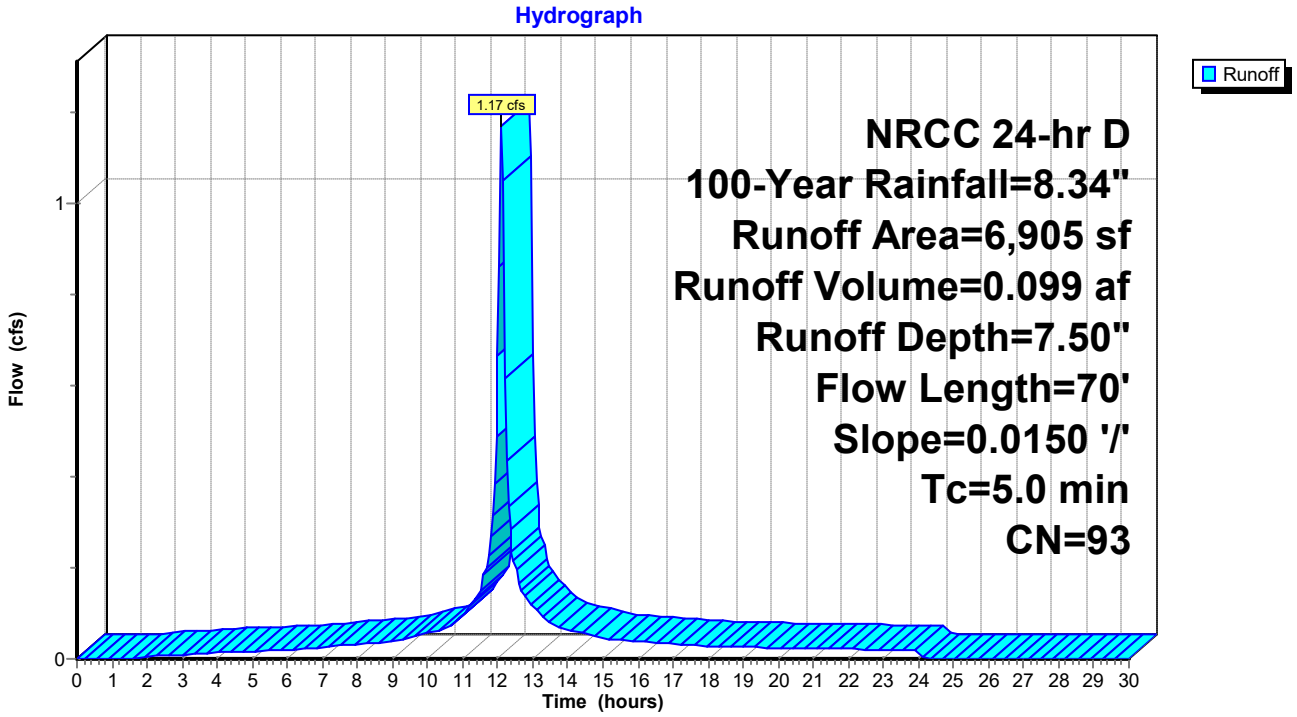
Runoff = 1.17 cfs @ 12.11 hrs, Volume= 0.099 af, Depth= 7.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
537	39	>75% Grass cover, Good, HSG A
6,368	98	Paved parking, HSG A
6,905	93	Weighted Average
537		7.78% Pervious Area
6,368		92.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	20	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	70	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P103: TO DCB#3



Summary for Subcatchment P104: TO DCB#4

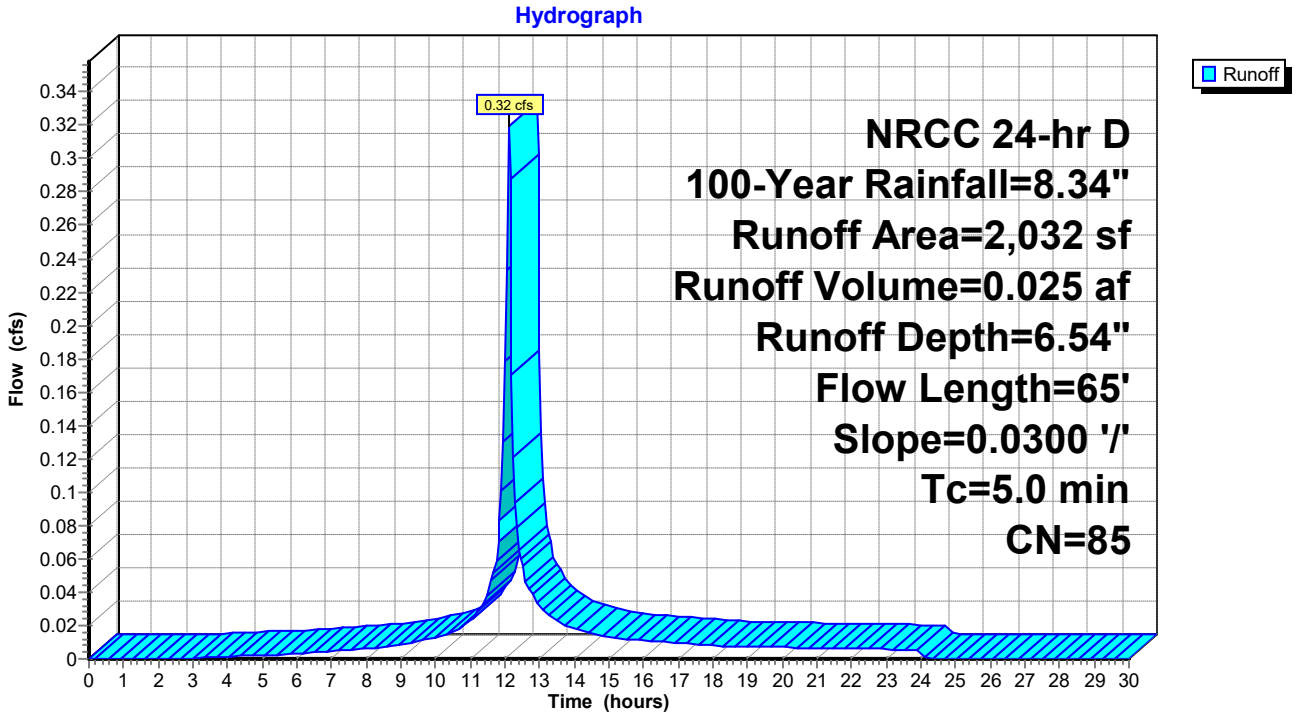
Runoff = 0.32 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 6.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
445	39	>75% Grass cover, Good, HSG A
1,587	98	Paved parking, HSG A
2,032	85	Weighted Average
445		21.90% Pervious Area
1,587		78.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	15	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	65	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P104: TO DCB#4



Summary for Subcatchment P105: TO DCB#5

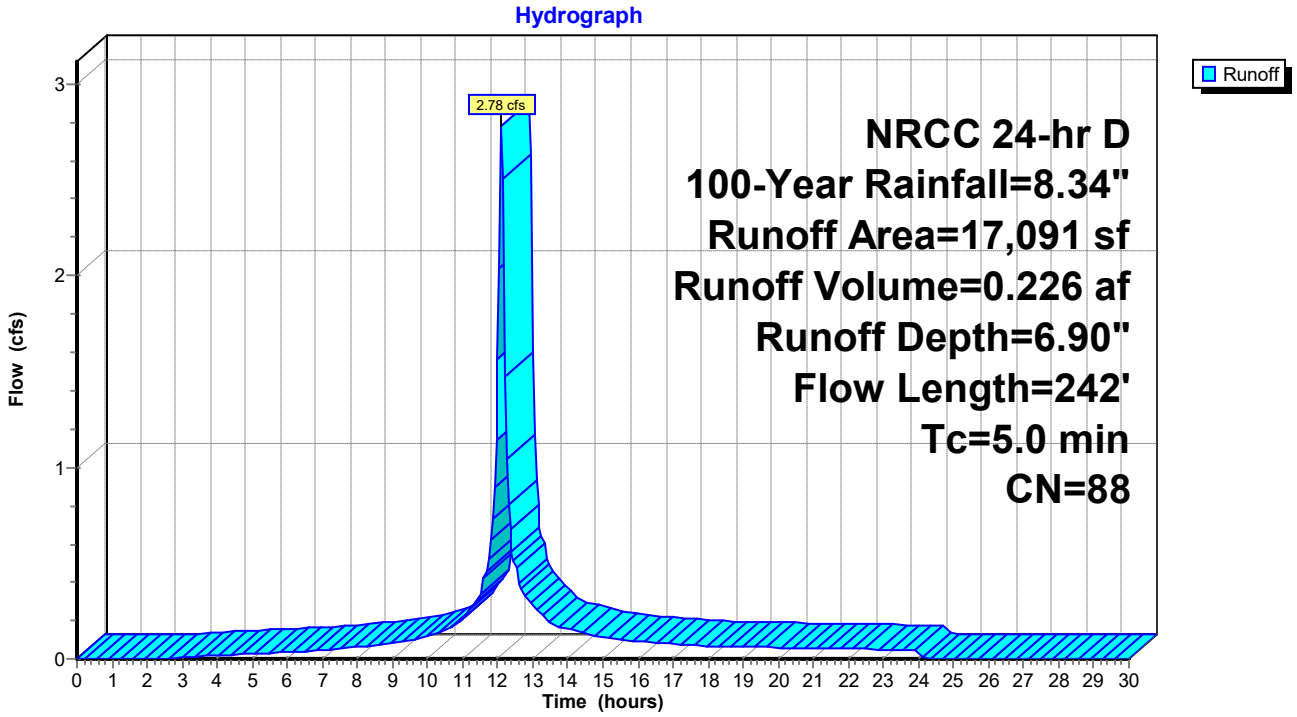
Runoff = 2.78 cfs @ 12.11 hrs, Volume= 0.226 af, Depth= 6.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
2,829	39	>75% Grass cover, Good, HSG A
14,262	98	Paved parking, HSG A
17,091	88	Weighted Average
2,829		16.55% Pervious Area
14,262		83.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0150	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	192	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	242	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P105: TO DCB#5



Summary for Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM

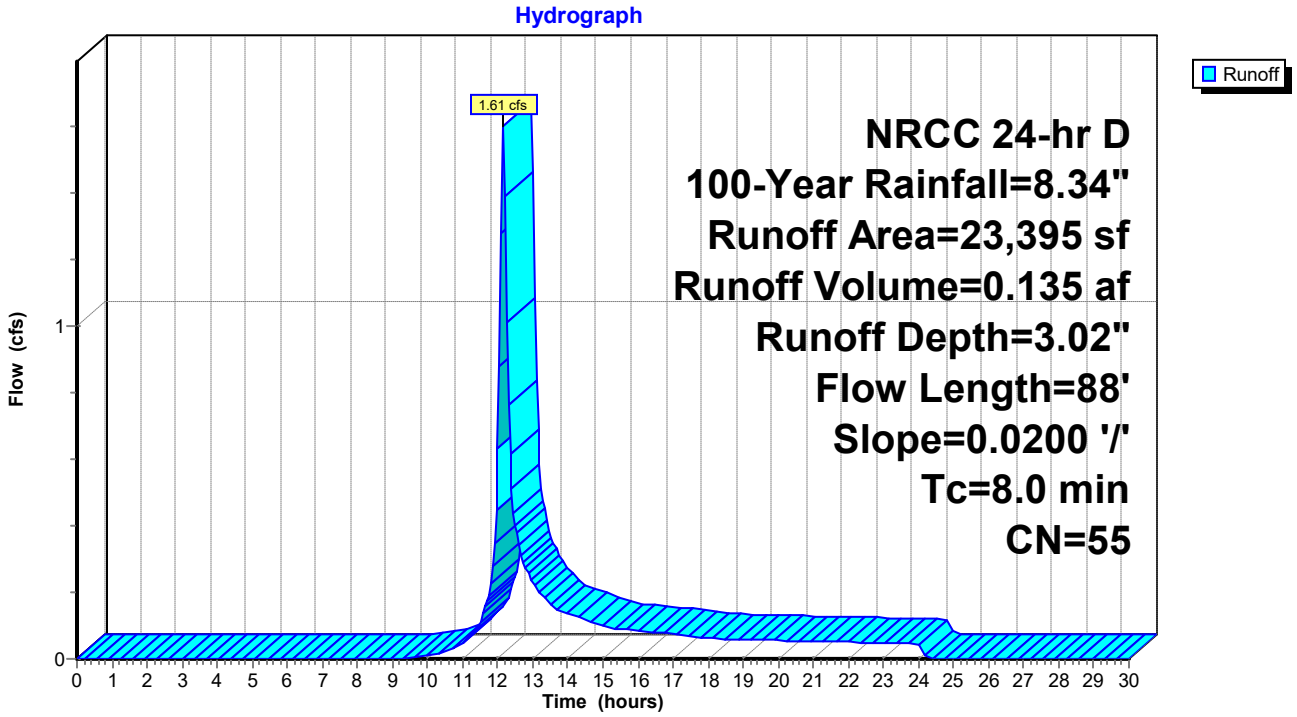
Runoff = 1.61 cfs @ 12.16 hrs, Volume= 0.135 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
17,058	39	>75% Grass cover, Good, HSG A
6,337	98	Paved parking, HSG A
23,395	55	Weighted Average
17,058		72.91% Pervious Area
6,337		27.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	13	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.0	88	Total			

Subcatchment P106: TO COURTYARD DRAINAGE SYSTEM



Summary for Subcatchment P107: TO DCB#8

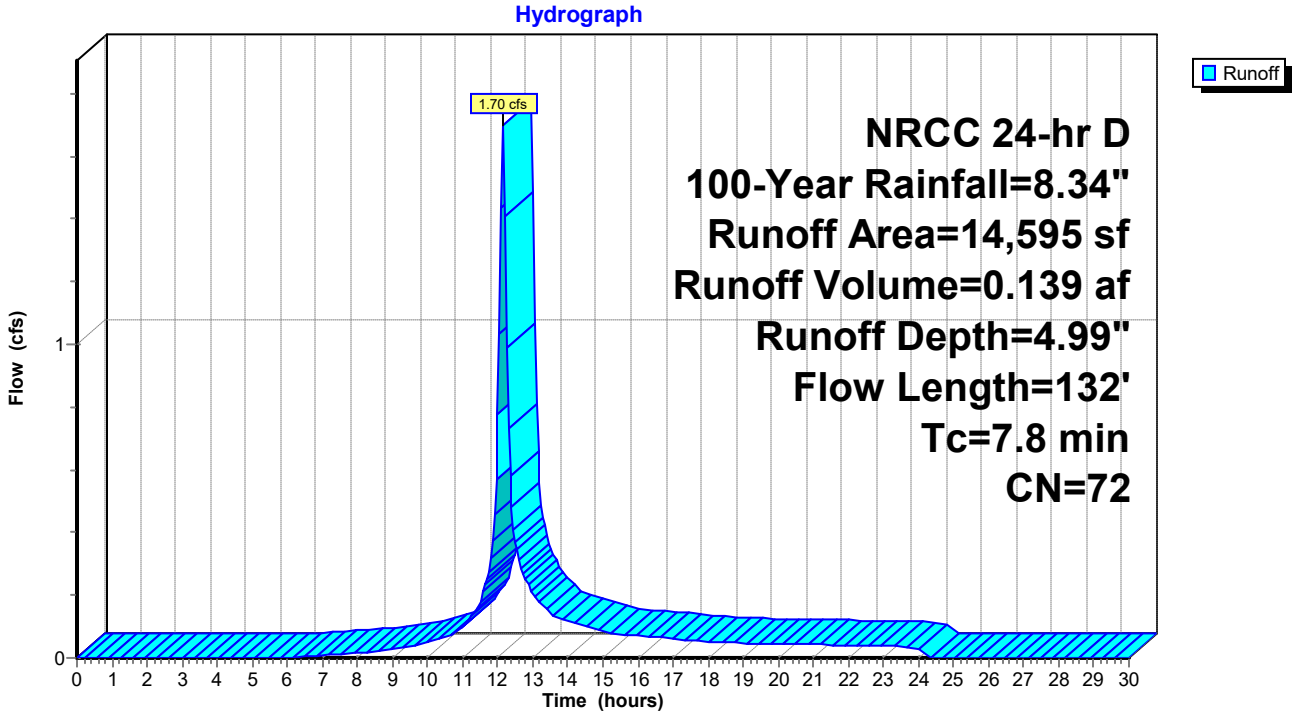
Runoff = 1.70 cfs @ 12.15 hrs, Volume= 0.139 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
6,415	39	>75% Grass cover, Good, HSG A
8,180	98	Paved parking, HSG A
14,595	72	Weighted Average
6,415		43.95% Pervious Area
8,180		56.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	23	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
5.9	52	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	57	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.8	132	Total			

Subcatchment P107: TO DCB#8



Summary for Subcatchment P108: TO DCB#6

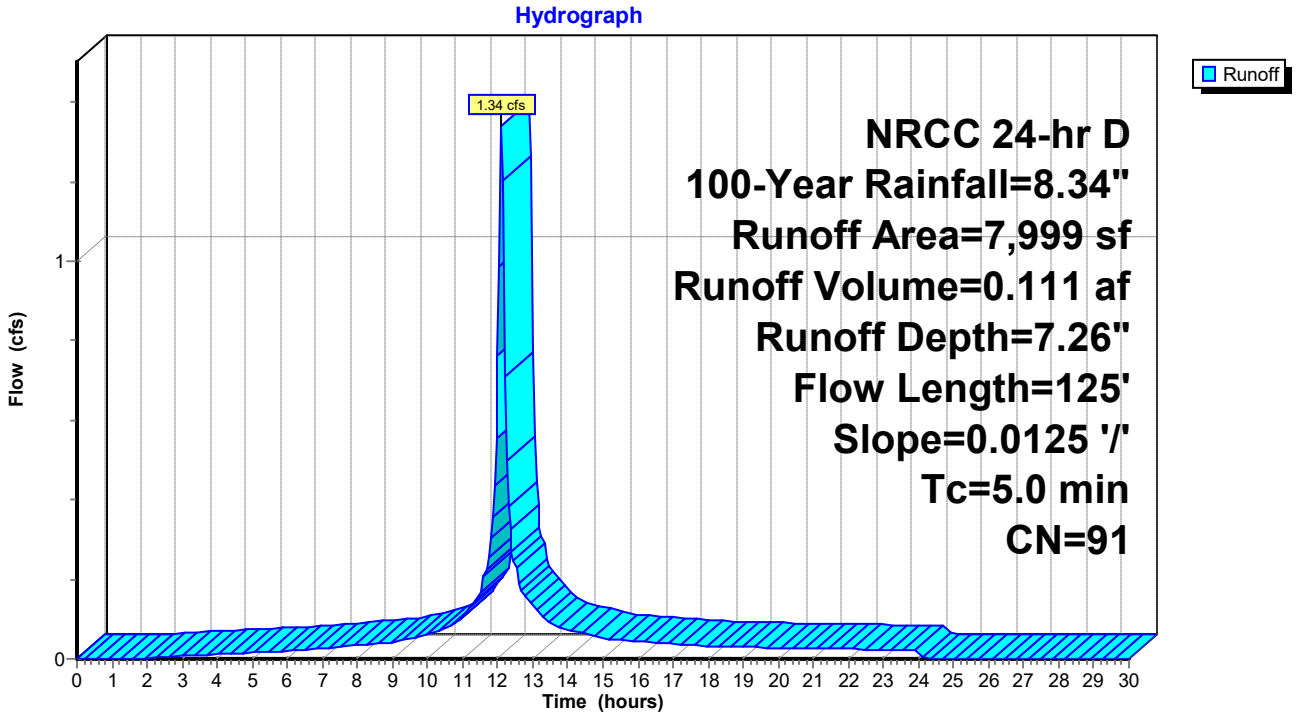
Runoff = 1.34 cfs @ 12.11 hrs, Volume= 0.111 af, Depth= 7.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,013	39	>75% Grass cover, Good, HSG A
6,986	98	Paved parking, HSG A
7,999	91	Weighted Average
1,013		12.66% Pervious Area
6,986		87.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	75	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	125	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#6



Summary for Subcatchment P109: TO DCB#7

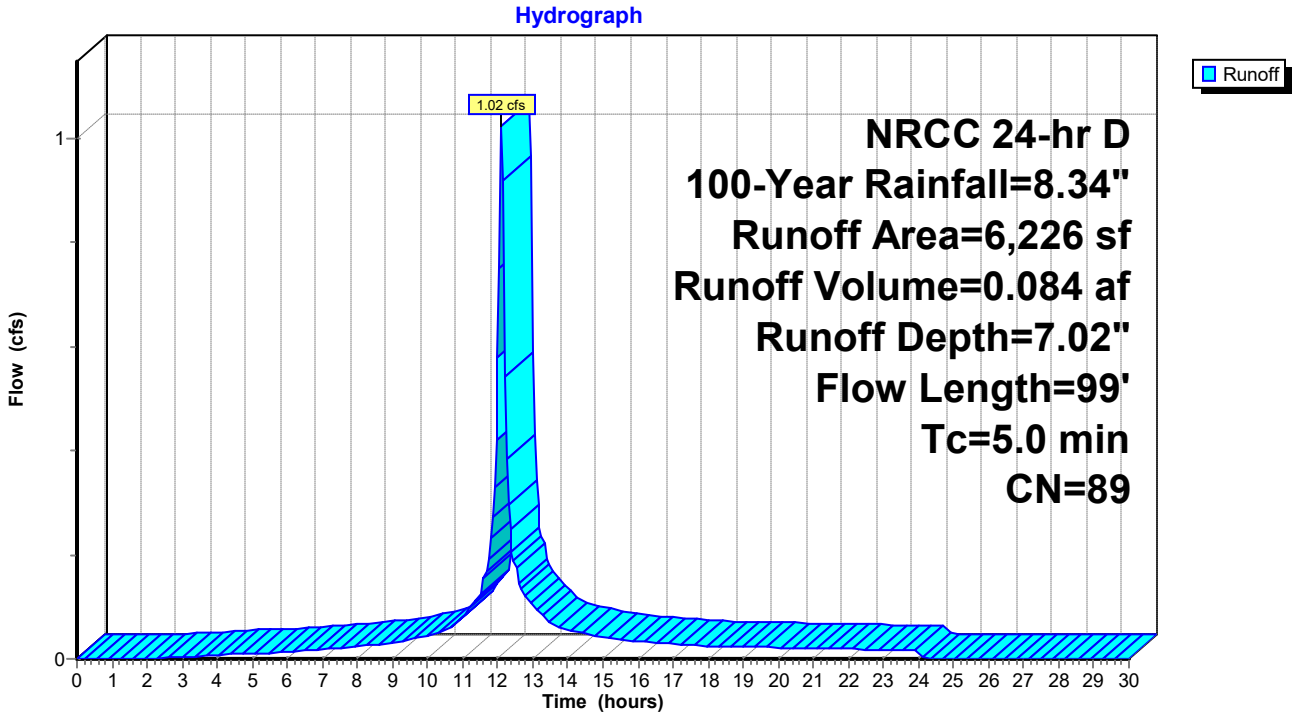
Runoff = 1.02 cfs @ 12.11 hrs, Volume= 0.084 af, Depth= 7.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
900	39	>75% Grass cover, Good, HSG A
5,326	98	Paved parking, HSG A
6,226	89	Weighted Average
900		14.46% Pervious Area
5,326		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0125	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.4	49	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	99	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P109: TO DCB#7



Summary for Subcatchment P11: TO DP#1

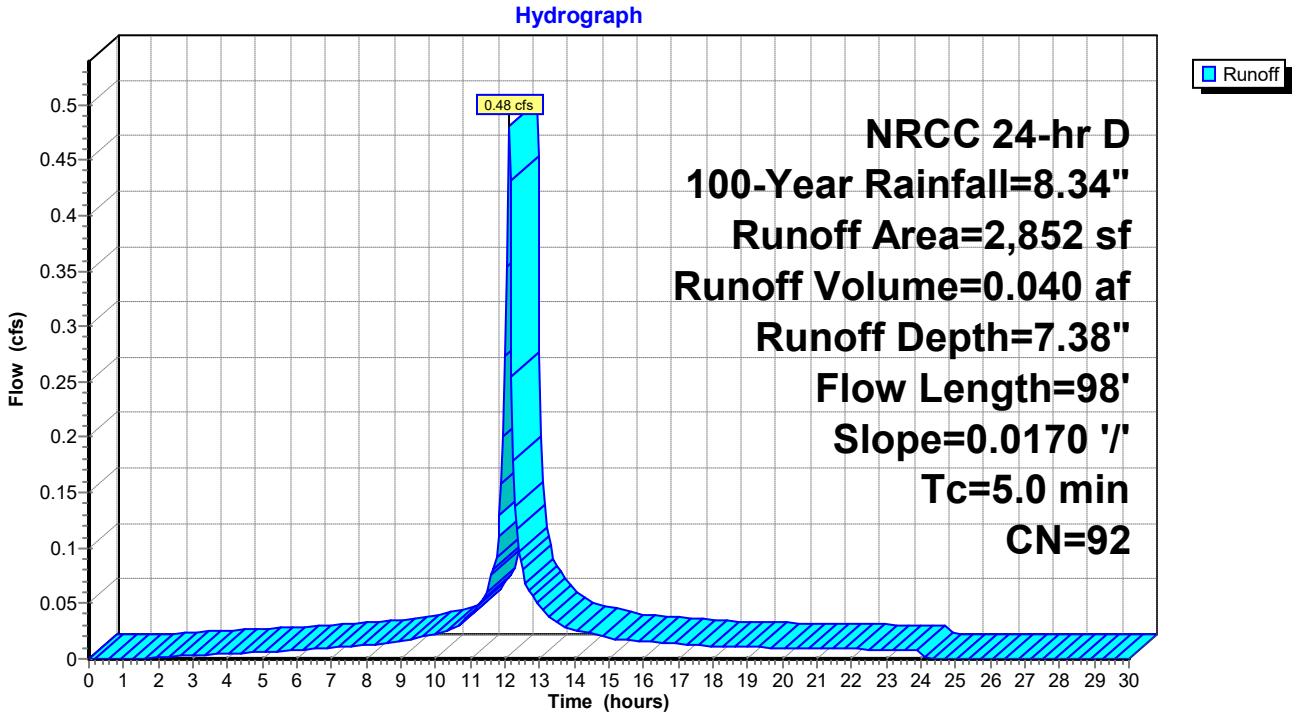
Runoff = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 7.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
293	39	>75% Grass cover, Good, HSG A
2,559	98	Paved parking, HSG A
2,852	92	Weighted Average
293		10.27% Pervious Area
2,559		89.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	48	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	98	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P11: TO DP#1



Summary for Subcatchment P12: TO DCB-A

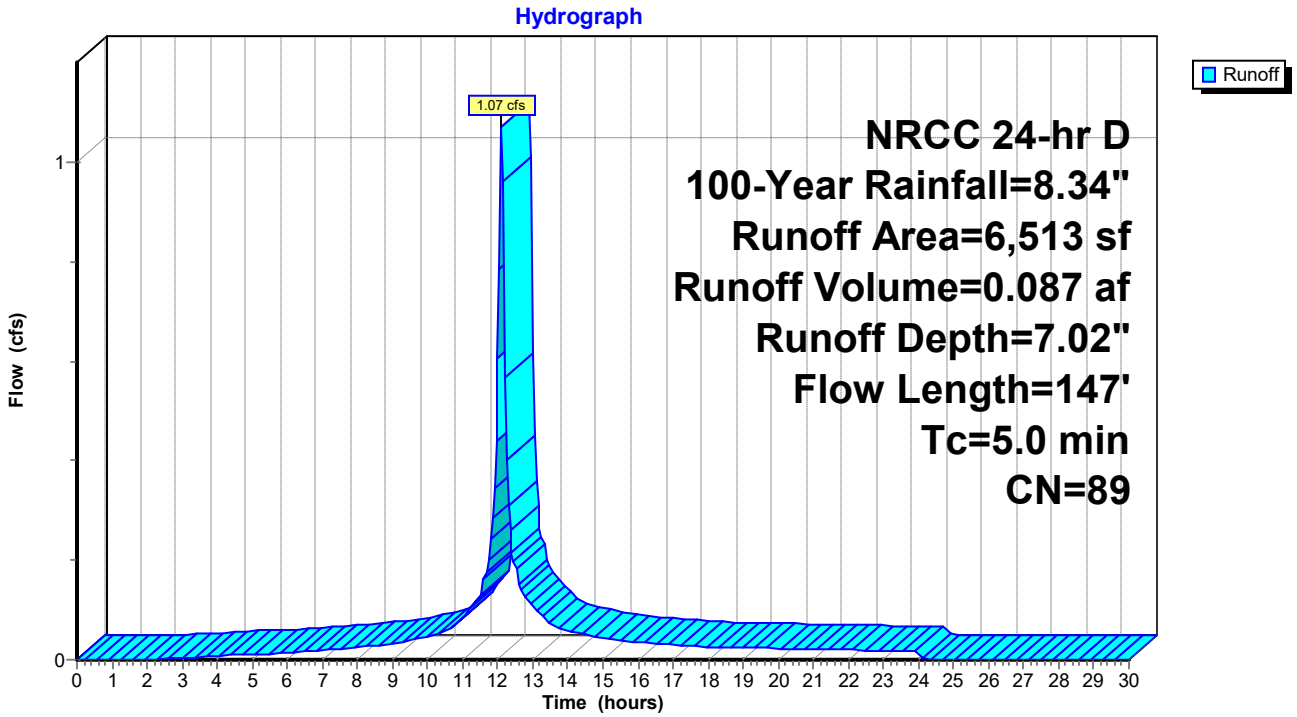
Runoff = 1.07 cfs @ 12.11 hrs, Volume= 0.087 af, Depth= 7.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
970	39	>75% Grass cover, Good, HSG A
5,543	98	Paved parking, HSG A
6,513	89	Weighted Average
970		14.89% Pervious Area
5,543		85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	8	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	35	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	97	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	147	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P12: TO DCB-A



Summary for Subcatchment P14: TO DCB-B

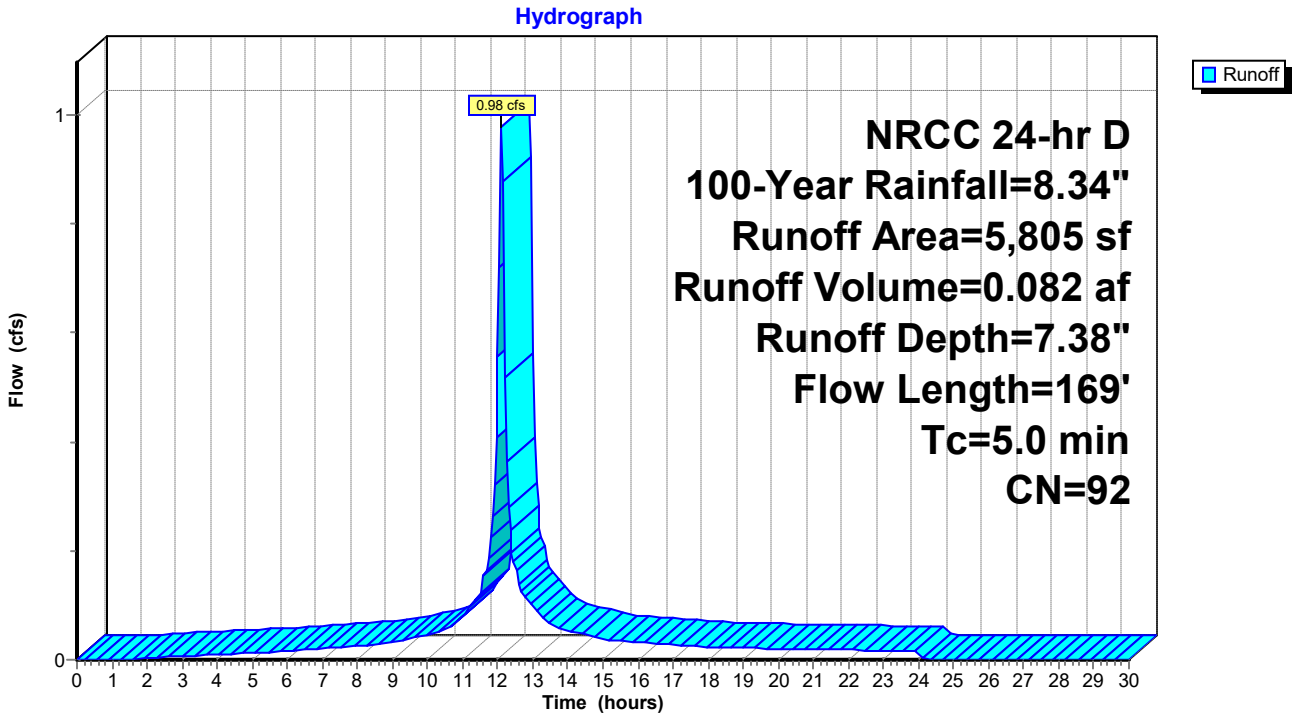
Runoff = 0.98 cfs @ 12.11 hrs, Volume= 0.082 af, Depth= 7.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
609	39	>75% Grass cover, Good, HSG A
5,196	98	Paved parking, HSG A
5,805	92	Weighted Average
609		10.49% Pervious Area
5,196		89.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	10	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	7	0.0150	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	33	0.0080	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	119	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	169	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P14: TO DCB-B



Summary for Subcatchment P15: TO DCB-C

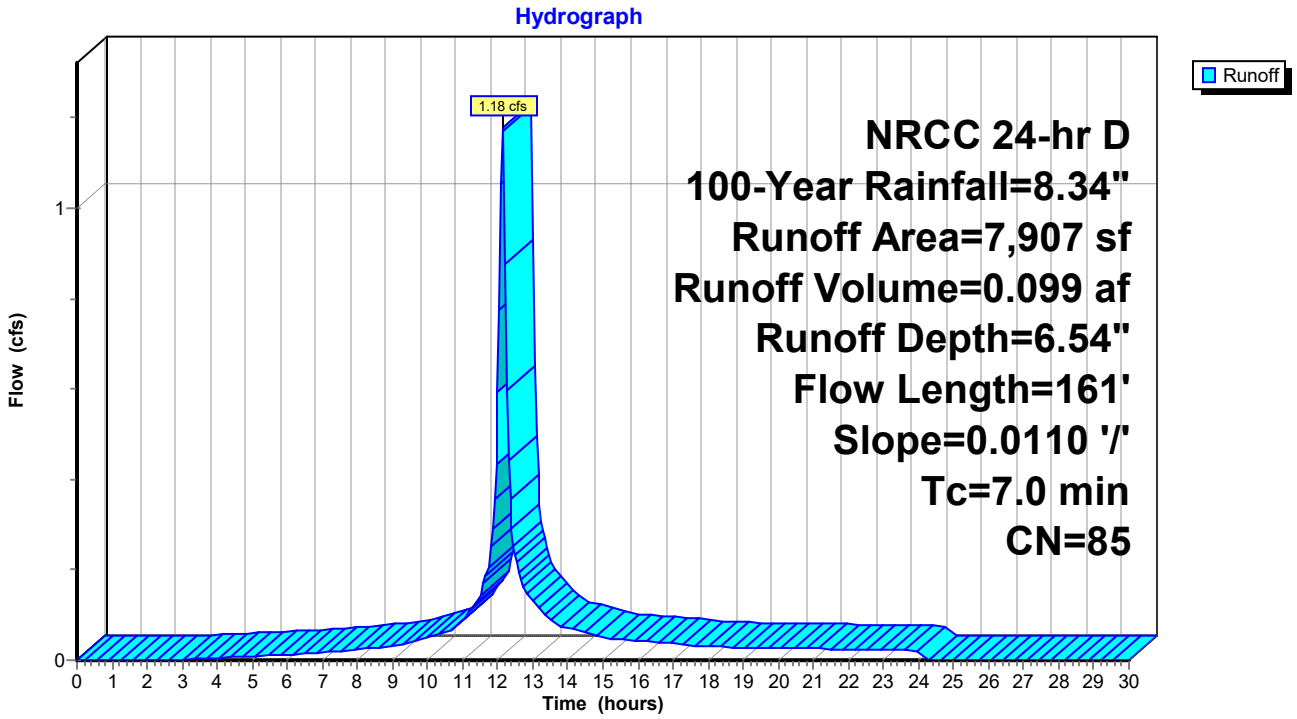
Runoff = 1.18 cfs @ 12.14 hrs, Volume= 0.099 af, Depth= 6.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,765	39	>75% Grass cover, Good, HSG A
5,412	98	Paved parking, HSG A
730	96	Gravel surface, HSG A
7,907	85	Weighted Average
2,495		31.55% Pervious Area
5,412		68.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	38	0.0110	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	12	0.0110	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	111	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	161	Total			

Subcatchment P15: TO DCB-C



Summary for Subcatchment P16: TO LOW POINT

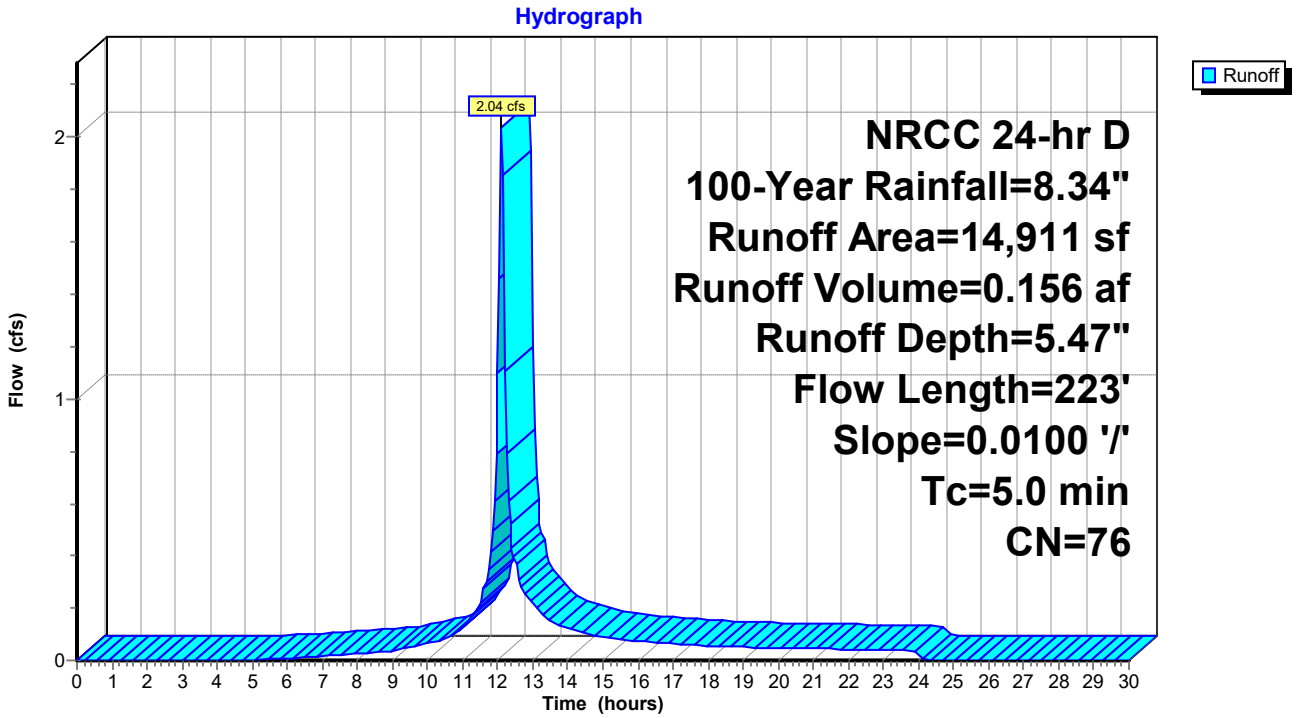
Runoff = 2.04 cfs @ 12.11 hrs, Volume= 0.156 af, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
5,411	39	>75% Grass cover, Good, HSG A
7,655	98	Paved parking, HSG A
1,845	96	Gravel surface, HSG A
14,911	76	Weighted Average
7,256		48.66% Pervious Area
7,655		51.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.8	173	0.0100	1.61		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
2.7	223	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P16: TO LOW POINT



Summary for Subcatchment P18: TO DCB-D

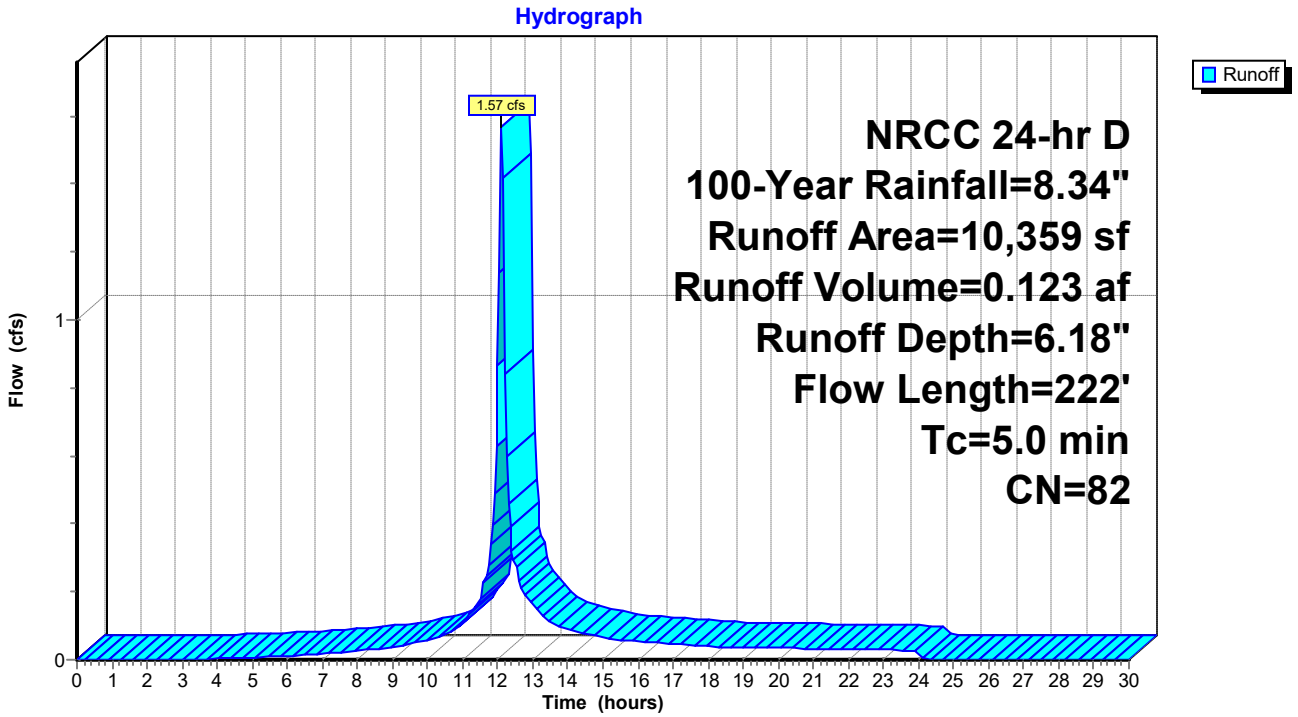
Runoff = 1.57 cfs @ 12.11 hrs, Volume= 0.123 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
2,781	39	>75% Grass cover, Good, HSG A
7,578	98	Paved parking, HSG A
10,359	82	Weighted Average
2,781		26.85% Pervious Area
7,578		73.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	9	0.0150	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	9	0.0150	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	32	0.0075	0.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	172	0.0075	1.76		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	222	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P18: TO DCB-D



Summary for Subcatchment P19: TO DCB-E

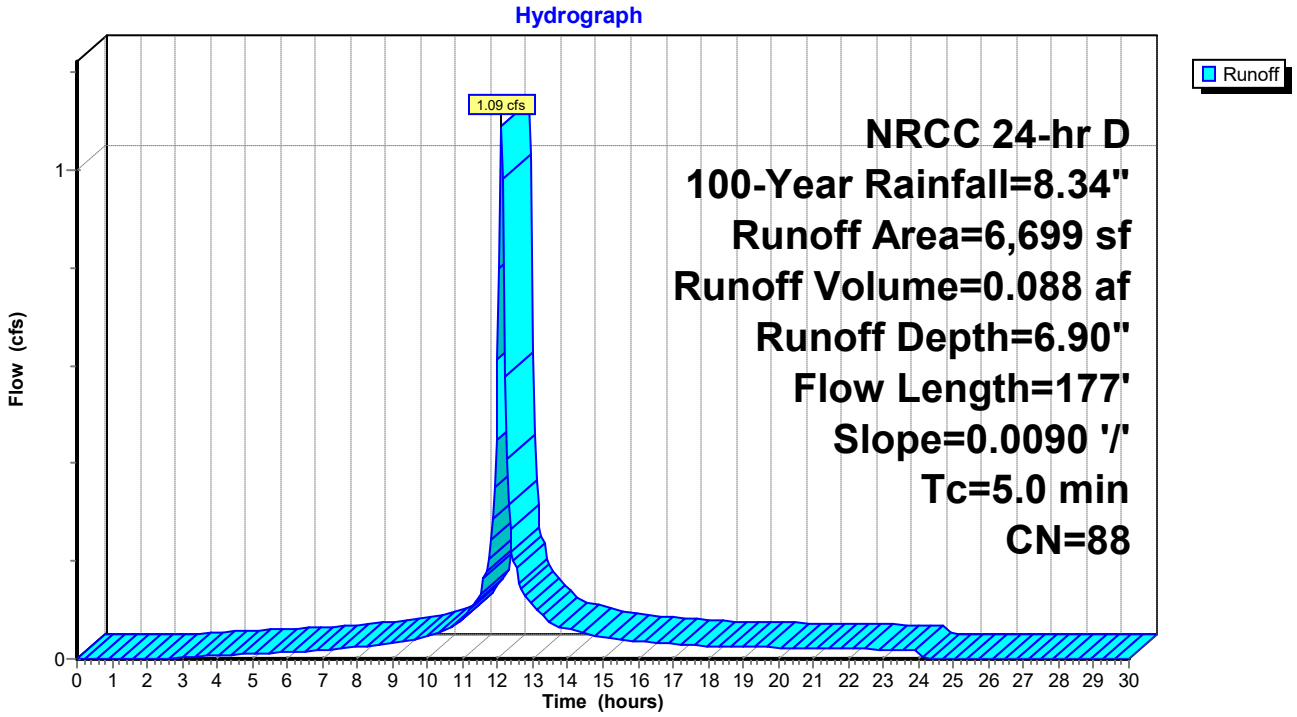
Runoff = 1.09 cfs @ 12.11 hrs, Volume= 0.088 af, Depth= 6.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,083	39	>75% Grass cover, Good, HSG A
5,616	98	Paved parking, HSG A
6,699	88	Weighted Average
1,083		16.17% Pervious Area
5,616		83.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0090	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.1	127	0.0090	1.93		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	177	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P19: TO DCB-E



Summary for Subcatchment P20: TO DP#3

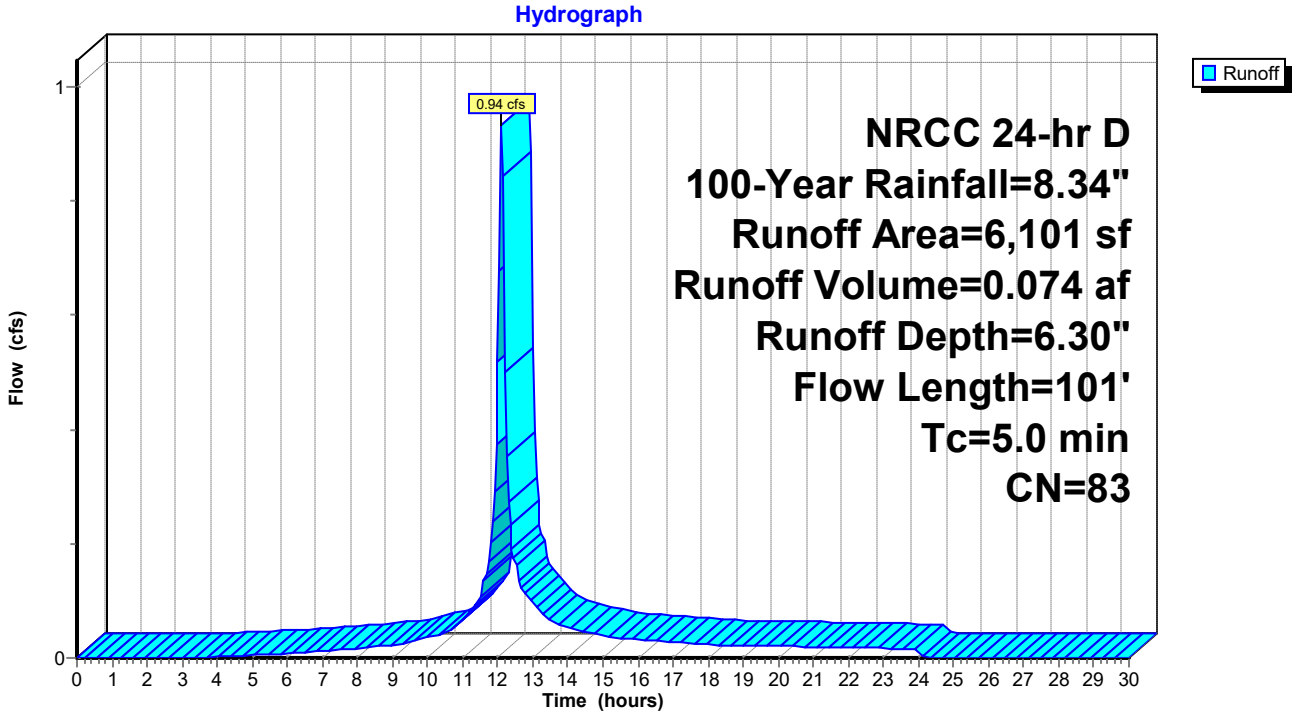
Runoff = 0.94 cfs @ 12.11 hrs, Volume= 0.074 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
1,501	39	>75% Grass cover, Good, HSG A
4,600	98	Paved parking, HSG A
6,101	83	Weighted Average
1,501		24.60% Pervious Area
4,600		75.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	9	0.0250	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	41	0.0150	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P20: TO DP#3



Summary for Subcatchment P24: TO DP#4

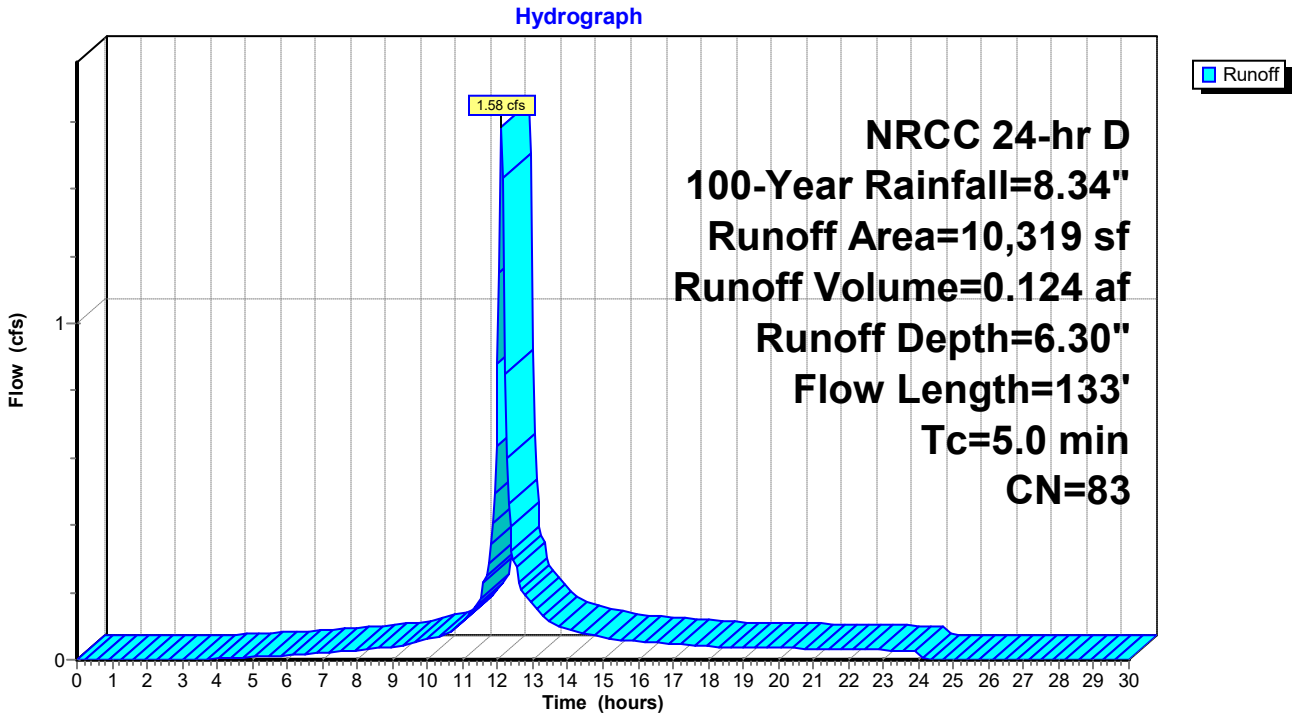
Runoff = 1.58 cfs @ 12.11 hrs, Volume= 0.124 af, Depth= 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
2,618	39	>75% Grass cover, Good, HSG A
7,701	98	Paved parking, HSG A
10,319	83	Weighted Average
2,618		25.37% Pervious Area
7,701		74.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	35	0.0600	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	10	0.3000	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0100	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.4	83	0.0100	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
4.8	133	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DP#4



Summary for Subcatchment P26: TO DCB-H

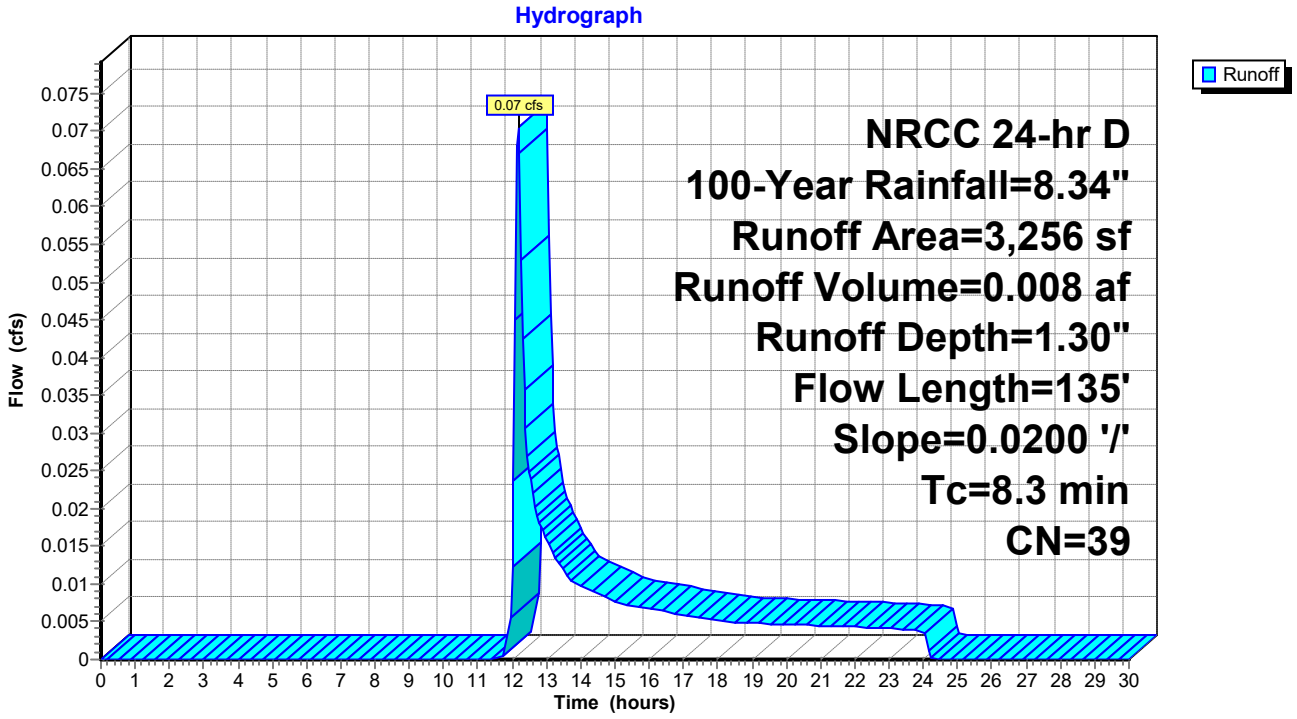
Runoff = 0.07 cfs @ 12.17 hrs, Volume= 0.008 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
3,256	39	>75% Grass cover, Good, HSG A
3,256		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	75	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
8.3	135	Total			

Subcatchment P26: TO DCB-H



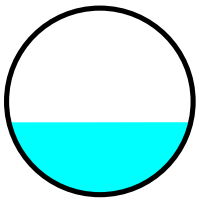
Summary for Reach CMH1: TO DMH-D

Inflow Area = 2.548 ac, 97.20% Impervious, Inflow Depth = 7.95" for 100-Year event
Inflow = 18.48 cfs @ 12.13 hrs, Volume= 1.688 af
Outflow = 18.31 cfs @ 12.14 hrs, Volume= 1.688 af, Atten= 1%, Lag= 0.4 min

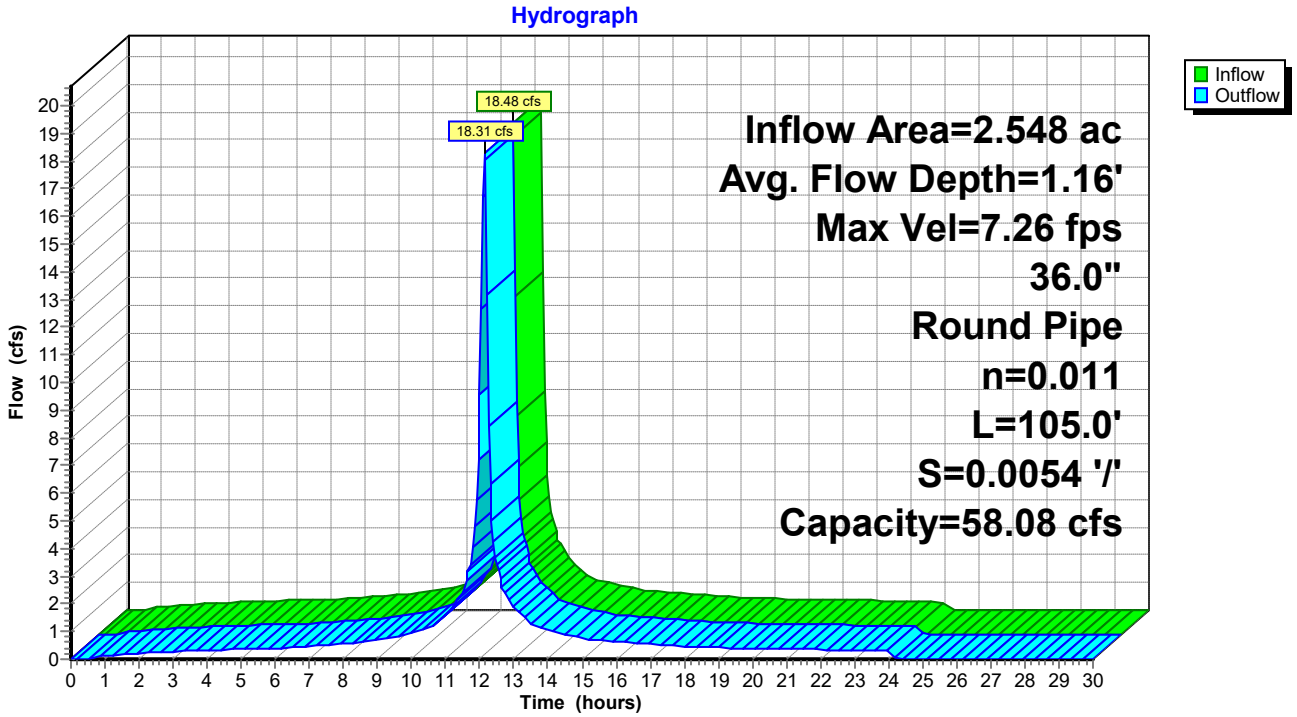
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.26 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.7 min

Peak Storage= 266 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.16'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.08 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 105.0' Slope= 0.0054 '/'
Inlet Invert= 456.47', Outlet Invert= 455.90'



Reach CMH1: TO DMH-D

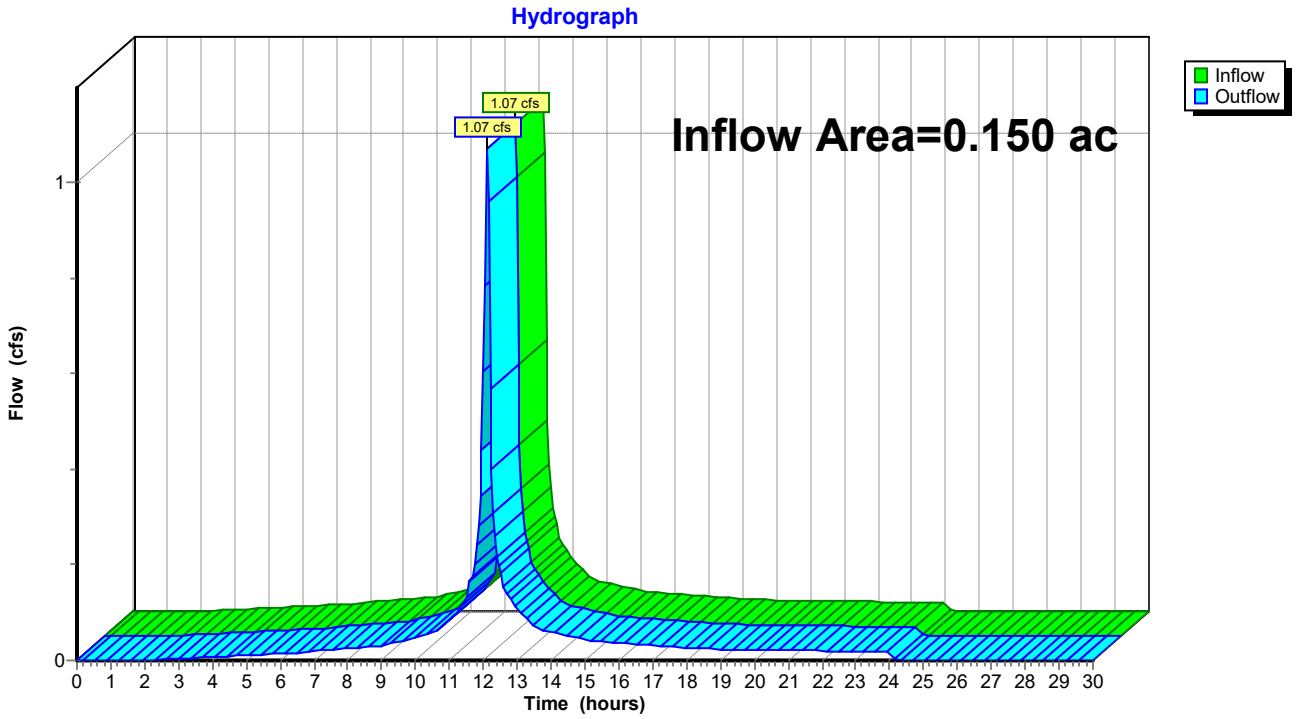


Summary for Reach DCB-A: TO DMH-D

Inflow Area = 0.150 ac, 85.11% Impervious, Inflow Depth = 7.02" for 100-Year event
Inflow = 1.07 cfs @ 12.11 hrs, Volume= 0.087 af
Outflow = 1.07 cfs @ 12.11 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-A: TO DMH-D

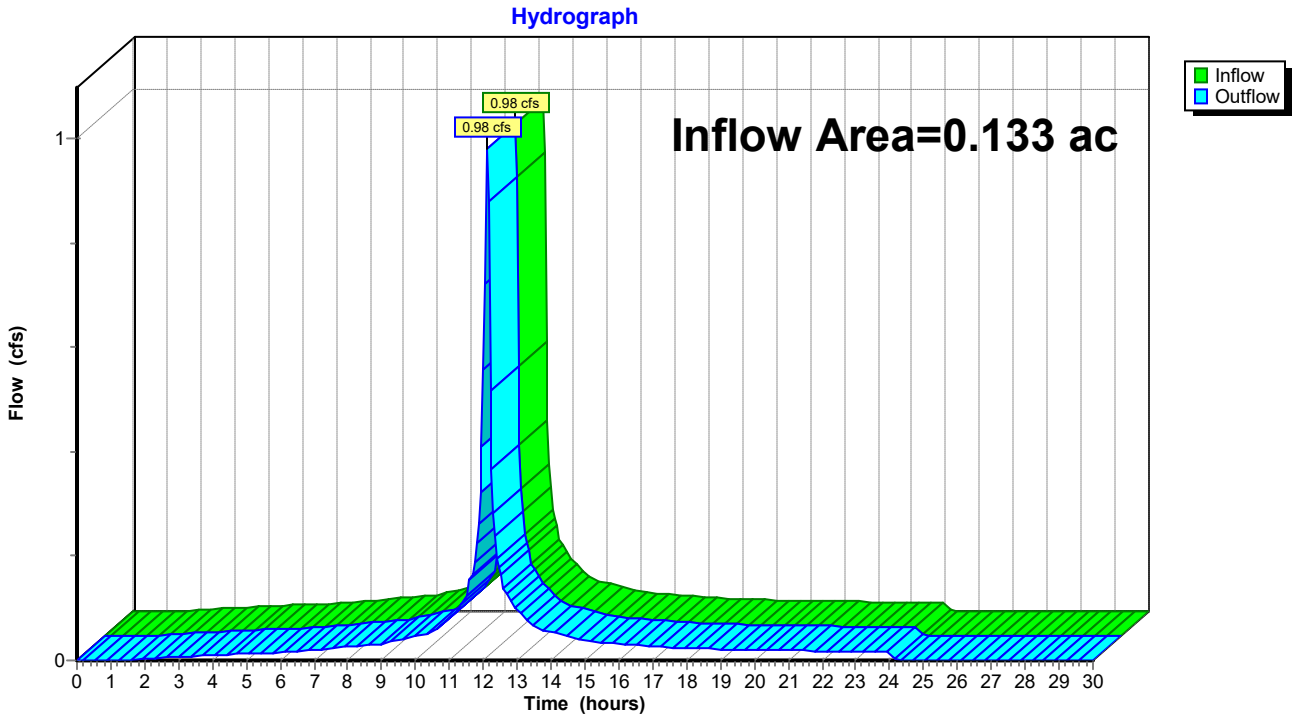


Summary for Reach DCB-B: TO DMH-E

Inflow Area = 0.133 ac, 89.51% Impervious, Inflow Depth = 7.38" for 100-Year event
Inflow = 0.98 cfs @ 12.11 hrs, Volume= 0.082 af
Outflow = 0.98 cfs @ 12.11 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-B: TO DMH-E

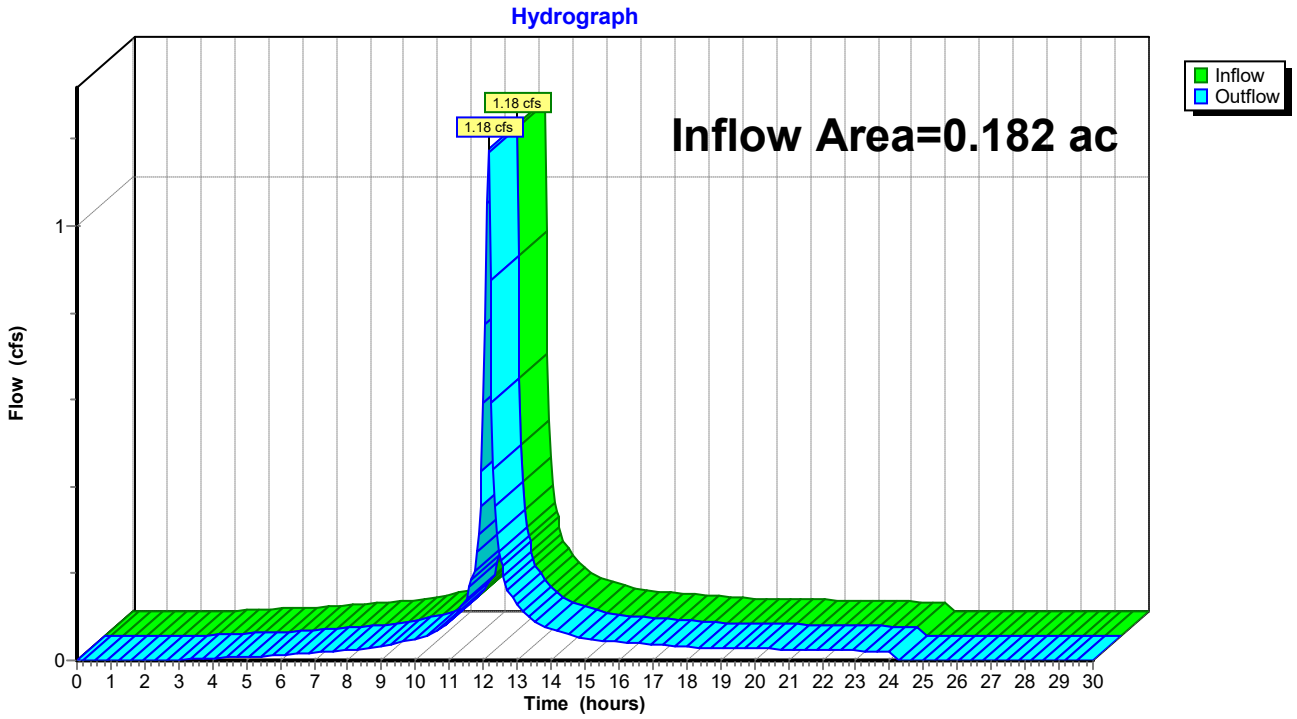


Summary for Reach DCB-C: TO TRUNKLINE

Inflow Area = 0.182 ac, 68.45% Impervious, Inflow Depth = 6.54" for 100-Year event
Inflow = 1.18 cfs @ 12.14 hrs, Volume= 0.099 af
Outflow = 1.18 cfs @ 12.14 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DCB-C: TO TRUNKLINE



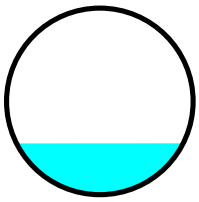
Summary for Reach DCB-D: TO DMH-A

Inflow Area = 0.238 ac, 73.15% Impervious, Inflow Depth = 6.18" for 100-Year event
Inflow = 1.57 cfs @ 12.11 hrs, Volume= 0.123 af
Outflow = 1.56 cfs @ 12.11 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.1 min

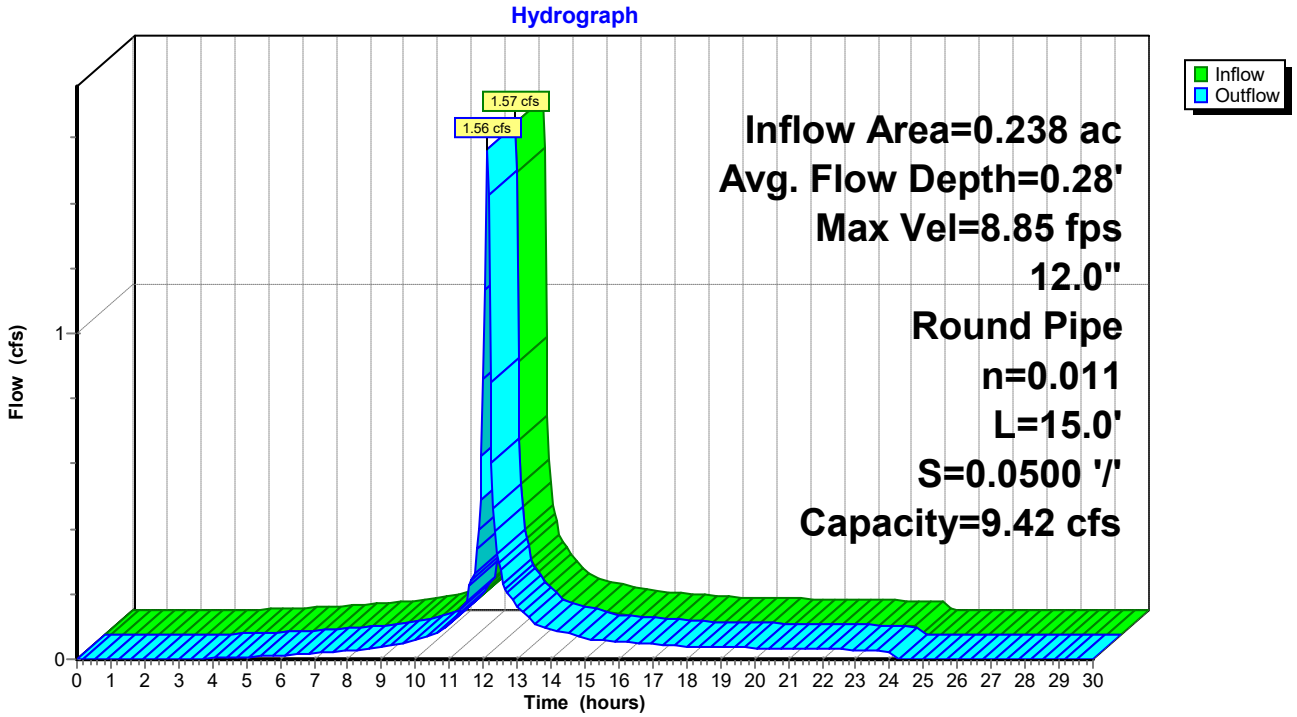
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.85 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.07 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.42 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 15.0' Slope= 0.0500 '/'
Inlet Invert= 466.75', Outlet Invert= 466.00'



Reach DCB-D: TO DMH-A



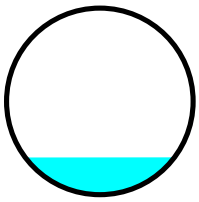
Summary for Reach DCB-E: TO DMH-A

Inflow Area = 0.154 ac, 83.83% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 1.09 cfs @ 12.11 hrs, Volume= 0.088 af
Outflow = 1.09 cfs @ 12.11 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

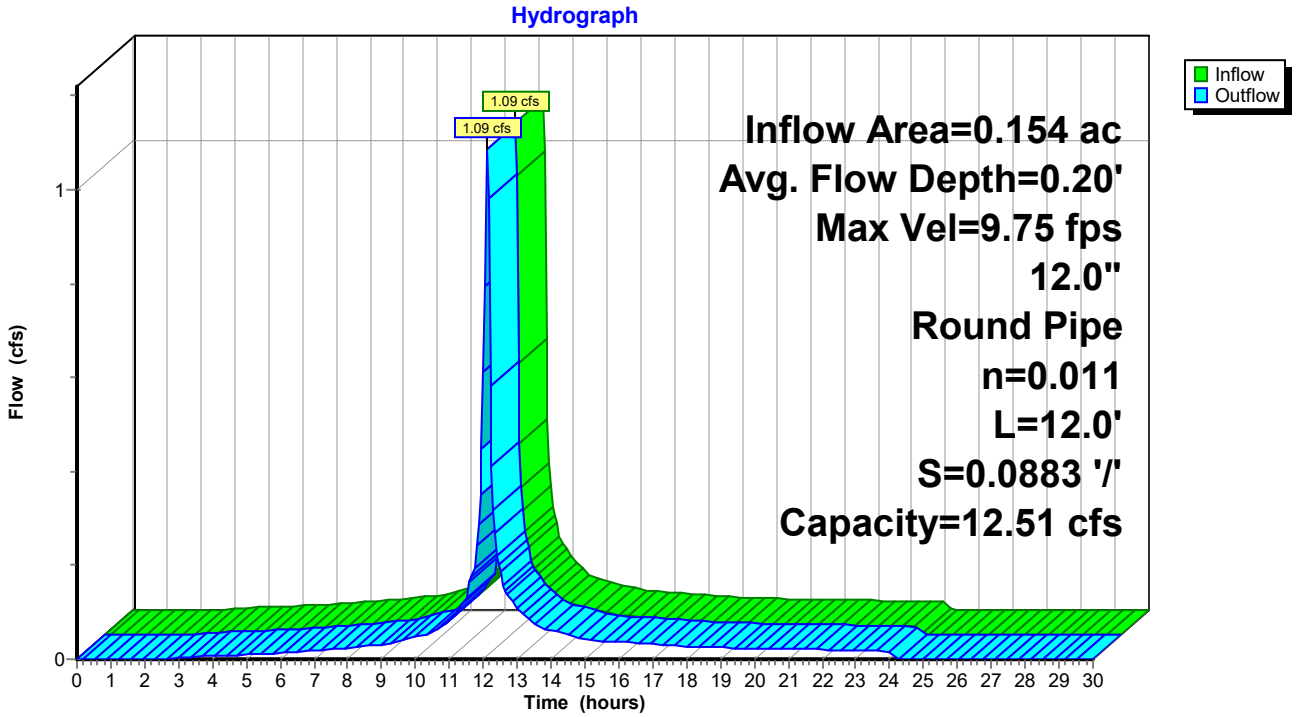
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.75 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.36 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.51 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 12.0' Slope= 0.0883 '/'
Inlet Invert= 467.63', Outlet Invert= 466.57'



Reach DCB-E: TO DMH-A



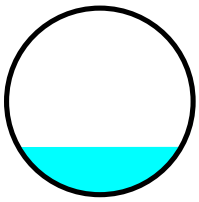
Summary for Reach DCB1: TO DMH#2

Inflow Area = 0.118 ac, 82.42% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 0.84 cfs @ 12.11 hrs, Volume= 0.068 af
Outflow = 0.82 cfs @ 12.12 hrs, Volume= 0.068 af, Atten= 3%, Lag= 0.6 min

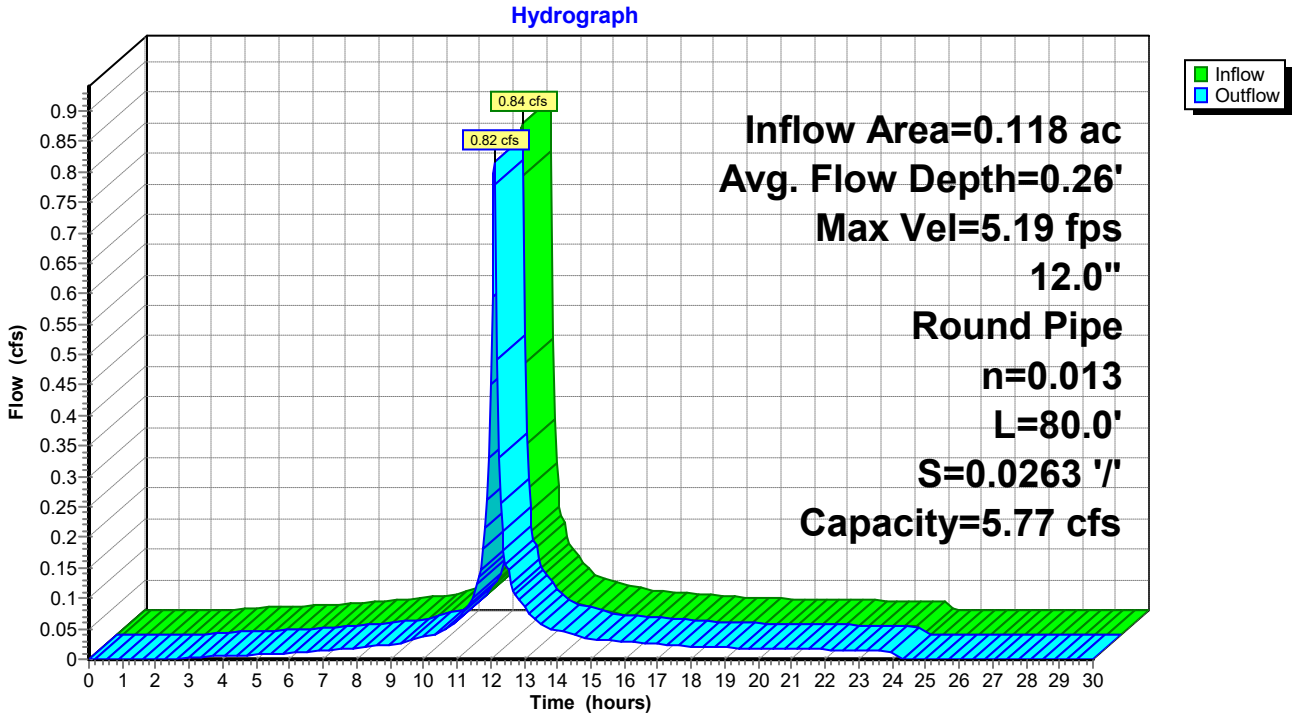
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.19 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.7 min

Peak Storage= 13 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.77 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 80.0' Slope= 0.0263 '/'
Inlet Invert= 469.10', Outlet Invert= 467.00'



Reach DCB1: TO DMH#2



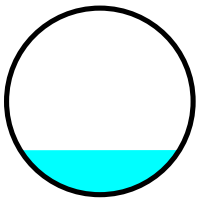
Summary for Reach DCB2: TO DMH#2

Inflow Area = 0.088 ac, 96.05% Impervious, Inflow Depth = 7.86" for 100-Year event
Inflow = 0.66 cfs @ 12.11 hrs, Volume= 0.058 af
Outflow = 0.64 cfs @ 12.12 hrs, Volume= 0.058 af, Atten= 3%, Lag= 0.6 min

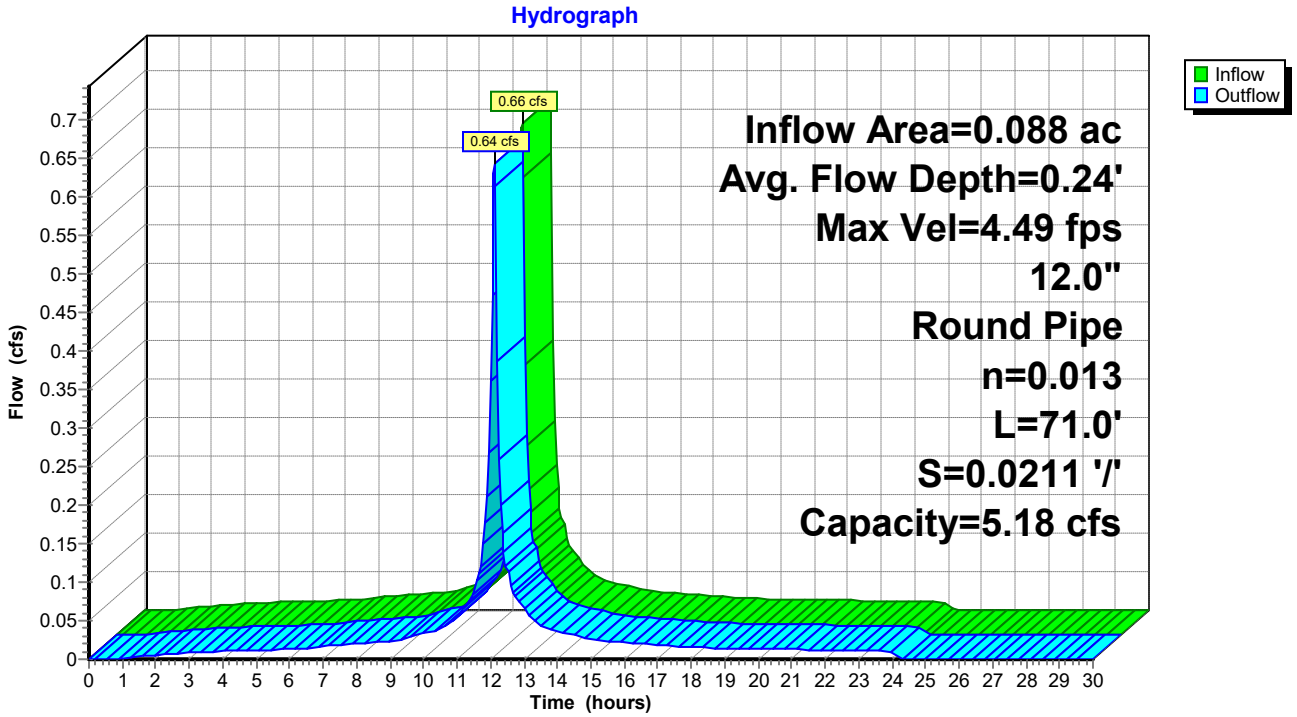
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.49 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 0.7 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.18 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 71.0' Slope= 0.0211 '/'
Inlet Invert= 469.10', Outlet Invert= 467.60'



Reach DCB2: TO DMH#2



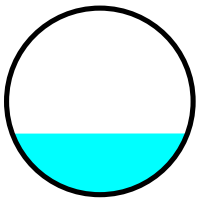
Summary for Reach DCB3: TO DMH#2

Inflow Area = 0.159 ac, 92.22% Impervious, Inflow Depth = 7.50" for 100-Year event
Inflow = 1.17 cfs @ 12.11 hrs, Volume= 0.099 af
Outflow = 1.17 cfs @ 12.11 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.1 min

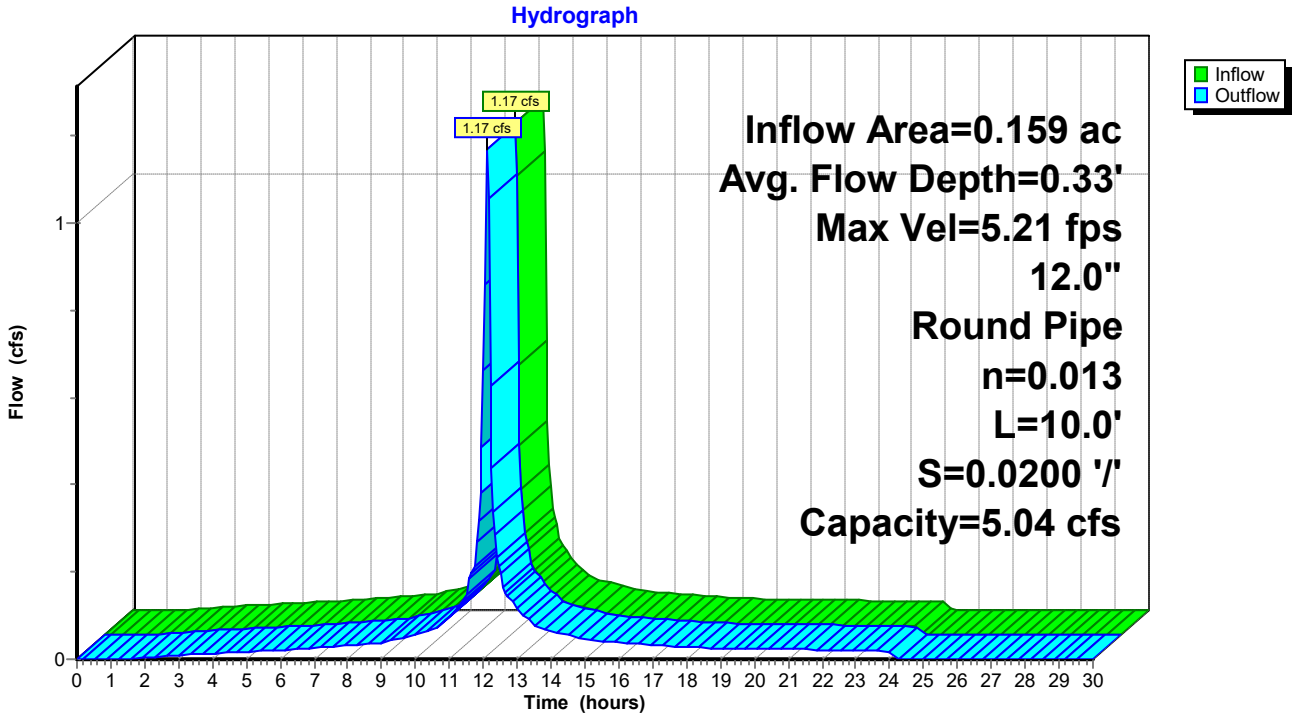
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.21 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.04 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 469.10', Outlet Invert= 468.90'



Reach DCB3: TO DMH#2



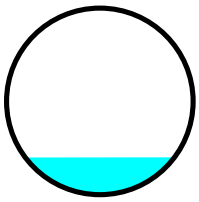
Summary for Reach DCB4: TO DMH#1

Inflow Area = 0.047 ac, 78.10% Impervious, Inflow Depth = 6.54" for 100-Year event
Inflow = 0.32 cfs @ 12.11 hrs, Volume= 0.025 af
Outflow = 0.31 cfs @ 12.13 hrs, Volume= 0.025 af, Atten= 3%, Lag= 1.1 min

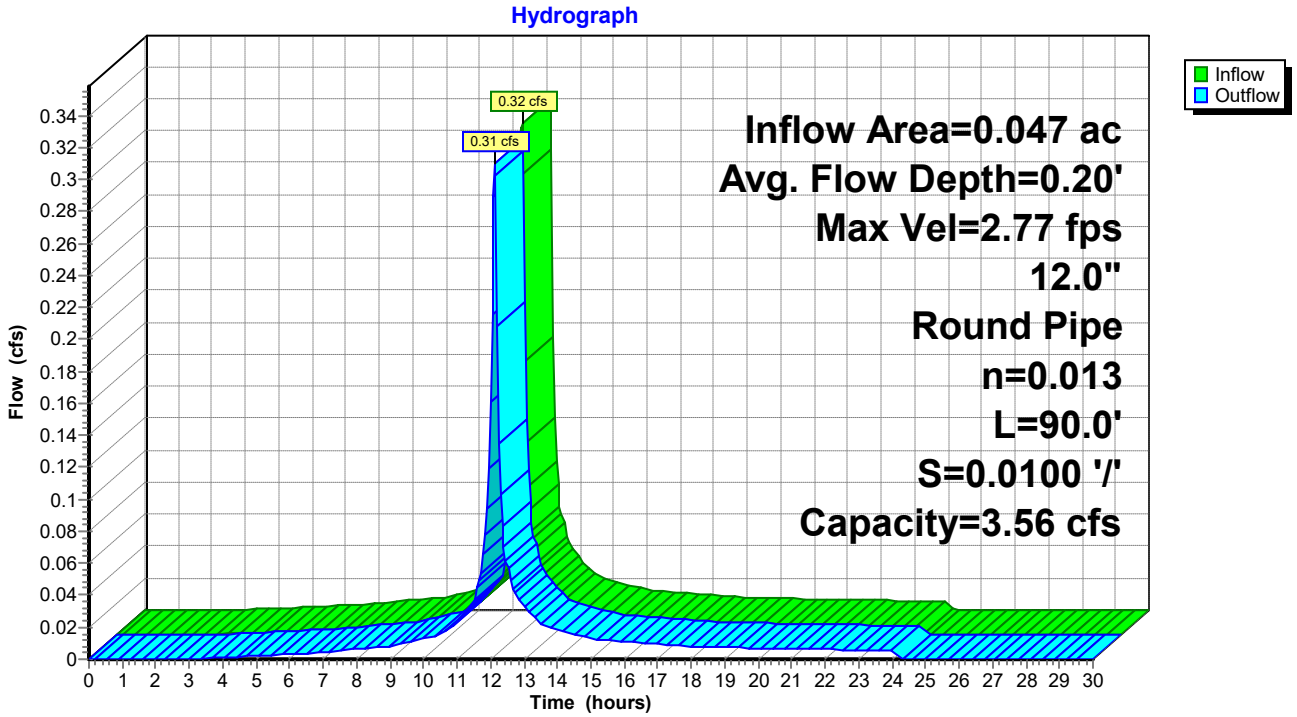
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 1.6 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 90.0' Slope= 0.0100 '/'
Inlet Invert= 468.50', Outlet Invert= 467.60'



Reach DCB4: TO DMH#1



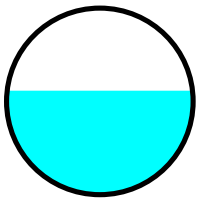
Summary for Reach DCB5: TO DMH#101

Inflow Area = 0.392 ac, 83.45% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 2.78 cfs @ 12.11 hrs, Volume= 0.226 af
Outflow = 2.76 cfs @ 12.11 hrs, Volume= 0.226 af, Atten= 1%, Lag= 0.1 min

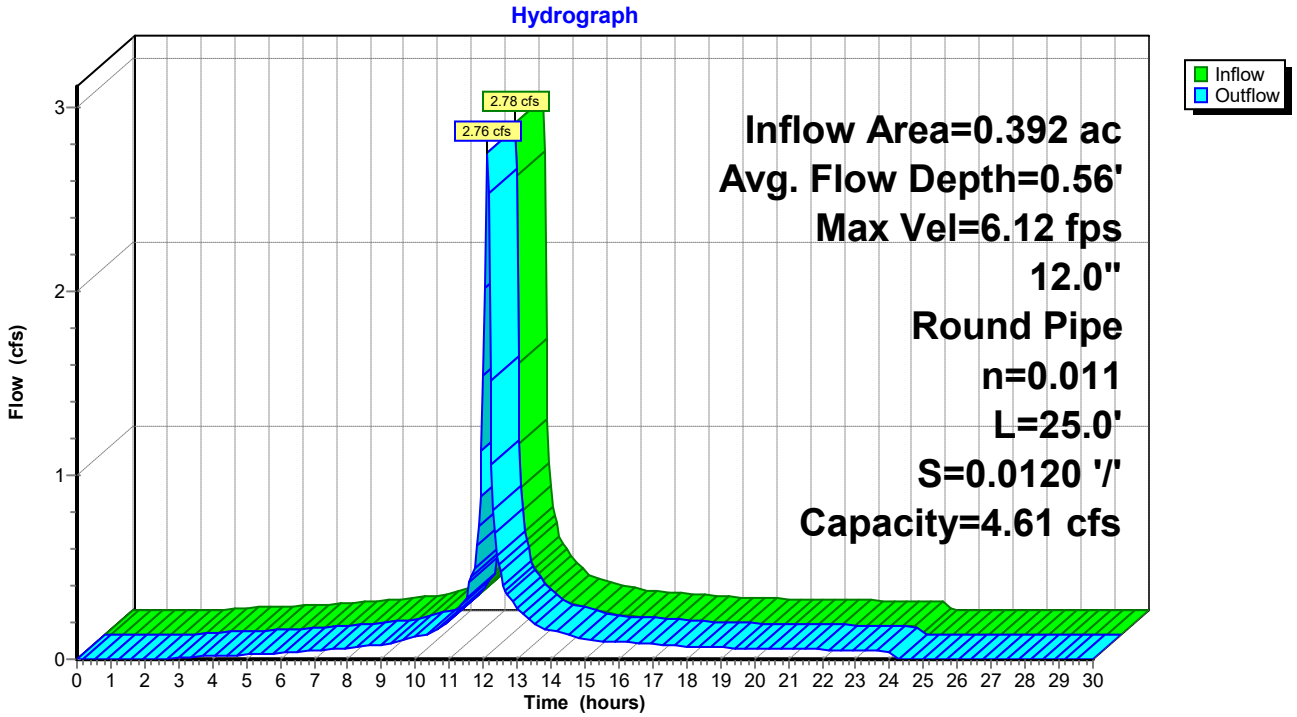
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.20 fps, Avg. Travel Time= 0.2 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0120 '/'
Inlet Invert= 468.30', Outlet Invert= 468.00'



Reach DCB5: TO DMH#101



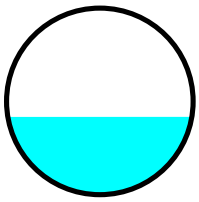
Summary for Reach DCB6: TO DMH#3

Inflow Area = 0.184 ac, 87.34% Impervious, Inflow Depth = 7.26" for 100-Year event
Inflow = 1.34 cfs @ 12.11 hrs, Volume= 0.111 af
Outflow = 1.30 cfs @ 12.13 hrs, Volume= 0.111 af, Atten= 3%, Lag= 0.9 min

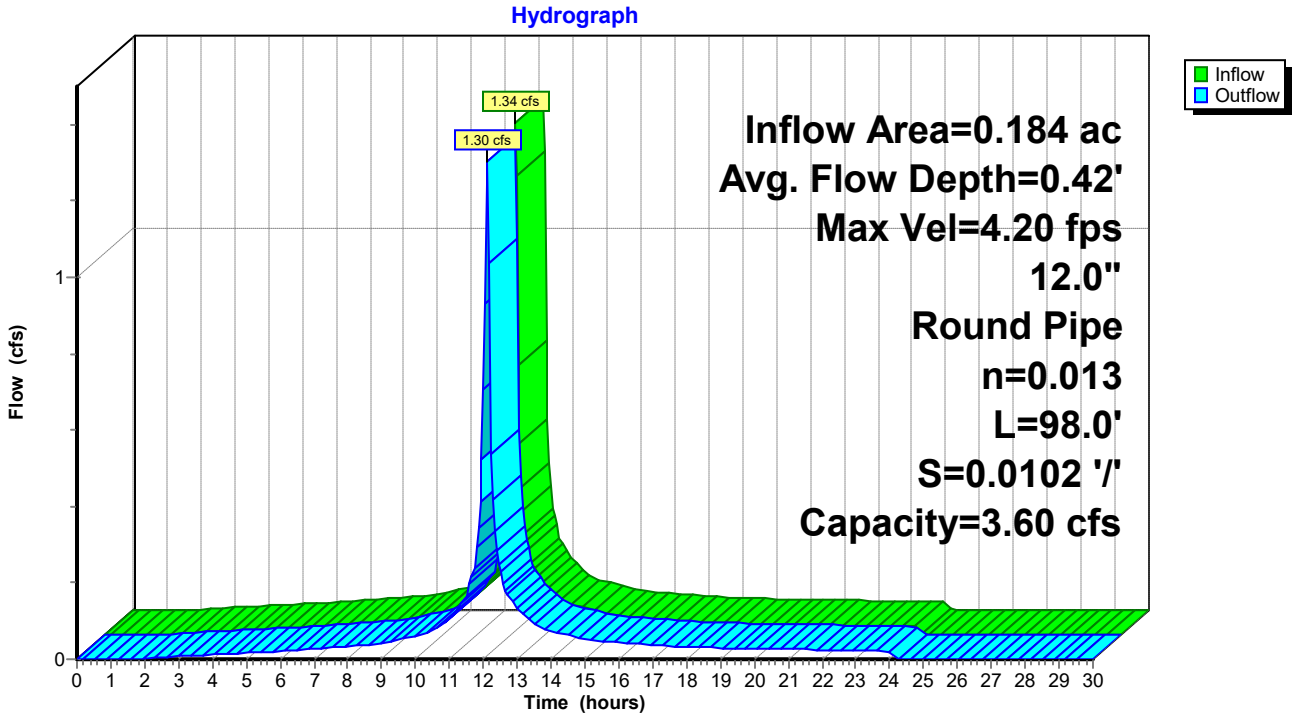
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 1.1 min

Peak Storage= 30 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 469.50', Outlet Invert= 468.50'



Reach DCB6: TO DMH#3



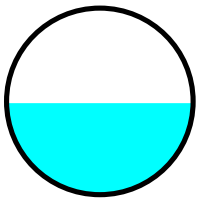
Summary for Reach DCB7: TO DMH#4

Inflow Area = 0.335 ac, 56.05% Impervious, Inflow Depth = 4.99" for 100-Year event
Inflow = 1.70 cfs @ 12.15 hrs, Volume= 0.139 af
Outflow = 1.65 cfs @ 12.16 hrs, Volume= 0.139 af, Atten= 3%, Lag= 0.6 min

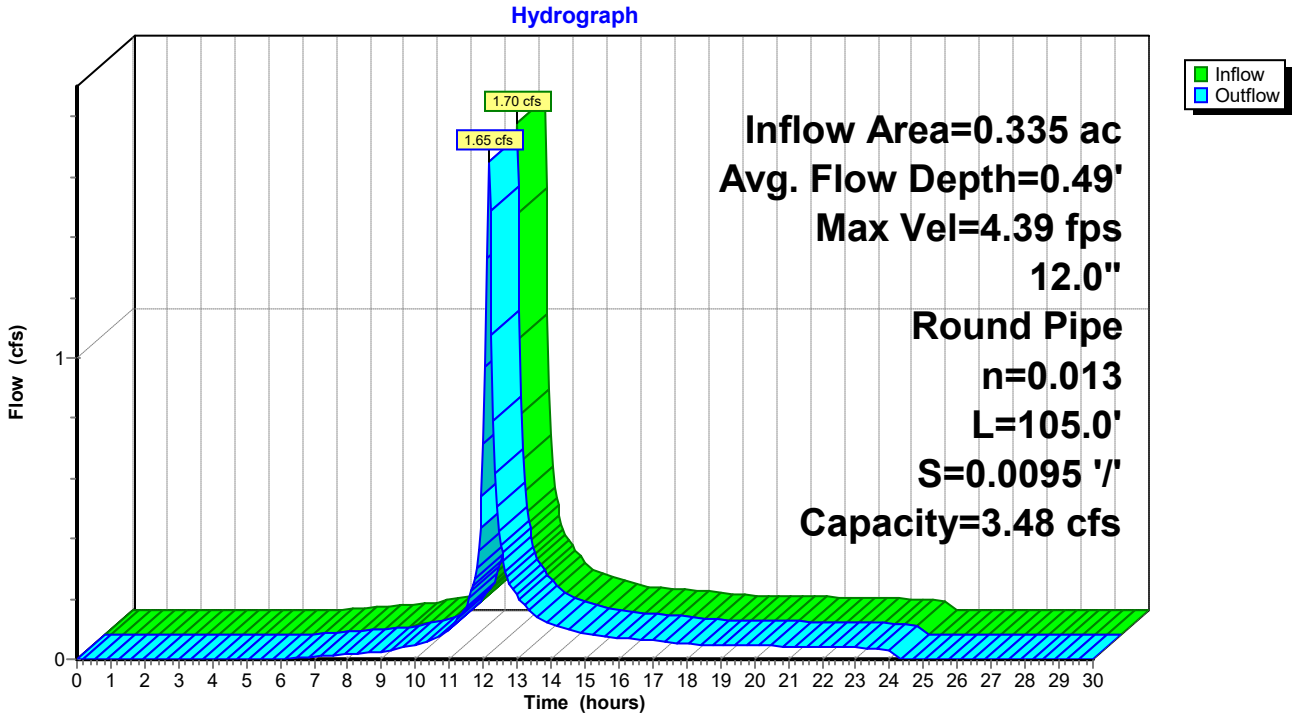
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.39 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 1.1 min

Peak Storage= 40 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.48 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 105.0' Slope= 0.0095 '/'
Inlet Invert= 470.00', Outlet Invert= 469.00'



Reach DCB7: TO DMH#4



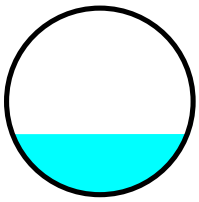
Summary for Reach DCB8: TO DMH#4

Inflow Area = 0.143 ac, 85.54% Impervious, Inflow Depth = 7.02" for 100-Year event
Inflow = 1.02 cfs @ 12.11 hrs, Volume= 0.084 af
Outflow = 1.00 cfs @ 12.12 hrs, Volume= 0.084 af, Atten= 2%, Lag= 0.5 min

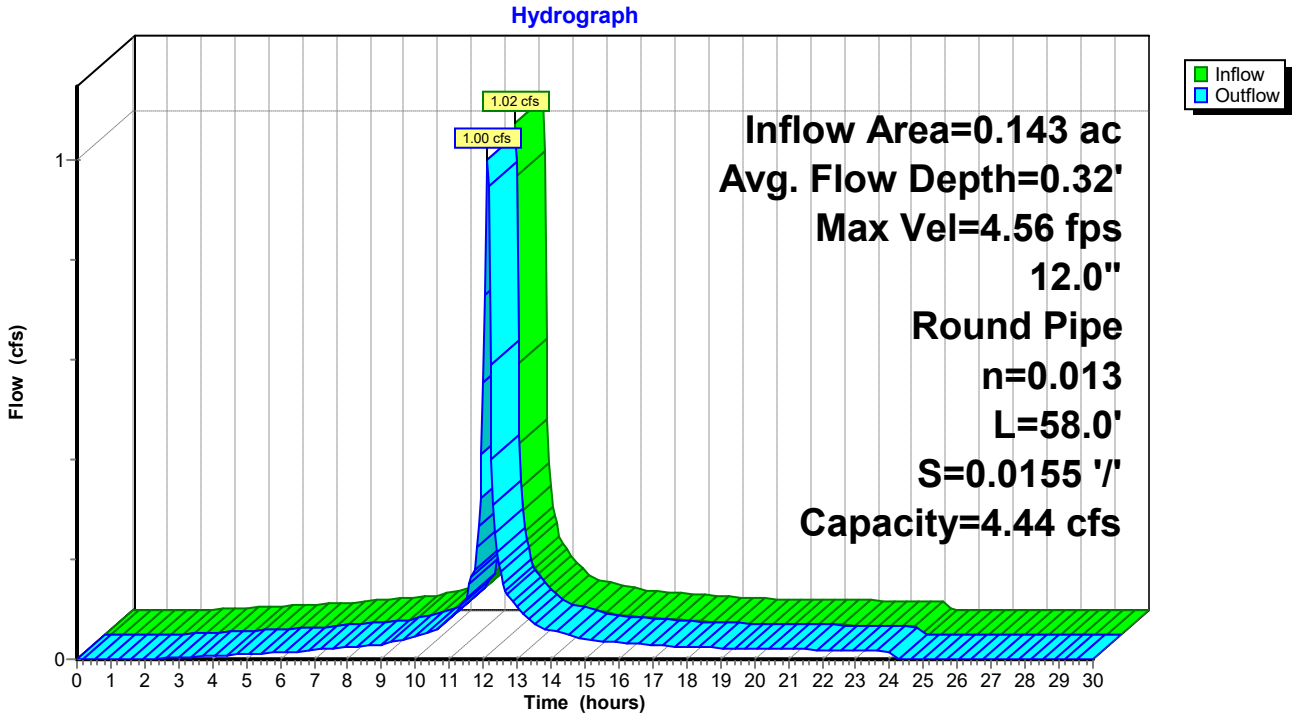
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 0.6 min

Peak Storage= 13 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 58.0' Slope= 0.0155 '/'
Inlet Invert= 469.90', Outlet Invert= 469.00'



Reach DCB8: TO DMH#4



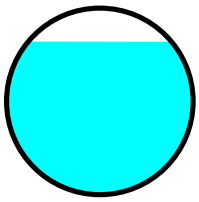
Summary for Reach DCB9: TO DMH#5

Inflow Area = 0.342 ac, 51.34% Impervious, Inflow Depth = 5.47" for 100-Year event
Inflow = 2.04 cfs @ 12.11 hrs, Volume= 0.156 af
Outflow = 2.00 cfs @ 12.13 hrs, Volume= 0.156 af, Atten= 2%, Lag= 0.7 min

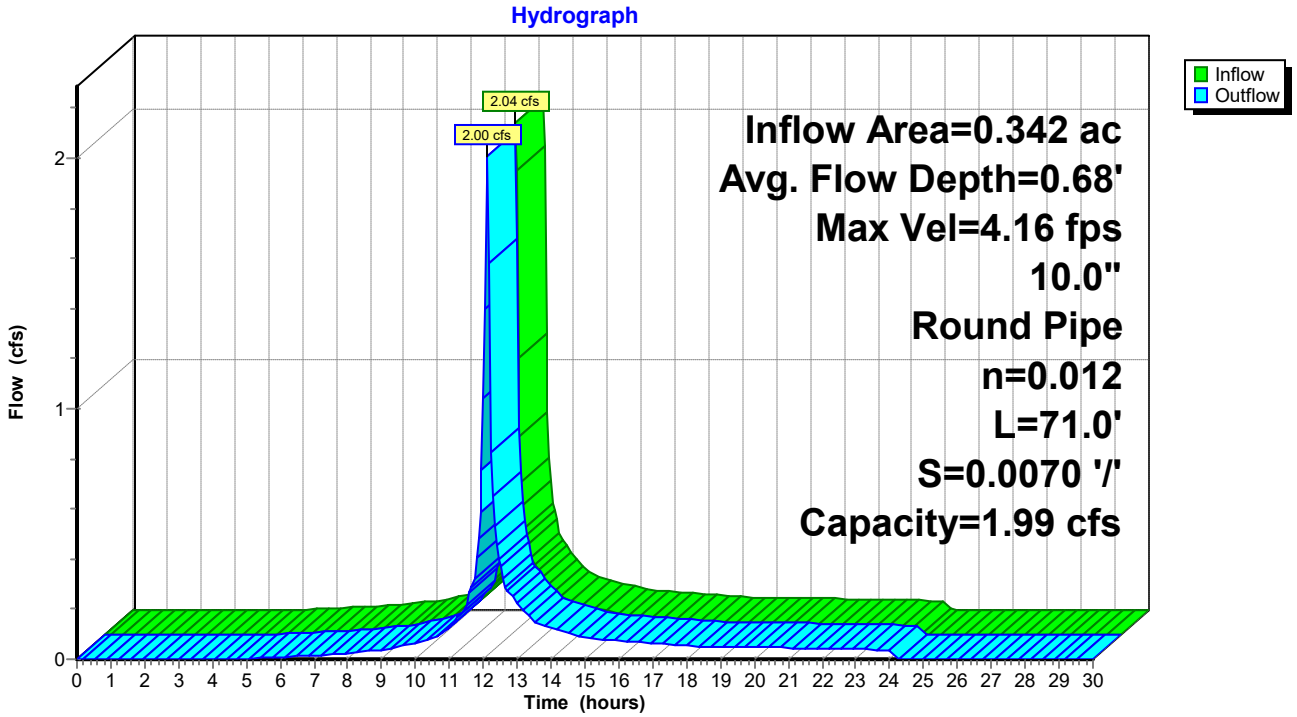
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.16 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 0.7 min

Peak Storage= 34 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 1.99 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 71.0' Slope= 0.0070 '/'
Inlet Invert= 471.00', Outlet Invert= 470.50'



Reach DCB9: TO DMH#5

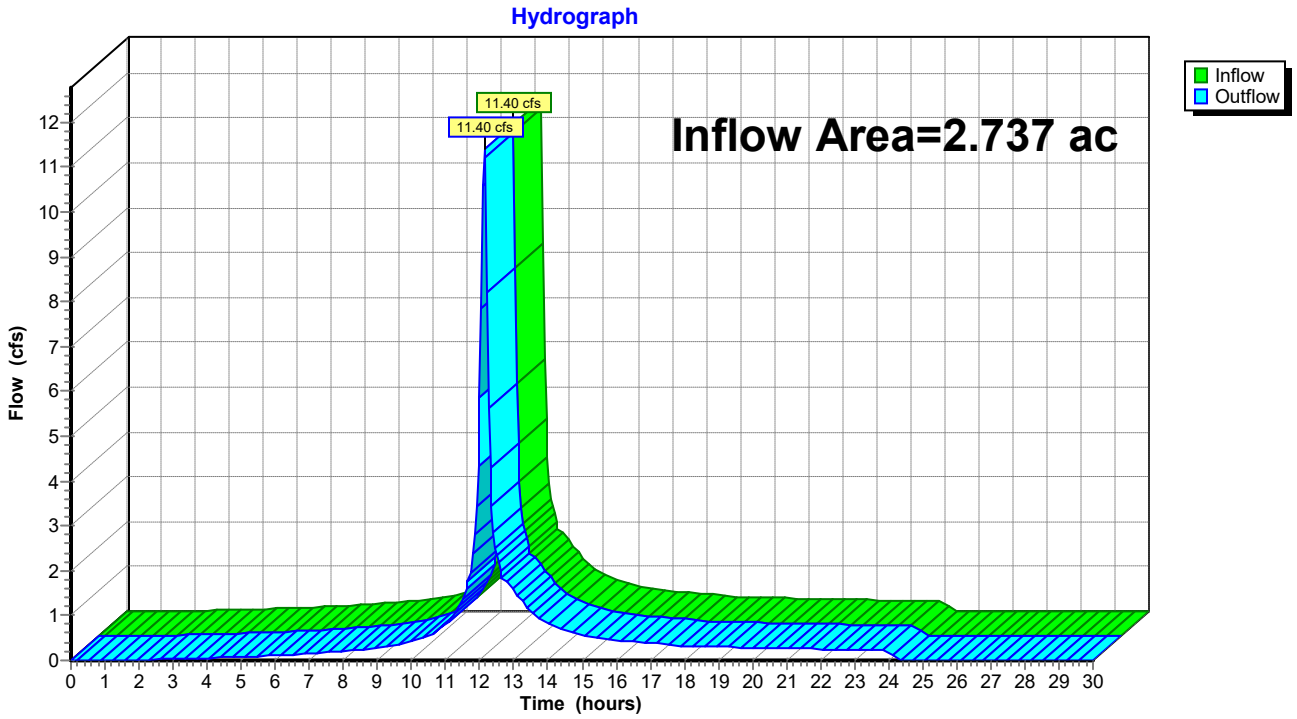


Summary for Reach DMH-A: TO DMH-B

Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 4.40" for 100-Year event
Inflow = 11.40 cfs @ 12.13 hrs, Volume= 1.004 af
Outflow = 11.40 cfs @ 12.13 hrs, Volume= 1.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-A: TO DMH-B

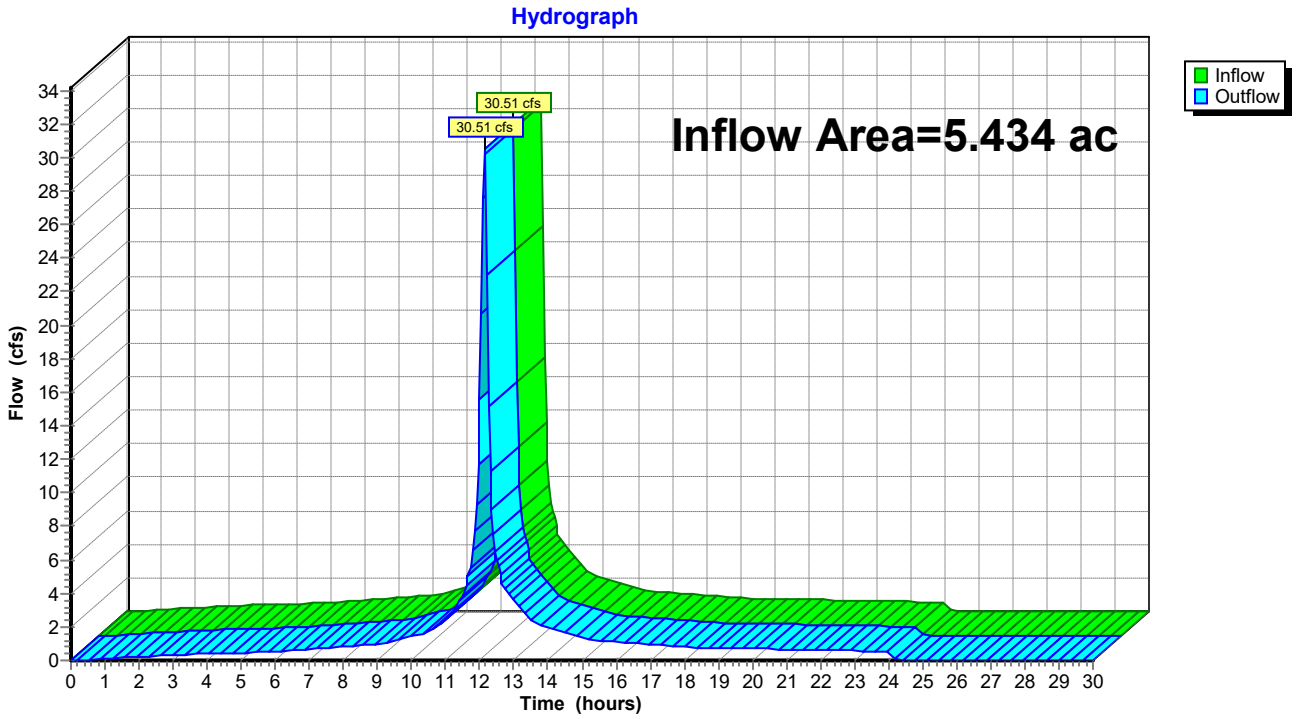


Summary for Reach DMH-C: TO DP#1

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 6.14" for 100-Year event
Inflow = 30.51 cfs @ 12.14 hrs, Volume= 2.779 af
Outflow = 30.51 cfs @ 12.14 hrs, Volume= 2.779 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DMH-C: TO DP#1



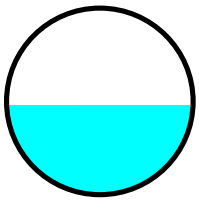
Summary for Reach DMH-D: TO DMH-C

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 6.14" for 100-Year event
Inflow = 30.73 cfs @ 12.13 hrs, Volume= 2.779 af
Outflow = 30.51 cfs @ 12.14 hrs, Volume= 2.779 af, Atten= 1%, Lag= 0.3 min

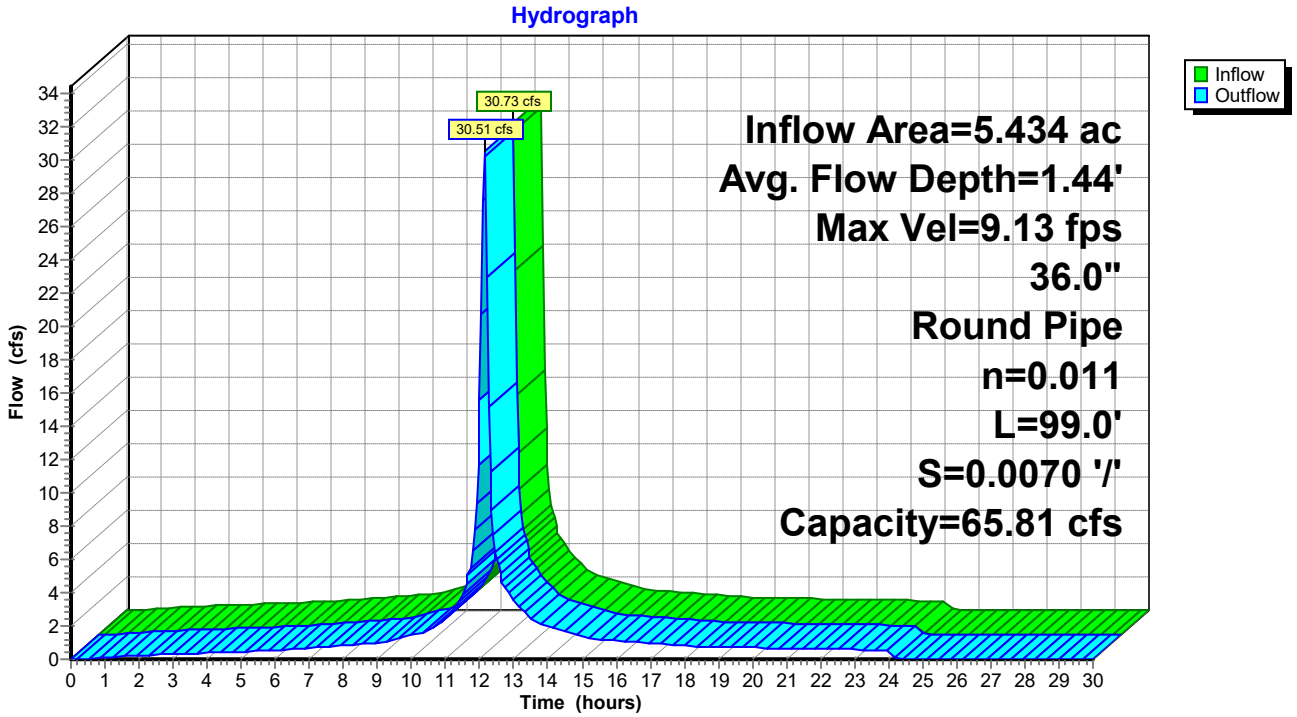
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.13 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.25 fps, Avg. Travel Time= 0.5 min

Peak Storage= 333 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 65.81 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 99.0' Slope= 0.0070 '/'
Inlet Invert= 455.90', Outlet Invert= 455.21'



Reach DMH-D: TO DMH-C



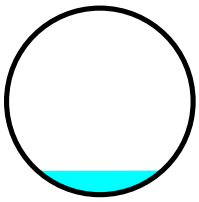
Summary for Reach DMH-E: TO DMH-D

Inflow Area = 0.315 ac, 77.36% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 2.12 cfs @ 12.13 hrs, Volume= 0.181 af
Outflow = 2.12 cfs @ 12.13 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.2 min

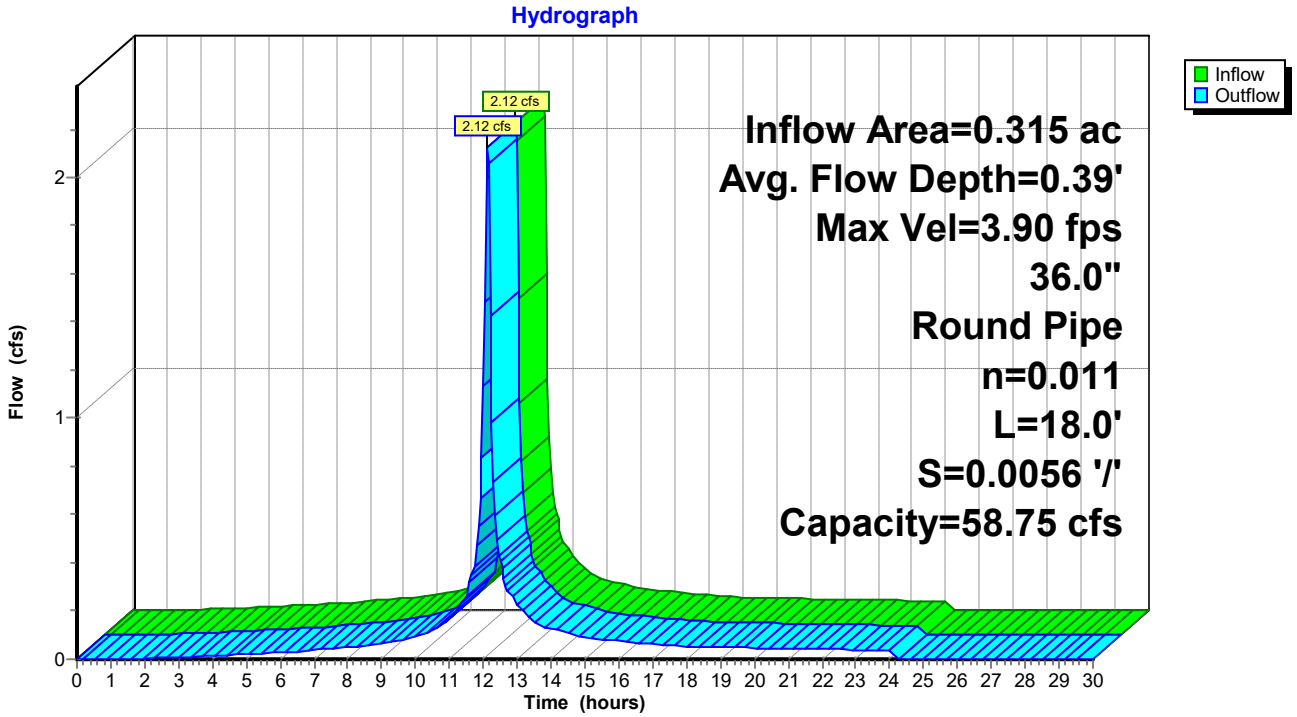
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.90 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.2 min

Peak Storage= 10 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 58.75 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 18.0' Slope= 0.0056 '/'
Inlet Invert= 456.57', Outlet Invert= 456.47'



Reach DMH-E: TO DMH-D



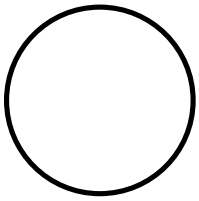
Summary for Reach DMH-F: TO DMH-E

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

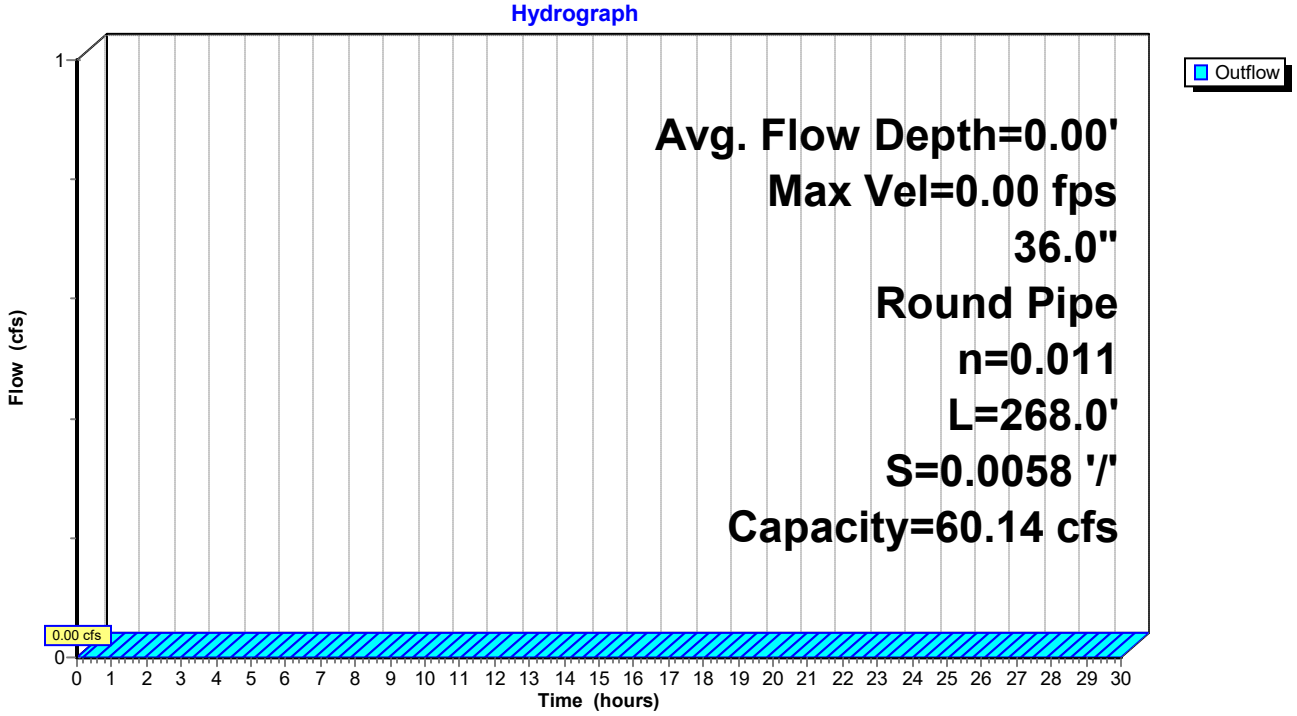
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.14 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 268.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 456.57'



Reach DMH-F: TO DMH-E



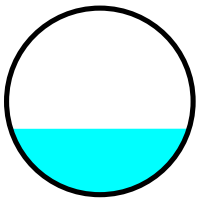
Summary for Reach DMH1: TO DMH#2

Inflow Area = 0.135 ac, 89.85% Impervious, Inflow Depth = 7.40" for 100-Year event
Inflow = 0.95 cfs @ 12.12 hrs, Volume= 0.083 af
Outflow = 0.95 cfs @ 12.13 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.4 min

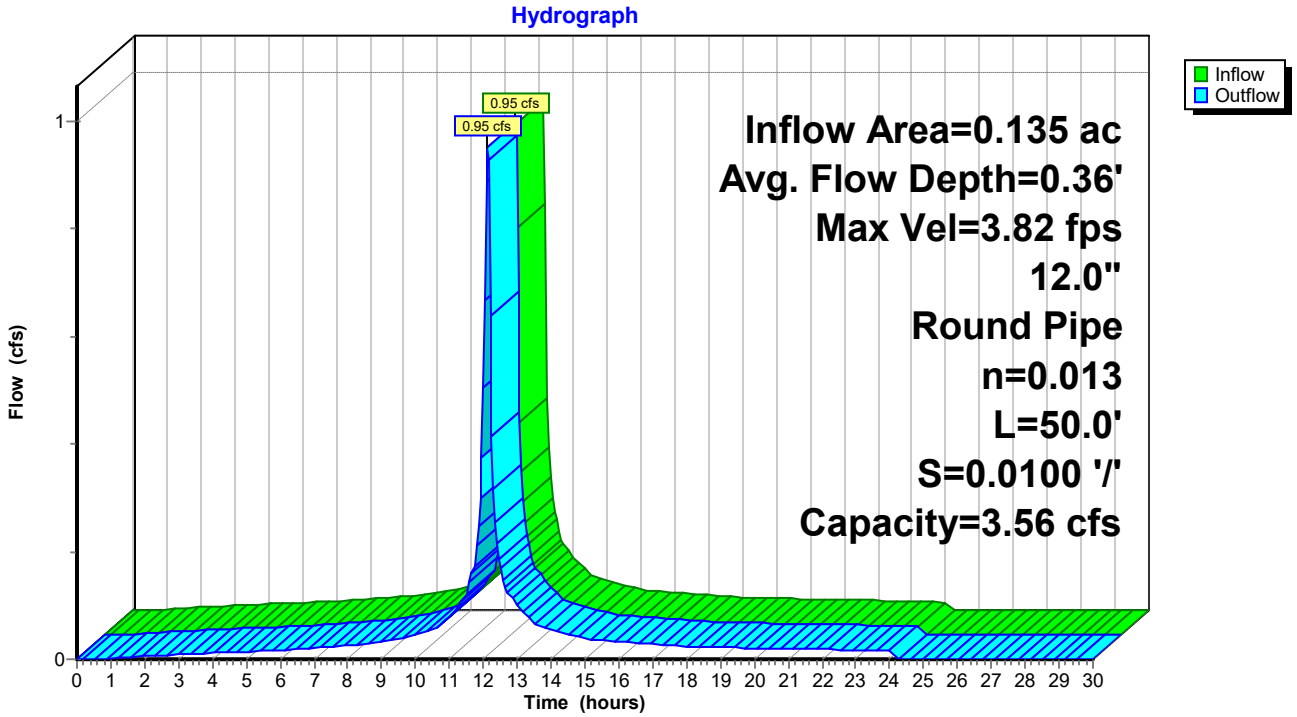
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.82 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.6 min

Peak Storage= 12 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DMH1: TO DMH#2



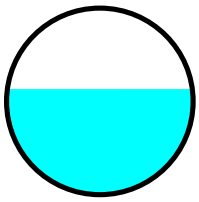
Summary for Reach DMH10: TO CMH#1

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 8.10" for 100-Year event
Inflow = 16.38 cfs @ 12.13 hrs, Volume= 1.507 af
Outflow = 16.36 cfs @ 12.13 hrs, Volume= 1.507 af, Atten= 0%, Lag= 0.1 min

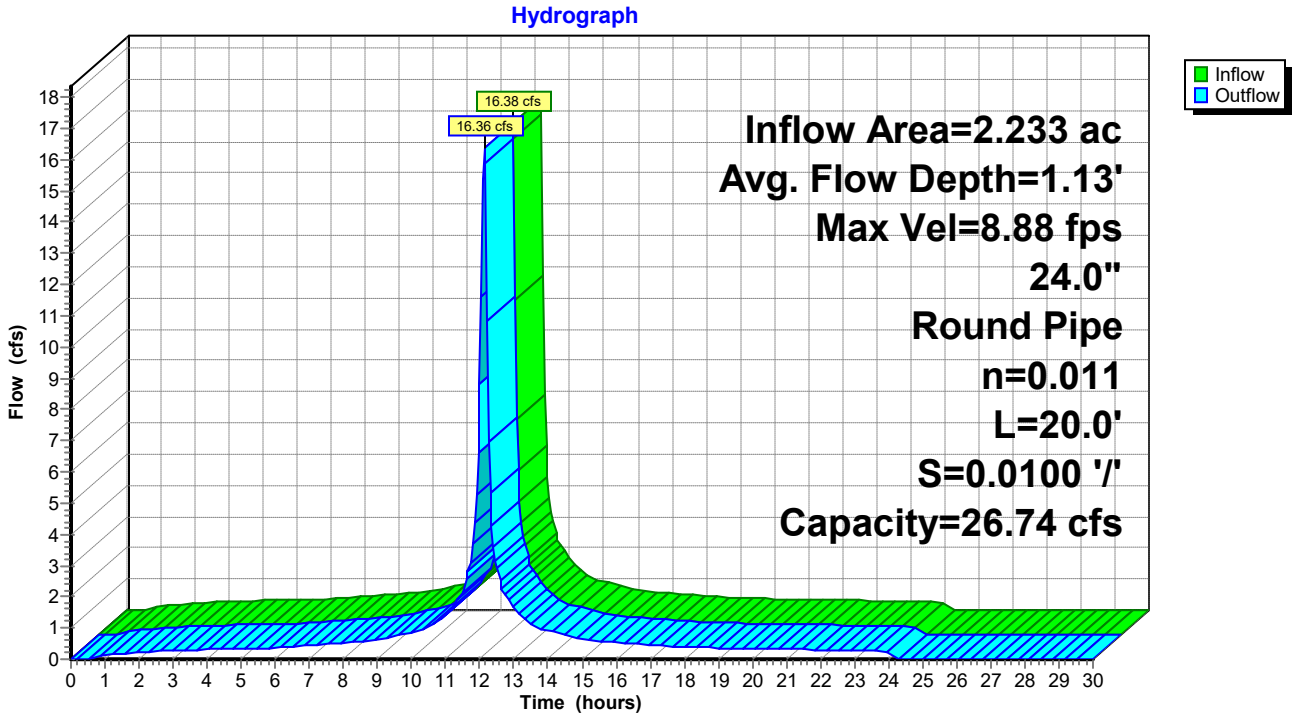
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.88 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.30 fps, Avg. Travel Time= 0.1 min

Peak Storage= 37 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.13'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 26.74 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0100 '/'
Inlet Invert= 458.10', Outlet Invert= 457.90'



Reach DMH10: TO CMH#1



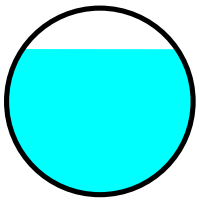
Summary for Reach DMH100: TO DMH-A

Inflow Area = 2.345 ac, 63.28% Impervious, Inflow Depth = 4.06" for 100-Year event
Inflow = 8.92 cfs @ 12.14 hrs, Volume= 0.793 af
Outflow = 8.86 cfs @ 12.14 hrs, Volume= 0.793 af, Atten= 1%, Lag= 0.3 min

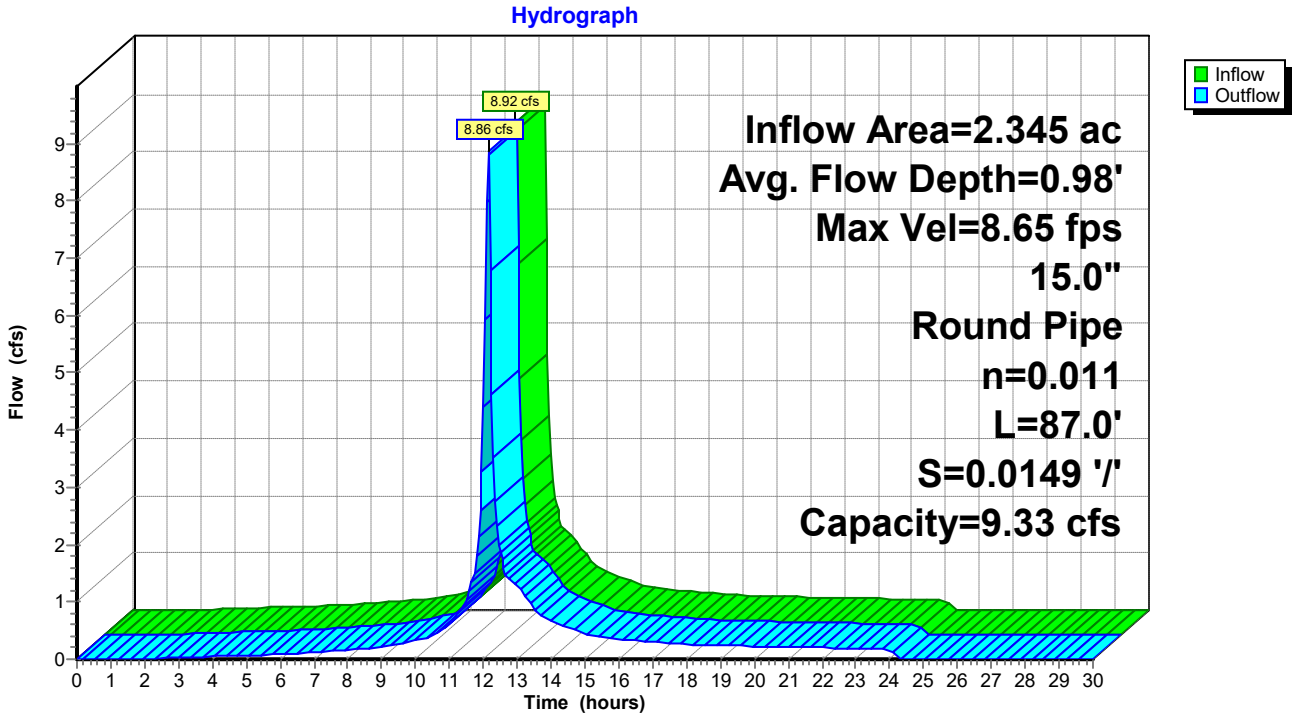
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.17 fps, Avg. Travel Time= 0.5 min

Peak Storage= 90 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 87.0' Slope= 0.0149 '/'
Inlet Invert= 466.10', Outlet Invert= 464.80'



Reach DMH100: TO DMH-A



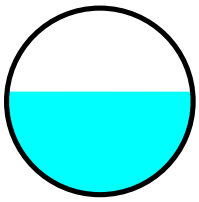
Summary for Reach DMH101: TO DMH#100

Inflow Area = 1.054 ac, 75.70% Impervious, Inflow Depth = 2.86" for 100-Year event
Inflow = 2.76 cfs @ 12.11 hrs, Volume= 0.251 af
Outflow = 2.70 cfs @ 12.12 hrs, Volume= 0.251 af, Atten= 2%, Lag= 0.5 min

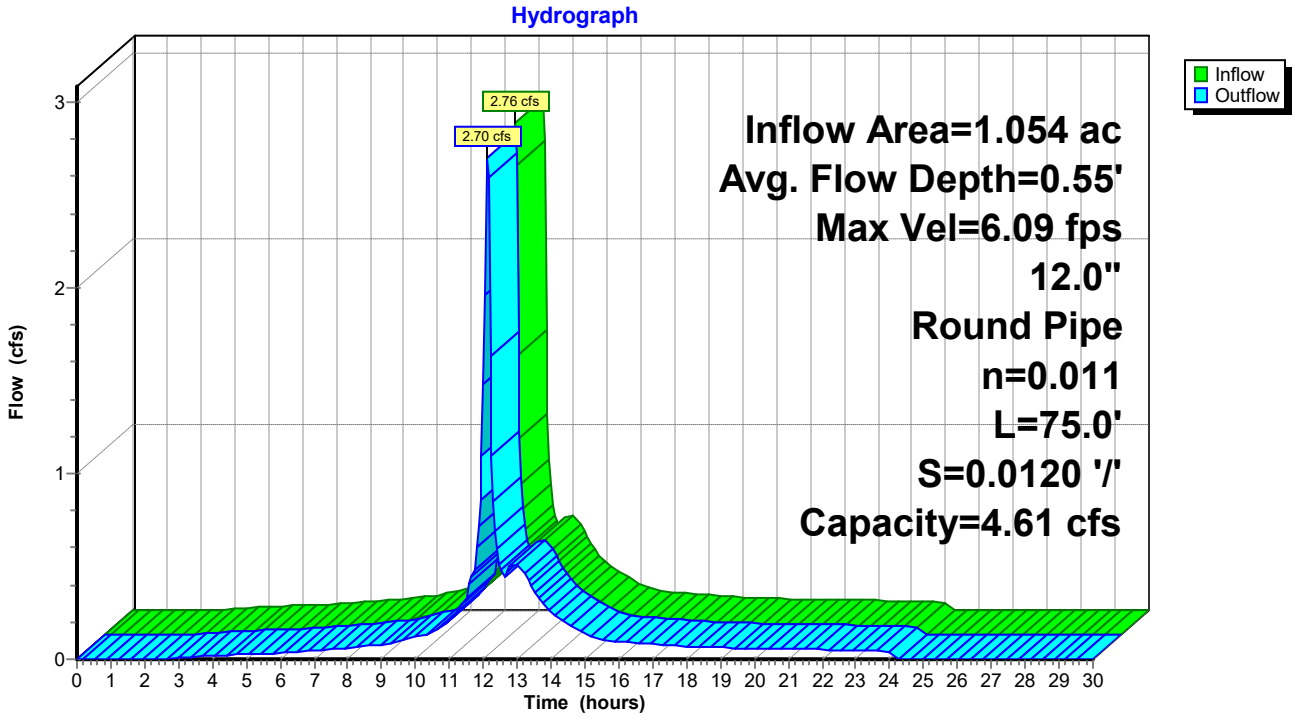
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.09 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 0.6 min

Peak Storage= 33 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 75.0' Slope= 0.0120 '/'
Inlet Invert= 467.10', Outlet Invert= 466.20'



Reach DMH101: TO DMH#100



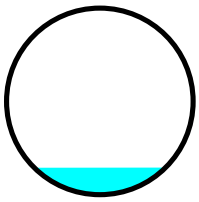
Summary for Reach DMH102: TO DMH#101

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.46" for 100-Year event
Inflow = 0.24 cfs @ 13.05 hrs, Volume= 0.025 af
Outflow = 0.24 cfs @ 13.05 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.2 min

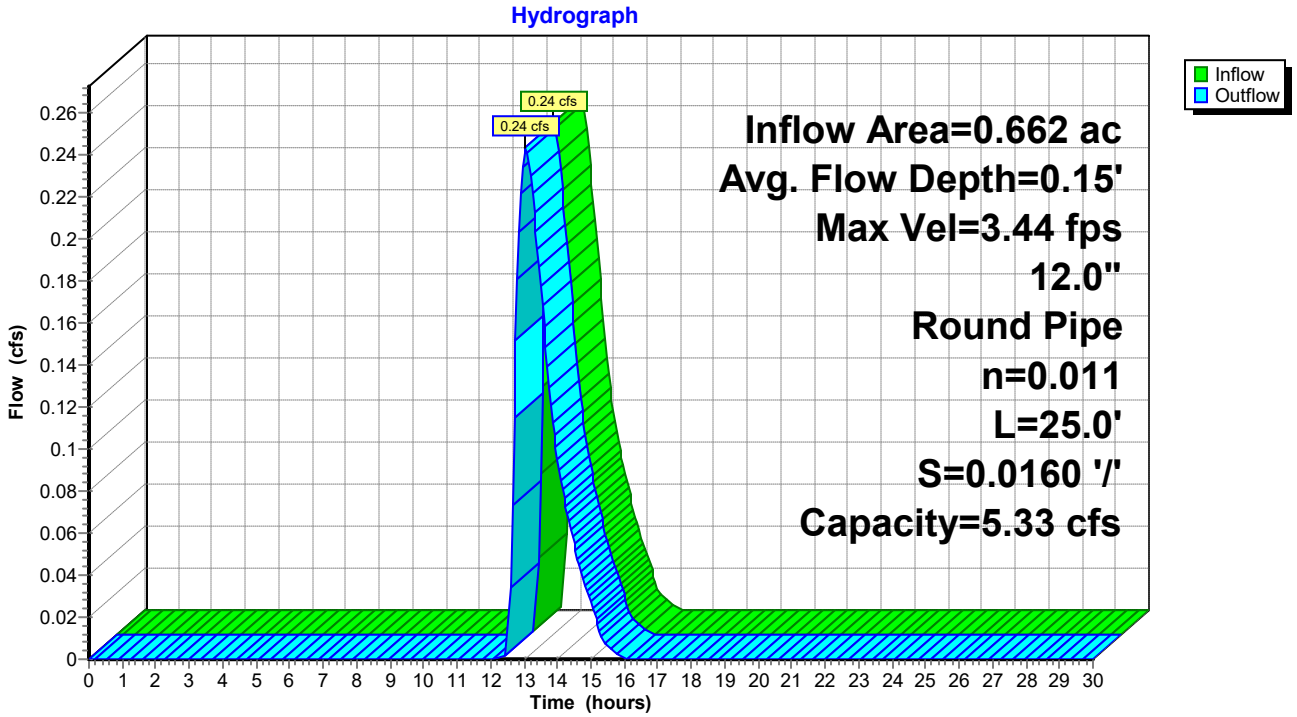
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.44 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 13.05 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.33 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0160 '/'
Inlet Invert= 467.60', Outlet Invert= 467.20'



Reach DMH102: TO DMH#101



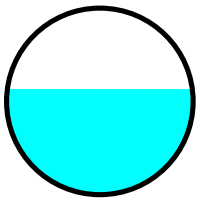
Summary for Reach DMH2: TO DMH#100

Inflow Area = 0.412 ac, 88.63% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 2.90 cfs @ 12.12 hrs, Volume= 0.250 af
Outflow = 2.91 cfs @ 12.13 hrs, Volume= 0.250 af, Atten= 0%, Lag= 0.3 min

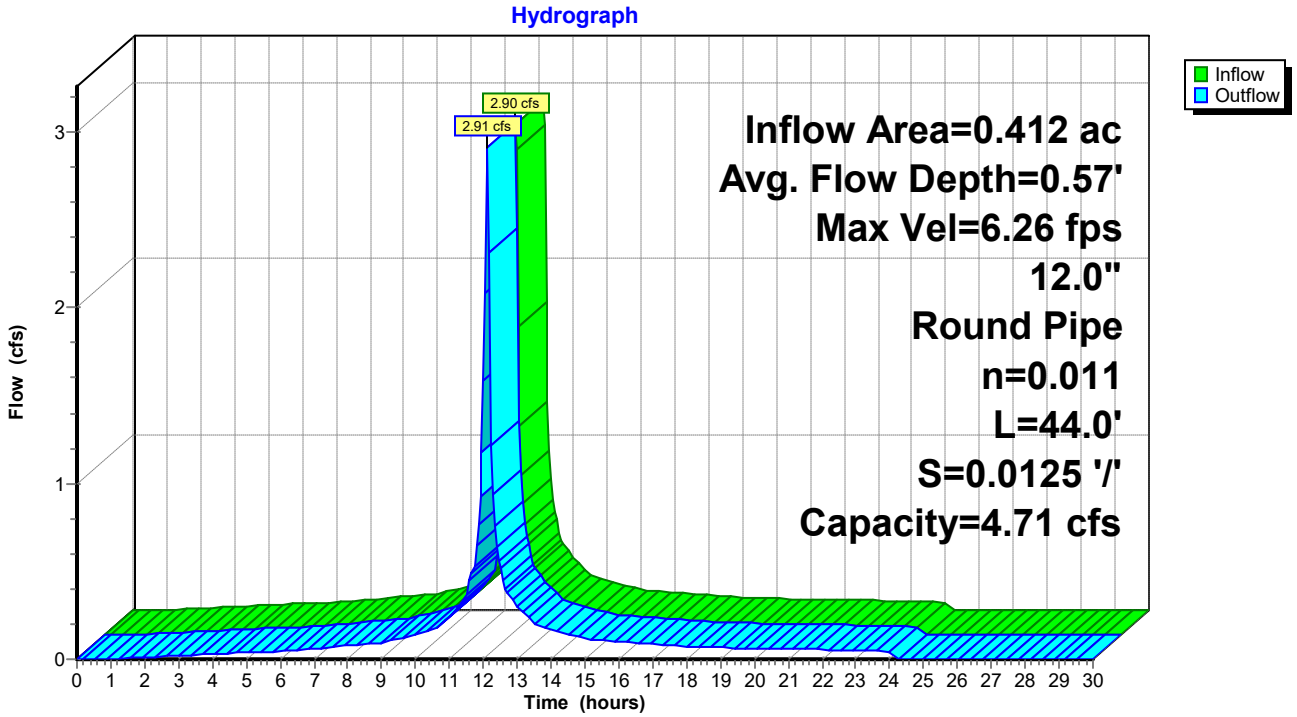
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.26 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 0.3 min

Peak Storage= 20 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.71 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 44.0' Slope= 0.0125 '/'
Inlet Invert= 466.75', Outlet Invert= 466.20'



Reach DMH2: TO DMH#100



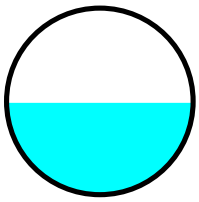
Summary for Reach DMH3: TO UGS#1A

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 6.06" for 100-Year event
Inflow = 3.88 cfs @ 12.14 hrs, Volume= 0.334 af
Outflow = 3.88 cfs @ 12.14 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

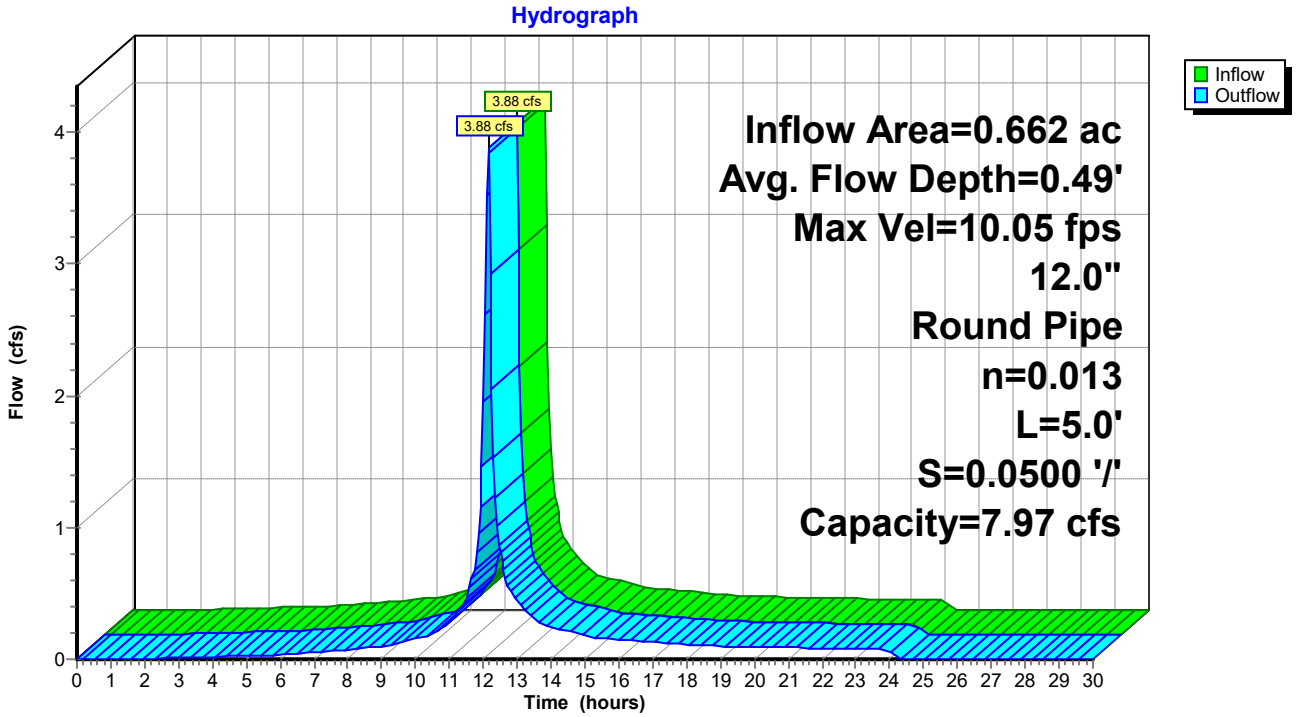
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.53 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.97 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 468.25', Outlet Invert= 468.00'



Reach DMH3: TO UGS#1A



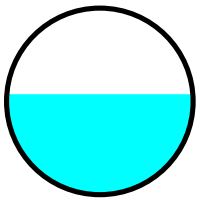
Summary for Reach DMH4: TO DMH#3

Inflow Area = 0.478 ac, 64.87% Impervious, Inflow Depth = 5.60" for 100-Year event
Inflow = 2.60 cfs @ 12.14 hrs, Volume= 0.223 af
Outflow = 2.60 cfs @ 12.14 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.1 min

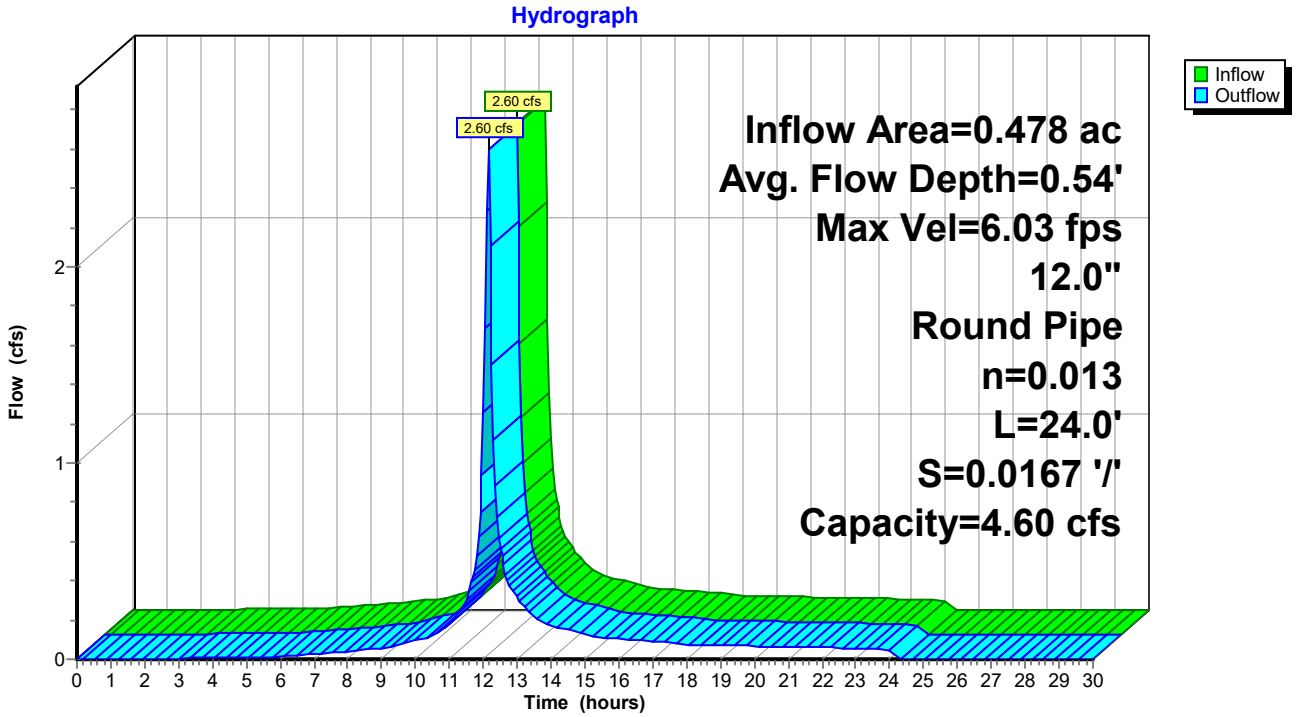
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.03 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.11 fps, Avg. Travel Time= 0.2 min

Peak Storage= 10 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0167 '/'
Inlet Invert= 468.90', Outlet Invert= 468.50'



Reach DMH4: TO DMH#3



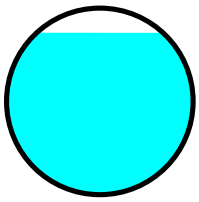
Summary for Reach DMH5: TO DMH#6

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 3.97" for 100-Year event
Inflow = 3.56 cfs @ 12.14 hrs, Volume= 0.291 af
Outflow = 3.48 cfs @ 12.15 hrs, Volume= 0.291 af, Atten= 2%, Lag= 0.5 min

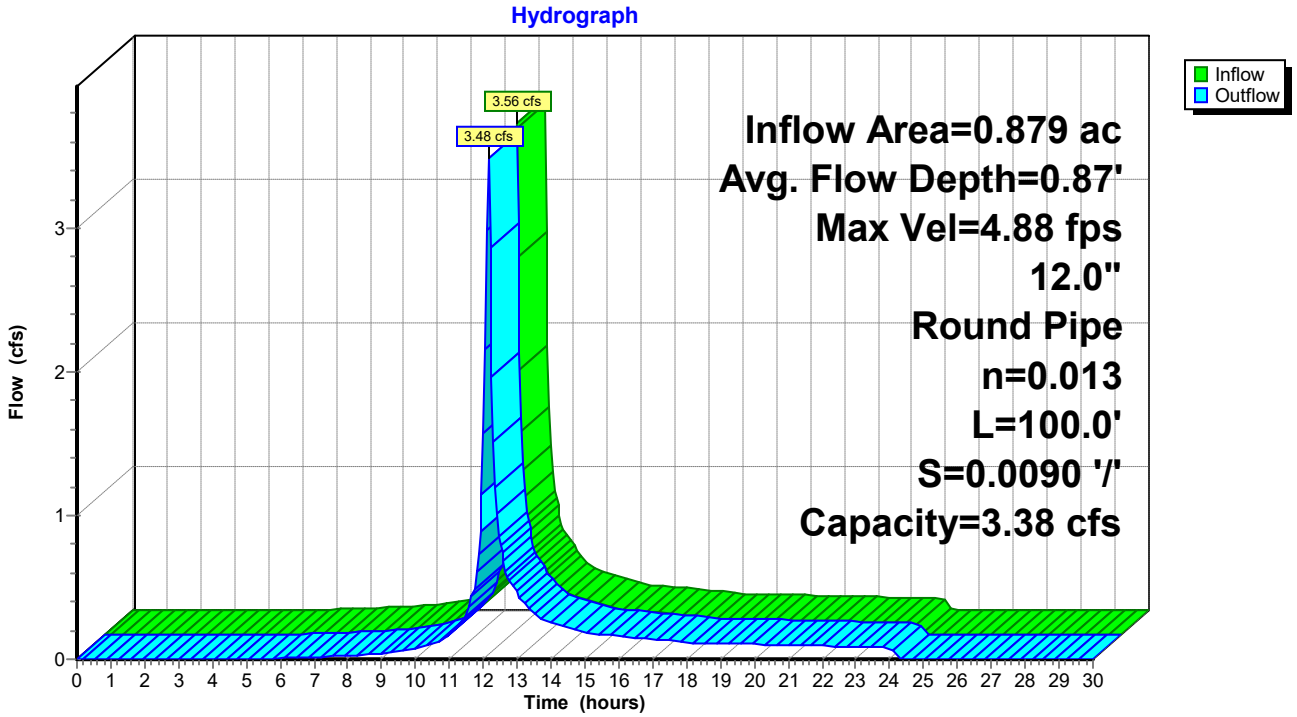
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.88 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.9 min

Peak Storage= 72 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.38 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 100.0' Slope= 0.0090 '/'
Inlet Invert= 470.30', Outlet Invert= 469.40'



Reach DMH5: TO DMH#6



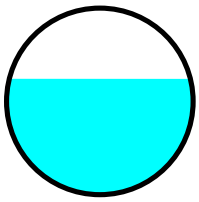
Summary for Reach DMH6: TO DMH#7

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 3.97" for 100-Year event
Inflow = 3.48 cfs @ 12.15 hrs, Volume= 0.291 af
Outflow = 3.46 cfs @ 12.15 hrs, Volume= 0.291 af, Atten= 1%, Lag= 0.1 min

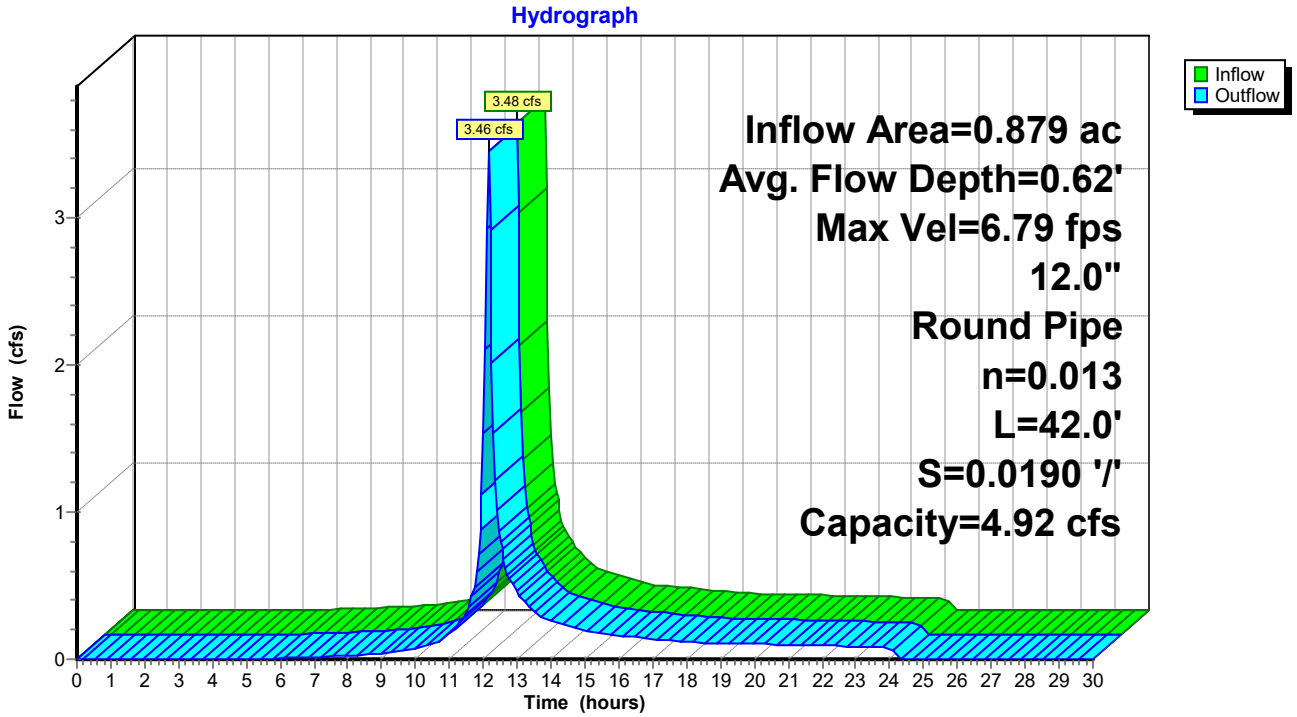
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.79 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.3 min

Peak Storage= 22 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.92 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 42.0' Slope= 0.0190 '/'
Inlet Invert= 469.30', Outlet Invert= 468.50'



Reach DMH6: TO DMH#7



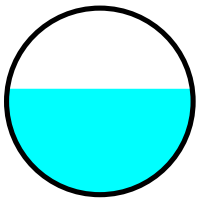
Summary for Reach DMH7: TO DMH#100

Inflow Area = 0.879 ac, 36.53% Impervious, Inflow Depth = 3.97" for 100-Year event
Inflow = 3.46 cfs @ 12.15 hrs, Volume= 0.291 af
Outflow = 3.41 cfs @ 12.16 hrs, Volume= 0.291 af, Atten= 1%, Lag= 0.3 min

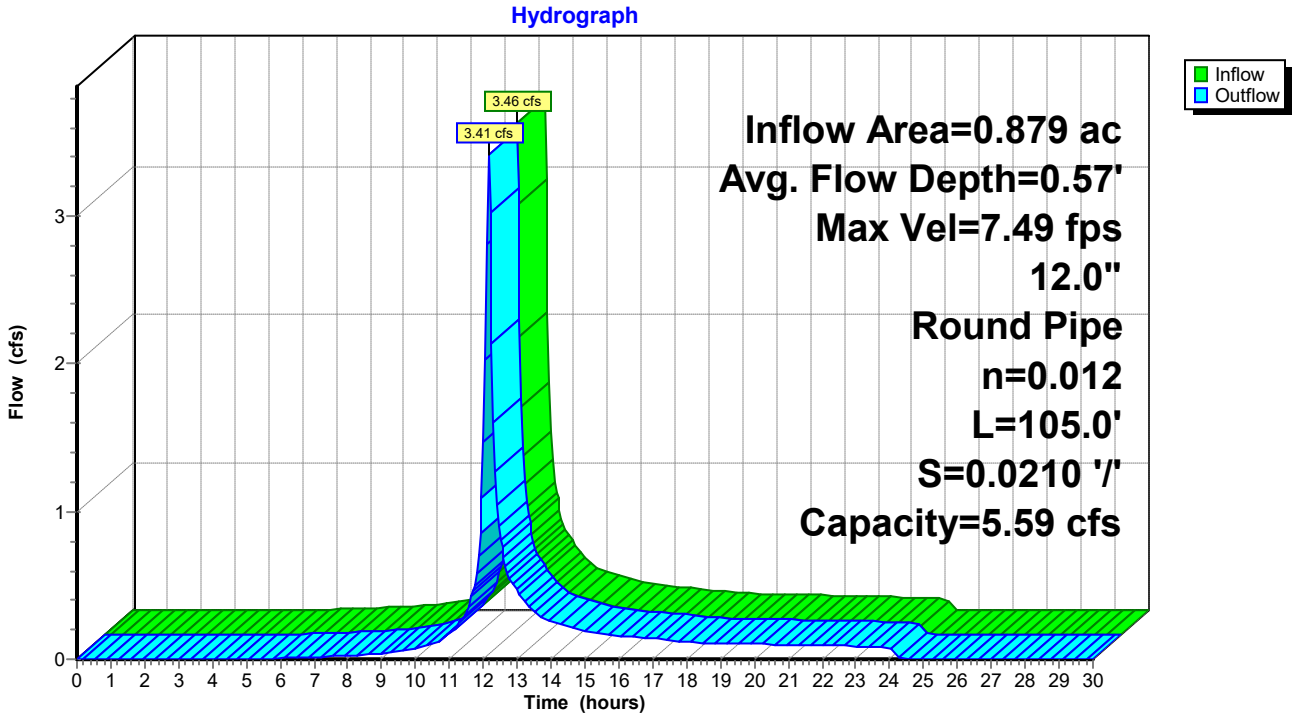
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.49 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.74 fps, Avg. Travel Time= 0.6 min

Peak Storage= 48 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.59 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 105.0' Slope= 0.0210 '/'
Inlet Invert= 468.40', Outlet Invert= 466.20'



Reach DMH7: TO DMH#100



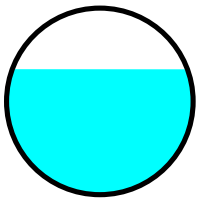
Summary for Reach DMH9: TO DMH#10

Inflow Area = 2.233 ac,100.00% Impervious, Inflow Depth = 8.10" for 100-Year event
Inflow = 16.89 cfs @ 12.11 hrs, Volume= 1.507 af
Outflow = 16.38 cfs @ 12.13 hrs, Volume= 1.507 af, Atten= 3%, Lag= 1.1 min

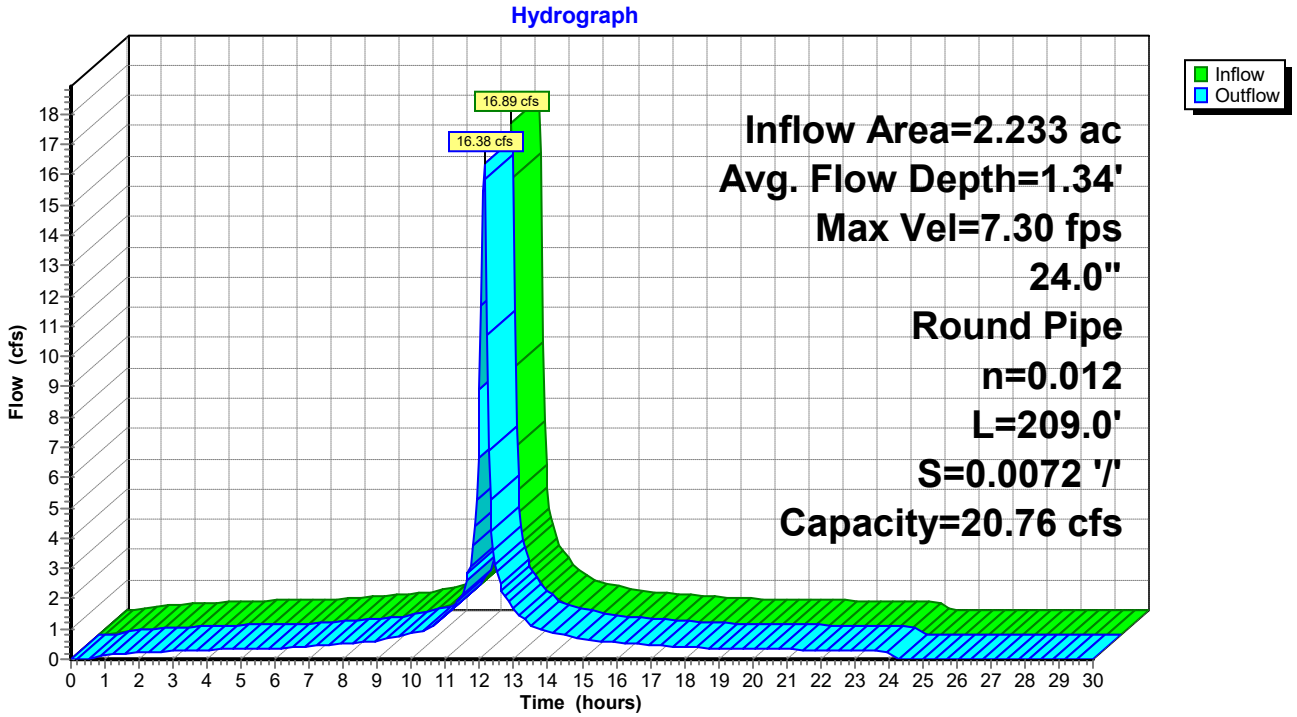
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.30 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.76 fps, Avg. Travel Time= 1.3 min

Peak Storage= 470 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.34'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 20.76 cfs

24.0" Round Pipe
n= 0.012 Steel, smooth
Length= 209.0' Slope= 0.0072 '/'
Inlet Invert= 459.70', Outlet Invert= 458.20'



Reach DMH9: TO DMH#10

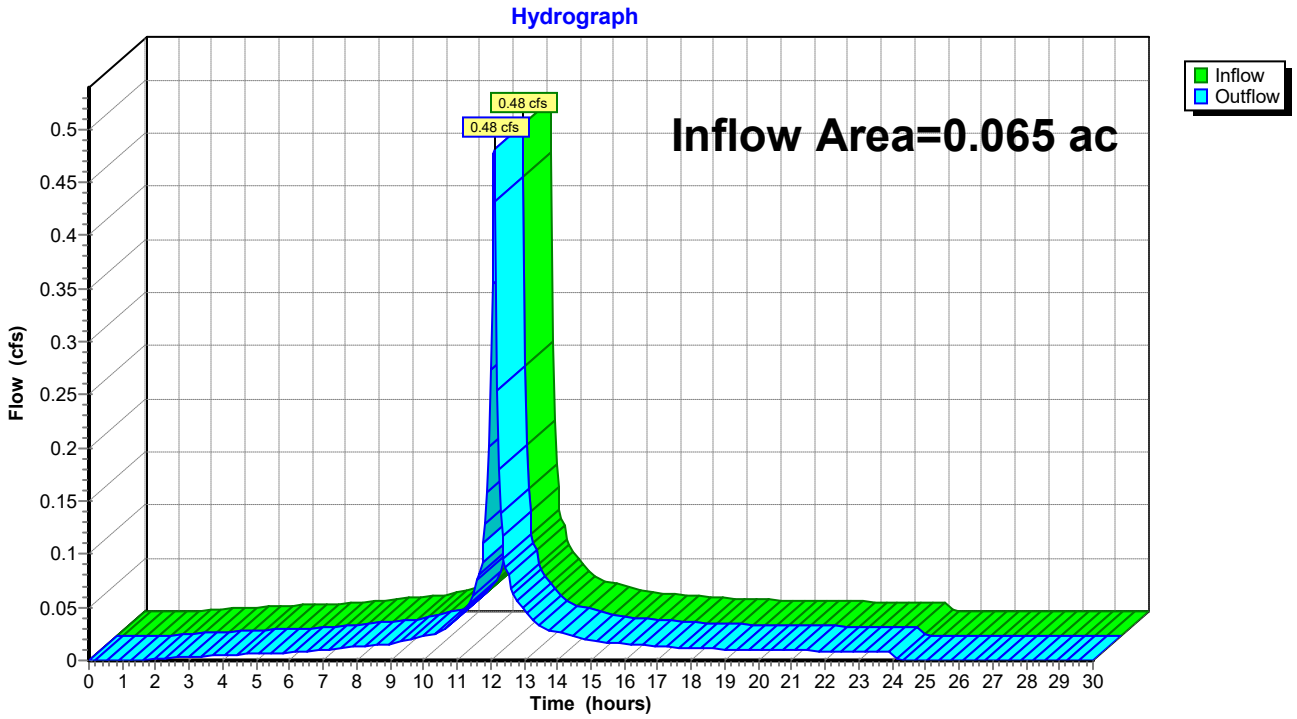


Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

Inflow Area = 0.065 ac, 89.73% Impervious, Inflow Depth = 7.38" for 100-Year event
Inflow = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af
Outflow = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP1: GUTTER POINT FRANKLIN (WEST)

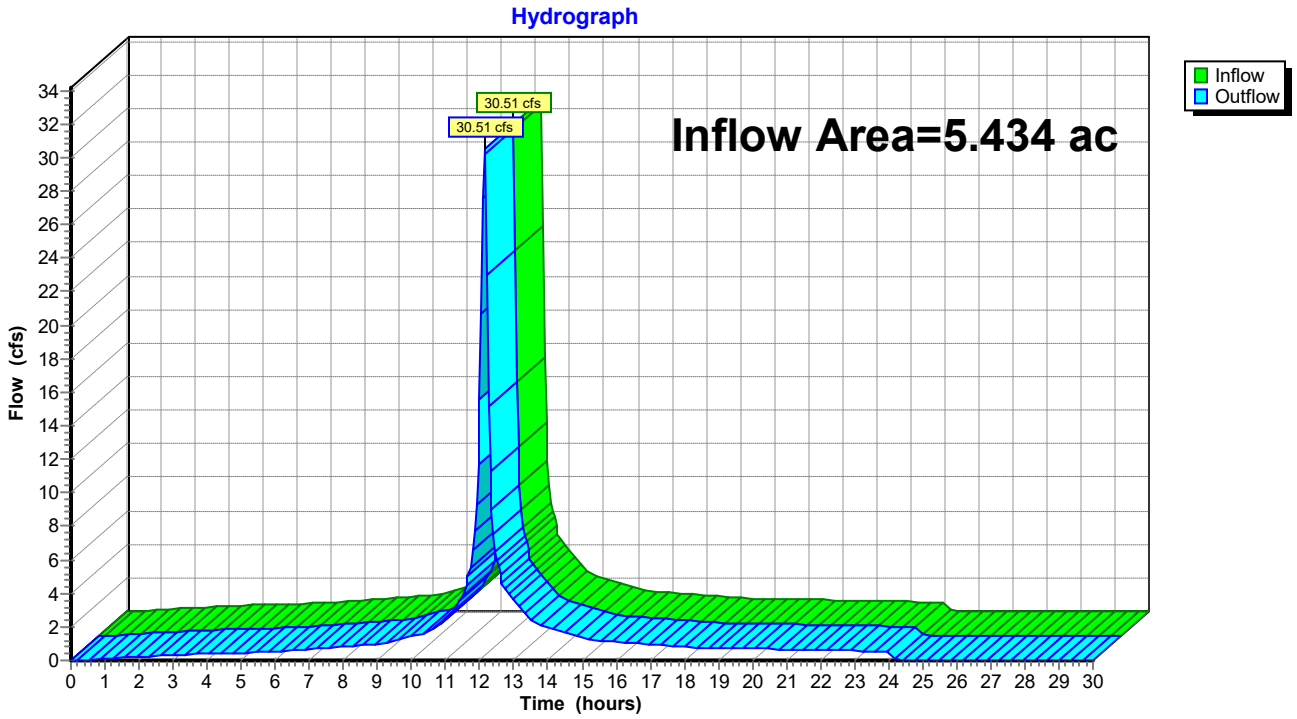


Summary for Reach DP2: MUNICIPAL SYSTEM

Inflow Area = 5.434 ac, 80.80% Impervious, Inflow Depth = 6.14" for 100-Year event
Inflow = 30.51 cfs @ 12.14 hrs, Volume= 2.779 af
Outflow = 30.51 cfs @ 12.14 hrs, Volume= 2.779 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP2: MUNICIPAL SYSTEM

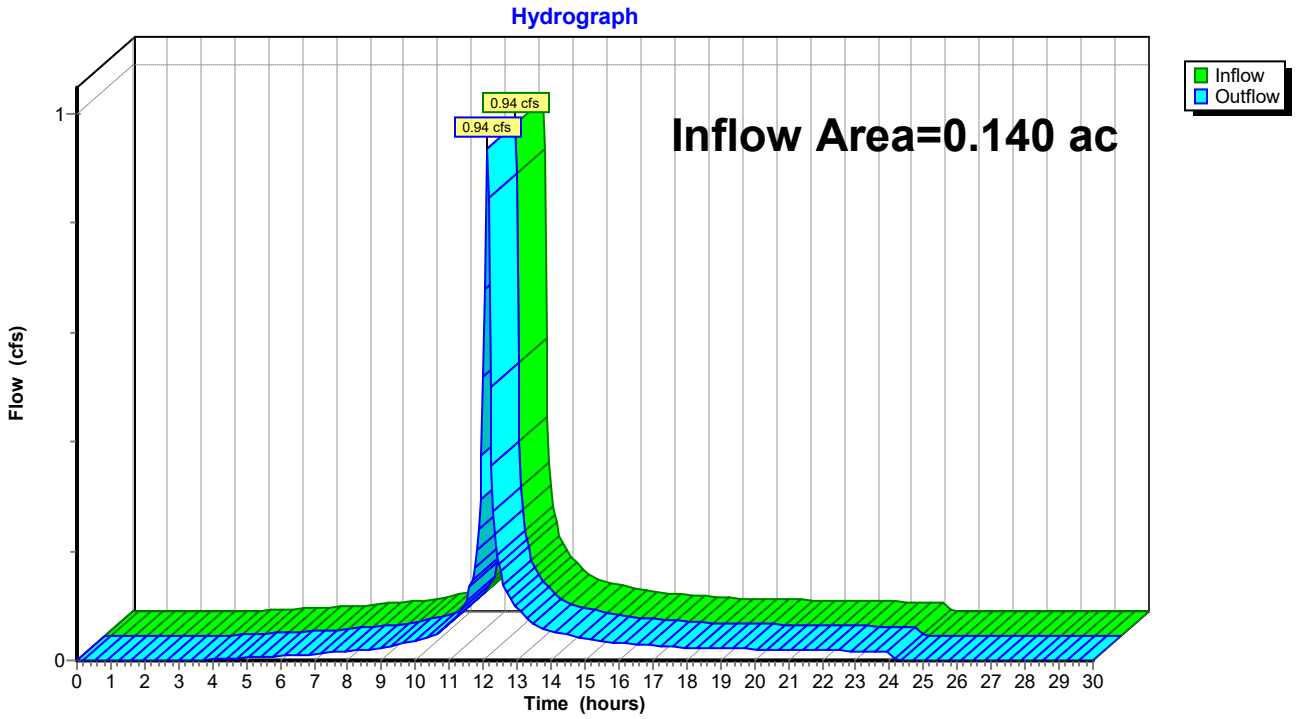


Summary for Reach DP3: CATCHBASIN (FIRE STATION)

Inflow Area = 0.140 ac, 75.40% Impervious, Inflow Depth = 6.30" for 100-Year event
Inflow = 0.94 cfs @ 12.11 hrs, Volume= 0.074 af
Outflow = 0.94 cfs @ 12.11 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP3: CATCHBASIN (FIRE STATION)

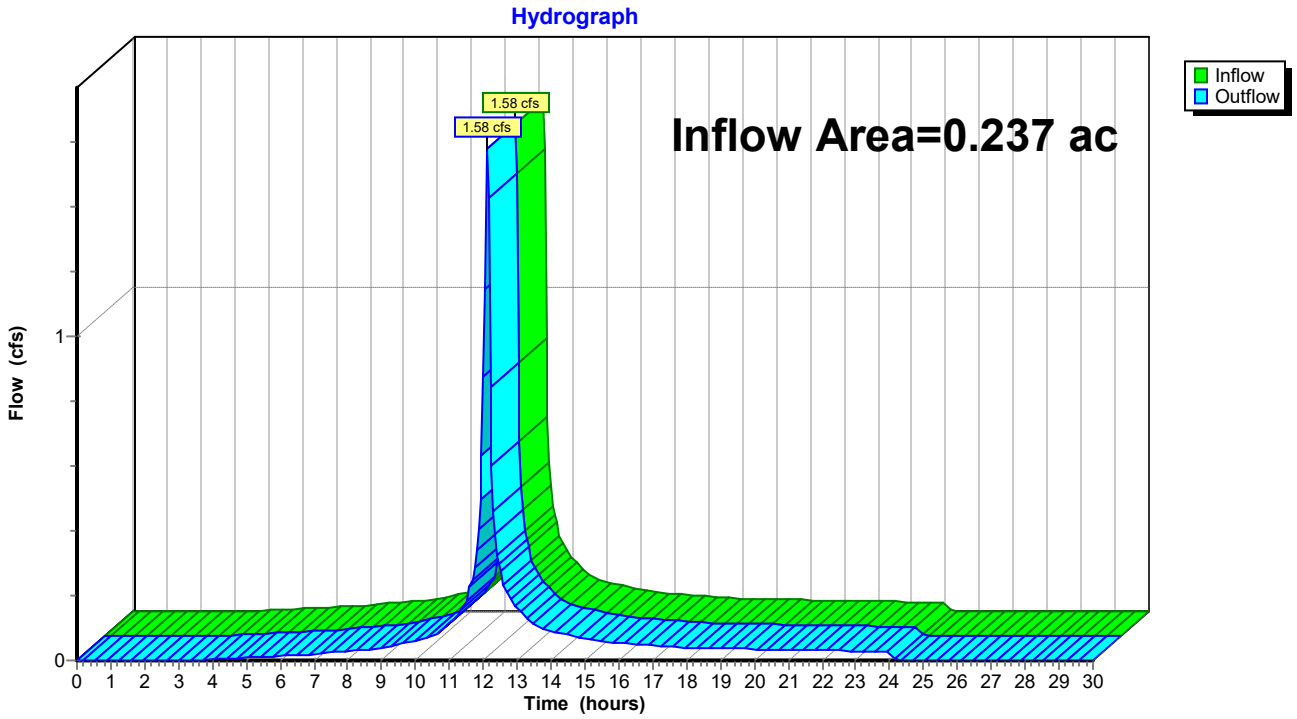


Summary for Reach DP4: LOW POINT OFF LOCUS

Inflow Area = 0.237 ac, 74.63% Impervious, Inflow Depth = 6.30" for 100-Year event
Inflow = 1.58 cfs @ 12.11 hrs, Volume= 0.124 af
Outflow = 1.58 cfs @ 12.11 hrs, Volume= 0.124 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP4: LOW POINT OFF LOCUS

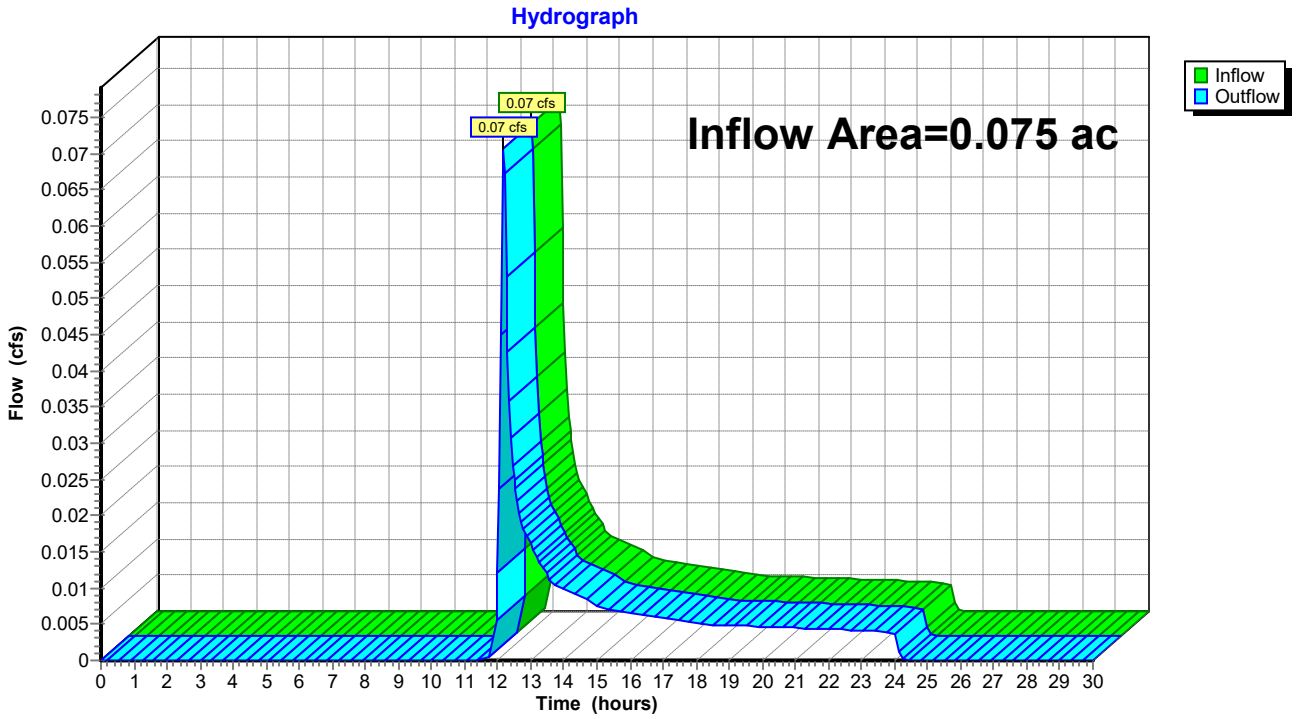


Summary for Reach DP5: DCB-H

Inflow Area = 0.075 ac, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
Inflow = 0.07 cfs @ 12.17 hrs, Volume= 0.008 af
Outflow = 0.07 cfs @ 12.17 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach DP5: DCB-H



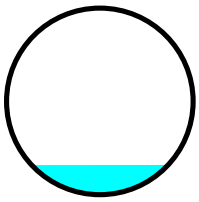
Summary for Reach UGS1B: TO DMH#102

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 0.46" for 100-Year event
Inflow = 0.24 cfs @ 13.02 hrs, Volume= 0.025 af
Outflow = 0.24 cfs @ 13.05 hrs, Volume= 0.025 af, Atten= 0%, Lag= 1.6 min

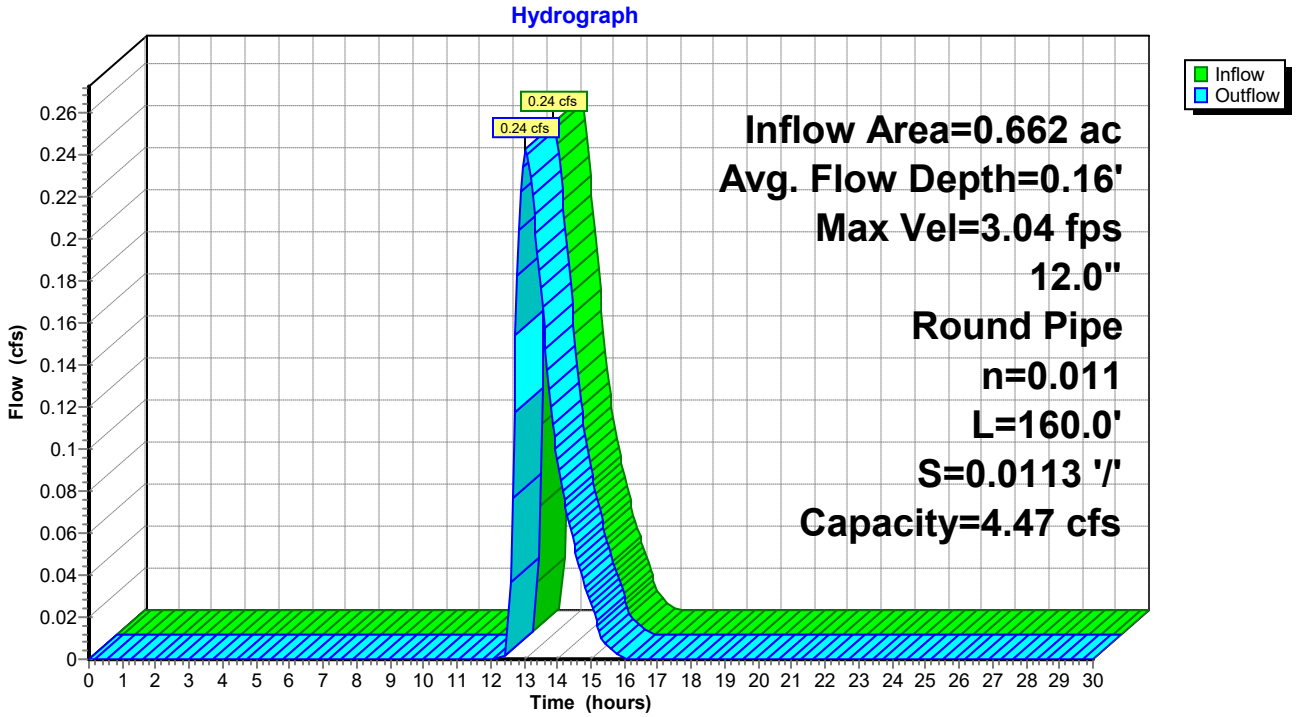
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.04 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 13.03 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.47 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 160.0' Slope= 0.0113 '/'
Inlet Invert= 469.50', Outlet Invert= 467.70'



Reach UGS1B: TO DMH#102



Summary for Pond DMH-B: TO DMH-D

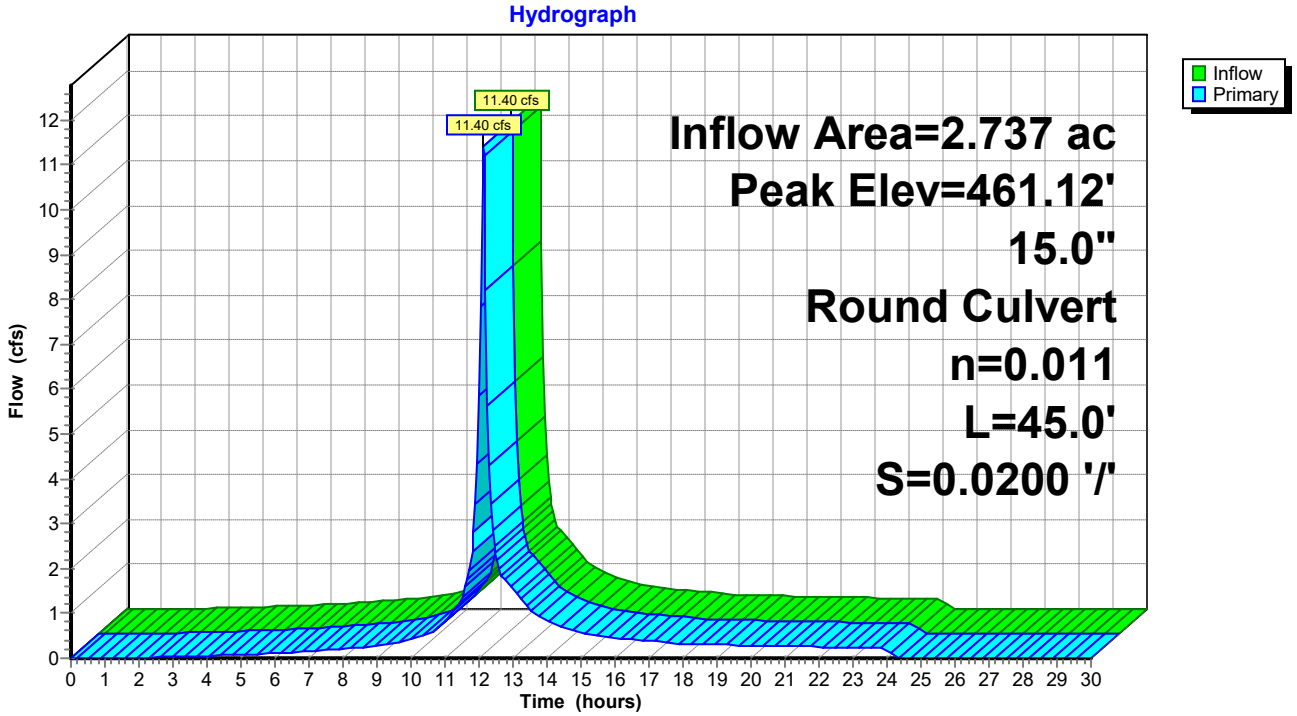
Inflow Area = 2.737 ac, 65.29% Impervious, Inflow Depth = 4.40" for 100-Year event
Inflow = 11.40 cfs @ 12.13 hrs, Volume= 1.004 af
Outflow = 11.40 cfs @ 12.13 hrs, Volume= 1.004 af, Atten= 0%, Lag= 0.0 min
Primary = 11.40 cfs @ 12.13 hrs, Volume= 1.004 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 461.12' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	456.80'	**15.0" Round Culvert** L= 45.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 456.80' / 455.90' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=11.01 cfs @ 12.13 hrs HW=460.90' (Free Discharge)
└**1=Culvert** (Inlet Controls 11.01 cfs @ 8.97 fps)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO UGS#1B

Inflow Area =	0.662 ac, 71.10% Impervious, Inflow Depth = 6.06" for 100-Year event				
Inflow =	3.88 cfs @	12.14 hrs,	Volume=	0.334 af	
Outflow =	0.44 cfs @	13.02 hrs,	Volume=	0.334 af,	Atten= 89%, Lag= 53.1 min
Discarded =	0.20 cfs @	13.02 hrs,	Volume=	0.309 af	
Primary =	0.24 cfs @	13.02 hrs,	Volume=	0.025 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 469.84' @ 13.02 hrs Surf.Area= 0.056 ac Storage= 0.133 af

Plug-Flow detention time= 263.4 min calculated for 0.334 af (100% of inflow)
Center-of-Mass det. time= 263.4 min (1,071.0 - 807.6)

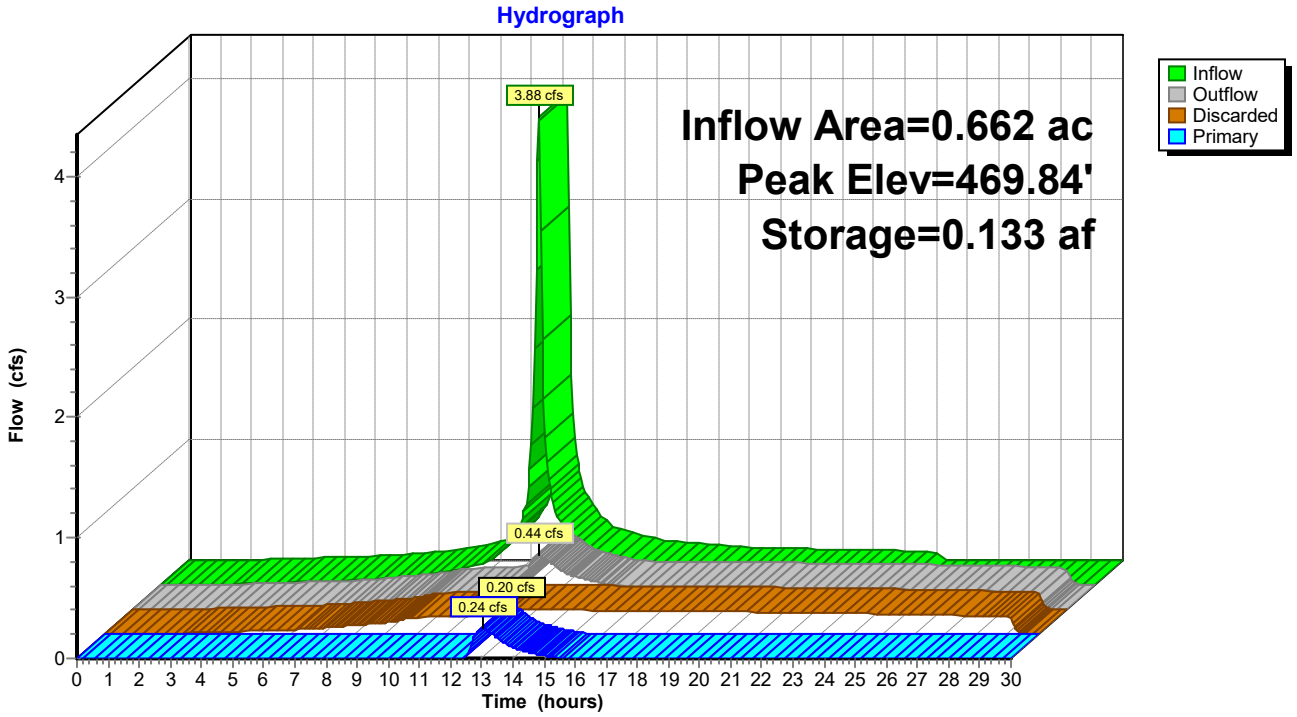
Volume	Invert	Avail.Storage	Storage Description
#1	466.70'	0.083 af	**36.00'W x 68.00'L x 6.00'H Prismatoid** 0.337 af Overall - 0.129 af Embedded = 0.208 af x 40.0% Voids
#2	467.40'	0.129 af	**ADS_StormTech MC-3500 c +Cap** x 49 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 49 Chambers in 7 Rows Cap Storage= +15.6 cf x 2 x 7 rows = 218.4 cf
		0.212 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	466.70'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'
#2	Primary	469.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.20 cfs @ 13.02 hrs HW=469.84' (Free Discharge)
└**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.24 cfs @ 13.02 hrs HW=469.84' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 0.24 cfs @ 1.67 fps)

Pond UGS1: TO UGS#1B



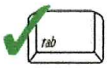
3.0
STORMWATER MANAGEMENT FORMS

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER
M ANDERSON
CIVIL
No. 55372
REGISTERED
PROFESSIONAL ENGINEER

1-7-2022
Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Deep Sump Catchbasins, Hydroworks Proprietary Unit, underground storage System

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do no exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge – NA Maximum Extent Practicable

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

Checklist for Stormwater Report

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist (continued)

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs))

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas ***(Not Applicable)***

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable – NOT APPLICABLE

☒ *Portions of the project are* subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Compliance Documentation

Franklin Street, Worcester, Massachusetts
November 12, 2021
REVISED JANUARY 7, 2022

Standard 1: No Untreated Discharges or Erosion to Wetlands

The drainage from the site currently overland flows to several points located around the project locus. Design Point #1 has been designated as a point in the gutter along Franklin Street west of the locus property. Design Point #2 has been designated as a combined sewer manhole located in Franklin Street. Design Point #3 is located at a catchbasin located on the abutting Fire Department Property. Design Point #4 is located at a low point on the abutting property to the south and Design Point #5 is located at a catchbasin located within Keyes Road.

In the area of the proposed development, the addition of new building and applicable parking and drive entrances, will have the stormwater directed through a series of catch basins, prior to be being discharged directly into the combined sewer system within Franklin Street.
Upper Blackstone Wastewater Treatment Plant (WWTP) and, as such, treatment of stormwater from impervious surfaces required to maximum extent practicable. Each treatment discharge will be directed through a hydrodynamic separator to provide treatment prior to discharge.

See the narrative within the Drainage Analysis and Report for further information.

Standard 2: Peak Rate Attenuation

Project is considered redevelopment compliance is required to maximum extent practicable

Table #1: Peak Rate of Runoff

Design Point		2-yr Storm	10-yr Storm	25-yr Storm	100-yr Storm
#1	Pre-	0.16	0.26	0.33	0.48
	Post-	0.16	0.26	0.33	0.48
#2	Pre-	10.14	16.24	20.98	30.58
	Post-	9.56	15.62	20.47	30.53
#3	Pre-	0.31	0.61	0.85	1.36
	Post-	0.24	0.44	0.60	0.94
#4	Pre-	1.22	2.51	3.58	5.83
	Post-	0.41	0.75	1.02	1.58
# 5	Pre-	0.30	0.46	0.58	0.83
	Post-	0.00	0.00	0.01	0.07

All flows are in cubic feet per second.

As outline above, the post-development peak rates are of runoff have been mitigated for all Storm Events.

Standard 3: Stormwater Recharge

Project is considered redevelopment compliance is required to maximum extent practicable

Impervious Area Proposed: (This area includes all proposed buildings, driveways, gravel parking areas)

The soils within the reviewed project area classified as HSG A

Existing Impervious HSG-A:	4.975 ac	216,711 sf
Proposed Impervious HSG-A:	4.732 ac	206,126 sf
Net New Impervious HSG-A:	-0.243 ac	-10,585 s.f.

Total New Impervious area = -10,585 s.f.
Total Project Impervious = 161,625 s.f.

Required Recharge Volume:

Net Increase HSG Soil A

Net New Impervious HSG A= -10,585 s.f.
HSG A: -10,585 s.f. x (0.6 in/12) = 0 c.f.

Required Recharge Volume = 0 c.f.

Capture Rate:

Total Impervious to UGS#1	20,492 sf
Net Captured Impervious	**20,492 sf**

Capture Rate = 20,492 s.f. / 161,625 s.f. = 12.7%

Compliance not provided, Capture rate in less of 65%

Adjustment Calculation

(1 / 0.127) x 0 cf = 0.00 c.f.
Required recharge volume = 0 c.f.

Recharge Provided:

Total Volume Required: 40,357 c.f.

UGS#1:	871 c.f. of Storage Volume Provided *
UGS#1:	3,572 c.f. of Infiltration Volume provided *
	4,443 c.f. of infiltration volume provided

**Recharge volume based on 2-Year Storm event.*

Required Recharge Volume = 0 c.f.
Provided Recharge Volume = 4,443 c.f.

Compliance is provided

Storage Volume Provided:

Volume below lowest outlet within detention facility.

UGS#1: 5,357 c.f. of storage volume provided

Drawdown Time: (72 Hours Max.)

Time = Storage Volume / (K x Bottom Area)

Where K = Saturated Hydraulic Conductivity (inches/hour) (From table 2.3.3 1982 Rawls Rates – Mass Stormwater Handbook)

UGS#1: 5,357 c.f. of storage volume provided.
Time = 5,357c.f. / (2.41 in/hr x (1 ft/ 12 in) x 2,448 s.f.) = **10.9 hrs**

Compliance is provided

Groundwater Offset Review:

Underground System #1

Boring Test PES-B12
Elevation of Test Area = 473.5
Presumed ESHWT = 458.4 *Groundwater observed*
Bottom of Basin = 466.7
Offset to Groundwater = 8.3 ft

Compliance is provided offset greater than 4.0ft.

Boring Test PES-B14
Elevation of Test Area = 473.5
Presumed ESHWT = 458.4 *Groundwater observed*
Bottom of Basin = 466.7
Offset to Groundwater = 8.3 ft

Compliance is provided offset greater than 4.0ft.

Standard 4: Water Quality

Project is considered redevelopment compliance is required to maximum extent practicable

Water Quality Volume (WQV) = Water Quality Depth x Impervious Area

Water Quality Depth = 1 inch
WQV = [(1 inch) / 12 inches/foot] x (161,625 s.f.) = 13,469 cf

The project has been designed to incorporate a series of proprietary and structural Best Management Practices (BMPs) in order to achieve the appropriate level of Water Quality Treatment. Runoff from within the development will be captured via deep-sump catchbasin which will direct runoff towards one of several drainage trunklines. These trunklines will then

direct runoff towards one of several Hydroworks Hydroguard units within DMH#2, DMH#3 as well as DCB#5. Upon treatment runoff will be directed towards the combined sewer system within Franklin Street. The treatment trains have been designed to provide in excess of the locally required 80% TSS removal with a total treatment volume of approximately 9,670 c.f. during the 2-year storm event.

Compliance has been provided to the maximum extent practicable. It is noted that the majority of the proposed impervious areas on the project are contributed to the roof top of the buildings, approximately 96,970 s.f or 59.8% of the total impervious area. As rooftops do not typically generate the sediment loading typical of other impervious surfaces such as parking lots, the runoff is considered clean relative to TSS Loading. Currently the property does not contain any treatment facilities, thus the incorporation of these systems will provide an improvement over the existing condition.

Standard 5: Land Uses with Higher Potential Pollutant Loads

It is anticipated that the traffic generated from this project will be in excess of 1,000 vehicle trips per day. As such this project would be considered as a Land Use with a Higher Potential Pollutant Load (LUHPPL). To provide compliance with the requirements for Standard 5, the Water Quality depth has been increased to 1" and the treatment system will incorporate oil-grit separators within the treatment train.

Standard 6: Critical Areas

Not Applicable

Standard 7: Redevelopment

As this project is associated with the demolition and general reconstruction of a previously developed parcels of land, this project is being considered as a redevelopment project under stormwater management. As such compliance with Standards 2, 3, 5, and 6 have been provided. Compliance with Standard 4 has bee provided to maximum extent practicable. Currently the property does not contain any stormwater treatment facilities, as such providing these systems provides an improvement over the existing condition. Furthermore approximately 59.8% of the proposed impervious area is contributed to the rooftop areas of the existing and proposed buildings, which is typically cleaner than runoff from other impervious areas.

Standard 8: Construction Period Controls

Proper erosion controls have been incorporated into the submitted plans and details to ensure compliance with the standard.

Standard 9: Operation and Maintenance Plan

Operation and Maintenance plans for the project have been incorporated into the submitted plans and details to ensure compliance with the standard.

Standard 10: Illicit Discharges to Drainage System

No Illicit discharges to the drainage system will occur as a result of this proposed project. A No Illicit discharge statement shall be provided prior to construction.

Summary for Pond UGS1: TO UGS#1B

[63] Warning: Exceeded Reach DMH3 INLET depth by 1.74' @ 14.45 hrs

Inflow Area =	0.749 ac, 78.25% Impervious, Inflow Depth = 4.56" for Custom event				
Inflow =	3.33 cfs @	12.14 hrs,	Volume=	0.285 af	
Outflow =	0.20 cfs @	14.31 hrs,	Volume=	0.285 af,	Atten= 94%, Lag= 130.0 min
Discarded =	0.20 cfs @	14.31 hrs,	Volume=	0.285 af	
Primary =	0.00 cfs @	14.31 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 469.60' @ 14.31 hrs Surf.Area= 0.056 ac Storage= 0.123 af <=Drawdown VOlume

Plug-Flow detention time= 272.6 min calculated for 0.284 af (100% of inflow)
Center-of-Mass det. time= 272.6 min (1,085.7 - 813.1)

Volume	Invert	Avail.Storage	Storage Description
#1	466.70'	0.083 af	**36.00'W x 68.00'L x 6.00'H Prismatoid** 0.337 af Overall - 0.129 af Embedded = 0.208 af x 40.0% Voids
#2	467.40'	0.129 af	**ADS_StormTech MC-3500 c +Cap** x 49 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 49 Chambers in 7 Rows Cap Storage= +15.6 cf x 2 x 7 rows = 218.4 cf
		0.212 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	466.70'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'
#2	Primary	469.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.20 cfs @ 14.31 hrs HW=469.60' (Free Discharge)
└**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 14.31 hrs HW=469.60' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.04 fps)

MASS DEP "Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices"

DCB#5-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

0.392 acres @ 83.45% Impervious = 0.327 Acres Impervious

0.327 Acres x .0015625 sq mi = ***5.11x(10^-4) square miles.***

Step 2: Tc of Train

P105 to DCB#5:	5.0 min
Total Tc to DCB#5	***5.0 min or 0.083 hours***

Step 3: Determine qu

From Figure 4:

Tc @ 0.083, qu=795csm/in

Step 4: Determine Q(1)

Q(1) = (qu)x(A)x(WQV)

Q(1) = (795csm/in)x(5.11x(10^-4)) x(1.0 in)

Q(1) = 0.41 CFS

Determination

Determination of Water Quality Flow rates for units by Connecticut DOT (CONNDOT)

From Technology Verification

HS 4I Treatment Flow rate

1.1 cf.s > 0.63 c.f.s. "Pass"

HydroGuard HS4i to be utilized in Design.

INSTRUCTIONS:

Non-automated: Jan. 31, 2019

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: DCB#5

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Hydroworks Unit HG4i	**0.85**	**1.00**	**0.85**	**0.15**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Franklin Street, Worcester**

Prepared By: **Hannigan Engineering, Inc.**

Date: **1/5/2022**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DCB5: TO DMH#101

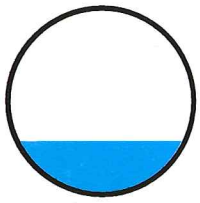
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.392 ac, 83.45% Impervious, Inflow Depth = 1.93" for 2-Year event
Inflow = 0.83 cfs @ 12.11 hrs, Volume= 0.063 af <= WQV
Outflow = 0.82 cfs @ 12.12 hrs, Volume= 0.063 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.3 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0120 '/'
Inlet Invert= 468.30', Outlet Invert= 468.00'



Summary for Subcatchment P105: TO DCB#5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.38 cfs @ 12.11 hrs, Volume= 0.109 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
1,930	39	>75% Grass cover, Good, HSG A
21,991	98	Paved parking, HSG A
23,921	93	Weighted Average
1,930		8.07% Pervious Area
21,991		91.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	37	0.0830	1.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.3	13	0.0100	0.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.6	194	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	244	Total, Increased to minimum Tc = 5.0 min <=Tc			

```
**************************************************
*      Storm Water Management Sizing Model       *
*               Hydroworks, LLC                  *
*                Version 4.4                     *
*                                                *
*        Continuous Simulation Program           *
*              Based on SWMM 4.4H                *
*              Hydroworks, LLC                   *
*               Graham Bryant                    *
*                2003 - 2013                     *
**************************************************

                 Developed by

**************************************************
*               Hydroworks, LLC                  *
*             Metcalf & Eddy, Inc.               *
*            University of Florida               *
*       Water Resources Engineers, Inc.          *
*      (Now Camp Dresser & McKee, Inc.)          *
*              Modified SWMM 4.4                 *
**************************************************

         Distributed and Maintained by

**************************************************
*                                                *
*                Hydroworks, LLC                 *
*                 888-290-7900                   *
*              www.hydroworks.com                *
*                                                *
**************************************************

**************************************************
*     If any problems occur executing this       *
*     model, contact Mr. Graham Bryant at        *
*     Hydroworks, LLC by phone at 908-272-4411   *
*     or by e-mail: support@hydroworks.com       *
**************************************************

**************************************************
*     This model is based on EPA SWMM 4.4        *
*  "Nature is full of infinite causes which      *
*   have never occurred in experience" da Vinci  *
**************************************************


**************************************************
* Entry made to the Rain Block                   *
* Created by the University of Florida - 1988    *
* Updated by Oregon State University, March 2000 *
**************************************************
```

GoVenture - Franklin St, Worcester
DCB#5

```
#########################################
#  Precipitation Block Input Commands  #
#########################################

Station Name..........................  Worcester Wso Ap

Station Location......................  Massachusetts

Station, ISTA.........................    9923

Beginning date, IYBEG (Yr/Mo/Dy......  1957/ 1/ 1

Ending date, IYEND (Yr/Mo/Dy.........  2001/12/31

Minimum interevent time, MIT..........     1

Number of ranked storms, NPTS.........    10

NWS format, IFORM (See text)..........     1

Print storm summary, ISUM (O-No 1-Yes)     0

Print all rainfall, IYEAR (O-No 1-Yes)     0

Save storm event data on NSCRAT(1)....     0
(IFILE =0 -Do not save, =1 -Save data)

IDECID 0 - Create interface file
       1 - Create file and analyze
       2 - Synoptic analysis..........     2

Plotting position parameter, A........  0.40

Storm event statistics, NOSTAT........  1100


KODEA (from optional group B0)........     2
 = 0, Do not include NCDC cumulative values.
 = 1, Average NCDC cumulative values.
 = 2, Use NCDC cumulative value as inst. rain.

KODEPR (from optional group B0).......     0
 Print NCDC special codes in event summary:
 = 0, only on days with events.
 = 1, on all days with codes present.
 Codes: A = accumulated value, I = incomplete value,
        M = missing value,     O = other code present
```

```
Hour of day at start of storm - NHR.............          1

Minute of hour at start of storm - NMN..........          1

Time TZERO at start of storm (hours)............      1.017

Use U.S. Customary units for most I/O - METRIC...          0

Runoff input print control...                              0

Runoff graph plot control....                              1

Runoff output print control..                              0

Print headers every 50 lines - NOHEAD (0=yes, 1=no)        0

Print land use load percentages -LANDUPR (0=no, 1=yes)     0

Limit number of groundwater convergence messages to 10000 (if simulated)

Month, day, year of start of storm is:              1/ 1/1957

Wet time step length (seconds).......                   300.

Dry time step length (seconds).......                   900.

Wet/Dry time step length (seconds)...                   450.

Simulation length is......                       20011231.0 Yr/Mo/Dy

Percent of impervious area with zero detention depth    25.0

Horton infiltration model being used
Rate for regeneration of infiltration = REGEN * DECAY
DECAY is read in for each subcatchment
REGEN = ........................................   0.01000
```

```
*******************************************************
*   Processed Precipitation will be read from file     *
*******************************************************

  ##############################
  #        Data Group F1       #
  # Evaporation Rate (in/day) #
  ##############################

 JAN.  FEB.  MAR.  APR.  MAY   JUN.  JUL.  AUG.  SEP.  OCT.  NOV.  DEC.
 ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----
 0.00  0.00  0.00  0.10  0.10  0.15  0.15  0.15  0.10  0.10  0.00  0.00
```

```
*****************************************************
*  Precipitation output created using the Rain block   *
*  Number of precipitation stations...        1        *
*****************************************************

Location Station Number
-------- --------------
       1.     9923


STATION ID ON PRECIP. DATA INPUT FILE = 2302
REQUESTED STATION ID =     9923  CHECK TO BE SURE THEY MATCH.


$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
Note, 15-min. data are being processed, but hourly
print-out, summaries, and statistics are based on
hourly totals only.  Data placed on interface file
are at correct 15-min. intervals.
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

##################################################
# Entry made to the Runoff Block, last updated by #
# Oregon State University, and Camp, Dresser and  #
# McKee, Inc., March 2002.                        #
##################################################
# "And wherever water goes, amoebae go along for  #
#  the ride"                        Tom Robbins    #
##################################################


                  GoVenture - Franklin St, Worcester

                  DCB#5


Snowmelt parameter - ISNOW.......................          0

Number of rain gages - NRGAG.....................          1

Horton infiltration equation used - INFILM.......          2
Maximum infiltration volume is limited to RMAXINF input on  subcatchment lines.
Infiltration volume regenerates during  non rainfall periods.

Quality is simulated - KWALTY....................          1

IVAP is negative.  Evaporation will be set to zero
    during time steps with rainfall.

Read evaporation data on line(s) F1 (F2) - IVAP..          1
```

```
*******************************************************
*        C H A N N E L  A N D  P I P E  D A T A       *
*******************************************************
```

Input equen umber	NAMEG: Channel ID #	Drains to NGTO:	Channel Type	Width (ft)	Length (ft)	Invert Slope (ft/ft)	L Side Slope (ft/ft)	R Side Slope (ft/ft)	Intial Depth (ft)	Max Depth (ft)	Mann- ings "N"	Full Flow (cfs)
1	201	200	Dummy	0.0	0.0	0.0000	0.0000	0.0000	0.0	0.0	0.0000	0.00E+00

```
*************************************************
*         S U B C A T C H M E N T   D A T A     *
*************************************************
```

NOTE. SEE LATER TABLE FOR OPTIONAL SUBCATCHMENT PARAMETERS

	SUBCATCH- MENT NO.	CHANNEL OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	RESISTANCE IMPERV.	FACTOR PERV.	DEPRES. IMPERV.	STORAGE(IN) PERV.	INFILTRATION RATE(IN/HR) MAXIMUM	MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	130.67	0.39	83.45	0.0200	0.015	0.250	0.020	0.200	2.50	0.40	0.00055	1	4.00000

```
TOTAL NUMBER OF SUBCATCHMENTS...              1
TOTAL TRIBUTARY AREA (ACRES)....           0.39
IMPERVIOUS AREA (ACRES).........           0.33
PERVIOUS AREA (ACRES)...........           0.06
TOTAL WIDTH (FEET)..............         130.67
PERCENT IMPERVIOUSNESS..........          83.45
```

```
*******************************************************
*     G R O U N D W A T E R   I N P U T   D A T A     *
*******************************************************
```

SUB-CATCH NUMBER	CHANNEL OR INLET	ELEVATIONS GROUND (FT)	BOTTOM (FT)	STAGE (FT)	BC (FT)	TW (FT)	FLOW CONSTANTS A1 (IN/HR-FT^B1)	B1	A2 (IN/HR-FT^B2)	B2	A3 (IN/HR-FT^2)
0	602	10.00	0.00	0.00	2.00	2.00	4.500E-05	2.600	0.000E+00	1.000	0.00E+00

```
*********************************************************
* G R O U N D W A T E R   I N P U T   D A T A (CONTINUED) *
*********************************************************
```

S O I L P R O P E R T I E S

SUBCAT. NO.	POROSITY	SATURATED HYDRAULIC CONDUCTIVITY (in/hr)	WILTING POINT	FIELD CAPACITY	INITIAL MOISTURE	MAX. DEEP PERCOLATION (in/hr)	PERCOLATION PARAMETERS HCO	PCO	ET PARAMETERS DEPTH OF ET (ft)	FRACTION OF ET TO UPPER ZONE
0	.4000	5.000	.1500	.3000	.3000	2.000E-03	10.00	15.00	14.00	0.350

```
*******************************************************
*    Arrangement of Subcatchments and Channel/Pipes     *
*******************************************************
* See second subcatchment output table for connectivity *
* of subcatchment to subcatchment flows.                *
*******************************************************

   Channel
   or Pipe
       201     No Tributary Channel/Pipes
               No Tributary Subareas.....


    INLET
       200     Tributary Channel/Pipes...        201
               Tributary Subareas........        300


*********************************************************
* Hydrographs will be stored for the following   1 INLETS *
*********************************************************
          200

↑
##################################################
#               Quality Simulation               #
##################################################
#      General Quality Control Data Groups       #
##################################################

 Description                          Variable       Value
 -----------                          --------       -----

 Number of quality constituents.....   NQS.......        1

 Number of land uses................  JLAND.......        1

 Standard catchbasin volume.........  CBVOL.......     4.00 cubic feet

 Erosion is not simulated.........    IROS........        0

 DRY DAYS PRIOR TO START OF STORM... DRYDAY.......     3.00 DAYS

 DRY DAYS REQUIRED TO RECHARGE
 CATCHBASIN CONCENTRATION TO
 INITIAL VALUES..................... DRYBSN.......     5.00 DAYS

 DUST AND DIRT
 STREET SWEEPING EFFICIENCY......... REFFDD.......    0.000

 DAY OF YEAR ON WHICH STREET
 SWEEPING BEGINS.................... KLNBGN.......      120

 DAY OF YEAR ON WHICH STREET
 SWEEPING ENDS...................... KLNEND.......      270
```

```
##########################################
#     Land use data on data group J2     #
##########################################
```

AND USE LNAME)	BUILDUP EQUATION TYPE (METHOD)	FUNCTIONAL DEPENDENCE OF BUILDUP PARAMETER(JACGUT)	LIMITING BUILDUP QUANTITY (DDLIM)	BUILDUP POWER (DDPOW)	BUILDUP COEFF. (DDFACT)	CLEANING INTERVAL IN DAYS (CLFREQ)	AVAIL. FACTOR FRACTION (AVSWP)	DAYS SINCE LAST SWEEPING (DSLCL)
Urban De	EXPONENTIAL(1)	AREA(1)	2.500E+01	0.500	60.000	30.000	0.300	30.000

```
##############################################
#     Constituent data on data group J3      #
##############################################
```

	Total Su
Constituent units.....	mg/l
Type of units.....	0
KALC.....	2
Type of buildup calc.....	EXPONENTIAL(2)
KWASH.....	0
Type of washoff calc.....	POWER EXPONEN.(0)
KACGUT.....	1
Dependence of buildup....	AREA(1)
LINKUP.....	0
Linkage to snowmelt.....	NO SNOW LINKAGE
Buildup param 1 (QFACT1).	25.000
Buildup param 2 (QFACT2).	0.500
Buildup param 3 (QFACT3).	60.000
Buildup param 4 (QFACT4).	0.000
Buildup param 5 (QFACT5).	0.000
Washoff power (WASHPO)...	1.100
Washoff coef. (RCOEF)....	3.000
Init catchb conc (CBFACT)	100.000
Precip. conc. (CONCRN)...	0.000
Street sweep effic (REFF)	0.000
Remove fraction (REMOVE).	0.000
1st order QDECAY, 1/day..	0.000
Land use number.....	1

```
************************************************
* Constant Groundwater Quality Concentration(s) *
************************************************

 Total Susp has a concentration of..    0.0000   mg/l
```

```
***********************************************
* REMOVAL FRACTIONS FOR SELECTED CHANNEL/PIPES *
* FROM J7 LINES                                *
***********************************************

  CHANNEL/   CONSTITUENT
     PIPE Total Susp
---------- --------
       201     0.000


*****************************************************
*     Subcatchment surface quality on data group L1 *
*****************************************************


                                  Total   Number   Input
                          Land    Gutter     of    Loading
                Land      Use     Length   Catch-  load/ac
            No. Usage     No.    10**2ft   Basins   Total Su
        ------ --------  ----    -------- --------  -------
   1        300 Urban De  1         2.60     1.00  0.0E+00
   Totals (Loads in lb or other)    2.60     1.00  0.0E+00

    **********************
    *    DATA GROUP M1   *
    **********************


TOTAL NUMBER OF PRINTED GUTTERS/INLETS...NPRNT..        1
NUMBER OF TIME STEPS BETWEEN PRINTINGS..INTERV..        0
STARTING AND STOPPING PRINTOUT DATES............        0        0


    **********************
    *    DATA GROUP M3   *
    **********************

CHANNEL/INLET PRINT DATA GROUPS......       -200


          ****************************************
          * Rainfall from Nat. Weather Serv. file *
          * in units of hundredths of an inch     *
          ****************************************

         GoVenture - Franklin St, Worcester
         DCB#5
```

Rainfall Station Worcester Wso Ap
State/Province Massachusetts

Rainfall Depth Summary (in)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957.	0.4	1.4	2.8	3.6	3.4	3.0	1.1	2.8	1.1	3.8	5.7	7.3	36.5
1958.	9.0	2.9	4.9	7.2	4.3	2.8	6.1	4.4	8.1	2.8	5.0	3.2	60.8
1959.	5.1	2.8	8.2	4.2	2.4	4.7	8.4	4.5	3.1	8.3	6.1	5.1	62.9
1960.	2.4	6.3	4.2	5.4	5.9	3.1	7.2	3.9	7.0	3.0	4.0	5.0	57.4
1961.	3.7	2.5	5.8	5.2	4.2	2.5	4.3	5.3	6.1	3.5	3.3	5.1	51.5
1962.	2.4	5.4	2.6	3.9	4.4	3.5	2.1	4.6	5.7	9.2	4.9	5.8	54.4
1963.	4.2	3.4	4.7	1.9	3.6	2.6	2.0	3.0	4.9	1.7	8.8	3.3	44.0
1964.	5.9	3.6	4.2	4.5	1.5	1.8	3.6	2.9	2.1	2.5	3.5	6.2	42.4
1965.	3.1	4.9	2.7	3.9	3.1	2.0	2.0	3.2	3.8	2.3	3.2	2.9	37.1
1966.	4.4	4.4	3.2	1.7	3.8	2.6	3.5	2.0	7.5	3.5	4.9	4.2	45.6
1967.	2.8	3.7	4.9	5.2	7.4	3.9	6.5	3.5	5.2	2.4	5.1	5.0	55.7
1968.	3.7	1.4	7.9	2.3	7.1	8.4	1.9	0.7	2.2	2.4	6.2	6.5	50.7
1969.	1.8	4.2	2.7	5.6	3.4	1.7	4.3	4.7	5.4	1.8	7.1	8.5	51.1
1970.	2.2	5.5	4.1	3.9	6.1	2.9	0.9	5.8	3.6	3.0	4.0	3.9	45.7
1971.	3.2	5.9	1.9	2.0	5.6	2.6	4.9	8.0	1.6	3.6	5.5	3.7	48.3
1972.	3.1	8.2	6.1	4.8	8.4	9.7	6.6	5.1	3.3	6.0	10.2	6.4	77.7
1973.	4.4	4.1	4.9	5.7	4.8	7.3	4.1	4.4	4.1	4.8	3.9	8.8	61.1
1974.	4.2	3.4	5.6	3.6	6.3	3.8	3.4	3.7	13.4	3.6	5.7	4.1	61.0
1975.	6.9	3.3	5.9	1.3	2.0	3.8	4.3	5.1	7.6	6.6	6.0	5.2	57.9
1976.	6.9	2.9	4.5	2.5	3.2	2.8	3.6	6.6	2.3	5.3	1.0	3.4	45.0
1977.	2.4	3.2	6.4	4.2	2.7	4.2	4.8	2.4	8.2	5.6	4.2	6.8	55.0
1978.	11.9	1.8	3.4	2.5	3.8	1.8	3.8	5.4	1.3	4.1	2.5	4.3	46.5
1979.	12.2	3.1	4.0	5.5	4.7	0.6	6.1	7.7	4.1	4.9	4.1	1.8	58.8
1980.	0.8	1.2	7.4	5.2	2.4	4.8	3.9	2.1	3.3	5.4	4.8	2.2	43.4
1981.	1.9	9.4	1.4	4.9	4.1	2.7	8.2	1.2	5.5	5.7	3.9	6.1	55.0
1982.	4.4	4.0	4.2	4.8	3.4	13.1	6.0	2.0	2.1	3.2	4.6	3.9	55.7
1983.	5.3	5.3	9.0	8.4	7.3	2.7	0.9	6.4	1.5	6.3	9.3	7.1	69.5
1984.	3.3	6.7	6.3	5.1	10.3	3.3	6.4	1.2	2.8	3.3	3.0	3.4	55.1
1985.	1.9	3.6	3.5	3.0	5.1	5.2	6.6	4.1	4.7	3.0	7.3	2.7	50.7
1986.	5.5	3.5	3.6	1.9	3.4	9.6	3.5	3.6	0.9	3.0	6.7	7.8	52.9
1987.	6.2	1.9	5.8	9.9	1.5	5.0	1.0	5.4	6.7	4.5	3.1	2.6	53.6
1988.	3.7	3.5	3.3	3.8	5.1	1.4	6.7	4.5	1.2	5.9	5.9	1.8	46.8
1989.	1.6	3.4	3.0	4.8	6.6	7.3	4.6	5.9	5.1	0.0	0.0	0.0	42.3
1991.	0.0	0.0	0.0	0.0	0.0	0.0	3.2	8.1	6.9	3.8	6.0	3.5	31.5
1992.	3.1	3.3	4.7	3.2	2.7	5.0	5.7	7.2	2.3	2.4	6.3	5.1	50.9
1993.	3.2	2.9	7.1	4.0	1.9	2.9	3.4	2.1	9.4	4.0	5.2	5.8	51.8
1994.	6.0	2.9	6.6	2.9	6.8	2.5	3.2	8.0	5.3	1.3	6.0	4.2	55.7
1995.	5.9	2.3	2.2	2.5	0.0	0.0	4.7	2.1	3.7	8.8	5.2	1.4	38.8
1996.	7.1	3.3	2.5	7.3	4.1	3.1	6.3	4.5	4.9	4.9	3.0	5.0	55.8
1997.	3.3	1.7	4.6	3.4	2.6	1.6	3.2	2.8	1.6	1.8	5.5	2.3	34.4
1998.	3.9	2.8	6.3	2.8	5.7	9.7	1.8	2.3	1.2	5.0	2.4	1.4	45.4
1999.	7.0	2.4	4.6	1.1	3.3	1.8	2.4	2.4	8.6	4.6	3.1	4.3	45.7
2000.	3.5	3.3	4.2	7.6	4.2	5.4	4.5	2.5	3.4	2.4	4.0	4.2	49.3
2001.	2.2	3.2	7.4	1.0	3.9	5.0	3.7	1.1	3.5	0.9	1.7	3.2	36.7

Total Rainfall Depth for Simulation Period 2227.9 (in)

Rainfall Intensity Analysis (in/hr)

(in/hr)	(#)	(%)	(in)	(%)
0.10	55294	69.5	679.	30.5
0.20	15423	19.4	571.	25.6
0.30	3295	4.1	211.	9.5
0.40	2538	3.2	224.	10.1
0.50	868	1.1	100.	4.5
0.60	597	0.8	80.	3.6
0.70	577	0.7	92.	4.1
0.80	337	0.4	64.	2.9
0.90	120	0.2	26.	1.2
1.00	123	0.2	29.	1.3
1.10	70	0.1	18.	0.8
1.20	64	0.1	18.	0.8
1.30	56	0.1	17.	0.8
1.40	38	0.0	13.	0.6
1.50	18	0.0	7.	0.3
1.60	38	0.0	15.	0.7
1.70	16	0.0	7.	0.3
1.80	28	0.0	12.	0.6
1.90	14	0.0	7.	0.3
2.00	16	0.0	8.	0.4
> 2.00	48	0.1	30.	1.3

Total # of Intensities 79578

Daily Rainfall Depth Analysis (in)

(in)	(#)	(%)	(in)	(%)
0.10	1790	31.7	85.	3.8
0.20	996	17.7	143.	6.4
0.30	575	10.2	138.	6.2
0.40	489	8.7	166.	7.4
0.50	302	5.4	134.	6.0
0.60	279	4.9	152.	6.8
0.70	209	3.7	134.	6.0
0.80	152	2.7	113.	5.1
0.90	128	2.3	108.	4.8
1.00	126	2.2	119.	5.3
1.10	89	1.6	93.	4.2
1.20	79	1.4	90.	4.1
1.30	69	1.2	86.	3.9
1.40	49	0.9	66.	3.0
1.50	56	1.0	81.	3.6
1.60	44	0.8	68.	3.0
1.70	39	0.7	64.	2.9
1.80	28	0.5	49.	2.2
1.90	20	0.4	37.	1.6

```
  2.00     16       0.3       31.       1.4
> 2.00    104       1.8      270.      12.1

Total # Days with Rain   5639

************************************************
*      End of time step DO-loop in Runoff      *
************************************************

Final Date (Mo/Day/Year)   =                  12/31/2001
Total number of time steps =                     3055928
Final Julian Date  =                             2001365
Final time of day  =                              86398. seconds.
Final time of day  =                               24.00   hours.
Final running time =                          394464.0000   hours.
Final running time =                           16436.0000    days.

**************************************************
*     Extrapolation Summary for Watersheds       *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of OVERLND Calls      *
**************************************************

 Subcatch   # Steps   # Calls  Subcatch   # Steps   # Calls  Subcatch   # Steps   # Calls
 --------   -------   -------  --------   -------   -------  --------   -------   -------
      300  13534679   3355313

**************************************************
*     Extrapolation Summary for Channel/Pipes    *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of GUTNR Calls        *
**************************************************

Chan/Pipe   # Steps   # Calls Chan/Pipe   # Steps   # Calls Chan/Pipe   # Steps   # Calls
 --------   -------   -------  --------   -------   -------  --------   -------   -------
      201         0         0
↑
*********************************************
*       Continuity Check for Surface Water  *
*********************************************
                                                                  Inches over
                                                     cubic feet   Total Basin
Total Precipitation (Rain plus Snow)                   3165403.      2225.
Total Infiltration                                      516940.       363.
Total Evaporation                                       124256.        87.
Surface Runoff from Watersheds                         2549377.      1792.
Total Water remaining in Surface Storage                    18.         0.
Infiltration over the Pervious Area...                  516940.      2195.
                        --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
Water remaining in Snow Cover.........                 3190591.      2242.
Total Precipitation + Initial Storage.                 3165403.      2225.
```

```
The error in continuity is calculated as
*************************************
* Precipitation + Initial Snow Cover  *
*      - Infiltration -               *
*Evaporation - Snow removal -         *
*Surface Runoff from Watersheds -     *
*Water in Surface Storage -           *
*Water remaining in Snow Cover        *
*-----------------------------------*
* Precipitation + Initial Snow Cover  *
*************************************
Error.................................       -0.796 Percent


*********************************************
*       Continuity Check for Channel/Pipes   *
*********************************************
                                                          Inches over
                                                cubic feet  Total Basin
Initial Channel/Pipe Storage...............              0.         0.
Final Channel/Pipe Storage.................              0.         0.
Surface Runoff from Watersheds.............        2549377.      1792.
Baseflow...................................              0.
Groundwater Subsurface Inflow..............              0.         0.
Evaporation Loss from Channels.............              0.         0.
Channel/Pipe/Inlet Outflow.................        2549377.      1792.
Initial Storage + Inflow...................        2549377.      1792.
Final Storage + Outflow....................        2549377.      1792.
*******************************************
* Final Storage + Outflow + Evaporation  - *
* Watershed Runoff - Groundwater Inflow  - *
*     Initial Channel/Pipe Storage         *
*     ---------------------------------    *
*  Final Storage + Outflow  + Evaporation  *
*******************************************
Error.....................................      0.000 Percent

↑
****************************************************
*     Continuity Check for Subsurface Water       *
****************************************************

                                                          Inches over
                                                cubic feet  Subsurface Basin

Total Infiltration                                      0.         0.
Total Upper Zone ET                                     0.         0.
Total Lower Zone ET                                     0.         0.
Total Groundwater flow                                  0.         0.
Total Deep percolation                                  0.         0.
Initial Subsurface Storage                          51227.        36.
Final Subsurface Storage                            51227.        36.
Upper Zone ET over Pervious Area                        0.         0.
Lower Zone ET over Pervious Area                        0.         0.
```

```
****************************************
* Infiltration + Initial Storage - Final *
* Storage - Upper and Lower Zone ET -    *
* Groundwater Flow - Deep Percolation    *
* ------------------------------------- *
*     Infiltration + Initial Storage     *
****************************************
Error ....................................     0.000 Percent
```

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCH-MENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	PERVIOUS AREA TOTAL RUNOFF DEPTH (IN)	PERVIOUS AREA TOTAL LOSSES (IN)	PERVIOUS AREA PEAK RUNOFF RATE (CFS)	IMPERVIOUS AREA RUNOFF DEPTH (IN)	IMPERVIOUS AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA RUNOFF DEPTH (IN)	TOTAL SUBCATCHMENT AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA PEAK UNIT RUNOFF (IN/HR)
300	200	0.39	83.4	2224.52	27.495	2197.939	0.161	2139.487	1.187	1789.953	1.349	3.441

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CFS)	FULL VELOCITY (FPS)	FULL DEPTH (FT)	MAXIMUM COMPUTED INFLOW (CFS)	MAXIMUM COMPUTED OUTFLOW (CFS)	MAXIMUM COMPUTED DEPTH (FT)	MAXIMUM COMPUTED VELOCITY (FPS)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (AC-FT)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
201				0.00				1/ 0/1900	0.00				
200				1.34				7/19/1972	17.50				

TOTAL NUMBER OF CHANNELS/PIPES = 2

*** NOTE *** THE MAXIMUM FLOWS AND DEPTHS ARE CALCULATED AT THE END OF THE TIME INTERVAL

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##################################################
#             Runoff Quality Summary Page        #
# If NDIM = 0 Units for:   loads    mass rates   #
#             METRIC = 1    lb        lb/sec     #
#             METRIC = 2    kg        kg/sec     #
# If NDIM = 1 Loads are in units of quantity     #
#             and mass rates are quantity/sec    #
# If NDIM = 2 loads are in units of concentration #
#             times volume and mass rates have units#
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#              of concentration times volume/second  #
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Total Su NDIM =  0
METRIC =  1
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	Total Su
Inputs	
1. INITIAL SURFACE LOAD.....	8.
2. TOTAL SURFACE BUILDUP.....	14718.
3. INITIAL CATCHBASIN LOAD.....	0.
4. TOTAL CATCHBASIN LOAD.....	0.
5. TOTAL CATCHBASIN AND SURFACE BUILDUP (2+4).....	14718.
Remaining Loads	
6. LOAD REMAINING ON SURFACE...	2.
7. REMAINING IN CATCHBASINS....	0.
8. REMAINING IN CHANNEL/PIPES..	0.
Removals	
9. STREET SWEEPING REMOVAL.....	0.
10. NET SURFACE BUILDUP (2-9)...	14718.
11. SURFACE WASHOFF.....	14707.
12. CATCHBASIN WASHOFF.....	0.
13. TOTAL WASHOFF (11+12).....	14707.
14. LOAD FROM OTHER CONSTITUENTS	0.
15. PRECIPITATION LOAD.....	0.
15a.SUM SURFACE LOAD (13+14+15).	14707.
16. TOTAL GROUNDWATER LOAD.....	0.
16a.TOTAL I/I LOAD.....	0.
17. NET SUBCATCHMENT LOAD (15a-15b-15c-15d+16+16a)....	14707.
>>Removal in channel/pipes (17a, 17b):	
17a.REMOVE BY BMP FRACTION.....	0.
17b.REMOVE BY 1st ORDER DECAY...	0.
18. TOTAL LOAD TO INLETS.....	14708.
19. FLOW WT'D AVE.CONCENTRATION mg/l (INLET LOAD/TOTAL FLOW).....	92.
Percentages	
20. STREET SWEEPING (9/2).....	0.
21. SURFACE WASHOFF (11/2).....	100.
22. NET SURFACE WASHOFF(11/10)..	100.
23. WASHOFF/SUBCAT LOAD(11/17)..	100.
24. SURFACE WASHOFF/INLET LOAD (11/18).....	100.
25. CATCHBASIN WASHOFF/	

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    SUBCATCHMENT LOAD (12/17)...        0.
26. CATCHBASIN WASHOFF/
    INLET LOAD (12/18)..........        0.
27. OTHER CONSTITUENT LOAD/
    SUBCATCHMENT LOAD (14/17)...        0.
28. INSOLUBLE FRACTION/
    INLET LOAD (14/18)..........        0.
29. PRECIPITATION/
    SUBCATCHMENT LOAD (15/17)...        0.
30. PRECIPITATION/
    INLET LOAD (15/18)..........        0.
31. GROUNDWATER LOAD/
    SUBCATCHMENT LOAD (16/17)...        0.
32. GROUNDWATER LOAD/
    INLET LOAD (16/18)..........        0.
32a.INFILTRATION/INFLOW LOAD/
    SUBCATCHMENT LOAD (16a/17)..        0.
32b.INFILTRATION/INFLOW LOAD/
    INLET LOAD (16a/18).........        0.
32c.CH/PIPE BMP FRACTION REMOVAL/
    SUBCATCHMENT LOAD (17a/17)..        0.
32d.CH/PIPE 1st ORDER DECAY REMOVAL/
    SUBCATCHMENT LOAD (17b/17)..        0.
33. INLET LOAD SUMMATION ERROR
    (18+8+6a+17a+17b-17)/17.....        0.

CAUTION. Due to method of quality routing (Users Manual, Appendix IX)
quality routing through channel/pipes is sensitive to the time step.
Large "Inlet Load Summation Errors" may result.
These can be reduced by adjusting the time step(s).
Note: surface accumulation during dry time steps at end of simulation is
not included in totals.  Buildup is only performed at beginning of
wet steps or for street cleaning.


*******************************************************
*            TSS Particle Size Distribution           *
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Diameter (um)	%	Specific Gravity	Settling Velocity (ft/s)	Critical Peclet Number
2.	5.0	2.65	0.000009	0.032973
5.	5.0	2.65	0.000055	0.056296
8.	10.0	2.65	0.000141	0.074071
20.	15.0	2.65	0.000875	0.126463
50.	10.0	2.65	0.005346	0.215914
75.	5.0	2.65	0.011640	0.273579
100.	10.0	2.65	0.019828	0.323611
150.	15.0	2.65	0.040138	0.410039
250.	15.0	2.65	0.087320	0.552510
500.	5.0	2.65	0.198831	0.828097
1000.	5.0	2.65	0.365264	1.241146

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*                                                   *
*              Summary of TSS Removal               *
*                                                   *
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TSS Removal based on NJCAT Lab Performance Curve

Model #	Low Q Treated (cfs)	High Q Treated (cfs)	Runoff Treated (%)	TSS Removed (%)
HS 4	0.850	0.850	99.9	84.9 <=TSS Removal
HS 5	0.850	0.850	99.9	90.0
HS 6	0.850	0.850	99.9	93.6
HS 7	0.850	0.850	99.9	95.3
HS 8	0.850	0.850	99.9	96.6
HS 9	0.850	0.850	99.9	97.7
HS 10	0.850	0.850	99.9	98.4
HS 12	0.850	0.850	99.9	99.2

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*                                                   *
*  Summary of Annual Flow Treatmnet & TSS Removal   *
*                                                   *
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Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	223.4	45.9	100.0	83.0
1958.	760204.5	760204.5	371.3	307.2	64.1	100.0	82.7
1959.	794070.3	785941.9	382.3	311.2	56.9	99.0	81.4
1960.	726235.4	725988.8	357.3	305.6	51.8	100.0	85.5
1961.	645176.4	645176.4	353.7	306.7	47.1	100.0	86.7
1962.	687225.3	687225.3	336.2	287.9	48.3	100.0	85.7
1963.	551969.0	551969.0	330.7	283.4	47.3	100.0	85.7
1964.	529711.4	529711.3	315.0	273.9	41.1	100.0	86.9
1965.	461658.1	461658.1	305.8	263.4	42.4	100.0	86.1
1966.	574917.2	574917.2	332.7	285.1	47.6	100.0	85.7
1967.	700552.4	700552.4	376.8	318.7	58.2	100.0	84.6
1968.	643946.1	642759.1	321.8	275.0	45.2	99.8	85.5
1969.	643430.9	643430.9	325.8	279.7	46.2	100.0	85.8
1970.	577838.7	577838.7	315.4	272.4	43.0	100.0	86.4
1971.	614367.6	614367.6	348.3	287.5	60.8	100.0	82.5
1972.	995396.4	980737.8	484.4	363.5	85.6	98.5	75.0
1973.	776382.7	776382.7	380.2	312.1	68.1	100.0	82.1
1974.	779911.9	779503.1	368.1	300.4	67.5	99.9	81.6
1975.	727263.9	727263.9	340.1	294.8	45.3	100.0	86.7
1976.	561214.2	561214.2	339.5	291.2	48.2	100.0	85.8
1977.	688886.2	688886.2	371.4	320.8	50.6	100.0	86.4
1978.	579832.8	579832.8	301.4	264.5	36.8	100.0	87.8
1979.	744520.5	740101.3	351.0	292.5	57.9	99.4	83.3

1980.	540292.3	540292.3	316.5	262.2	54.3	100.0	82.9
1981.	690134.2	690134.2	355.5	294.6	61.0	100.0	82.9
1982.	700839.8	700839.8	350.8	294.8	56.0	100.0	84.1
1983.	886124.8	886124.8	407.3	342.8	64.5	100.0	84.2
1984.	695323.5	695323.5	346.4	298.3	48.2	100.0	86.1
1985.	634137.1	631849.6	347.3	298.6	46.4	99.6	86.0
1986.	660789.3	660789.2	321.8	275.6	46.3	100.0	85.6
1987.	678286.8	678286.8	320.6	279.4	41.2	100.0	87.1
1988.	584164.5	584164.5	320.4	272.4	48.0	100.0	85.0
1989.	522650.1	522650.1	279.3	239.8	39.5	100.0	85.8
1991.	403451.5	403451.5	165.5	141.1	24.4	100.0	85.2
1992.	635229.2	635229.2	357.4	309.3	48.2	100.0	86.5
1993.	652494.7	652488.2	358.4	306.9	51.6	100.0	85.6
1994.	699136.6	699136.6	372.1	315.3	56.8	100.0	84.7
1995.	491848.4	491848.4	265.4	224.8	40.6	100.0	84.7
1996.	702964.1	702964.1	377.3	315.4	61.9	100.0	83.6
1997.	430198.1	430198.1	286.4	249.8	36.5	100.0	87.2
1998.	572690.2	572690.2	309.8	256.8	53.1	100.0	82.9
1999.	574111.4	574111.4	312.6	265.9	46.8	100.0	85.0
2000.	608177.2	608177.2	339.2	288.0	51.2	100.0	84.9
2001.	454531.2	454085.1	283.8	243.0	39.8	99.9	85.6

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Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	237.8	31.6	100.0	88.3
1958.	760204.5	760204.5	371.3	325.8	45.5	100.0	87.7
1959.	794070.3	785941.9	382.3	330.9	37.2	99.0	86.6
1960.	726235.4	725988.8	357.3	325.3	32.0	100.0	91.0
1961.	645176.4	645176.4	353.7	324.4	29.3	100.0	91.7
1962.	687225.3	687225.3	336.2	305.8	30.4	100.0	91.0
1963.	551969.0	551969.0	330.7	302.4	28.3	100.0	91.5
1964.	529711.4	529711.3	315.0	288.3	26.8	100.0	91.5
1965.	461658.1	461658.1	305.8	278.6	27.3	100.0	91.1
1966.	574917.2	574917.2	332.7	301.7	31.1	100.0	90.7
1967.	700552.4	700552.4	376.8	338.8	38.0	100.0	89.9
1968.	643946.1	642759.1	321.8	292.4	27.8	99.8	90.9
1969.	643430.9	643430.9	325.8	297.1	28.8	100.0	91.2
1970.	577838.7	577838.7	315.4	286.0	29.4	100.0	90.7
1971.	614367.6	614367.6	348.3	306.5	41.8	100.0	88.0
1972.	995396.4	980737.8	484.4	389.9	59.2	98.5	80.5
1973.	776382.7	776382.7	380.2	333.1	47.1	100.0	87.6
1974.	779911.9	779503.1	368.1	321.8	46.1	99.9	87.4
1975.	727263.9	727263.9	340.1	312.0	28.1	100.0	91.7
1976.	561214.2	561214.2	339.5	307.9	31.5	100.0	90.7
1977.	688886.2	688886.2	371.4	338.3	33.1	100.0	91.1
1978.	579832.8	579832.8	301.4	278.5	22.9	100.0	92.4
1979.	744520.5	740101.3	351.0	311.0	39.4	99.4	88.6
1980.	540292.3	540292.3	316.5	279.1	37.4	100.0	88.2
1981.	690134.2	690134.2	355.5	313.7	41.9	100.0	88.2
1982.	700839.8	700839.8	350.8	311.6	39.2	100.0	88.8

1983.	886124.8	886124.8	407.3	364.3	43.0	100.0	89.4
1984.	695323.5	695323.5	346.4	316.6	29.8	100.0	91.4
1985.	634137.1	631849.6	347.3	314.4	30.5	99.6	90.5
1986.	660789.3	660789.2	321.8	292.1	29.8	100.0	90.7
1987.	678286.8	678286.8	320.6	294.1	26.5	100.0	91.7
1988.	584164.5	584164.5	320.4	287.7	32.8	100.0	89.8
1989.	522650.1	522650.1	279.3	253.4	25.9	100.0	90.7
1991.	403451.5	403451.5	165.5	149.6	15.9	100.0	90.4
1992.	635229.2	635229.2	357.4	326.8	30.7	100.0	91.4
1993.	652494.7	652488.2	358.4	323.0	35.5	100.0	90.1
1994.	699136.6	699136.6	372.1	332.4	39.7	100.0	89.3
1995.	491848.4	491848.4	265.4	237.9	27.5	100.0	89.6
1996.	702964.1	702964.1	377.3	335.6	41.7	100.0	89.0
1997.	430198.1	430198.1	286.4	265.2	21.2	100.0	92.6
1998.	572690.2	572690.2	309.8	274.2	35.6	100.0	88.5
1999.	574111.4	574111.4	312.6	280.0	32.6	100.0	89.6
2000.	608177.2	608177.2	339.2	305.8	33.5	100.0	90.1
2001.	454531.2	454085.1	283.8	258.1	24.8	99.9	90.9

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Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	247.8	21.6	100.0	92.0
1958.	760204.5	760204.5	371.3	340.5	30.8	100.0	91.7
1959.	794070.3	785941.9	382.3	344.4	23.6	99.0	90.1
1960.	726235.4	725988.8	357.3	336.9	20.5	100.0	94.3
1961.	645176.4	645176.4	353.7	335.7	18.1	100.0	94.9
1962.	687225.3	687225.3	336.2	317.0	19.2	100.0	94.3
1963.	551969.0	551969.0	330.7	313.8	16.8	100.0	94.9
1964.	529711.4	529711.3	315.0	297.3	17.8	100.0	94.4
1965.	461658.1	461658.1	305.8	289.9	15.9	100.0	94.8
1966.	574917.2	574917.2	332.7	313.4	19.3	100.0	94.2
1967.	700552.4	700552.4	376.8	352.7	24.1	100.0	93.6
1968.	643946.1	642759.1	321.8	303.5	16.7	99.8	94.3
1969.	643430.9	643430.9	325.8	308.1	17.8	100.0	94.5
1970.	577838.7	577838.7	315.4	296.1	19.2	100.0	93.9
1971.	614367.6	614367.6	348.3	319.8	28.5	100.0	91.8
1972.	995396.4	980737.8	484.4	407.9	41.2	98.5	84.2
1973.	776382.7	776382.7	380.2	348.5	31.7	100.0	91.7
1974.	779911.9	779503.1	368.1	337.2	30.7	99.9	91.6
1975.	727263.9	727263.9	340.1	325.0	15.2	100.0	95.5
1976.	561214.2	561214.2	339.5	320.0	19.5	100.0	94.3
1977.	688886.2	688886.2	371.4	350.7	20.7	100.0	94.4
1978.	579832.8	579832.8	301.4	287.5	13.8	100.0	95.4
1979.	744520.5	740101.3	351.0	323.6	26.7	99.4	92.2
1980.	540292.3	540292.3	316.5	291.0	25.5	100.0	91.9
1981.	690134.2	690134.2	355.5	326.2	29.3	100.0	91.8
1982.	700839.8	700839.8	350.8	325.5	25.3	100.0	92.8
1983.	886124.8	886124.8	407.3	381.8	25.5	100.0	93.7
1984.	695323.5	695323.5	346.4	327.8	18.6	100.0	94.6
1985.	634137.1	631849.6	347.3	325.2	19.7	99.6	93.6

1986.	660789.3	660789.2	321.8	304.0	17.9	100.0	94.5
1987.	678286.8	678286.8	320.6	305.5	15.2	100.0	95.3
1988.	584164.5	584164.5	320.4	300.0	20.4	100.0	93.6
1989.	522650.1	522650.1	279.3	263.0	16.4	100.0	94.1
1991.	403451.5	403451.5	165.5	155.2	10.3	100.0	93.8
1992.	635229.2	635229.2	357.4	340.4	17.1	100.0	95.2
1993.	652494.7	652488.2	358.4	334.8	23.6	100.0	93.4
1994.	699136.6	699136.6	372.1	346.2	25.8	100.0	93.1
1995.	491848.4	491848.4	265.4	247.5	17.9	100.0	93.3
1996.	702964.1	702964.1	377.3	349.0	28.3	100.0	92.5
1997.	430198.1	430198.1	286.4	273.8	12.5	100.0	95.6
1998.	572690.2	572690.2	309.8	286.6	23.2	100.0	92.5
1999.	574111.4	574111.4	312.6	292.5	20.1	100.0	93.6
2000.	608177.2	608177.2	339.2	317.6	21.6	100.0	93.6
2001.	454531.2	454085.1	283.8	266.2	16.6	99.9	93.8

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Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	253.9	15.4	100.0	94.3
1958.	760204.5	760204.5	371.3	348.1	23.2	100.0	93.8
1959.	794070.3	785941.9	382.3	350.5	17.6	99.0	91.7
1960.	726235.4	725988.8	357.3	343.2	14.2	100.0	96.0
1961.	645176.4	645176.4	353.7	340.4	13.3	100.0	96.2
1962.	687225.3	687225.3	336.2	322.1	14.1	100.0	95.8
1963.	551969.0	551969.0	330.7	319.5	11.2	100.0	96.6
1964.	529711.4	529711.3	315.0	302.3	12.8	100.0	96.0
1965.	461658.1	461658.1	305.8	294.9	10.9	100.0	96.4
1966.	574917.2	574917.2	332.7	318.9	13.8	100.0	95.9
1967.	700552.4	700552.4	376.8	359.1	17.7	100.0	95.3
1968.	643946.1	642759.1	321.8	308.5	11.7	99.8	95.9
1969.	643430.9	643430.9	325.8	312.7	13.2	100.0	96.0
1970.	577838.7	577838.7	315.4	301.3	14.1	100.0	95.5
1971.	614367.6	614367.6	348.3	327.3	21.0	100.0	94.0
1972.	995396.4	980737.8	484.4	418.0	31.1	98.5	86.3
1973.	776382.7	776382.7	380.2	357.7	22.5	100.0	94.1
1974.	779911.9	779503.1	368.1	344.0	24.0	99.9	93.4
1975.	727263.9	727263.9	340.1	330.0	10.1	100.0	97.0
1976.	561214.2	561214.2	339.5	324.4	15.0	100.0	95.6
1977.	688886.2	688886.2	371.4	356.6	14.8	100.0	96.0
1978.	579832.8	579832.8	301.4	292.2	9.1	100.0	97.0
1979.	744520.5	740101.3	351.0	328.9	21.4	99.4	93.7
1980.	540292.3	540292.3	316.5	297.5	19.0	100.0	94.0
1981.	690134.2	690134.2	355.5	333.9	21.7	100.0	93.9
1982.	700839.8	700839.8	350.8	331.4	19.3	100.0	94.5
1983.	886124.8	886124.8	407.3	389.3	18.0	100.0	95.6
1984.	695323.5	695323.5	346.4	332.5	13.9	100.0	96.0
1985.	634137.1	631849.6	347.3	331.0	14.0	99.6	95.3
1986.	660789.3	660789.2	321.8	309.2	12.7	100.0	96.1
1987.	678286.8	678286.8	320.6	310.4	10.2	100.0	96.8
1988.	584164.5	584164.5	320.4	305.4	15.0	100.0	95.3

1989.	522650.1	522650.1	279.3	267.3	12.0	100.0	95.7
1991.	403451.5	403451.5	165.5	158.2	7.3	100.0	95.6
1992.	635229.2	635229.2	357.4	345.6	11.8	100.0	96.7
1993.	652494.7	652488.2	358.4	341.4	17.0	100.0	95.3
1994.	699136.6	699136.6	372.1	353.1	19.0	100.0	94.9
1995.	491848.4	491848.4	265.4	253.2	12.2	100.0	95.4
1996.	702964.1	702964.1	377.3	356.7	20.6	100.0	94.5
1997.	430198.1	430198.1	286.4	278.4	8.0	100.0	97.2
1998.	572690.2	572690.2	309.8	293.3	16.5	100.0	94.7
1999.	574111.4	574111.4	312.6	297.8	14.8	100.0	95.3
2000.	608177.2	608177.2	339.2	324.1	15.2	100.0	95.5
2001.	454531.2	454085.1	283.8	269.8	13.1	99.9	95.1

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	258.2	11.1	100.0	95.9
1958.	760204.5	760204.5	371.3	355.0	16.3	100.0	95.6
1959.	794070.3	785941.9	382.3	354.5	13.6	99.0	92.7
1960.	726235.4	725988.8	357.3	347.9	9.4	100.0	97.4
1961.	645176.4	645176.4	353.7	344.0	9.8	100.0	97.2
1962.	687225.3	687225.3	336.2	326.2	10.0	100.0	97.0
1963.	551969.0	551969.0	330.7	323.1	7.6	100.0	97.7
1964.	529711.4	529711.3	315.0	306.0	9.0	100.0	97.1
1965.	461658.1	461658.1	305.8	298.6	7.2	100.0	97.6
1966.	574917.2	574917.2	332.7	322.2	10.5	100.0	96.8
1967.	700552.4	700552.4	376.8	364.2	12.6	100.0	96.7
1968.	643946.1	642759.1	321.8	311.6	8.5	99.8	96.8
1969.	643430.9	643430.9	325.8	316.1	9.8	100.0	97.0
1970.	577838.7	577838.7	315.4	305.3	10.0	100.0	96.8
1971.	614367.6	614367.6	348.3	334.0	14.3	100.0	95.9
1972.	995396.4	980737.8	484.4	425.1	24.0	98.5	87.8
1973.	776382.7	776382.7	380.2	364.6	15.5	100.0	95.9
1974.	779911.9	779503.1	368.1	348.8	19.2	99.9	94.7
1975.	727263.9	727263.9	340.1	333.3	6.8	100.0	98.0
1976.	561214.2	561214.2	339.5	328.3	11.2	100.0	96.7
1977.	688886.2	688886.2	371.4	360.8	10.6	100.0	97.1
1978.	579832.8	579832.8	301.4	295.3	6.1	100.0	98.0
1979.	744520.5	740101.3	351.0	333.7	16.7	99.4	95.1
1980.	540292.3	540292.3	316.5	301.9	14.6	100.0	95.4
1981.	690134.2	690134.2	355.5	338.1	17.4	100.0	95.1
1982.	700839.8	700839.8	350.8	337.7	13.0	100.0	96.3
1983.	886124.8	886124.8	407.3	395.0	12.3	100.0	97.0
1984.	695323.5	695323.5	346.4	336.6	9.8	100.0	97.2
1985.	634137.1	631849.6	347.3	335.3	9.6	99.6	96.6
1986.	660789.3	660789.2	321.8	313.2	8.6	100.0	97.3
1987.	678286.8	678286.8	320.6	313.5	7.1	100.0	97.8
1988.	584164.5	584164.5	320.4	309.6	10.8	100.0	96.6
1989.	522650.1	522650.1	279.3	270.4	8.9	100.0	96.8
1991.	403451.5	403451.5	165.5	160.6	4.9	100.0	97.1
1992.	635229.2	635229.2	357.4	349.1	8.3	100.0	97.7

1993.	652494.7	652488.2	358.4	346.5	11.9	100.0	96.7
1994.	699136.6	699136.6	372.1	358.9	13.1	100.0	96.5
1995.	491848.4	491848.4	265.4	256.8	8.6	100.0	96.8
1996.	702964.1	702964.1	377.3	362.3	15.0	100.0	96.0
1997.	430198.1	430198.1	286.4	280.8	5.5	100.0	98.1
1998.	572690.2	572690.2	309.8	297.5	12.4	100.0	96.0
1999.	574111.4	574111.4	312.6	302.8	9.9	100.0	96.8
2000.	608177.2	608177.2	339.2	328.2	11.1	100.0	96.7
2001.	454531.2	454085.1	283.8	272.2	10.6	99.9	95.9

HS 9

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	261.7	7.6	100.0	97.2
1958.	760204.5	760204.5	371.3	360.2	11.1	100.0	97.0
1959.	794070.3	785941.9	382.3	358.0	10.1	99.0	93.7
1960.	726235.4	725988.8	357.3	351.4	5.9	100.0	98.4
1961.	645176.4	645176.4	353.7	347.0	6.7	100.0	98.1
1962.	687225.3	687225.3	336.2	329.8	6.4	100.0	98.1
1963.	551969.0	551969.0	330.7	326.0	4.7	100.0	98.6
1964.	529711.4	529711.3	315.0	309.4	5.7	100.0	98.2
1965.	461658.1	461658.1	305.8	301.2	4.6	100.0	98.5
1966.	574917.2	574917.2	332.7	325.9	6.9	100.0	97.9
1967.	700552.4	700552.4	376.8	368.3	8.5	100.0	97.7
1968.	643946.1	642759.1	321.8	314.4	5.8	99.8	97.7
1969.	643430.9	643430.9	325.8	319.2	6.7	100.0	98.0
1970.	577838.7	577838.7	315.4	308.4	6.9	100.0	97.8
1971.	614367.6	614367.6	348.3	338.5	9.8	100.0	97.2
1972.	995396.4	980737.8	484.4	431.5	17.6	98.5	89.1
1973.	776382.7	776382.7	380.2	369.4	10.8	100.0	97.2
1974.	779911.9	779503.1	368.1	353.7	14.2	99.9	96.1
1975.	727263.9	727263.9	340.1	335.8	4.3	100.0	98.7
1976.	561214.2	561214.2	339.5	331.4	8.0	100.0	97.6
1977.	688886.2	688886.2	371.4	363.8	7.6	100.0	98.0
1978.	579832.8	579832.8	301.4	297.4	4.0	100.0	98.7
1979.	744520.5	740101.3	351.0	338.0	12.4	99.4	96.3
1980.	540292.3	540292.3	316.5	306.7	9.8	100.0	96.9
1981.	690134.2	690134.2	355.5	343.9	11.6	100.0	96.7
1982.	700839.8	700839.8	350.8	342.0	8.8	100.0	97.5
1983.	886124.8	886124.8	407.3	399.3	8.0	100.0	98.0
1984.	695323.5	695323.5	346.4	340.1	6.3	100.0	98.2
1985.	634137.1	631849.6	347.3	338.0	6.9	99.6	97.3
1986.	660789.3	660789.2	321.8	316.4	5.4	100.0	98.3
1987.	678286.8	678286.8	320.6	315.9	4.7	100.0	98.5
1988.	584164.5	584164.5	320.4	312.5	8.0	100.0	97.5
1989.	522650.1	522650.1	279.3	273.3	6.0	100.0	97.8
1991.	403451.5	403451.5	165.5	162.2	3.3	100.0	98.0
1992.	635229.2	635229.2	357.4	352.0	5.4	100.0	98.5
1993.	652494.7	652488.2	358.4	350.5	8.0	100.0	97.8
1994.	699136.6	699136.6	372.1	363.5	8.6	100.0	97.7
1995.	491848.4	491848.4	265.4	259.6	5.8	100.0	97.8

1996.	702964.1	702964.1	377.3	366.9	10.4	100.0	97.3
1997.	430198.1	430198.1	286.4	283.0	3.3	100.0	98.8
1998.	572690.2	572690.2	309.8	301.6	8.2	100.0	97.4
1999.	574111.4	574111.4	312.6	305.7	6.9	100.0	97.8
2000.	608177.2	608177.2	339.2	332.2	7.0	100.0	97.9
2001.	454531.2	454085.1	283.8	275.0	7.8	99.9	96.9

HS 10 Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	264.3	5.0	100.0	98.1
1958.	760204.5	760204.5	371.3	363.5	7.8	100.0	97.9
1959.	794070.3	785941.9	382.3	361.3	6.7	99.0	94.5
1960.	726235.4	725988.8	357.3	353.2	4.1	100.0	98.8
1961.	645176.4	645176.4	353.7	349.1	4.6	100.0	98.7
1962.	687225.3	687225.3	336.2	331.9	4.3	100.0	98.7
1963.	551969.0	551969.0	330.7	327.7	2.9	100.0	99.1
1964.	529711.4	529711.3	315.0	311.1	3.9	100.0	98.8
1965.	461658.1	461658.1	305.8	302.6	3.2	100.0	99.0
1966.	574917.2	574917.2	332.7	327.9	4.8	100.0	98.5
1967.	700552.4	700552.4	376.8	371.3	5.5	100.0	98.5
1968.	643946.1	642759.1	321.8	315.9	4.3	99.8	98.2
1969.	643430.9	643430.9	325.8	321.3	4.5	100.0	98.6
1970.	577838.7	577838.7	315.4	310.8	4.6	100.0	98.6
1971.	614367.6	614367.6	348.3	341.7	6.6	100.0	98.1
1972.	995396.4	980737.8	484.4	435.8	13.3	98.5	90.0
1973.	776382.7	776382.7	380.2	373.0	7.2	100.0	98.1
1974.	779911.9	779503.1	368.1	358.0	10.0	99.9	97.2
1975.	727263.9	727263.9	340.1	337.3	2.8	100.0	99.2
1976.	561214.2	561214.2	339.5	334.3	5.2	100.0	98.5
1977.	688886.2	688886.2	371.4	366.1	5.3	100.0	98.6
1978.	579832.8	579832.8	301.4	298.8	2.6	100.0	99.1
1979.	744520.5	740101.3	351.0	342.0	8.4	99.4	97.4
1980.	540292.3	540292.3	316.5	310.1	6.4	100.0	98.0
1981.	690134.2	690134.2	355.5	347.0	8.5	100.0	97.6
1982.	700839.8	700839.8	350.8	344.4	6.3	100.0	98.2
1983.	886124.8	886124.8	407.3	401.8	5.5	100.0	98.6
1984.	695323.5	695323.5	346.4	342.4	4.0	100.0	98.8
1985.	634137.1	631849.6	347.3	340.1	4.8	99.6	97.9
1986.	660789.3	660789.2	321.8	318.1	3.7	100.0	98.9
1987.	678286.8	678286.8	320.6	317.5	3.1	100.0	99.0
1988.	584164.5	584164.5	320.4	314.9	5.5	100.0	98.3
1989.	522650.1	522650.1	279.3	275.5	3.9	100.0	98.6
1991.	403451.5	403451.5	165.5	163.3	2.2	100.0	98.7
1992.	635229.2	635229.2	357.4	354.0	3.4	100.0	99.0
1993.	652494.7	652488.2	358.4	352.7	5.7	100.0	98.4
1994.	699136.6	699136.6	372.1	366.0	6.1	100.0	98.4
1995.	491848.4	491848.4	265.4	261.4	4.0	100.0	98.5
1996.	702964.1	702964.1	377.3	370.5	6.8	100.0	98.2
1997.	430198.1	430198.1	286.4	284.3	2.0	100.0	99.3
1998.	572690.2	572690.2	309.8	304.5	5.3	100.0	98.3

1999.	574111.4	574111.4	312.6	308.1	4.5	100.0	98.6
2000.	608177.2	608177.2	339.2	334.6	4.7	100.0	98.6
2001.	454531.2	454085.1	283.8	277.4	5.5	99.9	97.7

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	455703.0	455703.0	269.3	266.8	2.5	100.0	99.1
1958.	760204.5	760204.5	371.3	367.2	4.1	100.0	98.9
1959.	794070.3	785941.9	382.3	364.8	3.2	99.0	95.4
1960.	726235.4	725988.8	357.3	355.3	2.0	100.0	99.4
1961.	645176.4	645176.4	353.7	351.5	2.3	100.0	99.4
1962.	687225.3	687225.3	336.2	334.0	2.2	100.0	99.3
1963.	551969.0	551969.0	330.7	329.4	1.2	100.0	99.6
1964.	529711.4	529711.3	315.0	312.9	2.1	100.0	99.3
1965.	461658.1	461658.1	305.8	304.5	1.3	100.0	99.6
1966.	574917.2	574917.2	332.7	330.3	2.4	100.0	99.3
1967.	700552.4	700552.4	376.8	374.1	2.8	100.0	99.3
1968.	643946.1	642759.1	321.8	318.2	2.0	99.8	98.9
1969.	643430.9	643430.9	325.8	323.6	2.2	100.0	99.3
1970.	577838.7	577838.7	315.4	312.9	2.4	100.0	99.2
1971.	614367.6	614367.6	348.3	344.9	3.4	100.0	99.0
1972.	995396.4	980737.8	484.4	442.6	6.5	98.5	91.4
1973.	776382.7	776382.7	380.2	376.5	3.7	100.0	99.0
1974.	779911.9	779503.1	368.1	363.2	4.7	99.9	98.7
1975.	727263.9	727263.9	340.1	339.0	1.1	100.0	99.7
1976.	561214.2	561214.2	339.5	336.9	2.5	100.0	99.3
1977.	688886.2	688886.2	371.4	369.0	2.4	100.0	99.4
1978.	579832.8	579832.8	301.4	300.1	1.2	100.0	99.6
1979.	744520.5	740101.3	351.0	346.1	4.3	99.4	98.6
1980.	540292.3	540292.3	316.5	313.2	3.3	100.0	98.9
1981.	690134.2	690134.2	355.5	351.2	4.3	100.0	98.8
1982.	700839.8	700839.8	350.8	347.7	3.1	100.0	99.1
1983.	886124.8	886124.8	407.3	404.8	2.5	100.0	99.4
1984.	695323.5	695323.5	346.4	344.4	2.1	100.0	99.4
1985.	634137.1	631849.6	347.3	342.6	2.3	99.6	98.7
1986.	660789.3	660789.2	321.8	320.1	1.7	100.0	99.5
1987.	678286.8	678286.8	320.6	319.3	1.3	100.0	99.6
1988.	584164.5	584164.5	320.4	317.9	2.6	100.0	99.2
1989.	522650.1	522650.1	279.3	277.4	2.0	100.0	99.3
1991.	403451.5	403451.5	165.5	164.4	1.1	100.0	99.3
1992.	635229.2	635229.2	357.4	356.0	1.4	100.0	99.6
1993.	652494.7	652488.2	358.4	355.6	2.9	100.0	99.2
1994.	699136.6	699136.6	372.1	369.1	3.0	100.0	99.2
1995.	491848.4	491848.4	265.4	263.4	2.0	100.0	99.3
1996.	702964.1	702964.1	377.3	373.8	3.5	100.0	99.1
1997.	430198.1	430198.1	286.4	285.4	1.0	100.0	99.7
1998.	572690.2	572690.2	309.8	307.0	2.8	100.0	99.1
1999.	574111.4	574111.4	312.6	310.5	2.1	100.0	99.3
2000.	608177.2	608177.2	339.2	336.9	2.3	100.0	99.3
2001.	454531.2	454085.1	283.8	280.1	2.7	99.9	98.7

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**************************************************
*  Summary of Quantity and Quality Results at      *
*  Location        200  INFlow in cfs.             *
*  Values are instantaneous at indicated time step *
**************************************************

  GoVenture - Franklin St, Worcester
  DCB#5

     Date      Time         Flow   Total Su
 Mo/Da/Year  Hr:Min         cfs    mg/l
 ----------  -------     -------  --------
Flow wtd means.....         0.004       93.
Flow wtd std devs..         0.020       69.
Maximum value......         1.339      294.
Minimum value......         0.000        0.
Total loads........      2547310.    14716.
                         Cub-Ft     POUNDS

===> Runoff simulation ended normally.

===> SWMM 4.4    simulation ended normally.
     Always check output file for possible warning messages.

*****************************************************
*       SWMM 4.4    Simulation Date and Time Summary  *
*****************************************************
* Starting Date... January     5, 2022               *
*          Time...         14:25:11.417              *
*   Ending Date... January     5, 2022               *
*          Time...         14:25:19.308              *
*  Elapsed Time...               0.132 minutes.      *
*  Elapsed Time...               7.891 seconds.      *
*****************************************************
```

MASS DEP "Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices"

DMH#2-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

0.412 acres @ 88.63% Impervious = 0.365 Acres Impervious
0.365 Acres x .0015625 sq mi = ***5.7x(10^-4) square miles.***

Step 2: Tc of Train

P104 to DCB#4:	5.0 min
DCB#4 to DMH#1:	2.2 min
DMH#1 to DMH#2:	0.9 min
Total Tc to DMH#2	***8.1 min or 0.135 hours***

Step 3: Determine qu

From Figure 4:

Tc @ 0.133, qu=669csm/in

Step 4: Determine Q(1)

Q(1) = (qu)x(A)x(WQV)

Q(1) = (669csm/in)x(5.7x(10^-4)) x(1.0 in)

Q(1) = 0.38 CFS

Determination

Determination of Water Quality Flow rates for units by Connecticut DOT (CONNDOT)

From Technology Verification
HS 4 Treatment Flow rate
1.1 cf.s > 0.43 c.f.s. "Pass"

HydroGuard HS4 to be utilized in Design.

INSTRUCTIONS:

Non-automated: Jan. 31, 2019

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: DMH#2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Hydroworks Unit HG4	**0.83**	**0.75**	**0.62**	**0.13**

Total TSS Removal = **87%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Franklin Street, Worcester**

Prepared By: **Hannigan Engineering, Inc.**

Date: **1/5/2022**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DMH2: TO DMH#100

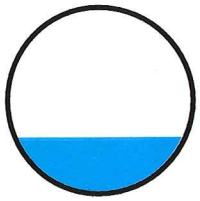
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB1 outlet invert by 0.05' @ 12.15 hrs
[61] Hint: Exceeded Reach DMH1 outlet invert by 0.05' @ 12.15 hrs

Inflow Area = 0.412 ac, 88.63% Impervious, Inflow Depth = 2.24" for 2-Year event
Inflow = 0.95 cfs @ 12.13 hrs, Volume= 0.077 af <=WQV
Outflow = 0.94 cfs @ 12.13 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.5 min

Peak Storage= 9 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.71 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 44.0' Slope= 0.0125 '/'
Inlet Invert= 466.75', Outlet Invert= 466.20'



Summary for Subcatchment P104: TO DCB#4

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.13"

Area (sf)	CN	Description
445	39	>75% Grass cover, Good, HSG A
1,587	98	Paved parking, HSG A
2,032	85	Weighted Average
445		21.90% Pervious Area
1,587		78.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.1	15	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	65	Total, Increased to minimum Tc = 5.0 min <=Tc			

Summary for Reach DCB4: TO DMH#1

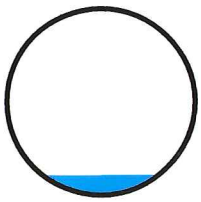
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.047 ac, 78.10% Impervious, Inflow Depth = 1.70" for 2-Year event
Inflow = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af
Outflow = 0.08 cfs @ 12.14 hrs, Volume= 0.007 af, Atten= 4%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 2.2 min <=Tc

Peak Storage= 4 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 90.0' Slope= 0.0100 '/'
Inlet Invert= 468.50', Outlet Invert= 467.60'



Summary for Reach DMH1: TO DMH#2

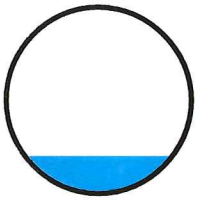
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB2 outlet invert by 0.10' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB4 outlet invert by 0.10' @ 12.15 hrs

Inflow Area = 0.135 ac, 89.85% Impervious, Inflow Depth = 2.34" for 2-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af
Outflow = 0.31 cfs @ 12.14 hrs, Volume= 0.026 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 0.9 min <=Tc

Peak Storage= 6 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.56 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



```
**************************************************
*      Storm Water Management Sizing Model       *
*               Hydroworks, LLC                  *
*                Version 4.4                     *
*                                                *
*        Continuous Simulation Program           *
*              Based on SWMM 4.4H                *
*              Hydroworks, LLC                   *
*               Graham Bryant                    *
*                2003 - 2013                     *
**************************************************

                Developed by

**************************************************
*               Hydroworks, LLC                  *
*             Metcalf & Eddy, Inc.               *
*            University of Florida               *
*       Water Resources Engineers, Inc.          *
*      (Now Camp Dresser & McKee, Inc.)          *
*              Modified SWMM 4.4                 *
**************************************************

         Distributed and Maintained by

**************************************************
*                                                *
*                Hydroworks, LLC                 *
*                 888-290-7900                   *
*              www.hydroworks.com                *
*                                                *
**************************************************

**************************************************
*     If any problems occur executing this       *
*     model, contact Mr. Graham Bryant at        *
*     Hydroworks, LLC by phone at 908-272-4411   *
*     or by e-mail: support@hydroworks.com       *
**************************************************

**************************************************
*     This model is based on EPA SWMM 4.4        *
*  "Nature is full of infinite causes which      *
*   have never occurred in experience" da Vinci  *
**************************************************


**************************************************
* Entry made to the Rain Block                   *
* Created by the University of Florida - 1988    *
* Updated by Oregon State University, March 2000 *
**************************************************
```

GoVenture - Franklin Street, Worcester
DMH#2

```
#######################################
#  Precipitation Block Input Commands  #
#######################################

Station Name........................  Worcester Wso Ap

Station Location....................  Massachusetts

Station, ISTA.......................    9923

Beginning date, IYBEG (Yr/Mo/Dy......  1957/ 1/ 1

Ending date, IYEND (Yr/Mo/Dy)........  2001/12/31

Minimum interevent time, MIT.........     1

Number of ranked storms, NPTS........    10

NWS format, IFORM (See text).........     1

Print storm summary, ISUM (O-No 1-Yes)    0

Print all rainfall, IYEAR (O-No 1-Yes)    0

Save storm event data on NSCRAT(1)....    0
(IFILE =0 -Do not save, =1 -Save data)

IDECID 0 - Create interface file
       1 - Create file and analyze
       2 - Synoptic analysis.........     2

Plotting position parameter, A........  0.40

Storm event statistics, NOSTAT........  1100


KODEA (from optional group B0)........     2
 = 0, Do not include NCDC cumulative values.
 = 1, Average NCDC cumulative values.
 = 2, Use NCDC cumulative value as inst. rain.

KODEPR (from optional group B0).......     0
 Print NCDC special codes in event summary:
 = 0, only on days with events.
 = 1, on all days with codes present.
 Codes: A = accumulated value, I = incomplete value,
        M = missing value,     O = other code present
```

```
*******************************************************
*  Precipitation output created using the Rain block   *
*  Number of precipitation stations...        1        *
*******************************************************

Location Station Number
-------- --------------
       1.     9923


STATION ID ON PRECIP. DATA INPUT FILE = 2302
REQUESTED STATION ID =     9923  CHECK TO BE SURE THEY MATCH.



$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
Note, 15-min. data are being processed, but hourly
print-out, summaries, and statistics are based on
hourly totals only.  Data placed on interface file
are at correct 15-min. intervals.
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

#################################################
# Entry made to the Runoff Block, last updated by #
# Oregon State University, and Camp, Dresser and  #
# McKee, Inc., March 2002.                        #
#################################################
# "And wherever water goes, amoebae go along for  #
#  the ride"                        Tom Robbins     #
#################################################


                    GoVenture - Franklin Street, Worcester

                    DMH#2


Snowmelt parameter - ISNOW.......................          0

Number of rain gages - NRGAG.....................          1

Horton infiltration equation used - INFILM.......          2
Maximum infiltration volume is limited to RMAXINF input on  subcatchment lines.
Infiltration volume regenerates during  non rainfall periods.

Quality is simulated - KWALTY....................          1

IVAP is negative.  Evaporation will be set to zero
    during time steps with rainfall.

Read evaporation data on line(s) F1 (F2) - IVAP..          1
```

```
Hour of day at start of storm - NHR.............          1

Minute of hour at start of storm - NMN..........          1

Time TZERO at start of storm (hours)............      1.017

Use U.S. Customary units for most I/O - METRIC...          0

Runoff input print control...                              0

Runoff graph plot control....                              1

Runoff output print control..                              0

Print headers every 50 lines - NOHEAD (0=yes, 1=no)        0

Print land use load percentages -LANDUPR (0=no, 1=yes)     0

Limit number of groundwater convergence messages to 10000 (if simulated)

Month, day, year of start of storm is:              1/ 1/1957

Wet time step length (seconds).......                   300.

Dry time step length (seconds).......                   900.

Wet/Dry time step length (seconds)...                   450.

Simulation length is......                        20011231.0 Yr/Mo/Dy

Percent of impervious area with zero detention depth    25.0

Horton infiltration model being used
Rate for regeneration of infiltration = REGEN * DECAY
DECAY is read in for each subcatchment
REGEN = ........................................   0.01000
```

```
*******************************************************
*   Processed Precipitation will be read from file     *
*******************************************************

  ##############################
  #        Data Group F1       #
  # Evaporation Rate (in/day) #
  ##############################
```

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
0.00	0.00	0.00	0.10	0.10	0.15	0.15	0.15	0.10	0.10	0.00	0.00

```
*********************************************************
*        C H A N N E L   A N D   P I P E   D A T A      *
*********************************************************
```

Input equen umber	NAMEG: Channel ID #	Drains to NGTO:	Channel Type	Width (ft)	Length (ft)	Invert Slope (ft/ft)	L Side Slope (ft/ft)	R Side Slope (ft/ft)	Intial Depth (ft)	Max Depth (ft)	Mann- ings "N"	Full Flow (cfs)
1	201	200	Dummy	0.0	0.0	0.0000	0.0000	0.0000	0.0	0.0	0.0000	0.00E+00

```
*****************************************************
*          S U B C A T C H M E N T   D A T A        *
*****************************************************
```

NOTE. SEE LATER TABLE FOR OPTIONAL SUBCATCHMENT PARAMETERS

	SUBCATCH- MENT NO.	CHANNEL OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	RESISTANCE IMPERV.	FACTOR PERV.	DEPRES. IMPERV.	STORAGE(IN) PERV.	INFILTRATION RATE(IN/HR) MAXIMUM	MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	133.97	0.41	88.63	0.0200	0.015	0.250	0.020	0.200	2.50	0.40	0.00055	1	4.00000

```
TOTAL NUMBER OF SUBCATCHMENTS...              1
TOTAL TRIBUTARY AREA (ACRES)....           0.41
IMPERVIOUS AREA (ACRES).........           0.37
PERVIOUS AREA (ACRES)...........           0.05
TOTAL WIDTH (FEET)..............         133.97
PERCENT IMPERVIOUSNESS..........          88.63
```

```
*******************************************************
*     G R O U N D W A T E R   I N P U T   D A T A     *
*******************************************************
```

SUB-CATCH NUMBER	CHANNEL OR INLET	ELEVATIONS GROUND (FT)	BOTTOM (FT)	STAGE (FT)	BC (FT)	TW (FT)	FLOW CONSTANTS A1 (IN/HR-FT^B1)	B1	A2 (IN/HR-FT^B2)	B2	A3 (IN/HR-FT^2)
0	602	10.00	0.00	0.00	2.00	2.00	4.500E-05	2.600	0.000E+00	1.000	0.00E+00

```
*********************************************************
* G R O U N D W A T E R   I N P U T   D A T A (CONTINUED) *
*********************************************************
```

S O I L   P R O P E R T I E S

SUBCAT. NO.	POROSITY	SATURATED HYDRAULIC CONDUCTIVITY (in/hr)	WILTING POINT	FIELD CAPACITY	INITIAL MOISTURE	MAX. DEEP PERCOLATION (in/hr)	PERCOLATION PARAMETERS HCO	PCO	ET PARAMETERS DEPTH OF ET (ft)	FRACTION OF ET TO UPPER ZONE
0	.4000	5.000	.1500	.3000	.3000	2.000E-03	10.00	15.00	14.00	0.350

```
*********************************************************
*    Arrangement of Subcatchments and Channel/Pipes     *
*********************************************************
* See second subcatchment output table for connectivity *
* of subcatchment to subcatchment flows.                *
*********************************************************

   Channel
   or Pipe
       201     No Tributary Channel/Pipes
               No Tributary Subareas.....


    INLET
       200     Tributary Channel/Pipes...        201
               Tributary Subareas........        300


***********************************************************
* Hydrographs will be stored for the following   1 INLETS *
***********************************************************
          200

↑
#####################################################
#              Quality Simulation                   #
#####################################################
#      General Quality Control Data Groups          #
#####################################################

 Description                            Variable       Value
 -----------                            --------       -----

 Number of quality constituents.....    NQS.......         1

 Number of land uses................  JLAND.......         1

 Standard catchbasin volume.........  CBVOL.......      4.00 cubic feet

 Erosion is not simulated.........    IROS........         0

 DRY DAYS PRIOR TO START OF STORM... DRYDAY.......      3.00 DAYS

 DRY DAYS REQUIRED TO RECHARGE
 CATCHBASIN CONCENTRATION TO
 INITIAL VALUES..................... DRYBSN.......      5.00 DAYS

 DUST AND DIRT
 STREET SWEEPING EFFICIENCY......... REFFDD.......     0.000

 DAY OF YEAR ON WHICH STREET
 SWEEPING BEGINS.................... KLNBGN.......       120

 DAY OF YEAR ON WHICH STREET
 SWEEPING ENDS...................... KLNEND.......       270
```

```
##########################################
#     Land use data on data group J2     #
##########################################
```

AND USE LNAME)	BUILDUP EQUATION TYPE (METHOD)	FUNCTIONAL DEPENDENCE OF BUILDUP PARAMETER(JACGUT)	LIMITING BUILDUP QUANTITY (DDLIM)	BUILDUP POWER (DDPOW)	BUILDUP COEFF. (DDFACT)	CLEANING INTERVAL IN DAYS (CLFREQ)	AVAIL. FACTOR FRACTION (AVSWP)	DAYS SINCE LAST SWEEPING (DSLCL)
Urban De	EXPONENTIAL(1)	AREA(1)	2.500E+01	0.500	60.000	30.000	0.300	30.000

```
##############################################
#     Constituent data on data group J3      #
##############################################
```

	Total Su
Constituent units.....	mg/l
Type of units.....	0
KALC.....	2
Type of buildup calc.....	EXPONENTIAL(2)
KWASH.....	0
Type of washoff calc.....	POWER EXPONEN.(0)
KACGUT.....	1
Dependence of buildup....	AREA(1)
LINKUP.....	0
Linkage to snowmelt.....	NO SNOW LINKAGE
Buildup param 1 (QFACT1).	25.000
Buildup param 2 (QFACT2).	0.500
Buildup param 3 (QFACT3).	60.000
Buildup param 4 (QFACT4).	0.000
Buildup param 5 (QFACT5).	0.000
Washoff power (WASHPO)...	1.100
Washoff coef. (RCOEF)....	3.000
Init catchb conc (CBFACT)	100.000
Precip. conc. (CONCRN)...	0.000
Street sweep effic (REFF)	0.000
Remove fraction (REMOVE).	0.000
1st order QDECAY, 1/day..	0.000
Land use number.....	1

```
************************************************
* Constant Groundwater Quality Concentration(s) *
************************************************
```

Total Susp has a concentration of.. 0.0000 mg/l

```
***********************************************
* REMOVAL FRACTIONS FOR SELECTED CHANNEL/PIPES *
* FROM J7 LINES                                *
***********************************************

  CHANNEL/   CONSTITUENT
     PIPE Total Susp
----------  --------
       201     0.000


*****************************************************
*     Subcatchment surface quality on data group L1 *
*****************************************************


                                  Total   Number   Input
                          Land    Gutter     of    Loading
                Land      Use     Length   Catch-  load/ac
            No. Usage     No.    10**2ft   Basins  Total Su
         ------ --------  ----   -------- --------  -------
   1        300 Urban De  1         2.70     1.00  0.0E+00
   Totals (Loads in lb or other)    2.70     1.00  0.0E+00

    ************************
    *    DATA GROUP M1     *
    ************************


TOTAL NUMBER OF PRINTED GUTTERS/INLETS...NPRNT..        1
NUMBER OF TIME STEPS BETWEEN PRINTINGS..INTERV..        0
STARTING AND STOPPING PRINTOUT DATES............        0        0


    ************************
    *    DATA GROUP M3     *
    ************************

CHANNEL/INLET PRINT DATA GROUPS......       -200


          ****************************************
          * Rainfall from Nat. Weather Serv. file *
          * in units of hundredths of an inch     *
          ****************************************

         GoVenture - Franklin Street, Worcester
         DMH#2
```

Rainfall Station Worcester Wso Ap
State/Province Massachusetts

Rainfall Depth Summary (in)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957.	0.4	1.4	2.8	3.6	3.4	3.0	1.1	2.8	1.1	3.8	5.7	7.3	36.5
1958.	9.0	2.9	4.9	7.2	4.3	2.8	6.1	4.4	8.1	2.8	5.0	3.2	60.8
1959.	5.1	2.8	8.2	4.2	2.4	4.7	8.4	4.5	3.1	8.3	6.1	5.1	62.9
1960.	2.4	6.3	4.2	5.4	5.9	3.1	7.2	3.9	7.0	3.0	4.0	5.0	57.4
1961.	3.7	2.5	5.8	5.2	4.2	2.5	4.3	5.3	6.1	3.5	3.3	5.1	51.5
1962.	2.4	5.4	2.6	3.9	4.4	3.5	2.1	4.6	5.7	9.2	4.9	5.8	54.4
1963.	4.2	3.4	4.7	1.9	3.6	2.6	2.0	3.0	4.9	1.7	8.8	3.3	44.0
1964.	5.9	3.6	4.2	4.5	1.5	1.8	3.6	2.9	2.1	2.5	3.5	6.2	42.4
1965.	3.1	4.9	2.7	3.9	3.1	2.0	2.0	3.2	3.8	2.3	3.2	2.9	37.1
1966.	4.4	4.4	3.2	1.7	3.8	2.6	3.5	2.0	7.5	3.5	4.9	4.2	45.6
1967.	2.8	3.7	4.9	5.2	7.4	3.9	6.5	3.5	5.2	2.4	5.1	5.0	55.7
1968.	3.7	1.4	7.9	2.3	7.1	8.4	1.9	0.7	2.2	2.4	6.2	6.5	50.7
1969.	1.8	4.2	2.7	5.6	3.4	1.7	4.3	4.7	5.4	1.8	7.1	8.5	51.1
1970.	2.2	5.5	4.1	3.9	6.1	2.9	0.9	5.8	3.6	3.0	4.0	3.9	45.7
1971.	3.2	5.9	1.9	2.0	5.6	2.6	4.9	8.0	1.6	3.6	5.5	3.7	48.3
1972.	3.1	8.2	6.1	4.8	8.4	9.7	6.6	5.1	3.3	6.0	10.2	6.4	77.7
1973.	4.4	4.1	4.9	5.7	4.8	7.3	4.1	4.4	4.1	4.8	3.9	8.8	61.1
1974.	4.2	3.4	5.6	3.6	6.3	3.8	3.4	3.7	13.4	3.6	5.7	4.1	61.0
1975.	6.9	3.3	5.9	1.3	2.0	3.8	4.3	5.1	7.6	6.6	6.0	5.2	57.9
1976.	6.9	2.9	4.5	2.5	3.2	2.8	3.6	6.6	2.3	5.3	1.0	3.4	45.0
1977.	2.4	3.2	6.4	4.2	2.7	4.2	4.8	2.4	8.2	5.6	4.2	6.8	55.0
1978.	11.9	1.8	3.4	2.5	3.8	1.8	3.8	5.4	1.3	4.1	2.5	4.3	46.5
1979.	12.2	3.1	4.0	5.5	4.7	0.6	6.1	7.7	4.1	4.9	4.1	1.8	58.8
1980.	0.8	1.2	7.4	5.2	2.4	4.8	3.9	2.1	3.3	5.4	4.8	2.2	43.4
1981.	1.9	9.4	1.4	4.9	4.1	2.7	8.2	1.2	5.5	5.7	3.9	6.1	55.0
1982.	4.4	4.0	4.2	4.8	3.4	13.1	6.0	2.0	2.1	3.2	4.6	3.9	55.7
1983.	5.3	5.3	9.0	8.4	7.3	2.7	0.9	6.4	1.5	6.3	9.3	7.1	69.5
1984.	3.3	6.7	6.3	5.1	10.3	3.3	6.4	1.2	2.8	3.3	3.0	3.4	55.1
1985.	1.9	3.6	3.5	3.0	5.1	5.2	6.6	4.1	4.7	3.0	7.3	2.7	50.7
1986.	5.5	3.5	3.6	1.9	3.4	9.6	3.5	3.6	0.9	3.0	6.7	7.8	52.9
1987.	6.2	1.9	5.8	9.9	1.5	5.0	1.0	5.4	6.7	4.5	3.1	2.6	53.6
1988.	3.7	3.5	3.3	3.8	5.1	1.4	6.7	4.5	1.2	5.9	5.9	1.8	46.8
1989.	1.6	3.4	3.0	4.8	6.6	7.3	4.6	5.9	5.1	0.0	0.0	0.0	42.3
1991.	0.0	0.0	0.0	0.0	0.0	0.0	3.2	8.1	6.9	3.8	6.0	3.5	31.5
1992.	3.1	3.3	4.7	3.2	2.7	5.0	5.7	7.2	2.3	2.4	6.3	5.1	50.9
1993.	3.2	2.9	7.1	4.0	1.9	2.9	3.4	2.1	9.4	4.0	5.2	5.8	51.8
1994.	6.0	2.9	6.6	2.9	6.8	2.5	3.2	8.0	5.3	1.3	6.0	4.2	55.7
1995.	5.9	2.3	2.2	2.5	0.0	0.0	4.7	2.1	3.7	8.8	5.2	1.4	38.8
1996.	7.1	3.3	2.5	7.3	4.1	3.1	6.3	4.5	4.9	4.9	3.0	5.0	55.8
1997.	3.3	1.7	4.6	3.4	2.6	1.6	3.2	2.8	1.6	1.8	5.5	2.3	34.4
1998.	3.9	2.8	6.3	2.8	5.7	9.7	1.8	2.3	1.2	5.0	2.4	1.4	45.4
1999.	7.0	2.4	4.6	1.1	3.3	1.8	2.4	2.4	8.6	4.6	3.1	4.3	45.7
2000.	3.5	3.3	4.2	7.6	4.2	5.4	4.5	2.5	3.4	2.4	4.0	4.2	49.3
2001.	2.2	3.2	7.4	1.0	3.9	5.0	3.7	1.1	3.5	0.9	1.7	3.2	36.7

Total Rainfall Depth for Simulation Period 2227.9 (in)

Rainfall Intensity Analysis (in/hr)

(in/hr)	(#)	(%)	(in)	(%)
0.10	55294	69.5	679.	30.5
0.20	15423	19.4	571.	25.6
0.30	3295	4.1	211.	9.5
0.40	2538	3.2	224.	10.1
0.50	868	1.1	100.	4.5
0.60	597	0.8	80.	3.6
0.70	577	0.7	92.	4.1
0.80	337	0.4	64.	2.9
0.90	120	0.2	26.	1.2
1.00	123	0.2	29.	1.3
1.10	70	0.1	18.	0.8
1.20	64	0.1	18.	0.8
1.30	56	0.1	17.	0.8
1.40	38	0.0	13.	0.6
1.50	18	0.0	7.	0.3
1.60	38	0.0	15.	0.7
1.70	16	0.0	7.	0.3
1.80	28	0.0	12.	0.6
1.90	14	0.0	7.	0.3
2.00	16	0.0	8.	0.4
> 2.00	48	0.1	30.	1.3

Total # of Intensities 79578

Daily Rainfall Depth Analysis (in)

(in)	(#)	(%)	(in)	(%)
0.10	1790	31.7	85.	3.8
0.20	996	17.7	143.	6.4
0.30	575	10.2	138.	6.2
0.40	489	8.7	166.	7.4
0.50	302	5.4	134.	6.0
0.60	279	4.9	152.	6.8
0.70	209	3.7	134.	6.0
0.80	152	2.7	113.	5.1
0.90	128	2.3	108.	4.8
1.00	126	2.2	119.	5.3
1.10	89	1.6	93.	4.2
1.20	79	1.4	90.	4.1
1.30	69	1.2	86.	3.9
1.40	49	0.9	66.	3.0
1.50	56	1.0	81.	3.6
1.60	44	0.8	68.	3.0
1.70	39	0.7	64.	2.9
1.80	28	0.5	49.	2.2
1.90	20	0.4	37.	1.6

```
  2.00     16       0.3       31.       1.4
> 2.00    104       1.8      270.      12.1

Total # Days with Rain   5639

***********************************************
*      End of time step DO-loop in Runoff     *
***********************************************

Final Date (Mo/Day/Year)   =                  1/ 1/2002
Total number of time steps =                    3055964
Final Julian Date  =                            2002001
Final time of day  =                                 1. seconds.
Final time of day  =                              0.00   hours.
Final running time =                        394464.0000   hours.
Final running time =                         16436.0000    days.

**************************************************
*     Extrapolation Summary for Watersheds       *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of OVERLND Calls      *
**************************************************

 Subcatch   # Steps   # Calls  Subcatch   # Steps   # Calls  Subcatch   # Steps   # Calls
 --------   -------   -------  --------   -------   -------  --------   -------   -------
      300  13541248   3358964

**************************************************
*     Extrapolation Summary for Channel/Pipes    *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of GUTNR Calls        *
**************************************************

Chan/Pipe   # Steps   # Calls Chan/Pipe   # Steps   # Calls Chan/Pipe   # Steps   # Calls
 --------   -------   -------  --------   -------   -------  --------   -------   -------
      201         0         0
↑
*********************************************
*       Continuity Check for Surface Water  *
*********************************************
                                                                  Inches over
                                                   cubic feet     Total Basin
Total Precipitation (Rain plus Snow)                 3326903.       2225.
Total Infiltration                                    373143.        250.
Total Evaporation                                     139274.         93.
Surface Runoff from Watersheds                       2841262.       1900.
Total Water remaining in Surface Storage                   20.          0.
Infiltration over the Pervious Area...                373143.       2194.
                       --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
Water remaining in Snow Cover.........               3353700.       2242.
Total Precipitation + Initial Storage.               3326903.       2225.
```

```
The error in continuity is calculated as
**************************************
* Precipitation + Initial Snow Cover  *
*      - Infiltration -               *
*Evaporation - Snow removal -         *
*Surface Runoff from Watersheds -     *
*Water in Surface Storage -           *
*Water remaining in Snow Cover        *
*-------------------------------------*
* Precipitation + Initial Snow Cover  *
**************************************
Error.................................       -0.805 Percent


*********************************************
*       Continuity Check for Channel/Pipes  *
*********************************************
```

	cubic feet	Inches over Total Basin
Initial Channel/Pipe Storage.....	0.	0.
Final Channel/Pipe Storage.....	0.	0.
Surface Runoff from Watersheds.....	2841262.	1900.
Baseflow.....	0.	
Groundwater Subsurface Inflow.....	0.	0.
Evaporation Loss from Channels.....	0.	0.
Channel/Pipe/Inlet Outflow.....	2841262.	1900.
Initial Storage + Inflow.....	2841262.	1900.
Final Storage + Outflow.....	2841262.	1900.

```
*****************************************
* Final Storage + Outflow + Evaporation  - *
* Watershed Runoff - Groundwater Inflow  - *
*     Initial Channel/Pipe Storage         *
*     ---------------------------------    *
*  Final Storage + Outflow  + Evaporation  *
*****************************************
Error.....................................      0.000 Percent

↑
**************************************************
*     Continuity Check for Subsurface Water      *
**************************************************
```

	cubic feet	Inches over Subsurface Basin
Total Infiltration	0.	0.
Total Upper Zone ET	0.	0.
Total Lower Zone ET	0.	0.
Total Groundwater flow	0.	0.
Total Deep percolation	0.	0.
Initial Subsurface Storage	53840.	36.
Final Subsurface Storage	53840.	36.
Upper Zone ET over Pervious Area	0.	0.
Lower Zone ET over Pervious Area	0.	0.

```
****************************************
* Infiltration + Initial Storage - Final *
* Storage - Upper and Lower Zone ET -    *
* Groundwater Flow - Deep Percolation    *
* ------------------------------------- *
*     Infiltration + Initial Storage     *
****************************************
Error ....................................     0.000 Percent
```

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCH-MENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	PERVIOUS AREA TOTAL RUNOFF DEPTH (IN)	PERVIOUS AREA TOTAL LOSSES (IN)	PERVIOUS AREA PEAK RUNOFF RATE (CFS)	IMPERVIOUS AREA RUNOFF DEPTH (IN)	IMPERVIOUS AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA RUNOFF DEPTH (IN)	TOTAL SUBCATCHMENT AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA PEAK UNIT RUNOFF (IN/HR)
300	200	0.41	88.6	2224.52	28.432	2197.222	0.116	2138.333	1.326	1898.438	1.442	3.500

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CFS)	FULL VELOCITY (FPS)	FULL DEPTH (FT)	MAXIMUM COMPUTED INFLOW (CFS)	MAXIMUM COMPUTED OUTFLOW (CFS)	MAXIMUM COMPUTED DEPTH (FT)	MAXIMUM COMPUTED VELOCITY (FPS)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (AC-FT)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
201				0.00				1/ 0/1900	0.00				
200				1.44				7/19/1972	17.50				

TOTAL NUMBER OF CHANNELS/PIPES = 2

*** NOTE *** THE MAXIMUM FLOWS AND DEPTHS ARE CALCULATED AT THE END OF THE TIME INTERVAL

```
##################################################
#            Runoff Quality Summary Page         #
# If NDIM = 0 Units for:   loads    mass rates   #
#             METRIC = 1    lb        lb/sec     #
#             METRIC = 2    kg        kg/sec     #
# If NDIM = 1 Loads are in units of quantity     #
#             and mass rates are quantity/sec    #
# If NDIM = 2 loads are in units of concentration #
#             times volume and mass rates have units#
```

```
#              of concentration times volume/second  #
#####################################################

Total Su NDIM =  0
METRIC =  1

                                    Total Su
                                    --------
Inputs
------
 1. INITIAL SURFACE LOAD........        8.
 2. TOTAL SURFACE BUILDUP.......    15771.
 3. INITIAL CATCHBASIN LOAD.....        0.
 4. TOTAL CATCHBASIN LOAD.......        0.
 5. TOTAL CATCHBASIN AND
    SURFACE BUILDUP (2+4).......    15771.

Remaining Loads
---------------
 6. LOAD REMAINING ON SURFACE...        2.
 7. REMAINING IN CATCHBASINS....        0.
 8. REMAINING IN CHANNEL/PIPES..        0.

Removals
--------
 9. STREET SWEEPING REMOVAL.....        0.
10. NET SURFACE BUILDUP (2-9)...    15771.
11. SURFACE WASHOFF.............    15760.
12. CATCHBASIN WASHOFF..........        0.
13. TOTAL WASHOFF (11+12).......    15760.
14. LOAD FROM OTHER CONSTITUENTS        0.
15. PRECIPITATION LOAD..........        0.
15a.SUM SURFACE LOAD (13+14+15).    15760.
16. TOTAL GROUNDWATER LOAD......        0.
16a.TOTAL I/I LOAD..............        0.
17. NET SUBCATCHMENT LOAD
    (15a-15b-15c-15d+16+16a)....    15760.
>>Removal in channel/pipes (17a, 17b):
17a.REMOVE BY BMP FRACTION......        0.
17b.REMOVE BY 1st ORDER DECAY...        0.
18. TOTAL LOAD TO INLETS........    15760.
19. FLOW WT'D AVE.CONCENTRATION  mg/l
    (INLET LOAD/TOTAL FLOW).....       89.

Percentages
-----------
20. STREET SWEEPING (9/2).......        0.
21. SURFACE WASHOFF (11/2)......      100.
22. NET SURFACE WASHOFF(11/10)..      100.
23. WASHOFF/SUBCAT LOAD(11/17)..      100.
24. SURFACE WASHOFF/INLET LOAD
    (11/18).....................      100.
25. CATCHBASIN WASHOFF/
```

```
    SUBCATCHMENT LOAD (12/17)...        0.
26. CATCHBASIN WASHOFF/
    INLET LOAD (12/18)..........        0.
27. OTHER CONSTITUENT LOAD/
    SUBCATCHMENT LOAD (14/17)...        0.
28. INSOLUBLE FRACTION/
    INLET LOAD (14/18)..........        0.
29. PRECIPITATION/
    SUBCATCHMENT LOAD (15/17)...        0.
30. PRECIPITATION/
    INLET LOAD (15/18)..........        0.
31. GROUNDWATER LOAD/
    SUBCATCHMENT LOAD (16/17)...        0.
32. GROUNDWATER LOAD/
    INLET LOAD (16/18)..........        0.
32a.INFILTRATION/INFLOW LOAD/
    SUBCATCHMENT LOAD (16a/17)..        0.
32b.INFILTRATION/INFLOW LOAD/
    INLET LOAD (16a/18).........        0.
32c.CH/PIPE BMP FRACTION REMOVAL/
    SUBCATCHMENT LOAD (17a/17)..        0.
32d.CH/PIPE 1st ORDER DECAY REMOVAL/
    SUBCATCHMENT LOAD (17b/17)..        0.
33. INLET LOAD SUMMATION ERROR
    (18+8+6a+17a+17b-17)/17.....        0.

CAUTION. Due to method of quality routing (Users Manual, Appendix IX)
quality routing through channel/pipes is sensitive to the time step.
Large "Inlet Load Summation Errors" may result.
These can be reduced by adjusting the time step(s).
Note: surface accumulation during dry time steps at end of simulation is
not included in totals.  Buildup is only performed at beginning of
wet steps or for street cleaning.


*********************************************************
*            TSS Particle Size Distribution             *
*********************************************************
```

Diameter (um)	%	Specific Gravity	Settling Velocity (ft/s)	Critical Peclet Number
2.	5.0	2.65	0.000009	0.032973
5.	5.0	2.65	0.000055	0.056296
8.	10.0	2.65	0.000141	0.074071
20.	15.0	2.65	0.000875	0.126463
50.	10.0	2.65	0.005346	0.215914
75.	5.0	2.65	0.011640	0.273579
100.	10.0	2.65	0.019828	0.323611
150.	15.0	2.65	0.040138	0.410039
250.	15.0	2.65	0.087320	0.552510
500.	5.0	2.65	0.198831	0.828097
1000.	5.0	2.65	0.365264	1.241146

```
****************************************************
*                                                  *
*              Summary of TSS Removal              *
*                                                  *
****************************************************
```

TSS Removal based on NJCAT Lab Performance Curve

Model #	Low Q Treated (cfs)	High Q Treated (cfs)	Runoff Treated (%)	TSS Removed (%)
HS 4	0.921	0.940	99.9	83.6 <=Tss Removal
HS 5	0.940	0.940	99.9	89.3
HS 6	0.940	0.940	99.9	92.9
HS 7	0.940	0.940	99.9	94.9
HS 8	0.940	0.940	99.9	96.2
HS 9	0.940	0.940	99.9	97.4
HS 10	0.940	0.940	99.9	98.2
HS 12	0.940	0.940	99.9	99.1

```
****************************************************
*                                                  *
*  Summary of Annual Flow Treatmnet & TSS Removal  *
*                                                  *
****************************************************
```

HS 4

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	237.0	52.4	100.0	81.9
1958.	847869.1	847869.1	396.7	323.0	73.7	100.0	81.4
1959.	884083.1	875291.8	407.7	328.6	65.0	99.0	80.6
1960.	808332.2	808270.0	382.4	322.7	59.7	100.0	84.4
1961.	719243.6	719243.6	378.8	324.1	54.6	100.0	85.6
1962.	764996.0	764996.0	360.3	305.1	55.2	100.0	84.7
1963.	615680.2	615680.2	355.5	300.1	55.3	100.0	84.4
1964.	590922.1	590922.1	338.6	290.0	48.7	100.0	85.6
1965.	514942.7	514942.7	329.3	279.2	50.2	100.0	84.8
1966.	641288.0	641288.0	357.2	302.0	55.3	100.0	84.5
1967.	781202.1	781202.1	403.8	336.6	67.2	100.0	83.4
1968.	716305.1	714890.9	344.2	290.6	52.2	99.8	84.4
1969.	717629.9	717629.8	348.7	295.0	53.8	100.0	84.6
1970.	643865.1	643865.4	338.7	287.2	51.5	100.0	84.8
1971.	684866.9	684866.9	373.5	303.2	70.3	100.0	81.2
1972.	1108500.0	1092259.5	514.1	380.4	98.2	98.5	74.0
1973.	865523.9	865523.9	406.2	328.3	78.0	100.0	80.8
1974.	868409.9	868026.3	393.3	316.7	76.6	100.0	80.5
1975.	811161.1	811161.1	363.5	310.5	53.1	100.0	85.4
1976.	625764.6	625764.6	364.8	308.7	56.1	100.0	84.6
1977.	767870.5	767870.5	397.8	338.0	59.8	100.0	85.0
1978.	646763.4	646763.4	323.3	279.9	43.3	100.0	86.6
1979.	829305.6	824706.3	375.0	307.9	66.6	99.4	82.1

1980.	602555.1	602555.1	340.4	278.5	61.9	100.0	81.8
1981.	769688.6	769688.6	380.7	311.7	69.0	100.0	81.9
1982.	780838.9	780838.9	375.7	310.8	64.9	100.0	82.7
1983.	987917.1	987917.1	433.9	360.1	73.8	100.0	83.0
1984.	773951.9	773951.9	371.2	313.9	57.3	100.0	84.6
1985.	705592.2	703037.2	372.2	315.6	54.5	99.6	84.8
1986.	736417.4	736417.6	344.7	290.6	54.1	100.0	84.3
1987.	753131.5	753131.5	344.0	295.7	48.3	100.0	86.0
1988.	651445.1	651445.1	344.2	288.0	56.2	100.0	83.7
1989.	582908.6	582908.6	299.6	253.4	46.2	100.0	84.6
1991.	448223.9	448223.8	177.0	148.5	28.5	100.0	83.9
1992.	708418.4	708418.4	383.0	327.2	55.8	100.0	85.4
1993.	726825.2	726825.2	383.8	323.2	60.6	100.0	84.2
1994.	779760.1	779760.1	398.1	331.6	66.5	100.0	83.3
1995.	548417.3	548417.3	283.6	236.1	47.5	100.0	83.3
1996.	783933.9	783933.9	404.7	332.8	71.9	100.0	82.2
1997.	479840.4	479840.4	308.5	265.8	42.8	100.0	86.1
1998.	638582.4	638582.4	333.1	271.8	61.3	100.0	81.6
1999.	639791.5	639791.5	335.1	280.7	54.4	100.0	83.8
2000.	678286.8	678286.7	364.2	304.9	59.3	100.0	83.7
2001.	506898.1	506052.9	305.4	256.5	47.6	99.8	84.0

HS 5

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	252.8	36.6	100.0	87.4
1958.	847869.1	847869.1	396.7	345.4	51.3	100.0	87.1
1959.	884083.1	875980.2	407.7	349.6	44.0	99.1	85.7
1960.	808332.2	808332.2	382.4	346.0	36.4	100.0	90.5
1961.	719243.6	719243.6	378.8	345.3	33.5	100.0	91.2
1962.	764996.0	764996.0	360.3	325.4	34.9	100.0	90.3
1963.	615680.2	615680.2	355.5	322.1	33.4	100.0	90.6
1964.	590922.1	590922.1	338.6	308.4	30.2	100.0	91.1
1965.	514942.7	514942.7	329.3	298.1	31.2	100.0	90.5
1966.	641288.0	641288.0	357.2	321.9	35.3	100.0	90.1
1967.	781202.1	781202.1	403.8	360.0	43.8	100.0	89.2
1968.	716305.1	715203.2	344.2	310.8	31.9	99.8	90.3
1969.	717629.9	717629.8	348.7	315.5	33.2	100.0	90.5
1970.	643865.1	643865.4	338.7	304.9	33.7	100.0	90.0
1971.	684866.9	684866.9	373.5	325.6	47.9	100.0	87.2
1972.	1108500.0	1093320.5	514.1	411.5	67.1	98.6	80.0
1973.	865523.9	865523.9	406.2	352.8	53.5	100.0	86.8
1974.	868409.9	868322.5	393.3	341.6	51.7	100.0	86.9
1975.	811161.1	811161.1	363.5	331.3	32.2	100.0	91.1
1976.	625764.6	625764.6	364.8	328.4	36.4	100.0	90.0
1977.	767870.5	767870.5	397.8	360.5	37.3	100.0	90.6
1978.	646763.4	646763.4	323.3	296.7	26.5	100.0	91.8
1979.	829305.6	825082.2	375.0	329.2	45.3	99.5	87.8
1980.	602555.1	602555.1	340.4	297.7	42.7	100.0	87.5
1981.	769688.6	769688.6	380.7	333.2	47.5	100.0	87.5
1982.	780838.9	780838.9	375.7	331.4	44.3	100.0	88.2

1983.	987917.1	987917.1	433.9	384.9	49.0	100.0	88.7
1984.	773951.9	773951.9	371.2	335.8	35.4	100.0	90.5
1985.	705592.2	703350.2	372.2	334.5	35.6	99.7	89.9
1986.	736417.4	736417.6	344.7	310.5	34.2	100.0	90.1
1987.	753131.5	753131.5	344.0	313.2	30.8	100.0	91.1
1988.	651445.1	651445.1	344.2	306.7	37.5	100.0	89.1
1989.	582908.6	582908.6	299.6	269.2	30.3	100.0	89.9
1991.	448223.9	448223.8	177.0	158.7	18.3	100.0	89.7
1992.	708418.4	708418.4	383.0	347.3	35.6	100.0	90.7
1993.	726825.2	726825.2	383.8	343.6	40.2	100.0	89.5
1994.	779760.1	779760.1	398.1	352.6	45.5	100.0	88.6
1995.	548417.3	548417.3	283.6	252.3	31.3	100.0	89.0
1996.	783933.9	783933.9	404.7	357.0	47.6	100.0	88.2
1997.	479840.4	479840.4	308.5	282.8	25.8	100.0	91.7
1998.	638582.4	638582.4	333.1	291.7	41.4	100.0	87.6
1999.	639791.5	639791.5	335.1	297.6	37.5	100.0	88.8
2000.	678286.8	678286.7	364.2	325.7	38.4	100.0	89.4
2001.	506898.1	506365.9	305.4	274.9	29.3	99.9	90.0

HS 6

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	264.5	24.9	100.0	91.4
1958.	847869.1	847869.1	396.7	360.7	36.0	100.0	90.9
1959.	884083.1	875980.2	407.7	364.3	29.3	99.1	89.4
1960.	808332.2	808332.2	382.4	358.0	24.4	100.0	93.6
1961.	719243.6	719243.6	378.8	357.0	21.8	100.0	94.3
1962.	764996.0	764996.0	360.3	337.3	23.0	100.0	93.6
1963.	615680.2	615680.2	355.5	334.4	21.0	100.0	94.1
1964.	590922.1	590922.1	338.6	317.4	21.2	100.0	93.7
1965.	514942.7	514942.7	329.3	309.5	19.8	100.0	94.0
1966.	641288.0	641288.0	357.2	334.1	23.1	100.0	93.5
1967.	781202.1	781202.1	403.8	374.0	29.8	100.0	92.6
1968.	716305.1	715203.2	344.2	322.3	20.4	99.8	93.6
1969.	717629.9	717629.8	348.7	327.8	20.9	100.0	94.0
1970.	643865.1	643865.4	338.7	316.5	22.2	100.0	93.4
1971.	684866.9	684866.9	373.5	340.1	33.3	100.0	91.1
1972.	1108500.0	1093320.5	514.1	430.1	48.6	98.6	83.7
1973.	865523.9	865523.9	406.2	369.1	37.1	100.0	90.9
1974.	868409.9	868322.5	393.3	356.5	36.7	100.0	90.6
1975.	811161.1	811161.1	363.5	344.4	19.1	100.0	94.7
1976.	625764.6	625764.6	364.8	341.7	23.1	100.0	93.7
1977.	767870.5	767870.5	397.8	373.1	24.7	100.0	93.8
1978.	646763.4	646763.4	323.3	307.0	16.3	100.0	95.0
1979.	829305.6	825082.2	375.0	343.8	30.7	99.5	91.7
1980.	602555.1	602555.1	340.4	309.9	30.5	100.0	91.0
1981.	769688.6	769688.6	380.7	347.1	33.6	100.0	91.2
1982.	780838.9	780838.9	375.7	344.9	30.8	100.0	91.8
1983.	987917.1	987917.1	433.9	402.4	31.5	100.0	92.7
1984.	773951.9	773951.9	371.2	349.4	21.8	100.0	94.1
1985.	705592.2	703350.2	372.2	346.6	23.5	99.7	93.1

1986.	736417.4	736417.6	344.7	322.6	22.1	100.0	93.6
1987.	753131.5	753131.5	344.0	324.9	19.1	100.0	94.4
1988.	651445.1	651445.1	344.2	319.7	24.5	100.0	92.9
1989.	582908.6	582908.6	299.6	280.1	19.5	100.0	93.5
1991.	448223.9	448223.8	177.0	164.7	12.3	100.0	93.1
1992.	708418.4	708418.4	383.0	362.4	20.5	100.0	94.6
1993.	726825.2	726825.2	383.8	356.0	27.8	100.0	92.8
1994.	779760.1	779760.1	398.1	367.2	30.9	100.0	92.2
1995.	548417.3	548417.3	283.6	262.7	20.9	100.0	92.6
1996.	783933.9	783933.9	404.7	371.6	33.1	100.0	91.8
1997.	479840.4	479840.4	308.5	293.3	15.3	100.0	95.0
1998.	638582.4	638582.4	333.1	305.3	27.8	100.0	91.7
1999.	639791.5	639791.5	335.1	310.9	24.2	100.0	92.8
2000.	678286.8	678286.7	364.2	338.6	25.6	100.0	93.0
2001.	506898.1	506365.9	305.4	284.6	19.6	99.9	93.2

HS 7

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	271.1	18.3	100.0	93.7
1958.	847869.1	847869.1	396.7	369.6	27.1	100.0	93.2
1959.	884083.1	875980.2	407.7	373.3	20.3	99.1	91.6
1960.	808332.2	808332.2	382.4	365.4	17.0	100.0	95.6
1961.	719243.6	719243.6	378.8	363.4	15.4	100.0	95.9
1962.	764996.0	764996.0	360.3	343.8	16.5	100.0	95.4
1963.	615680.2	615680.2	355.5	342.0	13.5	100.0	96.2
1964.	590922.1	590922.1	338.6	323.3	15.4	100.0	95.5
1965.	514942.7	514942.7	329.3	316.1	13.2	100.0	96.0
1966.	641288.0	641288.0	357.2	340.8	16.4	100.0	95.4
1967.	781202.1	781202.1	403.8	383.3	20.5	100.0	94.9
1968.	716305.1	715203.2	344.2	328.6	14.1	99.8	95.5
1969.	717629.9	717629.8	348.7	333.4	15.3	100.0	95.6
1970.	643865.1	643865.4	338.7	322.2	16.5	100.0	95.1
1971.	684866.9	684866.9	373.5	348.4	25.0	100.0	93.3
1972.	1108500.0	1093320.5	514.1	442.1	36.6	98.6	86.0
1973.	865523.9	865523.9	406.2	378.8	27.5	100.0	93.2
1974.	868409.9	868322.5	393.3	365.9	27.3	100.0	93.0
1975.	811161.1	811161.1	363.5	351.5	12.1	100.0	96.7
1976.	625764.6	625764.6	364.8	347.6	17.2	100.0	95.3
1977.	767870.5	767870.5	397.8	380.5	17.3	100.0	95.6
1978.	646763.4	646763.4	323.3	311.9	11.3	100.0	96.5
1979.	829305.6	825082.2	375.0	350.3	24.2	99.5	93.4
1980.	602555.1	602555.1	340.4	318.0	22.4	100.0	93.4
1981.	769688.6	769688.6	380.7	355.1	25.7	100.0	93.3
1982.	780838.9	780838.9	375.7	353.2	22.5	100.0	94.0
1983.	987917.1	987917.1	433.9	412.4	21.5	100.0	95.0
1984.	773951.9	773951.9	371.2	355.0	16.3	100.0	95.6
1985.	705592.2	703350.2	372.2	353.5	16.5	99.7	95.0
1986.	736417.4	736417.6	344.7	329.8	14.9	100.0	95.7
1987.	753131.5	753131.5	344.0	331.9	12.1	100.0	96.5
1988.	651445.1	651445.1	344.2	327.0	17.2	100.0	95.0

1989.	582908.6	582908.6	299.6	285.9	13.7	100.0	95.4
1991.	448223.9	448223.8	177.0	168.5	8.5	100.0	95.2
1992.	708418.4	708418.4	383.0	368.6	14.3	100.0	96.3
1993.	726825.2	726825.2	383.8	363.7	20.0	100.0	94.8
1994.	779760.1	779760.1	398.1	376.3	21.9	100.0	94.5
1995.	548417.3	548417.3	283.6	268.9	14.8	100.0	94.8
1996.	783933.9	783933.9	404.7	380.6	24.0	100.0	94.1
1997.	479840.4	479840.4	308.5	298.8	9.8	100.0	96.8
1998.	638582.4	638582.4	333.1	313.1	20.0	100.0	94.0
1999.	639791.5	639791.5	335.1	317.7	17.4	100.0	94.8
2000.	678286.8	678286.7	364.2	345.8	18.4	100.0	95.0
2001.	506898.1	506365.9	305.4	289.1	15.1	99.9	94.7

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	276.2	13.2	100.0	95.4
1958.	847869.1	847869.1	396.7	376.4	20.3	100.0	94.9
1959.	884083.1	875980.2	407.7	377.8	15.8	99.1	92.7
1960.	808332.2	808332.2	382.4	370.4	12.0	100.0	96.9
1961.	719243.6	719243.6	378.8	367.2	11.5	100.0	97.0
1962.	764996.0	764996.0	360.3	347.8	12.5	100.0	96.5
1963.	615680.2	615680.2	355.5	346.2	9.2	100.0	97.4
1964.	590922.1	590922.1	338.6	327.9	10.8	100.0	96.8
1965.	514942.7	514942.7	329.3	320.4	8.9	100.0	97.3
1966.	641288.0	641288.0	357.2	344.8	12.4	100.0	96.5
1967.	781202.1	781202.1	403.8	388.3	15.5	100.0	96.2
1968.	716305.1	715203.2	344.2	332.6	10.1	99.8	96.6
1969.	717629.9	717629.8	348.7	337.2	11.5	100.0	96.7
1970.	643865.1	643865.4	338.7	326.7	12.0	100.0	96.5
1971.	684866.9	684866.9	373.5	355.7	17.8	100.0	95.2
1972.	1108500.0	1093320.5	514.1	451.0	27.6	98.6	87.7
1973.	865523.9	865523.9	406.2	386.8	19.4	100.0	95.2
1974.	868409.9	868322.5	393.3	371.2	22.1	100.0	94.4
1975.	811161.1	811161.1	363.5	355.1	8.4	100.0	97.7
1976.	625764.6	625764.6	364.8	351.4	13.4	100.0	96.3
1977.	767870.5	767870.5	397.8	385.3	12.5	100.0	96.8
1978.	646763.4	646763.4	323.3	316.0	7.3	100.0	97.7
1979.	829305.6	825082.2	375.0	354.8	19.7	99.5	94.6
1980.	602555.1	602555.1	340.4	323.3	17.1	100.0	95.0
1981.	769688.6	769688.6	380.7	360.8	20.0	100.0	94.8
1982.	780838.9	780838.9	375.7	359.1	16.6	100.0	95.6
1983.	987917.1	987917.1	433.9	419.4	14.6	100.0	96.6
1984.	773951.9	773951.9	371.2	359.2	12.0	100.0	96.8
1985.	705592.2	703350.2	372.2	358.7	11.3	99.7	96.4
1986.	736417.4	736417.6	344.7	333.8	10.9	100.0	96.8
1987.	753131.5	753131.5	344.0	335.4	8.6	100.0	97.5
1988.	651445.1	651445.1	344.2	330.9	13.4	100.0	96.1
1989.	582908.6	582908.6	299.6	289.0	10.6	100.0	96.5
1991.	448223.9	448223.8	177.0	170.8	6.3	100.0	96.5
1992.	708418.4	708418.4	383.0	373.0	9.9	100.0	97.4

1993.	726825.2	726825.2	383.8	369.7	14.1	100.0	96.3
1994.	779760.1	779760.1	398.1	382.4	15.8	100.0	96.0
1995.	548417.3	548417.3	283.6	273.0	10.6	100.0	96.2
1996.	783933.9	783933.9	404.7	386.3	18.3	100.0	95.5
1997.	479840.4	479840.4	308.5	301.9	6.7	100.0	97.8
1998.	638582.4	638582.4	333.1	318.4	14.7	100.0	95.6
1999.	639791.5	639791.5	335.1	323.1	12.0	100.0	96.4
2000.	678286.8	678286.7	364.2	350.8	13.4	100.0	96.3
2001.	506898.1	506365.9	305.4	292.0	12.1	99.9	95.6

HS 9

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	279.9	9.5	100.0	96.7
1958.	847869.1	847869.1	396.7	383.5	13.2	100.0	96.7
1959.	884083.1	875980.2	407.7	381.9	11.7	99.1	93.7
1960.	808332.2	808332.2	382.4	375.3	7.1	100.0	98.2
1961.	719243.6	719243.6	378.8	370.6	8.2	100.0	97.8
1962.	764996.0	764996.0	360.3	352.6	7.7	100.0	97.9
1963.	615680.2	615680.2	355.5	349.5	5.9	100.0	98.3
1964.	590922.1	590922.1	338.6	331.1	7.5	100.0	97.8
1965.	514942.7	514942.7	329.3	323.6	5.7	100.0	98.3
1966.	641288.0	641288.0	357.2	349.1	8.1	100.0	97.7
1967.	781202.1	781202.1	403.8	393.6	10.2	100.0	97.5
1968.	716305.1	715203.2	344.2	335.8	6.9	99.8	97.6
1969.	717629.9	717629.8	348.7	340.9	7.8	100.0	97.8
1970.	643865.1	643865.4	338.7	330.6	8.1	100.0	97.6
1971.	684866.9	684866.9	373.5	362.0	11.5	100.0	96.9
1972.	1108500.0	1093320.5	514.1	458.1	20.5	98.6	89.1
1973.	865523.9	865523.9	406.2	393.5	12.7	100.0	96.9
1974.	868409.9	868322.5	393.3	377.0	16.3	100.0	95.9
1975.	811161.1	811161.1	363.5	358.2	5.3	100.0	98.5
1976.	625764.6	625764.6	364.8	355.4	9.4	100.0	97.4
1977.	767870.5	767870.5	397.8	388.8	9.0	100.0	97.7
1978.	646763.4	646763.4	323.3	318.5	4.8	100.0	98.5
1979.	829305.6	825082.2	375.0	360.0	14.5	99.5	96.0
1980.	602555.1	602555.1	340.4	328.0	12.3	100.0	96.4
1981.	769688.6	769688.6	380.7	366.4	14.4	100.0	96.2
1982.	780838.9	780838.9	375.7	365.3	10.4	100.0	97.2
1983.	987917.1	987917.1	433.9	424.4	9.6	100.0	97.8
1984.	773951.9	773951.9	371.2	363.1	8.1	100.0	97.8
1985.	705592.2	703350.2	372.2	362.1	8.0	99.7	97.3
1986.	736417.4	736417.6	344.7	338.0	6.7	100.0	98.0
1987.	753131.5	753131.5	344.0	338.3	5.7	100.0	98.4
1988.	651445.1	651445.1	344.2	334.9	9.3	100.0	97.3
1989.	582908.6	582908.6	299.6	291.9	7.7	100.0	97.4
1991.	448223.9	448223.8	177.0	173.1	3.9	100.0	97.8
1992.	708418.4	708418.4	383.0	376.5	6.5	100.0	98.3
1993.	726825.2	726825.2	383.8	374.3	9.4	100.0	97.5
1994.	779760.1	779760.1	398.1	387.2	10.9	100.0	97.3
1995.	548417.3	548417.3	283.6	276.7	6.9	100.0	97.6

1996.	783933.9	783933.9	404.7	392.1	12.6	100.0	96.9
1997.	479840.4	479840.4	308.5	304.4	4.1	100.0	98.7
1998.	638582.4	638582.4	333.1	323.4	9.7	100.0	97.1
1999.	639791.5	639791.5	335.1	326.9	8.2	100.0	97.6
2000.	678286.8	678286.7	364.2	355.5	8.6	100.0	97.6
2001.	506898.1	506365.9	305.4	295.1	9.1	99.9	96.6

HS 10

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	282.9	6.5	100.0	97.7
1958.	847869.1	847869.1	396.7	386.9	9.8	100.0	97.5
1959.	884083.1	875980.2	407.7	385.3	8.3	99.1	94.5
1960.	808332.2	808332.2	382.4	377.5	4.9	100.0	98.7
1961.	719243.6	719243.6	378.8	372.9	5.8	100.0	98.5
1962.	764996.0	764996.0	360.3	354.9	5.4	100.0	98.5
1963.	615680.2	615680.2	355.5	351.7	3.7	100.0	98.9
1964.	590922.1	590922.1	338.6	334.0	4.7	100.0	98.6
1965.	514942.7	514942.7	329.3	325.4	3.9	100.0	98.8
1966.	641288.0	641288.0	357.2	351.2	6.0	100.0	98.3
1967.	781202.1	781202.1	403.8	397.1	6.7	100.0	98.3
1968.	716305.1	715203.2	344.2	337.7	5.1	99.8	98.1
1969.	717629.9	717629.8	348.7	342.9	5.8	100.0	98.3
1970.	643865.1	643865.4	338.7	332.9	5.8	100.0	98.3
1971.	684866.9	684866.9	373.5	365.3	8.2	100.0	97.8
1972.	1108500.0	1093320.5	514.1	463.2	15.4	98.6	90.1
1973.	865523.9	865523.9	406.2	397.5	8.7	100.0	97.9
1974.	868409.9	868322.5	393.3	381.7	11.6	100.0	97.0
1975.	811161.1	811161.1	363.5	360.1	3.5	100.0	99.0
1976.	625764.6	625764.6	364.8	358.6	6.2	100.0	98.3
1977.	767870.5	767870.5	397.8	391.5	6.3	100.0	98.4
1978.	646763.4	646763.4	323.3	320.0	3.3	100.0	99.0
1979.	829305.6	825082.2	375.0	364.5	10.0	99.5	97.2
1980.	602555.1	602555.1	340.4	332.4	8.0	100.0	97.7
1981.	769688.6	769688.6	380.7	370.6	10.1	100.0	97.3
1982.	780838.9	780838.9	375.7	368.2	7.5	100.0	98.0
1983.	987917.1	987917.1	433.9	427.3	6.6	100.0	98.5
1984.	773951.9	773951.9	371.2	366.3	4.9	100.0	98.7
1985.	705592.2	703350.2	372.2	364.3	5.8	99.7	97.9
1986.	736417.4	736417.6	344.7	340.2	4.5	100.0	98.7
1987.	753131.5	753131.5	344.0	340.3	3.8	100.0	98.9
1988.	651445.1	651445.1	344.2	337.2	7.0	100.0	98.0
1989.	582908.6	582908.6	299.6	294.4	5.2	100.0	98.3
1991.	448223.9	448223.8	177.0	174.3	2.7	100.0	98.5
1992.	708418.4	708418.4	383.0	378.7	4.3	100.0	98.9
1993.	726825.2	726825.2	383.8	377.0	6.8	100.0	98.2
1994.	779760.1	779760.1	398.1	390.8	7.4	100.0	98.2
1995.	548417.3	548417.3	283.6	278.7	4.9	100.0	98.3
1996.	783933.9	783933.9	404.7	396.3	8.3	100.0	97.9
1997.	479840.4	479840.4	308.5	305.9	2.6	100.0	99.1
1998.	638582.4	638582.4	333.1	326.1	7.0	100.0	97.9

1999.	639791.5	639791.5	335.1	329.6	5.5	100.0	98.3
2000.	678286.8	678286.7	364.2	358.6	5.6	100.0	98.5
2001.	506898.1	506365.9	305.4	297.2	7.0	99.9	97.3

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	508306.0	508306.0	289.4	286.3	3.1	100.0	98.9
1958.	847869.1	847869.1	396.7	391.7	5.0	100.0	98.7
1959.	884083.1	875980.2	407.7	388.9	4.7	99.1	95.4
1960.	808332.2	808332.2	382.4	380.0	2.4	100.0	99.4
1961.	719243.6	719243.6	378.8	376.1	2.7	100.0	99.3
1962.	764996.0	764996.0	360.3	357.6	2.7	100.0	99.2
1963.	615680.2	615680.2	355.5	353.8	1.7	100.0	99.5
1964.	590922.1	590922.1	338.6	336.1	2.6	100.0	99.2
1965.	514942.7	514942.7	329.3	327.6	1.7	100.0	99.5
1966.	641288.0	641288.0	357.2	354.3	2.9	100.0	99.2
1967.	781202.1	781202.1	403.8	400.3	3.5	100.0	99.1
1968.	716305.1	715203.2	344.2	340.1	2.6	99.8	98.8
1969.	717629.9	717629.8	348.7	346.1	2.6	100.0	99.2
1970.	643865.1	643865.4	338.7	335.8	2.9	100.0	99.1
1971.	684866.9	684866.9	373.5	369.3	4.1	100.0	98.9
1972.	1108500.0	1093320.5	514.1	469.4	9.2	98.6	91.3
1973.	865523.9	865523.9	406.2	401.8	4.5	100.0	98.9
1974.	868409.9	868322.5	393.3	387.5	5.8	100.0	98.5
1975.	811161.1	811161.1	363.5	362.1	1.4	100.0	99.6
1976.	625764.6	625764.6	364.8	361.7	3.1	100.0	99.2
1977.	767870.5	767870.5	397.8	394.8	3.0	100.0	99.2
1978.	646763.4	646763.4	323.3	321.8	1.5	100.0	99.5
1979.	829305.6	825082.2	375.0	369.4	5.1	99.5	98.5
1980.	602555.1	602555.1	340.4	336.2	4.2	100.0	98.8
1981.	769688.6	769688.6	380.7	375.6	5.2	100.0	98.6
1982.	780838.9	780838.9	375.7	371.9	3.8	100.0	99.0
1983.	987917.1	987917.1	433.9	430.8	3.1	100.0	99.3
1984.	773951.9	773951.9	371.2	368.7	2.5	100.0	99.3
1985.	705592.2	703350.2	372.2	367.1	2.9	99.7	98.6
1986.	736417.4	736417.6	344.7	342.6	2.1	100.0	99.4
1987.	753131.5	753131.5	344.0	342.4	1.6	100.0	99.5
1988.	651445.1	651445.1	344.2	341.1	3.1	100.0	99.1
1989.	582908.6	582908.6	299.6	297.2	2.4	100.0	99.2
1991.	448223.9	448223.8	177.0	175.7	1.3	100.0	99.3
1992.	708418.4	708418.4	383.0	381.2	1.8	100.0	99.5
1993.	726825.2	726825.2	383.8	380.3	3.5	100.0	99.1
1994.	779760.1	779760.1	398.1	394.4	3.8	100.0	99.1
1995.	548417.3	548417.3	283.6	281.2	2.4	100.0	99.2
1996.	783933.9	783933.9	404.7	400.4	4.3	100.0	98.9
1997.	479840.4	479840.4	308.5	307.3	1.2	100.0	99.6
1998.	638582.4	638582.4	333.1	329.7	3.4	100.0	99.0
1999.	639791.5	639791.5	335.1	332.5	2.6	100.0	99.2
2000.	678286.8	678286.7	364.2	361.3	2.9	100.0	99.2
2001.	506898.1	506365.9	305.4	300.5	3.7	99.9	98.4

```
*****************************************************
*  Summary of Quantity and Quality Results at       *
*  Location        200  INFlow in cfs.               *
*  Values are instantaneous at indicated time step *
*****************************************************

  GoVenture - Franklin Street, Worcester
  DMH#2

     Date      Time         Flow   Total Su
 Mo/Da/Year  Hr:Min         cfs    mg/l
 ----------  -------     -------  --------
Flow wtd means.....        0.005       89.
Flow wtd std devs..        0.022       69.
Maximum value......        1.436      294.
Minimum value......        0.000        0.
Total loads........     2839031.    15769.
                        Cub-Ft     POUNDS

===> Runoff simulation ended normally.

===> SWMM 4.4    simulation ended normally.
     Always check output file for possible warning messages.

*******************************************************
*       SWMM 4.4    Simulation Date and Time Summary  *
*******************************************************
* Starting Date... January     5, 2022                *
*          Time...         14:13: 1.820               *
*   Ending Date... January     5, 2022                *
*          Time...         14:13: 9.655               *
*  Elapsed Time...               0.131 minutes.       *
*  Elapsed Time...               7.835 seconds.       *
*******************************************************
```

MASS DEP "Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices"

DMH#3-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

0.662 acres @ 71.1% Impervious = 0.471 Acres Impervious
0.471 Acres x .0015625 sq mi = ***7.3x(10^-4) square miles.***

Step 2: Tc of Train

P107 to DCB#7:	7.8 min
DCB#7 to DMH#4	1.6 min
DMH#4 to DMH#3:	0.3 min
Total Tc to DMH#3	***9.7 min or 0.162 hours***

Step 3: Determine qu

From Figure 4:

Tc @ 0.15, qu=717csm/in

Step 4: Determine Q(1)

Q(1) = (qu)x(A)x(WQV)

Q(1) = (717csm/in)x(7.3x(10^-4)) x(1.0 in)

Q(1) = 0.53 CFS

Determination

Determination of Water Quality Flow rates for units by Connecticut DOT (CONNDOT)

From Technology Verification
HS 5 Treatment Flow rate
1.1 cf.s > 0.53 c.f.s. "Pass"

HydroGuard HS4 to be utilized in Design.

INSTRUCTIONS:

Non-automated: Jan. 31, 2019

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: DMH#3

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Hydroworks Unit HG4	**0.80**	**0.75**	**0.60**	**0.15**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Franklin Street, Worcester**

Prepared By: **Hannigan Engineering, Inc.**

Date: **1/5/2022**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DMH3: TO UGS#1A

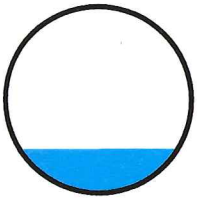
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.662 ac, 71.10% Impervious, Inflow Depth = 1.49" for 2-Year event
Inflow = 0.97 cfs @ 12.14 hrs, Volume= 0.082 af <=WQV
Outflow = 0.97 cfs @ 12.14 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.87 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.97 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 468.25', Outlet Invert= 468.00'



Summary for Subcatchment P107: TO DCB#8

Runoff = 2.65 cfs @ 12.15 hrs, Volume= 0.224 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
5,209	39	>75% Grass cover, Good, HSG A
13,754	98	Paved parking, HSG A
18,963	82	Weighted Average
5,209		27.47% Pervious Area
13,754		72.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	23	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
5.9	52	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.3	57	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.8	132	Total <=Tc			

Summary for Reach DCB7: TO DMH#4

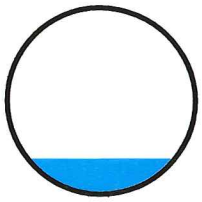
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.335 ac, 56.05% Impervious, Inflow Depth = 0.89" for 2-Year event
Inflow = 0.29 cfs @ 12.16 hrs, Volume= 0.025 af
Outflow = 0.27 cfs @ 12.18 hrs, Volume= 0.025 af, Atten= 5%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.65 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 1.6 min <=Tc

Peak Storage= 11 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.48 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 105.0' Slope= 0.0095 '/'
Inlet Invert= 470.00', Outlet Invert= 469.00'



Summary for Reach DMH4: TO DMH#3

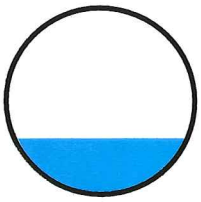
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB7 outlet invert by 0.20' @ 12.15 hrs
[62] Hint: Exceeded Reach DCB8 OUTLET depth by 0.06' @ 12.20 hrs

Inflow Area = 0.573 ac, 75.56% Impervious, Inflow Depth = 1.61" for 2-Year event
Inflow = 0.91 cfs @ 12.15 hrs, Volume= 0.077 af
Outflow = 0.91 cfs @ 12.15 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.2 min <=Tc

Peak Storage= 5 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.60 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0167 '/'
Inlet Invert= 468.40', Outlet Invert= 468.00'



```
  ************************************************
*      Storm Water Management Sizing Model      *
*               Hydroworks, LLC                 *
*                Version 4.4                    *
*                                               *
*        Continuous Simulation Program          *
*              Based on SWMM 4.4H               *
*              Hydroworks, LLC                  *
*               Graham Bryant                   *
*                2003 - 2013                    *
************************************************

                 Developed by

************************************************
*               Hydroworks, LLC                 *
*             Metcalf & Eddy, Inc.              *
*            University of Florida              *
*       Water Resources Engineers, Inc.         *
*      (Now Camp Dresser & McKee, Inc.)         *
*              Modified SWMM 4.4                *
************************************************

         Distributed and Maintained by

************************************************
*                                               *
*                Hydroworks, LLC                *
*                 888-290-7900                  *
*              www.hydroworks.com               *
*                                               *
************************************************

************************************************
*     If any problems occur executing this      *
*     model, contact Mr. Graham Bryant at       *
*     Hydroworks, LLC by phone at 908-272-4411  *
*     or by e-mail: support@hydroworks.com      *
************************************************

************************************************
*     This model is based on EPA SWMM 4.4       *
*  "Nature is full of infinite causes which     *
*   have never occurred in experience" da Vinci *
************************************************


************************************************
* Entry made to the Rain Block                 *
* Created by the University of Florida - 1988  *
* Updated by Oregon State University, March 2000 *
************************************************
```

GoVenture - Franklin Street, Worcester
DMH#3

```
#######################################
#  Precipitation Block Input Commands  #
#######################################

Station Name........................  Worcester Wso Ap

Station Location....................  Massachusetts

Station, ISTA.......................    9923

Beginning date, IYBEG (Yr/Mo/Dy......  1957/ 1/ 1

Ending date, IYEND (Yr/Mo/Dy)........  2001/12/31

Minimum interevent time, MIT.........     1

Number of ranked storms, NPTS........    10

NWS format, IFORM (See text).........     1

Print storm summary, ISUM (O-No 1-Yes)    0

Print all rainfall, IYEAR (O-No 1-Yes)    0

Save storm event data on NSCRAT(1)....    0
(IFILE =0 -Do not save, =1 -Save data)

IDECID 0 - Create interface file
       1 - Create file and analyze
       2 - Synoptic analysis.........     2

Plotting position parameter, A........  0.40

Storm event statistics, NOSTAT........  1100


KODEA (from optional group B0)........     2
 = 0, Do not include NCDC cumulative values.
 = 1, Average NCDC cumulative values.
 = 2, Use NCDC cumulative value as inst. rain.

KODEPR (from optional group B0).......     0
 Print NCDC special codes in event summary:
 = 0, only on days with events.
 = 1, on all days with codes present.
 Codes: A = accumulated value, I = incomplete value,
        M = missing value,     O = other code present
```

```
*****************************************************
*  Precipitation output created using the Rain block   *
*  Number of precipitation stations...        1        *
*****************************************************

Location Station Number
-------- --------------
       1.     9923


STATION ID ON PRECIP. DATA INPUT FILE = 2302
REQUESTED STATION ID =     9923  CHECK TO BE SURE THEY MATCH.


$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
Note, 15-min. data are being processed, but hourly
print-out, summaries, and statistics are based on
hourly totals only.  Data placed on interface file
are at correct 15-min. intervals.
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

##################################################
# Entry made to the Runoff Block, last updated by #
# Oregon State University, and Camp, Dresser and  #
# McKee, Inc., March 2002.                        #
##################################################
# "And wherever water goes, amoebae go along for  #
#  the ride"                      Tom Robbins     #
##################################################


                    GoVenture - Franklin Street, Worcester

                    DMH#3


Snowmelt parameter - ISNOW......................          0

Number of rain gages - NRGAG....................          1

Horton infiltration equation used - INFILM......          2
Maximum infiltration volume is limited to RMAXINF input on  subcatchment lines.
Infiltration volume regenerates during  non rainfall periods.

Quality is simulated - KWALTY...................          1

IVAP is negative.  Evaporation will be set to zero
    during time steps with rainfall.

Read evaporation data on line(s) F1 (F2) - IVAP..          1
```

```
Hour of day at start of storm - NHR.............          1

Minute of hour at start of storm - NMN..........          1

Time TZERO at start of storm (hours)............      1.017

Use U.S. Customary units for most I/O - METRIC...          0

Runoff input print control...                              0

Runoff graph plot control....                              1

Runoff output print control..                              0

Print headers every 50 lines - NOHEAD (0=yes, 1=no)        0

Print land use load percentages -LANDUPR (0=no, 1=yes)     0

Limit number of groundwater convergence messages to 10000 (if simulated)

Month, day, year of start of storm is:              1/ 1/1957

Wet time step length (seconds).......                   300.

Dry time step length (seconds).......                   900.

Wet/Dry time step length (seconds)...                   450.

Simulation length is......                       20011231.0 Yr/Mo/Dy

Percent of impervious area with zero detention depth    25.0

Horton infiltration model being used
Rate for regeneration of infiltration = REGEN * DECAY
DECAY is read in for each subcatchment
REGEN = ........................................   0.01000
```

```
*******************************************************
*   Processed Precipitation will be read from file     *
*******************************************************

  ############################
  #        Data Group F1      #
  # Evaporation Rate (in/day) #
  ############################

 JAN.  FEB.  MAR.  APR.  MAY   JUN.  JUL.  AUG.  SEP.  OCT.  NOV.  DEC.
 ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----
 0.00  0.00  0.00  0.10  0.10  0.15  0.15  0.15  0.10  0.10  0.00  0.00
```

```
*******************************************************
*        C H A N N E L   A N D   P I P E   D A T A    *
*******************************************************
```

Input equen umber	NAMEG: Channel ID #	Drains to NGTO:	Channel Type	Width (ft)	Length (ft)	Invert Slope (ft/ft)	L Side Slope (ft/ft)	R Side Slope (ft/ft)	Intial Depth (ft)	Max Depth (ft)	Mann- ings "N"	Full Flow (cfs)
1	201	200	Dummy	0.0	0.0	0.0000	0.0000	0.0000	0.0	0.0	0.0000	0.00E+00

```
*************************************************
*         S U B C A T C H M E N T   D A T A     *
*************************************************
```

NOTE. SEE LATER TABLE FOR OPTIONAL SUBCATCHMENT PARAMETERS

SUBCATCH- MENT NO.	CHANNEL OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	RESISTANCE IMPERV.	FACTOR PERV.	DEPRES. IMPERV.	STORAGE(IN) PERV.	INFILTRATION RATE(IN/HR) MAXIMUM	MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	169.81	0.66	71.70	0.0200	0.015	0.250	0.020	0.200	2.50	0.40	0.00055	1	4.00000

```
TOTAL NUMBER OF SUBCATCHMENTS...          1
TOTAL TRIBUTARY AREA (ACRES)....       0.66
IMPERVIOUS AREA (ACRES).........       0.47
PERVIOUS AREA (ACRES)...........       0.19
TOTAL WIDTH (FEET)..............     169.81
PERCENT IMPERVIOUSNESS..........      71.70
```

```
*******************************************************
*     G R O U N D W A T E R   I N P U T   D A T A     *
*******************************************************
```

SUB-CATCH NUMBER	CHANNEL OR INLET	ELEVATIONS GROUND (FT)	BOTTOM (FT)	STAGE (FT)	BC (FT)	TW (FT)	FLOW CONSTANTS A1 (IN/HR-FT^B1)	B1	A2 (IN/HR-FT^B2)	B2	A3 (IN/HR-FT^2)
0	602	10.00	0.00	0.00	2.00	2.00	4.500E-05	2.600	0.000E+00	1.000	0.00E+00

```
*********************************************************
* G R O U N D W A T E R   I N P U T   D A T A (CONTINUED) *
*********************************************************
```

S O I L   P R O P E R T I E S

SUBCAT. NO.	POROSITY	SATURATED HYDRAULIC CONDUCTIVITY (in/hr)	WILTING POINT	FIELD CAPACITY	INITIAL MOISTURE	MAX. DEEP PERCOLATION (in/hr)	PERCOLATION PARAMETERS HCO	PCO	ET PARAMETERS DEPTH OF ET (ft)	FRACTION OF ET TO UPPER ZONE
0	.4000	5.000	.1500	.3000	.3000	2.000E-03	10.00	15.00	14.00	0.350

```
*******************************************************
*    Arrangement of Subcatchments and Channel/Pipes     *
*******************************************************
* See second subcatchment output table for connectivity *
* of subcatchment to subcatchment flows.                *
*******************************************************

   Channel
   or Pipe
       201     No Tributary Channel/Pipes
               No Tributary Subareas.....


    INLET
       200     Tributary Channel/Pipes...        201
               Tributary Subareas........        300


*********************************************************
* Hydrographs will be stored for the following   1 INLETS *
*********************************************************
           200

↑
#####################################################
#              Quality Simulation                   #
#####################################################
#      General Quality Control Data Groups          #
#####################################################

 Description                            Variable       Value
 -----------                            --------       -----

 Number of quality constituents.....    NQS.......        1

 Number of land uses................  JLAND.......        1

 Standard catchbasin volume.........  CBVOL.......     4.00 cubic feet

 Erosion is not simulated.........    IROS........        0

 DRY DAYS PRIOR TO START OF STORM... DRYDAY.......     3.00 DAYS

 DRY DAYS REQUIRED TO RECHARGE
 CATCHBASIN CONCENTRATION TO
 INITIAL VALUES..................... DRYBSN.......     5.00 DAYS

 DUST AND DIRT
 STREET SWEEPING EFFICIENCY......... REFFDD.......    0.000

 DAY OF YEAR ON WHICH STREET
 SWEEPING BEGINS.................... KLNBGN.......      120

 DAY OF YEAR ON WHICH STREET
 SWEEPING ENDS...................... KLNEND.......      270
```

```
##########################################
#     Land use data on data group J2      #
##########################################
```

AND USE LNAME)	BUILDUP EQUATION TYPE (METHOD)	FUNCTIONAL DEPENDENCE OF BUILDUP PARAMETER(JACGUT)	LIMITING BUILDUP QUANTITY (DDLIM)	BUILDUP POWER (DDPOW)	BUILDUP COEFF. (DDFACT)	CLEANING INTERVAL IN DAYS (CLFREQ)	AVAIL. FACTOR FRACTION (AVSWP)	DAYS SINCE LAST SWEEPING (DSLCL)
Urban De	EXPONENTIAL(1)	AREA(1)	2.500E+01	0.500	60.000	30.000	0.300	30.000

```
##############################################
#     Constituent data on data group J3      #
##############################################
```

	Total Su
Constituent units.....	mg/l
Type of units.....	0
KALC.....	2
Type of buildup calc.....	EXPONENTIAL(2)
KWASH.....	0
Type of washoff calc.....	POWER EXPONEN.(0)
KACGUT.....	1
Dependence of buildup....	AREA(1)
LINKUP.....	0
Linkage to snowmelt.....	NO SNOW LINKAGE
Buildup param 1 (QFACT1).	25.000
Buildup param 2 (QFACT2).	0.500
Buildup param 3 (QFACT3).	60.000
Buildup param 4 (QFACT4).	0.000
Buildup param 5 (QFACT5).	0.000
Washoff power (WASHPO)...	1.100
Washoff coef. (RCOEF)....	3.000
Init catchb conc (CBFACT)	100.000
Precip. conc. (CONCRN)...	0.000
Street sweep effic (REFF)	0.000
Remove fraction (REMOVE).	0.000
1st order QDECAY, 1/day..	0.000
Land use number.....	1

```
************************************************
* Constant Groundwater Quality Concentration(s) *
************************************************
```

Total Susp has a concentration of.. 0.0000 mg/l

```
**********************************************
* REMOVAL FRACTIONS FOR SELECTED CHANNEL/PIPES *
* FROM J7 LINES                                *
**********************************************

  CHANNEL/   CONSTITUENT
     PIPE Total Susp
---------- --------
       201     0.000


****************************************************
*     Subcatchment surface quality on data group L1 *
****************************************************
```

	No.	Land Usage	Land Use No.	Total Gutter Length 10**2ft	Number of Catch-Basins	Input Loading load/ac Total Su
1	300	Urban De	1	3.40	1.00	0.0E+00
Totals (Loads in lb or other)				3.40	1.00	0.0E+00

```
    ************************
    *    DATA GROUP M1     *
    ************************


TOTAL NUMBER OF PRINTED GUTTERS/INLETS...NPRNT..        1
NUMBER OF TIME STEPS BETWEEN PRINTINGS..INTERV..        0
STARTING AND STOPPING PRINTOUT DATES............        0         0


    ************************
    *    DATA GROUP M3     *
    ************************

CHANNEL/INLET PRINT DATA GROUPS......        -200


          ******************************************
          * Rainfall from Nat. Weather Serv. file  *
          * in units of hundredths of an inch      *
          ******************************************

         GoVenture - Franklin Street, Worcester
         DMH#3
```

Rainfall Station Worcester Wso Ap
State/Province Massachusetts

Rainfall Depth Summary (in)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957.	0.4	1.4	2.8	3.6	3.4	3.0	1.1	2.8	1.1	3.8	5.7	7.3	36.5
1958.	9.0	2.9	4.9	7.2	4.3	2.8	6.1	4.4	8.1	2.8	5.0	3.2	60.8
1959.	5.1	2.8	8.2	4.2	2.4	4.7	8.4	4.5	3.1	8.3	6.1	5.1	62.9
1960.	2.4	6.3	4.2	5.4	5.9	3.1	7.2	3.9	7.0	3.0	4.0	5.0	57.4
1961.	3.7	2.5	5.8	5.2	4.2	2.5	4.3	5.3	6.1	3.5	3.3	5.1	51.5
1962.	2.4	5.4	2.6	3.9	4.4	3.5	2.1	4.6	5.7	9.2	4.9	5.8	54.4
1963.	4.2	3.4	4.7	1.9	3.6	2.6	2.0	3.0	4.9	1.7	8.8	3.3	44.0
1964.	5.9	3.6	4.2	4.5	1.5	1.8	3.6	2.9	2.1	2.5	3.5	6.2	42.4
1965.	3.1	4.9	2.7	3.9	3.1	2.0	2.0	3.2	3.8	2.3	3.2	2.9	37.1
1966.	4.4	4.4	3.2	1.7	3.8	2.6	3.5	2.0	7.5	3.5	4.9	4.2	45.6
1967.	2.8	3.7	4.9	5.2	7.4	3.9	6.5	3.5	5.2	2.4	5.1	5.0	55.7
1968.	3.7	1.4	7.9	2.3	7.1	8.4	1.9	0.7	2.2	2.4	6.2	6.5	50.7
1969.	1.8	4.2	2.7	5.6	3.4	1.7	4.3	4.7	5.4	1.8	7.1	8.5	51.1
1970.	2.2	5.5	4.1	3.9	6.1	2.9	0.9	5.8	3.6	3.0	4.0	3.9	45.7
1971.	3.2	5.9	1.9	2.0	5.6	2.6	4.9	8.0	1.6	3.6	5.5	3.7	48.3
1972.	3.1	8.2	6.1	4.8	8.4	9.7	6.6	5.1	3.3	6.0	10.2	6.4	77.7
1973.	4.4	4.1	4.9	5.7	4.8	7.3	4.1	4.4	4.1	4.8	3.9	8.8	61.1
1974.	4.2	3.4	5.6	3.6	6.3	3.8	3.4	3.7	13.4	3.6	5.7	4.1	61.0
1975.	6.9	3.3	5.9	1.3	2.0	3.8	4.3	5.1	7.6	6.6	6.0	5.2	57.9
1976.	6.9	2.9	4.5	2.5	3.2	2.8	3.6	6.6	2.3	5.3	1.0	3.4	45.0
1977.	2.4	3.2	6.4	4.2	2.7	4.2	4.8	2.4	8.2	5.6	4.2	6.8	55.0
1978.	11.9	1.8	3.4	2.5	3.8	1.8	3.8	5.4	1.3	4.1	2.5	4.3	46.5
1979.	12.2	3.1	4.0	5.5	4.7	0.6	6.1	7.7	4.1	4.9	4.1	1.8	58.8
1980.	0.8	1.2	7.4	5.2	2.4	4.8	3.9	2.1	3.3	5.4	4.8	2.2	43.4
1981.	1.9	9.4	1.4	4.9	4.1	2.7	8.2	1.2	5.5	5.7	3.9	6.1	55.0
1982.	4.4	4.0	4.2	4.8	3.4	13.1	6.0	2.0	2.1	3.2	4.6	3.9	55.7
1983.	5.3	5.3	9.0	8.4	7.3	2.7	0.9	6.4	1.5	6.3	9.3	7.1	69.5
1984.	3.3	6.7	6.3	5.1	10.3	3.3	6.4	1.2	2.8	3.3	3.0	3.4	55.1
1985.	1.9	3.6	3.5	3.0	5.1	5.2	6.6	4.1	4.7	3.0	7.3	2.7	50.7
1986.	5.5	3.5	3.6	1.9	3.4	9.6	3.5	3.6	0.9	3.0	6.7	7.8	52.9
1987.	6.2	1.9	5.8	9.9	1.5	5.0	1.0	5.4	6.7	4.5	3.1	2.6	53.6
1988.	3.7	3.5	3.3	3.8	5.1	1.4	6.7	4.5	1.2	5.9	5.9	1.8	46.8
1989.	1.6	3.4	3.0	4.8	6.6	7.3	4.6	5.9	5.1	0.0	0.0	0.0	42.3
1991.	0.0	0.0	0.0	0.0	0.0	0.0	3.2	8.1	6.9	3.8	6.0	3.5	31.5
1992.	3.1	3.3	4.7	3.2	2.7	5.0	5.7	7.2	2.3	2.4	6.3	5.1	50.9
1993.	3.2	2.9	7.1	4.0	1.9	2.9	3.4	2.1	9.4	4.0	5.2	5.8	51.8
1994.	6.0	2.9	6.6	2.9	6.8	2.5	3.2	8.0	5.3	1.3	6.0	4.2	55.7
1995.	5.9	2.3	2.2	2.5	0.0	0.0	4.7	2.1	3.7	8.8	5.2	1.4	38.8
1996.	7.1	3.3	2.5	7.3	4.1	3.1	6.3	4.5	4.9	4.9	3.0	5.0	55.8
1997.	3.3	1.7	4.6	3.4	2.6	1.6	3.2	2.8	1.6	1.8	5.5	2.3	34.4
1998.	3.9	2.8	6.3	2.8	5.7	9.7	1.8	2.3	1.2	5.0	2.4	1.4	45.4
1999.	7.0	2.4	4.6	1.1	3.3	1.8	2.4	2.4	8.6	4.6	3.1	4.3	45.7
2000.	3.5	3.3	4.2	7.6	4.2	5.4	4.5	2.5	3.4	2.4	4.0	4.2	49.3
2001.	2.2	3.2	7.4	1.0	3.9	5.0	3.7	1.1	3.5	0.9	1.7	3.2	36.7

Total Rainfall Depth for Simulation Period 2227.9 (in)

Rainfall Intensity Analysis (in/hr)

(in/hr)	(#)	(%)	(in)	(%)
0.10	55294	69.5	679.	30.5
0.20	15423	19.4	571.	25.6
0.30	3295	4.1	211.	9.5
0.40	2538	3.2	224.	10.1
0.50	868	1.1	100.	4.5
0.60	597	0.8	80.	3.6
0.70	577	0.7	92.	4.1
0.80	337	0.4	64.	2.9
0.90	120	0.2	26.	1.2
1.00	123	0.2	29.	1.3
1.10	70	0.1	18.	0.8
1.20	64	0.1	18.	0.8
1.30	56	0.1	17.	0.8
1.40	38	0.0	13.	0.6
1.50	18	0.0	7.	0.3
1.60	38	0.0	15.	0.7
1.70	16	0.0	7.	0.3
1.80	28	0.0	12.	0.6
1.90	14	0.0	7.	0.3
2.00	16	0.0	8.	0.4
> 2.00	48	0.1	30.	1.3

Total # of Intensities 79578

Daily Rainfall Depth Analysis (in)

(in)	(#)	(%)	(in)	(%)
0.10	1790	31.7	85.	3.8
0.20	996	17.7	143.	6.4
0.30	575	10.2	138.	6.2
0.40	489	8.7	166.	7.4
0.50	302	5.4	134.	6.0
0.60	279	4.9	152.	6.8
0.70	209	3.7	134.	6.0
0.80	152	2.7	113.	5.1
0.90	128	2.3	108.	4.8
1.00	126	2.2	119.	5.3
1.10	89	1.6	93.	4.2
1.20	79	1.4	90.	4.1
1.30	69	1.2	86.	3.9
1.40	49	0.9	66.	3.0
1.50	56	1.0	81.	3.6
1.60	44	0.8	68.	3.0
1.70	39	0.7	64.	2.9
1.80	28	0.5	49.	2.2
1.90	20	0.4	37.	1.6

```
  2.00     16       0.3       31.       1.4
> 2.00    104       1.8      270.      12.1

Total # Days with Rain   5639

***********************************************
*      End of time step DO-loop in Runoff      *
***********************************************

Final Date (Mo/Day/Year)   =                  1/ 1/2002
Total number of time steps =                    3055971
Final Julian Date  =                            2002001
Final time of day  =                                 1. seconds.
Final time of day  =                              0.00   hours.
Final running time =                        394464.0000   hours.
Final running time =                         16436.0000    days.

**************************************************
*     Extrapolation Summary for Watersheds       *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of OVERLND Calls      *
**************************************************

 Subcatch   # Steps   # Calls  Subcatch   # Steps   # Calls  Subcatch   # Steps   # Calls
 --------   -------   -------  --------   -------   -------  --------   -------   -------
      300  13541817   3360047

**************************************************
*     Extrapolation Summary for Channel/Pipes    *
* # Steps ==> Total Number of Extrapolated Steps *
* # Calls ==> Total Number of GUTNR Calls        *
**************************************************

Chan/Pipe   # Steps   # Calls Chan/Pipe   # Steps   # Calls Chan/Pipe   # Steps   # Calls
 --------   -------   -------  --------   -------   -------  --------   -------   -------
      201         0         0
↑
*********************************************
*       Continuity Check for Surface Water   *
*********************************************
                                                                  Inches over
                                                   cubic feet     Total Basin
Total Precipitation (Rain plus Snow)                 5345655.       2225.
Total Infiltration                                   1494151.        622.
Total Evaporation                                     182728.         76.
Surface Runoff from Watersheds                       3703206.       1541.
Total Water remaining in Surface Storage                  26.          0.
Infiltration over the Pervious Area...               1494151.       2197.
                       --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
Water remaining in Snow Cover........                5380110.       2239.
Total Precipitation + Initial Storage.               5345655.       2225.
```

```
The error in continuity is calculated as
*************************************
* Precipitation + Initial Snow Cover  *
*      - Infiltration -               *
*Evaporation - Snow removal -         *
*Surface Runoff from Watersheds -     *
*Water in Surface Storage -           *
*Water remaining in Snow Cover        *
*-----------------------------------*
* Precipitation + Initial Snow Cover  *
*************************************
Error.................................       -0.645 Percent


**********************************************
*       Continuity Check for Channel/Pipes   *
**********************************************
```

	cubic feet	Inches over Total Basin
Initial Channel/Pipe Storage.....	0.	0.
Final Channel/Pipe Storage.....	0.	0.
Surface Runoff from Watersheds.....	3703206.	1541.
Baseflow.....	0.	
Groundwater Subsurface Inflow.....	0.	0.
Evaporation Loss from Channels.....	0.	0.
Channel/Pipe/Inlet Outflow.....	3703206.	1541.
Initial Storage + Inflow.....	3703206.	1541.
Final Storage + Outflow.....	3703206.	1541.

```
*****************************************
* Final Storage + Outflow + Evaporation  - *
* Watershed Runoff - Groundwater Inflow  - *
*     Initial Channel/Pipe Storage         *
*     ---------------------------------    *
*  Final Storage + Outflow  + Evaporation  *
*****************************************
Error.....................................      0.000 Percent

↑
**************************************************
*     Continuity Check for Subsurface Water      *
**************************************************
```

	cubic feet	Inches over Subsurface Basin
Total Infiltration	0.	0.
Total Upper Zone ET	0.	0.
Total Lower Zone ET	0.	0.
Total Groundwater flow	0.	0.
Total Deep percolation	0.	0.
Initial Subsurface Storage	86510.	36.
Final Subsurface Storage	86510.	36.
Upper Zone ET over Pervious Area	0.	0.
Lower Zone ET over Pervious Area	0.	0.

```
****************************************
* Infiltration + Initial Storage - Final *
* Storage - Upper and Lower Zone ET -    *
* Groundwater Flow - Deep Percolation    *
* -------------------------------------- *
*     Infiltration + Initial Storage     *
****************************************
Error ....................................     0.000 Percent
```

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCH-MENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	PERVIOUS AREA TOTAL RUNOFF DEPTH (IN)	PERVIOUS AREA TOTAL LOSSES (IN)	PERVIOUS AREA PEAK RUNOFF RATE (CFS)	IMPERVIOUS AREA RUNOFF DEPTH (IN)	IMPERVIOUS AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA RUNOFF DEPTH (IN)	TOTAL SUBCATCHMENT AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA PEAK UNIT RUNOFF (IN/HR)
300	200	0.66	71.7	2224.52	25.0552	199.980	0.454	2137.893	1.723	1539.960	2.177	3.288

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CFS)	FULL VELOCITY (FPS)	FULL DEPTH (FT)	MAXIMUM COMPUTED INFLOW (CFS)	MAXIMUM COMPUTED OUTFLOW (CFS)	MAXIMUM COMPUTED DEPTH (FT)	MAXIMUM COMPUTED VELOCITY (FPS)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (AC-FT)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
201				0.00				1/ 0/1900	0.00				
200				2.12				7/19/1972	17.50				

TOTAL NUMBER OF CHANNELS/PIPES = 2

*** NOTE *** THE MAXIMUM FLOWS AND DEPTHS ARE CALCULATED AT THE END OF THE TIME INTERVAL

```
##################################################
#             Runoff Quality Summary Page        #
# If NDIM = 0 Units for:   loads    mass rates   #
#             METRIC = 1    lb        lb/sec     #
#             METRIC = 2    kg        kg/sec     #
# If NDIM = 1 Loads are in units of quantity     #
#             and mass rates are quantity/sec    #
# If NDIM = 2 loads are in units of concentration #
#             times volume and mass rates have units#
```

```
#              of concentration times volume/second  #
#####################################################

Total Su NDIM =  0
METRIC =  1

                                    Total Su
                                    --------
Inputs
------
 1. INITIAL SURFACE LOAD........        13.
 2. TOTAL SURFACE BUILDUP.......     23259.
 3. INITIAL CATCHBASIN LOAD.....         0.
 4. TOTAL CATCHBASIN LOAD.......         0.
 5. TOTAL CATCHBASIN AND
    SURFACE BUILDUP (2+4).......     23259.

Remaining Loads
---------------
 6. LOAD REMAINING ON SURFACE...         5.
 7. REMAINING IN CATCHBASINS....         0.
 8. REMAINING IN CHANNEL/PIPES..         0.

Removals
--------
 9. STREET SWEEPING REMOVAL.....         0.
10. NET SURFACE BUILDUP (2-9)...     23259.
11. SURFACE WASHOFF.............     23242.
12. CATCHBASIN WASHOFF..........         0.
13. TOTAL WASHOFF (11+12).......     23242.
14. LOAD FROM OTHER CONSTITUENTS         0.
15. PRECIPITATION LOAD..........         0.
15a.SUM SURFACE LOAD (13+14+15).     23242.
16. TOTAL GROUNDWATER LOAD......         0.
16a.TOTAL I/I LOAD..............         0.
17. NET SUBCATCHMENT LOAD
    (15a-15b-15c-15d+16+16a)....     23242.
>>Removal in channel/pipes (17a, 17b):
17a.REMOVE BY BMP FRACTION......         0.
17b.REMOVE BY 1st ORDER DECAY...         0.
18. TOTAL LOAD TO INLETS........     23242.
19. FLOW WT'D AVE.CONCENTRATION  mg/l
    (INLET LOAD/TOTAL FLOW).....       101.

Percentages
-----------
20. STREET SWEEPING (9/2).......         0.
21. SURFACE WASHOFF (11/2)......       100.
22. NET SURFACE WASHOFF(11/10)..       100.
23. WASHOFF/SUBCAT LOAD(11/17)..       100.
24. SURFACE WASHOFF/INLET LOAD
    (11/18).....................       100.
25. CATCHBASIN WASHOFF/
```

```
    SUBCATCHMENT LOAD (12/17)...        0.
26. CATCHBASIN WASHOFF/
    INLET LOAD (12/18)..........        0.
27. OTHER CONSTITUENT LOAD/
    SUBCATCHMENT LOAD (14/17)...        0.
28. INSOLUBLE FRACTION/
    INLET LOAD (14/18)..........        0.
29. PRECIPITATION/
    SUBCATCHMENT LOAD (15/17)...        0.
30. PRECIPITATION/
    INLET LOAD (15/18)..........        0.
31. GROUNDWATER LOAD/
    SUBCATCHMENT LOAD (16/17)...        0.
32. GROUNDWATER LOAD/
    INLET LOAD (16/18)..........        0.
32a.INFILTRATION/INFLOW LOAD/
    SUBCATCHMENT LOAD (16a/17)..        0.
32b.INFILTRATION/INFLOW LOAD/
    INLET LOAD (16a/18).........        0.
32c.CH/PIPE BMP FRACTION REMOVAL/
    SUBCATCHMENT LOAD (17a/17)..        0.
32d.CH/PIPE 1st ORDER DECAY REMOVAL/
    SUBCATCHMENT LOAD (17b/17)..        0.
33. INLET LOAD SUMMATION ERROR
    (18+8+6a+17a+17b-17)/17.....        0.

CAUTION. Due to method of quality routing (Users Manual, Appendix IX)
quality routing through channel/pipes is sensitive to the time step.
Large "Inlet Load Summation Errors" may result.
These can be reduced by adjusting the time step(s).
Note: surface accumulation during dry time steps at end of simulation is
not included in totals.  Buildup is only performed at beginning of
wet steps or for street cleaning.
```

****
* TSS Particle Size Distribution *
****

Diameter (um)	%	Specific Gravity	Settling Velocity (ft/s)	Critical Peclet Number
2.	5.0	2.65	0.000009	0.032973
5.	5.0	2.65	0.000055	0.056296
8.	10.0	2.65	0.000141	0.074071
20.	15.0	2.65	0.000875	0.126463
50.	10.0	2.65	0.005346	0.215914
75.	5.0	2.65	0.011640	0.273579
100.	10.0	2.65	0.019828	0.323611
150.	15.0	2.65	0.040138	0.410039
250.	15.0	2.65	0.087320	0.552510
500.	5.0	2.65	0.198831	0.828097
1000.	5.0	2.65	0.365264	1.241146

```
*****************************************************
*                                                   *
*              Summary of TSS Removal               *
*                                                   *
*****************************************************
```

TSS Removal based on NJCAT Lab Performance Curve

Model #	Low Q Treated (cfs)	High Q Treated (cfs)	Runoff Treated (%)	TSS Removed (%)
HS 4	0.921	0.970	99.5	80.1 <=TSS Removal
HS 5	0.970	0.970	99.6	86.3
HS 6	0.970	0.970	99.6	90.4
HS 7	0.970	0.970	99.6	92.9
HS 8	0.970	0.970	99.6	94.7
HS 9	0.970	0.970	99.6	96.2
HS 10	0.970	0.970	99.6	97.3
HS 12	0.970	0.970	99.6	98.6

```
*****************************************************
*                                                   *
*  Summary of Annual Flow Treatmnet & TSS Removal   *
*                                                   *
*****************************************************
```

HS 4

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	331.2	92.0	100.0	78.3
1958.	1101920.1	1101920.1	590.4	458.9	131.5	100.0	77.7
1959.	1155776.2	1128994.6	634.4	464.9	117.7	97.7	73.3
1960.	1058433.2	1047763.4	568.9	457.7	110.7	99.0	80.5
1961.	935842.6	931943.6	565.7	456.2	103.6	99.6	80.7
1962.	1001490.3	1001490.3	532.1	430.3	101.8	100.0	80.9
1963.	800071.3	800071.3	518.2	420.6	97.6	100.0	81.2
1964.	767892.4	767892.4	494.3	404.2	90.1	100.0	81.8
1965.	669134.8	669134.8	477.6	388.9	88.7	100.0	81.4
1966.	833386.4	833386.4	524.0	423.5	100.6	100.0	80.8
1967.	1015570.9	1015570.9	594.9	474.0	120.8	100.0	79.7
1968.	940258.2	932111.4	521.9	410.3	93.2	99.1	78.6
1969.	932656.4	931143.8	518.6	414.8	99.9	99.8	80.0
1970.	839660.9	838782.1	494.8	402.2	92.6	99.9	81.3
1971.	891551.8	888688.4	550.6	427.5	122.1	99.7	77.6
1972.	1447890.2	1403193.4	839.2	539.9	173.9	96.9	64.3
1973.	1126787.5	1125512.1	606.8	466.2	140.4	99.9	76.8
1974.	1134949.8	1119612.9	603.6	446.8	138.1	98.6	74.0
1975.	1054282.1	1054282.1	539.8	442.4	97.4	100.0	82.0
1976.	813845.6	812813.8	532.1	432.4	99.3	99.9	81.3
1977.	999719.9	996174.1	588.0	477.2	109.2	99.6	81.2
1978.	840461.9	840461.9	474.3	394.2	80.1	100.0	83.1
1979.	1082843.1	1062294.0	571.6	439.5	116.1	98.1	76.9

1980.	783070.0	783069.9	496.7	386.9	109.8	100.0	77.9
1981.	1000404.5	999945.6	562.4	438.3	124.1	100.0	77.9
1982.	1018472.7	1018472.7	554.6	440.0	114.6	100.0	79.3
1983.	1286141.8	1283160.0	653.5	517.9	135.0	99.8	79.2
1984.	1013741.4	1013741.4	547.0	443.6	103.4	100.0	81.1
1985.	924335.1	910143.1	560.2	443.1	99.1	98.5	79.1
1986.	959843.1	959843.1	508.9	412.3	96.6	100.0	81.0
1987.	995421.2	995421.2	506.8	418.5	88.3	100.0	82.6
1988.	846875.8	842968.3	516.1	403.4	99.2	99.5	78.2
1989.	757483.8	757483.8	441.1	356.7	84.4	100.0	80.9
1991.	590710.4	586571.2	263.6	212.1	51.3	99.3	80.5
1992.	920824.1	920824.1	564.5	463.5	101.0	100.0	82.1
1993.	948857.9	941883.3	571.1	455.8	110.6	99.3	79.8
1994.	1013411.9	1013411.9	588.8	470.7	118.1	100.0	79.9
1995.	713668.0	710950.4	422.2	335.2	85.0	99.6	79.4
1996.	1019290.1	1016635.3	599.4	468.6	127.1	99.7	78.2
1997.	623576.2	623576.2	447.1	367.5	79.6	100.0	82.2
1998.	830558.6	830558.6	487.8	378.4	109.3	100.0	77.6
1999.	834235.4	833906.9	493.0	395.5	97.5	100.0	80.2
2000.	881499.2	881499.2	534.1	428.2	105.9	100.0	80.2
2001.	659041.1	652993.1	464.2	357.4	82.8	99.1	77.0

HS 5

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	356.0	67.2	100.0	84.1
1958.	1101920.1	1101920.1	590.4	497.4	93.0	100.0	84.2
1959.	1155776.2	1130933.9	634.4	500.8	81.7	97.9	78.9
1960.	1058433.2	1049464.4	568.9	495.9	72.5	99.2	87.2
1961.	935842.6	932751.6	565.7	493.1	66.7	99.7	87.2
1962.	1001490.3	1001490.3	532.1	463.8	68.3	100.0	87.2
1963.	800071.3	800071.3	518.2	452.5	65.6	100.0	87.3
1964.	767892.4	767892.4	494.3	436.5	57.8	100.0	88.3
1965.	669134.8	669134.8	477.6	419.2	58.4	100.0	87.8
1966.	833386.4	833386.4	524.0	456.1	67.9	100.0	87.0
1967.	1015570.9	1015570.9	594.9	512.3	82.6	100.0	86.1
1968.	940258.2	933080.9	521.9	440.7	62.7	99.2	84.4
1969.	932656.4	931950.4	518.6	449.7	65.1	99.9	86.7
1970.	839660.9	839359.2	494.8	433.4	61.4	100.0	87.6
1971.	891551.8	889469.9	550.6	461.4	88.2	99.8	83.8
1972.	1447890.2	1406911.8	839.2	589.3	124.5	97.2	70.2
1973.	1126787.5	1126017.4	606.8	506.6	100.0	99.9	83.5
1974.	1134949.8	1122961.1	603.6	486.3	98.7	98.9	80.6
1975.	1054282.1	1054282.1	539.8	476.1	63.7	100.0	88.2
1976.	813845.6	813517.0	532.1	462.6	69.1	100.0	86.9
1977.	999719.9	997652.7	588.0	515.1	71.3	99.8	87.6
1978.	840461.9	840461.9	474.3	421.5	52.8	100.0	88.9
1979.	1082843.1	1064879.8	571.6	471.4	84.2	98.3	82.5
1980.	783070.0	783069.9	496.7	416.8	79.9	100.0	83.9
1981.	1000404.5	1000404.5	562.4	474.6	87.8	100.0	84.4
1982.	1018472.7	1018472.7	554.6	473.5	81.1	100.0	85.4

1983.	1286141.8	1283908.5	653.5	558.7	94.2	99.8	85.5
1984.	1013741.4	1013741.4	547.0	478.5	68.4	100.0	87.5
1985.	924335.1	911920.9	560.2	475.7	66.4	98.7	84.9
1986.	959843.1	959843.1	508.9	441.8	67.1	100.0	86.8
1987.	995421.2	995421.2	506.8	447.2	59.6	100.0	88.2
1988.	846875.8	843776.0	516.1	433.6	69.1	99.6	84.0
1989.	757483.8	757483.8	441.1	383.8	57.2	100.0	87.0
1991.	590710.4	588221.2	263.6	227.5	35.9	99.6	86.3
1992.	920824.1	920824.1	564.5	495.1	69.4	100.0	87.7
1993.	948857.9	943337.8	571.1	492.0	74.4	99.4	86.1
1994.	1013411.9	1013411.9	588.8	505.8	83.0	100.0	85.9
1995.	713668.0	711758.4	422.2	361.4	58.7	99.7	85.6
1996.	1019290.1	1017443.3	599.4	505.2	90.5	99.8	84.3
1997.	623576.2	623576.2	447.1	396.4	50.7	100.0	88.7
1998.	830558.6	830558.6	487.8	412.0	75.7	100.0	84.5
1999.	834235.4	834185.3	493.0	424.2	68.8	100.0	86.0
2000.	881499.2	881499.2	534.1	461.4	72.8	100.0	86.4
2001.	659041.1	653962.6	464.2	385.1	55.0	99.2	83.0

HS 6

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	375.8	47.4	100.0	88.8
1958.	1101920.1	1101920.1	590.4	520.4	70.0	100.0	88.1
1959.	1155776.2	1130933.9	634.4	526.6	55.9	97.9	83.0
1960.	1058433.2	1049464.4	568.9	519.0	49.4	99.2	91.2
1961.	935842.6	932751.6	565.7	515.2	44.6	99.7	91.1
1962.	1001490.3	1001490.3	532.1	485.6	46.6	100.0	91.3
1963.	800071.3	800071.3	518.2	476.9	41.3	100.0	92.0
1964.	767892.4	767892.4	494.3	454.3	40.1	100.0	91.9
1965.	669134.8	669134.8	477.6	437.5	40.1	100.0	91.6
1966.	833386.4	833386.4	524.0	477.4	46.6	100.0	91.1
1967.	1015570.9	1015570.9	594.9	538.4	56.5	100.0	90.5
1968.	940258.2	933080.9	521.9	462.5	41.0	99.2	88.6
1969.	932656.4	931950.4	518.6	472.3	42.5	99.9	91.1
1970.	839660.9	839359.2	494.8	450.5	44.3	100.0	91.1
1971.	891551.8	889469.9	550.6	486.9	62.7	99.8	88.4
1972.	1447890.2	1406911.8	839.2	624.2	89.6	97.2	74.4
1973.	1126787.5	1126017.4	606.8	534.1	72.4	99.9	88.0
1974.	1134949.8	1122961.1	603.6	513.4	71.6	98.9	85.1
1975.	1054282.1	1054282.1	539.8	497.9	41.9	100.0	92.2
1976.	813845.6	813517.0	532.1	483.9	47.7	100.0	90.9
1977.	999719.9	997652.7	588.0	536.9	49.6	99.8	91.3
1978.	840461.9	840461.9	474.3	439.9	34.4	100.0	92.7
1979.	1082843.1	1064879.8	571.6	495.5	60.2	98.3	86.7
1980.	783070.0	783069.9	496.7	439.2	57.5	100.0	88.4
1981.	1000404.5	1000404.5	562.4	498.1	64.2	100.0	88.6
1982.	1018472.7	1018472.7	554.6	494.4	60.2	100.0	89.1
1983.	1286141.8	1283908.5	653.5	587.3	65.6	99.8	89.9
1984.	1013741.4	1013741.4	547.0	502.4	44.6	100.0	91.9
1985.	924335.1	911920.9	560.2	496.0	46.2	98.7	88.5

1986.	959843.1	959843.1	508.9	463.5	45.5	100.0	91.1
1987.	995421.2	995421.2	506.8	466.3	40.6	100.0	92.0
1988.	846875.8	843776.0	516.1	453.5	49.2	99.6	87.9
1989.	757483.8	757483.8	441.1	401.9	39.2	100.0	91.1
1991.	590710.4	588221.2	263.6	238.8	24.7	99.6	90.6
1992.	920824.1	920824.1	564.5	518.6	45.9	100.0	91.9
1993.	948857.9	943337.8	571.1	512.3	54.0	99.4	89.7
1994.	1013411.9	1013411.9	588.8	528.8	60.1	100.0	89.8
1995.	713668.0	711758.4	422.2	378.1	42.0	99.7	89.6
1996.	1019290.1	1017443.3	599.4	532.6	63.1	99.8	88.9
1997.	623576.2	623576.2	447.1	416.4	30.7	100.0	93.1
1998.	830558.6	830558.6	487.8	434.5	53.2	100.0	89.1
1999.	834235.4	834185.3	493.0	443.7	49.3	100.0	90.0
2000.	881499.2	881499.2	534.1	483.8	50.4	100.0	90.6
2001.	659041.1	653962.6	464.2	403.4	36.7	99.2	86.9

HS 7

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	387.5	35.7	100.0	91.6
1958.	1101920.1	1101920.1	590.4	537.1	53.3	100.0	91.0
1959.	1155776.2	1130933.9	634.4	540.9	41.6	97.9	85.3
1960.	1058433.2	1049464.4	568.9	532.0	36.4	99.2	93.5
1961.	935842.6	932751.6	565.7	527.5	32.3	99.7	93.3
1962.	1001490.3	1001490.3	532.1	498.4	33.7	100.0	93.7
1963.	800071.3	800071.3	518.2	489.0	29.2	100.0	94.4
1964.	767892.4	767892.4	494.3	463.6	30.7	100.0	93.8
1965.	669134.8	669134.8	477.6	449.7	27.9	100.0	94.2
1966.	833386.4	833386.4	524.0	490.4	33.6	100.0	93.6
1967.	1015570.9	1015570.9	594.9	552.2	42.6	100.0	92.8
1968.	940258.2	933080.9	521.9	474.6	28.8	99.2	90.9
1969.	932656.4	931950.4	518.6	484.5	30.3	99.9	93.4
1970.	839660.9	839359.2	494.8	462.1	32.6	100.0	93.4
1971.	891551.8	889469.9	550.6	501.6	48.0	99.8	91.1
1972.	1447890.2	1406911.8	839.2	644.8	69.0	97.2	76.8
1973.	1126787.5	1126017.4	606.8	551.4	55.1	99.9	90.9
1974.	1134949.8	1122961.1	603.6	530.4	54.7	98.9	87.9
1975.	1054282.1	1054282.1	539.8	511.3	28.5	100.0	94.7
1976.	813845.6	813517.0	532.1	497.4	34.2	100.0	93.5
1977.	999719.9	997652.7	588.0	550.6	35.9	99.8	93.6
1978.	840461.9	840461.9	474.3	450.1	24.3	100.0	94.9
1979.	1082843.1	1064879.8	571.6	510.4	45.3	98.3	89.3
1980.	783070.0	783069.9	496.7	451.9	44.8	100.0	91.0
1981.	1000404.5	1000404.5	562.4	512.9	49.5	100.0	91.2
1982.	1018472.7	1018472.7	554.6	508.8	45.7	100.0	91.8
1983.	1286141.8	1283908.5	653.5	605.3	47.6	99.8	92.6
1984.	1013741.4	1013741.4	547.0	515.2	31.8	100.0	94.2
1985.	924335.1	911920.9	560.2	507.9	34.3	98.7	90.7
1986.	959843.1	959843.1	508.9	475.6	33.3	100.0	93.5
1987.	995421.2	995421.2	506.8	477.8	29.0	100.0	94.3
1988.	846875.8	843776.0	516.1	467.9	34.8	99.6	90.7

1989.	757483.8	757483.8	441.1	412.4	28.7	100.0	93.5
1991.	590710.4	588221.2	263.6	244.8	18.7	99.6	92.9
1992.	920824.1	920824.1	564.5	534.1	30.3	100.0	94.6
1993.	948857.9	943337.8	571.1	524.8	41.6	99.4	91.9
1994.	1013411.9	1013411.9	588.8	543.3	45.6	100.0	92.3
1995.	713668.0	711758.4	422.2	389.2	30.9	99.7	92.2
1996.	1019290.1	1017443.3	599.4	547.2	48.6	99.8	91.3
1997.	623576.2	623576.2	447.1	425.1	21.9	100.0	95.1
1998.	830558.6	830558.6	487.8	447.4	40.4	100.0	91.7
1999.	834235.4	834185.3	493.0	457.0	36.0	100.0	92.7
2000.	881499.2	881499.2	534.1	496.8	37.3	100.0	93.0
2001.	659041.1	653962.6	464.2	413.1	27.0	99.2	89.0

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	396.0	27.2	100.0	93.6
1958.	1101920.1	1101920.1	590.4	549.3	41.2	100.0	93.0
1959.	1155776.2	1130933.9	634.4	552.2	30.3	97.9	87.0
1960.	1058433.2	1049464.4	568.9	541.6	26.8	99.2	95.2
1961.	935842.6	932751.6	565.7	535.5	24.3	99.7	94.7
1962.	1001490.3	1001490.3	532.1	506.6	25.5	100.0	95.2
1963.	800071.3	800071.3	518.2	498.3	19.9	100.0	96.2
1964.	767892.4	767892.4	494.3	470.7	23.6	100.0	95.2
1965.	669134.8	669134.8	477.6	458.4	19.2	100.0	96.0
1966.	833386.4	833386.4	524.0	499.2	24.8	100.0	95.3
1967.	1015570.9	1015570.9	594.9	564.4	30.5	100.0	94.9
1968.	940258.2	933080.9	521.9	482.7	20.8	99.2	92.5
1969.	932656.4	931950.4	518.6	491.6	23.1	99.9	94.8
1970.	839660.9	839359.2	494.8	469.3	25.5	100.0	94.8
1971.	891551.8	889469.9	550.6	512.3	37.3	99.8	93.0
1972.	1447890.2	1406911.8	839.2	659.0	54.8	97.2	78.5
1973.	1126787.5	1126017.4	606.8	564.0	42.6	99.9	92.9
1974.	1134949.8	1122961.1	603.6	542.4	42.6	98.9	89.9
1975.	1054282.1	1054282.1	539.8	521.3	18.5	100.0	96.6
1976.	813845.6	813517.0	532.1	505.6	26.0	100.0	95.0
1977.	999719.9	997652.7	588.0	560.4	26.1	99.8	95.3
1978.	840461.9	840461.9	474.3	456.8	17.5	100.0	96.3
1979.	1082843.1	1064879.8	571.6	519.3	36.3	98.3	90.9
1980.	783070.0	783069.9	496.7	462.9	33.8	100.0	93.2
1981.	1000404.5	1000404.5	562.4	522.9	39.5	100.0	93.0
1982.	1018472.7	1018472.7	554.6	520.3	34.3	100.0	93.8
1983.	1286141.8	1283908.5	653.5	619.6	33.2	99.8	94.8
1984.	1013741.4	1013741.4	547.0	522.8	24.2	100.0	95.6
1985.	924335.1	911920.9	560.2	516.5	25.7	98.7	92.2
1986.	959843.1	959843.1	508.9	485.9	23.1	100.0	95.5
1987.	995421.2	995421.2	506.8	488.0	18.9	100.0	96.3
1988.	846875.8	843776.0	516.1	476.7	26.0	99.6	92.4
1989.	757483.8	757483.8	441.1	420.0	21.1	100.0	95.2
1991.	590710.4	588221.2	263.6	250.1	13.3	99.6	94.9
1992.	920824.1	920824.1	564.5	542.8	21.7	100.0	96.2

1993.	948857.9	943337.8	571.1	535.7	30.7	99.4	93.8
1994.	1013411.9	1013411.9	588.8	556.0	32.8	100.0	94.4
1995.	713668.0	711758.4	422.2	397.5	22.6	99.7	94.2
1996.	1019290.1	1017443.3	599.4	559.1	36.6	99.8	93.3
1997.	623576.2	623576.2	447.1	432.4	14.7	100.0	96.7
1998.	830558.6	830558.6	487.8	458.0	29.8	100.0	93.9
1999.	834235.4	834185.3	493.0	466.9	26.1	100.0	94.7
2000.	881499.2	881499.2	534.1	506.0	28.1	100.0	94.7
2001.	659041.1	653962.6	464.2	418.3	21.9	99.2	90.1

HS 9

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	404.4	18.8	100.0	95.6
1958.	1101920.1	1101920.1	590.4	560.5	30.0	100.0	94.9
1959.	1155776.2	1130933.9	634.4	560.2	22.3	97.9	88.3
1960.	1058433.2	1049464.4	568.9	550.7	17.6	99.2	96.8
1961.	935842.6	932751.6	565.7	542.6	17.2	99.7	95.9
1962.	1001490.3	1001490.3	532.1	514.0	18.1	100.0	96.6
1963.	800071.3	800071.3	518.2	505.6	12.6	100.0	97.6
1964.	767892.4	767892.4	494.3	478.9	15.4	100.0	96.9
1965.	669134.8	669134.8	477.6	465.2	12.4	100.0	97.4
1966.	833386.4	833386.4	524.0	506.3	17.7	100.0	96.6
1967.	1015570.9	1015570.9	594.9	572.7	22.1	100.0	96.3
1968.	940258.2	933080.9	521.9	489.5	14.0	99.2	93.8
1969.	932656.4	931950.4	518.6	498.2	16.5	99.9	96.1
1970.	839660.9	839359.2	494.8	476.9	17.8	100.0	96.4
1971.	891551.8	889469.9	550.6	523.6	26.0	99.8	95.1
1972.	1447890.2	1406911.8	839.2	674.6	39.1	97.2	80.4
1973.	1126787.5	1126017.4	606.8	577.9	28.6	99.9	95.2
1974.	1134949.8	1122961.1	603.6	552.1	32.9	98.9	91.5
1975.	1054282.1	1054282.1	539.8	527.7	12.1	100.0	97.8
1976.	813845.6	813517.0	532.1	512.0	19.7	100.0	96.2
1977.	999719.9	997652.7	588.0	568.2	18.2	99.8	96.6
1978.	840461.9	840461.9	474.3	463.7	10.7	100.0	97.8
1979.	1082843.1	1064879.8	571.6	527.2	28.4	98.3	92.2
1980.	783070.0	783069.9	496.7	471.8	24.9	100.0	95.0
1981.	1000404.5	1000404.5	562.4	533.3	29.1	100.0	94.8
1982.	1018472.7	1018472.7	554.6	530.2	24.4	100.0	95.6
1983.	1286141.8	1283908.5	653.5	631.5	21.4	99.8	96.6
1984.	1013741.4	1013741.4	547.0	530.0	17.0	100.0	96.9
1985.	924335.1	911920.9	560.2	525.4	16.7	98.7	93.8
1986.	959843.1	959843.1	508.9	493.0	15.9	100.0	96.9
1987.	995421.2	995421.2	506.8	494.3	12.6	100.0	97.5
1988.	846875.8	843776.0	516.1	483.8	18.9	99.6	93.7
1989.	757483.8	757483.8	441.1	425.7	15.4	100.0	96.5
1991.	590710.4	588221.2	263.6	254.0	9.5	99.6	96.4
1992.	920824.1	920824.1	564.5	550.1	14.4	100.0	97.5
1993.	948857.9	943337.8	571.1	545.5	20.9	99.4	95.5
1994.	1013411.9	1013411.9	588.8	566.1	22.7	100.0	96.1
1995.	713668.0	711758.4	422.2	404.6	15.5	99.7	95.8

1996.	1019290.1	1017443.3	599.4	569.3	26.5	99.8	95.0
1997.	623576.2	623576.2	447.1	437.6	9.5	100.0	97.9
1998.	830558.6	830558.6	487.8	467.0	20.8	100.0	95.7
1999.	834235.4	834185.3	493.0	475.3	17.7	100.0	96.4
2000.	881499.2	881499.2	534.1	515.1	19.0	100.0	96.4
2001.	659041.1	653962.6	464.2	423.2	16.9	99.2	91.2

HS 10

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	409.3	13.8	100.0	96.7
1958.	1101920.1	1101920.1	590.4	570.7	19.7	100.0	96.7
1959.	1155776.2	1130933.9	634.4	565.7	16.8	97.9	89.2
1960.	1058433.2	1049464.4	568.9	557.5	10.9	99.2	98.0
1961.	935842.6	932751.6	565.7	547.1	12.7	99.7	96.7
1962.	1001490.3	1001490.3	532.1	520.0	12.2	100.0	97.7
1963.	800071.3	800071.3	518.2	509.6	8.6	100.0	98.3
1964.	767892.4	767892.4	494.3	483.2	11.1	100.0	97.8
1965.	669134.8	669134.8	477.6	469.3	8.3	100.0	98.3
1966.	833386.4	833386.4	524.0	511.0	13.0	100.0	97.5
1967.	1015570.9	1015570.9	594.9	579.5	15.3	100.0	97.4
1968.	940258.2	933080.9	521.9	493.6	9.9	99.2	94.6
1969.	932656.4	931950.4	518.6	503.2	11.5	99.9	97.0
1970.	839660.9	839359.2	494.8	482.7	12.1	100.0	97.6
1971.	891551.8	889469.9	550.6	532.5	17.1	99.8	96.7
1972.	1447890.2	1406911.8	839.2	683.7	30.1	97.2	81.5
1973.	1126787.5	1126017.4	606.8	587.0	19.5	99.9	96.7
1974.	1134949.8	1122961.1	603.6	560.1	25.0	98.9	92.8
1975.	1054282.1	1054282.1	539.8	531.7	8.1	100.0	98.5
1976.	813845.6	813517.0	532.1	517.4	14.3	100.0	97.2
1977.	999719.9	997652.7	588.0	573.1	13.4	99.8	97.5
1978.	840461.9	840461.9	474.3	466.9	7.4	100.0	98.4
1979.	1082843.1	1064879.8	571.6	534.0	21.7	98.3	93.4
1980.	783070.0	783069.9	496.7	478.2	18.5	100.0	96.3
1981.	1000404.5	1000404.5	562.4	540.9	21.5	100.0	96.2
1982.	1018472.7	1018472.7	554.6	538.4	16.2	100.0	97.1
1983.	1286141.8	1283908.5	653.5	637.9	15.0	99.8	97.6
1984.	1013741.4	1013741.4	547.0	534.8	12.2	100.0	97.8
1985.	924335.1	911920.9	560.2	530.1	12.1	98.7	94.6
1986.	959843.1	959843.1	508.9	498.4	10.6	100.0	97.9
1987.	995421.2	995421.2	506.8	498.1	8.7	100.0	98.3
1988.	846875.8	843776.0	516.1	489.3	13.4	99.6	94.8
1989.	757483.8	757483.8	441.1	429.6	11.5	100.0	97.4
1991.	590710.4	588221.2	263.6	257.2	6.3	99.6	97.6
1992.	920824.1	920824.1	564.5	554.6	9.9	100.0	98.3
1993.	948857.9	943337.8	571.1	551.8	14.5	99.4	96.6
1994.	1013411.9	1013411.9	588.8	572.6	16.2	100.0	97.3
1995.	713668.0	711758.4	422.2	409.7	10.4	99.7	97.0
1996.	1019290.1	1017443.3	599.4	576.6	19.1	99.8	96.2
1997.	623576.2	623576.2	447.1	440.6	6.5	100.0	98.6
1998.	830558.6	830558.6	487.8	473.0	14.7	100.0	97.0

1999.	834235.4	834185.3	493.0	480.7	12.3	100.0	97.5
2000.	881499.2	881499.2	534.1	521.4	12.8	100.0	97.6
2001.	659041.1	653962.6	464.2	426.9	13.3	99.2	92.0

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS IN (lb)	TSS Rem (lb)	TSS Out (lb)	Flow Treated (%)	TSS Removal (%)
1957.	660548.1	660548.1	423.2	416.5	6.7	100.0	98.4
1958.	1101920.1	1101920.1	590.4	579.7	10.7	100.0	98.2
1959.	1155776.2	1130933.9	634.4	573.8	8.7	97.9	90.4
1960.	1058433.2	1049464.4	568.9	562.7	5.7	99.2	98.9
1961.	935842.6	932751.6	565.7	553.5	6.3	99.7	97.9
1962.	1001490.3	1001490.3	532.1	526.3	5.9	100.0	98.9
1963.	800071.3	800071.3	518.2	514.3	3.8	100.0	99.3
1964.	767892.4	767892.4	494.3	489.0	5.3	100.0	98.9
1965.	669134.8	669134.8	477.6	473.4	4.2	100.0	99.1
1966.	833386.4	833386.4	524.0	517.9	6.1	100.0	98.8
1967.	1015570.9	1015570.9	594.9	587.5	7.4	100.0	98.8
1968.	940258.2	933080.9	521.9	498.0	5.4	99.2	95.4
1969.	932656.4	931950.4	518.6	508.6	6.2	99.9	98.1
1970.	839660.9	839359.2	494.8	488.5	6.3	100.0	98.7
1971.	891551.8	889469.9	550.6	540.7	8.9	99.8	98.2
1972.	1447890.2	1406911.8	839.2	696.6	17.2	97.2	83.0
1973.	1126787.5	1126017.4	606.8	596.6	9.9	99.9	98.3
1974.	1134949.8	1122961.1	603.6	571.8	13.2	98.9	94.7
1975.	1054282.1	1054282.1	539.8	536.0	3.8	100.0	99.3
1976.	813845.6	813517.0	532.1	524.4	7.2	100.0	98.6
1977.	999719.9	997652.7	588.0	579.1	7.4	99.8	98.5
1978.	840461.9	840461.9	474.3	470.7	3.6	100.0	99.2
1979.	1082843.1	1064879.8	571.6	544.2	11.4	98.3	95.2
1980.	783070.0	783069.9	496.7	488.0	8.7	100.0	98.2
1981.	1000404.5	1000404.5	562.4	550.5	11.9	100.0	97.9
1982.	1018472.7	1018472.7	554.6	545.9	8.7	100.0	98.4
1983.	1286141.8	1283908.5	653.5	645.2	7.6	99.8	98.7
1984.	1013741.4	1013741.4	547.0	541.6	5.4	100.0	99.0
1985.	924335.1	911920.9	560.2	535.8	6.4	98.7	95.6
1986.	959843.1	959843.1	508.9	503.9	5.0	100.0	99.0
1987.	995421.2	995421.2	506.8	502.6	4.2	100.0	99.2
1988.	846875.8	843776.0	516.1	495.4	7.2	99.6	96.0
1989.	757483.8	757483.8	441.1	435.8	5.3	100.0	98.8
1991.	590710.4	588221.2	263.6	260.3	3.2	99.6	98.8
1992.	920824.1	920824.1	564.5	559.9	4.6	100.0	99.2
1993.	948857.9	943337.8	571.1	558.4	8.0	99.4	97.8
1994.	1013411.9	1013411.9	588.8	580.5	8.3	100.0	98.6
1995.	713668.0	711758.4	422.2	414.6	5.5	99.7	98.2
1996.	1019290.1	1017443.3	599.4	586.5	9.2	99.8	97.8
1997.	623576.2	623576.2	447.1	444.4	2.7	100.0	99.4
1998.	830558.6	830558.6	487.8	480.5	7.3	100.0	98.5
1999.	834235.4	834185.3	493.0	486.8	6.2	100.0	98.7
2000.	881499.2	881499.2	534.1	527.9	6.3	100.0	98.8
2001.	659041.1	653962.6	464.2	433.2	7.0	99.2	93.3

```
**************************************************
*  Summary of Quantity and Quality Results at      *
*  Location        200  INFlow in cfs.             *
*  Values are instantaneous at indicated time step *
**************************************************

  GoVenture - Franklin Street, Worcester
  DMH#3

     Date      Time         Flow   Total Su
 Mo/Da/Year  Hr:Min         cfs    mg/l
 ----------  -------     -------  --------
Flow wtd means.....        0.006      101.
Flow wtd std devs..        0.029       68.
Maximum value......        2.122      294.
Minimum value......        0.000        0.
Total loads........     3700685.    23255.
                        Cub-Ft     POUNDS

===> Runoff simulation ended normally.

===> SWMM 4.4    simulation ended normally.
     Always check output file for possible warning messages.

*****************************************************
*       SWMM 4.4    Simulation Date and Time Summary  *
*****************************************************
* Starting Date... January     5, 2022               *
*          Time...         14:16:41.667              *
*   Ending Date... January     5, 2022               *
*          Time...         14:16:49.488              *
*  Elapsed Time...               0.130 minutes.      *
*  Elapsed Time...               7.821 seconds.      *
*****************************************************
```

3.1
OPERATION AND MAINTENANCE

STORMWATER OPERATION, MAINTENANCE AND POLLUTION PREVENTION PLAN

Residential Apartment Complex
Franklin
Worcester, Massachusetts

RESPONSIBLE PARTY DURING CONSTRUCTION:
T.B.D.
N/A

RESPONSIBLE PARTY POST CONSTRUCTION:
GoVenture Capital Group, LLC
Brendan Gove, Manager
10 E. Worcester Street, Suite 3A
Worcester, Massachusetts 01605

BEST MANAGEMENT PRACTICES

To prevent the migration of soils, Best Management Practices (BMP's) shall be employed. During construction, hay bales and silt fence will be installed as shown on the plans and also at additional locations on an as needed basis to provide sufficient erosion controls on the site. These components shall be installed to catch and trap the migrating soil materials and pollutants.

All applicable BMP's listed below and in the Department of Environmental Protection's Stormwater Management Handbooks (Volume1: Overview of Massachusetts Stormwater Management Standards and Volume 2: Technical Guide for Compliance with Massachusetts Stormwater Management Standards) dated January 2008 (as amended), shall be incorporated in this project.

INSPECTION AND MAINTENANCE (DURING CONSTRUCTION)

1. At all times, hay bales, siltation fabric fencing and wooden stakes sufficient to construct sedimentation control barrier a minimum of 50 feet long will be stockpiled on the site in order to repair established barriers which may have been damaged or breached.

2. Necessary erosion controls shall be in place prior to any clearing or construction on the site. Construction sequence shall be phased in such a manner that the on-site detention basins are stabilized and functioning prior to the establishment of any new impervious areas on the site. The Contractor shall provide temporary stilling or settling basins as needed to catch and trap any migrating soil materials and pollutants from the construction areas.

3. An inspection of all erosion control and stormwater management systems shall be conducted at least once every fourteen (14) calendar days and following significant storm events. Where sites have been finally or temporarily stabilized, or runoff is unlikely due to

winter conditions, such inspections shall be conducted at least once every month. (EPA SWPPP IS REQUIRED FOR THIS PROJECT)

In case of any noted breach or failure, the General Contractor shall immediately make appropriate repairs to any erosion control system and notify the engineer of any problems involving storm water management systems.

A significant storm event shall be defined as all or one of the following thresholds.

a. Any storm in which rain is predicted to last for twelve consecutive hours or more.
b. Any storm for which a flash flood watch or warning is issued.
c. Any single storm predicted to have a cumulative rainfall of greater than one inch.
d. Any storm not meeting the previous three thresholds but which would mark a third consecutive day of measurable rainfall.

4. If site inspections identify BMPs not operating effectively, maintenance must be performed as soon as possible and before the next storm event.

5. If BMPs need modification or additional BMPs need to be added, implementation must be completed before the next storm if practicable. If implementation before the next storm event is impracticable, the situation must be documented in the construction log and alternative BMPs must be implemented as soon as possible

6. The General Contractor shall also inspect the erosion control and stormwater management systems at times of significant increase in surface water runoff due to rapid thawing when the risk of failure of erosion control measures is significant.

7. In such instances as remedial action is necessary, the General Contractor shall repair any and all significant deficiencies in erosion control systems within two days.

8. The Department of Public Works and/or Conservation Commission shall be notified of any significant failure of storm water management systems and erosion and sediment control measures and shall be notified of any release of pollutants to a water body (stream, brook, pond, etc.).

9. The General Contractor shall remove the sediment from behind the fence of the sedimentation control barrier when the accumulated sediment has reached one-half of the original installed height of the barrier.

INSPECTION AND MAINTENANCE (POST-CONSTRUCTION)

It is the agreement of the responsible parties to finance, inspect, and perform (respectfully) the long-term maintenance of the erosion control devices and the stormwater management systems within the limits stated below.

1. A visual inspection of all erosion control and stormwater management systems shall be conducted by the above identified person(s) a minimum of once per month and after every major storm during the first six months of operation (a portion of that time must be in the growing season). Thorough investigations shall be conducted twice a year. Monthly maintenance requirements may be adjusted based upon the results obtained from the first year of operation.

2. Roads and parking lots shall be swept at least twice per year and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of off-site in accordance with MADEP and other applicable requirements.

3. Accumulated sediment shall be removed a minimum of one time per year by means of a clamshell bucket or equivalent from the bottom of the deep sump catch basins and manhole. Disposal of accumulated sediment and pollutants must be in accordance with local, state, and federal guidelines and requirements.

4. Hydroworks Units shall be inspected and maintained per the manufactures recommendations or as needed.

5. All resulting sweepings or sediment removed from catch basins, Hydroworks Units, and manhole connections shall be collected and properly disposed of off-site in accordance with MADEP and other applicable requirements.

6. **Maintenance Schedule**

Structure Type	Inspection	Maintenance	Task	Cost Estimate	Owner
Deep Sump Catchbasin	Quarterly and at the end of the foliage and snow removal seasons	Quarterly, or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe	Clean/Remove Debris and Sediment	$1,000* *($2,000/Year)*	Land Owner
Hydroworks Unit	Annually in the spring	Annually in the spring	Clean/Remove Debris and sediment	$1,000* *($1,000/Year)*	Land Owner
StormTech Underground Storage	Seasonally	Six Months	Clean/Remove Debris	$750* *($750/Year)*	Land Owner
	Total Annual Estimated Cost			$2,750/Year	Land Owner

LONG TERM POLLUTION PREVENTION PLAN

1. Access drives to the site shall be swept on an annual basis with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.

2. Trash and other debris shall be removed from the drives periodically as needed. Full inspection of the site shall be made on a semi-annual basis to ensure clean and neat appearance to the site. This measure will help in the overall performance of the onsite systems.

3. Trash and other debris shall be removed from landscaped and planted areas periodically as needed. Full inspection of the site shall be made on a semi-annual basis to ensure clean and neat appearance to the site. This measure will help in the overall performance of the onsite systems.

4. Reseed any bare areas as soon as they occur. Erosion control measures shall be installed in these areas to prevent deposits of sediment from entering the drainage system

5. Grass shall be maintained at a minimum blade height of two to three inches and only 1/3 of the plant height shall be removed at a time.

6. Plants shall be pruned as necessary. The use of fertilizers will be kept at a level consistent with typical residential use. Fertilizer will be applied a maximum of once to twice per year during the initial planting and stabilization of landscaped areas. Once plants are established and growing well fertilizer will be applied judiciously.

7. The use of pesticides will be kept at a level consistent with typical residential use. Where possible mechanical methods (i.e. pest traps) or biological methods (i.e. beneficial insects) of pest control shall be implemented. If pesticides (insecticide, herbicide, and fungicide) are required to be used a pesticide which poses the lowest risk to public health and the environment shall be used.

8. Pet waste shall be disposed of in accordance with local regulations. Pet waste shall not be disposed of in a storm drain or catch basin.

Inspection Log

Franklin Street, Worcester, Massachusetts

DATE	ACTION	RESULT	PERFORMED BY

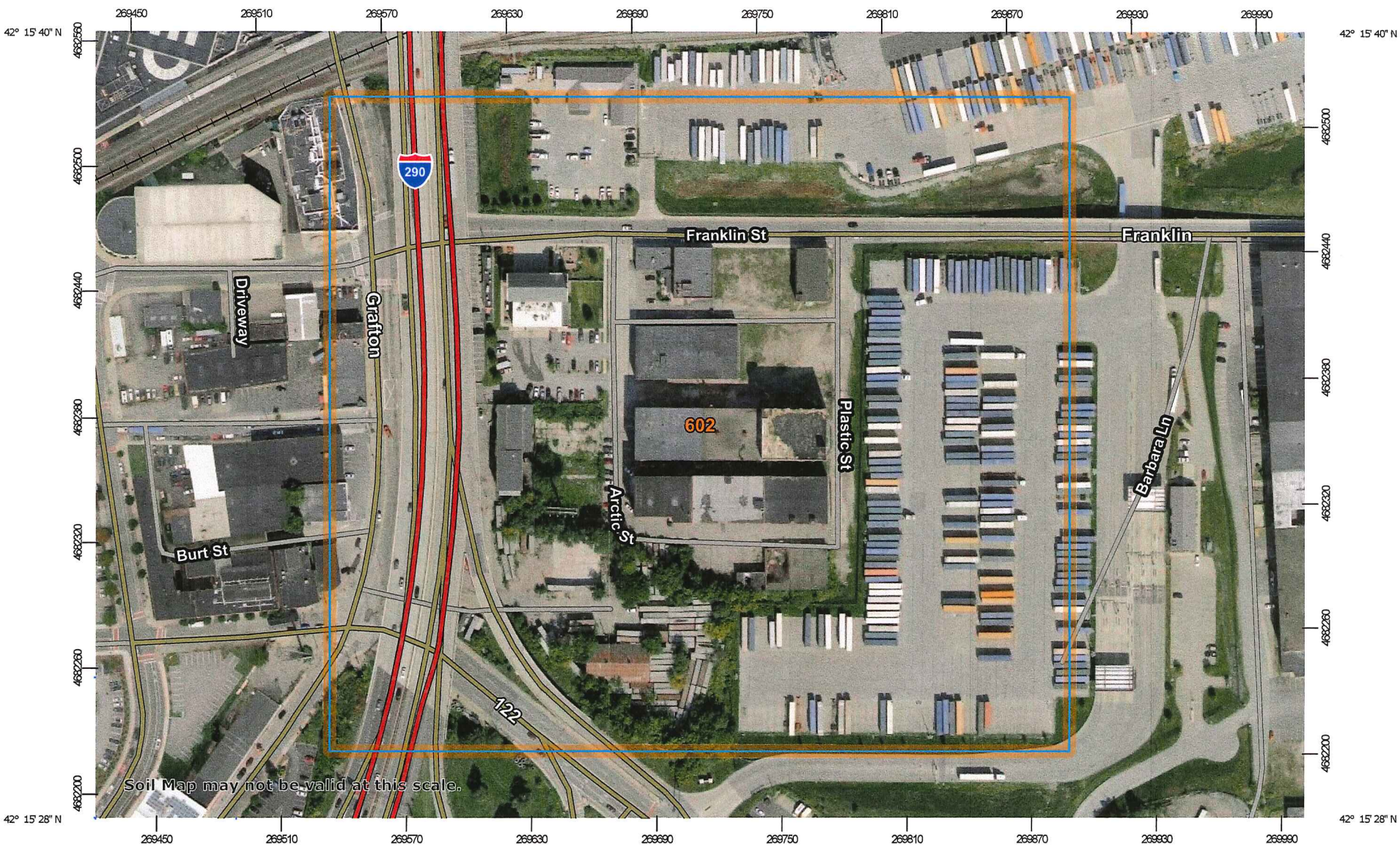
Maintenance Log

Franklin Street, Worcester, Massachusetts

DATE	ACTION	PERFORMED BY

FIGURE 1
LOCUS MAP AND SOILS MAP

Soil Map—Worcester County, Massachusetts, Northeastern Part



Map Scale: 1:2,650 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 16, Sep 3, 2021

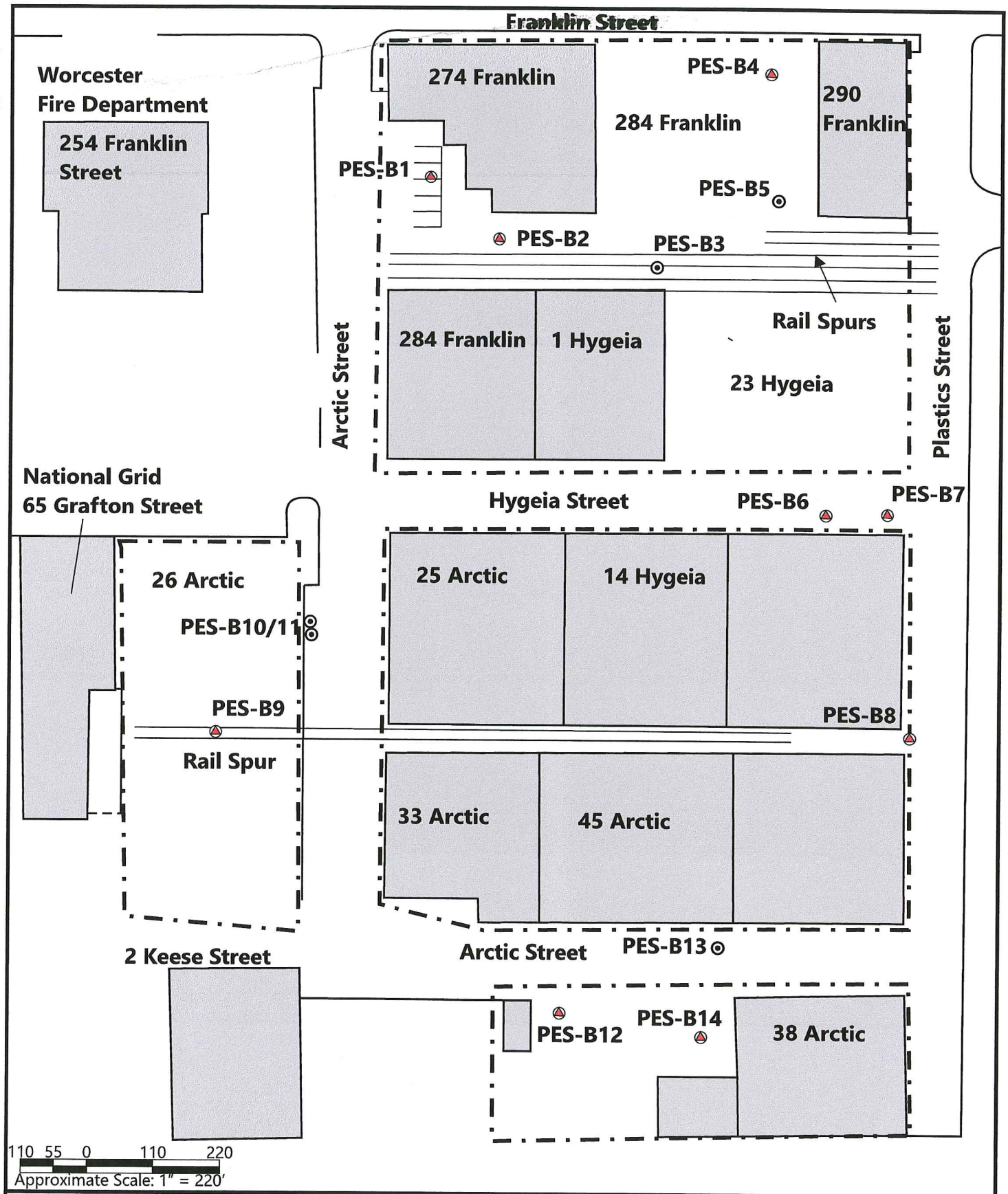
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 16, 2020—Oct 1, 2020

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
602	Urban land	27.6	100.0%
Totals for Area of Interest		**27.6**	**100.0%**



PARTNER
495 Old Connecticut Path
Framingham, Massachusetts 01701
Project Number: 21-323856.2

N

Legend

Subject Property

Boring Location

Monitoring Well

Sample Location Map

Figure	Prepared By	Date
3	S. Barta	July 2021

274 Franklin Street
Worcester, Massachusetts 01604

APPENDIX A: BORING LOGS

PARTNER

Boring Identification:	PES-B1		Page 1 of 1
Boring Location:	REC #1 Gas Tank	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	16.18
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/44
2				4" Asphalt over 4" Binder over 8" Brown fine to medium SAND and small GRAVEL over 28" fine to medium dark brown SAND with brick fragments, ash, wood ash.	
3			SM		
4		1.1			
5					
6	PES-B1-6	2.2			Penetration/Recovery: 60/46
7					
8			SM	10" fine to medium dark brown SAND with brick fragments, ash, wood ash over 36" light brown fine to medium SAND with small Gravel	
9		<1			
10					
11					Penetration/Recovery: 60/60
12			SM		
13				12" Blowback over 48" light brown fine to medium SAND with small Gravel	
14		<1			
15					
16					Penetration/Recovery: 60/36
17					
18			SM	36" light brown fine to medium SAND with small Gravel with faint petroleum odor	
19					
20					End of Boring: Scope of Work

Boring Identification:	PES-B2		Page 1 of 1
Boring Location:	REC # 2 Oil Room	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	15.4
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/50
2					
3			SM	4" Asphalt over 6" Binder over 30" dark brown fine to medium SAND with brick, ash, coal fragments, slag over 10" light brown medium to coarse SAND	
4	PES-B2-4	5.1			
5					
6					Penetration/Recovery: 60/56
7					
8		3.7	SM	18" light brown medium to coarse SAND over 38" light brown fine to medium SAND	
9					
10					
11					Penetration/Recovery: 60/60
12					
13		2.3		60" light brown fine to medium SAND	
14					
15					
16					Penetration/Recovery: 60/44
17					
18			SM	44" light brown fine to medium SAND	
19					
20					End of Boring: Scope of Work

Boring Identification:	PES-B3		Page 1 of 1
Boring Location:	REC #3 Foundry/Rail Road Spur	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/46
2					
3		<1	SM	46" black fine SAND with brick, ash, coal ash	
4					
5	PES-B3-5	1.7			
6					Penetration/Recovery: 60/52
7		<1			
8			SM	52" brown fine to coarse SAND	
9					
10					
11					Penetration/Recovery: 60/50
12					
13		<1		50" brown fine to coarse SAND	
14					
15					End of Boring: Scope of Work

Boring Identification:	PES-B4		Page 1 of 1
Boring Location:	REC # 4 Gas Tank	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	15.1
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/40
2					
3		<1	SM	2" Loam over 38" black fine to medium SAND with brick and coal ash	
4					
5					
6		3.4			Penetration/Recovery: 60/48
7					
8	PES-B4-8	3237.0	SM	10 light brown coarse SAND over 10" light brown fine SAND with faint petroleum odor over 14" grey fine SAND with strong petroleum odor over 4" light brown SAND with faint petroleum odor	
9					
10		239.0			
11					Penetration/Recovery: 60/40
12		55.1			
13			SM	30" light brown SAND without petroleum odor over 6" brown fine SAND over 4" black fine SAND	
14					
15					
16					Penetration/Recovery: 60/60
17					
18			SM	4" black fine SAND over 34" brown fine to medium SAND	
19					
20					End of Boring: Scope of Work

Boring Identification:	PES-B5		Page 1 of 1
Boring Location:	REC # 5 Forge Shot	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/30
2					
3		<1	SM	2" Loam over 36" brown medium SAND with brick and some GRAVEL	
4					
5					
6					Penetration/Recovery: 60/42
7					
8		<1	SM	42" brown medium SAND with brick and some GRAVEL	
9					
10	PES-B5-10				End of Boring: Refusal

Boring Identification:	PES-B6		Page 1 of 1
Boring Location:	REC # 6 Oil Tanks	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	14.22
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/52
2					
3		<1	SM	52" black fine to medium SAND with coal ash and brick	
4					
5					
6					Penetration/Recovery: 60/54
7					
8			SM	6" black fine to medium SAND with coal ash and brick over 16" light brown coarse SAND over 16" light brown fine SAND over 16" grey fine SAND with petroleum odor	
9	PES-B6-9	760.1			
10					
11					Penetration/Recovery: 60/54
12					
13		54.7	SM	10" light brown fine sand over 24" grey fine SAND with petroleum odor over 14" light brown fine sand	
14					
15					
16					Penetration/Recovery: 60/60
17					
18			SM	60" light brown fine sand	
19					
20					End of Boring: Scope of Work

Boring Identification:	PES-B7		Page 1 of 1
Boring Location:	REC # 7 Oil Tanks	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	14.25
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/44
2					
3		<1	SM	2" Asphalt over 42" black fine SAND with coal ash	
4					
5					
6					Penetration/Recovery: 60/52
7					
8		<1	SM	8" black fine SAND with coal ash and slag over 44" light brown fine SAND	
9					
10					
11					Penetration/Recovery: 60/52
12					
13				52" light brown fine SAND	
14	PES-B7-14	<1			
15					
16					Penetration/Recovery: 60/60
17					
18			SM	60" light brown fine SAND	
19					
20					End of Boring: Scope of Work

Boring Identification:	PES-B8		Page 1 of 1
Boring Location:	REC # 8 Oil House	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	11.83
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/48
2					
3		<1	SM	28" black fine to medium SAND with coal and coal ash over 8" light brown coarse SAND over 22" light brown fine SAND	
4					
5					
6		<1			Penetration/Recovery: 60/48
7					
8			SM	16" light brown coarse SAND over 16" light brown fine SAND over 16" light grey fine SAND with faint petroleum odor	
9					
10	PES-B8-10	16.8			
11					Penetration/Recovery: 60/44
12					
13			SM	44" light brown fine SAND	
14					
15					End of Boring: Scope of Work

Boring Identification:	PES-B9		Page 1 of 1
Boring Location:	REC # 9 Rail Spur (No access to crane pit)	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	14.7
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1	PES-B9-1-2				Penetration/Recovery: 60/60
2					
3			SM	30" dark brown fine SAND with coal and brick fragments	
4					
5					Heavy Rain no PID
6					Penetration/Recovery: 60/48
7					
8			SM	48" light brown fine to medium SAND	
9					
10					Heavy Rain no PID
11					Penetration/Recovery: 60/52
12					
13				52" light brown fine to medium SAND	
14					
15					Heavy Rain no PID
16					Penetration/Recovery: 60/60
17					
18			SM	60" light brown fine to medium SAND	
19					
20					Heavy Rain no PID

Boring Identification:	PES-B10		Page 1 of 1
Boring Location:	REC # 10 Gas Retorts	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
20	NA			2" Asphalt over Concrete	End of Boring: Refusal

Boring Identification:	PES-B11	Page 1 of 1	
Boring Location:	REC # 10 Gas Retorts	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
20	NA			2" Asphalt over Concrete	End of Boring: Refusal

Boring Identification:	PES-B12		Page 1 of 1
Boring Location:	REC # 12 Gas Tank	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	15.1
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/42
2					
3			SM	2" Asphalt over 40" coal ash and slag	
4					
5					Heavy Rain no PID
6					Penetration/Recovery: 60/30
7					
8			SM	30" coal ash and slag	
9					
10					Heavy Rain no PID
11					Penetration/Recovery: 60/22
12					
13	PES-B12-13			22" coal ash and slag	
14					
15					Heavy Rain no PID
16					Penetration/Recovery: 60/18
17					
18			SM	18" coal ash and slag	
19					Heavy Rain no PID
20					End of Boring: Scope of Work

Boring Identification:	PES-B13		Page 1 of 1
Boring Location:	REC # 13 Rail Road Spur / Gas Tank	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/30
2					
3		<1	SM	4" Asphalt over 26" black fine to medium SAND with brick ash coal	
4					
5					
6					Penetration/Recovery: 60/30
7					
8			SM	30" black fine to medium SAND with brick ash coal	
9					
10	PES-B13-10	<1			
11		<1			Penetration/Recovery: 60/40
12					Wet at 12'
13				40" brown fine to medium SAND	
14					
15					End of Boring: Scope of Work

Boring Identification:	PES-B14		Page 1 of 1
Boring Location:	REC # 14 Chemical & Drug Storage	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	15.05
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/30
2					
3			SM	30" black fine SAND with brick coal ash	
4					
5					Heavy Rain no PID
6					Penetration/Recovery: 60/52
7					
8			SM	52" black fine SAND with brick coal ash	
9					
10					Heavy Rain no PID
11					Penetration/Recovery: 60/60
12					
13	PES-B14-13		SM	60" black fine SAND with brick coal ash	
14					
15					Heavy Rain no PID
16					Penetration/Recovery: 36/12
17				12" black fine SAND with brick coal ash	
18			SM		End of Boring: Refusal

Boring Identification:	PES-B7		Page 1 of 1
Boring Location:	REC # 7 Oil Tanks	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	14.25
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/44
2					
3		<1	SM	2" Asphalt over 42" black fine SAND with coal ash	
4					
5					
6					Penetration/Recovery: 60/52
7					
8		<1	SM	8" black fine SAND with coal ash and slag over 44" light brown fine SAND	
9					
10					
11					Penetration/Recovery: 60/52
12					
13				52" light brown fine SAND	
14	PES-B7-14	<1			
15					
16					Penetration/Recovery: 60/60
17					
18			SM	60" light brown fine SAND	
19					
20					End of Boring: Scope of Work

Boring Identification:	PES-B8		Page 1 of 1
Boring Location:	REC # 8 Oil House	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	11.83
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/48
2					
3		<1	SM	28" black fine to medium SAND with coal and coal ash over 8" light brown coarse SAND over 22" light brown fine SAND	
4					
5					
6		<1			Penetration/Recovery: 60/48
7					
8			SM	16" light brown coarse SAND over 16" light brown fine SAND over 16" light grey fine SAND with faint petroleum odor	
9					
10	PES-B8-10	16.8			
11					Penetration/Recovery: 60/44
12					
13			SM	44" light brown fine SAND	
14					
15					End of Boring: Scope of Work

Boring Identification:	PES-B9		Page 1 of 1
Boring Location:	REC # 9 Rail Spur (No access to crane pit)	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	14.7
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1	PES-B9-1-2				Penetration/Recovery: 60/60
2					
3			SM	30" dark brown fine SAND with coal and brick fragments	
4					
5					Heavy Rain no PID
6					Penetration/Recovery: 60/48
7					
8			SM	48" light brown fine to medium SAND	
9					
10					Heavy Rain no PID
11					Penetration/Recovery: 60/52
12					
13				52" light brown fine to medium SAND	
14					
15					Heavy Rain no PID
16					Penetration/Recovery: 60/60
17					
18			SM	60" light brown fine to medium SAND	
19					
20					Heavy Rain no PID

Boring Identification:	PES-B10		Page 1 of 1
Boring Location:	REC # 10 Gas Retorts	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
20	NA			2" Asphalt over Concrete	End of Boring: Refusal

Boring Identification:	PES-B11	Page 1 of 1	
Boring Location:	REC # 10 Gas Retorts	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
20	NA			2" Asphalt over Concrete	End of Boring: Refusal

Boring Identification:	PES-B12		Page 1 of 1
Boring Location:	REC # 12 Gas Tank	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	15.1
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/42
2					
3			SM	2" Asphalt over 40" coal ash and slag	
4					
5					Heavy Rain no PID
6					Penetration/Recovery: 60/30
7					
8			SM	30" coal ash and slag	
9					
10					Heavy Rain no PID
11					Penetration/Recovery: 60/22
12					
13	PES-B12-13			22" coal ash and slag	
14					
15					Heavy Rain no PID
16					Penetration/Recovery: 60/18
17					
18			SM	18" coal ash and slag	
19					Heavy Rain no PID
20					End of Boring: Scope of Work

Boring Identification:	PES-B13		Page 1 of 1
Boring Location:	REC # 13 Rail Road Spur / Gas Tank	Date Started:	7.6.2021
Site Address:	274 Franklin Street	Date Completed:	7.6.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	NA
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

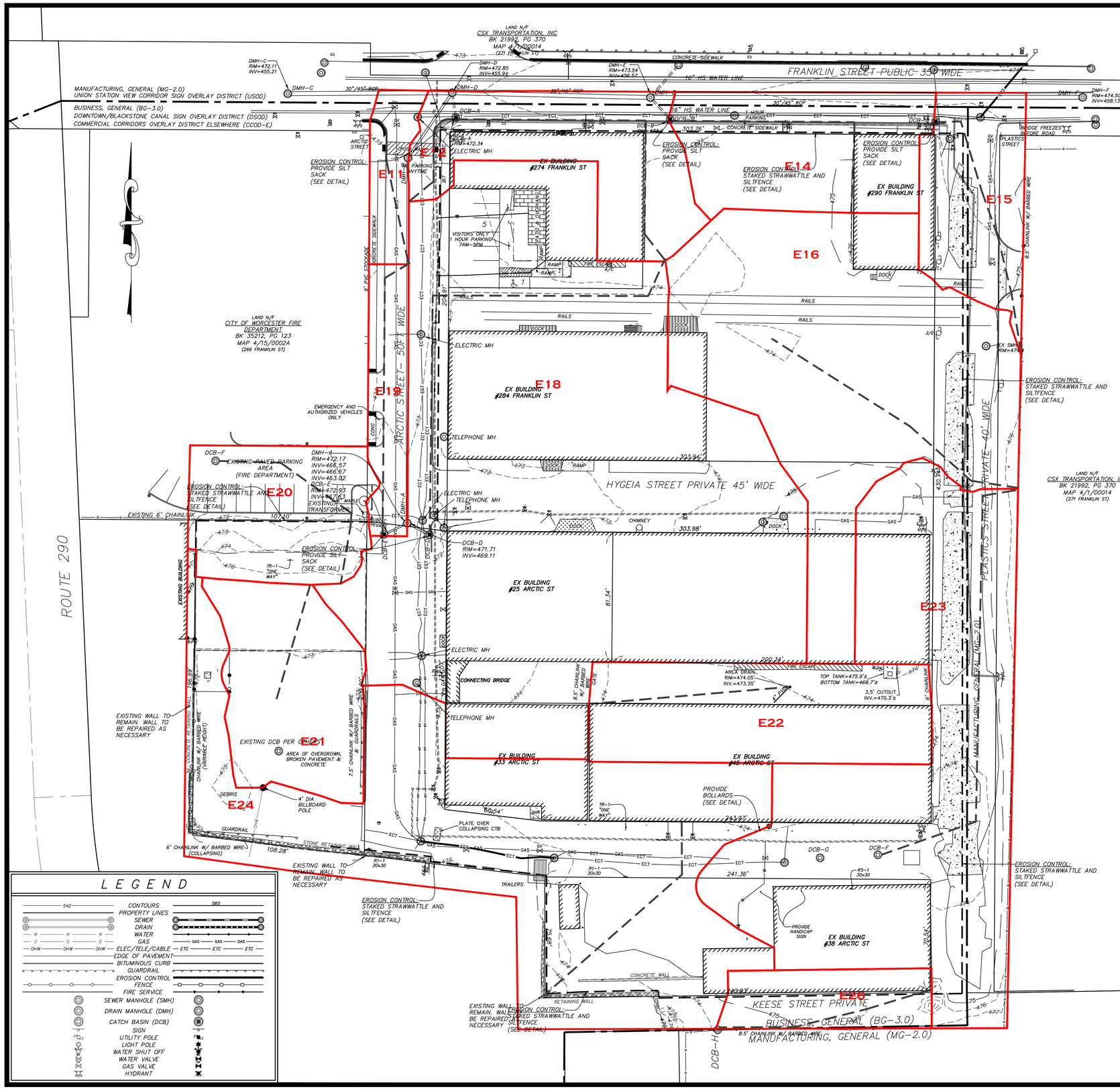
Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/30
2					
3		<1	SM	4" Asphalt over 26" black fine to medium SAND with brick ash coal	
4					
5					
6					Penetration/Recovery: 60/30
7					
8			SM	30" black fine to medium SAND with brick ash coal	
9					
10	PES-B13-10	<1			
11		<1			Penetration/Recovery: 60/40
12					Wet at 12'
13				40" brown fine to medium SAND	
14					
15					End of Boring: Scope of Work

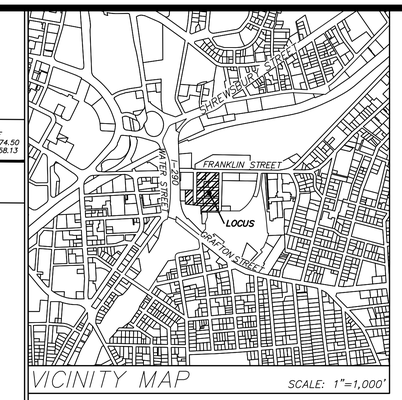
Boring Identification:	PES-B14		Page 1 of 1
Boring Location:	REC # 14 Chemical & Drug Storage	Date Started:	7.9.2021
Site Address:	274 Franklin Street	Date Completed:	7.9.2021
	Worcester, Massachusetts 01604	Depth to Groundwater (feet bgs):	15.05
Project Number:	21-323856.2	Field Technician:	SWB
Drill Rig Type:	Geoprobe Direct Push	PARTNER	
Sampling Equipment:	Macrocore Barrel	495 Old Connecticut Path	
Borehole Diameter:	3.25	Framingham, Massachusetts 01701	

Depth	Sample	PID	USCS	Description	Notes
1					Penetration/Recovery: 60/30
2					
3			SM	30" black fine SAND with brick coal ash	
4					
5					Heavy Rain no PID
6					Penetration/Recovery: 60/52
7					
8			SM	52" black fine SAND with brick coal ash	
9					
10					Heavy Rain no PID
11					Penetration/Recovery: 60/60
12					
13	PES-B14-13		SM	60" black fine SAND with brick coal ash	
14					
15					Heavy Rain no PID
16					Penetration/Recovery: 36/12
17				12" black fine SAND with brick coal ash	
18			SM		End of Boring: Refusal

FIGURE 2
PRE-DEVELOMPENT WATERSHED MAP

FIGURE 3
POST-DEVELOMPENT WATERSHED MAP





VICINITY MAP SCALE: 1"=1,000'

PARKING CALCULATION:
MULTI-FAMILY RESIDENTIAL CCOD-E DISTRICT

PER ZONING ORDINANCE
1 SPACE PER UNIT
415 UNITS X 1 SPACE = 415 SPACES

1 SPACE PER 10 UNITS (GUEST)
415 UNITS / 10 UNITS = 41.5 SPACES

TOTAL SPACES REQUIRED=456 SPACES REQUIRED

TOTAL PROVIDED
TOTAL INTERIOR = 360 SPACES
TOTAL SURFACE PARKING = 108

TOTAL SPACES PROVIDED = 468 SPACES

COMPACT SPARKING SPACE CALCULATION
456 SPACES x 25% = 114 SPACES BY RIGHT
67 SPACES PROVIDED (15%-COMPACT)

MISCELLANEOUS PARKING COUNT:

10 ELECTRIC VEHICLE CAPABLE SPACES
11 HANDICAP ACCESSIBLE PARKING SPACES

APPLICANT:

GOVENTURE CAPITAL GROUP, LLC
10 E. WORCESTER STREET, SUITE 3A
WORCESTER, MASSACHUSETTS 01605

PROJECT INFORMATION

LAND INFORMATION

MAP/PARCEL:	04-015/2A,3,3A,4,5,13,14,15,16,23,17+24
DEED BOOK/PAGE:	VARIUS
PROPOSED FRONTAGE:	303.76 FT
PROPOSED AREA:	3.89 ACRES±

ZONING INFORMATION

ZONING DISTRICT: BUSINESS, GENERAL (BG-3.0)
COMMERCIAL CORRIDORS OVERLAY DISTRICT ELSEWHERE (CCOD-E)
DOWNTOWN/BLACKSTONE CANAL SIGN OVERLAY DISTRICT (DSOD)

DIMENSIONAL REQUIREMENTS:

MINIMUM AREA:	5,000 SF
MINIMUM FRONTAGE:	40 FEET PER UNIT (UP TO 200')
MAXIMUM HEIGHT:	100 FEET
MINIMUM SETBACKS:	
FRONT YARD:	N/A
SIDE YARD:	N/A
REAR YARD:	10 FT
FLOOR AREA RATIO:	3:1 (BUILDING:LAND)

GENERAL NOTES:

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DEFINITIVE SITE PLAN

LEGEND

CONTOURS
PROPERTY LINES
SEWER
DRAIN
WATER
GAS
ELEC/TELE/CABLE
EDGE OF PAVEMENT
BITUMINOUS CURB
GUARDRAIL
EROSION CONTROL
FENCE
FIRE SERVICE
SEWER MANHOLE (SMH)
DRAIN MANHOLE (DMH)
CATCH BASIN (DCB)
SIGN
UTILITY POLE
LIGHT POLE
WATER SHUT OFF
WATER VALVE
GAS VALVE
HYDRANT

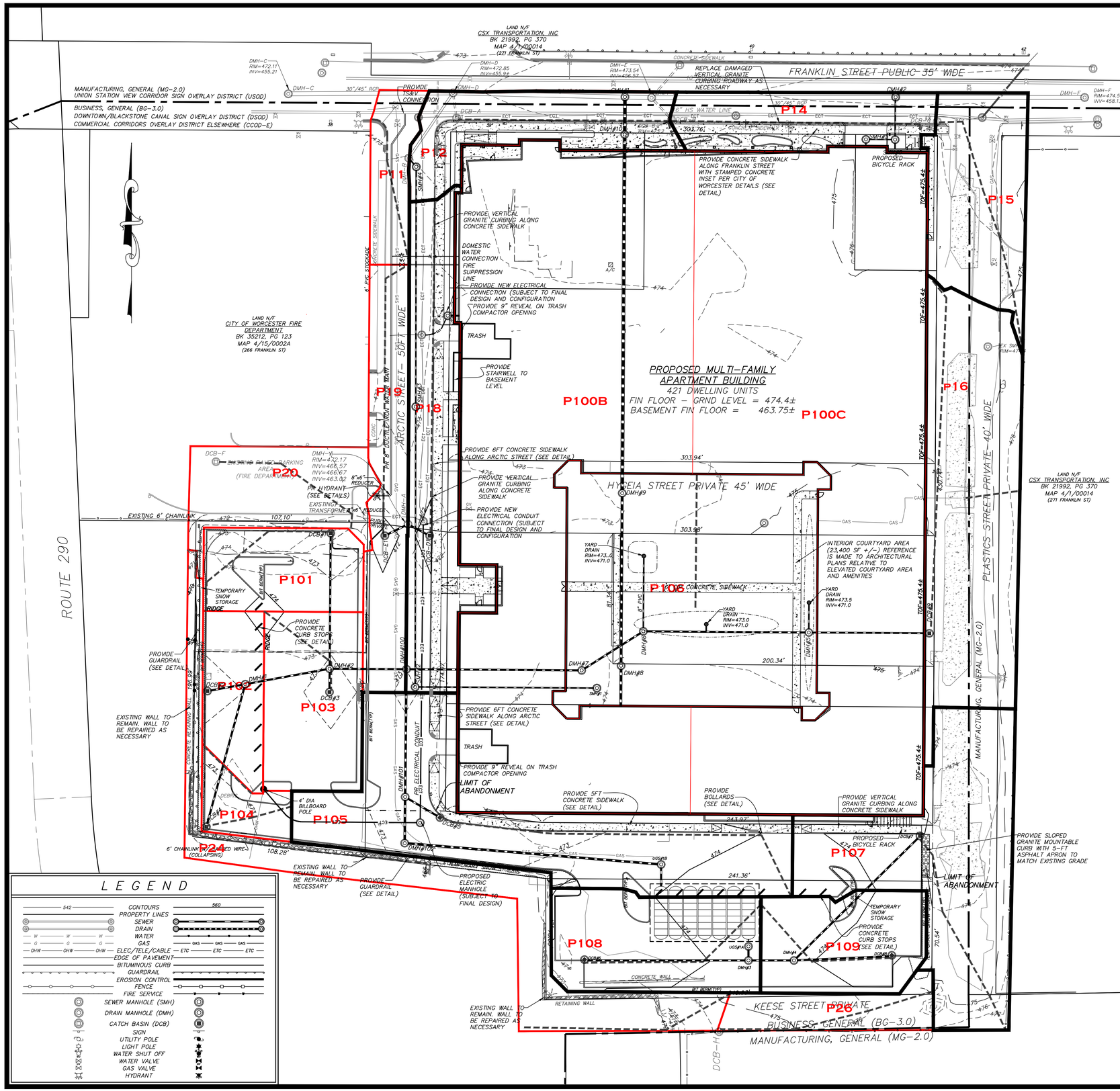
HANNIGAN ENGINEERING, INC.
CIVIL ENGINEERS & LAND SURVEYORS
8 MONUMENT SQUARE
LEOMINSTER, MASSACHUSETTS 01453
(978) 534-1234 (T)
(978) 534-6060 (F)
WWW.HANNIGANENGINEERING.COM

EXISTING WATERSHED PLAN IN WORCESTER, MASSACHUSETTS

PREPARED FOR:
GOVENTURE CAPITAL GROUP, LLC.
BRENDAN GOVE
10 E. WORCESTER ST.
WORCESTER, MASSACHUSETTS 01604
TEL:

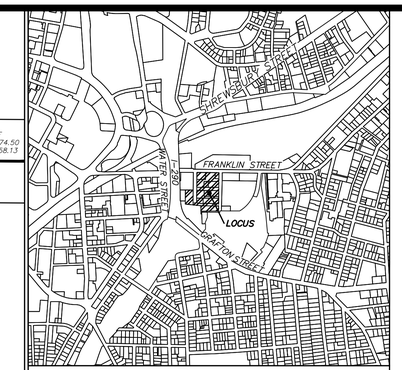
GRAPHIC SCALE: 1"=30'
0 10 20 30 40 50 75 100 125 FEET
0 5 10 15 20 25 30 35 METERS

CALC: CMA/WDH	DRWN: CMA/WDH	SCALE: 1"=30'
CHKD: WDH	APPD: WDH	DATE: NOV 12, 2021
SRV: JHG	FB: 71-144	JOB NO: 3030
TAB: WS	SHEET 1 OF 2	PLAN NO: FILE



LEGEND

CONTOURS	542 / 560
PROPERTY LINES	
SEWER	
DRAIN	
WATER	W
GAS	G
ELEC/TELE/CABLE	OHW / ETC
EDGE OF PAVEMENT	
BITUMINOUS CURB	
GUARDRAIL	
EROSION CONTROL FENCE	
FIRE SERVICE	
SEWER MANHOLE (SMH)	
DRAIN MANHOLE (DMH)	
CATCH BASIN (DCB)	
SIGN	
UTILITY POLE	
LIGHT POLE	
WATER SHUT OFF	
WATER VALVE	
GAS VALVE	
HYDRANT	



VICINITY MAP SCALE: 1"=1,000'

PARKING CALCULATION:
MULTI-FAMILY RESIDENTIAL CCOD-E DISTRICT

PER ZONING ORDINANCE
1 SPACE PER UNIT
415 UNITS X 1 SPACE = 415 SPACES

1 SPACE PER 10 UNITS (GUEST)
415 UNITS / 10 UNITS = 41.5 SPACES

TOTAL SPACES REQUIRED=456 SPACES REQUIRED

TOTAL PROVIDED
TOTAL INTERIOR = 360 SPACES
TOTAL SURFACE PARKING = 108

TOTAL SPACES PROVIDED = 468 SPACES

COMPACT SPARKING SPACE CALCULATION
456 SPACES x 25% = 114 SPACES BY RIGHT
67 SPACES PROVIDED (15%-COMPACT)

MISCELLANEOUS PARKING COUNT:
10 ELECTRIC VEHICLE CAPABLE SPACES
11 HANDICAP ACCESSIBLE PARKING SPACES

APPLICANT:
GOVENTURE CAPITAL GROUP, LLC
10 E. WORCESTER STREET, SUITE 3A
WORCESTER, MASSACHUSETTS 01605

PROJECT INFORMATION

LAND INFORMATION

MAP/PARCEL:	04-015/2A,3,3A,4,5,13,14,15,16,23,17+24
DEED BOOK/PAGE:	VARIUS
PROPOSED FRONTAGE:	303.76 FT
PROPOSED AREA:	3.89 ACRES±

ZONING INFORMATION

ZONING DISTRICT: BUSINESS, GENERAL (BG-3.0)
COMMERCIAL CORRIDORS OVERLAY DISTRICT ELSEWHERE (CCOD-E)
DOWNTOWN/BLACKSTONE CANAL SIGN OVERLAY DISTRICT (DSOD)

DIMENSIONAL REQUIREMENTS:

MINIMUM AREA:	5,000 SF
MINIMUM FRONTAGE:	40 FEET PER UNIT (UP TO 200')
MAXIMUM HEIGHT:	100 FEET
MINIMUM SETBACKS:	
FRONT YARD:	N/A
SIDE YARD:	N/A
REAR YARD:	10 FT
FLOOR AREA RATIO:	3:1 (BUILDING:LAND)

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